Microtest
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Test Report

Report No.: MTi210816017-04E1

Date of issue: October 27, 2021

Applicant: Shenzhen Topband Co., Ltd.

Product: Wireless Charging With Power Bank

Model(s): WPB02

FCC ID: 2ADDW-WPB02

Shenzhen Microtest Co., Ltd.

http://www.mtitest.com

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Instructions

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2. The test results in this test report are only responsible for the samples submitted

3. This test report is invalid without the seal and signature of the laboratory.

4. This test report is invalid if transferred, altered, or tampered with in any form without authorization.

5. Any objection to this test report shall be submitted to the laboratory within 15 days from the date of receipt of the report.

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Test Result Certification	
Applicant:	**Shenzhen Topband Co., Ltd**
Address:	Topband Industrial Park, LiYuan Industrial Zone, ShiYan Town, Bao'An Distric, shenzhen, China 518108
Manufacturer:	**Shenzhen Topband Co., Ltd**
Address:	Topband Industrial Park, LiYuan Industrial Zone, ShiYan Town, Bao'An Distric, shenzhen, China 518108
Product description	
Product name:	Wireless Charging With Power Bank
Trademark:	N/A
Model name:	WPB02
Serial Model:	N/A
Standards:	FCC 47 CFR Part 15 Subpart C
Test method:	ANSI C63.10-2013
Date of Test	
Date of test:	2021-08-26 ~ 2021-10-26
Test result:	Pass

Test Engineer : Danny Xu

(Danny Xu)

Reviewed By: : Leon Chen

(Leon Chen)

Approved By: : Tom Xue

(Tom Xue)

1 General Description

1.1 Description of the EUT

Product name:	Wireless Charging With Power Bank
Model name:	WPB02
Series Model:	N/A
Model difference:	N/A
Electrical rating:	USB-C IN/OUT: DC 5V/2A, 9V/1.1A Wireless Output: 5W/7.5W/10W Battery: 5000mAh 3.7V 18.5Wh
Accessories:	N/A
EUT serial number:	MTi210816017-04S0001
RF specification:	
Operation frequency:	115 kHz – 205 kHz
Modulation type:	ASK
Antenna type:	Coil Antenna

1.2 Description of test modes

All the test modes were carried out with the EUT in normal operation, the final test mode of the EUT was the worst test mode for emission test, which was shown in this report and defined as:

No.	Emission test modes
Mode 1	Stand-by mode
Mode 2	Operating mode (5W)
Mode 3	Operating mode (7.5W)
Mode 4	Operating mode (10W)
The worst test mode of conducted emissions: Mode 4 **The worst test mode of radiated emissions:** Mode 4	

1.3 Description of support units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Support equipment list			
Description	Model	Serial No.	Manufacturer
15W wireless charger load	EESON 15W	/	YBZ
Adapter	HW-090200CH0	/	Huizhou BYD Electronics Co., Ltd.
Support cable list			
Description	Length (m)	From	To
USB-A to USB-C Cable	1.2m	Adapter	EUT

1.4 Environmental conditions

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

Temperature:	15ºC~35ºC
Humidity:	20 % RH ~ 75 % RH
Atmospheric pressure:	98 kPa~101 kPa

1.5 Measurement uncertainty

Measurement	Uncertainty
Conducted emission (9 kHz~30 MHz)	± 2.5 dB
Radiated emission (9 kHz ~ 30 MHz)	± 4.0dB
Radiated emission (30 MHz~1 GHz)	± 4.2 dB
Radiated emission (above 1 GHz)	± 4.3 dB
Occupied bandwidth	± 3 %
Temperature	±1 degree
Humidity	± 5 %

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

2 Summary of Test Result

No.	FCC reference	Description of test	Result
Emission			
1	FCC Part 15.203	Antenna requirement	Pass
2	FCC Part 15.207	AC power line Conducted emissions	Pass
3	FCC Part 15.209	Radiated emissions	Pass
4	FCC Part 15.215	Occupied bandwidth	Pass

Note: N/A means not applicable.

3 Test Facilities and accreditations

3.1 Test laboratory

Test laboratory:	Shenzhen Microtest Co., Ltd.
Test site location:	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China
Telephone:	(86-755)88850135
Fax:	(86-755)88850136
CNAS Registration No.:	CNAS L5868
FCC Registration No.:	448573

