# FCC TEST REPORT

# (PART 27)

| | |
|---|---|
| Applicant: | Xiaomi Communications Co., Ltd. |
| Address: | #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China,10085 |

| | |
|---|---|
| Manufacturer or Supplier: | Xiaomi Communications Co., Ltd. |
| Address: | #019, 9th Floor, Building 6, 33 Xi'erqi Middle Road, Haidian District, Beijing, China,10085 |
| Product: | Mobile Phone |
| Brand Name: | Redmi |
| Model Name: | M2003J6B2G |
| FCC ID: | 2AFZZJ6B2G |
| Date of tests: | Mar. 05, 2020 ~ Apr. 09, 2020 |

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

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

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

| Prepared by Alex Chen<br>Engineer / Mobile Department | Approved by Luke Lu<br>Manager / Mobile Department |
|---|---|
| Alex<br>Date: Apr. 09, 2020 | Luke Lu<br>Date: Apr. 09, 2020 |

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# RELEASE CONTROL RECORD

| ISSUE NO. | REASON FOR CHANGE | DATE ISSUED |
|---|---|---|
| RF200304W004-6 | Original release | Apr. 09, 2020 |

# 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

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

## 1.1 MEASUREMENT UNCERTAINTY

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

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

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

## 1.2 TEST SITE AND INSTRUMENTS

| Equipment | Manufacturer | Model No. | Serial No. | Last Cal. | Next Cal. |
|---|---|---|---|---|---|
| MXE EMI Receiver | KEYSIGHT | N9038A-544 | MY54450026 | Feb. 28,20 | Feb. 27,21 |
| EXA Signal Analyzer | KEYSIGHT | N9010A-526 | MY54510322 | Feb. 28,20 | Feb. 27,21 |
| Bilog Antenna | ETS-LINDGREN | 3143B | 00161965 | Feb. 28,20 | Feb. 27,21 |
| Horn Antenna (1GHz-18GHz) | ETS-LINDGREN | 3117 | 00168692 | Nov. 30, 19 | Nov. 29, 20 |
| Horn Antenna (18GHz-40GHz) | N/A | QWH-SL-18-40-K-SG/QMS-00361 | 15433 | Nov. 21, 19 | Nov. 20, 20 |
| Radio Communication Analyzer | ANRITSU | MT8820C | 6201465426 | Feb. 28,20 | Feb. 27,21 |
| Signal Pre-Amplifier | EMSI | EMC 9135 | 980249 | Jul. 08,19 | Jul. 09,20 |
| Signal Pre-Amplifier | EMSI | EMC 012645B | 980257 | Jul. 08,19 | Jul. 09,20 |
| Signal Pre-Amplifier | EMSI | EMC 184045B | 980259 | Jul. 08,19 | Jul. 09,20 |
| 3m Semi-anechoic Chamber | ETS-LINDGREN | 9m*6m*6m | Euroshieldpn-CT0001143-1216 | Feb. 28,20 | Feb. 27,21 |
| Test Software | E3 | V 9.160323 | N/A | N/A | N/A |
| Test Software | ADT | ADT_Radiated_V7.6.15.9.2 | N/A | N/A | N/A |
| 10dB Attenuator | JFW/USA | 50HF-010-SMA | 1505 | Jul. 08,19 | Jul. 09,20 |
| Power Meter | Anritsu | ML2495A | 1506002 | Feb. 28,20 | Feb. 27,21 |
| Power Sensor | Anritsu | MA2411B | 1339352 | Feb. 28,20 | Feb. 27,21 |
| Humid & Temp Programmable Tester | Juyi | ITH-120-45-CP-AR | IAA1504-001 | Jul. 08,19 | Jul. 09,20 |
| MXG Analog Microvave Signal Generator | KEYSIGHT | N5183A | MY50143024 | Feb. 28,20 | Feb. 27,21 |
| Power Divider | MCLI/USA | PS2-15 | 24880 | Jul. 09,19 | Jul. 08,20 |

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

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

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

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

# 2 GENERAL INFORMATION

## 2.1 GENERAL DESCRIPTION OF EUT

| | | |
|---|---|---|
| **PRODUCT** | Mobile Phone | |
| **BRAND NAME** | Redmi | |
| **MODEL NAME** | M2003J6B2G | |
| **POWER SUPPLY** | 5V/9V/11V/12/20Vdc (adapter or host equipment)<br>3.87Vdc (Li-ion, battery) | |
| **MODULATION TECHNOLOGY** | **WCDMA** | BPSK, QPSK |
| | **LTE** | QPSK, 16QAM, 64QAM |
| **FREQUENCY RANGE** | **WCDMA IV** | 1712.4MHz ~ 1752.6MHz |
| | **LTE Band 4<br>Channel Bandwidth: 1.4MHz** | 1710.7MHz ~ 1754.3MHz |
| | **LTE Band 4<br>Channel Bandwidth: 3MHz** | 1711.5MHz ~ 1753.5MHz |
| | **LTE Band 4<br>Channel Bandwidth: 5MHz** | 1712.5MHz ~ 1752.5MHz |
| | **LTE Band 4<br>Channel Bandwidth: 10MHz** | 1715.0MHz ~ 1750.0MHz |
| | **LTE Band 4<br>Channel Bandwidth: 15MHz** | 1717.5MHz ~ 1747.5MHz |
| | **LTE Band 4<br>Channel Bandwidth: 20MHz** | 1720.0MHz ~ 1745.0MHz |
| **EMISSION DESIGNATOR** | **WCDMA IV** | 4M16F9W |
| | **LTE Band 4<br>Channel Bandwidth: 1.4MHz** | QPSK: 1M09G7D |
| | | 16QAM: 1M09W7D |
| | | 64QAM: 1M09W7D |
| | **LTE Band 4<br>Channel Bandwidth: 3MHz** | QPSK: 2M69G7D |
| | | 16QAM: 2M68W7D |
| | | 64QAM: 2M68W7D |
| | **LTE Band 4<br>Channel Bandwidth: 5MHz** | QPSK: 4M49G7D |
| | | 16QAM: 4M49W7D |
| | | 64QAM: 4M47W7D |
| | **LTE Band 4<br>Channel Bandwidth: 10MHz** | QPSK: 8M95G7D |
| | | 16QAM: 8M96W7D |
| | | 64QAM: 8M95W7D |

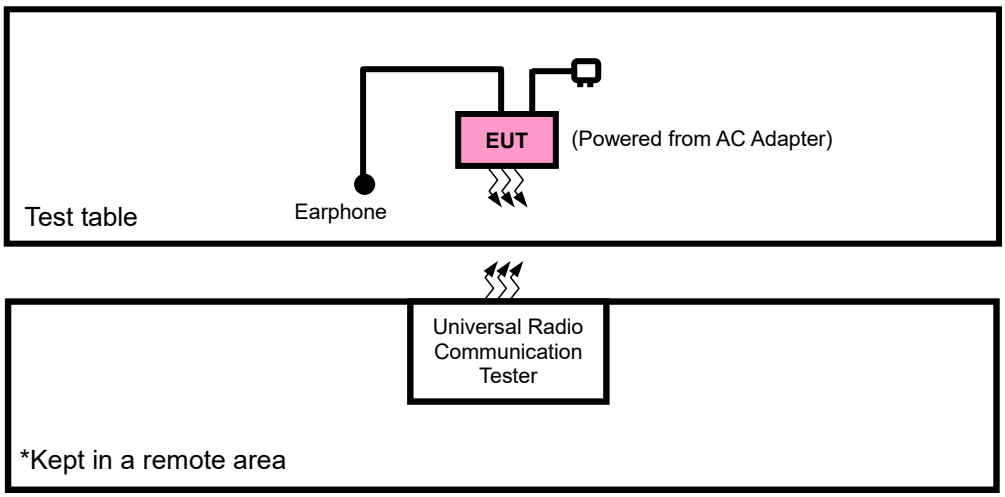
| | | |
|---|---|---|
| **EMISSION DESIGNATOR** | **LTE Band 4 Channel Bandwidth: 15MHz** | QPSK: 13M4G7D |
| | | 16QAM: 13M4W7D |
| | | 64QAM: 13M4W7D |
| | **LTE Band 4 Channel Bandwidth: 20MHz** | QPSK: 17M9G7D |
| | | 16QAM: 17M9W7D |
| | | 64QAM: 17M9W7D |
| **MAX. ERP/EIRP POWER** | **WCDMA IV** | 156mw |
| | **LTE Band 4 Channel Bandwidth: 1.4MHz** | 146mw |
| | **LTE Band 4 Channel Bandwidth: 3MHz** | 146mw |
| | **LTE Band 4 Channel Bandwidth: 5MHz** | 145mw |
| | **LTE Band 4 Channel Bandwidth: 10MHz** | 146mw |
| | **LTE Band 4 Channel Bandwidth: 15MHz** | 146mw |
| | **LTE Band 4 Channel Bandwidth: 20MHz** | 147mw |
| **ANTENNA TYPE** | Main Antenna(ANT 0): Fixed Internal Antenna 0 with -1.7dBi gain for WCDMA IV/LTE B4 | |
| **IMEI CODE** | 86531204 | |
| **HW VERSION** | P2.1 | |
| **SW VERSION** | MIUI 11 | |
| **I/O PORTS** | Refer to user's manual | |
| **CABLE SUPPLIED** | USB cable: 1.0 meter, non-shielded cable, with w/o ferrite core | |

**NOTE**:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. The "List of Accessory" was recorded in Report NO: FV200304W004.

## 2.2 CONFIGURATION OF SYSTEM UNDER TEST

**FOR RADIATION EMISSION TEST**



## 2.3 DESCRIPTION OF SUPPORT UNITS

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

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

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

**NOTE:**
1. All power cords of the above support units are non shielded (1.8m).

## 2.4 DESCRIPTION OF TEST MODES

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

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

**WCDMA MODE**

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

## LTE BAND 4

| EUT CONFIGURE MODE | TEST ITEM | AVAILABLE CHANNEL | TESTED CHANNEL | CHANNEL BANDWIDTH | MODULATION | MODE |
|---|---|---|---|---|---|---|
| B | EIRP | 19957 to 20393 | 19957, 20175, 20393 | 1.4MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 19965 to 20385 | 19965, 20175, 20385 | 3MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 19975 to 20375 | 19975, 20175, 20375 | 5MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 20000 to 20350 | 20000, 20175, 20350 | 10MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 20025 to 20325 | 20025, 20175, 20325 | 15MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 20050 to 20300 | 20050, 20175, 20300 | 20MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| B | FREQUENCY STABILITY | 19957 to 20393 | 19957, 20393 | 1.4MHz | QPSK | 1 RB / 0 RB Offset |
| | | 19965 to 20385 | 19965, 20385 | 3MHz | QPSK | 1 RB / 0 RB Offset |
| | | 19975 to 20375 | 19975, 20375 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20000 to 20350 | 20000, 20350 | 10MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20025 to 20325 | 20025, 20325 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20050 to 20300 | 20050, 20300 | 20MHz | QPSK | 1 RB / 0 RB Offset |
| B | OCCUPIED BANDWIDTH | 19957 to 20393 | 19957, 20175, 20393 | 1.4MHz | QPSK, 16QAM, 64QAM | 6 RB / 0 RB Offset |
| | | 19965 to 20385 | 19965, 20175, 20385 | 3MHz | QPSK, 16QAM, 64QAM | 15 RB / 0 RB Offset |
| | | 19975 to 20375 | 19975, 20175, 20375 | 5MHz | QPSK, 16QAM, 64QAM | 25 RB / 0 RB Offset |
| | | 20000 to 20350 | 20000, 20175, 20350 | 10MHz | QPSK, 16QAM, 64QAM | 50 RB / 0 RB Offset |
| | | 20025 to 20325 | 20025, 20175, 20325 | 15MHz | QPSK, 16QAM, 64QAM | 75 RB / 0 RB Offset |
| | | 20050 to 20300 | 20050, 20175, 20300 | 20MHz | QPSK, 16QAM, 64QAM | 100 RB / 0 RB Offset |
| B | PEAK TO AVERAGE RATIO | 19957 to 20393 | 19957, 20175, 20393 | 1.4MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 19965 to 20385 | 19965, 20175, 20385 | 3MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 19975 to 20375 | 19975, 20175, 20375 | 5MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 20000 to 20350 | 20000, 20175, 20350 | 10MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 20025 to 20325 | 20025, 20175, 20325 | 15MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | 20050 to 20300 | 20050, 20175, 20300 | 20MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| B | BAND EDGE | 19957 to 20393 | 19957 | 1.4MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | | 20393 | 1.4MHz | QPSK, 16QAM, 64QAM | 1 RB / 5 RB Offset |
| | | | | | | 6 RB / 0 RB Offset |
| | | 19965 to 20385 | 19965 | 3MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | | | | | 15 RB / 0 RB Offset |
| | | | 20385 | 3MHz | QPSK, 16QAM, 64QAM | 1 RB / 14 RB Offset |
| | | | | | | 15 RB / 0 RB Offset |
| | | 19975 to 20375 | 19975 | 5MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | | | | | 25 RB / 0 RB Offset |
| | | | 20375 | 5MHz | QPSK, 16QAM, 64QAM | 1 RB / 24 RB Offset |
| | | | | | | 25 RB / 0 RB Offset |
| | | 20000 to 20350 | 20000 | 10MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | | | | | 50 RB / 0 RB Offset |
| | | | 20350 | 10MHz | QPSK, 16QAM, 64QAM | 1 RB / 49 RB Offset |
| | | | | | | 50 RB / 0 RB Offset |

| | | | | | | |
|---|---|---|---|---|---|---|
| B | BAND EDGE | 20025 to 20325 | 20025 | 15MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | | | | | 75 RB / 0 RB Offset |
| | | | 20325 | 15MHz | QPSK, 16QAM, 64QAM | 1 RB / 74 RB Offset |
| | | | | | | 75 RB / 0 RB Offset |
| | | 20050 to 20300 | 20050 | 20MHz | QPSK, 16QAM, 64QAM | 1 RB / 0 RB Offset |
| | | | | | | 100 RB / 0 RB Offset |
| | | | 20300 | 20MHz | QPSK, 16QAM, 64QAM | 1 RB / 99 RB Offset |
| | | | | | | 100 RB / 0 RB Offset |
| B | CONDCUDETED EMISSION | 19957 to 20393 | 19957, 20175, 20393 | 1.4MHz | QPSK | 1 RB / 0 RB Offset |
| | | 19965 to 20385 | 19965, 20175, 20385 | 3MHz | QPSK | 1 RB / 0 RB Offset |
| | | 19975 to 20375 | 19975, 20175, 20375 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20000 to 20350 | 20000, 20175, 20350 | 10MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20025 to 20325 | 20025, 20175, 20325 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20050 to 20300 | 20050, 20175, 20300 | 20MHz | QPSK | 1 RB / 0 RB Offset |
| A | RADIATED EMISSION | 19957 to 20393 | 19957, 20175, 20393 | 1.4MHz | QPSK | 1 RB / 0 RB Offset |
| | | 19965 to 20385 | 20175 | 3MHz | QPSK | 1 RB / 0 RB Offset |
| | | 19975 to 20375 | 20175 | 5MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20000 to 20350 | 20175, | 10MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20025 to 20325 | 20175 | 15MHz | QPSK | 1 RB / 0 RB Offset |
| | | 20050 to 20300 | 20175 | 20MHz | QPSK | 1 RB / 0 RB Offset |

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

## TEST CONDITION:

| TEST ITEM | ENVIRONMENTAL CONDITIONS | INPUT POWER | TESTED BY |
|---|---|---|---|
| EIRP | 23deg. C, 70%RH | DC 3.87V By Battery | Tony Xiong |
| FREQUENCY STABILITY | 23deg. C, 70%RH | DC 3.6V/3.87V/4.45V | Harris Wang |
| OCCUPIED BANDWIDTH | 23deg. C, 70%RH | DC 3.87V By Battery | Harris Wang |
| PEAK TO AVERAGE RATIO | 23deg. C, 70%RH | DC 3.87V By Battery | Harris Wang |
| BAND EDGE | 23deg. C, 70%RH | DC 3.87V By Battery | Harris Wang |
| CONDCUDETED EMISSION | 23deg. C, 70%RH | DC 3.87V By Battery | Harris Wang |
| RADIATED EMISSION | 23deg. C, 70%RH | DC 5V/9V/11V/12/20V By Adapter | Tony Xiong |

## 2.5 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

**FCC 47 CFR Part 2**

**FCC 47 CFR Part 27**

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

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

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

**ANSI C63.26-2015**

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

# 3 TEST TYPES AND RESULTS

## 3.1 OUTPUT POWER MEASUREMENT

### 3.1.1 LIMITS OF OUTPUT POWER MEASUREMENT

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

### 3.1.2 TEST PROCEDURES

**EIRP / ERP MEASUREMENT:**

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

ERP or EIRP = $P_{Meas} + G_T – L_C$

Where:

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

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

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

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

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

**CONDUCTED POWER MEASUREMENT:**

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

## 3.1.3 TEST SETUP

**EIRP MEASUREMENT:**

**CONDUCTED POWER MEASUREMENT:**


## 3.1.4 TEST RESULTS

**AVERAGE CONDUCTED OUTPUT POWER (dBm)**

| Band | WCDMA IV | | | WCDMA IV |
|---|---|---|---|---|
| TX Channel | 1312 | 1413 | 1513 | Max. Tune-up Power |
| Rx Channel | 1537 | 1638 | 1738 | |
| Frequency | 1712.4 | 1732.6 | 1752.6 | |
| RMC 12.2K | 23.62 | 23.65 | 23.50 | 24.00 |
| HSDPA Subtest-1 | 22.57 | 22.61 | 22,49 | 23.00 |
| HSDPA Subtest-2 | 22.53 | 22.57 | 22.43 | 23.00 |
| HSDPA Subtest-3 | 22.05 | 22.09 | 21.96 | 22.50 |
| HSDPA Subtest-4 | 22.03 | 22.07 | 21.94 | 22.50 |
| DC-HSDPA Subtest-1 | 22.59 | 22.63 | 22.45 | 23.00 |
| DC-HSDPA Subtest-2 | 22.64 | 22.68 | 22.48 | 23.00 |
| DC-HSDPA Subtest-3 | 22.06 | 22.10 | 21.89 | 22.50 |
| DC-HSDPA Subtest-4 | 21.99 | 22.03 | 21.95 | 22.50 |
| HSUPA Subtest-1 | 22.52 | 22.56 | 22.51 | 23.00 |
| HSUPA Subtest-2 | 20.65 | 20.69 | 20.43 | 21.50 |
| HSUPA Subtest-3 | 21.69 | 21.73 | 21.70 | 22.00 |
| HSUPA Subtest-4 | 20.61 | 20.65 | 20.38 | 21.50 |
| HSUPA Subtest-5 | 22.53 | 22.57 | 22.55 | 23.00 |
| HSPA+ Subtest-1 | 20.11 | 20.16 | 19.89 | 21.00 |

| LTE Band 4 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| BW | MCS Index | RB Size | RB Offset | Low | Mid | High | 3GPP MPR (dB) | Max. Tune-up (dBm) |
| | | Channel | | Low CH 20050 | Mid CH 20175 | High CH 20300 | | |
| | | Frequence (MHz) | | Frequency 1720 MHz | Frequency 1732.5 MHz | Frequency 1745 MHz | | |
| 20M | QPSK | **1** | **0** | 23.33 | 23.22 | 23.21 | 0 | 24 |
| | | 1 | 50 | **23.38** | **23.27** | **23.26** | 0 | 24 |
| | | 1 | 99 | 23.32 | 23.21 | 23.20 | **0** | 24 |
| | | 50 | 0 | 22.54 | 22.43 | 22.42 | 1 | 23 |
| | | 50 | 25 | 22.51 | 22.40 | 22.39 | 1 | 23 |
| | | 50 | 50 | 22.53 | 22.42 | 22.41 | 1 | 23 |
| | | 100 | 0 | 22.47 | 22.36 | 22.35 | 1 | 23 |
| | 16QAM | 1 | 0 | 22.60 | 22.49 | 22.48 | 1 | 23 |
| | | 1 | 50 | 22.62 | 22.51 | 22.50 | 1 | 23 |
| | | 1 | 99 | 22.60 | 22.49 | 22.48 | 1 | 23 |
| | | 50 | 0 | 21.55 | 21.44 | 21.43 | 2 | 22 |
| | | 50 | 25 | 21.57 | 21.46 | 21.45 | 2 | 22 |
| | | 50 | 50 | 21.55 | 21.44 | 21.43 | 2 | 22 |
| | | 100 | 0 | 21.49 | 21.38 | 21.37 | 2 | 22 |
| | 64QAM | 1 | 0 | 21.52 | 21.41 | 21.40 | 2 | 22 |
| | | 1 | 50 | 21.56 | 21.45 | 21.44 | 2 | 22 |
| | | 1 | 99 | 21.58 | 21.47 | 21.46 | 2 | 22 |
| | | 50 | 0 | 20.53 | 20.42 | 20.41 | 3 | 21 |
| | | 50 | 25 | 20.55 | 20.44 | 20.43 | 3 | 21 |
| | | 50 | 50 | 20.54 | 20.43 | 20.42 | 3 | 21 |
| | | 100 | 0 | 20.50 | 20.39 | 20.38 | 3 | 21 |

| BW | MCS Index | Channel | | Low CH 20025 | Mid CH 20175 | High CH 20325 | 3GPP MPR | Max. Tune-up |
|---|---|---|---|---|---|---|---|---|
| | | Frequence (MHz) | | Frequency 1717.5 MHz | Frequency 1732.5 MHz | Frequency 1747.5 MHz | | |
| 15M | QPSK | 1 | 0 | 23.32 | 23.18 | 23.13 | 0 | 24 |
| | | 1 | 37 | 23.34 | 23.24 | 23.20 | 0 | 24 |
| | | 1 | 74 | 23.30 | 23.20 | 23.16 | 0 | 24 |
| | | 36 | 0 | 22.48 | 22.38 | 22.41 | 1 | 23 |
| | | 36 | 19 | 22.50 | 22.38 | 22.34 | 1 | 23 |
| | | 36 | 39 | 22.45 | 22.35 | 22.39 | 1 | 23 |
| | | 75 | 0 | 22.46 | 22.32 | 22.32 | 1 | 23 |
| | 16QAM | 1 | 0 | 22.57 | 22.48 | 22.42 | 1 | 23 |
| | | 1 | 37 | 22.58 | 22.46 | 22.48 | 1 | 23 |
| | | 1 | 74 | 22.54 | 22.47 | 22.45 | 1 | 23 |
| | | 36 | 0 | 21.53 | 21.36 | 21.42 | 2 | 22 |
| | | 36 | 19 | 21.49 | 21.42 | 21.40 | 2 | 22 |
| | | 36 | 39 | 21.52 | 21.38 | 21.41 | 2 | 22 |
| | | 75 | 0 | 21.48 | 21.33 | 21.29 | 2 | 22 |
| | 64QAM | 1 | 0 | 21.46 | 21.38 | 21.36 | 2 | 22 |
| | | 1 | 37 | 21.54 | 21.38 | 21.39 | 2 | 22 |
| | | 1 | 74 | 21.52 | 21.39 | 21.44 | 2 | 22 |
| | | 36 | 0 | 20.52 | 20.40 | 20.33 | 3 | 21 |
| | | 36 | 19 | 20.48 | 20.36 | 20.37 | 3 | 21 |
| | | 36 | 39 | 20.52 | 20.42 | 20.38 | 3 | 21 |
| | | 75 | 0 | 20.48 | 20.31 | 20.37 | 3 | 21 |

| BW | MCS Index | Channel | | Low CH 20000 | Mid CH 20175 | High CH 20350 | 3GPP MPR | Max. Tune-up |
|---|---|---|---|---|---|---|---|---|
| | | Frequence (MHz) | | Frequency 1715 MHz | Frequency 1732.5 MHz | Frequency 1750 MHz | | |
| 10M | QPSK | 1 | 0 | 23.25 | 23.18 | 23.16 | 0 | 24 |
| | | 1 | 24 | 23.36 | 23.19 | 23.25 | 0 | 24 |
| | | 1 | 49 | 23.24 | 23.17 | 23.15 | 0 | 24 |
| | | 25 | 0 | 22.51 | 22.37 | 22.40 | 1 | 23 |
| | | 25 | 12 | 22.49 | 22.33 | 22.34 | 1 | 23 |
| | | 25 | 25 | 22.47 | 22.34 | 22.39 | 1 | 23 |
| | | 50 | 0 | 22.46 | 22.34 | 22.27 | 1 | 23 |
| | 16QAM | 1 | 0 | 22.53 | 22.41 | 22.42 | 1 | 23 |
| | | 1 | 24 | 22.59 | 22.45 | 22.48 | 1 | 23 |
| | | 1 | 49 | 22.58 | 22.42 | 22.43 | 1 | 23 |
| | | 25 | 0 | 21.49 | 21.36 | 21.41 | 2 | 22 |
| | | 25 | 12 | 21.55 | 21.38 | 21.44 | 2 | 22 |
| | | 25 | 25 | 21.47 | 21.40 | 21.38 | 2 | 22 |
| | | 50 | 0 | 21.47 | 21.30 | 21.36 | 2 | 22 |
| | 64QAM | 1 | 0 | 21.44 | 21.37 | 21.35 | 2 | 22 |
| | | 1 | 24 | 21.53 | 21.39 | 21.42 | 2 | 22 |
| | | 1 | 49 | 21.56 | 21.40 | 21.41 | 2 | 22 |
| | | 25 | 0 | 20.47 | 20.34 | 20.39 | 3 | 21 |
| | | 25 | 12 | 20.54 | 20.42 | 20.35 | 3 | 21 |
| | | 25 | 25 | 20.49 | 20.35 | 20.36 | 3 | 21 |
| | | 50 | 0 | 20.49 | 20.33 | 20.36 | 3 | 21 |

