



# FCC SAR TEST REPORT

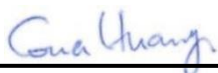
FCC ID : 2AJN7-TP00109B  
Equipment : Notebook Computer  
Brand Name : Lenovo  
Model Name : TP00109B  
Marketing Name : ThinkPad X1 Carbon Gen 8  
Applicant : LC Future Center Limited Taiwan Branch  
7F., No.780, Bei'an Rd., Zhongshan Dist., Taipei City 104,  
Taiwan  
Manufacturer : LC Future Center Limited Taiwan Branch  
7F., No.780, Bei'an Rd., Zhongshan Dist., Taipei City 104,  
Taiwan  
Standard : FCC 47 CFR Part 2 (2.1093)  
ANSI/IEEE C95.1-1992  
IEEE 1528-2013

Equipment : Fibocom L860-GL tested inside of Lenovo Notebook.

The product was received on Oct. 30, 2019 and testing was started from Nov. 02, 2019 and completed on Nov. 04, 2019. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.



Approved by: Cona Huang / Deputy Manager

**SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory**



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## History of this test report

| Report No. | Version | Description             | Issued Date   |
|------------|---------|-------------------------|---------------|
| FA9O1135   | 01      | Initial issue of report | Dec. 24, 2019 |
|            |         |                         |               |
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|            |         |                         |               |

## 1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for **LC Future Center Limited Taiwan Branch, Notebook Computer, TP00109B** are as follows.

| Equipment Class  | Frequency Band   | Highest SAR Summary     | Highest Simultaneous Transmission<br>1g SAR (W/kg) |
|------------------|------------------|-------------------------|----------------------------------------------------|
|                  |                  | Body                    |                                                    |
|                  |                  | 1g SAR (W/kg)           |                                                    |
| Licensed         | WCDMA II         | 1.03                    | 1.59                                               |
|                  | WCDMA IV         | 1.17                    |                                                    |
|                  | WCDMA V          | 1.13                    |                                                    |
|                  | LTE Band 7       | 1.18                    |                                                    |
|                  | LTE Band 12 / 17 | 1.12                    |                                                    |
|                  | LTE Band 13      | 1.12                    |                                                    |
|                  | LTE Band 14      | 1.14                    |                                                    |
|                  | LTE Band 2 / 25  | 1.15                    |                                                    |
|                  | LTE Band 5 / 26  | 1.01                    |                                                    |
|                  | LTE Band 30      | 0.98                    |                                                    |
|                  | LTE Band 38 / 41 | 1.16                    |                                                    |
|                  | LTE Band 4 / 66  | 1.04                    |                                                    |
| Date of Testing: |                  | 2019/11/02 ~ 2019/11/04 |                                                    |

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC test.(FCC). This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg for Partial-Body 1g SAR, 4.0 W/kg for Product Specific 10g SAR) specified in FCC 47 CFR part 2 (2.1093) and ANSI/IEEE C95.1-1992, and had been tested in accordance with the measurement methods and procedures specified in IEEE 1528-2013 and FCC KDB publications

**Reviewed by: Jason Wang**

**Report Producer: Daisy Peng**



## **2. Guidance Applied**

The Specific Absorption Rate (SAR) testing specification, method, and procedure for this device is in accordance with the following standards:

- FCC 47 CFR Part 2 (2.1093)
- ANSI/IEEE C95.1-1992
- IEEE 1528-2013
- FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
- FCC KDB 865664 D02 SAR Reporting v01r02
- FCC KDB 447498 D01 General RF Exposure Guidance v06
- FCC KDB 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB 616217 D04 SAR for laptop and tablets v01r02
- FCC KDB 941225 D01 3G SAR Procedures v03r01
- FCC KDB 941225 D05 SAR for LTE Devices v02r05
- FCC KDB 941225 D05A Rel.10 LTE SAR Test Guidance v01r02

### **3. Equipment Under Test (EUT) Information**

#### **3.1 General Information**

| Product Feature & Specification                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Equipment Name                                                                                                                                                                                              | Notebook Computer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Brand Name                                                                                                                                                                                                  | Lenovo                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Model Name                                                                                                                                                                                                  | TP00109B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Marketing Name                                                                                                                                                                                              | ThinkPad X1 Carbon Gen 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| FCC ID                                                                                                                                                                                                      | 2AJN7-TP00109B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Integrated WWAN Module                                                                                                                                                                                      | Brand Name: Fibocom<br>Model Name: L860-GL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Integrated NFC Module                                                                                                                                                                                       | Brand Name: FOXCONN<br>Model Name: T77H747                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Wireless Technology and Frequency Range                                                                                                                                                                     | WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz<br>WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz<br>WCDMA Band V: 826.4 MHz ~ 846.6 MHz<br>LTE Band 2: 1850.7 MHz ~ 1909.3 MHz<br>LTE Band 4: 1710.7 MHz ~ 1754.3 MHz<br>LTE Band 5: 824.7 MHz ~ 848.3 MHz<br>LTE Band 7: 2502.5 MHz ~ 2567.5 MHz<br>LTE Band 12: 699.7 MHz ~ 715.3 MHz<br>LTE Band 13: 779.5 MHz ~ 784.5 MHz<br>LTE Band 14: 790.5 MHz ~ 795.5 MHz<br>LTE Band 17: 706.5 MHz ~ 713.5 MHz<br>LTE Band 25: 1850.7 MHz ~ 1914.3 MHz<br>LTE Band 26: 814.7 MHz ~ 848.3 MHz<br>LTE Band 30: 2307.5 MHz ~ 2312.5 MHz<br>LTE Band 38: 2572.5 MHz ~ 2617.5 MHz<br>LTE Band 41: 2498.5 MHz ~ 2687.5 MHz<br>LTE Band 66: 1710.7 MHz ~ 1779.3 MHz<br>NFC : 13.56 MHz |
| Mode                                                                                                                                                                                                        | RMC 12.2Kbps<br>HSDPA<br>HSUPA<br>DC-HSDPA<br>LTE: QPSK, 16QAM, 64QAM<br>NFC:ASK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Remark:</b><br>1. For WWAN RF exposure evaluation is selected antenna vendor of "Amphenol" as the main tested and spot check antenna vendor of "Speedwire" to ensure both antenna vendors are compliant. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| WWAN Antenna Information |              |                     |                 |                     |
|--------------------------|--------------|---------------------|-----------------|---------------------|
| Antenna 1                | Manufacturer | Amphenol            | Peak gain (dbi) | CE:1.17<br>FCC:1.12 |
|                          | Part number  | LXA113-16-000-C     | Type            | PIFA                |
| Antenna 2                | Manufacturer | SPEEDWIRE           | Peak gain (dbi) | CE:1.25<br>FCC:1.63 |
|                          | Part number  | F.0G.ZV-0009-001-00 | Type            | PIFA                |

| WLAN Module Information                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Brand Name                                                                                                                                                                                                                                                                              | Intel                                                                                                                                                                                                                                       |
| Model Name                                                                                                                                                                                                                                                                              | AX201D2W                                                                                                                                                                                                                                    |
| Wireless Technology and Frequency Range                                                                                                                                                                                                                                                 | WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz<br>WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz<br>WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz<br>WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz<br>WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz<br>Bluetooth: 2402 MHz ~ 2480 MHz |
| Mode                                                                                                                                                                                                                                                                                    | WLAN: 802.11a/b/g/n/ac/ax HT20 / HT40 / VHT20 / VHT40 / VHT80 / VHT160 / HE20 / HE40 / HE80 / HE160<br>Bluetooth BR/EDR/LE/HS                                                                                                               |
| EUT Stage                                                                                                                                                                                                                                                                               | Production Unit                                                                                                                                                                                                                             |
| <b>Remark:</b>                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                             |
| 1. The Intel AX201D2W WLAN/BT module integrated in this host, the 2.4GHz/5 GHz WLAN and Bluetooth SAR results are referenced from the report of FCC ID: PD9AX201D2 (SAR Report No. 180717-03.TR11) , and these SAR results are also used to perform simultaneous transmission analysis. |                                                                                                                                                                                                                                             |

### 3.2 General LTE SAR Test and Reporting Considerations

| Summarized necessary items addressed in KDB 941225 D05 v02r05 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                               |         |       |        |        |        |          |
|---------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|---------|-------|--------|--------|--------|----------|
| FCC ID                                                        |  | 2AJN7-TP00109B                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                               |         |       |        |        |        |          |
| Equipment Name                                                |  | Notebook Computer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                               |         |       |        |        |        |          |
| Operating Frequency Range of each LTE transmission band       |  | LTE Band 2: 1850.7 MHz ~ 1909.3 MHz<br>LTE Band 4: 1710.7 MHz ~ 1754.3 MHz<br>LTE Band 5: 824.7 MHz ~ 848.3 MHz<br>LTE Band 7: 2502.5 MHz ~ 2567.5 MHz<br>LTE Band 12: 699.7 MHz ~ 715.3 MHz<br>LTE Band 13: 779.5 MHz ~ 784.5 MHz<br>LTE Band 14: 790.5 MHz ~ 795.5 MHz<br>LTE Band 17: 706.5 MHz ~ 713.5 MHz<br>LTE Band 25: 1850.7 MHz ~ 1914.3 MHz<br>LTE Band 26: 814.7 MHz ~ 848.3 MHz<br>LTE Band 30: 2307.5 MHz ~ 2312.5 MHz<br>LTE Band 38: 2572.5 MHz ~ 2617.5 MHz<br>LTE Band 41: 2498.5 MHz ~ 2687.5 MHz<br>LTE Band 66: 1710.7 MHz ~ 1779.3 MHz                                             |                                                               |         |       |        |        |        |          |
| Channel Bandwidth                                             |  | LTE Band 02:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 04:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 05:1.4MHz, 3MHz, 5MHz, 10MHz<br>LTE Band 07: 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz<br>LTE Band 13: 5MHz, 10MHz<br>LTE Band 14: 5MHz, 10MHz<br>LTE Band 17: 5MHz, 10MHz<br>LTE Band 25:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 26:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz<br>LTE Band 30: 5MHz, 10MHz<br>LTE Band 38: 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 41: 5MHz, 10MHz, 15MHz, 20MHz<br>LTE Band 66:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz |                                                               |         |       |        |        |        |          |
| uplink modulations used                                       |  | QPSK / 16QAM / 64QAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                               |         |       |        |        |        |          |
| LTE Voice / Data requirements                                 |  | Data only                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                               |         |       |        |        |        |          |
| LTE MPR permanently built-in by design                        |  | Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                               |         |       |        |        |        |          |
|                                                               |  | Modulation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Channel bandwidth / Transmission bandwidth (N <sub>RB</sub> ) |         |       |        |        |        | MPR (dB) |
|                                                               |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1.4 MHz                                                       | 3.0 MHz | 5 MHz | 10 MHz | 15 MHz | 20 MHz |          |
|                                                               |  | QPSK                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | > 5                                                           | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 1      |
|                                                               |  | 16 QAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ≤ 5                                                           | ≤ 4     | ≤ 8   | ≤ 12   | ≤ 16   | ≤ 18   | ≤ 1      |
|                                                               |  | 16 QAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | > 5                                                           | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 2      |
|                                                               |  | 64 QAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ≤ 5                                                           | ≤ 4     | ≤ 8   | ≤ 12   | ≤ 16   | ≤ 18   | ≤ 2      |
|                                                               |  | 64 QAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | > 5                                                           | > 4     | > 8   | > 12   | > 16   | > 18   | ≤ 3      |
|                                                               |  | 256 QAM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                               |         |       |        |        | ≥ 1    | ≤ 5      |
| LTE A-MPR                                                     |  | In the base station simulator configuration, Network Setting value is set to NS_01 to disable A-MPR during SAR testing and the LTE SAR tests was transmitting on all TTI frames (Maximum TTI)                                                                                                                                                                                                                                                                                                                                                                                                            |                                                               |         |       |        |        |        |          |
| Spectrum plots for RB configuration                           |  | A properly configured base station simulator was used for the SAR and power measurement; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.                                                                                                                                                                                                                                                                                                                                                                                                   |                                                               |         |       |        |        |        |          |
| Power reduction applied to satisfy SAR compliance             |  | Yes, Proximity Sensor and G-sensor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                               |         |       |        |        |        |          |
| LTE Carrier Aggregation Combinations                          |  | Inter-Band and Intra-Band possible combinations and the detail power measurement please referred to section 11.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                               |         |       |        |        |        |          |
| LTE Carrier Aggregation Additional Information                |  | This device supports maximum of 5 carriers in the downlink. Additional following LTE Release features are not supported: Relay, HetNet, Enhanced MIMO, eICI, WiFi Offloading, MDH, eMBMA, Cross-Carrier Scheduling, Enhanced SC-FDMA.                                                                                                                                                                                                                                                                                                                                                                    |                                                               |         |       |        |        |        |          |

| Transmission (H, M, L) channel numbers and frequencies in each LTE band |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |  |  |
|-------------------------------------------------------------------------|-------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|--|--|
| LTE Band 2                                                              |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |  |  |
|                                                                         | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz  |             | Bandwidth 5 MHz  |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |  |  |
|                                                                         | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |  |  |
| L                                                                       | 18607             | 1850.7      | 18615            | 1851.5      | 18625            | 1852.5      | 18650            | 1855        | 18675            | 1857.5      | 18700            | 1860        |  |  |
| M                                                                       | 18900             | 1880        | 18900            | 1880        | 18900            | 1880        | 18900            | 1880        | 18900            | 1880        | 18900            | 1880        |  |  |
| H                                                                       | 19193             | 1909.3      | 19185            | 1908.5      | 19175            | 1907.5      | 19150            | 1905        | 19125            | 1902.5      | 19100            | 1900        |  |  |
| LTE Band 4                                                              |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |  |  |
|                                                                         | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz  |             | Bandwidth 5 MHz  |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |  |  |
|                                                                         | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |  |  |
| L                                                                       | 19957             | 1710.7      | 19965            | 1711.5      | 19975            | 1712.5      | 20000            | 1715        | 20025            | 1717.5      | 20050            | 1720        |  |  |
| M                                                                       | 20175             | 1732.5      | 20175            | 1732.5      | 20175            | 1732.5      | 20175            | 1732.5      | 20175            | 1732.5      | 20175            | 1732.5      |  |  |
| H                                                                       | 20393             | 1754.3      | 20385            | 1753.5      | 20375            | 1752.5      | 20350            | 1750        | 20325            | 1747.5      | 20300            | 1745        |  |  |
| LTE Band 5                                                              |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |  |  |
|                                                                         | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz  |             | Bandwidth 5 MHz  |             | Bandwidth 10 MHz |             |                  |             |                  |             |  |  |
|                                                                         | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |  |  |
| L                                                                       | 20407             | 824.7       | 20415            | 825.5       | 20425            | 826.5       | 20450            | 829         |                  |             |                  |             |  |  |
| M                                                                       | 20525             | 836.5       | 20525            | 836.5       | 20525            | 836.5       | 20525            | 836.5       |                  |             |                  |             |  |  |
| H                                                                       | 20643             | 848.3       | 20635            | 847.5       | 20625            | 846.5       | 20600            | 844         |                  |             |                  |             |  |  |
| LTE Band 7                                                              |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |  |  |
|                                                                         | Bandwidth 5 MHz   |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |                  |             |                  |             |  |  |
|                                                                         | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |  |  |
| L                                                                       | 20775             | 2502.5      | 20800            | 2505        | 20825            | 2507.5      | 20850            | 2510        |                  |             |                  |             |  |  |
| M                                                                       | 21100             | 2535        | 21100            | 2535        | 21100            | 2535        | 21100            | 2535        |                  |             |                  |             |  |  |
| H                                                                       | 21425             | 2567.5      | 21400            | 2565        | 21375            | 2562.5      | 21350            | 2560        |                  |             |                  |             |  |  |
| LTE Band 12                                                             |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |  |  |
|                                                                         | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz  |             | Bandwidth 5 MHz  |             | Bandwidth 10 MHz |             |                  |             |                  |             |  |  |
|                                                                         | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |  |  |
| L                                                                       | 23017             | 699.7       | 23025            | 700.5       | 23035            | 701.5       | 23060            | 704         |                  |             |                  |             |  |  |
| M                                                                       | 23095             | 707.5       | 23095            | 707.5       | 23095            | 707.5       | 23095            | 707.5       |                  |             |                  |             |  |  |
| H                                                                       | 23173             | 715.3       | 23165            | 714.5       | 23155            | 713.5       | 23130            | 711         |                  |             |                  |             |  |  |
| LTE Band 13                                                             |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |  |  |
|                                                                         | Bandwidth 5 MHz   |             |                  |             | Bandwidth 10 MHz |             |                  |             |                  |             |                  |             |  |  |
|                                                                         | Channel #         |             | Freq.(MHz)       |             | Channel #        |             | Freq.(MHz)       |             |                  |             |                  |             |  |  |
| L                                                                       | 23205             |             | 779.5            |             | 23230            |             | 782              |             |                  |             |                  |             |  |  |
| M                                                                       | 23230             |             | 782              |             |                  |             |                  |             |                  |             |                  |             |  |  |
| H                                                                       | 23255             |             | 784.5            |             |                  |             |                  |             |                  |             |                  |             |  |  |
| LTE Band 14                                                             |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |  |  |
|                                                                         | Bandwidth 5 MHz   |             |                  |             | Bandwidth 10 MHz |             |                  |             |                  |             |                  |             |  |  |
|                                                                         | Channel #         |             | Channel #        |             | Channel #        |             | Freq.(MHz)       |             |                  |             |                  |             |  |  |
| L                                                                       | 23305             |             | 790.5            |             | 23330            |             | 793              |             |                  |             |                  |             |  |  |
| M                                                                       | 23330             |             | 793              |             |                  |             |                  |             |                  |             |                  |             |  |  |
| H                                                                       | 23355             |             | 795.5            |             |                  |             |                  |             |                  |             |                  |             |  |  |
| LTE Band 17                                                             |                   |             |                  |             |                  |             |                  |             |                  |             |                  |             |  |  |
|                                                                         | Bandwidth 5 MHz   |             |                  |             | Bandwidth 10 MHz |             |                  |             |                  |             |                  |             |  |  |
|                                                                         | Channel #         |             | Freq.(MHz)       |             | Channel #        |             | Freq. (MHz)      |             |                  |             |                  |             |  |  |
| L                                                                       | 23755             |             | 706.5            |             | 23780            |             | 709              |             |                  |             |                  |             |  |  |
| M                                                                       | 23790             |             | 710              |             | 23790            |             | 710              |             |                  |             |                  |             |  |  |
| H                                                                       | 23825             |             | 713.5            |             | 23800            |             | 711              |             |                  |             |                  |             |  |  |

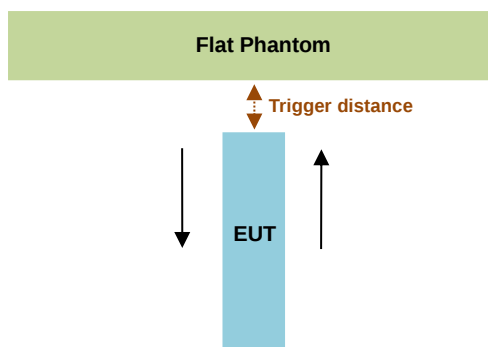
| LTE Band 25 |                   |             |                  |             |                  |                  |                  |             |                  |             |                  |             |
|-------------|-------------------|-------------|------------------|-------------|------------------|------------------|------------------|-------------|------------------|-------------|------------------|-------------|
|             | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz  |             | Bandwidth 5 MHz  |                  | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |
|             | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz)      | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L           | 26047             | 1850.7      | 26055            | 1851.5      | 26065            | 1852.5           | 26090            | 1855        | 26115            | 1857.5      | 26140            | 1860        |
| M           | 26340             | 1880        | 26340            | 1880        | 26340            | 1880             | 26340            | 1880        | 26340            | 1880        | 26340            | 1880        |
| H           | 26683             | 1914.3      | 26675            | 1913.5      | 26665            | 1912.5           | 26640            | 1910        | 26615            | 1907.5      | 26590            | 1905        |
| LTE Band 26 |                   |             |                  |             |                  |                  |                  |             |                  |             |                  |             |
|             | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz  |             | Bandwidth 5 MHz  |                  | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             |                  |             |
|             | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz)      | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L           | 26697             | 814.7       | 26705            | 815.5       | 26715            | 816.5            | 26740            | 819         | 26765            | 821.5       | 26790            | 824.5       |
| M           | 26865             | 831.5       | 26865            | 831.5       | 26865            | 831.5            | 26865            | 831.5       | 26865            | 831.5       | 26865            | 831.5       |
| H           | 27033             | 848.3       | 27025            | 847.5       | 27015            | 846.5            | 26990            | 844         | 26965            | 841.5       | 26940            | 838.5       |
| LTE Band 30 |                   |             |                  |             |                  |                  |                  |             |                  |             |                  |             |
|             | Bandwidth 5 MHz   |             |                  |             |                  | Bandwidth 10 MHz |                  |             |                  |             |                  |             |
|             | Channel #         |             |                  | Freq.(MHz)  |                  | Channel #        |                  |             | Freq.(MHz)       |             |                  |             |
| L           | 27685             |             |                  | 2307.5      |                  | 27710            |                  |             | 2310             |             |                  |             |
| M           | 27710             |             |                  | 2310        |                  |                  |                  |             |                  |             |                  |             |
| H           | 27735             |             |                  | 2312.5      |                  |                  |                  |             |                  |             |                  |             |
| LTE Band 38 |                   |             |                  |             |                  |                  |                  |             |                  |             |                  |             |
|             | Bandwidth 5 MHz   |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |                  | Bandwidth 20 MHz |             |                  |             |                  |             |
|             | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz)      | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L           | 37775             | 2572.5      | 37800            | 2575        | 37825            | 2577.5           | 37850            | 2580        | 37875            | 2582.5      | 37900            | 2585        |
| M           | 38000             | 2595        | 38000            | 2595        | 38000            | 2595             | 38000            | 2595        | 38000            | 2595        | 38000            | 2595        |
| H           | 38225             | 2617.5      | 38200            | 2615        | 38175            | 2612.5           | 38150            | 2610        | 38125            | 2607.5      | 38100            | 2605        |
| LTE Band 41 |                   |             |                  |             |                  |                  |                  |             |                  |             |                  |             |
|             | Bandwidth 5 MHz   |             | Bandwidth 10 MHz |             | Bandwidth 15 MHz |                  | Bandwidth 20 MHz |             |                  |             |                  |             |
|             | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz)      | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L           | 39675             | 2498.5      | 39700            | 2501        | 39725            | 2503.5           | 39750            | 2506        | 39775            | 2508.5      | 39800            | 2511        |
| L<br>M      | 40148             | 2545.8      | 40160            | 2547        | 40173            | 2548.3           | 40185            | 2549.5      | 40197            | 2550.7      | 40210            | 2552        |
| M           | 40620             | 2593        | 40620            | 2593        | 40620            | 2593             | 40620            | 2593        | 40620            | 2593        | 40620            | 2593        |
| H<br>M      | 41093             | 2640.3      | 41080            | 2639        | 41068            | 2637.8           | 41055            | 2636.5      | 41042            | 2635.2      | 41030            | 2634        |
| H           | 41565             | 2687.5      | 41540            | 2685        | 41515            | 2682.5           | 41490            | 2680        | 41465            | 2677.5      | 41440            | 2675        |
| LTE Band 66 |                   |             |                  |             |                  |                  |                  |             |                  |             |                  |             |
|             | Bandwidth 1.4 MHz |             | Bandwidth 3 MHz  |             | Bandwidth 5 MHz  |                  | Bandwidth 10 MHz |             | Bandwidth 15 MHz |             | Bandwidth 20 MHz |             |
|             | Ch. #             | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz)      | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) | Ch. #            | Freq. (MHz) |
| L           | 131979            | 1710.7      | 131987           | 1711.5      | 131997           | 1712.5           | 132022           | 1715        | 132047           | 1717.5      | 132072           | 1720        |
| M           | 132322            | 1745        | 132322           | 1745        | 132322           | 1745             | 132322           | 1745        | 132322           | 1745        | 132322           | 1745        |
| H           | 132665            | 1779.3      | 132657           | 1778.5      | 132647           | 1777.5           | 132622           | 1775        | 132597           | 1772.5      | 132572           | 1770        |

## 4. Proximity Sensor Triggering Test

### <Proximity Sensor Triggering Distance (KDB 616217 D04 section 6.2)>:

Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed. The details are illustrated in the exhibit “P-Sensor operational description”, and the shortest triggering distances were reported and used for SAR assessment.

In the preliminary triggering distance testing, the tissue-equivalent medium for different frequency bands were used for verification; no other frequency bands tissue-equivalent medium was found to result in shortest triggering distance than that for 1900MHz, and the tissue-equivalent medium for 1900MHz was used for formal proximity sensor triggering testing.



| Proximity Sensor Trigger Distance (mm) |                  |             |
|----------------------------------------|------------------|-------------|
| Position                               | Bottom of Laptop |             |
| Position                               | Moving towards   | Moving away |
| Minimum                                | 11               | 12          |

### <Proximity Sensor Triggering Coverage (KDB 616217 D04 section 6.3)>:

If a sensor is spatially offset from the antenna(s), it is necessary to verify sensor triggering for conditions where the antenna is next to the user but the sensor is laterally further away to ensure sensor coverage is sufficient for reducing the power to maintain compliance. For p-sensor coverage testing, the device is moved and “along the direction of maximum antenna and sensor offset”.

Illustrated in the internal photo exhibit, although the sensor is spatially offset, there is no trigger condition where the antenna is next to the user but the sensor is laterally further away, therefore proximity sensor coverage testing is not required.

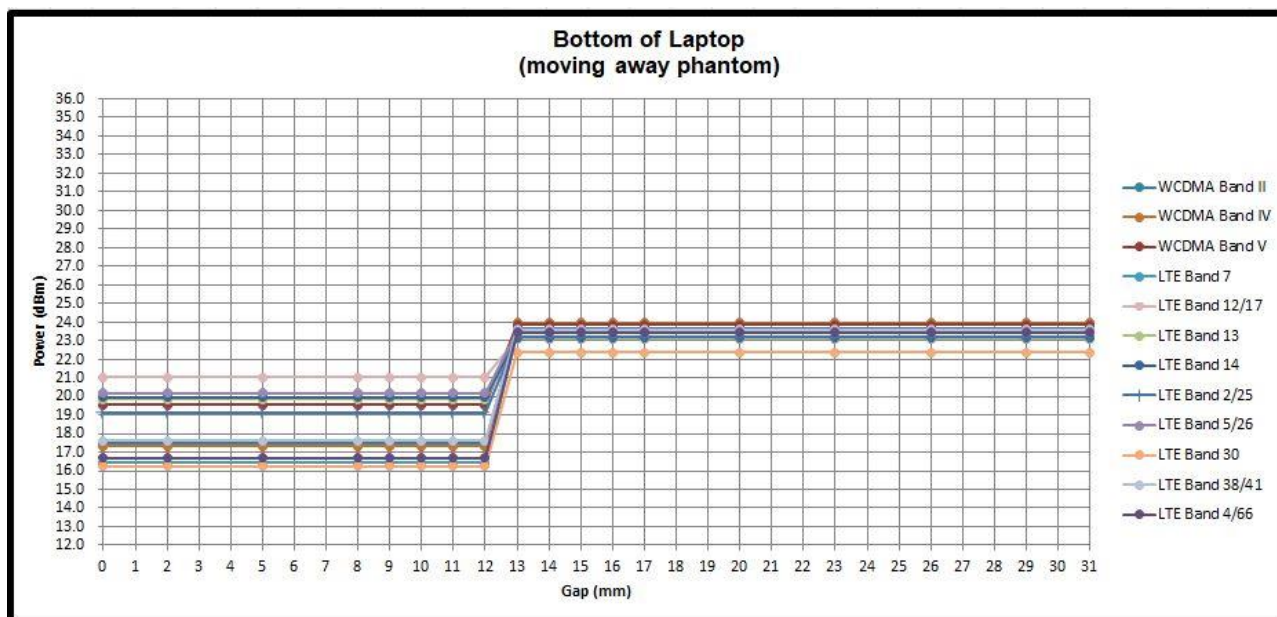
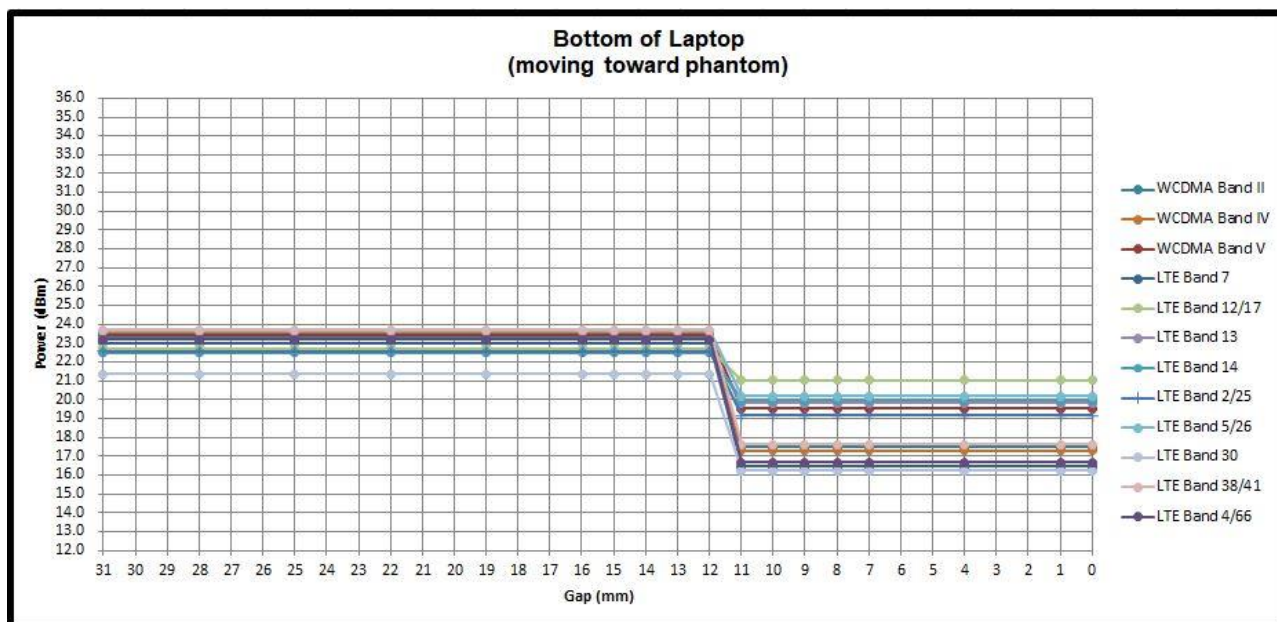
This procedure is not required because antenna and sensor are collocated and the peak SAR location is overlapping with the sensor.

**Proximity sensor power reduction**

| Exposure Position / wireless mode | Bottom of Laptop <sup>(1)</sup> |
|-----------------------------------|---------------------------------|
| WCDMA Band V                      | 4.0 dB                          |
| WCDMA Band II                     | 6.5 dB                          |
| WCDMA Band IV                     | 6.5 dB                          |
| LTE Band 2                        | 5.5 dB                          |
| LTE Band 4                        | 7.0 dB                          |
| LTE Band 5                        | 4.5 dB                          |
| LTE Band 7                        | 7.0 dB                          |
| LTE Band 12                       | 1.5 dB                          |
| LTE Band 13                       | 3.0 dB                          |
| LTE Band 14                       | 3.0 dB                          |
| LTE Band 17                       | 2.0 dB                          |
| LTE Band 25                       | 5.5 dB                          |
| LTE Band 26                       | 4.5 dB                          |
| LTE Band 30                       | 6.0 dB                          |
| LTE Band 38                       | 5.0 dB                          |
| LTE Band 41                       | 6.0 dB                          |
| LTE Band 66                       | 7.0 dB                          |

**Remark:**

- <sup>(1)</sup>: Reduced maximum limit applied by activation of proximity sensor and G-sensor
- Power reduction is not applicable for WLAN and Bluetooth.
- Tests were performed in accordance with KDB 616217 D04 section 6.1, 6.2, 6.3, 6.4 and 6.5 and compliant results are shown and described in exhibit "P-Sensor operational description"
- For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance was performed:
  - Bottom of Laptop: [10 mm](#)

**<Sensor triggers distance V.S Measure power>**


## **5. RF Exposure Limits**

### **5.1 Uncontrolled Environment**

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

### **5.2 Controlled Environment**

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

**Limits for Occupational/Controlled Exposure (W/kg)**

| Whole-Body | Partial-Body | Hands, Wrists, Feet and Ankles |
|------------|--------------|--------------------------------|
| 0.4        | 8.0          | 20.0                           |

**Limits for General Population/Uncontrolled Exposure (W/kg)**

| Whole-Body | Partial-Body | Hands, Wrists, Feet and Ankles |
|------------|--------------|--------------------------------|
| 0.08       | 1.6          | 4.0                            |

1. Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.

## **6. Specific Absorption Rate (SAR)**

### **6.1 Introduction**

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

### **6.2 SAR Definition**

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt} \left( \frac{dW}{dm} \right) = \frac{d}{dt} \left( \frac{dW}{\rho dv} \right)$$

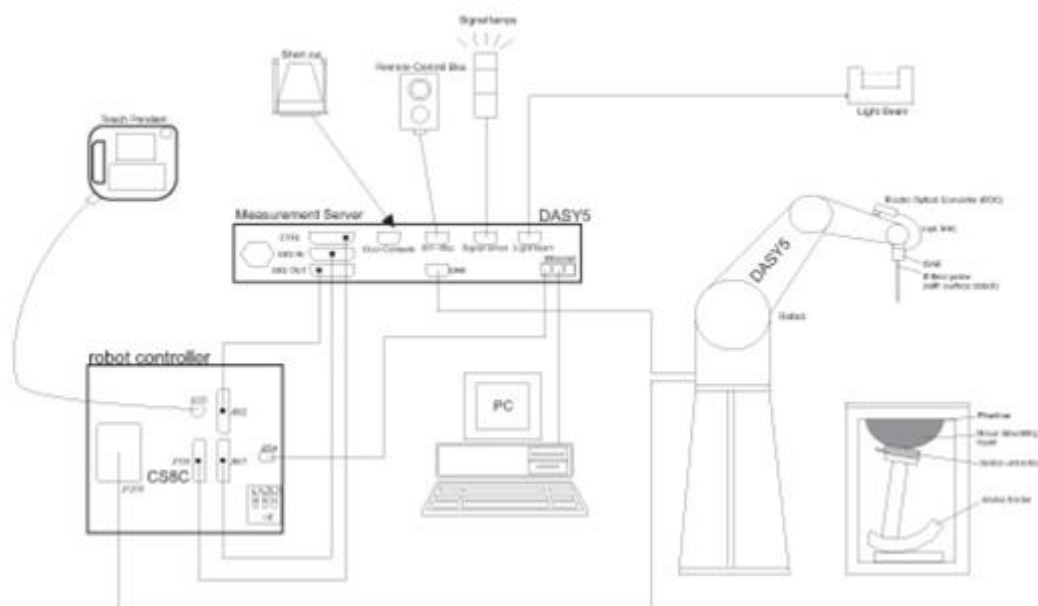
SAR is expressed in units of Watts per kilogram (W/kg)

$$SAR = \frac{\sigma |E|^2}{\rho}$$

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

## **7. System Description and Setup**

The DASY system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

## 7.1 E-Field Probe

The SAR measurement is conducted with the dosimetric probe (manufactured by SPEAG). The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency. This probe has a built in optical surface detection system to prevent from collision with phantom.

### <ES3DV3 Probe>

|                      |                                                                                                                                                                                  |                                                                                    |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Construction</b>  | Symmetric design with triangular core<br>Interleaved sensors<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |  |
| <b>Frequency</b>     | 10 MHz – 4 GHz;<br>Linearity: $\pm 0.2$ dB (30 MHz – 4 GHz)                                                                                                                      |                                                                                    |
| <b>Directivity</b>   | $\pm 0.2$ dB in TSL (rotation around probe axis)<br>$\pm 0.3$ dB in TSL (rotation normal to probe axis)                                                                          |                                                                                    |
| <b>Dynamic Range</b> | 5 $\mu$ W/g – >100 mW/g;<br>Linearity: $\pm 0.2$ dB                                                                                                                              |                                                                                    |
| <b>Dimensions</b>    | Overall length: 337 mm (tip: 20 mm)<br>Tip diameter: 3.9 mm (body: 12 mm)<br>Distance from probe tip to dipole centers: 3.0 mm                                                   |                                                                                    |

### <EX3DV4 Probe>

|                      |                                                                                                                                                           |                                                                                     |
|----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Construction</b>  | Symmetric design with triangular core<br>Built-in shielding against static charges<br>PEEK enclosure material (resistant to organic solvents, e.g., DGBE) |  |
| <b>Frequency</b>     | 10 MHz – >6 GHz<br>Linearity: $\pm 0.2$ dB (30 MHz – 6 GHz)                                                                                               |                                                                                     |
| <b>Directivity</b>   | $\pm 0.3$ dB in TSL (rotation around probe axis)<br>$\pm 0.5$ dB in TSL (rotation normal to probe axis)                                                   |                                                                                     |
| <b>Dynamic Range</b> | 10 $\mu$ W/g – >100 mW/g<br>Linearity: $\pm 0.2$ dB (noise: typically <1 $\mu$ W/g)                                                                       |                                                                                     |
| <b>Dimensions</b>    | Overall length: 337 mm (tip: 20 mm)<br>Tip diameter: 2.5 mm (body: 12 mm)<br>Typical distance from probe tip to dipole centers: 1 mm                      |                                                                                     |

## 7.2 Data Acquisition Electronics (DAE)

The data acquisition electronics (DAE) consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information as well as an optical uplink for commands and the clock.

The input impedance of the DAE is 200 MOhm; the inputs are symmetrical and floating. Common mode rejection is above 80 dB.



**Fig 5.1 Photo of DAE**

### **7.3 Phantom**

#### **<SAM Twin Phantom>**

|                          |                                                         |                                                                                    |
|--------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------|
| <b>Shell Thickness</b>   | 2 ± 0.2 mm;<br>Center ear point: 6 ± 0.2 mm             |  |
| <b>Filling Volume</b>    | Approx. 25 liters                                       |                                                                                    |
| <b>Dimensions</b>        | Length: 1000 mm; Width: 500 mm; Height: adjustable feet |                                                                                    |
| <b>Measurement Areas</b> | Left Hand, Right Hand, Flat Phantom                     |                                                                                    |

The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. A white cover is provided to tap the phantom during off-periods to prevent water evaporation and changes in the liquid parameters. On the phantom top, three reference markers are provided to identify the phantom position with respect to the robot.

#### **<ELI Phantom>**

|                        |                                                  |                                                                                     |
|------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------|
| <b>Shell Thickness</b> | 2 ± 0.2 mm (sagging: <1%)                        |  |
| <b>Filling Volume</b>  | Approx. 30 liters                                |                                                                                     |
| <b>Dimensions</b>      | Major ellipse axis: 600 mm<br>Minor axis: 400 mm |                                                                                     |

The ELI phantom is intended for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI4 is fully compatible with standard and all known tissue simulating liquids.

## **7.4 Device Holder**

### **<Mounting Device for Hand-Held Transmitter>**

In combination with the Twin SAM V5.0/V5.0c or ELI phantoms, the Mounting Device for Hand-Held Transmitters enables rotation of the mounted transmitter device to specified spherical coordinates. At the heads, the rotation axis is at the ear opening. Transmitter devices can be easily and accurately positioned according to IEC 62209-1, IEEE 1528, FCC, or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat). And upgrade kit to Mounting Device to enable easy mounting of wider devices like big smart-phones, e-books, small tablets, etc. It holds devices with width up to 140 mm.



Mounting Device for Hand-Held Transmitters



Mounting Device Adaptor for Wide-Phones

### **<Mounting Device for Laptops and other Body-Worn Transmitters>**

The extension is lightweight and made of POM, acrylic glass and foam. It fits easily on the upper part of the mounting device in place of the phone positioned. The extension is fully compatible with the SAM Twin and ELI phantoms.



Mounting Device for Laptops

## **8. Measurement Procedures**

The measurement procedures are as follows:

### <Conducted power measurement>

- (a) For WWAN power measurement, use base station simulator to configure EUT WWAN transmission in conducted connection with RF cable, at maximum power in each supported wireless interface and frequency band.
- (b) Read the WWAN RF power level from the base station simulator.
- (c) For WLAN/BT power measurement, use engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power in each supported wireless interface and frequency band
- (d) Connect EUT RF port through RF cable to the power meter, and measure WLAN/BT output power

### <SAR measurement>

- (a) Use base station simulator to configure EUT WWAN transmission in radiated connection, and engineering software to configure EUT WLAN/BT continuously transmission, at maximum RF power, in the highest power channel.
- (b) Place the EUT in the positions as Appendix D demonstrates.
- (c) Set scan area, grid size and other setting on the DASY software.
- (d) Measure SAR results for the highest power channel on each testing position.
- (e) Find out the largest SAR result on these testing positions of each band
- (f) Measure SAR results for other channels in worst SAR testing position if the reported SAR of highest power channel is larger than 0.8 W/kg

According to the test standard, the recommended procedure for assessing the peak spatial-average SAR value consists of the following steps:

- (a) Power reference measurement
- (b) Area scan
- (c) Zoom scan
- (d) Power drift measurement

### **8.1 Spatial Peak SAR Evaluation**

The procedure for spatial peak SAR evaluation has been implemented according to the test standard. It can be conducted for 1g and 10g, as well as for user-specific masses. The DASY software includes all numerical procedures necessary to evaluate the spatial peak SAR value.

The base for the evaluation is a "cube" measurement. The measured volume must include the 1g and 10g cubes with the highest averaged SAR values. For that purpose, the center of the measured volume is aligned to the interpolated peak SAR value of a previously performed area scan.

The entire evaluation of the spatial peak values is performed within the post-processing engine (SEMCAD). The system always gives the maximum values for the 1g and 10g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

- (a) Extraction of the measured data (grid and values) from the Zoom Scan
- (b) Calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
- (c) Generation of a high-resolution mesh within the measured volume
- (d) Interpolation of all measured values from the measurement grid to the high-resolution grid
- (e) Extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
- (f) Calculation of the averaged SAR within masses of 1g and 10g

## **8.2 Power Reference Measurement**

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

## **8.3 Area Scan**

The area scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan), if only one zoom scan follows the area scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of zoom scans has to be increased accordingly.

Area scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

|                                                                                                        | $\leq 3$ GHz                                                                                                                                                                                                                                                           | $> 3$ GHz                                              |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface | $5 \pm 1$ mm                                                                                                                                                                                                                                                           | $\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5$ mm     |
| Maximum probe angle from probe axis to phantom surface normal at the measurement location              | $30^\circ \pm 1^\circ$                                                                                                                                                                                                                                                 | $20^\circ \pm 1^\circ$                                 |
| Maximum area scan spatial resolution: $\Delta x_{Area}$ , $\Delta y_{Area}$                            | $\leq 2$ GHz: $\leq 15$ mm<br>$2 - 3$ GHz: $\leq 12$ mm                                                                                                                                                                                                                | $3 - 4$ GHz: $\leq 12$ mm<br>$4 - 6$ GHz: $\leq 10$ mm |
|                                                                                                        | When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be $\leq$ the corresponding x or y dimension of the test device with at least one measurement point on the test device. |                                                        |

### 8.4 Zoom Scan

Zoom scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 gram and 10 gram of simulated tissue. The zoom scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the zoom scan evaluates the averaged SAR for 1 gram and 10 gram and displays these values next to the job's label.

Zoom scan parameters extracted from FCC KDB 865664 D01v01r04 SAR measurement 100 MHz to 6 GHz.

|                                                                                                                                                                                                                                                                                                             |                                           |                                                                                             | $\leq 3$ GHz                                         | $> 3$ GHz                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------|-------------------------------------------------------------------------------|
| Maximum zoom scan spatial resolution: $\Delta x_{\text{Zoom}}, \Delta y_{\text{Zoom}}$                                                                                                                                                                                                                      |                                           |                                                                                             | $\leq 2$ GHz: $\leq 8$ mm<br>2 – 3 GHz: $\leq 5$ mm* | 3 – 4 GHz: $\leq 5$ mm*<br>4 – 6 GHz: $\leq 4$ mm*                            |
| Maximum zoom scan spatial resolution, normal to phantom surface                                                                                                                                                                                                                                             | uniform grid: $\Delta z_{\text{Zoom}}(n)$ |                                                                                             | $\leq 5$ mm                                          | 3 – 4 GHz: $\leq 4$ mm<br>4 – 5 GHz: $\leq 3$ mm<br>5 – 6 GHz: $\leq 2$ mm    |
|                                                                                                                                                                                                                                                                                                             | graded grid                               | $\Delta z_{\text{Zoom}}(1)$ : between 1 <sup>st</sup> two points closest to phantom surface | $\leq 4$ mm                                          | 3 – 4 GHz: $\leq 3$ mm<br>4 – 5 GHz: $\leq 2.5$ mm<br>5 – 6 GHz: $\leq 2$ mm  |
|                                                                                                                                                                                                                                                                                                             |                                           | $\Delta z_{\text{Zoom}}(n>1)$ : between subsequent points                                   | $\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$         |                                                                               |
| Minimum zoom scan volume                                                                                                                                                                                                                                                                                    | x, y, z                                   |                                                                                             | $\geq 30$ mm                                         | 3 – 4 GHz: $\geq 28$ mm<br>4 – 5 GHz: $\geq 25$ mm<br>5 – 6 GHz: $\geq 22$ mm |
| Note: $\delta$ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.                                                                                                                                                           |                                           |                                                                                             |                                                      |                                                                               |
| * When zoom scan is required and the <i>reported</i> SAR from the <i>area scan based 1-g SAR estimation</i> procedures of KDB 447498 is $\leq 1.4$ W/kg, $\leq 8$ mm, $\leq 7$ mm and $\leq 5$ mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz. |                                           |                                                                                             |                                                      |                                                                               |

### 8.5 Volume Scan Procedures

The volume scan is used to assess overlapping SAR distributions for antennas transmitting in different frequency bands. It is equivalent to an oversized zoom scan used in standalone measurements. The measurement volume will be used to enclose all the simultaneous transmitting antennas. For antennas transmitting simultaneously in different frequency bands, the volume scan is measured separately in each frequency band. In order to sum correctly to compute the 1g aggregate SAR, the EUT remain in the same test position for all measurements and all volume scan use the same spatial resolution and grid spacing. When all volume scan were completed, the software, SEMCAD postprocessor can combine and subsequently superpose these measurement data to calculating the multiband SAR.

### 8.6 Power Drift Monitoring

All SAR testing is under the EUT install full charged battery and transmit maximum output power. In DASy measurement software, the power reference measurement and power drift measurement procedures are used for monitoring the power drift of EUT during SAR test. Both these procedures measure the field at a specified reference position before and after the SAR testing. The software will calculate the field difference in dB. If the power drifts more than 5%, the SAR will be retested.

## 9. Test Equipment List

| Manufacturer  | Name of Equipment             | Type/Model      | Serial Number | Calibration   |               |
|---------------|-------------------------------|-----------------|---------------|---------------|---------------|
|               |                               |                 |               | Last Cal.     | Due Date      |
| SPEAG         | 750MHz System Validation Kit  | D750V3          | 1099          | Dec. 06, 2018 | Dec. 05, 2019 |
| SPEAG         | 835MHz System Validation Kit  | D835V2          | 4d162         | Dec. 05, 2018 | Dec. 04, 2019 |
| SPEAG         | 1750MHz System Validation Kit | D1750V2         | 1090          | Mar. 27, 2019 | Mar. 26, 2020 |
| SPEAG         | 1900MHz System Validation Kit | D1900V2         | 5d182         | Dec. 07, 2018 | Dec. 06, 2019 |
| SPEAG         | 2300MHz System Validation Kit | D2300V2         | 1006          | Jan. 28, 2019 | Jan. 27, 2020 |
| SPEAG         | 2600MHz System Validation Kit | D2600V2         | 1070          | Dec. 07, 2018 | Dec. 06, 2019 |
| SPEAG         | Data Acquisition Electronics  | DAE4            | 1303          | Jan. 03, 2019 | Jan. 02, 2020 |
| SPEAG         | Dosimetric E-Field Probe      | ES3DV3          | 3169          | May. 24, 2019 | May. 23, 2020 |
| RCPTWN        | Thermometer                   | HTC-1           | TM685-1       | Nov. 12, 2018 | Nov. 11, 2019 |
| SPEAG         | Device Holder                 | N/A             | N/A           | N/A           | N/A           |
| Anritsu       | Signal Generator              | MG3710A         | 6201502524    | Dec. 11, 2018 | Dec. 10, 2019 |
| Agilent       | ENA Network Analyzer          | E5071C          | MY46104758    | Sep. 06, 2019 | Sep. 05, 2020 |
| SPEAG         | Dielectric Probe Kit          | DAK-3.5         | 1126          | Sep. 18, 2019 | Sep. 17, 2020 |
| LINE SEIKI    | Digital Thermometer           | DTM3000-spezial | 3169          | Sep. 10, 2019 | Sep. 09, 2020 |
| Anritsu       | Power Meter                   | ML2495A         | 1036004       | Aug. 08, 2019 | Aug. 07, 2020 |
| Anritsu       | Power Sensor                  | MA2411B         | 1027253       | Aug. 08, 2019 | Aug. 07, 2020 |
| Anritsu       | Power Meter                   | ML2495A         | 1419002       | May. 29, 2019 | May. 28, 2020 |
| Anritsu       | Power Sensor                  | MA2411B         | 1339124       | May. 29, 2019 | May. 28, 2020 |
| Agilent       | Spectrum Analyzer             | E4408B          | MY44211028    | Aug. 27, 2019 | Aug. 26, 2020 |
| Anritsu       | Spectrum Analyzer             | MS2830A         | 6201396378    | Jun. 27, 2019 | Jun. 26, 2020 |
| Mini-Circuits | Power Amplifier               | ZHL-42W+        | 321501827     | Aug. 12, 2019 | Aug. 11, 2020 |
| Mini-Circuits | Power Amplifier               | ZHL-42W+        | 715701915     | May. 10, 2019 | May. 09, 2020 |
| ATM           | Dual Directional Coupler      | C122H-10        | P610410z-02   | Note 1        |               |
| Woken         | Attenuator 1                  | WK0602-XX       | N/A           | Note 1        |               |
| PE            | Attenuator 2                  | PE7005-10       | N/A           | Note 1        |               |
| PE            | Attenuator 3                  | PE7005- 3       | N/A           | Note 1        |               |

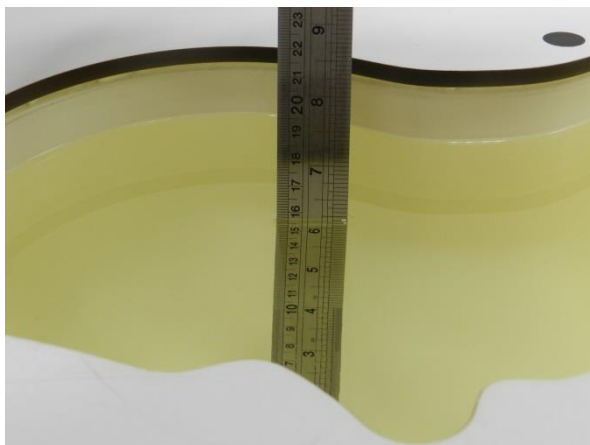
**General Note:**

1. Prior to system verification and validation, the path loss from the signal generator to the system check source and the power meter, which includes the amplifier, cable, attenuator and directional coupler, was measured by the network analyzer. The reading of the power meter was offset by the path loss difference between the path to the power meter and the path to the system check source to monitor the actual power level fed to the system check source.

## **10. System Verification**

### **10.1 Tissue Simulating Liquids**

For the measurement of the field distribution inside the SAM phantom with DASY, the phantom must be filled with around 25 liters of homogeneous body tissue simulating liquid. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.1. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm, which is shown in Fig. 10.2.



