

# FCC RF Test Report

## (LTE)

**Applicant:** SHENZHEN TRANSHAN TECHNOLOGY LIMITED

**Address of Applicant:** Room 03, 23/F, Unit B Building, No 9, Shenzhen Bay Eco - Technology Park, Yuehai Street, Nanshan District, Shenzhen, China

**Equipment Under Test (EUT)**

Product Name: Mobile Phone

Model No.: M9010

Trade Mark: VIMOQ

**FCC ID:** 2A5RQ-M9010

**Applicable Standards:** FCC CFR Title 47 Part 2, 22H, 24E, 27L & M

**Date of Sample Receipt:** 23 Feb., 2023

**Date of Test:** 24 Feb., to 16 Mar., 2023

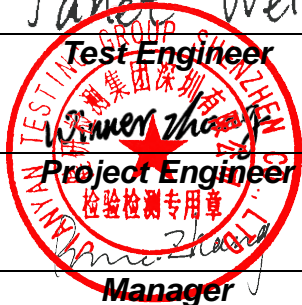
**Date of Report Issued:** 17 Mar., 2023

**Test Result:** PASS

**Tested by:** Janet Wei **Date:** 17 Mar., 2023  
*Test Engineer*

**Reviewed by:** Wenwen Zhang **Date:** 17 Mar., 2023  
*Project Engineer*

**Approved by:** Wenwen Zhang **Date:** 17 Mar., 2023  
*Manager*



This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in above the application standard version. Test results reported herein relate only to the item(s) tested.

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## 1 Version

| Version No. | Date          | Description |
|-------------|---------------|-------------|
| 00          | 17 Mar., 2023 | Original    |
|             |               |             |
|             |               |             |
|             |               |             |
|             |               |             |

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### 3 General Information

#### 3.1 Client Information

|               |   |
|---------------|---|
| Applicant:    | SHENZHEN TRANSCAN TECHNOLOGY LIMITED  |
| Address:      | Room 03, 23/F, Unit B Building, No 9, Shenzhen Bay Eco -Technology Park, Yuehai Street, Nanshan District, Shenzhen, China |
| Manufacturer: | SHENZHEN TRANSCAN TECHNOLOGY LIMITED  |
| Address:      | Room 03, 23/F, Unit B Building, No 9, Shenzhen Bay Eco -Technology Park, Yuehai Street, Nanshan District, Shenzhen, China |
| Factory:      | SHENZHEN TECNO TECHNOLOGY CO., LTD.   |
| Address:      | 101, Building 24, Waijing Industrial Park, Fumin Community, Fucheng Street, Longhua District, Shenzhen City, P.R.China    |

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

|                            |  |   |
|----------------------------|--|---|
| Product Name:              | Mobile Phone   |   |
| Model No.:                 | M9010  |   |
| Operation Frequency Range: | LTE band 2:  | Tx: 1850 MHz - 1910 MHz Rx: 1930 MHz - 1990 MHz |
|                            | LTE band 4:  | Tx: 1710 MHz - 1755 MHz Rx: 2110 MHz - 2155 MHz |
|                            | LTE band 5:  | Tx: 824 MHz - 849 MHz Rx: 869 MHz - 894 MHz     |
|                            | LTE band 7:  | Tx: 2500 MHz - 2570 MHz Rx: 2620 MHz - 2690 MHz |
|                            | LTE band 38:   | Tx: 2570 MHz - 2620 MHz Rx: 2570 MHz - 2620 MHz |
|                            | LTE band 41:   | Tx: 2535 MHz - 2655 MHz Rx: 2535 MHz - 2655 MHz |
|                            | LTE band 66:   | Tx: 1710 MHz - 1780 MHz Rx: 2110 MHz - 2200 MHz |
| Modulation Type:           | <input checked="" type="checkbox"/> QPSK <input checked="" type="checkbox"/> 16QAM <input checked="" type="checkbox"/> 64QAM(only supports downlink) |   |
| Antenna Type:              | Internal Antenna   |   |
| Antenna Gain:              | LTE band 2:  | 0.43 dBi (declare by Applicant)                 |
|                            | LTE band 4:  | 0.40 dBi (declare by Applicant)                 |
|                            | LTE band 5:  | 0.11 dBi (declare by Applicant)                 |
|                            | LTE band 7:  | 0.65 dBi (declare by Applicant)                 |
|                            | LTE band 38:   | 0.65 dBi (declare by Applicant)                 |
|                            | LTE band 41:   | 0.65 dBi (declare by Applicant)                 |
|                            | LTE band 66:   | 0.40 dBi (declare by Applicant)                 |
| Power Supply:              | Rechargeable Li-ion Battery DC3.7V, 1000mAh  |   |
| AC Adapter:                | Model:U050VSA<br>Input: AC100-240V, 50/60Hz, 0.2A<br>Output: DC 5.0V, 1.0A   |   |
| Test Sample Condition:     | The test samples were provided in good working order with no visible defects.  |   |

### 3.3 Test Mode and Environment

| Test Mode:  |   |
|---|---|
| QPSK mode:  | Keep the EUT communication with simulated station in QPSK mode  |
| 16QAM mode:   | Keep the EUT communication with simulated station in 16QAM mode |
| <i>Remark: The EUT has been tested under continuous transmitting mode. Channel Low, Mid and High for each type band with rated data rate were chosen for full testing. The field strength of spurious radiation emission was measured as EUT stand-up position (H mode) and lie down position (E1, E2 mode) for these modes. Just the worst case position (H mode) shown in report.</i> |   |
| Operating Environment:  |   |
| Temperature:  | Normal: 15°C ~ 35°C, Extreme: -30°C ~ +50°C                     |
| Humidity:   | 20 % ~ 75 % RH  |
| Atmospheric Pressure:   | 1008 mbar   |
| Voltage:  | Nominal: 3.70 Vdc, Extreme: Low 3.50 Vdc, High 4.20 Vdc         |

