# FCC RADIO TEST REPORT

| | | |
|---|---|---|
| **FCC ID** | : | **QYLWP7610BC03** |
| **Equipment** | : | **WWAN Module** |
| **Brand Name** | : | **Getac** |
| **Model Name** | : | **WP7610** |
| **Applicant** | : | **Getac Technology Corporation. 5F., Building A, No. 209, Sec.1, Nangang Rd.,Nangang Dist., Taipei City 11568, Taiwan, R.O.C.** |
| **Standard** | : | **FCC 47 CFR Part 2, 90(R)** |

**The product was received on Dec 10, 2019 and testing was started from Jan. 24, 2020 and completed on Feb. 06, 2020. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI / TIA-603-E and has been in compliance with the applicable technical standards.**

**The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.**

**The test results in this partial report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.**

Louis Wu

**Approved by: Louis Wu**

***SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory***
*No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)*

# Table of Contents

# History of this test report

| Report No. | Version | Description | Issued Date |
|---|---|---|---|
| FG9D1046C | 01 | Initial issue of report | Feb. 13, 2020 |
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# Summary of Test Result

| Report Clause | Ref Std. Clause | Test Items | Result (PASS/FAIL) |
|---|---|---|---|
| 3.2 | §2.1046 | Conducted Output Power | Reporting only |
| | §90.542 (a)(7) | Effective Radiated Power | Pass |
| 4.2 | §2.1053<br>§90.543 (e)(3)<br>§90.543 (f) | Radiated Spurious Emission | Pass |

| **Declaration of Conformity:** |
|---|
| The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers. |
| **Comments and Explanations:** |
| The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification. |

**Reviewed by: Wii Chang**

**Report Producer: Ruby Zou**

# 1 General Description

## 1.1 Product Feature of Equipment Under Test

WCDMA and LTE.

| Product Specification subjective to this standard | |
|---|---|
| **Integrated into Host** | Equipment Name: Body Worn Camera<br>Brand Name: Getac<br>Module Name: BC-03 |
| **Antenna Type** | WWAN: PIFA Antenna |

## 1.2 Modification of EUT

No modifications are made to the EUT during all test items.

## 1.3 Testing Site

| **Test Site** | SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory | |
|---|---|---|
| **Test Site Location** | No.52, Huaya 1st Rd., Guishan Dist.,<br>Taoyuan City, Taiwan (R.O.C.)<br>TEL: +886-3-327-3456<br>FAX: +886-3-328-4978 | |
| **Test Site No.** | **Sporton Site No.** | |
| | TH05-HY | 03CH07-HY |
| **Test Engineer** | Benjamin Lin | Ken Wu |
| **Temperature** | 23-25℃ | 20~24℃ |
| **Relative Humidity** | 51-55% | 48~58% |

**Note:** The test site complies with ANSI C63.4 2014 requirement.

FCC Designation No.: TW1190

## 1.4 Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ANSI C63.26-2015
- 47 CFR Part 2, Part 90(R)
- ANSI / TIA-603-E
- FCC KDB 971168 D01 Power Meas. License Digital Systems v03r01
- FCC KDB 412172 D01 Determining ERP and EIRP v01r01

**Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.

# 2 Test Configuration of Equipment Under Test

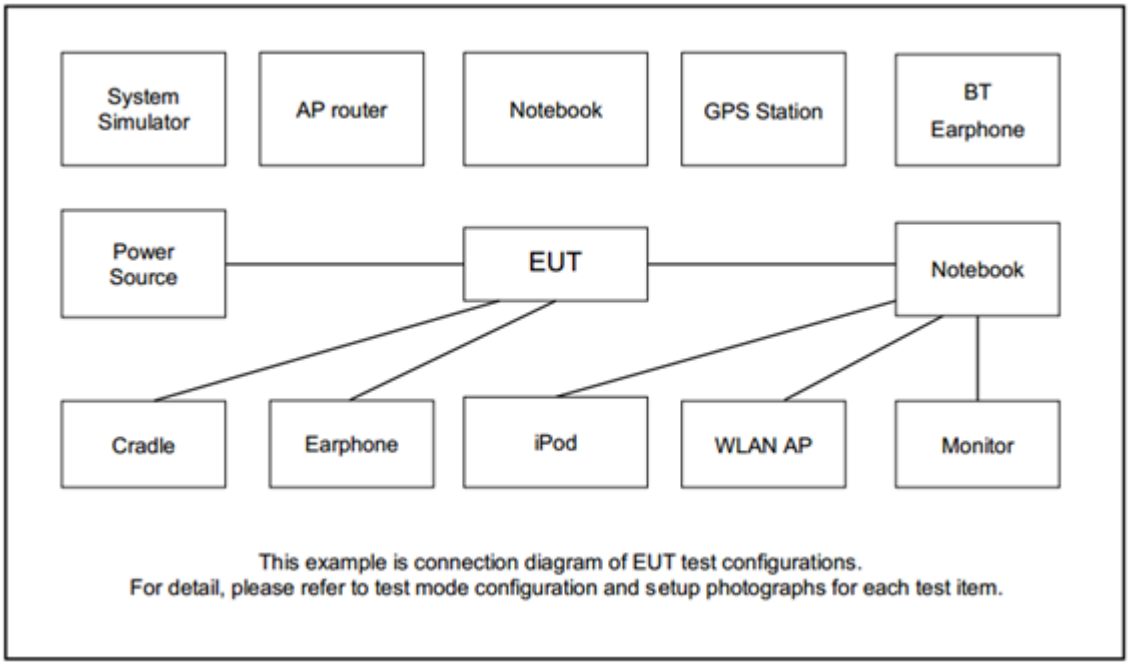
## 2.1 Test Mode

Antenna port conducted and radiated test items listed below are performed according to KDB 971168 D01 Power Meas. License Digital Systems v03r01 with maximum output power.

For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane) were recorded in this report.

| Conducted Test Cases | Band | Bandwidth (MHz) | | | | | | Modulation | | | RB # | | | Test Channel | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1.4 | 3 | 5 | 10 | 15 | 20 | QPSK | 16QAM | 64QAM | 1 | Half | Full | L | M | H |
| Max. Output Power | 14 | - | - | v | v | - | - | v | v | - | v | v | v | v | v | v |
| E.R.P | 14 | - | - | v | v | - | - | v | v | - | v | | | v | v | v |
| Radiated Spurious Emission | 14 | Worst Case | | | | | | | | | | | | v | v | v |
| Remark | 1. The mark "**v** " means that this configuration is chosen for testing<br>2. The mark "-" means that this bandwidth is not supported.<br>3. The device is investigated from 30MHz to 10 times of fundamental signal for radiated spurious emission test under different RB size/offset and modulations in exploratory test. Subsequently, only the worst case emissions are reported. | | | | | | | | | | | | | | | |

## 2.2 Connection Diagram of Test System



## 2.3 Support Unit used in test configuration and system

| Item | Equipment | Trade Name | Model No. | FCC ID | Data Cable | Power Cord |
|---|---|---|---|---|---|---|
| 1. | System Simulator | Anritsu | MT8821C | N/A | N/A | Unshielded, 1.8 m |

## 2.4 Frequency List of Low/Middle/High Channels

| LTE Band 14 Channel and Frequency List | | | | |
|---|---|---|---|---|
| BW [MHz] | Channel/Frequency(MHz) | Lowest | Middle | Highest |
| 10 | Channel | - | 23330 | - |
| | Frequency | - | 793 | - |
| 5 | Channel | 23305 | 23330 | 23355 |
| | Frequency | 790.5 | 793 | 795.5 |

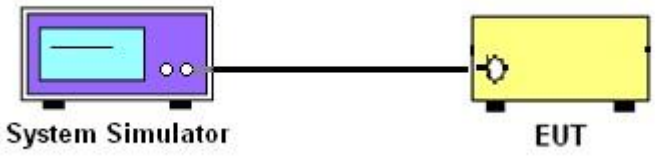
# 3 Conducted Test Items

## 3.1 Measuring Instruments

See list of measuring instruments of this test report.

