

# FCC TEST REPORT

Report No.....: AB26070209FW02

FCC ID.....: **2BH5J-P41**

Applicant.....: Hong Kong Yushengchang Technology Co.,Limited

Address.....: Unit 1801 18/ F office plus @Wan Chai No.303 Hennessy Road ,  
Wanchai HK

Manufacturer.....: Shenzhen Yushengchang Technology Co.,LTD

Address.....: F6, Jinhai building , songgang Town, Bao'an Zone, Shenzhen

Product Name.....: 4G GPS tracker watch

Trade Mark.....: 

Test Model.....: P41

Additional Model(s).....: /

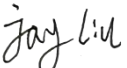
Standard.....: FCC 47 CFR Part 22 Subpart H;  
FCC 47 CFR Part 24 Subpart E;  
FCC 47 CFR Part 27;

Date of Receipt.....: 2026.07.10

Date of Test Date.....: 2026.07.10-2026.07.30

Date of Issue.....: 2026.07.30

Test Result.....: Pass

|                                              |             |                                                                                       |
|----------------------------------------------|-------------|---------------------------------------------------------------------------------------|
| Compiled by:<br>(Printed Name + Signature)   | Huajie Li   |  |
| Supervised by:<br>(Printed Name + Signature) | David Huang |  |
| Approved by:<br>(Printed Name + Signature)   | Jay Liu     |  |

Testing Laboratory Name.....: Aibo Standard Technology (Shenzhen) Co., Ltd.

Address.....: 101, Building B, Tuori New Energy Industrial Park, High-tech Park,  
Tianliao Community, Yutang Street, Guangming District, Shenzhen  
City, Guangdong Province, China

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## FCC TEST REPORT

|                          |                                                                              |
|--------------------------|------------------------------------------------------------------------------|
| EUT.....                 | : 4G GPS tracker watch                                                       |
| Test Model.....          | : P41                                                                        |
| <b>Applicant.....</b>    | <b>: Hong Kong Yushengchang Technology Co.,Limited</b>                       |
| Address.....             | : Unit 1801 18/ F office plus @Wan Chai No.303 Hennessy Road ,<br>Wanchai HK |
| <b>Manufacturer.....</b> | <b>: Shenzhen Yushengchang Technology Co.,LTD</b>                            |
| Address.....             | : F6, Jinhai building , songgang Town, Bao'an Zone, Shenzhen                 |

|                    |                 |
|--------------------|-----------------|
| <b>Test Result</b> | <b>Positive</b> |
|--------------------|-----------------|

The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

**REPORT VERSION**

| Version No. | Issue Date | Description   |
|-------------|------------|---------------|
| 01          | 2026.07.30 | Initial Issue |

## TABLE OF CONTENTS

|                                                             |           |
|-------------------------------------------------------------|-----------|
| <b>1. GENERAL INFORMATION .....</b>                         | <b>6</b>  |
| 1.1. GENERAL DESCRIPTION OF EUT .....                       | 6         |
| 1.2. DESCRIPTION OF SUPPORT EQUIPMENT .....                 | 6         |
| 1.3. DESCRIPTION OF EXTERNAL I/O .....                      | 6         |
| 1.4. GENERAL DESCRIPTION OF APPLIED STANDARDS .....         | 7         |
| 1.5. DESCRIPTION OF TEST FACILITY .....                     | 7         |
| 1.6. MEASUREMENT UNCERTAINTY .....                          | 8         |
| 1.7. ENVIRONMENTAL CONDITIONS .....                         | 8         |
| 1.8. DESCRIPTION OF TEST MODES .....                        | 9         |
| <b>2. SUMMARY OF TEST RESULT .....</b>                      | <b>10</b> |
| <b>3. MEASUREMENT INSTRUMENTS LIST .....</b>                | <b>12</b> |
| <b>4. CONDUCTED OUTPUT POWER AND MAXIMUM ERP/EIRP .....</b> | <b>13</b> |
| 4.1. LIMIT .....                                            | 13        |
| 4.2. TEST SETUP .....                                       | 13        |
| 4.3. TEST PROCEDURE .....                                   | 13        |
| 4.4. TEST RESULT .....                                      | 14        |
| <b>5. PEAK-AVERAGE RATIO .....</b>                          | <b>15</b> |
| 5.1. LIMIT .....                                            | 15        |
| 5.2. TEST SETUP .....                                       | 15        |
| 5.3. TEST PROCEDURE .....                                   | 15        |
| 5.4. TEST RESULT .....                                      | 15        |
| <b>6. 26DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH .....</b>   | <b>16</b> |
| 6.1. LIMIT .....                                            | 16        |
| 6.2. TEST SETUP .....                                       | 16        |
| 6.3. TEST PROCEDURE .....                                   | 16        |
| 6.4. TEST RESULT .....                                      | 16        |
| <b>7. BAND EDGE AT ANTENNA TERMINALS .....</b>              | <b>17</b> |
| 7.1. LIMIT .....                                            | 17        |
| 7.2. TEST SETUP .....                                       | 17        |
| 7.3. TEST PROCEDURE .....                                   | 17        |
| 7.4. TEST RESULT .....                                      | 18        |
| <b>8. SPURIOUS EMISSIONS AT ANTENNA TERMINALS .....</b>     | <b>19</b> |
| 8.1. LIMIT .....                                            | 19        |
| 8.2. TEST SETUP .....                                       | 19        |
| 8.3. TEST PROCEDURE .....                                   | 20        |
| 8.4. TEST RESULT .....                                      | 20        |
| <b>9. FIELD STRENGTH OF SPURIOUS RADIATION .....</b>        | <b>21</b> |
| 9.1. LIMIT .....                                            | 21        |
| 9.2. TEST SETUP .....                                       | 21        |
| 9.3. TEST PROCEDURE .....                                   | 23        |
| 9.4. TEST RESULT .....                                      | 23        |
| <b>10. FREQUENCY STABILITY .....</b>                        | <b>29</b> |
| 10.1. LIMIT .....                                           | 29        |
| 10.2. TEST SETUP .....                                      | 29        |
| 10.3. TEST PROCEDURE .....                                  | 29        |
| 10.4. TEST RESULT .....                                     | 29        |
| <b>11. PHOTOGRAPHS OF TEST SETUP .....</b>                  | <b>30</b> |

12. PHOTOGRAPHS OF THE EUT .....30

# 1. GENERAL INFORMATION

## 1.1. GENERAL DESCRIPTION OF EUT

|                                                      |                                                                                       |                                         |
|------------------------------------------------------|---------------------------------------------------------------------------------------|-----------------------------------------|
| Product Name:                                        | 4G GPS tracker watch                                                                  |                                         |
| Trade Mark:                                          |      |                                         |
| Test Model:                                          | P41                                                                                   |                                         |
| Additional Model(s):                                 | /                                                                                     |                                         |
| Model Difference:                                    | /                                                                                     |                                         |
| Hardware Version:                                    | /                                                                                     |                                         |
| Software Version:                                    | /                                                                                     |                                         |
| Power Supply:                                        | DC 5V/1A                                                                              |                                         |
| Battery:                                             | DC 3.85V/800mAh                                                                       |                                         |
| EUT Supports Function:<br>(Provided by the customer) | E-UTRA Bands:                                                                         | LTE Band 2/5/7                          |
| Test Sample(s) Number:                               | BA372260701-S003 (Engineer Sample)                                                    |                                         |
| Radio Specification Subject to this Report           |                                                                                       |                                         |
| Support Networks:                                    | Band 2/5/7                                                                            |                                         |
| Frequency Range:                                     | Band 2                                                                                | 1850MHz–1910MHz                         |
|                                                      | Band 5                                                                                | 824MHz–849MHz                           |
|                                                      | Band 7                                                                                | 2500MHz–2570MHz                         |
| Modulation Type:                                     | QPSK, 16QAM                                                                           |                                         |
| Channel Bandwidth:                                   | Band 2                                                                                | 1.4MHz, 3MHz, 5MHz, 10MHz, 15MHz, 20MHz |
|                                                      | Band 5                                                                                | 1.4MHz, 3MHz, 5MHz, 10MHz               |
|                                                      | Band 7                                                                                | 5MHz, 10MHz, 15MHz, 20MHz               |
| Antenna Type:                                        | Internal Antenna<br>1.90dBi for Band 2;<br>1.62dBi for Band 5;<br>2.13dBi for Band 7; |                                         |

