

# TEST REPORT

**Reference No.**..... : WTD22D12264079W002  
**FCC ID** ..... : 2ALCVCKSW7708M  
**Applicant**..... : Emerson Radio Corp.  
**Address**..... : 959 Route 46 East, Suite 210, 2nd Floor, Parsippany NJ 07054, USA  
**Manufacturer** ..... : Shenzhen Maniway Electronics Limited  
**Address**..... : Bldg 8, Hualian Hebei Industrial Estate, Longhua Street, Longhua District, SHENZHEN Guangdong  
**Product**..... : Alarm Clock Radio with Bluetooth and Wireless Charger  
**Model(s)**. .... : CKSW7708M, CKSWXXXXM (where XXXX denotes different LED display colors and cosmetics).  
**Brand Name**..... : Emerson  
**Standards**..... : FCC CFR47 Part 15C  
**Date of Receipt sample** .... : 2023-01-03  
**Date of Test** ..... : 2023-01-03 to 2023-02-06  
**Date of Issue**..... : 2023-02-28  
**Test Result**..... : **Pass**

**Remarks:**

The results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

**Prepared By:**

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3 Revision History

| Test Report No.    | Date of Receipt Sample | Date of Test             | Date of Issue | Purpose  | Comment | Approved |
|--------------------|------------------------|--------------------------|---------------|----------|---------|----------|
| WTD22D12264079W002 | 2023-01-03             | 2023-01-03 to 2023-02-06 | 2023-02-28    | Original | -       | Valid    |

## 4 General Information

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

|                       |                                                                                                                                                                                             |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product:              | Alarm Clock Radio with Bluetooth and Wireless Charger                                                                                                                                       |
| Model(s):             | CKSW7708M, CKSWXXXXM (where XXXX denotes different LED display colors and cosmetics).                                                                                                       |
| Model Difference:     | All models are same in all respects. Only the model names and LED display colors or cosmetics are different for different market requirement.<br>Model CKSW7708M was tested in this report. |
| Type of Modulation:   | FSK                                                                                                                                                                                         |
| Frequency Range:      | 110-145kHz                                                                                                                                                                                  |
| Antenna installation: | Coil antenna                                                                                                                                                                                |
| Hardware Version:     | VER:1.0                                                                                                                                                                                     |
| Software Version:     | U16                                                                                                                                                                                         |

### 4.2 Details of accessories

|          |                           |
|----------|---------------------------|
| Ratings: | Input: AC 120V, 60Hz, 42W |
|----------|---------------------------|

### 4.3 Test Mode

| Test Mode     | Descriptions                       |
|---------------|------------------------------------|
| Standby mode  | EUT alone powered by AC/DC adapter |
| Charging mode | Ant.1 loading of 3W                |
|               | Ant.2 loading of 15W               |
|               | Ant.3 loading of 5W                |

**Note:**

All test mode(s) and condition(s) mentioned were considered and evaluated respectively by performing full tests, the worst data were recorded and reported.

### 4.4 Test Facility

The test facility has a test site registered with the following organizations:

**ISED CAB identifier: CN0013. Test Firm Registration No.: 7760A.**

Waltek Testing Group Co., Ltd. Has been registered and fully described in a report filed with the Industry Canada. The acceptance letter from the Industry Canada is maintained in our files. Registration number 7760A, October 15, 2016.

**FCC Designation No.: CN1201. Test Firm Registration No.: 523476.**

Waltek Testing Group Co., Ltd. EMC Laboratory 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. Registration number 523476, September 10, 2019.

## 5 Test Summary

| Test Items                                                                  | Test Requirement                              | Result |
|-----------------------------------------------------------------------------|-----------------------------------------------|--------|
| Conducted Emission                                                          | 47CFR part 15§15.207                          | PASS   |
| Radiated Emission                                                           | 47CFR part 15§15.209                          | PASS   |
| 20dB Bandwidth                                                              | 47CFR part 15§15.215                          | PASS   |
| Antenna Requirement                                                         | 47CFR part 15§15.203                          | PASS   |
| RF Exposure                                                                 | FCC CFR 47 part1§1.1310<br>KDB 680106 D01 v03 | PASS   |
| Note: Pass=Compliance; NC=Not Compliance; NT=Not Tested; N/A=Not Applicable |                                               |        |

Note: -

## 6 Equipment Used during Test

### 6.1 Equipments List

| Conducted Emissions Test Site 2#                              |                              |              |             |                 |                       |                      |
|---------------------------------------------------------------|------------------------------|--------------|-------------|-----------------|-----------------------|----------------------|
| Item                                                          | Equipment                    | Manufacturer | Model No.   | Serial No.      | Last Calibration Date | Calibration Due Date |
| 1                                                             | EMI Test Receiver            | R&S          | ESCI        | 101155          | 2022-08-01            | 2023-07-31           |
| 2                                                             | LISN                         | SCHWARZBECK  | NSLK 8128   | 8128-259        | 2022-08-08            | 2023-08-07           |
| 3                                                             | Limiter                      | CYBERTEK     | EM5010      | 261115-001-0024 | 2022-08-01            | 2023-07-31           |
| 4                                                             | Cable                        | Laplace      | RF300       | -               | 2022-08-08            | 2023-08-07           |
| 3m Semi-anechoic Chamber for Radiation Emissions Test site 2# |                              |              |             |                 |                       |                      |
| Item                                                          | Equipment                    | Manufacturer | Model No.   | Serial No.      | Last Calibration Date | Calibration Due Date |
| 1                                                             | Spectrum Analyzer            | R&S          | FSP30       | 100091          | 2022-04-28            | 2023-04-27           |
| 2                                                             | Amplifier                    | Agilent      | 8447D       | 2944A10178      | 2022-08-01            | 2023-07-31           |
| 4                                                             | Trilog Broadband Antenna     | SCHWARZBECK  | VULB9163    | 336             | 2022-08-01            | 2023-07-31           |
| 5                                                             | Coaxial Cable (below 1GHz)   | Top          | TYPE16(13M) | -               | 2022-08-07            | 2023-08-06           |
| RF Conducted Testing                                          |                              |              |             |                 |                       |                      |
| Item                                                          | Equipment                    | Manufacturer | Model No.   | Serial No.      | Last Calibration Date | Calibration Due Date |
| 1.                                                            | Signal Analyzer (9k~26.5GHz) | Agilent      | N9010A      | MY50520207      | 2022-04-28            | 2023-04-27           |
| 2                                                             | Spectrum Analyzer            | R&S          | FSP40       | 100501          | 2022-08-01            | 2023-07-31           |

