# FCC TEST REPORT

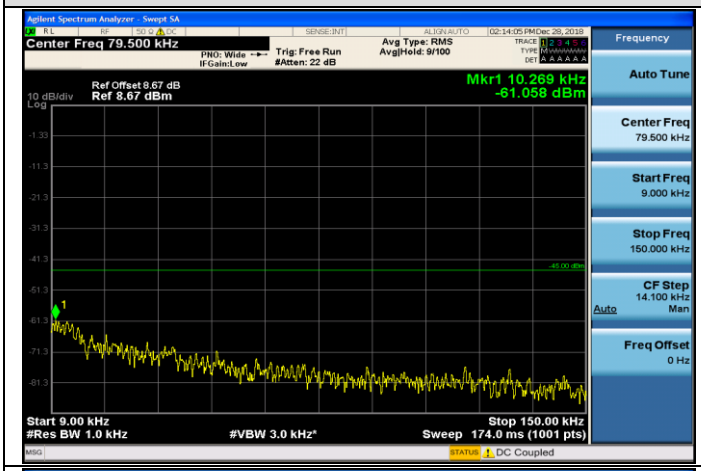
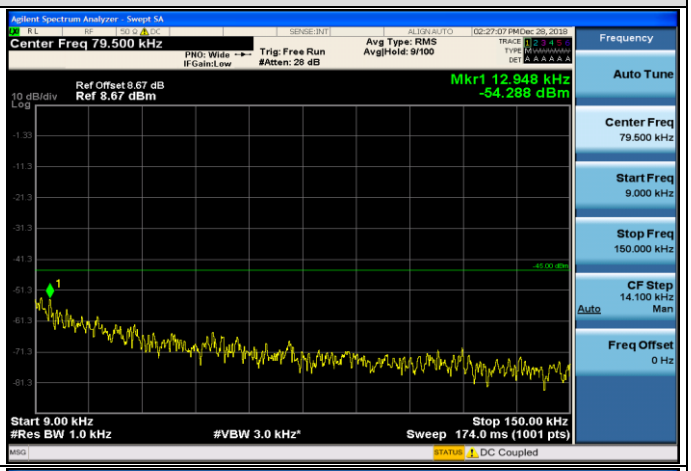
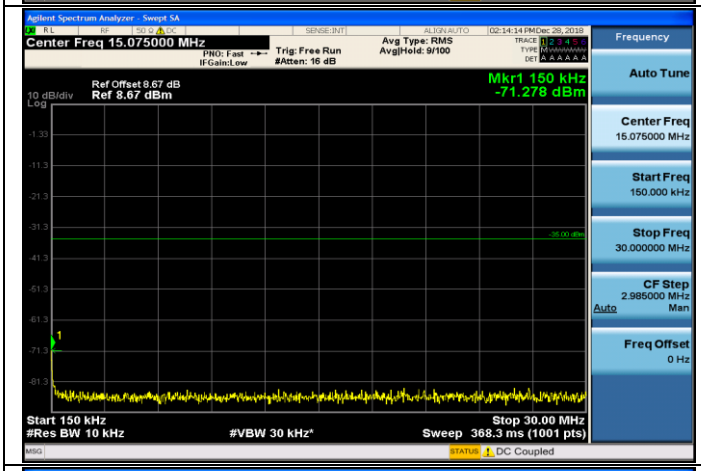
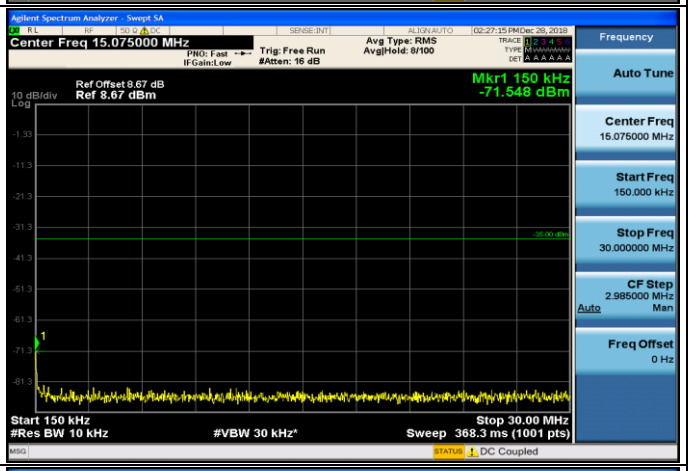
**Test report**
**On Behalf of**
**SOTEN TECHNOLOGY (HONGKONG) CO., LIMITED**
**For**
**Rugged Tablet**
**Model No.: T101, S101, K101, S70V2, T60**

**FCC ID: 2AI62T101**

| | |
|---|---|
| **Prepared for :** | **SOTEN TECHNOLOGY (HONGKONG) CO., LIMITED**<br>**FLAT/RM A 20/F KIU FU COMMERCIAL BLDG 300 LOCKHART ROAD WAN CHAI HK** |
| **Prepared By :** | **Shenzhen HUAK Testing Technology Co., Ltd.**<br>**1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China** |
| **Date of Test:** | **Nov. 13, 2018 ~ Jan. 14, 2019** |
| **Date of Report:** | **Jan. 15, 2019** |
| **Report Number:** | **HK1811161631E** |

## TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

## LTE BAND 7

| 1.4MHz_LCH_QPSK_1RB#0 | 20MHz_LCH_QPSK_1RB#0 |
|---|---|
|  |  |
|  |  |
|  |  |

**TEST RESULT CERTIFICATION**

| | |
|---|---|
| **Applicant's name** ..... : | SOTEN TECHNOLOGY (HONGKONG) CO., LIMITED |
| Address..... : | FLAT/RM A 20/F KIU FU COMMERCIAL BLDG 300 LOCKHART ROAD WAN CHAI HK |
| **Manufacture's Name** ..... : | Shenzhen SOTEN Technology Co., Ltd. |
| Address..... : | 10th Floor,2nd Building,BaiWang Research and development building, No. 5308 Shahe west road,Xili,Nanshan district,ShenZhen, China |
| **Factory Name** ..... : | Shenzhen SOTEN Technology Co., Ltd. |
| Address..... : | 10th Floor,2nd Building,BaiWang Research and development building, No. 5308 Shahe west road,Xili,Nanshan district,ShenZhen, China |
| **Product description** | Rugged Tablet |
| Brand name | HUGEROCK |
| Mode name | T101, S101, K101, S70V2, T60 |
| Test model name | T101 |
| Difference description | All the same except for the model name. |
| **Standards** ..... : | FCC Part 24: PERSONAL COMMUNICATIONS SERVICES<br>FCC Part 27: MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES |



| | |
|---|---|
| **Date of Test** .....: | |
| Date (s) of performance of tests.....: | **Nov. 13, 2018 ~ Jan. 14, 2019** |
| Date of Issue .....: | **Jan. 15, 2019** |
| Test Result.....: | **Pass** |

Testing Engineer : 

(Gary Qian)

Technical Manager : 

(Eden Hu)

Authorized Signatory : 

(Jason Zhou)

**Revision History**

| Report Version | Revise Time | Issued Date | Valid Version | Notes |
|---|---|---|---|---|
| V1.0 | / | Jan. 15, 2019 | Valid | Initial Release |

# TABLE OF CONTENTS

**1.TEST STANDARDS ..... 7**
**2. SUMMARY ..... 8**
2.1 PRODUCT DESCRIPTION ..... 8
2.2 RELATED SUBMITTAL(S) / GRANT (S) ..... 9
2.3 TEST METHODOLOGY ..... 9
2.4 TEST FACILITY ..... 10
2.5 SPECIAL ACCESSORIES ..... 11
2.6 EQUIPMENT MODIFICATIONS ..... 11
**3. SYSTEM TEST CONFIGURATION ..... 12**
3.1 EUT CONFIGURATION ..... 12
3.2 EUT EXERCISE ..... 12
3.3 GENERAL TECHNICAL REQUIREMENTS ..... 12
3.4 CONFIGURATION OF EUT SYSTEM ..... 13
**4. SUMMARY OF TEST RESULTS ..... 14**
**5. DESCRIPTION OF TEST MODES ..... 15**
**6. OUTPUT POWER ..... 17**
6.1 CONDUCTED OUTPUT POWER ..... 17
6.2 RADIATED OUTPUT POWER ..... 29
6.3. PEAK-TO-AVERAGE RATIO ..... 37
**7. SPURIOUS EMISSION ..... 51**
7.1 CONDUCTED SPURIOUS EMISSION ..... 51
7.2 RADIATED SPURIOUS EMISSION ..... 53
**8. FREQUENCY STABILITY ..... 58**
8.1 MEASUREMENT METHOD ..... 58
8.2 PROVISIONS APPLICABLE ..... 59
8.3 MEASUREMENT RESULT (WORST) ..... 60
**9. OCCUPIED BANDWIDTH ..... 62**
9.1 MEASUREMENT METHOD ..... 62
9.2 PROVISIONS APPLICABLE ..... 62
9.3 MEASUREMENT RESULT ..... 62
**10. EMISSION BANDWIDTH ..... 67**
10.1 MEASUREMENT METHOD ..... 67
10.2 PROVISIONS APPLICABLE ..... 67
10.3 MEASUREMENT RESULT ..... 67
**11. BAND EDGE ..... 72**
11.1 MEASUREMENT METHOD ..... 72

11.2 PROVISIONS APPLICABLE ..... 72
11.3 MEASUREMENT RESULT ..... 72
**APPENDIX A TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION ..... 73**
**APPENDIX B TEST PLOTS FOR OCCUPIED BANDWIDTH (99%) ..... 79**
**APPENDIX CTEST PLOTS FOR BAND EDGES ..... 89**
**APPENDIX D PHOTOGRAPHS OF TEST SETUP ..... 99**

## 1.TEST STANDARDS

The tests were performed according to following standards:

FCC Part 24 :PUBLIC MOBILE SERVICES
FCC Part 27 : MISCELLANEOUS WIRELESSCOMMUNICATIONS SERVICES
TIA/EIA 603 D June 2010:Land Mobile FM or PM Communications Equipment Measurement and Performance Standards.
47 CFR FCC Part 15 Subpart B: - Unintentional Radiators
FCC Part 2: FREQUENCY ALLOCA-TIONS AND RADIO TREATY MAT-TERS; GENERAL RULES AND REG-ULATIONS
KDB971168 D01:v02r02MEASUREMENT GUIDANCE FOR CERTIFICATION OF LICENSED DIGITAL TRANSMITTERS
ANSI C63.4:2014:Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

# 2. SUMMARY

## 2.1 PRODUCT DESCRIPTION

A major technical description of EUT is described as following:

| | | |
|---|---|---|
| Product Designation: | Rugged Tablet | |
| Model Name | T101 | |
| Hardware Version | T101-MainBoard-P3 | |
| Software Version | T101-20181026-Q | |
| Radio System Type: | LTE | |
| Frequency Bands: | ☒FDD Band 2 ☒FDD Band 7 (U.S. Bands)<br>☒FDD Band 3 ☒FDD Band 7 (Non-U.S. Bands) | |
| Frequency Range | LTE Band 2 | Transmission (TX): 1850 to 1909.9 MHz |
| | | Receiving (RX): 1930 to 1989.9 MHz |
| | LTE Band 7 | Transmission (TX): 2500 to 2569.9 MHz |
| | | Receiving (RX): 2620 to 2689.9 MHz |
| Supported Channel Bandwidth | LTE Band 2 | ☒ 1.4 MHz ☒ 3 MHz ☒ 5 MHz<br>☒ 10 MHz ☒ 15 MHz ☒ 20 MHz |
| | LTE Band 7 | ☒ 5 MHz ☒ 10 MHz ☒ 15 MHz ☒ 20 MHz |
| Antenna: | PCB Antenna | |
| Type of Modulation | QPSK/16QAM | |
| Antenna gain: | 0.85dBi(LTE band 2), 0.88dBi (LTE band 7) | |
| Diversity Antenna gain: | 0.74dBi(LTE band 2), 0.79dBi (LTE band 7) | |
| Power Supply: | DC 3.7V by battery | |
| Single Card: | GSM/WCDMA/LTE Card Slot | |
| Power Class | 3 | |
| Extreme Vol. Limits: | DC3.1V to 4.3 V (Normal: 3.7 V) | |
| Temperature range | -10℃ to +50℃ | |
| **Note1**: The High Voltage DC4.3V and Low Voltage DC3.1V were declared by manufacturer, The EUT couldn't be operating normally with higher or lower voltage.. | | |

## 2.2 RELATED SUBMITTAL(S) / GRANT (S)

This submittal(s) (test report) is intended for **FCC ID: 2AI62T101**, filing to comply with the Part 24 and Pant 27 requirements

.

## 2.3 TEST METHODOLOGY

The radiated emission testing was performed according to the procedures of ANSI/TIA-603-E-2016, and FCC KDB 971168 D01 Power Means License Digital Systems V03R01.

**2.4 TEST FACILITY**

| | |
|---|---|
| **Site** | Shenzhen HUAK Testing Technology Co., Ltd. |
| **Location** | 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park, Fuhai Street, Bao'an District, Shenzhen City, China |
| **Designation Number** | CN1229 |
| Test Firm Registration Number : 616276 | |

**ALL TEST EQUIPMENT LIST**

| Test Equipment | Manufacturer | Model No. | Serial No. | Calibration Date | Calibration Due Date |
|---|---|---|---|---|---|
| LISN | ENV216 | R&S | HKE-059 | 2018/12/27 | 2019/12/26 |
| LISN | R&S | ENV216 | HKE-002 | 2018/12/27 | 2019/12/26 |
| Broadband antenna | Schwarzbeck | VULB 9163 | HKE-012 | 2018/12/27 | 2019/12/26 |
| Receiver | R&S | ESCI 7 | HKE-010 | 2018/12/27 | 2019/12/26 |
| Spectrum analyzer | Agilent | N9020A | HKE-048 | 2018/12/27 | 2019/12/26 |
| RF automatic control unit | Tonscend | JS0806-2 | HKE-060 | 2018/12/27 | 2019/12/26 |
| Horn antenna | Schwarzbeck | 9120D | HKE-013 | 2018/12/27 | 2019/12/26 |
| Loop antenna | Schwarzbeck | FMZB 1519 B | HKE-014 | 2018/12/27 | 2019/12/26 |
| Preamplifier | EMCI | EMC051845SE | HKE-015 | 2018/12/27 | 2019/12/26 |
| Preamplifier | Agilent | 83051A | HKE-016 | 2018/12/27 | 2019/12/26 |
| Temperature and humidity meter | Boyang | HTC-1 | HKE-075 | 2018/12/27 | 2019/12/26 |
| High pass filter unit | Tonscend | JS0806-F | HKE-055 | 2018/12/27 | 2019/12/26 |
| RF cable | Times | 1-40G | HKE-034 | 2018/12/27 | 2019/12/26 |
| Power meter | Agilent | E4419B | HKE-085 | 2018/12/27 | 2019/12/26 |
| Power Sensor | Agilent | E9300A | HKE-086 | 2018/12/27 | 2019/12/26 |
| Wireless Communication Test Set | R&S | CMU200 | HKE-026 | 2018/12/27 | 2019/12/26 |

**2.5 SPECIAL ACCESSORIES**

The battery was supplied by the applicant were used as accessories and being tested with EUT intended for FCC grant together.

**2.6 EQUIPMENT MODIFICATIONS**

Not available for this EUT intended for grant.

# 3. SYSTEM TEST CONFIGURATION

## 3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

## 3.2 EUT EXERCISE

The Transmitter was operated in the maximum output power mode through Communication Tester. The TX frequency was fixed which was for the purpose of the measurements.

## 3.3 GENERAL TECHNICAL REQUIREMENTS

| Item Number | Item Description | | FCC Rules |
|---|---|---|---|
| 1 | Output Power | Conducted output power | 2.1046/24.232(c) /27.50(d)(4)/ 27.50(h)(2) |
| | | Radiated output power | |
| 2 | Peak-to-Average Ratio | Peak-to-Average Ratio | 24.232(d) |
| 3 | Spurious Emission | Conducted spurious emission | 2.1051/22.917(a)/24.238(a) 27.53(h)/ 27.53(g) |
| | | Radiated spurious emission | |
| 4 | Frequency Stability | | 2.1055/22.355/24.235/27.54 |
| 5 | Occupied Bandwidth | | 2.1049 (h)(i) |
| 6 | Band Edge | | 2.1051/22.917(a)/24.238(a) 27.53(h)/ 27.53(g) |

Note: Testing was performed by configuring EUT to maximum output power status, the declared output power class for different.

**3.4 CONFIGURATION OF EUT SYSTEM**

Fig. 2-1 Configuration of EUT System

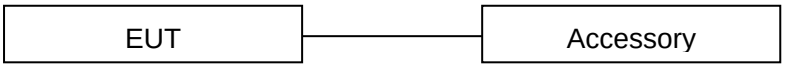



Table 2-1 Equipment Used in EUT System

| Item | Equipment | Model No. | ID or Specification | Remark |
|---|---|---|---|---|
| 1 | Rugged Tablet | T101 | 2AI62T101 | EUT |
| 2 | Adapter | 8395-UW01-1070 | DC 5.3V 2.0A | Accessory |
| 3 | Battery | 47206128 | DC3.7V/ 14600mAh | Accessory |
| 4 | USB | N/A | N/A | Accessory |

***Note: All the accessories have been used during the test. The following “EUT” in setup diagram means EUT system.

## 4. SUMMARY OF TEST RESULTS

| Item Number | Item Description | | FCC Rules | Result |
|---|---|---|---|---|
| 1 | Output Power | Conducted Output Power | 2.1046/22.913(a)(2)/24.232(c)/ 27.50(d)(4)/ 27.50(h)(2) | Pass |
| | | Radiated Output Power | | |
| 2 | Peak-to-Average Ratio | Peak-to-Average Ratio | 24.232(d) | Pass |
| 3 | Spurious Emission | Conducted Spurious Emission | 2.1051/24.238(a) 27.53(h)/ 27.53(g) | Pass |
| | | Radiated Spurious Emission | | |
| 4 | Frequency Stability | | 2.1055/24.235/27.54 | Pass |
| 5 | Occupied Bandwidth | | 2.1049 (h)(i) | Pass |
| 6 | Band Edge | | 2.1051/24.238(a) 27.53(h) /27.53(g) | Pass |

## 5. DESCRIPTION OF TEST MODES

During the testing, the EUT was controlled via Rhode & Schwarz Digital Radio Communication Tester (CMW 500) to ensure max power transmission and proper modulation. Three channels (The top channel, the middle channel and the bottom channel) were chosen for testing on both LTE frequency band.