**Fig 10.1**Photo of Liquid Height for Head SAR



**Fig 10.2** Photo of Liquid Height for Body SAR

## 10.2 Tissue Verification

The following tissue formulations are provided for reference only as some of the parameters have not been thoroughly verified. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation.

| Frequency (MHz)  | Water (%) | Sugar (%) | Cellulose (%) | Salt (%) | Preventol (%) | DGBE (%) | Conductivity ( $\sigma$ ) | Permittivity ( $\epsilon_r$ ) |
|------------------|-----------|-----------|---------------|----------|---------------|----------|---------------------------|-------------------------------|
| 750              | 41.1      | 57.0      | 0.2           | 1.4      | 0.2           | 0        | 0.89                      | 41.9                          |
| 835              | 40.3      | 57.9      | 0.2           | 1.4      | 0.2           | 0        | 0.90                      | 41.5                          |
| 900              | 40.3      | 57.9      | 0.2           | 1.4      | 0.2           | 0        | 0.97                      | 41.5                          |
| 1800, 1900, 2000 | 55.2      | 0         | 0             | 0.3      | 0             | 44.5     | 1.40                      | 40.0                          |
| 2450             | 55.0      | 0         | 0             | 0        | 0             | 45.0     | 1.80                      | 39.2                          |
| 2600             | 54.8      | 0         | 0             | 0.1      | 0             | 45.1     | 1.96                      | 39.0                          |

### Simulating Liquid for 5GHz, Manufactured by SPEAG

| Ingredients        | (% by weight) |
|--------------------|---------------|
| Water              | 64~78%        |
| Mineral oil        | 11~18%        |
| Emulsifiers        | 9~15%         |
| Additives and Salt | 2~3%          |

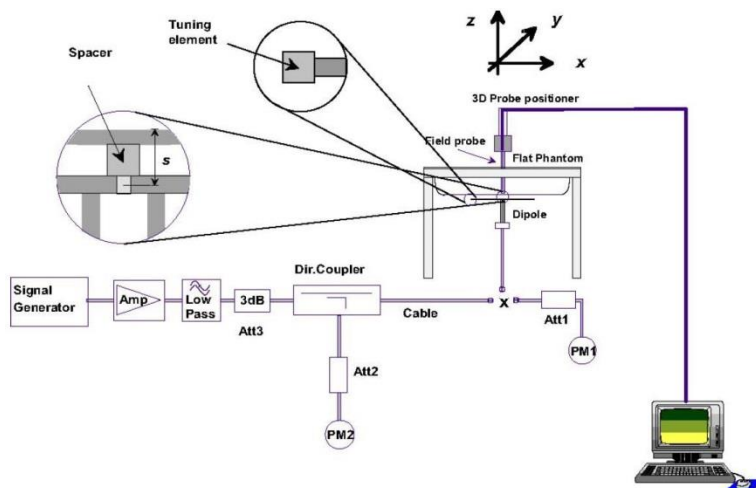
### <Tissue Dielectric Parameter Check Results>

| Frequency (MHz) | Liquid Temp. (°C) | Conductivity ( $\sigma$ ) | Permittivity ( $\epsilon_r$ ) | Conductivity Target ( $\sigma$ ) | Permittivity Target ( $\epsilon_r$ ) | Delta ( $\sigma$ ) (%) | Delta ( $\epsilon_r$ ) (%) | Limit (%) | Date      |
|-----------------|-------------------|---------------------------|-------------------------------|----------------------------------|--------------------------------------|------------------------|----------------------------|-----------|-----------|
| 750             | 22.6              | 0.879                     | 40.957                        | 0.89                             | 41.90                                | -1.24                  | -2.25                      | ±5        | 2019/11/2 |
| 835             | 22.7              | 0.919                     | 41.524                        | 0.90                             | 41.50                                | 2.11                   | 0.06                       | ±5        | 2019/11/2 |
| 1750            | 22.8              | 1.338                     | 38.819                        | 1.37                             | 40.10                                | -2.34                  | -3.19                      | ±5        | 2019/11/3 |
| 1900            | 22.9              | 1.443                     | 40.030                        | 1.40                             | 40.00                                | 3.07                   | 0.08                       | ±5        | 2019/11/3 |
| 2300            | 22.7              | 1.655                     | 38.865                        | 1.67                             | 39.50                                | -0.90                  | -1.61                      | ±5        | 2019/11/4 |
| 2600            | 22.8              | 2.055                     | 38.316                        | 1.96                             | 39.00                                | 4.85                   | -1.75                      | ±5        | 2019/11/4 |

### 10.3 System Performance Check Results

Comparing to the original SAR value provided by SPEAG, the verification data should be within its specification of 10 %. Below table shows the target SAR and measured SAR after normalized to 1W input power. The table below indicates the system performance check can meet the variation criterion and the plots can be referred to Appendix A of this report.

| Date      | Frequency (MHz) | Input Power (mW) | Dipole S/N    | Probe S/N       | DAE S/N     | Measured 1g SAR (W/kg) | Targeted 1g SAR (W/kg) | Normalized 1g SAR (W/kg) | Deviation (%) |
|-----------|-----------------|------------------|---------------|-----------------|-------------|------------------------|------------------------|--------------------------|---------------|
| 2019/11/2 | 750             | 250              | D750V3-1099   | ES3DV3 - SN3169 | DAE4 Sn1303 | 2.10                   | 8.52                   | 8.4                      | -1.41         |
| 2019/11/2 | 835             | 250              | D835V2-4d162  | ES3DV3 - SN3169 | DAE4 Sn1303 | 2.43                   | 9.61                   | 9.72                     | 1.14          |
| 2019/11/3 | 1750            | 250              | D1750V2-1090  | ES3DV3 - SN3169 | DAE4 Sn1303 | 9.38                   | 36.40                  | 37.52                    | 3.08          |
| 2019/11/3 | 1900            | 250              | D1900V2-5d182 | ES3DV3 - SN3169 | DAE4 Sn1303 | 10.40                  | 39.60                  | 41.6                     | 5.05          |
| 2019/11/4 | 2300            | 250              | D2300V2-1006  | ES3DV3 - SN3169 | DAE4 Sn1303 | 11.90                  | 48.70                  | 47.6                     | -2.26         |
| 2019/11/4 | 2600            | 250              | D2600V2-1070  | ES3DV3 - SN3169 | DAE4 Sn1303 | 15.30                  | 58.10                  | 61.2                     | 5.34          |



**Fig 8.3.1 System Performance Check Setup**



**Fig 8.3.2 Setup Photo**

## **11. Conducted RF Output Power (Unit: dBm)**

### **<WCDMA Conducted Power>**

1. The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification.
2. The procedures in KDB 941225 D01v03r01 are applied for 3GPP Rel. 6 HSPA to configure the device in the required sub-test mode(s) to determine SAR test exclusion.
3. For DC-HSDPA, the device was configured according to the H-Set 12, Fixed Reference Channel (FRC) configuration in Table C.8.1.12 of 3GPP TS 34.121-1, with the primary and the secondary serving HS-DSCH Cell enabled during the power measurement.

A summary of these settings are illustrated below:

### **HSDPA Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
  - i. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each
  - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
  - iii. Set RMC 12.2Kbps + HSDPA mode.
  - iv. Set Cell Power = -86 dBm
  - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
  - vi. Select HSDPA Uplink Parameters
  - vii. Set Delta ACK, Delta NACK and Delta CQI = 8
  - viii. Set Ack-Nack Repetition Factor to 3
  - ix. Set CQI Feedback Cycle (k) to 4 ms
  - x. Set CQI Repetition Factor to 2
  - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

**Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH**

| Sub-test | $\beta_c$         | $\beta_d$         | $\beta_d$<br>(SF) | $\beta_c/\beta_d$ | $\beta_{HS}$<br>(Note 1,<br>Note 2) | CM (dB)<br>(Note 3) | MPR (dB)<br>(Note 3) |
|----------|-------------------|-------------------|-------------------|-------------------|-------------------------------------|---------------------|----------------------|
| 1        | 2/15              | 15/15             | 64                | 2/15              | 4/15                                | 0.0                 | 0.0                  |
| 2        | 12/15<br>(Note 4) | 15/15<br>(Note 4) | 64                | 12/15<br>(Note 4) | 24/15                               | 1.0                 | 0.0                  |
| 3        | 15/15             | 8/15              | 64                | 15/8              | 30/15                               | 1.5                 | 0.5                  |
| 4        | 15/15             | 4/15              | 64                | 15/4              | 30/15                               | 1.5                 | 0.5                  |

**Note 1:**  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ .

**Note 2:** For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA,  $\Delta_{ACK}$  and  $\Delta_{NACK} = 30/15$  with  $\beta_{HS} = 30/15 * \beta_c$ , and  $\Delta_{CQI} = 24/15$  with  $\beta_{HS} = 24/15 * \beta_c$ .

**Note 3:** CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{HS}/\beta_c = 24/15$ . For all other combinations of DPCCH, DPDCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

**Note 4:** For subtest 2 the  $\beta_c/\beta_d$  ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 11/15$  and  $\beta_d = 15/15$ .

### **Setup Configuration**

**HSUPA Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration.
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting \* :
  - i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
  - ii. Set the Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121
  - iii. Set Cell Power = -86 dBm
  - iv. Set Channel Type = 12.2k + HSPA
  - v. Set UE Target Power
  - vi. Power Ctrl Mode= Alternating bits
  - vii. Set and observe the E-TFCI
  - viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
- d. The transmitted maximum output power was recorded.

**Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH**

| Sub-test | $\beta_c$      | $\beta_d$      | $\beta_d$ (SF) | $\beta_c/\beta_d$ | $\beta_{HS}$ (Note 1) | $\beta_{ec}$ | $\beta_{ed}$ (Note 4) (Note 5)                 | $\beta_{ed}$ (SF) | $\beta_{ed}$ (Codes) | CM (dB) (Note 2) | MPR (dB) (Note 2) (Note 6) | AG Index (Note 5) | E-TFCI |
|----------|----------------|----------------|----------------|-------------------|-----------------------|--------------|------------------------------------------------|-------------------|----------------------|------------------|----------------------------|-------------------|--------|
| 1        | 11/15 (Note 3) | 15/15 (Note 3) | 64             | 11/15 (Note 3)    | 22/15                 | 209/25       | 1309/225                                       | 4                 | 1                    | 1.0              | 0.0                        | 20                | 75     |
| 2        | 6/15           | 15/15          | 64             | 6/15              | 12/15                 | 12/15        | 94/75                                          | 4                 | 1                    | 3.0              | 2.0                        | 12                | 67     |
| 3        | 15/15          | 9/15           | 64             | 15/9              | 30/15                 | 30/15        | $\beta_{ed1}$ : 47/15<br>$\beta_{ed2}$ : 47/15 | 4                 | 2                    | 2.0              | 1.0                        | 15                | 92     |
| 4        | 2/15           | 15/15          | 64             | 2/15              | 4/15                  | 2/15         | 56/75                                          | 4                 | 1                    | 3.0              | 2.0                        | 17                | 71     |
| 5        | 15/15          | 0              | -              | -                 | 5/15                  | 5/15         | 47/15                                          | 4                 | 1                    | 1.0              | 0.0                        | 12                | 67     |

Note 1: For sub-test 1 to 4,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ . For sub-test 5,  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 5/15$  with  $\beta_{hs} = 5/15 * \beta_c$ .

Note 2: CM = 1 for  $\beta_d/\beta_c = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the  $\beta_c/\beta_d$  ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5:  $\beta_{ed}$  can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

**Setup Configuration**

**DC-HSDPA 3GPP release 8 Setup Configuration:**

- a. The EUT was connected to Base Station Agilent E5515C referred to the Setup Configuration below
- b. The RF path losses were compensated into the measurements.
- c. A call was established between EUT and Base Station with following setting:
  - i. Set RMC 12.2Kbps + HSDPA mode.
  - ii. Set Cell Power = -25 dBm
  - iii. Set HS-DSCH Configuration Type to FRC (H-set 12, QPSK)
  - iv. Select HSDPA Uplink Parameters
  - v. Set Gain Factors ( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
    - a). Subtest 1:  $\beta_c/\beta_d=2/15$
    - b). Subtest 2:  $\beta_c/\beta_d=12/15$
    - c). Subtest 3:  $\beta_c/\beta_d=15/8$
    - d). Subtest 4:  $\beta_c/\beta_d=15/4$
  - vi. Set Delta ACK, Delta NACK and Delta CQI = 8
  - vii. Set Ack-Nack Repetition Factor to 3
  - viii. Set CQI Feedback Cycle (k) to 4 ms
  - ix. Set CQI Repetition Cycle to 2
  - x. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

The following tests were conducted according to the test requirements outlines in 3GPP TS 34.121 specification. A summary of these settings are illustrated below:

**C.8.1.12 Fixed Reference Channel Definition H-Set 12**
**Table C.8.1.12: Fixed Reference Channel H-Set 12**

| Parameter                                                                                                                                              | Unit      | Value |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-------|
| Nominal Avg. Inf. Bit Rate                                                                                                                             | kbps      | 60    |
| Inter-TTI Distance                                                                                                                                     | TTI's     | 1     |
| Number of HARQ Processes                                                                                                                               | Processes | 6     |
| Information Bit Payload ( $N_{INF}$ )                                                                                                                  | Bits      | 120   |
| Number Code Blocks                                                                                                                                     | Blocks    | 1     |
| Binary Channel Bits Per TTI                                                                                                                            | Bits      | 960   |
| Total Available SML's in UE                                                                                                                            | SML's     | 19200 |
| Number of SML's per HARQ Proc.                                                                                                                         | SML's     | 3200  |
| Coding Rate                                                                                                                                            |           | 0.15  |
| Number of Physical Channel Codes                                                                                                                       | Codes     | 1     |
| Modulation                                                                                                                                             |           | QPSK  |
| Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.               |           |       |
| Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used. |           |       |


**Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)**
**Setup Configuration**

### <WCDMA Conducted Power>

#### General Note:

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is  $\leq \frac{1}{4}$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than  $\frac{1}{4}$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

#### Default Power Mode

| Band            |                    | WCDMA II |       |        | Tune-up Limit (dBm) | WCDMA IV |        |        | Tune-up Limit (dBm) | WCDMA V |       |       | Tune-up Limit (dBm) |
|-----------------|--------------------|----------|-------|--------|---------------------|----------|--------|--------|---------------------|---------|-------|-------|---------------------|
| TX Channel      |                    | 9262     | 9400  | 9538   |                     | 1312     | 1413   | 1513   |                     | 4132    | 4182  | 4233  |                     |
| Rx Channel      |                    | 9662     | 9800  | 9938   |                     | 1537     | 1638   | 1738   |                     | 4357    | 4407  | 4458  |                     |
| Frequency (MHz) |                    | 1852.4   | 1880  | 1907.6 |                     | 1712.4   | 1732.6 | 1752.6 |                     | 826.4   | 836.4 | 846.6 |                     |
| 3GPP Rel 99     | RMC 12.2Kbps       | 23.62    | 23.66 | 23.57  | 24.50               | 24.00    | 23.95  | 23.72  | 24.50               | 23.87   | 23.86 | 23.84 | 24.50               |
| 3GPP Rel 6      | HSDPA Subtest-1    | 23.60    | 23.62 | 23.54  | 24.50               | 23.98    | 23.91  | 23.79  | 24.50               | 23.85   | 23.84 | 23.83 | 24.50               |
| 3GPP Rel 6      | HSDPA Subtest-2    | 23.34    | 23.32 | 23.24  | 24.50               | 23.69    | 23.66  | 23.59  | 24.50               | 23.60   | 23.58 | 23.64 | 24.50               |
| 3GPP Rel 6      | HSDPA Subtest-3    | 23.05    | 23.11 | 22.96  | 24.00               | 23.48    | 23.41  | 23.30  | 24.00               | 23.32   | 23.35 | 23.37 | 24.00               |
| 3GPP Rel 6      | HSDPA Subtest-4    | 22.87    | 22.83 | 22.68  | 24.00               | 23.26    | 23.13  | 23.07  | 24.00               | 23.16   | 23.15 | 23.13 | 24.00               |
| 3GPP Rel 8      | DC-HSDPA Subtest-1 | 23.51    | 23.53 | 23.49  | 24.50               | 23.91    | 23.81  | 23.77  | 24.50               | 23.76   | 23.84 | 23.83 | 24.50               |
| 3GPP Rel 8      | DC-HSDPA Subtest-2 | 23.24    | 23.29 | 23.21  | 24.50               | 23.68    | 23.61  | 23.50  | 24.50               | 23.57   | 23.53 | 23.60 | 24.50               |
| 3GPP Rel 8      | DC-HSDPA Subtest-3 | 22.97    | 23.11 | 22.87  | 24.00               | 23.42    | 23.32  | 23.27  | 24.00               | 23.27   | 23.27 | 23.29 | 24.00               |
| 3GPP Rel 8      | DC-HSDPA Subtest-4 | 22.81    | 22.79 | 22.60  | 24.00               | 23.20    | 23.03  | 22.98  | 24.00               | 23.11   | 23.14 | 23.08 | 24.00               |
| 3GPP Rel 6      | HSUPA Subtest-1    | 23.29    | 23.17 | 23.08  | 24.50               | 23.40    | 23.43  | 23.30  | 24.50               | 23.10   | 23.13 | 23.00 | 24.50               |
| 3GPP Rel 6      | HSUPA Subtest-2    | 21.29    | 21.24 | 21.19  | 22.50               | 21.70    | 21.73  | 21.70  | 22.50               | 21.40   | 21.43 | 21.40 | 22.50               |
| 3GPP Rel 6      | HSUPA Subtest-3    | 22.25    | 22.32 | 22.15  | 23.50               | 22.61    | 22.64  | 22.57  | 23.50               | 22.31   | 22.34 | 22.27 | 23.50               |
| 3GPP Rel 6      | HSUPA Subtest-4    | 21.58    | 21.52 | 21.43  | 22.50               | 21.94    | 21.97  | 21.92  | 22.50               | 21.64   | 21.67 | 21.62 | 22.50               |
| 3GPP Rel 6      | HSUPA Subtest-5    | 23.30    | 23.30 | 23.20  | 24.50               | 23.70    | 23.60  | 23.57  | 24.50               | 23.40   | 23.30 | 23.27 | 24.50               |

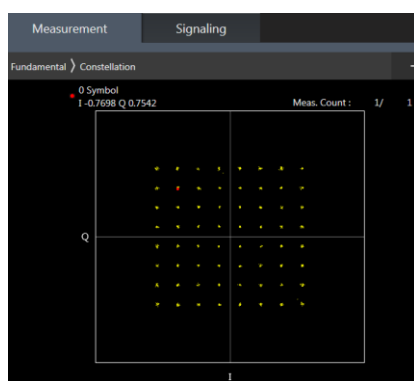
#### Reduced Power Mode

| Band            |                    | WCDMA II |       |        | Tune-up Limit (dBm) | WCDMA IV |        |        | Tune-up Limit (dBm) | WCDMA V |       |       | Tune-up Limit (dBm) |
|-----------------|--------------------|----------|-------|--------|---------------------|----------|--------|--------|---------------------|---------|-------|-------|---------------------|
| TX Channel      |                    | 9262     | 9400  | 9538   |                     | 1312     | 1413   | 1513   |                     | 4132    | 4182  | 4233  |                     |
| Rx Channel      |                    | 9662     | 9800  | 9938   |                     | 1537     | 1638   | 1738   |                     | 4357    | 4407  | 4458  |                     |
| Frequency (MHz) |                    | 1852.4   | 1880  | 1907.6 |                     | 1712.4   | 1732.6 | 1752.6 |                     | 826.4   | 836.4 | 846.6 |                     |
| 3GPP Rel 99     | RMC 12.2Kbps       | 17.46    | 17.48 | 17.42  | 18.00               | 16.98    | 16.81  | 16.82  | 17.50               | 19.69   | 19.53 | 19.62 | 20.50               |
| 3GPP Rel 6      | HSDPA Subtest-1    | 16.93    | 16.98 | 16.93  | 18.00               | 16.78    | 16.93  | 16.74  | 17.50               | 19.43   | 19.31 | 19.30 | 20.50               |
| 3GPP Rel 6      | HSDPA Subtest-2    | 16.89    | 16.92 | 16.85  | 18.00               | 16.77    | 16.97  | 16.72  | 17.50               | 19.43   | 19.34 | 19.30 | 20.50               |
| 3GPP Rel 6      | HSDPA Subtest-3    | 16.89    | 16.93 | 16.82  | 17.50               | 16.75    | 16.91  | 16.72  | 17.00               | 19.47   | 19.30 | 19.31 | 20.00               |
| 3GPP Rel 6      | HSDPA Subtest-4    | 16.88    | 16.90 | 16.83  | 17.50               | 16.76    | 16.93  | 16.73  | 17.00               | 19.44   | 19.31 | 19.27 | 20.00               |
| 3GPP Rel 8      | DC-HSDPA Subtest-1 | 16.86    | 16.94 | 16.85  | 18.00               | 16.74    | 16.80  | 16.72  | 17.50               | 19.30   | 19.24 | 19.26 | 20.50               |
| 3GPP Rel 8      | DC-HSDPA Subtest-2 | 16.83    | 16.72 | 16.77  | 18.00               | 16.65    | 16.93  | 16.54  | 17.50               | 19.42   | 19.29 | 19.16 | 20.50               |
| 3GPP Rel 8      | DC-HSDPA Subtest-3 | 16.78    | 16.86 | 16.80  | 17.50               | 16.74    | 16.82  | 16.55  | 17.00               | 19.31   | 19.26 | 19.23 | 20.00               |
| 3GPP Rel 8      | DC-HSDPA Subtest-4 | 16.79    | 16.78 | 16.77  | 17.50               | 16.75    | 16.83  | 16.62  | 17.00               | 19.35   | 19.29 | 19.13 | 20.00               |
| 3GPP Rel 6      | HSUPA Subtest-1    | 16.83    | 16.47 | 16.34  | 18.00               | 16.81    | 16.83  | 16.70  | 17.50               | 18.83   | 18.89 | 18.87 | 20.50               |
| 3GPP Rel 6      | HSUPA Subtest-2    | 16.82    | 16.87 | 16.77  | 17.00               | 16.40    | 16.48  | 16.29  | 16.50               | 19.35   | 19.33 | 19.32 | 19.50               |
| 3GPP Rel 6      | HSUPA Subtest-3    | 16.65    | 16.65 | 16.31  | 17.00               | 16.42    | 16.45  | 16.30  | 16.50               | 19.13   | 19.17 | 19.11 | 19.50               |
| 3GPP Rel 6      | HSUPA Subtest-4    | 16.74    | 16.70 | 16.51  | 17.00               | 16.37    | 16.50  | 16.34  | 16.50               | 19.30   | 19.21 | 19.14 | 19.50               |
| 3GPP Rel 6      | HSUPA Subtest-5    | 16.90    | 16.90 | 16.80  | 18.00               | 16.80    | 16.90  | 16.70  | 17.50               | 19.40   | 19.30 | 19.30 | 20.50               |

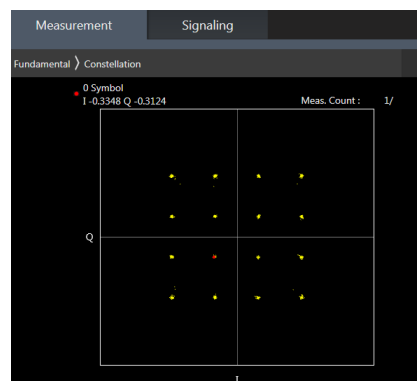
## <LTE Conducted Power>

### General Note:

1. Anritsu MT8820C base station simulator was used to setup the connection with EUT; the frequency band, channel bandwidth, RB allocation configuration, modulation type are set in the base station simulator to configure EUT transmitting at maximum power and at different configurations which are requested to be reported to FCC, for conducted power measurement and SAR testing.
2. Per KDB 941225 D05v02r05, when a properly configured base station simulator is used for the SAR and power measurements, spectrum plots for each RB allocation and offset configuration is not required.
3. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
4. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
5. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
6. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
7. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
8. For LTE B4 / B5 / B12 / B17 / B26 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
9. LTE band 2 / 4 / 5 / 17 / 38 SAR test was covered by Band 12 / 25 / 26 / 66 / 41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - a. the maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion
  - b. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band
10. According to 2017 TCB workshop, for 64 QAM and 16 QAM should be verified by checking the signal constellation with a call box to avoid incorrect maximum power levels due to MPR and other requirements associated with signal modulation, and the following figure is taken from the "Fundamental Measurement >> Modulation Analysis >> constellation" mode of the device connect to the MT8821C base station, therefore, the device 64QAM and 16QAM signal modulation are correct.



**64QAM**



**16QAM**

**Default Power Mode**
**<LTE Band 2>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 18700                    | 18900                       | 19100                     |                        |             |
| Frequency (MHz) |            |         |           | 1860                     | 1880                        | 1900                      |                        |             |
| 20              | QPSK       | 1       | 0         | 23.25                    | 23.26                       | 23.11                     | 24                     | 0           |
| 20              | QPSK       | 1       | 49        | 23.03                    | 23.24                       | 22.99                     |                        |             |
| 20              | QPSK       | 1       | 99        | 23.18                    | 23.07                       | 22.99                     |                        |             |
| 20              | QPSK       | 50      | 0         | 22.13                    | 22.25                       | 22.04                     | 23                     | 1           |
| 20              | QPSK       | 50      | 24        | 22.02                    | 22.25                       | 22.15                     |                        |             |
| 20              | QPSK       | 50      | 50        | 22.10                    | 22.17                       | 22.06                     |                        |             |
| 20              | QPSK       | 100     | 0         | 22.08                    | 22.24                       | 22.16                     | 23                     | 1           |
| 20              | 16QAM      | 1       | 0         | 22.40                    | 22.50                       | 22.17                     |                        |             |
| 20              | 16QAM      | 1       | 49        | 22.25                    | 22.53                       | 22.40                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 22.61                    | 22.43                       | 22.32                     | 22                     | 2           |
| 20              | 16QAM      | 50      | 0         | 21.15                    | 21.26                       | 21.07                     |                        |             |
| 20              | 16QAM      | 50      | 24        | 21.07                    | 21.26                       | 21.17                     |                        |             |
| 20              | 16QAM      | 50      | 50        | 21.13                    | 21.18                       | 21.13                     | 22                     | 2           |
| 20              | 16QAM      | 100     | 0         | 21.10                    | 21.24                       | 21.16                     |                        |             |
| 20              | 64QAM      | 1       | 0         | 21.43                    | 21.42                       | 21.30                     | 22                     | 2           |
| 20              | 64QAM      | 1       | 49        | 21.32                    | 21.52                       | 21.25                     |                        |             |
| 20              | 64QAM      | 1       | 99        | 21.46                    | 21.36                       | 21.23                     |                        |             |
| 20              | 64QAM      | 50      | 0         | 20.18                    | 20.27                       | 20.08                     | 21                     | 3           |
| 20              | 64QAM      | 50      | 24        | 20.05                    | 20.28                       | 20.17                     |                        |             |
| 20              | 64QAM      | 50      | 50        | 20.12                    | 20.19                       | 20.14                     |                        |             |
| 20              | 64QAM      | 100     | 0         | 20.10                    | 20.24                       | 20.18                     |                        |             |
| Channel         |            |         |           | 18675                    | 18900                       | 19125                     |                        |             |
| Frequency (MHz) |            |         |           | 1857.5                   | 1880                        | 1902.5                    | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| 15              | QPSK       | 1       | 0         | 23.12                    | 23.16                       | 22.91                     | 24                     | 0           |
| 15              | QPSK       | 1       | 37        | 22.97                    | 23.16                       | 23.06                     |                        |             |
| 15              | QPSK       | 1       | 74        | 23.20                    | 23.01                       | 22.93                     |                        |             |
| 15              | QPSK       | 36      | 0         | 22.05                    | 22.21                       | 22.09                     | 23                     | 1           |
| 15              | QPSK       | 36      | 20        | 22.05                    | 22.15                       | 22.06                     |                        |             |
| 15              | QPSK       | 36      | 39        | 22.03                    | 22.10                       | 22.01                     |                        |             |
| 15              | QPSK       | 75      | 0         | 22.02                    | 22.22                       | 22.09                     | 23                     | 1           |
| 15              | 16QAM      | 1       | 0         | 22.35                    | 22.47                       | 22.13                     |                        |             |
| 15              | 16QAM      | 1       | 37        | 22.20                    | 22.48                       | 22.36                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 22.52                    | 22.35                       | 22.26                     | 22                     | 2           |
| 15              | 16QAM      | 36      | 0         | 21.12                    | 21.23                       | 21.02                     |                        |             |
| 15              | 16QAM      | 36      | 20        | 20.99                    | 21.17                       | 21.14                     |                        |             |
| 15              | 16QAM      | 36      | 39        | 21.04                    | 21.10                       | 21.05                     | 22                     | 2           |
| 15              | 16QAM      | 75      | 0         | 21.00                    | 21.23                       | 21.13                     |                        |             |
| 15              | 64QAM      | 1       | 0         | 21.40                    | 21.38                       | 21.24                     |                        |             |
| 15              | 64QAM      | 1       | 37        | 21.30                    | 21.52                       | 21.24                     | 22                     | 2           |
| 15              | 64QAM      | 1       | 74        | 21.40                    | 21.31                       | 21.16                     |                        |             |
| 15              | 64QAM      | 36      | 0         | 20.08                    | 20.22                       | 20.06                     |                        |             |
| 15              | 64QAM      | 36      | 20        | 19.95                    | 20.20                       | 20.17                     | 21                     | 3           |
| 15              | 64QAM      | 36      | 39        | 20.12                    | 20.09                       | 20.10                     |                        |             |
| 15              | 64QAM      | 75      | 0         | 20.08                    | 20.19                       | 20.11                     |                        |             |



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| Channel         |       |    |    | 18650  | 18900 | 19150  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| Frequency (MHz) |       |    |    | 1855   | 1880  | 1905   |                        |             |
| 10              | QPSK  | 1  | 0  | 23.12  | 23.25 | 22.99  | 24                     | 0           |
| 10              | QPSK  | 1  | 25 | 23.02  | 23.23 | 23.05  |                        |             |
| 10              | QPSK  | 1  | 49 | 23.20  | 23.07 | 22.90  |                        |             |
| 10              | QPSK  | 25 | 0  | 22.08  | 22.19 | 22.02  | 23                     | 1           |
| 10              | QPSK  | 25 | 12 | 21.95  | 22.16 | 22.14  |                        |             |
| 10              | QPSK  | 25 | 25 | 22.07  | 22.10 | 22.05  |                        |             |
| 10              | QPSK  | 50 | 0  | 22.06  | 22.14 | 22.14  |                        |             |
| 10              | 16QAM | 1  | 0  | 22.30  | 22.44 | 22.07  | 23                     | 1           |
| 10              | 16QAM | 1  | 25 | 22.22  | 22.47 | 22.38  |                        |             |
| 10              | 16QAM | 1  | 49 | 22.57  | 22.43 | 22.24  |                        |             |
| 10              | 16QAM | 25 | 0  | 21.07  | 21.24 | 21.00  | 22                     | 2           |
| 10              | 16QAM | 25 | 12 | 20.98  | 21.17 | 21.10  |                        |             |
| 10              | 16QAM | 25 | 25 | 21.06  | 21.09 | 21.10  |                        |             |
| 10              | 16QAM | 50 | 0  | 21.07  | 21.20 | 21.10  |                        |             |
| 10              | 64QAM | 1  | 0  | 21.42  | 21.35 | 21.27  | 22                     | 2           |
| 10              | 64QAM | 1  | 25 | 21.28  | 21.49 | 21.25  |                        |             |
| 10              | 64QAM | 1  | 49 | 21.37  | 21.27 | 21.17  |                        |             |
| 10              | 64QAM | 25 | 0  | 20.13  | 20.27 | 20.04  | 21                     | 3           |
| 10              | 64QAM | 25 | 12 | 20.06  | 20.28 | 20.07  |                        |             |
| 10              | 64QAM | 25 | 25 | 20.03  | 20.14 | 20.04  |                        |             |
| 10              | 64QAM | 50 | 0  | 20.10  | 20.19 | 20.16  |                        |             |
| Channel         |       |    |    | 18625  | 18900 | 19175  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1852.5 | 1880  | 1907.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 23.15  | 23.20 | 22.89  | 24                     | 0           |
| 5               | QPSK  | 1  | 12 | 22.98  | 23.24 | 23.10  |                        |             |
| 5               | QPSK  | 1  | 24 | 23.25  | 23.02 | 22.95  |                        |             |
| 5               | QPSK  | 12 | 0  | 22.04  | 22.19 | 22.01  | 23                     | 1           |
| 5               | QPSK  | 12 | 7  | 21.94  | 22.16 | 22.15  |                        |             |
| 5               | QPSK  | 12 | 13 | 22.06  | 22.12 | 21.99  |                        |             |
| 5               | QPSK  | 25 | 0  | 22.01  | 22.14 | 22.11  |                        |             |
| 5               | 16QAM | 1  | 0  | 22.35  | 22.48 | 22.14  | 23                     | 1           |
| 5               | 16QAM | 1  | 12 | 22.18  | 22.47 | 22.32  |                        |             |
| 5               | 16QAM | 1  | 24 | 22.53  | 22.39 | 22.23  |                        |             |
| 5               | 16QAM | 12 | 0  | 21.12  | 21.26 | 20.99  | 22                     | 2           |
| 5               | 16QAM | 12 | 7  | 21.01  | 21.21 | 21.15  |                        |             |
| 5               | 16QAM | 12 | 13 | 21.07  | 21.15 | 21.12  |                        |             |
| 5               | 16QAM | 25 | 0  | 21.01  | 21.14 | 21.13  |                        |             |
| 5               | 64QAM | 1  | 0  | 21.39  | 21.39 | 21.25  | 22                     | 2           |
| 5               | 64QAM | 1  | 12 | 21.30  | 21.47 | 21.20  |                        |             |
| 5               | 64QAM | 1  | 24 | 21.42  | 21.27 | 21.17  |                        |             |
| 5               | 64QAM | 12 | 0  | 20.18  | 20.19 | 20.05  | 21                     | 3           |
| 5               | 64QAM | 12 | 7  | 20.06  | 20.26 | 20.07  |                        |             |
| 5               | 64QAM | 12 | 13 | 20.11  | 20.18 | 20.14  |                        |             |
| 5               | 64QAM | 25 | 0  | 20.07  | 20.21 | 20.15  |                        |             |
| Channel         |       |    |    | 18615  | 18900 | 19185  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1851.5 | 1880  | 1908.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 23.11  | 23.17 | 22.95  | 24                     | 0           |
| 3               | QPSK  | 1  | 8  | 23.03  | 23.14 | 23.08  |                        |             |



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|                 |       |    |    |        |       |        |                        |             |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| 3               | QPSK  | 1  | 14 | 23.17  | 23.06 | 22.97  |                        |             |
| 3               | QPSK  | 8  | 0  | 22.03  | 22.25 | 21.95  | 23                     | 1           |
| 3               | QPSK  | 8  | 4  | 21.93  | 22.15 | 22.11  |                        |             |
| 3               | QPSK  | 8  | 7  | 22.02  | 22.08 | 21.97  |                        |             |
| 3               | QPSK  | 15 | 0  | 22.05  | 22.22 | 22.07  |                        |             |
| 3               | 16QAM | 1  | 0  | 22.32  | 22.44 | 22.11  | 23                     | 1           |
| 3               | 16QAM | 1  | 8  | 22.19  | 22.53 | 22.31  |                        |             |
| 3               | 16QAM | 1  | 14 | 22.58  | 22.33 | 22.24  |                        |             |
| 3               | 16QAM | 8  | 0  | 21.06  | 21.17 | 21.04  | 22                     | 2           |
| 3               | 16QAM | 8  | 4  | 21.00  | 21.17 | 21.10  |                        |             |
| 3               | 16QAM | 8  | 7  | 21.12  | 21.18 | 21.04  |                        |             |
| 3               | 16QAM | 15 | 0  | 21.03  | 21.16 | 21.14  |                        |             |
| 3               | 64QAM | 1  | 0  | 21.35  | 21.41 | 21.23  | 22                     | 2           |
| 3               | 64QAM | 1  | 8  | 21.32  | 21.49 | 21.24  |                        |             |
| 3               | 64QAM | 1  | 14 | 21.36  | 21.34 | 21.13  |                        |             |
| 3               | 64QAM | 8  | 0  | 20.10  | 20.25 | 20.00  | 21                     | 3           |
| 3               | 64QAM | 8  | 4  | 20.01  | 20.25 | 20.16  |                        |             |
| 3               | 64QAM | 8  | 7  | 20.02  | 20.11 | 20.11  |                        |             |
| 3               | 64QAM | 15 | 0  | 20.06  | 20.16 | 20.13  |                        |             |
| Channel         |       |    |    | 18607  | 18900 | 19193  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1850.7 | 1880  | 1909.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 23.13  | 23.17 | 22.93  | 24                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 22.96  | 23.23 | 23.11  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 23.17  | 22.99 | 22.98  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 22.04  | 22.21 | 22.05  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 22.07  | 22.23 | 22.12  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 22.10  | 22.12 | 22.04  |                        |             |
| 1.4             | QPSK  | 6  | 0  | 22.01  | 22.24 | 22.13  | 23                     | 1           |
| 1.4             | 16QAM | 1  | 0  | 22.39  | 22.43 | 22.11  | 23                     | 1           |
| 1.4             | 16QAM | 1  | 3  | 22.24  | 22.53 | 22.38  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 22.57  | 22.36 | 22.23  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 21.10  | 21.20 | 21.05  |                        |             |
| 1.4             | 16QAM | 3  | 1  | 21.08  | 21.20 | 21.10  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 21.11  | 21.18 | 21.09  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 21.04  | 21.24 | 21.16  | 22                     | 2           |
| 1.4             | 64QAM | 1  | 0  | 21.40  | 21.40 | 21.20  | 22                     | 2           |
| 1.4             | 64QAM | 1  | 3  | 21.32  | 21.48 | 21.23  |                        |             |
| 1.4             | 64QAM | 1  | 5  | 21.44  | 21.32 | 21.22  |                        |             |
| 1.4             | 64QAM | 3  | 0  | 20.13  | 20.23 | 20.00  |                        |             |
| 1.4             | 64QAM | 3  | 1  | 20.09  | 20.23 | 20.10  |                        |             |
| 1.4             | 64QAM | 3  | 3  | 20.03  | 20.19 | 20.10  |                        |             |
| 1.4             | 64QAM | 6  | 0  | 20.08  | 20.15 | 20.17  | 21                     | 3           |

**<LTE Band 4>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 20050                    | 20175                       | 20300                     |                        |             |
| Frequency (MHz) |            |         |           | 1720                     | 1732.5                      | 1745                      |                        |             |
| 20              | QPSK       | 1       | 0         | 23.61                    | 23.56                       | 23.46                     | 24                     | 0           |
| 20              | QPSK       | 1       | 49        | 23.45                    | 23.50                       | 23.43                     |                        |             |
| 20              | QPSK       | 1       | 99        | 23.59                    | 23.44                       | 23.45                     |                        |             |
| 20              | QPSK       | 50      | 0         | 22.55                    | 22.55                       | 22.39                     | 23                     | 1           |
| 20              | QPSK       | 50      | 24        | 22.42                    | 22.49                       | 22.36                     |                        |             |
| 20              | QPSK       | 50      | 50        | 22.45                    | 22.36                       | 22.22                     |                        |             |
| 20              | QPSK       | 100     | 0         | 22.55                    | 22.53                       | 22.38                     | 23                     | 1           |
| 20              | 16QAM      | 1       | 0         | 22.91                    | 22.84                       | 22.68                     |                        |             |
| 20              | 16QAM      | 1       | 49        | 22.77                    | 22.81                       | 22.69                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 22.94                    | 22.83                       | 22.77                     | 22                     | 2           |
| 20              | 16QAM      | 50      | 0         | 21.50                    | 21.62                       | 21.45                     |                        |             |
| 20              | 16QAM      | 50      | 24        | 21.47                    | 21.56                       | 21.39                     |                        |             |
| 20              | 16QAM      | 50      | 50        | 21.61                    | 21.43                       | 21.28                     | 22                     | 2           |
| 20              | 16QAM      | 100     | 0         | 21.54                    | 21.60                       | 21.38                     |                        |             |
| 20              | 64QAM      | 1       | 0         | 21.84                    | 21.75                       | 21.75                     |                        |             |
| 20              | 64QAM      | 1       | 49        | 21.77                    | 21.77                       | 21.69                     | 22                     | 2           |
| 20              | 64QAM      | 1       | 99        | 21.80                    | 21.73                       | 21.76                     |                        |             |
| 20              | 64QAM      | 50      | 0         | 20.48                    | 20.65                       | 20.47                     |                        |             |
| 20              | 64QAM      | 50      | 24        | 20.49                    | 20.59                       | 20.44                     | 21                     | 3           |
| 20              | 64QAM      | 50      | 50        | 20.63                    | 20.42                       | 20.29                     |                        |             |
| 20              | 64QAM      | 100     | 0         | 20.59                    | 20.61                       | 20.45                     |                        |             |
| Channel         |            |         |           | 20025                    | 20175                       | 20325                     | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 1717.5                   | 1732.5                      | 1747.5                    |                        |             |
| 15              | QPSK       | 1       | 0         | 23.52                    | 23.52                       | 23.38                     | 24                     | 0           |
| 15              | QPSK       | 1       | 37        | 23.37                    | 23.47                       | 23.36                     |                        |             |
| 15              | QPSK       | 1       | 74        | 23.55                    | 23.34                       | 23.39                     |                        |             |
| 15              | QPSK       | 36      | 0         | 22.36                    | 22.49                       | 22.35                     | 23                     | 1           |
| 15              | QPSK       | 36      | 20        | 22.35                    | 22.45                       | 22.35                     |                        |             |
| 15              | QPSK       | 36      | 39        | 22.50                    | 22.33                       | 22.19                     |                        |             |
| 15              | QPSK       | 75      | 0         | 22.44                    | 22.55                       | 22.38                     | 23                     | 1           |
| 15              | 16QAM      | 1       | 0         | 22.86                    | 22.79                       | 22.61                     |                        |             |
| 15              | 16QAM      | 1       | 37        | 22.67                    | 22.81                       | 22.63                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 22.88                    | 22.78                       | 22.72                     | 22                     | 2           |
| 15              | 16QAM      | 36      | 0         | 21.43                    | 21.59                       | 21.36                     |                        |             |
| 15              | 16QAM      | 36      | 20        | 21.43                    | 21.47                       | 21.38                     |                        |             |
| 15              | 16QAM      | 36      | 39        | 21.53                    | 21.40                       | 21.20                     | 22                     | 2           |
| 15              | 16QAM      | 75      | 0         | 21.45                    | 21.57                       | 21.29                     |                        |             |
| 15              | 64QAM      | 1       | 0         | 21.83                    | 21.68                       | 21.73                     |                        |             |
| 15              | 64QAM      | 1       | 37        | 21.71                    | 21.71                       | 21.66                     | 22                     | 2           |
| 15              | 64QAM      | 1       | 74        | 21.75                    | 21.65                       | 21.69                     |                        |             |
| 15              | 64QAM      | 36      | 0         | 20.47                    | 20.57                       | 20.40                     |                        |             |
| 15              | 64QAM      | 36      | 20        | 20.49                    | 20.54                       | 20.44                     | 21                     | 3           |
| 15              | 64QAM      | 36      | 39        | 20.53                    | 20.40                       | 20.24                     |                        |             |
| 15              | 64QAM      | 75      | 0         | 20.57                    | 20.61                       | 20.38                     |                        |             |
| Channel         |            |         |           | 20000                    | 20175                       | 20350                     | Tune-up limit          | MPR         |



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| Frequency (MHz) |       |    |    | 1715   | 1732.5 | 1750   | (dBm)                  | (dB)        |
|-----------------|-------|----|----|--------|--------|--------|------------------------|-------------|
| 10              | QPSK  | 1  | 0  | 23.57  | 23.52  | 23.45  | 24                     | 0           |
| 10              | QPSK  | 1  | 25 | 23.43  | 23.44  | 23.43  |                        |             |
| 10              | QPSK  | 1  | 49 | 23.57  | 23.36  | 23.36  |                        |             |
| 10              | QPSK  | 25 | 0  | 22.42  | 22.53  | 22.33  | 23                     | 1           |
| 10              | QPSK  | 25 | 12 | 22.33  | 22.48  | 22.32  |                        |             |
| 10              | QPSK  | 25 | 25 | 22.45  | 22.30  | 22.15  |                        |             |
| 10              | QPSK  | 50 | 0  | 22.48  | 22.54  | 22.36  | 23                     | 1           |
| 10              | 16QAM | 1  | 0  | 22.81  | 22.77  | 22.62  |                        |             |
| 10              | 16QAM | 1  | 25 | 22.67  | 22.74  | 22.69  |                        |             |
| 10              | 16QAM | 1  | 49 | 22.85  | 22.73  | 22.72  | 22                     | 2           |
| 10              | 16QAM | 25 | 0  | 21.46  | 21.60  | 21.39  |                        |             |
| 10              | 16QAM | 25 | 12 | 21.40  | 21.49  | 21.31  |                        |             |
| 10              | 16QAM | 25 | 25 | 21.61  | 21.36  | 21.27  | 21                     | 3           |
| 10              | 16QAM | 50 | 0  | 21.52  | 21.56  | 21.29  |                        |             |
| 10              | 64QAM | 1  | 0  | 21.81  | 21.73  | 21.67  |                        |             |
| 10              | 64QAM | 1  | 25 | 21.76  | 21.67  | 21.61  | 22                     | 2           |
| 10              | 64QAM | 1  | 49 | 21.72  | 21.67  | 21.66  |                        |             |
| 10              | 64QAM | 25 | 0  | 20.39  | 20.61  | 20.43  |                        |             |
| 10              | 64QAM | 25 | 12 | 20.47  | 20.50  | 20.38  | 21                     | 3           |
| 10              | 64QAM | 25 | 25 | 20.58  | 20.38  | 20.27  |                        |             |
| 10              | 64QAM | 50 | 0  | 20.53  | 20.53  | 20.45  |                        |             |
| Channel         |       |    |    | 19975  | 20175  | 20375  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1712.5 | 1732.5 | 1752.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 23.60  | 23.53  | 23.41  | 24                     | 0           |
| 5               | QPSK  | 1  | 12 | 23.42  | 23.46  | 23.36  |                        |             |
| 5               | QPSK  | 1  | 24 | 23.54  | 23.37  | 23.37  |                        |             |
| 5               | QPSK  | 12 | 0  | 22.36  | 22.55  | 22.38  | 23                     | 1           |
| 5               | QPSK  | 12 | 7  | 22.38  | 22.39  | 22.31  |                        |             |
| 5               | QPSK  | 12 | 13 | 22.55  | 22.36  | 22.15  |                        |             |
| 5               | QPSK  | 25 | 0  | 22.48  | 22.45  | 22.32  | 23                     | 1           |
| 5               | 16QAM | 1  | 0  | 22.85  | 22.78  | 22.65  |                        |             |
| 5               | 16QAM | 1  | 12 | 22.76  | 22.72  | 22.61  |                        |             |
| 5               | 16QAM | 1  | 24 | 22.94  | 22.77  | 22.71  | 22                     | 2           |
| 5               | 16QAM | 12 | 0  | 21.50  | 21.60  | 21.37  |                        |             |
| 5               | 16QAM | 12 | 7  | 21.46  | 21.48  | 21.39  |                        |             |
| 5               | 16QAM | 12 | 13 | 21.58  | 21.37  | 21.20  | 22                     | 2           |
| 5               | 16QAM | 25 | 0  | 21.45  | 21.52  | 21.28  |                        |             |
| 5               | 64QAM | 1  | 0  | 21.79  | 21.70  | 21.65  |                        |             |
| 5               | 64QAM | 1  | 12 | 21.73  | 21.71  | 21.61  | 22                     | 2           |
| 5               | 64QAM | 1  | 24 | 21.80  | 21.67  | 21.76  |                        |             |
| 5               | 64QAM | 12 | 0  | 20.40  | 20.61  | 20.46  |                        |             |
| 5               | 64QAM | 12 | 7  | 20.46  | 20.58  | 20.44  | 21                     | 3           |
| 5               | 64QAM | 12 | 13 | 20.61  | 20.32  | 20.22  |                        |             |
| 5               | 64QAM | 25 | 0  | 20.56  | 20.51  | 20.40  |                        |             |
| Channel         |       |    |    | 19965  | 20175  | 20385  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1711.5 | 1732.5 | 1753.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 23.54  | 23.54  | 23.40  | 24                     | 0           |
| 3               | QPSK  | 1  | 8  | 23.40  | 23.46  | 23.37  |                        |             |
| 3               | QPSK  | 1  | 14 | 23.58  | 23.43  | 23.40  |                        |             |



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|                 |       |    |    |        |        |        |                        |             |
|-----------------|-------|----|----|--------|--------|--------|------------------------|-------------|
| 3               | QPSK  | 8  | 0  | 22.37  | 22.53  | 22.38  | 23                     | 1           |
| 3               | QPSK  | 8  | 4  | 22.40  | 22.39  | 22.26  |                        |             |
| 3               | QPSK  | 8  | 7  | 22.47  | 22.29  | 22.14  |                        |             |
| 3               | QPSK  | 15 | 0  | 22.52  | 22.55  | 22.36  |                        |             |
| 3               | 16QAM | 1  | 0  | 22.90  | 22.74  | 22.59  | 23                     | 1           |
| 3               | 16QAM | 1  | 8  | 22.67  | 22.71  | 22.63  |                        |             |
| 3               | 16QAM | 1  | 14 | 22.93  | 22.77  | 22.70  |                        |             |
| 3               | 16QAM | 8  | 0  | 21.50  | 21.61  | 21.43  | 22                     | 2           |
| 3               | 16QAM | 8  | 4  | 21.40  | 21.49  | 21.39  |                        |             |
| 3               | 16QAM | 8  | 7  | 21.56  | 21.36  | 21.22  |                        |             |
| 3               | 16QAM | 15 | 0  | 21.44  | 21.54  | 21.30  |                        |             |
| 3               | 64QAM | 1  | 0  | 21.75  | 21.73  | 21.65  | 22                     | 2           |
| 3               | 64QAM | 1  | 8  | 21.75  | 21.75  | 21.64  |                        |             |
| 3               | 64QAM | 1  | 14 | 21.74  | 21.72  | 21.74  |                        |             |
| 3               | 64QAM | 8  | 0  | 20.47  | 20.55  | 20.45  | 21                     | 3           |
| 3               | 64QAM | 8  | 4  | 20.48  | 20.50  | 20.42  |                        |             |
| 3               | 64QAM | 8  | 7  | 20.58  | 20.40  | 20.24  |                        |             |
| 3               | 64QAM | 15 | 0  | 20.49  | 20.51  | 20.38  |                        |             |
| Channel         |       |    |    | 19957  | 20175  | 20393  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1710.7 | 1732.5 | 1754.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 23.53  | 23.47  | 23.42  | 24                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 23.41  | 23.49  | 23.35  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 23.51  | 23.42  | 23.36  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 22.43  | 22.50  | 22.31  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 22.32  | 22.40  | 22.27  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 22.48  | 22.30  | 22.19  |                        |             |
| 1.4             | QPSK  | 6  | 0  | 22.43  | 22.48  | 22.29  | 23                     | 1           |
| 1.4             | 16QAM | 1  | 0  | 22.83  | 22.74  | 22.68  | 23                     | 1           |
| 1.4             | 16QAM | 1  | 3  | 22.72  | 22.81  | 22.63  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 22.89  | 22.83  | 22.77  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 21.44  | 21.53  | 21.40  |                        |             |
| 1.4             | 16QAM | 3  | 1  | 21.37  | 21.50  | 21.32  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 21.51  | 21.43  | 21.28  | 22                     | 2           |
| 1.4             | 16QAM | 6  | 0  | 21.51  | 21.56  | 21.30  |                        |             |
| 1.4             | 64QAM | 1  | 0  | 21.79  | 21.69  | 21.71  |                        |             |
| 1.4             | 64QAM | 1  | 3  | 21.70  | 21.72  | 21.66  |                        |             |
| 1.4             | 64QAM | 1  | 5  | 21.77  | 21.66  | 21.69  |                        |             |
| 1.4             | 64QAM | 3  | 0  | 20.39  | 20.57  | 20.45  |                        |             |
| 1.4             | 64QAM | 3  | 1  | 20.48  | 20.57  | 20.39  | 21                     | 3           |
| 1.4             | 64QAM | 3  | 3  | 20.59  | 20.34  | 20.20  |                        |             |
| 1.4             | 64QAM | 6  | 0  | 20.56  | 20.51  | 20.38  |                        |             |

