TCT 通测检测 TESTING CENTRE TECHNOLOGY

# TEST REPORT

| | |
|---|---|
| **FCC ID. ..... :** | 2APP6ARU-10 |
| **Test Report No..... :** | TCT240104E038 |
| **Date of issue..... :** | Mar. 26, 2025 |
| **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..... :** | Aroma Music Co., Ltd. |
| **Address..... :** | 203, No. 93 Qianjin 2nd Road, Area 81, Hexi Neighbourhood, Xixiang Town, Baoan District, Shenzhen City, Guangdong, 518000 China |
| **Manufacturer's name ... :** | Aroma Technology Co., Limited |
| **Address..... :** | Building A, Aroma Park, Guwu Village, Danshui Town, Huiyang District, Huizhou, Guangdong 516200 China |
| **Standard(s) ..... :** | FCC CFR Title 47 Part 15 Subpart C Section 15.236 |
| **Product Name..... :** | WIRELESS AUDIO TRANSMISSION |
| **Trade Mark ..... :** | N/A |
| **Model/Type reference..... :** | ARU-10, AirMate Ⅱ, IN-80, BRU-10, ARC2, VoxMate, M4, BRC2, EKGBUHF |
| **Rating(s)..... :** | Rechargeable Li-ion Battery DC 3.7V |
| **Date of receipt of test item ..... :** | Jan. 04, 2025 |
| **Date (s) of performance of test..... :** | Jan. 04, 2025 ~ Mar. 26, 2025 |
| **Tested by (+signature) ... :** | Ronald LUO |
| **Check by (+signature).... :** | Beryl ZHAO |
| **Approved by (+signature):** | Tomsin |

**General disclaimer:**

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# 1. General Product Information

## 1.1. EUT description

| | |
|---|---|
| **Product Name.....:** | WIRELESS AUDIO TRANSMISSION |
| **Model/Type reference.....:** | ARU-10 |
| **Sample Number.....:** | TCT240104E038-0101 |
| **Operation Frequency.....:** | 657.1MHz-662.9MHz |
| **Modulation Technology.....:** | FSK |
| **Antenna Type.....:** | Internal Antenna |
| **Antenna Gain.....:** | -3.75dBi |
| **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

| No. | Model No. | Tested with |
|---|---|---|
| 1 | ARU-10 | ☒ |
| Other models | AirMate Ⅱ, IN-80, BRU-10, ARC2, VoxMate, M4, BRC2, EKGBUHF | ☐ |

Note: ARU-10 is tested model, other models are derivative models. The models are identical in circuit and PCB layout, only different on the model names and timbre processing circuit. So the test data of ARU-10 can represent the remaining models.

## 1.3. Operation Frequency

657.1MHz-662.9MHz

| Channel | Frequency | Channel | Frequency | Channel | Frequency | Channel | Frequency |
|---|---|---|---|---|---|---|---|
| 1 | 657.1MHz | 3 | 658.7MHz | 5 | 660.3MHz | 7 | 662.9MHz |
| 2 | 657.9MHz | 4 | 659.5MHz | 6 | 661.1MHz | | |
| Remark: Channel 1, 4 & 7 have been tested for FSK modulation mode. | | | | | | | |



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# 2. General Information

## 2.1. Test environment and mode

| Operating Environment: | | |
|---|---|---|
| Condition | Conducted Emission | Radiated Emission |
| Temperature: | 23.5 °C | 23.7 °C |
| Humidity: | 52 % RH | 54 % RH |
| Atmospheric Pressure: | 1010 mbar | 1010 mbar |
| Test Mode: | | |
| Engineering mode: | Keep the EUT in continuous transmitting by select channel and modulations with Fully-charged battery | |
| The sample was placed 0.8m & 1.5m for the measurement below & above 1GHz 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. | | |

## 2.2. 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 |
|---|---|---|---|---|
| Adapter | JD-050200 | 2012010907576735 | / | JD |

***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.*



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# 3. Facilities and Accreditations

## 3.1. 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.

## 3.2. 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

## 3.3. Measurement Uncertainty

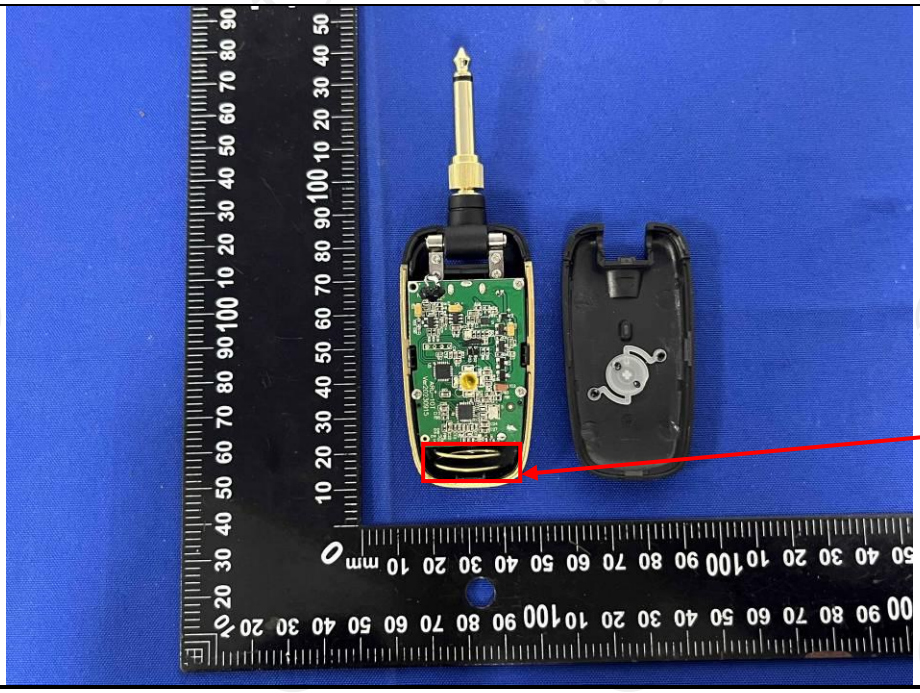
The reported uncertainty of measurement y ± U, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

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

# 4. Test Results and Measurement Data

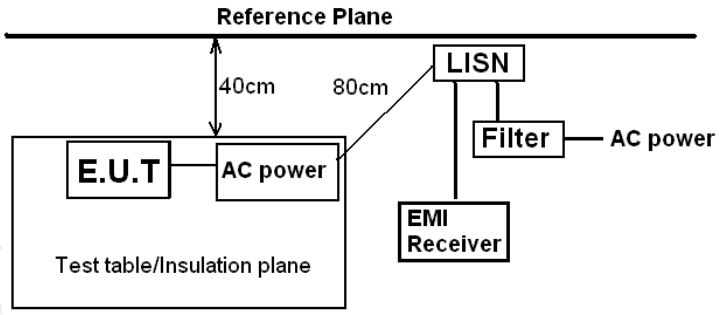
## 4.1. Antenna requirement

| **Standard requirement:** | FCC Part15 C Section 15.203 |
|---|---|
| 15.203 requirement:<br>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 an internal antenna which permanently attached, and the best case gain of the antenna is -3.75dBi. | |



## 4.2. Conducted Emission

### 4.2.1. 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:** | Frequency range (MHz) / Limit (dBuV): Quasi-peak / Average<br>0.15-0.5: 66 to 56* / 56 to 46*<br>0.5-5: 56 / 46<br>5-30: 60 / 50 |
| **Test Setup:** |  <br>*Remark:*<br>*E.U.T: Equipment Under Test*<br>*LISN: Line Impedence Stabilization Network*<br>*Test table height=0.8m* |
| **Test Mode:** | Charging + transmitting modulation |
| **Test Procedure:** | 1. The E.U.T is connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.<br>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).<br>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. |
| **Test Result:** | PASS |

