

# FCC TEST REPORT

## (PART 27)

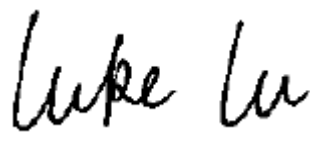
|            |                                                                                                                       |
|------------|-----------------------------------------------------------------------------------------------------------------------|
| Applicant: | Quectel Wireless Solutions Co., Ltd.                                                                                  |
| Address:   | Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233 |

|                           |                                                                                                                       |
|---------------------------|-----------------------------------------------------------------------------------------------------------------------|
| Manufacturer or Supplier: | Quectel Wireless Solutions Co., Ltd.                                                                                  |
| Address:                  | Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233 |
| Product:                  | LTE Module                                                                                                            |
| Brand Name:               | Quectel                                                                                                               |
| Model Name:               | SC66-A                                                                                                                |
| FCC ID:                   | XMR201908SC66A                                                                                                        |
| Date of tests:            | Jul. 13, 2019 ~ Sept. 06, 2019                                                                                        |

The tests have been carried out according to the requirements of the following standard:

☒ **FCC Part 27, Subpart C, L**    ☒ **ANSI/TIA/EIA-603- D**  
☒ **FCC Part 2**                      ☒ **ANSI/TIA/EIA-603-E**    ☒ **ANSI C63.26-2015**

**CONCLUSION:** The submitted sample was found to COMPLY with the test requirement

|                                                                                                             |                                                                                                              |
|-------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|
| Prepared by Alex Chen<br>Engineer / Mobile Department                                                       | Approved by Luke Lu<br>Manager / Mobile Department                                                           |
| <br>Date: Sept. 10, 2019 | <br>Date: Sept. 10, 2019 |

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## RELEASE CONTROL RECORD

| ISSUE NO.      | REASON FOR CHANGE | DATE ISSUED    |
|----------------|-------------------|----------------|
| RF190522W005-3 | Original release  | Sept. 10, 2019 |

## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: FCC Part 27 & Part 2 |                              |            |
|----------------------------------------|------------------------------|------------|
| STANDARD SECTION                       | TEST TYPE AND LIMIT          | RESULT     |
| 2.1046<br>27.50(d)(4)                  | Maximum Peak Output Power    | Compliance |
| 2.1055<br>27.54                        | Frequency Stability          | Compliance |
| 2.1049<br>27.53(h)                     | Occupied Bandwidth           | Compliance |
| 27.50(d)(5)                            | Peak to average ratio        | Compliance |
| 27.53(h)                               | Band Edge Measurements       | Compliance |
| 2.1051<br>27.53(h)                     | Conducted Spurious Emissions | Compliance |
| 2.1053<br>27.53(h)                     | Radiated Spurious Emissions  | Compliance |

### 1.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

| MEASUREMENT                                        | UNCERTAINTY           |
|----------------------------------------------------|-----------------------|
| Frequency Stability                                | $\pm 76.97\text{Hz}$  |
| Radiated emissions & Radiated Power (30MHz~1GMHz)  | $\pm 4.98\text{dB}$   |
| Radiated emissions & Radiated Power (1GMHz ~6GMHz) | $\pm 4.70\text{dB}$   |
| Radiated emissions (6GMHz ~18GMHz)                 | $\pm 4.60\text{dB}$   |
| Radiated emissions (18GMHz ~40GMHz)                | $\pm 4.12\text{dB}$   |
| Conducted emissions                                | $\pm 4.01\text{dB}$   |
| Occupied Channel Bandwidth                         | $\pm 43.58\text{KHz}$ |
| Conducted Output power                             | $\pm 2.06\text{dB}$   |
| Band Edge Measurements                             | $\pm 4.70\text{dB}$   |
| Peak to average ratio                              | $\pm 0.76\text{dB}$   |

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

## 1.2 TEST SITE AND INSTRUMENTS

| Equipment                                   | Manufacturer | Model No.                           | Serial No.                      | Last Cal.   | Next Cal.   |
|---------------------------------------------|--------------|-------------------------------------|---------------------------------|-------------|-------------|
| MXE EMI Receiver                            | KEYSIGHT     | N9038A-544                          | MY54450026                      | Feb. 26,19  | Feb. 25,20  |
| EXA Signal Analyzer                         | KEYSIGHT     | N9010A-526                          | MY54510322                      | Feb. 26,19  | Feb. 25,20  |
| Bilog Antenna                               | ETS-LINDGREN | 3143B                               | 00161965                        | Feb. 26,19  | Feb. 25,20  |
| Horn Antenna<br>(1GHz-18GHz)                | ETS-LINDGREN | 3117                                | 00168692                        | Nov. 30, 18 | Nov. 29, 19 |
| Horn Antenna<br>(18GHz-40GHz)               | N/A          | QWH-SL-18-40<br>-K-SG/QMS-00<br>361 | 15433                           | Nov. 21, 18 | Nov. 20, 19 |
| Radio<br>Communication<br>Analyzer          | ANRITSU      | MT8820C                             | 6201465426                      | Feb. 26,19  | Feb. 25,20  |
| Signal Pre-Amplifier                        | EMSI         | EMC 9135                            | 980249                          | Jun. 24,19  | Jun. 23,20  |
| Signal Pre-Amplifier                        | EMSI         | EMC 012645B                         | 980257                          | Jun. 24,19  | Jun. 23,20  |
| Signal Pre-Amplifier                        | EMSI         | EMC 184045B                         | 980259                          | Jun. 24,19  | Jun. 23,20  |
| 3m Semi-anechoic<br>Chamber                 | ETS-LINDGREN | 9m*6m*6m                            | Euroshieldpn-<br>CT0001143-1216 | Feb. 26,19  | Feb. 25,20  |
| Test Software                               | E3           | V 9.160323                          | N/A                             | N/A         | N/A         |
| Test Software                               | ADT          | ADT_Radiated<br>V7.6.15.9.2         | N/A                             | N/A         | N/A         |
| 10dB Attenuator                             | JFW/USA      | 50HF-010-SM<br>A                    | 1505                            | Jun. 24,19  | Jun. 23,20  |
| Power Meter                                 | Anritsu      | ML2495A                             | 1506002                         | Feb. 26,19  | Feb. 25,20  |
| Power Sensor                                | Anritsu      | MA2411B                             | 1339352                         | Feb. 26,19  | Feb. 25,20  |
| Humid & Temp<br>Programmable Tester         | Juyi         | ITH-120-45-CP<br>-AR                | IAA1504-001                     | Jun. 24,19  | Jun. 23,20  |
| MXG Analog<br>Microvave<br>Signal Generator | KEYSIGHT     | N5183A                              | MY50143024                      | Feb. 26,19  | Feb. 25,20  |
| Power Divider                               | MCLI/USA     | PS2-15                              | 24880                           | Jul. 09,19  | Jul. 08,20  |

**NOTE:** 1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

2. The test was performed in 3m Semi-anechoic Chamber and RF Oven Room.

3. The horn antenna is used only for the measurement of emission frequency above 1GHz if tested.

4. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

## 2 GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                              |                                                                                     |                       |
|------------------------------|-------------------------------------------------------------------------------------|-----------------------|
| <b>PRODUCT</b>               | LTE Module                                                                          |                       |
| <b>BRAND NAME</b>            | Quectel                                                                             |                       |
| <b>MODEL NAME</b>            | SC66-A                                                                              |                       |
| <b>POWER SUPPLY</b>          | $V_{\min}=3.55\text{Vdc}$ , $V_{\text{nor}}=4\text{Vdc}$ , $V_{\max}=4.4\text{Vdc}$ |                       |
| <b>MODULATION TECHNOLOGY</b> | <b>WCDMA</b>                                                                        | BPSK, QPSK            |
|                              | <b>LTE</b>                                                                          | QPSK, 16QAM,          |
| <b>FREQUENCY RANGE</b>       | <b>WCDMA IV</b>                                                                     | 1712.4MHz ~ 1752.6MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 1.4MHz</b>                                     | 1710.7MHz ~ 1754.3MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 3MHz</b>                                       | 1711.5MHz ~ 1753.5MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 5MHz</b>                                       | 1712.5MHz ~ 1752.5MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 10MHz</b>                                      | 1715.0MHz ~ 1750.0MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 15MHz</b>                                      | 1717.5MHz ~ 1747.5MHz |
|                              | <b>LTE Band 4<br/>Channel Bandwidth: 20MHz</b>                                      | 1720.0MHz ~ 1745.0MHz |
|                              | <b>LTE Band 66<br/>Channel Bandwidth: 1.4MHz</b>                                    | 1710.7MHz ~ 1779.3MHz |
|                              | <b>LTE Band 66<br/>Channel Bandwidth: 3MHz</b>                                      | 1711.5MHz ~ 1778.5MHz |
|                              | <b>LTE Band 66<br/>Channel Bandwidth: 5MHz</b>                                      | 1712.5MHz ~ 1777.5MHz |
|                              | <b>LTE Band 66<br/>Channel Bandwidth: 10MHz</b>                                     | 1715MHz ~ 1775MHz     |
|                              | <b>LTE Band 66<br/>Channel Bandwidth: 15MHz</b>                                     | 1717.5MHz ~ 1772.5MHz |
|                              | <b>LTE Band 66<br/>Channel Bandwidth: 20MHz</b>                                     | 1720MHz ~ 1770MHz     |

|                                |                                  |                |
|--------------------------------|----------------------------------|----------------|
| <b>EMISSION<br/>DESIGNATOR</b> | <b>WCDMA IV</b>                  | 4M14F9W        |
|                                | <b>LTE Band 4</b>                | QPSK: 1M08G7D  |
|                                | <b>Channel Bandwidth: 1.4MHz</b> | 16QAM: 1M08W7D |
|                                | <b>LTE Band 4</b>                | QPSK: 2M68G7D  |
|                                | <b>Channel Bandwidth: 3MHz</b>   | 16QAM: 2M68W7D |
|                                | <b>LTE Band 4</b>                | QPSK: 4M48G7D  |
|                                | <b>Channel Bandwidth: 5MHz</b>   | 16QAM: 4M47W7D |
|                                | <b>LTE Band 4</b>                | QPSK: 8M94G7D  |
|                                | <b>Channel Bandwidth: 10MHz</b>  | 16QAM: 8M93W7D |
|                                | <b>LTE Band 4</b>                | QPSK: 13M4G7D  |
|                                | <b>Channel Bandwidth: 15MHz</b>  | 16QAM: 13M4W7D |
|                                | <b>LTE Band 4</b>                | QPSK: 17M9G7D  |
|                                | <b>Channel Bandwidth: 20MHz</b>  | 16QAM: 17M9W7D |
|                                | <b>LTE Band 66</b>               | QPSK: 1M08G7D  |
|                                | <b>Channel Bandwidth: 1.4MHz</b> | 16QAM: 1M08W7D |
|                                | <b>LTE Band 66</b>               | QPSK: 2M68G7D  |
|                                | <b>Channel Bandwidth: 3MHz</b>   | 16QAM: 2M68W7D |
|                                | <b>LTE Band 66</b>               | QPSK: 4M47G7D  |
|                                | <b>Channel Bandwidth: 5MHz</b>   | 16QAM: 4M47W7D |
|                                | <b>LTE Band 66</b>               | QPSK: 8M94G7D  |
|                                | <b>Channel Bandwidth: 10MHz</b>  | 16QAM: 8M93W7D |
|                                | <b>LTE Band 66</b>               | QPSK: 13M4G7D  |
|                                | <b>Channel Bandwidth: 15MHz</b>  | 16QAM: 13M4W7D |
|                                | <b>LTE Band 66</b>               | QPSK: 17M9G7D  |
|                                | <b>Channel Bandwidth: 20MHz</b>  | 16QAM: 17M9W7D |

|                                |                                                  |          |
|--------------------------------|--------------------------------------------------|----------|
| <b>MAX. ERP/EIRP<br/>POWER</b> | <b>WCDMA IV</b>                                  | 272.90mw |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 1.4MHz</b>  | 330.37mw |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 3MHz</b>    | 326.59mw |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 5MHz</b>    | 326.59mw |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 10MHz</b>   | 327.34mw |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 15MHz</b>   | 324.34mw |
|                                | <b>LTE Band 4<br/>Channel Bandwidth: 20MHz</b>   | 330.37mw |
|                                | <b>LTE Band 66<br/>Channel Bandwidth: 1.4MHz</b> | 320.63mw |
|                                | <b>LTE Band 66<br/>Channel Bandwidth: 3MHz</b>   | 321.37mw |
|                                | <b>LTE Band 66<br/>Channel Bandwidth: 5MHz</b>   | 319.15mw |
|                                | <b>LTE Band 66<br/>Channel Bandwidth: 10MHz</b>  | 319.89mw |
|                                | <b>LTE Band 66<br/>Channel Bandwidth: 15MHz</b>  | 322.85mw |
|                                | <b>LTE Band 66<br/>Channel Bandwidth: 20MHz</b>  | 325.09mw |
| <b>ANTENNA TYPE</b>            | Fixed External Antenna with 1.94dBi gain         |          |
| <b>HW VERSION</b>              | R1.0                                             |          |
| <b>SW VERSION</b>              | SC66ANAR01A06                                    |          |
| <b>DATA CABLE</b>              | Refer to user's manual                           |          |

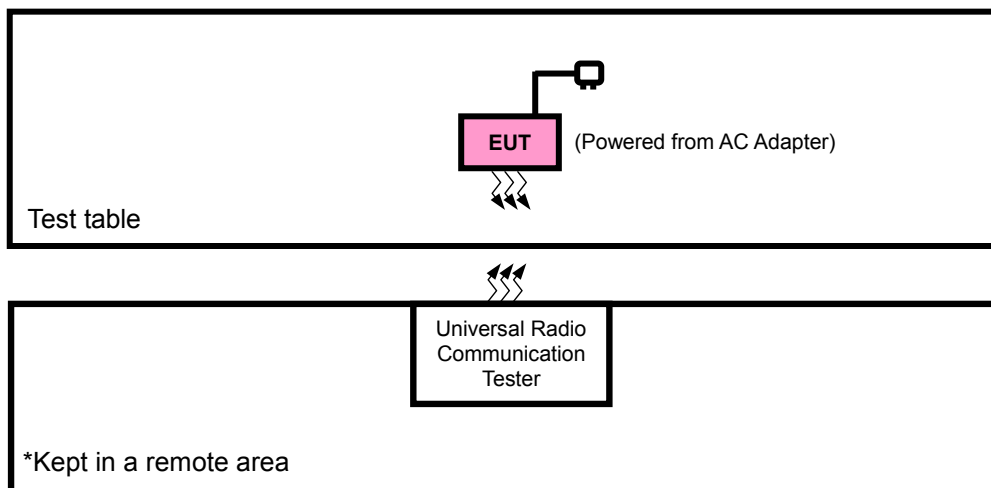
**NOTE:**

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitter and one receiver.

| <b>MODULATION MODE</b> | <b>TX FUNCTION</b> |
|------------------------|--------------------|
| <b>WCDMA</b>           | 1TX/1RX            |
| <b>LTE</b>             | 1TX/1RX            |

## 2.2 CONFIGURATION OF SYSTEM UNDER TEST

### FOR RADIATION EMISSION TEST



## 2.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| NO. | PRODUCT   | BRAND    | MODEL NO.  | SERIAL NO. | FCC ID |
|-----|-----------|----------|------------|------------|--------|
| 1   | Adapter   | JINGSAI  | CLS-050200 | N/A        | N/A    |
| 2   | DC source | LONG WEI | PS-6403D   | 010934269  | N/A    |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|-----------------------------------------------------|
| 1   | Unshielded, Detachable 1.8m                         |
| 2   | DC Line: Unshielded, Detachable 1.0m                |

## 2.4 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case in radiated emission was found when positioned on X-plane for WCDMA /LTE. Following channel(s) was (were) selected for the final test as listed below:

| EUT CONFIGURE MODE | DESCRIPTION                                      |
|--------------------|--------------------------------------------------|
| A                  | EUT + Adapter + USB Cable with WCDMA or LTE link |
| B                  | EUT + Battery with WCDMA or LTE link             |

### WCDMA MODE

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL   | MODE  |
|-----------------------|-------------------|------------------|-------|
| EIRP                  | 1312 to 1513      | 1312, 1413, 1513 | WCDMA |
| FREQUENCY STABILITY   | 1312 to 1513      | 1312, 1513       | WCDMA |
| OCCUPIED BANDWIDTH    | 1312 to 1513      | 1312, 1413, 1513 | WCDMA |
| BAND EDGE             | 1312 to 1513      | 1312, 1513       | WCDMA |
| PEAK TO AVERAGE RATIO | 1312 to 1513      | 1312, 1413, 1513 | WCDMA |
| CONDUCTED EMISSION    | 1312 to 1513      | 1312, 1413, 1513 | WCDMA |
| RADIATED EMISSION     | 1312 to 1513      | 1312, 1413, 1513 | WCDMA |

#### LTE BAND 4

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL      | CHANNEL BANDWIDTH | MODULATION   | MODE                 |
|-----------------------|-------------------|---------------------|-------------------|--------------|----------------------|
| EIRP                  | 19957 to 20393    | 19957, 20175, 20393 | 1.4MHz            | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 19965 to 20385    | 19965, 20175, 20385 | 3MHz              | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 19975 to 20375    | 19975, 20175, 20375 | 5MHz              | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 20000 to 20350    | 20000, 20175, 20350 | 10MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 20025 to 20325    | 20025, 20175, 20325 | 15MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 20050 to 20300    | 20050, 20175, 20300 | 20MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
| FREQUENCY STABILITY   | 19957 to 20393    | 19957, 20393        | 1.4MHz            | QPSK         | 1 RB / 0 RB Offset   |
|                       | 19965 to 20385    | 19965, 20385        | 3MHz              | QPSK         | 1 RB / 0 RB Offset   |
|                       | 19975 to 20375    | 19975, 20375        | 5MHz              | QPSK         | 1 RB / 0 RB Offset   |
|                       | 20000 to 20350    | 20000, 20350        | 10MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                       | 20025 to 20325    | 20025, 20325        | 15MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                       | 20050 to 20300    | 20050, 20300        | 20MHz             | QPSK         | 1 RB / 0 RB Offset   |
| OCCUPIED BANDWIDTH    | 19957 to 20393    | 19957, 20175, 20393 | 1.4MHz            | QPSK, 16QAM, | 6 RB / 0 RB Offset   |
|                       | 19965 to 20385    | 19965, 20175, 20385 | 3MHz              | QPSK, 16QAM, | 15 RB / 0 RB Offset  |
|                       | 19975 to 20375    | 19975, 20175, 20375 | 5MHz              | QPSK, 16QAM, | 25 RB / 0 RB Offset  |
|                       | 20000 to 20350    | 20000, 20175, 20350 | 10MHz             | QPSK, 16QAM, | 50 RB / 0 RB Offset  |
|                       | 20025 to 20325    | 20025, 20175, 20325 | 15MHz             | QPSK, 16QAM, | 75 RB / 0 RB Offset  |
|                       | 20050 to 20300    | 20050, 20175, 20300 | 20MHz             | QPSK, 16QAM, | 100 RB / 0 RB Offset |
| PEAK TO AVERAGE RATIO | 19957 to 20393    | 19957, 20175, 20393 | 1.4MHz            | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 19965 to 20385    | 19965, 20175, 20385 | 3MHz              | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 19975 to 20375    | 19975, 20175, 20375 | 5MHz              | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 20000 to 20350    | 20000, 20175, 20350 | 10MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 20025 to 20325    | 20025, 20175, 20325 | 15MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 20050 to 20300    | 20050, 20175, 20300 | 20MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
| BAND EDGE             | 19957 to 20393    | 19957               | 1.4MHz            | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       |                   |                     |                   |              | 6 RB / 0 RB Offset   |
|                       | 19957 to 20393    | 20393               | 1.4MHz            | QPSK, 16QAM, | 1 RB / 5 RB Offset   |
|                       |                   |                     |                   |              | 6 RB / 0 RB Offset   |
|                       | 19965 to 20385    | 19965               | 3MHz              | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       |                   |                     |                   |              | 15 RB / 0 RB Offset  |
|                       | 19965 to 20385    | 20385               | 3MHz              | QPSK, 16QAM, | 1 RB / 14 RB Offset  |
|                       |                   |                     |                   |              | 15 RB / 0 RB Offset  |
|                       | 19975 to 20375    | 19975               | 5MHz              | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       |                   |                     |                   |              | 25 RB / 0 RB Offset  |
|                       | 19975 to 20375    | 20375               | 5MHz              | QPSK, 16QAM, | 1 RB / 24 RB Offset  |
|                       |                   |                     |                   |              | 25 RB / 0 RB Offset  |
|                       | 20000 to 20350    | 20000               | 10MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       |                   |                     |                   |              | 50 RB / 0 RB Offset  |
|                       | 20000 to 20350    | 20350               | 10MHz             | QPSK, 16QAM, | 1 RB / 49 RB Offset  |
|                       |                   |                     |                   |              | 50 RB / 0 RB Offset  |

|                    |                |                     |        |              |                      |
|--------------------|----------------|---------------------|--------|--------------|----------------------|
| BAND EDGE          | 20025 to 20325 | 20025               | 15MHz  | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                    |                |                     |        |              | 75 RB / 0 RB Offset  |
|                    | 20050 to 20300 | 20325               | 15MHz  | QPSK, 16QAM, | 1 RB / 74 RB Offset  |
|                    |                |                     |        |              | 75 RB / 0 RB Offset  |
|                    |                | 20050               | 20MHz  | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                    |                |                     |        |              | 100 RB / 0 RB Offset |
| CONDCUDED EMISSION | 20025 to 20325 | 20300               | 20MHz  | QPSK, 16QAM, | 1 RB / 99 RB Offset  |
|                    |                |                     |        |              | 100 RB / 0 RB Offset |
|                    | 19957 to 20393 | 19957, 20175, 20393 | 1.4MHz | QPSK         | 1 RB / 0 RB Offset   |
|                    | 19965 to 20385 | 19965, 20175, 20385 | 3MHz   | QPSK         | 1 RB / 0 RB Offset   |
|                    | 19975 to 20375 | 19975, 20175, 20375 | 5MHz   | QPSK         | 1 RB / 0 RB Offset   |
|                    | 20000 to 20350 | 20000, 20175, 20350 | 10MHz  | QPSK         | 1 RB / 0 RB Offset   |
| RADIATED EMISSION  | 20025 to 20325 | 20025, 20175, 20325 | 15MHz  | QPSK         | 1 RB / 0 RB Offset   |
|                    | 20050 to 20300 | 20050, 20175, 20300 | 20MHz  | QPSK         | 1 RB / 0 RB Offset   |
|                    | 19957 to 20393 | 20175               | 1.4MHz | QPSK         | 1 RB / 0 RB Offset   |
|                    | 19965 to 20385 | 19965, 20175, 20385 | 3MHz   | QPSK         | 1 RB / 0 RB Offset   |
|                    | 19975 to 20375 | 20175               | 5MHz   | QPSK         | 1 RB / 0 RB Offset   |
|                    | 20000 to 20350 | 20175               | 10MHz  | QPSK         | 1 RB / 0 RB Offset   |
|                    | 20025 to 20325 | 20175               | 15MHz  | QPSK         | 1 RB / 0 RB Offset   |
|                    | 20050 to 20300 | 20175               | 20MHz  | QPSK         | 1 RB / 0 RB Offset   |