The worst condition was recorded in the test report if no other modes test data.

| Test Mode | Test Modes Description |
|---|---|
| LTE | LTE system, QPSK modulation |
| LTE | LTE system, 16QAM modulation |

| Test Mode | TX / RX | RF Channel | | |
|---|---|---|---|---|
| | | Low (B) | Middle (M) | High (T) |
| LTE Band 2 | TX (1.4M) | Channel 18607 | Channel 18900 | Channel 19193 |
| | | 1850.7 MHz | 1880 MHz | 1909.3 MHz |
| | TX (3M) | Channel 18615 | Channel 18900 | Channel 19185 |
| | | 1851.5 MHz | 1880 MHz | 1908.5 MHz |
| | TX (5M) | Channel 18625 | Channel 18900 | Channel 19175 |
| | | 1852.5 MHz | 1880 MHz | 1907.5 MHz |
| | TX (10M) | Channel 18650 | Channel 18900 | Channel 19150 |
| | | 1855.0 MHz | 1880 MHz | 1905.0 MHz |
| | TX (15M) | Channel 18675 | Channel 18900 | Channel 19125 |
| | | 1857.5 MHz | 1880 MHz | 1902.5 MHz |
| | TX (20M) | Channel 18700 | Channel 18900 | Channel 19100 |
| | | 1860.0 MHz | 1880 MHz | 1900.0 MHz |
| | RX (1.4M) | Channel 607 | Channel 900 | Channel 1193 |
| | | 1930.7 MHz | 1960 MHz | 1989.3 MHz |
| | RX (3M) | Channel 615 | Channel 900 | Channel 1185 |
| | | 1931.5 MHz | 1960 MHz | 1988.5 MHz |
| | RX (5M) | Channel 625 | Channel 900 | Channel 1175 |
| | | 1932.5 MHz | 1960 MHz | 1987.5 MHz |
| | RX (10M) | Channel 650 | Channel 900 | Channel 1150 |
| | | 1935 MHz | 1960 MHz | 1985 MHz |
| | RX (15M) | Channel 675 | Channel 900 | Channel 1125 |
| | | 1937.5 MHz | 1960 MHz | 1982.5 MHz |
| | RX (20M) | Channel 700 | Channel 900 | Channel 1100 |
| | | 1940.0 MHz | 1960 MHz | 1980 MHz |

| Test Mode | TX / RX | RF Channel | | |
|---|---|---|---|---|
| | | Low (B) | Middle (M) | High (T) |
| LTE Band 7 | TX (5M) | Channel 20775 | Channel 21100 | Channel 21425 |
| | | 2502.5 MHz | 2535 MHz | 2567.5 MHz |
| | TX (10M) | Channel 20800 | Channel 21100 | Channel 21400 |
| | | 2505.0 MHz | 2535 MHz | 2565 MHz |
| | TX (15M) | Channel 20825 | Channel 21100 | Channel 21275 |
| | | 2507.5 MHz | 2535 MHz | 2562.5 MHz |
| | TX (20M) | Channel 20850 | Channel 21100 | Channel 21350 |
| | | 2510.0 MHz | 2535 MHz | 2560 MHz |
| | RX (5M) | Channel 2775 | Channel 3100 | Channel 3425 |
| | | 2622.5 MHz | 2655 MHz | 2687.5 MHz |
| | RX (10M) | Channel 2800 | Channel 3100 | Channel 3400 |
| | | 2625.0 MHz | 2655 MHz | 2685 MHz |
| | RX (15M) | Channel 2825 | Channel 3100 | Channel 3375 |
| | | 2627.5 MHz | 2655 MHz | 2682.5 MHz |
| | RX (20M) | Channel 2850 | Channel 3100 | Channel 3350 |
| | | 2630.0 MHz | 2655 MHz | 2680.0 MHz |

# 6. OUTPUT POWER

## 6.1 CONDUCTED OUTPUT POWER

### 6.1.1 MEASUREMENT METHOD

The EUT is coupled to the SS with attenuator through power splitter; the RF load attached to EUT antenna terminal is 50ohm, the path loss as the factor is calibrated to correct the reading. A system simulator was used to establish communication with the EUT , Its parameters were set to force the EUT transmitting at maximum output power. The measured power in the radio frequency on the transmitter output terminals shall be reported. The measurements were performed on all modes at 3 typical channels (the Top Channel, the Middle Channel and the Bottom Channel) for each band.

### 6.1.2 Measurement Result

| Conducted Output Power Limits | | |
|---|---|---|
| **Mode** | **Average Power** | **Tolerance(dB)** |
| LTE | 23 dBm (0.2W) | ± 2.7 |

**LTE Band 2**

| BW (MHz) | Ch | Freq. (MHz) | Mode | UL RB Allocation | UL RB Offset | MPR | Average power (dBm) |
|---|---|---|---|---|---|---|---|
| 20MHz | 18700 | 1860.0 | QPSK | 1 | 0 | 0 | 21.32 |
| | | | | 1 | 49 | 0 | 21.29 |
| | | | | 1 | 99 | 0 | 21.39 |
| | | | | 50 | 0 | 1 | 20.24 |
| | | | | 50 | 25 | 1 | 20.19 |
| | | | | 50 | 49 | 1 | 20.29 |
| | | | | 100 | 0 | 1 | 20.23 |
| | | | 16QAM | 1 | 0 | 1 | 20.56 |
| | | | | 1 | 49 | 1 | 20.62 |
| | | | | 1 | 99 | 1 | 20.57 |
| | | | | 50 | 0 | 2 | 19.24 |
| | | | | 50 | 25 | 2 | 19.26 |
| | | | | 50 | 49 | 2 | 19.28 |
| | | | | 100 | 0 | 2 | 19.31 |
| | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 21.41 |
| | | | | 1 | 49 | 0 | 21.24 |
| | | | | 1 | 99 | 0 | 21.08 |
| | | | | 50 | 0 | 1 | 20.12 |
| | | | | 50 | 25 | 1 | 20.08 |
| | | | | 50 | 49 | 1 | 20.10 |
| | | | | 100 | 0 | 1 | 20.16 |
| | | | 16QAM | 1 | 0 | 1 | 20.73 |
| | | | | 1 | 49 | 1 | 20.64 |
| | | | | 1 | 99 | 1 | 20.47 |
| | | | | 50 | 0 | 2 | 19.20 |
| | | | | 50 | 25 | 2 | 19.13 |
| | | | | 50 | 49 | 2 | 19.14 |
| | | | | 100 | 0 | 2 | 19.18 |
| | 19100 | 1900.0 | QPSK | 1 | 0 | 0 | 20.93 |
| | | | | 1 | 49 | 0 | 20.76 |
| | | | | 1 | 99 | 0 | 21.04 |
| | | | | 50 | 0 | 1 | 20.08 |
| | | | | 50 | 25 | 1 | 20.01 |
| | | | | 50 | 49 | 1 | 20.05 |
| | | | | 100 | 0 | 1 | 20.01 |
| | | | 16QAM | 1 | 0 | 1 | 20.29 |
| | | | | 1 | 49 | 1 | 20.31 |
| | | | | 1 | 99 | 1 | 20.34 |
| | | | | 50 | 0 | 2 | 19.05 |
| | | | | 50 | 25 | 2 | 19.10 |
| | | | | 50 | 49 | 2 | 19.07 |
| | | | | 100 | 0 | 2 | 19.05 |

| BW (MHz) | Ch | Freq. (MHz) | Mode | UL RB Allocation | UL RB Offset | MPR | Average power (dBm) |
|---|---|---|---|---|---|---|---|
| 15MHz | 18675 | 1857.5 | QPSK | 1 | 0 | 0 | 21.20 |
| | | | | 1 | 37 | 0 | 21.17 |
| | | | | 1 | 74 | 0 | 21.18 |
| | | | | 36 | 0 | 1 | 20.14 |
| | | | | 36 | 16 | 1 | 20.20 |
| | | | | 36 | 35 | 1 | 20.22 |
| | | | | 75 | 0 | 1 | 20.23 |
| | | | 16QAM | 1 | 0 | 1 | 20.52 |
| | | | | 1 | 37 | 1 | 20.43 |
| | | | | 1 | 74 | 1 | 20.47 |
| | | | | 36 | 0 | 2 | 19.19 |
| | | | | 36 | 16 | 2 | 19.22 |
| | | | | 36 | 35 | 2 | 19.23 |
| | | | | 75 | 0 | 2 | 19.26 |
| | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 21.22 |
| | | | | 1 | 37 | 0 | 21.12 |
| | | | | 1 | 74 | 0 | 20.96 |
| | | | | 36 | 0 | 1 | 20.10 |
| | | | | 36 | 16 | 1 | 20.04 |
| | | | | 36 | 35 | 1 | 20.08 |
| | | | | 75 | 0 | 1 | 20.16 |
| | | | 16QAM | 1 | 0 | 1 | 20.50 |
| | | | | 1 | 37 | 1 | 20.41 |
| | | | | 1 | 74 | 1 | 20.29 |
| | | | | 36 | 0 | 2 | 19.08 |
| | | | | 36 | 16 | 2 | 19.03 |
| | | | | 36 | 35 | 2 | 19.10 |
| | | | | 75 | 0 | 2 | 19.18 |
| | 19125 | 1902.5 | QPSK | 1 | 0 | 0 | 20.92 |
| | | | | 1 | 37 | 0 | 20.96 |
| | | | | 1 | 74 | 0 | 21.06 |
| | | | | 36 | 0 | 1 | 20.15 |
| | | | | 36 | 16 | 1 | 20.17 |
| | | | | 36 | 35 | 1 | 20.19 |
| | | | | 75 | 0 | 1 | 20.13 |
| | | | 16QAM | 1 | 0 | 1 | 20.23 |
| | | | | 1 | 37 | 1 | 20.32 |
| | | | | 1 | 74 | 1 | 20.35 |
| | | | | 36 | 0 | 2 | 19.12 |
| | | | | 36 | 16 | 2 | 19.08 |
| | | | | 36 | 35 | 2 | 19.15 |
| | | | | 75 | 0 | 2 | 19.08 |

| BW (MHz) | Ch | Freq. (MHz) | Mode | UL RB Allocation | UL RB Offset | MPR | Average power (dBm) |
|---|---|---|---|---|---|---|---|
| 10MHz | 18650 | 1855.0 | QPSK | 1 | 0 | 0 | 21.16 |
| | | | | 1 | 24 | 0 | 21.17 |
| | | | | 1 | 49 | 0 | 21.14 |
| | | | | 25 | 0 | 1 | 20.18 |
| | | | | 25 | 12 | 1 | 20.21 |
| | | | | 25 | 25 | 1 | 20.23 |
| | | | | 50 | 0 | 1 | 20.24 |
| | | | 16QAM | 1 | 0 | 1 | 20.51 |
| | | | | 1 | 24 | 1 | 20.46 |
| | | | | 1 | 49 | 1 | 20.47 |
| | | | | 25 | 0 | 2 | 19.17 |
| | | | | 25 | 12 | 2 | 19.20 |
| | | | | 25 | 25 | 2 | 19.27 |
| | | | | 50 | 0 | 2 | 19.29 |
| | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 21.21 |
| | | | | 1 | 24 | 0 | 21.14 |
| | | | | 1 | 49 | 0 | 20.99 |
| | | | | 25 | 0 | 1 | 20.01 |
| | | | | 25 | 12 | 1 | 20.05 |
| | | | | 25 | 25 | 1 | 20.06 |
| | | | | 50 | 0 | 1 | 20.07 |
| | | | 16QAM | 1 | 0 | 1 | 20.59 |
| | | | | 1 | 24 | 1 | 20.38 |
| | | | | 1 | 49 | 1 | 20.41 |
| | | | | 25 | 0 | 2 | 19.14 |
| | | | | 25 | 12 | 2 | 19.11 |
| | | | | 25 | 25 | 2 | 19.12 |
| | | | | 50 | 0 | 2 | 19.14 |
| | 19150 | 1905.0 | QPSK | 1 | 0 | 0 | 20.96 |
| | | | | 1 | 24 | 0 | 21.05 |
| | | | | 1 | 49 | 0 | 21.04 |
| | | | | 25 | 0 | 1 | 20.06 |
| | | | | 25 | 12 | 1 | 20.09 |
| | | | | 25 | 25 | 1 | 20.05 |
| | | | | 50 | 0 | 1 | 19.99 |
| | | | 16QAM | 1 | 0 | 1 | 20.15 |
| | | | | 1 | 24 | 1 | 20.17 |
| | | | | 1 | 49 | 1 | 20.30 |
| | | | | 25 | 0 | 2 | 19.04 |
| | | | | 25 | 12 | 2 | 19.02 |
| | | | | 25 | 25 | 2 | 19.03 |
| | | | | 50 | 0 | 2 | 19.02 |

| BW (MHz) | Ch | Freq. (MHz) | Mode | UL RB Allocation | UL RB Offset | MPR | Average power (dBm) |
|---|---|---|---|---|---|---|---|
| 5MHz | 18625 | 1852.5 | QPSK | 1 | 0 | 0 | 21.21 |
| | | | | 1 | 12 | 0 | 21.15 |
| | | | | 1 | 24 | 0 | 21.20 |
| | | | | 12 | 0 | 1 | 20.20 |
| | | | | 12 | 6 | 1 | 20.19 |
| | | | | 12 | 11 | 1 | 20.23 |
| | | | | 25 | 0 | 1 | 20.22 |
| | | | 16QAM | 1 | 0 | 1 | 20.50 |
| | | | | 1 | 12 | 1 | 20.49 |
| | | | | 1 | 24 | 1 | 20.51 |
| | | | | 12 | 0 | 2 | 19.24 |
| | | | | 12 | 6 | 2 | 19.26 |
| | | | | 12 | 11 | 2 | 19.34 |
| | | | | 25 | 0 | 2 | 19.26 |
| | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 21.16 |
| | | | | 1 | 12 | 0 | 21.08 |
| | | | | 1 | 24 | 0 | 21.03 |
| | | | | 12 | 0 | 1 | 20.14 |
| | | | | 12 | 6 | 1 | 20.10 |
| | | | | 12 | 11 | 1 | 20.09 |
| | | | | 25 | 0 | 1 | 20.05 |
| | | | 16QAM | 1 | 0 | 1 | 20.41 |
| | | | | 1 | 12 | 1 | 20.37 |
| | | | | 1 | 24 | 1 | 20.30 |
| | | | | 12 | 0 | 2 | 19.19 |
| | | | | 12 | 6 | 2 | 19.12 |
| | | | | 12 | 11 | 2 | 19.22 |
| | | | | 25 | 0 | 2 | 19.09 |
| | 19175 | 1907.5 | QPSK | 1 | 0 | 0 | 21.11 |
| | | | | 1 | 12 | 0 | 21.09 |
| | | | | 1 | 24 | 0 | 21.05 |
| | | | | 12 | 0 | 1 | 20.17 |
| | | | | 12 | 6 | 1 | 20.04 |
| | | | | 12 | 11 | 1 | 20.07 |
| | | | | 25 | 0 | 1 | 20.02 |
| | | | 16QAM | 1 | 0 | 1 | 20.22 |
| | | | | 1 | 12 | 1 | 20.19 |
| | | | | 1 | 24 | 1 | 20.23 |
| | | | | 12 | 0 | 2 | 19.09 |
| | | | | 12 | 6 | 2 | 19.17 |
| | | | | 12 | 11 | 2 | 19.12 |
| | | | | 25 | 0 | 2 | 19.07 |

| BW (MHz) | Ch | Freq. (MHz) | Mode | UL RB Allocation | UL RB Offset | MPR | Average power (dBm) |
|---|---|---|---|---|---|---|---|
| 3MHz | 18615 | 1851.5 | QPSK | 1 | 0 | 0 | 21.05 |
| | | | | 1 | 7 | 0 | 21.09 |
| | | | | 1 | 14 | 0 | 21.11 |
| | | | | 8 | 0 | 1 | 20.00 |
| | | | | 8 | 4 | 1 | 20.06 |
| | | | | 8 | 7 | 1 | 20.16 |
| | | | | 15 | 0 | 1 | 20.17 |
| | | | 16QAM | 1 | 0 | 1 | 20.38 |
| | | | | 1 | 7 | 1 | 20.34 |
| | | | | 1 | 14 | 1 | 20.42 |
| | | | | 8 | 0 | 2 | 19.18 |
| | | | | 8 | 4 | 2 | 19.20 |
| | | | | 8 | 7 | 2 | 19.28 |
| | | | | 15 | 0 | 2 | 19.17 |
| | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 21.04 |
| | | | | 1 | 7 | 0 | 21.06 |
| | | | | 1 | 14 | 0 | 20.97 |
| | | | | 8 | 0 | 1 | 20.03 |
| | | | | 8 | 4 | 1 | 20.09 |
| | | | | 8 | 7 | 1 | 20.05 |
| | | | | 15 | 0 | 1 | 20.05 |
| | | | 16QAM | 1 | 0 | 1 | 20.40 |
| | | | | 1 | 7 | 1 | 20.37 |
| | | | | 1 | 14 | 1 | 20.36 |
| | | | | 8 | 0 | 2 | 19.06 |
| | | | | 8 | 4 | 2 | 19.03 |
| | | | | 8 | 7 | 2 | 19.07 |
| | | | | 15 | 0 | 2 | 19.06 |
| | 19185 | 1908.5 | QPSK | 1 | 0 | 0 | 21.00 |
| | | | | 1 | 7 | 0 | 21.02 |
| | | | | 1 | 14 | 0 | 20.98 |
| | | | | 8 | 0 | 1 | 20.04 |
| | | | | 8 | 4 | 1 | 20.04 |
| | | | | 8 | 7 | 1 | 20.03 |
| | | | | 15 | 0 | 1 | 20.03 |
| | | | 16QAM | 1 | 0 | 1 | 20.21 |
| | | | | 1 | 7 | 1 | 20.18 |
| | | | | 1 | 14 | 1 | 20.24 |
| | | | | 8 | 0 | 2 | 19.04 |
| | | | | 8 | 4 | 2 | 19.07 |
| | | | | 8 | 7 | 2 | 19.02 |
| | | | | 15 | 0 | 2 | 19.07 |

