

# 🥇 Shenzhen Zhongjian Nanfang Testing Co., Ltd.

Report No: CCISE161106105

# **FCC REPORT**

(LTE)

Applicant: Shenzhen RodinBell Technology Co., Ltd.

Address of Applicant: 905#, Tower B, Xinghe WORLD, Wuhe Avenue, Longgang

District, Shenzhen City, PRC

**Equipment Under Test (EUT)** 

Product Name: ORCA-50 Handheld Data Terminal

Model No.: ORCA-50

FCC ID: 2AKQD-ORCA-50

FCC CFR Title 47 Part 2

FCC CFR Title 47 Part 24 Subpart E

Applicable standards: FCC CFR Title 47 Part 22 Subpart H

FCC CFR Title 47 Part 27 Subpart L FCC CFR Title 47 Part 27 Subpart H

Date of sample receipt: 19 Dec., 2016

**Date of Test:** 19 Dec., 2016 to 03 Jan., 2017

Date of report issued: 04 Jan., 2017

Test Result: PASS\*

\* In the configuration tested, the EUT complied with the standards specified above.

#### Authorized Signature:



Bruce Zhang Laboratory Manager

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

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# 2. Version

| Version No. | Date          | Description                              |
|-------------|---------------|--|
|             |               | Main board with wireless module (FCC ID: |
|             |               | QISME909U-523) and same antenna were     |
| 00          | 04 Jan., 2017 | used by the device, only ERP, EIRP       |
|             |               | Measurement and Radiated emission were   |
|             |               | re-tested.                               |
|             |               |  |
|             |               |  |
|             |               |  |
|             |               |  |

| Tested by: | Carey Chen    | Date: | 04 Jan., 2017 |
|------------|---------------|-------|---------------|
|            | Test Engineer |       |               |

Project Engineer Date: Reviewed by: 04 Jan., 2017



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4. Test Summary

| Test Item                              | Section in CFR 47   | Result                                    |
|--|---|---|
| RF Exposure (SAR)                      | Part 1.1307<br>Part 2.1093  | Passed<br>(Please refer to<br>SAR Report) |
| RF Output Power                        | Part 2.1046 Part 24.232 (c) Part 27.50 (c)(10) Part 27.50 (d)(4) Part 22.913 (a)(2) | Pass*                                     |
| Peak-to-Average Ratio                  | Part 24.232 (d)   | Pass*                                     |
| Modulation Characteristics             | Part 2.1047   | Pass*                                     |
| 99% & -26 dB Occupied Bandwidth        | Part 2.1049 Part 24.238 Part 27.53(g) Part 27.53(h) Part 22.917(b)                  | Pass*                                     |
| Spurious Emissions at Antenna Terminal | Part 2.1051 Part 24.238 (a) Part 27.53 (g) Part 27.53 (h) Part 22.917(a)            | Pass*                                     |
| Field Strength of Spurious Radiation   | Part 2.1053 Part 24.238 (a) Part 27.53 (g) Part 27.53 (h) Part 22.917(a)            | Pass                                      |
| Out of band emission, Band Edge        | Part 24.238 (a) Part 27.53 (g) Part 27.53 (h) Part 22.917(a)                        | Pass*                                     |
| Frequency stability vs. temperature    | Part 2.1055(a)(1)(b)  | Pass*                                     |
| Frequency stability vs. voltage        | Part 2.1055(d)(1)(2)  | Pass*                                     |

Pass: The EUT complies with the essential requirements in the standard.

Pass\*: The test data refer to FCC ID: QISME909U-523.



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# 5. General Information

# **5.1 Client Information**

| Applicant:               | Shenzhen RodinBell Technology Co., Ltd.   |
|--------------------------|---|
| Address of Applicant:    | 905#, Tower B, Xinghe WORLD, Wuhe Avenue, Longgang District, Shenzhen City, PRC |
| Manufacturer:            | Shenzhen RodinBell Technology Co., Ltd.   |
| Address of Manufacturer: | 905#, Tower B, Xinghe WORLD, Wuhe Avenue, Longgang District, Shenzhen City, PRC |

# 5.2 General Description of E.U.T.

| ·                          |  |
|----------------------------|--|
| Product Name:              | ORCA-50 Handheld Data Terminal   |
| Model No.:                 | ORCA-50  |
| Operation Frequency range: | LTE Band 2: TX: 1850MHz-1910MHz, RX: 1930MHz-1990MHz<br>LTE Band 4:TX: 1710MHz-1755MHz, RX: 2110MHz-2155MHz<br>LTE Band 5:TX: 824MHz-849MHz, RX: 869MHz-894MHz<br>LTE Band 17: TX: 704MHz -716MHz, RX: 734MHz-746MHz |
| Modulation type:           | QPSK, 16QAM  |
| Antenna type:              | Internal Antenna   |
| Antenna gain:              | LTE Band 2: 0dBi<br>LTE Band 4: 0dBi<br>LTE Band 5: 0dBi<br>LTE Band 17: 0dBi  |
| AC adapter:                | Model: HKC0115020-2B<br>Input: AC100-240V 50/60Hz 0.5A<br>Output: DC 5.0V, 2A  |
| Power supply:              | Rechargeable Li-ion Battery DC3.7V-6000mAh   |



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Regards to the operating frequency range, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channels as below:

| LTE Band 2(1.4MHz) |               |                 | LTE Band 2(3MHz)  |               |                 |
|--------------------|---------------|-----------------|-------------------|---------------|-----------------|
| Channe             | el .          | Frequency (MHz) | Channel           |               | Frequency (MHz) |
| Lowest channel     | 18607         | 1850.70         | Lowest channel    | 18615         | 1851.50         |
| Middle channel     | 18900         | 1880.00         | Middle channel    | 18900         | 1880.00         |
| Highest channel    | 19193         | 1909.30         | Highest channel   | 19185         | 1908.50         |
| LT                 | E Band 2(5MH  | z)              | LTE               | E Band 2(10MF | Hz)             |
| Channe             | el            | Frequency (MHz) | Channel           |               | Frequency (MHz) |
| Lowest channel     | 18625         | 1852.50         | Lowest channel    | 18650         | 1855.00         |
| Middle channel     | 18900         | 1880.00         | Middle channel    | 18900         | 1880.00         |
| Highest channel    | 19175         | 1907.50         | Highest channel   | 19150         | 1905.00         |
| LTE                | E Band 2(15MH | łz)             | LTE Band 2(20MHz) |               |                 |
| Channe             | yl .          | Frequency (MHz) | Channel           |               | Frequency (MHz) |
| Lowest channel     | 18675         | 1857.50         | Lowest channel    | 18700         | 1860.00         |
| Middle channel     | 18900         | 1880.00         | Middle channel    | 18900         | 1880.00         |
| Highest channel    | 19125         | 1902.50         | Highest channel   | 19100         | 1900.00         |

| LTE Band 4(1.4MHz) |               |                 | LTE Band 4(3MHz)  |               |                 |
|--------------------|---------------|-----------------|-------------------|---------------|-----------------|
| Channe             | l:            | Frequency (MHz) | Channel           |               | Frequency (MHz) |
| Lowest channel     | 19957         | 1710.70         | Lowest channel    | 19965         | 1711.50         |
| Middle channel     | 20175         | 1732.50         | Middle channel    | 20175         | 1732.50         |
| Highest channel    | 20393         | 1754.30         | Highest channel   | 20385         | 1753.50         |
| LT                 | E Band 4(5MH  | z)              | LTE               | E Band 4(10MF | Hz)             |
| Channe             | el            | Frequency (MHz) | Channel           |               | Frequency (MHz) |
| Lowest channel     | 19975         | 1712.50         | Lowest channel    | 20000         | 1715.00         |
| Middle channel     | 20175         | 1732.50         | Middle channel    | 20175         | 1732.50         |
| Highest channel    | 20375         | 1752.50         | Highest channel   | 20350         | 1750.00         |
| LTE                | E Band 4(15MF | łz)             | LTE Band 4(20MHz) |               |                 |
| Channe             | el .          | Frequency (MHz) | Channel           |               | Frequency (MHz) |
| Lowest channel     | 20025         | 1717.50         | Lowest channel    | 20050         | 1720.00         |
| Middle channel     | 20175         | 1732.50         | Middle channel    | 20175         | 1732.50         |
| Highest channel    | 20325         | 1747.50         | Highest channel   | 20300         | 1745.00         |





| LTE Band 5(1.4MHz) |                            |                                  | LTE Band 5(3MHz)      |       |                 |
|--------------------|----------------------------|----------------------------------|-----------------------|-------|-----------------|
| Channel            |                            | Frequency (MHz)                  | Channel               |       | Frequency (MHz) |
| Lowest channel     | owest channel 20407 824.70 |                                  | Lowest channel        | 20415 | 825.50          |
| Middle channel     | 20525                      | 836.50                           | Middle channel        | 20525 | 836.50          |
| Highest channel    | ghest channel 20643        |                                  | Highest channel 20635 |       | 847.50          |
| LT                 | E Band 5(5MH               | E Band 5(5MHz) LTE Band 5(10MHz) |                       |       | Hz)             |
| Channe             | I                          | Frequency (MHz)                  | Channe                | el    | Frequency (MHz) |
| Lowest channel     | 20425                      | 826.50                           | Lowest channel        | 20450 | 829.00          |
| Middle channel     | 20525                      | 836.50                           | Middle channel        | 20525 | 836.50          |
| Highest channel    | 20625                      | 846.50                           | Highest channel       | 20600 | 844.00          |

| LTE Band 17(5MHz) |  |                 | LTE Band 17(10MHz)   |        |                 |
|-------------------|--|-----------------|----------------------|--------|-----------------|
| Channel Fre       |  | Frequency (MHz) | Channel              |        | Frequency (MHz) |
| Lowest channel    | 23755                                      | 706.50          | Lowest channel 23780 |        | 709.00          |
| Middle channel    | Middle channel 23790 710.00 Middle channel |                 | 23790                | 710.00 |                 |
| Highest channel   | 23825                                      | 713.50          | Highest channel      | 23800  | 711.00          |



#### 5.3 Test modes

| Data mode (LTE band 2(QPSK))            | Keep the EUT in data communicating mode on LTE band 2(QPSK). (LTE band2(1.4MHz), LTE band2(3MHz), LTE band2(5MHz), |  |  |
|---|--|--|--|
|   | LTE band2(10MHz), LTE band2(15MHz), LTE band2(20MHz))  |  |  |
| Data was to (LTE to a LO(400 ANA))      | Keep the EUT in data communicating mode on LTE band 2(16QAM).  |  |  |
| Data mode (LTE band 2(16QAM))           | (LTE band2(1.4MHz), LTE band2(3MHz), LTE band2(5MHz),  |  |  |
|   | LTE band2(10MHz), LTE band2(15MHz), LTE band2(20MHz))  |  |  |
| D - (   - /  TE     4/0 D0/()           | Keep the EUT in data communicating mode on LTE band 4(QPSK).   |  |  |
| Data mode (LTE band 4(QPSK))            | (LTE band 4(1.4MHz), LTE band 4(3MHz), LTE band 4(5MHz),   |  |  |
|   | LTE band 4(10MHz), LTE band 4(15MHz), LTE band 4(20MHz))   |  |  |
|   | Keep the EUT in data communicating mode on LTE band 4(16QAM).  |  |  |
| Data mode (LTE band 4(16QAM))           | (LTE band 4(1.4MHz), LTE band 4(3MHz), LTE band 4(5MHz),   |  |  |
|   | LTE band 4(10MHz), LTE band 4(15MHz), LTE band 4(20MHz))   |  |  |
|   | Keep the EUT in data communicating mode on LTE band 7(QPSK).   |  |  |
| Data mode (LTE band 5(QPSK))            | (LTE band7(5MHz), LTE band 7(10MHz), LTE band 7(15MHz), LTE band   |  |  |
| , | 7(20MHz))  |  |  |
|   | Keep the EUT in data communicating mode on LTE band  |  |  |
| Data mode (LTE band 5(16QAM))           | 7(16QAM).(LTE band7(5MHz), LTE band7(10MHz), LTE band 7(15MHz),  |  |  |
|   | LTE band 7(20MHz))   |  |  |
| Data mode (LTE hand 17(ODSK))           | Keep the EUT in data communicating mode on LTE band17(QPSK).   |  |  |
| Data mode (LTE band 17(QPSK))           | (LTE band17(5MHz), LTE band17(10MHz))  |  |  |
| Data mode (LTE hand 17/160 AM)          | Keep the EUT in data communicating mode on LTE band  |  |  |
| Data mode (LTE band 17(16QAM))          | 17(16QAM).(LTE band17(5MHz), LTE band17(10MHz))  |  |  |
| Remark :                                | Just the worst case data were shown in the report.   |  |  |

# 5.4 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is filing to comply with Section Part 24 subpart E, Part 27 subpart L, Part 22 Subpart H, Part 27 subpart H and Part 90 subpart S of the FCC CFR 47 Rules.

# 5.5 Test Methodology

Both conducted and radiated testing were performed according to the procedures document on TIA/EIA 603 and FCC CFR 47clause 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057

# 5.6 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### ● FCC - Registration No.: 817957

Shenzhen ZhongjianNanfang Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in out files. Registration 817957, February 27, 2012.

#### ●IC - Registration No.: 10106A-1

The 3m Semi-anechoic chamber of Shenzhen ZhongjianNanfang Testing Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.

#### ● CNAS - Registration No.: CNAS L6048

Shenzhen ZhongjianNanfang Testing Co., Ltd. is accredited to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L6048.

# 5.7 Laboratory Location

Shenzhen ZhongjianNanfang Testing Co., Ltd.