**Note:** This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

**LTE BAND 66**

| TEST ITEM             | AVAILABLE CHANNEL | TESTED CHANNEL         | CHANNEL BANDWIDTH | MODULATION   | MODE                 |
|-----------------------|-------------------|------------------------|-------------------|--------------|----------------------|
| EIRP                  | 131979 to 132665  | 131979, 132322, 132665 | 1.4MHz            | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 131987 to 132657  | 131987, 132322, 132657 | 3MHz              | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 131997 to 132647  | 131997, 132322, 132647 | 5MHz              | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 132022 to 132622  | 132022, 132322, 132622 | 10MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 132047 to 132597  | 132047, 132322, 132597 | 15MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 132072 to 132572  | 132072, 132322, 132572 | 20MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
| FREQUENCY STABILITY   | 131979 to 132665  | 131979, 132665         | 1.4MHz            | QPSK         | 1 RB / 0 RB Offset   |
|                       | 131987 to 132657  | 131987, 132657         | 3MHz              | QPSK         | 1 RB / 0 RB Offset   |
|                       | 131997 to 132647  | 131997, 132647         | 5MHz              | QPSK         | 1 RB / 0 RB Offset   |
|                       | 132022 to 132622  | 132022, 132622         | 10MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                       | 132047 to 132597  | 132047, 132597         | 15MHz             | QPSK         | 1 RB / 0 RB Offset   |
|                       | 132072 to 132572  | 132072, 132572         | 20MHz             | QPSK         | 1 RB / 0 RB Offset   |
| OCCUPIED BANDWIDTH    | 131979 to 132665  | 131979, 132322, 132665 | 1.4MHz            | QPSK, 16QAM, | 6 RB / 0 RB Offset   |
|                       | 131987 to 132657  | 131987, 132322, 132657 | 3MHz              | QPSK, 16QAM, | 15 RB / 0 RB Offset  |
|                       | 131997 to 132647  | 131997, 132322, 132647 | 5MHz              | QPSK, 16QAM, | 25 RB / 0 RB Offset  |
|                       | 132022 to 132622  | 132022, 132322, 132622 | 10MHz             | QPSK, 16QAM, | 50 RB / 0 RB Offset  |
|                       | 132047 to 132597  | 132047, 132322, 132597 | 15MHz             | QPSK, 16QAM, | 75 RB / 0 RB Offset  |
|                       | 132072 to 132572  | 132072, 132322, 132572 | 20MHz             | QPSK, 16QAM, | 100 RB / 0 RB Offset |
| PEAK TO AVERAGE RATIO | 131979 to 132665  | 131979, 132322, 132665 | 1.4MHz            | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 131987 to 132657  | 131987, 132322, 132657 | 3MHz              | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 131997 to 132647  | 131997, 132322, 132647 | 5MHz              | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 132022 to 132622  | 132022, 132322, 132622 | 10MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 132047 to 132597  | 132047, 132322, 132597 | 15MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       | 132072 to 132572  | 132072, 132322, 132572 | 20MHz             | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
| BAND EDGE             | 131979 to 132665  | 131979                 | 1.4MHz            | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                       |                   |                        |                   |              | 6 RB / 0 RB Offset   |
|                       |                   | 132665                 | 1.4MHz            | QPSK, 16QAM, | 1 RB / 5 RB Offset   |
|                       |                   |                        |                   |              | 6 RB / 0 RB Offset   |

|                    |                  |                        |        |              |                      |
|--------------------|------------------|------------------------|--------|--------------|----------------------|
|                    | 131987 to 132657 | 131987                 | 3MHz   | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                    |                  |                        |        |              | 15 RB / 0 RB Offset  |
|                    |                  | 132657                 | 3MHz   | QPSK, 16QAM, | 1 RB / 14 RB Offset  |
|                    |                  |                        |        |              | 15 RB / 0 RB Offset  |
|                    | 131997 to 132647 | 131997                 | 5MHz   | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                    |                  |                        |        |              | 25 RB / 0 RB Offset  |
|                    |                  | 132647                 | 5MHz   | QPSK, 16QAM, | 1 RB / 24 RB Offset  |
|                    |                  |                        |        |              | 25 RB / 0 RB Offset  |
|                    | 132022 to 132622 | 132022                 | 10MHz  | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                    |                  |                        |        |              | 50 RB / 0 RB Offset  |
|                    |                  | 132622                 | 10MHz  | QPSK, 16QAM, | 1 RB / 49 RB Offset  |
|                    |                  |                        |        |              | 50 RB / 0 RB Offset  |
|                    | 132047 to 132597 | 132047                 | 15MHz  | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                    |                  |                        |        |              | 75 RB / 0 RB Offset  |
| CONDCUDED EMISSION |                  | 132597                 | 15MHz  | QPSK, 16QAM, | 1 RB / 74 RB Offset  |
|                    |                  |                        |        |              | 75 RB / 0 RB Offset  |
|                    | 132072 to 132572 | 132072                 | 20MHz  | QPSK, 16QAM, | 1 RB / 0 RB Offset   |
|                    |                  |                        |        |              | 100 RB / 0 RB Offset |
|                    |                  | 132572                 | 20MHz  | QPSK, 16QAM, | 1 RB / 99 RB Offset  |
|                    |                  |                        |        |              | 100 RB / 0 RB Offset |
|                    | 131979 to 132665 | 131979, 132322, 132665 | 1.4MHz | QPSK         | 1 RB / 0 RB Offset   |
|                    | 131987 to 132657 | 131987, 132322, 132657 | 3MHz   | QPSK         | 1 RB / 0 RB Offset   |
|                    | 131997 to 132647 | 131997, 132322, 132647 | 5MHz   | QPSK         | 1 RB / 0 RB Offset   |
|                    | 132022 to 132622 | 132022, 132322, 132622 | 10MHz  | QPSK         | 1 RB / 0 RB Offset   |
|                    | 132047 to 132597 | 132047, 132322, 132597 | 15MHz  | QPSK         | 1 RB / 0 RB Offset   |
|                    | 132072 to 132572 | 132072, 132322, 132572 | 20MHz  | QPSK         | 1 RB / 0 RB Offset   |
| RADIATED EMISSION  | 131979 to 132665 | 132322                 | 1.4MHz | QPSK         | 1 RB / 0 RB Offset   |
|                    | 131987 to 132657 | 132322                 | 3MHz   | QPSK         | 1 RB / 0 RB Offset   |
|                    | 131997 to 132647 | 132322                 | 5MHz   | QPSK         | 1 RB / 0 RB Offset   |
|                    | 132022 to 132622 | 132022, 132322, 132622 | 10MHz  | QPSK         | 1 RB / 0 RB Offset   |
|                    | 132047 to 132597 | 132322                 | 15MHz  | QPSK         | 1 RB / 0 RB Offset   |
|                    | 132072 to 132572 | 132322                 | 20MHz  | QPSK         | 1 RB / 0 RB Offset   |

**Note:** This device was tested under all bandwidths, RB configurations and modulations. The worst case was found in QPSK modulation.

**TEST CONDITION:**

| TEST ITEM             | ENVIRONMENTAL CONDITIONS | INPUT POWER       | TESTED BY |
|-----------------------|--------------------------|-------------------|-----------|
| EIRP                  | 23deg. C, 70%RH          | 5Vdc from adapter | Star Le   |
| FREQUENCY STABILITY   | 23deg. C, 70%RH          | DC 3.55V/4V/4.4V  | Walker Ye |
| OCCUPIED BANDWIDTH    | 23deg. C, 70%RH          | 5Vdc from adapter | Walker Ye |
| PEAK TO AVERAGE RATIO | 23deg. C, 70%RH          | 5Vdc from adapter | Walker Ye |
| BAND EDGE             | 23deg. C, 70%RH          | 5Vdc from adapter | Walker Ye |
| CONDUCTED EMISSION    | 23deg. C, 70%RH          | 5Vdc from adapter | Walker Ye |
| RADIATED EMISSION     | 23deg. C, 70%RH          | 5Vdc from adapter | Star Le   |



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## 2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 27**

**KDB 971168 D01 Power Meas License Digital Systems v03r01**

**ANSI/TIA/EIA-603-D**

**ANSI/TIA/EIA-603-E**

**ANSI C63.26-2015**

**NOTE:** All test items have been performed and recorded as per the above standards.

### 3 TEST TYPES AND RESULTS

#### 3.1 OUTPUT POWER MEASUREMENT

##### 3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

##### 3.1.2 TEST PROCEDURES

###### **EIRP MEASUREMENT:**

Per KDB 971168 D01 Power Meas License Digital Systems v03r01 or subclause 5.2.5.5 of ANSI C63.26-2015, the relevant equation for determining the ERP or EIRP from the conducted RF output power measured using the guidance provided above is:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_{\text{T}} - L_{\text{C}}$$

Where:

ERP or EIRP = effective radiated power or equivalent isotropically radiated power, respectively

(expressed in the same units as  $P_{\text{Meas}}$ , typically dBW or dBm);

$P_{\text{Meas}}$  = measured transmitter output power or PSD, in dBm or dBW;

$G_{\text{T}}$  = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

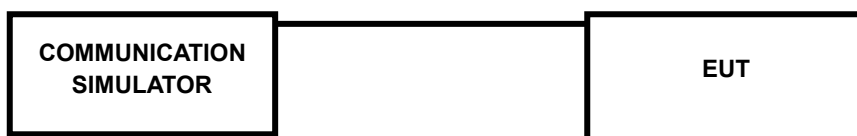
$L_{\text{C}}$  = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

###### **CONDUCTED POWER MEASUREMENT:**

- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.

### 3.1.3 TEST SETUP

#### CONDUCTED POWER MEASUREMENT:



### 3.1.4 TEST RESULTS

#### AVERAGE CONDUCTED OUTPUT POWER (dBm)

| Band               | WCDMA IV |        |              |
|--------------------|----------|--------|--------------|
| Channel            | 1312     | 1413   | 1513         |
| Frequency (MHz)    | 1712.4   | 1732.6 | 1752.6       |
| RMC 12.2K          | 22.37    | 22.33  | <b>22.42</b> |
| HSPA               |          |        |              |
| HSDPA Subtest-1    | 21.29    | 21.38  | 21.55        |
| HSDPA Subtest-2    | 21.34    | 21.42  | 21.48        |
| HSDPA Subtest-3    | 20.78    | 20.86  | 21.03        |
| HSDPA Subtest-4    | 20.83    | 20.91  | 20.99        |
| DC-HSDPA Subtest-1 | 21.41    | 21.29  | 21.45        |
| DC-HSDPA Subtest-2 | 21.42    | 21.35  | 21.37        |
| DC-HSDPA Subtest-3 | 20.73    | 20.81  | 21.05        |
| DC-HSDPA Subtest-4 | 20.92    | 20.84  | 20.96        |
| HSUPA Subtest-1    | 21.37    | 21.45  | 21.62        |
| HSUPA Subtest-2    | 19.35    | 19.42  | 19.66        |
| HSUPA Subtest-3    | 20.43    | 20.51  | 20.64        |
| HSUPA Subtest-4    | 19.38    | 19.46  | 19.63        |
| HSUPA Subtest-5    | 21.41    | 21.27  | 21.52        |

| LTE Band 4 |            |         |           |                         |                         |                         |     |
|------------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|-----|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>19957         | Mid CH<br>20175         | High CH<br>20393        | MPR |
|            |            |         |           | Frequency<br>1710.7 MHz | Frequency<br>1732.5 MHz | Frequency<br>1754.3 MHz |     |
| 1.4MHz     | QPSK       | 1       | 0         | 23.07                   | 23.15                   | 23.20                   | 0   |
|            |            | 1       | 2         | 23.09                   | 23.10                   | 23.20                   | 0   |
|            |            | 1       | 5         | 22.97                   | 22.96                   | 23.04                   | 0   |
|            |            | 3       | 0         | 23.11                   | 23.13                   | 23.25                   | 0   |
|            |            | 3       | 1         | 23.14                   | 23.17                   | 23.17                   | 0   |
|            |            | 3       | 3         | 23.04                   | 23.05                   | 23.13                   | 0   |
|            |            | 6       | 0         | 22.10                   | 22.09                   | 22.19                   | 1   |
|            | 16QAM      | 1       | 0         | 22.37                   | 22.39                   | 22.47                   | 1   |
|            |            | 1       | 2         | 22.44                   | 22.42                   | 22.54                   | 1   |
|            |            | 1       | 5         | 22.28                   | 22.29                   | 22.42                   | 1   |
|            |            | 3       | 0         | 22.20                   | 22.23                   | 22.29                   | 1   |
|            |            | 3       | 1         | 22.13                   | 22.24                   | 22.26                   | 1   |
|            |            | 3       | 3         | 22.13                   | 22.16                   | 22.26                   | 1   |
|            |            | 6       | 0         | 21.09                   | 21.17                   | 21.20                   | 2   |

| LTE Band 4 |            |         |           |                         |                         |                         |     |
|------------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|-----|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>19965         | Mid CH<br>20175         | High CH<br>20385        | MPR |
|            |            |         |           | Frequency<br>1711.5 MHz | Frequency<br>1732.5 MHz | Frequency<br>1753.5 MHz |     |
| 3MHz       | QPSK       | 1       | 0         | 23.09                   | 23.17                   | 23.19                   | 0   |
|            |            | 1       | 7         | 23.05                   | 23.11                   | 23.20                   | 0   |
|            |            | 1       | 14        | 22.93                   | 22.96                   | 23.04                   | 0   |
|            |            | 8       | 0         | 22.10                   | 22.16                   | 22.25                   | 1   |
|            |            | 8       | 3         | 22.07                   | 22.17                   | 22.19                   | 1   |
|            |            | 8       | 7         | 22.01                   | 22.12                   | 22.17                   | 1   |
|            |            | 15      | 0         | 22.07                   | 22.10                   | 22.13                   | 1   |
|            | 16QAM      | 1       | 0         | 22.34                   | 22.45                   | 22.50                   | 1   |
|            |            | 1       | 7         | 22.41                   | 22.45                   | 22.52                   | 1   |
|            |            | 1       | 14        | 22.31                   | 22.29                   | 22.42                   | 1   |
|            |            | 8       | 0         | 21.16                   | 21.24                   | 21.29                   | 2   |
|            |            | 8       | 3         | 21.18                   | 21.19                   | 21.29                   | 2   |
|            |            | 8       | 7         | 21.15                   | 21.14                   | 21.22                   | 2   |
|            |            | 15      | 0         | 21.09                   | 21.11                   | 21.23                   | 2   |

| LTE Band 4 |            |         |           |                         |                         |                         |     |
|------------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|-----|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>19975         | Mid CH<br>20175         | High CH<br>20375        | MPR |
|            |            |         |           | Frequency<br>1712.5 MHz | Frequency<br>1732.5 MHz | Frequency<br>1752.5 MHz |     |
| 5 MHz      | QPSK       | 1       | 0         | 23.10                   | 23.12                   | 23.20                   | 0   |
|            |            | 1       | 12        | 23.10                   | 23.08                   | 23.20                   | 0   |
|            |            | 1       | 24        | 22.94                   | 22.95                   | 23.08                   | 0   |
|            |            | 12      | 0         | 22.13                   | 22.16                   | 22.22                   | 1   |
|            |            | 12      | 6         | 22.07                   | 22.18                   | 22.20                   | 1   |
|            |            | 12      | 13        | 22.05                   | 22.08                   | 22.18                   | 1   |
|            |            | 25      | 0         | 22.05                   | 22.13                   | 22.16                   | 1   |
|            | 16QAM      | 1       | 0         | 22.35                   | 22.41                   | 22.50                   | 1   |
|            |            | 1       | 12        | 22.38                   | 22.48                   | 22.51                   | 1   |
|            |            | 1       | 24        | 22.31                   | 22.29                   | 22.41                   | 1   |
|            |            | 12      | 0         | 21.16                   | 21.22                   | 21.26                   | 2   |
|            |            | 12      | 6         | 21.15                   | 21.23                   | 21.25                   | 2   |
|            |            | 12      | 13        | 21.10                   | 21.16                   | 21.25                   | 2   |
|            |            | 25      | 0         | 21.09                   | 21.12                   | 21.20                   | 2   |

| LTE Band 4 |            |         |           |                       |                         |                       |     |
|------------|------------|---------|-----------|-----------------------|-------------------------|-----------------------|-----|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>20000       | Mid CH<br>20175         | High CH<br>20350      | MPR |
|            |            |         |           | Frequency<br>1715 MHz | Frequency<br>1732.5 MHz | Frequency<br>1750 MHz |     |
| 10 MHz     | QPSK       | 1       | 0         | 23.07                 | 23.15                   | 23.20                 | 0   |
|            |            | 1       | 24        | 23.10                 | 23.08                   | 23.21                 | 0   |
|            |            | 1       | 49        | 22.91                 | 22.99                   | 23.04                 | 0   |
|            |            | 25      | 0         | 22.14                 | 22.15                   | 22.25                 | 1   |
|            |            | 25      | 12        | 22.13                 | 22.12                   | 22.20                 | 1   |
|            |            | 25      | 25        | 22.03                 | 22.05                   | 22.17                 | 1   |
|            |            | 50      | 0         | 22.10                 | 22.13                   | 22.13                 | 1   |
|            | 16QAM      | 1       | 0         | 22.35                 | 22.38                   | 22.46                 | 1   |
|            |            | 1       | 24        | 22.43                 | 22.44                   | 22.54                 | 1   |
|            |            | 1       | 49        | 22.31                 | 22.30                   | 22.38                 | 1   |
|            |            | 25      | 0         | 21.18                 | 21.20                   | 21.32                 | 2   |
|            |            | 25      | 12        | 21.19                 | 21.17                   | 21.30                 | 2   |
|            |            | 25      | 25        | 21.09                 | 21.17                   | 21.22                 | 2   |
|            |            | 50      | 0         | 21.13                 | 21.11                   | 21.24                 | 2   |

