

# TEST REPORT

**Reference No.**..... : WTS18S08120417-4W  
**FCC ID** ..... : 2AQYLPT-V01  
**Applicant**..... : Iotech Management LLC  
**Address**..... : 3111 N University Dr Suite 105, Coral Spring, FL 33065, USA  
**Manufacturer** ..... : The same as above  
**Address**..... : The same as above  
**Product**..... : Pets Tracker  
**Model(s)** ..... : PT-v01  
**Brand Name**..... : iotech  
**Standards**..... : FCC CFR47 Part 27: 2017  
**Date of Receipt sample** .... : 2018-08-07  
**Date of Test** ..... : 2018-08-08 to 2018-10-11  
**Date of Issue**..... : 2018-10-12  
**Test Result**..... : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

**Prepared By:**

**Waltek Services (Shenzhen) Co., Ltd.**

**Address: 1/F., Fukangtai Building, West Baima Road, Songgang Street, Baoan District, Shenzhen, Guangdong, China**

**Tel :+86-755-83551033**

**Fax:+86-755-83552400**

Compiled by:

*Ford Wang*

Ford Wang / Project Engineer

Approved by:



*Philo Zhong*

Philo Zhong / Manager

## 2 Laboratories Introduction

**Waltek Services (Shenzhen) Co., Ltd** is a professional third-party testing and certification laboratory with multi-year product testing and certification experience, established strictly in accordance with ISO/IEC 17025 requirements, and accredited by ILAC (International Laboratory Accreditation Cooperation) member. A2LA (American Association for Laboratory Accreditation, the certification number is 4243.01) of USA, CNAS (China National Accreditation Service for Conformity Assessment, the registration number is L3110) of China. Meanwhile, Waltek has got recognition as registration and accreditation laboratory from EMSD (Electrical and Mechanical Services Department), and American Energy star, FCC (The Federal Communications Commission), CEC (California energy efficiency), ISED (Innovation, Science and Economic Development Canada). It's the strategic partner and data recognition laboratory of international authoritative organizations, such as Intertek (ETL-SEMKO), TÜV Rheinland, TÜV SÜD, etc.



Waltek Services (Shenzhen) Co., Ltd is one of the largest and the most comprehensive third party testing laboratory in China. Our test capability covered four large fields: safety test. Electro Magnetic Compatibility (EMC), and energy performance, wireless radio. As a professional, comprehensive, justice international test organization, we still keep the scientific and rigorous work attitude to help each client satisfy the international standards and assist their product enter into globe market smoothly.

**Test Facility:****A. Accreditations for Conformity Assessment (International)**

| Country/Region                                                      | Scope Covered By | Scope              | Note |
|---------------------------------------------------------------------|------------------|--------------------|------|
| USA                                                                 | ISO/IEC 17025    | FCC ID \ DOC \ VOC | 1    |
| Canada                                                              |                  | IC ID \ VOC        | 2    |
| Japan                                                               |                  | MIC-T \ MIC-R      | -    |
| Europe                                                              |                  | EMCD \ RED         | -    |
| Taiwan                                                              |                  | NCC                | -    |
| Hong Kong                                                           |                  | OFCA               | -    |
| Australia                                                           |                  | RCM                | -    |
| India                                                               |                  | WPC                | -    |
| Thailand                                                            |                  | NTC                | -    |
| Singapore                                                           |                  | IDA                | -    |
| Note:                                                               |                  |                    |      |
| 1. FCC Designation No.: CN1201. Test Firm Registration No.: 523476. |                  |                    |      |
| 2. ISED Canada Registration No.: 7760A                              |                  |                    |      |

**B. TCBs and Notify Bodies Recognized Testing Laboratory.**

| Recognized Testing Laboratory of ...     | Notify body number |
|------------------------------------------|--------------------|
| TUV Rheinland                            | Optional.          |
| Intertek                                 |                    |
| TUV SUD                                  |                    |
| SGS                                      |                    |
| Phoenix Testlab GmbH                     | 0700               |
| Element Materials Technology Warwick Ltd | 0891               |
| Timco Engineering, Inc.                  | 1177               |
| Eurofins Product Service GmbH            | 0681               |

### 3 Contents

|                                                         | Page      |
|---------------------------------------------------------|-----------|
| <b>1 COVER PAGE.....</b>                                | <b>1</b>  |
| <b>2 LABORATORIES INTRODUCTION .....</b>                | <b>2</b>  |
| <b>3 CONTENTS .....</b>                                 | <b>4</b>  |
| <b>4 REVISION HISTORY .....</b>                         | <b>6</b>  |
| <b>5 GENERAL INFORMATION.....</b>                       | <b>7</b>  |
| 5.1 GENERAL DESCRIPTION OF E.U.T. ....                  | 7         |
| 5.2 DETAILS OF E.U.T. ....                              | 7         |
| 5.3 TEST MODE .....                                     | 9         |
| <b>6 TEST SUMMARY .....</b>                             | <b>10</b> |
| <b>7 EQUIPMENT USED DURING TEST .....</b>               | <b>11</b> |
| 7.1 EQUIPMENTS LIST .....                               | 11        |
| 7.2 DESCRIPTION OF SUPPORT UNITS .....                  | 12        |
| 7.3 MEASUREMENT UNCERTAINTY .....                       | 12        |
| 7.4 TEST EQUIPMENT CALIBRATION .....                    | 12        |
| <b>8 RF OUTPUT POWER .....</b>                          | <b>13</b> |
| 8.1 EUT OPERATION.....                                  | 13        |
| 8.2 TEST PROCEDURE .....                                | 13        |
| 8.3 TEST RESULT .....                                   | 14        |
| <b>9 PEAK-TO-AVERAGE RATIO.....</b>                     | <b>29</b> |
| 9.1 EUT OPERATION.....                                  | 29        |
| 9.2 TEST PROCEDURE .....                                | 29        |
| 9.3 TEST RESULT .....                                   | 29        |
| <b>10 BANDWIDTH.....</b>                                | <b>30</b> |
| 10.1 EUT OPERATION.....                                 | 30        |
| 10.2 TEST PROCEDURE.....                                | 30        |
| 10.3 TEST RESULT .....                                  | 31        |
| <b>11 SPURIOUS EMISSIONS AT ANTENNA TERMINALS .....</b> | <b>43</b> |
| 11.1 EUT OPERATION.....                                 | 43        |
| 11.2 TEST PROCEDURE.....                                | 43        |
| 11.3 TEST RESULT .....                                  | 43        |
| <b>12 SPURIOUS RADIATED EMISSIONS.....</b>              | <b>44</b> |
| 12.1 EUT OPERATION.....                                 | 44        |
| 12.2 TEST SETUP .....                                   | 44        |
| 12.3 SPECTRUM ANALYZER SETUP .....                      | 45        |
| 12.4 TEST PROCEDURE.....                                | 46        |
| 12.5 SUMMARY OF TEST RESULTS .....                      | 47        |
| <b>13 BAND EDGE MEASUREMENT .....</b>                   | <b>49</b> |
| 13.1 EUT OPERATION.....                                 | 49        |
| 13.2 TEST PROCEDURE.....                                | 49        |
| 13.3 TEST RESULT .....                                  | 50        |
| <b>14 FREQUENCY STABILITY.....</b>                      | <b>51</b> |
| 14.1 EUT OPERATION.....                                 | 51        |
| 14.2 TEST PROCEDURE.....                                | 51        |

14.3 TEST RESULT ..... 52

15 RF EXPOSURE..... 62

16 PHOTOGRAPHS OF TEST SETUP AND EUT..... 63

#### 4 Revision History

| Test report No.       | Date of Receipt sample | Date of Test                | Date of Issue | Purpose  | Comment | Approved |
|-----------------------|------------------------|-----------------------------|---------------|----------|---------|----------|
| WTS18S08120<br>417-4W | 2018-08-07             | 2018-08-08<br>to 2018-10-11 | 2018-10-12    | original | -       | Valid    |
|                       |                        |                             |               |          |         |          |

## 5 General Information

### 5.1 General Description of E.U.T.

|                                       |                                          |
|---------------------------------------|------------------------------------------|
| Product:                              | Pets Tracker                             |
| Model(s):                             | PT-v01                                   |
| Model Description:                    | N/A                                      |
| GSM Band(s):                          | GSM 850/900/1800/1900MHz                 |
| GPRS/EGPRS Class:                     | 12                                       |
| WCDMA Band(s):                        | FDD Band II/V                            |
| LTE Band(s):                          | FDD Band 4/7                             |
| Wi-Fi Specification:                  | 2.4G-802.11b/g/n HT20                    |
| Bluetooth Version:                    | Bluetooth v4.0 with BLE                  |
| GPS:                                  | Support                                  |
| NFC:                                  | N/A                                      |
| Hardware Version:                     | G79-MB-V2.1                              |
| Software Version:                     | g79_37T_240_5m_tdw_petDog_cn_pr_20180821 |
| Highest frequency<br>(Exclude Radio): | 1.25GHz                                  |
| Storage Location:                     | Internal Storage                         |

### 5.2 Details of E.U.T.

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Operation Frequency:  | LTE Band 4: 1710~1755MHz<br>LTE Band 7: 2500~2570MHz                                                                                                                                                                                                                                                                                                                                                                 |
| Max. RF output power: | LTE Band 4: 22.74dBm<br>LTE Band 7: 21.98dBm                                                                                                                                                                                                                                                                                                                                                                         |
| Type of Modulation:   | LTE: QPSK, 16QAM                                                                                                                                                                                                                                                                                                                                                                                                     |
| Antenna installation: | LTE: internal permanent antenna                                                                                                                                                                                                                                                                                                                                                                                      |
| Antenna Gain:         | LTE Band 4: 0.5dBi<br>LTE Band 7: 0.5dBi                                                                                                                                                                                                                                                                                                                                                                             |
| Ratings:              | Battery DC 3.7V, 650mAh<br>DC 5V , charging from USB                                                                                                                                                                                                                                                                                                                                                                 |
| Type of Emission:     | LTE Band 4 1.4MHz: 1M09G7D(QPSK), 1M09W7D(16QAM)<br>LTE Band 4 3MHz: 2M73G7D(QPSK), 2M73W7D(16QAM)<br>LTE Band 4 5MHz: 4M50G7D(QPSK), 4M50W7D(16QAM)<br>LTE Band 4 10 MHz: 8M93G7D(QPSK), 8M93W7D(16QAM)<br>LTE Band 4 15MHz: 13M5G7D(QPSK), 13M5W7D(16QAM)<br>LTE Band 4 20MHz: 17M9G7D(QPSK), 17M9W7D(16QAM)<br>LTE Band 7 5MHz: 4M50G7D(QPSK), 4M50W7D(16QAM)<br>LTE Band 7 10 MHz: 8M94G7D(QPSK), 8M93W7D(16QAM) |

LTE Band 7 15MHz: 13M5G7D(QPSK), 13M5W7D(16QAM)

LTE Band 7 20MHz: 17M9G7D(QPSK), 17M9W7D(16QAM)

### 5.3 Test Mode

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

| Support Band                                                     | Test Mode BW(MHz) | Channel Frequency | Channel Number |
|------------------------------------------------------------------|-------------------|-------------------|----------------|
| LTE Band 4                                                       | 1.4               | 1710.7 MHz        | 19957          |
|                                                                  |                   | 1732.5 MHz        | 20175          |
|                                                                  |                   | 1754.3 MHz        | 20393          |
|                                                                  | 3                 | 1711.5 MHz        | 19965          |
|                                                                  |                   | 1732.5 MHz        | 20175          |
|                                                                  |                   | 1753.5 MHz        | 20385          |
|                                                                  | 5                 | 1712.5 MHz        | 19975          |
|                                                                  |                   | 1732.5 MHz        | 20175          |
|                                                                  |                   | 1752.5 MHz        | 20375          |
|                                                                  | 10                | 1715.0 MHz        | 20000          |
|                                                                  |                   | 1732.5 MHz        | 20175          |
|                                                                  |                   | 1750.0 MHz        | 20350          |
|                                                                  | 15                | 1717.5 MHz        | 20025          |
|                                                                  |                   | 1732.5 MHz        | 20175          |
|                                                                  |                   | 1747.5 MHz        | 20325          |
|                                                                  | 20                | 1720.0 MHz        | 20050          |
|                                                                  |                   | 1732.5 MHz        | 20175          |
|                                                                  |                   | 1745.0 MHz        | 20300          |
| LTE Band 7                                                       | 5                 | 2502.5 MHz        | 20775          |
|                                                                  |                   | 2535.0 MHz        | 21100          |
|                                                                  |                   | 2567.5 MHz        | 21425          |
|                                                                  | 10                | 2505.0 MHz        | 20800          |
|                                                                  |                   | 2535.0 MHz        | 21100          |
|                                                                  |                   | 2565.0 MHz        | 21400          |
|                                                                  | 15                | 2507.5 MHz        | 20825          |
|                                                                  |                   | 2535.0 MHz        | 21100          |
|                                                                  |                   | 2562.5 MHz        | 21375          |
|                                                                  | 20                | 2510.0 MHz        | 20850          |
|                                                                  |                   | 2535.0 MHz        | 21100          |
|                                                                  |                   | 2560.0 MHz        | 21350          |
| Remark: All mode(s) were tested and the worst data was recorded. |                   |                   |                |

## 6 Test Summary

| Test Items                             | Test Requirement                   | Result |
|----------------------------------------|------------------------------------|--------|
| RF Output Power                        | 2.1046<br>27.50(h.2)<br>27.50(d.4) | PASS   |
| Peak-to-Average Ratio                  | 27.50(d)                           | PASS   |
| Bandwidth                              | 2.1049<br>27.53(a)                 | PASS   |
| Spurious Emissions at Antenna Terminal | 2.1051<br>27.53(h)<br>27.53(m)(4)  | PASS   |
| Field Strength of Spurious Radiation   | 2.1053<br>27.53(h)<br>27.53(m)(4)  | PASS   |
| Out of band emission                   | 27.53(h)<br>27.53(m)(4)            | PASS   |
| Frequency Stability                    | 2.1055<br>27.5(h)<br>27.54         | PASS   |
| Maximum Permissible Exposure<br>(SAR)  | 1.1307<br>2.1093                   | PASS   |