**<LTE Band 5>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 20450                    | 20525                       | 20600                     |                        |             |
| Frequency (MHz) |            |         |           | 829                      | 836.5                       | 844                       |                        |             |
| 10              | QPSK       | 1       | 0         | 23.43                    | 23.44                       | 23.32                     | 25                     | 0           |
| 10              | QPSK       | 1       | 25        | 23.33                    | 23.33                       | 23.26                     |                        |             |
| 10              | QPSK       | 1       | 49        | 23.41                    | 23.27                       | 23.31                     |                        |             |
| 10              | QPSK       | 25      | 0         | 22.39                    | 22.31                       | 22.31                     | 24                     | 1           |
| 10              | QPSK       | 25      | 12        | 22.29                    | 22.27                       | 22.27                     |                        |             |
| 10              | QPSK       | 25      | 25        | 22.37                    | 22.24                       | 22.30                     |                        |             |
| 10              | QPSK       | 50      | 0         | 22.31                    | 22.32                       | 22.31                     | 24                     | 1           |
| 10              | 16QAM      | 1       | 0         | 22.66                    | 22.80                       | 22.50                     |                        |             |
| 10              | 16QAM      | 1       | 25        | 22.60                    | 22.65                       | 22.71                     |                        |             |
| 10              | 16QAM      | 1       | 49        | 22.71                    | 22.65                       | 22.59                     | 23                     | 2           |
| 10              | 16QAM      | 25      | 0         | 21.46                    | 21.38                       | 21.33                     |                        |             |
| 10              | 16QAM      | 25      | 12        | 21.39                    | 21.39                       | 21.37                     |                        |             |
| 10              | 16QAM      | 25      | 25        | 21.46                    | 21.34                       | 21.38                     | 23                     | 2           |
| 10              | 16QAM      | 50      | 0         | 21.34                    | 21.30                       | 21.34                     |                        |             |
| 10              | 64QAM      | 1       | 0         | 21.56                    | 21.62                       | 21.47                     |                        |             |
| 10              | 64QAM      | 1       | 25        | 21.52                    | 21.60                       | 21.44                     | 23                     | 2           |
| 10              | 64QAM      | 1       | 49        | 21.70                    | 21.49                       | 21.57                     |                        |             |
| 10              | 64QAM      | 25      | 0         | 20.47                    | 20.40                       | 20.33                     |                        |             |
| 10              | 64QAM      | 25      | 12        | 20.42                    | 20.37                       | 20.40                     | 22                     | 3           |
| 10              | 64QAM      | 25      | 25        | 20.46                    | 20.32                       | 20.38                     |                        |             |
| 10              | 64QAM      | 50      | 0         | 20.35                    | 20.30                       | 20.37                     |                        |             |
| Channel         |            |         |           | 20425                    | 20525                       | 20625                     | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 826.5                    | 836.5                       | 846.5                     |                        |             |
| 5               | QPSK       | 1       | 0         | 23.32                    | 23.43                       | 23.20                     | 25                     | 0           |
| 5               | QPSK       | 1       | 12        | 23.30                    | 23.33                       | 23.22                     |                        |             |
| 5               | QPSK       | 1       | 24        | 23.43                    | 23.23                       | 23.30                     |                        |             |
| 5               | QPSK       | 12      | 0         | 22.34                    | 22.28                       | 22.23                     | 24                     | 1           |
| 5               | QPSK       | 12      | 7         | 22.21                    | 22.22                       | 22.27                     |                        |             |
| 5               | QPSK       | 12      | 13        | 22.32                    | 22.24                       | 22.21                     |                        |             |
| 5               | QPSK       | 25      | 0         | 22.25                    | 22.18                       | 22.25                     | 24                     | 1           |
| 5               | 16QAM      | 1       | 0         | 22.58                    | 22.74                       | 22.50                     |                        |             |
| 5               | 16QAM      | 1       | 12        | 22.58                    | 22.65                       | 22.66                     |                        |             |
| 5               | 16QAM      | 1       | 24        | 22.64                    | 22.57                       | 22.51                     | 23                     | 2           |
| 5               | 16QAM      | 12      | 0         | 21.46                    | 21.38                       | 21.33                     |                        |             |
| 5               | 16QAM      | 12      | 7         | 21.34                    | 21.37                       | 21.29                     |                        |             |
| 5               | 16QAM      | 12      | 13        | 21.43                    | 21.28                       | 21.34                     | 23                     | 2           |
| 5               | 16QAM      | 25      | 0         | 21.24                    | 21.25                       | 21.30                     |                        |             |
| 5               | 64QAM      | 1       | 0         | 21.49                    | 21.59                       | 21.40                     |                        |             |
| 5               | 64QAM      | 1       | 12        | 21.45                    | 21.56                       | 21.44                     | 23                     | 2           |
| 5               | 64QAM      | 1       | 24        | 21.61                    | 21.42                       | 21.50                     |                        |             |
| 5               | 64QAM      | 12      | 0         | 20.42                    | 20.32                       | 20.29                     |                        |             |
| 5               | 64QAM      | 12      | 7         | 20.41                    | 20.30                       | 20.40                     | 22                     | 3           |
| 5               | 64QAM      | 12      | 13        | 20.44                    | 20.30                       | 20.29                     |                        |             |
| 5               | 64QAM      | 25      | 0         | 20.35                    | 20.29                       | 20.37                     |                        |             |
| Channel         |            |         |           | 20415                    | 20525                       | 20635                     | Tune-up limit          | MPR         |

| Frequency (MHz) |       |    |    | 825.5 | 836.5 | 847.5 | (dBm)                  | (dB)        |
|-----------------|-------|----|----|-------|-------|-------|------------------------|-------------|
| 3               | QPSK  | 1  | 0  | 23.41 | 23.43 | 23.16 | 25                     | 0           |
| 3               | QPSK  | 1  | 8  | 23.33 | 23.23 | 23.30 |                        |             |
| 3               | QPSK  | 1  | 14 | 23.34 | 23.23 | 23.21 |                        |             |
| 3               | QPSK  | 8  | 0  | 22.29 | 22.30 | 22.26 | 24                     | 1           |
| 3               | QPSK  | 8  | 4  | 22.28 | 22.27 | 22.25 |                        |             |
| 3               | QPSK  | 8  | 7  | 22.36 | 22.24 | 22.25 |                        |             |
| 3               | QPSK  | 15 | 0  | 22.22 | 22.24 | 22.23 |                        |             |
| 3               | 16QAM | 1  | 0  | 22.60 | 22.73 | 22.43 | 24                     | 1           |
| 3               | 16QAM | 1  | 8  | 22.50 | 22.55 | 22.70 |                        |             |
| 3               | 16QAM | 1  | 14 | 22.63 | 22.56 | 22.57 |                        |             |
| 3               | 16QAM | 8  | 0  | 21.40 | 21.34 | 21.24 | 23                     | 2           |
| 3               | 16QAM | 8  | 4  | 21.38 | 21.38 | 21.35 |                        |             |
| 3               | 16QAM | 8  | 7  | 21.38 | 21.31 | 21.30 |                        |             |
| 3               | 16QAM | 15 | 0  | 21.27 | 21.21 | 21.24 |                        |             |
| 3               | 64QAM | 1  | 0  | 21.54 | 21.52 | 21.47 | 23                     | 2           |
| 3               | 64QAM | 1  | 8  | 21.49 | 21.50 | 21.34 |                        |             |
| 3               | 64QAM | 1  | 14 | 21.70 | 21.45 | 21.48 |                        |             |
| 3               | 64QAM | 8  | 0  | 20.46 | 20.30 | 20.24 | 22                     | 3           |
| 3               | 64QAM | 8  | 4  | 20.41 | 20.27 | 20.38 |                        |             |
| 3               | 64QAM | 8  | 7  | 20.40 | 20.32 | 20.32 |                        |             |
| 3               | 64QAM | 15 | 0  | 20.35 | 20.29 | 20.35 |                        |             |
| Channel         |       |    |    | 20407 | 20525 | 20643 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 824.7 | 836.5 | 848.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 23.33 | 23.34 | 23.25 | 25                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 23.33 | 23.33 | 23.25 |                        |             |
| 1.4             | QPSK  | 1  | 5  | 23.37 | 23.23 | 23.27 |                        |             |
| 1.4             | QPSK  | 3  | 0  | 23.24 | 23.06 | 23.02 |                        |             |
| 1.4             | QPSK  | 3  | 1  | 23.04 | 23.09 | 23.11 |                        |             |
| 1.4             | QPSK  | 3  | 3  | 23.19 | 23.04 | 23.09 |                        |             |
| 1.4             | QPSK  | 6  | 0  | 22.28 | 22.24 | 22.29 | 24                     | 1           |
| 1.4             | 16QAM | 1  | 0  | 22.61 | 22.72 | 22.43 | 24                     | 1           |
| 1.4             | 16QAM | 1  | 3  | 22.56 | 22.64 | 22.67 |                        |             |
| 1.4             | 16QAM | 1  | 5  | 22.70 | 22.64 | 22.57 |                        |             |
| 1.4             | 16QAM | 3  | 0  | 22.21 | 22.08 | 22.07 |                        |             |
| 1.4             | 16QAM | 3  | 1  | 22.11 | 22.09 | 22.09 |                        |             |
| 1.4             | 16QAM | 3  | 3  | 22.18 | 22.02 | 22.06 |                        |             |
| 1.4             | 16QAM | 6  | 0  | 21.27 | 21.23 | 21.32 | 23                     | 2           |
| 1.4             | 64QAM | 1  | 0  | 21.54 | 21.52 | 21.43 | 23                     | 2           |
| 1.4             | 64QAM | 1  | 3  | 21.51 | 21.57 | 21.42 |                        |             |
| 1.4             | 64QAM | 1  | 5  | 21.62 | 21.47 | 21.49 |                        |             |
| 1.4             | 64QAM | 3  | 0  | 21.25 | 21.17 | 21.13 |                        |             |
| 1.4             | 64QAM | 3  | 1  | 21.22 | 21.12 | 21.19 |                        |             |
| 1.4             | 64QAM | 3  | 3  | 21.25 | 21.02 | 21.15 |                        |             |
| 1.4             | 64QAM | 6  | 0  | 21.11 | 21.05 | 21.15 | 22                     | 3           |

**<LTE Band 7>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 20850                    | 21100                       | 21350                     |                        |             |
| Frequency (MHz) |            |         |           | 2510                     | 2535                        | 2560                      |                        |             |
| 20              | QPSK       | 1       | 0         | 23.42                    | 23.44                       | 23.47                     | 24                     | 0           |
| 20              | QPSK       | 1       | 49        | 23.39                    | 23.24                       | 23.37                     |                        |             |
| 20              | QPSK       | 1       | 99        | 22.95                    | 23.43                       | 23.17                     |                        |             |
| 20              | QPSK       | 50      | 0         | 22.40                    | 22.43                       | 22.51                     | 23                     | 1           |
| 20              | QPSK       | 50      | 24        | 22.33                    | 22.32                       | 22.42                     |                        |             |
| 20              | QPSK       | 50      | 50        | 22.33                    | 22.32                       | 22.36                     |                        |             |
| 20              | QPSK       | 100     | 0         | 22.41                    | 22.36                       | 22.53                     | 23                     | 1           |
| 20              | 16QAM      | 1       | 0         | 22.29                    | 22.70                       | 22.83                     |                        |             |
| 20              | 16QAM      | 1       | 49        | 22.74                    | 22.57                       | 22.89                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 22.80                    | 22.78                       | 22.44                     | 22                     | 2           |
| 20              | 16QAM      | 50      | 0         | 21.38                    | 21.48                       | 21.48                     |                        |             |
| 20              | 16QAM      | 50      | 24        | 21.46                    | 21.38                       | 21.60                     |                        |             |
| 20              | 16QAM      | 50      | 50        | 21.39                    | 21.37                       | 21.44                     | 22                     | 2           |
| 20              | 16QAM      | 100     | 0         | 21.46                    | 21.43                       | 21.59                     |                        |             |
| 20              | 64QAM      | 1       | 0         | 21.29                    | 21.70                       | 21.68                     |                        |             |
| 20              | 64QAM      | 1       | 49        | 21.67                    | 21.59                       | 21.81                     | 22                     | 2           |
| 20              | 64QAM      | 1       | 99        | 21.78                    | 21.69                       | 21.46                     |                        |             |
| 20              | 64QAM      | 50      | 0         | 20.41                    | 20.48                       | 20.50                     |                        |             |
| 20              | 64QAM      | 50      | 24        | 20.46                    | 20.36                       | 20.59                     | 21                     | 3           |
| 20              | 64QAM      | 50      | 50        | 20.37                    | 20.37                       | 20.44                     |                        |             |
| 20              | 64QAM      | 100     | 0         | 20.45                    | 20.39                       | 20.59                     |                        |             |
| Channel         |            |         |           | 20825                    | 21100                       | 21375                     | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 2507.5                   | 2535                        | 2562.5                    |                        |             |
| 15              | QPSK       | 1       | 0         | 22.93                    | 23.43                       | 23.33                     | 24                     | 0           |
| 15              | QPSK       | 1       | 37        | 23.35                    | 23.19                       | 23.46                     |                        |             |
| 15              | QPSK       | 1       | 74        | 23.38                    | 23.33                       | 23.17                     |                        |             |
| 15              | QPSK       | 36      | 0         | 22.33                    | 22.36                       | 22.41                     | 23                     | 1           |
| 15              | QPSK       | 36      | 20        | 22.36                    | 22.31                       | 22.48                     |                        |             |
| 15              | QPSK       | 36      | 39        | 22.27                    | 22.31                       | 22.27                     |                        |             |
| 15              | QPSK       | 75      | 0         | 22.39                    | 22.30                       | 22.49                     | 23                     | 1           |
| 15              | 16QAM      | 1       | 0         | 22.21                    | 22.60                       | 22.76                     |                        |             |
| 15              | 16QAM      | 1       | 37        | 22.69                    | 22.55                       | 22.86                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 22.76                    | 22.69                       | 22.39                     | 22                     | 2           |
| 15              | 16QAM      | 36      | 0         | 21.34                    | 21.38                       | 21.43                     |                        |             |
| 15              | 16QAM      | 36      | 20        | 21.43                    | 21.35                       | 21.57                     |                        |             |
| 15              | 16QAM      | 36      | 39        | 21.37                    | 21.35                       | 21.38                     | 22                     | 2           |
| 15              | 16QAM      | 75      | 0         | 21.46                    | 21.37                       | 21.59                     |                        |             |
| 15              | 64QAM      | 1       | 0         | 21.21                    | 21.63                       | 21.67                     |                        |             |
| 15              | 64QAM      | 1       | 37        | 21.62                    | 21.50                       | 21.80                     | 22                     | 2           |
| 15              | 64QAM      | 1       | 74        | 21.70                    | 21.62                       | 21.37                     |                        |             |
| 15              | 64QAM      | 36      | 0         | 20.31                    | 20.43                       | 20.46                     |                        |             |
| 15              | 64QAM      | 36      | 20        | 20.40                    | 20.33                       | 20.51                     | 21                     | 3           |
| 15              | 64QAM      | 36      | 39        | 20.35                    | 20.37                       | 20.37                     |                        |             |
| 15              | 64QAM      | 75      | 0         | 20.36                    | 20.33                       | 20.59                     |                        |             |
| Channel         |            |         |           | 20800                    | 21100                       | 21400                     | Tune-up limit          | MPR         |



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| Frequency (MHz) |       |    |    | 2505   | 2535  | 2565   | (dBm)                  | (dB)        |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| 10              | QPSK  | 1  | 0  | 22.91  | 23.39 | 23.28  | 24                     | 0           |
| 10              | QPSK  | 1  | 25 | 23.31  | 23.14 | 23.43  |                        |             |
| 10              | QPSK  | 1  | 49 | 23.37  | 23.34 | 23.14  |                        |             |
| 10              | QPSK  | 25 | 0  | 22.30  | 22.36 | 22.34  | 23                     | 1           |
| 10              | QPSK  | 25 | 12 | 22.37  | 22.28 | 22.41  |                        |             |
| 10              | QPSK  | 25 | 25 | 22.23  | 22.28 | 22.34  |                        |             |
| 10              | QPSK  | 50 | 0  | 22.41  | 22.32 | 22.53  |                        |             |
| 10              | 16QAM | 1  | 0  | 22.25  | 22.62 | 22.78  | 23                     | 1           |
| 10              | 16QAM | 1  | 25 | 22.69  | 22.56 | 22.88  |                        |             |
| 10              | 16QAM | 1  | 49 | 22.80  | 22.69 | 22.39  |                        |             |
| 10              | 16QAM | 25 | 0  | 21.34  | 21.44 | 21.39  | 22                     | 2           |
| 10              | 16QAM | 25 | 12 | 21.36  | 21.34 | 21.57  |                        |             |
| 10              | 16QAM | 25 | 25 | 21.36  | 21.37 | 21.44  |                        |             |
| 10              | 16QAM | 50 | 0  | 21.46  | 21.37 | 21.50  |                        |             |
| 10              | 64QAM | 1  | 0  | 21.27  | 21.67 | 21.61  | 22                     | 2           |
| 10              | 64QAM | 1  | 25 | 21.61  | 21.59 | 21.73  |                        |             |
| 10              | 64QAM | 1  | 49 | 21.69  | 21.66 | 21.39  |                        |             |
| 10              | 64QAM | 25 | 0  | 20.34  | 20.48 | 20.48  | 21                     | 3           |
| 10              | 64QAM | 25 | 12 | 20.45  | 20.26 | 20.56  |                        |             |
| 10              | 64QAM | 25 | 25 | 20.32  | 20.29 | 20.37  |                        |             |
| 10              | 64QAM | 50 | 0  | 20.44  | 20.39 | 20.59  |                        |             |
| Channel         |       |    |    | 20775  | 21100 | 21425  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 2502.5 | 2535  | 2567.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 22.88  | 23.38 | 23.32  | 24                     | 0           |
| 5               | QPSK  | 1  | 12 | 23.34  | 23.18 | 23.46  |                        |             |
| 5               | QPSK  | 1  | 24 | 23.33  | 23.42 | 23.15  |                        |             |
| 5               | QPSK  | 12 | 0  | 22.33  | 22.40 | 22.35  | 23                     | 1           |
| 5               | QPSK  | 12 | 7  | 22.36  | 22.24 | 22.50  |                        |             |
| 5               | QPSK  | 12 | 13 | 22.33  | 22.31 | 22.26  |                        |             |
| 5               | QPSK  | 25 | 0  | 22.36  | 22.30 | 22.50  |                        |             |
| 5               | 16QAM | 1  | 0  | 22.27  | 22.64 | 22.78  | 23                     | 1           |
| 5               | 16QAM | 1  | 12 | 22.64  | 22.47 | 22.87  |                        |             |
| 5               | 16QAM | 1  | 24 | 22.75  | 22.70 | 22.41  |                        |             |
| 5               | 16QAM | 12 | 0  | 21.33  | 21.47 | 21.40  | 22                     | 2           |
| 5               | 16QAM | 12 | 7  | 21.44  | 21.29 | 21.59  |                        |             |
| 5               | 16QAM | 12 | 13 | 21.29  | 21.30 | 21.40  |                        |             |
| 5               | 16QAM | 25 | 0  | 21.40  | 21.40 | 21.50  |                        |             |
| 5               | 64QAM | 1  | 0  | 21.25  | 21.62 | 21.60  | 22                     | 2           |
| 5               | 64QAM | 1  | 12 | 21.63  | 21.50 | 21.79  |                        |             |
| 5               | 64QAM | 1  | 24 | 21.70  | 21.69 | 21.44  |                        |             |
| 5               | 64QAM | 12 | 0  | 20.35  | 20.40 | 20.42  | 21                     | 3           |
| 5               | 64QAM | 12 | 7  | 20.43  | 20.33 | 20.51  |                        |             |
| 5               | 64QAM | 12 | 13 | 20.32  | 20.28 | 20.44  |                        |             |
| 5               | 64QAM | 25 | 0  | 20.35  | 20.33 | 20.52  |                        |             |

**<LTE Band 12>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23060                 | 23095                    | 23130                  |                     |          |
| Frequency (MHz) |            |         |           | 704                   | 707.5                    | 711                    |                     |          |
| 10              | QPSK       | 1       | 0         | 23.09                 | 23.11                    | 23.04                  | 24                  | 0        |
| 10              | QPSK       | 1       | 25        | 23.08                 | 23.10                    | 23.01                  |                     |          |
| 10              | QPSK       | 1       | 49        | 22.90                 | 23.07                    | 22.97                  |                     |          |
| 10              | QPSK       | 25      | 0         | 22.06                 | 22.07                    | 22.06                  | 23                  | 1        |
| 10              | QPSK       | 25      | 12        | 22.01                 | 22.06                    | 22.06                  |                     |          |
| 10              | QPSK       | 25      | 25        | 21.97                 | 22.06                    | 21.99                  |                     |          |
| 10              | QPSK       | 50      | 0         | 22.07                 | 22.08                    | 22.06                  | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         | 22.07                 | 22.27                    | 22.32                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 22.34                 | 22.39                    | 22.29                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 22.35                 | 22.34                    | 22.18                  | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         | 21.00                 | 21.09                    | 21.18                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 21.07                 | 21.15                    | 21.21                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 21.16                 | 21.17                    | 21.08                  | 22                  | 2        |
| 10              | 16QAM      | 50      | 0         | 21.14                 | 21.13                    | 21.10                  |                     |          |
| 10              | 64QAM      | 1       | 0         | 21.06                 | 21.36                    | 21.42                  |                     |          |
| 10              | 64QAM      | 1       | 25        | 21.41                 | 21.38                    | 21.30                  | 22                  | 2        |
| 10              | 64QAM      | 1       | 49        | 21.24                 | 21.30                    | 21.24                  |                     |          |
| 10              | 64QAM      | 25      | 0         | 19.99                 | 20.09                    | 20.19                  |                     |          |
| 10              | 64QAM      | 25      | 12        | 20.07                 | 20.13                    | 20.19                  | 21                  | 3        |
| 10              | 64QAM      | 25      | 25        | 20.12                 | 20.18                    | 20.10                  |                     |          |
| 10              | 64QAM      | 50      | 0         | 20.15                 | 20.10                    | 20.12                  |                     |          |
| Channel         |            |         |           | 23035                 | 23095                    | 23155                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 701.5                 | 707.5                    | 713.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 22.86                 | 23.00                    | 23.05                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 23.00                 | 23.10                    | 22.95                  |                     |          |
| 5               | QPSK       | 1       | 24        | 23.02                 | 22.99                    | 22.91                  |                     |          |
| 5               | QPSK       | 12      | 0         | 21.87                 | 21.96                    | 21.98                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 21.92                 | 22.05                    | 22.03                  |                     |          |
| 5               | QPSK       | 12      | 13        | 22.02                 | 22.04                    | 21.98                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.98                 | 21.98                    | 22.03                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 0         | 22.06                 | 22.18                    | 22.30                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 22.26                 | 22.30                    | 22.25                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 22.26                 | 22.32                    | 22.13                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 0         | 20.94                 | 21.05                    | 21.17                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 21.04                 | 21.08                    | 21.18                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 21.13                 | 21.15                    | 21.01                  | 22                  | 2        |
| 5               | 16QAM      | 25      | 0         | 21.13                 | 21.12                    | 21.04                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 21.02                 | 21.32                    | 21.41                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 21.33                 | 21.35                    | 21.30                  | 22                  | 2        |
| 5               | 64QAM      | 1       | 24        | 21.18                 | 21.29                    | 21.16                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 19.96                 | 20.07                    | 20.18                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 20.01                 | 20.05                    | 20.14                  | 21                  | 3        |
| 5               | 64QAM      | 12      | 13        | 20.04                 | 20.13                    | 20.08                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 20.08                 | 20.09                    | 20.06                  |                     |          |
| Channel         |            |         |           | 23025                 | 23095                    | 23165                  | Tune-up limit       | MPR      |



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| Frequency (MHz) |       |    |    | 700.5 | 707.5 | 714.5 | (dBm)                  | (dB)        |
|-----------------|-------|----|----|-------|-------|-------|------------------------|-------------|
| 3               | QPSK  | 1  | 0  | 22.87 | 22.97 | 23.10 | 24                     | 0           |
| 3               | QPSK  | 1  | 8  | 23.05 | 23.09 | 22.98 |                        |             |
| 3               | QPSK  | 1  | 14 | 23.03 | 22.98 | 22.89 |                        |             |
| 3               | QPSK  | 8  | 0  | 21.82 | 21.95 | 22.05 | 23                     | 1           |
| 3               | QPSK  | 8  | 4  | 22.00 | 22.02 | 22.07 |                        |             |
| 3               | QPSK  | 8  | 7  | 22.00 | 22.06 | 21.95 |                        |             |
| 3               | QPSK  | 15 | 0  | 22.05 | 22.07 | 21.97 |                        |             |
| 3               | 16QAM | 1  | 0  | 22.00 | 22.19 | 22.28 | 23                     | 1           |
| 3               | 16QAM | 1  | 8  | 22.28 | 22.36 | 22.21 |                        |             |
| 3               | 16QAM | 1  | 14 | 22.25 | 22.25 | 22.15 |                        |             |
| 3               | 16QAM | 8  | 0  | 20.96 | 20.99 | 21.08 | 22                     | 2           |
| 3               | 16QAM | 8  | 4  | 21.03 | 21.09 | 21.19 |                        |             |
| 3               | 16QAM | 8  | 7  | 21.11 | 21.13 | 20.99 |                        |             |
| 3               | 16QAM | 15 | 0  | 21.09 | 21.03 | 21.02 |                        |             |
| 3               | 64QAM | 1  | 0  | 21.06 | 21.31 | 21.35 | 22                     | 2           |
| 3               | 64QAM | 1  | 8  | 21.33 | 21.31 | 21.30 |                        |             |
| 3               | 64QAM | 1  | 14 | 21.21 | 21.26 | 21.19 |                        |             |
| 3               | 64QAM | 8  | 0  | 19.90 | 20.08 | 20.13 | 21                     | 3           |
| 3               | 64QAM | 8  | 4  | 20.05 | 20.11 | 20.18 |                        |             |
| 3               | 64QAM | 8  | 7  | 20.03 | 20.08 | 20.04 |                        |             |
| 3               | 64QAM | 15 | 0  | 20.15 | 20.04 | 20.07 |                        |             |
| Channel         |       |    |    | 23017 | 23095 | 23173 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 699.7 | 707.5 | 715.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 22.83 | 22.91 | 23.01 | 24                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 23.05 | 23.08 | 23.03 |                        |             |
| 1.4             | QPSK  | 1  | 5  | 23.01 | 23.01 | 22.93 |                        |             |
| 1.4             | QPSK  | 3  | 0  | 22.01 | 22.02 | 22.05 |                        |             |
| 1.4             | QPSK  | 3  | 1  | 22.07 | 22.04 | 22.03 |                        |             |
| 1.4             | QPSK  | 3  | 3  | 22.03 | 22.02 | 22.00 |                        |             |
| 1.4             | QPSK  | 6  | 0  | 22.08 | 22.04 | 22.06 | 23                     | 1           |
| 1.4             | 16QAM | 1  | 0  | 21.98 | 22.17 | 22.22 | 23                     | 1           |
| 1.4             | 16QAM | 1  | 3  | 22.32 | 22.29 | 22.26 |                        |             |
| 1.4             | 16QAM | 1  | 5  | 22.33 | 22.34 | 22.10 |                        |             |
| 1.4             | 16QAM | 3  | 0  | 21.05 | 21.06 | 21.12 |                        |             |
| 1.4             | 16QAM | 3  | 1  | 21.00 | 21.12 | 21.16 |                        |             |
| 1.4             | 16QAM | 3  | 3  | 21.12 | 21.08 | 21.08 |                        |             |
| 1.4             | 16QAM | 6  | 0  | 21.08 | 21.11 | 21.04 | 22                     | 2           |
| 1.4             | 64QAM | 1  | 0  | 21.06 | 21.28 | 21.41 | 22                     | 2           |
| 1.4             | 64QAM | 1  | 3  | 21.36 | 21.30 | 21.23 |                        |             |
| 1.4             | 64QAM | 1  | 5  | 21.18 | 21.26 | 21.22 |                        |             |
| 1.4             | 64QAM | 3  | 0  | 20.06 | 20.02 | 20.19 |                        |             |
| 1.4             | 64QAM | 3  | 1  | 20.06 | 20.11 | 20.12 |                        |             |
| 1.4             | 64QAM | 3  | 3  | 20.10 | 20.09 | 20.06 |                        |             |
| 1.4             | 64QAM | 6  | 0  | 20.08 | 20.09 | 20.09 | 21                     | 3           |

**<LTE Band 13>**

| E-UTRA Band 20  |       |    |    | Power<br>Low<br>Ch. / Freq. | Power<br>Middle<br>Ch. / Freq. | Power<br>High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|-----------------------------|--------------------------------|------------------------------|------------------------|-------------|
| Channel         |       |    |    | 23230                       |                                |                              |                        |             |
| Frequency (MHz) |       |    |    | 782                         |                                |                              |                        |             |
| 10              | QPSK  | 1  | 0  |                             | 23.09                          |                              | 24                     | 0           |
| 10              | QPSK  | 1  | 25 |                             | 22.99                          |                              |                        |             |
| 10              | QPSK  | 1  | 49 |                             | 22.97                          |                              |                        |             |
| 10              | QPSK  | 25 | 0  |                             | 22.20                          |                              | 23                     | 1           |
| 10              | QPSK  | 25 | 12 |                             | 21.98                          |                              |                        |             |
| 10              | QPSK  | 25 | 25 |                             | 22.01                          |                              |                        |             |
| 10              | QPSK  | 50 | 0  |                             | 22.04                          |                              | 23                     | 1           |
| 10              | 16QAM | 1  | 0  |                             | 22.23                          |                              |                        |             |
| 10              | 16QAM | 1  | 25 |                             | 22.33                          |                              |                        |             |
| 10              | 16QAM | 1  | 49 |                             | 22.41                          |                              | 22                     | 2           |
| 10              | 16QAM | 25 | 0  |                             | 21.13                          |                              |                        |             |
| 10              | 16QAM | 25 | 12 |                             | 21.11                          |                              |                        |             |
| 10              | 16QAM | 25 | 25 |                             | 21.23                          |                              | 22                     | 2           |
| 10              | 16QAM | 50 | 0  |                             | 21.15                          |                              |                        |             |
| 10              | 64QAM | 1  | 0  |                             | 21.26                          |                              |                        |             |
| 10              | 64QAM | 1  | 25 |                             | 21.29                          |                              | 22                     | 2           |
| 10              | 64QAM | 1  | 49 |                             | 21.38                          |                              |                        |             |
| 10              | 64QAM | 25 | 0  |                             | 20.16                          |                              |                        |             |
| 10              | 64QAM | 25 | 12 |                             | 20.12                          |                              | 21                     | 3           |
| 10              | 64QAM | 25 | 25 |                             | 20.28                          |                              |                        |             |
| 10              | 64QAM | 50 | 0  |                             | 20.15                          |                              |                        |             |
| Channel         |       |    |    | 23205                       | 23230                          | 23255                        | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 779.5                       | 782                            | 784.5                        |                        |             |
| 5               | QPSK  | 1  | 0  | 22.94                       | 22.88                          | 22.95                        | 24                     | 0           |
| 5               | QPSK  | 1  | 12 | 22.98                       | 22.92                          | 22.90                        |                        |             |
| 5               | QPSK  | 1  | 24 | 23.00                       | 23.08                          | 23.08                        |                        |             |
| 5               | QPSK  | 12 | 0  | 22.01                       | 21.92                          | 21.97                        | 23                     | 1           |
| 5               | QPSK  | 12 | 7  | 21.91                       | 21.93                          | 21.96                        |                        |             |
| 5               | QPSK  | 12 | 13 | 22.20                       | 22.18                          | 22.20                        |                        |             |
| 5               | QPSK  | 25 | 0  | 22.02                       | 21.97                          | 22.02                        | 23                     | 1           |
| 5               | 16QAM | 1  | 0  | 22.19                       | 22.14                          | 22.14                        |                        |             |
| 5               | 16QAM | 1  | 12 | 22.33                       | 22.28                          | 22.33                        |                        |             |
| 5               | 16QAM | 1  | 24 | 22.34                       | 22.31                          | 22.35                        | 22                     | 2           |
| 5               | 16QAM | 12 | 0  | 21.06                       | 21.03                          | 21.04                        |                        |             |
| 5               | 16QAM | 12 | 7  | 21.02                       | 21.06                          | 21.01                        |                        |             |
| 5               | 16QAM | 12 | 13 | 21.20                       | 21.23                          | 21.18                        | 22                     | 2           |
| 5               | 16QAM | 25 | 0  | 21.15                       | 21.05                          | 21.12                        |                        |             |
| 5               | 64QAM | 1  | 0  | 21.21                       | 21.19                          | 21.25                        |                        |             |
| 5               | 64QAM | 1  | 12 | 21.29                       | 21.28                          | 21.25                        | 22                     | 2           |
| 5               | 64QAM | 1  | 24 | 21.30                       | 21.28                          | 21.36                        |                        |             |
| 5               | 64QAM | 12 | 0  | 20.09                       | 20.10                          | 20.14                        |                        |             |
| 5               | 64QAM | 12 | 7  | 20.02                       | 20.04                          | 20.05                        | 21                     | 3           |
| 5               | 64QAM | 12 | 13 | 20.28                       | 20.25                          | 20.22                        |                        |             |
| 5               | 64QAM | 25 | 0  | 20.06                       | 20.08                          | 20.06                        |                        |             |



**<LTE Band 14>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23330                 |                          |                        |                     |          |
| Frequency (MHz) |            |         |           | 793                   |                          |                        |                     |          |
| 10              | QPSK       | 1       | 0         |                       | 23.17                    |                        | 24                  | 0        |
| 10              | QPSK       | 1       | 25        |                       | 22.98                    |                        |                     |          |
| 10              | QPSK       | 1       | 49        |                       | 23.09                    |                        |                     |          |
| 10              | QPSK       | 25      | 0         |                       | 22.11                    |                        | 23                  | 1        |
| 10              | QPSK       | 25      | 12        |                       | 22.01                    |                        |                     |          |
| 10              | QPSK       | 25      | 25        |                       | 22.10                    |                        |                     |          |
| 10              | QPSK       | 50      | 0         |                       | 22.05                    |                        | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         |                       | 22.35                    |                        |                     |          |
| 10              | 16QAM      | 1       | 25        |                       | 22.24                    |                        |                     |          |
| 10              | 16QAM      | 1       | 49        |                       | 22.53                    |                        | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         |                       | 21.20                    |                        |                     |          |
| 10              | 16QAM      | 25      | 12        |                       | 21.05                    |                        |                     |          |
| 10              | 16QAM      | 25      | 25        |                       | 21.21                    |                        | 22                  | 2        |
| 10              | 16QAM      | 50      | 0         |                       | 21.13                    |                        |                     |          |
| 10              | 64QAM      | 1       | 0         |                       | 21.38                    |                        |                     |          |
| 10              | 64QAM      | 1       | 25        |                       | 21.23                    |                        | 22                  | 2        |
| 10              | 64QAM      | 1       | 49        |                       | 21.49                    |                        |                     |          |
| 10              | 64QAM      | 25      | 0         |                       | 20.18                    |                        |                     |          |
| 10              | 64QAM      | 25      | 12        |                       | 20.07                    |                        | 21                  | 3        |
| 10              | 64QAM      | 25      | 25        |                       | 20.21                    |                        |                     |          |
| 10              | 64QAM      | 50      | 0         |                       | 20.18                    |                        |                     |          |
| Channel         |            |         |           | 23305                 | 23330                    | 23355                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 790.5                 | 793                      | 795.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 22.99                 | 23.09                    | 23.04                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 22.95                 | 22.97                    | 22.98                  |                     |          |
| 5               | QPSK       | 1       | 24        | 23.07                 | 23.12                    | 23.07                  |                     |          |
| 5               | QPSK       | 12      | 0         | 22.02                 | 22.04                    | 22.03                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 21.96                 | 21.95                    | 21.99                  |                     |          |
| 5               | QPSK       | 12      | 13        | 22.06                 | 22.00                    | 22.04                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.96                 | 21.97                    | 21.96                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 0         | 22.34                 | 22.29                    | 22.34                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 22.19                 | 22.16                    | 22.17                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 22.43                 | 22.47                    | 22.44                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 0         | 21.13                 | 21.14                    | 21.13                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.96                 | 21.00                    | 20.95                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 21.12                 | 21.14                    | 21.18                  | 22                  | 2        |
| 5               | 16QAM      | 25      | 0         | 21.11                 | 21.05                    | 21.06                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 21.36                 | 21.30                    | 21.38                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 21.15                 | 21.23                    | 21.18                  | 22                  | 2        |
| 5               | 64QAM      | 1       | 24        | 21.44                 | 21.41                    | 21.42                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 20.18                 | 20.09                    | 20.12                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 20.07                 | 20.01                    | 20.06                  | 21                  | 3        |
| 5               | 64QAM      | 12      | 13        | 20.19                 | 20.15                    | 20.21                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 20.10                 | 20.15                    | 20.15                  |                     |          |

**<LTE Band 17>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23780                 | 23790                    | 23800                  |                     |          |
| Frequency (MHz) |            |         |           | 709                   | 710                      | 711                    |                     |          |
| 10              | QPSK       | 1       | 0         | 23.11                 | 23.15                    | 23.07                  | 24                  | 0        |
| 10              | QPSK       | 1       | 25        | 23.10                 | 23.11                    | 23.06                  |                     |          |
| 10              | QPSK       | 1       | 49        | 22.95                 | 22.97                    | 22.96                  |                     |          |
| 10              | QPSK       | 25      | 0         | 22.08                 | 22.08                    | 22.09                  | 23                  | 1        |
| 10              | QPSK       | 25      | 12        | 22.08                 | 22.07                    | 22.08                  |                     |          |
| 10              | QPSK       | 25      | 25        | 22.05                 | 22.06                    | 21.99                  |                     |          |
| 10              | QPSK       | 50      | 0         | 22.09                 | 22.08                    | 22.06                  | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         | 22.45                 | 22.40                    | 22.42                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 22.40                 | 22.40                    | 22.37                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 22.13                 | 22.25                    | 22.21                  | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         | 21.18                 | 21.18                    | 21.19                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 21.18                 | 21.17                    | 21.21                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 21.17                 | 21.10                    | 21.10                  | 22                  | 2        |
| 10              | 16QAM      | 50      | 0         | 21.11                 | 21.10                    | 21.10                  |                     |          |
| 10              | 64QAM      | 1       | 0         | 21.29                 | 21.25                    | 21.39                  |                     |          |
| 10              | 64QAM      | 1       | 25        | 21.34                 | 21.37                    | 21.35                  | 22                  | 2        |
| 10              | 64QAM      | 1       | 49        | 21.24                 | 21.19                    | 21.31                  |                     |          |
| 10              | 64QAM      | 25      | 0         | 20.16                 | 20.17                    | 20.16                  |                     |          |
| 10              | 64QAM      | 25      | 12        | 20.17                 | 20.18                    | 20.17                  | 21                  | 3        |
| 10              | 64QAM      | 25      | 25        | 20.15                 | 20.06                    | 20.09                  |                     |          |
| 10              | 64QAM      | 50      | 0         | 20.09                 | 20.12                    | 20.12                  |                     |          |
| Channel         |            |         |           | 23755                 | 23790                    | 23825                  |                     |          |
| Frequency (MHz) |            |         |           | 706.5                 | 710                      | 713.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 23.01                 | 23.08                    | 23.06                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 23.00                 | 23.01                    | 23.02                  |                     |          |
| 5               | QPSK       | 1       | 24        | 22.95                 | 22.92                    | 22.93                  |                     |          |
| 5               | QPSK       | 12      | 0         | 22.05                 | 21.99                    | 22.06                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 22.06                 | 21.99                    | 22.08                  |                     |          |
| 5               | QPSK       | 12      | 13        | 22.05                 | 21.91                    | 21.98                  |                     |          |
| 5               | QPSK       | 25      | 0         | 22.08                 | 22.07                    | 21.96                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 0         | 22.45                 | 22.37                    | 22.42                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 22.34                 | 22.31                    | 22.33                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 22.10                 | 22.21                    | 22.16                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 0         | 21.12                 | 21.12                    | 21.12                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 21.16                 | 21.17                    | 21.19                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 21.16                 | 21.10                    | 21.03                  | 22                  | 2        |
| 5               | 16QAM      | 25      | 0         | 21.01                 | 21.08                    | 21.09                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 21.26                 | 21.25                    | 21.32                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 21.30                 | 21.30                    | 21.27                  | 22                  | 2        |
| 5               | 64QAM      | 1       | 24        | 21.20                 | 21.14                    | 21.21                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 20.13                 | 20.08                    | 20.09                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 20.07                 | 20.08                    | 20.07                  | 21                  | 3        |
| 5               | 64QAM      | 12      | 13        | 20.05                 | 19.99                    | 20.01                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 20.02                 | 20.05                    | 20.08                  |                     |          |

**<LTE Band 25>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 26140                 | 26340                    | 26590                  |                     |          |
| Frequency (MHz) |            |         |           | 1860                  | 1880                     | 1905                   |                     |          |
| 20              | QPSK       | 1       | 0         | 23.25                 | 23.16                    | 23.13                  | 24                  | 0        |
| 20              | QPSK       | 1       | 49        | 23.07                 | 23.14                    | 23.01                  |                     |          |
| 20              | QPSK       | 1       | 99        | 23.16                 | 23.06                    | 23.11                  |                     |          |
| 20              | QPSK       | 50      | 0         | 22.25                 | 22.24                    | 22.21                  | 23                  | 1        |
| 20              | QPSK       | 50      | 24        | 22.07                 | 22.19                    | 22.04                  |                     |          |
| 20              | QPSK       | 50      | 50        | 22.07                 | 22.10                    | 22.05                  |                     |          |
| 20              | QPSK       | 100     | 0         | 22.12                 | 22.09                    | 22.06                  |                     |          |
| 20              | 16QAM      | 1       | 0         | 22.47                 | 22.43                    | 22.51                  | 23                  | 1        |
| 20              | 16QAM      | 1       | 49        | 22.42                 | 22.45                    | 22.26                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 22.49                 | 22.46                    | 22.40                  |                     |          |
| 20              | 16QAM      | 50      | 0         | 21.28                 | 21.28                    | 21.25                  | 22                  | 2        |
| 20              | 16QAM      | 50      | 24        | 21.17                 | 21.24                    | 21.12                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 21.14                 | 21.14                    | 21.08                  |                     |          |
| 20              | 16QAM      | 100     | 0         | 21.15                 | 21.14                    | 21.13                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 21.47                 | 21.43                    | 21.31                  | 22                  | 2        |
| 20              | 64QAM      | 1       | 49        | 21.32                 | 21.28                    | 21.26                  |                     |          |
| 20              | 64QAM      | 1       | 99        | 21.37                 | 21.29                    | 21.36                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 20.30                 | 20.31                    | 20.26                  | 21                  | 3        |
| 20              | 64QAM      | 50      | 24        | 20.14                 | 20.23                    | 20.13                  |                     |          |
| 20              | 64QAM      | 50      | 50        | 20.15                 | 20.16                    | 20.14                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 20.15                 | 20.17                    | 20.11                  |                     |          |
| Channel         |            |         |           | 26115                 | 26340                    | 26615                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 1857.5                | 1880                     | 1907.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 23.17                 | 23.06                    | 23.10                  | 24                  | 0        |
| 15              | QPSK       | 1       | 37        | 23.02                 | 23.10                    | 22.95                  |                     |          |
| 15              | QPSK       | 1       | 74        | 23.08                 | 23.00                    | 23.09                  |                     |          |
| 15              | QPSK       | 36      | 0         | 22.13                 | 22.19                    | 22.13                  | 23                  | 1        |
| 15              | QPSK       | 36      | 20        | 22.07                 | 22.11                    | 22.02                  |                     |          |
| 15              | QPSK       | 36      | 39        | 22.00                 | 22.01                    | 22.05                  |                     |          |
| 15              | QPSK       | 75      | 0         | 22.05                 | 22.02                    | 22.05                  |                     |          |
| 15              | 16QAM      | 1       | 0         | 22.41                 | 22.34                    | 22.46                  | 23                  | 1        |
| 15              | 16QAM      | 1       | 37        | 22.40                 | 22.35                    | 22.22                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 22.43                 | 22.36                    | 22.33                  |                     |          |
| 15              | 16QAM      | 36      | 0         | 21.27                 | 21.23                    | 21.15                  | 22                  | 2        |
| 15              | 16QAM      | 36      | 20        | 21.14                 | 21.23                    | 21.09                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 21.12                 | 21.09                    | 21.01                  |                     |          |
| 15              | 16QAM      | 75      | 0         | 21.10                 | 21.14                    | 21.11                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 21.46                 | 21.35                    | 21.29                  | 22                  | 2        |
| 15              | 64QAM      | 1       | 37        | 21.22                 | 21.20                    | 21.20                  |                     |          |
| 15              | 64QAM      | 1       | 74        | 21.35                 | 21.27                    | 21.35                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 20.30                 | 20.30                    | 20.21                  | 21                  | 3        |
| 15              | 64QAM      | 36      | 20        | 20.07                 | 20.21                    | 20.08                  |                     |          |
| 15              | 64QAM      | 36      | 39        | 20.15                 | 20.11                    | 20.04                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 20.13                 | 20.10                    | 20.11                  |                     |          |
| Channel         |            |         |           | 26090                 | 26340                    | 26640                  | Tune-up limit       | MPR      |



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| Frequency (MHz) |       |    |    | 1855   | 1880  | 1910   | (dBm)                  | (dB)        |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| 10              | QPSK  | 1  | 0  | 23.19  | 23.11 | 23.04  | 24                     | 0           |
| 10              | QPSK  | 1  | 25 | 22.97  | 23.10 | 22.93  |                        |             |
| 10              | QPSK  | 1  | 49 | 23.14  | 22.99 | 23.11  |                        |             |
| 10              | QPSK  | 25 | 0  | 22.19  | 22.14 | 22.21  | 23                     | 1           |
| 10              | QPSK  | 25 | 12 | 22.07  | 22.16 | 21.99  |                        |             |
| 10              | QPSK  | 25 | 25 | 22.07  | 22.07 | 21.95  |                        |             |
| 10              | QPSK  | 50 | 0  | 22.08  | 22.09 | 22.00  | 23                     | 1           |
| 10              | 16QAM | 1  | 0  | 22.44  | 22.35 | 22.41  |                        |             |
| 10              | 16QAM | 1  | 25 | 22.33  | 22.37 | 22.26  |                        |             |
| 10              | 16QAM | 1  | 49 | 22.45  | 22.39 | 22.39  | 22                     | 2           |
| 10              | 16QAM | 25 | 0  | 21.21  | 21.27 | 21.20  |                        |             |
| 10              | 16QAM | 25 | 12 | 21.11  | 21.17 | 21.03  |                        |             |
| 10              | 16QAM | 25 | 25 | 21.13  | 21.13 | 20.99  | 21                     | 3           |
| 10              | 16QAM | 50 | 0  | 21.11  | 21.05 | 21.09  |                        |             |
| 10              | 64QAM | 1  | 0  | 21.38  | 21.33 | 21.29  |                        |             |
| 10              | 64QAM | 1  | 25 | 21.28  | 21.21 | 21.21  | 22                     | 2           |
| 10              | 64QAM | 1  | 49 | 21.32  | 21.21 | 21.26  |                        |             |
| 10              | 64QAM | 25 | 0  | 20.20  | 20.28 | 20.22  |                        |             |
| 10              | 64QAM | 25 | 12 | 20.13  | 20.19 | 20.09  | 21                     | 3           |
| 10              | 64QAM | 25 | 25 | 20.15  | 20.12 | 20.05  |                        |             |
| 10              | 64QAM | 50 | 0  | 20.09  | 20.12 | 20.01  |                        |             |
| Channel         |       |    |    | 26065  | 26340 | 26665  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1852.5 | 1880  | 1912.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 23.16  | 23.12 | 23.13  | 24                     | 0           |
| 5               | QPSK  | 1  | 12 | 22.99  | 23.11 | 22.93  |                        |             |
| 5               | QPSK  | 1  | 24 | 23.12  | 22.98 | 23.09  |                        |             |
| 5               | QPSK  | 12 | 0  | 22.13  | 22.21 | 22.18  | 23                     | 1           |
| 5               | QPSK  | 12 | 7  | 22.01  | 22.18 | 21.94  |                        |             |
| 5               | QPSK  | 12 | 13 | 22.00  | 22.05 | 21.96  |                        |             |
| 5               | QPSK  | 25 | 0  | 22.02  | 22.09 | 22.00  | 23                     | 1           |
| 5               | 16QAM | 1  | 0  | 22.41  | 22.40 | 22.47  |                        |             |
| 5               | 16QAM | 1  | 12 | 22.35  | 22.45 | 22.21  |                        |             |
| 5               | 16QAM | 1  | 24 | 22.48  | 22.41 | 22.37  | 22                     | 2           |
| 5               | 16QAM | 12 | 0  | 21.27  | 21.22 | 21.18  |                        |             |
| 5               | 16QAM | 12 | 7  | 21.17  | 21.22 | 21.09  |                        |             |
| 5               | 16QAM | 12 | 13 | 21.12  | 21.05 | 21.02  | 22                     | 2           |
| 5               | 16QAM | 25 | 0  | 21.15  | 21.04 | 21.11  |                        |             |
| 5               | 64QAM | 1  | 0  | 21.46  | 21.36 | 21.24  |                        |             |
| 5               | 64QAM | 1  | 12 | 21.22  | 21.26 | 21.20  | 22                     | 2           |
| 5               | 64QAM | 1  | 24 | 21.29  | 21.27 | 21.36  |                        |             |
| 5               | 64QAM | 12 | 0  | 20.22  | 20.23 | 20.24  |                        |             |
| 5               | 64QAM | 12 | 7  | 20.07  | 20.18 | 20.13  | 21                     | 3           |
| 5               | 64QAM | 12 | 13 | 20.10  | 20.08 | 20.14  |                        |             |
| 5               | 64QAM | 25 | 0  | 20.06  | 20.16 | 20.08  |                        |             |
| Channel         |       |    |    | 26055  | 26340 | 26675  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1851.5 | 1880  | 1913.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 23.18  | 23.13 | 23.05  | 24                     | 0           |
| 3               | QPSK  | 1  | 8  | 22.97  | 23.10 | 22.95  |                        |             |
| 3               | QPSK  | 1  | 14 | 23.12  | 23.03 | 23.06  |                        |             |



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|                 |       |    |    |        |       |        |                        |             |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| 3               | QPSK  | 8  | 0  | 22.17  | 22.14 | 22.12  | 23                     | 1           |
| 3               | QPSK  | 8  | 4  | 21.98  | 22.17 | 21.94  |                        |             |
| 3               | QPSK  | 8  | 7  | 22.07  | 22.03 | 22.00  |                        |             |
| 3               | QPSK  | 15 | 0  | 22.07  | 22.02 | 22.06  | 23                     | 1           |
| 3               | 16QAM | 1  | 0  | 22.47  | 22.37 | 22.44  |                        |             |
| 3               | 16QAM | 1  | 8  | 22.40  | 22.39 | 22.16  |                        |             |
| 3               | 16QAM | 1  | 14 | 22.47  | 22.36 | 22.31  | 22                     | 2           |
| 3               | 16QAM | 8  | 0  | 21.20  | 21.22 | 21.17  |                        |             |
| 3               | 16QAM | 8  | 4  | 21.10  | 21.16 | 21.02  |                        |             |
| 3               | 16QAM | 8  | 7  | 21.05  | 21.07 | 20.98  | 22                     | 2           |
| 3               | 16QAM | 15 | 0  | 21.08  | 21.05 | 21.08  |                        |             |
| 3               | 64QAM | 1  | 0  | 21.46  | 21.39 | 21.29  |                        |             |
| 3               | 64QAM | 1  | 8  | 21.26  | 21.22 | 21.19  | 22                     | 2           |
| 3               | 64QAM | 1  | 14 | 21.31  | 21.25 | 21.27  |                        |             |
| 3               | 64QAM | 8  | 0  | 20.29  | 20.30 | 20.26  |                        |             |
| 3               | 64QAM | 8  | 4  | 20.14  | 20.21 | 20.03  | 21                     | 3           |
| 3               | 64QAM | 8  | 7  | 20.15  | 20.06 | 20.07  |                        |             |
| 3               | 64QAM | 15 | 0  | 20.07  | 20.15 | 20.10  |                        |             |
| Channel         |       |    |    | 26047  | 26340 | 26683  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1850.7 | 1880  | 1914.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 23.17  | 23.08 | 23.12  | 24                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 23.05  | 23.13 | 22.96  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 23.07  | 23.05 | 23.10  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 22.14  | 22.22 | 22.13  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 22.07  | 22.17 | 22.00  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 22.06  | 22.01 | 22.04  | 23                     | 1           |
| 1.4             | QPSK  | 6  | 0  | 22.07  | 22.09 | 22.04  |                        |             |
| 1.4             | 16QAM | 1  | 0  | 22.43  | 22.38 | 22.47  |                        |             |
| 1.4             | 16QAM | 1  | 3  | 22.32  | 22.35 | 22.22  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 22.39  | 22.43 | 22.35  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 21.24  | 21.22 | 21.18  | 23                     | 1           |
| 1.4             | 16QAM | 3  | 1  | 21.09  | 21.21 | 21.02  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 21.09  | 21.07 | 21.07  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 21.06  | 21.13 | 21.07  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 21.06  | 21.13 | 21.07  |                        |             |
| 1.4             | 64QAM | 1  | 0  | 21.38  | 21.36 | 21.28  | 22                     | 2           |
| 1.4             | 64QAM | 1  | 3  | 21.25  | 21.19 | 21.24  |                        |             |
| 1.4             | 64QAM | 1  | 5  | 21.35  | 21.27 | 21.34  |                        |             |
| 1.4             | 64QAM | 3  | 0  | 20.26  | 20.27 | 20.20  |                        |             |
| 1.4             | 64QAM | 3  | 1  | 20.06  | 20.18 | 20.06  |                        |             |
| 1.4             | 64QAM | 3  | 3  | 20.13  | 20.09 | 20.09  | 21                     | 3           |
| 1.4             | 64QAM | 6  | 0  | 20.10  | 20.11 | 20.09  |                        |             |

**<LTE Band 26>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 26765                    | 26865                       | 26965                     |                        |             |
| Frequency (MHz) |            |         |           | 821.5                    | 831.5                       | 841.5                     |                        |             |
| 15              | QPSK       | 1       | 0         | 23.42                    | 23.49                       | 23.37                     | 25                     | 0           |
| 15              | QPSK       | 1       | 37        | 23.35                    | 23.39                       | 23.28                     |                        |             |
| 15              | QPSK       | 1       | 74        | 23.35                    | 23.26                       | 23.30                     |                        |             |
| 15              | QPSK       | 36      | 0         | 22.38                    | 22.39                       | 22.26                     | 24                     | 1           |
| 15              | QPSK       | 36      | 20        | 22.31                    | 22.35                       | 22.25                     |                        |             |
| 15              | QPSK       | 36      | 39        | 22.31                    | 22.24                       | 22.25                     |                        |             |
| 15              | QPSK       | 75      | 0         | 22.37                    | 22.39                       | 22.30                     | 24                     | 1           |
| 15              | 16QAM      | 1       | 0         | 22.81                    | 22.74                       | 22.75                     |                        |             |
| 15              | 16QAM      | 1       | 37        | 22.62                    | 22.72                       | 22.61                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 22.64                    | 22.49                       | 22.54                     | 23                     | 2           |
| 15              | 16QAM      | 36      | 0         | 21.38                    | 21.42                       | 21.30                     |                        |             |
| 15              | 16QAM      | 36      | 20        | 21.37                    | 21.40                       | 21.29                     |                        |             |
| 15              | 16QAM      | 36      | 39        | 21.45                    | 21.32                       | 21.30                     | 23                     | 2           |
| 15              | 16QAM      | 75      | 0         | 21.39                    | 21.43                       | 21.30                     |                        |             |
| 15              | 64QAM      | 1       | 0         | 21.61                    | 21.57                       | 21.53                     |                        |             |
| 15              | 64QAM      | 1       | 37        | 21.50                    | 21.66                       | 21.52                     | 23                     | 2           |
| 15              | 64QAM      | 1       | 74        | 21.60                    | 21.40                       | 21.41                     |                        |             |
| 15              | 64QAM      | 36      | 0         | 20.36                    | 20.46                       | 20.31                     |                        |             |
| 15              | 64QAM      | 36      | 20        | 20.37                    | 20.43                       | 20.31                     | 22                     | 3           |
| 15              | 64QAM      | 36      | 39        | 20.44                    | 20.32                       | 20.31                     |                        |             |
| 15              | 64QAM      | 75      | 0         | 20.37                    | 20.43                       | 20.31                     |                        |             |
| Channel         |            |         |           | 26740                    | 26865                       | 26990                     | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 819                      | 831.5                       | 844                       |                        |             |
| 10              | QPSK       | 1       | 0         | 23.37                    | 23.34                       | 23.28                     | 25                     | 0           |
| 10              | QPSK       | 1       | 25        | 23.31                    | 23.31                       | 23.18                     |                        |             |
| 10              | QPSK       | 1       | 49        | 23.25                    | 23.19                       | 23.27                     |                        |             |
| 10              | QPSK       | 25      | 0         | 22.30                    | 22.36                       | 22.16                     | 24                     | 1           |
| 10              | QPSK       | 25      | 12        | 22.24                    | 22.26                       | 22.17                     |                        |             |
| 10              | QPSK       | 25      | 25        | 22.38                    | 22.24                       | 22.22                     |                        |             |
| 10              | QPSK       | 50      | 0         | 22.36                    | 22.32                       | 22.30                     | 24                     | 1           |
| 10              | 16QAM      | 1       | 0         | 22.80                    | 22.64                       | 22.65                     |                        |             |
| 10              | 16QAM      | 1       | 25        | 22.60                    | 22.68                       | 22.55                     |                        |             |
| 10              | 16QAM      | 1       | 49        | 22.64                    | 22.45                       | 22.48                     | 23                     | 2           |
| 10              | 16QAM      | 25      | 0         | 21.35                    | 21.42                       | 21.29                     |                        |             |
| 10              | 16QAM      | 25      | 12        | 21.30                    | 21.35                       | 21.20                     |                        |             |
| 10              | 16QAM      | 25      | 25        | 21.38                    | 21.22                       | 21.25                     | 23                     | 2           |
| 10              | 16QAM      | 50      | 0         | 21.37                    | 21.36                       | 21.28                     |                        |             |
| 10              | 64QAM      | 1       | 0         | 21.60                    | 21.49                       | 21.50                     |                        |             |
| 10              | 64QAM      | 1       | 25        | 21.46                    | 21.61                       | 21.51                     | 23                     | 2           |
| 10              | 64QAM      | 1       | 49        | 21.55                    | 21.34                       | 21.41                     |                        |             |
| 10              | 64QAM      | 25      | 0         | 20.34                    | 20.38                       | 20.25                     |                        |             |
| 10              | 64QAM      | 25      | 12        | 20.35                    | 20.34                       | 20.26                     | 22                     | 3           |
| 10              | 64QAM      | 25      | 25        | 20.37                    | 20.31                       | 20.21                     |                        |             |
| 10              | 64QAM      | 50      | 0         | 20.35                    | 20.42                       | 20.24                     |                        |             |
| Channel         |            |         |           | 26715                    | 26865                       | 27015                     | Tune-up limit          | MPR         |