| BW | MCS Index | Channel | | Low CH 19975 | Mid CH 20175 | High CH 20375 | 3GPP MPR | Max. Tune-up |
|---|---|---|---|---|---|---|---|---|
| | | Frequence (MHz) | | Frequency 1712.5 MHz | Frequency 1732.5 MHz | Frequency 1752.5 MHz | | |
| 5M | QPSK | 1 | 0 | 23.28 | 23.15 | 23.16 | 0 | 24 |
| | | 1 | 12 | 23.36 | 23.19 | 23.24 | 0 | 24 |
| | | 1 | 24 | 23.27 | 23.13 | 23.19 | 0 | 24 |
| | | 12 | 0 | 22.50 | 22.38 | 22.37 | 1 | 23 |
| | | 12 | 6 | 22.43 | 22.39 | 22.34 | 1 | 23 |
| | | 12 | 13 | 22.49 | 22.37 | 22.40 | 1 | 23 |
| | | 25 | 0 | 22.41 | 22.34 | 22.30 | 1 | 23 |
| | 16QAM | 1 | 0 | 22.53 | 22.44 | 22.46 | 1 | 23 |
| | | 1 | 12 | 22.54 | 22.49 | 22.45 | 1 | 23 |
| | | 1 | 24 | 22.58 | 22.41 | 22.46 | 1 | 23 |
| | | 12 | 0 | 21.47 | 21.38 | 21.35 | 2 | 22 |
| | | 12 | 6 | 21.51 | 21.44 | 21.39 | 2 | 22 |
| | | 12 | 13 | 21.48 | 21.39 | 21.41 | 2 | 22 |
| | | 25 | 0 | 21.43 | 21.31 | 21.32 | 2 | 22 |
| | 64QAM | 1 | 0 | 21.45 | 21.36 | 21.38 | 2 | 22 |
| | | 1 | 12 | 21.48 | 21.43 | 21.38 | 2 | 22 |
| | | 1 | 24 | 21.50 | 21.46 | 21.44 | 2 | 22 |
| | | 12 | 0 | 20.49 | 20.37 | 20.33 | 3 | 21 |
| | | 12 | 6 | 20.47 | 20.43 | 20.41 | 3 | 21 |
| | | 12 | 13 | 20.50 | 20.38 | 20.34 | 3 | 21 |
| | | 25 | 0 | 20.44 | 20.37 | 20.35 | 3 | 21 |

| BW | MCS Index | Channel | | Low CH 19965 | Mid CH 20175 | High CH 20385 | 3GPP MPR | Max. Tune-up |
|---|---|---|---|---|---|---|---|---|
| | | Frequence (MHz) | | Frequency 1711.5 MHz | Frequency 1732.5 MHz | Frequency 1753.5 MHz | | |
| 3M | QPSK | 1 | 0 | 23.27 | 23.20 | 23.15 | 0 | 24 |
| | | 1 | 7 | 23.31 | 23.22 | 23.24 | 0 | 24 |
| | | 1 | 14 | 23.26 | 23.14 | 23.15 | 0 | 24 |
| | | 8 | 0 | 22.47 | 22.38 | 22.40 | 1 | 23 |
| | | 8 | 3 | 22.43 | 22.38 | 22.33 | 1 | 23 |
| | | 8 | 7 | 22.45 | 22.41 | 22.39 | 1 | 23 |
| | | 15 | 0 | 22.43 | 22.31 | 22.27 | 1 | 23 |
| | 16QAM | 1 | 0 | 22.52 | 22.48 | 22.46 | 1 | 23 |
| | | 1 | 7 | 22.57 | 22.46 | 22.46 | 1 | 23 |
| | | 1 | 14 | 22.58 | 22.41 | 22.47 | 1 | 23 |
| | | 8 | 0 | 21.47 | 21.40 | 21.38 | 2 | 22 |
| | | 8 | 3 | 21.54 | 21.40 | 21.43 | 2 | 22 |
| | | 8 | 7 | 21.53 | 21.37 | 21.38 | 2 | 22 |
| | | 15 | 0 | 21.43 | 21.30 | 21.35 | 2 | 22 |
| | 64QAM | 1 | 0 | 21.51 | 21.39 | 21.32 | 2 | 22 |
| | | 1 | 7 | 21.51 | 21.37 | 21.38 | 2 | 22 |
| | | 1 | 14 | 21.57 | 21.41 | 21.44 | 2 | 22 |
| | | 8 | 0 | 20.48 | 20.40 | 20.34 | 3 | 21 |
| | | 8 | 3 | 20.53 | 20.36 | 20.42 | 3 | 21 |
| | | 8 | 7 | 20.46 | 20.39 | 20.37 | 3 | 21 |
| | | 15 | 0 | 20.48 | 20.31 | 20.37 | 3 | 21 |

| BW | MCS Index | Channel | | Low CH 19957 | Mid CH 20175 | High CH 20393 | 3GPP MPR | Max. Tune-up |
|---|---|---|---|---|---|---|---|---|
| | | Frequence (MHz) | | Frequency 1710.7 MHz | Frequency 1732.5 MHz | Frequency 1754.3 MHz | | |
| 1.4M | QPSK | 1 | 0 | 23.25 | 23.18 | 23.16 | 0 | 24 |
| | | 1 | 2 | 23.35 | 23.21 | 23.24 | 0 | 24 |
| | | 1 | 5 | 23.30 | 23.14 | 23.15 | 0 | 24 |
| | | 3 | 0 | 23.28 | 23.15 | 23.20 | 0 | 24 |
| | | 3 | 1 | 23.30 | 23.18 | 23.11 | 0 | 24 |
| | | 3 | 3 | 23.28 | 23.14 | 23.15 | 0 | 24 |
| | | 6 | 0 | 22.46 | 22.30 | 22.33 | 1 | 23 |
| | 16QAM | 1 | 0 | 22.55 | 22.42 | 22.43 | 1 | 23 |
| | | 1 | 2 | 22.60 | 22.43 | 22.48 | 1 | 23 |
| | | 1 | 5 | 22.55 | 22.41 | 22.47 | 1 | 23 |
| | | 3 | 0 | 22.51 | 22.39 | 22.38 | 1 | 23 |
| | | 3 | 1 | 22.49 | 22.45 | 22.40 | 1 | 23 |
| | | 3 | 3 | 22.51 | 22.39 | 22.42 | 1 | 23 |
| | | 6 | 0 | 21.43 | 21.36 | 21.32 | 2 | 22 |
| | 64QAM | 1 | 0 | 21.45 | 21.36 | 21.38 | 2 | 22 |
| | | 1 | 2 | 21.48 | 21.43 | 21.39 | 2 | 22 |
| | | 1 | 5 | 21.56 | 21.39 | 21.44 | 2 | 22 |
| | | 3 | 0 | 21.45 | 20.36 | 20.33 | 2 | 22 |
| | | 3 | 1 | 21.49 | 20.42 | 20.37 | 2 | 22 |
| | | 3 | 3 | 21.49 | 20.35 | 20.41 | 2 | 22 |
| | | 6 | 0 | 20.46 | 20.34 | 20.33 | 3 | 21 |

## EIRP

### WCDMA IV

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 1313 | 1712.6 | 22.82 | -0.90 | 21.92 | **155.60** | 1 |
| 1450 | 1740.0 | 22.81 | -0.90 | 21.91 | 155.24 | 1 |
| 1512 | 1752.4 | 22.78 | -0.90 | 21.88 | 154.17 | 1 |

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

## LTE BAND 4

### CHANNEL BANDWIDTH: 1.4MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 19957 | 1710.7 | 23.35 | -1.70 | 21.65 | **146.22** | 1 |
| 20175 | 1732.5 | 23.21 | -1.70 | 21.51 | 141.58 | 1 |
| 20393 | 1754.3 | 23.24 | -1.70 | 21.54 | 142.56 | 1 |

### CHANNEL BANDWIDTH: 1.4MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 19957 | 1710.7 | 22.53 | -1.70 | 20.83 | 121.06 | 1 |
| 20175 | 1732.5 | 22.53 | -1.70 | 20.83 | 121.06 | 1 |
| 20393 | 1754.3 | 22.49 | -1.70 | 20.79 | 119.95 | 1 |

### CHANNEL BANDWIDTH: 1.4MHz 64QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 19957 | 1710.7 | 21.41 | -1.70 | 19.71 | 93.54 | 1 |
| 20175 | 1732.5 | 21.46 | -1.70 | 19.76 | 94.62 | 1 |
| 20393 | 1754.3 | 21.37 | -1.70 | 19.67 | 92.68 | 1 |

### CHANNEL BANDWIDTH: 3MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 19965 | 1711.5 | 23.25 | -1.70 | 21.55 | 142.89 | 1 |
| 20175 | 1732.5 | 23.35 | -1.70 | 21.65 | **146.22** | 1 |
| 20385 | 1753.5 | 23.23 | -1.70 | 21.53 | 142.23 | 1 |

### CHANNEL BANDWIDTH: 3MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 19965 | 1711.5 | 22.50 | -1.70 | 20.80 | 120.23 | 1 |
| 20175 | 1732.5 | 22.56 | -1.70 | 20.86 | 121.90 | 1 |
| 20385 | 1753.5 | 22.47 | -1.70 | 20.77 | 119.40 | 1 |

### CHANNEL BANDWIDTH: 3MHz 64QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 19965 | 1711.5 | 21.42 | -1.70 | 19.72 | 93.76 | 1 |
| 20175 | 1732.5 | 21.43 | -1.70 | 19.73 | 93.97 | 1 |
| 20385 | 1753.5 | 21.37 | -1.70 | 19.67 | 92.68 | 1 |

### CHANNEL BANDWIDTH: 5MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 19975 | 1712.5 | 23.27 | -1.70 | 21.57 | 143.55 | 1 |
| 20175 | 1732.5 | 23.30 | -1.70 | 21.60 | **144.54** | 1 |
| 20375 | 1752.5 | 23.23 | -1.70 | 21.53 | 142.23 | 1 |

### CHANNEL BANDWIDTH: 5MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 19975 | 1712.5 | 22.50 | -1.70 | 20.80 | 120.23 | 1 |
| 20175 | 1732.5 | 22.51 | -1.70 | 20.81 | 120.50 | 1 |
| 20375 | 1752.5 | 22.46 | -1.70 | 20.76 | 119.12 | 1 |

### CHANNEL BANDWIDTH: 5MHz 64QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 19975 | 1712.5 | 21.35 | -1.70 | 19.65 | 92.26 | 1 |
| 20175 | 1732.5 | 21.48 | -1.70 | 19.78 | 95.06 | 1 |
| 20375 | 1752.5 | 21.37 | -1.70 | 19.67 | 92.68 | 1 |

### CHANNEL BANDWIDTH: 10MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 18650 | 1715.0 | 23.27 | -1.70 | 21.57 | 143.55 | 1 |
| 18900 | 1732.5 | 23.33 | -1.70 | 21.63 | **145.55** | 1 |
| 19150 | 1750.0 | 23.24 | -1.70 | 21.54 | 142.56 | 1 |

### CHANNEL BANDWIDTH: 10MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 20000 | 1715.0 | 22.52 | -1.70 | 20.82 | 120.78 | 1 |
| 20175 | 1732.5 | 22.55 | -1.70 | 20.85 | 121.62 | 1 |
| 20350 | 1750.0 | 22.49 | -1.70 | 20.79 | 119.95 | 1 |

### CHANNEL BANDWIDTH: 10MHz 64QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 20000 | 1715.0 | 21.41 | -1.70 | 19.71 | 93.54 | 1 |
| 20175 | 1732.5 | 21.42 | -1.70 | 19.72 | 93.76 | 1 |
| 20350 | 1750.0 | 21.34 | -1.70 | 19.64 | 92.04 | 1 |

### CHANNEL BANDWIDTH: 15MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 20025 | 1717.5 | 23.30 | -1.70 | 21.60 | 144.54 | 1 |
| 20175 | 1732.5 | 23.33 | -1.70 | 21.63 | **145.55** | 1 |
| 20325 | 1747.5 | 23.19 | -1.70 | 21.49 | 140.93 | 1 |

### CHANNEL BANDWIDTH: 15MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 20025 | 1717.5 | 22.51 | -1.70 | 20.81 | 120.50 | 1 |
| 20175 | 1732.5 | 22.56 | -1.70 | 20.86 | 121.90 | 1 |
| 20325 | 1747.5 | 22.49 | -1.70 | 20.79 | 119.95 | 1 |

### CHANNEL BANDWIDTH: 15MHz 64QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 20025 | 1717.5 | 21.40 | -1.70 | 19.70 | 93.33 | 1 |
| 20175 | 1732.5 | 21.41 | -1.70 | 19.71 | 93.54 | 1 |
| 20325 | 1747.5 | 21.37 | -1.70 | 19.67 | 92.68 | 1 |

### CHANNEL BANDWIDTH: 20MHz QPSK

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 20050 | 1720.0 | 23.31 | -1.70 | 21.61 | 144.88 | 1 |
| 20175 | 1732.5 | 23.37 | -1.70 | 21.67 | **146.89** | 1 |
| 20300 | 1745.0 | 23.27 | -1.70 | 21.57 | 143.55 | 1 |

### CHANNEL BANDWIDTH: 20MHz 16QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 20050 | 1720.0 | 22.55 | -1.70 | 20.85 | 121.62 | 1 |
| 20175 | 1732.5 | 22.61 | -1.70 | 20.91 | 123.31 | 1 |
| 20300 | 1745.0 | 22.51 | -1.70 | 20.81 | 120.50 | 1 |

### CHANNEL BANDWIDTH: 20MHz 64QAM

| Channel | Frequency (MHz) | Conducted Power (dBm) | $G_T$-$L_C$ (dB) | EIRP (dBm) | EIRP (mW) | Limit (W) |
|---|---|---|---|---|---|---|
| 20050 | 1720.0 | 21.43 | -1.70 | 19.73 | 93.97 | 1 |
| 20175 | 1732.5 | 21.49 | -1.70 | 19.79 | 95.28 | 1 |
| 20300 | 1745.0 | 21.39 | -1.70 | 19.69 | 93.11 | 1 |

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

## 3.2 FREQUENCY STABILITY MEASUREMENT

### 3.2.1 LIMITS OF FREQUENCY STABILIITY MEASUREMENT

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

### 3.2.2 TEST PROCEDURE

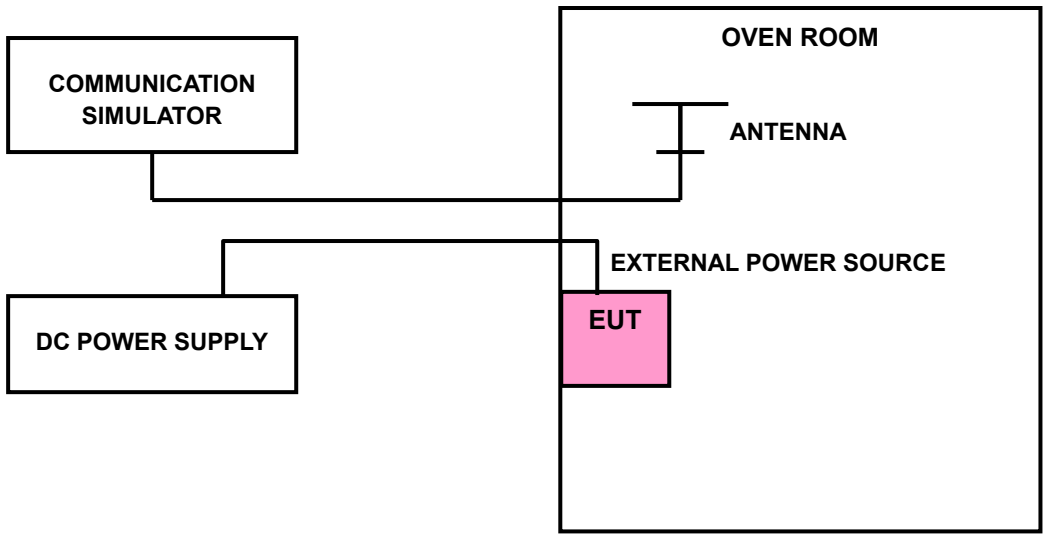
a. Device is placed at the oven room. The oven room could control the temperatures and humidity. Power warm up is at least 15 min and power applied should perform before recording frequency error.

b. EUT is connected the external power supply to control the DC input power. The test voltage range is from minimum to maximum working voltage. Each step shall be record the frequency error rate.

c. The temperature range step is 10 degrees in this test items. All temperature levels shall be hold the ±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.

### 3.2.3 TEST SETUP



## 3.2.4 TEST RESULTS

### WCDMA BAND IV

**FREQUENCY ERROR VS. VOLTAGE**

| VOLTAGE (Volts) | FREQUENCY ERROR (ppm) | | LIMIT (ppm) |
|---|---|---|---|
| | Low Channel | High Channel | |
| $V_{nor}$ | 0.0022 | 0.0021 | 2.5 |
| $V_{min}$ | -0.0026 | -0.0021 | 2.5 |
| $V_{max}$ | 0.0024 | 0.0021 | 2.5 |

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

**FREQUENCY ERROR vs. TEMPERATURE.**

| TEMP. (℃) | FREQUENCY ERROR (ppm) | | LIMIT (ppm) |
|---|---|---|---|
| | Low Channel | High Channel | |
| -30 | -0.0114 | -0.0120 | 2.5 |
| -20 | -0.0105 | -0.0102 | 2.5 |
| -10 | -0.0085 | -0.0082 | 2.5 |
| 0 | -0.0077 | -0.0073 | 2.5 |
| 10 | -0.0054 | -0.0047 | 2.5 |
| 20 | -0.0039 | -0.0042 | 2.5 |
| 30 | -0.0040 | -0.0035 | 2.5 |
| 40 | -0.0016 | -0.0018 | 2.5 |
| 50 | -0.0004 | -0.0003 | 2.5 |

## LTE BAND 4

### FREQUENCY ERROR VS. VOLTAGE

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

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

### FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (℃) | 1.4MHz | | LIMIT (ppm) |
|---|---|---|---|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0123 | -0.0114 | 2.5 |
| -20 | -0.0103 | -0.0098 | 2.5 |
| -10 | -0.0082 | -0.0080 | 2.5 |
| 0 | -0.0074 | -0.0074 | 2.5 |
| 10 | -0.0057 | -0.0044 | 2.5 |
| 20 | -0.0045 | -0.0038 | 2.5 |
| 30 | -0.0033 | -0.0026 | 2.5 |
| 40 | -0.0018 | -0.0020 | 2.5 |
| 50 | -0.0003 | -0.0003 | 2.5 |

## FREQUENCY ERROR VS. VOLTAGE

| VOLTAGE (Volts) | 3MHz | | LIMIT (ppm) |
|---|---|---|---|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| $V_{nor}$ | 0.0021 | 0.0020 | 2.5 |
| $V_{min}$ | -0.0021 | -0.0025 | 2.5 |
| $V_{max}$ | 0.0019 | 0.0018 | 2.5 |

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

## FREQUENCY ERROR vs. TEMPERATURE.

| TEMP. (℃) | 3MHz | | LIMIT (ppm) |
|---|---|---|---|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0116 | -0.0117 | 2.5 |
| -20 | -0.0111 | -0.0097 | 2.5 |
| -10 | -0.0085 | -0.0080 | 2.5 |
| 0 | -0.0075 | -0.0072 | 2.5 |
| 10 | -0.0049 | -0.0046 | 2.5 |
| 20 | -0.0041 | -0.0043 | 2.5 |
| 30 | -0.0041 | -0.0028 | 2.5 |
| 40 | -0.0017 | -0.0023 | 2.5 |
| 50 | -0.0002 | -0.0004 | 2.5 |

**FREQUENCY ERROR VS. VOLTAGE**

| VOLTAGE (Volts) | 5MHz | | LIMIT (ppm) |
|---|---|---|---|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| $V_{nor}$ | 0.0021 | 0.0024 | 2.5 |
| $V_{min}$ | -0.0023 | -0.0030 | 2.5 |
| $V_{max}$ | 0.0021 | 0.0020 | 2.5 |

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

**FREQUENCY ERROR vs. TEMPERATURE.**

| TEMP. (℃) | 5MHz | | LIMIT (ppm) |
|---|---|---|---|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0117 | -0.0112 | 2.5 |
| -20 | -0.0109 | -0.0100 | 2.5 |
| -10 | -0.0085 | -0.0084 | 2.5 |
| 0 | -0.0075 | -0.0075 | 2.5 |
| 10 | -0.0046 | -0.0047 | 2.5 |
| 20 | -0.0039 | -0.0041 | 2.5 |
| 30 | -0.0027 | -0.0039 | 2.5 |
| 40 | -0.0015 | -0.0017 | 2.5 |
| 50 | -0.0005 | -0.0001 | 2.5 |

**FREQUENCY ERROR VS. VOLTAGE**

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

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

**FREQUENCY ERROR vs. TEMPERATURE.**

| TEMP. (℃) | 10MHz | | LIMIT (ppm) |
|---|---|---|---|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0113 | -0.0119 | 2.5 |
| -20 | -0.0104 | -0.0109 | 2.5 |
| -10 | -0.0082 | -0.0081 | 2.5 |
| 0 | -0.0077 | -0.0072 | 2.5 |
| 10 | -0.0050 | -0.0053 | 2.5 |
| 20 | -0.0040 | -0.0037 | 2.5 |
| 30 | -0.0027 | -0.0035 | 2.5 |
| 40 | -0.0022 | -0.0020 | 2.5 |
| 50 | -0.0005 | -0.0002 | 2.5 |

**FREQUENCY ERROR VS. VOLTAGE**

| VOLTAGE (Volts) | 15MHz | | LIMIT (ppm) |
|---|---|---|---|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| $V_{nor}$ | 0.0026 | 0.0026 | 2.5 |
| $V_{min}$ | -0.0031 | -0.0030 | 2.5 |
| $V_{max}$ | 0.0026 | 0.0023 | 2.5 |

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

**FREQUENCY ERROR vs. TEMPERATURE.**

| TEMP. (℃) | 15MHz | | LIMIT (ppm) |
|---|---|---|---|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0117 | -0.0117 | 2.5 |
| -20 | -0.0100 | -0.0097 | 2.5 |
| -10 | -0.0083 | -0.0084 | 2.5 |
| 0 | -0.0078 | -0.0076 | 2.5 |
| 10 | -0.0049 | -0.0052 | 2.5 |
| 20 | -0.0044 | -0.0042 | 2.5 |
| 30 | -0.0039 | -0.0035 | 2.5 |
| 40 | -0.0021 | -0.0019 | 2.5 |
| 50 | -0.0003 | -0.0004 | 2.5 |

**FREQUENCY ERROR VS. VOLTAGE**

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

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

**FREQUENCY ERROR vs. TEMPERATURE.**

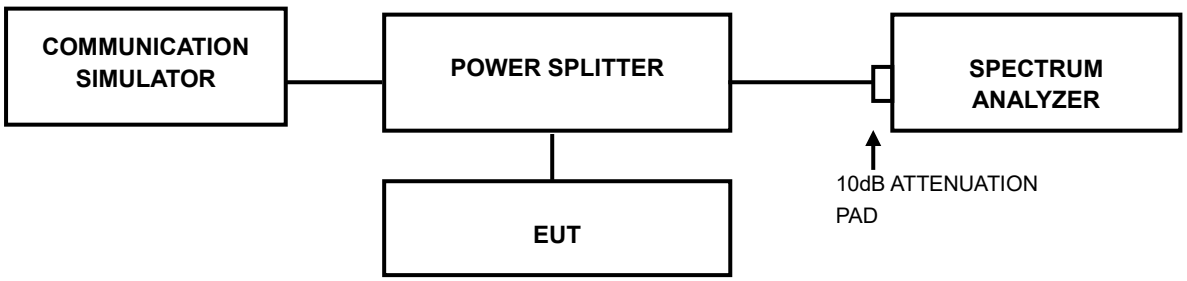
| TEMP. (℃) | 20MHz | | LIMIT (ppm) |
|---|---|---|---|
| | FREQUENCY ERROR (ppm) | | |
| | Low Channel | High Channel | |
| -30 | -0.0121 | -0.0112 | 2.5 |
| -20 | -0.0100 | -0.0105 | 2.5 |
| -10 | -0.0082 | -0.0080 | 2.5 |
| 0 | -0.0077 | -0.0075 | 2.5 |
| 10 | -0.0056 | -0.0050 | 2.5 |
| 20 | -0.0044 | -0.0037 | 2.5 |
| 30 | -0.0026 | -0.0032 | 2.5 |
| 40 | -0.0018 | -0.0017 | 2.5 |
| 50 | -0.0003 | -0.0003 | 2.5 |

## 3.3 OCCUPIED BANDWIDTH MEASUREMENT

### 3.3.1 LIMITS OF OCCUPIED BANDWIDTH MEASUREMENT

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

### 3.3.2 TEST SETUP




### 3.3.3 TEST PROCEDURES

a. The conducted occupied bandwidth used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

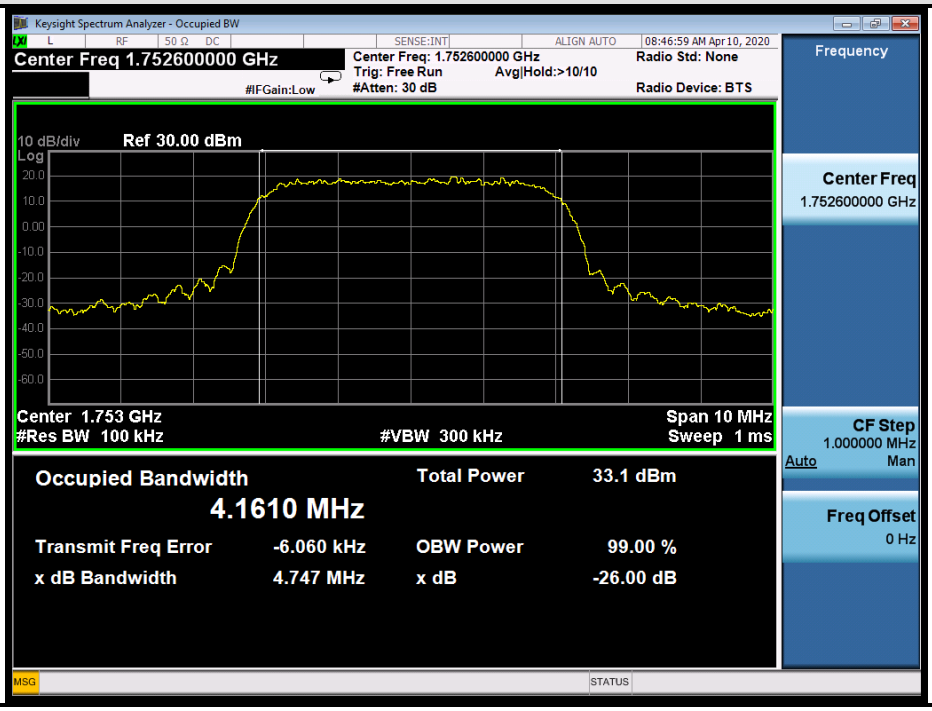
b. Use OBW measurement function of Spectrum analyzer to measure 99 % occupied bandwidth.