Address: No.B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road,

Bao'an District, Shenzhen, Guangdong, China

Tel: +86-755-23118282 Fax: +86-755-23116366

Shenzhen Zhongjian Nanfang Testing Co., Ltd. No.B-C, 1/F., Building 2, Laodong No.2 Industrial Park, Xixiang Road, Bao'an District, Shenzhen, Guangdong, China Telephone: +86 (0) 755 23118282 Fax: +86 (0) 755 23116366

Project No.: CCISE1611061

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### 5.8 Test Instruments list

| Test Equipment                       | Manufacturer                                   | Model No.                   | Inventory<br>No. | Cal. Date<br>(mm-dd-yy) | Cal. Due date<br>(mm-dd-yy) |
|--------------------------------------|--|-----------------------------|------------------|-------------------------|-----------------------------|
| 3m Semi- Anechoic<br>Chamber         | SAEMC  | 9(L)*6(W)* 6(H)             | CCIS0001         | 08-23-2014              | 08-22-2017                  |
| BiConiLog Antenna                    | SCHWARZBECK<br>MESS-ELEKTRONIK                 | VULB9163                    | CCIS0005         | 03-25-2016              | 03-25-2017                  |
| Double -ridged                       | SCHWARZBECK<br>MESS-ELEKTRONIK                 | BBHA9120D                   | CCIS0006         | 03-25-2016              | 03-25-2017                  |
| EMI Test Software                    | AUDIX  | E3                          | N/A              | N/A                     | N/A                         |
| Amplifier<br>(10kHz-1.3GHz)          | HP   | 8447D                       | CCIS0003         | 04-01-2016              | 03-31-2017                  |
| Amplifier<br>(1GHz-18GHz)            | Compliance Direction<br>Systems Inc.           | PAP-1G18                    | CCIS0011         | 04-01-2016              | 03-31-2017                  |
| Pre-amplifier<br>(18-26GHz)          | Rohde & Schwarz                                | AFS33-18002<br>650-30-8P-44 | GTS218           | 04-01-2016              | 03-31-2017                  |
| Horn Antenna                         | ETS-LINDGREN                                   | 3160                        | GTS217           | 04-01-2016              | 03-31-2017                  |
| Printer                              | HP   | HP LaserJet P1007           | N/A              | N/A                     | N/A                         |
| Positioning<br>Controller            | UC   | UC3000                      | CCIS0015         | N/A                     | N/A                         |
| Spectrum analyzer<br>9k-30GHz        | Rohde & Schwarz                                | FSP 30                      | CCIS0023         | 03-28-2016              | 03-28-2017                  |
| <b>EMI Test Receiver</b>             | Rohde & Schwarz                                | ESPI                        | CCIS0022         | 03-28-2016              | 03-28-2017                  |
| <b>EMI Test Receiver</b>             | Rohde & Schwarz                                | ESRP7                       | CCIS0167         | 03-24-2016              | 03-24-2017                  |
| Loop antenna                         | Laplace instrument                             | RF300                       | EMC0701          | 04-01-2016              | 03-31-2017                  |
| Universal radio communication tester | Rhode & Schwarz                                | CMU200                      | CCIS0069         | 03-28-2016              | 03-28-2017                  |
| Signal Analyzer                      | Rohde & Schwarz                                | FSIQ3                       | CCIS0088         | 04-08-2016              | 04-08-2017                  |
| DC Power Supply                      | Shenzhen XinNuoEr<br>Technologies Co.,<br>Ltd. | WYK-10020K                  | CCIS0201         | 10-31-2015              | 10-30-2016                  |
| Temperature<br>Humidity Chamber      | Fo Shan HengPu<br>Electronics Co., Ltd.        | HPGDS-500                   | CCIS0240         | 11-18-2015              | 11-27-2016                  |

# 6. System test configuration

# **6.1 EUT Configuration**

The EUT configuration for testing is installed on RF field strength measurement to meet the commission's requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

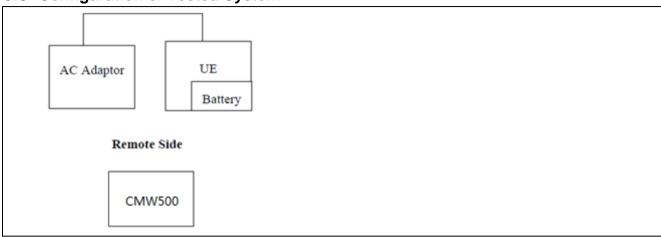
### 6.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency which was for the purpose of the measurements.





### 6.3 Configuration of Tested System



### 6.4 Description of Test Modes

The EUT has been tested under operating condition.

EUT staying in continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing.

The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for three modes (LTE Band 2, LTE Band 4, LTE Band 5 and LTE Band 17) with power adaptor, earphone and Data cable. The worst-case H mode for LTE Band 2, LTE Band 4, LTE Band 5 and LTE Band 17.





# **6.5** Conducted Output Power

| Test Requirement: | Part 24.232 (c), part 27.50(c), part 27.50(d), Part 22.913 (a)(2)  |  |  |  |  |  |  |
|-------------------|--|--|--|--|--|--|--|
| Test Method:      | FCC part2.1046   |  |  |  |  |  |  |
| Limit:            | LTE Band 2: 2W   |  |  |  |  |  |  |
|                   | LTE Band 4: 1W   |  |  |  |  |  |  |
|                   | LTE Band 5: 7W   |  |  |  |  |  |  |
|                   | LTE Band 17: 3W  |  |  |  |  |  |  |
| Test setup:       | EUT ATT Communication Tester  Note: Measurement setup for testing on Antenna connector   |  |  |  |  |  |  |
| Test Procedure:   | The transmitter output was connected to a calibrated attenuator, the other end of which was connected to the CMW500. Transmitter output power was read off in dBm. |  |  |  |  |  |  |
| Test Instruments: | Refer to section 5.8 for details   |  |  |  |  |  |  |
| Test mode:        | Refer to section 5.3 for details   |  |  |  |  |  |  |
| Test results:     | Refer to FCC ID: QISME909U-523   |  |  |  |  |  |  |



# 6.6 Peak-to-Average Ratio

| Test Requirement: | FCC part 24.232(d)   |  |  |  |  |  |  |  |
|-------------------|--|--|--|--|--|--|--|--|
| Limit:            | The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.  |  |  |  |  |  |  |  |
| Test setup:       | EUT Splitter Communication Tester  ATT  SPA  |  |  |  |  |  |  |  |
|                   | Note: Measurement setup for testing on Antenna connector   |  |  |  |  |  |  |  |
| Test Procedure:   | <ol> <li>The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.</li> <li>Set the CCDF option in spectrum analyzer, RBW ≥ OBW,</li> <li>Set the EUT working in highest power level, measured and recorded the 0.1% as PAPR level.</li> <li>Repeat step 1~3 at other frequency and modulations.</li> </ol> |  |  |  |  |  |  |  |
| Test Instruments: | Refer to section 5.8 for details   |  |  |  |  |  |  |  |
| Test mode:        | Refer to section 5.3 for details   |  |  |  |  |  |  |  |
| Test results:     | Refer to FCC ID: QISME909U-523   |  |  |  |  |  |  |  |



# 6.7 Occupy Bandwidth

| • | Joseph Danamani   |  |  |  |  |  |  |  |  |
|---|-------------------|--|--|--|--|--|--|--|--|
|   | Test Requirement: | Part 24.238, part 27.53(g), part 27.53(h), Part 22.917(b)  |  |  |  |  |  |  |  |
|   | Test Method:      | FCC part2.1049   |  |  |  |  |  |  |  |
|   | Test setup:       | EUT Splitter Communication Tester  SPA  SPA  Note: Measurement setup for testing on Antenna connector  |  |  |  |  |  |  |  |
|   | Test Procedure:   | <ol> <li>The EUT's output RF connector was connected with a short cable to the spectrum analyzer</li> <li>RBW was set to about 1% ~ 5% of emission BW, VBW= 3 times RBW.</li> <li>-26dBc display line was placed on the screen (or 99% bandwidth), the occupied bandwidth is the delta frequency between the two points where the display line intersects the signal trace.</li> </ol> |  |  |  |  |  |  |  |
|   | Test Instruments: | Refer to section 5.8 for details   |  |  |  |  |  |  |  |
|   | Test mode:        | Refer to section 5.3 for details   |  |  |  |  |  |  |  |
|   | Test results:     | Refer to FCC ID: QISME909U-523   |  |  |  |  |  |  |  |



### **6.8 Modulation Characteristic**

According to FCC § 2.1047(d), Part 24E & 27H & 27L & 22H there is no specific requirement for digital modulation, therefore modulation characteristic is not presented.

### 6.9 Out of band emission at antenna terminals

| Test Requirement: | Part 24.238 (a), part 27.53(g), part 27.53(h), Part 22.917(a)   |  |  |  |  |  |  |  |
|-------------------|---|--|--|--|--|--|--|--|
| Test Method:      | FCC part2.1051  |  |  |  |  |  |  |  |
| Limit:            | -13dBm  |  |  |  |  |  |  |  |
| Test setup:       | EUT Splitter Communication Tester  ATT  SPA   |  |  |  |  |  |  |  |
| Test Procedure:   | Note: Measurement setup for testing on Antenna connector  1 The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation.  |  |  |  |  |  |  |  |
|                   | 2 The resolution bandwidth of the spectrum analyzer was set at 100 kHz when below 1GHz, 1MHz when above 1 GHz; sufficient scans were taken to show the out of band Emissions if any up to 10th harmonic.  |  |  |  |  |  |  |  |
|                   | 3 For the out of band: Set the RBW=100 kHz, VBW=300 kHz when below 1 GHz, RBW =1 MHz, VBW=3 MHz when above 1 GHz, Start=30MHz, Stop= 10th harmonic.   |  |  |  |  |  |  |  |
|                   | 4 Band Edge Requirements: In the 1 MHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 1 percent of the emission bandwidth of the fundamental emission of the transmitter may be employed to measure the out of band Emissions. |  |  |  |  |  |  |  |
| Test Instruments: | Refer to section 5.8 for details  |  |  |  |  |  |  |  |
| Test mode:        | Refer to section 5.3 for details  |  |  |  |  |  |  |  |
| Test results:     | Refer to FCC ID: QISME909U-523  |  |  |  |  |  |  |  |





# 6.10 ERP, EIRP Measurement

| 0. 10 ERP, EIRP Weasure |   |
|-------------------------|---|
| Test Requirement:       | 24.232 (c), part 27.50(c), part 27.50(d) , Part 22.917(a),  |
| Test Method:            | FCC part2.1046  |
| Limit:                  | LTE Band 2: 2W EIRP LTE Band 4: 1W EIRP LTE Band 5: 7W ERP LTE Band 17: 3W ERP  |
| Test setup:             | Below 1GHz  |
|                         | Antenna Tower  Search Antenna  RF T est Receiver  Ground Plane  Above 1GHz  Antenna Tower  Horn Antenna  Spectrum Analyzer  Amplifier |
|                         | Substituted method:   |
|                         | Ground plane  d: distance in meters d:3 meter  1-4 meter  S.G.  Substituted Dipole or Horn Antenna  Bi-Log Antenna or Horn Antenna    |





|                   | ·   |  |  |  |  |
|-------------------|---|--|--|--|--|
| Test Procedure:   | 1. The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.  |  |  |  |  |
|                   | 2. During the measurement, the EUT was communication with the station. The highest emission was recorded with the rotation of the turntable and the lowering of the test antenna from 4m to 1m. The reading was recorded and the field strength (E in dBuV/m) was calculated. |  |  |  |  |
|                   | 3. ERP in frequency band below 1GHz were measured using a substitution method. The EUT was replaced by dipole antenna connected, the S.G. output was recorded and ERP was calculated as follows:  |  |  |  |  |
|                   | ERP = S.G. output (dBm) + Antenna Gain (dBd) – Cable Loss (dB)  |  |  |  |  |
|                   | 4. EIRP in frequency band above 1GHz were measured using a substitution method. The EUT was replaced by or horn antenna connected, the S.G. output was recorded and EIRP was calculated as follows:   |  |  |  |  |
|                   | EIRP = S.G. output (dBm) + Antenna Gain (dBi) - Cable Loss (dB)   |  |  |  |  |
|                   | 5. The worse case was relating to the conducted output power.   |  |  |  |  |
| Test Instruments: | Refer to section 5.8 for details  |  |  |  |  |
| Test mode:        | Refer to section 5.3 for details  |  |  |  |  |
| Test results:     | Passed  |  |  |  |  |



### Measurement Data (worst case):

### LTE band 2 part

### Lowest channel

| Frequency<br>(MHz) | UL<br>Channel                   | Modulation   | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result  |  |  |  |
|--------------------|---------------------------------|--------------|-------------|-------------|-----------------|-----------|----------------|---------|--|--|--|
|                    | 1.4MHz(RB size 1 & RB offset 0) |              |             |             |                 |           |                |         |  |  |  |
| 1850.70            | 18607                           | QPSK         | 1.4         | ы           | V               | 17.01     |                |         |  |  |  |
| 1650.70            | 10007                           | QFSK         | 1.4         | 1.4 H       |                 | 21.00     | 33.00          | Pass    |  |  |  |
| 1850.70            | 18607                           | 16QAM        | 1.4         | Н           | V               | 16.71     | 33.00          | F a 5 5 |  |  |  |
| 1650.70            | 10007                           | IOQAW        | 1.4         | П           | Н               | 19.61     |                |         |  |  |  |
|                    |                                 | 1.           | 4MHz(RB s   | ize 3 & RB  | offset 0)       |           |                |         |  |  |  |
| 1850.70            | 40007                           | ODCK         | 1.4         | Н           | V               | 17.03     |                |         |  |  |  |
| 1650.70            | 18607                           | QPSK         |             | П           | Н               | 21.37     | 33.00          | Pass    |  |  |  |
| 1950.70            | 18607                           | 16QAM        | 4.4         | Н           | V               | 16.42     | 33.00          | Pass    |  |  |  |
| 1850.70            | 10007                           | TOQAW        | 1.4         | П           | Н               | 19.64     |                |         |  |  |  |
|                    |                                 | 1.           | 4MHz(RB s   | ize 6 & RB  | offset 0)       |           |                |         |  |  |  |
| 4050.70            | 40007                           | ODCK         | 4.4         |             | V               | 17.56     |                |         |  |  |  |
| 1850.70            | 18607                           | QPSK         | QPSK 1.4    | H           | Н               | 21.31     | 22.00          | Door    |  |  |  |
| 1950.70            | 40007                           | 40007 400414 | 1.4         |             | V               | 16.40     | 33.00          | Pass    |  |  |  |
| 1850.70            | 18607                           | 16QAM        | 1.4         | Н           | Н               | 19.41     |                |         |  |  |  |

