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.

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Compiled by:

James Cheng / Project Engineer

Approved by:

Deval Qin / Designated Reviewer

2 Contents

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. 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 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	± 3.64 dB (AC mains 150KHz~30MHz)
Radiated Spurious Emissions	± 5.08 dB (Bilog antenna 30M~1000MHz)
	± 5.47 dB (Horn antenna 1000M~25000MHz)
Radio Frequency	± 1 x 10^{-7}Hz
RF Power	± 0.42 dB
RF Power Density	± 0.7dB
Conducted Spurious Emissions	± 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

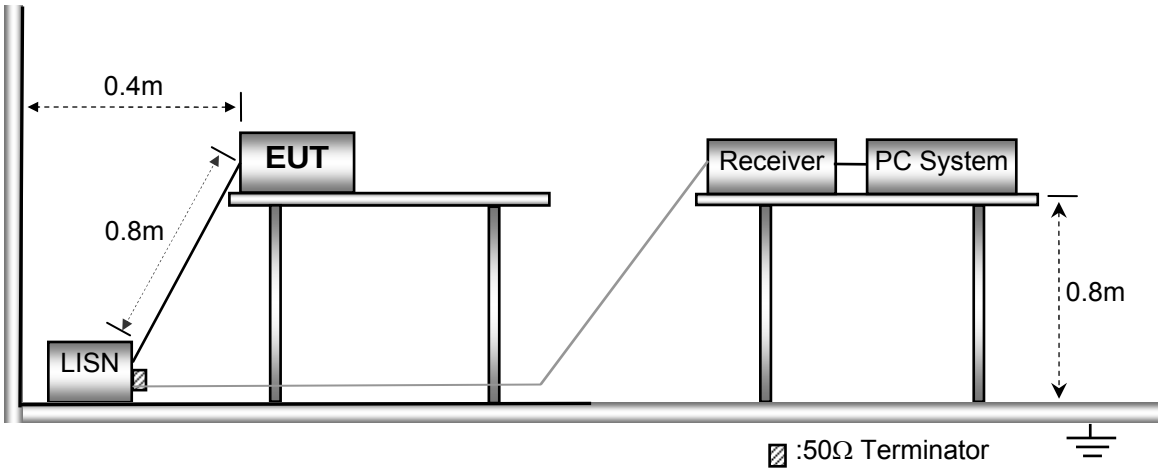
Atmospheric Pressure: 101.2kPa

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.