## 3.3.4 TEST RESULTS

### WCDMA BAND IV

| Channel | FREQ. (MHz) | 99% Occupied Bandwidth (MHz) | Channel | FREQ. (MHz) | 26dB Bandwidth (MHz) |
|---|---|---|---|---|---|
| | | WCDMA | | | WCDMA |
| 1312 | 1712.40 | 4.15 | 1312 | 1712.40 | 4.73 |
| 1413 | 1732.60 | 4.15 | 1413 | 1732.60 | 4.72 |
| 1513 | 1752.60 | 4.16 | 1513 | 1752.60 | 4.75 |

**SPECTRUM PLOT OF WORST VALUE ( 99% Occupied Bandwidth+26dB Bandwidth）**

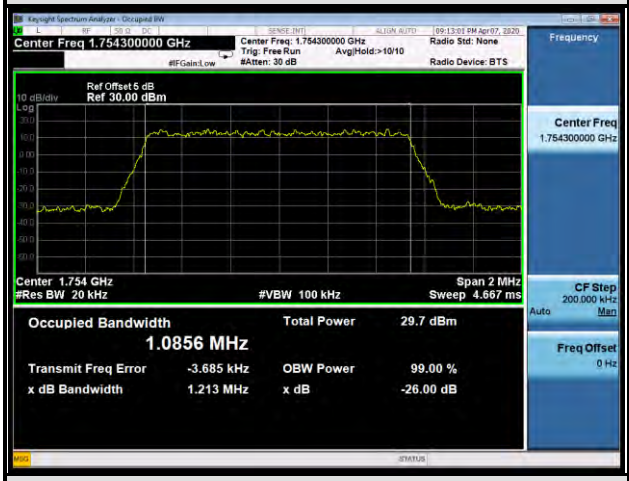


## LTE BAND 4

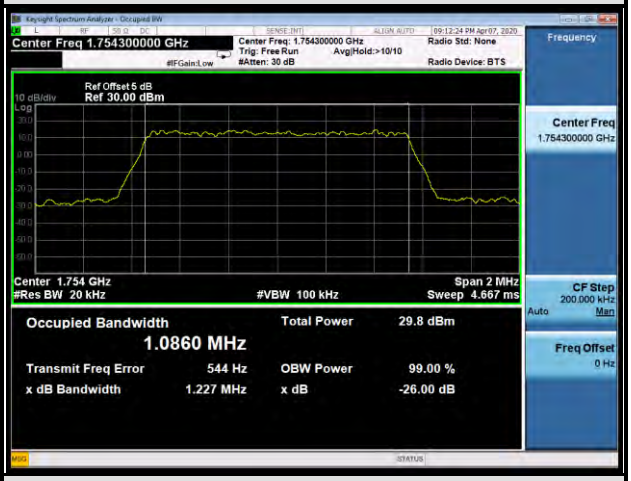
| CHANNEL BANDWIDTH: 1.4MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 19957 | 1710.7 | 1.08 | 1.09 | 1.08 |
| 20175 | 1732.5 | 1.08 | 1.03 | 1.08 |
| 20393 | 1754.3 | 1.09 | 1.09 | 1.09 |
| CHANNEL | Frequency (MHz) | 26dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 19957 | 1710.7 | 1.23 | 1.23 | 1.24 |
| 20175 | 1732.5 | 1.23 | 1.21 | 1.22 |
| 20393 | 1754.3 | 1.21 | 1.23 | 1.23 |

**SPECTRUM PLOT OF WORST VALUE**

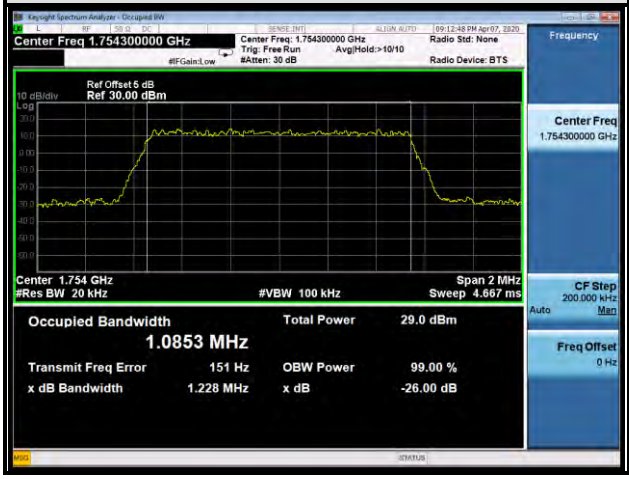
**1.4MHz / QPSK**




**1.4MHz / 16QAM**




**1.4MHz / 64QAM**

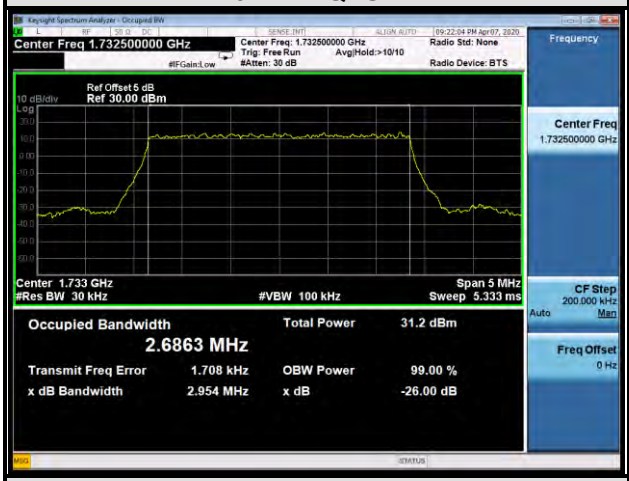


## LTE BAND 4

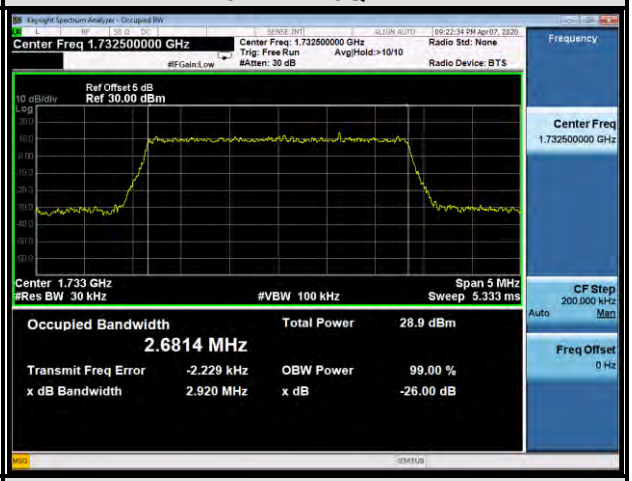
| CHANNEL BANDWIDTH: 3MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 19965 | 1711.5 | 2.68 | 2.68 | 2.68 |
| 20175 | 1732.5 | 2.69 | 2.68 | 2.68 |
| 20385 | 1753.5 | 2.69 | 2.68 | 2.68 |
| CHANNEL | Frequency (MHz) | 26dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 19965 | 1711.5 | 2.92 | 2.94 | 2.93 |
| 20175 | 1732.5 | 2.95 | 2.92 | 2.95 |
| 20385 | 1753.5 | 2.95 | 2.97 | 2.95 |

**SPECTRUM PLOT OF WORST VALUE**

**3MHz / QPSK**




**3MHz / 16QAM**



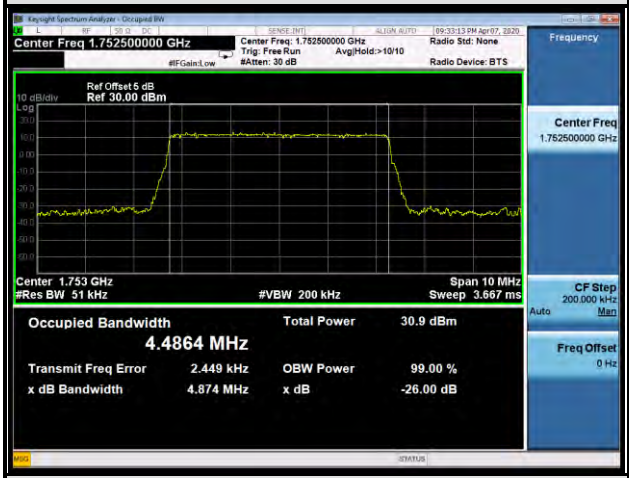

**3MHz / 64QAM**

## LTE BAND 4

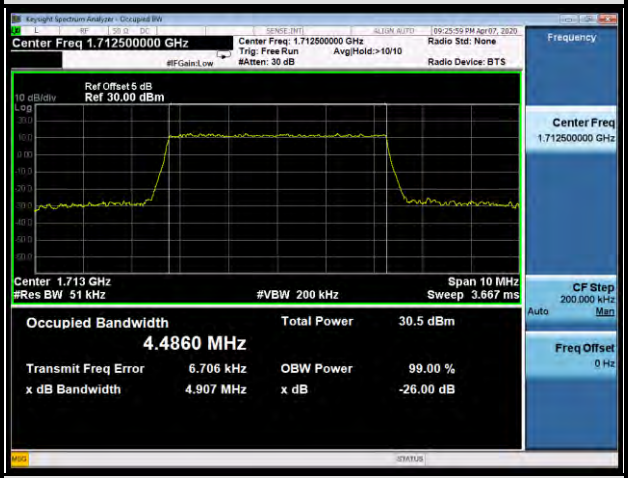
| CHANNEL BANDWIDTH: 5MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 19975 | 1712.5 | 4.46 | 4.49 | 4.46 |
| 20175 | 1732.5 | 4.47 | 4.46 | 4.47 |
| 20375 | 1752.5 | 4.49 | 4.47 | 4.46 |
| CHANNEL | Frequency (MHz) | 26dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 19975 | 1712.5 | 4.90 | 4.91 | 4.87 |
| 20175 | 1732.5 | 4.88 | 4.91 | 4.88 |
| 20375 | 1752.5 | 4.87 | 4.86 | 4.80 |

**SPECTRUM PLOT OF WORST VALUE**

**5MHz / QPSK**




**5MHz / 16QAM**




**5MHz / 64QAM**

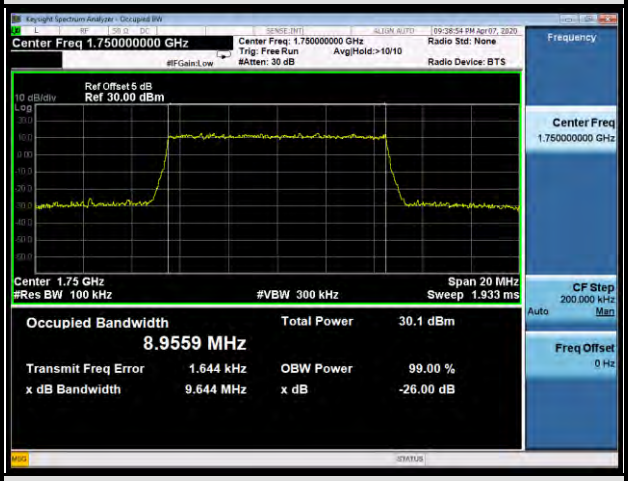
## LTE BAND 4

| CHANNEL BANDWIDTH: 10MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 20000 | 1715 | 8.94 | 8.94 | 8.95 |
| 20175 | 1732.5 | 8.95 | 8.94 | 8.95 |
| 20350 | 1750 | 8.95 | 8.96 | 8.94 |
| CHANNEL | Frequency (MHz) | 26dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 20000 | 1715 | 9.71 | 9.50 | 9.55 |
| 20175 | 1732.5 | 9.72 | 9.67 | 9.62 |
| 20350 | 1750 | 9.72 | 9.64 | 9.55 |

**SPECTRUM PLOT OF WORST VALUE**

**10MHz / QPSK**


**10MHz / 16QAM**



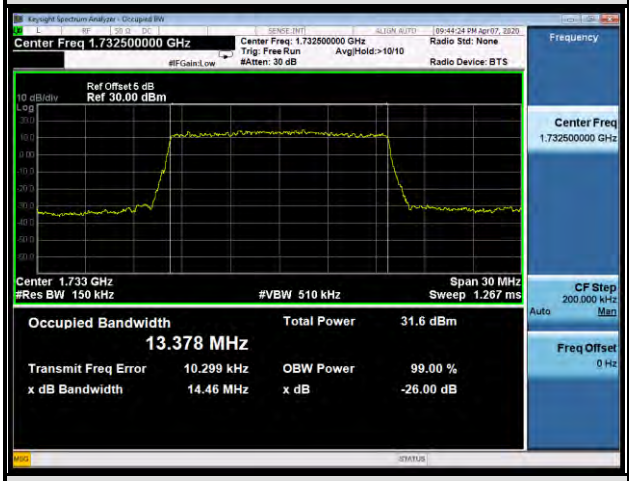

**10MHz / 64QAM**

## LTE BAND 4

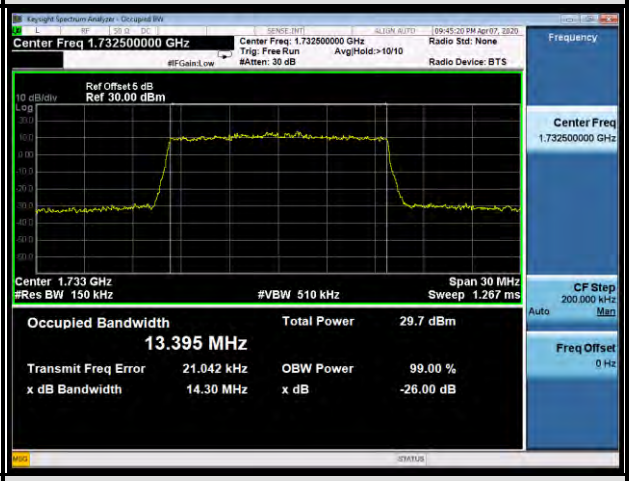
| CHANNEL BANDWIDTH: 15MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 20025 | 1717.5 | 13.36 | 13.36 | 13.36 |
| 20175 | 1732.5 | 13.38 | 13.40 | 13.39 |
| 20325 | 1747.5 | 13.37 | 13.37 | 13.36 |
| CHANNEL | Frequency (MHz) | 26dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 20025 | 1717.5 | 14.33 | 14.36 | 14.33 |
| 20175 | 1732.5 | 14.46 | 14.30 | 14.31 |
| 20325 | 1747.5 | 14.21 | 14.38 | 14.36 |

**SPECTRUM PLOT OF WORST VALUE**

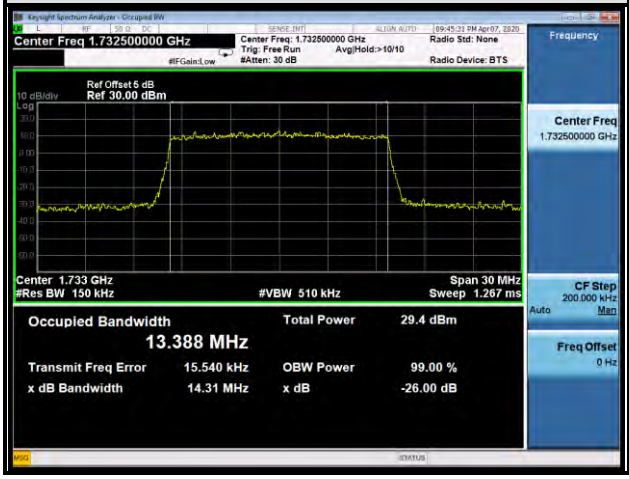
**15MHz / QPSK**




**15MHz / 16QAM**




**15MHz / 64QAM**

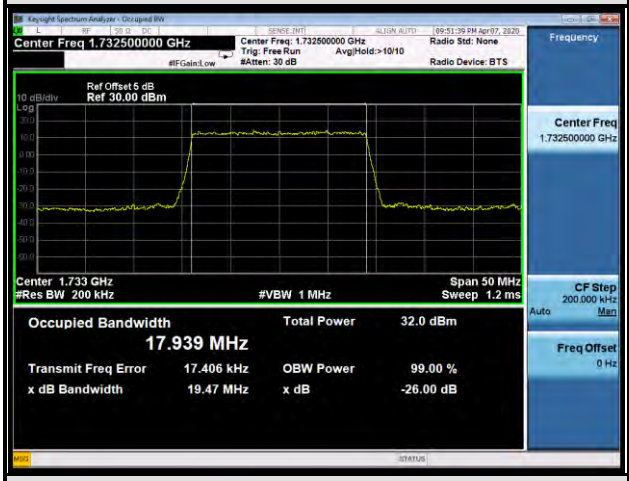


## LTE BAND 4

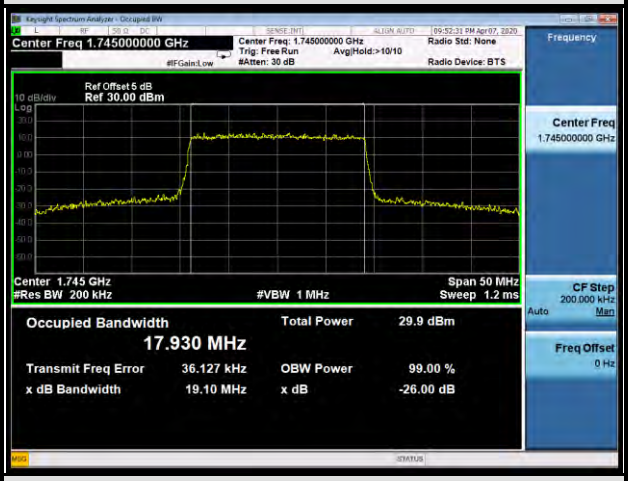
| CHANNEL BANDWIDTH: 20MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | 99% OCCUPIED Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 20050 | 1720 | 17.88 | 17.89 | 17.89 |
| 20175 | 1732.5 | 17.94 | 17.89 | 17.87 |
| 20300 | 1745 | 17.89 | 17.93 | 17.93 |
| CHANNEL | Frequency (MHz) | 26dB Bandwidth (MHz) | | |
| | | QPSK | 16QAM | 64QAM |
| 20050 | 1720 | 19.04 | 19.47 | 19.20 |
| 20175 | 1732.5 | 19.47 | 18.98 | 18.98 |
| 20300 | 1745 | 19.02 | 19.10 | 19.08 |

**SPECTRUM PLOT OF WORST VALUE**

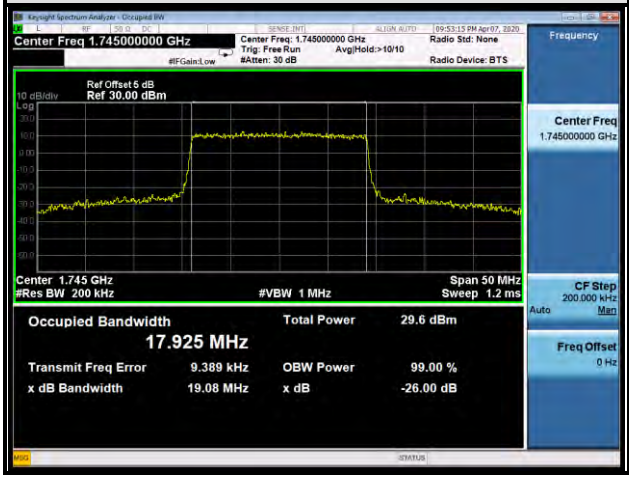
**20MHz / QPSK**




**20MHz / 16QAM**




**20MHz / 64QAM**

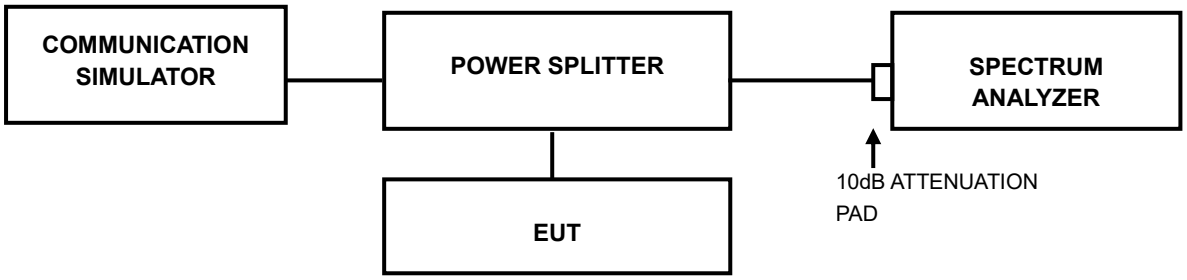


## 3.4 PEAK TO AVERAGE RATIO

### 3.4.1 LIMITS OF PEAK TO AVERAGE RATIO MEASUREMENT

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

### 3.4.2 TEST SETUP




### 3.4.3 TEST PROCEDURES

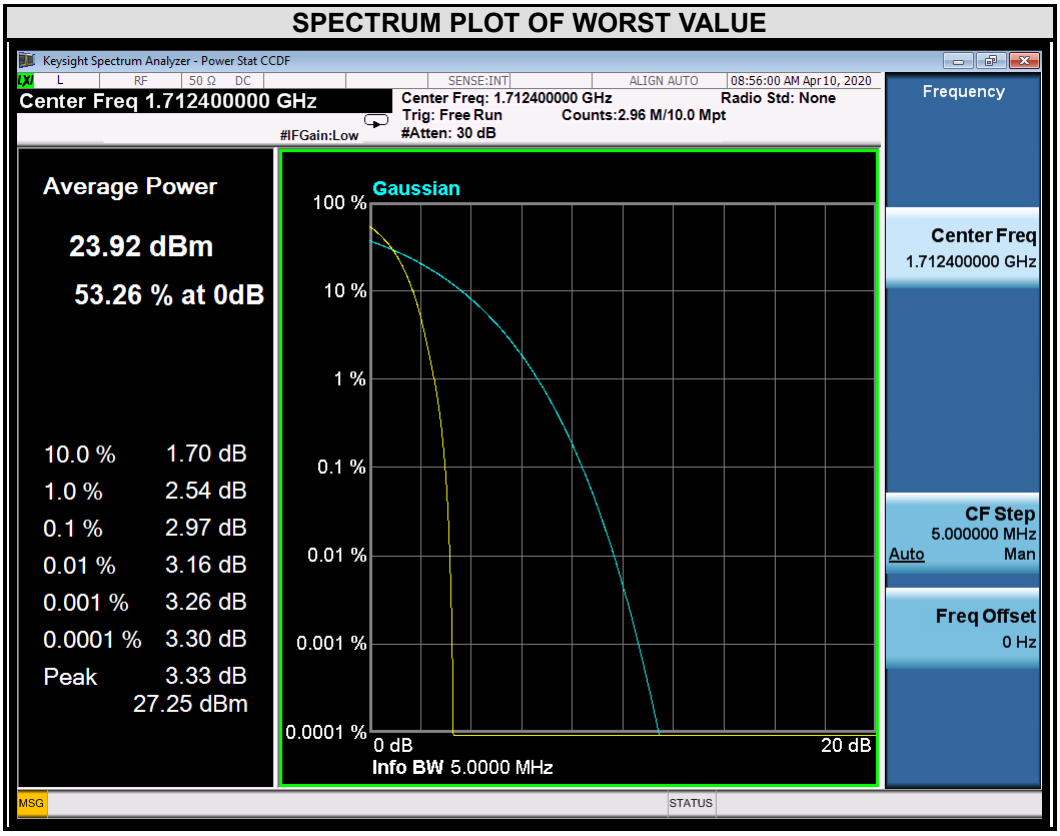
1. Set resolution/measurement bandwidth ≥ signal's occupied bandwidth;
2. Set the number of counts to a value that stabilizes the measured CCDF curve;
3. Record the maximum PAPR level associated with a probability of 0.1%.

