

**Industrial Internet Innovation Center (Shanghai) Co.,Ltd.****RF TEST REPORT**

|                    |                                                     |
|--------------------|-----------------------------------------------------|
| <b>PRODUCT</b>     | LTE CAT-M1 Data Module                              |
| <b>BRAND</b>       | u-blox                                              |
| <b>MODEL</b>       | SARA-R510M8S                                        |
| <b>APPLICANT</b>   | u-blox AG                                           |
| <b>FCC ID</b>      | XPYUBX19KM01                                        |
| <b>ISSUE DATE</b>  | June 25, 2024                                       |
| <b>STANDARD(S)</b> | FCC Part 2, FCC Part 22H, FCC Part 24E, FCC Part 27 |

Prepared by: *Fan Yuhang*Reviewed by: *Yang Fan*Approved by: *Zhang Min***CAUTION:**

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## 1. Summary of Test Report

### 1.1 Test Standard (s)

| No.                                                | Test Standard | Title                                                                         | Version |
|----------------------------------------------------|---------------|-------------------------------------------------------------------------------|---------|
| 1                                                  | FCC Part 2    | FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS | -       |
| 2                                                  | FCC Part 22H  | CELLULAR RADIOTELEPHONE SERVICE                                               | -       |
| 3                                                  | FCC Part 24E  | BROADBAND PCS                                                                 | -       |
| 4                                                  | FCC Part 27   | MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES                                | -       |
| Note: FCC Part 2 have not been accredited by A2LA. |               |                                                                               |         |

### 1.2 Reference Documents

| No.                                                    | Test Standard  | Title                                                                                                           | Version |
|--------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------|---------|
| 1                                                      | ANSI/TIA-603-E | Land Mobile FM or PM Communications Equipment Measurement and Performance Standards                             | 2016    |
| 2                                                      | ANSI C63.26    | American National Standard of Procedures for Compliance Testing of Licensed Transmitters Used in Licensed Radio | 2015    |
| 3                                                      | KDB 971168 D01 | Measurement Guidance for Certification of Licensed Digital Transmitters                                         | v03r01  |
| Note: KDB 971168 D01 have not been accredited by A2LA. |                |                                                                                                                 |         |

### 1.3 Summary of Test Results

#### LTE CAT-M Band 2

| Items | Test Name                   | Clause in FCC rules | Verdict     |
|-------|-----------------------------|---------------------|-------------|
| 1     | Output Power                | 2.1046/24.232(c)    | Pass(Note3) |
| 2     | Emission Limit              | 2.1053/24.238(a)    | Pass        |
| 3     | Frequency Stability         | 2.1055/24.235       | Pass(Note2) |
| 4     | Occupied Bandwidth          | 2.1049              | Pass(Note2) |
| 5     | Emission Bandwidth          | 2.1049              | Pass(Note2) |
| 6     | Band Edge Compliance        | 2.1051/24.238(a)    | Pass(Note2) |
| 7     | Conducted Spurious Emission | 2.1051/24.238(a)    | Pass(Note2) |
| 8     | Peak to Average Power Ratio | 24.232 (d)          | Pass(Note2) |

**LTE CAT-M Band 4**

| Items | Test Name                   | Clause in FCC rules | Verdict     |
|-------|-----------------------------|---------------------|-------------|
| 1     | Output Power                | 2.1046/27.50(d)(4)  | Pass(Note3) |
| 2     | Emission Limit              | 2.1053/27.53(h)     | Pass        |
| 3     | Frequency Stability         | 2.1055/27.54        | Pass(Note2) |
| 4     | Occupied Bandwidth          | 2.1049              | Pass(Note2) |
| 5     | Emission Bandwidth          | 2.1049              | Pass(Note2) |
| 6     | Band Edge Compliance        | 2.1051/27.53(h)     | Pass(Note2) |
| 7     | Conducted Spurious Emission | 2.1051/27.53(h)     | Pass(Note2) |
| 8     | Peak to Average Power Ratio | 27.50(d)(5)         | Pass(Note2) |

**LTE CAT-M Band 5**

| Items | Test Name                   | Clause in FCC rules | Verdict     |
|-------|-----------------------------|---------------------|-------------|
| 1     | Output Power                | 2.1046/22.913(a)    | Pass(Note3) |
| 2     | Emission Limit              | 2.1053/22.917(a)    | Pass        |
| 3     | Frequency Stability         | 2.1055/22.355       | Pass(Note2) |
| 4     | Occupied Bandwidth          | 2.1049              | Pass(Note2) |
| 5     | Emission Bandwidth          | 2.1049              | Pass(Note2) |
| 6     | Band Edge Compliance        | 2.1051/22.917(a)    | Pass(Note2) |
| 7     | Conducted Spurious Emission | 2.1051/22.917(a)    | Pass(Note2) |
| 8     | Peak to Average Power Ratio | N/A                 | Pass(Note2) |

**LTE CAT-M Band 12**

| Items | Test Name                   | Clause in FCC rules | Verdict     |
|-------|-----------------------------|---------------------|-------------|
| 1     | Output Power                | 2.1046/27.50(c)(10) | Pass(Note3) |
| 2     | Emission Limit              | 2.1053/27.53(g)     | Pass        |
| 3     | Frequency Stability         | 27.54, 2.1055       | Pass(Note2) |
| 4     | Occupied Bandwidth          | 2.1049              | Pass(Note2) |
| 5     | Emission Bandwidth          | 2.1049              | Pass(Note2) |
| 6     | Band Edge Compliance        | 27.53(g)            | Pass(Note2) |
| 7     | Conducted Spurious Emission | 27.53(g), 2.1057    | Pass(Note2) |

**LTE CAT-M Band 13**

| Items | Test Name           | Clause in FCC rules | Verdict     |
|-------|---------------------|---------------------|-------------|
| 1     | Output Power        | 2.1046/27.50(b)(10) | Pass(Note3) |
| 2     | Emission Limit      | 2.1053/27.53(c) (2) | Pass        |
| 3     | Frequency Stability | 27.54, 2.1055       | Pass(Note2) |

|   |                             |                     |             |
|---|-----------------------------|---------------------|-------------|
| 4 | Occupied Bandwidth          | 2.1049              | Pass(Note2) |
| 5 | Emission Bandwidth          | 2.1049              | Pass(Note2) |
| 6 | Band Edge Compliance        | 27.53(c) (2)        | Pass(Note2) |
| 7 | Conducted Spurious Emission | 27.53(c) (2),2.1057 | Pass(Note2) |