#### Middle channel

| Middle channel     |                                 |            |             |             |                 |           |                |         |  |
|--------------------|---------------------------------|------------|-------------|-------------|-----------------|-----------|----------------|---------|--|
| Frequency<br>(MHz) | UL<br>Channel                   | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result  |  |
|                    |                                 | 1.4        | 4MHz(RB     | size 1 & RE | 3 offset 0)     |           |                |         |  |
| 1880.00            | 18900                           | QPSK       | 1.4         | Н           | V               | 17.41     |                |         |  |
| 1000.00            | 16900                           | QFSN       | 1.4         | П           | Н               | 21.74     | 33.00          | Pass    |  |
| 1880.00            | 18900                           | 16QAM      | 1.4         | Н           | V               | 16.99     | 33.00          | rass    |  |
| 1000.00            | 10900                           | IOQAIVI    | 1.4         | !!          | Н               | 19.32     |                |         |  |
|                    |                                 | 1.4        | 4MHz(RB     | size 3 & RE | 3 offset 0)     |           |                |         |  |
| 1880.00            | 18900                           | QPSK       | 1.4         | н           | V               | 17.12     |                |         |  |
| 1000.00            | 10900                           | QFOR       | 1.4         | 11          | Н               | 21.99     | 33.00          | Pass    |  |
| 1880.00            | 18900                           | 16QAM      | 1.4         | Н           | V               | 16.20     | 33.00          | rass    |  |
| 1000.00            | 10900                           | IOQAW      | 1.4         | 11          | Н               | 19.13     |                |         |  |
|                    | 1.4MHz(RB size 6 & RB offset 0) |            |             |             |                 |           |                |         |  |
| 1880.00            | 18900                           | QPSK       | 1.40        | Н           | V               | 17.57     |                |         |  |
| 1000.00            | 10900                           | QFSK       | 1.40        | 11          | Н               | 21.72     | 33.00          | Pass    |  |
| 1880.00            | 18900                           | 16QAM      | 1.40        | Н           | V               | 16.40     | 33.00          | F a 3 3 |  |
| 1000.00            | 10900                           | IOQAW      | 1.40        | 11          | Н               | 19.11     |                |         |  |





**Highest channel** 

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol.  | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result |      |
|--------------------|---------------|------------|-------------|--------------|-----------------|-----------|----------------|--------|------|
|                    |               |            | 1.4MHz(RE   | 3 size 1 & F | RB offset 0)    |           |                |        |      |
| 1909.30            | 19193         | QPSK       | 1.4         | Н            | V               | 17.41     |                |        |      |
| 1909.30            | 19193         | QFSK       | 1.4         | П            | Н               | 21.39     | 22.00          | Door   |      |
| 1000 20            | 10102         | 160 AM     | 1 1         | Н            | V               | 16.47     | 33.00          | Pass   |      |
| 1909.30            | 19193         | 16QAM      | 1.4         | П            | Н               | 19.17     |                |        |      |
|                    |               |            | 1.4MHz(RE   | 3 size 3 & F | RB offset 0)    |           |                |        |      |
| 4000.20            | 40400         | ODCK       | 4.4         | 1.1          | V               | 17.74     |                |        |      |
| 1909.30            | 19193         | QPSK       | 1.4         | Н            | Н               | 21.32     | 22.00          | Daga   |      |
| 1000.20            | 10102         | 16001      | 160014      | 4.4          | Н               | V         | 16.32          | 33.00  | Pass |
| 1909.30            | 19193         | 16QAM      | 1.4         | П            | Н               | 19.12     |                |        |      |
|                    |               |            | 1.4MHz(RE   | 3 size 6 & F | RB offset 0)    |           |                |        |      |
| 4000.20            | 10100 0000 11 | 0.000/     | 11          | V            | 17.64           |           |                |        |      |
| 1909.30            | 19193         | QPSK       | 1.4         | Н            | Н               | 21.39     | 22.00          | Daga   |      |
| 1000.20            | 10102         | 160 AM     | 4.4         | Ш            | V               | 16.74     | 33.00          | Pass   |      |
| 1909.30            | 19193         | 16QAM      | 1.4         | Н            | Н               | 19.31     |                |        |      |

#### Lowest channel

| Lowest channel     |                        |            |             |             |                 |           |                |        |       |
|--------------------|------------------------|------------|-------------|-------------|-----------------|-----------|----------------|--------|-------|
| Frequency<br>(MHz) | UL<br>Channel          | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result |       |
|                    |                        | 2          | 20MHz(RB s  | ize 1 & RE  | 3 offset 0)     |           |                |        |       |
| 1860.00            | 18700                  | QPSK       | 20          | Н           | V               | 16.99     |                |        |       |
| 1000.00            | 18700                  | QFSK       | 20          | П           | Н               | 19.90     | 33.00          | Pass   |       |
| 1860.00            | 18700                  | 16QAM      | 20          | Н           | V               | 16.81     | 33.00          | F 455  |       |
| 1860.00            | 10700                  | TOQAM      | 20          | П           | Н               | 19.84     |                |        |       |
|                    |                        | 2          | 0MHz(RB si  | ze 50 & RI  | B offset 0)     |           |                |        |       |
| 1860.00            | 18700                  | QPSK       | 20          | Н           | V               | 16.21     |                |        |       |
| 1000.00            | 18700                  | QFSK       | 20          |             | Н               | 19.18     | 33.00          | Pass   |       |
| 1860.00            | 18700                  | 16QAM      | 20          | 20          | Н               | ٧         | 16.21          | 33.00  | F 455 |
| 1800.00            | 18700                  | TOQAM      | 20          |             | Н               | 19.19     |                |        |       |
|                    |                        | 20         | MHz(RB siz  | e 100 & R   | B offset 0)     |           |                |        |       |
| 1960.00            | 19700                  | ODSK       | 20          | Н           | V               | 16.37     |                |        |       |
| 1860.00            | 00   18700   QPSK   20 | 20         | П           | Н           | 19.19           | 33.00     | Pass           |        |       |
| 1860.00            | 18700                  | 16QAM      | 20          | Н           | V               | 16.39     | 33.00          | Fa55   |       |
| 1000.00            | 10700                  | IOQAW      | 20          | П           | Н               | 19.17     |                |        |       |





Middle channel

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result  |
|--------------------|---------------|------------|-------------|-------------|-----------------|-----------|----------------|---------|
|                    |               | 2          | 20MHz(RB s  | ize 1 & RE  | offset 0)       |           |                |         |
| 1880.00            | 18900         | QPSK       | 20          | Н           | V               | 16.37     |                |         |
| 1000.00            | 10900         | QFSK       | 20          | П           | Н               | 19.74     | 33.00          | Pass    |
| 1880.00            | 18900         | 16QAM      | 20          | Н           | V               | 16.38     | 33.00          | Fa55    |
| 1660.00            | 10900         | IOQAIVI    | 20          | П           | Н               | 19.12     |                |         |
|                    |               | 2          | 0MHz(RB si  | ze 50 & RI  | B offset 0)     |           |                |         |
| 1880.00            | 18900         | QPSK       | 20          | Н           | V               | 16.64     |                |         |
| 1000.00            | 10900         | QF5K       | 20          | П           | Н               | 19.41     | 33.00          | Pass    |
| 1880.00            | 18900         | 16QAM      | 20          | Н           | V               | 16.44     | 33.00          | F 4 5 5 |
| 1000.00            | 10900         | IOQAW      | 20          | П           | Н               | 19.28     |                |         |
|                    |               | 20         | MHz(RB siz  | ze 100 & R  | B offset 0)     |           |                |         |
| 1000.00            | 10000         | ODSK       | 20          | Ш           | V               | 16.47     |                |         |
| 1880.00            | 18900         | QPSK       | 20          | Н           | Н               | 19.44     | 33.00          | Pass    |
| 1880.00            | 18900         | 16QAM      | 20          | Н           | V               | 16.31     | 33.00          | F 455   |
| 1000.00            | 10900         | IOQAW      | 20          | 17          | Н               | 19.56     |                |         |

**Highest channel** 

| nighest chainer    |                                  |            |             |             |                 |           |                |        |       |    |  |    |   |       |       |
|--------------------|----------------------------------|------------|-------------|-------------|-----------------|-----------|----------------|--------|-------|----|--|----|---|-------|-------|
| Frequency<br>(MHz) | UL<br>Channel                    | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result |       |    |  |    |   |       |       |
|                    |                                  |            | 20MHz(RB    | size 1 &    | RB offset 0)    |           |                |        |       |    |  |    |   |       |       |
| 1900.00            | 19100                            | QPSK       | 20          | Н           | V               | 16.36     |                |        |       |    |  |    |   |       |       |
| 1900.00            | 19100                            | QFSK       | 20          |             | Н               | 19.65     | 33.00          | Door   |       |    |  |    |   |       |       |
| 1900.00            | 19100                            | 16QAM      | 20          | Н           | V               | 16.24     | 33.00          | Pass   |       |    |  |    |   |       |       |
| 1900.00            | 19100                            | TOQAW      | 20          | 11          | Н               | 19.28     |                | ·      |       |    |  |    |   |       |       |
|                    |                                  | 2          | 20MHz(RB s  | size 50 &   | RB offset 0     | )         |                |        |       |    |  |    |   |       |       |
| 1900.00            | 19100                            | QPSK       | 20          | Н           | V               | 16.25     | 33.00          |        |       |    |  |    |   |       |       |
| 1900.00            | 19100                            | QF3K       | 20          |             | Н               | 19.36     |                | Pass   |       |    |  |    |   |       |       |
| 1900.00            | 19100                            | 16QAM      | 20          | Н           | ٧               | 16.57     | 33.00          | Fa55   |       |    |  |    |   |       |       |
| 1900.00            | 19100                            | TOQAW      | 20          | 11          | Н               | 19.57     |                |        |       |    |  |    |   |       |       |
|                    | 20MHz(RB size 100 & RB offset 0) |            |             |             |                 |           |                |        |       |    |  |    |   |       |       |
| 1900.00            | 19100 QPSK                       | ODCK       | 10100 ODCV  | 0100 ODSK   | ODCK            | QPSK 20   | 20 H           | V      | 16.57 |    |  |    |   |       |       |
| 1900.00            | 19100                            | QF SIX     | 20          | 20          | 20              |           | 20             | 20     |       | 20 |  | 11 | Н | 19.31 | 33.00 |
| 1900.00            | 19100                            | 16QAM      | 20          | Н           | V               | 16.47     | 33.00          | r a55  |       |    |  |    |   |       |       |
| 1900.00            | 19100                            | ΙΟΩΛΙΝΙ    | 20          | 11          | Н               | 19.63     |                |        |       |    |  |    |   |       |       |





### LTE band 4 part

#### Lowest channel

| Frequency<br>(MHz) | UL<br>Channel     | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result |
|--------------------|-------------------|------------|-------------|-------------|-----------------|-----------|----------------|--------|
|                    |                   | •          | I.4MHz(RE   | 3 size 1 &  | RB offset 0)    |           |                |        |
| 1710.70            | 19957             | QPSK       | 1.4         | Н           | V               | 23.64     |                |        |
| 1710.70            | 19937             | QFSK       | 1.4         | П           | Н               | 16.74     | 30.00          | Pass   |
| 1710.70            | 19957             | 16QAM      | 1.4         | Н           | V               | 22.65     | 30.00          | Fa55   |
| 1710.70            | 19937             | IOQAW      | 1.4         |             | Н               | 15.80     |                |        |
|                    |                   | •          | I.4MHz(RE   | 3 size 3 &  | RB offset 0)    |           |                |        |
| 1710.70            | 19957             | QPSK       | 1.4         | Н           | V               | 23.16     |                | Door   |
| 1710.70            | 19937             | QFSK       | 1.4         |             | Н               | 16.64     | 30.00          |        |
| 1710.70            | 19957             | 16QAM      | 1.4         | Н           | V               | 22.46     | 30.00          | Pass   |
| 1710.70            | 19937             | IOQAW      | 1.4         |             | Н               | 15.69     |                |        |
|                    |                   | •          | 1.4MHz(RE   | 3 size 6 &  | RB offset 0)    |           |                |        |
| 1710 70            | 10057             | ODSK       | 4.4         | Н           | V               | 23.37     |                |        |
| 1710.70            | 19957             | QPSK       | 1.4         |             | Н               | 16.54     | 00.00          | Door   |
| 1710.70            | .70 19957 16QAM 1 | 1.4        | Н           | V           | 22.37           | 30.00     | Pass           |        |
| 1710.70            | 19907             | IOQAW      | 1.4         | П           | Н               | 15.39     |                |        |

