

# Test Report

FCC ID:2ATCAUP2QC10AWA

Date of issue: Oct. 27, 2020

Report number: MTi20073017-4E1

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Sample description: ALOGIC 4-in-1 Wireless Charging Dock

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Model(s): UP2QC10AWA

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Applicant: ALOGIC Corporation Pty Ltd.

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Address: Level 40, 140 William St, Melbourne, Victoria 3000 Australia

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Date of test: Agu. 29, 2020 - Oct. 16, 2020

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

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## Test Result Certification

Applicant's name: ALOGIC Corporation Pty Ltd.

Address: Level 40, 140 William St, Melbourne, Victoria 3000 Australia

Manufacture's name: ALOGIC Corporation Pty Ltd.

Address: Level 40, 140 William St, Melbourne, Victoria 3000 Australia

Factory: Dongguan DBK Energy Technology Co., Ltd

Address: No. 51, Zhangshen Mid Rd, Xuzhen Community, Zhangmutou Town, Dongguan, Guangdong, China

Product name: ALOGIC 4-in-1 Wireless Charging Dock

Trademark: ALOGIC

Model name: UP2QC10AWA

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.

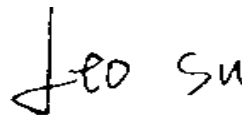
Tested by:



Danny Xu

Oct. 16, 2020

Reviewed by:



Leo Su

Oct. 27, 2020

Approved by:



Tom Xue

Oct. 27, 2020

## 1 GENERAL INFORMATION

### 1.1 Feature of equipment under test (EUT)

Product name:	ALOGIC 4-in-1 Wireless Charging Dock
Model name:	UP2QC10AWA
Model difference:	N/A
Operation frequency:	115–205 kHz, 326.5 kHz
Modulation type:	Load modulation
Antenna type:	Coil Antenna
Power supply:	DC 9V from adapter AC 120V/60Hz
Battery:	N/A
Adapter information:	Model Code:A361-09040001 Input AC:100-240V~50/60Hz 1.5A Output DC:9V 4000mA(36W)
EUT serial number:	MTi20073017-4-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(Load)
Mode 2	TX(Apple watch)

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 worst case (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
Watch	/	/	Apple
Load 1	/	/	/
Load 2	/	/	/

## 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 Frequency Range

Channel	Frequency (kHz)		
	Left load	Right load	Apple watch
Low	115	115	326.5
High	205	205	

### 2.2 Test channel

	Channel	Frequency (kHz)
Left load	/	116
Right load	/	116
Apple watch	/	326.5

### 3 Test Facilities and Accreditations

#### 3.1 Test laboratory

Test Laboratory	Shenzhen Microtest Co., Ltd
Location	101, No. 7, Zone 2, Xinxing Industrial Park, Fuhai Avenue, Xinhe Community, Fuhai Street, Bao' an District, Shenzhen, Guangdong, China
FCC Registration No.:	448573

#### 3.2 Environmental conditions

Temperature:	15°C~35°C
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	$1 \times 10^{-7}$
RF power, conducted	$\pm 1$ dB
Conducted emission(150kHz~30MHz)	$\pm 2.5$ dB
Radiated emission(30MHz~1GHz)	$\pm 4.2$ dB
Radiated emission (above 1GHz)	$\pm 4.3$ dB
Temperature	$\pm 1$ degree
Humidity	$\pm 5$ %

#### 3.4 Test software

Software Name	Manufacturer	Model	Version
RF Test System	Shenzhen JS tonscond 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	2020/10/08	2021/10/08
MTI-E006	TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	9163-872	2020/10/14	2021/10/14
MTI-E014	amplifier	Hewlett-Packard	8447D	3113A06150	2020/10/08	2021/10/08
MTI-E036	Single path vehicle AMN(LISN)	Schwarzbeck	NNBM 8124	01175	2020/10/08	2021/10/08
MTI-E038	Low noise active vertical monopole antenna	Schwarzbeck	VAMP 9243	#565	2020/10/15	2021/10/15
MTI-E039	Biconical antenna	Schwarzbeck	BBA 9106	#164	2020/10/14	2021/10/14
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	2020/05/21	2021/05/20
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	2022/04/10
MTI-E063	Log Periodic Dipole Array Antenna	ETS-LINDGREN	3148B	00224524	2020/04/11	2022/04/10
MTI-E065	Amplifier	EMtrace	RP06A	00117	2020/04/29	2021/04/28
MTI-E071	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2020/10/25	2021/10/24
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-Dtronics	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  $\mu$ H/50 ohms line impedance stabilization network (LISN).

Frequency (MHz)	Conducted limit (dB $\mu$ V)	
	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.

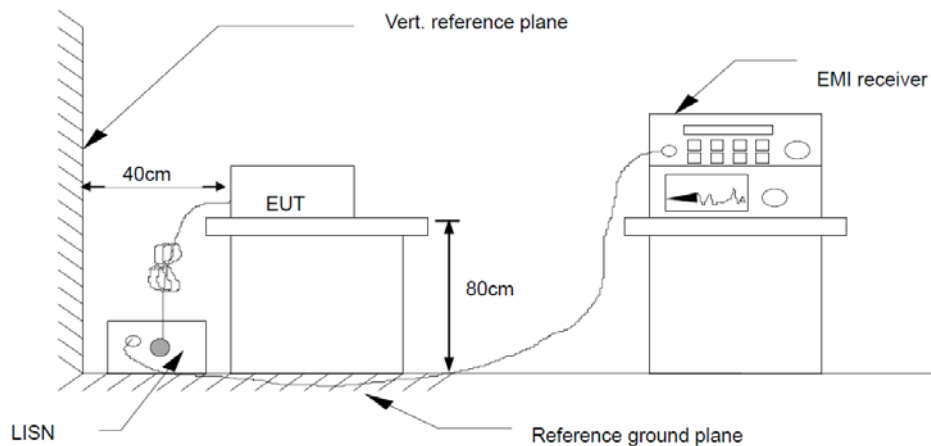
Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

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.