**LTE CAT-M Band 66**

| Items | Test Name                   | Clause in FCC rules | Verdict     |
|-------|-----------------------------|---------------------|-------------|
| 1     | Output Power                | 27.50(d)(4)         | Pass(Note3) |
| 2     | Emission Limit              | 2.1053/27.53(h)     | Pass        |
| 3     | Frequency Stability         | 27.54, 2.1055       | Pass(Note2) |
| 4     | Occupied Bandwidth          | 2.1049              | Pass(Note2) |
| 5     | Emission Bandwidth          | 2.1049              | Pass(Note2) |
| 6     | Band Edge Compliance        | 27.53(h)            | Pass(Note2) |
| 7     | Conducted Spurious Emission | 27.53(h), 2.1057    | Pass(Note2) |
| 8     | Peak to Average Power Ratio | 27.50(d)(5)         | Pass(Note2) |

**LTE CAT-M Band 71**

| Items | Test Name                   | Clause in FCC rules | Verdict     |
|-------|-----------------------------|---------------------|-------------|
| 1     | Output Power                | 27.50(c)(10)        | Pass(Note3) |
| 2     | Emission Limit              | 2.1053/27.53(g)     | Pass        |
| 3     | Frequency Stability         | 27.54, 2.1055       | Pass(Note2) |
| 4     | Occupied Bandwidth          | 2.1049              | Pass(Note2) |
| 5     | Emission Bandwidth          | 2.1049              | Pass(Note2) |
| 6     | Band Edge Compliance        | 27.53(g)            | Pass(Note2) |
| 7     | Conducted Spurious Emission | 27.53(g),2.1057     | Pass(Note2) |

**Note1:**

The LootPaw GPS Tracker, manufactured by u-blox AG is a variant product for testing.

This project is a variant project based on the MDE\_UBLOX\_2105\_FCC\_01. Verify worst mode power. Retest the RSE in the all mode, and the test data was recorded in this report.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. only performed test cases which identified with Pass/Fail/Inc result in section 1.3.

Industrial Internet Innovation Center (Shanghai) Co., Ltd. has verified that the compliance of the tested device specified in section 4 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 1 of this test report.

**Note2:**

The test verdict of this item come form the original report.

**Note3:**

This test item verifies only the worst mode.

#### 1.4 Data Provided by Applicant

| No. | Item(s)           | Data   |
|-----|-------------------|--------|
| 1   | LTE CAT-M band 2  | -3.42  |
| 2   | LTE CAT-M band 4  | -3.15  |
| 3   | LTE CAT-M band 5  | -10.68 |
| 4   | LTE CAT-M band 12 | -11.25 |
| 5   | LTE CAT-M band 13 | -4.34  |
| 6   | LTE CAT-M band 66 | -3.15  |
| 7   | LTE CAT-M band 71 | -12.54 |

Note: The data of antenna gain is provided by Antenna specification may affect the validity of the test results in this report, and the impact and consequences of this shall be undertaken by the customer.

## 2. General Information of The Laboratory

### 2.1 Testing Laboratory

|                      |                                                            |
|----------------------|------------------------------------------------------------|
| Lab Name             | Industrial Internet Innovation Center (Shanghai) Co.,Ltd.  |
| Address              | Building 4, No. 766, Jingang Road, Pudong, Shanghai, China |
| Telephone            | 021-68866880                                               |
| FCC Registration No. | 708870                                                     |
| FCC Designation No.  | CN1364                                                     |

### 2.2 Laboratory Environmental Requirements

|                      |              |
|----------------------|--------------|
| Temperature          | 15℃~35℃      |
| Relative Humidity    | 25%RH~75%RH  |
| Atmospheric Pressure | 86kPa~106kPa |

### 2.3 Project Information

|                 |                                    |
|-----------------|------------------------------------|
| Project Manager | Zhang Heng                         |
| Test Date       | February 06, 2024 to March 26,2024 |

### 3. General Information of The Customer

#### 3.1 Applicant

|           |                                              |
|-----------|----------------------------------------------|
| Company   | u-blox AG                                    |
| Address   | Zürcherstrasse 68Thalwil CH-8800 Switzerland |
| Telephone | +41 44 722 7462                              |

#### 3.2 Manufacturer

|           |                                              |
|-----------|----------------------------------------------|
| Company   | u-blox AG                                    |
| Address   | Zürcherstrasse 68Thalwil CH-8800 Switzerland |
| Telephone | +41 44 722 7462                              |

## 4. General Information of The Product

### 4.1 Product Description for Equipment under Test (EUT)

|                                                                                                                                                                                                                         |                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| Product                                                                                                                                                                                                                 | LTE CAT-M1 Data Module                                                                    |
| Model                                                                                                                                                                                                                   | SARA-R510M8S                                                                              |
| Date of Receipt                                                                                                                                                                                                         | S03aa: February 04, 2024<br>S04aa: February 04, 2024                                      |
| EUT ID*                                                                                                                                                                                                                 | S03aa/S04aa                                                                               |
| SN/IMEI                                                                                                                                                                                                                 | S03aa:352709570799593<br>S04aa: N/A                                                       |
| Supported Radio Technology and Bands                                                                                                                                                                                    | LTE CAT-M Band 2/4/5/12/13/66/71<br>BT 5.3 BLE<br>WLAN 802.11b/g/n<br>GPS/GLONASS/Galileo |
| Hardware Version                                                                                                                                                                                                        | v1                                                                                        |
| Software Version                                                                                                                                                                                                        | v1                                                                                        |
| FCC ID                                                                                                                                                                                                                  | XPYUBX19KM01                                                                              |
| Power Rating                                                                                                                                                                                                            | 30.5mm*47mm*18mm                                                                          |
| NOTE1: EUT ID is the internal identification code of the laboratory.<br>NOTE2: Samples in the test report are provided by the customer. The test results are only applicable to the samples received by the laboratory. |                                                                                           |

### 4.2 Description for Auxiliary Equipment (AE)

| AE ID*                                                              | Description | Model | SN/Remark |
|---------------------------------------------------------------------|-------------|-------|-----------|
| AE1                                                                 | RF Cable    | N/A   | N/A       |
| NOTE1: AE ID is the internal identification code of the laboratory. |             |       |           |

### 4.3 Additional Information

Modulation:

|                    |      |
|--------------------|------|
| Type of modulation | QPSK |
|--------------------|------|