### 4.2.2. 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 Stabilisation Newtork(LISN) | Schwarzbeck | NSLK 8126 | 8126453 | Jan. 31, 2025 |
| Line-5 | TCT | CE-05 | / | Jul. 03, 2024 |
| EMI Test Software | Shurple Technology | EZ-EMC | / | / |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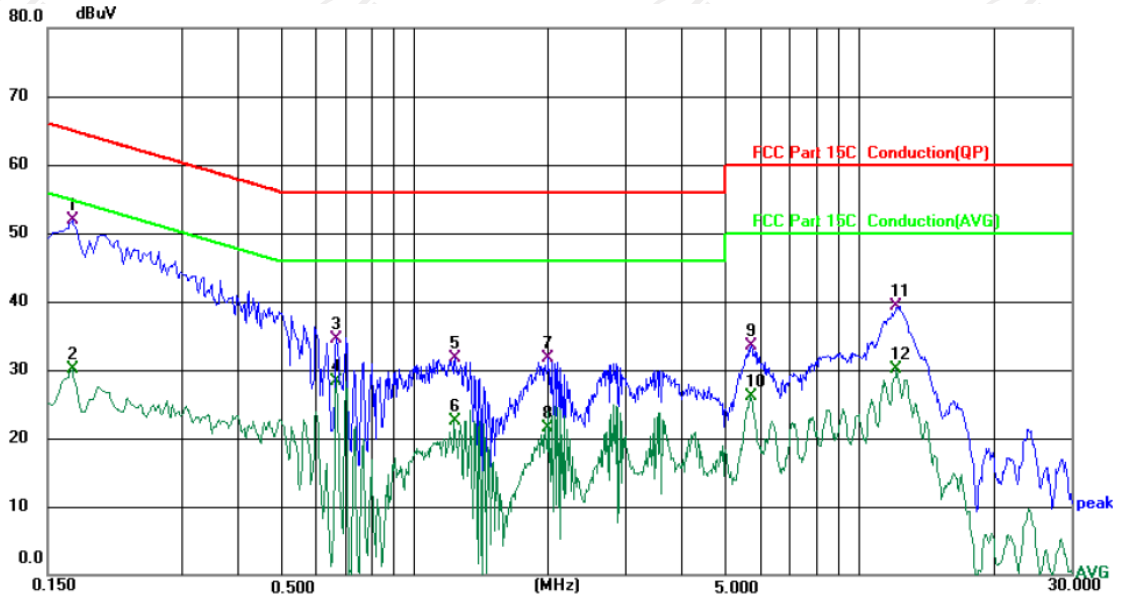
### 4.2.3. Test data

**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 (℃) | Humidity: 52 %

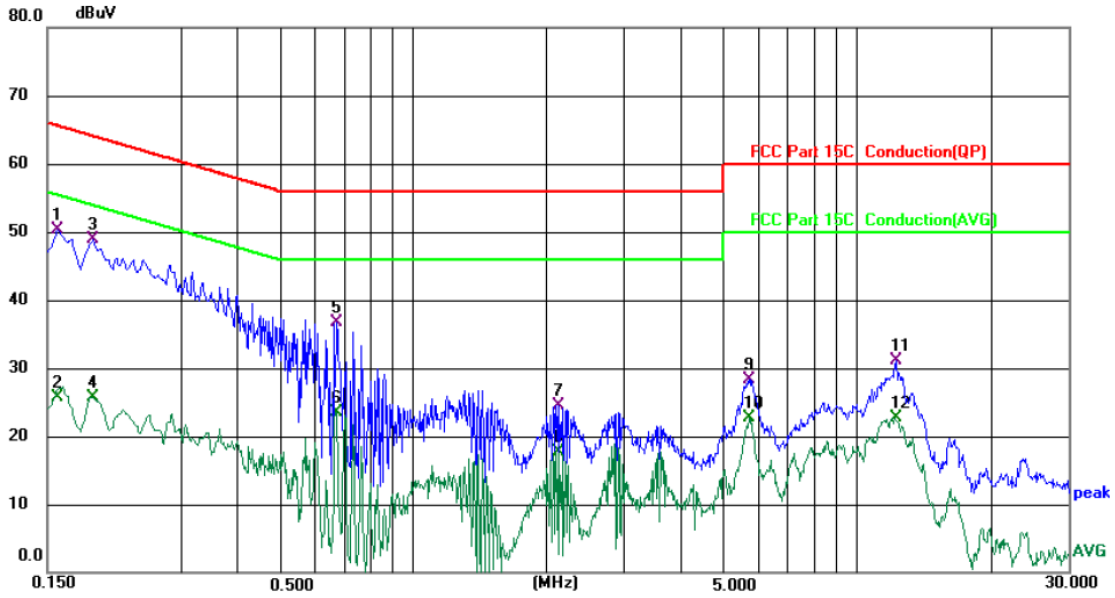
Limit: FCC Part 15C Conduction(QP) | Power: DC 5 V(Adapter Input AC 120 V/ 60 Hz)

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | * | 0.1700 | 41.79 | 10.13 | 51.92 | 64.96 | -13.04 | QP | |
| 2 | | 0.1700 | 20.02 | 10.13 | 30.15 | 54.96 | -24.81 | AVG | |
| 3 | | 0.6700 | 25.26 | 9.29 | 34.55 | 56.00 | -21.45 | QP | |
| 4 | | 0.6700 | 18.95 | 9.29 | 28.24 | 46.00 | -17.76 | AVG | |
| 5 | | 1.2379 | 21.68 | 9.98 | 31.66 | 56.00 | -24.34 | QP | |
| 6 | | 1.2379 | 12.45 | 9.98 | 22.43 | 46.00 | -23.57 | AVG | |
| 7 | | 2.0059 | 21.65 | 10.01 | 31.66 | 56.00 | -24.34 | QP | |
| 8 | | 2.0059 | 11.53 | 10.01 | 21.54 | 46.00 | -24.46 | AVG | |
| 9 | | 5.7179 | 23.35 | 10.10 | 33.45 | 60.00 | -26.55 | QP | |
| 10 | | 5.7179 | 15.92 | 10.10 | 26.02 | 50.00 | -23.98 | AVG | |
| 11 | | 12.1700 | 29.08 | 10.16 | 39.24 | 60.00 | -20.76 | QP | |
| 12 | | 12.1700 | 19.93 | 10.16 | 30.09 | 50.00 | -19.91 | 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 (℃) | Humidity: 52 %

Limit: FCC Part 15C Conduction(QP) | Power: DC 5 V(Adapter Input AC 120 V/ 60 Hz)

| No. | Mk. | Freq. | Reading Level | Correct Factor | Measure-ment | Limit | Over | | |
|---|---|---|---|---|---|---|---|---|---|
| | | MHz | dBuV | dB | dBuV | dBuV | dB | Detector | Comment |
| 1 | | 0.1580 | 40.25 | 10.10 | 50.35 | 65.57 | -15.22 | QP | |
| 2 | | 0.1580 | 15.70 | 10.10 | 25.80 | 55.57 | -29.77 | AVG | |
| 3 | * | 0.1900 | 38.68 | 10.14 | 48.82 | 64.04 | -15.22 | QP | |
| 4 | | 0.1900 | 15.48 | 10.14 | 25.62 | 54.04 | -28.42 | AVG | |
| 5 | | 0.6740 | 27.41 | 9.30 | 36.71 | 56.00 | -19.29 | QP | |
| 6 | | 0.6740 | 14.25 | 9.30 | 23.55 | 46.00 | -22.45 | AVG | |
| 7 | | 2.1419 | 14.54 | 10.02 | 24.56 | 56.00 | -31.44 | QP | |
| 8 | | 2.1419 | 7.68 | 10.02 | 17.70 | 46.00 | -28.30 | AVG | |
| 9 | | 5.7179 | 18.24 | 10.12 | 28.36 | 60.00 | -31.64 | QP | |
| 10 | | 5.7179 | 12.52 | 10.12 | 22.64 | 50.00 | -27.36 | AVG | |
| 11 | | 12.2620 | 20.80 | 10.22 | 31.02 | 60.00 | -28.98 | QP | |
| 12 | | 12.2620 | 12.46 | 10.22 | 22.68 | 50.00 | -27.32 | AVG | |

