

# TEST REPORT

**Product Name** : Multi-function Wireless Charger  
**Brand Name** : N/A  
**Model** : T1  
**Series Model** : N/A  
**FCC ID** : 2BCFE-T1  
**Applicant** : **Shenzhen Sister Digital Technology Co.,Ltd**  
**Address** : Room 507, 5th Floor, Building 1, Baokun Science and Technology Park,Dalang Xinling Road, Longhua District, Shenzhen  
**Manufacturer** : **Shenzhen Sister Digital Technology Co.,Ltd**  
**Address** : Room 507, 5th Floor, Building 1, Baokun Science and Technology Park,Dalang Xinling Road, Longhua District, Shenzhen  
**Standard(s)** : FCC CFR Title 47 Part 15 Subpart C  
**Date of Receipt** : Aug.15, 2024  
**Date of Test** : Aug.15, 2024 ~ Aug.22, 2024  
**Issued Date** : Aug.22, 2024

**Issued By:** **Guangdong Asia Hongke Test Technology Limited**  
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**Reviewed by:**   
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Note: This device has been tested and found to comply with the standard(s) listed, this test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory. This report shall not be reproduced except in full, without the written approval of Guangdong Asia Hongke Test Technology Limited. If there is a need to alter or revise this document, the right belongs to Guangdong Asia Hongke Test Technology Limited, and it should give a prior written notice of the revision document. This test report must not be used by the client to claim product endorsement.



**Report Revise Record**

| Report Version | Issued Date  | Notes           |
|----------------|--------------|-----------------|
| M1             | Aug.22, 2024 | Initial Release |

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# 1 TEST SUMMARY

## 1.1 Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.207,15.209, 15.215\(c\)](#)

[ANSI C63.10: 2013](#): American National Standard for Testing Unlicensed Wireless Devices

## 1.2 Test Summary

| Test Item                         | Section in CFR 47                | Test Result |
|-----------------------------------|----------------------------------|-------------|
| Electric Field Radiated Emissions | FCC Part 15 C (Section15.209)    | PASS        |
| 20dB Bandwidth/99% Bandwidth      | FCC Part 15 C (Section15.215(c)) | PASS        |
| AC Power Line Conducted Emission  | FCC Part 15 C (Section15.207)    | PASS        |
| Antenna Requirement               | FCC Part 15 C (Section15.203)    | PASS        |

### 1.3 Test Facility

#### Test Laboratory:

##### Guangdong Asia Hongke Test Technology Limited

B1/F, Building 11, Junfeng Industrial Park, Chongqing Road, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

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

##### FCC-Registration No.: 251906 Designation Number: CN1376

Guangdong Asia Hongke Test Technology Limited has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

##### IC —Registration No.: 31737 CAB identifier: CN0165

The 3m Semi-anechoic chamber of Guangdong Asia Hongke Test Technology Limited has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 31737

##### A2LA-Lab Cert. No.: 7133.01

Guangdong Asia Hongke Test Technology Limited has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

### 1.4 Measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Guangdong Asia Hongke Test Technology Limited's quality system according to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Asia Hongke laboratory is reported:

| Test                          | Measurement Uncertainty    | Notes |
|-------------------------------|----------------------------|-------|
| Power Line Conducted Emission | 150KHz~30MHz $\pm 1.20$ dB | (1)   |
| Radiated Emission             | 9KHz~30Hz $\pm 3.10$ dB    | (1)   |
| Radiated Emission             | 9KHz~1GHz $\pm 3.75$ dB    | (1)   |
| Radiated Emission             | 1GHz~18GHz $\pm 3.88$ dB   | (1)   |
| Radiated Emission             | 18GHz~40GHz $\pm 3.88$ dB  | (1)   |
| RF power, conducted           | 30MHz~6GHz $\pm 0.16$ dB   | (1)   |
| RF power density, conducted   | $\pm 0.24$ dB              | (1)   |
| Spurious emissions, conducted | $\pm 0.21$ dB              | (1)   |
| Temperature                   | $\pm 1^{\circ}\text{C}$    | (1)   |
| Humidity                      | $\pm 3\%$                  | (1)   |
| DC and low frequency voltages | $\pm 1.5\%$                | (1)   |
| Time                          | $\pm 2\%$                  | (1)   |
| Duty cycle                    | $\pm 2\%$                  | (1)   |

The report 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%

## 2 GENGGENERAL INFORMATION

### 2.1 Environmental conditions

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

|                     |         |
|---------------------|---------|
| Normal Temperature: | 25°C    |
| Relative Humidity:  | 55 %    |
| Air Pressure:       | 101 kPa |

### 2.2 General Description of EUT

|                                                                                                                                                                                             |                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Product Name:                                                                                                                                                                               | Multi-function Wireless Charger                                                                             |
| Model/Type reference:                                                                                                                                                                       | T1                                                                                                          |
| Serial Model:                                                                                                                                                                               | N/A                                                                                                         |
| Power Supply:                                                                                                                                                                               | Input: 9V=3A<br>Output: 5W/7.5W/10W/15W(Phone)<br>Output: 5W(USB)<br>Output: 5W(Type-C)<br>Output: 2W(Lamp) |
| Hardware version:                                                                                                                                                                           | N/A                                                                                                         |
| Software version:                                                                                                                                                                           | N/A                                                                                                         |
| Sample(s) Status:                                                                                                                                                                           | AiTSZ-240815024-01(Normal sample)<br>AiTSZ-240815024-02(Engineer sample)                                    |
| <b>Wireless Charger:</b>                                                                                                                                                                    |                                                                                                             |
| Operation frequency:                                                                                                                                                                        | 113kHz-205kHz                                                                                               |
| Modulation Technology:                                                                                                                                                                      | ASK                                                                                                         |
| Antenna Type:                                                                                                                                                                               | Loop coil Antenna                                                                                           |
| Antenna gain:                                                                                                                                                                               | 0dBi                                                                                                        |
| <b>Remark:</b><br>The above DUT's information was declared by manufacturer. For more detailed features description, please refer to the manufacturer's specifications or the User's Manual. |                                                                                                             |