### 3.1.1 Test Setup

### 3.1.2 Conducted Output Power




### 3.1.3 Test Result of Conducted Test

Please refer to Appendix A.

# 3.2 Conducted Output Power Measurement and ERP

## 3.2.1 Description of the Conducted Output Power Measurement and ERP Measurement

A base station simulator was used to establish communication with the EUT. Its parameters were set to transmit the maximum power on the EUT. The measured power in the radio frequency on the transmitter output terminals shall be reported.

The ERP of mobile transmitters must not exceed 3 Watts for LTE Band 14.

According to KDB 412172 D01 Power Approach,

EIRP = $P_T + G_T – L_C$, ERP = EIRP -2.15, where

$P_T$ = transmitter output power in dBm

$G_T$ = gain of the transmitting antenna in dBi

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

## 3.2.2 Test Procedures

1. The transmitter output port was connected to base station.
2. Set EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record the power level from the system simulator.

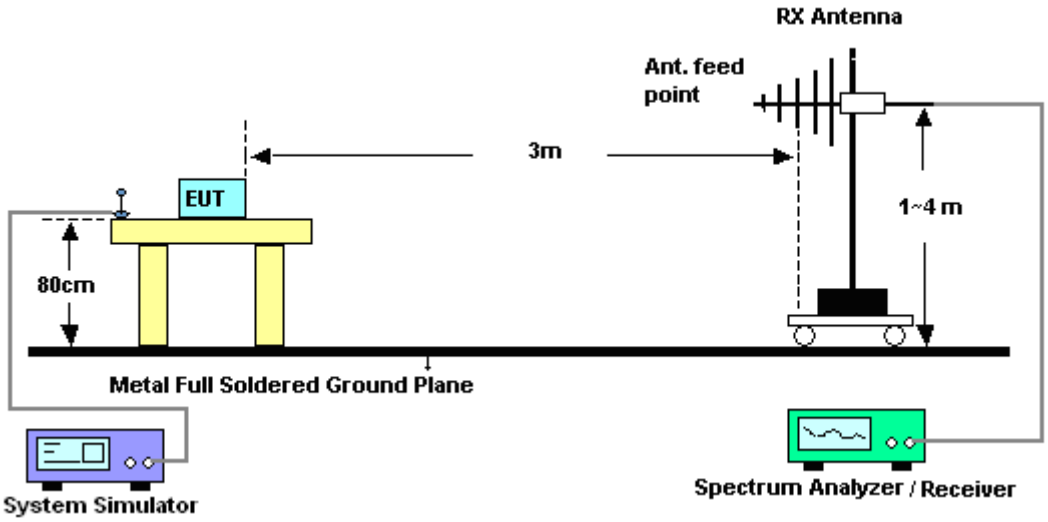
# 4 Radiated Test Items

## 4.1 Measuring Instruments

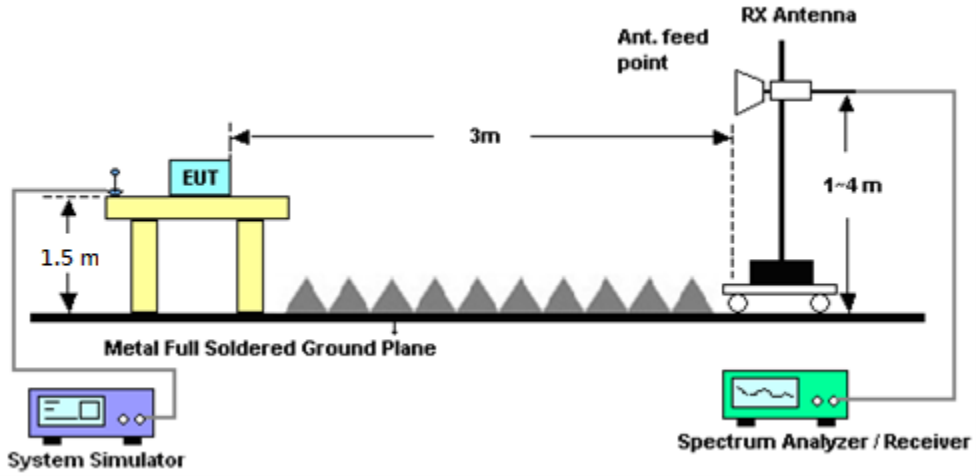
See list of measuring instruments of this test report.