### 3.4 Description of Test Auxiliary Equipment

| Test Equipment    | Manufacturer    | Model No. | Serial No. |
|-------------------|-----------------|-----------|------------|
| Simulated Station | Anritsu         | MT8820C   | 6201026545 |
| Simulated Station | Rohde & Schwarz | CMW500    | 108209     |

### 3.5 Measurement Uncertainty

| Parameter                                  | Expanded Uncertainty<br>(Confidence of 95%(U = 2Uc(y))) |
|--|---|
| Radiated Emission (30MHz ~ 1GHz) (3m SAC)  | 3.8 dB  |
| Radiated Emission (1GHz ~ 18GHz) (3m SAC)  | 3.6 dB  |
| Radiated Emission (18GHz ~ 40GHz) (3m SAC) | 5.34 dB   |

*Note: All the measurement uncertainty value were shown with a coverage k=2 to indicate 95% level of confidence. 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.*

### 3.6 Additions to, Deviations, or Exclusions from the Method

|    |
|----|
| No |
|----|

### 3.7 Laboratory Facility

|  |
|--|
| <p>The test facility is recognized, certified, or accredited by the following organizations:</p> <ul style="list-style-type: none"> <li>● <b>FCC - Designation No.: CN1211</b><br/>JianYan Testing Group Shenzhen Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 727551.</li> <li>● <b>ISED – CAB identifier.: CN0021</b><br/>The 3m Semi-anechoic chamber and 10m Semi-anechoic chamber of JianYan Testing Group Shenzhen Co., Ltd. has been Registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 10106A-1.</li> <li>● <b>CNAS - Registration No.: CNAS L15527</b><br/>JianYan Testing Group Shenzhen Co., Ltd. is accredited to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration laboratories for the competence of testing. The Registration No. is CNAS L15527.</li> <li>● <b>A2LA - Registration No.: 4346.01</b><br/>This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: <a href="https://portal.a2la.org/scopepdf/4346-01.pdf">https://portal.a2la.org/scopepdf/4346-01.pdf</a></li> </ul> |
|--|

### 3.8 Laboratory Location

JianYan Testing Group Shenzhen Co., Ltd.  
 Address: No.101, Building 8, Innovation Wisdom Port, No.155 Hongtian Road, Huangpu Community, Xinqiao Street, Bao'an District, Shenzhen, Guangdong, People's Republic of China.  
 Tel: +86-755-23118282, Fax: +86-755-23116366  
 Email: info-JYTee@lets.com, Website: <http://jyt.lets.com>

### 3.9 Test Instruments List

| Radiated Emission(3m SAC):    |                 |                 |                  |                      |                          |
|-------------------------------|-----------------|-----------------|------------------|----------------------|--------------------------|
| Test Equipment                | Manufacturer    | Model No.       | Manage No.       | Cal. Date (mm-dd-yy) | Cal. Due date (mm-dd-yy) |
| 3m SAC                        | ETS             | 9m*6m*6m        | WXJ001-1         | 04-14-2021           | 04-13-2024               |
| Loop Antenna                  | Schwarzbeck     | FMZB 1519 B     | WXJ002-4         | 02-09-2023           | 02-08-2024               |
| BiConiLog Antenna             | Schwarzbeck     | VULB9163        | WXJ002           | 02-09-2023           | 02-08-2024               |
| Biconical Antenna             | Schwarzbeck     | VUBA9117        | WXJ002-1         | 07-02-2021           | 07-01-2024               |
| Horn Antenna                  | Schwarzbeck     | BBHA9120D       | WXJ002-2         | 02-09-2023           | 02-08-2024               |
| Horn Antenna                  | Schwarzbeck     | BBHA9120D       | WXJ002-3         | 04-07-2022           | 04-06-2023               |
| Horn Antenna                  | Schwarzbeck     | BBHA9170        | WXJ002-5         | 04-07-2022           | 04-06-2023               |
| Horn Antenna                  | Schwarzbeck     | BBHA9170        | WXJ002-6         | 04-07-2022           | 04-06-2023               |
| Pre-amplifier (30MHz ~ 1GHz)  | Schwarzbeck     | BBV9743B        | WXJ001-2         | 01-10-2023           | 01-09-2024               |
| Pre-amplifier (1GHz ~ 18GHz)  | SKET            | LNPA_0118G-50   | WXJ001-3         | 01-10-2023           | 01-09-2024               |
| Pre-amplifier (18GHz ~ 40GHz) | RF System       | TRLA-180400G45B | WXJ002-7         | 03-30-2022           | 03-29-2023               |
| EMI Test Receiver             | Rohde & Schwarz | ESRP7           | WXJ003-1         | 01-11-2023           | 01-10-2024               |
| Spectrum Analyzer             | Rohde & Schwarz | FSP 30          | WXJ004           | 01-10-2023           | 01-09-2024               |
| Spectrum Analyzer             | KEYSIGHT        | N9010B          | WXJ004-2         | 10-17-2022           | 10-16-2023               |
| Coaxial Cable (30MHz ~ 1GHz)  | JYTSZ           | JYT3M-1G-NN-8M  | WXG001-4         | 01-18-2023           | 01-17-2024               |
| Coaxial Cable (1GHz ~ 18GHz)  | JYTSZ           | JYT3M-18G-NN-8M | WXG001-5         | 01-18-2023           | 01-17-2024               |
| Coaxial Cable (18GHz ~ 40GHz) | JYTSZ           | JYT3M-40G-SS-8M | WXG001-7         | 01-18-2023           | 01-17-2024               |
| Band Reject Filter Group      | Tonscend        | JS0806-F        | WXJ089           | N/A                  |                          |
| Test Software                 | Tonscend        | TS+             | Version: 3.0.0.1 |                      |                          |

