Test Report

FCC ID:2AOKB-A2575

Date of issue: May 28, 2020

Report number:	MTi20030608-7E3
Sample description:	PowerWave 4-in-1 Stand
Model(s):	A2575
Applicant:	Anker Innovations Limited
Address:	Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hongkong
Date of test:	Apr. 18, 2020 – Apr. 30, 2020

Shenzhen Microtest Co., Ltd.
http://www.mtitest.com

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Address: No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China

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Test Result Certification

Applicant's name:	Anker Innovations Limited
Address:	Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hongkong
Manufacture's name:	Anker Innovations Limited
Address:	Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hongkong
Factory's name:	HU NAN GIANTSUN POWER ELECTRONICS CO., LTD
Address:	Building 15,16&17, Taiwan Industrial Zone, Nonferrous Metals Industrial Park, Chenzhou, Hunan, China
Factory's name:	Giantsun Power Electronics (VietNam) Co Ltd
Address:	Factory No.6, Lot CN 8, Thach That-Quoc Oai Industrial Park, Phung Xa Commune, Thach That District,Hanoi City, Viet Nam, 155380
Factory's name:	Gopod Group Holding Limited
Address:	4-6/F, Building 8, Lian Jian Industrial Park, Hua Rong Rd, DaLang, LongHua New District, Shenzhen, China
Product name:	PowerWave 4-in-1 Stand
Trademark:	ANKER
Model name:	A2575
Standards:	FCC Part 15C
Test procedure:	ANSI C63.10-2013

This device described above has been tested by Shenzhen Microtest Co., Ltd. and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

Tested by: Demi Mu — Apr. 30, 2020

Reviewed by: Leo Su — May 28, 2020

Approved by: Tom Xue — May 28, 2020

1 GENERAL INFORMATION

1.1 Feature of equipment under test (EUT)

Product name:	PowerWave 4-in-1 Stand
Model name:	A2575
Model difference:	N/A
Operation frequency:	326.5kHz
Modulation type:	Load modulation
Antenna type:	Coil Antenna
Power supply:	DC 12V from adapter AC 120V/60Hz
Battery:	N/A
Adapter information:	Model: ASSA1OW-120500 Input:AC100-240V 50/60Hz 1.5A Output: 12V 5.0A 60.0W
EUT serial number:	MTi20030608-4-S0001

1.2 Test mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test mode	Description
Mode 1	TX

Note:

1: The test modes were carried out for all operation modes. The final test mode of the EUT was the worst test mode for EMI, and its test data was showed.

2: EUT is tested under full load.

1.3 EUT test setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

1.4 Ancillary equipment

Equipment	Model	S/N	Manufacturer
Adapter	ASSA1OW-120500	AC207485 00001	Shenzhen Aquilstar Techology Co., Ltd
Apple Watch	/	/	APPLE

2 Summary of Test Result

Item	FCC Part No.	Description of Test	Result
1	FCC PART 15.203	Antenna requirement	Pass
2	FCC PART 15.207	Conducted emission	Pass
3	FCC PART 15.209	Radiated emission	Pass
4	FCC Part 15.215	20dB bandwidth	Pass

2.1 Operation channel list

Channel	Frequency (kHz)
1	326.5

2.2 Test channel

Channel	Frequency (kHz)
Middle	326.5

3 Test Facilities and Accreditations

3.1 Test laboratory

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	No.102A & 302A, East Block, Hengfang Industrial Park, Xingye Road, Xixiang, Bao'an District, Shenzhen, Guangdong, China
FCC Registration No.:	448573

3.2 Environmental conditions

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

3.3 Measurement uncertainty

Measurement Uncertainty for a Level of Confidence of 95 %, U=2xUc(y)

RF frequency	1 x 10-7
RF power, conducted	± 1 dB
Conducted emission(150kHz~30MHz)	± 2.5 dB
Radiated emission(30MHz~1GHz)	± 4.2 dB
Radiated emission (above 1GHz)	± 4.3 dB
Temperature	±1 degree
Humidity	± 5 %

3.4 Test software

Software Name	Manufacturer	Model	Version
RF Test System	Shenzhen JS tonscend co., ltd	JS1120-3	2.5.77.0418

4 List of test equipment

Equipment No.	Equipment Name	Manufacturer	Model	Serial No.	Calibration date	Due date
MTI-E004	EMI Test Receiver	Rohde&schwarz	ESPI7	100314	2019/10/09	2020/10/08
MTI-E006	TRILOG Broadband Antenna	schwarabeck	VULB 9163	9163-872	2019/10/15	2020/10/14
MTI-E014	amplifier	Hewlett-Packard	8447D	3113A06150	2019/10/09	2020/10/08
MTI-E036	Single path vehicle AMN(LISN)	Schwarzbeck	NNBM 8124	01175	2019/10/09	2020/10/08
MTI-E038	Low noise active vertical monopole antenna	Schwarzbeck	VAMP 9243	#565	2019/10/16	2020/10/15
MTI-E039	Biconical antenna	Schwarzbeck	BBA 9106	#164	2019/10/15	2020/10/14
MTI-E041	MXG Vector Signal Generator	Agilent	N5182A	MY49060455	2020/04/16	2021/04/15
MTI-E042	ESG Series Analog signal generator	Agilent	E4421B	GB40051240	2019/05/21	2020/05/20
MTI-E044	Thermometer clock humidity monitor	-	HTC-1	/	2020/04/17	2021/04/16
MTI-E062	Log Periodic Antenna	Schwarzbeck	VUSLP 9111B	#312	2020/04/11	2021/04/10
MTI-E063	Log Periodic Dipole Array Antenna	ETS-LINDGREN	3148B	00224524	2020/04/11	2022/04/10
MTI-E065	Amplifier	EMtrace	RP06A	00117	2019/04/29	2021/04/28
MTI-E071	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2019/10/25	2020/10/24
MTI-E076	EMI Test Receiver	Rohde&schwarz	ESIB26	100273	2020/04/16	2021/04/15
MTI-E078	Synthesized Sweeper	Agilent	83752A	3610A01957	2020/04/16	2021/04/15
MTI-E079	DC Power Supply	Agilent	E3632A	MY40027695	2020/04/16	2021/04/15
MTI-E093	Artificial mains network	3ctest	LISN J50	ES3911805	2020/04/16	2021/04/15
MTI-E096	Power amplifier	Space-Dtroniccs	EWLNA0118G-P40	1852001	2020/04/29	2021/04/28
MTI-E097	Current Probe	SOLAR ELECTRONICS CO.	9207-1	220095-1	2020/04/17	2021/04/16
MTI-E098	Loop Sensor	SOLAR ELECTRONICS CO.	7334-1	220095-2	2020/04/21	2021/04/20
Note: the calibration interval of the above test instruments is 12 or 24 months and the calibrations are traceable to international system unit (SI).						