4 List of test equipment

No.	Equipment	Manufacturer	Model	Serial No.	Cal. date	Cal. Due
MTI-E043	EMI test receiver	R&S	ESCI7	101166	2021/06/02	2022/06/01
MTI-E044	Broadband antenna	Schwarzbeck	VULB9163	9163-1338	2021/05/30	2023/05/29
MTI-E045	Horn antenna	Schwarzbeck	BBHA9120D	9120D-2278	2021/05/30	2023/05/29
MTi-E046	Active Loop Antenna	Schwarzbeck	FMZB 1519 B	00066	2021/05/30	2023/05/29
MTI-E047	Pre-amplifier	Hewlett-Packard	8447F	3113A06184	2021/06/02	2022/06/01
MTI-E048	Pre-amplifier	Agilent	8449B	3008A01120	2021/06/02	2022/06/01
MTi-E005	EMI test receiver	R&S	ESPI7	100314	2021/06/02	2022/06/01
MTi-E120	Broadband antenna	Schwarzbeck	VULB9163	9163-1419	2021/05/30	2023/05/29
MTi-E121	Pre-amplifier	Hewlett-Packard	8447D	2944A09365	2021/04/16	2022/04/15
MTi-E123	Pre-amplifier	Agilent	8449B	3008A04723	2021/05/06	2022/05/05
MTi-E122	MXA signal analyzer	Agilent	N9020A	MY5444085 9	2021/05/06	2022/05/05
MTi-E001	Artificial Mains Network	R&S	ESH2-Z5	100263	2021/06/02	2022/06/01
MTi-E002	EMI Test Receiver	R&S	ESCI3	101368	2021/06/02	2022/06/01
MTi-E023	Artificial power network	Schwarzbeck	NSLK8127	NSLK8127# 841	2021/06/02	2022/06/01
MTi-E025	Artificial power network	Schwarzbeck	NSLK8127	8127183	2021/06/02	2022/06/01
MTi-E026	8-wire Impedance Stabilization Network	Schwarzbeck	NTFM 8158	NTFM 8158 #199	2021/06/02	2022/06/01
MTi-E021	EMI Test Receiver	R&S	ESCS30	100210	2021/06/02	2022/06/01
MTi-E024	Artificial power network	Schwarzbeck	NSLK8127	01001	2021/06/02	2022/06/01

5 Test Results

5.1 Standard requirement

15.203 requirement

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 shall be considered sufficient to comply with the provisions of this section. 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. This requirement does not apply to carrier current devices or to devices operated under the provisions of §§15.211, 15.213, 15.217, 15.219, 15.221, or §15.236. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

5.2 Description of the EUT antenna

The antenna of EUT is coil antenna, which is integrated on the main PCB of the EUT and no consideration of replacement.

5.3 AC power line Conducted emissions

5.3.1 Limits

Frequency (MHz)	Detector type / Bandwidth	Limit-Quasi-peak dBμV	Limit-Average dBμV
0.15 -0.5	Average / 9 kHz	66 to 56	56 to 46
0.5 -5		56	46
5 -30		60	50

Note 1: the limit decreases with the logarithm of the frequency in the range of 0.15 MHz to 0.5 MHz.

5.3.2 Test Procedures

a) The test setup is refer to the standard ANSI C63.10-2013.

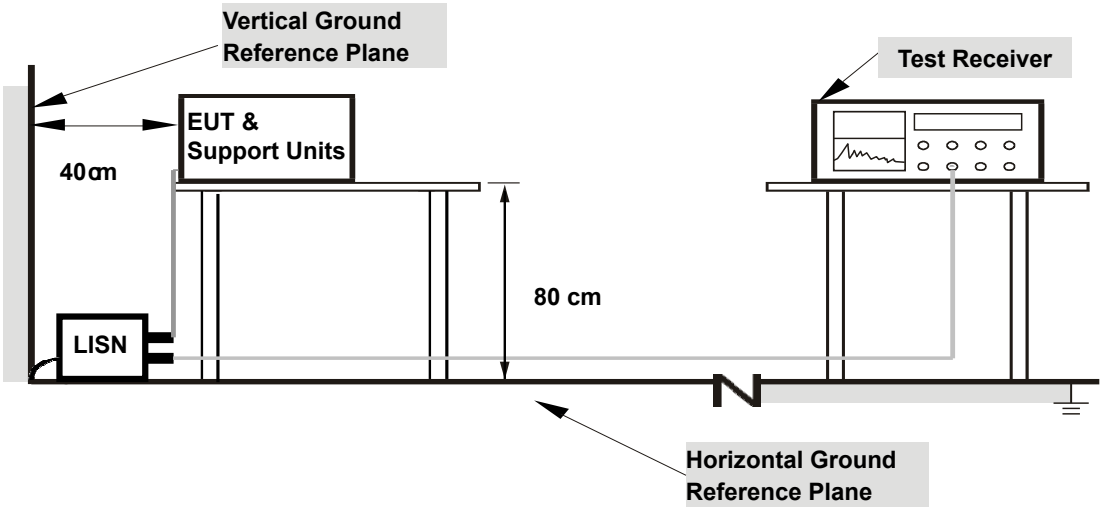
b) The EUT is connected to the main power through a line impedance stabilization network (LISN). All support equipment is powered from additional LISN(s).

c) Emissions were measured on each current carrying line of the EUT using an EMI test receiver connected to the LISN powering the EUT.

d) The test receiver scanned from 150 kHz to 30 MHz for emissions in each of the test modes described in Item 1.2.

e) The test data of the worst-case condition(s) was recorded.