| Conducted Method:            |                 |           |                     |                      |                          |
|------------------------------|-----------------|-----------|---------------------|----------------------|--------------------------|
| Test Equipment               | Manufacturer    | Model No. | Manage No.          | Cal. Date (mm-dd-yy) | Cal. Due date (mm-dd-yy) |
| Spectrum Analyzer            | Keysight        | N9020B    | WXJ081-1            | 06-29-2022           | 06-28-2023               |
| Simulated Station            | Rohde & Schwarz | CMW500    | WXJ081              | 06-29-2022           | 06-28-2023               |
| Temperature Humidity Chamber | ZHONG ZHI       | CZ-A-80D  | WXJ032-3            | 03-19-2021           | 03-18-2023               |
| DC Power Supply              | Keysight        | E3642A    | WXJ025-2            | N/A                  |                          |
| RF Control Unit              | Tonscend        | JS0806-1  | WXG010              | N/A                  |                          |
| Band Reject Filter Group     | Tonscend        | JS0806-F  | WXG010-1            | N/A                  |                          |
| Test Software                | Tonscend        | TS+       | Version: 2.6.9.0526 |                      |                          |

## 4 Measurement Setup and Procedure

### 4.1 Test Channel

According to ANSI C63.26-2015 chapter 5.1.2.1 Table 2 requirement, select lowest channel, middle channel, and highest channel in the frequency range in which device operates for testing. The detailed frequency points are as follows:

| LTE band 2      |       |                 |                 |       |                 |
|-----------------|-------|-----------------|-----------------|-------|-----------------|
| Channels        |       | Frequency (MHz) | Channels        |       | Frequency (MHz) |
| <b>1.4 MHz</b>  |       |                 | <b>3 MHz</b>    |       |                 |
| Lowest channel  | 18607 | 1850.7          | Lowest channel  | 18915 | 1851.5          |
| Middle channel  | 18900 | 1880.0          | Middle channel  | 18900 | 1880.0          |
| Highest channel | 19193 | 1909.3          | Highest channel | 19185 | 1908.5          |
| <b>5 MHz</b>    |       |                 | <b>10 MHz</b>   |       |                 |
| Lowest channel  | 18625 | 1852.5          | Lowest channel  | 18650 | 1855.0          |
| Middle channel  | 18900 | 1880.0          | Middle channel  | 18900 | 1880.0          |
| Highest channel | 19175 | 1907.5          | Highest channel | 19150 | 1905.0          |
| <b>15 MHz</b>   |       |                 | <b>20 MHz</b>   |       |                 |
| Lowest channel  | 18675 | 1857.5          | Lowest channel  | 18700 | 1860.0          |
| Middle channel  | 18900 | 1880.0          | Middle channel  | 18900 | 1880.0          |
| Highest channel | 19125 | 1902.5          | Highest channel | 19100 | 1900.0          |
| LTE band 5      |       |                 |                 |       |                 |
| Channels        |       | Frequency (MHz) | Channels        |       | Frequency (MHz) |
| <b>1.4 MHz</b>  |       |                 | <b>3 MHz</b>    |       |                 |
| Lowest channel  | 20407 | 824.7           | Lowest channel  | 20415 | 825.5           |
| Middle channel  | 20525 | 836.5           | Middle channel  | 20525 | 836.5           |
| Highest channel | 20643 | 848.3           | Highest channel | 20635 | 847.5           |
| <b>5 MHz</b>    |       |                 | <b>10 MHz</b>   |       |                 |
| Lowest channel  | 20425 | 826.5           | Lowest channel  | 20450 | 829.0           |
| Middle channel  | 20525 | 836.5           | Middle channel  | 20525 | 836.5           |
| Highest channel | 20625 | 846.5           | Highest channel | 20600 | 844.0           |
| LTE band 7      |       |                 |                 |       |                 |
| Channels        |       | Frequency (MHz) | Channels        |       | Frequency (MHz) |
| <b>5 MHz</b>    |       |                 | <b>10 MHz</b>   |       |                 |
| Lowest channel  | 20775 | 2502.5          | Lowest channel  | 20800 | 2505.0          |
| Middle channel  | 21100 | 2535.0          | Middle channel  | 21100 | 2535.0          |
| Highest channel | 21425 | 2567.5          | Highest channel | 21400 | 2565.0          |
| <b>15 MHz</b>   |       |                 | <b>20 MHz</b>   |       |                 |
| Lowest channel  | 20825 | 2507.5          | Lowest channel  | 20850 | 2510.0          |
| Middle channel  | 21100 | 2535.0          | Middle channel  | 21100 | 2535.0          |
| Highest channel | 21375 | 2562.5          | Highest channel | 21350 | 2560.0          |