5 Test Results

5.1 Antenna requirement

5.1.1 Standard requirement

15.203 requirement: For intentional device, according to 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

5.1.2 EUT Antenna

The EUT antenna is Coil Antenna. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

5.2 Conducted emission

5.2.1 Limits

For the following equipment, when 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 shall not exceed the limits in the following tables. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal using a 50 μH/50 ohms line impedance stabilization network (LISN).

Frequency (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.5 -5	56	46
5 -30	60	50

Note:
the limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

5.2.2 Test Procedures

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.

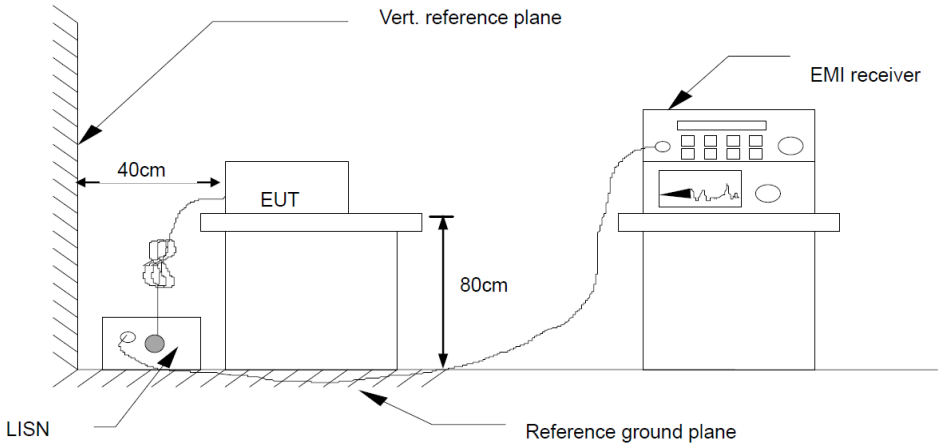
Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN is at least 80 cm from nearest part of EUT chassis.

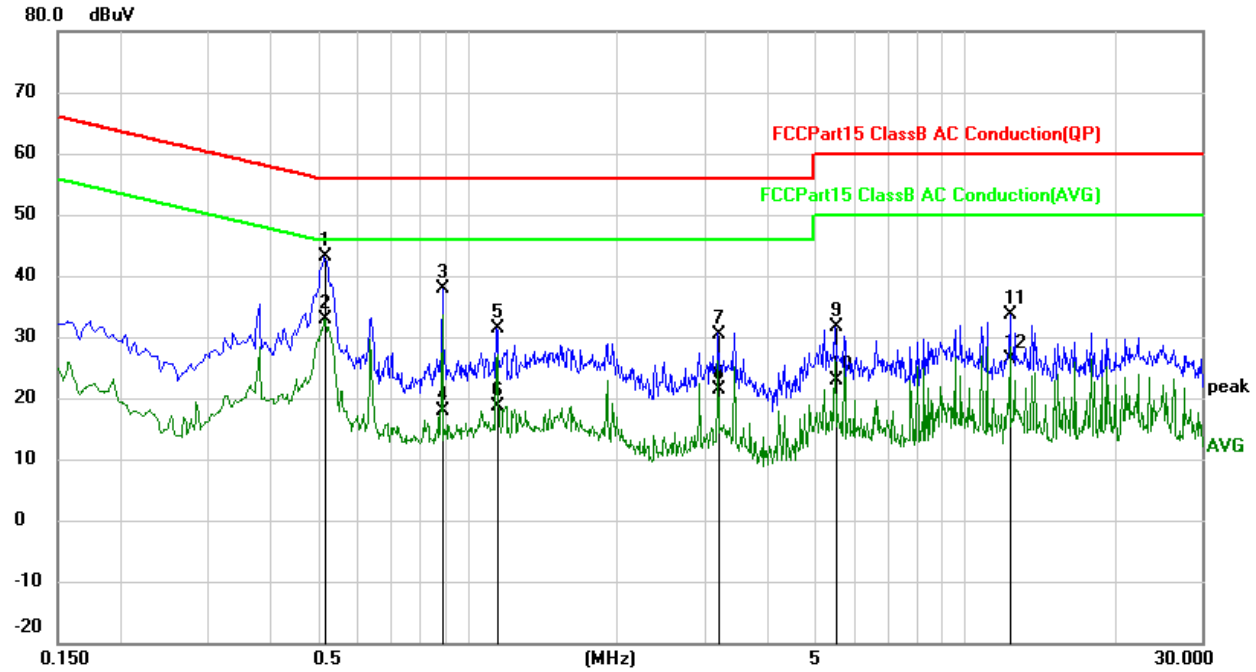
For the actual test configuration, please refer to the related Item – photographs of the test setup.

5.2.3 Test Setup



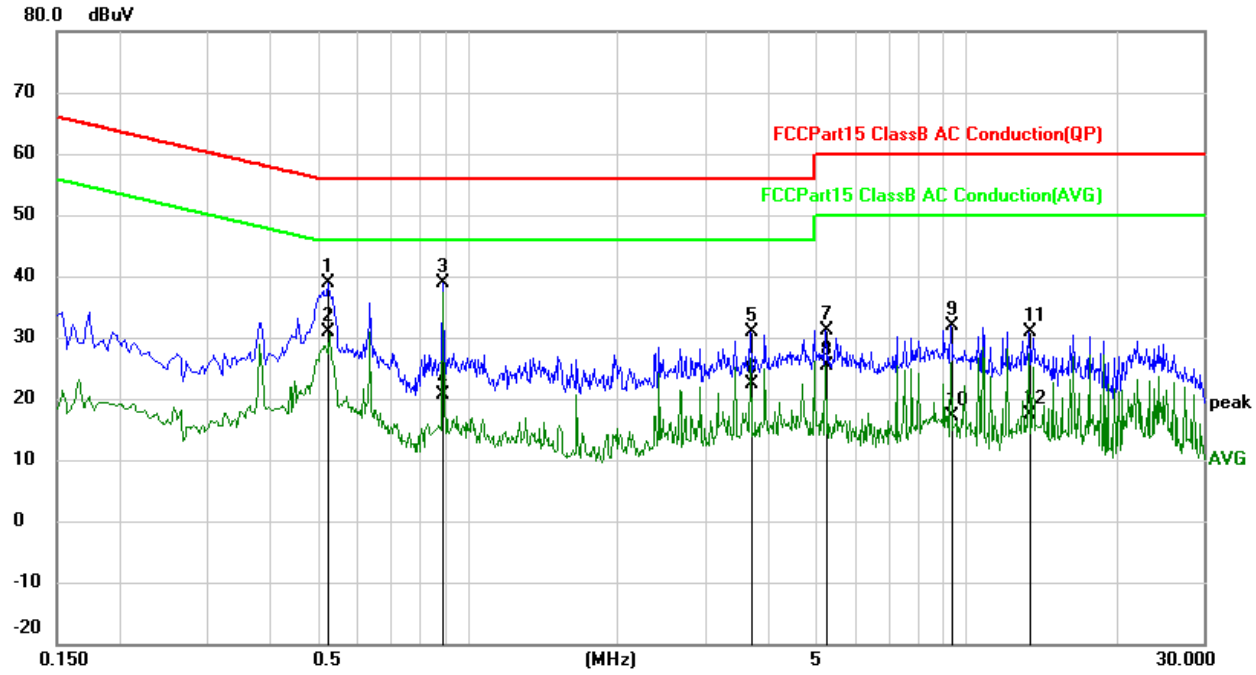
5.2.4 Test Result

EUT:	PowerWave 4-in-1 Stand	Model Name:	A2575
Pressure:	101kPa	Phase:	L
Test voltage:	DC 12V from adapter AC 120V/60Hz	Test mode:	Mode 1



