



# FCC SAR TEST REPORT

FCC ID : QYLEM7455R  
Equipment : WWAN module  
Brand Name : Getac  
Model Name : EM7455  
Applicant : Getac Technology Corporation.  
5F., Building A, No. 209, Sec.1, Nangang  
Rd., Nangang Dist., Taipei City 11568,  
Taiwan, R.O.C.  
Manufacturer : Sierra Wireless, Inc.  
13811, Wireless Way, Richmond, British  
Columbia  
Standard : FCC 47 CFR Part 2 (2.1093)  
ANSI/IEEE C95.1-1992  
IEEE 1528-2013

The product was installed into Tablet (Brand Name Getac, Model Name: RX10) during test.

The product was received on Jun. 17, 2018 and testing was started from Jul. 01, 2018 and completed on Jul. 03, 2018. 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 variant 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: Jones Tsai / Manager

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## History of this test report

| Report No.  | Version | Description             | Issued Date   |
|-------------|---------|-------------------------|---------------|
| FA570164-38 | 01      | Initial issue of report | Aug. 01, 2018 |
|             |         |                         |               |
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|             |         |                         |               |

## 1. Statement of Compliance

The maximum results of Specific Absorption Rate (SAR) found during testing for Getac Technology Corporation., WWAN module, EM7455, 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        | 1.04                | 1.47                                               |
|                  | WCDMA IV        | 1.16                |                                                    |
|                  | WCDMA V         | 0.52                |                                                    |
|                  | LTE Band 4      | 0.93                |                                                    |
|                  | LTE Band 7      | 0.56                |                                                    |
|                  | LTE Band 12     | 0.63                |                                                    |
|                  | LTE Band 13     | 0.60                |                                                    |
|                  | LTE Band 2 / 25 | 1.06                |                                                    |
|                  | LTE Band 5 / 26 | 0.46                |                                                    |
|                  | LTE Band 41     | 0.62                |                                                    |
| Date of Testing: |                 | 2018/7/1 ~ 2018/7/3 |                                                    |

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. This device is in compliance with Specific Absorption Rate (SAR) for general population/uncontrolled exposure limits (1.6 W/kg) 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: Eric Huang**  
**Report Producer: Wan Liu**

## 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 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | WWAN module                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Brand Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Getac                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Model Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | EM7455                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| FCC ID                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | QYLEM7455R                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 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 25: 1850.7 MHz ~ 1914.3 MHz<br>LTE Band 26: 814.7 MHz ~ 848.3 MHz<br>LTE Band 41: 2498.5 MHz ~ 2687.5 MHz |
| Mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | RMC 12.2Kbps<br>HSDPA<br>HSUPA<br>DC-HSDPA<br>LTE: QPSK, 16QAM                                                                                                                                                                                                                                                                                                                                                                                                                      |
| EUT Stage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Production Unit                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Remark:</b><br>1. The WLAN/BT module, Brand Name: Intel, Model Name: 8265NGW, FCC ID: QYL8265NG is also integrated into this host and the WLAN SAR testing results are also used perform transmission simultaneous analysis which can be referred to FCC ID: QYL8265NG, Sporton SAR Test Report, Report No: FA570164-39.<br>2. This device has two kinds of SKU, RF exposure evaluation is selected SKU A as the main tested, SKU B does not support any RF transmitter, additional RF exposure evaluation is not necessary.<br>3. SKU A has two batteries, RF exposure evaluation is selected battery 2160mAh as the main tested, battery 5800mAh will spot check worst case found in battery 2160mAh. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

| Host Information                        |                                                                                                                                                                                                                                                                |
|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Host Name                               | Tablet                                                                                                                                                                                                                                                         |
| Brand Name                              | Getac                                                                                                                                                                                                                                                          |
| Model Name                              | RX10                                                                                                                                                                                                                                                           |
| Integrated Module                       | Brand Name: Intel<br>Model Name: 8265NGW                                                                                                                                                                                                                       |
| 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 ~ 5720 MHz<br>WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz<br>Bluetooth: 2402 MHz ~ 2480 MHz<br>NFC : 13.56 MHz |
| Wireless Technology                     | WLAN 2.4GHz : 802.11b/g/n HT20/HT40<br>WLAN 5GHz : 802.11a/n/ac HT20/HT40/VHT20/VHT40/VHT80<br>Bluetooth BR/EDR/LE/HS<br>NFC:ASK                                                                                                                               |

|           | RX10G2 SKU        |             |
|-----------|-------------------|-------------|
|           | SKU A             | SKU B       |
| CPU       | i5                | M3          |
| DDR       | 8G                | 4G          |
| SSD       | 256GB             | 128GB       |
| Panel     | FHD               | FHD         |
| Digitizer | Support           | Not Support |
| WLAN/BT   | Support           | Not Support |
| WWAN      | Support           | Not Support |
| GPS       | Support           | Not Support |
| RFID      | Support           | Not Support |
| Battery   | 5800mAh & 2160mAh | 2160mAh     |

### 3.2 General LTE SAR Test and Reporting Considerations

| Summarized necessary items addressed in KDB 941225 D05 v02r05           |                   |             |                                                                                                                                                                                                                                       |             |                                                               |             |                  |             |                  |             |                  |             |
|-------------------------------------------------------------------------|-------------------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------|-------------|------------------|-------------|------------------|-------------|------------------|-------------|
| FCC ID                                                                  |                   |             | QYLEM7455R                                                                                                                                                                                                                            |             |                                                               |             |                  |             |                  |             |                  |             |
| Equipment Name                                                          |                   |             | WWAN module                                                                                                                                                                                                                           |             |                                                               |             |                  |             |                  |             |                  |             |
| Operating Frequency Range of each LTE transmission band                 |                   |             | LTE Band 2: 1850.7 MHz ~ 1909.3 MHz                                                                                                                                                                                                   |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 4: 1710.7 MHz ~ 1754.3 MHz                                                                                                                                                                                                   |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 5: 824.7 MHz ~ 848.3 MHz                                                                                                                                                                                                     |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 7: 2502.5 MHz ~ 2567.5 MHz                                                                                                                                                                                                   |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 12: 699.7 MHz ~ 715.3 MHz                                                                                                                                                                                                    |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 13: 779.5 MHz ~ 784.5 MHz                                                                                                                                                                                                    |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 25: 1850.7 MHz ~ 1914.3 MHz                                                                                                                                                                                                  |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 26: 814.7 MHz ~ 848.3 MHz                                                                                                                                                                                                    |             |                                                               |             |                  |             |                  |             |                  |             |
| Channel Bandwidth                                                       |                   |             | LTE Band 41: 2498.5 MHz ~ 2687.5 MHz                                                                                                                                                                                                  |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 02:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz                                                                                                                                                                                   |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 04:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz                                                                                                                                                                                   |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 05:1.4MHz, 3MHz, 5MHz, 10MHz                                                                                                                                                                                                 |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 07: 5MHz, 10MHz, 15MHz, 20MHz                                                                                                                                                                                                |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 12:1.4MHz, 3MHz, 5MHz, 10MHz                                                                                                                                                                                                 |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 13: 5MHz, 10MHz                                                                                                                                                                                                              |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | LTE Band 25:1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz                                                                                                                                                                                   |             |                                                               |             |                  |             |                  |             |                  |             |
| uplink modulations used                                                 |                   |             | QPSK / 16QAM                                                                                                                                                                                                                          |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | 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         |                  |             |
| LTE A-MPR                                                               |                   |             | 256 QAM                                                                                                                                                                                                                               |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | ≥ 1                                                                                                                                                                                                                                   |             |                                                               |             |                  |             |                  |             |                  |             |
| LTE A-MPR                                                               |                   |             | ≤ 5                                                                                                                                                                                                                                   |             |                                                               |             |                  |             |                  |             |                  |             |
|                                                                         |                   |             | 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.                                                                                                                                                                                                                |             |                                                               |             |                  |             |                  |             |                  |             |
| LTE Carrier Aggregation Combinations                                    |                   |             | Inter-Band and Intra-Band possible combinations and the detail power measurement please referred to section 12.                                                                                                                       |             |                                                               |             |                  |             |                  |             |                  |             |
| LTE Carrier Aggregation Additional Information                          |                   |             | This device supports maximum of 2 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        |

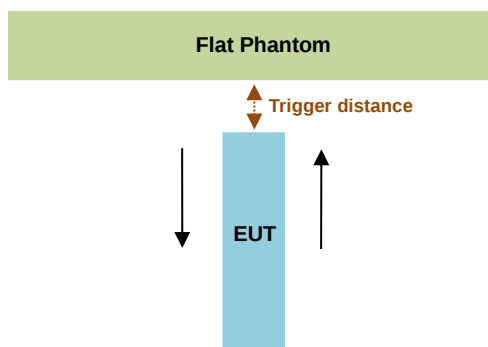
| LTE Band 4  |                   |             |                  |             |                  |                  |                  |             |                  |             |                  |             |
|-------------|-------------------|-------------|------------------|-------------|------------------|------------------|------------------|-------------|------------------|-------------|------------------|-------------|
|             | 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 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       |                  |             |
| M           | 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       |                  |             |
| 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             |             |                  |             |
| L<br>M      | 40148             | 2545.8      | 40160            | 2547        | 40173            | 2548.3           | 40185            |             | 2549.5           |             |                  |             |
| M           | 40620             | 2593        | 40620            | 2593        | 40620            | 2593             | 40620            |             | 2593             |             |                  |             |
| H<br>M      | 41093             | 2640.3      | 41080            | 2639        | 41068            | 2637.8           | 41055            |             | 2636.5           |             |                  |             |
| H           | 41565             | 2687.5      | 41540            | 2685        | 41515            | 2682.5           | 41490            |             | 2680             |             |                  |             |

## 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 Face |
| Minimum                                | 14          |

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

Proximity sensors are not normally designed to cover the entire back surface or edges of a tablet. The sensing regions are usually limited to areas near the sensor element. 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. Except when the SAR test exclusion provisions of KDB Publication 447498 D01 are applied, or when SAR is tested at the normal full power for the tablet edges, if an antenna is located near the corner of a tablet, the adjacent edges within 50 mm from the corner antenna must be tested for sensor triggering coverage. Depending on how the antenna and sensor are overlapping, if the required procedures cannot be fully applied, a KDB inquiry must be submitted to determine sensor coverage test procedures.

**Proximity sensor power reduction**

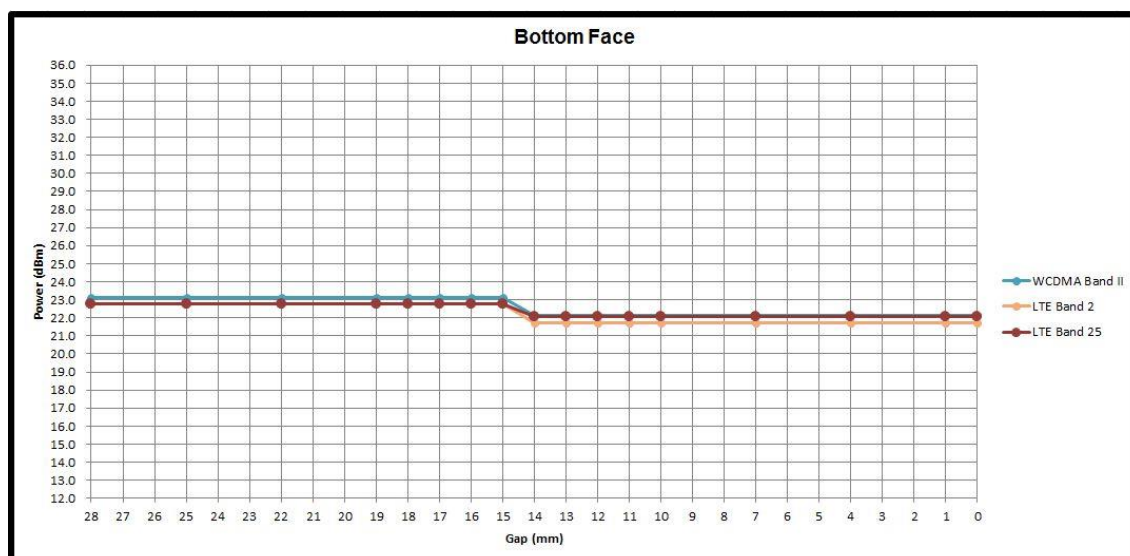
| Exposure Position / wireless mode | Bottom Face <sup>(1)</sup> | Edge 1 | Edge 2 | Edge 3 | Edge 4 |
|-----------------------------------|----------------------------|--------|--------|--------|--------|
| WCDMA Band II                     | 1.0 dB                     | 0 dB   | 0 dB   | 0 dB   | 0 dB   |
| LTE Band 2                        | 1.0 dB                     | 0 dB   | 0 dB   | 0 dB   | 0 dB   |
| LTE Band 25                       | 1.0 dB                     | 0 dB   | 0 dB   | 0 dB   | 0 dB   |

**Remark:**

- <sup>(1)</sup>: Reduced maximum limit applied by activation of proximity 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 Face: [10mm](#)

**Power Measurement during Sensor Trigger distance testing**

| Band/Mode     | Measured power reduction (dBm) |                   | Reduction Levels |
|---------------|--------------------------------|-------------------|------------------|
|               | w/o power back-off             | w/ power back-off | (dB)             |
| WCDMA Band II | 23.12                          | 22.15             | 0.97             |
| LTE Band 2    | 22.76                          | 21.70             | 1.06             |
| LTE Band 25   | 22.76                          | 22.07             | 0.69             |



## **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.



## 7.1 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 dB0) 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          | 1107          | Feb. 27, 2018 | Feb. 26, 2019 |
| SPEAG         | 835MHz System Validation Kit    | D835V2          | 4d167         | Feb. 27, 2018 | Feb. 26, 2019 |
| SPEAG         | 1750MHz System Validation Kit   | D1750V2         | 1068          | Nov. 15, 2017 | Nov. 14, 2018 |
| SPEAG         | 1900MHz System Validation Kit   | D1900V2         | 5d041         | Sep. 28, 2017 | Sep. 27, 2018 |
| SPEAG         | 2600MHz System Validation Kit   | D2600V2         | 1008          | Sep. 18, 2017 | Sep. 17, 2018 |
| SPEAG         | Data Acquisition Electronics    | DAE3            | 495           | May. 24, 2018 | May. 23, 2019 |
| SPEAG         | Dosimetric E-Field Probe        | EX3DV4          | 7306          | Jul. 24, 2017 | Jul. 23, 2018 |
| RCPTWN        | Thermometer                     | HTC-1           | TM685-1       | Mar. 16, 2018 | Mar. 15, 2019 |
| Anritsu       | Radio Communication Analyzer    | MT8821C         | 6201341950    | Apr. 17, 2018 | Apr. 16, 2019 |
| Agilent       | Wireless Communication Test Set | E5515C          | MY48360820    | Jan. 15, 2018 | Jan. 14, 2019 |
| SPEAG         | Device Holder                   | N/A             | N/A           | N/A           | N/A           |
| Anritsu       | Signal Generator                | MG3710A         | 6201502524    | Dec. 07, 2017 | Dec. 06, 2018 |
| Agilent       | ENA Network Analyzer            | E5071C          | MY46316648    | Jan. 17, 2018 | Jan. 16, 2019 |
| SPEAG         | Dielectric Probe Kit            | DAK-3.5         | 1126          | Sep. 26, 2017 | Sep. 25, 2018 |
| LINE SEIKI    | Digital Thermometer             | DTM3000-spezial | 3169          | Sep. 06, 2017 | Sep. 05, 2018 |
| Anritsu       | Power Meter                     | ML2495A         | 1419002       | May. 18, 2018 | May. 17, 2019 |
| Anritsu       | Power Sensor                    | MA2411B         | 1339124       | May. 18, 2018 | May. 17, 2019 |
| Anritsu       | Power Meter                     | ML2495A         | 1218006       | Oct. 06, 2017 | Oct. 05, 2018 |
| Anritsu       | Power Sensor                    | MA2411B         | 1207363       | Oct. 06, 2017 | Oct. 05, 2018 |
| Agilent       | Spectrum Analyzer               | E4408B          | MY44211028    | Aug. 23, 2017 | Aug. 22, 2018 |
| R&S           | Spectrum Analyzer               | FSL             | 100863        | Jul. 05, 2017 | Jul. 04, 2018 |
| Mini-Circuits | Power Amplifier                 | ZVE-8G+         | D120604       | Mar. 12, 2018 | Mar. 11, 2019 |
| Mini-Circuits | Power Amplifier                 | ZHL-42W+        | QA1344002     | Mar. 12, 2018 | Mar. 11, 2019 |
| 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        |               |

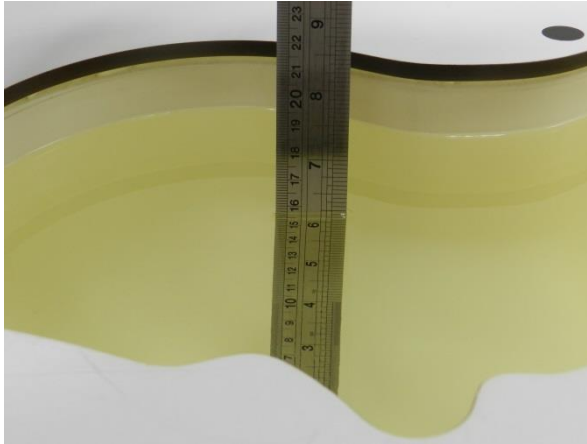
**General Note:**

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.