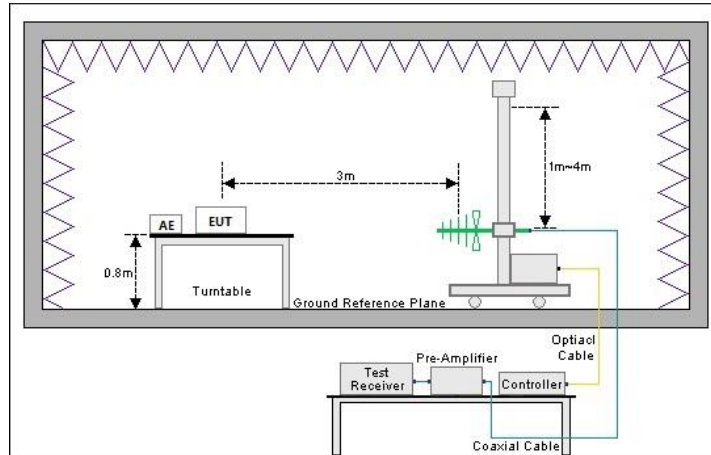
| LTE band 41 Include LTE band 38 |        |                 |                 |        |                 |
|---------------------------------|--------|-----------------|-----------------|--------|-----------------|
| Channels                        |        | Frequency (MHz) | Channels        |        | Frequency (MHz) |
| <b>5 MHz</b>                    |        |                 | <b>10 MHz</b>   |        |                 |
| Lowest channel                  | 40065  | 2537.50         | Lowest channel  | 40090  | 2540.00         |
| Middle channel                  | 40640  | 2595.00         | Middle channel  | 40640  | 2595.00         |
| Highest channel                 | 41215  | 2652.50         | Highest channel | 41190  | 2650.00         |
| <b>15 MHz</b>                   |        |                 | <b>20 MHz</b>   |        |                 |
| Lowest channel                  | 40115  | 2542.50         | Lowest channel  | 40140  | 2545.00         |
| Middle channel                  | 40640  | 2595.00         | Middle channel  | 40640  | 2595.00         |
| Highest channel                 | 41165  | 2647.50         | Highest channel | 41140  | 2645.00         |
| LTE band 66 Include LTE band 4  |        |                 |                 |        |                 |
| Channels                        |        | Frequency (MHz) | Channels        |        | Frequency (MHz) |
| <b>1.4 MHz</b>                  |        |                 | <b>3 MHz</b>    |        |                 |
| Lowest channel                  | 131979 | 1710.7          | Lowest channel  | 131987 | 1711.5          |
| Middle channel                  | 132322 | 1745.0          | Middle channel  | 132322 | 1745.0          |
| Highest channel                 | 132665 | 1779.3          | Highest channel | 132657 | 1778.5          |
| <b>5 MHz</b>                    |        |                 | <b>10 MHz</b>   |        |                 |
| Lowest channel                  | 131997 | 1712.5          | Lowest channel  | 132022 | 1715.0          |
| Middle channel                  | 132322 | 1745.5          | Middle channel  | 132322 | 1745.0          |
| Highest channel                 | 132647 | 1777.5          | Highest channel | 132622 | 1775.0          |
| <b>15 MHz</b>                   |        |                 | <b>20 MHz</b>   |        |                 |
| Lowest channel                  | 132047 | 1717.5          | Lowest channel  | 132072 | 1720.0          |
| Middle channel                  | 132322 | 1745.0          | Middle channel  | 132322 | 1745.0          |
| Highest channel                 | 132597 | 1772.5          | Highest channel | 132572 | 1770.0          |



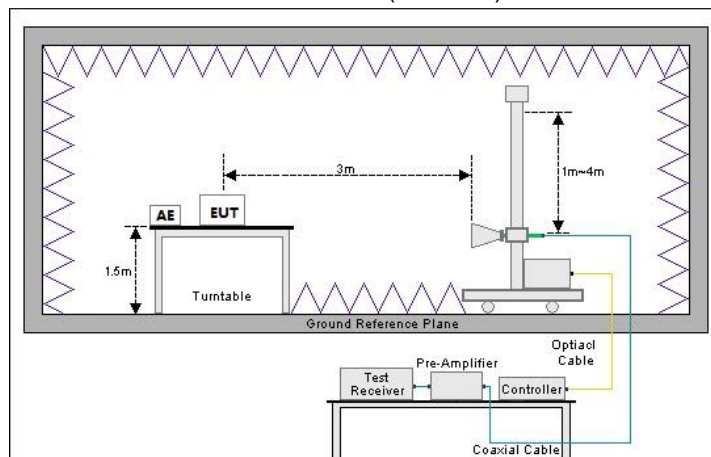
## 4.2 Test Setup

### 1) Radiated emission measurement:

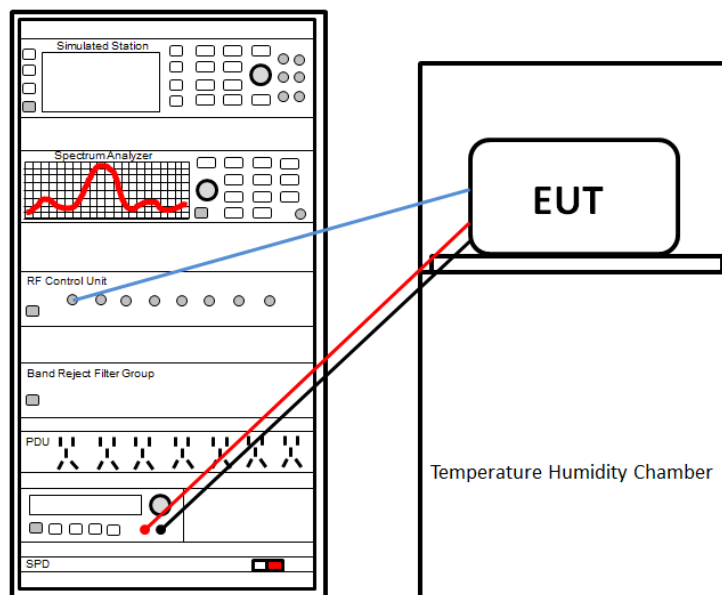
Below 1GHz (3m SAC)