***Note1:***

*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*

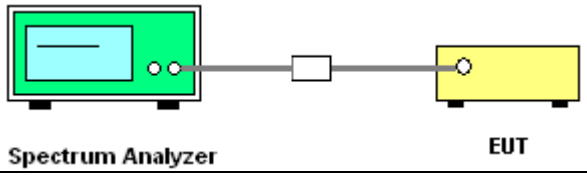
*AVG =average*

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

***Note2:*** *Measurements were conducted in all three channels (high, middle, low), and the worst case Mode (Lowest channel) was submitted only.*

## 4.3. Maximum Radiated Output Power

### 4.3.1. Test Specification

| | |
|---|---|
| **Test Requirement:** | FCC Part15 C Section 15.236 (d) |
| **Test Method:** | ANSI C63.10:2013 |
| **Limit:** | 20 mW EIRP |
| **Test Setup:** |  |
| **Test Mode:** | Transmitting mode with modulation |
| **Test Procedure:** | 1. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.<br>2. Set to the maximum power setting and enable the EUT transmit continuously.<br>3. Measure the conducted output power and record the results in the test report. |
| **Test Result:** | PASS |

### 4.3.2. Test Instruments

| Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| Spectrum Analyzer | R&S | FSU | 200054 | Jun. 27, 2024 |

### 4.3.3. Test Data

| Frequency (MHz) | Conducted Output Power (dBm) | Antenna Gain | EIRP (dBm) | EIRP (mw) | EIRP Limit (mw) | Result |
|---|---|---|---|---|---|---|
| 657.1 | 11.96 | -3.75 | 8.21 | 6.62 | 20 | PASS |
| 659.5 | 11.90 | -3.75 | 8.15 | 6.53 | 20 | PASS |
| 662.9 | 11.80 | -3.75 | 8.05 | 6.38 | 20 | PASS |

**Note: EIRP = Conducted Output Power + Antenna Gain**



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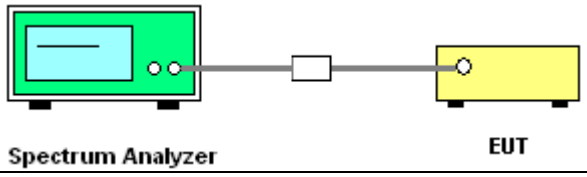
## 4.4. Occupied Bandwidth

### 4.4.1. Test Specification

| | |
|---|---|
| **Test Requirement:** | FCC Part15 C Section 15.236 (f) |
| **Test Method:** | ANSI C63.10:2013 |
| **Limit:** | not exceed 200 kHz |
| **Test Setup:** |  |
| **Test Mode:** | Transmitting mode with modulation |
| **Test Procedure:** | 1. Set to the maximum power setting and enable the EUT transmit continuously.<br>2. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) shall be in the range of 1% to 5% of the OBW, and VBW shall be approximately three times the RBW. The frequency span for the spectrum analyzer shall be between 1.5 times and 5.0 times the OBW.<br>3. Use the 99% power bandwidth function and record the results in the test report. |
| **Test Result:** | PASS |

### 4.4.2. Test Instruments

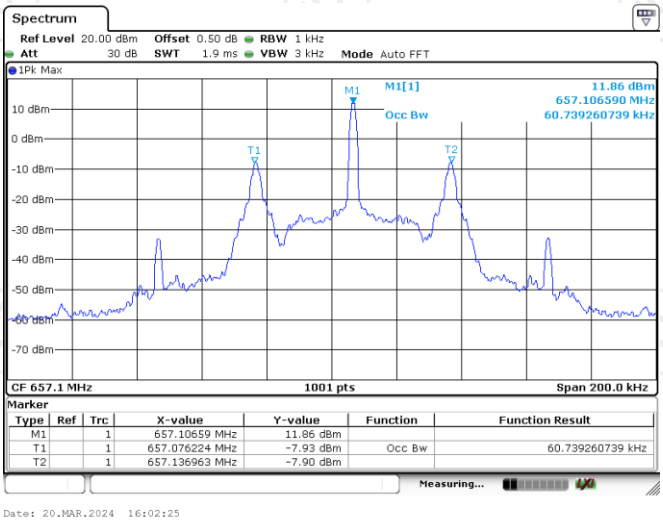
| RF Test Room | | | | |
|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model** | **Serial Number** | **Calibration Due** |
| Spectrum Analyzer | R&S | FSU | 200054 | Jun. 27, 2024 |

### 4.4.3. Test data

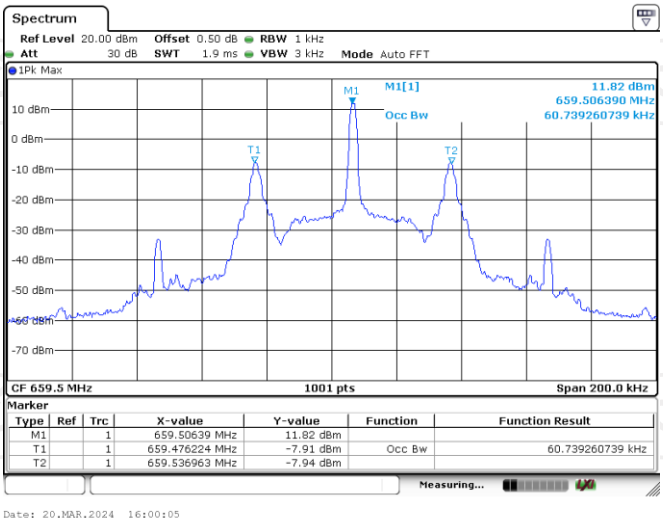
| Frequency (MHz) | Occupy Bandwidth (kHz) | Limit (kHz) | Conclusion |
|---|---|---|---|
| 657.1 | 60.74 | 200 | PASS |
| 659.5 | 60.74 | 200 | PASS |
| 662.9 | 60.74 | 200 | PASS |