| LTE Band 4 |            |         |           |                         |                         |                         |     |
|------------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|-----|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>20025         | Mid CH<br>20175         | High CH<br>20325        | MPR |
|            |            |         |           | Frequency<br>1717.5 MHz | Frequency<br>1732.5 MHz | Frequency<br>1747.5 MHz |     |
| 15 MHz     | QPSK       | 1       | 0         | 23.14                   | 23.15                   | 23.17                   | 0   |
|            |            | 1       | 37        | 23.08                   | 23.13                   | 23.16                   | 0   |
|            |            | 1       | 74        | 22.97                   | 23.02                   | 23.05                   | 0   |
|            |            | 36      | 0         | 22.11                   | 22.16                   | 22.26                   | 1   |
|            |            | 36      | 19        | 22.14                   | 22.17                   | 22.20                   | 1   |
|            |            | 36      | 39        | 22.01                   | 22.06                   | 22.17                   | 1   |
|            |            | 75      | 0         | 22.10                   | 22.11                   | 22.18                   | 1   |
|            | 16QAM      | 1       | 0         | 22.39                   | 22.45                   | 22.46                   | 1   |
|            |            | 1       | 37        | 22.42                   | 22.45                   | 22.54                   | 1   |
|            |            | 1       | 74        | 22.27                   | 22.35                   | 22.40                   | 1   |
|            |            | 36      | 0         | 21.22                   | 21.20                   | 21.33                   | 2   |
|            |            | 36      | 19        | 21.13                   | 21.21                   | 21.26                   | 2   |
|            |            | 36      | 39        | 21.14                   | 21.15                   | 21.25                   | 2   |
|            |            | 75      | 0         | 21.14                   | 21.14                   | 21.17                   | 2   |

| LTE Band 4 |            |         |           |                       |                         |                       |     |
|------------|------------|---------|-----------|-----------------------|-------------------------|-----------------------|-----|
| BW         | Modulation | RB Size | RB Offset | Low CH<br>20050       | Mid CH<br>20175         | High CH<br>20300      | MPR |
|            |            |         |           | Frequency<br>1720 MHz | Frequency<br>1732.5 MHz | Frequency<br>1745 MHz |     |
| 20 MHz     | QPSK       | 1       | 0         | 23.15                 | 23.19                   | 23.25                 | 0   |
|            |            | 1       | 50        | 23.12                 | 23.16                   | 23.22                 | 0   |
|            |            | 1       | 99        | 22.99                 | 23.03                   | 23.09                 | 0   |
|            |            | 50      | 0         | 22.17                 | 22.21                   | 22.27                 | 1   |
|            |            | 50      | 25        | 22.15                 | 22.19                   | 22.25                 | 1   |
|            |            | 50      | 50        | 22.09                 | 22.13                   | 22.19                 | 1   |
|            |            | 100     | 0         | 22.11                 | 22.15                   | 22.21                 | 1   |
|            | 16QAM      | 1       | 0         | 22.42                 | 22.46                   | 22.52                 | 1   |
|            |            | 1       | 50        | 22.46                 | 22.50                   | 22.56                 | 1   |
|            |            | 1       | 99        | 22.33                 | 22.37                   | 22.43                 | 1   |
|            |            | 50      | 0         | 21.24                 | 21.28                   | 21.34                 | 2   |
|            |            | 50      | 25        | 21.21                 | 21.25                   | 21.31                 | 2   |
|            |            | 50      | 50        | 21.17                 | 21.21                   | 21.27                 | 2   |
|            |            | 100     | 0         | 21.15                 | 21.19                   | 21.25                 | 2   |

| LTE Band 66 |            |         |           |                         |                       |                         |     |
|-------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|-----|
| BW          | Modulation | RB Size | RB Offset | Low CH<br>131979        | Mid CH<br>132422      | High CH<br>132665       | MPR |
|             |            |         |           | Frequency<br>1710.7 MHz | Frequency<br>1755 MHz | Frequency<br>1779.3 MHz |     |
| 1.4MHz      | QPSK       | 1       | 0         | 22.97                   | 23.10                 | 23.03                   | 0   |
|             |            | 1       | 2         | 23.06                   | 23.12                 | 23.10                   | 0   |
|             |            | 1       | 5         | 22.78                   | 22.82                 | 22.78                   | 0   |
|             |            | 3       | 0         | 22.92                   | 22.99                 | 22.99                   | 0   |
|             |            | 3       | 1         | 22.99                   | 23.07                 | 22.95                   | 0   |
|             |            | 3       | 3         | 22.88                   | 22.94                 | 22.90                   | 0   |
|             |            | 6       | 0         | 21.96                   | 22.00                 | 21.98                   | 1   |
|             | 16QAM      | 1       | 0         | 22.28                   | 22.35                 | 22.31                   | 1   |
|             |            | 1       | 2         | 22.36                   | 22.39                 | 22.39                   | 1   |
|             |            | 1       | 5         | 22.10                   | 22.16                 | 22.17                   | 1   |
|             |            | 3       | 0         | 22.05                   | 22.13                 | 22.07                   | 1   |
|             |            | 3       | 1         | 21.97                   | 22.13                 | 22.03                   | 1   |
|             |            | 3       | 3         | 21.95                   | 22.03                 | 22.01                   | 1   |
|             |            | 6       | 0         | 20.96                   | 21.09                 | 21.00                   | 2   |

| LTE Band 66 |            |         |           |                         |                       |                         |     |
|-------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|-----|
| BW          | Modulation | RB Size | RB Offset | Low CH<br>131987        | Mid CH<br>132422      | High CH<br>132657       | MPR |
|             |            |         |           | Frequency<br>1711.5 MHz | Frequency<br>1755 MHz | Frequency<br>1778.5 MHz |     |
| 3MHz        | QPSK       | 1       | 0         | 22.99                   | 23.12                 | 23.02                   | 0   |
|             |            | 1       | 7         | 23.02                   | 23.13                 | 23.10                   | 0   |
|             |            | 1       | 14        | 22.74                   | 22.82                 | 22.78                   | 0   |
|             |            | 8       | 0         | 21.91                   | 22.02                 | 21.99                   | 1   |
|             |            | 8       | 3         | 21.92                   | 22.07                 | 21.97                   | 1   |
|             |            | 8       | 7         | 21.85                   | 22.01                 | 21.94                   | 1   |
|             |            | 15      | 0         | 21.93                   | 22.01                 | 21.92                   | 1   |
|             | 16QAM      | 1       | 0         | 22.25                   | 22.41                 | 22.34                   | 1   |
|             |            | 1       | 7         | 22.33                   | 22.42                 | 22.37                   | 1   |
|             |            | 1       | 14        | 22.13                   | 22.16                 | 22.17                   | 1   |
|             |            | 8       | 0         | 21.01                   | 21.14                 | 21.07                   | 2   |
|             |            | 8       | 3         | 21.02                   | 21.08                 | 21.06                   | 2   |
|             |            | 8       | 7         | 20.97                   | 21.01                 | 20.97                   | 2   |
|             |            | 15      | 0         | 20.96                   | 21.03                 | 21.03                   | 2   |

| LTE Band 66 |            |         |           |                         |                       |                         |     |
|-------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|-----|
| BW          | Modulation | RB Size | RB Offset | Low CH<br>131997        | Mid CH<br>132422      | High CH<br>132647       | MPR |
|             |            |         |           | Frequency<br>1712.5 MHz | Frequency<br>1755 MHz | Frequency<br>1777.5 MHz |     |
| 5 MHz       | QPSK       | 1       | 0         | 23.00                   | 23.07                 | 23.03                   | 0   |
|             |            | 1       | 12        | 23.07                   | 23.10                 | 23.10                   | 0   |
|             |            | 1       | 24        | 22.75                   | 22.81                 | 22.82                   | 0   |
|             |            | 12      | 0         | 21.94                   | 22.02                 | 21.96                   | 1   |
|             |            | 12      | 6         | 21.92                   | 22.08                 | 21.98                   | 1   |
|             |            | 12      | 13        | 21.89                   | 21.97                 | 21.95                   | 1   |
|             |            | 25      | 0         | 21.91                   | 22.04                 | 21.95                   | 1   |
|             | 16QAM      | 1       | 0         | 22.26                   | 22.37                 | 22.34                   | 1   |
|             |            | 1       | 12        | 22.30                   | 22.45                 | 22.36                   | 1   |
|             |            | 1       | 24        | 22.13                   | 22.16                 | 22.16                   | 1   |
|             |            | 12      | 0         | 21.01                   | 21.12                 | 21.04                   | 2   |
|             |            | 12      | 6         | 20.99                   | 21.12                 | 21.02                   | 2   |
|             |            | 12      | 13        | 20.92                   | 21.03                 | 21.00                   | 2   |
|             |            | 25      | 0         | 20.96                   | 21.04                 | 21.00                   | 2   |

| LTE Band 66 |            |         |           |                       |                       |                       |     |
|-------------|------------|---------|-----------|-----------------------|-----------------------|-----------------------|-----|
| BW          | Modulation | RB Size | RB Offset | Low CH<br>132022      | Mid CH<br>132422      | High CH<br>132622     | MPR |
|             |            |         |           | Frequency<br>1715 MHz | Frequency<br>1755 MHz | Frequency<br>1775 MHz |     |
| 10 MHz      | QPSK       | 1       | 0         | 22.97                 | 23.10                 | 23.03                 | 0   |
|             |            | 1       | 24        | 23.07                 | 23.10                 | 23.11                 | 0   |
|             |            | 1       | 49        | 22.72                 | 22.85                 | 22.78                 | 0   |
|             |            | 25      | 0         | 21.95                 | 22.01                 | 21.99                 | 1   |
|             |            | 25      | 12        | 21.98                 | 22.02                 | 21.98                 | 1   |
|             |            | 25      | 25        | 21.87                 | 21.94                 | 21.94                 | 1   |
|             |            | 50      | 0         | 21.96                 | 22.04                 | 21.92                 | 1   |
|             | 16QAM      | 1       | 0         | 22.26                 | 22.34                 | 22.30                 | 1   |
|             |            | 1       | 24        | 22.35                 | 22.41                 | 22.39                 | 1   |
|             |            | 1       | 49        | 22.13                 | 22.17                 | 22.13                 | 1   |
|             |            | 25      | 0         | 21.03                 | 21.10                 | 21.10                 | 2   |
|             |            | 25      | 12        | 21.03                 | 21.06                 | 21.07                 | 2   |
|             |            | 25      | 25        | 20.91                 | 21.04                 | 20.97                 | 2   |
|             |            | 50      | 0         | 21.00                 | 21.03                 | 21.04                 | 2   |

| LTE Band 66 |            |         |           |                         |                       |                         |     |
|-------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|-----|
| BW          | Modulation | RB Size | RB Offset | Low CH<br>132047        | Mid CH<br>132422      | High CH<br>132597       | MPR |
|             |            |         |           | Frequency<br>1717.5 MHz | Frequency<br>1755 MHz | Frequency<br>1772.5 MHz |     |
| 15 MHz      | QPSK       | 1       | 0         | 23.04                   | 23.10                 | 23.00                   | 0   |
|             |            | 1       | 37        | 23.05                   | 23.15                 | 23.06                   | 0   |
|             |            | 1       | 74        | 22.78                   | 22.88                 | 22.79                   | 0   |
|             |            | 36      | 0         | 21.92                   | 22.02                 | 22.00                   | 1   |
|             |            | 36      | 19        | 21.99                   | 22.07                 | 21.98                   | 1   |
|             |            | 36      | 39        | 21.85                   | 21.95                 | 21.94                   | 1   |
|             |            | 75      | 0         | 21.96                   | 22.02                 | 21.97                   | 1   |
|             | 16QAM      | 1       | 0         | 22.30                   | 22.41                 | 22.30                   | 1   |
|             |            | 1       | 37        | 22.34                   | 22.42                 | 22.39                   | 1   |
|             |            | 1       | 74        | 22.09                   | 22.22                 | 22.15                   | 1   |
|             |            | 36      | 0         | 21.07                   | 21.10                 | 21.11                   | 2   |
|             |            | 36      | 19        | 20.97                   | 21.10                 | 21.03                   | 2   |
|             |            | 36      | 39        | 20.96                   | 21.02                 | 21.00                   | 2   |
|             |            | 75      | 0         | 21.01                   | 21.06                 | 20.97                   | 2   |

| LTE Band 66 |            |         |           |                       |                       |                       |     |
|-------------|------------|---------|-----------|-----------------------|-----------------------|-----------------------|-----|
| BW          | Modulation | RB Size | RB Offset | Low CH<br>132072      | Mid CH<br>132422      | High CH<br>132572     | MPR |
|             |            |         |           | Frequency<br>1720 MHz | Frequency<br>1755 MHz | Frequency<br>1770 MHz |     |
| 20 MHz      | QPSK       | 1       | 0         | 23.05                 | 23.14                 | 23.08                 | 0   |
|             |            | 1       | 50        | 23.09                 | 23.18                 | 23.12                 | 0   |
|             |            | 1       | 99        | 22.80                 | 22.89                 | 22.83                 | 0   |
|             |            | 50      | 0         | 21.98                 | 22.07                 | 22.01                 | 1   |
|             |            | 50      | 25        | 22.00                 | 22.09                 | 22.03                 | 1   |
|             |            | 50      | 50        | 21.93                 | 22.02                 | 21.96                 | 1   |
|             |            | 100     | 0         | 21.97                 | 22.06                 | 22.00                 | 1   |
|             | 16QAM      | 1       | 0         | 22.33                 | 22.42                 | 22.36                 | 1   |
|             |            | 1       | 50        | 22.38                 | 22.47                 | 22.41                 | 1   |
|             |            | 1       | 99        | 22.15                 | 22.24                 | 22.18                 | 1   |
|             |            | 50      | 0         | 21.09                 | 21.18                 | 21.12                 | 2   |
|             |            | 50      | 25        | 21.05                 | 21.14                 | 21.08                 | 2   |
|             |            | 50      | 50        | 20.99                 | 21.08                 | 21.02                 | 2   |
|             |            | 100     | 0         | 21.02                 | 21.11                 | 21.05                 | 2   |

## EIRP

### WCDMA IV

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 1313    | 1712.6             | 22.37                       | 1.94                                   | 24.31         | 269.77       | 1            |
| 1450    | 1740.0             | 22.33                       | 1.94                                   | 24.27         | 267.30       | 1            |
| 1512    | 1752.4             | 22.42                       | 1.94                                   | 24.36         | 272.90       | 1            |

### LTE BAND 4

#### CHANNEL BANDWIDTH: 1.4MHz QPSK

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 19957   | 1710.7             | 23.14                       | 1.94                                   | 25.08         | 322.11       | 1            |
| 20175   | 1732.5             | 23.17                       | 1.94                                   | 25.11         | 324.34       | 1            |
| 20393   | 1754.3             | 23.25                       | 1.94                                   | 25.19         | 330.37       | 1            |

#### CHANNEL BANDWIDTH: 1.4MHz 16QAM

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 19957   | 1710.7             | 22.42                       | 1.94                                   | 24.36         | 272.9        | 1            |
| 20175   | 1732.5             | 22.44                       | 1.94                                   | 24.38         | 274.16       | 1            |
| 20393   | 1754.3             | 22.54                       | 1.94                                   | 24.48         | 280.54       | 1            |



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#### LTE BAND 4

##### CHANNEL BANDWIDTH: 3MHz QPSK

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 19965   | 1711.5             | 23.09                       | 1.94                                   | 25.03         | 318.42       | 1            |
| 20175   | 1732.5             | 23.17                       | 1.94                                   | 25.11         | 324.34       | 1            |
| 20385   | 1753.5             | 23.20                       | 1.94                                   | 25.14         | 326.59       | 1            |

##### CHANNEL BANDWIDTH: 3MHz 16QAM

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 19965   | 1711.5             | 22.41                       | 1.94                                   | 24.35         | 272.27       | 1            |
| 20175   | 1732.5             | 22.45                       | 1.94                                   | 24.39         | 274.79       | 1            |
| 20385   | 1753.5             | 22.52                       | 1.94                                   | 24.46         | 279.25       | 1            |



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#### LTE BAND 4

##### CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 19975   | 1712.5             | 23.10                       | 1.94                                   | 25.04         | 319.15       | 1            |
| 20175   | 1732.5             | 23.12                       | 1.94                                   | 25.06         | 320.63       | 1            |
| 20375   | 1752.5             | 23.20                       | 1.94                                   | 25.14         | 326.59       | 1            |

##### CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 19975   | 1712.5             | 22.38                       | 1.94                                   | 24.32         | 270.4        | 1            |
| 20175   | 1732.5             | 22.48                       | 1.94                                   | 24.42         | 276.69       | 1            |
| 20375   | 1752.5             | 22.51                       | 1.94                                   | 24.45         | 278.61       | 1            |



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#### **LTE BAND 4**

##### **CHANNEL BANDWIDTH: 10MHz QPSK**

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Conducted<br/>Power<br/>(dBm)</b> | <b>G<sub>T</sub>-L<sub>C</sub><br/>(dB)</b> | <b>EIRP<br/>(dBm)</b> | <b>EIRP<br/>(mW)</b> | <b>Limit<br/>(W)</b> |
|----------------|----------------------------|--------------------------------------|---------------------------------------------|-----------------------|----------------------|----------------------|
| 18650          | 1715.0                     | 23.10                                | 1.94                                        | 25.04                 | 319.15               | 1                    |
| 18900          | 1732.5                     | 23.15                                | 1.94                                        | 25.09                 | 322.85               | 1                    |
| 19150          | 1750.0                     | 23.21                                | 1.94                                        | 25.15                 | 327.34               | 1                    |

##### **CHANNEL BANDWIDTH: 10MHz 16QAM**

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Conducted<br/>Power<br/>(dBm)</b> | <b>G<sub>T</sub>-L<sub>C</sub><br/>(dB)</b> | <b>EIRP<br/>(dBm)</b> | <b>EIRP<br/>(mW)</b> | <b>Limit<br/>(W)</b> |
|----------------|----------------------------|--------------------------------------|---------------------------------------------|-----------------------|----------------------|----------------------|
| 20000          | 1715.0                     | 22.43                                | 1.94                                        | 24.37                 | 273.53               | 1                    |
| 20175          | 1732.5                     | 22.44                                | 1.94                                        | 24.38                 | 274.16               | 1                    |
| 20350          | 1750.0                     | 22.54                                | 1.94                                        | 24.48                 | 280.54               | 1                    |



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#### **LTE BAND 4**

##### **CHANNEL BANDWIDTH: 15MHz QPSK**

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Conducted<br/>Power<br/>(dBm)</b> | <b>G<sub>T</sub>-L<sub>C</sub><br/>(dB)</b> | <b>EIRP<br/>(dBm)</b> | <b>EIRP<br/>(mW)</b> | <b>Limit<br/>(W)</b> |
|----------------|----------------------------|--------------------------------------|---------------------------------------------|-----------------------|----------------------|----------------------|
| 20025          | 1717.5                     | 23.14                                | 1.94                                        | 25.08                 | 322.11               | 1                    |
| 20175          | 1732.5                     | 23.15                                | 1.94                                        | 25.09                 | 322.85               | 1                    |
| 20325          | 1747.5                     | 23.17                                | 1.94                                        | 25.11                 | 324.34               | 1                    |

##### **CHANNEL BANDWIDTH: 15MHz 16QAM**

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Conducted<br/>Power<br/>(dBm)</b> | <b>G<sub>T</sub>-L<sub>C</sub><br/>(dB)</b> | <b>EIRP<br/>(dBm)</b> | <b>EIRP<br/>(mW)</b> | <b>Limit<br/>(W)</b> |
|----------------|----------------------------|--------------------------------------|---------------------------------------------|-----------------------|----------------------|----------------------|
| 20025          | 1717.5                     | 22.42                                | 1.94                                        | 24.36                 | 272.9                | 2                    |
| 20175          | 1732.5                     | 22.45                                | 1.94                                        | 24.39                 | 274.79               | 2                    |
| 20325          | 1747.5                     | 22.54                                | 1.94                                        | 24.48                 | 280.54               | 2                    |



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#### LTE BAND 4

##### CHANNEL BANDWIDTH: 20MHz QPSK

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>c</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 20050   | 1720.0             | 23.15                       | 1.94                                   | 25.09         | 322.85       | 2            |
| 20175   | 1732.5             | 23.19                       | 1.94                                   | 25.13         | 325.84       | 2            |
| 20300   | 1745.0             | 23.25                       | 1.94                                   | 25.19         | 330.37       | 2            |

