




FCC RADIO TEST REPORT

Applicant : Protop International Inc.
Address : 10F-8, No.237, Sec.,1, Datong Rd., Xizhi Dist., 22161New Taipei City, Taiwan
Equipment : OTTERBOX Wireless Charger Car Mount
Model No. : OBFTC-0091-A, 78-80532, 78-80531, 78-80600, 78-80601
Trademark : OTTERBOX
FCC ID : 2AAYX0091A

I HEREBY CERTIFY THAT :

The sample was received on Aug. 03, 2021 and the test items were conducted during Aug. 18, 2021 at CerpPASS Technology Corp. The test result refers exclusively to the test presented test model / sample. Without written approval of CerpPASS Technology Corp., the test report shall not be reproduced except in full.

Approved by:



Leevin Li / Supervisor



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1. Report of Measurements and Examinations

1.1 List of Measurements and Examinations

FCC CFR Title 47 Part 15 Subpart C Section 15.209

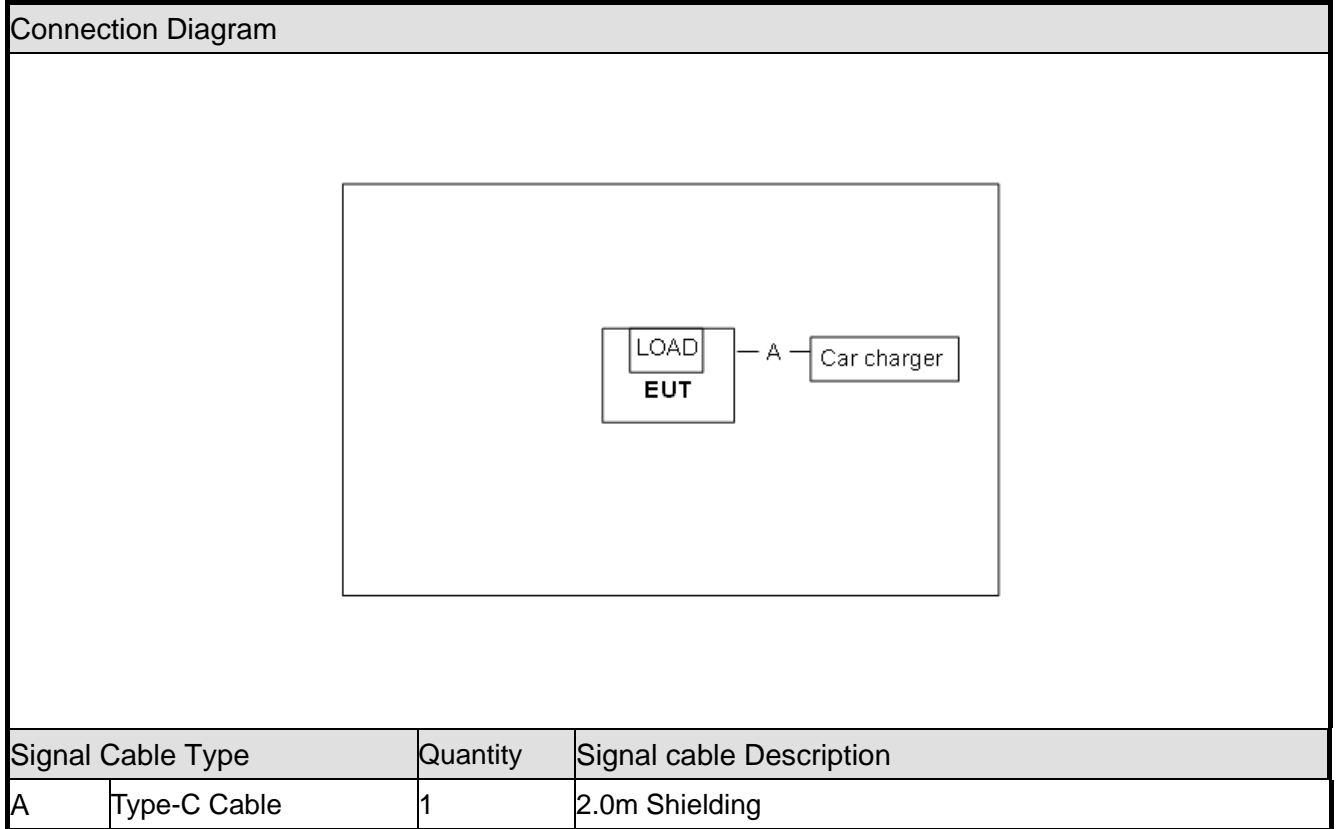
FCC Rule	Description of Test	Result
§ 15.203	. Antenna Requirement	Pass
§ 15.207(a)	. Conducted Emission	N/A
§ 15.209(a)	. Radiated Emission	Pass
§ 15.215	20dB Bandwidth	Pass

Note: Deviations Yes No
*The lab has reduced the uncertainty risk factor from test equipment, environment and staff technicians which according to the standard on contract. Therefore, the test result will only be determined by standard requirement.



