



# TEST REPORT

Product Name: Smart Phone  
FCC ID: 2ANMU-WP19PRO  
Trademark: **OUKITEL**  
Model Number: WP19 Pro  
Prepared For: SHENZHEN YUNJI INTELLIGENT TECHNOLOGY CO.,LTD  
Address: A2 2F BUILDING ENET NEW INDUSTRIAL PARK, DAFU INDUSTRIAL ZONE, GUANLAN, LONGHUA SHENZHEN, 518XXX China  
Manufacturer: SHENZHEN YUNJI INTELLIGENT TECHNOLOGY CO.,LTD  
Address: A2 2F BUILDING ENET NEW INDUSTRIAL PARK, DAFU INDUSTRIAL ZONE, GUANLAN, LONGHUA SHENZHEN, 518XXX China  
Prepared By: Shenzhen CTB Testing Technology Co., Ltd.  
Address: 1&2/F., Building A, No.26, Xinhe Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China  
Sample Received Date: Oct. 18, 2023  
Sample tested Date: Oct. 18, 2023 to Oct. 31, 2023  
Issue Date: Oct. 31, 2023  
Report No.: CTB231031030RFX  
Test Standards: FCC Part 2, 22, 24E, 27  
Test Results: PASS  
Remark: This is LTE radio test report.

Compiled by:

Zhou kui

Zhou Kui

Reviewed by:

Arron Liu

Arron Liu

Approved by:



Bin Mei / Director

Note: If there is any objection to the inspection results in this report, please submit a written report to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen CTB Testing Technology Co., Ltd. this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client. "\*" indicates the testing items were fulfilled by subcontracted lab. "#" indicates the items are not in CNAS accreditation scope.

---

**TABLE OF CONTENT**

|  | Page      |
|--|-----------|
| Test Report Declaration                                    |           |
| <b>1. VERSION</b> .....                                    | <b>3</b>  |
| <b>2. TEST SUMMARY</b> .....                               | <b>4</b>  |
| <b>3. MEASUREMENT UNCERTAINTY</b> .....                    | <b>5</b>  |
| <b>4. PRODUCT INFORMATION AND TEST SETUP</b> .....         | <b>6</b>  |
| 4.1 Product Information .....                              | 6         |
| 4.2 Test Setup Configuration .....                         | 7         |
| 4.3 Support Equipment .....                                | 7         |
| 4.4 Test Mode .....  | 7         |
| 4.5 Test Environment .....                                 | 7         |
| <b>5. TEST FACILITY AND TEST INSTRUMENT USED</b> .....     | <b>8</b>  |
| 5.1 Test Facility .....                                    | 8         |
| 5.2 Test Instrument Used .....                             | 8         |
| <b>6. RF EXPOSURE</b> .....                                | <b>10</b> |
| 6.1 Standard Applicable .....                              | 10        |
| 6.2 Test Result .....                                      | 10        |
| <b>7. RF OUTPUT POWER</b> .....                            | <b>11</b> |
| 7.1 Standard Applicable .....                              | 11        |
| 7.2 Test Procedure .....                                   | 11        |
| 7.3 Summary of Test Results/Plots .....                    | 12        |
| <b>8. PEAK-TO-AVERAGE RATIO (PAR) OF TRANSMITTER</b> ..... | <b>23</b> |
| 8.1 Standard Applicable .....                              | 23        |
| 8.2 Test Procedure .....                                   | 23        |
| 8.3 Summary of Test Results .....                          | 23        |
| <b>9. EMISSION BANDWIDTH</b> .....                         | <b>24</b> |
| 9.1 Standard Applicable .....                              | 24        |
| 9.2 Test Procedure .....                                   | 24        |
| 9.3 Summary of Test Results/Plots .....                    | 24        |
| <b>10. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL</b> ..... | <b>25</b> |
| 10.1 Standard Applicable .....                             | 25        |
| 10.2 Test Procedure .....                                  | 25        |
| 10.3 Summary of Test Results/Plots .....                   | 26        |
| <b>11. SPURIOUS RADIATED EMISSIONS</b> .....               | <b>27</b> |
| 11.1 Standard Applicable .....                             | 27        |
| 11.2 Test Procedure .....                                  | 28        |
| 11.3 Summary of Test Results/Plots .....                   | 28        |
| <b>12. FREQUENCY STABILITY</b> .....                       | <b>47</b> |
| 12.1 Standard Applicable .....                             | 47        |
| 12.2 Test Procedure .....                                  | 47        |
| 12.3 Summary of Test Results/Plots .....                   | 47        |

*(Note: N/A means not applicable)*

1. VERSION

| Report No.      | Issue Date    | Description | Approved |
|-----------------|---------------|-------------|----------|
| CTB231031030RFX | Oct. 31, 2023 | Original    | Valid    |



## 2. TEST SUMMARY

The Product has been tested according to the following specifications:

| Test Item                                     | Test Requirement                              | Test method                           | Result |
|---|---|---------------------------------------|--------|
| Conducted output power                        | Part 2.1046(a)                                | TIA-603-E-2016 & KDB 971168 D01v03r01 | PASS   |
| Effective Radiated Power of Transmitter(EIRP) | Part 22.913(a)(5)/Part27.50(h)(2)             | TIA-603-E-2016 & KDB 971168 D01v03r01 | PASS   |
| peak-to-average ratio                         | Part 27.50(d)                                 | KDB 971168 D01v03r01                  | PASS   |
| 99% & 26dB Occupied Bandwidth                 | Part 2.1049(h)                                | KDB 971168 D01v03r01                  | PASS   |
| Band Edge at antenna terminals                | Part 2.1051/ Part 22.917(a)/Part 27.53(m) (4) | KDB 971168 D01v03r01                  | PASS   |
| Spurious emissions at antenna terminals       | Part 2.1051/ Part 22.917(a)/Part 27.53(m) (4) | TIA-603-E-2016 & KDB 971168 D01v03r01 | PASS   |
| Field strength of spurious radiation          | Part 2.1053/ Part 22.917(a)/Part 27.53(m) (4) | TIA-603-E-2016 & KDB 971168 D01v03r01 | PASS   |
| Frequency stability                           | Part 2.1055/Part 27.54                        | TIA-603-E-2016 & KDB 971168 D01v03r01 | PASS   |

### 3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

| Item   | Uncertainty        |
|--|--------------------|
| Occupancy bandwidth                                | 54.3kHz            |
| Conducted output power Above 1G                    | 0.9dB              |
| Conducted output power below 1G                    | 0.9dB              |
| Power Spectral Density , Conduction                | 0.9dB              |
| Conduction spurious emissions                      | 2.0dB              |
| Out of band emission                               | 2.0dB              |
| 3m chamber Radiated spurious emission(30MHz-1GHz)  | 4.6dB              |
| 3m chamber Radiated spurious emission(1GHz-18GHz)  | 5.1dB              |
| 3m chamber Radiated spurious emission(18GHz-40GHz) | 3.4dB              |
| Receiver Reference Sensitivity level               | 1.9dB              |
| humidity uncertainty                               | 5.5%               |
| Temperature uncertainty                            | 0.63°C             |
| frequency  | 1×10 <sup>-7</sup> |

#### 4. PRODUCT INFORMATION AND TEST SETUP

##### 4.1 Product Information

|                       |   |
|-----------------------|---|
| Model(s):             | WP19 Pro  |
| Model Description:    | N/A   |
| Hardware Version:     | LG985_MB_V4.0   |
| Software Version:     | OUKITEL_WP19 Pro_EEA_V03_20231030   |
| Operation Frequency:  | FDD-LTE BAND 2:1850-1910MHz<br>FDD-LTE BAND 4:1710-1755MHz<br>FDD-LTE BAND 5:824-849MHz<br>FDD-LTE BAND 7:2500-2570MHz<br>FDD-LTE BAND 12: 699-716MHz<br>FDD-LTE BAND 17:704-716MHz |
| Max. RF output power: | FDD-LTE BAND 2: 23.57dBm<br>FDD-LTE BAND 4: 22.58dBm<br>FDD-LTE BAND 5: 23.43dBm<br>FDD-LTE BAND 7: 23.34dBm<br>FDD-LTE BAND 12: 21.81dBm<br>FDD-LTE BAND 17: 21.89dBm              |
| Type of Modulation:   | QPSK, 16QAM   |
| Antenna installation: | FPC antenna   |
| Antenna Gain:         | LTE BAND 2: -1.06dBi<br>LTE BAND 4: -1.11dBi<br>LTE BAND 5: -2.13dBi<br>LTE BAND 7: 0.83dBi<br>LTE BAND 12: -3.05dBi<br>LTE BAND 17: -3.05dBi                                       |
| Ratings:              | DC 5V charging from adapter<br>DC 3.7V from battery   |



#### 4.2 Test Setup Configuration

See test photographs attached in EUT TEST SETUP PHOTOGRAPHS for the actual connections between Product and support equipment.

#### 4.3 Support Equipment

| No. | Device Type | Brand | Model     | Series No. | Note |
|-----|-------------|-------|-----------|------------|------|
| 1.  | Adapter     | JIYIN | JY-05100C | /          | /    |

**Notes:**

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

#### 4.4 Test Mode

| Test Mode List |                 |                            |
|----------------|-----------------|----------------------------|
| Test Mode      | Description     | Remark                     |
| TM1            | FDD-LTE BAND 2  | Low, Middle, High Channels |
| TM2            | FDD-LTE BAND 4  | Low, Middle, High Channels |
| TM3            | FDD-LTE BAND 5  | Low, Middle, High Channels |
| TM4            | FDD-LTE BAND 7  | Low, Middle, High Channels |
| TM5            | FDD-LTE BAND 12 | Low, Middle, High Channels |
| TM6            | FDD-LTE BAND 17 | Low, Middle, High Channels |

#### 4.5 Test Environment

|                            |      |
|----------------------------|------|
| Humidity(%):               | 54   |
| Atmospheric Pressure(kPa): | 101  |
| Normal Voltage(DC):        | 3.7V |
| Normal Temperature(°C)     | 23   |
| Low Temperature(°C)        | 0    |
| High Temperature(°C)       | 40   |

## 5. TEST FACILITY AND TEST INSTRUMENT USED

### 5.1 Test Facility

All measurement facilities used to collect the measurement data are located at 1&2F., Building A, No. 26, Xinh Road, Xinqiao, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

### 5.2 Test Instrument Used

| Item | Equipment                                 | Manufacturer | Type No.              | Serial No.   | Calibrated until |
|------|---|--------------|-----------------------|--------------|------------------|
| 1    | Spectrum Analyzer                         | Agilent      | N9020A                | MY52090073   | 2024.07.05       |
| 2    | Power Sensor                              | Agilent      | U2021XA               | MY56120032   | 2024.07.05       |
| 3    | Power Sensor                              | Agilent      | U2021XA               | MY56120034   | 2024.07.05       |
| 4    | Communication test set                    | R&S          | CMW500                | 108058       | 2024.07.05       |
| 5    | Spectrum Analyzer                         | KEYSIGHT     | N9020A                | MY51289897   | 2024.07.05       |
| 6    | Signal Generator                          | Agilent      | N5181A                | MY50140365   | 2024.07.05       |
| 7    | Vector signal generator                   | Agilent      | N5182A                | MY47420195   | 2024.07.05       |
| 8    | Communication test set                    | Agilent      | E5515C                | MY50102567   | 2024.07.06       |
| 9    | 2.4 GHz Filter                            | Shenxiang    | MSF2400-2483.5MS-1154 | 20181015001  | 2024.07.05       |
| 10   | 5 GHz Filter                              | Shenxiang    | MSF5150-5850 MS-1155  | 20181015001  | 2024.07.06       |
| 11   | Filter                                    | Xingbo       | XBLBQ-DZA120          | 190821-1-1   | 2024.07.06       |
| 12   | BT&WI-FI Automatic test software          | Microwave    | MTS8000               | Ver. 2.0.0.0 | /                |
| 13   | Rohde & Schwarz SFU Broadcast Test System | R&S          | SFU                   | 101017       | 2024.10.30       |
| 14   | Temperature humidity chamber              | Hongjing     | TH-80CH               | DG-15174     | 2024.07.05       |
| 15   | 234G Automatic test software              | Microwave    | MTS8200               | Ver. 2.0.0.0 | /                |
| 16   | 966 chamber                               | C.R.T.       | 966                   | /            | 2024.08.11       |
| 17   | Receiver                                  | R&S          | ESPI                  | 100362       | 2024.07.05       |
| 18   | Amplifier                                 | HP           | 8447E                 | 2945A02747   | 2024.07.05       |
| 19   | Amplifier                                 | Agilent      | 8449B                 | 3008A01838   | 2024.07.05       |
| 20   | TRILOG Broadband Antenna                  | Schwarzbeck  | VULB 9168             | 00869        | 2024.07.08       |



|    |                                      |             |            |            |            |
|----|--------------------------------------|-------------|------------|------------|------------|
| 21 | Double Ridged Broadband Horn Antenna | Schwarzbeck | BBHA9120D  | 01911      | 2024.07.08 |
| 22 | EMI test software                    | Fala        | EZ-EMC     | FA-03A2 RE | /          |
| 23 | Loop Antenna                         | Schwarzbeck | FMZB 1519B | 1519B-224  | 2024.07.08 |
| 24 | loop antenna                         | ZHINAN      | ZN30900A   | GTS534     | /          |
| 25 | 40G Horn antenna                     | A/H/System  | SAS-574    | 588        | 2024.10.30 |
| 26 | Amplifier                            | AEROFLEX    | Aeroflex   | 097        | 2024.07.05 |

## 6. RF EXPOSURE

### 6.1 Standard Applicable

According to §1.1307 and §2.1091, §2.1093, the portable transmitter must comply the RF exposure requirements.

### 6.2 Test Result

This product complied with the requirement of the RF exposure, please see the RF Exposure report.

## 7. RF OUTPUT POWER

### 7.1 Standard Applicable

According to §22.913(a)(2), the ERP of mobile and portable stations transmitters and auxiliary test transmitters must not exceed 7 Watts.

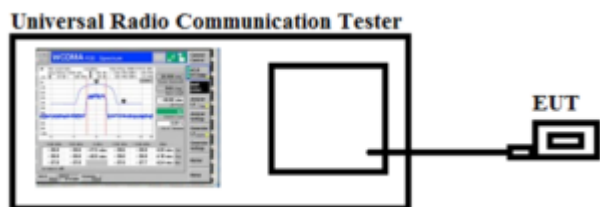
According to §24.232(c), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to §27.50(d)(4), fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band and mobile and portable stations operating in the 1695-1710 MHz and 1755-1780 MHz bands are limited to 1 watt EIRP.

According to §27.50(c)(10), portable stations (hand-held devices) in the 698-746 MHz band are limited to 3 watts ERP.

### 7.2 Test Procedure

Conducted output power test method:



Radiated power test method:

1. The setup of EUT is according with per ANSI/TIA Standard 603E and ANSI C63.26 measurement procedure.
2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.



## 7.3 Summary of Test Results/Plots

 Max. Radiated Power:  
 FDD-LTE Band 2

| Channel Bandwidth: 1.4 MHz |         |               |            |             |         |
|----------------------------|---------|---------------|------------|-------------|---------|
| Modulation                 | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                       | LCH     | V             | 22.59      | <33.00      | PASS    |
|                            |         | H             | 23.06      |             |         |
|                            | MCH     | V             | 22.32      |             | PASS    |
|                            |         | H             | 22.27      |             |         |
|                            | HCH     | V             | 21.98      |             | PASS    |
|                            |         | H             | 22.92      |             |         |
| 16QAM                      | LCH     | V             | 22.71      | <33.00      | PASS    |
|                            |         | H             | 21.61      |             |         |
|                            | MCH     | V             | 23.24      |             | PASS    |
|                            |         | H             | 21.67      |             |         |
|                            | HCH     | V             | 22.46      |             | PASS    |
|                            |         | H             | 22.97      |             |         |
| Channel Bandwidth: 3 MHz   |         |               |            |             |         |
| Modulation                 | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                       | LCH     | V             | 21.61      | <33.00      | PASS    |
|                            |         | H             | 21.38      |             |         |
|                            | MCH     | V             | 21.03      |             | PASS    |
|                            |         | H             | 22.45      |             |         |
|                            | HCH     | V             | 22.85      |             | PASS    |
|                            |         | H             | 21.66      |             |         |
| 16QAM                      | LCH     | V             | 21.10      | <33.00      | PASS    |
|                            |         | H             | 21.59      |             |         |
|                            | MCH     | V             | 20.96      |             | PASS    |
|                            |         | H             | 21.96      |             |         |
|                            | HCH     | V             | 22.63      |             | PASS    |
|                            |         | H             | 22.38      |             |         |
| Channel Bandwidth: 5 MHz   |         |               |            |             |         |
| Modulation                 | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                       | LCH     | V             | 21.32      | <33.00      | PASS    |
|                            |         | H             | 20.54      |             |         |
|                            | MCH     | V             | 21.44      |             | PASS    |
|                            |         | H             | 21.68      |             |         |

|                           | HCH     | V             | 22.28      |             | PASS    |
|---------------------------|---------|---------------|------------|-------------|---------|
|                           |         | H             | 20.88      |             |         |
| 16QAM                     | LCH     | V             | 20.50      | <33.00      | PASS    |
|                           |         | H             | 22.37      |             |         |
|                           | MCH     | V             | 21.45      |             | PASS    |
|                           |         | H             | 21.89      |             |         |
|                           | HCH     | V             | 22.30      |             | PASS    |
|                           |         | H             | 20.71      |             |         |
| Channel Bandwidth: 10 MHz |         |               |            |             |         |
| Modulation                | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 22.42      | <33.00      | PASS    |
|                           |         | H             | 21.03      |             |         |
|                           | MCH     | V             | 21.75      |             | PASS    |
|                           |         | H             | 20.51      |             |         |
|                           | HCH     | V             | 22.30      |             | PASS    |
|                           |         | H             | 21.60      |             |         |
| 16QAM                     | LCH     | V             | 20.61      | <33.00      | PASS    |
|                           |         | H             | 21.28      |             |         |
|                           | MCH     | V             | 21.83      |             | PASS    |
|                           |         | H             | 21.76      |             |         |
|                           | HCH     | V             | 21.12      |             | PASS    |
|                           |         | H             | 22.00      |             |         |
| Channel Bandwidth: 15 MHz |         |               |            |             |         |
| Modulation                | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 22.35      | <33.00      | PASS    |
|                           |         | H             | 21.14      |             |         |
|                           | MCH     | V             | 20.63      |             | PASS    |
|                           |         | H             | 20.67      |             |         |
|                           | HCH     | V             | 20.87      |             | PASS    |
|                           |         | H             | 21.70      |             |         |
| 16QAM                     | LCH     | V             | 21.26      | <33.00      | PASS    |
|                           |         | H             | 20.80      |             |         |
|                           | MCH     | V             | 21.22      |             | PASS    |
|                           |         | H             | 20.98      |             |         |
|                           | HCH     | V             | 21.50      |             | PASS    |
|                           |         | H             | 20.56      |             |         |

| Channel Bandwidth: 20 MHz |         |               |            |             |         |
|---------------------------|---------|---------------|------------|-------------|---------|
| Modulation                | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 23.57      | <33.00      | PASS    |
|                           |         | H             | 20.73      |             |         |
|                           | MCH     | V             | 22.49      |             | PASS    |
|                           |         | H             | 20.97      |             |         |
|                           | HCH     | V             | 22.38      |             | PASS    |
|                           |         | H             | 22.50      |             |         |
| 16QAM                     | LCH     | V             | 23.48      | <33.00      | PASS    |
|                           |         | H             | 21.50      |             |         |
|                           | MCH     | V             | 20.79      |             | PASS    |
|                           |         | H             | 20.64      |             |         |
|                           | HCH     | V             | 22.19      |             | PASS    |
|                           |         | H             | 22.41      |             |         |