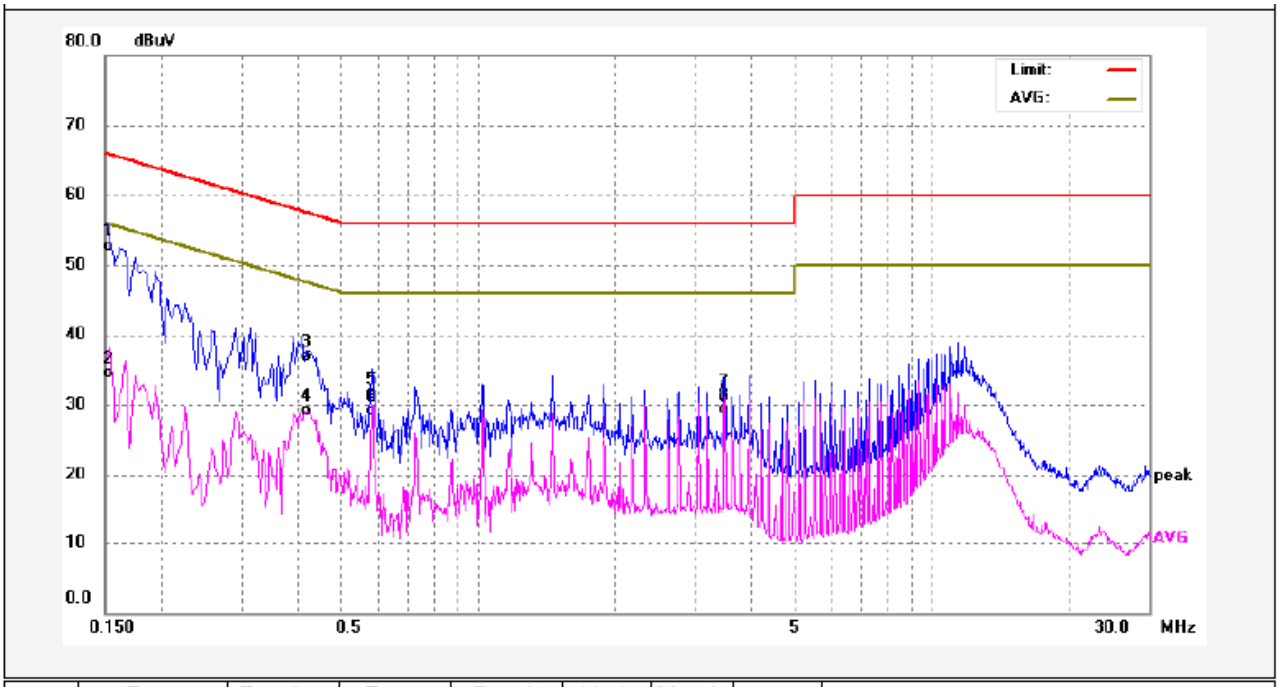


7.3 Measurement Description

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.

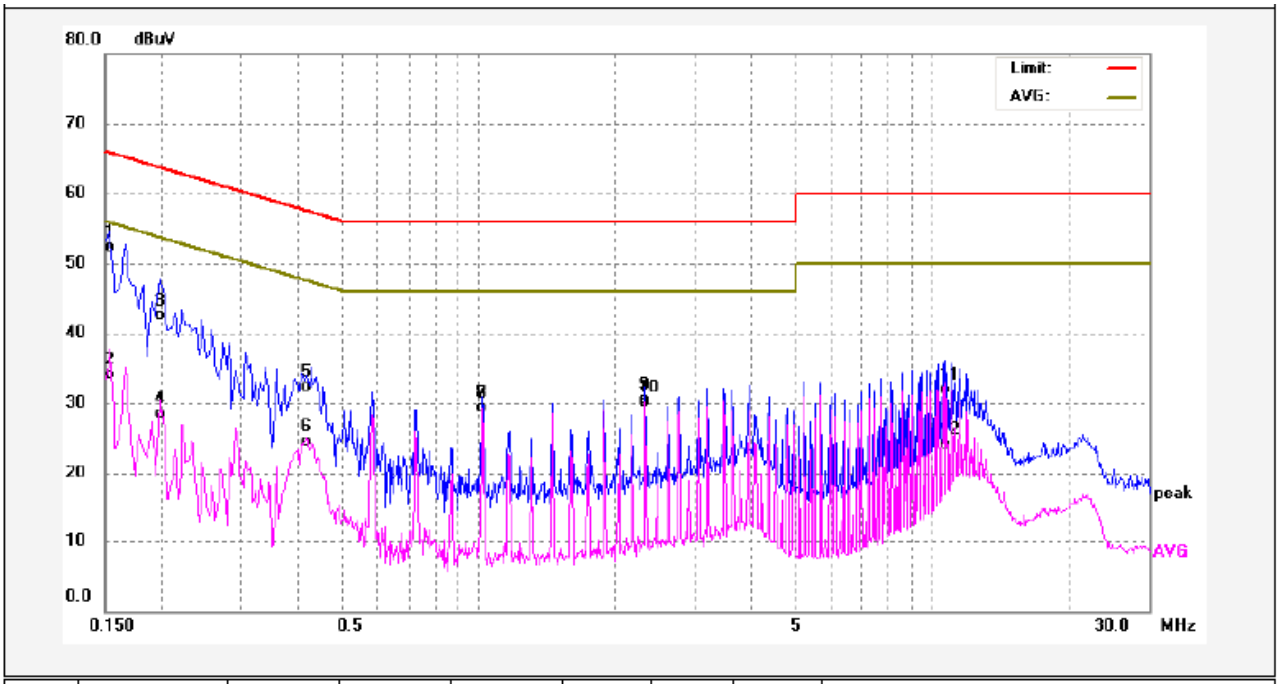
7.4 Conducted Emission Test Result

Live line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1539	42.28	10.33	52.61	65.78	-13.17	QP	
2	0.1539	24.20	10.33	34.53	55.78	-21.25	AVG	
3	0.4180	26.66	10.26	36.92	57.49	-20.57	QP	
4	0.4180	18.90	10.26	29.16	47.49	-18.33	AVG	
5	0.5820	21.31	10.29	31.60	56.00	-24.40	QP	
6	0.5820	18.78	10.29	29.07	46.00	-16.93	AVG	
7	3.4940	20.61	10.50	31.11	56.00	-24.89	QP	
8	3.4940	18.86	10.50	29.36	46.00	-16.64	AVG	

Neutral line:



