

# TEST REPORT

|                                      |                                                                                                                                                      |                                                                                       |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| FCC ID .....                         | 2AUARTPMST600                                                                                                                                        |                                                                                       |
| Test Report No.....                  | TCT231101E104                                                                                                                                        |                                                                                       |
| Date of issue.....                   | Nov. 27, 2023                                                                                                                                        |                                                                                       |
| Testing laboratory .....             | SHENZHEN TONGCE TESTING LAB                                                                                                                          |                                                                                       |
| Testing location/ address:           | 2101 & 2201, Zhenchang Factory, Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China |                                                                                       |
| Applicant's name.....                | THINKCAR TECH CO., LTD.                                                                                                                              |                                                                                       |
| Address.....                         | 2606, building 4, phase II, TiananYungu, Gangtou community, Bantian, Longgang District, Shenzhen, China                                              |                                                                                       |
| Manufacturer's name ...              | THINKCAR TECH CO., LTD.                                                                                                                              |                                                                                       |
| Address.....                         | 2606, building 4, phase II, TiananYungu, Gangtou community, Bantian, Longgang District, Shenzhen, China                                              |                                                                                       |
| Standard(s) .....                    | FCC CFR Title 47 Part 15 Subpart C                                                                                                                   |                                                                                       |
| Product Name.....                    | TPMS Diagnostic Tool                                                                                                                                 |                                                                                       |
| Trade Mark .....                     | THINKCAR, XHINKCAR, MUCAR                                                                                                                            |                                                                                       |
| Model/Type reference.....            | TKTT6                                                                                                                                                |                                                                                       |
| Rating(s).....                       | Rechargeable Li-ion Battery DC 3.7V                                                                                                                  |                                                                                       |
| Date of receipt of test item .....   | Nov. 01, 2023                                                                                                                                        |                                                                                       |
| Date (s) of performance of test..... | Nov. 01, 2023 - Nov. 27, 2023                                                                                                                        |                                                                                       |
| Tested by (+signature) ...           | Yannie ZHONG                                                                                                                                         |  |
| Check by (+signature)....            | Beryl ZHAO                                                                                                                                           |  |
| Approved by (+signature):            | Tomsin                                                                                                                                               |  |

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**Appendix B: Photographs of Test Setup**

**Appendix C: Photographs of EUT**

## 1. General Product Information

### 1.1.EUT description

|                             |                                     |
|-----------------------------|-------------------------------------|
| Product Name.....:          | TPMS Diagnostic Tool                |
| Model/Type reference.....:  | TKTT6                               |
| Sample Number.....:         | TCT231101E023-0101                  |
| Operation Frequency .....   | 125kHz                              |
| Modulation Technology ..... | FSK                                 |
| Antenna Type.....:          | Internal Antenna                    |
| Rating(s).....:             | Rechargeable Li-ion Battery DC 3.7V |

Note: The antenna gain listed in this report is provided by applicant, and the test laboratory is not responsible for this parameter.

### 1.2.Model(s) list

None.

## 2. Test Result Summary

| Requirement                      | CFR 47 Section | Result |
|----------------------------------|----------------|--------|
| Antenna requirement              | §15.203        | PASS   |
| AC Power Line Conducted Emission | §15.207        | PASS   |
| Spurious Emission                | §15.209(a)(f)  | PASS   |

**Note:**

1. PASS: Test item meets the requirement.
2. Fail: Test item does not meet the requirement.
3. N/A: Test case does not apply to the test object.
4. The test result judgment is decided by the limit of test standard.

### 3. General Information

#### 3.1. Test environment and mode

| Operating Environment:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                          |                   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------|
| Condition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Conducted Emission                       | Radiated Emission |
| Temperature:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 23.5 °C                                  | 24.1 °C           |
| Humidity:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 52 % RH                                  | 54 % RH           |
| Atmospheric Pressure:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1010 mbar                                | 1010 mbar         |
| Test Mode:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                          |                   |
| Engineering mode:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Keep the EUT in continuous transmitting. |                   |
| The sample was placed 0.8m for the measurement below above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case(Z axis) are shown in Test Results of the following pages. |                                          |                   |

#### 3.2. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Equipment | Model No. | Serial No. | FCC ID | Trade Name |
|-----------|-----------|------------|--------|------------|
| /         | /         | /          | /      | /          |

**Note:**

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

## 4. Facilities and Accreditations

### 4.1. Facilities

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

- FCC - Registration No.: 645098

SHENZHEN TONGCE TESTING LAB

Designation Number: CN1205

The testing lab has been registered and fully described in a report with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

- IC - Registration No.: 10668A-1

SHENZHEN TONGCE TESTING LAB

CAB identifier: CN0031

The testing lab has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

### 4.2. Location

SHENZHEN TONGCE TESTING LAB

Address: 2101 & 2201, Zhenchang Factory Renshan Industrial Zone, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, 518103, People's Republic of China

TEL: +86-755-27673339

### 4.3. Measurement Uncertainty

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately 95 %.

| No. | Item                                    | MU            |
|-----|-----------------------------------------|---------------|
| 1   | Conducted Emission                      | $\pm 3.10$ dB |
| 2   | RF power, conducted                     | $\pm 0.12$ dB |
| 3   | Spurious emissions, conducted           | $\pm 0.11$ dB |
| 4   | All emissions, radiated(<1 GHz)         | $\pm 4.56$ dB |
| 5   | All emissions, radiated(1 GHz - 18 GHz) | $\pm 4.22$ dB |
| 6   | All emissions, radiated(18 GHz- 40 GHz) | $\pm 4.36$ dB |

