



Test Report No.: RF200327S003-3



FCC TEST REPORT (PART 27)

| | |
|------------|--|
| Applicant: | PAX Technology Limited |
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| | |
|---------------------------|---|
| Manufacturer or Supplier: | PAX Computer Technology (Shenzhen) Co., Ltd. |
| Address: | 4/F, No.3 Building, Software Park, Second Central Science-Tech Road, High-Tech industrial Park, Shenzhen, Guangdong, P.R.C. |
| Product: | Smart Mobile Payment Terminal |
| Brand Name: | PAX |
| Model Name: | A920Pro |
| FCC ID: | V5PA920PRO |
| Date of tests: | Apr. 01, 2020~ May 15, 2020 |

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

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

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

| | |
|--|--|
| Prepared by Evans He Engineer / Mobile Department | Approved by David Huang Manager / Mobile Department |
| Date: May 18, 2020 | Date: May 18, 2020 |

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**4 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT
BY THE LAB 124**



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RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|----------------|-------------------|--------------|
| RF200327S003-3 | Original release | May 18, 2020 |



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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 | REMARK |
| 2.1046 27.50(d)(4) | Maximum Peak Output Power | PASS | Meet the requirement of limit. |
| 2.1055 27.54 | Frequency Stability | PASS | Meet the requirement of limit. |
| 2.1049 27.53(h) | Occupied Bandwidth | PASS | Meet the requirement of limit. |
| 27.50(d)(5) | Peak to average ratio | PASS | Meet the requirement of limit. |
| 27.53(h) | Band Edge Measurements | PASS | Meet the requirement of limit. |
| 2.1051 27.53(h) | Conducted Spurious Emissions | PASS | Meet the requirement of limit. |
| 2.1053 27.53(h) | Radiated Spurious Emissions | PASS | Meet the requirement of limit. Minimum passing margin is -13.21dB at 1569MHz. |



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 | FREQUENCY | UNCERTAINTY |
|---------------------|---------------|-------------|
| Conducted emissions | 9kHz~30MHz | 2.70dB |
| Radiated emissions | 9KHz ~ 30MHz | 2.16dB |
| | 30MHz ~ 1GMHz | 3.74dB |
| | 1GHz ~ 18GHz | 4.66dB |
| | 18GHz ~ 40GHz | 4.67dB |

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



1.2 TEST SITE AND INSTRUMENTS

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|-----------------------------|------------------|-----------------------------|-------------|-------------|
| EMI Test Receiver | Rohde&Schwarz | ESL6 | 1300.5001K06-10 0262-eQ | Mar. 24,20 | Mar. 24,21 |
| Bilog Antenna | Sunol Sciences | JB6 | A110712 | Apr. 08, 20 | Apr. 07, 21 |
| Active Antenna | CMO-POWER | AL-130 | 121031 | Mar. 27, 20 | Mar. 26, 21 |
| Signal Amplifier | HP | 8447E | 443008 | Mar. 24, 20 | Mar. 24, 21 |
| Spectrum | Agilent | E4446A | MY46180622 | Mar. 24, 20 | Mar. 24, 21 |
| MXA signal analyzer | Agilent | N9020A | MY49100060 | Mar. 22, 20 | Mar. 21, 21 |
| Horn Antenna | COM-POWER | HAH-118 | 71259 | Mar. 20, 20 | Mar. 19, 21 |
| Horn Antenna | COM-POWER | HAH-118 | 71283 | Jun. 30, 19 | Jun. 29, 20 |
| SHF-EHF Horn | Schwarzbeck | BBHA9170 | BBHA9170147 | Jun. 30, 19 | Jun. 29, 20 |
| SHF-EHF Horn | Schwarzbeck | BBHA9170 | BBHA9170242 | Mar. 24, 20 | Mar. 24, 21 |
| AMPLIFIER | EM Electornic Corporation | EM01G26G | 60613 | Jan. 04, 20 | Jan. 03,21 |
| AMPLIFIER | Emc Instruments Corporation | Emc012645 | 980077 | Oct. 18,18 | Oct. 17,21 |
| 3m Semi-anechoic Chamber | SAEMC | 9m*6m*6m | N/A | Mar. 24, 20 | Mar. 24, 21 |
| Test Software | EZ-EMC | ICP-03A1 | N/A | N/A | N/A |
| Wireless Connectivity Tester | R&S | CMW270 | 1201.0002K75 | Dec. 18, 19 | Dec. 17, 20 |
| MXA VEXTOR SIGNAL | Agilent | n5182a | MY50140530 | Mar. 24,20 | Mar. 24,21 |
| MXA signal analyzer | Agilent | n9020a | MY49100060 | Mar. 24,20 | Mar. 24,21 |
| RF Control Unit | Tonscend | JS0806-2 | 188060112 | Mar. 24,20 | Mar. 24,21 |
| Signal Generation | Agilent | E4421B | US40051152 | Dec. 18, 19 | Dec. 17, 20 |
| DC Power Supply | Agilent | E3640A | MY40004013 | Mar. 28,20 | Mar. 27,21 |
| Programmable Temperature & Humidity Chamber | Hongjin | HYC-TH-225D H | DG-180746 | Mar. 24,20 | Mar. 24,21 |
| Test System | Tonscend | JS 1120-3 | N/A | N/A | N/A |
| Power Splitter | Weinschel | 1580-1 | TL177 | Mar. 20,20 | Mar. 19,21 |
| Universal Radio Communication | ROHDE&SCHW ARZ | CMU200 | 112012 | Mar. 24,20 | Mar. 24,21 |
| Universal Radio Communication | ROHDE&SCHW ARZ | CMU200 | 121393 | Mar. 28,20 | Mar. 27,21 |
| Wireless Communication Test Set | ROHDE&SCHW ARZ | CMW500 | 1201.0002K500-1 55842-Gd | Nov. 1, 19 | Oct. 31, 20 |

- NOTE:**
1. The calibration interval of the above test instruments is 12 months (except 3m Semi-anechoic Chamber). 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 535293.

2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

| | | | |
|--|---|---|----------------|
| PRODUCT | Smart Mobile Payment Terminal | | |
| MODEL NAME | A920Pro | | |
| POWER SUPPLY | 5.0Vdc (adapter or host equipment) 3.7Vdc (Li-ion, ion battery) | | |
| MODULATION TECHNOLOGY | LTE | QPSK, 16QAM | |
| FREQUENCY RANGE | LTE Band 4 Channel Bandwidth: 1.4MHz | 1710.7MHz ~ 1754.3MHz | |
| | LTE Band 4 Channel Bandwidth: 3MHz | 1711.5MHz ~ 1753.5MHz | |
| | LTE Band 4 Channel Bandwidth: 5MHz | 1712.5MHz ~ 1752.5MHz | |
| | LTE Band 4 Channel Bandwidth: 10MHz | 1715.0MHz ~ 1750.0MHz | |
| | LTE Band 4 Channel Bandwidth: 15MHz | 1717.5MHz ~ 1747.5MHz | |
| | LTE Band 4 Channel Bandwidth: 20MHz | 1720.0MHz ~ 1745.0MHz | |
| | 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 | 704.0MHz ~ 711.0MHz | |
| | LTE Band 13 Channel Bandwidth: 5MHz | 779.5MHz ~ 784.5MHz | |
| | LTE Band 13 Channel Bandwidth: 10MHz | 782.0MHz | |
| | EMISSION DESIGNATOR | LTE Band 4 Channel Bandwidth: 1.4MHz | QPSK: 1M09G7D |
| | | | 16QAM: 1M09W7D |
| LTE Band 4 Channel Bandwidth: 3MHz | | QPSK: 2M69G7D | |
| | | 16QAM: 2M69W7D | |
| LTE Band 4 Channel Bandwidth: 5MHz | | QPSK: 4M47G7D | |
| | | 16QAM: 4M48W7D | |
| LTE Band 4 Channel Bandwidth: 10MHz | | QPSK: 8M94G7D | |
| | | 16QAM: 8M95W7D | |
| LTE Band 4 Channel Bandwidth: 15MHz | | QPSK: 13M42G7D | |
| | | 16QAM: 13M43W7D | |



**BUREAU
VERITAS**

Test Report No.: RF200327S003-3

| | | |
|---|--|-----------------------------------|
| | LTE Band 4 Channel Bandwidth: 20MHz | QPSK: 17M94G7D 16QAM: 17M89W7D |
| EMISSION DESIGNATOR | LTE Band 12 Channel Bandwidth: 1.4MHz | QPSK: 1M09G7D 16QAM: 1M09W7D |
| | LTE Band 12 Channel Bandwidth: 3MHz | QPSK: 2M68G7D 16QAM: 2M68W7D |
| | LTE Band 12 Channel Bandwidth: 5MHz | QPSK: 4M49G7D 16QAM: 4M49W7D |
| | LTE Band 12 Channel Bandwidth: 10MHz | QPSK: 8M94G7D 16QAM: 8M96W7D |
| | LTE Band 13 Channel Bandwidth: 5MHz | QPSK: 4M47G7D 16QAM: 4M49W7D |
| | LTE Band 13 Channel Bandwidth: 10MHz | QPSK: 9M02G7D 16QAM: 9M02W7D |
| MAX. ERP/EIRP POWER | LTE Band 4 Channel Bandwidth: 1.4MHz | 316.23mW |
| | LTE Band 4 Channel Bandwidth: 3MHz | 315.5mW |
| | LTE Band 4 Channel Bandwidth: 5MHz | 319.15mW |
| | LTE Band 4 Channel Bandwidth: 10MHz | 321.37mW |
| | LTE Band 4 Channel Bandwidth: 15MHz | 308.32mW |
| | LTE Band 4 Channel Bandwidth: 20MHz | 313.33mW |
| | LTE Band 12 Channel Bandwidth: 1.4MHz | 179.47mW |
| | LTE Band 12 Channel Bandwidth: 3MHz | 179.47mW |
| | LTE Band 12 Channel Bandwidth: 5MHz | 187.07mW |
| | LTE Band 12 Channel Bandwidth: 10MHz | 189.67mW |
| | LTE Band 13 Channel Bandwidth: 5MHz | 167.49mW |
| LTE Band 13 Channel Bandwidth: 10MHz | 161.44mW | |
| ANTENNA TYPE | LTE Band 4 | PIFA Antenna with 1.5dBi |



BUREAU VERITAS

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| | | |
|------------------|---|-----------------------|
| | LTE Band 12/ LTE Band 13 | FPC Antenna with 1dBi |
| HW VERSION | N/A | |
| SW VERSION | N/A | |
| ACCESSORY DEVICE | Refer to note as below | |
| DATA CABLE | USB cable: non-shielded, detachable, 1.0m | |
| EUT STAGE | Production Unit | |

NOTE:

1. For a more detailed features description, please refer to the manufacturer’s specifications or the user's manual.

2. The EUT was powered by the following adapter:

| ADAPTER | |
|---------|------------------------|
| BRAND: | N/A |
| MODEL: | GLH50D2000HW |
| INPUT: | 100-240V~50/60Hz 0.40A |
| OUTPUT: | 5.0V --- 2000mA |