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Margin (dB)	Detector	Remark
1	0.1539	41.92	10.36	52.28	65.78	-13.50	QP	
2	0.1539	23.82	10.36	34.18	55.78	-21.60	AVG	
3	0.1980	32.18	10.31	42.49	63.69	-21.20	QP	
4	0.1980	18.13	10.31	28.44	53.69	-25.25	AVG	
5	0.4180	21.94	10.27	32.21	57.49	-25.28	QP	
6	0.4180	14.14	10.27	24.41	47.49	-23.08	AVG	
7	1.0180	18.95	10.36	29.31	56.00	-26.69	QP	
8	1.0180	18.86	10.36	29.22	46.00	-16.78	AVG	
9	2.3260	20.12	10.42	30.54	56.00	-25.46	QP	
10	2.3260	19.76	10.42	30.18	46.00	-15.82	AVG	
11	10.6220	21.32	10.61	31.93	60.00	-28.07	QP	
12	10.6220	13.41	10.61	24.02	50.00	-25.98	AVG	

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 (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	μV/m	Distance (m)	μV/m	dBμV/m
0.009 ~ 0.490	2400/F(kHz)	300	10000 * 2400/F(kHz)	$20\log^{(2400/F(kHz))} + 80$
0.490 ~ 1.705	24000/F(kHz)	30	100 * 24000/F(kHz)	$20\log^{(24000/F(kHz))} + 40$
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 (dBμV/m) = 300m Measurement level (dBμV/m) + 40log (300/3) (dBμV/m).

8.1 EUT Operation

Operating Environment:

Temperature: 25.2 °C

Humidity: 51.5 % RH

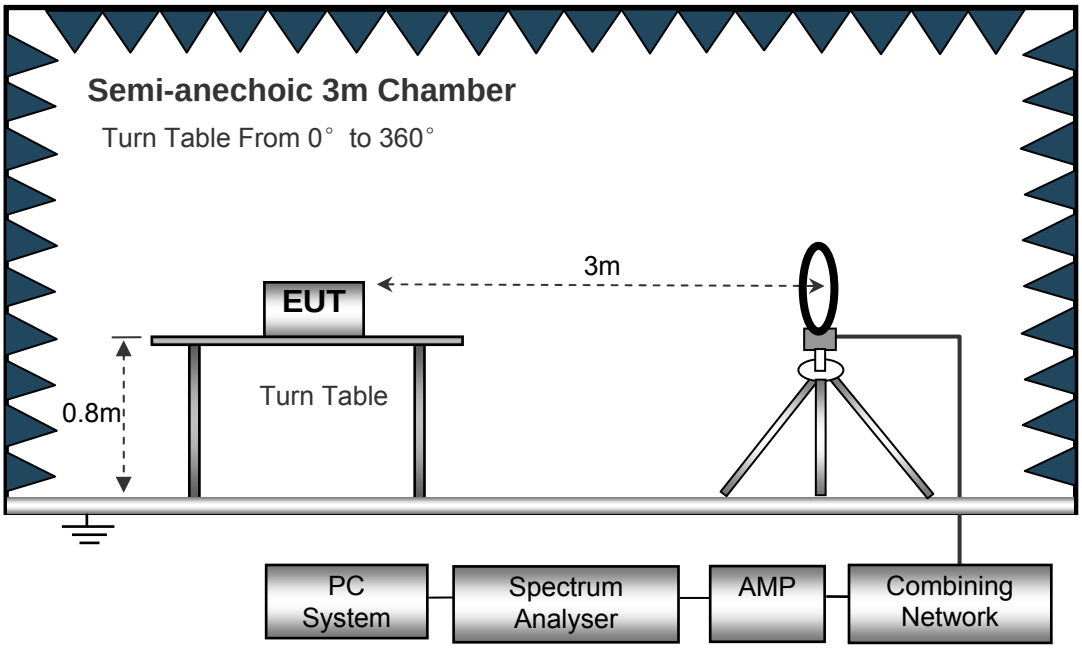
Atmospheric Pressure: 101.2kPa

EUT Operation: Ant. 2 loading of 15W

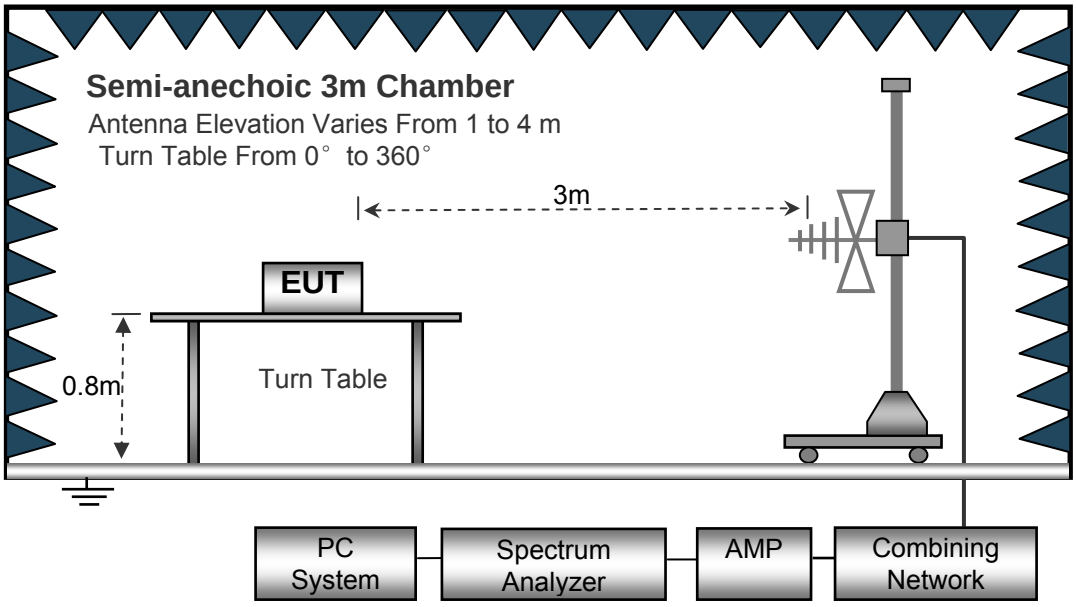
Only the worst-case transmitting mode were record in the report.

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:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

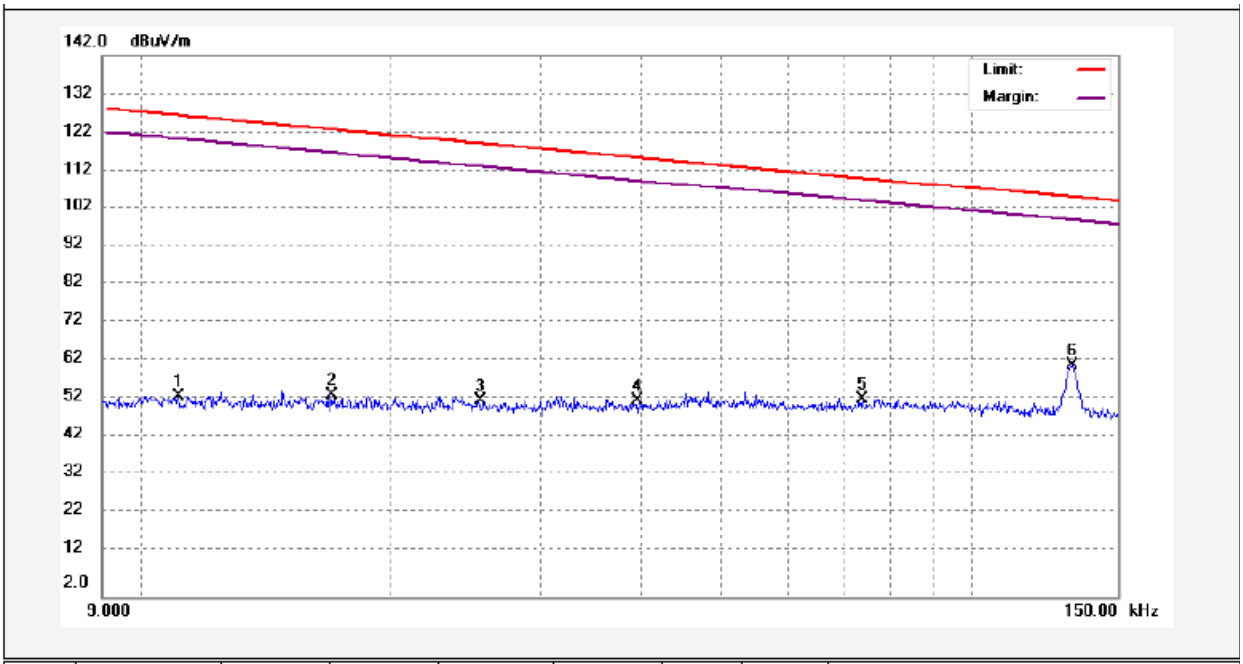
The “Margin” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. – Limit