## 1.2. DESCRIPTION OF SUPPORT EQUIPMENT

| Description | Manufacturer | Model | Serial Number | Supplied by |
|-------------|--------------|-------|---------------|-------------|
| /           | /            | /     | /             | /           |

## 1.3. DESCRIPTION OF EXTERNAL I/O

| I/O Port Description | Quantity | Cable |
|----------------------|----------|-------|
| /                    | /        | /     |

#### 1.4. GENERAL DESCRIPTION OF APPLIED STANDARDS

The tests were performed according to following standards:

[FCC 47 CFR Part 22](#) - Public Mobile Services

[FCC 47 CFR Part 24](#) - Personal Communications Services

[FCC 47 CFR Part 27](#) -Miscellaneous Wireless Communications Services

[FCC 47 CFR Part 2](#) - Frequency Allocations and Radio Treaty Matters; General Rules and Regulations

[ANSI C63.26-2015](#) - American National Standard for Compliance Testing of Transmitters Used in Licensed Radio Services

[KDB 971168 D01](#) - KDB 971168 D01 Power Meas License Digital Systems v03r01

[KDB 412172 D01 Determining ERP and EIRP v01r01](#) - Guidelines for determining the effective radiated power (ERP) and isotropically radiated power (EIRP) of an RF transmitting system

#### 1.5. DESCRIPTION OF TEST FACILITY

**Test Lab:** Aibo Standard Technology (Shenzhen) Co., Ltd.

**Address:** 101, Building B, Tuori New Energy Industrial Park, High-tech Park, Tianliao Community, Yutang Street, Guangming District, Shenzhen City, Guangdong Province, China

Tel.: +86 755 85250797

E-mail: aibo@aibonorm.com

Website: www.aibonorm.com

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

##### **A2LA-Lab Certificate No.: 7514.01**

Aibo Standard Technology (Shenzhen) Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

##### **FCC Accredited Lab.**

Designation Number: CN1411

Test Firm Registration Number: 567066

##### **ISED Wireless Device Testing Laboratories**

CAB identifier: CN0185

## 1.6. MEASUREMENT UNCERTAINTY

The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

| Items                                      | Measurement Uncertainty |
|--------------------------------------------|-------------------------|
| Radiated Spurious Emissions(9KHz~30MHz)    | ±2.70dB                 |
| Radiated Spurious Emissions(25MHz~1000MHz) | ±1.60dB                 |
| Radiated Spurious Emissions(1GHz~20GHz)    | ±2.29dB                 |
| Radiated Spurious Emissions(20GHz~40GHz)   | ±5.32dB                 |
| RF Conducted Power                         | ±0.57dB                 |
| Conducted Spurious Emissions               | ±1.60dB                 |
| RF Frequency                               | ±6.0 x 10 <sup>-7</sup> |

Note: All measurement uncertainty values are shown with a coverage factor of k = 2 to indicate a 95 % level of confidence.

## 1.7. ENVIRONMENTAL CONDITIONS

During the measurement the environmental conditions were within the listed ranges:

|                     |                |
|---------------------|----------------|
| Normal Temperature: | +15°C ~ +35°C  |
| Lative Humidity     | 20 % ~ 75 %    |
| Air Pressure        | 98KPa ~ 101KPa |

### Normal or Extreme Test Conditions

| Environment Parameter | Selected Values During Tests |             |                       |
|-----------------------|------------------------------|-------------|-----------------------|
| Test Condition        | Ambient                      |             |                       |
|                       | Temperature (°C)             | Voltage (V) | Relative Humidity (%) |
| NVNT                  | +15 to +35                   | 3.85        | 20 to 75              |
| NVLT                  | -30                          | 3.85        | 20 to 75              |
| NVHT                  | +50                          | 3.85        | 20 to 75              |
| LVLT                  | -30                          | 3.27        | 20 to 75              |
| HVHT                  | +50                          | 4.43        | 20 to 75              |

Remark:

1) The EUT just work in such extreme temperature of -30 °C to +50 °C, so here the EUT is tested in the temperature of -30 °C to +50 °C.

2) NV: Normal Voltage; NT: Normal Temperature

LV: Low Extreme Test Voltage; HV: High Extreme Test Voltage.

3) LT: Low Extreme Test Temperature; HT: High Extreme Test Temperature.

## 1.8. DESCRIPTION OF TEST MODES

### System Test Configuration:

For emissions testing, the equipment under test (EUT) setup to transmit continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, radiated emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario. It was powered by a 3.85Vdc battery. Only the worst case data were recorded in this test report.

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, X/Y/Z axis, and antenna ports.

All readings are extrapolated back to the equivalent three meter reading using inverse scaling with distance. Analyzer resolution is 100 kHz or greater for frequencies below 1000MHz. The resolution is 1 MHz or greater for frequencies above 1000MHz. The spurious emissions more than 20 dB below the permissible value are not reported.

Radiated emission measurement were performed from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

## 2. SUMMARY OF TEST RESULT

| B2                                               |                           |                                |        |
|--------------------------------------------------|---------------------------|--------------------------------|--------|
| Item                                             | FCC Rule No.              | Requirements                   | Result |
| Effective (Isotropic) Radiated Power Output Data | §2.1046,<br>§24.232(c)    | EIRP $\leq 2$ W                | PASS   |
| Peak-Average Ratio                               | §24.232(d)                | Limit $\leq 13$ dB             | PASS   |
| Bandwidth                                        | §2.1049                   | OBW: No limit<br>EBW: No limit | PASS   |
| Band Edges Compliance                            | §2.1051,<br>§24.238(a)(b) | Refer to section 2.6           | PASS   |
| Spurious Emission at Antenna Terminals           | §2.1051,<br>§24.238(a)(b) | $\leq -13$ dBm/1MHz            | PASS   |
| Field Strength of Spurious Radiation             | §2.1053,<br>§24.238(a)    | $\leq -13$ dBm/1MHz            | PASS   |
| Frequency Stability                              | §2.1055,<br>§24.235       | No limit                       | N/A    |

| B5                                               |                           |                                |        |
|--------------------------------------------------|---------------------------|--------------------------------|--------|
| Item                                             | FCC Rule No.              | Requirements                   | Result |
| Effective (Isotropic) Radiated Power Output Data | §2.1046,<br>§22.913(a)(5) | ERP $\leq 7$ W                 | PASS   |
| Peak-Average Ratio                               | N/A                       | N/A                            | N/A    |
| Bandwidth                                        | §2.1049                   | OBW: No limit<br>EBW: No limit | PASS   |
| Band Edges Compliance                            | §2.1051,<br>§22.917(a)(b) | Refer to section 2.6           | PASS   |
| Spurious Emission at Antenna Terminals           | §2.1051,<br>§22.917(a)    | $\leq -13$ dBm/1MHz            | PASS   |
| Field Strength of Spurious Radiation             | §2.1053,<br>§22.355       | $\leq -13$ dBm/1MHz            | PASS   |
| Frequency Stability                              | §2.1055,<br>§22.355       | $\leq \pm 2.5$ ppm             | PASS   |