### 6.2 Description of Support Units

| Equipment | Manufacturer | Model No. | Series No. |
|-----------|--------------|-----------|------------|
| /         | /            | /         | /          |

### 6.3 Measurement Uncertainty

| Parameter                                        | Uncertainty                                 |
|--------------------------------------------------|---------------------------------------------|
| Conducted Emission                               | $\pm 3.64$ dB (AC mains 150KHz~30MHz)       |
| Radiated Spurious Emissions                      | $\pm 5.08$ dB (Bilog antenna 30M~1000MHz)   |
|                                                  | $\pm 5.47$ dB (Horn antenna 1000M~25000MHz) |
| Radio Frequency                                  | $\pm 1 \times 10^{-7}$ Hz                   |
| RF Power                                         | $\pm 0.42$ dB                               |
| RF Power Density                                 | $\pm 0.7$ dB                                |
| Conducted Spurious Emissions                     | $\pm 2.76$ dB (9kHz~26500MHz)               |
| Confidence interval: 95%. Confidence factor: k=2 |                                             |

### 6.4 Test Equipment Calibration

All the test equipments used are valid and calibrated by CEPREI Certification Body that address is No.110 Dongguan Zhuang RD. Guangzhou, P. R. China.

7 Conducted Emission

Test Requirement: FCC CFR 47 Part 15 Section 15.207  
Test Method: ANSI C63.10:2013  
Test Result: PASS  
Frequency Range: 150kHz to 30MHz  
Class/Severity: Class B  
Limit:

| Frequency (MHz) | Limit (dBμV) |          |
|-----------------|--------------|----------|
|                 | Quasi-peak   | Average  |
| 0.15 o 0.5      | 66 to 56*    | 56 o 46* |
| 0.5 to 5        | 56           | 46       |
| 5 to 30         | 60           | 50       |

\* Decreases with the logarithm of the frequency.

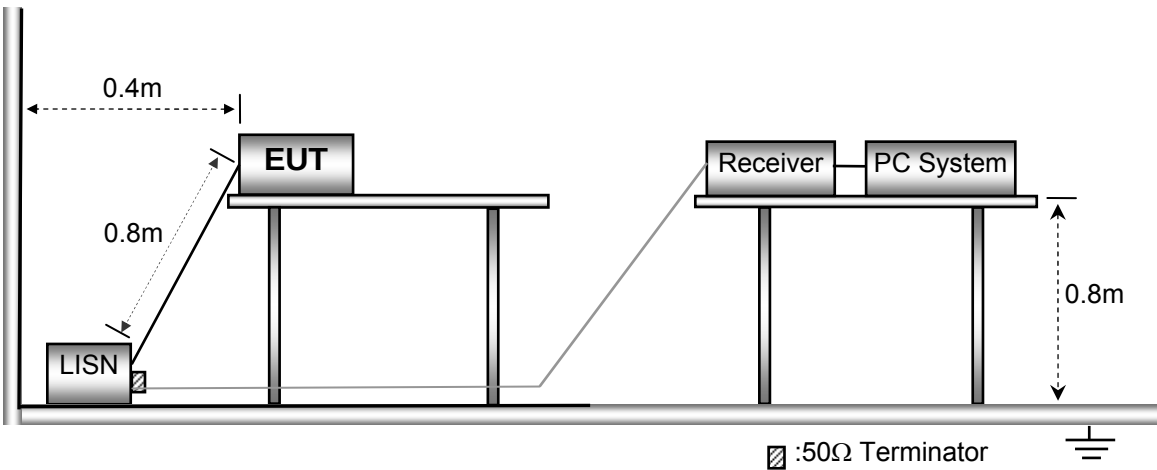
7.1 EUT Operation

Operating Environment:  
Temperature: 22.8 °C  
Humidity: 45.6 % RH  
Atmospheric Pressure: 101.2kPa  
EUT Operation: Ant.2 loading of 15W

Only the worst-case transmitting mode were record in the report.

7.2 EUT Setup

The EUT was placed on the test table in shielding room.