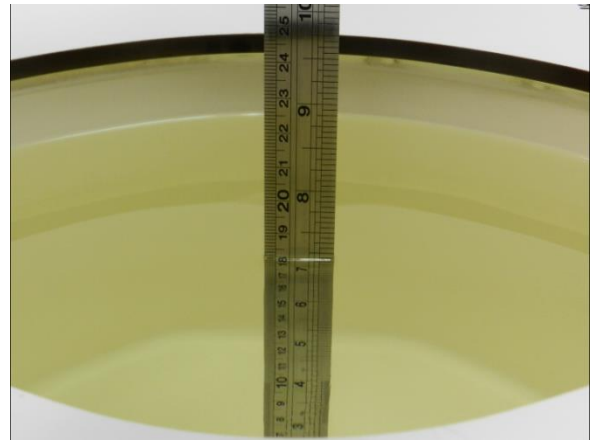
## **10. System Verification**

### **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 ( $\epsilon_r$ ) |
|------------------|-----------|-----------|---------------|----------|---------------|----------|---------------------------|-------------------------------|
| For Head         |           |           |               |          |               |          |                           |                               |
| 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                          |
| For Body         |           |           |               |          |               |          |                           |                               |
| 750              | 51.7      | 47.2      | 0             | 0.9      | 0.1           | 0        | 0.96                      | 55.5                          |
| 835              | 50.8      | 48.2      | 0             | 0.9      | 0.1           | 0        | 0.97                      | 55.2                          |
| 900              | 50.8      | 48.2      | 0             | 0.9      | 0.1           | 0        | 1.05                      | 55.0                          |
| 1800, 1900, 2000 | 70.2      | 0         | 0             | 0.4      | 0             | 29.4     | 1.52                      | 53.3                          |
| 2450             | 68.6      | 0         | 0             | 0        | 0             | 31.4     | 1.95                      | 52.7                          |
| 2600             | 68.1      | 0         | 0             | 0.1      | 0             | 31.8     | 2.16                      | 52.5                          |

### 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%          |

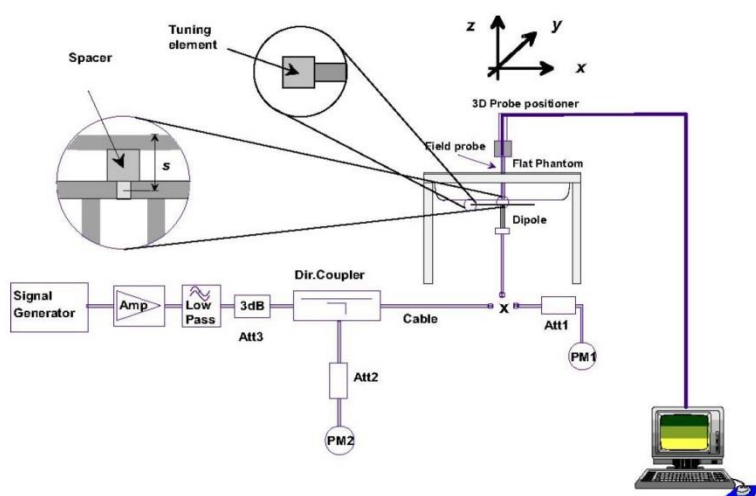
### <Tissue Dielectric Parameter Check Results>

| Frequency (MHz) | Tissue Type | Liquid Temp. (°C) | Conductivity ( $\sigma$ ) | Permittivity ( $\epsilon_r$ ) | Conductivity Target ( $\sigma$ ) | Permittivity Target ( $\epsilon_r$ ) | Delta ( $\sigma$ ) (%) | Delta ( $\epsilon_r$ ) (%) | Limit (%) | Date     |
|-----------------|-------------|-------------------|---------------------------|-------------------------------|----------------------------------|--------------------------------------|------------------------|----------------------------|-----------|----------|
| 750             | MSL         | 22.5              | 0.970                     | 54.098                        | 0.96                             | 55.50                                | 1.04                   | -2.53                      | ±5        | 2018/7/2 |
| 835             | MSL         | 22.6              | 0.966                     | 56.332                        | 0.97                             | 55.20                                | -0.41                  | 2.05                       | ±5        | 2018/7/3 |
| 1750            | MSL         | 22.6              | 1.483                     | 55.402                        | 1.49                             | 53.40                                | -0.47                  | 3.75                       | ±5        | 2018/7/2 |
| 1900            | MSL         | 22.6              | 1.556                     | 51.544                        | 1.52                             | 53.30                                | 2.37                   | -3.29                      | ±5        | 2018/7/2 |
| 2600            | MSL         | 22.4              | 2.113                     | 52.491                        | 2.16                             | 52.50                                | -2.18                  | -0.02                      | ±5        | 2018/7/1 |

### 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) | Tissue Type | 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 (%) |
|----------|-----------------|-------------|------------------|---------------|-----------------|------------|------------------------|------------------------|--------------------------|---------------|
| 2018/7/2 | 750             | MSL         | 250              | D750V3-1107   | EX3DV4 - SN7306 | DAE3 Sn495 | 2.15                   | 8.52                   | 8.6                      | 0.94          |
| 2018/7/3 | 835             | MSL         | 250              | D835V2-4d167  | EX3DV4 - SN7306 | DAE3 Sn495 | 2.41                   | 9.62                   | 9.64                     | 0.21          |
| 2018/7/2 | 1750            | MSL         | 250              | D1750V2-1068  | EX3DV4 - SN7306 | DAE3 Sn495 | 9.33                   | 37.20                  | 37.32                    | 0.32          |
| 2018/7/2 | 1900            | MSL         | 250              | D1900V2-5d041 | EX3DV4 - SN7306 | DAE3 Sn495 | 9.67                   | 40.70                  | 38.68                    | -4.96         |
| 2018/7/1 | 2600            | MSL         | 250              | D2600V2-1008  | EX3DV4 - SN7306 | DAE3 Sn495 | 13.60                  | 55.00                  | 54.4                     | -1.09         |



**Fig 8.3.1 System Performance Check Setup**



**Fig 8.3.2 Setup Photo**

## 11. RF Exposure Positions

### 11.1 SAR Testing for Tablet

This device can be used also in full sized tablet exposure conditions, due to its size. Per FCC KDB 616217, the back surface and edges of the tablet should be tested for SAR compliance with the tablet touching the phantom. The SAR exclusion threshold in KDB 447498 D01v06 can be applied to determine SAR test exclusion for adjacent edge configurations. The closest distance from the antenna to an adjacent tablet edge is used to determine if SAR testing is required for the adjacent edges, with the adjacent edge positioned against the phantom and the edge containing the antenna positioned perpendicular to the phantom.

## **12. 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  $\beta_d/\beta_c$  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**

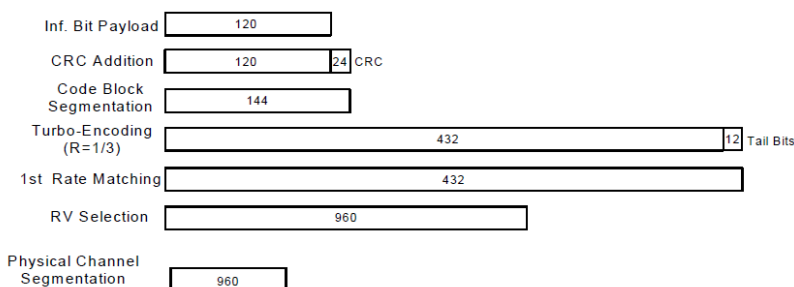
**DC-HSDPA 3GPP release 8 Setup Configuration:**

- 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       | 23.12    | 22.98 | 23.05  | 24.00               | 23.13    | 22.95  | 22.95  | 24.00               | 22.60   | 22.50 | 22.54 | 24.00               |
| 3GPP Rel 6      | HSDPA Subtest-1    | 21.83    | 21.94 | 21.83  | 23.00               | 21.90    | 21.86  | 21.88  | 23.00               | 21.27   | 21.03 | 21.17 | 23.00               |
| 3GPP Rel 6      | HSDPA Subtest-2    | 21.92    | 21.95 | 21.84  | 23.00               | 21.94    | 21.89  | 21.91  | 23.00               | 21.30   | 21.06 | 21.22 | 23.00               |
| 3GPP Rel 6      | HSDPA Subtest-3    | 21.42    | 21.45 | 21.34  | 22.50               | 21.27    | 21.39  | 21.39  | 22.50               | 20.80   | 20.57 | 20.71 | 22.50               |
| 3GPP Rel 6      | HSDPA Subtest-4    | 21.42    | 21.44 | 21.34  | 22.50               | 21.42    | 21.39  | 21.40  | 22.50               | 20.80   | 20.57 | 20.71 | 22.50               |
| 3GPP Rel 8      | DC-HSDPA Subtest-1 | 21.76    | 21.93 | 21.79  | 23.00               | 21.90    | 21.78  | 21.83  | 23.00               | 21.19   | 20.93 | 21.15 | 23.00               |
| 3GPP Rel 8      | DC-HSDPA Subtest-2 | 21.91    | 21.86 | 21.74  | 23.00               | 21.87    | 21.88  | 21.82  | 23.00               | 21.27   | 21.02 | 21.22 | 23.00               |
| 3GPP Rel 8      | DC-HSDPA Subtest-3 | 21.35    | 21.44 | 21.30  | 22.50               | 21.18    | 21.29  | 21.34  | 22.50               | 20.71   | 20.52 | 20.68 | 22.50               |
| 3GPP Rel 8      | DC-HSDPA Subtest-4 | 21.40    | 21.34 | 21.33  | 22.50               | 21.40    | 21.30  | 21.35  | 22.50               | 20.77   | 20.53 | 20.61 | 22.50               |
| 3GPP Rel 6      | HSUPA Subtest-1    | 21.18    | 21.66 | 21.56  | 23.00               | 21.63    | 21.50  | 21.60  | 23.00               | 21.07   | 21.06 | 21.02 | 23.00               |
| 3GPP Rel 6      | HSUPA Subtest-2    | 20.80    | 20.98 | 20.92  | 21.00               | 20.93    | 20.89  | 20.91  | 21.00               | 20.37   | 19.98 | 20.14 | 21.00               |
| 3GPP Rel 6      | HSUPA Subtest-3    | 20.55    | 20.59 | 20.51  | 22.00               | 20.55    | 20.46  | 20.50  | 22.00               | 20.02   | 20.01 | 20.03 | 22.00               |
| 3GPP Rel 6      | HSUPA Subtest-4    | 20.84    | 20.96 | 20.79  | 21.00               | 20.85    | 20.95  | 20.81  | 21.00               | 20.23   | 19.97 | 20.02 | 21.00               |
| 3GPP Rel 6      | HSUPA Subtest-5    | 22.00    | 22.00 | 21.90  | 23.00               | 21.90    | 21.90  | 21.90  | 23.00               | 21.40   | 21.10 | 21.10 | 23.00               |

**<Reduced Power Mode>**

| Band            |                    | WCDMA II |       |        | Tune-up Limit (dBm) |
|-----------------|--------------------|----------|-------|--------|---------------------|
| TX Channel      |                    | 9262     | 9400  | 9538   |                     |
| Rx Channel      |                    | 9662     | 9800  | 9938   |                     |
| Frequency (MHz) |                    | 1852.4   | 1880  | 1907.6 |                     |
| 3GPP Rel 99     | RMC 12.2Kbps       | 22.15    | 22.00 | 22.06  | 23.00               |
| 3GPP Rel 6      | HSDPA Subtest-1    | 20.74    | 20.82 | 20.73  | 22.00               |
| 3GPP Rel 6      | HSDPA Subtest-2    | 20.80    | 20.85 | 20.75  | 22.00               |
| 3GPP Rel 6      | HSDPA Subtest-3    | 20.38    | 20.39 | 20.30  | 21.50               |
| 3GPP Rel 6      | HSDPA Subtest-4    | 20.40    | 20.38 | 20.25  | 21.50               |
| 3GPP Rel 8      | DC-HSDPA Subtest-1 | 20.70    | 20.82 | 20.75  | 22.00               |
| 3GPP Rel 8      | DC-HSDPA Subtest-2 | 20.85    | 20.76 | 20.68  | 22.00               |
| 3GPP Rel 8      | DC-HSDPA Subtest-3 | 20.28    | 20.33 | 20.26  | 21.50               |
| 3GPP Rel 8      | DC-HSDPA Subtest-4 | 20.32    | 20.28 | 20.28  | 21.50               |
| 3GPP Rel 6      | HSUPA Subtest-1    | 20.14    | 20.61 | 20.44  | 22.00               |
| 3GPP Rel 6      | HSUPA Subtest-2    | 19.72    | 19.89 | 19.83  | 20.00               |
| 3GPP Rel 6      | HSUPA Subtest-3    | 19.53    | 19.47 | 19.47  | 21.00               |
| 3GPP Rel 6      | HSUPA Subtest-4    | 19.77    | 19.90 | 19.71  | 20.00               |
| 3GPP Rel 6      | HSUPA Subtest-5    | 20.98    | 20.90 | 20.81  | 22.00               |

**<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 / B26 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 / 5 SAR test was covered by Band 25 / 26; 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

**<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         | 22.67                    | 22.76                       | 22.74                     | 24                     | 0           |
| 20              | QPSK       | 1       | 49        | 22.35                    | 22.36                       | 22.62                     |                        |             |
| 20              | QPSK       | 1       | 99        | 22.12                    | 22.27                       | 22.33                     |                        |             |
| 20              | QPSK       | 50      | 0         | 21.40                    | 21.53                       | 21.50                     | 23                     | 1           |
| 20              | QPSK       | 50      | 24        | 21.51                    | 21.40                       | 21.73                     |                        |             |
| 20              | QPSK       | 50      | 50        | 21.41                    | 21.42                       | 21.71                     |                        |             |
| 20              | QPSK       | 100     | 0         | 21.32                    | 21.52                       | 21.61                     | 23                     | 1           |
| 20              | 16QAM      | 1       | 0         | 21.79                    | 21.82                       | 21.72                     |                        |             |
| 20              | 16QAM      | 1       | 49        | 21.73                    | 21.85                       | 21.92                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 21.40                    | 21.68                       | 21.58                     | 22                     | 2           |
| 20              | 16QAM      | 50      | 0         | 20.62                    | 20.50                       | 20.58                     |                        |             |
| 20              | 16QAM      | 50      | 24        | 20.60                    | 20.56                       | 20.64                     |                        |             |
| 20              | 16QAM      | 50      | 50        | 20.47                    | 20.50                       | 20.64                     | 22                     | 2           |
| 20              | 16QAM      | 100     | 0         | 20.52                    | 20.58                       | 20.71                     |                        |             |
| Channel         |            |         |           | 18675                    | 18900                       | 19125                     |                        |             |
| Frequency (MHz) |            |         |           | 1857.5                   | 1880                        | 1902.5                    |                        |             |
| 15              | QPSK       | 1       | 0         | 22.48                    | 22.55                       | 22.59                     | 24                     | 0           |
| 15              | QPSK       | 1       | 37        | 22.20                    | 22.21                       | 22.38                     |                        |             |
| 15              | QPSK       | 1       | 74        | 22.16                    | 22.03                       | 22.06                     |                        |             |
| 15              | QPSK       | 36      | 0         | 21.14                    | 21.36                       | 21.26                     | 23                     | 1           |
| 15              | QPSK       | 36      | 20        | 21.25                    | 21.16                       | 21.58                     |                        |             |
| 15              | QPSK       | 36      | 39        | 21.30                    | 21.16                       | 21.52                     |                        |             |
| 15              | QPSK       | 75      | 0         | 21.08                    | 21.23                       | 21.51                     | 23                     | 1           |
| 15              | 16QAM      | 1       | 0         | 21.59                    | 21.55                       | 21.53                     |                        |             |
| 15              | 16QAM      | 1       | 37        | 21.62                    | 21.63                       | 21.80                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 21.26                    | 21.58                       | 21.30                     | 22                     | 2           |
| 15              | 16QAM      | 36      | 0         | 20.39                    | 20.25                       | 20.48                     |                        |             |
| 15              | 16QAM      | 36      | 20        | 20.47                    | 20.27                       | 20.41                     |                        |             |
| 15              | 16QAM      | 36      | 39        | 20.21                    | 20.32                       | 20.47                     | 22                     | 2           |
| 15              | 16QAM      | 75      | 0         | 20.39                    | 20.46                       | 20.57                     |                        |             |
| Channel         |            |         |           | 18650                    | 18900                       | 19150                     |                        |             |
| Frequency (MHz) |            |         |           | 1855                     | 1880                        | 1905                      |                        |             |
| 10              | QPSK       | 1       | 0         | 22.55                    | 22.48                       | 22.54                     | 24                     | 0           |
| 10              | QPSK       | 1       | 25        | 22.08                    | 22.21                       | 22.38                     |                        |             |
| 10              | QPSK       | 1       | 49        | 22.00                    | 22.00                       | 22.15                     |                        |             |
| 10              | QPSK       | 25      | 0         | 21.13                    | 21.34                       | 21.39                     | 23                     | 1           |
| 10              | QPSK       | 25      | 12        | 21.38                    | 21.29                       | 21.49                     |                        |             |
| 10              | QPSK       | 25      | 25        | 21.13                    | 21.15                       | 21.54                     |                        |             |
| 10              | QPSK       | 50      | 0         | 21.10                    | 21.26                       | 21.32                     | 23                     | 1           |
| 10              | 16QAM      | 1       | 0         | 21.49                    | 21.71                       | 21.42                     |                        |             |
| 10              | 16QAM      | 1       | 25        | 21.46                    | 21.71                       | 21.70                     |                        |             |
| 10              | 16QAM      | 1       | 49        | 21.19                    | 21.49                       | 21.41                     | 22                     | 2           |
| 10              | 16QAM      | 25      | 0         | 20.45                    | 20.40                       | 20.31                     |                        |             |
| 10              | 16QAM      | 25      | 12        | 20.47                    | 20.35                       | 20.49                     |                        |             |
| 10              | 16QAM      | 25      | 25        | 20.28                    | 20.28                       | 20.49                     | 22                     | 2           |
| 10              | 16QAM      | 50      | 0         | 20.36                    | 20.38                       | 20.50                     |                        |             |



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| Channel         |       |    |    | 18625  | 18900 | 19175  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| Frequency (MHz) |       |    |    | 1852.5 | 1880  | 1907.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 22.39  | 22.53 | 22.57  | 24                     | 0           |
| 5               | QPSK  | 1  | 12 | 22.16  | 22.15 | 22.42  |                        |             |
| 5               | QPSK  | 1  | 24 | 22.07  | 22.01 | 22.17  |                        |             |
| 5               | QPSK  | 12 | 0  | 21.18  | 21.34 | 21.39  | 23                     | 1           |
| 5               | QPSK  | 12 | 7  | 21.25  | 21.16 | 21.43  |                        |             |
| 5               | QPSK  | 12 | 13 | 21.29  | 21.15 | 21.61  |                        |             |
| 5               | QPSK  | 25 | 0  | 21.17  | 21.29 | 21.46  |                        |             |
| 5               | 16QAM | 1  | 0  | 21.53  | 21.62 | 21.51  | 23                     | 1           |
| 5               | 16QAM | 1  | 12 | 21.59  | 21.72 | 21.74  |                        |             |
| 5               | 16QAM | 1  | 24 | 21.24  | 21.58 | 21.28  |                        |             |
| 5               | 16QAM | 12 | 0  | 20.38  | 20.30 | 20.29  | 22                     | 2           |
| 5               | 16QAM | 12 | 7  | 20.36  | 20.39 | 20.40  |                        |             |
| 5               | 16QAM | 12 | 13 | 20.33  | 20.30 | 20.46  |                        |             |
| 5               | 16QAM | 25 | 0  | 20.34  | 20.35 | 20.43  |                        |             |
| Channel         |       |    |    | 18615  | 18900 | 19185  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1851.5 | 1880  | 1908.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 22.42  | 22.50 | 22.59  | 24                     | 0           |
| 3               | QPSK  | 1  | 8  | 22.23  | 22.26 | 22.44  |                        |             |
| 3               | QPSK  | 1  | 14 | 22.17  | 22.17 | 22.20  |                        |             |
| 3               | QPSK  | 8  | 0  | 21.10  | 21.37 | 21.26  | 23                     | 1           |
| 3               | QPSK  | 8  | 4  | 21.29  | 21.13 | 21.50  |                        |             |
| 3               | QPSK  | 8  | 7  | 21.23  | 21.28 | 21.61  |                        |             |
| 3               | QPSK  | 15 | 0  | 21.15  | 21.33 | 21.48  |                        |             |
| 3               | 16QAM | 1  | 0  | 21.57  | 21.56 | 21.53  | 23                     | 1           |
| 3               | 16QAM | 1  | 8  | 21.53  | 21.73 | 21.65  |                        |             |
| 3               | 16QAM | 1  | 14 | 21.15  | 21.53 | 21.32  |                        |             |
| 3               | 16QAM | 8  | 0  | 20.40  | 20.36 | 20.38  | 22                     | 2           |
| 3               | 16QAM | 8  | 4  | 20.45  | 20.38 | 20.54  |                        |             |
| 3               | 16QAM | 8  | 7  | 20.26  | 20.38 | 20.43  |                        |             |
| 3               | 16QAM | 15 | 0  | 20.30  | 20.39 | 20.47  |                        |             |
| Channel         |       |    |    | 18607  | 18900 | 19193  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1850.7 | 1880  | 1909.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 22.58  | 22.39 | 22.53  | 24                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 22.60  | 22.58 | 22.60  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 22.67  | 22.60 | 22.65  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 22.54  | 22.53 | 22.53  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 22.63  | 22.57 | 22.48  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 22.70  | 22.47 | 22.59  |                        |             |
| 1.4             | QPSK  | 6  | 0  | 21.52  | 21.36 | 21.54  | 23                     | 1           |
| 1.4             | 16QAM | 1  | 0  | 21.92  | 21.71 | 21.83  | 23                     | 1           |
| 1.4             | 16QAM | 1  | 3  | 21.87  | 21.88 | 21.75  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 21.88  | 21.87 | 21.87  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 21.62  | 21.58 | 21.54  |                        |             |
| 1.4             | 16QAM | 3  | 1  | 21.73  | 21.53 | 21.49  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 21.58  | 21.43 | 21.46  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 20.62  | 20.58 | 20.58  | 22                     | 2           |