2.3 Description of Test System

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 Car charger	Protop	OBFTC-0086-A	N/A	N/A
2 Wireless Load	N/A	N/A	N/A	N/A





2.4 General Information of Test

Test Site	CerpPASS Technology Corporation(CerpPASS Laboratory) Address: Room 102, No. 5, Xing'an Road, Chang'an Town, Dongguan City, Guangdong Province Tel: +86-769-8547-1212 Fax: +86-769-8547-1912
FCC Designation No.:	CN1288
Frequency Range Investigated:	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 40,000MHz
Test Distance:	9KHz~30MHz: radiated emission from antenna to EUT is 1 M. 30MHz~1GHz: radiated emission from antenna to EUT is 3 M.

Test Item	Test Site	Test period	Environmental Conditions	Tested By
Radiated Emissions	3M02-DG	2021/08/03~2021/08/09	22~25°C / 50~60%	Amos Zhang

2.5 Measurement Uncertainty

Conducted Emission	
The measurement uncertainty is evaluated as ± 2.88 dB.	
Radiated Emission	
(9KHz -30MHz)	The measurement uncertainty is evaluated as ± 2.15 dB.
(30MHz -200MHz)	The measurement uncertainty is evaluated as ± 3.90 dB.
(200M-1000M)	The measurement uncertainty is evaluated as ± 4.95 dB.
(1000M-6000M)	The measurement uncertainty is evaluated as ± 3.24 dB.
(6000M-18000M)	The measurement uncertainty is evaluated as ± 3.22 dB.



3. Test Equipment and Ancillaries Used for Tests

Radiated Emissions					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMI Test Receiver	R&S	ESCI	100563	2021.05.14	2022.05.13
H64 Preamplifier	HP	8447F	3113A05582	2021.01.07	2022.01.06
Loop Antenna	R&S	HFH2-Z2	100150	2020.06.08	2022.06.07
Bilog Antenna	Sunol Science	JB1	A072414-1	2020.06.08	2022.06.07
Temperature/ Humidity Meter	GEMLEAD	STH200A	N/A	2020.08.20	2021.08.19



4. Antenna Requirements

4.1 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.

4.2 Antenna Construction

The antenna is Coil Antenna, and the antenna connector is de-signed with permanent attachment and on consideration of replacement. Please see the EUT photo for details.

4.3 Result

The EUT antenna is Loop Antenna. It complies with the standard requirement.



5. Test of Conducted Emission

5.1 Test Limit

According to §15.207: For all the consumer devices which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range are listed as follows:

Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

Remark: (1)*Decreases with the logarithm of the frequency.

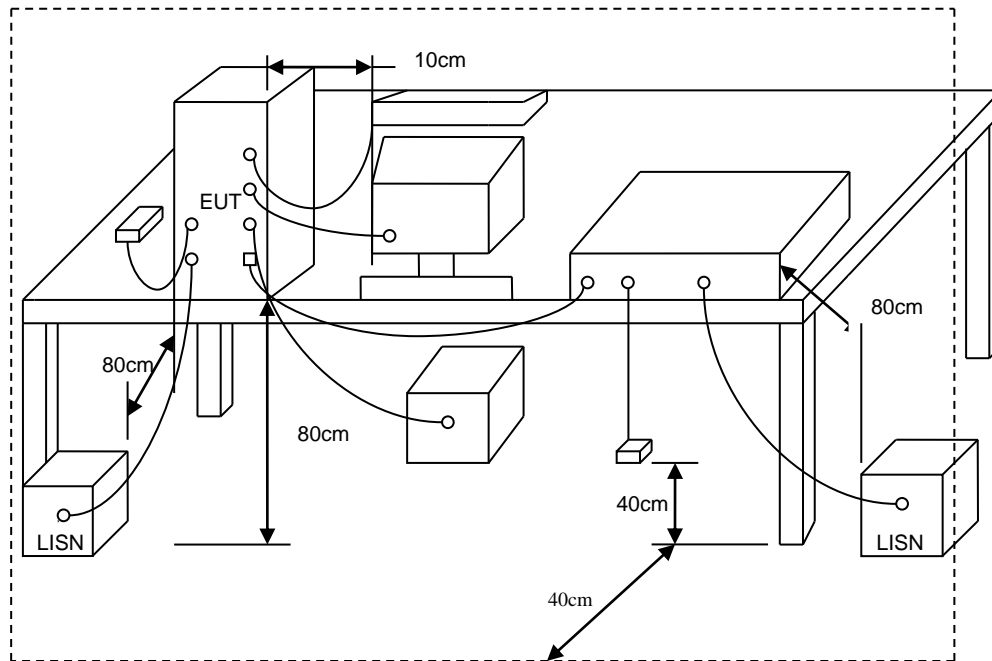
(2)The lower limit shall apply at the transition frequency.