## FDD-LTE Band 4

| Channel Bandwidth: 1.4 MHz |         |               |            |             |         |
|----------------------------|---------|---------------|------------|-------------|---------|
| Modulation                 | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                       | LCH     | V             | 20.61      | <30.00      | PASS    |
|                            |         | H             | 19.61      |             |         |
|                            | MCH     | V             | 19.68      |             | PASS    |
|                            |         | H             | 20.60      |             |         |
|                            | HCH     | V             | 19.53      |             | PASS    |
|                            |         | H             | 19.68      |             |         |
| 16QAM                      | LCH     | V             | 19.89      | <30.00      | PASS    |
|                            |         | H             | 20.13      |             |         |
|                            | MCH     | V             | 19.32      |             | PASS    |
|                            |         | H             | 20.32      |             |         |
|                            | HCH     | V             | 19.95      |             | PASS    |
|                            |         | H             | 20.24      |             |         |
| Channel Bandwidth: 3 MHz   |         |               |            |             |         |
| Modulation                 | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                       | LCH     | V             | 18.74      | <30.00      | PASS    |
|                            |         | H             | 19.78      |             |         |
|                            | MCH     | V             | 20.04      |             | PASS    |
|                            |         | H             | 20.26      |             |         |



|                           | HCH     | V             | 20.30      |             | PASS    |
|---------------------------|---------|---------------|------------|-------------|---------|
|                           |         | H             | 20.13      |             |         |
| 16QAM                     | LCH     | V             | 19.47      | <30.00      | PASS    |
|                           |         | H             | 20.24      |             |         |
|                           | MCH     | V             | 18.63      |             | PASS    |
|                           |         | H             | 19.80      |             |         |
|                           | HCH     | V             | 20.22      |             | PASS    |
|                           |         | H             | 19.66      |             |         |
| Channel Bandwidth: 5 MHz  |         |               |            |             |         |
| Modulation                | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 18.57      | <30.00      | PASS    |
|                           |         | H             | 20.35      |             |         |
|                           | MCH     | V             | 20.40      |             | PASS    |
|                           |         | H             | 20.27      |             |         |
|                           | HCH     | V             | 20.32      |             | PASS    |
|                           |         | H             | 19.81      |             |         |
| 16QAM                     | LCH     | V             | 20.16      | <30.00      | PASS    |
|                           |         | H             | 18.73      |             |         |
|                           | MCH     | V             | 18.87      |             | PASS    |
|                           |         | H             | 19.06      |             |         |
|                           | HCH     | V             | 19.73      |             | PASS    |
|                           |         | H             | 19.05      |             |         |
| Channel Bandwidth: 10 MHz |         |               |            |             |         |
| Modulation                | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 19.67      | <30.00      | PASS    |
|                           |         | H             | 19.99      |             |         |
|                           | MCH     | V             | 19.38      |             | PASS    |
|                           |         | H             | 18.91      |             |         |
|                           | HCH     | V             | 20.13      |             | PASS    |
|                           |         | H             | 20.10      |             |         |
| 16QAM                     | LCH     | V             | 19.65      | <30.00      | PASS    |
|                           |         | H             | 18.99      |             |         |
|                           | MCH     | V             | 19.51      |             | PASS    |
|                           |         | H             | 18.93      |             |         |
|                           | HCH     | V             | 20.58      |             | PASS    |
|                           |         | H             | 19.79      |             |         |

| Channel Bandwidth: 15 MHz |         |               |            |             |         |
|---------------------------|---------|---------------|------------|-------------|---------|
| Modulation                | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 20.24      | <30.00      | PASS    |
|                           |         | H             | 19.52      |             |         |
|                           | MCH     | V             | 19.36      |             | PASS    |
|                           |         | H             | 19.26      |             |         |
|                           | HCH     | V             | 20.51      |             | PASS    |
|                           |         | H             | 19.72      |             |         |
| 16QAM                     | LCH     | V             | 20.23      | <30.00      | PASS    |
|                           |         | H             | 18.77      |             |         |
|                           | MCH     | V             | 18.85      |             | PASS    |
|                           |         | H             | 18.87      |             |         |
|                           | HCH     | V             | 19.04      |             | PASS    |
|                           |         | H             | 19.83      |             |         |
| Channel Bandwidth: 20 MHz |         |               |            |             |         |
| Modulation                | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 22.58      | <30.00      | PASS    |
|                           |         | H             | 20.64      |             |         |
|                           | MCH     | V             | 21.05      |             | PASS    |
|                           |         | H             | 21.25      |             |         |
|                           | HCH     | V             | 20.17      |             | PASS    |
|                           |         | H             | 21.50      |             |         |
| 16QAM                     | LCH     | V             | 22.55      | <30.00      | PASS    |
|                           |         | H             | 20.94      |             |         |
|                           | MCH     | V             | 19.96      |             | PASS    |
|                           |         | H             | 20.07      |             |         |
|                           | HCH     | V             | 20.63      |             | PASS    |
|                           |         | H             | 19.95      |             |         |

## FDD-LTE Band 5

| Channel Bandwidth: 1.4 MHz |         |               |           |             |         |
|----------------------------|---------|---------------|-----------|-------------|---------|
| Modulation                 | Channel | Antenna Polar | ERP [dBm] | Limit (dBm) | Verdict |
| QPSK                       | LCH     | V             | 22.23     | <34.77      | PASS    |
|                            |         | H             | 21.09     |             |         |
|                            | MCH     | V             | 22.59     |             | PASS    |
|                            |         | H             | 20.72     |             |         |
|                            | HCH     | V             | 22.51     |             | PASS    |

|                          |         | H             | 22.48     |             |         |
|--------------------------|---------|---------------|-----------|-------------|---------|
| 16QAM                    | LCH     | V             | 21.98     | <34.77      | PASS    |
|                          |         | H             | 22.51     |             |         |
|                          | MCH     | V             | 20.90     |             | PASS    |
|                          |         | H             | 22.49     |             |         |
|                          | HCH     | V             | 21.13     |             | PASS    |
|                          |         | H             | 21.11     |             |         |
| Channel Bandwidth: 3 MHz |         |               |           |             |         |
| Modulation               | Channel | Antenna Polar | ERP [dBm] | Limit (dBm) | Verdict |
| QPSK                     | LCH     | V             | 20.27     | <34.77      | PASS    |
|                          |         | H             | 21.59     |             |         |
|                          | MCH     | V             | 20.20     |             | PASS    |
|                          |         | H             | 20.10     |             |         |
|                          | HCH     | V             | 20.64     |             | PASS    |
|                          |         | H             | 19.92     |             |         |
| 16QAM                    | LCH     | V             | 20.63     | <34.77      | PASS    |
|                          |         | H             | 20.76     |             |         |
|                          | MCH     | V             | 21.65     |             | PASS    |
|                          |         | H             | 20.11     |             |         |
|                          | HCH     | V             | 21.63     |             | PASS    |
|                          |         | H             | 20.80     |             |         |
| Channel Bandwidth: 5 MHz |         |               |           |             |         |
| Modulation               | Channel | Antenna Polar | ERP [dBm] | Limit (dBm) | Verdict |
| QPSK                     | LCH     | V             | 21.29     | <34.77      | PASS    |
|                          |         | H             | 20.68     |             |         |
|                          | MCH     | V             | 21.57     |             | PASS    |
|                          |         | H             | 21.81     |             |         |
|                          | HCH     | V             | 20.97     |             | PASS    |
|                          |         | H             | 21.55     |             |         |
| 16QAM                    | LCH     | V             | 20.23     | <34.77      | PASS    |
|                          |         | H             | 21.29     |             |         |
|                          | MCH     | V             | 21.76     |             | PASS    |
|                          |         | H             | 21.79     |             |         |
|                          | HCH     | V             | 21.39     |             | PASS    |
|                          |         | H             | 20.59     |             |         |



| Channel Bandwidth: 10 MHz |         |               |           |             |         |
|---------------------------|---------|---------------|-----------|-------------|---------|
| Modulation                | Channel | Antenna Polar | ERP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 23.43     | <34.77      | PASS    |
|                           |         | H             | 21.05     |             |         |
|                           | MCH     | V             | 21.03     |             | PASS    |
|                           |         | H             | 21.16     |             |         |
|                           | HCH     | V             | 20.05     |             | PASS    |
|                           |         | H             | 20.24     |             |         |
| 16QAM                     | LCH     | V             | 23.39     | <34.77      | PASS    |
|                           |         | H             | 21.27     |             |         |
|                           | MCH     | V             | 21.12     |             | PASS    |
|                           |         | H             | 21.18     |             |         |
|                           | HCH     | V             | 21.00     |             | PASS    |
|                           |         | H             | 20.38     |             |         |

## FDD-LTE Band 7

| Channel Bandwidth: 5 MHz  |         |               |            |             |         |
|---------------------------|---------|---------------|------------|-------------|---------|
| Modulation                | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 21.26      | <33         | PASS    |
|                           |         | H             | 21.01      |             |         |
|                           | MCH     | V             | 20.27      |             | PASS    |
|                           |         | H             | 21.12      |             |         |
|                           | HCH     | V             | 20.49      |             | PASS    |
|                           |         | H             | 20.18      |             |         |
| 16QAM                     | LCH     | V             | 20.74      | <33         | PASS    |
|                           |         | H             | 20.24      |             |         |
|                           | MCH     | V             | 21.63      |             | PASS    |
|                           |         | H             | 20.92      |             |         |
|                           | HCH     | V             | 20.96      |             | PASS    |
|                           |         | H             | 21.49      |             |         |
| Channel Bandwidth: 10 MHz |         |               |            |             |         |
| Modulation                | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 22.27      | <33         | PASS    |
|                           |         | H             | 22.08      |             |         |
|                           | MCH     | V             | 20.54      |             | PASS    |
|                           |         | H             | 21.96      |             |         |
|                           | HCH     | V             | 22.48      |             | PASS    |
|                           |         |               |            |             |         |

|       |     |   |       |     |      |
|-------|-----|---|-------|-----|------|
| 16QAM | LCH | H | 21.78 | <33 | PASS |
|       |     | V | 21.14 |     |      |
|       | MCH | H | 22.39 |     | PASS |
|       |     | V | 22.50 |     |      |
|       | HCH | H | 20.98 |     | PASS |
|       |     | V | 21.17 |     |      |
|       |     | H | 22.44 |     |      |

| Channel Bandwidth: 15 MHz |         |               |            |             |         |
|---------------------------|---------|---------------|------------|-------------|---------|
| Modulation                | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 21.16      | <33         | PASS    |
|                           |         | H             | 21.98      |             |         |
|                           | MCH     | V             | 21.83      |             | PASS    |
|                           |         | H             | 21.76      |             |         |
|                           | HCH     | V             | 21.44      |             | PASS    |
|                           |         | H             | 20.77      |             |         |
| 16QAM                     | LCH     | V             | 21.31      | <33         | PASS    |
|                           |         | H             | 22.32      |             |         |
|                           | MCH     | V             | 20.76      |             | PASS    |
|                           |         | H             | 22.36      |             |         |
|                           | HCH     | V             | 20.67      |             | PASS    |
|                           |         | H             | 21.01      |             |         |

| Channel Bandwidth: 20 MHz |         |               |            |             |         |
|---------------------------|---------|---------------|------------|-------------|---------|
| Modulation                | Channel | Antenna Polar | EIRP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 23.34      | <33         | PASS    |
|                           |         | H             | 22.42      |             |         |
|                           | MCH     | V             | 20.61      |             | PASS    |
|                           |         | H             | 20.71      |             |         |
|                           | HCH     | V             | 22.36      |             | PASS    |
|                           |         | H             | 21.84      |             |         |
| 16QAM                     | LCH     | V             | 23.27      | <33         | PASS    |
|                           |         | H             | 20.63      |             |         |
|                           | MCH     | V             | 21.49      |             | PASS    |
|                           |         | H             | 21.96      |             |         |
|                           | HCH     | V             | 22.32      |             | PASS    |
|                           |         | H             | 20.81      |             |         |

## FDD-LTE Band 12

| Channel Bandwidth: 1.4 MHz |         |               |           |             |         |
|----------------------------|---------|---------------|-----------|-------------|---------|
| Modulation                 | Channel | Antenna Polar | ERP [dBm] | Limit (dBm) | Verdict |
| QPSK                       | LCH     | V             | 21.15     | <34.77      | PASS    |
|                            |         | H             | 19.78     |             |         |
|                            | MCH     | V             | 20.98     |             | PASS    |
|                            |         | H             | 20.59     |             |         |
|                            | HCH     | V             | 19.70     |             | PASS    |
|                            |         | H             | 21.06     |             |         |
| 16QAM                      | LCH     | V             | 20.56     | <34.77      | PASS    |
|                            |         | H             | 20.50     |             |         |
|                            | MCH     | V             | 19.76     |             | PASS    |
|                            |         | H             | 19.76     |             |         |
|                            | HCH     | V             | 20.63     |             | PASS    |
|                            |         | H             | 20.13     |             |         |
| Channel Bandwidth: 3 MHz   |         |               |           |             |         |
| Modulation                 | Channel | Antenna Polar | ERP [dBm] | Limit (dBm) | Verdict |
| QPSK                       | LCH     | V             | 20.77     | <34.77      | PASS    |
|                            |         | H             | 20.13     |             |         |
|                            | MCH     | V             | 19.85     |             | PASS    |
|                            |         | H             | 20.35     |             |         |
|                            | HCH     | V             | 19.72     |             | PASS    |
|                            |         | H             | 19.75     |             |         |
| 16QAM                      | LCH     | V             | 19.92     | <34.77      | PASS    |
|                            |         | H             | 21.09     |             |         |
|                            | MCH     | V             | 21.05     |             | PASS    |
|                            |         | H             | 20.18     |             |         |
|                            | HCH     | V             | 20.25     |             | PASS    |
|                            |         | H             | 19.72     |             |         |



| Channel Bandwidth: 5 MHz  |         |               |           |             |         |
|---------------------------|---------|---------------|-----------|-------------|---------|
| Modulation                | Channel | Antenna Polar | ERP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 20.29     | <34.77      | PASS    |
|                           |         | H             | 20.25     |             |         |
|                           | MCH     | V             | 21.38     |             | PASS    |
|                           |         | H             | 20.47     |             |         |
|                           | HCH     | V             | 21.02     |             | PASS    |
|                           |         | H             | 21.55     |             |         |
| 16QAM                     | LCH     | V             | 20.90     | <34.77      | PASS    |
|                           |         | H             | 20.53     |             |         |
|                           | MCH     | V             | 21.09     |             | PASS    |
|                           |         | H             | 20.80     |             |         |
|                           | HCH     | V             | 20.11     |             | PASS    |
|                           |         | H             | 20.45     |             |         |
| Channel Bandwidth: 10 MHz |         |               |           |             |         |
| Modulation                | Channel | Antenna Polar | ERP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 21.81     | <34.77      | PASS    |
|                           |         | H             | 20.07     |             |         |
|                           | MCH     | V             | 20.01     |             | PASS    |
|                           |         | H             | 21.52     |             |         |
|                           | HCH     | V             | 20.71     |             | PASS    |
|                           |         | H             | 20.70     |             |         |
| 16QAM                     | LCH     | V             | 21.79     | <34.77      | PASS    |
|                           |         | H             | 21.19     |             |         |
|                           | MCH     | V             | 19.83     |             | PASS    |
|                           |         | H             | 20.13     |             |         |
|                           | HCH     | V             | 21.43     |             | PASS    |
|                           |         | H             | 21.11     |             |         |

FDD-LTE Band 17

| Channel Bandwidth: 5 MHz |         |               |           |             |         |
|--------------------------|---------|---------------|-----------|-------------|---------|
| Modulation               | Channel | Antenna Polar | ERP [dBm] | Limit (dBm) | Verdict |
| QPSK                     | LCH     | V             | 21.20     | <34.77      | PASS    |
|                          |         | H             | 21.20     |             |         |
|                          | MCH     | V             | 20.85     |             | PASS    |
|                          |         | H             | 20.78     |             |         |

|                           | HCH     | V             | 20.18     |             | PASS    |
|---------------------------|---------|---------------|-----------|-------------|---------|
|                           |         | H             | 20.09     |             |         |
| 16QAM                     | LCH     | V             | 21.02     | <34.77      | PASS    |
|                           |         | H             | 20.90     |             |         |
|                           | MCH     | V             | 20.12     |             | PASS    |
|                           |         | H             | 20.16     |             |         |
|                           | HCH     | V             | 20.19     |             | PASS    |
|                           |         | H             | 21.09     |             |         |
| Channel Bandwidth: 10 MHz |         |               |           |             |         |
| Modulation                | Channel | Antenna Polar | ERP [dBm] | Limit (dBm) | Verdict |
| QPSK                      | LCH     | V             | 21.89     | <34.77      | PASS    |
|                           |         | H             | 21.23     |             |         |
|                           | MCH     | V             | 20.72     |             | PASS    |
|                           |         | H             | 21.41     |             |         |
|                           | HCH     | V             | 21.74     |             | PASS    |
|                           |         | H             | 21.77     |             |         |
| 16QAM                     | LCH     | V             | 21.86     | <34.77      | PASS    |
|                           |         | H             | 21.03     |             |         |
|                           | MCH     | V             | 21.35     |             | PASS    |
|                           |         | H             | 21.51     |             |         |
|                           | HCH     | V             | 20.47     |             | PASS    |
|                           |         | H             | 21.01     |             |         |

## 8. PEAK-TO-AVERAGE RATIO (PAR) OF TRANSMITTER

### 8.1 Standard Applicable

According to §24.232(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a Commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51, in measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 dB.