## 2.3 Description of the test mode

Equipment under test was operated during the measurement under the following conditions:

☒ Charging and communication mode

| Test Modes:                                                                               |                                                  |            |
|-------------------------------------------------------------------------------------------|--------------------------------------------------|------------|
| Mode 1                                                                                    | AC/DC Adapter+ EUT + phone(Battery Status:< 1%)  | Record     |
| Mode 2                                                                                    | AC/DC Adapter+ EUT + phone(Battery Status:< 50%) | Pre-tested |
| Mode 3                                                                                    | AC/DC Adapter+ EUT + phone(Battery Status:< 99%) | Pre-tested |
| Mode 4                                                                                    | Stand-by mode.                                   | Pre-tested |
| Note: All test modes were pre-tested, but we only recorded the worst case in this report. |                                                  |            |

## 2.4 Special Accessories

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

| Description | Manufacturer | Model     | Serial No. | Provided by | Other |
|-------------|--------------|-----------|------------|-------------|-------|
| Adapter     | HNT          | HNT-QC530 | /          | Test lab    | /     |
| Phone       | OSCAL        | PILOT2    | /          | Test lab    | /     |
| /           | /            | /         | /          | /           | /     |
| /           | /            | /         | /          | /           | /     |

## 2.5 Equipment List for the Test

| No | Test Equipment                      | Manufacturer | Model No        | Serial No    | Cal. Date  | Cal. Due Date |
|----|-------------------------------------|--------------|-----------------|--------------|------------|---------------|
| 1  | Spectrum Analyzer                   | R&S          | FSV40           | 101470       | 2023.09.08 | 2024.09.07    |
| 2  | Spectrum Analyzer                   | Keysight     | N9020A          | MY51280643   | 2023.09.08 | 2024.09.07    |
| 3  | EMI Measuring Receiver              | R&S          | ESR             | 101660       | 2023.09.08 | 2024.09.07    |
| 4  | Low Noise Pre-Amplifier             | HP           | HP8447E         | 1937A01855   | 2023.09.08 | 2024.09.07    |
| 5  | Low Noise Pre-Amplifier             | Tsj          | MLA-0120-A02-34 | 2648A04738   | 2023.09.08 | 2024.09.07    |
| 6  | Passive Loop                        | ETS          | 6512            | 00165355     | 2022.09.04 | 2024.09.03    |
| 7  | TRILOG Super Broadband test Antenna | SCHWARZBECK  | VULB9160        | 9160-3206    | 2021.08.29 | 2024.08.28    |
| 8  | Broadband Horn Antenna              | SCHWARZBECK  | BBHA9120D       | 452          | 2021.08.29 | 2024.08.28    |
| 9  | SHF-EHF Horn Antenna 15-40GHz       | SCHWARZBECK  | BBHA9170        | BBHA9170367d | 2021.08.29 | 2024.08.28    |
| 10 | EMI Measuring Receiver              | R&S          | ESR             | 101160       | 2023.09.13 | 2024.09.12    |
| 11 | LISN                                | SCHWARZBECK  | NNLK 8129       | 8130179      | 2023.10.29 | 2024.10.28    |
| 12 | Pulse Limiter                       | R&S          | ESH3-Z2         | 102789       | 2023.09.13 | 2024.09.12    |
| 13 | Pro.Temp&Humi.chamber               | MENTEK       | MHP-150-1C      | MAA08112501  | 2023.09.08 | 2024.09.07    |
| 14 | RF Automatic Test system            | MW           | MW100-RFCB      | 21033016     | 2023.09.08 | 2024.09.07    |

|    |                                     |         |            |              |            |            |
|----|-------------------------------------|---------|------------|--------------|------------|------------|
| 15 | Signal Generator                    | Agilent | N5182A     | MY50143009   | 2023.09.08 | 2024.09.07 |
| 16 | Wideband Radio communication tester | R&S     | CMW500     | 1201.0002K50 | 2023.09.08 | 2024.09.07 |
| 17 | RF Automatic Test system            | MW      | MW100-RFCB | 21033016     | 2023.09.08 | 2024.09.07 |
| 18 | DC power supply                     | ZHAOXIN | RXN-305D-2 | 28070002559  | N/A        | N/A        |
| 19 | RE Software                         | EZ      | EZ-EMC_RE  | Ver.AIT-03A  | N/A        | N/A        |
| 20 | CE Software                         | EZ      | EZ-EMC_CE  | Ver.AIT-03A  | N/A        | N/A        |
| 21 | RF Software                         | MW      | MTS 8310   | 2.0.0.0      | N/A        | N/A        |
| 22 | temporary antenna connector(Note)   | NTS     | R001       | N/A          | N/A        | N/A        |

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

### 3 TEST CONDITIONS AND RESULTS

#### 3.1 Conducted Emissions Test

##### LIMIT

| Frequency range (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        |

\* Decreases with the logarithm of the frequency.