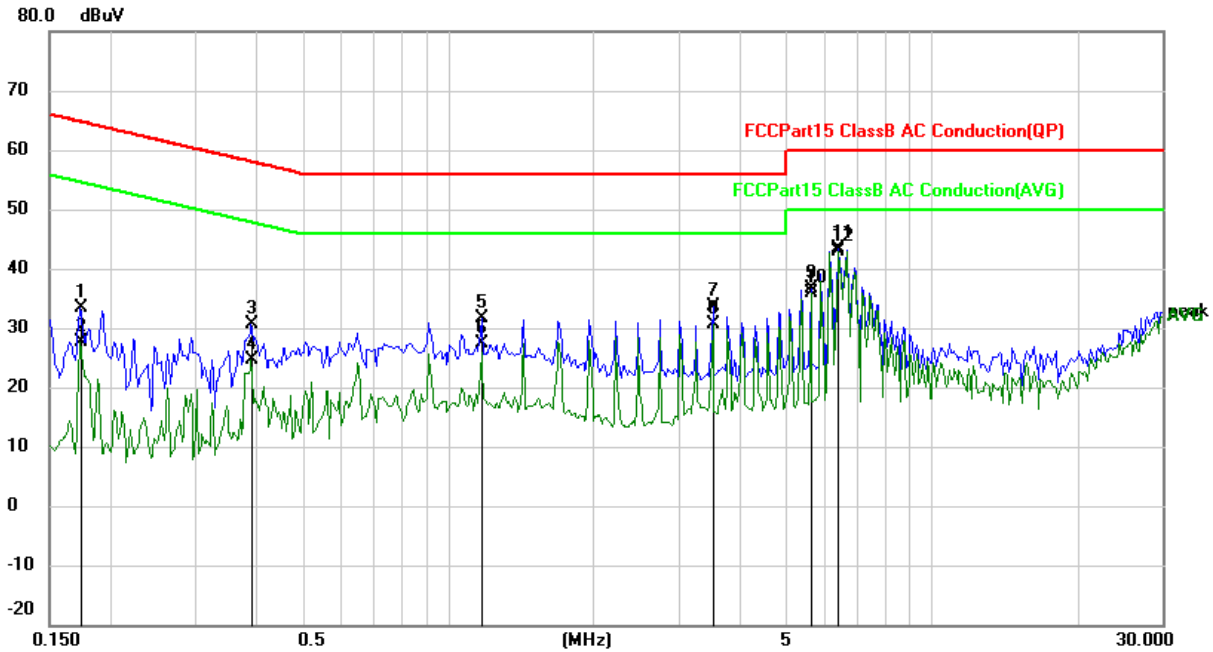
### 5.2.3 Test Setup



### 5.2.4 Test Result



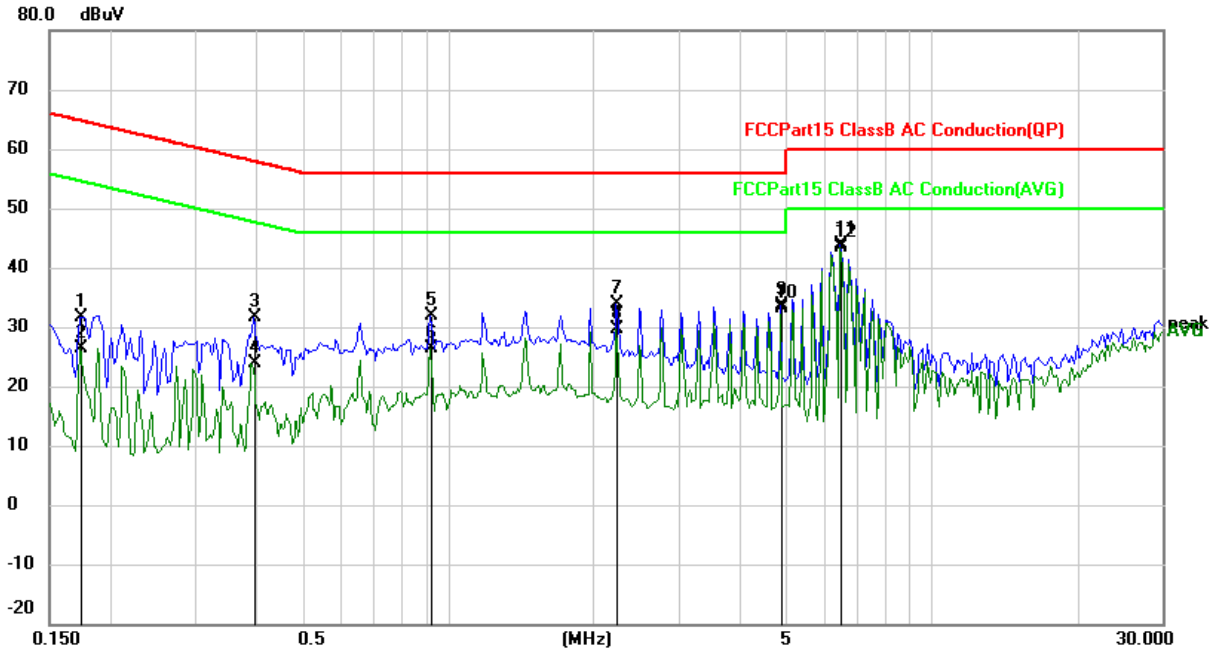
EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Phase:	L
Test voltage:	DC 9V from adapter AC 120V/60Hz	Test mode:	Mode 1



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1734	23.71	9.74	33.45	64.80	-31.35	QP
2		0.1734	17.77	9.74	27.51	54.80	-27.29	AVG
3		0.3922	20.73	9.85	30.58	58.02	-27.44	QP
4		0.3922	14.71	9.85	24.56	48.02	-23.46	AVG
5		1.1734	21.54	9.99	31.53	56.00	-24.47	QP
6		1.1734	17.39	9.99	27.38	46.00	-18.62	AVG
7		3.5352	23.69	10.05	33.74	56.00	-22.26	QP
8		3.5352	20.66	10.05	30.71	46.00	-15.29	AVG
9		5.6328	26.49	10.11	36.60	60.00	-23.40	QP
10		5.6328	25.74	10.11	35.85	50.00	-14.15	AVG
11		6.4141	33.27	10.16	43.43	60.00	-16.57	QP
12	*	6.4141	32.83	10.16	42.99	50.00	-7.01	AVG



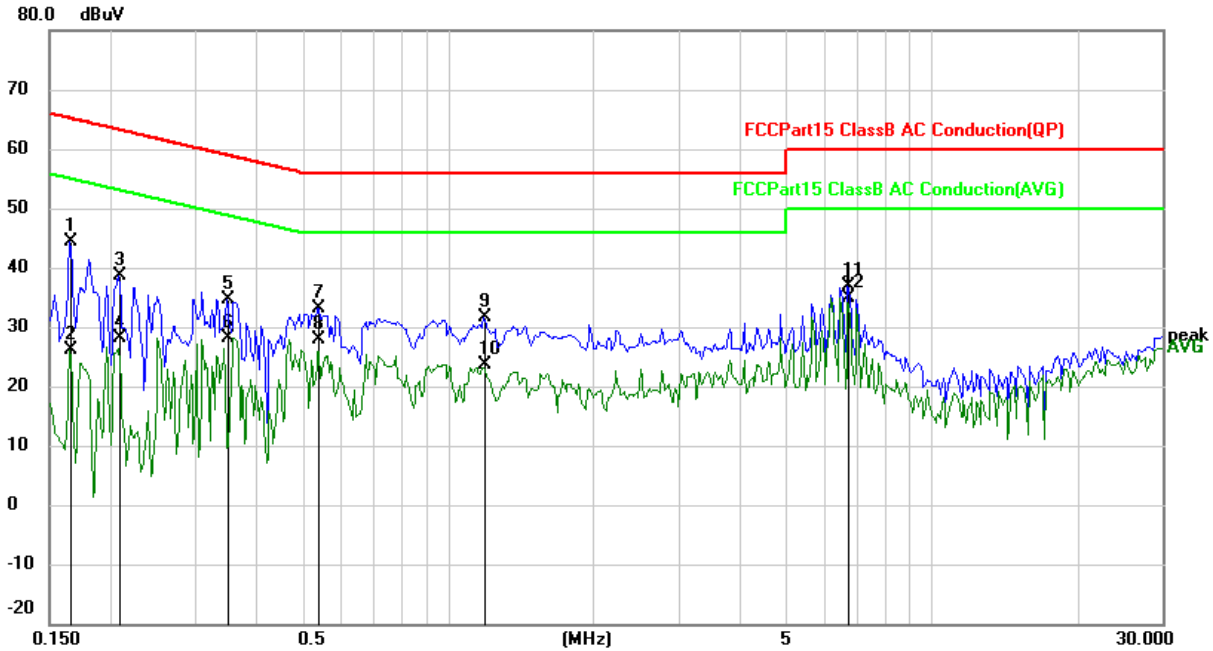
EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Phase:	N
Test voltage:	DC 9V from adapter AC 120V/60Hz	Test mode:	Mode 1



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1734	21.99	9.74	31.73	64.80	-33.07	QP
2		0.1734	16.68	9.74	26.42	54.80	-28.38	AVG
3		0.3961	21.73	9.85	31.58	57.93	-26.35	QP
4		0.3961	14.02	9.85	23.87	47.93	-24.06	AVG
5		0.9195	21.82	9.98	31.80	56.00	-24.20	QP
6		0.9195	16.34	9.98	26.32	46.00	-19.68	AVG
7		2.2359	23.93	10.02	33.95	56.00	-22.05	QP
8		2.2359	19.71	10.02	29.73	46.00	-16.27	AVG
9		4.8750	23.64	10.08	33.72	56.00	-22.28	QP
10		4.8750	23.10	10.08	33.18	46.00	-12.82	AVG
11		6.4688	33.72	10.16	43.88	60.00	-16.12	QP
12	*	6.4688	33.14	10.16	43.30	50.00	-6.70	AVG



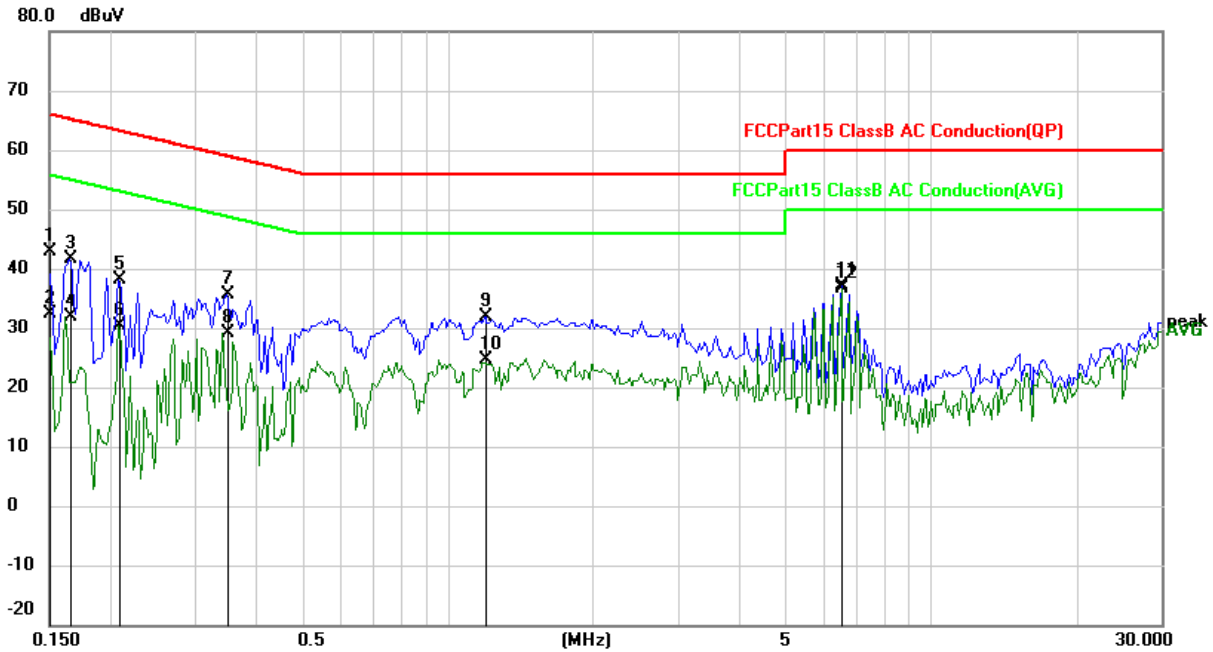
EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Phase:	L
Test voltage:	DC 9V from adapter AC 240V/60Hz	Test mode:	Mode 1