| B7                                               |                          |                                |        |
|--------------------------------------------------|--------------------------|--------------------------------|--------|
| Item                                             | FCC Rule No.             | Requirements                   | Result |
| Effective (Isotropic) Radiated Power Output Data | §2.1046,<br>§27.50(h)(2) | EIRP ≤2W                       | PASS   |
| Peak-Average Ratio                               | N/A                      | N/A                            | N/A    |
| Bandwidth                                        | §2.1049                  | OBW: No limit<br>EBW: No limit | PASS   |
| Band Edges Compliance                            | §2.1051,<br>§27.53(m)(4) | Refer to section 2.6           | PASS   |
| Spurious Emission at Antenna Terminals           | §2.1051,<br>§27.53(m)(4) | ≤ -25 dBm/1MHz                 | PASS   |
| Field Strength of Spurious Radiation             | §2.1053,<br>§27.53(m)(4) | ≤ -25 dBm/1MHz                 | PASS   |
| Frequency Stability                              | §2.1055,<br>§27.54       | No limit                       | N/A    |

### 3. MEASUREMENT INSTRUMENTS LIST

| Item | Test Equipment                      | Manufacturer | Model No.      | Serial No.   | Cal. Date  | Cal. Until |
|------|-------------------------------------|--------------|----------------|--------------|------------|------------|
| 1    | Loop Antenna                        | Schwarzbeck  | FMZB 1519      | 1519-025     | 01/18/2026 | 01/17/2028 |
| 2    | Power Amplifier                     | HZEMC        | HPA-9K0133     | HYP A23029   | 01/20/2026 | 01/19/2027 |
| 3    | Broadband Antenna                   | Schwarzbeck  | VULB 9168      | 01763        | 01/29/2026 | 01/28/2028 |
| 4    | Attenuator                          | PRM          | ATT50-6-3      | ATT50-6-3    | 01/20/2026 | 01/19/2027 |
| 5    | Spectrum Analyzer                   | R&S          | FSV40-N        | 101365       | 01/20/2026 | 01/19/2027 |
| 6    | Horn Antenna                        | Schwarzbeck  | BBHA 9120 D    | 02786        | 02/19/2026 | 02/18/2028 |
| 7    | Horn Antenna                        | KMW          | ZLB7-18-40G-77 | 072410839    | 02/19/2026 | 02/18/2028 |
| 8    | Power Amplifier                     | HZEMC        | PA0118-43      | HYP A23030   | 01/20/2026 | 01/19/2027 |
| 9    | Power Amplifier                     | HZEMC        | PA01840-45     | HYP A23031   | 01/20/2026 | 01/19/2027 |
| 10   | EMI Test Receiver                   | R&S          | ESCI           | 101196       | 01/20/2026 | 01/19/2027 |
| 11   | LISN                                | R&S          | ENV216         | 102374       | 01/20/2026 | 01/19/2027 |
| 12   | Pulse Limiter                       | Schwarzbeck  | ESH3-Z2        | 0357.8810.54 | 01/20/2026 | 01/19/2027 |
| 13   | MXA Signal Analyzer                 | Keysight     | N9020A         | MY52091389   | 01/20/2026 | 01/19/2027 |
| 14   | Power Sensor                        | Agilent      | U2021XA        | MY54110007   | 01/20/2026 | 01/19/2027 |
| 15   | Power Sensor                        | Agilent      | U2021XA        | MY54110009   | 01/20/2026 | 01/19/2027 |
| 16   | MXG Vector Signal Generator         | Agilent      | N5182A         | MY47070153   | 01/20/2026 | 01/19/2027 |
| 17   | Analog Signal Source                | Keysight     | N5173B         | MY60403029   | 01/20/2026 | 01/19/2027 |
| 18   | Vector Signal Generator             | R&S          | SMCV100B       | 106103       | 01/20/2026 | 01/19/2027 |
| 19   | WIDEBAND RADIO COMMUNICATION TESTER | R&S          | CMW500         | 118780       | 01/20/2026 | 01/19/2027 |
| 20   | DC POWER SUPPLY                     | MAISHENG     | MT-305DS       | 2021040016   | 02/28/2026 | 02/27/2027 |
| 21   | Const Temp. & Humidity Chamber      | GRT          | GR-HWX-150L    | GR25010601   | 01/20/2026 | 01/19/2027 |

| Test Software                               |          |          |
|---------------------------------------------|----------|----------|
| Software name                               | Model    | Version  |
| Radiated Emission Measurement Software      | FASLAB   | V4.1     |
| RF Conducted Measurement Software(2G/3G/4G) | MTS 8200 | V2.0.0.0 |

## 4. CONDUCTED OUTPUT POWER AND MAXIMUM ERP/EIRP

### 4.1. LIMIT

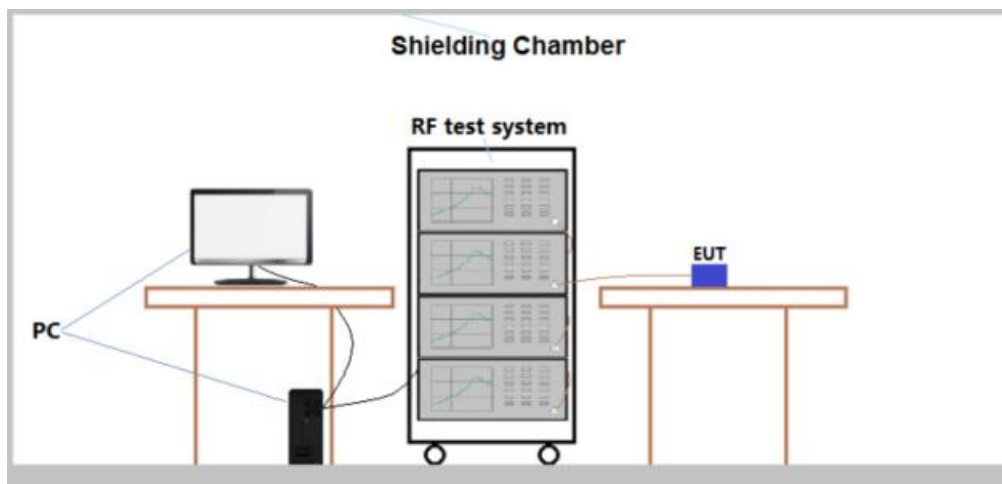
According to FCC section 2.1046(a), for transmitters other than single sideband, independent sideband and controlled carrier radiotelephone, power output shall be measured at the RF output terminals when the transmitter is adjusted in accordance with the tune-up procedure to give the values of current and voltage on the circuit elements specified in FCC section 2.1033(c)(8).

According to FCC section 24.232 (c) for LTE Band 2, Mobile and portable stations are limited to 2 watts E.I.R.P. and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to FCC section 22.913 (a)(2) for LTE Band 5, the E.R.P. of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.

According to FCC section 27.50 (h)(2) for LTE Band 7, Mobile and other user stations. Mobile stations are limited to 2 watts E.I.R.P. All user stations are limited to 2 watts transmitter output power.

### 4.2. TEST SETUP



### 4.3. TEST PROCEDURE

#### For Conducted Output Power Measurement:

Refer to KDB 971168 D01v03r01 & ANSI C63.26-2015 for test method.