Above 1GHz (3m SAC)



### 2) Conducted test method



### 4.3 Test Procedure

| Test method           | Test step   |
|-----------------------|---|
| Radiated emission     | <p><b>For below 1GHz:</b></p> <ol style="list-style-type: none"> <li>The EUT was placed on the tabletop of a rotating table 0.8 m the ground at a 3 m semi anechoic chamber. The measurement distance from the EUT to the receiving antenna is 3 m.</li> <li>EUT works in each mode of operation that needs to be tested , and having the EUT continuously working, respectively on 3 axis (X, Y &amp; Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.</li> <li>Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.</li> </ol> <p><b>For above 1GHz:</b></p> <ol style="list-style-type: none"> <li>The EUT was placed on the tabletop of a rotating table 1.5 m the ground at a 3 m fully anechoic room. The measurement distance from the EUT to the receiving antenna is 3 m.</li> <li>EUT works in each mode of operation that needs to be tested , and having the EUT continuously working, respectively on 3 axis (X, Y &amp; Z) and considered typical configuration to obtain worst position. The highest signal levels relative to the limit shall be determined by rotating the EUT from 0° to 360° and with varying the measurement antenna height between 1 m and 4 m in vertical and horizontal polarizations.</li> <li>Open the test software to control the test antenna and test turntable. Perform the test, save the test results, and export the test data.</li> </ol> |
| Conducted test method | <ol style="list-style-type: none"> <li>The LTE antenna port of EUT was connected to the test port of the test system through an RF cable.</li> <li>The EUT is keeping in continuous transmission mode and tested in all modulation modes.</li> <li>Open the test software, prepare a test plan, and control the system through the software. After the test is completed, the test report is exported through the test software.</li> </ol>   |

## 5 Test Results

### 5.1 Summary

#### 5.1.1 Clause and Data Summary

| Test items  | Standard clause  | Test data       | Result |
|---|--|-----------------|--------|
| RF Exposure (SAR)   | Part 1.1307<br>Part 2.1093   | See SAR Report  | Pass   |
| RF Output Power   | Part 2.1046<br>Part 22.913 (a)(5)<br>Part 24.232 (c)<br>Part 27.50 (d)(4) Part<br>27.50 (h)(2) | Appendix – LTE  | Pass   |
| Peak-to-Average Power Ratio   | Part 24.232 (d)<br>Part 27.50 (d)(5)   | Appendix – LTE  | Pass   |
| Modulation Characteristics  | Part 2.1047  | Appendix – LTE  | Pass   |
| 26dB Emission Bandwidth<br>99% Occupied Bandwidth   | Part 2.1049  | Appendix – LTE  | Pass   |
| Out of Band Emission at Antenna<br>Terminals  | Part 2.1051<br>Part 22.917 (a)<br>Part 24.238 (a)<br>Part 27.53 (h)<br>Part 27.53 (m)(4)       | Appendix – LTE  | Pass   |
| Field Strength of Spurious Radiation  | Part 2.1053<br>Part 22.917 (a)<br>Part 24.238 (a)<br>Part 27.53 (h)<br>Part 27.53 (m)(4)       | See Section 5.2 | Pass   |
| Frequency Stability vs. Temperature   | Part 2.1055 (a)(1)(b)<br>Part 22.355<br>Part 24.235<br>Part 27.54                              | Appendix – LTE  | Pass   |
| Frequency Stability vs. Voltage   | Part 2.1055 (d)(2)<br>Part 22.355<br>Part 24.235<br>Part 27.54                                 | Appendix – LTE  | Pass   |
| <b>Remark:</b><br>1. Pass: The EUT complies with the essential requirements in the standard.<br>2. The cable insertion loss used by “RF Output Power” and other conduction measurement items is 0.5dB (Fundamental Frequency below 1GHz)/1.0dB (Fundamental Frequency above 1GHz) (provided by the customer). |  |                 |        |
| <b>Test Method:</b>   | ANSI/TIA-603-E-2016<br>ANSI C63.26-2015  |                 |        |