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1655	34.53	9.74	44.27	65.18	-20.91	QP
2		0.1655	16.40	9.74	26.14	55.18	-29.04	AVG
3		0.2086	28.82	9.74	38.56	63.26	-24.70	QP
4		0.2086	18.27	9.74	28.01	53.26	-25.25	AVG
5		0.3492	24.79	9.82	34.61	58.98	-24.37	QP
6		0.3492	18.26	9.82	28.08	48.98	-20.90	AVG
7		0.5406	23.13	9.93	33.06	56.00	-22.94	QP
8		0.5406	17.86	9.93	27.79	46.00	-18.21	AVG
9		1.1852	21.53	9.99	31.52	56.00	-24.48	QP
10		1.1852	13.70	9.99	23.69	46.00	-22.31	AVG
11		6.7305	26.67	10.17	36.84	60.00	-23.16	QP
12	*	6.7305	24.72	10.17	34.89	50.00	-15.11	AVG



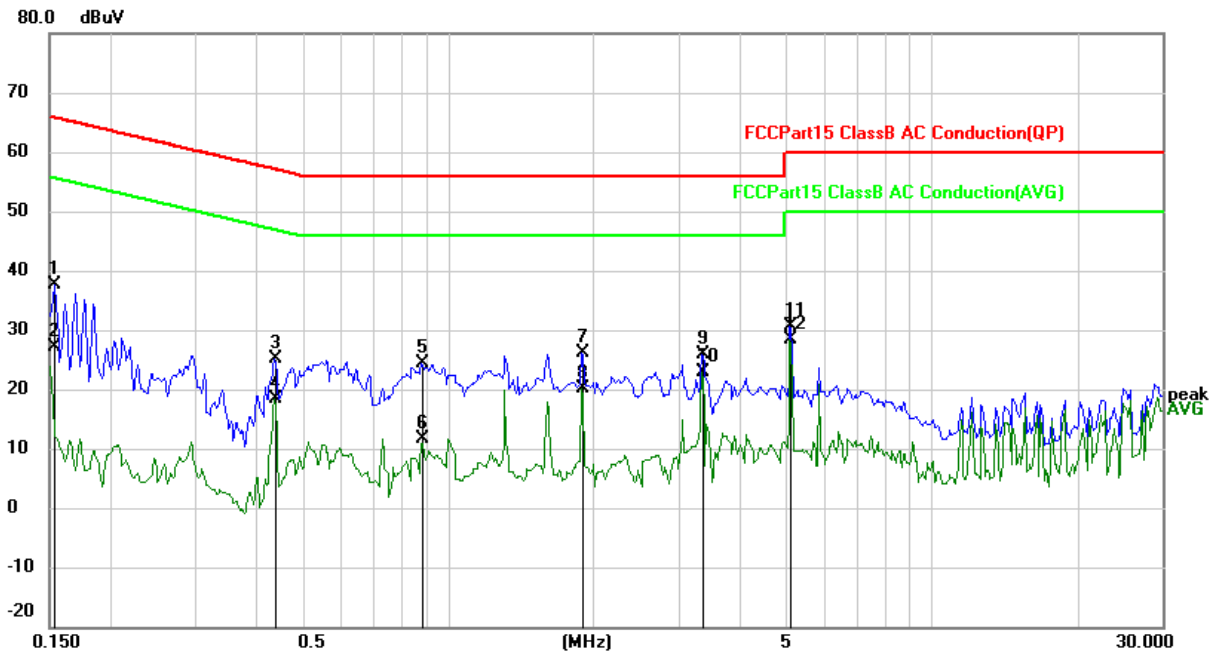
EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Phase:	N
Test voltage:	DC 9V from adapter AC 240V/60Hz	Test mode:	Mode 1



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1500	33.02	9.74	42.76	66.00	-23.24	QP
2		0.1500	22.69	9.74	32.43	56.00	-23.57	AVG
3		0.1655	32.00	9.74	41.74	65.18	-23.44	QP
4		0.1655	22.07	9.74	31.81	55.18	-23.37	AVG
5		0.2086	28.46	9.74	38.20	63.26	-25.06	QP
6		0.2086	20.71	9.74	30.45	53.26	-22.81	AVG
7		0.3492	25.74	9.82	35.56	58.98	-23.42	QP
8		0.3492	19.25	9.82	29.07	48.98	-19.91	AVG
9		1.1969	21.90	9.99	31.89	56.00	-24.11	QP
10		1.1969	14.63	9.99	24.62	46.00	-21.38	AVG
11		6.5233	26.92	10.16	37.08	60.00	-22.92	QP
12	*	6.5233	26.54	10.16	36.70	50.00	-13.30	AVG

**Apple Watch:**

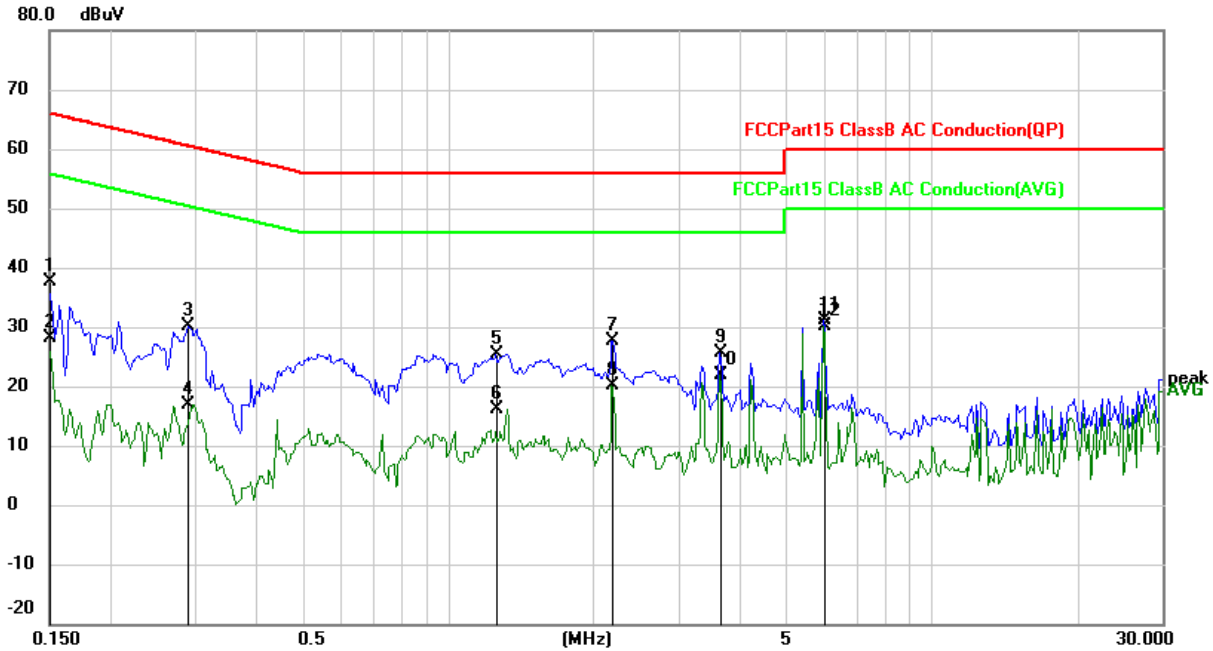
EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Phase:	L
Test voltage:	DC 9V from adapter AC 120V/60Hz	Test mode:	Mode 2