According to §27.50(B), the peak-to-average power ratio (PAPR) of the transmitter output power must not exceed 13 dB. The PAPR measurements should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that PAPR will not exceed 13 dB for more than 0.1 percent of the time or other Commission approved procedure. The measurement must be performed using a signal

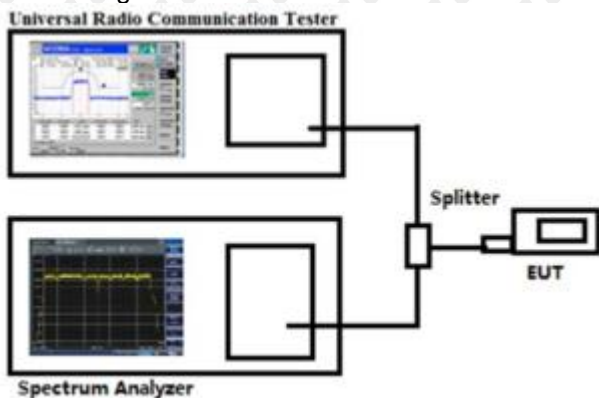
corresponding to the highest PAPR expected during periods of continuous transmission.

### 8.2 Test Procedure

According with KDB 971168

1. The signal analyzer's CCDF measurement profile is enabled
2. Frequency = carrier center frequency
3. Measurement BW > Emission bandwidth of signal
4. The signal analyzer was set to collect one million samples to generate the CCDF curve
5. The measurement interval was set depending on the type of signal analyzed. For continuous signals (>98% duty cycle), the measurement interval was set to 1ms. For burst transmissions, the spectrum analyzer is set to use an internal "RF Burst" trigger that is synced with an incoming pulse and the measurement interval is set to less than the duration of the "on time" of one burst to ensure that energy is only captured during a time in which the transmitter is operating at maximum power

Test Configuration for the emission bandwidth testing:



### 8.3 Summary of Test Results

Please refer to Appendix 3: Peak-to-Average Ratio

Test result: Pass



**9. EMISSION BANDWIDTH**

**9.1 Standard Applicable**

According to §22.917(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

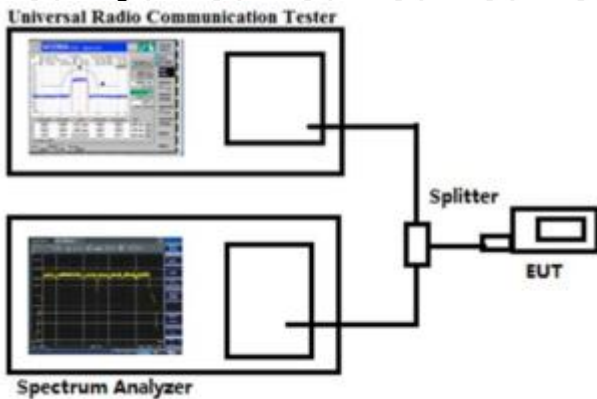
According to §24.238(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

According to §27.53, the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

**9.2 Test Procedure**

According to §22.917(b), the emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

Test Configuration for the emission bandwidth testing:



**9.3 Summary of Test Results/Plots**

Please refer to Appendix 4: 26dB Bandwidth and Occupied Bandwidth  
 Test result: Pass

## 10. OUT OF BAND EMISSIONS AT ANTENNA TERMINAL

### 10.1 Standard Applicable

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

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

According to §27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log(P)$  dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

According to §27.53 (f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

According to §27.53(h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

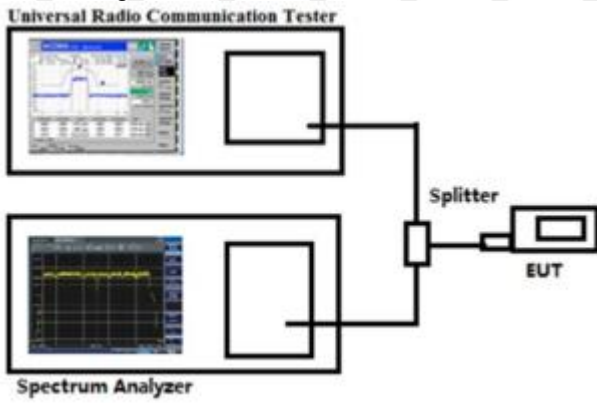
According to §27.53(g), for operations in the 600 MHz band and the 698-746 MHz band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB.

According to §27.53(m)(4), for mobile digital stations, the attenuation factor shall be not less than  $40 + 10 \log(P)$  dB on all frequencies between the channel edge and 5 megahertz from the channel edge,  $43 + 10 \log(P)$  dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and  $55 + 10 \log(P)$  dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5 MHz.

### 10.2 Test Procedure

The RF output terminal of the transmitter was connected to the input of the spectrum analyzer via a suitable attenuation. The RBW of the spectrum analyzer was set to 100kHz and 1MHz for the scan frequency from 30MHz to 1GHz and the scan frequency from 1GHz to up to 10 th harmonic.

Test Configuration for the out of band emissions testing:



### 10.3 Summary of Test Results/Plots

Please refer to Appendix 5 & 6: Band Edge & Conducted Spurious Emission  
Test result: Pass



## 11. SPURIOUS RADIATED EMISSIONS

### 11.1 Standard Applicable

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

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

According to §27.53 (c) For operations in the 746-758 MHz band and the 776-788 MHz band, the power of any emission outside the licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, in accordance with the following:

(1) On any frequency outside the 746-758 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;

(2) On any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least  $43 + 10 \log(P)$  dB;

(3) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $76 + 10 \log(P)$  dB in a 6.25 kHz band segment, for base and fixed stations;

(4) On all frequencies between 763-775 MHz and 793-805 MHz, by a factor not less than  $65 + 10 \log(P)$  dB in a 6.25 kHz band segment, for mobile and portable stations;

(5) Compliance with the provisions of paragraphs (c)(1) and (c)(2) of this section is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. However, in the 100 kHz bands immediately outside and adjacent to the frequency block, a resolution bandwidth of at least 30 kHz may be employed;

(6) Compliance with the provisions of paragraphs (c)(3) and (c)(4) of this section is based on the use of measurement instrumentation such that the reading taken with any resolution bandwidth setting should be adjusted to indicate spectral energy in a 6.25 kHz segment.

According to §27.53 (f) For operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to  $-70$  dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and  $-80$  dBW EIRP for discrete emissions of less than 700 Hz bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

According to §27.53(h), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

According to §27.53(g) the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least  $43 + 10 \log(P)$  dB.

## 11.2 Test Procedure

1. The setup of EUT is according with per ANSI/TIA-603-E and ANSI C63.4-2014 measurement procedure.
  2. The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3-orthogonal axis.
  3. The frequency range up to tenth harmonic of the fundamental frequency was investigated.
  4. Remove the EUT and replace it with substitution antenna. A signal generator was connected to the substitution antenna by a non-radiating cable. The absolute levels of the spurious emissions were measured by the substitution.
- Spurious attenuation limit in dB =  $43 + 10 \log_{10}(\text{power out in Watts})$

## 11.3 Summary of Test Results/Plots

- Note: 1. this EUT was tested in 3 orthogonal positions and the worst case position data was reported.  
2. All test modes (different bandwidth and different modulation) are performed, but only the worst case is recorded in this report.

**Test Data:  
QPSK**

| Band 2 18607 channel/BW1.4(lowest channel) |             |               |                               |             |                 |        |                  |
|--|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                            | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1267.85                                    | 140         | 344           | -57.11                        | -13         | -44.11          | Pass   | H                |
| 1672.66                                    | 144         | 172           | -49.14                        | -13         | -36.14          | Pass   | H                |
| 3920.76                                    | 153         | 77            | -45.11                        | -13         | -32.11          | Pass   | H                |
| 5917.07                                    | 145         | 211           | -44.82                        | -13         | -31.82          | Pass   | H                |
| 6451.11                                    | 157         | 275           | -41.67                        | -13         | -28.67          | Pass   | H                |
| 8174.12                                    | 153         | 254           | -43.94                        | -13         | -30.94          | Pass   | H                |
| 1217.62                                    | 154         | 157           | -55.55                        | -13         | -42.55          | Pass   | V                |
| 1470.13                                    | 157         | 76            | -58.11                        | -13         | -45.11          | Pass   | V                |
| 3621.09                                    | 153         | 69            | -52.43                        | -13         | -39.43          | Pass   | V                |
| 3922.45                                    | 148         | 210           | -50.39                        | -13         | -37.39          | Pass   | V                |
| 5856.87                                    | 151         | 67            | -47.32                        | -13         | -34.32          | Pass   | V                |
| 6599.20                                    | 157         | 27            | -45.96                        | -13         | -32.96          | Pass   | V                |
| Band 2 18900 channel/BW1.4(middle channel) |             |               |                               |             |                 |        |                  |
| Frequency (MHz)                            | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1209.86                                    | 150         | 45            | -59.04                        | -13         | -46.04          | Pass   | H                |
| 1666.12                                    | 146         | 255           | -52.17                        | -13         | -39.17          | Pass   | H                |
| 3801.04                                    | 150         | 285           | -51.23                        | -13         | -38.23          | Pass   | H                |
| 5825.92                                    | 146         | 259           | -44.81                        | -13         | -31.81          | Pass   | H                |
| 6358.76                                    | 149         | 186           | -46.17                        | -13         | -33.17          | Pass   | H                |
| 8078.57                                    | 151         | 195           | -48.51                        | -13         | -35.51          | Pass   | H                |
| 1229.21                                    | 149         | 126           | -55.26                        | -13         | -42.26          | Pass   | V                |
| 1465.17                                    | 148         | 318           | -56.28                        | -13         | -43.28          | Pass   | V                |
| 3576.83                                    | 147         | 286           | -55.61                        | -13         | -42.61          | Pass   | V                |
| 3995.29                                    | 148         | 65            | -49.17                        | -13         | -36.17          | Pass   | V                |
| 5732.65                                    | 150         | 129           | -47.65                        | -13         | -34.65          | Pass   | V                |
| 6420.36                                    | 150         | 29            | -45.67                        | -13         | -32.67          | Pass   | V                |



| Band 2 19193 channel/BW1.4(highest channel) |             |               |                               |             |                 |        |                  |
|---|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1277.28                                     | 148         | 20            | -57.30                        | -13         | -44.30          | Pass   | H                |
| 1696.77                                     | 152         | 144           | -51.30                        | -13         | -38.30          | Pass   | H                |
| 3895.42                                     | 149         | 186           | -46.59                        | -13         | -33.59          | Pass   | H                |
| 5981.69                                     | 145         | 150           | -42.26                        | -13         | -29.26          | Pass   | H                |
| 6603.70                                     | 152         | 297           | -40.11                        | -13         | -27.11          | Pass   | H                |
| 8017.28                                     | 148         | 65            | -42.17                        | -13         | -29.17          | Pass   | H                |
| 1253.51                                     | 151         | 223           | -58.04                        | -13         | -45.04          | Pass   | V                |
| 1460.52                                     | 150         | 143           | -59.24                        | -13         | -46.24          | Pass   | V                |
| 3487.96                                     | 150         | 256           | -51.67                        | -13         | -38.67          | Pass   | V                |
| 3903.59                                     | 146         | 181           | -47.37                        | -13         | -34.37          | Pass   | V                |
| 5695.15                                     | 145         | 179           | -42.12                        | -13         | -29.12          | Pass   | V                |
| 6558.93                                     | 146         | 108           | -49.57                        | -13         | -36.57          | Pass   | V                |

**16QAM**

| Band 2 18607 channel/BW1.4(lowest channel) |             |               |                               |             |                 |        |                  |
|--|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                            | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1259.29                                    | 146         | 221           | -59.21                        | -13         | -46.21          | Pass   | H                |
| 1665.25                                    | 153         | 292           | -48.27                        | -13         | -35.27          | Pass   | H                |
| 3818.03                                    | 147         | 352           | -51.71                        | -13         | -38.71          | Pass   | H                |
| 5938.27                                    | 151         | 258           | -46.87                        | -13         | -33.87          | Pass   | H                |
| 6552.67                                    | 155         | 270           | -44.60                        | -13         | -31.60          | Pass   | H                |
| 7929.25                                    | 150         | 94            | -42.94                        | -13         | -29.94          | Pass   | H                |
| 1128.83                                    | 153         | 258           | -55.05                        | -13         | -42.05          | Pass   | V                |
| 1517.19                                    | 154         | 37            | -54.90                        | -13         | -41.90          | Pass   | V                |
| 3508.36                                    | 153         | 277           | -50.86                        | -13         | -37.86          | Pass   | V                |
| 3812.04                                    | 149         | 145           | -50.51                        | -13         | -37.51          | Pass   | V                |
| 5845.28                                    | 149         | 292           | -44.34                        | -13         | -31.34          | Pass   | V                |
| 6641.50                                    | 145         | 24            | -49.12                        | -13         | -36.12          | Pass   | V                |

| Band 2 18900 channel/BW1.4(middle channel)  |             |               |                               |             |                 |        |                  |
|---|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1413.61                                     | 149         | 267           | -50.95                        | -13         | -41.45          | Pass   | H                |
| 1657.53                                     | 150         | 145           | -51.99                        | -13         | -37.85          | Pass   | H                |
| 3812.81                                     | 154         | 210           | -45.12                        | -13         | -35.2           | Pass   | H                |
| 5873.72                                     | 152         | 20            | -44.22                        | -13         | -30.39          | Pass   | H                |
| 6499.53                                     | 145         | 288           | -47.69                        | -13         | -32.24          | Pass   | H                |
| 8113.01                                     | 146         | 121           | -40.67                        | -13         | -30.22          | Pass   | H                |
| 1108.47                                     | 149         | 125           | -58.87                        | -13         | -44.9           | Pass   | V                |
| 1308.26                                     | 146         | 192           | -54.90                        | -13         | -43.63          | Pass   | V                |
| 3557.89                                     | 150         | 153           | -45.37                        | -13         | -35.94          | Pass   | V                |
| 3938.96                                     | 153         | 13            | -50.30                        | -13         | -36.01          | Pass   | V                |
| 5881.17                                     | 151         | 115           | -44.76                        | -13         | -33.75          | Pass   | V                |
| 6433.39                                     | 152         | 69            | -45.83                        | -13         | -32.41          | Pass   | V                |
| Band 2 19193 channel/BW1.4(highest channel) |             |               |                               |             |                 |        |                  |
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1251.18                                     | 152         | 338           | -56.87                        | -13         | -43.87          | Pass   | H                |
| 1621.20                                     | 155         | 88            | -50.45                        | -13         | -37.45          | Pass   | H                |
| 3825.80                                     | 152         | 134           | -42.68                        | -13         | -29.68          | Pass   | H                |
| 5814.83                                     | 148         | 117           | -44.11                        | -13         | -31.11          | Pass   | H                |
| 6472.92                                     | 154         | 74            | -43.01                        | -13         | -30.01          | Pass   | H                |
| 8166.16                                     | 149         | 153           | -48.66                        | -13         | -35.66          | Pass   | H                |
| 1221.35                                     | 145         | 226           | -55.50                        | -13         | -42.50          | Pass   | V                |
| 1457.64                                     | 148         | 350           | -56.90                        | -13         | -43.90          | Pass   | V                |
| 3486.95                                     | 150         | 275           | -46.61                        | -13         | -33.61          | Pass   | V                |
| 3817.82                                     | 154         | 38            | -53.09                        | -13         | -40.09          | Pass   | V                |
| 5736.09                                     | 151         | 71            | -47.83                        | -13         | -34.83          | Pass   | V                |
| 6644.83                                     | 150         | 194           | -44.00                        | -13         | -31.00          | Pass   | V                |

Note:

- 1) Scan from 9kHz to 40GHz, the disturbance above 13GHz and below 1GHz are attenuated more than 20 dB below the applicable limit and not required to be reported, the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 2) Tested with all kind of bandwidth, RB Size and RB Offset, Found the 1.4MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