5.2 Test Procedures

- The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- Connect EUT to the power mains through a line impedance stabilization network (LISN).
- All the support units are connecting to the other LISN.
- The LISN provides 50 ohm coupling impedance for the measuring instrument.
- The FCC states that a 50 ohm, 50 micro-Henry LISN should be used.
- Both sides of AC line were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched.
- Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.



5.3 Typical Test Setup



5.4 Test Result and Data

Not applicable since the EUT supplied by DC power.



6. Test of Radiated Emission

6.1 Test Limit

In any 100kHz bandwidth outside the frequency band, the radio frequency power produced by According to §15.209(a), for a intentional device, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the following values:

Radiated Emission Limit (9KHz~1000MHz)

FREQUENCIES(MHz)	FIELD STRENGTH(microvolts/meter)	MEASUREMENT DISTANCE(meters)
0.009~0.490	2400/F(kHz)	300
0.490~1.705	24000/F(kHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
Above 960	500	3

Note:

- (1) The tighter limit applies at the band edges.
- (2) Emission Level (dBuV/m)=20log Emission Level(uV/m)



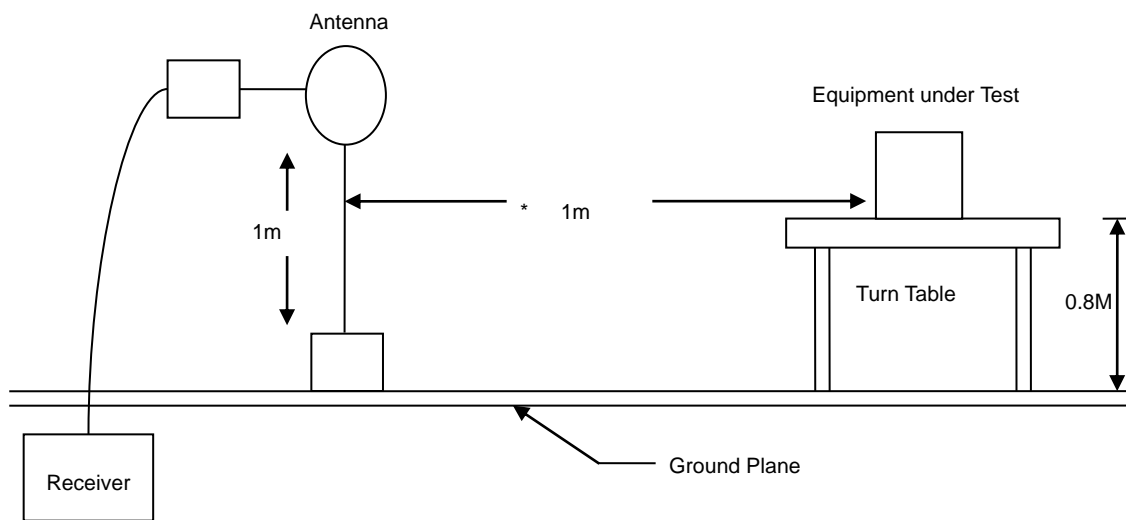
6.2 Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 1/3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a broadband antenna and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.
- h. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