## 7 Equipment Used during Test

### 7.1 Equipments List

| Conducted Emissions Test Site 1#                              |                            |                      |              |                 |                       |                      |
|---------------------------------------------------------------|----------------------------|----------------------|--------------|-----------------|-----------------------|----------------------|
| Item                                                          | Equipment                  | Manufacturer         | Model No.    | Serial No.      | Last Calibration Date | Calibration Due Date |
| 1.                                                            | EMI Test Receiver          | R&S                  | ESCI         | 100947          | 2018-09-12            | 2019-09-11           |
| 2.                                                            | LISN                       | R&S                  | ENV216       | 101215          | 2018-09-12            | 2019-09-11           |
| 3.                                                            | Cable                      | Top                  | TYPE16(3.5M) | -               | 2018-09-12            | 2019-09-11           |
| Conducted Emissions Test Site 2#                              |                            |                      |              |                 |                       |                      |
| Item                                                          | Equipment                  | Manufacturer         | Model No.    | Serial No.      | Last Calibration Date | Calibration Due Date |
| 1.                                                            | EMI Test Receiver          | R&S                  | ESCI         | 101155          | 2018-09-12            | 2019-09-11           |
| 2.                                                            | LISN                       | SCHWARZBECK          | NSLK 8128    | 8128-289        | 2018-09-12            | 2019-09-11           |
| 3.                                                            | Limiter                    | York                 | MTS-IMP-136  | 261115-001-0024 | 2018-09-12            | 2019-09-11           |
| 4.                                                            | Cable                      | LARGE                | RF300        | -               | 2018-09-12            | 2019-09-11           |
| 3m Semi-anechoic Chamber for Radiation Emissions Test site 1# |                            |                      |              |                 |                       |                      |
| Item                                                          | Equipment                  | Manufacturer         | Model No.    | Serial No.      | Last Calibration Date | Calibration Due Date |
| 1                                                             | Spectrum Analyzer          | R&S                  | FSP          | 100091          | 2018-04-29            | 2019-04-28           |
| 2                                                             | Active Loop Antenna        | Beijing Dazhi        | ZN30900A     | -               | 2018-04-09            | 2019-04-08           |
| 3                                                             | Trilog Broadband Antenna   | SCHWARZBECK          | VULB9163     | 336             | 2018-04-09            | 2019-04-08           |
| 4                                                             | Coaxial Cable (below 1GHz) | Top                  | TYPE16(13M)  | -               | 2018-09-12            | 2019-09-11           |
| 5                                                             | Broad-band Horn Antenna    | SCHWARZBECK          | BBHA 9120 D  | 667             | 2018-04-09            | 2019-04-08           |
| 6                                                             | Broad-band Horn Antenna    | SCHWARZBECK          | BBHA 9170    | 335             | 2018-04-09            | 2019-04-08           |
| 7                                                             | Broadband Preamplifier     | COMPLIANCE DIRECTION | PAP-1G18     | 2004            | 2018-04-13            | 2019-04-12           |
| 8                                                             | Coaxial Cable (above 1GHz) | Top                  | 1GHz-25GHz   | EW02014-7       | 2018-04-13            | 2019-04-12           |
| 9                                                             | Signal Generator           | R&S                  | SMR20        | 100046          | 2018-09-12            | 2019-09-11           |
| 10                                                            | Smart Antenna              | SCHWARZBECK          | HA08         | -               | 2018-04-09            | 2019-04-08           |
| 3m Semi-anechoic Chamber for Radiation Emissions Test site 2# |                            |                      |              |                 |                       |                      |
| Item                                                          | Equipment                  | Manufacturer         | Model No.    | Serial No.      | Last Calibration Date | Calibration Due Date |
| 1                                                             | Test Receiver              | R&S                  | ESCI         | 101296          | 2018-04-13            | 2019-04-12           |
| 2                                                             | Trilog Broadband Antenna   | SCHWARZBECK          | VULB9160     | 9160-3325       | 2018-04-09            | 2019-04-08           |

| 3                           | Amplifier                                  | Compliance<br>pirection<br>systems inc | PAP-0203  | 22024      | 2018-04-13                  | 2019-04-12              |
|-----------------------------|--------------------------------------------|----------------------------------------|-----------|------------|-----------------------------|-------------------------|
| 4                           | Cable                                      | HUBER+SUHNER                           | CBL2      | 525178     | 2018-04-13                  | 2019-04-12              |
| <b>RF Conducted Testing</b> |                                            |                                        |           |            |                             |                         |
| Item                        | Equipment                                  | Manufacturer                           | Model No. | Serial No. | Last<br>Calibration<br>Date | Calibration<br>Due Date |
| 1.                          | EMC Analyzer<br>(9k~26.5GHz)               | Agilent                                | E7405A    | MY45114943 | 2018-09-12                  | 2019-09-11              |
| 2.                          | Spectrum Analyzer                          | Agilent                                | N9020A    | MY49100060 | 2018-09-12                  | 2019-09-11              |
| 3.                          | Universal Radio<br>Communication<br>Tester | R&S                                    | CMW 500   | 127818     | 2018-04-13                  | 2019-04-12              |
| 4                           | Signal Analyzer<br>(9k~26.5GHz)            | Agilent                                | N9010A    | MY50520207 | 2018-09-12                  | 2019-09-11              |

## 7.2 Description of Support Units

| Equipment    | Manufacturer                           | Model No. | Series No.   |
|--------------|----------------------------------------|-----------|--------------|
| MacBook Air  | APPLE                                  | A1465     | C17KTQDNF5N7 |
| Power Supply | LPS DELTA ELECTRONICS<br>UIANG CO.,LTD | ADP-45GD  | -            |

## 7.3 Measurement Uncertainty

| Parameter                                       | Uncertainty                             |
|-------------------------------------------------|-----------------------------------------|
| Conducted Emission                              | ± 3.64 dB(AC mains 150KHz~30MHz)        |
| Radiated Spurious Emissions                     | ± 5.08 dB (Bilog antenna 30M~1000MHz)   |
|                                                 | ± 5.47 dB (Horn antenna 1000M~25000MHz) |
| Radio Frequency                                 | ± 1 x 10 <sup>-7</sup> Hz               |
| RF Power                                        | ± 0.42 dB                               |
| RF Power Density                                | ± 0.7dB                                 |
| Conducted Spurious Emissions                    | ± 2.76 dB (9kHz~26500MHz)               |
| Confidence interval: 95%. Confidence factor:k=2 |                                         |

## 7.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P.R.China.

## 8 RF OUTPUT POWER

|                   |                                          |
|-------------------|------------------------------------------|
| Test Requirement: | FCC Part 2.1046, 27.50(h.2); 27.50(d.4); |
| Test Method:      | TIA/EIA-603-D:2010<br>KDB971168 D01 v03  |
| Test Mode:        | TX transmitting                          |

### 8.1 EUT Operation

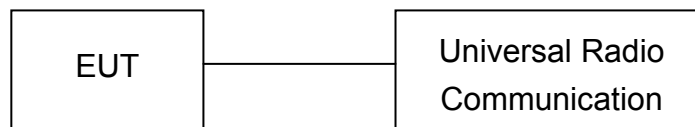
Operating Environment :

|                       |           |
|-----------------------|-----------|
| Temperature:          | 22.5 °C   |
| Humidity:             | 52.1 % RH |
| Atmospheric Pressure: | 101.2kPa  |

### 8.2 Test Procedure

Conducted method:

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.



Radiated method:

1. The setup of EUT is according with per TIA/EIA Standard 603D:2010.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. 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.

### 8.3 Test Result

#### Conducted Power

##### LTE Band 4:

| BW(MHz) | Ch    | Freq(MHz) | Mode  | UL RB Allocation | UL RB Offset | Average Power (dbm) | Tune up limited(dBm) | MPR (dB) |
|---------|-------|-----------|-------|------------------|--------------|---------------------|----------------------|----------|
| 1.4MHz  | 19957 | 1710.7    | QPSK  | 1                | 0            | 22.13               | 22.0±1               | /        |
|         |       |           |       | 1                | 2            | 22.12               | 22.0±1               | /        |
|         |       |           |       | 1                | 5            | 22.09               | 22.0±1               | /        |
|         |       |           |       | 3                | 0            | 22.12               | 22.0±1               | /        |
|         |       |           |       | 3                | 1            | 22.12               | 22.0±1               | /        |
|         |       |           |       | 3                | 2            | 22.1                | 22.0±1               | /        |
|         |       |           |       | 6                | 0            | 21.08               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 21.14               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 2            | 21.19               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 5            | 21.16               | 21.0±1               | 1.0      |
|         |       |           |       | 3                | 0            | 21.11               | 21.0±1               | 1.0      |
|         |       |           |       | 3                | 1            | 21.11               | 21.0±1               | 1.0      |
|         |       |           |       | 3                | 2            | 21.13               | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 0            | 20.17               | 21.0±1               | 1.0      |
|         | 20175 | 1732.5    | QPSK  | 1                | 0            | 22.1                | 22.0±1               | /        |
|         |       |           |       | 1                | 2            | 22.15               | 22.0±1               | /        |
|         |       |           |       | 1                | 5            | 22.08               | 22.0±1               | /        |
|         |       |           |       | 3                | 0            | 22.03               | 22.0±1               | /        |
|         |       |           |       | 3                | 1            | 22.07               | 22.0±1               | /        |
|         |       |           |       | 3                | 2            | 22.02               | 22.0±1               | /        |
|         |       |           |       | 6                | 0            | 21.11               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 21.3                | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 2            | 21.3                | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 5            | 21.26               | 21.0±1               | 1.0      |
|         |       |           |       | 3                | 0            | 21.12               | 21.0±1               | 1.0      |
|         |       |           |       | 3                | 1            | 21.11               | 21.0±1               | 1.0      |
|         |       |           |       | 3                | 2            | 21.07               | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 0            | 20.88               | 21.0±1               | 1.0      |
|         | 20393 | 1754.3    | QPSK  | 1                | 0            | 21.85               | 22.0±1               | /        |
|         |       |           |       | 1                | 2            | 21.94               | 22.0±1               | /        |
|         |       |           |       | 1                | 5            | 21.9                | 22.0±1               | /        |
|         |       |           |       | 3                | 0            | 21.8                | 22.0±1               | /        |
|         |       |           |       | 3                | 1            | 21.8                | 22.0±1               | /        |
|         |       |           |       | 3                | 2            | 21.8                | 22.0±1               | /        |
|         |       |           |       | 6                | 0            | 20.8                | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.67               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 2            | 20.72               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 5            | 20.71               | 21.0±1               | 1.0      |
|         |       |           |       | 3                | 0            | 20.85               | 21.0±1               | 1.0      |
|         |       |           |       | 3                | 1            | 20.8                | 21.0±1               | 1.0      |
|         |       |           |       | 3                | 2            | 20.82               | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 0            | 20.85               | 21.0±1               | 1.0      |

| BW(MHz) | Ch    | Freq(MHz) | Mode  | UL RB Allocation | UL RB Offset | Average Power (dbm) | Tune up limited(dBm) | MPR (dB) |
|---------|-------|-----------|-------|------------------|--------------|---------------------|----------------------|----------|
| 3MHz    | 19965 | 1711.5    | QPSK  | 1                | 0            | 22.16               | 22.0±1               | /        |
|         |       |           |       | 1                | 8            | 22.18               | 22.0±1               | /        |
|         |       |           |       | 1                | 14           | 22.15               | 22.0±1               | /        |
|         |       |           |       | 6                | 0            | 21.26               | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 4            | 21.26               | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 9            | 21.26               | 21.0±1               | 1.0      |
|         |       |           |       | 15               | 0            | 21.2                | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.98               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 8            | 21.02               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 14           | 20.94               | 21.0±1               | 1.0      |
|         |       |           |       | 8                | 0            | 20.31               | 21.0±1               | 1.0      |
|         |       |           |       | 8                | 4            | 20.27               | 21.0±1               | 1.0      |
|         |       |           |       | 8                | 9            | 20.25               | 21.0±1               | 1.0      |
|         |       |           |       | 15               | 0            | 20.18               | 21.0±1               | 1.0      |
|         | 20175 | 1732.5    | QPSK  | 1                | 0            | 22.09               | 22.0±1               | /        |
|         |       |           |       | 1                | 8            | 22.11               | 22.0±1               | /        |
|         |       |           |       | 1                | 14           | 22.05               | 22.0±1               | /        |
|         |       |           |       | 6                | 0            | 21.19               | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 4            | 21.19               | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 9            | 21.17               | 21.0±1               | 1.0      |
|         |       |           |       | 15               | 0            | 21.04               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 21.23               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 8            | 21.24               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 14           | 21.19               | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 0            | 20.09               | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 4            | 20.13               | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 9            | 20.09               | 21.0±1               | 1.0      |
|         |       |           |       | 15               | 0            | 20.04               | 21.0±1               | 1.0      |
|         | 20385 | 1753.5    | QPSK  | 1                | 0            | 21.88               | 22.0±1               | /        |
|         |       |           |       | 1                | 8            | 21.94               | 22.0±1               | /        |
|         |       |           |       | 1                | 14           | 21.92               | 22.0±1               | /        |
|         |       |           |       | 6                | 0            | 20.9                | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 4            | 20.93               | 21.0±1               | 1.0      |
|         |       |           |       | 6                | 9            | 20.89               | 21.0±1               | 1.0      |
|         |       |           |       | 15               | 0            | 20.81               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.69               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 8            | 20.7                | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 14           | 20.64               | 21.0±1               | 1.0      |
|         |       |           |       | 8                | 0            | 20.84               | 21.0±1               | 1.0      |
|         |       |           |       | 8                | 4            | 20.82               | 21.0±1               | 1.0      |
|         |       |           |       | 8                | 9            | 20.81               | 21.0±1               | 1.0      |
|         |       |           |       | 15               | 0            | 20.71               | 21.0±1               | 1.0      |

| BW(MHz) | Ch    | Freq(MHz) | Mode  | UL RB Allocation | UL RB Offset | Average Power (dbm) | Tune up limited(dBm) | MPR (dB) |
|---------|-------|-----------|-------|------------------|--------------|---------------------|----------------------|----------|
| 5MHz    | 19975 | 1712.5    | QPSK  | 1                | 0            | 22.27               | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 22.19               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 22.2                | 22.0±1               | /        |
|         |       |           |       | 12               | 0            | 21.28               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 21.26               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 21.26               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 21.21               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 21.39               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 21.31               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 21.31               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 0            | 20.32               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 20.29               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 20.28               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 20.19               | 21.0±1               | 1.0      |
|         | 20175 | 1732.5    | QPSK  | 1                | 0            | 22.23               | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 22.19               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 22.09               | 22.0±1               | /        |
|         |       |           |       | 12               | 0            | 21.12               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 21.06               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 21.04               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 21.01               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 21.47               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 21.44               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 21.38               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 0            | 20.16               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 20.14               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 20.1                | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 20.03               | 21.0±1               | 1.0      |
|         | 20375 | 1752.5    | QPSK  | 1                | 0            | 21.89               | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.92               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.95               | 22.0±1               | /        |
|         |       |           |       | 12               | 0            | 20.86               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 20.86               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 20.84               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 20.81               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.87               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.84               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.85               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 0            | 20.83               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 20.81               | 21.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 20.81               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 20.69               | 21.0±1               | 1.0      |