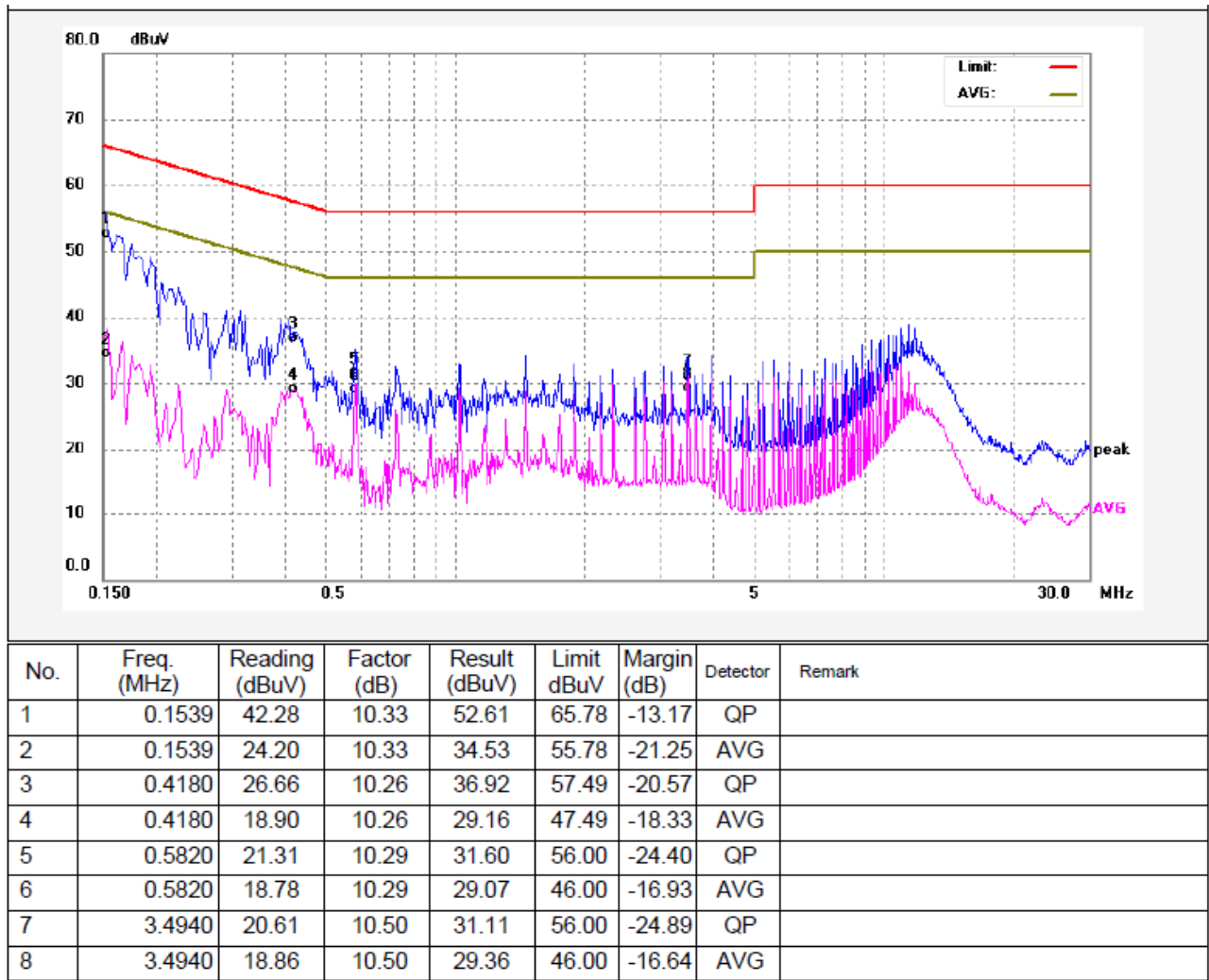


7.3 Measurement Description

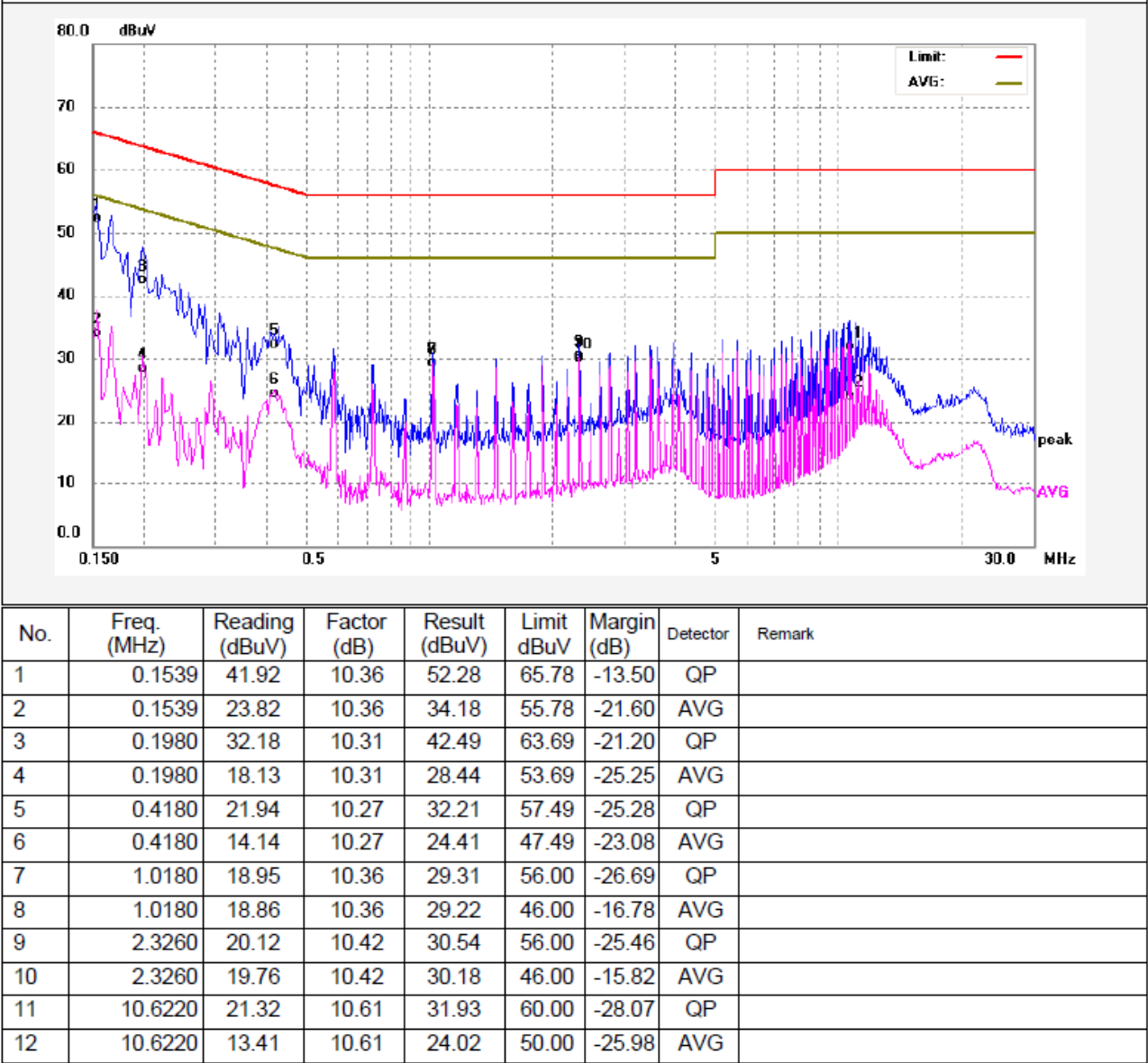
The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

7.4 Conducted Emission Test Result

Live line:



Neutral line:



## 8 Radiated Spurious Emissions

Test Requirement: FCC CFR47 Part 15 Section 15.209

Test Method: ANSI C63.10:2013

Test Result: PASS

Measurement Distance: 3m

Limit:

FCC Part15 Paragraph 15.209

| Frequency<br>(MHz) | Field Strength        |                 | Field Strength Limit at 3m Measurement Dist |                                       |
|--------------------|-----------------------|-----------------|---------------------------------------------|---------------------------------------|
|                    | $\mu\text{V/m}$       | Distance<br>(m) | $\mu\text{V/m}$                             | $\text{dB}\mu\text{V/m}$              |
| 0.009 ~ 0.490      | $2400/F(\text{kHz})$  | 300             | $10000 * 2400/F(\text{kHz})$                | $20\log^{(2400/F(\text{kHz}))} + 80$  |
| 0.490 ~ 1.705      | $24000/F(\text{kHz})$ | 30              | $100 * 24000/F(\text{kHz})$                 | $20\log^{(24000/F(\text{kHz}))} + 40$ |
| 1.705 ~ 30         | 30                    | 30              | $100 * 30$                                  | $20\log^{(30)} + 40$                  |
| 30 ~ 88            | 100**                 | 3               | 100                                         | $20\log^{(100)}$                      |
| 88 ~ 216           | 150**                 | 3               | 150                                         | $20\log^{(150)}$                      |
| 216 ~ 960          | 200**                 | 3               | 200                                         | $20\log^{(200)}$                      |
| Above 960          | 500                   | 3               | 500                                         | $20\log^{(500)}$                      |

\*\*Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

In the emission table above, the tighter limit applies at the band edges.