5.1.2 Test Limit

| Test items  | Limit  |                       |                       |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
|---|--|-----------------------|-----------------------|-----------------------|-----------------------|----------|--|------|------|-----------|--|-----|------|------------|--|-----|-----|------------|--|-----|-----|------------|--|-----|-----|------------|--|-----|-----|--------------|--|------|-----|
| RF Output Power   | <p><b>LTE band 2/7/38/41:</b> 2W EIRP</p> <p><b>LTE band 4/66:</b> 1W EIRP</p> <p><b>LTE band 5:</b> 7W ERP</p>  |                       |                       |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| Peak-to-Average Power Ratio   | <p><b>LTE band 2/4:</b>The peak-to-average ratio (PAR) of the transmission may not exceed 13 dB</p> <p><b>Other bands:</b> N/A report only</p>   |                       |                       |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| Modulation Characteristics  | N/A  |                       |                       |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| 26dB Emission Bandwidth<br>99% Occupied Bandwidth                                     | N/A  |                       |                       |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| Out of Band Emission at Antenna Terminals<br><br>Field Strength of Spurious Radiation | <p><b>LTE band 2, 4, 5, 66:</b><br/>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 <math>43 + 10 \log(P)</math> dB.</p> <p><b>LTE band 7, 38, 41:</b><br/>For mobile digital stations, the attenuation factor shall be not less than <math>40 + 10 \log(P)</math> dB on all frequencies between the channel edge and 5 megahertz from the channel edge, <math>43 + 10 \log(P)</math> dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and <math>55 + 10 \log(P)</math> dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than <math>43 + 10 \log(P)</math> dB on all frequencies between 2490.5 MHz and 2496 MHz and <math>55 + 10 \log(P)</math> dB at or below 2490.5 MHz.</p>   |                       |                       |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| Frequency Stability vs. Temperature<br><br>Frequency Stability vs. Voltage            | <p><b>LTE band 2:</b><br/>The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.</p> <p><b>LTE band 4, 7, 38, 41, 66:</b><br/>The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.</p> <p><b>LTE band 5:</b><br/>Except as otherwise provided in this part, the carrier frequency of each transmitter in the Public Mobile Services must be maintained within the tolerances given in Table C-1 of this section.</p> <p style="text-align: center;"><b>TABLE C-1—FREQUENCY TOLERANCE FOR TRANSMITTERS IN THE PUBLIC MOBILE SERVICES</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Frequency range (MHz)</th> <th>Base, fixed (ppm)</th> <th>Mobile &gt;3 watts (ppm)</th> <th>Mobile ≤3 watts (ppm)</th> </tr> </thead> <tbody> <tr> <td>25 to 50</td> <td></td> <td>20.0</td> <td>50.0</td> </tr> <tr> <td>50 to 450</td> <td></td> <td>5.0</td> <td>50.0</td> </tr> <tr> <td>450 to 512</td> <td></td> <td>2.5</td> <td>5.0</td> </tr> <tr> <td>821 to 896</td> <td></td> <td>1.5</td> <td>2.5</td> </tr> <tr> <td>928 to 929</td> <td></td> <td>5.0</td> <td>n/a</td> </tr> <tr> <td>929 to 960</td> <td></td> <td>1.5</td> <td>n/a</td> </tr> <tr> <td>2110 to 2220</td> <td></td> <td>10.0</td> <td>n/a</td> </tr> </tbody> </table> | Frequency range (MHz) | Base, fixed (ppm)     | Mobile >3 watts (ppm) | Mobile ≤3 watts (ppm) | 25 to 50 |  | 20.0 | 50.0 | 50 to 450 |  | 5.0 | 50.0 | 450 to 512 |  | 2.5 | 5.0 | 821 to 896 |  | 1.5 | 2.5 | 928 to 929 |  | 5.0 | n/a | 929 to 960 |  | 1.5 | n/a | 2110 to 2220 |  | 10.0 | n/a |
| Frequency range (MHz)   | Base, fixed (ppm)  | Mobile >3 watts (ppm) | Mobile ≤3 watts (ppm) |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| 25 to 50  |  | 20.0                  | 50.0                  |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| 50 to 450   |  | 5.0                   | 50.0                  |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| 450 to 512  |  | 2.5                   | 5.0                   |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| 821 to 896  |  | 1.5                   | 2.5                   |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| 928 to 929  |  | 5.0                   | n/a                   |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| 929 to 960  |  | 1.5                   | n/a                   |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |
| 2110 to 2220  |  | 10.0                  | n/a                   |                       |                       |          |  |      |      |           |  |     |      |            |  |     |     |            |  |     |     |            |  |     |     |            |  |     |     |              |  |      |     |

## 5.2 Field Strength of Spurious Radiation Measurement

Note: All bandwidths, modulation types and RB configurations were pretested, and it was found that minimum bandwidths, QPSK modulation and 1RB0 were the worst modes, and only the worst modes were reflected in the report.

| LTE band 2 – 1.4 MHz bandwidth   |                     |             |             |             |             |              |
|--|---------------------|-------------|-------------|-------------|-------------|--------------|
| Lowest channel   |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 3701.40  | -48.52              | -1.36       | -49.88      | -13.00      | 36.88       | Vertical     |
| 5552.10  | -51.61              | 5.43        | -46.18      | -13.00      | 33.18       | Vertical     |
| 7402.00  | -52.25              | 12.61       | -39.64      | -13.00      | 26.64       | Vertical     |
| 3701.40  | -49.10              | -1.85       | -50.95      | -13.00      | 37.95       | Horizontal   |
| 5552.10  | -51.78              | 3.80        | -47.98      | -13.00      | 34.98       | Horizontal   |
| 7402.00  | -53.54              | 10.88       | -42.66      | -13.00      | 29.66       | Horizontal   |
| Middle channel   |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 3760.00  | -48.18              | -1.06       | -49.24      | -13.00      | 36.24       | Vertical     |
| 5640.00  | -51.42              | 7.14        | -44.28      | -13.00      | 31.28       | Vertical     |
| 7520.00  | -51.89              | 11.47       | -40.42      | -13.00      | 27.42       | Vertical     |
| 3760.00  | -49.48              | -1.55       | -51.03      | -13.00      | 38.03       | Horizontal   |
| 5640.00  | -52.14              | 4.45        | -47.69      | -13.00      | 34.69       | Horizontal   |
| 7520.00  | -53.19              | 9.98        | -43.21      | -13.00      | 30.21       | Horizontal   |
| Highest channel  |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 3816.60  | -48.74              | -0.76       | -49.50      | -13.00      | 36.50       | Vertical     |
| 5724.90  | -51.76              | 8.51        | -43.25      | -13.00      | 30.25       | Vertical     |
| 7633.20  | -52.67              | 11.11       | -41.56      | -13.00      | 28.56       | Vertical     |
| 3816.60  | -49.33              | -1.24       | -50.57      | -13.00      | 37.57       | Horizontal   |
| 5724.90  | -52.19              | 5.85        | -46.34      | -13.00      | 33.34       | Horizontal   |
| 7633.20  | -53.35              | 9.95        | -43.40      | -13.00      | 30.40       | Horizontal   |
| <b>Remark:</b>   |                     |             |             |             |             |              |
| 1. The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report. |                     |             |             |             |             |              |