| BW(MHz) | Ch    | Freq(MHz) | Mode  | UL RB Allocation | UL RB Offset | Average Power (dbm) | Tune up limited(dBm) | MPR (dB) |
|---------|-------|-----------|-------|------------------|--------------|---------------------|----------------------|----------|
| 10MHz   | 20000 | 1715      | QPSK  | 1                | 0            | 21.62               | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.87               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.97               | 22.0±1               | /        |
|         |       |           |       | 25               | 0            | 20.86               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 20.56               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 20.49               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.5                | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.93               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.3                | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.5                | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 20.91               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 20.02               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 20.27               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.27               | 21.0±1               | 1.0      |
|         | 20175 | 1732.5    | QPSK  | 1                | 0            | 22.35               | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 22.18               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.71               | 22.0±1               | /        |
|         |       |           |       | 25               | 0            | 21.19               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 21.17               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 21.14               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 21.14               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 21.44               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 21.4                | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 21.07               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 20.11               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 20.09               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 20.08               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.09               | 21.0±1               | 1.0      |
|         | 20350 | 1750      | QPSK  | 1                | 0            | 22                  | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 22.02               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 22.02               | 22.0±1               | /        |
|         |       |           |       | 25               | 0            | 20.92               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 20.9                | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 20.91               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.93               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.87               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.82               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.82               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 20.98               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 20.95               | 21.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 20.95               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.9                | 21.0±1               | 1.0      |

| BW(MHz) | Ch    | Freq(MHz) | Mode  | UL RB Allocation | UL RB Offset | Average Power (dbm) | Tune up limited(dBm) | MPR (dB) |
|---------|-------|-----------|-------|------------------|--------------|---------------------|----------------------|----------|
| 15MHz   | 20025 | 1717.5    | QPSK  | 1                | 0            | 21.63               | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 22.19               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 22.32               | 22.0±1               | /        |
|         |       |           |       | 36               | 0            | 21.12               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 21.4                | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 21.48               | 21.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 21.32               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.51               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 21.08               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 21.09               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 0            | 20.07               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 20.33               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 20.31               | 21.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 20.3                | 21.0±1               | 1.0      |
|         | 20175 | 1732.5    | QPSK  | 1                | 0            | 22.2                | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 22.32               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 22.44               | 22.0±1               | /        |
|         |       |           |       | 36               | 0            | 20.75               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 20.28               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 20.84               | 21.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 20.4                | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.86               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.33               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.83               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 0            | 20.62               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 20.43               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 20.09               | 21.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 20.42               | 21.0±1               | 1.0      |
|         | 20325 | 1747.5    | QPSK  | 1                | 0            | 21.72               | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.04               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.15               | 22.0±1               | /        |
|         |       |           |       | 36               | 0            | 20.01               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 20.21               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 20.42               | 21.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 20.16               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.99               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.29               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.36               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 0            | 20.94               | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 20.2                | 21.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 20.38               | 21.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 20.21               | 21.0±1               | 1.0      |

| BW(MHz) | Ch    | Freq(MHz) | Mode  | UL RB Allocation | UL RB Offset | Average Power (dbm) | Tune up limited(dBm) | MPR (dB) |
|---------|-------|-----------|-------|------------------|--------------|---------------------|----------------------|----------|
| 20MHz   | 20050 | 1720      | QPSK  | 1                | 0            | 22.49               | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 22.12               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.74               | 22.0±1               | /        |
|         |       |           |       | 50               | 0            | 21.11               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 21.29               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 21.28               | 21.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 21.26               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.98               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 21.66               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 21.27               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.19               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 20.27               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 20.24               | 21.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 20.28               | 21.0±1               | 1.0      |
|         | 20175 | 1732.5    | QPSK  | 1                | 0            | 22.29               | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 22.74               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.89               | 22.0±1               | /        |
|         |       |           |       | 50               | 0            | 21.22               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 21.87               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 21.41               | 21.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 20.9                | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 21.58               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.96               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.42               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.18               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 20.02               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 20.53               | 21.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 20.04               | 21.0±1               | 1.0      |
|         | 20300 | 1745      | QPSK  | 1                | 0            | 21.39               | 22.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.56               | 22.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.76               | 22.0±1               | /        |
|         |       |           |       | 50               | 0            | 20.62               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 20.72               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 20.04               | 21.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 20.73               | 21.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.81               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.82               | 21.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.58               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.46               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 20.53               | 21.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 20.8                | 21.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 20.67               | 21.0±1               | 1.0      |

**LTE Band 7:**

| BW(MHz) | Ch    | Freq(MHz) | Mode  | UL RB Allocation | UL RB Offset | Average Power (dbm) | Tune up limited(dBm) | MPR (dB) |
|---------|-------|-----------|-------|------------------|--------------|---------------------|----------------------|----------|
| 5MHz    | 20775 | 2502.5    | QPSK  | 1                | 0            | 21.91               | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.42               | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.71               | 21.0±1               | /        |
|         |       |           |       | 12               | 0            | 20.94               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 20.95               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 20.94               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 20.92               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.12               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.1                | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.04               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 0            | 20.08               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 20.07               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 20.07               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 20                  | 20.0±1               | 1.0      |
|         | 21100 | 2535      | QPSK  | 1                | 0            | 21.8                | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.32               | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.7                | 21.0±1               | /        |
|         |       |           |       | 12               | 0            | 20.76               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 20.78               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 20.78               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 20.73               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.19               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.2                | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.2                | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 0            | 19.89               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 19.92               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 19.93               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 19.82               | 20.0±1               | 1.0      |
|         | 21425 | 2567.5    | QPSK  | 1                | 0            | 21.54               | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 20.82               | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 20.86               | 21.0±1               | /        |
|         |       |           |       | 12               | 0            | 19.85               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 19.59               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 19.54               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 19.65               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.27               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 19.61               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 19.71               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 0            | 19.79               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 24           | 19.79               | 20.0±1               | 1.0      |
|         |       |           |       | 12               | 49           | 19.8                | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 19.66               | 20.0±1               | 1.0      |

| BW(MHz) | Ch    | Freq(MHz) | Mode  | UL RB Allocation | UL RB Offset | Average Power (dbm) | Tune up limited(dBm) | MPR (dB) |
|---------|-------|-----------|-------|------------------|--------------|---------------------|----------------------|----------|
| 10MHz   | 20800 | 2505      | QPSK  | 1                | 0            | 21.91               | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.87               | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.85               | 21.0±1               | /        |
|         |       |           |       | 25               | 0            | 20.98               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 20.93               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 20.9                | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.95               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.91               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.87               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.78               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 20.06               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 20                  | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 19.99               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20                  | 20.0±1               | 1.0      |
|         | 21100 | 2535      | QPSK  | 1                | 0            | 21.75               | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.81               | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.42               | 21.0±1               | /        |
|         |       |           |       | 25               | 0            | 20.75               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 20.78               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 20.81               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.78               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.98               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.09               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.09               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 19.76               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 19.8                | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 19.82               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 19.79               | 20.0±1               | 1.0      |
|         | 21400 | 2565      | QPSK  | 1                | 0            | 21.72               | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.6                | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 20.75               | 21.0±1               | /        |
|         |       |           |       | 25               | 0            | 20.74               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 20.72               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 20.45               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.73               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.62               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.51               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 19.79               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 0            | 19.78               | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 24           | 19.8                | 20.0±1               | 1.0      |
|         |       |           |       | 25               | 49           | 19.8                | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 19.75               | 20.0±1               | 1.0      |

| BW(MHz) | Ch    | Freq(MHz) | Mode  | UL RB Allocation | UL RB Offset | Average Power (dbm) | Tune up limited(dBm) | MPR (dB) |
|---------|-------|-----------|-------|------------------|--------------|---------------------|----------------------|----------|
| 15MHz   | 20825 | 2507.5    | QPSK  | 1                | 0            | 21.89               | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.83               | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.99               | 21.0±1               | /        |
|         |       |           |       | 36               | 0            | 20.1                | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 20.03               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 20.98               | 20.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 20.06               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.92               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.81               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.69               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 0            | 20.07               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 20.01               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 19.97               | 20.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 20.04               | 20.0±1               | 1.0      |
|         | 21100 | 2535      | QPSK  | 1                | 0            | 21.75               | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.7                | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.32               | 21.0±1               | /        |
|         |       |           |       | 36               | 0            | 20.94               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 20.96               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 20.89               | 20.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 20.94               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.96               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.09               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.12               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 0            | 19.86               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 19.94               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 19.9                | 20.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 19.9                | 20.0±1               | 1.0      |
|         | 21375 | 2562.5    | QPSK  | 1                | 0            | 21.69               | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.63               | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 20.75               | 21.0±1               | /        |
|         |       |           |       | 36               | 0            | 20.93               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 20.96               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 20.91               | 20.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 20.91               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.87               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.93               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.25               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 0            | 19.75               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 24           | 19.79               | 20.0±1               | 1.0      |
|         |       |           |       | 36               | 49           | 19.8                | 20.0±1               | 1.0      |
|         |       |           |       | 75               | 0            | 19.81               | 20.0±1               | 1.0      |

| BW(MHz) | Ch    | Freq(MHz) | Mode  | UL RB Allocation | UL RB Offset | Average Power (dbm) | Tune up limited(dBm) | MPR (dB) |
|---------|-------|-----------|-------|------------------|--------------|---------------------|----------------------|----------|
| 20MHz   | 20850 | 2510      | QPSK  | 1                | 0            | 21.97               | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.97               | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.76               | 21.0±1               | /        |
|         |       |           |       | 50               | 0            | 20.02               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 20.9                | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 20.86               | 20.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 20.91               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.57               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.41               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.28               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 20.07               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 19.96               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 19.9                | 20.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 19.97               | 20.0±1               | 1.0      |
|         | 21100 | 2535      | QPSK  | 1                | 0            | 21.71               | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.98               | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 21.3                | 21.0±1               | /        |
|         |       |           |       | 50               | 0            | 20.77               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 20.99               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 20.83               | 20.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 20.79               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.96               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.13               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.18               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 19.76               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 19.82               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 19.85               | 20.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 19.79               | 20.0±1               | 1.0      |
|         | 21350 | 2560      | QPSK  | 1                | 0            | 21.67               | 21.0±1               | /        |
|         |       |           |       | 1                | 49           | 21.76               | 21.0±1               | /        |
|         |       |           |       | 1                | 99           | 20.91               | 21.0±1               | /        |
|         |       |           |       | 50               | 0            | 20.7                | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 20.75               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 20.77               | 20.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 20.74               | 20.0±1               | 1.0      |
|         |       |           | 16QAM | 1                | 0            | 20.98               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 49           | 20.94               | 20.0±1               | 1.0      |
|         |       |           |       | 1                | 99           | 20.14               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 0            | 19.64               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 24           | 19.66               | 20.0±1               | 1.0      |
|         |       |           |       | 50               | 49           | 19.73               | 20.0±1               | 1.0      |
|         |       |           |       | 100              | 0            | 19.71               | 20.0±1               | 1.0      |

**ERP and EIRP****LTE Band 4**

| Frequency                                 | Receiver Reading | Turn table Angle | RX Antenna |       | Substituted |       |              | Absolute Level | Part 27 |        |
|-------------------------------------------|------------------|------------------|------------|-------|-------------|-------|--------------|----------------|---------|--------|
|                                           |                  |                  | Height     | Polar | SG Level    | Cable | Antenna Gain |                | Limit   | Margin |
| (MHz)                                     | (dBμV)           | Degree           | (m)        | (H/V) | (dBm)       | (dB)  | (dB)         | (dBm)          | (dBm)   | (dB)   |
| LTE Band 4 Channel 19957 – 1.4MHz – QPSK  |                  |                  |            |       |             |       |              |                |         |        |
| 1710.70                                   | 88.54            | 166              | 2.3        | H     | 14.43       | 0.30  | 9.40         | 23.53          | 30      | -6.47  |
| 1710.70                                   | 88.01            | 184              | 1.7        | V     | 14.48       | 0.30  | 9.40         | 23.58          | 30      | -6.42  |
| LTE Band 4 Channel 20175 – 1.4MHz – QPSK  |                  |                  |            |       |             |       |              |                |         |        |
| 1732.50                                   | 88.50            | 36               | 2.2        | H     | 14.39       | 0.30  | 9.40         | 23.49          | 30      | -6.51  |
| 1732.50                                   | 87.70            | 14               | 2.1        | V     | 14.17       | 0.30  | 9.40         | 23.27          | 30      | -6.73  |
| LTE Band 4 Channel 20393 – 1.4MHz – QPSK  |                  |                  |            |       |             |       |              |                |         |        |
| 1754.30                                   | 88.35            | 123              | 1.5        | H     | 14.24       | 0.30  | 9.40         | 23.34          | 30      | -6.66  |
| 1754.30                                   | 87.69            | 148              | 1.8        | V     | 14.16       | 0.30  | 9.40         | 23.26          | 30      | -6.74  |
| LTE Band 4 Channel 19957 – 1.4MHz – 16QAM |                  |                  |            |       |             |       |              |                |         |        |
| 1710.70                                   | 88.37            | 5                | 1.5        | H     | 14.26       | 0.30  | 9.40         | 23.36          | 30      | -6.64  |
| 1710.70                                   | 87.80            | 183              | 2.4        | V     | 14.27       | 0.30  | 9.40         | 23.37          | 30      | -6.63  |
| LTE Band 4 Channel 20175 – 1.4MHz – 16QAM |                  |                  |            |       |             |       |              |                |         |        |
| 1732.50                                   | 88.45            | 11               | 1.6        | H     | 14.34       | 0.30  | 9.40         | 23.44          | 30      | -6.56  |
| 1732.50                                   | 87.79            | 170              | 1.9        | V     | 14.26       | 0.30  | 9.40         | 23.36          | 30      | -6.64  |
| LTE Band 4 Channel 20393 – 1.4MHz – 16QAM |                  |                  |            |       |             |       |              |                |         |        |
| 1754.30                                   | 88.41            | 42               | 2.0        | H     | 14.30       | 0.30  | 9.40         | 23.40          | 30      | -6.60  |
| 1754.30                                   | 87.75            | 251              | 1.5        | V     | 14.22       | 0.30  | 9.40         | 23.32          | 30      | -6.68  |
| LTE Band 4 Channel 19965 – 3MHz – QPSK    |                  |                  |            |       |             |       |              |                |         |        |
| 1711.50                                   | 88.46            | 280              | 2.0        | H     | 14.35       | 0.30  | 9.40         | 23.45          | 30      | -6.55  |
| 1711.50                                   | 87.73            | 39               | 1.1        | V     | 14.20       | 0.30  | 9.40         | 23.30          | 30      | -6.70  |
| LTE Band 4 Channel 20175 – 3MHz – QPSK    |                  |                  |            |       |             |       |              |                |         |        |
| 1732.50                                   | 88.44            | 187              | 2.4        | H     | 14.33       | 0.30  | 9.40         | 23.43          | 30      | -6.57  |
| 1732.50                                   | 87.79            | 71               | 1.3        | V     | 14.26       | 0.30  | 9.40         | 23.36          | 30      | -6.64  |
| LTE Band 4 Channel 20385 – 3MHz – QPSK    |                  |                  |            |       |             |       |              |                |         |        |
| 1753.50                                   | 88.36            | 97               | 2.1        | H     | 14.25       | 0.30  | 9.40         | 23.35          | 30      | -6.65  |
| 1753.50                                   | 87.82            | 160              | 1.3        | V     | 14.29       | 0.30  | 9.40         | 23.39          | 30      | -6.61  |
| LTE Band 4 Channel 19965 – 3MHz – 16QAM   |                  |                  |            |       |             |       |              |                |         |        |
| 1711.50                                   | 88.40            | 306              | 2.1        | H     | 14.29       | 0.30  | 9.40         | 23.39          | 30      | -6.61  |
| 1711.50                                   | 87.86            | 168              | 1.4        | V     | 14.33       | 0.30  | 9.40         | 23.43          | 30      | -6.57  |
| LTE Band 4 Channel 20175 – 3MHz – 16QAM   |                  |                  |            |       |             |       |              |                |         |        |
| 1732.50                                   | 88.46            | 29               | 1.0        | H     | 14.35       | 0.30  | 9.40         | 23.45          | 30      | -6.55  |
| 1732.50                                   | 87.88            | 199              | 2.3        | V     | 14.35       | 0.30  | 9.40         | 23.45          | 30      | -6.55  |
| LTE Band 4 Channel 20385 – 3MHz – 16QAM   |                  |                  |            |       |             |       |              |                |         |        |
| 1753.50                                   | 88.39            | 190              | 2.0        | H     | 14.28       | 0.30  | 9.40         | 23.38          | 30      | -6.62  |
| 1753.50                                   | 87.89            | 204              | 1.3        | V     | 14.36       | 0.30  | 9.40         | 23.46          | 30      | -6.54  |
| LTE Band 4 Channel 19975 – 5MHz – QPSK    |                  |                  |            |       |             |       |              |                |         |        |
| 1712.50                                   | 88.42            | 38               | 1.2        | H     | 14.31       | 0.30  | 9.40         | 23.41          | 30      | -6.59  |
| 1712.50                                   | 87.80            | 242              | 1.5        | V     | 14.27       | 0.30  | 9.40         | 23.37          | 30      | -6.63  |
| LTE Band 4 Channel 20175 – 5MHz – QPSK    |                  |                  |            |       |             |       |              |                |         |        |

