# FCC Test Report
# (Part 27)

| | |
|---|---|
| **Report No.:** | RF200610C03 |
| **FCC ID:** | H8N-ASK-SFE116 |
| **Test Model:** | ASK-SFE116 |
| **Received Date:** | Jun. 10, 2020 |
| **Test Date:** | Jul. 02 ~ Jul. 31, 2020 |
| **Issued Date:** | Jul. 31, 2020 |
| **Applicant:** | ASKEY COMPUTER CORP. |
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| **Issued By:** | Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch<br>Lin Kou Laboratories |
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| **Test Location:** | No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan |
| **FCC Registration / Designation Number:** | 788550 / TW0003 |

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## Release Control Record

| Issue No. | Description | Date Issued |
|---|---|---|
| RF200610C03 | Original release | Jul. 31, 2020 |

## 1 Certificate of Conformity

**Product:** LTE Network Extender

**Brand:** ASKEY

**Test Model:** ASK-SFE116

**Sample Status:** Engineering Sample

**Applicant:** ASKEY COMPUTER CORP.

**Test Date:** Jul. 02 ~ Jul. 31, 2020

**Standards:** FCC Part 27, Subpart C, F, L

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

**Prepared by :** _____ , **Date:** Jul. 31, 2020

Polly Chien / Specialist

**Approved by :** _____ , **Date:** Jul. 31, 2020

Bruce Chen / Senior Project Engineer

## 2 Summary of Test Results

| Applied Standard: FCC Part 27 & Part 2 | | | | | |
|---|---|---|---|---|---|
| FCC Clause | | | Test Item | Result | Remarks |
| LTE B4 | LTE B13 | LTE B66 | | | |
| 2.1046<br>27.50(d)(2) | 2.1046<br>27.50(b)(4) | 2.1046<br>27.50(d)(2) | Equivalent Isotropically Radiated Power / Equivalent Radiated Power | Pass | Meet the requirement of limit. |
| 2.1047 | 2.1047 | 2.1047 | Modulation Characteristics | Pass | Meet the requirement of limit. |
| 27.50<br>(d)(5) | ---- | 27.50<br>(d)(5) | Peak To Average Ratio | Pass | Meet the requirement of limit. |
| 2.1055<br>27.54 | 2.1055<br>27.54 | 2.1055<br>27.54 | Frequency Stability<br>Stay with the authorized bands of operation | Pass | Meet the requirement of limit. |
| 2.1049<br>27.53(h) | 2.1049 | 2.1049 | Occupied Bandwidth | Pass | Meet the requirement of limit. |
| 27.53(h) | 2.1051<br>27.53(c) | 27.53(h) | Band Edge Measurements | Pass | Meet the requirement of limit. |
| 2.1051<br>27.53(h) | 2.1051<br>27.53(c) | 2.1051<br>27.53(h) | Conducted Spurious Emissions | Pass | Meet the requirement of limit. |
| 2.1053<br>27.53(h) | 2.1053<br>27.53(c) | 2.1053<br>27.53(h) | Radiated Spurious Emissions | Pass | Meet the requirement of limit.<br>Minimum passing margin is -23.3dB at 4380.00MHz. |

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

### 2.1 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 | Expanded Uncertainty (k=2) (±) |
|---|---|---|
| Radiated Emissions up to 1 GHz | 9kHz ~ 30MHz | 3.04 dB |
| | 30MHz ~ 200MHz | 3.59 dB |
| | 200MHz ~1000MHz | 3.60 dB |
| Radiated Emissions above 1 GHz | 1GHz ~ 18GHz | 2.29 dB |
| | 18GHz ~ 40GHz | 2.29 dB |

## 2.2 Test Site and Instruments

| Description & Manufacturer | Model No. | Serial No. | Cal. Date | Cal. Due |
|---|---|---|---|---|
| Test Receiver<br>KEYSIGHT | N9038A | MY55420137 | Apr. 16, 2020 | Apr. 15, 2021 |
| Spectrum Analyzer<br>ROHDE & SCHWARZ | FSP40 | 100039 | Jun. 12, 2020 | Jun. 11, 2021 |
| Spectrum Analyzer<br>ROHDE & SCHWARZ | FSW43 | 101582 | Mar. 31, 2020 | Mar. 30, 2021 |
| BILOG Antenna<br>SCHWARZBECK | VULB9168 | 9168-160 | Nov. 07, 2019 | Nov. 06, 2020 |
| HORN Antenna<br>SCHWARZBECK | BBHA 9120 D | 9120D-1169 | Nov. 24, 2019 | Nov. 23, 2020 |
| HORN Antenna<br>SCHWARZBECK | BBHA 9170 | BBHA9170241 | Nov. 24, 2019 | Nov. 23, 2020 |
| BILOG Antenna<br>SCHWARZBECK | VULB9168 | 9168-158 | Nov. 08, 2019 | Nov. 07, 2020 |
| Loop Antenna<br>TESEQ | EM-6879 | 269 | Sep. 16, 2019 | Sep. 15, 2020 |
| Preamplifier<br>Agilent<br>(Below 1GHz) | 8447D | 2944A10638 | Jun. 08, 2020 | Jun. 07, 2021 |
| Preamplifier<br>Agilent<br>(Above 1GHz) | 8449B | 3008A02367 | Feb. 18, 2020 | Feb. 17, 2021 |
| RF signal cable<br>HUBER+SUHNER&EMCI | SUCOFLEX 104 &<br>EMC104-SM-SM8000 | CABLE-CH9-02<br>(248780+171006) | Jan. 18, 2020 | Jan. 17, 2021 |
| RF signal cable<br>HUBER+SUHNER | SUCOFLEX 104 | CABLE-CH9-(250795/4) | Jan. 18, 2020 | Jan. 17, 2021 |
| RF signal cable<br>Woken | 8D-FB | Cable-CH9-01 | Jun. 08, 2020 | Jun. 07, 2021 |
| Software<br>BV ADT | ADT_Radiated_<br>V7.6.15.9.5 | NA | NA | NA |
| Antenna Tower<br>EMCO | 2070/2080 | 512.835.4684 | NA | NA |
| Turn Table<br>EMCO | 2087-2.03 | NA | NA | NA |
| Antenna Tower &Turn<br>BV ADT | AT100 | AT93021705 | NA | NA |
| Turn Table<br>BV ADT | TT100 | TT93021705 | NA | NA |
| Turn Table Controller<br>BV ADT | SC100 | SC93021705 | NA | NA |
| Boresight Antenna Fixture | BAF-02 | 5 | NA | NA |
| Standard Temperature And<br>Humidity Chamber TERCHY | HRM-120RF | 931022 | Dec. 12, 2019 | Dec. 11, 2020 |
| JFW 20dB attenuation | 50HF-020-SMA | NA | NA | NA |
| DC Power Supply Keysight | U8002A | MY56330015 | NA | NA |
| Radio Communication Analyzer<br>Anritsu | MT8821C | 6201462755 | Feb. 13, 2020 | Feb. 12, 2021 |
| Digital Multimeter Fluke | 87-III | 70360742 | Jul. 12, 2019 | Jul. 11, 2020 |
| | | | Jul. 10, 2020 | Jul. 09, 2021 |
| MXG Vector signal generator<br>Agilent | N5182B | MY53050430 | Nov. 25, 2019 | Nov. 24, 2020 |

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 9.

# 3 General Information

## 3.1 General Description of EUT

| | | | | | |
|---|---|---|---|---|---|
| Product | LTE Network Extender | | | | |
| Brand | ASKEY | | | | |
| Test Model | ASK-SFE116 | | | | |
| Operating Software | V0.07_V1.0.008 | | | | |
| Status of EUT | Engineering Sample | | | | |
| Power Supply Rating | 12Vdc (Adapter) | | | | |
| Modulation Type | LTE: QPSK, 16QAM, 64QAM | | | | |
| Operating Frequency | LTE Band 4 | Channel Bandwidth 5MHz | 2112.5MHz ~ 2152.5MHz | | |
| | | Channel Bandwidth 10MHz | 2115.0MHz ~ 2150.0MHz | | |
| | | Channel Bandwidth 15MHz | 2117.5MHz ~ 2147.5MHz | | |
| | | Channel Bandwidth 20MHz | 2120.0MHz ~ 2145.0MHz | | |
| | LTE Band 13 | Channel Bandwidth 5MHz | 748.5MHz ~ 753.5MHz | | |
| | | Channel Bandwidth 10MHz | 751MHz | | |
| | LTE Band 66 | Channel Bandwidth 5MHz | 2112.5MHz ~ 2177.5MHz | | |
| | | Channel Bandwidth 10MHz | 2115.0MHz ~ 2175.0MHz | | |
| | | Channel Bandwidth 15MHz | 2117.5MHz ~ 2172.5MHz | | |
| | | Channel Bandwidth 20MHz | 2120.0MHz ~ 2170.0MHz | | |
| Max. EIRP Power | | | QPSK | 16QAM | 64QAM |
| | LTE Band 4 | Channel Bandwidth 5MHz | 213.796mW (23.3dBm) | 173.780mW (22.4dBm) | 154.882mW (21.9dBm) |
| | | Channel Bandwidth 10MHz | 223.872mW (23.5dBm) | 186.209mW (22.7dBm) | 173.780mW (22.4dBm) |
| | | Channel Bandwidth 15MHz | 223.872mW (23.5dBm) | 186.209mW (22.7dBm) | 158.489mW (22.0dBm) |
| | | Channel Bandwidth 20MHz | 229.087mW (23.6dBm) | 165.959mW (22.2dBm) | 151.356mW (21.8dBm) |
| | LTE Band 66 | Channel Bandwidth 5MHz | 213.796mW (23.3dBm) | 177.828mW (22.5dBm) | 158.489mW (22.0dBm) |
| | | Channel Bandwidth 10MHz | 218.776mW (23.4dBm) | 177.828mW (22.5dBm) | 162.181mW (22.1dBm) |
| | | Channel Bandwidth 15MHz | 223.872mW (23.5dBm) | 181.970mW (22.6dBm) | 169.824mW (22.3dBm) |
| | | Channel Bandwidth 20MHz | 229.087mW (23.6dBm) | 173.780mW (22.4dBm) | 158.489mW (22.0dBm) |
| Max. ERP Power | | | QPSK | 16QAM | 64QAM |
| | LTE Band 13 | Channel Bandwidth 5MHz | 190.546mW (22.8dBm) | 154.882mW (21.9dBm) | 141.254mW (21.5dBm) |
| | | Channel Bandwidth 10MHz | 181.970mW (22.6dBm) | 154.882mW (21.9dBm) | 141.254mW (21.5dBm) |

| | | | QPSK | 16QAM | 64QAM |
|---|---|---|---|---|---|
| Emission Designator | LTE Band 4 | Channel Bandwidth 5MHz | 4M47G7D | 4M47D7W | 4M47D7W |
| | | Channel Bandwidth 10MHz | 8M93G7D | 8M93D7W | 8M93D7W |
| | | Channel Bandwidth 15MHz | 13M4G7D | 13M4D7W | 13M4D7W |
| | | Channel Bandwidth 20MHz | 17M9G7D | 17M9D7W | 17M9D7W |
| | LTE Band 13 | Channel Bandwidth 5MHz | 4M47G7D | 4M47D7W | 4M47D7W |
| | | Channel Bandwidth 10MHz | 8M93G7D | 8M93D7W | 8M93D7W |
| | LTE Band 66 | Channel Bandwidth 5MHz | 4M47G7D | 4M47D7W | 4M47D7W |
| | | Channel Bandwidth 10MHz | 8M92G7D | 8M93D7W | 8M92D7W |
| | | Channel Bandwidth 15MHz | 13M4G7D | 13M4D7W | 13M4D7W |
| | | Channel Bandwidth 20MHz | 17M9G7D | 17M9D7W | 17M9D7W |
| Antenna Type | Refer to Note as below | | | | |
| Antenna Connector | Refer to Note as below | | | | |
| Accessory Device | Adapter, GPS antenna (7m, model: GPSGLONASS53D-S6-00) | | | | |
| Data Cable Supplied | 1.45m non-shielded RJ45 cable without core | | | | |

Note:

1. The EUT uses following antenna.

| Antenna Type | Connector Type | Band | Freq. (MHz) | Antenna Gain (dBi) | |
|---|---|---|---|---|---|
| | | | | Main | Aux |
| Dipole | I-pex | LTE Band 13 | 746 | 1.31 | -0.26 |
| | | | 751 | 1.36 | -0.47 |
| | | | 756 | 1.47 | 0.52 |
| | | LTE Band 4, LTE Band 66 | 2110 | 1.20 | 2.72 |
| | | | 2155 | 1.88 | 2.55 |
| | | | 2200 | 1.29 | 2.89 |

* The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

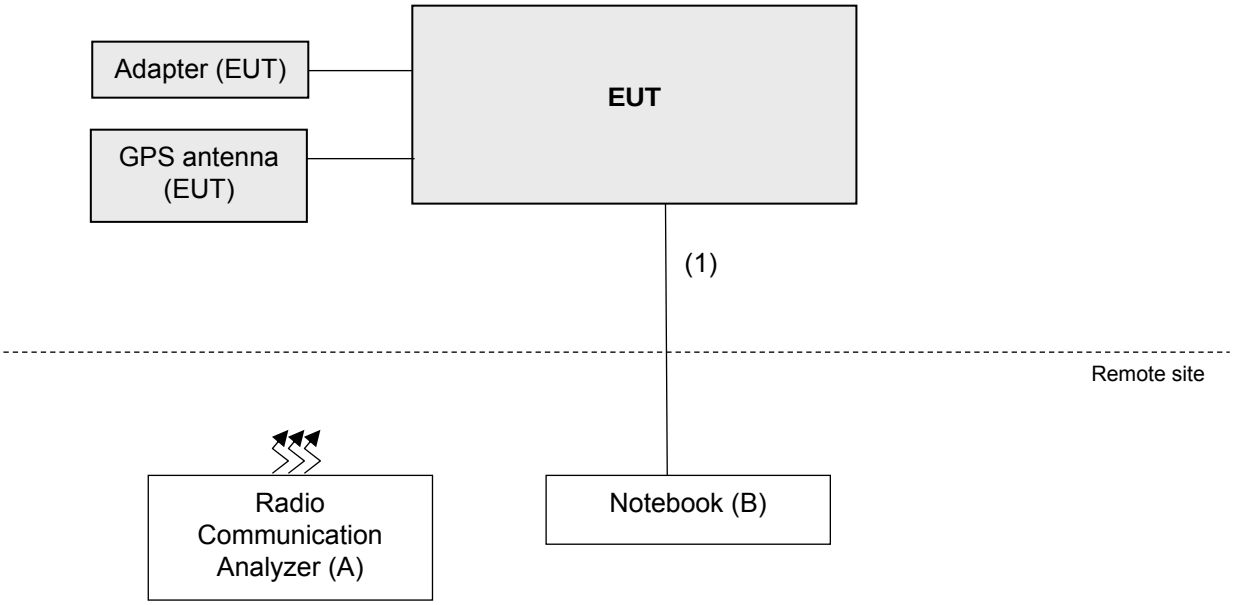
2. The EUT consumes following Adapters.

| Adapter 1 | |
|---|---|
| Brand | ChenZhou Frecom Elecronics Co., Ltd |
| Model | F18L16-120150SPAU |
| Input Power | 100-240Vac, 50/60Hz, 0.6A |
| Output Power | +12Vdc, 1.5A |
| Power Line | 1.5 m cable without core |

| Adapter 2 | |
|---|---|
| Brand | I.T.E Power Supply |
| Model | MU18B1120150-A1 |
| Input Power | 100-240Vac, 50/60Hz, 0.6A |
| Output Power | +12Vdc, 1.5A |
| Power Line | 1.45 m cable without core |

* After the pretesting, the adapter 1 is found to be the worst case and chosen for final test.