| BW (MHz) | Ch | Freq. (MHz) | Mode | UL RB Allocation | UL RB Offset | MPR | Average power (dBm) |
|---|---|---|---|---|---|---|---|
| 1.4MHz | 18607 | 1850.7 | QPSK | 1 | 0 | 0 | 21.07 |
| | | | | 1 | 2 | 0 | 21.03 |
| | | | | 1 | 5 | 0 | 21.08 |
| | | | | 3 | 0 | 0 | 21.13 |
| | | | | 3 | 1 | 0 | 21.17 |
| | | | | 3 | 2 | 0 | 21.18 |
| | | | | 6 | 0 | 1 | 20.12 |
| | | | 16QAM | 1 | 0 | 1 | 20.36 |
| | | | | 1 | 2 | 1 | 20.37 |
| | | | | 1 | 5 | 1 | 20.41 |
| | | | | 3 | 0 | 1 | 20.22 |
| | | | | 3 | 1 | 1 | 20.26 |
| | | | | 3 | 2 | 1 | 20.30 |
| | | | | 6 | 0 | 2 | 19.17 |
| | 18900 | 1880.0 | QPSK | 1 | 0 | 0 | 21.02 |
| | | | | 1 | 2 | 0 | 20.03 |
| | | | | 1 | 5 | 0 | 21.02 |
| | | | | 3 | 0 | 0 | 21.15 |
| | | | | 3 | 1 | 0 | 21.07 |
| | | | | 3 | 2 | 0 | 21.06 |
| | | | | 6 | 0 | 1 | 20.03 |
| | | | 16QAM | 1 | 0 | 1 | 20.37 |
| | | | | 1 | 2 | 1 | 20.15 |
| | | | | 1 | 5 | 1 | 20.37 |
| | | | | 3 | 0 | 1 | 20.14 |
| | | | | 3 | 1 | 1 | 20.09 |
| | | | | 3 | 2 | 1 | 20.07 |
| | | | | 6 | 0 | 2 | 19.03 |
| | 19193 | 1909.3 | QPSK | 1 | 0 | 0 | 21.00 |
| | | | | 1 | 2 | 0 | 21.04 |
| | | | | 1 | 5 | 0 | 21.02 |
| | | | | 3 | 0 | 0 | 21.08 |
| | | | | 3 | 1 | 0 | 21.11 |
| | | | | 3 | 2 | 0 | 21.08 |
| | | | | 6 | 0 | 1 | 20.02 |
| | | | 16QAM | 1 | 0 | 1 | 20.24 |
| | | | | 1 | 2 | 1 | 20.28 |
| | | | | 1 | 5 | 1 | 20.26 |
| | | | | 3 | 0 | 1 | 20.15 |
| | | | | 3 | 1 | 1 | 20.18 |
| | | | | 3 | 2 | 1 | 20.14 |
| | | | | 6 | 0 | 2 | 19.18 |

**LTE Band 7**

| BW (MHz) | Ch | Freq. (MHz) | Mode | UL RB Allocation | UL RB Offset | MPR | Average power (dBm) |
|---|---|---|---|---|---|---|---|
| 20MHz | 20850 | 2510 | QPSK | 1 | 0 | 0 | 22.41 |
| | | | | 1 | 49 | 0 | 22.45 |
| | | | | 1 | 99 | 0 | 22.59 |
| | | | | 50 | 0 | 1 | 21.91 |
| | | | | 50 | 25 | 1 | 21.82 |
| | | | | 50 | 49 | 1 | 21.95 |
| | | | | 100 | 0 | 1 | 21.53 |
| | | | 16QAM | 1 | 0 | 1 | 21.24 |
| | | | | 1 | 49 | 1 | 21.64 |
| | | | | 1 | 99 | 1 | 21.78 |
| | | | | 50 | 0 | 2 | 20.67 |
| | | | | 50 | 25 | 2 | 20.82 |
| | | | | 50 | 49 | 2 | 20.88 |
| | | | | 100 | 0 | 2 | 20.79 |
| | 21100 | 2535 | QPSK | 1 | 0 | 0 | 22.40 |
| | | | | 1 | 49 | 0 | 22.41 |
| | | | | 1 | 99 | 0 | 22.47 |
| | | | | 50 | 0 | 1 | 21.87 |
| | | | | 50 | 25 | 1 | 22.04 |
| | | | | 50 | 49 | 1 | 21.94 |
| | | | | 100 | 0 | 1 | 21.38 |
| | | | 16QAM | 1 | 0 | 1 | 21.88 |
| | | | | 1 | 49 | 1 | 21.73 |
| | | | | 1 | 99 | 1 | 21.85 |
| | | | | 50 | 0 | 2 | 20.77 |
| | | | | 50 | 25 | 2 | 20.58 |
| | | | | 50 | 49 | 2 | 20.48 |
| | | | | 100 | 0 | 2 | 20.15 |
| | 21350 | 2560 | QPSK | 1 | 0 | 0 | 22.19 |
| | | | | 1 | 49 | 0 | 22.61 |
| | | | | 1 | 99 | 0 | 22.64 |
| | | | | 50 | 0 | 1 | 21.87 |
| | | | | 50 | 25 | 1 | 22.05 |
| | | | | 50 | 49 | 1 | 22.12 |
| | | | | 100 | 0 | 1 | 22.03 |
| | | | 16QAM | 1 | 0 | 1 | 20.85 |
| | | | | 1 | 49 | 1 | 20.82 |
| | | | | 1 | 99 | 1 | 20.81 |
| | | | | 50 | 0 | 2 | 20.71 |
| | | | | 50 | 25 | 2 | 20.64 |
| | | | | 50 | 49 | 2 | 20.85 |
| | | | | 100 | 0 | 2 | 20.61 |

| BW (MHz) | Ch | Freq. (MHz) | Mode | UL RB Allocation | UL RB Offset | MPR | Average power (dBm) |
|---|---|---|---|---|---|---|---|
| 15MHz | 20825 | 2507.5 | QPSK | 1 | 0 | 0 | 22.28 |
| | | | | 1 | 37 | 0 | 22.43 |
| | | | | 1 | 74 | 0 | 22.59 |
| | | | | 36 | 0 | 1 | 21.34 |
| | | | | 36 | 16 | 1 | 22.03 |
| | | | | 36 | 35 | 1 | 22.12 |
| | | | | 75 | 0 | 1 | 21.86 |
| | | | 16QAM | 1 | 0 | 1 | 21.49 |
| | | | | 1 | 37 | 1 | 21.23 |
| | | | | 1 | 74 | 1 | 21.86 |
| | | | | 36 | 0 | 2 | 21.05 |
| | | | | 36 | 16 | 2 | 21.13 |
| | | | | 36 | 35 | 2 | 21.14 |
| | | | | 75 | 0 | 2 | 20.84 |
| | 21100 | 2535 | QPSK | 1 | 0 | 0 | 22.27 |
| | | | | 1 | 37 | 0 | 22.18 |
| | | | | 1 | 74 | 0 | 22.19 |
| | | | | 36 | 0 | 1 | 21.41 |
| | | | | 36 | 16 | 1 | 21.34 |
| | | | | 36 | 35 | 1 | 21.45 |
| | | | | 75 | 0 | 1 | 21.29 |
| | | | 16QAM | 1 | 0 | 1 | 21.57 |
| | | | | 1 | 37 | 1 | 21.51 |
| | | | | 1 | 74 | 1 | 21.63 |
| | | | | 36 | 0 | 2 | 20.41 |
| | | | | 36 | 16 | 2 | 20.53 |
| | | | | 36 | 35 | 2 | 20.23 |
| | | | | 75 | 0 | 2 | 20.20 |
| | 21375 | 2562.5 | QPSK | 1 | 0 | 0 | 22.39 |
| | | | | 1 | 37 | 0 | 22.32 |
| | | | | 1 | 74 | 0 | 22.43 |
| | | | | 36 | 0 | 1 | 21.85 |
| | | | | 36 | 16 | 1 | 21.69 |
| | | | | 36 | 35 | 1 | 21.87 |
| | | | | 75 | 0 | 1 | 22.16 |
| | | | 16QAM | 1 | 0 | 1 | 22.09 |
| | | | | 1 | 37 | 1 | 21.22 |
| | | | | 1 | 74 | 1 | 21.30 |
| | | | | 36 | 0 | 2 | 20.94 |
| | | | | 36 | 16 | 2 | 20.81 |
| | | | | 36 | 35 | 2 | 20.70 |
| | | | | 75 | 0 | 2 | 20.69 |

| BW (MHz) | Ch | Freq. (MHz) | Mode | UL RB Allocation | UL RB Offset | MPR | Average power (dBm) |
|---|---|---|---|---|---|---|---|
| 10MHz | 20800 | 2505 | QPSK | 1 | 0 | 0 | 22.15 |
| | | | | 1 | 24 | 0 | 22.34 |
| | | | | 1 | 49 | 0 | 22.52 |
| | | | | 25 | 0 | 1 | 21.41 |
| | | | | 25 | 12 | 1 | 21.37 |
| | | | | 25 | 25 | 1 | 21.48 |
| | | | | 50 | 0 | 1 | 21.37 |
| | | | 16QAM | 1 | 0 | 1 | 21.40 |
| | | | | 1 | 24 | 1 | 21.67 |
| | | | | 1 | 49 | 1 | 21.78 |
| | | | | 25 | 0 | 2 | 20.43 |
| | | | | 25 | 12 | 2 | 20.28 |
| | | | | 25 | 25 | 2 | 20.45 |
| | | | | 50 | 0 | 2 | 20.34 |
| | 21100 | 2535 | QPSK | 1 | 0 | 0 | 22.21 |
| | | | | 1 | 24 | 0 | 22.16 |
| | | | | 1 | 49 | 0 | 22.18 |
| | | | | 25 | 0 | 1 | 21.36 |
| | | | | 25 | 12 | 1 | 21.21 |
| | | | | 25 | 25 | 1 | 21.17 |
| | | | | 50 | 0 | 1 | 21.17 |
| | | | 16QAM | 1 | 0 | 1 | 21.50 |
| | | | | 1 | 24 | 1 | 21.52 |
| | | | | 1 | 49 | 1 | 21.50 |
| | | | | 25 | 0 | 2 | 20.34 |
| | | | | 25 | 12 | 2 | 20.39 |
| | | | | 25 | 25 | 2 | 20.14 |
| | | | | 50 | 0 | 2 | 20.15 |
| | 21400 | 2565 | QPSK | 1 | 0 | 0 | 22.51 |
| | | | | 1 | 24 | 0 | 22.39 |
| | | | | 1 | 49 | 0 | 22.32 |
| | | | | 25 | 0 | 1 | 21.37 |
| | | | | 25 | 12 | 1 | 21.41 |
| | | | | 25 | 25 | 1 | 21.43 |
| | | | | 50 | 0 | 1 | 21.47 |
| | | | 16QAM | 1 | 0 | 1 | 21.75 |
| | | | | 1 | 24 | 1 | 21.67 |
| | | | | 1 | 49 | 1 | 21.59 |
| | | | | 25 | 0 | 2 | 20.27 |
| | | | | 25 | 12 | 2 | 20.33 |
| | | | | 25 | 25 | 2 | 20.41 |
| | | | | 50 | 0 | 2 | 20.47 |

| BW (MHz) | Ch | Freq. (MHz) | Mode | UL RB Allocation | UL RB Offset | MPR | Average power (dBm) |
|---|---|---|---|---|---|---|---|
| 5MHz | 20775 | 2502.5 | QPSK | 1 | 0 | 0 | 22.24 |
| | | | | 1 | 12 | 0 | 22.20 |
| | | | | 1 | 24 | 0 | 22.32 |
| | | | | 12 | 0 | 1 | 21.18 |
| | | | | 12 | 6 | 1 | 21.29 |
| | | | | 12 | 13 | 1 | 21.33 |
| | | | | 25 | 0 | 1 | 21.23 |
| | | | 16QAM | 1 | 0 | 1 | 21.38 |
| | | | | 1 | 12 | 1 | 21.46 |
| | | | | 1 | 24 | 1 | 21.55 |
| | | | | 12 | 0 | 2 | 20.24 |
| | | | | 12 | 6 | 2 | 20.26 |
| | | | | 12 | 13 | 2 | 20.33 |
| | | | | 25 | 0 | 2 | 20.20 |
| | 21100 | 2535 | QPSK | 1 | 0 | 0 | 22.27 |
| | | | | 1 | 12 | 0 | 22.18 |
| | | | | 1 | 24 | 0 | 22.19 |
| | | | | 12 | 0 | 1 | 21.25 |
| | | | | 12 | 6 | 1 | 21.31 |
| | | | | 12 | 13 | 1 | 21.20 |
| | | | | 25 | 0 | 1 | 21.17 |
| | | | 16QAM | 1 | 0 | 1 | 21.43 |
| | | | | 1 | 12 | 1 | 21.39 |
| | | | | 1 | 24 | 1 | 21.34 |
| | | | | 12 | 0 | 2 | 20.31 |
| | | | | 12 | 6 | 2 | 20.29 |
| | | | | 12 | 13 | 2 | 20.24 |
| | | | | 25 | 0 | 2 | 20.13 |
| | 21425 | 2567.5 | QPSK | 1 | 0 | 0 | 22.55 |
| | | | | 1 | 12 | 0 | 22.41 |
| | | | | 1 | 24 | 0 | 22.34 |
| | | | | 12 | 0 | 1 | 21.38 |
| | | | | 12 | 6 | 1 | 21.34 |
| | | | | 12 | 13 | 1 | 21.40 |
| | | | | 25 | 0 | 1 | 21.40 |
| | | | 16QAM | 1 | 0 | 1 | 21.71 |
| | | | | 1 | 12 | 1 | 21.62 |
| | | | | 1 | 24 | 1 | 21.51 |
| | | | | 12 | 0 | 2 | 20.32 |
| | | | | 12 | 6 | 2 | 20.36 |
| | | | | 12 | 13 | 2 | 20.38 |
| | | | | 25 | 0 | 2 | 20.41 |

According to 3GPP 36.521 sub-clause 6.2.3.3, the maximum output power is allowed to be reduced by following the table.

Table 6.2.3.3-1: Maximum Power Reduction (MPR) for Power Class 3

| **Modulation** | **Channel bandwidth / Transmission bandwidth configuration [RB]** | | | | | | **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 |

The device supports MPR to solve linearity issues (ACLR or SEM) due to the higher peak-to average ratios (PAR) of the HSUPA signal. This prevents saturating the full range of the TX DAC inside of device and provides a reduced power output to the RF transceiver chip according to the Cubic Metric (For PRACH, PUCCH and SRS transmission, the allowed MPR is according to that specified for PUSCH QPSK modulation for the corresponding transmission bandwidth.).

When PRACH, PUCCH are present the beta gains on those channels are reduced firsts to try to get the power under the allowed limit. If the beta gains are lowered as far as possible, then a hard limiting is applied at the maximum allowed level.

For each subframe, the MPR is evaluated per slot and given by the maximum value taken over the transmission(s) within the slot, the maximum MPR over the two slots is then applied for the entire subframe.

For the UE maximum output power modified by MPR, the power limits specified in subclause 6.2.5.3 apply. The normative reference for this requirement is TS 36.101 clause 6.2.3.

The end effect is that the DUT output power is identical to the case where there is no MPR in the device.

## 6.2 RADIATED OUTPUT POWER

### 6.2.1 MEASUREMENT METHOD

The measurements procedures specified in ANSI/TIA-603-E-2016 were applied.

1In an anechoic antenna test chamber, a half-wave dipole antenna for the frequency band of interest is placed at the reference centre of the chamber. An RF Signal source for the frequency band of interest is connected to the dipole with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A known (measured) power (Pin) is applied to the input of the dipole, and the power received (Pr) at the chamber's probe antenna is recorded.

2The substitution method is used. Substitution values at each frequency are measured before and saved to the test software. A "reference path loss" is established as ARpl=Pin + 2.15 - Pr. The ARpl is the attenuation of “reference path loss”, and including the gain of receive antenna, the cable loss and the air loss. The measurement results are obtained as described below: Power=PMea+ARpl

3The EUT is substituted for the dipole at the reference centre of the chamber and a scan is performed to obtain the radiation pattern.

4From the radiation pattern, the co-ordinates where the maximum antenna gain occurs are identified.

5The EUT is then put into continuously transmitting mode at its maximum power level.

6Power mode measurements are performed with the receiving antenna placed at the coordinates determined in Step 3 to determine the output power as defined in Rule 27.50(d)(4). The "reference path loss" from Step1 is added to this result.