#### Middle channel

| -                  | Middle Channel                  |            |             |             |                 |           |                |        |  |  |  |
|--------------------|---------------------------------|------------|-------------|-------------|-----------------|-----------|----------------|--------|--|--|--|
| Frequency<br>(MHz) | UL<br>Channel                   | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result |  |  |  |
|                    | 1.4MHz(RB size 1 & RB offset 0) |            |             |             |                 |           |                |        |  |  |  |
| 1732.50            | 32.50 20175 QPSK 1.4 H V 23.    |            |             |             |                 |           |                |        |  |  |  |
| 1732.50            | 20175                           | QFSK       | 1.4         | П           | Н               | 16.37     | 30.00          | Pass   |  |  |  |
| 1732.50            | 20175                           | 16QAM      | 1.4         | Н           | V               | 22.41     | 30.00          | Fa55   |  |  |  |
| 1732.50            | 20173                           | TOQAM      | 1.4         | - 11        | Н               | 15.37     |                |        |  |  |  |
|                    | 1.4MHz(RB size 3 & RB offset 0) |            |             |             |                 |           |                |        |  |  |  |
| 1732.50            | 20175                           | QPSK       | 1.4         | Н           | V               | 23.37     |                | Pass   |  |  |  |
| 1732.50            | 20175                           | QFSK       | 1.4         | - 11        | Н               | 16.41     | 30.00          |        |  |  |  |
| 1732.50            | 20175                           | 16QAM      | 1.4         | Н           | V               | 22.37     | 30.00          | rass   |  |  |  |
| 1732.30            | 20173                           | IOQAW      | 1.4         | 11          | Н               | 15.91     |                |        |  |  |  |
|                    |                                 | 1          | .4MHz(RE    | 3 size 6 &  | RB offset 0)    |           |                |        |  |  |  |
| 1732.50            | 20175                           | QPSK       | 1.4         | Н           | V               | 23.74     |                |        |  |  |  |
| 1732.50            | 20173                           | QP3N       | 1.4         | 17          | Н               | 16.29     | 30.00          | Page   |  |  |  |
| 1732.50            | 732.50 20175 16QAM              | 1.4        | Н           | V           | 22.48           | 30.00     | Pass           |        |  |  |  |
| 1732.50            | 20175                           | IOQAW      | 1.4         | 11          | Н               | 15.45     |                |        |  |  |  |





**Highest channel** 

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol.  | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result |  |  |  |  |   |       |       |      |
|--------------------|---------------|------------|-------------|--------------|-----------------|-----------|----------------|--------|--|--|--|--|---|-------|-------|------|
|                    |               | •          | 1.4MHz(RE   | size 1 & l   | RB offset 0)    |           |                |        |  |  |  |  |   |       |       |      |
| 1754.30            | 20393         | 23.27      |             |              |                 |           |                |        |  |  |  |  |   |       |       |      |
| 1754.50            | 20393         | QPSK       | 1.4         | Н            | Н               | 16.75     | 30.00          | Pass   |  |  |  |  |   |       |       |      |
| 1754 20            | 20393         | 16QAM      | 1.4         | Н            | V               | 22.12     | 30.00          | Fa55   |  |  |  |  |   |       |       |      |
| 1754.30            | 20393         | IOQAW      | 1.4         | П            | Н               | 15.99     |                |        |  |  |  |  |   |       |       |      |
|                    |               | •          | 1.4MHz(RE   | 3 size 3 & l | RB offset 0)    |           |                |        |  |  |  |  |   |       |       |      |
| 1754.30            | 20202         | QPSK       | 1.4         | Н            | V               | 23.39     |                | Pass   |  |  |  |  |   |       |       |      |
| 1754.30            | 20393         | QPSK       | 1.4         | П            | Н               | 16.74     | 30.00          |        |  |  |  |  |   |       |       |      |
| 1754.30            | 20393         | 16QAM      | 1.4         | Н            | V               | 22.54     | 30.00          | Fa55   |  |  |  |  |   |       |       |      |
| 1754.50            | 20393         | IOQAW      | 1.4         | П            | Н               | 15.99     |                |        |  |  |  |  |   |       |       |      |
|                    |               | •          | 1.4MHz(RE   | 3 size 6 & F | RB offset 0)    |           |                |        |  |  |  |  |   |       |       |      |
| 1754.20            | 20202         | ODSK       | 1.4         | Н            | V               | 23.31     |                |        |  |  |  |  |   |       |       |      |
| 1754.30            | 20393         | QPSK       | 1.4         | "            | Н               | 16.40     | 20.00          | Door   |  |  |  |  |   |       |       |      |
| 1754.20            | 20202         | 160 AM     | 1 1         | 11           | 11              | Н         | 11             | 11     |  |  |  |  | V | 22.41 | 30.00 | Pass |
| 1754.30            | 20393         | 16QAM      | 1.4         | П            | Н               | 15.29     |                |        |  |  |  |  |   |       |       |      |

#### Lowest channel

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result |
|--------------------|---------------|------------|-------------|-------------|-----------------|-----------|----------------|--------|
|                    |               | 2          | 0MHz(RB si  | ze 1 & RB   | offset 0)       |           |                |        |
| 1720.00            | 20050         | ODSK       | 20          | Ш           | V               | 23.16     |                |        |
| 1720.00            | 20050         | QPSK       | 20          | Н           | Н               | 16.68     | 20.00          | Doos   |
| 1720.00            | 20050         | 160014     | 20          | ы           | V               | 22.24     | 30.00          | Pass   |
| 1720.00            | 20050         | 16QAM      | 20          | Н           | Н               | 15.27     |                |        |
|                    |               | 20MHz      | (RB size 50 | & RB offse  | et 0)           |           |                |        |
| 1720.00            | 20050         | ODSK       | 20          | Н           | V               | 23.33     |                |        |
| 1720.00            | 20050         | QPSK       | 20          | П           | Н               | 16.39     | 30.00          | Doos   |
| 1720.00            | 20050         | 16QAM      | 20          | Н           | V               | 22.11     | 30.00          | Pass   |
| 1720.00            | 20030         | TOQAM      | 20          |             | Н               | 15.34     |                |        |
|                    |               | 20MHz(     | RB size 100 | & RB offs   | et 0)           |           |                |        |
| 1720.00            | 20050         | QPSK       | 20          | Н           | V               | 23.34     |                |        |
| 1720.00            | 20000         | QF3N       | 20          | П           | Н               | 16.99     | 20.00          | Pass   |
| 1720.00            | 20050         | 16QAM      | 20          | Н           | V               | 22.44     | 30.00          | rass   |
| 1720.00            | 20030         | TOQAM      | 20          | 17          | Н               | 15.56     |                |        |



Middle channel

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result |
|--------------------|---------------|------------|-------------|-------------|-----------------|-----------|----------------|--------|
|                    |               | 2          | 0MHz(RB si  | ze 1 & RB   | offset 0)       |           |                |        |
| 1732.50            | 20175         | QPSK       | 20          | Н           | V               | 23.25     |                |        |
| 1732.50            | 20175         | QFSK       | 20          | П           | Н               | 16.32     | 30.00          | Pass   |
| 1732.50            | 20175         | 16QAM      | 20          | Н           | V               | 22.33     | 30.00 Pa       | F 455  |
| 1732.50            | 20175         | TOQAW      | 20          | П           | Н               | 15.42     |                |        |
|                    |               | 20         | MHz(RB siz  | ze 50 & RE  | 3 offset 0)     |           |                |        |
| 1732.50            | 20175         | QPSK       | 20          | Н           | V               | 23.31     |                |        |
| 1732.50            | 20175         | QFSK       | 20          | П           | Н               | 16.33     | 30.00          | Pass   |
| 1732.50            | 20175         | 16QAM      | 20          | Н           | V               | 22.43     | 30.00          | F 455  |
| 1732.50            | 20175         | TOQAW      | 20          | П           | Н               | 15.45     |                |        |
|                    |               | 20         | MHz(RB siz  | e 100 & RI  | B offset 0)     |           |                |        |
| 1732.50            | 20175         | QPSK       | 20          | Н           | V               | 23.64     |                |        |
| 1732.00            | 20173         | QF3N       | 20          | П           | Н               | 16.04     | 30.00          | Pass   |
| 1732.50            | 20175         | 16QAM      | 20          | Н           | V               | 22.16     | 30.00          | Fa55   |
| 1732.30            | 20173         | IOQAW      | 20          | 11          | Н               | 15.99     |                |        |

High channel

| High channel       |                                 |            |              |             |                 |           |                |         |  |  |
|--------------------|---------------------------------|------------|--------------|-------------|-----------------|-----------|----------------|---------|--|--|
| Frequency<br>(MHz) | UL<br>Channel                   | Modulation | BW (MHz)     | EUT<br>Pol. | Antenna<br>Pol. | EIRP(dBm) | Limit<br>(dBm) | Result  |  |  |
|                    | 20MHz(RB size 1 & RB offset 0)  |            |              |             |                 |           |                |         |  |  |
| 1745.00            | 20300                           | QPSK       | 20           | Н           | V               | 23.32     |                |         |  |  |
| 1745.00            | 20300                           | QFSK       | 20           | П           | Н               | 16.18     | 30.00          | Pass    |  |  |
| 1745.00            | 20300                           | 16QAM      | 20           | Н           | V               | 22.39     | 30.00          | F a 5 5 |  |  |
| 1745.00            | 20300                           | TOQAM      | 20           | !!          | Н               | 15.41     |                |         |  |  |
|                    | 20MHz(RB size 50 & RB offset 0) |            |              |             |                 |           |                |         |  |  |
| 1745.00            | 20300                           | QPSK       | 20           | Н           | V               | 23.56     |                |         |  |  |
| 1745.00            | 20300                           | QFSK       | 20           | П           | Н               | 16.12     | 30.00          | Pass    |  |  |
| 1745.00            | 20300                           | 16QAM      | 20           | Н           | V               | 22.45     | 30.00          | F a 5 5 |  |  |
| 1745.00            | 20300                           | TOQAM      | 20           | 11          | Н               | 15.11     |                |         |  |  |
|                    |                                 | 2          | 20MHz(RB siz | e 100 & RI  | 3 offset 0)     |           |                |         |  |  |
| 1745.00            | 20300                           | QPSK       | 20           | Н           | V               | 23.43     |                |         |  |  |
| 1745.00            | 20300                           | QFSK       | 20           | П           | Н               | 16.42     | 30.00          | Pass    |  |  |
| 1745.00            | 20300                           | 16QAM      | 20           | Н           | V               | 22.53     | 30.00          | F a 5 5 |  |  |
| 1745.00            | 20300                           | IOQAW      | 20           | 11          | Н               | 15.48     |                |         |  |  |





### LTE band 5 part

#### Lowest channel

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | ERP(dBm) | Limit<br>(dBm) | Result |
|--------------------|---------------|------------|-------------|-------------|-----------------|----------|----------------|--------|
|                    |               | 1          | I.4MHz(RE   | 3 size 1 &  | RB offset 0)    |          |                |        |
| 824.70             | 20407         | QPSK       | 1.4         | Н           | V               | 16.05    |                |        |
| 024.70             | 20407         | QFSK       | 1.4         | П           | Н               | 16.44    | 38.45          | Pass   |
| 824.70             | 20407         | 16QAM      | 1.4         | Н           | V               | 14.93    | 30.43          | Fa55   |
| 024.70             | 20407         | IOQAW      | 1.4         | 11          | Н               | 16.34    |                |        |
|                    |               |            | 1.4MHz(RI   | B size 3&   | RB offset 0)    |          |                |        |
| 824.70             | 20407         | QPSK       | 1.4         | Н           | V               | 16.37    |                |        |
| 024.70             | 20407         | QFSK       | 1.4         | П           | Н               | 16.70    | 38.45          | Pass   |
| 824.70             | 20407         | 16QAM      | 1.4         | Н           | V               | 14.42    | 30.43          | Fa55   |
| 024.70             | 20407         | IOQAW      | 1.4         | П           | Н               | 16.47    |                |        |
|                    |               |            | 1.4MHz(RI   | B size 6&   | RB offset 0)    |          |                |        |
| 024.70             | 20407         | ODSK       | 1.1         | Н           | V               | 16.41    |                |        |
| 824.70             | 20407         | QPSK       | 1.4         | П           | Н               | 16.31    | 20.45          | Door   |
| 824.70             | 20407         | 16QAM      | 1.4         | Н           | V               | 14.51    | 38.45          | Pass   |
| 024.70             | 20407         | IOQAW      | 1.4         | П           | Н               | 16.47    |                |        |

#### Middle channel

| Middle channel     |                                 |            |             |             |                 |          |                |         |  |  |
|--------------------|---------------------------------|------------|-------------|-------------|-----------------|----------|----------------|---------|--|--|
| Frequency<br>(MHz) | UL<br>Channel                   | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | ERP(dBm) | Limit<br>(dBm) | Result  |  |  |
|                    | 1.4MHz(RB size 1 & RB offset 0) |            |             |             |                 |          |                |         |  |  |
| 836.50             | 20525                           | QPSK       | 1.1         | Н           | V               | 16.41    |                |         |  |  |
| 636.50             | 20525                           | QFSK       | 1.4         | П           | Н               | 16.68    | 38.45          | Pass    |  |  |
| 836.50             | 20525                           | 16QAM      | 1.4         | Н           | V               | 14.26    | 30.43          | F a 5 5 |  |  |
| 630.30             | 20020                           | TOQAW      | 1.4         |             | Н               | 16.92    |                |         |  |  |
|                    | 1.4MHz(RB size 3& RB offset 0)  |            |             |             |                 |          |                |         |  |  |
| 836.50             | 20525                           | QPSK       | 1.4         | Н           | V               | 16.51    |                |         |  |  |
| 630.50             | 20020                           | QFSK       | 1.4         |             | Н               | 16.47    | 38.45          | Dace    |  |  |
| 836.50             | 20525                           | 16QAM      | 1.4         | Н           | V               | 14.31    | 30.43          | rass    |  |  |
| 830.30             | 20020                           | TOQAM      | 1.4         | 11          | Н               | 16.16    |                |         |  |  |
|                    |                                 | 1          | .4MHz(RI    | B size 6&   | RB offset 0)    |          |                |         |  |  |
| 836.50             | 20525                           | QPSK       | 1.4         | Η           | V               | 16.51    |                |         |  |  |
| 630.50             | 20323                           | QFSK       | 1.4         |             | Н               | 16.42    | 38.45          | Door    |  |  |
| 836.50             | 20525                           | 16QAM      | 1.4         | Η           | V               | 14.86    | 36.43          | Pass    |  |  |
| 030.50             | 20020                           | TOQAM      | 1.4         | 11          | Н               | 16.47    |                |         |  |  |