## 3.2 Configuration of System under Test




### 3.2.1 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.

| ID | Product | Brand | Model No. | Serial No. | FCC ID | Remarks |
|---|---|---|---|---|---|---|
| A. | Radio Communication Analyzer | Anritsu | MT8821C | 6261806803 | NA | - |
| B. | Notebook | DELL | E5410 | 1HC2XM1 | FCC DoC Approved | - |

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items A, B acted as communication partners to transfer data.

| No. | Cable Description | Qty. | Length (m) | Shielded (Yes/ No) | Cores (Number) | Remark |
|---|---|---|---|---|---|---|
| 1. | LAN cable | 1 | 7 | N | 0 | Provided by Lab<br>RJ45, Cat5e |

### 3.3 Test Mode Applicability and Tested Channel Detail

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 X-plane. Following channel(s) was (were) selected for the final test as listed below.

LTE Band 4

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Channel Bandwidth | Modulation |
|---|---|---|---|---|---|
| - | EIRP | 1975 to 2375 | 1975(2112.5MHz), 2175(2132.5MHz), 2375(2152.5MHz) | 5MHz | QPSK / 16QAM / 64QAM |
| | | 2000 to 2350 | 2000(2115.0MHz), 2175(2132.5MHz), 2350(2150.0MHz) | 10MHz | QPSK / 16QAM / 64QAM |
| | | 2025 to 2325 | 2025(2117.5MHz), 2175(2132.5MHz), 2325(2147.5MHz) | 15MHz | QPSK / 16QAM / 64QAM |
| | | 2050 to 2300 | 2050(2120.0MHz), 2175(2132.5MHz), 2300(2145.0MHz) | 20MHz | QPSK / 16QAM / 64QAM |
| - | Modulation Characteristics | 2050 to 2300 | 2175(2132.5MHz) | 20MHz | QPSK / 16QAM / 64QAM |
| - | Frequency Stability | 1975 to 2375 | 1975(2112.5MHz), 2375(2152.5MHz) | 5MHz | QPSK |
| | | 2000 to 2350 | 2000(2115.0MHz), 2350(2150.0MHz) | 10MHz | QPSK |
| | | 2025 to 2325 | 2025(2117.5MHz), 2325(2147.5MHz) | 15MHz | QPSK |
| | | 2050 to 2300 | 2050(2120.0MHz), 2300(2145.0MHz) | 20MHz | QPSK |
| - | Emission Bandwidth | 1975 to 2375 | 1975(2112.5MHz), 2375(2152.5MHz) | 5MHz | QPSK / 16QAM / 64QAM |
| | | 2000 to 2350 | 2000(2115.0MHz), 2350(2150.0MHz) | 10MHz | QPSK / 16QAM / 64QAM |
| | | 2025 to 2325 | 2025(2117.5MHz), 2175(2132.5MHz), 2325(2147.5MHz) | 15MHz | QPSK / 16QAM / 64QAM |
| | | 2050 to 2300 | 2050(2120.0MHz), 2175(2132.5MHz), 2300(2145.0MHz) | 20MHz | QPSK / 16QAM / 64QAM |
| - | Peak to Average Ratio | 1975 to 2375 | 1975(2112.5MHz), 2175(2132.5MHz), 2375(2152.5MHz) | 5MHz | QPSK / 16QAM / 64QAM |
| | | 2000 to 2350 | 2000(2115.0MHz), 2175(2132.5MHz), 2350(2150.0MHz) | 10MHz | QPSK / 16QAM / 64QAM |
| | | 2025 to 2325 | 2025(2117.5MHz), 2175(2132.5MHz), 2325(2147.5MHz) | 15MHz | QPSK / 16QAM / 64QAM |
| | | 2050 to 2300 | 2050(2120.0MHz), 2175(2132.5MHz), 2300(2145.0MHz) | 20MHz | QPSK / 16QAM / 64QAM |
| - | Conducted Emission | 1975 to 2375 | 1975(2112.5MHz), 2175(2132.5MHz), 2375(2152.5MHz) | 5MHz | QPSK |
| | | 2000 to 2350 | 2000(2115.0MHz), 2175(2132.5MHz), 2350(2150.0MHz) | 10MHz | QPSK |
| | | 2025 to 2325 | 2025(2117.5MHz), 2175(2132.5MHz), 2325(2147.5MHz) | 15MHz | QPSK |
| | | 2050 to 2300 | 2050(2120.0MHz), 2175(2132.5MHz), 2300(2145.0MHz) | 20MHz | QPSK |

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Channel Bandwidth | Modulation |
|---|---|---|---|---|---|
| - | Radiated Emission Below 1GHz | 2050 to 2300 | 2300(2145.0MHz) | 20MHz | QPSK |
| - | Radiated Emission Above 1GHz | 1975 to 2375 | 1975(2112.5MHz), 2175(2132.5MHz), 2375(2152.5MHz) | 5MHz | QPSK |
| | | 2050 to 2300 | 2050(2120.0MHz), 2175(2132.5MHz), 2300(2145.0MHz) | 20MHz | QPSK |

Note: The conducted output power for QPSK, 16QAM and 64QAM measured value of QPSK is higher than 16QAM and 64QAM mode. Therefore, only EIRP, Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK, 16QAM and 64QAM modes, the other test items were performed under QPSK mode only.

LTE Band 13

| EUT Configure Mode | Test item | Available channel | Tested channel | Channel Bandwidth | Modulation |
|---|---|---|---|---|---|
| - | ERP | 5205 to 5255 | 5205(748.5MHz), 5230(751.0MHz), 5255(753.5MHz) | 5MHz | QPSK / 16QAM / 64QAM |
| | | 5230 | 5230(751.0MHz) | 10MHz | QPSK / 16QAM / 64QAM |
| - | Modulation Characteristics | 5230 | 5230(751.0MHz), | 10MHz | QPSK / 16QAM / 64QAM |
| - | Frequency Stability | 5205 to 5255 | 5205(748.5MHz), 5255(753.5MHz) | 5MHz | QPSK |
| | | 5230 | 5230(751.0MHz), | 10MHz | QPSK |
| - | Emission Bandwidth | 5205 to 5255 | 5205(748.5MHz), 5230(751.0MHz), 5255(753.5MHz) | 5MHz | QPSK / 16QAM / 64QAM |
| | | 5230 | 5230(751.0MHz) | 10MHz | QPSK / 16QAM / 64QAM |
| - | Band Edge | 5205 to 5255 | 5205(748.5MHz), 5255(753.5MHz) | 5MHz | QPSK |
| | | 5230 | 5230(751.0MHz) | 10MHz | QPSK |
| - | Peak to Average Ratio | 5205 to 5255 | 5205(748.5MHz), 5230(751.0MHz), 5255(753.5MHz) | 5MHz | QPSK / 16QAM / 64QAM |
| | | 5230 | 5230(751.0MHz) | 10MHz | QPSK / 16QAM / 64QAM |
| - | Conducted Emission | 5205 to 5255 | 5205(748.5MHz), 5230(751.0MHz), 5255(753.5MHz) | 5MHz | QPSK |
| | | 5230 | 5230(751.0MHz) | 10MHz | QPSK |
| - | Radiated Emission Below 1GHz | 5205 to 5255 | 5205(748.5MHz) | 5MHz | QPSK |
| - | Radiated Emission Above 1GHz | 5205 to 5255 | 5205(748.5MHz), 5230(751.0MHz), 5255(753.5MHz) | 5MHz | QPSK |
| | | 5230 | 5230(751.0MHz) | 10MHz | QPSK |

Note: The conducted output power for QPSK, 16QAM and 64QAM measured value of QPSK is higher than 16QAM and 64QAM mode. Therefore, only ERP, Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK, 16QAM and 64QAM modes, the other test items were performed under QPSK mode only.

LTE Band 66

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Channel Bandwidth | Modulation |
|---|---|---|---|---|---|
| - | EIRP | 66461 to 67111 | 66461 (2112.5MHz), 66786 (2145.0MHz), 67111 (2177.5MHz) | 5MHz | QPSK / 16QAM / 64QAM |
| | | 66486 to 67086 | 66486 (2115.0MHz), 66786 (2145.0MHz), 67086 (2175.0MHz) | 10MHz | QPSK / 16QAM / 64QAM |
| | | 66511 to 67061 | 66511 (2117.5MHz), 66786 (2145.0MHz), 67061 (2172.5MHz) | 15MHz | QPSK / 16QAM / 64QAM |
| | | 66536 to 67036 | 66536 (2120.0MHz), 66786 (2145.0MHz), 67036 (2170.0MHz) | 20MHz | QPSK / 16QAM / 64QAM |
| - | Modulation Characteristics | 66536 to 67036 | 66786 (2145.0MHz) | 20MHz | QPSK / 16QAM / 64QAM |
| - | Frequency Stability | 66461 to 67111 | 66461 (2112.5MHz), 67111 (2177.5MHz) | 5MHz | QPSK |
| | | 66486 to 67086 | 66486 (2115.0MHz), 67086 (2175.0MHz) | 10MHz | QPSK |
| | | 66511 to 67061 | 66511 (2117.5MHz), 67061 (2172.5MHz) | 15MHz | QPSK |
| | | 66536 to 67036 | 66536 (2120.0MHz), 67036 (2170.0MHz) | 20MHz | QPSK |
| - | Emission Bandwidth | 66461 to 67111 | 66461 (2112.5MHz), 66786 (2145.0MHz), 67111 (2177.5MHz) | 5MHz | QPSK / 16QAM / 64QAM |
| | | 66486 to 67086 | 66486 (2115.0MHz), 66786 (2145.0MHz), 67086 (2175.0MHz) | 10MHz | QPSK / 16QAM / 64QAM |
| | | 66511 to 67061 | 66511 (2117.5MHz), 66786 (2145.0MHz), 67061 (2172.5MHz) | 15MHz | QPSK / 16QAM / 64QAM |
| | | 66536 to 67036 | 66536 (2120.0MHz), 66786 (2145.0MHz), 67036 (2170.0MHz) | 20MHz | QPSK / 16QAM / 64QAM |
| - | Band Edge | 66461 to 67111 | 66461 (2112.5MHz), 66786 (2145.0MHz), 67111 (2177.5MHz) | 5MHz | QPSK |
| | | 66486 to 67086 | 66486 (2115.0MHz), 66786 (2145.0MHz), 67086 (2175.0MHz) | 10MHz | QPSK |
| | | 66511 to 67061 | 66511 (2117.5MHz), 66786 (2145.0MHz), 67061 (2172.5MHz) | 15MHz | QPSK |
| | | 66536 to 67036 | 66536 (2120.0MHz), 66786 (2145.0MHz), 67036 (2170.0MHz) | 20MHz | QPSK |

| EUT Configure Mode | Test Item | Available Channel | Tested Channel | Channel Bandwidth | Modulation |
|---|---|---|---|---|---|
| - | Peak to Average Ratio | 66461 to 67111 | 66461 (2112.5MHz), 66786 (2145.0MHz), 67111 (2177.5MHz) | 5MHz | QPSK / 16QAM / 64QAM |
| | | 66486 to 67086 | 66486 (2115.0MHz), 66786 (2145.0MHz), 67086 (2175.0MHz) | 10MHz | QPSK / 16QAM / 64QAM |
| | | 66511 to 67061 | 66511 (2117.5MHz), 66786 (2145.0MHz), 67061 (2172.5MHz) | 15MHz | QPSK / 16QAM / 64QAM |
| | | 66536 to 67036 | 66536 (2120.0MHz), 66786 (2145.0MHz), 67036 (2170.0MHz) | 20MHz | QPSK / 16QAM / 64QAM |
| - | Conducted Emission | 66461 to 67111 | 66461 (2112.5MHz), 66786 (2145.0MHz), 67111 (2177.5MHz) | 5MHz | QPSK |
| | | 66486 to 67086 | 66486 (2115.0MHz), 66786 (2145.0MHz), 67086 (2175.0MHz) | 10MHz | QPSK |
| | | 66511 to 67061 | 66511 (2117.5MHz), 66786 (2145.0MHz), 67061 (2172.5MHz) | 15MHz | QPSK |
| | | 66536 to 67036 | 66536 (2120.0MHz), 66786 (2145.0MHz), 67036 (2170.0MHz) | 20MHz | QPSK |
| - | Radiated Emission Below 1GHz | 66536 to 67036 | 67036 (2170.0MHz) | 20MHz | QPSK |
| - | Radiated Emission Above 1GHz | 66461 to 67111 | 66461 (2112.5MHz), 66786 (2145.0MHz), 67111 (2177.5MHz) | 5MHz | QPSK |
| | | 66536 to 67036 | 66536 (2120.0MHz), 66786 (2145.0MHz), 67036 (2170.0MHz) | 20MHz | QPSK |

Note: The conducted output power for QPSK, 16QAM and 64QAM measured value of QPSK is higher than 16QAM and 64QAM mode. Therefore, only EIRP, Modulation characteristics, occupied bandwidth and Peak to average ratio items had been tested under QPSK, 16QAM and 64QAM modes, the other test items were performed under QPSK mode only.