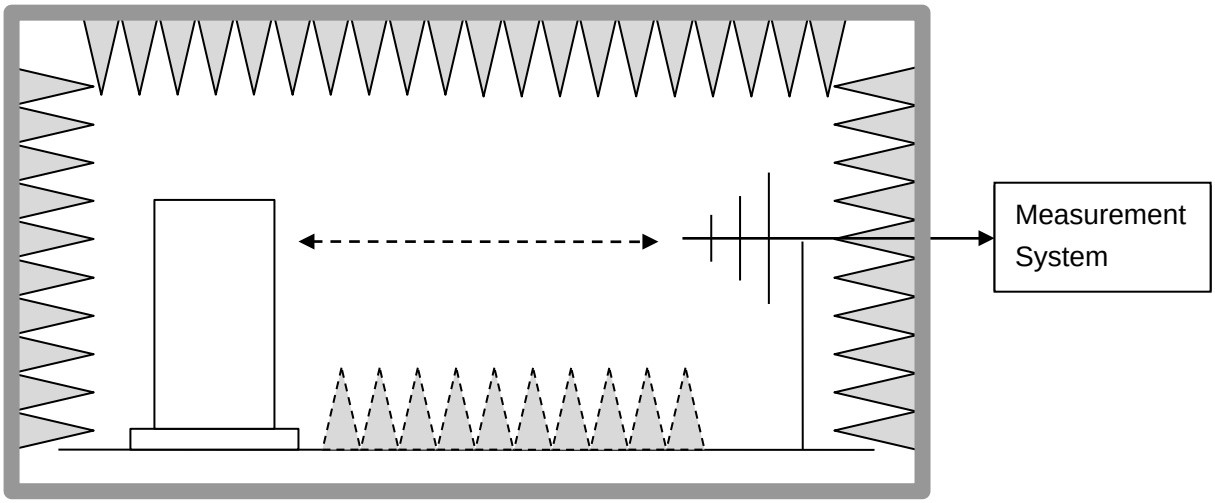
7This value is EIRP since the measurement is calibrated using a half-wave dipole antenna of known gain (2.15 dBi) and known input power (Pin).

8ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi..

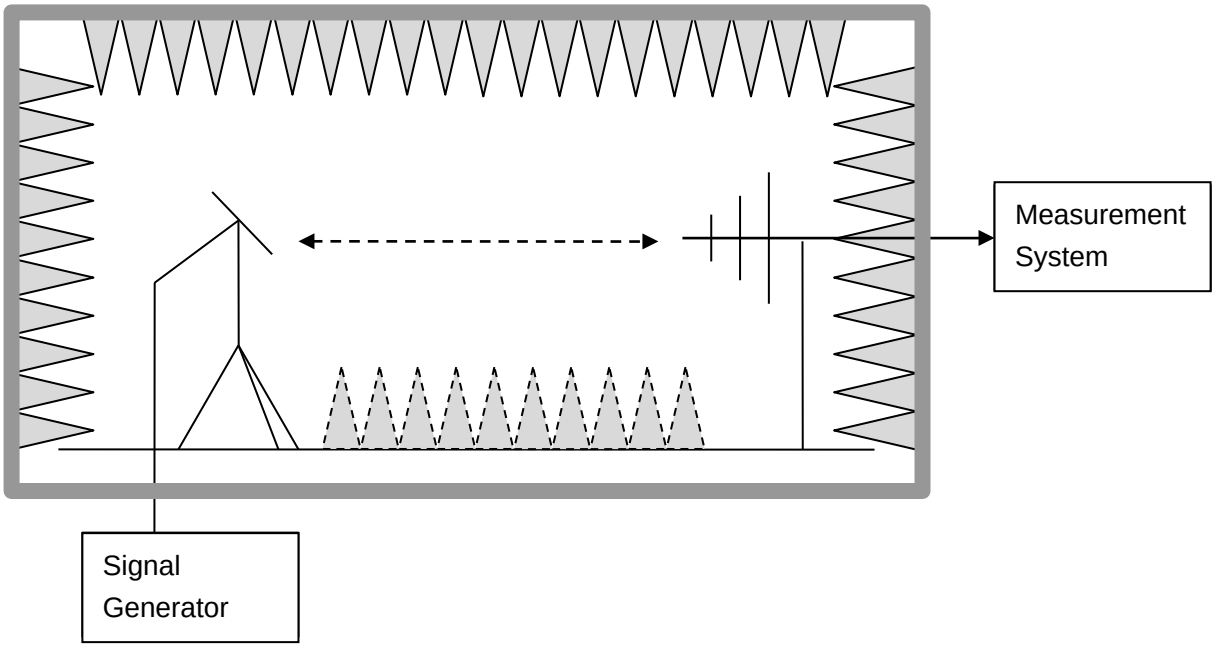
**Test Setup**

NOTE: Effective radiated power (ERP) refers to the radiation power output of the EUT, assuming all emissions are radiated from half-wave dipole antennas.

Step 1: Pre-test




Step 2: Substitution method to verify the maximum ERP



### 6.2.2 PROVISIONS APPLICABLE

This is the test for the maximum radiated power from the EUT. Rule Part 24.232(c) specifies, “Mobile/portable stations are limited to 2 watts e.i.r.p.

| Mode | FCC Part Section(s) | Nominal Peak Power |
|---|---|---|
| LTE Band 2 | 24.232(c) | <=33dBm (2W) |
| LTE Band 7 | 27.50(i)(2) | <=33dBm (2W) |

### 6.2.3 MEASUREMENT RESULT

**EIRP for LTE Band 2**

| Frequency | Channel Bandwidth | Mode. | RB | Substituted level | Antenna Polarization | Antenna Gain correction | Cable Loss | Absolute Level | Limit (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| 1850.7 | 1.4 | QPSK | 1/0 | 12.81 | V | 7.95 | 0.79 | 19.97 | 33 |
| 1880.0 | 1.4 | QPSK | 1/0 | 12.36 | V | 7.95 | 0.79 | 19.52 | 33 |
| 1909.3 | 1.4 | QPSK | 1/0 | 12.8 | V | 7.95 | 0.79 | 19.96 | 33 |
| 1850.7 | 1.4 | QPSK | 1/0 | 12.33 | H | 7.95 | 0.79 | 19.49 | 33 |
| 1880.0 | 1.4 | QPSK | 1/0 | 12.53 | H | 7.95 | 0.79 | 19.69 | 33 |
| 1909.3 | 1.4 | QPSK | 1/0 | 12.8 | H | 7.95 | 0.79 | 19.96 | 33 |
| 1850.7 | 1.4 | 16-QAM | 1/5 | 12.08 | V | 7.95 | 0.79 | 19.24 | 33 |
| 1880.0 | 1.4 | 16-QAM | 1/0 | 12.84 | V | 7.95 | 0.79 | 20 | 33 |
| 1909.3 | 1.4 | 16-QAM | 1/0 | 10.63 | V | 7.95 | 0.79 | 17.79 | 33 |
| 1850.7 | 1.4 | 16-QAM | 1/5 | 12.35 | H | 7.95 | 0.79 | 19.51 | 33 |
| 1880.0 | 1.4 | 16-QAM | 1/0 | 11.32 | H | 7.95 | 0.79 | 18.48 | 33 |
| 1909.3 | 1.4 | 16-QAM | 1/0 | 11.14 | H | 7.95 | 0.79 | 18.3 | 33 |
| 1851.5 | 3 | QPSK | 1/0 | 11.08 | V | 7.95 | 0.79 | 18.24 | 33 |
| 1880.0 | 3 | QPSK | 1/0 | 12.93 | V | 7.95 | 0.79 | 20.09 | 33 |
| 1908.5 | 3 | QPSK | 1/0 | 12.83 | V | 7.95 | 0.79 | 19.99 | 33 |
| 1851.5 | 3 | QPSK | 1/0 | 12.39 | H | 7.95 | 0.79 | 19.55 | 33 |
| 1880.0 | 3 | QPSK | 1/0 | 10.85 | H | 7.95 | 0.79 | 18.01 | 33 |
| 1908.5 | 3 | QPSK | 1/0 | 10.37 | H | 7.95 | 0.79 | 17.53 | 33 |
| 1851.5 | 3 | 16-QAM | 1/0 | 11.29 | V | 7.95 | 0.79 | 18.45 | 33 |
| 1880.0 | 3 | 16-QAM | 1/0 | 10.85 | V | 7.95 | 0.79 | 18.01 | 33 |
| 1908.5 | 3 | 16-QAM | 1/0 | 11.18 | V | 7.95 | 0.79 | 18.34 | 33 |
| 1851.5 | 3 | 16-QAM | 1/0 | 11.24 | H | 7.95 | 0.79 | 18.4 | 33 |
| 1880.0 | 3 | 16-QAM | 1/0 | 12.13 | H | 7.95 | 0.79 | 19.29 | 33 |
| 1908.5 | 3 | 16-QAM | 1/0 | 12.43 | H | 7.95 | 0.79 | 19.59 | 33 |
| 1852.5 | 5 | QPSK | 1/0 | 12.27 | V | 7.95 | 0.79 | 19.43 | 33 |
| 1880.0 | 5 | QPSK | 1/0 | 12.63 | V | 7.95 | 0.79 | 19.79 | 33 |
| 1907.5 | 5 | QPSK | 1/24 | 11.93 | V | 7.95 | 0.79 | 19.09 | 33 |
| 1852.5 | 5 | QPSK | 1/0 | 11.91 | H | 7.95 | 0.79 | 19.07 | 33 |
| 1880.0 | 5 | QPSK | 1/0 | 11.95 | H | 7.95 | 0.79 | 19.11 | 33 |
| 1907.5 | 5 | QPSK | 1/24 | 11.97 | H | 7.95 | 0.79 | 19.13 | 33 |
| 1852.5 | 5 | 16-QAM | 1/0 | 12.22 | V | 7.95 | 0.79 | 19.38 | 33 |
| 1880.0 | 5 | 16-QAM | 1/0 | 12.35 | V | 7.95 | 0.79 | 19.51 | 33 |
| 1907.5 | 5 | 16-QAM | 1/24 | 10.79 | V | 7.95 | 0.79 | 17.95 | 33 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1852.5 | 5 | 16-QAM | 1/0 | 11.17 | H | 7.95 | 0.79 | 18.33 | 33 |
| 1880.0 | 5 | 16-QAM | 1/0 | 12.19 | H | 7.95 | 0.79 | 19.35 | 33 |
| 1907.5 | 5 | 16-QAM | 1/24 | 11.24 | H | 7.95 | 0.79 | 18.4 | 33 |
| 1855 | 10 | QPSK | 1/0 | 11.3 | V | 7.95 | 0.79 | 18.46 | 33 |
| 1880 | 10 | QPSK | 1/49 | 11.03 | V | 7.95 | 0.79 | 18.19 | 33 |
| 1905 | 10 | QPSK | 1/0 | 11.36 | V | 7.95 | 0.79 | 18.52 | 33 |
| 1855 | 10 | QPSK | 1/0 | 11.28 | H | 7.95 | 0.79 | 18.44 | 33 |
| 1880 | 10 | QPSK | 1/49 | 12.24 | H | 7.95 | 0.79 | 19.4 | 33 |
| 1905 | 10 | QPSK | 1/0 | 11.88 | H | 7.95 | 0.79 | 19.04 | 33 |
| 1855 | 10 | 16-QAM | 1/0 | 12.71 | V | 7.95 | 0.79 | 19.87 | 33 |
| 1880 | 10 | 16-QAM | 1/49 | 11.56 | V | 7.95 | 0.79 | 18.72 | 33 |
| 1905 | 10 | 16-QAM | 1/0 | 12.4 | V | 7.95 | 0.79 | 19.56 | 33 |
| 1855 | 10 | 16-QAM | 1/0 | 11.96 | H | 7.95 | 0.79 | 19.12 | 33 |
| 1880 | 10 | 16-QAM | 1/49 | 12.56 | H | 7.95 | 0.79 | 19.72 | 33 |
| 1905 | 10 | 16-QAM | 1/0 | 12.53 | H | 7.95 | 0.79 | 19.69 | 33 |
| 1857.5 | 15 | QPSK | 1/0 | 11.86 | V | 7.95 | 0.79 | 16.2 | 33 |
| 1880 | 15 | QPSK | 1/74 | 11.51 | V | 7.95 | 0.79 | 16.85 | 33 |
| 1902.5 | 15 | QPSK | 1/0 | 11.75 | V | 7.95 | 0.79 | 17.91 | 33 |
| 1857.5 | 15 | QPSK | 1/0 | 11.7 | H | 7.95 | 0.79 | 16.44 | 33 |
| 1880 | 15 | QPSK | 1/74 | 12.13 | H | 7.95 | 0.79 | 15.91 | 33 |
| 1902.5 | 15 | QPSK | 1/0 | 12.15 | H | 7.95 | 0.79 | 16.75 | 33 |
| 1857.5 | 15 | 16-QAM | 1/0 | 11.77 | V | 7.95 | 0.79 | 17.17 | 33 |
| 1880 | 15 | 16-QAM | 1/74 | 11.92 | V | 7.95 | 0.79 | 16.26 | 33 |
| 1902.5 | 15 | 16-QAM | 1/0 | 12.12 | V | 7.95 | 0.79 | 16.36 | 33 |
| 1857.5 | 15 | 16-QAM | 1/0 | 12.14 | H | 7.95 | 0.79 | 16.74 | 33 |
| 1880 | 15 | 16-QAM | 1/74 | 11.57 | H | 7.95 | 0.79 | 17.35 | 33 |
| 1902.5 | 15 | 16-QAM | 1/0 | 11.62 | H | 7.95 | 0.79 | 18.16 | 33 |
| 1860 | 20 | QPSK | 1/99 | 11.54 | V | 7.95 | 0.79 | 18.34 | 33 |
| 1880 | 20 | QPSK | 1/99 | 11.74 | V | 7.95 | 0.79 | 17.98 | 33 |
| 1900 | 20 | QPSK | 1/0 | 12.19 | V | 7.95 | 0.79 | 15.93 | 33 |
| 1860 | 20 | QPSK | 1/99 | 11.6 | H | 7.95 | 0.79 | 17.42 | 33 |
| 1880 | 20 | QPSK | 1/99 | 11.94 | H | 7.95 | 0.79 | 17.9 | 33 |
| 1900 | 20 | QPSK | 1/0 | 11.67 | H | 7.95 | 0.79 | 16.85 | 33 |
| 1860 | 20 | 16-QAM | 1/99 | 12.11 | V | 7.95 | 0.79 | 17.87 | 33 |
| 1880 | 20 | 16-QAM | 1/99 | 12.38 | V | 7.95 | 0.79 | 16.48 | 33 |
| 1900 | 20 | 16-QAM | 1/0 | 12.68 | V | 7.95 | 0.79 | 14.72 | 33 |
| 1860 | 20 | 16-QAM | 1/99 | 12.32 | H | 7.95 | 0.79 | 15.68 | 33 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1880 | 20 | 16-QAM | 1/99 | 13.07 | H | 7.95 | 0.79 | 16.21 | 33 |
| 1900 | 20 | 16-QAM | 1/0 | 12.71 | H | 7.95 | 0.79 | 16.07 | 33 |

**EIRP for LTE Band 7**

| Frequency | Channel Bandwidth | Mode. | RB | Substituted level | Antenna Polarization | Antenna Gain correction | Cable Loss | Absolute Level | Limit (dBm) |
|---|---|---|---|---|---|---|---|---|---|
| 2502.5 | 5 | QPSK | 1/0 | 12.23 | V | 8.23 | 1.12 | 19.34 | 33 |
| 2535 | 5 | QPSK | 1/0 | 12.62 | V | 8.23 | 1.12 | 19.73 | 33 |
| 2567.5 | 5 | QPSK | 1/24 | 11.27 | V | 8.23 | 1.12 | 18.38 | 33 |
| 2502.5 | 5 | QPSK | 1/0 | 12.51 | H | 8.23 | 1.12 | 19.62 | 33 |
| 2535 | 5 | QPSK | 1/0 | 12.46 | H | 8.23 | 1.12 | 19.57 | 33 |
| 2567.5 | 5 | QPSK | 1/24 | 10.89 | H | 8.23 | 1.12 | 18 | 33 |
| 2502.5 | 5 | 16-QAM | 1/0 | 11.91 | V | 8.23 | 1.12 | 19.02 | 33 |
| 2535 | 5 | 16-QAM | 1/0 | 11.53 | V | 8.23 | 1.12 | 18.64 | 33 |
| 2567.5 | 5 | 16-QAM | 1/24 | 11.68 | V | 8.23 | 1.12 | 18.79 | 33 |
| 2502.5 | 5 | 16-QAM | 1/0 | 10.88 | H | 8.23 | 1.12 | 17.99 | 33 |
| 2535 | 5 | 16-QAM | 1/0 | 12.9 | H | 8.23 | 1.12 | 20.01 | 33 |
| 2567.5 | 5 | 16-QAM | 1/24 | 11.33 | H | 8.23 | 1.12 | 18.44 | 33 |
| 2505 | 10 | QPSK | 1/0 | 11.38 | V | 8.23 | 1.12 | 18.49 | 33 |
| 2535 | 10 | QPSK | 1/49 | 12.3 | V | 8.23 | 1.12 | 19.41 | 33 |
| 2565 | 10 | QPSK | 1/0 | 12.5 | V | 8.23 | 1.12 | 19.61 | 33 |
| 2505 | 10 | QPSK | 1/0 | 11.95 | H | 8.23 | 1.12 | 19.06 | 33 |
| 2535 | 10 | QPSK | 1/49 | 12.36 | H | 8.23 | 1.12 | 19.47 | 33 |
| 2565 | 10 | QPSK | 1/0 | 11.7 | H | 8.23 | 1.12 | 18.81 | 33 |
| 2505 | 10 | 16-QAM | 1/0 | 11.43 | V | 8.23 | 1.12 | 18.54 | 33 |
| 2535 | 10 | 16-QAM | 1/49 | 12.89 | V | 8.23 | 1.12 | 20 | 33 |
| 2565 | 10 | 16-QAM | 1/0 | 12.14 | V | 8.23 | 1.12 | 19.25 | 33 |
| 2505 | 10 | 16-QAM | 1/0 | 12.44 | H | 8.23 | 1.12 | 19.55 | 33 |
| 2535 | 10 | 16-QAM | 1/49 | 12.08 | H | 8.23 | 1.12 | 19.19 | 33 |
| 2565 | 10 | 16-QAM | 1/0 | 11.83 | H | 8.23 | 1.12 | 18.94 | 33 |
| 2507.5 | 15 | QPSK | 1/0 | 12.47 | V | 8.23 | 1.12 | 19.58 | 33 |
| 2535 | 15 | QPSK | 1/74 | 12.62 | V | 8.23 | 1.12 | 19.73 | 33 |
| 2562.5 | 15 | QPSK | 1/0 | 12.27 | V | 8.23 | 1.12 | 19.38 | 33 |
| 2507.5 | 15 | QPSK | 1/0 | 12.51 | H | 8.23 | 1.12 | 19.62 | 33 |
| 2535 | 15 | QPSK | 1/74 | 12.46 | H | 8.23 | 1.12 | 19.57 | 33 |
| 2562.5 | 15 | QPSK | 1/0 | 10.89 | H | 8.23 | 1.12 | 18 | 33 |
| 2507.5 | 15 | 16-QAM | 1/0 | 11.91 | V | 8.23 | 1.12 | 19.02 | 33 |
| 2535 | 15 | 16-QAM | 1/74 | 12.53 | V | 8.23 | 1.12 | 19.64 | 33 |
| 2562.5 | 15 | 16-QAM | 1/0 | 11.68 | V | 8.23 | 1.12 | 18.79 | 33 |
| 2507.5 | 15 | 16-QAM | 1/0 | 10.88 | H | 8.23 | 1.12 | 17.99 | 33 |
| 2535 | 15 | 16-QAM | 1/74 | 12.9 | H | 8.23 | 1.12 | 20.01 | 33 |
| 2562.5 | 15 | 16-QAM | 1/0 | 11.33 | H | 8.23 | 1.12 | 18.44 | 33 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 2510 | 20 | QPSK | 1/99 | 11.38 | V | 8.23 | 1.12 | 18.49 | 33 |
| 2535 | 20 | QPSK | 1/99 | 12.3 | V | 8.23 | 1.12 | 19.41 | 33 |
| 2560 | 20 | QPSK | 1/0 | 12.5 | V | 8.23 | 1.12 | 19.61 | 33 |
| 2510 | 20 | QPSK | 1/99 | 11.95 | H | 8.23 | 1.12 | 19.06 | 33 |
| 2535 | 20 | QPSK | 1/99 | 12.36 | H | 8.23 | 1.12 | 19.47 | 33 |
| 2560 | 20 | QPSK | 1/0 | 11.7 | H | 8.23 | 1.12 | 18.81 | 33 |
| 2510 | 20 | 16-QAM | 1/99 | 11.43 | V | 8.23 | 1.12 | 18.54 | 33 |
| 2535 | 20 | 16-QAM | 1/99 | 12.89 | V | 8.23 | 1.12 | 20 | 33 |
| 2560 | 20 | 16-QAM | 1/0 | 11.14 | V | 8.23 | 1.12 | 18.25 | 33 |
| 2510 | 20 | 16-QAM | 1/99 | 12.44 | H | 8.23 | 1.12 | 19.55 | 33 |
| 2535 | 20 | 16-QAM | 1/99 | 12.08 | H | 8.23 | 1.12 | 19.19 | 33 |
| 2560 | 20 | 16-QAM | 1/0 | 11.83 | H | 8.23 | 1.12 | 18.94 | 33 |