|                                          |       |     |     |   |       |      |      |       |    |       |
|------------------------------------------|-------|-----|-----|---|-------|------|------|-------|----|-------|
| 1732.50                                  | 88.55 | 278 | 1.3 | H | 14.44 | 0.30 | 9.40 | 23.54 | 30 | -6.46 |
| 1732.50                                  | 87.84 | 294 | 2.0 | V | 14.31 | 0.30 | 9.40 | 23.41 | 30 | -6.59 |
| LTE Band 4 Channel 20375 – 5MHz – QPSK   |       |     |     |   |       |      |      |       |    |       |
| 1752.50                                  | 88.59 | 259 | 1.5 | H | 14.48 | 0.30 | 9.40 | 23.58 | 30 | -6.42 |
| 1752.50                                  | 87.90 | 91  | 2.2 | V | 14.37 | 0.30 | 9.40 | 23.47 | 30 | -6.53 |
| LTE Band 4 Channel 19975 – 5MHz – 16QAM  |       |     |     |   |       |      |      |       |    |       |
| 1712.50                                  | 88.86 | 49  | 1.8 | H | 14.75 | 0.30 | 9.40 | 23.85 | 30 | -6.15 |
| 1712.50                                  | 87.94 | 169 | 2.5 | V | 14.41 | 0.30 | 9.40 | 23.51 | 30 | -6.49 |
| LTE Band 4 Channel 20175 – 5MHz – 16QAM  |       |     |     |   |       |      |      |       |    |       |
| 1732.50                                  | 88.87 | 345 | 2.0 | H | 14.76 | 0.30 | 9.40 | 23.86 | 30 | -6.14 |
| 1732.50                                  | 87.95 | 22  | 1.5 | V | 14.42 | 0.30 | 9.40 | 23.52 | 30 | -6.48 |
| LTE Band 4 Channel 20375 – 5MHz – 16QAM  |       |     |     |   |       |      |      |       |    |       |
| 1752.50                                  | 88.86 | 87  | 1.5 | H | 14.75 | 0.30 | 9.40 | 23.85 | 30 | -6.15 |
| 1752.50                                  | 87.91 | 163 | 1.1 | V | 14.38 | 0.30 | 9.40 | 23.48 | 30 | -6.52 |
| LTE Band 4 Channel 20000 – 10MHz – QPSK  |       |     |     |   |       |      |      |       |    |       |
| 1715.00                                  | 88.53 | 191 | 1.6 | H | 14.42 | 0.30 | 9.40 | 23.52 | 30 | -6.48 |
| 1715.00                                  | 87.92 | 262 | 2.2 | V | 14.39 | 0.30 | 9.40 | 23.49 | 30 | -6.51 |
| LTE Band 4 Channel 20175 – 10MHz – QPSK  |       |     |     |   |       |      |      |       |    |       |
| 1732.50                                  | 88.51 | 276 | 1.9 | H | 14.40 | 0.30 | 9.40 | 23.50 | 30 | -6.50 |
| 1732.50                                  | 87.93 | 77  | 1.2 | V | 14.40 | 0.30 | 9.40 | 23.50 | 30 | -6.50 |
| LTE Band 4 Channel 20350 – 10MHz – QPSK  |       |     |     |   |       |      |      |       |    |       |
| 1750.00                                  | 88.69 | 124 | 2.4 | H | 14.58 | 0.30 | 9.40 | 23.68 | 30 | -6.32 |
| 1750.00                                  | 87.86 | 82  | 1.8 | V | 14.33 | 0.30 | 9.40 | 23.43 | 30 | -6.57 |
| LTE Band 4 Channel 20000 – 10MHz – 16QAM |       |     |     |   |       |      |      |       |    |       |
| 1715.00                                  | 88.66 | 357 | 1.4 | H | 14.55 | 0.30 | 9.40 | 23.65 | 30 | -6.35 |
| 1715.00                                  | 87.68 | 329 | 1.9 | V | 14.15 | 0.30 | 9.40 | 23.25 | 30 | -6.75 |
| LTE Band 4 Channel 20175 – 10MHz – 16QAM |       |     |     |   |       |      |      |       |    |       |
| 1732.50                                  | 88.71 | 267 | 1.7 | H | 14.60 | 0.30 | 9.40 | 23.70 | 30 | -6.30 |
| 1732.50                                  | 87.69 | 41  | 2.3 | V | 14.16 | 0.30 | 9.40 | 23.26 | 30 | -6.74 |
| LTE Band 4 Channel 20350 – 10MHz – 16QAM |       |     |     |   |       |      |      |       |    |       |
| 1750.00                                  | 88.75 | 274 | 2.0 | H | 14.64 | 0.30 | 9.40 | 23.74 | 30 | -6.26 |
| 1750.00                                  | 87.63 | 187 | 1.8 | V | 14.10 | 0.30 | 9.40 | 23.20 | 30 | -6.80 |
| LTE Band 4 Channel 20025 – 15MHz – QPSK  |       |     |     |   |       |      |      |       |    |       |
| 1717.50                                  | 88.74 | 178 | 1.1 | H | 14.63 | 0.30 | 9.40 | 23.73 | 30 | -6.27 |
| 1717.50                                  | 87.60 | 219 | 2.2 | V | 14.07 | 0.30 | 9.40 | 23.17 | 30 | -6.83 |
| LTE Band 4 Channel 20175 – 15MHz – QPSK  |       |     |     |   |       |      |      |       |    |       |
| 1732.50                                  | 88.76 | 78  | 1.2 | H | 14.65 | 0.30 | 9.40 | 23.75 | 30 | -6.25 |
| 1732.50                                  | 87.65 | 157 | 2.1 | V | 14.12 | 0.30 | 9.40 | 23.22 | 30 | -6.78 |
| LTE Band 4 Channel 20325 – 15MHz – QPSK  |       |     |     |   |       |      |      |       |    |       |
| 1747.50                                  | 88.74 | 207 | 1.4 | H | 14.63 | 0.30 | 9.40 | 23.73 | 30 | -6.27 |
| 1747.50                                  | 87.63 | 254 | 2.4 | V | 14.10 | 0.30 | 9.40 | 23.20 | 30 | -6.80 |
| LTE Band 4 Channel 20025 – 15MHz – 16QAM |       |     |     |   |       |      |      |       |    |       |
| 1717.50                                  | 88.79 | 300 | 2.2 | H | 14.68 | 0.30 | 9.40 | 23.78 | 30 | -6.22 |
| 1717.50                                  | 87.69 | 309 | 1.2 | V | 14.16 | 0.30 | 9.40 | 23.26 | 30 | -6.74 |
| LTE Band 4 Channel 20175 – 15MHz – 16QAM |       |     |     |   |       |      |      |       |    |       |
| 1732.50                                  | 88.86 | 211 | 2.1 | H | 14.75 | 0.30 | 9.40 | 23.85 | 30 | -6.15 |
| 1732.50                                  | 87.66 | 127 | 1.2 | V | 14.13 | 0.30 | 9.40 | 23.23 | 30 | -6.77 |

| LTE Band 4 Channel 20325 – 15MHz – 16QAM |       |     |     |   |       |      |      |       |    |       |
|------------------------------------------|-------|-----|-----|---|-------|------|------|-------|----|-------|
| 1747.50                                  | 88.91 | 147 | 2.4 | H | 14.80 | 0.30 | 9.40 | 23.90 | 30 | -6.10 |
| 1747.50                                  | 87.49 | 206 | 1.4 | V | 13.96 | 0.30 | 9.40 | 23.06 | 30 | -6.94 |
| LTE Band 4 Channel 20050 – 20MHz – QPSK  |       |     |     |   |       |      |      |       |    |       |
| 1720.00                                  | 88.87 | 302 | 2.1 | H | 14.76 | 0.30 | 9.40 | 23.86 | 30 | -6.14 |
| 1720.00                                  | 87.45 | 336 | 2.3 | V | 13.92 | 0.30 | 9.40 | 23.02 | 30 | -6.98 |
| LTE Band 4 Channel 20175 – 20MHz – QPSK  |       |     |     |   |       |      |      |       |    |       |
| 1732.50                                  | 88.92 | 129 | 1.4 | H | 14.81 | 0.30 | 9.40 | 23.91 | 30 | -6.09 |
| 1732.50                                  | 87.41 | 305 | 1.7 | V | 13.88 | 0.30 | 9.40 | 22.98 | 30 | -7.02 |
| LTE Band 4 Channel 20300 – 20MHz – QPSK  |       |     |     |   |       |      |      |       |    |       |
| 1745.00                                  | 88.98 | 112 | 1.0 | H | 14.87 | 0.30 | 9.40 | 23.97 | 30 | -6.03 |
| 1745.00                                  | 87.54 | 291 | 1.4 | V | 14.01 | 0.30 | 9.40 | 23.11 | 30 | -6.89 |
| LTE Band 4 Channel 20050 – 20MHz – 16QAM |       |     |     |   |       |      |      |       |    |       |
| 1720.00                                  | 88.65 | 61  | 1.2 | H | 14.54 | 0.30 | 9.40 | 23.64 | 30 | -6.36 |
| 1720.00                                  | 87.53 | 60  | 1.8 | V | 14.00 | 0.30 | 9.40 | 23.10 | 30 | -6.90 |
| LTE Band 4 Channel 20175 – 20MHz – 16QAM |       |     |     |   |       |      |      |       |    |       |
| 1732.50                                  | 88.54 | 164 | 2.2 | H | 14.43 | 0.30 | 9.40 | 23.53 | 30 | -6.47 |
| 1732.50                                  | 87.66 | 249 | 1.7 | V | 14.13 | 0.30 | 9.40 | 23.23 | 30 | -6.77 |
| LTE Band 4 Channel 20300 – 20MHz – 16QAM |       |     |     |   |       |      |      |       |    |       |
| 1745.00                                  | 88.77 | 88  | 1.2 | H | 14.66 | 0.30 | 9.40 | 23.76 | 30 | -6.24 |
| 1745.00                                  | 87.49 | 245 | 1.1 | V | 13.96 | 0.30 | 9.40 | 23.06 | 30 | -6.94 |

**LTE Band 7**

| Frequency                                | Receiver Reading | Turn table Angle | RX Antenna |       | Substituted |       |              | Absolute Level | Part 27 |        |
|------------------------------------------|------------------|------------------|------------|-------|-------------|-------|--------------|----------------|---------|--------|
|                                          |                  |                  | Height     | Polar | SG Level    | Cable | Antenna Gain |                | Limit   | Margin |
| (MHz)                                    | (dBμV)           | Degree           | (m)        | (H/V) | (dBm)       | (dB)  | (dB)         | (dBm)          | (dBm)   | (dB)   |
| LTE Band 7 Channel 20775 – 5MHz – QPSK   |                  |                  |            |       |             |       |              |                |         |        |
| 2502.50                                  | 86.35            | 45               | 1.9        | H     | 12.35       | 0.43  | 10.60        | 22.52          | 33      | -10.48 |
| 2502.50                                  | 82.42            | 280              | 2.1        | V     | 12.14       | 0.43  | 10.60        | 22.31          | 33      | -10.69 |
| LTE Band 7 Channel 21100 – 5MHz – QPSK   |                  |                  |            |       |             |       |              |                |         |        |
| 2535.00                                  | 86.30            | 70               | 2.3        | H     | 12.30       | 0.43  | 10.60        | 22.47          | 33      | -10.53 |
| 2535.00                                  | 82.45            | 290              | 2.2        | V     | 12.17       | 0.43  | 10.60        | 22.34          | 33      | -10.66 |
| LTE Band 7 Channel 21425 – 5MHz – QPSK   |                  |                  |            |       |             |       |              |                |         |        |
| 2567.50                                  | 86.31            | 331              | 1.7        | H     | 12.20       | 0.43  | 10.60        | 22.37          | 33      | -10.63 |
| 2567.50                                  | 82.47            | 117              | 2.2        | V     | 12.28       | 0.43  | 10.60        | 22.45          | 33      | -10.55 |
| LTE Band 7 Channel 20775 – 5MHz – 16QAM  |                  |                  |            |       |             |       |              |                |         |        |
| 2502.50                                  | 86.34            | 303              | 1.5        | H     | 12.34       | 0.43  | 10.60        | 22.51          | 33      | -10.49 |
| 2502.50                                  | 82.44            | 60               | 1.4        | V     | 12.16       | 0.43  | 10.60        | 22.33          | 33      | -10.67 |
| LTE Band 7 Channel 21100 – 5MHz – 16QAM  |                  |                  |            |       |             |       |              |                |         |        |
| 2535.00                                  | 86.32            | 177              | 1.6        | H     | 12.32       | 0.43  | 10.60        | 22.49          | 33      | -10.51 |
| 2535.00                                  | 82.47            | 315              | 1.2        | V     | 12.19       | 0.43  | 10.60        | 22.36          | 33      | -10.64 |
| LTE Band 7 Channel 21425 – 5MHz – 16QAM  |                  |                  |            |       |             |       |              |                |         |        |
| 2567.50                                  | 86.39            | 250              | 1.3        | H     | 12.28       | 0.43  | 10.60        | 22.45          | 33      | -10.55 |
| 2567.50                                  | 82.41            | 44               | 2.3        | V     | 12.22       | 0.43  | 10.60        | 22.39          | 33      | -10.61 |
| LTE Band 7 Channel 20800 – 10MHz – QPSK  |                  |                  |            |       |             |       |              |                |         |        |
| 2505.00                                  | 86.29            | 121              | 1.4        | H     | 12.29       | 0.43  | 10.60        | 22.46          | 33      | -10.54 |
| 2505.00                                  | 82.40            | 357              | 1.6        | V     | 12.12       | 0.43  | 10.60        | 22.29          | 33      | -10.71 |
| LTE Band 7 Channel 21100 – 10MHz – QPSK  |                  |                  |            |       |             |       |              |                |         |        |
| 2535.00                                  | 86.23            | 33               | 1.4        | H     | 12.23       | 0.43  | 10.60        | 22.40          | 33      | -10.60 |
| 2535.00                                  | 82.48            | 65               | 2.3        | V     | 12.20       | 0.43  | 10.60        | 22.37          | 33      | -10.63 |
| LTE Band 7 Channel 21400 – 10MHz – QPSK  |                  |                  |            |       |             |       |              |                |         |        |
| 2565.00                                  | 86.25            | 315              | 1.0        | H     | 12.14       | 0.43  | 10.60        | 22.31          | 33      | -10.69 |
| 2565.00                                  | 82.46            | 197              | 2.1        | V     | 12.27       | 0.43  | 10.60        | 22.44          | 33      | -10.56 |
| LTE Band 7 Channel 20800 – 10MHz – 16QAM |                  |                  |            |       |             |       |              |                |         |        |
| 2505.00                                  | 86.28            | 121              | 2.1        | H     | 12.28       | 0.43  | 10.60        | 22.45          | 33      | -10.55 |
| 2505.00                                  | 82.43            | 269              | 2.2        | V     | 12.15       | 0.43  | 10.60        | 22.32          | 33      | -10.68 |
| LTE Band 7 Channel 21100 – 10MHz – 16QAM |                  |                  |            |       |             |       |              |                |         |        |
| 2535.00                                  | 86.20            | 189              | 2.2        | H     | 12.20       | 0.43  | 10.60        | 22.37          | 33      | -10.63 |
| 2535.00                                  | 82.44            | 116              | 1.5        | V     | 12.16       | 0.43  | 10.60        | 22.33          | 33      | -10.67 |
| LTE Band 7 Channel 21400 – 10MHz – 16QAM |                  |                  |            |       |             |       |              |                |         |        |
| 2565.00                                  | 86.22            | 70               | 2.5        | H     | 12.11       | 0.43  | 10.60        | 22.28          | 33      | -10.72 |
| 2565.00                                  | 82.43            | 183              | 1.1        | V     | 12.24       | 0.43  | 10.60        | 22.41          | 33      | -10.59 |
| LTE Band 7 Channel 20825 – 15MHz – QPSK  |                  |                  |            |       |             |       |              |                |         |        |
| 2507.50                                  | 86.23            | 351              | 1.4        | H     | 12.23       | 0.43  | 10.60        | 22.40          | 33      | -10.60 |
| 2507.50                                  | 82.51            | 307              | 1.8        | V     | 12.23       | 0.43  | 10.60        | 22.40          | 33      | -10.60 |
| LTE Band 7 Channel 21100 – 15MHz – QPSK  |                  |                  |            |       |             |       |              |                |         |        |
| 2535.00                                  | 86.25            | 23               | 1.8        | H     | 12.25       | 0.43  | 10.60        | 22.42          | 33      | -10.58 |