5.3.3 Test setup



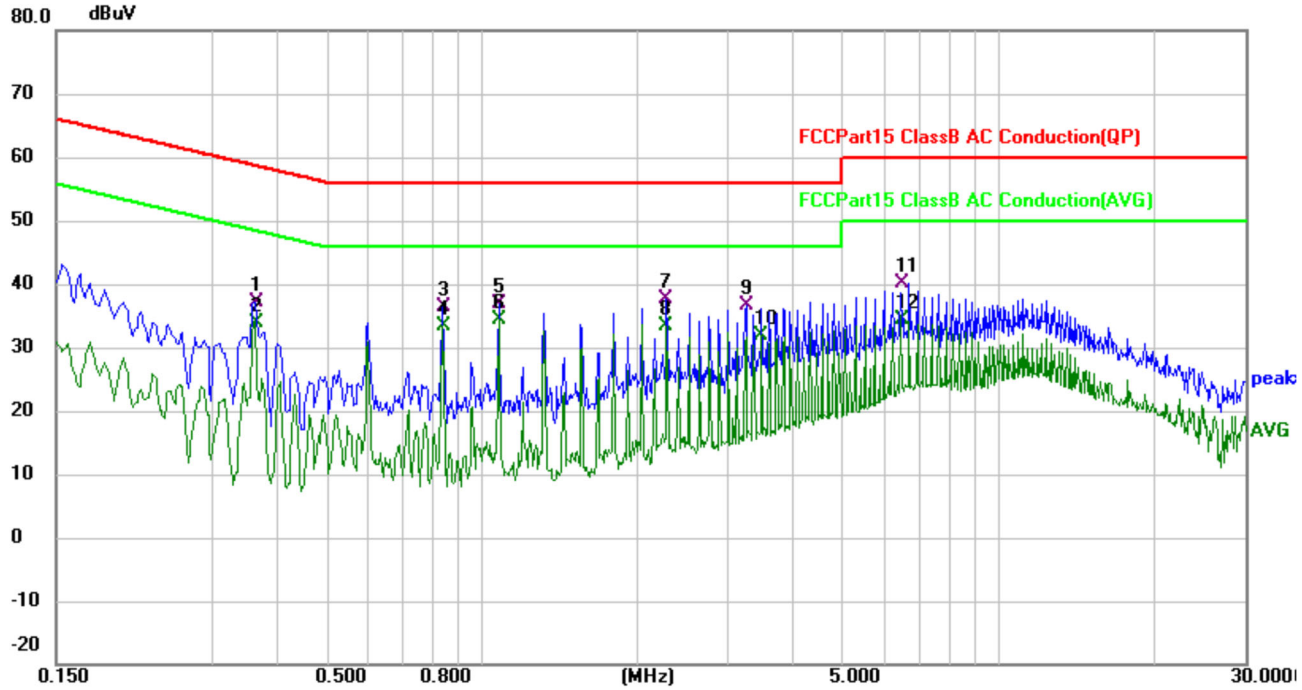
For the actual test configuration, please refer to the related item – Photographs of the test setup.

5.3.4 Test Result

Calculation formula:

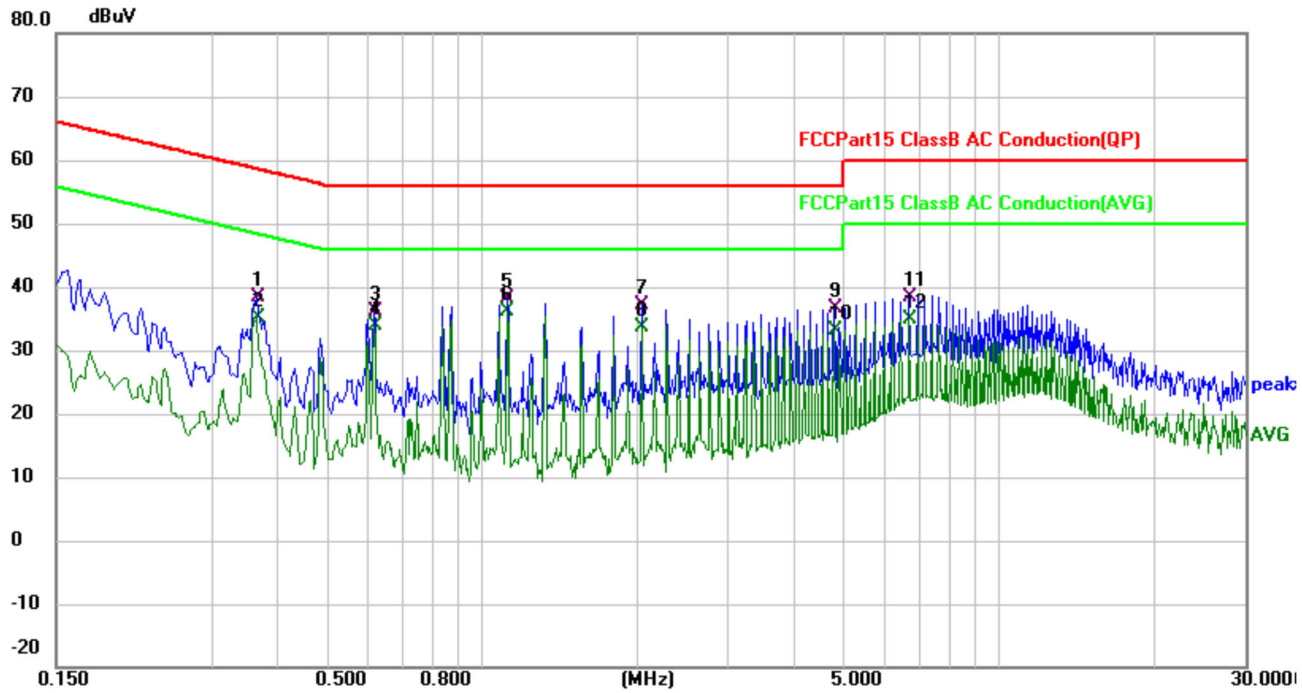
Measurement (dBμV) = Reading Level (dBμV) + Correct Factor (dB)
Over (dB) = Measurement (dBμV) – Limit (dBμV)