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1539	27.94	9.74	37.68	65.79	-28.11	QP
2		0.1539	17.27	9.74	27.01	55.79	-28.78	AVG
3		0.4391	15.24	9.88	25.12	57.08	-31.96	QP
4		0.4391	8.45	9.88	18.33	47.08	-28.75	AVG
5		0.8844	14.29	9.98	24.27	56.00	-31.73	QP
6		0.8844	1.75	9.98	11.73	46.00	-34.27	AVG
7		1.8961	16.21	10.01	26.22	56.00	-29.78	QP
8		1.8961	10.05	10.01	20.06	46.00	-25.94	AVG
9		3.3594	15.94	10.04	25.98	56.00	-30.02	QP
10		3.3594	12.96	10.04	23.00	46.00	-23.00	AVG
11		5.1094	20.67	10.08	30.75	60.00	-29.25	QP
12	*	5.1094	18.20	10.08	28.28	50.00	-21.72	AVG



EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Phase:	N
Test voltage:	DC 9V from adapter AC 120V/60Hz	Test mode:	Mode 2

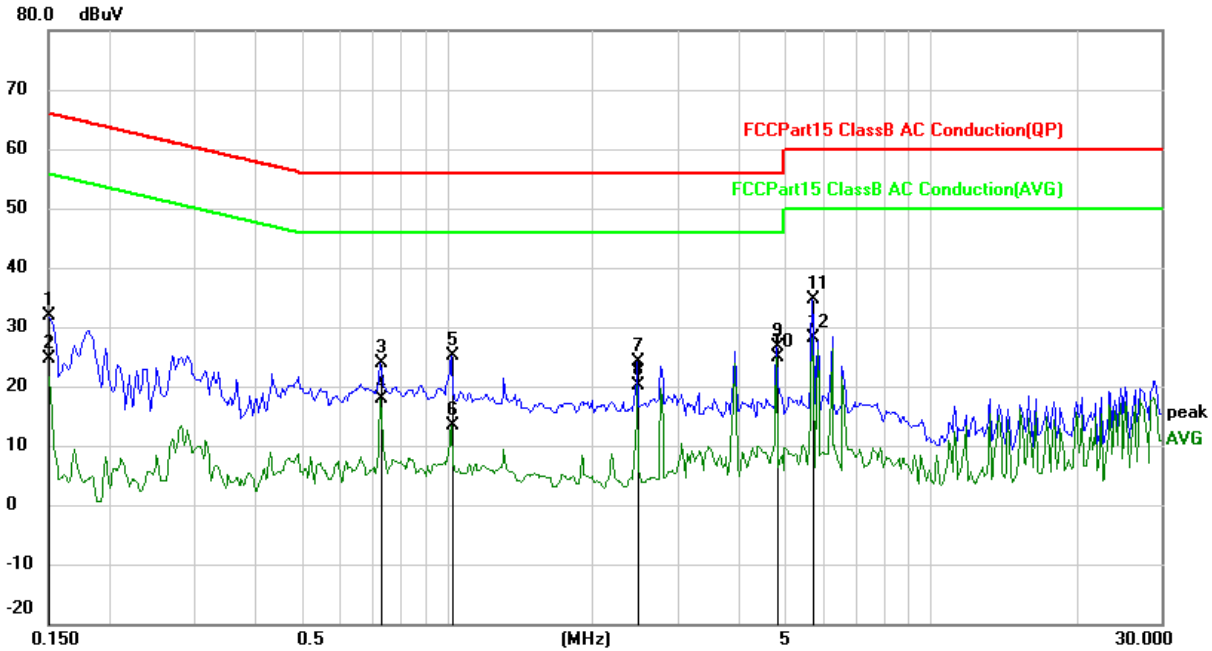


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1500	27.92	9.74	37.66	66.00	-28.34	QP
2		0.1500	18.27	9.74	28.01	56.00	-27.99	AVG
3		0.2906	20.31	9.77	30.08	60.51	-30.43	QP
4		0.2906	7.09	9.77	16.86	50.51	-33.65	AVG
5		1.2594	15.40	10.00	25.40	56.00	-30.60	QP
6		1.2594	6.07	10.00	16.07	46.00	-29.93	AVG
7		2.1891	17.63	10.02	27.65	56.00	-28.35	QP
8		2.1891	9.99	10.02	20.01	46.00	-25.99	AVG
9		3.6523	15.65	10.05	25.70	56.00	-30.30	QP
10		3.6523	11.87	10.05	21.92	46.00	-24.08	AVG
11		5.9844	20.93	10.13	31.06	60.00	-28.94	QP
12	*	5.9844	19.97	10.13	30.10	50.00	-19.90	AVG





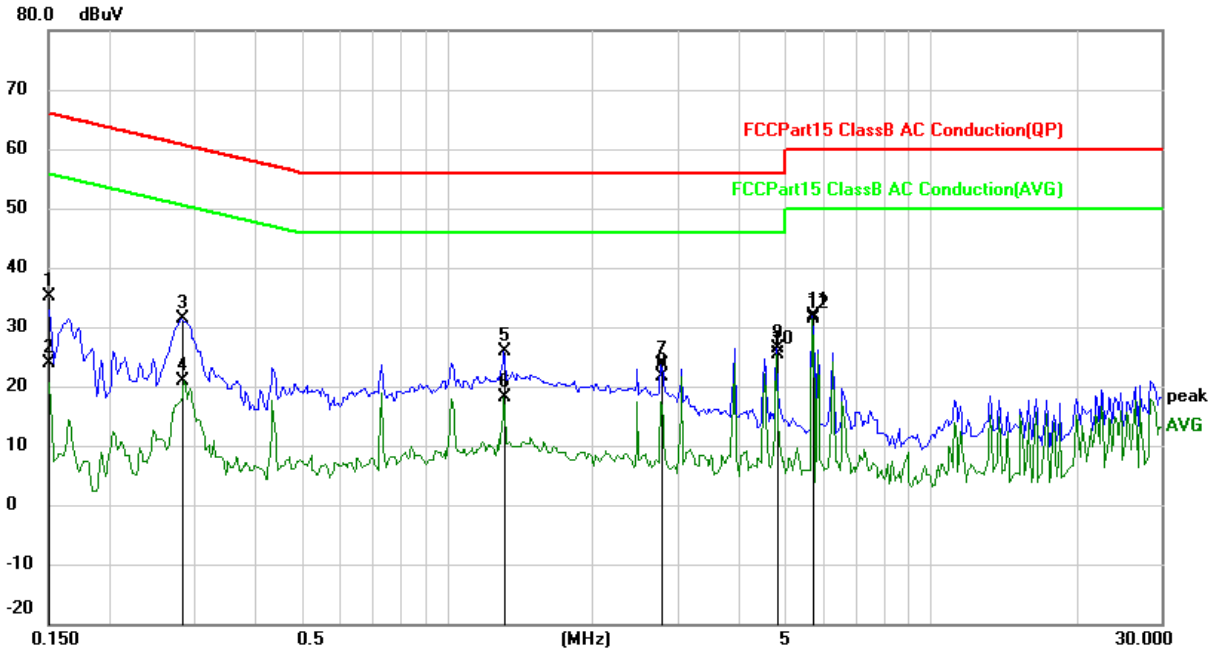
EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Phase:	L
Test voltage:	DC 9V from adapter AC 240V/60Hz	Test mode:	Mode 2



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1500	22.25	9.74	31.99	66.00	-34.01	QP
2		0.1500	14.95	9.74	24.69	56.00	-31.31	AVG
3		0.7281	14.04	9.96	24.00	56.00	-32.00	QP
4		0.7281	8.01	9.96	17.97	46.00	-28.03	AVG
5		1.0211	15.04	9.99	25.03	56.00	-30.97	QP
6		1.0211	3.42	9.99	13.41	46.00	-32.59	AVG
7		2.4820	14.22	10.02	24.24	56.00	-31.76	QP
8		2.4820	10.05	10.02	20.07	46.00	-25.93	AVG
9		4.8163	16.52	10.08	26.60	56.00	-29.40	QP
10	*	4.8163	14.82	10.08	24.90	46.00	-21.10	AVG
11		5.6953	24.57	10.11	34.68	60.00	-25.32	QP
12		5.6953	17.90	10.11	28.01	50.00	-21.99	AVG



EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Phase:	N
Test voltage:	DC 9V from adapter AC 240V/60Hz	Test mode:	Mode 2