|                                          |       |     |     |   |       |      |       |       |    |        |
|------------------------------------------|-------|-----|-----|---|-------|------|-------|-------|----|--------|
| 2535.00                                  | 82.52 | 4   | 1.8 | V | 12.24 | 0.43 | 10.60 | 22.41 | 33 | -10.59 |
| LTE Band 7 Channel 21375 – 15MHz – QPSK  |       |     |     |   |       |      |       |       |    |        |
| 2562.50                                  | 86.30 | 106 | 1.1 | H | 12.19 | 0.43 | 10.60 | 22.36 | 33 | -10.64 |
| 2562.50                                  | 82.53 | 326 | 1.1 | V | 12.34 | 0.43 | 10.60 | 22.51 | 33 | -10.49 |
| LTE Band 7 Channel 20825 – 15MHz – 16QAM |       |     |     |   |       |      |       |       |    |        |
| 2507.50                                  | 86.36 | 321 | 1.6 | H | 12.36 | 0.43 | 10.60 | 22.53 | 33 | -10.47 |
| 2507.50                                  | 82.54 | 283 | 1.2 | V | 12.26 | 0.43 | 10.60 | 22.43 | 33 | -10.57 |
| LTE Band 7 Channel 21100 – 15MHz – 16QAM |       |     |     |   |       |      |       |       |    |        |
| 2535.00                                  | 86.36 | 79  | 1.1 | H | 12.36 | 0.43 | 10.60 | 22.53 | 33 | -10.47 |
| 2535.00                                  | 82.56 | 135 | 1.8 | V | 12.28 | 0.43 | 10.60 | 22.45 | 33 | -10.55 |
| LTE Band 7 Channel 21375 – 15MHz – 16QAM |       |     |     |   |       |      |       |       |    |        |
| 2562.50                                  | 86.37 | 122 | 1.6 | H | 12.26 | 0.43 | 10.60 | 22.43 | 33 | -10.57 |
| 2562.50                                  | 82.57 | 136 | 2.4 | V | 12.38 | 0.43 | 10.60 | 22.55 | 33 | -10.45 |
| LTE Band 7 Channel 20850 – 20MHz – QPSK  |       |     |     |   |       |      |       |       |    |        |
| 2510.00                                  | 86.38 | 28  | 1.1 | H | 12.38 | 0.43 | 10.60 | 22.55 | 33 | -10.45 |
| 2510.00                                  | 82.54 | 168 | 1.5 | V | 12.26 | 0.43 | 10.60 | 22.43 | 33 | -10.57 |
| LTE Band 7 Channel 21100 – 20MHz – QPSK  |       |     |     |   |       |      |       |       |    |        |
| 2535.00                                  | 86.39 | 340 | 1.6 | H | 12.39 | 0.43 | 10.60 | 22.56 | 33 | -10.44 |
| 2535.00                                  | 82.57 | 184 | 1.6 | V | 12.29 | 0.43 | 10.60 | 22.46 | 33 | -10.54 |
| LTE Band 7 Channel 21350 – 20MHz – QPSK  |       |     |     |   |       |      |       |       |    |        |
| 2560.00                                  | 86.34 | 19  | 1.7 | H | 12.23 | 0.43 | 10.60 | 22.40 | 33 | -10.60 |
| 2560.00                                  | 82.59 | 194 | 2.2 | V | 12.40 | 0.43 | 10.60 | 22.57 | 33 | -10.43 |
| LTE Band 7 Channel 20850 – 20MHz – 16QAM |       |     |     |   |       |      |       |       |    |        |
| 2510.00                                  | 86.36 | 59  | 1.8 | H | 12.36 | 0.43 | 10.60 | 22.53 | 33 | -10.47 |
| 2510.00                                  | 82.58 | 56  | 1.1 | V | 12.30 | 0.43 | 10.60 | 22.47 | 33 | -10.53 |
| LTE Band 7 Channel 21100 – 20MHz – 16QAM |       |     |     |   |       |      |       |       |    |        |
| 2535.00                                  | 86.38 | 354 | 1.6 | H | 12.38 | 0.43 | 10.60 | 22.55 | 33 | -10.45 |
| 2535.00                                  | 82.59 | 70  | 1.6 | V | 12.31 | 0.43 | 10.60 | 22.48 | 33 | -10.52 |
| LTE Band 7 Channel 21350 – 20MHz – 16QAM |       |     |     |   |       |      |       |       |    |        |
| 2560.00                                  | 86.39 | 244 | 1.1 | H | 12.28 | 0.43 | 10.60 | 22.45 | 33 | -10.55 |
| 2560.00                                  | 82.55 | 336 | 2.3 | V | 12.36 | 0.43 | 10.60 | 22.53 | 33 | -10.47 |

## 9 Peak-to-Average Ratio

|                   |                 |
|-------------------|-----------------|
| Test Requirement: | 27.50(d)        |
| Test Method:      | N/A             |
| Test Mode:        | TX transmitting |

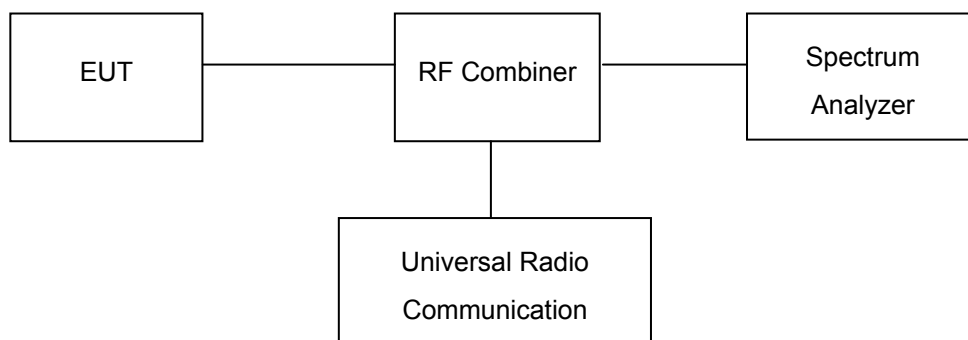
### 9.1 EUT Operation

Operating Environment :

|                       |          |
|-----------------------|----------|
| Temperature:          | 22.5 °C  |
| Humidity:             | 52.3% RH |
| Atmospheric Pressure: | 101.2kPa |

### 9.2 Test Procedure

1. The EUT was connected to spectrum analyzer and system simulator via a power divider.
2. Set EUT to transmit at maximum output power.
3. When the duty cycle is less than 98%, then signal gating will be implemented on the spectrum analyzer by triggering from the system simulator.
4. Set the CCDF (Complementary Cumulative Distribution Function) option of the spectrum analyzer. Record the maximum PAPR level associated with a probability of 0.1%.



### 9.3 Test Result

PASS

#### LTE Band

Please refer to the Appendix Band 4/7 LTE Peak to Average Ratio.

## 10 BANDWIDTH

|                   |                                         |
|-------------------|-----------------------------------------|
| Test Requirement: | FCC Part 2.1049, 27.53(a)               |
| Test Method:      | TIA/EIA-603-D:2010<br>KDB971168 D01 v03 |
| Test Mode:        | TX transmitting                         |

### 10.1 EUT Operation

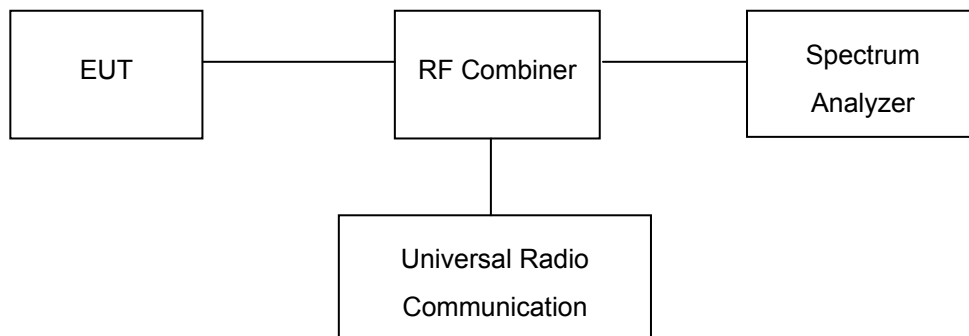
Operating Environment :

|                       |          |
|-----------------------|----------|
| Temperature:          | 22.5 °C  |
| Humidity:             | 52.3% RH |
| Atmospheric Pressure: | 101.2kPa |

### 10.2 Test Procedure

The RF output of the transmitter was connected to the wireless test set and the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set in the range of 1 to 5 % of the anticipated OBW and the 26 dB & 99%bandwidth was recorded.