Test Condition:

| Test Item | Environmental Conditions | Input Power | Tested By |
|---|---|---|---|
| EIRP / ERP | 22deg. C, 66%RH | 120Vac, 60Hz | Han Wu |
| Modulation characteristics | 24deg. C, 64%RH | 120Vac, 60Hz | James Yang |
| Frequency Stability | 24deg. C, 64%RH | 120Vac, 60Hz | James Yang |
| Occupied Bandwidth | 24deg. C, 64%RH | 120Vac, 60Hz | James Yang |
| Band Edge | 24deg. C, 64%RH | 120Vac, 60Hz | James Yang |
| Peak To Average Ratio | 24deg. C, 64%RH | 120Vac, 60Hz | James Yang |
| Conducted Emission | 24deg. C, 64%RH | 120Vac, 60Hz | James Yang |
| Radiated Emission | 22deg. C, 66%RH<br>22deg. C, 68%RH | 120Vac, 60Hz | Greg Lin<br>Han Wu |

### 3.4 EUT Operating Conditions

The EUT makes a call to the communication simulator. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency

### 3.5 General Description of Applied Standards and References

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

**Test Standard:**

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 27**

**ANSI/TIA/EIA-603-E 2016**

**ANSI 63.26-2015**

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

**References Test Guidance:**

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

All test items have been performed as a reference to the above KDB test guidance.

# 4 Test Types and Results

## 4.1 Output Power Measurement

### 4.1.1 Limits of Output Power Measurement

LTE Band 4/LTE Band 66:

The radiated peak output power shall be according to the specific rule Part 27.50(d)(2) that are limited to EIRP of 1640 watts/MHz when transmitting with an emission bandwidth greater than 1 MHz.

LTE Band 13:

Fixed and base stations transmitting a signal in the 746-757 MHz and 776-787 MHz bands with an emission bandwidth greater than 1 MHz must not exceed an ERP of 1000 watts/MHz and an antenna height of 305 m HAAT, except that antenna heights greater than 305 m HAAT are permitted if power levels are reduced below 1000 watts/MHz ERP in accordance with Table 3 of this section.

### 4.1.2 Test Procedures

**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.

**EIRP / ERP Measurement:**

a. All measurements were done at low, middle and high operational frequency range. RBW and VBW is 20MHz for LTE mode.
b. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m(below or equal 1GHz) and/or 1.5m(above 1GHz) height of Turn Table, rotated the table around 360 degrees to search the maximum radiation power and receiver antenna shall be rotated vertical and horizontal polarization and moved height from 1m to 4m to find the maximum polar radiated power. The "Read Value" is the spectrum reading the maximum power value.
c. The substitution horn antenna is substituted for EUT at the same position and signals generator export the CW signal to the substitution antenna via a TX cable. Rotated the Turn Table and moved receiving antenna to find the maximum radiation power. Adjust output power level of S.G to get a Value of spectrum reading equal to "Read Value" of step b. Record the power level of S.G
d. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.E.R.P power can be calculated form E.I.R.P power by subtracting the gain of dipole, E.R.P power = E.I.R.P power - 2.15dBi.

Where:

$ERP/EIRP = P_{Meas} + G_T - L_C$

$P_{Meas}$ : Measure transmitter output power.
$G_T$ : Gain of the transmitting antenna.
$L_C$ : signal attenuation in the connecting cable between the transmitter and antenna.

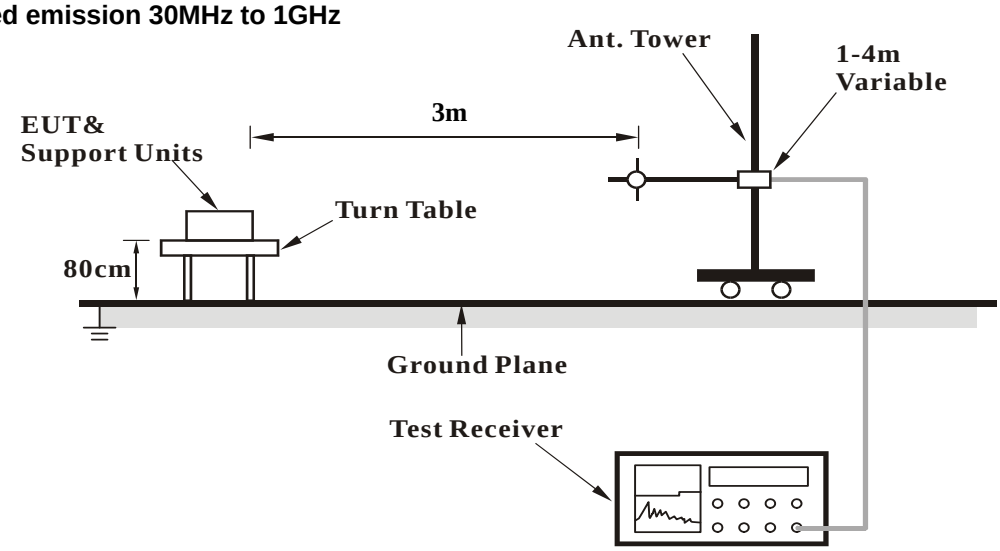
### 4.1.3 Test Setup

Conducted Power Measurement:

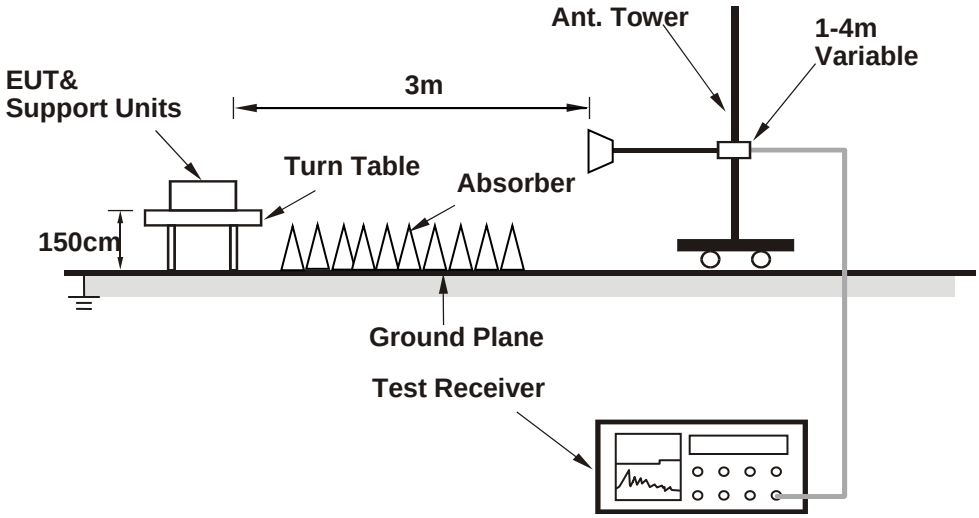
For the actual test configuration, please refer to the attached file (Test Setup Photo).

**EIRP / ERP Measurement:**

**For radiated emission 30MHz to 1GHz**




**For radiated emission above 1GHz**




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

### 4.1.4 Test Results

**Conducted Output Power (dBm)**

LTE Band 4

| Band | BW | Chain | QPSK | | | 16QAM | | | 64QAM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low CH 1975 | Mid CH 2175 | High CH 2375 | Low CH 1975 | Mid CH 2175 | High CH 2375 | Low CH 1975 | Mid CH 2175 | High CH 2375 |
| | | | 2112.5 MHz | 2132.5 MHz | 2152.5 MHz | 2112.5 MHz | 2132.5 MHz | 2152.5 MHz | 2112.5 MHz | 2132.5 MHz | 2152.5 MHz |
| LTE Band 4 | 5M | 0 | 18.26 | 18.24 | 18.27 | 18.25 | 18.20 | 18.22 | 18.23 | 18.21 | 18.22 |
| | | 1 | 18.18 | 18.15 | 18.16 | 18.13 | 18.16 | 18.12 | 18.15 | 18.14 | 18.14 |
| | | Total | 21.23 | 21.21 | 21.23 | 21.20 | 21.19 | 21.18 | 21.20 | 21.19 | 21.19 |

| Band | BW | Chain | QPSK | | | 16QAM | | | 64QAM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low CH 2000 | Mid CH 2175 | High CH 2350 | Low CH 2000 | Mid CH 2175 | High CH 2350 | Low CH 2000 | Mid CH 2175 | High CH 2350 |
| | | | 2115 MHz | 2132.5 MHz | 2150 MHz | 2115 MHz | 2132.5 MHz | 2150 MHz | 2115 MHz | 2132.5 MHz | 2150 MHz |
| LTE Band 4 | 10M | 0 | 18.28 | 18.26 | 18.26 | 18.27 | 18.24 | 18.23 | 18.22 | 18.24 | 18.20 |
| | | 1 | 18.12 | 18.17 | 18.14 | 18.05 | 18.12 | 18.16 | 18.13 | 18.15 | 18.13 |
| | | Total | 21.21 | 21.23 | 21.21 | 21.17 | 21.19 | 21.21 | 21.19 | 21.21 | 21.18 |

| Band | BW | Chain | QPSK | | | 16QAM | | | 64QAM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low CH 2025 | Mid CH 2175 | High CH 2325 | Low CH 2025 | Mid CH 2175 | High CH 2325 | Low CH 2025 | Mid CH 2175 | High CH 2325 |
| | | | 2117.5 MHz | 2132.5 MHz | 2147.5 MHz | 2117.5 MHz | 2132.5 MHz | 2147.5 MHz | 2117.5 MHz | 2132.5 MHz | 2147.5 MHz |
| LTE Band 4 | 15M | 0 | 18.25 | 18.27 | 18.24 | 18.21 | 18.22 | 18.23 | 18.24 | 18.26 | 18.24 |
| | | 1 | 18.18 | 18.10 | 18.10 | 18.12 | 18.17 | 18.19 | 18.12 | 18.09 | 18.12 |
| | | Total | 21.23 | 21.20 | 21.18 | 21.18 | 21.21 | 21.22 | 21.19 | 21.19 | 21.19 |

| Band | BW | Chain | QPSK | | | 16QAM | | | 64QAM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low CH 2050 | Mid CH 2175 | High CH 2300 | Low CH 2050 | Mid CH 2175 | High CH 2300 | Low CH 2050 | Mid CH 2175 | High CH 2300 |
| | | | 2120 MHz | 2132.5 MHz | 2145 MHz | 2120 MHz | 2132.5 MHz | 2145 MHz | 2120 MHz | 2132.5 MHz | 2145 MHz |
| LTE Band 4 | 20M | 0 | 18.31 | 18.28 | 18.23 | 18.22 | 18.25 | 18.19 | 18.24 | 18.22 | 18.20 |
| | | 1 | 18.11 | 18.04 | 18.06 | 18.04 | 18.05 | 18.02 | 18.08 | 18.06 | 18.04 |
| | | Total | 21.22 | 21.17 | 21.16 | 21.14 | 21.16 | 21.12 | 21.17 | 21.15 | 21.13 |

LTE Band 13

| Band | BW | Chain | QPSK | | | 16QAM | | | 64QAM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low CH 5205 | Mid CH 5230 | High CH 5255 | Low CH 5205 | Mid CH 5230 | High CH 5255 | Low CH 5205 | Mid CH 5230 | High CH 5255 |
| | | | 748.5 MHz | 751 MHz | 753.5 MHz | 748.5 MHz | 751 MHz | 753.5 MHz | 748.5 MHz | 751 MHz | 753.5 MHz |
| LTE Band 13 | 5M | 0 | 18.52 | 18.56 | 18.55 | 18.50 | 18.52 | 18.51 | 18.51 | 18.53 | 18.54 |
| | | 1 | 18.82 | 18.79 | 18.79 | 18.76 | 18.77 | 18.75 | 18.77 | 18.76 | 18.77 |
| | | Total | 21.68 | 21.69 | 21.68 | 21.64 | 21.66 | 21.64 | 21.65 | 21.66 | 21.67 |

| Band | BW | Chain | QPSK | 16QAM | 64QAM |
|---|---|---|---|---|---|
| | | | Mid CH 5230 | Mid CH 5230 | Mid CH 5230 |
| | | | 751 MHz | 751 MHz | 751 MHz |
| LTE Band 13 | 10M | 0 | 18.56 | 18.52 | 18.55 |
| | | 1 | 18.88 | 18.80 | 18.81 |
| | | Total | 21.73 | 21.67 | 21.69 |

LTE Band 66

| Band | BW | Chain | QPSK | | | 16QAM | | | 64QAM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low CH 66461 2112.5 MHz | Mid CH 66786 2145 MHz | High CH 67111 2177.5 MHz | Low CH 66461 2112.5 MHz | Mid CH 66786 2145 MHz | High CH 67111 2177.5 MHz | Low CH 66461 2112.5 MHz | Mid CH 66786 2145 MHz | High CH 67111 2177.5 MHz |
| LTE Band 66 | 5M | 0 | 18.25 | 18.27 | 18.24 | 18.25 | 18.23 | 18.22 | 18.24 | 18.22 | 18.23 |
| | | 1 | 17.82 | 17.88 | 17.86 | 17.79 | 17.83 | 17.81 | 17.80 | 17.82 | 17.84 |
| | | Total | 21.05 | 21.09 | 21.06 | 21.04 | 21.04 | 21.03 | 21.04 | 21.03 | 21.05 |

| Band | BW | Chain | QPSK | | | 16QAM | | | 64QAM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low CH 66486 2115 MHz | Mid CH 66786 2145 MHz | High CH 67086 2175 MHz | Low CH 66486 2115 MHz | Mid CH 66786 2145 MHz | High CH 67086 2175 MHz | Low CH 66486 2115 MHz | Mid CH 66786 2145 MHz | High CH 67086 2175 MHz |
| LTE Band 66 | 10M | 0 | 18.24 | 18.27 | 18.23 | 18.22 | 18.23 | 18.21 | 18.23 | 18.25 | 18.22 |
| | | 1 | 17.85 | 17.83 | 17.88 | 17.88 | 17.85 | 17.86 | 17.82 | 17.84 | 17.84 |
| | | Total | 21.06 | 21.07 | 21.07 | 21.06 | 21.05 | 21.05 | 21.04 | 21.06 | 21.04 |

| Band | BW | Chain | QPSK | | | 16QAM | | | 64QAM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low CH 66511 2117.5 MHz | Mid CH 66786 2145 MHz | High CH 67061 2172.5 MHz | Low CH 66511 2117.5 MHz | Mid CH 66786 2145 MHz | High CH 67061 2172.5 MHz | Low CH 66511 2117.5 MHz | Mid CH 66786 2145 MHz | High CH 67061 2172.5 MHz |
| LTE Band 66 | 15M | 0 | 18.22 | 18.24 | 18.26 | 18.24 | 18.21 | 18.22 | 18.23 | 18.25 | 18.23 |
| | | 1 | 17.86 | 17.91 | 17.81 | 17.77 | 17.85 | 17.76 | 17.80 | 17.84 | 17.86 |
| | | Total | 21.05 | 21.09 | 21.05 | 21.02 | 21.04 | 21.01 | 21.03 | 21.06 | 21.06 |

| Band | BW | Chain | QPSK | | | 16QAM | | | 64QAM | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Low CH 66536 2120 MHz | Mid CH 66786 2145 MHz | High CH 67036 2170 MHz | Low CH 66536 2120 MHz | Mid CH 66786 2145 MHz | High CH 67036 2170 MHz | Low CH 66536 2120 MHz | Mid CH 66786 2145 MHz | High CH 67036 2170 MHz |
| LTE Band 66 | 20M | 0 | 18.18 | 18.21 | 18.24 | 18.11 | 18.17 | 18.16 | 18.14 | 18.12 | 18.11 |
| | | 1 | 17.90 | 17.84 | 17.88 | 17.86 | 17.82 | 17.84 | 17.86 | 17.82 | 17.84 |
| | | Total | 21.05 | 21.04 | 21.07 | 21.00 | 21.01 | 21.01 | 21.01 | 20.98 | 20.99 |