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| Frequency (MHz) |       |    |    | 816.5 | 831.5 | 846.5 | (dBm)                  | (dB)        |
|-----------------|-------|----|----|-------|-------|-------|------------------------|-------------|
| 5               | QPSK  | 1  | 0  | 23.41 | 23.39 | 23.28 | 25                     | 0           |
| 5               | QPSK  | 1  | 12 | 23.25 | 23.36 | 23.26 |                        |             |
| 5               | QPSK  | 1  | 24 | 23.28 | 23.19 | 23.22 |                        |             |
| 5               | QPSK  | 12 | 0  | 22.23 | 22.34 | 22.18 | 24                     | 1           |
| 5               | QPSK  | 12 | 7  | 22.27 | 22.27 | 22.17 |                        |             |
| 5               | QPSK  | 12 | 13 | 22.32 | 22.17 | 22.20 |                        |             |
| 5               | QPSK  | 25 | 0  | 22.36 | 22.30 | 22.28 |                        |             |
| 5               | 16QAM | 1  | 0  | 22.78 | 22.65 | 22.69 | 24                     | 1           |
| 5               | 16QAM | 1  | 12 | 22.53 | 22.67 | 22.58 |                        |             |
| 5               | 16QAM | 1  | 24 | 22.54 | 22.47 | 22.50 |                        |             |
| 5               | 16QAM | 12 | 0  | 21.33 | 21.35 | 21.21 | 23                     | 2           |
| 5               | 16QAM | 12 | 7  | 21.37 | 21.38 | 21.24 |                        |             |
| 5               | 16QAM | 12 | 13 | 21.45 | 21.24 | 21.29 |                        |             |
| 5               | 16QAM | 25 | 0  | 21.34 | 21.42 | 21.21 |                        |             |
| 5               | 64QAM | 1  | 0  | 21.55 | 21.57 | 21.43 | 23                     | 2           |
| 5               | 64QAM | 1  | 12 | 21.40 | 21.61 | 21.42 |                        |             |
| 5               | 64QAM | 1  | 24 | 21.54 | 21.37 | 21.35 |                        |             |
| 5               | 64QAM | 12 | 0  | 20.35 | 20.40 | 20.27 | 22                     | 3           |
| 5               | 64QAM | 12 | 7  | 20.37 | 20.36 | 20.30 |                        |             |
| 5               | 64QAM | 12 | 13 | 20.41 | 20.30 | 20.22 |                        |             |
| 5               | 64QAM | 25 | 0  | 20.36 | 20.35 | 20.28 |                        |             |
| Channel         |       |    |    | 26705 | 26865 | 27025 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 815.5 | 831.5 | 847.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 23.35 | 23.39 | 23.33 | 25                     | 0           |
| 3               | QPSK  | 1  | 8  | 23.35 | 23.35 | 23.20 |                        |             |
| 3               | QPSK  | 1  | 14 | 23.29 | 23.18 | 23.24 |                        |             |
| 3               | QPSK  | 8  | 0  | 22.22 | 22.33 | 22.16 | 24                     | 1           |
| 3               | QPSK  | 8  | 4  | 22.27 | 22.34 | 22.22 |                        |             |
| 3               | QPSK  | 8  | 7  | 22.28 | 22.22 | 22.20 |                        |             |
| 3               | QPSK  | 15 | 0  | 22.30 | 22.37 | 22.30 |                        |             |
| 3               | 16QAM | 1  | 0  | 22.77 | 22.68 | 22.74 | 24                     | 1           |
| 3               | 16QAM | 1  | 8  | 22.58 | 22.68 | 22.56 |                        |             |
| 3               | 16QAM | 1  | 14 | 22.63 | 22.43 | 22.52 |                        |             |
| 3               | 16QAM | 8  | 0  | 21.38 | 21.42 | 21.26 | 23                     | 2           |
| 3               | 16QAM | 8  | 4  | 21.27 | 21.33 | 21.20 |                        |             |
| 3               | 16QAM | 8  | 7  | 21.43 | 21.29 | 21.26 |                        |             |
| 3               | 16QAM | 15 | 0  | 21.30 | 21.43 | 21.24 |                        |             |
| 3               | 64QAM | 1  | 0  | 21.59 | 21.57 | 21.52 | 23                     | 2           |
| 3               | 64QAM | 1  | 8  | 21.47 | 21.61 | 21.50 |                        |             |
| 3               | 64QAM | 1  | 14 | 21.57 | 21.30 | 21.40 |                        |             |
| 3               | 64QAM | 8  | 0  | 20.32 | 20.37 | 20.26 | 22                     | 3           |
| 3               | 64QAM | 8  | 4  | 20.31 | 20.41 | 20.21 |                        |             |
| 3               | 64QAM | 8  | 7  | 20.44 | 20.27 | 20.25 |                        |             |
| 3               | 64QAM | 15 | 0  | 20.31 | 20.42 | 20.28 |                        |             |
| Channel         |       |    |    | 26697 | 26865 | 27033 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 814.7 | 831.5 | 848.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 23.40 | 23.35 | 23.29 | 25                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 23.30 | 23.33 | 23.26 |                        |             |
| 1.4             | QPSK  | 1  | 5  | 23.29 | 23.17 | 23.25 |                        |             |



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|     |       |   |   |       |       |       |    |   |
|-----|-------|---|---|-------|-------|-------|----|---|
| 1.4 | QPSK  | 3 | 0 | 23.07 | 23.13 | 23.03 |    |   |
| 1.4 | QPSK  | 3 | 1 | 23.07 | 23.14 | 23.06 |    |   |
| 1.4 | QPSK  | 3 | 3 | 23.18 | 23.09 | 23.04 |    |   |
| 1.4 | QPSK  | 6 | 0 | 22.30 | 22.32 | 22.22 | 24 | 1 |
| 1.4 | 16QAM | 1 | 0 | 22.80 | 22.70 | 22.74 | 24 | 1 |
| 1.4 | 16QAM | 1 | 3 | 22.58 | 22.71 | 22.58 |    |   |
| 1.4 | 16QAM | 1 | 5 | 22.55 | 22.40 | 22.45 |    |   |
| 1.4 | 16QAM | 3 | 0 | 22.10 | 22.21 | 22.06 |    |   |
| 1.4 | 16QAM | 3 | 1 | 22.07 | 22.19 | 22.07 |    |   |
| 1.4 | 16QAM | 3 | 3 | 22.20 | 22.12 | 22.01 |    |   |
| 1.4 | 16QAM | 6 | 0 | 21.33 | 21.38 | 21.26 | 23 | 2 |
| 1.4 | 64QAM | 1 | 0 | 21.52 | 21.53 | 21.52 | 23 | 2 |
| 1.4 | 64QAM | 1 | 3 | 21.42 | 21.64 | 21.42 |    |   |
| 1.4 | 64QAM | 1 | 5 | 21.57 | 21.38 | 21.35 |    |   |
| 1.4 | 64QAM | 3 | 0 | 21.16 | 21.25 | 21.08 |    |   |
| 1.4 | 64QAM | 3 | 1 | 21.09 | 21.16 | 21.11 |    |   |
| 1.4 | 64QAM | 3 | 3 | 21.20 | 21.06 | 21.10 |    |   |
| 1.4 | 64QAM | 6 | 0 | 21.12 | 21.13 | 21.08 | 22 | 3 |

**<LTE Band 30>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 27710                    |                             |                           |                        |             |
| Frequency (MHz) |            |         |           | 2310                     |                             |                           |                        |             |
| 10              | QPSK       | 1       | 0         |                          | 22.65                       |                           | 23                     | 0           |
| 10              | QPSK       | 1       | 25        |                          | 22.53                       |                           |                        |             |
| 10              | QPSK       | 1       | 49        |                          | 22.37                       |                           |                        |             |
| 10              | QPSK       | 25      | 0         |                          | 21.55                       |                           | 22                     | 1           |
| 10              | QPSK       | 25      | 12        |                          | 21.48                       |                           |                        |             |
| 10              | QPSK       | 25      | 25        |                          | 21.39                       |                           |                        |             |
| 10              | QPSK       | 50      | 0         |                          | 21.58                       |                           | 22                     | 1           |
| 10              | 16QAM      | 1       | 0         |                          | 22.00                       |                           |                        |             |
| 10              | 16QAM      | 1       | 25        |                          | 21.94                       |                           |                        |             |
| 10              | 16QAM      | 1       | 49        |                          | 21.77                       |                           | 21                     | 2           |
| 10              | 16QAM      | 25      | 0         |                          | 20.55                       |                           |                        |             |
| 10              | 16QAM      | 25      | 12        |                          | 20.47                       |                           |                        |             |
| 10              | 16QAM      | 25      | 25        |                          | 20.40                       |                           | 21                     | 2           |
| 10              | 16QAM      | 50      | 0         |                          | 20.57                       |                           |                        |             |
| 10              | 64QAM      | 1       | 0         |                          | 20.89                       |                           |                        |             |
| 10              | 64QAM      | 1       | 25        |                          | 20.75                       |                           | 21                     | 2           |
| 10              | 64QAM      | 1       | 49        |                          | 20.52                       |                           |                        |             |
| 10              | 64QAM      | 25      | 0         |                          | 19.59                       |                           |                        |             |
| 10              | 64QAM      | 25      | 12        |                          | 19.56                       |                           | 20                     | 3           |
| 10              | 64QAM      | 25      | 25        |                          | 19.42                       |                           |                        |             |
| 10              | 64QAM      | 50      | 0         |                          | 19.60                       |                           |                        |             |
| Channel         |            |         |           | 27685                    | 27710                       | 27735                     | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 2307.5                   | 2310                        | 2312.5                    |                        |             |
| 5               | QPSK       | 1       | 0         | 22.58                    | 22.63                       | 22.62                     | 23                     | 0           |
| 5               | QPSK       | 1       | 12        | 22.52                    | 22.47                       | 22.50                     |                        |             |
| 5               | QPSK       | 1       | 24        | 22.30                    | 22.33                       | 22.29                     |                        |             |
| 5               | QPSK       | 12      | 0         | 21.49                    | 21.46                       | 21.54                     | 22                     | 1           |
| 5               | QPSK       | 12      | 7         | 21.46                    | 21.38                       | 21.48                     |                        |             |
| 5               | QPSK       | 12      | 13        | 21.39                    | 21.35                       | 21.29                     |                        |             |
| 5               | QPSK       | 25      | 0         | 21.52                    | 21.49                       | 21.54                     | 22                     | 1           |
| 5               | 16QAM      | 1       | 0         | 21.96                    | 21.90                       | 21.98                     |                        |             |
| 5               | 16QAM      | 1       | 12        | 21.93                    | 21.90                       | 21.89                     |                        |             |
| 5               | 16QAM      | 1       | 24        | 21.71                    | 21.71                       | 21.72                     | 21                     | 2           |
| 5               | 16QAM      | 12      | 0         | 20.55                    | 20.54                       | 20.52                     |                        |             |
| 5               | 16QAM      | 12      | 7         | 20.47                    | 20.42                       | 20.42                     |                        |             |
| 5               | 16QAM      | 12      | 13        | 20.38                    | 20.38                       | 20.30                     | 21                     | 2           |
| 5               | 16QAM      | 25      | 0         | 20.48                    | 20.54                       | 20.47                     |                        |             |
| 5               | 64QAM      | 1       | 0         | 20.86                    | 20.86                       | 20.81                     |                        |             |
| 5               | 64QAM      | 1       | 12        | 20.66                    | 20.67                       | 20.68                     | 21                     | 2           |
| 5               | 64QAM      | 1       | 24        | 20.50                    | 20.43                       | 20.42                     |                        |             |
| 5               | 64QAM      | 12      | 0         | 19.52                    | 19.49                       | 19.50                     |                        |             |
| 5               | 64QAM      | 12      | 7         | 19.52                    | 19.53                       | 19.49                     | 20                     | 3           |
| 5               | 64QAM      | 12      | 13        | 19.36                    | 19.34                       | 19.41                     |                        |             |
| 5               | 64QAM      | 25      | 0         | 19.56                    | 19.59                       | 19.55                     |                        |             |

**<LTE Band 66>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 132072                | 132322                   | 132572                 | 24                  | 0        |
| Frequency (MHz) |            |         |           | 1720                  | 1745                     | 1770                   |                     |          |
| 20              | QPSK       | 1       | 0         | 23.61                 | 23.42                    | 23.41                  |                     |          |
| 20              | QPSK       | 1       | 49        | 23.48                 | 23.37                    | 23.36                  | 23                  | 1        |
| 20              | QPSK       | 1       | 99        | 23.55                 | 23.39                    | 23.35                  |                     |          |
| 20              | QPSK       | 50      | 0         | 22.57                 | 22.37                    | 22.38                  |                     |          |
| 20              | QPSK       | 50      | 24        | 22.43                 | 22.33                    | 22.36                  | 23                  | 1        |
| 20              | QPSK       | 50      | 50        | 22.45                 | 22.21                    | 22.30                  |                     |          |
| 20              | QPSK       | 100     | 0         | 22.54                 | 22.37                    | 22.38                  |                     |          |
| 20              | 16QAM      | 1       | 0         | 22.83                 | 22.73                    | 22.73                  | 23                  | 1        |
| 20              | 16QAM      | 1       | 49        | 22.83                 | 22.74                    | 22.69                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 22.84                 | 22.67                    | 22.48                  |                     |          |
| 20              | 16QAM      | 50      | 0         | 21.46                 | 21.44                    | 21.40                  | 22                  | 2        |
| 20              | 16QAM      | 50      | 24        | 21.46                 | 21.36                    | 21.41                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 21.62                 | 21.27                    | 21.31                  |                     |          |
| 20              | 16QAM      | 100     | 0         | 21.53                 | 21.38                    | 21.40                  | 22                  | 2        |
| 20              | 64QAM      | 1       | 0         | 21.80                 | 21.71                    | 21.53                  |                     |          |
| 20              | 64QAM      | 1       | 49        | 21.74                 | 21.65                    | 21.59                  |                     |          |
| 20              | 64QAM      | 1       | 99        | 21.86                 | 21.73                    | 21.64                  | 21                  | 3        |
| 20              | 64QAM      | 50      | 0         | 20.47                 | 20.43                    | 20.40                  |                     |          |
| 20              | 64QAM      | 50      | 24        | 20.48                 | 20.39                    | 20.40                  |                     |          |
| 20              | 64QAM      | 50      | 50        | 20.64                 | 20.26                    | 20.30                  | 21                  | 3        |
| 20              | 64QAM      | 100     | 0         | 20.57                 | 20.41                    | 20.40                  |                     |          |
| Channel         |            |         |           | 132047                | 132322                   | 132597                 | 24                  | 0        |
| Frequency (MHz) |            |         |           | 1717.5                | 1745                     | 1772.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 23.56                 | 23.31                    | 23.29                  |                     |          |
| 15              | QPSK       | 1       | 37        | 23.42                 | 23.31                    | 23.38                  | 23                  | 1        |
| 15              | QPSK       | 1       | 74        | 23.51                 | 23.40                    | 23.32                  |                     |          |
| 15              | QPSK       | 36      | 0         | 22.36                 | 22.31                    | 22.29                  |                     |          |
| 15              | QPSK       | 36      | 20        | 22.39                 | 22.26                    | 22.35                  | 23                  | 1        |
| 15              | QPSK       | 36      | 39        | 22.51                 | 22.20                    | 22.26                  |                     |          |
| 15              | QPSK       | 75      | 0         | 22.48                 | 22.37                    | 22.34                  |                     |          |
| 15              | 16QAM      | 1       | 0         | 22.78                 | 22.71                    | 22.66                  | 23                  | 1        |
| 15              | 16QAM      | 1       | 37        | 22.83                 | 22.66                    | 22.59                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 22.76                 | 22.66                    | 22.44                  |                     |          |
| 15              | 16QAM      | 36      | 0         | 21.38                 | 21.35                    | 21.30                  | 22                  | 2        |
| 15              | 16QAM      | 36      | 20        | 21.43                 | 21.34                    | 21.33                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 21.57                 | 21.17                    | 21.27                  |                     |          |
| 15              | 16QAM      | 75      | 0         | 21.43                 | 21.37                    | 21.40                  | 22                  | 2        |
| 15              | 64QAM      | 1       | 0         | 21.77                 | 21.61                    | 21.47                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 21.66                 | 21.65                    | 21.57                  |                     |          |
| 15              | 64QAM      | 1       | 74        | 21.79                 | 21.65                    | 21.64                  | 21                  | 3        |
| 15              | 64QAM      | 36      | 0         | 20.39                 | 20.36                    | 20.32                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 20.44                 | 20.38                    | 20.39                  |                     |          |
| 15              | 64QAM      | 36      | 39        | 20.61                 | 20.26                    | 20.20                  | 21                  | 3        |
| 15              | 64QAM      | 75      | 0         | 20.55                 | 20.35                    | 20.37                  |                     |          |
| Channel         |            |         |           | 132022                | 132322                   | 132622                 | Tune-up limit       | MPR      |



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| Frequency (MHz) |       |    |    | 1715   | 1745   | 1775   | (dBm)                  | (dB)        |
|-----------------|-------|----|----|--------|--------|--------|------------------------|-------------|
| 10              | QPSK  | 1  | 0  | 23.52  | 23.31  | 23.31  | 24                     | 0           |
| 10              | QPSK  | 1  | 25 | 23.48  | 23.35  | 23.40  |                        |             |
| 10              | QPSK  | 1  | 49 | 23.49  | 23.35  | 23.31  |                        |             |
| 10              | QPSK  | 25 | 0  | 22.40  | 22.28  | 22.28  | 23                     | 1           |
| 10              | QPSK  | 25 | 12 | 22.42  | 22.30  | 22.38  |                        |             |
| 10              | QPSK  | 25 | 25 | 22.55  | 22.20  | 22.22  |                        |             |
| 10              | QPSK  | 50 | 0  | 22.44  | 22.35  | 22.35  | 23                     | 1           |
| 10              | 16QAM | 1  | 0  | 22.76  | 22.69  | 22.68  |                        |             |
| 10              | 16QAM | 1  | 25 | 22.73  | 22.65  | 22.65  |                        |             |
| 10              | 16QAM | 1  | 49 | 22.79  | 22.60  | 22.39  | 22                     | 2           |
| 10              | 16QAM | 25 | 0  | 21.39  | 21.36  | 21.33  |                        |             |
| 10              | 16QAM | 25 | 12 | 21.38  | 21.33  | 21.37  |                        |             |
| 10              | 16QAM | 25 | 25 | 21.55  | 21.26  | 21.28  | 21                     | 3           |
| 10              | 16QAM | 50 | 0  | 21.47  | 21.32  | 21.36  |                        |             |
| 10              | 64QAM | 1  | 0  | 21.74  | 21.70  | 21.49  |                        |             |
| 10              | 64QAM | 1  | 25 | 21.69  | 21.57  | 21.55  | 22                     | 2           |
| 10              | 64QAM | 1  | 49 | 21.85  | 21.64  | 21.61  |                        |             |
| 10              | 64QAM | 25 | 0  | 20.46  | 20.37  | 20.35  |                        |             |
| 10              | 64QAM | 25 | 12 | 20.44  | 20.37  | 20.37  | 21                     | 3           |
| 10              | 64QAM | 25 | 25 | 20.64  | 20.19  | 20.23  |                        |             |
| 10              | 64QAM | 50 | 0  | 20.49  | 20.35  | 20.39  |                        |             |
| Channel         |       |    |    | 131997 | 132322 | 132647 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1712.5 | 1745   | 1777.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 23.54  | 23.39  | 23.33  | 24                     | 0           |
| 5               | QPSK  | 1  | 12 | 23.42  | 23.27  | 23.32  |                        |             |
| 5               | QPSK  | 1  | 24 | 23.50  | 23.42  | 23.28  |                        |             |
| 5               | QPSK  | 12 | 0  | 22.40  | 22.29  | 22.27  | 23                     | 1           |
| 5               | QPSK  | 12 | 7  | 22.38  | 22.30  | 22.35  |                        |             |
| 5               | QPSK  | 12 | 13 | 22.49  | 22.11  | 22.20  |                        |             |
| 5               | QPSK  | 25 | 0  | 22.45  | 22.27  | 22.35  | 23                     | 1           |
| 5               | 16QAM | 1  | 0  | 22.75  | 22.70  | 22.69  |                        |             |
| 5               | 16QAM | 1  | 12 | 22.79  | 22.74  | 22.66  |                        |             |
| 5               | 16QAM | 1  | 24 | 22.74  | 22.62  | 22.46  | 22                     | 2           |
| 5               | 16QAM | 12 | 0  | 21.36  | 21.44  | 21.36  |                        |             |
| 5               | 16QAM | 12 | 7  | 21.38  | 21.34  | 21.38  |                        |             |
| 5               | 16QAM | 12 | 13 | 21.58  | 21.22  | 21.29  | 22                     | 2           |
| 5               | 16QAM | 25 | 0  | 21.50  | 21.31  | 21.35  |                        |             |
| 5               | 64QAM | 1  | 0  | 21.72  | 21.67  | 21.43  |                        |             |
| 5               | 64QAM | 1  | 12 | 21.65  | 21.60  | 21.57  | 22                     | 2           |
| 5               | 64QAM | 1  | 24 | 21.84  | 21.65  | 21.59  |                        |             |
| 5               | 64QAM | 12 | 0  | 20.45  | 20.36  | 20.34  |                        |             |
| 5               | 64QAM | 12 | 7  | 20.42  | 20.29  | 20.30  | 21                     | 3           |
| 5               | 64QAM | 12 | 13 | 20.64  | 20.24  | 20.21  |                        |             |
| 5               | 64QAM | 25 | 0  | 20.56  | 20.41  | 20.30  |                        |             |
| Channel         |       |    |    | 131987 | 132322 | 132657 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1711.5 | 1745   | 1778.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 23.59  | 23.34  | 23.33  | 24                     | 0           |
| 3               | QPSK  | 1  | 8  | 23.40  | 23.33  | 23.35  |                        |             |
| 3               | QPSK  | 1  | 14 | 23.54  | 23.32  | 23.26  |                        |             |



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|                 |       |    |    |        |        |        |                        |             |
|-----------------|-------|----|----|--------|--------|--------|------------------------|-------------|
| 3               | QPSK  | 8  | 0  | 22.43  | 22.34  | 22.26  | 23                     | 1           |
| 3               | QPSK  | 8  | 4  | 22.42  | 22.30  | 22.32  |                        |             |
| 3               | QPSK  | 8  | 7  | 22.57  | 22.13  | 22.28  |                        |             |
| 3               | QPSK  | 15 | 0  | 22.44  | 22.36  | 22.29  | 23                     | 1           |
| 3               | 16QAM | 1  | 0  | 22.77  | 22.73  | 22.64  |                        |             |
| 3               | 16QAM | 1  | 8  | 22.77  | 22.74  | 22.67  |                        |             |
| 3               | 16QAM | 1  | 14 | 22.83  | 22.59  | 22.47  | 22                     | 2           |
| 3               | 16QAM | 8  | 0  | 21.42  | 21.35  | 21.40  |                        |             |
| 3               | 16QAM | 8  | 4  | 21.44  | 21.35  | 21.32  |                        |             |
| 3               | 16QAM | 8  | 7  | 21.60  | 21.18  | 21.25  | 22                     | 2           |
| 3               | 16QAM | 15 | 0  | 21.49  | 21.30  | 21.31  |                        |             |
| 3               | 64QAM | 1  | 0  | 21.74  | 21.63  | 21.52  |                        |             |
| 3               | 64QAM | 1  | 8  | 21.65  | 21.60  | 21.58  | 22                     | 2           |
| 3               | 64QAM | 1  | 14 | 21.76  | 21.71  | 21.55  |                        |             |
| 3               | 64QAM | 8  | 0  | 20.44  | 20.41  | 20.40  |                        |             |
| 3               | 64QAM | 8  | 4  | 20.47  | 20.31  | 20.32  | 21                     | 3           |
| 3               | 64QAM | 8  | 7  | 20.58  | 20.25  | 20.23  |                        |             |
| 3               | 64QAM | 15 | 0  | 20.47  | 20.38  | 20.36  |                        |             |
| Channel         |       |    |    | 131979 | 132322 | 132665 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1710.7 | 1745   | 1779.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 23.54  | 23.34  | 23.32  | 24                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 23.41  | 23.32  | 23.32  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 23.48  | 23.40  | 23.30  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 22.40  | 22.32  | 22.31  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 22.37  | 22.27  | 22.31  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 22.48  | 22.17  | 22.24  | 23                     | 1           |
| 1.4             | QPSK  | 6  | 0  | 22.46  | 22.34  | 22.32  |                        |             |
| 1.4             | 16QAM | 1  | 0  | 22.83  | 22.68  | 22.73  |                        |             |
| 1.4             | 16QAM | 1  | 3  | 22.74  | 22.73  | 22.59  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 22.81  | 22.57  | 22.48  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 21.44  | 21.40  | 21.38  | 23                     | 1           |
| 1.4             | 16QAM | 3  | 1  | 21.41  | 21.35  | 21.35  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 21.55  | 21.25  | 21.21  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 21.47  | 21.29  | 21.36  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 21.47  | 21.29  | 21.36  |                        |             |
| 1.4             | 64QAM | 1  | 0  | 21.70  | 21.62  | 21.45  | 22                     | 2           |
| 1.4             | 64QAM | 1  | 3  | 21.67  | 21.55  | 21.59  |                        |             |
| 1.4             | 64QAM | 1  | 5  | 21.80  | 21.64  | 21.62  |                        |             |
| 1.4             | 64QAM | 3  | 0  | 20.37  | 20.40  | 20.32  |                        |             |
| 1.4             | 64QAM | 3  | 1  | 20.45  | 20.33  | 20.33  |                        |             |
| 1.4             | 64QAM | 3  | 3  | 20.57  | 20.22  | 20.20  | 21                     | 3           |
| 1.4             | 64QAM | 6  | 0  | 20.57  | 20.32  | 20.34  |                        |             |

**Reduced Power Mode**
**<LTE Band 2>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|---------------------------|-------------|
| Channel         |            |         |           | 18700                    | 18900                       | 19100                     |                           |             |
| Frequency (MHz) |            |         |           | 1860                     | 1880                        | 1900                      |                           |             |
| 20              | QPSK       | 1       | 0         | 17.53                    | 17.58                       | 17.41                     | 18.5                      | 0           |
| 20              | QPSK       | 1       | 49        | 17.35                    | 17.49                       | 17.40                     |                           |             |
| 20              | QPSK       | 1       | 99        | 17.42                    | 17.37                       | 17.26                     |                           |             |
| 20              | QPSK       | 50      | 0         | 17.33                    | 17.36                       | 17.19                     | 18.5                      | 0           |
| 20              | QPSK       | 50      | 24        | 17.23                    | 17.33                       | 17.22                     |                           |             |
| 20              | QPSK       | 50      | 50        | 17.24                    | 17.26                       | 17.15                     |                           |             |
| 20              | QPSK       | 100     | 0         | 17.24                    | 17.33                       | 17.24                     | 18.5                      | 0           |
| 20              | 16QAM      | 1       | 0         | 17.35                    | 17.52                       | 17.39                     |                           |             |
| 20              | 16QAM      | 1       | 49        | 17.46                    | 17.36                       | 17.38                     |                           |             |
| 20              | 16QAM      | 1       | 99        | 17.40                    | 17.40                       | 17.22                     | 18.5                      | 0           |
| 20              | 16QAM      | 50      | 0         | 17.03                    | 17.02                       | 16.86                     |                           |             |
| 20              | 16QAM      | 50      | 24        | 16.88                    | 17.02                       | 16.88                     |                           |             |
| 20              | 16QAM      | 50      | 50        | 16.90                    | 16.92                       | 16.82                     | 18.5                      | 0           |
| 20              | 16QAM      | 100     | 0         | 16.91                    | 16.95                       | 16.86                     |                           |             |
| 20              | 64QAM      | 1       | 0         | 17.35                    | 17.48                       | 17.49                     |                           |             |
| 20              | 64QAM      | 1       | 49        | 17.52                    | 17.28                       | 17.38                     | 18.5                      | 0           |
| 20              | 64QAM      | 1       | 99        | 17.33                    | 17.43                       | 17.32                     |                           |             |
| 20              | 64QAM      | 50      | 0         | 17.02                    | 17.02                       | 16.78                     |                           |             |
| 20              | 64QAM      | 50      | 24        | 16.87                    | 17.04                       | 16.86                     | 18.5                      | 0           |
| 20              | 64QAM      | 50      | 50        | 16.91                    | 17.00                       | 16.91                     |                           |             |
| 20              | 64QAM      | 100     | 0         | 16.88                    | 16.97                       | 16.84                     |                           |             |
| Channel         |            |         |           | 18675                    | 18900                       | 19125                     | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 1857.5                   | 1880                        | 1902.5                    |                           |             |
| 15              | QPSK       | 1       | 0         | 17.33                    | 17.35                       | 17.13                     | 18.5                      | 0           |
| 15              | QPSK       | 1       | 37        | 17.28                    | 17.28                       | 17.19                     |                           |             |
| 15              | QPSK       | 1       | 74        | 17.23                    | 17.13                       | 17.07                     |                           |             |
| 15              | QPSK       | 36      | 0         | 17.20                    | 17.17                       | 17.04                     | 18.5                      | 0           |
| 15              | QPSK       | 36      | 20        | 17.06                    | 17.15                       | 17.00                     |                           |             |
| 15              | QPSK       | 36      | 39        | 16.98                    | 17.05                       | 16.98                     |                           |             |
| 15              | QPSK       | 75      | 0         | 17.06                    | 17.11                       | 17.03                     | 18.5                      | 0           |
| 15              | 16QAM      | 1       | 0         | 17.50                    | 17.46                       | 17.36                     |                           |             |
| 15              | 16QAM      | 1       | 37        | 17.42                    | 17.32                       | 17.40                     |                           |             |
| 15              | 16QAM      | 1       | 74        | 17.39                    | 17.15                       | 17.22                     | 18.5                      | 0           |
| 15              | 16QAM      | 36      | 0         | 17.10                    | 17.06                       | 16.94                     |                           |             |
| 15              | 16QAM      | 36      | 20        | 16.99                    | 17.03                       | 16.90                     |                           |             |
| 15              | 16QAM      | 36      | 39        | 16.90                    | 16.90                       | 16.86                     | 18.5                      | 0           |
| 15              | 16QAM      | 75      | 0         | 16.94                    | 16.94                       | 16.88                     |                           |             |
| 15              | 64QAM      | 1       | 0         | 17.36                    | 17.52                       | 17.34                     |                           |             |
| 15              | 64QAM      | 1       | 37        | 17.37                    | 17.39                       | 17.45                     | 18.5                      | 0           |
| 15              | 64QAM      | 1       | 74        | 17.40                    | 17.40                       | 17.23                     |                           |             |
| 15              | 64QAM      | 36      | 0         | 16.93                    | 16.92                       | 16.88                     |                           |             |
| 15              | 64QAM      | 36      | 20        | 16.88                    | 16.94                       | 16.81                     | 18.5                      | 0           |
| 15              | 64QAM      | 36      | 39        | 16.83                    | 16.99                       | 16.92                     |                           |             |
| 15              | 64QAM      | 75      | 0         | 16.98                    | 16.96                       | 16.88                     |                           |             |



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| Channel         |       |    |    | 18650  | 18900 | 19150  | Tune-up limit (dBm) | MPR (dB) |
|-----------------|-------|----|----|--------|-------|--------|---------------------|----------|
| Frequency (MHz) |       |    |    | 1855   | 1880  | 1905   |                     |          |
| 10              | QPSK  | 1  | 0  | 17.29  | 17.32 | 17.18  | 18.5                | 0        |
| 10              | QPSK  | 1  | 25 | 17.30  | 17.27 | 17.09  |                     |          |
| 10              | QPSK  | 1  | 49 | 17.17  | 17.18 | 17.12  |                     |          |
| 10              | QPSK  | 25 | 0  | 17.20  | 17.18 | 17.05  | 18.5                | 0        |
| 10              | QPSK  | 25 | 12 | 17.12  | 17.17 | 17.02  |                     |          |
| 10              | QPSK  | 25 | 25 | 17.04  | 17.08 | 17.03  |                     |          |
| 10              | QPSK  | 50 | 0  | 17.11  | 17.07 | 16.98  |                     |          |
| 10              | 16QAM | 1  | 0  | 17.45  | 17.35 | 17.41  | 18.5                | 0        |
| 10              | 16QAM | 1  | 25 | 17.46  | 17.30 | 17.23  |                     |          |
| 10              | 16QAM | 1  | 49 | 17.47  | 17.31 | 17.30  |                     |          |
| 10              | 16QAM | 25 | 0  | 17.12  | 17.10 | 16.99  | 18.5                | 0        |
| 10              | 16QAM | 25 | 12 | 17.05  | 17.07 | 16.94  |                     |          |
| 10              | 16QAM | 25 | 25 | 16.98  | 16.99 | 16.89  |                     |          |
| 10              | 16QAM | 50 | 0  | 16.98  | 16.93 | 16.86  |                     |          |
| 10              | 64QAM | 1  | 0  | 17.45  | 17.49 | 17.36  | 18.5                | 0        |
| 10              | 64QAM | 1  | 25 | 17.40  | 17.35 | 17.42  |                     |          |
| 10              | 64QAM | 1  | 49 | 17.32  | 17.47 | 17.30  |                     |          |
| 10              | 64QAM | 25 | 0  | 17.12  | 17.05 | 16.89  | 18.5                | 0        |
| 10              | 64QAM | 25 | 12 | 16.86  | 17.03 | 16.96  |                     |          |
| 10              | 64QAM | 25 | 25 | 16.82  | 17.00 | 16.82  |                     |          |
| 10              | 64QAM | 50 | 0  | 16.99  | 16.96 | 16.85  |                     |          |
| Channel         |       |    |    | 18625  | 18900 | 19175  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 1852.5 | 1880  | 1907.5 |                     |          |
| 5               | QPSK  | 1  | 0  | 17.26  | 17.20 | 17.11  | 18.5                | 0        |
| 5               | QPSK  | 1  | 12 | 17.27  | 17.14 | 17.10  |                     |          |
| 5               | QPSK  | 1  | 24 | 17.20  | 17.11 | 17.04  |                     |          |
| 5               | QPSK  | 12 | 0  | 17.22  | 17.22 | 17.11  | 18.5                | 0        |
| 5               | QPSK  | 12 | 7  | 17.25  | 17.21 | 17.12  |                     |          |
| 5               | QPSK  | 12 | 13 | 17.24  | 17.13 | 17.12  |                     |          |
| 5               | QPSK  | 25 | 0  | 17.22  | 17.11 | 17.10  |                     |          |
| 5               | 16QAM | 1  | 0  | 17.32  | 17.26 | 17.25  | 18.5                | 0        |
| 5               | 16QAM | 1  | 12 | 17.47  | 17.20 | 17.21  |                     |          |
| 5               | 16QAM | 1  | 24 | 17.42  | 17.31 | 17.18  |                     |          |
| 5               | 16QAM | 12 | 0  | 17.14  | 17.12 | 17.01  | 18.5                | 0        |
| 5               | 16QAM | 12 | 7  | 17.21  | 17.11 | 16.93  |                     |          |
| 5               | 16QAM | 12 | 13 | 17.17  | 17.03 | 16.98  |                     |          |
| 5               | 16QAM | 25 | 0  | 17.15  | 17.01 | 16.97  |                     |          |
| 5               | 64QAM | 1  | 0  | 17.39  | 17.42 | 17.30  | 18.5                | 0        |
| 5               | 64QAM | 1  | 12 | 17.54  | 17.29 | 17.30  |                     |          |
| 5               | 64QAM | 1  | 24 | 17.31  | 17.38 | 17.12  |                     |          |
| 5               | 64QAM | 12 | 0  | 17.05  | 16.93 | 16.81  | 18.5                | 0        |
| 5               | 64QAM | 12 | 7  | 16.95  | 16.99 | 16.88  |                     |          |
| 5               | 64QAM | 12 | 13 | 16.81  | 16.82 | 16.86  |                     |          |
| 5               | 64QAM | 25 | 0  | 17.00  | 16.97 | 16.85  |                     |          |
| Channel         |       |    |    | 18615  | 18900 | 19185  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |       |    |    | 1851.5 | 1880  | 1908.5 |                     |          |
| 3               | QPSK  | 1  | 0  | 17.14  | 17.12 | 16.99  | 18.5                | 0        |
| 3               | QPSK  | 1  | 8  | 17.17  | 17.08 | 17.03  |                     |          |



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|                 |       |    |    |        |       |        |                           |             |
|-----------------|-------|----|----|--------|-------|--------|---------------------------|-------------|
| 3               | QPSK  | 1  | 14 | 17.20  | 17.04 | 16.97  |                           |             |
| 3               | QPSK  | 8  | 0  | 17.13  | 17.14 | 17.00  | 18.5                      | 0           |
| 3               | QPSK  | 8  | 4  | 17.12  | 17.05 | 16.96  |                           |             |
| 3               | QPSK  | 8  | 7  | 17.17  | 17.05 | 16.98  |                           |             |
| 3               | QPSK  | 15 | 0  | 17.11  | 17.04 | 16.98  |                           |             |
| 3               | 16QAM | 1  | 0  | 17.54  | 17.39 | 17.28  | 18.5                      | 0           |
| 3               | 16QAM | 1  | 8  | 17.50  | 17.43 | 17.34  |                           |             |
| 3               | 16QAM | 1  | 14 | 17.56  | 17.33 | 17.30  |                           |             |
| 3               | 16QAM | 8  | 0  | 17.22  | 17.17 | 17.03  | 18.5                      | 0           |
| 3               | 16QAM | 8  | 4  | 17.19  | 17.13 | 17.02  |                           |             |
| 3               | 16QAM | 8  | 7  | 17.28  | 17.11 | 17.03  |                           |             |
| 3               | 16QAM | 15 | 0  | 17.16  | 17.08 | 17.02  |                           |             |
| 3               | 64QAM | 1  | 0  | 17.33  | 17.56 | 17.32  | 18.5                      | 0           |
| 3               | 64QAM | 1  | 8  | 17.47  | 17.40 | 17.42  |                           |             |
| 3               | 64QAM | 1  | 14 | 17.35  | 17.33 | 17.19  |                           |             |
| 3               | 64QAM | 8  | 0  | 17.01  | 17.04 | 16.96  | 18.5                      | 0           |
| 3               | 64QAM | 8  | 4  | 16.87  | 17.01 | 16.97  |                           |             |
| 3               | 64QAM | 8  | 7  | 16.88  | 17.01 | 16.82  |                           |             |
| 3               | 64QAM | 15 | 0  | 16.85  | 16.91 | 16.84  |                           |             |
| Channel         |       |    |    | 18607  | 18900 | 19193  | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1850.7 | 1880  | 1909.3 |                           |             |
| 1.4             | QPSK  | 1  | 0  | 17.18  | 17.18 | 17.06  | 18.5                      | 0           |
| 1.4             | QPSK  | 1  | 3  | 17.20  | 17.18 | 17.02  |                           |             |
| 1.4             | QPSK  | 1  | 5  | 17.19  | 17.10 | 17.03  |                           |             |
| 1.4             | QPSK  | 3  | 0  | 17.16  | 17.14 | 17.02  |                           |             |
| 1.4             | QPSK  | 3  | 1  | 17.16  | 17.13 | 17.00  |                           |             |
| 1.4             | QPSK  | 3  | 3  | 17.14  | 17.07 | 17.00  |                           |             |
| 1.4             | QPSK  | 6  | 0  | 17.14  | 17.05 | 16.99  | 18.5                      | 0           |
| 1.4             | 16QAM | 1  | 0  | 17.40  | 17.31 | 17.20  | 18.5                      | 0           |
| 1.4             | 16QAM | 1  | 3  | 17.35  | 17.22 | 17.13  |                           |             |
| 1.4             | 16QAM | 1  | 5  | 17.33  | 17.24 | 17.08  |                           |             |
| 1.4             | 16QAM | 3  | 0  | 17.09  | 17.10 | 16.89  |                           |             |
| 1.4             | 16QAM | 3  | 1  | 17.08  | 16.99 | 16.93  |                           |             |
| 1.4             | 16QAM | 3  | 3  | 17.07  | 16.95 | 16.92  |                           |             |
| 1.4             | 16QAM | 6  | 0  | 17.03  | 16.90 | 16.88  | 18.5                      | 0           |
| 1.4             | 64QAM | 1  | 0  | 17.35  | 17.42 | 17.32  | 18.5                      | 0           |
| 1.4             | 64QAM | 1  | 3  | 17.36  | 17.45 | 17.48  |                           |             |
| 1.4             | 64QAM | 1  | 5  | 17.43  | 17.36 | 17.24  |                           |             |
| 1.4             | 64QAM | 3  | 0  | 17.10  | 17.11 | 16.84  |                           |             |
| 1.4             | 64QAM | 3  | 1  | 16.97  | 17.09 | 16.97  |                           |             |
| 1.4             | 64QAM | 3  | 3  | 16.82  | 16.91 | 16.73  |                           |             |
| 1.4             | 64QAM | 6  | 0  | 16.82  | 17.01 | 16.93  | 18.5                      | 0           |

**<LTE Band 4>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 20050                    | 20175                       | 20300                     |                        |             |
| Frequency (MHz) |            |         |           | 1720                     | 1732.5                      | 1745                      |                        |             |
| 20              | QPSK       | 1       | 0         | 16.32                    | 16.40                       | 16.26                     | 17                     | 0           |
| 20              | QPSK       | 1       | 49        | 16.21                    | 16.30                       | 16.21                     |                        |             |
| 20              | QPSK       | 1       | 99        | 16.20                    | 16.20                       | 16.18                     |                        |             |
| 20              | QPSK       | 50      | 0         | 16.16                    | 16.26                       | 16.14                     | 17                     | 0           |
| 20              | QPSK       | 50      | 24        | 16.12                    | 16.14                       | 16.04                     |                        |             |
| 20              | QPSK       | 50      | 50        | 16.21                    | 15.99                       | 15.91                     |                        |             |
| 20              | QPSK       | 100     | 0         | 16.19                    | 16.24                       | 16.06                     | 17                     | 0           |
| 20              | 16QAM      | 1       | 0         | 16.38                    | 16.30                       | 16.12                     |                        |             |
| 20              | 16QAM      | 1       | 49        | 16.22                    | 16.09                       | 16.15                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 16.04                    | 16.11                       | 16.18                     | 17                     | 0           |
| 20              | 16QAM      | 50      | 0         | 15.83                    | 15.91                       | 15.80                     |                        |             |
| 20              | 16QAM      | 50      | 24        | 15.77                    | 15.81                       | 15.72                     |                        |             |
| 20              | 16QAM      | 50      | 50        | 15.86                    | 15.66                       | 15.57                     | 17                     | 0           |
| 20              | 16QAM      | 100     | 0         | 15.83                    | 15.86                       | 15.70                     |                        |             |
| 20              | 64QAM      | 1       | 0         | 16.38                    | 16.37                       | 16.08                     |                        |             |
| 20              | 64QAM      | 1       | 49        | 16.26                    | 16.13                       | 16.12                     | 17                     | 0           |
| 20              | 64QAM      | 1       | 99        | 16.05                    | 16.03                       | 16.19                     |                        |             |
| 20              | 64QAM      | 50      | 0         | 15.78                    | 15.90                       | 15.90                     |                        |             |
| 20              | 64QAM      | 50      | 24        | 15.83                    | 15.82                       | 15.63                     | 17                     | 0           |
| 20              | 64QAM      | 50      | 50        | 15.92                    | 15.59                       | 15.55                     |                        |             |
| 20              | 64QAM      | 100     | 0         | 15.74                    | 15.80                       | 15.78                     |                        |             |
| Channel         |            |         |           | 20025                    | 20175                       | 20325                     | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 1717.5                   | 1732.5                      | 1747.5                    |                        |             |
| 15              | QPSK       | 1       | 0         | 16.09                    | 16.18                       | 16.04                     | 17                     | 0           |
| 15              | QPSK       | 1       | 37        | 16.08                    | 16.06                       | 15.97                     |                        |             |
| 15              | QPSK       | 1       | 74        | 16.09                    | 15.90                       | 15.98                     |                        |             |
| 15              | QPSK       | 36      | 0         | 15.84                    | 16.02                       | 15.93                     | 17                     | 0           |
| 15              | QPSK       | 36      | 20        | 15.88                    | 15.96                       | 15.81                     |                        |             |
| 15              | QPSK       | 36      | 39        | 15.88                    | 15.79                       | 15.75                     |                        |             |
| 15              | QPSK       | 75      | 0         | 15.88                    | 15.97                       | 15.81                     | 17                     | 0           |
| 15              | 16QAM      | 1       | 0         | 16.30                    | 16.18                       | 16.31                     |                        |             |
| 15              | 16QAM      | 1       | 37        | 16.22                    | 16.19                       | 16.29                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 16.10                    | 16.00                       | 16.29                     | 17                     | 0           |
| 15              | 16QAM      | 36      | 0         | 15.75                    | 15.88                       | 15.83                     |                        |             |
| 15              | 16QAM      | 36      | 20        | 15.78                    | 15.81                       | 15.73                     |                        |             |
| 15              | 16QAM      | 36      | 39        | 15.80                    | 15.70                       | 15.66                     | 17                     | 0           |
| 15              | 16QAM      | 75      | 0         | 15.75                    | 15.81                       | 15.67                     |                        |             |
| 15              | 64QAM      | 1       | 0         | 16.34                    | 16.24                       | 16.02                     |                        |             |
| 15              | 64QAM      | 1       | 37        | 16.20                    | 16.18                       | 16.24                     | 17                     | 0           |
| 15              | 64QAM      | 1       | 74        | 16.00                    | 16.18                       | 16.16                     |                        |             |
| 15              | 64QAM      | 36      | 0         | 15.78                    | 15.98                       | 15.89                     |                        |             |
| 15              | 64QAM      | 36      | 20        | 15.71                    | 15.72                       | 15.67                     | 17                     | 0           |
| 15              | 64QAM      | 36      | 39        | 15.77                    | 15.70                       | 15.52                     |                        |             |
| 15              | 64QAM      | 75      | 0         | 15.87                    | 15.77                       | 15.65                     |                        |             |
| Channel         |            |         |           | 20000                    | 20175                       | 20350                     | Tune-up limit          | MPR         |



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| Frequency (MHz) |       |    |    | 1715   | 1732.5 | 1750   | (dBm)                  | (dB)        |
|-----------------|-------|----|----|--------|--------|--------|------------------------|-------------|
| 10              | QPSK  | 1  | 0  | 16.11  | 16.13  | 16.09  | 17                     | 0           |
| 10              | QPSK  | 1  | 25 | 15.98  | 16.04  | 15.89  |                        |             |
| 10              | QPSK  | 1  | 49 | 16.00  | 15.97  | 16.09  |                        |             |
| 10              | QPSK  | 25 | 0  | 15.88  | 16.05  | 15.87  | 17                     | 0           |
| 10              | QPSK  | 25 | 12 | 15.83  | 15.97  | 15.75  |                        |             |
| 10              | QPSK  | 25 | 25 | 15.90  | 15.86  | 15.85  |                        |             |
| 10              | QPSK  | 50 | 0  | 15.94  | 15.95  | 15.83  |                        |             |
| 10              | 16QAM | 1  | 0  | 16.29  | 16.11  | 16.30  | 17                     | 0           |
| 10              | 16QAM | 1  | 25 | 16.14  | 16.17  | 16.13  |                        |             |
| 10              | 16QAM | 1  | 49 | 16.19  | 16.09  | 16.28  |                        |             |
| 10              | 16QAM | 25 | 0  | 15.82  | 15.93  | 15.80  | 17                     | 0           |
| 10              | 16QAM | 25 | 12 | 15.79  | 15.85  | 15.70  |                        |             |
| 10              | 16QAM | 25 | 25 | 15.84  | 15.77  | 15.78  |                        |             |
| 10              | 16QAM | 50 | 0  | 15.80  | 15.81  | 15.70  |                        |             |
| 10              | 64QAM | 1  | 0  | 16.31  | 16.37  | 16.12  | 17                     | 0           |
| 10              | 64QAM | 1  | 25 | 16.22  | 16.05  | 16.17  |                        |             |
| 10              | 64QAM | 1  | 49 | 15.94  | 16.01  | 16.10  |                        |             |
| 10              | 64QAM | 25 | 0  | 15.88  | 15.89  | 15.71  | 17                     | 0           |
| 10              | 64QAM | 25 | 12 | 15.76  | 15.80  | 15.81  |                        |             |
| 10              | 64QAM | 25 | 25 | 15.86  | 15.63  | 15.56  |                        |             |
| 10              | 64QAM | 50 | 0  | 15.86  | 15.81  | 15.60  |                        |             |
| Channel         |       |    |    | 19975  | 20175  | 20375  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1712.5 | 1732.5 | 1752.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 16.04  | 16.15  | 15.97  | 17                     | 0           |
| 5               | QPSK  | 1  | 12 | 15.98  | 16.06  | 16.00  |                        |             |
| 5               | QPSK  | 1  | 24 | 15.94  | 15.97  | 16.02  |                        |             |
| 5               | QPSK  | 12 | 0  | 16.03  | 16.16  | 15.95  | 17                     | 0           |
| 5               | QPSK  | 12 | 7  | 15.94  | 16.09  | 15.96  |                        |             |
| 5               | QPSK  | 12 | 13 | 15.93  | 16.05  | 15.96  |                        |             |
| 5               | QPSK  | 25 | 0  | 15.91  | 16.06  | 15.93  |                        |             |
| 5               | 16QAM | 1  | 0  | 16.31  | 16.18  | 16.18  | 17                     | 0           |
| 5               | 16QAM | 1  | 12 | 16.13  | 16.10  | 16.26  |                        |             |
| 5               | 16QAM | 1  | 24 | 16.15  | 16.04  | 16.18  |                        |             |
| 5               | 16QAM | 12 | 0  | 15.99  | 16.04  | 15.87  | 17                     | 0           |
| 5               | 16QAM | 12 | 7  | 15.89  | 15.96  | 15.94  |                        |             |
| 5               | 16QAM | 12 | 13 | 15.90  | 15.91  | 15.93  |                        |             |
| 5               | 16QAM | 25 | 0  | 15.84  | 15.92  | 15.84  |                        |             |
| 5               | 64QAM | 1  | 0  | 16.35  | 16.30  | 16.17  | 17                     | 0           |
| 5               | 64QAM | 1  | 12 | 16.15  | 16.01  | 16.22  |                        |             |
| 5               | 64QAM | 1  | 24 | 16.06  | 16.20  | 16.21  |                        |             |
| 5               | 64QAM | 12 | 0  | 15.78  | 16.00  | 15.84  | 17                     | 0           |
| 5               | 64QAM | 12 | 7  | 15.81  | 15.72  | 15.73  |                        |             |
| 5               | 64QAM | 12 | 13 | 15.76  | 15.58  | 15.55  |                        |             |
| 5               | 64QAM | 25 | 0  | 15.90  | 15.93  | 15.80  |                        |             |
| Channel         |       |    |    | 19965  | 20175  | 20385  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1711.5 | 1732.5 | 1753.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 15.95  | 16.04  | 15.91  | 17                     | 0           |
| 3               | QPSK  | 1  | 8  | 16.02  | 16.03  | 15.98  |                        |             |
| 3               | QPSK  | 1  | 14 | 15.85  | 15.92  | 15.92  |                        |             |



