

# TEST REPORT

Applicant Name : Axtel sp. z o.o. sp. k.  
Address : 16 Woloska st. Warsaw Mazowieckie 02-675 Poland  
Report Number : RA221118-55023E-EM  
FCC ID: 2A9UU-AXVDM

**Test Standard (s)**  
FCC PART 15B

## Sample Description

Product Type: Axtel USB Headset  
Model No.: Voice UC45 duo NC  
Trade Mark: Axtel  
Date Received: 2022-11-18  
Date of Test: 2022-11-21 to 2022-11-25  
Report Date: 2022-11-27

|              |       |
|--------------|-------|
| Test Result: | Pass* |
|--------------|-------|

\* In the configuration tested, the EUT complied with the standards above.

**Prepared and Checked By:**

*Zeki Ma*

Zeki Ma  
EMC Engineer

**Approved By:**

*Candy Li*

Candy Li  
EMC Engineer

**Note:** This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★".

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**DOCUMENT REVISION HISTORY**

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| Revision Number | Report Number      | Description of Revision | Date of Revision |
|-----------------|--------------------|-------------------------|------------------|
| 0               | RA221118-55023E-EM | Original Report         | 2022-11-27       |

## GENERAL INFORMATION

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

|                             |                                          |
|-----------------------------|------------------------------------------|
| Product                     | Axtel USB Headset                        |
| Tested Model                | Voice UC45 duo NC                        |
| Highest Operation Frequency | 48MHz (It is provided by the applicant.) |
| Voltage Range               | DC 5V                                    |
| Sample number               | RA221118-55023E-EM-S1 (Assigned by ATC)  |
| Sample/EUT Status           | Good condition                           |

### Objective

This report is in accordance with Part 2-Subpart J, and Part 15-Subparts A and B of the Federal Communication Commission's rules.

The objective of the manufacturer is to determine the compliance of EUT with FCC Part 15, Class B device.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2014, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

## Measurement Uncertainty

| Parameter                          |              | Uncertainty |
|------------------------------------|--------------|-------------|
| AC Power Lines Conducted Emissions |              | 2.72dB      |
| Emissions,<br>Radiated             | 9kHz - 30MHz | 2.66dB      |
|                                    | 30MHz - 1GHz | 4.28dB      |
|                                    | 1GHz - 18GHz | 4.98dB      |
| Temperature                        |              | 1°C         |
| Humidity                           |              | 6%          |
| Supply voltages                    |              | 0.4%        |

*Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.*

## Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189.

Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01.

Listed by Innovation, Science and Economic Development Canada (ISED), the Registration Number is 5077A.

## SYSTEM TEST CONFIGURATION

### Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

Test Mode 1: Playing for Phone

Test Mode 2: Playing for Notebook

### EUT Exercise Software

No exercise software.

### Special Accessories

No special accessory was used.

### Equipment Modifications

No modification was made to the EUT tested.

### Support Equipment List and Details

| Manufacturer | Description      | Model   | Serial Number |
|--------------|------------------|---------|---------------|
| Redmi        | Phone            | K20Pro  | Unknown       |
| Lenovo       | Notebook         | T430    | Unknown       |
| Unknown      | Notebook Adapter | 92P1156 | Unknown       |