### 4.1.1 Test Setup

**For radiated test from 30MHz to 1GHz**




**For radiated test above 1GHz**




### 4.1.2 Test Result of Radiated Test

Please refer to Appendix B.

## 4.2 Radiated Spurious Emission

### 4.2.1 Description of Radiated Spurious Emission

The radiated spurious emission was measured by substitution method according to ANSI / TIA-603-E. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitter power (P) by a factor of at least 43 + 10 log (P) dB.

For operations in the 758-775 MHz and 788-805 MHz bands, all emissions including harmonics in the band 1559–1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

The spectrum is scanned from 30 MHz up to a frequency including its 10th harmonic.

### 4.2.2 Test Procedures

The testing follows FCC KDB 971168 D01 v03r01 Section 7 and ANSI / TIA-603-E Section 2.2.12.

1. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
2. The EUT was set 3 meters from the receiving antenna, which was mounted on the antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest spurious emission.
4. The height of the receiving antenna is varied between one meter and four meters to search the maximum spurious emission for both horizontal and vertical polarizations.
5. Make the measurement with the spectrum analyzer's RBW = 1MHz, VBW = 3MHz, Sweep = 500ms, Taking the record of maximum spurious emission.
6. A horn antenna was substituted in place of the EUT and was driven by a signal generator.
7. Tune the output power of signal generator to the same emission level with EUT maximum spurious emission.
8. Taking the record of output power at antenna port.
9. Repeat step 7 to step 8 for another polarization.
10. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.
11. The limit line is derived from 43 + 10log(P)dB below the transmitter power P(Watts)