**<LTE Band 4>**

| 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         |            |         |           | 20050                 | 20175                    | 20300                  | 24                  | 0        |
| Frequency (MHz) |            |         |           | 1720                  | 1732.5                   | 1745                   |                     |          |
| 20              | QPSK       | 1       | 0         | 23.10                 | 22.75                    | 22.77                  |                     |          |
| 20              | QPSK       | 1       | 49        | 22.59                 | 22.65                    | 22.61                  | 23                  | 1        |
| 20              | QPSK       | 1       | 99        | 22.35                 | 22.16                    | 22.36                  |                     |          |
| 20              | QPSK       | 50      | 0         | 21.78                 | 21.60                    | 21.61                  |                     |          |
| 20              | QPSK       | 50      | 24        | 21.78                 | 21.73                    | 21.72                  | 23                  | 1        |
| 20              | QPSK       | 50      | 50        | 21.65                 | 21.46                    | 21.60                  |                     |          |
| 20              | QPSK       | 100     | 0         | 21.70                 | 21.57                    | 21.57                  |                     |          |
| 20              | 16QAM      | 1       | 0         | 22.09                 | 21.88                    | 22.03                  | 23                  | 1        |
| 20              | 16QAM      | 1       | 49        | 22.02                 | 21.89                    | 21.85                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 21.71                 | 21.61                    | 21.60                  |                     |          |
| 20              | 16QAM      | 50      | 0         | 20.82                 | 20.61                    | 20.69                  | 22                  | 2        |
| 20              | 16QAM      | 50      | 24        | 20.83                 | 20.55                    | 20.51                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 20.60                 | 20.43                    | 20.60                  |                     |          |
| 20              | 16QAM      | 100     | 0         | 20.80                 | 20.62                    | 20.54                  | 24                  | 0        |
| Channel         |            |         |           | 20025                 | 20175                    | 20325                  |                     |          |
| Frequency (MHz) |            |         |           | 1717.5                | 1732.5                   | 1747.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 23.06                 | 22.83                    | 22.66                  | 24                  | 0        |
| 15              | QPSK       | 1       | 37        | 23.01                 | 22.72                    | 22.85                  |                     |          |
| 15              | QPSK       | 1       | 74        | 22.84                 | 22.56                    | 22.79                  |                     |          |
| 15              | QPSK       | 36      | 0         | 22.15                 | 21.88                    | 21.74                  | 23                  | 1        |
| 15              | QPSK       | 36      | 20        | 21.95                 | 21.88                    | 21.93                  |                     |          |
| 15              | QPSK       | 36      | 39        | 21.83                 | 21.82                    | 21.76                  |                     |          |
| 15              | QPSK       | 75      | 0         | 22.01                 | 21.74                    | 21.75                  | 23                  | 1        |
| 15              | 16QAM      | 1       | 0         | 22.22                 | 22.08                    | 21.95                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 22.24                 | 22.04                    | 22.03                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 22.01                 | 21.96                    | 21.92                  | 22                  | 2        |
| 15              | 16QAM      | 36      | 0         | 21.14                 | 20.75                    | 20.80                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 20.93                 | 20.74                    | 20.72                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 20.79                 | 20.73                    | 20.80                  | 24                  | 0        |
| 15              | 16QAM      | 75      | 0         | 21.07                 | 20.77                    | 20.87                  |                     |          |
| Channel         |            |         |           | 20000                 | 20175                    | 20350                  |                     |          |
| Frequency (MHz) |            |         |           | 1715                  | 1732.5                   | 1750                   |                     |          |
| 10              | QPSK       | 1       | 0         | 23.02                 | 22.75                    | 22.81                  | 24                  | 0        |
| 10              | QPSK       | 1       | 25        | 22.90                 | 22.80                    | 22.80                  |                     |          |
| 10              | QPSK       | 1       | 49        | 22.80                 | 22.66                    | 22.78                  |                     |          |
| 10              | QPSK       | 25      | 0         | 22.12                 | 21.88                    | 21.89                  | 23                  | 1        |
| 10              | QPSK       | 25      | 12        | 22.04                 | 21.90                    | 21.82                  |                     |          |
| 10              | QPSK       | 25      | 25        | 21.88                 | 21.78                    | 21.70                  |                     |          |
| 10              | QPSK       | 50      | 0         | 21.94                 | 21.73                    | 21.85                  | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         | 22.22                 | 22.00                    | 22.03                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 22.32                 | 21.95                    | 22.08                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 21.97                 | 21.95                    | 21.96                  | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         | 21.03                 | 20.88                    | 20.82                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 21.05                 | 20.90                    | 20.87                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.83                 | 20.67                    | 20.72                  | 22                  | 2        |
| 10              | 16QAM      | 50      | 0         | 21.00                 | 20.81                    | 20.75                  |                     |          |



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| Channel         |       |    |    | 19975  | 20175  | 20375  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|--------|--------|------------------------|-------------|
| Frequency (MHz) |       |    |    | 1712.5 | 1732.5 | 1752.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 22.99  | 22.82  | 22.85  | 24                     | 0           |
| 5               | QPSK  | 1  | 12 | 23.05  | 22.67  | 22.74  |                        |             |
| 5               | QPSK  | 1  | 24 | 22.89  | 22.92  | 22.85  |                        |             |
| 5               | QPSK  | 12 | 0  | 21.87  | 21.71  | 21.82  | 23                     | 1           |
| 5               | QPSK  | 12 | 7  | 21.90  | 21.83  | 21.87  |                        |             |
| 5               | QPSK  | 12 | 13 | 21.78  | 21.58  | 21.75  |                        |             |
| 5               | QPSK  | 25 | 0  | 21.90  | 21.72  | 21.75  |                        |             |
| 5               | 16QAM | 1  | 0  | 22.23  | 22.02  | 22.01  | 23                     | 1           |
| 5               | 16QAM | 1  | 12 | 22.29  | 22.16  | 22.22  |                        |             |
| 5               | 16QAM | 1  | 24 | 22.15  | 22.17  | 22.05  |                        |             |
| 5               | 16QAM | 12 | 0  | 20.93  | 20.81  | 20.69  | 22                     | 2           |
| 5               | 16QAM | 12 | 7  | 20.99  | 20.71  | 20.68  |                        |             |
| 5               | 16QAM | 12 | 13 | 20.72  | 20.62  | 20.68  |                        |             |
| 5               | 16QAM | 25 | 0  | 21.04  | 20.69  | 20.71  |                        |             |
| Channel         |       |    |    | 19965  | 20175  | 20385  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1711.5 | 1732.5 | 1753.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 22.87  | 22.70  | 22.58  | 24                     | 0           |
| 3               | QPSK  | 1  | 8  | 22.87  | 22.77  | 22.61  |                        |             |
| 3               | QPSK  | 1  | 14 | 22.81  | 22.68  | 22.62  |                        |             |
| 3               | QPSK  | 8  | 0  | 21.80  | 21.69  | 21.61  | 23                     | 1           |
| 3               | QPSK  | 8  | 4  | 21.70  | 21.55  | 21.73  |                        |             |
| 3               | QPSK  | 8  | 7  | 21.71  | 21.59  | 21.67  |                        |             |
| 3               | QPSK  | 15 | 0  | 21.70  | 21.72  | 21.71  |                        |             |
| 3               | 16QAM | 1  | 0  | 21.83  | 21.85  | 21.84  | 23                     | 1           |
| 3               | 16QAM | 1  | 8  | 22.01  | 22.06  | 22.08  |                        |             |
| 3               | 16QAM | 1  | 14 | 21.82  | 21.77  | 21.87  |                        |             |
| 3               | 16QAM | 8  | 0  | 20.86  | 20.66  | 20.75  | 22                     | 2           |
| 3               | 16QAM | 8  | 4  | 20.72  | 20.60  | 20.69  |                        |             |
| 3               | 16QAM | 8  | 7  | 20.83  | 20.62  | 20.76  |                        |             |
| 3               | 16QAM | 15 | 0  | 20.78  | 20.68  | 20.64  |                        |             |
| 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  | 22.91  | 22.84  | 22.93  | 24                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 23.09  | 22.82  | 22.93  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 22.88  | 22.64  | 22.84  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 22.86  | 22.62  | 22.71  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 22.95  | 22.80  | 22.85  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 22.99  | 22.65  | 22.63  |                        |             |
| 1.4             | QPSK  | 6  | 0  | 21.84  | 21.71  | 21.75  | 23                     | 1           |
| 1.4             | 16QAM | 1  | 0  | 22.38  | 22.07  | 22.22  | 23                     | 1           |
| 1.4             | 16QAM | 1  | 3  | 22.42  | 22.10  | 22.13  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 22.31  | 21.93  | 22.12  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 21.93  | 21.71  | 21.75  |                        |             |
| 1.4             | 16QAM | 3  | 1  | 21.91  | 21.67  | 21.87  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 21.91  | 21.69  | 21.81  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 20.85  | 20.77  | 20.84  | 22                     | 2           |



**<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         | 22.73                 | 22.65                    | 22.70                  | 24                  | 0        |
| 10              | QPSK       | 1       | 25        | 22.56                 | 22.53                    | 22.64                  |                     |          |
| 10              | QPSK       | 1       | 49        | 22.34                 | 22.43                    | 22.51                  |                     |          |
| 10              | QPSK       | 25      | 0         | 21.57                 | 21.54                    | 21.56                  | 23                  | 1        |
| 10              | QPSK       | 25      | 12        | 21.54                 | 21.38                    | 21.57                  |                     |          |
| 10              | QPSK       | 25      | 25        | 21.53                 | 21.34                    | 21.38                  |                     |          |
| 10              | QPSK       | 50      | 0         | 21.45                 | 21.37                    | 21.38                  |                     |          |
| 10              | 16QAM      | 1       | 0         | 21.98                 | 21.70                    | 21.77                  | 23                  | 1        |
| 10              | 16QAM      | 1       | 25        | 22.02                 | 21.86                    | 21.72                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 21.65                 | 21.65                    | 21.78                  |                     |          |
| 10              | 16QAM      | 25      | 0         | 20.56                 | 20.45                    | 20.64                  | 22                  | 2        |
| 10              | 16QAM      | 25      | 12        | 20.42                 | 20.49                    | 20.43                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.55                 | 20.37                    | 20.50                  |                     |          |
| 10              | 16QAM      | 50      | 0         | 20.51                 | 20.45                    | 20.50                  |                     |          |
| Channel         |            |         |           | 20425                 | 20525                    | 20625                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 826.5                 | 836.5                    | 846.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 22.59                 | 22.34                    | 22.47                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 22.44                 | 22.50                    | 22.56                  |                     |          |
| 5               | QPSK       | 1       | 24        | 22.45                 | 22.50                    | 22.39                  |                     |          |
| 5               | QPSK       | 12      | 0         | 21.45                 | 21.43                    | 21.48                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 21.51                 | 21.50                    | 21.44                  |                     |          |
| 5               | QPSK       | 12      | 13        | 21.54                 | 21.51                    | 21.39                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.50                 | 21.46                    | 21.50                  |                     |          |
| 5               | 16QAM      | 1       | 0         | 21.91                 | 21.55                    | 21.75                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 12        | 21.86                 | 21.71                    | 21.87                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 21.81                 | 21.63                    | 21.80                  |                     |          |
| 5               | 16QAM      | 12      | 0         | 20.47                 | 20.36                    | 20.45                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 7         | 20.59                 | 20.55                    | 20.63                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.53                 | 20.50                    | 20.41                  |                     |          |
| 5               | 16QAM      | 25      | 0         | 20.59                 | 20.48                    | 20.36                  |                     |          |
| Channel         |            |         |           | 20415                 | 20525                    | 20635                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 825.5                 | 836.5                    | 847.5                  |                     |          |
| 3               | QPSK       | 1       | 0         | 22.59                 | 22.48                    | 22.31                  | 24                  | 0        |
| 3               | QPSK       | 1       | 8         | 22.45                 | 22.51                    | 22.54                  |                     |          |
| 3               | QPSK       | 1       | 14        | 22.47                 | 22.52                    | 22.51                  |                     |          |
| 3               | QPSK       | 8       | 0         | 21.47                 | 21.51                    | 21.32                  | 23                  | 1        |
| 3               | QPSK       | 8       | 4         | 21.60                 | 21.35                    | 21.52                  |                     |          |
| 3               | QPSK       | 8       | 7         | 21.44                 | 21.42                    | 21.55                  |                     |          |
| 3               | QPSK       | 15      | 0         | 21.44                 | 21.47                    | 21.43                  |                     |          |
| 3               | 16QAM      | 1       | 0         | 21.81                 | 21.57                    | 21.69                  | 23                  | 1        |
| 3               | 16QAM      | 1       | 8         | 21.75                 | 21.56                    | 21.65                  |                     |          |
| 3               | 16QAM      | 1       | 14        | 21.71                 | 21.53                    | 21.64                  |                     |          |
| 3               | 16QAM      | 8       | 0         | 20.65                 | 20.36                    | 20.41                  | 22                  | 2        |
| 3               | 16QAM      | 8       | 4         | 20.49                 | 20.58                    | 20.50                  |                     |          |
| 3               | 16QAM      | 8       | 7         | 20.38                 | 20.47                    | 20.56                  |                     |          |
| 3               | 16QAM      | 15      | 0         | 20.45                 | 20.55                    | 20.46                  |                     |          |



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| 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 | 22.71 | 22.56 | 22.65 | 24                     | 0           |
| 1.4             | QPSK  | 1 | 3 | 22.55 | 22.65 | 22.59 |                        |             |
| 1.4             | QPSK  | 1 | 5 | 22.49 | 22.44 | 22.57 |                        |             |
| 1.4             | QPSK  | 3 | 0 | 22.61 | 22.60 | 22.55 |                        |             |
| 1.4             | QPSK  | 3 | 1 | 22.59 | 22.54 | 22.51 |                        |             |
| 1.4             | QPSK  | 3 | 3 | 22.40 | 22.52 | 22.58 |                        |             |
| 1.4             | QPSK  | 6 | 0 | 21.41 | 21.61 | 21.34 | 23                     | 1           |
| 1.4             | 16QAM | 1 | 0 | 21.98 | 21.75 | 21.89 | 23                     | 1           |
| 1.4             | 16QAM | 1 | 3 | 22.00 | 21.68 | 21.96 |                        |             |
| 1.4             | 16QAM | 1 | 5 | 21.86 | 21.67 | 21.81 |                        |             |
| 1.4             | 16QAM | 3 | 0 | 21.62 | 21.45 | 21.56 |                        |             |
| 1.4             | 16QAM | 3 | 1 | 21.71 | 21.57 | 21.53 |                        |             |
| 1.4             | 16QAM | 3 | 3 | 21.57 | 21.38 | 21.45 |                        |             |
| 1.4             | 16QAM | 6 | 0 | 20.56 | 20.51 | 20.54 | 22                     | 2           |



**<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         | 22.14                    | 22.49                       | 22.11                     |                        |             |
| 20              | QPSK       | 1       | 49        | 22.36                    | 22.36                       | 22.20                     | 23                     | 0           |
| 20              | QPSK       | 1       | 99        | 22.28                    | 22.14                       | 22.10                     |                        |             |
| 20              | QPSK       | 50      | 0         | 21.32                    | 21.47                       | 21.22                     |                        |             |
| 20              | QPSK       | 50      | 24        | 21.40                    | 21.54                       | 21.24                     | 22                     | 1           |
| 20              | QPSK       | 50      | 50        | 21.48                    | 21.38                       | 21.31                     |                        |             |
| 20              | QPSK       | 100     | 0         | 21.31                    | 21.46                       | 21.22                     |                        |             |
| 20              | 16QAM      | 1       | 0         | 21.35                    | 21.69                       | 21.40                     | 22                     | 1           |
| 20              | 16QAM      | 1       | 49        | 21.65                    | 21.61                       | 21.57                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 21.46                    | 21.44                       | 21.34                     |                        |             |
| 20              | 16QAM      | 50      | 0         | 20.30                    | 20.52                       | 20.28                     | 22                     | 1           |
| 20              | 16QAM      | 50      | 24        | 20.39                    | 20.55                       | 20.28                     |                        |             |
| 20              | 16QAM      | 50      | 50        | 20.43                    | 20.43                       | 20.33                     |                        |             |
| 20              | 16QAM      | 100     | 0         | 20.33                    | 20.51                       | 20.28                     |                        |             |
| Channel         |            |         |           | 20825                    | 21100                       | 21375                     | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 2507.5                   | 2535                        | 2562.5                    |                        |             |
| 15              | QPSK       | 1       | 0         | 22.05                    | 22.42                       | 22.13                     |                        |             |
| 15              | QPSK       | 1       | 37        | 22.45                    | 22.33                       | 22.17                     | 23                     | 0           |
| 15              | QPSK       | 1       | 74        | 22.37                    | 22.10                       | 22.03                     |                        |             |
| 15              | QPSK       | 36      | 0         | 21.40                    | 21.55                       | 21.30                     |                        |             |
| 15              | QPSK       | 36      | 20        | 21.42                    | 21.60                       | 21.25                     | 22                     | 1           |
| 15              | QPSK       | 36      | 39        | 21.38                    | 21.39                       | 21.39                     |                        |             |
| 15              | QPSK       | 75      | 0         | 21.39                    | 21.48                       | 21.13                     |                        |             |
| 15              | 16QAM      | 1       | 0         | 21.45                    | 21.67                       | 21.34                     | 22                     | 1           |
| 15              | 16QAM      | 1       | 37        | 21.65                    | 21.52                       | 21.63                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 21.47                    | 21.39                       | 21.28                     |                        |             |
| 15              | 16QAM      | 36      | 0         | 20.34                    | 20.57                       | 20.37                     | 22                     | 1           |
| 15              | 16QAM      | 36      | 20        | 20.41                    | 20.52                       | 20.36                     |                        |             |
| 15              | 16QAM      | 36      | 39        | 20.51                    | 20.33                       | 20.28                     |                        |             |
| 15              | 16QAM      | 75      | 0         | 20.42                    | 20.43                       | 20.30                     |                        |             |
| Channel         |            |         |           | 20800                    | 21100                       | 21400                     | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 2505                     | 2535                        | 2565                      |                        |             |
| 10              | QPSK       | 1       | 0         | 22.22                    | 22.40                       | 22.05                     |                        |             |
| 10              | QPSK       | 1       | 25        | 22.28                    | 22.29                       | 22.18                     | 23                     | 0           |
| 10              | QPSK       | 1       | 49        | 22.36                    | 22.09                       | 22.19                     |                        |             |
| 10              | QPSK       | 25      | 0         | 21.41                    | 21.53                       | 21.31                     |                        |             |
| 10              | QPSK       | 25      | 12        | 21.30                    | 21.54                       | 21.14                     | 22                     | 1           |
| 10              | QPSK       | 25      | 25        | 21.42                    | 21.37                       | 21.32                     |                        |             |
| 10              | QPSK       | 50      | 0         | 21.32                    | 21.37                       | 21.23                     |                        |             |
| 10              | 16QAM      | 1       | 0         | 21.39                    | 21.75                       | 21.36                     | 22                     | 1           |
| 10              | 16QAM      | 1       | 25        | 21.74                    | 21.54                       | 21.57                     |                        |             |
| 10              | 16QAM      | 1       | 49        | 21.38                    | 21.38                       | 21.32                     |                        |             |
| 10              | 16QAM      | 25      | 0         | 20.34                    | 20.62                       | 20.34                     | 22                     | 1           |
| 10              | 16QAM      | 25      | 12        | 20.49                    | 20.52                       | 20.18                     |                        |             |
| 10              | 16QAM      | 25      | 25        | 20.33                    | 20.42                       | 20.24                     |                        |             |
| 10              | 16QAM      | 50      | 0         | 20.29                    | 20.43                       | 20.25                     |                        |             |