| LTE band 5 – 1.4 MHz bandwidth   |                     |             |             |             |             |              |
|--|---------------------|-------------|-------------|-------------|-------------|--------------|
| Lowest channel   |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 1649.40  | -42.94              | -11.41      | -54.35      | -13.00      | 41.35       | Vertical     |
| 2474.10  | -45.44              | -6.45       | -51.89      | -13.00      | 38.89       | Vertical     |
| 3298.80  | -48.78              | -4.88       | -53.66      | -13.00      | 40.66       | Vertical     |
| 1649.40  | -43.58              | -11.31      | -54.89      | -13.00      | 41.89       | Horizontal   |
| 2474.10  | -46.27              | -6.79       | -53.06      | -13.00      | 40.06       | Horizontal   |
| 3298.80  | -49.89              | -5.17       | -55.06      | -13.00      | 42.06       | Horizontal   |
| Middle channel   |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 1673.30  | -43.44              | -11.39      | -54.83      | -13.00      | 41.83       | Vertical     |
| 2509.50  | -45.47              | -6.70       | -52.17      | -13.00      | 39.17       | Vertical     |
| 3346.00  | -48.70              | -5.17       | -53.87      | -13.00      | 40.87       | Vertical     |
| 1673.30  | -43.83              | -11.48      | -55.31      | -13.00      | 42.31       | Horizontal   |
| 2509.50  | -46.01              | -6.40       | -52.41      | -13.00      | 39.41       | Horizontal   |
| 3346.00  | -49.90              | -4.96       | -54.86      | -13.00      | 41.86       | Horizontal   |
| Highest channel  |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 1696.60  | -42.62              | -11.54      | -54.16      | -13.00      | 41.16       | Vertical     |
| 2544.90  | -45.67              | -6.25       | -51.92      | -13.00      | 38.92       | Vertical     |
| 3393.20  | -48.62              | -5.05       | -53.67      | -13.00      | 40.67       | Vertical     |
| 1696.60  | -43.28              | -11.48      | -54.76      | -13.00      | 41.76       | Horizontal   |
| 2544.90  | -46.32              | -6.56       | -52.88      | -13.00      | 39.88       | Horizontal   |
| 3393.20  | -49.67              | -5.16       | -54.83      | -13.00      | 41.83       | Horizontal   |
| <b>Remark:</b>   |                     |             |             |             |             |              |
| 1. The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report. |                     |             |             |             |             |              |

| LTE band 7 – 5 MHz bandwidth   |                     |             |             |             |             |              |
|--|---------------------|-------------|-------------|-------------|-------------|--------------|
| Lowest channel   |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 5005.00  | -49.50              | 4.03        | -45.47      | -25.00      | 20.47       | Vertical     |
| 7507.50  | -52.78              | 11.51       | -41.27      | -25.00      | 16.27       | Vertical     |
| 10010.00   | -52.76              | 16.40       | -36.36      | -25.00      | 11.36       | Vertical     |
| 5005.00  | -50.97              | 3.59        | -47.38      | -25.00      | 22.38       | Horizontal   |
| 7507.50  | -50.77              | 9.97        | -40.80      | -25.00      | 15.80       | Horizontal   |
| 10010.00   | -52.26              | 16.02       | -36.24      | -25.00      | 11.24       | Horizontal   |
| Middle channel   |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 5070.00  | -49.78              | 4.68        | -45.10      | -25.00      | 20.10       | Vertical     |
| 7605.00  | -53.22              | 11.22       | -42.00      | -25.00      | 17.00       | Vertical     |
| 10140.00   | -52.40              | 17.42       | -34.98      | -25.00      | 9.98        | Vertical     |
| 5070.00  | -51.30              | 4.23        | -47.07      | -25.00      | 22.07       | Horizontal   |
| 7605.00  | -51.23              | 10.04       | -41.19      | -25.00      | 16.19       | Horizontal   |
| 10140.00   | -52.74              | 16.47       | -36.27      | -25.00      | 11.27       | Horizontal   |
| Highest channel  |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 5135.00  | -50.27              | 4.66        | -45.61      | -25.00      | 20.61       | Vertical     |
| 7702.50  | -53.59              | 10.87       | -42.72      | -25.00      | 17.72       | Vertical     |
| 10270.00   | -52.34              | 18.25       | -34.09      | -25.00      | 9.09        | Vertical     |
| 5135.00  | -51.07              | 4.19        | -46.88      | -25.00      | 21.88       | Horizontal   |
| 7702.50  | -51.22              | 9.77        | -41.45      | -25.00      | 16.45       | Horizontal   |
| 10270.00   | -52.81              | 17.13       | -35.68      | -25.00      | 10.68       | Horizontal   |
| <b>Remark:</b>   |                     |             |             |             |             |              |
| 1. The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report. |                     |             |             |             |             |              |