## 5. Test Results and Measurement Data

### 5.1. Antenna requirement

**Standard requirement:**

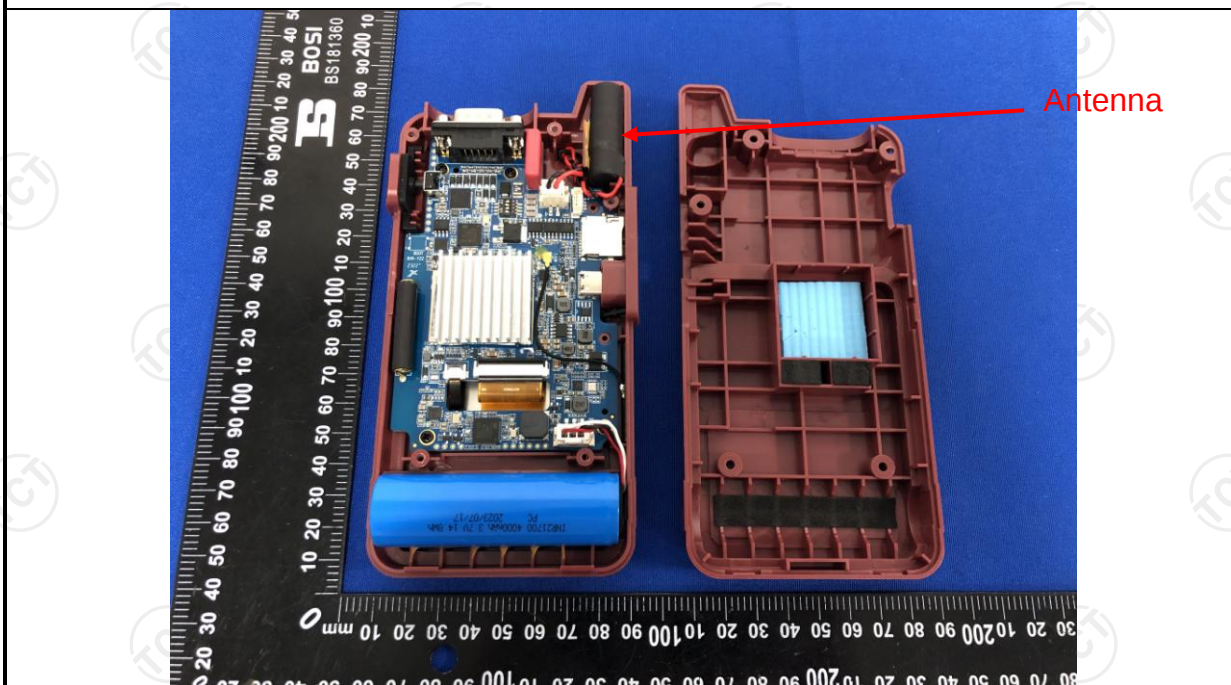
FCC Part15 C Section 15.203

**15.203 requirement:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

**E.U.T Antenna:**

The antenna is internal antenna which permanently attached.



## 5.2. Conducted Emission

### 5.2.1. Test Specification

| Test Requirement:        | FCC Part15 C Section 15.207                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|--------------|--|------------|---------|----------|-----------|-----------|-------|----|----|------|----|----|
| Test Method:             | ANSI C63.10: 2013                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| Frequency Range:         | 150 kHz to 30 MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| Receiver setup:          | RBW=9 kHz, VBW=30 kHz, Sweep time=auto                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| Limits:                  | <table><tr><th rowspan="2">Frequency range<br/>(MHz)</th><th colspan="2">Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr><tr><td>0.5-5</td><td>56</td><td>46</td></tr><tr><td>5-30</td><td>60</td><td>50</td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                        | Frequency range<br>(MHz) | Limit (dBuV) |  | Quasi-peak | Average | 0.15-0.5 | 66 to 56* | 56 to 46* | 0.5-5 | 56 | 46 | 5-30 | 60 | 50 |
| Frequency range<br>(MHz) | Limit (dBuV)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
|                          | Quasi-peak                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Average                  |              |  |            |         |          |           |           |       |    |    |      |    |    |
| 0.15-0.5                 | 66 to 56*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 56 to 46*                |              |  |            |         |          |           |           |       |    |    |      |    |    |
| 0.5-5                    | 56                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 46                       |              |  |            |         |          |           |           |       |    |    |      |    |    |
| 5-30                     | 60                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 50                       |              |  |            |         |          |           |           |       |    |    |      |    |    |
| Test Setup:              | <div><p>Reference Plane</p><p>40cm</p><p>E.U.T</p><p>AC power</p><p>80cm</p><p>LISN</p><p>Filter</p><p>AC power</p><p>EMI Receiver</p><p>Test table/Insulation plane</p><p>Remark:<br/>E.U.T: Equipment Under Test<br/>LISN: Line Impedance Stabilization Network<br/>Test table height=0.8m</p></div>                                                                                                                                                                                                                                                                                                                                                                                                            |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| Test Mode:               | Charging +Transmitting Mode                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| Test Procedure:          | <div><div>1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.</div><div>2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).</div><div>3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</div></div> |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |
| Test Result:             | PASS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                          |              |  |            |         |          |           |           |       |    |    |      |    |    |

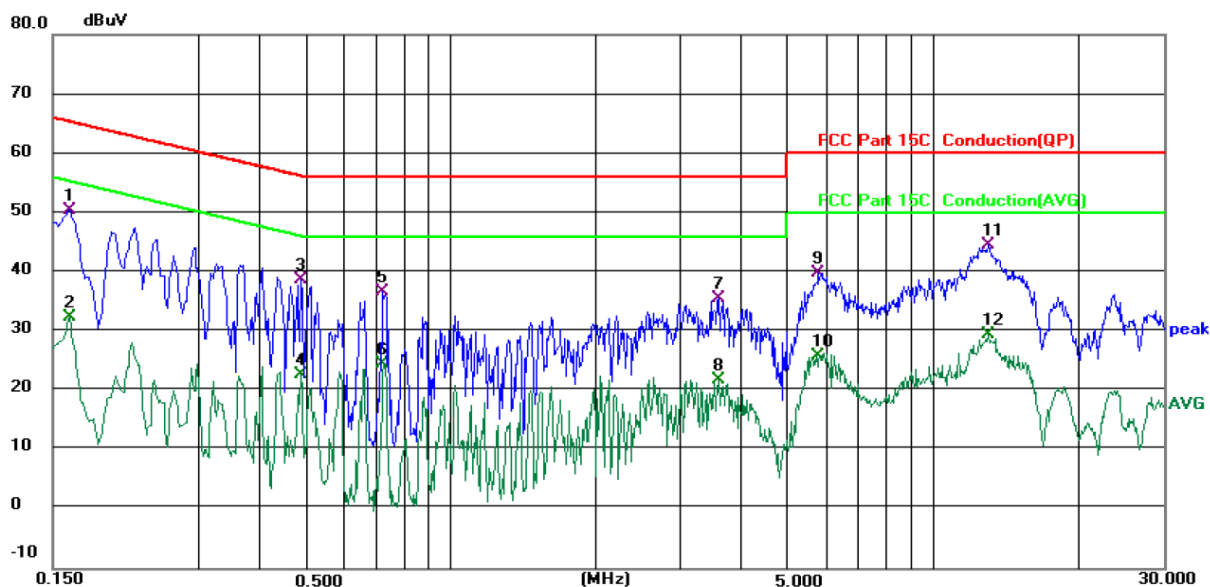
**5.2.2. Test Instruments**

| Conducted Emission Shielding Room Test Site (843) |                       |           |               |                 |
|---------------------------------------------------|-----------------------|-----------|---------------|-----------------|
| Equipment                                         | Manufacturer          | Model     | Serial Number | Calibration Due |
| EMI Test Receiver                                 | R&S                   | ESCI3     | 100898        | Jun. 29, 2024   |
| Line Impedance<br>Stabilisation<br>Newtork(LISN)  | Schwarzbeck           | NSLK 8126 | 8126453       | Feb. 20, 2024   |
| Line-5                                            | TCT                   | CE-05     | /             | Jul. 03, 2024   |
| EMI Test Software                                 | Shurple<br>Technology | EZ-EMC    | /             | /               |

### 5.2.3. Test data

Please refer to following diagram for individual

#### Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room

Phase: **L1**

Temperature: 23.5 (°C)

Humidity: 52 %

Limit: FCC Part 15C Conduction(QP)

Power: DC 5 V(Adapter Input AC 120 V/60 Hz)