Note: Above is the worst mode data.

## 6.3. PEAK-TO-AVERAGE RATIO

### 6.3.1 MEASUREMENT METHOD

The peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

According to KDB 971168 D01v03 - Section 5.7:

a)Refer to instrument's analyzer instruction manual for details on how to use the power statistics /CCDF function;

b) Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;

c) Set the number of counts to a value that stabilizes the measured CCDF curve;

d) Set the measurement interval to 1 ms

e) Record the maximum PAPR level associated with a probability of 0.1%

### 6.3.2 PROVISIONS APPLICABLE

This is the test for the Peak-to-Average Ratio from the EUT.

Power Complementary Cumulative Distribution Function (CCDF) curves provide a means for characterizing the power peaks of a digitally modulated signal on a statistical basis. A CCDF curve depicts the probability of the peak signal amplitude exceeding the average power level. Most contemporary measurement instrumentation include the capability to produce CCDF curves for an input signal provided that the instrument's resolution bandwidth can be set wide enough to accommodate the entire input signal bandwidth. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

### 6.3.3MEASUREMENT RESULT

**LTE Band 2**

**Channel Bandwidth: 1.4 MHz**

| Channel Bandwidth: 1.4 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Peak-to-Average Ratio (dB) | Limit (dB) | Verdict |
| | | Size | Offset | | | |
| QPSK | LCH | 1 | 0 | 1.79 | <13 | PASS |
| | | 1 | 3 | 1.80 | <13 | PASS |
| | | 1 | 5 | 1.82 | <13 | PASS |
| | | 3 | 0 | 1.74 | <13 | PASS |
| | | 3 | 2 | 1.81 | <13 | PASS |
| | | 3 | 3 | 1.82 | <13 | PASS |
| | | 6 | 0 | 2.45 | <13 | PASS |
| | MCH | 1 | 0 | 1.61 | <13 | PASS |
| | | 1 | 3 | 1.61 | <13 | PASS |
| | | 1 | 5 | 1.62 | <13 | PASS |
| | | 3 | 0 | 1.63 | <13 | PASS |
| | | 3 | 2 | 1.64 | <13 | PASS |
| | | 3 | 3 | 1.65 | <13 | PASS |
| | | 6 | 0 | 2.25 | <13 | PASS |
| | HCH | 1 | 0 | 1.77 | <13 | PASS |
| | | 1 | 3 | 1.80 | <13 | PASS |
| | | 1 | 5 | 1.82 | <13 | PASS |
| | | 3 | 0 | 1.73 | <13 | PASS |
| | | 3 | 2 | 1.76 | <13 | PASS |
| | | 3 | 3 | 1.77 | <13 | PASS |
| | | 6 | 0 | 2.43 | <13 | PASS |
| 16QAM | LCH | 1 | 0 | 2.48 | <13 | PASS |
| | | 1 | 3 | 2.44 | <13 | PASS |
| | | 1 | 5 | 2.4 | <13 | PASS |
| | | 3 | 0 | 2.41 | <13 | PASS |
| | | 3 | 2 | 2.43 | <13 | PASS |
| | | 3 | 3 | 2.44 | <13 | PASS |
| | | 6 | 0 | 3.15 | <13 | PASS |
| | MCH | 1 | 0 | 2.23 | <13 | PASS |
| | | 1 | 3 | 2.24 | <13 | PASS |
| | | 1 | 5 | 2.25 | <13 | PASS |
| | | 3 | 0 | 2.27 | <13 | PASS |
| | | 3 | 2 | 2.29 | <13 | PASS |
| | | 3 | 3 | 2.3 | <13 | PASS |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 6 | 0 | 2.96 | <13 | PASS |
| | HCH | 1 | 0 | 2.32 | <13 | PASS |
| | | 1 | 3 | 2.35 | <13 | PASS |
| | | 1 | 5 | 2.37 | <13 | PASS |
| | | 3 | 0 | 2.33 | <13 | PASS |
| | | 3 | 2 | 2.36 | <13 | PASS |
| | | 3 | 3 | 2.37 | <13 | PASS |
| | | 6 | 0 | 3.11 | <13 | PASS |

**Channel Bandwidth: 3 MHz**

| Channel Bandwidth: 3 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Peak-to-Average Ratio [dB] | Limit [dB] | Verdict |
| | | Size | Offset | | | |
| QPSK | LCH | 1 | 0 | 1.81 | <13 | PASS |
| | | 1 | 7 | 1.84 | <13 | PASS |
| | | 1 | 14 | 1.9 | <13 | PASS |
| | | 8 | 0 | 1.96 | <13 | PASS |
| | | 8 | 4 | 2.23 | <13 | PASS |
| | | 8 | 7 | 2.58 | <13 | PASS |
| | | 15 | 0 | 2.78 | <13 | PASS |
| | MCH | 1 | 0 | 1.63 | <13 | PASS |
| | | 1 | 7 | 1.6 | <13 | PASS |
| | | 1 | 14 | 1.58 | <13 | PASS |
| | | 8 | 0 | 1.97 | <13 | PASS |
| | | 8 | 4 | 2.05 | <13 | PASS |
| | | 8 | 7 | 2.33 | <13 | PASS |
| | | 15 | 0 | 2.57 | <13 | PASS |
| | HCH | 1 | 0 | 1.68 | <13 | PASS |
| | | 1 | 7 | 1.73 | <13 | PASS |
| | | 1 | 14 | 1.78 | <13 | PASS |
| | | 8 | 0 | 2.22 | <13 | PASS |
| | | 8 | 4 | 2.35 | <13 | PASS |
| | | 8 | 7 | 2.5 | <13 | PASS |
| | | 15 | 0 | 2.66 | <13 | PASS |
| 16QAM | LCH | 1 | 0 | 2.4 | <13 | PASS |
| | | 1 | 7 | 2.42 | <13 | PASS |
| | | 1 | 14 | 2.45 | <13 | PASS |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 8 | 0 | 3.01 | <13 | PASS |
| | | 8 | 4 | 3.15 | <13 | PASS |
| | | 8 | 7 | 3.26 | <13 | PASS |
| | | 15 | 0 | 3.49 | <13 | PASS |
| | MCH | 1 | 0 | 2.23 | <13 | PASS |
| | | 1 | 7 | 2.25 | <13 | PASS |
| | | 1 | 14 | 2.26 | <13 | PASS |
| | | 8 | 0 | 2.84 | <13 | PASS |
| | | 8 | 4 | 2.88 | <13 | PASS |
| | | 8 | 7 | 2.92 | <13 | PASS |
| | | 15 | 0 | 3.24 | <13 | PASS |
| | HCH | 1 | 0 | 2.25 | <13 | PASS |
| | | 1 | 7 | 2.32 | <13 | PASS |
| | | 1 | 14 | 2.35 | <13 | PASS |
| | | 8 | 0 | 3.09 | <13 | PASS |
| | | 8 | 4 | 3.12 | <13 | PASS |
| | | 8 | 7 | 3.18 | <13 | PASS |
| | | 15 | 0 | 3.35 | <13 | PASS |

**Channel Bandwidth: 5 MHz**

| Channel Bandwidth: 5 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Peak-to-Average Ratio [dB] | Limit [dB] | Verdict |
| | | Size | Offset | | | |
| QPSK | LCH | 1 | 0 | 1.82 | <13 | PASS |
| | | 1 | 12 | 1.92 | <13 | PASS |
| | | 1 | 24 | 1.98 | <13 | PASS |
| | | 12 | 0 | 2.54 | <13 | PASS |
| | | 12 | 6 | 2.63 | <13 | PASS |
| | | 12 | 13 | 2.71 | <13 | PASS |
| | | 25 | 0 | 3.17 | <13 | PASS |
| | MCH | 1 | 0 | 1.7 | <13 | PASS |
| | | 1 | 12 | 1.69 | <13 | PASS |
| | | 1 | 24 | 1.67 | <13 | PASS |
| | | 12 | 0 | 2.32 | <13 | PASS |
| | | 12 | 6 | 2.35 | <13 | PASS |
| | | 12 | 13 | 2.38 | <13 | PASS |
| | | 25 | 0 | 2.95 | <13 | PASS |

| | | | | | | |
|---|---|---|---|---|---|---|
| | HCH | 1 | 0 | 1.55 | <13 | PASS |
| | | 1 | 12 | 1.62 | <13 | PASS |
| | | 1 | 24 | 1.73 | <13 | PASS |
| | | 12 | 0 | 2.03 | <13 | PASS |
| | | 12 | 6 | 2.47 | <13 | PASS |
| | | 12 | 13 | 2.59 | <13 | PASS |
| | | 25 | 0 | 3.01 | <13 | PASS |
| 16QAM | LCH | 1 | 0 | 2.38 | <13 | PASS |
| | | 1 | 12 | 2.48 | <13 | PASS |
| | | 1 | 24 | 2.58 | <13 | PASS |
| | | 12 | 0 | 3.21 | <13 | PASS |
| | | 12 | 6 | 3.34 | <13 | PASS |
| | | 12 | 13 | 3.44 | <13 | PASS |
| | | 25 | 0 | 3.77 | <13 | PASS |
| | MCH | 1 | 0 | 2.12 | <13 | PASS |
| | | 1 | 12 | 2.19 | <13 | PASS |
| | | 1 | 24 | 2.24 | <13 | PASS |
| | | 12 | 0 | 2.72 | <13 | PASS |
| | | 12 | 6 | 2.93 | <13 | PASS |
| | | 12 | 13 | 3.08 | <13 | PASS |
| | | 25 | 0 | 3.52 | <13 | PASS |
| | HCH | 1 | 0 | 1.99 | <13 | PASS |
| | | 1 | 12 | 2.14 | <13 | PASS |
| | | 1 | 24 | 2.26 | <13 | PASS |
| | | 12 | 0 | 3.06 | <13 | PASS |
| | | 12 | 6 | 3.17 | <13 | PASS |
| | | 12 | 13 | 3.24 | <13 | PASS |
| | | 25 | 0 | 3.56 | <13 | PASS |

**Channel Bandwidth: 10 MHz**

| Channel Bandwidth: 10 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Peak-to-Average Ratio [dB] | Limit [dB] | Verdict |
| | | Size | Offset | | | |
| QPSK | LCH | 1 | 0 | 1.75 | <13 | PASS |
| | | 1 | 24 | 1.77 | <13 | PASS |
| | | 1 | 49 | 1.81 | <13 | PASS |
| | | 25 | 0 | 2.84 | <13 | PASS |
| | | 25 | 12 | 2.97 | <13 | PASS |
| | | 25 | 25 | 3.02 | <13 | PASS |
| | | 50 | 0 | 3.22 | <13 | PASS |
| | MCH | 1 | 0 | 1.62 | <13 | PASS |
| | | 1 | 24 | 1.59 | <13 | PASS |
| | | 1 | 49 | 1.53 | <13 | PASS |
| | | 25 | 0 | 2.23 | <13 | PASS |
| | | 25 | 12 | 2.51 | <13 | PASS |
| | | 25 | 25 | 2.69 | <13 | PASS |
| | | 50 | 0 | 2.91 | <13 | PASS |
| | HCH | 1 | 0 | 1.31 | <13 | PASS |
| | | 1 | 24 | 1.68 | <13 | PASS |
| | | 1 | 49 | 1.88 | <13 | PASS |
| | | 25 | 0 | 2.52 | <13 | PASS |
| | | 25 | 12 | 2.68 | <13 | PASS |
| | | 25 | 25 | 2.7 | <13 | PASS |
| | | 50 | 0 | 2.93 | <13 | PASS |
| 16QAM | LCH | 1 | 0 | 2.44 | <13 | PASS |
| | | 1 | 24 | 2.4 | <13 | PASS |
| | | 1 | 49 | 2.44 | <13 | PASS |
| | | 25 | 0 | 3.22 | <13 | PASS |
| | | 25 | 12 | 3.49 | <13 | PASS |
| | | 25 | 25 | 3.66 | <13 | PASS |
| | | 50 | 0 | 3.83 | <13 | PASS |
| | MCH | 1 | 0 | 2.17 | <13 | PASS |
| | | 1 | 24 | 2.14 | <13 | PASS |
| | | 1 | 49 | 2.17 | <13 | PASS |
| | | 25 | 0 | 3.03 | <13 | PASS |
| | | 25 | 12 | 3.17 | <13 | PASS |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 25 | 25 | 3.28 | <13 | PASS |
| | | 50 | 0 | 3.54 | <13 | PASS |
| | HCH | 1 | 0 | 1.95 | <13 | PASS |
| | | 1 | 24 | 2.28 | <13 | PASS |
| | | 1 | 49 | 2.58 | <13 | PASS |
| | | 25 | 0 | 3.05 | <13 | PASS |
| | | 25 | 12 | 3.24 | <13 | PASS |
| | | 25 | 25 | 3.35 | <13 | PASS |
| | | 50 | 0 | 3.5 | <13 | PASS |

**Channel Bandwidth: 15 MHz**

| Channel Bandwidth: 15 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Peak-to-Average Ratio [dB] | Limit [dB] | Verdict |
| | | Size | Offset | | | |
| QPSK | LCH | 1 | 0 | 1.78 | <13 | PASS |
| | | 1 | 37 | 1.64 | <13 | PASS |
| | | 1 | 74 | 1.59 | <13 | PASS |
| | | 37 | 0 | 2.94 | <13 | PASS |
| | | 37 | 18 | 2.99 | <13 | PASS |
| | | 37 | 38 | 3.03 | <13 | PASS |
| | | 75 | 0 | 3.85 | <13 | PASS |
| | MCH | 1 | 0 | 1.67 | <13 | PASS |
| | | 1 | 37 | 1.61 | <13 | PASS |
| | | 1 | 74 | 1.51 | <13 | PASS |
| | | 37 | 0 | 2.36 | <13 | PASS |
| | | 37 | 18 | 2.71 | <13 | PASS |
| | | 37 | 38 | 2.8 | <13 | PASS |
| | | 75 | 0 | 3.63 | <13 | PASS |
| | HCH | 1 | 0 | 1.32 | <13 | PASS |
| | | 1 | 37 | 1.52 | <13 | PASS |
| | | 1 | 74 | 1.69 | <13 | PASS |
| | | 37 | 0 | 2.15 | <13 | PASS |
| | | 37 | 18 | 2.47 | <13 | PASS |
| | | 37 | 38 | 2.76 | <13 | PASS |
| | | 75 | 0 | 3.44 | <13 | PASS |
| 16QAM | LCH | 1 | 0 | 2.4 | <13 | PASS |
| | | 1 | 37 | 2.31 | <13 | PASS |
| | | 1 | 74 | 2.23 | <13 | PASS |
| | | 37 | 0 | 3.06 | <13 | PASS |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 37 | 18 | 3.63 | <13 | PASS |
| | | 37 | 38 | 3.79 | <13 | PASS |
| | | 75 | 0 | 4.42 | <13 | PASS |
| | MCH | 1 | 0 | 2.19 | <13 | PASS |
| | | 1 | 37 | 2.11 | <13 | PASS |
| | | 1 | 74 | 2.06 | <13 | PASS |
| | | 37 | 0 | 3.09 | <13 | PASS |
| | | 37 | 18 | 3.27 | <13 | PASS |
| | | 37 | 38 | 3.44 | <13 | PASS |
| | | 75 | 0 | 4.22 | <13 | PASS |
| | HCH | 1 | 0 | 1.81 | <13 | PASS |
| | | 1 | 37 | 2.03 | <13 | PASS |
| | | 1 | 74 | 2.31 | <13 | PASS |
| | | 37 | 0 | 3.12 | <13 | PASS |
| | | 37 | 18 | 3.34 | <13 | PASS |
| | | 37 | 38 | 3.42 | <13 | PASS |
| | | 75 | 0 | 4.04 | <13 | PASS |