**QPSK**

| Band 4 19957 channel/BW1.4(lowest channel) |             |               |                               |             |                 |        |                  |
|--|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                            | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1410.89                                    | 145         | 68            | -55.59                        | -13         | -42.59          | Pass   | H                |
| 1717.19                                    | 153         | 147           | -50.08                        | -13         | -37.08          | Pass   | H                |
| 3777.72                                    | 151         | 59            | -48.85                        | -13         | -35.85          | Pass   | H                |
| 6001.66                                    | 149         | 251           | -46.56                        | -13         | -33.56          | Pass   | H                |
| 6578.01                                    | 145         | 102           | -43.20                        | -13         | -30.20          | Pass   | H                |
| 7991.18                                    | 153         | 178           | -41.42                        | -13         | -28.42          | Pass   | H                |
| 1106.14                                    | 154         | 123           | -51.32                        | -13         | -38.32          | Pass   | V                |
| 1334.16                                    | 149         | 130           | -55.99                        | -13         | -42.99          | Pass   | V                |
| 3667.28                                    | 150         | 87            | -49.09                        | -13         | -36.09          | Pass   | V                |
| 3960.83                                    | 145         | 259           | -51.10                        | -13         | -38.10          | Pass   | V                |
| 5927.25                                    | 146         | 268           | -41.90                        | -13         | -28.90          | Pass   | V                |
| 6642.29                                    | 154         | 16            | -46.64                        | -13         | -33.64          | Pass   | V                |
| Band 4 20175 channel/BW1.4(middle channel) |             |               |                               |             |                 |        |                  |
| Frequency (MHz)                            | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1264.19                                    | 146         | 173           | -51.68                        | -13         | -38.68          | Pass   | H                |
| 1808.75                                    | 154         | 191           | -51.35                        | -13         | -38.35          | Pass   | H                |
| 3753.95                                    | 155         | 324           | -49.63                        | -13         | -36.63          | Pass   | H                |
| 5857.48                                    | 146         | 282           | -40.52                        | -13         | -27.52          | Pass   | H                |
| 6431.26                                    | 148         | 241           | -40.80                        | -13         | -27.80          | Pass   | H                |
| 8025.89                                    | 151         | 220           | -42.79                        | -13         | -29.79          | Pass   | H                |
| 1134.95                                    | 150         | 137           | -60.54                        | -13         | -47.54          | Pass   | V                |
| 1365.77                                    | 152         | 330           | -56.89                        | -13         | -43.89          | Pass   | V                |
| 3624.64                                    | 146         | 6             | -51.79                        | -13         | -38.79          | Pass   | V                |
| 3822.69                                    | 150         | 265           | -46.35                        | -13         | -33.35          | Pass   | V                |
| 5747.91                                    | 146         | 261           | -45.24                        | -13         | -32.24          | Pass   | V                |
| 6578.21                                    | 153         | 166           | -46.32                        | -13         | -33.32          | Pass   | V                |



| Band 4 20393 channel/BW1.4(highest channel) |             |               |                               |             |                 |        |                  |
|---|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1412.58                                     | 149         | 165           | -56.21                        | -13         | -43.21          | Pass   | H                |
| 1662.55                                     | 146         | 208           | -46.12                        | -13         | -33.12          | Pass   | H                |
| 3814.71                                     | 146         | 4             | -43.26                        | -13         | -30.26          | Pass   | H                |
| 5901.80                                     | 150         | 198           | -40.97                        | -13         | -27.97          | Pass   | H                |
| 6439.23                                     | 146         | 341           | -41.23                        | -13         | -28.23          | Pass   | H                |
| 8025.62                                     | 150         | 235           | -42.94                        | -13         | -29.94          | Pass   | H                |
| 1262.20                                     | 146         | 292           | -51.62                        | -13         | -38.62          | Pass   | V                |
| 1460.22                                     | 150         | 158           | -59.58                        | -13         | -46.58          | Pass   | V                |
| 3587.82                                     | 149         | 55            | -52.64                        | -13         | -39.64          | Pass   | V                |
| 3870.42                                     | 150         | 319           | -47.73                        | -13         | -34.73          | Pass   | V                |
| 5827.52                                     | 146         | 118           | -44.86                        | -13         | -31.86          | Pass   | V                |
| 6471.04                                     | 150         | 155           | -45.56                        | -13         | -32.56          | Pass   | V                |

**16QAM**

| Band 4 19957 channel/BW1.4(lowest channel) |             |               |                               |             |                 |        |                  |
|--|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                            | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1304.47                                    | 150         | 78            | -59.00                        | -13         | -46.00          | Pass   | H                |
| 1782.67                                    | 149         | 291           | -50.24                        | -13         | -37.24          | Pass   | H                |
| 3831.87                                    | 151         | 213           | -52.88                        | -13         | -39.88          | Pass   | H                |
| 5906.00                                    | 150         | 89            | -49.36                        | -13         | -36.36          | Pass   | H                |
| 6578.20                                    | 151         | 329           | -47.78                        | -13         | -34.78          | Pass   | H                |
| 7969.53                                    | 148         | 138           | -44.23                        | -13         | -31.23          | Pass   | H                |
| 1145.49                                    | 149         | 99            | -56.22                        | -13         | -43.22          | Pass   | V                |
| 1469.73                                    | 148         | 217           | -53.03                        | -13         | -40.03          | Pass   | V                |
| 3665.07                                    | 150         | 12            | -50.50                        | -13         | -37.50          | Pass   | V                |
| 3848.10                                    | 150         | 137           | -50.34                        | -13         | -37.34          | Pass   | V                |
| 5731.11                                    | 146         | 356           | -42.54                        | -13         | -29.54          | Pass   | V                |
| 6598.84                                    | 146         | 95            | -45.07                        | -13         | -32.07          | Pass   | V                |

| Band 4 20175 channel/BW1.4(middle channel)  |             |               |                               |             |                 |        |                  |
|---|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1236.45                                     | 150         | 142           | -56.07                        | -13         | -43.07          | Pass   | H                |
| 1754.11                                     | 146         | 280           | -51.60                        | -13         | -38.60          | Pass   | H                |
| 3860.21                                     | 150         | 330           | -46.82                        | -13         | -33.82          | Pass   | H                |
| 5806.42                                     | 146         | 194           | -47.70                        | -13         | -34.70          | Pass   | H                |
| 6449.73                                     | 149         | 260           | -47.41                        | -13         | -34.41          | Pass   | H                |
| 7971.22                                     | 151         | 31            | -45.24                        | -13         | -32.24          | Pass   | H                |
| 1139.73                                     | 149         | 4             | -56.61                        | -13         | -43.61          | Pass   | V                |
| 1465.46                                     | 148         | 257           | -59.34                        | -13         | -46.34          | Pass   | V                |
| 3508.83                                     | 147         | 55            | -48.57                        | -13         | -35.57          | Pass   | V                |
| 4005.35                                     | 148         | 273           | -49.95                        | -13         | -36.95          | Pass   | V                |
| 5850.66                                     | 150         | 136           | -48.40                        | -13         | -35.40          | Pass   | V                |
| 6424.53                                     | 150         | 16            | -46.44                        | -13         | -33.44          | Pass   | V                |
| Band 4 20393 channel/BW1.4(highest channel) |             |               |                               |             |                 |        |                  |
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1337.05                                     | 149         | 156           | -54.16                        | -13         | -41.16          | Pass   | H                |
| 1648.37                                     | 149         | 170           | -48.71                        | -13         | -35.71          | Pass   | H                |
| 3789.27                                     | 149         | 127           | -49.26                        | -13         | -36.26          | Pass   | H                |
| 5822.74                                     | 146         | 42            | -45.27                        | -13         | -32.27          | Pass   | H                |
| 6466.32                                     | 147         | 69            | -43.77                        | -13         | -30.77          | Pass   | H                |
| 7930.83                                     | 151         | 110           | -44.55                        | -13         | -31.55          | Pass   | H                |
| 1215.52                                     | 148         | 61            | -50.50                        | -13         | -37.50          | Pass   | V                |
| 1355.60                                     | 147         | 266           | -51.30                        | -13         | -38.30          | Pass   | V                |
| 3476.33                                     | 148         | 303           | -53.22                        | -13         | -40.22          | Pass   | V                |
| 3905.03                                     | 149         | 195           | -46.82                        | -13         | -33.82          | Pass   | V                |
| 5746.10                                     | 147         | 323           | -44.44                        | -13         | -31.44          | Pass   | V                |
| 6489.94                                     | 146         | 325           | -47.91                        | -13         | -34.91          | Pass   | V                |

Note:

3) Scan from 9kHz to 40GHz, the disturbance above 13GHz and below 1GHz are attenuated more than 20 dB below the applicable limit and not required to be reported, the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

4) Tested with all kind of bandwidth, RB Size and RB Offset, Found the 1.4MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

**QPSK**

| Band 5 20407 channel/BW1.4(lowest channel) |                |                  |  |                |                    |        |                     |
|--|----------------|------------------|--|----------------|--------------------|--------|---------------------|
| Frequency<br>(MHz)                         | Height<br>(cm) | Azimuth<br>(deg) | Spurious<br>Emission<br>Level<br>(dBm) | Limit<br>(dBm) | Over Limit<br>(dB) | Result | Antenna<br>Polaxis. |
| 1239.05                                    | 150            | 239              | -58.26                                 | -13            | -45.26             | Pass   | H                   |
| 1631.21                                    | 144            | 184              | -49.54                                 | -13            | -36.54             | Pass   | H                   |
| 3963.13                                    | 141            | 177              | -44.92                                 | -13            | -31.92             | Pass   | H                   |
| 5926.25                                    | 145            | 21               | -44.23                                 | -13            | -31.23             | Pass   | H                   |
| 6437.92                                    | 142            | 165              | -42.17                                 | -13            | -29.17             | Pass   | H                   |
| 8067.06                                    | 151            | 152              | -43.06                                 | -13            | -30.06             | Pass   | H                   |
| 1199.22                                    | 148            | 44               | -56.12                                 | -13            | -43.12             | Pass   | V                   |
| 1455.71                                    | 152            | 174              | -55.96                                 | -13            | -42.96             | Pass   | V                   |
| 3452.19                                    | 158            | 168              | -51.81                                 | -13            | -38.81             | Pass   | V                   |
| 3760.49                                    | 143            | 79               | -50.34                                 | -13            | -37.34             | Pass   | V                   |
| 5709.65                                    | 155            | 49               | -47.38                                 | -13            | -34.38             | Pass   | V                   |
| 6465.55                                    | 145            | 334              | -47.14                                 | -13            | -34.14             | Pass   | V                   |
| Band 5 20525 channel/BW1.4(middle channel) |                |                  |  |                |                    |        |                     |
| Frequency<br>(MHz)                         | Height<br>(cm) | Azimuth<br>(deg) | Spurious<br>Emission<br>Level<br>(dBm) | Limit<br>(dBm) | Over Limit<br>(dB) | Result | Antenna<br>Polaxis. |
| 1328.85                                    | 150            | 20               | -59.08                                 | -13            | -46.08             | Pass   | H                   |
| 1778.35                                    | 146            | 105              | -49.21                                 | -13            | -36.21             | Pass   | H                   |
| 3808.90                                    | 150            | 233              | -52.96                                 | -13            | -39.96             | Pass   | H                   |
| 5963.15                                    | 146            | 169              | -46.98                                 | -13            | -33.98             | Pass   | H                   |
| 6449.24                                    | 149            | 310              | -48.35                                 | -13            | -35.35             | Pass   | H                   |
| 7987.58                                    | 151            | 122              | -48.21                                 | -13            | -35.21             | Pass   | H                   |
| 1164.59                                    | 149            | 293              | -55.50                                 | -13            | -42.50             | Pass   | V                   |
| 1408.35                                    | 148            | 230              | -57.19                                 | -13            | -44.19             | Pass   | V                   |
| 3548.62                                    | 147            | 309              | -56.33                                 | -13            | -43.33             | Pass   | V                   |
| 3866.49                                    | 148            | 359              | -51.15                                 | -13            | -38.15             | Pass   | V                   |
| 5879.28                                    | 150            | 273              | -49.17                                 | -13            | -36.17             | Pass   | V                   |
| 6598.26                                    | 150            | 66               | -50.65                                 | -13            | -37.65             | Pass   | V                   |



| Band 5 20643 channel/BW1.4(highest channel) |                |                  |  |                |                    |        |                     |
|---|----------------|------------------|--|----------------|--------------------|--------|---------------------|
| Frequency<br>(MHz)                          | Height<br>(cm) | Azimuth<br>(deg) | Spurious<br>Emission<br>Level<br>(dBm) | Limit<br>(dBm) | Over Limit<br>(dB) | Result | Antenna<br>Polaxis. |
| 1403.19                                     | 146            | 217              | -57.85                                 | -13            | -44.85             | Pass   | H                   |
| 1733.47                                     | 153            | 11               | -53.73                                 | -13            | -40.73             | Pass   | H                   |
| 3784.82                                     | 153            | 133              | -44.79                                 | -13            | -31.79             | Pass   | H                   |
| 5808.03                                     | 148            | 162              | -43.56                                 | -13            | -30.56             | Pass   | H                   |
| 6432.33                                     | 149            | 290              | -44.97                                 | -13            | -31.97             | Pass   | H                   |
| 8019.02                                     | 148            | 152              | -42.08                                 | -13            | -29.08             | Pass   | H                   |
| 1314.13                                     | 145            | 237              | -56.73                                 | -13            | -43.73             | Pass   | V                   |
| 1316.23                                     | 149            | 68               | -58.70                                 | -13            | -45.70             | Pass   | V                   |
| 3526.12                                     | 154            | 44               | -54.05                                 | -13            | -41.05             | Pass   | V                   |
| 3834.35                                     | 147            | 281              | -47.97                                 | -13            | -34.97             | Pass   | V                   |
| 5846.68                                     | 154            | 28               | -43.41                                 | -13            | -30.41             | Pass   | V                   |
| 6549.26                                     | 155            | 7                | -49.05                                 | -13            | -36.05             | Pass   | V                   |

**16QAM**

| Band 5 20407 channel/BW1.4(lowest channel) |                |                  |  |                |                    |        |                     |
|--|----------------|------------------|--|----------------|--------------------|--------|---------------------|
| Frequency<br>(MHz)                         | Height<br>(cm) | Azimuth<br>(deg) | Spurious<br>Emission<br>Level<br>(dBm) | Limit<br>(dBm) | Over Limit<br>(dB) | Result | Antenna<br>Polaxis. |
| 1289.34                                    | 154            | 32               | -56.92                                 | -13            | -43.92             | Pass   | H                   |
| 1778.70                                    | 146            | 3                | -48.32                                 | -13            | -35.32             | Pass   | H                   |
| 3850.56                                    | 152            | 241              | -46.79                                 | -13            | -33.79             | Pass   | H                   |
| 6000.45                                    | 148            | 25               | -44.13                                 | -13            | -31.13             | Pass   | H                   |
| 6539.13                                    | 153            | 4                | -44.91                                 | -13            | -31.91             | Pass   | H                   |
| 8041.18                                    | 148            | 268              | -42.41                                 | -13            | -29.41             | Pass   | H                   |
| 1195.10                                    | 149            | 292              | -51.36                                 | -13            | -38.36             | Pass   | V                   |
| 1509.03                                    | 153            | 119              | -58.54                                 | -13            | -45.54             | Pass   | V                   |
| 3660.37                                    | 152            | 193              | -53.16                                 | -13            | -40.16             | Pass   | V                   |
| 3813.15                                    | 150            | 294              | -49.70                                 | -13            | -36.70             | Pass   | V                   |
| 5875.91                                    | 146            | 156              | -44.91                                 | -13            | -31.91             | Pass   | V                   |
| 6494.63                                    | 154            | 55               | -47.60                                 | -13            | -34.60             | Pass   | V                   |

| Band 5 20525 channel/BW1.4(middle channel)  |                |                  |  |                |                    |        |                     |
|---|----------------|------------------|--|----------------|--------------------|--------|---------------------|
| Frequency<br>(MHz)                          | Height<br>(cm) | Azimuth<br>(deg) | Spurious<br>Emission<br>Level<br>(dBm) | Limit<br>(dBm) | Over Limit<br>(dB) | Result | Antenna<br>Polaxis. |
| 1416.95                                     | 153            | 291              | -56.49                                 | -13            | -41.45             | Pass   | H                   |
| 1768.46                                     | 154            | 288              | -53.43                                 | -13            | -37.85             | Pass   | H                   |
| 3946.48                                     | 154            | 113              | -49.73                                 | -13            | -35.2              | Pass   | H                   |
| 5915.12                                     | 148            | 100              | -40.70                                 | -13            | -30.39             | Pass   | H                   |
| 6410.77                                     | 148            | 3                | -44.04                                 | -13            | -32.24             | Pass   | H                   |
| 8145.14                                     | 149            | 263              | -45.34                                 | -13            | -30.22             | Pass   | H                   |
| 1253.33                                     | 150            | 220              | -57.26                                 | -13            | -44.9              | Pass   | V                   |
| 1385.12                                     | 151            | 133              | -54.30                                 | -13            | -43.63             | Pass   | V                   |
| 3453.25                                     | 148            | 325              | -50.02                                 | -13            | -35.94             | Pass   | V                   |
| 3832.38                                     | 148            | 192              | -50.37                                 | -13            | -36.01             | Pass   | V                   |
| 5820.25                                     | 146            | 177              | -45.35                                 | -13            | -33.75             | Pass   | V                   |
| 6469.14                                     | 150            | 161              | -47.00                                 | -13            | -32.41             | Pass   | V                   |
| Band 5 20643 channel/BW1.4(highest channel) |                |                  |  |                |                    |        |                     |
| Frequency<br>(MHz)                          | Height<br>(cm) | Azimuth<br>(deg) | Spurious<br>Emission<br>Level<br>(dBm) | Limit<br>(dBm) | Over Limit<br>(dB) | Result | Antenna<br>Polaxis. |
| 1316.62                                     | 145            | 58               | -52.76                                 | -13            | -39.76             | Pass   | H                   |
| 1709.43                                     | 150            | 185              | -49.89                                 | -13            | -36.89             | Pass   | H                   |
| 3910.95                                     | 146            | 82               | -41.51                                 | -13            | -28.51             | Pass   | H                   |
| 5829.24                                     | 147            | 12               | -43.67                                 | -13            | -30.67             | Pass   | H                   |
| 6514.03                                     | 153            | 134              | -43.85                                 | -13            | -30.85             | Pass   | H                   |
| 8086.92                                     | 153            | 312              | -46.63                                 | -13            | -33.63             | Pass   | H                   |
| 1202.61                                     | 146            | 22               | -54.24                                 | -13            | -41.24             | Pass   | V                   |
| 1472.87                                     | 148            | 93               | -61.86                                 | -13            | -48.86             | Pass   | V                   |
| 3500.20                                     | 151            | 333              | -47.09                                 | -13            | -34.09             | Pass   | V                   |
| 3766.84                                     | 150            | 212              | -51.85                                 | -13            | -38.85             | Pass   | V                   |
| 5899.71                                     | 151            | 117              | -51.89                                 | -13            | -38.89             | Pass   | V                   |
| 6572.16                                     | 152            | 194              | -44.84                                 | -13            | -31.84             | Pass   | V                   |