## 3.4.4 TEST RESULTS

### WCDMA Band IV

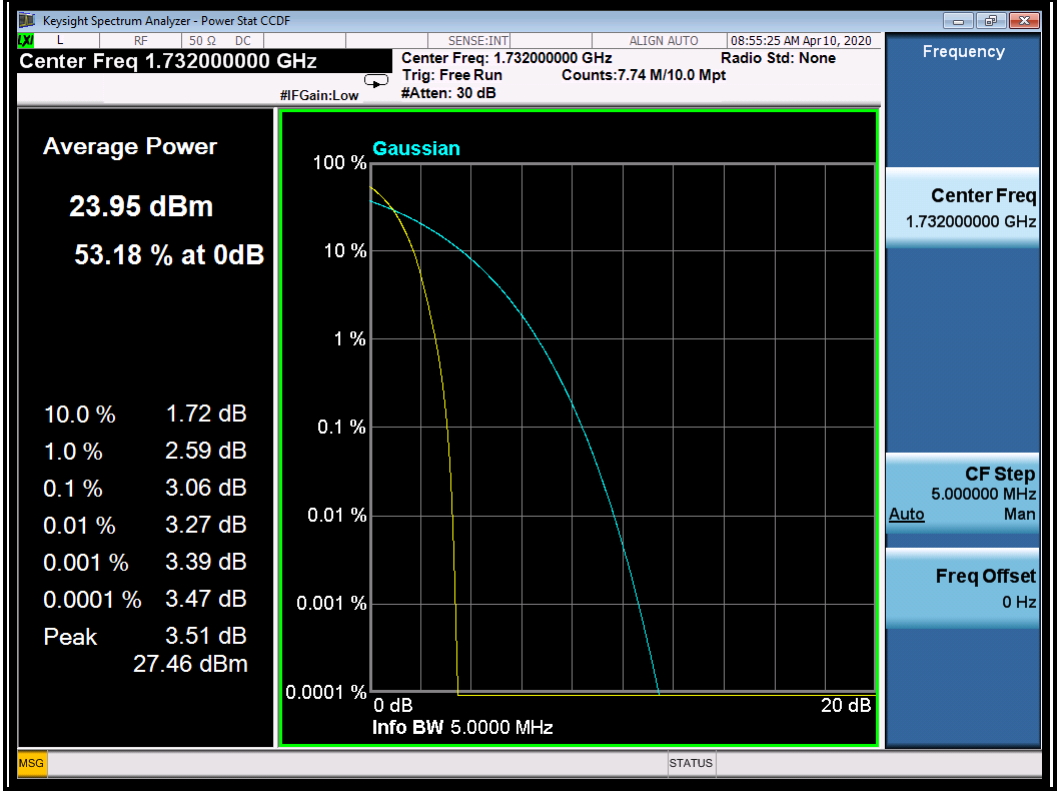
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---|---|---|
| 1312 | 1712.4 | 2.97 |

**SPECTRUM PLOT OF WORST VALUE**



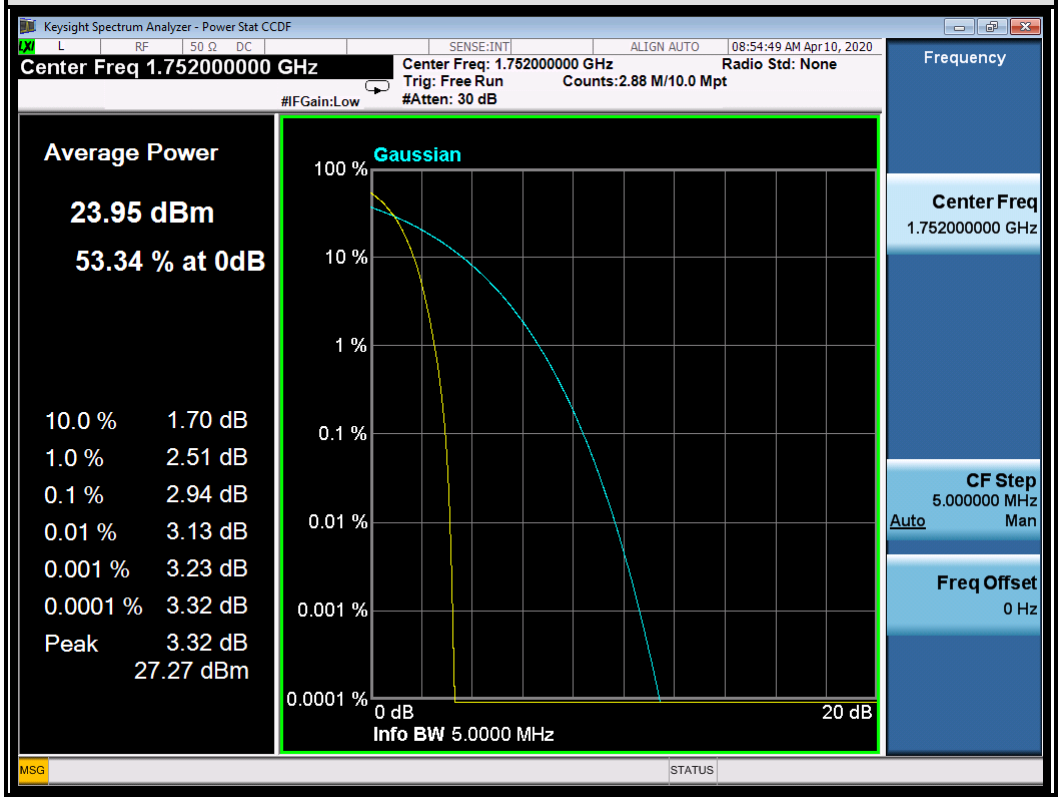
| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---|---|---|
| 1413 | 1732.6 | 3.06 |

**SPECTRUM PLOT OF WORST VALUE**



| CHANNEL | FREQUENCY (MHz) | PEAK TO AVERAGE RATIO (dB) |
|---|---|---|
| 1513 | 1752.6 | 2.94 |

**SPECTRUM PLOT OF WORST VALUE**

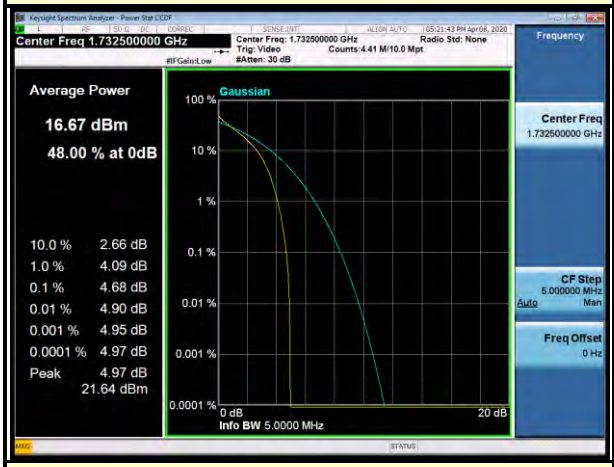


## LTE BAND 4

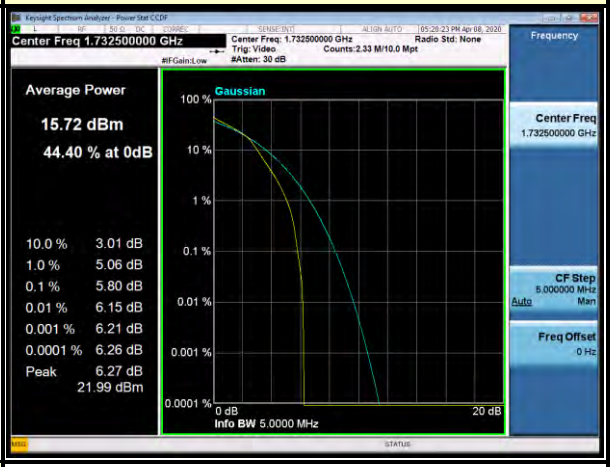
| CHANNEL BANDWIDTH: 1.4MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) | | |
| | | QPSK | 16QAM | 64QAM |
| 19957 | 1710.7 | 4.46 | 5.59 | 5.59 |
| 20175 | 1732.5 | 4.68 | 5.80 | 5.79 |
| 20393 | 1754.3 | 4.55 | 5.62 | 5.61 |

**SPECTRUM PLOT OF WORST VALUE**

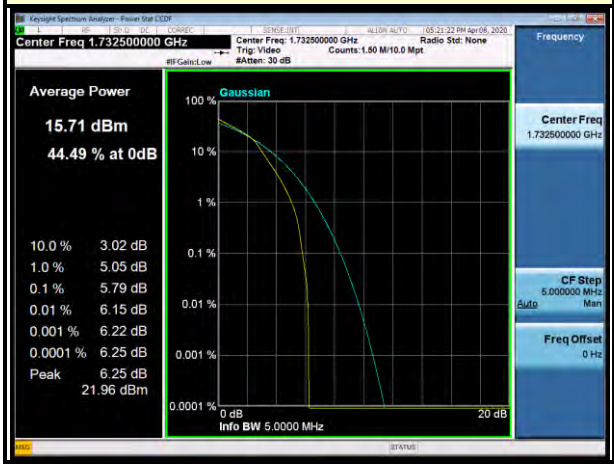
**1.4MHz / QPSK**




**1.4MHz / 16QAM**




**1.4MHz / 64QAM**

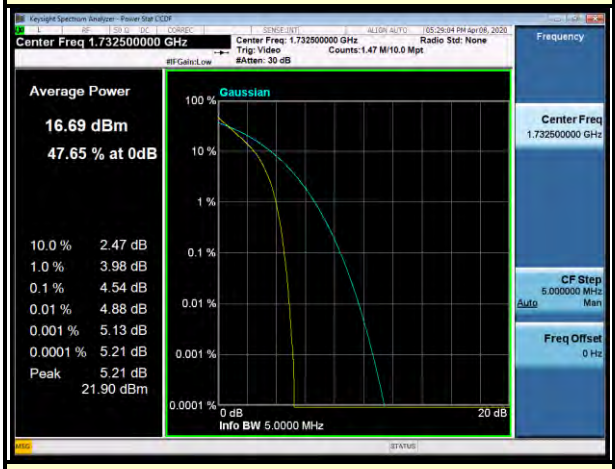


## LTE BAND 4

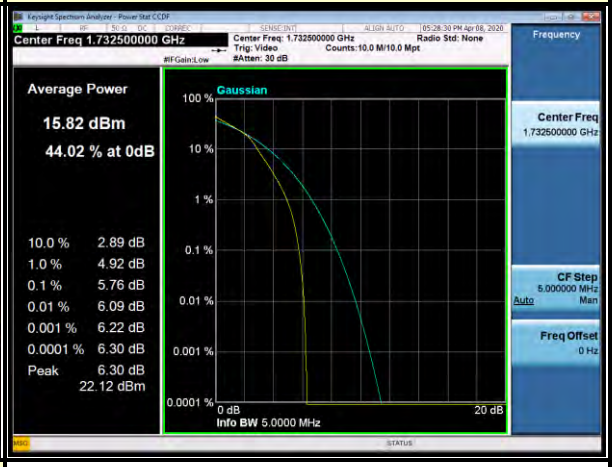
| CHANNEL BANDWIDTH: 3MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) | | |
| | | QPSK | 16QAM | 64QAM |
| 19965 | 1711.5 | 4.40 | 5.59 | 5.60 |
| 20175 | 1732.5 | 4.54 | 5.76 | 5.77 |
| 20385 | 1753.5 | 4.43 | 5.68 | 5.67 |

**SPECTRUM PLOT OF WORST VALUE**

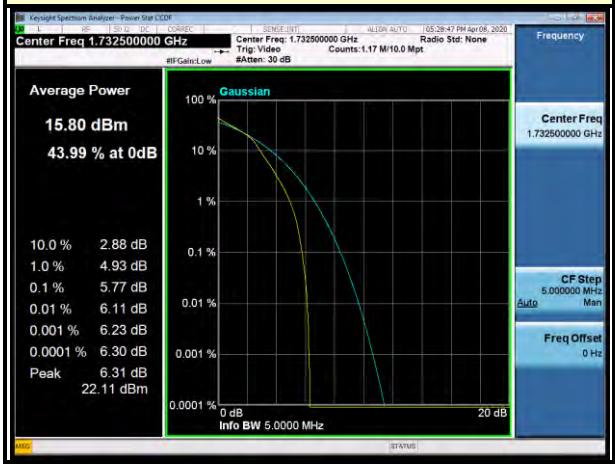
**3MHz / QPSK**




**3MHz / 16QAM**



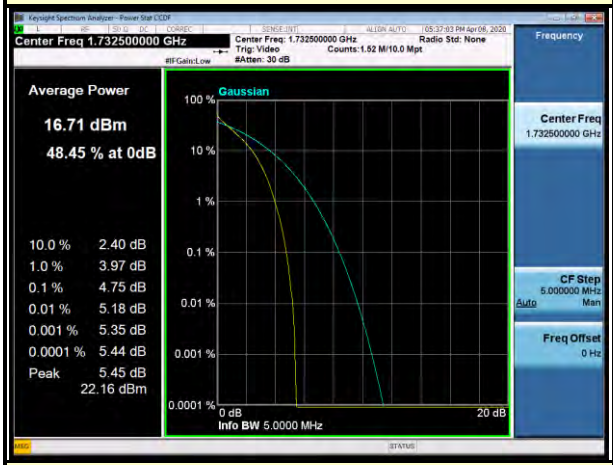

**3MHz / 64QAM**



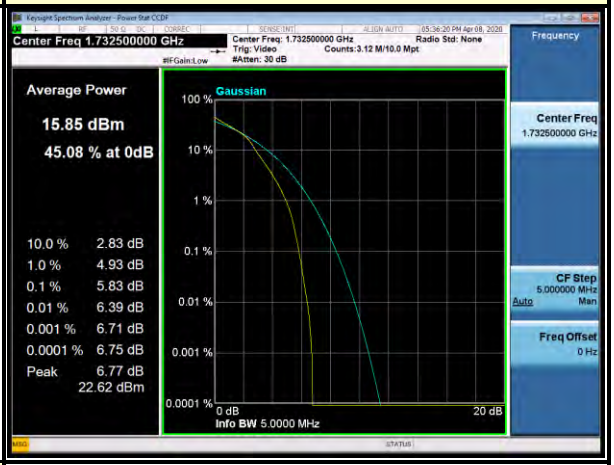
| CHANNEL BANDWIDTH: 5MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) | | |
| | | QPSK | 16QAM | 64QAM |
| 19975 | 1712.5 | 4.67 | 5.77 | 5.77 |
| 20175 | 1732.5 | 4.75 | 5.83 | 5.83 |
| 20375 | 1752.5 | 4.68 | 5.75 | 5.77 |

**SPECTRUM PLOT OF WORST VALUE**

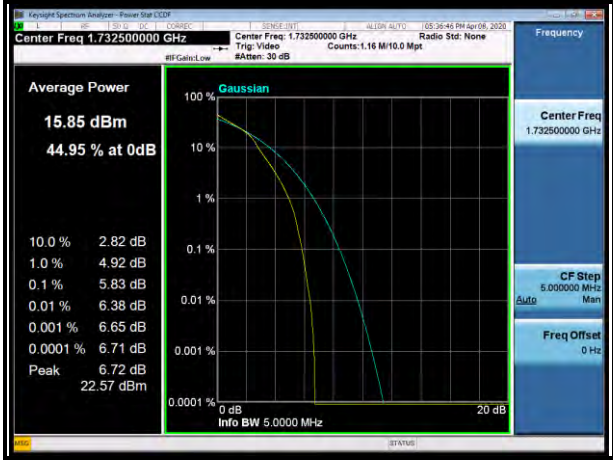
**5MHz / QPSK**




**5MHz / 16QAM**



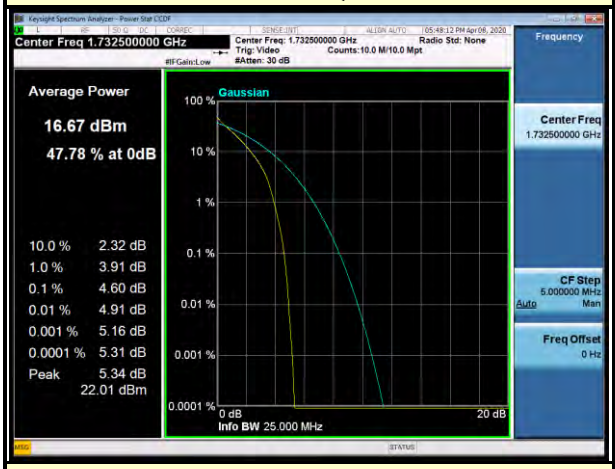

**5MHz / 64QAM**



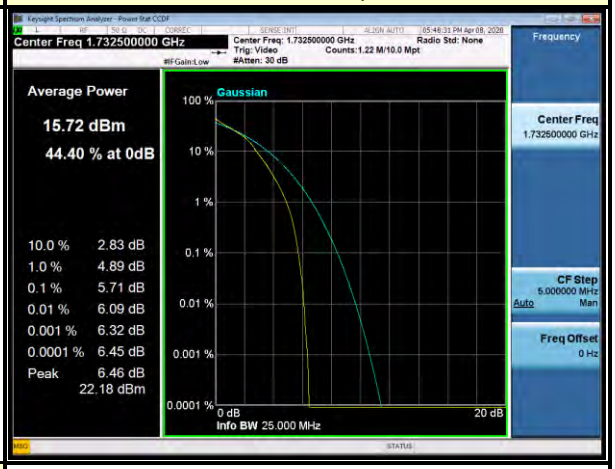
| CHANNEL BANDWIDTH: 10MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) | | |
| | | QPSK | 16QAM | 64QAM |
| 20000 | 1715 | 4.51 | 5.59 | 5.60 |
| 20175 | 1732.5 | 4.60 | 5.71 | 5.72 |
| 20350 | 1750 | 4.54 | 5.63 | 5.63 |

**SPECTRUM PLOT OF WORST VALUE**

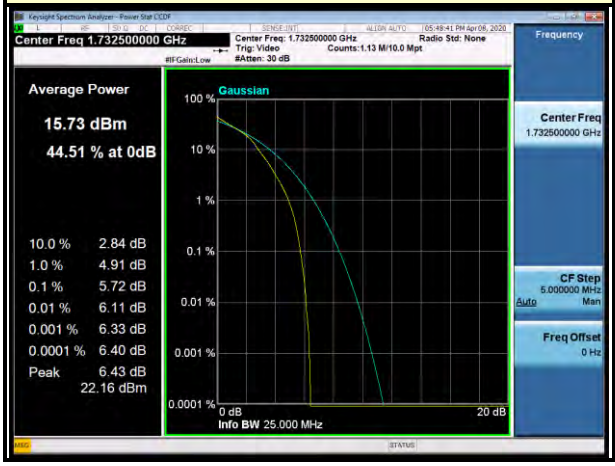
**10MHz / QPSK**




**10MHz / 16QAM**



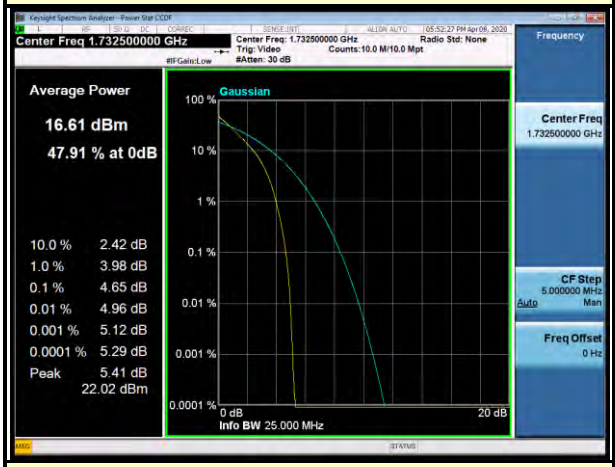

**10MHz / 64QAM**



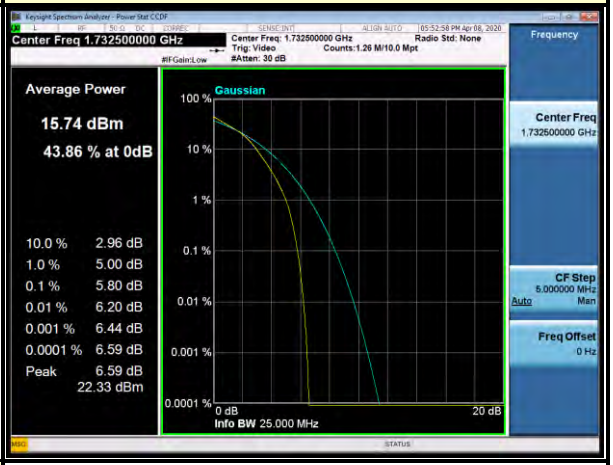
| CHANNEL BANDWIDTH: 15MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) | | |
| | | QPSK | 16QAM | 64QAM |
| 20025 | 1717.5 | 4.61 | 5.72 | 5.74 |
| 20175 | 1732.5 | 4.65 | 5.80 | 5.79 |
| 20325 | 1747.5 | 4.54 | 5.66 | 5.67 |

**SPECTRUM PLOT OF WORST VALUE**

**15MHz / QPSK**




**15MHz / 16QAM**

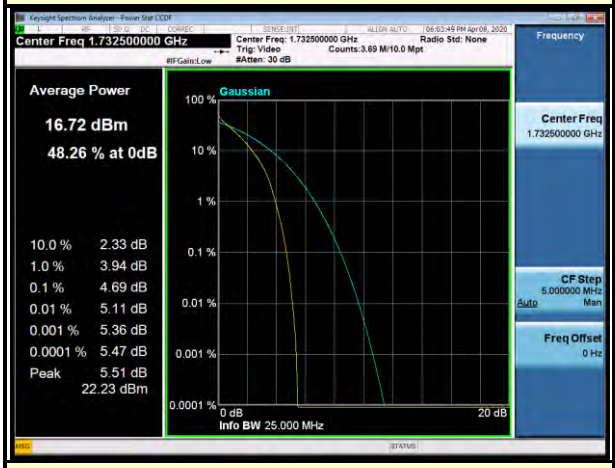



**15MHz / 64QAM**

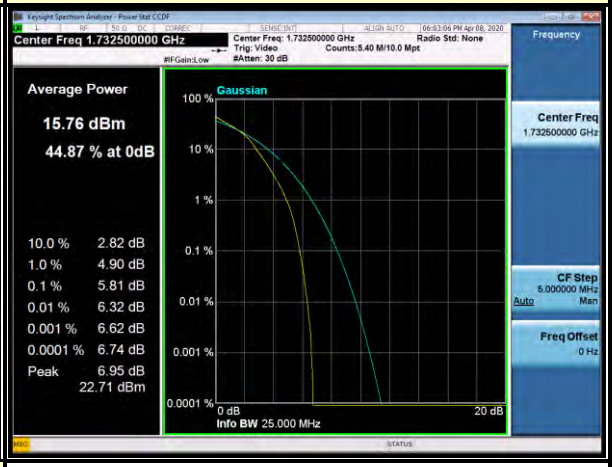
| CHANNEL BANDWIDTH: 20MHz | | | | |
|---|---|---|---|---|
| CHANNEL | Frequency (MHz) | PEAK TO AVERAGE RATIO (dB) | | |
| | | QPSK | 16QAM | 64QAM |
| 20050 | 1720 | 4.62 | 5.71 | 5.72 |
| 20175 | 1732.5 | 4.69 | 5.81 | 5.83 |
| 20300 | 1745 | 4.44 | 5.53 | 5.52 |

**SPECTRUM PLOT OF WORST VALUE**

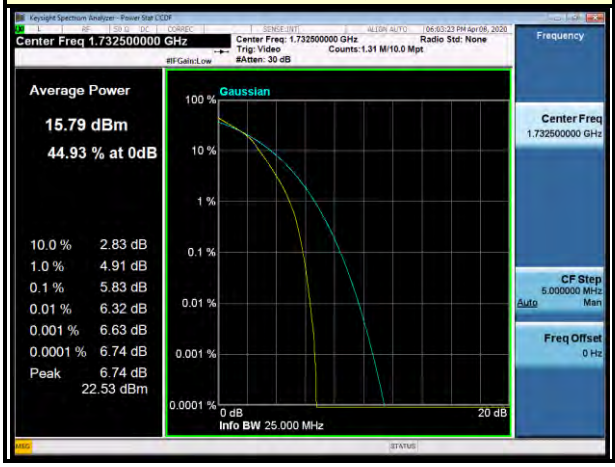
**20MHz / QPSK**




**20MHz / 16QAM**




**20MHz / 64QAM**

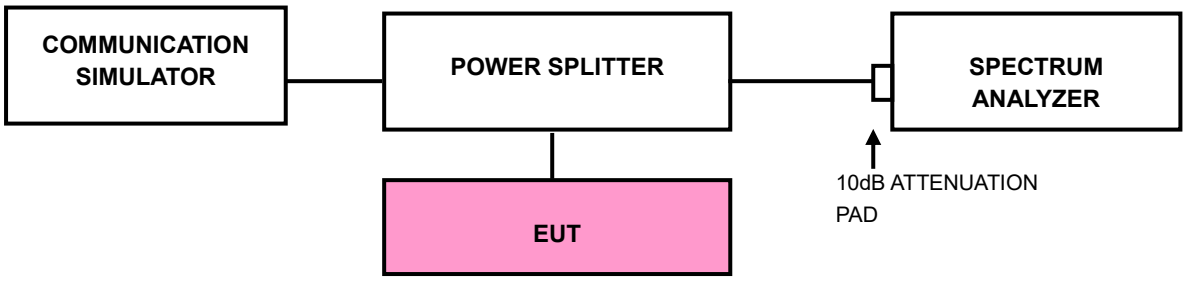


## 3.5 BAND EDGE MEASUREMENT

### 3.5.1 LIMITS OF BAND EDGE MEASUREMENT

The power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10 log (P) dB. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater.
However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

### 3.5.2 TEST SETUP



### 3.5.3 TEST PROCEDURES

a. The EUT was set up for the maximum peak power with LTE link data modulation. The power was measured with R&S Spectrum Analyzer. All measurements were done at 2 channels (low and high operational frequency range.).

b. The band edge measurement used the power splitter via EUT RF power connector between simulation base station and spectrum analyzer.

c. The center frequency of spectrum is the band edge frequency and span is 10MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz (WCDMA).

d. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 20kHz and VBW of the spectrum is 100 kHz. (LTE bandwidth 1.4MHz)

e. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 30kHz and VBW of the spectrum is 100kHz. (LTE bandwidth 3MHz)

f. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 50kHz and VBW of the spectrum is 200kHz. (LTE bandwidth 5MHz)

g. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 100kHz and VBW of the spectrum is 300kHz. (LTE bandwidth 10MHz)

h. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 15MHz)

i. The center frequency of spectrum is the band edge frequency and span is 1~5 MHz. RBW of the spectrum is 200kHz and VBW of the spectrum is 1MHz. (LTE bandwidth 20MHz)

j. Record the max trace plot into the test report.