**Channel Bandwidth: 20 MHz**

| Channel Bandwidth: 20 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Peak-to-Average Ratio [dB] | Limit [dB] | Verdict |
| | | Size | Offset | | | |
| QPSK | LCH | 1 | 0 | 1.82 | <13 | PASS |
| | | 1 | 49 | 1.74 | <13 | PASS |
| | | 1 | 99 | 1.65 | <13 | PASS |
| | | 50 | 0 | 3.02 | <13 | PASS |
| | | 50 | 25 | 3.16 | <13 | PASS |
| | | 50 | 50 | 3.23 | <13 | PASS |
| | | 100 | 0 | 4.08 | <13 | PASS |
| | MCH | 1 | 0 | 1.64 | <13 | PASS |
| | | 1 | 49 | 1.57 | <13 | PASS |
| | | 1 | 99 | 1.39 | <13 | PASS |
| | | 50 | 0 | 3.03 | <13 | PASS |
| | | 50 | 25 | 3.08 | <13 | PASS |
| | | 50 | 50 | 3.11 | <13 | PASS |
| | | 100 | 0 | 3.9 | <13 | PASS |
| | HCH | 1 | 0 | 1.32 | <13 | PASS |
| | | 1 | 49 | 1.66 | <13 | PASS |
| | | 1 | 99 | 1.75 | <13 | PASS |
| | | 50 | 0 | 2.87 | <13 | PASS |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 50 | 25 | 2.91 | <13 | PASS |
| | | 50 | 50 | 2.96 | <13 | PASS |
| | | 100 | 0 | 3.74 | <13 | PASS |
| 16QAM | LCH | 1 | 0 | 2.27 | <13 | PASS |
| | | 1 | 49 | 2.26 | <13 | PASS |
| | | 1 | 99 | 2.25 | <13 | PASS |
| | | 50 | 0 | 3.65 | <13 | PASS |
| | | 50 | 25 | 3.72 | <13 | PASS |
| | | 50 | 50 | 3.85 | <13 | PASS |
| | | 100 | 0 | 4.6 | <13 | PASS |
| | MCH | 1 | 0 | 2.14 | <13 | PASS |
| | | 1 | 49 | 2.02 | <13 | PASS |
| | | 1 | 99 | 1.94 | <13 | PASS |
| | | 50 | 0 | 3.07 | <13 | PASS |
| | | 50 | 25 | 3.42 | <13 | PASS |
| | | 50 | 50 | 3.63 | <13 | PASS |
| | | 100 | 0 | 4.45 | <13 | PASS |
| | HCH | 1 | 0 | 1.9 | <13 | PASS |
| | | 1 | 49 | 2.2 | <13 | PASS |
| | | 1 | 99 | 2.4 | <13 | PASS |
| | | 50 | 0 | 3.09 | <13 | PASS |
| | | 50 | 25 | 3.38 | <13 | PASS |
| | | 50 | 50 | 3.56 | <13 | PASS |
| | | 100 | 0 | 4.23 | <13 | PASS |

**LTE BAND 7**

**Channel Bandwidth: 5 MHz**

| Channel Bandwidth: 5 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Peak-to-Average Ratio [dB] | Limit [dB] | Verdict |
| | | Size | Offset | | | |
| QPSK | LCH | 1 | 0 | 1.87 | <13 | PASS |
| | | 1 | 12 | 1.91 | <13 | PASS |
| | | 1 | 24 | 1.96 | <13 | PASS |
| | | 12 | 0 | 2.45 | <13 | PASS |
| | | 12 | 6 | 2.63 | <13 | PASS |
| | | 12 | 13 | 2.8 | <13 | PASS |
| | | 25 | 0 | 3.19 | <13 | PASS |
| | MCH | 1 | 0 | 1.08 | <13 | PASS |
| | | 1 | 12 | 1.16 | <13 | PASS |
| | | 1 | 24 | 1.23 | <13 | PASS |
| | | 12 | 0 | 1.07 | <13 | PASS |
| | | 12 | 6 | 1.38 | <13 | PASS |
| | | 12 | 13 | 1.65 | <13 | PASS |
| | | 25 | 0 | 2.41 | <13 | PASS |
| | HCH | 1 | 0 | 1.65 | <13 | PASS |
| | | 1 | 12 | 1.77 | <13 | PASS |
| | | 1 | 24 | 1.97 | <13 | PASS |
| | | 12 | 0 | 2.84 | <13 | PASS |
| | | 12 | 6 | 2.96 | <13 | PASS |
| | | 12 | 13 | 3.1 | <13 | PASS |
| | | 25 | 0 | 3.46 | <13 | PASS |
| 16QAM | LCH | 1 | 0 | 2.49 | <13 | PASS |
| | | 1 | 12 | 2.47 | <13 | PASS |
| | | 1 | 24 | 2.48 | <13 | PASS |
| | | 12 | 0 | 3.18 | <13 | PASS |
| | | 12 | 6 | 3.26 | <13 | PASS |
| | | 12 | 13 | 3.46 | <13 | PASS |
| | | 25 | 0 | 3.85 | <13 | PASS |
| | MCH | 1 | 0 | 1.51 | <13 | PASS |
| | | 1 | 12 | 1.62 | <13 | PASS |
| | | 1 | 24 | 1.68 | <13 | PASS |
| | | 12 | 0 | 2.06 | <13 | PASS |
| | | 12 | 6 | 2.29 | <13 | PASS |
| | | 12 | 13 | 2.38 | <13 | PASS |
| | | 25 | 0 | 2.73 | <13 | PASS |

| | | | | | | |
|---|---|---|---|---|---|---|
| | HCH | 1 | 0 | 2.71 | <13 | PASS |
| | | 1 | 12 | 2.78 | <13 | PASS |
| | | 1 | 24 | 2.84 | <13 | PASS |
| | | 12 | 0 | 3.11 | <13 | PASS |
| | | 12 | 6 | 3.27 | <13 | PASS |
| | | 12 | 13 | 3.33 | <13 | PASS |
| | | 25 | 0 | 3.96 | <13 | PASS |

**Channel Bandwidth: 10 MHz**

| Channel Bandwidth: 10 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Peak-to-Average Ratio [dB] | Limit [dB] | Verdict |
| | | Size | Offset | | | |
| QPSK | LCH | 1 | 0 | 1.81 | <13 | PASS |
| | | 1 | 24 | 1.95 | <13 | PASS |
| | | 1 | 49 | 2.08 | <13 | PASS |
| | | 25 | 0 | 3.43 | <13 | PASS |
| | | 25 | 12 | 3.59 | <13 | PASS |
| | | 25 | 25 | 3.66 | <13 | PASS |
| | | 50 | 0 | 3.54 | <13 | PASS |
| | MCH | 1 | 0 | 0.9 | <13 | PASS |
| | | 1 | 24 | 1.33 | <13 | PASS |
| | | 1 | 49 | 1.63 | <13 | PASS |
| | | 25 | 0 | 2.04 | <13 | PASS |
| | | 25 | 12 | 2.37 | <13 | PASS |
| | | 25 | 25 | 2.59 | <13 | PASS |
| | | 50 | 0 | 2.69 | <13 | PASS |
| | HCH | 1 | 0 | 1.46 | <13 | PASS |
| | | 1 | 24 | 1.99 | <13 | PASS |
| | | 1 | 49 | 2.05 | <13 | PASS |
| | | 25 | 0 | 3.02 | <13 | PASS |
| | | 25 | 12 | 3.14 | <13 | PASS |
| | | 25 | 25 | 3.17 | <13 | PASS |
| | | 50 | 0 | 3.32 | <13 | PASS |
| 16QAM | LCH | 1 | 0 | 3.2 | <13 | PASS |
| | | 1 | 24 | 3.34 | <13 | PASS |
| | | 1 | 49 | 3.44 | <13 | PASS |
| | | 25 | 0 | 3.21 | <13 | PASS |
| | | 25 | 12 | 3.53 | <13 | PASS |
| | | 25 | 25 | 3.68 | <13 | PASS |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 50 | 0 | 3.8 | <13 | PASS |
| | MCH | 1 | 0 | 2.03 | <13 | PASS |
| | | 1 | 24 | 2.09 | <13 | PASS |
| | | 1 | 49 | 2.13 | <13 | PASS |
| | | 25 | 0 | 3.01 | <13 | PASS |
| | | 25 | 12 | 3.25 | <13 | PASS |
| | | 25 | 25 | 3.38 | <13 | PASS |
| | | 50 | 0 | 3.03 | <13 | PASS |
| | HCH | 1 | 0 | 2.78 | <13 | PASS |
| | | 1 | 24 | 2.7 | <13 | PASS |
| | | 1 | 49 | 2.62 | <13 | PASS |
| | | 25 | 0 | 3.95 | <13 | PASS |
| | | 25 | 12 | 4.07 | <13 | PASS |
| | | 25 | 25 | 4.11 | <13 | PASS |
| | | 50 | 0 | 4.01 | <13 | PASS |

**Channel Bandwidth: 15 MHz**

| Channel Bandwidth: 15 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Peak-to-Average Ratio [dB] | Limit [dB] | Verdict |
| | | Size | Offset | | | |
| QPSK | LCH | 1 | 0 | 2.35 | <13 | PASS |
| | | 1 | 37 | 2.27 | <13 | PASS |
| | | 1 | 74 | 2.16 | <13 | PASS |
| | | 37 | 0 | 3.44 | <13 | PASS |
| | | 37 | 18 | 3.53 | <13 | PASS |
| | | 37 | 38 | 3.57 | <13 | PASS |
| | | 75 | 0 | 4.15 | <13 | PASS |
| | MCH | 1 | 0 | 1.37 | <13 | PASS |
| | | 1 | 37 | 1.55 | <13 | PASS |
| | | 1 | 74 | 1.68 | <13 | PASS |
| | | 37 | 0 | 2.46 | <13 | PASS |
| | | 37 | 18 | 2.68 | <13 | PASS |
| | | 37 | 38 | 2.73 | <13 | PASS |
| | | 75 | 0 | 3.36 | <13 | PASS |
| | HCH | 1 | 0 | 2.09 | <13 | PASS |
| | | 1 | 37 | 2.07 | <13 | PASS |
| | | 1 | 74 | 2.05 | <13 | PASS |
| | | 37 | 0 | 3.07 | <13 | PASS |
| | | 37 | 18 | 3.21 | <13 | PASS |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 37 | 38 | 3.31 | <13 | PASS |
| | | 75 | 0 | 3.97 | <13 | PASS |
| 16QAM | LCH | 1 | 0 | 2.68 | <13 | PASS |
| | | 1 | 37 | 2.94 | <13 | PASS |
| | | 1 | 74 | 3.03 | <13 | PASS |
| | | 37 | 0 | 3.97 | <13 | PASS |
| | | 37 | 18 | 4.08 | <13 | PASS |
| | | 37 | 38 | 4.13 | <13 | PASS |
| | | 75 | 0 | 4.74 | <13 | PASS |
| | MCH | 1 | 0 | 2.02 | <13 | PASS |
| | | 1 | 37 | 2.22 | <13 | PASS |
| | | 1 | 74 | 2.31 | <13 | PASS |
| | | 37 | 0 | 3.11 | <13 | PASS |
| | | 37 | 18 | 3.25 | <13 | PASS |
| | | 37 | 38 | 3.37 | <13 | PASS |
| | | 75 | 0 | 3.96 | <13 | PASS |
| | HCH | 1 | 0 | 2.62 | <13 | PASS |
| | | 1 | 37 | 2.58 | <13 | PASS |
| | | 1 | 74 | 2.54 | <13 | PASS |
| | | 37 | 0 | 3.89 | <13 | PASS |
| | | 37 | 18 | 4.01 | <13 | PASS |
| | | 37 | 38 | 4.04 | <13 | PASS |
| | | 75 | 0 | 4.52 | <13 | PASS |

**Channel Bandwidth: 20 MHz**

| Channel Bandwidth: 20 MHz | | | | | | |
|---|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Peak-to-Average Ratio [dB] | Limit [dB] | Verdict |
| | | Size | Offset | | | |
| QPSK | LCH | 1 | 0 | 2.06 | <13 | PASS |
| | | 1 | 49 | 2.01 | <13 | PASS |
| | | 1 | 99 | 1.92 | <13 | PASS |
| | | 50 | 0 | 3.24 | <13 | PASS |
| | | 50 | 25 | 3.52 | <13 | PASS |
| | | 50 | 50 | 3.66 | <13 | PASS |
| | | 100 | 0 | 4.38 | <13 | PASS |
| | MCH | 1 | 0 | 1.47 | <13 | PASS |
| | | 1 | 49 | 1.66 | <13 | PASS |
| | | 1 | 99 | 1.8 | <13 | PASS |
| | | 50 | 0 | 2.97 | <13 | PASS |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 50 | 25 | 3.02 | <13 | PASS |
| | | 50 | 50 | 3.05 | <13 | PASS |
| | | 100 | 0 | 3.68 | <13 | PASS |
| | HCH | 1 | 0 | 2.09 | <13 | PASS |
| | | 1 | 49 | 2.07 | <13 | PASS |
| | | 1 | 99 | 2.06 | <13 | PASS |
| | | 50 | 0 | 3.47 | <13 | PASS |
| | | 50 | 25 | 3.49 | <13 | PASS |
| | | 50 | 50 | 3.53 | <13 | PASS |
| | | 100 | 0 | 4.22 | <13 | PASS |
| 16QAM | LCH | 1 | 0 | 2.83 | <13 | PASS |
| | | 1 | 49 | 2.73 | <13 | PASS |
| | | 1 | 99 | 2.56 | <13 | PASS |
| | | 50 | 0 | 4.17 | <13 | PASS |
| | | 50 | 25 | 4.25 | <13 | PASS |
| | | 50 | 50 | 4.29 | <13 | PASS |
| | | 100 | 0 | 4.97 | <13 | PASS |
| | MCH | 1 | 0 | 2.04 | <13 | PASS |
| | | 1 | 49 | 2.19 | <13 | PASS |
| | | 1 | 99 | 2.35 | <13 | PASS |
| | | 50 | 0 | 3.32 | <13 | PASS |
| | | 50 | 25 | 3.47 | <13 | PASS |
| | | 50 | 50 | 3.64 | <13 | PASS |
| | | 100 | 0 | 4.22 | <13 | PASS |
| | HCH | 1 | 0 | 2.65 | <13 | PASS |
| | | 1 | 49 | 2.64 | <13 | PASS |
| | | 1 | 99 | 2.62 | <13 | PASS |
| | | 50 | 0 | 4.02 | <13 | PASS |
| | | 50 | 25 | 4.11 | <13 | PASS |
| | | 50 | 50 | 4.18 | <13 | PASS |
| | | 100 | 0 | 4.75 | <13 | PASS |

# 7. SPURIOUS EMISSION

## 7.1 CONDUCTED SPURIOUS EMISSION

### 7.1.1 MEASUREMENT METHOD

The level of the carrier and the various conducted spurious and harmonic frequencies is measured by means of a calibrated spectrum analyzer. The spectrum is scanned from the lowest frequency generated in the equipment up to a frequency including its 10th harmonic. All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.

**The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.**

For Band 7:
(i) 40 + 10 log10 p from the channel edges to 5 MHz away
(ii) 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and
(iii) 55 + 10 log10 p at X MHz and beyond from the channel edges

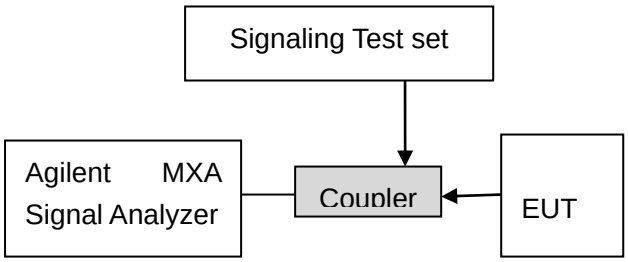
Test Procedure Used
KDB 971168 D01v03 – Section 6.0

**Test Settings**

1. Start frequency was set to 30MHz and stop frequency was set to at least 10 * the fundamental frequency (separated into at least two plots per channel)
2. Detector = RMS
3. Trace mode = max hold
4. Sweep time = auto couple
5. The trace was allowed to stabilize
6. Please see test notes below for RBW and VBW settings

**Test Setup**

The EUT and measurement equipment were set up as shown in the diagram below.




Test Instrument & Measurement Setup
shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. For all power levels

+30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

**Test Note**

Compliance with the applicable limits is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater for frequencies less than 1 GHz and 1 MHz or greater for frequencies greater than 1 GHz. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emission are attenuated at least 26 dB below the transmitter power.

