# Radio Test Report

## *FCC ID: 2AVE6TG6A*

## *Original Grant*

| | | |
|---|---|---|
| **Report No.** | : | TBR-C-202403-0336-93 |
| **Applicant** | : | Tractive GmbH |
| **Equipment Under Test (EUT)** | | |
| **EUT Name** | : | Tractive Dog 6 |
| **Model No.** | : | TG6A |
| **Series Model No.** | : | ---- |
| **Brand Name** | : | Tractive |
| **Sample ID** | : | HC-C-202403-0336-01-01# & HC-C-202403-0336-01-04# |
| **Receipt Date** | : | 2024-06-20 |
| **Test Date** | : | 2024-06-20 to 2024-09-04 |
| **Issue Date** | : | 2024-09-04 |
| **Standards** | : | 47 CFR Part 2, 22(H), 24(E), 27 |
| **Test Method** | : | ANSI C63.26 2015 |
| **Conclusions** | : | **PASS** |
| | | In the configuration tested, the EUT complied with the standards specified above. |

| | | | |
|---|---|---|---|
| **Test By** | : | Mike Yan | Mike Yan |
| **Reviewed By** | : | Camille Li | Camille Li |
| **Approved By** | : | IVAN SU | Ivan Su |

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.



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# Contents

# Revision History

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| TBR-C-202403-0336-93 | Rev.01 | Initial issue of report | 2024-09-04 |
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# 1. General Information about EUT

## 1.1 Client Information

| | | |
|---|---|---|
| **Applicant** | : | Tractive GmbH |
| **Address** | : | Poststrasse 4, 4061 Pasching, AUSTRIA |
| **Manufacturer** | : | Tractive GmbH |
| **Address** | : | Poststrasse 4, 4061 Pasching, AUSTRIA |

## 1.2 General Description of EUT (Equipment Under Test)

| | | | |
|---|---|---|---|
| **EUT Name** | : | Tractive Dog 6 | |
| **Models No.** | : | TG6A | |
| **Model Different** | : | ---- | |
| **Product Description** | : | Frequency Bands:<br>LTE Band 2: TX: 1850MHz-1910MHz, RX: 1930MHz-1990MHz<br>LTE Band 4: TX: 1710MHz-1755MHz, RX: 2110MHz-2155MHz<br>LTE Band 5: TX: 824MHz-849MHz, RX: 869MHz-894MHz<br>LTE Band 12: TX: 699MHz -716MHz, RX: 729MHz-746MHz<br>LTE Band 13: TX: 777MHz -787MHz, RX: 746MHz-756MHz | |
| | | Antenna Gain: | FPC Antenna:<br>LTE Band 2: -0.2dBi<br>LTE Band 4: -0.2dBi<br>LTE Band 5: -5.5dBi<br>LTE Band 12: -5.5dBi<br>LTE Band 13: -5.5dBi |
| | | Modulation Type: | QPSK, 16QAM |
| | | Bandwidth: | LTE Band 2: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz<br>LTE Band 4: 1.4MHz/3MHz/5MHz/10MHz/15MHz/20MHz<br>LTE Band 5: 1.4MHz/3MHz/5MHz/10MHz<br>LTE Band 12: 1.4MHz/3MHz/5MHz/10MHz<br>LTE Band 13: 5MHz/10MHz |
| **Power Rating** | : | Input: DC 5V/1A | |
| **Li-ion Polymer Battery** | : | DC 3.87V by 930mAh Rechargeable Li-ion battery | |
| **Software Version** | : | TRV6-005 | |
| **Hardware Version** | : | v.5 | |

**Remark:**
(1) The antenna gain provided by the applicant, the adapter and verified for the RF conduction test provided by TOBY test lab.
(2) The above antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(3) Channel List

| Test mode: | Nominal Bandwidth (MHz) | RF Channel | | |
|---|---|---|---|---|
| | | Low (L) | Middle (M) | High (H) |
| | | MHz | MHz | MHz |
| LTE Band 2 | 1.4 | 1850.7 | 1880.0 | 1909.3 |
| | 3 | 1851.5 | 1880.0 | 1908.5 |
| | 5 | 1852.5 | 1880.0 | 1907.5 |
| | 10 | 1855.0 | 1880.0 | 1905.0 |
| | 15 | 1857.5 | 1880.0 | 1902.5 |
| | 20 | 1860.0 | 1880.0 | 1900.0 |

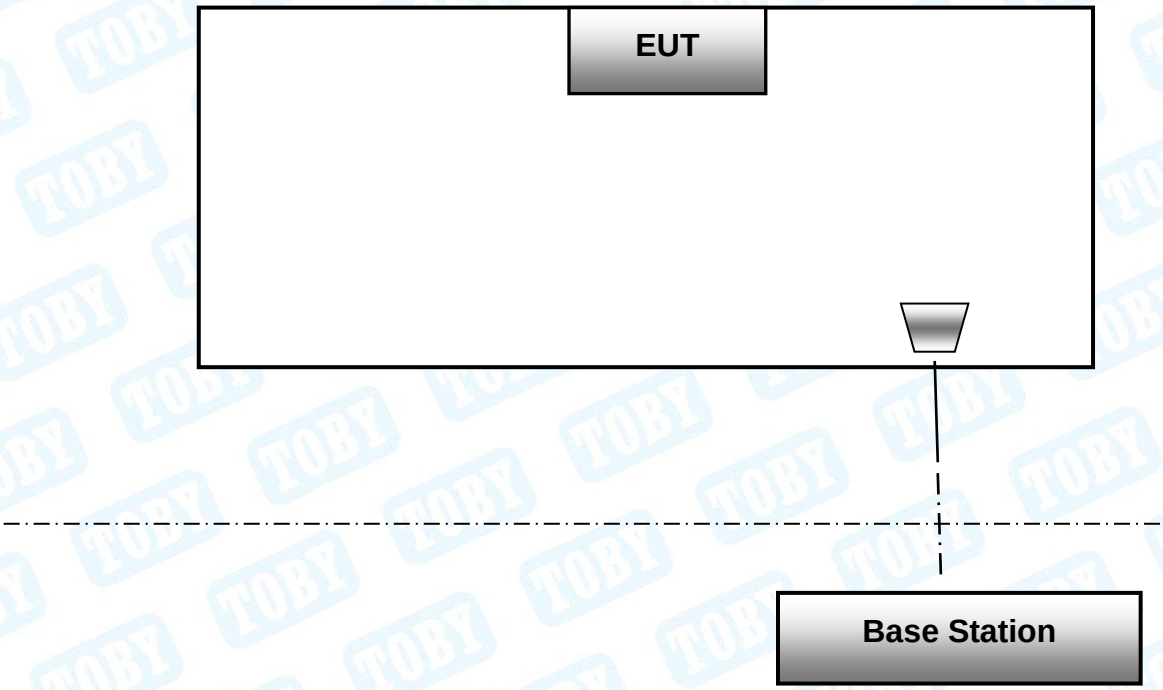
| Test mode: | Nominal Bandwidth (MHz) | RF Channel | | |
|---|---|---|---|---|
| | | Low (L) | Middle (M) | High (H) |
| | | MHz | MHz | MHz |
| LTE Band 4 | 1.4 | 1710.7 | 1732.5 | 1754.3 |
| | 3 | 1711.5 | 1732.5 | 1753.5 |
| | 5 | 1712.5 | 1732.5 | 1752.5 |
| | 10 | 1715.0 | 1732.5 | 1750.0 |
| | 15 | 1715.5 | 1732.5 | 1747.5 |
| | 20 | 1720.0 | 1732.5 | 1745.0 |

| Test mode: | Nominal Bandwidth (MHz) | RF Channel | | |
|---|---|---|---|---|
| | | Low (L) | Middle (M) | High (H) |
| | | MHz | MHz | MHz |
| LTE Band 5 | 1.4 | 824.7 | 836.5 | 848.3 |
| | 3 | 825.5 | 836.5 | 847.5 |
| | 5 | 826.5 | 836.5 | 846.5 |
| | 10 | 829.0 | 836.5 | 844.0 |

| Test mode: | Nominal Bandwidth (MHz) | RF Channel | | |
|---|---|---|---|---|
| | | Low (L) | Middle (M) | High (H) |
| | | MHz | MHz | MHz |
| LTE Band 12 | 1.4 | 699.7 | 707.5 | 715.3 |
| | 3 | 700.5 | 707.5 | 714.5 |
| | 5 | 701.5 | 707.5 | 713.5 |
| | 10 | 704.0 | 707.5 | 711.0 |

| Test mode: | Nominal Bandwidth (MHz) | RF Channel | | |
|---|---|---|---|---|
| | | Low (L) | Middle (M) | High (H) |
| | | MHz | MHz | MHz |
| LTE Band 13 | 5 | 779.5 | 782.0 | 784.5 |
| | 10 | --- | 782.0 | --- |

## 1.3 Block Diagram Showing the Configuration of System Tested




The above block diagram of setup is the normal mode. And more detail please refer to the test setup of each test item of bellow.