**Highest channel** 

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | ERP(dBm) | Limit<br>(dBm) | Result |
|--------------------|---------------|------------|-------------|-------------|-----------------|----------|----------------|--------|
|                    |               |            | 1.4MHz(RE   | size 1 & F  | RB offset 0)    |          |                |        |
| 848.30             | 20643         | QPSK       | 1.4         | Н           | V               | 16.92    |                |        |
| 040.30             | 20043         | QPSK       | 1.4         | П           | Н               | 16.43    | 38.45          | Pass   |
| 949 20             | 20643         | 16O A M    | 1.4         | Н           | V               | 14.72    | 30.43          | Fa55   |
| 848.30             | 20043         | 16QAM      | 1.4         | П           | Н               | 16.42    |                |        |
|                    |               |            | 1.4MHz(RE   | 3 size 3& F | RB offset 0)    |          |                |        |
| 040.20             | 20642         | ODSK       | 1.4         | Н           | V               | 16.50    |                |        |
| 848.30             | 20643         | QPSK       | 1.4         | П           | Н               | 16.47    | 38.45          | Pass   |
| 848.30             | 20643         | 16QAM      | 1.4         | Н           | V               | 14.57    | 30.43          | Fa55   |
| 040.30             | 20043         | IOQAW      | 1.4         | П           | Н               | 16.13    |                |        |
|                    |               |            | 1.4MHz(RE   | 3 size 6& F | RB offset 0)    |          |                |        |
| 0.40, 0.0          | 20042         | ODCK       | 4.4         |             | V               | 16.58    |                |        |
| 848.30             | 20643         | QPSK       | 1.4         | Н           | Н               | 16.55    | 20.45          | Door   |
| 0.40.20            | 20642         | 160 A M    | 1.4         | Н           | V               | 14.26    | 38.45          | Pass   |
| 848.30             | 20643         | 16QAM      | 1.4         | П           | Н               | 16.51    |                |        |

#### Lowest channel

| Frequency<br>(MHz) | UL<br>Channel                  | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | ERP(dBm) | Limit<br>(dBm) | Result |  |
|--------------------|--------------------------------|------------|-------------|-------------|-----------------|----------|----------------|--------|--|
|                    |                                | 1          | 0MHz(RB si  | ze 1 & RB   | offset 0)       |          |                |        |  |
| 920.00             | 20450                          | ODSK       | 10          | ы           | V               | 16.17    |                |        |  |
| 829.00             | 20450                          | QPSK       | 10          | Н           | Н               | 16.35    | 38.45          | Doos   |  |
| 920.00             | 20450                          | 160014     | 10          | ы           | V               | 14.47    | 30.45 Pass     | Pass   |  |
| 829.00             | 20450                          | 16QAM      | 10          | Н           | Н               | 16.19    |                |        |  |
|                    | 10MHz(RB size 25& RB offset 0) |            |             |             |                 |          |                |        |  |
| 920.00             | 20450                          | ODSK       | 10          | Н           | V               | 16.41    |                |        |  |
| 829.00             | 20450                          | QPSK       | 10          | П           | Н               | 16.42    | 38.45          | Pass   |  |
| 920.00             | 20450                          | 16QAM      | 10          | Н           | V               | 14.16    | 30.43          | Pa55   |  |
| 829.00             | 20430                          | TOQAM      | 10          | П           | Н               | 16.31    |                |        |  |
|                    |                                | 1          | 0MHz(RB siz | ze 50& RB   | offset 0)       |          |                |        |  |
| 829.00             | 20450                          | QPSK       | 10          | Н           | V               | 16.94    |                |        |  |
| 629.00             | 20430                          | QFSK       | 10          | П           | Н               | 16.42    | 20.45          | Doos   |  |
| 829.00             | 20450                          | 16QAM      | 10          | Н           | V               | 14.12    | 38.45          | Pass   |  |
| 029.00             | 20430                          | TOQAM      | 10          | П           | Н               | 16.99    |                |        |  |



Middle channel

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | ERP(dBm) | Limit<br>(dBm) | Result  |
|--------------------|---------------|------------|-------------|-------------|-----------------|----------|----------------|---------|
|                    |               | 1          | 0MHz(RB si  | ze 1 & RB   | offset 0)       |          |                |         |
| 836.50             | 20525         | QPSK       | 10          | Н           | V               | 16.47    |                |         |
| 636.30             | 20525         | QFSK       | 10          | П           | Н               | 16.59    | 38.45          | Pass    |
| 836.50             | 20525         | 16QAM      | 10          | Н           | V               | 14.72    | 30.43          | F 455   |
| 030.30             | 20020         | TOQAW      | 10          | II          | Н               | 16.31    |                |         |
|                    |               | 10         | OMHz(RB siz | ze 25& RB   | offset 0)       |          |                |         |
| 836.50             | 20525         | QPSK       | 10          | Н           | V               | 16.28    |                |         |
| 636.50             | 20323         | QFSK       | 10          | П           | Н               | 16.99    | 38.45          | Pass    |
| 836.50             | 20525         | 16QAM      | 10          | Н           | V               | 14.18    | 30.43          | rass    |
| 030.30             | 20020         | TOQAW      | 10          | II          | Н               | 16.99    |                |         |
|                    |               | 10         | MHz(RB siz  | ze 50 & RE  | 3 offset 0)     |          |                |         |
| 836.50             | 20525         | QPSK       | 10          | Н           | V               | 16.43    |                |         |
| 630.30             | 20020         | QF3N       | 10          | IT.         | Н               | 16.47    | 38.45          | Pass    |
| 836.50             | 20525         | 16QAM      | 10          | Н           | V               | 14.72    | 30.43          | F d 5 5 |
| 030.30             | 20020         | ΙΟΘΑΙΝΙ    | 10          | 11          | Н               | 16.47    |                |         |

High channel

| High channel       |                                |            |             |             |                 |          |                |        |  |  |
|--------------------|--------------------------------|------------|-------------|-------------|-----------------|----------|----------------|--------|--|--|
| Frequency<br>(MHz) | UL<br>Channel                  | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | ERP(dBm) | Limit<br>(dBm) | Result |  |  |
|                    |                                | 1          | 0MHz(RB siz | e 1 & RB    | offset 0)       |          |                |        |  |  |
| 844.00             | 20600                          | QPSK       | 10          | Н           | V               | 16.41    |                |        |  |  |
| 044.00             | 20000                          | QFSK       | 10          | П           | Н               | 16.31    | 38.45          | Pass   |  |  |
| 844.00             | 20600                          | 16QAM      | 10          | Н           | V               | 14.29    | 30.43          | F 455  |  |  |
| 044.00             | 20000                          | TOQAM      | 10          | 11          | Н               | 16.99    |                |        |  |  |
|                    | 10MHz(RB size 25& RB offset 0) |            |             |             |                 |          |                |        |  |  |
| 844.00             | 20600                          | QPSK       | 10          | Н           | V               | 16.94    |                |        |  |  |
| 044.00             | 20000                          | QFSK       | 10          | П           | Н               | 16.61    | 38.45          | Pass   |  |  |
| 844.00             | 20600                          | 16QAM      | 10          | Н           | V               | 14.68    | 30.43          | F 455  |  |  |
| 044.00             | 20000                          | TOQAM      | 10          | 11          | Н               | 16.92    |                |        |  |  |
|                    |                                | 10         | MHz(RB size | e 50 & RE   | offset 0)       |          |                |        |  |  |
| 844.00             | 20600                          | QPSK       | 10          | Н           | V               | 16.85    |                |        |  |  |
| 044.00             | 20000                          | QF3N       | 10          | П           | Н               | 16.99    | 38.45          | Pass   |  |  |
| 844.00 200         | 20600                          | 16QAM      | 10          | Н           | V               | 14.24    | 30.43          | rass   |  |  |
| 044.00             | 20000                          | IOQAW      | 10          | П           | Н               | 16.82    |                |        |  |  |





## LTE band 17 part Lowest channel

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | ERP(dBm) | Limit<br>(dBm) | Result  |
|--------------------|---------------|------------|-------------|-------------|-----------------|----------|----------------|---------|
|                    |               |            | 5MHz(RE     | 3 size 1 &  | RB offset 0)    |          |                |         |
| 706.50             | 23755         | QPSK       | 5           | Н           | V               | 16.76    |                |         |
| 706.50             | 23733         | QFSK       | 5           | П           | Н               | 14.63    | 34.77          | Pass    |
| 706.50             | 23755         | 16QAM      | 5           | Н           | V               | 16.62    | 34.77          | Fa55    |
| 706.50             | 23733         | IOQAW      | 5           | П           | Н               | 13.47    |                |         |
|                    |               |            | 5MHz(RB     | size 12 8   | RB offset 0)    |          |                |         |
| 706.50             | 23755         | QPSK       | 5           | Н           | V               | 16.34    |                |         |
| 706.50             | 23733         | QFSK       | 5           | П           | Н               | 14.49    | 34.77          | Pass    |
| 706.50             | 23755         | 16QAM      | 5           | Н           | V               | 16.98    | 34.77          | газэ    |
| 700.50             | 23755         | TOQAW      | 5           | [7]         | Н               | 13.87    |                |         |
|                    |               | !          | 5MHz(RB     | size 25 8   | RB offset 0)    |          |                |         |
| 706.50             | 23755         | QPSK       | 5           | Н           | V               | 16.73    |                |         |
| 700.50             | 23755         | QF SK      | 3           | 11          | Н               | 14.35    | 34.77          | Pass    |
| 706.50             | 23755         | 16QAM      | 5           | Н           | V               | 16.53    | 34.77          | F a 3 3 |
| 700.50             | 20700         | IOQAW      | 3           | 11          | Н               | 13.38    |                |         |

#### Middle channel

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | ERP(dBm) | Limit<br>(dBm) | Result  |
|--------------------|---------------|------------|-------------|-------------|-----------------|----------|----------------|---------|
|                    |               |            | 5MHz(RI     | B size 1 &  | RB offset 0)    |          |                |         |
| 710.00             | 23790         | QPSK       | 5           | Н           | V               | 16.81    |                |         |
| 710.00             | 23790         | QFSK       | 5           | П           | Н               | 14.14    | 34.77          | Pass    |
| 710.00             | 23790         | 16QAM      | 5           | Н           | V               | 16.42    | 34.77          | F a 5 5 |
| 710.00             | 23790         | IOQAW      | 5           | П           | Н               | 13.24    |                |         |
|                    |               |            | 5MHz(RE     | 3 size 12 & | RB offset 0)    |          |                |         |
| 710.00             | 22700         | QPSK       | E           | Н           | V               | 16.49    |                |         |
| 710.00             | 23790         | QPSK       | 5           | П           | Н               | 14.95    | 34.77          | Pass    |
| 710.00             | 23790         | 16QAM      | 5           | Н           | V               | 16.57    | 34.77          | Fa55    |
| 710.00             | 23790         | IOQAW      | 5           | П           | Н               | 13.76    |                |         |
|                    |               |            | 5MHz(RE     | 3 size 25 & | RB offset 0)    |          |                |         |
| 740.00             | 22700         | ODCK       | _           | 1.1         | V               | 16.64    |                |         |
| 710.00             | 23790         | QPSK       | 5           | Н           | Н               | 14.41    | 24.77          | Door    |
| 710.00             | 23790         | 16QAM      | 5           | Н           | V               | 16.14    | 34.77          | Pass    |
| 7 10.00            | 23/90         | TOQAM      | 3           | П           | Н               | 16.44    |                |         |





Highest channel

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | ERP(dBm) | Limit<br>(dBm) | Result |
|--------------------|---------------|------------|-------------|-------------|-----------------|----------|----------------|--------|
|                    |               |            | 5MHz(RE     | 3 size 1 &  | RB offset 0)    |          |                |        |
| 712.50             | 22025         | QPSK       | 5           | Н           | V               | 16.43    |                |        |
| 713.50             | 23825         | QPSK       | 5           | П           | Н               | 14.31    | 34.77          | Pass   |
| 712.50             | 22025         | 160 AM     | 5           | Н           | V               | 16.30    | 34.77          | Fa55   |
| 713.50             | 23825         | 16QAM      | 5           | П           | Н               | 13.13    |                |        |
|                    |               |            | 5MHz(RB     | size 12 &   | RB offset 0)    |          |                |        |
| 712.50             | 22025         | QPSK       | 5           | Н           | V               | 16.52    |                |        |
| 713.50             | 23825         | QPSK       | 5           | П           | Н               | 14.25    | 24.77          | Door   |
| 713.50             | 23825         | 16QAM      | 5           | Н           | V               | 16.57    | 34.77          | Pass   |
| 713.50             | 23023         | TOQAW      | 5           | П           | Н               | 13.76    |                |        |
|                    |               |            | 5MHz(RB     | size 25 &   | RB offset 0)    |          |                |        |
| 742.50             | 22025         | ODCK       | _           | Н           | V               | 16.66    |                |        |
| 713.50             | 23825         | QPSK       | 5           | П           | Н               | 14.62    | 24.77          | Door   |
| 712.50             | 22025         | 160 AM     | E           | Ш           | V               | 16.23    | 34.77          | Pass   |
| 713.50             | 23825         | 16QAM      | 3           | 5 H         | Н               | 16.38    |                |        |