**7.1.2 MEASUREMENT RESULT**

**PLEASE REFER TO:** APPENDIX A TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

**Note:** 1. No emission found in standby or receive mode, no recording in this report.

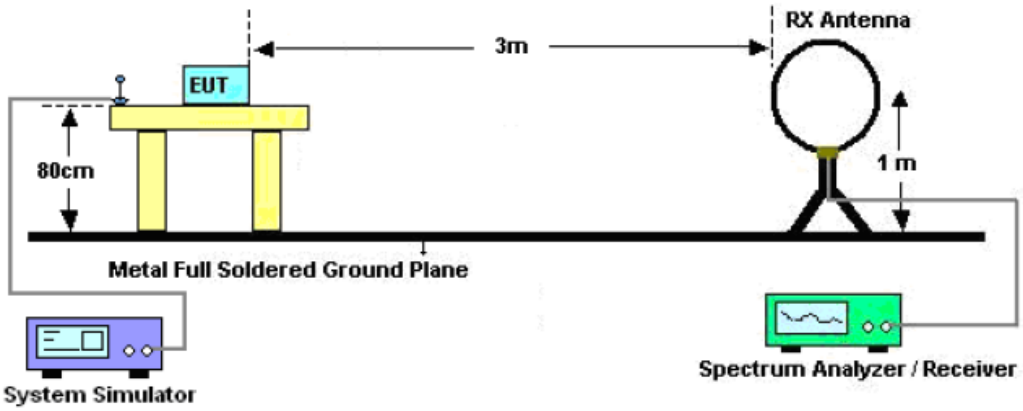
## 7.2 RADIATED SPURIOUS EMISSION

### 7.2.1. MEASUREMENT PROCEDURE

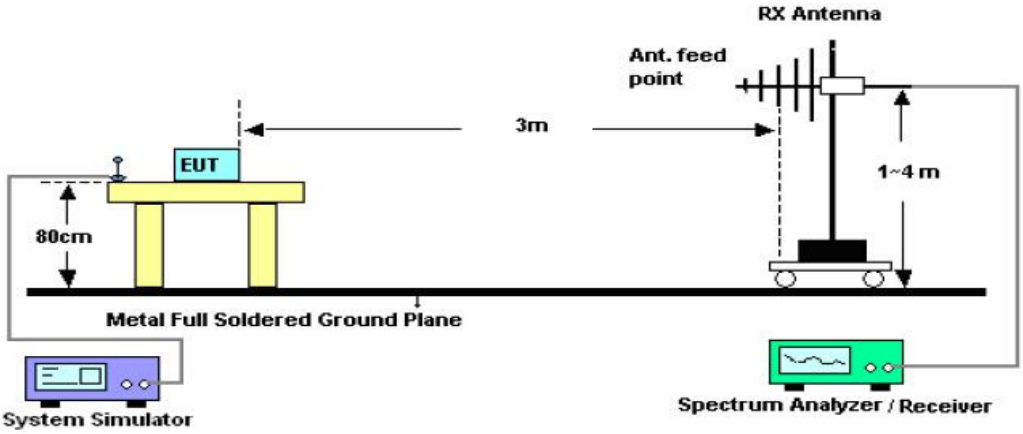
1. The EUT was placed on the top of the turntable 0.8 or 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum values.
8. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
9. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
10. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High - Low scan is not required in this case.

**7.2.2. TEST SETUP**

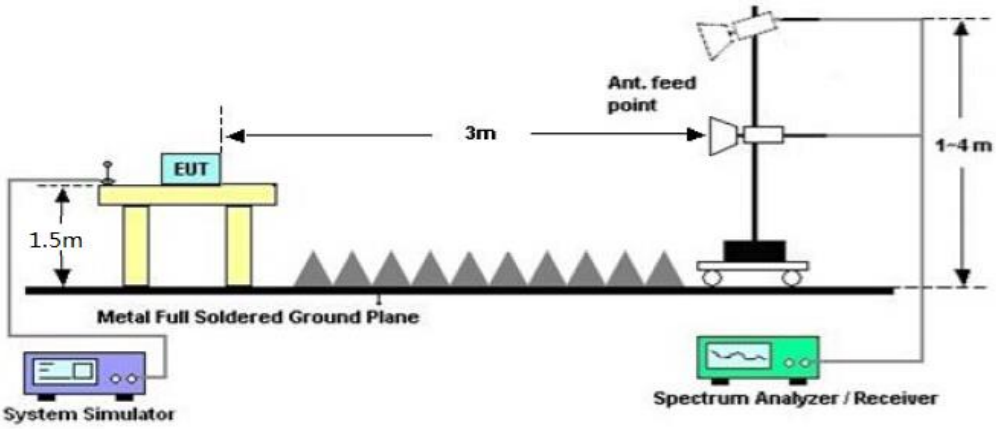
Radiated Emission Test-Setup Frequency Below 30MHz




RADIATED EMISSION TEST SETUP 30MHz-1000MHz




RADIATED EMISSION TEST SETUP ABOVE 1000MHz



**7.2.3 PROVISIONS APPLICABLE**

(a) On any frequency outside a licensee's frequency block (e.g. A, D, B, etc.) within the USPCS spectrum, the power of any emission shall be attenuated below the transmitter power (P, in Watts) by at least 43+10Log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

**Note:** Only record the worst condition of each test mode:

### 7.2.4 MEASUREMENT RESULT

**LTE Band 2**

**Low channel**

| Frequency (MHz) | Polarity (H/V) | Emission Level (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| 3720 | V | -52.00 | -13 | -39.00 |
| 886.45 | V | -61.16 | -13 | -48.16 |
| 352.14 | V | -60.59 | -13 | -47.59 |
| 3720 | H | -51.63 | -13 | -38.63 |
| 748.56 | H | -61.05 | -13 | -48.05 |
| 453.11 | H | -61.56 | -13 | -48.56 |

**Middle channel**

| Frequency (MHz) | Polarity (H/V) | Emission Level (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| 3760 | V | -51.88 | -13 | -38.88 |
| 689.45 | V | -62.25 | -13 | -49.25 |
| 435.11 | V | -61.69 | -13 | -48.69 |
| 3760 | H | -52.69 | -13 | -39.69 |
| 714.51 | H | -62.00 | -13 | -49.00 |
| 512.33 | H | -61.33 | -13 | -48.33 |

**High channel**

| Frequency (MHz) | Polarity (H/V) | Emission Level (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| 3800 | V | -53.07 | -13 | -40.07 |
| 744.36 | V | -62.28 | -13 | -49.28 |
| 365.89 | V | -61.76 | -13 | -48.76 |
| 3800 | H | -52.74 | -13 | -39.74 |
| 697.66 | H | -60.93 | -13 | -47.93 |
| 398.45 | H | -61.26 | -13 | -48.26 |

**LTE Band 7**

**Low channel**

| Frequency (MHz) | Polarity (H/V) | Emission Level (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| 3440 | V | -52.04 | -25 | -39.04 |
| 785.42 | V | -61.38 | -25 | -48.38 |
| 658.36 | V | -61.99 | -25 | -48.99 |
| 3440 | H | -52.87 | -25 | -39.87 |
| 694.12 | H | -60.89 | -25 | -47.89 |
| 458.63 | H | -62.03 | -25 | -49.03 |

**Middle channel**

| Frequency (MHz) | Polarity (H/V) | Emission Level (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| 3465 | V | -52.13 | -25 | -39.13 |
| 682.16 | V | -61.41 | -25 | -48.41 |
| 398.66 | V | -61.91 | -25 | -48.91 |
| 3465 | H | -52.91 | -25 | -39.91 |
| 596.32 | H | -60.94 | -25 | -47.94 |
| 400.25 | H | -61.93 | -25 | -48.93 |

**High channel**

| Frequency (MHz) | Polarity (H/V) | Emission Level (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| 3490 | V | -52.11 | -25 | -39.11 |
| 498.69 | V | -59.42 | -25 | -46.42 |
| 258.47 | V | -61.96 | -25 | -48.96 |
| 3490 | H | -52.95 | -25 | -39.95 |
| 450.55 | H | -60.99 | -25 | -47.99 |
| 226.45 | H | -61.98 | -25 | -48.98 |

**Note:** 1. Margin = Emission Level -Limit

2. (30MHz-26GHz) Below 30MHZ no Spurious found and above is the worst mode data

# 8. FREQUENCY STABILITY

## 8.1 MEASUREMENT METHOD

In order to measure the carrier frequency under the condition of AFC lock, it is necessary to make measurements with the EUT in a “call mode”. This is accomplished with the use of R&S CMW500 DIGITAL RADIO COMMUNICATION TESTER.

1Measure the carrier frequency at room temperature.

2Subject the EUT to overnight soak at -10℃. With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on channel 20175 for LTE band 4 measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

3Repeat the above measurements at 10℃ increments from -10℃ to +50℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

4Re-measure carrier frequency at room temperature with nominal voltage. Vary supply voltage from minimum voltage to maximum voltage, in 0.1Volt increments re-measuring carrier frequency at each voltage. Pause at nominal voltage for 1 1/2 hours unpowered, to allow any self-heating to stabilize, before continuing.

5Subject the EUT to overnight soak at +50℃.

6With the EUT, powered via nominal voltage, connected to the CMW500 and in a simulated call on the centre channel, measure the carrier frequency. These measurements should be made within 2 minutes of Powering up the EUT, to prevent significant self-warming.

7Repeat the above measurements at 10℃ increments from +50℃ to -10℃. Allow at least 1 1/2 hours at each temperature, unpowered, before making measurements.

8At all temperature levels hold the temperature to +/- 0.5℃ during the measurement procedure.

## 8.2 PROVISIONS APPLICABLE

### 8.2.1 For Hand carried battery powered equipment

Frequency stability testing is performed in accordance with the guidelines of ANSI/TIA-603-E-2016. The frequency stability of the transmitter is measured by:

a.) Temperature: The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.

b.) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within ±0.00025% (±2.5 ppm) of the center frequency. For Part 24 and Part 27, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 8.2.2 For equipment powered by primary supply voltage

1. The carrier frequency of the transmitter is measured at room temperature (20°C to provide a reference).

2. The equipment is turned on in a “standby” condition for fifteen minutes before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.

3. Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each temperature level.

**8.3 MEASUREMENT RESULT (WORST)**

**LTE Band 2**

| Middle Channel, $f_O$ = 1880 MHz | | | |
|---|---|---|---|
| Temperature (℃) | Power Supplied (VDC) | Frequency Error (Hz) | Frequency Error (ppm) |
| -10 | 3.7 | -2.49 | 0.00 |
| 0 | | 1.75 | 0.00 |
| 10 | | 3.13 | 0.00 |
| 20 | | -1.33 | 0.00 |
| 30 | | 0.50 | 0.00 |
| 40 | | 0.54 | 0.00 |
| 50 | | 1.70 | 0.00 |
| 25 | 4.3 | 2.10 | 0.00 |
| | 3.1 | -2.60 | 0.00 |

Note: Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very samll. As such it is determined that channels at the band edge would remain in-band when the maximum measured frequency deviation noted duing the frequency stability tests is applied. Therefore the device is detemined to remain operating in band over the temperture and voltage range as tested.
The EUT doesn't work below -10℃

**LTE Band 7**

| Middle Channel, $f_O$ = 2535.0MHz | | | |
|---|---|---|---|
| Temperature (℃) | Power Supplied (VDC) | Frequency Error (Hz) | Frequency Error (ppm) |
| -10 | 3.7 | 5.51 | 0.00 |
| 0 | | 5.51 | 0.00 |
| 10 | | 5.01 | 0.00 |
| 20 | | 4.21 | 0.00 |
| 30 | | 3.09 | 0.00 |
| 40 | | 2.10 | 0.00 |
| 50 | | 2.63 | 0.00 |
| 25 | 4.3 | 2.85 | 0.00 |
| | 3.1 | 4.85 | 0.00 |

Note: Based on the results of the frequency stability test at the center channel the frequency deviation results measured are very samll. As such it is determined that channels at the band edge would remain in-band when

the maximum measured frequency deviation noted duing the frequency stability tests is applied. Therefore the device is detemined to remain operating in band over the temperture and voltage range as tested.

The EUT doesn’t work below -10℃

# 9. OCCUPIED BANDWIDTH

## 9.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

## 9.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power

## 9.3 MEASUREMENT RESULT

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

**LTE Band 2**

**Channel Bandwidth: 1.4 MHz**

| Channel Bandwidth: 1.4 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Occupied Bandwidth(MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 6 | 0 | 1.1128 | PASS |
| | MCH | 6 | 0 | 1.1148 | PASS |
| | HCH | 6 | 0 | 1.1022 | PASS |
| 16QAM | LCH | 6 | 0 | 1.0987 | PASS |
| | MCH | 6 | 0 | 1.1100 | PASS |
| | HCH | 6 | 0 | 1.0936 | PASS |

**Channel Bandwidth: 3 MHz**

| Channel Bandwidth: 3 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Occupied Bandwidth(MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 15 | 0 | 2.7039 | PASS |
| | MCH | 15 | 0 | 2.7129 | PASS |
| | HCH | 15 | 0 | 2.7033 | PASS |
| 16QAM | LCH | 15 | 0 | 2.7022 | PASS |
| | MCH | 15 | 0 | 2.7066 | PASS |
| | HCH | 15 | 0 | 2.6994 | PASS |

**Channel Bandwidth: 5 MHz**

| Channel Bandwidth: 5 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Occupied Bandwidth(MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 25 | 0 | 4.5108 | PASS |
| | MCH | 25 | 0 | 4.5158 | PASS |
| | HCH | 25 | 0 | 4.5120 | PASS |
| 16QAM | LCH | 25 | 0 | 4.5121 | PASS |
| | MCH | 25 | 0 | 4.5196 | PASS |
| | HCH | 25 | 0 | 4.5072 | PASS |

**Channel Bandwidth: 10 MHz**

| Channel Bandwidth: 10 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Occupied Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 50 | 0 | 8.9866 | PASS |
| | MCH | 50 | 0 | 9.0023 | PASS |
| | HCH | 50 | 0 | 9.0165 | PASS |
| 16QAM | LCH | 50 | 0 | 8.9953 | PASS |
| | MCH | 50 | 0 | 9.0029 | PASS |
| | HCH | 50 | 0 | 9.0048 | PASS |

**Channel Bandwidth: 15 MHz**

| Channel Bandwidth: 15 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Occupied Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 75 | 0 | 13.517 | PASS |
| | MCH | 75 | 0 | 13.554 | PASS |
| | HCH | 75 | 0 | 13.623 | PASS |
| 16QAM | LCH | 75 | 0 | 13.494 | PASS |
| | MCH | 75 | 0 | 13.539 | PASS |
| | HCH | 75 | 0 | 13.575 | PASS |

**Channel Bandwidth: 20 MHz**

| Channel Bandwidth: 20 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Occupied Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 100 | 0 | 17.958 | PASS |
| | MCH | 100 | 0 | 17.998 | PASS |
| | HCH | 100 | 0 | 17.985 | PASS |
| 16QAM | LCH | 100 | 0 | 17.962 | PASS |
| | MCH | 100 | 0 | 17.983 | PASS |
| | HCH | 100 | 0 | 17.970 | PASS |

**LTE Band 7**

**Channel Bandwidth: 5MHz**

| Channel Bandwidth: 5 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Occupied Bandwidth(MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 25 | 0 | 4.4967 | PASS |
| | MCH | 25 | 0 | 4.5282 | PASS |
| | HCH | 25 | 0 | 4.5133 | PASS |
| 16QAM | LCH | 25 | 0 | 4.5026 | PASS |
| | MCH | 25 | 0 | 4.5346 | PASS |
| | HCH | 25 | 0 | 4.5040 | PASS |

**Channel Bandwidth: 10 MHz**

| Channel Bandwidth: 10 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Occupied Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 50 | 0 | 9.0161 | PASS |
| | MCH | 50 | 0 | 9.3270 | PASS |
| | HCH | 50 | 0 | 9.0268 | PASS |
| 16QAM | LCH | 50 | 0 | 9.0006 | PASS |
| | MCH | 50 | 0 | 9.2387 | PASS |
| | HCH | 50 | 0 | 9.0046 | PASS |

**Channel Bandwidth: 15 MHz**

| Channel Bandwidth: 15 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Occupied Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 75 | 0 | 13.559 | PASS |
| | MCH | 75 | 0 | 14.986 | PASS |
| | HCH | 75 | 0 | 13.540 | PASS |
| 16QAM | LCH | 75 | 0 | 13.515 | PASS |
| | MCH | 75 | 0 | 14.232 | PASS |
| | HCH | 75 | 0 | 13.488 | PASS |

**Channel Bandwidth: 20 MHz**

| Channel Bandwidth: 20 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | Occupied Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 100 | 0 | 17.995 | PASS |
| | MCH | 100 | 0 | 18.047 | PASS |
| | HCH | 100 | 0 | 17.968 | PASS |
| 16QAM | LCH | 100 | 0 | 17.995 | PASS |
| | MCH | 100 | 0 | 17.982 | PASS |
| | HCH | 100 | 0 | 17.934 | PASS |

Note: Please refers to Appendix B for compliance test plots for Occupied Bandwidth (99%)

# 10. EMISSION BANDWIDTH

## 10.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

## 10.2 PROVISIONS APPLICABLE

The emission bandwidth is defined as two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

## 10.3 MEASUREMENT RESULT

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured. All modes of operation were investigated and the worst case configuration results are reported in this section.