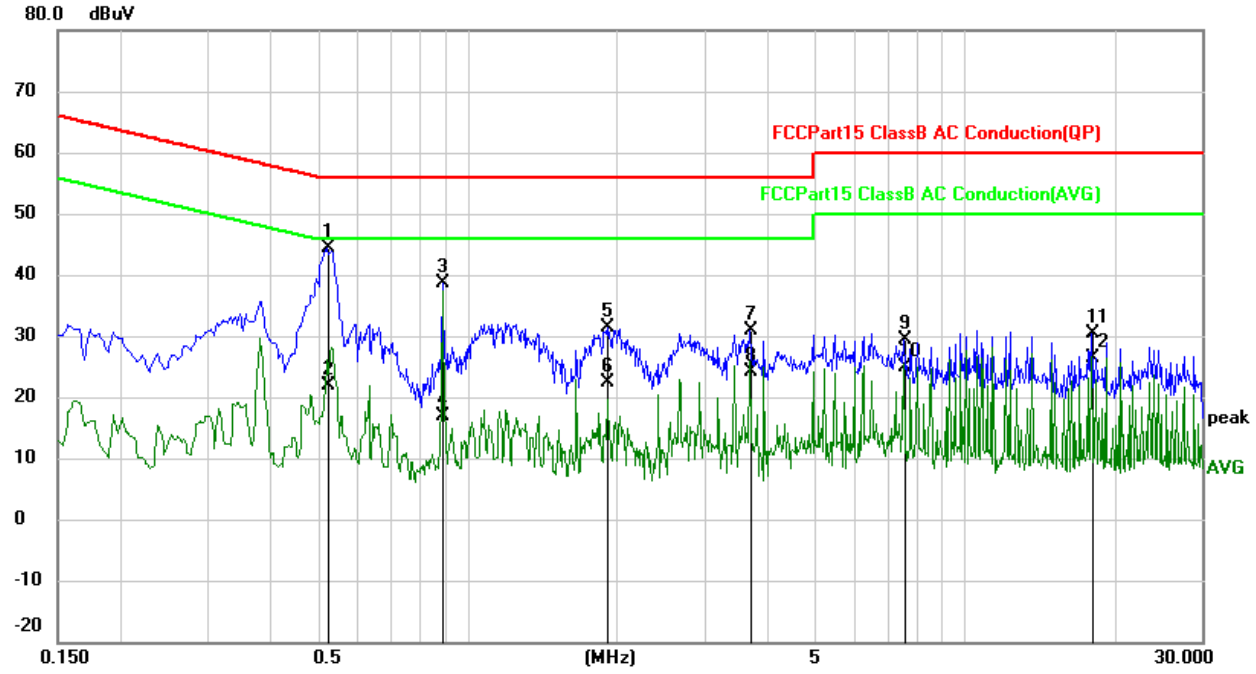
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.5180	33.27	9.92	43.19	56.00	-12.81	QP
2		0.5180	23.08	9.92	33.00	46.00	-13.00	AVG
3		0.8900	27.98	9.97	37.95	56.00	-18.05	QP
4		0.8900	7.86	9.97	17.83	46.00	-28.17	AVG
5		1.1460	21.34	9.98	31.32	56.00	-24.68	QP
6		1.1460	8.67	9.98	18.65	46.00	-27.35	AVG
7		3.1900	20.47	10.03	30.50	56.00	-25.50	QP
8		3.1900	11.40	10.03	21.43	46.00	-24.57	AVG
9		5.4860	21.53	10.10	31.63	60.00	-28.37	QP
10		5.4860	12.81	10.10	22.91	50.00	-27.09	AVG
11		12.3780	23.21	10.30	33.51	60.00	-26.49	QP
12		12.3780	15.99	10.30	26.29	50.00	-23.71	AVG

EUT:	PowerWave 4-in-1 Stand	Model Name:	A2575
Pressure:	101kPa	Phase:	N
Test voltage:	DC 12V from adapter AC 120V/60Hz	Test mode:	Mode 1



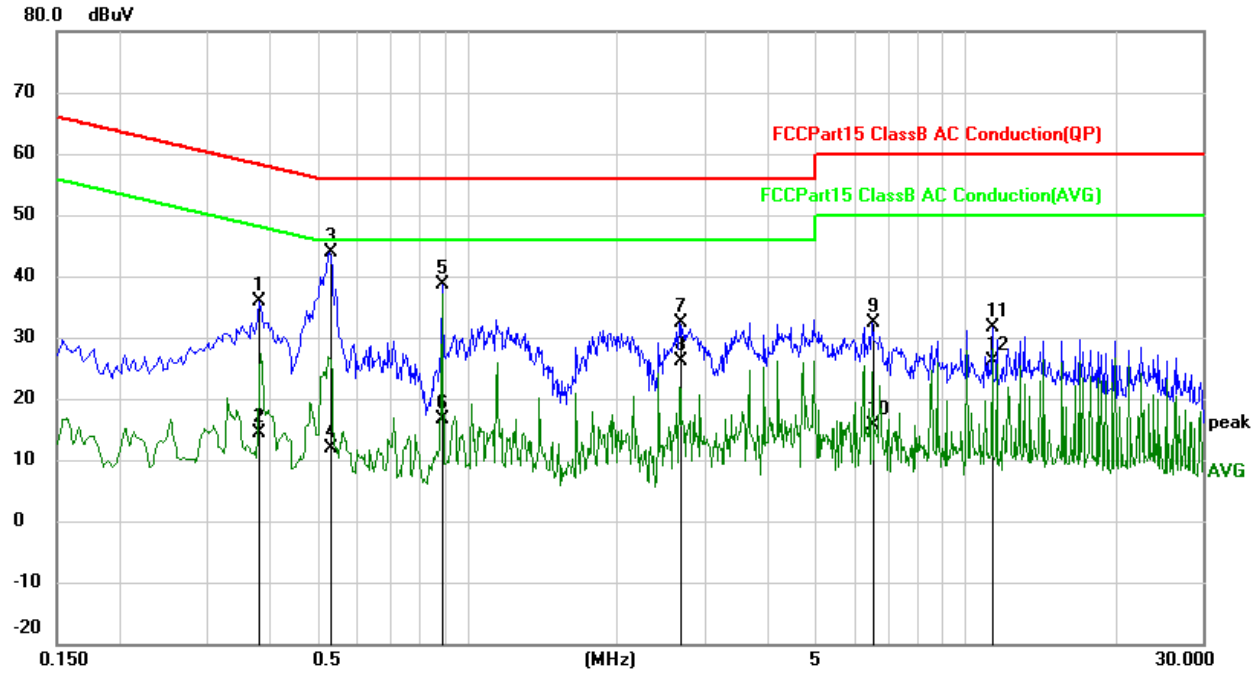
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.5260	29.03	9.92	38.95	56.00	-17.05	QP
2	*	0.5260	20.88	9.92	30.80	46.00	-15.20	AVG
3		0.8940	28.83	9.97	38.80	56.00	-17.20	QP
4		0.8940	10.68	9.97	20.65	46.00	-25.35	AVG
5		3.7020	20.96	10.04	31.00	56.00	-25.00	QP
6		3.7020	12.43	10.04	22.47	46.00	-23.53	AVG
7		5.2340	21.02	10.08	31.10	60.00	-28.90	QP
8		5.2340	15.30	10.08	25.38	50.00	-24.62	AVG
9		9.3139	21.66	10.30	31.96	60.00	-28.04	QP
10		9.3139	6.94	10.30	17.24	50.00	-32.76	AVG
11		13.3980	20.62	10.29	30.91	60.00	-29.09	QP
12		13.3980	7.12	10.29	17.41	50.00	-32.59	AVG