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBμV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBμV | Limit<br>dBμV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   | *   | 0.1620       | 40.39                    | 10.12                   | 50.51                    | 65.36         | -14.85     | QP       |         |
| 2   |     | 0.1620       | 22.37                    | 10.12                   | 32.49                    | 55.36         | -22.87     | AVG      |         |
| 3   |     | 0.4900       | 29.18                    | 9.47                    | 38.65                    | 56.17         | -17.52     | QP       |         |
| 4   |     | 0.4900       | 13.20                    | 9.47                    | 22.67                    | 46.17         | -23.50     | AVG      |         |
| 5   |     | 0.7258       | 27.37                    | 9.23                    | 36.60                    | 56.00         | -19.40     | QP       |         |
| 6   |     | 0.7258       | 15.39                    | 9.23                    | 24.62                    | 46.00         | -21.38     | AVG      |         |
| 7   |     | 3.5939       | 25.49                    | 10.07                   | 35.56                    | 56.00         | -20.44     | QP       |         |
| 8   |     | 3.5939       | 11.88                    | 10.07                   | 21.95                    | 46.00         | -24.05     | AVG      |         |
| 9   |     | 5.7980       | 29.68                    | 10.10                   | 39.78                    | 60.00         | -20.22     | QP       |         |
| 10  |     | 5.7980       | 15.76                    | 10.10                   | 25.86                    | 50.00         | -24.14     | AVG      |         |
| 11  |     | 13.0500      | 34.39                    | 10.16                   | 44.55                    | 60.00         | -15.45     | QP       |         |
| 12  |     | 13.0500      | 19.23                    | 10.16                   | 29.39                    | 50.00         | -20.61     | AVG      |         |

#### Note:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

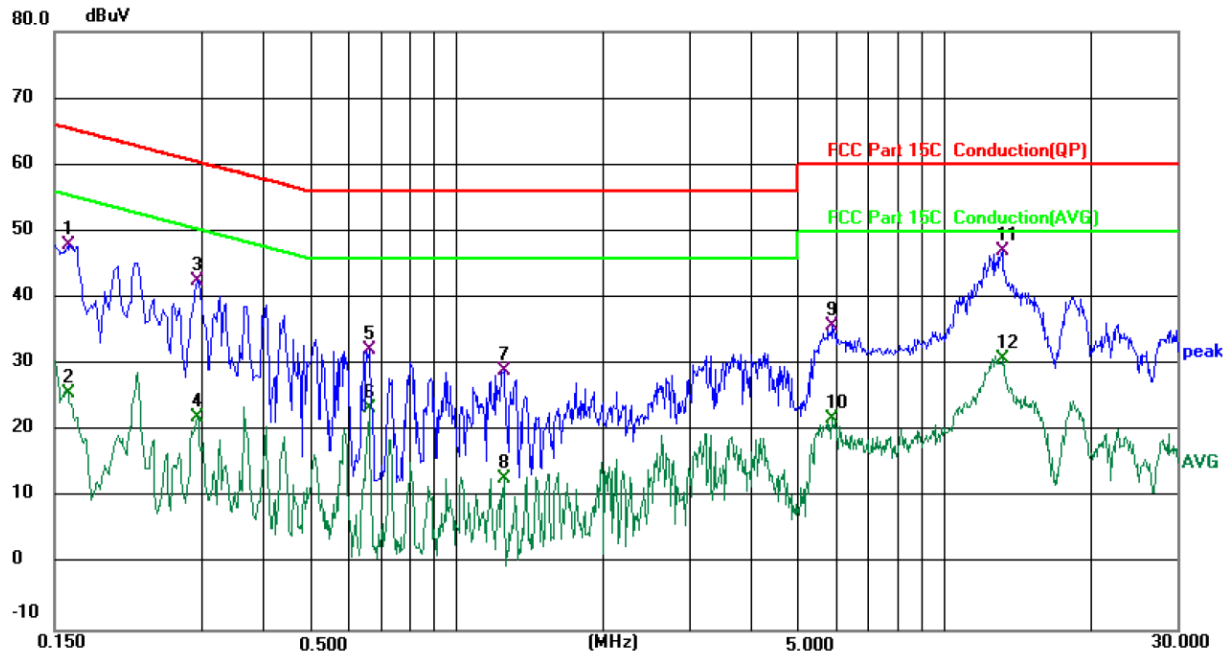
Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak

AVG =average

\* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz

## Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



Site 844 Shielding Room

Phase: **N**

Temperature: 23.5 (°C)

Humidity: 52 %

Limit: FCC Part 15C Conduction(QP)

Power: DC 5 V(Adapter Input AC 120 V/60 Hz)

| No. | Mk. | Freq.<br>MHz | Reading<br>Level<br>dBuV | Correct<br>Factor<br>dB | Measure-<br>ment<br>dBuV | Limit<br>dBuV | Over<br>dB | Detector | Comment |
|-----|-----|--------------|--------------------------|-------------------------|--------------------------|---------------|------------|----------|---------|
| 1   |     | 0.1597       | 37.93                    | 10.10                   | 48.03                    | 65.48         | -17.45     | QP       |         |
| 2   |     | 0.1597       | 15.52                    | 10.10                   | 25.62                    | 55.48         | -29.86     | AVG      |         |
| 3   |     | 0.2938       | 33.00                    | 9.65                    | 42.65                    | 60.42         | -17.77     | QP       |         |
| 4   |     | 0.2938       | 12.42                    | 9.65                    | 22.07                    | 50.42         | -28.35     | AVG      |         |
| 5   |     | 0.6620       | 22.86                    | 9.31                    | 32.17                    | 56.00         | -23.83     | QP       |         |
| 6   |     | 0.6620       | 14.07                    | 9.31                    | 23.38                    | 46.00         | -22.62     | AVG      |         |
| 7   |     | 1.2540       | 18.96                    | 10.00                   | 28.96                    | 56.00         | -27.04     | QP       |         |
| 8   |     | 1.2540       | 2.79                     | 10.00                   | 12.79                    | 46.00         | -33.21     | AVG      |         |
| 9   |     | 5.8900       | 25.69                    | 10.12                   | 35.81                    | 60.00         | -24.19     | QP       |         |
| 10  |     | 5.8900       | 11.72                    | 10.12                   | 21.84                    | 50.00         | -28.16     | AVG      |         |
| 11  | *   | 13.1900      | 36.76                    | 10.23                   | 46.99                    | 60.00         | -13.01     | QP       |         |
| 12  |     | 13.1900      | 20.56                    | 10.23                   | 30.79                    | 50.00         | -19.21     | AVG      |         |

### Note1:

Freq. = Emission frequency in MHz

Reading level (dBuV) = Receiver reading

Corr. Factor (dB) = LISN factor + Cable loss

Measurement (dBuV) = Reading level (dBuV) + Corr. Factor (dB)

Limit (dBuV) = Limit stated in standard

Margin (dB) = Measurement (dBuV) – Limits (dBuV)

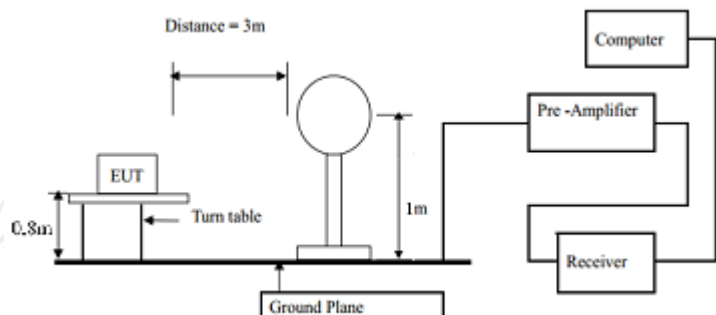
Q.P. =Quasi-Peak

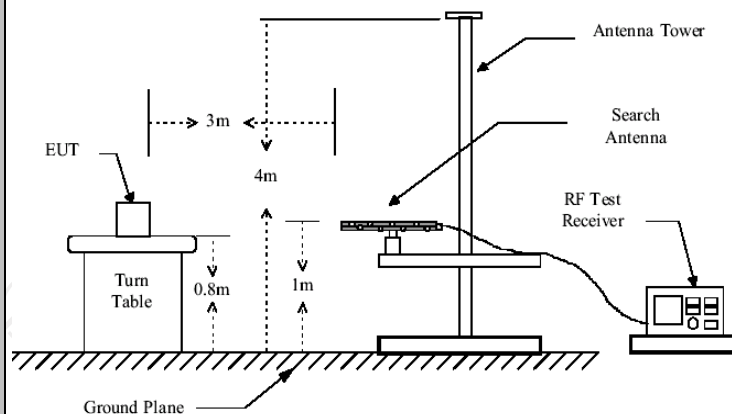
AVG =average

\* is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.