**Test plots as follows:**

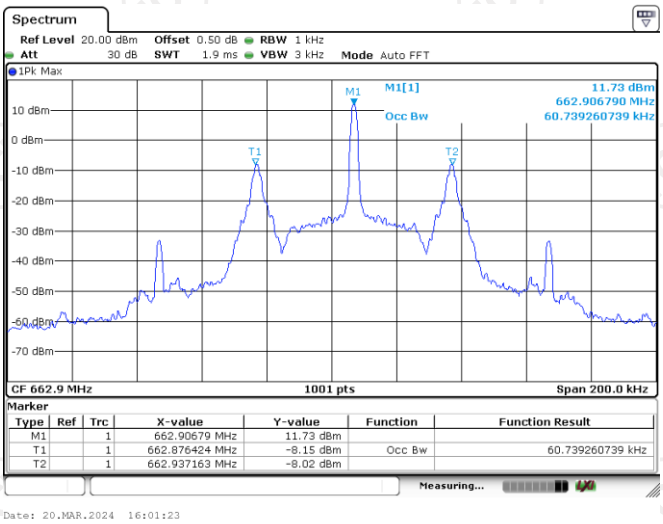
657.1MHz




657.1MHz

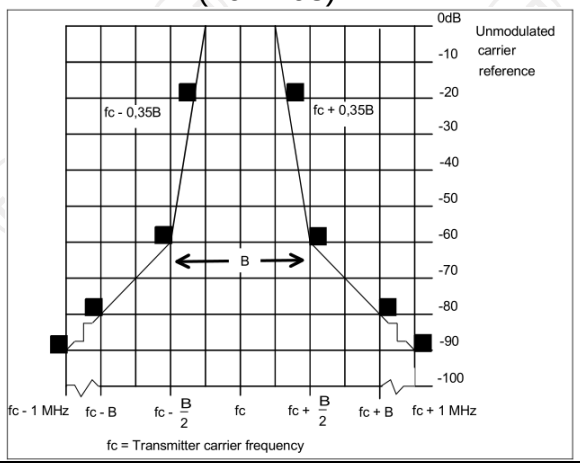
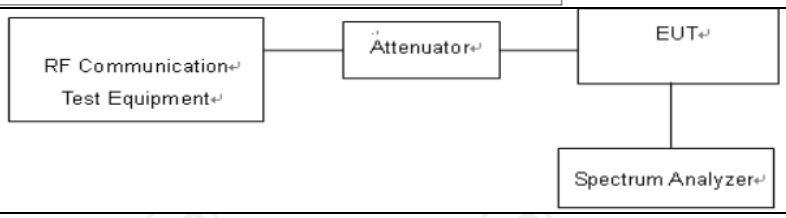



657.1MHz



## 4.5. Necessary Bandwidth Spurious Emissions

### 4.5.1. Test Specification

| | |
|---|---|
| **Test Requirement:** | FCC Part15 C Section 15.236 (g) |
| **Test Method:** | ANSI C63.10:2013 |
| **Limit:** | Emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in §8.3.1.2 of ETSI EN 300 422-1 V1.4.2 (2011-08)<br>  |
| **Test Setup:** |  |
| **Test Mode:** | Transmitting mode with modulation |
| **Test Procedure:** | 1. With the Low Frequency (LF) audio signal generator set to 500 Hz, the audio input level to the EUT shall be adjusted to 8 dB below the limiting threshold (-8 dB (lim)) as declared by the manufacturer.<br>2. The corresponding audio output level from the demodulator shall be measured and recorded.<br>3. The input impedance of the noise meter shall be sufficiently high to avoid more than 0.1 dB change in input level when the meter is switched between input and output.<br>4.The audio input level shall be increased by 20 dB, i.e. to +12 dB (lim), and the corresponding change in output level shall be measured.It shall be checked that the audio output level has increased by ⩽ 10 dB. If this condition is not met, the initial audio input level shall be increased from -8 dB (lim) in 1 dB steps until the above condition is fulfilled, and the input level recorded in the test report. This level replaces the value derived from the manufacturer's declaration and is defined as -8 dB (lim). |



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| | |
|---|---|
| | 5. Measure the input level at the transmitter required to give +12 dB (lim).<br>6. The transmitter RF output spectrum shall be measured, using a spectrum analyser with the following settings:<br>- centre frequency: fc: Transmitter (Tx) nominal frequency;<br>- dispersion (Span): fc - 1 MHz to fc + 1 MHz;<br>- Resolution BandWidth (RBW): 1 kHz;<br>- Video BandWidth (VBW): 1 kHz;<br>- detector: Peak hold. |
| **Test Result:** | PASS |

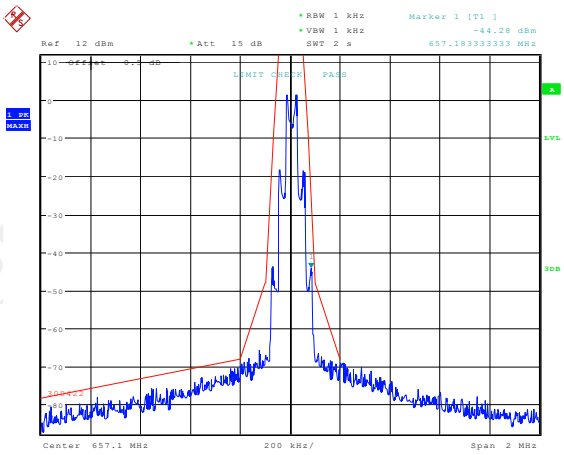
### 4.5.2. Test Instruments

| RF Test Room | | | | |
|---|---|---|---|---|
| **Equipment** | **Manufacturer** | **Model** | **Serial Number** | **Calibration Due** |
| Spectrum Analyzer | R&S | FSU | 200054 | Jun. 27, 2024 |
| Signal Generator | Agilent | N5182A | MY47420221 | Jun. 28, 2024 |