EUT:	PowerWave 4-in-1 Stand	Model Name:	A2575
Pressure:	101kPa	Phase:	L
Test voltage:	DC 12V from adapter AC 240V/60Hz	Test mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.5220	34.42	9.92	44.34	56.00	-11.66	QP
2		0.5220	11.85	9.92	21.77	46.00	-24.23	AVG
3		0.8940	28.58	9.97	38.55	56.00	-17.45	QP
4		0.8940	6.83	9.97	16.80	46.00	-29.20	AVG
5		1.9180	21.36	10.00	31.36	56.00	-24.64	QP
6		1.9180	12.33	10.00	22.33	46.00	-23.67	AVG
7		3.7020	20.93	10.04	30.97	56.00	-25.03	QP
8		3.7020	14.08	10.04	24.12	46.00	-21.88	AVG
9		7.5300	19.27	10.20	29.47	60.00	-30.53	QP
10		7.5300	14.60	10.20	24.80	50.00	-25.20	AVG
11		17.9940	20.16	10.24	30.40	60.00	-29.60	QP
12		17.9940	16.26	10.24	26.50	50.00	-23.50	AVG

EUT:	PowerWave 4-in-1 Stand	Model Name:	A2575
Pressure:	101kPa	Phase:	N
Test voltage:	DC 12V from adapter AC 240V/60Hz	Test mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.3820	26.06	9.83	35.89	58.24	-22.35	QP
2		0.3820	4.60	9.83	14.43	48.24	-33.81	AVG
3	*	0.5299	34.03	9.92	43.95	56.00	-12.05	QP
4		0.5299	2.04	9.92	11.96	46.00	-34.04	AVG
5		0.8940	28.76	9.97	38.73	56.00	-17.27	QP
6		0.8940	6.67	9.97	16.64	46.00	-29.36	AVG
7		2.6780	22.39	10.02	32.41	56.00	-23.59	QP
8		2.6780	16.14	10.02	26.16	46.00	-19.84	AVG
9		6.5100	22.14	10.15	32.29	60.00	-27.71	QP
10		6.5100	5.48	10.15	15.63	50.00	-34.37	AVG
11		11.3580	21.35	10.31	31.66	60.00	-28.34	QP
12		11.3580	15.79	10.31	26.10	50.00	-23.90	AVG

5.3 Radiated emission

5.3.1 Limits

In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

Frequencies (MHz)	Field Strength (micorvolts/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

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

FREQUENCY (MHz)	Class B (dBuV/m) (at 3M)	
	PEAK	AVERAGE
Above 1000	74	54

Notes:

The limit for radiated test was performed according to FCC PART 15C.

The tighter limit applies at the band edges.

Emission level (dBuV/m)=20log Emission level (uV/m).

FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

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

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP

Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

5.3.2 Test Procedures

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 25GHz. For frequencies above 1GHz, any suitable measuring distance may be used.

b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-chamber test. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The height of the equipment or of the substitution antenna shall be 0.8m; above 1GHz, the height was 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

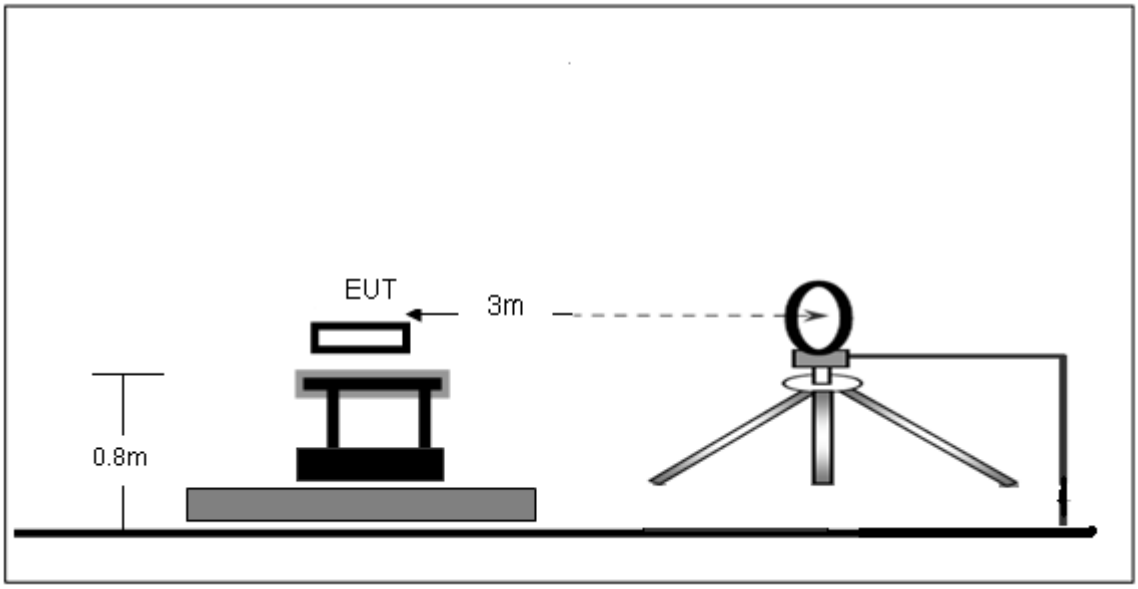
g. For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.

h. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

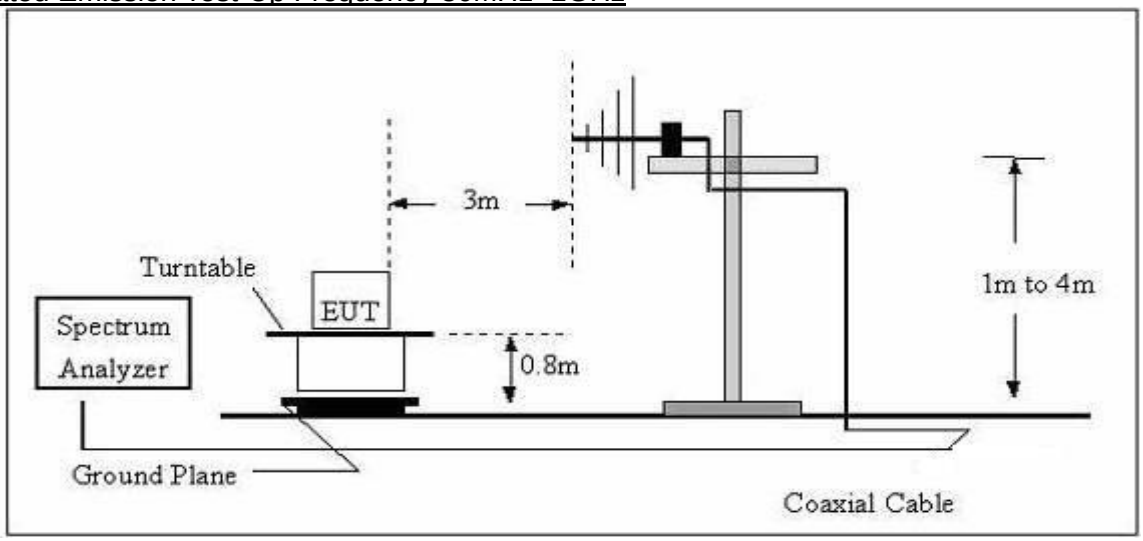
Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

5.3.3 Test Setup

Radiated Emission Test-Up Frequency Below 30MHz



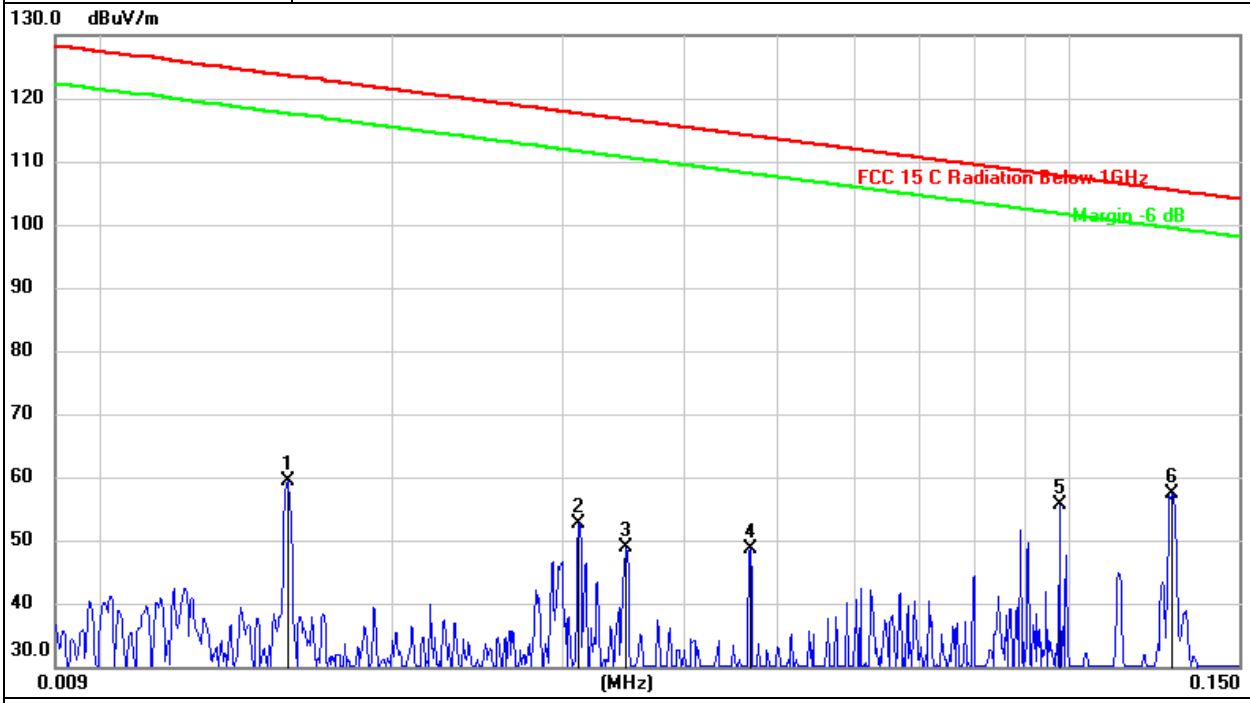
Radiated Emission Test-Up Frequency 30MHz~1GHz



5.3.4 Test Result

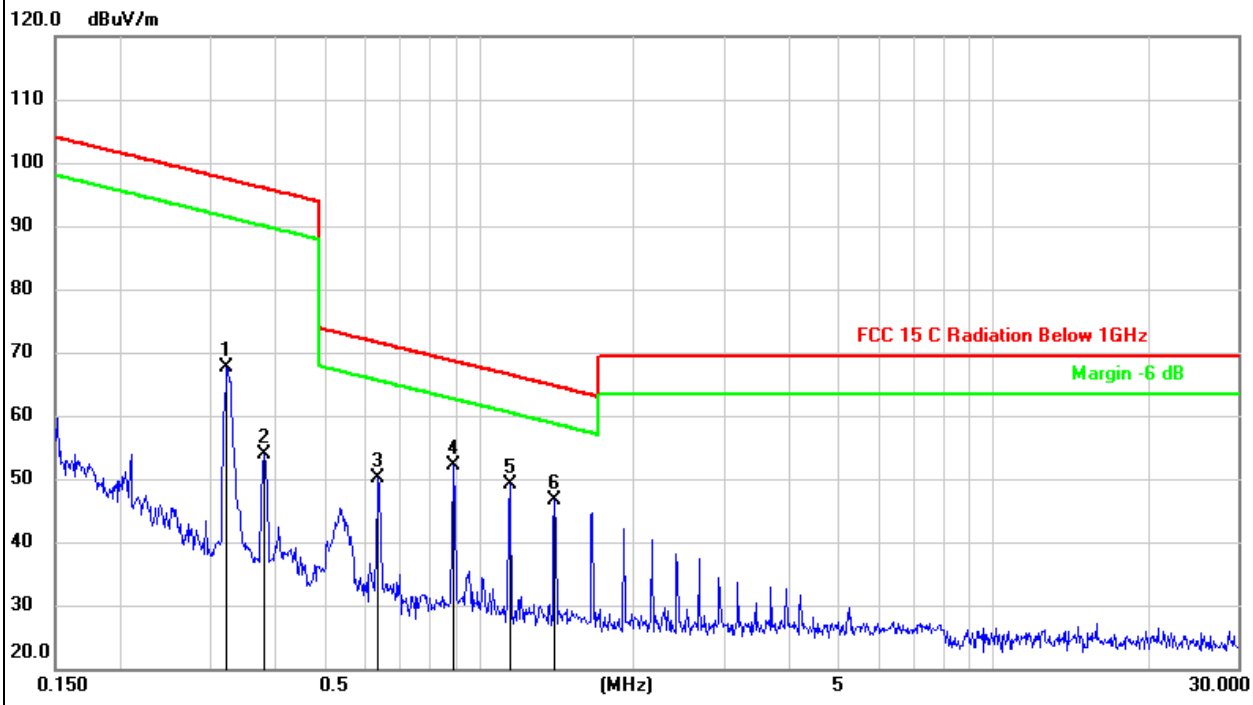
Frequency range (9kHz – 30MHz)