##### CHANNEL BANDWIDTH: 20MHz 16QAM

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>c</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 20050   | 1720.0             | 22.46                       | 1.94                                   | 24.40         | 275.42       | 2            |
| 20175   | 1732.5             | 22.50                       | 1.94                                   | 24.44         | 277.97       | 2            |
| 20300   | 1745.0             | 22.56                       | 1.94                                   | 24.50         | 281.84       | 2            |



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## **LTE BAND 66**

### **CHANNEL BANDWIDTH: 1.4MHz QPSK**

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Conducted<br/>Power<br/>(dBm)</b> | <b>G<sub>T</sub>-L<sub>C</sub><br/>(dB)</b> | <b>EIRP<br/>(dBm)</b> | <b>EIRP<br/>(mW)</b> | <b>Limit<br/>(W)</b> |
|----------------|----------------------------|--------------------------------------|---------------------------------------------|-----------------------|----------------------|----------------------|
| 131979         | 1710.7                     | 23.06                                | 1.94                                        | 25.00                 | 316.23               | 1                    |
| 132322         | 1745.0                     | 23.12                                | 1.94                                        | 25.06                 | 320.63               | 1                    |
| 132665         | 1779.3                     | 23.10                                | 1.94                                        | 25.04                 | 319.15               | 1                    |

### **CHANNEL BANDWIDTH: 1.4MHz 16QAM**

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Conducted<br/>Power<br/>(dBm)</b> | <b>G<sub>T</sub>-L<sub>C</sub><br/>(dB)</b> | <b>EIRP<br/>(dBm)</b> | <b>EIRP<br/>(mW)</b> | <b>Limit<br/>(W)</b> |
|----------------|----------------------------|--------------------------------------|---------------------------------------------|-----------------------|----------------------|----------------------|
| 131979         | 1710.7                     | 22.36                                | 1.94                                        | 24.30                 | 269.15               | 1                    |
| 132322         | 1745.0                     | 22.39                                | 1.94                                        | 24.33                 | 271.02               | 1                    |
| 132665         | 1779.3                     | 22.39                                | 1.94                                        | 24.33                 | 271.02               | 1                    |

**LTE BAND 66**

**CHANNEL BANDWIDTH: 3MHz QPSK**

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>c</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 131987  | 1711.5             | 23.02                       | 1.94                                   | 24.96         | 313.33       | 1            |
| 132322  | 1745.0             | 23.13                       | 1.94                                   | 25.07         | 321.37       | 1            |
| 132657  | 1778.5             | 23.10                       | 1.94                                   | 25.04         | 319.15       | 1            |

**CHANNEL BANDWIDTH: 3MHz 16QAM**

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>c</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 131987  | 1711.5             | 22.33                       | 1.94                                   | 24.27         | 267.3        | 1            |
| 132322  | 1745.0             | 22.42                       | 1.94                                   | 24.36         | 272.9        | 1            |
| 132657  | 1778.5             | 22.37                       | 1.94                                   | 24.31         | 269.77       | 1            |



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## LTE BAND 66

### CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 131997  | 1712.5             | 23.07                       | 1.94                                   | 25.01         | 316.96       | 1            |
| 132322  | 1745.0             | 23.10                       | 1.94                                   | 25.04         | 319.15       | 1            |
| 132647  | 1777.5             | 23.10                       | 1.94                                   | 25.04         | 319.15       | 1            |

### CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 131997  | 1712.5             | 22.30                       | 1.94                                   | 24.24         | 265.46       | 1            |
| 132322  | 1745.0             | 22.45                       | 1.94                                   | 24.39         | 274.79       | 1            |
| 132647  | 1777.5             | 22.36                       | 1.94                                   | 24.30         | 269.15       | 1            |



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## LTE BAND 66

### CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 132022  | 1715.0             | 23.07                       | 1.94                                   | 25.01         | 316.96       | 1            |
| 132322  | 1745.0             | 23.10                       | 1.94                                   | 25.04         | 319.15       | 1            |
| 132622  | 1775.0             | 23.11                       | 1.94                                   | 25.05         | 319.89       | 1            |

### CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 132022  | 1715.0             | 22.35                       | 1.94                                   | 24.29         | 268.53       | 1            |
| 132322  | 1745.0             | 22.41                       | 1.94                                   | 24.35         | 272.27       | 1            |
| 132622  | 1775.0             | 22.39                       | 1.94                                   | 24.33         | 271.02       | 1            |



**BUREAU  
VERITAS**

**Test Report No.: RF190712W002-5**

## **LTE BAND 66**

### **CHANNEL BANDWIDTH: 15MHz QPSK**

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Conducted<br/>Power<br/>(dBm)</b> | <b>G<sub>T</sub>-L<sub>C</sub><br/>(dB)</b> | <b>EIRP<br/>(dBm)</b> | <b>EIRP<br/>(mW)</b> | <b>Limit<br/>(W)</b> |
|----------------|----------------------------|--------------------------------------|---------------------------------------------|-----------------------|----------------------|----------------------|
| 132047         | 1717.5                     | 23.05                                | 1.94                                        | 24.99                 | 315.50               | 1                    |
| 132322         | 1745.0                     | 23.15                                | 1.94                                        | 25.09                 | 322.85               | 1                    |
| 132597         | 1772.5                     | 23.06                                | 1.94                                        | 25.00                 | 316.23               | 1                    |

### **CHANNEL BANDWIDTH: 15MHz 16QAM**

| <b>Channel</b> | <b>Frequency<br/>(MHz)</b> | <b>Conducted<br/>Power<br/>(dBm)</b> | <b>G<sub>T</sub>-L<sub>C</sub><br/>(dB)</b> | <b>EIRP<br/>(dBm)</b> | <b>EIRP<br/>(mW)</b> | <b>Limit<br/>(W)</b> |
|----------------|----------------------------|--------------------------------------|---------------------------------------------|-----------------------|----------------------|----------------------|
| 132047         | 1717.5                     | 22.34                                | 1.94                                        | 24.28                 | 267.92               | 1                    |
| 132322         | 1745.0                     | 22.42                                | 1.94                                        | 24.36                 | 272.90               | 1                    |
| 132597         | 1772.5                     | 22.39                                | 1.94                                        | 24.33                 | 271.02               | 1                    |



**BUREAU  
VERITAS**

Test Report No.: RF190712W002-5

## LTE BAND 66

### CHANNEL BANDWIDTH: 20MHz QPSK

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 132072  | 1720.0             | 23.09                       | 1.94                                   | 25.03         | 318.42       | 1            |
| 132322  | 1745.0             | 23.18                       | 1.94                                   | 25.12         | 325.09       | 1            |
| 132572  | 1770.0             | 23.12                       | 1.94                                   | 25.06         | 320.63       | 1            |

### CHANNEL BANDWIDTH: 20MHz 16QAM

| Channel | Frequency<br>(MHz) | Conducted<br>Power<br>(dBm) | G <sub>T</sub> -L <sub>C</sub><br>(dB) | EIRP<br>(dBm) | EIRP<br>(mW) | Limit<br>(W) |
|---------|--------------------|-----------------------------|----------------------------------------|---------------|--------------|--------------|
| 132072  | 1720.0             | 22.38                       | 1.94                                   | 24.32         | 270.4        | 1            |
| 132322  | 1745.0             | 22.47                       | 1.94                                   | 24.41         | 276.06       | 1            |
| 132572  | 1770.0             | 22.41                       | 1.94                                   | 24.35         | 272.27       | 1            |

## 3.2 FREQUENCY STABILITY MEASUREMENT

### 3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

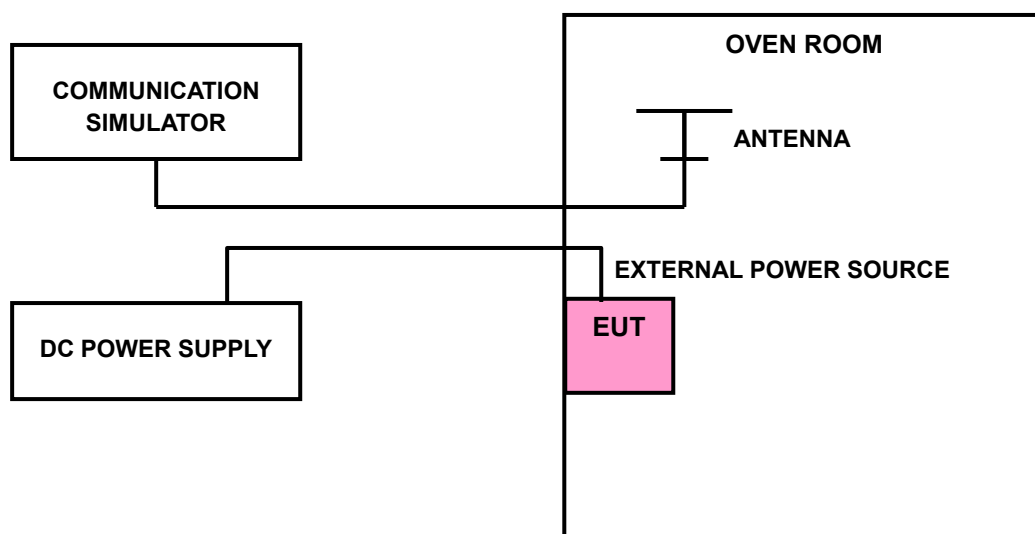
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

### 3.2.2 TEST PROCEDURE

- Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.
- EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.
- The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the  $\pm 0.5^{\circ}\text{C}$  during the measurement testing. The each temperature step shall be at least 0.5 hours, consider the EUT could be test under the stability condition.

**NOTE:** The frequency error was recorded frequency error from the communication simulator.

### 3.2.3 TEST SETUP



### 3.2.4 TEST RESULTS

#### WCDMA BAND IV

##### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | FREQUENCY ERROR (ppm) |              | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
|                 | Low Channel           | High Channel |             |
| $V_{nor}$       | 0.0022                | 0.0021       | 2.5         |
| $V_{min}$       | -0.0026               | -0.0021      | 2.5         |
| $V_{max}$       | 0.0026                | 0.0021       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

##### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | FREQUENCY ERROR (ppm) |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | Low Channel           | High Channel |             |
| -30        | -0.0113               | -0.0114      | 2.5         |
| -20        | -0.0098               | -0.0105      | 2.5         |
| -10        | -0.0084               | -0.0083      | 2.5         |
| 0          | -0.0073               | -0.0074      | 2.5         |
| 10         | -0.0055               | -0.0046      | 2.5         |
| 20         | -0.0042               | -0.0041      | 2.5         |
| 30         | -0.0030               | -0.0035      | 2.5         |
| 40         | -0.0017               | -0.0015      | 2.5         |
| 50         | -0.0004               | -0.0005      | 2.5         |

#### LTE BAND 4

##### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 1.4MHz                |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0019                | 0.0023       | 2.5         |
| V <sub>min</sub> | -0.0031               | -0.0030      | 2.5         |
| V <sub>max</sub> | 0.0021                | 0.0020       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

##### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 1.4MHz                |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0114               | -0.0113      | 2.5         |
| -20        | -0.0111               | -0.0108      | 2.5         |
| -10        | -0.0083               | -0.0079      | 2.5         |
| 0          | -0.0075               | -0.0074      | 2.5         |
| 10         | -0.0047               | -0.0046      | 2.5         |
| 20         | -0.0044               | -0.0039      | 2.5         |
| 30         | -0.0038               | -0.0030      | 2.5         |
| 40         | -0.0020               | -0.0022      | 2.5         |
| 50         | -0.0003               | -0.0003      | 2.5         |

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 3MHz                  |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0021                | 0.0021       | 2.5         |
| V <sub>min</sub> | -0.0021               | -0.0025      | 2.5         |
| V <sub>max</sub> | 0.0018                | 0.0018       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

#### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 3MHz                  |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0122               | -0.0118      | 2.5         |
| -20        | -0.0100               | -0.0103      | 2.5         |
| -10        | -0.0086               | -0.0081      | 2.5         |
| 0          | -0.0077               | -0.0075      | 2.5         |
| 10         | -0.0053               | -0.0048      | 2.5         |
| 20         | -0.0042               | -0.0040      | 2.5         |
| 30         | -0.0034               | -0.0031      | 2.5         |
| 40         | -0.0018               | -0.0017      | 2.5         |
| 50         | -0.0005               | -0.0002      | 2.5         |

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 5MHz                  |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0022                | 0.0025       | 2.5         |
| V <sub>min</sub> | -0.0024               | -0.0030      | 2.5         |
| V <sub>max</sub> | 0.0021                | 0.0021       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

#### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz                  |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0113               | -0.0117      | 2.5         |
| -20        | -0.0105               | -0.0107      | 2.5         |
| -10        | -0.0084               | -0.0079      | 2.5         |
| 0          | -0.0078               | -0.0075      | 2.5         |
| 10         | -0.0055               | -0.0051      | 2.5         |
| 20         | -0.0039               | -0.0037      | 2.5         |
| 30         | -0.0027               | -0.0041      | 2.5         |
| 40         | -0.0016               | -0.0016      | 2.5         |
| 50         | -0.0003               | -0.0001      | 2.5         |

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 10MHz                 |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0026                | 0.0025       | 2.5         |
| V <sub>min</sub> | -0.0031               | -0.0030      | 2.5         |
| V <sub>max</sub> | 0.0025                | 0.0026       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

#### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz                 |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0118               | -0.0119      | 2.5         |
| -20        | -0.0111               | -0.0097      | 2.5         |
| -10        | -0.0086               | -0.0081      | 2.5         |
| 0          | -0.0076               | -0.0074      | 2.5         |
| 10         | -0.0045               | -0.0051      | 2.5         |
| 20         | -0.0039               | -0.0042      | 2.5         |
| 30         | -0.0039               | -0.0031      | 2.5         |
| 40         | -0.0020               | -0.0022      | 2.5         |
| 50         | -0.0002               | -0.0003      | 2.5         |

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 15MHz                 |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0026                | 0.0024       | 2.5         |
| V <sub>min</sub> | -0.0031               | -0.0030      | 2.5         |
| V <sub>max</sub> | 0.0024                | 0.0026       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

#### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 15MHz                 |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0118               | -0.0112      | 2.5         |
| -20        | -0.0103               | -0.0106      | 2.5         |
| -10        | -0.0080               | -0.0084      | 2.5         |
| 0          | -0.0078               | -0.0074      | 2.5         |
| 10         | -0.0048               | -0.0055      | 2.5         |
| 20         | -0.0040               | -0.0039      | 2.5         |
| 30         | -0.0031               | -0.0037      | 2.5         |
| 40         | -0.0017               | -0.0022      | 2.5         |
| 50         | -0.0006               | -0.0003      | 2.5         |

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 20MHz                 |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0027                | 0.0025       | 2.5         |
| V <sub>min</sub> | -0.0030               | -0.0030      | 2.5         |
| V <sub>max</sub> | 0.0024                | 0.0024       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

#### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 20MHz                 |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0123               | -0.0117      | 2.5         |
| -20        | -0.0104               | -0.0109      | 2.5         |
| -10        | -0.0083               | -0.0079      | 2.5         |
| 0          | -0.0076               | -0.0074      | 2.5         |
| 10         | -0.0056               | -0.0051      | 2.5         |
| 20         | -0.0041               | -0.0041      | 2.5         |
| 30         | -0.0041               | -0.0042      | 2.5         |
| 40         | -0.0022               | -0.0015      | 2.5         |
| 50         | -0.0006               | -0.0005      | 2.5         |

## LTE BAND 66

### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 1.4MHz                |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0020                | 0.0024       | 2.5         |
| V <sub>min</sub> | -0.0031               | -0.0030      | 2.5         |
| V <sub>max</sub> | 0.0021                | 0.0020       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 1.4MHz                |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0114               | -0.0116      | 2.5         |
| -20        | -0.0107               | -0.0104      | 2.5         |
| -10        | -0.0084               | -0.0081      | 2.5         |
| 0          | -0.0078               | -0.0075      | 2.5         |
| 10         | -0.0051               | -0.0046      | 2.5         |
| 20         | -0.0044               | -0.0042      | 2.5         |
| 30         | -0.0026               | -0.0027      | 2.5         |
| 40         | -0.0021               | -0.0019      | 2.5         |
| 50         | -0.0004               | -0.0002      | 2.5         |

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 3MHz                  |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0021                | 0.0021       | 2.5         |
| V <sub>min</sub> | -0.0022               | -0.0025      | 2.5         |
| V <sub>max</sub> | 0.0018                | 0.0018       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

#### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 3MHz                  |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0115               | -0.0120      | 2.5         |
| -20        | -0.0102               | -0.0100      | 2.5         |
| -10        | -0.0081               | -0.0084      | 2.5         |
| 0          | -0.0075               | -0.0075      | 2.5         |
| 10         | -0.0048               | -0.0047      | 2.5         |
| 20         | -0.0045               | -0.0043      | 2.5         |
| 30         | -0.0038               | -0.0028      | 2.5         |
| 40         | -0.0017               | -0.0017      | 2.5         |
| 50         | -0.0004               | -0.0003      | 2.5         |

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 5MHz                  |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0022                | 0.0023       | 2.5         |
| V <sub>min</sub> | -0.0024               | -0.0030      | 2.5         |
| V <sub>max</sub> | 0.0021                | 0.0020       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

#### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz                  |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0116               | -0.0119      | 2.5         |
| -20        | -0.0099               | -0.0109      | 2.5         |
| -10        | -0.0084               | -0.0079      | 2.5         |
| 0          | -0.0077               | -0.0075      | 2.5         |
| 10         | -0.0050               | -0.0055      | 2.5         |
| 20         | -0.0044               | -0.0043      | 2.5         |
| 30         | -0.0030               | -0.0040      | 2.5         |
| 40         | -0.0015               | -0.0021      | 2.5         |
| 50         | -0.0004               | -0.0002      | 2.5         |

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 10MHz                 |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0024                | 0.0025       | 2.5         |
| V <sub>min</sub> | -0.0031               | -0.0030      | 2.5         |
| V <sub>max</sub> | 0.0024                | 0.0023       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

#### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz                 |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0119               | -0.0114      | 2.5         |
| -20        | -0.0110               | -0.0104      | 2.5         |
| -10        | -0.0084               | -0.0081      | 2.5         |
| 0          | -0.0077               | -0.0076      | 2.5         |
| 10         | -0.0049               | -0.0052      | 2.5         |
| 20         | -0.0039               | -0.0038      | 2.5         |
| 30         | -0.0026               | -0.0026      | 2.5         |
| 40         | -0.0017               | -0.0016      | 2.5         |
| 50         | -0.0002               | -0.0004      | 2.5         |

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 15MHz                 |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0026                | 0.0024       | 2.5         |
| V <sub>min</sub> | -0.0031               | -0.0030      | 2.5         |
| V <sub>max</sub> | 0.0024                | 0.0024       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

#### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 15MHz                 |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0113               | -0.0116      | 2.5         |
| -20        | -0.0108               | -0.0109      | 2.5         |
| -10        | -0.0081               | -0.0082      | 2.5         |
| 0          | -0.0075               | -0.0073      | 2.5         |
| 10         | -0.0050               | -0.0045      | 2.5         |
| 20         | -0.0041               | -0.0037      | 2.5         |
| 30         | -0.0025               | -0.0031      | 2.5         |
| 40         | -0.0023               | -0.0021      | 2.5         |
| 50         | -0.0005               | -0.0004      | 2.5         |

#### FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts)  | 20MHz                 |              | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
|                  | FREQUENCY ERROR (ppm) |              |             |
|                  | Low Channel           | High Channel |             |
| V <sub>nor</sub> | 0.0025                | 0.0024       | 2.5         |
| V <sub>min</sub> | -0.0031               | -0.0031      | 2.5         |
| V <sub>max</sub> | 0.0024                | 0.0025       | 2.5         |