**EIRP/ERP**

**Modulation Type: QPSK**

LTE Band 4, Channel Bandwidth: 5MHz

| Mode | | TX channel 1975, 2175, 2375 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -18.3 | 23.4 | -0.3 | 23.1 | 62.1 | -39.0 |
| 2 | 2132.5 | -18.5 | 23.4 | -0.4 | 23.0 | 62.1 | -39.1 |
| 3 | 2152.5 | -18.4 | 23.6 | -0.3 | **23.3** | 62.1 | -38.8 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -22.3 | 20.2 | -0.3 | 19.9 | 62.1 | -42.2 |
| 2 | 2132.5 | -21.6 | 21.0 | -0.4 | 20.6 | 62.1 | -41.5 |
| 3 | 2152.5 | -22.0 | 20.4 | -0.3 | 20.1 | 62.1 | -42.0 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4, Channel Bandwidth: 10MHz

| Mode | | TX channel 2000, 2175, 2350 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -18.4 | 23.3 | -0.3 | 23.0 | 62.1 | -39.1 |
| 2 | 2132.5 | -18.7 | 23.2 | -0.4 | 22.8 | 62.1 | -39.3 |
| 3 | 2150.0 | -18.1 | 23.8 | -0.3 | **23.5** | 62.1 | -38.6 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -21.7 | 20.8 | -0.3 | 20.5 | 62.1 | -41.6 |
| 2 | 2132.5 | -22.4 | 20.2 | -0.4 | 19.8 | 62.1 | -42.3 |
| 3 | 2150.0 | -22.2 | 20.2 | -0.3 | 19.9 | 62.1 | -42.2 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4, Channel Bandwidth: 15MHz

| Mode | | TX channel 2025, 2175, 2325 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -18.2 | 23.5 | -0.3 | 23.2 | 62.1 | -38.9 |
| 2 | 2132.5 | -18.6 | 23.3 | -0.4 | 22.9 | 62.1 | -39.2 |
| 3 | 2147.5 | -18.1 | 23.8 | -0.3 | **23.5** | 62.1 | -38.6 |
| Antenna Polarity & Test Distance: Vertical at 3 m | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -21.8 | 20.7 | -0.3 | 20.4 | 62.1 | -41.7 |
| 2 | 2132.5 | -22.1 | 20.5 | -0.4 | 20.1 | 62.1 | -42.0 |
| 3 | 2147.5 | -21.7 | 20.7 | -0.3 | 20.4 | 62.1 | -41.7 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4, Channel Bandwidth: 20MHz

| Mode | TX channel 2050, 2175, 2300 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -18.6 | 23.2 | -0.3 | 22.9 | 62.1 | -39.2 |
| 2 | 2132.5 | -18.5 | 23.4 | -0.4 | 23.0 | 62.1 | -39.1 |
| 3 | 2145.0 | -18.0 | 23.9 | -0.3 | **23.6** | 62.1 | -38.5 |
| Antenna Polarity & Test Distance: Vertical at 3 m | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -22.3 | 20.2 | -0.3 | 19.9 | 62.1 | -42.2 |
| 2 | 2132.5 | -22.2 | 20.4 | -0.4 | 20.0 | 62.1 | -42.1 |
| 3 | 2145.0 | -22.6 | 19.9 | -0.3 | 19.6 | 62.1 | -42.5 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 13, Channel Bandwidth: 5MHz

| MODE | TX channel 5205, 5230, 5255 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 748.5 | -6.2 | 19.1 | 3.7 | **22.8** | 60.0 | -37.2 |
| 2 | 751.0 | -6.2 | 19.0 | 3.7 | 22.7 | 60.0 | -37.3 |
| 3 | 753.5 | -6.6 | 18.5 | 3.9 | 22.4 | 60.0 | -37.6 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 748.5 | -11.4 | 16.8 | 3.7 | 20.5 | 60.0 | -39.5 |
| 2 | 751.0 | -11.2 | 17.0 | 3.7 | 20.7 | 60.0 | -39.3 |
| 3 | 753.5 | -11.7 | 16.4 | 3.9 | 20.3 | 60.0 | -39.7 |

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 13, Channel Bandwidth: 10MHz

| MODE | TX channel 5230 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 751.0 | -6.2 | 18.9 | 3.7 | **22.6** | 60.0 | -37.4 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 751.0 | -11.4 | 16.8 | 3.7 | 20.5 | 60.0 | -39.5 |

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 5MHz

| MODE | | TX channel 66461, 66786, 67111 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -18.9 | 22.8 | -0.3 | 22.5 | 62.1 | -39.6 |
| 2 | 2145.0 | -19.1 | 22.8 | -0.3 | 22.5 | 62.1 | -39.6 |
| 3 | 2177.5 | -18.5 | 23.5 | -0.2 | **23.3** | 62.1 | -38.8 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -22.4 | 20.1 | -0.3 | 19.8 | 62.1 | -42.3 |
| 2 | 2145.0 | -22.7 | 19.8 | -0.3 | 19.5 | 62.1 | -42.6 |
| 3 | 2177.5 | -22.2 | 20.1 | -0.2 | 19.9 | 62.1 | -42.2 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 10MHz

| MODE | | TX channel 66486, 66786, 67086 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -18.7 | 23.0 | -0.3 | 22.7 | 62.1 | -39.4 |
| 2 | 2145.0 | -19.2 | 22.8 | -0.3 | 22.5 | 62.1 | -39.6 |
| 3 | 2175.0 | -18.5 | 23.6 | -0.2 | **23.4** | 62.1 | -38.7 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -22.3 | 20.2 | -0.3 | 19.9 | 62.1 | -42.2 |
| 2 | 2145.0 | -22.6 | 19.8 | -0.3 | 19.5 | 62.1 | -42.6 |
| 3 | 2175.0 | -22.0 | 20.3 | -0.2 | 20.1 | 62.1 | -42.0 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 15MHz

| MODE | | TX channel 66511, 66786, 67061 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -18.6 | 23.1 | -0.3 | 22.8 | 62.1 | -39.3 |
| 2 | 2145.0 | -19.0 | 23.0 | -0.3 | 22.7 | 62.1 | -39.4 |
| 3 | 2172.5 | -18.4 | 23.7 | -0.2 | **23.5** | 62.1 | -38.6 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -22.3 | 20.2 | -0.3 | 19.9 | 62.1 | -42.2 |
| 2 | 2145.0 | -22.8 | 19.6 | -0.3 | 19.3 | 62.1 | -42.8 |
| 3 | 2172.5 | -22.2 | 20.1 | -0.2 | 19.9 | 62.1 | -42.2 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 20MHz

| MODE | TX channel 66536, 66786, 67036 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -18.9 | 22.9 | -0.3 | 22.6 | 62.1 | -39.5 |
| 2 | 2145.0 | -19.0 | 23.0 | -0.3 | 22.7 | 62.1 | -39.4 |
| 3 | 2170.0 | -18.3 | 23.8 | -0.2 | **23.6** | 62.1 | -38.5 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -22.3 | 20.2 | -0.3 | 19.9 | 62.1 | -42.2 |
| 2 | 2145.0 | -22.6 | 19.8 | -0.3 | 19.5 | 62.1 | -42.6 |
| 3 | 2170.0 | -22.2 | 20.1 | -0.2 | 19.9 | 62.1 | -42.2 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

**Modulation Type: 16QAM**

LTE Band 4, Channel Bandwidth: 5MHz

| Mode | | TX channel 1975, 2175, 2375 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -19.1 | 22.6 | -0.3 | 22.3 | 62.1 | -39.8 |
| 2 | 2132.5 | -19.2 | 22.7 | -0.4 | 22.3 | 62.1 | -39.8 |
| 3 | 2152.5 | -19.3 | 22.7 | -0.3 | **22.4** | 62.1 | -39.7 |
| Antenna Polarity & Test Distance: Vertical at 3 m | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -23.0 | 19.5 | -0.3 | 19.2 | 62.1 | -42.9 |
| 2 | 2132.5 | -22.4 | 20.2 | -0.4 | 19.8 | 62.1 | -42.3 |
| 3 | 2152.5 | -22.6 | 19.8 | -0.3 | 19.5 | 62.1 | -42.6 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4, Channel Bandwidth: 10MHz

| Mode | | TX channel 2000, 2175, 2350 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -19.2 | 22.5 | -0.3 | 22.2 | 62.1 | -39.9 |
| 2 | 2132.5 | -19.4 | 22.5 | -0.4 | 22.1 | 62.1 | -40.0 |
| 3 | 2150.0 | -18.9 | 23.0 | -0.3 | **22.7** | 62.1 | -39.4 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -22.5 | 20.0 | -0.3 | 19.7 | 62.1 | -42.4 |
| 2 | 2132.5 | -23.3 | 19.3 | -0.4 | 18.9 | 62.1 | -43.2 |
| 3 | 2150.0 | -23.0 | 19.4 | -0.3 | 19.1 | 62.1 | -43.0 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4, Channel Bandwidth: 15MHz

| Mode | | TX channel 2025, 2175, 2325 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -18.9 | 22.8 | -0.3 | 22.5 | 62.1 | -39.6 |
| 2 | 2132.5 | -19.4 | 22.5 | -0.4 | 22.1 | 62.1 | -40.0 |
| 3 | 2147.5 | -18.9 | 23.0 | -0.3 | **22.7** | 62.1 | -39.4 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -22.6 | 19.9 | -0.3 | 19.6 | 62.1 | -42.5 |
| 2 | 2132.5 | -22.8 | 19.8 | -0.4 | 19.4 | 62.1 | -42.7 |
| 3 | 2147.5 | -22.6 | 19.8 | -0.3 | 19.5 | 62.1 | -42.6 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4, Channel Bandwidth: 20MHz

| Mode | | TX channel 2050, 2175, 2300 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -19.4 | 22.4 | -0.3 | 22.1 | 62.1 | -40.0 |
| 2 | 2132.5 | -19.3 | 22.6 | -0.4 | **22.2** | 62.1 | -39.9 |
| 3 | 2145.0 | -19.5 | 22.4 | -0.3 | 22.1 | 62.1 | -40.0 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -23.2 | 19.3 | -0.3 | 19.0 | 62.1 | -43.1 |
| 2 | 2132.5 | -23.1 | 19.5 | -0.4 | 19.1 | 62.1 | -43.0 |
| 3 | 2145.0 | -23.2 | 19.3 | -0.3 | 19.0 | 62.1 | -43.1 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 13, Channel Bandwidth: 5MHz

| MODE | | TX channel 5205, 5230, 5255 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 748.5 | -7.1 | 18.2 | 3.7 | **21.9** | 60.0 | -38.1 |
| 2 | 751.0 | -7.0 | 18.2 | 3.7 | **21.9** | 60.0 | -38.1 |
| 3 | 753.5 | -7.5 | 17.6 | 3.9 | 21.5 | 60.0 | -38.5 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 748.5 | -12.2 | 15.9 | 3.7 | 19.6 | 60.0 | -40.4 |
| 2 | 751.0 | -12.1 | 16.1 | 3.7 | 19.8 | 60.0 | -40.2 |
| 3 | 753.5 | -12.5 | 15.6 | 3.9 | 19.5 | 60.0 | -40.5 |

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 13, Channel Bandwidth: 10MHz

| MODE | | TX channel 5230 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 751.0 | -7.0 | 18.2 | 3.7 | **21.9** | 60.0 | -38.1 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 751.0 | -12.2 | 15.9 | 3.7 | 19.6 | 60.0 | -40.4 |

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 5MHz

| MODE | TX channel 66461, 66786, 67111 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -19.7 | 22.0 | -0.3 | 21.7 | 62.1 | -40.4 |
| 2 | 2145.0 | -20.0 | 21.9 | -0.3 | 21.6 | 62.1 | -40.5 |
| 3 | 2177.5 | -19.3 | 22.7 | -0.2 | **22.5** | 62.1 | -39.6 |
| Antenna Polarity & Test Distance: Vertical at 3 m | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -23.3 | 19.2 | -0.3 | 18.9 | 62.1 | -43.2 |
| 2 | 2145.0 | -23.6 | 18.9 | -0.3 | 18.6 | 62.1 | -43.5 |
| 3 | 2177.5 | -23.0 | 19.3 | -0.2 | 19.1 | 62.1 | -43.0 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 10MHz

| MODE | TX channel 66486, 66786, 67086 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -19.5 | 22.2 | -0.3 | 21.9 | 62.1 | -40.2 |
| 2 | 2145.0 | -20.0 | 22.0 | -0.3 | 21.7 | 62.1 | -40.4 |
| 3 | 2175.0 | -19.4 | 22.7 | -0.2 | **22.5** | 62.1 | -39.6 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -23.1 | 19.4 | -0.3 | 19.1 | 62.1 | -43.0 |
| 2 | 2145.0 | -23.4 | 19.0 | -0.3 | 18.7 | 62.1 | -43.4 |
| 3 | 2175.0 | -22.9 | 19.4 | -0.2 | 19.2 | 62.1 | -42.9 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 15MHz

| MODE | TX channel 66511, 66786, 67061 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -19.4 | 22.3 | -0.3 | 22.0 | 62.1 | -40.1 |
| 2 | 2145.0 | -19.9 | 22.1 | -0.3 | 21.8 | 62.1 | -40.3 |
| 3 | 2172.5 | -19.3 | 22.8 | -0.2 | **22.6** | 62.1 | -39.5 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -23.2 | 19.3 | -0.3 | 19.0 | 62.1 | -43.1 |
| 2 | 2145.0 | -23.6 | 18.8 | -0.3 | 18.5 | 62.1 | -43.6 |
| 3 | 2172.5 | -23.1 | 19.2 | -0.2 | 19.0 | 62.1 | -43.1 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 20MHz

| MODE | TX channel 66536, 66786, 67036 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -19.7 | 22.1 | -0.3 | 21.8 | 62.1 | -40.3 |
| 2 | 2145.0 | -19.8 | 22.2 | -0.3 | 21.9 | 62.1 | -40.2 |
| 3 | 2170.0 | -19.5 | 22.6 | -0.2 | **22.4** | 62.1 | -39.7 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -23.2 | 19.3 | -0.3 | 19.0 | 62.1 | -43.1 |
| 2 | 2145.0 | -23.4 | 19.0 | -0.3 | 18.7 | 62.1 | -43.4 |
| 3 | 2170.0 | -23.0 | 19.3 | -0.2 | 19.1 | 62.1 | -43.0 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

