

FCC TEST REPORT

(PART 27)


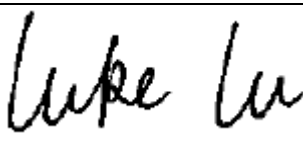
| | |
|------------|---|
| Applicant: | Quectel Wireless Solutions Co., Ltd. |
| Address: | Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District, Shanghai, China 200233 |

| | |
|---------------------------|---|
| 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, M**
☒ **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 Engineer / Mobile Department | Approved by Luke Lu Manager / Mobile Department |
|  Date: Sept. 11, 2019 |  Date: Sept. 11, 2019 |

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RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|----------------|-------------------|----------------|
| RF190522W005-4 | Original release | Sept. 11, 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 27.50(b)(10) (c)(10) (h)(2) | Equivalent Isotropically Radiated Power | Compliance |
| 2.1055 27.54 | Frequency Stability | Compliance |
| 2.1049 | Occupied Bandwidth | Compliance |
| 27.50(d)(5) | Peak to average ratio | Compliance |
| 2.1051 27.53(c)(f)(g) (m)(4)(6) | Band Edge Measurements | Compliance |
| 2.1051 27.53(c)(f)(g) (m)(4) | Conducted Spurious Emissions | Compliance |
| 2.1053 27.53(c)(f)(g) (m)(4) | 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 | $\pm 4.70\text{dB}$ |

This uncertainty represents an expanded uncertainty expressed at approximately the



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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 (1GHz-18GHz) | ETS-LINDGREN | 3117 | 00168692 | Nov. 30, 18 | Nov. 29, 19 |
| Horn Antenna (18GHz-40GHz) | N/A | QWH-SL-18-40-K-SG/QMS-00361 | 15433 | Nov. 21, 18 | Nov. 20, 19 |
| Radio Communication 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 Chamber | ETS-LINDGREN | 9m*6m*6m | Euroshieldpn-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 V7.6.15.9.2 | N/A | N/A | N/A |
| 10dB Attenuator | JFW/USA | 50HF-010-SM 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 Programmable Tester | Juyi | ITH-120-45-CP-AR | IAA1504-001 | Jun. 24,19 | Jun. 23,20 |
| MXG Analog Microwave 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

| | | |
|------------------------------|---|-----------------------|
| PRODUCT | LTE Module | |
| BRAND NAME | Quectel | |
| MODEL NAME | SC66-A | |
| POWER SUPPLY | $V_{\min}=3.55\text{Vdc}$, $V_{\text{nor}}=4\text{Vdc}$, $V_{\max}=4.4\text{Vdc}$ | |
| MODULATION TECHNOLOGY | LTE | QPSK, 16QAM |
| FREQUENCY RANGE | LTE Band 7 Channel Bandwidth: 5MHz | 2502.5MHz ~ 2567.5MHz |
| | LTE Band 7 Channel Bandwidth: 10MHz | 2505MHz ~ 2565MHz |
| | LTE Band 7 Channel Bandwidth: 15MHz | 2507.5MHz ~ 2562.5MHz |
| | LTE Band 7 Channel Bandwidth: 20MHz | 2510MHz ~ 2560MHz |
| | LTE Band 12 Channel Bandwidth: 1.4MHz | 699.7MHz ~ 715.3MHz |
| | LTE Band 12 Channel Bandwidth: 3MHz | 700.5MHz ~ 714.5MHz |
| | LTE Band 12 Channel Bandwidth: 5MHz | 701.5MHz ~ 713.5MHz |
| | LTE Band 12 Channel Bandwidth: 10MHz | 704MHz ~ 711MHz |
| | LTE Band 13 Channel Bandwidth: 5MHz | 779.5MHz ~ 784.5MHz |
| | LTE Band 13 Channel Bandwidth: 10MHz | 782MHz |
| | LTE Band 17 Channel Bandwidth: 5MHz | 706.5MHz ~ 713.5MHz |
| | LTE Band 17 Channel Bandwidth: 10MHz | 709MHz ~ 711MHz |
| | LTE Band 41 Channel Bandwidth: 5MHz | 2498.5MHz ~ 2687.5MHz |
| | LTE Band 41 Channel Bandwidth: 10MHz | 2501MHz ~ 2685MHz |
| | LTE Band 41 Channel Bandwidth: 15MHz | 2503.5MHz ~ 2682.5MHz |
| | LTE Band 41 Channel Bandwidth: 20MHz | 2506MHz ~ 2680MHz |
| | LTE Band 71 Channel Bandwidth: 5MHz | 665.5MHz ~ 695.5MHz |
| | LTE Band 71 Channel Bandwidth: 10MHz | 668MHz ~ 693MHz |

| | | |
|----------------------------|--|---------------------------------|
| | LTE Band 71 Channel Bandwidth: 15MHz | 670.5MHz ~ 690.5MHz |
| | LTE Band 71 Channel Bandwidth: 20MHz | 673MHz ~ 688MHz |
| EMISSION DESIGNATOR | LTE Band 7 Channel Bandwidth: 5MHz | QPSK: 4M49G7D 16QAM: 4M48W7D |
| | LTE Band 7 Channel Bandwidth: 10MHz | QPSK: 8M94G7D 16QAM: 8M94W7D |
| | LTE Band 7 Channel Bandwidth: 15MHz | QPSK: 13M4G7D 16QAM: 13M4W7D |
| | LTE Band 7 Channel Bandwidth: 20MHz | QPSK: 17M9G7D 16QAM: 17M9W7D |
| | LTE Band 12 Channel Bandwidth: 1.4MHz | QPSK: 1M08G7D 16QAM: 1M08W7D |
| | LTE Band 12 Channel Bandwidth: 3MHz | QPSK: 2M68G7D 16QAM: 2M68W7D |
| | LTE Band 12 Channel Bandwidth: 5MHz | QPSK: 4M47G7D 16QAM: 4M47W7D |
| | LTE Band 12 Channel Bandwidth: 10MHz | QPSK: 8M94G7D 16QAM: 8M93W7D |
| | LTE Band 13 Channel Bandwidth: 5MHz | QPSK: 4M48G7D 16QAM: 4M47W7D |
| | LTE Band 13 Channel Bandwidth: 10MHz | QPSK: 8M92G7D 16QAM: 8M91W7D |
| | LTE Band 17 Channel Bandwidth: 5MHz | QPSK: 4M47G7D 16QAM: 4M47W7D |
| | LTE Band 17 Channel Bandwidth: 10MHz | QPSK: 8M94G7D 16QAM: 8M92W7D |
| | LTE Band 41 Channel Bandwidth: 5MHz | QPSK: 4M48G7D 16QAM: 4M48W7D |
| | LTE Band 41 Channel Bandwidth: 10MHz | QPSK: 8M93G7D 16QAM: 8M92W7D |
| | LTE Band 41 Channel Bandwidth: 15MHz | QPSK: 13M4G7D 16QAM: 13M4W7D |
| | LTE Band 41 Channel Bandwidth: 20MHz | QPSK: 17M8G7D 16QAM: 17M8W7D |
| | LTE Band 71 Channel Bandwidth: 5MHz | QPSK: 4M49G7D 16QAM: 4M49W7D |
| | LTE Band 71 Channel Bandwidth: 10MHz | QPSK: 8M96G7D 16QAM: 8M96W7D |
| | LTE Band 71 Channel Bandwidth: 15MHz | QPSK: 13M4G7D 16QAM: 13M4W7D |

| | | |
|------------------------|---|----------------|
| | LTE Band 71 Channel Bandwidth: 20MHz | QPSK: 17M9G7D |
| | | 16QAM: 17M9W7D |
| MAX. EIRP POWER | LTE Band 7 Channel Bandwidth: 5MHz | 414.00 mW |
| | LTE Band 7 Channel Bandwidth: 10MHz | 414.00 mW |
| | LTE Band 7 Channel Bandwidth: 15MHz | 415.91 mW |
| | LTE Band 7 Channel Bandwidth: 20MHz | 417.83 mW |
| | LTE Band 12 Channel Bandwidth: 1.4MHz | 249.46 mW |
| | LTE Band 12 Channel Bandwidth: 3MHz | 246.04 mW |
| | LTE Band 12 Channel Bandwidth: 5MHz | 247.74 mW |
| | LTE Band 12 Channel Bandwidth: 10MHz | 248.89 mW |
| | LTE Band 13 Channel Bandwidth: 5MHz | 321.37 mW |
| | LTE Band 13 Channel Bandwidth: 10MHz | 322.85 mW |
| | LTE Band 17 Channel Bandwidth: 5MHz | 247.17 mW |
| | LTE Band 17 Channel Bandwidth: 10MHz | 247.74 mW |
| | LTE Band 41 Channel Bandwidth: 5MHz | 373.25 mW |
| | LTE Band 41 Channel Bandwidth: 10MHz | 372.39 mW |
| | LTE Band 41 Channel Bandwidth: 15MHz | 376.70 mW |
| | LTE Band 41 Channel Bandwidth: 20MHz | 377.57 mW |
| | LTE Band 71 Channel Bandwidth: 5MHz | 187.07 mW |
| | LTE Band 71 Channel Bandwidth: 10MHz | 185.78 mW |
| | LTE Band 71 Channel Bandwidth: 15MHz | 186.21 mW |
| | LTE Band 71 Channel Bandwidth: 20MHz | 187.50 mW |
| ANTENNA TYPE | Fixed External Antenna with 2.68dBi gain for band 7 Fixed External Antenna with 3.26dBi gain for band 12 & band 17 Fixed External Antenna with 4.45dBi gain for band 13 Fixed External Antenna with 2.44dBi gain for band 41 Fixed External Antenna with 1.66dBi gain for band 71 | |



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Test Report No.: RF190522W005-4

| | |
|-------------------|------------------------|
| HW VERSION | R1.0 |
| SW VERSION | SC66ANAR01A06 |
| DATA CABLE | Refer to user's manual |

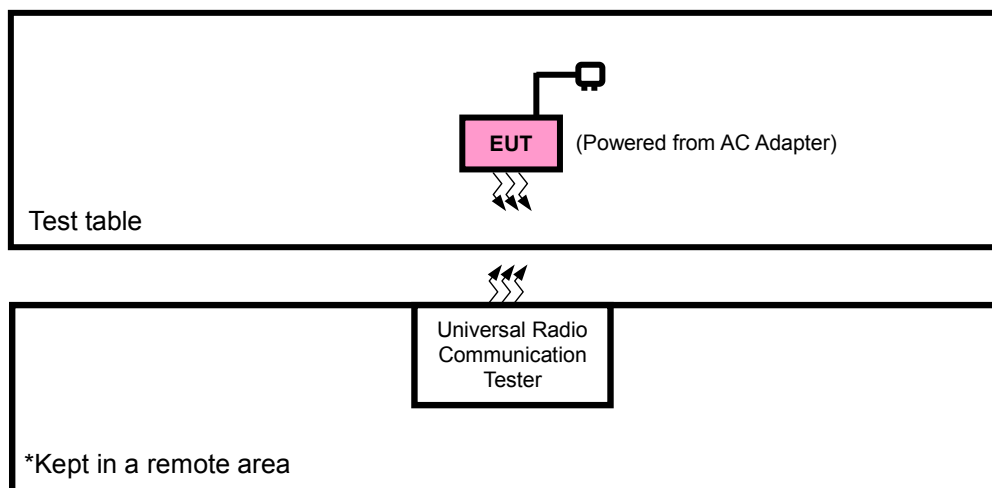
NOTE:

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.

| | |
|------------------------|--------------------|
| MODULATION MODE | TX FUNCTION |
| LTE | 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 TEST ITEM AND TEST CONFIGURATION

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 was found when positioned on Y-plane for EIRP and X-axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

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

LTE BAND 7 MODE

| TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION | MODE |
|-----------------------|-------------------|---------------------|-------------------|-------------|----------------------|
| EIRP | 20775 to 21425 | 20775, 21100, 21425 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | 20800 to 21400 | 20800, 21100, 21400 | 10MHz | QPSK, 16QAM | 1 RB / 0RB Offset |
| | 20825 to 21375 | 20825, 21100, 21375 | 15MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | 20850 to 21350 | 20850, 21100, 21350 | 20MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| FREQUENCY STABILITY | 20775 to 21425 | 20775, 21425 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 20800 to 21400 | 20800, 21400 | 10MHz | QPSK | 1 RB / 0RB Offset |
| | 20825 to 21375 | 20825, 21375 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | 20850 to 21350 | 20850, 21350 | 20MHz | QPSK | 1 RB / 0 RB Offset |
| OCCUPIED BANDWIDTH | 20775 to 21425 | 20775, 21100, 21425 | 5MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | 20800 to 21400 | 20800, 21100, 21400 | 10MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| | 20825 to 21375 | 20825, 21100, 21375 | 15MHz | QPSK, 16QAM | 75 RB / 0 RB Offset |
| | 20850 to 21350 | 20850, 21100, 21350 | 20MHz | QPSK, 16QAM | 100 RB / 0 RB Offset |
| PEAK TO AVERAGE RATIO | 20775 to 21425 | 20775, 21100, 21425 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 20800 to 21400 | 20800, 21100, 21400 | 10MHz | QPSK | 1 RB / 0RB Offset |
| | 20825 to 21375 | 20825, 21100, 21375 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | 20850 to 21350 | 20850, 21100, 21350 | 20MHz | QPSK | 1 RB / 0 RB Offset |
| BAND EDGE | 20775 to 21425 | 20775 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 25 RB / 0 RB Offset |
| | | 21425 | 5MHz | QPSK, 16QAM | 1 RB / 24 RB Offset |
| | | | | | 25 RB / 0 RB Offset |
| | 20800 to 21400 | 20800 | 10MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 50 RB / 0 RB Offset |
| | | 21400 | 10MHz | QPSK, 16QAM | 1 RB / 49 RB Offset |
| | | | | | 50 RB / 0 RB Offset |
| | 20825 to 21375 | 20825 | 15MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 75 RB / 0 RB Offset |
| | | 21375 | 15MHz | QPSK, 16QAM | 1 RB / 74 RB Offset |
| | | | | | 75 RB / 0 RB Offset |
| | 20850 to 21350 | 20850 | 20MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 100 RB / 0 RB Offset |
| | | 21350 | 20MHz | QPSK, 16QAM | 1 RB / 99 RB Offset |
| | | | | | 100 RB / 0 RB Offset |
| CONDUCTED EMISSION | 20775 to 21425 | 20775, 21100, 21425 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 20800 to 21400 | 20800, 21100, 21400 | 10MHz | QPSK | 1 RB / 0RB Offset |
| | 20825 to 21375 | 20825, 21100, 21375 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | 20850 to 21350 | 20850, 21100, 21350 | 20MHz | QPSK | 1 RB / 0 RB Offset |
| RADIATED EMISSION | 20775 to 21425 | 21100 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 20800 to 21400 | 20800, 21100, 21400 | 10MHz | QPSK | 1 RB / 0RB Offset |
| | 20825 to 21375 | 21100 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | 20850 to 21350 | 21100 | 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 12 MODE

| TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION | MODE |
|-----------------------|-------------------|---------------------|-------------------|-------------|---------------------|
| EIRP | 23017 to 23173 | 23017, 23095, 23173 | 1.4MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | 23025 to 23165 | 23025, 23095, 23165 | 3MHz | QPSK, 16QAM | 1 RB / 0RB Offset |
| | 23035 to 23155 | 23035, 23095, 23155 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | 23060 to 23130 | 23060, 23095, 23130 | 10MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| FREQUENCY STABILITY | 23017 to 23173 | 23017, 23173 | 1.4MHz | QPSK | 1 RB / 0 RB Offset |
| | 23025 to 23165 | 23025, 23165 | 3MHz | QPSK | 1 RB / 0RB Offset |
| | 23035 to 23155 | 23035, 23155 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23060 to 23130 | 23060, 23130 | 10MHz | QPSK | 1 RB / 0 RB Offset |
| OCCUPIED BANDWIDTH | 23017 to 23173 | 23017, 23095, 23173 | 1.4MHz | QPSK, 16QAM | 6 RB / 0 RB Offset |
| | 23025 to 23165 | 23025, 23095, 23165 | 3MHz | QPSK, 16QAM | 15 RB / 0 RB Offset |
| | 23035 to 23155 | 23035, 23095, 23155 | 5MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | 23060 to 23130 | 23060, 23095, 23130 | 10MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| PEAK TO AVERAGE RATIO | 23017 to 23173 | 23017, 23095, 23173 | 1.4MHz | QPSK | 1 RB / 0 RB Offset |
| | 23025 to 23165 | 23025, 23095, 23165 | 3MHz | QPSK | 1 RB / 0RB Offset |
| | 23035 to 23155 | 23035, 23095, 23155 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23060 to 23130 | 23060, 23095, 23130 | 10MHz | QPSK | 1 RB / 0 RB Offset |
| BAND EDGE | 23017 to 23173 | 23017 | 1.4MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 23173 | 1.4MHz | QPSK, 16QAM | 6 RB / 0 RB Offset |
| | | | | | 1 RB / 5 RB Offset |
| | | | | | 6 RB / 0 RB Offset |
| | 23025 to 23165 | 23025 | 3MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 23165 | 3MHz | QPSK, 16QAM | 15 RB / 0 RB Offset |
| | | | | | 1 RB / 14 RB Offset |
| | | | | | 15 RB / 0 RB Offset |
| | 23035 to 23155 | 23035 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 23155 | 5MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | | | | | 1 RB / 24 RB Offset |
| | | | | | 25 RB / 0 RB Offset |
| | 23060 to 23130 | 23060 | 10MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 23130 | 10MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| | | | | | 1 RB / 49 RB Offset |
| | | | | | 50 RB / 0 RB Offset |
| CONDUCTED EMISSION | 23017 to 23173 | 23017, 23095, 23173 | 1.4MHz | QPSK | 1 RB / 0 RB Offset |
| | 23025 to 23165 | 23025, 23095, 23165 | 3MHz | QPSK | 1 RB / 0RB Offset |
| | 23035 to 23155 | 23035, 23095, 23155 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23060 to 23130 | 23060, 23095, 23130 | 10MHz | QPSK | 1 RB / 0 RB Offset |
| RADIATED | 23017 to 23173 | 23095 | 1.4MHz | QPSK | 1 RB / 0 RB Offset |



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| | | | | | |
|----------|----------------|------------------------|-------|------|--------------------|
| EMISSION | 23025 to 23165 | 23025, 23095, 23165 | 3MHz | QPSK | 1 RB / 0RB Offset |
| | 23035 to 23155 | 23095 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23060 to 23130 | 23095 | 10MHz | 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 13 MODE

| TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION | MODE |
|-----------------------|-------------------|---------------------|-------------------|-------------|---------------------|
| EIRP | 23205 to 23255 | 23205, 23230, 23255 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | 23230 | 23230 | 10MHz | QPSK, 16QAM | 1 RB / 0RB Offset |
| FREQUENCY STABILITY | 23205 to 23255 | 23205, 23255 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23230 | 23230 | 10MHz | QPSK | 1 RB / 0RB Offset |
| OCCUPIED BANDWIDTH | 23205 to 23255 | 23205, 23230, 23255 | 5MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | 23230 | 23230 | 10MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| PEAK TO AVERAGE RATIO | 23205 to 23255 | 23205, 23230, 23255 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23230 | 23230 | 10MHz | QPSK | 1 RB / 0RB Offset |
| BAND EDGE | 23205 to 23255 | 23205 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 25 RB / 0 RB Offset |
| | | 23255 | 5MHz | QPSK, 16QAM | 1 RB / 24 RB Offset |
| | | | | | 25 RB / 0 RB Offset |
| | 23230 | 23230 | 10MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 50 RB / 0 RB Offset |
| | | 23230 | 10MHz | QPSK, 16QAM | 1 RB / 49 RB Offset |
| | | | | | 50 RB / 0 RB Offset |
| CONDUCTED EMISSION | 23205 to 23255 | 23205, 23230, 23255 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23230 | 23230 | 10MHz | QPSK | 1 RB / 0RB Offset |
| RADIATED EMISSION | 23205 to 23255 | 23205, 23230, 23255 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23230 | 23230 | 10MHz | QPSK | 1 RB / 0RB Offset |

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

LTE BAND 17 MODE

| TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION | MODE |
|-----------------------|-------------------|---------------------|-------------------|-------------|---------------------|
| EIRP | 23755 to 23825 | 23755, 23790, 23825 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | 23780 to 23800 | 23780, 23790, 23800 | 10MHz | QPSK, 16QAM | 1 RB / 0RB Offset |
| FREQUENCY STABILITY | 23755 to 23825 | 23755, 23825 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23780 to 23800 | 23780, 23800 | 10MHz | QPSK | 1 RB / 0RB Offset |
| OCCUPIED BANDWIDTH | 23755 to 23825 | 23755, 23790, 23825 | 5MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | 23780 to 23800 | 23780, 23790, 23800 | 10MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| PEAK TO AVERAGE RATIO | 23755 to 23825 | 23755, 23790, 23825 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23780 to 23800 | 23780, 23790, 23800 | 10MHz | QPSK | 1 RB / 0RB Offset |
| BAND EDGE | 23755 to 23825 | 23755 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 25 RB / 0 RB Offset |
| | 23755 to 23825 | 23825 | 5MHz | QPSK, 16QAM | 1 RB / 24 RB Offset |
| | | | | | 25 RB / 0 RB Offset |
| | 23780 to 23800 | 23780 | 10MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 50 RB / 0 RB Offset |
| CONDUCTED EMISSION | 23755 to 23825 | 23755, 23790, 23825 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23780 to 23800 | 23780, 23790, 23800 | 10MHz | QPSK | 1 RB / 0RB Offset |
| RADIATED EMISSION | 23755 to 23825 | 23790 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 23780 to 23800 | 23780, 23790, 23800 | 10MHz | QPSK | 1 RB / 0RB Offset |

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

LTE BAND 41 MODE

| TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION | MODE |
|-----------------------|-------------------|---------------------|-------------------|-------------|----------------------|
| EIRP | 39675 to 41565 | 39675, 40620, 41565 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | 39700 to 41540 | 39700, 40620, 41540 | 10MHz | QPSK, 16QAM | 1 RB / 0RB Offset |
| | 39725 to 41515 | 39725, 40620, 41515 | 15MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | 39750 to 41490 | 39750, 40620, 41490 | 20MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| FREQUENCY STABILITY | 39675 to 41565 | 39675, 41565 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 39700 to 41540 | 39700, 41540 | 10MHz | QPSK | 1 RB / 0RB Offset |
| | 39725 to 41515 | 39725, 41515 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | 39750 to 41490 | 39750, 41490 | 20MHz | QPSK | 1 RB / 0 RB Offset |
| OCCUPIED BANDWIDTH | 39675 to 41565 | 39675, 40620, 41565 | 5MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | 39700 to 41540 | 39700, 40620, 41540 | 10MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| | 39725 to 41515 | 39725, 40620, 41515 | 15MHz | QPSK, 16QAM | 75 RB / 0 RB Offset |
| | 39750 to 41490 | 39750, 40620, 41490 | 20MHz | QPSK, 16QAM | 100 RB / 0 RB Offset |
| PEAK TO AVERAGE RATIO | 39675 to 41565 | 39675, 40620, 41565 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 39700 to 41540 | 39700, 40620, 41540 | 10MHz | QPSK | 1 RB / 0RB Offset |
| | 39725 to 41515 | 39725, 40620, 41515 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | 39750 to 41490 | 39750, 40620, 41490 | 20MHz | QPSK | 1 RB / 0 RB Offset |
| BAND EDGE | 39675 to 41565 | 39675 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 41565 | 5MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | 39700 to 41540 | 39700 | 10MHz | QPSK, 16QAM | 1 RB / 24 RB Offset |
| | | 41540 | 10MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | 39725 to 41515 | 39725 | 15MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 41515 | 15MHz | QPSK, 16QAM | 1 RB / 49 RB Offset |
| | 39750 to 41490 | 39750 | 20MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| | | 41490 | 20MHz | QPSK, 16QAM | 1 RB / 74 RB Offset |
| | | | | | 75 RB / 0 RB Offset |
| | | | | | 1 RB / 0 RB Offset |
| | | | | | 100 RB / 0 RB Offset |
| | | | | | 1 RB / 99 RB Offset |
| CONDCUDET EMISSION | 39675 to 41565 | 39675, 40620, 41565 | 5MHz | QPSK | 100 RB / 0 RB Offset |
| | 39700 to 41540 | 39700, 40620, 41540 | 10MHz | QPSK | 1 RB / 0 RB Offset |
| | 39725 to 41515 | 39725, 40620, 41515 | 15MHz | QPSK | 1 RB / 0RB Offset |
| | 39750 to 41490 | 39750, 40620, 41490 | 20MHz | QPSK | 1 RB / 0 RB Offset |
| RADIATED | 39675 to 41565 | 40620 | 5MHz | QPSK | 1 RB / 0 RB Offset |



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| | | | | | |
|----------|----------------|---------------------|-------|------|--------------------|
| EMISSION | 39700 to 41540 | 39700, 40620, 41540 | 10MHz | QPSK | 1 RB / 0RB Offset |
| | 39725 to 41515 | 40620 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | 39750 to 41490 | 40620 | 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 71 MODE

| TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION | MODE |
|-----------------------|-------------------|------------------------|-------------------|-------------|----------------------|
| EIRP | 133147 to 133447 | 133147, 133297, 133447 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | 133172 to 133422 | 133172, 133297, 133422 | 10MHz | QPSK, 16QAM | 1 RB / 0RB Offset |
| | 133197 to 133397 | 133197, 133297, 133397 | 15MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | 133222 to 133372 | 133222, 133322, 133372 | 20MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| FREQUENCY STABILITY | 133147 to 133447 | 133147, 133447 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 133172 to 133422 | 133172, 133422 | 10MHz | QPSK | 1 RB / 0RB Offset |
| | 133197 to 133397 | 133197, 133397 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | 133222 to 133372 | 133222, 133372 | 20MHz | QPSK | 1 RB / 0 RB Offset |
| OCCUPIED BANDWIDTH | 133147 to 133447 | 133147, 133297, 133447 | 5MHz | QPSK, 16QAM | 25 RB / 0 RB Offset |
| | 133172 to 133422 | 133172, 133297, 133422 | 10MHz | QPSK, 16QAM | 50 RB / 0 RB Offset |
| | 133197 to 133397 | 133197, 133297, 133397 | 15MHz | QPSK, 16QAM | 75 RB / 0 RB Offset |
| | 133222 to 133372 | 133222, 133322, 133372 | 20MHz | QPSK, 16QAM | 100 RB / 0 RB Offset |
| PEAK TO AVERAGE RATIO | 133147 to 133447 | 133147, 133297, 133447 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 133172 to 133422 | 133172, 133297, 133422 | 10MHz | QPSK | 1 RB / 0RB Offset |
| | 133197 to 133397 | 133197, 133297, 133397 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | 133222 to 133372 | 133222, 133322, 133372 | 20MHz | QPSK | 1 RB / 0 RB Offset |
| BAND EDGE | 133147 to 133447 | 133147 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 25 RB / 0 RB Offset |
| | | 133447 | 5MHz | QPSK, 16QAM | 1 RB / 24 RB Offset |
| | | | | | 25 RB / 0 RB Offset |
| | 133172 to 133422 | 133172 | 10MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 50 RB / 0 RB Offset |
| | | 133422 | 10MHz | QPSK, 16QAM | 1 RB / 49 RB Offset |
| | | | | | 50 RB / 0 RB Offset |
| | 133197 to 133397 | 133197 | 15MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 75 RB / 0 RB Offset |
| | | 133397 | 15MHz | QPSK, 16QAM | 1 RB / 74 RB Offset |
| | | | | | 75 RB / 0 RB Offset |
| CONDCUDED EMISSION | 133222 to 133372 | 133222 | 20MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | | | | 100 RB / 0 RB Offset |
| | | 133372 | 20MHz | QPSK, 16QAM | 1 RB / 99 RB Offset |
| | | | | | 100 RB / 0 RB Offset |



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| | | | | | |
|----------------------|------------------|---------------------------|-------|------|--------------------|
| RADIATED EMISSION | 133147 to 133447 | 133297 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | 133172 to 133422 | 133297 | 10MHz | QPSK | 1 RB / 0RB Offset |
| | 133197 to 133397 | 133297 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | 133222 to 133372 | 133222, 133322, 133372 | 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 |

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

27.50(b)(10) Portable stations (hand-held devices) transmitting in the 746-757 MHz, 776-788 MHz, and 805-806 MHz bands are limited to 3 watts ERP.