The EUT was set up for the maximum power with LTE and link up with simulator (CMW500). Set the EUT to transmit under low, middle and high channel and record the power level.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

#### For ERP/EIRP:

According to KDB 412172 D01 Power Approach,

- $ERP \text{ or } EIRP = PT + GT - LC$
- $ERP = EIRP - 2.15$

where

- PT = transmitter output power, expressed in dBW, dBm, or PSD;
- GT = gain of the transmitting antenna, in dBd (ERP) or dBi (EIRP);
- LC = signal attenuation in the connecting cable between the transmitter and antenna, in dB.

#### 4.4. TEST RESULT

**Pass.**

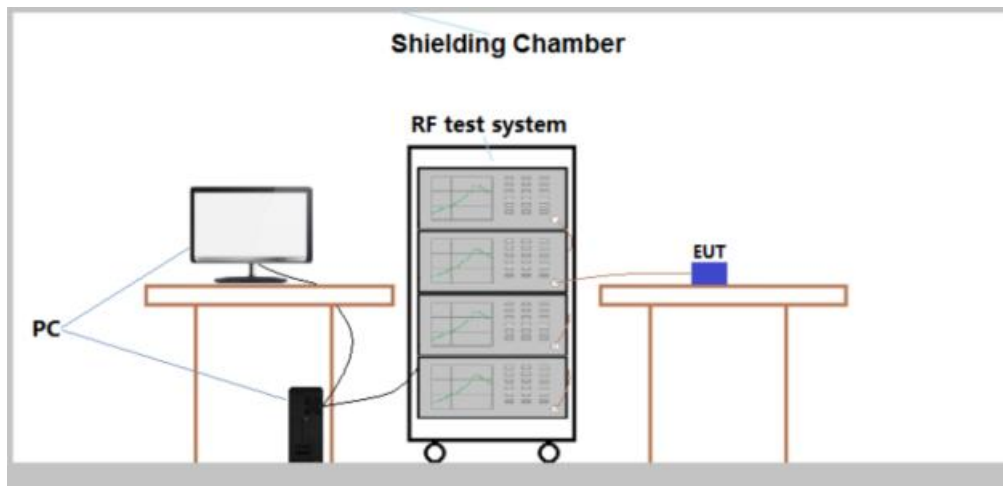
Please refer to the Appendix E for LTE Test Data.

## 5. PEAK-AVERAGE RATIO

### 5.1. LIMIT

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.

### 5.2. TEST SETUP



### 5.3. TEST PROCEDURE

Refer to KDB 971168 D01v03r01 Section 5.7 for test method.

The transmitter output was connected to the RF test system.

- Set resolution/measurement bandwidth  $\geq$  signal's occupied bandwidth
- Set the number of counts to a value that stabilizes the measured CCDF curve
- Record the maximum PAPR level associated with a probability of 0.1 %

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

### 5.4. TEST RESULT

**Pass.**

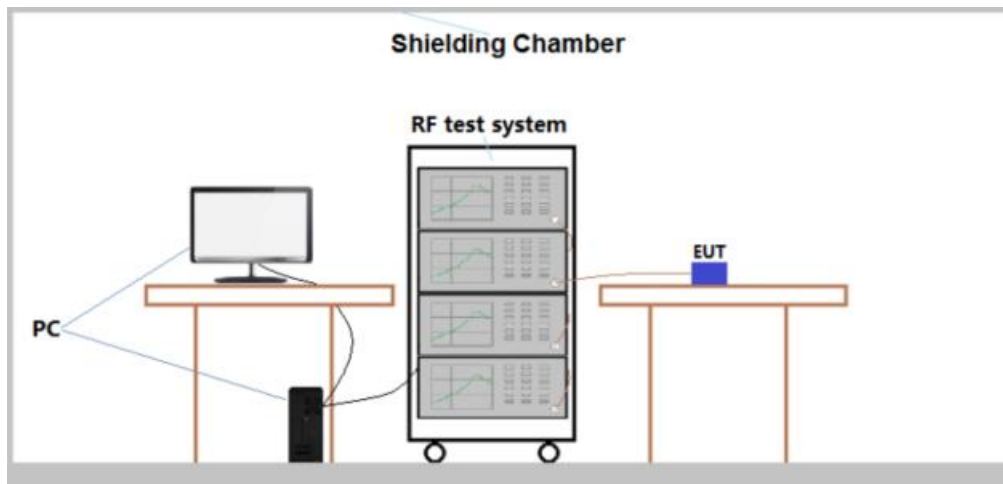
Please refer to the Appendix E for LTE Test Data.

## 6. 26DB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

### 6.1. LIMIT

No Limit, for reporting purposes only.

### 6.2. TEST SETUP



### 6.3. TEST PROCEDURE

Refer to ANSI C63.26-2015 & KDB 971168 D01v03r01 Section 4 for test method.

The transmitter output was connected to the RF test system. The occupied bandwidth was measured with the spectrum analyzer at the low, middle and high channel in each band. The 99% and -26dB bandwidths was also measured and recorded.

### 6.4. TEST RESULT

**Pass.**

Please refer to the Appendix E for LTE Test Data.

## 7. BAND EDGE AT ANTENNA TERMINALS

### 7.1. LIMIT

#### Band 2

According to FCC section 24.238(a), for operations in the 1850–1910MHz bands, 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  $43 + 10 \log(P)$  dBm a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

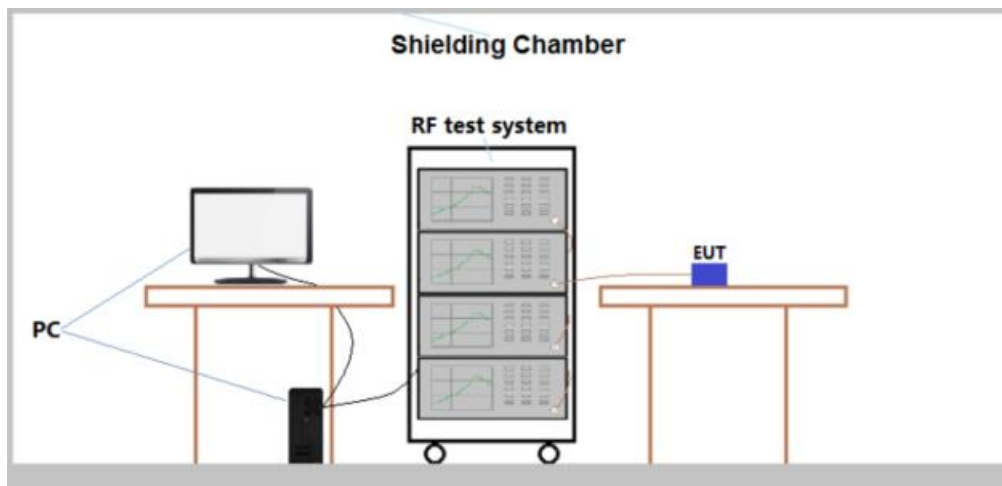
#### Band 5

According to FCC section 22.917(a), for operations in the 824–849MHz bands, 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  $43 + 10 \log(P)$  dBm a 100kHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

#### Band 7

According to FCC section 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 that  $43 + 10 \log(P)$  dB on all frequencies between 2490.5 MHz and 2496 MHz and  $55 + 10 \log(P)$  dB at or below 2490.5 MHz Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

### 7.2. TEST SETUP



### 7.3. TEST PROCEDURE

Refer to ANSI C63.26-2015 & KDB 971168 D01v03r01 for test method.

The transmitter output was connected to the RF test system.

For each band edge measurement:

- 1) Set the spectrum analyzer span to include the block edge frequency.
- 2) Set a marker to point the corresponding band edge frequency in each test case.
- 3) Set display line at -13 dBm
- 4) Set resolution bandwidth to at least 1% of emission bandwidth.