## 1.4 Description of Support Units

The EUT has been tested as an independent unit.

## 1.5 Measurement Uncertainty

| Test Item | Parameters | Expanded Uncertainty ($U_{Lab}$) |
|---|---|---|
| RF Power, conducted | / | ±0.82 dB |
| Radiated Emission | Level Accuracy: 9kHz to 30 MHz | ±4.60 dB |
| Radiated Emission | Level Accuracy: 30MHz to 1000 MHz | ±4.40 dB |
| Radiated Emission | Level Accuracy: Above 1000MHz | ±4.20 dB |

## 1.6 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1/F., Building 6, Rundongsheng Industrial Zone, Longzhu, Xixiang, Bao'an District, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

**CNAS (L5813)**
The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

**A2LA Certificate No.: 4750.01**
The laboratory has been accredited by American Association for Laboratory Accreditation(A2LA) to ISO/IEC 17025：2017 General Requirements for the Competence of Testing and Calibration Laboratories for the technical competence in the field of Electrical Testing. And the A2LA Certificate No.: 4750.01.FCC Accredited Test Site Number: 854351. Designation Number: CN1223.

**IC Registration No.: (11950A)**
The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A. CAB identifier: CN0056.

# 2. Test Summary

| Test Item | Section in CFR 47 | Result |
|---|---|---|
| RF Output Power | Part 2.1046<br>Part 22.913(a)(2)<br>Part 24.232(c)<br>Part 27.50 (b)(10)<br>Part 27.50 (d)(4)<br>Part 27.50 (h)(2) | **PASS** |
| Peak-to-Average Ratio | Part 24.232(d)<br>Part 27.50(d)(5) | **PASS** |
| 99% & -26 dB Occupied Bandwidth | Part 2.1049<br>Part 22.917(a)<br>Part 24.238(b)<br>Part 27.53(h)<br>Part 27.53(m) | **PASS** |
| Spurious Emissions at Antenna Terminal | Part 2.1051<br>Part 24.238(a)<br>Part 27.53 (h)<br>Part 27.53(m) | **PASS** |
| Field Strength of Spurious Radiation | Part 2.1053<br>Part 22.917(a)<br>Part 24.238(a)<br>Part 27.53 (h)<br>Part 27.53(m) | **PASS** |
| Out of band emission, Band Edge | Part 24.238(a)<br>Part 22.917(a)<br>Part 27.53 (h)<br>Part 27.53(m) | **PASS** |
| Frequency stability vs. temperature | Part 27.54<br>Part 24.235<br>Part 22.355<br>Part 2.1055(a)(1)(b) | **PASS** |
| Frequency stability vs. voltage | Part 27.54<br>Part 24.235<br>Part 22.355<br>Part 2.1055(d)(2) | **PASS** |
| ***Pass: The EUT complies with the essential requirements in the standard.*** | | |

# 3. Test Software

| Test Item | Test Software | Manufacturer | Version No. |
|---|---|---|---|
| Radiation Emission | EZ-EMC | EZ | FA-03A2RE+ |
| RF Test System | JS1120 | Tonscend | V3.1.46 |

# 4. Test Equipment and Test Site

| Test Site | | | | |
|---|---|---|---|---|
| **No.** | **Test Site** | **Manufacturer** | **Specification** | **Used** |
| TB-EMCSR001 | Shielding Chamber #1 | YIHENG | 7.5*4.0*3.0 ( m ) | X |
| TB-EMCSR002 | Shielding Chamber #2 | YIHENG | 8.0*4.0*3.0 ( m ) | √ |
| TB-EMCCA001 | 3m Anechoic Chamber #A | ETS | 9.0*6.0*6.0 ( m ) | X |
| TB-EMCCB002 | 3m Anechoic Chamber #B | YIHENG | 9.0*6.0*6.0 ( m ) | √ |

| Radiation Emission Test (B Site) | | | | | |
|---|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Cal. Due Date** |
| Spectrum Analyzer | Agilent | N9020A | MY49100060 | Aug. 29, 2024 | Aug. 28, 2025 |
| Spectrum Analyzer | Rohde & Schwarz | FSV40-N | 102197 | Jun. 17, 2024 | Jun. 16, 2025 |
| EMI Test Receiver | Rohde & Schwarz | ESU-8 | 100472/008 | Feb. 23, 2024 | Feb.22, 2025 |
| Bilog Antenna | SCHWARZBECK | VULB 9168 | 1225 | Nov. 13, 2023 | Nov. 12, 2025 |
| Horn Antenna | SCHWARZBECK | BBHA 9120 D | 2463 | Jun. 14, 2024 | Jun. 13, 2026 |
| Horn Antenna | SCHWARZBECK | BBHA 9170 | 1118 | Feb. 27, 2024 | Feb.26, 2026 |
| Loop Antenna | SCHWARZBECK | FMZB 1519 B | 1519B-059 | Jun. 14, 2024 | Jun. 13, 2026 |
| HF Amplifier | Tonscend | TAP9E6343 | AP21C806117 | Aug. 29, 2024 | Aug. 28, 2025 |
| HF Amplifier | Tonscend | TAP051845 | AP21C806141 | Aug. 29, 2024 | Aug. 28, 2025 |
| HF Amplifier | Tonscend | TAP0184050 | AP21C806129 | Aug. 29, 2024 | Aug. 28, 2025 |
| Highpass Filter | CD | HPM-6.4/18G | --- | N/A | N/A |
| Highpass Filter | CD | HPM-2.8/18G | --- | N/A | N/A |
| Highpass Filter | XINBO | XBLBQ-HTA67(8-25G) | 22052702-1 | N/A | N/A |
| **Antenna Conducted Emission** | | | | | |
| **Equipment** | **Manufacturer** | **Model No.** | **Serial No.** | **Last Cal.** | **Cal. Due Date** |
| Spectrum Analyzer | Rohde & Schwarz | FSV40-N | 102197 | Jun. 17, 2024 | Jun. 16, 2025 |
| MXA Signal Analyzer | KEYSIGHT | N9020B | MY60110172 | Aug. 29, 2024 | Aug. 28, 2025 |
| MXA Signal Analyzer | Agilent | N9020A | MY47380425 | Aug. 29, 2024 | Aug. 28, 2025 |
| Vector Signal Generator | Agilent | N5182A | MY50141294 | Aug. 29, 2024 | Aug. 28, 2025 |
| Analog Signal Generator | Agilent | N5181A | MY48180463 | Aug. 29, 2024 | Aug. 28, 2025 |
| Vector Signal Generator | KEYSIGHT | N5182B | MY59101429 | Aug. 29, 2024 | Aug. 28, 2025 |
| Analog Signal Generator | KEYSIGHT | N5173B | MY61252685 | Aug. 29, 2024 | Aug. 28, 2025 |
| RF Power Sensor | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO26 | Aug. 29, 2024 | Aug. 28, 2025 |
| | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO29 | Aug. 29, 2024 | Aug. 28, 2025 |
| | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO31 | Aug. 29, 2024 | Aug. 28, 2025 |
| | DARE!! Instruments | RadiPowerRPR3006W | 17I00015SNO33 | Aug. 29, 2024 | Aug. 28, 2025 |
| RF Control Unit | Tonsced | JS0806-1 | 21C8060380 | N/A | N/A |
| RF Control Unit | Tonsced | JS0806-2 | 21F8060439 | Aug. 29, 2024 | Aug. 28, 2025 |
| Power Control Box | Tonsced | JS0806-4ADC | 21C8060387 | N/A | N/A |
| Wideband Radio | Rohde & Schwarz | CMW500 | 144382 | Aug. 29, 2024 | Aug. 28, 2025 |

| | | | | | |
|---|---|---|---|---|---|
| Comunication Tester | | | | | |
| Universal Radio Communication Tester | Rohde&Schwarz | CMW500 | 168796 | Feb. 23, 2024 | Feb.22, 2025 |
| Temperature and Humidity Chamber | ZhengHang | ZH-QTH-1500 | ZH2107264 | Jun. 14, 2024 | Jun. 13, 2026 |

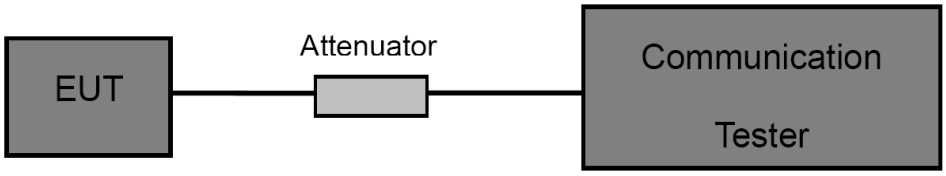
# 5. Conducted RF Output Power

## 5.1 Test Standard

### 5.1.1 Test Standard

FCC part 2.1046, FCC part 22.913(a)(2), FCC part 24.232(c), FCC Part 27.50(b)&(d), FCC Part 27.50 (h)

## 5.2 Test Setup




## 5.3 Test Procedure

(1) The EUT is coupled to the Base Station with the suitable Attenuator, the path loss is calibrated to correct the reading.