27.50(c)(10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698-746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

27.50(h)(2) Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

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:

$$\text{ERP or EIRP} = P_{\text{Meas}} + G_T - L_C$$

Where:

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

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

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

G_T = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);

L_C = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

CONDUCTED POWER MEASUREMENT:

- The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- 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:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

3.1.4 TEST RESULTS

AVERAGE CONDUCTED OUTPUT POWER (dBm)

| LTE Band 7 | | | | | | | |
|------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 20775 | Mid CH 21100 | High CH 21425 | 3GPP MPR (dB) |
| | | | | Frequency 2502.5 MHz | Frequency 2535 MHz | Frequency 2567.5 MHz | |
| 5MHz | QPSK | 1 | 0 | 23.38 | 23.31 | 23.30 | 0 |
| | | 1 | 12 | 23.49 | 23.38 | 23.41 | 0 |
| | | 1 | 24 | 23.48 | 23.40 | 23.44 | 0 |
| | | 12 | 0 | 22.47 | 22.41 | 22.38 | 1 |
| | | 12 | 6 | 22.39 | 22.41 | 22.34 | 1 |
| | | 12 | 13 | 22.50 | 22.44 | 22.45 | 1 |
| | | 25 | 0 | 22.43 | 22.42 | 22.36 | 1 |
| | 16QAM | 1 | 0 | 22.59 | 22.56 | 22.56 | 1 |
| | | 1 | 12 | 22.70 | 22.71 | 22.65 | 1 |
| | | 1 | 24 | 22.74 | 22.63 | 22.66 | 1 |
| | | 12 | 0 | 21.47 | 21.44 | 21.39 | 2 |
| | | 12 | 6 | 21.50 | 21.49 | 21.42 | 2 |
| | | 12 | 13 | 21.52 | 21.49 | 21.49 | 2 |
| | | 25 | 0 | 21.48 | 21.42 | 21.41 | 2 |

| LTE Band 7 | | | | | | | |
|------------|------------|---------|-----------|-----------------------|-----------------------|-----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 20800 | Mid CH 21100 | High CH 21400 | 3GPP MPR (dB) |
| | | | | Frequency 2505 MHz | Frequency 2535 MHz | Frequency 2565 MHz | |
| 10MHz | QPSK | 1 | 0 | 23.35 | 23.34 | 23.30 | 0 |
| | | 1 | 24 | 23.49 | 23.38 | 23.42 | 0 |
| | | 1 | 49 | 23.45 | 23.44 | 23.40 | 0 |
| | | 25 | 0 | 22.48 | 22.40 | 22.41 | 1 |
| | | 25 | 12 | 22.45 | 22.35 | 22.34 | 1 |
| | | 25 | 25 | 22.48 | 22.41 | 22.44 | 1 |
| | | 50 | 0 | 22.48 | 22.42 | 22.33 | 1 |
| | 16QAM | 1 | 0 | 22.59 | 22.53 | 22.52 | 1 |
| | | 1 | 24 | 22.75 | 22.67 | 22.68 | 1 |
| | | 1 | 49 | 22.74 | 22.64 | 22.63 | 1 |
| | | 25 | 0 | 21.49 | 21.42 | 21.45 | 2 |
| | | 25 | 12 | 21.54 | 21.43 | 21.47 | 2 |
| | | 25 | 25 | 21.51 | 21.50 | 21.46 | 2 |
| | | 50 | 0 | 21.52 | 21.41 | 21.45 | 2 |

| LTE Band 7 | | | | | | | |
|------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 20825 | Mid CH 21100 | High CH 21375 | 3GPP MPR (dB) |
| | | | | Frequency 2507.5 MHz | Frequency 2535 MHz | Frequency 2562.5 MHz | |
| 15MHz | QPSK | 1 | 0 | 23.42 | 23.34 | 23.27 | 0 |
| | | 1 | 37 | 23.47 | 23.43 | 23.37 | 0 |
| | | 1 | 74 | 23.51 | 23.47 | 23.41 | 0 |
| | | 36 | 0 | 22.45 | 22.41 | 22.42 | 1 |
| | | 36 | 19 | 22.46 | 22.40 | 22.34 | 1 |
| | | 36 | 39 | 22.46 | 22.42 | 22.44 | 1 |
| | | 75 | 0 | 22.48 | 22.40 | 22.38 | 1 |
| | 16QAM | 1 | 0 | 22.63 | 22.60 | 22.52 | 1 |
| | | 1 | 37 | 22.74 | 22.68 | 22.68 | 1 |
| | | 1 | 74 | 22.70 | 22.69 | 22.65 | 1 |
| | | 36 | 0 | 21.53 | 21.42 | 21.46 | 2 |
| | | 36 | 19 | 21.48 | 21.47 | 21.43 | 2 |
| | | 36 | 39 | 21.56 | 21.48 | 21.49 | 2 |
| | | 75 | 0 | 21.53 | 21.44 | 21.38 | 2 |

| LTE Band 7 | | | | | | | |
|------------|------------|---------|-----------|-----------------------|-----------------------|-----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 20850 | Mid CH 21100 | High CH 21350 | 3GPP MPR (dB) |
| | | | | Frequency 2510 MHz | Frequency 2535 MHz | Frequency 2560 MHz | |
| 20MHz | QPSK | 1 | 0 | 23.43 | 23.38 | 23.35 | 0 |
| | | 1 | 50 | 23.51 | 23.46 | 23.43 | 0 |
| | | 1 | 99 | 23.53 | 23.48 | 23.45 | 0 |
| | | 50 | 0 | 22.51 | 22.46 | 22.43 | 1 |
| | | 50 | 25 | 22.47 | 22.42 | 22.39 | 1 |
| | | 50 | 50 | 22.54 | 22.49 | 22.46 | 1 |
| | | 100 | 0 | 22.49 | 22.44 | 22.41 | 1 |
| | 16QAM | 1 | 0 | 22.66 | 22.61 | 22.58 | 1 |
| | | 1 | 50 | 22.78 | 22.73 | 22.70 | 1 |
| | | 1 | 99 | 22.76 | 22.71 | 22.68 | 1 |
| | | 50 | 0 | 21.55 | 21.50 | 21.47 | 2 |
| | | 50 | 25 | 21.56 | 21.51 | 21.48 | 2 |
| | | 50 | 50 | 21.59 | 21.54 | 21.51 | 2 |
| | | 100 | 0 | 21.54 | 21.49 | 21.46 | 2 |

| LTE Band 12 | | | | | | | |
|-------------|------------|---------|-----------|------------------------|------------------------|-----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 23017 | Mid CH 23095 | High CH 23173 | 3GPP MPR (dB) |
| | | | | Frequency 699.7 MHz | Frequency 707.5 MHz | Frequency 715.3MHz | |
| 1.4MHz | QPSK | 1 | 0 | 22.68 | 22.65 | 22.68 | 0 |
| | | 1 | 2 | 22.82 | 22.72 | 22.80 | 0 |
| | | 1 | 5 | 22.73 | 22.61 | 22.67 | 0 |
| | | 3 | 0 | 22.80 | 22.71 | 22.81 | 0 |
| | | 3 | 1 | 22.86 | 22.78 | 22.76 | 0 |
| | | 3 | 3 | 22.78 | 22.68 | 22.74 | 0 |
| | | 6 | 0 | 21.87 | 21.75 | 21.83 | 1 |
| | 16QAM | 1 | 0 | 22.08 | 21.99 | 22.05 | 1 |
| | | 1 | 2 | 22.13 | 22.00 | 22.10 | 1 |
| | | 1 | 5 | 21.98 | 21.88 | 21.99 | 1 |
| | | 3 | 0 | 21.97 | 21.89 | 21.93 | 1 |
| | | 3 | 1 | 21.90 | 21.90 | 21.90 | 1 |
| | | 3 | 3 | 21.87 | 21.79 | 21.87 | 1 |
| | | 6 | 0 | 20.88 | 20.85 | 20.86 | 2 |

| LTE Band 12 | | | | | | | |
|-------------|------------|---------|-----------|------------------------|------------------------|------------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 23025 | Mid CH 23095 | High CH 23165 | 3GPP MPR (dB) |
| | | | | Frequency 700.5 MHz | Frequency 707.5 MHz | Frequency 714.5 MHz | |
| 3MHz | QPSK | 1 | 0 | 22.70 | 22.67 | 22.67 | 0 |
| | | 1 | 7 | 22.78 | 22.73 | 22.80 | 0 |
| | | 1 | 14 | 22.69 | 22.61 | 22.67 | 0 |
| | | 8 | 0 | 21.79 | 21.74 | 21.81 | 1 |
| | | 8 | 3 | 21.79 | 21.78 | 21.78 | 1 |
| | | 8 | 7 | 21.75 | 21.75 | 21.78 | 1 |
| | | 15 | 0 | 21.84 | 21.76 | 21.77 | 1 |
| | 16QAM | 1 | 0 | 22.05 | 22.05 | 22.08 | 1 |
| | | 1 | 7 | 22.10 | 22.03 | 22.08 | 1 |
| | | 1 | 14 | 22.01 | 21.88 | 21.99 | 1 |
| | | 8 | 0 | 20.93 | 20.90 | 20.93 | 2 |
| | | 8 | 3 | 20.95 | 20.85 | 20.93 | 2 |
| | | 8 | 7 | 20.89 | 20.77 | 20.83 | 2 |
| | | 15 | 0 | 20.88 | 20.79 | 20.89 | 2 |

| LTE Band 12 | | | | | | | |
|-------------|------------|---------|-----------|------------------------|------------------------|-----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 23035 | Mid CH 23095 | High CH 23155 | 3GPP MPR (dB) |
| | | | | Frequency 701.5 MHz | Frequency 707.5 MHz | Frequency 713.5MHz | |
| 5MHz | QPSK | 1 | 0 | 22.71 | 22.62 | 22.68 | 0 |
| | | 1 | 12 | 22.83 | 22.70 | 22.80 | 0 |
| | | 1 | 24 | 22.70 | 22.60 | 22.71 | 0 |
| | | 12 | 0 | 21.82 | 21.74 | 21.78 | 1 |
| | | 12 | 6 | 21.79 | 21.79 | 21.79 | 1 |
| | | 12 | 13 | 21.79 | 21.71 | 21.79 | 1 |
| | | 25 | 0 | 21.82 | 21.79 | 21.80 | 1 |
| | 16QAM | 1 | 0 | 22.06 | 22.01 | 22.08 | 1 |
| | | 1 | 12 | 22.07 | 22.06 | 22.07 | 1 |
| | | 1 | 24 | 22.01 | 21.88 | 21.98 | 1 |
| | | 12 | 0 | 20.93 | 20.88 | 20.90 | 2 |
| | | 12 | 6 | 20.92 | 20.89 | 20.89 | 2 |
| | | 12 | 13 | 20.84 | 20.79 | 20.86 | 2 |
| | | 25 | 0 | 20.88 | 20.80 | 20.86 | 2 |

| LTE Band 12 | | | | | | | |
|-------------|------------|---------|-----------|----------------------|------------------------|----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 23060 | Mid CH 23095 | High CH 23130 | 3GPP MPR (dB) |
| | | | | Frequency 704 MHz | Frequency 707.5 MHz | Frequency 711 MHz | |
| 10MHz | QPSK | 1 | 0 | 22.76 | 22.69 | 22.73 | 0 |
| | | 1 | 24 | 22.85 | 22.78 | 22.82 | 0 |
| | | 1 | 49 | 22.75 | 22.68 | 22.72 | 0 |
| | | 25 | 0 | 21.86 | 21.79 | 21.83 | 1 |
| | | 25 | 12 | 21.87 | 21.80 | 21.84 | 1 |
| | | 25 | 25 | 21.83 | 21.76 | 21.80 | 1 |
| | | 50 | 0 | 21.88 | 21.81 | 21.85 | 1 |
| | 16QAM | 1 | 0 | 22.13 | 22.06 | 22.10 | 1 |
| | | 1 | 24 | 22.15 | 22.08 | 22.12 | 1 |
| | | 1 | 49 | 22.03 | 21.96 | 22.00 | 1 |
| | | 25 | 0 | 21.01 | 20.94 | 20.98 | 2 |
| | | 25 | 12 | 20.98 | 20.91 | 20.95 | 2 |
| | | 25 | 25 | 20.91 | 20.84 | 20.88 | 2 |
| | | 50 | 0 | 20.94 | 20.87 | 20.91 | 2 |

| LTE Band 13 | | | | | | | |
|-------------|------------|---------|-----------|------------------------|------------------------|-----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 23205 | Mid CH 23230 | High CH 23255 | 3GPP MPR (dB) |
| | | | | Frequency 779.5 MHz | Frequency 782.0 MHz | Frequency 784.5MHz | |
| 5MHz | QPSK | 1 | 0 | 22.62 | 22.60 | 22.62 | 0 |
| | | 1 | 12 | 22.77 | 22.71 | 22.73 | 0 |
| | | 1 | 24 | 22.66 | 22.63 | 22.70 | 0 |
| | | 12 | 0 | 21.75 | 21.74 | 21.74 | 1 |
| | | 12 | 6 | 21.74 | 21.81 | 21.77 | 1 |
| | | 12 | 13 | 21.72 | 21.71 | 21.75 | 1 |
| | | 25 | 0 | 21.73 | 21.77 | 21.74 | 1 |
| | 16QAM | 1 | 0 | 21.92 | 21.94 | 21.97 | 1 |
| | | 1 | 12 | 22.05 | 22.11 | 22.08 | 1 |
| | | 1 | 24 | 21.99 | 21.93 | 21.94 | 1 |
| | | 12 | 0 | 20.84 | 20.86 | 20.81 | 2 |
| | | 12 | 6 | 20.90 | 20.94 | 20.93 | 2 |
| | | 12 | 13 | 20.80 | 20.82 | 20.85 | 2 |
| | | 25 | 0 | 20.86 | 20.85 | 20.87 | 2 |

| LTE Band 13 | | | | | |
|-------------|------------|---------|-----------|------------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Mid CH 23230 | 3GPP MPR (dB) |
| | | | | Frequency 707.5 MHz | |
| 10MHz | QPSK | 1 | 0 | 22.67 | 0 |
| | | 1 | 24 | 22.79 | 0 |
| | | 1 | 49 | 22.71 | 0 |
| | | 25 | 0 | 21.79 | 1 |
| | | 25 | 12 | 21.82 | 1 |
| | | 25 | 25 | 21.76 | 1 |
| | | 50 | 0 | 21.79 | 1 |
| | 16QAM | 1 | 0 | 21.99 | 1 |
| | | 1 | 24 | 22.13 | 1 |
| | | 1 | 49 | 22.01 | 1 |
| | | 25 | 0 | 20.92 | 2 |
| | | 25 | 12 | 20.96 | 2 |
| | | 25 | 25 | 20.87 | 2 |
| | | 50 | 0 | 20.92 | 2 |