Note:

According to §15.209(d), the emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

According to §15.31(f)(2):

3m Measurement level ( $\text{dB}\mu\text{V/m}$ ) = 300m Measurement level ( $\text{dB}\mu\text{V/m}$ ) +  $40\log(300/3)$  ( $\text{dB}\mu\text{V/m}$ ).

### 8.1 EUT Operation

Operating Environment:

Temperature: 25.2 °C

Humidity: 51.5 % RH

Atmospheric Pressure: 101.2kPa

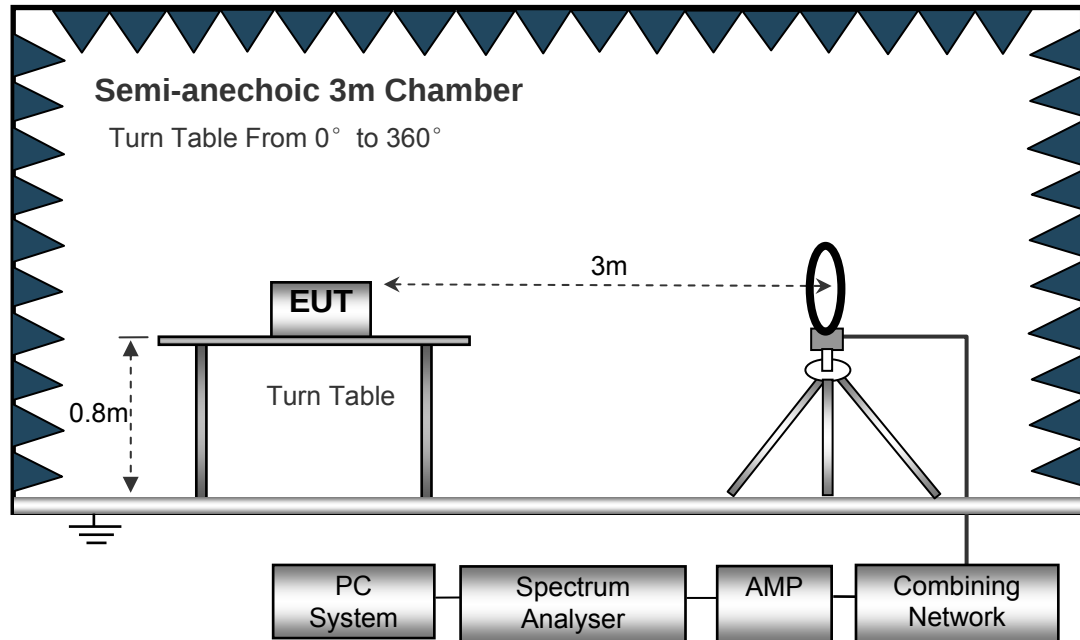
EUT Operation: Ant. 2 loading of 15W

Only the worst-case transmitting mode were record in the report.

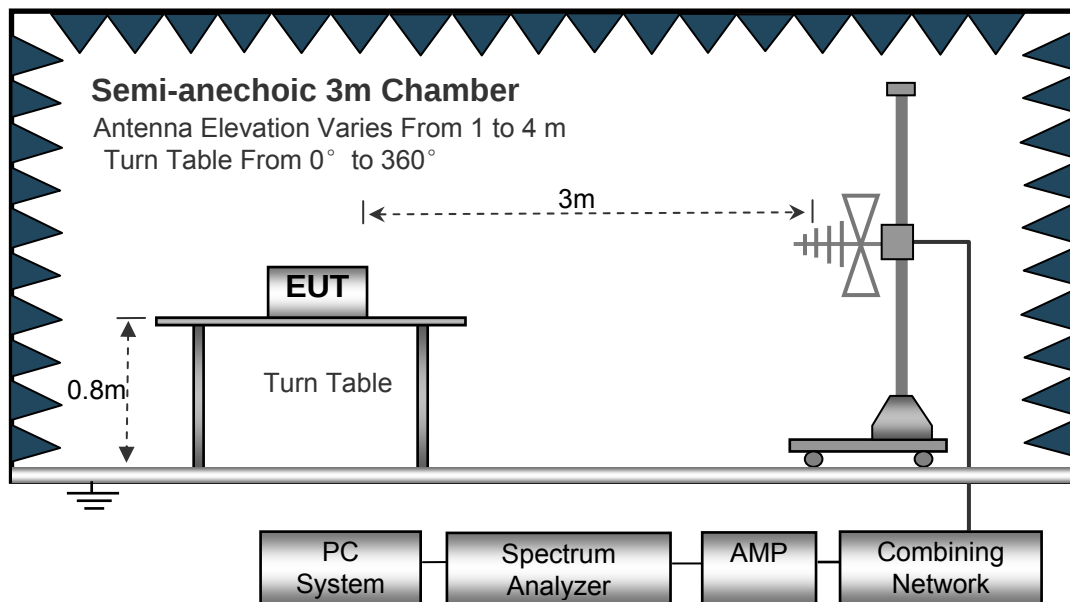
## 8.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site, using the setup accordance with the ANSI 63.10:2013.

The test setup for emission measurement below 30MHz.



The test setup for emission measurement above 30MHz and up to 1 000MHz.



### 8.3 Spectrum Analyzer Setup

Below 30MHz

Sweep Speed ..... Auto  
 IF Bandwidth..... 10kHz  
 Video Bandwidth..... 10kHz  
 Resolution Bandwidth..... 10kHz

Above 30MHz

Sweep Speed ..... Auto  
 Video Bandwidth..... 300kHz  
 Resolution Bandwidth..... 100kHz

### 8.4 Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane, EUT is set 3m away from the receiving antenna, which is 1.0m above ground plane (Height of the centre of the loop above the GRP of the SAC is 1 m).
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And each emission was to be maximized by changing the polarization of receiving antenna both vertical coaxial and vertical coplanar.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The radiation measurements are tested under 3-axes (X, Y, Z) position (X denotes lying on the table, Y denotes side stand and Z denotes vertical stand). After pre-test, it was found that the worse radiation emission was get at the Z position. So the data shown was the Z position only.

**Note:**

Although these test were performed other than open area test site, adequate comparison measurements were confirmed against 300m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788 D01.