Note:

5) Scan from 9kHz to 40GHz, the disturbance above 13GHz and below 1GHz are attenuated more than 20 dB below the applicable limit and not required to be reported, the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

6) Tested with all kind of bandwidth, RB Size and RB Offset, Found the 1.4MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

**QPSK**

| Band 7 20775 channel/BW 5(lowest channel)  |             |               |                               |             |                 |        |                  |
|--|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                            | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1355.32                                    | 146         | 286           | -57.35                        | -13         | -44.35          | Pass   | H                |
| 1733.01                                    | 154         | 51            | -48.69                        | -13         | -35.69          | Pass   | H                |
| 3943.37                                    | 145         | 87            | -47.27                        | -13         | -34.27          | Pass   | H                |
| 6013.72                                    | 149         | 270           | -45.35                        | -13         | -32.35          | Pass   | H                |
| 6545.48                                    | 146         | 217           | -45.18                        | -13         | -32.18          | Pass   | H                |
| 7992.67                                    | 152         | 32            | -37.92                        | -13         | -24.92          | Pass   | H                |
| 1272.05                                    | 148         | 70            | -57.19                        | -13         | -44.19          | Pass   | V                |
| 1355.92                                    | 148         | 341           | -57.29                        | -13         | -44.29          | Pass   | V                |
| 3579.43                                    | 153         | 94            | -50.56                        | -13         | -37.56          | Pass   | V                |
| 3871.39                                    | 148         | 319           | -54.17                        | -13         | -41.17          | Pass   | V                |
| 5759.18                                    | 154         | 356           | -42.19                        | -13         | -29.19          | Pass   | V                |
| 6679.15                                    | 147         | 12            | -45.85                        | -13         | -32.85          | Pass   | V                |
| Band 7 21100 channel/BW 5 (middle channel) |             |               |                               |             |                 |        |                  |
| Frequency (MHz)                            | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1255.03                                    | 153         | 152           | -54.47                        | -13         | -41.47          | Pass   | H                |
| 1706.64                                    | 147         | 209           | -49.35                        | -13         | -36.35          | Pass   | H                |
| 3929.87                                    | 146         | 314           | -45.67                        | -13         | -32.67          | Pass   | H                |
| 5898.52                                    | 153         | 305           | -44.55                        | -13         | -31.55          | Pass   | H                |
| 6500.92                                    | 149         | 53            | -40.94                        | -13         | -27.94          | Pass   | H                |
| 8109.65                                    | 146         | 198           | -43.67                        | -13         | -30.67          | Pass   | H                |
| 1172.63                                    | 145         | 319           | -59.07                        | -13         | -46.07          | Pass   | V                |
| 1350.00                                    | 150         | 241           | -57.49                        | -13         | -44.49          | Pass   | V                |
| 3494.72                                    | 149         | 134           | -45.91                        | -13         | -32.91          | Pass   | V                |
| 3921.04                                    | 146         | 40            | -48.94                        | -13         | -35.94          | Pass   | V                |
| 5878.02                                    | 149         | 45            | -41.09                        | -13         | -28.09          | Pass   | V                |
| 6485.44                                    | 145         | 283           | -47.47                        | -13         | -34.47          | Pass   | V                |



| Band 7 21425 channel/BW 5 (highest channel) |             |               |                               |             |                 |        |                  |
|---|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1311.69                                     | 149         | 165           | -53.77                        | -13         | -40.77          | Pass   | H                |
| 1705.91                                     | 146         | 208           | -47.00                        | -13         | -34.00          | Pass   | H                |
| 3803.61                                     | 146         | 4             | -45.96                        | -13         | -32.96          | Pass   | H                |
| 5930.49                                     | 150         | 198           | -42.03                        | -13         | -29.03          | Pass   | H                |
| 6493.18                                     | 146         | 341           | -41.52                        | -13         | -28.52          | Pass   | H                |
| 8076.60                                     | 150         | 235           | -40.41                        | -13         | -27.41          | Pass   | H                |
| 1122.43                                     | 146         | 292           | -52.86                        | -13         | -39.86          | Pass   | V                |
| 1440.51                                     | 150         | 158           | -58.86                        | -13         | -45.86          | Pass   | V                |
| 3476.97                                     | 149         | 55            | -50.47                        | -13         | -37.47          | Pass   | V                |
| 3881.70                                     | 150         | 319           | -45.03                        | -13         | -32.03          | Pass   | V                |
| 5764.06                                     | 146         | 118           | -44.46                        | -13         | -31.46          | Pass   | V                |
| 6621.80                                     | 150         | 155           | -44.87                        | -13         | -31.87          | Pass   | V                |

**16QAM**

| Band 7 20775 channel/BW 5 (lowest channel) |             |               |                               |             |                 |        |                  |
|--|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                            | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1218.26                                    | 150         | 142           | -54.03                        | -13         | -41.03          | Pass   | H                |
| 1699.43                                    | 146         | 280           | -52.71                        | -13         | -39.71          | Pass   | H                |
| 3873.73                                    | 150         | 330           | -50.05                        | -13         | -37.05          | Pass   | H                |
| 5939.41                                    | 146         | 194           | -43.05                        | -13         | -30.05          | Pass   | H                |
| 6427.35                                    | 149         | 260           | -50.25                        | -13         | -37.25          | Pass   | H                |
| 8066.69                                    | 151         | 31            | -45.39                        | -13         | -32.39          | Pass   | H                |
| 1237.31                                    | 149         | 4             | -50.48                        | -13         | -37.48          | Pass   | V                |
| 1454.70                                    | 148         | 257           | -66.28                        | -13         | -53.28          | Pass   | V                |
| 3519.80                                    | 147         | 55            | -52.60                        | -13         | -39.60          | Pass   | V                |
| 4011.49                                    | 148         | 273           | -53.98                        | -13         | -40.98          | Pass   | V                |
| 5907.29                                    | 150         | 136           | -51.33                        | -13         | -38.33          | Pass   | V                |
| 6597.63                                    | 150         | 16            | -48.25                        | -13         | -35.25          | Pass   | V                |

| Band 7 21100 channel/BW 5 (middle channel)  |             |               |                               |             |                 |        |                  |
|---|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1264.33                                     | 149         | 156           | -56.17                        | -13         | -43.17          | Pass   | H                |
| 1660.16                                     | 149         | 170           | -53.25                        | -13         | -40.25          | Pass   | H                |
| 3753.25                                     | 149         | 127           | -48.52                        | -13         | -35.52          | Pass   | H                |
| 5844.11                                     | 146         | 42            | -42.86                        | -13         | -29.86          | Pass   | H                |
| 6467.89                                     | 147         | 69            | -44.66                        | -13         | -31.66          | Pass   | H                |
| 7924.83                                     | 151         | 110           | -44.26                        | -13         | -31.26          | Pass   | H                |
| 1196.71                                     | 148         | 61            | -54.26                        | -13         | -41.26          | Pass   | V                |
| 1323.82                                     | 147         | 266           | -53.34                        | -13         | -40.34          | Pass   | V                |
| 3447.09                                     | 148         | 303           | -54.72                        | -13         | -41.72          | Pass   | V                |
| 3840.34                                     | 149         | 195           | -49.67                        | -13         | -36.67          | Pass   | V                |
| 5726.83                                     | 147         | 323           | -41.60                        | -13         | -28.60          | Pass   | V                |
| 6542.61                                     | 146         | 325           | -48.40                        | -13         | -35.40          | Pass   | V                |
| Band 7 21425 channel/BW 5 (highest channel) |             |               |                               |             |                 |        |                  |
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1250.21                                     | 149         | 156           | -54.56                        | -13         | -41.56          | Pass   | H                |
| 1668.41                                     | 149         | 170           | -49.13                        | -13         | -36.13          | Pass   | H                |
| 3794.48                                     | 149         | 127           | -44.45                        | -13         | -31.45          | Pass   | H                |
| 5822.08                                     | 146         | 42            | -45.58                        | -13         | -32.58          | Pass   | H                |
| 6452.92                                     | 147         | 69            | -45.91                        | -13         | -32.91          | Pass   | H                |
| 7907.10                                     | 151         | 110           | -47.32                        | -13         | -34.32          | Pass   | H                |
| 1211.10                                     | 148         | 61            | -56.23                        | -13         | -43.23          | Pass   | V                |
| 1367.23                                     | 147         | 266           | -56.50                        | -13         | -43.50          | Pass   | V                |
| 3427.58                                     | 148         | 303           | -51.08                        | -13         | -38.08          | Pass   | V                |
| 3816.33                                     | 149         | 195           | -46.52                        | -13         | -33.52          | Pass   | V                |
| 5732.68                                     | 147         | 323           | -44.98                        | -13         | -31.98          | Pass   | V                |
| 6519.76                                     | 146         | 325           | -44.01                        | -13         | -31.01          | Pass   | V                |

**QPSK**

| Band 12 23017 channel/BW1.4(lowest channel) |             |               |                               |             |                 |        |                  |
|---|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1355.61                                     | 154         | 340           | -57.05                        | -13         | -44.05          | Pass   | H                |
| 1713.13                                     | 153         | 190           | -45.78                        | -13         | -32.78          | Pass   | H                |
| 3934.49                                     | 154         | 155           | -51.58                        | -13         | -38.58          | Pass   | H                |
| 5994.68                                     | 150         | 347           | -46.27                        | -13         | -33.27          | Pass   | H                |
| 6525.13                                     | 151         | 184           | -42.27                        | -13         | -29.27          | Pass   | H                |
| 8068.46                                     | 149         | 340           | -40.03                        | -13         | -27.03          | Pass   | H                |
| 1174.41                                     | 150         | 106           | -55.63                        | -13         | -42.63          | Pass   | V                |
| 1474.73                                     | 153         | 100           | -55.78                        | -13         | -42.78          | Pass   | V                |
| 3552.39                                     | 148         | 250           | -51.57                        | -13         | -38.57          | Pass   | V                |
| 3809.27                                     | 151         | 351           | -51.83                        | -13         | -38.83          | Pass   | V                |
| 5841.57                                     | 154         | 83            | -43.11                        | -13         | -30.11          | Pass   | V                |
| 6502.24                                     | 149         | 262           | -49.53                        | -13         | -36.53          | Pass   | V                |
| Band 12 23095 channel/BW1.4(middle channel) |             |               |                               |             |                 |        |                  |
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1403.11                                     | 150         | 312           | -52.90                        | -13         | -39.90          | Pass   | H                |
| 1806.68                                     | 150         | 181           | -47.20                        | -13         | -34.20          | Pass   | H                |
| 3854.56                                     | 146         | 328           | -50.43                        | -13         | -37.43          | Pass   | H                |
| 5865.36                                     | 148         | 161           | -41.73                        | -13         | -28.73          | Pass   | H                |
| 6443.86                                     | 147         | 263           | -40.23                        | -13         | -27.23          | Pass   | H                |
| 8116.95                                     | 150         | 10            | -45.24                        | -13         | -32.24          | Pass   | H                |
| 1132.90                                     | 147         | 305           | -58.32                        | -13         | -45.32          | Pass   | V                |
| 1285.87                                     | 150         | 56            | -56.45                        | -13         | -43.45          | Pass   | V                |
| 3452.20                                     | 149         | 281           | -47.98                        | -13         | -34.98          | Pass   | V                |
| 3852.55                                     | 150         | 61            | -48.88                        | -13         | -35.88          | Pass   | V                |
| 5852.61                                     | 150         | 208           | -44.71                        | -13         | -31.71          | Pass   | V                |
| 6588.73                                     | 152         | 158           | -46.69                        | -13         | -33.69          | Pass   | V                |



| Band 12 23173 channel/BW1.4(highest channel) |             |               |                               |             |                 |        |                  |
|--|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                              | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1410.11                                      | 149         | 165           | -51.55                        | -13         | -38.55          | Pass   | H                |
| 1662.37                                      | 146         | 208           | -45.65                        | -13         | -32.65          | Pass   | H                |
| 3831.10                                      | 146         | 4             | -45.31                        | -13         | -32.31          | Pass   | H                |
| 5906.71                                      | 150         | 198           | -43.80                        | -13         | -30.80          | Pass   | H                |
| 6572.38                                      | 146         | 341           | -46.33                        | -13         | -33.33          | Pass   | H                |
| 8063.64                                      | 150         | 235           | -39.28                        | -13         | -26.28          | Pass   | H                |
| 1130.26                                      | 146         | 292           | -56.95                        | -13         | -43.95          | Pass   | V                |
| 1553.93                                      | 150         | 158           | -53.65                        | -13         | -40.65          | Pass   | V                |
| 3502.24                                      | 149         | 55            | -48.59                        | -13         | -35.59          | Pass   | V                |
| 3848.28                                      | 150         | 319           | -49.71                        | -13         | -36.71          | Pass   | V                |
| 5843.94                                      | 146         | 118           | -43.56                        | -13         | -30.56          | Pass   | V                |
| 6508.67                                      | 150         | 155           | -50.78                        | -13         | -37.78          | Pass   | V                |

**16QAM**

| Band 12 23017 channel/BW1.4(lowest channel) |             |               |                               |             |                 |        |                  |
|---|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1416.49                                     | 150         | 78            | -54.72                        | -13         | -41.72          | Pass   | H                |
| 1799.06                                     | 149         | 291           | -49.48                        | -13         | -36.48          | Pass   | H                |
| 3818.57                                     | 151         | 213           | -52.19                        | -13         | -39.19          | Pass   | H                |
| 5804.48                                     | 150         | 89            | -43.82                        | -13         | -30.82          | Pass   | H                |
| 6546.12                                     | 151         | 329           | -46.46                        | -13         | -33.46          | Pass   | H                |
| 7914.50                                     | 148         | 138           | -47.29                        | -13         | -34.29          | Pass   | H                |
| 1183.78                                     | 149         | 99            | -56.85                        | -13         | -43.85          | Pass   | V                |
| 1516.86                                     | 148         | 217           | -57.40                        | -13         | -44.40          | Pass   | V                |
| 3594.72                                     | 150         | 12            | -46.58                        | -13         | -33.58          | Pass   | V                |
| 3788.17                                     | 150         | 137           | -50.17                        | -13         | -37.17          | Pass   | V                |
| 5846.38                                     | 146         | 356           | -45.06                        | -13         | -32.06          | Pass   | V                |
| 6616.60                                     | 146         | 95            | -50.86                        | -13         | -37.86          | Pass   | V                |

| Band 12 23095 channel/BW1.4(middle channel)  |             |               |                               |             |                 |        |                  |
|--|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                              | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1209.31                                      | 150         | 142           | -57.55                        | -13         | -44.55          | Pass   | H                |
| 1791.47                                      | 146         | 280           | -55.37                        | -13         | -42.37          | Pass   | H                |
| 3816.97                                      | 150         | 330           | -50.27                        | -13         | -37.27          | Pass   | H                |
| 5850.39                                      | 146         | 194           | -45.53                        | -13         | -32.53          | Pass   | H                |
| 6361.25                                      | 149         | 260           | -52.87                        | -13         | -39.87          | Pass   | H                |
| 8092.90                                      | 151         | 31            | -48.25                        | -13         | -35.25          | Pass   | H                |
| 1229.81                                      | 149         | 4             | -56.06                        | -13         | -43.06          | Pass   | V                |
| 1380.44                                      | 148         | 257           | -59.91                        | -13         | -46.91          | Pass   | V                |
| 3550.09                                      | 147         | 55            | -50.03                        | -13         | -37.03          | Pass   | V                |
| 3859.91                                      | 148         | 273           | -53.19                        | -13         | -40.19          | Pass   | V                |
| 5890.16                                      | 150         | 136           | -50.96                        | -13         | -37.96          | Pass   | V                |
| 6609.96                                      | 150         | 16            | -47.93                        | -13         | -34.93          | Pass   | V                |
| Band 12 23173 channel/BW1.4(highest channel) |             |               |                               |             |                 |        |                  |
| Frequency (MHz)                              | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1264.07                                      | 149         | 156           | -55.34                        | -13         | -42.34          | Pass   | H                |
| 1655.81                                      | 149         | 170           | -52.40                        | -13         | -39.40          | Pass   | H                |
| 3749.15                                      | 149         | 127           | -44.20                        | -13         | -31.20          | Pass   | H                |
| 5841.04                                      | 146         | 42            | -39.86                        | -13         | -26.86          | Pass   | H                |
| 6463.96                                      | 147         | 69            | -39.89                        | -13         | -26.89          | Pass   | H                |
| 7944.04                                      | 151         | 110           | -49.11                        | -13         | -36.11          | Pass   | H                |
| 1253.12                                      | 148         | 61            | -55.34                        | -13         | -42.34          | Pass   | V                |
| 1371.52                                      | 147         | 266           | -55.37                        | -13         | -42.37          | Pass   | V                |
| 3445.16                                      | 148         | 303           | -49.09                        | -13         | -36.09          | Pass   | V                |
| 3867.61                                      | 149         | 195           | -46.98                        | -13         | -33.98          | Pass   | V                |
| 5709.31                                      | 147         | 323           | -47.09                        | -13         | -34.09          | Pass   | V                |
| 6507.63                                      | 146         | 325           | -50.27                        | -13         | -37.27          | Pass   | V                |