Test mode:	Mode 4	Phase:	L
Power supply:	Power by AC/DC adapter (AC 120V/60Hz)	Test site:	CE chamber 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.3620	26.09	11.00	37.09	58.68	-21.59	QP
2		0.3620	22.94	11.00	33.94	48.68	-14.74	AVG
3		0.8420	25.08	11.19	36.27	56.00	-19.73	QP
4		0.8420	22.19	11.19	33.38	46.00	-12.62	AVG
5		1.0820	23.51	13.45	36.96	56.00	-19.04	QP
6	*	1.0820	20.97	13.45	34.42	46.00	-11.58	AVG
7		2.2820	21.68	15.96	37.64	56.00	-18.36	QP
8		2.2820	17.37	15.96	33.33	46.00	-12.67	AVG
9		3.2420	25.27	11.39	36.66	56.00	-19.34	QP
10		3.4820	20.54	11.41	31.95	46.00	-14.05	AVG
11		6.4820	28.62	11.60	40.22	60.00	-19.78	QP
12		6.4820	22.73	11.60	34.33	50.00	-15.67	AVG

Test mode:	Mode 4	Phase:	N
Power supply:	Power by AC/DC adapter (AC 120V/60Hz)	Test site:	CE chamber 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.3660	27.51	10.90	38.41	58.59	-20.18	QP
2		0.3660	24.16	10.90	35.06	48.59	-13.53	AVG
3		0.6180	25.16	11.01	36.17	56.00	-19.83	QP
4		0.6180	22.81	11.01	33.82	46.00	-12.18	AVG
5		1.1220	24.73	13.47	38.20	56.00	-17.80	QP
6	*	1.1220	22.58	13.47	36.05	46.00	-9.95	AVG
7		2.0420	21.56	15.46	37.02	56.00	-18.98	QP
8		2.0420	18.24	15.46	33.70	46.00	-12.30	AVG
9		4.8020	25.19	11.40	36.59	56.00	-19.41	QP
10		4.8020	21.84	11.40	33.24	46.00	-12.76	AVG
11		6.7220	27.03	11.42	38.45	60.00	-21.55	QP
12		6.7220	23.36	11.42	34.78	50.00	-15.22	AVG

5.4 Radiated emissions

5.4.1 Limits

Frequency (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.
Note 2: 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

§ 15.35 (b) requirements:

When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§ 15.250, 15.252, 15.253(d), 15.255, 15.256, and 15.509 through 15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

5.4.2 Test setup

According to ANSI C63.10, the tests shall be performed in the frequency range shown in the following table:

Frequency range of measurements for unlicensed wireless device

Lowest frequency generated in the device	Upper frequency range of measurement
9 kHz to below 10 GHz	10th harmonic of highest fundamental frequency or to 40 GHz, whichever is lower
At or above 10 GHz to below 30 GHz	5th harmonic of highest fundamental frequency or to 100 GHz, whichever is lower
At or above 30 GHz	5th harmonic of highest fundamental frequency or to 200 GHz, whichever is lower, unless otherwise specified

Frequency range of measurements for unlicensed wireless device with digital device

Highest frequency generated or used in the device or on which the device operates or tunes	Upper frequency range of measurement
Below 1.705 MHz	30 MHz
1.705 MHz to 108 MHz	1000 MHz
108 MHz to 500 MHz	2000 MHz
500 MHz to 1000 MHz	5000 MHz
Above 1000 MHz	5th harmonic of the highest frequency or 40 GHz, whichever is lower

Test instrument setup

Frequency	Test receiver / Spectrum analyzer setting
9 kHz ~ 150 kHz	Quasi Peak / 200 kHz
150 kHz ~ 30 MHz	Quasi Peak / 9 kHz
30 MHz ~ 1 GHz	Quasi Peak / 120 kHz

5.4.3 Test Procedures

The EUT is placed on a non-conducting table 80cm above the ground plane for measurement blew 1 GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10-2013.

For measurement blew 1 GHz, the resolution bandwidth is set as item 5.4.2.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned form 1 to 4m meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and horizontal positions.

Special requirements for 9 KHz to 30 MHz:

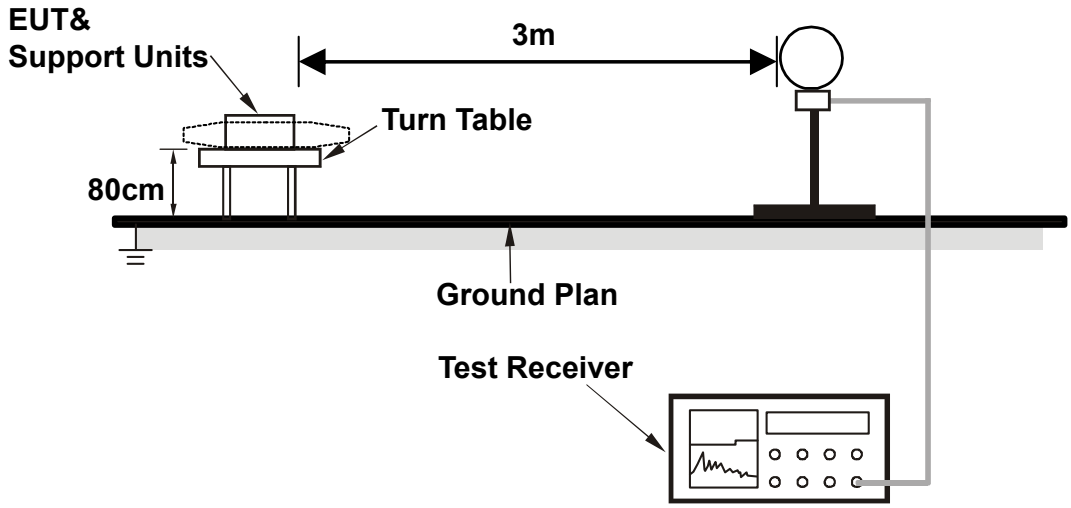
The lowest height of the magnetic antenna shall be 1 m above the ground