**NOTE:** The applicant defined the normal working voltage of the battery is from  $V_{min}$  to  $V_{dc}$ .

#### FREQUENCY ERROR vs. TEMPERATURE.

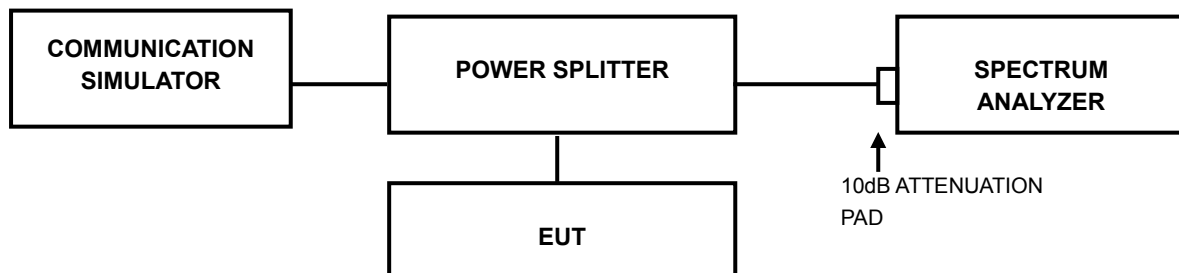
| TEMP. (°C) | 20MHz                 |              | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
|            | FREQUENCY ERROR (ppm) |              |             |
|            | Low Channel           | High Channel |             |
| -30        | -0.0113               | -0.0111      | 2.5         |
| -20        | -0.0104               | -0.0104      | 2.5         |
| -10        | -0.0082               | -0.0083      | 2.5         |
| 0          | -0.0075               | -0.0072      | 2.5         |
| 10         | -0.0049               | -0.0047      | 2.5         |
| 20         | -0.0043               | -0.0044      | 2.5         |
| 30         | -0.0039               | -0.0034      | 2.5         |
| 40         | -0.0015               | -0.0020      | 2.5         |
| 50         | -0.0003               | -0.0003      | 2.5         |

### 3.3 OCCUPIED BANDWIDTH MEASUREMENT

#### 3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 %of the total mean power of a given emission.

#### 3.3.2 TEST SETUP



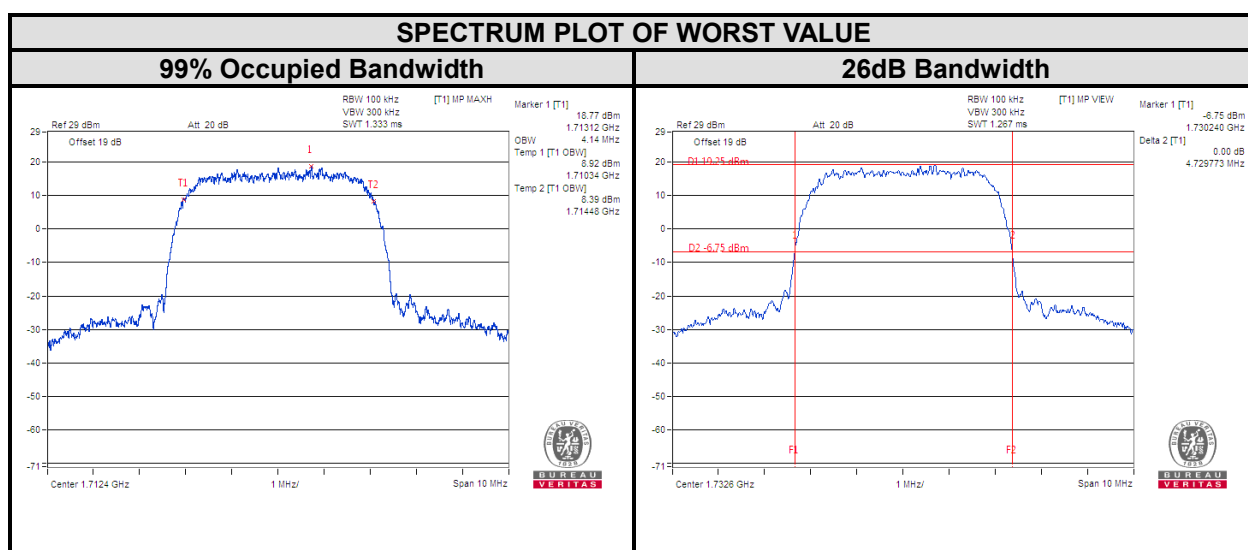
#### 3.3.3 TEST PROCEDURES

- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

### 3.3.4 TEST RESULTS

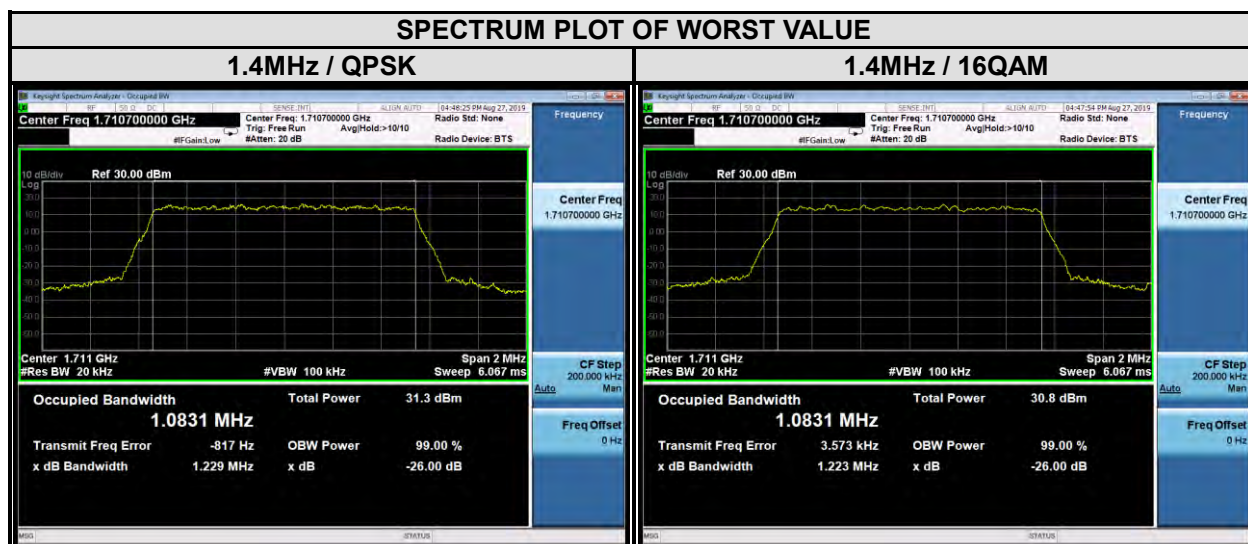
#### WCDMA BAND IV

| Channel | FREQ. (MHz) | 99% Occupied Bandwidth (MHz) | Channel | FREQ. (MHz) | 26dB Bandwidth (MHz) |
|---------|-------------|------------------------------|---------|-------------|----------------------|
|         |             | WCDMA                        |         |             | WCDMA                |
| 1312    | 1712.40     | 4.14                         | 1312    | 1712.40     | 4.72                 |
| 1413    | 1732.60     | 4.13                         | 1413    | 1732.60     | 4.73                 |
| 1513    | 1752.60     | 4.14                         | 1513    | 1752.60     | 4.72                 |



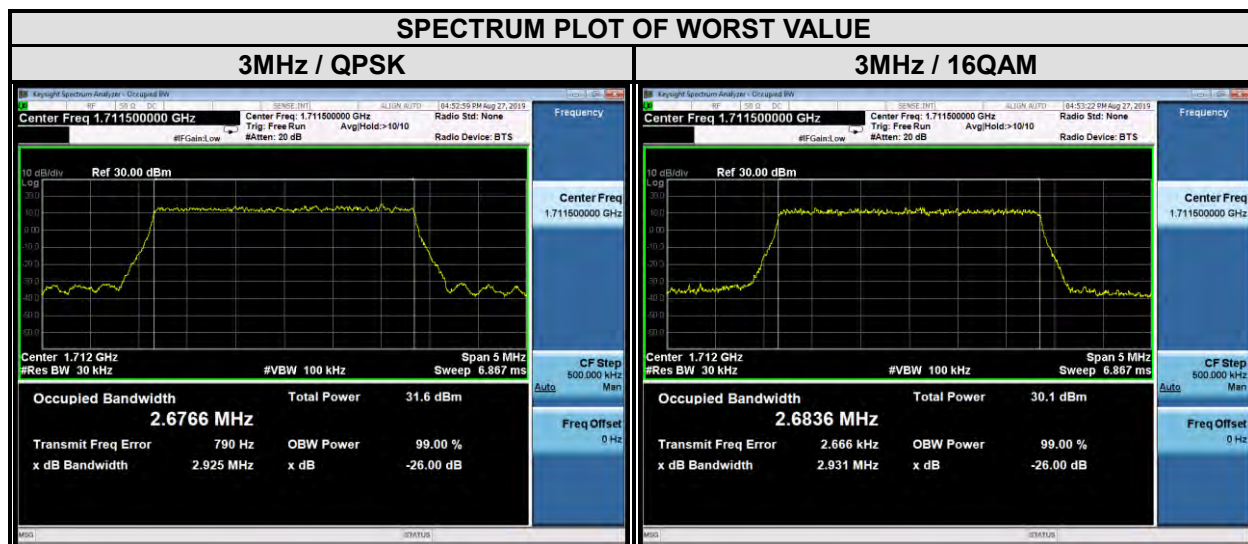
#### LTE BAND 4

| CHANNEL BANDWIDTH: 1.4MHz |                    |                               |       |
|---------------------------|--------------------|-------------------------------|-------|
| CHANNEL                   | Frequency<br>(MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                           |                    | QPSK                          | 16QAM |
| 19957                     | 1710.7             | 1.08                          | 1.08  |
| 20175                     | 1732.5             | 1.08                          | 1.08  |
| 20393                     | 1754.3             | 1.08                          | 1.08  |
| CHANNEL                   | Frequency<br>(MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                           |                    | QPSK                          | 16QAM |
| 19957                     | 1710.7             | 1.23                          | 1.22  |
| 20175                     | 1732.5             | 1.22                          | 1.22  |
| 20393                     | 1754.3             | 1.23                          | 1.23  |



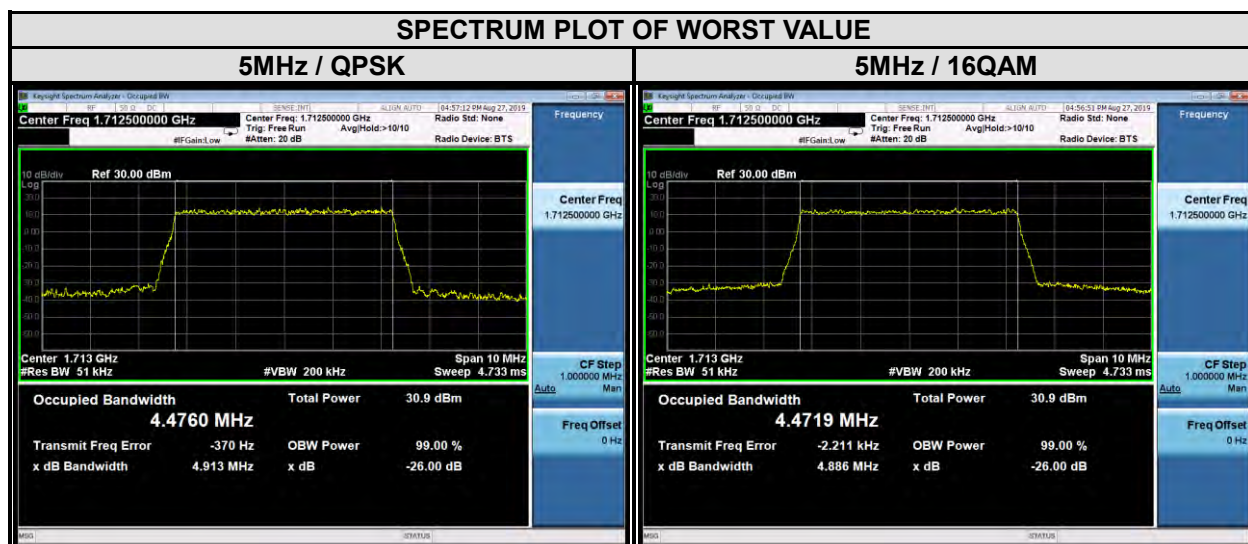
#### LTE BAND 4

| CHANNEL BANDWIDTH: 3MHz |                    |                               |       |
|-------------------------|--------------------|-------------------------------|-------|
| CHANNEL                 | Frequency<br>(MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                         |                    | QPSK                          | 16QAM |
| 19965                   | 1711.5             | 2.68                          | 2.68  |
| 20175                   | 1732.5             | 2.68                          | 2.68  |
| 20385                   | 1753.5             | 2.68                          | 2.68  |
| CHANNEL                 | Frequency<br>(MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                         |                    | QPSK                          | 16QAM |
| 19965                   | 1711.5             | 2.93                          | 2.93  |
| 20175                   | 1732.5             | 2.92                          | 2.93  |
| 20385                   | 1753.5             | 2.93                          | 2.94  |



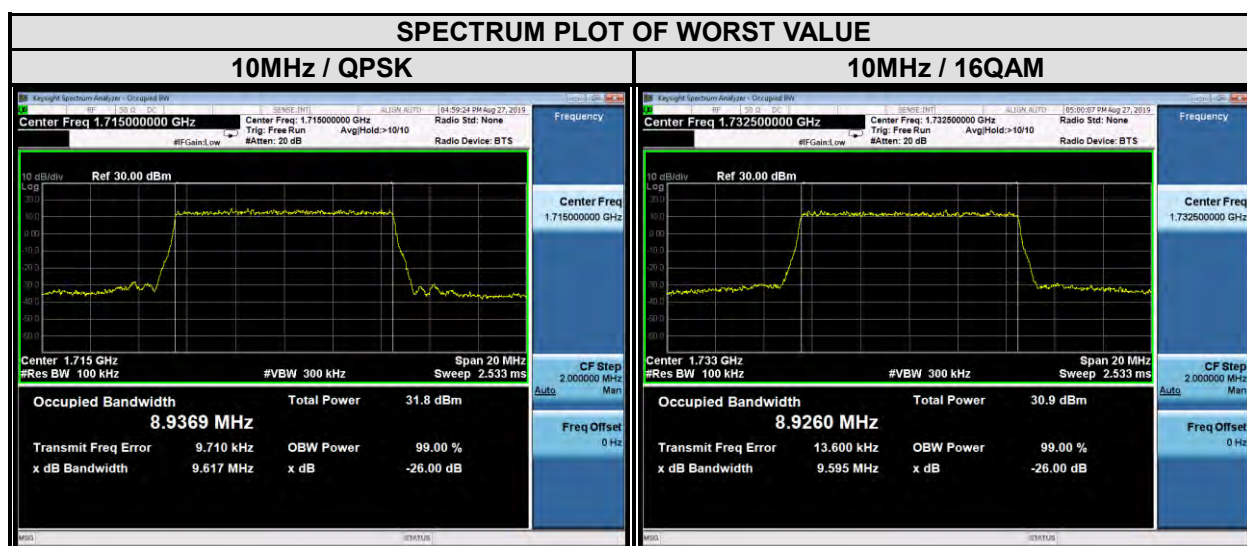
#### LTE BAND 4

| CHANNEL BANDWIDTH: 5MHz |                 |                               |       |
|-------------------------|-----------------|-------------------------------|-------|
| CHANNEL                 | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                         |                 | QPSK                          | 16QAM |
| 19975                   | 1712.5          | 4.48                          | 4.47  |
| 20175                   | 1732.5          | 4.48                          | 4.47  |
| 20375                   | 1752.5          | 4.47                          | 4.47  |
| CHANNEL                 | Frequency (MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                         |                 | QPSK                          | 16QAM |
| 19975                   | 1712.5          | 4.91                          | 4.89  |
| 20175                   | 1732.5          | 4.86                          | 4.89  |
| 20375                   | 1752.5          | 4.84                          | 4.89  |



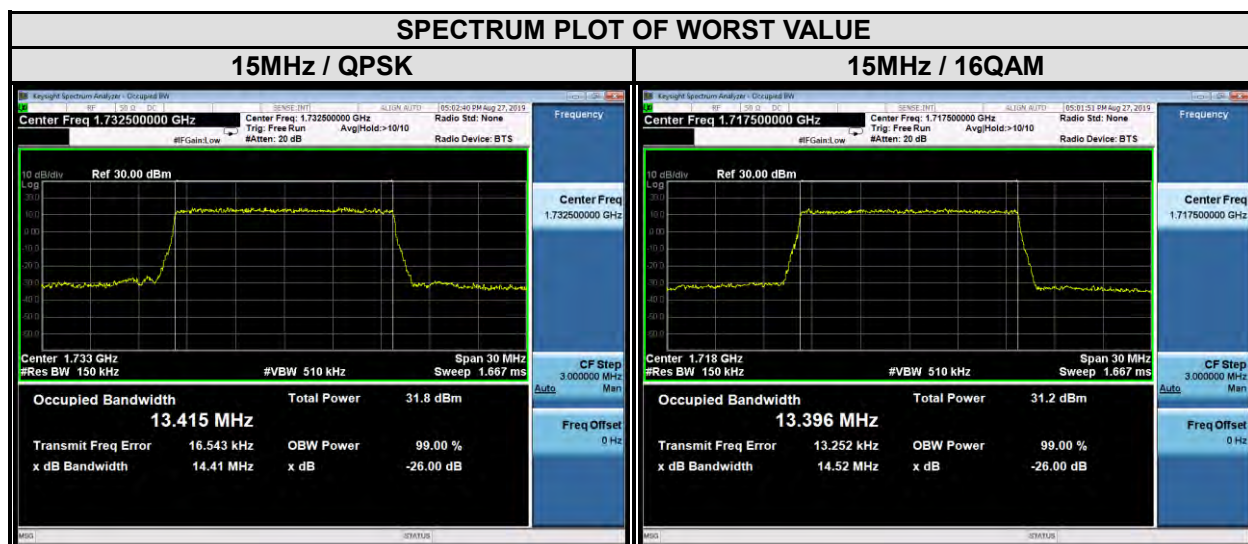
## LTE BAND 4

| CHANNEL BANDWIDTH: 10MHz |                 |                               |       |
|--------------------------|-----------------|-------------------------------|-------|
| CHANNEL                  | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                          |                 | QPSK                          | 16QAM |
| 20000                    | 1715            | 8.94                          | 8.92  |
| 20175                    | 1732.5          | 8.93                          | 8.93  |
| 20350                    | 1750            | 8.94                          | 8.90  |
| CHANNEL                  | Frequency (MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                          |                 | QPSK                          | 16QAM |
| 20000                    | 1715            | 9.62                          | 9.60  |
| 20175                    | 1732.5          | 9.59                          | 9.60  |
| 20350                    | 1750            | 9.58                          | 9.64  |



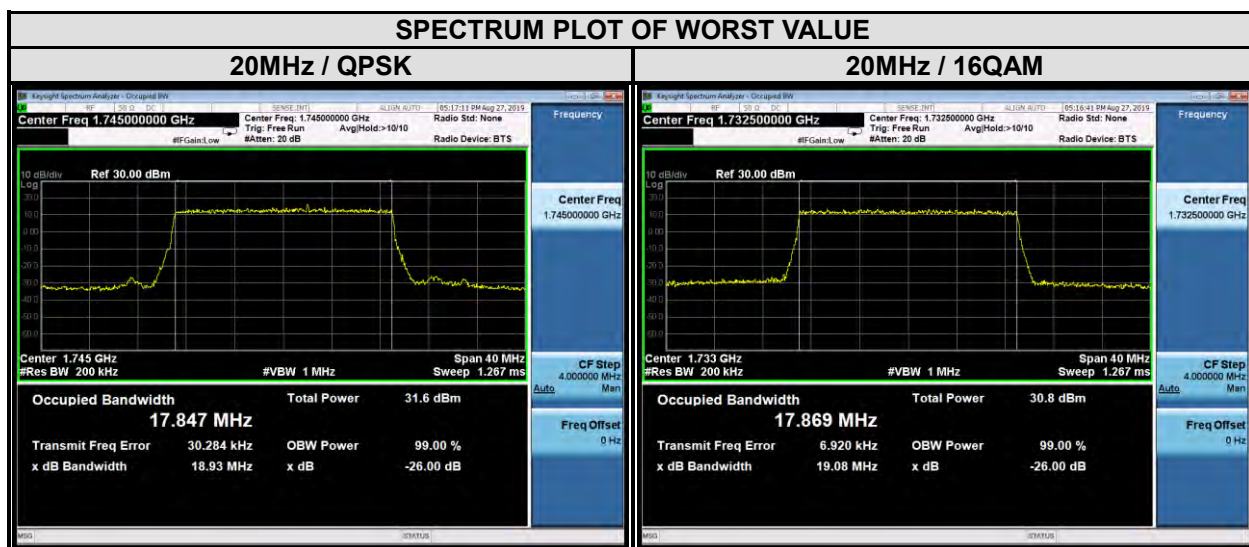
#### LTE BAND 4

| CHANNEL BANDWIDTH: 15MHz |                    |                               |       |
|--------------------------|--------------------|-------------------------------|-------|
| CHANNEL                  | Frequency<br>(MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                          |                    | QPSK                          | 16QAM |
| 20025                    | 1717.5             | 13.39                         | 13.40 |
| 20175                    | 1732.5             | 13.42                         | 13.37 |
| 20325                    | 1747.5             | 13.40                         | 13.40 |
| CHANNEL                  | Frequency<br>(MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                          |                    | QPSK                          | 16QAM |
| 20025                    | 1717.5             | 14.38                         | 14.52 |
| 20175                    | 1732.5             | 14.41                         | 14.27 |
| 20325                    | 1747.5             | 14.32                         | 14.51 |