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1500	25.42	9.74	35.16	66.00	-30.84	QP
2		0.1500	14.20	9.74	23.94	56.00	-32.06	AVG
3		0.2828	21.51	9.76	31.27	60.73	-29.46	QP
4		0.2828	11.09	9.76	20.85	50.73	-29.88	AVG
5		1.3141	15.86	10.00	25.86	56.00	-30.14	QP
6		1.3141	8.08	10.00	18.08	46.00	-27.92	AVG
7		2.7750	13.48	10.03	23.51	56.00	-32.49	QP
8		2.7750	11.49	10.03	21.52	46.00	-24.48	AVG
9		4.8163	16.40	10.08	26.48	56.00	-29.52	QP
10		4.8163	15.30	10.08	25.38	46.00	-20.62	AVG
11		5.6953	21.82	10.11	31.93	60.00	-28.07	QP
12	*	5.6953	21.26	10.11	31.37	50.00	-18.63	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 (micovolts/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	5 <sup>th</sup> 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

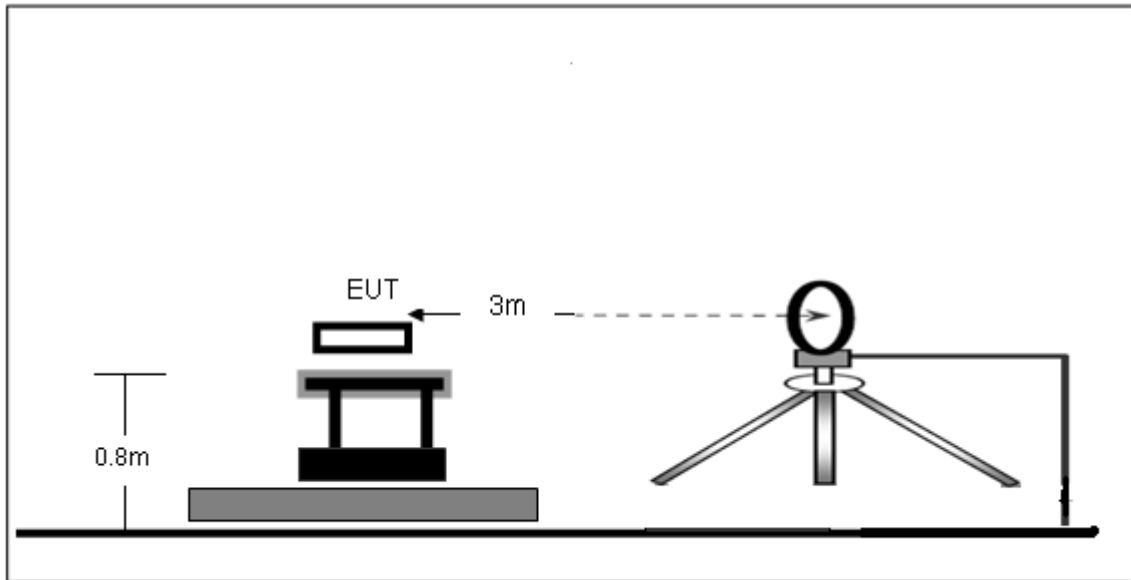
### 5.3.2 Test Procedures

- 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.

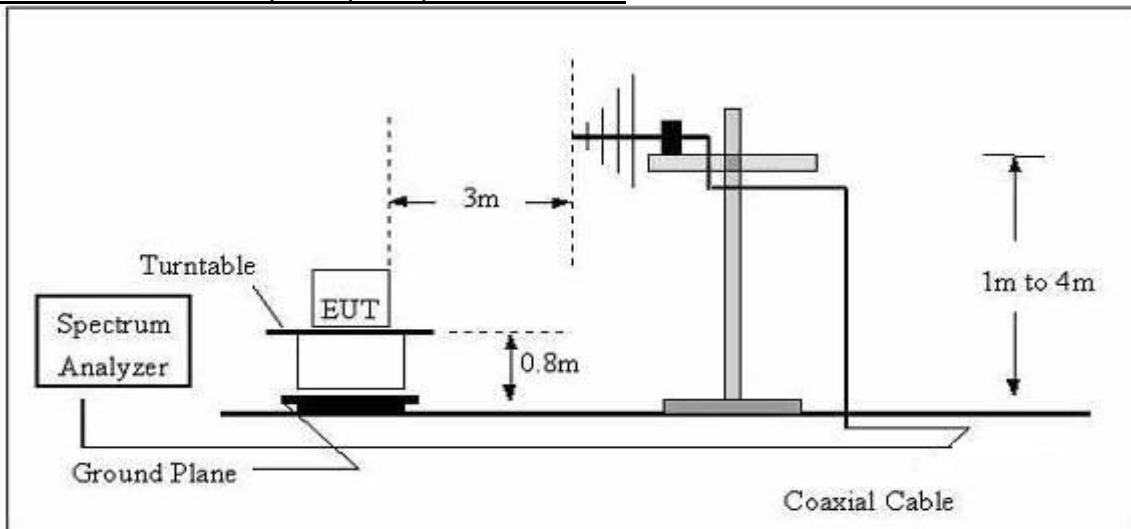
Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

### 5.3.3 Test Setup

#### Radiated Emission Test-Up Frequency Below 30MHz



#### Radiated Emission Test-Up Frequency 30MHz~1GHz

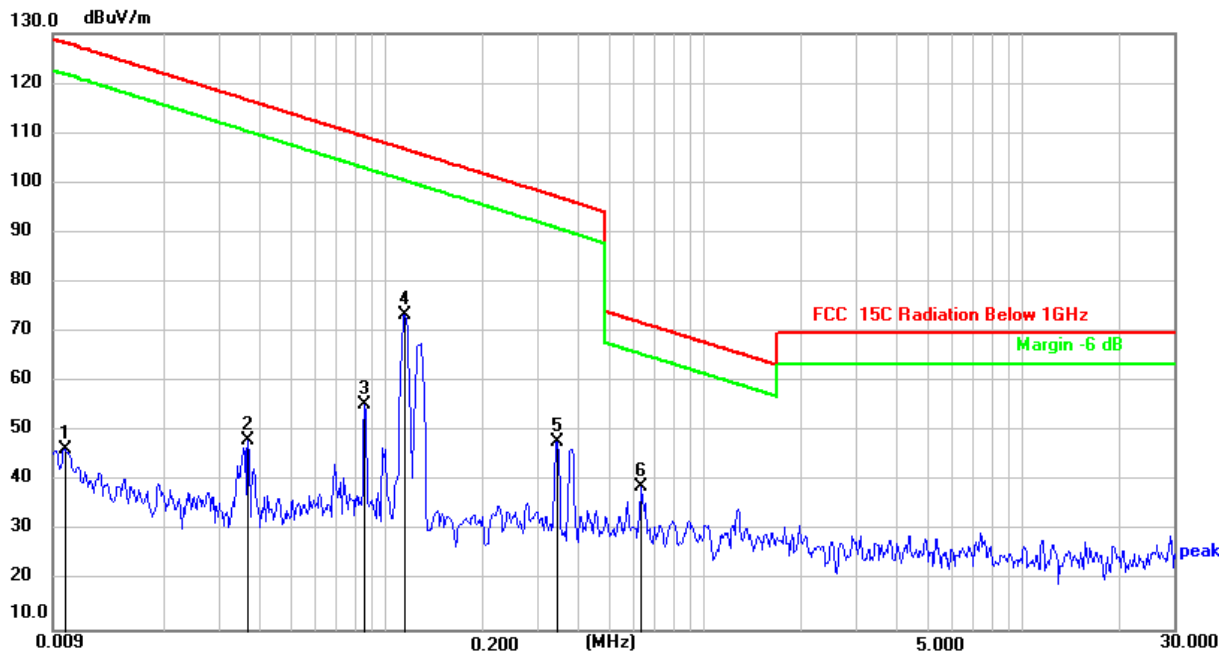


### 5.3.4 Test Result



Frequency range (9kHz – 30MHz)