## 5.3. Radiated Spurious Emission Measurement

### 5.3.1. Test Specification

|                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                   |                               |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-------------------------------|------------------|------------------|-----------|-----------------------------------|-------------------------------|-------------|-------------|--------------|-------------|--------------|------|------------------|---------------|------------|-------|-------|------------------|------------|------------|--------|---------|------------------|---|-----------|-----|---|
| Test Requirement:     | FCC Part15 C Section 15.209                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                   |                               |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
| Test Method:          | ANSI C63.10: 2013                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                   |                               |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
| Frequency Range:      | 9 kHz to 25 GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                   |                               |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
| Measurement Distance: | 3 m                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                   |                               |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
| Antenna Polarization: | Horizontal & Vertical                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                   |                               |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
| Operation mode:       | Refer to item 3.1                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                   |                               |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
| Receiver Setup:       | <table><tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr><tr><td>9kHz- 150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr><tr><td>150kHz- 30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr><tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr></table>                                                                             |                                   |                               |                  |                  | Frequency | Detector                          | RBW                           | VBW         | Remark      | 9kHz- 150kHz | Quasi-peak  | 200Hz        | 1kHz | Quasi-peak Value | 150kHz- 30MHz | Quasi-peak | 9kHz  | 30kHz | Quasi-peak Value | 30MHz-1GHz | Quasi-peak | 120KHz | 300KHz  | Quasi-peak Value |   |           |     |   |
|                       | Frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Detector                          | RBW                           | VBW              | Remark           |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | 9kHz- 150kHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Quasi-peak                        | 200Hz                         | 1kHz             | Quasi-peak Value |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | 150kHz- 30MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Quasi-peak                        | 9kHz                          | 30kHz            | Quasi-peak Value |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
| 30MHz-1GHz            | Quasi-peak                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 120KHz                            | 300KHz                        | Quasi-peak Value |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
| Limit:                | <table><tr><td>Frequency</td><td>Field Strength (microvolts/meter)</td><td>Measurement Distance (meters)</td></tr><tr><td>0.009-0.490</td><td>2400/F(KHz)</td><td>300</td></tr><tr><td>0.490-1.705</td><td>24000/F(KHz)</td><td>30</td></tr><tr><td>1.705-30</td><td>30</td><td>30</td></tr><tr><td>30-88</td><td>100</td><td>3</td></tr><tr><td>88-216</td><td>150</td><td>3</td></tr><tr><td>216-960</td><td>200</td><td>3</td></tr><tr><td>Above 960</td><td>500</td><td>3</td></tr></table> |                                   |                               |                  |                  | Frequency | Field Strength (microvolts/meter) | Measurement Distance (meters) | 0.009-0.490 | 2400/F(KHz) | 300          | 0.490-1.705 | 24000/F(KHz) | 30   | 1.705-30         | 30            | 30         | 30-88 | 100   | 3                | 88-216     | 150        | 3      | 216-960 | 200              | 3 | Above 960 | 500 | 3 |
|                       | Frequency                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Field Strength (microvolts/meter) | Measurement Distance (meters) |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | 0.009-0.490                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 2400/F(KHz)                       | 300                           |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | 0.490-1.705                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 24000/F(KHz)                      | 30                            |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | 1.705-30                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 30                                | 30                            |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | 30-88                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 100                               | 3                             |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | 88-216                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 150                               | 3                             |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | 216-960                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 200                               | 3                             |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | Above 960                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 500                               | 3                             |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | <table><tr><td>Frequency</td><td>Field Strength (microvolts/meter)</td><td>Measurement Distance (meters)</td><td>Detector</td></tr><tr><td rowspan="2">Above 1GHz</td><td>500</td><td>3</td><td>Average</td></tr><tr><td>5000</td><td>3</td><td>Peak</td></tr></table>                                                                                                                                                                                                                          |                                   |                               |                  |                  | Frequency | Field Strength (microvolts/meter) | Measurement Distance (meters) | Detector    | Above 1GHz  | 500          | 3           | Average      | 5000 | 3                | Peak          |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
| Frequency             | Field Strength (microvolts/meter)                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Measurement Distance (meters)     | Detector                      |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
| Above 1GHz            | 500                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 3                                 | Average                       |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | 5000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 3                                 | Peak                          |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
| Test setup:           | For radiated emissions below 30MHz                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                   |                               |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       |                                                                                                                                                                                                                                                                                                                                                                                                             |                                   |                               |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |
|                       | 30MHz to 1GHz                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                   |                               |                  |                  |           |                                   |                               |             |             |              |             |              |      |                  |               |            |       |       |                  |            |            |        |         |                  |   |           |     |   |



### Test Procedure:

1. For the radiated emission test below 1GHz:  
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.  
For the radiated emission test above 1GHz:  
Place the measurement antenna on a turntable with 1.5 meter above ground, which is away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.
2. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
4. Use the following spectrum analyzer settings:

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                      | <p>(1) Span shall wide enough to fully capture the emission being measured;</p> <p>(2) Set RBW=120 kHz for <math>f &lt; 1</math> GHz; VBW <math>\geq</math> RBW; Sweep = auto; Detector function = peak; Trace = max hold;</p> <p>For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW <math>\geq 1/T</math>, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.</p> |
| <b>Test mode:</b>    | Refer to section 3.1 for details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Test results:</b> | PASS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |

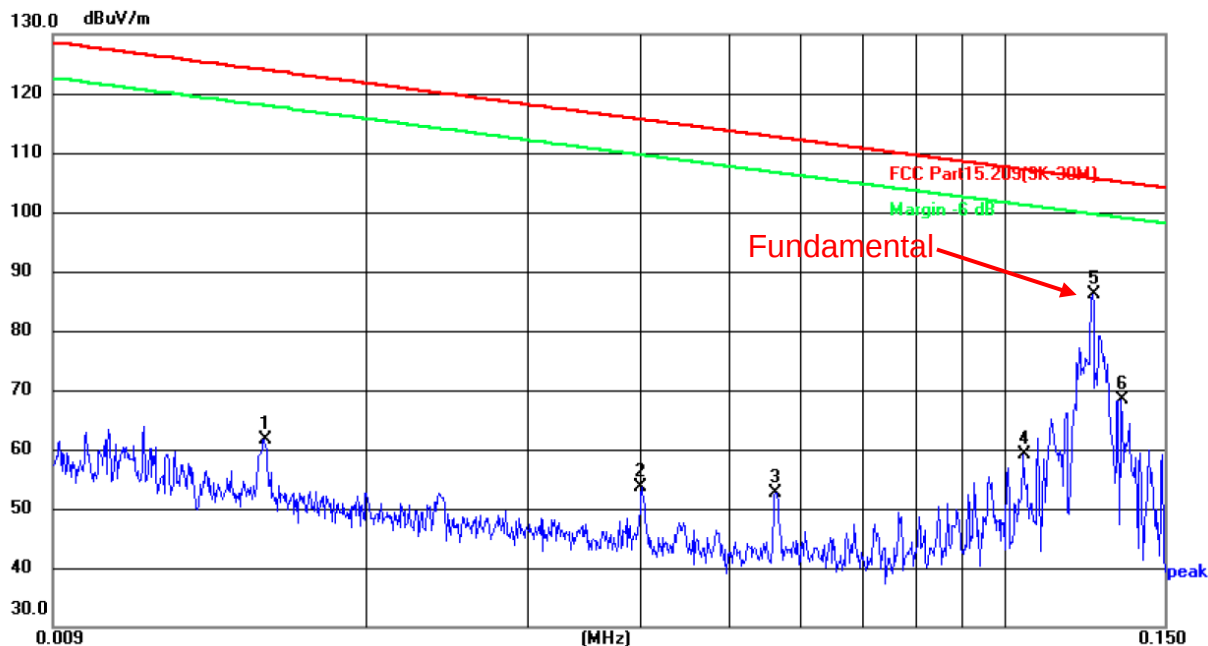
### 5.3.2. Test Instruments

| Radiated Emission Test Site (966) |                    |               |                |                 |
|-----------------------------------|--------------------|---------------|----------------|-----------------|
| Name of Equipment                 | Manufacturer       | Model         | Serial Number  | Calibration Due |
| EMI Test Receiver                 | R&S                | ESIB7         | 100197         | Jun. 29, 2024   |
| Spectrum Analyzer                 | R&S                | FSQ40         | 200061         | Jun. 29, 2024   |
| Pre-amplifier                     | SKET               | LNPA_0118G-45 | SK2021012102   | Feb. 20, 2024   |
| Pre-amplifier                     | SKET               | LNPA_1840G-50 | SK202109203500 | Feb. 20, 2024   |
| Pre-amplifier                     | HP                 | 8447D         | 2727A05017     | Jun. 27, 2024   |
| Loop antenna                      | Schwarzbeck        | FMZB1519B     | 00191          | Jul. 02, 2024   |
| Broadband Antenna                 | Schwarzbeck        | VULB9163      | 340            | Jul. 01, 2024   |
| Horn Antenna                      | Schwarzbeck        | BBHA 9120D    | 631            | Jul. 01, 2024   |
| Horn Antenna                      | Schwarzbeck        | BBHA 9170     | 00956          | Feb. 24, 2024   |
| Antenna Mast                      | Keleto             | RE-AM         | /              | /               |
| Coaxial cable                     | SKET               | RC-18G-N-M    | /              | Feb. 24, 2024   |
| Coaxial cable                     | SKET               | RC_40G-K-M    | /              | Feb. 24, 2024   |
| EMI Test Software                 | Shurple Technology | EZ-EMC        | /              | /               |

### 5.3.3. Test Data

Please refer to following diagram for individual  
9KHz-30MHz

9KHz-150KHz:



Site: #3 3m Anechoic Chamber

Polarization: **Coaxial**

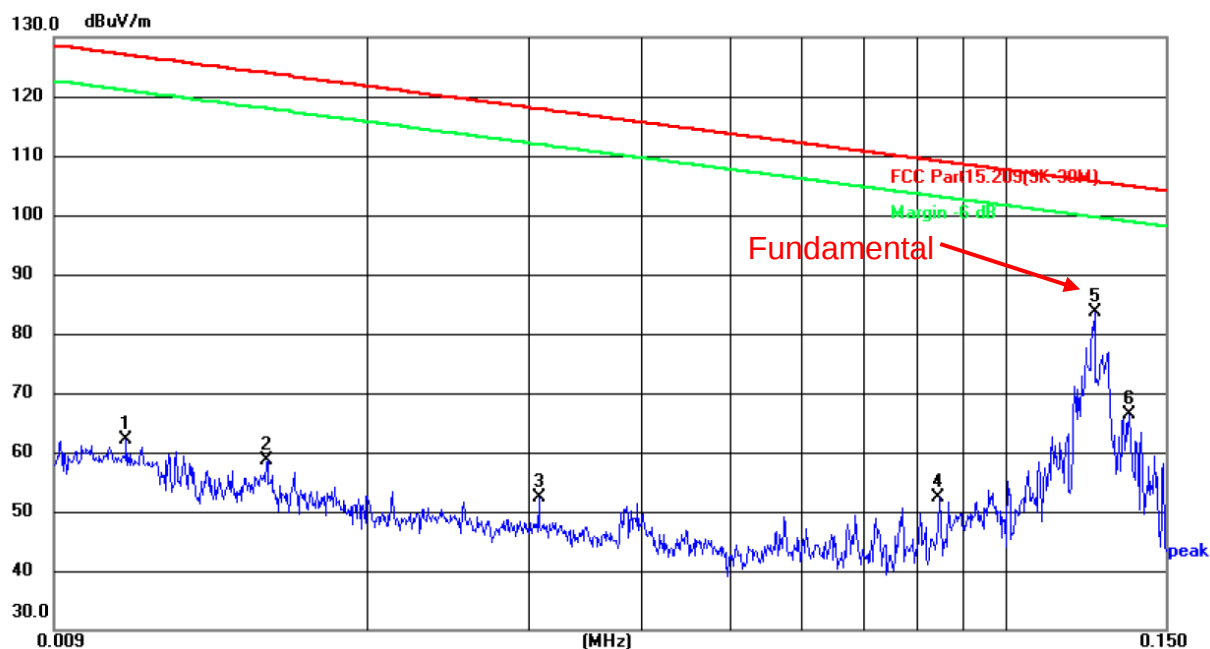
Temperature: 23.9(°C)

Humidity: 42 %

Limit: FCC Part15.209(9K-30M)

Power:DC 3.7 V

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-----|--------|
| 1   | 0.0153          | 40.96          | 20.67         | 61.63          | 123.91         | -62.28      | peak     | P   |        |
| 2   | 0.0400          | 33.06          | 20.54         | 53.60          | 115.56         | -61.96      | peak     | P   |        |
| 3   | 0.0560          | 31.81          | 20.76         | 52.57          | 112.64         | -60.07      | peak     | P   |        |
| 4   | 0.1049          | 38.12          | 21.09         | 59.21          | 107.19         | -47.98      | peak     | P   |        |
| 5 * | 0.1251          | 65.73          | 20.35         | 86.08          | 105.66         | -19.58      | peak     | P   |        |
| 6   | 0.1347          | 48.07          | 20.22         | 68.29          | 105.02         | -36.73      | peak     | P   |        |



Site: #3 3m Anechoic Chamber

Polarization: **Conplanar**

Temperature: 23.9(°C)