Band Frequency Range:

| Band    | Frequency Range |
|---------|-----------------|
| Band 2  | 1850 - 1910 MHz |
| Band 4  | 1710 - 1755 MHz |
| Band 5  | 824 - 849 MHz   |
| Band 12 | 699-716 MHz     |
| Band 13 | 777-787 MHz     |
| Band 66 | 1710-1780 MHz   |

|         |             |
|---------|-------------|
| Band 71 | 663-698 MHz |
|---------|-------------|

Band List:

| Band    | BW (MHz) | Low Channel | Low Freq. (MHz) | Mid Channel | Mid Freq. (MHz) | High Channel | High Freq. (MHz) |
|---------|----------|-------------|-----------------|-------------|-----------------|--------------|------------------|
| Band 2  | 1.4      | 18607       | 1850.7          | 18900       | 1880            | 19193        | 1909.3           |
|         | 3        | 18615       | 1851.5          | 18900       | 1880            | 19185        | 1908.5           |
|         | 5        | 18625       | 1852.5          | 18900       | 1880            | 19175        | 1907.5           |
|         | 10       | 18650       | 1855            | 18900       | 1880            | 19150        | 1905             |
|         | 15       | 18675       | 1857.5          | 18900       | 1880            | 19125        | 1902.5           |
|         | 20       | 18700       | 1860            | 18900       | 1880            | 19100        | 1900             |
| Band 4  | 1.4      | 19957       | 1710.7          | 20175       | 1732.5          | 20393        | 1754.3           |
|         | 3        | 19965       | 1711.5          | 20175       | 1732.5          | 20385        | 1753.5           |
|         | 5        | 19975       | 1712.5          | 20175       | 1732.5          | 20375        | 1752.5           |
|         | 10       | 20000       | 1715            | 20175       | 1732.5          | 20350        | 1750             |
|         | 15       | 20025       | 1717.5          | 20175       | 1732.5          | 20325        | 1747.5           |
|         | 20       | 20050       | 1720            | 20175       | 1732.5          | 20300        | 1745             |
| Band 5  | 1.4      | 20407       | 824.7           | 20525       | 836.5           | 20643        | 848.3            |
|         | 3        | 20415       | 825.5           | 20525       | 836.5           | 20635        | 847.5            |
|         | 5        | 20425       | 826.5           | 20525       | 836.5           | 20625        | 846.5            |
|         | 10       | 20450       | 829             | 20525       | 836.5           | 20600        | 844              |
| Band 12 | 1.4      | 23017       | 699.7           | 23095       | 707.5           | 23173        | 715.3            |
|         | 3        | 23025       | 700.5           | 23095       | 707.5           | 23165        | 714.5            |
|         | 5        | 23035       | 701.5           | 23095       | 707.5           | 23155        | 713.5            |
|         | 10       | 23060       | 704             | 23095       | 707.5           | 23130        | 711              |
| Band 13 | 5        | 23205       | 779.5           | 23230       | 782             | 23255        | 784.5            |
|         | 10       | 23230       | 782             | 23230       | 782             | 23230        | 782              |
| Band 66 | 1.4      | 131979      | 1710.7          | 132322      | 1745            | 132665       | 1779.3           |
|         | 3        | 131987      | 1711.5          | 132322      | 1745            | 132657       | 1778.5           |
|         | 5        | 131997      | 1712.5          | 132322      | 1745            | 132647       | 1777.5           |
|         | 10       | 132022      | 1715            | 132322      | 1745            | 132622       | 1775             |
|         | 15       | 132047      | 1717.5          | 132322      | 1745            | 132597       | 1772.5           |
|         | 20       | 132072      | 1720            | 132322      | 1745            | 132572       | 1770             |
| Band 71 | 5        | 133147      | 665.5           | 133297      | 680.5           | 133447       | 695.5            |
|         | 10       | 133172      | 668             | 133297      | 680.5           | 133422       | 693              |
|         | 15       | 133197      | 670.5           | 133297      | 680.5           | 133397       | 690.5            |
|         | 20       | 133222      | 673             | 133297      | 680.5           | 133372       | 688              |

## 5. Test Configuration Information

### 5.1 Laboratory Environmental Conditions

#### 5.1.1 Permanent Facilities

|                        |                        |         |         |
|------------------------|------------------------|---------|---------|
| Relative Humidity      | Min. = 45%, Max. = 55% |         |         |
| Atmospheric Pressure   | 101kPa                 |         |         |
| Temperature            | Normal                 | Minimum | Maximum |
|                        | 25°C                   | -10°C   | 45°C    |
| Working Voltage of EUT | Normal                 | Minimum | Maximum |
|                        | 3.7V                   | 3.0V    | 4.2 V   |

### 5.2 Test Equipments Utilized

#### Conduction test system

| No. | Name                                | Model         | S/N       | SW Version | HW Version | Manufacturer | Cal. Date  | Cal. Interval |
|-----|-------------------------------------|---------------|-----------|------------|------------|--------------|------------|---------------|
| 1   | Software                            | Eagle V3.3    | N/A       | V3.3       | N/A        | 3IN          | N/A        | N/A           |
| 2   | Frequency spectrum analyzer         | FSQ           | 101091    | V4.75      | V11.00     | R&S          | 2023-07-26 | 1 Year        |
| 3   | Frequency spectrum analyzer         | FSW43         | 101943    | 1.12       | 00         | R&S          | 2023-08-31 | 1 Year        |
| 4   | Wideband Radio Communication Tester | CMW 500       | 148874    | V3.5.136   | N/A        | R&S          | 2023-07-27 | 1 Year        |
| 5   | Temperature Chamber                 | B-TF-107C     | 201804107 | N/A        | N/A        | BoYi         | 2023-06-28 | 1 Year        |
| 6   | Programmable power supply           | Keithley 2303 | 4039070   | N/A        | N/A        | Keithley     | 2023-06-23 | 1 Year        |
| 7   | RF Test Automation Box              | RF 2021B      | 2001      | V3.3       | N/A        | RANATEC      | N/A        | N/A           |