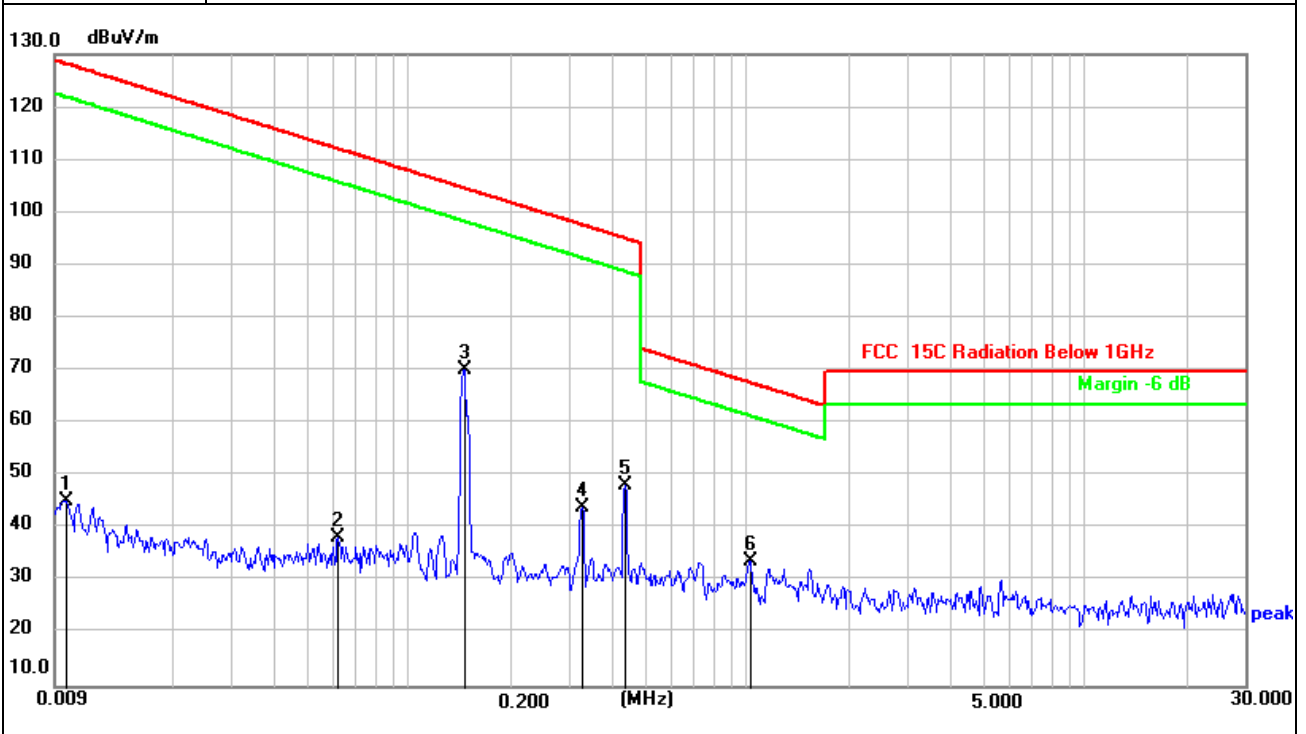
EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Test mode:	Mode 1
Test voltage:	DC 9V from adapter AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.0098	25.99	20.43	46.42	127.78	-81.36	peak
2	0.0369	27.64	20.52	48.16	116.26	-68.10	peak
3	0.0858	34.67	20.67	55.34	108.93	-53.59	peak
4	0.1149	53.18	20.41	73.59	106.40	-32.81	peak
5	0.3436	27.82	20.24	48.06	96.88	-48.82	peak
6 *	0.6313	18.50	20.41	38.91	71.61	-32.70	peak

Apple Watch:

EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Test mode:	Mode 2
Test voltage:	DC 9V from adapter AC 120V/60Hz		

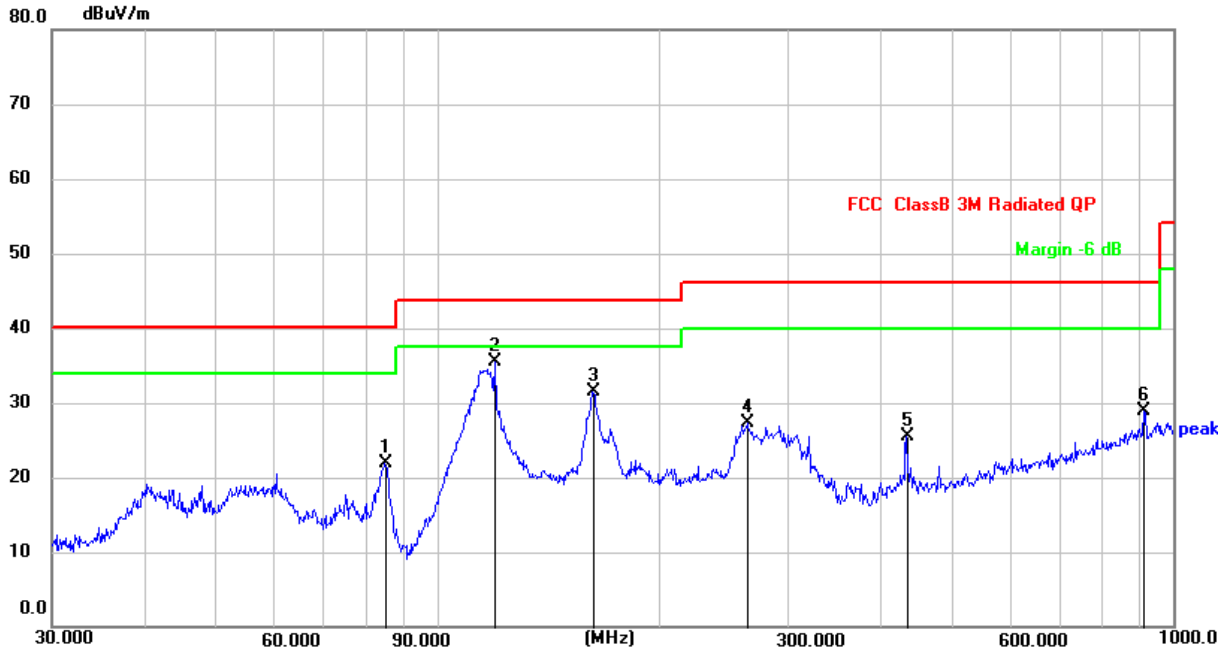


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.0097	24.86	20.43	45.29	127.87	-82.58	QP
2	0.0620	17.72	20.55	38.27	111.76	-73.49	QP
3	0.1466	49.92	20.11	70.03	104.28	-34.25	QP
4	0.3272	23.96	20.23	44.19	97.31	-53.12	QP
5	0.4382	28.08	20.30	48.38	94.77	-46.39	QP
6 *	1.0271	13.43	20.56	33.99	67.39	-33.40	QP



Frequency range (30MHz – 1GHz)

EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	DC 9V from adapter AC 120V/60Hz	Test mode:	Mode 1

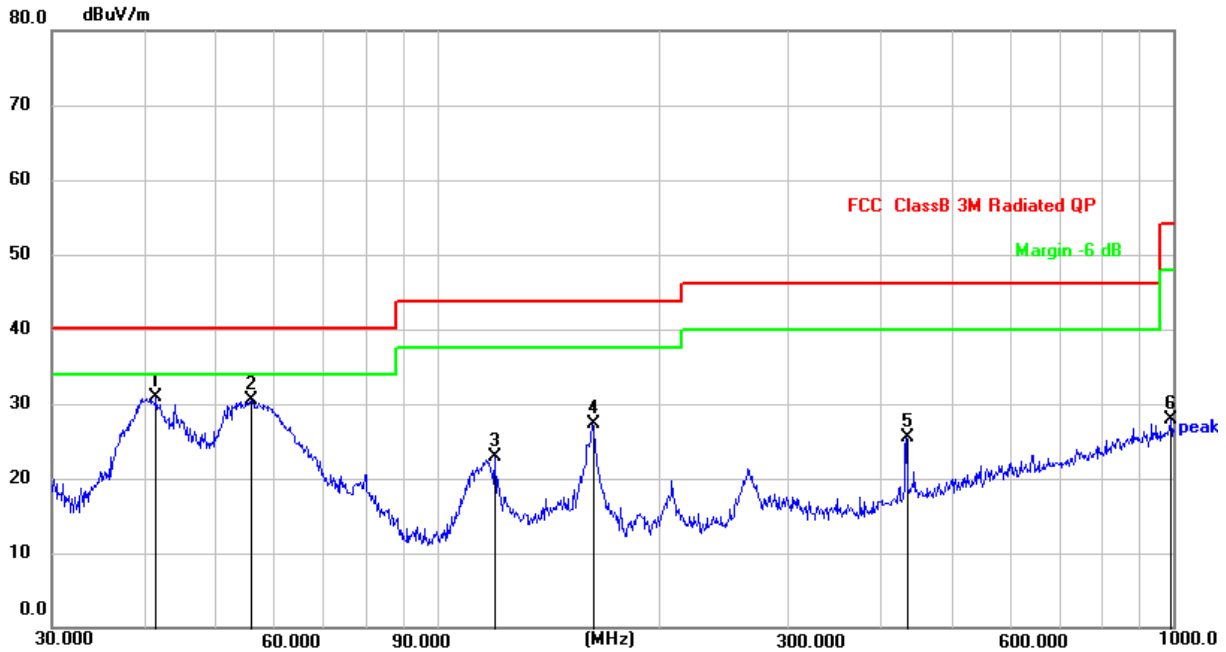


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	84.9995	39.15	-17.17	21.98	40.00	-18.02	QP
2 *	119.8556	51.42	-15.91	35.51	43.50	-7.99	QP
3	162.6106	48.05	-16.46	31.59	43.50	-11.91	QP
4	263.8190	38.93	-11.61	27.32	46.00	-18.68	QP
5	434.0651	33.80	-8.32	25.48	46.00	-20.52	QP
6	912.8620	28.52	0.46	28.98	46.00	-17.02	QP