## 3.5.4 TEST RESULTS

### WCDMA BAND 4

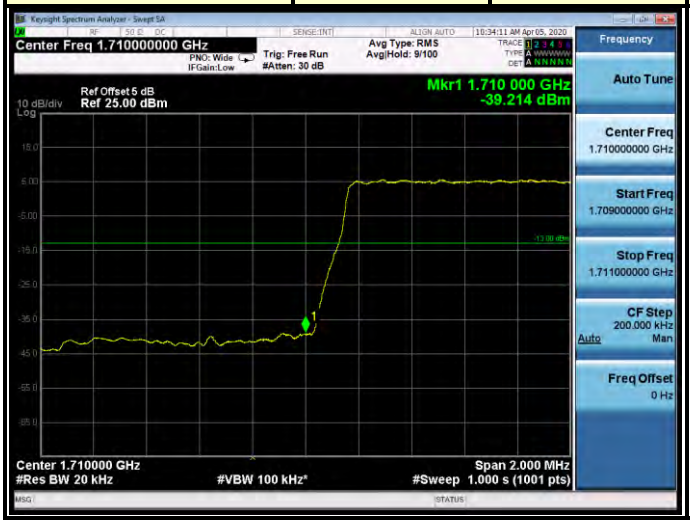
| WCDMA | | | |
|---|---|---|---|
| CHANNEL | 1312 | CHANNEL | 1513 |


## LTE BAND 4

| Channel Bandwidth: 1.4MHz QPSK | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 19957 | 1 RB | CHANNEL | 20393 | 1 RB |



| CHANNEL | 19957 | Full RB | CHANNEL | 20393 | Full RB |
|---|---|---|---|---|---|




| Channel Bandwidth: 1.4MHz 16QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 19957 | 1 RB | CHANNEL | 20393 | 1 RB |
|  | | |  | | |
| CHANNEL | 19957 | Full RB | CHANNEL | 20393 | Full RB |
|  | | |  | | |

| Channel Bandwidth: 1.4MHz 64QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 19957 | 1 RB | CHANNEL | 20393 | 1 RB |
|  | | |  | | |
| CHANNEL | 19957 | Full RB | CHANNEL | 20393 | Full RB |
|  | | |  | | |

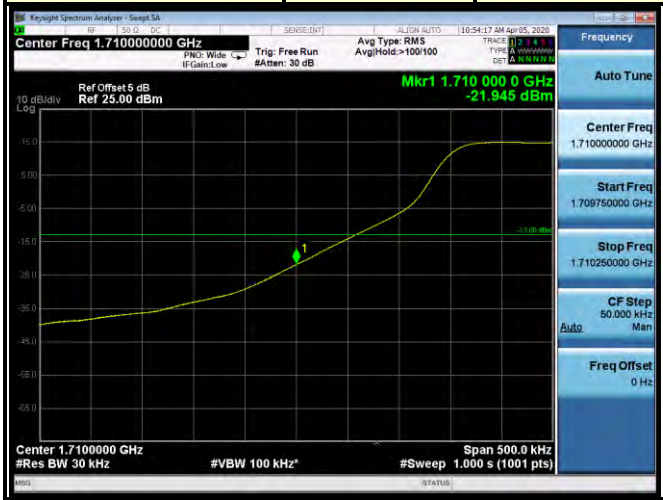
## LTE BAND 4

| Channel Bandwidth: 3MHz QPSK | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 19965 | 1 RB | CHANNEL | 20385 | 1 RB |



| CHANNEL | 19965 | Full RB | CHANNEL | 20385 | Full RB |
|---|---|---|---|---|---|

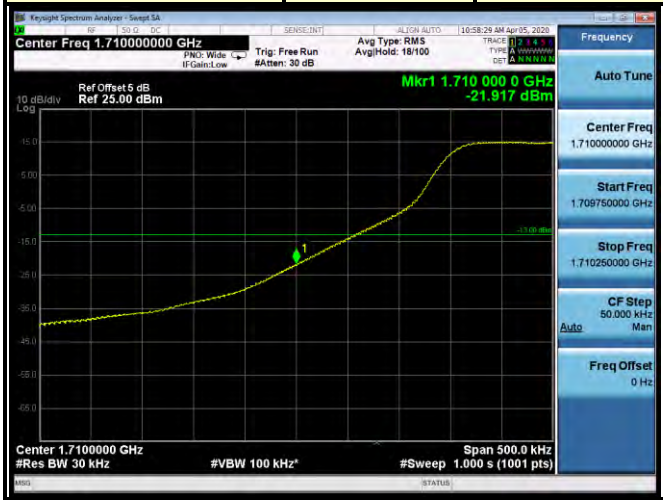

| Channel Bandwidth: 3MHz 16QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 19965 | 1 RB | CHANNEL | 20385 | 1 RB |





| CHANNEL | 19965 | Full RB | CHANNEL | 20385 | Full RB |
|---|---|---|---|---|---|


| Channel Bandwidth: 3MHz 64QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 19965 | 1 RB | CHANNEL | 20385 | 1 RB |

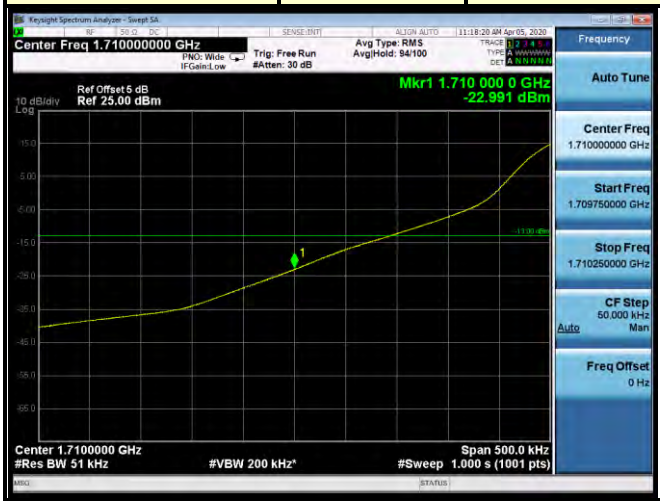




| CHANNEL | 19965 | Full RB | CHANNEL | 20385 | Full RB |
|---|---|---|---|---|---|


## LTE BAND 4

| Channel Bandwidth: 5MHz QPSK | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 19975 | 1 RB | CHANNEL | 20375 | 1 RB |





| CHANNEL | 19975 | Full RB | CHANNEL | 20375 | Full RB |
|---|---|---|---|---|---|

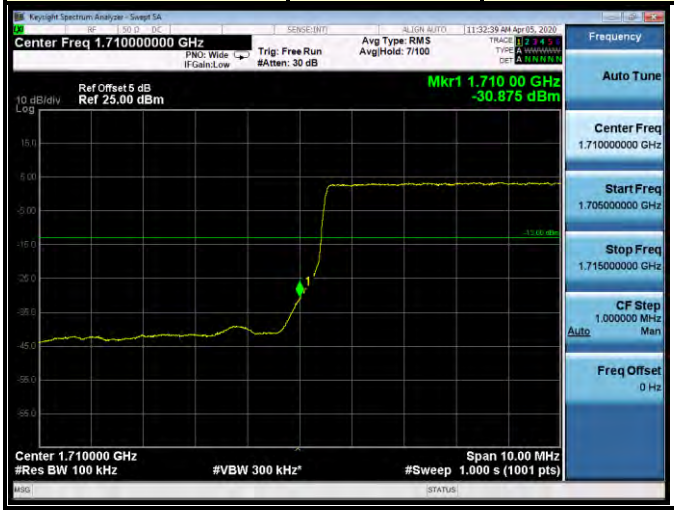

| Channel Bandwidth: 5MHz 16QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 19975 | 1 RB | CHANNEL | 20375 | 1 RB |



| CHANNEL | 19975 | Full RB | CHANNEL | 20375 | Full RB |
|---|---|---|---|---|---|


| Channel Bandwidth: 5MHz 64QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 19975 | 1 RB | CHANNEL | 20375 | 1 RB |
|  | | |  | | |
| CHANNEL | 19975 | Full RB | CHANNEL | 20375 | Full RB |
|  | | |  | | |

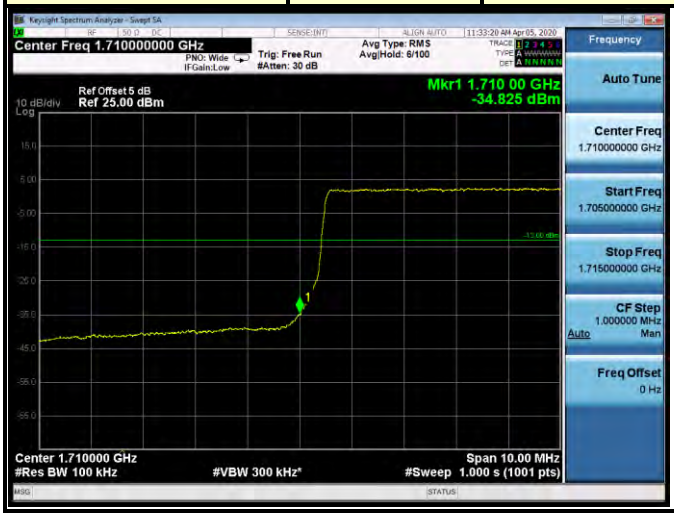
## LTE BAND 4

| Channel Bandwidth: 10MHz QPSK | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 20000 | 1 RB | CHANNEL | 20350 | 1 RB |
|  | | |  | | |
| CHANNEL | 20000 | Full RB | CHANNEL | 20350 | Full RB |
|  | | |  | | |

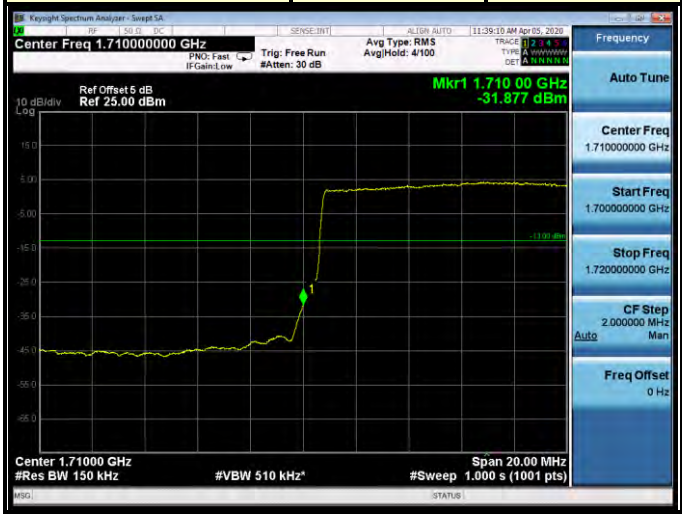
| Channel Bandwidth: 10MHz 16QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 20000 | 1 RB | CHANNEL | 20350 | 1 RB |

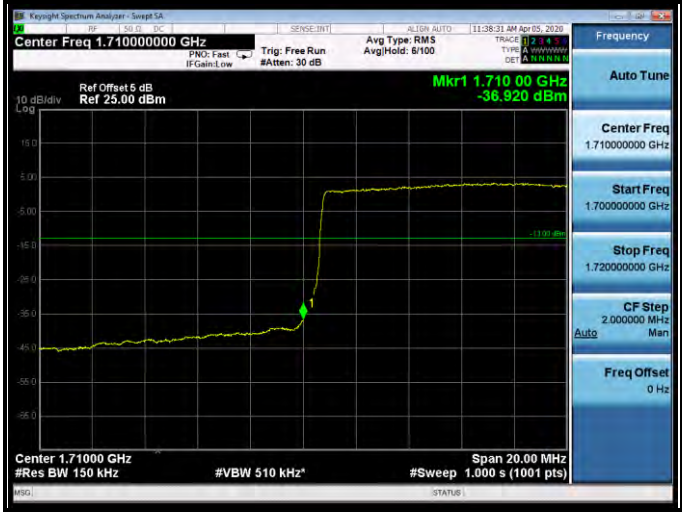


| CHANNEL | 20000 | Full RB | CHANNEL | 20350 | Full RB |
|---|---|---|---|---|---|


| Channel Bandwidth: 10MHz 64QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 20000 | 1 RB | CHANNEL | 20350 | 1 RB |
|  | | |  | | |
| CHANNEL | 20000 | Full RB | CHANNEL | 20350 | Full RB |
|  | | |  | | |

## LTE BAND 4

| Channel Bandwidth: 15MHz QPSK | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 20025 | 1 RB | CHANNEL | 20325 | 1 RB |
|  | | |  | | |
| CHANNEL | 20025 | Full RB | CHANNEL | 20325 | Full RB |
|  | | |  | | |

| Channel Bandwidth: 15MHz 16QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 20025 | 1 RB | CHANNEL | 20325 | 1 RB |
|  | | |  | | |
| CHANNEL | 20025 | Full RB | CHANNEL | 20325 | Full RB |
|  | | |  | | |

| Channel Bandwidth: 15MHz 64QAM | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 20025 | 1 RB | CHANNEL | 20325 | 1 RB |
|  | | |  | | |
| CHANNEL | 20025 | Full RB | CHANNEL | 20325 | Full RB |
|  | | |  | | |

## LTE BAND 4

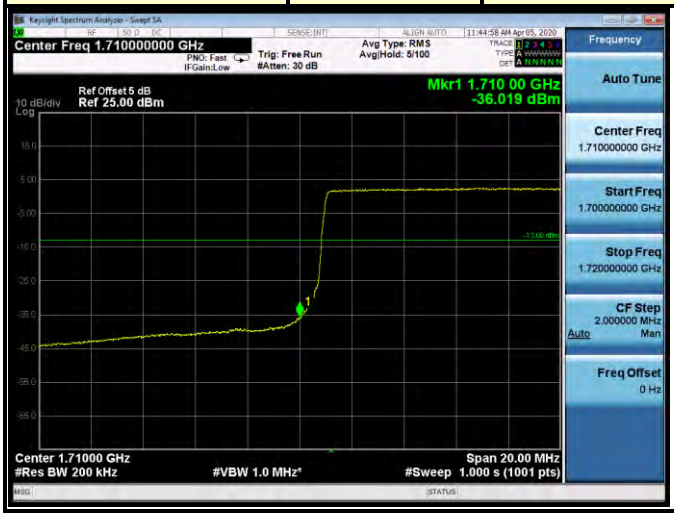
| Channel Bandwidth: 20MHz QPSK | | | | | |
|---|---|---|---|---|---|
| CHANNEL | 20050 | 1 RB | CHANNEL | 20300 | 1 RB |
|  | | |  | | |
| CHANNEL | 20050 | Full RB | CHANNEL | 20300 | Full RB |
|  | | |  | | |

## Channel Bandwidth: 20MHz 16QAM

| CHANNEL | 20050 | 1 RB | CHANNEL | 20300 | 1 RB |
|---|---|---|---|---|---|



| CHANNEL | 20050 | Full RB | CHANNEL | 20300 | Full RB |
|---|---|---|---|---|---|

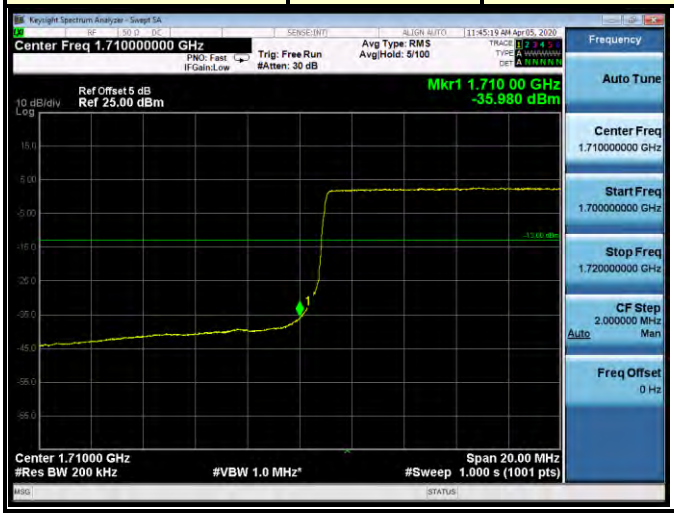



## Channel Bandwidth: 20MHz 64QAM

| CHANNEL | 20050 | 1 RB | CHANNEL | 20300 | 1 RB |
|---|---|---|---|---|---|



| CHANNEL | 20050 | Full RB | CHANNEL | 20300 | Full RB |
|---|---|---|---|---|---|




## 3.6 CONDUCTED SPURIOUS EMISSIONS

### 3.6.1 LIMITS OF CONDUCTED SPURIOUS EMISSIONS MEASUREMENT

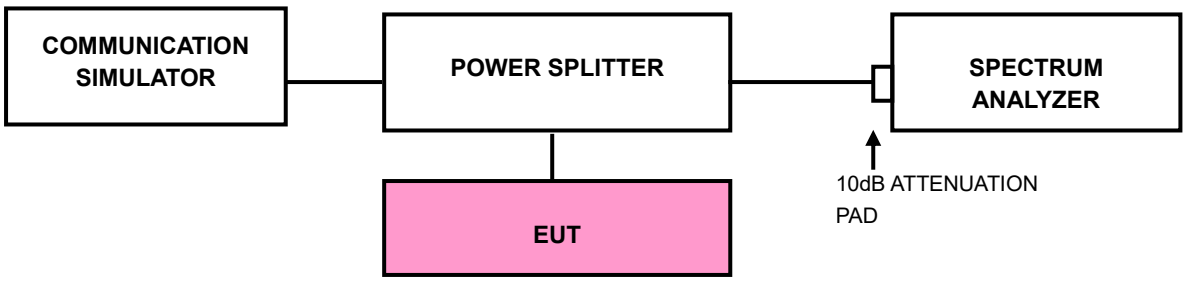
The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission equal to –13dBm

### 3.6.2 TEST PROCEDURE

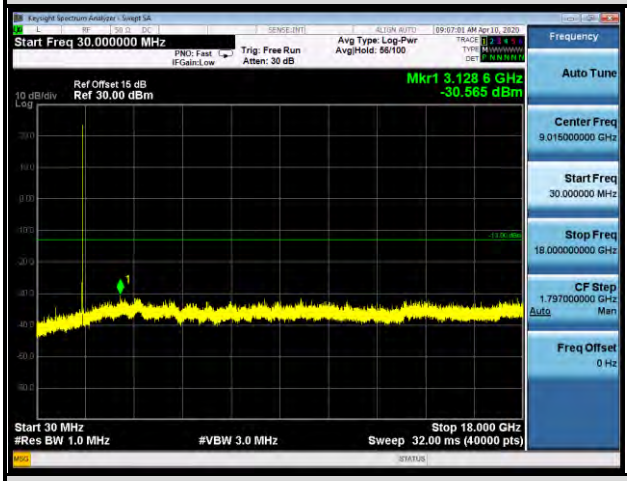
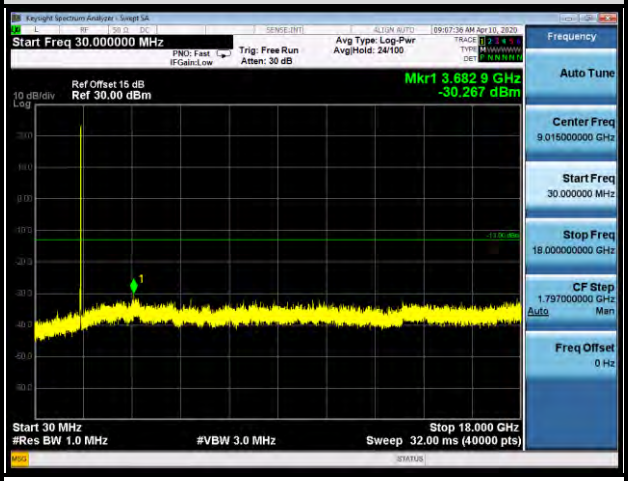
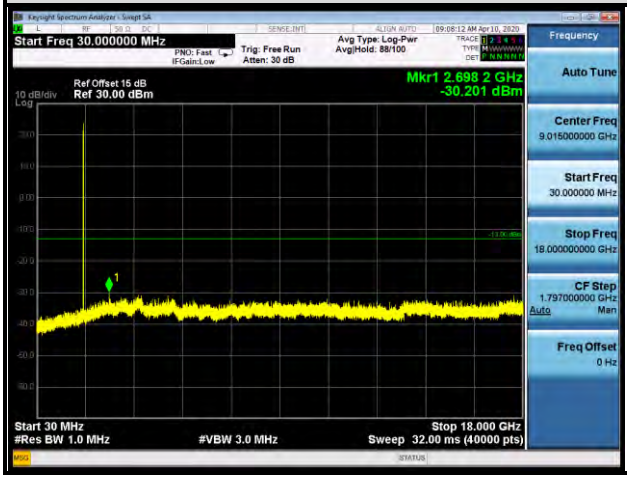
a. The EUT makes a phone call to the communication simulator. All measurements were done at middle operational frequency range.

b. Measuring frequency range is from 30 MHz to 19.1GHz for WCDMA Band 4 & LTE Band 4. 10dB attenuation pad is connected with spectrum. RBW=1MHz and VBW=3MHz are used for conducted emission measurement.