# 5 List of Measuring Equipment

| Instrument | Manufacturer | Model No. | Serial No. | Characteristics | Calibration Date | Test Date | Due Date | Remark |
|---|---|---|---|---|---|---|---|---|
| Base Station (Measure) | Anritsu | MT8820C | 6201107507 | FDD/TDD/NB-IoT/Cat-M1/SEQ | Jun. 27, 2019 | Feb. 04, 2020 | Jun. 26, 2020 | Conducted (TH05-HY) |
| Bilog Antenna | TESEQ | CBL 6111D & 00800N1D01N-06 | 35419 & 03 | 30MHz~1GHz | Apr. 30, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Apr. 29, 2020 | Radiation (03CH07-HY) |
| Bilog Antenna | TESEQ | CBL 6111D & N-6-06 | 35414 & AT-N0602 | 30MHz~1GHz | Oct. 12, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Oct. 11, 2020 | Radiation (03CH07-HY) |
| Double Ridge Horn Antenna | ESCO | 3117 | 00075962 | 1GHz ~ 18GHz | Dec. 06, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Dec. 05, 2020 | Radiation (03CH07-HY) |
| Horn Antenna | ESCO | 3117 | 00066584 | 1GHz ~18GHz | Sep. 25, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Sep. 24, 2020 | Radiation (03CH07-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170576 | 18GHz~40GHz | May 14, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | May 13, 2020 | Radiation (03CH07-HY) |
| SHF-EHF Horn Antenna | SCHWARZBECK | BBHA 9170 | BBHA9170251 | 18GHz~40GHz | Dec. 06, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Dec. 06, 2020 | Radiation (03CH07-HY) |
| Spectrum Analyzer | Agilent | N9030A | MY52350276 | 3Hz~44GHz | Apr. 02, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Apr. 01, 2020 | Radiation (03CH07-HY) |
| Spectrum Analyzer | Keysight | N9010A | MY54200486 | 10Hz~44GHz | Oct. 28, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Oct. 27, 2020 | Radiation (03CH07-HY) |
| Preamplifier | MITEQ | AMF-7D-00101800-30-10P | 1590075 | 1GHz~18GHz | Apr. 24, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Apr. 23, 2020 | Radiation (03CH07-HY) |
| Preamplifier | COM-POWER | PA-103A | 161241 | 10MHz~1GHz | May 20, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | May 19, 2020 | Radiation (03CH07-HY) |
| Preamplifier | Agilent | 8449B | 3008A02362 | 1GHz~26.5GHz | Nov. 01, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Oct. 31, 2020 | Radiation (03CH07-HY) |
| Preamplifier | EMEC | EM18G40G | 060715 | 18GHz~40GHz | Dec. 13, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Dec. 12, 2020 | Radiation (03CH07-HY) |
| Filter | Microwave | H1G013G1 | SN477215 | 1GHz High Pass Filter | Nov. 01, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Oct. 31, 2020 | Radiation (03CH07-HY) |
| Filter | Microwave | H3G018G1 | SN477220 | 3GHz High Pass Filter | Nov. 01, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Oct. 31, 2020 | Radiation (03CH07-HY) |
| Filter | Wainwright | WHNX7.0-26.5G-6SS | SN7 | 7GHz High Pass Filter | Aug. 22, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Aug. 21, 2020 | Radiation (03CH07-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY28655/4, MY24971/4, MY15682/4 | 30MHz~1GHz | Feb. 26, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Feb. 25, 2020 | Radiation (03CH07-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 104 | MY28655/4, MY24971/4, MY15682/4 | 1GHz~18GHz | Feb. 26, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Feb. 25, 2020 | Radiation (03CH07-HY) |
| RF Cable | HUBER + SUHNER | SUCOFLEX 102 | MY2858/2 | 18GHz~40GHz | Feb. 26, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Feb. 25, 2020 | Radiation (03CH07-HY) |
| Antenna Mast | Max-Full | MFA520BS | N/A | 1m~4m | N/A | Jan. 24, 2020~ Feb. 06, 2020 | N/A | Radiation (03CH07-HY) |
| Turn Table | ChainTek | Chaintek 3000 | N/A | 0~360 Degree | N/A | Jan. 24, 2020~ Feb. 06, 2020 | N/A | Radiation (03CH07-HY) |
| Signal Generator | Rohde & Schwarz | SMF100A | 101107 | 100kHz~40GHz | Aug. 27, 2019 | Jan. 24, 2020~ Feb. 06, 2020 | Aug. 26, 2020 | Radiation (03CH07-HY) |
| Software | Audix | E3 6.2009-8-24 | 80504004656H | N/A | N/A | Jan. 24, 2020~ Feb. 06, 2020 | N/A | Radiation (03CH07-HY) |

# 6 Uncertainty of Evaluation

**Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **3.23** |

**Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **3.63** |

**Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)**

| | |
|---|---|
| **Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))** | **4.70** |

# Appendix A. Test Results of Conducted Test

## Conducted Output Power(Average power)

| LTE Band 14 Maximum Average Power [dBm] | | | | | | |
|---|---|---|---|---|---|---|
| BW [MHz] | RB Size | RB Offset | Mod | Lowest | Middle | Highest |
| 10 | 1 | 0 | QPSK | - | 21.83 | - |
| 10 | 1 | 25 | | | **22.10** | |
| 10 | 1 | 49 | | | 21.73 | |
| 10 | 25 | 0 | | | 20.88 | |
| 10 | 25 | 12 | | | 21.06 | |
| 10 | 25 | 25 | | | 21.03 | |
| 10 | 50 | 0 | | | 21.09 | |
| 10 | 1 | 0 | 16-QAM | | 20.68 | |
| 10 | 1 | 25 | | | 21.08 | |
| 10 | 1 | 49 | | | 20.80 | |
| 10 | 25 | 0 | | | 20.00 | |
| 10 | 25 | 12 | | | 20.01 | |
| 10 | 25 | 25 | | | 19.97 | |
| 10 | 50 | 0 | | | 20.05 | |
| 5 | 1 | 0 | QPSK | 21.69 | 21.64 | 21.96 |
| 5 | 1 | 12 | | 22.07 | 22.07 | 22.05 |
| 5 | 1 | 24 | | 21.70 | 21.71 | 21.67 |
| 5 | 12 | 0 | | 20.85 | 20.83 | 20.93 |
| 5 | 12 | 7 | | 20.93 | 21.05 | 20.89 |
| 5 | 12 | 13 | | 20.85 | 21.03 | 20.92 |
| 5 | 25 | 0 | | 20.99 | 20.95 | 20.85 |
| 5 | 1 | 0 | 16-QAM | 20.66 | 20.66 | 20.74 |
| 5 | 1 | 12 | | 20.48 | 21.24 | 20.64 |
| 5 | 1 | 24 | | 20.71 | 20.65 | 20.64 |
| 5 | 12 | 0 | | 19.81 | 19.90 | 19.85 |
| 5 | 12 | 7 | | 20.05 | 20.20 | 19.84 |
| 5 | 12 | 13 | | 19.77 | 19.94 | 19.88 |
| 5 | 25 | 0 | | 19.94 | 19.96 | 19.89 |