| LTE Band 17 | | | | | | | |
|-------------|------------|---------|-----------|------------------------|----------------------|-----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 23755 | Mid CH 23790 | High CH 23825 | 3GPP MPR (dB) |
| | | | | Frequency 706.5 MHz | Frequency 710 MHz | Frequency 713.5MHz | |
| 5MHz | QPSK | 1 | 0 | 22.67 | 22.64 | 22.71 | 0 |
| | | 1 | 12 | 22.72 | 22.65 | 22.76 | 0 |
| | | 1 | 24 | 22.74 | 22.70 | 22.82 | 0 |
| | | 12 | 0 | 21.77 | 21.75 | 21.80 | 1 |
| | | 12 | 6 | 21.74 | 21.80 | 21.81 | 1 |
| | | 12 | 13 | 21.75 | 21.73 | 21.82 | 1 |
| | | 25 | 0 | 21.72 | 21.75 | 21.77 | 1 |
| | 16QAM | 1 | 0 | 21.94 | 21.95 | 22.03 | 1 |
| | | 1 | 12 | 21.99 | 22.04 | 22.06 | 1 |
| | | 1 | 24 | 22.01 | 21.94 | 22.05 | 1 |
| | | 12 | 0 | 20.81 | 20.82 | 20.85 | 2 |
| | | 12 | 6 | 20.88 | 20.91 | 20.92 | 2 |
| | | 12 | 13 | 20.81 | 20.82 | 20.90 | 2 |
| | | 25 | 0 | 20.86 | 20.84 | 20.91 | 2 |

| LTE Band 17 | | | | | | | |
|-------------|------------|---------|-----------|----------------------|----------------------|----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 23780 | Mid CH 23790 | High CH 23800 | 3GPP MPR (dB) |
| | | | | Frequency 709 MHz | Frequency 710 MHz | Frequency 711 MHz | |
| 10MHz | QPSK | 1 | 0 | 22.72 | 22.71 | 22.76 | 0 |
| | | 1 | 24 | 22.74 | 22.73 | 22.78 | 0 |
| | | 1 | 49 | 22.79 | 22.78 | 22.83 | 0 |
| | | 25 | 0 | 21.81 | 21.80 | 21.85 | 1 |
| | | 25 | 12 | 21.82 | 21.81 | 21.86 | 1 |
| | | 25 | 25 | 21.79 | 21.78 | 21.83 | 1 |
| | | 50 | 0 | 21.78 | 21.77 | 21.82 | 1 |
| | 16QAM | 1 | 0 | 22.01 | 22.00 | 22.05 | 1 |
| | | 1 | 24 | 22.07 | 22.06 | 22.11 | 1 |
| | | 1 | 49 | 22.03 | 22.02 | 22.07 | 1 |
| | | 25 | 0 | 20.89 | 20.88 | 20.93 | 2 |
| | | 25 | 12 | 20.94 | 20.93 | 20.98 | 2 |
| | | 25 | 25 | 20.88 | 20.87 | 20.92 | 2 |
| | | 50 | 0 | 20.92 | 20.91 | 20.96 | 2 |

| LTE Band 41 | | | | | | | |
|-------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 39675 | Mid CH 40620 | High CH 41565 | 3GPP MPR (dB) |
| | | | | Frequency 2498.5 MHz | Frequency 2593 MHz | Frequency 2687.5 MHz | |
| 5MHz | QPSK | 1 | 0 | 23.28 | 22.82 | 22.80 | 0 |
| | | 1 | 12 | 23.27 | 22.77 | 22.79 | 0 |
| | | 1 | 24 | 23.27 | 22.80 | 22.83 | 0 |
| | | 12 | 0 | 22.24 | 21.79 | 21.75 | 1 |
| | | 12 | 6 | 22.18 | 21.81 | 21.73 | 1 |
| | | 12 | 13 | 22.27 | 21.82 | 21.82 | 1 |
| | | 25 | 0 | 22.18 | 21.78 | 21.71 | 1 |
| | 16QAM | 1 | 0 | 22.38 | 21.96 | 21.95 | 1 |
| | | 1 | 12 | 22.30 | 21.92 | 21.85 | 1 |
| | | 1 | 24 | 22.39 | 21.89 | 21.91 | 1 |
| | | 12 | 0 | 21.33 | 20.91 | 20.85 | 2 |
| | | 12 | 6 | 21.31 | 20.91 | 20.83 | 2 |
| | | 12 | 13 | 21.31 | 20.89 | 20.88 | 2 |
| | | 25 | 0 | 21.29 | 20.84 | 20.82 | 2 |

| LTE Band 41 | | | | | | | |
|-------------|------------|---------|-----------|-----------------------|-----------------------|-----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 39700 | Mid CH 40620 | High CH 41540 | 3GPP MPR (dB) |
| | | | | Frequency 2501 MHz | Frequency 2593 MHz | Frequency 2685 MHz | |
| 10MHz | QPSK | 1 | 0 | 23.25 | 22.85 | 22.80 | 0 |
| | | 1 | 24 | 23.27 | 22.77 | 22.80 | 0 |
| | | 1 | 49 | 23.24 | 22.84 | 22.79 | 0 |
| | | 25 | 0 | 22.25 | 21.78 | 21.78 | 1 |
| | | 25 | 12 | 22.24 | 21.75 | 21.73 | 1 |
| | | 25 | 25 | 22.25 | 21.79 | 21.81 | 1 |
| | | 50 | 0 | 22.23 | 21.78 | 21.68 | 1 |
| | 16QAM | 1 | 0 | 22.38 | 21.93 | 21.91 | 1 |
| | | 1 | 24 | 22.35 | 21.88 | 21.88 | 1 |
| | | 1 | 49 | 22.39 | 21.90 | 21.88 | 1 |
| | | 25 | 0 | 21.35 | 20.89 | 20.91 | 2 |
| | | 25 | 12 | 21.35 | 20.85 | 20.88 | 2 |
| | | 25 | 25 | 21.30 | 20.90 | 20.85 | 2 |
| | | 50 | 0 | 21.33 | 20.83 | 20.86 | 2 |

| LTE Band 41 | | | | | | | |
|-------------|------------|---------|-----------|-------------------------|-----------------------|-------------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 39725 | Mid CH 40620 | High CH 41515 | 3GPP MPR (dB) |
| | | | | Frequency 2503.5 MHz | Frequency 2593 MHz | Frequency 2682.5 MHz | |
| 15MHz | QPSK | 1 | 0 | 23.32 | 22.85 | 22.77 | 0 |
| | | 1 | 37 | 23.25 | 22.82 | 22.75 | 0 |
| | | 1 | 74 | 23.30 | 22.87 | 22.80 | 0 |
| | | 36 | 0 | 22.22 | 21.79 | 21.79 | 1 |
| | | 36 | 19 | 22.25 | 21.80 | 21.73 | 1 |
| | | 36 | 39 | 22.23 | 21.80 | 21.81 | 1 |
| | | 75 | 0 | 22.23 | 21.76 | 21.73 | 1 |
| | 16QAM | 1 | 0 | 22.42 | 22.00 | 21.91 | 1 |
| | | 1 | 37 | 22.34 | 21.89 | 21.88 | 1 |
| | | 1 | 74 | 22.35 | 21.95 | 21.90 | 1 |
| | | 36 | 0 | 21.39 | 20.89 | 20.92 | 2 |
| | | 36 | 19 | 21.29 | 20.89 | 20.84 | 2 |
| | | 36 | 39 | 21.35 | 20.88 | 20.88 | 2 |
| | | 75 | 0 | 21.34 | 20.86 | 20.79 | 2 |

| LTE Band 41 | | | | | | | |
|-------------|------------|---------|-----------|-----------------------|-----------------------|-----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 39750 | Mid CH 40620 | High CH 41490 | 3GPP MPR (dB) |
| | | | | Frequency 2506 MHz | Frequency 2593 MHz | Frequency 2680 MHz | |
| 20MHz | QPSK | 1 | 0 | 23.33 | 22.89 | 22.85 | 0 |
| | | 1 | 50 | 23.29 | 22.85 | 22.81 | 0 |
| | | 1 | 99 | 23.32 | 22.88 | 22.84 | 0 |
| | | 50 | 0 | 22.28 | 21.84 | 21.80 | 1 |
| | | 50 | 25 | 22.26 | 21.82 | 21.78 | 1 |
| | | 50 | 50 | 22.31 | 21.87 | 21.83 | 1 |
| | | 100 | 0 | 22.24 | 21.80 | 21.76 | 1 |
| | 16QAM | 1 | 0 | 22.45 | 22.01 | 21.97 | 1 |
| | | 1 | 50 | 22.38 | 21.94 | 21.90 | 1 |
| | | 1 | 99 | 22.41 | 21.97 | 21.93 | 1 |
| | | 50 | 0 | 21.41 | 20.97 | 20.93 | 2 |
| | | 50 | 25 | 21.37 | 20.93 | 20.89 | 2 |
| | | 50 | 50 | 21.38 | 20.94 | 20.90 | 2 |
| | | 100 | 0 | 21.35 | 20.91 | 20.87 | 2 |

| LTE Band 71 | | | | | | | |
|-------------|------------|---------|-----------|------------------------|-----------------------|------------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 133147 | Mid CH 133297 | High CH 133447 | 3GPP MPR (dB) |
| | | | | Frequency 665.5 MHz | Frequency 680.5MHz | Frequency 695.5 MHz | |
| 5MHz | QPSK | 1 | 0 | 22.92 | 23.02 | 23.06 | 0 |
| | | 1 | 12 | 23.03 | 23.09 | 23.17 | 0 |
| | | 1 | 24 | 23.03 | 23.12 | 23.21 | 0 |
| | | 12 | 0 | 21.82 | 21.93 | 21.95 | 1 |
| | | 12 | 6 | 21.79 | 21.98 | 21.96 | 1 |
| | | 12 | 13 | 21.85 | 21.96 | 22.02 | 1 |
| | | 25 | 0 | 21.75 | 21.91 | 21.90 | 1 |
| | 16QAM | 1 | 0 | 21.72 | 21.86 | 21.91 | 1 |
| | | 1 | 12 | 21.65 | 21.83 | 21.82 | 1 |
| | | 1 | 24 | 21.80 | 21.86 | 21.94 | 1 |
| | | 12 | 0 | 20.83 | 20.97 | 20.97 | 2 |
| | | 12 | 6 | 20.87 | 21.03 | 21.01 | 2 |
| | | 12 | 13 | 20.87 | 21.01 | 21.06 | 2 |
| | | 25 | 0 | 20.81 | 20.92 | 20.96 | 2 |

| LTE Band 71 | | | | | | | |
|-------------|------------|---------|-----------|----------------------|------------------------|----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 133172 | Mid CH 133297 | High CH 133422 | 3GPP MPR (dB) |
| | | | | Frequency 668 MHz | Frequency 680.5 MHz | Frequency 693 MHz | |
| 10MHz | QPSK | 1 | 0 | 22.89 | 23.05 | 23.06 | 0 |
| | | 1 | 24 | 23.03 | 23.09 | 23.18 | 0 |
| | | 1 | 49 | 23.00 | 23.16 | 23.17 | 0 |
| | | 25 | 0 | 21.83 | 21.92 | 21.98 | 1 |
| | | 25 | 12 | 21.85 | 21.92 | 21.96 | 1 |
| | | 25 | 25 | 21.83 | 21.93 | 22.01 | 1 |
| | | 50 | 0 | 21.80 | 21.91 | 21.87 | 1 |
| | 16QAM | 1 | 0 | 21.72 | 21.83 | 21.87 | 1 |
| | | 1 | 24 | 21.70 | 21.79 | 21.85 | 1 |
| | | 1 | 49 | 21.80 | 21.87 | 21.91 | 1 |
| | | 25 | 0 | 20.85 | 20.95 | 21.03 | 2 |
| | | 25 | 12 | 20.91 | 20.97 | 21.06 | 2 |
| | | 25 | 25 | 20.86 | 21.02 | 21.03 | 2 |
| | | 50 | 0 | 20.85 | 20.91 | 21.00 | 2 |

| LTE Band 71 | | | | | | | |
|-------------|------------|---------|-----------|------------------------|------------------------|------------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 133197 | Mid CH 133297 | High CH 133397 | 3GPP MPR (dB) |
| | | | | Frequency 670.5 MHz | Frequency 680.5 MHz | Frequency 690.5 MHz | |
| 15MHz | QPSK | 1 | 0 | 22.96 | 23.05 | 23.03 | 0 |
| | | 1 | 37 | 23.01 | 23.14 | 23.13 | 0 |
| | | 1 | 74 | 23.06 | 23.19 | 23.18 | 0 |
| | | 36 | 0 | 21.80 | 21.93 | 21.99 | 1 |
| | | 36 | 19 | 21.86 | 21.97 | 21.96 | 1 |
| | | 36 | 39 | 21.81 | 21.94 | 22.01 | 1 |
| | | 75 | 0 | 21.80 | 21.89 | 21.92 | 1 |
| | 16QAM | 1 | 0 | 21.76 | 21.90 | 21.87 | 1 |
| | | 1 | 37 | 21.69 | 21.80 | 21.85 | 1 |
| | | 1 | 74 | 21.76 | 21.92 | 21.93 | 1 |
| | | 36 | 0 | 20.89 | 20.95 | 21.04 | 2 |
| | | 36 | 19 | 20.85 | 21.01 | 21.02 | 2 |
| | | 36 | 39 | 20.91 | 21.00 | 21.06 | 2 |
| | | 75 | 0 | 20.86 | 20.94 | 20.93 | 2 |

| LTE Band 71 | | | | | | | |
|-------------|------------|---------|-----------|----------------------|----------------------|----------------------|---------------------|
| BW | Modulation | RB Size | RB Offset | Low CH 133222 | Mid CH 133322 | High CH 133372 | 3GPP MPR (dB) |
| | | | | Frequency 673 MHz | Frequency 683 MHz | Frequency 688 MHz | |
| 20MHz | QPSK | 1 | 0 | 22.97 | 23.09 | 23.11 | 0 |
| | | 1 | 50 | 23.05 | 23.17 | 23.19 | 0 |
| | | 1 | 99 | 23.08 | 23.20 | 23.22 | 0 |
| | | 50 | 0 | 21.86 | 21.98 | 22.00 | 1 |
| | | 50 | 25 | 21.87 | 21.99 | 22.01 | 1 |
| | | 50 | 50 | 21.89 | 22.01 | 22.03 | 1 |
| | | 100 | 0 | 21.81 | 21.93 | 21.95 | 1 |
| | 16QAM | 1 | 0 | 21.79 | 21.91 | 21.93 | 1 |
| | | 1 | 50 | 21.73 | 21.85 | 21.87 | 1 |
| | | 1 | 99 | 21.82 | 21.94 | 21.96 | 1 |
| | | 50 | 0 | 20.91 | 21.03 | 21.05 | 2 |
| | | 50 | 25 | 20.93 | 21.05 | 21.07 | 2 |
| | | 50 | 50 | 20.94 | 21.06 | 21.08 | 2 |
| | | 100 | 0 | 20.87 | 20.99 | 21.01 | 2 |