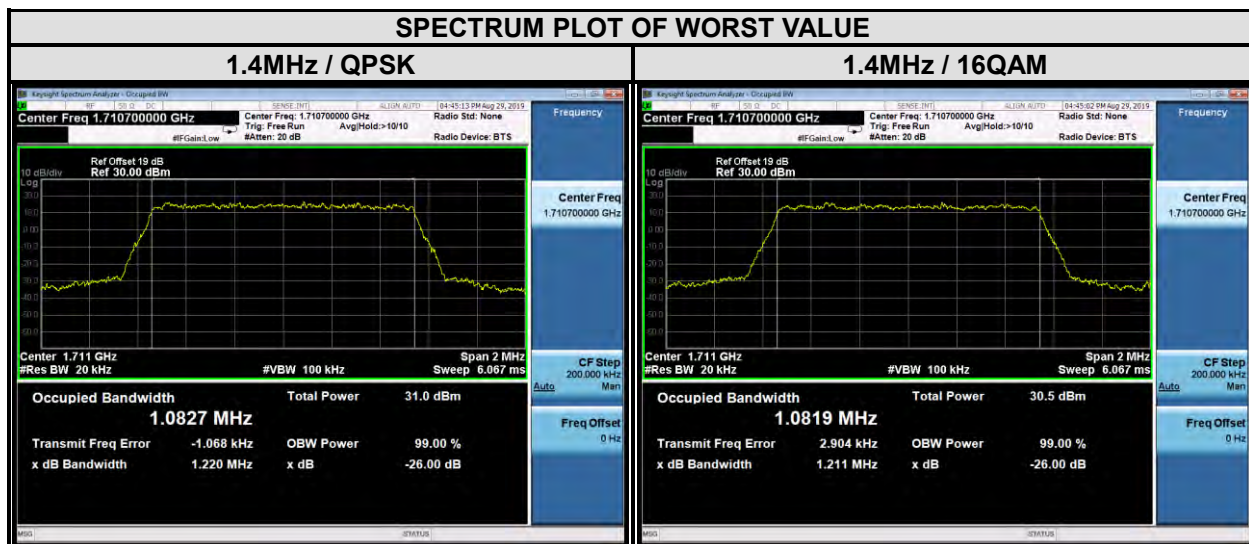
#### LTE BAND 4

| CHANNEL BANDWIDTH: 20MHz |                    |                               |       |
|--------------------------|--------------------|-------------------------------|-------|
| CHANNEL                  | Frequency<br>(MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                          |                    | QPSK                          | 16QAM |
| 20050                    | 1720               | 17.84                         | 17.85 |
| 20175                    | 1732.5             | 17.84                         | 17.87 |
| 20300                    | 1745               | 17.85                         | 17.83 |
| CHANNEL                  | Frequency<br>(MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                          |                    | QPSK                          | 16QAM |
| 20050                    | 1720               | 19.01                         | 19.11 |
| 20175                    | 1732.5             | 19.07                         | 19.08 |
| 20300                    | 1745               | 18.93                         | 19.02 |



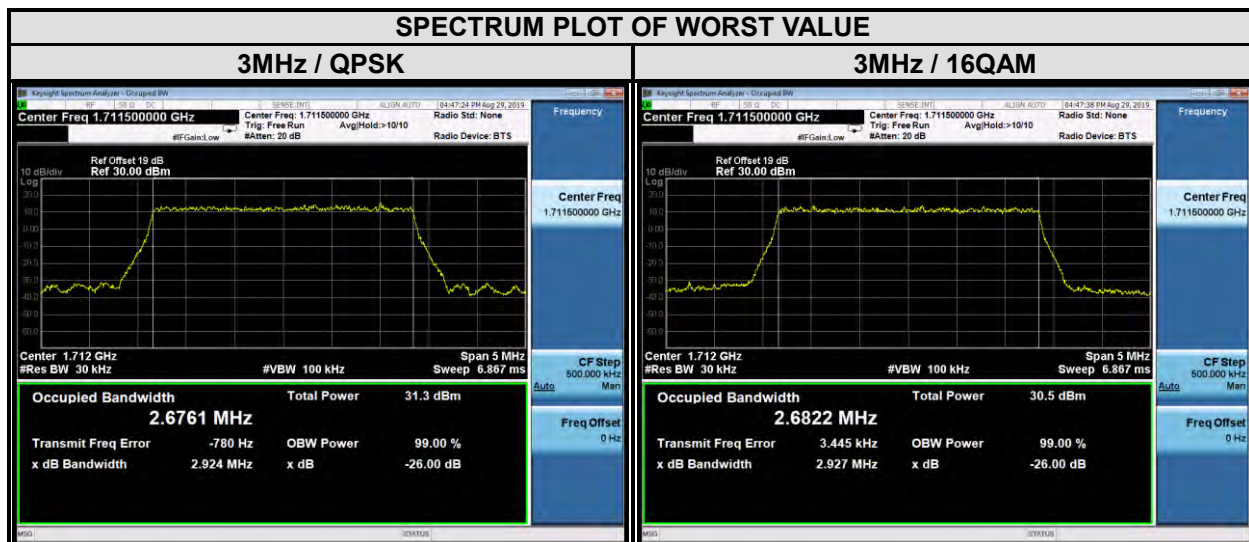
## LTE BAND 66

| CHANNEL BANDWIDTH: 1.4MHz |                    |                               |       |
|---------------------------|--------------------|-------------------------------|-------|
| CHANNEL                   | Frequency<br>(MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                           |                    | QPSK                          | 16QAM |
| 131979                    | 1710.7             | 1.08                          | 1.08  |
| 132322                    | 1745               | 1.08                          | 1.08  |
| 132665                    | 1779.3             | 1.08                          | 1.08  |
| CHANNEL                   | Frequency<br>(MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                           |                    | QPSK                          | 16QAM |
| 131979                    | 1710.7             | 1.22                          | 1.21  |
| 132322                    | 1745               | 1.23                          | 1.22  |
| 132665                    | 1779.3             | 1.23                          | 1.21  |



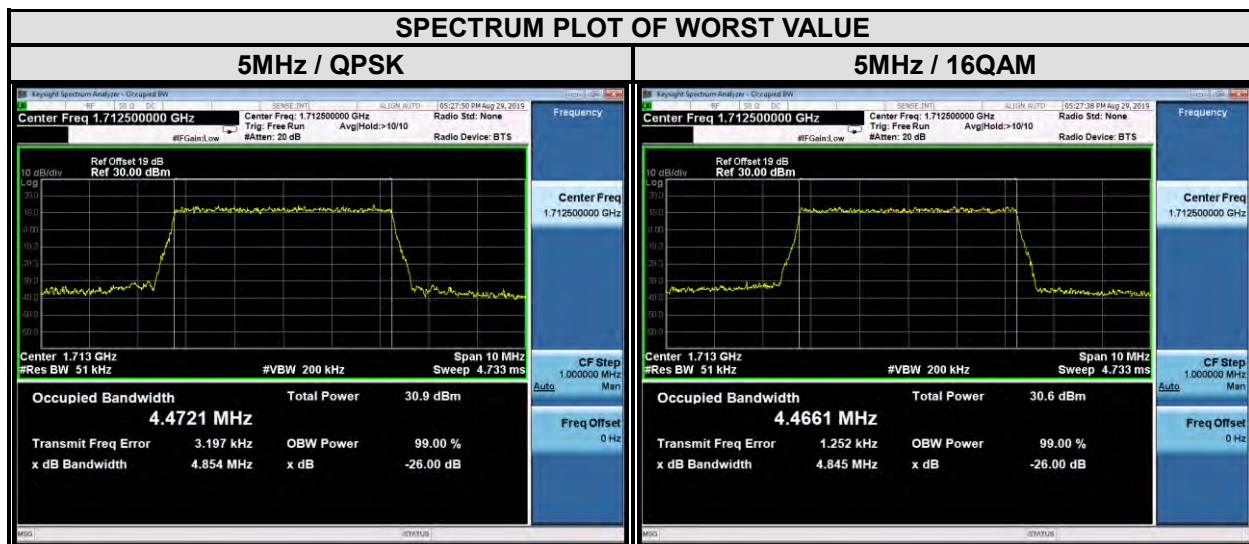
**LTE BAND 66**

| CHANNEL BANDWIDTH: 3MHz |                 |                               |       |
|-------------------------|-----------------|-------------------------------|-------|
| CHANNEL                 | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                         |                 | QPSK                          | 16QAM |
| 131987                  | 1711.5          | 2.68                          | 2.68  |
| 132322                  | 1745            | 2.68                          | 2.68  |
| 132657                  | 1778.5          | 2.68                          | 2.68  |
| CHANNEL                 | Frequency (MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                         |                 | QPSK                          | 16QAM |
| 131987                  | 1711.5          | 2.92                          | 2.93  |
| 132322                  | 1745            | 2.94                          | 2.93  |
| 132657                  | 1778.5          | 2.94                          | 2.93  |



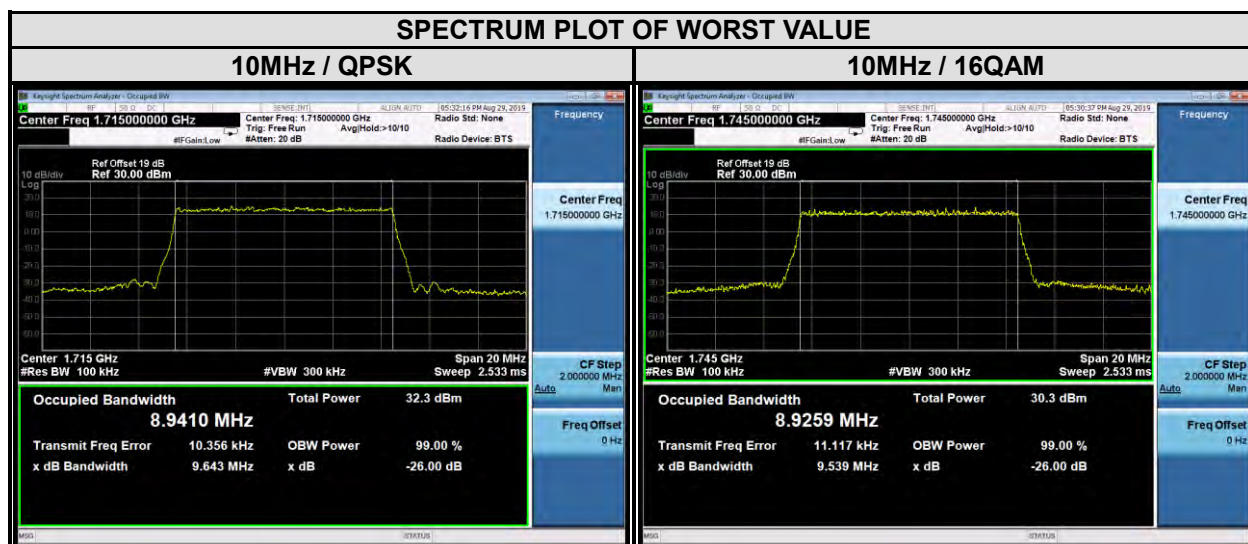
## LTE BAND 66

| CHANNEL BANDWIDTH: 5MHz |                 |                               |       |
|-------------------------|-----------------|-------------------------------|-------|
| CHANNEL                 | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                         |                 | QPSK                          | 16QAM |
| 131997                  | 1712.5          | 4.47                          | 4.47  |
| 132322                  | 1745            | 4.47                          | 4.47  |
| 132647                  | 1777.5          | 4.47                          | 4.47  |
| CHANNEL                 | Frequency (MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                         |                 | QPSK                          | 16QAM |
| 131997                  | 1712.5          | 4.85                          | 4.85  |
| 132322                  | 1745            | 4.91                          | 4.81  |
| 132647                  | 1777.5          | 4.92                          | 4.87  |



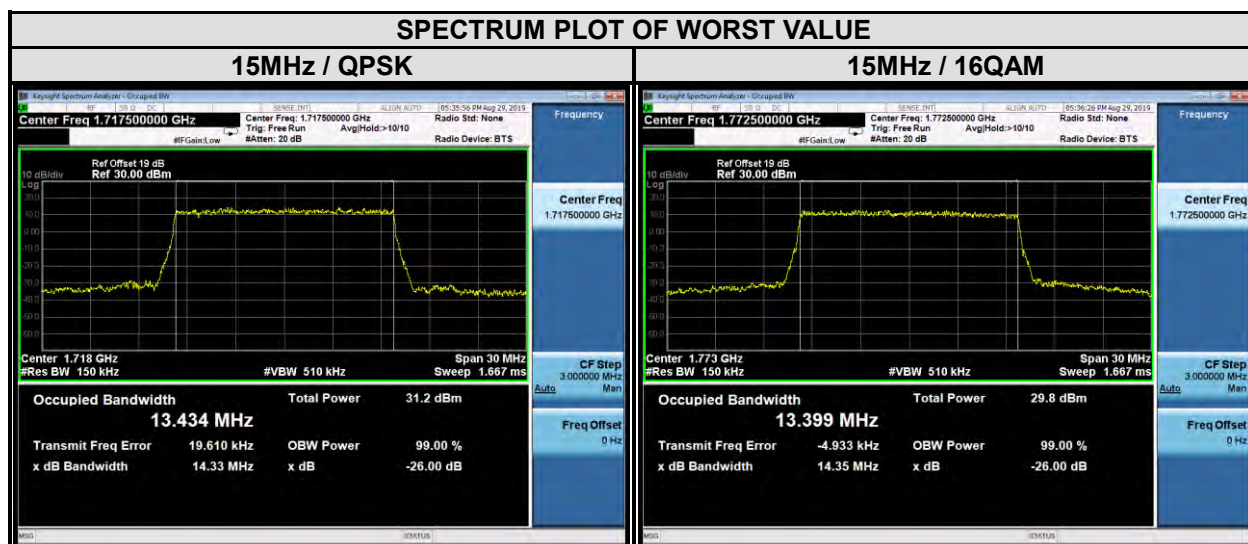
## LTE BAND 66

| CHANNEL BANDWIDTH: 10MHz |                 |                               |       |
|--------------------------|-----------------|-------------------------------|-------|
| CHANNEL                  | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                          |                 | QPSK                          | 16QAM |
| 132022                   | 1715            | 8.94                          | 8.92  |
| 132322                   | 1745            | 8.93                          | 8.93  |
| 132622                   | 1775            | 8.94                          | 8.92  |
| CHANNEL                  | Frequency (MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                          |                 | QPSK                          | 16QAM |
| 132022                   | 1715            | 9.64                          | 9.57  |
| 132322                   | 1745            | 9.58                          | 9.54  |
| 132622                   | 1775            | 9.61                          | 9.55  |



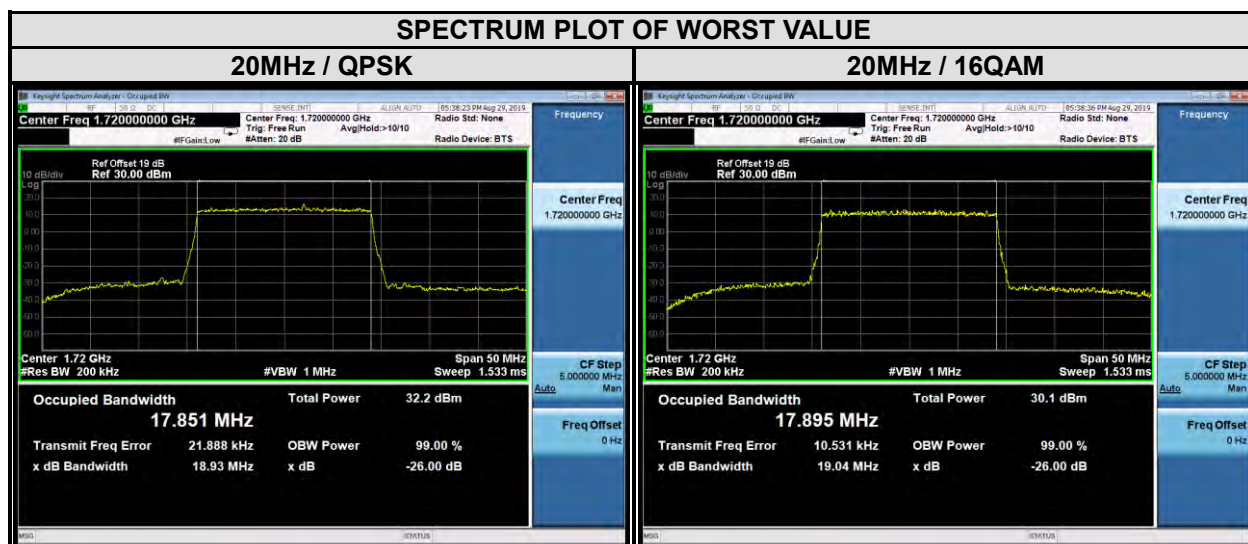
## LTE BAND 66

| CHANNEL BANDWIDTH: 15MHz |                 |                               |       |
|--------------------------|-----------------|-------------------------------|-------|
| CHANNEL                  | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                          |                 | QPSK                          | 16QAM |
| 132047                   | 1717.5          | 13.43                         | 13.39 |
| 132322                   | 1745            | 13.41                         | 13.39 |
| 132597                   | 1772.5          | 13.38                         | 13.40 |
| CHANNEL                  | Frequency (MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                          |                 | QPSK                          | 16QAM |
| 132047                   | 1717.5          | 14.33                         | 14.49 |
| 132322                   | 1745            | 14.48                         | 14.42 |
| 132597                   | 1772.5          | 14.45                         | 14.35 |



## LTE BAND 66

| CHANNEL BANDWIDTH: 20MHz |                    |                               |       |
|--------------------------|--------------------|-------------------------------|-------|
| CHANNEL                  | Frequency<br>(MHz) | 99% OCCUPIED Bandwidth (MHz)  |       |
|                          |                    | QPSK                          | 16QAM |
| 132072                   | 1720               | 17.85                         | 17.90 |
| 132322                   | 1745               | 17.85                         | 17.85 |
| 132572                   | 1770               | 17.82                         | 17.87 |
| CHANNEL                  | Frequency<br>(MHz) | 26dB OCCUPIED Bandwidth (MHz) |       |
|                          |                    | QPSK                          | 16QAM |
| 132072                   | 1720               | 18.93                         | 19.04 |
| 132322                   | 1745               | 18.97                         | 19.16 |
| 132572                   | 1770               | 19.05                         | 19.13 |