(2) A call is set up by the Base Station to the generic call set up procedure.

(3) Set EUT at maximum power level through base station by power level command.

(4) Then read record the power value from the Base Station in dBm.

## 5.4 Deviation From Test Standard

No deviation

## 5.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

## 5.6 Test Data

Please refer to the Appendix D.

# 6. Peak-Average Ratio

## 6.1 Test Standard and Limit

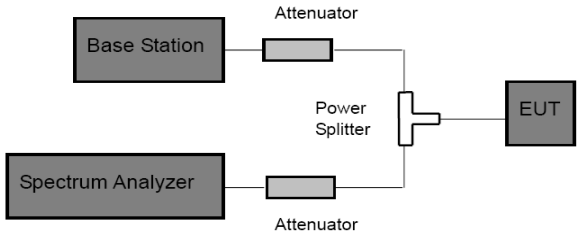
### 6.1.1 Test Standard

FCC part 24.232(d); FCC Part 27.50(d); FCC Part 27.50 (h)

### 6.1.2 Test Limit

| Peak-to-Average Ratio |
|---|
| The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB. |

## 6.2 Test Setup




## 6.3 Test Procedure

According with KDB 971168

(1) The signal analyzer's CCDF measurement profile is enabled.

(2) Frequency = carrier center frequency.

(3) Measurement BW>Emission bandwidth of signal.

(4) The signal analyzer was set to collect one million samples to generate the CCDF curve.

(5) Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level.

(6) The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which of the transmitter is operating at maximum power.

## 6.4 Deviation From Test Standard

No deviation

## 6.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

## 6.6 Test Data

Please refer to the Appendix D.

# 7. Occupied Bandwidth

## 7.1 Test Standard and Limit

### 7.1.1 Test Standard

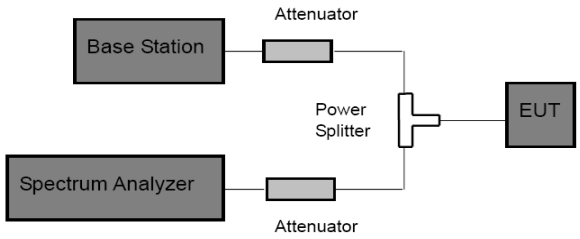
FCC Part 2: 2.1049, FCC Part 22.917(a), FCC part 24.238(b), FCC Part 27.53(h)
FCC Part 27.53(m)

### 7.1.2 Test Limit

According to FCC section 2.1049, the occupied bandwidth is the frequency bandwidth such that below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission.

Occupied bandwidth is also known as 99% power and -26dBC occupied bandwidths.

## 7.2 Test Setup




## 7.3 Test Procedure

(1) The EUT was directly connected to the spectrum analyzer and Base station via power splitter as show in the block diagram above.

(2) The resolution bandwidth of the Spectrum Analyzer is set to at least 1% of the occupied bandwidth. VBW= 3 times RBW.

(3) The low, middle and the high channels are selected to perform tests respectively.

(4) Set the frequency range of the Spectrum Analyzer suitably to capture the waveform; search peak; make a line whose value is 26dB lower than the peak; mark two points which the line intersected the waveform at; finally record the delta of the two points as the occupied bandwidth and the plot.

(5) Set the Spectrum Analyzer Occupied bandwidth function to measure the 99% occupied bandwidth.

## 7.4 Deviation From Test Standard

No deviation

## 7.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

## 7.6 Test Data

Please refer to the Appendix D.

# 8. Out of Band Emission at Antenna Terminals

## 8.1 Test Standard and Limit

### 8.1.1 Test Standard

FCC Part 2: 2.1051, 2.1057; FCC Part 22.917(a), FCC part 24.238(a);
FCC Part 27.53 (h), FCC Part 27.53(m)

### 8.1.2 Test Limit

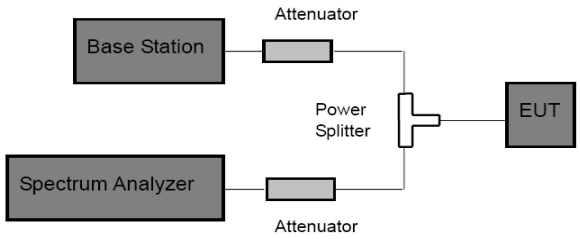
In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:
a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
(i) 76 + 10 log10 p (watts), dB, for base and fixed equipment, and
(ii) 65 + 10 log10 p (watts), dB, for mobile and portable equipment.
b) The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.
(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p (watts).
(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

Equipment shall comply with the limits in (i) and (ii) below.
(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p(watts).
(ii)After the first 1.0 MHz, theemissionpowerin any 1 MHz bandwidth shall be attenuated(in dB) below the transmitter output powerP (dBW) by at least 43+10log10p(watts). If themeasurement isperformedusing 1% of the emission bandwidth, power integration over 1.0MHz is required.

(i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block,2 which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.
(ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB

## 8.2 Test Setup




## 8.3 Test Procedure

1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.

2 The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10$^{th}$ harmonic.

3 For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic.

4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter.

## 8.4 Deviation From Test Standard

No deviation

## 8.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

## 8.6 Test Data

Please refer to the Appendix D.

# 9. Band Edge Test

## 9.1 Test Standard and Limit

### 9.1.1 Test Standard

FCC Part 2: 2.1051, 2.1057; FCC Part 22.917(a), FCC part 24.238(a)
FCC Part 27.53 (h), FCC Part 27.53(m)

### 9.1.2 Test Limit

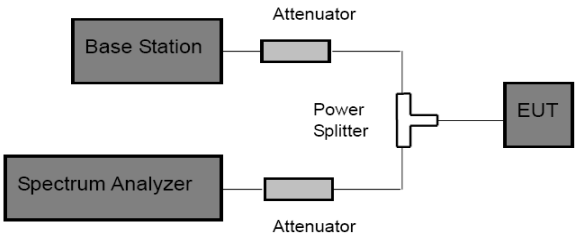
In addition to the limit outlined in section 4.7.1 above, equipment operating in the frequency bands 746-756 MHz and 777-787 MHz shall also comply with the following restrictions:
a) The power of any unwanted emissions in any 6.25 kHz bandwidth for all frequencies between 763-775 MHz and 793-806 MHz shall be attenuated below the transmitter power, P (dBW), by at least:
(i) 76 + 10 log10 p (watts), dB, for base and fixed equipment, and
(ii) 65 + 10 log10 p (watts), dB, for mobile and portable equipment.
b) The e.i.r.p. in the band 1559-1610 MHz shall not exceed -70 dBW/MHz for wideband signal and -80 dBW for discrete emission with bandwidth less than 700 Hz.

Mobile and base station equipment shall comply with the limits in (i) and (ii) below.
(i) In the first 1.0 MHz band immediately outside and adjacent to each of the sub-bands specified in Section 5.1, the power of emissions per any 1% of the occupied bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p (watts).
(ii) After the first 1.0 MHz immediately outside and adjacent to each of the sub-bands, the power of emissions in any 100 kHz bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p (watts). If the measurement is performed using 1% of the occupied bandwidth, power integration over 100 kHz is required.