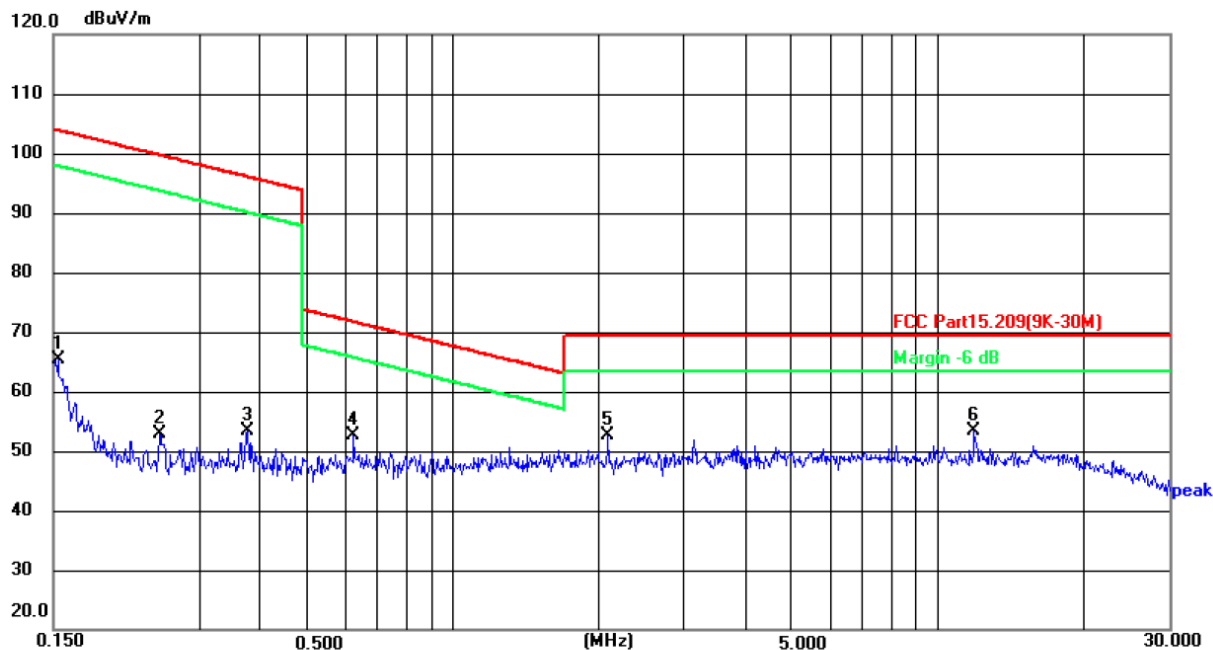
Humidity: 42 %

Limit: FCC Part15.209(9K-30M)

Power:DC 3.7 V

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-----|--------|
| 1   | 0.0108          | 41.50          | 20.72         | 62.22          | 126.94         | -64.72      | peak     | P   |        |
| 2   | 0.0154          | 37.93          | 20.67         | 58.60          | 123.85         | -65.25      | peak     | P   |        |
| 3   | 0.0307          | 31.97          | 20.47         | 52.44          | 117.86         | -65.42      | peak     | P   |        |
| 4   | 0.0844          | 31.30          | 21.01         | 52.31          | 109.08         | -56.77      | peak     | P   |        |
| 5 * | 0.1252          | 63.27          | 20.34         | 83.61          | 105.65         | -22.04      | peak     | P   |        |
| 6   | 0.1370          | 46.06          | 20.31         | 66.37          | 104.87         | -38.50      | peak     | P   |        |

150KHz-30MHz:



Site: #3 3m Anechoic Chamber

Polarization: **Coaxial**

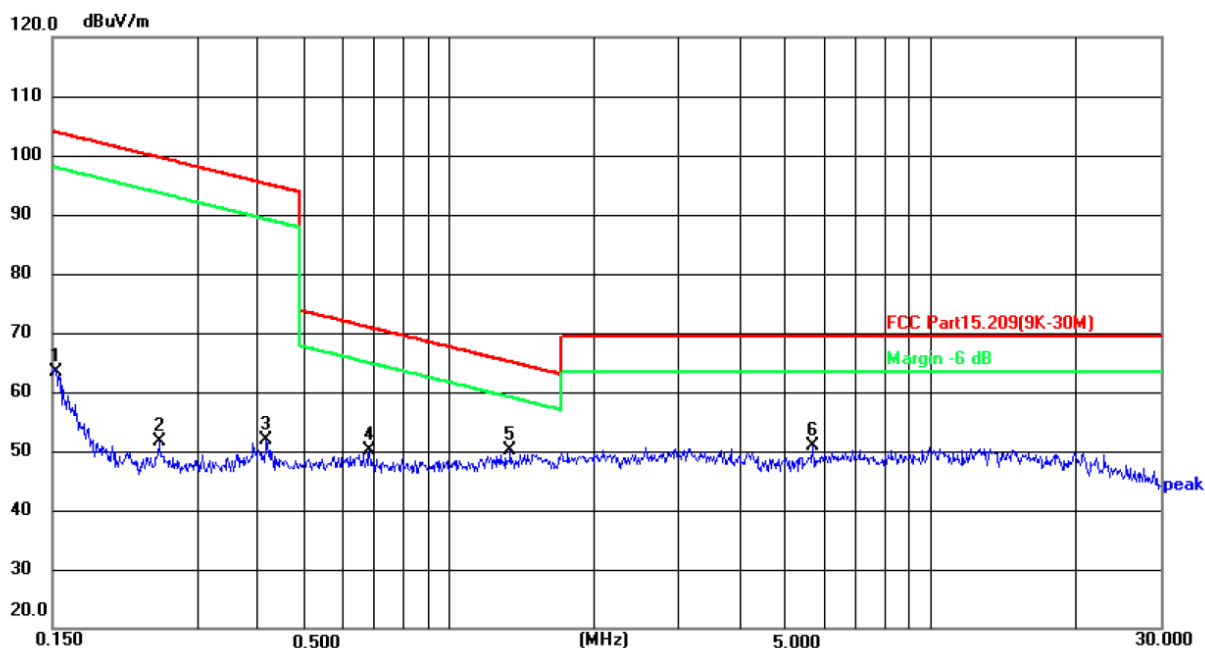
Temperature: 23.9(°C)

Humidity: 42 %

Limit: FCC Part15.209(9K-30M)

Power:DC 3.7 V

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-----|--------|
| 1   | 0.1534          | 44.58          | 20.72         | 65.30          | 103.89         | -38.59      | peak     | P   |        |
| 2   | 0.2487          | 31.92          | 20.96         | 52.88          | 99.69          | -46.81      | peak     | P   |        |
| 3   | 0.3769          | 32.22          | 21.25         | 53.47          | 96.08          | -42.61      | peak     | P   |        |
| 4   | 0.6250          | 30.83          | 21.82         | 52.65          | 71.69          | -19.04      | peak     | P   |        |
| 5   | 2.0932          | 27.63          | 24.91         | 52.54          | 69.50          | -16.96      | peak     | P   |        |
| 6 * | 11.9009         | 33.44          | 20.04         | 53.48          | 69.50          | -16.02      | peak     | P   |        |



Site: #3 3m Anechoic Chamber

Polarization: **Conplanar**

Temperature: 23.9(°C)