### 8.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

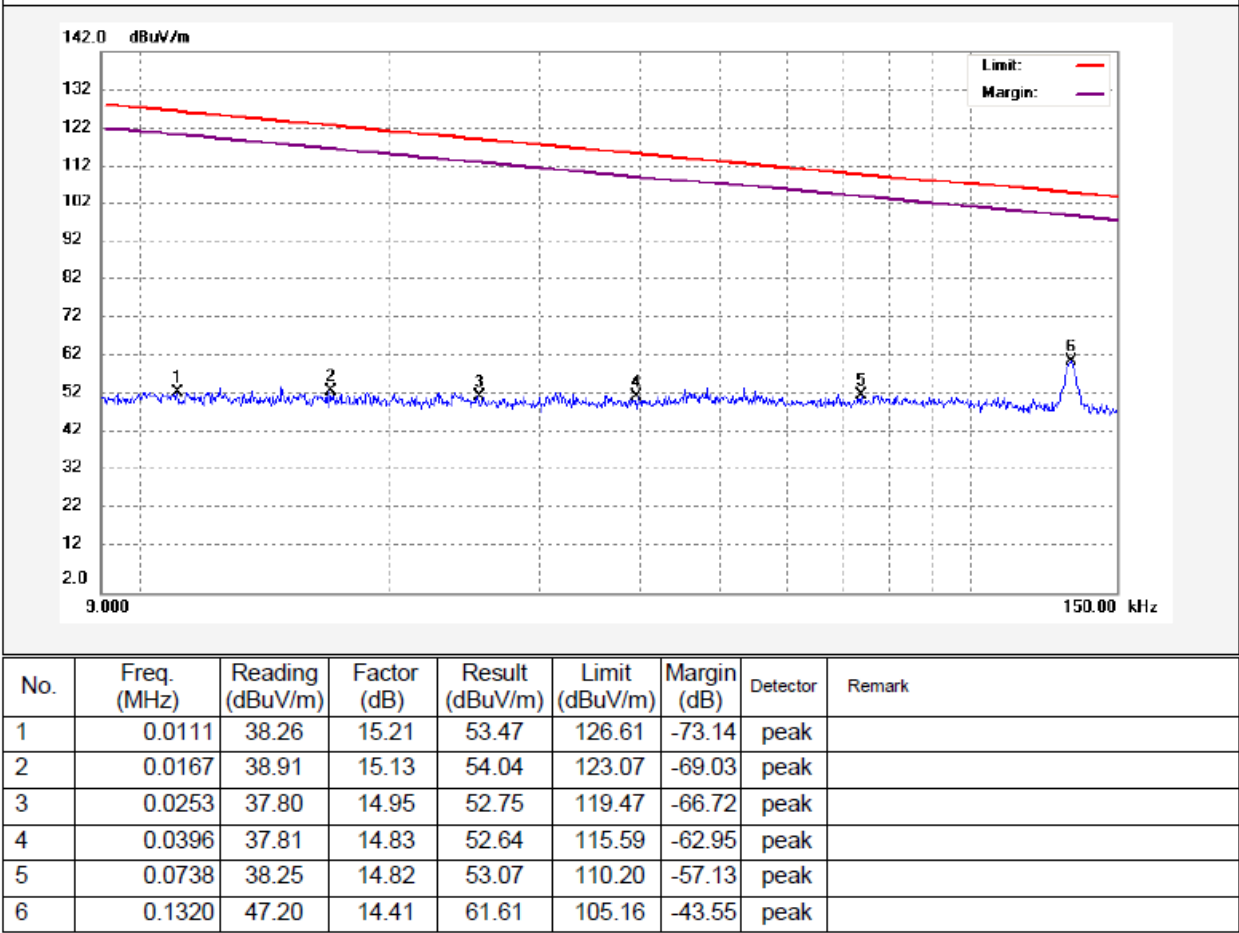
The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