Equipment shall comply with the limits in (i) and (ii) below.
(i) In the 1.0 MHz bands immediately outside and adjacent to the equipment's operating frequency block, the emission power per any 1% of the emission bandwidth shall be attenuated (in dB) below the transmitter output power P (dBW) by at least 43 + 10 log10 p(watts).
(ii)After the first 1.0 MHz, theemissionpowerin any 1 MHz bandwidth shall be attenuated(in dB) below the transmitter output powerP (dBW) by at least 43+10log10p(watts). If themeasurement isperformedusing 1% of the emission bandwidth, power integration over 1.0MHz is required.

(i) In the first 1.0 MHz bands immediately outside and adjacent to the equipment's smallest operating frequency block,2 which can contain the equipment's occupied bandwidth, the emission power per any 1% of the emission bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB.
(ii) After the first 1.0 MHz outside the equipment's smallest operating frequency block, which can contain the equipment's occupied bandwidth, the emission power in any 1 MHz bandwidth shall be attenuated below the transmitter output power P (in dBW) by at least 43 + 10 log10 p (watts) dB

## 9.2 Test Setup




## 9.3 Test Procedure

1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.

2 The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10$^{th}$ harmonic.

3 For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic.

4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter.

## 9.4 Deviation From Test Standard

No deviation

## 9.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

## 9.6 Test Data

Please refer to the Appendix D.

# 10. Radiated Output Power

## 10.1 Test Standard and Limit

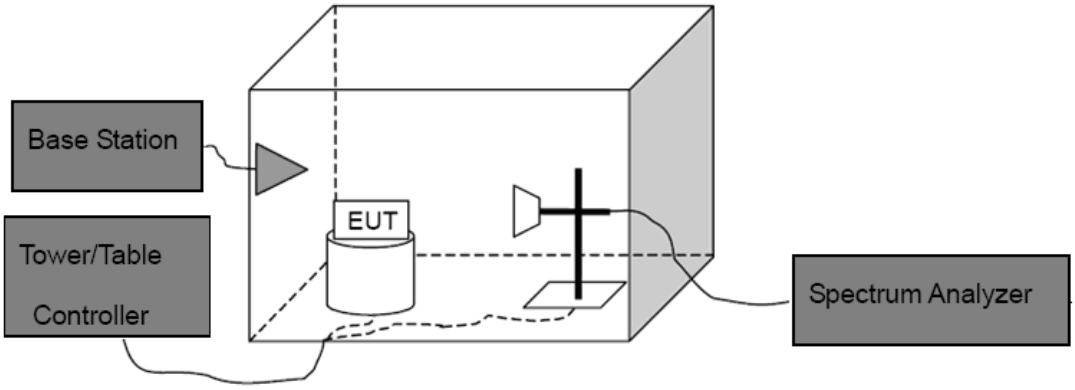
### 10.1.1 Test Standard

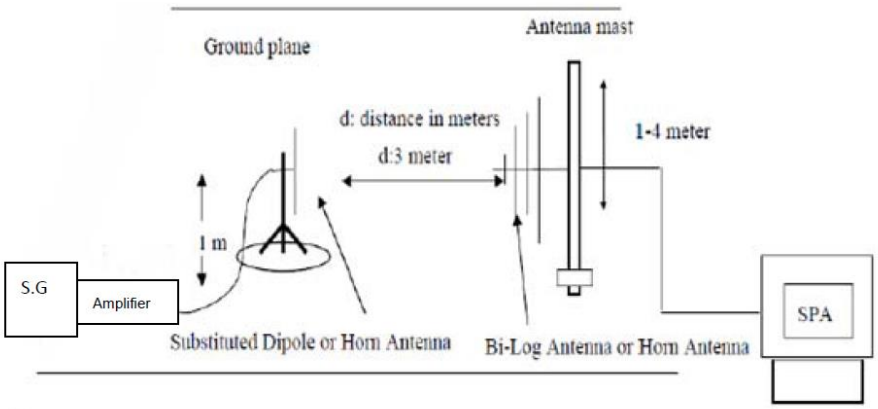
FCC Part 2.1046, FCC Part 22.913(a)(2), FCC part 24.232(c), FCC part 27.50(c), FCC part 27.50(d)

### 10.1.2 Test Limit

| E.I.R.P | E.I.R.P | E.R.P | E.R.P |
|---|---|---|---|
| **LTE Band 2** | **LTE Band 4** | **LTE Band 5** | **LTE Band 12** |
| 2W(33 dBm) | 1W(30 dBm) | 7W(38.45dBm) | 3W(34.77dBm) |
| **E.R.P** | | | |
| **LTE Band 13** | | | |
| 3W(34.77dBm) | | | |

## 10.2 Test Setup




**Substituted Method**

## 10.3 Test Procedure

(1) The EUT was placed on an non-conductive rotating platform with 0.8 meter height in an anechoic chamber. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and a spectrum analyzer with RBW=3 MHz, VBW=3 MHz and peak detector settings.

(2) During the measurement, the EUT was enforced in maximum power and linked with the Base Station. The highest was recorded from analyzer power level (LVT) from the 360 degrees rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.

(3) Effective Isotropic Radiated Power (EIRP) was measured by substitution method according to C63.26. The EUT was replaced by dipole antenna (for frequency below 1 GHz) or Horn antenna (for frequency above 1 GHz) at same location with same polarize of receiver antenna and then a known power of each measure frequency from S.G. was applied into the dipole antenna or Horn antenna through a TX cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna.

**Note: In test, the S.G Connect the Pre-amplifier(Sonoma 310N Pre-amplifier for frequency below 1 GHz, HP 8449B Pre-amplifier for frequency above 1 GHz )**

Then the EUT's EIRP and ERP was calculated with the correction factor:

ERP=S.G.Level +Antenna Gain Cord.(dB)-Cable Loss(dB)

EIRP=S.G.Level+Antenna Gain Cord.(dBi)-Cable Loss(dB)

## 10.4 Deviation From Test Standard

No deviation

## 10.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

## 10.6 Test Data

Please refer to the Attachment A.

Measurement Data (worst case)

# 11. Radiated Out Band of Emissions

## 11.1 Test Standard and Limit

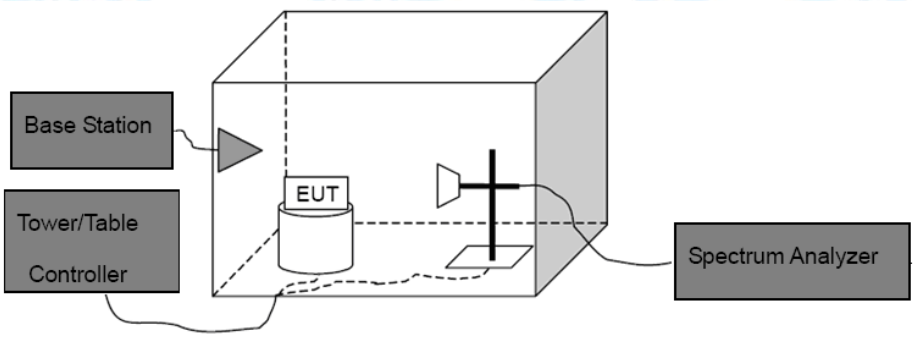
### 11.1.1 Test Standard

FCC Part 2: 2.1053, FCC Part 22.917(a), FCC part 24.238(a)
FCC Part 27.53 (h), FCC Part 27.53(m)

### 11.1.2 Test Limit

The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power(P) by a factor of at least 43+10log(P) dB. For all power levels +30 dBm to 0 dBm, this becomes a constant specification limit of -13 dBm.

## 11.2 Test Setup




## 11.3 Test Procedure

(1) The test system setup as show in the block diagram above.
(2) The EUT was placed on an non-conductive rotating platform in an anechoic chamber. The radiated spurious emissions from 30MHz to 10$^{th}$ harmonious of fundamental frequency were measured at 3 m with a test antenna and a spectrum analyzer with RBW=1 MHz, VBW=1 MHz, peak detector settings.
(3) During the measurement, the EUT was enforced in maximum power and linked with a base station. All the spurious emissions at 3m were measured by rotation of the turntable and the test antenna raised and lowered over a range from 1 to 4 meters in both horizontally and vertically polarized orientations.
(4) When found the maximum level of emissions from the EUT. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.

Spurious emissions in dB=10 log(TX power in Watts/0.001)-the absolute level
Spurious attenuation limit in dB=43+10 log(power out in Watts)

## 11.4 Deviation From Test Standard

No deviation

## 11.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

## 11.6 Test Data

Please refer to the Attachment B.