EUT:	PowerWave 4-in-1 Stand	Model Name:	A2575
Pressure:	101kPa	Test mode:	Mode 1
Test voltage:	DC 12V from adapter AC 120V/60Hz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1		0.0156	38.71	20.60	59.31	123.57	-64.26	peak
2		0.0312	31.94	20.61	52.55	117.59	-65.04	peak
3		0.0349	28.13	20.65	48.78	116.62	-67.84	peak
4		0.0469	27.94	20.77	48.71	114.07	-65.36	peak
5		0.0978	34.82	20.82	55.64	107.72	-52.08	peak
6	*	0.1276	37.07	20.35	57.42	105.42	-48.00	peak

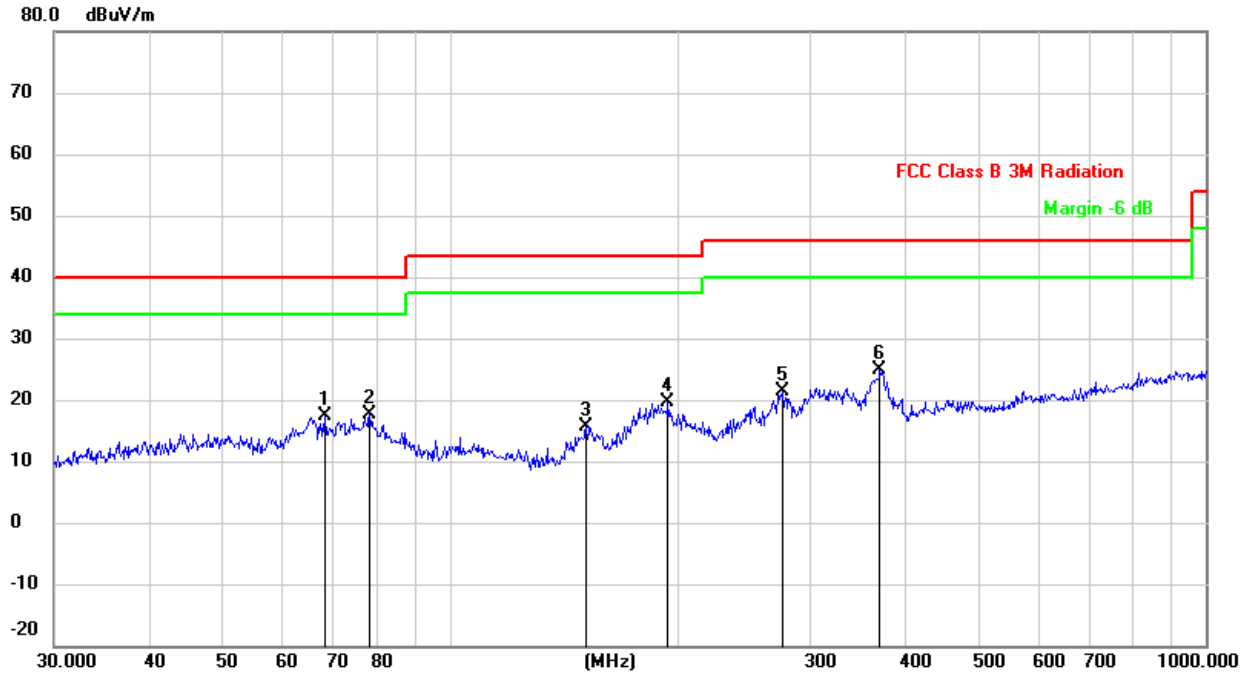
EUT:	PowerWave 4-in-1 Stand	Model Name:	A2575
Pressure:	101kPa	Test mode:	Mode 1
Test voltage:	DC 12V from adapter AC 120V/60Hz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1		0.3234	47.30	20.42	67.72	97.39	-29.67	peak
2		0.3830	33.32	20.46	53.78	95.93	-42.15	peak
3		0.6370	29.49	20.61	50.10	71.53	-21.43	peak
4	*	0.8941	31.44	20.76	52.20	68.59	-16.39	peak
5		1.1471	28.28	20.78	49.06	66.43	-17.37	peak
6		1.4032	25.90	20.73	46.63	64.69	-18.06	peak

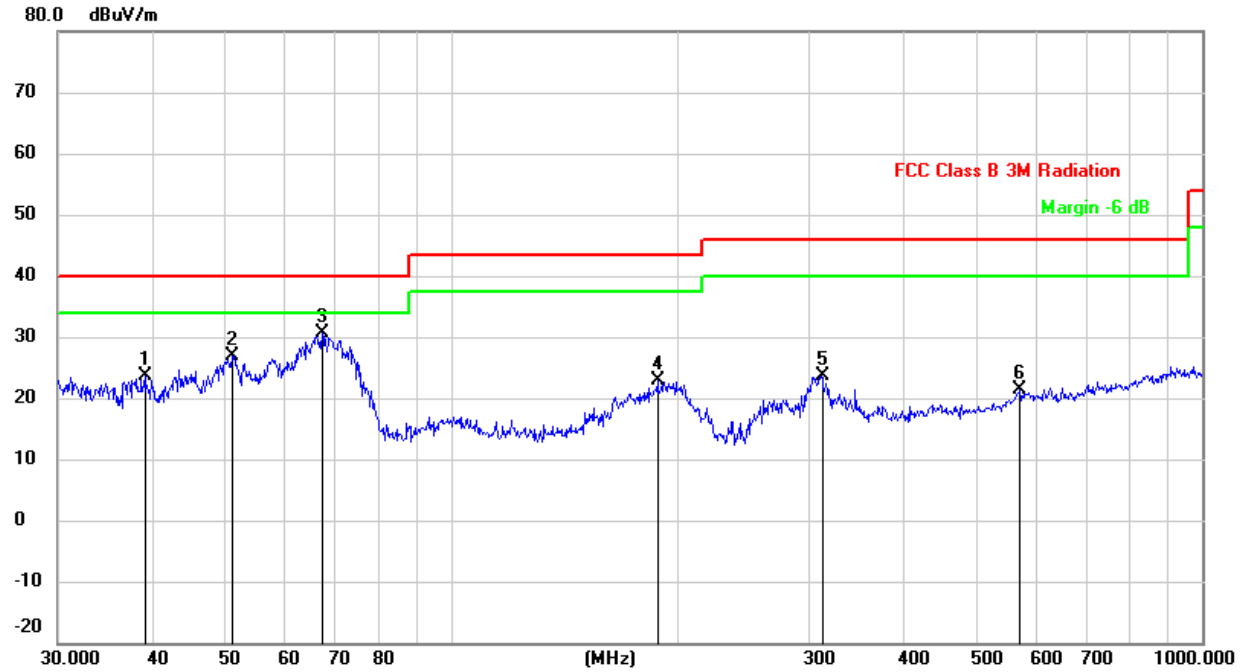
Frequency range (30MHz – 1GHz)