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|                 |       |    |    |        |        |        |                        |             |
|-----------------|-------|----|----|--------|--------|--------|------------------------|-------------|
| 3               | QPSK  | 8  | 0  | 15.94  | 16.00  | 15.88  | 17                     | 0           |
| 3               | QPSK  | 8  | 4  | 15.94  | 15.99  | 15.87  |                        |             |
| 3               | QPSK  | 8  | 7  | 15.85  | 15.95  | 15.94  |                        |             |
| 3               | QPSK  | 15 | 0  | 15.91  | 15.99  | 15.84  | 17                     | 0           |
| 3               | 16QAM | 1  | 0  | 16.17  | 16.10  | 16.27  |                        |             |
| 3               | 16QAM | 1  | 8  | 16.25  | 16.08  | 16.13  |                        |             |
| 3               | 16QAM | 1  | 14 | 16.06  | 16.06  | 16.18  | 17                     | 0           |
| 3               | 16QAM | 8  | 0  | 15.86  | 15.86  | 15.83  |                        |             |
| 3               | 16QAM | 8  | 4  | 15.87  | 15.86  | 15.82  |                        |             |
| 3               | 16QAM | 8  | 7  | 15.74  | 15.84  | 15.89  | 17                     | 0           |
| 3               | 16QAM | 15 | 0  | 15.79  | 15.82  | 15.70  |                        |             |
| 3               | 64QAM | 1  | 0  | 16.34  | 16.25  | 16.09  |                        |             |
| 3               | 64QAM | 1  | 8  | 16.32  | 16.03  | 16.07  | 17                     | 0           |
| 3               | 64QAM | 1  | 14 | 16.01  | 16.20  | 16.11  |                        |             |
| 3               | 64QAM | 8  | 0  | 15.81  | 15.89  | 15.74  |                        |             |
| 3               | 64QAM | 8  | 4  | 15.73  | 15.88  | 15.68  | 17                     | 0           |
| 3               | 64QAM | 8  | 7  | 15.76  | 15.72  | 15.53  |                        |             |
| 3               | 64QAM | 15 | 0  | 15.92  | 15.91  | 15.62  |                        |             |
| Channel         |       |    |    | 19957  | 20175  | 20393  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1710.7 | 1732.5 | 1754.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 16.01  | 16.02  | 15.97  | 17                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 16.01  | 16.03  | 16.02  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 15.99  | 16.03  | 16.03  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 15.96  | 16.00  | 16.01  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 15.97  | 16.01  | 15.98  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 15.97  | 16.00  | 15.95  | 17                     | 0           |
| 1.4             | QPSK  | 6  | 0  | 15.96  | 15.99  | 15.96  |                        |             |
| 1.4             | 16QAM | 1  | 0  | 16.28  | 16.10  | 16.26  |                        |             |
| 1.4             | 16QAM | 1  | 3  | 16.21  | 16.08  | 16.24  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 16.18  | 16.15  | 16.30  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 15.95  | 15.94  | 16.00  | 17                     | 0           |
| 1.4             | 16QAM | 3  | 1  | 15.99  | 15.93  | 15.96  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 15.96  | 15.91  | 15.97  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 15.89  | 15.87  | 15.88  |                        |             |
| 1.4             | 64QAM | 1  | 0  | 16.37  | 16.32  | 16.02  |                        |             |
| 1.4             | 64QAM | 1  | 3  | 16.30  | 15.99  | 16.25  | 17                     | 0           |
| 1.4             | 64QAM | 1  | 5  | 16.08  | 16.21  | 16.16  |                        |             |
| 1.4             | 64QAM | 3  | 0  | 15.74  | 15.97  | 15.78  |                        |             |
| 1.4             | 64QAM | 3  | 1  | 15.78  | 15.90  | 15.72  |                        |             |
| 1.4             | 64QAM | 3  | 3  | 15.96  | 15.61  | 15.60  |                        |             |
| 1.4             | 64QAM | 6  | 0  | 15.73  | 15.79  | 15.80  | 17                     | 0           |



**<LTE Band 5>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 20450                 | 20525                    | 20600                  |                     |          |
| Frequency (MHz) |            |         |           | 829                   | 836.5                    | 844                    |                     |          |
| 10              | QPSK       | 1       | 0         | 20.11                 | 20.19                    | 20.03                  | 20.5                | 0        |
| 10              | QPSK       | 1       | 25        | 20.10                 | 20.06                    | 20.10                  |                     |          |
| 10              | QPSK       | 1       | 49        | 20.18                 | 20.04                    | 20.10                  |                     |          |
| 10              | QPSK       | 25      | 0         | 20.11                 | 20.04                    | 20.02                  | 20.5                | 0        |
| 10              | QPSK       | 25      | 12        | 20.03                 | 20.01                    | 20.06                  |                     |          |
| 10              | QPSK       | 25      | 25        | 20.10                 | 19.99                    | 20.06                  |                     |          |
| 10              | QPSK       | 50      | 0         | 20.03                 | 20.01                    | 20.05                  | 20.5                | 0        |
| 10              | 16QAM      | 1       | 0         | 20.06                 | 20.15                    | 19.86                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 20.08                 | 20.09                    | 20.00                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 20.12                 | 19.94                    | 19.99                  | 20.5                | 0        |
| 10              | 16QAM      | 25      | 0         | 19.78                 | 19.73                    | 19.67                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 19.72                 | 19.71                    | 19.72                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 19.82                 | 19.68                    | 19.73                  | 20.5                | 0        |
| 10              | 16QAM      | 50      | 0         | 19.67                 | 19.63                    | 19.71                  |                     |          |
| 10              | 64QAM      | 1       | 0         | 20.15                 | 20.14                    | 19.98                  |                     |          |
| 10              | 64QAM      | 1       | 25        | 20.15                 | 20.12                    | 20.01                  | 20.5                | 0        |
| 10              | 64QAM      | 1       | 49        | 20.07                 | 19.90                    | 19.95                  |                     |          |
| 10              | 64QAM      | 25      | 0         | 19.80                 | 19.75                    | 19.69                  |                     |          |
| 10              | 64QAM      | 25      | 12        | 19.74                 | 19.83                    | 19.83                  | 20.5                | 0        |
| 10              | 64QAM      | 25      | 25        | 19.88                 | 19.65                    | 19.87                  |                     |          |
| 10              | 64QAM      | 50      | 0         | 19.75                 | 19.70                    | 19.84                  |                     |          |
| Channel         |            |         |           | 20425                 | 20525                    | 20625                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 826.5                 | 836.5                    | 846.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 19.81                 | 19.82                    | 19.88                  | 20.5                | 0        |
| 5               | QPSK       | 1       | 12        | 19.84                 | 19.81                    | 19.85                  |                     |          |
| 5               | QPSK       | 1       | 24        | 19.79                 | 19.78                    | 19.85                  |                     |          |
| 5               | QPSK       | 12      | 0         | 19.93                 | 19.88                    | 19.91                  | 20.5                | 0        |
| 5               | QPSK       | 12      | 7         | 19.92                 | 19.87                    | 19.89                  |                     |          |
| 5               | QPSK       | 12      | 13        | 19.92                 | 19.86                    | 19.91                  |                     |          |
| 5               | QPSK       | 25      | 0         | 19.91                 | 19.85                    | 19.89                  | 20.5                | 0        |
| 5               | 16QAM      | 1       | 0         | 19.92                 | 20.01                    | 19.98                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 19.86                 | 19.92                    | 19.95                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 19.88                 | 19.92                    | 19.91                  | 20.5                | 0        |
| 5               | 16QAM      | 12      | 0         | 19.78                 | 19.79                    | 19.79                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 19.78                 | 19.75                    | 19.77                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 19.76                 | 19.73                    | 19.84                  | 20.5                | 0        |
| 5               | 16QAM      | 25      | 0         | 19.78                 | 19.74                    | 19.77                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 20.23                 | 20.18                    | 20.05                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 20.11                 | 20.15                    | 20.06                  | 20.5                | 0        |
| 5               | 64QAM      | 1       | 24        | 20.28                 | 20.02                    | 20.03                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 19.93                 | 19.93                    | 19.72                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 19.79                 | 19.83                    | 19.82                  | 20.5                | 0        |
| 5               | 64QAM      | 12      | 13        | 19.92                 | 19.74                    | 19.76                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 19.77                 | 19.83                    | 19.85                  |                     |          |
| Channel         |            |         |           | 20415                 | 20525                    | 20635                  | Tune-up limit       | MPR      |



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| Frequency (MHz) |       |    |    | 825.5 | 836.5 | 847.5 | (dBm)                  | (dB)        |
|-----------------|-------|----|----|-------|-------|-------|------------------------|-------------|
| 3               | QPSK  | 1  | 0  | 19.74 | 19.76 | 19.80 | 20.5                   | 0           |
| 3               | QPSK  | 1  | 8  | 19.85 | 19.80 | 19.88 |                        |             |
| 3               | QPSK  | 1  | 14 | 19.80 | 19.74 | 19.78 |                        |             |
| 3               | QPSK  | 8  | 0  | 19.78 | 19.80 | 19.82 | 20.5                   | 0           |
| 3               | QPSK  | 8  | 4  | 19.83 | 19.77 | 19.84 |                        |             |
| 3               | QPSK  | 8  | 7  | 19.84 | 19.76 | 19.81 |                        |             |
| 3               | QPSK  | 15 | 0  | 19.85 | 19.77 | 19.82 |                        |             |
| 3               | 16QAM | 1  | 0  | 19.86 | 19.86 | 19.99 | 20.5                   | 0           |
| 3               | 16QAM | 1  | 8  | 19.91 | 19.93 | 19.99 |                        |             |
| 3               | 16QAM | 1  | 14 | 19.87 | 19.87 | 19.86 |                        |             |
| 3               | 16QAM | 8  | 0  | 19.59 | 19.66 | 19.68 | 20.5                   | 0           |
| 3               | 16QAM | 8  | 4  | 19.68 | 19.62 | 19.68 |                        |             |
| 3               | 16QAM | 8  | 7  | 19.64 | 19.64 | 19.66 |                        |             |
| 3               | 16QAM | 15 | 0  | 19.66 | 19.60 | 19.62 |                        |             |
| 3               | 64QAM | 1  | 0  | 20.08 | 20.18 | 20.00 | 20.5                   | 0           |
| 3               | 64QAM | 1  | 8  | 20.14 | 20.09 | 20.08 |                        |             |
| 3               | 64QAM | 1  | 14 | 20.17 | 19.97 | 20.16 |                        |             |
| 3               | 64QAM | 8  | 0  | 19.80 | 19.93 | 19.87 | 20.5                   | 0           |
| 3               | 64QAM | 8  | 4  | 19.75 | 19.82 | 19.92 |                        |             |
| 3               | 64QAM | 8  | 7  | 20.01 | 19.75 | 19.83 |                        |             |
| 3               | 64QAM | 15 | 0  | 19.70 | 19.73 | 19.78 |                        |             |
| Channel         |       |    |    | 20407 | 20525 | 20643 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 824.7 | 836.5 | 848.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 19.86 | 19.80 | 19.87 | 20.5                   | 0           |
| 1.4             | QPSK  | 1  | 3  | 19.82 | 19.78 | 19.87 |                        |             |
| 1.4             | QPSK  | 1  | 5  | 19.88 | 19.77 | 19.82 |                        |             |
| 1.4             | QPSK  | 3  | 0  | 19.79 | 19.77 | 19.83 |                        |             |
| 1.4             | QPSK  | 3  | 1  | 19.81 | 19.76 | 19.81 |                        |             |
| 1.4             | QPSK  | 3  | 3  | 19.79 | 19.75 | 19.81 |                        |             |
| 1.4             | QPSK  | 6  | 0  | 19.81 | 19.76 | 19.80 | 20.5                   | 0           |
| 1.4             | 16QAM | 1  | 0  | 19.97 | 19.95 | 19.97 | 20.5                   | 0           |
| 1.4             | 16QAM | 1  | 3  | 19.93 | 19.91 | 19.97 |                        |             |
| 1.4             | 16QAM | 1  | 5  | 20.05 | 19.84 | 19.84 |                        |             |
| 1.4             | 16QAM | 3  | 0  | 19.68 | 19.66 | 19.69 |                        |             |
| 1.4             | 16QAM | 3  | 1  | 19.68 | 19.65 | 19.72 |                        |             |
| 1.4             | 16QAM | 3  | 3  | 19.69 | 19.64 | 19.64 | 20.5                   | 0           |
| 1.4             | 16QAM | 6  | 0  | 19.67 | 19.62 | 19.63 |                        |             |
| 1.4             | 64QAM | 1  | 0  | 20.13 | 20.10 | 19.88 | 20.5                   | 0           |
| 1.4             | 64QAM | 1  | 3  | 20.11 | 20.14 | 20.01 |                        |             |
| 1.4             | 64QAM | 1  | 5  | 20.16 | 20.05 | 20.01 |                        |             |
| 1.4             | 64QAM | 3  | 0  | 19.92 | 19.86 | 19.83 |                        |             |
| 1.4             | 64QAM | 3  | 1  | 19.87 | 19.89 | 19.92 |                        |             |
| 1.4             | 64QAM | 3  | 3  | 19.87 | 19.86 | 19.84 |                        |             |
| 1.4             | 64QAM | 6  | 0  | 19.75 | 19.82 | 19.74 | 20.5                   | 0           |



**<LTE Band 7>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 20850                 | 21100                    | 21350                  |                     |          |
| Frequency (MHz) |            |         |           | 2510                  | 2535                     | 2560                   |                     |          |
| 20              | QPSK       | 1       | 0         | 16.38                 | 16.44                    | 16.63                  | 17                  | 0        |
| 20              | QPSK       | 1       | 49        | 16.32                 | 16.40                    | 16.62                  |                     |          |
| 20              | QPSK       | 1       | 99        | 16.36                 | 16.60                    | 16.49                  |                     |          |
| 20              | QPSK       | 50      | 0         | 16.42                 | 16.47                    | 16.62                  | 17                  | 0        |
| 20              | QPSK       | 50      | 24        | 16.40                 | 16.41                    | 16.61                  |                     |          |
| 20              | QPSK       | 50      | 50        | 16.38                 | 16.42                    | 16.55                  |                     |          |
| 20              | QPSK       | 100     | 0         | 16.46                 | 16.42                    | 16.61                  | 17                  | 0        |
| 20              | 16QAM      | 1       | 0         | 16.00                 | 16.40                    | 16.42                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 16.43                 | 16.31                    | 16.56                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 16.49                 | 16.58                    | 16.41                  | 17                  | 0        |
| 20              | 16QAM      | 50      | 0         | 15.97                 | 16.10                    | 16.13                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 16.06                 | 16.02                    | 16.30                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 16.04                 | 16.06                    | 16.18                  | 17                  | 0        |
| 20              | 16QAM      | 100     | 0         | 16.09                 | 16.08                    | 16.29                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 16.54                 | 16.46                    | 16.43                  |                     |          |
| 20              | 64QAM      | 1       | 49        | 16.43                 | 16.52                    | 16.55                  | 17                  | 0        |
| 20              | 64QAM      | 1       | 99        | 16.49                 | 16.51                    | 16.57                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 16.35                 | 16.41                    | 16.42                  |                     |          |
| 20              | 64QAM      | 50      | 24        | 16.35                 | 16.50                    | 16.50                  | 17                  | 0        |
| 20              | 64QAM      | 50      | 50        | 16.34                 | 16.54                    | 16.44                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 16.42                 | 16.53                    | 16.53                  |                     |          |
| Channel         |            |         |           | 20825                 | 21100                    | 21375                  |                     |          |
| Frequency (MHz) |            |         |           | 2507.5                | 2535                     | 2562.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 15.88                 | 16.26                    | 16.31                  | 17                  | 0        |
| 15              | QPSK       | 1       | 37        | 16.21                 | 16.21                    | 16.40                  |                     |          |
| 15              | QPSK       | 1       | 74        | 16.19                 | 16.29                    | 16.23                  |                     |          |
| 15              | QPSK       | 36      | 0         | 16.00                 | 16.28                    | 16.41                  | 17                  | 0        |
| 15              | QPSK       | 36      | 20        | 16.22                 | 16.24                    | 16.40                  |                     |          |
| 15              | QPSK       | 36      | 39        | 16.24                 | 16.21                    | 16.30                  |                     |          |
| 15              | QPSK       | 75      | 0         | 16.23                 | 16.24                    | 16.39                  | 17                  | 0        |
| 15              | 16QAM      | 1       | 0         | 15.98                 | 16.30                    | 16.49                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 16.33                 | 16.30                    | 16.51                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 16.47                 | 16.41                    | 16.28                  | 17                  | 0        |
| 15              | 16QAM      | 36      | 0         | 15.84                 | 16.13                    | 16.27                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 16.07                 | 16.09                    | 16.23                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 16.08                 | 16.07                    | 16.12                  | 17                  | 0        |
| 15              | 16QAM      | 75      | 0         | 16.07                 | 16.07                    | 16.22                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 16.10                 | 16.30                    | 16.61                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 16.35                 | 16.41                    | 16.55                  | 17                  | 0        |
| 15              | 64QAM      | 1       | 74        | 16.53                 | 16.51                    | 16.46                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 15.99                 | 16.29                    | 16.42                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 16.24                 | 16.20                    | 16.30                  | 17                  | 0        |
| 15              | 64QAM      | 36      | 39        | 16.28                 | 16.19                    | 16.28                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 16.27                 | 16.21                    | 16.41                  |                     |          |
| Channel         |            |         |           | 20800                 | 21100                    | 21400                  | Tune-up limit       | MPR      |



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| Frequency (MHz) |       |    |    | 2505   | 2535  | 2565   | (dBm)                  | (dB)        |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| 10              | QPSK  | 1  | 0  | 15.94  | 16.26 | 16.38  | 17                     | 0           |
| 10              | QPSK  | 1  | 25 | 16.07  | 16.18 | 16.38  |                        |             |
| 10              | QPSK  | 1  | 49 | 16.28  | 16.14 | 16.25  |                        |             |
| 10              | QPSK  | 25 | 0  | 15.88  | 16.20 | 16.39  | 17                     | 0           |
| 10              | QPSK  | 25 | 12 | 16.05  | 16.22 | 16.33  |                        |             |
| 10              | QPSK  | 25 | 25 | 16.23  | 16.20 | 16.31  |                        |             |
| 10              | QPSK  | 50 | 0  | 16.06  | 16.20 | 16.33  |                        |             |
| 10              | 16QAM | 1  | 0  | 16.10  | 16.40 | 16.51  | 17                     | 0           |
| 10              | 16QAM | 1  | 25 | 16.16  | 16.32 | 16.48  |                        |             |
| 10              | 16QAM | 1  | 49 | 16.49  | 16.25 | 16.34  |                        |             |
| 10              | 16QAM | 25 | 0  | 15.70  | 16.05 | 16.22  | 17                     | 0           |
| 10              | 16QAM | 25 | 12 | 15.92  | 16.04 | 16.18  |                        |             |
| 10              | 16QAM | 25 | 25 | 16.06  | 16.04 | 16.16  |                        |             |
| 10              | 16QAM | 50 | 0  | 15.92  | 16.04 | 16.17  |                        |             |
| 10              | 64QAM | 1  | 0  | 16.14  | 16.37 | 16.55  | 17                     | 0           |
| 10              | 64QAM | 1  | 25 | 16.45  | 16.30 | 16.55  |                        |             |
| 10              | 64QAM | 1  | 49 | 16.56  | 16.44 | 16.32  |                        |             |
| 10              | 64QAM | 25 | 0  | 15.91  | 16.29 | 16.40  | 17                     | 0           |
| 10              | 64QAM | 25 | 12 | 16.13  | 16.13 | 16.35  |                        |             |
| 10              | 64QAM | 25 | 25 | 16.15  | 16.12 | 16.18  |                        |             |
| 10              | 64QAM | 50 | 0  | 16.13  | 16.16 | 16.24  |                        |             |
| Channel         |       |    |    | 20775  | 21100 | 21425  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 2502.5 | 2535  | 2567.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 15.91  | 16.10 | 16.31  | 17                     | 0           |
| 5               | QPSK  | 1  | 12 | 15.81  | 16.08 | 16.27  |                        |             |
| 5               | QPSK  | 1  | 24 | 16.01  | 16.07 | 16.22  |                        |             |
| 5               | QPSK  | 12 | 0  | 15.73  | 16.00 | 16.15  | 17                     | 0           |
| 5               | QPSK  | 12 | 7  | 15.71  | 16.01 | 16.14  |                        |             |
| 5               | QPSK  | 12 | 13 | 15.79  | 16.01 | 16.07  |                        |             |
| 5               | QPSK  | 25 | 0  | 15.75  | 16.02 | 16.15  |                        |             |
| 5               | 16QAM | 1  | 0  | 16.03  | 16.16 | 16.41  | 17                     | 0           |
| 5               | 16QAM | 1  | 12 | 16.01  | 16.16 | 16.34  |                        |             |
| 5               | 16QAM | 1  | 24 | 16.17  | 16.15 | 16.29  |                        |             |
| 5               | 16QAM | 12 | 0  | 15.54  | 15.77 | 15.92  | 17                     | 0           |
| 5               | 16QAM | 12 | 7  | 15.54  | 15.78 | 15.94  |                        |             |
| 5               | 16QAM | 12 | 13 | 15.58  | 15.75 | 15.87  |                        |             |
| 5               | 16QAM | 25 | 0  | 15.58  | 15.77 | 15.91  |                        |             |
| 5               | 64QAM | 1  | 0  | 15.86  | 16.17 | 16.40  | 17                     | 0           |
| 5               | 64QAM | 1  | 12 | 16.15  | 16.27 | 16.32  |                        |             |
| 5               | 64QAM | 1  | 24 | 16.27  | 16.22 | 16.08  |                        |             |
| 5               | 64QAM | 12 | 0  | 15.73  | 16.09 | 16.14  | 17                     | 0           |
| 5               | 64QAM | 12 | 7  | 15.87  | 15.89 | 16.05  |                        |             |
| 5               | 64QAM | 12 | 13 | 15.97  | 16.01 | 15.97  |                        |             |
| 5               | 64QAM | 25 | 0  | 15.94  | 15.95 | 16.11  |                        |             |

**<LTE Band 12>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23060                 | 23095                    | 23130                  |                     |          |
| Frequency (MHz) |            |         |           | 704                   | 707.5                    | 711                    |                     |          |
| 10              | QPSK       | 1       | 0         | 20.76                 | 21.03                    | 20.94                  | 22.5                | 0        |
| 10              | QPSK       | 1       | 25        | 20.94                 | 21.02                    | 21.00                  |                     |          |
| 10              | QPSK       | 1       | 49        | 21.00                 | 21.02                    | 20.95                  |                     |          |
| 10              | QPSK       | 25      | 0         | 20.79                 | 20.98                    | 20.92                  | 22.5                | 0        |
| 10              | QPSK       | 25      | 12        | 20.89                 | 20.95                    | 20.94                  |                     |          |
| 10              | QPSK       | 25      | 25        | 20.96                 | 20.97                    | 20.89                  |                     |          |
| 10              | QPSK       | 50      | 0         | 20.95                 | 20.97                    | 20.94                  | 22.5                | 0        |
| 10              | 16QAM      | 1       | 0         | 20.66                 | 20.76                    | 20.81                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 20.77                 | 20.96                    | 20.93                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 20.92                 | 20.85                    | 20.75                  | 22                  | 0.5      |
| 10              | 16QAM      | 25      | 0         | 20.46                 | 20.52                    | 20.63                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 20.57                 | 20.64                    | 20.67                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.63                 | 20.66                    | 20.58                  | 22                  | 0.5      |
| 10              | 16QAM      | 50      | 0         | 20.62                 | 20.58                    | 20.59                  |                     |          |
| 10              | 64QAM      | 1       | 0         | 20.63                 | 20.72                    | 20.72                  |                     |          |
| 10              | 64QAM      | 1       | 25        | 20.75                 | 20.81                    | 20.81                  | 22                  | 0.5      |
| 10              | 64QAM      | 1       | 49        | 20.86                 | 20.66                    | 20.55                  |                     |          |
| 10              | 64QAM      | 25      | 0         | 20.29                 | 20.47                    | 20.47                  |                     |          |
| 10              | 64QAM      | 25      | 12        | 20.44                 | 20.55                    | 20.51                  | 21                  | 1.5      |
| 10              | 64QAM      | 25      | 25        | 20.59                 | 20.60                    | 20.51                  |                     |          |
| 10              | 64QAM      | 50      | 0         | 20.62                 | 20.55                    | 20.48                  |                     |          |
| Channel         |            |         |           | 23035                 | 23095                    | 23155                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 701.5                 | 707.5                    | 713.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 20.55                 | 20.64                    | 20.67                  | 22.5                | 0        |
| 5               | QPSK       | 1       | 12        | 20.55                 | 20.66                    | 20.60                  |                     |          |
| 5               | QPSK       | 1       | 24        | 20.66                 | 20.70                    | 20.67                  |                     |          |
| 5               | QPSK       | 12      | 0         | 20.55                 | 20.73                    | 20.65                  | 22.5                | 0        |
| 5               | QPSK       | 12      | 7         | 20.62                 | 20.75                    | 20.66                  |                     |          |
| 5               | QPSK       | 12      | 13        | 20.66                 | 20.76                    | 20.68                  |                     |          |
| 5               | QPSK       | 25      | 0         | 20.63                 | 20.74                    | 20.65                  | 22.5                | 0        |
| 5               | 16QAM      | 1       | 0         | 20.63                 | 20.71                    | 20.73                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 20.66                 | 20.89                    | 20.68                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 20.74                 | 20.84                    | 20.75                  | 22                  | 0.5      |
| 5               | 16QAM      | 12      | 0         | 20.45                 | 20.61                    | 20.53                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.46                 | 20.65                    | 20.50                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.53                 | 20.64                    | 20.50                  | 22                  | 0.5      |
| 5               | 16QAM      | 25      | 0         | 20.50                 | 20.63                    | 20.52                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 20.60                 | 20.63                    | 20.76                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 20.62                 | 20.80                    | 20.81                  | 22                  | 0.5      |
| 5               | 64QAM      | 1       | 24        | 20.78                 | 20.79                    | 20.66                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 20.26                 | 20.50                    | 20.56                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 20.49                 | 20.49                    | 20.65                  | 21                  | 1.5      |
| 5               | 64QAM      | 12      | 13        | 20.57                 | 20.59                    | 20.40                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 20.60                 | 20.56                    | 20.45                  |                     |          |
| Channel         |            |         |           | 23025                 | 23095                    | 23165                  | Tune-up limit       | MPR      |



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| Frequency (MHz) |       |    |    | 700.5 | 707.5 | 714.5 | (dBm)                  | (dB)        |
|-----------------|-------|----|----|-------|-------|-------|------------------------|-------------|
| 3               | QPSK  | 1  | 0  | 20.56 | 20.61 | 20.53 | 22.5                   | 0           |
| 3               | QPSK  | 1  | 8  | 20.58 | 20.68 | 20.60 |                        |             |
| 3               | QPSK  | 1  | 14 | 20.57 | 20.61 | 20.58 |                        |             |
| 3               | QPSK  | 8  | 0  | 20.56 | 20.66 | 20.55 | 22.5                   | 0           |
| 3               | QPSK  | 8  | 4  | 20.54 | 20.65 | 20.56 |                        |             |
| 3               | QPSK  | 8  | 7  | 20.50 | 20.66 | 20.56 |                        |             |
| 3               | QPSK  | 15 | 0  | 20.54 | 20.66 | 20.55 |                        |             |
| 3               | 16QAM | 1  | 0  | 20.52 | 20.70 | 20.57 | 22.5                   | 0           |
| 3               | 16QAM | 1  | 8  | 20.55 | 20.82 | 20.69 |                        |             |
| 3               | 16QAM | 1  | 14 | 20.61 | 20.69 | 20.63 |                        |             |
| 3               | 16QAM | 8  | 0  | 20.31 | 20.52 | 20.35 | 22                     | 0.5         |
| 3               | 16QAM | 8  | 4  | 20.27 | 20.52 | 20.37 |                        |             |
| 3               | 16QAM | 8  | 7  | 20.33 | 20.52 | 20.41 |                        |             |
| 3               | 16QAM | 15 | 0  | 20.23 | 20.48 | 20.33 |                        |             |
| 3               | 64QAM | 1  | 0  | 20.47 | 20.68 | 20.66 | 22                     | 0.5         |
| 3               | 64QAM | 1  | 8  | 20.59 | 20.93 | 20.88 |                        |             |
| 3               | 64QAM | 1  | 14 | 20.84 | 20.78 | 20.64 |                        |             |
| 3               | 64QAM | 8  | 0  | 20.28 | 20.49 | 20.61 | 21                     | 1.5         |
| 3               | 64QAM | 8  | 4  | 20.37 | 20.62 | 20.48 |                        |             |
| 3               | 64QAM | 8  | 7  | 20.46 | 20.53 | 20.58 |                        |             |
| 3               | 64QAM | 15 | 0  | 20.52 | 20.49 | 20.57 |                        |             |
| Channel         |       |    |    | 23017 | 23095 | 23173 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 699.7 | 707.5 | 715.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 20.52 | 20.68 | 20.61 | 22.5                   | 0           |
| 1.4             | QPSK  | 1  | 3  | 20.50 | 20.68 | 20.58 |                        |             |
| 1.4             | QPSK  | 1  | 5  | 20.51 | 20.69 | 20.62 |                        |             |
| 1.4             | QPSK  | 3  | 0  | 20.48 | 20.65 | 20.58 |                        |             |
| 1.4             | QPSK  | 3  | 1  | 20.48 | 20.65 | 20.56 |                        |             |
| 1.4             | QPSK  | 3  | 3  | 20.46 | 20.66 | 20.57 |                        |             |
| 1.4             | QPSK  | 6  | 0  | 20.48 | 20.65 | 20.56 | 22.5                   | 0           |
| 1.4             | 16QAM | 1  | 0  | 20.61 | 20.73 | 20.66 | 22.5                   | 0           |
| 1.4             | 16QAM | 1  | 3  | 20.55 | 20.77 | 20.68 |                        |             |
| 1.4             | 16QAM | 1  | 5  | 20.61 | 20.79 | 20.73 |                        |             |
| 1.4             | 16QAM | 3  | 0  | 20.36 | 20.58 | 20.50 |                        |             |
| 1.4             | 16QAM | 3  | 1  | 20.34 | 20.53 | 20.42 |                        |             |
| 1.4             | 16QAM | 3  | 3  | 20.36 | 20.53 | 20.49 |                        |             |
| 1.4             | 16QAM | 6  | 0  | 20.31 | 20.54 | 20.41 | 22                     | 0.5         |
| 1.4             | 64QAM | 1  | 0  | 20.66 | 20.59 | 20.68 | 22                     | 0.5         |
| 1.4             | 64QAM | 1  | 3  | 20.59 | 20.77 | 20.80 |                        |             |
| 1.4             | 64QAM | 1  | 5  | 20.82 | 20.71 | 20.69 |                        |             |
| 1.4             | 64QAM | 3  | 0  | 20.26 | 20.40 | 20.52 |                        |             |
| 1.4             | 64QAM | 3  | 1  | 20.39 | 20.52 | 20.56 |                        |             |
| 1.4             | 64QAM | 3  | 3  | 20.47 | 20.62 | 20.57 |                        |             |
| 1.4             | 64QAM | 6  | 0  | 20.44 | 20.50 | 20.39 | 21                     | 1.5         |



**<LTE Band 13>**

| E-UTRA Band 20  |       |    |    | Power<br>Low<br>Ch. / Freq. | Power<br>Middle<br>Ch. / Freq. | Power<br>High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|-----------------------------|--------------------------------|------------------------------|------------------------|-------------|
| Channel         |       |    |    | 23230                       |                                |                              |                        |             |
| Frequency (MHz) |       |    |    | 782                         |                                |                              |                        |             |
| 10              | QPSK  | 1  | 0  |                             | 19.84                          |                              | 21                     | 0           |
| 10              | QPSK  | 1  | 25 |                             | 19.76                          |                              |                        |             |
| 10              | QPSK  | 1  | 49 |                             | 19.80                          |                              |                        |             |
| 10              | QPSK  | 25 | 0  |                             | 19.81                          |                              | 21                     | 0           |
| 10              | QPSK  | 25 | 12 |                             | 19.77                          |                              |                        |             |
| 10              | QPSK  | 25 | 25 |                             | 19.80                          |                              |                        |             |
| 10              | QPSK  | 50 | 0  |                             | 19.82                          |                              | 21                     | 0           |
| 10              | 16QAM | 1  | 0  |                             | 19.73                          |                              |                        |             |
| 10              | 16QAM | 1  | 25 |                             | 19.69                          |                              |                        |             |
| 10              | 16QAM | 1  | 49 |                             | 19.80                          |                              | 21                     | 0           |
| 10              | 16QAM | 25 | 0  |                             | 19.48                          |                              |                        |             |
| 10              | 16QAM | 25 | 12 |                             | 19.48                          |                              |                        |             |
| 10              | 16QAM | 25 | 25 |                             | 19.66                          |                              | 21                     | 0           |
| 10              | 16QAM | 50 | 0  |                             | 19.49                          |                              |                        |             |
| 10              | 64QAM | 1  | 0  |                             | 19.63                          |                              |                        |             |
| 10              | 64QAM | 1  | 25 |                             | 19.49                          |                              | 21                     | 0           |
| 10              | 64QAM | 1  | 49 |                             | 19.64                          |                              |                        |             |
| 10              | 64QAM | 25 | 0  |                             | 19.45                          |                              |                        |             |
| 10              | 64QAM | 25 | 12 |                             | 19.47                          |                              | 21                     | 0           |
| 10              | 64QAM | 25 | 25 |                             | 19.55                          |                              |                        |             |
| 10              | 64QAM | 50 | 0  |                             | 19.33                          |                              |                        |             |
| Channel         |       |    |    | 23205                       | 23230                          | 23255                        | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 779.5                       | 782                            | 784.5                        |                        |             |
| 5               | QPSK  | 1  | 0  | 19.52                       | 19.55                          | 19.57                        | 21                     | 0           |
| 5               | QPSK  | 1  | 12 | 19.56                       | 19.56                          | 19.65                        |                        |             |
| 5               | QPSK  | 1  | 24 | 19.57                       | 19.65                          | 19.63                        |                        |             |
| 5               | QPSK  | 12 | 0  | 19.44                       | 19.52                          | 19.56                        | 21                     | 0           |
| 5               | QPSK  | 12 | 7  | 19.46                       | 19.43                          | 19.64                        |                        |             |
| 5               | QPSK  | 12 | 13 | 19.55                       | 19.50                          | 19.69                        |                        |             |
| 5               | QPSK  | 25 | 0  | 19.52                       | 19.51                          | 19.65                        | 21                     | 0           |
| 5               | 16QAM | 1  | 0  | 19.58                       | 19.70                          | 19.68                        |                        |             |
| 5               | 16QAM | 1  | 12 | 19.75                       | 19.73                          | 19.80                        |                        |             |
| 5               | 16QAM | 1  | 24 | 19.72                       | 19.83                          | 19.79                        | 21                     | 0           |
| 5               | 16QAM | 12 | 0  | 19.30                       | 19.43                          | 19.35                        |                        |             |
| 5               | 16QAM | 12 | 7  | 19.36                       | 19.28                          | 19.41                        |                        |             |
| 5               | 16QAM | 12 | 13 | 19.43                       | 19.35                          | 19.48                        | 21                     | 0           |
| 5               | 16QAM | 25 | 0  | 19.28                       | 19.34                          | 19.42                        |                        |             |
| 5               | 64QAM | 1  | 0  | 19.42                       | 19.61                          | 19.62                        |                        |             |
| 5               | 64QAM | 1  | 12 | 19.70                       | 19.57                          | 19.62                        | 21                     | 0           |
| 5               | 64QAM | 1  | 24 | 19.66                       | 19.82                          | 19.70                        |                        |             |
| 5               | 64QAM | 12 | 0  | 19.27                       | 19.39                          | 19.22                        |                        |             |
| 5               | 64QAM | 12 | 7  | 19.22                       | 19.15                          | 19.23                        | 21                     | 0           |
| 5               | 64QAM | 12 | 13 | 19.32                       | 19.24                          | 19.28                        |                        |             |
| 5               | 64QAM | 25 | 0  | 19.13                       | 19.34                          | 19.27                        |                        |             |



**<LTE Band 14>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 23330                    |                             |                           |                        |             |
| Frequency (MHz) |            |         |           | 793                      |                             |                           |                        |             |
| 10              | QPSK       | 1       | 0         |                          | 19.97                       |                           | 21                     | 0           |
| 10              | QPSK       | 1       | 25        |                          | 19.74                       |                           |                        |             |
| 10              | QPSK       | 1       | 49        |                          | 19.91                       |                           |                        |             |
| 10              | QPSK       | 25      | 0         |                          | 19.84                       |                           | 21                     | 0           |
| 10              | QPSK       | 25      | 12        |                          | 19.76                       |                           |                        |             |
| 10              | QPSK       | 25      | 25        |                          | 19.79                       |                           |                        |             |
| 10              | QPSK       | 50      | 0         |                          | 19.77                       |                           | 21                     | 0           |
| 10              | 16QAM      | 1       | 0         |                          | 19.69                       |                           |                        |             |
| 10              | 16QAM      | 1       | 25        |                          | 19.69                       |                           |                        |             |
| 10              | 16QAM      | 1       | 49        |                          | 19.90                       |                           | 21                     | 0           |
| 10              | 16QAM      | 25      | 0         |                          | 19.53                       |                           |                        |             |
| 10              | 16QAM      | 25      | 12        |                          | 19.43                       |                           |                        |             |
| 10              | 16QAM      | 25      | 25        |                          | 19.56                       |                           | 21                     | 0           |
| 10              | 16QAM      | 50      | 0         |                          | 19.44                       |                           |                        |             |
| 10              | 64QAM      | 1       | 0         |                          | 19.63                       |                           |                        |             |
| 10              | 64QAM      | 1       | 25        |                          | 19.64                       |                           | 21                     | 0           |
| 10              | 64QAM      | 1       | 49        |                          | 19.88                       |                           |                        |             |
| 10              | 64QAM      | 25      | 0         |                          | 19.50                       |                           |                        |             |
| 10              | 64QAM      | 25      | 12        |                          | 19.42                       |                           | 21                     | 0           |
| 10              | 64QAM      | 25      | 25        |                          | 19.51                       |                           |                        |             |
| 10              | 64QAM      | 50      | 0         |                          | 19.29                       |                           |                        |             |
| Channel         |            |         |           | 23305                    | 23330                       | 23355                     | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 790.5                    | 793                         | 795.5                     |                        |             |
| 5               | QPSK       | 1       | 0         | 19.57                    | 19.56                       | 19.50                     | 21                     | 0           |
| 5               | QPSK       | 1       | 12        | 19.56                    | 19.54                       | 19.56                     |                        |             |
| 5               | QPSK       | 1       | 24        | 19.50                    | 19.62                       | 19.68                     |                        |             |
| 5               | QPSK       | 12      | 0         | 19.44                    | 19.43                       | 19.39                     | 21                     | 0           |
| 5               | QPSK       | 12      | 7         | 19.50                    | 19.42                       | 19.53                     |                        |             |
| 5               | QPSK       | 12      | 13        | 19.43                    | 19.50                       | 19.59                     |                        |             |
| 5               | QPSK       | 25      | 0         | 19.51                    | 19.51                       | 19.54                     | 21                     | 0           |
| 5               | 16QAM      | 1       | 0         | 19.69                    | 19.61                       | 19.58                     |                        |             |
| 5               | 16QAM      | 1       | 12        | 19.67                    | 19.69                       | 19.79                     |                        |             |
| 5               | 16QAM      | 1       | 24        | 19.58                    | 19.72                       | 19.86                     | 21                     | 0           |
| 5               | 16QAM      | 12      | 0         | 19.31                    | 19.23                       | 19.18                     |                        |             |
| 5               | 16QAM      | 12      | 7         | 19.33                    | 19.25                       | 19.38                     |                        |             |
| 5               | 16QAM      | 12      | 13        | 19.26                    | 19.32                       | 19.46                     | 21                     | 0           |
| 5               | 16QAM      | 25      | 0         | 19.33                    | 19.29                       | 19.37                     |                        |             |
| 5               | 64QAM      | 1       | 0         | 19.50                    | 19.50                       | 19.38                     |                        |             |
| 5               | 64QAM      | 1       | 12        | 19.63                    | 19.58                       | 19.77                     | 21                     | 0           |
| 5               | 64QAM      | 1       | 24        | 19.55                    | 19.60                       | 19.73                     |                        |             |
| 5               | 64QAM      | 12      | 0         | 19.22                    | 19.04                       | 19.05                     |                        |             |
| 5               | 64QAM      | 12      | 7         | 19.28                    | 19.17                       | 19.27                     | 21                     | 0           |
| 5               | 64QAM      | 12      | 13        | 19.11                    | 19.18                       | 19.42                     |                        |             |
| 5               | 64QAM      | 25      | 0         | 19.30                    | 19.19                       | 19.24                     |                        |             |

**<LTE Band 17>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 23780                 | 23790                    | 23800                  |                     |          |
| Frequency (MHz) |            |         |           | 709                   | 710                      | 711                    |                     |          |
| 10              | QPSK       | 1       | 0         | 20.93                 | 21.01                    | 20.87                  | 22                  | 0        |
| 10              | QPSK       | 1       | 25        | 21.00                 | 21.00                    | 20.95                  |                     |          |
| 10              | QPSK       | 1       | 49        | 20.93                 | 20.93                    | 20.90                  |                     |          |
| 10              | QPSK       | 25      | 0         | 20.90                 | 20.96                    | 20.89                  | 22                  | 0        |
| 10              | QPSK       | 25      | 12        | 20.92                 | 20.94                    | 20.92                  |                     |          |
| 10              | QPSK       | 25      | 25        | 20.94                 | 20.89                    | 20.87                  |                     |          |
| 10              | QPSK       | 50      | 0         | 20.95                 | 20.94                    | 20.92                  | 22                  | 0        |
| 10              | 16QAM      | 1       | 0         | 20.86                 | 20.69                    | 20.85                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 20.88                 | 20.89                    | 20.83                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 20.75                 | 20.79                    | 20.88                  | 22                  | 0        |
| 10              | 16QAM      | 25      | 0         | 20.60                 | 20.60                    | 20.61                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 20.61                 | 20.64                    | 20.65                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.64                 | 20.58                    | 20.56                  | 22                  | 0        |
| 10              | 16QAM      | 50      | 0         | 20.56                 | 20.57                    | 20.56                  |                     |          |
| 10              | 64QAM      | 1       | 0         | 20.71                 | 20.50                    | 20.68                  |                     |          |
| 10              | 64QAM      | 1       | 25        | 20.83                 | 20.88                    | 20.63                  | 22                  | 0        |
| 10              | 64QAM      | 1       | 49        | 20.59                 | 20.66                    | 20.73                  |                     |          |
| 10              | 64QAM      | 25      | 0         | 20.53                 | 20.49                    | 20.61                  |                     |          |
| 10              | 64QAM      | 25      | 12        | 20.46                 | 20.44                    | 20.60                  | 21                  | 1        |
| 10              | 64QAM      | 25      | 25        | 20.55                 | 20.46                    | 20.37                  |                     |          |
| 10              | 64QAM      | 50      | 0         | 20.47                 | 20.40                    | 20.50                  |                     |          |
| Channel         |            |         |           | 23755                 | 23790                    | 23825                  |                     |          |
| Frequency (MHz) |            |         |           | 706.5                 | 710                      | 713.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 20.68                 | 20.64                    | 20.64                  | 22                  | 0        |
| 5               | QPSK       | 1       | 12        | 20.64                 | 20.65                    | 20.59                  |                     |          |
| 5               | QPSK       | 1       | 24        | 20.68                 | 20.60                    | 20.66                  |                     |          |
| 5               | QPSK       | 12      | 0         | 20.68                 | 20.70                    | 20.64                  | 22                  | 0        |
| 5               | QPSK       | 12      | 7         | 20.74                 | 20.69                    | 20.64                  |                     |          |
| 5               | QPSK       | 12      | 13        | 20.75                 | 20.68                    | 20.66                  |                     |          |
| 5               | QPSK       | 25      | 0         | 20.74                 | 20.71                    | 20.65                  | 22                  | 0        |
| 5               | 16QAM      | 1       | 0         | 20.97                 | 20.99                    | 20.93                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 20.93                 | 20.96                    | 20.87                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 21.01                 | 20.94                    | 20.93                  | 22                  | 0        |
| 5               | 16QAM      | 12      | 0         | 20.70                 | 20.81                    | 20.67                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.82                 | 20.81                    | 20.71                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.81                 | 20.82                    | 20.70                  | 22                  | 0        |
| 5               | 16QAM      | 25      | 0         | 20.80                 | 20.80                    | 20.71                  |                     |          |
| 5               | 64QAM      | 1       | 0         | 20.66                 | 20.49                    | 20.71                  |                     |          |
| 5               | 64QAM      | 1       | 12        | 20.75                 | 20.89                    | 20.73                  | 22                  | 0        |
| 5               | 64QAM      | 1       | 24        | 20.75                 | 20.68                    | 20.86                  |                     |          |
| 5               | 64QAM      | 12      | 0         | 20.51                 | 20.45                    | 20.51                  |                     |          |
| 5               | 64QAM      | 12      | 7         | 20.48                 | 20.51                    | 20.45                  | 21                  | 1        |
| 5               | 64QAM      | 12      | 13        | 20.56                 | 20.43                    | 20.54                  |                     |          |
| 5               | 64QAM      | 25      | 0         | 20.55                 | 20.43                    | 20.39                  |                     |          |



**<LTE Band 25>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 26140                 | 26340                    | 26590                  |                     |          |
| Frequency (MHz) |            |         |           | 1860                  | 1880                     | 1905                   |                     |          |
| 20              | QPSK       | 1       | 0         | 17.25                 | 17.15                    | 17.12                  | 18.5                | 0        |
| 20              | QPSK       | 1       | 49        | 17.10                 | 17.10                    | 17.06                  |                     |          |
| 20              | QPSK       | 1       | 99        | 17.10                 | 17.03                    | 17.00                  |                     |          |
| 20              | QPSK       | 50      | 0         | 17.24                 | 17.14                    | 17.13                  | 18.5                | 0        |
| 20              | QPSK       | 50      | 24        | 17.13                 | 17.11                    | 17.06                  |                     |          |
| 20              | QPSK       | 50      | 50        | 17.08                 | 17.06                    | 17.04                  |                     |          |
| 20              | QPSK       | 100     | 0         | 17.12                 | 17.11                    | 17.05                  | 18.5                | 0        |
| 20              | 16QAM      | 1       | 0         | 17.16                 | 17.02                    | 17.07                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 17.05                 | 17.05                    | 17.00                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 17.03                 | 16.99                    | 16.95                  | 18.5                | 0        |
| 20              | 16QAM      | 50      | 0         | 16.90                 | 16.79                    | 16.79                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 16.77                 | 16.76                    | 16.71                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 16.72                 | 16.70                    | 16.71                  | 18.5                | 0        |
| 20              | 16QAM      | 100     | 0         | 16.73                 | 16.75                    | 16.71                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 17.05                 | 16.91                    | 16.99                  |                     |          |
| 20              | 64QAM      | 1       | 49        | 17.02                 | 16.88                    | 16.94                  | 18.5                | 0        |
| 20              | 64QAM      | 1       | 99        | 16.89                 | 16.97                    | 16.90                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 16.90                 | 16.78                    | 16.78                  |                     |          |
| 20              | 64QAM      | 50      | 24        | 16.67                 | 16.70                    | 16.58                  | 18.5                | 0        |
| 20              | 64QAM      | 50      | 50        | 16.69                 | 16.54                    | 16.62                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 16.57                 | 16.69                    | 16.64                  |                     |          |
| Channel         |            |         |           | 26115                 | 26340                    | 26615                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 1857.5                | 1880                     | 1907.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 17.02                 | 17.00                    | 16.94                  | 18.5                | 0        |
| 15              | QPSK       | 1       | 37        | 16.97                 | 16.92                    | 16.85                  |                     |          |
| 15              | QPSK       | 1       | 74        | 16.87                 | 16.79                    | 16.79                  |                     |          |
| 15              | QPSK       | 36      | 0         | 17.06                 | 16.99                    | 16.91                  | 18.5                | 0        |
| 15              | QPSK       | 36      | 20        | 17.00                 | 16.98                    | 16.85                  |                     |          |
| 15              | QPSK       | 36      | 39        | 16.90                 | 16.93                    | 16.80                  |                     |          |
| 15              | QPSK       | 75      | 0         | 16.93                 | 16.93                    | 16.83                  | 18.5                | 0        |
| 15              | 16QAM      | 1       | 0         | 17.09                 | 17.07                    | 17.09                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 17.04                 | 17.06                    | 17.00                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 17.00                 | 16.96                    | 16.87                  | 18.5                | 0        |
| 15              | 16QAM      | 36      | 0         | 16.90                 | 16.85                    | 16.76                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 16.84                 | 16.82                    | 16.70                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 16.75                 | 16.77                    | 16.64                  | 18.5                | 0        |
| 15              | 16QAM      | 75      | 0         | 16.78                 | 16.78                    | 16.66                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 17.15                 | 16.86                    | 17.07                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 17.02                 | 17.04                    | 16.98                  | 18.5                | 0        |
| 15              | 64QAM      | 1       | 74        | 16.90                 | 16.80                    | 16.84                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 16.75                 | 16.72                    | 16.77                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 16.76                 | 16.58                    | 16.70                  | 18.5                | 0        |
| 15              | 64QAM      | 36      | 39        | 16.62                 | 16.70                    | 16.68                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 16.60                 | 16.71                    | 16.61                  |                     |          |
| Channel         |            |         |           | 26090                 | 26340                    | 26640                  | Tune-up limit       | MPR      |



# FCC SAR TEST REPORT

Report No. : FA9O1135

| Frequency (MHz) |       |    |    | 1855   | 1880  | 1910   | (dBm)                  | (dB)        |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| 10              | QPSK  | 1  | 0  | 17.01  | 16.94 | 16.91  | 18.5                   | 0           |
| 10              | QPSK  | 1  | 25 | 17.02  | 16.91 | 16.81  |                        |             |
| 10              | QPSK  | 1  | 49 | 16.91  | 16.86 | 16.85  |                        |             |
| 10              | QPSK  | 25 | 0  | 17.03  | 16.96 | 16.87  | 18.5                   | 0           |
| 10              | QPSK  | 25 | 12 | 17.04  | 16.95 | 16.85  |                        |             |
| 10              | QPSK  | 25 | 25 | 16.97  | 16.93 | 16.80  |                        |             |
| 10              | QPSK  | 50 | 0  | 17.02  | 16.92 | 16.87  | 18.5                   | 0           |
| 10              | 16QAM | 1  | 0  | 17.17  | 17.07 | 17.08  |                        |             |
| 10              | 16QAM | 1  | 25 | 17.12  | 17.12 | 16.93  |                        |             |
| 10              | 16QAM | 1  | 49 | 17.07  | 16.94 | 16.97  | 18.5                   | 0           |
| 10              | 16QAM | 25 | 0  | 16.89  | 16.82 | 16.71  |                        |             |
| 10              | 16QAM | 25 | 12 | 16.89  | 16.78 | 16.69  |                        |             |
| 10              | 16QAM | 25 | 25 | 16.84  | 16.78 | 16.64  | 18.5                   | 0           |
| 10              | 16QAM | 50 | 0  | 16.87  | 16.78 | 16.70  |                        |             |
| 10              | 64QAM | 1  | 0  | 17.09  | 16.93 | 17.00  |                        |             |
| 10              | 64QAM | 1  | 25 | 16.86  | 16.87 | 16.85  | 18.5                   | 0           |
| 10              | 64QAM | 1  | 49 | 16.88  | 16.96 | 16.85  |                        |             |
| 10              | 64QAM | 25 | 0  | 16.80  | 16.78 | 16.64  |                        |             |
| 10              | 64QAM | 25 | 12 | 16.67  | 16.72 | 16.64  | 18.5                   | 0           |
| 10              | 64QAM | 25 | 25 | 16.72  | 16.65 | 16.70  |                        |             |
| 10              | 64QAM | 50 | 0  | 16.53  | 16.63 | 16.51  |                        |             |
| Channel         |       |    |    | 26065  | 26340 | 26665  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1852.5 | 1880  | 1912.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 16.94  | 16.85 | 16.76  | 18.5                   | 0           |
| 5               | QPSK  | 1  | 12 | 16.94  | 16.82 | 16.72  |                        |             |
| 5               | QPSK  | 1  | 24 | 16.99  | 16.83 | 16.81  |                        |             |
| 5               | QPSK  | 12 | 0  | 16.94  | 16.80 | 16.67  | 18.5                   | 0           |
| 5               | QPSK  | 12 | 7  | 16.89  | 16.80 | 16.64  |                        |             |
| 5               | QPSK  | 12 | 13 | 16.92  | 16.79 | 16.67  |                        |             |
| 5               | QPSK  | 25 | 0  | 16.90  | 16.81 | 16.67  | 18.5                   | 0           |
| 5               | 16QAM | 1  | 0  | 17.08  | 16.92 | 16.95  |                        |             |
| 5               | 16QAM | 1  | 12 | 17.07  | 16.92 | 16.87  |                        |             |
| 5               | 16QAM | 1  | 24 | 17.11  | 16.96 | 16.91  | 18.5                   | 0           |
| 5               | 16QAM | 12 | 0  | 16.73  | 16.58 | 16.50  |                        |             |
| 5               | 16QAM | 12 | 7  | 16.71  | 16.60 | 16.54  |                        |             |
| 5               | 16QAM | 12 | 13 | 16.73  | 16.56 | 16.54  | 18.5                   | 0           |
| 5               | 16QAM | 25 | 0  | 16.69  | 16.59 | 16.55  |                        |             |
| 5               | 64QAM | 1  | 0  | 17.14  | 16.99 | 16.99  |                        |             |
| 5               | 64QAM | 1  | 12 | 17.05  | 16.86 | 16.97  | 18.5                   | 0           |
| 5               | 64QAM | 1  | 24 | 16.94  | 16.86 | 16.88  |                        |             |
| 5               | 64QAM | 12 | 0  | 16.74  | 16.62 | 16.74  |                        |             |
| 5               | 64QAM | 12 | 7  | 16.77  | 16.64 | 16.68  | 18.5                   | 0           |
| 5               | 64QAM | 12 | 13 | 16.59  | 16.54 | 16.51  |                        |             |
| 5               | 64QAM | 25 | 0  | 16.61  | 16.63 | 16.57  |                        |             |
| Channel         |       |    |    | 26055  | 26340 | 26675  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1851.5 | 1880  | 1913.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 16.86  | 16.78 | 16.61  | 18.5                   | 0           |
| 3               | QPSK  | 1  | 8  | 16.96  | 16.81 | 16.69  |                        |             |
| 3               | QPSK  | 1  | 14 | 16.87  | 16.75 | 16.68  |                        |             |