#### Radiated emission test system

| No. | Name                                 | Model    | S/N    | SW Version | HW Version   | Manufacturer | Cal. Date  | Cal. Interval |
|-----|--------------------------------------|----------|--------|------------|--------------|--------------|------------|---------------|
| 1   | Universal Radio Communication Tester | CMU200   | 123126 | V5.2.1     | B12          | R&S          | 2023-10-16 | 1 Year        |
| 2   | Universal Radio Communication Tester | CMW500   | 104178 | V3.7.20    | 1206.0600.00 | R&S          | 2023-10-16 | 1 Year        |
| 3   | EMI Test Receiver                    | ESU40    | 100307 | V5.1-24-3  | 01           | R&S          | 2023-12-19 | 1 Year        |
| 4   | TRILOG Broadband Antenna             | VULB9163 | 01345  | N/A        | N/A          | Schwarzbeck  | 2023-03-23 | 1 Year        |

|    |                                  |                 |          |             |       |              |            |         |
|----|----------------------------------|-----------------|----------|-------------|-------|--------------|------------|---------|
| 5  | Double- ridged Waveguide Antenna | ETS-3117        | 00135890 | N/A         | N/A   | ETS          | 2023-07-28 | 1 Years |
| 6  | EMI Test Software                | EMC32 V10.35.02 | N/A      | N/A         | N/A   | R&S          | N/A        | N/A     |
| 7  | Preamplifier                     | SCU08F1         | 8320024  | N/A         | N/A   | R&S          | 2023-10-16 | 1 year  |
| 8  | Preamplifier                     | SCU18           | 10155    | N/A         | N/A   | R&S          | 2023-10-16 | 1 year  |
| 9  | Antenna                          | SWB-VUBA 9117   | 9117-266 | N/A         | N/A   | Schwar zbeck | 2023-9-8   | 1 year  |
| 10 | Antenna                          | BBHA9120 D      | 02112    | N/A         | N/A   | Schwar zbeck | 2023-7-28  | 1 year  |
| 11 | Signal Generator                 | SMF100A         | 102314   | 3.20.390.24 | 05.10 | R&S          | 2023-10-16 | 1 year  |

Note:After 2024-3-22, the TRILOG Broadband Antenna is not used for radiation testing.

### 5.3 Measurement Uncertainty

#### Measurement Uncertainty of Radiation test

| Frequency Range                         | Uncertainty(dB) |
|-----------------------------------------|-----------------|
| $30\text{MHz} \leq f \leq 1\text{GHz}$  | $\pm 5.10$      |
| $1\text{GHz} \leq f \leq 18\text{GHz}$  | $\pm 5.66$      |
| $18\text{GHz} \leq f \leq 40\text{GHz}$ | $\pm 5.22$      |

#### Measurement Uncertainty of Conduction test

| No | Item                     | Extended uncertainty (k=2) |         |
|----|--------------------------|----------------------------|---------|
| 1  | Frequency Tolerance      | 23Hz                       |         |
| 2  | RF Output Power          | 0.7dB                      |         |
| 3  | conducted spurious       | 9kHz~3.6GHz                | 1.5dB   |
|    |                          | 3.6GHz~8.4GHz              | 2.8dB   |
|    |                          | 8.4GHz~12.75GHz            | 3.4dB   |
| 4  | EVM                      | 2.1%                       |         |
| 5  | Occupied Bandwidth       | Bandwidth 1.4MHz           | 0.03MHz |
|    |                          | Bandwidth 3MHz             | 0.03MHz |
|    |                          | Bandwidth 5MHz             | 0.03MHz |
|    |                          | Bandwidth 10MHz            | 0.05MHz |
|    |                          | Bandwidth 15MHz            | 0.06MHz |
|    |                          | Bandwidth 20MHz            | 0.08MHz |
| 6  | Emission intermodulation | Adjacent channel           | 1.4dB   |
|    |                          | Alternate channel          | 1.4dB   |
| 7  | Range of frequency       | 0.08MHz                    |         |

## 6. Test Results

### 6.1 Output Power

#### 6.1.1 Measurement Limit

FCC §22.913(a) (5) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.  
FCC §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.

FCC §27.50(a) For mobile and portable stations transmitting in the 2305–2315 MHz band or the 2350–2360 MHz band, the average EIRP must not exceed 50 milliwatts within any 1 megahertz of authorized bandwidth, except that for mobile and portable stations compliant with 3GPP LTE standards or another advanced mobile broadband protocol that avoids concentrating energy at the edge of the operating band the average EIRP must not exceed 250 milliwatts within any 5 megahertz of authorized bandwidth but may exceed 50 milliwatts within any 1 megahertz of authorized bandwidth. ( $EIRP \leq 24dBm/5MHz$ )

FCC §27.50(b) (10) Portable stations (hand-held devices) transmitting in the 746–757 MHz, 776–788 MHz, and 805–806 MHz bands are limited to 3 watts ERP.

FCC §27.50(c) (10) Portable stations (hand-held devices) in the 600 MHz uplink band and the 698–746 MHz band, and fixed and mobile stations in the 600 MHz uplink band are limited to 3 watts ERP.

FCC §27.50(d) (4) Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band is limited to 1 watt EIRP.

FCC §27.50(h): Mobile and other user stations. Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

#### 6.1.2 Method of Measurements

Method of measurements please refer to KDB971168 D01 v03 clause 5.

The EUT was set up for the max output power with pseudo random data modulation.

The power was measured with Rhode & Schwarz base station CMW500.

These measurements were done at 3 frequencies.(bottom, middle and top of operational frequency range).

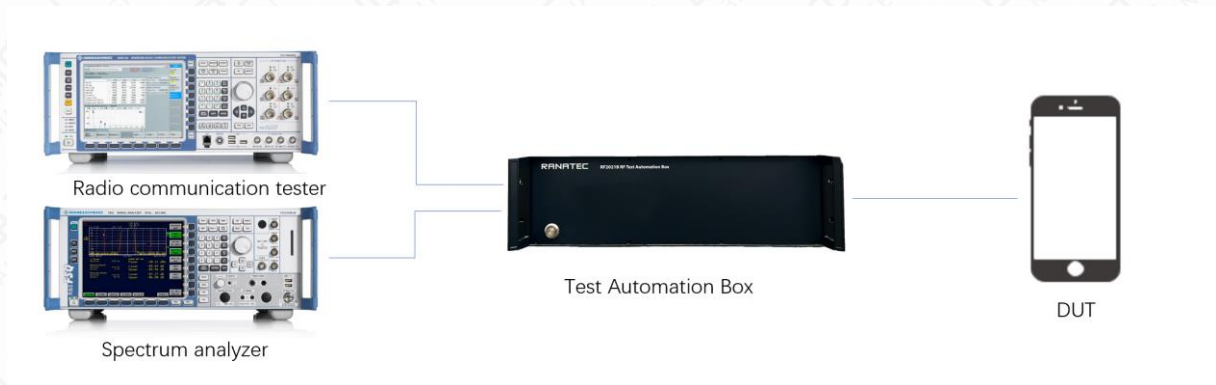
1. The transmitter output port was connected to base station.
2. Set the EUT at maximum power through base station.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Measure and record maximum average power for other modulation signal.
5. During the process of testing, the EUT was controlled Rhode & Schwarz Digital Radio.
6. Communication tester to ensure max power transmission and proper modulation.
7. This result contains output power and EIRP measurements for the EUT. In all cases, output power is within the specified limits.