**LTE Band 2**

**Channel Bandwidth: 1.4 MHz**

| Channel Bandwidth: 1.4 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | 26dB Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 6 | 0 | 2.279 | PASS |
| | MCH | 6 | 0 | 2.164 | PASS |
| | HCH | 6 | 0 | 2.166 | PASS |
| 16QAM | LCH | 6 | 0 | 2.009 | PASS |
| | MCH | 6 | 0 | 2.087 | PASS |
| | HCH | 6 | 0 | 2.129 | PASS |

**Channel Bandwidth: 3 MHz**

| Channel Bandwidth: 3 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | 26dB Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 15 | 0 | 4.604 | PASS |
| | MCH | 15 | 0 | 5.240 | PASS |
| | HCH | 15 | 0 | 4.201 | PASS |
| 16QAM | LCH | 15 | 0 | 4.915 | PASS |
| | MCH | 15 | 0 | 7.013 | PASS |
| | HCH | 15 | 0 | 8.242 | PASS |

**Channel Bandwidth: 5 MHz**

| Channel Bandwidth: 5 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | 26dB Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 25 | 0 | 7.556 | PASS |
| | MCH | 25 | 0 | 9.201 | PASS |
| | HCH | 25 | 0 | 8.344 | PASS |
| 16QAM | LCH | 25 | 0 | 6.787 | PASS |
| | MCH | 25 | 0 | 7.013 | PASS |
| | HCH | 25 | 0 | 8.242 | PASS |

**Channel Bandwidth: 10 MHz**

| Channel Bandwidth: 10 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | 26dB Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 50 | 0 | 15.85 | PASS |
| | MCH | 50 | 0 | 16.09 | PASS |
| | HCH | 50 | 0 | 16.60 | PASS |
| 16QAM | LCH | 50 | 0 | 14.85 | PASS |
| | MCH | 50 | 0 | 15.99 | PASS |
| | HCH | 50 | 0 | 16.16 | PASS |

**Channel Bandwidth: 15 MHz**

| Channel Bandwidth: 15 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | 26dB Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 75 | 0 | 28.55 | PASS |
| | MCH | 75 | 0 | 28.70 | PASS |
| | HCH | 75 | 0 | 25.70 | PASS |
| 16QAM | LCH | 75 | 0 | 25.47 | PASS |
| | MCH | 75 | 0 | 28.62 | PASS |
| | HCH | 75 | 0 | 26.42 | PASS |

**Channel Bandwidth: 20 MHz**

| Channel Bandwidth: 20 MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | 26dB Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 100 | 0 | 28.51 | PASS |
| | MCH | 100 | 0 | 31.08 | PASS |
| | HCH | 100 | 0 | 31.85 | PASS |
| 16QAM | LCH | 100 | 0 | 28.75 | PASS |
| | MCH | 100 | 0 | 33.95 | PASS |
| | HCH | 100 | 0 | 34.35 | PASS |

**LTE Band 7**

**Channel Bandwidth: 5 MHz**

| Channel Bandwidth: 5MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | 26dB Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 25 | 0 | 6.157 | PASS |
| | MCH | 25 | 0 | 8.767 | PASS |
| | HCH | 25 | 0 | 9.012 | PASS |
| 16QAM | LCH | 25 | 0 | 5.525 | PASS |
| | MCH | 25 | 0 | 8.064 | PASS |
| | HCH | 25 | 0 | 7.304 | PASS |

**Channel Bandwidth: 10 MHz**

| Channel Bandwidth: 10MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | 26dB Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 50 | 0 | 18.44 | PASS |
| | MCH | 50 | 0 | 19.86 | PASS |
| | HCH | 50 | 0 | 18.85 | PASS |
| 16QAM | LCH | 50 | 0 | 18.07 | PASS |
| | MCH | 50 | 0 | 19.18 | PASS |
| | HCH | 50 | 0 | 18.46 | PASS |

**Channel Bandwidth: 15 MHz**

| Channel Bandwidth: 15MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | 26dB Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 75 | 0 | 29.29 | PASS |
| | MCH | 75 | 0 | 29.03 | PASS |
| | HCH | 75 | 0 | 28.59 | PASS |
| 16QAM | LCH | 75 | 0 | 28.60 | PASS |
| | MCH | 75 | 0 | 29.34 | PASS |
| | HCH | 75 | 0 | 25.32 | PASS |

**Channel Bandwidth: 20 MHz**

| Channel Bandwidth: 20MHz | | | | | |
|---|---|---|---|---|---|
| Modulation | Channel | RB Configuration | | 26dB Bandwidth (MHz) | Verdict |
| | | Size | Offset | | |
| QPSK | LCH | 100 | 0 | 36.49 | PASS |
| | MCH | 100 | 0 | 37.92 | PASS |
| | HCH | 100 | 0 | 35.92 | PASS |
| 16QAM | LCH | 100 | 0 | 36.12 | PASS |
| | MCH | 100 | 0 | 31.29 | PASS |
| | HCH | 100 | 0 | 28.93 | PASS |

Note: Please refers to Appendix B for compliance test plots for emission bandwidth (-26dBc).

# 11. BAND EDGE

## 11.1 MEASUREMENT METHOD

The test set up and general procedure is similar to conducted peak output power test. Only different for setting the measurement configuration of the measuring instrument of Spectrum Analyzer.

## 11.2 PROVISIONS APPLICABLE

As Specified in FCC rules of §2.1051 §24.238(a) §27.53(g) §27.53(h) §27.53(m)
KDB 971168 D01v03 – Section 6.0

## 11.3 MEASUREMENT RESULT

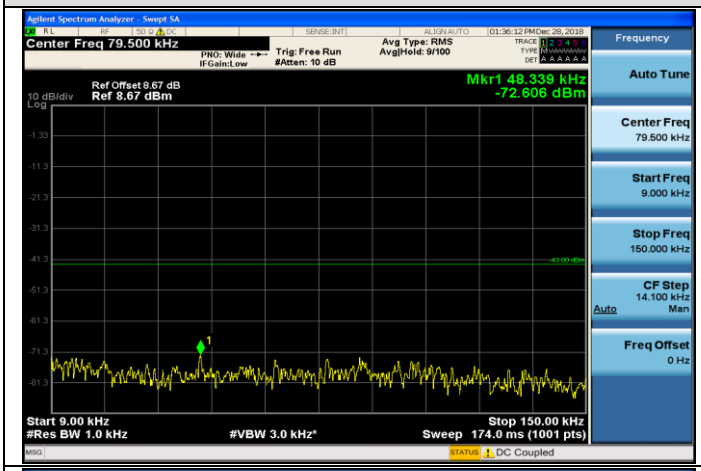
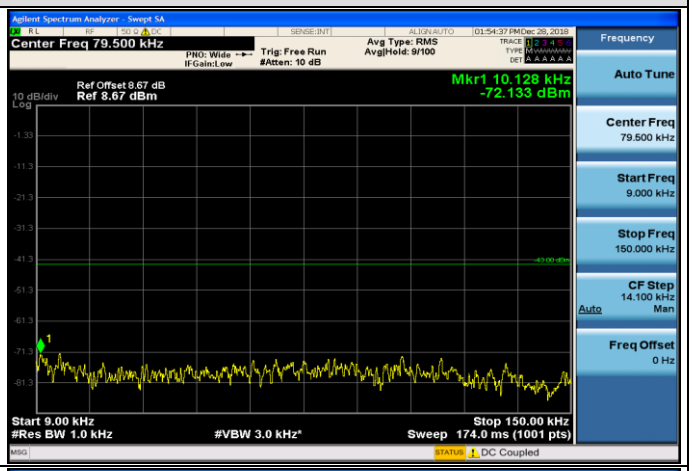
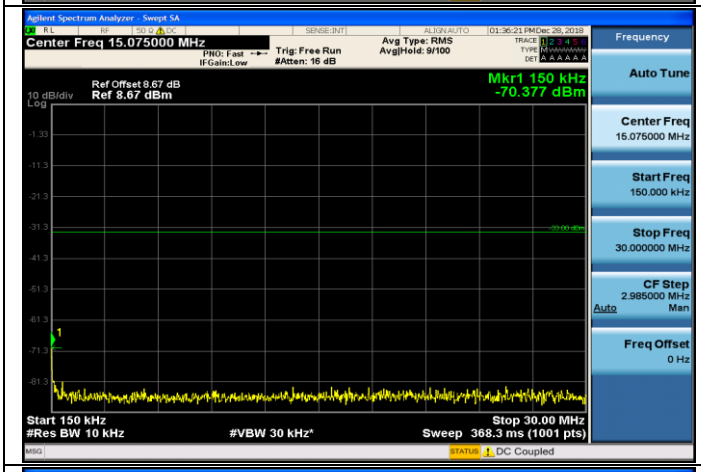
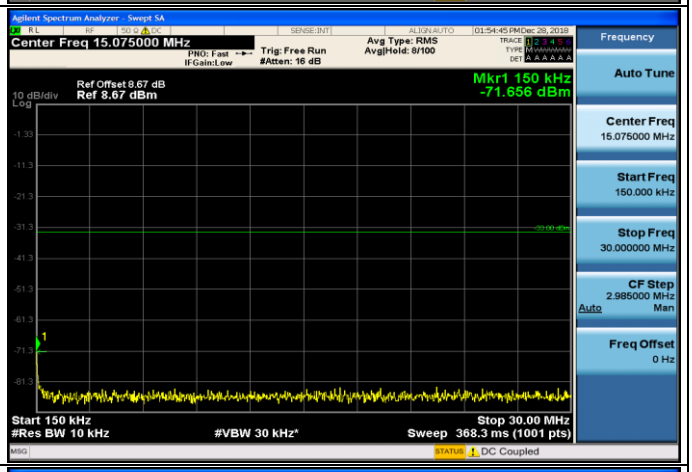
All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequency. All data rates were investigated to determine the worst case configuration. All modes of operation were investigated and the worst case configuration results are reported in this section.
The minimum permissible attenuation level of any spurious emission is 43 + log10(P[Watts]), where P is the transmitter power in Watts.

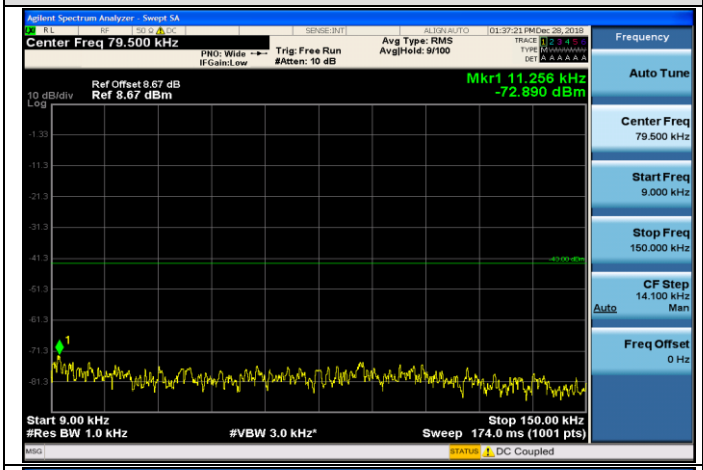
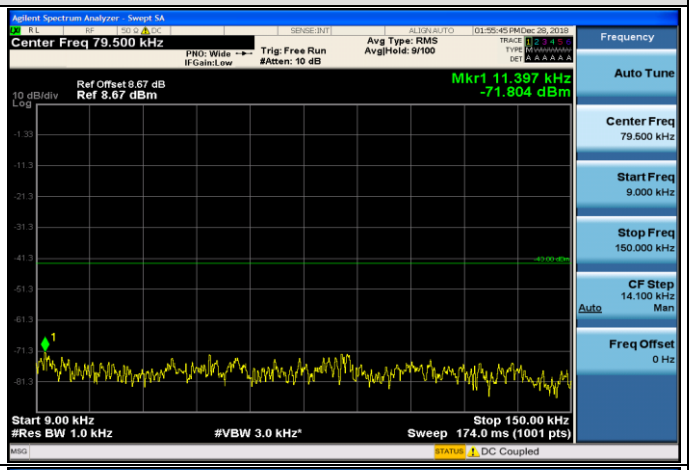
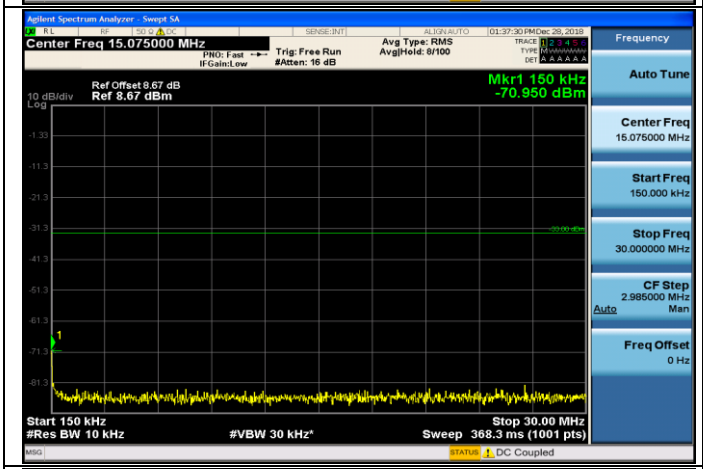
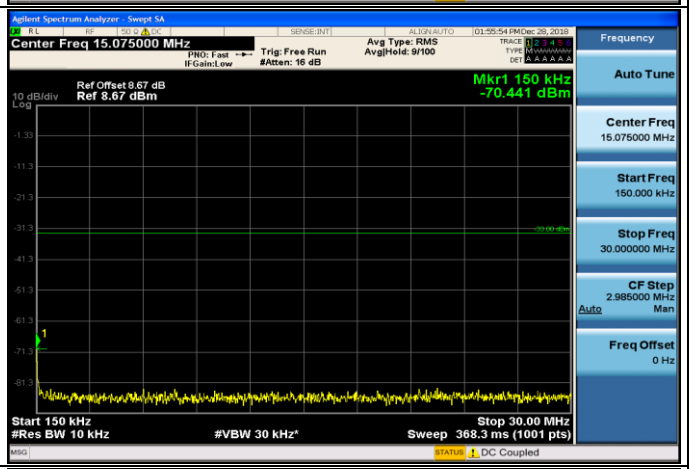
For Band 7:
(i) 40 + 10 log10 p from the channel edges to 5 MHz away
(ii) 43 + 10 log10 p between 5 MHz and X MHz from the channel edges, and
(iii) 55 + 10 log10 p at X MHz and beyond from the channel edges

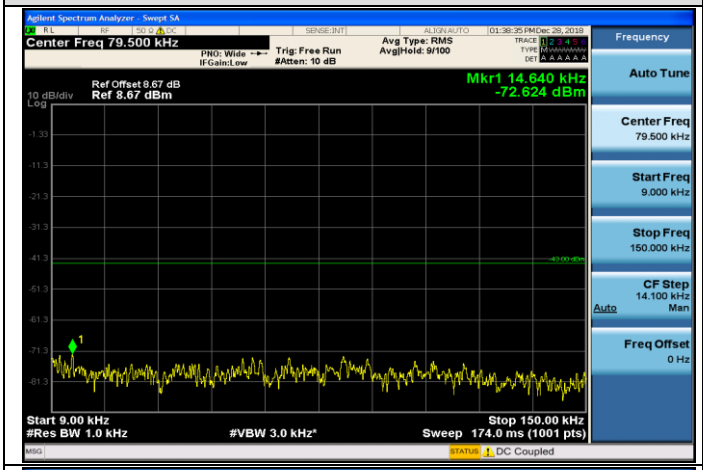
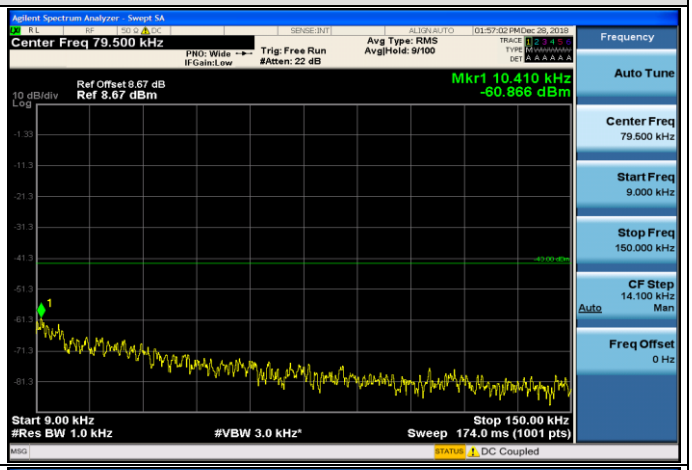
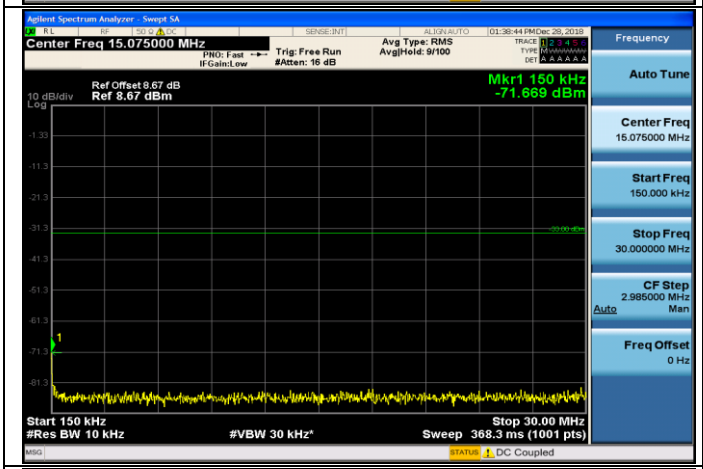
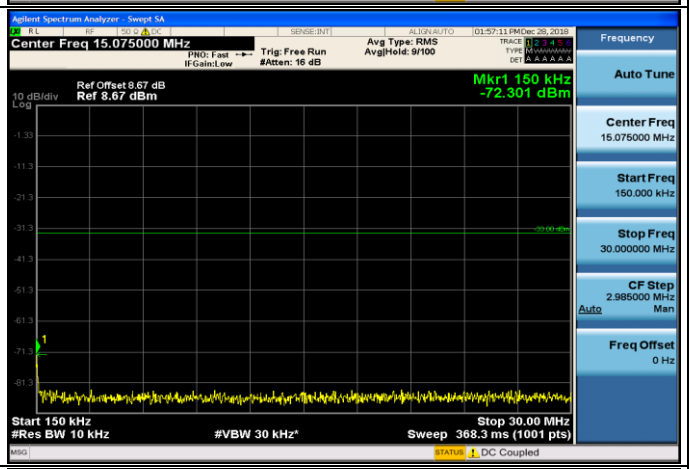
Please refers to Appendix C for compliance test plots for band edge

# APPENDIX A TEST PLOTS FOR CONDUCTED SPURIOUS EMISSION

## LTE BAND 2

| 1.4MHz_LCH_QPSK_1RB#0 | 20MHz_LCH_QPSK_1RB#0 |
|---|---|
|  |  |
|  |  |
|  |  |

| 1.4MHz_MCH_QPSK_1RB#0 | 20MHz_MCH_QPSK_1RB#0 |
|---|---|
|  |  |
|  |  |
|  |  |

| 1.4MHz_HCH_QPSK_1RB#0 | 20MHz_HCH_QPSK_1RB#0 |
|---|---|
|  |  |
|  |  |
|  |  |