8.6 Summary of Test Results

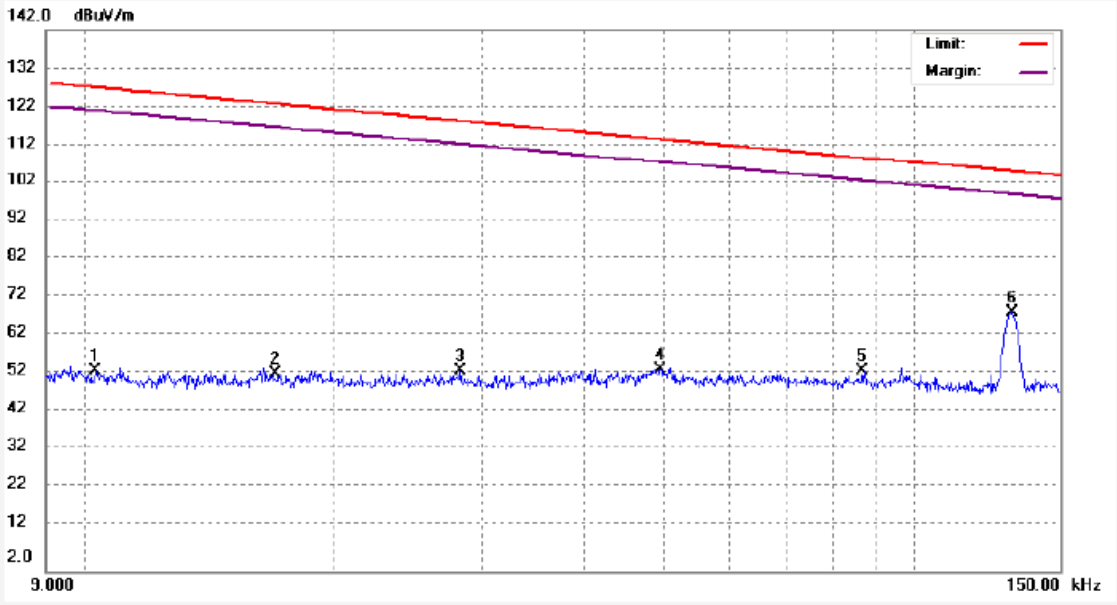
Test Frequency: 9kHz ~ 150kHz

Antenna Polarization: 0°



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	0.0111	38.26	15.21	53.47	126.61	-73.14	peak	
2	0.0167	38.91	15.13	54.04	123.07	-69.03	peak	
3	0.0253	37.80	14.95	52.75	119.47	-66.72	peak	
4	0.0396	37.81	14.83	52.64	115.59	-62.95	peak	
5	0.0738	38.25	14.82	53.07	110.20	-57.13	peak	
6	0.1320	47.20	14.41	61.61	105.16	-43.55	peak	