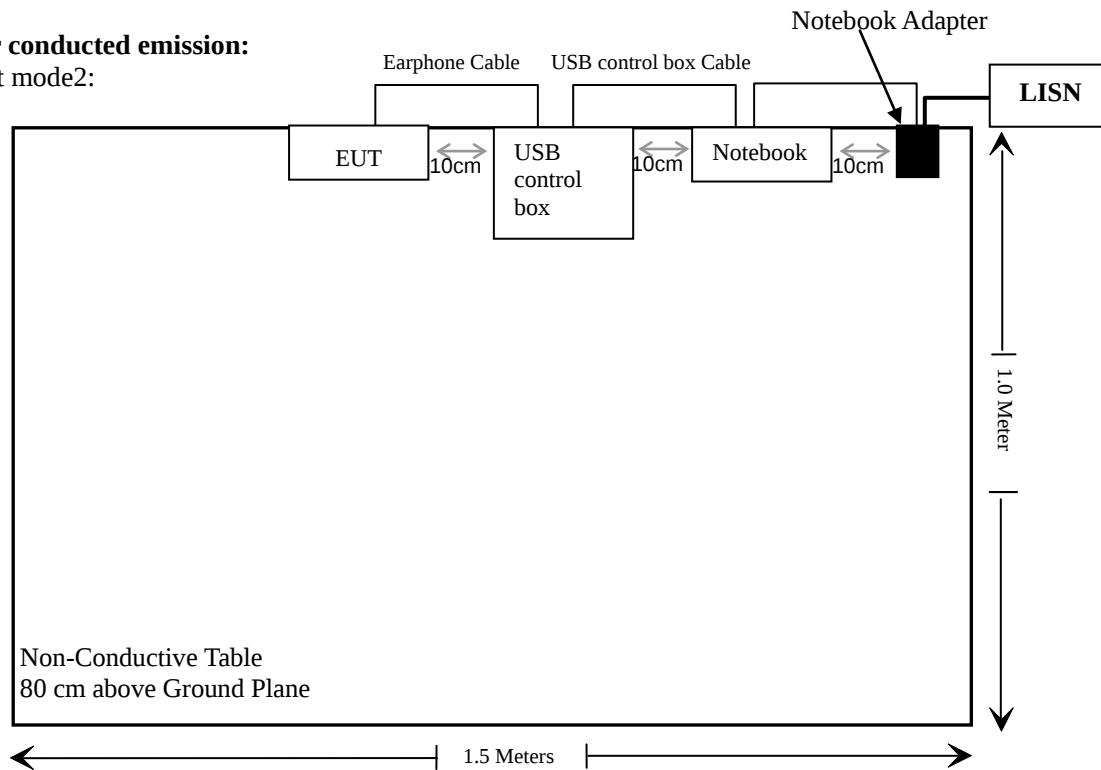
### External I/O Cable

| Cable Description                         | Length (m) | From Port           | To Port                   |
|-------------------------------------------|------------|---------------------|---------------------------|
| Un-shielding Un-Detachable Earphone Cable | 1.2        | EUT                 | USB control box/<br>Phone |
| Un-shielding Detachable USB Cable         | 1.3        | USB control box     | Notebook                  |
| Un-shielding Detachable AC Cable          | 2.0        | Notebook<br>Adapter | LISN                      |
| Un-shielding Detachable DC Cable          | 2.0        | Notebook<br>Adapter | Notebook                  |
| Unshielded Detachable Network cable       | 5.0        | Notebook            | Network                   |

## Block Diagram of Radiated Test Setup

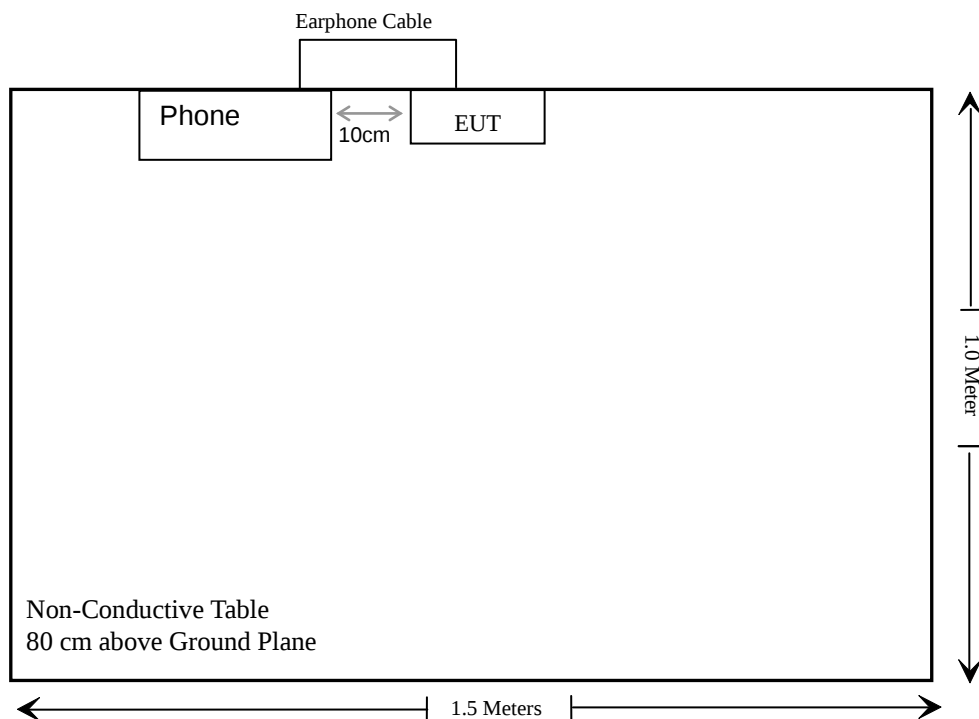
### For conducted emission:

Test mode2:

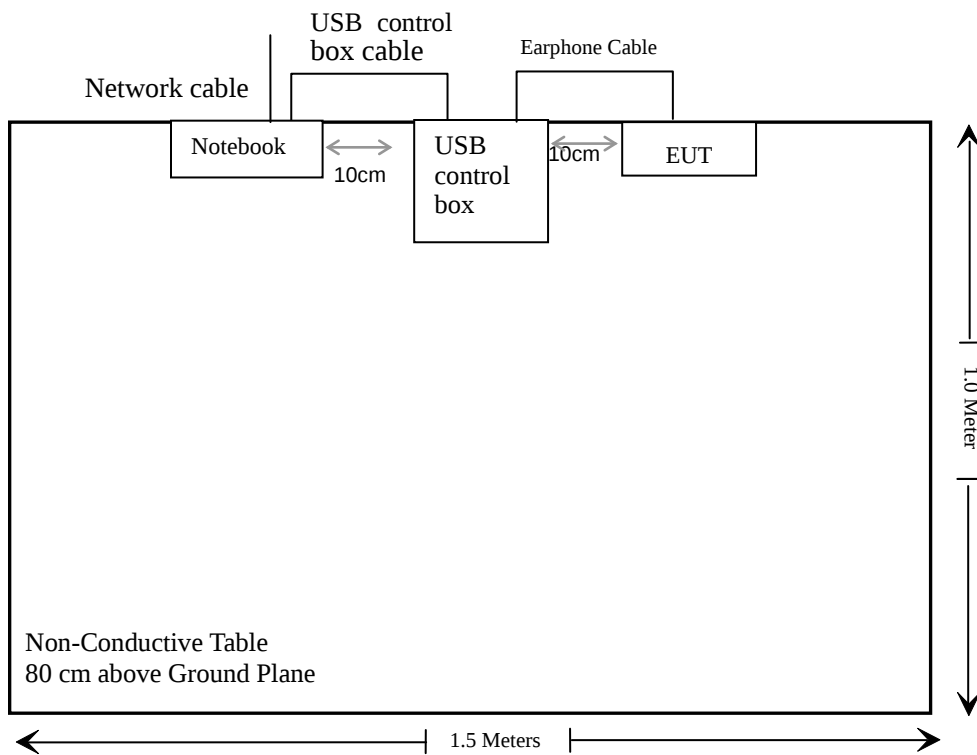


### For Radiated emission:

Test mode1:



Test mode 2:



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**SUMMARY OF TEST RESULTS**

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| FCC Rules | Description of Test | Results   |
|-----------|---------------------|-----------|
| §15.107   | Conducted Emissions | Compliant |
| §15.109   | Radiated Emissions  | Compliant |

## TEST EQUIPMENT LIST

| Manufacturer                                     | Description       | Model    | Serial Number | Calibration Date | Calibration Due Date |
|--------------------------------------------------|-------------------|----------|---------------|------------------|----------------------|
| <b>Conducted emission</b>                        |                   |          |               |                  |                      |
| Rohde & Schwarz                                  | EMI Test Receiver | ESCI     | 100784        | 2021/12/13       | 2022/12/12           |
| Rohde & Schwarz                                  | L.I.S.N.          | ENV216   | 101314        | 2021/12/13       | 2022/12/12           |
| Anritsu Corp                                     | 50 Coaxial Switch | MP59B    | 6100237248    | 2021/12/13       | 2022/12/12           |
| Unknown                                          | RF Coaxial Cable  | No.17    | N0350         | 2021/12/14       | 2022/12/13           |
| Conducted Emission Test Software: e3 19821b (V9) |                   |          |               |                  |                      |
| <b>Radiated Emissions Test</b>                   |                   |          |               |                  |                      |
| Rohde& Schwarz                                   | Test Receiver     | ESR      | 102725        | 2021/12/13       | 2022/12/12           |
| SONOMA INSTRUMENT                                | Amplifier         | 310 N    | 186131        | 2022/11/08       | 2023/11/07           |
| Schwarzbeck                                      | Bilog Antenna     | VULB9163 | 9163-323      | 2021/07/06       | 2024/07/05           |
| Unknown                                          | RF Coaxial Cable  | No.12    | N040          | 2021/12/14       | 2022/12/13           |
| Unknown                                          | RF Coaxial Cable  | No.13    | N300          | 2021/12/14       | 2022/12/13           |
| Unknown                                          | RF Coaxial Cable  | No.14    | N800          | 2021/12/14       | 2022/12/13           |
| Radiated Emission Test Software: e3 19821b(V9)   |                   |          |               |                  |                      |

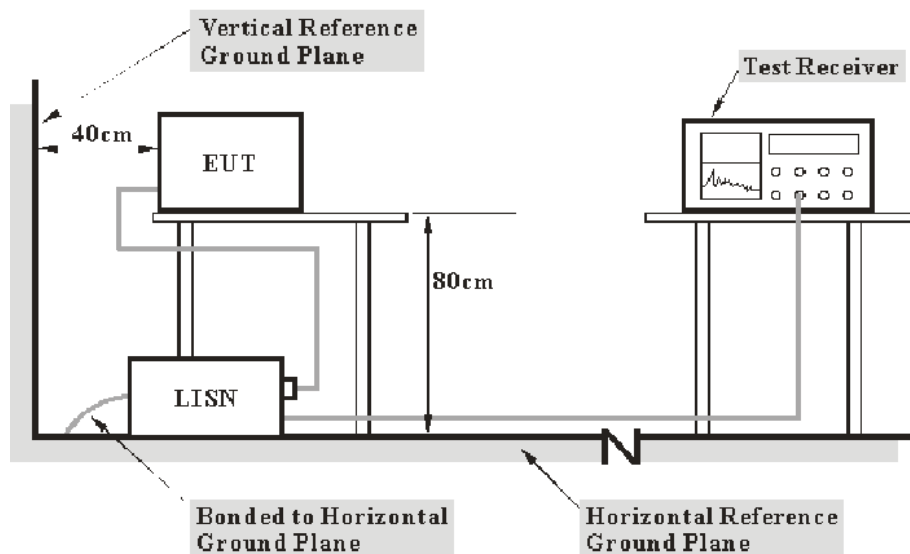
\* **Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