### 10.3 Test Result

#### LTE Band 4 (Part 27):

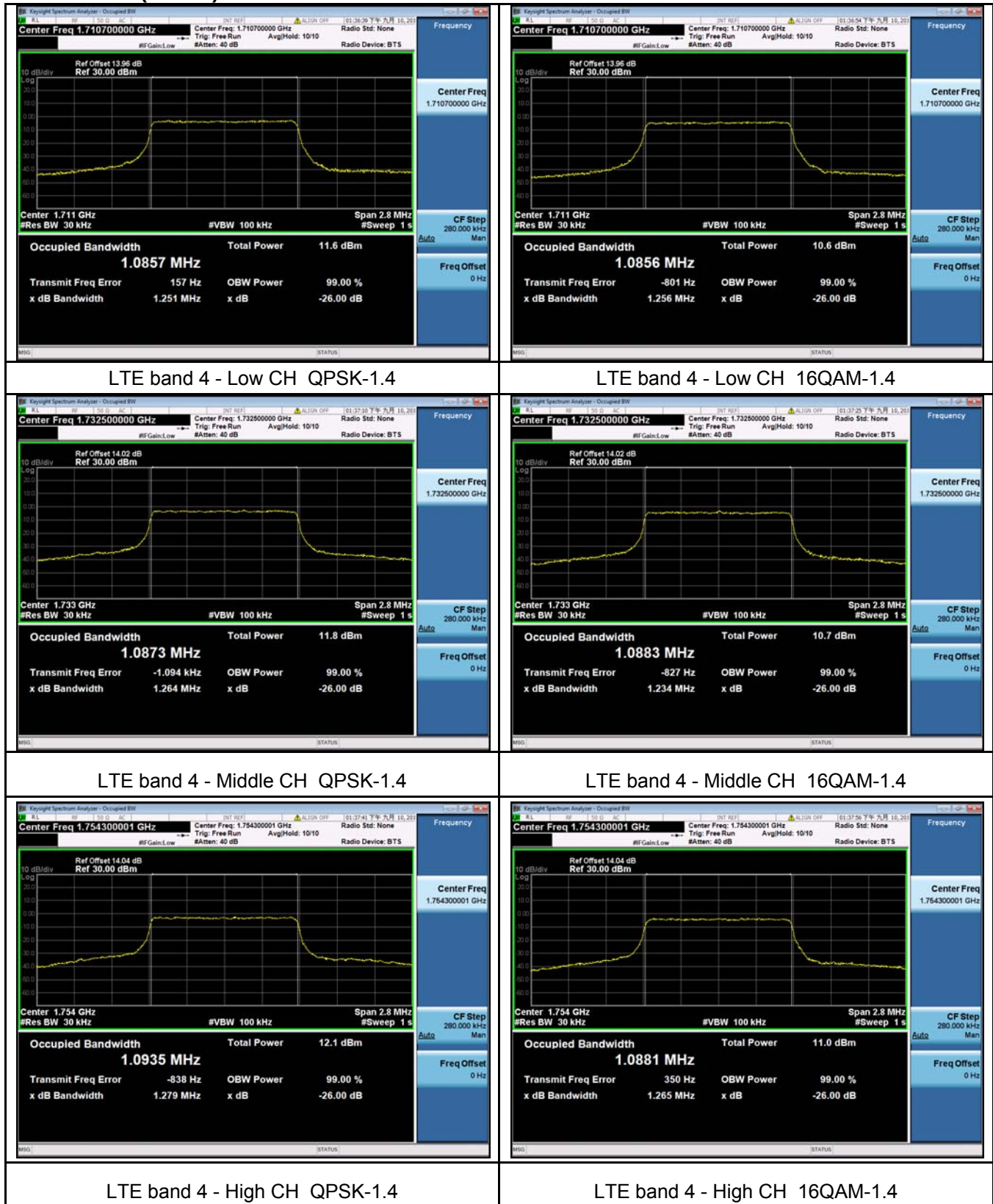
| BW(MHz) | Channel | Frequency (MHz) | Modulation | 99% Occupied Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---------|---------|-----------------|------------|------------------------------|-----------------------|
| 1.4     | 19957   | 1710.7          | QPSK       | 1.09                         | 1.25                  |
|         |         |                 | 16QAM      | 1.09                         | 1.26                  |
| 1.4     | 2.175   | 1732.5          | QPSK       | 1.09                         | 1.26                  |
|         |         |                 | 16QAM      | 1.09                         | 1.23                  |
| 1.4     | 20393   | 1754.3          | QPSK       | 1.09                         | 1.28                  |
|         |         |                 | 16QAM      | 1.09                         | 1.27                  |
| 3       | 19965   | 1711.5          | QPSK       | 2.72                         | 2.97                  |
|         |         |                 | 16QAM      | 2.72                         | 2.96                  |
| 3       | 2.175   | 1732.5          | QPSK       | 2.73                         | 2.97                  |
|         |         |                 | 16QAM      | 2.73                         | 2.97                  |
| 3       | 2.385   | 1753.5          | QPSK       | 2.73                         | 2.98                  |
|         |         |                 | 16QAM      | 2.72                         | 2.97                  |
| 5       | 19975   | 1712.5          | QPSK       | 4.5                          | 4.89                  |
|         |         |                 | 16QAM      | 4.5                          | 4.85                  |
| 5       | 20175   | 1732.5          | QPSK       | 4.5                          | 4.87                  |
|         |         |                 | 16QAM      | 4.5                          | 4.89                  |
| 5       | 20375   | 1752.5          | QPSK       | 4.5                          | 4.88                  |
|         |         |                 | 16QAM      | 4.5                          | 4.88                  |
| 10      | 2000    | 1715            | QPSK       | 8.92                         | 9.42                  |
|         |         |                 | 16QAM      | 8.92                         | 9.4                   |
| 10      | 20175   | 1732.5          | QPSK       | 8.91                         | 9.41                  |
|         |         |                 | 16QAM      | 8.91                         | 9.39                  |
| 10      | 20350   | 1750            | QPSK       | 8.93                         | 9.39                  |
|         |         |                 | 16QAM      | 8.93                         | 9.42                  |
| 15      | 20025   | 1717.5          | QPSK       | 13.46                        | 14.27                 |
|         |         |                 | 16QAM      | 13.46                        | 14.25                 |
| 15      | 20175   | 1732.5          | QPSK       | 13.46                        | 14.31                 |
|         |         |                 | 16QAM      | 13.45                        | 14.28                 |
| 15      | 20325   | 1747.5          | QPSK       | 13.48                        | 14.29                 |
|         |         |                 | 16QAM      | 13.48                        | 14.28                 |
| 20      | 20050   | 1720            | QPSK       | 17.9                         | 18.77                 |

|    |       |        |       |       |       |
|----|-------|--------|-------|-------|-------|
|    |       |        | 16QAM | 17.9  | 18.77 |
| 20 | 20175 | 1732.5 | QPSK  | 17.88 | 18.78 |
|    |       |        | 16QAM | 17.87 | 18.78 |
| 20 | 20300 | 1745   | QPSK  | 17.92 | 18.78 |
|    |       |        | 16QAM | 17.93 | 18.8  |

**LTE Band 7 (Part 27):**

| BW(MHz) | Channel | Frequency (MHz) | Modulation | 99% Occupied Bandwidth (MHz) | 26 dB Bandwidth (MHz) |
|---------|---------|-----------------|------------|------------------------------|-----------------------|
| 5       | 20775   | 2502.5          | QPSK       | 4.5                          | 4.83                  |
|         |         |                 | 16QAM      | 4.5                          | 4.85                  |
| 5       | 21100   | 2535            | QPSK       | 4.5                          | 4.89                  |
|         |         |                 | 16QAM      | 4.5                          | 4.87                  |
| 5       | 21425   | 2567.5          | QPSK       | 4.5                          | 4.85                  |
|         |         |                 | 16QAM      | 4.5                          | 4.87                  |
| 10      | 20850   | 2510            | QPSK       | 8.94                         | 9.43                  |
|         |         |                 | 16QAM      | 8.93                         | 9.4                   |
| 10      | 21100   | 2535            | QPSK       | 8.92                         | 9.36                  |
|         |         |                 | 16QAM      | 8.91                         | 9.37                  |
| 10      | 21400   | 2565            | QPSK       | 8.92                         | 9.38                  |
|         |         |                 | 16QAM      | 8.92                         | 9.38                  |
| 15      | 20800   | 2505            | QPSK       | 13.49                        | 14.28                 |
|         |         |                 | 16QAM      | 13.49                        | 14.29                 |
| 15      | 21100   | 2535            | QPSK       | 13.46                        | 14.26                 |
|         |         |                 | 16QAM      | 13.44                        | 14.26                 |
| 15      | 21375   | 2562.5          | QPSK       | 13.44                        | 14.33                 |
|         |         |                 | 16QAM      | 13.44                        | 14.28                 |
| 20      | 20825   | 2507.5          | QPSK       | 17.92                        | 18.78                 |
|         |         |                 | 16QAM      | 17.92                        | 18.79                 |
| 20      | 21100   | 2535            | QPSK       | 17.88                        | 18.77                 |
|         |         |                 | 16QAM      | 17.88                        | 18.77                 |
| 20      | 21350   | 2560            | QPSK       | 17.86                        | 18.78                 |
|         |         |                 | 16QAM      | 17.87                        | 18.79                 |

### Test Plots LTE Band 4 (Part 27)













## LTE Band 7 (Part 27)









## 11 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

|                   |                                         |
|-------------------|-----------------------------------------|
| Test Requirement: | FCC Part 2.1051, 27.53(h), 27.53(m)(4)  |
| Test Method:      | TIA/EIA-603-D:2010<br>KDB971168 D01 v03 |
| Test Mode:        | TX transmitting                         |

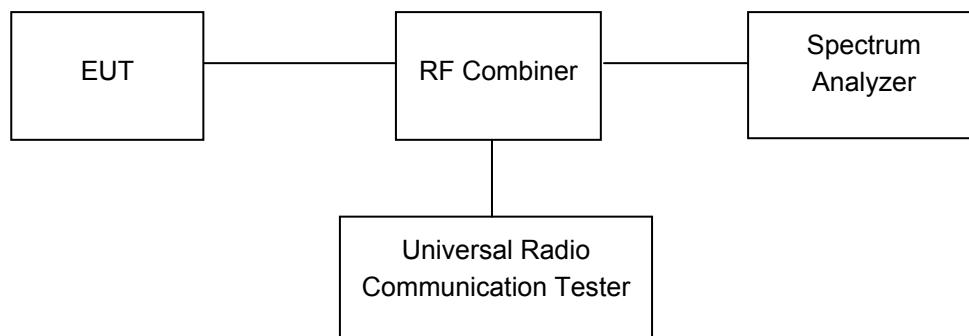
### 11.1 EUT Operation

Operating Environment :

|                       |           |
|-----------------------|-----------|
| Temperature:          | 23.5 °C   |
| Humidity:             | 52.1 % RH |
| Atmospheric Pressure: | 101.3kPa  |

### 11.2 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer and simulator through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 1MHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonics.



### 11.3 Test Result

PASS

#### LTE Band

Please refer to the Appendix Band 4/7 LTE Transmitter Spurious Emissions.

## 12 SPURIOUS RADIATED EMISSIONS

|                   |                                         |
|-------------------|-----------------------------------------|
| Test Requirement: | FCC Part 2.1053, 27.53(h), 27.53(m)(4)  |
| Test Method:      | TIA/EIA-603-D:2010<br>KDB971168 D01 v03 |
| Test Mode:        | TX transmitting                         |

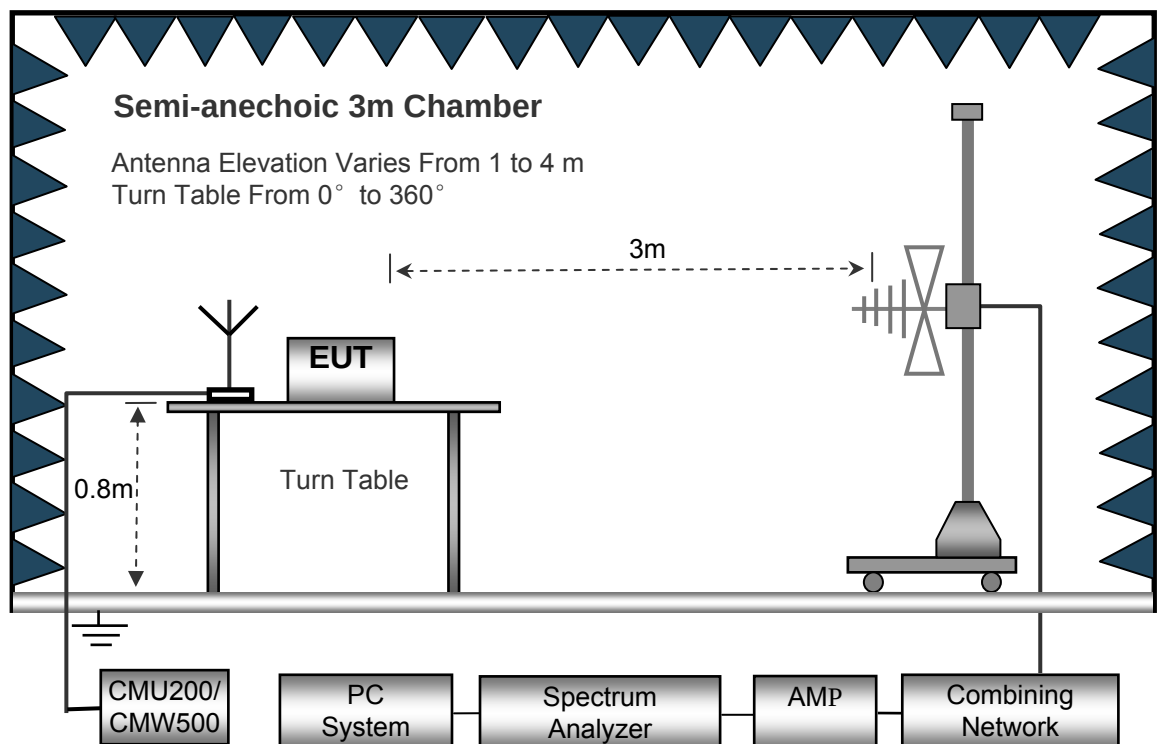
### 12.1 EUT Operation

Operating Environment :

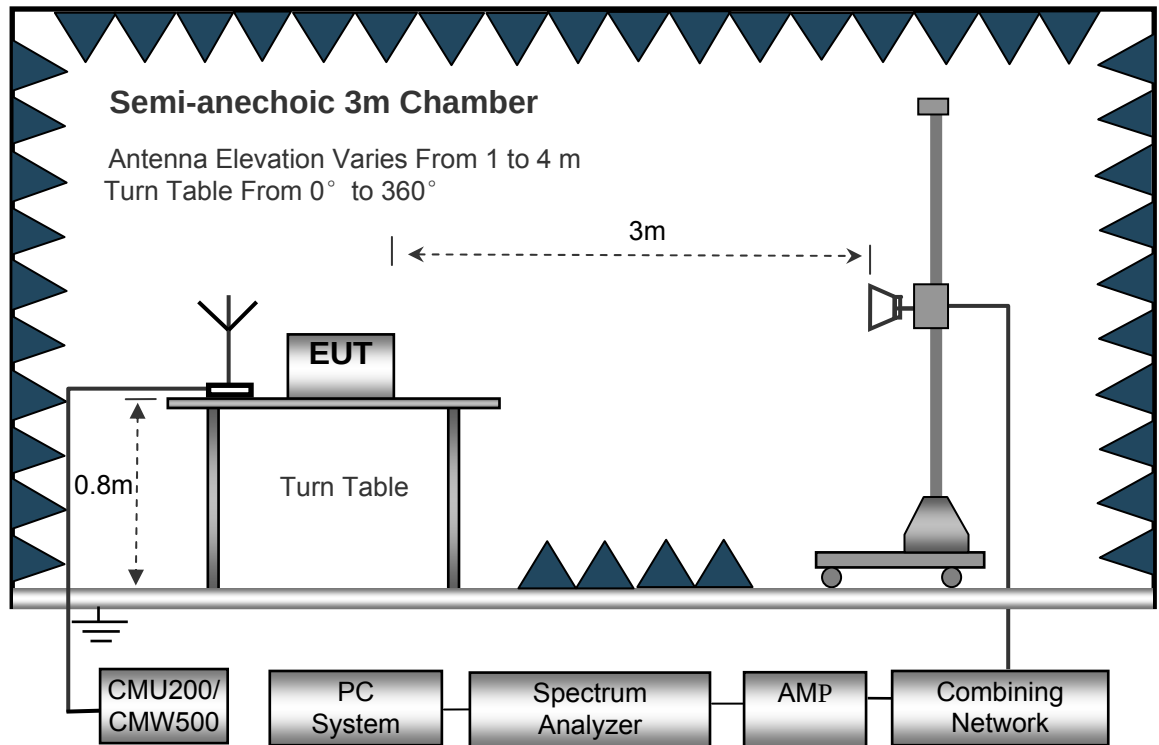
|                       |           |
|-----------------------|-----------|
| Temperature:          | 23.5 °C   |
| Humidity:             | 52.1 % RH |
| Atmospheric Pressure: | 101.2kPa  |

### 12.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site.  
The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



### 12.3 Spectrum Analyzer Setup

30MHz ~ 1GHz

Sweep Speed ..... Auto  
 Detector ..... PK  
 Resolution Bandwidth..... 100kHz  
 Video Bandwidth..... 300kHz

Above 1GHz

Sweep Speed ..... Auto  
 Detector ..... PK  
 Resolution Bandwidth..... 1MHz  
 Video Bandwidth..... 3MHz  
 Detector ..... Ave.  
 Resolution Bandwidth..... 1MHz  
 Video Bandwidth..... 10Hz

## 12.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from 30MHz up to the tenth harmonic of the highest fundamental frequency.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the Z position. So the data shown was the Z position only.
7. 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 =  $10 \lg (\text{TXpwr in Watts}/0.001)$  – the absolute level

Spurious attenuation limit in dB =  $43 + 10 \lg (\text{power out in Watts})$

8. Repeat above procedures until the measurements for all frequencies are completed.

## 12.5 Summary of Test Results

Remark: Test performed from 30MHz to 10<sup>th</sup> harmonics with low/middle/high channels, only the worst data were recorded.