Humidity: 42 %

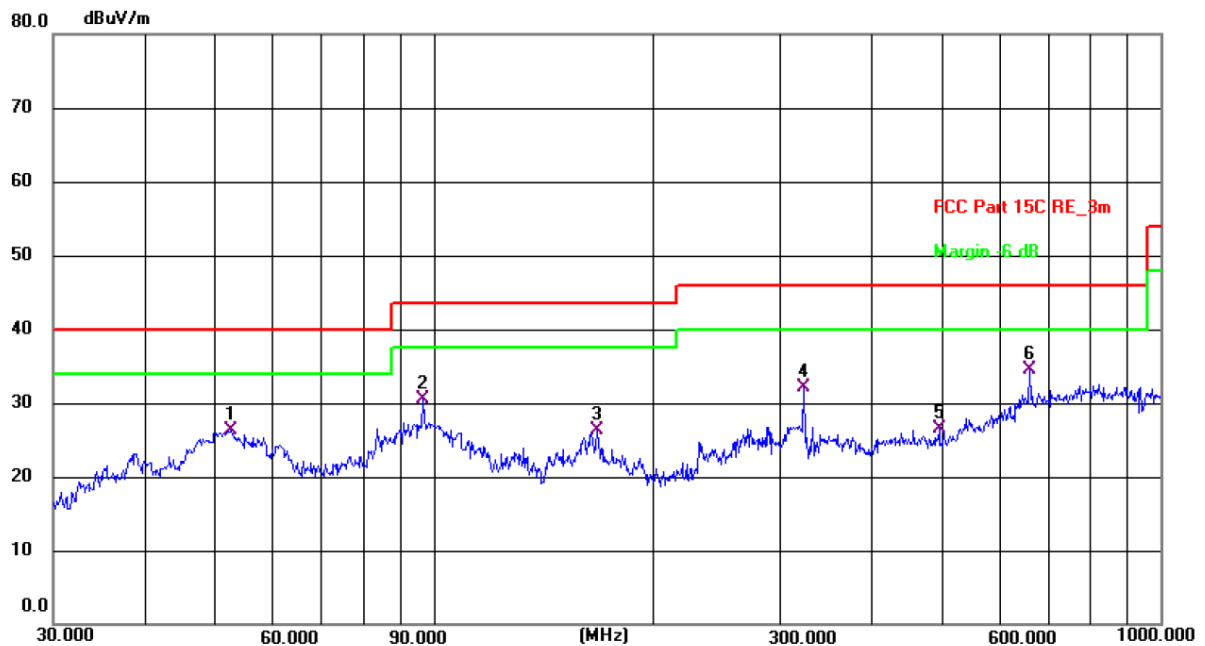
Limit: FCC Part15.209(9K-30M)

Power:DC 3.7 V

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-----|--------|
| 1   | 0.1527          | 42.56          | 20.72         | 63.28          | 103.93         | -40.65      | peak     | P   |        |
| 2   | 0.2494          | 31.74          | 20.96         | 52.70          | 99.67          | -46.97      | peak     | P   |        |
| 3   | 0.4181          | 31.90          | 21.36         | 53.26          | 95.18          | -41.92      | peak     | P   |        |
| 4   | 0.6844          | 30.20          | 21.95         | 52.15          | 70.91          | -18.76      | peak     | P   |        |
| 5 * | 1.3378          | 28.82          | 23.37         | 52.19          | 65.10          | -12.91      | peak     | P   |        |
| 6   | 5.7134          | 20.37          | 31.99         | 52.36          | 69.50          | -17.14      | peak     | P   |        |

## 30MHz-1GHz

Horizontal:



Site #2 3m Anechoic Chamber

Polarization: **Horizontal**

Temperature: 24.1(C)

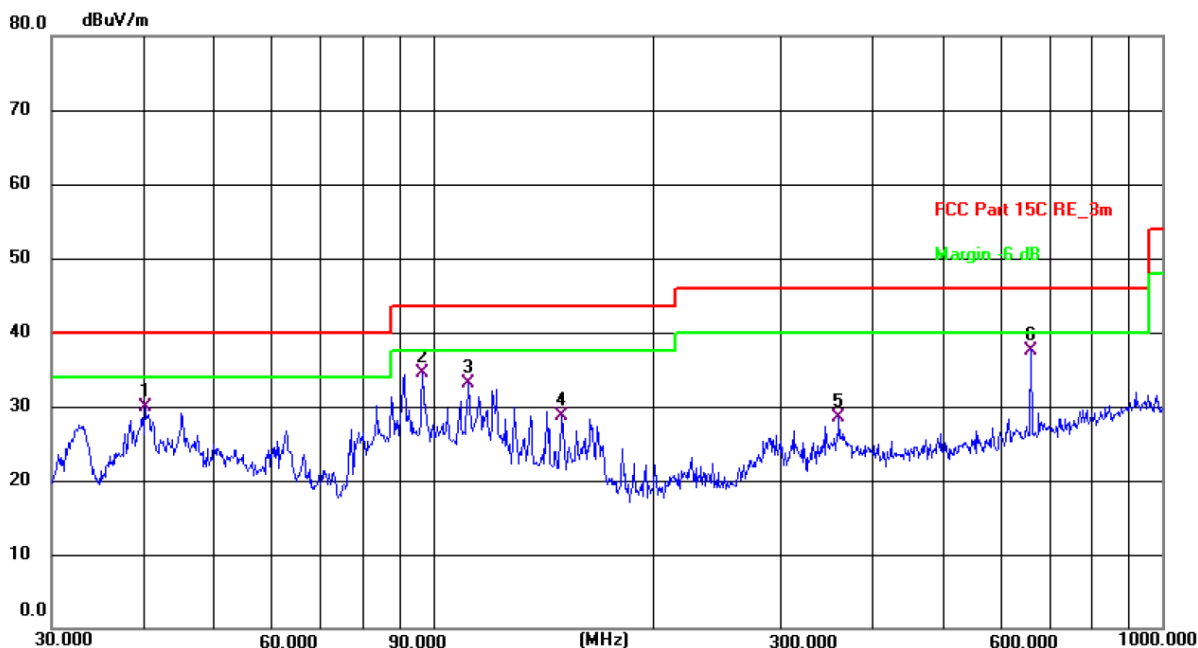
Humidity: 54 %

Limit: FCC Part 15C RE\_3m

Power: DC 3.7 V

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-----|--------|
| 1   | 52.7600         | 12.86          | 13.39         | 26.25          | 40.00          | -13.75      | QP       | P   |        |
| 2   | 96.7749         | 19.77          | 10.68         | 30.45          | 43.50          | -13.05      | QP       | P   |        |
| 3   | 167.8240        | 11.99          | 14.28         | 26.27          | 43.50          | -17.23      | QP       | P   |        |
| 4   | 323.3201        | 16.64          | 15.42         | 32.06          | 46.00          | -13.94      | QP       | P   |        |
| 5   | 495.9343        | 7.25           | 19.28         | 26.53          | 46.00          | -19.47      | QP       | P   |        |
| 6 * | 661.1503        | 11.68          | 22.73         | 34.41          | 46.00          | -11.59      | QP       | P   |        |

Vertical:



Site #2 3m Anechoic Chamber

Polarization: **Vertical**

Temperature: 24.1(C)