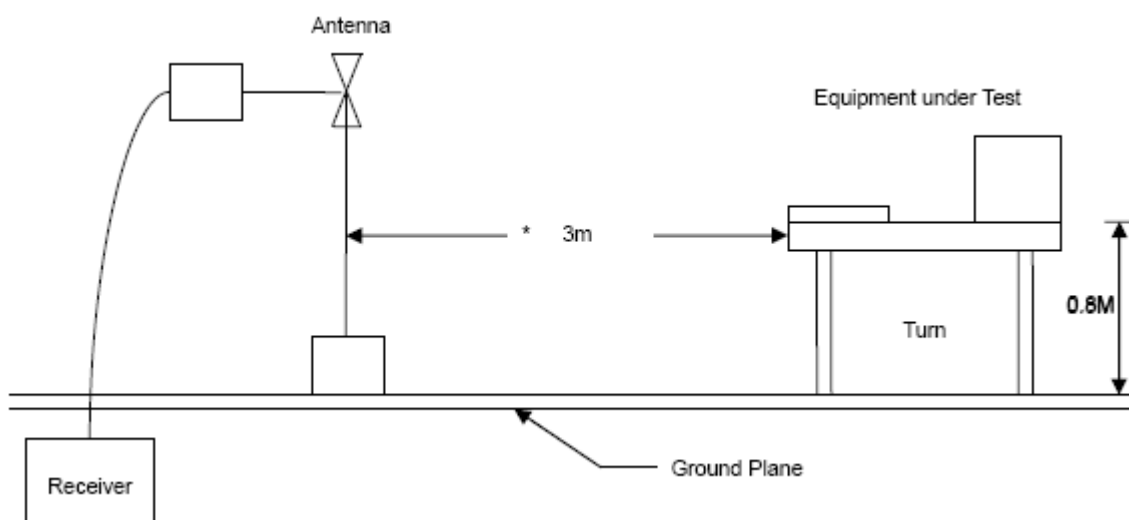


6.3 Typical Test Setup

Below 30MHz Test Setup



30M - 1GHz Test Setup

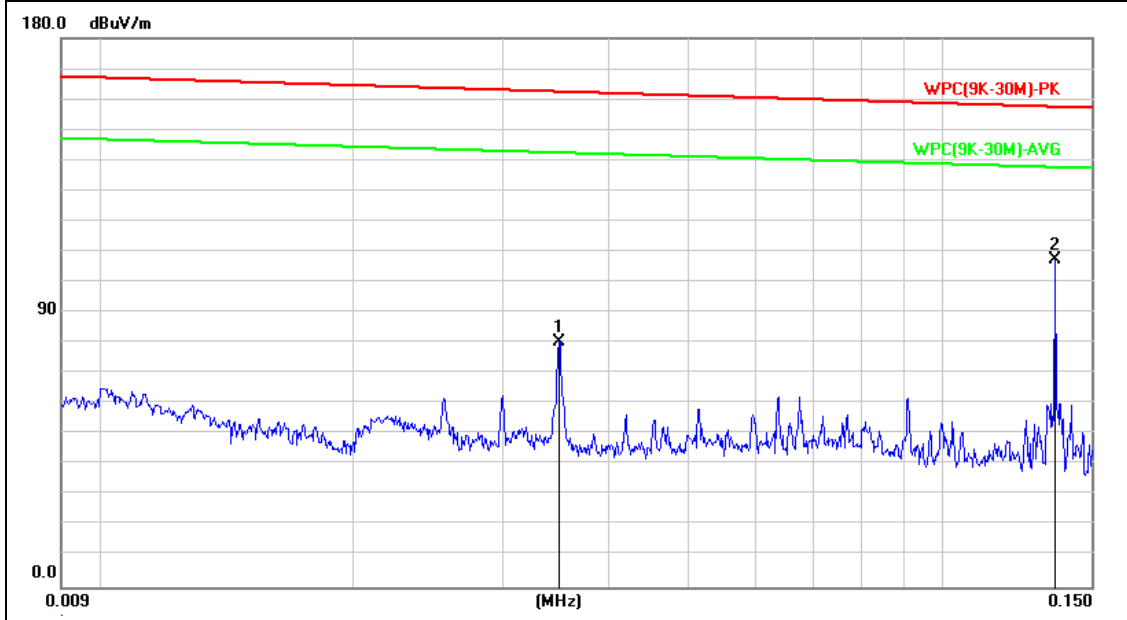




6.4 Test Result and Data

For 9KHz~30MHz

Test Mode	: Mode 5	Polarization	: X
Power	: DC 12V	Frequency range	9KHz-150KHz

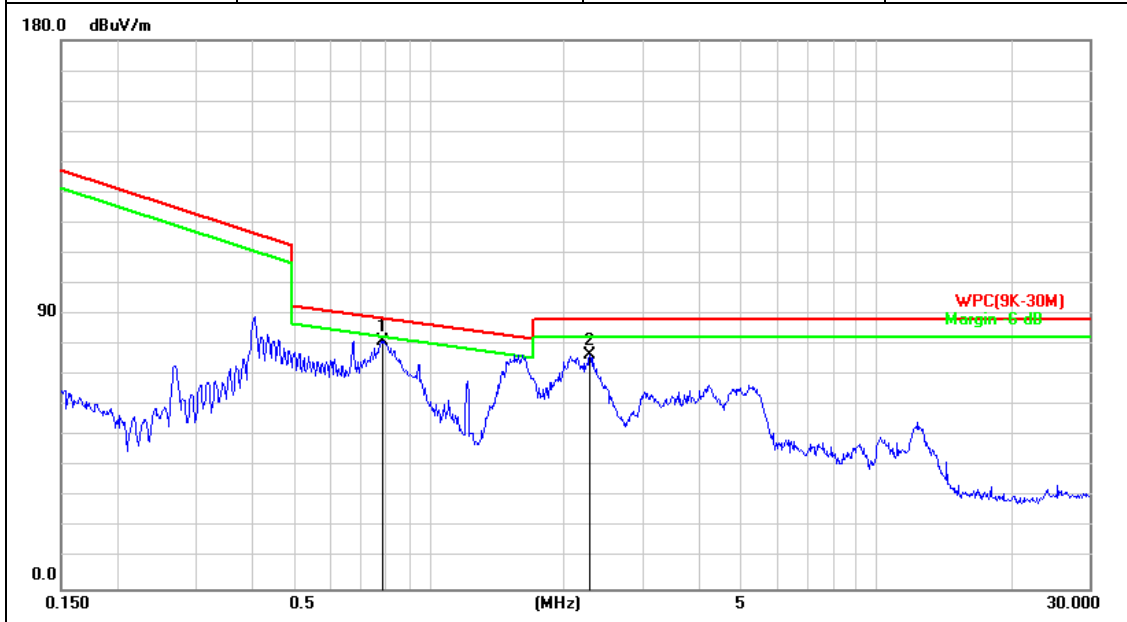


N o.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0350	20.78	59.70	80.48	135.80	-55.32	AVG
2	0.1358	20.24	87.15	107.39	124.03	-16.64	AVG