$EIRP = \text{Conducted power} + \text{Gain}$ ,  $ERP = EIRP - 2.15dB_i$ .

#### 6.1.3 Test procedures

The transmitter output power was connected to calibrated attenuator, the other end of which was connected to signal analyzer. Transmitter output power was read off the power in dBm. The power outputs at the transmitter antenna port was determined by adding the value of attenuator to the base station reading.

#### 6.1.4 Test Setup



#### 6.1.5 Output Power Measurement result

| LTE CatM | Mode | Origina data(dBm) | Verified power(dBm) |
|----------|------|-------------------|---------------------|
| Band2    | QPSK | 23.12             | 22.35               |
| Band 4   | QPSK | 23.56             | 20.37               |
| Band 5   | QPSK | 22.63             | 22.55               |
| Band 12  | QPSK | 23                | 22.99               |
| Band 13  | QPSK | 22.83             | 22.79               |
| Band 66  | QPSK | 23.79             | 20.63               |
| Band 71  | QPSK | 22.89             | 21.71               |

Note1: The power of the worst part is verified to meet the requirements.

## 6.2 Emission Limit

### 6.2.1 Measurement Limit

According to KDB 971168, a relaxation of the reference bandwidth is often provided for measurements within a specified frequency range at the edge of the authorized frequency block/band. This is often implemented by permitting the use of a narrower RBW (typically limited to a minimum RBW of 1% of the OBW) for measuring the out-of-band emissions without a requirement to integrate the result over the full reference bandwidth.

FCC §22.917(a) Out of band emissions. 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.

FCC §24.238(a) Out of band emissions. 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.

FCC §27.53(a) For mobile and portable stations operating in the 2305–2315 MHz and 2350–2360 MHz bands:

(i) By a factor of not less than:  $43 + 10 \log(P)$  dB on all frequencies between 2305 and 2320 MHz and on all frequencies between 2345 and 2360 MHz that are outside the licensed band(s) of operation, not less than  $55 + 10 \log(P)$  dB on all frequencies between 2320 and 2324 MHz and on all frequencies between 2341 and 2345 MHz, not less than  $61 + 10 \log(P)$  dB on all frequencies between 2324 and 2328 MHz and on all frequencies between 2337 and 2341 MHz, and not less than  $67 + 10 \log(P)$  dB on all frequencies between 2328 and 2337 MHz;

(ii) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2300 and 2305 MHz,  $55 + 10 \log(P)$  dB on all frequencies between 2296 and 2300 MHz,  $61 + 10 \log(P)$  dB on all frequencies between 2292 and 2296 MHz,  $67 + 10 \log(P)$  dB on all frequencies between 2288 and 2292 MHz, and  $70 + 10 \log(P)$  dB below 2288 MHz;

(iii) By a factor of not less than  $43 + 10 \log(P)$  dB on all frequencies between 2360 and 2365 MHz, and not less than  $70 + 10 \log(P)$  dB above 2365 MHz.

FCC §27.53(h) (1) General protection levels. Except as otherwise specified below, for operations in the 1695–1710 MHz, 1710–1755 MHz, 1755–1780 MHz, 1915–1920 MHz, 1995–2000 MHz, 2000–2020 MHz, 2110–2155 MHz, 2155–2180 MHz, and 2180–2200 bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least  $43 + 10 \log_{10}(P)$  dB.

FCC §27.53(c) (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;

FCC §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. Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kilohertz or greater. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

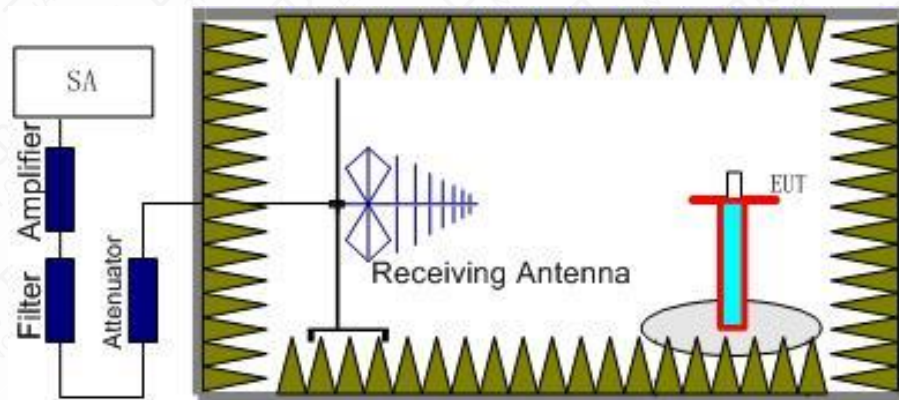
### 6.2.2 Method of Measurement

The measurements procedures in TIA-603E-2016 are used. This measurement is carried out in fully-anechoic chamber FAC-3.

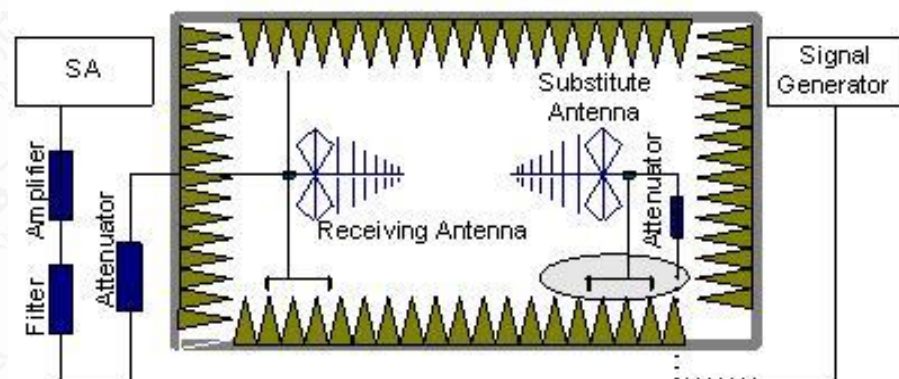
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz as outlined in Part 22.917(a)/24.238(a)/27.53(g)/27.53(h)/27.53(m)(4). The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 2/4/5/7/26/38/40/41.

**The procedure of radiated spurious emissions is as follows:**

1. Below 1 GHz, EUT was placed on a 0.8 meter high non-conductive stand at a 3 meter test distance from the receive antenna. Above 1 GHz, EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded (Pr). The power of

signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4.The Path loss (Pcl) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (Ga) should be recorded after test.