**QPSK**

| Band 17 23755 channel/BW1.4(lowest channel) |             |               |                               |             |                 |        |                  |
|---|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1397.59                                     | 149         | 238           | -54.12                        | -13         | -41.12          | Pass   | H                |
| 1656.33                                     | 147         | 117           | -47.24                        | -13         | -34.24          | Pass   | H                |
| 3822.52                                     | 153         | 136           | -49.36                        | -13         | -36.36          | Pass   | H                |
| 5989.54                                     | 148         | 80            | -44.77                        | -13         | -31.77          | Pass   | H                |
| 6506.56                                     | 149         | 315           | -46.04                        | -13         | -33.04          | Pass   | H                |
| 8095.17                                     | 147         | 307           | -41.75                        | -13         | -28.75          | Pass   | H                |
| 1117.59                                     | 148         | 345           | -50.70                        | -13         | -37.70          | Pass   | V                |
| 1399.73                                     | 151         | 39            | -54.64                        | -13         | -41.64          | Pass   | V                |
| 3614.26                                     | 149         | 29            | -53.00                        | -13         | -40.00          | Pass   | V                |
| 3912.62                                     | 147         | 267           | -53.33                        | -13         | -40.33          | Pass   | V                |
| 5915.83                                     | 152         | 45            | -43.53                        | -13         | -30.53          | Pass   | V                |
| 6647.78                                     | 146         | 20            | -46.21                        | -13         | -33.21          | Pass   | V                |
| Band 17 23790 channel/BW1.4(middle channel) |             |               |                               |             |                 |        |                  |
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1320.37                                     | 148         | 196           | -51.53                        | -13         | -38.53          | Pass   | H                |
| 1704.86                                     | 154         | 141           | -47.56                        | -13         | -34.56          | Pass   | H                |
| 3834.22                                     | 147         | 351           | -46.13                        | -13         | -33.13          | Pass   | H                |
| 5897.38                                     | 154         | 9             | -43.70                        | -13         | -30.70          | Pass   | H                |
| 6560.84                                     | 150         | 276           | -45.81                        | -13         | -32.81          | Pass   | H                |
| 7964.94                                     | 151         | 104           | -46.43                        | -13         | -33.43          | Pass   | H                |
| 1252.49                                     | 148         | 289           | -53.68                        | -13         | -40.68          | Pass   | V                |
| 1392.22                                     | 146         | 269           | -62.51                        | -13         | -49.51          | Pass   | V                |
| 3595.52                                     | 149         | 248           | -48.57                        | -13         | -35.57          | Pass   | V                |
| 3764.29                                     | 155         | 276           | -47.01                        | -13         | -34.01          | Pass   | V                |
| 5802.28                                     | 147         | 239           | -43.57                        | -13         | -30.57          | Pass   | V                |
| 6523.35                                     | 147         | 351           | -42.77                        | -13         | -29.77          | Pass   | V                |



| Band 17 23825 channel/BW1.4(highest channel) |             |               |                               |             |                 |        |                  |
|--|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                              | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1265.91                                      | 149         | 165           | -51.70                        | -13         | -38.70          | Pass   | H                |
| 1623.81                                      | 146         | 208           | -47.55                        | -13         | -34.55          | Pass   | H                |
| 3960.36                                      | 146         | 4             | -44.90                        | -13         | -31.90          | Pass   | H                |
| 5896.76                                      | 150         | 198           | -39.12                        | -13         | -26.12          | Pass   | H                |
| 6608.65                                      | 146         | 341           | -43.56                        | -13         | -30.56          | Pass   | H                |
| 8068.23                                      | 150         | 235           | -40.08                        | -13         | -27.08          | Pass   | H                |
| 1255.07                                      | 146         | 292           | -53.07                        | -13         | -40.07          | Pass   | V                |
| 1381.79                                      | 150         | 158           | -57.78                        | -13         | -44.78          | Pass   | V                |
| 3558.00                                      | 149         | 55            | -49.25                        | -13         | -36.25          | Pass   | V                |
| 3744.64                                      | 150         | 319           | -48.10                        | -13         | -35.10          | Pass   | V                |
| 5718.01                                      | 146         | 118           | -46.43                        | -13         | -33.43          | Pass   | V                |
| 6558.03                                      | 150         | 155           | -47.95                        | -13         | -34.95          | Pass   | V                |

**16QAM**

| Band 17 23755 channel/BW1.4(lowest channel) |             |               |                               |             |                 |        |                  |
|---|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                             | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1433.85                                     | 150         | 78            | -52.77                        | -13         | -39.77          | Pass   | H                |
| 1732.04                                     | 149         | 291           | -49.41                        | -13         | -36.41          | Pass   | H                |
| 3901.92                                     | 151         | 213           | -48.52                        | -13         | -35.52          | Pass   | H                |
| 5930.65                                     | 150         | 89            | -48.60                        | -13         | -35.60          | Pass   | H                |
| 6570.47                                     | 151         | 329           | -43.94                        | -13         | -30.94          | Pass   | H                |
| 7924.85                                     | 148         | 138           | -49.52                        | -13         | -36.52          | Pass   | H                |
| 1256.05                                     | 149         | 99            | -58.22                        | -13         | -45.22          | Pass   | V                |
| 1534.45                                     | 148         | 217           | -51.66                        | -13         | -38.66          | Pass   | V                |
| 3495.90                                     | 150         | 12            | -48.04                        | -13         | -35.04          | Pass   | V                |
| 3812.28                                     | 150         | 137           | -46.87                        | -13         | -33.87          | Pass   | V                |
| 5735.70                                     | 146         | 356           | -46.77                        | -13         | -33.77          | Pass   | V                |
| 6568.41                                     | 146         | 95            | -49.62                        | -13         | -36.62          | Pass   | V                |

| Band 17 23790 channel/BW1.4(middle channel)  |             |               |                               |             |                 |        |                  |
|--|-------------|---------------|-------------------------------|-------------|-----------------|--------|------------------|
| Frequency (MHz)                              | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1236.42                                      | 150         | 142           | -53.58                        | -13         | -40.58          | Pass   | H                |
| 1623.39                                      | 146         | 280           | -54.65                        | -13         | -41.65          | Pass   | H                |
| 3837.61                                      | 150         | 330           | -50.34                        | -13         | -37.34          | Pass   | H                |
| 5843.59                                      | 146         | 194           | -42.15                        | -13         | -29.15          | Pass   | H                |
| 6469.28                                      | 149         | 260           | -52.86                        | -13         | -39.86          | Pass   | H                |
| 7971.46                                      | 151         | 31            | -45.27                        | -13         | -32.27          | Pass   | H                |
| 1160.40                                      | 149         | 4             | -50.80                        | -13         | -37.80          | Pass   | V                |
| 1491.37                                      | 148         | 257           | -64.23                        | -13         | -51.23          | Pass   | V                |
| 3576.12                                      | 147         | 55            | -53.08                        | -13         | -40.08          | Pass   | V                |
| 3973.61                                      | 148         | 273           | -55.77                        | -13         | -42.77          | Pass   | V                |
| 5822.78                                      | 150         | 136           | -51.87                        | -13         | -38.87          | Pass   | V                |
| 6523.96                                      | 150         | 16            | -49.01                        | -13         | -36.01          | Pass   | V                |
| Band 17 23825 channel/BW1.4(highest channel) |             |               |                               |             |                 |        |                  |
| Frequency (MHz)                              | Height (cm) | Azimuth (deg) | Spurious Emission Level (dBm) | Limit (dBm) | Over Limit (dB) | Result | Antenna Polaxis. |
| 1273.34                                      | 149         | 156           | -56.19                        | -13         | -43.19          | Pass   | H                |
| 1646.58                                      | 149         | 170           | -52.53                        | -13         | -39.53          | Pass   | H                |
| 3765.44                                      | 149         | 127           | -47.05                        | -13         | -34.05          | Pass   | H                |
| 5874.60                                      | 146         | 42            | -42.33                        | -13         | -29.33          | Pass   | H                |
| 6468.87                                      | 147         | 69            | -46.21                        | -13         | -33.21          | Pass   | H                |
| 7957.70                                      | 151         | 110           | -46.79                        | -13         | -33.79          | Pass   | H                |
| 1175.43                                      | 148         | 61            | -53.99                        | -13         | -40.99          | Pass   | V                |
| 1401.81                                      | 147         | 266           | -52.71                        | -13         | -39.71          | Pass   | V                |
| 3491.30                                      | 148         | 303           | -52.64                        | -13         | -39.64          | Pass   | V                |
| 3845.68                                      | 149         | 195           | -47.32                        | -13         | -34.32          | Pass   | V                |
| 5698.19                                      | 147         | 323           | -44.64                        | -13         | -31.64          | Pass   | V                |
| 6530.10                                      | 146         | 325           | -50.37                        | -13         | -37.37          | Pass   | V                |

Note:

7) Scan from 9kHz to 40GHz, the disturbance above 13GHz and below 1GHz are attenuated more than 20 dB below the applicable limit and not required to be reported, the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

8) Tested with all kind of bandwidth, RB Size and RB Offset, Found the 1.4MHz with full RB were the worst case; and then Only the worst case is recorded in the report.

## 12. FREQUENCY STABILITY

### 12.1 Standard Applicable

According to §22.355, §24.235, §27.54 the limit is 2.5ppm.

### 12.2 Test Procedure

According to §2.1055, the following test procedure was performed.

The Frequency Stability is measured directly with a Frequency Domain Analyzer. Frequency Deviation in ppm is calculated from the measured peak to peak value.

The Carrier Frequency Stability over Power Supply Voltage and over Temperature is measured with a Frequency Domain Analyzer in histogram mode

### 12.3 Summary of Test Results/Plots

Note: 1.Normal Voltage NV=DC3.7V; Low Voltage LV=DC3.33; High Voltage HV=DC4.07V

Please refer to Appendix F: Frequency Stability

Test result: Pass



LTE Band 2

| Test Frequency:1880.0MHz QPSK 1.4MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.85               | 7                    | 0.0037                | 2.5         |
| 40                                   |                    | 9                    | 0.0048                | 2.5         |
| 30                                   |                    | 7                    | 0.0037                | 2.5         |
| 20                                   |                    | 1                    | 0.0005                | 2.5         |
| 10                                   |                    | -4                   | -0.0021               | 2.5         |
| 0                                    |                    | 0                    | 0.0000                | 2.5         |
| -10                                  |                    | 0                    | 0.0000                | 2.5         |
| -20                                  |                    | 8                    | 0.0043                | 2.5         |
| -30                                  |                    | 8                    | 0.0043                | 2.5         |
| 20                                   |                    | 3.3                  | -6                    | -0.0032     |
| 20                                   | 4.2                | -1                   | -0.0005               | 2.5         |

| T Test Frequency:1880.0MHz 16QAM 1.4MHz |                    |                      |                       |             |
|---|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                        | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                      | 3.85               | 5                    | 0.0027                | 2.5         |
| 40                                      |                    | -1                   | -0.0005               | 2.5         |
| 30                                      |                    | -7                   | -0.0037               | 2.5         |
| 20                                      |                    | 1                    | 0.0005                | 2.5         |
| 10                                      |                    | 6                    | 0.0032                | 2.5         |
| 0                                       |                    | -7                   | -0.0037               | 2.5         |
| -10                                     |                    | 9                    | 0.0048                | 2.5         |
| -20                                     |                    | 5                    | 0.0027                | 2.5         |
| -30                                     |                    | -7                   | -0.0037               | 2.5         |
| 20                                      |                    | 3.3                  | 3                     | 0.0016      |
| 20                                      | 4.2                | 9                    | 0.0048                | 2.5         |

## LTE Band 2

| Test Frequency:1880.0MHz QPSK 3MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | 7                    | 0.0037                | 2.5         |
| 40                                 |                    | -4                   | -0.0021               | 2.5         |
| 30                                 |                    | 7                    | 0.0037                | 2.5         |
| 20                                 |                    | 2                    | 0.0011                | 2.5         |
| 10                                 |                    | 5                    | 0.0027                | 2.5         |
| 0                                  |                    | -1                   | -0.0005               | 2.5         |
| -10                                |                    | 1                    | 0.0005                | 2.5         |
| -20                                |                    | 9                    | 0.0048                | 2.5         |
| -30                                |                    | 1                    | 0.0005                | 2.5         |
| 20                                 |                    | 3.3                  | 11                    | 0.0059      |
| 20                                 | 4.2                | -7                   | -0.0037               | 2.5         |

| Test Frequency:1880.0MHz 16QAM 3MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 0                    | 0.0000                | 2.5         |
| 40                                  |                    | 1                    | 0.0005                | 2.5         |
| 30                                  |                    | 1                    | 0.0005                | 2.5         |
| 20                                  |                    | -1                   | -0.0005               | 2.5         |
| 10                                  |                    | 1                    | 0.0005                | 2.5         |
| 0                                   |                    | 2                    | 0.0011                | 2.5         |
| -10                                 |                    | -6                   | -0.0032               | 2.5         |
| -20                                 |                    | -8                   | -0.0043               | 2.5         |
| -30                                 |                    | -6                   | -0.0032               | 2.5         |
| 20                                  |                    | 3.3                  | -6                    | -0.0032     |
| 20                                  | 4.2                | 2                    | 0.0011                | 2.5         |

## LTE Band 2

| Test Frequency:1880.0MHz QPSK 5MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | -11                  | -0.0059               | 2.5         |
| 40                                 |                    | -11                  | -0.0059               | 2.5         |
| 30                                 |                    | -7                   | -0.0037               | 2.5         |
| 20                                 |                    | -2                   | -0.0011               | 2.5         |
| 10                                 |                    | -4                   | -0.0021               | 2.5         |
| 0                                  |                    | -5                   | -0.0027               | 2.5         |
| -10                                |                    | -5                   | -0.0027               | 2.5         |
| -20                                |                    | -6                   | -0.0032               | 2.5         |
| -30                                |                    | -3                   | -0.0016               | 2.5         |
| 20                                 |                    | 3.3                  | -4                    | -0.0021     |
| 20                                 | 4.2                | 4                    | 0.0021                | 2.5         |

| Test Frequency:1880.0MHz 16QAM 5MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 4                    | 0.0021                | 2.5         |
| 40                                  |                    | -2                   | -0.0011               | 2.5         |
| 30                                  |                    | -5                   | -0.0027               | 2.5         |
| 20                                  |                    | -3                   | -0.0016               | 2.5         |
| 10                                  |                    | -1                   | -0.0005               | 2.5         |
| 0                                   |                    | -4                   | -0.0021               | 2.5         |
| -10                                 |                    | 5                    | 0.0027                | 2.5         |
| -20                                 |                    | -1                   | -0.0005               | 2.5         |
| -30                                 |                    | 2                    | 0.0011                | 2.5         |
| 20                                  |                    | 3.3                  | -4                    | -0.0021     |
| 20                                  | 4.2                | 2                    | 0.0011                | 2.5         |



LTE Band 2

| Test Frequency:1880.0MHz QPSK 10MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 7                    | 0.0037                | 2.5         |
| 40                                  |                    | 4                    | 0.0021                | 2.5         |
| 30                                  |                    | 7                    | 0.0037                | 2.5         |
| 20                                  |                    | 4                    | 0.0021                | 2.5         |
| 10                                  |                    | 2                    | 0.0011                | 2.5         |
| 0                                   |                    | 11                   | 0.0059                | 2.5         |
| -10                                 |                    | 2                    | 0.0011                | 2.5         |
| -20                                 |                    | 8                    | 0.0043                | 2.5         |
| -30                                 |                    | 11                   | 0.0059                | 2.5         |
| 20                                  |                    | 3.3                  | 0                     | 0.0000      |
| 20                                  | 4.2                | 13                   | 0.0069                | 2.5         |

| Test Frequency:1880.0MHz 16QAM 10MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.85               | 7                    | 0.0037                | 2.5         |
| 40                                   |                    | 13                   | 0.0069                | 2.5         |
| 30                                   |                    | 1                    | 0.0005                | 2.5         |
| 20                                   |                    | 5                    | 0.0027                | 2.5         |
| 10                                   |                    | 1                    | 0.0005                | 2.5         |
| 0                                    |                    | 8                    | 0.0043                | 2.5         |
| -10                                  |                    | 1                    | 0.0005                | 2.5         |
| -20                                  |                    | -4                   | -0.0021               | 2.5         |
| -30                                  |                    | 4                    | 0.0021                | 2.5         |
| 20                                   |                    | 3.3                  | 3                     | 0.0016      |
| 20                                   | 4.2                | -4                   | -0.0021               | 2.5         |

## LTE Band 2

| Test Frequency:1880.0MHz QPSK 15MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | -5                   | -0.0027               | 2.5         |
| 40                                  |                    | 4                    | 0.0021                | 2.5         |
| 30                                  |                    | 5                    | 0.0027                | 2.5         |
| 20                                  |                    | 1                    | 0.0005                | 2.5         |
| 10                                  |                    | 7                    | 0.0037                | 2.5         |
| 0                                   |                    | -7                   | -0.0037               | 2.5         |
| -10                                 |                    | -2                   | -0.0011               | 2.5         |
| -20                                 |                    | 4                    | 0.0021                | 2.5         |
| -30                                 |                    | 5                    | 0.0027                | 2.5         |
| 20                                  |                    | 3.3                  | -6                    | -0.0032     |
| 20                                  | 4.2                | -6                   | -0.0032               | 2.5         |

| Test Frequency:1880.0MHz 16QAM 15MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.85               | 15                   | 0.0080                | 2.5         |
| 40                                   |                    | 3                    | 0.0016                | 2.5         |
| 30                                   |                    | 10                   | 0.0053                | 2.5         |
| 20                                   |                    | 6                    | 0.0032                | 2.5         |
| 10                                   |                    | 2                    | 0.0011                | 2.5         |
| 0                                    |                    | 1                    | 0.0005                | 2.5         |
| -10                                  |                    | 12                   | 0.0064                | 2.5         |
| -20                                  |                    | 9                    | 0.0048                | 2.5         |
| -30                                  |                    | 0                    | 0.0000                | 2.5         |
| 20                                   |                    | 3.3                  | 9                     | 0.0048      |
| 20                                   | 4.2                | 6                    | 0.0032                | 2.5         |