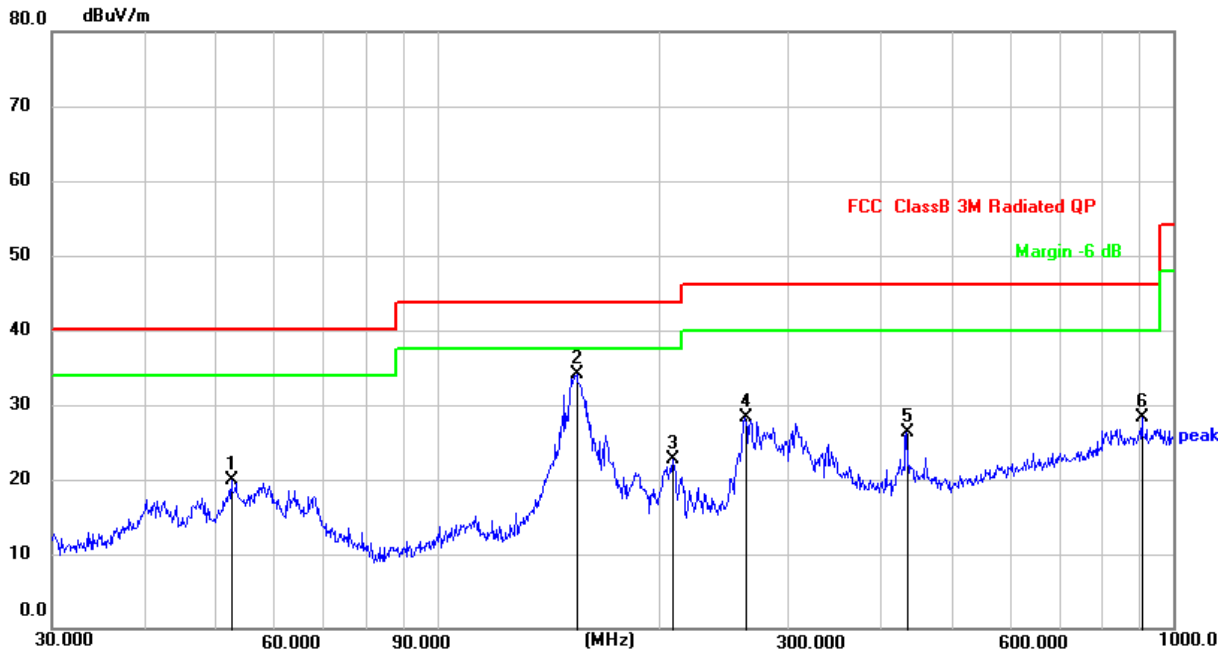
EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	DC 9V from adapter AC 120V/60Hz	Test mode:	Mode 1



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	41.5670	44.96	-13.99	30.97	40.00	-9.03	QP
2	56.0007	44.65	-14.19	30.46	40.00	-9.54	QP
3	119.8556	38.85	-15.91	22.94	43.50	-20.56	QP
4	162.6106	43.73	-16.46	27.27	43.50	-16.23	QP
5	434.0651	33.80	-8.32	25.48	46.00	-20.52	QP
6	993.0114	26.25	1.70	27.95	54.00	-26.05	QP

Apple Watch:

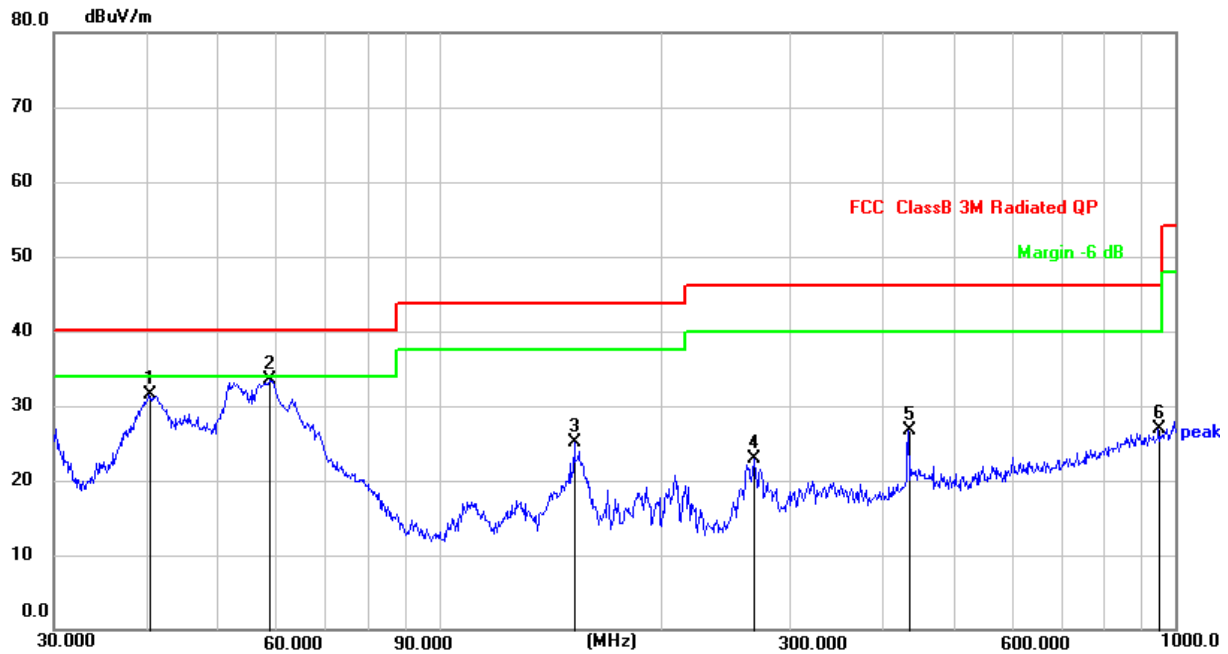
EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	DC 9V from adapter AC 120V/60Hz	Test mode:	Mode 2



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	52.5753	33.66	-13.81	19.85	40.00	-20.15	QP
2 *	154.8204	51.18	-17.05	34.13	43.50	-9.37	QP
3	209.3129	36.06	-13.45	22.61	43.50	-20.89	QP
4	261.9753	39.97	-11.68	28.29	46.00	-17.71	QP
5	434.0651	34.65	-8.32	26.33	46.00	-19.67	QP
6	906.4824	27.88	0.37	28.25	46.00	-17.75	QP



EUT:	ALOGIC 4-in-1 Wireless Charging Dock	Model Name:	UP2QC10AWA
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	DC 9V from adapter AC 120V/60Hz	Test mode:	Mode 2



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	40.4172	45.66	-14.07	31.59	40.00	-8.41	QP
2 *	58.8185	47.99	-14.51	33.48	40.00	-6.52	QP
3	152.6641	42.40	-17.26	25.14	43.50	-18.36	QP
4	267.5455	34.33	-11.50	22.83	46.00	-23.17	QP
5	434.0651	35.09	-8.32	26.77	46.00	-19.23	QP
6	948.7610	25.91	1.02	26.93	46.00	-19.07	QP

## 5.4 Occupied bandwidth

### 5.4.1 Test method

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW  $\geq 1\%$  of the 20 dB bandwidth