#### Lowest channel

| Frequency<br>(MHz) | UL<br>Channel | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | ERP(dBm) | Limit<br>(dBm) | Result |
|--------------------|---------------|------------|-------------|-------------|-----------------|----------|----------------|--------|
|                    |               |            | 10MHz(R     | B size 1 &  | RB offset 0)    |          |                |        |
| 709.00             | 23780         | QPSK       | 10          | Н           | V               | 16.38    |                |        |
| 709.00             | 23700         | QFSK       | 10          | П           | Н               | 14.86    | 34.77          | Pass   |
| 700.00             | 23780         | 16QAM      | 10          | Н           | V               | 16.64    | 34.77          | Pa55   |
| 709.00             | 23700         | IOQAW      | 10          | П           | Н               | 13.44    |                |        |
|                    |               | •          | 10MHz(R     | B size 258  | RB offset 0)    |          |                |        |
| 700.00             | 22700         | ODSK       | 10          | Н           | V               | 16.46    |                |        |
| 709.00             | 23780         | QPSK       | 10          | П           | Н               | 14.69    | 34.77          | Pass   |
| 709.00             | 23780         | 16QAM      | 10          | Н           | V               | 16.92    | 34.77          | Pa55   |
| 709.00             | 23700         | IOQAW      | 10          | П           | Н               | 13.16    |                |        |
|                    |               | •          | 10MHz(R     | B size 508  | RB offset 0)    |          |                |        |
| 700.00             | 22700         | ODSK       | 10          | Н           | V               | 16.50    |                |        |
| 709.00             | 23780         | QPSK       | 10          | п           | Н               | 14.16    | 34.77          | Pass   |
| 709.00             | 23780         | 16QAM      | 10          | Н           | V               | 16.84    | 34.77          | rass   |
| 709.00             | 23700         | IOQAW      | 10          | П           | Н               | 13.97    |                |        |





Middle channel

| Frequency | UL      | Modulation | BW      | EUT<br>Pol | Antenna      | ERP(dBm) | Limit | Result |
|-----------|---------|------------|---------|------------|--------------|----------|-------|--------|
| (MHz)     | Channel |            | (MHz)   | Pol.       | Pol.         |          | (dBm) |        |
|           |         |            | 10MHz(R | B size 1 & | RB offset 0) |          |       |        |
| 710.00    | 23790   | QPSK       | 10 H    | V          | 16.19        |          |       |        |
| 710.00    | 23130   | QI OIX     | 10      | 11         | Н            | 14.35    | 34.77 | Pass   |
| 710.00    | 23790   | 16QAM      | 10      | Н          | V            | 16.91    | 34.77 | rass   |
| 7 10.00   | 23790   | TOQAM      | 10      |            | Н            | 13.43    |       |        |
|           |         | •          | 10MHz(R | B size 25& | RB offset 0) |          |       |        |
| 710.00    | 23790   | QPSK       | 10      | Н          | V            | 16.14    |       |        |
| 7 10.00   | 23790   | QFSK       | 10      | П          | Н            | 14.91    | 34.77 | Pass   |
| 710.00    | 23790   | 16QAM      | 10      | Н          | V            | 16.35    | 34.77 | Fa55   |
| 7 10.00   | 23790   | TOQAM      | 10      |            | Н            | 13.97    |       |        |
|           |         | •          | 10MHz(R | B size 50& | RB offset 0) |          |       |        |
| 710.00    | 22700   | ODSK       | 10      | Н          | V            | 16.57    |       |        |
| 710.00    | 23790   | QPSK       | 10      |            | Н            | 14.41    | 24 77 | Door   |
| 710.00    | 23790   | 16QAM      | 10      | Н          | V            | 16.31    | 34.77 | Pass   |
| 7 10.00   | 23790   | TOQAM      | 10      | 17         | Н            | 13.26    |       |        |

Highest channel

|                    | rignest channel |            |             |             |                 |          |                |        |      |
|--------------------|-----------------|------------|-------------|-------------|-----------------|----------|----------------|--------|------|
| Frequency<br>(MHz) | UL<br>Channel   | Modulation | BW<br>(MHz) | EUT<br>Pol. | Antenna<br>Pol. | ERP(dBm) | Limit<br>(dBm) | Result |      |
|                    |                 |            | 10MHz(R     | B size 1 &  | RB offset 0)    |          |                |        |      |
| 711.00             | 23800           | QPSK       | 10          | Н           | V               | 16.21    |                |        |      |
| 711.00             | 23000           | QFSK       | 10          | П           | Н               | 14.37    | 34.77          | Pass   |      |
| 711.00             | 23800           | 16QAM      | 10          | 10 H        | Н               | V        | 16.35          | 34.77  | Pa55 |
| 711.00             | 23000           | TOQAW      | 10          | П           | Н               | 13.87    |                |        |      |
|                    |                 |            | 10MHz(R     | B size 25&  | RB offset 0)    |          |                |        |      |
| 711.00             | 23800           | QPSK       | 10          | Н           | V               | 16.53    |                |        |      |
| 711.00             | 23000           | QFSK       | 10          | П           | Н               | 14.34    | 34.77          | Pass   |      |
| 711.00             | 22000           | 16QAM      | 10          | Н           | V               | 16.97    | 34.77          | Pa55   |      |
| 711.00             | 23800           | IOQAW      | 10          | П           | Н               | 13.79    |                |        |      |
|                    |                 |            | 10MHz(R     | B size 50&  | RB offset 0)    |          |                |        |      |
| 711.00             | 22000           | ODSK       | 10          | Ш           | V               | 16.41    |                |        |      |
| 711.00             | 23800           | QPSK       | 10          | H           | Н               | 14.26    | 34.77          | Pass   |      |
| 711.00             | 23800           | 16QAM      | 10          | Н           | V               | 16.91    | 34.77          | Fa55   |      |
| 711.00             | 23000           | IOQAW      | 10          | П           | Н               | 13.35    |                |        |      |



# **6.11** Field strength of spurious radiation measurement

| Test Requirement: | Part 24.238 (a),Part 27.53(g), Part 22.917(a), Part 27.53(h)  |
|-------------------|---|
| Test Method:      | FCC part2.1053  |
| Limit:            | LTE Band 2, LTE Band 4, LTE Band 5 ,LTE Band 17: -13dBm,  |
| Test setup:       | Below 1GHz  Antenna Tower  Search Antenna  RF T est Receiver  |
|                   | Above 1GHz  |
|                   | Antenna Tower  Horn Antenna  Spectrum Analyzer  Turn 0.8m Im Amplifier  |
|                   | Substituted method:  Antenna mast  Ground plane  d: distance in meters d:3 meter  1-4 meter  SPA  Substituted Dipole or Horn Antenna  Bi-Log Antenna or Horn Antenna  |
| Test Procedure:   | <ol> <li>The EUT was placed on an non-conductive turntable using a non-conductive support. The radiated emission at the fundamental frequency was measured at 3 m with a test antenna and EMI spectrum analyzer.</li> <li>During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.</li> <li>The frequency range up to tenth harmonic was investigated for each of three fundamental frequency (low, middle and high channels). Once spurious emission was identified, the power of the emission</li> </ol> |



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|                   | <ul> <li>was determined using the substitution method.</li> <li>4. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and the spurious emissions frequency.</li> <li>ERP / EIRP = S.G. output (dBm) + Antenna Gain(dB/dBi) – Cable Loss (dB)</li> </ul> |
|-------------------|--|
| Test Instruments: | Refer to section 5.8 for details   |
| Test mode:        | Refer to section 5.3 for details.  |
| Test results:     | Passed   |

#### Measurement Data (worst case):

#### **Below 1GHz:**

The emission levels of below 1 GHz are 20 dB lower than the limit so not show in this report.

#### **Above 1GHz**

For above 1 GHz, all test modes were performed, and just the worst case shown in the report.





LTE band 2 part:

| 1.4MHz(RB size 1 & RB offset 0) for QPSK |  |  |  |  |  |  |
|--|--|--|--|--|--|--|
|  |  | Limit (dRm)                              | Result   |  |  |  |
| Polarization                             | Level (dBm)  | Lillill (dDill)                          | Nesuit   |  |  |  |
|  | Lowest   |  |  |  |  |  |
| Vertical                                 | -28.00   |  |  |  |  |  |
| V  | -31.16   |  |  |  |  |  |
| V  | -42.67   | 12.00                                    | Door   |  |  |  |
| Horizontal                               | -29.37   | -13.00                                   | Pass   |  |  |  |
| Н  | -28.99   |  |  |  |  |  |
| Н  | -42.37   |  |  |  |  |  |
| Middle                                   |  |  |  |  |  |  |
| Vertical                                 | -30.81   |  |  |  |  |  |
| V  | -32.01   |  |  |  |  |  |
| V  | -42.42   | 42.00                                    | Dana   |  |  |  |
| Horizontal                               | -32.99   | -13.00                                   | Pass   |  |  |  |
| Н  | -26.98   |  |  |  |  |  |
| Н  | -42.32   |  |  |  |  |  |
|  | Highest  |  |  |  |  |  |
| Vertical                                 | -37.14   |  |  |  |  |  |
| V  | -33.90   |  |  |  |  |  |
| V  | -42.39   | 42.00                                    | Dana   |  |  |  |
| Horizontal                               | -35.17   | -13.00                                   | Pass   |  |  |  |
|  |  |  |  |  |  |  |
| Н  | -29.98   |  |  |  |  |  |
|  | 1.4MHz(RB si Spurious Polarization  Vertical V V Horizontal H H Vertical V V V V V V V V V V V V V V V V V V V | Spurious Emission   Level (dBm)   Lowest | 1.4MHz(RB size 1 & RB offset 0) for QPSK  Spurious Emission Polarization Level (dBm)  Lowest  Vertical -28.00  V -31.16  V -42.67  Horizontal -29.37  H -28.99  H -42.37  Middle  Vertical -30.81  V -32.01  V -42.42  Horizontal -32.99  H -26.98  H -24.32  Highest  Vertical -37.14  V -33.90  V -42.39  -13.00 |  |  |  |





|                 | 3MHz(RB siz  | ze 1 & RB offset 0) | for QPSK    |        |  |
|-----------------|--------------|---------------------|-------------|--------|--|
| Fragueney (MHz) | •            | Emission            |             | Result |  |
| Frequency (MHz) | Polarization | Level (dBm)         | Limit (dBm) | Result |  |
|                 |              | Lowest              |             |        |  |
| 3703.00         | Vertical     | -28.44              |             |        |  |
| 5554.50         | V            | -31.57              |             |        |  |
| 7406.00         | V            | -42.22              | -13.00      | Pass   |  |
| 3703.00         | Horizontal   | -29.42              | -13.00      | Pass   |  |
| 5554.50         | Н            | -28.68              |             |        |  |
| 7406.00         | Н            | -42.13              |             |        |  |
|                 |              | Middle              |             |        |  |
| 3760.00         | Vertical     | -30.74              |             |        |  |
| 5640.00         | V            | -32.46              |             | Pass   |  |
| 7520.00         | V            | -42.17              | -13.00      |        |  |
| 3760.00         | Horizontal   | -32.46              | -13.00      |        |  |
| 5640.00         | Н            | -26.74              |             |        |  |
| 7520.00         | Н            | -42.67              |             |        |  |
|                 |              | Highest             |             |        |  |
| 3817.00         | Vertical     | -37.57              |             |        |  |
| 5725.50         | V            | -33.74              | -13.00      |        |  |
| 7634.00         | V            | -42.64              |             | Pass   |  |
| 3817.00         | Horizontal   | -35.75              |             | Pass   |  |
| 5725.50         | Н            | -29.99              |             |        |  |
| 7634.00         | Н            | -42.14              |             |        |  |





|                   | 5MHz(RB siz  | ze 1 & RB offset 0) fo | or QPSK      |        |
|-------------------|--------------|------------------------|--------------|--------|
| Frequency (MHz)   | Spurious     | Emission               | Limit (dBm)  | Result |
| Frequency (Miriz) | Polarization | Level (dBm)            | Limit (ubin) | Kesuit |
|                   |              | Lowest                 |              |        |
| 3705.00           | Vertical     | -28.38                 |              |        |
| 5557.50           | V            | -31.85                 |              |        |
| 7410.00           | V            | -42.44                 | 42.00        | Door   |
| 3705.00           | Horizontal   | -29.37                 | -13.00       | Pass   |
| 5557.50           | Н            | -28.44                 |              |        |
| 7410.00           | Н            | -42.33                 |              |        |
|                   |              | Middle                 |              |        |
| 3760.00           | Vertical     | -30.13                 |              |        |
| 5640.00           | V            | -32.64                 |              | Pass   |
| 7520.00           | V            | -42.41                 | 40.00        |        |
| 3760.00           | Horizontal   | -32.24                 | -13.00       |        |
| 5640.00           | Н            | -26.91                 |              |        |
| 7520.00           | Н            | -42.68                 |              |        |
|                   |              | Highest                |              |        |
| 3815.00           | Vertical     | -37.44                 |              |        |
| 5722.50           | V            | -33.46                 |              |        |
| 7630.00           | V            | -42.42                 | -13.00       | Dese   |
| 3815.00           | Horizontal   | -35.68                 |              | Pass   |
| 5722.50           | Н            | -29.74                 |              |        |
| 7630.00           | Н            | -42.79                 |              |        |