## LTE Band 2

| Test Frequency:1880.0MHz QPSK 20MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | -7                   | -0.0037               | 2.5         |
| 40                                  |                    | -1                   | -0.0005               | 2.5         |
| 30                                  |                    | -8                   | -0.0043               | 2.5         |
| 20                                  |                    | -6                   | -0.0032               | 2.5         |
| 10                                  |                    | -14                  | -0.0074               | 2.5         |
| 0                                   |                    | 1                    | 0.0005                | 2.5         |
| -10                                 |                    | -11                  | -0.0059               | 2.5         |
| -20                                 |                    | -11                  | -0.0059               | 2.5         |
| -30                                 |                    | -5                   | -0.0027               | 2.5         |
| 20                                  |                    | 3.3                  | -9                    | -0.0048     |
| 20                                  | 4.2                | -8                   | -0.0043               | 2.5         |

| Test Frequency:1880.0MHz 16QAM 20MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.85               | -12                  | -0.0064               | 2.5         |
| 40                                   |                    | 0                    | 0.0000                | 2.5         |
| 30                                   |                    | -8                   | -0.0043               | 2.5         |
| 20                                   |                    | -7                   | -0.0037               | 2.5         |
| 10                                   |                    | -8                   | -0.0043               | 2.5         |
| 0                                    |                    | -11                  | -0.0059               | 2.5         |
| -10                                  |                    | -9                   | -0.0048               | 2.5         |
| -20                                  |                    | 1                    | 0.0005                | 2.5         |
| -30                                  |                    | -1                   | -0.0005               | 2.5         |
| 20                                   |                    | 3.3                  | -6                    | -0.0032     |
| 20                                   | 4.2                | -6                   | -0.0032               | 2.5         |



## LTE Band 4

| Test Frequency:1732.5MHz QPSK 1.4MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.85               | -5                   | -0.0029               | 2.5         |
| 40                                   |                    | -1                   | -0.0006               | 2.5         |
| 30                                   |                    | -2                   | -0.0012               | 2.5         |
| 20                                   |                    | 1                    | 0.0006                | 2.5         |
| 10                                   |                    | -1                   | -0.0006               | 2.5         |
| 0                                    |                    | 10                   | 0.0058                | 2.5         |
| -10                                  |                    | 5                    | 0.0029                | 2.5         |
| -20                                  |                    | 7                    | 0.0040                | 2.5         |
| -30                                  |                    | -8                   | -0.0046               | 2.5         |
| 20                                   |                    | 3.3                  | -5                    | -0.0029     |
| 20                                   | 4.2                | 7                    | 0.0040                | 2.5         |

| Test Frequency:1732.5MHz 16QAM 1.4MHz |                    |                      |                       |             |
|---------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                      | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                    | 3.85               | 5                    | 0.0029                | 2.5         |
| 40                                    |                    | 9                    | 0.0052                | 2.5         |
| 30                                    |                    | 9                    | 0.0052                | 2.5         |
| 20                                    |                    | 2                    | 0.0012                | 2.5         |
| 10                                    |                    | 8                    | 0.0046                | 2.5         |
| 0                                     |                    | 1                    | 0.0006                | 2.5         |
| -10                                   |                    | 4                    | 0.0023                | 2.5         |
| -20                                   |                    | 1                    | 0.0006                | 2.5         |
| -30                                   |                    | 7                    | 0.0040                | 2.5         |
| 20                                    |                    | 3.3                  | 4                     | 0.0023      |
| 20                                    | 4.2                | -1                   | -0.0006               | 2.5         |

## LTE Band 4

| Test Frequency:1732.5MHz QPSK 3MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | -5                   | -0.0029               | 2.5         |
| 40                                 |                    | 9                    | 0.0052                | 2.5         |
| 30                                 |                    | 3                    | 0.0017                | 2.5         |
| 20                                 |                    | 3                    | 0.0017                | 2.5         |
| 10                                 |                    | 3                    | 0.0017                | 2.5         |
| 0                                  |                    | -3                   | -0.0017               | 2.5         |
| -10                                |                    | 3                    | 0.0017                | 2.5         |
| -20                                |                    | 4                    | 0.0023                | 2.5         |
| -30                                |                    | 2                    | 0.0012                | 2.5         |
| 20                                 |                    | 3.3                  | 12                    | 0.0069      |
| 20                                 | 4.2                | 5                    | 0.0029                | 2.5         |

| Test Frequency:1732.5MHz 16QAM 3MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 5                    | 0.0029                | 2.5         |
| 40                                  |                    | 11                   | 0.0063                | 2.5         |
| 30                                  |                    | 5                    | 0.0029                | 2.5         |
| 20                                  |                    | 4                    | 0.0023                | 2.5         |
| 10                                  |                    | 2                    | 0.0012                | 2.5         |
| 0                                   |                    | -4                   | -0.0023               | 2.5         |
| -10                                 |                    | -1                   | -0.0006               | 2.5         |
| -20                                 |                    | 0                    | 0.0000                | 2.5         |
| -30                                 |                    | 5                    | 0.0029                | 2.5         |
| 20                                  |                    | 3.3                  | 2                     | 0.0012      |
| 20                                  | 4.2                | 2                    | 0.0012                | 2.5         |

LTE Band 4

| Test Frequency:1732.5MHz QPSK 5MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | (Hz)                 | (ppm)                 | (ppm)       |
| 40                                 |                    | 4                    | 0.0023                | 2.5         |
| 30                                 |                    | 0                    | 0.0000                | 2.5         |
| 20                                 |                    | 13                   | 0.0075                | 2.5         |
| 10                                 |                    | 5                    | 0.0029                | 2.5         |
| 0                                  |                    | 12                   | 0.0069                | 2.5         |
| -10                                |                    | 11                   | 0.0063                | 2.5         |
| -20                                |                    | 10                   | 0.0058                | 2.5         |
| -30                                |                    | 2                    | 0.0012                | 2.5         |
| 20                                 |                    | 3.3                  | 6                     | 0.0035      |
| 20                                 | 4.2                | 3                    | 0.0017                | 2.5         |

| Test Frequency:1732.5MHz 16QAM 5MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 1                    | 0.0006                | 2.5         |
| 40                                  |                    | -2                   | -0.0012               | 2.5         |
| 30                                  |                    | 7                    | 0.0040                | 2.5         |
| 20                                  |                    | 6                    | 0.0035                | 2.5         |
| 10                                  |                    | 0                    | 0.0000                | 2.5         |
| 0                                   |                    | 4                    | 0.0023                | 2.5         |
| -10                                 |                    | -1                   | -0.0006               | 2.5         |
| -20                                 |                    | 5                    | 0.0029                | 2.5         |
| -30                                 |                    | -1                   | -0.0006               | 2.5         |
| 20                                  |                    | 3.3                  | 9                     | 0.0052      |
| 20                                  | 4.2                | 9                    | 0.0052                | 2.5         |



## LTE Band 4

| Test Frequency:1732.5MHz QPSK 10MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 13                   | 0.0075                | 2.5         |
| 40                                  |                    | 13                   | 0.0075                | 2.5         |
| 30                                  |                    | -2                   | -0.0012               | 2.5         |
| 20                                  |                    | 7                    | 0.0040                | 2.5         |
| 10                                  |                    | 13                   | 0.0075                | 2.5         |
| 0                                   |                    | 2                    | 0.0012                | 2.5         |
| -10                                 |                    | 0                    | 0.0000                | 2.5         |
| -20                                 |                    | 5                    | 0.0029                | 2.5         |
| -30                                 |                    | 3                    | 0.0017                | 2.5         |
| 20                                  |                    | 3.3                  | 15                    | 0.0087      |
| 20                                  | 4.2                | 8                    | 0.0046                | 2.5         |

| Test Frequency:1732.5MHz 16QAM 10MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.85               | -7                   | -0.0040               | 2.5         |
| 40                                   |                    | -2                   | -0.0012               | 2.5         |
| 30                                   |                    | 1                    | 0.0006                | 2.5         |
| 20                                   |                    | -1                   | -0.0006               | 2.5         |
| 10                                   |                    | -9                   | -0.0052               | 2.5         |
| 0                                    |                    | -8                   | -0.0046               | 2.5         |
| -10                                  |                    | -5                   | -0.0029               | 2.5         |
| -20                                  |                    | 8                    | 0.0046                | 2.5         |
| -30                                  |                    | -2                   | -0.0012               | 2.5         |
| 20                                   |                    | 3.3                  | 6                     | 0.0035      |
| 20                                   | 4.2                | -6                   | -0.0035               | 2.5         |

## LTE Band 4

| Test Frequency:1732.5MHz QPSK 15MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 1                    | 0.0006                | 2.5         |
| 40                                  |                    | 7                    | 0.0040                | 2.5         |
| 30                                  |                    | 6                    | 0.0035                | 2.5         |
| 20                                  |                    | -2                   | -0.0012               | 2.5         |
| 10                                  |                    | -2                   | -0.0012               | 2.5         |
| 0                                   |                    | -7                   | -0.0040               | 2.5         |
| -10                                 |                    | -8                   | -0.0046               | 2.5         |
| -20                                 |                    | -10                  | -0.0058               | 2.5         |
| -30                                 |                    | -10                  | -0.0058               | 2.5         |
| 20                                  |                    | 3.3                  | -6                    | -0.0035     |
| 20                                  | 4.2                | -1                   | -0.0006               | 2.5         |

| Test Frequency:1732.5MHz 16QAM 15MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.85               | 1                    | 0.0006                | 2.5         |
| 40                                   |                    | -5                   | -0.0029               | 2.5         |
| 30                                   |                    | -9                   | -0.0052               | 2.5         |
| 20                                   |                    | -3                   | -0.0017               | 2.5         |
| 10                                   |                    | -5                   | -0.0029               | 2.5         |
| 0                                    |                    | -6                   | -0.0035               | 2.5         |
| -10                                  |                    | -3                   | -0.0017               | 2.5         |
| -20                                  |                    | -4                   | -0.0023               | 2.5         |
| -30                                  |                    | 4                    | 0.0023                | 2.5         |
| 20                                   |                    | 3.3                  | -6                    | -0.0035     |
| 20                                   | 4.2                | -6                   | -0.0035               | 2.5         |

## LTE Band 4

| Test Frequency:1732.5MHz QPSK 20MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | -11                  | -0.0063               | 2.5         |
| 40                                  |                    | -13                  | -0.0075               | 2.5         |
| 30                                  |                    | -1                   | -0.0006               | 2.5         |
| 20                                  |                    | -4                   | -0.0023               | 2.5         |
| 10                                  |                    | -11                  | -0.0063               | 2.5         |
| 0                                   |                    | -4                   | -0.0023               | 2.5         |
| -10                                 |                    | -12                  | -0.0069               | 2.5         |
| -20                                 |                    | 2                    | 0.0012                | 2.5         |
| -30                                 |                    | 3                    | 0.0017                | 2.5         |
| 20                                  |                    | 3.3                  | 3                     | 0.0017      |
| 20                                  | 4.2                | -7                   | -0.0040               | 2.5         |

| Test Frequency:1732.5MHz 16QAM 20MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.85               | -5                   | -0.0029               | 2.5         |
| 40                                   |                    | 0                    | 0.0000                | 2.5         |
| 30                                   |                    | -2                   | -0.0012               | 2.5         |
| 20                                   |                    | -5                   | -0.0029               | 2.5         |
| 10                                   |                    | -7                   | -0.0040               | 2.5         |
| 0                                    |                    | -9                   | -0.0052               | 2.5         |
| -10                                  |                    | -4                   | -0.0023               | 2.5         |
| -20                                  |                    | -13                  | -0.0075               | 2.5         |
| -30                                  |                    | -2                   | -0.0012               | 2.5         |
| 20                                   |                    | 3.3                  | -9                    | -0.0052     |
| 20                                   | 4.2                | -10                  | -0.0058               | 2.5         |



## LTE Band 5

| Test Frequency:836.5MHz QPSK 1.4MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | -2                   | -0.0024               | 2.5         |
| 40                                  |                    | -4                   | -0.0048               | 2.5         |
| 30                                  |                    | 8                    | 0.0096                | 2.5         |
| 20                                  |                    | 1                    | 0.0012                | 2.5         |
| 10                                  |                    | -3                   | -0.0036               | 2.5         |
| 0                                   |                    | 3                    | 0.0036                | 2.5         |
| -10                                 |                    | 4                    | 0.0048                | 2.5         |
| -20                                 |                    | -2                   | -0.0024               | 2.5         |
| -30                                 |                    | 5                    | 0.0060                | 2.5         |
| 20                                  |                    | 3.3                  | 3                     | 0.0036      |
| 20                                  | 4.2                | 2                    | 0.0024                | 2.5         |

| Test Frequency:836.5MHz 16QAM 1.4MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.85               | 2                    | 0.0024                | 2.5         |
| 40                                   |                    | 11                   | 0.0132                | 2.5         |
| 30                                   |                    | -6                   | -0.0072               | 2.5         |
| 20                                   |                    | 2                    | 0.0024                | 2.5         |
| 10                                   |                    | -2                   | -0.0024               | 2.5         |
| 0                                    |                    | -7                   | -0.0084               | 2.5         |
| -10                                  |                    | 1                    | 0.0012                | 2.5         |
| -20                                  |                    | 9                    | 0.0108                | 2.5         |
| -30                                  |                    | -6                   | -0.0072               | 2.5         |
| 20                                   |                    | 3.3                  | 11                    | 0.0132      |
| 20                                   | 4.2                | 7                    | 0.0084                | 2.5         |

LTE Band 5

| Test Frequency:836.5MHz QPSK 3MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.85               | -5                   | -0.0060               | 2.5         |
| 40                                |                    | 9                    | 0.0108                | 2.5         |
| 30                                |                    | 4                    | 0.0048                | 2.5         |
| 20                                |                    | 3                    | 0.0036                | 2.5         |
| 10                                |                    | 11                   | 0.0132                | 2.5         |
| 0                                 |                    | -1                   | -0.0012               | 2.5         |
| -10                               |                    | 4                    | 0.0048                | 2.5         |
| -20                               |                    | -5                   | -0.0060               | 2.5         |
| -30                               |                    | -1                   | -0.0012               | 2.5         |
| 20                                |                    | 3.3                  | 1                     | 0.0012      |
| 20                                | 4.2                | -2                   | -0.0024               | 2.5         |

| Test Frequency:836.5MHz 16QAM 3MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | -4                   | -0.0048               | 2.5         |
| 40                                 |                    | 5                    | 0.0060                | 2.5         |
| 30                                 |                    | -4                   | -0.0048               | 2.5         |
| 20                                 |                    | 4                    | 0.0048                | 2.5         |
| 10                                 |                    | 10                   | 0.0120                | 2.5         |
| 0                                  |                    | -3                   | -0.0036               | 2.5         |
| -10                                |                    | -4                   | -0.0048               | 2.5         |
| -20                                |                    | -5                   | -0.0060               | 2.5         |
| -30                                |                    | 1                    | 0.0012                | 2.5         |
| 20                                 |                    | 3.3                  | 3                     | 0.0036      |
| 20                                 | 4.2                | 7                    | 0.0084                | 2.5         |

## LTE Band 5

| Test Frequency:836.5MHz QPSK 5MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.85               | 13                   | 0.0155                | 2.5         |
| 40                                |                    | -1                   | -0.0012               | 2.5         |
| 30                                |                    | 6                    | 0.0072                | 2.5         |
| 20                                |                    | 5                    | 0.0060                | 2.5         |
| 10                                |                    | 2                    | 0.0024                | 2.5         |
| 0                                 |                    | 12                   | 0.0143                | 2.5         |
| -10                               |                    | 8                    | 0.0096                | 2.5         |
| -20                               |                    | 3                    | 0.0036                | 2.5         |
| -30                               |                    | 7                    | 0.0084                | 2.5         |
| 20                                |                    | 3.3                  | 3                     | 0.0036      |
| 20                                | 4.2                | 6                    | 0.0072                | 2.5         |

| Test Frequency:836.5MHz 16QAM 5MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | -2                   | -0.0024               | 2.5         |
| 40                                 |                    | 11                   | 0.0132                | 2.5         |
| 30                                 |                    | 1                    | 0.0012                | 2.5         |
| 20                                 |                    | 6                    | 0.0072                | 2.5         |
| 10                                 |                    | 11                   | 0.0132                | 2.5         |
| 0                                  |                    | 2                    | 0.0024                | 2.5         |
| -10                                |                    | 0                    | 0.0000                | 2.5         |
| -20                                |                    | -3                   | -0.0036               | 2.5         |
| -30                                |                    | 1                    | 0.0012                | 2.5         |
| 20                                 |                    | 3.3                  | 13                    | 0.0155      |
| 20                                 | 4.2                | 3                    | 0.0036                | 2.5         |