**Modulation Type: 64QAM**

LTE Band 4, Channel Bandwidth: 5MHz

| Mode | | TX channel 1975, 2175, 2375 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -19.5 | 22.2 | -0.3 | **21.9** | 62.1 | -40.2 |
| 2 | 2132.5 | -19.7 | 22.2 | -0.4 | 21.8 | 62.1 | -40.3 |
| 3 | 2152.5 | -19.8 | 22.2 | -0.3 | **21.9** | 62.1 | -40.2 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -23.5 | 19.0 | -0.3 | 18.7 | 62.1 | -43.4 |
| 2 | 2132.5 | -23.0 | 19.6 | -0.4 | 19.2 | 62.1 | -42.9 |
| 3 | 2152.5 | -23.2 | 19.2 | -0.3 | 18.9 | 62.1 | -43.2 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4, Channel Bandwidth: 10MHz

| Mode | | TX channel 2000, 2175, 2350 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -19.6 | 22.1 | -0.3 | 21.8 | 62.1 | -40.3 |
| 2 | 2132.5 | -19.8 | 22.1 | -0.4 | 21.7 | 62.1 | -40.4 |
| 3 | 2150.0 | -19.2 | 22.7 | -0.3 | **22.4** | 62.1 | -39.7 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -22.9 | 19.6 | -0.3 | 19.3 | 62.1 | -42.8 |
| 2 | 2132.5 | -23.6 | 19.0 | -0.4 | 18.6 | 62.1 | -43.5 |
| 3 | 2150.0 | -23.4 | 19.0 | -0.3 | 18.7 | 62.1 | -43.4 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4, Channel Bandwidth: 15MHz

| Mode | | TX channel 2025, 2175, 2325 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -19.8 | 21.9 | -0.3 | 21.6 | 62.1 | -40.5 |
| 2 | 2132.5 | -20.2 | 21.7 | -0.4 | 21.3 | 62.1 | -40.8 |
| 3 | 2147.5 | -19.6 | 22.3 | -0.3 | **22.0** | 62.1 | -40.1 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -23.9 | 18.6 | -0.3 | 18.3 | 62.1 | -43.8 |
| 2 | 2132.5 | -23.3 | 19.3 | -0.4 | 18.9 | 62.1 | -43.2 |
| 3 | 2147.5 | -23.1 | 19.3 | -0.3 | 19.0 | 62.1 | -43.1 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 4, Channel Bandwidth: 20MHz

| Mode | | TX channel 2050, 2175, 2300 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -19.7 | 22.1 | -0.3 | **21.8** | 62.1 | -40.3 |
| 2 | 2132.5 | -19.8 | 22.1 | -0.4 | 21.7 | 62.1 | -40.4 |
| 3 | 2145.0 | -19.9 | 22.0 | -0.3 | 21.7 | 62.1 | -40.4 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -23.5 | 19.0 | -0.3 | 18.7 | 62.1 | -43.4 |
| 2 | 2132.5 | -23.5 | 19.1 | -0.4 | 18.7 | 62.1 | -43.4 |
| 3 | 2145.0 | -23.7 | 18.8 | -0.3 | 18.5 | 62.1 | -43.6 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 13, Channel Bandwidth: 5MHz

| MODE | | TX channel 5205, 5230, 5255 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 748.5 | -7.5 | 17.8 | 3.7 | **21.5** | 60.0 | -38.5 |
| 2 | 751.0 | -7.4 | 17.8 | 3.7 | **21.5** | 60.0 | -38.5 |
| 3 | 753.5 | -7.8 | 17.3 | 3.9 | 21.2 | 60.0 | -38.8 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 748.5 | -12.5 | 15.7 | 3.7 | 19.4 | 60.0 | -40.6 |
| 2 | 751.0 | -12.5 | 15.7 | 3.7 | 19.4 | 60.0 | -40.6 |
| 3 | 753.5 | -12.8 | 15.3 | 3.9 | 19.2 | 60.0 | -40.8 |

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 13, Channel Bandwidth: 10MHz

| MODE | | TX channel 5230 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | ERP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 751.0 | -7.4 | 17.8 | 3.7 | **21.5** | 60.0 | -38.5 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| 1 | 751.0 | -12.7 | 15.5 | 3.7 | 19.2 | 60.0 | -40.8 |

Note: ERP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 5MHz

| MODE | | TX channel 66461, 66786, 67111 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -20.1 | 21.6 | -0.3 | 21.3 | 62.1 | -40.8 |
| 2 | 2145.0 | -20.5 | 21.4 | -0.3 | 21.1 | 62.1 | -41.0 |
| 3 | 2177.5 | -19.8 | 22.2 | -0.2 | **22.0** | 62.1 | -40.1 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2112.5 | -23.6 | 18.9 | -0.3 | 18.6 | 62.1 | -43.5 |
| 2 | 2145.0 | -24.0 | 18.5 | -0.3 | 18.2 | 62.1 | -43.9 |
| 3 | 2177.5 | -23.4 | 18.9 | -0.2 | 18.7 | 62.1 | -43.4 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 10MHz

| MODE | | TX channel 66486, 66786, 67086 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -19.9 | 21.8 | -0.3 | 21.5 | 62.1 | -40.6 |
| 2 | 2145.0 | -20.3 | 21.7 | -0.3 | 21.4 | 62.1 | -40.7 |
| 3 | 2175.0 | -19.8 | 22.3 | -0.2 | **22.1** | 62.1 | -40.0 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2115.0 | -23.5 | 19.0 | -0.3 | 18.7 | 62.1 | -43.4 |
| 2 | 2145.0 | -23.7 | 18.7 | -0.3 | 18.4 | 62.1 | -43.7 |
| 3 | 2175.0 | -23.4 | 18.9 | -0.2 | 18.7 | 62.1 | -43.4 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 15MHz

| MODE | | TX channel 66511, 66786, 67061 | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -19.8 | 21.9 | -0.3 | 21.6 | 62.1 | -40.5 |
| 2 | 2145.0 | -20.3 | 21.7 | -0.3 | 21.4 | 62.1 | -40.7 |
| 3 | 2172.5 | -19.6 | 22.5 | -0.2 | **22.3** | 62.1 | -39.8 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2117.5 | -23.6 | 18.9 | -0.3 | 18.6 | 62.1 | -43.5 |
| 2 | 2145.0 | -24.0 | 18.4 | -0.3 | 18.1 | 62.1 | -44.0 |
| 3 | 2172.5 | -23.4 | 18.9 | -0.2 | 18.7 | 62.1 | -43.4 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

LTE Band 66, Channel Bandwidth: 20MHz

| MODE | TX channel 66536, 66786, 67036 | | | | | | |
|---|---|---|---|---|---|---|---|
| Antenna Polarity & Test Distance: Horizontal at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -20.0 | 21.8 | -0.3 | 21.5 | 62.1 | -40.6 |
| 2 | 2145.0 | -20.2 | 21.8 | -0.3 | 21.5 | 62.1 | -40.6 |
| 3 | 2170.0 | -19.9 | 22.2 | -0.2 | **22.0** | 62.1 | -40.1 |
| Antenna Polarity & Test Distance: Vertical at 3 M | | | | | | | |
| No. | Freq. (MHz) | Reading (dBm) | S.G Power Value (dBm) | Correction Factor (dB) | EIRP (dBm) | Limit (dBm) | Margin (dB) |
| 1 | 2120.0 | -23.6 | 18.9 | -0.3 | 18.6 | 62.1 | -43.5 |
| 2 | 2145.0 | -23.8 | 18.6 | -0.3 | 18.3 | 62.1 | -43.8 |
| 3 | 2170.0 | -23.3 | 19.0 | -0.2 | 18.8 | 62.1 | -43.3 |

Note: EIRP (dBm) = S.G Power Value (dBm) + Correction Factor (dB).

## 4.2 Modulation Characteristics Measurement

### 4.2.1 Limits of Modulation Characteristics

N/A

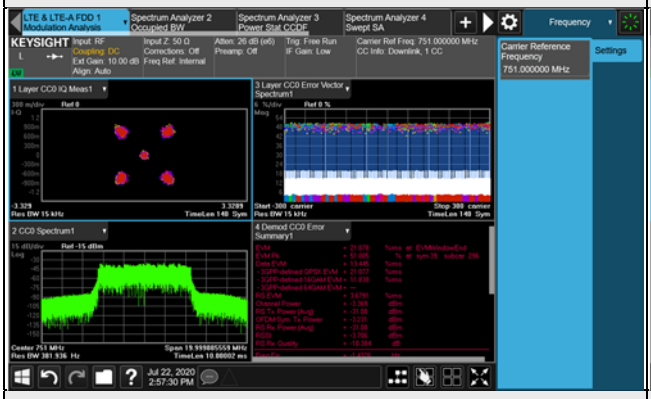
### 4.2.2 Test Procedure

Connect the EUT to Communication Simulator via the antenna connector, The frequency band is set as EUT supported Modulation and Channels, the EUT output is matched with 50 ohm load, the waveform quality and constellation of the EUT was tested.

### 4.2.3 Test Setup

### 4.2.4 Test Results

| LTE Band 4 | |
|---|---|
| Spectrum Plot of Measurement Value | |
| Channel: 2175 / Frequency (MHz): 2132.5MHz | |
| QPSK | 16QAM |
| | |
| 64QAM | |
| | |

| LTE Band 13 | |
|---|---|
| Spectrum Plot of Measurement Value | |
| Channel: 5230 / Frequency (MHz): 751.0MHz | |
| QPSK | 16QAM |
|  | |
| 64QAM | |
| | |

| LTE Band 66 | |
|---|---|
| Spectrum Plot of Measurement Value | |
| Channel: 66786 / Frequency (MHz): 2145.0 MHz | |
| QPSK | 16QAM |
| | |
| 64QAM | |
| | |

## 4.3 Frequency Stability Measurement

### 4.3.1 Limits of Frequency Stability Measurement

According to the FCC part 2.1055 shall be tested the frequency stability. The rule is defined that" The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block." The test extreme voltage is according to the 2.1055(d)(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment and the extreme temperature rule is comply with specification of EUT -30℃ ~ 50℃.

### 4.3.2 Test Procedure

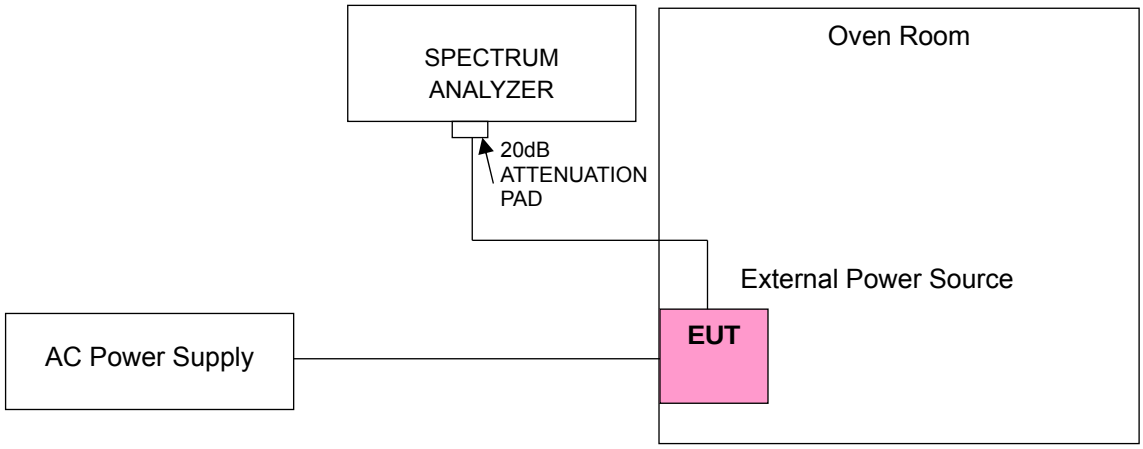
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the AC 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 ±0.5 ℃ 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.

### 4.3.3 Test Setup



### 4.3.4 Test Results

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 4 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 5 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| 120 | 2112.500003 | 0.001 | 2152.500004 | 0.002 |
| 102 | 2112.500002 | 0.001 | 2152.500004 | 0.002 |
| 138 | 2112.500003 | 0.002 | 2152.500002 | 0.001 |

Note: The applicant defined the normal working voltage is from 102Vac to 138Vac.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 4 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 5 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| -30 | 2112.500001 | 0.001 | 2152.500004 | 0.002 |
| -20 | 2112.500001 | 0.001 | 2152.500002 | 0.001 |
| -10 | 2112.500003 | 0.002 | 2152.500002 | 0.001 |
| 0 | 2112.500004 | 0.002 | 2152.500002 | 0.001 |
| 10 | 2112.500002 | 0.001 | 2152.500001 | 0.001 |
| 20 | 2112.499999 | -0.001 | 2152.499999 | 0.000 |
| 30 | 2112.499998 | -0.001 | 2152.499997 | -0.002 |
| 40 | 2112.499996 | -0.002 | 2152.499999 | -0.001 |
| 50 | 2112.499998 | -0.001 | 2152.499999 | -0.001 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 4 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 10 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| 120 | 2115.000004 | 0.002 | 2150.000003 | 0.001 |
| 102 | 2115.000002 | 0.001 | 2150.000004 | 0.002 |
| 138 | 2115.000004 | 0.002 | 2150.000003 | 0.001 |

Note: The applicant defined the normal working voltage is from 102Vac to 138Vac.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 4 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 10 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| -30 | 2115.000002 | 0.001 | 2150.000002 | 0.001 |
| -20 | 2115.000001 | 0.001 | 2150.000003 | 0.002 |
| -10 | 2115.000001 | 0.001 | 2150.000004 | 0.002 |
| 0 | 2115.000002 | 0.001 | 2150.000002 | 0.001 |
| 10 | 2115.000003 | 0.001 | 2150.000002 | 0.001 |
| 20 | 2114.999998 | -0.001 | 2149.999998 | -0.001 |
| 30 | 2114.999998 | -0.001 | 2149.999997 | -0.001 |
| 40 | 2114.999997 | -0.001 | 2149.999998 | -0.001 |
| 50 | 2114.999996 | -0.002 | 2149.999998 | -0.001 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 4 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 15 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| 120 | 2117.500004 | 0.002 | 2147.500001 | 0.001 |
| 102 | 2117.500001 | 0.000 | 2147.500004 | 0.002 |
| 138 | 2117.500001 | 0.001 | 2147.500001 | 0.001 |