- 5) Set spectrum analyzer with RMS detector.
- 6) Record the max trace plot into the test report

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

#### 7.4. TEST RESULT

**Pass.**

Please refer to the Appendix E for LTE Test Data.

## 8. SPURIOUS EMISSIONS AT ANTENNA TERMINALS

### 8.1. LIMIT

According to FCC section 2.1051, 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. This calculated to be -13dBm.

Additional requirement for LTE Band 2:

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. This calculated to be -13dBm.

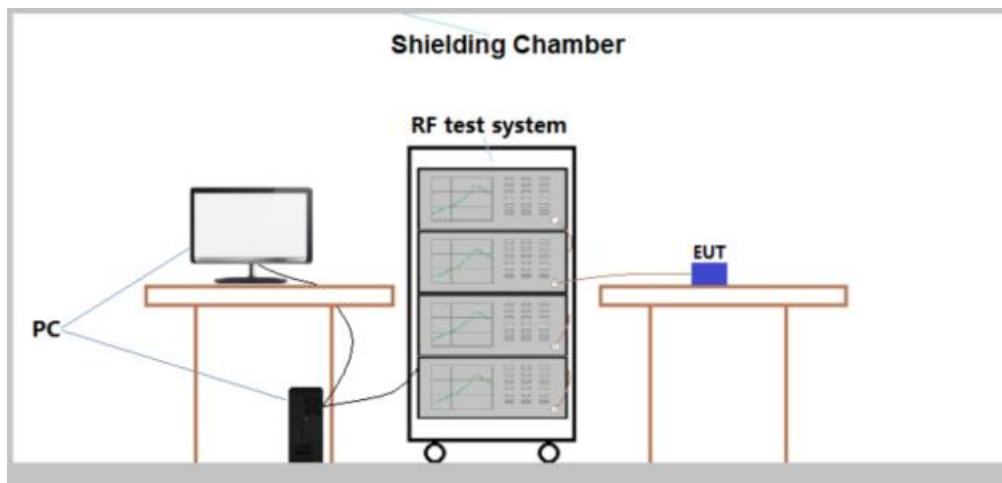
Additional requirement for LTE Band 5:

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. This calculated to be -13dBm.

Additional requirement for LTE Band 7:

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  $55 + 10 \log(P)$  dB. This calculated to be -25dBm.

### 8.2. TEST SETUP



### 8.3. TEST PROCEDURE

Refer to ANSI C63.26-2015 & KDB 971168 D01v03r01 for test method.

The EUT was connect to the communication simulator. All measurements were done at low, middle and high operational frequency range. Measuring frequency range is from 30 MHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. Set RBW & VBW to 100 kHz for the measurement below 1 GHz, and 1 MHz for the measurement above 1 GHz.

### 8.4. TEST RESULT

**Pass.**

Please refer to the Appendix E for LTE Test Data.

## 9. FIELD STRENGTH OF SPURIOUS RADIATION

### 9.1. LIMIT

According to FCC section 2.1051, 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. This calculated to be -13dBm.

Additional requirement for LTE Band 2:

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. This calculated to be -13dBm.

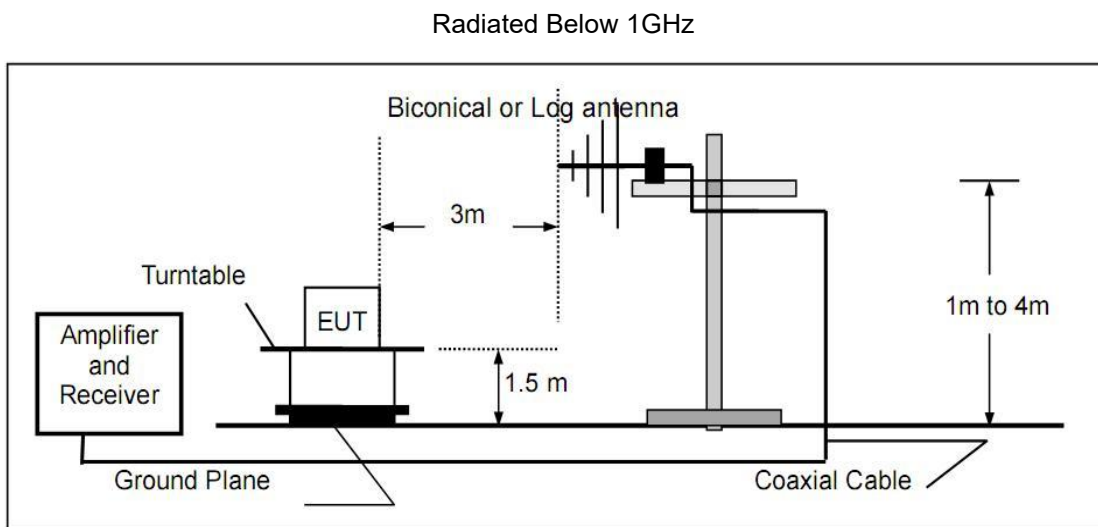
Additional requirement for LTE Band 5:

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. This calculated to be -13dBm.

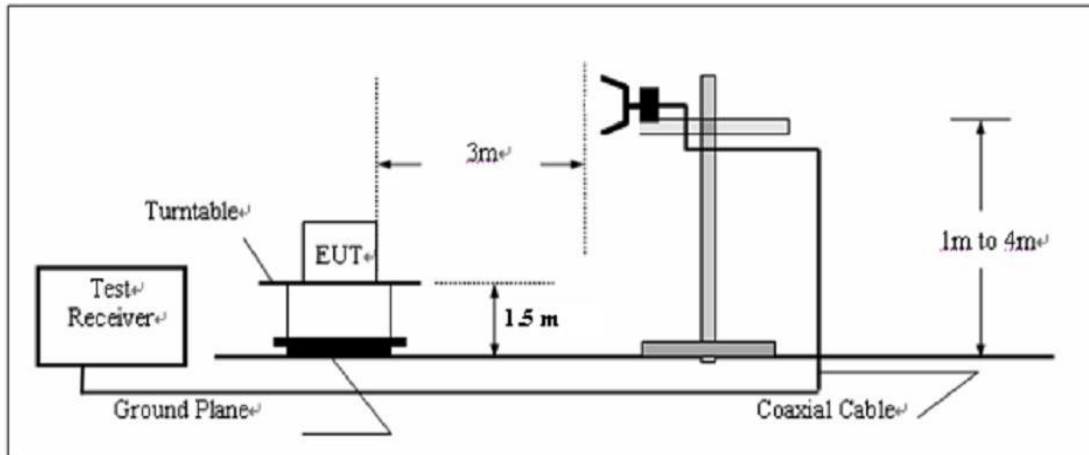
Additional requirement for LTE Band 7:

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  $55 + 10 \log(P)$  dB. This calculated to be -25dBm.