## FCC §15.107 – CONDUCTED EMISSIONS

### Applicable Standard

According to FCC§15.107

### EUT Setup



Note: 1. Support units were connected to second LISN.  
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The measurement procedure of EUT setup is according with ANSI C63.4-2014. The related limit was specified in FCC Part 15.107 Class B.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

### EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

| Frequency Range  | IF B/W |
|------------------|--------|
| 150 kHz – 30 MHz | 9 kHz  |

## Test Procedure

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

## Factor & Over Limit Calculation

The factor is calculated by adding LISN VDF (Voltage Division Factor) and Cable Loss. The basic equation is as follows:

$$\text{Factor} = \text{LISN VDF} + \text{Cable Loss}$$

The “**Over limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over limit of -7 dB means the emission is 7 dB below the limit. The equation for calculation is as follows:

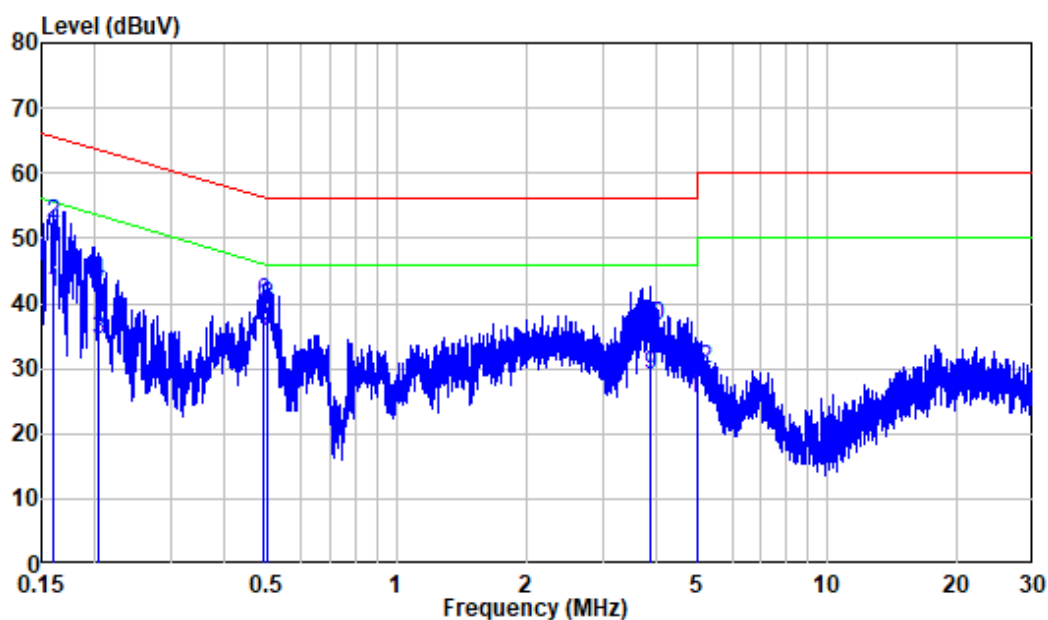
$$\begin{aligned}\text{Over Limit} &= \text{Level} - \text{Limit} \\ \text{Level} &= \text{Read Level} + \text{Factor}\end{aligned}$$

## Test Data

### Environmental Conditions

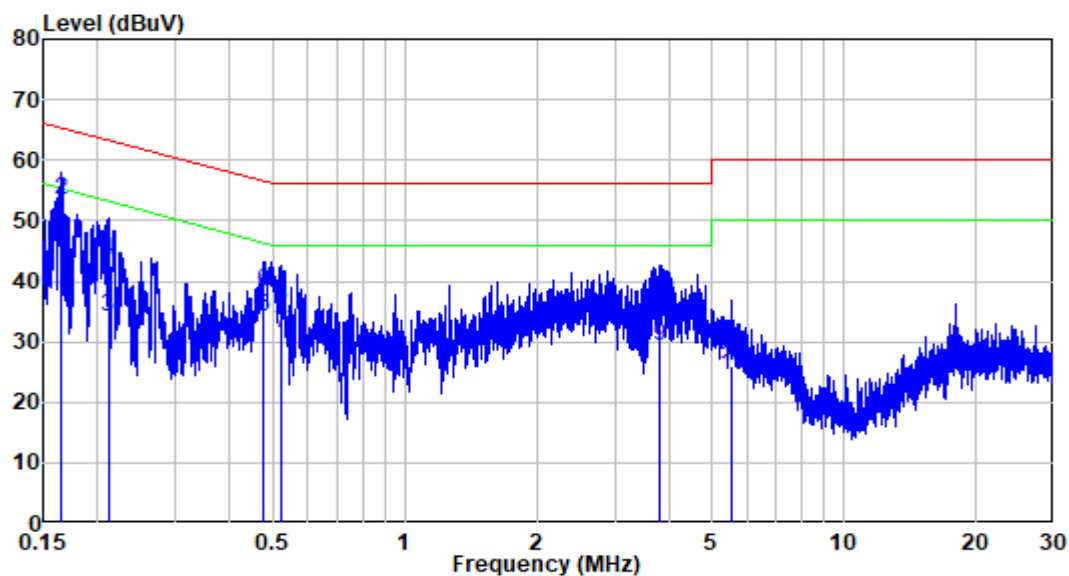
|                           |           |
|---------------------------|-----------|
| <b>Temperature:</b>       | 23 °C     |
| <b>Relative Humidity:</b> | 60 %      |
| <b>ATM Pressure:</b>      | 101.0 kPa |