EIRP

LTE BAND 7

CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 20775 | 2502.5 | 23.49 | 2.68 | 26.17 | 414.00 | 2 |
| 21100 | 2535.0 | 23.38 | 2.68 | 26.06 | 403.65 | 2 |
| 21425 | 2567.5 | 23.44 | 2.68 | 26.12 | 409.26 | 2 |

CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 20775 | 2502.5 | 22.74 | 2.68 | 25.42 | 348.34 | 2 |
| 21100 | 2535.0 | 22.71 | 2.68 | 25.39 | 345.94 | 2 |
| 21425 | 2567.5 | 22.66 | 2.68 | 25.34 | 341.98 | 2 |

CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 20800 | 2505.0 | 23.49 | 2.68 | 26.17 | 414.00 | 2 |
| 21100 | 2535.0 | 23.44 | 2.68 | 26.12 | 409.26 | 2 |
| 21400 | 2565.0 | 23.42 | 2.68 | 26.10 | 407.38 | 2 |

CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 20800 | 2505.0 | 22.75 | 2.68 | 25.43 | 349.14 | 2 |
| 21100 | 2535.0 | 22.67 | 2.68 | 25.35 | 342.77 | 2 |
| 21400 | 2565.0 | 22.68 | 2.68 | 25.36 | 343.56 | 2 |

CHANNEL BANDWIDTH: 15MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 20825 | 2507.5 | 23.51 | 2.68 | 26.19 | 415.91 | 2 |
| 21100 | 2535.0 | 23.47 | 2.68 | 26.15 | 412.10 | 2 |
| 21375 | 2562.5 | 23.41 | 2.68 | 26.09 | 406.44 | 2 |

CHANNEL BANDWIDTH: 15MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 20825 | 2507.5 | 22.74 | 2.68 | 25.42 | 348.34 | 2 |
| 21100 | 2535.0 | 22.69 | 2.68 | 25.37 | 344.35 | 2 |
| 21375 | 2562.5 | 22.68 | 2.68 | 25.36 | 343.56 | 2 |

CHANNEL BANDWIDTH: 20MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 20850 | 2510.0 | 23.53 | 2.68 | 26.21 | 417.83 | 2 |
| 21100 | 2535.0 | 23.48 | 2.68 | 26.16 | 413.05 | 2 |
| 21350 | 2560.0 | 23.45 | 2.68 | 26.13 | 410.20 | 2 |

CHANNEL BANDWIDTH: 20MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 20850 | 2510.0 | 22.78 | 2.68 | 25.46 | 351.56 | 2 |
| 21100 | 2535.0 | 22.73 | 2.68 | 25.41 | 347.54 | 2 |
| 21350 | 2560.0 | 22.70 | 2.68 | 25.38 | 345.14 | 2 |



BUREAU
VERITAS

Test Report No.: RF190522W005-4

LTE BAND 12

CHANNEL BANDWIDTH: 1.4MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _{T-Lc} (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|---------------------------|--------------|-------------|--------------|
| 23017 | 699.7 | 22.86 | 3.26 | 23.97 | 249.46 | 3 |
| 23095 | 707.5 | 22.78 | 3.26 | 23.89 | 244.91 | 3 |
| 23173 | 715.3 | 22.80 | 3.26 | 23.91 | 246.04 | 3 |

CHANNEL BANDWIDTH: 1.4MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _{T-Lc} (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|---------------------------|--------------|-------------|--------------|
| 23017 | 699.7 | 22.13 | 3.26 | 23.24 | 210.86 | 3 |
| 23095 | 707.5 | 22.00 | 3.26 | 23.11 | 204.64 | 3 |
| 23173 | 715.3 | 22.10 | 3.26 | 23.21 | 209.41 | 3 |

CHANNEL BANDWIDTH: 3MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 23025 | 700.5 | 22.78 | 3.26 | 23.89 | 244.91 | 3 |
| 23095 | 707.5 | 22.73 | 3.26 | 23.84 | 242.10 | 3 |
| 23165 | 714.5 | 22.80 | 3.26 | 23.91 | 246.04 | 3 |

CHANNEL BANDWIDTH: 3MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 23025 | 700.5 | 22.10 | 3.26 | 23.21 | 209.41 | 3 |
| 23095 | 707.5 | 22.05 | 3.26 | 23.16 | 207.01 | 3 |
| 23165 | 714.5 | 22.08 | 3.26 | 23.19 | 208.45 | 3 |

CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _{T-Lc} (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|---------------------------|--------------|-------------|--------------|
| 23035 | 701.5 | 22.83 | 3.26 | 23.94 | 247.74 | 3 |
| 23095 | 707.5 | 22.73 | 3.26 | 23.84 | 242.10 | 3 |
| 23155 | 713.5 | 22.80 | 3.26 | 23.91 | 246.04 | 3 |

CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _{T-Lc} (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|---------------------------|--------------|-------------|--------------|
| 23035 | 701.5 | 22.07 | 3.26 | 23.18 | 207.97 | 3 |
| 23095 | 707.5 | 22.06 | 3.26 | 23.17 | 207.49 | 3 |
| 23155 | 713.5 | 22.08 | 3.26 | 23.19 | 208.45 | 3 |

CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 23060 | 704.0 | 22.85 | 3.26 | 23.96 | 248.89 | 3 |
| 23095 | 707.5 | 22.78 | 3.26 | 23.89 | 244.91 | 3 |
| 23130 | 711.0 | 22.82 | 3.26 | 23.93 | 247.17 | 3 |

CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 23060 | 704.0 | 22.15 | 3.26 | 23.26 | 211.84 | 3 |
| 23095 | 707.5 | 22.08 | 3.26 | 23.19 | 208.45 | 3 |
| 23130 | 711.0 | 22.12 | 3.26 | 23.23 | 210.38 | 3 |



BUREAU
VERITAS

Test Report No.: RF190522W005-4

LTE BAND 13

CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 23205 | 779.5 | 22.77 | 4.45 | 25.07 | 321.37 | 3 |
| 23230 | 782.0 | 22.71 | 4.45 | 25.01 | 316.96 | 3 |
| 23255 | 784.5 | 22.73 | 4.45 | 25.03 | 318.42 | 3 |

CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 23205 | 779.5 | 22.05 | 4.45 | 24.35 | 272.27 | 3 |
| 23230 | 782.0 | 22.11 | 4.45 | 24.41 | 276.06 | 3 |
| 23255 | 784.5 | 22.08 | 4.45 | 24.38 | 274.16 | 3 |

CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 23230 | 782.0 | 22.79 | 4.45 | 25.09 | 322.85 | 3 |

CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 23230 | 782.0 | 22.13 | 4.45 | 24.43 | 277.33 | 3 |

LTE BAND 17

CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _{T-Lc} (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|---------------------------|---------------|--------------|--------------|
| 23755 | 706.5 | 22.74 | 3.26 | 23.85 | 242.66 | 3 |
| 23790 | 710.0 | 22.70 | 3.26 | 23.81 | 240.44 | 3 |
| 23825 | 713.5 | 22.82 | 3.26 | 23.93 | 247.17 | 3 |

CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _{T-Lc} (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|---------------------------|---------------|--------------|--------------|
| 23755 | 706.5 | 22.01 | 3.26 | 23.12 | 205.12 | 3 |
| 23790 | 710.0 | 22.04 | 3.26 | 23.15 | 206.54 | 3 |
| 23825 | 713.5 | 22.06 | 3.26 | 23.17 | 207.49 | 3 |

CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 23780 | 706.5 | 22.79 | 3.26 | 23.90 | 245.47 | 3 |
| 23790 | 710.0 | 22.78 | 3.26 | 23.89 | 244.91 | 3 |
| 23800 | 713.5 | 22.83 | 3.26 | 23.94 | 247.74 | 3 |

CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 23780 | 706.5 | 22.07 | 3.26 | 23.18 | 207.97 | 3 |
| 23790 | 710.0 | 22.06 | 3.26 | 23.17 | 207.49 | 3 |
| 23800 | 713.5 | 22.11 | 3.26 | 23.22 | 209.89 | 3 |

LTE BAND 41

CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 39675 | 2498.5 | 23.28 | 2.44 | 25.72 | 373.25 | 2 |
| 40620 | 2593.0 | 22.82 | 2.44 | 25.26 | 335.74 | 2 |
| 41565 | 2687.5 | 22.80 | 2.44 | 25.24 | 334.20 | 2 |

CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 39675 | 2498.5 | 22.39 | 2.44 | 24.83 | 304.09 | 2 |
| 40620 | 2593.0 | 21.96 | 2.44 | 24.40 | 275.42 | 2 |
| 41565 | 2687.5 | 21.95 | 2.44 | 24.39 | 274.79 | 2 |

CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 39700 | 2501.0 | 23.27 | 2.44 | 25.71 | 372.39 | 2 |
| 40620 | 2593.0 | 22.85 | 2.44 | 25.29 | 338.06 | 2 |
| 41540 | 2685.0 | 22.70 | 2.44 | 25.14 | 326.59 | 2 |

CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 39700 | 2501.0 | 22.39 | 2.44 | 24.83 | 304.09 | 2 |
| 40620 | 2593.0 | 21.93 | 2.44 | 24.37 | 273.53 | 2 |
| 41540 | 2685.0 | 21.91 | 2.44 | 24.35 | 272.27 | 2 |

CHANNEL BANDWIDTH: 15MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 18675 | 2503.5 | 23.32 | 2.44 | 25.76 | 376.70 | 2 |
| 18900 | 2593.0 | 22.85 | 2.44 | 25.29 | 338.06 | 2 |
| 19125 | 2682.5 | 22.77 | 2.44 | 25.21 | 331.89 | 2 |

CHANNEL BANDWIDTH: 15MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 39725 | 2503.5 | 22.42 | 2.44 | 24.86 | 306.20 | 2 |
| 40620 | 2593.0 | 22.00 | 2.44 | 24.44 | 277.97 | 2 |
| 41515 | 2682.5 | 21.91 | 2.44 | 24.35 | 272.27 | 2 |

CHANNEL BANDWIDTH: 20MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 39750 | 2506.0 | 23.33 | 2.44 | 25.77 | 377.57 | 2 |
| 40620 | 2593.0 | 22.89 | 2.44 | 25.33 | 341.19 | 2 |
| 41490 | 2680.0 | 22.85 | 2.44 | 25.29 | 338.06 | 2 |

CHANNEL BANDWIDTH: 20MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|---------------|--------------|--------------|
| 39750 | 2506.0 | 22.45 | 2.44 | 24.89 | 308.32 | 2 |
| 40620 | 2593.0 | 22.01 | 2.44 | 24.45 | 278.61 | 2 |
| 41490 | 2680.0 | 21.93 | 2.44 | 24.37 | 273.53 | 2 |

LTE BAND 71

CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 133147 | 665.5 | 23.03 | 1.66 | 22.54 | 179.47 | 3 |
| 133297 | 680.5 | 23.12 | 1.66 | 22.63 | 183.23 | 3 |
| 133447 | 695.5 | 23.21 | 1.66 | 22.72 | 187.07 | 3 |

CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 133147 | 665.5 | 21.80 | 1.66 | 21.31 | 135.21 | 3 |
| 133297 | 680.5 | 21.86 | 1.66 | 21.37 | 137.09 | 3 |
| 133447 | 695.5 | 21.94 | 1.66 | 21.45 | 139.64 | 3 |

CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 133172 | 668.0 | 23.03 | 1.66 | 22.54 | 179.47 | 3 |
| 133297 | 680.5 | 23.09 | 1.66 | 22.60 | 181.97 | 3 |
| 133422 | 693.0 | 23.18 | 1.66 | 22.69 | 185.78 | 3 |

CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 133172 | 668.0 | 21.80 | 1.66 | 21.31 | 135.21 | 3 |
| 133297 | 680.5 | 21.87 | 1.66 | 21.38 | 137.40 | 3 |
| 133422 | 693.0 | 21.91 | 1.66 | 21.42 | 138.68 | 3 |

CHANNEL BANDWIDTH: 15MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 133197 | 670.5 | 23.06 | 1.66 | 22.57 | 180.72 | 3 |
| 133297 | 680.5 | 23.19 | 1.66 | 22.70 | 186.21 | 3 |
| 132647 | 690.5 | 23.18 | 1.66 | 22.69 | 185.78 | 3 |

CHANNEL BANDWIDTH: 15MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 133197 | 670.5 | 21.76 | 1.66 | 21.27 | 133.97 | 3 |
| 133297 | 680.5 | 21.92 | 1.66 | 21.43 | 139.00 | 3 |
| 132647 | 690.5 | 21.93 | 1.66 | 21.44 | 139.32 | 3 |

CHANNEL BANDWIDTH: 20MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 133222 | 673.0 | 23.08 | 1.66 | 22.59 | 181.55 | 3 |
| 133297 | 680.5 | 23.20 | 1.66 | 22.71 | 186.64 | 3 |
| 133372 | 688.0 | 23.22 | 1.66 | 22.73 | 187.50 | 3 |

CHANNEL BANDWIDTH: 20MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|--------------------|-----------------------------|--|--------------|-------------|--------------|
| 133222 | 673.0 | 21.82 | 1.66 | 21.33 | 135.83 | 3 |
| 133297 | 680.5 | 21.94 | 1.66 | 21.45 | 139.64 | 3 |
| 133372 | 688.0 | 21.96 | 1.66 | 21.47 | 140.28 | 3 |

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

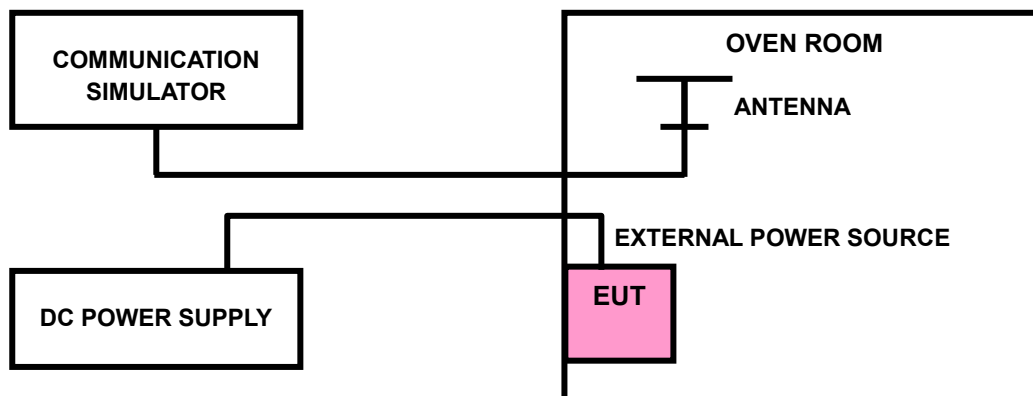
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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