### 9.2. TEST SETUP

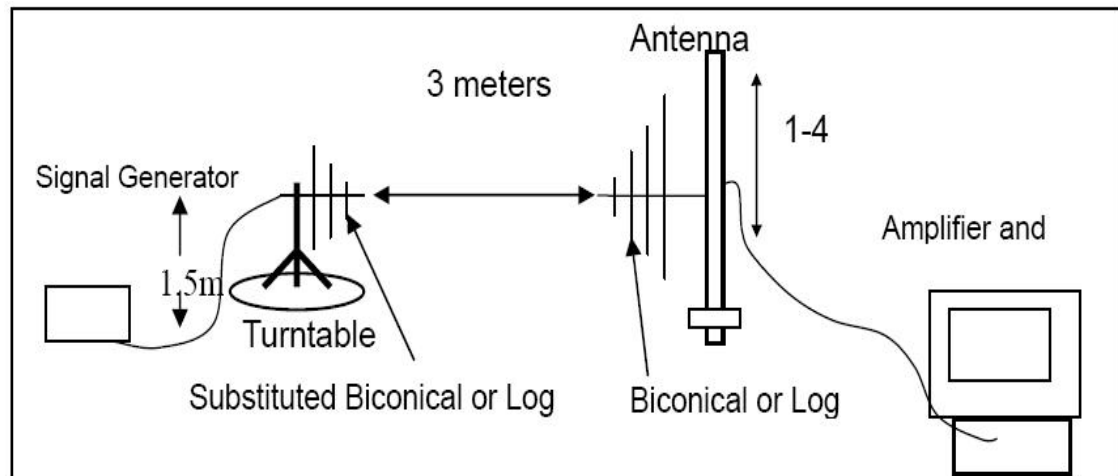


Radiated Above 1GHz

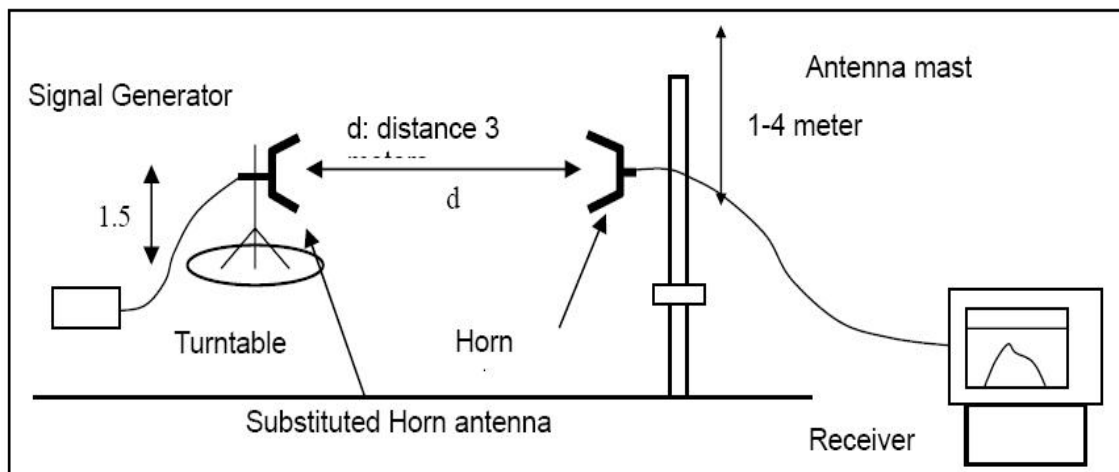


### Substitution Method

Radiated Below 1GHz



Radiated Above 1 GHz



### 9.3. TEST PROCEDURE

Refer to KDB 971168 D01 v03r01 Section 7 for test method.

- (1) EUT was placed on a 1.50 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 1.50m. 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 transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
- (2) A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.
- (3) The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as ( $P_r$ ).
- (4) The EUT shall be replaced by a substitution antenna. 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 ( $P_{Mea}$ ) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded ( $P_r$ ). The power of signal source ( $P_{Mea}$ ) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
- (5) An amplifier should be connected to the Signal Source output port. And the cable should be connecting between the Amplifier and the Substitution Antenna. The cable loss ( $P_{cl}$ ), the Substitution Antenna Gain ( $G_a$ ) and the Amplifier Gain ( $P_{Ag}$ ) should be recorded after test.
- (6) The measurement results are obtained as described below:  
$$\text{Power(EIRP)} = P_{Mea} - P_{Ag} - P_{cl} + G_a$$

We used signal generator which signal level can up to 33dBm, so we not used power Amplifier for substitution test; The measurement results are amend as described below:  
$$\text{Power(EIRP)} = P_{Mea} - P_{cl} + G_a$$
- (7) This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.  
ERP can be calculated from EIRP by subtracting the gain of the dipole,  $ERP = EIRP - 2.15\text{dBi}$ .
- (8) Test frequency range should extend to 10th harmonic of highest fundamental frequency.

### 9.4. TEST RESULT

**Pass.**

Remark:

- a) By preliminary testing and verifying three axis (X, Y and Z) position of EUT transmitted status, it was found that "Y axis" position was the worst, and test data recorded in this report.
- b) Pre-scan all modes and recorded the worst case in this report.
- c) Radiated spurious emission test from 9KHz to 10th harmonic of fundamental was verified, and the emission levels from 9kHz to 30MHz are attenuated 20dB below the limit and not recorded in report.

The measurement data as follows:

| LTE Band2_1.4M_Low Channel |                |                  |               |                |                |                |      |      |
|----------------------------|----------------|------------------|---------------|----------------|----------------|----------------|------|------|
| No.                        | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                          | 195.87         | -64.49           | 2.69          | -61.8          | -13            | -48.8          | PK+  | H    |
| 2                          | 468.16         | -71.97           | 8.65          | -63.32         | -13            | -50.32         | PK+  | H    |
| 3                          | 993.39         | -73.16           | 14.42         | -58.74         | -13            | -45.74         | PK+  | H    |
| 4                          | 3710.2         | -50.99           | -4.67         | -55.66         | -13            | -42.66         | PK+  | H    |
| 5                          | 9189.4         | -55.64           | 10.91         | -44.73         | -13            | -31.73         | PK+  | H    |
| 6                          | 17784.6        | -67.59           | 21.51         | -46.08         | -13            | -33.08         | PK+  | H    |
| No.                        | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                          | 195.17         | -67.01           | 2.8           | -64.21         | -13            | -51.21         | PK+  | V    |
| 2                          | 467.03         | -73.03           | 8.16          | -64.87         | -13            | -51.87         | PK+  | V    |
| 3                          | 910.65         | -70.31           | 16.43         | -53.88         | -13            | -40.88         | PK+  | V    |
| 4                          | 5114.4         | -52.18           | 1.19          | -50.99         | -13            | -37.99         | PK+  | V    |
| 5                          | 11016.2        | -62.94           | 13.28         | -49.66         | -13            | -36.66         | PK+  | V    |
| 6                          | 17782.9        | -61.07           | 20.15         | -40.92         | -13            | -27.92         | PK+  | V    |

| LTE Band2_1.4M_Middle Channel |                |                  |               |                |                |                |      |      |
|-------------------------------|----------------|------------------|---------------|----------------|----------------|----------------|------|------|
| No.                           | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                             | 188.73         | -65.44           | 3.12          | -62.32         | -13            | -49.32         | PK+  | H    |
| 2                             | 581.93         | -66.91           | 6.72          | -60.19         | -13            | -47.19         | PK+  | H    |
| 3                             | 1014.06        | -69.8            | 15.66         | -54.14         | -13            | -41.14         | PK+  | H    |
| 4                             | 4000.9         | -53.99           | -0.7          | -54.69         | -13            | -41.69         | PK+  | H    |
| 5                             | 9352.5         | -60.42           | 11.07         | -49.35         | -13            | -36.35         | PK+  | H    |
| 6                             | 17940.9        | -70.52           | 22.04         | -48.48         | -13            | -35.48         | PK+  | H    |
| No.                           | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                             | 467.93         | -70.99           | 7.52          | -63.47         | -13            | -50.47         | PK+  | V    |
| 2                             | 1068.46        | -72.22           | 14.05         | -58.17         | -13            | -45.17         | PK+  | V    |
| 3                             | 2909.4         | -55.76           | 4.84          | -50.92         | -13            | -37.92         | PK+  | V    |
| 4                             | 5118.2         | -51.79           | 3.21          | -48.58         | -13            | -35.58         | PK+  | V    |
| 5                             | 11255.2        | -62.75           | 11.18         | -51.57         | -13            | -38.57         | PK+  | V    |
| 6                             | 17894.7        | -60.18           | 21.59         | -38.59         | -13            | -25.59         | PK+  | V    |