3. The EUT matched the following USB cable:

| USB CABLE | |
|--------------|-----------|
| BRAND: | N/A |
| MODEL: | N/A |
| SIGNAL LINE: | 1.0 METER |

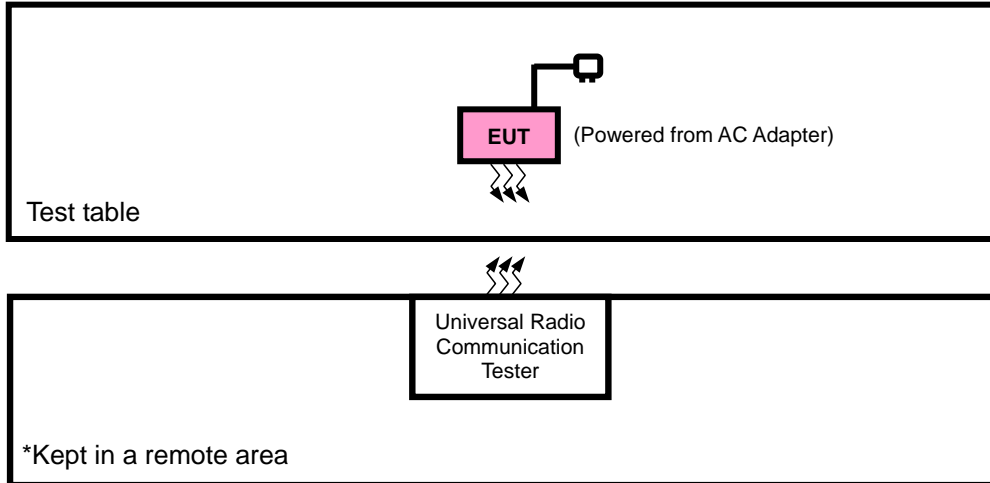
4. The EUT was powered by the following Battery:

| ADAPTER | |
|---------------|--------------------------|
| BRAND: | VEKEN |
| MODEL: | YW-008 |
| POWER RATING: | 3.7V --- 5150mAh 19.05Wh |

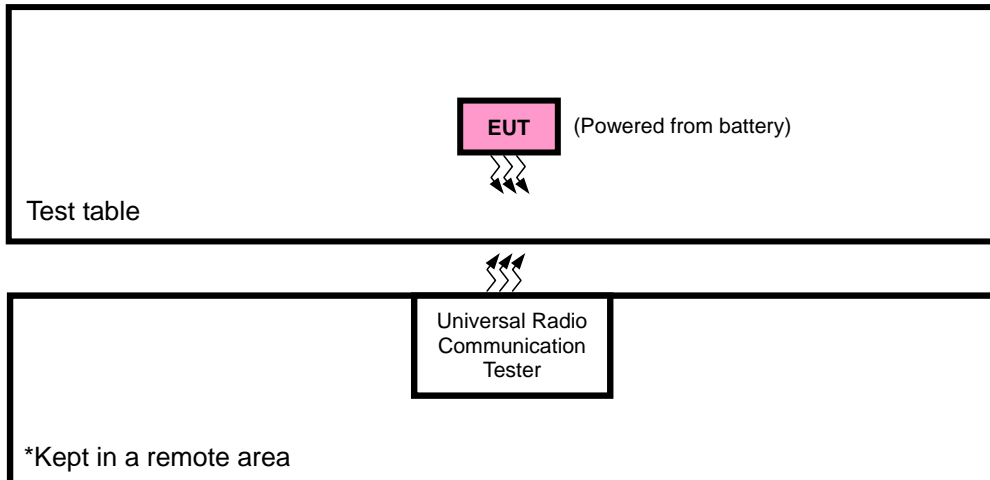
5. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

2.2 CONFIGURATION OF SYSTEM UNDER TEST

FOR RADIATION EMISSION TEST



FOR CONDUCTED & E.R.P./E.I.R.P 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 | N/A | N/A | N/A | N/A | N/A |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS |
|-----|---|
| 1 | N/A |

2.4 DESCRIPTION OF TEST MODES

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case in ERP/EIRP and radiated emission was found when positioned on X-plane for LTE. 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 4

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

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

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

LTE BAND 12

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



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LTE BAND 13

| EUT CONFIGURE MODE | TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION | MODE |
|--------------------|-----------------------|-------------------|---------------------|-------------------|--------------------|---------------------|
| B | ERP | 23205 to 23255 | 23205, 23230, 23255 | 5MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 23230 | 23230 | 10MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| B | FREQUENCY STABILITY | 23205 to 23255 | 23205, 23255 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 23230 | 23230 | 10MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| B | OCCUPIED BANDWIDTH | 23205 to 23255 | 23205, 23230, 23255 | 5MHz | QPSK, 16QAM, 64QAM | 25 RB / 0 RB Offset |
| | | 23230 | 23230 | 10MHz | QPSK, 16QAM, 64QAM | 50 RB / 0 RB Offset |
| B | PEAK TO AVERAGE RATIO | 23205 to 23255 | 23205, 23230, 23255 | 5MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 23230 | 23230 | 10MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| B | BAND EDGE | 23205 to 23255 | 23205 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | | | | | | 25 RB / 0 RB Offset |
| | | | 23255 | 5MHz | QPSK | 1 RB / 24 RB Offset |
| | | 23230 | 23230 | 10MHz | QPSK | 25 RB / 0 RB Offset |
| | | | | | | 1 RB / 0 RB Offset |
| | | | 23230 | 10MHz | QPSK | 50 RB / 0 RB Offset |
| B | CONDCUDED EMISSION | 23205 to 23255 | 23205, 23230, 23255 | 5MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| | | 23230 | 23230 | 10MHz | QPSK, 16QAM | 1 RB / 0 RB Offset |
| A | RADIATED EMISSION | 23205 to 23255 | 23230 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | | 23230 | 23230 | 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.

TEST CONDITION:

| TEST ITEM | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|-----------------------|--------------------------|---------------------|-------------|
| EIRP(ERP) | 24deg. C, 60%RH | 3.7Vdc from Battery | Aaron Liang |
| FREQUENCY STABILITY | 24deg. C, 60%RH | DC 3.4V/3.7V/4.2V | Aaron Liang |
| OCCUPIED BANDWIDTH | 24deg. C, 60%RH | 3.7Vdc from Battery | Aaron Liang |
| PEAK TO AVERAGE RATIO | 24deg. C, 60%RH | 3.7Vdc from Battery | Aaron Liang |
| BAND EDGE | 24deg. C, 60%RH | 3.7Vdc from Battery | Aaron Liang |
| CONDCUDED EMISSION | 24deg. C, 60%RH | 3.7Vdc from Battery | Aaron Liang |
| RADIATED EMISSION | 25deg. C, 59%RH | 5Vdc from adapter | Aaron Liang |



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2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2

FCC 47 CFR Part 27

KDB 971168 D01 Power Meas License Digital Systems v03

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(d)(4) Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.

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

3.1.2 TEST PROCEDURES

EIRP / ERP MEASUREMENT:

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

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

Where:

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

(expressed in the same units as P_{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:

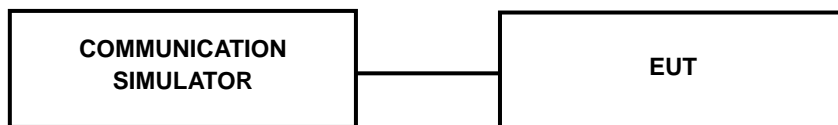
- a. The EUT was set up for the maximum power with LTE link data modulation and link up with simulator.
- b. Set the EUT to transmit under low, middle and high channel and record the power level shown on simulator.



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3.1.3 TEST SETUP

CONDUCTED POWER MEASUREMENT:



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



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3.1.4 TEST RESULTS

AVERAGE CONDUCTED OUTPUT POWER (dBm)

| LTE Band 4 | | | | | | | |
|------------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|-----|
| BW | Modulation | RB Size | RB Offset | Low CH 19957 | Mid CH 20175 | High CH 20393 | MPR |
| | | | | Frequency 1710.7 MHz | Frequency 1732.5 MHz | Frequency 1754.3 MHz | |
| 1.4MHz | QPSK | 1 | 0 | 23.44 | 23.44 | 23.46 | 0 |
| | | 1 | 2 | 23.38 | 23.44 | 23.5 | 0 |
| | | 1 | 5 | 23.45 | 23.38 | 23.47 | 0 |
| | | 3 | 0 | 23.28 | 23.39 | 23.27 | 0 |
| | | 3 | 1 | 23.36 | 23.4 | 23.33 | 0 |
| | | 3 | 3 | 23.29 | 23.48 | 23.38 | 0 |
| | | 6 | 0 | 22.31 | 22.42 | 22.49 | 1 |
| | 16QAM | 1 | 0 | 22.94 | 22.93 | 22.48 | 1 |
| | | 1 | 2 | 22.94 | 22.91 | 22.53 | 1 |
| | | 1 | 5 | 22.94 | 22.93 | 22.53 | 1 |
| | | 3 | 0 | 22.7 | 22.55 | 22.73 | 1 |
| | | 3 | 1 | 22.69 | 22.54 | 22.73 | 1 |
| | | 3 | 3 | 22.7 | 22.51 | 22.79 | 1 |
| | | 6 | 0 | 21.63 | 21.52 | 21.51 | 2 |
| BW | Modulation | RB Size | RB Offset | Low CH 19965 | Mid CH 20175 | High CH 20385 | MPR |
| | | | | Frequency 1711.5 MHz | Frequency 1732.5 MHz | Frequency 1753.5 MHz | |
| 3 MHz | QPSK | 1 | 0 | 23.25 | 23.37 | 23.49 | 0 |
| | | 1 | 7 | 23.21 | 23.37 | 23.44 | 0 |
| | | 1 | 14 | 23.21 | 23.38 | 23.43 | 0 |
| | | 8 | 0 | 22.29 | 22.38 | 22.4 | 1 |
| | | 8 | 3 | 22.35 | 22.41 | 22.41 | 1 |
| | | 8 | 7 | 22.32 | 22.33 | 22.34 | 1 |
| | | 15 | 0 | 22.29 | 22.36 | 22.39 | 1 |
| | 16QAM | 1 | 0 | 22.21 | 23.17 | 22.85 | 1 |
| | | 1 | 7 | 22.26 | 23.16 | 22.9 | 1 |
| | | 1 | 14 | 22.25 | 23.14 | 22.88 | 1 |
| | | 8 | 0 | 21.5 | 21.59 | 21.85 | 2 |
| | | 8 | 3 | 21.32 | 21.39 | 21.4 | 2 |
| | | 8 | 7 | 21.3 | 21.31 | 21.33 | 2 |
| | | 15 | 0 | 21.27 | 21.34 | 21.37 | 2 |