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| Channel         |       |    |    | 20775  | 21100 | 21425  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| Frequency (MHz) |       |    |    | 2502.5 | 2535  | 2567.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 22.09  | 22.48 | 22.10  | 23                     | 0           |
| 5               | QPSK  | 1  | 12 | 22.45  | 22.30 | 22.14  |                        |             |
| 5               | QPSK  | 1  | 24 | 22.29  | 22.16 | 22.06  |                        |             |
| 5               | QPSK  | 12 | 0  | 21.30  | 21.53 | 21.28  | 22                     | 1           |
| 5               | QPSK  | 12 | 7  | 21.36  | 21.52 | 21.33  |                        |             |
| 5               | QPSK  | 12 | 13 | 21.55  | 21.44 | 21.41  |                        |             |
| 5               | QPSK  | 25 | 0  | 21.37  | 21.43 | 21.22  |                        |             |
| 5               | 16QAM | 1  | 0  | 21.36  | 21.70 | 21.50  | 22                     | 1           |
| 5               | 16QAM | 1  | 12 | 21.58  | 21.52 | 21.62  |                        |             |
| 5               | 16QAM | 1  | 24 | 21.50  | 21.52 | 21.28  |                        |             |
| 5               | 16QAM | 12 | 0  | 20.23  | 20.59 | 20.21  | 22                     | 1           |
| 5               | 16QAM | 12 | 7  | 20.47  | 20.64 | 20.26  |                        |             |
| 5               | 16QAM | 12 | 13 | 20.47  | 20.38 | 20.40  |                        |             |
| 5               | 16QAM | 25 | 0  | 20.39  | 20.59 | 20.28  |                        |             |

**<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                  | 24                  | 0        |
| Frequency (MHz) |            |         |           | 704                   | 707.5                    | 711                    |                     |          |
| 10              | QPSK       | 1       | 0         | 23.33                 | 23.24                    | 23.24                  |                     |          |
| 10              | QPSK       | 1       | 25        | 23.21                 | 23.15                    | 23.19                  | 23                  | 1        |
| 10              | QPSK       | 1       | 49        | 23.08                 | 23.24                    | 22.95                  |                     |          |
| 10              | QPSK       | 25      | 0         | 22.20                 | 22.13                    | 21.91                  |                     |          |
| 10              | QPSK       | 25      | 12        | 22.08                 | 22.10                    | 21.89                  |                     |          |
| 10              | QPSK       | 25      | 25        | 22.15                 | 21.96                    | 22.03                  | 23                  | 1        |
| 10              | QPSK       | 50      | 0         | 22.25                 | 21.95                    | 21.96                  |                     |          |
| 10              | 16QAM      | 1       | 0         | 22.55                 | 22.36                    | 22.52                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 22.53                 | 22.32                    | 22.39                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 22.20                 | 22.26                    | 22.35                  | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         | 21.19                 | 21.05                    | 21.00                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 21.12                 | 21.06                    | 21.06                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 21.17                 | 21.05                    | 21.03                  |                     |          |
| 10              | 16QAM      | 50      | 0         | 21.07                 | 21.05                    | 21.02                  | 24                  | 0        |
| Channel         |            |         |           | 23035                 | 23095                    | 23155                  |                     |          |
| Frequency (MHz) |            |         |           | 701.5                 | 707.5                    | 713.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 23.31                 | 23.05                    | 23.07                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 23.19                 | 22.89                    | 22.80                  |                     |          |
| 5               | QPSK       | 1       | 24        | 23.13                 | 22.91                    | 22.99                  |                     |          |
| 5               | QPSK       | 12      | 0         | 22.17                 | 21.99                    | 21.94                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 22.18                 | 22.05                    | 21.96                  |                     |          |
| 5               | QPSK       | 12      | 13        | 22.11                 | 22.02                    | 21.83                  |                     |          |
| 5               | QPSK       | 25      | 0         | 22.18                 | 21.93                    | 22.04                  |                     |          |
| 5               | 16QAM      | 1       | 0         | 22.51                 | 22.39                    | 22.19                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 12        | 22.59                 | 22.33                    | 22.50                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 22.37                 | 22.16                    | 22.27                  |                     |          |
| 5               | 16QAM      | 12      | 0         | 21.07                 | 21.08                    | 20.93                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 7         | 21.12                 | 20.99                    | 20.90                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 21.13                 | 21.01                    | 20.85                  |                     |          |
| 5               | 16QAM      | 25      | 0         | 21.22                 | 21.11                    | 20.80                  |                     |          |
| Channel         |            |         |           | 23025                 | 23095                    | 23165                  | 24                  | 0        |
| Frequency (MHz) |            |         |           | 700.5                 | 707.5                    | 714.5                  |                     |          |
| 3               | QPSK       | 1       | 0         | 23.19                 | 22.97                    | 22.87                  |                     |          |
| 3               | QPSK       | 1       | 8         | 23.14                 | 22.94                    | 22.84                  | 23                  | 1        |
| 3               | QPSK       | 1       | 14        | 22.96                 | 22.86                    | 22.87                  |                     |          |
| 3               | QPSK       | 8       | 0         | 22.16                 | 22.00                    | 21.92                  |                     |          |
| 3               | QPSK       | 8       | 4         | 22.05                 | 21.93                    | 21.99                  |                     |          |
| 3               | QPSK       | 8       | 7         | 22.05                 | 21.77                    | 21.98                  | 23                  | 1        |
| 3               | QPSK       | 15      | 0         | 22.25                 | 21.85                    | 21.93                  |                     |          |
| 3               | 16QAM      | 1       | 0         | 22.41                 | 22.19                    | 22.05                  |                     |          |
| 3               | 16QAM      | 1       | 8         | 22.39                 | 22.18                    | 22.22                  |                     |          |
| 3               | 16QAM      | 1       | 14        | 22.39                 | 22.05                    | 22.20                  | 22                  | 2        |
| 3               | 16QAM      | 8       | 0         | 21.32                 | 21.00                    | 20.94                  |                     |          |
| 3               | 16QAM      | 8       | 4         | 21.22                 | 21.01                    | 20.94                  |                     |          |
| 3               | 16QAM      | 8       | 7         | 21.07                 | 20.86                    | 20.95                  |                     |          |
| 3               | 16QAM      | 15      | 0         | 21.25                 | 20.86                    | 21.01                  | 24                  | 0        |



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| 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 | 23.14 | 23.21 | 23.13 | 24                     | 0           |
| 1.4             | QPSK  | 1 | 3 | 23.14 | 23.01 | 23.11 |                        |             |
| 1.4             | QPSK  | 1 | 5 | 23.07 | 23.13 | 22.99 |                        |             |
| 1.4             | QPSK  | 3 | 0 | 23.13 | 23.02 | 22.86 |                        |             |
| 1.4             | QPSK  | 3 | 1 | 23.03 | 23.13 | 23.04 |                        |             |
| 1.4             | QPSK  | 3 | 3 | 23.23 | 23.03 | 22.87 |                        |             |
| 1.4             | QPSK  | 6 | 0 | 22.09 | 22.03 | 21.87 | 23                     | 1           |
| 1.4             | 16QAM | 1 | 0 | 22.61 | 22.35 | 22.37 | 23                     | 1           |
| 1.4             | 16QAM | 1 | 3 | 22.58 | 22.42 | 22.46 |                        |             |
| 1.4             | 16QAM | 1 | 5 | 22.58 | 22.32 | 22.31 |                        |             |
| 1.4             | 16QAM | 3 | 0 | 22.21 | 22.04 | 22.13 |                        |             |
| 1.4             | 16QAM | 3 | 1 | 22.27 | 22.09 | 21.89 |                        |             |
| 1.4             | 16QAM | 3 | 3 | 22.17 | 22.11 | 22.08 |                        |             |
| 1.4             | 16QAM | 6 | 0 | 21.29 | 20.89 | 21.06 | 22                     | 2           |

**<LTE Band 13>**

| BW [MHz]        | Modulation | RB Size | RB Offset | 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         | 22.46                       |                                |                              | 24                     | 0           |
| 10              | QPSK       | 1       | 25        | 22.28                       |                                |                              |                        |             |
| 10              | QPSK       | 1       | 49        | 22.40                       |                                |                              |                        |             |
| 10              | QPSK       | 25      | 0         | 21.34                       |                                |                              | 23                     | 1           |
| 10              | QPSK       | 25      | 12        | 21.20                       |                                |                              |                        |             |
| 10              | QPSK       | 25      | 25        | 21.18                       |                                |                              |                        |             |
| 10              | QPSK       | 50      | 0         | 21.28                       |                                |                              |                        |             |
| 10              | 16QAM      | 1       | 0         | 21.76                       |                                |                              | 23                     | 1           |
| 10              | 16QAM      | 1       | 25        | 21.49                       |                                |                              |                        |             |
| 10              | 16QAM      | 1       | 49        | 21.57                       |                                |                              |                        |             |
| 10              | 16QAM      | 25      | 0         | 20.33                       |                                |                              | 22                     | 2           |
| 10              | 16QAM      | 25      | 12        | 20.25                       |                                |                              |                        |             |
| 10              | 16QAM      | 25      | 25        | 20.21                       |                                |                              |                        |             |
| 10              | 16QAM      | 50      | 0         | 20.26                       |                                |                              |                        |             |
| Channel         |            |         |           | 23205                       | 23230                          | 23255                        | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 779.5                       | 782                            | 784.5                        |                        |             |
| 5               | QPSK       | 1       | 0         | 22.38                       | 22.22                          | 22.08                        | 24                     | 0           |
| 5               | QPSK       | 1       | 12        | 22.36                       | 22.03                          | 22.21                        |                        |             |
| 5               | QPSK       | 1       | 24        | 22.23                       | 22.33                          | 22.41                        |                        |             |
| 5               | QPSK       | 12      | 0         | 21.42                       | 21.03                          | 21.08                        | 23                     | 1           |
| 5               | QPSK       | 12      | 7         | 21.28                       | 21.19                          | 21.32                        |                        |             |
| 5               | QPSK       | 12      | 13        | 21.14                       | 21.07                          | 21.30                        |                        |             |
| 5               | QPSK       | 25      | 0         | 21.27                       | 21.16                          | 21.15                        |                        |             |
| 5               | 16QAM      | 1       | 0         | 21.73                       | 21.53                          | 21.39                        | 23                     | 1           |
| 5               | 16QAM      | 1       | 12        | 21.79                       | 21.42                          | 21.58                        |                        |             |
| 5               | 16QAM      | 1       | 24        | 21.39                       | 21.56                          | 21.68                        |                        |             |
| 5               | 16QAM      | 12      | 0         | 20.33                       | 20.15                          | 20.19                        | 22                     | 2           |
| 5               | 16QAM      | 12      | 7         | 20.42                       | 20.08                          | 20.24                        |                        |             |
| 5               | 16QAM      | 12      | 13        | 20.05                       | 20.09                          | 20.34                        |                        |             |
| 5               | 16QAM      | 25      | 0         | 20.25                       | 20.07                          | 20.16                        |                        |             |

**<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                  | 24                  | 0        |
| Frequency (MHz) |            |         |           | 1860                  | 1880                     | 1905                   |                     |          |
| 20              | QPSK       | 1       | 0         | 23.05                 | 22.91                    | 23.02                  |                     |          |
| 20              | QPSK       | 1       | 49        | 22.89                 | 22.90                    | 22.90                  | 23                  | 1        |
| 20              | QPSK       | 1       | 99        | 22.67                 | 22.53                    | 22.76                  |                     |          |
| 20              | QPSK       | 50      | 0         | 21.85                 | 21.77                    | 21.90                  |                     |          |
| 20              | QPSK       | 50      | 24        | 21.83                 | 21.78                    | 21.92                  | 23                  | 1        |
| 20              | QPSK       | 50      | 50        | 21.77                 | 21.75                    | 21.84                  |                     |          |
| 20              | QPSK       | 100     | 0         | 21.74                 | 21.74                    | 21.98                  |                     |          |
| 20              | 16QAM      | 1       | 0         | 22.20                 | 21.98                    | 22.24                  | 23                  | 1        |
| 20              | 16QAM      | 1       | 49        | 22.07                 | 22.02                    | 22.31                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 21.96                 | 21.75                    | 21.96                  |                     |          |
| 20              | 16QAM      | 50      | 0         | 20.90                 | 20.85                    | 20.85                  | 22                  | 2        |
| 20              | 16QAM      | 50      | 24        | 20.83                 | 20.77                    | 20.98                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 20.73                 | 20.69                    | 20.76                  |                     |          |
| 20              | 16QAM      | 100     | 0         | 20.73                 | 20.75                    | 20.94                  | 24                  | 0        |
| Channel         |            |         |           | 26115                 | 26340                    | 26615                  |                     |          |
| Frequency (MHz) |            |         |           | 1857.5                | 1880                     | 1907.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 22.78                 | 22.78                    | 22.94                  | 24                  | 0        |
| 15              | QPSK       | 1       | 37        | 22.92                 | 22.80                    | 22.89                  |                     |          |
| 15              | QPSK       | 1       | 74        | 22.73                 | 22.61                    | 22.65                  |                     |          |
| 15              | QPSK       | 36      | 0         | 21.82                 | 21.66                    | 22.01                  | 23                  | 1        |
| 15              | QPSK       | 36      | 20        | 21.79                 | 21.84                    | 21.98                  |                     |          |
| 15              | QPSK       | 36      | 39        | 21.81                 | 21.79                    | 21.94                  |                     |          |
| 15              | QPSK       | 75      | 0         | 21.74                 | 21.86                    | 22.02                  | 23                  | 1        |
| 15              | 16QAM      | 1       | 0         | 21.99                 | 22.17                    | 22.19                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 22.13                 | 22.12                    | 22.25                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 21.98                 | 21.89                    | 21.90                  | 22                  | 2        |
| 15              | 16QAM      | 36      | 0         | 20.80                 | 20.73                    | 20.85                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 20.93                 | 20.94                    | 20.96                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 20.78                 | 20.75                    | 20.74                  | 24                  | 0        |
| 15              | 16QAM      | 75      | 0         | 20.78                 | 20.78                    | 21.00                  |                     |          |
| Channel         |            |         |           | 26090                 | 26340                    | 26640                  |                     |          |
| Frequency (MHz) |            |         |           | 1855                  | 1880                     | 1910                   |                     |          |
| 10              | QPSK       | 1       | 0         | 22.92                 | 22.88                    | 23.02                  | 24                  | 0        |
| 10              | QPSK       | 1       | 25        | 22.99                 | 23.04                    | 22.80                  |                     |          |
| 10              | QPSK       | 1       | 49        | 22.76                 | 22.74                    | 22.78                  |                     |          |
| 10              | QPSK       | 25      | 0         | 21.74                 | 21.82                    | 21.88                  | 23                  | 1        |
| 10              | QPSK       | 25      | 12        | 21.73                 | 21.71                    | 21.77                  |                     |          |
| 10              | QPSK       | 25      | 25        | 21.78                 | 21.76                    | 21.74                  |                     |          |
| 10              | QPSK       | 50      | 0         | 21.67                 | 21.74                    | 21.96                  | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         | 22.12                 | 22.23                    | 22.27                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 22.09                 | 22.09                    | 22.23                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 21.82                 | 22.02                    | 22.12                  | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         | 20.74                 | 20.82                    | 20.76                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 20.64                 | 20.82                    | 20.84                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.76                 | 20.60                    | 20.83                  | 22                  | 2        |
| 10              | 16QAM      | 50      | 0         | 20.79                 | 20.73                    | 20.89                  |                     |          |

| Channel         |       |    |    | 26065  | 26340 | 26665  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| Frequency (MHz) |       |    |    | 1852.5 | 1880  | 1912.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 22.89  | 22.97 | 22.76  | 24                     | 0           |
| 5               | QPSK  | 1  | 12 | 22.91  | 22.63 | 22.73  |                        |             |
| 5               | QPSK  | 1  | 24 | 22.79  | 22.71 | 22.79  |                        |             |
| 5               | QPSK  | 12 | 0  | 21.83  | 21.69 | 21.87  | 23                     | 1           |
| 5               | QPSK  | 12 | 7  | 21.75  | 21.71 | 21.94  |                        |             |
| 5               | QPSK  | 12 | 13 | 21.78  | 21.67 | 21.79  |                        |             |
| 5               | QPSK  | 25 | 0  | 21.74  | 21.75 | 21.89  |                        |             |
| 5               | 16QAM | 1  | 0  | 22.35  | 22.00 | 22.20  | 23                     | 1           |
| 5               | 16QAM | 1  | 12 | 22.12  | 21.91 | 22.20  |                        |             |
| 5               | 16QAM | 1  | 24 | 21.93  | 21.99 | 22.12  |                        |             |
| 5               | 16QAM | 12 | 0  | 20.85  | 20.74 | 20.74  | 22                     | 2           |
| 5               | 16QAM | 12 | 7  | 20.84  | 20.82 | 20.79  |                        |             |
| 5               | 16QAM | 12 | 13 | 20.82  | 20.78 | 20.90  |                        |             |
| 5               | 16QAM | 25 | 0  | 20.75  | 20.69 | 20.87  |                        |             |
| Channel         |       |    |    | 26055  | 26340 | 26675  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1851.5 | 1880  | 1913.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 22.98  | 22.90 | 22.70  | 24                     | 0           |
| 3               | QPSK  | 1  | 8  | 22.84  | 22.77 | 22.83  |                        |             |
| 3               | QPSK  | 1  | 14 | 22.79  | 22.76 | 22.87  |                        |             |
| 3               | QPSK  | 8  | 0  | 21.91  | 21.80 | 21.73  | 23                     | 1           |
| 3               | QPSK  | 8  | 4  | 21.85  | 21.68 | 21.75  |                        |             |
| 3               | QPSK  | 8  | 7  | 21.77  | 21.76 | 21.76  |                        |             |
| 3               | QPSK  | 15 | 0  | 21.77  | 21.64 | 21.83  |                        |             |
| 3               | 16QAM | 1  | 0  | 22.22  | 22.01 | 22.06  | 23                     | 1           |
| 3               | 16QAM | 1  | 8  | 22.14  | 21.94 | 22.14  |                        |             |
| 3               | 16QAM | 1  | 14 | 21.94  | 21.88 | 22.03  |                        |             |
| 3               | 16QAM | 8  | 0  | 20.97  | 20.70 | 20.70  | 22                     | 2           |
| 3               | 16QAM | 8  | 4  | 20.97  | 20.86 | 20.65  |                        |             |
| 3               | 16QAM | 8  | 7  | 20.90  | 20.74 | 20.71  |                        |             |
| 3               | 16QAM | 15 | 0  | 20.80  | 20.71 | 20.68  |                        |             |
| Channel         |       |    |    | 26047  | 26340 | 26683  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1850.7 | 1880  | 1914.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 22.92  | 22.76 | 22.79  | 24                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 22.79  | 22.66 | 22.89  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 22.76  | 22.77 | 22.67  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 22.72  | 22.70 | 22.65  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 22.81  | 22.69 | 22.66  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 22.68  | 22.68 | 22.64  |                        |             |
| 1.4             | QPSK  | 6  | 0  | 21.74  | 21.54 | 21.69  | 23                     | 1           |
| 1.4             | 16QAM | 1  | 0  | 22.01  | 21.98 | 22.06  | 23                     | 1           |
| 1.4             | 16QAM | 1  | 3  | 21.99  | 21.91 | 21.99  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 21.99  | 21.85 | 21.97  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 21.72  | 21.78 | 21.73  |                        |             |
| 1.4             | 16QAM | 3  | 1  | 21.74  | 21.80 | 21.86  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 21.82  | 21.63 | 21.79  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 20.74  | 20.74 | 20.74  | 22                     | 2           |