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|                 |       |    |    |        |       |        |                        |             |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| 3               | QPSK  | 8  | 0  | 16.78  | 16.69 | 16.51  | 18.5                   | 0           |
| 3               | QPSK  | 8  | 4  | 16.82  | 16.68 | 16.54  |                        |             |
| 3               | QPSK  | 8  | 7  | 16.75  | 16.68 | 16.57  |                        |             |
| 3               | QPSK  | 15 | 0  | 16.82  | 16.72 | 16.59  | 18.5                   | 0           |
| 3               | 16QAM | 1  | 0  | 17.03  | 16.89 | 16.69  |                        |             |
| 3               | 16QAM | 1  | 8  | 17.07  | 16.88 | 16.78  |                        |             |
| 3               | 16QAM | 1  | 14 | 16.97  | 16.82 | 16.83  | 18.5                   | 0           |
| 3               | 16QAM | 8  | 0  | 16.59  | 16.56 | 16.56  |                        |             |
| 3               | 16QAM | 8  | 4  | 16.59  | 16.54 | 16.59  |                        |             |
| 3               | 16QAM | 8  | 7  | 16.56  | 16.54 | 16.61  | 18.5                   | 0           |
| 3               | 16QAM | 15 | 0  | 16.60  | 16.51 | 16.63  |                        |             |
| 3               | 64QAM | 1  | 0  | 17.00  | 17.01 | 17.05  |                        |             |
| 3               | 64QAM | 1  | 8  | 17.01  | 16.99 | 16.96  | 18.5                   | 0           |
| 3               | 64QAM | 1  | 14 | 16.84  | 16.81 | 16.90  |                        |             |
| 3               | 64QAM | 8  | 0  | 16.70  | 16.75 | 16.79  |                        |             |
| 3               | 64QAM | 8  | 4  | 16.75  | 16.68 | 16.62  | 18.5                   | 0           |
| 3               | 64QAM | 8  | 7  | 16.61  | 16.51 | 16.56  |                        |             |
| 3               | 64QAM | 15 | 0  | 16.67  | 16.56 | 16.56  |                        |             |
| Channel         |       |    |    | 26047  | 26340 | 26683  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1850.7 | 1880  | 1914.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 16.89  | 16.88 | 16.70  | 18.5                   | 0           |
| 1.4             | QPSK  | 1  | 3  | 16.88  | 16.83 | 16.73  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 16.94  | 16.86 | 16.71  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 16.80  | 16.77 | 16.62  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 16.79  | 16.75 | 16.61  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 16.81  | 16.75 | 16.61  |                        |             |
| 1.4             | QPSK  | 6  | 0  | 16.79  | 16.74 | 16.62  | 18.5                   | 0           |
| 1.4             | 16QAM | 1  | 0  | 16.94  | 16.96 | 16.82  | 18.5                   | 0           |
| 1.4             | 16QAM | 1  | 3  | 16.98  | 16.91 | 16.91  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 17.05  | 16.97 | 16.82  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 16.66  | 16.65 | 16.54  |                        |             |
| 1.4             | 16QAM | 3  | 1  | 16.69  | 16.61 | 16.57  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 16.69  | 16.60 | 16.57  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 16.54  | 16.52 | 16.57  | 18.5                   | 0           |
| 1.4             | 64QAM | 1  | 0  | 16.97  | 16.88 | 17.07  | 18.5                   | 0           |
| 1.4             | 64QAM | 1  | 3  | 16.87  | 16.90 | 16.98  |                        |             |
| 1.4             | 64QAM | 1  | 5  | 16.83  | 16.86 | 16.84  |                        |             |
| 1.4             | 64QAM | 3  | 0  | 16.75  | 16.62 | 16.63  |                        |             |
| 1.4             | 64QAM | 3  | 1  | 16.58  | 16.71 | 16.63  |                        |             |
| 1.4             | 64QAM | 3  | 3  | 16.70  | 16.68 | 16.71  |                        |             |
| 1.4             | 64QAM | 6  | 0  | 16.69  | 16.55 | 16.55  | 18.5                   | 0           |



**<LTE Band 26>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 26765                 | 26865                    | 26965                  |                     |          |
| Frequency (MHz) |            |         |           | 821.5                 | 831.5                    | 841.5                  |                     |          |
| 15              | QPSK       | 1       | 0         | 20.16                 | 20.19                    | 20.08                  | 20.5                | 0        |
| 15              | QPSK       | 1       | 37        | 20.13                 | 20.18                    | 20.06                  |                     |          |
| 15              | QPSK       | 1       | 74        | 20.06                 | 20.02                    | 20.08                  |                     |          |
| 15              | QPSK       | 36      | 0         | 20.07                 | 20.09                    | 20.01                  | 20.5                | 0        |
| 15              | QPSK       | 36      | 20        | 20.00                 | 20.07                    | 20.00                  |                     |          |
| 15              | QPSK       | 36      | 39        | 20.06                 | 19.96                    | 20.00                  |                     |          |
| 15              | QPSK       | 75      | 0         | 20.03                 | 20.10                    | 20.03                  | 20.5                | 0        |
| 15              | 16QAM      | 1       | 0         | 20.03                 | 19.98                    | 20.04                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 20.01                 | 20.11                    | 19.88                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 20.02                 | 19.95                    | 19.90                  | 20.5                | 0        |
| 15              | 16QAM      | 36      | 0         | 19.68                 | 19.70                    | 19.62                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 19.67                 | 19.72                    | 19.67                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 19.73                 | 19.64                    | 19.66                  | 20.5                | 0        |
| 15              | 16QAM      | 75      | 0         | 19.65                 | 19.72                    | 19.67                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 19.91                 | 19.96                    | 20.03                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 19.94                 | 20.10                    | 19.80                  | 20.5                | 0        |
| 15              | 64QAM      | 1       | 74        | 19.94                 | 19.76                    | 19.81                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 19.60                 | 19.50                    | 19.52                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 19.62                 | 19.63                    | 19.59                  | 20.5                | 0        |
| 15              | 64QAM      | 36      | 39        | 19.57                 | 19.44                    | 19.54                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 19.52                 | 19.59                    | 19.67                  |                     |          |
| Channel         |            |         |           | 26740                 | 26865                    | 26990                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 819                   | 831.5                    | 844                    |                     |          |
| 10              | QPSK       | 1       | 0         | 19.89                 | 19.95                    | 19.79                  | 20.5                | 0        |
| 10              | QPSK       | 1       | 25        | 19.87                 | 19.85                    | 19.86                  |                     |          |
| 10              | QPSK       | 1       | 49        | 19.93                 | 19.83                    | 19.87                  |                     |          |
| 10              | QPSK       | 25      | 0         | 19.88                 | 19.80                    | 19.80                  | 20.5                | 0        |
| 10              | QPSK       | 25      | 12        | 19.80                 | 19.79                    | 19.84                  |                     |          |
| 10              | QPSK       | 25      | 25        | 19.88                 | 19.76                    | 19.83                  |                     |          |
| 10              | QPSK       | 50      | 0         | 19.80                 | 19.79                    | 19.83                  | 20.5                | 0        |
| 10              | 16QAM      | 1       | 0         | 20.00                 | 20.07                    | 19.83                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 20.01                 | 20.01                    | 19.89                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 20.19                 | 19.86                    | 19.90                  | 20.5                | 0        |
| 10              | 16QAM      | 25      | 0         | 19.76                 | 19.71                    | 19.66                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 19.70                 | 19.72                    | 19.68                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 19.76                 | 19.66                    | 19.73                  | 20.5                | 0        |
| 10              | 16QAM      | 50      | 0         | 19.66                 | 19.62                    | 19.67                  |                     |          |
| 10              | 64QAM      | 1       | 0         | 19.92                 | 19.96                    | 19.84                  |                     |          |
| 10              | 64QAM      | 1       | 25        | 19.92                 | 20.03                    | 19.78                  | 20.5                | 0        |
| 10              | 64QAM      | 1       | 49        | 19.95                 | 19.82                    | 19.87                  |                     |          |
| 10              | 64QAM      | 25      | 0         | 19.54                 | 19.67                    | 19.52                  |                     |          |
| 10              | 64QAM      | 25      | 12        | 19.60                 | 19.60                    | 19.51                  | 20.5                | 0        |
| 10              | 64QAM      | 25      | 25        | 19.58                 | 19.53                    | 19.59                  |                     |          |
| 10              | 64QAM      | 50      | 0         | 19.61                 | 19.55                    | 19.67                  |                     |          |
| Channel         |            |         |           | 26715                 | 26865                    | 27015                  | Tune-up limit       | MPR      |



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| Frequency (MHz) |       |    |    | 816.5 | 831.5 | 846.5 | (dBm)                  | (dB)        |
|-----------------|-------|----|----|-------|-------|-------|------------------------|-------------|
| 5               | QPSK  | 1  | 0  | 19.81 | 19.83 | 19.87 | 20.5                   | 0           |
| 5               | QPSK  | 1  | 12 | 19.84 | 19.78 | 19.81 |                        |             |
| 5               | QPSK  | 1  | 24 | 19.81 | 19.75 | 19.82 |                        |             |
| 5               | QPSK  | 12 | 0  | 19.93 | 19.85 | 19.89 | 20.5                   | 0           |
| 5               | QPSK  | 12 | 7  | 19.93 | 19.83 | 19.88 |                        |             |
| 5               | QPSK  | 12 | 13 | 19.93 | 19.82 | 19.90 |                        |             |
| 5               | QPSK  | 25 | 0  | 19.91 | 19.82 | 19.87 |                        |             |
| 5               | 16QAM | 1  | 0  | 19.93 | 19.91 | 19.95 | 20.5                   | 0           |
| 5               | 16QAM | 1  | 12 | 19.93 | 19.92 | 19.95 |                        |             |
| 5               | 16QAM | 1  | 24 | 19.97 | 19.91 | 19.81 |                        |             |
| 5               | 16QAM | 12 | 0  | 19.81 | 19.77 | 19.76 | 20.5                   | 0           |
| 5               | 16QAM | 12 | 7  | 19.77 | 19.74 | 19.76 |                        |             |
| 5               | 16QAM | 12 | 13 | 19.82 | 19.71 | 19.79 |                        |             |
| 5               | 16QAM | 25 | 0  | 19.80 | 19.73 | 19.75 |                        |             |
| 5               | 64QAM | 1  | 0  | 19.96 | 19.98 | 19.95 | 20.5                   | 0           |
| 5               | 64QAM | 1  | 12 | 19.86 | 19.98 | 19.72 |                        |             |
| 5               | 64QAM | 1  | 24 | 19.86 | 19.75 | 19.86 |                        |             |
| 5               | 64QAM | 12 | 0  | 19.50 | 19.70 | 19.47 | 20.5                   | 0           |
| 5               | 64QAM | 12 | 7  | 19.67 | 19.67 | 19.61 |                        |             |
| 5               | 64QAM | 12 | 13 | 19.53 | 19.52 | 19.54 |                        |             |
| 5               | 64QAM | 25 | 0  | 19.48 | 19.57 | 19.53 |                        |             |
| Channel         |       |    |    | 26705 | 26865 | 27025 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 815.5 | 831.5 | 847.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 19.74 | 19.72 | 19.79 | 20.5                   | 0           |
| 3               | QPSK  | 1  | 8  | 19.85 | 19.77 | 19.88 |                        |             |
| 3               | QPSK  | 1  | 14 | 19.79 | 19.73 | 19.77 |                        |             |
| 3               | QPSK  | 8  | 0  | 19.77 | 19.76 | 19.79 | 20.5                   | 0           |
| 3               | QPSK  | 8  | 4  | 19.84 | 19.74 | 19.82 |                        |             |
| 3               | QPSK  | 8  | 7  | 19.82 | 19.75 | 19.81 |                        |             |
| 3               | QPSK  | 15 | 0  | 19.84 | 19.75 | 19.82 |                        |             |
| 3               | 16QAM | 1  | 0  | 19.86 | 19.89 | 19.91 | 20.5                   | 0           |
| 3               | 16QAM | 1  | 8  | 20.02 | 19.86 | 19.97 |                        |             |
| 3               | 16QAM | 1  | 14 | 19.89 | 19.83 | 19.89 |                        |             |
| 3               | 16QAM | 8  | 0  | 19.62 | 19.62 | 19.66 | 20.5                   | 0           |
| 3               | 16QAM | 8  | 4  | 19.67 | 19.59 | 19.67 |                        |             |
| 3               | 16QAM | 8  | 7  | 19.69 | 19.62 | 19.67 |                        |             |
| 3               | 16QAM | 15 | 0  | 19.64 | 19.59 | 19.61 |                        |             |
| 3               | 64QAM | 1  | 0  | 19.97 | 19.84 | 19.99 | 20.5                   | 0           |
| 3               | 64QAM | 1  | 8  | 19.82 | 20.04 | 19.76 |                        |             |
| 3               | 64QAM | 1  | 14 | 19.91 | 19.78 | 19.76 |                        |             |
| 3               | 64QAM | 8  | 0  | 19.52 | 19.55 | 19.49 | 20.5                   | 0           |
| 3               | 64QAM | 8  | 4  | 19.47 | 19.68 | 19.49 |                        |             |
| 3               | 64QAM | 8  | 7  | 19.71 | 19.50 | 19.61 |                        |             |
| 3               | 64QAM | 15 | 0  | 19.62 | 19.58 | 19.67 |                        |             |
| Channel         |       |    |    | 26697 | 26865 | 27033 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 814.7 | 831.5 | 848.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 19.86 | 19.88 | 19.87 | 20.5                   | 0           |
| 1.4             | QPSK  | 1  | 3  | 19.83 | 19.86 | 19.85 |                        |             |
| 1.4             | QPSK  | 1  | 5  | 19.88 | 19.87 | 19.82 |                        |             |



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|     |       |   |   |       |       |       |      |   |
|-----|-------|---|---|-------|-------|-------|------|---|
| 1.4 | QPSK  | 3 | 0 | 19.83 | 19.86 | 19.83 |      |   |
| 1.4 | QPSK  | 3 | 1 | 19.82 | 19.85 | 19.83 |      |   |
| 1.4 | QPSK  | 3 | 3 | 19.83 | 19.84 | 19.82 |      |   |
| 1.4 | QPSK  | 6 | 0 | 19.82 | 19.86 | 19.83 | 20.5 | 0 |
| 1.4 | 16QAM | 1 | 0 | 19.97 | 20.10 | 19.97 | 20.5 | 0 |
| 1.4 | 16QAM | 1 | 3 | 19.98 | 19.97 | 19.94 |      |   |
| 1.4 | 16QAM | 1 | 5 | 20.03 | 20.08 | 19.84 |      |   |
| 1.4 | 16QAM | 3 | 0 | 19.74 | 19.79 | 19.74 |      |   |
| 1.4 | 16QAM | 3 | 1 | 19.70 | 19.74 | 19.70 |      |   |
| 1.4 | 16QAM | 3 | 3 | 19.73 | 19.76 | 19.66 |      |   |
| 1.4 | 16QAM | 6 | 0 | 19.67 | 19.72 | 19.64 | 20.5 | 0 |
| 1.4 | 64QAM | 1 | 0 | 19.91 | 19.88 | 19.97 | 20.5 | 0 |
| 1.4 | 64QAM | 1 | 3 | 19.98 | 20.10 | 19.85 |      |   |
| 1.4 | 64QAM | 1 | 5 | 19.85 | 19.84 | 19.76 |      |   |
| 1.4 | 64QAM | 3 | 0 | 19.66 | 19.61 | 19.53 |      |   |
| 1.4 | 64QAM | 3 | 1 | 19.53 | 19.68 | 19.58 |      |   |
| 1.4 | 64QAM | 3 | 3 | 19.71 | 19.56 | 19.48 |      |   |
| 1.4 | 64QAM | 6 | 0 | 19.54 | 19.52 | 19.52 | 20.5 | 0 |



**<LTE Band 30>**

| E-UTRA Band 30  |       |    |    | Power<br>Low<br>Ch. / Freq. | Power<br>Middle<br>Ch. / Freq. | Power<br>High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|-----------------------------|--------------------------------|------------------------------|------------------------|-------------|
| Channel         |       |    |    | 27710                       |                                |                              |                        |             |
| Frequency (MHz) |       |    |    | 2310                        |                                |                              |                        |             |
| 10              | QPSK  | 1  | 0  |                             | 16.23                          |                              | 17                     | 0           |
| 10              | QPSK  | 1  | 25 |                             | 15.98                          |                              |                        |             |
| 10              | QPSK  | 1  | 49 |                             | 15.87                          |                              |                        |             |
| 10              | QPSK  | 25 | 0  |                             | 15.98                          |                              | 17                     | 0           |
| 10              | QPSK  | 25 | 12 |                             | 15.93                          |                              |                        |             |
| 10              | QPSK  | 25 | 25 |                             | 15.86                          |                              |                        |             |
| 10              | QPSK  | 50 | 0  |                             | 16.02                          |                              | 17                     | 0           |
| 10              | 16QAM | 1  | 0  |                             | 16.20                          |                              |                        |             |
| 10              | 16QAM | 1  | 25 |                             | 15.98                          |                              |                        |             |
| 10              | 16QAM | 1  | 49 |                             | 15.90                          |                              | 17                     | 0           |
| 10              | 16QAM | 25 | 0  |                             | 15.63                          |                              |                        |             |
| 10              | 16QAM | 25 | 12 |                             | 15.59                          |                              |                        |             |
| 10              | 16QAM | 25 | 25 |                             | 15.52                          |                              | 17                     | 0           |
| 10              | 16QAM | 50 | 0  |                             | 15.68                          |                              |                        |             |
| 10              | 64QAM | 1  | 0  |                             | 16.03                          |                              |                        |             |
| 10              | 64QAM | 1  | 25 |                             | 16.05                          |                              | 17                     | 0           |
| 10              | 64QAM | 1  | 49 |                             | 16.03                          |                              |                        |             |
| 10              | 64QAM | 25 | 0  |                             | 16.09                          |                              |                        |             |
| 10              | 64QAM | 25 | 12 |                             | 16.08                          |                              | 17                     | 0           |
| 10              | 64QAM | 25 | 25 |                             | 16.07                          |                              |                        |             |
| 10              | 64QAM | 50 | 0  |                             | 16.02                          |                              |                        |             |
| Channel         |       |    |    | 27685                       | 27710                          | 27735                        | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 2307.5                      | 2310                           | 2312.5                       |                        |             |
| 5               | QPSK  | 1  | 0  | 15.86                       | 15.85                          | 15.86                        | 17                     | 0           |
| 5               | QPSK  | 1  | 12 | 15.76                       | 15.86                          | 15.81                        |                        |             |
| 5               | QPSK  | 1  | 24 | 15.72                       | 15.69                          | 15.68                        |                        |             |
| 5               | QPSK  | 12 | 0  | 15.71                       | 15.61                          | 15.67                        | 17                     | 0           |
| 5               | QPSK  | 12 | 7  | 15.62                       | 15.71                          | 15.71                        |                        |             |
| 5               | QPSK  | 12 | 13 | 15.56                       | 15.75                          | 15.70                        |                        |             |
| 5               | QPSK  | 25 | 0  | 15.63                       | 15.72                          | 15.70                        | 17                     | 0           |
| 5               | 16QAM | 1  | 0  | 16.21                       | 16.22                          | 16.22                        |                        |             |
| 5               | 16QAM | 1  | 12 | 16.10                       | 16.22                          | 16.21                        |                        |             |
| 5               | 16QAM | 1  | 24 | 16.09                       | 16.14                          | 16.10                        | 17                     | 0           |
| 5               | 16QAM | 12 | 0  | 15.73                       | 15.60                          | 15.71                        |                        |             |
| 5               | 16QAM | 12 | 7  | 15.63                       | 15.70                          | 15.71                        |                        |             |
| 5               | 16QAM | 12 | 13 | 15.56                       | 15.74                          | 15.70                        | 17                     | 0           |
| 5               | 16QAM | 25 | 0  | 15.60                       | 15.69                          | 15.65                        |                        |             |
| 5               | 64QAM | 1  | 0  | 16.06                       | 16.03                          | 16.07                        |                        |             |
| 5               | 64QAM | 1  | 12 | 16.04                       | 16.10                          | 16.00                        | 17                     | 0           |
| 5               | 64QAM | 1  | 24 | 15.98                       | 15.86                          | 16.02                        |                        |             |
| 5               | 64QAM | 12 | 0  | 15.73                       | 15.60                          | 15.62                        |                        |             |
| 5               | 64QAM | 12 | 7  | 15.65                       | 15.71                          | 15.70                        | 17                     | 0           |
| 5               | 64QAM | 12 | 13 | 15.57                       | 15.71                          | 15.71                        |                        |             |
| 5               | 64QAM | 25 | 0  | 15.64                       | 15.67                          | 15.66                        |                        |             |



**<LTE Band 66>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|--------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 132072                | 132322                   | 132572                 |                     |          |
| Frequency (MHz) |            |         |           | 1720                  | 1745                     | 1770                   |                     |          |
| 20              | QPSK       | 1       | 0         | 16.79                 | 16.69                    | 16.65                  | 17                  | 0        |
| 20              | QPSK       | 1       | 49        | 16.66                 | 16.68                    | 16.55                  |                     |          |
| 20              | QPSK       | 1       | 99        | 16.70                 | 16.59                    | 16.53                  |                     |          |
| 20              | QPSK       | 50      | 0         | 16.66                 | 16.54                    | 16.51                  | 17                  | 0        |
| 20              | QPSK       | 50      | 24        | 16.57                 | 16.52                    | 16.47                  |                     |          |
| 20              | QPSK       | 50      | 50        | 16.64                 | 16.34                    | 16.35                  |                     |          |
| 20              | QPSK       | 100     | 0         | 16.67                 | 16.54                    | 16.46                  | 17                  | 0        |
| 20              | 16QAM      | 1       | 0         | 16.78                 | 16.53                    | 16.55                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 16.53                 | 16.75                    | 16.47                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 16.61                 | 16.56                    | 16.48                  | 17                  | 0        |
| 20              | 16QAM      | 50      | 0         | 16.24                 | 16.21                    | 16.17                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 16.20                 | 16.19                    | 16.14                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 16.30                 | 16.01                    | 16.01                  | 17                  | 0        |
| 20              | 16QAM      | 100     | 0         | 16.29                 | 16.18                    | 16.10                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 16.63                 | 16.45                    | 16.57                  |                     |          |
| 20              | 64QAM      | 1       | 49        | 16.51                 | 16.54                    | 16.34                  | 17                  | 0        |
| 20              | 64QAM      | 1       | 99        | 16.49                 | 16.48                    | 16.35                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 16.24                 | 16.24                    | 16.17                  |                     |          |
| 20              | 64QAM      | 50      | 24        | 16.23                 | 16.16                    | 16.13                  | 17                  | 0        |
| 20              | 64QAM      | 50      | 50        | 16.31                 | 15.98                    | 16.01                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 16.31                 | 16.18                    | 16.11                  |                     |          |
| Channel         |            |         |           | 132047                | 132322                   | 132597                 | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 1717.5                | 1745                     | 1772.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 16.48                 | 16.47                    | 16.40                  | 17                  | 0        |
| 15              | QPSK       | 1       | 37        | 16.46                 | 16.47                    | 16.33                  |                     |          |
| 15              | QPSK       | 1       | 74        | 16.53                 | 16.31                    | 16.22                  |                     |          |
| 15              | QPSK       | 36      | 0         | 16.34                 | 16.36                    | 16.31                  | 17                  | 0        |
| 15              | QPSK       | 36      | 20        | 16.30                 | 16.34                    | 16.21                  |                     |          |
| 15              | QPSK       | 36      | 39        | 16.39                 | 16.14                    | 16.17                  |                     |          |
| 15              | QPSK       | 75      | 0         | 16.33                 | 16.35                    | 16.24                  | 17                  | 0        |
| 15              | 16QAM      | 1       | 0         | 16.73                 | 16.59                    | 16.36                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 16.64                 | 16.72                    | 16.45                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 16.69                 | 16.63                    | 16.46                  | 17                  | 0        |
| 15              | 16QAM      | 36      | 0         | 16.22                 | 16.25                    | 16.18                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 16.20                 | 16.24                    | 16.07                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 16.26                 | 16.04                    | 16.08                  | 17                  | 0        |
| 15              | 16QAM      | 75      | 0         | 16.17                 | 16.20                    | 16.07                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 16.60                 | 16.48                    | 16.35                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 16.47                 | 16.54                    | 16.35                  | 17                  | 0        |
| 15              | 64QAM      | 1       | 74        | 16.57                 | 16.45                    | 16.29                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 16.24                 | 16.22                    | 16.17                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 16.20                 | 16.24                    | 16.11                  | 17                  | 0        |
| 15              | 64QAM      | 36      | 39        | 16.25                 | 16.05                    | 16.06                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 16.14                 | 16.20                    | 16.07                  |                     |          |
| Channel         |            |         |           | 132022                | 132322                   | 132622                 | Tune-up limit       | MPR      |



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| Frequency (MHz) |       |    |    | 1715   | 1745   | 1775   | (dBm)                  | (dB)        |
|-----------------|-------|----|----|--------|--------|--------|------------------------|-------------|
| 10              | QPSK  | 1  | 0  | 16.53  | 16.50  | 16.35  | 17                     | 0           |
| 10              | QPSK  | 1  | 25 | 16.43  | 16.45  | 16.30  |                        |             |
| 10              | QPSK  | 1  | 49 | 16.47  | 16.29  | 16.22  |                        |             |
| 10              | QPSK  | 25 | 0  | 16.39  | 16.37  | 16.23  | 17                     | 0           |
| 10              | QPSK  | 25 | 12 | 16.36  | 16.34  | 16.22  |                        |             |
| 10              | QPSK  | 25 | 25 | 16.35  | 16.25  | 16.19  |                        |             |
| 10              | QPSK  | 50 | 0  | 16.40  | 16.32  | 16.20  |                        |             |
| 10              | 16QAM | 1  | 0  | 16.69  | 16.57  | 16.47  | 17                     | 0           |
| 10              | 16QAM | 1  | 25 | 16.68  | 16.64  | 16.52  |                        |             |
| 10              | 16QAM | 1  | 49 | 16.59  | 16.59  | 16.52  |                        |             |
| 10              | 16QAM | 25 | 0  | 16.35  | 16.28  | 16.10  | 17                     | 0           |
| 10              | 16QAM | 25 | 12 | 16.29  | 16.27  | 16.12  |                        |             |
| 10              | 16QAM | 25 | 25 | 16.28  | 16.17  | 16.11  |                        |             |
| 10              | 16QAM | 50 | 0  | 16.24  | 16.21  | 16.05  |                        |             |
| 10              | 64QAM | 1  | 0  | 16.63  | 16.58  | 16.33  | 17                     | 0           |
| 10              | 64QAM | 1  | 25 | 16.57  | 16.49  | 16.37  |                        |             |
| 10              | 64QAM | 1  | 49 | 16.50  | 16.44  | 16.32  |                        |             |
| 10              | 64QAM | 25 | 0  | 16.38  | 16.27  | 16.11  | 17                     | 0           |
| 10              | 64QAM | 25 | 12 | 16.31  | 16.26  | 16.13  |                        |             |
| 10              | 64QAM | 25 | 25 | 16.26  | 16.19  | 16.12  |                        |             |
| 10              | 64QAM | 50 | 0  | 16.24  | 16.18  | 16.06  |                        |             |
| Channel         |       |    |    | 131997 | 132322 | 132647 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1712.5 | 1745   | 1777.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 16.49  | 16.46  | 16.30  | 17                     | 0           |
| 5               | QPSK  | 1  | 12 | 16.43  | 16.43  | 16.27  |                        |             |
| 5               | QPSK  | 1  | 24 | 16.42  | 16.35  | 16.28  |                        |             |
| 5               | QPSK  | 12 | 0  | 16.47  | 16.48  | 16.30  | 17                     | 0           |
| 5               | QPSK  | 12 | 7  | 16.45  | 16.45  | 16.29  |                        |             |
| 5               | QPSK  | 12 | 13 | 16.42  | 16.37  | 16.30  |                        |             |
| 5               | QPSK  | 25 | 0  | 16.41  | 16.41  | 16.26  |                        |             |
| 5               | 16QAM | 1  | 0  | 16.65  | 16.63  | 16.51  | 17                     | 0           |
| 5               | 16QAM | 1  | 12 | 16.61  | 16.61  | 16.44  |                        |             |
| 5               | 16QAM | 1  | 24 | 16.61  | 16.47  | 16.35  |                        |             |
| 5               | 16QAM | 12 | 0  | 16.41  | 16.38  | 16.19  | 17                     | 0           |
| 5               | 16QAM | 12 | 7  | 16.35  | 16.37  | 16.20  |                        |             |
| 5               | 16QAM | 12 | 13 | 16.37  | 16.28  | 16.25  |                        |             |
| 5               | 16QAM | 25 | 0  | 16.33  | 16.33  | 16.16  |                        |             |
| 5               | 64QAM | 1  | 0  | 16.53  | 16.52  | 16.34  | 17                     | 0           |
| 5               | 64QAM | 1  | 12 | 16.47  | 16.45  | 16.30  |                        |             |
| 5               | 64QAM | 1  | 24 | 16.53  | 16.37  | 16.28  |                        |             |
| 5               | 64QAM | 12 | 0  | 16.42  | 16.43  | 16.23  | 17                     | 0           |
| 5               | 64QAM | 12 | 7  | 16.36  | 16.41  | 16.21  |                        |             |
| 5               | 64QAM | 12 | 13 | 16.34  | 16.29  | 16.17  |                        |             |
| 5               | 64QAM | 25 | 0  | 16.34  | 16.33  | 16.12  |                        |             |
| Channel         |       |    |    | 131987 | 132322 | 132657 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1711.5 | 1745   | 1778.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 16.34  | 16.40  | 16.17  | 17                     | 0           |
| 3               | QPSK  | 1  | 8  | 16.38  | 16.37  | 16.23  |                        |             |
| 3               | QPSK  | 1  | 14 | 16.31  | 16.26  | 16.13  |                        |             |



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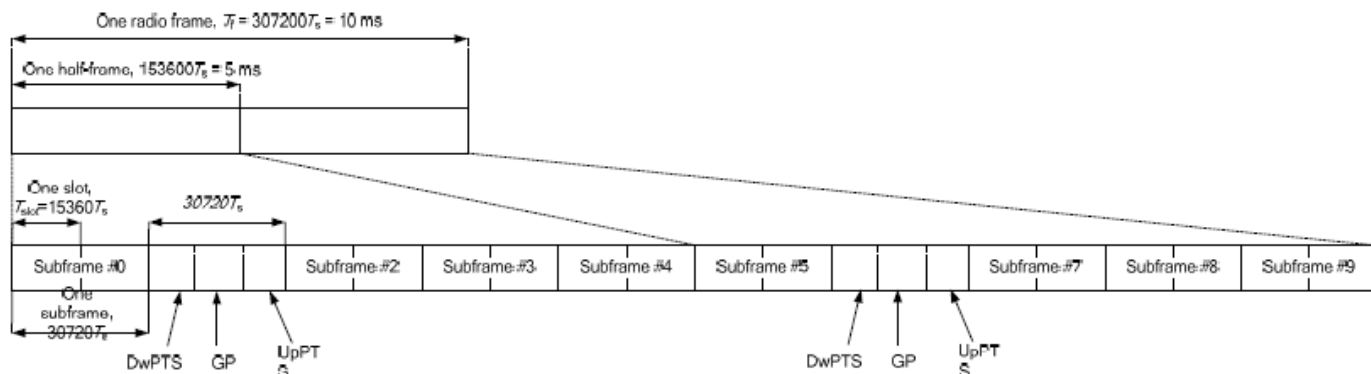
|                 |       |    |    |        |        |        |                        |             |
|-----------------|-------|----|----|--------|--------|--------|------------------------|-------------|
| 3               | QPSK  | 8  | 0  | 16.34  | 16.37  | 16.18  | 17                     | 0           |
| 3               | QPSK  | 8  | 4  | 16.34  | 16.35  | 16.18  |                        |             |
| 3               | QPSK  | 8  | 7  | 16.33  | 16.37  | 16.16  |                        |             |
| 3               | QPSK  | 15 | 0  | 16.34  | 16.35  | 16.17  | 17                     | 0           |
| 3               | 16QAM | 1  | 0  | 16.52  | 16.59  | 16.36  |                        |             |
| 3               | 16QAM | 1  | 8  | 16.58  | 16.60  | 16.45  |                        |             |
| 3               | 16QAM | 1  | 14 | 16.48  | 16.51  | 16.29  | 17                     | 0           |
| 3               | 16QAM | 8  | 0  | 16.27  | 16.28  | 16.06  |                        |             |
| 3               | 16QAM | 8  | 4  | 16.26  | 16.26  | 16.09  |                        |             |
| 3               | 16QAM | 8  | 7  | 16.24  | 16.26  | 16.07  | 17                     | 0           |
| 3               | 16QAM | 15 | 0  | 16.18  | 16.20  | 16.03  |                        |             |
| 3               | 64QAM | 1  | 0  | 16.43  | 16.49  | 16.26  |                        |             |
| 3               | 64QAM | 1  | 8  | 16.50  | 16.45  | 16.20  | 17                     | 0           |
| 3               | 64QAM | 1  | 14 | 16.38  | 16.35  | 16.19  |                        |             |
| 3               | 64QAM | 8  | 0  | 16.25  | 16.25  | 16.06  |                        |             |
| 3               | 64QAM | 8  | 4  | 16.24  | 16.29  | 16.07  | 17                     | 0           |
| 3               | 64QAM | 8  | 7  | 16.19  | 16.26  | 16.04  |                        |             |
| 3               | 64QAM | 15 | 0  | 16.22  | 16.18  | 16.01  |                        |             |
| Channel         |       |    |    | 131979 | 132322 | 132665 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1710.7 | 1745   | 1779.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 16.46  | 16.46  | 16.29  | 17                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 16.44  | 16.42  | 16.19  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 16.44  | 16.44  | 16.21  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 16.41  | 16.41  | 16.23  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 16.40  | 16.40  | 16.20  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 16.40  | 16.40  | 16.17  | 17                     | 0           |
| 1.4             | QPSK  | 6  | 0  | 16.39  | 16.39  | 16.18  |                        |             |
| 1.4             | 16QAM | 1  | 0  | 16.61  | 16.60  | 16.46  |                        |             |
| 1.4             | 16QAM | 1  | 3  | 16.62  | 16.64  | 16.37  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 16.65  | 16.64  | 16.39  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 16.35  | 16.38  | 16.21  | 17                     | 0           |
| 1.4             | 16QAM | 3  | 1  | 16.35  | 16.39  | 16.19  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 16.42  | 16.40  | 16.13  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 16.32  | 16.31  | 16.09  |                        |             |
| 1.4             | 64QAM | 1  | 0  | 16.55  | 16.54  | 16.40  |                        |             |
| 1.4             | 64QAM | 1  | 3  | 16.47  | 16.58  | 16.15  | 17                     | 0           |
| 1.4             | 64QAM | 1  | 5  | 16.56  | 16.48  | 16.19  |                        |             |
| 1.4             | 64QAM | 3  | 0  | 16.40  | 16.41  | 16.16  |                        |             |
| 1.4             | 64QAM | 3  | 1  | 16.43  | 16.45  | 16.16  |                        |             |
| 1.4             | 64QAM | 3  | 3  | 16.39  | 16.36  | 16.18  |                        |             |
| 1.4             | 64QAM | 6  | 0  | 16.31  | 16.32  | 16.02  | 17                     | 0           |

**<TDD LTE SAR Measurement>**

TDD LTE configuration setup for SAR measurement

SAR was tested with a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by 3GPP.

- 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations
- “special subframe S” contains both uplink and downlink transmissions, it has been taken into consideration to determine the transmission duty factor according to the worst case uplink and downlink cyclic prefix requirements for UpPTS
- Establishing connections with base station simulators ensure a consistent means for testing SAR and recommended for evaluating SAR. The Anritsu MT8820C (firmware: #22.52#004) was used for LTE output power measurements and SAR testing.



**Figure 4.2-1: Frame structure type 2 (for 5 ms switch-point periodicity).**

**Table 4.2-2: Uplink-downlink configurations.**

| Uplink-downlink configuration | Downlink-to-Uplink Switch-point periodicity | Subframe number |   |   |   |   |   |   |   |   |   |
|-------------------------------|---------------------------------------------|-----------------|---|---|---|---|---|---|---|---|---|
|                               |                                             | 0               | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| 0                             | 5 ms                                        | D               | S | U | U | U | D | S | U | U | U |
| 1                             | 5 ms                                        | D               | S | U | U | D | D | S | U | U | D |
| 2                             | 5 ms                                        | D               | S | U | D | D | D | S | U | D | D |
| 3                             | 10 ms                                       | D               | S | U | U | U | D | D | D | D | D |
| 4                             | 10 ms                                       | D               | S | U | U | D | D | D | D | D | D |
| 5                             | 10 ms                                       | D               | S | U | D | D | D | D | D | D | D |
| 6                             | 5 ms                                        | D               | S | U | U | U | D | S | U | U | D |

**Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS).**

| Special subframe configuration | Normal cyclic prefix in downlink |                                |                                  | Extended cyclic prefix in downlink |                                |                                  |
|--------------------------------|----------------------------------|--------------------------------|----------------------------------|------------------------------------|--------------------------------|----------------------------------|
|                                | DwPTS                            | UpPTS                          |                                  | DwPTS                              | UpPTS                          |                                  |
|                                |                                  | Normal cyclic prefix in uplink | Extended cyclic prefix in uplink |                                    | Normal cyclic prefix in uplink | Extended cyclic prefix in uplink |
| 0                              | $6592 \cdot T_s$                 | $2192 \cdot T_s$               | $2560 \cdot T_s$                 | $7680 \cdot T_s$                   | $2192 \cdot T_s$               | $2560 \cdot T_s$                 |
| 1                              | $19760 \cdot T_s$                |                                |                                  | $20480 \cdot T_s$                  |                                |                                  |
| 2                              | $21952 \cdot T_s$                |                                |                                  | $23040 \cdot T_s$                  |                                |                                  |
| 3                              | $24144 \cdot T_s$                |                                |                                  | $25600 \cdot T_s$                  |                                |                                  |
| 4                              | $26336 \cdot T_s$                | $4384 \cdot T_s$               | $5120 \cdot T_s$                 | $7680 \cdot T_s$                   | $4384 \cdot T_s$               | $5120 \cdot T_s$                 |
| 5                              | $6592 \cdot T_s$                 |                                |                                  | $20480 \cdot T_s$                  |                                |                                  |
| 6                              | $19760 \cdot T_s$                |                                |                                  | $23040 \cdot T_s$                  |                                |                                  |
| 7                              | $21952 \cdot T_s$                |                                |                                  | $12800 \cdot T_s$                  |                                |                                  |
| 8                              | $24144 \cdot T_s$                |                                |                                  | -                                  | -                              | -                                |
| 9                              | $13168 \cdot T_s$                |                                |                                  | -                                  | -                              | -                                |

| Special subframe (30720·T <sub>s</sub> ): Normal cyclic prefix in downlink (UpPTS) |                                |                                |                                  |
|------------------------------------------------------------------------------------|--------------------------------|--------------------------------|----------------------------------|
|                                                                                    | Special subframe configuration | Normal cyclic prefix in uplink | Extended cyclic prefix in uplink |
| Uplink duty factor in one special subframe                                         | 0~4                            | 7.13%                          | 8.33%                            |
|                                                                                    | 5~9                            | 14.3%                          | 16.7%                            |

| Special subframe(30720·T <sub>s</sub> ): Extended cyclic prefix in downlink (UpPTS) |                                |                                |                                  |
|-------------------------------------------------------------------------------------|--------------------------------|--------------------------------|----------------------------------|
|                                                                                     | Special subframe configuration | Normal cyclic prefix in uplink | Extended cyclic prefix in uplink |
| Uplink duty factor in one special subframe                                          | 0~3                            | 7.13%                          | 8.33%                            |
|                                                                                     | 4~7                            | 14.3%                          | 16.7%                            |

The highest duty factor is resulted from:

- Uplink-downlink configuration: 0. In a half-frame consisted of 5 subframes, uplink operation is in 3 uplink subframes and 1 special subframe.
- special subframe configuration: 5-9 for normal cyclic prefix in downlink, 4-7 for extended cyclic prefix in downlink
- for special subframe with extended cyclic prefix in uplink, the total uplink duty factor in one half-frame is:  
 $(3+0.167)/5 = 63.3\%$
- for special subframe with normal cyclic prefix in uplink, the total uplink duty factor in one half-frame is:  
 $(3+0.143)/5 = 62.9\%$
- For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix  $63.3\%/62.9\% = 1.006$  is applied to scale-up the measured SAR result. The scaled TDD LTE SAR = measured SAR (W/kg)\* Tune-up Scaling Factor\* scaling factor for extended cyclic prefix.

**Default Power Mode**
**<LTE Band 38>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 37850                    | 38000                       | 38150                     |                        |             |
| Frequency (MHz) |            |         |           | 2580                     | 2595                        | 2610                      |                        |             |
| 20              | QPSK       | 1       | 0         | 23.26                    | 23.20                       | 23.36                     | 24                     | 0           |
| 20              | QPSK       | 1       | 49        | 23.09                    | 23.11                       | 23.23                     |                        |             |
| 20              | QPSK       | 1       | 99        | 23.05                    | 23.12                       | 23.22                     |                        |             |
| 20              | QPSK       | 50      | 0         | 22.49                    | 22.49                       | 22.61                     | 23                     | 1           |
| 20              | QPSK       | 50      | 24        | 22.42                    | 22.44                       | 22.57                     |                        |             |
| 20              | QPSK       | 50      | 50        | 22.36                    | 22.46                       | 22.56                     |                        |             |
| 20              | QPSK       | 100     | 0         | 22.43                    | 22.47                       | 22.61                     | 23                     | 1           |
| 20              | 16QAM      | 1       | 0         | 22.50                    | 22.48                       | 22.60                     |                        |             |
| 20              | 16QAM      | 1       | 49        | 22.39                    | 22.40                       | 22.58                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 22.31                    | 22.55                       | 22.57                     | 22                     | 2           |
| 20              | 16QAM      | 50      | 0         | 21.53                    | 21.51                       | 21.66                     |                        |             |
| 20              | 16QAM      | 50      | 24        | 21.46                    | 21.48                       | 21.61                     |                        |             |
| 20              | 16QAM      | 50      | 50        | 21.39                    | 21.54                       | 21.59                     | 22                     | 2           |
| 20              | 16QAM      | 100     | 0         | 21.44                    | 21.46                       | 21.61                     |                        |             |
| 20              | 64QAM      | 1       | 0         | 21.57                    | 21.41                       | 21.59                     |                        |             |
| 20              | 64QAM      | 1       | 49        | 21.46                    | 21.56                       | 21.60                     | 22                     | 2           |
| 20              | 64QAM      | 1       | 99        | 21.38                    | 21.49                       | 21.56                     |                        |             |
| 20              | 64QAM      | 50      | 0         | 20.58                    | 20.56                       | 20.69                     |                        |             |
| 20              | 64QAM      | 50      | 24        | 20.51                    | 20.54                       | 20.65                     | 21                     | 3           |
| 20              | 64QAM      | 50      | 50        | 20.46                    | 20.56                       | 20.65                     |                        |             |
| 20              | 64QAM      | 100     | 0         | 20.49                    | 20.52                       | 20.62                     |                        |             |
| Channel         |            |         |           | 37825                    | 38000                       | 38175                     |                        |             |
| Frequency (MHz) |            |         |           | 2577.5                   | 2595                        | 2612.5                    |                        |             |
| 15              | QPSK       | 1       | 0         | 23.16                    | 23.06                       | 23.29                     | 24                     | 0           |
| 15              | QPSK       | 1       | 37        | 23.02                    | 23.09                       | 23.19                     |                        |             |
| 15              | QPSK       | 1       | 74        | 23.02                    | 23.10                       | 23.20                     |                        |             |
| 15              | QPSK       | 36      | 0         | 22.46                    | 22.40                       | 22.59                     | 23                     | 1           |
| 15              | QPSK       | 36      | 20        | 22.37                    | 22.37                       | 22.49                     |                        |             |
| 15              | QPSK       | 36      | 39        | 22.30                    | 22.41                       | 22.53                     |                        |             |
| 15              | QPSK       | 75      | 0         | 22.40                    | 22.42                       | 22.53                     | 23                     | 1           |
| 15              | 16QAM      | 1       | 0         | 22.42                    | 22.38                       | 22.50                     |                        |             |
| 15              | 16QAM      | 1       | 37        | 22.33                    | 22.34                       | 22.56                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 22.21                    | 22.45                       | 22.54                     | 22                     | 2           |
| 15              | 16QAM      | 36      | 0         | 21.53                    | 21.51                       | 21.66                     |                        |             |
| 15              | 16QAM      | 36      | 20        | 21.41                    | 21.48                       | 21.58                     |                        |             |
| 15              | 16QAM      | 36      | 39        | 21.30                    | 21.49                       | 21.57                     | 22                     | 2           |
| 15              | 16QAM      | 75      | 0         | 21.41                    | 21.41                       | 21.51                     |                        |             |
| 15              | 64QAM      | 1       | 0         | 21.57                    | 21.39                       | 21.58                     |                        |             |
| 15              | 64QAM      | 1       | 37        | 21.38                    | 21.53                       | 21.59                     | 22                     | 2           |
| 15              | 64QAM      | 1       | 74        | 21.30                    | 21.49                       | 21.56                     |                        |             |
| 15              | 64QAM      | 36      | 0         | 20.54                    | 20.46                       | 20.69                     |                        |             |
| 15              | 64QAM      | 36      | 20        | 20.47                    | 20.53                       | 20.65                     | 21                     | 3           |
| 15              | 64QAM      | 36      | 39        | 20.46                    | 20.48                       | 20.65                     |                        |             |
| 15              | 64QAM      | 75      | 0         | 20.44                    | 20.44                       | 20.61                     |                        |             |



# FCC SAR TEST REPORT

Report No. : FA9O1135

| Channel         |       |    |    | 37800  | 38000 | 38200  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| Frequency (MHz) |       |    |    | 2575   | 2595  | 2615   |                        |             |
| 10              | QPSK  | 1  | 0  | 23.21  | 23.04 | 23.26  | 24                     | 0           |
| 10              | QPSK  | 1  | 25 | 23.08  | 23.11 | 23.20  |                        |             |
| 10              | QPSK  | 1  | 49 | 22.96  | 23.15 | 23.13  |                        |             |
| 10              | QPSK  | 25 | 0  | 22.41  | 22.45 | 22.59  | 23                     | 1           |
| 10              | QPSK  | 25 | 12 | 22.37  | 22.41 | 22.55  |                        |             |
| 10              | QPSK  | 25 | 25 | 22.27  | 22.42 | 22.55  |                        |             |
| 10              | QPSK  | 50 | 0  | 22.39  | 22.37 | 22.52  |                        |             |
| 10              | 16QAM | 1  | 0  | 22.40  | 22.46 | 22.58  | 23                     | 1           |
| 10              | 16QAM | 1  | 25 | 22.39  | 22.36 | 22.49  |                        |             |
| 10              | 16QAM | 1  | 49 | 22.24  | 22.46 | 22.57  |                        |             |
| 10              | 16QAM | 25 | 0  | 21.46  | 21.43 | 21.65  | 22                     | 2           |
| 10              | 16QAM | 25 | 12 | 21.39  | 21.44 | 21.55  |                        |             |
| 10              | 16QAM | 25 | 25 | 21.34  | 21.47 | 21.55  |                        |             |
| 10              | 16QAM | 50 | 0  | 21.41  | 21.42 | 21.59  |                        |             |
| 10              | 64QAM | 1  | 0  | 21.54  | 21.39 | 21.56  | 22                     | 2           |
| 10              | 64QAM | 1  | 25 | 21.39  | 21.47 | 21.56  |                        |             |
| 10              | 64QAM | 1  | 49 | 21.29  | 21.48 | 21.47  |                        |             |
| 10              | 64QAM | 25 | 0  | 20.56  | 20.54 | 20.67  | 21                     | 3           |
| 10              | 64QAM | 25 | 12 | 20.42  | 20.52 | 20.59  |                        |             |
| 10              | 64QAM | 25 | 25 | 20.36  | 20.53 | 20.65  |                        |             |
| 10              | 64QAM | 50 | 0  | 20.39  | 20.42 | 20.54  |                        |             |
| Channel         |       |    |    | 37775  | 38000 | 38225  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 2572.5 | 2595  | 2617.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 23.19  | 23.03 | 23.28  | 24                     | 0           |
| 5               | QPSK  | 1  | 12 | 23.04  | 23.08 | 23.20  |                        |             |
| 5               | QPSK  | 1  | 24 | 23.03  | 23.19 | 23.20  |                        |             |
| 5               | QPSK  | 12 | 0  | 22.42  | 22.42 | 22.54  | 23                     | 1           |
| 5               | QPSK  | 12 | 7  | 22.35  | 22.36 | 22.49  |                        |             |
| 5               | QPSK  | 12 | 13 | 22.33  | 22.47 | 22.51  |                        |             |
| 5               | QPSK  | 25 | 0  | 22.33  | 22.44 | 22.51  |                        |             |
| 5               | 16QAM | 1  | 0  | 22.45  | 22.43 | 22.56  | 23                     | 1           |
| 5               | 16QAM | 1  | 12 | 22.33  | 22.40 | 22.57  |                        |             |
| 5               | 16QAM | 1  | 24 | 22.22  | 22.46 | 22.56  |                        |             |
| 5               | 16QAM | 12 | 0  | 21.45  | 21.42 | 21.59  | 22                     | 2           |
| 5               | 16QAM | 12 | 7  | 21.40  | 21.41 | 21.61  |                        |             |
| 5               | 16QAM | 12 | 13 | 21.30  | 21.46 | 21.55  |                        |             |
| 5               | 16QAM | 25 | 0  | 21.37  | 21.43 | 21.56  |                        |             |
| 5               | 64QAM | 1  | 0  | 21.51  | 21.40 | 21.54  | 22                     | 2           |
| 5               | 64QAM | 1  | 12 | 21.44  | 21.53 | 21.51  |                        |             |
| 5               | 64QAM | 1  | 24 | 21.32  | 21.48 | 21.47  |                        |             |
| 5               | 64QAM | 12 | 0  | 20.52  | 20.51 | 20.66  | 21                     | 3           |
| 5               | 64QAM | 12 | 7  | 20.42  | 20.45 | 20.55  |                        |             |
| 5               | 64QAM | 12 | 13 | 20.45  | 20.51 | 20.57  |                        |             |
| 5               | 64QAM | 25 | 0  | 20.45  | 20.50 | 20.57  |                        |             |