Note: Level = Reading + Factor
 Margin = Level – Limit
 Factor= Antenna Factor + Cable Loss - Amplifier Factor



Test Mode	: Mode 5	Polarization	: X
Power	: DC 12V	Frequency range	: 150KHz-30MHz

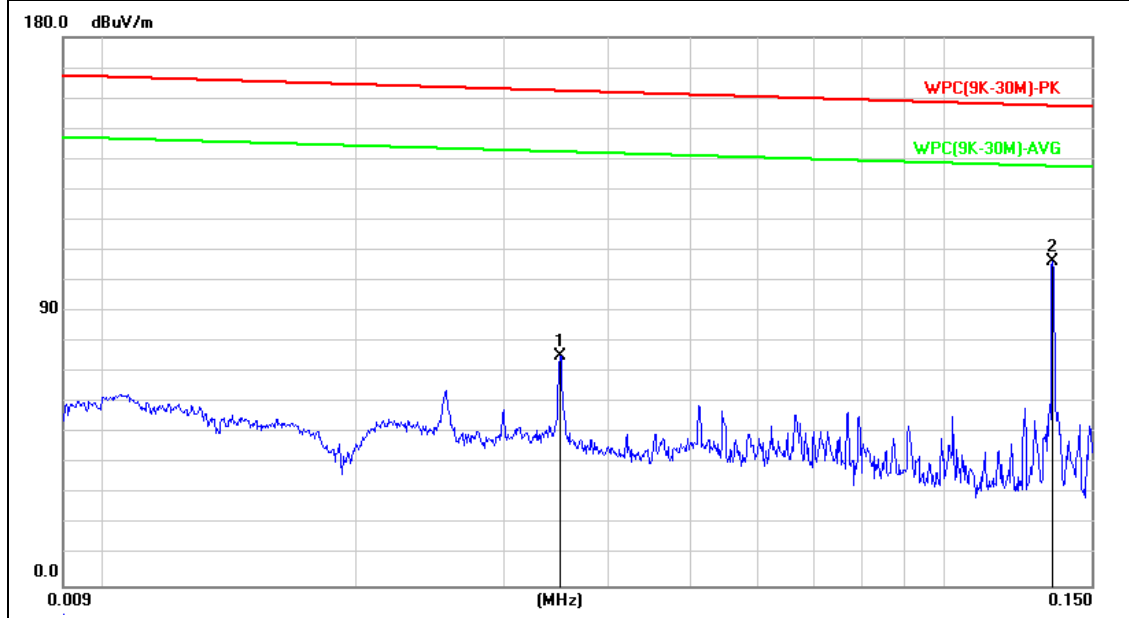


N	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.7835	20.79	60.63	81.42	88.80	-7.38	QP
2	2.2845	20.64	56.05	76.69	88.63	-11.94	QP

Note: Level = Reading + Factor
 Margin = Level – Limit
 Factor= Antenna Factor + Cable Loss - Amplifier Factor