| LTE Band 4 | | | | | | | |
|------------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|-----|
| BW | Modulation | RB Size | RB Offset | Low CH 19975 | Mid CH 20175 | High CH 20375 | MPR |
| | | | | Frequency 1712.5 MHz | Frequency 1732.5 MHz | Frequency 1752.5 MHz | |
| 5 MHz | QPSK | 1 | 0 | 23.25 | 23.54 | 23.05 | 0 |
| | | 1 | 12 | 23.21 | 23.52 | 23.08 | 0 |
| | | 1 | 24 | 23.2 | 23.51 | 23.15 | 0 |
| | | 12 | 0 | 22.25 | 22.36 | 22.42 | 1 |
| | | 12 | 6 | 22.43 | 22.46 | 22.43 | 1 |
| | | 12 | 13 | 22.34 | 22.45 | 22.35 | 1 |
| | | 25 | 0 | 22.29 | 22.31 | 22.39 | 1 |
| | 16QAM | 1 | 0 | 22.07 | 22.13 | 21.92 | 1 |
| | | 1 | 12 | 22.07 | 22.19 | 21.84 | 1 |
| | | 1 | 24 | 22.05 | 22.18 | 21.88 | 1 |
| | | 12 | 0 | 21.52 | 21.4 | 21.25 | 2 |
| | | 12 | 6 | 21.46 | 21.49 | 21.26 | 2 |
| | | 12 | 13 | 21.43 | 21.43 | 21.23 | 2 |
| | | 25 | 0 | 21.51 | 21.43 | 21.5 | 2 |
| BW | Modulation | RB Size | RB Offset | Low CH 20000 | Mid CH 20175 | High CH 20350 | MPR |
| | | | | Frequency 1715 MHz | Frequency 1732.5 MHz | Frequency 1750 MHz | |
| 10 MHz | QPSK | 1 | 0 | 23.21 | 23.28 | 23.53 | 0 |
| | | 1 | 24 | 23.23 | 23.31 | 23.52 | 0 |
| | | 1 | 49 | 23.24 | 23.32 | 23.57 | 0 |
| | | 25 | 0 | 22.25 | 22.39 | 22.3 | 1 |
| | | 25 | 12 | 22.29 | 22.43 | 22.38 | 1 |
| | | 25 | 25 | 22.38 | 22.32 | 22.46 | 1 |
| | | 50 | 0 | 22.29 | 22.43 | 22.28 | 1 |
| | 16QAM | 1 | 0 | 22.2 | 22.67 | 23 | 1 |
| | | 1 | 24 | 22.16 | 22.7 | 22.92 | 1 |
| | | 1 | 49 | 22.22 | 22.69 | 22.93 | 1 |
| | | 25 | 0 | 21.46 | 21.56 | 21.7 | 2 |
| | | 25 | 12 | 21.53 | 21.49 | 21.68 | 2 |
| | | 25 | 25 | 21.59 | 21.54 | 21.69 | 2 |
| | | 50 | 0 | 21.38 | 21.43 | 21.54 | 2 |



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| LTE Band 4 | | | | | | | |
|------------|------------|---------|-----------|-------------------------|-------------------------|-------------------------|-----|
| BW | Modulation | RB Size | RB Offset | Low CH 20025 | Mid CH 20175 | High CH 20325 | MPR |
| | | | | Frequency 1717.5 MHz | Frequency 1732.5 MHz | Frequency 1747.5 MHz | |
| 15 MHz | QPSK | 1 | 0 | 23.25 | 23.22 | 23.38 | 0 |
| | | 1 | 37 | 23.22 | 23.29 | 23.33 | 0 |
| | | 1 | 74 | 23.25 | 23.34 | 23.39 | 0 |
| | | 36 | 0 | 22.23 | 22.4 | 22.46 | 1 |
| | | 36 | 19 | 22.32 | 22.33 | 22.33 | 1 |
| | | 36 | 39 | 22.32 | 22.39 | 22.29 | 1 |
| | | 75 | 0 | 22.4 | 22.29 | 22.31 | 1 |
| | 16QAM | 1 | 0 | 22.16 | 22.66 | 22.79 | 1 |
| | | 1 | 37 | 22.25 | 22.66 | 22.81 | 1 |
| | | 1 | 74 | 22.31 | 22.67 | 22.73 | 1 |
| | | 36 | 0 | 21.48 | 21.45 | 21.51 | 2 |
| | | 36 | 19 | 21.51 | 21.5 | 21.55 | 2 |
| | | 36 | 39 | 21.53 | 21.43 | 21.5 | 2 |
| | | 75 | 0 | 21.5 | 21.46 | 21.44 | 2 |
| BW | Modulation | RB Size | RB Offset | Low CH 20050 | Mid CH 20175 | High CH 20300 | MPR |
| | | | | Frequency 1720 MHz | Frequency 1732.5 MHz | Frequency 1745 MHz | |
| 20MHz | QPSK | 1 | 0 | 23.36 | 23.31 | 23.43 | 0 |
| | | 1 | 50 | 23.38 | 23.3 | 23.45 | 0 |
| | | 1 | 99 | 23.46 | 23.34 | 23.46 | 0 |
| | | 50 | 0 | 22.22 | 22.36 | 22.45 | 1 |
| | | 50 | 25 | 22.43 | 22.45 | 22.35 | 1 |
| | | 50 | 50 | 22.43 | 22.34 | 22.46 | 1 |
| | | 100 | 0 | 22.33 | 22.39 | 22.26 | 1 |
| | 16QAM | 1 | 0 | 22.3 | 22.45 | 23.22 | 1 |
| | | 1 | 50 | 22.37 | 22.5 | 23.24 | 1 |
| | | 1 | 99 | 22.39 | 22.46 | 23.21 | 1 |
| | | 50 | 0 | 21.45 | 21.58 | 21.43 | 2 |
| | | 50 | 25 | 21.48 | 21.54 | 21.38 | 2 |
| | | 50 | 50 | 21.53 | 21.56 | 21.43 | 2 |
| | | 100 | 0 | 22.33 | 22.27 | 22.26 | 2 |

| LTE Band 12 | | | | | | | |
|-------------|------------|---------|-----------|---------------------|---------------------|---------------------|-----|
| BW | Modulation | RB Size | RB Offset | Low CH 23017 | Mid CH 23095 | High CH 23173 | MPR |
| | | | | Frequency 699.7 MHz | Frequency 707.5 MHz | Frequency 715.3 MHz | |
| 1.4 MHz | QPSK | 1 | 0 | 23.66 | 23.41 | 23.65 | 0 |
| | | 1 | 2 | 23.64 | 23.5 | 23.59 | 0 |
| | | 1 | 5 | 23.69 | 23.55 | 23.63 | 0 |
| | | 3 | 0 | 23.58 | 23.45 | 23.51 | 0 |
| | | 3 | 1 | 23.6 | 23.53 | 23.48 | 0 |
| | | 3 | 3 | 23.55 | 23.5 | 23.66 | 0 |
| | | 6 | 0 | 22.7 | 22.47 | 22.43 | 1 |
| | 16QAM | 1 | 0 | 23.26 | 23.15 | 23.01 | 1 |
| | | 1 | 2 | 23.34 | 23.23 | 23.01 | 1 |
| | | 1 | 5 | 23.33 | 23.19 | 23 | 1 |
| | | 3 | 0 | 22.88 | 22.72 | 22.6 | 1 |
| | | 3 | 1 | 22.83 | 22.68 | 22.74 | 1 |
| | | 3 | 3 | 22.9 | 22.69 | 22.76 | 1 |
| | | 6 | 0 | 22.05 | 22.07 | 21.86 | 2 |
| LTE Band 12 | | | | | | | |
| BW | Modulation | RB Size | RB Offset | Low CH 23025 | Mid CH 23095 | High CH 23165 | MPR |
| | | | | Frequency 700.5 MHz | Frequency 707.5 MHz | Frequency 714.5 MHz | |
| 3 MHz | QPSK | 1 | 0 | 23.53 | 23.47 | 23.69 | 0 |
| | | 1 | 7 | 23.55 | 23.52 | 23.68 | 0 |
| | | 1 | 14 | 23.57 | 23.47 | 23.59 | 0 |
| | | 8 | 0 | 22.56 | 22.51 | 22.47 | 1 |
| | | 8 | 3 | 22.7 | 22.42 | 22.54 | 1 |
| | | 8 | 7 | 22.58 | 22.73 | 22.42 | 1 |
| | | 15 | 0 | 22.56 | 22.78 | 22.63 | 1 |
| | 16QAM | 1 | 0 | 22.91 | 22.89 | 23.07 | 1 |
| | | 1 | 7 | 22.97 | 22.99 | 23.07 | 1 |
| | | 1 | 14 | 22.85 | 22.98 | 22.99 | 1 |
| | | 8 | 0 | 22.03 | 21.93 | 21.48 | 2 |
| | | 8 | 3 | 21.71 | 21.57 | 21.43 | 2 |
| | | 8 | 7 | 21.54 | 21.7 | 21.39 | 2 |
| | | 15 | 0 | 21.64 | 21.74 | 21.6 | 2 |

| LTE Band 12 | | | | | | | |
|-------------|------------|---------|-----------|------------------------|------------------------|------------------------|-----|
| BW | Modulation | RB Size | RB Offset | Low CH 23035 | Mid CH 23095 | High CH 23155 | MPR |
| | | | | Frequency 701.5 MHz | Frequency 707.5 MHz | Frequency 713.5 MHz | |
| 5 MHz | QPSK | 1 | 0 | 23.58 | 23.53 | 23.49 | 0 |
| | | 1 | 12 | 23.65 | 23.58 | 23.56 | 0 |
| | | 1 | 24 | 23.58 | 23.87 | 23.53 | 0 |
| | | 12 | 0 | 22.74 | 22.59 | 22.59 | 1 |
| | | 12 | 6 | 22.6 | 22.64 | 22.5 | 1 |
| | | 12 | 13 | 22.58 | 22.54 | 22.42 | 1 |
| | | 25 | 0 | 22.52 | 22.67 | 22.58 | 1 |
| | 16QAM | 1 | 0 | 22.66 | 22.33 | 22.55 | 1 |
| | | 1 | 12 | 22.61 | 22.36 | 22.6 | 1 |
| | | 1 | 24 | 22.49 | 22.62 | 22.39 | 1 |
| | | 12 | 0 | 21.92 | 21.79 | 21.61 | 2 |
| | | 12 | 6 | 21.59 | 21.67 | 21.62 | 2 |
| | | 12 | 13 | 21.56 | 21.7 | 21.55 | 2 |
| | | 25 | 0 | 21.5 | 21.76 | 21.65 | 2 |
| LTE Band 12 | | | | | | | |
| BW | Modulation | RB Size | RB Offset | Low CH 23060 | Mid CH 23095 | High CH 23130 | MPR |
| | | | | Frequency 704 MHz | Frequency 707.5 MHz | Frequency 711 MHz | |
| 10 MHz | QPSK | 1 | 0 | 23.46 | 23.53 | 23.64 | 0 |
| | | 1 | 24 | 23.47 | 23.55 | 23.93 | 0 |
| | | 1 | 49 | 23.46 | 23.41 | 23.72 | 0 |
| | | 25 | 0 | 22.52 | 22.54 | 22.7 | 1 |
| | | 25 | 12 | 22.66 | 22.63 | 22.71 | 1 |
| | | 25 | 25 | 22.6 | 22.75 | 22.55 | 1 |
| | | 50 | 0 | 22.57 | 22.66 | 22.68 | 1 |
| | 16QAM | 1 | 0 | 22.89 | 22.9 | 23.01 | 1 |
| | | 1 | 24 | 22.82 | 23.01 | 23.14 | 1 |
| | | 1 | 49 | 22.86 | 22.84 | 22.91 | 1 |
| | | 25 | 0 | 21.59 | 21.9 | 21.89 | 2 |
| | | 25 | 12 | 21.86 | 21.81 | 21.95 | 2 |
| | | 25 | 25 | 21.84 | 21.78 | 21.92 | 2 |
| | | 50 | 0 | 21.63 | 21.72 | 21.75 | 2 |