##### TEST CONFIGURATION

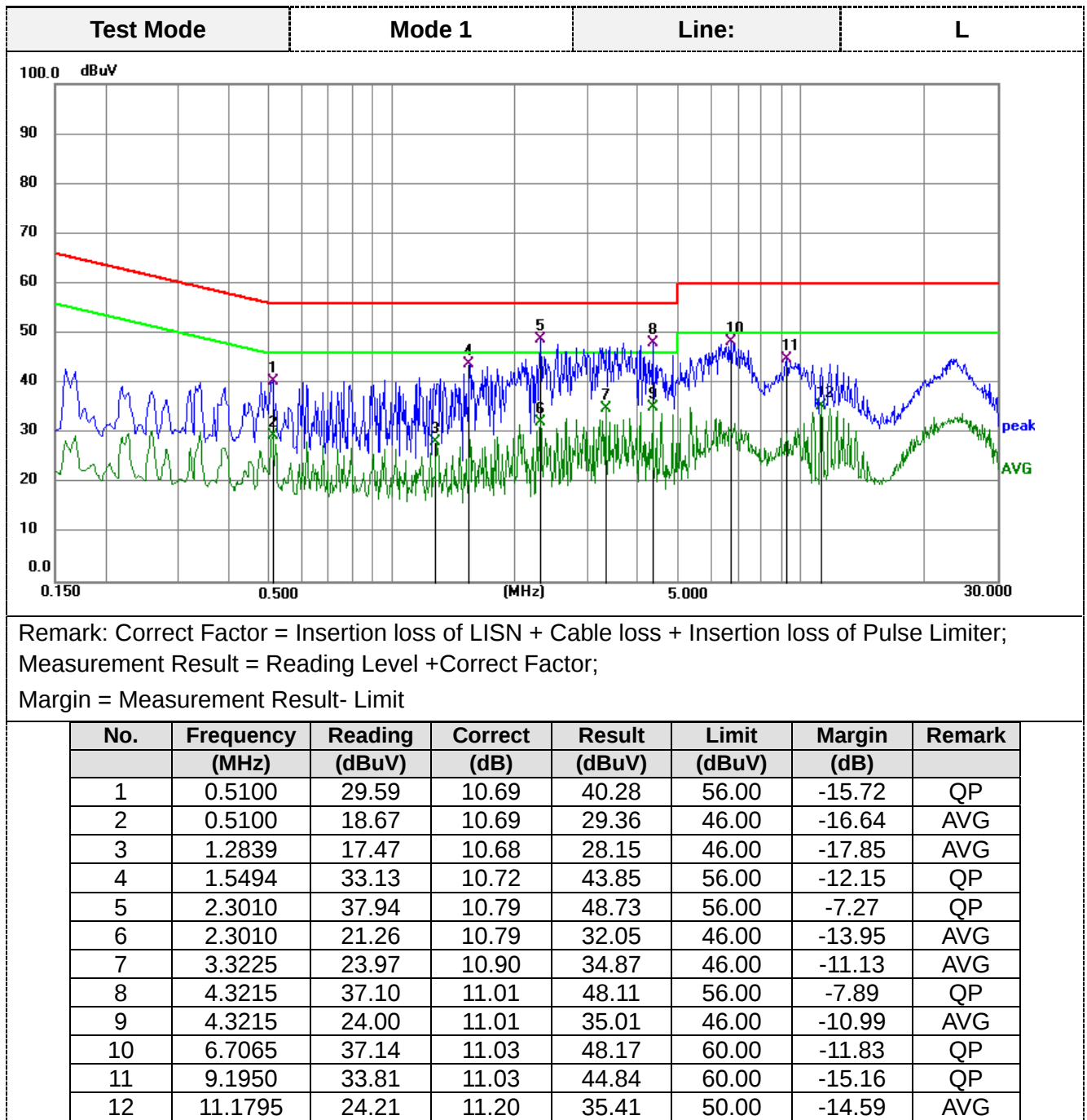


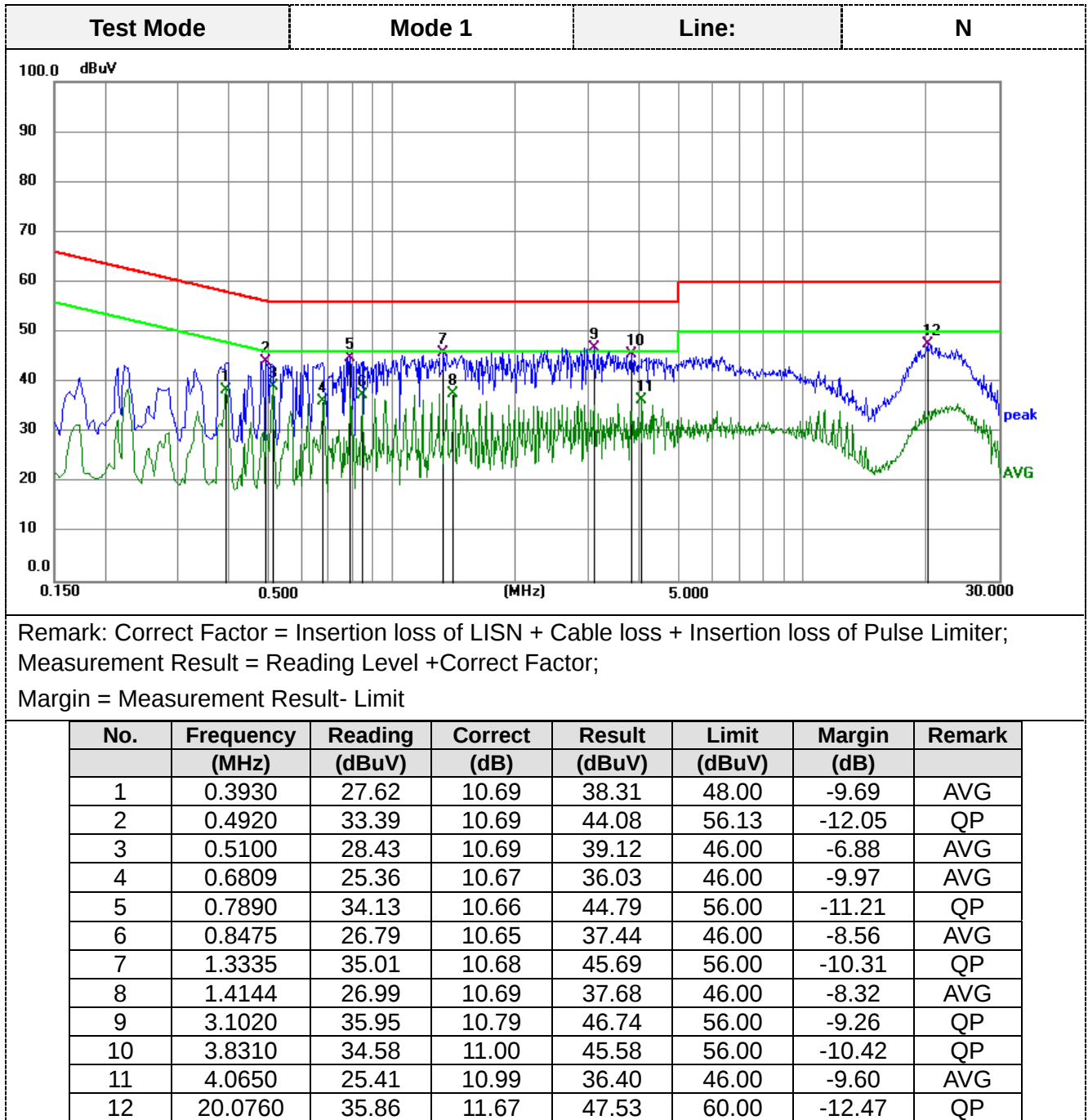
##### TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

## TEST RESULTS

Remark: Both 120 VAC, 50/60 Hz and 240 VAC, 50/60 Hz power supply have been tested, only the worst result of 120 VAC, 60 Hz was reported as below:





## 3.2 Radiated Emissions

### Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

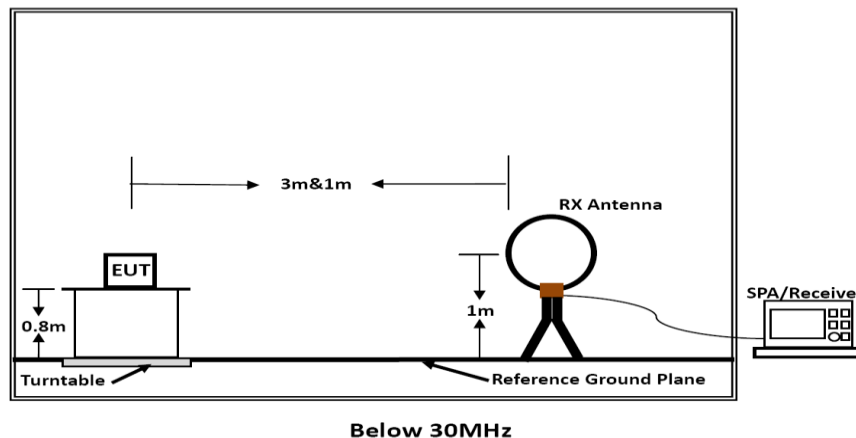
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

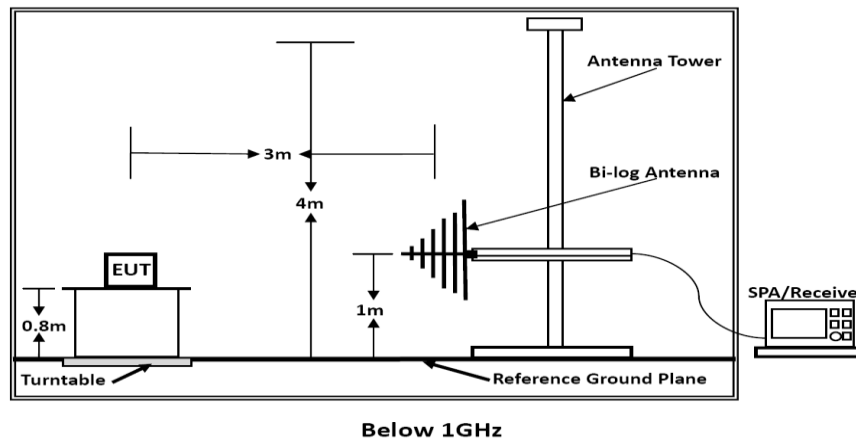
| Frequency (MHz) | Distance (Meters) | Radiated (dBμV/m)                          | Radiated (μV/m)       |
|-----------------|-------------------|--------------------------------------------|-----------------------|
| 0.009-0.49      | 3                 | $20\log(2400/F(\text{KHz}))+40\log(300/3)$ | $2400/F(\text{KHz})$  |
| 0.49-1.705      | 3                 | $20\log(24000/F(\text{KHz}))+40\log(30/3)$ | $24000/F(\text{KHz})$ |
| 1.705-30        | 3                 | $20\log(30)+40\log(30/3)$                  | 30                    |
| 30-88           | 3                 | 40.0                                       | 100                   |
| 88-216          | 3                 | 43.5                                       | 150                   |
| 216-960         | 3                 | 46.0                                       | 200                   |
| Above 960       | 3                 | 54.0                                       | 500                   |