An amplifier should be connected in for the test.

The Path loss (Pcl) is the summation of the cable loss and the gain of the amplifier.

The measurement results are obtained as described below:

Power (EIRP) =PMea- Pcl + Ga

5.This value is EIRP since the measurement is calibrated using an antenna of known gain (unit: dBi) and known input power.

6.ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dBi.

### 6.2.3 Measurement Results

Radiated emissions measurements were made at the upper, middle, and lower carrier frequencies of the LTE Bands.It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the LTE Bands. Into any of the other blocks. The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this. The evaluated frequency range is from 30MHz to ten times the main frequency signal. The final data result takes the worst pattern data and places it in the report.

| Band    | BW (MHz) | Low Freq. (MHz) | Mid Freq. (MHz) | High Freq. (MHz) | Result |
|---------|----------|-----------------|-----------------|------------------|--------|
| Band 2  | 1.4      | 1850.7          | 1880            | 1909.3           | PASS   |
|         | 3        | 1851.5          | 1880            | 1908.5           | PASS   |
|         | 5        | 1852.5          | 1880            | 1907.5           | PASS   |
|         | 10       | 1855            | 1880            | 1905             | PASS   |
|         | 15       | 1857.5          | 1880            | 1902.5           | PASS   |
|         | 20       | 1860            | 1880            | 1900             | PASS   |
| Band 4  | 1.4      | 1710.7          | 1732.5          | 1754.3           | PASS   |
|         | 3        | 1711.5          | 1732.5          | 1753.5           | PASS   |
|         | 5        | 1712.5          | 1732.5          | 1752.5           | PASS   |
|         | 10       | 1715            | 1732.5          | 1750             | PASS   |
|         | 15       | 1717.5          | 1732.5          | 1747.5           | PASS   |
|         | 20       | 1720            | 1732.5          | 1745             | PASS   |
| Band 5  | 1.4      | 824.7           | 836.5           | 848.3            | PASS   |
|         | 3        | 825.5           | 836.5           | 847.5            | PASS   |
|         | 5        | 826.5           | 836.5           | 846.5            | PASS   |
|         | 10       | 829             | 836.5           | 844              | PASS   |
| Band 12 | 1.4      | 699.7           | 707.5           | 715.3            | PASS   |
|         | 3        | 700.5           | 707.5           | 714.5            | PASS   |
|         | 5        | 701.5           | 707.5           | 713.5            | PASS   |
|         | 10       | 704             | 707.5           | 711              | PASS   |
| Band 13 | 5        | 779.5           | 782             | 784.5            | PASS   |
|         | 10       | 782             | 782             | 782              | PASS   |
| Band 66 | 1.4      | 1710.7          | 1745            | 1779.3           | PASS   |

| Band    | BW (MHz) | Low Freq. (MHz) | Mid Freq. (MHz) | High Freq. (MHz) | Result |
|---------|----------|-----------------|-----------------|------------------|--------|
|         | 3        | 1711.5          | 1745            | 1778.5           | PASS   |
|         | 5        | 1712.5          | 1745            | 1777.5           | PASS   |
|         | 10       | 1715            | 1745            | 1775             | PASS   |
|         | 15       | 1717.5          | 1745            | 1772.5           | PASS   |
|         | 20       | 1720            | 1745            | 1770             | PASS   |
| Band 71 | 5        | 665.5           | 680.5           | 695.5            | PASS   |
|         | 10       | 668             | 680.5           | 693              | PASS   |
|         | 15       | 670.5           | 680.5           | 690.5            | PASS   |
|         | 20       | 673             | 680.5           | 688              | PASS   |

Only the worst mode data is provided

#### RSE-CATM2-L

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 3701.2          | -22.28     | 6.6       | 7.9      | -20.98            | -13         | 7.98        | H            |
| 4275.6          | -40.92     | 7.1       | 8.9      | -39.12            | -13         | 26.12       | H            |
| 5552.4          | -35.3      | 8.2       | 9.8      | -33.7             | -13         | 20.70       | H            |
| 7402.4          | -44.79     | 9.7       | 11.6     | -42.89            | -13         | 29.89       | H            |
| 9254.0          | -46.77     | 10.7      | 12.7     | -44.77            | -13         | 31.77       | V            |
| 12954.4         | -34.64     | 13.2      | 12.3     | -35.54            | -13         | 22.54       | V            |

#### RSE-CATM2-M

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 3211.6          | -46.03     | 6.1       | 6.9      | -45.23            | -13         | 32.23       | H            |
| 3760.0          | -25.61     | 6.6       | 7.9      | -24.31            | -13         | 11.31       | V            |
| 4360.0          | -45.41     | 7.2       | 8.9      | -43.71            | -13         | 30.71       | V            |
| 5640.8          | -44.71     | 8.3       | 10.2     | -42.81            | -13         | 29.81       | V            |
| 7519.6          | -41.29     | 9.7       | 11.6     | -39.39            | -13         | 26.39       | V            |
| 13158.8         | -36.58     | 13.0      | 12.3     | -37.28            | -13         | 24.28       | V            |

#### RSE-CATM2-H

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 3051.6          | -40.45     | 6.0       | 6.7      | -39.75            | -13         | 26.75       | V            |

|         |        |      |      |        |     |       |   |
|---------|--------|------|------|--------|-----|-------|---|
| 3819.6  | -25.46 | 6.7  | 7.9  | -24.26 | -13 | 11.26 | H |
| 4310.0  | -45.36 | 7.1  | 8.9  | -43.56 | -13 | 30.56 | H |
| 5728.0  | -36.87 | 8.5  | 10.2 | -35.17 | -13 | 22.17 | V |
| 7637.2  | -42.52 | 9.7  | 11.8 | -40.42 | -13 | 27.42 | V |
| 13364.6 | -34.94 | 13.7 | 12.3 | -36.34 | -13 | 23.34 | V |

**RSE-CATM4-L**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 3421.6          | -28.32     | 6.3       | 7.8      | -26.82            | -13         | 13.82       | V            |
| 4100.0          | -54.81     | 7.0       | 8.6      | -53.21            | -13         | 40.21       | H            |
| 5132.4          | -41.07     | 7.9       | 9.4      | -39.57            | -13         | 26.57       | H            |
| 6843.2          | -47.31     | 9.2       | 10.9     | -45.61            | -13         | 32.61       | V            |
| 8553.6          | -46.78     | 10.3      | 12.6     | -44.48            | -13         | 31.48       | H            |
| 13685.2         | -38.94     | 13.9      | 12.3     | -40.54            | -13         | 27.54       | V            |