| LTE Band 13 | | | | | | | |
|-------------|------------|---------|-----------|---------------------|---------------------|---------------------|-----|
| BW | Modulation | RB Size | RB Offset | Low CH 23205 | Mid CH 23230 | High CH 23255 | MPR |
| | | | | Frequency 779.5 MHz | Frequency 782.0 MHz | Frequency 784.5 MHz | |
| 5 MHz | QPSK | 1 | 0 | 23.22 | 23.39 | 23.12 | 0 |
| | | 1 | 12 | 23.14 | 23.29 | 23.08 | 0 |
| | | 1 | 24 | 23.23 | 23.19 | 23.24 | 0 |
| | | 12 | 0 | 22.44 | 22.2 | 22.4 | 1 |
| | | 12 | 6 | 22.31 | 22.28 | 22.36 | 1 |
| | | 12 | 13 | 22.13 | 22.5 | 22.31 | 1 |
| | 16QAM | 25 | 0 | 22.23 | 22.29 | 22.34 | 1 |
| | | 1 | 0 | 22.3 | 22.07 | 22.27 | 1 |
| | | 1 | 12 | 22.27 | 22.14 | 22.43 | 1 |
| | | 1 | 24 | 22.3 | 22.16 | 22.26 | 1 |
| | | 12 | 0 | 21.58 | 21.23 | 21.45 | 2 |
| | | 12 | 6 | 21.3 | 21.23 | 21.42 | 2 |
| | | 12 | 13 | 21.33 | 21.52 | 21.24 | 2 |
| | | 25 | 0 | 21.22 | 21.16 | 21.4 | 2 |

| LTE Band 13 | | | | | |
|-------------|------------|---------|-----------|---------------------|-----|
| BW | Modulation | RB Size | RB Offset | CH 23230 | MPR |
| | | | | Frequency 782.0 MHz | |
| 10 MHz | QPSK | 1 | 0 | 23.23 | 0 |
| | | 1 | 24 | 23.17 | 0 |
| | | 1 | 49 | 23.16 | 0 |
| | | 25 | 0 | 22.34 | 1 |
| | | 25 | 12 | 22.28 | 1 |
| | | 25 | 25 | 22.37 | 1 |
| | | 50 | 0 | 22.3 | 1 |
| | 16QAM | 1 | 0 | 22.51 | 1 |
| | | 1 | 24 | 22.53 | 1 |
| | | 1 | 49 | 22.56 | 1 |
| | | 25 | 0 | 21.34 | 2 |
| | | 25 | 12 | 21.35 | 2 |
| | | 25 | 25 | 21.61 | 2 |
| | | 50 | 0 | 21.06 | 2 |



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Test Report No.: RF200327S003-3

EIRP

LTE BAND 4

CHANNEL BANDWIDTH: 1.4MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 19957 | 1710.7 | 23.45 | 1.5 | 24.95 | 312.61 | 1 |
| 20175 | 1732.5 | 23.48 | 1.5 | 24.98 | 314.77 | 1 |
| 20393 | 1754.3 | 23.5 | 1.5 | 25 | 316.23 | 1 |

CHANNEL BANDWIDTH: 1.4MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 19957 | 1710.7 | 22.94 | 1.5 | 24.44 | 277.97 | 1 |
| 20175 | 1732.5 | 22.93 | 1.5 | 24.43 | 277.33 | 1 |
| 20393 | 1754.3 | 22.79 | 1.5 | 24.29 | 268.53 | 1 |

LTE BAND 4

CHANNEL BANDWIDTH: 3MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 19965 | 1711.5 | 23.25 | 1.5 | 24.75 | 298.54 | 1 |
| 20175 | 1732.5 | 23.38 | 1.5 | 24.88 | 307.61 | 1 |
| 20385 | 1753.5 | 23.49 | 1.5 | 24.99 | 315.5 | 1 |

CHANNEL BANDWIDTH: 3MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 19965 | 1711.5 | 22.26 | 1.5 | 23.76 | 237.68 | 1 |
| 20175 | 1732.5 | 23.17 | 1.5 | 24.67 | 293.09 | 1 |
| 20385 | 1753.5 | 22.9 | 1.5 | 24.4 | 275.42 | 1 |

LTE BAND 4

CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 19975 | 1712.5 | 23.25 | 1.5 | 24.75 | 298.54 | 1 |
| 20175 | 1732.5 | 23.54 | 1.5 | 25.04 | 319.15 | 1 |
| 20375 | 1752.5 | 23.15 | 1.5 | 24.65 | 291.74 | 1 |

CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 19975 | 1712.5 | 22.07 | 1.5 | 23.57 | 227.51 | 1 |
| 20175 | 1732.5 | 22.19 | 1.5 | 23.69 | 233.88 | 1 |
| 20375 | 1752.5 | 21.92 | 1.5 | 23.42 | 219.79 | 1 |

LTE BAND 4

CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 20000 | 1715 | 23.24 | 1.5 | 24.74 | 297.85 | 1 |
| 20175 | 1732.5 | 23.32 | 1.5 | 24.82 | 303.39 | 1 |
| 20350 | 1750 | 23.57 | 1.5 | 25.07 | 321.37 | 1 |

CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 20000 | 1715 | 22.22 | 1.5 | 23.72 | 235.5 | 1 |
| 20175 | 1732.5 | 22.7 | 1.5 | 24.2 | 263.03 | 1 |
| 20350 | 1750 | 23 | 1.5 | 24.5 | 281.84 | 1 |

LTE BAND 4

CHANNEL BANDWIDTH: 15MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 20025 | 1717.5 | 23.25 | 1.5 | 24.75 | 298.54 | 1 |
| 20175 | 1732.5 | 23.34 | 1.5 | 24.84 | 304.79 | 1 |
| 20325 | 1747.5 | 23.39 | 1.5 | 24.89 | 308.32 | 1 |

CHANNEL BANDWIDTH: 15MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 20025 | 1717.5 | 22.31 | 1.5 | 23.81 | 240.44 | 1 |
| 20175 | 1732.5 | 22.67 | 1.5 | 24.17 | 261.22 | 1 |
| 20325 | 1747.5 | 22.81 | 1.5 | 24.31 | 269.77 | 1 |

LTE BAND 4

CHANNEL BANDWIDTH: 20MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 20050 | 1720 | 23.46 | 1.5 | 24.96 | 313.33 | 1 |
| 20175 | 1732.5 | 23.34 | 1.5 | 24.84 | 304.79 | 1 |
| 20300 | 1745 | 23.46 | 1.5 | 24.96 | 313.33 | 1 |

CHANNEL BANDWIDTH: 20MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 20050 | 1720 | 22.39 | 1.5 | 23.89 | 244.91 | 1 |
| 20175 | 1732.5 | 22.5 | 1.5 | 24 | 251.19 | 1 |
| 20300 | 1745 | 23.24 | 1.5 | 24.74 | 297.85 | 1 |

REMARKS: 1. ERP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB) -2.15(dB).
: 2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss



BUREAU
VERITAS

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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 | 23.69 | 1 | 22.54 | 179.47 | 3 |
| 23095 | 707.5 | 23.55 | 1 | 22.4 | 173.78 | 3 |
| 23171 | 715.3 | 23.66 | 1 | 22.51 | 178.24 | 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 | 23.34 | 1 | 22.19 | 165.58 | 3 |
| 23095 | 707.5 | 23.23 | 1 | 22.08 | 161.44 | 3 |
| 23171 | 715.3 | 23.01 | 1 | 21.86 | 153.46 | 3 |

LTE BAND 12

CHANNEL BANDWIDTH: 3MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _{T-Lc} (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|------------------------|-----------|----------|-----------|
| 23025 | 700.5 | 23.57 | 1 | 22.42 | 174.58 | 3 |
| 23095 | 707.5 | 23.52 | 1 | 22.37 | 172.58 | 3 |
| 23165 | 714.5 | 23.69 | 1 | 22.54 | 179.47 | 3 |

CHANNEL BANDWIDTH: 3MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _{T-Lc} (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|------------------------|-----------|----------|-----------|
| 23025 | 700.5 | 22.97 | 1 | 21.82 | 152.05 | 3 |
| 23095 | 707.5 | 22.99 | 1 | 21.84 | 152.76 | 3 |
| 23165 | 714.5 | 23.07 | 1 | 21.92 | 155.6 | 3 |

LTE BAND 12

CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 23035 | 701.5 | 23.65 | 1 | 22.5 | 177.83 | 3 |
| 23095 | 707.5 | 23.87 | 1 | 22.72 | 187.07 | 3 |
| 23155 | 713.5 | 23.56 | 1 | 22.41 | 174.18 | 3 |

CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 23035 | 701.5 | 22.66 | 1 | 21.51 | 141.58 | 3 |
| 23095 | 707.5 | 22.62 | 1 | 21.47 | 140.28 | 3 |
| 23155 | 713.5 | 22.6 | 1 | 21.45 | 139.64 | 3 |

LTE BAND 12

CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 23060 | 804 | 23.47 | 1 | 22.32 | 170.61 | 3 |
| 23095 | 707.5 | 23.55 | 1 | 22.4 | 173.78 | 3 |
| 23130 | 811 | 23.93 | 1 | 22.78 | 189.67 | 3 |

CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _c (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 23060 | 804 | 22.89 | 1 | 21.74 | 149.28 | 3 |
| 23095 | 707.5 | 23.01 | 1 | 21.86 | 153.46 | 3 |
| 23130 | 811 | 23.14 | 1 | 21.99 | 158.12 | 3 |

REMARKS: 1. ERP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB) -2.15(dB).
: 2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

LTE BAND 13

CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 23205 | 779.5 | 23.23 | 1 | 22.08 | 161.44 | 3 |
| 23230 | 782 | 23.39 | 1 | 22.24 | 167.49 | 3 |
| 23255 | 784.5 | 23.24 | 1 | 22.09 | 161.81 | 3 |

CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 23205 | 779.5 | 22.3 | 1 | 21.15 | 130.32 | 3 |
| 23230 | 782 | 22.16 | 1 | 21.01 | 126.18 | 3 |
| 23255 | 784.5 | 22.43 | 1 | 21.28 | 134.28 | 3 |

LTE BAND 13

CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 23230 | 782 | 23.23 | 1 | 22.08 | 161.44 | 3 |

CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | G _T -L _C (dB) | ERP (dBm) | ERP (mW) | Limit (W) |
|---------|-----------------|-----------------------|-------------------------------------|-----------|----------|-----------|
| 23230 | 782 | 22.56 | 1 | 21.41 | 138.36 | 3 |

REMARKS: 1. ERP Output Power (dBm) = SPA LVL (dBm) + Correction Factor (dB) -2.15(dB).
: 2. Correction factor (dB) = Free Space Loss + Antenna Factor + Cable Loss