When the EUT contains a loop antenna that can only be placed in a vertical axis, normal measurements shall be made aligning the measurement antenna along the site axis, and then orthogonal to the axis. For each measurement antenna alignment, the EUT shall be rotated through 0° to 360° on a turntable.

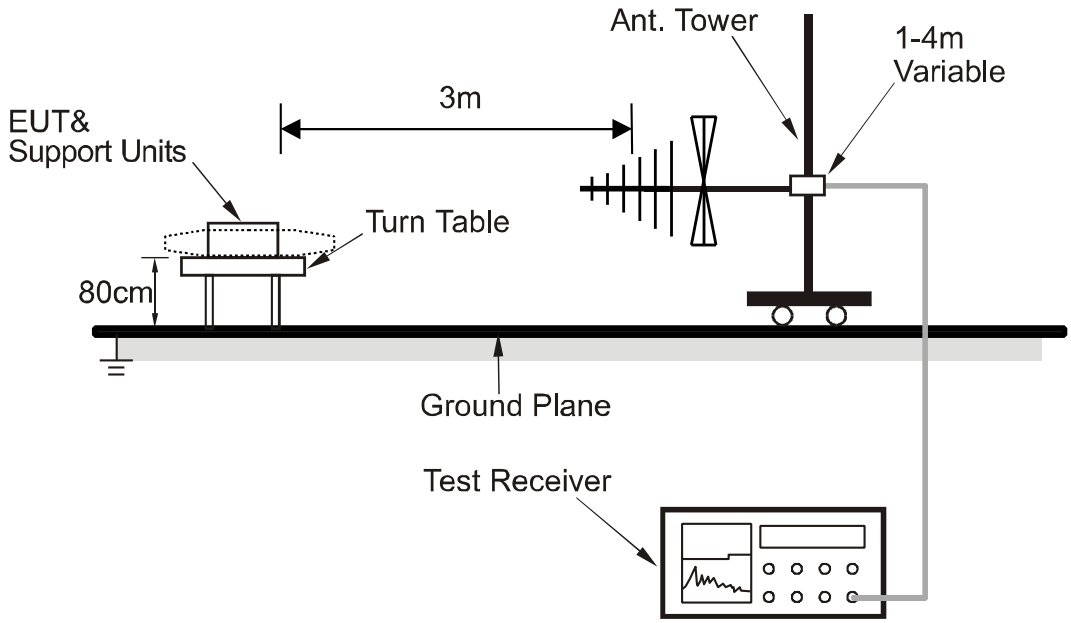
When the EUT contains a loop antenna that can be placed in a horizontal or vertical axis, normal measurements shall be made aligning the measurement antenna along the site axis, orthogonal to the axis, and then with the measurement antenna horizontal. For each measurement antenna alignment, the EUT shall be rotated through 0° to 360° on a turntable.

5.4.4 Test Setup

Blew 30 MHz:



Blew 1 GHz:



For the actual test configuration, please refer to the related item – Photographs of the test setup.

5.4.5 Test result

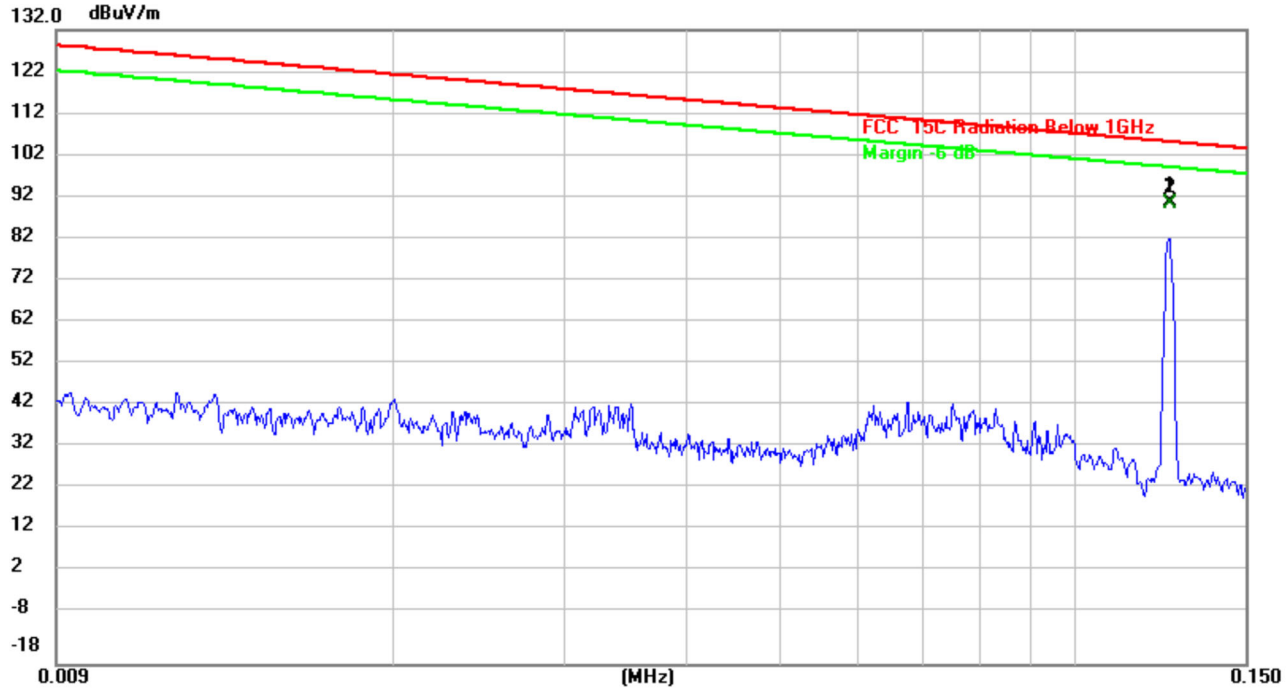
Calculation formula:

Measurement (dBμV/m) = Reading Level (dBμV) + Correct Factor (dB/m)
Over (dB) = Measurement (dBμV/m) – Limit (dBμV/m)

Note: For 9 kHz - 30 MHz testing, all the required orthogonal orientations of the measurement loop antenna were performed for pre-scan, the maximum radiated transmissions (Site axis) were recorded.

Frequency 9 kHz ~ 150 kHz

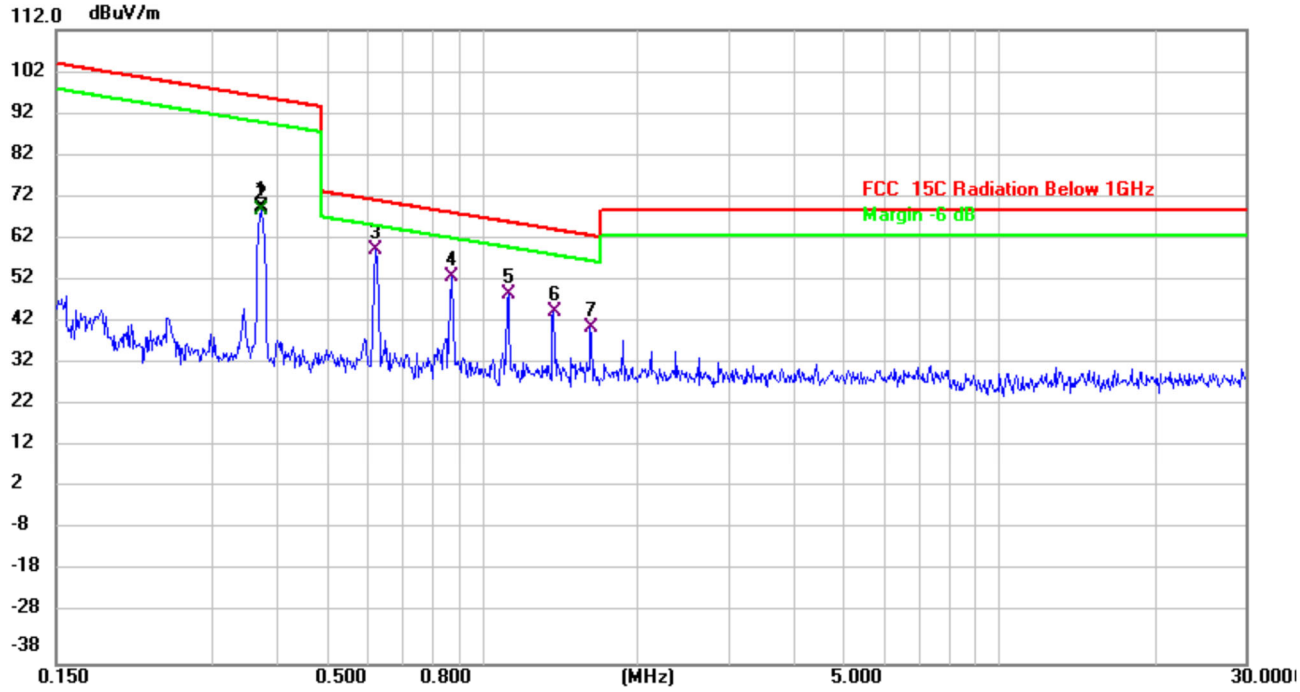
Test mode:	Mode 4	Polarization:	Site axis
Power supply:	Power by AC/DC adapter (AC 120V/60Hz)	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	0.1249	70.62	20.43	91.05	125.6	-34.55	peak
2		0.1249	70.35	20.43	90.78	105.6	-14.82	AVG