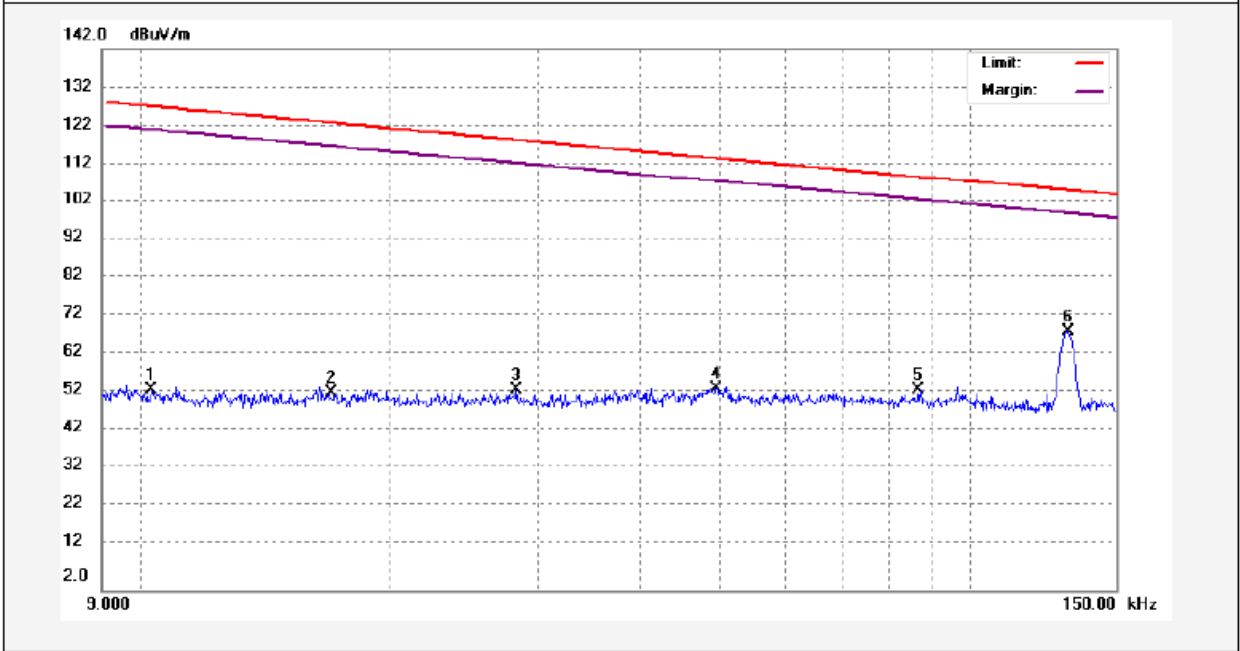
8.6 Summary of Test Results

Test Frequency: 9kHz ~ 150kHz

Antenna Polarization: 0°



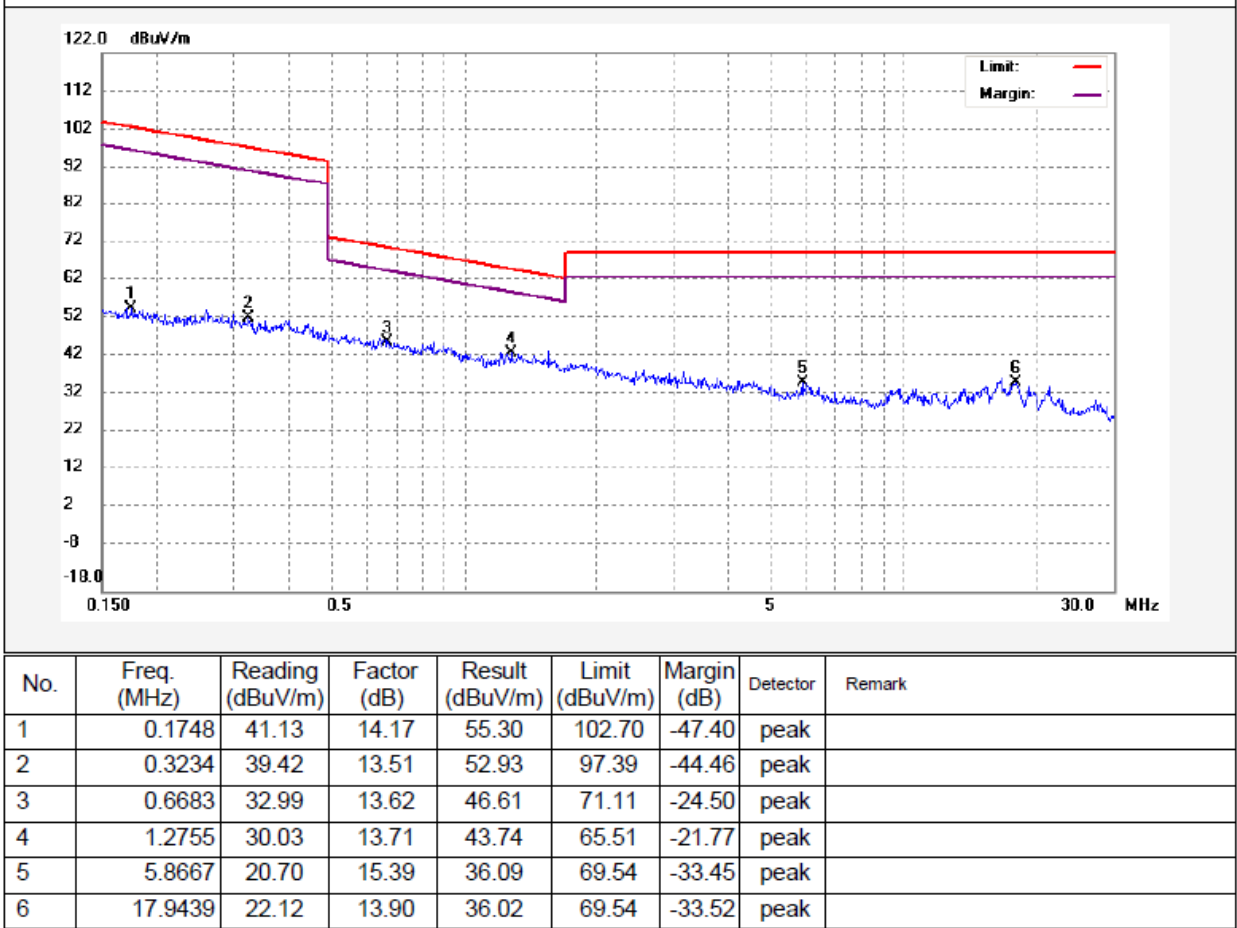
Antenna Polarization: 90°



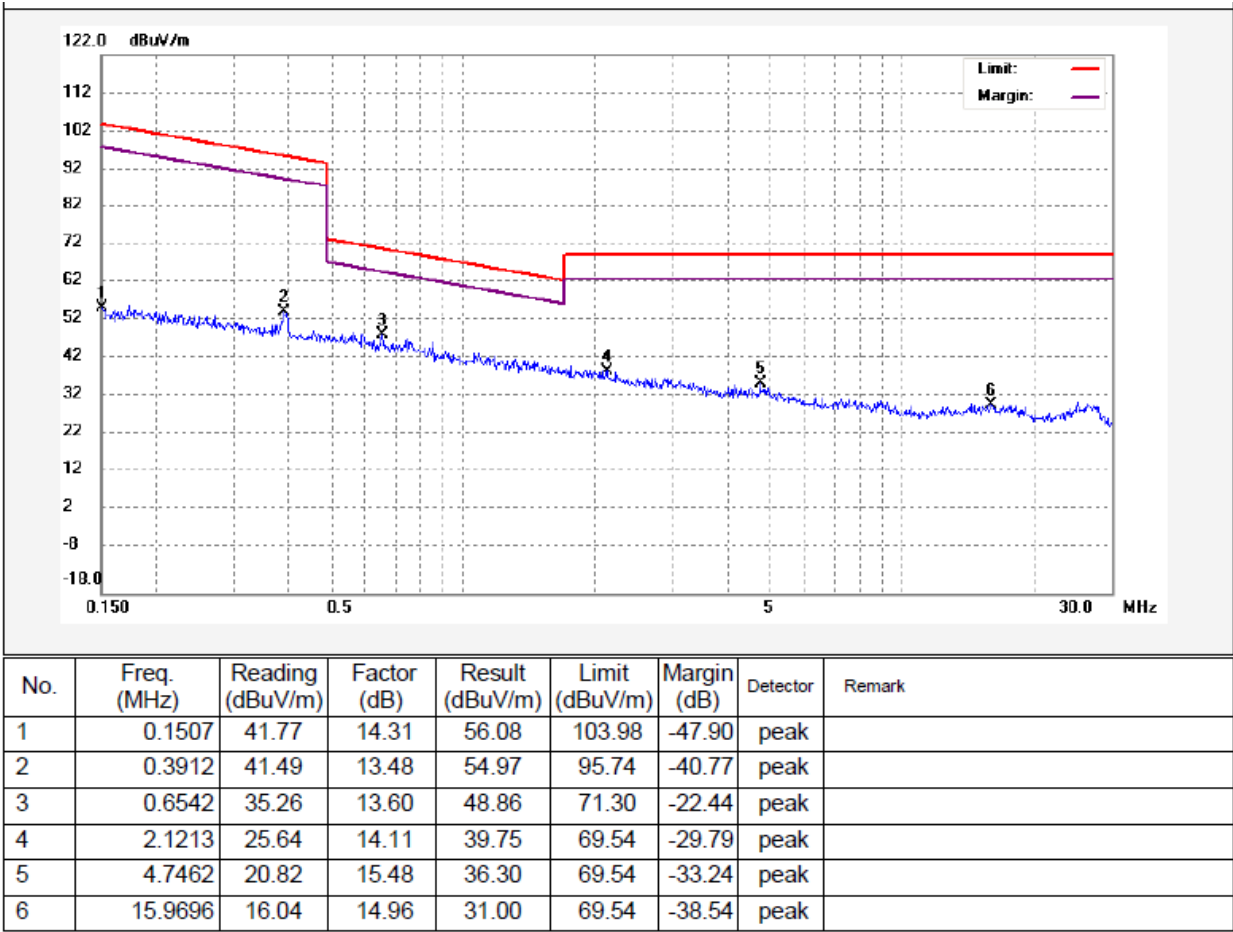
| No. | Freq. (MHz) | Reading (dBuV/m) | Factor (dB) | Result (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Detector | Remark |
|-----|-------------|------------------|-------------|-----------------|----------------|-------------|----------|--------|
| 1   | 0.0103      | 38.52            | 15.22       | 53.74           | 127.25         | -73.51      | peak     |        |
| 2   | 0.0167      | 37.65            | 15.13       | 52.78           | 123.07         | -70.29      | peak     |        |
| 3   | 0.0284      | 38.59            | 14.87       | 53.46           | 118.47         | -65.01      | peak     |        |
| 4   | 0.0495      | 39.31            | 14.83       | 54.14           | 113.66         | -59.52      | peak     |        |
| 5   | 0.0868      | 38.85            | 14.74       | 53.59           | 108.79         | -55.20      | peak     |        |
| 6   | 0.1310      | 54.40            | 14.42       | 68.82           | 105.23         | -36.41      | peak     |        |