Note: The applicant defined the normal working voltage is from 102Vac to 138Vac.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 4 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 15 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| -30 | 2117.500002 | 0.001 | 2147.500003 | 0.002 |
| -20 | 2117.500004 | 0.002 | 2147.500002 | 0.001 |
| -10 | 2117.500003 | 0.001 | 2147.500003 | 0.002 |
| 0 | 2117.500003 | 0.001 | 2147.500004 | 0.002 |
| 10 | 2117.500003 | 0.001 | 2147.500004 | 0.002 |
| 20 | 2117.499998 | -0.001 | 2147.499997 | -0.001 |
| 30 | 2117.499997 | -0.001 | 2147.499998 | -0.001 |
| 40 | 2117.499998 | -0.001 | 2147.499997 | -0.001 |
| 50 | 2117.499998 | -0.001 | 2147.499997 | -0.001 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 4 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 20 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| 120 | 2120.000004 | 0.002 | 2145.000001 | 0.001 |
| 102 | 2120.000003 | 0.001 | 2145.000004 | 0.002 |
| 138 | 2120.000003 | 0.001 | 2145.000003 | 0.001 |

Note: The applicant defined the normal working voltage is from 102Vac to 138Vac.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 4 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 20 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| -30 | 2120.000003 | 0.002 | 2145.000002 | 0.001 |
| -20 | 2120.000003 | 0.001 | 2145.000003 | 0.002 |
| -10 | 2120.000004 | 0.002 | 2145.000003 | 0.001 |
| 0 | 2120.000003 | 0.001 | 2145.000004 | 0.002 |
| 10 | 2120.000002 | 0.001 | 2145.000001 | 0.001 |
| 20 | 2119.999999 | -0.001 | 2144.999996 | -0.002 |
| 30 | 2119.999999 | -0.001 | 2144.999998 | -0.001 |
| 40 | 2119.999998 | -0.001 | 2144.999996 | -0.002 |
| 50 | 2119.999999 | -0.001 | 2144.999998 | -0.001 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 13 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 5 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| 120 | 748.500003 | 0.003 | 753.500002 | 0.002 |
| 102 | 748.500002 | 0.002 | 753.500002 | 0.002 |
| 138 | 748.500002 | 0.002 | 753.500003 | 0.004 |

Note: The applicant defined the normal working voltage is from 102Vac to 138Vac.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 13 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 5 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| -30 | 748.500001 | 0.001 | 753.500002 | 0.003 |
| -20 | 748.500001 | 0.002 | 753.500002 | 0.003 |
| -10 | 748.500002 | 0.003 | 753.500001 | 0.002 |
| 0 | 748.500004 | 0.005 | 753.500002 | 0.003 |
| 10 | 748.500003 | 0.003 | 753.500003 | 0.004 |
| 20 | 748.499997 | -0.005 | 753.499997 | -0.005 |
| 30 | 748.499998 | -0.003 | 753.499999 | -0.002 |
| 40 | 748.499996 | -0.005 | 753.499999 | -0.001 |
| 50 | 748.499999 | -0.002 | 753.499998 | -0.003 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 13 | |
|---|---|---|
| | Channel Bandwidth: 10 MHz | |
| | Frequency (MHz) | Frequency Error (ppm) |
| 120 | 751.000004 | 0.005 |
| 102 | 751.000004 | 0.005 |
| 138 | 751.000003 | 0.004 |

Note: The applicant defined the normal working voltage is from 102Vac to 138Vac.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 13 | |
|---|---|---|
| | Channel Bandwidth: 10 MHz | |
| | Frequency (MHz) | Frequency Error (ppm) |
| -30 | 751.000003 | 0.004 |
| -20 | 751.000002 | 0.003 |
| -10 | 751.000004 | 0.005 |
| 0 | 751.000003 | 0.003 |
| 10 | 751.000001 | 0.002 |
| 20 | 750.999998 | -0.003 |
| 30 | 750.999996 | -0.005 |
| 40 | 750.999998 | -0.003 |
| 50 | 750.999999 | -0.002 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 66 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 5 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| 120 | 2112.500003 | 0.002 | 2177.500004 | 0.002 |
| 102 | 2112.500003 | 0.001 | 2177.500004 | 0.002 |
| 138 | 2112.500002 | 0.001 | 2177.500002 | 0.001 |

Note: The applicant defined the normal working voltage is from 102Vac to 138Vac.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 66 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 5 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| -30 | 2112.500002 | 0.001 | 2177.500002 | 0.001 |
| -20 | 2112.500004 | 0.002 | 2177.500003 | 0.001 |
| -10 | 2112.500004 | 0.002 | 2177.500001 | 0.001 |
| 0 | 2112.500002 | 0.001 | 2177.500001 | 0.001 |
| 10 | 2112.500002 | 0.001 | 2177.500002 | 0.001 |
| 20 | 2112.499998 | -0.001 | 2177.499996 | -0.002 |
| 30 | 2112.499997 | -0.002 | 2177.499997 | -0.001 |
| 40 | 2112.499997 | -0.001 | 2177.499999 | -0.001 |
| 50 | 2112.499997 | -0.002 | 2177.499998 | -0.001 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 66 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 10 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| 120 | 2115.000002 | 0.001 | 2175.000002 | 0.001 |
| 102 | 2115.000001 | 0.001 | 2175.000002 | 0.001 |
| 138 | 2115.000002 | 0.001 | 2175.000001 | 0.000 |

Note: The applicant defined the normal working voltage is from 102Vac to 138Vac.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 66 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 10 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| -30 | 2115.000002 | 0.001 | 2175.000004 | 0.002 |
| -20 | 2115.000001 | 0.001 | 2175.000003 | 0.001 |
| -10 | 2115.000003 | 0.001 | 2175.000002 | 0.001 |
| 0 | 2115.000002 | 0.001 | 2175.000002 | 0.001 |
| 10 | 2115.000001 | 0.001 | 2175.000002 | 0.001 |
| 20 | 2114.999997 | -0.001 | 2174.999998 | -0.001 |
| 30 | 2114.999996 | -0.002 | 2174.999997 | -0.001 |
| 40 | 2114.999998 | -0.001 | 2174.999999 | -0.001 |
| 50 | 2114.999999 | -0.001 | 2174.999997 | -0.001 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 66 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 15 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| 120 | 2117.500001 | 0.001 | 2172.500003 | 0.001 |
| 102 | 2117.500001 | 0.001 | 2172.500002 | 0.001 |
| 138 | 2117.500003 | 0.002 | 2172.500001 | 0.001 |

Note: The applicant defined the normal working voltage is from 102Vac to 138Vac.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 66 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 15 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| -30 | 2117.500003 | 0.001 | 2172.500002 | 0.001 |
| -20 | 2117.500003 | 0.002 | 2172.500003 | 0.001 |
| -10 | 2117.500002 | 0.001 | 2172.500002 | 0.001 |
| 0 | 2117.500001 | 0.001 | 2172.500002 | 0.001 |
| 10 | 2117.500002 | 0.001 | 2172.500002 | 0.001 |
| 20 | 2117.499999 | -0.001 | 2172.499996 | -0.002 |
| 30 | 2117.499999 | 0.000 | 2172.499998 | -0.001 |
| 40 | 2117.499998 | -0.001 | 2172.499998 | -0.001 |
| 50 | 2117.499999 | -0.001 | 2172.499997 | -0.001 |

Frequency Error vs. Voltage

| Voltage (Volts) | LTE Band 66 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 20 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| 120 | 2120.000004 | 0.002 | 2170.000004 | 0.002 |
| 102 | 2120.000002 | 0.001 | 2170.000004 | 0.002 |
| 138 | 2120.000004 | 0.002 | 2170.000003 | 0.001 |

Note: The applicant defined the normal working voltage is from 102Vac to 138Vac.

Frequency Error vs. Temperature

| Temp. (℃) | LTE Band 66 | | | |
|---|---|---|---|---|
| | Channel Bandwidth: 20 MHz | | | |
| | Low Channel | | High Channel | |
| | Frequency (MHz) | Frequency Error (ppm) | Frequency (MHz) | Frequency Error (ppm) |
| -30 | 2120.000002 | 0.001 | 2170.000004 | 0.002 |
| -20 | 2120.000001 | 0.000 | 2170.000003 | 0.001 |
| -10 | 2120.000002 | 0.001 | 2170.000004 | 0.002 |
| 0 | 2120.000003 | 0.001 | 2170.000001 | 0.001 |
| 10 | 2120.000003 | 0.002 | 2170.000001 | 0.001 |
| 20 | 2119.999997 | -0.001 | 2169.999997 | -0.001 |
| 30 | 2119.999998 | -0.001 | 2169.999997 | -0.001 |
| 40 | 2119.999996 | -0.002 | 2169.999997 | -0.001 |
| 50 | 2119.999996 | -0.002 | 2169.999998 | -0.001 |

## 4.4 Occupied Bandwidth Measurement

### 4.4.1 Limits of Occupied Bandwidth Measurement

**-26dBc Bandwidth**
According to FCC 27.53(m)(6) specified that emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26dB below the transmitter power.

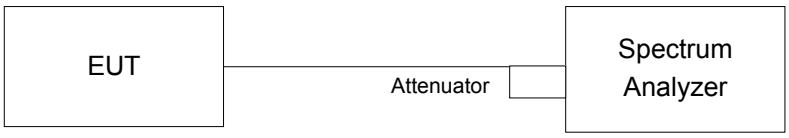
**Occupied Bandwidth**
The EUT makes a call to the communication simulator. All measurements were done at low, middle and high operational frequency range. The communication simulator station system controlled a EUT to export maximum output power under transmission mode and specific channel frequency. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

### 4.4.2 Test Procedure

**-26dBc Bandwidth**
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 51kHz and VBW = 150kHz (Channel Bandwidth: 5MHz), RBW = 100kHz and VBW = 300kHz (Channel Bandwidth: 10MHz), RBW = 150kHz and VBW = 470kHz (Channel Bandwidth: 15MHz) and RBW = 200kHz and VBW = 620kHz (Channel Bandwidth: 20MHz). The 26dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 26dB.

**Occupied Channel Bandwidth**
The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with RBW = 51kHz and VBW = 150kHz (Channel Bandwidth: 5MHz), RBW = 100kHz and VBW = 300kHz (Channel Bandwidth: 10MHz), RBW = 150kHz and VBW = 470kHz (Channel Bandwidth: 15MHz) and RBW = 200kHz and VBW = 620kHz (Channel Bandwidth: 20MHz).

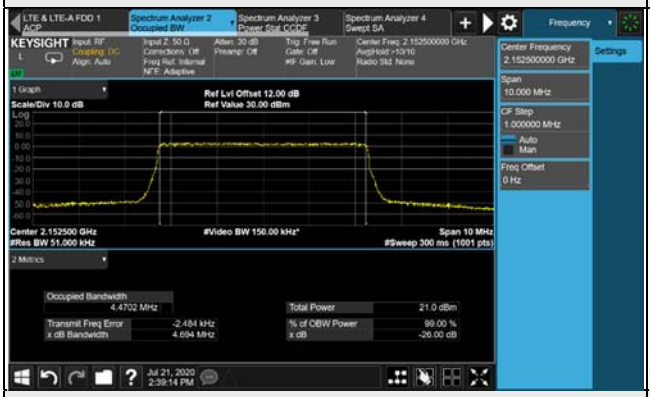
### 4.4.3 Test Setup



### 4.4.4 Test Result

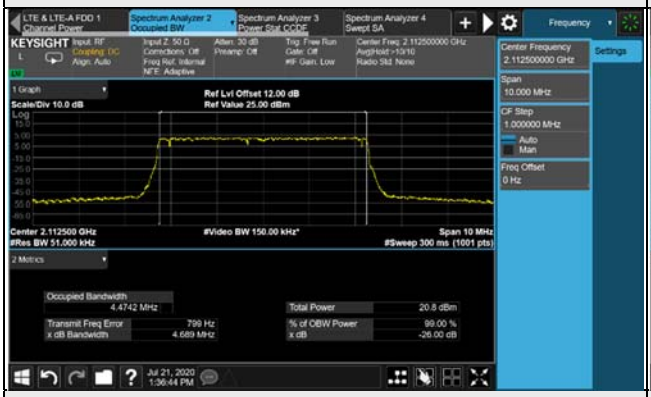
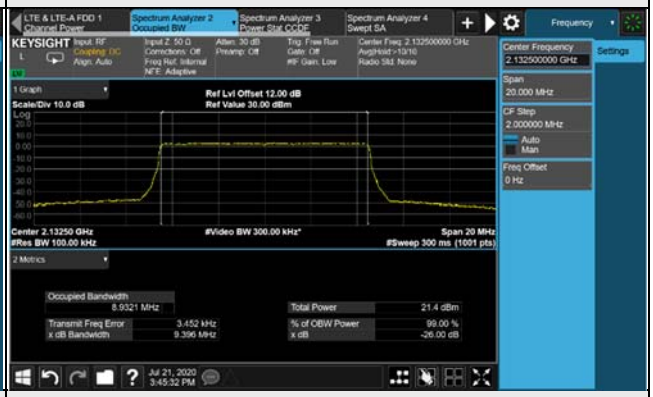
Occupied Bandwidth
LTE Band 4
**Chain 0**

| LTE Band 4, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 1975 | 2112.5 | 4.47 | 4.47 | 4.47 |
| 2175 | 2132.5 | 4.47 | 4.46 | 4.47 |
| 2375 | 2152.5 | 4.47 | 4.47 | 4.47 |
| LTE Band 4, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2000 | 2115.0 | 8.93 | 8.93 | 8.92 |
| 2175 | 2132.5 | 8.92 | 8.93 | 8.92 |
| 2350 | 2150.0 | 8.92 | 8.92 | 8.93 |
| LTE Band 4, Channel Bandwidth 15MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2025 | 2117.5 | 13.41 | 13.41 | 13.40 |
| 2175 | 2132.5 | 13.40 | 13.40 | 13.40 |
| 2325 | 2147.5 | 13.39 | 13.39 | 13.40 |
| LTE Band 4, Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2050 | 2120.0 | 17.87 | 17.84 | 17.87 |
| 2175 | 2132.5 | 17.86 | 17.85 | 17.86 |
| 2300 | 2145.0 | 17.84 | 17.85 | 17.84 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / 64QAM | 10MHz / 64QAM |
|  | |
| 15MHz / 16QAM | 20MHz / 64QAM |
| | |