**RSE-CATM4-M**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 3464.8          | -28.27     | 6.4       | 7.8      | -26.87            | -13         | 13.87       | V            |
| 5197.2          | -39.73     | 8.0       | 9.4      | -38.33            | -13         | 25.33       | V            |
| 6930.4          | -48.71     | 9.3       | 11.1     | -46.91            | -13         | 33.91       | V            |
| 8662.4          | -50.86     | 10.3      | 12.7     | -48.46            | -13         | 35.46       | V            |
| 12127.0         | -41.11     | 12.6      | 12.3     | -41.41            | -13         | 28.41       | V            |
| 13860.2         | -38.89     | 13.5      | 12.3     | -40.09            | -13         | 27.09       | H            |

**RSE-CATM4-H**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 3509.2          | -29.35     | 6.4       | 7.8      | -27.95            | -13         | 14.95       | V            |
| 5262.0          | -40.73     | 8.0       | 9.4      | -39.33            | -13         | 26.33       | V            |
| 7206.8          | -48.53     | 9.5       | 11.4     | -46.63            | -13         | 33.63       | V            |

|         |        |      |      |        |     |       |   |
|---------|--------|------|------|--------|-----|-------|---|
| 9549.2  | -49.87 | 10.7 | 12.7 | -47.87 | -13 | 34.87 | H |
| 12279.6 | -43.01 | 12.7 | 12.3 | -43.41 | -13 | 30.41 | V |
| 16705.0 | -36.23 | 15.1 | 12.3 | -39.03 | -13 | 26.03 | H |

**RSE-CATM5-L**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1649.3          | -40.56     | 4.2       | 4.7      | -40.06            | -13         | 27.06       | V            |
| 2475.4          | -45.61     | 5.4       | 5.6      | -45.41            | -13         | 32.41       | V            |
| 3334.4          | -53.77     | 6.2       | 6.9      | -53.07            | -13         | 40.07       | V            |
| 4297.6          | -53.09     | 7.1       | 8.9      | -51.29            | -13         | 38.29       | H            |
| 5875.6          | -53.01     | 8.5       | 10.2     | -51.31            | -13         | 38.31       | H            |
| 8013.4          | -53.25     | 9.9       | 12.2     | -50.95            | -13         | 37.95       | V            |

**RSE-CATM5-M**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1672.9          | -42.55     | 4.5       | 4.7      | -42.35            | -13         | 29.35       | V            |
| 2514.6          | -43.08     | 5.4       | 5.6      | -42.88            | -13         | 29.88       | H            |
| 3345.2          | -51.5      | 6.2       | 6.9      | -50.8             | -13         | 37.80       | V            |
| 4183.2          | -54.13     | 7.0       | 8.9      | -52.23            | -13         | 39.23       | H            |
| 5239.6          | -51.11     | 8.0       | 9.4      | -49.71            | -13         | 36.71       | H            |
| 6621.2          | -51.13     | 9.1       | 10.6     | -49.63            | -13         | 36.63       | V            |

**RSE-CATM5-H**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1697.5          | -44.2      | 4.5       | 4.7      | -44               | -13         | 31.00       | V            |
| 2530.0          | -43.49     | 5.4       | 5.6      | -43.29            | -13         | 30.29       | H            |
| 3393.6          | -50.79     | 6.3       | 7.8      | -49.29            | -13         | 36.29       | V            |
| 4242.8          | -53.74     | 7.1       | 8.9      | -51.94            | -13         | 38.94       | H            |
| 5028.8          | -52.59     | 7.8       | 9.6      | -50.79            | -13         | 37.79       | H            |

|        |        |     |      |        |     |       |   |
|--------|--------|-----|------|--------|-----|-------|---|
| 7441.3 | -49.34 | 9.7 | 11.6 | -47.44 | -13 | 34.44 | V |
|--------|--------|-----|------|--------|-----|-------|---|

**RSE-CATM12-L**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1399.1          | -48.9      | 4.0       | 5.3      | -47.6             | -13         | 34.60       | V            |
| 2099.2          | -45.9      | 4.9       | 4.5      | -46.3             | -13         | 33.30       | V            |
| 2782.7          | -41.35     | 5.7       | 6.1      | -40.95            | -13         | 27.95       | H            |
| 3498.4          | -49.98     | 6.4       | 7.8      | -48.58            | -13         | 35.58       | V            |
| 4292.8          | -53.32     | 7.1       | 8.9      | -51.52            | -13         | 38.52       | H            |
| 7439.5          | -48.27     | 9.7       | 11.6     | -46.37            | -13         | 33.37       | H            |

**RSE-CATM12-M**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1414.0          | -49.24     | 4.0       | 5.3      | -47.94            | -13         | 34.94       | V            |
| 2122.7          | -43.84     | 4.9       | 4.5      | -44.24            | -13         | 31.24       | V            |
| 2811.2          | -41.66     | 5.7       | 6.1      | -41.26            | -13         | 28.26       | H            |
| 3537.2          | -47.25     | 6.4       | 7.8      | -45.85            | -13         | 32.85       | V            |
| 4852.0          | -51.18     | 7.6       | 9.0      | -49.78            | -13         | 36.78       | H            |
| 7277.5          | -47.56     | 9.6       | 11.4     | -45.76            | -13         | 32.76       | V            |

**RSE-CATM12-H**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1431.3          | -50.06     | 4.1       | 5.3      | -48.86            | -13         | 35.87       | V            |
| 2145.8          | -44.36     | 5.0       | 5.1      | -44.26            | -13         | 31.26       | H            |
| 2816.9          | -42.23     | 5.7       | 6.1      | -41.83            | -13         | 28.83       | V            |
| 3576.4          | -46.5      | 6.5       | 7.8      | -45.2             | -13         | 32.20       | V            |
| 4291.2          | -52.33     | 7.1       | 8.9      | -50.53            | -13         | 37.53       | H            |
| 5090.8          | -52.02     | 7.9       | 9.6      | -50.32            | -13         | 37.32       | H            |

**RSE-CATM13-L**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1555.9          | -46.34     | 4.2       | 5.3      | -45.24            | -13         | 32.24       | V            |
| 3111.2          | -50.03     | 6.0       | 6.7      | -49.33            | -13         | 36.33       | H            |
| 3888.8          | -48.74     | 6.8       | 8.6      | -46.94            | -13         | 33.94       | V            |
| 4960.4          | -51.36     | 7.7       | 9.6      | -49.46            | -13         | 36.46       | V            |
| 6307.2          | -52.18     | 8.8       | 10.3     | -50.68            | -13         | 37.68       | V            |
| 7946.5          | -52.85     | 9.8       | 12.2     | -50.45            | -13         | 37.45       | V            |