*The testing was performed by Lipa Wu on 2022-11-25.*

**Test mode 2:****AC 120V/60Hz, Line:**

Site : Shielding Room  
 Condition: Line  
 Job No. : RA221118-55023E-EM  
 Mode : Playing for Notebook  
 Power : AC 120V 60Hz

|    | Freq  | Factor | Read Level | Level | Limit Line | Over Limit | Remark  |
|----|-------|--------|------------|-------|------------|------------|---------|
|    | MHz   | dB     | dBuV       | dBuV  | dBuV       | dB         |         |
| 1  | 0.160 | 9.80   | 31.75      | 41.55 | 55.48      | -13.93     | Average |
| 2  | 0.160 | 9.80   | 42.45      | 52.25 | 65.48      | -13.23     | QP      |
| 3  | 0.204 | 9.80   | 24.52      | 34.32 | 53.44      | -19.12     | Average |
| 4  | 0.204 | 9.80   | 33.41      | 43.21 | 63.44      | -20.23     | QP      |
| 5  | 0.493 | 9.80   | 26.69      | 36.49 | 46.11      | -9.62      | Average |
| 6  | 0.493 | 9.80   | 30.35      | 40.15 | 56.11      | -15.96     | QP      |
| 7  | 0.503 | 9.80   | 25.96      | 35.76 | 46.00      | -10.24     | Average |
| 8  | 0.503 | 9.80   | 29.66      | 39.46 | 56.00      | -16.54     | QP      |
| 9  | 3.894 | 9.84   | 19.22      | 29.06 | 46.00      | -16.94     | Average |
| 10 | 3.894 | 9.84   | 26.61      | 36.45 | 56.00      | -19.55     | QP      |
| 11 | 4.998 | 9.85   | 15.50      | 25.35 | 46.00      | -20.65     | Average |
| 12 | 4.998 | 9.85   | 19.94      | 29.79 | 56.00      | -26.21     | QP      |

**AC 120V/60Hz, Neutral:**

Site : Shielding Room  
 Condition: Neutral  
 Job No. : RA221118-55023E-EM  
 Mode : Playing for Notebook  
 Power : AC 120V 60Hz

|    | Freq  | Factor | Read<br>Level | Level | Limit<br>Line | Over<br>Limit | Remark  |
|----|-------|--------|---------------|-------|---------------|---------------|---------|
|    | MHz   | dB     | dBuV          | dBuV  | dBuV          | dB            |         |
| 1  | 0.164 | 9.80   | 33.67         | 43.47 | 55.24         | -11.77        | Average |
| 2  | 0.164 | 9.80   | 43.59         | 53.39 | 65.24         | -11.85        | QP      |
| 3  | 0.211 | 9.80   | 24.36         | 34.16 | 53.17         | -19.01        | Average |
| 4  | 0.211 | 9.80   | 33.60         | 43.40 | 63.17         | -19.77        | QP      |
| 5  | 0.478 | 9.80   | 24.33         | 34.13 | 46.37         | -12.24        | Average |
| 6  | 0.478 | 9.80   | 28.64         | 38.44 | 56.37         | -17.93        | QP      |
| 7  | 0.524 | 9.81   | 21.50         | 31.31 | 46.00         | -14.69        | Average |
| 8  | 0.524 | 9.81   | 25.98         | 35.79 | 56.00         | -20.21        | QP      |
| 9  | 3.792 | 9.84   | 19.56         | 29.40 | 46.00         | -16.60        | Average |
| 10 | 3.792 | 9.84   | 27.36         | 37.20 | 56.00         | -18.80        | QP      |
| 11 | 5.520 | 9.92   | 14.57         | 24.49 | 50.00         | -25.51        | Average |
| 12 | 5.520 | 9.92   | 16.17         | 26.09 | 60.00         | -33.91        | QP      |

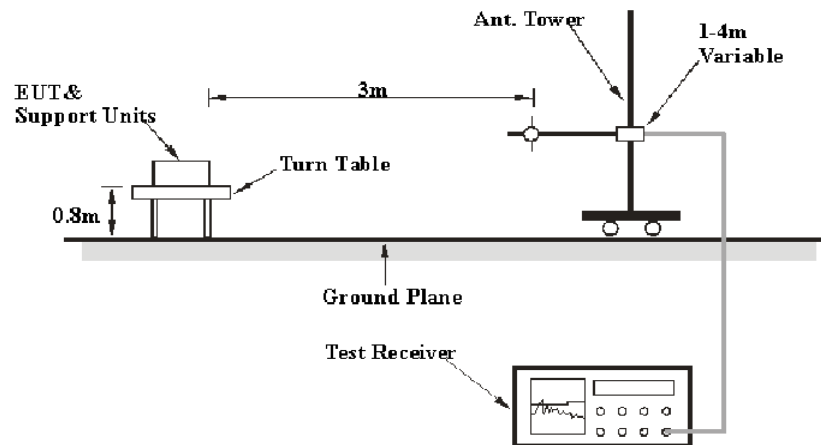
## FCC §15.109 - RADIATED EMISSIONS

### Applicable Standard

FCC §15.109

### EUT Setup

Below 1GHz:



The radiated emission tests were performed in the 3 meters chamber test site, using the setup accordance with the ANSI C63.4-2014. The specification used was the FCC Part 15.109 Class B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

## EMI Test Receiver & Spectrum Analyzer Setup

The system was investigated from 30 MHz to 1 GHz.

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

| Frequency Range  | RBW     | Video B/W | IF B/W | Detector |
|------------------|---------|-----------|--------|----------|
| 30MHz – 1000 MHz | 120 kHz | 300 kHz   | 120kHz | QP       |

All data was recorded in the Quasi-peak detector mode from 30 MHz to 1 GHz.

## Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

## Factor & Over Limit Calculation

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Meter Reading. The basic equation is as follows:

$$\text{Factor} = \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Over Limit**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit of -7dB means the emission is 7dB below the limit. The equation for Over Limit calculation is as follows:

$$\begin{aligned}\text{Over Limit} &= \text{Level} - \text{Limit} \\ \text{Level} &= \text{Reading} + \text{Factor}\end{aligned}$$

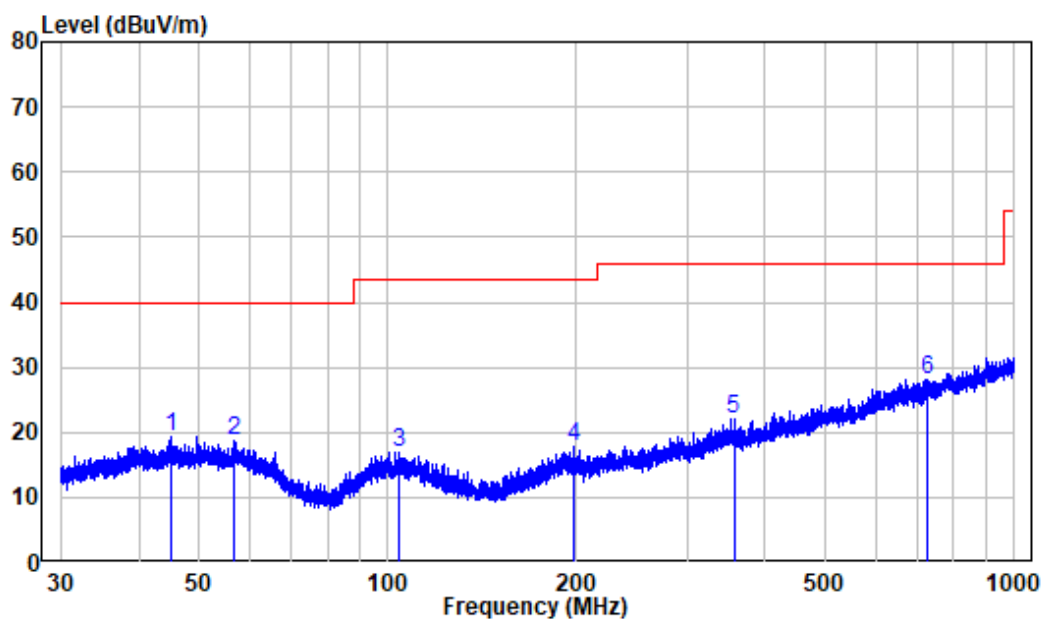
## Test Data

### Environmental Conditions

|                    |           |
|--------------------|-----------|
| Temperature:       | 24 °C     |
| Relative Humidity: | 60%       |
| ATM Pressure:      | 101.0 kPa |