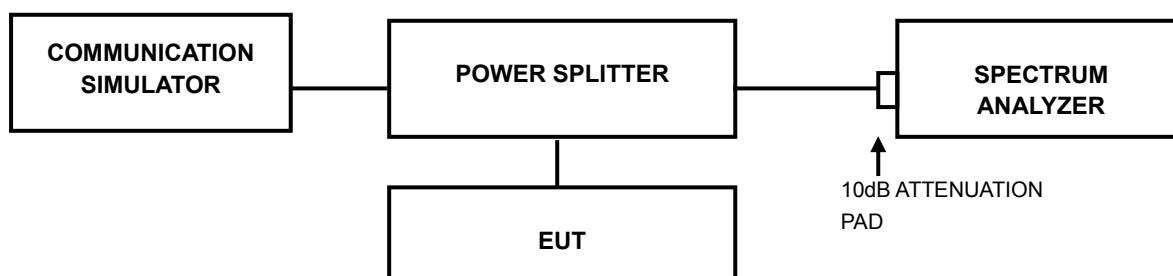


### 3.4 PEAK TO AVERAGE RATIO

#### 3.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

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

#### 3.4.2 TEST SETUP



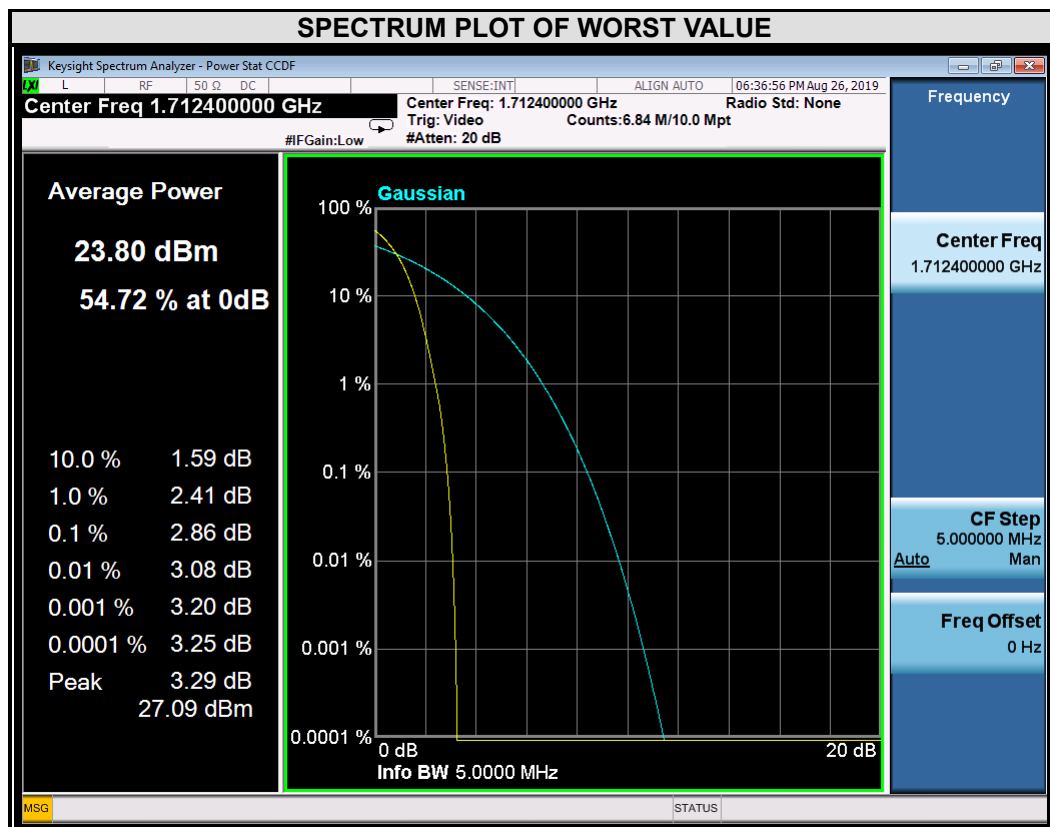
#### 3.4.3 TEST PROCEDURES

1. Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

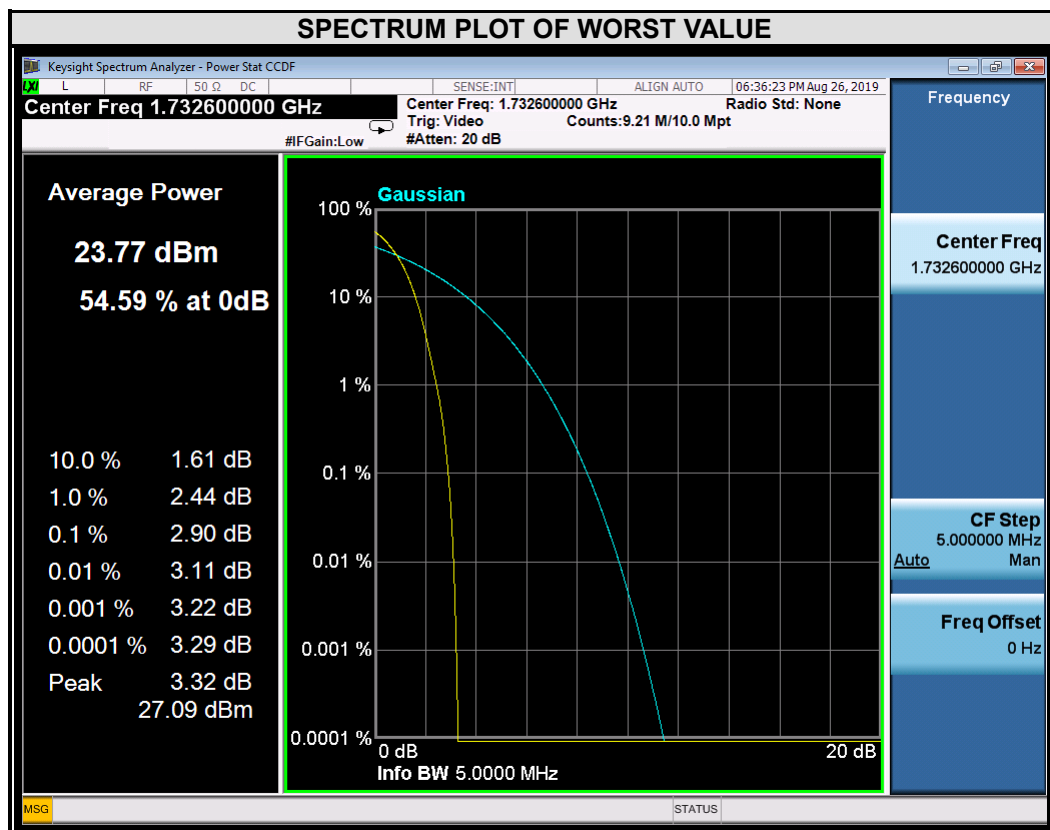
### 3.4.4 TEST RESULTS

#### WCDMA Band IV

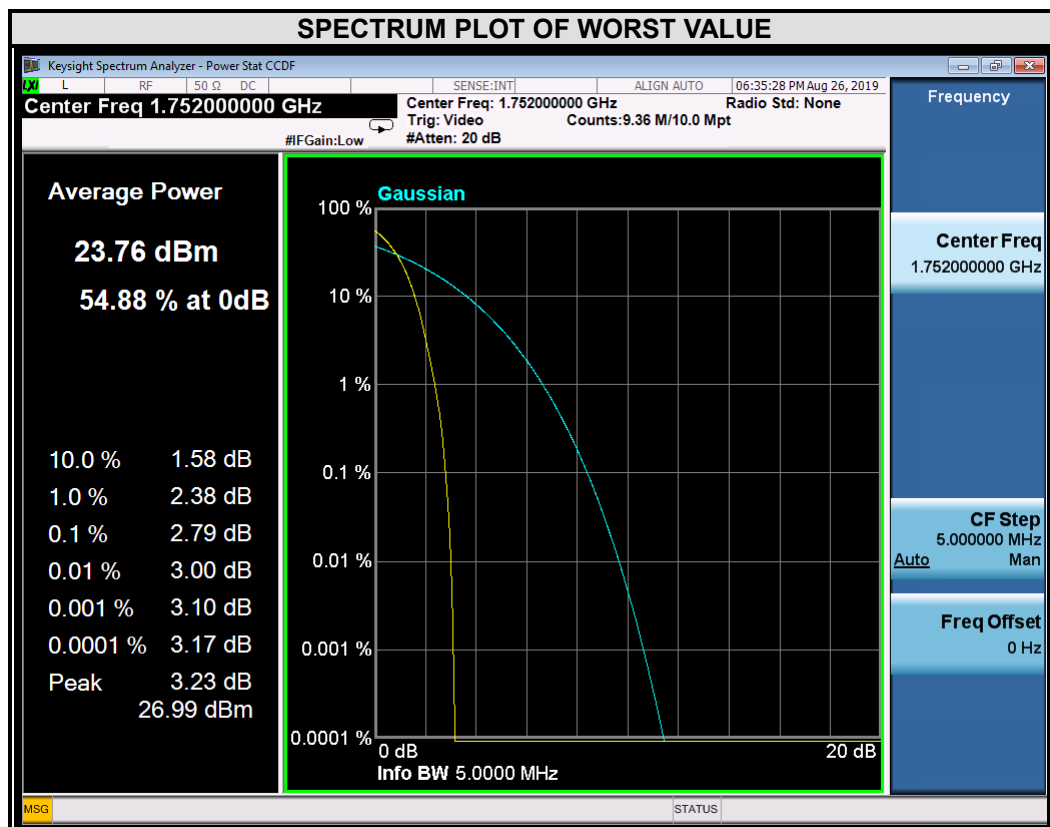
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 1312    | 1712.4          | 2.86                       |



| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 1413    | 1732.6          | 2.90                       |

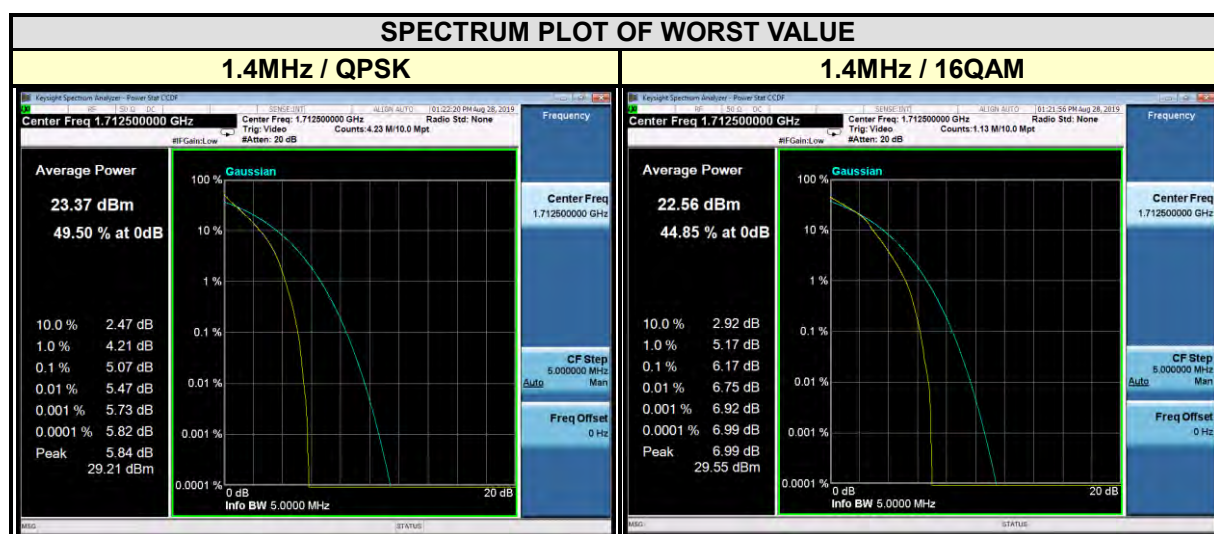


| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---------|-----------------|----------------------------|
| 1513    | 1752.6          | 2.79                       |



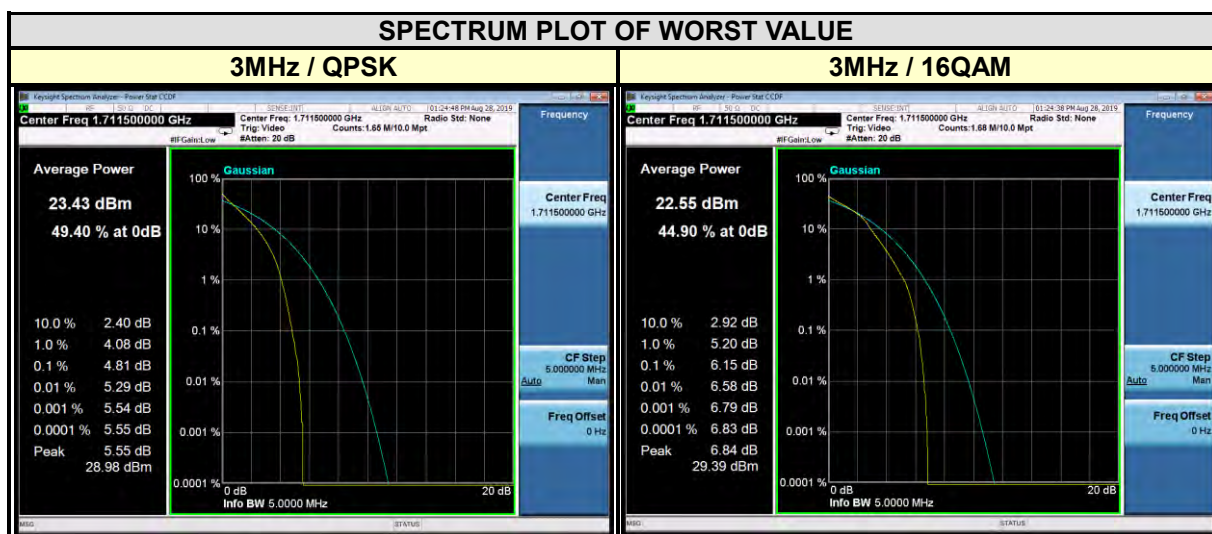
## LTE BAND 4

| CHANNEL BANDWIDTH: 1.4MHz |                 |                            |       |
|---------------------------|-----------------|----------------------------|-------|
| CHANNEL                   | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                           |                 | QPSK                       | 16QAM |
| 19957                     | 1710.7          | 5.07                       | 6.17  |
| 20175                     | 1732.5          | 4.92                       | 6.00  |
| 20393                     | 1754.3          | 4.64                       | 5.73  |

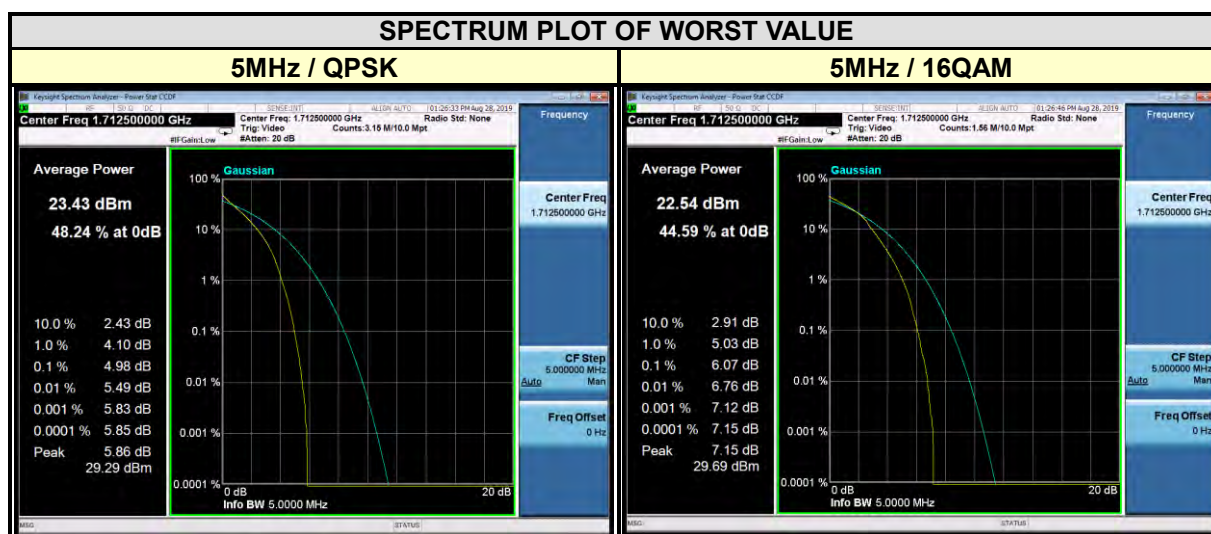


## LTE BAND 4

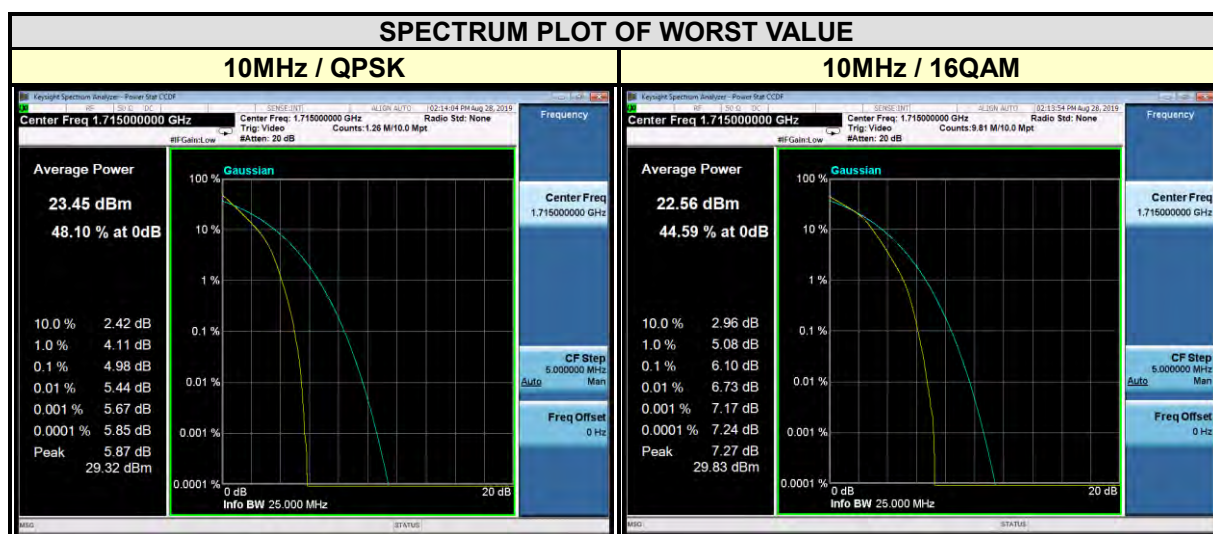
| CHANNEL BANDWIDTH: 3MHz |                    |                            |       |
|-------------------------|--------------------|----------------------------|-------|
| CHANNEL                 | Frequency<br>(MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                         |                    | QPSK                       | 16QAM |
| 19965                   | 1711.5             | 4.81                       | 6.15  |
| 20175                   | 1732.5             | 4.64                       | 5.97  |
| 20385                   | 1753.5             | 4.47                       | 5.76  |



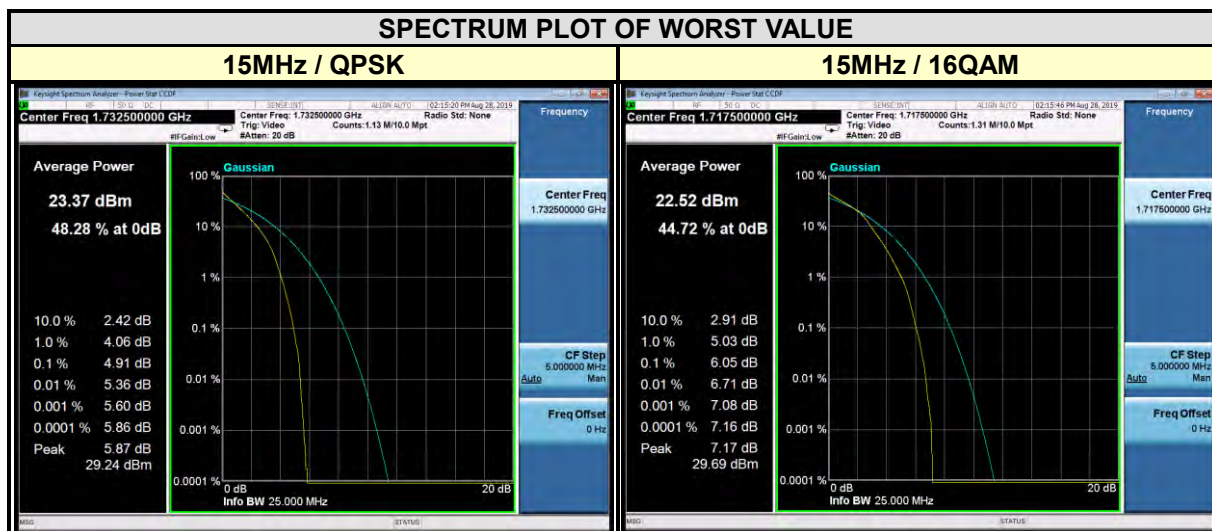
| CHANNEL BANDWIDTH: 5MHz |                    |                            |       |
|-------------------------|--------------------|----------------------------|-------|
| CHANNEL                 | Frequency<br>(MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                         |                    | QPSK                       | 16QAM |
| 19975                   | 1712.5             | 4.98                       | 6.07  |
| 20175                   | 1732.5             | 4.89                       | 5.95  |
| 20375                   | 1752.5             | 4.72                       | 5.77  |