**<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                  | 24                  | 0        |
| Frequency (MHz) |            |         |           | 821.5                 | 831.5                    | 841.5                  |                     |          |
| 15              | QPSK       | 1       | 0         | 22.65                 | 22.93                    | 22.72                  |                     |          |
| 15              | QPSK       | 1       | 37        | 22.84                 | 22.57                    | 22.67                  | 23                  | 1        |
| 15              | QPSK       | 1       | 74        | 22.51                 | 22.53                    | 22.48                  |                     |          |
| 15              | QPSK       | 36      | 0         | 21.97                 | 21.72                    | 21.56                  |                     |          |
| 15              | QPSK       | 36      | 20        | 22.00                 | 21.69                    | 21.74                  | 23                  | 1        |
| 15              | QPSK       | 36      | 39        | 21.71                 | 21.46                    | 21.73                  |                     |          |
| 15              | QPSK       | 75      | 0         | 21.95                 | 21.63                    | 21.66                  |                     |          |
| 15              | 16QAM      | 1       | 0         | 22.34                 | 21.88                    | 21.72                  | 23                  | 1        |
| 15              | 16QAM      | 1       | 37        | 22.13                 | 21.74                    | 21.90                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 21.81                 | 21.65                    | 21.83                  |                     |          |
| 15              | 16QAM      | 36      | 0         | 20.91                 | 20.70                    | 20.67                  | 22                  | 2        |
| 15              | 16QAM      | 36      | 20        | 21.08                 | 20.63                    | 20.57                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 20.64                 | 20.53                    | 20.60                  |                     |          |
| 15              | 16QAM      | 75      | 0         | 20.83                 | 20.63                    | 20.74                  | 24                  | 0        |
| Channel         |            |         |           | 26740                 | 26865                    | 26990                  |                     |          |
| Frequency (MHz) |            |         |           | 819                   | 831.5                    | 844                    |                     |          |
| 10              | QPSK       | 1       | 0         | 22.87                 | 22.67                    | 22.60                  | 24                  | 0        |
| 10              | QPSK       | 1       | 25        | 22.87                 | 22.69                    | 22.53                  |                     |          |
| 10              | QPSK       | 1       | 49        | 22.83                 | 22.65                    | 22.48                  |                     |          |
| 10              | QPSK       | 25      | 0         | 21.99                 | 21.79                    | 21.61                  | 23                  | 1        |
| 10              | QPSK       | 25      | 12        | 22.01                 | 21.47                    | 21.48                  |                     |          |
| 10              | QPSK       | 25      | 25        | 21.92                 | 21.76                    | 21.54                  |                     |          |
| 10              | QPSK       | 50      | 0         | 21.94                 | 21.58                    | 21.59                  | 23                  | 1        |
| 10              | 16QAM      | 1       | 0         | 22.29                 | 21.71                    | 21.89                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 22.34                 | 21.86                    | 21.78                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 22.18                 | 21.70                    | 21.86                  | 22                  | 2        |
| 10              | 16QAM      | 25      | 0         | 20.86                 | 20.63                    | 20.70                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 20.93                 | 20.60                    | 20.43                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.81                 | 20.62                    | 20.56                  | 24                  | 0        |
| 10              | 16QAM      | 50      | 0         | 20.95                 | 20.82                    | 20.77                  |                     |          |
| Channel         |            |         |           | 26715                 | 26865                    | 27015                  |                     |          |
| Frequency (MHz) |            |         |           | 816.5                 | 831.5                    | 846.5                  |                     |          |
| 5               | QPSK       | 1       | 0         | 22.81                 | 22.71                    | 22.52                  | 24                  | 0        |
| 5               | QPSK       | 1       | 12        | 22.79                 | 22.67                    | 22.53                  |                     |          |
| 5               | QPSK       | 1       | 24        | 22.82                 | 22.64                    | 22.65                  |                     |          |
| 5               | QPSK       | 12      | 0         | 21.97                 | 21.67                    | 21.45                  | 23                  | 1        |
| 5               | QPSK       | 12      | 7         | 21.95                 | 21.47                    | 21.54                  |                     |          |
| 5               | QPSK       | 12      | 13        | 21.88                 | 21.67                    | 21.58                  |                     |          |
| 5               | QPSK       | 25      | 0         | 21.87                 | 21.55                    | 21.58                  | 23                  | 1        |
| 5               | 16QAM      | 1       | 0         | 22.32                 | 21.71                    | 21.76                  |                     |          |
| 5               | 16QAM      | 1       | 12        | 22.24                 | 21.87                    | 21.86                  |                     |          |
| 5               | 16QAM      | 1       | 24        | 22.18                 | 21.59                    | 21.74                  | 22                  | 2        |
| 5               | 16QAM      | 12      | 0         | 20.98                 | 20.70                    | 20.63                  |                     |          |
| 5               | 16QAM      | 12      | 7         | 20.90                 | 20.67                    | 20.47                  |                     |          |
| 5               | 16QAM      | 12      | 13        | 20.92                 | 20.64                    | 20.50                  | 22                  | 2        |
| 5               | 16QAM      | 25      | 0         | 21.00                 | 20.63                    | 20.66                  |                     |          |



# FCC SAR TEST REPORT

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| Channel         |       |    |    | 26705 | 26865 | 27025 | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|-------|-------|-------|------------------------|-------------|
| Frequency (MHz) |       |    |    | 815.5 | 831.5 | 847.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 22.84 | 22.91 | 22.69 | 24                     | 0           |
| 3               | QPSK  | 1  | 8  | 22.92 | 22.88 | 22.57 |                        |             |
| 3               | QPSK  | 1  | 14 | 22.90 | 22.70 | 22.69 |                        |             |
| 3               | QPSK  | 8  | 0  | 22.02 | 21.82 | 21.68 | 23                     | 1           |
| 3               | QPSK  | 8  | 4  | 22.02 | 21.71 | 21.76 |                        |             |
| 3               | QPSK  | 8  | 7  | 22.03 | 21.60 | 21.58 |                        |             |
| 3               | QPSK  | 15 | 0  | 22.05 | 21.78 | 21.51 |                        |             |
| 3               | 16QAM | 1  | 0  | 22.20 | 21.91 | 21.91 | 23                     | 1           |
| 3               | 16QAM | 1  | 8  | 22.27 | 22.09 | 21.86 |                        |             |
| 3               | 16QAM | 1  | 14 | 22.17 | 21.97 | 21.91 |                        |             |
| 3               | 16QAM | 8  | 0  | 20.99 | 20.80 | 20.77 | 22                     | 2           |
| 3               | 16QAM | 8  | 4  | 20.96 | 20.77 | 20.62 |                        |             |
| 3               | 16QAM | 8  | 7  | 20.93 | 20.69 | 20.69 |                        |             |
| 3               | 16QAM | 15 | 0  | 20.86 | 20.65 | 20.63 |                        |             |
| 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  | 22.92 | 22.56 | 22.54 | 24                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 22.90 | 22.57 | 22.49 |                        |             |
| 1.4             | QPSK  | 1  | 5  | 22.90 | 22.71 | 22.55 |                        |             |
| 1.4             | QPSK  | 3  | 0  | 22.85 | 22.73 | 22.56 |                        |             |
| 1.4             | QPSK  | 3  | 1  | 22.84 | 22.65 | 22.47 |                        |             |
| 1.4             | QPSK  | 3  | 3  | 22.81 | 22.63 | 22.46 |                        |             |
| 1.4             | QPSK  | 6  | 0  | 21.84 | 21.91 | 21.59 | 23                     | 1           |
| 1.4             | 16QAM | 1  | 0  | 22.21 | 21.72 | 21.84 | 23                     | 1           |
| 1.4             | 16QAM | 1  | 3  | 22.40 | 21.66 | 21.86 |                        |             |
| 1.4             | 16QAM | 1  | 5  | 22.34 | 21.78 | 21.87 |                        |             |
| 1.4             | 16QAM | 3  | 0  | 21.97 | 21.61 | 21.61 |                        |             |
| 1.4             | 16QAM | 3  | 1  | 22.02 | 21.93 | 21.45 |                        |             |
| 1.4             | 16QAM | 3  | 3  | 22.08 | 21.82 | 21.59 |                        |             |
| 1.4             | 16QAM | 6  | 0  | 21.04 | 20.91 | 20.80 | 22                     | 2           |

**<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 limit<br>(dBm) | MPR<br>(dB) |
|-----------------|------------|---------|-----------|--------------------------|-----------------------------|---------------------------|------------------------|-------------|
| Channel         |            |         |           | 18700                    | 18900                       | 19100                     |                        |             |
| Frequency (MHz) |            |         |           | 1860                     | 1880                        | 1900                      |                        |             |
| 20              | QPSK       | 1       | 0         | 21.62                    | 21.70                       | 21.88                     | 23                     | 0           |
| 20              | QPSK       | 1       | 49        | 21.33                    | 21.29                       | 21.53                     |                        |             |
| 20              | QPSK       | 1       | 99        | 21.11                    | 21.19                       | 21.31                     |                        |             |
| 20              | QPSK       | 50      | 0         | 21.31                    | 21.50                       | 21.49                     | 23                     | 0           |
| 20              | QPSK       | 50      | 24        | 21.41                    | 21.39                       | 21.71                     |                        |             |
| 20              | QPSK       | 50      | 50        | 21.36                    | 21.41                       | 21.66                     |                        |             |
| 20              | QPSK       | 100     | 0         | 21.29                    | 21.50                       | 21.56                     |                        |             |
| 20              | 16QAM      | 1       | 0         | 21.79                    | 21.73                       | 21.67                     | 23                     | 0           |
| 20              | 16QAM      | 1       | 49        | 21.73                    | 21.79                       | 21.88                     |                        |             |
| 20              | 16QAM      | 1       | 99        | 21.30                    | 21.59                       | 21.48                     |                        |             |
| 20              | 16QAM      | 50      | 0         | 20.54                    | 20.46                       | 20.57                     | 22                     | 1           |
| 20              | 16QAM      | 50      | 24        | 20.55                    | 20.52                       | 20.54                     |                        |             |
| 20              | 16QAM      | 50      | 50        | 20.38                    | 20.49                       | 20.62                     |                        |             |
| 20              | 16QAM      | 100     | 0         | 20.46                    | 20.52                       | 20.68                     |                        |             |
| Channel         |            |         |           | 18675                    | 18900                       | 19125                     | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 1857.5                   | 1880                        | 1902.5                    |                        |             |
| 15              | QPSK       | 1       | 0         | 21.55                    | 21.63                       | 21.77                     | 23                     | 0           |
| 15              | QPSK       | 1       | 37        | 21.22                    | 21.22                       | 21.48                     |                        |             |
| 15              | QPSK       | 1       | 74        | 21.01                    | 21.11                       | 21.16                     |                        |             |
| 15              | QPSK       | 36      | 0         | 21.19                    | 21.37                       | 21.36                     | 23                     | 0           |
| 15              | QPSK       | 36      | 20        | 21.26                    | 21.24                       | 21.65                     |                        |             |
| 15              | QPSK       | 36      | 39        | 21.29                    | 21.32                       | 21.57                     |                        |             |
| 15              | QPSK       | 75      | 0         | 21.16                    | 21.44                       | 21.42                     |                        |             |
| 15              | 16QAM      | 1       | 0         | 21.68                    | 21.62                       | 21.52                     | 23                     | 0           |
| 15              | 16QAM      | 1       | 37        | 21.58                    | 21.73                       | 21.80                     |                        |             |
| 15              | 16QAM      | 1       | 74        | 21.19                    | 21.54                       | 21.37                     |                        |             |
| 15              | 16QAM      | 36      | 0         | 20.42                    | 20.39                       | 20.44                     | 22                     | 1           |
| 15              | 16QAM      | 36      | 20        | 20.45                    | 20.41                       | 20.39                     |                        |             |
| 15              | 16QAM      | 36      | 39        | 20.33                    | 20.43                       | 20.55                     |                        |             |
| 15              | 16QAM      | 75      | 0         | 20.36                    | 20.41                       | 20.53                     |                        |             |
| Channel         |            |         |           | 18650                    | 18900                       | 19150                     | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |            |         |           | 1855                     | 1880                        | 1905                      |                        |             |
| 10              | QPSK       | 1       | 0         | 21.48                    | 21.57                       | 21.74                     | 23                     | 0           |
| 10              | QPSK       | 1       | 25        | 21.23                    | 21.24                       | 21.45                     |                        |             |
| 10              | QPSK       | 1       | 49        | 21.04                    | 21.14                       | 21.23                     |                        |             |
| 10              | QPSK       | 25      | 0         | 21.16                    | 21.43                       | 21.34                     | 23                     | 0           |
| 10              | QPSK       | 25      | 12        | 21.33                    | 21.26                       | 21.64                     |                        |             |
| 10              | QPSK       | 25      | 25        | 21.25                    | 21.35                       | 21.56                     |                        |             |
| 10              | QPSK       | 50      | 0         | 21.15                    | 21.40                       | 21.46                     |                        |             |
| 10              | 16QAM      | 1       | 0         | 21.74                    | 21.65                       | 21.60                     | 23                     | 0           |
| 10              | 16QAM      | 1       | 25        | 21.60                    | 21.70                       | 21.74                     |                        |             |
| 10              | 16QAM      | 1       | 49        | 21.17                    | 21.47                       | 21.42                     |                        |             |
| 10              | 16QAM      | 25      | 0         | 20.44                    | 20.35                       | 20.51                     | 22                     | 1           |
| 10              | 16QAM      | 25      | 12        | 20.50                    | 20.38                       | 20.43                     |                        |             |
| 10              | 16QAM      | 25      | 25        | 20.24                    | 20.35                       | 20.51                     |                        |             |
| 10              | 16QAM      | 50      | 0         | 20.40                    | 20.41                       | 20.62                     |                        |             |



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| Channel         |       |    |    | 18625  | 18900 | 19175  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| Frequency (MHz) |       |    |    | 1852.5 | 1880  | 1907.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 21.49  | 21.56 | 21.82  | 23                     | 0           |
| 5               | QPSK  | 1  | 12 | 21.28  | 21.15 | 21.46  |                        |             |
| 5               | QPSK  | 1  | 24 | 21.01  | 21.10 | 21.25  |                        |             |
| 5               | QPSK  | 12 | 0  | 21.19  | 21.37 | 21.38  | 23                     | 0           |
| 5               | QPSK  | 12 | 7  | 21.26  | 21.27 | 21.63  |                        |             |
| 5               | QPSK  | 12 | 13 | 21.28  | 21.34 | 21.52  |                        |             |
| 5               | QPSK  | 25 | 0  | 21.17  | 21.42 | 21.45  |                        |             |
| 5               | 16QAM | 1  | 0  | 21.69  | 21.66 | 21.58  | 23                     | 0           |
| 5               | 16QAM | 1  | 12 | 21.65  | 21.70 | 21.81  |                        |             |
| 5               | 16QAM | 1  | 24 | 21.20  | 21.47 | 21.38  |                        |             |
| 5               | 16QAM | 12 | 0  | 20.48  | 20.32 | 20.42  | 22                     | 1           |
| 5               | 16QAM | 12 | 7  | 20.41  | 20.41 | 20.47  |                        |             |
| 5               | 16QAM | 12 | 13 | 20.26  | 20.38 | 20.47  |                        |             |
| 5               | 16QAM | 25 | 0  | 20.36  | 20.47 | 20.59  |                        |             |
| Channel         |       |    |    | 18615  | 18900 | 19185  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1851.5 | 1880  | 1908.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 21.47  | 21.56 | 21.82  | 23                     | 0           |
| 3               | QPSK  | 1  | 8  | 21.27  | 21.18 | 21.46  |                        |             |
| 3               | QPSK  | 1  | 14 | 21.03  | 21.11 | 21.25  |                        |             |
| 3               | QPSK  | 8  | 0  | 21.21  | 21.42 | 21.34  | 23                     | 0           |
| 3               | QPSK  | 8  | 4  | 21.30  | 21.28 | 21.61  |                        |             |
| 3               | QPSK  | 8  | 7  | 21.27  | 21.31 | 21.54  |                        |             |
| 3               | QPSK  | 15 | 0  | 21.19  | 21.43 | 21.45  |                        |             |
| 3               | 16QAM | 1  | 0  | 21.72  | 21.67 | 21.59  | 23                     | 0           |
| 3               | 16QAM | 1  | 8  | 21.67  | 21.64 | 21.76  |                        |             |
| 3               | 16QAM | 1  | 14 | 21.22  | 21.44 | 21.41  |                        |             |
| 3               | 16QAM | 8  | 0  | 20.39  | 20.33 | 20.45  | 22                     | 1           |
| 3               | 16QAM | 8  | 4  | 20.49  | 20.37 | 20.42  |                        |             |
| 3               | 16QAM | 8  | 7  | 20.27  | 20.40 | 20.49  |                        |             |
| 3               | 16QAM | 15 | 0  | 20.39  | 20.45 | 20.54  |                        |             |
| Channel         |       |    |    | 18607  | 18900 | 19193  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1850.7 | 1880  | 1909.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 21.50  | 21.56 | 21.77  | 23                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 21.19  | 21.19 | 21.41  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 21.06  | 21.05 | 21.21  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 21.21  | 21.43 | 21.34  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 21.29  | 21.28 | 21.60  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 21.29  | 21.28 | 21.57  |                        |             |
| 1.4             | QPSK  | 6  | 0  | 21.14  | 21.39 | 21.45  | 23                     | 0           |
| 1.4             | 16QAM | 1  | 0  | 21.69  | 21.64 | 21.58  | 23                     | 0           |
| 1.4             | 16QAM | 1  | 3  | 21.59  | 21.64 | 21.74  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 21.20  | 21.50 | 21.43  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 21.63  | 21.56 | 21.59  |                        |             |
| 1.4             | 16QAM | 3  | 1  | 21.58  | 21.56 | 21.76  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 21.20  | 21.45 | 21.32  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 20.40  | 20.38 | 20.56  | 22                     | 1           |

**<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         | 22.07                 | 21.94                    | 21.97                  |                     |          |
| 20              | QPSK       | 1       | 49        | 21.84                 | 21.86                    | 21.82                  | 23                  | 0        |
| 20              | QPSK       | 1       | 99        | 21.63                 | 21.44                    | 21.68                  |                     |          |
| 20              | QPSK       | 50      | 0         | 21.78                 | 21.71                    | 21.81                  |                     |          |
| 20              | QPSK       | 50      | 24        | 21.82                 | 21.77                    | 21.87                  | 23                  | 0        |
| 20              | QPSK       | 50      | 50        | 21.71                 | 21.75                    | 21.79                  |                     |          |
| 20              | QPSK       | 100     | 0         | 21.74                 | 21.68                    | 21.93                  |                     |          |
| 20              | 16QAM      | 1       | 0         | 21.98                 | 21.98                    | 22.01                  | 23                  | 0        |
| 20              | 16QAM      | 1       | 49        | 22.04                 | 21.92                    | 21.96                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 21.95                 | 21.65                    | 21.90                  |                     |          |
| 20              | 16QAM      | 50      | 0         | 20.87                 | 20.84                    | 20.81                  | 22                  | 1        |
| 20              | 16QAM      | 50      | 24        | 20.79                 | 20.68                    | 20.90                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 20.66                 | 20.66                    | 20.69                  |                     |          |
| 20              | 16QAM      | 100     | 0         | 20.71                 | 20.65                    | 20.91                  |                     |          |
| Channel         |            |         |           | 26115                 | 26340                    | 26615                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 1857.5                | 1880                     | 1907.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 22.02                 | 21.88                    | 21.84                  |                     |          |
| 15              | QPSK       | 1       | 37        | 21.74                 | 21.76                    | 21.76                  | 23                  | 0        |
| 15              | QPSK       | 1       | 74        | 21.54                 | 21.29                    | 21.55                  |                     |          |
| 15              | QPSK       | 36      | 0         | 21.67                 | 21.61                    | 21.75                  |                     |          |
| 15              | QPSK       | 36      | 20        | 21.73                 | 21.68                    | 21.79                  | 23                  | 0        |
| 15              | QPSK       | 36      | 39        | 21.63                 | 21.65                    | 21.65                  |                     |          |
| 15              | QPSK       | 75      | 0         | 21.63                 | 21.57                    | 21.85                  |                     |          |
| 15              | 16QAM      | 1       | 0         | 21.90                 | 21.93                    | 21.87                  | 23                  | 0        |
| 15              | 16QAM      | 1       | 37        | 21.98                 | 21.82                    | 21.83                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 21.86                 | 21.55                    | 21.75                  |                     |          |
| 15              | 16QAM      | 36      | 0         | 20.81                 | 20.72                    | 20.73                  | 22                  | 1        |
| 15              | 16QAM      | 36      | 20        | 20.69                 | 20.56                    | 20.78                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 20.60                 | 20.60                    | 20.60                  |                     |          |
| 15              | 16QAM      | 75      | 0         | 20.62                 | 20.59                    | 20.76                  |                     |          |
| Channel         |            |         |           | 26090                 | 26340                    | 26640                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 1855                  | 1880                     | 1910                   |                     |          |
| 10              | QPSK       | 1       | 0         | 22.01                 | 21.82                    | 21.87                  |                     |          |
| 10              | QPSK       | 1       | 25        | 21.73                 | 21.78                    | 21.72                  | 23                  | 0        |
| 10              | QPSK       | 1       | 49        | 21.53                 | 21.33                    | 21.58                  |                     |          |
| 10              | QPSK       | 25      | 0         | 21.63                 | 21.59                    | 21.67                  |                     |          |
| 10              | QPSK       | 25      | 12        | 21.73                 | 21.68                    | 21.73                  | 23                  | 0        |
| 10              | QPSK       | 25      | 25        | 21.57                 | 21.70                    | 21.65                  |                     |          |
| 10              | QPSK       | 50      | 0         | 21.69                 | 21.60                    | 21.86                  |                     |          |
| 10              | 16QAM      | 1       | 0         | 21.90                 | 21.88                    | 21.95                  | 23                  | 0        |
| 10              | 16QAM      | 1       | 25        | 21.93                 | 21.82                    | 21.85                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 21.82                 | 21.51                    | 21.75                  |                     |          |
| 10              | 16QAM      | 25      | 0         | 20.73                 | 20.69                    | 20.70                  | 22                  | 1        |
| 10              | 16QAM      | 25      | 12        | 20.72                 | 20.54                    | 20.83                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.61                 | 20.59                    | 20.64                  |                     |          |
| 10              | 16QAM      | 50      | 0         | 20.56                 | 20.51                    | 20.84                  |                     |          |