3.2 FREQUENCY STABILITY MEASUREMENT

3.2.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

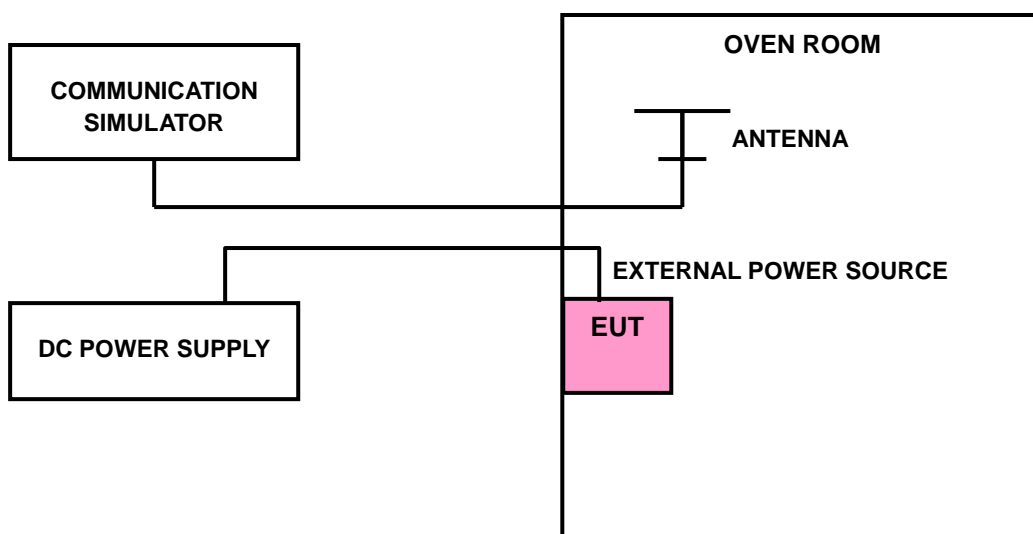
The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

3.2.2 TEST PROCEDURE

- a. 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.
- b. 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.
- c. 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

LTE BAND 4

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 1.4MHz | | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| 3.8 | 0.1028 | 0.104 | 2.5 |
| 3.55(BEP) | 0.1168 | 0.1063 | 2.5 |
| 4.35 | 0.1215 | 0.1053 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 1.4MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | 0.1198 | 0.1064 | 2.5 |
| -20 | 0.1132 | 0.1051 | 2.5 |
| -10 | 0.1018 | 0.0906 | 2.5 |
| 0 | 0.0979 | 0.0879 | 2.5 |
| 10 | 0.1128 | 0.077 | 2.5 |
| 20 | 0.1269 | 0.0789 | 2.5 |
| 30 | 0.127 | 0.0898 | 2.5 |
| 40 | 0.1185 | 0.0807 | 2.5 |
| 50 | 0.1189 | 0.0827 | 2.5 |



Test Report No.: RF200327S003-3

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 3MHz | | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| 3.8 | 0.0915 | 0.1049 | 2.5 |
| 3.55(BEP) | 0.0831 | 0.0949 | 2.5 |
| 4.35 | 0.0841 | 0.1068 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 3MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | 0.0967 | 0.089 | 2.5 |
| -20 | 0.1086 | 0.0908 | 2.5 |
| -10 | 0.1189 | 0.0888 | 2.5 |
| 0 | 0.1122 | 0.077 | 2.5 |
| 10 | 0.1026 | 0.0797 | 2.5 |
| 20 | 0.0919 | 0.0856 | 2.5 |
| 30 | 0.0802 | 0.0746 | 2.5 |
| 40 | 0.0715 | 0.0671 | 2.5 |
| 50 | 0.0567 | 0.0538 | 2.5 |



Test Report No.: RF200327S003-3

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 5MHz | | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| 3.8 | 0.1111 | 0.1157 | 2.5 |
| 3.55(BEP) | 0.1032 | 0.1262 | 2.5 |
| 4.35 | 0.0989 | 0.1349 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | 0.0909 | 0.1257 | 2.5 |
| -20 | 0.0881 | 0.1345 | 2.5 |
| -10 | 0.0801 | 0.1488 | 2.5 |
| 0 | 0.095 | 0.1521 | 2.5 |
| 10 | 0.08 | 0.139 | 2.5 |
| 20 | 0.076 | 0.1299 | 2.5 |
| 30 | 0.0906 | 0.1252 | 2.5 |
| 40 | 0.0895 | 0.1239 | 2.5 |
| 50 | 0.0967 | 0.1256 | 2.5 |



Test Report No.: RF200327S003-3

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 10MHz | | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| 3.8 | 0.1084 | 0.1014 | 2.5 |
| 3.55(BEP) | 0.1202 | 0.096 | 2.5 |
| 4.35 | 0.1136 | 0.1077 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | 0.1349 | 0.1103 | 2.5 |
| -20 | 0.1235 | 0.1221 | 2.5 |
| -10 | 0.1135 | 0.1124 | 2.5 |
| 0 | 0.124 | 0.1218 | 2.5 |
| 10 | 0.1251 | 0.1145 | 2.5 |
| 20 | 0.1201 | 0.1248 | 2.5 |
| 30 | 0.1285 | 0.1279 | 2.5 |
| 40 | 0.1364 | 0.1242 | 2.5 |
| 50 | 0.1217 | 0.1372 | 2.5 |



Test Report No.: RF200327S003-3

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 15MHz | | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| 3.8 | 0.1055 | 0.0967 | 2.5 |
| 3.55(BEP) | 0.1131 | 0.1073 | 2.5 |
| 4.35 | 0.1135 | 0.1148 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 15MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | 0.1047 | 0.1126 | 2.5 |
| -20 | 0.1142 | 0.1084 | 2.5 |
| -10 | 0.1163 | 0.1178 | 2.5 |
| 0 | 0.1173 | 0.1137 | 2.5 |
| 10 | 0.1285 | 0.1091 | 2.5 |
| 20 | 0.1371 | 0.0993 | 2.5 |
| 30 | 0.1256 | 0.0946 | 2.5 |
| 40 | 0.1125 | 0.0828 | 2.5 |
| 50 | 0.0987 | 0.0679 | 2.5 |



Test Report No.: RF200327S003-3

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 20MHz | | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| 3.8 | 0.0007 | 0.0009 | 2.5 |
| 3.55(BEP) | 0.0156 | 0.0054 | 2.5 |
| 4.35 | 0.0208 | 0.0011 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 20MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | 0.0146 | 0.0199 | 2.5 |
| -20 | 0.0196 | 0.0201 | 2.5 |
| -10 | 0.0156 | 0.0147 | 2.5 |
| 0 | 0.0119 | 0.0014 | 2.5 |
| 10 | 0.0232 | -0.0073 | 2.5 |
| 20 | 0.0278 | 0.007 | 2.5 |
| 30 | 0.029 | 0.0054 | 2.5 |
| 40 | 0.0169 | 0.0027 | 2.5 |
| 50 | 0.0171 | 0.0104 | 2.5 |



LTE BAND 12

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 1.4MHz | | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| 3.8 | 0.1061 | 0.0969 | 2.5 |
| 3.55(BEP) | 0.1015 | 0.0976 | 2.5 |
| 4.35 | 0.1144 | 0.1068 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 1.4MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | 0.1137 | 0.0935 | 2.5 |
| -20 | 0.1156 | 0.0862 | 2.5 |
| -10 | 0.1186 | 0.074 | 2.5 |
| 0 | 0.1082 | 0.0718 | 2.5 |
| 10 | 0.1045 | 0.063 | 2.5 |
| 20 | 0.0904 | 0.0745 | 2.5 |
| 30 | 0.1044 | 0.0756 | 2.5 |
| 40 | 0.1064 | 0.0626 | 2.5 |
| 50 | 0.1144 | 0.0651 | 2.5 |



Test Report No.: RF200327S003-3

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 3MHz | | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| 3.8 | 0.1047 | 0.1042 | 2.5 |
| 3.55(BEP) | -0.0011 | -0.0011 | 2.5 |
| 4.35 | 0.0009 | 0.001 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 3MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0107 | 0.0093 | 2.5 |
| -20 | 0.0025 | 0.019 | 2.5 |
| -10 | 0.0002 | 0.0291 | 2.5 |
| 0 | 0.0143 | 0.0177 | 2.5 |
| 10 | 0.0103 | 0.0085 | 2.5 |
| 20 | 0.0234 | 0.0057 | 2.5 |
| 30 | 0.025 | 0.009 | 2.5 |
| 40 | 0.0237 | -0.0045 | 2.5 |
| 50 | 0.0308 | -0.0144 | 2.5 |



Test Report No.: RF200327S003-3

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 5MHz | | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| 3.8 | 0.1156 | 0.1001 | 2.5 |
| 3.55(BEP) | 0.1191 | 0.1116 | 2.5 |
| 4.35 | 0.1158 | 0.1232 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | 0.1337 | 0.0975 | 2.5 |
| -20 | 0.1407 | 0.0916 | 2.5 |
| -10 | 0.1456 | 0.0974 | 2.5 |
| 0 | 0.1364 | 0.1082 | 2.5 |
| 10 | 0.1255 | 0.0998 | 2.5 |
| 20 | 0.1338 | 0.1119 | 2.5 |
| 30 | 0.1299 | 0.1171 | 2.5 |
| 40 | 0.143 | 0.1275 | 2.5 |
| 50 | 0.1339 | 0.1242 | 2.5 |



Test Report No.: RF200327S003-3

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 10MHz | | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| 3.8 | 0.1183 | 0.107 | 2.5 |
| 3.55(BEP) | 0.1202 | 0.1212 | 2.5 |
| 4.35 | 0.1322 | 0.1293 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.55Vdc to 4.35Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 10MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | 0.1119 | 0.1222 | 2.5 |
| -20 | 0.1181 | 0.112 | 2.5 |
| -10 | 0.1109 | 0.1117 | 2.5 |
| 0 | 0.1238 | 0.1059 | 2.5 |
| 10 | 0.1335 | 0.1025 | 2.5 |
| 20 | 0.1373 | 0.0971 | 2.5 |
| 30 | 0.1467 | 0.1066 | 2.5 |
| 40 | 0.1476 | 0.0994 | 2.5 |
| 50 | 0.1538 | 0.0969 | 2.5 |



LTE BAND 13

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 5MHz | | LIMIT (ppm) |
|-----------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| 3.8 | 0.0908 | 0.1044 | 2.5 |
| 3.55(BEP) | 0.0847 | 0.1142 | 2.5 |
| 4.35 | 0.0763 | 0.1038 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.2Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (°C) | 5MHz | | LIMIT (ppm) |
|------------|-----------------------|--------------|-------------|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | 0.0975 | 0.1185 | 2.5 |
| -20 | 0.1057 | 0.1198 | 2.5 |
| -10 | 0.1132 | 0.1156 | 2.5 |
| 0 | 0.1257 | 0.1073 | 2.5 |
| 10 | 0.1282 | 0.1069 | 2.5 |
| 20 | 0.1175 | 0.0966 | 2.5 |
| 30 | 0.1271 | 0.1063 | 2.5 |
| 40 | 0.1304 | 0.1079 | 2.5 |
| 50 | 0.1199 | 0.1147 | 2.5 |
| 60 | 0.0975 | 0.1185 | 2.5 |



Test Report No.: RF200327S003-3

FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 10MHz | LIMIT (ppm) |
|-----------------|-----------------------|-------------|
| | FREQUENCY ERROR (ppm) | |
| | Channel 23230 | |
| 3.8 | 0.0949 | 2.5 |
| 3.55(BEP) | 0.089 | 2.5 |
| 4.35 | 0.0995 | 2.5 |

NOTE: The applicant defined the normal working voltage of the battery is from 3.5Vdc to 4.2Vdc.

FREQUENCY ERROR vs. TEMPERATURE.