Humidity: 54 %

Limit: FCC Part 15C RE\_3m

Power: DC 3.7 V

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | P/F | Remark |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|----------|-----|--------|
| 1   | 40.2754         | 15.47          | 14.40         | 29.87          | 40.00          | -10.13      | QP       | P   |        |
| 2   | 96.7749         | 23.83          | 10.68         | 34.51          | 43.50          | -8.99       | QP       | P   |        |
| 3   | 111.7377        | 21.04          | 12.02         | 33.06          | 43.50          | -10.44      | QP       | P   |        |
| 4   | 150.0107        | 13.76          | 14.88         | 28.64          | 43.50          | -14.86      | QP       | P   |        |
| 5   | 360.4476        | 12.38          | 16.16         | 28.54          | 46.00          | -17.46      | QP       | P   |        |
| 6 * | 661.1503        | 14.87          | 22.73         | 37.60          | 46.00          | -8.40       | QP       | P   |        |

**Note:**

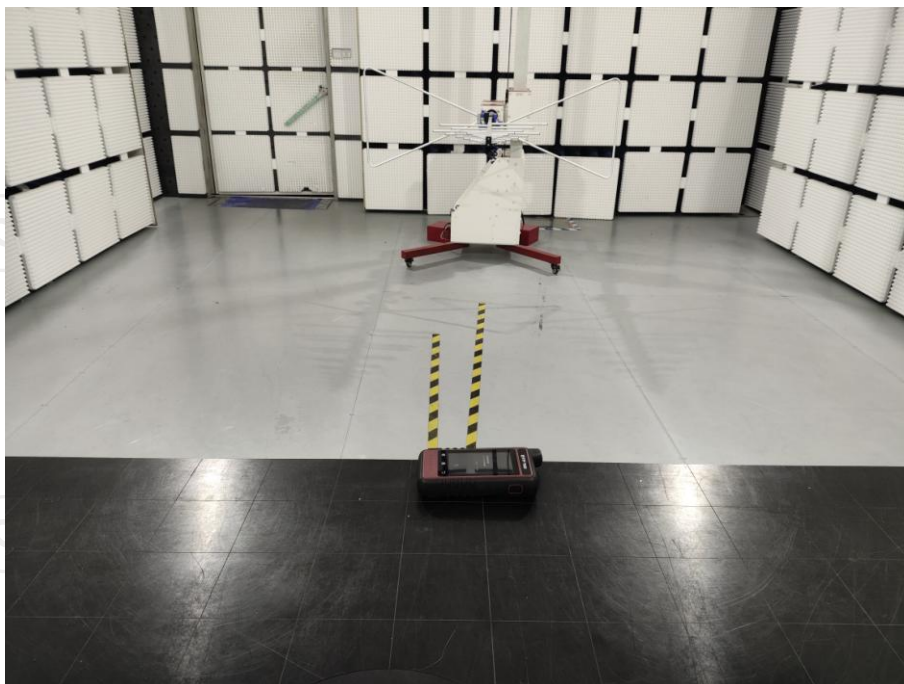
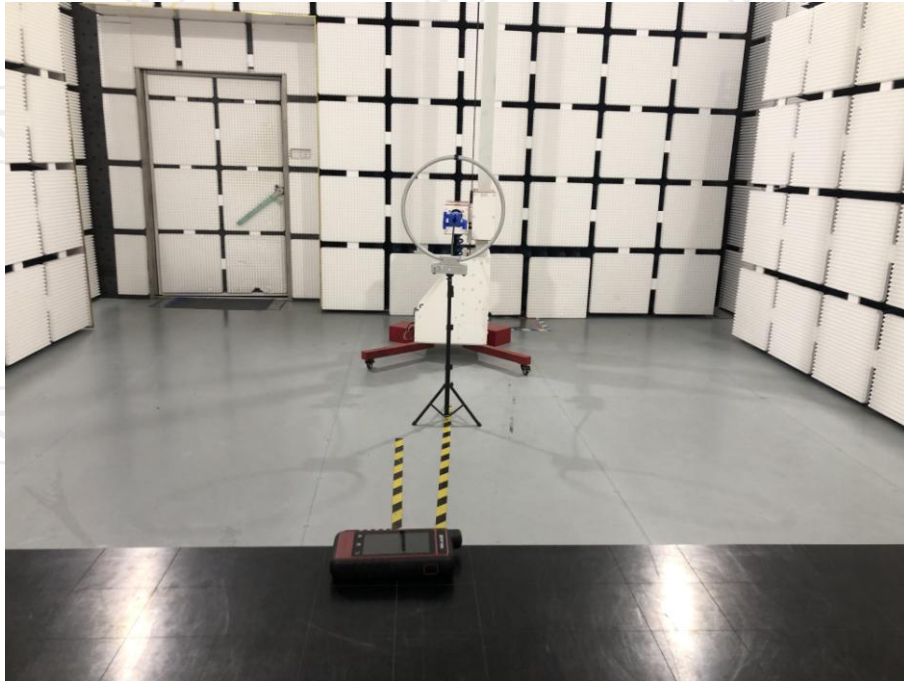
Emission Level=Peak Reading + Correction Factor; Correction Factor= Antenna Factor + Cable loss – Pre-amplifier

## Appendix B: Photographs of Test Setup

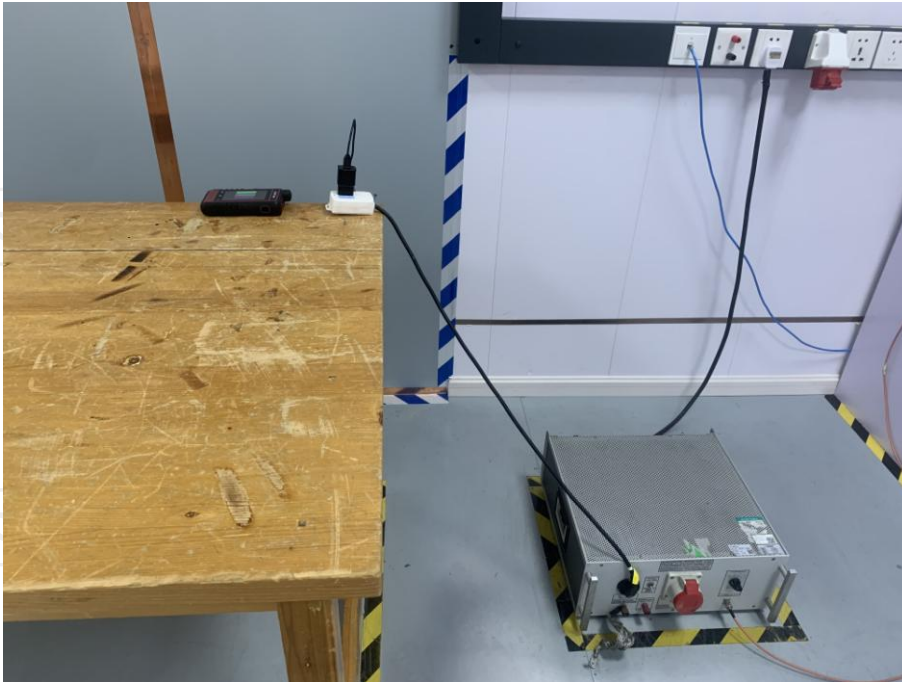
Product: TPMS Diagnostic Tool

Model: TKTT6

Radiated Emission



### Conducted Emission



## Appendix C: Photographs of EUT

Refer to the test report No. TCT231101E023

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