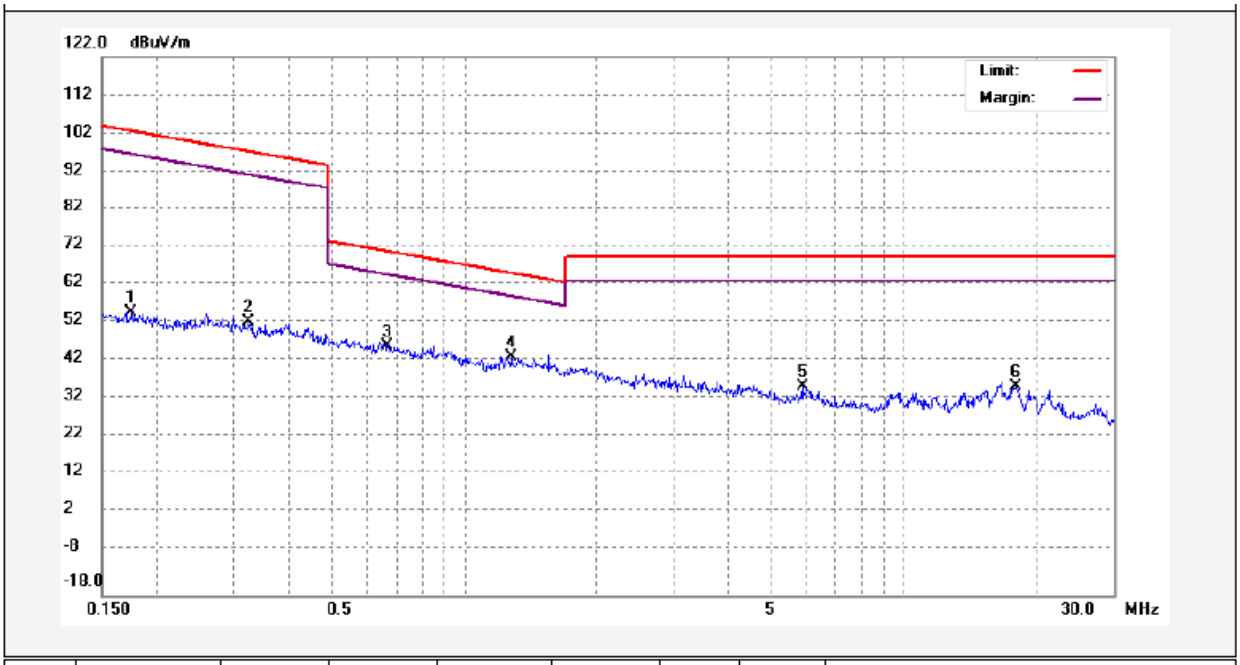
Antenna Polarization: 90°



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	

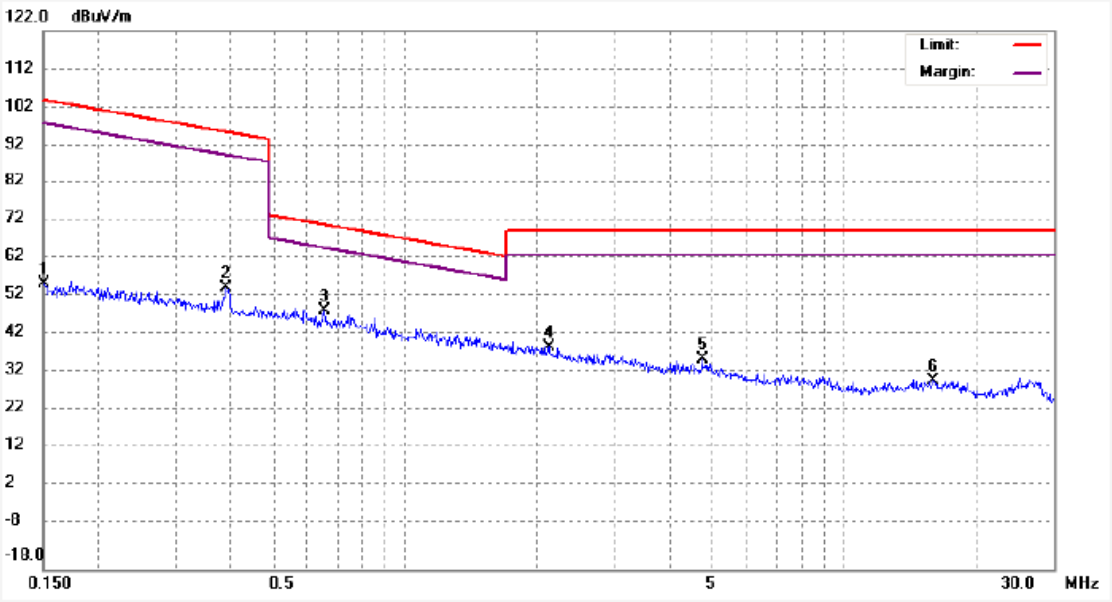
Test Frequency: 150kHz ~ 30MHz

Antenna Polarization: 0°



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	0.1748	41.13	14.17	55.30	102.70	-47.40	peak	
2	0.3234	39.42	13.51	52.93	97.39	-44.46	peak	
3	0.6683	32.99	13.62	46.61	71.11	-24.50	peak	
4	1.2755	30.03	13.71	43.74	65.51	-21.77	peak	
5	5.8667	20.70	15.39	36.09	69.54	-33.45	peak	
6	17.9439	22.12	13.90	36.02	69.54	-33.52	peak	