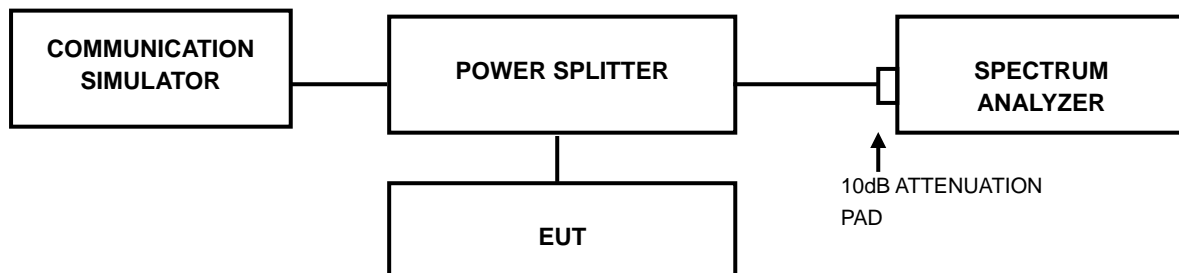
| TEMP. (°C) | 10MHz | LIMIT (ppm) |
|------------|-----------------------|-------------|
| | FREQUENCY ERROR (ppm) | |
| | Channel 23230 | |
| -30 | 0.0896 | 2.5 |
| -20 | 0.0966 | 2.5 |
| -10 | 0.0964 | 2.5 |
| 0 | 0.0957 | 2.5 |
| 10 | 0.1077 | 2.5 |
| 20 | 0.0983 | 2.5 |
| 30 | 0.1096 | 2.5 |
| 40 | 0.1119 | 2.5 |
| 50 | 0.0991 | 2.5 |
| 60 | 0.0896 | 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

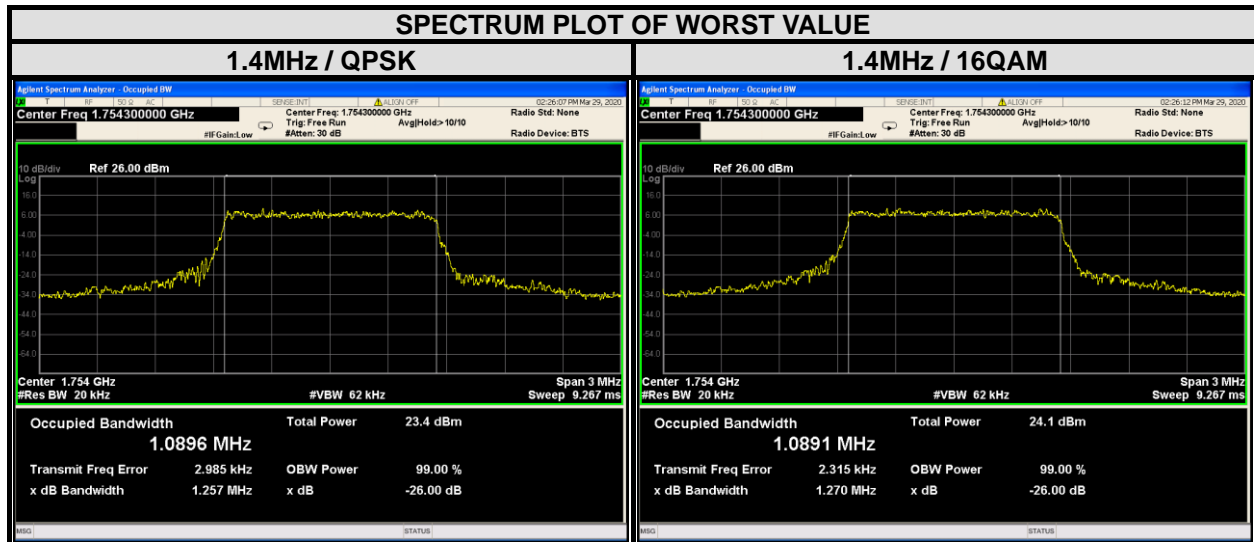
- The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.
- Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.



3.3.4 TEST RESULTS

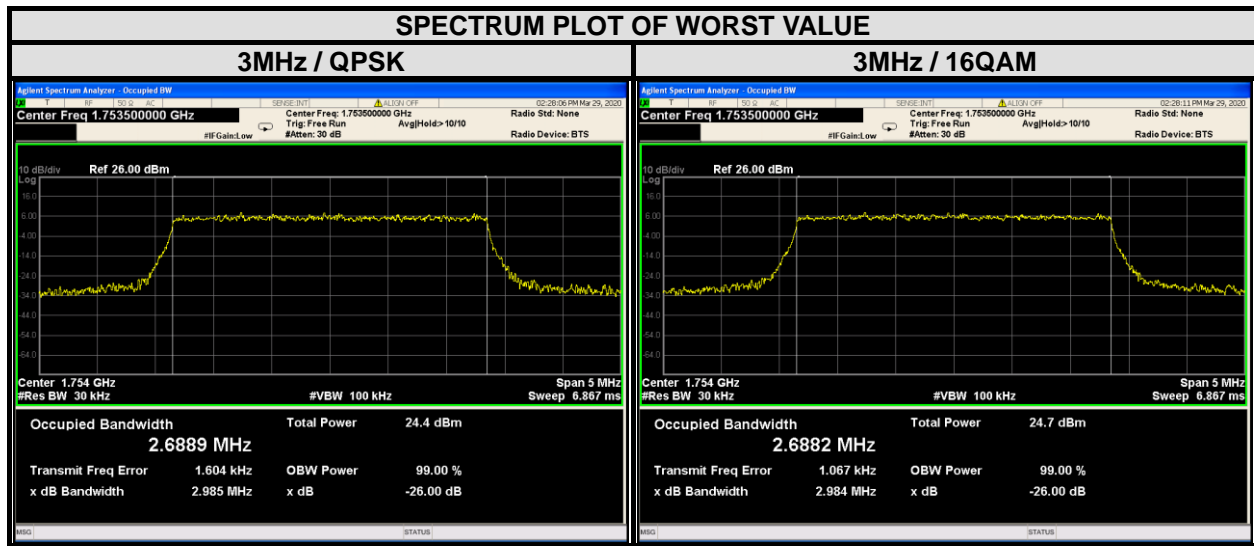
LTE BAND 4

| CHANNEL BANDWIDTH: 1.4MHz | | | | | | | |
|---------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 19957 | 1710.7 | 1.0873 | 1.081 | 19957 | 1710.7 | 1.276 | 1.267 |
| 20175 | 1732.5 | 1.0803 | 1.0838 | 20175 | 1732.5 | 1.248 | 1.276 |
| 20393 | 1754.3 | 1.0896 | 1.0891 | 20393 | 1754.3 | 1.257 | 1.27 |



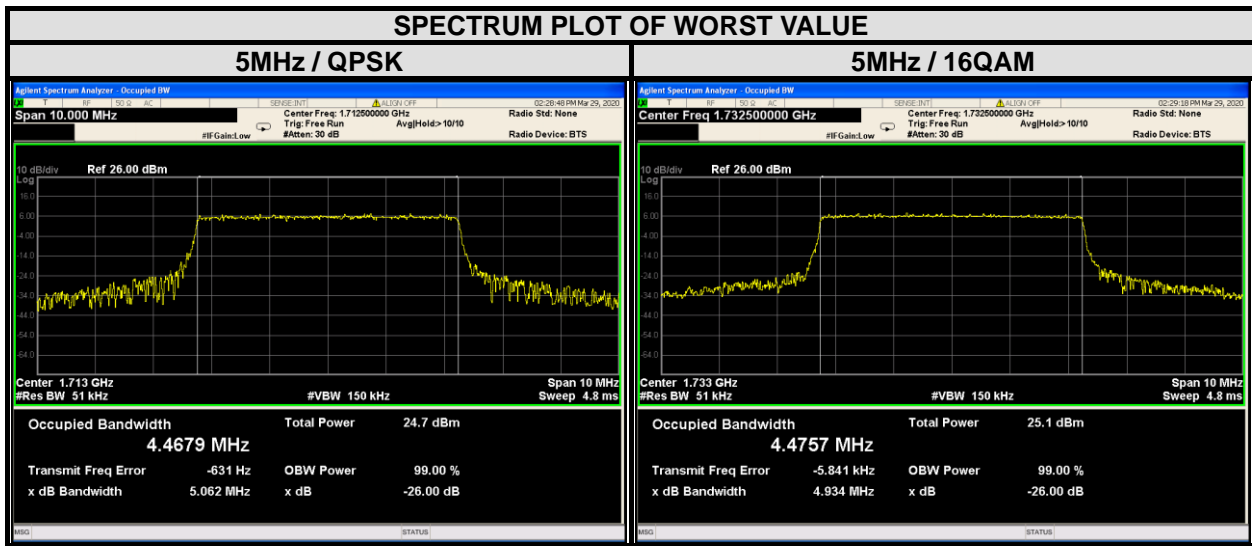
LTE BAND 4

| CHANNEL BANDWIDTH: 3MHz | | | | | | | |
|-------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 19965 | 1711.5 | 2.6846 | 2.684 | 19965 | 1711.5 | 2.966 | 3.017 |
| 20175 | 1732.5 | 2.6810 | 2.6836 | 20175 | 1732.5 | 2.998 | 2.995 |
| 20385 | 1753.5 | 2.6889 | 2.6882 | 20385 | 1753.5 | 2.985 | 2.984 |



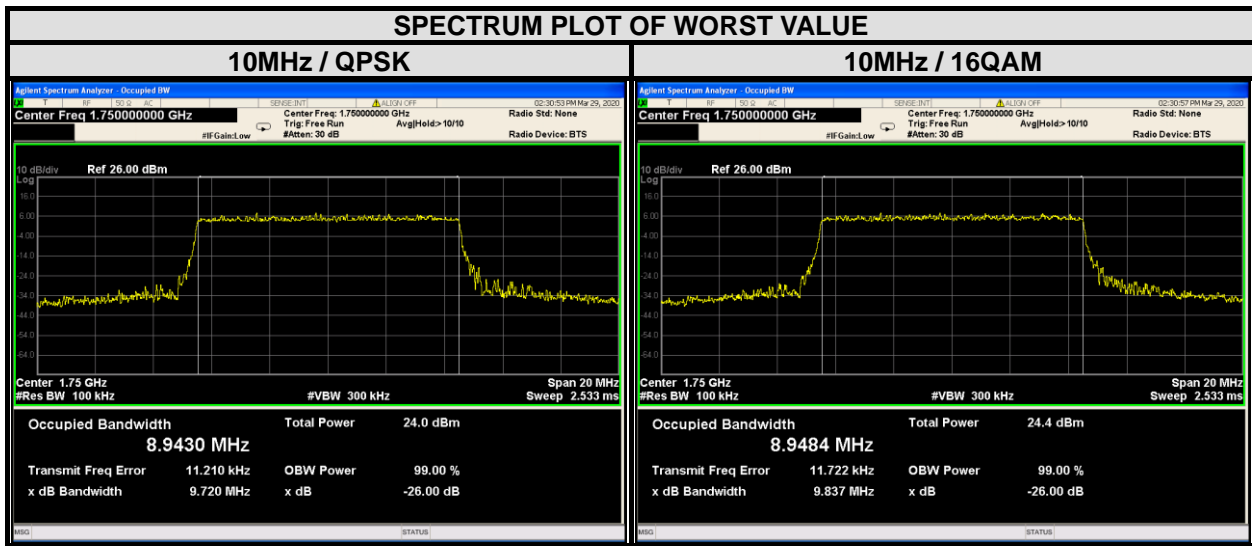
LTE BAND 4

| CHANNEL BANDWIDTH: 5MHz | | | | | | | |
|-------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 19975 | 1712.5 | 4.4679 | 4.4706 | 19975 | 1712.5 | 5.062 | 5.096 |
| 20175 | 1732.5 | 4.4657 | 4.4757 | 20175 | 1732.5 | 4.964 | 4.934 |
| 20375 | 1752.5 | 4.4578 | 4.4666 | 20375 | 1752.5 | 4.977 | 5.144 |