Measurement Data (worst case)

# 12. Frequency Stability

## 12.1 Test Standard and Limit

### 12.1.1 Test Standard

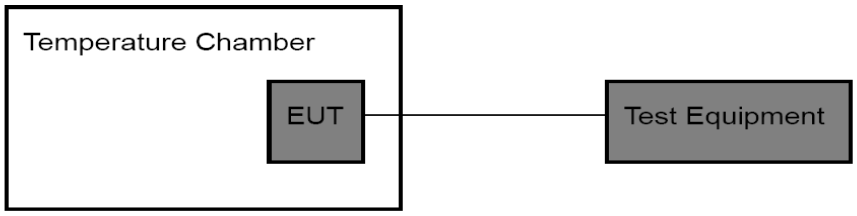
FCC Part 2.1055(a)(1)(b); FCC Part 22.355; FCC Part 24.235, Part 27.54

### 12.1.2 Test Limit

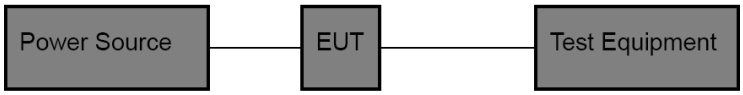
| |
|---|
| ±2.5ppm |

## 12.2 Test Setup

For Temperature Test:




For Voltage Test:




## 12.3 Test Procedure

Test Procedures for Temperature Variation:

(1) The EUT was set up in the thermal chamber and connected with the base station.

(2) With power off, the temperature was decreased to -30℃ and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.

(3) With power off, the temperature was raised in 10℃ set up to 50℃ and the EUT was stabilized for three hours. Power was applied and the maximum change in frequency was recorded within one minute.

(4) If the EUT cannot be turned on at -30℃, the testing lowest temperature will be raised in 10℃ step until the EUT can be turned on.

Test Procedures for Voltage Variation:

(1) The EUT was placed in a temperature chamber at 25±5℃ and connected with the base station.

(2) Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

(3) The variation in frequency was measured for the worst case.

## 12.4 Deviation From Test Standard

No deviation

## 12.5 EUT Operating Mode

The EUT was continuously connected with the Base station and transmitting in the max power during the test.

## 12.6 Test Data

Please refer to the Appendix D.

# ATTACHMENT A--RADIATED OUTPUT POWER

| Radiated Power (EIRP) for LTE Band 2 / 1.4M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 18.05 | 5.01 | 2.59 | 20.47 |
| | | | | V | 20.41 | 5.01 | 2.59 | 22.83 |
| | 1 | 0 | Middle | H | 22.39 | 4.82 | 2.59 | 24.62 |
| | | | | V | 22.33 | 4.82 | 2.59 | 24.56 |
| | 1 | 0 | Highest | H | 18.07 | 4.45 | 2.59 | 19.93 |
| | | | | V | 20.33 | 4.45 | 2.59 | 22.19 |
| 16QAM | 1 | 0 | Lowest | H | 17.18 | 5.01 | 2.59 | 19.60 |
| | | | | V | 19.00 | 5.01 | 2.59 | 21.42 |
| | 1 | 0 | Middle | H | 21.95 | 4.82 | 2.59 | 24.18 |
| | | | | V | 21.22 | 4.82 | 2.59 | 23.45 |
| | 1 | 0 | Highest | H | 16.87 | 4.45 | 2.59 | 18.73 |
| | | | | V | 17.34 | 4.45 | 2.59 | 19.20 |
| Limit (dBm) | | | | | | | | 33 |

| Radiated Power (EIRP) for LTE Band 2 / 3M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 19.20 | 5.01 | 2.59 | 21.62 |
| | | | | V | 19.71 | 5.01 | 2.59 | 22.13 |
| | 1 | 0 | Middle | H | 19.04 | 4.82 | 2.59 | 21.27 |
| | | | | V | 16.62 | 4.82 | 2.59 | 18.85 |
| | 1 | 0 | Highest | H | 21.05 | 4.45 | 2.59 | 22.91 |
| | | | | V | 20.92 | 4.45 | 2.59 | 22.78 |
| 16QAM | 1 | 0 | Lowest | H | 16.86 | 5.01 | 2.59 | 19.28 |
| | | | | V | 19.17 | 5.01 | 2.59 | 21.59 |
| | 1 | 0 | Middle | H | 18.75 | 4.82 | 2.59 | 20.98 |
| | | | | V | 16.53 | 4.82 | 2.59 | 18.76 |
| | 1 | 0 | Highest | H | 18.24 | 4.45 | 2.59 | 20.10 |
| | | | | V | 19.97 | 4.45 | 2.59 | 21.83 |
| Limit (dBm) | | | | | | | | 33 |

| Radiated Power (EIRP) for LTE Band 2 / 5M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 21.41 | 5.01 | 2.59 | 23.83 |
| | | | | V | 21.09 | 5.01 | 2.59 | 23.51 |
| | 1 | 0 | Middle | H | 20.23 | 4.82 | 2.59 | 22.46 |
| | | | | V | 20.24 | 4.82 | 2.59 | 22.47 |
| | 1 | 0 | Highest | H | 17.83 | 4.45 | 2.59 | 19.69 |
| | | | | V | 20.18 | 4.45 | 2.59 | 22.04 |
| 16QAM | 1 | 0 | Lowest | H | 19.93 | 5.01 | 2.59 | 22.35 |
| | | | | V | 20.27 | 5.01 | 2.59 | 22.69 |
| | 1 | 0 | Middle | H | 18.72 | 4.82 | 2.59 | 20.95 |
| | | | | V | 18.32 | 4.82 | 2.59 | 20.55 |
| | 1 | 0 | Highest | H | 16.68 | 4.45 | 2.59 | 18.54 |
| | | | | V | 19.37 | 4.45 | 2.59 | 21.23 |
| Limit (dBm) | | | | | | | | 33 |

| Radiated Power (EIRP) for LTE Band 2 / 10M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 17.81 | 5.01 | 2.59 | 20.23 |
| | | | | V | 20.74 | 5.01 | 2.59 | 23.16 |
| | 1 | 0 | Middle | H | 22.93 | 4.82 | 2.59 | 25.16 |
| | | | | V | 19.60 | 4.82 | 2.59 | 21.83 |
| | 1 | 0 | Highest | H | 18.63 | 4.45 | 2.59 | 20.49 |
| | | | | V | 18.07 | 4.45 | 2.59 | 19.93 |
| 16QAM | 1 | 0 | Lowest | H | 17.35 | 5.01 | 2.59 | 19.77 |
| | | | | V | 18.94 | 5.01 | 2.59 | 21.36 |
| | 1 | 0 | Middle | H | 21.35 | 4.82 | 2.59 | 23.58 |
| | | | | V | 18.91 | 4.82 | 2.59 | 21.14 |
| | 1 | 0 | Highest | H | 17.85 | 4.45 | 2.59 | 19.71 |
| | | | | V | 16.80 | 4.45 | 2.59 | 18.66 |
| Limit (dBm) | | | | | | | | 33 |

| Radiated Power (EIRP) for LTE Band 2 / 15M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 16.66 | 5.01 | 2.59 | 19.08 |
| | | | | V | 19.96 | 5.01 | 2.59 | 22.38 |
| | 1 | 0 | Middle | H | 17.88 | 4.82 | 2.59 | 20.11 |
| | | | | V | 19.91 | 4.82 | 2.59 | 22.14 |
| | 1 | 0 | Highest | H | 18.80 | 4.45 | 2.59 | 20.66 |
| | | | | V | 18.52 | 4.45 | 2.59 | 20.38 |
| 16QAM | 1 | 0 | Lowest | H | 16.44 | 5.01 | 2.59 | 18.86 |
| | | | | V | 18.73 | 5.01 | 2.59 | 21.15 |
| | 1 | 0 | Middle | H | 17.45 | 4.82 | 2.59 | 19.68 |
| | | | | V | 19.50 | 4.82 | 2.59 | 21.73 |
| | 1 | 0 | Highest | H | 17.80 | 4.45 | 2.59 | 19.66 |
| | | | | V | 17.60 | 4.45 | 2.59 | 19.46 |
| Limit (dBm) | | | | | | | | 33 |