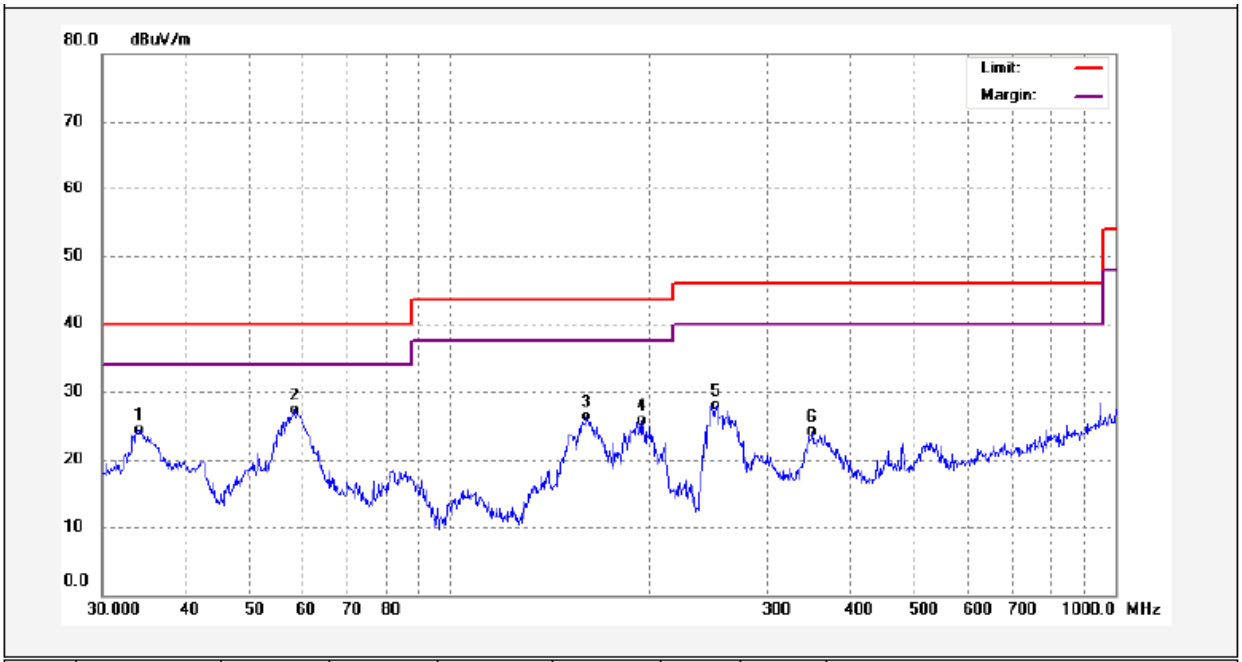
Antenna Polarization: 90°



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	0.1507	41.77	14.31	56.08	103.98	-47.90	peak	
2	0.3912	41.49	13.48	54.97	95.74	-40.77	peak	
3	0.6542	35.26	13.60	48.86	71.30	-22.44	peak	
4	2.1213	25.64	14.11	39.75	69.54	-29.79	peak	
5	4.7462	20.82	15.48	36.30	69.54	-33.24	peak	
6	15.9696	16.04	14.96	31.00	69.54	-38.54	peak	