### 3.6.3 TEST SETUP



## 3.6.4 TEST RESULTS

| WCDMA | |
|---|---|
| **CHANNEL 1312** | **CHANNEL 1413** |
| **FREQUENCY RANGE : 30MHz~18.0GHz** | **FREQUENCY RANGE : 30MHz~18.0GHz** |
|  |  |
| **CHANNEL 1513** | |
| **FREQUENCY RANGE : 30MHz~18.0GHz** | |
|  | |

## LTE BAND 4

### 1.4MHz / QPSK

**CHANNEL 19957**

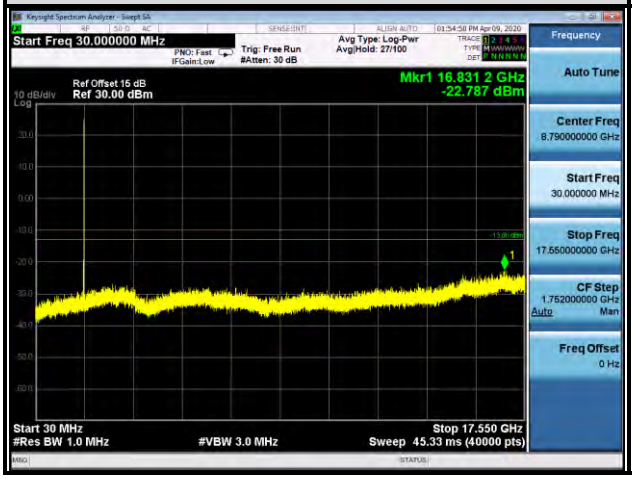
**FREQUENCY RANGE : 30MHz~17.55GHz**

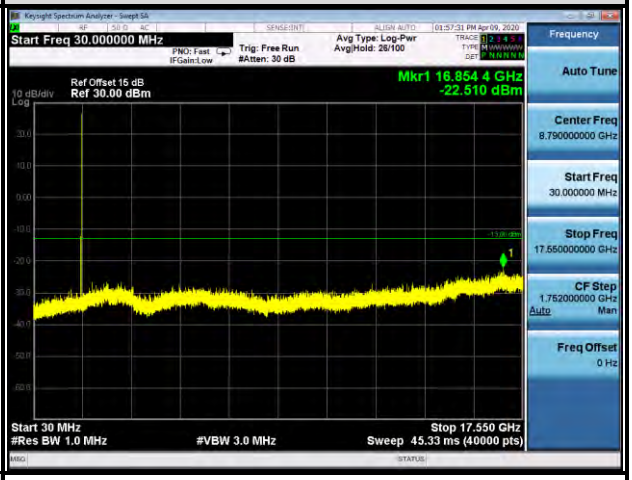
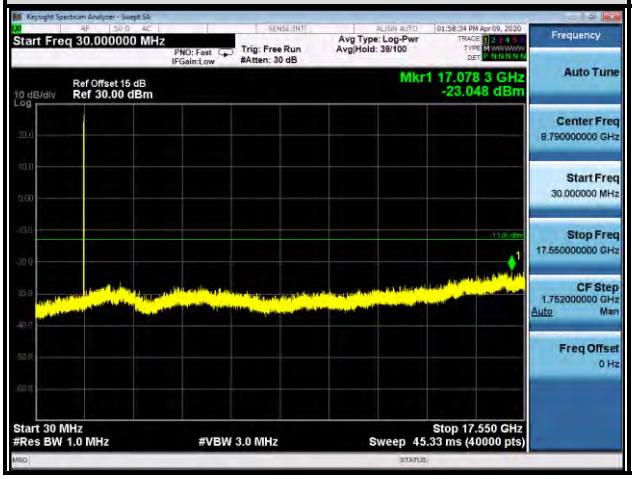

**CHANNEL 20175**

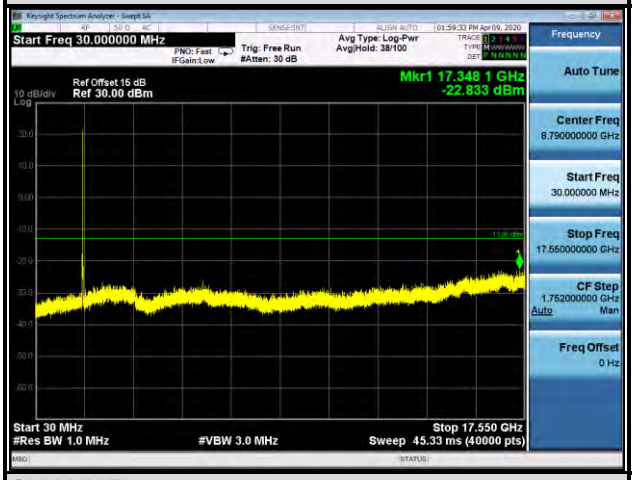
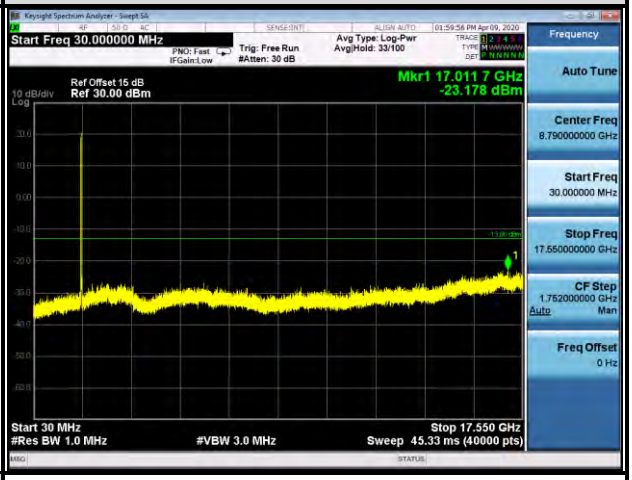
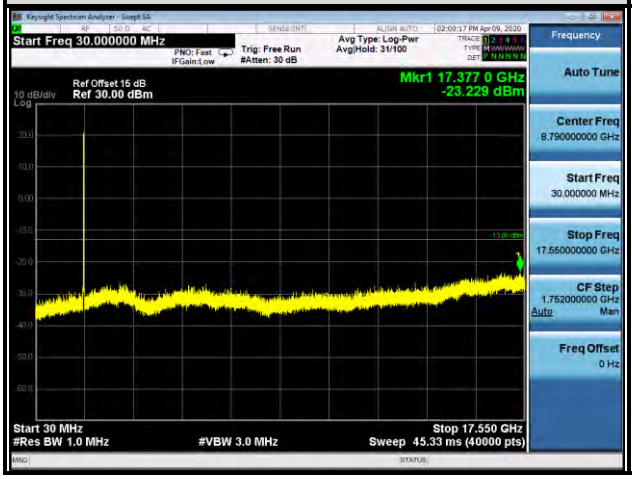
**FREQUENCY RANGE : 30MHz~17.55GHz**

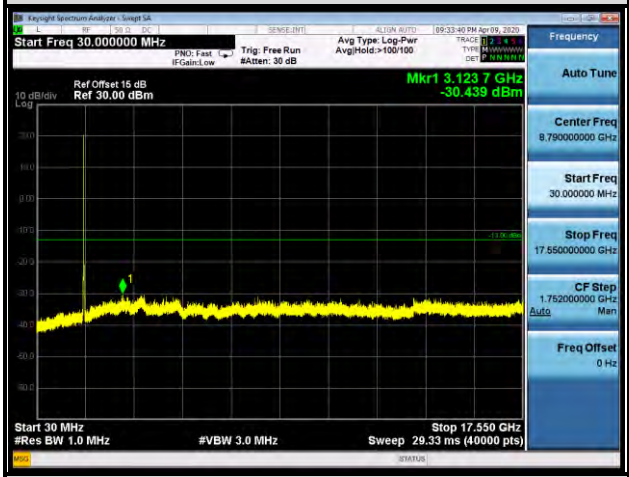
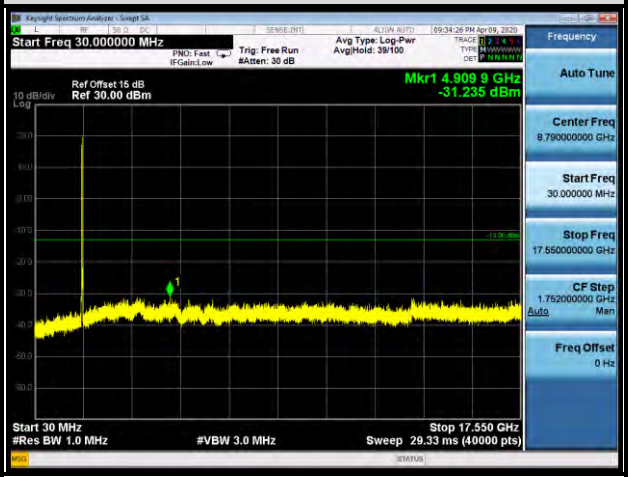
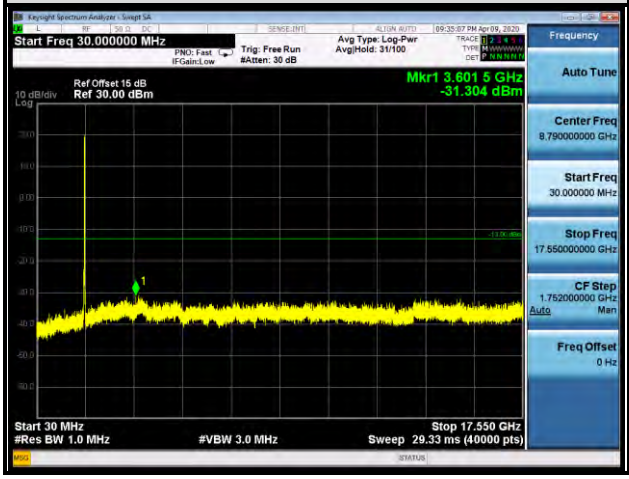

**CHANNEL 20393**

**FREQUENCY RANGE : 30MHz~17.55GHz**

| 3MHz / QPSK | |
|---|---|
| CHANNEL 19965 | CHANNEL 20175 |
| FREQUENCY RANGE : 30MHz~17.55GHz | FREQUENCY RANGE : 30MHz~17.55GHz |
|  |  |
| CHANNEL 20385 | |
| FREQUENCY RANGE : 30MHz~17.55GHz | |
|  | |

| 5MHz / QPSK | |
|---|---|
| CHANNEL 19975 | CHANNEL 20175 |
| FREQUENCY RANGE : 30MHz~17.55GHz | FREQUENCY RANGE : 30MHz~17.55GHz |
|  |  |
| CHANNEL 20375 | |
| FREQUENCY RANGE : 30MHz~17.55GHz | |
|  | |

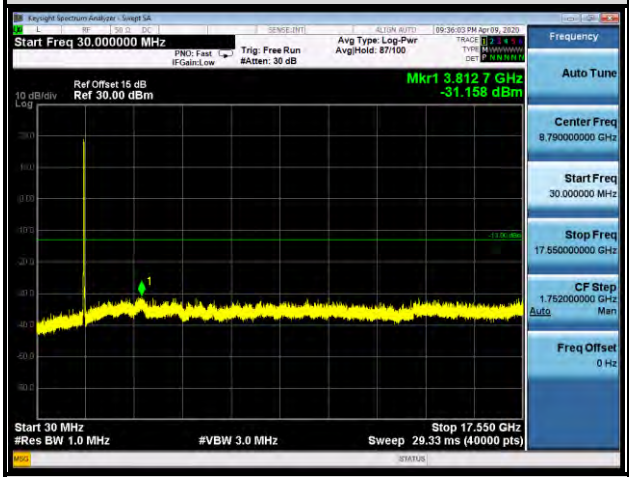
| 10MHz / QPSK | |
|---|---|
| CHANNEL 20000 | CHANNEL 20175 |
| FREQUENCY RANGE : 30MHz~17.55GHz | FREQUENCY RANGE : 30MHz~17.55GHz |
|  |  |
| CHANNEL 20350 | |
| FREQUENCY RANGE : 30MHz~17.55GHz | |
|  | |

| 15MHz / QPSK | |
|---|---|
| CHANNEL 20025 | CHANNEL 20175 |
| FREQUENCY RANGE : 30MHz~17.55GHz | FREQUENCY RANGE : 30MHz~17.55GHz |
|  |  |
| CHANNEL 20325 | |
| FREQUENCY RANGE : 30MHz~17.55GHz | |
|  | |

## 20MHz / QPSK

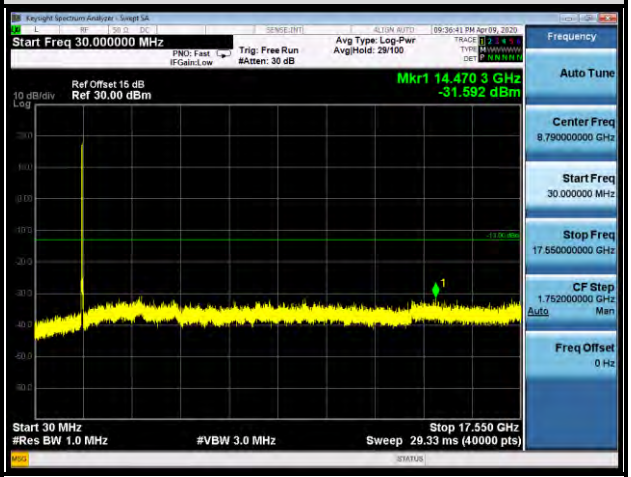
### CHANNEL 20050

FREQUENCY RANGE : 30MHz~17.55GHz



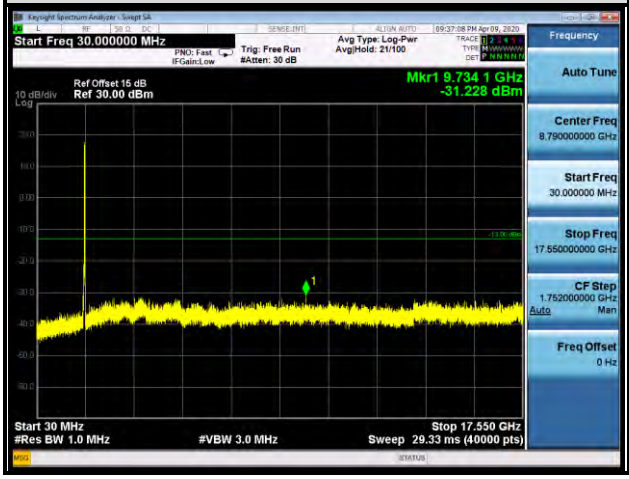

### CHANNEL 20175

FREQUENCY RANGE : 30MHz~17.55GHz




### CHANNEL 20300

FREQUENCY RANGE : 30MHz~17.55GHz



## 3.7 RADIATED EMISSION MEASUREMENT

### 3.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 +10 log10(P) dB. The limit of emission equal to –13dBm

### 3.7.2 TEST PROCEDURES

a. Substitution method is used for E.I.R.P measurement. In the semi-anechoic chamber, EUT placed on the 0.8m 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.

b. 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 a. Record the power level of S.G

c. EIRP = Output power level of S.G – TX cable loss + Antenna gain of substitution horn.

d. 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.P.R power - 2.15dBi.

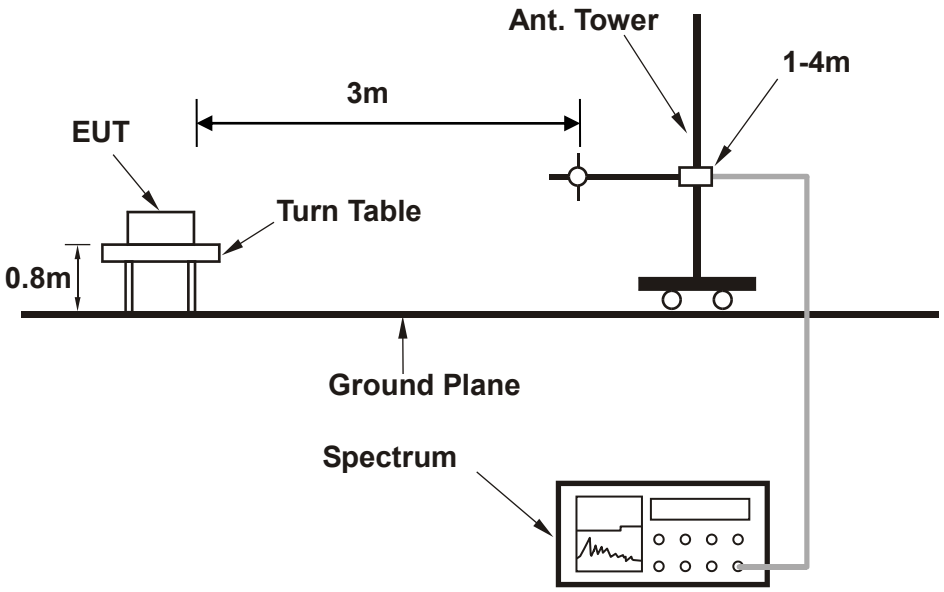
**NOTE:** The resolution bandwidth of spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz.

### 3.7.3 DEVIATION FROM TEST STANDARD

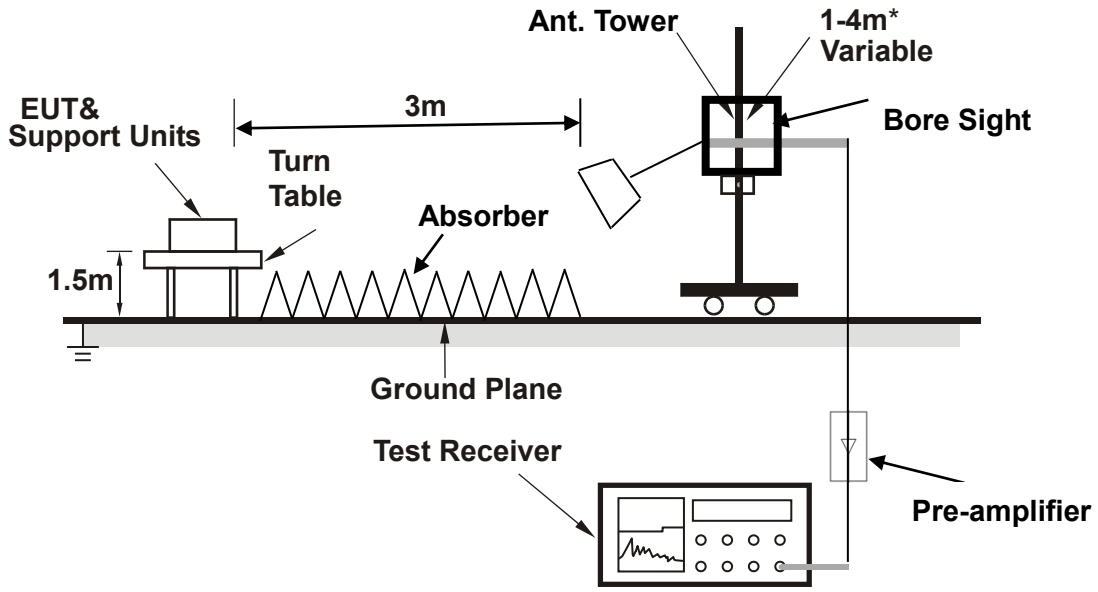
No deviation

## 3.7.4 TEST SETUP

**< Frequency Range 30MHz~1GHz >**




**<Frequency Range above 1GHz>**




**Note**: Above 1G is a directional antenna

Depends on the EUT height and the antenna 3dB beamwidth both, refer to section 7.3 of CISPR 16-2-3.

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

## 3.7.5 TEST RESULTS

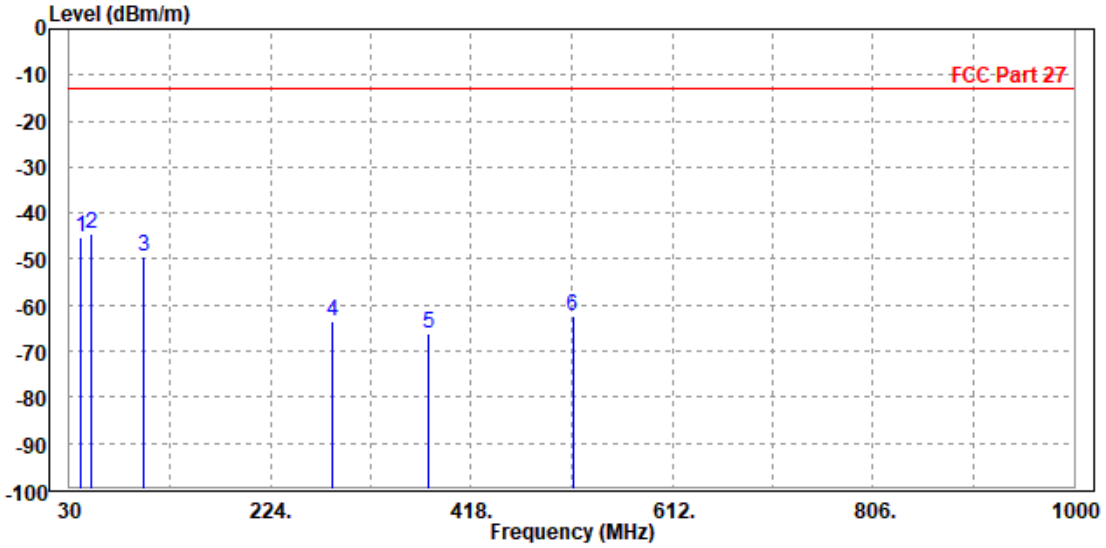
**BELOW 1GHz WORST-CASE DATA FROM ANT 0**

**30 MHz – 1GHz data:**

**WCDMA IV**

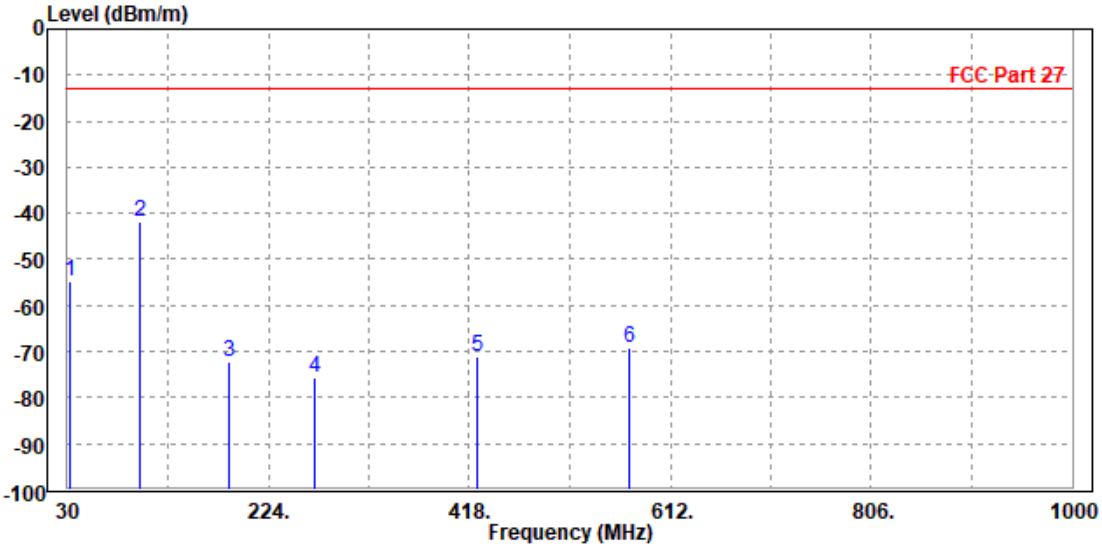
| MODE | TX channel 1413 | FREQUENCY RANGE | Below 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 41.560 | -45.13 | -43.26 | -13.00 | -32.13 | -1.87 | Peak | Horizontal |
| 2 PP | 50.680 | -44.49 | -39.25 | -13.00 | -31.49 | -5.24 | Peak | Horizontal |
| 3 | 101.250 | -49.29 | -38.45 | -13.00 | -36.29 | -10.84 | Peak | Horizontal |
| 4 | 283.650 | -63.54 | -52.17 | -13.00 | -50.54 | -11.37 | Peak | Horizontal |
| 5 | 377.110 | -66.19 | -55.17 | -13.00 | -53.19 | -11.02 | Peak | Horizontal |
| 6 | 515.890 | -62.37 | -55.11 | -13.00 | -49.37 | -7.26 | Peak | Horizontal |



| MODE | TX channel 1413 | FREQUENCY RANGE | Below 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 33.250 | -54.78 | -69.65 | -13.00 | -41.78 | 14.87 | Peak | Vertical |
| 2 PP | 100.233 | -41.74 | -30.54 | -13.00 | -28.74 | -11.20 | Peak | Vertical |
| 3 | 186.512 | -72.27 | -54.68 | -13.00 | -59.27 | -17.59 | Peak | Vertical |
| 4 | 268.110 | -75.63 | -60.25 | -13.00 | -62.63 | -15.38 | Peak | Vertical |
| 5 | 425.170 | -71.18 | -60.74 | -13.00 | -58.18 | -10.44 | Peak | Vertical |
| 6 | 572.330 | -69.33 | -60.17 | -13.00 | -56.33 | -9.16 | Peak | Vertical |