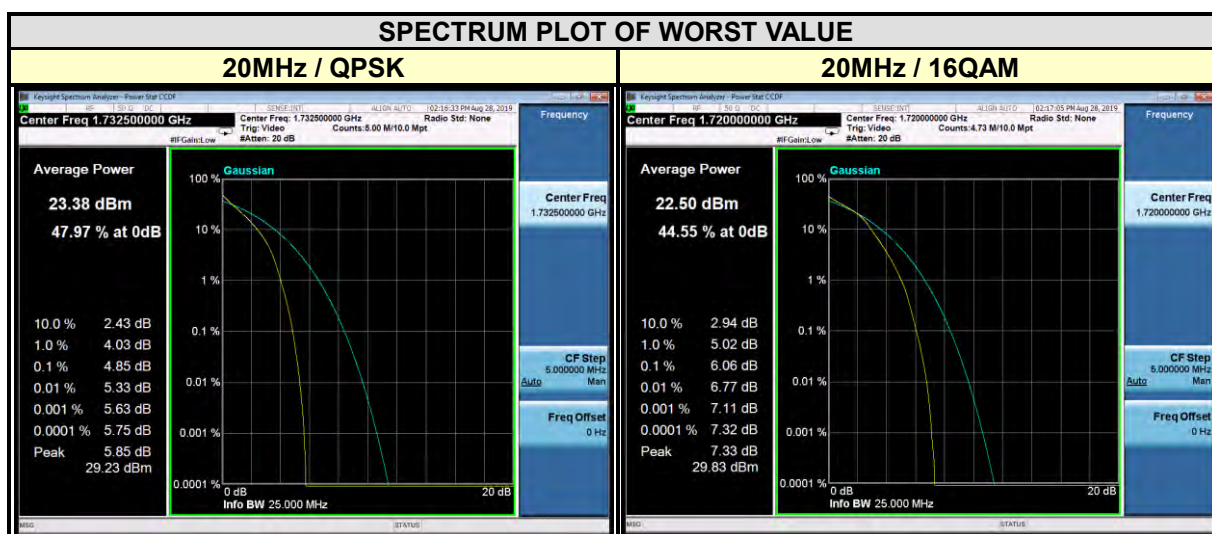
| CHANNEL BANDWIDTH: 10MHz |                    |                            |       |
|--------------------------|--------------------|----------------------------|-------|
| CHANNEL                  | Frequency<br>(MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                          |                    | QPSK                       | 16QAM |
| 20000                    | 1715               | 4.98                       | 6.10  |
| 20175                    | 1732.5             | 4.79                       | 5.90  |
| 20350                    | 1750               | 4.62                       | 5.70  |



| CHANNEL BANDWIDTH: 15MHz |                    |                            |       |
|--------------------------|--------------------|----------------------------|-------|
| CHANNEL                  | Frequency<br>(MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                          |                    | QPSK                       | 16QAM |
| 20025                    | 1717.5             | 4.87                       | 6.05  |
| 20175                    | 1732.5             | 4.91                       | 5.87  |
| 20325                    | 1747.5             | 4.65                       | 5.77  |



| CHANNEL BANDWIDTH: 20MHz |                    |                            |       |
|--------------------------|--------------------|----------------------------|-------|
| CHANNEL                  | Frequency<br>(MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                          |                    | QPSK                       | 16QAM |
| 20050                    | 1720               | 4.82                       | 6.06  |
| 20175                    | 1732.5             | 4.85                       | 6.06  |
| 20300                    | 1745               | 4.67                       | 5.84  |



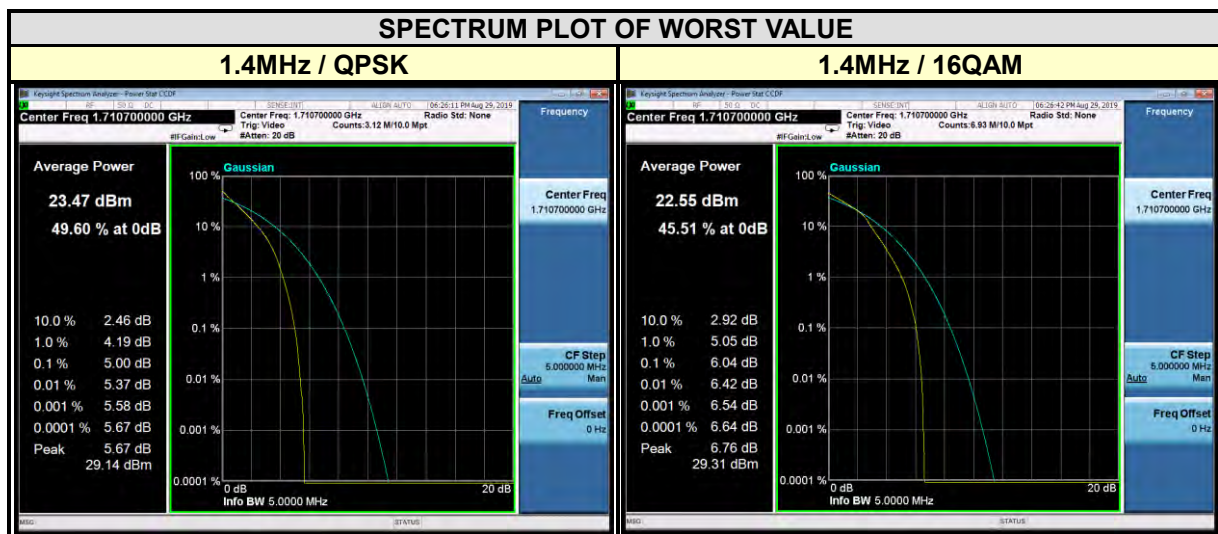


**BUREAU  
VERITAS**

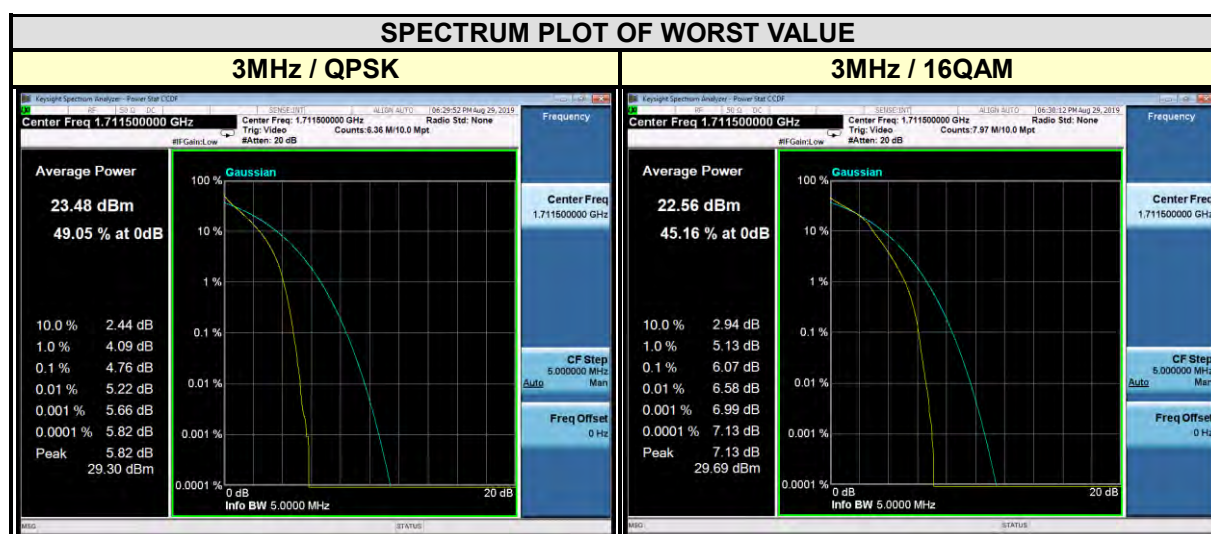
Test Report No.: RF190712W002-5

## LTE BAND 66

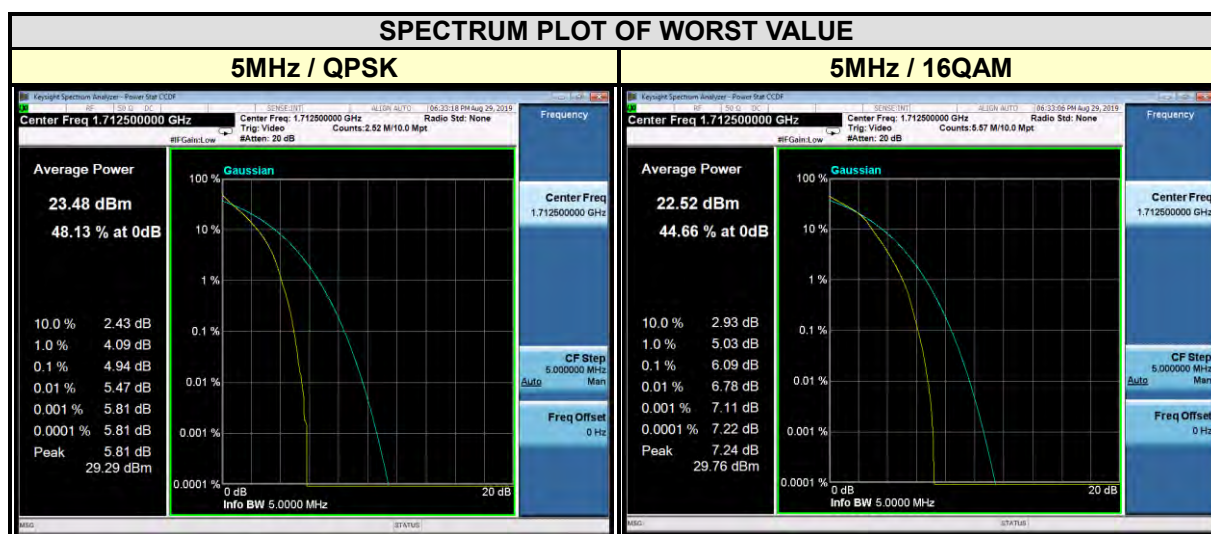
| CHANNEL BANDWIDTH: 1.4MHz |                    |                            |       |
|---------------------------|--------------------|----------------------------|-------|
| CHANNEL                   | Frequency<br>(MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                           |                    | QPSK                       | 16QAM |
| 131979                    | 1710.7             | 5.00                       | 6.04  |
| 132322                    | 1745               | 4.67                       | 5.90  |
| 132665                    | 1779.3             | 4.64                       | 5.78  |



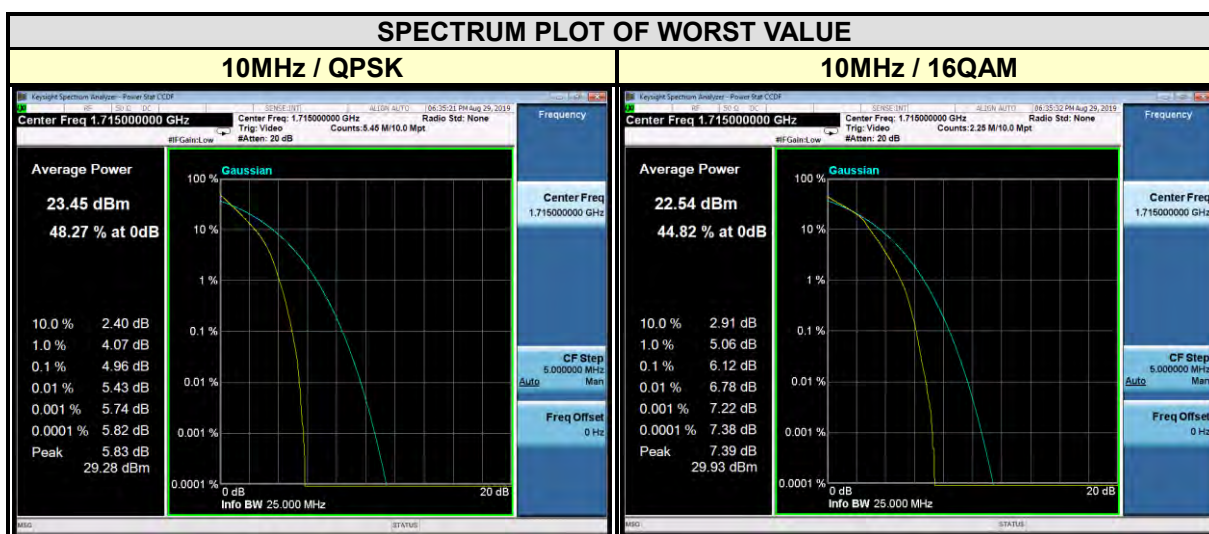
| CHANNEL BANDWIDTH: 3MHz |                    |                            |       |
|-------------------------|--------------------|----------------------------|-------|
| CHANNEL                 | Frequency<br>(MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                         |                    | QPSK                       | 16QAM |
| 131987                  | 1711.5             | 4.76                       | 6.07  |
| 132322                  | 1745               | 4.55                       | 5.85  |
| 132657                  | 1778.5             | 4.55                       | 5.81  |



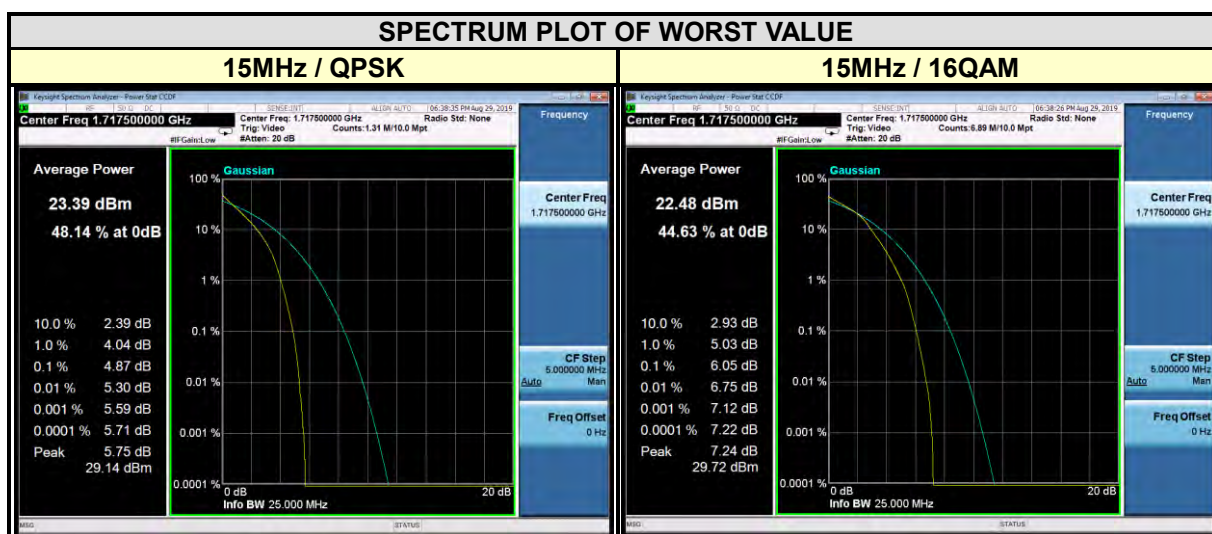
| CHANNEL BANDWIDTH: 5MHz |                    |                            |       |
|-------------------------|--------------------|----------------------------|-------|
| CHANNEL                 | Frequency<br>(MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                         |                    | QPSK                       | 16QAM |
| 131997                  | 1712.5             | 4.94                       | 6.09  |
| 132322                  | 1745               | 4.81                       | 5.91  |
| 132647                  | 1777.5             | 4.75                       | 5.85  |



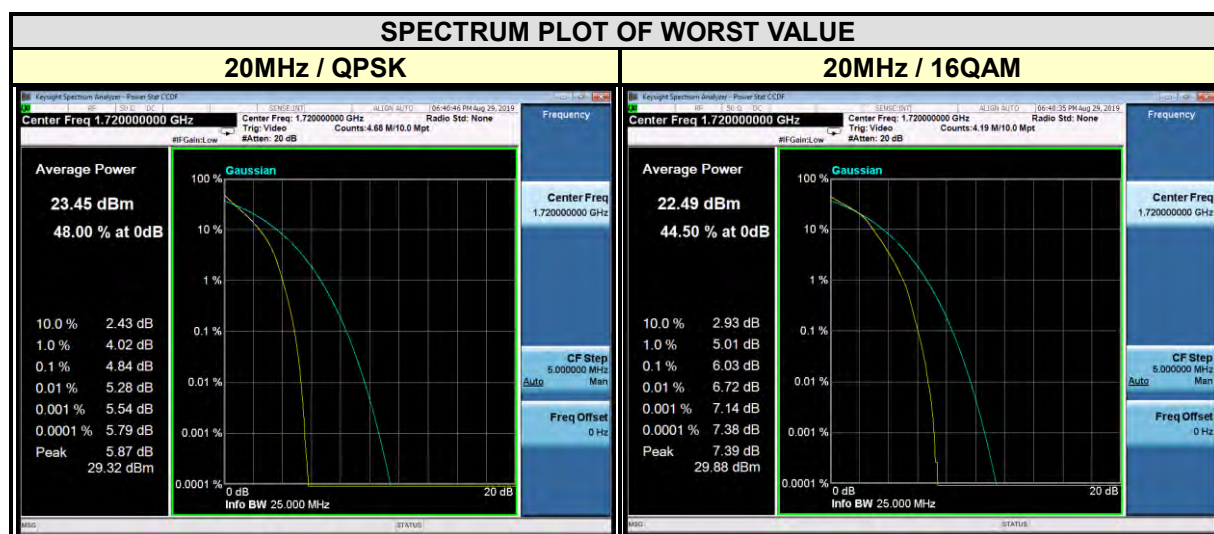
| CHANNEL BANDWIDTH: 10MHz |                 |                            |       |
|--------------------------|-----------------|----------------------------|-------|
| CHANNEL                  | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                          |                 | QPSK                       | 16QAM |
| 132022                   | 1715            | 4.96                       | 6.12  |
| 132322                   | 1745            | 4.69                       | 5.85  |
| 132622                   | 1775            | 4.66                       | 5.79  |



| CHANNEL BANDWIDTH: 15MHz |                    |                            |       |
|--------------------------|--------------------|----------------------------|-------|
| CHANNEL                  | Frequency<br>(MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                          |                    | QPSK                       | 16QAM |
| 132047                   | 1717.5             | 4.87                       | 6.05  |
| 132322                   | 1745               | 4.64                       | 5.80  |
| 132597                   | 1772.5             | 4.63                       | 5.80  |



| CHANNEL BANDWIDTH: 20MHz |                    |                            |       |
|--------------------------|--------------------|----------------------------|-------|
| CHANNEL                  | Frequency<br>(MHz) | PEAK TO AVERAGE RATIO (dB) |       |
|                          |                    | QPSK                       | 16QAM |
| 132072                   | 1720               | 4.84                       | 6.03  |
| 132322                   | 1745               | 4.69                       | 5.83  |
| 132572                   | 1770               | 4.68                       | 5.80  |



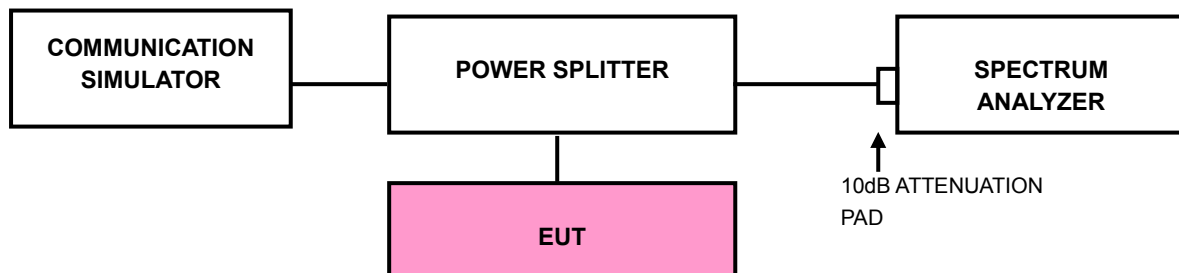
### 3.5 BAND EDGE MEASUREMENT

#### 3.5.1 LIMITS OF BAND EDGE MEASUREMENT

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log (P)$  dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.

However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

#### 3.5.2 TEST SETUP



### 3.5.3 TEST PROCEDURES

- a. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).
- b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- c. The center frequency of spectrum is the band edge frequency and span is 10MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz (WCDMA).
- d. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 20kHz and VBW of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz)
- e. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 30kHz and VBW of the spectrum is 100kHz. (LTE bandwidth 3MHz)
- f. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 50kHz and VBW of the spectrum is 200kHz. (LTE bandwidth 5MHz)
- g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz. (LTE bandwidth 10MHz)
- h. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 15MHz)
- i. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 20MHz)
- j. Record the max trace plot into the test report.