### LTE Band 4

| Frequency                | Receiver Reading | Turn table Angle | RX Antenna |       | Substituted |       |              | Absolute Level | Result |        |
|--------------------------|------------------|------------------|------------|-------|-------------|-------|--------------|----------------|--------|--------|
|                          |                  |                  | Height     | Polar | SG Level    | Cable | Antenna Gain |                | Limit  | Margin |
| (MHz)                    | (dBμV)           | Degree           | (m)        | (H/V) | (dBm)       | (dB)  | (dB)         | (dBm)          | (dBm)  | (dB)   |
| LTE BAND 4 Channel 19957 |                  |                  |            |       |             |       |              |                |        |        |
| 223.12                   | 38.41            | 252              | 2.0        | H     | -72.10      | 0.15  | 0.00         | -72.25         | -13.00 | -59.25 |
| 223.12                   | 31.16            | 308              | 2.0        | V     | -76.43      | 0.15  | 0.00         | -76.58         | -13.00 | -63.58 |
| 3421.40                  | 65.95            | 126              | 1.2        | H     | -47.10      | 2.34  | 12.40        | -37.04         | -13.00 | -24.04 |
| 3421.40                  | 59.98            | 237              | 1.9        | V     | -51.17      | 2.34  | 12.40        | -41.11         | -13.00 | -28.11 |
| 5132.10                  | 53.58            | 258              | 1.9        | H     | -55.83      | 2.79  | 12.70        | -45.92         | -13.00 | -32.92 |
| 5132.10                  | 44.73            | 345              | 1.2        | V     | -64.04      | 2.79  | 12.70        | -54.13         | -13.00 | -41.13 |
| LTE BAND 4 Channel 20175 |                  |                  |            |       |             |       |              |                |        |        |
| 223.12                   | 38.09            | 265              | 1.1        | H     | -72.42      | 0.15  | 0.00         | -72.57         | -13.00 | -59.57 |
| 223.12                   | 30.71            | 238              | 2.1        | V     | -76.88      | 0.15  | 0.00         | -77.03         | -13.00 | -64.03 |
| 3465.00                  | 59.12            | 8                | 1.3        | H     | -53.93      | 2.37  | 12.50        | -43.80         | -13.00 | -30.80 |
| 3465.00                  | 53.62            | 60               | 1.6        | V     | -57.53      | 2.37  | 12.50        | -47.40         | -13.00 | -34.40 |
| 5197.50                  | 45.70            | 108              | 1.3        | H     | -63.71      | 2.79  | 12.70        | -53.80         | -13.00 | -40.80 |
| 5197.50                  | 37.67            | 222              | 1.6        | V     | -71.10      | 2.79  | 12.70        | -61.19         | -13.00 | -48.19 |
| LTE BAND 4 Channel 20393 |                  |                  |            |       |             |       |              |                |        |        |
| 223.12                   | 37.18            | 35               | 1.3        | H     | -73.33      | 0.15  | 0.00         | -73.48         | -13.00 | -60.48 |
| 223.12                   | 30.68            | 201              | 2.1        | V     | -76.91      | 0.15  | 0.00         | -77.06         | -13.00 | -64.06 |
| 3508.60                  | 52.27            | 132              | 1.4        | H     | -60.37      | 2.37  | 12.50        | -50.24         | -13.00 | -37.24 |
| 3508.60                  | 46.88            | 351              | 2.0        | V     | -63.85      | 2.37  | 12.50        | -53.72         | -13.00 | -40.72 |
| 5262.90                  | 38.31            | 3                | 1.8        | H     | -71.27      | 2.81  | 12.80        | -61.28         | -13.00 | -48.28 |
| 5262.90                  | 31.03            | 197              | 2.1        | V     | -77.77      | 2.81  | 12.80        | -67.78         | -13.00 | -54.78 |

**LTE Band 7**

| Frequency                | Receiver Reading | Turn table Angle | RX Antenna |       | Substituted |       |              | Absolute Level | Result |        |
|--------------------------|------------------|------------------|------------|-------|-------------|-------|--------------|----------------|--------|--------|
|                          |                  |                  | Height     | Polar | SG Level    | Cable | Antenna Gain |                | Limit  | Margin |
| (MHz)                    | (dBμV)           | Degree           | (m)        | (H/V) | (dBm)       | (dB)  | (dB)         | (dBm)          | (dBm)  | (dB)   |
| LTE BAND 7 Channel 20775 |                  |                  |            |       |             |       |              |                |        |        |
| 223.12                   | 37.56            | 276              | 1.2        | H     | -72.95      | 0.15  | 0.00         | -73.10         | -25.00 | -48.10 |
| 223.12                   | 30.90            | 276              | 1.9        | V     | -76.69      | 0.15  | 0.00         | -76.84         | -25.00 | -51.84 |
| 5005.00                  | 65.95            | 209              | 1.6        | H     | -43.29      | 2.79  | 12.70        | -33.38         | -25.00 | -8.38  |
| 5005.00                  | 59.98            | 157              | 2.2        | V     | -48.79      | 2.79  | 12.70        | -38.88         | -25.00 | -13.88 |
| 7507.50                  | 53.58            | 261              | 1.9        | H     | -52.96      | 3.12  | 11.50        | -44.58         | -25.00 | -19.58 |
| 7507.50                  | 44.73            | 160              | 1.3        | V     | -60.70      | 3.12  | 11.50        | -52.32         | -25.00 | -27.32 |
| LTE BAND 7 Channel 21100 |                  |                  |            |       |             |       |              |                |        |        |
| 223.12                   | 37.39            | 86               | 1.7        | H     | -73.12      | 0.15  | 0.00         | -73.27         | -25.00 | -48.27 |
| 223.12                   | 31.01            | 345              | 1.6        | V     | -76.58      | 0.15  | 0.00         | -76.73         | -25.00 | -51.73 |
| 5070.00                  | 58.57            | 131              | 1.9        | H     | -50.67      | 2.37  | 12.50        | -40.54         | -25.00 | -15.54 |
| 5070.00                  | 52.91            | 132              | 1.7        | V     | -55.86      | 2.37  | 12.50        | -45.73         | -25.00 | -20.73 |
| 7605.00                  | 45.92            | 215              | 1.6        | H     | -60.62      | 3.12  | 11.50        | -52.24         | -25.00 | -27.24 |
| 7605.00                  | 37.78            | 33               | 1.3        | V     | -67.65      | 3.12  | 11.50        | -59.27         | -25.00 | -34.27 |
| LTE BAND 7 Channel 21425 |                  |                  |            |       |             |       |              |                |        |        |
| 223.12                   | 37.39            | 349              | 1.5        | H     | -73.12      | 0.15  | 0.00         | -73.27         | -25.00 | -48.27 |
| 223.12                   | 30.15            | 81               | 1.0        | V     | -77.44      | 0.15  | 0.00         | -77.59         | -25.00 | -52.59 |
| 5135.00                  | 50.93            | 128              | 1.6        | H     | -58.48      | 2.37  | 12.50        | -48.35         | -25.00 | -23.35 |
| 5135.00                  | 46.77            | 121              | 2.0        | V     | -62.00      | 2.37  | 12.50        | -51.87         | -25.00 | -26.87 |
| 7702.50                  | 39.08            | 270              | 2.1        | H     | -66.15      | 3.12  | 11.50        | -57.77         | -25.00 | -32.77 |
| 7702.50                  | 31.09            | 258              | 1.0        | V     | -73.80      | 3.12  | 11.50        | -65.42         | -25.00 | -40.42 |

Note: 1) Absolute Level = SG Level - Cable loss + Antenna Gain

2) Margin = Absolute Level - Limit

## 13 Band Edge Measurement

|                   |                                         |
|-------------------|-----------------------------------------|
| Test Requirement: | FCC Part 2.1051, 27.53(h), 27.53(m)(4)  |
| Test Method:      | TIA/EIA-603-D:2010<br>KDB971168 D01 v03 |
| Test Mode:        | TX transmitting                         |

### 13.1 EUT Operation

Operating Environment :

|                       |           |
|-----------------------|-----------|
| Temperature:          | 23.5 °C   |
| Humidity:             | 52.3 % RH |
| Atmospheric Pressure: | 101.3kPa  |

### 13.2 Test Procedure

The RF output of the transmitter was connected to the input of the spectrum analyzer through sufficient attenuation.

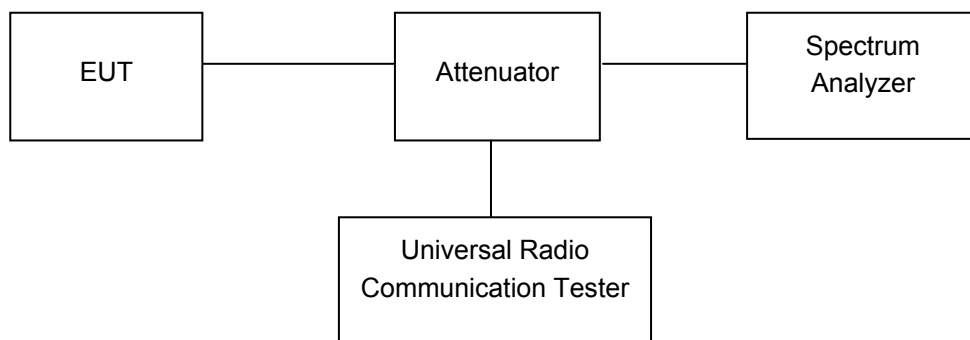
According to FCC Part 22.917(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the TX transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

According to FCC Part 24.238(a), the power of any emissions outside of the authorized operating frequency ranges must be attenuated below the TX transmitting power (P) by a factor of at least  $43 + 10 \log(P)$  dB.

According to FCC Part 27.53(h), Except as otherwise specified below, for operations in the 1695-1710 MHz, 1710-1755 MHz, 1755-1780 MHz, 1915-1920 MHz, 1995-2000 MHz, 2000-2020 MHz, 2110-2155 MHz, 2155-2180 MHz, and 2180-2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

According to FCC Part 27.53(m)(4), For mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log(P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log(P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log(P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

The center of the spectrum analyzer was set to block edge frequency  
Waltek Services (Shenzhen) Co.,Ltd.  
<http://www.waltek.com.cn>



### 13.3 Test Result

PASS

#### LTE Band

Please refer to the Appendix Band 4/7 LTE Band Edge.

## 14 FREQUENCY STABILITY

|                   |                                         |
|-------------------|-----------------------------------------|
| Test Requirement: | FCC Part 2.1055, 27.5(h),27.54          |
| Test Method:      | TIA/EIA-603-D:2010<br>KDB971168 D01 v03 |
| Test Mode:        | TX transmitting                         |

### 14.1 EUT Operation

Operating Environment :

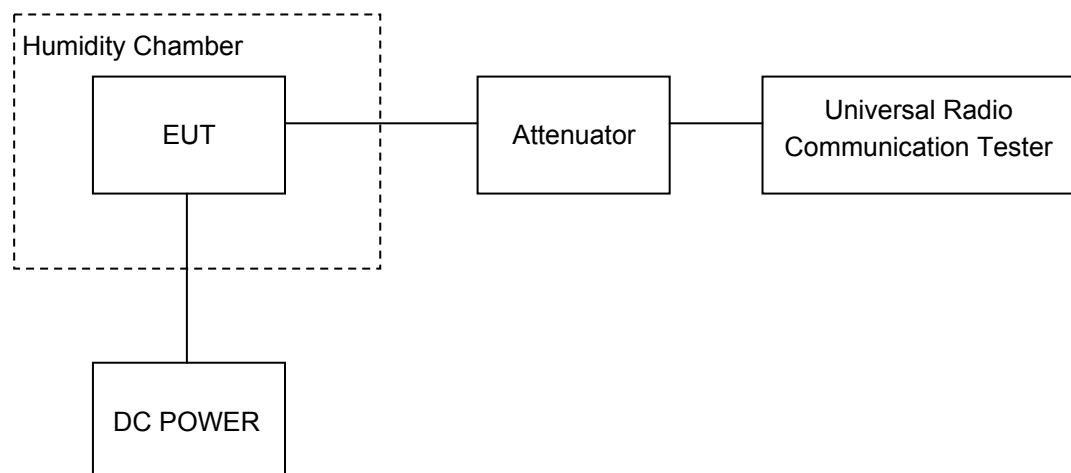
|                       |           |
|-----------------------|-----------|
| Temperature:          | 22.9 °C   |
| Humidity:             | 52.0 % RH |
| Atmospheric Pressure: | 101.3kPa  |

### 14.2 Test Procedure

Frequency Stability vs. Temperature: The equipment under test was connected to an external DC power supply and the RF output was connected to communication test set via feed-through attenuators. The EUT was placed inside the temperature chamber. The DC leads and RF output cable exited the chamber through an opening made for the purpose.

After the temperature stabilized for approximately 20 minutes, the frequency output was recorded from the communication test set.

Frequency Stability vs. Voltage: For hand carried, battery powered equipment; reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.