## ABOVE 1GHz

**Note:** For higher frequency, the emission is too low to be detected.

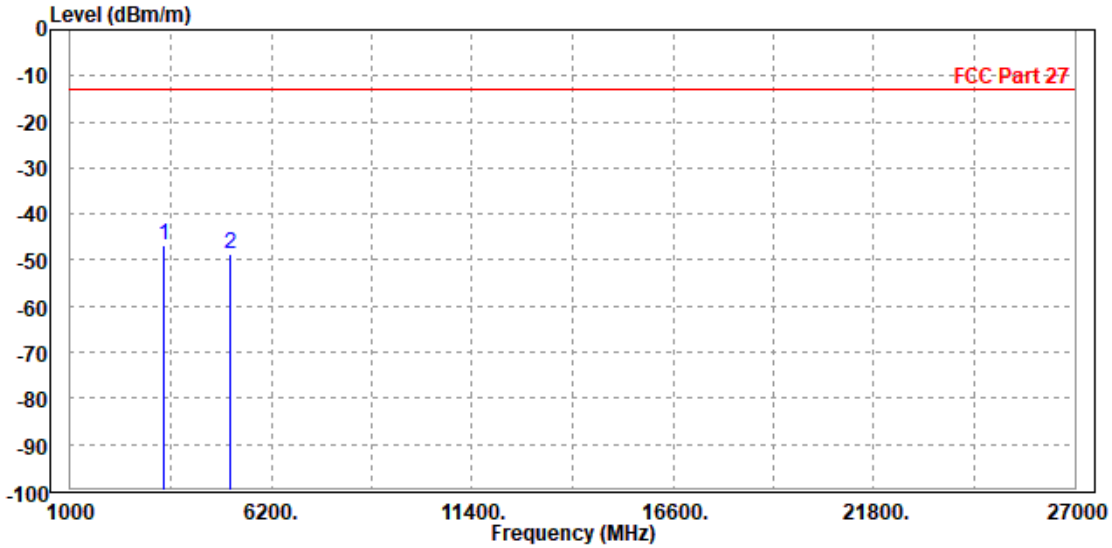
## WORST-CASE DATA FROM ANT 0

## WCDMA Band IV:

## CH 1312

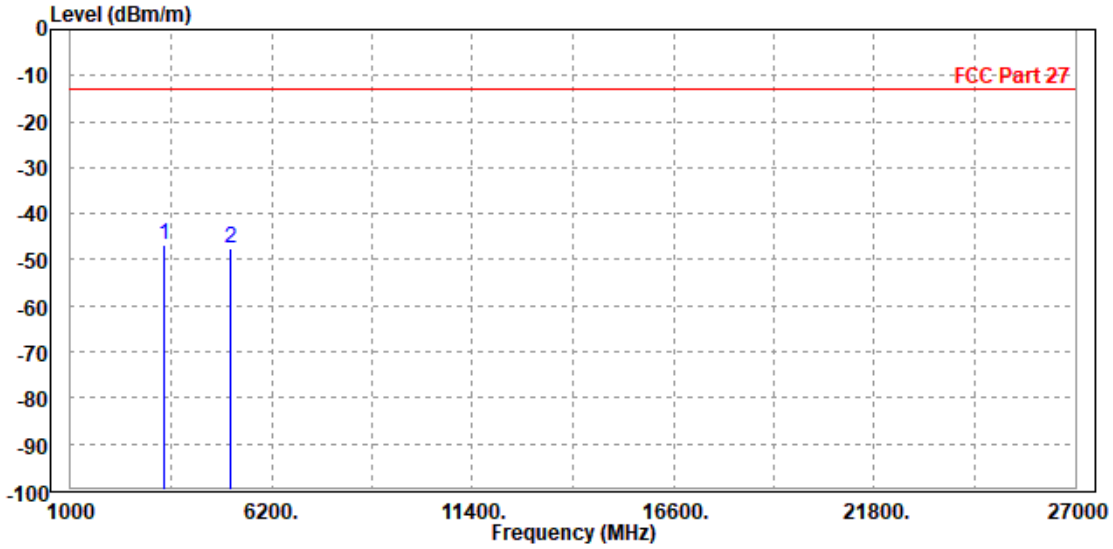
| MODE | TX channel 1312 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 PP | 3418.000 | -46.90 | -55.49 | -13.00 | -33.90 | 8.59 | Peak | Horizontal |
| 2 | 5137.200 | -48.70 | -57.64 | -13.00 | -35.70 | 8.94 | Peak | Horizontal |



| MODE | TX channel 1312 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

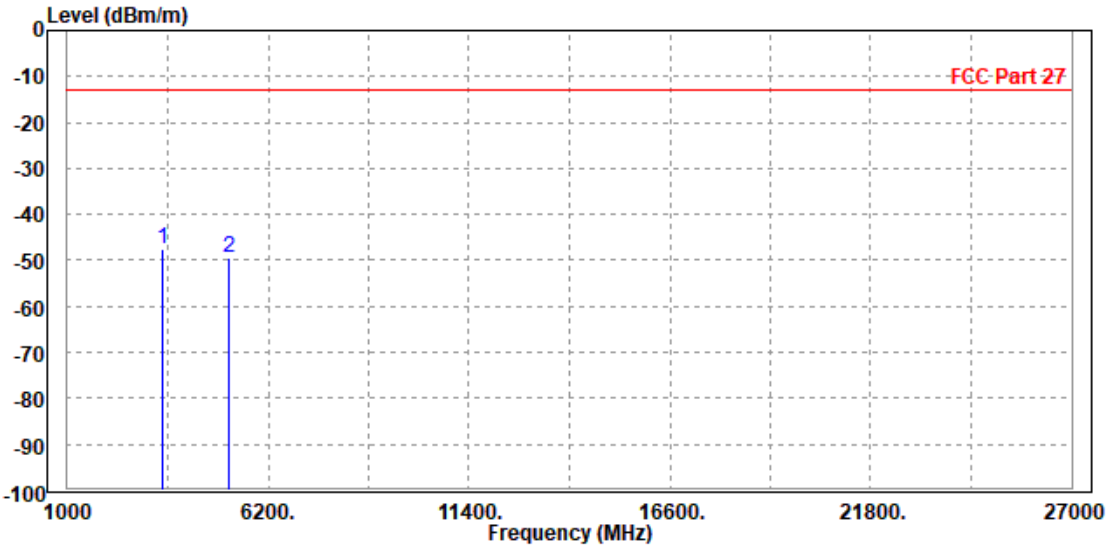
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 PP | 3418.000 | -46.68 | -55.79 | -13.00 | -33.68 | 9.11 | Peak | Vertical |
| 2 | 5137.200 | -47.48 | -57.33 | -13.00 | -34.48 | 9.85 | Peak | Vertical |



## CH 1413

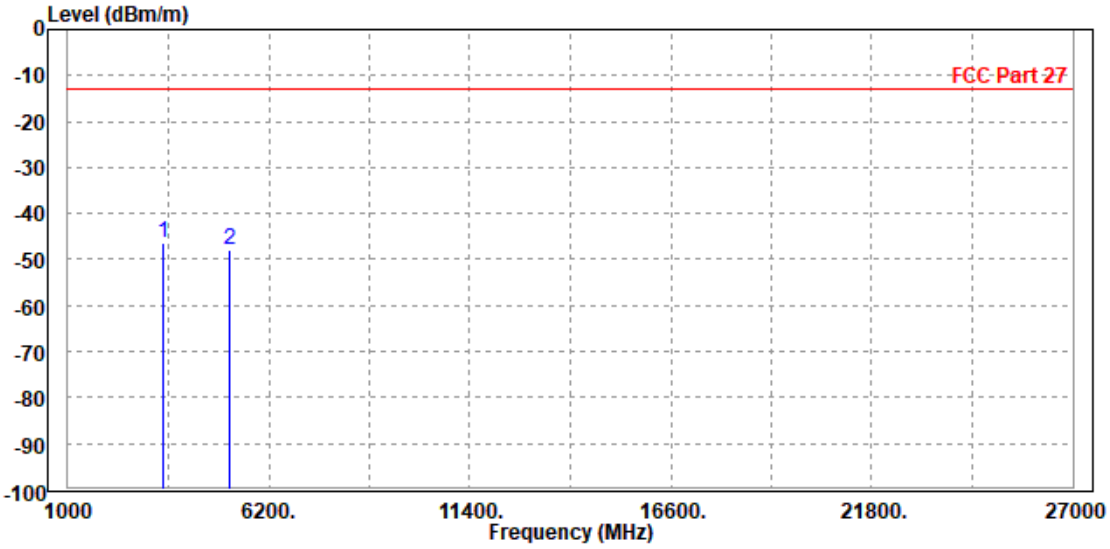
| MODE | TX channel 1413 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | PP 3470.000 | -47.59 | -56.17 | -13.00 | -34.59 | 8.58 | Peak | Horizontal |
| 2 | 5197.800 | -49.29 | -58.41 | -13.00 | -36.29 | 9.12 | Peak | Horizontal |



| MODE | TX channel 1413 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

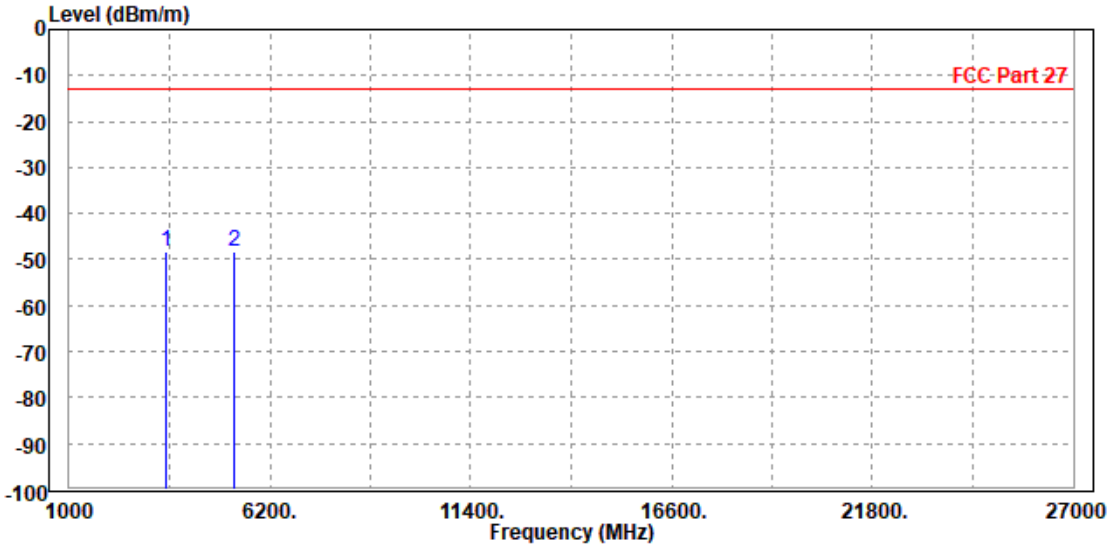
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | PP 3470.000 | -46.47 | -55.63 | -13.00 | -33.47 | 9.16 | Peak | Vertical |
| 2 | 5197.800 | -48.10 | -57.92 | -13.00 | -35.10 | 9.82 | Peak | Vertical |



## CH 1513

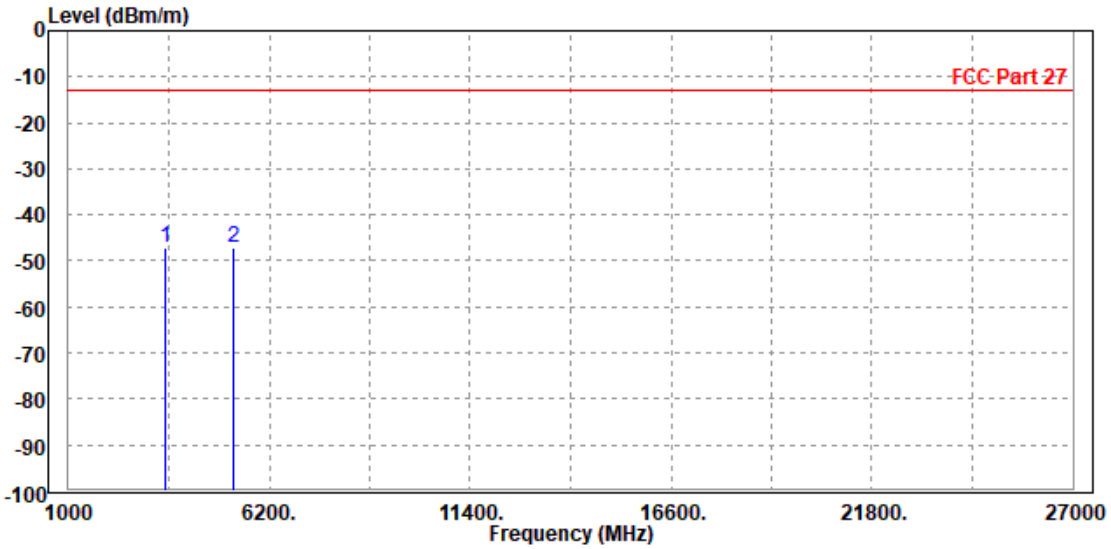
| MODE | TX channel 1513 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | PP 3496.000 | -48.23 | -56.80 | -13.00 | -35.23 | 8.57 | Peak | Horizontal |
| 2 | 5257.800 | -48.39 | -57.69 | -13.00 | -35.39 | 9.30 | Peak | Horizontal |



| MODE | TX channel 1513 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 3496.000 | -47.25 | -56.44 | -13.00 | -34.25 | 9.19 | Peak | Vertical |
| 2 PP | 5257.800 | -47.06 | -56.86 | -13.00 | -34.06 | 9.80 | Peak | Vertical |



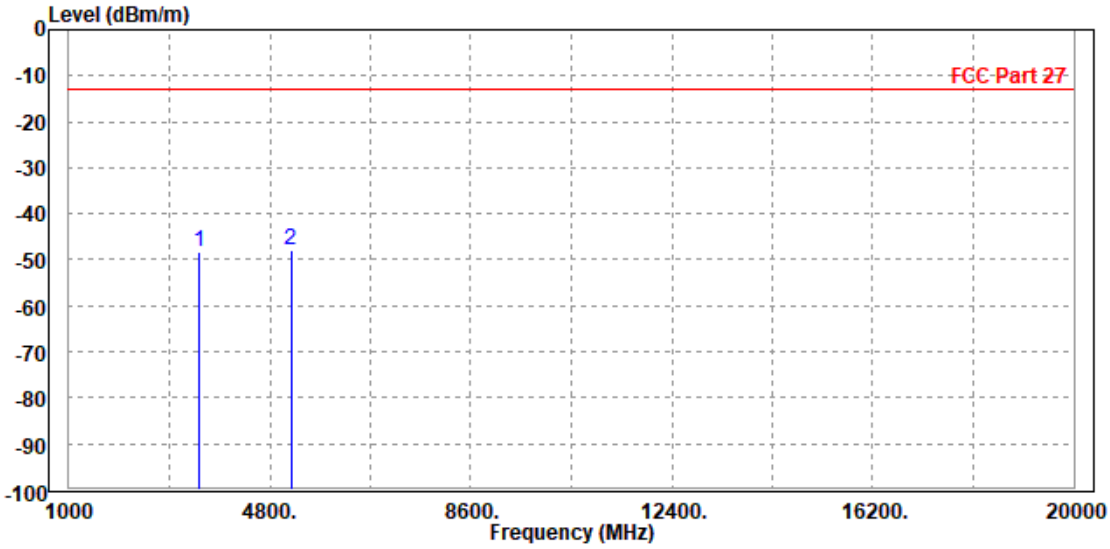
## LTE BAND 4

## CHANNEL BANDWIDTH: 1.4MHz / QPSK

## CH 20175

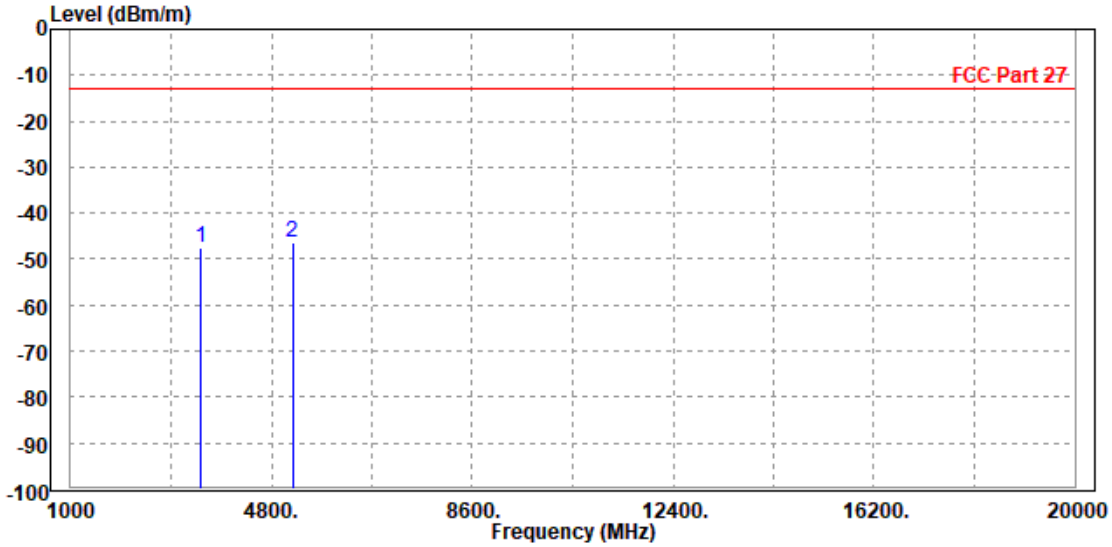
| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 3470.000 | -48.39 | -56.97 | -13.00 | -35.39 | 8.58 | Peak | Horizontal |
| 2 PP | 5197.500 | -47.87 | -56.99 | -13.00 | -34.87 | 9.12 | Peak | Horizontal |



| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 3470.000 | -47.48 | -56.64 | -13.00 | -34.48 | 9.16 | Peak | Vertical |
| 2 PP | 5197.500 | -46.28 | -56.10 | -13.00 | -33.28 | 9.82 | Peak | Vertical |

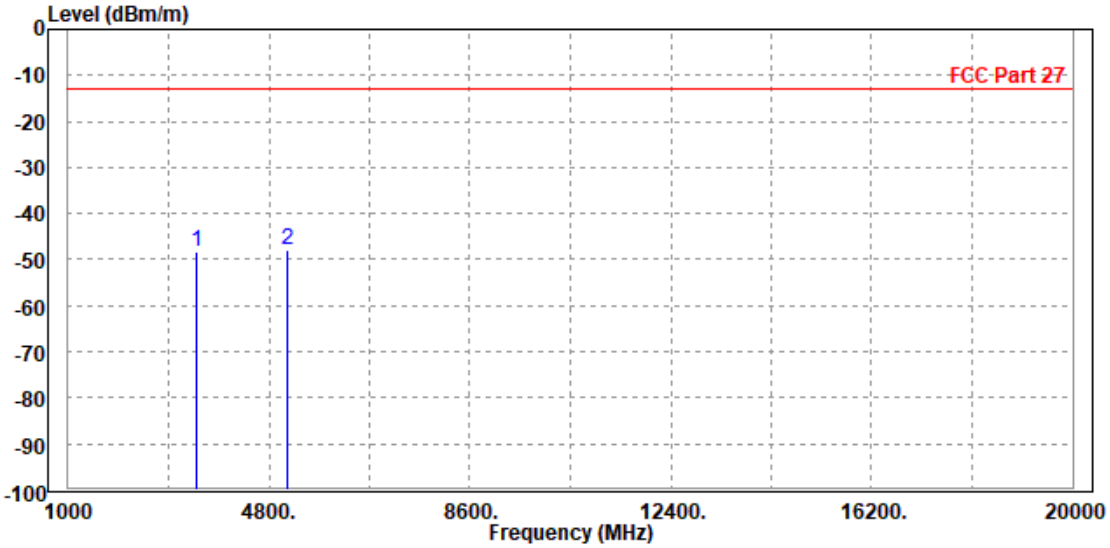


## CHANNEL BANDWIDTH: 3MHz / QPSK

### CH 19965

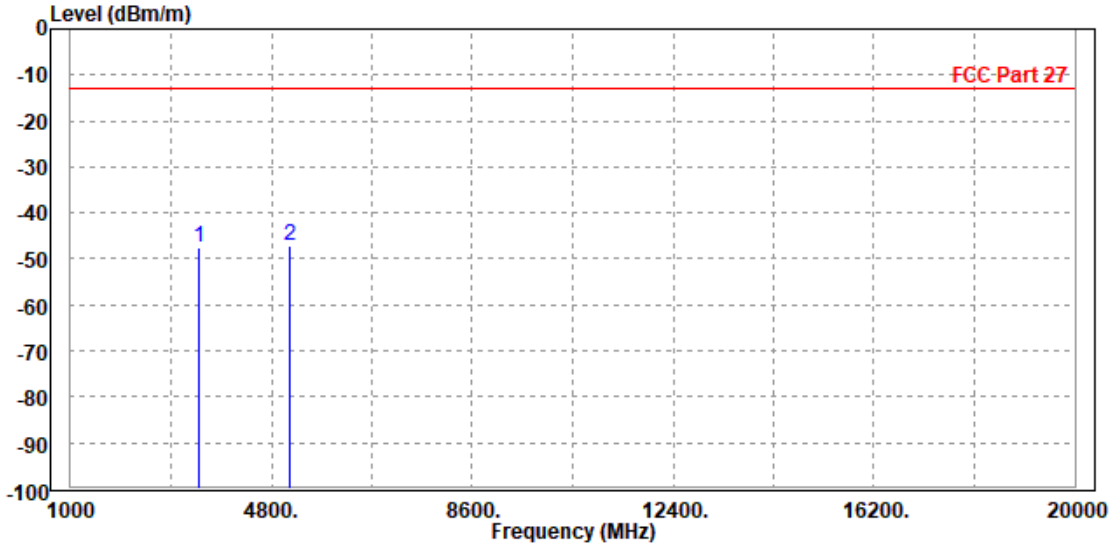
| MODE | TX channel 19965 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 3432.000 | -48.13 | -56.72 | -13.00 | -35.13 | 8.59 | Peak | Horizontal |
| 2 PP | 5134.500 | -48.01 | -56.94 | -13.00 | -35.01 | 8.93 | Peak | Horizontal |



| MODE | TX channel 19965 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

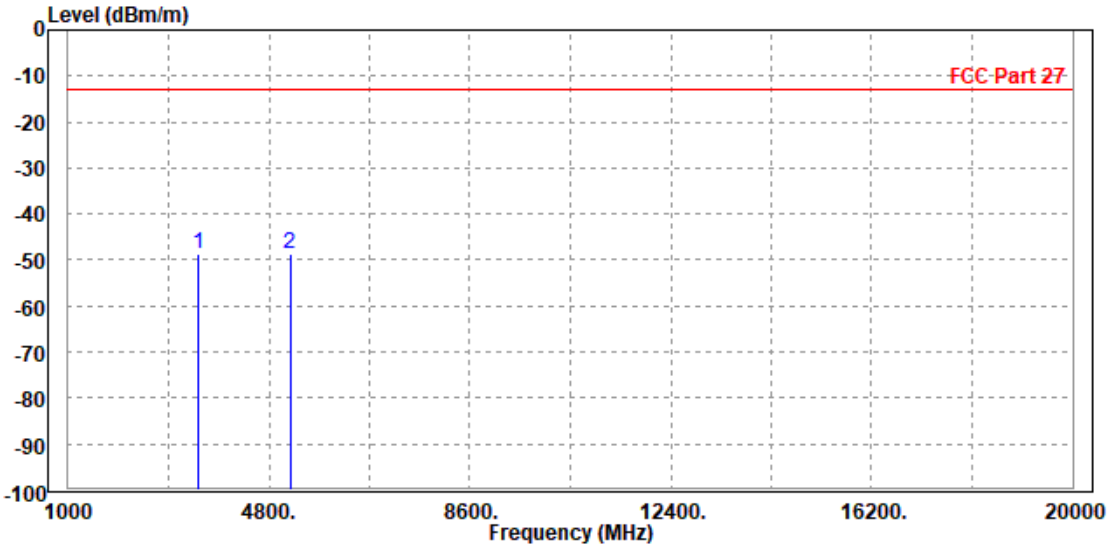
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 3432.000 | -47.50 | -56.63 | -13.00 | -34.50 | 9.13 | Peak | Vertical |
| 2 PP | 5134.500 | -46.97 | -56.82 | -13.00 | -33.97 | 9.85 | Peak | Vertical |