## 4.5.3. Test data

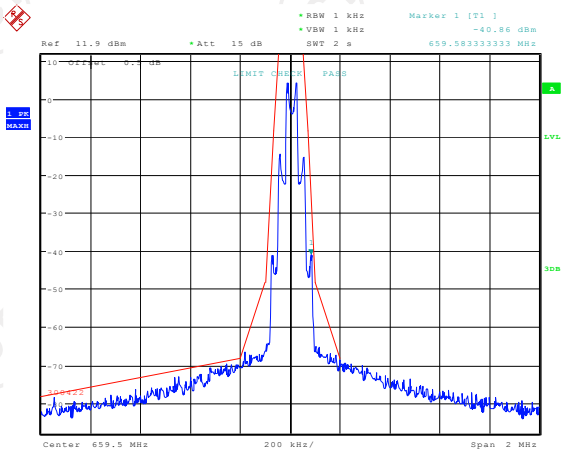
**Test plots as follows:**

657.1MHz



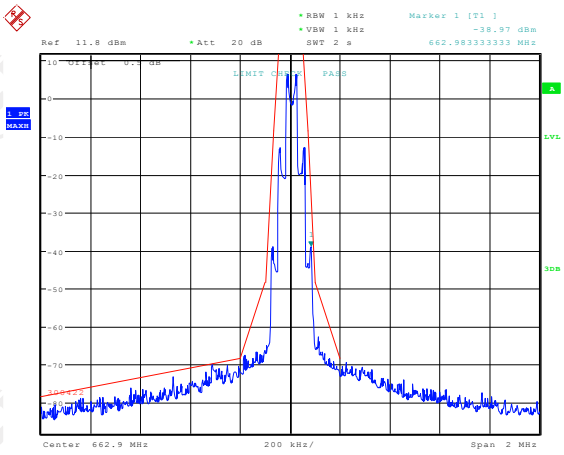

Date: 23.MAR.2024 11:42:37

659.5MHz




Date: 23.MAR.2024 11:31:33

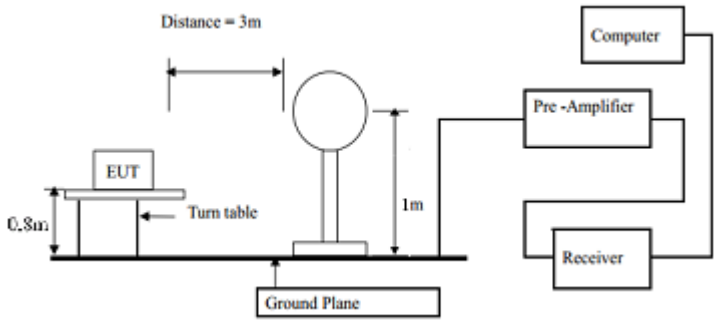
662.9MHz



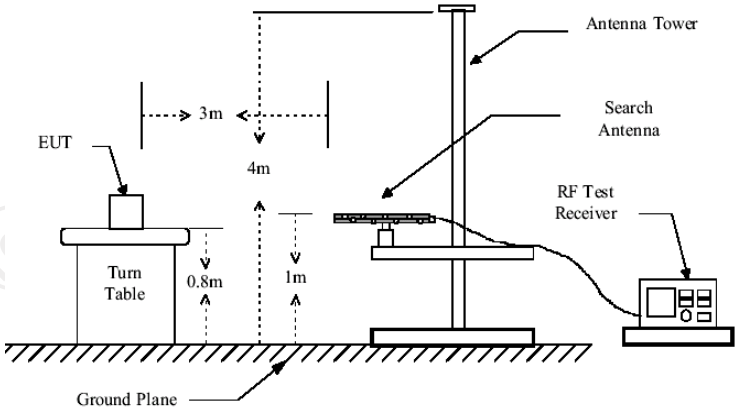

Date: 23.MAR.2024 11:13:19

## 4.6. Radiated Spurious Emission Measurement

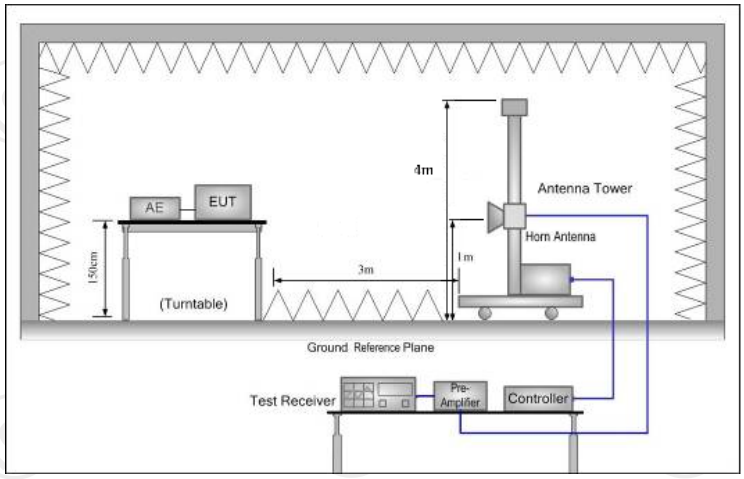
### 4.6.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.236 (g)</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10: 2013</td></tr>
<tr><td>Frequency Range:</td><td>9 kHz to 2 GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Transmitting mode with modulation</td></tr>
<tr><td>Receiver Setup:</td><td>
<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>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td rowspan="2">State</td><td colspan="3">Frequency</td></tr>
<tr><td>47 MHz to 74 MHz<br>87,5 MHz to 137 MHz<br>174 MHz to 230 MHz<br>470 MHz to 862 MHz</td><td>Other Frequencies below 1 000 MHz</td><td>Frequencies above 1 000 MHz</td></tr>
<tr><td>Operation</td><td>4 nW</td><td>250 nW</td><td>1 µW</td></tr>
<tr><td>Standby</td><td>2 nW</td><td>2 nW</td><td>20 nW</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz<br> 

<br>30MHz to 1GHz</td></tr>
</table>




Above 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.<br>3. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level<br>4. 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.<br>5. Use the following spectrum analyzer settings:<br>(1) Span shall wide enough to fully capture the emission being measured;<br>(2) Set RBW=120 kHz for f < 1 GHz; VBW ≥ RBW; Sweep = auto; Detector function = peak; Trace = max hold;<br>(3) Set RBW = 1 MHz, VBW= 3MHz for f >1 GHz for peak measurement.<br>For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 1/T, 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. |
| **Test results:** | PASS |



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### 4.6.2. 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 | Jan. 31, 2025 |
| Pre-amplifier | SKET | LNPA_1840G-50 | SK202109203500 | Jan. 31, 2025 |
| 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. 02, 2025 |
| Antenna Mast | Keleto | RE-AM | / | / |
| Coaxial cable | SKET | RC-18G-N-M | / | Jan. 31, 2025 |
| Coaxial cable | SKET | RC_40G-K-M | / | Jan. 31, 2025 |
| EMI Test Software | Shurple Technology | EZ-EMC | / | / |


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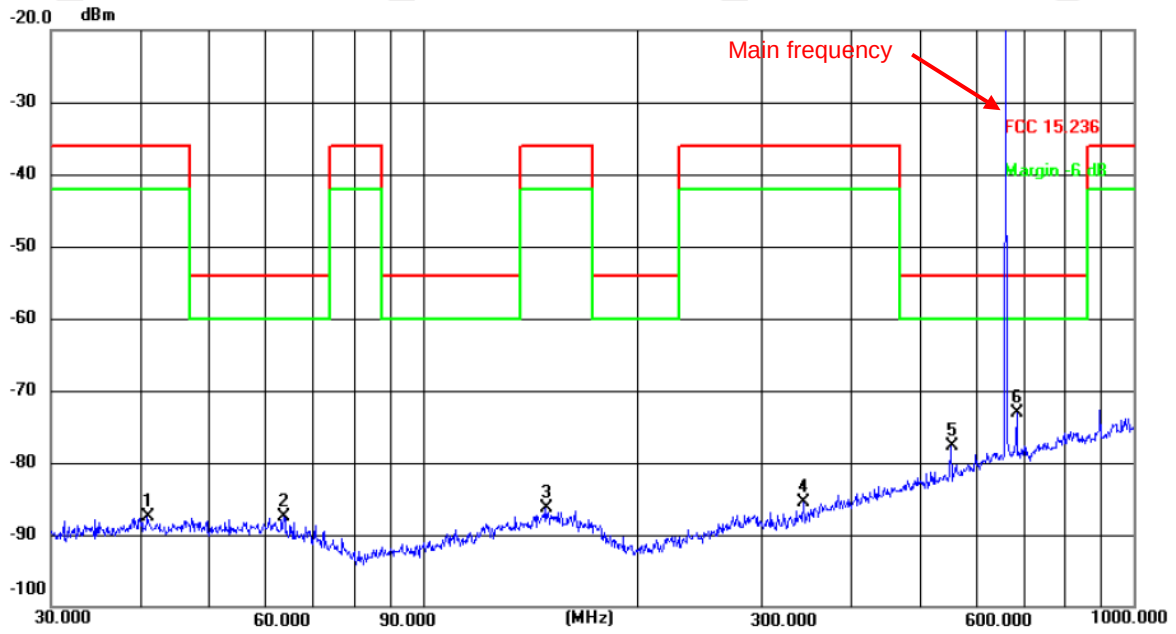
### 4.6.3. Test Data

**Please refer to following diagram for individual**

**Below 1GHz**

Horizontal:

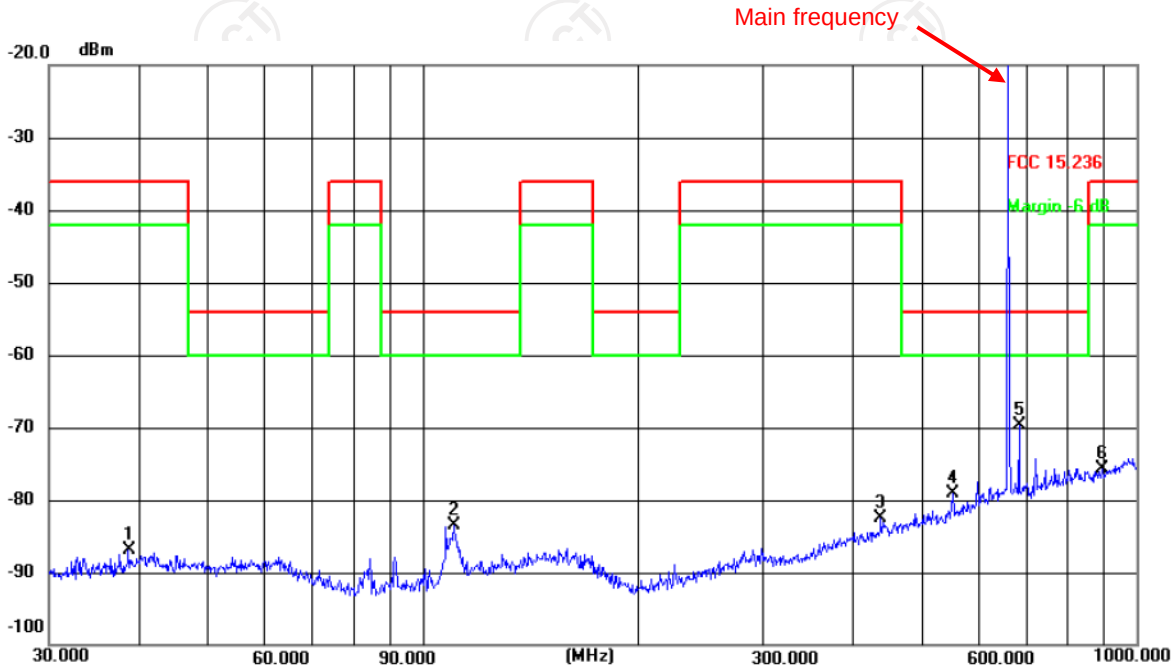



Site #2 3m Anechoic Chamber Polarization: *Horizontal* Temperature: 23.7(C) Humidity: 54 %

Limit: FCC 15.236 Power: DC 3.7V

| No. | Frequency (MHz) | Reading (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 40.9881 | -101.62 | 14.12 | -87.50 | -36.00 | -51.50 | peak | P | |
| 2 | 63.7588 | -100.50 | 13.08 | -87.42 | -54.00 | -33.42 | peak | P | |
| 3 | 148.9625 | -101.00 | 14.75 | -86.25 | -36.00 | -50.25 | peak | P | |
| 4 | 343.1800 | -100.47 | 14.96 | -85.51 | -36.00 | -49.51 | peak | P | |
| 5 | 552.8832 | -97.98 | 20.22 | -77.76 | -54.00 | -23.76 | peak | P | |
| 6 * | 684.7454 | -96.14 | 22.96 | -73.18 | -54.00 | -19.18 | peak | P | |

Vertical:




Site #2 3m Anechoic Chamber Polarization: *Vertical* Temperature: 23.7(C) Humidity: 54 %

Limit: FCC 15.236 Power: DC 3.7V

| No. | Frequency (MHz) | Reading (dBm) | Factor (dB) | Level (dBm) | Limit (dBm) | Margin (dB) | Detector | P/F | Remark |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 38.7518 | -100.88 | 13.96 | -86.92 | -36.00 | -50.92 | peak | P | |
| 2 | 110.5687 | -95.25 | 11.84 | -83.41 | -54.00 | -29.41 | peak | P | |
| 3 | 438.6554 | -100.38 | 17.96 | -82.42 | -36.00 | -46.42 | peak | P | |
| 4 | 552.8832 | -99.29 | 20.22 | -79.07 | -54.00 | -25.07 | peak | P | |
| 5 * | 684.7454 | -92.57 | 22.96 | -69.61 | -54.00 | -15.61 | peak | P | |
| 6 | 896.9965 | -100.87 | 25.22 | -75.65 | -36.00 | -39.65 | peak | P | |

***Note1:*** *Measurements were conducted in all three channels (high, middle, low), and the worst case Mode (Lowest channel) was submitted only.*

**Above 1GHz**

| Frequency (MHz) | Spurious Emission | | Limit (dBm) | Result |
|---|---|---|---|---|
| | Polarization | Level (dBm) | | |
| 2628.792 | V | -39.13 | -30.00 | PASS |
| 3286.002 | V | -40.89 | | |
| -- | -- | -- | | |
| 2628.792 | H | -38.08 | | |
| 3286.154 | H | -35.12 | | |
| -- | -- | -- | | |

***Note:***

1. *The emission levels of other frequencies are very lower than the limit and not show in test report.*
2. *Measurements were conducted at the frequency range 25 MHz to 4 GHz for equipment operating on frequencies below 1 GHz.*
3. *Data of measurement shown "---"in the above table mean that the reading of emissions is attenuated more than 20 dB below the limits or the field strength is too small to be measured.*
4. *Measurements were conducted in all three channels (high, middle, low), and the worst case Mode (Lowest channel) was submitted only.*



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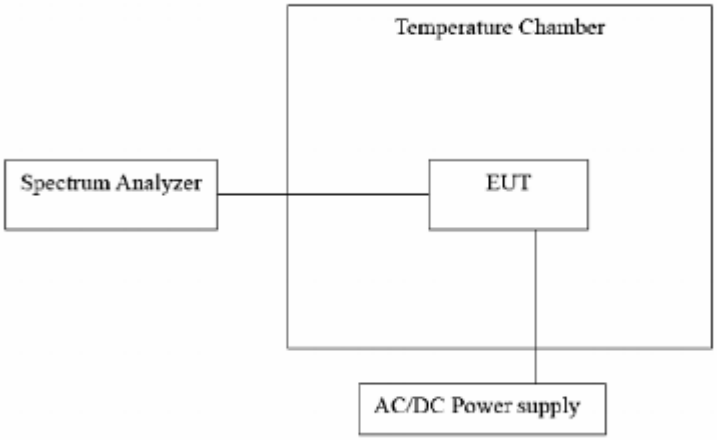
## 4.7. Frequency Stability Measurement

### 4.7.1. Test Specification

| | |
|---|---|
| **Test Requirement:** | FCC Part15 Section 15.236 (f)(3) |
| **Test Method:** | ANSI C63.10: 2013 |
| **Limit:** | The frequency tolerance of the carrier signal shall be maintained within ±0.005% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to115% of the rated supply voltage at a temperature of 20 degrees C. |
| **Test Setup:** |  |
| **Test Procedure:** | The EUT was placed inside the environmental test chamber and powered by nominal AC/DC voltage. b. Turn the EUT on and couple its output to a spectrum analyzer. c. Turn the EUT off and set the chamber to the highest temperature specified. d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature. f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record. |
| **Test Result:** | PASS |



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### 4.7.2. Test Instruments

| Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|---|---|---|---|---|
| Spectrum Analyzer | ROHDE&SCHWARZ | FSQ40 | 200061 | Jun. 29, 2024 |
| Programable tempratuce and humidity chamber | JQ | JQ-2000 | 510101234 | Jun. 28, 2024 |
| DC power supply | Kingrang | KR3005K | / | Jun. 28, 2024 |

### 4.7.3. Test data

Test plots as follows:

657.1MHz

| Temperature (°C) | Voltage (VDC) | Measurement Frequency (MHz) | Delta Frequency (Hz) | Limit (Hz) | Result |
|---|---|---|---|---|---|
| 50 | 3.7V | 657.1062 | 6200 | 32855 | PASS |
| 40 | | 657.1059 | 5900 | 32855 | PASS |
| 30 | | 657.1063 | 6300 | 32855 | PASS |
| 20 | | 657.1065 | 6500 | 32855 | PASS |
| 10 | | 657.1077 | 7700 | 32855 | PASS |
| 0 | | 657.1071 | 7100 | 32855 | PASS |
| -10 | | 657.1055 | 5500 | 32855 | PASS |
| -20 | | 657.1059 | 5900 | 32855 | PASS |
| 20 | 3.3 | 657.1060 | 6000 | 32855 | PASS |
| | 3.7 | 657.1068 | 6800 | 32855 | PASS |
| | 4.2 | 657.1067 | 6700 | 32855 | PASS |