| LTE Band2_1.4M_High Channel |                |                  |               |                |                |                |      |      |
|-----------------------------|----------------|------------------|---------------|----------------|----------------|----------------|------|------|
| No.                         | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                           | 147.58         | -68.71           | 0.83          | -67.88         | -13            | -54.88         | PK+  | H    |
| 2                           | 517.73         | -72.9            | 8.06          | -64.84         | -13            | -51.84         | PK+  | H    |
| 3                           | 968.59         | -70.88           | 14.92         | -55.96         | -13            | -42.96         | PK+  | H    |
| 4                           | 3818.2         | -56.6            | -3.39         | -59.99         | -13            | -46.99         | PK+  | H    |
| 5                           | 7398.3         | -56.97           | 8.23          | -48.74         | -13            | -35.74         | PK+  | H    |
| 6                           | 17802.4        | -60.47           | 22.16         | -38.31         | -13            | -25.31         | PK+  | H    |
| No.                         | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                           | 229.9          | -72.11           | 0.22          | -71.89         | -13            | -58.89         | PK+  | V    |
| 2                           | 441.87         | -62.58           | 9.43          | -53.15         | -13            | -40.15         | PK+  | V    |
| 3                           | 899.35         | -63.83           | 16.36         | -47.47         | -13            | -34.47         | PK+  | V    |
| 4                           | 3783.8         | -52.38           | -1.67         | -54.05         | -13            | -41.05         | PK+  | V    |
| 5                           | 8051.7         | -58.8            | 9.16          | -49.64         | -13            | -36.64         | PK+  | V    |
| 6                           | 17730.7        | -58.33           | 18.91         | -39.42         | -13            | -26.42         | PK+  | V    |

| LTE Band5_1.4M_Low Channel |                |                  |               |                |                |                |      |      |
|----------------------------|----------------|------------------|---------------|----------------|----------------|----------------|------|------|
| No.                        | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                          | 256.05         | -70.06           | 1.12          | -68.94         | -13            | -55.94         | PK+  | H    |
| 2                          | 273.46         | -70.54           | 2.53          | -68.01         | -13            | -55.01         | PK+  | H    |
| 3                          | 907.2          | -64.83           | 13.18         | -51.65         | -13            | -38.65         | PK+  | H    |
| 4                          | 1617.5         | -42.48           | -9.89         | -52.37         | -13            | -39.37         | PK+  | H    |
| 5                          | 3043.8         | -49.85           | 0.49          | -49.36         | -13            | -36.36         | PK+  | H    |
| 6                          | 7491.8         | -62.97           | 5.87          | -57.1          | -13            | -44.1          | PK+  | H    |
| No.                        | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                          | 219.77         | -72.92           | 3.45          | -69.47         | -13            | -56.47         | PK+  | V    |
| 2                          | 374.88         | -71.07           | 4.71          | -66.36         | -13            | -53.36         | PK+  | V    |
| 3                          | 889.5          | -66.79           | 14.26         | -52.53         | -13            | -39.53         | PK+  | V    |
| 4                          | 1688.5         | -43.79           | -10.5         | -54.29         | -13            | -41.29         | PK+  | V    |
| 5                          | 3048.9         | -53.64           | 1.73          | -51.91         | -13            | -38.91         | PK+  | V    |
| 6                          | 7985.4         | -61.07           | 9.32          | -51.75         | -13            | -38.75         | PK+  | V    |

| LTE Band5_1.4M_Middle Channel |                |                  |               |                |                |                |      |      |
|-------------------------------|----------------|------------------|---------------|----------------|----------------|----------------|------|------|
| No.                           | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                             | 229.08         | -67.48           | 2.12          | -65.36         | -13            | -52.36         | PK+  | H    |
| 2                             | 623.69         | -68.84           | 9.39          | -59.45         | -13            | -46.45         | PK+  | H    |
| 3                             | 1714.1         | -37.49           | -12.03        | -49.52         | -13            | -36.52         | PK+  | H    |
| 4                             | 3041.3         | -51.01           | -1.01         | -52.02         | -13            | -39.02         | PK+  | H    |
| 5                             | 5068.2         | -57.49           | 3.91          | -53.58         | -13            | -40.58         | PK+  | H    |
| 6                             | 8833.2         | -59.77           | 9.96          | -49.81         | -13            | -36.81         | PK+  | H    |
| No.                           | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                             | 222.53         | -63.48           | 2.22          | -61.26         | -13            | -48.26         | PK+  | V    |
| 2                             | 451.04         | -68.34           | 4.8           | -63.54         | -13            | -50.54         | PK+  | V    |
| 3                             | 929.36         | -68.37           | 14.93         | -53.44         | -13            | -40.44         | PK+  | V    |
| 4                             | 1649.8         | -43.1            | -11.91        | -55.01         | -13            | -42.01         | PK+  | V    |
| 5                             | 2984           | -57.44           | 2.64          | -54.8          | -13            | -41.8          | PK+  | V    |
| 6                             | 8971.7         | -62.31           | 9.17          | -53.14         | -13            | -40.14         | PK+  | V    |

| LTE Band5_1.4M_High Channel |                |                  |               |                |                |                |      |      |
|-----------------------------|----------------|------------------|---------------|----------------|----------------|----------------|------|------|
| No.                         | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                           | 213.76         | -69.87           | 3.41          | -66.46         | -13            | -53.46         | PK+  | H    |
| 2                           | 674.74         | -69.86           | 8.53          | -61.33         | -13            | -48.33         | PK+  | H    |
| 3                           | 1724           | -41.67           | -9.28         | -50.95         | -13            | -37.95         | PK+  | H    |
| 4                           | 2959.2         | -52.77           | -0.25         | -53.02         | -13            | -40.02         | PK+  | H    |
| 5                           | 5449.2         | -55.08           | 1.59          | -53.49         | -13            | -40.49         | PK+  | H    |
| 6                           | 8531.6         | -54.46           | 8.8           | -45.66         | -13            | -32.66         | PK+  | H    |
| No.                         | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                           | 247.13         | -73.14           | 1.6           | -71.54         | -13            | -58.54         | PK+  | V    |
| 2                           | 525.18         | -67.69           | 5.53          | -62.16         | -13            | -49.16         | PK+  | V    |
| 3                           | 1289.3         | -54.19           | -11.07        | -65.26         | -13            | -52.26         | PK+  | V    |
| 4                           | 3050.3         | -56.83           | 0.61          | -56.22         | -13            | -43.22         | PK+  | V    |
| 5                           | 5079.8         | -53.37           | 2.99          | -50.38         | -13            | -37.38         | PK+  | V    |
| 6                           | 8780.1         | -55.74           | 7.04          | -48.7          | -13            | -35.7          | PK+  | V    |