## CH 20175

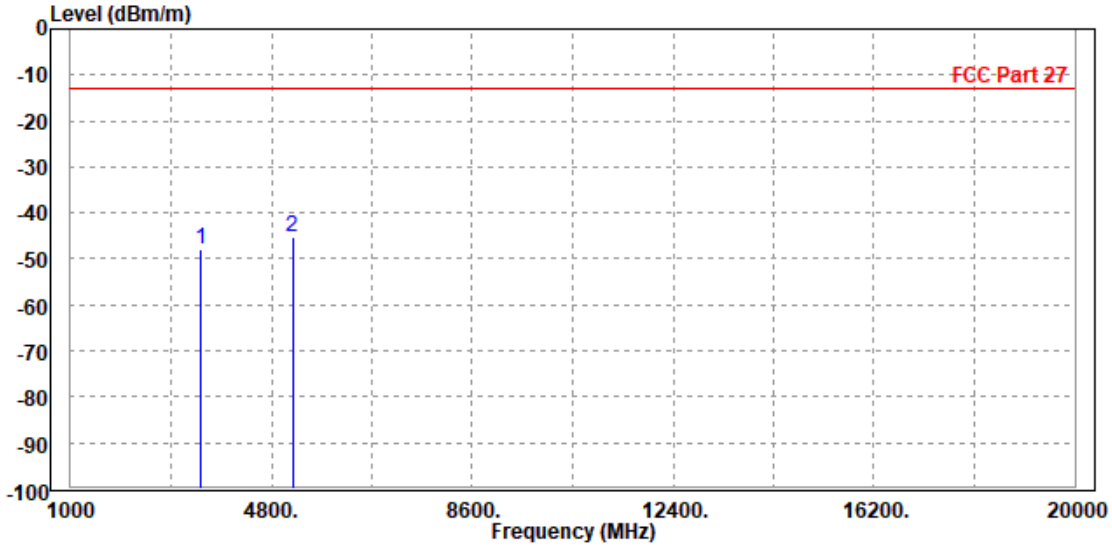
| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | PP 3470.000 | -48.62 | -57.20 | -13.00 | -35.62 | 8.58 | Peak | Horizontal |
| 2 | 5197.500 | -48.68 | -57.80 | -13.00 | -35.68 | 9.12 | Peak | Horizontal |



| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

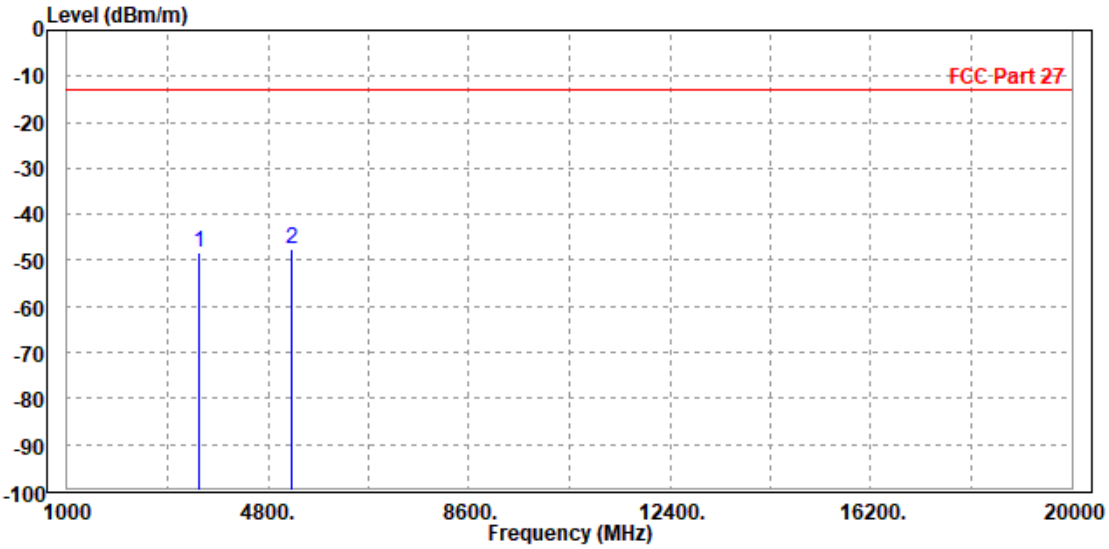
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 3470.000 | -48.04 | -57.20 | -13.00 | -35.04 | 9.16 | Peak | Vertical |
| 2 PP | 5197.500 | -45.28 | -55.10 | -13.00 | -32.28 | 9.82 | Peak | Vertical |



## CH 20385

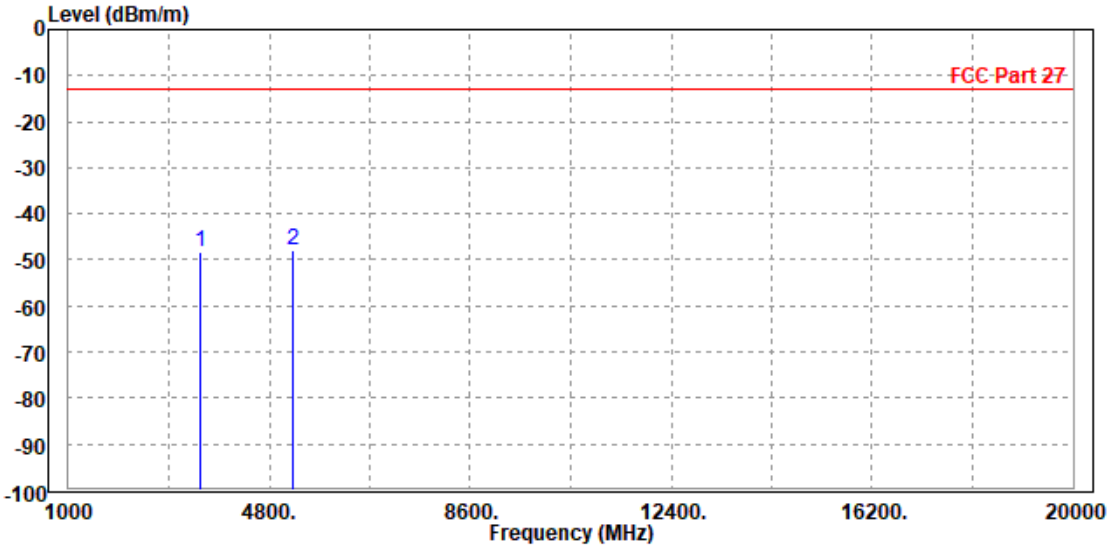
| MODE | TX channel 20385 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 3508.000 | -48.36 | -56.94 | -13.00 | -35.36 | 8.58 | Peak | Horizontal |
| 2 PP | 5260.500 | -47.58 | -56.88 | -13.00 | -34.58 | 9.30 | Peak | Horizontal |



| MODE | TX channel 20385 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

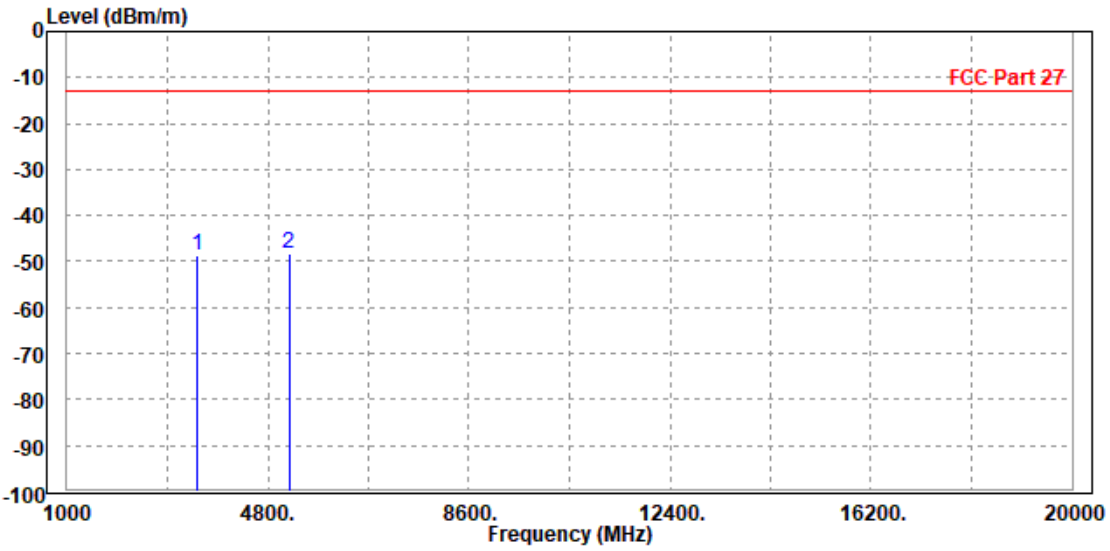
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 3508.000 | -48.17 | -57.36 | -13.00 | -35.17 | 9.19 | Peak | Vertical |
| 2 PP | 5260.500 | -47.75 | -57.55 | -13.00 | -34.75 | 9.80 | Peak | Vertical |



## CHANNEL BANDWIDTH: 5MHz / QPSK

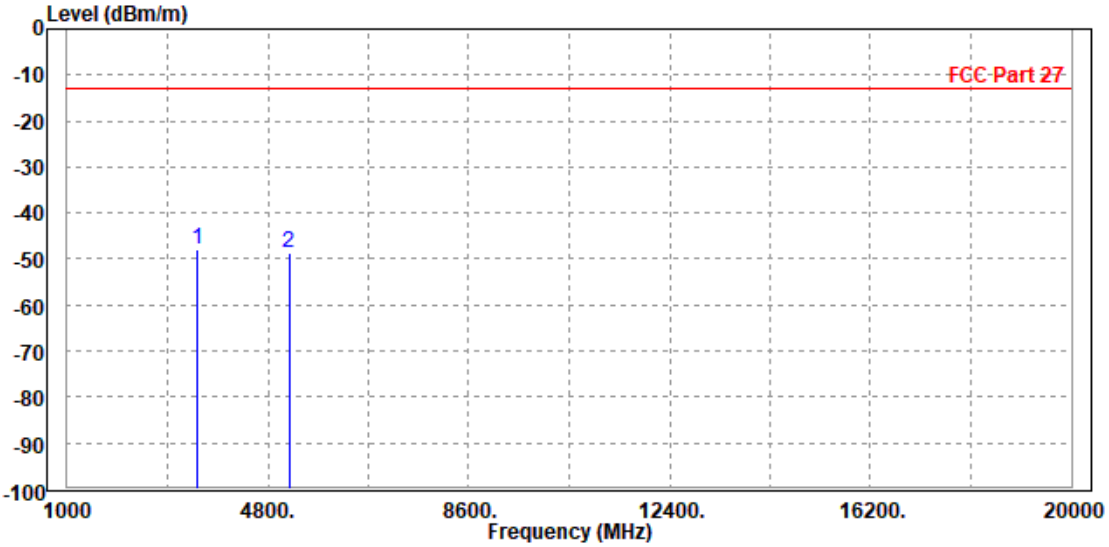
| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 3470.000 | -48.80 | -57.38 | -13.00 | -35.80 | 8.58 | Peak | Horizontal |
| 2 PP | 5197.500 | -48.30 | -57.42 | -13.00 | -35.30 | 9.12 | Peak | Horizontal |



| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

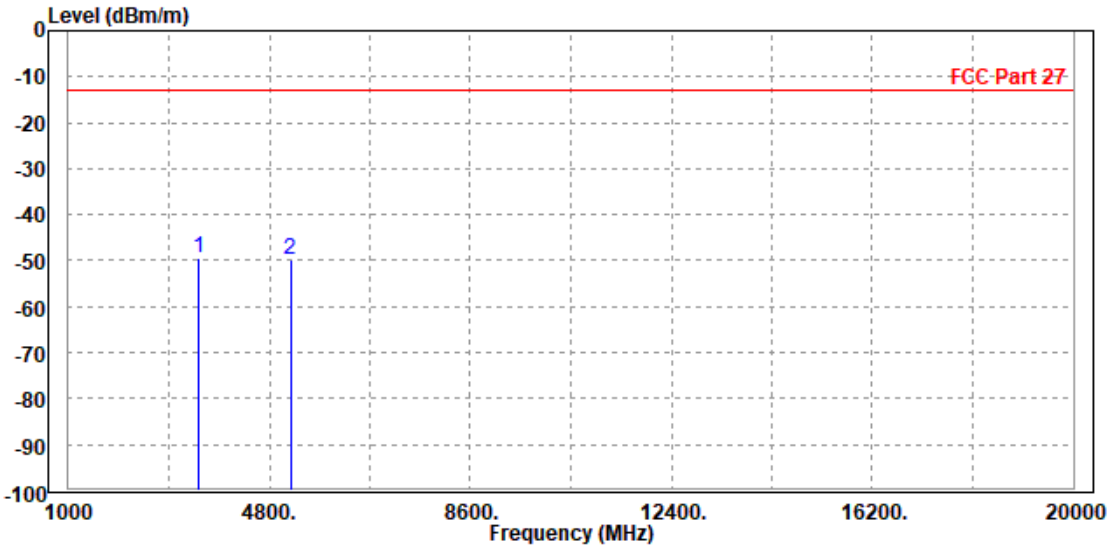
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 PP | 3470.000 | -47.78 | -56.94 | -13.00 | -34.78 | 9.16 | Peak | Vertical |
| 2 | 5197.500 | -48.57 | -58.39 | -13.00 | -35.57 | 9.82 | Peak | Vertical |



## CHANNEL BANDWIDTH: 10MHz / QPSK

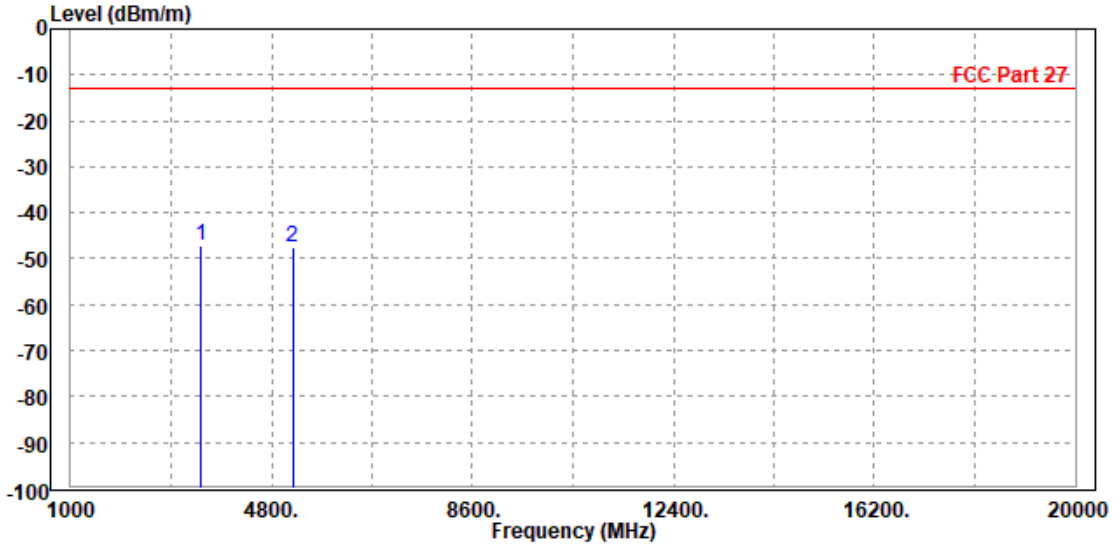
| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | PP 3470.000 | -49.31 | -57.89 | -13.00 | -36.31 | 8.58 | Peak | Horizontal |
| 2 | 5197.500 | -49.77 | -58.89 | -13.00 | -36.77 | 9.12 | Peak | Horizontal |



| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

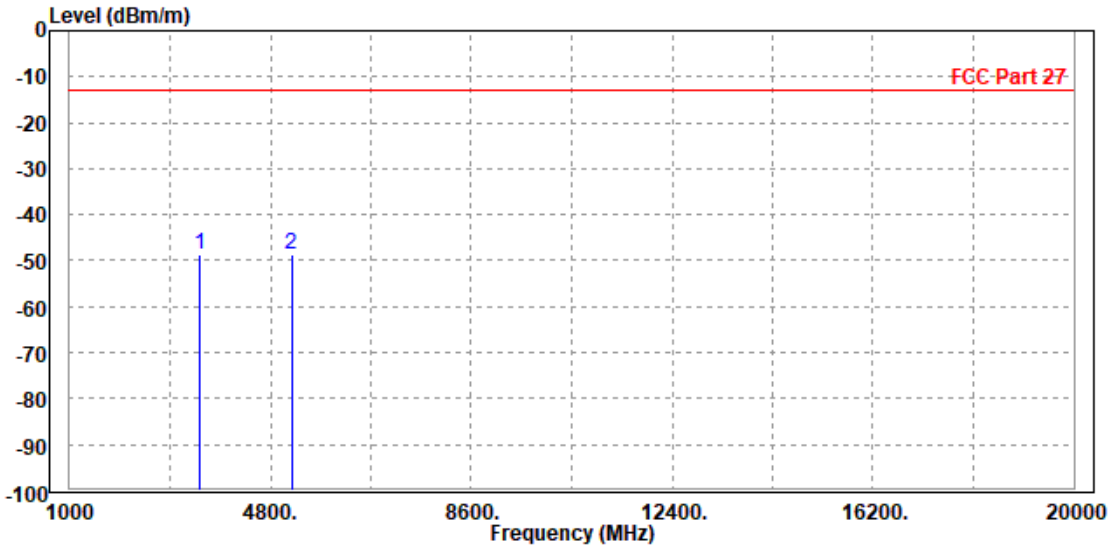
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 PP | 3470.000 | -47.03 | -56.19 | -13.00 | -34.03 | 9.16 | Peak | Vertical |
| 2 | 5197.500 | -47.71 | -57.53 | -13.00 | -34.71 | 9.82 | Peak | Vertical |



## CHANNEL BANDWIDTH: 15MHz / QPSK

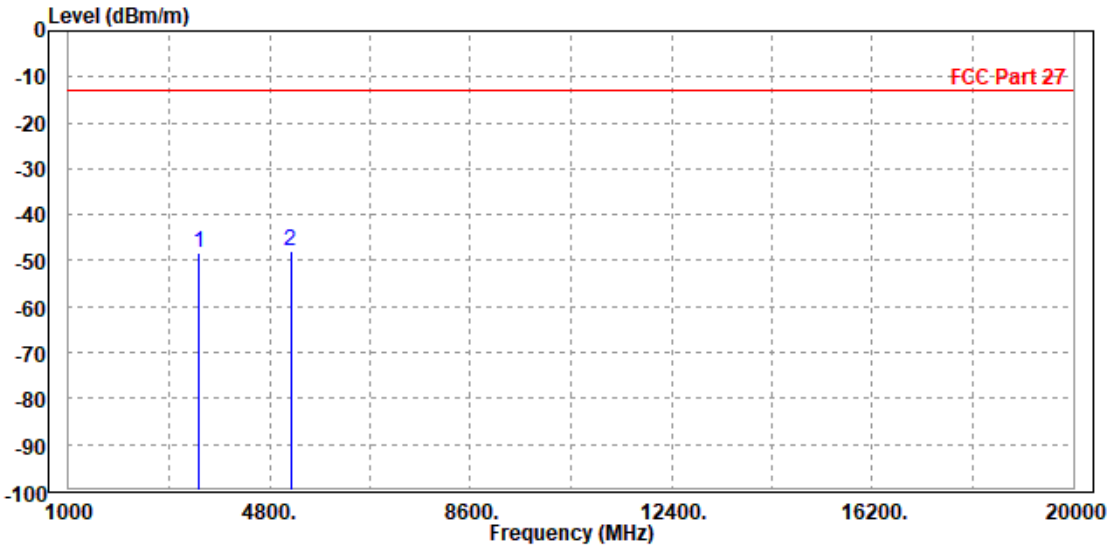
| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | PP 3470.000 | -48.54 | -57.12 | -13.00 | -35.54 | 8.58 | Peak | Horizontal |
| 2 | 5197.500 | -48.76 | -57.88 | -13.00 | -35.76 | 9.12 | Peak | Horizontal |



| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

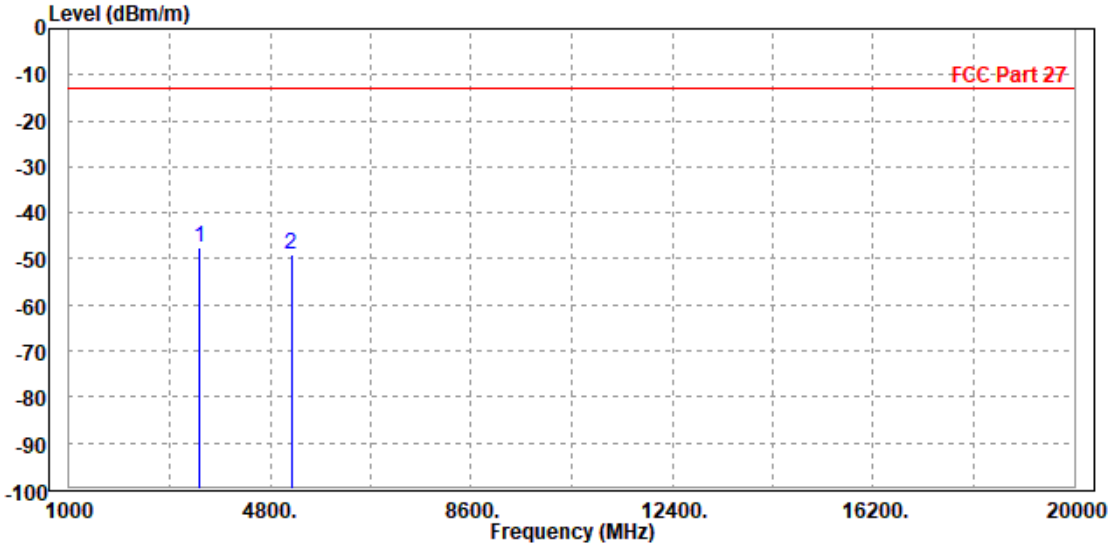
| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 3470.000 | -48.14 | -57.30 | -13.00 | -35.14 | 9.16 | Peak | Vertical |
| 2 PP | 5197.500 | -47.75 | -57.57 | -13.00 | -34.75 | 9.82 | Peak | Vertical |



## CHANNEL BANDWIDTH: 20MHz / QPSK

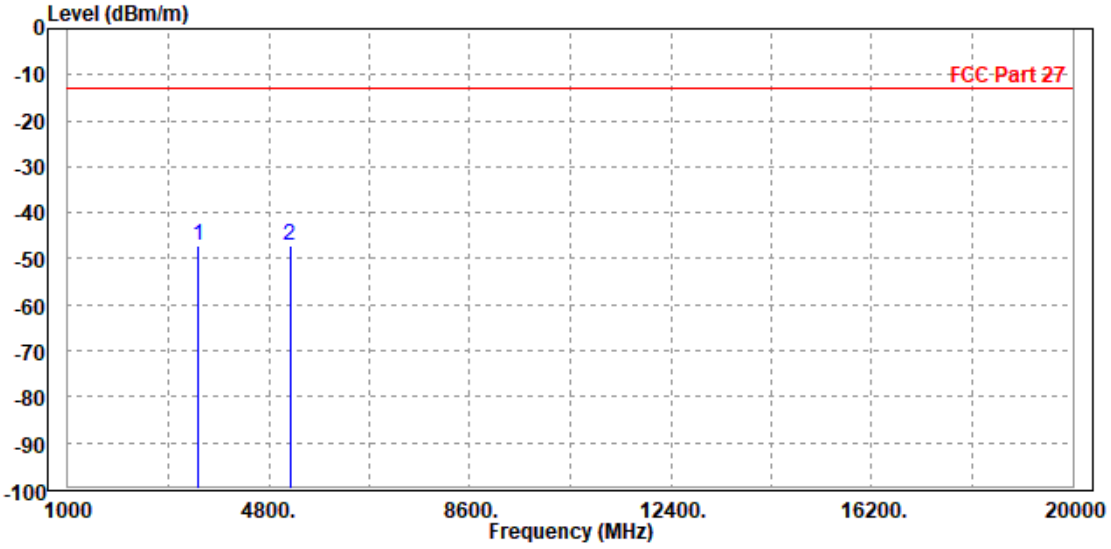
| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 PP | 3470.000 | -47.47 | -56.05 | -13.00 | -34.47 | 8.58 | Peak | Horizontal |
| 2 | 5197.500 | -48.96 | -58.08 | -13.00 | -35.96 | 9.12 | Peak | Horizontal |



| MODE | TX channel 20175 | FREQUENCY RANGE | Above 1000MHz |
|---|---|---|---|
| ENVIRONMENTAL CONDITIONS | 23deg. C, 70%RH | INPUT POWER | DC 5V/9V/11V/12/20V from adapter |
| TESTED BY | Tony | | |
| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M | | | |

| | Freq | Level | Read Level | Limit Line | Over Limit | Factor | Remark | Pol/Phase |
|---|---|---|---|---|---|---|---|---|
| | MHz | dBm/m | dBm | dBm/m | dB | dB/m | | |
| 1 | 3470.000 | -47.29 | -56.45 | -13.00 | -34.29 | 9.16 | Peak | Vertical |
| 2 PP | 5197.500 | -47.26 | -57.08 | -13.00 | -34.26 | 9.82 | Peak | Vertical |



# 4 INFORMATION ON THE TESTING LABORATORIES

We, BV 7LAYERS COMMUNICATIONS TECHNOLOGY (SHENZHEN) CO. LTD., were founded in 2015 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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The address and road map of all our labs can be found in our web site also.

# 5 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

**---END---**