|                 | 10MHz(RB size 1 & RB offset 0) for QPSK |             |             |        |  |  |  |  |
|-----------------|---|-------------|-------------|--------|--|--|--|--|
|                 | Spurious                                | Emission    |             |        |  |  |  |  |
| Frequency (MHz) | Polarization                            | Level (dBm) | Limit (dBm) | Result |  |  |  |  |
|                 | Lowest                                  |             |             |        |  |  |  |  |
| 3710.00         | Vertical                                | -28.68      |             |        |  |  |  |  |
| 5565.00         | V                                       | -31.23      |             |        |  |  |  |  |
| 7420.00         | V                                       | -42.18      | -13.00      | Door   |  |  |  |  |
| 3710.00         | Horizontal                              | -29.47      | -13.00      | Pass   |  |  |  |  |
| 5565.00         | Н                                       | -26.82      |             |        |  |  |  |  |
| 7420.00         | Н                                       | -42.41      |             |        |  |  |  |  |
|                 | Middle                                  |             |             |        |  |  |  |  |
| 3760.00         | Vertical                                | -30.79      |             |        |  |  |  |  |
| 5640.00         | V                                       | -32.41      |             | Pass   |  |  |  |  |
| 7520.00         | V                                       | -42.14      | -13.00      |        |  |  |  |  |
| 3760.00         | Horizontal                              | -32.22      | -13.00      |        |  |  |  |  |
| 5640.00         | Н                                       | -26.15      |             |        |  |  |  |  |
| 7520.00         | Н                                       | -42.37      |             |        |  |  |  |  |
| ·               |   | Highest     |             |        |  |  |  |  |
| 3810.00         | Vertical                                | -37.99      |             |        |  |  |  |  |
| 5715.00         | V                                       | -33.15      | -13.00      |        |  |  |  |  |
| 7620.00         | V                                       | -42.29      |             | Pass   |  |  |  |  |
| 3810.00         | Horizontal                              | -35.91      |             | Pass   |  |  |  |  |
| 5715.00         | Н                                       | -29.79      |             |        |  |  |  |  |
| 7620.00         | Н                                       | -42.42      |             |        |  |  |  |  |





|                 | 15MHz(RB          | size 1 & RB offset ( | ) for QPSK   |        |
|-----------------|-------------------|----------------------|--------------|--------|
| Frequency (MHz) | Spurious Emission |                      | Limit (dBm)  | Result |
|                 | Polarization      | Level (dBm)          | Limit (dbin) | Result |
|                 |                   | Lowest               |              |        |
| 3715.00         | Vertical          | -28.37               | -13.00       | Pass   |
| 5572.50         | V                 | -31.14               |              |        |
| 7430.00         | V                 | -42.42               |              |        |
| 3715.00         | Horizontal        | -29.68               |              |        |
| 5572.50         | Н                 | -28.13               |              |        |
| 7430.00         | Н                 | -42.99               |              |        |
|                 |                   | Middle               | <u> </u>     |        |
| 3760.00         | Vertical          | -30.84               |              | Pass   |
| 5640.00         | V                 | -32.76               | -13.00       |        |
| 7520.00         | V                 | -42.12               |              |        |
| 3760.00         | Horizontal        | -32.29               |              |        |
| 5640.00         | Н                 | -26.15               |              |        |
| 7520.00         | Н                 | -42.41               |              |        |
|                 |                   | Highest              |              |        |
| 3805.00         | Vertical          | -37.14               | -13.00       | Pass   |
| 5707.50         | V                 | -33.41               |              |        |
| 7610.00         | V                 | -42.91               |              |        |
| 3805.00         | Horizontal        | -35.19               |              |        |
| 5707.50         | Н                 | -29.46               |              |        |
| 7610.00         | Н                 | -42.13               |              |        |





|                 | 20MHz(RB          | size 1 & RB offset 0 | for QPSK    |        |
|-----------------|-------------------|----------------------|-------------|--------|
| Frequency (MHz) | Spurious Emission |                      |             |        |
|                 | Polarization      | Level (dBm)          | Limit (dBm) | Result |
|                 |                   | Lowest               |             |        |
| 3720.00         | Vertical          | -38.00               | -13.00      | Pass   |
| 5580.00         | V                 | -31.42               |             |        |
| 7440.00         | V                 | -42.12               |             |        |
| 3720.00         | Horizontal        | -29.90               |             |        |
| 5580.00         | Н                 | -26.18               |             |        |
| 7440.00         | Н                 | -42.99               |             |        |
|                 |                   | Middle               |             |        |
| 3760.00         | Vertical          | -30.74               | -13.00      | Pass   |
| 5640.00         | V                 | -32.41               |             |        |
| 7520.00         | V                 | -42.12               |             |        |
| 3760.00         | Horizontal        | -32.81               |             |        |
| 5640.00         | Н                 | -26.71               |             |        |
| 7520.00         | Н                 | -42.21               |             |        |
|                 |                   | Highest              |             |        |
| 3800.00         | Vertical          | -37.89               | -13.00      | Pass   |
| 5700.00         | V                 | -33.92               |             |        |
| 7600.00         | V                 | -42.88               |             |        |
| 3800.00         | Horizontal        | -35.62               |             |        |
| 5700.00         | Н                 | -29.31               |             |        |
| 7600.00         | Н                 | -42.81               |             |        |





#### LTE Band 4 Part:

|                      | 1.4MHz(RB size 1 & RB offset 0) for QPSK |             |              |        |  |  |
|----------------------|--|-------------|--------------|--------|--|--|
| Frequency (MHz)      | Spurious                                 |             | Limit (dBm)  | Result |  |  |
| 1 requericy (Wir 12) | Polarization                             | Level (dBm) | Limit (dbin) | Nesuit |  |  |
|                      | Lowest                                   |             |              |        |  |  |
| 3421.40              | Vertical                                 | -30.08      |              |        |  |  |
| 5132.10              | V  | -30.14      |              |        |  |  |
| 6842.80              | V  | -40.37      | -13.00       | Pass   |  |  |
| 3421.40              | Horizontal                               | -30.91      | -13.00       | Pass   |  |  |
| 5132.10              | Н  | -32.93      |              |        |  |  |
| 6842.80              | Н  | -42.37      |              |        |  |  |
|                      |  | Middle      |              |        |  |  |
| 3465.00              | Vertical                                 | -33.64      |              |        |  |  |
| 5197.50              | V  | -29.21      |              |        |  |  |
| 6930.00              | V  | -42.36      | 42.00        | Door   |  |  |
| 3465.00              | Horizontal                               | -34.88      | -13.00       | Pass   |  |  |
| 5197.50              | Н  | -30.88      |              |        |  |  |
| 6930.00              | Н  | -42.41      |              |        |  |  |
|                      |  | Highest     |              |        |  |  |
| 3508.60              | Vertical                                 | -31.30      |              |        |  |  |
| 5262.90              | V  | -26.56      |              |        |  |  |
| 7017.20              | V  | -37.64      | -13.00       | Pass   |  |  |
| 3508.60              | Horizontal                               | -36.35      |              | Pass   |  |  |
| 5262.90              | Н  | -29.83      |              |        |  |  |
| 7017.20              | Н  | -41.12      |              |        |  |  |





|                         | 3MHz(RB siz  | ze 1 & RB offset 0) fo | or QPSK     |        |
|-------------------------|--------------|------------------------|-------------|--------|
| Гто «о » с. / (М. I – ) | <u> </u>     | Emission               |             | Decult |
| Frequency (MHz)         | Polarization | Level (dBm)            | Limit (dBm) | Result |
|                         |              | Lowest                 |             |        |
| 3423.00                 | Vertical     | -30.52                 |             |        |
| 5134.50                 | V            | -30.25                 |             |        |
| 6846.00                 | V            | -40.43                 | 42.00       | Dana   |
| 3423.00                 | Horizontal   | -30.57                 | -13.00      | Pass   |
| 5134.50                 | Н            | -32.66                 |             |        |
| 6846.00                 | Н            | -42.42                 |             |        |
|                         |              | Middle                 |             |        |
| 3465.00                 | Vertical     | -30.43                 |             | Pass   |
| 5197.50                 | V            | -29.73                 |             |        |
| 6930.00                 | V            | -42.42                 | 42.00       |        |
| 3465.00                 | Horizontal   | -34.57                 | -13.00      |        |
| 5197.50                 | Н            | -30.42                 |             |        |
| 6930.00                 | Н            | -42.69                 |             |        |
|                         |              | Highest                |             |        |
| 3507.00                 | Vertical     | -34.44                 |             |        |
| 5260.50                 | V            | -26.83                 |             |        |
| 7014.00                 | V            | -37.12                 | -13.00      | Door   |
| 3507.00                 | Horizontal   | -36.36                 |             | Pass   |
| 5260.50                 | Н            | -29.12                 |             |        |
| 7014.00                 | Н            | -41.23                 |             |        |





|                   | 5MHz(RB siz  | ze 1 & RB offset 0) fo | or QPSK         |        |
|-------------------|--------------|------------------------|-----------------|--------|
| Frequency (MHz)   |              | Emission               | Limit (dBm)     | Result |
| Frequency (Miriz) | Polarization | Level (dBm)            | Lilliit (ubili) | Nesuit |
|                   |              | Lowest                 |                 |        |
| 3425.00           | Vertical     | -30.42                 |                 |        |
| 5137.50           | V            | -30.16                 |                 |        |
| 6850.00           | V            | -40.57                 | -13.00          | Pass   |
| 3425.00           | Horizontal   | -30.41                 | -13.00          | Pass   |
| 5137.50           | Н            | -32.16                 |                 |        |
| 6850.00           | Н            | -42.34                 |                 |        |
| <u> </u>          |              | Middle                 |                 |        |
| 3465.00           | Vertical     | -33.49                 |                 |        |
| 5197.50           | V            | -29.98                 |                 |        |
| 6930.00           | V            | -42.73                 | 42.00           | Dese   |
| 3465.00           | Horizontal   | -34.87                 | -13.00          | Pass   |
| 5197.50           | Н            | -30.73                 |                 |        |
| 6930.00           | Н            | -42.43                 |                 |        |
|                   |              | Highest                |                 |        |
| 3505.00           | Vertical     | -31.54                 |                 |        |
| 5257.50           | V            | -26.43                 |                 |        |
| 7010.00           | V            | -37.42                 | -13.00          | Deet   |
| 3505.00           | Horizontal   | -36.16                 |                 | Pass   |
| 5257.50           | Н            | -29.57                 |                 |        |
| 7010.00           | Н            | -41.44                 |                 |        |





|                 | 10MHz(RB s   | ize 1 & RB offset 0) | for QPSK    |        |
|-----------------|--------------|----------------------|-------------|--------|
| F (MIL)         | •            | Emission             |             | D      |
| Frequency (MHz) | Polarization | Level (dBm)          | Limit (dBm) | Result |
|                 |              | Lowest               |             |        |
| 3430.00         | Vertical     | -30.66               |             |        |
| 5145.00         | V            | -30.79               |             |        |
| 6860.00         | V            | -40.29               | -13.00      | Pass   |
| 3430.00         | Horizontal   | -30.12               | -13.00      | Pass   |
| 5145.00         | Н            | -32.36               |             |        |
| 6860.00         | Н            | -42.16               |             |        |
|                 |              | Middle               |             |        |
| 3465.00         | Vertical     | -30.36               |             | Pass   |
| 5197.50         | V            | -29.63               |             |        |
| 6930.00         | V            | -42.21               | -13.00      |        |
| 3465.00         | Horizontal   | -34.99               | -13.00      | Fass   |
| 5197.50         | Н            | -30.16               |             |        |
| 6930.00         | Н            | -42.92               |             |        |
|                 |              | Highest              |             |        |
| 3500.00         | Vertical     | -34.91               |             |        |
| 5250.00         | V            | -26.41               |             |        |
| 7000.00         | V            | -37.49               | -13.00      | Pass   |
| 3500.00         | Horizontal   | -36.29               |             | Pass   |
| 5250.00         | Н            | -29.12               |             |        |
| 7000.00         | Н            | -41.23               |             |        |





|                 | 15MHz(RR s   | ize 1 & RB offset 0) | for QPSK    |        |
|-----------------|--------------|----------------------|-------------|--------|
|                 |              | Emission             |             |        |
| Frequency (MHz) | Polarization | Level (dBm)          | Limit (dBm) | Result |
| <u>.</u>        |              | Lowest               |             |        |
| 3435.00         | Vertical     | -30.57               |             |        |
| 5152.50         | V            | -30.12               | ]           |        |
| 6870.00         | V            | -40.23               | 42.00       | Dana   |
| 3435.00         | Horizontal   | -30.36               | -13.00      | Pass   |
| 5152.50         | Н            | -32.84               | ]           |        |
| 6870.00         | Н            | -42.12               | ]           |        |
| <u>.</u>        |              | Middle               |             |        |
| 3465.00         | Vertical     | -33.41               |             |        |
| 5197.50         | V            | -29.44               |             |        |
| 6930.00         | V            | -42.36               | 42.00       | Dana   |
| 3465.00         | Horizontal   | -34.35               | -13.00      | Pass   |
| 5197.50         | Н            | -30.66               |             |        |
| 6930.00         | Н            | -42.42               | ]           |        |
|                 |              | Highest              |             |        |
| 3495.00         | Vertical     | -31.52               |             |        |
| 5242.50         | V            | -26.41               | 1           |        |
| 6990.00         | V            | -37.33               | -13.00      | Pass   |
| 3495.00         | Horizontal   | -36.63               |             | Fass   |
| 5242.50         | Н            | -29.46               |             |        |
| 6990.00         | Н            | -41.14               |             |        |





|                 | 20MHz/RR s   | ize 1 & RB offset 0 | )) for QPSK |        |
|-----------------|--------------|---------------------|-------------|--------|
| (8411.)         |              | Emission            |             | D 1    |
| Frequency (MHz) | Polarization | Level (dBm)         | Limit (dBm) | Result |
|                 |              | Lowest              |             |        |
| 3440.00         | Vertical     | -30.23              |             |        |
| 5160.00         | V            | -30.36              |             |        |
| 6880.00         | V            | -40.84              | 12.00       | Dana   |
| 3440.00         | Horizontal   | -30.44              | -13.00      | Pass   |
| 5160.00         | Н            | -30.29              |             |        |
| 6880.00         | Н            | -42.41              |             |        |
|                 |              | Middle              |             |        |
| 3465.00         | Vertical     | -30.49              |             | Pass   |
| 5197.50         | V            | -29.41              |             |        |
| 6930.00         | V            | -42.36              | -13.00      |        |
| 3465.00         | Horizontal   | -34.12              | -13.00      |        |
| 5197.50         | Н            | -30.49              |             |        |
| 6930.00         | Н            | -42.57              |             |        |
|                 |              | Highest             |             |        |
| 3490.00         | Vertical     | -34.42              |             |        |
| 5235.00         | V            | -26.57              |             |        |
| 6980.00         | V            | -37.35              | -13.00      | Door   |
| 3490.00         | Horizontal   | -36.42              |             | Pass   |
| 5235.00         | Н            | -29.46              |             |        |
| 6980.00         | Н            | -41.91              |             |        |