| Radiated Power (EIRP) for LTE Band 2 / 20M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 17.74 | 5.01 | 2.59 | 20.16 |
| | | | | V | 22.59 | 5.01 | 2.59 | 25.01 |
| | 1 | 0 | Middle | H | 18.79 | 4.82 | 2.59 | 21.02 |
| | | | | V | 21.93 | 4.82 | 2.59 | 24.16 |
| | 1 | 0 | Highest | H | 21.09 | 4.45 | 2.59 | 22.95 |
| | | | | V | 18.70 | 4.45 | 2.59 | 20.56 |
| 16QAM | 1 | 0 | Lowest | H | 16.77 | 5.01 | 2.59 | 19.19 |
| | | | | V | 19.75 | 5.01 | 2.59 | 22.17 |
| | 1 | 0 | Middle | H | 15.80 | 4.82 | 2.59 | 18.03 |
| | | | | V | 19.57 | 4.82 | 2.59 | 21.80 |
| | 1 | 0 | Highest | H | 19.76 | 4.45 | 2.59 | 21.62 |
| | | | | V | 18.09 | 4.45 | 2.59 | 19.95 |
| Limit (dBm) | | | | | | | | 33 |

| Radiated Power (EIRP) for LTE Band 4 / 1.4M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 21.46 | 5.01 | 2.59 | 23.88 |
| | | | | V | 19.16 | 5.01 | 2.59 | 21.58 |
| | 1 | 0 | Middle | H | 21.33 | 4.82 | 2.59 | 23.56 |
| | | | | V | 18.46 | 4.82 | 2.59 | 20.69 |
| | 1 | 0 | Highest | H | 18.28 | 4.45 | 2.59 | 20.14 |
| | | | | V | 23.35 | 4.45 | 2.59 | 25.21 |
| 16QAM | 1 | 0 | Lowest | H | 21.07 | 5.01 | 2.59 | 23.49 |
| | | | | V | 16.50 | 5.01 | 2.59 | 18.92 |
| | 1 | 0 | Middle | H | 20.17 | 4.82 | 2.59 | 22.40 |
| | | | | V | 16.35 | 4.82 | 2.59 | 18.58 |
| | 1 | 0 | Highest | H | 16.30 | 4.45 | 2.59 | 18.16 |
| | | | | V | 21.96 | 4.45 | 2.59 | 23.82 |
| Limit (dBm) | | | | | | | | 30 |

| Radiated Power (EIRP) for LTE Band 4 / 3M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 18.72 | 5.01 | 2.59 | 21.14 |
| | | | | V | 19.52 | 5.01 | 2.59 | 21.94 |
| | 1 | 0 | Middle | H | 20.02 | 4.82 | 2.59 | 22.25 |
| | | | | V | 20.34 | 4.82 | 2.59 | 22.57 |
| | 1 | 0 | Highest | H | 17.62 | 4.45 | 2.59 | 19.48 |
| | | | | V | 17.71 | 4.45 | 2.59 | 19.57 |
| 16QAM | 1 | 0 | Lowest | H | 16.90 | 5.01 | 2.59 | 19.32 |
| | | | | V | 17.43 | 5.01 | 2.59 | 19.85 |
| | 1 | 0 | Middle | H | 19.96 | 4.82 | 2.59 | 22.19 |
| | | | | V | 19.26 | 4.82 | 2.59 | 21.49 |
| | 1 | 0 | Highest | H | 16.49 | 4.45 | 2.59 | 18.35 |
| | | | | V | 17.05 | 4.45 | 2.59 | 18.91 |
| Limit (dBm) | | | | | | | | 30 |

| Radiated Power (EIRP) for LTE Band 4 / 5M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 18.89 | 5.01 | 2.59 | 21.31 |
| | | | | V | 19.21 | 5.01 | 2.59 | 21.63 |
| | 1 | 0 | Middle | H | 16.98 | 4.82 | 2.59 | 19.21 |
| | | | | V | 16.39 | 4.82 | 2.59 | 18.62 |
| | 1 | 0 | Highest | H | 18.90 | 4.45 | 2.59 | 20.76 |
| | | | | V | 21.41 | 4.45 | 2.59 | 23.27 |
| 16QAM | 1 | 0 | Lowest | H | 16.18 | 5.01 | 2.59 | 18.60 |
| | | | | V | 16.87 | 5.01 | 2.59 | 19.29 |
| | 1 | 0 | Middle | H | 16.04 | 4.82 | 2.59 | 18.27 |
| | | | | V | 15.99 | 4.82 | 2.59 | 18.22 |
| | 1 | 0 | Highest | H | 18.63 | 4.45 | 2.59 | 20.49 |
| | | | | V | 21.21 | 4.45 | 2.59 | 23.07 |
| Limit (dBm) | | | | | | | | 30 |

| Radiated Power (EIRP) for LTE Band 4 / 10M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 19.46 | 5.01 | 2.59 | 21.88 |
| | | | | V | 18.01 | 5.01 | 2.59 | 20.43 |
| | 1 | 0 | Middle | H | 18.89 | 4.82 | 2.59 | 21.12 |
| | | | | V | 19.89 | 4.82 | 2.59 | 22.12 |
| | 1 | 0 | Highest | H | 18.46 | 4.45 | 2.59 | 20.32 |
| | | | | V | 20.60 | 4.45 | 2.59 | 22.46 |
| 16QAM | 1 | 0 | Lowest | H | 19.37 | 5.01 | 2.59 | 21.79 |
| | | | | V | 17.02 | 5.01 | 2.59 | 19.44 |
| | 1 | 0 | Middle | H | 17.15 | 4.82 | 2.59 | 19.38 |
| | | | | V | 18.40 | 4.82 | 2.59 | 20.63 |
| | 1 | 0 | Highest | H | 17.91 | 4.45 | 2.59 | 19.77 |
| | | | | V | 18.03 | 4.45 | 2.59 | 19.89 |
| Limit (dBm) | | | | | | | | 30 |

| Radiated Power (EIRP) for LTE Band 4 / 15M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 19.88 | 5.01 | 2.59 | 22.30 |
| | | | | V | 18.56 | 5.01 | 2.59 | 20.98 |
| | 1 | 0 | Middle | H | 18.88 | 4.82 | 2.59 | 21.11 |
| | | | | V | 17.42 | 4.82 | 2.59 | 19.65 |
| | 1 | 0 | Highest | H | 18.00 | 4.45 | 2.59 | 19.86 |
| | | | | V | 19.21 | 4.45 | 2.59 | 21.07 |
| 16QAM | 1 | 0 | Lowest | H | 18.50 | 5.01 | 2.59 | 20.92 |
| | | | | V | 16.53 | 5.01 | 2.59 | 18.95 |
| | 1 | 0 | Middle | H | 17.65 | 4.82 | 2.59 | 19.88 |
| | | | | V | 17.07 | 4.82 | 2.59 | 19.30 |
| | 1 | 0 | Highest | H | 17.46 | 4.45 | 2.59 | 19.32 |
| | | | | V | 18.36 | 4.45 | 2.59 | 20.22 |
| Limit (dBm) | | | | | | | | 30 |

| Radiated Power (EIRP) for LTE Band 4 / 20M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | EIRP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 20.03 | 5.01 | 2.59 | 22.45 |
| | | | | V | 18.13 | 5.01 | 2.59 | 20.55 |
| | 1 | 0 | Middle | H | 18.19 | 4.82 | 2.59 | 20.42 |
| | | | | V | 18.06 | 4.82 | 2.59 | 20.29 |
| | 1 | 0 | Highest | H | 19.31 | 4.45 | 2.59 | 21.17 |
| | | | | V | 20.36 | 4.45 | 2.59 | 22.22 |
| 16QAM | 1 | 0 | Lowest | H | 18.53 | 5.01 | 2.59 | 20.95 |
| | | | | V | 17.99 | 5.01 | 2.59 | 20.41 |
| | 1 | 0 | Middle | H | 16.33 | 4.82 | 2.59 | 18.56 |
| | | | | V | 17.00 | 4.82 | 2.59 | 19.23 |
| | 1 | 0 | Highest | H | 18.14 | 4.45 | 2.59 | 20.00 |
| | | | | V | 18.02 | 4.45 | 2.59 | 19.88 |
| Limit (dBm) | | | | | | | | 30 |