### TEST CONFIGURATION

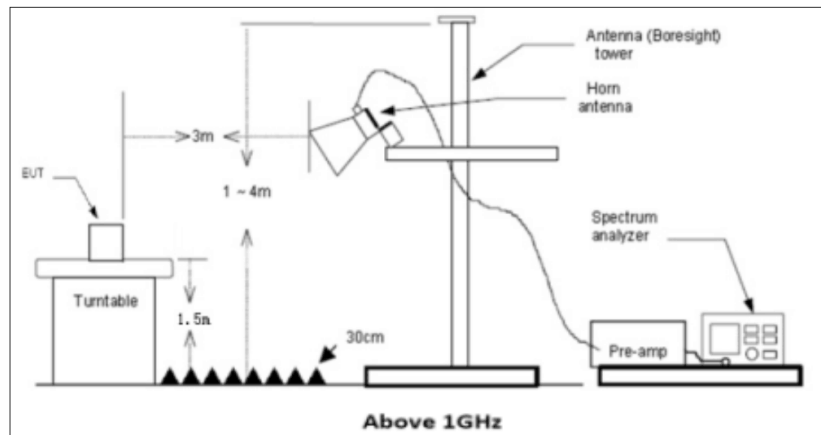
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



### (C) Radiated Emission Test Set-Up, Frequency above 1000MHz



### Test Procedure

- Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
- Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until all frequency measurements have been completed.
- Radiated emission test frequency band from 9KHz to 1000MHz.
- The distance between test antenna and EUT as following table states:

| Test Frequency range | Test Antenna Type   | Test Distance |
|----------------------|---------------------|---------------|
| 9KHz-30MHz           | Active Loop Antenna | 3             |
| 30MHz-1GHz           | Bilog Antenna       | 3             |

- Setting test receiver/spectrum as following table states:

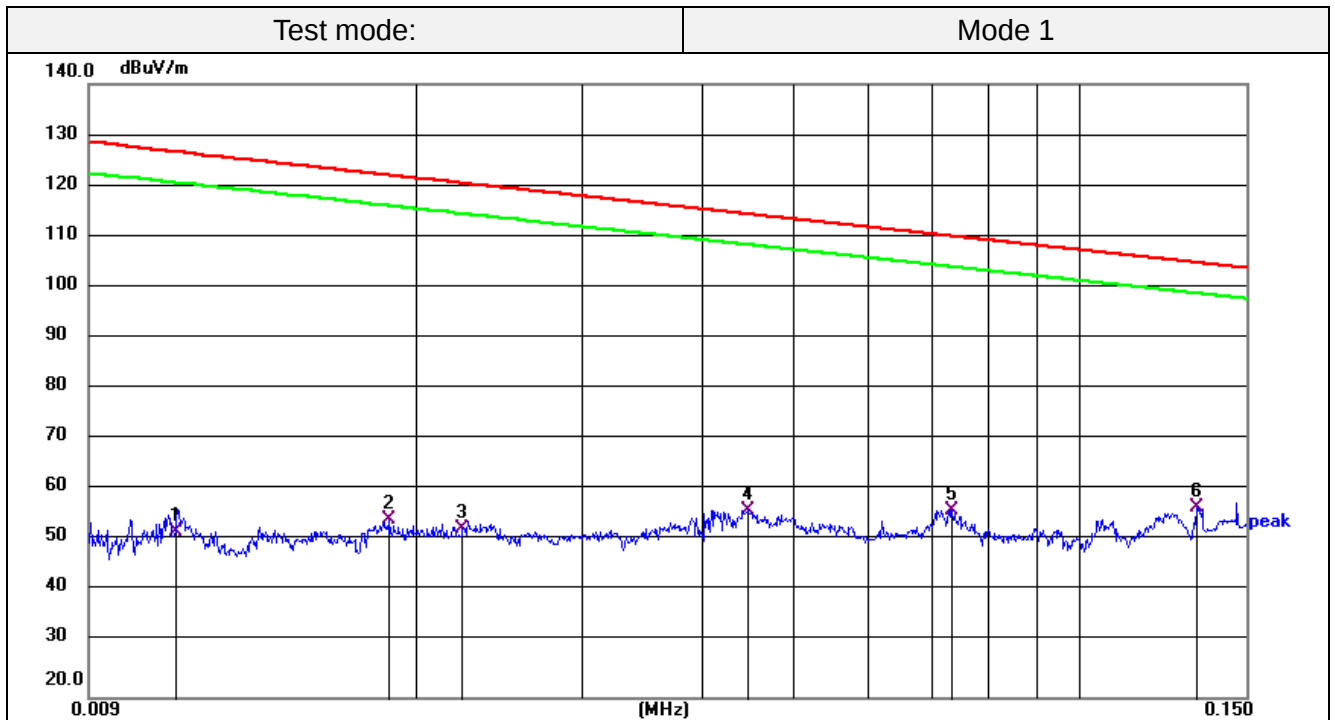
| Test Frequency range | Test Receiver/Spectrum Setting          | Detector |
|----------------------|-----------------------------------------|----------|
| 9KHz-150KHz          | RBW=200Hz/VBW=3KHz, Sweep time=Auto     | QP       |
| 150KHz-30MHz         | RBW=9KHz/VBW=100KHz, Sweep time=Auto    | QP       |
| 30MHz-1GHz           | RBW=120KHz/VBW=1000KHz, Sweep time=Auto | QP       |