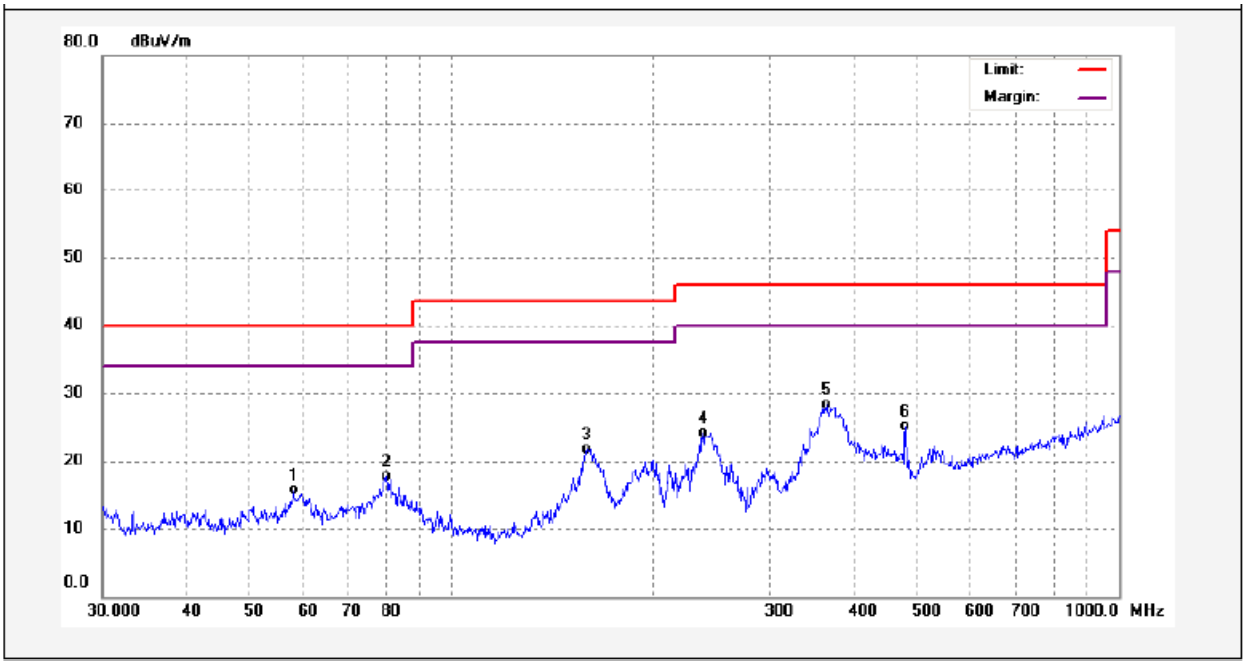
Test Frequency: 30MHz ~ 1 000MHz

Antenna Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	34.0365	44.12	-19.81	24.31	40.00	-15.69	QP	
2	58.4074	46.37	-19.05	27.32	40.00	-12.68	QP	
3	160.3456	43.49	-17.26	26.23	43.50	-17.27	QP	
4	193.7728	45.60	-19.93	25.67	43.50	-17.83	QP	
5	251.1804	46.36	-18.49	27.87	46.00	-18.13	QP	
6	350.4768	39.61	-15.59	24.02	46.00	-21.98	QP	

Antenna Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Remark
1	57.9993	34.65	-19.04	15.61	40.00	-24.39	QP	
2	79.8003	40.88	-23.18	17.70	40.00	-22.30	QP	
3	159.2251	38.96	-17.23	21.73	43.50	-21.77	QP	
4	238.3102	43.38	-19.22	24.16	46.00	-21.84	QP	
5	365.5391	43.51	-15.23	28.28	46.00	-17.72	QP	
6	478.8456	37.51	-12.40	25.11	46.00	-20.89	QP	

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.

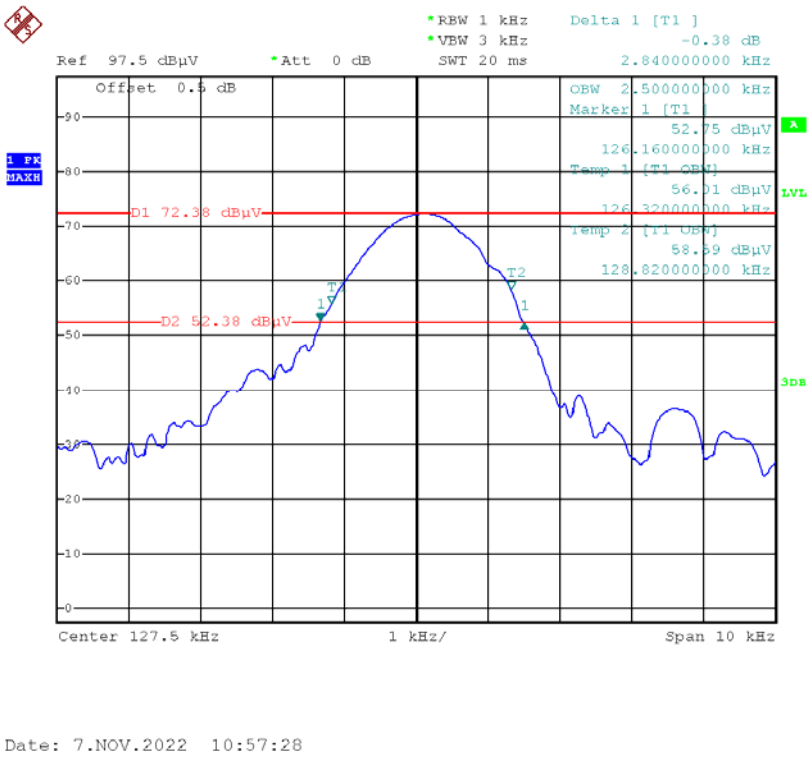
3. The resolution bandwidth (RBW) shall be in the range of 1% to 5% of the occupied bandwidth (OBW), video bandwidth (VBW) is set to approximately 3 times of the RBW.

4. Measured the spectrum width with power higher than 20dB below carrier and 99% Bandwidth.

9.2 Test Result

Test Channel (kHz)	99% Bandwidth (kHz)	20dB Bandwidth Emission(kHz)
127.5	2.500	2.840

Test result plot as follows:



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 ======