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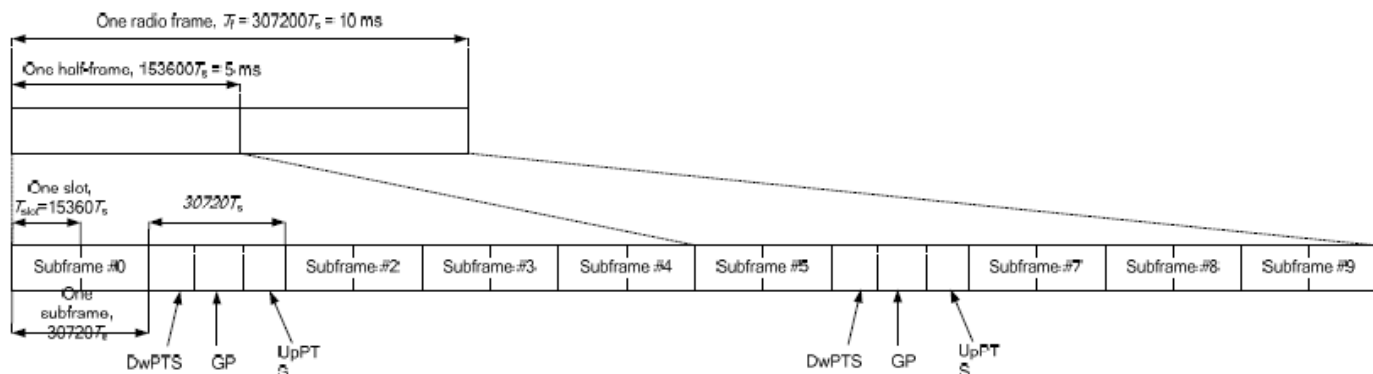
| Channel         |       |    |    | 26065  | 26340 | 26665  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
|-----------------|-------|----|----|--------|-------|--------|------------------------|-------------|
| Frequency (MHz) |       |    |    | 1852.5 | 1880  | 1912.5 |                        |             |
| 5               | QPSK  | 1  | 0  | 22.00  | 21.89 | 21.91  | 23                     | 0           |
| 5               | QPSK  | 1  | 12 | 21.73  | 21.74 | 21.76  |                        |             |
| 5               | QPSK  | 1  | 24 | 21.53  | 21.32 | 21.58  |                        |             |
| 5               | QPSK  | 12 | 0  | 21.68  | 21.57 | 21.72  | 23                     | 0           |
| 5               | QPSK  | 12 | 7  | 21.73  | 21.69 | 21.74  |                        |             |
| 5               | QPSK  | 12 | 13 | 21.57  | 21.61 | 21.68  |                        |             |
| 5               | QPSK  | 25 | 0  | 21.62  | 21.57 | 21.85  |                        |             |
| 5               | 16QAM | 1  | 0  | 21.86  | 21.91 | 21.93  | 23                     | 0           |
| 5               | 16QAM | 1  | 12 | 21.89  | 21.85 | 21.86  |                        |             |
| 5               | 16QAM | 1  | 24 | 21.90  | 21.59 | 21.76  |                        |             |
| 5               | 16QAM | 12 | 0  | 20.74  | 20.79 | 20.72  | 22                     | 1           |
| 5               | 16QAM | 12 | 7  | 20.65  | 20.60 | 20.80  |                        |             |
| 5               | 16QAM | 12 | 13 | 20.61  | 20.52 | 20.58  |                        |             |
| 5               | 16QAM | 25 | 0  | 20.56  | 20.60 | 20.81  |                        |             |
| Channel         |       |    |    | 26055  | 26340 | 26675  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1851.5 | 1880  | 1913.5 |                        |             |
| 3               | QPSK  | 1  | 0  | 21.95  | 21.82 | 21.89  | 23                     | 0           |
| 3               | QPSK  | 1  | 8  | 21.77  | 21.80 | 21.73  |                        |             |
| 3               | QPSK  | 1  | 14 | 21.55  | 21.33 | 21.58  |                        |             |
| 3               | QPSK  | 8  | 0  | 21.71  | 21.63 | 21.73  | 23                     | 0           |
| 3               | QPSK  | 8  | 4  | 21.75  | 21.68 | 21.74  |                        |             |
| 3               | QPSK  | 8  | 7  | 21.65  | 21.69 | 21.69  |                        |             |
| 3               | QPSK  | 15 | 0  | 21.63  | 21.60 | 21.81  |                        |             |
| 3               | 16QAM | 1  | 0  | 21.89  | 21.86 | 21.89  | 23                     | 0           |
| 3               | 16QAM | 1  | 8  | 21.94  | 21.77 | 21.91  |                        |             |
| 3               | 16QAM | 1  | 14 | 21.90  | 21.50 | 21.80  |                        |             |
| 3               | 16QAM | 8  | 0  | 20.75  | 20.77 | 20.72  | 22                     | 1           |
| 3               | 16QAM | 8  | 4  | 20.68  | 20.54 | 20.78  |                        |             |
| 3               | 16QAM | 8  | 7  | 20.51  | 20.53 | 20.57  |                        |             |
| 3               | 16QAM | 15 | 0  | 20.65  | 20.55 | 20.77  |                        |             |
| Channel         |       |    |    | 26047  | 26340 | 26683  | Tune-up limit<br>(dBm) | MPR<br>(dB) |
| Frequency (MHz) |       |    |    | 1850.7 | 1880  | 1914.3 |                        |             |
| 1.4             | QPSK  | 1  | 0  | 22.02  | 21.81 | 21.84  | 23                     | 0           |
| 1.4             | QPSK  | 1  | 3  | 21.77  | 21.79 | 21.77  |                        |             |
| 1.4             | QPSK  | 1  | 5  | 21.55  | 21.39 | 21.63  |                        |             |
| 1.4             | QPSK  | 3  | 0  | 21.64  | 21.63 | 21.76  |                        |             |
| 1.4             | QPSK  | 3  | 1  | 21.76  | 21.66 | 21.81  |                        |             |
| 1.4             | QPSK  | 3  | 3  | 21.56  | 21.64 | 21.73  |                        |             |
| 1.4             | QPSK  | 6  | 0  | 21.60  | 21.53 | 21.79  | 23                     | 0           |
| 1.4             | 16QAM | 1  | 0  | 21.83  | 21.93 | 21.88  | 23                     | 0           |
| 1.4             | 16QAM | 1  | 3  | 21.98  | 21.85 | 21.87  |                        |             |
| 1.4             | 16QAM | 1  | 5  | 21.85  | 21.51 | 21.78  |                        |             |
| 1.4             | 16QAM | 3  | 0  | 21.88  | 21.81 | 21.82  |                        |             |
| 1.4             | 16QAM | 3  | 1  | 21.87  | 21.77 | 21.86  |                        |             |
| 1.4             | 16QAM | 3  | 3  | 21.74  | 21.50 | 21.72  |                        |             |
| 1.4             | 16QAM | 6  | 0  | 20.62  | 20.54 | 20.81  | 22                     | 1           |

**<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 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         | 22.31                 | 22.25                        | 22.30                    | 22.17                         | 22.50                  | 23                  | 0        |
| 20              | QPSK       | 1       | 49        | 22.24                 | 22.23                        | 22.28                    | 22.07                         | 21.92                  |                     |          |
| 20              | QPSK       | 1       | 99        | 21.92                 | 21.96                        | 22.00                    | 22.00                         | 21.52                  |                     |          |
| 20              | QPSK       | 50      | 0         | 21.45                 | 21.34                        | 21.39                    | 21.31                         | 21.69                  | 22                  | 1        |
| 20              | QPSK       | 50      | 24        | 21.42                 | 21.33                        | 21.39                    | 21.30                         | 21.38                  |                     |          |
| 20              | QPSK       | 50      | 50        | 21.22                 | 21.26                        | 21.12                    | 21.28                         | 21.02                  |                     |          |
| 20              | QPSK       | 100     | 0         | 21.30                 | 21.24                        | 21.31                    | 21.23                         | 21.39                  | 22                  | 1        |
| 20              | 16QAM      | 1       | 0         | 21.30                 | 21.22                        | 21.40                    | 21.28                         | 21.55                  |                     |          |
| 20              | 16QAM      | 1       | 49        | 21.31                 | 21.38                        | 21.44                    | 21.42                         | 21.04                  |                     |          |
| 20              | 16QAM      | 1       | 99        | 21.06                 | 21.13                        | 21.11                    | 21.28                         | 20.67                  | 22                  | 1        |
| 20              | 16QAM      | 50      | 0         | 20.38                 | 20.36                        | 20.48                    | 20.22                         | 20.76                  |                     |          |
| 20              | 16QAM      | 50      | 24        | 20.41                 | 20.31                        | 20.44                    | 20.28                         | 20.45                  |                     |          |
| 20              | 16QAM      | 50      | 50        | 20.23                 | 20.30                        | 20.23                    | 20.36                         | 20.09                  | 22                  | 1        |
| 20              | 16QAM      | 100     | 0         | 20.33                 | 20.26                        | 20.41                    | 20.24                         | 20.37                  |                     |          |
| Channel         |            |         |           | 39725                 | 40173                        | 40620                    | 41068                         | 41515                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 2503.5                | 2548.3                       | 2593                     | 2637.8                        | 2682.5                 |                     |          |
| 15              | QPSK       | 1       | 0         | 22.03                 | 22.23                        | 22.26                    | 22.01                         | 22.38                  | 23                  | 0        |
| 15              | QPSK       | 1       | 37        | 22.25                 | 22.17                        | 22.19                    | 21.99                         | 21.85                  |                     |          |
| 15              | QPSK       | 1       | 74        | 21.90                 | 22.02                        | 22.05                    | 22.08                         | 21.43                  |                     |          |
| 15              | QPSK       | 36      | 0         | 21.28                 | 21.22                        | 21.49                    | 21.17                         | 21.68                  | 22                  | 1        |
| 15              | QPSK       | 36      | 20        | 21.35                 | 21.38                        | 21.41                    | 21.27                         | 21.29                  |                     |          |
| 15              | QPSK       | 36      | 39        | 21.29                 | 21.30                        | 21.13                    | 21.38                         | 21.10                  |                     |          |
| 15              | QPSK       | 75      | 0         | 21.26                 | 21.34                        | 21.22                    | 21.23                         | 21.24                  | 22                  | 1        |
| 15              | 16QAM      | 1       | 0         | 21.25                 | 21.32                        | 21.39                    | 21.18                         | 21.64                  |                     |          |
| 15              | 16QAM      | 1       | 37        | 21.35                 | 21.41                        | 21.44                    | 21.39                         | 20.99                  |                     |          |
| 15              | 16QAM      | 1       | 74        | 21.05                 | 21.22                        | 21.17                    | 21.22                         | 20.57                  | 22                  | 1        |
| 15              | 16QAM      | 36      | 0         | 20.47                 | 20.46                        | 20.55                    | 20.27                         | 20.81                  |                     |          |
| 15              | 16QAM      | 36      | 20        | 20.36                 | 20.41                        | 20.41                    | 20.29                         | 20.40                  |                     |          |
| 15              | 16QAM      | 36      | 39        | 20.30                 | 20.28                        | 20.26                    | 20.43                         | 20.13                  | 22                  | 1        |
| 15              | 16QAM      | 75      | 0         | 20.39                 | 20.19                        | 20.35                    | 20.32                         | 20.28                  |                     |          |
| Channel         |            |         |           | 39700                 | 40160                        | 40620                    | 41080                         | 41540                  | Tune-up limit (dBm) | MPR (dB) |
| Frequency (MHz) |            |         |           | 2501                  | 2547                         | 2593                     | 2639                          | 2685                   |                     |          |
| 10              | QPSK       | 1       | 0         | 22.02                 | 22.12                        | 22.32                    | 21.95                         | 22.33                  | 23                  | 0        |
| 10              | QPSK       | 1       | 25        | 22.17                 | 22.26                        | 22.31                    | 21.98                         | 21.99                  |                     |          |
| 10              | QPSK       | 1       | 49        | 21.92                 | 22.00                        | 21.98                    | 22.02                         | 21.49                  |                     |          |
| 10              | QPSK       | 25      | 0         | 21.30                 | 21.23                        | 21.35                    | 21.18                         | 21.70                  | 22                  | 1        |
| 10              | QPSK       | 25      | 12        | 21.44                 | 21.23                        | 21.33                    | 21.25                         | 21.39                  |                     |          |
| 10              | QPSK       | 25      | 25        | 21.25                 | 21.20                        | 21.16                    | 21.30                         | 21.04                  |                     |          |
| 10              | QPSK       | 50      | 0         | 21.20                 | 21.15                        | 21.37                    | 21.26                         | 21.35                  | 22                  | 1        |
| 10              | 16QAM      | 1       | 0         | 21.38                 | 21.15                        | 21.48                    | 21.23                         | 21.53                  |                     |          |
| 10              | 16QAM      | 1       | 25        | 21.38                 | 21.29                        | 21.38                    | 21.44                         | 21.04                  |                     |          |
| 10              | 16QAM      | 1       | 49        | 20.99                 | 21.13                        | 21.09                    | 21.23                         | 20.70                  | 22                  | 1        |
| 10              | 16QAM      | 25      | 0         | 20.32                 | 20.40                        | 20.57                    | 20.25                         | 20.78                  |                     |          |
| 10              | 16QAM      | 25      | 12        | 20.44                 | 20.39                        | 20.45                    | 20.26                         | 20.43                  |                     |          |
| 10              | 16QAM      | 25      | 25        | 20.28                 | 20.24                        | 20.24                    | 20.36                         | 20.15                  | 22                  | 1        |
| 10              | 16QAM      | 50      | 0         | 20.28                 | 20.36                        | 20.39                    | 20.15                         | 20.28                  |                     |          |



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| 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  | 22.16  | 22.12  | 22.33 | 21.96   | 22.49  | 23                        | 0           |
| 5               | QPSK  | 1  | 12 | 22.24  | 22.26  | 22.20 | 22.13   | 21.82  |                           |             |
| 5               | QPSK  | 1  | 24 | 21.84  | 22.02  | 21.90 | 22.07   | 21.56  |                           |             |
| 5               | QPSK  | 12 | 0  | 21.44  | 21.33  | 21.38 | 21.22   | 21.65  | 22                        | 1           |
| 5               | QPSK  | 12 | 7  | 21.43  | 21.39  | 21.32 | 21.31   | 21.45  |                           |             |
| 5               | QPSK  | 12 | 13 | 21.30  | 21.31  | 21.20 | 21.25   | 21.09  |                           |             |
| 5               | QPSK  | 25 | 0  | 21.40  | 21.16  | 21.25 | 21.24   | 21.20  | 22                        | 1           |
| 5               | 16QAM | 1  | 0  | 21.40  | 21.22  | 21.50 | 21.28   | 21.53  |                           |             |
| 5               | 16QAM | 1  | 12 | 21.32  | 21.46  | 21.37 | 21.37   | 21.13  |                           |             |
| 5               | 16QAM | 1  | 24 | 20.97  | 21.07  | 21.19 | 21.36   | 20.76  | 22                        | 1           |
| 5               | 16QAM | 12 | 0  | 20.47  | 20.37  | 20.41 | 20.19   | 20.67  |                           |             |
| 5               | 16QAM | 12 | 7  | 20.44  | 20.37  | 20.37 | 20.29   | 20.47  |                           |             |
| 5               | 16QAM | 12 | 13 | 20.21  | 20.20  | 20.19 | 20.30   | 20.14  | 22                        | 1           |
| 5               | 16QAM | 25 | 0  | 20.26  | 20.16  | 20.51 | 20.16   | 20.42  |                           |             |

**<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. All permutations exist. No restrictions on Pcell & SCell combinations. Only LTE Band 29A is limited to SCell.

| Inter-Band |                |
|------------|----------------|
|            | 2 bands / 2 CC |
| Band 2     | 2A-5A          |
|            | 2A-12A         |
|            | 2A-13A         |
|            | 2A-29A         |
| Band 4     | 4A-5A          |
|            | 4A-12A         |
|            | 4A-13A         |
|            | 4A-29A         |
| Band 5     | 2A-5A          |
|            | 4A-5A          |
| Band 12    | 2A-12A         |
|            | 4A-12A         |
| Band 13    | 2A-13A         |
|            | 4A-13A         |
| Band 29    | 2A-29A         |
|            | 4A-29A         |

|         | Intra-Band Contiguous | Intra-Band Non-Contiguous |
|---------|-----------------------|---------------------------|
| Band 2  | 2C                    | 2A-2A                     |
| Band 4  |                       | 4A-4A                     |
| Band 7  | 7C                    | 7A-7A                     |
| Band 41 | 41C                   | 41A-41A                   |