**<LTE Band 41>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Low Middle Ch. / Freq. | Power Middle Ch. / Freq. | Power High Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|------------------------------|--------------------------|-------------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 39750                 | 40185                        | 40620                    | 41055                         | 41490                  |                     |          |
| Frequency (MHz) |            |         |           | 2506                  | 2549.5                       | 2593                     | 2636.5                        | 2680                   |                     |          |
| 20              | QPSK       | 1       | 0         | 23.59                 | 23.54                        | 23.58                    | 23.63                         | 23.64                  | 25                  | 0        |
| 20              | QPSK       | 1       | 49        | 23.49                 | 23.43                        | 23.49                    | 23.55                         | 23.61                  |                     |          |
| 20              | QPSK       | 1       | 99        | 23.47                 | 23.49                        | 23.49                    | 23.49                         | 23.62                  |                     |          |
| 20              | QPSK       | 50      | 0         | 22.54                 | 22.46                        | 22.52                    | 22.59                         | 22.60                  | 24                  | 1        |
| 20              | QPSK       | 50      | 24        | 22.49                 | 22.40                        | 22.45                    | 22.49                         | 22.60                  |                     |          |
| 20              | QPSK       | 50      | 50        | 22.47                 | 22.43                        | 22.42                    | 22.50                         | 22.56                  |                     |          |
| 20              | QPSK       | 100     | 0         | 22.51                 | 22.45                        | 22.49                    | 22.54                         | 22.57                  | 24                  | 1        |
| 20              | 16QAM      | 1       | 0         | 22.67                 | 22.51                        | 22.57                    | 22.59                         | 22.64                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 22.60                 | 22.41                        | 22.54                    | 22.36                         | 22.57                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 22.45                 | 22.41                        | 22.60                    | 22.44                         | 22.54                  | 23                  | 2        |
| 20              | 16QAM      | 50      | 0         | 21.56                 | 21.53                        | 21.45                    | 21.64                         | 21.66                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 21.51                 | 21.45                        | 21.49                    | 21.55                         | 21.66                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 21.48                 | 21.48                        | 21.56                    | 21.56                         | 21.62                  | 23                  | 2        |
| 20              | 16QAM      | 100     | 0         | 21.51                 | 21.45                        | 21.48                    | 21.54                         | 21.57                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 21.68                 | 21.56                        | 21.57                    | 21.59                         | 21.60                  | 23                  | 2        |
| 20              | 64QAM      | 1       | 49        | 21.51                 | 21.42                        | 21.37                    | 21.38                         | 21.51                  |                     |          |
| 20              | 64QAM      | 1       | 99        | 21.33                 | 21.38                        | 21.57                    | 21.42                         | 21.62                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 20.58                 | 20.51                        | 20.50                    | 20.63                         | 20.69                  | 22                  | 3        |
| 20              | 64QAM      | 50      | 24        | 20.53                 | 20.51                        | 20.54                    | 20.56                         | 20.68                  |                     |          |
| 20              | 64QAM      | 50      | 50        | 20.49                 | 20.52                        | 20.59                    | 20.56                         | 20.63                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 20.50                 | 20.47                        | 20.53                    | 20.55                         | 20.57                  |                     |          |
| Channel         |            |         |           | 39725                 | 40173                        | 40620                    | 41068                         | 41515                  |                     |          |
| Frequency (MHz) |            |         |           | 2503.5                | 2548.3                       | 2593                     | 2637.8                        | 2682.5                 | Tune-up limit (dBm) | MPR (dB) |
| 15              | QPSK       | 1       | 0         | 23.51                 | 23.42                        | 23.43                    | 23.53                         | 23.61                  | 25                  | 0        |
| 15              | QPSK       | 1       | 37        | 23.39                 | 23.36                        | 23.48                    | 23.51                         | 23.51                  |                     |          |
| 15              | QPSK       | 1       | 74        | 23.45                 | 23.50                        | 23.52                    | 23.40                         | 23.53                  |                     |          |
| 15              | QPSK       | 36      | 0         | 22.47                 | 22.37                        | 22.35                    | 22.54                         | 22.50                  | 24                  | 1        |
| 15              | QPSK       | 36      | 20        | 22.48                 | 22.39                        | 22.44                    | 22.40                         | 22.60                  |                     |          |
| 15              | QPSK       | 36      | 39        | 22.39                 | 22.37                        | 22.45                    | 22.45                         | 22.49                  |                     |          |
| 15              | QPSK       | 75      | 0         | 22.41                 | 22.36                        | 22.44                    | 22.49                         | 22.47                  | 24                  | 1        |
| 15              | 16QAM      | 1       | 0         | 22.60                 | 22.48                        | 22.51                    | 22.51                         | 22.56                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 22.50                 | 22.37                        | 22.45                    | 22.31                         | 22.48                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 22.40                 | 22.37                        | 22.56                    | 22.41                         | 22.49                  | 23                  | 2        |
| 15              | 16QAM      | 36      | 0         | 21.50                 | 21.51                        | 21.41                    | 21.62                         | 21.59                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 21.44                 | 21.35                        | 21.45                    | 21.45                         | 21.62                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 21.39                 | 21.39                        | 21.51                    | 21.56                         | 21.57                  | 23                  | 2        |
| 15              | 16QAM      | 75      | 0         | 21.42                 | 21.39                        | 21.42                    | 21.46                         | 21.54                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 21.61                 | 21.48                        | 21.47                    | 21.54                         | 21.59                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 21.48                 | 21.40                        | 21.36                    | 21.29                         | 21.51                  | 23                  | 2        |
| 15              | 64QAM      | 1       | 74        | 21.25                 | 21.33                        | 21.53                    | 21.37                         | 21.62                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 20.53                 | 20.48                        | 20.50                    | 20.61                         | 20.59                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 20.48                 | 20.43                        | 20.52                    | 20.48                         | 20.61                  | 22                  | 3        |
| 15              | 64QAM      | 36      | 39        | 20.43                 | 20.52                        | 20.59                    | 20.56                         | 20.57                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 20.48                 | 20.38                        | 20.50                    | 20.49                         | 20.48                  |                     |          |

| Channel         |       |    |    | 39700  | 40160  | 40620 | 41080   | 41540  | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|--------|-------|---------|--------|---------------------------|-------------|
| Frequency (MHz) |       |    |    | 2501   | 2547   | 2593  | 2639    | 2685   |                           |             |
| 10              | QPSK  | 1  | 0  | 23.51  | 23.45  | 23.43 | 23.60   | 23.63  | 25                        | 0           |
| 10              | QPSK  | 1  | 25 | 23.39  | 23.39  | 23.45 | 23.50   | 23.61  |                           |             |
| 10              | QPSK  | 1  | 49 | 23.42  | 23.53  | 23.57 | 23.44   | 23.54  |                           |             |
| 10              | QPSK  | 25 | 0  | 22.44  | 22.37  | 22.35 | 22.54   | 22.57  | 24                        | 1           |
| 10              | QPSK  | 25 | 12 | 22.42  | 22.39  | 22.35 | 22.41   | 22.55  |                           |             |
| 10              | QPSK  | 25 | 25 | 22.39  | 22.43  | 22.47 | 22.43   | 22.47  |                           |             |
| 10              | QPSK  | 50 | 0  | 22.47  | 22.39  | 22.46 | 22.49   | 22.54  |                           |             |
| 10              | 16QAM | 1  | 0  | 22.65  | 22.45  | 22.51 | 22.54   | 22.59  | 24                        | 1           |
| 10              | 16QAM | 1  | 25 | 22.56  | 22.40  | 22.45 | 22.33   | 22.57  |                           |             |
| 10              | 16QAM | 1  | 49 | 22.41  | 22.35  | 22.57 | 22.37   | 22.53  |                           |             |
| 10              | 16QAM | 25 | 0  | 21.47  | 21.49  | 21.42 | 21.55   | 21.61  | 23                        | 2           |
| 10              | 16QAM | 25 | 12 | 21.44  | 21.39  | 21.40 | 21.51   | 21.65  |                           |             |
| 10              | 16QAM | 25 | 25 | 21.46  | 21.45  | 21.53 | 21.55   | 21.58  |                           |             |
| 10              | 16QAM | 50 | 0  | 21.51  | 21.38  | 21.47 | 21.51   | 21.48  |                           |             |
| 10              | 64QAM | 1  | 0  | 21.66  | 21.53  | 21.51 | 21.55   | 21.54  | 23                        | 2           |
| 10              | 64QAM | 1  | 25 | 21.51  | 21.32  | 21.28 | 21.36   | 21.42  |                           |             |
| 10              | 64QAM | 1  | 49 | 21.33  | 21.32  | 21.51 | 21.37   | 21.54  |                           |             |
| 10              | 64QAM | 25 | 0  | 20.57  | 20.42  | 20.43 | 20.60   | 20.67  | 22                        | 3           |
| 10              | 64QAM | 25 | 12 | 20.52  | 20.50  | 20.45 | 20.48   | 20.60  |                           |             |
| 10              | 64QAM | 25 | 25 | 20.45  | 20.52  | 20.57 | 20.48   | 20.59  |                           |             |
| 10              | 64QAM | 50 | 0  | 20.41  | 20.41  | 20.45 | 20.51   | 20.48  |                           |             |
| Channel         |       |    |    | 39675  | 40148  | 40620 | 41093   | 41565  | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 2498.5 | 2545.8 | 2593  | 2640.30 | 2687.5 |                           |             |
| 5               | QPSK  | 1  | 0  | 23.58  | 23.43  | 23.44 | 23.63   | 23.59  | 25                        | 0           |
| 5               | QPSK  | 1  | 12 | 23.41  | 23.43  | 23.45 | 23.48   | 23.51  |                           |             |
| 5               | QPSK  | 1  | 24 | 23.47  | 23.48  | 23.57 | 23.46   | 23.54  |                           |             |
| 5               | QPSK  | 12 | 0  | 22.54  | 22.41  | 22.40 | 22.56   | 22.50  | 24                        | 1           |
| 5               | QPSK  | 12 | 7  | 22.45  | 22.33  | 22.44 | 22.47   | 22.51  |                           |             |
| 5               | QPSK  | 12 | 13 | 22.42  | 22.33  | 22.51 | 22.49   | 22.47  |                           |             |
| 5               | QPSK  | 25 | 0  | 22.42  | 22.35  | 22.49 | 22.44   | 22.48  |                           |             |
| 5               | 16QAM | 1  | 0  | 22.67  | 22.51  | 22.54 | 22.57   | 22.62  | 24                        | 1           |
| 5               | 16QAM | 1  | 12 | 22.52  | 22.41  | 22.48 | 22.30   | 22.56  |                           |             |
| 5               | 16QAM | 1  | 24 | 22.35  | 22.37  | 22.55 | 22.40   | 22.50  |                           |             |
| 5               | 16QAM | 12 | 0  | 21.47  | 21.44  | 21.44 | 21.57   | 21.57  | 23                        | 2           |
| 5               | 16QAM | 12 | 7  | 21.47  | 21.38  | 21.42 | 21.54   | 21.59  |                           |             |
| 5               | 16QAM | 12 | 13 | 21.46  | 21.40  | 21.55 | 21.56   | 21.61  |                           |             |
| 5               | 16QAM | 25 | 0  | 21.41  | 21.40  | 21.43 | 21.49   | 21.55  |                           |             |
| 5               | 64QAM | 1  | 0  | 21.62  | 21.53  | 21.52 | 21.53   | 21.54  | 23                        | 2           |
| 5               | 64QAM | 1  | 12 | 21.47  | 21.41  | 21.35 | 21.35   | 21.46  |                           |             |
| 5               | 64QAM | 1  | 24 | 21.32  | 21.29  | 21.51 | 21.36   | 21.56  |                           |             |
| 5               | 64QAM | 12 | 0  | 20.49  | 20.50  | 20.48 | 20.58   | 20.64  | 22                        | 3           |
| 5               | 64QAM | 12 | 7  | 20.46  | 20.41  | 20.52 | 20.49   | 20.67  |                           |             |
| 5               | 64QAM | 12 | 13 | 20.49  | 20.47  | 20.49 | 20.53   | 20.62  |                           |             |
| 5               | 64QAM | 25 | 0  | 20.47  | 20.47  | 20.51 | 20.54   | 20.52  |                           |             |

**Reduced Power Mode**
**<LTE Band 38>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low<br>Ch. / Freq. | Power Middle<br>Ch. / Freq. | Power High<br>Ch. / Freq. | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 37850                    | 38000                       | 38150                     |                        |             |
| Frequency (MHz) |            |         |           | 2580                     | 2595                        | 2610                      |                        |             |
| 20              | QPSK       | 1       | 0         | 17.73                    | 17.68                       | 17.84                     | 19                     | 0           |
| 20              | QPSK       | 1       | 49        | 17.62                    | 17.61                       | 17.62                     |                        |             |
| 20              | QPSK       | 1       | 99        | 17.56                    | 17.65                       | 17.80                     |                        |             |
| 20              | QPSK       | 50      | 0         | 17.63                    | 17.63                       | 17.69                     | 19                     | 0           |
| 20              | QPSK       | 50      | 24        | 17.54                    | 17.53                       | 17.67                     |                        |             |
| 20              | QPSK       | 50      | 50        | 17.49                    | 17.61                       | 17.60                     |                        |             |
| 20              | QPSK       | 100     | 0         | 17.54                    | 17.54                       | 17.68                     | 19                     | 0           |
| 20              | 16QAM      | 1       | 0         | 17.46                    | 17.47                       | 17.74                     |                        |             |
| 20              | 16QAM      | 1       | 49        | 17.40                    | 17.42                       | 17.61                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 17.65                    | 17.64                       | 17.76                     | 19                     | 0           |
| 20              | 16QAM      | 50      | 0         | 17.22                    | 17.25                       | 17.27                     |                        |             |
| 20              | 16QAM      | 50      | 24        | 17.23                    | 17.21                       | 17.29                     |                        |             |
| 20              | 16QAM      | 50      | 50        | 17.17                    | 17.29                       | 17.34                     | 19                     | 0           |
| 20              | 16QAM      | 100     | 0         | 17.18                    | 17.21                       | 17.31                     |                        |             |
| 20              | 64QAM      | 1       | 0         | 17.62                    | 17.22                       | 17.39                     |                        |             |
| 20              | 64QAM      | 1       | 49        | 17.35                    | 17.45                       | 17.47                     | 19                     | 0           |
| 20              | 64QAM      | 1       | 99        | 17.60                    | 17.27                       | 17.67                     |                        |             |
| 20              | 64QAM      | 50      | 0         | 17.23                    | 17.22                       | 17.28                     |                        |             |
| 20              | 64QAM      | 50      | 24        | 17.22                    | 17.19                       | 17.37                     | 19                     | 0           |
| 20              | 64QAM      | 50      | 50        | 17.23                    | 17.25                       | 17.32                     |                        |             |
| 20              | 64QAM      | 100     | 0         | 17.18                    | 17.18                       | 17.32                     |                        |             |
| Channel         |            |         |           | 37825                    | 38000                       | 38175                     |                        |             |
| Frequency (MHz) |            |         |           | 2577.5                   | 2595                        | 2612.5                    |                        |             |
| 15              | QPSK       | 1       | 0         | 17.30                    | 17.38                       | 17.57                     | 19                     | 0           |
| 15              | QPSK       | 1       | 37        | 17.54                    | 17.28                       | 17.47                     |                        |             |
| 15              | QPSK       | 1       | 74        | 17.31                    | 17.65                       | 17.56                     |                        |             |
| 15              | QPSK       | 36      | 0         | 17.44                    | 17.33                       | 17.46                     | 19                     | 0           |
| 15              | QPSK       | 36      | 20        | 17.42                    | 17.37                       | 17.49                     |                        |             |
| 15              | QPSK       | 36      | 39        | 17.38                    | 17.41                       | 17.49                     |                        |             |
| 15              | QPSK       | 75      | 0         | 17.40                    | 17.35                       | 17.46                     | 19                     | 0           |
| 15              | 16QAM      | 1       | 0         | 17.17                    | 17.33                       | 17.36                     |                        |             |
| 15              | 16QAM      | 1       | 37        | 17.63                    | 17.47                       | 17.37                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 17.53                    | 17.54                       | 17.57                     | 19                     | 0           |
| 15              | 16QAM      | 36      | 0         | 17.31                    | 17.21                       | 17.32                     |                        |             |
| 15              | 16QAM      | 36      | 20        | 17.36                    | 17.24                       | 17.36                     |                        |             |
| 15              | 16QAM      | 36      | 39        | 17.28                    | 17.27                       | 17.33                     | 19                     | 0           |
| 15              | 16QAM      | 75      | 0         | 17.22                    | 17.17                       | 17.33                     |                        |             |
| 15              | 64QAM      | 1       | 0         | 17.51                    | 17.58                       | 17.44                     |                        |             |
| 15              | 64QAM      | 1       | 37        | 17.40                    | 17.36                       | 17.63                     | 19                     | 0           |
| 15              | 64QAM      | 1       | 74        | 16.82                    | 17.38                       | 17.51                     |                        |             |
| 15              | 64QAM      | 36      | 0         | 17.37                    | 17.25                       | 17.33                     |                        |             |
| 15              | 64QAM      | 36      | 20        | 17.28                    | 17.28                       | 17.36                     | 19                     | 0           |
| 15              | 64QAM      | 36      | 39        | 17.30                    | 17.30                       | 17.28                     |                        |             |
| 15              | 64QAM      | 75      | 0         | 17.22                    | 17.15                       | 17.27                     |                        |             |



# FCC SAR TEST REPORT

Report No. : FA9O1135

| Channel         |       |    |    | 37800  | 38000 | 38200  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| Frequency (MHz) |       |    |    | 2575   | 2595  | 2615   |                        |             |
| 10              | QPSK  | 1  | 0  | 17.52  | 17.59 | 17.42  | 19                     | 0           |
| 10              | QPSK  | 1  | 25 | 17.55  | 17.38 | 17.35  |                        |             |
| 10              | QPSK  | 1  | 49 | 17.38  | 17.41 | 17.52  |                        |             |
| 10              | QPSK  | 25 | 0  | 17.49  | 17.38 | 17.45  | 19                     | 0           |
| 10              | QPSK  | 25 | 12 | 17.50  | 17.37 | 17.47  |                        |             |
| 10              | QPSK  | 25 | 25 | 17.47  | 17.46 | 17.52  |                        |             |
| 10              | QPSK  | 50 | 0  | 17.39  | 17.32 | 17.47  |                        |             |
| 10              | 16QAM | 1  | 0  | 17.10  | 17.43 | 17.57  | 19                     | 0           |
| 10              | 16QAM | 1  | 25 | 17.51  | 17.44 | 17.63  |                        |             |
| 10              | 16QAM | 1  | 49 | 17.58  | 17.75 | 17.59  |                        |             |
| 10              | 16QAM | 25 | 0  | 17.39  | 17.25 | 17.47  | 19                     | 0           |
| 10              | 16QAM | 25 | 12 | 17.52  | 17.30 | 17.45  |                        |             |
| 10              | 16QAM | 25 | 25 | 17.40  | 17.36 | 17.34  |                        |             |
| 10              | 16QAM | 50 | 0  | 17.25  | 17.20 | 17.36  |                        |             |
| 10              | 64QAM | 1  | 0  | 17.20  | 17.58 | 17.47  | 19                     | 0           |
| 10              | 64QAM | 1  | 25 | 17.40  | 17.42 | 17.55  |                        |             |
| 10              | 64QAM | 1  | 49 | 17.63  | 17.43 | 17.34  |                        |             |
| 10              | 64QAM | 25 | 0  | 17.34  | 17.26 | 17.36  | 19                     | 0           |
| 10              | 64QAM | 25 | 12 | 17.44  | 17.33 | 17.39  |                        |             |
| 10              | 64QAM | 25 | 25 | 17.45  | 17.35 | 17.44  |                        |             |
| 10              | 64QAM | 50 | 0  | 17.27  | 17.20 | 17.33  |                        |             |
| Channel         |       |    |    | 37775  | 38000 | 38225  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 2572.5 | 2595  | 2617.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 17.60  | 17.35 | 17.51  | 19                     | 0           |
| 5               | QPSK  | 1  | 12 | 17.54  | 17.41 | 17.45  |                        |             |
| 5               | QPSK  | 1  | 24 | 17.61  | 17.46 | 17.51  |                        |             |
| 5               | QPSK  | 12 | 0  | 17.44  | 17.34 | 17.44  | 19                     | 0           |
| 5               | QPSK  | 12 | 7  | 17.46  | 17.39 | 17.46  |                        |             |
| 5               | QPSK  | 12 | 13 | 17.46  | 17.41 | 17.48  |                        |             |
| 5               | QPSK  | 25 | 0  | 17.43  | 17.33 | 17.47  |                        |             |
| 5               | 16QAM | 1  | 0  | 17.65  | 17.33 | 17.45  | 19                     | 0           |
| 5               | 16QAM | 1  | 12 | 17.51  | 17.32 | 17.54  |                        |             |
| 5               | 16QAM | 1  | 24 | 17.64  | 17.57 | 17.60  |                        |             |
| 5               | 16QAM | 12 | 0  | 17.21  | 17.21 | 17.25  | 19                     | 0           |
| 5               | 16QAM | 12 | 7  | 17.35  | 17.25 | 17.32  |                        |             |
| 5               | 16QAM | 12 | 13 | 17.32  | 17.34 | 17.30  |                        |             |
| 5               | 16QAM | 25 | 0  | 17.34  | 17.34 | 17.16  |                        |             |
| 5               | 64QAM | 1  | 0  | 17.36  | 17.32 | 17.35  | 19                     | 0           |
| 5               | 64QAM | 1  | 12 | 17.67  | 17.20 | 17.26  |                        |             |
| 5               | 64QAM | 1  | 24 | 17.30  | 17.48 | 17.37  |                        |             |
| 5               | 64QAM | 12 | 0  | 17.35  | 17.15 | 17.39  | 19                     | 0           |
| 5               | 64QAM | 12 | 7  | 17.41  | 17.32 | 17.31  |                        |             |
| 5               | 64QAM | 12 | 13 | 17.40  | 17.23 | 17.38  |                        |             |
| 5               | 64QAM | 25 | 0  | 17.23  | 17.25 | 17.35  |                        |             |

**<LTE Band 41>**

| BW [MHz]        | Modulation | RB Size | RB Offset | Power Low Ch. / Freq. | Power Low Middle Ch. / Freq. | Power Middle Ch. / Freq. | Power High Middle Ch. / Freq. | Power High Ch. / Freq. | Tune-up limit (dBm) | MPR (dB) |
|-----------------|------------|---------|-----------|-----------------------|------------------------------|--------------------------|-------------------------------|------------------------|---------------------|----------|
| Channel         |            |         |           | 39750                 | 40185                        | 40620                    | 41055                         | 41490                  |                     |          |
| Frequency (MHz) |            |         |           | 2506                  | 2549.5                       | 2593                     | 2636.5                        | 2680                   |                     |          |
| 20              | QPSK       | 1       | 0         | 17.53                 | 17.67                        | 17.63                    | 17.60                         | 17.76                  | 19                  | 0        |
| 20              | QPSK       | 1       | 49        | 17.52                 | 17.66                        | 17.60                    | 17.53                         | 17.70                  |                     |          |
| 20              | QPSK       | 1       | 99        | 17.42                 | 17.65                        | 17.60                    | 17.53                         | 17.56                  |                     |          |
| 20              | QPSK       | 50      | 0         | 17.50                 | 17.53                        | 17.55                    | 17.57                         | 17.59                  | 19                  | 0        |
| 20              | QPSK       | 50      | 24        | 17.49                 | 17.53                        | 17.53                    | 17.54                         | 17.51                  |                     |          |
| 20              | QPSK       | 50      | 50        | 17.43                 | 17.51                        | 17.52                    | 17.57                         | 17.51                  |                     |          |
| 20              | QPSK       | 100     | 0         | 17.52                 | 17.53                        | 17.57                    | 17.57                         | 17.58                  | 19                  | 0        |
| 20              | 16QAM      | 1       | 0         | 17.57                 | 17.44                        | 17.50                    | 17.65                         | 17.43                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 17.60                 | 17.38                        | 17.24                    | 17.69                         | 17.34                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 17.36                 | 17.67                        | 17.64                    | 17.40                         | 17.49                  | 19                  | 0        |
| 20              | 16QAM      | 50      | 0         | 17.15                 | 17.23                        | 17.13                    | 17.30                         | 17.17                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 17.15                 | 17.22                        | 17.13                    | 17.20                         | 17.17                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 17.22                 | 17.18                        | 17.22                    | 17.26                         | 17.17                  | 19                  | 0        |
| 20              | 16QAM      | 100     | 0         | 17.17                 | 17.16                        | 17.15                    | 17.15                         | 17.13                  |                     |          |
| 20              | 64QAM      | 1       | 0         | 17.07                 | 17.21                        | 17.27                    | 17.75                         | 17.33                  |                     |          |
| 20              | 64QAM      | 1       | 49        | 17.45                 | 17.70                        | 17.25                    | 17.23                         | 17.53                  | 19                  | 0        |
| 20              | 64QAM      | 1       | 99        | 17.28                 | 17.36                        | 17.23                    | 17.49                         | 17.47                  |                     |          |
| 20              | 64QAM      | 50      | 0         | 17.18                 | 17.24                        | 17.24                    | 17.30                         | 17.24                  |                     |          |
| 20              | 64QAM      | 50      | 24        | 17.23                 | 17.14                        | 17.24                    | 17.18                         | 17.27                  | 19                  | 0        |
| 20              | 64QAM      | 50      | 50        | 17.24                 | 17.28                        | 17.25                    | 17.22                         | 17.21                  |                     |          |
| 20              | 64QAM      | 100     | 0         | 17.21                 | 17.17                        | 17.20                    | 17.17                         | 17.11                  |                     |          |
| Channel         |            |         |           | 39725                 | 40173                        | 40620                    | 41068                         | 41515                  |                     |          |
| Frequency (MHz) |            |         |           | 2503.5                | 2548.3                       | 2593                     | 2637.8                        | 2682.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 17.41                 | 17.27                        | 17.28                    | 17.40                         | 17.31                  | 19                  | 0        |
| 15              | QPSK       | 1       | 37        | 17.35                 | 17.42                        | 17.37                    | 17.51                         | 17.56                  |                     |          |
| 15              | QPSK       | 1       | 74        | 17.44                 | 17.58                        | 17.58                    | 17.44                         | 17.27                  |                     |          |
| 15              | QPSK       | 36      | 0         | 17.35                 | 17.40                        | 17.27                    | 17.43                         | 17.32                  | 19                  | 0        |
| 15              | QPSK       | 36      | 20        | 17.39                 | 17.47                        | 17.38                    | 17.40                         | 17.34                  |                     |          |
| 15              | QPSK       | 36      | 39        | 17.35                 | 17.41                        | 17.39                    | 17.40                         | 17.38                  |                     |          |
| 15              | QPSK       | 75      | 0         | 17.30                 | 17.41                        | 17.34                    | 17.38                         | 17.31                  | 19                  | 0        |
| 15              | 16QAM      | 1       | 0         | 17.59                 | 17.47                        | 17.56                    | 17.41                         | 17.36                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 17.57                 | 17.46                        | 17.40                    | 17.36                         | 17.70                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 17.34                 | 17.56                        | 17.19                    | 17.34                         | 17.29                  | 19                  | 0        |
| 15              | 16QAM      | 36      | 0         | 17.26                 | 17.21                        | 17.11                    | 17.31                         | 17.20                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 17.26                 | 17.38                        | 17.24                    | 17.29                         | 17.25                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 17.25                 | 17.22                        | 17.25                    | 17.29                         | 17.26                  | 19                  | 0        |
| 15              | 16QAM      | 75      | 0         | 17.14                 | 17.29                        | 17.17                    | 17.18                         | 17.14                  |                     |          |
| 15              | 64QAM      | 1       | 0         | 17.55                 | 17.47                        | 17.34                    | 17.58                         | 17.13                  |                     |          |
| 15              | 64QAM      | 1       | 37        | 17.21                 | 17.67                        | 17.42                    | 17.36                         | 17.59                  | 19                  | 0        |
| 15              | 64QAM      | 1       | 74        | 17.44                 | 17.34                        | 17.29                    | 17.48                         | 17.32                  |                     |          |
| 15              | 64QAM      | 36      | 0         | 17.20                 | 17.30                        | 17.16                    | 17.26                         | 17.21                  |                     |          |
| 15              | 64QAM      | 36      | 20        | 17.20                 | 17.31                        | 17.28                    | 17.35                         | 17.22                  | 19                  | 0        |
| 15              | 64QAM      | 36      | 39        | 17.27                 | 17.34                        | 17.34                    | 17.19                         | 17.23                  |                     |          |
| 15              | 64QAM      | 75      | 0         | 17.16                 | 17.25                        | 17.25                    | 17.19                         | 17.23                  |                     |          |

| Channel         |       |    |    | 39700  | 40160  | 40620 | 41080   | 41540  | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|--------|-------|---------|--------|---------------------------|-------------|
| Frequency (MHz) |       |    |    | 2501   | 2547   | 2593  | 2639    | 2685   |                           |             |
| 10              | QPSK  | 1  | 0  | 17.41  | 17.51  | 17.33 | 17.41   | 17.43  | 19                        | 0           |
| 10              | QPSK  | 1  | 25 | 17.22  | 17.35  | 17.35 | 17.46   | 17.46  |                           |             |
| 10              | QPSK  | 1  | 49 | 17.52  | 17.43  | 17.40 | 17.50   | 17.39  |                           |             |
| 10              | QPSK  | 25 | 0  | 17.31  | 17.39  | 17.43 | 17.40   | 17.39  | 19                        | 0           |
| 10              | QPSK  | 25 | 12 | 17.34  | 17.45  | 17.40 | 17.43   | 17.41  |                           |             |
| 10              | QPSK  | 25 | 25 | 17.37  | 17.41  | 17.42 | 17.44   | 17.42  |                           |             |
| 10              | QPSK  | 50 | 0  | 17.33  | 17.41  | 17.35 | 17.37   | 17.34  |                           |             |
| 10              | 16QAM | 1  | 0  | 17.48  | 17.72  | 17.68 | 17.57   | 17.51  | 19                        | 0           |
| 10              | 16QAM | 1  | 25 | 17.35  | 17.61  | 17.52 | 17.56   | 17.63  |                           |             |
| 10              | 16QAM | 1  | 49 | 17.55  | 17.63  | 17.54 | 17.65   | 17.16  |                           |             |
| 10              | 16QAM | 25 | 0  | 17.26  | 17.34  | 17.33 | 17.33   | 17.37  | 19                        | 0           |
| 10              | 16QAM | 25 | 12 | 17.29  | 17.32  | 17.32 | 17.39   | 17.29  |                           |             |
| 10              | 16QAM | 25 | 25 | 17.29  | 17.41  | 17.32 | 17.37   | 17.30  |                           |             |
| 10              | 16QAM | 50 | 0  | 17.18  | 17.32  | 17.20 | 17.25   | 17.22  |                           |             |
| 10              | 64QAM | 1  | 0  | 17.54  | 17.33  | 17.50 | 17.40   | 17.21  | 19                        | 0           |
| 10              | 64QAM | 1  | 25 | 17.35  | 17.37  | 17.30 | 17.53   | 17.56  |                           |             |
| 10              | 64QAM | 1  | 49 | 17.48  | 17.26  | 17.50 | 17.66   | 17.27  |                           |             |
| 10              | 64QAM | 25 | 0  | 17.22  | 17.40  | 17.32 | 17.33   | 17.33  | 19                        | 0           |
| 10              | 64QAM | 25 | 12 | 17.32  | 17.35  | 17.25 | 17.29   | 17.39  |                           |             |
| 10              | 64QAM | 25 | 25 | 17.23  | 17.30  | 17.40 | 17.28   | 17.32  |                           |             |
| 10              | 64QAM | 50 | 0  | 17.17  | 17.26  | 17.23 | 17.18   | 17.24  |                           |             |
| Channel         |       |    |    | 39675  | 40148  | 40620 | 41093   | 41565  | Tune-up<br>limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 2498.5 | 2545.8 | 2593  | 2640.30 | 2687.5 |                           |             |
| 5               | QPSK  | 1  | 0  | 17.39  | 17.37  | 17.30 | 17.46   | 17.27  | 19                        | 0           |
| 5               | QPSK  | 1  | 12 | 17.37  | 17.34  | 17.34 | 17.50   | 17.32  |                           |             |
| 5               | QPSK  | 1  | 24 | 17.25  | 17.46  | 17.40 | 17.55   | 17.24  |                           |             |
| 5               | QPSK  | 12 | 0  | 17.27  | 17.37  | 17.36 | 17.36   | 17.37  | 19                        | 0           |
| 5               | QPSK  | 12 | 7  | 17.31  | 17.41  | 17.33 | 17.40   | 17.38  |                           |             |
| 5               | QPSK  | 12 | 13 | 17.30  | 17.41  | 17.38 | 17.36   | 17.38  |                           |             |
| 5               | QPSK  | 25 | 0  | 17.28  | 17.41  | 17.36 | 17.41   | 17.34  |                           |             |
| 5               | 16QAM | 1  | 0  | 17.27  | 17.58  | 17.33 | 17.34   | 17.35  | 19                        | 0           |
| 5               | 16QAM | 1  | 12 | 17.47  | 17.53  | 17.68 | 17.36   | 17.41  |                           |             |
| 5               | 16QAM | 1  | 24 | 17.32  | 17.54  | 17.40 | 17.39   | 17.60  |                           |             |
| 5               | 16QAM | 12 | 0  | 17.06  | 17.25  | 17.28 | 17.21   | 17.29  | 19                        | 0           |
| 5               | 16QAM | 12 | 7  | 17.19  | 17.24  | 17.24 | 17.26   | 17.22  |                           |             |
| 5               | 16QAM | 12 | 13 | 17.12  | 17.36  | 17.28 | 17.24   | 17.24  |                           |             |
| 5               | 16QAM | 25 | 0  | 17.16  | 17.14  | 17.25 | 17.27   | 17.22  |                           |             |
| 5               | 64QAM | 1  | 0  | 17.38  | 17.45  | 17.11 | 17.32   | 17.33  | 19                        | 0           |
| 5               | 64QAM | 1  | 12 | 17.17  | 17.44  | 17.46 | 17.17   | 17.17  |                           |             |
| 5               | 64QAM | 1  | 24 | 17.17  | 17.53  | 17.15 | 17.25   | 17.42  |                           |             |
| 5               | 64QAM | 12 | 0  | 17.13  | 17.19  | 17.24 | 17.30   | 17.21  | 19                        | 0           |
| 5               | 64QAM | 12 | 7  | 17.17  | 17.29  | 17.33 | 17.19   | 17.30  |                           |             |
| 5               | 64QAM | 12 | 13 | 17.22  | 17.29  | 17.27 | 17.32   | 17.33  |                           |             |
| 5               | 64QAM | 25 | 0  | 17.09  | 17.26  | 17.23 | 17.26   | 17.23  |                           |             |

**<LTE Carrier Aggregation combinations>**
**General Note:**

1. This device supports Carrier Aggregation on downlink only for inter and intra band, Uplink CA is not supported. For the device supports combination bands and configurations are according to 3GPP.
2. In applying the existing power measurement procedure of KDB 941225 D05A for DL CA SAR test exclusion, only the subset with the largest number of combinations of the frequency band and CCs in each row need consideration, and that configurations require power measurement should be highlighted in the below table.
3. LTE Band 29A is limited to Scell.

| 2CC Downlink Carrier Aggregation |             |                                 | 3CC Downlink Carrier Aggregation |             |                                 | 4CC Downlink Carrier Aggregation |                |                                 |
|----------------------------------|-------------|---------------------------------|----------------------------------|-------------|---------------------------------|----------------------------------|----------------|---------------------------------|
| Number                           | Combination | Covered by Measurement Superset | Number                           | Combination | Covered by Measurement Superset | Number                           | Combination    | Covered by Measurement Superset |
| 1                                | 2A-4A       | 49                              | 49                               | 2A-4A-4A    |                                 | 108                              | 2A-2A-5A-66A   | 142                             |
| 2                                | 2A-5A       | 50                              | 50                               | 2A-4A-5A    |                                 | 109                              | 2A-2A-12A-30A  |                                 |
| 3                                | 2A-12A      | 51                              | 51                               | 2A-4A-12A   |                                 | 110                              | 2A-2A-12A-66A  |                                 |
| 4                                | 2A-13A      | 52                              | 52                               | 2A-4A-13A   |                                 | 111                              | 2A-12A-30A-66A |                                 |
| 5                                | 2A-14A      | 58                              | 53                               | 2A-5A-30A   | 112                             | 112                              | 2A-5A-30A-66A  |                                 |
| 6                                | 2A-29A      | 55                              | 54                               | 2A-12A-30A  | 111                             | 113                              | 2A-2A-13A-66A  |                                 |
| 7                                | 2A-30A      | 55                              | 55                               | 2A-29A-30A  |                                 | 114                              | 2A-5A-66A-66A  | 143                             |
| 8                                | 2A-66A      | 56                              | 56                               | 2A-5A-66A   | 112                             | 115                              | 2A-5B-30A      | 142                             |
| 9                                | 4A-5A       | 50                              | 57                               | 2A-13A-66A  | 113                             | 116                              | 2A-5B-66A      | 143                             |
| 10                               | 4A-12A      | 51                              | 58                               | 2A-14A-30A  | 121                             | 117                              | 2A-5A-66B      | 143                             |
| 11                               | 4A-13A      | 52                              | 59                               | 2A-14A-66A  | 121                             | 118                              | 2A-12A-66A-66A |                                 |
| 12                               | 4A-29A      | 64                              | 60                               | 2A-30A-66A  | 121                             | 119                              | 2A-13A-66A-66A |                                 |
| 13                               | 4A-30A      | 64                              | 61                               | 2A-66A-66A  | 118                             | 120                              | 2A-13A-66B     |                                 |
| 14                               | 5A-30A      | 62                              | 62                               | 4A-5A-30A   |                                 | 121                              | 2A-14A-30A-66A |                                 |
| 15                               | 5A-66A      | 77                              | 63                               | 4A-12A-30A  |                                 | 122                              | 5A-30A-66A-66A | 142                             |
| 16                               | 12A-30A     | 54                              | 64                               | 4A-29A-30A  |                                 | 123                              | 5B-30A-66A     | 142                             |
| 17                               | 13A-66A     | 57                              | 65                               | 2A-2A-5A    | 108                             | 124                              | 5B-66A-66A     | 143                             |
| 18                               | 14A-30A     | 58                              | 66                               | 2A-2A-12A   | 109                             | 125                              | 25A-41D        |                                 |
| 19                               | 14A-66A     | 59                              | 67                               | 2A-2A-13A   | 113                             | 126                              | 41A-41D        | 144                             |
| 20                               | 29A-30A     | 55                              | 68                               | 2A-2A-30A   | 109                             | 127                              | 41C-41C        | 144                             |
| 21                               | 2A-2A       | 65                              | 69                               | 2A-2A-66A   | 110                             | 128                              | 2A-5A-46C      | 145                             |
| 22                               | 4A-4A       | 70                              | 70                               | 4A-4A-5A    |                                 | 129                              | 2A-13A-46C     | 146                             |
| 23                               | 7A-7A       |                                 | 71                               | 4A-4A-12A   |                                 | 130                              | 2A-46A-46A-66A | 147                             |
| 24                               | 25A-25A     |                                 | 72                               | 4A-4A-13A   |                                 | 131                              | 2A-46A-46C     | 155                             |
| 25                               | 25A-26A     |                                 | 73                               | 13A-66A-66A | 119                             | 132                              | 4A-46A-46C     | 148                             |
| 26                               | 25A-41A     | 125                             | 74                               | 14A-30A-66A | 121                             | 133                              | 5A-46C-66A     | 149                             |
| 27                               | 26A-41A     | 81                              | 75                               | 2A-5B       | 115                             | 134                              | 5A-46D         | 150                             |
| 28                               | 41A-41A     | 126                             | 76                               | 2A-66C      |                                 | 135                              | 13A-46C-66A    | 151                             |
| 29                               | 66A-66A     | 73                              | 77                               | 5A-66A-66A  | 122                             | 136                              | 13A-46D        | 151                             |
| 30                               | 2C          |                                 | 78                               | 5B-30A      | 115                             | 137                              | 66A-46C-46A    |                                 |
| 31                               | 5B          |                                 | 79                               | 5B-66A      | 116                             | 138                              | 66A-46D        |                                 |
| 32                               | 7C          |                                 | 80                               | 25A-41C     | 125                             | 139                              | 2A-46C-66A     | 147                             |
| 33                               | 41C         | 84                              | 81                               | 26A-41C     |                                 | 140                              | 2A-46D         | 154                             |
| 34                               | 66C         |                                 | 82                               | 41A-41C     | 126                             | 141                              | 4A-46D         | 148                             |
| 35                               | 2A-46A      | 85                              | 83                               | 66A-66C     |                                 |                                  |                |                                 |
| 36                               | 4A-46A      | 90                              | 84                               | 41D         |                                 |                                  |                |                                 |
| 37                               | 7A-46A      |                                 | 85                               | 2A-5A-46A   | 145                             |                                  |                |                                 |
| 38                               | 13A-46A     | 93                              | 86                               | 2A-13A-46A  | 146                             |                                  |                |                                 |
| 39                               | 25A-46A     |                                 | 87                               | 2A-46A-46A  | 130                             |                                  |                |                                 |
| 40                               | 41A-46A     |                                 | 88                               | 2A-46A-66A  | 130                             |                                  |                |                                 |
| 41                               | 46A-66A     | 88                              | 89                               | 2A-46C      | 131                             | 5CC Downlink Carrier Aggregation |                |                                 |
| 42                               | 5A-46A      | 85                              | 90                               | 4A-46A-46A  | 148                             | Number                           | Combination    | Covered by Measurement Superset |
| 43                               | 5A-7A       |                                 | 91                               | 4A-46C      | 132                             | 142                              | 2A-5B-30A-66A  |                                 |
| 44                               |             |                                 | 92                               | 5A-46A-66A  | 149                             | 143                              | 2A-5B-66A-66A  |                                 |
| 45                               | 12A-66A     | 102                             | 93                               | 13A-46A-66A | 151                             | 144                              | 41C-41D        |                                 |
| 46                               | 29A-66A     | 105                             | 94                               | 13A-46C     | 136                             | 145                              | 2A-5A-46D      |                                 |
| 47                               | 30A-66A     | 106                             | 95                               | 66A-46A-46A | 137                             | 146                              | 2A-13A-46D     |                                 |
| 48                               | 66B         | 34                              | 96                               | 5A-46C      | 150                             | 147                              | 2A-46D-66A     |                                 |
|                                  |             |                                 | 97                               | 2A-12A-66A  | 118                             | 148                              | 4A-46A-46D     |                                 |
|                                  |             |                                 | 98                               | 2A-66B      | 117                             | 149                              | 5A-46D-66A     |                                 |
|                                  |             |                                 | 99                               | 5A-30A-66A  | 112                             | 150                              | 5A-46E         |                                 |
|                                  |             |                                 | 100                              | 5A-66B      | 117                             | 151                              | 13A-46D-66A    |                                 |
|                                  |             |                                 | 101                              | 12A-30A-66A | 111                             | 152                              | 13A-46E        |                                 |
|                                  |             |                                 | 102                              | 12A-66A-66A | 118                             | 153                              | 46A-46D-66A    | B46 RX Only                     |
|                                  |             |                                 | 103                              | 13A-66B     | 120                             | 154                              | 2A-2A-46D      |                                 |
|                                  |             |                                 | 104                              | 29A-30A-66A | B29 RX Only                     | 155                              | 2A-46A-46D     |                                 |
|                                  |             |                                 | 105                              | 29A-66A-66A | B29 RX Only                     | 156                              | 2A-46C-46C     |                                 |
|                                  |             |                                 | 106                              | 30A-66A-66A | 122                             | 157                              | 2A-46E         |                                 |
|                                  |             |                                 | 107                              | 46C-66A     | 133                             | 158                              | 46C-46C-66A    | B46 RX Only                     |
|                                  |             |                                 |                                  |             |                                 | 159                              | 46D-66A-66A    | B46 RX Only                     |
|                                  |             |                                 |                                  |             |                                 | 160                              | 46E-66A        | B46 RX Only                     |

**<Power verification when LTE Carrier Aggregation Active>**
**General Note:**

- i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output measured without downlink carrier aggregation active.
- ii. Uplink maximum output power with downlink carrier aggregation active does not show more than ¼ dB higher than the maximum output power without downlink carrier aggregation active, therefore SAR evaluation with downlink carrier aggregation active can be excluded.
- iii. The device supports downlink two carrier aggregation. For power measurement were control and acknowledge data is sent on uplink channels that operate identical to specifications when downlink carrier aggregation is inactive.
- iv. Selected highest measured power when downlink carrier aggregation is inactive for conducted power comparison with downlink carrier aggregation is active, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive.
- v. For non-contiguous intra-band CA, the SCC selected to provide maximum separation from the PCC and must remain fully within the downlink transmission band.
- vi. For Intra-band, contiguous CA, the downlink channels selected to perform the uplink power measurement must satisfy 3GPP channel spacing (5.4.1A of 3GPP TS 36.521 or equivalent) and channel bandwidth (5.4.2A) requirements.

$$\text{Nominal channel spacing} = \left\lceil \frac{BW_{\text{Channel}(1)} + BW_{\text{Channel}(2)} - 0.1|BW_{\text{Channel}(1)} - BW_{\text{Channel}(2)}|}{0.6} \right\rceil 0.3 \text{ [MHz]}$$

**<Two Carrier power verification>**

| Configure  |                | CA Configuration (BCS) | PCC      |          |                |            |      |        | SCC          |          |          |                | Power      |                        |                       |
|------------|----------------|------------------------|----------|----------|----------------|------------|------|--------|--------------|----------|----------|----------------|------------|------------------------|-----------------------|
|            |                |                        | LTE Band | BW (MHz) | UL Freq. (MHz) | UL Channel | Mod. | UL# RB | UL RB Offset | LTE Band | BW (MHz) | DL Freq. (MHz) | DL Channel | With CA Tx.Power (dBm) | W/O CA Tx.Power (dBm) |
| Inter-Band |                | 5A (4x4 MIMO) -7A      | 5        | 10       | 836.5          | 20525      | QPSK | 1      | 0            | 7        | 20       | 2655           | 3100       | 23.74                  | 23.81                 |
|            |                | 7A (4x4 MIMO) -46A     | 7        | 20       | 2535           | 21100      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 23.14                  | 23.29                 |
|            |                | 25A-26A                | 25       | 20       | 1880           | 26340      | QPSK | 1      | 0            | 26       | 15       | 876.5          | 8865       | 23.31                  | 23.16                 |
|            |                | 25A-41A (4x4 MIMO)     | 25       | 20       | 1880           | 26340      | QPSK | 1      | 0            | 41       | 20       | 2593           | 40620      | 23.21                  | 23.27                 |
|            |                | 25A-46A                | 25       | 20       | 1880           | 26340      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 23.25                  | 23.22                 |
|            |                | 41A (4x4 MIMO) -46A    | 41       | 20       | 2549.5         | 40185      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 24.11                  | 24.05                 |
| Intra-Band | Non-Contiguous | 7A (4x4 MIMO)-7A       | 7        | 20       | 2535           | 21100      | QPSK | 1      | 0            | 7        | 20       | 2680           | 3350       | 23.24                  | 23.39                 |
|            |                | 25A-25A                | 25       | 20       | 1880           | 26340      | QPSK | 1      | 0            | 25       | 20       | 1985           | 8590       | 23.28                  | 23.34                 |
|            | Contiguous     | 2C (4x4 MIMO)          | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 2        | 20       | 1979.8         | 1098       | 23.39                  | 23.41                 |
|            |                | 5B                     | 5        | 10       | 836.5          | 20525      | QPSK | 1      | 0            | 5        | 10       | 891.4          | 2624       | 23.46                  | 23.51                 |
|            |                | 7C (4x4 MIMO)          | 7        | 20       | 2535           | 21100      | QPSK | 1      | 0            | 7        | 20       | 2674.8         | 3298       | 23.56                  | 23.47                 |
|            |                | 66C                    | 66       | 20       | 1770           | 132572     | QPSK | 1      | 0            | 66       | 20       | 2150.2         | 66838      | 23.53                  | 23.58                 |

**<Three Carrier power verification>**

| Configure  |            | CA Configuration (BCS) | PCC      |          |                |            |      |        | SCC          |          |          |                | SCC2       |          |          |                | Power      |                        |                       |
|------------|------------|------------------------|----------|----------|----------------|------------|------|--------|--------------|----------|----------|----------------|------------|----------|----------|----------------|------------|------------------------|-----------------------|
|            |            |                        | LTE Band | BW (MHz) | UL Freq. (MHz) | UL Channel | Mod. | UL# RB | UL RB Offset | LTE Band | BW (MHz) | DL Freq. (MHz) | DL Channel | LTE Band | BW (MHz) | DL Freq. (MHz) | DL Channel | With CA Tx.Power (dBm) | W/O CA Tx.Power (dBm) |
| Inter-Band |            | 2A-4A (4x4 MIMO)-4A    | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 4        | 20       | 2132.5         | 2175       | 4        | 20       | 2300           | 2145       | 23.58                  | 23.62                 |
|            |            | 2A-4A (4x4 MIMO)-5A    | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 4        | 20       | 2132.5         | 2175       | 5        | 10       | 881.5          | 2525       | 23.51                  | 23.53                 |
|            |            | 2A-4A (4x4 MIMO)-12A   | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 4        | 20       | 2132.5         | 2175       | 12       | 10       | 737.5          | 5095       | 23.54                  | 23.55                 |
|            |            | 2A-4A (4x4 MIMO)-13A   | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 4        | 20       | 2132.5         | 2175       | 13       | 10       | 751            | 5230       | 23.43                  | 23.46                 |
|            |            | 2A-29A-30A (4x4 MIMO)  | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 29       | 10       | 722.5          | 9715       | 30       | 10       | 2355           | 9820       | 23.44                  | 23.46                 |
|            |            | 2A-66C (4x4 MIMO)      | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 66       | 20       | 2155           | 66886      | 66       | 20       | 2174.8         | 67084      | 23.51                  | 23.56                 |
|            |            | 4A (4x4 MIMO)-4A-5A    | 4        | 20       | 1732.5         | 20175      | QPSK | 1      | 0            | 4        | 20       | 2300           | 2145       | 5        | 10       | 881.5          | 2525       | 23.54                  | 23.55                 |
|            |            | 4A (4x4 MIMO)-4A-12A   | 4        | 20       | 1732.5         | 20175      | QPSK | 1      | 0            | 4        | 20       | 2300           | 2145       | 12       | 10       | 737.5          | 5095       | 23.50                  | 23.59                 |
|            |            | 4A (4x4 MIMO)-4A-13A   | 4        | 20       | 1732.5         | 20175      | QPSK | 1      | 0            | 4        | 20       | 2300           | 2145       | 13       | 10       | 751            | 5230       | 23.33                  | 23.42                 |
|            |            | 4A-5A-30A (4x4 MIMO)   | 4        | 20       | 1732.5         | 20175      | QPSK | 1      | 0            | 5        | 10       | 881.5          | 2525       | 30       | 10       | 2355           | 9820       | 23.38                  | 23.39                 |
|            |            | 4A-12A-30A (4x4 MIMO)  | 4        | 20       | 1732.5         | 20175      | QPSK | 1      | 0            | 12       | 10       | 737.5          | 5095       | 30       | 10       | 2355           | 9820       | 23.27                  | 23.41                 |
|            |            | 4A-29A-30A (4x4 MIMO)  | 4        | 20       | 1732.5         | 20175      | QPSK | 1      | 0            | 29       | 10       | 722.5          | 9715       | 30       | 10       | 2197.5         | 67311      | 23.25                  | 23.44                 |
|            |            | 26A-41C (4x4 MIMO)     | 26       | 15       | 831.5          | 26865      | QPSK | 1      | 0            | 41       | 20       | 2593           | 40620      | 41       | 20       | 2612.3         | 40818      | 23.81                  | 23.92                 |
|            |            | 66A (4x4 MIMO)-66C     | 66       | 20       | 1770           | 132572     | QPSK | 1      | 0            | 66       | 20       | 2155           | 66886      | 66       | 20       | 2174.8         | 67084      | 23.58                  | 23.61                 |
| Intra-Band | Contiguous | 41D                    | 41       | 20       | 2549.5         | 40185      | QPSK | 1      | 0            | 41       | 20       | 2569.3         | 40383      | 41       | 20       | 2589.1         | 40581      | 23.84                  | 23.96                 |

**<Four Carrier power verification>**

| Configure  | CA Configuration (BCS) | PCC      |          |                |            |      |        |              | SCC1     |          |                |            | SCC2     |          |                |            | SCC3     |          |                |            | Power                  |                       |
|------------|------------------------|----------|----------|----------------|------------|------|--------|--------------|----------|----------|----------------|------------|----------|----------|----------------|------------|----------|----------|----------------|------------|------------------------|-----------------------|
|            |                        | LTE Band | BW (MHz) | UL Freq. (MHz) | UL Channel | Mod. | UL# RB | UL RB Offset | LTE Band | BW (MHz) | DL Freq. (MHz) | DL Channel | LTE Band | BW (MHz) | DL Freq. (MHz) | DL Channel | LTE Band | BW (MHz) | DL Freq. (MHz) | DL Channel | With CA Tx.Power (dBm) | W/O CA Tx.Power (dBm) |
| Inter-Band | 2A-2A-12A-30A          | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 2        | 20       | 1960           | 900        | 12       | 10       | 737.5          | 5095       | 30       | 10       | 2355           | 9820       | 23.43                  | 23.41                 |
|            | 2A-2A-12A-66A          | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 2        | 20       | 1960           | 900        | 12       | 10       | 737.5          | 5095       | 66       | 20       | 2155           | 66886      | 23.47                  | 23.44                 |
|            | 2A-2A-13A-66A          | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 2        | 20       | 1960           | 900        | 13       | 10       | 751            | 5230       | 66       | 20       | 2155           | 66886      | 23.42                  | 23.36                 |
|            | 2A-5A-30A-66A          | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 5        | 10       | 881.5          | 2525       | 30       | 10       | 2355           | 9820       | 66       | 20       | 2155           | 66886      | 23.41                  | 23.37                 |
|            | 2A-12A-30A-66A         | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 12       | 10       | 737.5          | 5095       | 30       | 10       | 2355           | 9820       | 60       | 20       | 2155           | 66886      | 23.39                  | 23.42                 |
|            | 2A-12A-66A-66A         | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 12       | 10       | 737.5          | 5095       | 66       | 20       | 2155           | 66886      | 60       | 20       | 2190           | 67236      | 23.46                  | 23.44                 |
|            | 2A (4x4 MIMO)-13A-46C  | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 13       | 10       | 751            | 5230       | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 23.51                  | 23.48                 |
|            | 2A-13A-66A-66A         | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 13       | 10       | 751            | 5230       | 66       | 20       | 2155           | 66886      | 60       | 20       | 2190           | 67236      | 23.45                  | 23.41                 |
|            | 2A (4x4 MIMO)-13A-66B  | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 13       | 10       | 751            | 5230       | 66       | 15       | 2155           | 66886      | 66       | 5        | 2164.3         | 66979      | 23.47                  | 23.45                 |
|            | 2A-14A-30A-66A         | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 14       | 10       | 763            | 5330       | 30       | 10       | 2355           | 9820       | 66       | 20       | 2155           | 66886      | 23.36                  | 23.34                 |
|            | 25A-41D                | 25       | 20       | 1880           | 26340      | QPSK | 1      | 0            | 41       | 20       | 2593           | 40620      | 41       | 20       | 2612.8         | 40818      | 41       | 20       | 2632.6         | 41016      | 23.38                  | 23.33                 |
|            | 66A-46C-46A            | 66       | 20       | 1770           | 132572     | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5915           | 54440      | 23.39                  | 23.36                 |
|            | 66A-46D                | 66       | 20       | 1770           | 132572     | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5577.1         | 51061      | 23.21                  | 23.25                 |

**<Five Carrier power verification>**

| Configure  | CA Configuration (BCS) | PCC      |          |                |            |      |        |              | SCC1     |          |                |            | SCC2     |          |                |            | SCC3     |          |                |            | SCC4     |          |                |            | Power                  |                       |
|------------|------------------------|----------|----------|----------------|------------|------|--------|--------------|----------|----------|----------------|------------|----------|----------|----------------|------------|----------|----------|----------------|------------|----------|----------|----------------|------------|------------------------|-----------------------|
|            |                        | LTE Band | BW (MHz) | UL Freq. (MHz) | UL Channel | Mod. | UL# RB | UL RB Offset | LTE Band | BW (MHz) | DL Freq. (MHz) | DL Channel | LTE Band | BW (MHz) | DL Freq. (MHz) | DL Channel | LTE Band | BW (MHz) | DL Freq. (MHz) | DL Channel | LTE Band | BW (MHz) | DL Freq. (MHz) | DL Channel | With CA Tx.Power (dBm) | W/O CA Tx.Power (dBm) |
| Inter-Band | 2A-2A-46D              | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 2        | 20       | 1960           | 900        | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5577.1         | 51061      | 23.37                  | 23.26                 |
|            | 2A-5A-46D              | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 5        | 10       | 881.5          | 2525       | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5577.1         | 51061      | 23.43                  | 23.35                 |
|            | 2A-5B-30A-66A          | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 5        | 10       | 881.5          | 2525       | 5        | 10       | 891.4          | 2624       | 30       | 10       | 2355           | 9820       | 66       | 20       | 2155           | 66886      | 23.49                  | 23.51                 |
|            | 2A-5B-66A-66A          | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 5        | 10       | 881.5          | 2525       | 5        | 10       | 891.4          | 2624       | 66       | 20       | 2155           | 66886      | 66       | 20       | 2190           | 67236      | 23.51                  | 23.46                 |
|            | 2A-13A-46D             | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 13       | 10       | 751            | 5230       | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5577.1         | 51061      | 23.36                  | 23.38                 |
|            | 2A-46A-46D             | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5915           | 54440      | 46       | 20       | 5895.2         | 54242      | 46       | 20       | 5785.4         | 54044      | 23.34                  | 23.32                 |
|            | 2A-46C-46C             | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5915           | 54440      | 46       | 20       | 5895.2         | 54242      | 23.52                  | 23.51                 |
|            | 2A-46D-66A             | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5577.1         | 51061      | 66       | 20       | 2155           | 66886      | 23.41                  | 23.38                 |
|            | 2A-46E                 | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5577.1         | 51061      | 46       | 20       | 5596.9         | 51259      | 23.61                  | 23.54                 |
|            | 4A-46A-46D             | 4        | 20       | 1732.5         | 20175      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5915           | 54440      | 46       | 20       | 5895.2         | 54242      | 46       | 20       | 5785.4         | 54044      | 23.42                  | 23.41                 |
|            | 5A-46D-66A             | 5        | 10       | 836.5          | 20525      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5577.1         | 51061      | 66       | 20       | 2155           | 66886      | 23.92                  | 23.88                 |
|            | 5A-46E                 | 5        | 10       | 836.5          | 20525      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5577.1         | 51061      | 46       | 20       | 5596.9         | 51259      | 23.98                  | 23.92                 |
|            | 13A-46D-66A            | 13       | 10       | 782            | 23230      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5577.1         | 51061      | 66       | 20       | 2155           | 66886      | 22.86                  | 22.97                 |
|            | 13A-46E                | 13       | 10       | 782            | 23230      | QPSK | 1      | 0            | 46       | 20       | 5537.5         | 50665      | 46       | 20       | 5557.3         | 50863      | 46       | 20       | 5577.1         | 51061      | 46       | 20       | 5596.9         | 51259      | 22.96                  | 22.99                 |
|            | 41C-41D                | 41       | 20       | 2549.5         | 40185      | QPSK | 1      | 0            | 41       | 20       | 2569.3         | 40383      | 41       | 20       | 2680           | 41490      | 41       | 20       | 2660.2         | 41292      | 41       | 20       | 2640.4         | 41094      | 23.93                  | 24.00                 |

## **12. SAR Test Results**

### **General Note:**

1. Per KDB 447498 D01v06, the reported SAR is the measured SAR value adjusted for maximum tune-up tolerance.
  - a. Tune-up scaling Factor = tune-up limit power (mW) / EUT RF power (mW), where tune-up limit is the maximum rated power among all production units.
  - b. For SAR testing of WLAN signal with non-100% duty cycle, the measured SAR is scaled-up by the duty cycle scaling factor which is equal to "1/(duty cycle)"
  - c. For WWAN: Reported SAR(W/kg)= Measured SAR(W/kg)\*Tune-up Scaling Factor
  - d. For TDD LTE SAR measurement, the duty cycle 1:1.59 (62.9 %) was used perform testing and considering the theoretical duty cycle of 63.3% for extended cyclic prefix in the uplink, and the theoretical duty cycle of 62.9% for normal cyclic prefix in uplink, a scaling factor of extended cyclic prefix  $63.3\%/62.9\% = 1.006$  is applied to scale-up the measured SAR result.  
The Reported TDD LTE SAR = measured SAR (W/kg)\* Tune-up Scaling Factor\* scaling factor for extended cyclic prefix.
2. Per KDB 447498 D01v06, for each exposure position, testing of other required channels within the operating mode of a frequency band is not required when the *reported* 1-g or 10-g SAR for the mid-band or highest output power channel is:
  - $\leq 0.8$  W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\leq 100$  MHz
  - $\leq 0.6$  W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
  - $\leq 0.4$  W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is  $\geq 200$  MHz
3. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8$ W/kg.
4. For the exposure positions that proximity sensor power reduction is applied for SAR compliance, additional SAR testing with EUT transmitting full power in normal mode was performed; 10mm for bottom of Laptop.
5. The proximity sensor is used to detect the human proximity, and the G-sensor is used to detect EUT motion and determine whether the proximity sensor is triggered by human or fixed objects such as the table. During SAR test for EUT at the power reduction mode, the EUT positioning was stationary for stable measurement, and G-sensor was manually set not enabled to successfully set EUT in the power reduction mode

### **UMTS Note:**

1. Per KDB 941225 D01v03r01, for SAR testing is measured using a 12.2 kbps RMC with TPC bits configured to all "1's".
2. Per KDB 941225 D01v03r01, RMC 12.2kbps setting is used to evaluate SAR. The maximum output power and tune-up tolerance specified for production units in HSDPA / HSUPA / DC-HSDPA is  $\leq 1/4$  dB higher than RMC 12.2Kbps or when the highest reported SAR of the RMC12.2Kbps is scaled by the ratio of specified maximum output power and tune-up tolerance of HSDPA / HSUPA / DC-HSDPA to RMC12.2Kbps and the adjusted SAR is  $\leq 1.2$  W/kg, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA, and according to the following RF output power, the output power results of the secondary modes (HSUPA, HSDPA, DC-HSDPA) are less than  $1/4$  dB higher than the primary modes; therefore, SAR measurement is not required for HSDPA / HSUPA / DC-HSDPA.