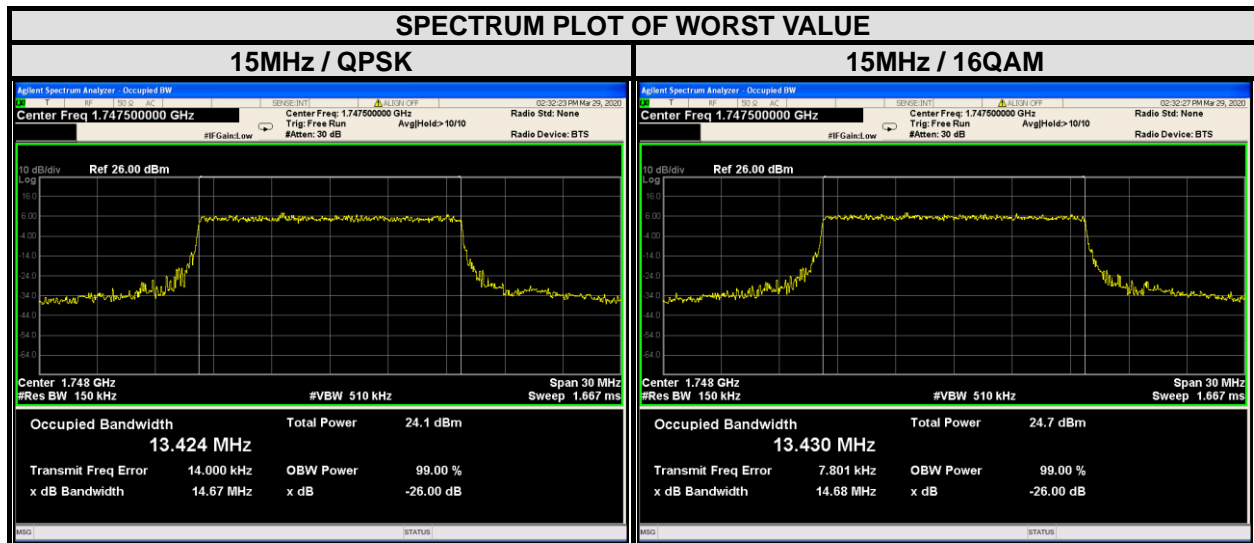
LTE BAND 4

| CHANNEL BANDWIDTH: 10MHz | | | | | | | |
|--------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 20000 | 1715 | 8.9402 | 8.9469 | 20000 | 1715 | 9.65 | 9.719 |
| 20175 | 1732.5 | 8.9327 | 8.9386 | 20175 | 1732.5 | 9.783 | 9.784 |
| 20350 | 1750 | 8.9430 | 8.9484 | 20350 | 1750 | 9.72 | 9.837 |



LTE BAND 4

| CHANNEL BANDWIDTH: 15MHz | | | | | | | |
|--------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 20025 | 1717.5 | 13.411 | 13.408 | 20025 | 14.7 | 14.76 | 14.7 |
| 20175 | 1732.5 | 13.387 | 13.369 | 20175 | 14.77 | 14.91 | 14.77 |
| 20325 | 1747.5 | 13.424 | 13.430 | 20325 | 14.67 | 14.68 | 14.67 |





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LTE BAND 4

| CHANNEL BANDWIDTH: 20MHz | | | | | | | |
|--------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 20050 | 1720 | 17.851 | 17.846 | 20050 | 1720 | 19.13 | 18.99 |
| 20175 | 1732.5 | 17.859 | 17.854 | 20175 | 1732.5 | 19.2 | 19.2 |
| 20300 | 1745 | 17.942 | 17.888 | 20300 | 1745 | 19.65 | 19.54 |



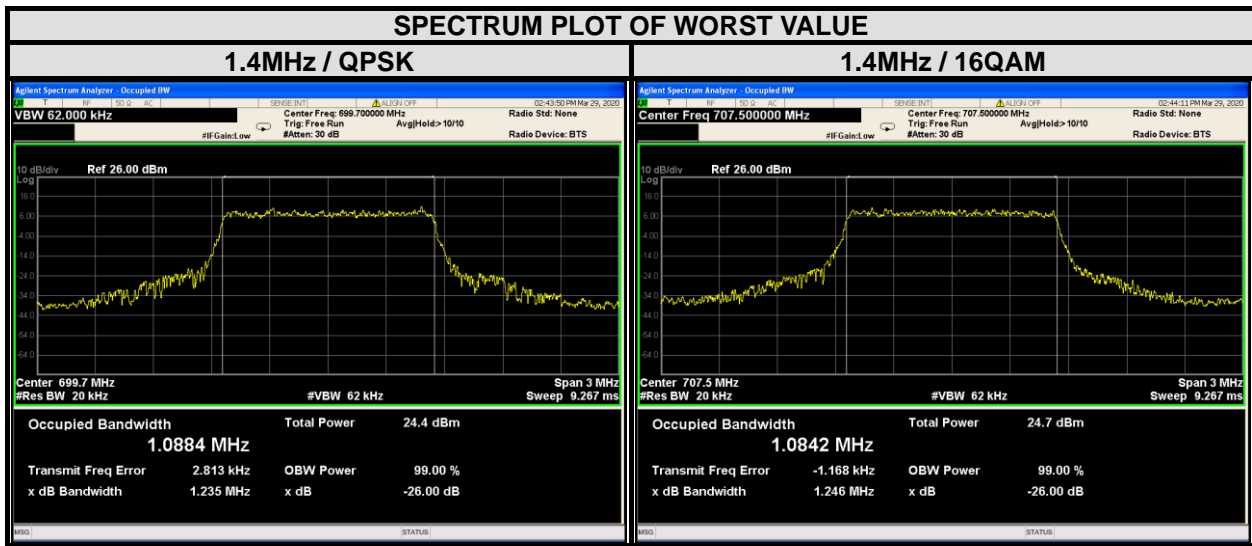


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Test Report No.: RF200327S003-3

LTE BAND 12

| CHANNEL BANDWIDTH: 1.4MHz | | | | | | | |
|---------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 23017 | 699.7 | 1.0884 | 1.0905 | 23017 | 699.7 | 1.235 | 1.26 |
| 23095 | 707.5 | 1.0839 | 1.0842 | 23095 | 707.5 | 1.246 | 1.246 |
| 23173 | 715.3 | 1.0840 | 1.0839 | 23173 | 715.3 | 1.271 | 1.271 |



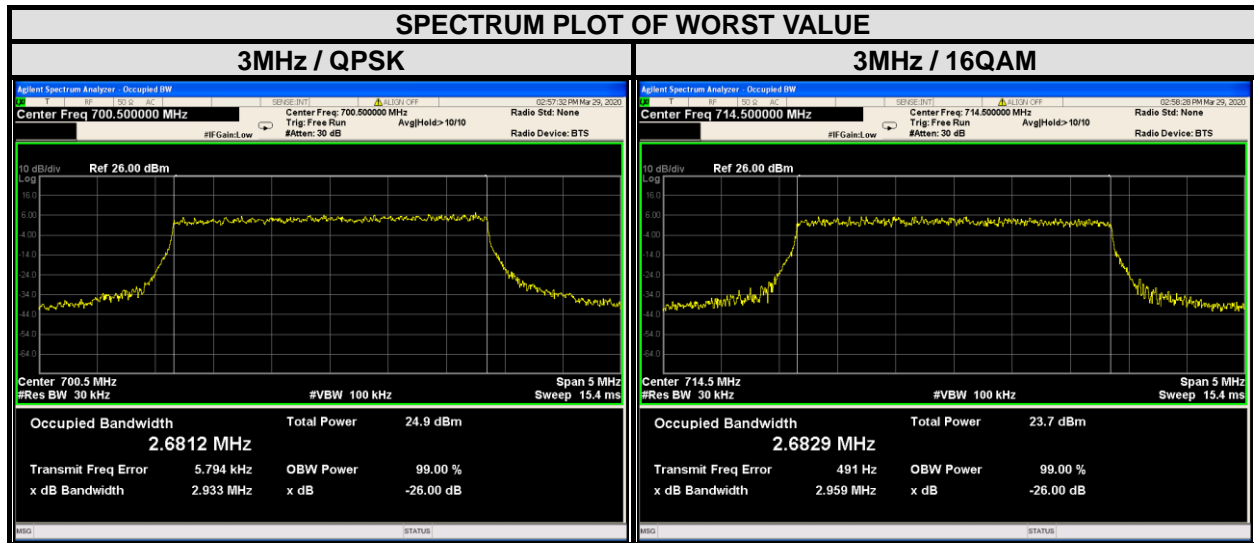


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Test Report No.: RF200327S003-3

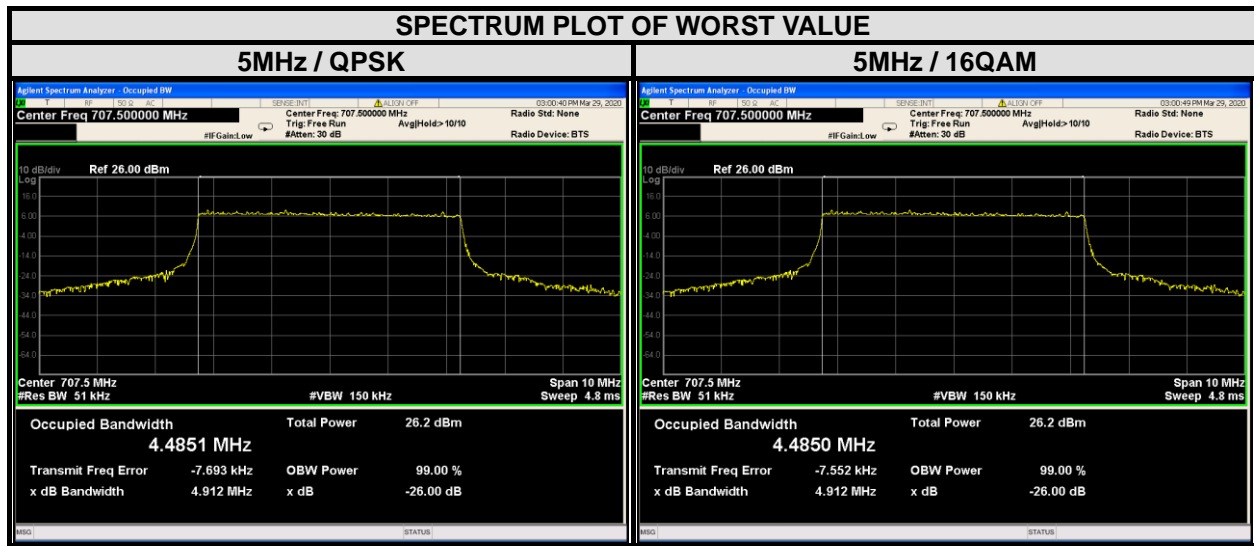
LTE BAND 12

| CHANNEL BANDWIDTH: 3MHz | | | | | | | |
|-------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 23025 | 700.5 | 2.6812 | 2.6816 | 23025 | 700.5 | 2.933 | 2.921 |
| 23095 | 707.5 | 2.6808 | 2.6819 | 23095 | 707.5 | 2.942 | 2.929 |
| 23165 | 714.5 | 2.6806 | 2.6829 | 23165 | 714.5 | 2.938 | 2.959 |