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

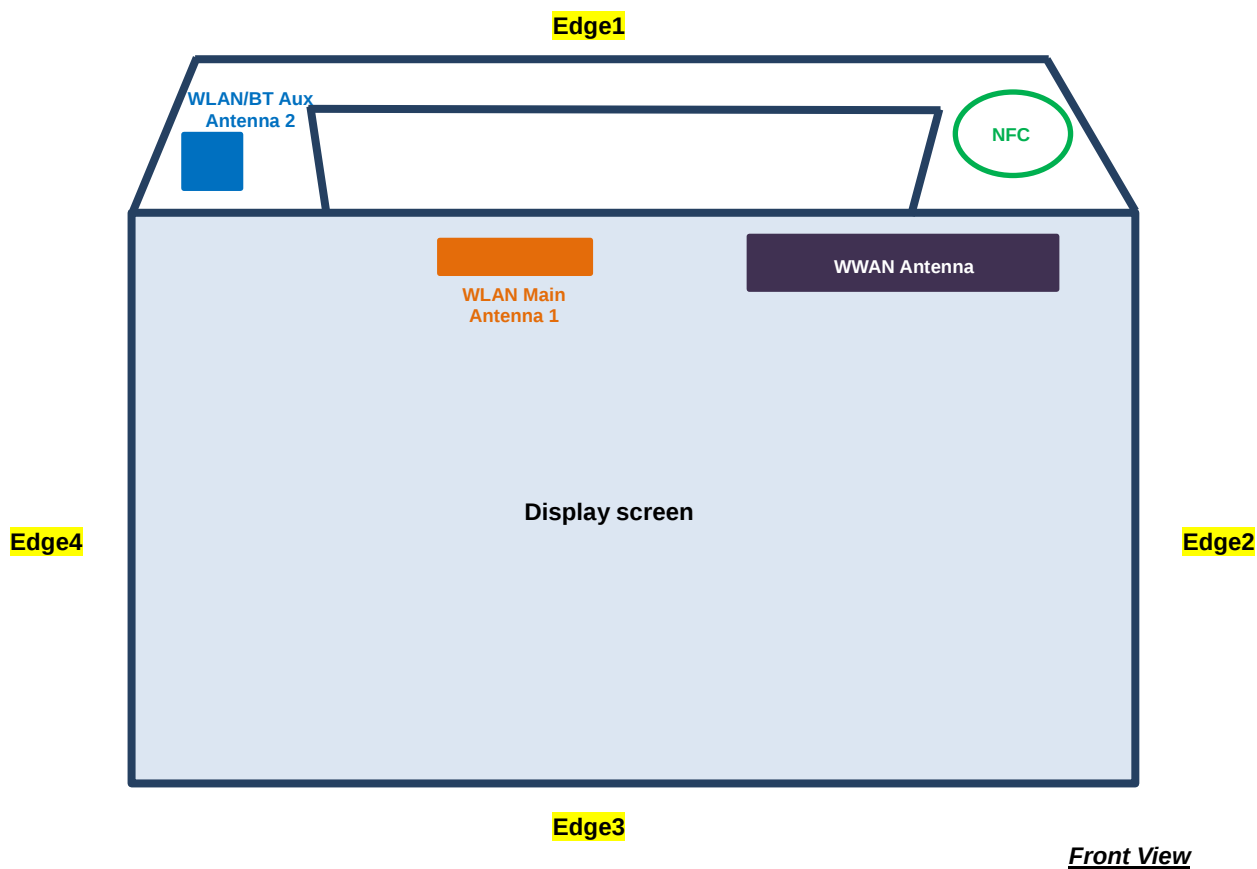
- i. According to KDB941225 D05A v01r02, Uplink maximum output power measurement with downlink carrier aggregation active should be measured, using the highest output channel measured without downlink carrier aggregation, to confirm that uplink maximum output power with downlink carrier aggregation active 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 carrier aggregation only. Uplink carrier aggregation is not supported. 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 inter-band CA, the SCC selected highest bandwidth and near the middle of its transmission band.
- vii. 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  |                | 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 |                | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 5        | 10       | 881.5          | 2525       | 22.75                  | 22.69                 |
|            |                | 5        | 10       | 829            | 20450      | QPSK | 1      | 0            | 2        | 20       | 1960           | 900        | 22.63                  | 22.42                 |
|            |                | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 12       | 10       | 737.5          | 5095       | 22.61                  | 22.77                 |
|            |                | 12       | 10       | 704            | 23060      | QPSK | 1      | 0            | 2        | 20       | 1960           | 900        | 22.62                  | 22.58                 |
|            |                | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 13       | 10       | 751            | 5230       | 22.71                  | 22.71                 |
|            |                | 13       | 10       | 782            | 23230      | QPSK | 1      | 0            | 2        | 20       | 1960           | 900        | 22.08                  | 22.22                 |
|            |                | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 29       | 10       | 722.5          | 9715       | 22.61                  | 22.74                 |
|            |                | 4        | 20       | 1720           | 20050      | QPSK | 1      | 0            | 5        | 10       | 881.5          | 2525       | 22.79                  | 22.99                 |
|            |                | 5        | 10       | 836.5          | 20525      | QPSK | 1      | 0            | 4        | 20       | 2132.5         | 2175       | 22.25                  | 22.45                 |
|            |                | 4        | 20       | 1720           | 20050      | QPSK | 1      | 0            | 12       | 10       | 737.5          | 5095       | 22.97                  | 22.93                 |
|            |                | 12       | 10       | 704            | 23060      | QPSK | 1      | 0            | 4        | 20       | 2132.5         | 2175       | 22.49                  | 22.63                 |
|            |                | 4        | 20       | 1720           | 20050      | QPSK | 1      | 0            | 13       | 10       | 751            | 5230       | 22.71                  | 22.91                 |
|            |                | 13       | 10       | 782            | 23230      | QPSK | 1      | 0            | 4        | 20       | 2132.5         | 2175       | 22.19                  | 22.30                 |
|            |                | 4        | 20       | 1720           | 20050      | QPSK | 1      | 0            | 29       | 10       | 722.5          | 9715       | 22.72                  | 22.91                 |
| Intra-Band | Non-Contiguous | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 2        | 5        | 1987.5         | 1175       | 22.49                  | 22.70                 |
|            |                | 4        | 20       | 1720           | 20050      | QPSK | 1      | 0            | 4        | 5        | 2152.5         | 2375       | 22.90                  | 22.91                 |
|            |                | 7        | 20       | 2535           | 21100      | QPSK | 1      | 0            | 7        | 5        | 2687.5         | 3425       | 21.45                  | 21.57                 |
|            |                | 41       | 20       | 2680           | 41490      | QPSK | 1      | 0            | 41       | 5        | 2545.8         | 40148      | 21.61                  | 21.54                 |
|            | Contiguous     | 2        | 20       | 1880           | 18900      | QPSK | 1      | 0            | 2        | 20       | 1979.80        | 1098       | 22.51                  | 22.67                 |
|            |                | 7        | 20       | 2535           | 20175      | QPSK | 1      | 0            | 7        | 20       | 2674.80        | 2373       | 21.51                  | 21.58                 |
|            |                | 41       | 20       | 2680           | 41490      | QPSK | 1      | 0            | 41       | 20       | 2660.20        | 41292      | 21.40                  | 21.61                 |

### 13. Antenna Location



Minimum separation distance for antenna to edge:

| Antenna           | Bottom Face (mm) | To Edge1 (mm) | To Edge2 (mm) | To Edge3 (mm) | To Edge4 (mm) |
|-------------------|------------------|---------------|---------------|---------------|---------------|
| WWAN Antenna      | ≤ 5              | 54.00         | 22.00         | 173.00        | 151.00        |
| WLAN Antenna 1    | ≤ 5              | 55.40         | 133.80        | 182.10        | 99.70         |
| WLAN/BT Antenna 2 | ≤ 5              | 32.00         | 256.00        | 201.00        | 7.00          |



**<SAR test exclusion table>**

**General Note:**

1. The below table, when the distance is < 50 mm exclusion threshold is "Ratio", when the distance is > 50 mm exclusion threshold is "mW"
2. Maximum power is the source-based time-average power and represents the maximum RF output power among production units
3. Per KDB 447498 D01v06, for larger devices, the test separation distance of adjacent edge configuration is determined by the closest separation between the antenna and the user.
4. Per KDB 447498 D01v06, standalone SAR test exclusion threshold is applied; If the test separation distance is < 5mm, 5mm is used to determine SAR exclusion threshold.
5. Per KDB 447498 D01v06, the 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at *test separation distances* ≤ 50 mm are determined by:  

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$$
 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR
  - f(GHz) is the RF channel transmit frequency in GHz
  - Power and distance are rounded to the nearest mW and mm before calculation
  - The result is rounded to one decimal place for comparison
6. Per KDB 447498 D01v06, at 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following
  - a) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · ( f(MHz)/150)] mW, at 100 MHz to 1500 MHz
  - b) [Threshold at 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at > 1500 MHz and ≤ 6 GHz

|                   | Wireless Interface      | WCDMA Band V | WCDMA Band IV | WCDMA Band II | LTE Band 12 | LTE Band 13 | LTE Band 5 | LTE Band 26 | LTE Band 4 | LTE Band 2 | LTE Band 25 | LTE Band 7 | LTE Band 41 |
|-------------------|-------------------------|--------------|---------------|---------------|-------------|-------------|------------|-------------|------------|------------|-------------|------------|-------------|
| Exposure Position | Calculated Frequency    | 846MHz       | 1750MHz       | 1907MHz       | 715MHz      | 784MHz      | 848MHz     | 848MHz      | 1754MHz    | 1909MHz    | 1914MHz     | 2567MHz    | 2687MHz     |
|                   | Maximum power (dBm)     | 24           | 24            | 24            | 24          | 24          | 24         | 24          | 24         | 24         | 24          | 23         | 23          |
|                   | Maximum rated power(mW) | 251.0        | 251.0         | 251.0         | 251.0       | 251.0       | 251.0      | 251.0       | 251.0      | 251.0      | 251.0       | 200.0      | 200.0       |
| Bottom Face       | Separation distance(mm) | 5.0          |               |               |             |             |            |             |            |            |             |            |             |
|                   | exclusion threshold     | 46.2         | 66.4          | 69.3          | 42.5        | 44.5        | 46.2       | 46.2        | 66.5       | 69.4       | 69.5        | 64.1       | 65.6        |
|                   | Testing required?       | Yes          | Yes           | Yes           | Yes         | Yes         | Yes        | Yes         | Yes        | Yes        | Yes         | Yes        | Yes         |
| Edge 1            | Separation distance(mm) | 54.0         |               |               |             |             |            |             |            |            |             |            |             |
|                   | exclusion threshold     | 186.0        | 153.0         | 149.0         | 196.0       | 190.0       | 186.0      | 186.0       | 153.0      | 149.0      | 148.0       | 134.0      | 132.0       |
|                   | Testing required?       | Yes          | Yes           | Yes           | Yes         | Yes         | Yes        | Yes         | Yes        | Yes        | Yes         | Yes        | Yes         |
| Edge 2            | Separation distance(mm) | 22.0         |               |               |             |             |            |             |            |            |             |            |             |
|                   | exclusion threshold     | 10.5         | 15.1          | 15.8          | 9.7         | 10.1        | 10.5       | 10.5        | 15.1       | 15.8       | 15.8        | 14.6       | 14.9        |
|                   | Testing required?       | Yes          | Yes           | Yes           | Yes         | Yes         | Yes        | Yes         | Yes        | Yes        | Yes         | Yes        | Yes         |
| Edge 3            | Separation distance(mm) | 173.0        |               |               |             |             |            |             |            |            |             |            |             |
|                   | exclusion threshold     | 857.0        | 1343.0        | 1339.0        | 764.0       | 812.0       | 858.0      | 858.0       | 1343.0     | 1339.0     | 1338.0      | 1324.0     | 1322.0      |
|                   | Testing required?       | No           | No            | No            | No          | No          | No         | No          | No         | No         | No          | No         | No          |
| Edge 4            | Separation distance(mm) | 151.0        |               |               |             |             |            |             |            |            |             |            |             |
|                   | exclusion threshold     | 733.0        | 1123.0        | 1119.0        | 659.0       | 697.0       | 734.0      | 734.0       | 1123.0     | 1119.0     | 1118.0      | 1104.0     | 1102.0      |
|                   | Testing required?       | No           | No            | No            | No          | No          | No         | No          | No         | No         | No          | No         | No          |

## 14. 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 face

### 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  $\leq \frac{1}{4}$  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.

### 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 / B26 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 / 5 SAR test was covered by Band 25 / 26; according to 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.

## 14.1 Body SAR

### <WCDMA SAR>

| Plot No. | Band     | Mode         | Test Position | Gap (mm) | Battery | 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 Face   | 10mm     | 2160mAh | OFF             | 9262 | 1852.4      | 23.12               | 24.00               | 1.225                  | 0.01             | 0.187                  | 0.229                  |
|          | WCDMA II | RMC 12.2Kbps | Bottom Face   | 0mm      | 2160mAh | ON              | 9262 | 1852.4      | 22.15               | 23.00               | 1.216                  | 0                | 0.709                  | 0.862                  |
|          | WCDMA II | RMC 12.2Kbps | Bottom Face   | 0mm      | 2160mAh | ON              | 9400 | 1880        | 22.00               | 23.00               | 1.259                  | 0.04             | 0.728                  | 0.916                  |
| 01       | WCDMA II | RMC 12.2Kbps | Bottom Face   | 0mm      | 2160mAh | ON              | 9538 | 1907.6      | 22.06               | 23.00               | 1.242                  | 0.12             | 0.840                  | 1.043                  |
|          | WCDMA II | RMC 12.2Kbps | Edge 1        | 0mm      | 2160mAh | OFF             | 9262 | 1852.4      | 23.12               | 24.00               | 1.225                  | 0.02             | 0.305                  | 0.374                  |
|          | WCDMA II | RMC 12.2Kbps | Edge 2        | 0mm      | 2160mAh | OFF             | 9262 | 1712.4      | 23.12               | 24.00               | 1.225                  | -0.06            | 0.106                  | 0.130                  |
|          | WCDMA II | RMC 12.2Kbps | Bottom Face   | 0mm      | 5800mAh | ON              | 9538 | 1907.6      | 22.06               | 23.00               | 1.242                  | -0.15            | 0.141                  | 0.175                  |
|          | WCDMA IV | RMC 12.2Kbps | Bottom Face   | 0mm      | 2160mAh | OFF             | 1312 | 1712.4      | 23.13               | 24.00               | 1.222                  | 0.04             | 0.721                  | 0.881                  |
|          | WCDMA IV | RMC 12.2Kbps | Bottom Face   | 0mm      | 2160mAh | OFF             | 1413 | 1732.6      | 22.95               | 24.00               | 1.274                  | 0.01             | 0.797                  | 1.015                  |
| 02       | WCDMA IV | RMC 12.2Kbps | Bottom Face   | 0mm      | 2160mAh | OFF             | 1513 | 1752.6      | 22.95               | 24.00               | 1.274                  | 0.07             | 0.907                  | 1.155                  |
|          | WCDMA IV | RMC 12.2Kbps | Edge 1        | 0mm      | 2160mAh | OFF             | 1312 | 1712.4      | 23.13               | 24.00               | 1.222                  | -0.04            | 0.068                  | 0.083                  |
|          | WCDMA IV | RMC 12.2Kbps | Edge 2        | 0mm      | 2160mAh | OFF             | 1312 | 1712.4      | 23.13               | 24.00               | 1.222                  | 0.01             | 0.237                  | 0.290                  |
|          | WCDMA IV | RMC 12.2Kbps | Bottom Face   | 0mm      | 5800mAh | OFF             | 1513 | 1752.6      | 22.95               | 24.00               | 1.274                  | 0.04             | 0.183                  | 0.233                  |
| 03       | WCDMA V  | RMC 12.2Kbps | Bottom Face   | 0mm      | 2160mAh | OFF             | 4132 | 826.4       | 22.60               | 24.00               | 1.380                  | -0.08            | 0.373                  | 0.515                  |
|          | WCDMA V  | RMC 12.2Kbps | Edge 1        | 0mm      | 2160mAh | OFF             | 4132 | 826.4       | 22.60               | 24.00               | 1.380                  | -0.03            | 0.057                  | 0.079                  |
|          | WCDMA V  | RMC 12.2Kbps | Edge 2        | 0mm      | 2160mAh | OFF             | 4132 | 826.4       | 22.60               | 24.00               | 1.380                  | 0.05             | 0.069                  | 0.095                  |
|          | WCDMA V  | RMC 12.2Kbps | Bottom Face   | 0mm      | 5800mAh | OFF             | 4132 | 826.4       | 22.60               | 24.00               | 1.380                  | 0.01             | 0.165                  | 0.228                  |

### <FDD LTE SAR>

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB offset | Test Position | Gap (mm) | Battery | 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) |
|----------|-------------|----------|------------|---------|-----------|---------------|----------|---------|-----------------|-------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
| 04       | LTE Band 4  | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 20175 | 1732.5      | 22.75               | 24.00               | 1.334                  | 0.05             | 0.695                  | 0.927                  |
|          | LTE Band 4  | 20M      | QPSK       | 50      | 24        | Bottom Face   | 0mm      | 2160mAh | OFF             | 20175 | 1732.5      | 21.73               | 23.00               | 1.340                  | -0.1             | 0.592                  | 0.793                  |
|          | LTE Band 4  | 20M      | QPSK       | 100     | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 20175 | 1732.5      | 21.57               | 23.00               | 1.390                  | -0.07            | 0.593                  | 0.824                  |
|          | LTE Band 4  | 20M      | QPSK       | 1       | 0         | Edge 1        | 0mm      | 2160mAh | OFF             | 20175 | 1732.5      | 22.75               | 24.00               | 1.334                  | 0                | 0.073                  | 0.097                  |
|          | LTE Band 4  | 20M      | QPSK       | 50      | 24        | Edge 1        | 0mm      | 2160mAh | OFF             | 20175 | 1732.5      | 21.73               | 23.00               | 1.340                  | -0.09            | 0.061                  | 0.082                  |
|          | LTE Band 4  | 20M      | QPSK       | 1       | 0         | Edge 2        | 0mm      | 2160mAh | OFF             | 20175 | 1732.5      | 22.75               | 24.00               | 1.334                  | 0.02             | 0.225                  | 0.300                  |
|          | LTE Band 4  | 20M      | QPSK       | 50      | 24        | Edge 2        | 0mm      | 2160mAh | OFF             | 20175 | 1732.5      | 21.73               | 23.00               | 1.340                  | -0.02            | 0.178                  | 0.238                  |
|          | LTE Band 4  | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 5800mAh | OFF             | 20175 | 1732.5      | 22.75               | 24.00               | 1.334                  | -0.02            | 0.179                  | 0.239                  |
| 05       | LTE Band 7  | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 21100 | 2535        | 22.49               | 23.00               | 1.125                  | -0.14            | 0.500                  | 0.562                  |
|          | LTE Band 7  | 20M      | QPSK       | 50      | 24        | Bottom Face   | 0mm      | 2160mAh | OFF             | 21100 | 2535        | 21.54               | 22.00               | 1.112                  | -0.11            | 0.410                  | 0.456                  |
|          | LTE Band 7  | 20M      | QPSK       | 1       | 0         | Edge 1        | 0mm      | 2160mAh | OFF             | 21100 | 2535        | 22.49               | 23.00               | 1.125                  | -0.02            | 0.069                  | 0.078                  |
|          | LTE Band 7  | 20M      | QPSK       | 50      | 24        | Edge 1        | 0mm      | 2160mAh | OFF             | 21100 | 2535        | 21.54               | 22.00               | 1.112                  | 0                | 0.058                  | 0.064                  |
|          | LTE Band 7  | 20M      | QPSK       | 1       | 0         | Edge 2        | 0mm      | 2160mAh | OFF             | 21100 | 2535        | 22.49               | 23.00               | 1.125                  | 0.05             | 0.066                  | 0.074                  |
|          | LTE Band 7  | 20M      | QPSK       | 50      | 24        | Edge 2        | 0mm      | 2160mAh | OFF             | 21100 | 2535        | 21.54               | 22.00               | 1.112                  | 0.07             | 0.048                  | 0.053                  |
|          | LTE Band 7  | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 5800mAh | OFF             | 21100 | 2535        | 22.49               | 23.00               | 1.125                  | 0.03             | 0.212                  | 0.238                  |
| 06       | LTE Band 12 | 10M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 23095 | 707.5       | 23.24               | 24.00               | 1.191                  | -0.12            | 0.526                  | 0.627                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 23095 | 707.5       | 22.13               | 23.00               | 1.222                  | -0.1             | 0.427                  | 0.522                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 0         | Edge 1        | 0mm      | 2160mAh | OFF             | 23095 | 707.5       | 23.24               | 24.00               | 1.191                  | 0                | 0.025                  | 0.030                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 0         | Edge 1        | 0mm      | 2160mAh | OFF             | 23095 | 707.5       | 22.13               | 23.00               | 1.222                  | -0.11            | 0.020                  | 0.024                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 0         | Edge 2        | 0mm      | 2160mAh | OFF             | 23095 | 707.5       | 23.24               | 24.00               | 1.191                  | -0.02            | 0.016                  | 0.019                  |
|          | LTE Band 12 | 10M      | QPSK       | 25      | 0         | Edge 2        | 0mm      | 2160mAh | OFF             | 23095 | 707.5       | 22.13               | 23.00               | 1.222                  | -0.17            | 0.013                  | 0.016                  |
|          | LTE Band 12 | 10M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 5800mAh | OFF             | 23095 | 707.5       | 23.24               | 24.00               | 1.191                  | -0.06            | 0.251                  | 0.299                  |