**LTE Note:**

1. Per KDB 941225 D05v02r05, start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel.
2. Per KDB 941225 D05v02r05, 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.
3. Per KDB 941225 D05v02r05, For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation are  $\leq 0.8$  W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is  $> 1.45$  W/kg, the remaining required test channels must also be tested.
4. Per KDB 941225 D05v02r05, 16QAM output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in QPSK and the reported SAR for the QPSK configuration is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, 16QAM SAR testing is not required.
5. Per KDB 941225 D05v02r05, Smaller bandwidth output power for each RB allocation configuration is  $>$  not  $\frac{1}{2}$  dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is  $\leq 1.45$  W/kg; Per KDB 941225 D05v02r05, smaller bandwidth SAR testing is not required.
6. For LTE B4 / B5 / B12 / B17 / B26 / B38 the maximum bandwidth does not support three non-overlapping channels, per KDB 941225 D05v02r05, when a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.
7. LTE band 2 / 4 / 5 / 17 / 38 SAR test was covered by Band 12 / 25 / 26 / 66 / 41; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if
  - c. the maximum output power, including tolerance, for the smaller band is  $\leq$  the larger band to qualify for the SAR test exclusion
  - d. the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band

**12.1 Body SAR****<WCDMA SAR>**

| Plot No. | Band     | Mode         | Test Position    | Gap (mm) | Antenna Vendor | Power Reduction | Ch.  | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|----------|----------|--------------|------------------|----------|----------------|-----------------|------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
|          | WCDMA II | RMC 12.2Kbps | Bottom of Laptop | 10mm     | AMP            | OFF             | 9400 | 1880        | 23.66               | 24.50               | 1.213                  | 0.01             | 0.651                  | 0.790                  |
|          | WCDMA II | RMC 12.2Kbps | Bottom of Laptop | 0mm      | AMP            | ON              | 9400 | 1880        | 17.48               | 18.00               | 1.127                  | -0.01            | 0.834                  | 0.940                  |
|          | WCDMA II | RMC 12.2Kbps | Bottom of Laptop | 0mm      | AMP            | ON              | 9262 | 1852.4      | 17.46               | 18.00               | 1.132                  | -0.09            | 0.836                  | 0.947                  |
| 01       | WCDMA II | RMC 12.2Kbps | Bottom of Laptop | 0mm      | AMP            | ON              | 9538 | 1907.6      | 17.42               | 18.00               | 1.143                  | 0.05             | 0.905                  | 1.034                  |
|          | WCDMA II | RMC 12.2Kbps | Bottom of Laptop | 0mm      | Speed          | ON              | 9538 | 1907.6      | 17.42               | 18.00               | 1.143                  | 0.01             | 0.181                  | 0.207                  |
|          | WCDMA IV | RMC 12.2Kbps | Bottom of Laptop | 10mm     | AMP            | OFF             | 1312 | 1712.4      | 24.00               | 24.50               | 1.122                  | 0.02             | 0.992                  | 1.113                  |
|          | WCDMA IV | RMC 12.2Kbps | Bottom of Laptop | 10mm     | AMP            | OFF             | 1413 | 1732.6      | 23.95               | 24.50               | 1.135                  | -0.08            | 0.883                  | 1.002                  |
|          | WCDMA IV | RMC 12.2Kbps | Bottom of Laptop | 10mm     | AMP            | OFF             | 1513 | 1752.6      | 23.72               | 24.50               | 1.197                  | 0.08             | 0.930                  | 1.113                  |
| 02       | WCDMA IV | RMC 12.2Kbps | Bottom of Laptop | 0mm      | AMP            | ON              | 1312 | 1712.4      | 17.33               | 18.00               | 1.167                  | 0.02             | 0.999                  | 1.166                  |
|          | WCDMA IV | RMC 12.2Kbps | Bottom of Laptop | 0mm      | AMP            | ON              | 1413 | 1732.6      | 17.31               | 18.00               | 1.172                  | 0.01             | 0.897                  | 1.051                  |
|          | WCDMA IV | RMC 12.2Kbps | Bottom of Laptop | 0mm      | AMP            | ON              | 1513 | 1752.6      | 17.25               | 18.00               | 1.189                  | 0.09             | 0.960                  | 1.141                  |
|          | WCDMA IV | RMC 12.2Kbps | Bottom of Laptop | 0mm      | Speed          | ON              | 1312 | 1712.4      | 17.33               | 18.00               | 1.167                  | 0.15             | 0.348                  | 0.406                  |
|          | WCDMA V  | RMC 12.2Kbps | Bottom of Laptop | 10mm     | AMP            | OFF             | 4132 | 826.4       | 23.87               | 24.50               | 1.156                  | -0.02            | 0.663                  | 0.767                  |
|          | WCDMA V  | RMC 12.2Kbps | Bottom of Laptop | 0mm      | AMP            | ON              | 4132 | 826.4       | 19.69               | 20.50               | 1.205                  | 0.08             | 0.822                  | 0.991                  |
| 03       | WCDMA V  | RMC 12.2Kbps | Bottom of Laptop | 0mm      | AMP            | ON              | 4182 | 836.4       | 19.53               | 20.50               | 1.250                  | 0.04             | 0.907                  | 1.134                  |
|          | WCDMA V  | RMC 12.2Kbps | Bottom of Laptop | 0mm      | AMP            | ON              | 4233 | 846.6       | 19.62               | 20.50               | 1.225                  | -0.04            | 0.874                  | 1.070                  |
|          | WCDMA V  | RMC 12.2Kbps | Bottom of Laptop | 0mm      | Speed          | ON              | 4182 | 836.4       | 19.53               | 20.50               | 1.250                  | -0.01            | 0.385                  | 0.481                  |



## &lt;FDD LTE SAR&gt;

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB offset | Test Position    | Gap (mm) | Antenna Vendor | Power Reduction | Ch.   | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|----------|-------------|----------|------------|---------|-----------|------------------|----------|----------------|-----------------|-------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
|          | LTE Band 7  | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 21350 | 2560        | 23.47               | 24.00               | 1.130                  | 0.01             | 0.677                  | 0.765                  |
|          | LTE Band 7  | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 21350 | 2560        | 22.51               | 23.00               | 1.119                  | -0.1             | 0.536                  | 0.600                  |
|          | LTE Band 7  | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 21350 | 2560        | 16.63               | 17.00               | 1.089                  | 0.03             | 0.868                  | 0.945                  |
| 04       | LTE Band 7  | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 20850 | 2510        | 16.38               | 17.00               | 1.153                  | 0.07             | 1.020                  | 1.177                  |
|          | LTE Band 7  | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 21100 | 2535        | 16.44               | 17.00               | 1.138                  | 0.19             | 0.932                  | 1.060                  |
|          | LTE Band 7  | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 21350 | 2560        | 16.62               | 17.00               | 1.091                  | 0.09             | 0.859                  | 0.938                  |
|          | LTE Band 7  | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 20850 | 2510        | 16.42               | 17.00               | 1.143                  | -0.09            | 0.960                  | 1.097                  |
|          | LTE Band 7  | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 21100 | 2535        | 16.47               | 17.00               | 1.130                  | -0.01            | 0.918                  | 1.037                  |
|          | LTE Band 7  | 20M      | QPSK       | 100     | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 21350 | 2560        | 16.61               | 17.00               | 1.094                  | 0.01             | 0.846                  | 0.925                  |
|          | LTE Band 7  | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 21350 | 2560        | 16.63               | 17.00               | 1.089                  | 0.07             | 0.851                  | 0.927                  |
|          | LTE Band 7  | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 20850 | 2510        | 16.38               | 17.00               | 1.153                  | 0.02             | 0.784                  | 0.904                  |
|          | LTE Band 7  | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 21100 | 2535        | 16.44               | 17.00               | 1.138                  | -0.14            | 0.855                  | 0.973                  |
|          | LTE Band 7  | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 21350 | 2560        | 16.62               | 17.00               | 1.091                  | 0.03             | 0.831                  | 0.907                  |
|          | LTE Band 7  | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 20850 | 2510        | 16.42               | 17.00               | 1.143                  | -0.01            | 0.757                  | 0.865                  |
|          | LTE Band 7  | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 21100 | 2535        | 16.47               | 17.00               | 1.130                  | 0.08             | 0.840                  | 0.949                  |
|          | LTE Band 7  | 20M      | QPSK       | 100     | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 21350 | 2560        | 16.61               | 17.00               | 1.094                  | 0.07             | 0.809                  | 0.885                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 23095 | 707.5       | 23.11               | 24.00               | 1.227                  | 0.05             | 0.287                  | 0.352                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 23095 | 707.5       | 22.07               | 23.00               | 1.239                  | 0.01             | 0.233                  | 0.289                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 23095 | 707.5       | 21.03               | 22.50               | 1.403                  | -0.09            | 0.708                  | 0.993                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 23095 | 707.5       | 20.98               | 22.50               | 1.419                  | -0.03            | 0.710                  | 1.008                  |
| 05       | LTE Band 12 | 10M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 23095 | 707.5       | 20.97               | 22.50               | 1.422                  | 0.05             | 0.784                  | 1.115                  |
|          | LTE Band 12 | 10M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 23095 | 707.5       | 20.97               | 22.50               | 1.422                  | 0.02             | 0.149                  | 0.212                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 23230 | 782         | 23.09               | 24.00               | 1.233                  | 0.08             | 0.478                  | 0.589                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 23230 | 782         | 22.20               | 23.00               | 1.202                  | 0.09             | 0.387                  | 0.465                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 23230 | 782         | 19.84               | 21.00               | 1.306                  | -0.07            | 0.757                  | 0.989                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 23230 | 782         | 19.81               | 21.00               | 1.315                  | 0.07             | 0.768                  | 1.010                  |
| 06       | LTE Band 13 | 10M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 23230 | 782         | 19.82               | 21.00               | 1.312                  | 0.13             | 0.856                  | 1.123                  |
|          | LTE Band 13 | 10M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 23230 | 782         | 19.82               | 21.00               | 1.312                  | 0.01             | 0.183                  | 0.240                  |
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 23330 | 793         | 23.17               | 24.00               | 1.211                  | 0.04             | 0.505                  | 0.611                  |
|          | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 23330 | 793         | 22.11               | 23.00               | 1.227                  | -0.05            | 0.406                  | 0.498                  |
|          | LTE Band 14 | 10M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 23330 | 793         | 19.97               | 21.00               | 1.268                  | 0.02             | 0.788                  | 0.999                  |
| 07       | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 23330 | 793         | 19.84               | 21.00               | 1.306                  | 0.08             | 0.874                  | 1.142                  |
|          | LTE Band 14 | 10M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 23330 | 793         | 19.77               | 21.00               | 1.327                  | 0.07             | 0.790                  | 1.049                  |
|          | LTE Band 14 | 10M      | QPSK       | 25      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 23330 | 793         | 19.84               | 21.00               | 1.306                  | 0.06             | 0.208                  | 0.272                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 26140 | 1860        | 23.25               | 24.00               | 1.189                  | -0.05            | 0.595                  | 0.707                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 26140 | 1860        | 22.25               | 23.00               | 1.189                  | 0.04             | 0.458                  | 0.544                  |
| 08       | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 26140 | 1860        | 17.25               | 18.50               | 1.334                  | 0.05             | 0.861                  | 1.148                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 26340 | 1880        | 17.15               | 18.50               | 1.365                  | 0.06             | 0.837                  | 1.142                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 26590 | 1905        | 17.12               | 18.50               | 1.374                  | 0.04             | 0.823                  | 1.131                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 26140 | 1860        | 17.24               | 18.50               | 1.337                  | 0.07             | 0.836                  | 1.117                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 26340 | 1880        | 17.14               | 18.50               | 1.368                  | 0.03             | 0.837                  | 1.145                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 26590 | 1905        | 17.13               | 18.50               | 1.371                  | -0.03            | 0.833                  | 1.142                  |
|          | LTE Band 25 | 20M      | QPSK       | 100     | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 26140 | 1860        | 17.12               | 18.50               | 1.374                  | -0.14            | 0.821                  | 1.128                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 26140 | 1860        | 17.25               | 18.50               | 1.334                  | -0.14            | 0.650                  | 0.867                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 26340 | 1880        | 17.15               | 18.50               | 1.365                  | 0.07             | 0.620                  | 0.846                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 26590 | 1905        | 17.12               | 18.50               | 1.374                  | 0.06             | 0.603                  | 0.829                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 26140 | 1860        | 17.24               | 18.50               | 1.337                  | -0.02            | 0.614                  | 0.821                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 26340 | 1880        | 17.14               | 18.50               | 1.368                  | 0.04             | 0.569                  | 0.778                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 26590 | 1905        | 17.13               | 18.50               | 1.371                  | 0.09             | 0.497                  | 0.681                  |
|          | LTE Band 25 | 20M      | QPSK       | 100     | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 26140 | 1860        | 17.12               | 18.50               | 1.374                  | -0.09            | 0.565                  | 0.776                  |



# FCC SAR TEST REPORT

Report No. : FA901135

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB offset | Test Position    | Gap (mm) | Antenna Vendor | Power Reduction | Ch.    | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|----------|-------------|----------|------------|---------|-----------|------------------|----------|----------------|-----------------|--------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
|          | LTE Band 26 | 15M      | QPSK       | 1       | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 26865  | 831.5       | 23.49               | 25.00               | 1.416                  | 0.04             | 0.524                  | 0.742                  |
|          | LTE Band 26 | 15M      | QPSK       | 36      | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 26865  | 831.5       | 22.39               | 24.00               | 1.449                  | 0.02             | 0.419                  | 0.607                  |
|          | LTE Band 26 | 15M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 26865  | 831.5       | 20.19               | 20.50               | 1.074                  | 0.05             | 0.870                  | 0.934                  |
|          | LTE Band 26 | 15M      | QPSK       | 36      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 26865  | 831.5       | 20.09               | 20.50               | 1.099                  | 0.07             | 0.869                  | 0.955                  |
| 09       | LTE Band 26 | 15M      | QPSK       | 75      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 26865  | 831.5       | 20.10               | 20.50               | 1.096                  | -0.05            | 0.919                  | 1.008                  |
|          | LTE Band 26 | 15M      | QPSK       | 75      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 26865  | 831.5       | 20.10               | 20.50               | 1.096                  | 0.01             | 0.408                  | 0.447                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 27710  | 2310        | 22.65               | 23.00               | 1.084                  | 0.08             | 0.790                  | 0.856                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 27710  | 2310        | 21.55               | 22.00               | 1.109                  | 0.11             | 0.634                  | 0.703                  |
|          | LTE Band 30 | 10M      | QPSK       | 50      | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 27710  | 2310        | 21.58               | 22.00               | 1.102                  | 0.09             | 0.587                  | 0.647                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 27710  | 2310        | 16.23               | 17.00               | 1.194                  | 0.05             | 0.822                  | 0.981                  |
|          | LTE Band 30 | 10M      | QPSK       | 25      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 27710  | 2310        | 15.98               | 17.00               | 1.265                  | 0.05             | 0.775                  | 0.980                  |
|          | LTE Band 30 | 10M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 27710  | 2310        | 16.02               | 17.00               | 1.253                  | 0.07             | 0.781                  | 0.979                  |
|          | LTE Band 30 | 10M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 27710  | 2310        | 16.23               | 17.00               | 1.194                  | 0.11             | 0.595                  | 0.710                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 132072 | 1720        | 23.61               | 24.00               | 1.094                  | 0.02             | 0.875                  | 0.957                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 132322 | 1745        | 23.42               | 24.00               | 1.143                  | -0.08            | 0.800                  | 0.914                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 132572 | 1770        | 23.41               | 24.00               | 1.146                  | 0.03             | 0.736                  | 0.843                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 132072 | 1720        | 22.57               | 23.00               | 1.104                  | 0.06             | 0.676                  | 0.746                  |
|          | LTE Band 66 | 20M      | QPSK       | 100     | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 132072 | 1720        | 22.54               | 23.00               | 1.112                  | -0.14            | 0.687                  | 0.764                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 132072 | 1720        | 16.79               | 17.00               | 1.050                  | 0.1              | 0.951                  | 0.998                  |
| 10       | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 132322 | 1745        | 16.69               | 17.00               | 1.074                  | 0.02             | 0.971                  | 1.043                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 132572 | 1770        | 16.65               | 17.00               | 1.084                  | 0.04             | 0.894                  | 0.969                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 132072 | 1720        | 16.66               | 17.00               | 1.081                  | -0.11            | 0.924                  | 0.999                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 132322 | 1745        | 16.54               | 17.00               | 1.112                  | 0.08             | 0.897                  | 0.997                  |
|          | LTE Band 66 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 132572 | 1770        | 16.51               | 17.00               | 1.119                  | 0.06             | 0.831                  | 0.930                  |
|          | LTE Band 66 | 20M      | QPSK       | 100     | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 132072 | 1720        | 16.67               | 17.00               | 1.079                  | 0.07             | 0.944                  | 1.019                  |
|          | LTE Band 66 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 132322 | 1745        | 16.69               | 17.00               | 1.074                  | 0.02             | 0.739                  | 0.794                  |

**<TDD LTE SAR>**

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB offset | Test Position    | Gap (mm) | Antenna Vendor | Power Reduction | Ch.   | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Duty Cycle % | Duty Cycle Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Reported 1g SAR (W/kg) |
|----------|-------------|----------|------------|---------|-----------|------------------|----------|----------------|-----------------|-------|-------------|---------------------|---------------------|------------------------|--------------|---------------------------|------------------|------------------------|------------------------|
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 41490 | 2680        | 23.64               | 25.00               | 1.368                  | 62.9         | 1.006                     | 0.06             | 0.342                  | 0.471                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 10mm     | AMP            | OFF             | 41490 | 2680        | 22.60               | 24.00               | 1.380                  | 62.9         | 1.006                     | 0.06             | 0.270                  | 0.375                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 41490 | 2680        | 17.76               | 19.00               | 1.330                  | 62.9         | 1.006                     | 0.02             | 0.537                  | 0.719                  |
| 11       | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 39750 | 2506        | 17.53               | 19.00               | 1.403                  | 62.9         | 1.006                     | 0.09             | 0.823                  | 1.161                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 40185 | 2549.5      | 17.67               | 19.00               | 1.358                  | 62.9         | 1.006                     | 0.01             | 0.798                  | 1.090                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 40620 | 2593        | 17.63               | 19.00               | 1.371                  | 62.9         | 1.006                     | 0.08             | 0.714                  | 0.985                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 41055 | 2636.5      | 17.60               | 19.00               | 1.380                  | 62.9         | 1.006                     | 0.05             | 0.563                  | 0.782                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 41490 | 2680        | 17.59               | 19.00               | 1.384                  | 62.9         | 1.006                     | -0.05            | 0.512                  | 0.713                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 39750 | 2506        | 17.50               | 19.00               | 1.413                  | 62.9         | 1.006                     | 0.07             | 0.678                  | 0.963                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 40185 | 2549.5      | 17.53               | 19.00               | 1.403                  | 62.9         | 1.006                     | -0.03            | 0.651                  | 0.919                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 40620 | 2593        | 17.55               | 19.00               | 1.396                  | 62.9         | 1.006                     | 0.07             | 0.592                  | 0.832                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 41055 | 2636.5      | 17.57               | 19.00               | 1.390                  | 62.9         | 1.006                     | 0.02             | 0.523                  | 0.731                  |
|          | LTE Band 41 | 20M      | QPSK       | 100     | 0         | Bottom of Laptop | 0mm      | AMP            | ON              | 41490 | 2680        | 17.58               | 19.00               | 1.387                  | 62.9         | 1.006                     | 0.06             | 0.527                  | 0.735                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 41490 | 2680        | 17.76               | 19.00               | 1.330                  | 62.9         | 1.006                     | 0.06             | 0.752                  | 1.007                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 39750 | 2506        | 17.53               | 19.00               | 1.403                  | 62.9         | 1.006                     | 0.06             | 0.703                  | 0.992                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 40185 | 2549.5      | 17.67               | 19.00               | 1.358                  | 62.9         | 1.006                     | 0.08             | 0.710                  | 0.970                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 40620 | 2593        | 17.63               | 19.00               | 1.371                  | 62.9         | 1.006                     | 0.05             | 0.725                  | 1.000                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 41055 | 2636.5      | 17.60               | 19.00               | 1.380                  | 62.9         | 1.006                     | 0.03             | 0.788                  | 1.094                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 41490 | 2680        | 17.59               | 19.00               | 1.384                  | 62.9         | 1.006                     | 0.06             | 0.734                  | 1.022                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 39750 | 2506        | 17.50               | 19.00               | 1.413                  | 62.9         | 1.006                     | -0.02            | 0.685                  | 0.973                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 40185 | 2549.5      | 17.53               | 19.00               | 1.403                  | 62.9         | 1.006                     | 0.08             | 0.698                  | 0.985                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 40620 | 2593        | 17.55               | 19.00               | 1.396                  | 62.9         | 1.006                     | 0.06             | 0.706                  | 0.992                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 41055 | 2636.5      | 17.57               | 19.00               | 1.390                  | 62.9         | 1.006                     | -0.01            | 0.743                  | 1.039                  |
|          | LTE Band 41 | 20M      | QPSK       | 100     | 0         | Bottom of Laptop | 0mm      | Speed          | ON              | 41490 | 2680        | 17.58               | 19.00               | 1.387                  | 62.9         | 1.006                     | 0.07             | 0.714                  | 0.996                  |

## 12.2 Repeated SAR Measurement

| No. | Band        | Mode          | Test Position    | Gap (mm) | Antenna Vendor | Power Reduction | Ch.   | Freq. (MHz) | Average Power (dBm) | Tune-Up Limit (dBm) | Tune-up Scaling Factor | Power Drift (dB) | Measured 1g SAR (W/kg) | Ratio | Reported 1g SAR (W/kg) |
|-----|-------------|---------------|------------------|----------|----------------|-----------------|-------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|-------|------------------------|
| 1st | WCDMA II    | RMC 12.2Kbps  | Bottom of Laptop | 0mm      | AMP            | ON              | 9538  | 1907.6      | 17.42               | 18.00               | 1.143                  | 0.05             | 0.905                  |       | 1.034                  |
| 2nd | WCDMA II    | RMC 12.2Kbps  | Bottom of Laptop | 0mm      | AMP            | ON              | 9538  | 1907.6      | 17.42               | 18.00               | 1.143                  | 0.02             | 0.872                  | 1.04  | 0.997                  |
| 1st | WCDMA IV    | RMC 12.2Kbps  | Bottom of Laptop | 0mm      | AMP            | ON              | 1312  | 1712.4      | 17.33               | 18.00               | 1.167                  | 0.02             | 0.999                  |       | 1.166                  |
| 2nd | WCDMA IV    | RMC 12.2Kbps  | Bottom of Laptop | 0mm      | AMP            | ON              | 1312  | 1712.4      | 17.33               | 18.00               | 1.167                  | 0.11             | 0.974                  | 1.03  | 1.136                  |
| 1st | LTE Band 7  | 20M_QPSK_1_0  | Bottom of Laptop | 0mm      | AMP            | ON              | 20850 | 2510        | 16.38               | 17.00               | 1.153                  | 0.07             | 1.020                  |       | 1.177                  |
| 2nd | LTE Band 7  | 20M_QPSK_1_0  | Bottom of Laptop | 0mm      | AMP            | ON              | 20850 | 2510        | 16.38               | 17.00               | 1.153                  | 0.05             | 0.994                  | 1.03  | 1.147                  |
| 1st | LTE Band 14 | 10M_QPSK_25_0 | Bottom of Laptop | 0mm      | AMP            | ON              | 23330 | 793         | 19.84               | 21.00               | 1.306                  | 0.08             | 0.874                  |       | 1.142                  |
| 2nd | LTE Band 14 | 10M_QPSK_25_0 | Bottom of Laptop | 0mm      | AMP            | ON              | 23330 | 793         | 19.84               | 21.00               | 1.306                  | 0.04             | 0.858                  | 1.02  | 1.121                  |
| 1st | LTE Band 26 | 15M_QPSK_75_0 | Bottom of Laptop | 0mm      | AMP            | ON              | 26865 | 831.5       | 20.10               | 20.50               | 1.096                  | -0.05            | 0.919                  |       | 1.008                  |
| 2nd | LTE Band 26 | 15M_QPSK_75_0 | Bottom of Laptop | 0mm      | AMP            | ON              | 26865 | 831.5       | 20.10               | 20.50               | 1.096                  | 0.04             | 0.907                  | 1.01  | 0.995                  |
| 1st | LTE Band 26 | 15M_QPSK_75_0 | Bottom of Laptop | 0mm      | AMP            | ON              | 26915 | 836.5       | 20.10               | 20.50               | 1.096                  | -0.05            | 0.919                  |       | 1.008                  |
| 2nd | LTE Band 26 | 15M_QPSK_75_0 | Bottom of Laptop | 0mm      | AMP            | ON              | 26915 | 836.5       | 20.10               | 20.50               | 1.096                  | 0.04             | 0.907                  | 1.01  | 0.995                  |
| 1st | LTE Band 30 | 10M_QPSK_1_0  | Bottom of Laptop | 0mm      | AMP            | ON              | 27710 | 2310        | 16.23               | 17.00               | 1.194                  | 0.05             | 0.822                  |       | 0.981                  |
| 2nd | LTE Band 30 | 10M_QPSK_1_0  | Bottom of Laptop | 0mm      | AMP            | ON              | 27710 | 2310        | 16.23               | 17.00               | 1.194                  | 0.03             | 0.814                  | 1.01  | 0.972                  |

### General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8\text{W/kg}$ .
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is  $\leq 1.2$  and the measured SAR  $< 1.45\text{W/kg}$ , only one repeated measurement is required.
3. The ratio is the difference in percentage between original and repeated *measured SAR*.
4. All measurement SAR result is scaled-up to account for tune-up tolerance and is compliant.

### 13. Simultaneous Transmission Analysis

| NO. | Simultaneous Transmission Configurations                   | Body |
|-----|------------------------------------------------------------|------|
| 1.  | WWAN + 2.4GHz WLAN ANT 1 + 2.4GHz WLAN ANT 2               | Yes  |
| 2.  | WWAN + 2.4GHz WLAN ANT 1+ Bluetooth ANT 2                  | Yes  |
| 3.  | WWAN + 5GHz WLAN ANT 1 + 5GHz WLAN ANT 2 + Bluetooth ANT 2 | Yes  |

**General Note:**

- 2.4GHz WLAN and Bluetooth share the same antenna 2, and cannot transmit simultaneously.
- All licensed modes share the same antenna part and cannot transmit simultaneously
- EUT will choose either WLAN 2.4GHz or WLAN 5GHz according to the network signal condition; therefore, 2.4GHz WLAN and 5GHz WLAN will not operate simultaneously at any moment.
- The Scaled SAR summation is calculated based on the same configuration and test position.
- Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
  - Scalar SAR summation < 1.6W/kg.
  - $SPLSR = (SAR1 + SAR2)^{1.5} / (\min. \text{ separation distance, mm})$ , and the peak separation distance is determined from the square root of  $[(x1-x2)^2 + (y1-y2)^2 + (z1-z2)^2]$ , where (x1, y1, z1) and (x2, y2, z2) are the coordinates of the extrapolated peak SAR locations in the zoom scan.
  - If  $SPLSR \leq 0.04$ , simultaneously transmission SAR measurement is not necessary.
  - Simultaneously transmission SAR measurement, and the reported multi-band SAR < 1.6W/kg.
  - The SPLSR calculated results please refer to section 13.2.

#### 13.1 Body Exposure Conditions

| WWAN Band |             | Exposure Position        | 1<br>WWAN<br>1g SAR<br>(W/kg) | 2<br>2.4GHz<br>WLAN<br>Ant 1<br>1g SAR<br>(W/kg) | 3<br>2.4GHz<br>WLAN<br>Ant 2<br>1g SAR<br>(W/kg) | 4<br>5GHz<br>WLAN<br>Ant 1<br>1g SAR<br>(W/kg) | 5<br>5GHz<br>WLAN<br>Ant 2<br>1g SAR<br>(W/kg) | 6<br>Bluetooth<br>Ant 2<br>1g SAR<br>(W/kg) | 1+2+3<br>Summed<br>1g SAR<br>(W/kg) | 1+4+5+6<br>Summed<br>1g SAR<br>(W/kg) | 1+2+6<br>Summed<br>1g SAR<br>(W/kg) | SPLSR | Case No |
|-----------|-------------|--------------------------|-------------------------------|--------------------------------------------------|--------------------------------------------------|------------------------------------------------|------------------------------------------------|---------------------------------------------|-------------------------------------|---------------------------------------|-------------------------------------|-------|---------|
| WCDMA     | WCDMA II    | Bottom of Laptop at 10mm | 0.790                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.740                               | 1.790                                 | 1.320                               | 0.02  | 1       |
|           |             | Bottom of Laptop at 0mm  | 1.034                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.984                               | 2.034                                 | 1.564                               | 0.02  | 2       |
|           | WCDMA IV    | Bottom of Laptop at 10mm | 1.113                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 2.063                               | 2.113                                 | 1.643                               | 0.02  | 3       |
|           |             | Bottom of Laptop at 0mm  | 1.126                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 2.076                               | 2.126                                 | 1.656                               | 0.02  | 4       |
|           | WCDMA V     | Bottom of Laptop at 10mm | 0.767                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.717                               | 1.767                                 | 1.297                               | 0.02  | 5       |
|           |             | Bottom of Laptop at 0mm  | 1.134                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 2.084                               | 2.134                                 | 1.664                               | 0.02  | 6       |
| LTE       | LTE Band 7  | Bottom of Laptop at 10mm | 0.765                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.715                               | 1.765                                 | 1.295                               | 0.02  | 7       |
|           |             | Bottom of Laptop at 0mm  | 1.177                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 2.127                               | 2.177                                 | 1.707                               | 0.02  | 8       |
|           | LTE Band 12 | Bottom of Laptop at 10mm | 0.352                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.302                               | 1.352                                 | 0.882                               |       |         |
|           |             | Bottom of Laptop at 0mm  | 1.115                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 2.065                               | 2.115                                 | 1.645                               | 0.02  | 9       |
|           | LTE Band 13 | Bottom of Laptop at 10mm | 0.589                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.539                               | 1.589                                 | 1.119                               |       |         |
|           |             | Bottom of Laptop at 0mm  | 1.123                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 2.073                               | 2.123                                 | 1.653                               | 0.02  | 10      |
|           | LTE Band 14 | Bottom of Laptop at 10mm | 0.611                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.561                               | 1.611                                 | 1.141                               |       |         |
|           |             | Bottom of Laptop at 0mm  | 1.142                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 2.092                               | 2.142                                 | 1.672                               | 0.02  | 11      |
|           | LTE Band 25 | Bottom of Laptop at 10mm | 0.707                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.657                               | 1.707                                 | 1.237                               | 0.02  | 12      |
|           |             | Bottom of Laptop at 0mm  | 1.148                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 2.098                               | 2.148                                 | 1.678                               | 0.02  | 13      |
|           | LTE Band 26 | Bottom of Laptop at 10mm | 0.742                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.692                               | 1.742                                 | 1.272                               | 0.02  | 14      |
|           |             | Bottom of Laptop at 0mm  | 1.008                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.958                               | 2.008                                 | 1.538                               | 0.02  | 15      |
|           | LTE Band 30 | Bottom of Laptop at 10mm | 0.856                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.806                               | 1.856                                 | 1.386                               | 0.02  | 16      |
|           |             | Bottom of Laptop at 0mm  | 0.981                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.931                               | 1.981                                 | 1.511                               | 0.02  | 17      |
|           | LTE Band 41 | Bottom of Laptop at 10mm | 0.471                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.421                               | 1.471                                 | 1.001                               |       |         |
|           |             | Bottom of Laptop at 0mm  | 1.161                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 2.111                               | 2.161                                 | 1.691                               | 0.02  | 18      |
|           | LTE Band 66 | Bottom of Laptop at 10mm | 0.957                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.907                               | 1.957                                 | 1.487                               | 0.02  | 19      |
|           |             | Bottom of Laptop at 0mm  | 1.043                         | 0.460                                            | 0.490                                            | 0.400                                          | 0.530                                          | 0.070                                       | 1.993                               | 2.043                                 | 1.573                               | 0.02  | 20      |

### 13.2 SPLSR Evaluation and Analysis

**General Note:**

1.  $SPLSR = (SAR_1 + SAR_2)^{1.5} / (\text{min. separation distance, mm})$ . If  $SPLSR \leq 0.04$ , simultaneously transmission SAR measurement is not necessary
2. The detail hotspot point for each transmitter in each exposure condition are showing as below figure and the minimum 3D distance for each sum combination is used for SPLSR analysis.

|        | Band                    | Position         | SAR (W/kg) | Gap (mm) | Minimum distance (mm) | Summed SAR (W/kg) | SPLSR Results | Simultaneous SAR |
|--------|-------------------------|------------------|------------|----------|-----------------------|-------------------|---------------|------------------|
|        |                         |                  |            |          |                       |                   |               |                  |
| Case 1 | WCDMA II                | Bottom of Laptop | 0.79       | 10       | 212.2                 | 1.25              | 0.01          | Not required     |
|        | WLAN2.4GHz_Ant 1        |                  | 0.46       | 0        |                       |                   |               |                  |
|        | WCDMA II                | Bottom of Laptop | 0.79       | 10       | 178.7                 | 1.28              | 0.01          | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49       | 0        |                       |                   |               |                  |
|        | WCDMA II                | Bottom of Laptop | 0.79       | 10       | 212.2                 | 1.19              | 0.01          | Not required     |
|        | WLAN5GHz_Ant 1          |                  | 0.4        | 0        |                       |                   |               |                  |
|        | WCDMA II                | Bottom of Laptop | 0.79       | 10       | 178.7                 | 1.39              | 0.01          | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6        | 0        |                       |                   |               |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46       | 0        | 48.1                  | 0.95              | 0.02          | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49       | 0        |                       |                   |               |                  |
| Case 2 | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4        | 0        | 48.1                  | 1.00              | 0.02          | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6        | 0        |                       |                   |               |                  |
|        | WCDMA II                | Bottom of Laptop | 1.034      | 0        | 212.2                 | 1.49              | 0.01          | Not required     |
|        | WLAN2.4GHz_Ant 1        |                  | 0.46       | 0        |                       |                   |               |                  |
|        | WCDMA II                | Bottom of Laptop | 1.034      | 0        | 178.7                 | 1.52              | 0.01          | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49       | 0        |                       |                   |               |                  |
|        | WCDMA II                | Bottom of Laptop | 1.034      | 0        | 212.2                 | 1.43              | 0.01          | Not required     |
|        | WLAN5GHz_Ant 1          |                  | 0.4        | 0        |                       |                   |               |                  |
|        | WCDMA II                | Bottom of Laptop | 1.034      | 0        | 178.7                 | 1.63              | 0.01          | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6        | 0        |                       |                   |               |                  |
| Case 3 | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46       | 0        | 48.1                  | 0.95              | 0.02          | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49       | 0        |                       |                   |               |                  |
|        | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4        | 0        | 48.1                  | 1.00              | 0.02          | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6        | 0        |                       |                   |               |                  |
|        | WCDMA IV                | Bottom of Laptop | 1.113      | 10       | 212.2                 | 1.57              | 0.01          | Not required     |
|        | WLAN2.4GHz_Ant 1        |                  | 0.46       | 0        |                       |                   |               |                  |
|        | WCDMA IV                | Bottom of Laptop | 1.113      | 10       | 178.7                 | 1.60              | 0.01          | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49       | 0        |                       |                   |               |                  |
|        | WCDMA IV                | Bottom of Laptop | 1.113      | 10       | 212.2                 | 1.51              | 0.01          | Not required     |
|        | WLAN5GHz_Ant 1          |                  | 0.4        | 0        |                       |                   |               |                  |
|        | WCDMA IV                | Bottom of Laptop | 1.113      | 10       | 178.7                 | 1.71              | 0.01          | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6        | 0        |                       |                   |               |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46       | 0        | 48.1                  | 0.95              | 0.02          | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49       | 0        |                       |                   |               |                  |
|        | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4        | 0        | 48.1                  | 1.00              | 0.02          | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6        | 0        |                       |                   |               |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46       | 0        | 48.1                  | 0.53              | 0.01          | Not required     |
|        | BT Ant 2                |                  | 0.07       | 0        |                       |                   |               |                  |

|        | Band                    | Position         | SAR<br>(W/kg) | Gap  | Minimum<br>distance<br>(mm) | Summed<br>SAR (W/kg) | SPLSR<br>Results | Simultaneous SAR |
|--------|-------------------------|------------------|---------------|------|-----------------------------|----------------------|------------------|------------------|
|        |                         |                  |               | (mm) |                             |                      |                  |                  |
| Case 4 | WCDMA IV                | Bottom of Laptop | 1.126         | 0    | 212.2                       | 1.59                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|        | WCDMA IV                | Bottom of Laptop | 1.126         | 0    | 178.7                       | 1.62                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|        | WCDMA IV                | Bottom of Laptop | 1.126         | 0    | 212.2                       | 1.53                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|        | WCDMA IV                | Bottom of Laptop | 1.126         | 0    | 178.7                       | 1.73                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|        | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
| Case 5 | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.53                 | 0.01             | Not required     |
|        | BT Ant 2                |                  | 0.07          | 0    |                             |                      |                  |                  |
|        | WCDMA V                 | Bottom of Laptop | 0.767         | 10   | 212.2                       | 1.23                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|        | WCDMA V                 | Bottom of Laptop | 0.767         | 10   | 178.7                       | 1.26                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|        | WCDMA V                 | Bottom of Laptop | 0.767         | 10   | 212.2                       | 1.17                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|        | WCDMA V                 | Bottom of Laptop | 0.767         | 10   | 178.7                       | 1.37                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
| Case 6 | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|        | WCDMA V                 | Bottom of Laptop | 1.134         | 0    | 212.2                       | 1.59                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|        | WCDMA V                 | Bottom of Laptop | 1.134         | 0    | 178.7                       | 1.62                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|        | WCDMA V                 | Bottom of Laptop | 1.134         | 0    | 212.2                       | 1.53                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|        | WCDMA V                 | Bottom of Laptop | 1.134         | 0    | 178.7                       | 1.73                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
| Case 6 | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.53                 | 0.01             | Not required     |
|        | BT Ant 2                |                  | 0.07          | 0    |                             |                      |                  |                  |

|        | Band                    | Position         | SAR<br>(W/kg) | Gap  | Minimum<br>distance<br>(mm) | Summed<br>SAR (W/kg) | SPLSR<br>Results | Simultaneous SAR |
|--------|-------------------------|------------------|---------------|------|-----------------------------|----------------------|------------------|------------------|
|        |                         |                  |               | (mm) |                             |                      |                  |                  |
| Case 7 | LTE Band 7              | Bottom of Laptop | 0.765         | 10   | 212.2                       | 1.23                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|        | LTE Band 7              | Bottom of Laptop | 0.765         | 10   | 178.7                       | 1.26                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|        | LTE Band 7              | Bottom of Laptop | 0.765         | 10   | 212.2                       | 1.17                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|        | LTE Band 7              | Bottom of Laptop | 0.765         | 10   | 178.7                       | 1.37                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|        | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|        | Band                    | Position         | SAR<br>(W/kg) | Gap  | Minimum<br>distance<br>(mm) | Summed<br>SAR (W/kg) | SPLSR<br>Results | Simultaneous SAR |
|        |                         |                  |               | (mm) |                             |                      |                  |                  |
| Case 8 | LTE Band 7              | Bottom of Laptop | 1.177         | 0    | 212.2                       | 1.64                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|        | LTE Band 7              | Bottom of Laptop | 1.177         | 0    | 178.7                       | 1.67                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|        | LTE Band 7              | Bottom of Laptop | 1.177         | 0    | 212.2                       | 1.58                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|        | LTE Band 7              | Bottom of Laptop | 1.177         | 0    | 178.7                       | 1.78                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|        | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.53                 | 0.01             | Not required     |
|        | BT Ant 2                |                  | 0.07          | 0    |                             |                      |                  |                  |
|        | Band                    | Position         | SAR<br>(W/kg) | Gap  | Minimum<br>distance<br>(mm) | Summed<br>SAR (W/kg) | SPLSR<br>Results | Simultaneous SAR |
|        |                         |                  |               | (mm) |                             |                      |                  |                  |
| Case 9 | LTE Band 12             | Bottom of Laptop | 1.115         | 0    | 212.2                       | 1.58                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|        | LTE Band 12             | Bottom of Laptop | 1.115         | 0    | 178.7                       | 1.61                 | 0.01             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|        | LTE Band 12             | Bottom of Laptop | 1.115         | 0    | 212.2                       | 1.52                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|        | LTE Band 12             | Bottom of Laptop | 1.115         | 0    | 178.7                       | 1.72                 | 0.01             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|        | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|        | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|        | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|        | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.53                 | 0.01             | Not required     |
|        | BT Ant 2                |                  | 0.07          | 0    |                             |                      |                  |                  |

|         | Band                    | Position         | SAR<br>(W/kg) | Gap  | Minimum<br>distance<br>(mm) | Summed<br>SAR (W/kg) | SPLSR<br>Results | Simultaneous SAR |
|---------|-------------------------|------------------|---------------|------|-----------------------------|----------------------|------------------|------------------|
|         |                         |                  |               | (mm) |                             |                      |                  |                  |
| Case 10 | LTE Band 13             | Bottom of Laptop | 1.123         | 0    | 212.2                       | 1.58                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|         | LTE Band 13             | Bottom of Laptop | 1.123         | 0    | 178.7                       | 1.61                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | LTE Band 13             | Bottom of Laptop | 1.123         | 0    | 212.2                       | 1.52                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|         | LTE Band 13             | Bottom of Laptop | 1.123         | 0    | 178.7                       | 1.72                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.53                 | 0.01             | Not required     |
|         | BT Ant 2                |                  | 0.07          | 0    |                             |                      |                  |                  |
| Case 11 | LTE Band 14             | Bottom of Laptop | 1.142         | 0    | 212.2                       | 1.60                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|         | LTE Band 14             | Bottom of Laptop | 1.142         | 0    | 178.7                       | 1.63                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | LTE Band 14             | Bottom of Laptop | 1.142         | 0    | 212.2                       | 1.54                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|         | LTE Band 14             | Bottom of Laptop | 1.142         | 0    | 178.7                       | 1.74                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.53                 | 0.01             | Not required     |
|         | BT Ant 2                |                  | 0.07          | 0    |                             |                      |                  |                  |
| Case 12 | LTE Band 25             | Bottom of Laptop | 0.707         | 10   | 212.2                       | 1.17                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|         | LTE Band 25             | Bottom of Laptop | 0.707         | 10   | 178.7                       | 1.20                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | LTE Band 25             | Bottom of Laptop | 0.707         | 10   | 212.2                       | 1.11                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|         | LTE Band 25             | Bottom of Laptop | 0.707         | 10   | 178.7                       | 1.31                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |

|         | Band                    | Position         | SAR<br>(W/kg) | Gap  | Minimum<br>distance<br>(mm) | Summed<br>SAR (W/kg) | SPLSR<br>Results | Simultaneous SAR |
|---------|-------------------------|------------------|---------------|------|-----------------------------|----------------------|------------------|------------------|
|         |                         |                  |               | (mm) |                             |                      |                  |                  |
| Case 13 | LTE Band 25             | Bottom of Laptop | 1.148         | 0    | 212.2                       | 1.61                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|         | LTE Band 25             | Bottom of Laptop | 1.148         | 0    | 178.7                       | 1.64                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | LTE Band 25             | Bottom of Laptop | 1.148         | 0    | 212.2                       | 1.55                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|         | LTE Band 25             | Bottom of Laptop | 1.148         | 0    | 178.7                       | 1.75                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
| Case 14 | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.53                 | 0.01             | Not required     |
|         | BT Ant 2                |                  | 0.07          | 0    |                             |                      |                  |                  |
|         | Band                    | Position         | SAR<br>(W/kg) | Gap  | Minimum<br>distance<br>(mm) | Summed<br>SAR (W/kg) | SPLSR<br>Results | Simultaneous SAR |
|         |                         |                  |               | (mm) |                             |                      |                  |                  |
| Case 14 | LTE Band 26             | Bottom of Laptop | 0.742         | 10   | 212.2                       | 1.20                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|         | LTE Band 26             | Bottom of Laptop | 0.742         | 10   | 178.7                       | 1.23                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | LTE Band 26             | Bottom of Laptop | 0.742         | 10   | 212.2                       | 1.14                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|         | LTE Band 26             | Bottom of Laptop | 0.742         | 10   | 178.7                       | 1.34                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | Band                    | Position         | SAR<br>(W/kg) | Gap  | Minimum<br>distance<br>(mm) | Summed<br>SAR (W/kg) | SPLSR<br>Results | Simultaneous SAR |
|         |                         |                  |               | (mm) |                             |                      |                  |                  |
| Case 15 | LTE Band 26             | Bottom of Laptop | 1.008         | 0    | 212.2                       | 1.47                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|         | LTE Band 26             | Bottom of Laptop | 1.008         | 0    | 178.7                       | 1.50                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | LTE Band 26             | Bottom of Laptop | 1.008         | 0    | 212.2                       | 1.41                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|         | LTE Band 26             | Bottom of Laptop | 1.008         | 0    | 178.7                       | 1.61                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |

|         | Band                    | Position         | SAR<br>(W/kg) | Gap  | Minimum<br>distance<br>(mm) | Summed<br>SAR (W/kg) | SPLSR<br>Results | Simultaneous SAR |
|---------|-------------------------|------------------|---------------|------|-----------------------------|----------------------|------------------|------------------|
|         |                         |                  |               | (mm) |                             |                      |                  |                  |
| Case 16 | LTE Band 30             | Bottom of Laptop | 0.856         | 10   | 212.2                       | 1.32                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|         | LTE Band 30             | Bottom of Laptop | 0.856         | 10   | 178.7                       | 1.35                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | LTE Band 26             | Bottom of Laptop | 0.856         | 10   | 212.2                       | 1.26                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|         | LTE Band 30             | Bottom of Laptop | 0.856         | 10   | 178.7                       | 1.46                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
| Case 17 | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | LTE Band 30             | Bottom of Laptop | 0.981         | 0    | 212.2                       | 1.44                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|         | LTE Band 30             | Bottom of Laptop | 0.981         | 10   | 178.7                       | 1.47                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | LTE Band 30             | Bottom of Laptop | 0.981         | 0    | 212.2                       | 1.38                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|         | LTE Band 30             | Bottom of Laptop | 0.981         | 0    | 178.7                       | 1.58                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
| Case 18 | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | LTE Band 41             | Bottom of Laptop | 1.161         | 0    | 212.2                       | 1.62                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|         | LTE Band 41             | Bottom of Laptop | 1.161         | 0    | 178.7                       | 1.65                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | LTE Band 41             | Bottom of Laptop | 1.161         | 0    | 212.2                       | 1.56                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|         | LTE Band 41             | Bottom of Laptop | 1.161         | 0    | 178.7                       | 1.76                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.53                 | 0.01             | Not required     |
|         | BT Ant 2                |                  | 0.07          | 0    |                             |                      |                  |                  |

|         | Band                    | Position         | SAR<br>(W/kg) | Gap  | Minimum<br>distance<br>(mm) | Summed<br>SAR (W/kg) | SPLSR<br>Results | Simultaneous SAR |
|---------|-------------------------|------------------|---------------|------|-----------------------------|----------------------|------------------|------------------|
|         |                         |                  |               | (mm) |                             |                      |                  |                  |
| Case 19 | LTE Band 66             | Bottom of Laptop | 0.957         | 10   | 212.2                       | 1.42                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|         | LTE Band 66             | Bottom of Laptop | 0.957         | 10   | 178.7                       | 1.45                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | LTE Band 66             | Bottom of Laptop | 0.957         | 10   | 212.2                       | 1.36                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|         | LTE Band 66             | Bottom of Laptop | 0.957         | 10   | 178.7                       | 1.56                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | Band                    | Position         | SAR<br>(W/kg) | Gap  | Minimum<br>distance<br>(mm) | Summed<br>SAR (W/kg) | SPLSR<br>Results | Simultaneous SAR |
|         |                         |                  |               | (mm) |                             |                      |                  |                  |
| Case 20 | LTE Band 66             | Bottom of Laptop | 1.043         | 0    | 212.2                       | 1.50                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 1        |                  | 0.46          | 0    |                             |                      |                  |                  |
|         | LTE Band 66             | Bottom of Laptop | 1.043         | 0    | 178.7                       | 1.53                 | 0.01             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | LTE Band 66             | Bottom of Laptop | 1.043         | 0    | 212.2                       | 1.44                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 1          |                  | 0.4           | 0    |                             |                      |                  |                  |
|         | LTE Band 66             | Bottom of Laptop | 1.043         | 0    | 178.7                       | 1.64                 | 0.01             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |
|         | WLAN2.4GHz_Ant 1        | Bottom of Laptop | 0.46          | 0    | 48.1                        | 0.95                 | 0.02             | Not required     |
|         | WLAN2.4GHz_Ant 2        |                  | 0.49          | 0    |                             |                      |                  |                  |
|         | WLAN5GHz_Ant 1          | Bottom of Laptop | 0.4           | 0    | 48.1                        | 1.00                 | 0.02             | Not required     |
|         | WLAN5GHz_Ant 2+BT Ant 2 |                  | 0.6           | 0    |                             |                      |                  |                  |

**Test Engineer :** Tommy Chen, Mood Huang, Thomas Wang, Jay Jian and White Huang

## **14. Uncertainty Assessment**

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be  $\leq 30\%$ , for a confidence interval of  $k = 2$ . If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. For this device, the highest measured 1-g SAR is less 1.5W/kg. Therefore, the measurement uncertainty table is not required in this report.

## **15. References**

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
- [2] ANSI/IEEE Std. C95.1-1992, "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz", September 1992
- [3] IEEE Std. 1528-2013, "IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques", Sep 2013
- [4] SPEAG DASY System Handbook
- [5] FCC KDB 248227 D01 v02r02, "SAR Guidance for IEEE 802.11 (WiFi) Transmitters", Oct 2015.
- [6] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [7] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [8] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
- [9] FCC KDB 941225 D05A v01r02, "Rel. 10 LTE SAR Test Guidance and KDB Inquiries", Oct 2015
- [10] FCC KDB 616217 D04 v01r02, "SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers", Oct 2015
- [11] FCC KDB 865664 D01 v01r04, "SAR Measurement Requirements for 100 MHz to 6 GHz", Aug 2015.
- [12] FCC KDB 865664 D02 v01r02, "RF Exposure Compliance Reporting and Documentation Considerations" Oct 2015.