**Note**: Limit(Hz)= 0.00005*Frequency(Hz)=0.00005*657.1*$10^{6=}$32855(Hz)

659.5MHz

| Temperature (°C) | Voltage (VDC) | Measurement Frequency (MHz) | Delta Frequency (Hz) | Limit (Hz) | Result |
|---|---|---|---|---|---|
| 50 | 3.7V | 659.5061 | 6100 | 32975 | PASS |
| 40 | | 659.5063 | 6300 | 32975 | PASS |
| 30 | | 659.5069 | 6900 | 32975 | PASS |
| 20 | | 659.5070 | 7000 | 32975 | PASS |
| 10 | | 659.5058 | 5800 | 32975 | PASS |
| 0 | | 659.5074 | 7400 | 32975 | PASS |
| -10 | | 659.5075 | 7500 | 32975 | PASS |
| -20 | | 659.5068 | 6800 | 32975 | PASS |
| 20 | 3.3 | 659.5057 | 5700 | 32975 | PASS |
| | 3.7 | 659.5066 | 6600 | 32975 | PASS |
| | 4.2 | 659.5053 | 5300 | 32975 | PASS |

**Note**: Limit(Hz)= 0.00005*Frequency(Hz)=0.00005*659.5*$10^{6=}$32975(Hz)



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662.9MHz

| Temperature (°C) | Voltage (VDC) | Measurement Frequency (MHz) | Delta Frequency (Hz) | Limit (Hz) | Result |
|---|---|---|---|---|---|
| 50 | 3.7V | 662.9071 | 7100 | 33145 | PASS |
| 40 | | 662.9079 | 7900 | 33145 | PASS |
| 30 | | 662.9070 | 7000 | 33145 | PASS |
| 20 | | 662.9069 | 6900 | 33145 | PASS |
| 10 | | 662.9066 | 6600 | 33145 | PASS |
| 0 | | 662.9068 | 6800 | 33145 | PASS |
| -10 | | 662.9075 | 7500 | 33145 | PASS |
| -20 | | 662.9073 | 7300 | 33145 | PASS |
| 20 | 3.3 | 662.9081 | 8100 | 33145 | PASS |
| | 3.7 | 662.9076 | 7600 | 33145 | PASS |
| | 4.2 | 662.9083 | 8300 | 33145 | PASS |

**Note**: Limit(Hz)= 0.00005*Frequency(Hz)=0.00005*662.9*$10^{6=}$33145(Hz)



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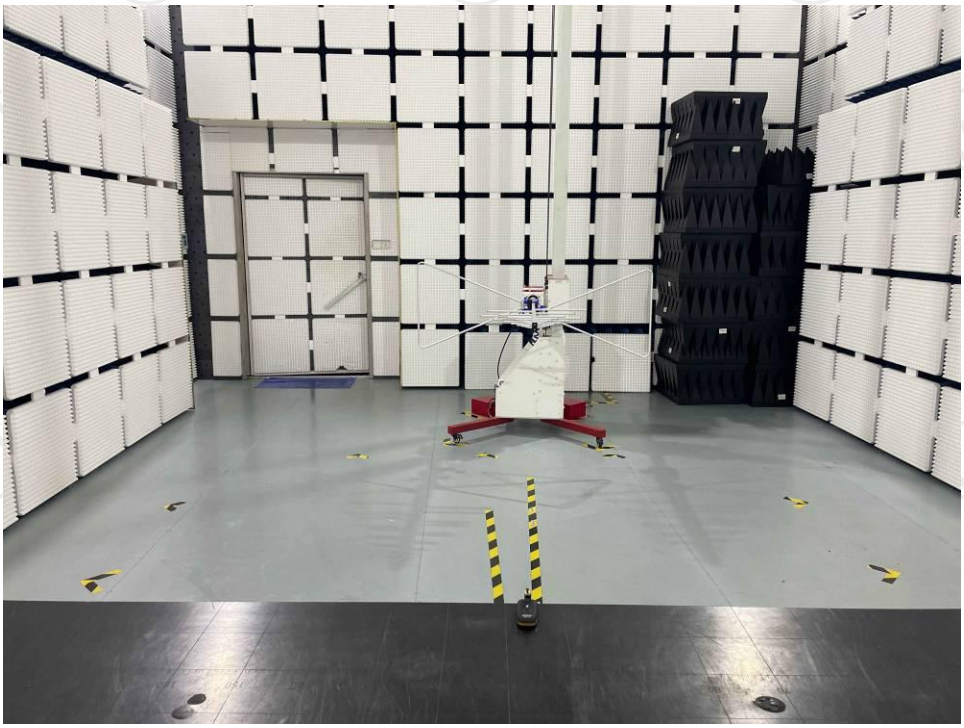
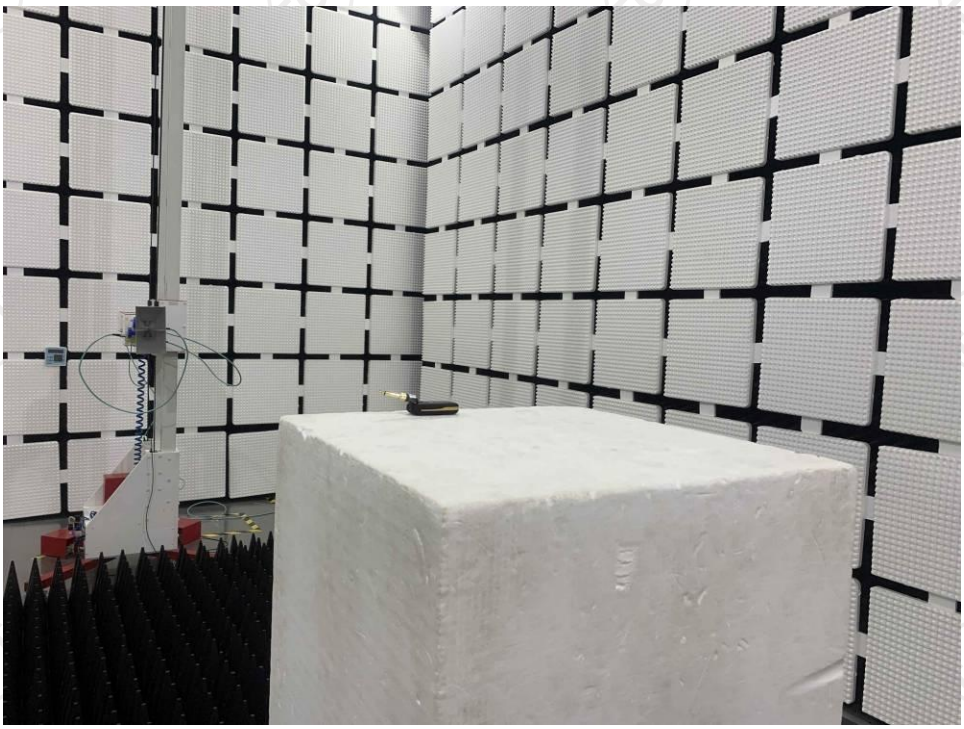
# Appendix A: Photographs of Test Setup