LTE BAND 12

| CHANNEL BANDWIDTH: 5MHz | | | | | | | |
|-------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 23035 | 701.5 | 4.4790 | 4.4788 | 23035 | 701.5 | 5.001 | 5.001 |
| 23095 | 707.5 | 4.4851 | 4.4850 | 23095 | 707.5 | 4.912 | 4.912 |
| 23155 | 713.5 | 4.4503 | 4.4537 | 23155 | 713.5 | 5.034 | 5.037 |



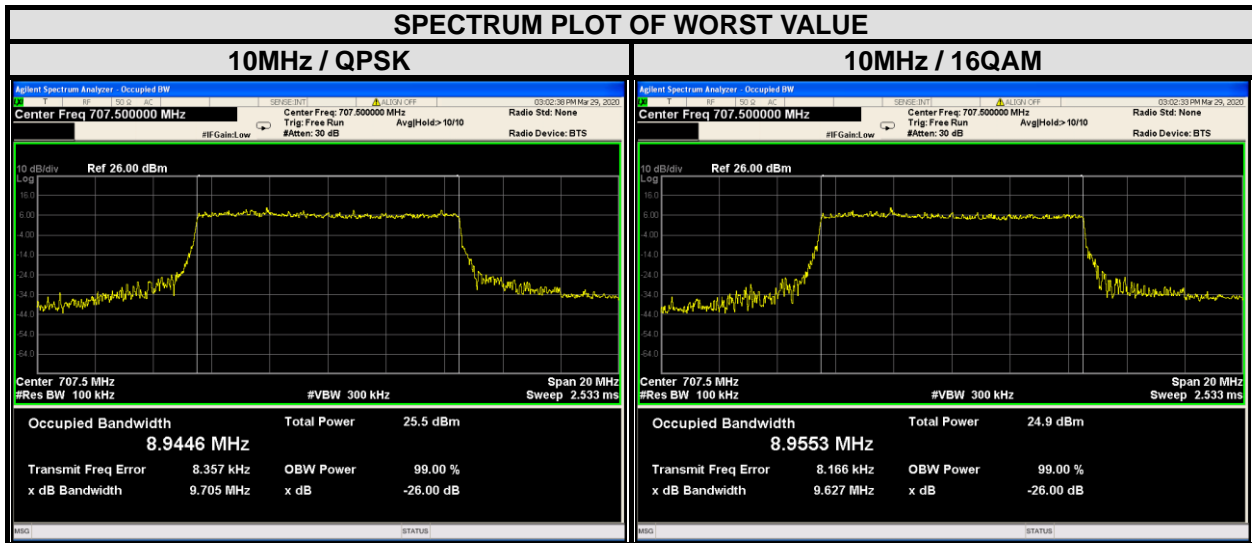


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Test Report No.: RF200327S003-3

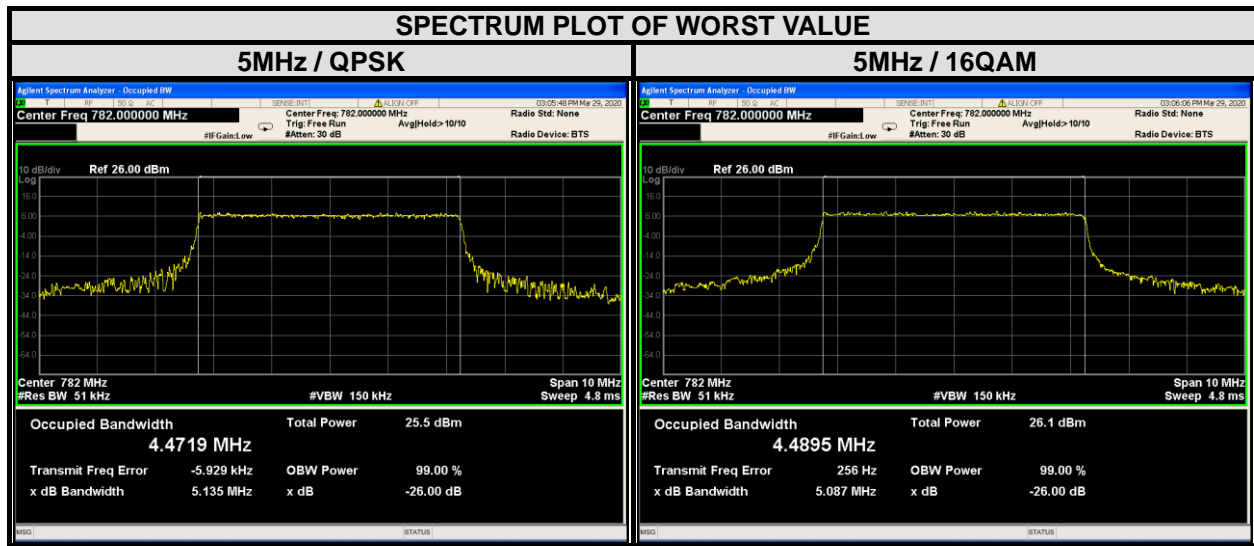
LTE BAND 12

| CHANNEL BANDWIDTH: 10MHz | | | | | | | |
|--------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 23060 | 704 | 8.9002 | 8.9017 | 23060 | 704 | 9.651 | 9.543 |
| 23095 | 707.5 | 8.9446 | 8.9553 | 23095 | 707.5 | 9.705 | 9.627 |
| 23130 | 711 | 8.9417 | 8.9477 | 23130 | 711 | 9.779 | 9.746 |



LTE BAND 13

| CHANNEL BANDWIDTH: 5MHz | | | | | | | |
|-------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 23205 | 779.5 | 4.4572 | 4.4665 | 23205 | 779.5 | 5.007 | 5.164 |
| 23230 | 782 | 4.4719 | 4.4895 | 23230 | 782 | 5.135 | 5.087 |
| 23255 | 784.5 | 4.4638 | 4.4731 | 23255 | 784.5 | 4.91 | 4.944 |



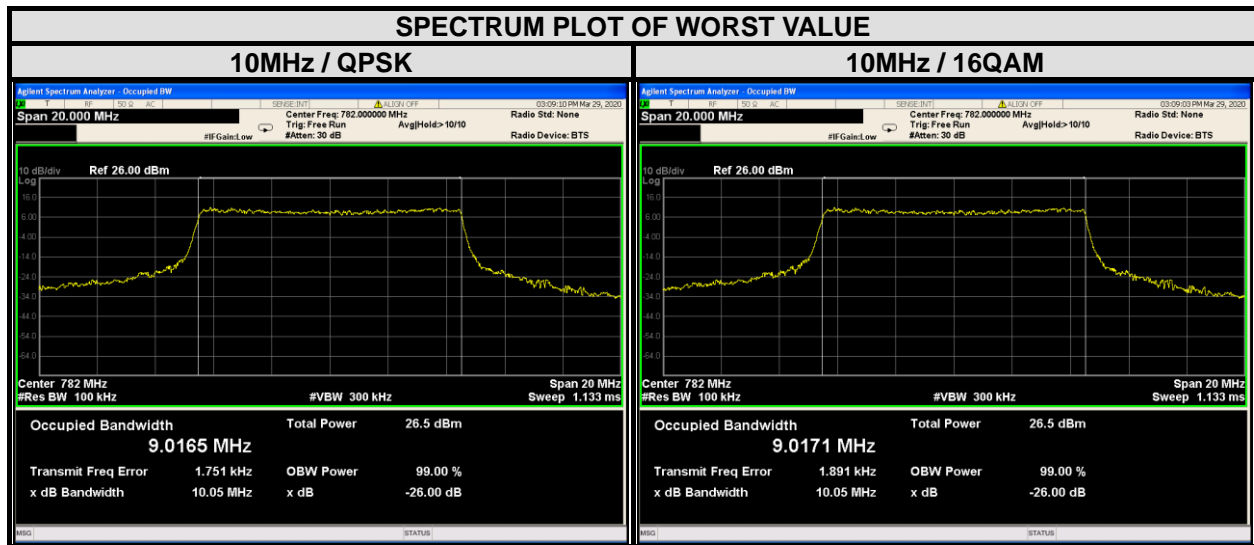


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LTE BAND 13

| CHANNEL BANDWIDTH: 10MHz | | | | | | | |
|--------------------------|-----------------|------------------------------|--------|---------|-----------------|----------------------|-------|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (kHz) | | CHANNEL | Frequency (MHz) | 26dB Bandwidth (kHz) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| - | - | - | - | - | - | - | - |
| 23230 | 782 | 9.0165 | 9.0171 | 23230 | 782 | 10.05 | 10.05 |
| - | - | - | - | - | - | - | - |

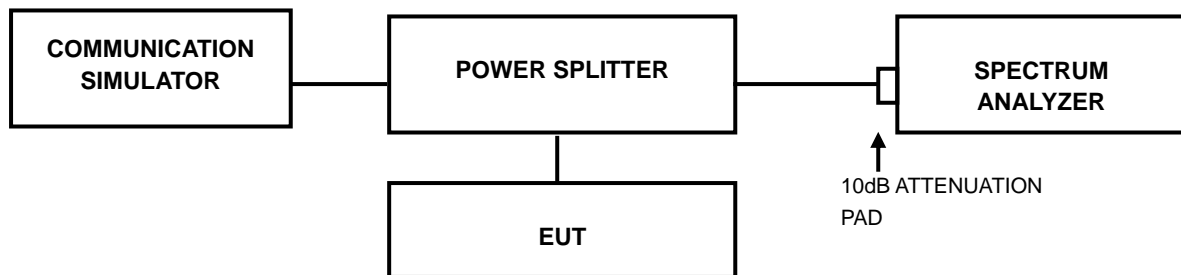


3.4 PEAK TO AVERAGE RATIO

3.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

In measuring transmissions in this band using an average power technique, the peak to-average ratio (PAR) of the transmission may not exceed 13 dB

3.4.2 TEST SETUP



3.4.3 TEST PROCEDURES

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

3.4.4 TEST RESULTS

LTE BAND 4

| CHANNEL BANDWIDTH: 1.4MHz | | | | CHANNEL BANDWIDTH: 3MHz | | | |
|---------------------------|-----------------|----------------------------|-------|-------------------------|-----------------|----------------------------|-------|
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | | CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) | |
| | | QPSK | 16QAM | | | QPSK | 16QAM |
| 19957 | 1710.7 | 5.29 | 6.06 | 19965 | 1711.5 | 5.46 | 6.23 |
| 20175 | 1732.5 | 4.64 | 5.44 | 20175 | 1732.5 | 4.86 | 6.14 |
| 20393 | 1754.3 | 4.7 | 5.43 | 20385 | 1753.5 | 4.66 | 5.88 |