### TEST RESULTS

Remark:

All test modes described in section 2.3 has been tested, only the worst result of Mode 1 is recorded as below:

### For 9KHz-150KHz



Remark:

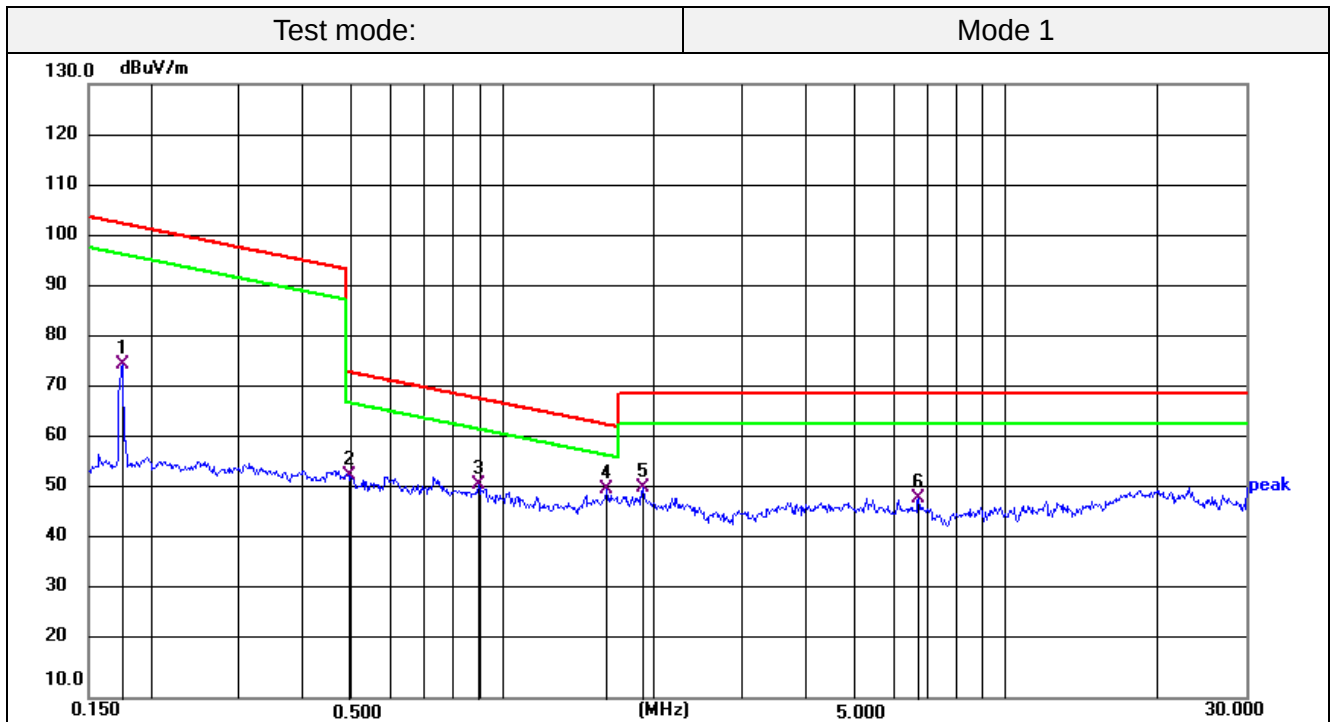
Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss;

Margin= Emission Level - Limit.

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|------|
| 1   | 0.0111          | 31.25          | 21.36         | 52.61          | 126.70         | -74.09      | QP   |
| 2   | 0.0187          | 33.89          | 20.88         | 54.77          | 122.17         | -67.40      | QP   |
| 3   | 0.0223          | 32.04          | 20.94         | 52.98          | 120.64         | -67.66      | QP   |
| 4   | 0.0446          | 34.47          | 22.28         | 56.75          | 114.62         | -57.87      | QP   |
| 5   | 0.0734          | 34.12          | 22.68         | 56.80          | 110.29         | -53.49      | QP   |
| 6 * | 0.1330          | 35.26          | 22.07         | 57.33          | 105.13         | -47.80      | QP   |

# For 150KHz-30MHz



Remark:

Emission Level = Reading + Factor;