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FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 5MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0021 | 0.0024 | 2.5 |
| V _{min} | -0.0023 | -0.0030 | 2.5 |
| V _{max} | 0.0021 | 0.0021 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0113 | -0.0117 | 2.5 |
| -20 | -0.0104 | -0.0105 | 2.5 |
| -10 | -0.0081 | -0.0082 | 2.5 |
| 0 | -0.0077 | -0.0074 | 2.5 |
| 10 | -0.0046 | -0.0052 | 2.5 |
| 20 | -0.0040 | -0.0040 | 2.5 |
| 30 | -0.0034 | -0.0026 | 2.5 |
| 40 | -0.0015 | -0.0020 | 2.5 |
| 50 | -0.0002 | -0.0001 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 10MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0026 | 0.0025 | 2.5 |
| V _{min} | -0.0031 | -0.0030 | 2.5 |
| V _{max} | 0.0024 | 0.0026 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0115 | -0.0121 | 2.5 |
| -20 | -0.0104 | -0.0099 | 2.5 |
| -10 | -0.0082 | -0.0082 | 2.5 |
| 0 | -0.0077 | -0.0075 | 2.5 |
| 10 | -0.0051 | -0.0052 | 2.5 |
| 20 | -0.0039 | -0.0043 | 2.5 |
| 30 | -0.0036 | -0.0034 | 2.5 |
| 40 | -0.0023 | -0.0021 | 2.5 |
| 50 | -0.0003 | -0.0004 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 15MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0024 | 0.0026 | 2.5 |
| V _{min} | -0.0031 | -0.0030 | 2.5 |
| V _{max} | 0.0025 | 0.0026 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 15MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0115 | -0.0116 | 2.5 |
| -20 | -0.0105 | -0.0103 | 2.5 |
| -10 | -0.0082 | -0.0084 | 2.5 |
| 0 | -0.0073 | -0.0076 | 2.5 |
| 10 | -0.0049 | -0.0044 | 2.5 |
| 20 | -0.0042 | -0.0044 | 2.5 |
| 30 | -0.0037 | -0.0028 | 2.5 |
| 40 | -0.0016 | -0.0018 | 2.5 |
| 50 | -0.0005 | -0.0005 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 20MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0024 | 0.0026 | 2.5 |
| V _{min} | -0.0031 | -0.0031 | 2.5 |
| V _{max} | 0.0024 | 0.0026 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 20MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0121 | -0.0119 | 2.5 |
| -20 | -0.0100 | -0.0098 | 2.5 |
| -10 | -0.0082 | -0.0084 | 2.5 |
| 0 | -0.0073 | -0.0073 | 2.5 |
| 10 | -0.0051 | -0.0054 | 2.5 |
| 20 | -0.0038 | -0.0040 | 2.5 |
| 30 | -0.0030 | -0.0034 | 2.5 |
| 40 | -0.0019 | -0.0020 | 2.5 |
| 50 | -0.0004 | -0.0003 | 2.5 |

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FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 1.4MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0020 | 0.0024 | 2.5 |
| V _{min} | -0.0031 | -0.0030 | 2.5 |
| V _{max} | 0.0021 | 0.0021 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.4Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 1.4MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0117 | -0.0117 | 2.5 |
| -20 | -0.0106 | -0.0103 | 2.5 |
| -10 | -0.0084 | -0.0081 | 2.5 |
| 0 | -0.0077 | -0.0073 | 2.5 |
| 10 | -0.0057 | -0.0046 | 2.5 |
| 20 | -0.0042 | -0.0041 | 2.5 |
| 30 | -0.0028 | -0.0038 | 2.5 |
| 40 | -0.0016 | -0.0014 | 2.5 |
| 50 | -0.0002 | -0.0002 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 3MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0021 | 0.0021 | 2.5 |
| V _{min} | -0.0022 | -0.0025 | 2.5 |
| V _{max} | 0.0018 | 0.0017 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 3MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0114 | -0.0113 | 2.5 |
| -20 | -0.0113 | -0.0107 | 2.5 |
| -10 | -0.0085 | -0.0083 | 2.5 |
| 0 | -0.0076 | -0.0076 | 2.5 |
| 10 | -0.0057 | -0.0055 | 2.5 |
| 20 | -0.0042 | -0.0043 | 2.5 |
| 30 | -0.0041 | -0.0034 | 2.5 |
| 40 | -0.0016 | -0.0016 | 2.5 |
| 50 | -0.0003 | -0.0005 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 5MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0021 | 0.0024 | 2.5 |
| V _{min} | -0.0024 | -0.0030 | 2.5 |
| V _{max} | 0.0021 | 0.0021 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0123 | -0.0116 | 2.5 |
| -20 | -0.0098 | -0.0096 | 2.5 |
| -10 | -0.0083 | -0.0079 | 2.5 |
| 0 | -0.0078 | -0.0074 | 2.5 |
| 10 | -0.0046 | -0.0045 | 2.5 |
| 20 | -0.0039 | -0.0043 | 2.5 |
| 30 | -0.0043 | -0.0032 | 2.5 |
| 40 | -0.0017 | -0.0022 | 2.5 |
| 50 | -0.0006 | -0.0002 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 10MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0026 | 0.0023 | 2.5 |
| V _{min} | -0.0031 | -0.0031 | 2.5 |
| V _{max} | 0.0026 | 0.0024 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0122 | -0.0116 | 2.5 |
| -20 | -0.0104 | -0.0101 | 2.5 |
| -10 | -0.0084 | -0.0080 | 2.5 |
| 0 | -0.0074 | -0.0075 | 2.5 |
| 10 | -0.0045 | -0.0053 | 2.5 |
| 20 | -0.0038 | -0.0037 | 2.5 |
| 30 | -0.0030 | -0.0030 | 2.5 |
| 40 | -0.0021 | -0.0020 | 2.5 |
| 50 | -0.0002 | -0.0004 | 2.5 |

LTE BAND 13

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 5MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0022 | 0.0025 | 2.5 |
| V _{min} | -0.0023 | -0.0031 | 2.5 |
| V _{max} | 0.0021 | 0.0021 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.4Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0115 | -0.0117 | 2.5 |
| -20 | -0.0110 | -0.0104 | 2.5 |
| -10 | -0.0086 | -0.0083 | 2.5 |
| 0 | -0.0073 | -0.0073 | 2.5 |
| 10 | -0.0046 | -0.0053 | 2.5 |
| 20 | -0.0044 | -0.0041 | 2.5 |
| 30 | -0.0042 | -0.0029 | 2.5 |
| 40 | -0.0016 | -0.0017 | 2.5 |
| 50 | -0.0004 | -0.0002 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 10MHz | LIMIT (ppm) |
|-----------------|-----------------------|-------------|
| | FREQUENCY ERROR (ppm) | |
| | Mid Channel | |
| V_{nor} | 0.0024 | 2.5 |
| V_{min} | -0.0030 | 2.5 |
| V_{max} | 0.0024 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz | LIMIT (ppm) |
|------------|-----------------------|-------------|
| | FREQUENCY ERROR (ppm) | |
| | Mid Channel | |
| -30 | -0.0116 | 2.5 |
| -20 | -0.0101 | 2.5 |
| -10 | -0.0085 | 2.5 |
| 0 | -0.0074 | 2.5 |
| 10 | -0.0046 | 2.5 |
| 20 | -0.0037 | 2.5 |
| 30 | -0.0037 | 2.5 |
| 40 | -0.0018 | 2.5 |
| 50 | -0.0003 | 2.5 |

LTE BAND 14

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 5MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0021 | 0.0024 | 2.5 |
| V _{min} | -0.0024 | -0.0030 | 2.5 |
| V _{max} | 0.0021 | 0.0020 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.6Vdc to 4.4Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0114 | -0.0117 | 2.5 |
| -20 | -0.0111 | -0.0107 | 2.5 |
| -10 | -0.0081 | -0.0082 | 2.5 |
| 0 | -0.0076 | -0.0075 | 2.5 |
| 10 | -0.0050 | -0.0054 | 2.5 |
| 20 | -0.0042 | -0.0037 | 2.5 |
| 30 | -0.0026 | -0.0041 | 2.5 |
| 40 | -0.0017 | -0.0016 | 2.5 |
| 50 | -0.0002 | -0.0002 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 10MHz | LIMIT (ppm) |
|-----------------|-----------------------|-------------|
| | FREQUENCY ERROR (ppm) | |
| | Mid Channel | |
| V_{nor} | 0.0026 | 2.5 |
| V_{min} | -0.0031 | 2.5 |
| V_{max} | 0.0024 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz | LIMIT (ppm) |
|------------|-----------------------|-------------|
| | FREQUENCY ERROR (ppm) | |
| | Mid Channel | |
| -30 | -0.0113 | 2.5 |
| -20 | -0.0104 | 2.5 |
| -10 | -0.0085 | 2.5 |
| 0 | -0.0074 | 2.5 |
| 10 | -0.0046 | 2.5 |
| 20 | -0.0042 | 2.5 |
| 30 | -0.0024 | 2.5 |
| 40 | -0.0020 | 2.5 |
| 50 | -0.0005 | 2.5 |

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FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 5MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0021 | 0.0024 | 2.5 |
| V _{min} | -0.0024 | -0.0030 | 2.5 |
| V _{max} | 0.0021 | 0.0021 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0123 | -0.0116 | 2.5 |
| -20 | -0.0105 | -0.0099 | 2.5 |
| -10 | -0.0082 | -0.0084 | 2.5 |
| 0 | -0.0074 | -0.0074 | 2.5 |
| 10 | -0.0046 | -0.0052 | 2.5 |
| 20 | -0.0040 | -0.0037 | 2.5 |
| 30 | -0.0031 | -0.0028 | 2.5 |
| 40 | -0.0018 | -0.0019 | 2.5 |
| 50 | -0.0003 | -0.0004 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 10MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0025 | 0.0024 | 2.5 |
| V _{min} | -0.0030 | -0.0030 | 2.5 |
| V _{max} | 0.0026 | 0.0026 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0113 | -0.0117 | 2.5 |
| -20 | -0.0099 | -0.0104 | 2.5 |
| -10 | -0.0081 | -0.0082 | 2.5 |
| 0 | -0.0074 | -0.0076 | 2.5 |
| 10 | -0.0051 | -0.0046 | 2.5 |
| 20 | -0.0044 | -0.0039 | 2.5 |
| 30 | -0.0030 | -0.0031 | 2.5 |
| 40 | -0.0019 | -0.0021 | 2.5 |
| 50 | -0.0003 | -0.0002 | 2.5 |

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FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 5MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0021 | 0.0025 | 2.5 |
| V _{min} | -0.0024 | -0.0030 | 2.5 |
| V _{max} | 0.0021 | 0.0021 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0118 | -0.0114 | 2.5 |
| -20 | -0.0109 | -0.0107 | 2.5 |
| -10 | -0.0085 | -0.0080 | 2.5 |
| 0 | -0.0074 | -0.0072 | 2.5 |
| 10 | -0.0046 | -0.0052 | 2.5 |
| 20 | -0.0044 | -0.0037 | 2.5 |
| 30 | -0.0038 | -0.0027 | 2.5 |
| 40 | -0.0019 | -0.0015 | 2.5 |
| 50 | -0.0004 | -0.0005 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 10MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0025 | 0.0026 | 2.5 |
| V _{min} | -0.0031 | -0.0031 | 2.5 |
| V _{max} | 0.0025 | 0.0025 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0122 | -0.0114 | 2.5 |
| -20 | -0.0110 | -0.0107 | 2.5 |
| -10 | -0.0083 | -0.0081 | 2.5 |
| 0 | -0.0078 | -0.0072 | 2.5 |
| 10 | -0.0054 | -0.0045 | 2.5 |
| 20 | -0.0042 | -0.0038 | 2.5 |
| 30 | -0.0040 | -0.0026 | 2.5 |
| 40 | -0.0019 | -0.0022 | 2.5 |
| 50 | -0.0006 | -0.0004 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 15MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0026 | 0.0024 | 2.5 |
| V _{min} | -0.0031 | -0.0030 | 2.5 |
| V _{max} | 0.0025 | 0.0025 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 15MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0119 | -0.0115 | 2.5 |
| -20 | -0.0106 | -0.0105 | 2.5 |
| -10 | -0.0081 | -0.0082 | 2.5 |
| 0 | -0.0075 | -0.0073 | 2.5 |
| 10 | -0.0050 | -0.0047 | 2.5 |
| 20 | -0.0044 | -0.0039 | 2.5 |
| 30 | -0.0042 | -0.0033 | 2.5 |
| 40 | -0.0019 | -0.0017 | 2.5 |
| 50 | -0.0003 | -0.0004 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 20MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0024 | 0.0025 | 2.5 |
| V _{min} | -0.0031 | -0.0030 | 2.5 |
| V _{max} | 0.0025 | 0.0025 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 20MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0119 | -0.0112 | 2.5 |
| -20 | -0.0104 | -0.0097 | 2.5 |
| -10 | -0.0085 | -0.0079 | 2.5 |
| 0 | -0.0075 | -0.0073 | 2.5 |
| 10 | -0.0045 | -0.0045 | 2.5 |
| 20 | -0.0040 | -0.0042 | 2.5 |
| 30 | -0.0036 | -0.0040 | 2.5 |
| 40 | -0.0019 | -0.0016 | 2.5 |
| 50 | -0.0004 | -0.0003 | 2.5 |