EUT:	PowerWave 4-in-1 Stand	Model Name:	A2575
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	DC 12V from adapter AC 120V/60Hz	Test mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1		68.3908	32.55	-15.27	17.28	40.00	-22.72	QP
2		78.4133	34.89	-17.26	17.63	40.00	-22.37	QP
3		151.5972	31.73	-16.10	15.63	43.50	-27.87	QP
4		194.4534	32.86	-13.18	19.68	43.50	-23.82	QP
5		276.1235	32.31	-11.05	21.26	46.00	-24.74	QP
6	*	370.7023	33.77	-8.90	24.87	46.00	-21.13	QP

EUT:	PowerWave 4-in-1 Stand	Model Name:	A2575
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	DC 12V from adapter AC 120V/60Hz	Test mode:	Mode 1



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1		39.1616	37.28	-13.54	23.74	40.00	-16.26	QP
2		51.1209	39.34	-12.40	26.94	40.00	-13.06	QP
3	*	67.4382	45.79	-15.11	30.68	40.00	-9.32	QP
4		188.4125	36.71	-13.72	22.99	43.50	-20.51	QP
5		311.0867	33.66	-9.98	23.68	46.00	-22.32	QP
6		572.6144	26.83	-5.54	21.29	46.00	-24.71	QP

5.4 Occupied bandwidth

5.4.1 Test method

The transmitter output is connected to the spectrum analyzer.
The RBW is set to 300Hz. The VBW is set to 3 times the RBW.
The sweep time is coupled.
The spectrum analyzer internal 99% bandwidth function is utilized.

Note: Because the measured signal is CW-like, adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW.

Note that when the EUT was in standby mode the only signal that comes out from the EUT was the intentional charging signal of 326.5kHz. On the other hand, when the EUT was in operational mode there were two signals. One of the intentional charging signal of 326.5kHz and the other one the control signal of 340kHz that controls the communication/charging status between EUT and the client device-the watch.

5.4.2 EUT SETUP

Configuration 1: Charger in standby mode, transmitting low duty cycle CW signal at 326.5kHz test.

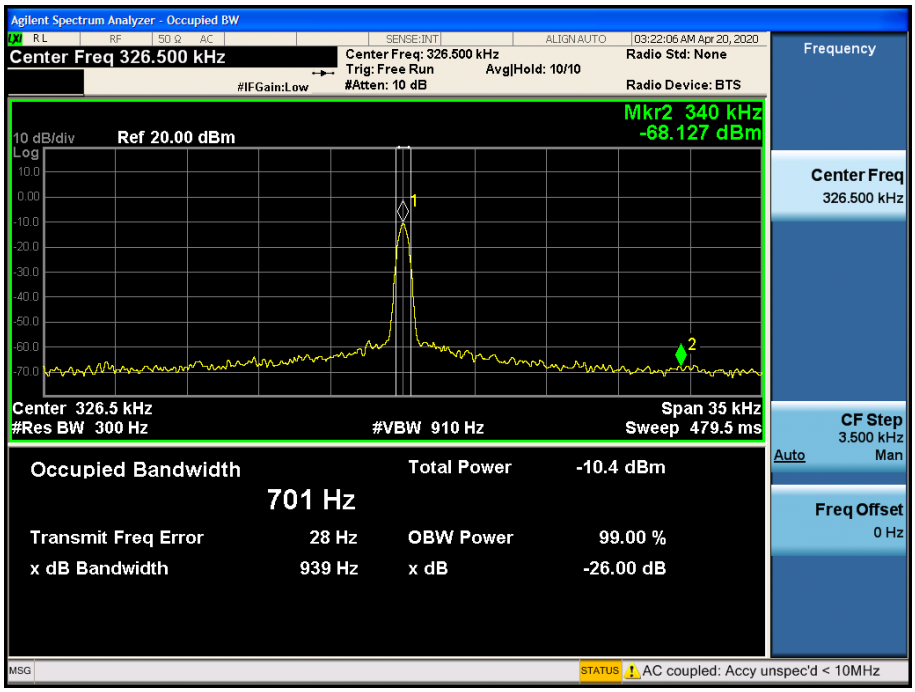
Configuration 2: Charger in pairing mode with FSK modulation (-0/+15 kHz) which occurs over a very short period of time as soon as the watch is placed on the charger.

Configuration 3: Charger in charging mode with CW signal and duty cycle varied to control charge level via load modulation from watch.

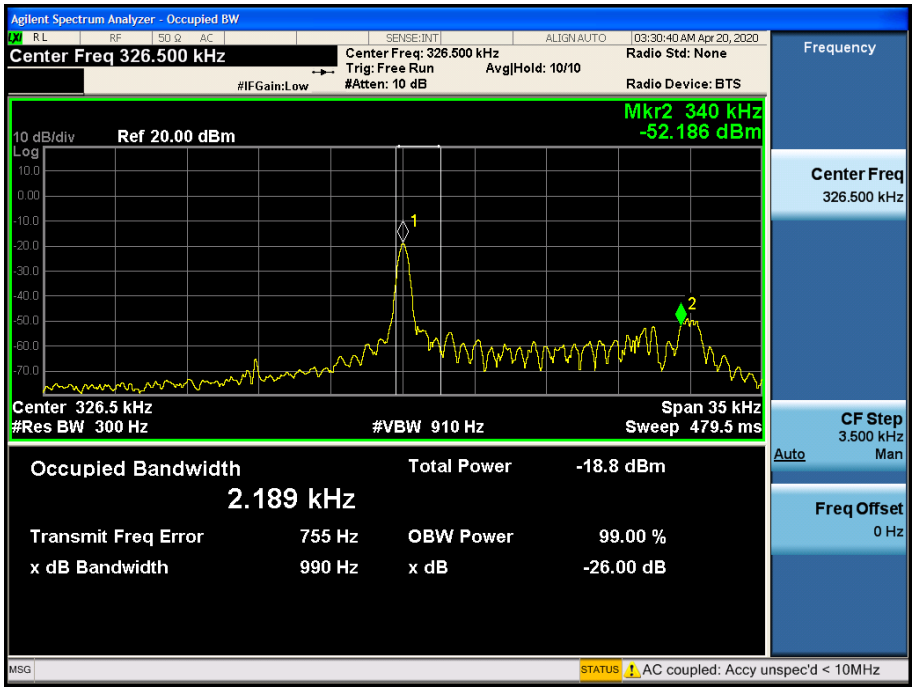
5.4.3 Test result

Test plots as below:

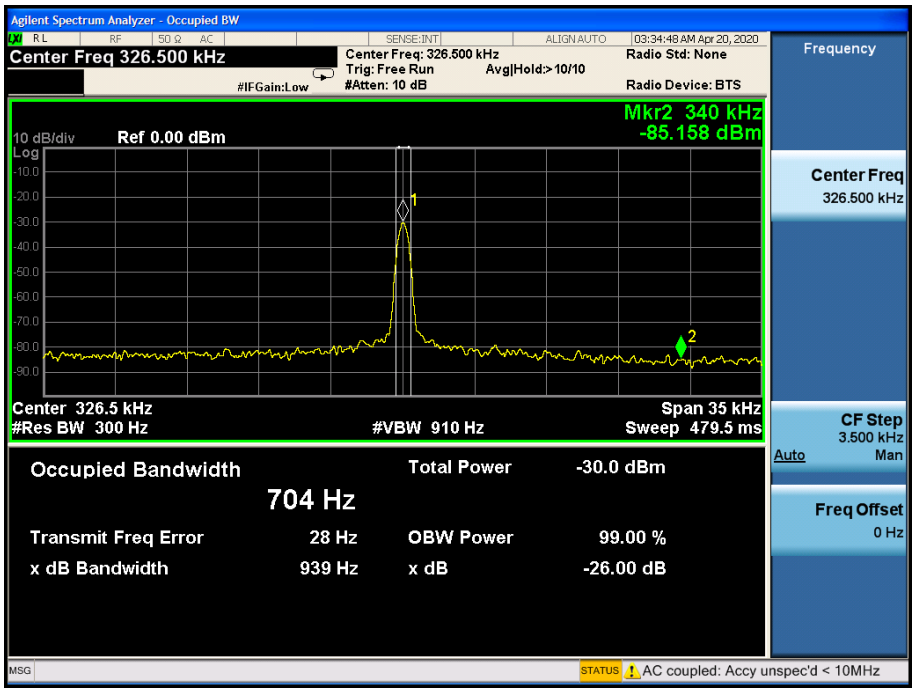
Configuration 1:



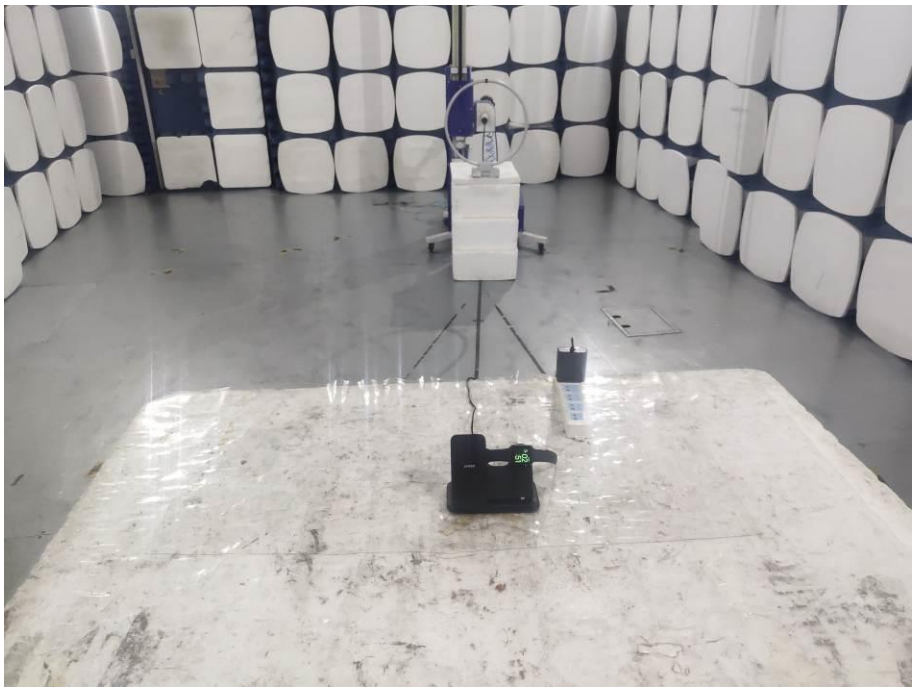
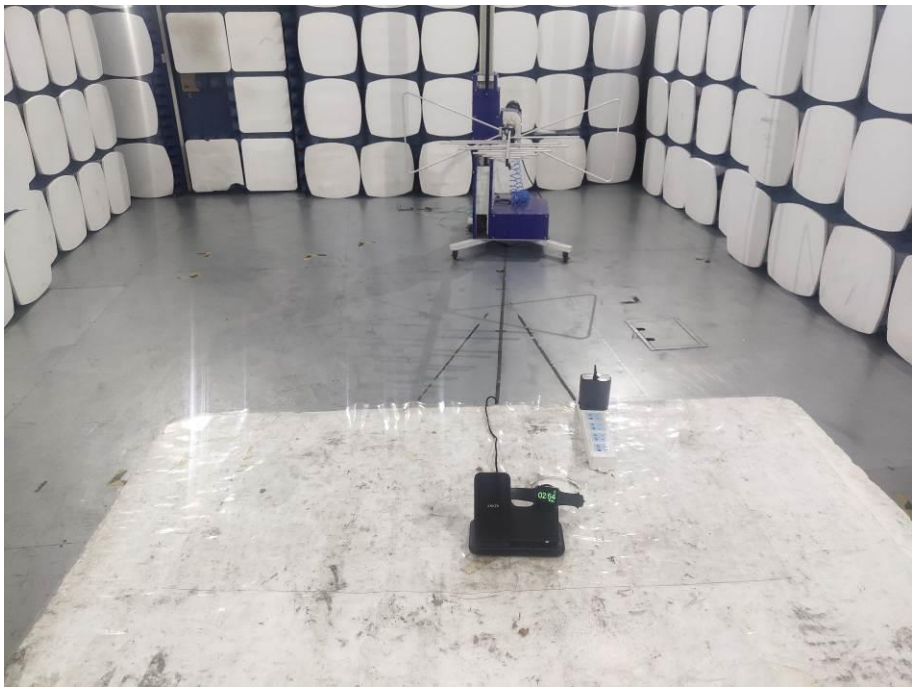
Configuration 2:



Configuration 3:



Photographs of the Test Setup

Radiated emission



Conducted emission


Photographs of the EUT

See the APPENDIX 1: EUT PHOTOS in the report No.: MTi20030608-7E1-1.

----END OF REPORT----