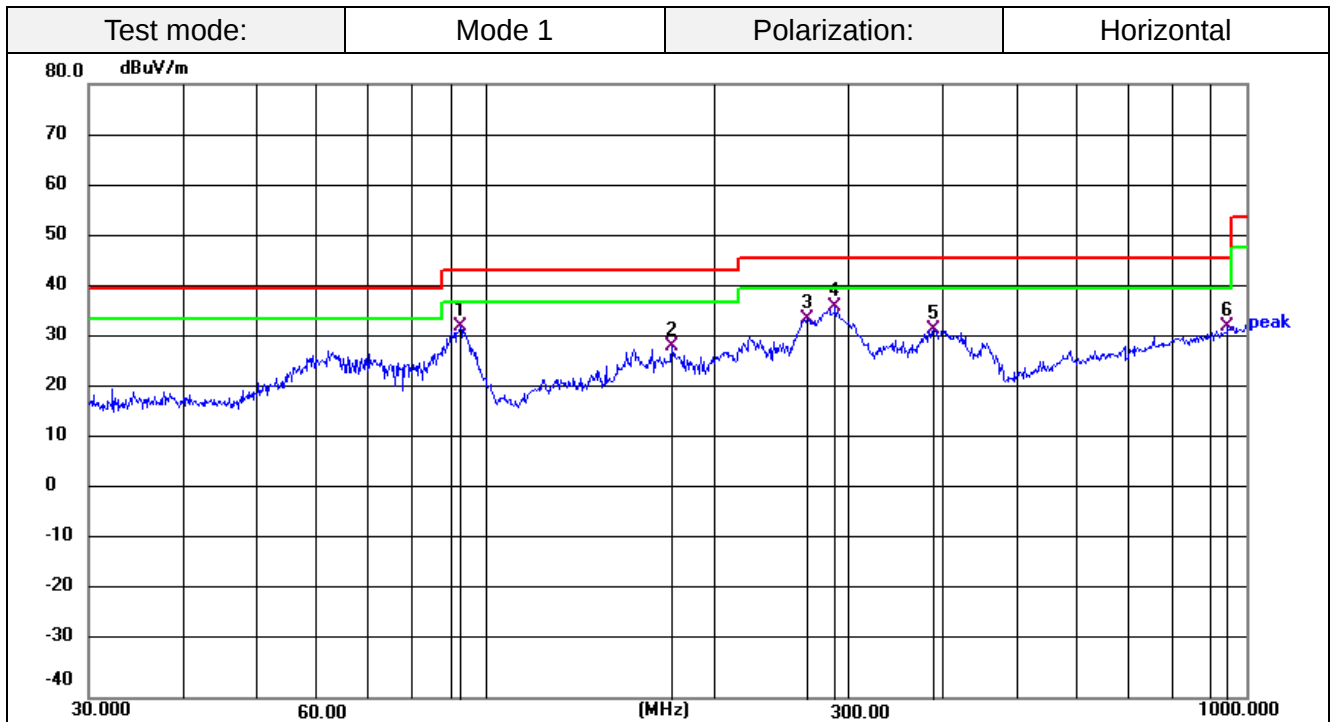
Factor = Antenna Factor + Cable Loss;

Margin= Emission Level - Limit.

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|------|
| 1   | 0.1750          | 53.46          | 21.77         | 75.23          | 102.74         | -27.51      | QP   |
| 2   | 0.4940          | 31.80          | 21.79         | 53.59          | 73.73          | -20.14      | QP   |
| 3   | 0.8941          | 29.32          | 22.56         | 51.88          | 68.58          | -16.70      | QP   |
| 4 * | 1.6104          | 28.32          | 22.48         | 50.80          | 63.47          | -12.67      | QP   |
| 5   | 1.8980          | 28.68          | 22.42         | 51.10          | 69.54          | -18.44      | QP   |
| 6   | 6.6977          | 25.92          | 23.06         | 48.98          | 69.54          | -20.56      | QP   |

Note: Pre-scan in the all of mode, the worst case in of was recorded.

### For 30MHz-1GHz



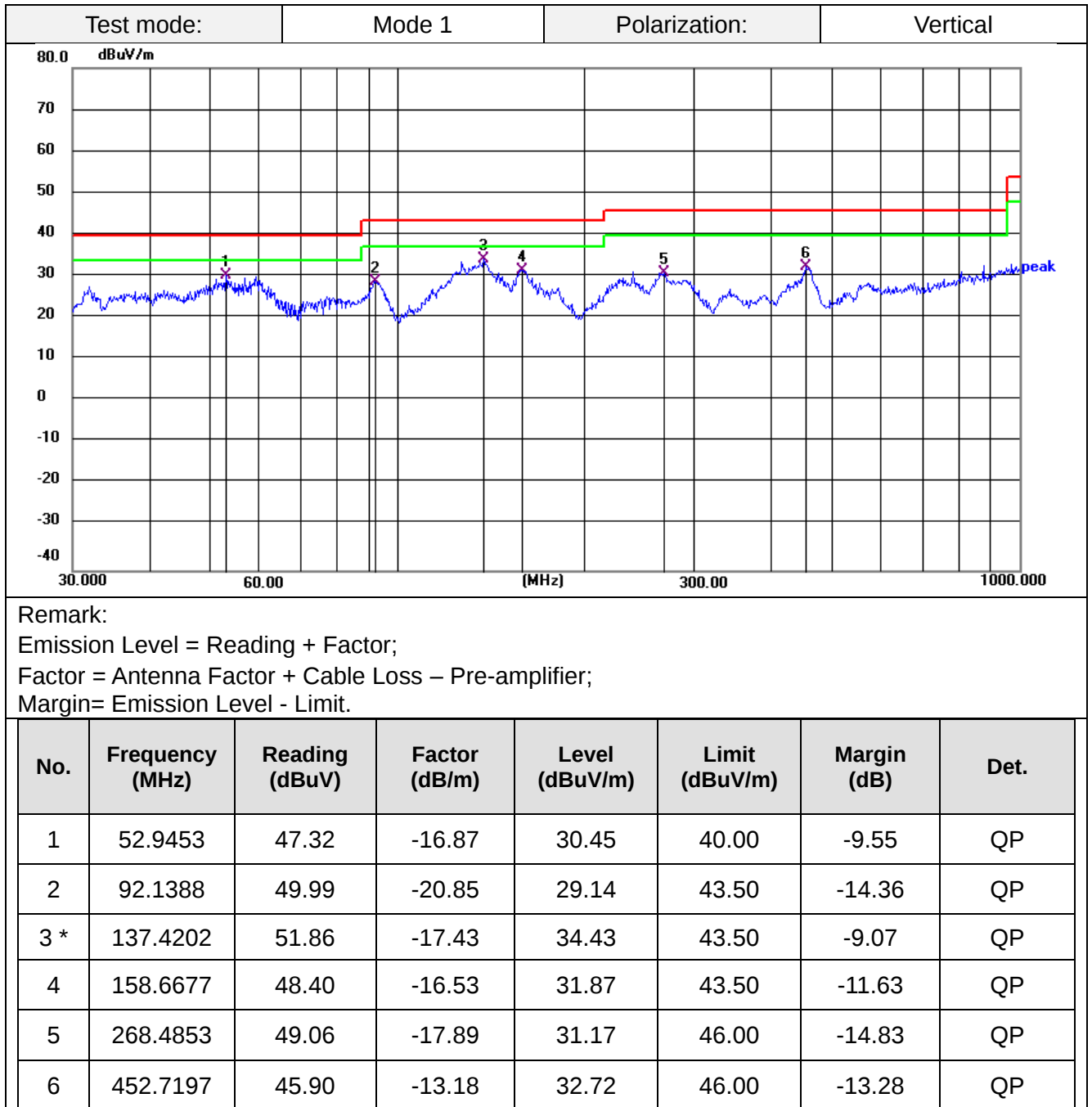
#### Remark:

Emission Level = Reading + Factor;

Factor = Antenna Factor + Cable Loss – Pre-amplifier;

Margin= Emission Level - Limit.

| No. | Frequency (MHz) | Reading (dBuV) | Factor (dB/m) | Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Det. |
|-----|-----------------|----------------|---------------|----------------|----------------|-------------|------|
| 1   | 92.4624         | 53.40          | -20.82        | 32.58          | 43.50          | -10.92      | QP   |
| 2   | 175.6516        | 46.55          | -17.68        | 28.87          | 43.50          | -14.63      | QP   |
| 3   | 264.7457        | 52.15          | -18.03        | 34.12          | 46.00          | -11.88      | QP   |
| 4 * | 287.9904        | 53.87          | -17.28        | 36.59          | 46.00          | -9.41       | QP   |
| 5   | 387.9920        | 46.88          | -14.83        | 32.05          | 46.00          | -13.95      | QP   |
| 6   | 945.4399        | 36.29          | -3.63         | 32.66          | 46.00          | -13.34      | QP   |



### 3.3 20dB Bandwidth

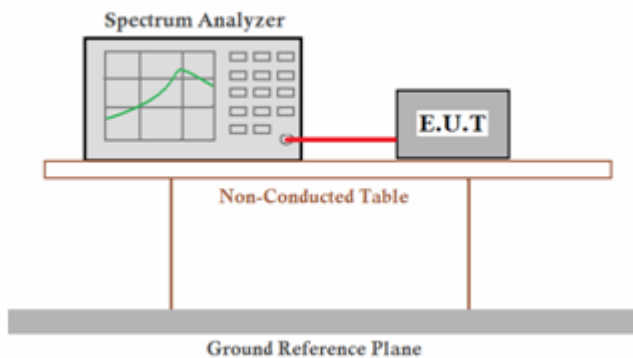
#### Limit

The 20dB bandwidth shall be less than 80% of the permitted frequency band.

#### Test Procedure

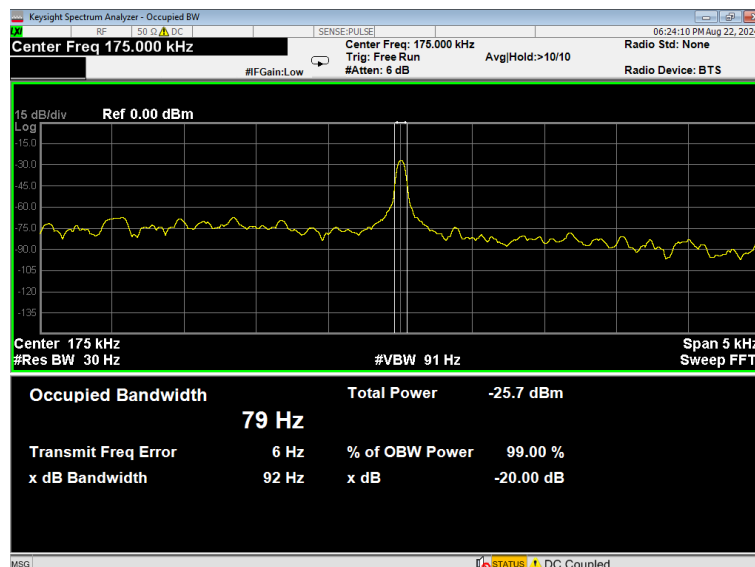
1. Set RBW = 30Hz.
2. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Sweep = auto couple.
6. Allow the trace to stabilize.
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB relative to the maximum level measured in the fundamental emission.

#### Test setup



#### Test Results

| Mode    | Frequency (KHz) | 20dB Bandwidth (KHz) | 99% OBW (KHz) | Conclusion |
|---------|-----------------|----------------------|---------------|------------|
| Tx Mode | 175.0           | 0.092                | -             | PASS       |



### 3.4 Antenna Requirement

#### **Standard Applicable**

**For intentional device, according to FCC 47 CFR Section 15.203:**

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

#### **Confirmation**

The EUT's antenna is an Inductive Loop coil Antenna, the best case gain of the antenna is 0dBi.

## **4 Test Setup Photographs of EUT**

Please refer to separated files for Test Setup Photos of the EUT.

## **5 External Photographs of EUT**

Please refer to separated files for External Photos of the EUT.

## **6 Internal Photographs of EUT**

Please refer to separated files for Internal Photos of the EUT.

**\*\*\*\*\* End of Report \*\*\*\*\***