| LTE band 41 – 5 MHz bandwidth  |                     |             |             |             |             |              |
|--|---------------------|-------------|-------------|-------------|-------------|--------------|
| Lowest channel   |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 5075.00  | -50.45              | 4.73        | -45.72      | -25.00      | 20.72       | Vertical     |
| 7612.50  | -52.96              | 11.19       | -41.77      | -25.00      | 16.77       | Vertical     |
| 10150.00   | -53.50              | 17.43       | -36.07      | -25.00      | 11.07       | Vertical     |
| 5075.00  | -50.42              | 4.28        | -46.14      | -25.00      | 21.14       | Horizontal   |
| 7612.50  | -52.68              | 10.02       | -42.66      | -25.00      | 17.66       | Horizontal   |
| 10150.00   | -52.34              | 16.49       | -35.85      | -25.00      | 10.85       | Horizontal   |
| Middle channel   |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 5190.00  | -50.55              | 4.18        | -46.37      | -25.00      | 21.37       | Vertical     |
| 7785.00  | -53.42              | 11.37       | -42.05      | -25.00      | 17.05       | Vertical     |
| 10380.00   | -53.69              | 18.35       | -35.34      | -25.00      | 10.34       | Vertical     |
| 5190.00  | -50.15              | 3.68        | -46.47      | -25.00      | 21.47       | Horizontal   |
| 7785.00  | -52.74              | 10.95       | -41.79      | -25.00      | 16.79       | Horizontal   |
| 10380.00   | -52.01              | 17.07       | -34.94      | -25.00      | 9.94        | Horizontal   |
| Highest channel  |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 5305.00  | -50.80              | 3.54        | -47.26      | -25.00      | 22.26       | Vertical     |
| 7957.50  | -53.07              | 12.36       | -40.71      | -25.00      | 15.71       | Vertical     |
| 10610.00   | -53.51              | 19.40       | -34.11      | -25.00      | 9.11        | Vertical     |
| 5305.00  | -50.77              | 3.17        | -47.60      | -25.00      | 22.60       | Horizontal   |
| 7957.50  | -53.03              | 11.92       | -41.11      | -25.00      | 16.11       | Horizontal   |
| 10610.00   | -52.65              | 17.79       | -34.86      | -25.00      | 9.86        | Horizontal   |
| <b>Remark:</b>   |                     |             |             |             |             |              |
| 1. The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report. |                     |             |             |             |             |              |



| LTE band 66 – 1.4 MHz bandwidth  |                     |             |             |             |             |              |
|--|---------------------|-------------|-------------|-------------|-------------|--------------|
| Lowest channel   |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 3421.40  | -49.54              | -4.19       | -53.73      | -13.00      | 40.73       | Vertical     |
| 5132.10  | -51.64              | 4.68        | -46.96      | -13.00      | 33.96       | Vertical     |
| 6842.80  | -52.67              | 10.63       | -42.04      | -13.00      | 29.04       | Vertical     |
| 3421.40  | -48.70              | -4.29       | -52.99      | -13.00      | 39.99       | Horizontal   |
| 5132.10  | -50.86              | 4.21        | -46.65      | -13.00      | 33.65       | Horizontal   |
| 6842.80  | -52.83              | 9.58        | -43.25      | -13.00      | 30.25       | Horizontal   |
| Middle channel   |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 3490.00  | -49.31              | -2.31       | -51.62      | -13.00      | 38.62       | Vertical     |
| 5235.00  | -52.01              | 3.88        | -48.13      | -13.00      | 35.13       | Vertical     |
| 6980.00  | -53.17              | 11.02       | -42.15      | -13.00      | 29.15       | Vertical     |
| 3490.00  | -48.96              | -2.42       | -51.38      | -13.00      | 38.38       | Horizontal   |
| 5235.00  | -50.53              | 3.44        | -47.09      | -13.00      | 34.09       | Horizontal   |
| 6980.00  | -52.97              | 9.59        | -43.38      | -13.00      | 30.38       | Horizontal   |
| Highest channel  |                     |             |             |             |             |              |
| Frequency (MHz)  | Reading Level (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Polarization |
| 3558.60  | -49.81              | -1.53       | -51.34      | -13.00      | 38.34       | Vertical     |
| 5337.90  | -51.27              | 3.90        | -47.37      | -13.00      | 34.37       | Vertical     |
| 7117.20  | -52.44              | 12.22       | -40.22      | -13.00      | 27.22       | Vertical     |
| 3558.60  | -48.77              | -2.00       | -50.77      | -13.00      | 37.77       | Horizontal   |
| 5337.90  | -50.99              | 3.31        | -47.68      | -13.00      | 34.68       | Horizontal   |
| 7117.20  | -52.52              | 10.42       | -42.10      | -13.00      | 29.10       | Horizontal   |
| <b>Remark:</b>   |                     |             |             |             |             |              |
| 1. The emission levels of below 1 GHz are lower than the limit 10dB, so not show in test report. |                     |             |             |             |             |              |

-----End of report-----