Frequency 150 kHz ~ 30 MHz

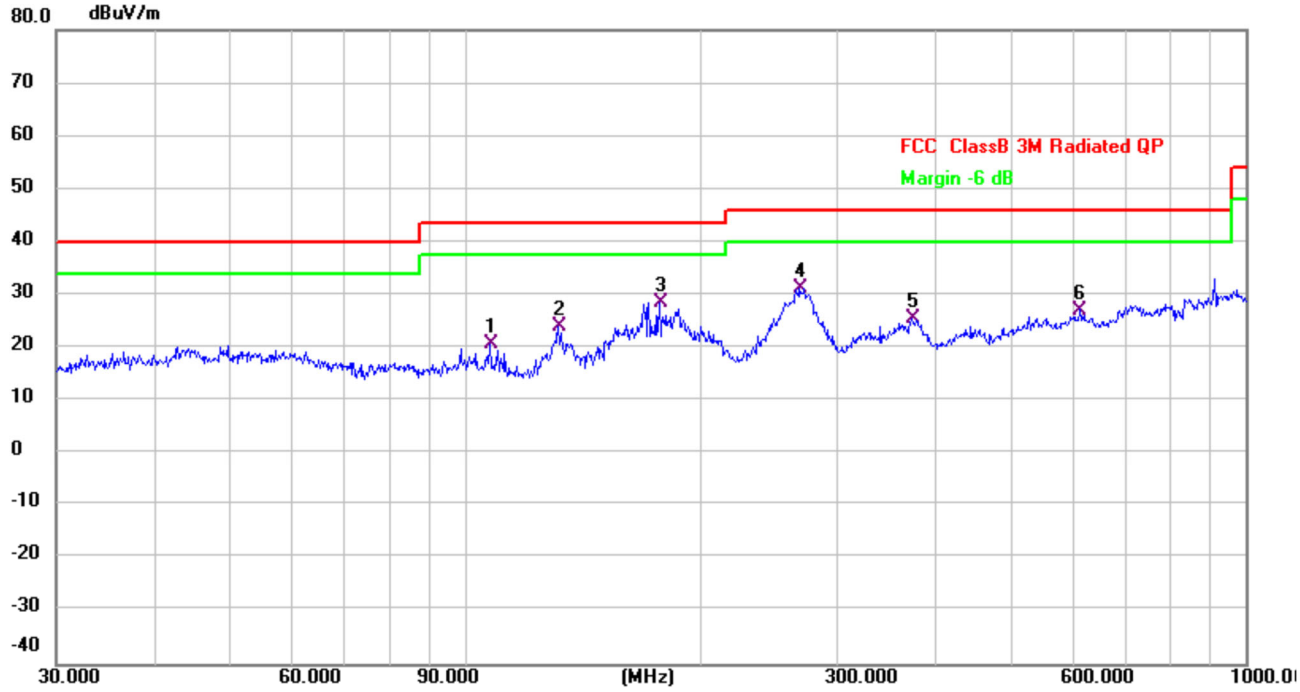
Test mode:	Mode 4	Polarization:	Site axis
Power supply:	Power by AC/DC adapter (AC 120V/60Hz)	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		0.3731	49.61	20.56	70.17	116.15	-45.98	peak
2		0.3731	48.73	20.56	69.29	96.15	-26.86	AVG
3	*	0.6238	39.38	20.65	60.03	71.71	-11.68	QP
4		0.8710	32.87	20.75	53.62	68.82	-15.20	QP
5		1.1233	28.62	20.81	49.43	66.61	-17.18	QP
6		1.3738	24.52	20.82	45.34	64.87	-19.53	QP
7		1.6190	20.92	20.83	41.75	63.45	-21.70	QP

Frequency 30 MHz ~ 1 GHz

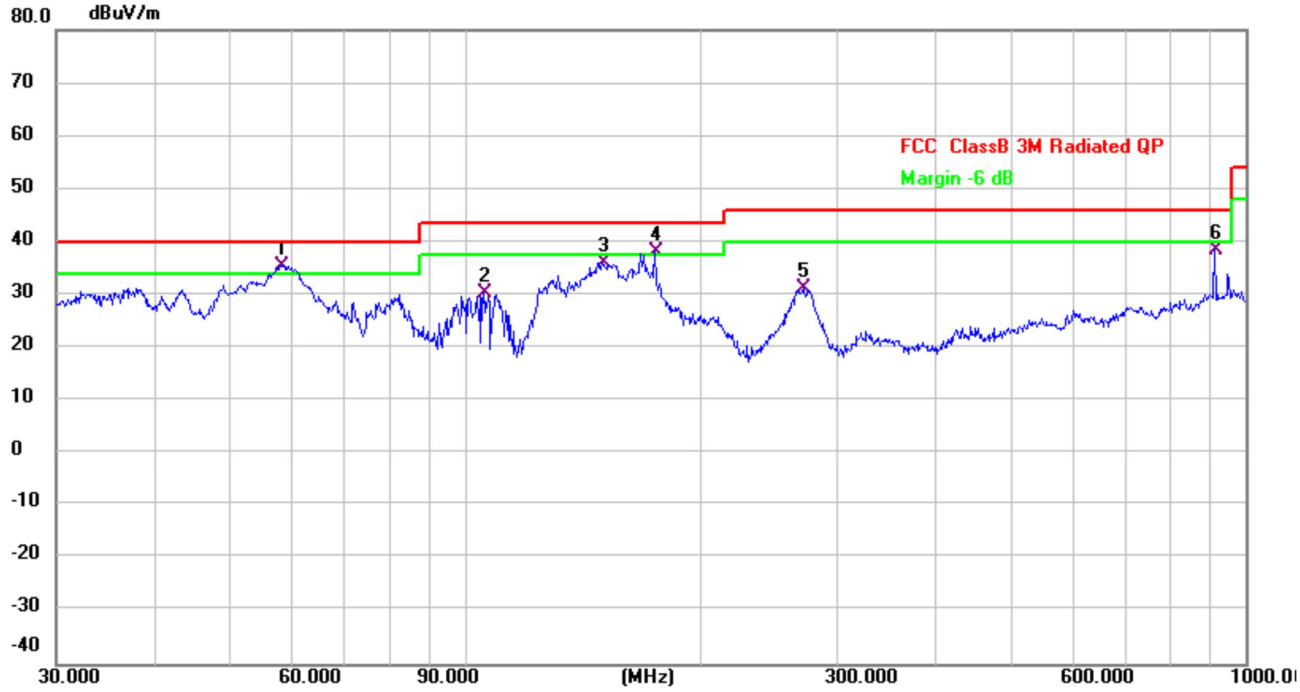
Test mode:	Mode 4	Polarization:	Horizontal
Power supply:	Power by AC/DC adapter (AC 120V/60Hz)	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		107.8877	29.53	-8.71	20.82	43.50	-22.68	QP
2		131.7577	34.78	-10.81	23.97	43.50	-19.53	QP
3		177.5092	37.66	-9.05	28.61	43.50	-14.89	QP
4	*	268.4853	36.98	-5.68	31.30	46.00	-14.70	QP
5		373.3112	30.14	-4.46	25.68	46.00	-20.32	QP
6		614.2142	27.20	0.00	27.20	46.00	-18.80	QP