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FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 5MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0022 | 0.0023 | 2.5 |
| V _{min} | -0.0023 | -0.0030 | 2.5 |
| V _{max} | 0.0022 | 0.0021 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0122 | -0.0112 | 2.5 |
| -20 | -0.0110 | -0.0099 | 2.5 |
| -10 | -0.0083 | -0.0079 | 2.5 |
| 0 | -0.0078 | -0.0073 | 2.5 |
| 10 | -0.0049 | -0.0052 | 2.5 |
| 20 | -0.0041 | -0.0037 | 2.5 |
| 30 | -0.0026 | -0.0036 | 2.5 |
| 40 | -0.0023 | -0.0016 | 2.5 |
| 50 | -0.0006 | -0.0004 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 10MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0024 | 0.0025 | 2.5 |
| V _{min} | -0.0031 | -0.0031 | 2.5 |
| V _{max} | 0.0024 | 0.0024 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0116 | -0.0112 | 2.5 |
| -20 | -0.0100 | -0.0098 | 2.5 |
| -10 | -0.0083 | -0.0081 | 2.5 |
| 0 | -0.0075 | -0.0073 | 2.5 |
| 10 | -0.0051 | -0.0046 | 2.5 |
| 20 | -0.0041 | -0.0039 | 2.5 |
| 30 | -0.0042 | -0.0024 | 2.5 |
| 40 | -0.0021 | -0.0015 | 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 _{nor} | 0.0025 | 0.0024 | 2.5 |
| V _{min} | -0.0031 | -0.0030 | 2.5 |
| V _{max} | 0.0024 | 0.0023 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 15MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0122 | -0.0112 | 2.5 |
| -20 | -0.0109 | -0.0098 | 2.5 |
| -10 | -0.0082 | -0.0082 | 2.5 |
| 0 | -0.0073 | -0.0075 | 2.5 |
| 10 | -0.0045 | -0.0046 | 2.5 |
| 20 | -0.0039 | -0.0042 | 2.5 |
| 30 | -0.0037 | -0.0034 | 2.5 |
| 40 | -0.0019 | -0.0015 | 2.5 |
| 50 | -0.0005 | -0.0003 | 2.5 |

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 20MHz | | LIMIT (ppm) |
|------------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| V _{nor} | 0.0024 | 0.0026 | 2.5 |
| V _{min} | -0.0031 | -0.0030 | 2.5 |
| V _{max} | 0.0025 | 0.0026 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from V_{min} Vdc to V_{max} Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

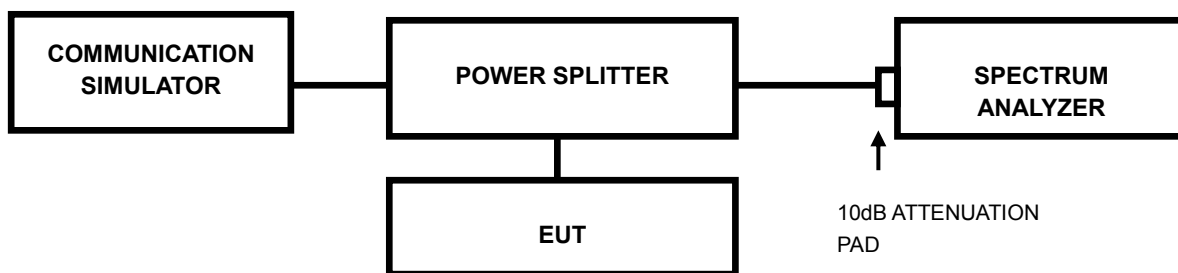
| TEMP. (°C) | 20MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0113 | -0.0116 | 2.5 |
| -20 | -0.0105 | -0.0104 | 2.5 |
| -10 | -0.0084 | -0.0079 | 2.5 |
| 0 | -0.0076 | -0.0075 | 2.5 |
| 10 | -0.0053 | -0.0053 | 2.5 |
| 20 | -0.0044 | -0.0038 | 2.5 |
| 30 | -0.0032 | -0.0035 | 2.5 |
| 40 | -0.0022 | -0.0019 | 2.5 |
| 50 | -0.0004 | -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

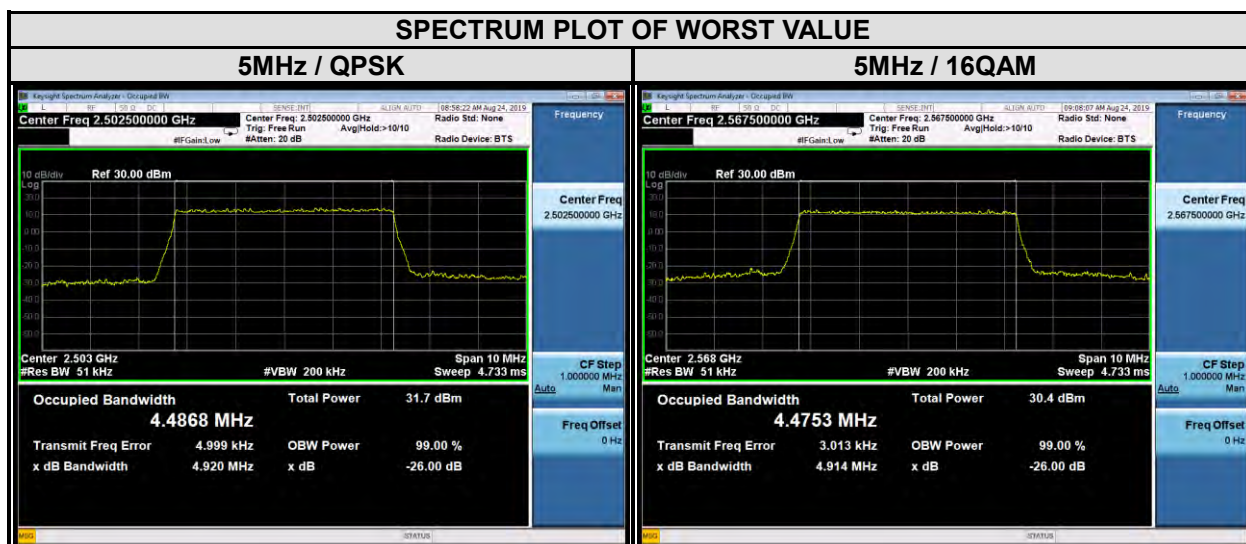


3.3.3 TEST PROCEDURES

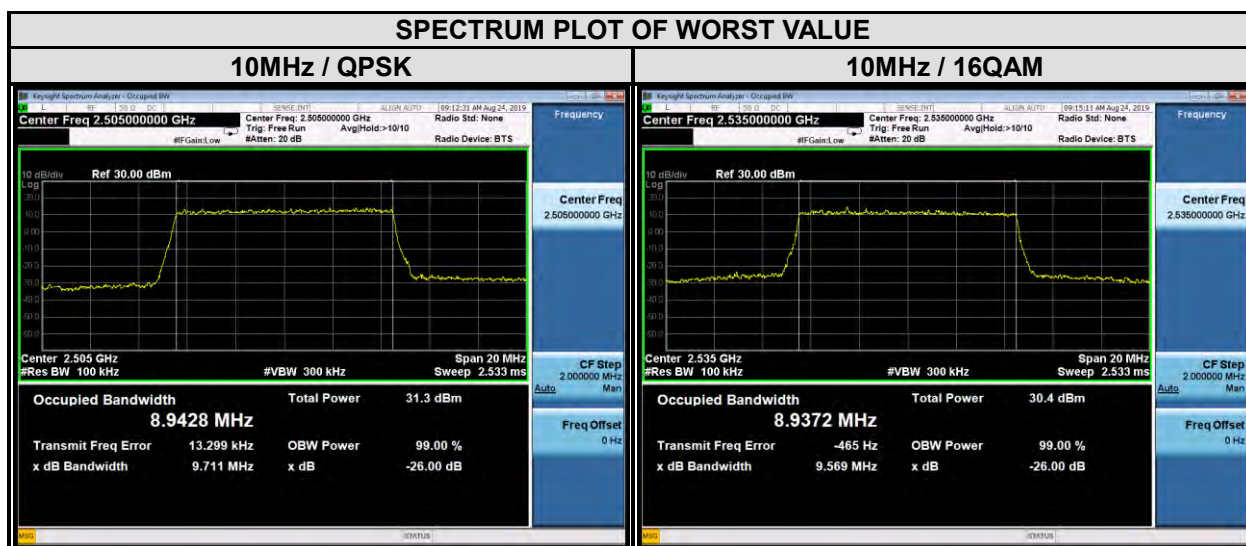
- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

3.3.4 TEST RESULTS

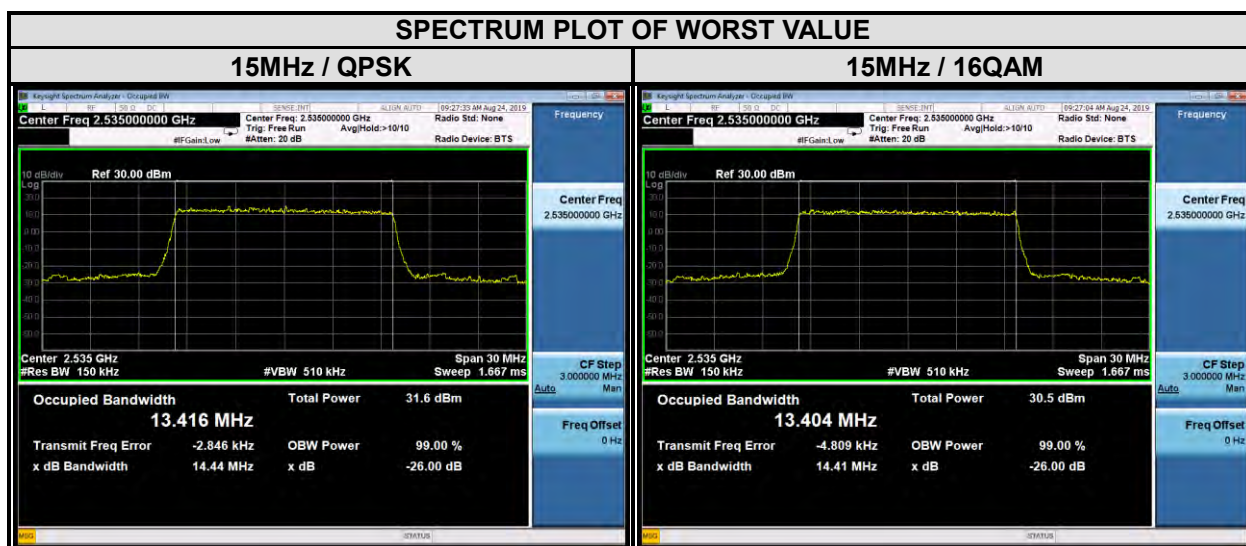
| LTE band 7 | | | | | |
|--------------------------|-----------------|------------------------------|-------|-----------------------|-------|
| Channel Bandwidth : 5MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 20775 | 2502.5 | 4.49 | 4.47 | 4.92 | 4.87 |
| 21100 | 2535 | 4.48 | 4.47 | 4.92 | 4.90 |
| 21425 | 2567.5 | 4.47 | 4.48 | 4.92 | 4.91 |



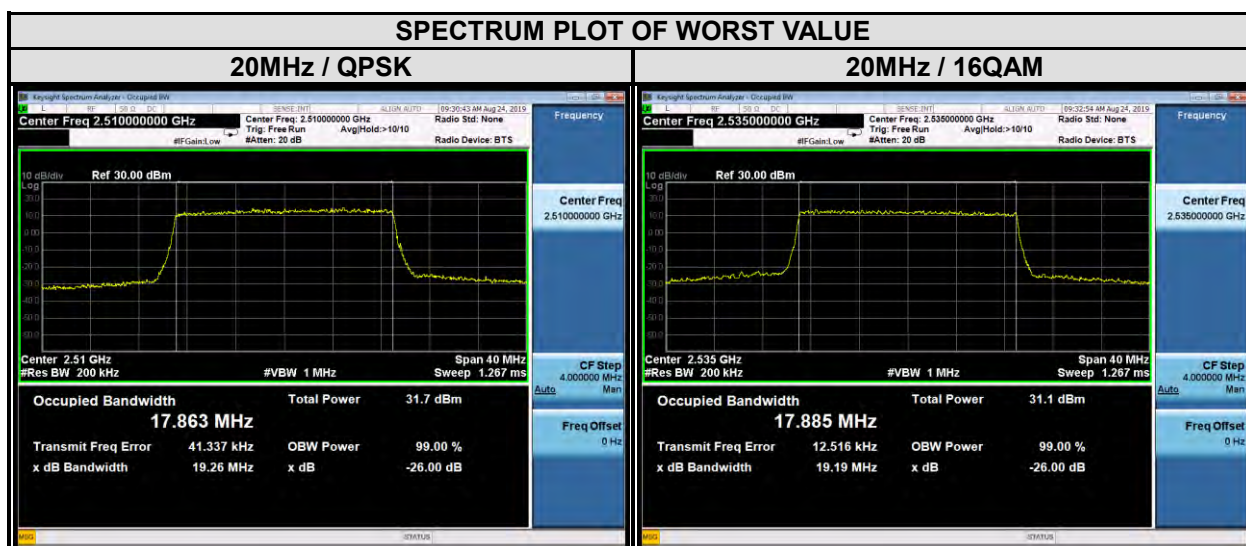
| LTE band 7 | | | | | |
|---------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 10MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 20800 | 2505 | 8.94 | 8.93 | 9.71 | 9.55 |
| 21100 | 2535 | 8.92 | 8.94 | 9.64 | 9.57 |
| 21400 | 2565 | 8.94 | 8.94 | 9.61 | 9.56 |



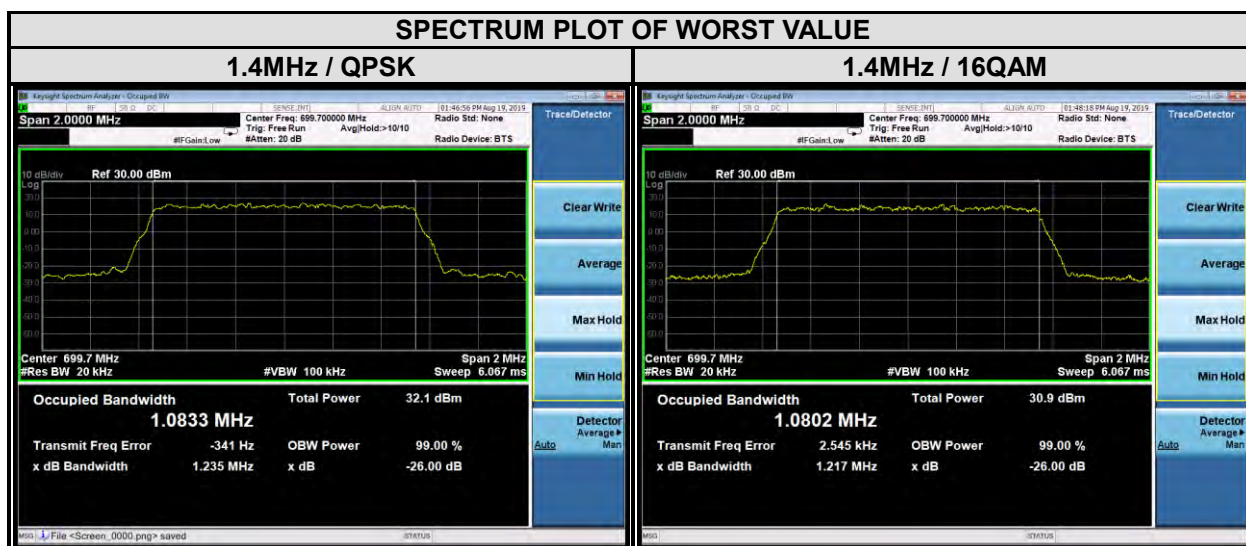
| LTE band 7 | | | | | |
|---------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 15MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 20825 | 2507.5 | 13.39 | 13.39 | 14.51 | 14.34 |
| 21100 | 2535 | 13.42 | 13.40 | 14.44 | 14.41 |
| 21375 | 2562.5 | 13.39 | 13.40 | 14.45 | 14.38 |