| Radiated Power (ERP) for LTE Band 5 / 1.4M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | ERP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 17.37 | 5.01 | 2.59 | 19.79 |
| | | | | V | 19.16 | 5.01 | 2.59 | 21.58 |
| | 1 | 0 | Middle | H | 18.73 | 4.82 | 2.59 | 20.96 |
| | | | | V | 17.59 | 4.82 | 2.59 | 19.82 |
| | 1 | 0 | Highest | H | 18.73 | 4.45 | 2.59 | 20.59 |
| | | | | V | 21.03 | 4.45 | 2.59 | 22.89 |
| 16QAM | 1 | 0 | Lowest | H | 16.29 | 5.01 | 2.59 | 18.71 |
| | | | | V | 17.65 | 5.01 | 2.59 | 20.07 |
| | 1 | 0 | Middle | H | 17.33 | 4.82 | 2.59 | 19.56 |
| | | | | V | 15.99 | 4.82 | 2.59 | 18.22 |
| | 1 | 0 | Highest | H | 18.51 | 4.45 | 2.59 | 20.37 |
| | | | | V | 18.67 | 4.45 | 2.59 | 20.53 |
| Limit (dBm) | | | | | | | | 38.45 |

| Radiated Power (ERP) for LTE Band 5 / 3M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | ERP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 18.28 | 5.01 | 2.59 | 20.70 |
| | | | | V | 19.67 | 5.01 | 2.59 | 22.09 |
| | 1 | 0 | Middle | H | 21.00 | 4.82 | 2.59 | 23.23 |
| | | | | V | 19.91 | 4.82 | 2.59 | 22.14 |
| | 1 | 0 | Highest | H | 21.08 | 4.45 | 2.59 | 22.94 |
| | | | | V | 18.01 | 4.45 | 2.59 | 19.87 |
| 16QAM | 1 | 0 | Lowest | H | 16.80 | 5.01 | 2.59 | 19.22 |
| | | | | V | 18.56 | 5.01 | 2.59 | 20.98 |
| | 1 | 0 | Middle | H | 19.73 | 4.82 | 2.59 | 21.96 |
| | | | | V | 17.60 | 4.82 | 2.59 | 19.83 |
| | 1 | 0 | Highest | H | 18.72 | 4.45 | 2.59 | 20.58 |
| | | | | V | 16.27 | 4.45 | 2.59 | 18.13 |
| Limit (dBm) | | | | | | | | 38.45 |

| Radiated Power (ERP) for LTE Band 5 / 5M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | ERP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 17.00 | 5.01 | 2.59 | 19.42 |
| | | | | V | 18.24 | 5.01 | 2.59 | 20.66 |
| | 1 | 0 | Middle | H | 21.24 | 4.82 | 2.59 | 23.47 |
| | | | | V | 19.57 | 4.82 | 2.59 | 21.80 |
| | 1 | 0 | Highest | H | 17.36 | 4.45 | 2.59 | 19.22 |
| | | | | V | 17.58 | 4.45 | 2.59 | 19.44 |
| 16QAM | 1 | 0 | Lowest | H | 16.10 | 5.01 | 2.59 | 18.52 |
| | | | | V | 17.36 | 5.01 | 2.59 | 19.78 |
| | 1 | 0 | Middle | H | 18.96 | 4.82 | 2.59 | 21.19 |
| | | | | V | 18.25 | 4.82 | 2.59 | 20.48 |
| | 1 | 0 | Highest | H | 16.50 | 4.45 | 2.59 | 18.36 |
| | | | | V | 16.74 | 4.45 | 2.59 | 18.60 |
| Limit (dBm) | | | | | | | | 38.45 |

| Radiated Power (ERP) for LTE Band 5 / 10M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | ERP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 17.17 | 5.01 | 2.59 | 19.59 |
| | | | | V | 21.27 | 5.01 | 2.59 | 23.69 |
| | 1 | 0 | Middle | H | 18.53 | 4.82 | 2.59 | 20.76 |
| | | | | V | 19.22 | 4.82 | 2.59 | 21.45 |
| | 1 | 0 | Highest | H | 17.46 | 4.45 | 2.59 | 19.32 |
| | | | | V | 23.05 | 4.45 | 2.59 | 24.91 |
| 16QAM | 1 | 0 | Lowest | H | 16.92 | 5.01 | 2.59 | 19.34 |
| | | | | V | 18.97 | 5.01 | 2.59 | 21.39 |
| | 1 | 0 | Middle | H | 15.92 | 4.82 | 2.59 | 18.15 |
| | | | | V | 18.41 | 4.82 | 2.59 | 20.64 |
| | 1 | 0 | Highest | H | 17.00 | 4.45 | 2.59 | 18.86 |
| | | | | V | 22.27 | 4.45 | 2.59 | 24.13 |
| Limit (dBm) | | | | | | | | 38.45 |

| Radiated Power (ERP) for LTE Band 12 / 1.4M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | ERP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 21.00 | 5.01 | 2.59 | 23.42 |
| | | | | V | 20.24 | 5.01 | 2.59 | 22.66 |
| | 1 | 0 | Middle | H | 20.22 | 4.82 | 2.59 | 22.45 |
| | | | | V | 16.15 | 4.82 | 2.59 | 18.38 |
| | 1 | 0 | Highest | H | 22.26 | 4.45 | 2.59 | 24.12 |
| | | | | V | 23.51 | 4.45 | 2.59 | 25.37 |
| 16QAM | 1 | 0 | Lowest | H | 19.09 | 5.01 | 2.59 | 21.51 |
| | | | | V | 17.29 | 5.01 | 2.59 | 19.71 |
| | 1 | 0 | Middle | H | 18.16 | 4.82 | 2.59 | 20.39 |
| | | | | V | 16.16 | 4.82 | 2.59 | 18.39 |
| | 1 | 0 | Highest | H | 22.10 | 4.45 | 2.59 | 23.96 |
| | | | | V | 22.84 | 4.45 | 2.59 | 24.70 |
| Limit (dBm) | | | | | | | | 34.77 |

| Radiated Power (ERP) for LTE Band 12 / 3M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | ERP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 21.08 | 5.01 | 2.59 | 23.50 |
| | | | | V | 21.57 | 5.01 | 2.59 | 23.99 |
| | 1 | 0 | Middle | H | 23.01 | 4.82 | 2.59 | 25.24 |
| | | | | V | 17.06 | 4.82 | 2.59 | 19.29 |
| | 1 | 0 | Highest | H | 16.71 | 4.45 | 2.59 | 18.57 |
| | | | | V | 19.02 | 4.45 | 2.59 | 20.88 |
| 16QAM | 1 | 0 | Lowest | H | 18.72 | 5.01 | 2.59 | 21.14 |
| | | | | V | 19.12 | 5.01 | 2.59 | 21.54 |
| | 1 | 0 | Middle | H | 21.63 | 4.82 | 2.59 | 23.86 |
| | | | | V | 16.85 | 4.82 | 2.59 | 19.08 |
| | 1 | 0 | Highest | H | 16.67 | 4.45 | 2.59 | 18.53 |
| | | | | V | 18.39 | 4.45 | 2.59 | 20.25 |
| Limit (dBm) | | | | | | | | 34.77 |

| Radiated Power (ERP) for LTE Band 12 / 5M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | ERP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 19.85 | 5.01 | 2.59 | 22.27 |
| | | | | V | 17.77 | 5.01 | 2.59 | 20.19 |
| | 1 | 0 | Middle | H | 22.71 | 4.82 | 2.59 | 24.94 |
| | | | | V | 20.88 | 4.82 | 2.59 | 23.11 |
| | 1 | 0 | Highest | H | 22.82 | 4.45 | 2.59 | 24.68 |
| | | | | V | 20.56 | 4.45 | 2.59 | 22.42 |
| 16QAM | 1 | 0 | Lowest | H | 17.53 | 5.01 | 2.59 | 19.95 |
| | | | | V | 15.88 | 5.01 | 2.59 | 18.30 |
| | 1 | 0 | Middle | H | 22.16 | 4.82 | 2.59 | 24.39 |
| | | | | V | 19.71 | 4.82 | 2.59 | 21.94 |
| | 1 | 0 | Highest | H | 22.50 | 4.45 | 2.59 | 24.36 |
| | | | | V | 20.21 | 4.45 | 2.59 | 22.07 |
| Limit (dBm) | | | | | | | | 34.77 |