Product: WIRELESS AUDIO TRANSMISSION

Model: ARU-10

Radiated Emission







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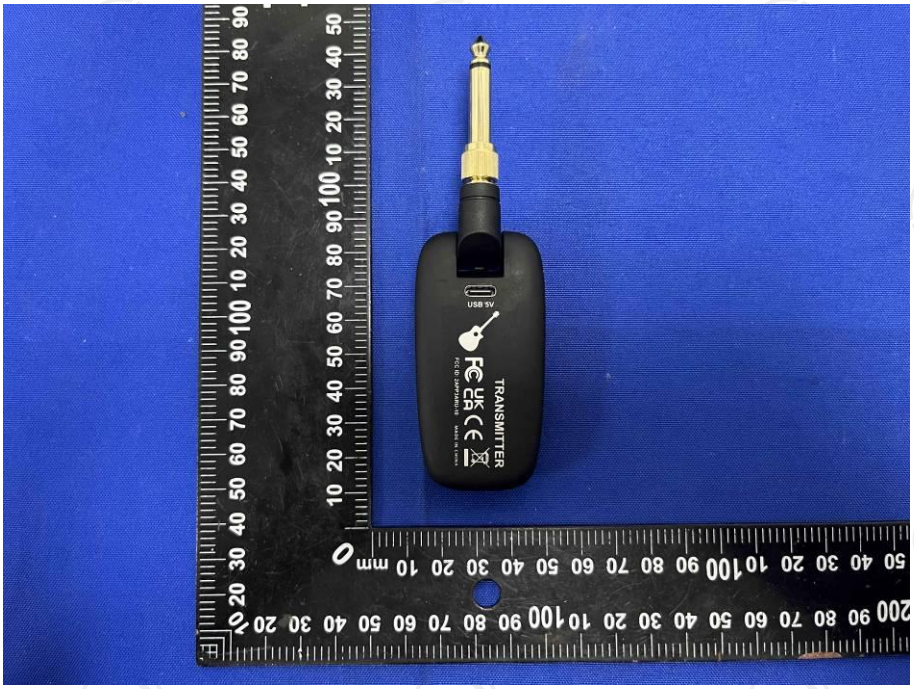
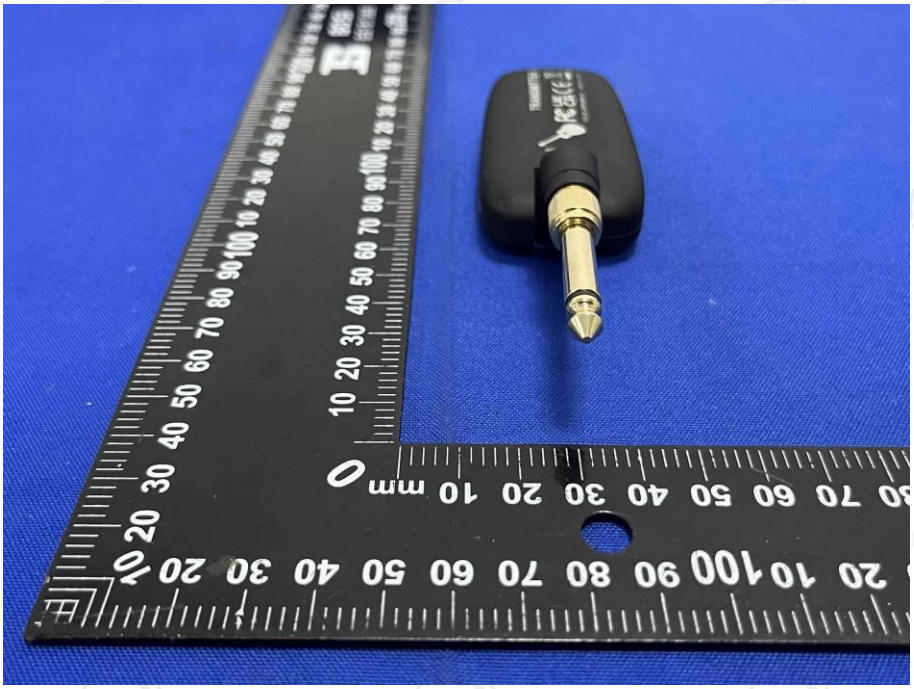
Conducted Emission

# Appendix B: Photographs of EUT
# Product: WIRELESS AUDIO TRANSMISSION
# Model: ARU-10
# External Photos

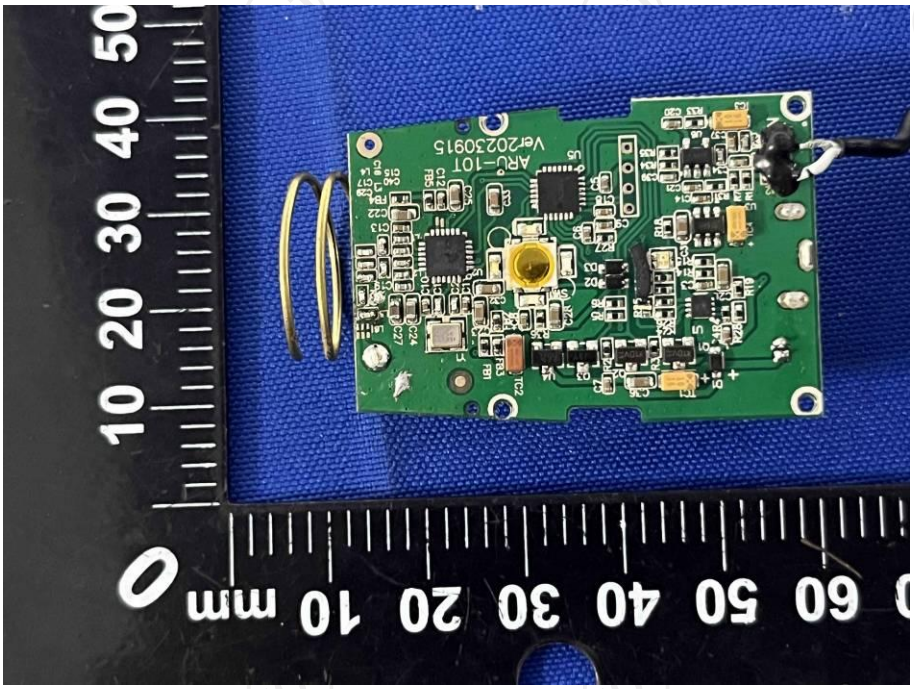


USB 5V
TRANSMITTER


TRANSMITTER
USB 5V


TRANSMITTER



# Product: WIRELESS AUDIO TRANSMISSION
# Model: ARU-10
# Internal Photos



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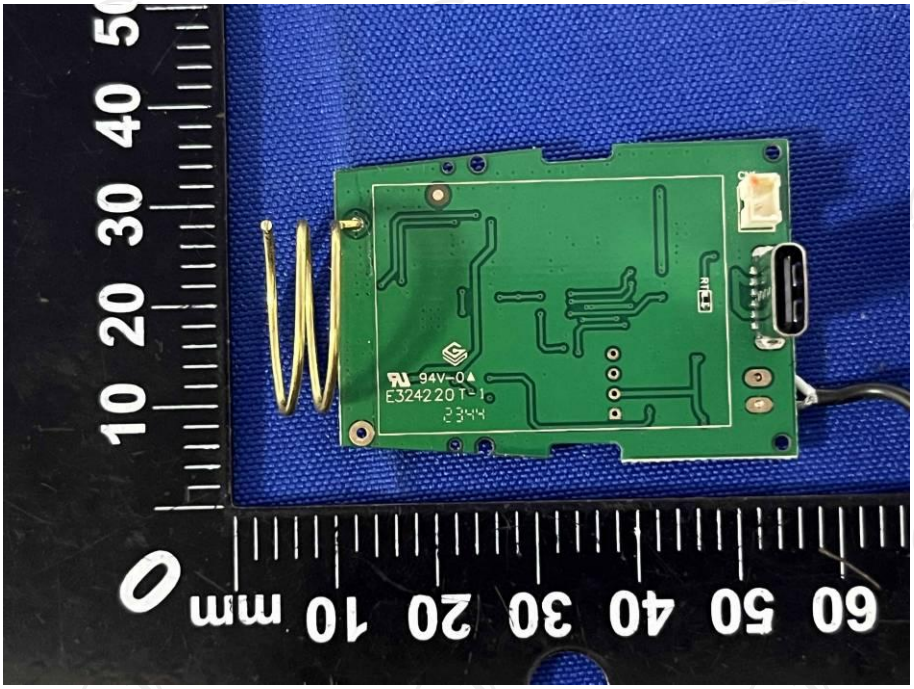



*****END OF REPORT*****



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