**Chain 1**

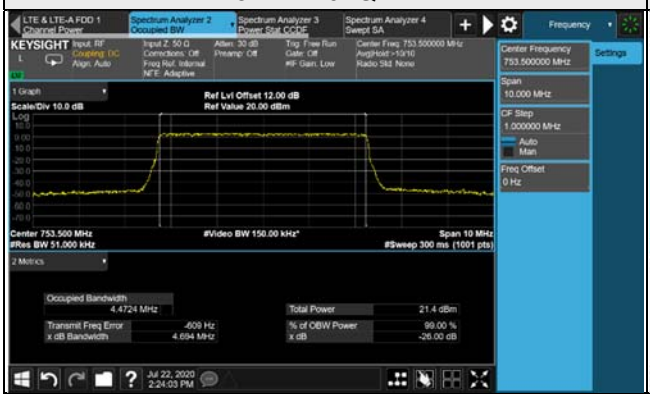
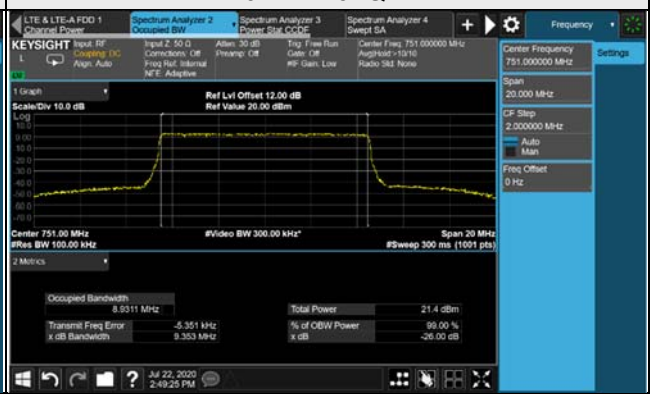
| LTE Band 4, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 1975 | 2112.5 | 4.47 | 4.47 | 4.47 |
| 2175 | 2132.5 | 4.47 | 4.47 | 4.47 |
| 2375 | 2152.5 | 4.47 | 4.46 | 4.47 |
| LTE Band 4, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2000 | 2115.0 | 8.93 | 8.92 | 8.92 |
| 2175 | 2132.5 | 8.93 | 8.93 | 8.93 |
| 2350 | 2150.0 | 8.93 | 8.92 | 8.92 |
| LTE Band 4, Channel Bandwidth 15MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2025 | 2117.5 | 13.40 | 13.40 | 13.40 |
| 2175 | 2132.5 | 13.40 | 13.40 | 13.40 |
| 2325 | 2147.5 | 13.41 | 13.40 | 13.40 |
| LTE Band 4, Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2050 | 2120.0 | 17.86 | 17.85 | 17.85 |
| 2175 | 2132.5 | 17.86 | 17.86 | 17.85 |
| 2300 | 2145.0 | 17.85 | 17.86 | 17.86 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / 64QAM | 10MHz / QPSK |
|  |  |
| 15MHz / QPSK | 20MHz / 16QAM |
| | |

LTE Band 13

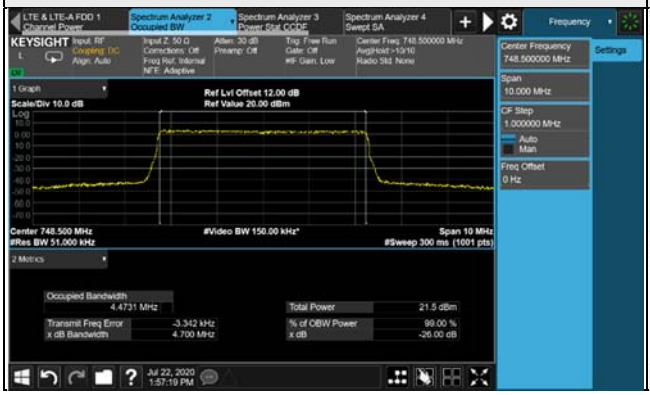
**Chain 0**

| LTE Band 13, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 5205 | 748.5 | 4.47 | 4.47 | 4.47 |
| 5230 | 751.0 | 4.47 | 4.47 | 4.47 |
| 5255 | 753.5 | 4.47 | 4.47 | 4.47 |
| LTE Band 13, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 5230 | 751.0 | 8.92 | 8.93 | 8.93 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / 64QAM | 10MHz / 64QAM |
|  |  |

## Chain 1

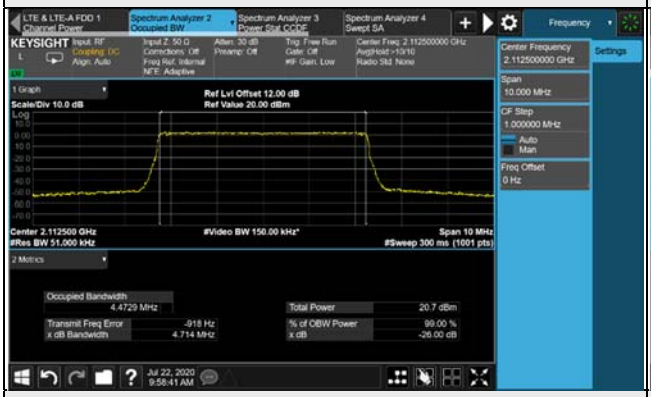
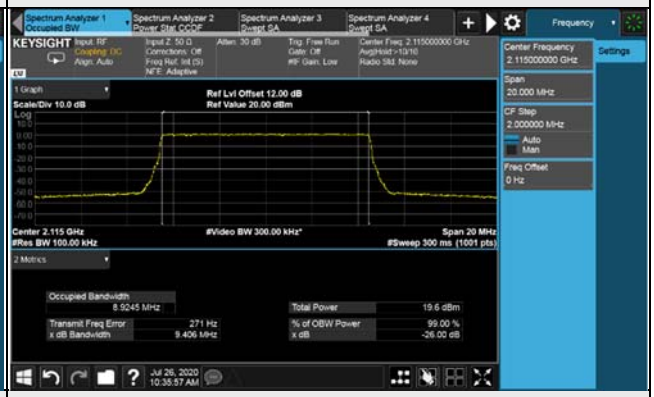
| LTE Band 13, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 5205 | 748.5 | 4.47 | 4.47 | 4.47 |
| 5230 | 751.0 | 4.47 | 4.47 | 4.47 |
| 5255 | 753.5 | 4.46 | 4.46 | 4.46 |
| LTE Band 13, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 5230 | 751.0 | 8.93 | 8.93 | 8.93 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / 64QAM | 10MHz / QPSK |
|  | |

LTE Band 66

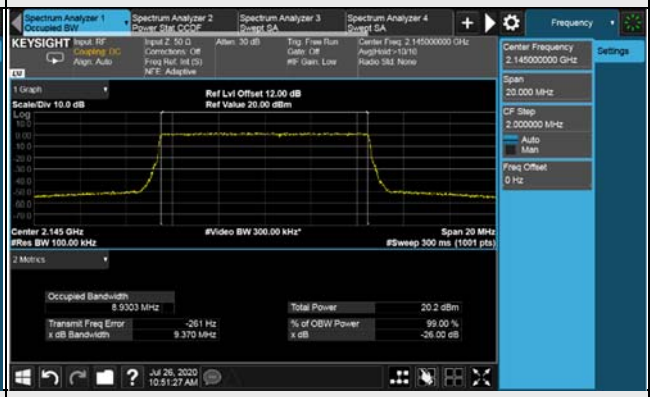
**Chain 0**

| LTE Band 66, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66461 | 2112.5 | 4.47 | 4.47 | 4.47 |
| 66786 | 2145.0 | 4.47 | 4.47 | 4.46 |
| 67111 | 2177.5 | 4.47 | 4.47 | 4.47 |
| LTE Band 66, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66486 | 2115.0 | 8.92 | 8.92 | 8.92 |
| 66786 | 2145.0 | 8.92 | 8.92 | 8.92 |
| 67086 | 2175.0 | 8.92 | 8.92 | 8.92 |
| LTE Band 66, Channel Bandwidth 15MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66511 | 2117.5 | 13.41 | 13.41 | 13.41 |
| 66786 | 2145.0 | 13.40 | 13.40 | 13.39 |
| 67061 | 2172.5 | 13.41 | 13.41 | 13.41 |
| LTE Band 66, Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66536 | 2120.0 | 17.88 | 17.88 | 17.88 |
| 66786 | 2145.0 | 17.83 | 17.86 | 17.86 |
| 67036 | 2170.0 | 17.88 | 17.89 | 17.88 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / 64QAM | 10MHz / 64QAM |
|  |  |
| 15MHz / 64QAM | 20MHz / 16QAM |
| | |

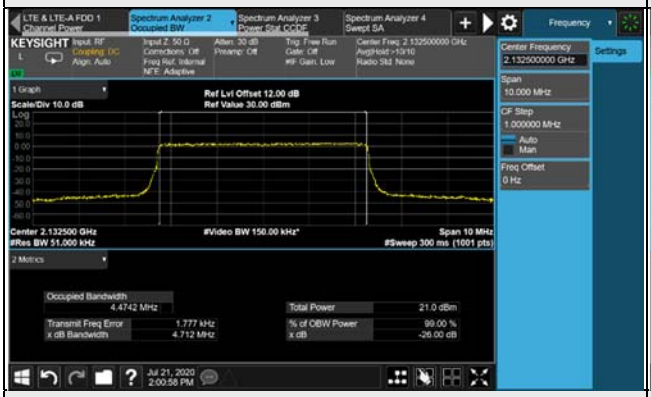
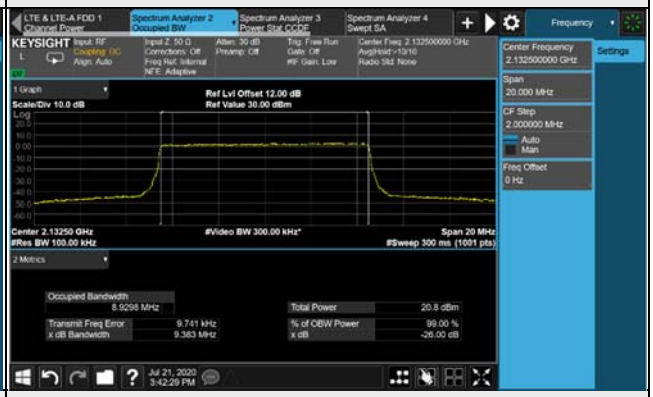
**Chain 1**

| LTE Band 66, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66461 | 2112.5 | 4.47 | 4.47 | 4.46 |
| 66786 | 2145.0 | 4.46 | 4.47 | 4.47 |
| 67111 | 2177.5 | 4.47 | 4.47 | 4.47 |
| LTE Band 66, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66486 | 2115.0 | 8.92 | 8.92 | 8.92 |
| 66786 | 2145.0 | 8.92 | 8.93 | 8.92 |
| 67086 | 2175.0 | 8.92 | 8.92 | 8.92 |
| LTE Band 66, Channel Bandwidth 15MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66511 | 2117.5 | 13.40 | 13.41 | 13.40 |
| 66786 | 2145.0 | 13.40 | 13.40 | 13.40 |
| 67061 | 2172.5 | 13.40 | 13.40 | 13.40 |
| LTE Band 66, Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | 99% Occupied Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66536 | 2120.0 | 17.86 | 17.86 | 17.86 |
| 66786 | 2145.0 | 17.87 | 17.87 | 17.88 |
| 67036 | 2170.0 | 17.86 | 17.86 | 17.86 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / 16QAM | 10MHz / 16QAM |
| |  |
| 15MHz / 16QAM | 20MHz / 64QAM |
| | |

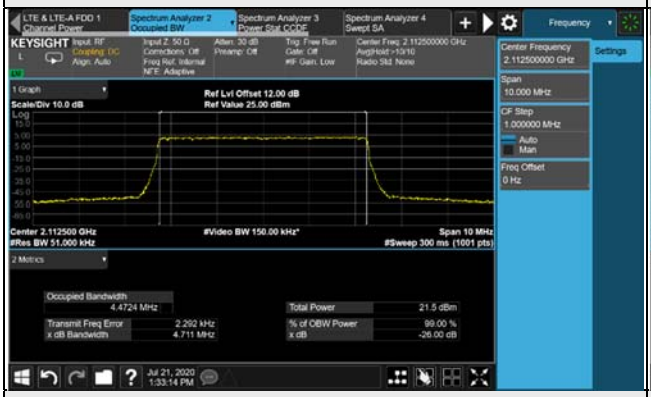
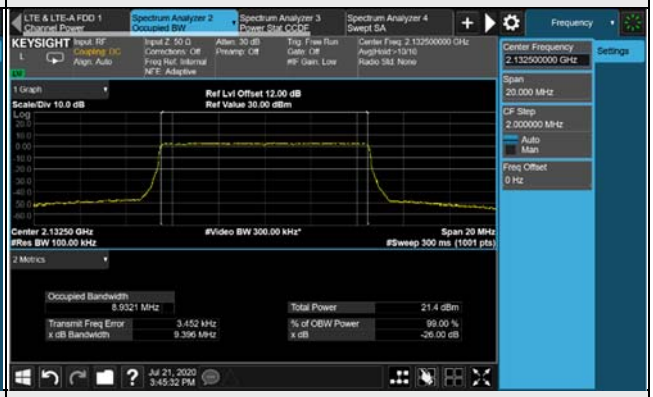
26dB Bandwidth
LTE Band 4
**Chain 0**

| LTE Band 4, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 1975 | 2112.5 | 4.69 | 4.70 | 4.71 |
| 2175 | 2132.5 | 4.71 | 4.71 | 4.70 |
| 2375 | 2152.5 | 4.71 | 4.71 | 4.69 |
| LTE Band 4, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2000 | 2115.0 | 9.38 | 9.38 | 9.36 |
| 2175 | 2132.5 | 9.36 | 9.34 | 9.38 |
| 2350 | 2150.0 | 9.37 | 9.35 | 9.36 |
| LTE Band 4, Channel Bandwidth 15MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2025 | 2117.5 | 14.04 | 14.02 | 14.07 |
| 2175 | 2132.5 | 14.01 | 14.08 | 14.00 |
| 2325 | 2147.5 | 14.04 | 14.04 | 14.03 |
| LTE Band 4, Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2050 | 2120.0 | 18.55 | 18.54 | 18.57 |
| 2175 | 2132.5 | 18.56 | 18.55 | 18.55 |
| 2300 | 2145.0 | 18.56 | 18.55 | 18.55 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / QPSK | 10MHz / 64QAM |
|  |  |
| 15MHz / 16QAM | 20MHz / 64QAM |
| | |