### 14.3 Test Result

LTE Band 4

| Test Frequency:1732.5MHz QPSK 1.4MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.7                | 7                    | 0.0040                | 2.5         |
| 40                                   |                    | 6                    | 0.0035                | 2.5         |
| 30                                   |                    | 9                    | 0.0052                | 2.5         |
| 20                                   |                    | 2                    | 0.0010                | 2.5         |
| 10                                   |                    | -1                   | -0.0006               | 2.5         |
| 0                                    |                    | -1                   | -0.0006               | 2.5         |
| -10                                  |                    | 6                    | 0.0035                | 2.5         |
| -20                                  |                    | 7                    | 0.0040                | 2.5         |
| -30                                  |                    | -5                   | -0.0029               | 2.5         |
| 20                                   | 3.3                | -3                   | -0.0017               | 2.5         |
| 20                                   | 4.1                | 9                    | 0.0052                | 2.5         |

| Test Frequency:1732.5MHz 16QAM 1.4MHz |                    |                      |                       |             |
|---------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                      | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                    | 3.7                | 6                    | 0.0035                | 2.5         |
| 40                                    |                    | 5                    | 0.0029                | 2.5         |
| 30                                    |                    | -5                   | -0.0029               | 2.5         |
| 20                                    |                    | 3                    | 0.0017                | 2.5         |
| 10                                    |                    | 10                   | 0.0058                | 2.5         |
| 0                                     |                    | 11                   | 0.0063                | 2.5         |
| -10                                   |                    | 2                    | 0.0012                | 2.5         |
| -20                                   |                    | 7                    | 0.0040                | 2.5         |
| -30                                   |                    | -4                   | -0.0023               | 2.5         |
| 20                                    | 3.3                | 8                    | 0.0046                | 2.5         |
| 20                                    | 4.1                | -2                   | -0.0012               | 2.5         |

## LTE Band 4

| Test Frequency:1732.5MHz QPSK 3MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.7                | 1                    | 0.0006                | 2.5         |
| 40                                 |                    | 4                    | 0.0023                | 2.5         |
| 30                                 |                    | 4                    | 0.0023                | 2.5         |
| 20                                 |                    | 5                    | 0.0029                | 2.5         |
| 10                                 |                    | 7                    | 0.0040                | 2.5         |
| 0                                  |                    | 12                   | 0.0069                | 2.5         |
| -10                                |                    | 13                   | 0.0075                | 2.5         |
| -20                                |                    | 11                   | 0.0063                | 2.5         |
| -30                                |                    | -3                   | -0.0017               | 2.5         |
| 20                                 | 3.3                | 14                   | 0.0081                | 2.5         |
| 20                                 | 4.1                | 4                    | 0.0023                | 2.5         |

| Test Frequency:1732.5MHz 16QAM 3MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.7                | 6                    | 0.0035                | 2.5         |
| 40                                  |                    | 1                    | 0.0006                | 2.5         |
| 30                                  |                    | 4                    | 0.0023                | 2.5         |
| 20                                  |                    | 0                    | 0.0000                | 2.5         |
| 10                                  |                    | 8                    | 0.0046                | 2.5         |
| 0                                   |                    | -2                   | -0.0012               | 2.5         |
| -10                                 |                    | 6                    | 0.0035                | 2.5         |
| -20                                 |                    | 9                    | 0.0052                | 2.5         |
| -30                                 |                    | 2                    | 0.0012                | 2.5         |
| 20                                  | 3.3                | -9                   | -0.0052               | 2.5         |
| 20                                  | 4.1                | -3                   | -0.0017               | 2.5         |

## LTE Band 4

| Test Frequency:1732.5MHz QPSK 5MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.7                | (Hz)                 | (ppm)                 | (ppm)       |
| 40                                 |                    | 4                    | 0.0023                | 2.5         |
| 30                                 |                    | 0                    | 0.0000                | 2.5         |
| 20                                 |                    | 13                   | 0.0075                | 2.5         |
| 10                                 |                    | 5                    | 0.0029                | 2.5         |
| 0                                  |                    | 12                   | 0.0069                | 2.5         |
| -10                                |                    | 11                   | 0.0063                | 2.5         |
| -20                                |                    | 10                   | 0.0058                | 2.5         |
| -30                                |                    | 2                    | 0.0012                | 2.5         |
| 20                                 | 3.3                | 6                    | 0.0035                | 2.5         |
| 20                                 | 4.1                | 3                    | 0.0017                | 2.5         |

| Test Frequency:1732.5MHz 16QAM 5MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.7                | 1                    | 0.0006                | 2.5         |
| 40                                  |                    | -2                   | -0.0012               | 2.5         |
| 30                                  |                    | 7                    | 0.0040                | 2.5         |
| 20                                  |                    | 6                    | 0.0035                | 2.5         |
| 10                                  |                    | 0                    | 0.0000                | 2.5         |
| 0                                   |                    | 4                    | 0.0023                | 2.5         |
| -10                                 |                    | -1                   | -0.0006               | 2.5         |
| -20                                 |                    | 5                    | 0.0029                | 2.5         |
| -30                                 |                    | -1                   | -0.0006               | 2.5         |
| 20                                  | 3.3                | 9                    | 0.0052                | 2.5         |
| 20                                  | 4.1                | 9                    | 0.0052                | 2.5         |

## LTE Band 4

| Test Frequency:1732.5MHz QPSK 10MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.7                | 13                   | 0.0075                | 2.5         |
| 40                                  |                    | 13                   | 0.0075                | 2.5         |
| 30                                  |                    | -2                   | -0.0012               | 2.5         |
| 20                                  |                    | 7                    | 0.0040                | 2.5         |
| 10                                  |                    | 13                   | 0.0075                | 2.5         |
| 0                                   |                    | 2                    | 0.0012                | 2.5         |
| -10                                 |                    | 0                    | 0.0000                | 2.5         |
| -20                                 |                    | 5                    | 0.0029                | 2.5         |
| -30                                 |                    | 3                    | 0.0017                | 2.5         |
| 20                                  | 3.3                | 15                   | 0.0087                | 2.5         |
| 20                                  | 4.1                | 8                    | 0.0046                | 2.5         |

| Test Frequency:1732.5MHz 16QAM 10MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.7                | -7                   | -0.0040               | 2.5         |
| 40                                   |                    | -2                   | -0.0012               | 2.5         |
| 30                                   |                    | 1                    | 0.0006                | 2.5         |
| 20                                   |                    | -1                   | -0.0006               | 2.5         |
| 10                                   |                    | -9                   | -0.0052               | 2.5         |
| 0                                    |                    | -8                   | -0.0046               | 2.5         |
| -10                                  |                    | -5                   | -0.0029               | 2.5         |
| -20                                  |                    | 8                    | 0.0046                | 2.5         |
| -30                                  |                    | -2                   | -0.0012               | 2.5         |
| 20                                   | 3.3                | 6                    | 0.0035                | 2.5         |
| 20                                   | 4.1                | -6                   | -0.0035               | 2.5         |

## LTE Band 4

| Test Frequency:1732.5MHz QPSK 15MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.7                | 1                    | 0.0006                | 2.5         |
| 40                                  |                    | 7                    | 0.0040                | 2.5         |
| 30                                  |                    | 6                    | 0.0035                | 2.5         |
| 20                                  |                    | -2                   | -0.0012               | 2.5         |
| 10                                  |                    | -2                   | -0.0012               | 2.5         |
| 0                                   |                    | -7                   | -0.0040               | 2.5         |
| -10                                 |                    | -8                   | -0.0046               | 2.5         |
| -20                                 |                    | -10                  | -0.0058               | 2.5         |
| -30                                 |                    | -10                  | -0.0058               | 2.5         |
| 20                                  | 3.3                | -6                   | -0.0035               | 2.5         |
| 20                                  | 4.1                | -1                   | -0.0006               | 2.5         |

| Test Frequency:1732.5MHz 16QAM 15MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.7                | 1                    | 0.0006                | 2.5         |
| 40                                   |                    | -5                   | -0.0029               | 2.5         |
| 30                                   |                    | -9                   | -0.0052               | 2.5         |
| 20                                   |                    | -3                   | -0.0017               | 2.5         |
| 10                                   |                    | -5                   | -0.0029               | 2.5         |
| 0                                    |                    | -6                   | -0.0035               | 2.5         |
| -10                                  |                    | -3                   | -0.0017               | 2.5         |
| -20                                  |                    | -4                   | -0.0023               | 2.5         |
| -30                                  |                    | 4                    | 0.0023                | 2.5         |
| 20                                   | 3.3                | -6                   | -0.0035               | 2.5         |
| 20                                   | 4.1                | -6                   | -0.0035               | 2.5         |

## LTE Band 4

| Test Frequency:1732.5MHz QPSK 20MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.7                | -11                  | -0.0063               | 2.5         |
| 40                                  |                    | -13                  | -0.0075               | 2.5         |
| 30                                  |                    | -1                   | -0.0006               | 2.5         |
| 20                                  |                    | -4                   | -0.0023               | 2.5         |
| 10                                  |                    | -11                  | -0.0063               | 2.5         |
| 0                                   |                    | -4                   | -0.0023               | 2.5         |
| -10                                 |                    | -12                  | -0.0069               | 2.5         |
| -20                                 |                    | 2                    | 0.0012                | 2.5         |
| -30                                 |                    | 3                    | 0.0017                | 2.5         |
| 20                                  | 3.3                | 3                    | 0.0017                | 2.5         |
| 20                                  | 4.1                | -7                   | -0.0040               | 2.5         |

| Test Frequency:1732.5MHz 16QAM 20MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.7                | -5                   | -0.0029               | 2.5         |
| 40                                   |                    | 0                    | 0.0000                | 2.5         |
| 30                                   |                    | -2                   | -0.0012               | 2.5         |
| 20                                   |                    | -5                   | -0.0029               | 2.5         |
| 10                                   |                    | -7                   | -0.0040               | 2.5         |
| 0                                    |                    | -9                   | -0.0052               | 2.5         |
| -10                                  |                    | -4                   | -0.0023               | 2.5         |
| -20                                  |                    | -13                  | -0.0075               | 2.5         |
| -30                                  |                    | -2                   | -0.0012               | 2.5         |
| 20                                   | 3.3                | -9                   | -0.0052               | 2.5         |
| 20                                   | 4.1                | -10                  | -0.0058               | 2.5         |

## LTE Band 7

| Test Frequency:2535MHz QPSK 5MHz |                    |                      |                       |             |
|----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                 | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                               | 3.7                | 2                    | 0.0008                | 2.5         |
| 40                               |                    | 5                    | 0.0020                | 2.5         |
| 30                               |                    | 9                    | 0.0036                | 2.5         |
| 20                               |                    | 3                    | 0.0012                | 2.5         |
| 10                               |                    | 8                    | 0.0032                | 2.5         |
| 0                                |                    | 5                    | 0.0020                | 2.5         |
| -10                              |                    | 4                    | 0.0016                | 2.5         |
| -20                              |                    | 0                    | 0.0000                | 2.5         |
| -30                              |                    | 9                    | 0.0036                | 2.5         |
| 20                               | 3.3                | 0                    | 0.0000                | 2.5         |
| 20                               | 4.1                | -5                   | -0.0020               | 2.5         |

| Test Frequency:2535MHz 16QAM 5MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.7                | -8                   | -0.0032               | 2.5         |
| 40                                |                    | -1                   | -0.0004               | 2.5         |
| 30                                |                    | 2                    | 0.0008                | 2.5         |
| 20                                |                    | 0                    | 0.0000                | 2.5         |
| 10                                |                    | 0                    | 0.0000                | 2.5         |
| 0                                 |                    | -4                   | -0.0016               | 2.5         |
| -10                               |                    | -5                   | -0.0020               | 2.5         |
| -20                               |                    | 0                    | 0.0000                | 2.5         |
| -30                               |                    | -4                   | -0.0016               | 2.5         |
| 20                                | 3.3                | 6                    | 0.0024                | 2.5         |
| 20                                | 4.1                | 8                    | 0.0032                | 2.5         |

## LTE Band 7

| Test Frequency:2535MHz QPSK 10MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.7                | 6                    | 0.0024                | (ppm)       |
| 40                                |                    | 6                    | 0.0024                | 2.5         |
| 30                                |                    | 14                   | 0.0055                | 2.5         |
| 20                                |                    | 6                    | 0.0024                | 2.5         |
| 10                                |                    | 0                    | 0.0000                | 2.5         |
| 0                                 |                    | 15                   | 0.0059                | 2.5         |
| -10                               |                    | -1                   | -0.0004               | 2.5         |
| -20                               |                    | 13                   | 0.0051                | 2.5         |
| -30                               |                    | 8                    | 0.0032                | 2.5         |
| 20                                | 3.3                | -3                   | -0.0012               | 2.5         |
| 20                                | 4.1                | 1                    | 0.0004                | 2.5         |

| Test Frequency:2535MHz 16QAM 10MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.7                | 0                    | 0.0000                | 2.5         |
| 40                                 |                    | 9                    | 0.0036                | 2.5         |
| 30                                 |                    | -2                   | -0.0008               | 2.5         |
| 20                                 |                    | 5                    | 0.0020                | 2.5         |
| 10                                 |                    | 5                    | 0.0020                | 2.5         |
| 0                                  |                    | 7                    | 0.0028                | 2.5         |
| -10                                |                    | 6                    | 0.0024                | 2.5         |
| -20                                |                    | 10                   | 0.0039                | 2.5         |
| -30                                |                    | 14                   | 0.0055                | 2.5         |
| 20                                 | 3.3                | 0                    | 0.0000                | 2.5         |
| 20                                 | 4.1                | 6                    | 0.0024                | 2.5         |

## LTE Band 7

| Test Frequency:2535MHz QPSK 15MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.7                | -8                   | -0.0032               | 2.5         |
| 40                                |                    | 4                    | 0.0016                | 2.5         |
| 30                                |                    | 4                    | 0.0016                | 2.5         |
| 20                                |                    | 0                    | 0.0000                | 2.5         |
| 10                                |                    | -5                   | -0.0020               | 2.5         |
| 0                                 |                    | -5                   | -0.0020               | 2.5         |
| -10                               |                    | -9                   | -0.0036               | 2.5         |
| -20                               |                    | 0                    | 0.0000                | 2.5         |
| -30                               |                    | 2                    | 0.0008                | 2.5         |
| 20                                | 3.3                | 7                    | 0.0028                | 2.5         |
| 20                                | 4.1                | 6                    | 0.0024                | 2.5         |

| Test Frequency:2535MHz 16QAM 15MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.7                | 10                   | 0.0039                | 2.5         |
| 40                                 |                    | 1                    | 0.0004                | 2.5         |
| 30                                 |                    | 16                   | 0.0063                | 2.5         |
| 20                                 |                    | 8                    | 0.0032                | 2.5         |
| 10                                 |                    | 8                    | 0.0032                | 2.5         |
| 0                                  |                    | 4                    | 0.0016                | 2.5         |
| -10                                |                    | -1                   | -0.0004               | 2.5         |
| -20                                |                    | 8                    | 0.0032                | 2.5         |
| -30                                |                    | 5                    | 0.0020                | 2.5         |
| 20                                 | 3.3                | 4                    | 0.0016                | 2.5         |
| 20                                 | 4.1                | 10                   | 0.0039                | 2.5         |

## LTE Band 7

| Test Frequency:2535MHz QPSK 20MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.7                | 4                    | 0.0016                | 2.5         |
| 40                                |                    | -9                   | -0.0036               | 2.5         |
| 30                                |                    | -4                   | -0.0016               | 2.5         |
| 20                                |                    | -1                   | -0.0004               | 2.5         |
| 10                                |                    | 5                    | 0.0020                | 2.5         |
| 0                                 |                    | 7                    | 0.0028                | 2.5         |
| -10                               |                    | -7                   | -0.0028               | 2.5         |
| -20                               |                    | 5                    | 0.0020                | 2.5         |
| -30                               |                    | -5                   | -0.0020               | 2.5         |
| 20                                | 3.3                | 3                    | 0.0012                | 2.5         |
| 20                                | 4.1                | -5                   | -0.0020               | 2.5         |

| Test Frequency:2535MHz 16QAM 20MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.7                | -6                   | -0.0024               | 2.5         |
| 40                                 |                    | 2                    | 0.0008                | 2.5         |
| 30                                 |                    | -9                   | -0.0036               | 2.5         |
| 20                                 |                    | -2                   | -0.0008               | 2.5         |
| 10                                 |                    | 5                    | 0.0020                | 2.5         |
| 0                                  |                    | 2                    | 0.0008                | 2.5         |
| -10                                |                    | 4                    | 0.0016                | 2.5         |
| -20                                |                    | 4                    | 0.0016                | 2.5         |
| -30                                |                    | 4                    | 0.0016                | 2.5         |
| 20                                 | 3.3                | 0                    | 0.0000                | 2.5         |
| 20                                 | 4.1                | 0                    | 0.0000                | 2.5         |

## **15 RF Exposure**

Remark: refer to SAR test report: WTS18S08120418W.

## **16 Photographs of test setup and EUT.**

Note: Please refer to appendix: WTS18S08120417W\_Photo.

===== End of Report =====