*The testing was performed by Jimi Zheng on 2022-11-21.*

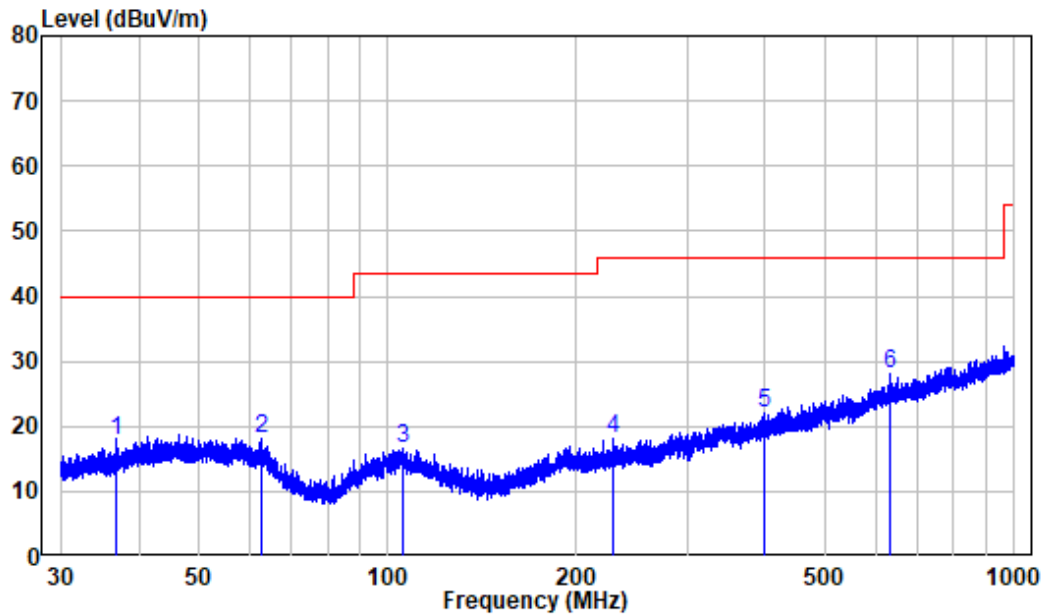
Note: Pre-scan in the X, Y and Z axes of orientation, the worst case of orientation was photo and recorded.

**30MHz-1GHz:****Test mode 1****Horizontal:**

Site : chamber  
Condition: 3m HORIZONTAL  
Job No. : RA221118-55023E-EM  
Test Mode: Playing for Phone

|   | Freq    | Factor | Read<br>Level | Level  | Limit<br>Line | Over<br>Limit | Remark |
|---|---------|--------|---------------|--------|---------------|---------------|--------|
|   | MHz     | dB/m   | dBuV          | dBuV/m | dBuV/m        | dB            |        |
| 1 | 44.940  | -9.94  | 29.13         | 19.19  | 40.00         | -20.81        | Peak   |
| 2 | 56.941  | -10.06 | 28.66         | 18.60  | 40.00         | -21.40        | Peak   |
| 3 | 104.399 | -11.78 | 28.82         | 17.04  | 43.50         | -26.46        | Peak   |
| 4 | 198.240 | -11.52 | 29.37         | 17.85  | 43.50         | -25.65        | Peak   |
| 5 | 356.676 | -7.56  | 29.55         | 21.99  | 46.00         | -24.01        | Peak   |
| 6 | 725.850 | -1.22  | 29.44         | 28.22  | 46.00         | -17.78        | Peak   |

## Vertical

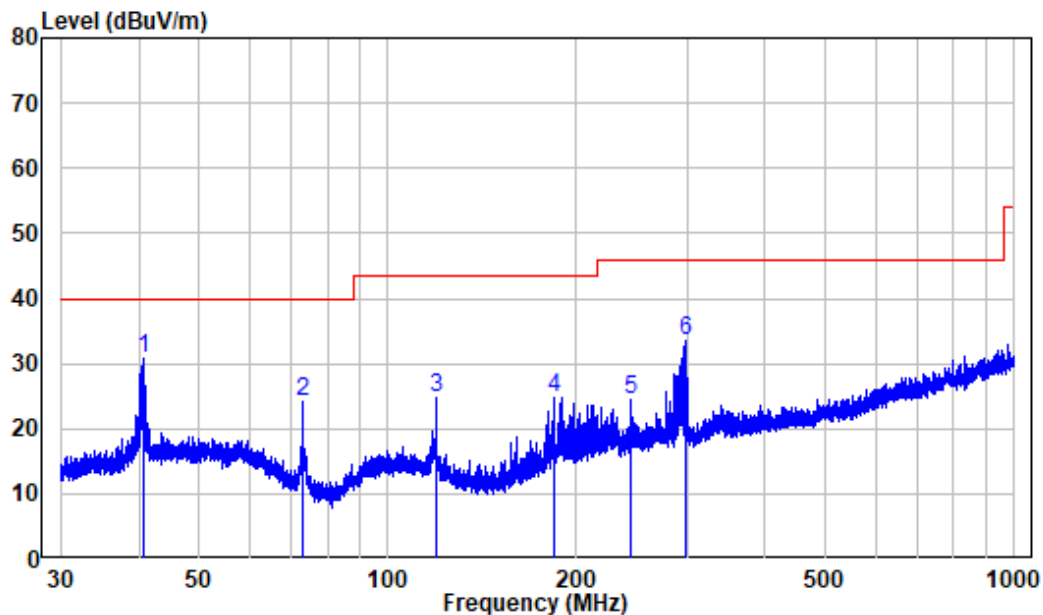


Site : chamber  
Condition: 3m VERTICAL  
Job No. : RA221118-55023E-EM  
Test Mode: Playing for Phone

|   | Freq    | Factor | Read<br>Level | Level  | Limit<br>Line | Over<br>Limit | Remark |
|---|---------|--------|---------------|--------|---------------|---------------|--------|
|   | MHz     | dB/m   | dBuV          | dBuV/m | dBuV/m        | dB            |        |
| 1 | 36.847  | -11.04 | 29.00         | 17.96  | 40.00         | -22.04        | Peak   |
| 2 | 62.761  | -11.71 | 29.80         | 18.09  | 40.00         | -21.91        | Peak   |
| 3 | 105.827 | -11.91 | 28.50         | 16.59  | 43.50         | -26.91        | Peak   |
| 4 | 228.290 | -11.17 | 29.36         | 18.19  | 46.00         | -27.81        | Peak   |
| 5 | 399.380 | -6.74  | 28.91         | 22.17  | 46.00         | -23.83        | Peak   |
| 6 | 632.520 | -2.03  | 30.14         | 28.11  | 46.00         | -17.89        | Peak   |