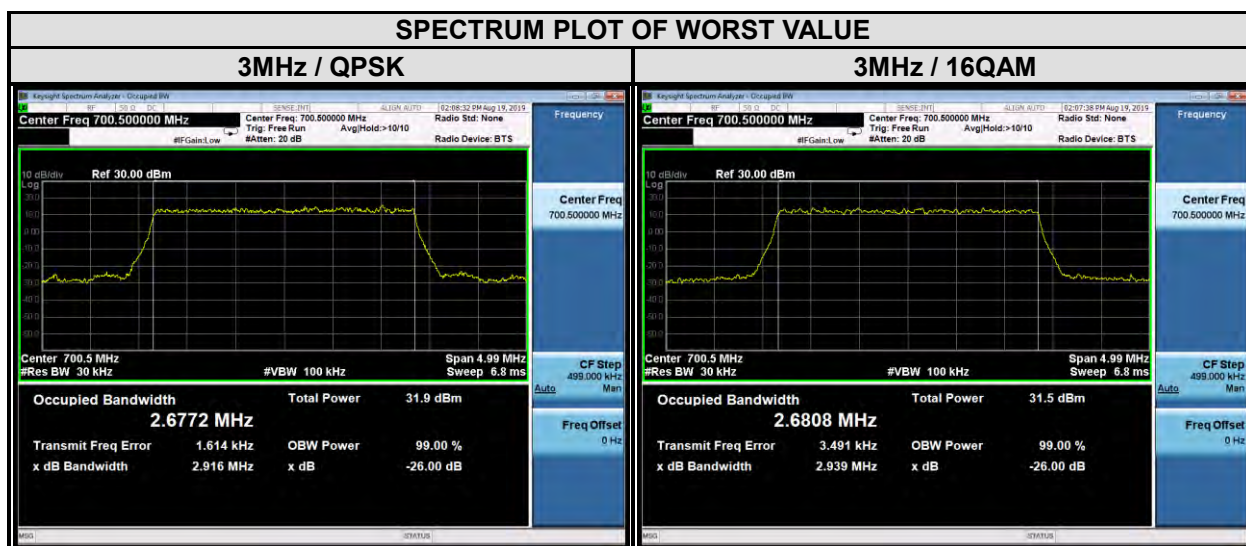
| LTE band 7 | | | | | |
|---------------------------|-----------------|------------------------------|-------|-----------------------|-------|
| Channel Bandwidth : 20MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 20850 | 2510 | 17.86 | 17.82 | 19.26 | 19.16 |
| 21100 | 2535 | 17.84 | 17.89 | 19.06 | 19.19 |
| 21350 | 2560 | 17.82 | 17.85 | 19.19 | 19.16 |



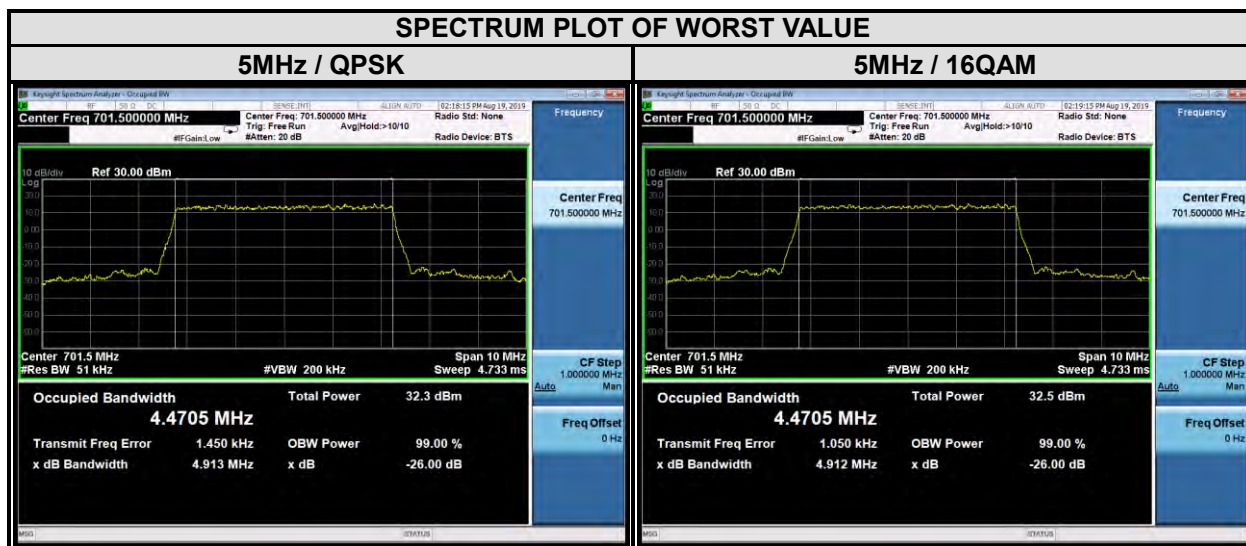
| LTE band 12 | | | | | |
|----------------------------|-----------------|------------------------------|-------|-----------------------|-------|
| Channel Bandwidth : 1.4MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 23017 | 699.7 | 1.08 | 1.08 | 1.24 | 1.22 |
| 23095 | 707.5 | 1.08 | 1.08 | 1.23 | 1.22 |
| 23173 | 715.3 | 1.08 | 1.08 | 1.22 | 1.22 |



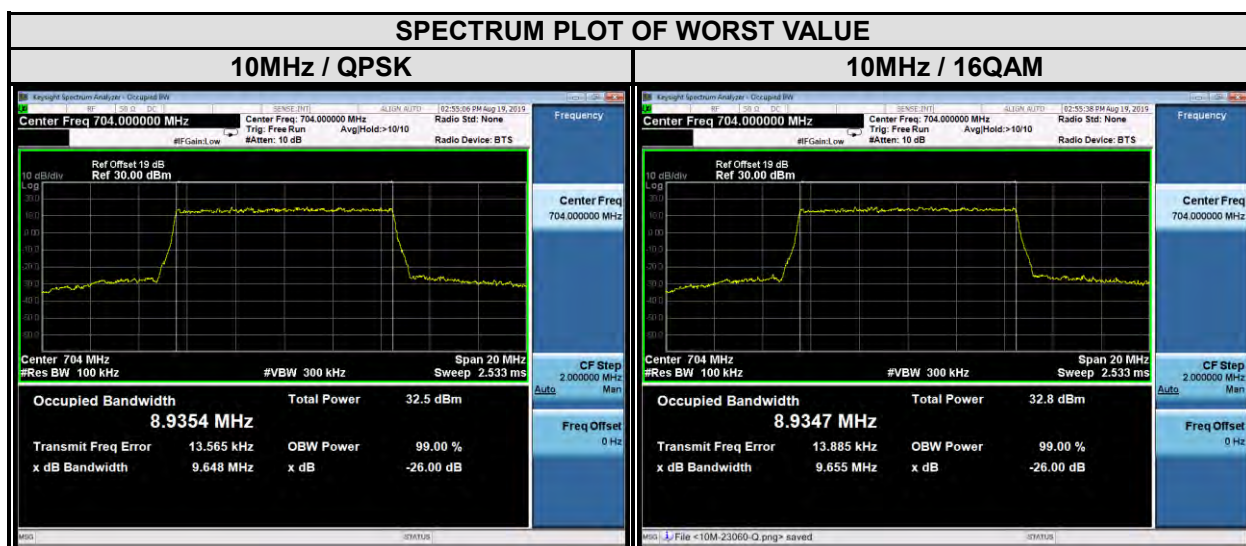
| LTE band 12 | | | | | |
|--------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 3MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 23025 | 700.5 | 2.68 | 2.68 | 2.92 | 2.94 |
| 23095 | 707.5 | 2.68 | 2.68 | 2.93 | 2.94 |
| 23165 | 714.5 | 2.68 | 2.68 | 2.92 | 2.93 |



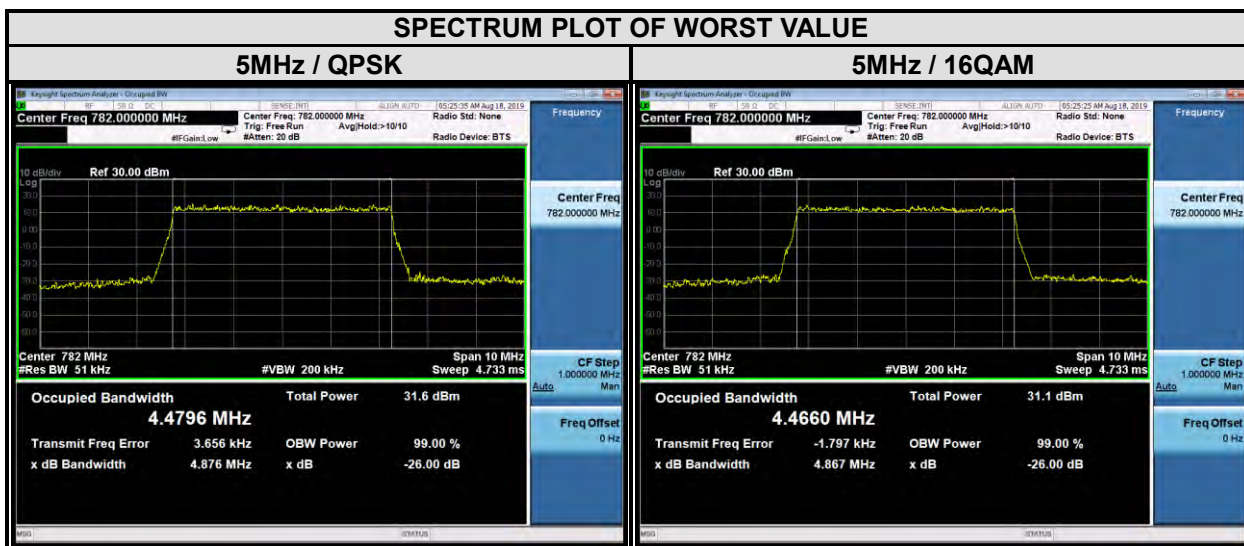
| LTE band 12 | | | | | |
|--------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 5MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 23035 | 701.5 | 4.47 | 4.47 | 4.91 | 4.91 |
| 23095 | 707.5 | 4.47 | 4.47 | 4.91 | 4.89 |
| 23155 | 713.5 | 4.47 | 4.47 | 4.89 | 4.91 |



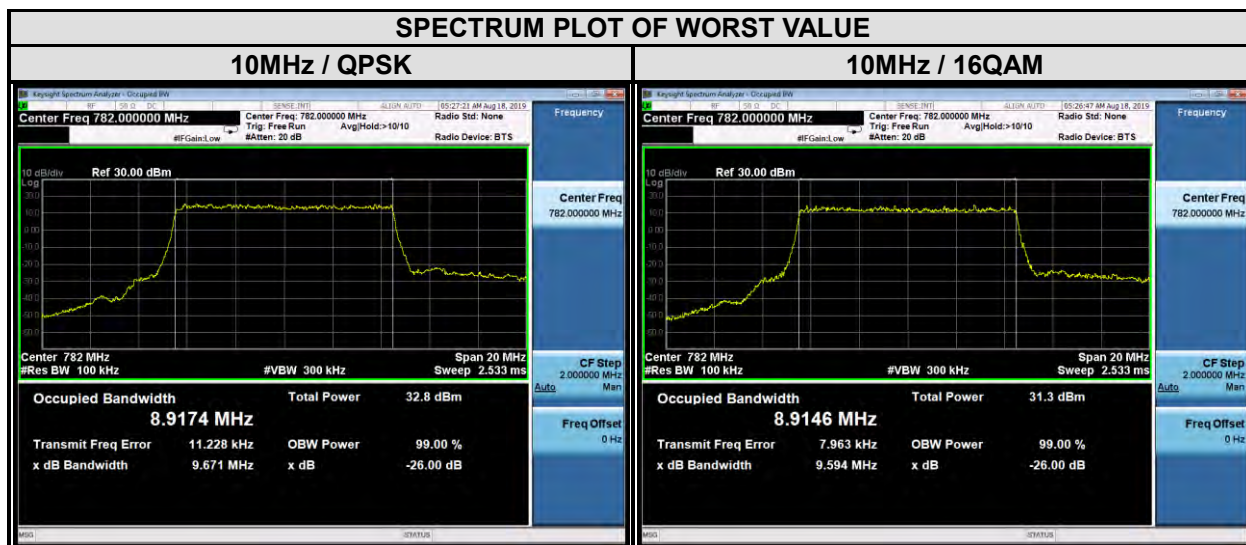
| LTE band 12 | | | | | |
|---------------------------|-----------------|------------------------------|-------|-----------------------|-------|
| Channel Bandwidth : 10MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 23060 | 704 | 8.94 | 8.93 | 9.65 | 9.66 |
| 23095 | 707.5 | 8.93 | 8.90 | 9.59 | 9.56 |
| 23130 | 711 | 8.94 | 8.93 | 9.63 | 9.62 |



| LTE band 13 | | | | | |
|--------------------------|-----------------|------------------------------|-------|-----------------------|-------|
| Channel Bandwidth : 5MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 23205 | 779.5 | 4.47 | 4.46 | 4.87 | 4.79 |
| 23230 | 793 | 4.48 | 4.47 | 4.88 | 4.87 |
| 23255 | 784.5 | 4.48 | 4.46 | 4.87 | 4.85 |



| LTE band 13 | | | | | |
|---------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 10MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 23230 | 782 | 8.92 | 8.91 | 9.67 | 9.59 |



| LTE band 17 | | | | | |
|--------------------------|--------------------|------------------------------------|-------|--------------------------|-------|
| Channel Bandwidth : 5MHz | | | | | |
| Channel | Frequency (MHz) | 99% Occupied bandwidth (MHz) | | 26 dB bandwidth (MHz) | |
| | | QPSK | 16QAM | QPSK | 16QAM |
| 23755 | 706.5 | 4.47 | 4.47 | 4.90 | 4.90 |
| 23790 | 710 | 4.47 | 4.47 | 4.91 | 4.91 |
| 23825 | 713.5 | 4.47 | 4.47 | 4.89 | 4.90 |