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB offset | Test Position | Gap (mm) | Battery | 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) |
|----------|-------------|----------|------------|---------|-----------|---------------|----------|---------|-----------------|-------|-------------|---------------------|---------------------|------------------------|------------------|------------------------|------------------------|
| 07       | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 23230 | 782         | 22.46               | 24.00               | 1.426                  | -0.18            | 0.418                  | 0.596                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 23230 | 782         | 21.34               | 23.00               | 1.466                  | -0.16            | 0.350                  | 0.513                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Edge 1        | 0mm      | 2160mAh | OFF             | 23230 | 782         | 22.46               | 24.00               | 1.426                  | -0.15            | 0.032                  | 0.046                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Edge 1        | 0mm      | 2160mAh | OFF             | 23230 | 782         | 21.34               | 23.00               | 1.466                  | -0.16            | 0.058                  | 0.085                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Edge 2        | 0mm      | 2160mAh | OFF             | 23230 | 782         | 22.46               | 24.00               | 1.426                  | -0.13            | 0.018                  | 0.026                  |
|          | LTE Band 13 | 10M      | QPSK       | 25      | 0         | Edge 2        | 0mm      | 2160mAh | OFF             | 23230 | 782         | 21.34               | 23.00               | 1.466                  | -0.03            | 0.015                  | 0.022                  |
|          | LTE Band 13 | 10M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 5800mAh | OFF             | 23230 | 782         | 22.46               | 24.00               | 1.426                  | -0.13            | 0.176                  | 0.251                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Bottom Face   | 10mm     | 2160mAh | OFF             | 26140 | 1860        | 23.05               | 24.00               | 1.245                  | -0.15            | 0.177                  | 0.220                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 24        | Bottom Face   | 10mm     | 2160mAh | OFF             | 26590 | 1905        | 21.92               | 23.00               | 1.282                  | -0.06            | 0.171                  | 0.219                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | ON              | 26140 | 1860        | 22.07               | 23.00               | 1.239                  | -0.15            | 0.668                  | 0.828                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | ON              | 26340 | 1880        | 21.94               | 23.00               | 1.276                  | -0.19            | 0.742                  | 0.947                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | ON              | 26590 | 1905        | 21.97               | 23.00               | 1.268                  | -0.14            | 0.796                  | 1.009                  |
| 08       | LTE Band 25 | 20M      | QPSK       | 50      | 24        | Bottom Face   | 0mm      | 2160mAh | ON              | 26590 | 1905        | 21.87               | 23.00               | 1.297                  | -0.14            | 0.815                  | 1.057                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 24        | Bottom Face   | 0mm      | 2160mAh | ON              | 26140 | 1860        | 21.82               | 23.00               | 1.312                  | -0.03            | 0.686                  | 0.900                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 24        | Bottom Face   | 0mm      | 2160mAh | ON              | 26340 | 1880        | 21.87               | 23.00               | 1.297                  | -0.12            | 0.754                  | 0.978                  |
|          | LTE Band 25 | 20M      | QPSK       | 100     | 0         | Bottom Face   | 0mm      | 2160mAh | ON              | 26590 | 1905        | 21.93               | 23.00               | 1.279                  | -0.17            | 0.813                  | 1.040                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Edge 1        | 0mm      | 2160mAh | OFF             | 26140 | 1860        | 23.05               | 24.00               | 1.245                  | -0.12            | 0.275                  | 0.342                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 24        | Edge 1        | 0mm      | 2160mAh | OFF             | 26590 | 1905        | 21.92               | 23.00               | 1.282                  | -0.08            | 0.118                  | 0.151                  |
|          | LTE Band 25 | 20M      | QPSK       | 1       | 0         | Edge 2        | 0mm      | 2160mAh | OFF             | 26140 | 1860        | 23.05               | 24.00               | 1.245                  | 0                | 0.119                  | 0.148                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 24        | Edge 2        | 0mm      | 2160mAh | OFF             | 26590 | 1905        | 21.92               | 23.00               | 1.282                  | -0.19            | 0.026                  | 0.033                  |
|          | LTE Band 25 | 20M      | QPSK       | 50      | 24        | Bottom Face   | 0mm      | 5800mAh | ON              | 26590 | 1905        | 21.87               | 23.00               | 1.297                  | -0.12            | 0.161                  | 0.209                  |
| 09       | LTE Band 26 | 15M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 26865 | 831.5       | 22.93               | 24.00               | 1.279                  | -0.07            | 0.359                  | 0.459                  |
|          | LTE Band 26 | 15M      | QPSK       | 36      | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 26865 | 831.5       | 21.72               | 23.00               | 1.343                  | -0.01            | 0.298                  | 0.400                  |
|          | LTE Band 26 | 15M      | QPSK       | 1       | 0         | Edge 1        | 0mm      | 2160mAh | OFF             | 26865 | 831.5       | 22.93               | 24.00               | 1.279                  | -0.15            | 0.063                  | 0.081                  |
|          | LTE Band 26 | 15M      | QPSK       | 36      | 0         | Edge 1        | 0mm      | 2160mAh | OFF             | 26865 | 831.5       | 21.72               | 23.00               | 1.343                  | -0.04            | 0.047                  | 0.063                  |
|          | LTE Band 26 | 15M      | QPSK       | 1       | 0         | Edge 2        | 0mm      | 2160mAh | OFF             | 26865 | 831.5       | 22.93               | 24.00               | 1.279                  | -0.1             | 0.005                  | 0.006                  |
|          | LTE Band 26 | 15M      | QPSK       | 36      | 0         | Edge 2        | 0mm      | 2160mAh | OFF             | 26865 | 831.5       | 21.72               | 23.00               | 1.343                  | 0.06             | 0.004                  | 0.005                  |
|          | LTE Band 26 | 15M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 5800mAh | OFF             | 26865 | 831.5       | 22.93               | 24.00               | 1.279                  | -0.12            | 0.120                  | 0.154                  |

**<TDD LTE SAR>**

| Plot No. | Band        | BW (MHz) | Modulation | RB Size | RB offset | Test Position | Gap (mm) | Battery | 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) |
|----------|-------------|----------|------------|---------|-----------|---------------|----------|---------|-----------------|-------|-------------|---------------------|---------------------|------------------------|--------------|---------------------------|------------------|------------------------|------------------------|
| 10       | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 41490 | 2680        | 22.50               | 23.00               | 1.122                  | 62.9         | 1.006                     | -0.16            | 0.552                  | 0.623                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 39750 | 2506        | 22.31               | 23.00               | 1.172                  | 62.9         | 1.006                     | -0.12            | 0.301                  | 0.355                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 40185 | 2549.5      | 22.25               | 23.00               | 1.189                  | 62.9         | 1.006                     | -0.16            | 0.299                  | 0.357                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 40620 | 2593        | 22.30               | 23.00               | 1.175                  | 62.9         | 1.006                     | -0.15            | 0.343                  | 0.405                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 41055 | 2636.5      | 22.17               | 23.00               | 1.211                  | 62.9         | 1.006                     | -0.19            | 0.466                  | 0.568                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 41490 | 2680        | 21.69               | 22.00               | 1.074                  | 62.9         | 1.006                     | -0.11            | 0.424                  | 0.458                  |
|          | LTE Band 41 | 20M      | QPSK       | 100     | 0         | Bottom Face   | 0mm      | 2160mAh | OFF             | 41490 | 2680        | 21.39               | 22.00               | 1.151                  | 62.9         | 1.006                     | -0.06            | 0.339                  | 0.392                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Edge 1        | 0mm      | 2160mAh | OFF             | 41490 | 2680        | 22.50               | 23.00               | 1.122                  | 62.9         | 1.006                     | 0.04             | 0.105                  | 0.119                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Edge 1        | 0mm      | 2160mAh | OFF             | 41490 | 2680        | 21.69               | 22.00               | 1.074                  | 62.9         | 1.006                     | -0.07            | 0.082                  | 0.089                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Edge 2        | 0mm      | 2160mAh | OFF             | 41490 | 2680        | 22.50               | 23.00               | 1.122                  | 62.9         | 1.006                     | -0.03            | 0.033                  | 0.037                  |
|          | LTE Band 41 | 20M      | QPSK       | 50      | 0         | Edge 2        | 0mm      | 2160mAh | OFF             | 41490 | 2680        | 21.69               | 22.00               | 1.074                  | 62.9         | 1.006                     | -0.04            | 0.021                  | 0.023                  |
|          | LTE Band 41 | 20M      | QPSK       | 1       | 0         | Bottom Face   | 0mm      | 5800mAh | OFF             | 41490 | 2680        | 22.50               | 23.00               | 1.122                  | 62.9         | 1.006                     | -0.04            | 0.115                  | 0.130                  |

## 14.2 Repeated SAR Measurement

| No. | Band     | Mode         | Test Position | Gap (mm) | Battery | 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 Face   | 0mm      | 2160mAh | ON              | 9538 | 1907.6      | 22.06               | 23.00               | 1.242                  | 0.12             | 0.840                  |       | 1.043                  |
| 2nd | WCDMA II | RMC 12.2Kbps | Bottom Face   | 0mm      | 2160mAh | ON              | 9538 | 1907.6      | 22.06               | 23.00               | 1.242                  | -0.08            | 0.783                  | 1.07  | 0.972                  |
| 1st | WCDMA IV | RMC 12.2Kbps | Bottom Face   | 0mm      | 2160mAh | OFF             | 1513 | 1752.6      | 22.95               | 24.00               | 1.274                  | 0.07             | 0.907                  |       | 1.155                  |
| 2nd | WCDMA IV | RMC 12.2Kbps | Bottom Face   | 0mm      | 2160mAh | OFF             | 1513 | 1752.6      | 22.95               | 24.00               | 1.274                  | 0.02             | 0.834                  | 1.09  | 1.062                  |

### General Note:

1. Per KDB 865664 D01v01r04, for each frequency band, repeated SAR measurement is required only when the measured SAR is  $\geq 0.8$ W/kg.
2. Per KDB 865664 D01v01r04, if the ratio among the repeated measurement is  $\leq 1.2$  and the measured SAR  $< 1.45$ 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.

## 15. Simultaneous Transmission Analysis

| NO. | Simultaneous Transmission Configurations | Tablet |
|-----|------------------------------------------|--------|
|     |                                          | Body   |
| 1.  | WWAN + WLAN ANT1 + WLAN ANT2             | Yes    |
| 2.  | WWAN + WLAN ANT1 + Bluetooth ANT2        | Yes    |

### General Note:

1. The WLAN/BT module, Brand Name: Intel, Model Name: 8265NGW, FCC ID: QYL8265NG is also integrated into this host and the WLAN SAR testing results are also used perform transmission simultaneous analysis which can be referred to FCC ID: QYL8265NG, Sporton SAR Test Report, Report No: FA570164-39.
2. All licensed modes share the same antenna part and cannot transmit simultaneously.
3. WLAN and Bluetooth share the same antenna2, and cannot transmit simultaneously.
4. The Scaled SAR summation is calculated based on the same configuration and test position.
5. Per KDB 447498 D01v06, simultaneous transmission SAR is compliant if,
  - i) Scalar SAR summation  $< 1.6$ W/kg.
  - ii)  $SPLSR = (SAR1 + SAR2)^{1.5} / (\text{min. separation distance, mm})$ , 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.
  - iii) If  $SPLSR \leq 0.04$ , simultaneously transmission SAR measurement is not necessary.
  - iv) Simultaneously transmission SAR measurement, and the reported multi-band SAR  $< 1.6$ W/kg.

**15.1 Body Exposure Conditions**

| WWAN Band     |             | Exposure Position   | 1                | 2                       | 3                       | 4                     | 5                     | 6                  | 1+2+3<br>Summed<br>1g SAR<br>(W/kg) | 1+2+5<br>Summed<br>1g SAR<br>(W/kg) | 1+2+6<br>Summed<br>1g SAR<br>(W/kg) | 1+4+5<br>Summed<br>1g SAR<br>(W/kg) | 1+4+3<br>Summed<br>1g SAR<br>(W/kg) | 1+4+6<br>Summed<br>1g SAR<br>(W/kg) |
|---------------|-------------|---------------------|------------------|-------------------------|-------------------------|-----------------------|-----------------------|--------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
|               |             |                     | WWAN             | 2.4GHz<br>WLAN<br>Ant 1 | 2.4GHz<br>WLAN<br>Ant 2 | 5GHz<br>WLAN<br>Ant 1 | 5GHz<br>WLAN<br>Ant 2 | Bluetooth<br>Ant 2 |                                     |                                     |                                     |                                     |                                     |                                     |
|               |             |                     | 1g SAR<br>(W/kg) | 1g SAR<br>(W/kg)        | 1g SAR<br>(W/kg)        | 1g SAR<br>(W/kg)      | 1g SAR<br>(W/kg)      | 1g SAR<br>(W/kg)   |                                     |                                     |                                     |                                     |                                     |                                     |
| WCDMA         | WCDMA II    | Bottom Face at 10mm | 0.229            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 0.379                               | 0.541                               | 0.357                               | 0.532                               | 0.370                               | 0.348                               |
|               |             | Bottom Face at 0mm  | 1.043            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 1.193                               | 1.355                               | 1.171                               | 1.346                               | 1.184                               | 1.162                               |
|               |             | Edge 1 at 0mm       | 0.374            |                         |                         |                       |                       |                    | 0.374                               | 0.374                               | 0.374                               | 0.374                               | 0.374                               | 0.374                               |
|               |             | Edge 2 at 0mm       | 0.130            |                         |                         |                       |                       |                    | 0.130                               | 0.130                               | 0.130                               | 0.130                               | 0.130                               | 0.130                               |
|               | WCDMA IV    | Bottom Face at 0mm  | 1.155            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 1.305                               | 1.467                               | 1.283                               | 1.458                               | 1.296                               | 1.274                               |
|               |             | Edge 1 at 0mm       | 0.083            |                         |                         |                       |                       |                    | 0.083                               | 0.083                               | 0.083                               | 0.083                               | 0.083                               | 0.083                               |
|               |             | Edge 2 at 0mm       | 0.290            |                         |                         |                       |                       |                    | 0.290                               | 0.290                               | 0.290                               | 0.290                               | 0.290                               | 0.290                               |
|               | WCDMA V     | Bottom Face at 0mm  | 0.515            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 0.665                               | 0.827                               | 0.643                               | 0.818                               | 0.656                               | 0.634                               |
|               |             | Edge 1 at 0mm       | 0.079            |                         |                         |                       |                       |                    | 0.079                               | 0.079                               | 0.079                               | 0.079                               | 0.079                               | 0.079                               |
| Edge 2 at 0mm |             | 0.095               |                  |                         |                         |                       |                       | 0.095              | 0.095                               | 0.095                               | 0.095                               | 0.095                               | 0.095                               |                                     |
| LTE           | LTE Band 4  | Bottom Face at 0mm  | 0.927            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 1.077                               | 1.239                               | 1.055                               | 1.230                               | 1.068                               | 1.046                               |
|               |             | Edge 1 at 0mm       | 0.097            |                         |                         |                       |                       |                    | 0.097                               | 0.097                               | 0.097                               | 0.097                               | 0.097                               | 0.097                               |
|               |             | Edge 2 at 0mm       | 0.300            |                         |                         |                       |                       |                    | 0.300                               | 0.300                               | 0.300                               | 0.300                               | 0.300                               | 0.300                               |
|               | LTE Band 7  | Bottom Face at 0mm  | 0.562            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 0.712                               | 0.874                               | 0.690                               | 0.865                               | 0.703                               | 0.681                               |
|               |             | Edge 1 at 0mm       | 0.078            |                         |                         |                       |                       |                    | 0.078                               | 0.078                               | 0.078                               | 0.078                               | 0.078                               | 0.078                               |
|               |             | Edge 2 at 0mm       | 0.074            |                         |                         |                       |                       |                    | 0.074                               | 0.074                               | 0.074                               | 0.074                               | 0.074                               | 0.074                               |
|               | LTE Band 12 | Bottom Face at 0mm  | 0.627            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 0.777                               | 0.939                               | 0.755                               | 0.930                               | 0.768                               | 0.746                               |
|               |             | Edge 1 at 0mm       | 0.030            |                         |                         |                       |                       |                    | 0.030                               | 0.030                               | 0.030                               | 0.030                               | 0.030                               | 0.030                               |
|               |             | Edge 2 at 0mm       | 0.019            |                         |                         |                       |                       |                    | 0.019                               | 0.019                               | 0.019                               | 0.019                               | 0.019                               | 0.019                               |
|               | LTE Band 13 | Bottom Face at 0mm  | 0.596            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 0.746                               | 0.908                               | 0.724                               | 0.899                               | 0.737                               | 0.715                               |
|               |             | Edge 1 at 0mm       | 0.085            |                         |                         |                       |                       |                    | 0.085                               | 0.085                               | 0.085                               | 0.085                               | 0.085                               | 0.085                               |
|               |             | Edge 2 at 0mm       | 0.026            |                         |                         |                       |                       |                    | 0.026                               | 0.026                               | 0.026                               | 0.026                               | 0.026                               | 0.026                               |
|               | LTE Band 25 | Bottom Face at 10mm | 0.220            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 0.370                               | 0.532                               | 0.348                               | 0.523                               | 0.361                               | 0.339                               |
|               |             | Bottom Face at 0mm  | 1.057            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 1.207                               | 1.369                               | 1.185                               | 1.360                               | 1.198                               | 1.176                               |
|               |             | Edge 1 at 0mm       | 0.342            |                         |                         |                       |                       |                    | 0.342                               | 0.342                               | 0.342                               | 0.342                               | 0.342                               | 0.342                               |
|               |             | Edge 2 at 0mm       | 0.148            |                         |                         |                       |                       |                    | 0.148                               | 0.148                               | 0.148                               | 0.148                               | 0.148                               | 0.148                               |
|               | LTE Band 26 | Bottom Face at 0mm  | 0.459            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 0.609                               | 0.771                               | 0.587                               | 0.762                               | 0.600                               | 0.578                               |
|               |             | Edge 1 at 0mm       | 0.081            |                         |                         |                       |                       |                    | 0.081                               | 0.081                               | 0.081                               | 0.081                               | 0.081                               | 0.081                               |
|               |             | Edge 2 at 0mm       | 0.006            |                         |                         |                       |                       |                    | 0.006                               | 0.006                               | 0.006                               | 0.006                               | 0.006                               | 0.006                               |
|               | LTE Band 41 | Bottom Face at 0mm  | 0.623            | 0.115                   | 0.035                   | 0.106                 | 0.197                 | 0.013              | 0.773                               | 0.935                               | 0.751                               | 0.926                               | 0.764                               | 0.742                               |
|               |             | Edge 1 at 0mm       | 0.119            |                         |                         |                       |                       |                    | 0.119                               | 0.119                               | 0.119                               | 0.119                               | 0.119                               | 0.119                               |
|               |             | Edge 2 at 0mm       | 0.037            |                         |                         |                       |                       |                    | 0.037                               | 0.037                               | 0.037                               | 0.037                               | 0.037                               | 0.037                               |

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## **16. 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.

## **17. References**

- [1] FCC 47 CFR Part 2 "Frequency Allocations and Radio Treaty Matters; General Rules and Regulations"
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- [5] FCC KDB 447498 D01 v06, "Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Policies", Oct 2015
- [6] FCC KDB 941225 D01 v03r01, "3G SAR MEAUREMENT PROCEDURES", Oct 2015
- [7] FCC KDB 941225 D05 v02r05, "SAR Evaluation Considerations for LTE Devices", Dec 2015
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- [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.