## LTE Band 5

| Test Frequency:836.5MHz QPSK 10MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | 7                    | 0.0084                | 2.5         |
| 40                                 |                    | 11                   | 0.0132                | 2.5         |
| 30                                 |                    | 16                   | 0.0191                | 2.5         |
| 20                                 |                    | 7                    | 0.0084                | 2.5         |
| 10                                 |                    | 4                    | 0.0048                | 2.5         |
| 0                                  |                    | 0                    | 0.0000                | 2.5         |
| -10                                |                    | 9                    | 0.0108                | 2.5         |
| -20                                |                    | 11                   | 0.0132                | 2.5         |
| -30                                |                    | 0                    | 0.0000                | 2.5         |
| 20                                 |                    | 3.3                  | -2                    | -0.0024     |
| 20                                 | 4.2                | 16                   | 0.0191                | 2.5         |

| Test Frequency:836.5MHz 16QAM 10MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 16                   | 0.0191                | 2.5         |
| 40                                  |                    | 0                    | 0.0000                | 2.5         |
| 30                                  |                    | 11                   | 0.0132                | 2.5         |
| 20                                  |                    | 8                    | 0.0096                | 2.5         |
| 10                                  |                    | 12                   | 0.0143                | 2.5         |
| 0                                   |                    | 5                    | 0.0060                | 2.5         |
| -10                                 |                    | 1                    | 0.0012                | 2.5         |
| -20                                 |                    | 0                    | 0.0000                | 2.5         |
| -30                                 |                    | 16                   | 0.0191                | 2.5         |
| 20                                  |                    | 3.3                  | 7                     | 0.0084      |
| 20                                  | 4.2                | 13                   | 0.0155                | 2.5         |

## LTE Band 7

| Test Frequency:2535MHz QPSK 5MHz |                    |                      |                       |             |
|----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                 | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                               | 3.85               | 5                    | 0.0020                | 2.5         |
| 40                               |                    | -5                   | -0.0020               | 2.5         |

|     |     |    |         |     |
|-----|-----|----|---------|-----|
| 30  |     | -4 | -0.0016 | 2.5 |
| 20  |     | 3  | 0.0012  | 2.5 |
| 10  |     | 2  | 0.0008  | 2.5 |
| 0   |     | 2  | 0.0008  | 2.5 |
| -10 |     | -3 | -0.0012 | 2.5 |
| -20 |     | 3  | 0.0012  | 2.5 |
| -30 |     | 1  | 0.0004  | 2.5 |
| 20  | 3.3 | 3  | 0.0012  | 2.5 |
| 20  | 4.2 | 9  | 0.0036  | 2.5 |

| Test Frequency:2535MHz 16QAM 5MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.85               | 4                    | 0.0016                | 2.5         |
| 40                                |                    | -3                   | -0.0012               | 2.5         |
| 30                                |                    | 11                   | 0.0043                | 2.5         |
| 20                                |                    | 2                    | 0.0008                | 2.5         |
| 10                                |                    | 6                    | 0.0024                | 2.5         |
| 0                                 |                    | -6                   | -0.0024               | 2.5         |
| -10                               |                    | 11                   | 0.0043                | 2.5         |
| -20                               |                    | -4                   | -0.0016               | 2.5         |
| -30                               |                    | 4                    | 0.0016                | 2.5         |
| 20                                |                    | 3.3                  | 9                     | 0.0036      |
| 20                                | 4.2                | 1                    | 0.0004                | 2.5         |

LTE Band 7

| Test Frequency:2535MHz QPSK 10MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.85               | (Hz)                 | (ppm)                 | (ppm)       |
| 40                                |                    | -1                   | -0.0004               | 2.5         |
| 30                                |                    | 4                    | 0.0016                | 2.5         |
| 20                                |                    | 11                   | 0.0043                | 2.5         |
| 10                                |                    | 3                    | 0.0012                | 2.5         |
| 0                                 |                    | 9                    | 0.0036                | 2.5         |
| -10                               |                    | -3                   | -0.0012               | 2.5         |
| -20                               |                    | 11                   | 0.0043                | 2.5         |
| -30                               |                    | -1                   | -0.0004               | 2.5         |
| 20                                |                    | 3.3                  | 10                    | 0.0039      |
| 20                                | 4.2                | -1                   | -0.0004               | 2.5         |

| Test Frequency:2535MHz 16QAM 10MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | 0                    | 0.0000                | 2.5         |
| 40                                 |                    | 9                    | 0.0036                | 2.5         |
| 30                                 |                    | -2                   | -0.0008               | 2.5         |
| 20                                 |                    | 5                    | 0.0020                | 2.5         |
| 10                                 |                    | 5                    | 0.0020                | 2.5         |
| 0                                  |                    | 7                    | 0.0028                | 2.5         |
| -10                                |                    | 6                    | 0.0024                | 2.5         |
| -20                                |                    | 10                   | 0.0039                | 2.5         |
| -30                                |                    | 14                   | 0.0055                | 2.5         |
| 20                                 |                    | 3.3                  | 0                     | 0.0000      |
| 20                                 | 4.2                | 6                    | 0.0024                | 2.5         |



## LTE Band 7

| Test Frequency:2535MHz QPSK 15MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.85               | 10                   | 0.0039                | 2.5         |
| 40                                |                    | 7                    | 0.0028                | 2.5         |
| 30                                |                    | 3                    | 0.0012                | 2.5         |
| 20                                |                    | 6                    | 0.0024                | 2.5         |
| 10                                |                    | 5                    | 0.0020                | 2.5         |
| 0                                 |                    | 6                    | 0.0024                | 2.5         |
| -10                               |                    | -1                   | -0.0004               | 2.5         |
| -20                               |                    | 2                    | 0.0008                | 2.5         |
| -30                               |                    | 4                    | 0.0016                | 2.5         |
| 20                                |                    | 3.3                  | 3                     | 0.0012      |
| 20                                | 4.2                | 6                    | 0.0024                | 2.5         |

| Test Frequency:2535MHz 16QAM 15MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | 10                   | 0.0039                | 2.5         |
| 40                                 |                    | 1                    | 0.0004                | 2.5         |
| 30                                 |                    | 16                   | 0.0063                | 2.5         |
| 20                                 |                    | 8                    | 0.0032                | 2.5         |
| 10                                 |                    | 8                    | 0.0032                | 2.5         |
| 0                                  |                    | 4                    | 0.0016                | 2.5         |
| -10                                |                    | -1                   | -0.0004               | 2.5         |
| -20                                |                    | 8                    | 0.0032                | 2.5         |
| -30                                |                    | 5                    | 0.0020                | 2.5         |
| 20                                 |                    | 3.3                  | 4                     | 0.0016      |
| 20                                 | 4.2                | 10                   | 0.0039                | 2.5         |

## LTE Band 7

| Test Frequency:2535MHz QPSK 20MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.85               | 4                    | 0.0016                | 2.5         |
| 40                                |                    | -9                   | -0.0036               | 2.5         |
| 30                                |                    | -4                   | -0.0016               | 2.5         |
| 20                                |                    | -1                   | -0.0004               | 2.5         |
| 10                                |                    | 5                    | 0.0020                | 2.5         |
| 0                                 |                    | 7                    | 0.0028                | 2.5         |
| -10                               |                    | -7                   | -0.0028               | 2.5         |
| -20                               |                    | 5                    | 0.0020                | 2.5         |
| -30                               |                    | -5                   | -0.0020               | 2.5         |
| 20                                |                    | 3.3                  | 3                     | 0.0012      |
| 20                                | 4.2                | -5                   | -0.0020               | 2.5         |

| Test Frequency:2535MHz 16QAM 20MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | -6                   | -0.0024               | 2.5         |
| 40                                 |                    | 2                    | 0.0008                | 2.5         |
| 30                                 |                    | -9                   | -0.0036               | 2.5         |
| 20                                 |                    | -2                   | -0.0008               | 2.5         |
| 10                                 |                    | 5                    | 0.0020                | 2.5         |
| 0                                  |                    | 2                    | 0.0008                | 2.5         |
| -10                                |                    | 4                    | 0.0016                | 2.5         |
| -20                                |                    | 4                    | 0.0016                | 2.5         |
| -30                                |                    | 4                    | 0.0016                | 2.5         |
| 20                                 |                    | 3.3                  | 0                     | 0.0000      |
| 20                                 | 4.2                | 0                    | 0.0000                | 2.5         |

LTE Band 12

| Test Frequency:707.5MHz QPSK 1.4MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 4                    | 0.0016                | 2.5         |
| 40                                  |                    | 4                    | 0.0016                | 2.5         |
| 30                                  |                    | 12                   | 0.0047                | 2.5         |
| 20                                  |                    | 5                    | 0.0020                | 2.5         |
| 10                                  |                    | 7                    | 0.0028                | 2.5         |
| 0                                   |                    | 10                   | 0.0039                | 2.5         |
| -10                                 |                    | 11                   | 0.0043                | 2.5         |
| -20                                 |                    | 3                    | 0.0012                | 2.5         |
| -30                                 |                    | 13                   | 0.0051                | 2.5         |
| 20                                  |                    | 3.3                  | 1                     | 0.0004      |
| 20                                  | 4.2                | -2                   | -0.0008               | 2.5         |

| Test Frequency:707.5MHz 16QAM 1.4MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.85               | 6                    | 0.0024                | 2.5         |
| 40                                   |                    | 4                    | 0.0016                | 2.5         |
| 30                                   |                    | -6                   | -0.0024               | 2.5         |
| 20                                   |                    | 3                    | 0.0012                | 2.5         |
| 10                                   |                    | 11                   | 0.0043                | 2.5         |
| 0                                    |                    | -3                   | -0.0012               | 2.5         |
| -10                                  |                    | -5                   | -0.0020               | 2.5         |
| -20                                  |                    | 4                    | 0.0016                | 2.5         |
| -30                                  |                    | 8                    | 0.0032                | 2.5         |
| 20                                   |                    | 3.3                  | -1                    | -0.0004     |
| 20                                   | 4.2                | -5                   | -0.0020               | 2.5         |



LTE Band 12

| Test Frequency:707.5MHz QPSK 3MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.85               | 1                    | 0.0004                | 2.5         |
| 40                                |                    | 7                    | 0.0028                | 2.5         |
| 30                                |                    | 10                   | 0.0039                | 2.5         |
| 20                                |                    | 1                    | 0.0004                | 2.5         |
| 10                                |                    | 7                    | 0.0028                | 2.5         |
| 0                                 |                    | 7                    | 0.0028                | 2.5         |
| -10                               |                    | 5                    | 0.0020                | 2.5         |
| -20                               |                    | -8                   | -0.0032               | 2.5         |
| -30                               |                    | -4                   | -0.0016               | 2.5         |
| 20                                |                    | 3.3                  | 7                     | 0.0028      |
| 20                                | 4.2                | -4                   | -0.0016               | 2.5         |

| Test Frequency:707.5MHz 16QAM 3MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | 4                    | 0.0016                | 2.5         |
| 40                                 |                    | 0                    | 0.0000                | 2.5         |
| 30                                 |                    | -5                   | -0.0020               | 2.5         |
| 20                                 |                    | 3                    | 0.0012                | 2.5         |
| 10                                 |                    | 11                   | 0.0043                | 2.5         |
| 0                                  |                    | -5                   | -0.0020               | 2.5         |
| -10                                |                    | 4                    | 0.0016                | 2.5         |
| -20                                |                    | -4                   | -0.0016               | 2.5         |
| -30                                |                    | 11                   | 0.0043                | 2.5         |
| 20                                 |                    | 3.3                  | -5                    | -0.0020     |
| 20                                 | 4.2                | 9                    | 0.0036                | 2.5         |

## LTE Band 12

| Test Frequency:707.5MHz QPSK 5MHz |                    |                      |                       |             |
|-----------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                  | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                | 3.85               | 4                    | 0.0016                | 2.5         |
| 40                                |                    | 4                    | 0.0016                | 2.5         |
| 30                                |                    | 0                    | 0.0000                | 2.5         |
| 20                                |                    | 3                    | 0.0012                | 2.5         |
| 10                                |                    | 4                    | 0.0016                | 2.5         |
| 0                                 |                    | 6                    | 0.0024                | 2.5         |
| -10                               |                    | 7                    | 0.0028                | 2.5         |
| -20                               |                    | 1                    | 0.0004                | 2.5         |
| -30                               |                    | 6                    | 0.0024                | 2.5         |
| 20                                |                    | 3.3                  | -5                    | -0.0020     |
| 20                                | 4.2                | 9                    | 0.0036                | 2.5         |

| Test Frequency:707.5MHz 16QAM 5MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | 3                    | 0.0012                | 2.5         |
| 40                                 |                    | 8                    | 0.0032                | 2.5         |
| 30                                 |                    | 5                    | 0.0020                | 2.5         |
| 20                                 |                    | 6                    | 0.0024                | 2.5         |
| 10                                 |                    | -1                   | -0.0004               | 2.5         |
| 0                                  |                    | 13                   | 0.0051                | 2.5         |
| -10                                |                    | 6                    | 0.0024                | 2.5         |
| -20                                |                    | -1                   | -0.0004               | 2.5         |
| -30                                |                    | 12                   | 0.0047                | 2.5         |
| 20                                 |                    | 3.3                  | 5                     | 0.0020      |
| 20                                 | 4.2                | 14                   | 0.0055                | 2.5         |

## LTE Band 12

| Test Frequency:707.5MHz QPSK 10MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | 10                   | 0.0039                | 2.5         |
| 40                                 |                    | -6                   | -0.0024               | 2.5         |
| 30                                 |                    | 11                   | 0.0043                | 2.5         |
| 20                                 |                    | 3                    | 0.0012                | 2.5         |
| 10                                 |                    | 6                    | 0.0024                | 2.5         |
| 0                                  |                    | -2                   | -0.0008               | 2.5         |
| -10                                |                    | 12                   | 0.0047                | 2.5         |
| -20                                |                    | 9                    | 0.0036                | 2.5         |
| -30                                |                    | 4                    | 0.0016                | 2.5         |
| 20                                 |                    | 3.3                  | -5                    | -0.0020     |
| 20                                 | 4.2                | 10                   | 0.0039                | 2.5         |

| Test Frequency:707.5MHz 16QAM 10MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 6                    | 0.0024                | 2.5         |
| 40                                  |                    | -5                   | -0.0020               | 2.5         |
| 30                                  |                    | -7                   | -0.0028               | 2.5         |
| 20                                  |                    | -2                   | -0.0008               | 2.5         |
| 10                                  |                    | 0                    | 0.0000                | 2.5         |
| 0                                   |                    | -1                   | -0.0004               | 2.5         |
| -10                                 |                    | -3                   | -0.0012               | 2.5         |
| -20                                 |                    | 0                    | 0.0000                | 2.5         |
| -30                                 |                    | 0                    | 0.0000                | 2.5         |
| 20                                  |                    | 3.3                  | -10                   | -0.0039     |
| 20                                  | 4.2                | -1                   | -0.0004               | 2.5         |



LTE Band 17

| Test Frequency: 710.0MHz QPSK 5MHz |                    |                      |                       |             |
|------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                   | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                 | 3.85               | 3                    | 0.0012                | 2.5         |
| 40                                 |                    | -6                   | -0.0024               | 2.5         |
| 30                                 |                    | 5                    | 0.0020                | 2.5         |
| 20                                 |                    | 2                    | 0.0008                | 2.5         |
| 10                                 |                    | 7                    | 0.0028                | 2.5         |
| 0                                  |                    | 3                    | 0.0012                | 2.5         |
| -10                                |                    | 8                    | 0.0032                | 2.5         |
| -20                                |                    | 7                    | 0.0028                | 2.5         |
| -30                                |                    | 5                    | 0.0020                | 2.5         |
| 20                                 |                    | 3.3                  | 3                     | 0.0012      |
| 20                                 | 4.2                | 9                    | 0.0036                | 2.5         |

| Test Frequency: 710.0MHz 16QAM 5MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 5                    | 0.0020                | 2.5         |
| 40                                  |                    | 1                    | 0.0004                | 2.5         |
| 30                                  |                    | 0                    | 0.0000                | 2.5         |
| 20                                  |                    | 5                    | 0.0020                | 2.5         |
| 10                                  |                    | 5                    | 0.0020                | 2.5         |
| 0                                   |                    | 0                    | 0.0000                | 2.5         |
| -10                                 |                    | 1                    | 0.0004                | 2.5         |
| -20                                 |                    | 0                    | 0.0000                | 2.5         |
| -30                                 |                    | 1                    | 0.0004                | 2.5         |
| 20                                  |                    | 3.3                  | 13                    | 0.0051      |
| 20                                  | 4.2                | -1                   | -0.0004               | 2.5         |

LTE Band 17

| Test Frequency: 710.0MHz QPSK 10MHz |                    |                      |                       |             |
|-------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                    | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                  | 3.85               | 3                    | 0.0012                | 2.5         |
| 40                                  |                    | 10                   | 0.0039                | 2.5         |
| 30                                  |                    | 17                   | 0.0067                | 2.5         |
| 20                                  |                    | 8                    | 0.0032                | 2.5         |
| 10                                  |                    | 1                    | 0.0004                | 2.5         |
| 0                                   |                    | 1                    | 0.0004                | 2.5         |
| -10                                 |                    | 15                   | 0.0059                | 2.5         |
| -20                                 |                    | 14                   | 0.0055                | 2.5         |
| -30                                 |                    | 7                    | 0.0028                | 2.5         |
| 20                                  |                    | 3.3                  | 3                     | 0.0012      |
| 20                                  | 4.2                | 1                    | 0.0004                | 2.5         |

| Test Frequency: 710.0MHz 16QAM 10MHz |                    |                      |                       |             |
|--------------------------------------|--------------------|----------------------|-----------------------|-------------|
| Temperature (°C)                     | Power Supply (VDC) | Frequency Error (Hz) | Frequency Error (ppm) | Limit (ppm) |
| 50                                   | 3.85               | 7                    | 0.0028                | 2.5         |
| 40                                   |                    | 10                   | 0.0039                | 2.5         |
| 30                                   |                    | 3                    | 0.0012                | 2.5         |
| 20                                   |                    | 2                    | 0.0008                | 2.5         |
| 10                                   |                    | 1                    | 0.0004                | 2.5         |
| 0                                    |                    | 1                    | 0.0004                | 2.5         |
| -10                                  |                    | 7                    | 0.0028                | 2.5         |
| -20                                  |                    | 7                    | 0.0028                | 2.5         |
| -30                                  |                    | 10                   | 0.0039                | 2.5         |
| 20                                   |                    | 3.3                  | 5                     | 0.0020      |
| 20                                   | 4.2                | -5                   | -0.0020               | 2.5         |

\*\*\*\*\* END OF REPORT \*\*\*\*\*