# Appendix B. Test Results of ERP and Radiated Test

## ERP

| LTE Band 14 / 5MHz (Average) (GT - LC = -2.22 dB) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Mode | RB | | Conducted | | ERP | |
| | | Size | Offset | EIRP(dBm) | EIRP(W) | ERP(dBm) | ERP(W) |
| Lowest | QPSK | 1 | 12 | 22.07 | 0.1611 | 17.70 | 0.0589 |
| Middle | | 1 | 12 | 22.07 | 0.1611 | 17.70 | 0.0589 |
| Highest | | 1 | 12 | 22.05 | 0.1603 | 17.68 | 0.0586 |
| Lowest | 16QAM | 1 | 12 | 20.48 | 0.1117 | 16.11 | 0.0408 |
| Middle | | 1 | 12 | 21.24 | 0.1330 | 16.87 | 0.0486 |
| Highest | | 1 | 12 | 20.64 | 0.1159 | 16.27 | 0.0424 |
| Limit | ERP < 3W | | | Result | | PASS | |

| LTE Band 14 / 10MHz (Average) (GT - LC = -2.22 dB) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Channel | Mode | RB | | Conducted | | ERP | |
| | | Size | Offset | EIRP(dBm) | EIRP(W) | ERP(dBm) | ERP(W) |
| Lowest | QPSK | - | - | - | - | - | - |
| Middle | | 1 | 25 | 22.10 | 0.1622 | 17.73 | 0.0593 |
| Highest | | - | - | - | - | - | - |
| Lowest | 16QAM | - | - | - | - | - | - |
| Middle | | 1 | 25 | 21.08 | 0.1282 | 16.71 | 0.0469 |
| Highest | | - | - | - | - | - | - |
| Limit | ERP < 3W | | | Result | | PASS | |

# Radiated Spurious Emission

## LTE Band 14

| LTE Band 14 / 10MHz / QPSK | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Channel | Frequency ( MHz ) | ERP ( dBm ) | Limit ( dBm ) | Over Limit ( dB ) | SPA Reading (dBm) | S.G. Power ( dBm ) | TX Cable loss ( dB ) | TX Antenna Gain (dBi) | Polarization (H/V) |
| Middle | 1584 | -53.13 | -42.15 | -10.98 | -64.26 | -55.1 | 0.95 | 5.06 | H |
| | 2376 | -53.77 | -13 | -40.77 | -70.53 | -55.4 | 1.25 | 5.03 | H |
| | 3172 | -57.89 | -13 | -44.89 | -76.77 | -60.8 | 1.50 | 6.56 | H |
| | | | | | | | | | H |
| | 1584 | -54.23 | -42.15 | -12.08 | -66.15 | -56.2 | 0.95 | 5.06 | V |
| | 2376 | -52.67 | -13 | -39.67 | -69.79 | -54.3 | 1.25 | 5.03 | V |
| | 3172 | -57.59 | -13 | -44.59 | -76.9 | -60.5 | 1.50 | 6.56 | V |
| | | | | | | | | | V |

**Remark:** Spurious emissions within 30-1000MHz were found more than 20dB below limit line.