Test Frequency: 150kHz ~ 30MHz

Antenna Polarization: 0°

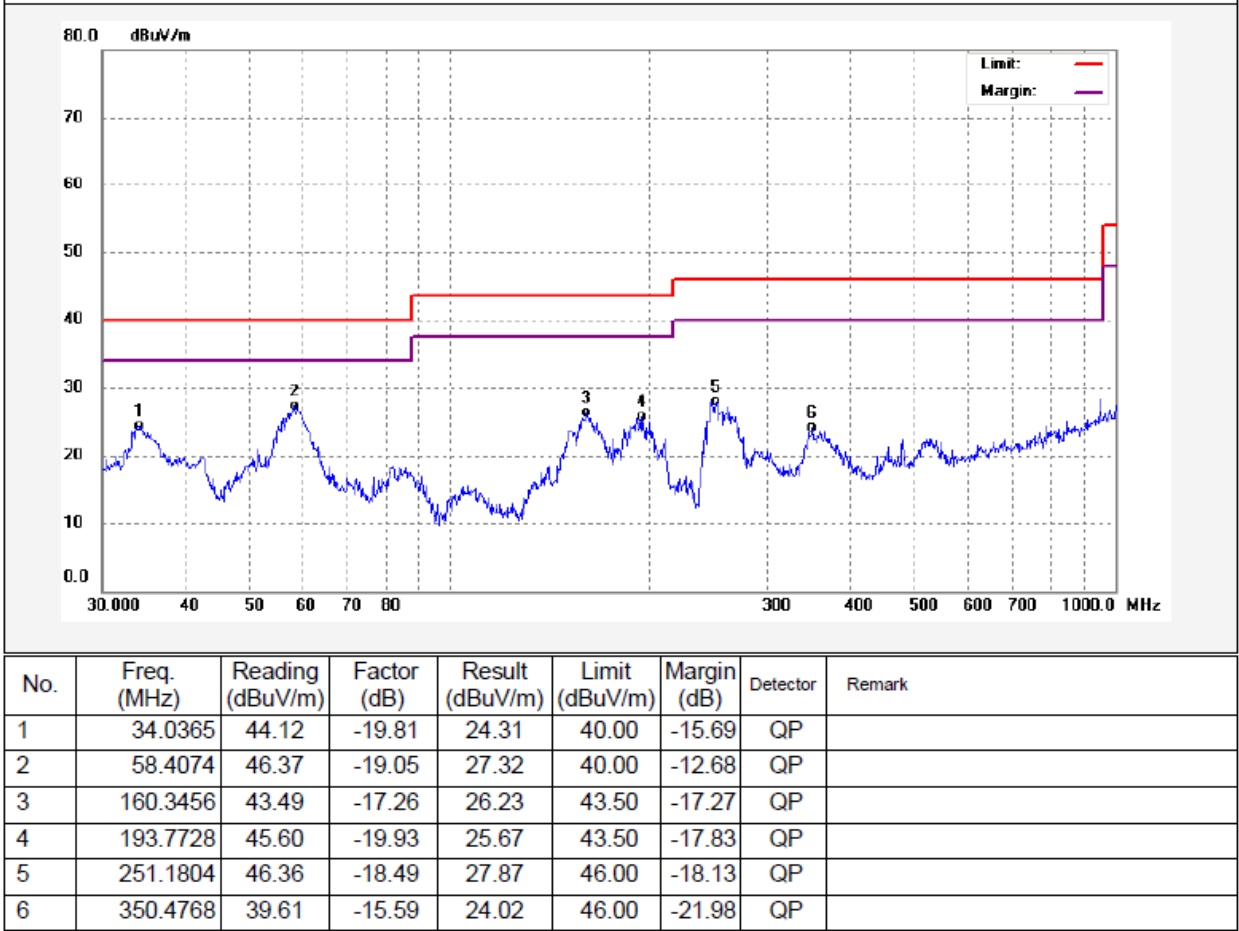


Antenna Polarization: 90°

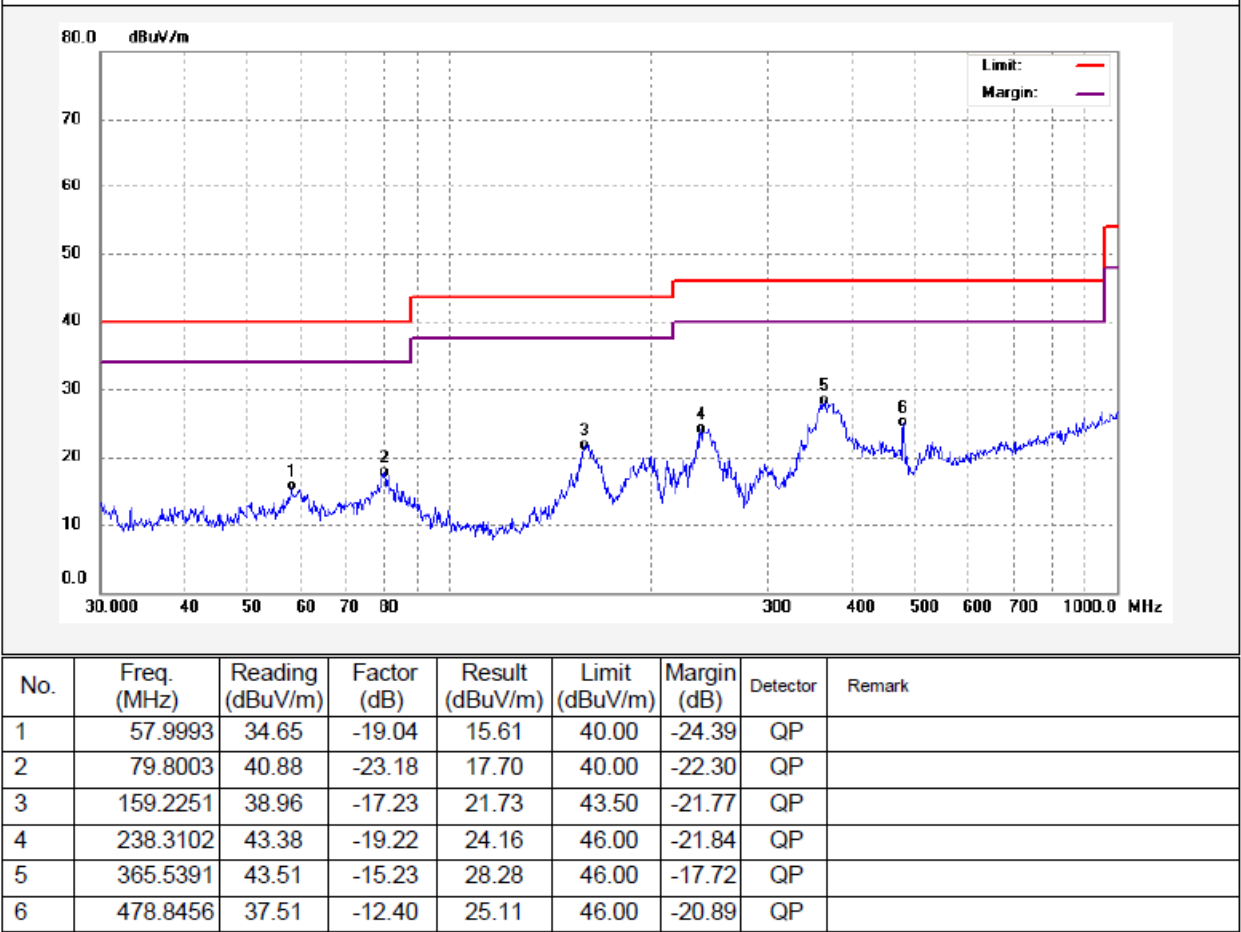


Test Frequency: 30MHz ~ 1 000MHz

Antenna Polarization: Vertical



Antenna Polarization: Horizontal



## 9 Bandwidth Measurement

Test Requirement: FCC CFR47 Part 15 Section 15.215

Test Method: ANSI C63.10:2013

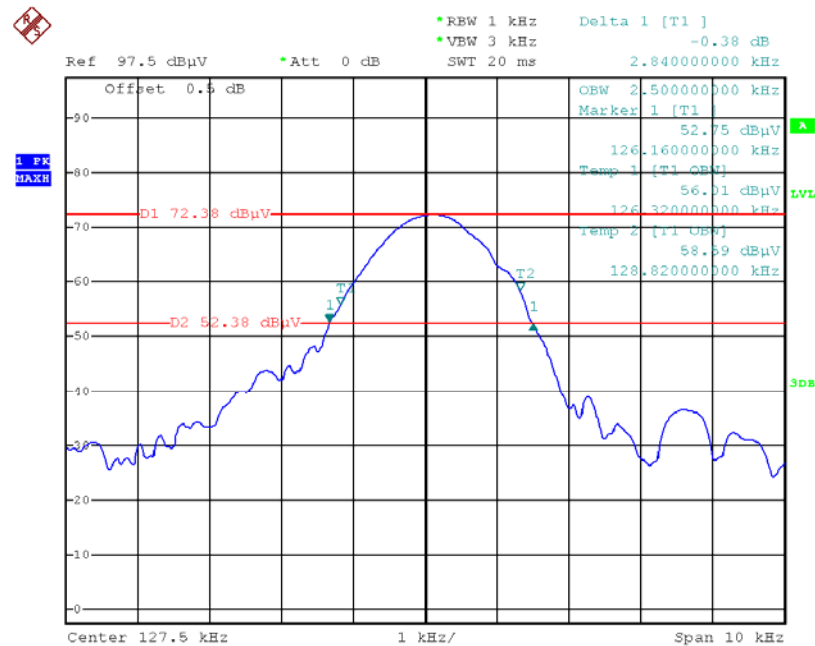
### 9.1 Test Procedure

- 1 The transmitter shall be operated at its maximum carrier power measured under normal test conditions;
2. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.
3. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW), video bandwidth (VBW) is set to approximately 3 times of the RBW.
4. Measured the spectrum width with power higher than 20dB below carrier and 99% Bandwidth.

### 9.2 Test Result

| Test Channel<br>(kHz) | 99% Bandwidth<br>(kHz) | 20dB Bandwidth<br>Emission(kHz) |
|-----------------------|------------------------|---------------------------------|
| 127.5                 | 2.500                  | 2.840                           |

Test result plot as follows:



Date: 7.NOV.2022 10:57:28

## **10 Antenna Requirement**

According to the FCC Part 15 Paragraph 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 an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Note: Please refer to EUT photos for more details.

## **11 RF Exposure**

Note: Please refer to RF Exposure test report: WTD22X12263982W.

## **12 Photographs of test setup and EUT**

Note: Please refer to appendix: Appendix-CKSW7708M -Photos.

===== End of Report =====