| LTE Band7_5M_Low Channel |                |                  |               |                |                |                |      |      |
|--------------------------|----------------|------------------|---------------|----------------|----------------|----------------|------|------|
| No.                      | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                        | 215.31         | -63.82           | 2.93          | -60.89         | -25            | -35.89         | PK+  | H    |
| 2                        | 536.71         | -71.67           | 11.27         | -60.4          | -25            | -35.4          | PK+  | H    |
| 3                        | 1395.6         | -56.38           | 3.12          | -53.26         | -25            | -28.26         | PK+  | H    |
| 4                        | 4992.3         | -59              | 1.49          | -57.51         | -25            | -32.51         | PK+  | H    |
| 5                        | 11150.4        | -57.54           | 14.74         | -42.8          | -25            | -17.8          | PK+  | H    |
| 6                        | 17975.1        | -62.16           | 21.92         | -40.24         | -25            | -15.24         | PK+  | H    |
| No.                      | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                        | 475.58         | -72.25           | 6.41          | -65.84         | -25            | -40.84         | PK+  | V    |
| 2                        | 953.4          | -67.08           | 17.45         | -49.63         | -25            | -24.63         | PK+  | V    |
| 3                        | 1898.3         | -60.47           | 4.25          | -56.22         | -25            | -31.22         | PK+  | V    |
| 4                        | 5002.6         | -56.4            | 3.34          | -53.06         | -25            | -28.06         | PK+  | V    |
| 5                        | 8687.9         | -60.08           | 6.91          | -53.17         | -25            | -28.17         | PK+  | V    |
| 6                        | 17892.1        | -59.89           | 20.95         | -38.94         | -25            | -13.94         | PK+  | V    |

| LTE Band7_5M_Middle Channel |                |                  |               |                |                |                |      |      |
|-----------------------------|----------------|------------------|---------------|----------------|----------------|----------------|------|------|
| No.                         | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                           | 177.43         | -64.91           | 0.8           | -64.11         | -25            | -39.11         | PK+  | H    |
| 2                           | 565.8          | -71.85           | 10.72         | -61.13         | -25            | -36.13         | PK+  | H    |
| 3                           | 1272.9         | -62.4            | 1.61          | -60.79         | -25            | -35.79         | PK+  | H    |
| 4                           | 5285.2         | -53.52           | 0.87          | -52.65         | -25            | -27.65         | PK+  | H    |
| 5                           | 11270.2        | -58.93           | 14.67         | -44.26         | -25            | -19.26         | PK+  | H    |
| 6                           | 17894.1        | -68.08           | 20.38         | -47.7          | -25            | -22.7          | PK+  | H    |
| No.                         | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                           | 206.85         | -65.84           | 3.5           | -62.34         | -25            | -37.34         | PK+  | V    |
| 2                           | 461.17         | -71.15           | 5.7           | -65.45         | -25            | -40.45         | PK+  | V    |
| 3                           | 1442.1         | -57.75           | 2.96          | -54.79         | -25            | -29.79         | PK+  | V    |
| 4                           | 4690.8         | -56.27           | -1.34         | -57.61         | -25            | -32.61         | PK+  | V    |
| 5                           | 8825.7         | -62.17           | 9.54          | -52.63         | -25            | -27.63         | PK+  | V    |
| 6                           | 17823          | -62.39           | 20.95         | -41.44         | -25            | -16.44         | PK+  | V    |

| LTE Band7_5M_High Channel |                |                  |               |                |                |                |      |      |
|---------------------------|----------------|------------------|---------------|----------------|----------------|----------------|------|------|
| No.                       | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                         | 499.7          | -69.58           | 6.97          | -62.61         | -25            | -37.61         | PK+  | H    |
| 2                         | 943.41         | -70.53           | 14.5          | -56.03         | -25            | -31.03         | PK+  | H    |
| 3                         | 1809.4         | -58.24           | 5.04          | -53.2          | -25            | -28.2          | PK+  | H    |
| 4                         | 5301.3         | -56.78           | 2.3           | -54.48         | -25            | -29.48         | PK+  | H    |
| 5                         | 10163.9        | -62.28           | 12.34         | -49.94         | -25            | -24.94         | PK+  | H    |
| 6                         | 17682.9        | -67.34           | 21.01         | -46.33         | -25            | -21.33         | PK+  | H    |
| No.                       | Freq.<br>(MHz) | Reading<br>(dBm) | Corr.<br>(dB) | Meas.<br>(dBm) | Limit<br>(dBm) | Margin<br>(dB) | Det. | Pol. |
| 1                         | 487.5          | -71.76           | 7.55          | -64.21         | -25            | -39.21         | PK+  | V    |
| 2                         | 924.96         | -68.38           | 15.05         | -53.33         | -25            | -28.33         | PK+  | V    |
| 3                         | 2181.3         | -57.29           | 5.56          | -51.73         | -25            | -26.73         | PK+  | V    |
| 4                         | 5330.7         | -53.71           | 0.39          | -53.32         | -25            | -28.32         | PK+  | V    |
| 5                         | 11035.5        | -64.33           | 12.44         | -51.89         | -25            | -26.89         | PK+  | V    |
| 6                         | 17814.5        | -66.52           | 21.83         | -44.69         | -25            | -19.69         | PK+  | V    |

## 10. FREQUENCY STABILITY

### 10.1. LIMIT

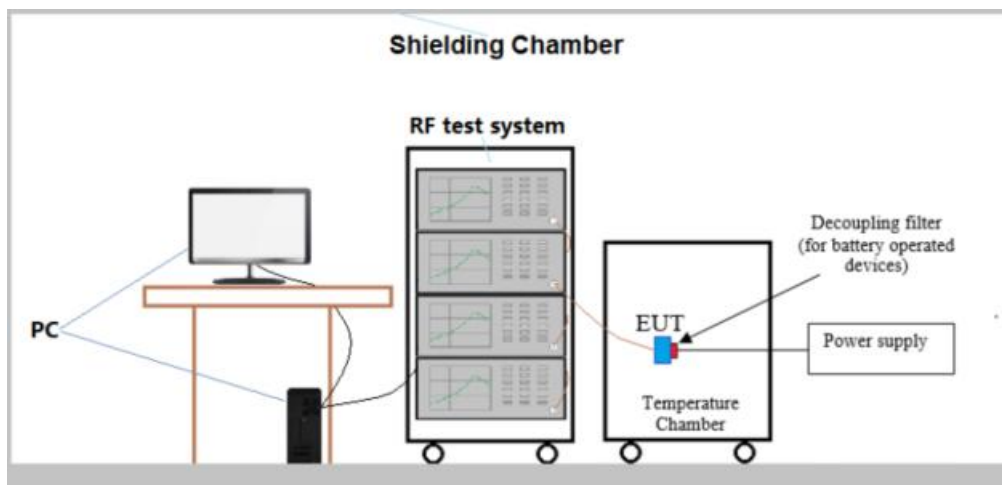
#### FCC 47 CFR Part 22.355,

The carrier frequency shall not depart from the reference frequency in excess of  $\pm 2.5$  ppm for mobile stations.

#### FCC 47 CFR Part 24.235, FCC 47 CFR Part 27.54

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

### 10.2. TEST SETUP



### 10.3. TEST PROCEDURE

Refer to ANSI C63.26-2015 & KDB 971168 D01v03r01 for test method.

1) The transmitter output was connected to the RF test system.

a) Temp. =  $-30^{\circ}$  to  $+50^{\circ}\text{C}$

b) Voltage = low voltage, Normal voltage and High voltage.

2) Frequency Stability vs Temperature:

The EUT is placed inside a temperature chamber. The temperature is set to  $20^{\circ}\text{C}$  and allowed to stabilize. After sufficient soak time, the transmitting frequency error is measured. The temperature is increased by 10 degrees, allowed to stabilize and soak, and then the measurement is repeated. This is repeated until  $+50^{\circ}\text{C}$  is reached.

3) Frequency Stability vs Voltage:

The peak frequency error is recorded (worst-case).

### 10.4. TEST RESULT

**Pass.**

Please refer to the Appendix E for LTE Test Data.

## 11. PHOTOGRAPHS OF TEST SETUP

Please refer to Appendix A for Test Setup Photos of the EUT.

## 12. PHOTOGRAPHS OF THE EUT

Please refer to Appendix B for External Photos of the EUT.

\*\*\*\*\*THE END\*\*\*\*\*