**RSE-CATM13-M**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1563.8          | -46.91     | 4.2       | 5.3      | -45.81            | -13         | 32.81       | V            |
| 2318.5          | -45.35     | 5.1       | 5.1      | -45.35            | -13         | 32.35       | V            |
| 3182.8          | -47.5      | 6.1       | 6.9      | -46.7             | -13         | 33.70       | H            |
| 3910.0          | -53.33     | 6.8       | 8.6      | -51.53            | -13         | 38.53       | V            |
| 4543.6          | -52.92     | 7.4       | 8.7      | -51.62            | -13         | 38.62       | H            |
| 5312.4          | -52.87     | 8.0       | 9.4      | -51.47            | -13         | 38.47       | H            |

**RSE-CATM13-H**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1569.7          | -51.44     | 4.2       | 5.3      | -50.34            | -13         | 37.34       | H            |
| 3210.4          | -49.33     | 6.1       | 6.9      | -48.53            | -13         | 35.53       | H            |
| 3922.0          | -52.96     | 6.8       | 8.6      | -51.16            | -13         | 38.16       | H            |
| 4852.4          | -51.53     | 7.6       | 9.0      | -50.13            | -13         | 37.13       | H            |
| 6246.0          | -50.65     | 8.8       | 10.3     | -49.15            | -13         | 36.15       | V            |
| 7278.7          | -47.4      | 9.6       | 11.4     | -45.6             | -13         | 32.60       | H            |

**RSE-CATM66-L**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|

|         |        |      |      |        |     |       |   |
|---------|--------|------|------|--------|-----|-------|---|
| 3421.2  | -25.64 | 6.3  | 7.8  | -24.14 | -13 | 11.14 | V |
| 5131.6  | -41.53 | 7.9  | 9.4  | -40.03 | -13 | 27.03 | V |
| 6842.8  | -49.3  | 9.2  | 10.9 | -47.6  | -13 | 34.60 | V |
| 8552.8  | -47.98 | 10.3 | 12.6 | -45.68 | -13 | 32.68 | H |
| 11974.4 | -37.32 | 12.6 | 12.3 | -37.62 | -13 | 24.62 | V |
| 13689.4 | -38.83 | 13.9 | 12.3 | -40.43 | -13 | 27.43 | V |

**RSE-CATM66-M**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 3489.2          | -28.95     | 6.4       | 7.8      | -27.55            | -13         | 14.55       | V            |
| 5235.6          | -39.03     | 8.0       | 9.4      | -37.63            | -13         | 24.63       | H            |
| 7277.2          | -48.36     | 9.6       | 11.4     | -46.56            | -13         | 33.56       | H            |
| 8725.2          | -48.92     | 10.4      | 12.7     | -46.62            | -13         | 33.62       | H            |
| 12215.2         | -36.48     | 12.6      | 12.3     | -36.78            | -13         | 23.78       | V            |
| 13959.6         | -39.34     | 13.7      | 12.3     | -40.74            | -13         | 27.74       | H            |

**RSE-CATM66-H**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 3559.2          | -29.72     | 6.4       | 7.8      | -28.32            | -13         | 15.32       | V            |
| 4180.8          | -45.2      | 7.0       | 8.9      | -43.3             | -13         | 30.30       | H            |
| 5338.0          | -33.7      | 8.1       | 9.4      | -32.4             | -13         | 19.40       | H            |
| 7439.2          | -48.74     | 9.7       | 11.6     | -46.84            | -13         | 33.84       | V            |
| 12454.6         | -36.27     | 12.7      | 12.3     | -36.67            | -13         | 23.67       | V            |
| 14236.8         | -39.63     | 13.7      | 12.3     | -41.03            | -13         | 28.03       | V            |

**RSE-CATM71-L**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1327.8          | -44.82     | 3.9       | 3.0      | -45.72            | -13         | 32.72       | H            |
| 1995.8          | -48.98     | 4.8       | 4.5      | -49.28            | -13         | 36.29       | H            |

|        |        |     |     |        |     |       |   |
|--------|--------|-----|-----|--------|-----|-------|---|
| 2601.5 | -43.76 | 5.5 | 5.6 | -43.66 | -13 | 30.66 | H |
| 3318.8 | -48.17 | 6.2 | 6.9 | -47.47 | -13 | 34.47 | V |
| 3981.6 | -51.13 | 6.9 | 8.6 | -49.43 | -13 | 36.43 | V |
| 5046.0 | -53.28 | 7.8 | 9.6 | -51.48 | -13 | 38.48 | V |

**RSE-CATM71-M**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1357.5          | -44.89     | 3.9       | 3.0      | -45.79            | -13         | 32.79       | H            |
| 2041.5          | -48.3      | 4.8       | 4.5      | -48.6             | -13         | 35.60       | V            |
| 2714.6          | -42.47     | 5.6       | 6.1      | -41.97            | -13         | 28.97       | H            |
| 3393.6          | -44.14     | 6.3       | 7.8      | -42.64            | -13         | 29.64       | V            |
| 4072.8          | -53.14     | 6.9       | 8.6      | -51.44            | -13         | 38.44       | H            |
| 7277.8          | -46.96     | 9.6       | 11.4     | -45.16            | -13         | 32.16       | H            |

**RSE-CATM71-H**

| Frequency (MHz) | PMea (dBm) | Pcl (dBm) | Ga (dBd) | Test Result (dBm) | Limit (dBm) | Margin(dBm) | Polarization |
|-----------------|------------|-----------|----------|-------------------|-------------|-------------|--------------|
| 1387.7          | -48.82     | 4.0       | 5.3      | -47.52            | -13         | 34.52       | H            |
| 2081.5          | -47.67     | 4.9       | 4.5      | -48.07            | -13         | 35.07       | H            |
| 2780.4          | -42.39     | 5.7       | 6.1      | -41.99            | -13         | 28.99       | V            |
| 3470.0          | -50.2      | 6.4       | 7.8      | -48.8             | -13         | 35.80       | V            |
| 4162.4          | -53        | 7.0       | 8.9      | -51.1             | -13         | 38.10       | H            |
| 5203.2          | -51.8      | 8.0       | 9.4      | -50.4             | -13         | 37.40       | H            |

## Annex A: Revised History

| Version | Revised Content |
|---------|-----------------|
| V0      | Initial         |

## Annex B: Accreditation Certificate



**END OF REPORT**