Test Mode	: Mode 5	Polarization	: Y
Power	: DC 12V	Frequency range	9KHz-150KHz

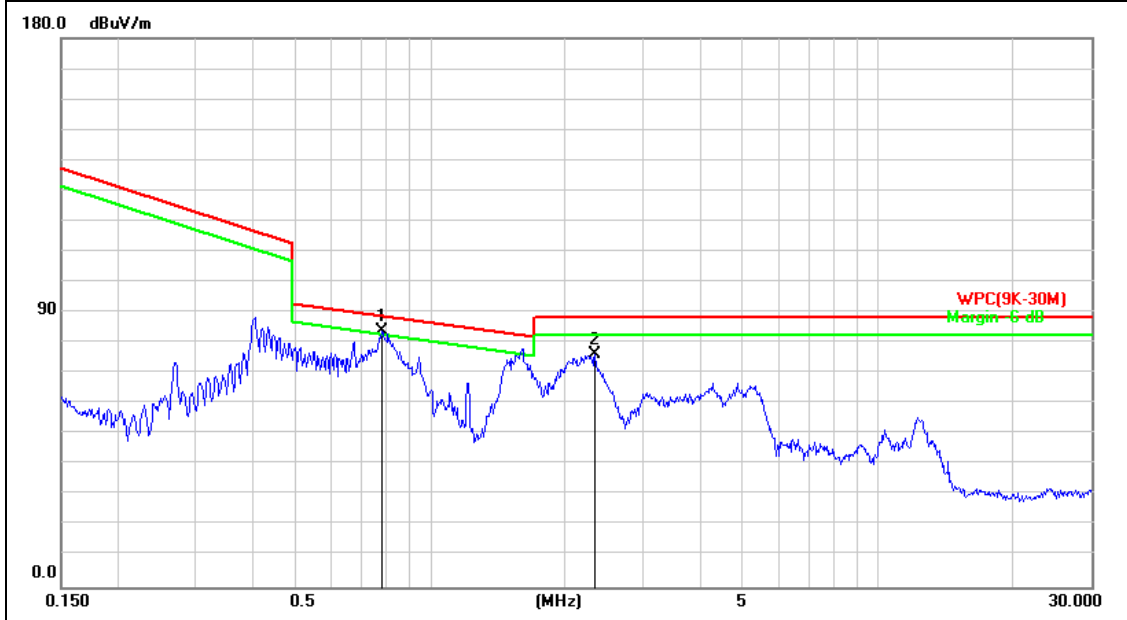


N o.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.0350	20.78	54.62	75.40	135.80	-60.40	AVG
2	0.1348	20.25	86.33	106.58	124.09	-16.70	AVG

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor



Test Mode	: Mode 5	Polarization	: Y
Power	: DC 12V	Frequency range	: 150KHz-30MHz



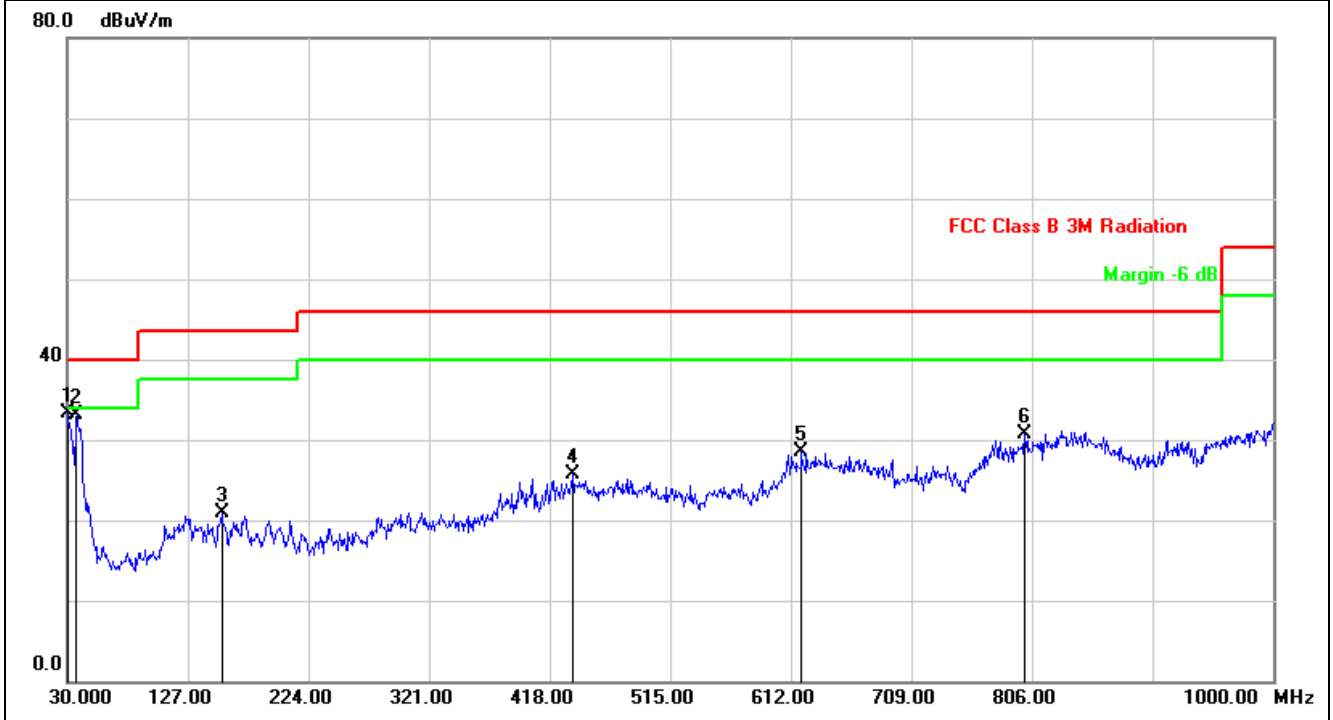
N o.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.
1	0.7793	20.79	62.94	83.73	88.85	-5.12	QP
2	2.3335	20.63	55.61	76.24	88.63	-12.39	QP