**Chain 1**

| LTE Band 4, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 1975 | 2112.5 | 4.71 | 4.69 | 4.68 |
| 2175 | 2132.5 | 4.69 | 4.70 | 4.70 |
| 2375 | 2152.5 | 4.69 | 4.69 | 4.69 |
| LTE Band 4, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2000 | 2115.0 | 9.35 | 9.34 | 9.33 |
| 2175 | 2132.5 | 9.39 | 9.39 | 9.37 |
| 2350 | 2150.0 | 9.36 | 9.35 | 9.34 |
| LTE Band 4, Channel Bandwidth 15MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2025 | 2117.5 | 14.03 | 14.05 | 14.10 |
| 2175 | 2132.5 | 14.05 | 14.00 | 14.05 |
| 2325 | 2147.5 | 13.99 | 14.03 | 14.07 |
| LTE Band 4, Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 2050 | 2120.0 | 18.59 | 18.55 | 18.57 |
| 2175 | 2132.5 | 18.55 | 18.55 | 18.59 |
| 2300 | 2145.0 | 18.59 | 18.61 | 18.59 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / QPSK | 10MHz / QPSK |
|  |  |
| 15MHz / 64QAM | 20MHz / 16QAM |
| | |

LTE Band 13

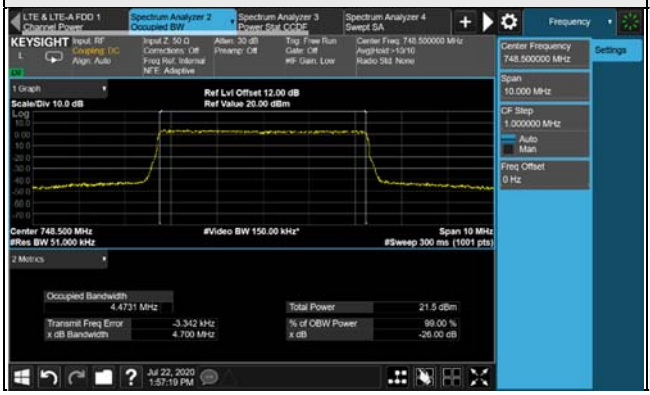
**Chain 0**

| LTE Band 13, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 5205 | 748.5 | 4.69 | 4.71 | 4.69 |
| 5230 | 751.0 | 4.70 | 4.69 | 4.70 |
| 5255 | 753.5 | 4.71 | 4.69 | 4.69 |
| LTE Band 13, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 5230 | 751.0 | 9.38 | 9.36 | 9.35 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / 16QAM | 10MHz / QPSK |
| | |

## Chain 1

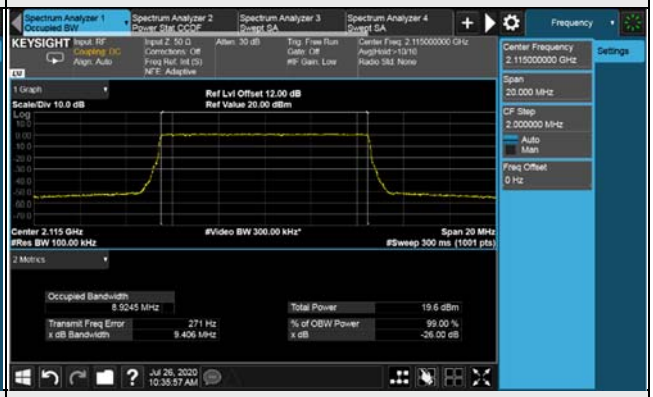
| LTE Band 13, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 5205 | 748.5 | 4.70 | 4.70 | 4.70 |
| 5230 | 751.0 | 4.70 | 4.70 | 4.70 |
| 5255 | 753.5 | 4.70 | 4.69 | 4.67 |
| LTE Band 13, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 5230 | 751.0 | 9.37 | 9.35 | 9.36 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / 64QAM | 10MHz / QPSK |
|  | |

LTE Band 66

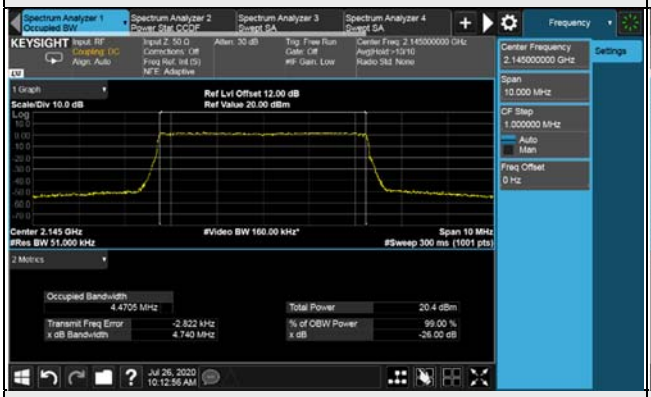
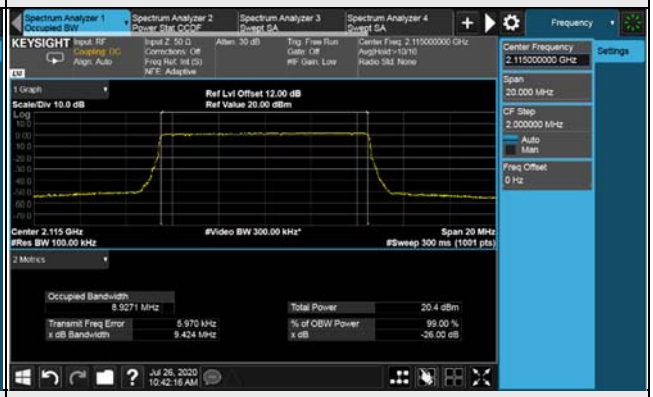
**Chain 0**

| LTE Band 66, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66461 | 2112.5 | 4.69 | 4.71 | 4.71 |
| 66786 | 2145.0 | 4.73 | 4.74 | 4.74 |
| 67111 | 2177.5 | 4.74 | 4.74 | 4.73 |
| LTE Band 66, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66486 | 2115.0 | 9.38 | 9.36 | 9.40 |
| 66786 | 2145.0 | 9.34 | 9.40 | 9.39 |
| 67086 | 2175.0 | 9.40 | 9.39 | 9.36 |
| LTE Band 66, Channel Bandwidth 15MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66511 | 2117.5 | 14.00 | 13.97 | 14.05 |
| 66786 | 2145.0 | 14.02 | 14.01 | 14.03 |
| 67061 | 2172.5 | 13.99 | 14.04 | 13.97 |
| LTE Band 66, Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66536 | 2120.0 | 18.70 | 18.76 | 18.73 |
| 66786 | 2145.0 | 18.61 | 18.61 | 18.67 |
| 67036 | 2170.0 | 18.63 | 18.57 | 18.60 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / 64QAM | 10MHz / 64QAM |
| |  |
| 15MHz / 64QAM | 20MHz / 16QAM |
| | |

**Chain 1**

| LTE Band 66, Channel Bandwidth 5MHz | | | | |
|---|---|---|---|---|
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66461 | 2112.5 | 4.71 | 4.70 | 4.68 |
| 66786 | 2145.0 | 4.72 | 4.74 | 4.72 |
| 67111 | 2177.5 | 4.73 | 4.73 | 4.73 |
| LTE Band 66, Channel Bandwidth 10MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66486 | 2115.0 | 9.42 | 9.42 | 9.37 |
| 66786 | 2145.0 | 9.41 | 9.37 | 9.38 |
| 67086 | 2175.0 | 9.37 | 9.34 | 9.40 |
| LTE Band 66, Channel Bandwidth 15MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66511 | 2117.5 | 14.03 | 13.99 | 14.02 |
| 66786 | 2145.0 | 14.02 | 14.00 | 14.01 |
| 67061 | 2172.5 | 14.05 | 14.01 | 14.04 |
| LTE Band 66, Channel Bandwidth 20MHz | | | | |
| Channel | Frequency (MHz) | 26 dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 66536 | 2120.0 | 18.68 | 18.58 | 18.61 |
| 66786 | 2145.0 | 18.66 | 18.64 | 18.72 |
| 67036 | 2170.0 | 18.66 | 18.57 | 18.69 |

| Spectrum Plot of Worst Value | |
|---|---|
| 5MHz / 16QAM | 10MHz / QPSK |
|  |  |
| 15MHz / QPSK | 20MHz / 64QAM |
| | |

## 4.5 Channel Edge Measurement

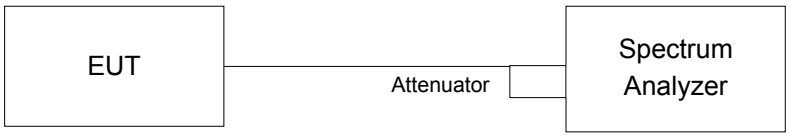
### 4.5.1 Limits of Band Edge Measurement

LTE Band 4, 66

According to FCC 27.53(h) specified the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10 log10 (P) dB. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

For LTE Band 13
According to FCC 27.53(c), for operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured watts, in accordance with the following:
(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB.

### 4.5.2 Test Setup



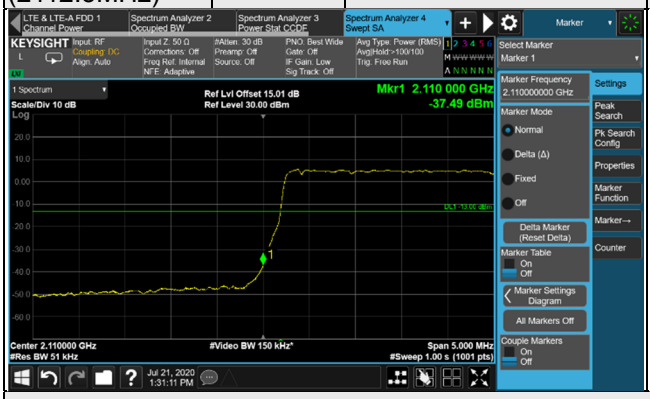

### 4.5.3 Test Procedures

a. The EUT was set up for the rated peak power. The power was measured with Spectrum Analyzer. Band edge measurements were done at 3 channels: low, middle and high operational frequency range. Emission mask measurements were done at 2 channels: low and high operational frequency range.
b. Offset=12(Cable loss)+3.01(2TX directional)=15.01 dB.
c. The center frequency of spectrum is the band edge frequency and span is 5MHz. RB of the spectrum is 51kHz and VB of the spectrum is 150kHz (LTE Channel Bandwidth 5MHz).
d. The center frequency of spectrum is the band edge frequency and span is 5MHz. RB of the spectrum is 100kHz and VB of the spectrum is 300kHz (LTE Channel Bandwidth 10MHz).
e. The center frequency of spectrum is the band edge frequency and span is 5MHz. RB of the spectrum is 150kHz and VB of the spectrum is 470kHz (LTE Channel Bandwidth 15MHz).
f. The center frequency of spectrum is the band edge frequency and span is 5MHz. RB of the spectrum is 200kHz and VB of the spectrum is 1MHz (LTE Channel Bandwidth 20MHz).
g. Record the max trace plot into the test report.

### 4.5.4 Test Results

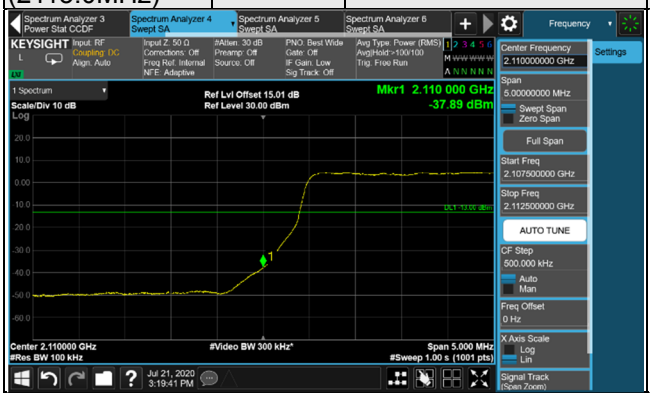
LTE Band 4

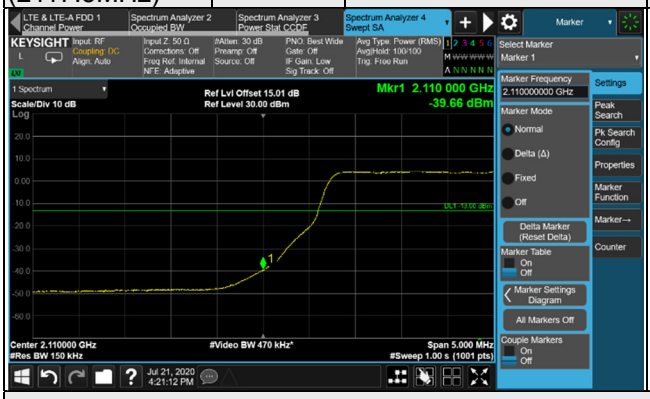
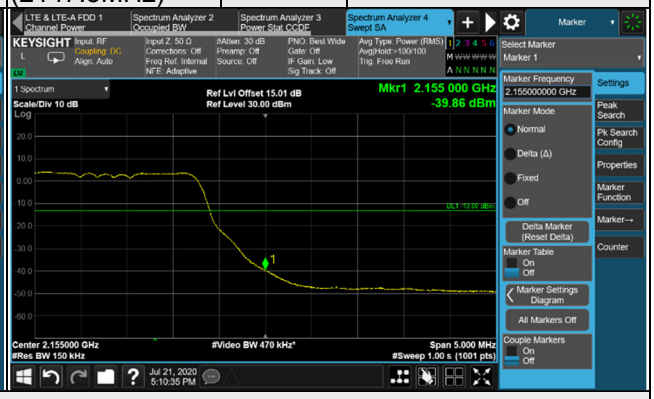
Chain 0

| Channel Bandwidth: 5MHz | | | | | |
|---|---|---|---|---|---|
| Channel 1975 (2112.5MHz) | QPSK | | Channel 2375 (2152.5MHz) | QPSK | |
|  | | | | | |





| Channel Bandwidth: 10MHz | | | | | |
|---|---|---|---|---|---|
| Channel 2000 (2115.0MHz) | QPSK | | Channel 2350 (2150.0MHz) | QPSK | |
|  | | | | | |

| Channel Bandwidth: 15MHz | | | | | |
|---|---|---|---|---|---|
| Channel 2025 (2117.5MHz) | QPSK | | Channel 2325 (2147.5MHz) | QPSK | |
|  | | |  | | |





| Channel Bandwidth: 20MHz | | | | | |
|---|---|---|---|---|---|
| Channel 2050 (2120.0MHz) | QPSK | | Channel 2300 (2145.0MHz) | QPSK | |
| | | | | | |