| Radiated Power (ERP) for LTE Band 12 / 10M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | ERP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 18.58 | 5.01 | 2.59 | 21.00 |
| | | | | V | 22.75 | 5.01 | 2.59 | 25.17 |
| | 1 | 0 | Middle | H | 19.91 | 4.82 | 2.59 | 22.14 |
| | | | | V | 22.56 | 4.82 | 2.59 | 24.79 |
| | 1 | 0 | Highest | H | 18.97 | 4.45 | 2.59 | 20.83 |
| | | | | V | 22.31 | 4.45 | 2.59 | 24.17 |
| 16QAM | 1 | 0 | Lowest | H | 18.51 | 5.01 | 2.59 | 20.93 |
| | | | | V | 19.93 | 5.01 | 2.59 | 22.35 |
| | 1 | 0 | Middle | H | 18.28 | 4.82 | 2.59 | 20.51 |
| | | | | V | 21.25 | 4.82 | 2.59 | 23.48 |
| | 1 | 0 | Highest | H | 18.92 | 4.45 | 2.59 | 20.78 |
| | | | | V | 20.92 | 4.45 | 2.59 | 22.78 |
| Limit (dBm) | | | | | | | | 34.77 |

| Radiated Power (ERP) for LTE Band 13 / 5M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | ERP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 20.37 | 5.01 | 2.59 | 22.79 |
| | | | | V | 17.42 | 5.01 | 2.59 | 19.84 |
| | 1 | 0 | Middle | H | 20.30 | 4.82 | 2.59 | 22.53 |
| | | | | V | 18.25 | 4.82 | 2.59 | 20.48 |
| | 1 | 0 | Highest | H | 20.29 | 4.45 | 2.59 | 22.15 |
| | | | | V | 16.75 | 4.45 | 2.59 | 18.61 |
| 16QAM | 1 | 0 | Lowest | H | 17.41 | 5.01 | 2.59 | 19.83 |
| | | | | V | 15.75 | 5.01 | 2.59 | 18.17 |
| | 1 | 0 | Middle | H | 18.60 | 4.82 | 2.59 | 20.83 |
| | | | | V | 17.32 | 4.82 | 2.59 | 19.55 |
| | 1 | 0 | Highest | H | 18.83 | 4.45 | 2.59 | 20.69 |
| | | | | V | 16.34 | 4.45 | 2.59 | 18.20 |
| **Limit (dBm)** | | | | | | | | **34.77** |

| Radiated Power (ERP) for LTE Band 13 / 10M | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Modulation | RB | | Channel | Antenna (H&V) | SG Level (dBm) | Antenna Factor (dBd) | Cable Loss (dB) | ERP (dBm) |
| | Size | offset | | | | | | |
| QPSK | 1 | 0 | Lowest | H | 19.03 | 5.01 | 2.59 | 21.45 |
| | | | | V | 20.49 | 5.01 | 2.59 | 22.91 |
| | 1 | 0 | Middle | H | 20.11 | 4.82 | 2.59 | 22.34 |
| | | | | V | 17.77 | 4.82 | 2.59 | 20.00 |
| | 1 | 0 | Highest | H | 18.05 | 4.45 | 2.59 | 19.91 |
| | | | | V | 18.73 | 4.45 | 2.59 | 20.59 |
| 16QAM | 1 | 0 | Lowest | H | 18.42 | 5.01 | 2.59 | 20.84 |
| | | | | V | 17.87 | 5.01 | 2.59 | 20.29 |
| | 1 | 0 | Middle | H | 19.68 | 4.82 | 2.59 | 21.91 |
| | | | | V | 16.21 | 4.82 | 2.59 | 18.44 |
| | 1 | 0 | Highest | H | 16.59 | 4.45 | 2.59 | 18.45 |
| | | | | V | 16.67 | 4.45 | 2.59 | 18.53 |
| **Limit (dBm)** | | | | | | | | **34.77** |

# ATTACHMENT B--RADIATED OUT BAND OF EMISSIONS

Measurement Data (worst case)

## Internal antenna

| Test mode: | LTE BAND 2 20MHz (RB size 1 & RB offset 0) for QPSK | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel: | Middle | | | | | | |
| Frequency (MHz) | Spurious Emission | | | | | Limit (dBm) | Result |
| | Polarization (H&V) | Read Level (dBm) | Antenna Correct Factor (dBi) | Cable Loss (dB) | Emission Level (dBm) | | |
| 7729.56 | Horizontal | -55.64 | 14.94 | 6.12 | -34.58 | -13.00 | Pass |
| 10867.49 | H | -63.78 | 13.87 | 7.86 | -42.05 | | |
| 7100.86 | Vertical | -36.39 | 8.02 | 3.97 | -24.40 | -13.00 | Pass |
| 10822.20 | V | -46.68 | 10.47 | 5.05 | -31.16 | | |
| Remark: 1, The testing has been conformed to 10*1880MHz=18800MHz.<br>2, All other emissions more than 30 dB below the limit.<br>3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss | | | | | | | |

| Test mode: | LTE BAND 4 20MHz (RB size 1 & RB offset 0) for QPSK | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel: | Middle | | | | | | |
| Frequency (MHz) | Spurious Emission | | | | | Limit (dBm) | Result |
| | Polarization (H&V) | Read Level (dBm) | Antenna Correct Factor (dBi) | Cable Loss (dB) | Emission Level (dBm) | | |
| 7732.62 | Horizontal | -55.31 | 14.94 | 6.12 | -34.25 | -13.00 | Pass |
| 10924.42 | H | -65.46 | 13.87 | 7.86 | -43.73 | | |
| 6734.60 | Vertical | -41.28 | 8.02 | 3.97 | -29.29 | -13.00 | Pass |
| 8474.15 | V | -46.96 | 10.47 | 5.05 | -31.44 | | |
| Remark: 1, The testing has been conformed to 10*1732.5MHz=17325MHz.<br>2, All other emissions more than 30 dB below the limit.<br>3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss | | | | | | | |

| Test mode: | LTE BAND 5 10MHz (RB size 1 & RB offset 0) for QPSK | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel: | Middle | | | | | | |
| Frequency (MHz) | Spurious Emission | | | | | Limit (dBm) | Result |
| | Polarization (H&V) | Read Level (dBm) | Antenna Correct Factor (dBi) | Cable Loss (dB) | Emission Level (dBm) | | |
| 7295.59 | Horizontal | -51.56 | 14.94 | 6.12 | -30.50 | -13.00 | Pass |
| 8552.28 | H | -67.37 | 13.87 | 7.86 | -45.64 | | |
| 6738.58 | Vertical | -33.77 | 8.02 | 3.97 | -21.78 | -13.00 | Pass |
| 10303.57 | V | -46.49 | 10.47 | 5.05 | -30.97 | | |
| Remark: 1, The testing has been conformed to 10*836.5MHz=8365MHz.<br>2, All other emissions more than 30 dB below the limit.<br>3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss | | | | | | | |

| Test mode: | LTE BAND 12 10MHz (RB size 1 & RB offset 0) for QPSK | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel: | Middle | | | | | | |
| Frequency (MHz) | Spurious Emission | | | | | Limit (dBm) | Result |
| | Polarization (H&V) | Read Level (dBm) | Antenna Correct Factor (dBi) | Cable Loss (dB) | Emission Level (dBm) | | |
| 7139.44 | Horizontal | -56.03 | 14.94 | 6.12 | -34.97 | -25.00 | Pass |
| 9510.72 | H | -68.77 | 13.87 | 7.86 | -47.04 | | |
| 3595.18 | Vertical | -39.21 | 8.02 | 3.97 | -27.22 | -25.00 | Pass |
| 4807.52 | V | -44.28 | 10.47 | 5.05 | -28.76 | | |
| Remark: 1, The testing has been conformed to 10*707.5MHz=7075MHz.<br>2, All other emissions more than 30 dB below the limit.<br>3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Test mode:** | **LTE BAND 13 10MHz (RB size 1 & RB offset 0) for QPSK** | | | | | | |
| **Channel:** | **Middle** | | | | | | |
| Frequency (MHz) | Spurious Emission | | | | | Limit (dBm) | Result |
| | Polarization (H&V) | Read Level (dBm) | Antenna Correct Factor (dBi) | Cable Loss (dB) | Emission Level (dBm) | | |
| 8450.16 | Horizontal | -58.78 | 14.94 | 6.12 | -37.72 | -25.00 | Pass |
| 10871.68 | H | -66.87 | 13.87 | 7.86 | -45.14 | | |
| 7042.06 | Vertical | -40.21 | 8.02 | 3.97 | -28.22 | -25.00 | Pass |
| 10841.71 | V | -46.71 | 10.47 | 5.05 | -31.19 | | |
| Remark: 1, The testing has been conformed to 10*782.0MHz=7820MHz.<br>2, All other emissions more than 30 dB below the limit.<br>3, Emission Level= Read Level+ Antenna Correct Factor +Cable Loss | | | | | | | |

------End of Report------