Note: Level = Reading + Factor
Margin = Level – Limit
Factor= Antenna Factor + Cable Loss - Amplifier Factor



For 30MHz~1GHz

Test Mode	: Mode 5	Pol/Phase	: VERTICAL
Power	: DC 12V		

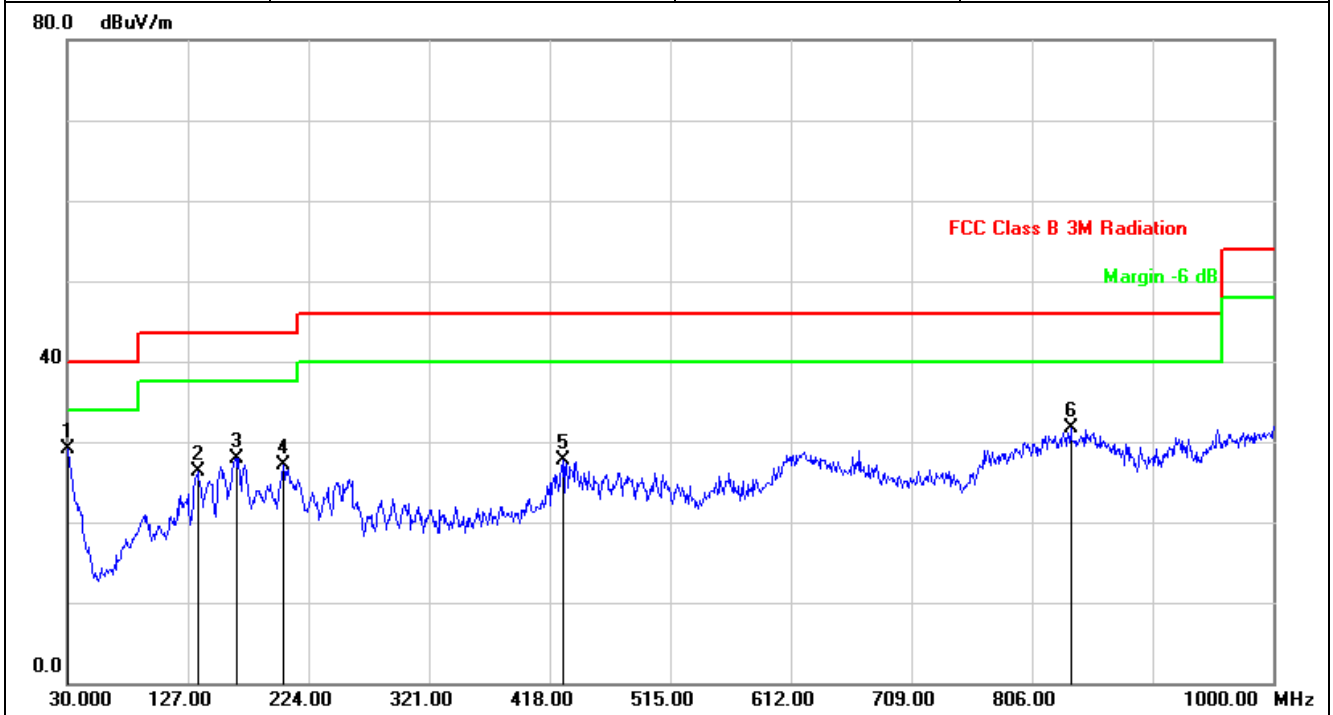


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.0000	-21.87	55.24	33.37	40.00	-6.63	peak	200	112
2	37.7599	-21.80	54.86	33.06	40.00	-6.94	peak	100	346
3	154.1600	-20.69	41.54	20.85	43.50	-22.65	peak	200	193
4	436.4300	-1.56	27.21	25.65	46.00	-20.35	peak	100	208
5	620.7300	1.62	26.92	28.54	46.00	-17.46	peak	100	224
6	800.1800	-18.82	49.44	30.62	46.00	-15.38	peak	100	317

Note: Level = Reading + Factor
 Margin = Level - Limit
 Factor= Antenna Factor + Cable Loss - Amplifier Factor