## Test mode 2

## Horizontal:



Site : chamber

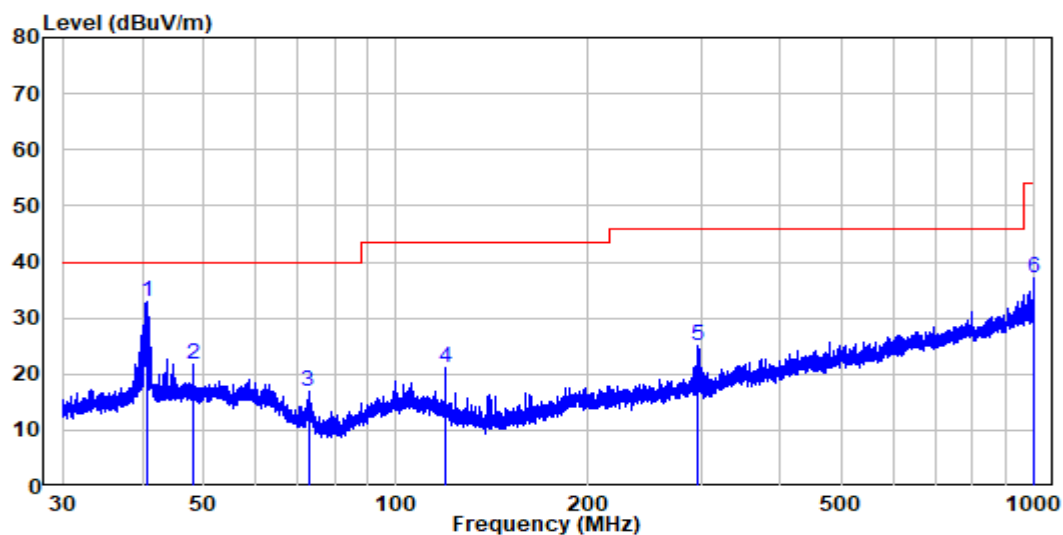
Condition: 3m HORIZONTAL

Job No. : RA221118-55023E-EM

Test Mode: Playing for Notebook

|   | Freq    | Factor | Read Level | Level  | Limit  | Over   | Remark |
|---|---------|--------|------------|--------|--------|--------|--------|
|   | MHz     | dB/m   | dBuV       | dBuV/m | dBuV/m | dB     |        |
| 1 | 40.613  | -10.25 | 41.13      | 30.88  | 40.00  | -9.12  | Peak   |
| 2 | 73.038  | -15.85 | 39.95      | 24.10  | 40.00  | -15.90 | Peak   |
| 3 | 119.541 | -13.45 | 38.22      | 24.77  | 43.50  | -18.73 | Peak   |
| 4 | 184.409 | -12.25 | 37.06      | 24.81  | 43.50  | -18.69 | Peak   |
| 5 | 244.768 | -10.59 | 34.92      | 24.33  | 46.00  | -21.67 | Peak   |
| 6 | 298.399 | -9.25  | 42.78      | 33.53  | 46.00  | -12.47 | Peak   |

## Vertical



Site : chamber  
Condition: 3m VERTICAL  
Job No. : RA221118-55023E-EM  
Test Mode: Playing for Notebook

|   | Freq    | Factor | Read<br>Level | Limit<br>Level | Limit<br>Line | Over<br>Limit | Remark |
|---|---------|--------|---------------|----------------|---------------|---------------|--------|
|   | MHz     | dB/m   | dBuV          | dBuV/m         | dBuV/m        | dB            |        |
| 1 | 40.613  | -10.25 | 43.08         | 32.83          | 40.00         | -7.17         | Peak   |
| 2 | 48.057  | -10.00 | 31.81         | 21.81          | 40.00         | -18.19        | Peak   |
| 3 | 72.815  | -15.80 | 32.75         | 16.95          | 40.00         | -23.05        | Peak   |
| 4 | 119.541 | -13.45 | 34.67         | 21.22          | 43.50         | -22.28        | Peak   |
| 5 | 297.615 | -9.25  | 34.28         | 25.03          | 46.00         | -20.97        | Peak   |
| 6 | 999.124 | 3.00   | 34.12         | 37.12          | 54.00         | -16.88        | Peak   |

**Note:**

The other spurious emission which is in the noise floor level was not recorded.

For below 1GHz, If the maximized peak measured value complies with under the QP/Average limit more than 6dB, then it is unnecessary to perform QP/Average measurement.

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