Frequency 30 MHz ~ 1 GHz

Test mode:	Mode 4	Polarization:	Vertical
Power supply:	Power by AC/DC adapter (AC 120V/60Hz)	Test site:	RE chamber 2



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	58.2030	44.74	-9.18	35.56	40.00	-4.44	QP
2		105.6415	39.07	-8.64	30.43	43.50	-13.07	QP
3		150.0108	46.34	-10.36	35.98	43.50	-7.52	QP
4	!	175.0368	47.43	-9.24	38.19	43.50	-5.31	QP
5		271.3246	36.97	-5.65	31.32	46.00	-14.68	QP
6		912.8620	34.71	3.73	38.44	46.00	-7.56	QP

5.5 Occupied bandwidth test

5.5.1 Test Procedures

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency. The span range for the EMI receiver or spectrum analyzer shall be between two times and five times the OBW.

b) The nominal IF filter bandwidth (3 dB RBW) shall be in the range of 1% to 5% of the OBW and video bandwidth (VBW) shall be approximately three times RBW.

c) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation.

d) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target "−xx dB down" requirement

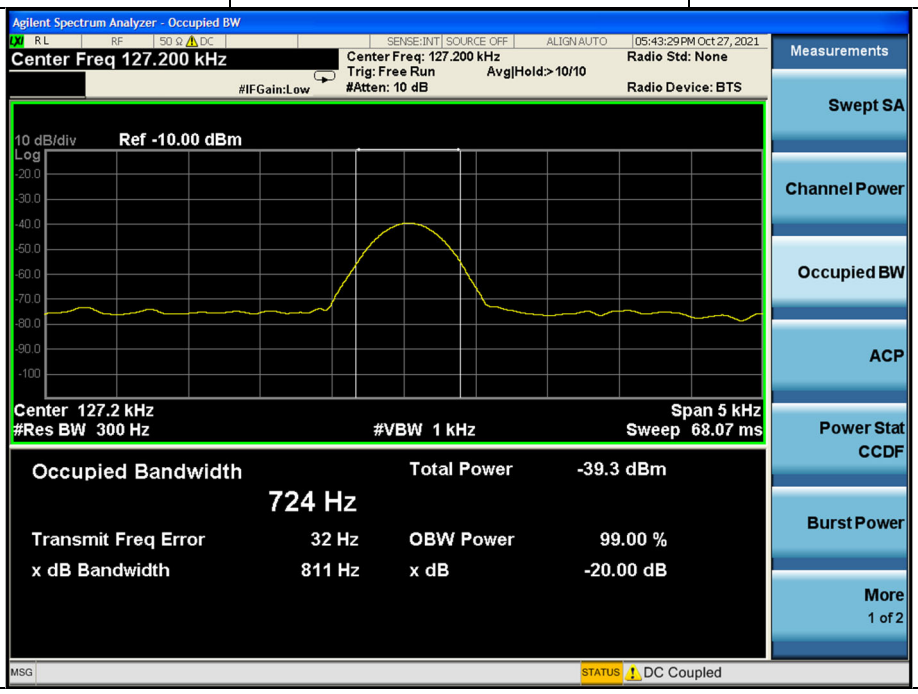
e) Set detection mode to peak and trace mode to max hold.

f) Determine the "−xx dB down amplitude" using [(reference value) − xx]. Alternatively, this calculation may be made by using the marker-delta function of the instrument.

5.5.2 Test Result

Note: Because the measured signal is CW-like, adjusting the RBW per C63.10 would not be practical since measurement bandwidth will always follow the RBW. The RBW is set to 300 Hz to perform the occupied bandwidth test.

Frequency kHz	20 dB occupied bandwidth Hz	99% occupied bandwidth Hz
127.2	811	724



6 Photographs of the test setup

See the Appendix – Test Setup Photos.

7 Photographs of the EUT

See the Appendix - EUT Photos.

----End of Report----