### LTE Band 5 Part:

|                 | 1.4MHz(RB s  | size 1 & RB offset 0) | for QPSK      |         |
|-----------------|--------------|-----------------------|---------------|---------|
|                 | Spurious     | Emission              |               |         |
| Frequency (MHz) | Polarization | Level (dBm)           | Limit (dBm)   | Result  |
| <u> </u>        |              | Lowest                |               |         |
| 1649.40         | Vertical     | -30.33                |               |         |
| 2474.10         | V            | -36.84                |               |         |
| 3298.80         | V            | -43.49                | -<br>-<br>-13 | Pass    |
| 1649.40         | Horizontal   | -37.73                | -13           | Pass    |
| 2474.10         | Н            | -27.41                |               |         |
| 3298.80         | Н            | -49.36                |               |         |
| ·               |              | Middle                |               |         |
| 1673.00         | Vertical     | -31.86                |               |         |
| 2509.50         | V            | -37.54                |               |         |
| 3346.00         | V            | -44.99                | -13           | Pass    |
| 1673.00         | Horizontal   | -35.54                | -13           | Pass    |
| 2509.50         | Н            | -31.12                |               |         |
| 3346.00         | Н            | -46.61                |               |         |
|                 |              | Highest               |               |         |
| 1696.60         | Vertical     | -30.37                |               |         |
| 2544.90         | V            | -35.41                |               |         |
| 3393.20         | V            | -44.54                | -13           | Pass    |
| 1696.60         | Horizontal   | -34.42                |               | F d 3 3 |
| 2544.90         | Н            | -28.99                |               |         |
| 3393.20         | Н            | -34.29                |               |         |





|                    | 3MHz(RB si   | ze 1 & RB offset 0) f | or QPSK     |        |  |
|--------------------|--------------|-----------------------|-------------|--------|--|
| Crossianos (MIII-) | •            | s Emission            |             | Dooult |  |
| Frequency (MHz)    | Polarization | Level (dBm)           | Limit (dBm) | Result |  |
| Lowest             |              |                       |             |        |  |
| 1651.00            | Vertical     | -33.30                |             |        |  |
| 2476.50            | V            | -36.06                |             |        |  |
| 3302.00            | V            | -43.39                | -13         | Pass   |  |
| 1651.00            | Horizontal   | -37.40                | -13         | Fd55   |  |
| 2476.50            | Н            | -27.50                |             |        |  |
| 3302.00            | Н            | -49.24                |             |        |  |
|                    |              | Middle                |             |        |  |
| 1673.00            | Vertical     | -31.61                |             |        |  |
| 2509.50            | V            | -37.13                |             |        |  |
| 3346.00            | V            | -44.66                | -13         | Pass   |  |
| 1673.00            | Horizontal   | -35.75                | -13         | r d55  |  |
| 2509.50            | Н            | -31.72                |             |        |  |
| 3346.00            | Н            | -46.79                |             |        |  |
|                    |              | Highest               |             |        |  |
| 1695.00            | Vertical     | -30.54                |             |        |  |
| 2542.50            | V            | -35.90                |             |        |  |
| 3390.00            | V            | -42.94                | -13         | Pass   |  |
| 1695.00            | Horizontal   | -34.99                |             | rass   |  |
| 2542.50            | Н            | -28.97                |             |        |  |
| 3390.00            | Н            | -44.16                |             |        |  |





|                 | 5MHz(RB siz       | ze 1 & RB offset 0) fo | or QPSK     |        |
|-----------------|-------------------|------------------------|-------------|--------|
|                 | Spurious Emission |                        |             |        |
| Frequency (MHz) | Polarization      | Level (dBm)            | Limit (dBm) | Result |
|                 |                   | Lowest                 |             |        |
| 1653.00         | Vertical          | -30.33                 |             |        |
| 2479.50         | V                 | -36.73                 |             |        |
| 3306.00         | V                 | -43.41                 | -13         | Pass   |
| 1653.00         | Horizontal        | -37.54                 | -13         | Pass   |
| 2479.50         | Н                 | -27.99                 |             |        |
| 3306.00         | Н                 | -49.35                 |             |        |
|                 |                   | Middle                 |             |        |
| 1673.00         | Vertical          | -31.95                 |             |        |
| 2509.50         | V                 | -37.95                 |             |        |
| 3346.00         | V                 | -44.54                 | 13          | Pass   |
| 1673.00         | Horizontal        | -35.42                 | -13         | Pass   |
| 2509.50         | Н                 | -31.17                 |             |        |
| 3346.00         | Н                 | -46.55                 |             |        |
|                 |                   | Highest                |             |        |
| 1693.00         | Vertical          | -30.33                 |             |        |
| 2539.50         | V                 | -35.11                 |             |        |
| 3386.00         | V                 | -44.54                 | -13         | Pass   |
| 1693.00         | Horizontal        | -34.41                 |             | Pass   |
| 2539.50         | Н                 | -28.35                 |             |        |
| 3386.00         | Н                 | -34.49                 |             |        |





| 10MHz(RB size 1 & RB offset 0) for QPSK |                   |             |             |        |
|---|-------------------|-------------|-------------|--------|
| Fraguency (MHz)                         | Spurious Emission |             | Limit (dDm) | Desult |
| Frequency (MHz)                         | Polarization      | Level (dBm) | Limit (dBm) | Result |
|   |                   | Lowest      |             |        |
| 1658.00                                 | Vertical          | -33.16      |             |        |
| 2487.00                                 | V                 | -36.25      |             |        |
| 3316.00                                 | V                 | -43.37      | -13         | Pass   |
| 1658.00                                 | Horizontal        | -37.39      | -13         | F 455  |
| 2487.00                                 | Н                 | -27.34      |             |        |
| 3316.00                                 | Н                 | -49.12      |             |        |
|   |                   | Middle      |             |        |
| 1673.00                                 | Vertical          | -31.12      |             |        |
| 2509.50                                 | V                 | -37.11      |             |        |
| 3346.00                                 | V                 | -44.17      | -13         | Pass   |
| 1673.00                                 | Horizontal        | -35.54      | -13         | F 455  |
| 2509.50                                 | Н                 | -31.35      |             |        |
| 3346.00                                 | Н                 | -46.12      |             |        |
|   |                   | Highest     |             |        |
| 1688.00                                 | Vertical          | -30.52      |             |        |
| 2532.00                                 | V                 | -35.37      |             |        |
| 3376.00                                 | V                 | -42.33      | -13         | Pass   |
| 1688.00                                 | Horizontal        | -34.52      |             | Pass   |
| 2532.00                                 | Н                 | -28.33      |             |        |
| 3376.00                                 | Н                 | -44.89      |             |        |





### LTE Band 17 Part:

|                   | 5MHz(RB size | e 1 & RB offset 0) fo | r QPSK       |        |
|-------------------|--------------|-----------------------|--------------|--------|
| Frequency (MHz)   | Spurious I   | Emission              | Limit (dBm)  | Result |
| riequency (wiriz) | Polarization | Level (dBm)           | Limit (ubin) | Result |
|                   |              | Lowest                |              |        |
| 1413.00           | Vertical     | -35.19                |              |        |
| 2119.50           | V            | -42.05                |              |        |
| 2826.00           | V            | -50.26                | 12.00        | Pass   |
| 1413.00           | Horizontal   | -38.17                | -13.00       | Pass   |
| 2119.50           | Н            | -42.36                |              |        |
| 2826.00           | Н            | -49.98                |              |        |
|                   |              | Middle                |              |        |
| 1420.00           | Vertical     | -37.75                |              |        |
| 2130.00           | V            | -41.77                |              |        |
| 2840.00           | V            | -50.39                | 42.00        | Desc   |
| 1420.00           | Horizontal   | -40.86                | -13.00       | Pass   |
| 2130.00           | Н            | -45.60                |              |        |
| 2840.00           | Н            | -53.56                |              |        |
|                   |              | Highest               |              | •      |
| 1427.00           | Vertical     | -39.09                |              |        |
| 2140.50           | V            | -42.40                |              |        |
| 2854.00           | V            | -45.87                | -13.00       | Dogs   |
| 1427.00           | Horizontal   | -41.22                |              | Pass   |
| 2140.50           | Н            | -45.96                |              |        |
| 2854.00           | Н            | -50.14                |              |        |





|                 | 10MHz(RB siz      | e 1 & RB offset 0) fo | or QPSK        |          |
|-----------------|-------------------|-----------------------|----------------|----------|
| Fraguency (MUz) | Spurious Emission |                       | Line it (dDne) | Dogult   |
| Frequency (MHz) | Polarization      | Level (dBm)           | Limit (dBm)    | Result   |
|                 |                   | Lowest                |                |          |
| 1418.00         | Vertical          | -35.14                |                |          |
| 2127.00         | V                 | -42.20                |                |          |
| 2836.00         | V                 | -50.36                | -13.00         | Pass     |
| 1418.00         | Horizontal        | -38.36                | -13.00         | Pass     |
| 2127.00         | Н                 | -42.39                |                |          |
| 2836.00         | Н                 | -49.42                |                |          |
|                 |                   | Middle                |                | <u>.</u> |
| 1420.00         | Vertical          | -37.50                |                |          |
| 2130.00         | V                 | -41.36                |                |          |
| 2840.00         | V                 | -50.42                | -13.00         | Pass     |
| 1420.00         | Horizontal        | -40.41                | -13.00         | Fass     |
| 2130.00         | Н                 | -45.44                |                |          |
| 2840.00         | Н                 | -53.53                |                |          |
|                 |                   | Highest               |                |          |
| 1422.00         | Vertical          | -39.36                |                |          |
| 2133.00         | V                 | -42.41                |                |          |
| 2844.00         | V                 | -45.58                | -13.00         | Pass     |
| 1422.00         | Horizontal        | -41.50                |                | F 455    |
| 2133.00         | Н                 | -45.68                |                |          |
| 2844.00         | Н                 | -50.14                |                |          |



## 6.12 Frequency stability V.S. Temperature measurement

| Test Requirement: | FCC Part2.1055(a)(1)(b)   |
|-------------------|---|
| Test Method:      | FCC Part2.1055(a)(1)(b)   |
| Limit:            | ±2.5ppm   |
| Test setup:       | Spectrum analyzer  EUT  Att.  Variable Power Supply   |
|                   | Note: Measurement setup for testing on Antenna connector  |
| Test procedure:   | <ol> <li>The equipment under test was connected to an external DC power supply and input rated voltage.</li> <li>RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.</li> <li>The EUT was placed inside the temperature chamber.</li> <li>Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25°C operating frequency as reference frequency.</li> <li>Turn EUT off and set the chamber temperature to −30°C. After the temperature stabilized for approximately 30 minutes recorded the frequency.</li> <li>Repeat step measure with 10°C increased per stage until the highest temperature of +50°C reached</li> </ol> |
| Test Instruments: | Refer to section 5.8 for details  |
| Test mode:        | Refer to section 5.3 for details  |
| Test results:     | Refer to FCC ID: QISME909U-523  |
| Remark:           | All three channels of all modulations have been tested, but only the worst channel and the worst modulation show in this test item.   |



# 6.13 Frequency stability V.S. Voltage measurement

| Test Requirement: | FCC Part2.1055(d)(1)(2)  |
|-------------------|--|
| Test Method:      | FCC Part2.1055(d)(1)(2)  |
| Limit:            | 2.5ppm   |
| Test setup:       | Spectrum analyzer  EUT  Att.  Variable Power Supply  |
| <del>-</del>      | Note: Measurement setup for testing on Antenna connector   |
| Test procedure:   | <ol> <li>Set chamber temperature to 25°C. Use a variable DC power source to power the EUT and set the voltage to rated voltage.</li> <li>Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and recorded the frequency.</li> <li>Reduce the input voltage to specify extreme voltage variation (+/-15%) and endpoint, record the maximum frequency change.</li> </ol> |
| Test Instruments: | Refer to section 5.8 for details   |
| Test mode:        | Refer to section 5.3 for details, and all channels have been tested, only shows the worst channel data in this report.   |
| Test results:     | Refer to FCC ID: QISME909U-523   |