Test Mode	: Mode 5	Pol/Phase	: Horizontal
Power	: DC 12V		



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	30.0000	-21.87	51.02	29.15	40.00	-10.85	peak	200	143
2	134.7600	-20.87	47.10	26.23	43.50	-17.27	peak	200	276
3	165.8000	-20.55	48.48	27.93	43.50	-15.57	peak	100	118
4	203.6300	-20.18	47.20	27.02	43.50	-16.48	peak	200	302
5	428.6700	-2.12	29.80	27.68	46.00	-18.32	peak	100	215
6	837.0400	-18.61	50.23	31.62	46.00	-14.38	peak	200	351

Note: Level = Reading + Factor
 Margin = Level – Limit
 Factor= Antenna Factor + Cable Loss - Amplifier Factor



7. 20dB Bandwidth

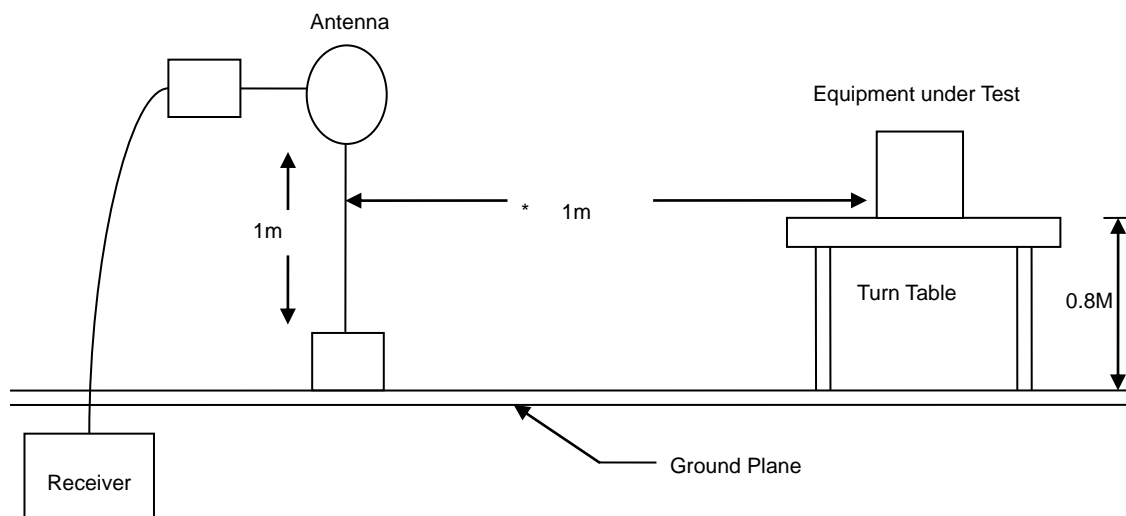
7.1 Test Limit

None: for reporting purposed only.

7.2 Test Procedures

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §15.215, must be designed to ensure that 20dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates is contained within the frequency band designated in the rule section under which the equipment is operated.

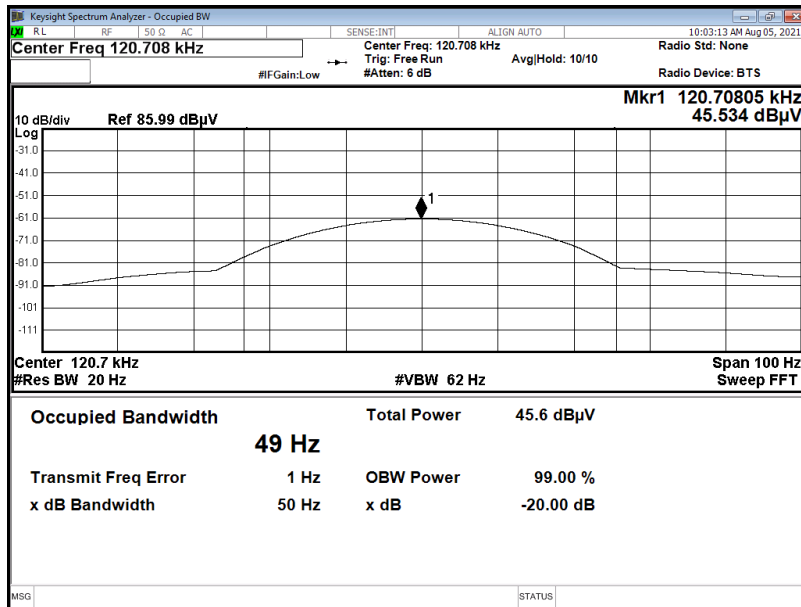
7.3 Typical Test Setup





7.4 Test Result and Data

Frequency (KHz)	20 dB bandwidth (KHz)	PASS / FAIL
120.708KHz	0.050	PASS



----- End of the report -----