VBW  $\geq$  RBW

Sweep = auto

Detector function = peak

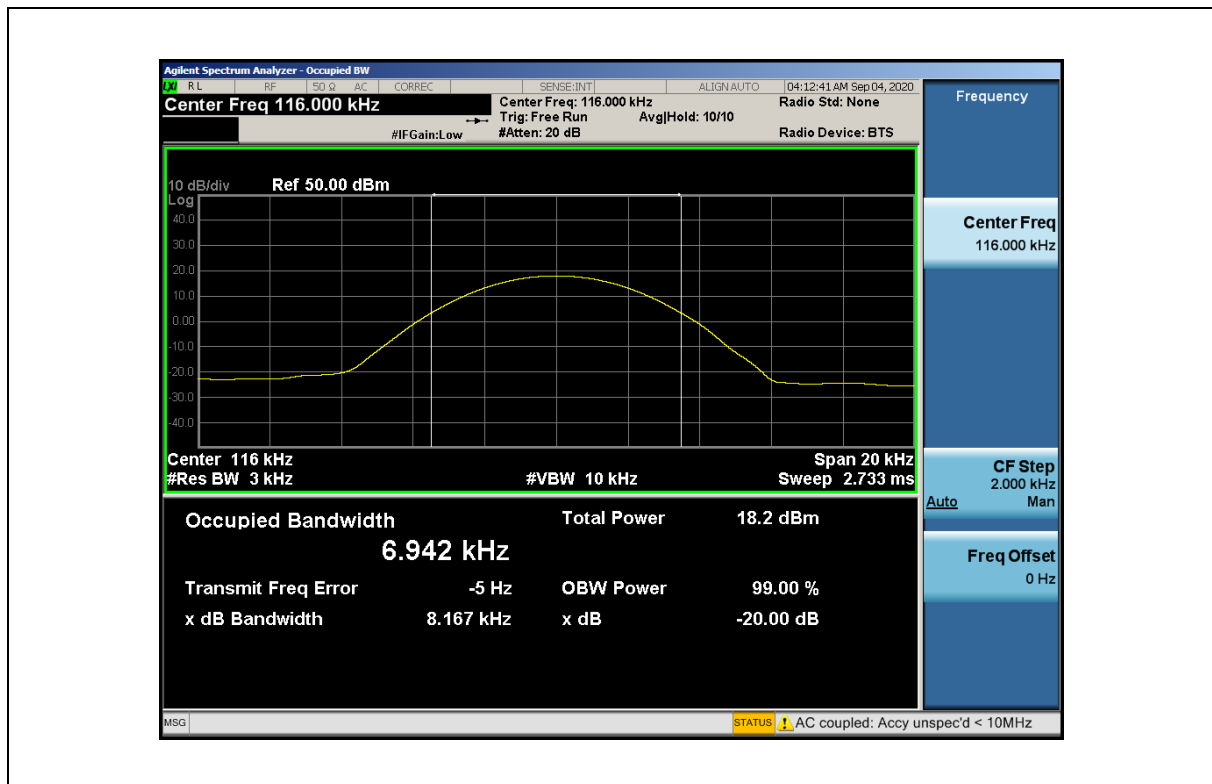
Trace = max hold

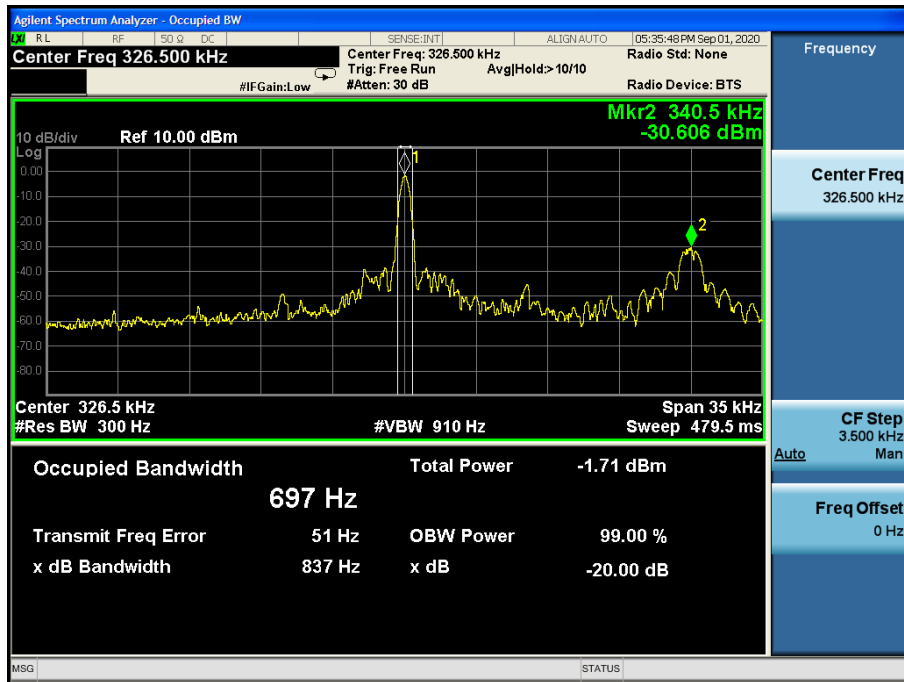
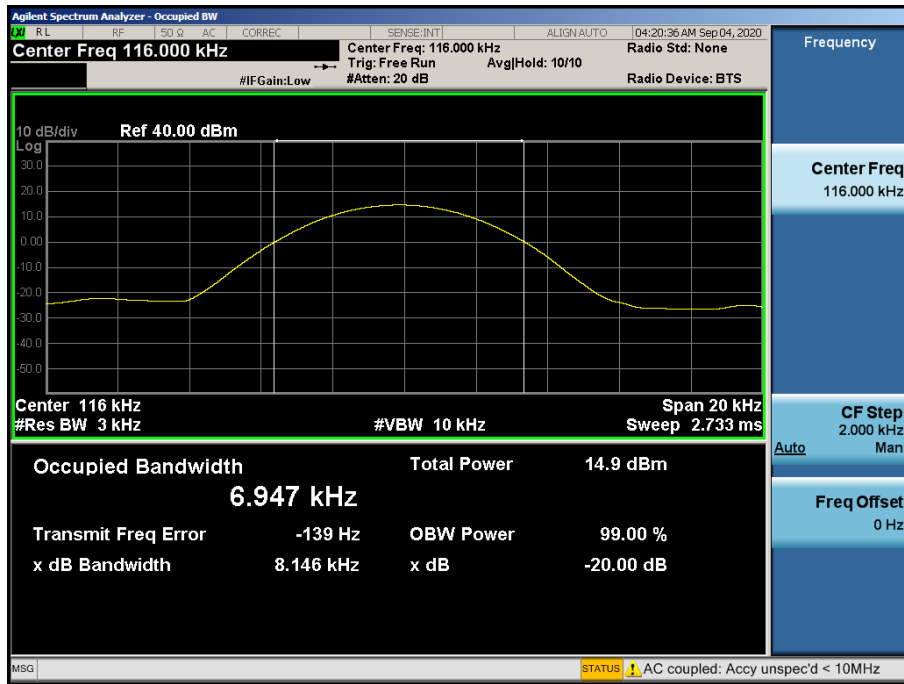
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth and 99% occupied bandwidth of the emission.

### 5.4.2 Test result

/	Frequency (kHz)	20dB emission bandwidth (kHz)	99% occupied bandwidth (kHz)
Load 1	116	8.167	6.942
Load 2	116	8.146	6.947
Watch	326.5	0.837	0.697

Test plots as below:





### 5.4.3 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.

### 5.4.4 EUT SETUP

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

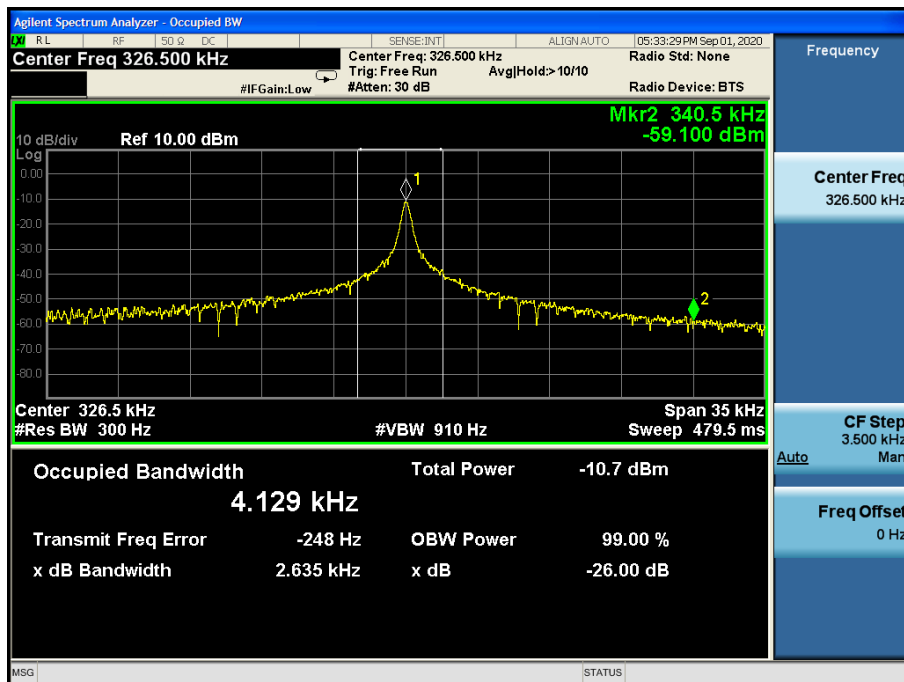
Configuration 2: Charger in pairing mode with FSK modulation (-0/+15 kHz) which occurs over a very short period of time as soon as the watch is placed on the charger.

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

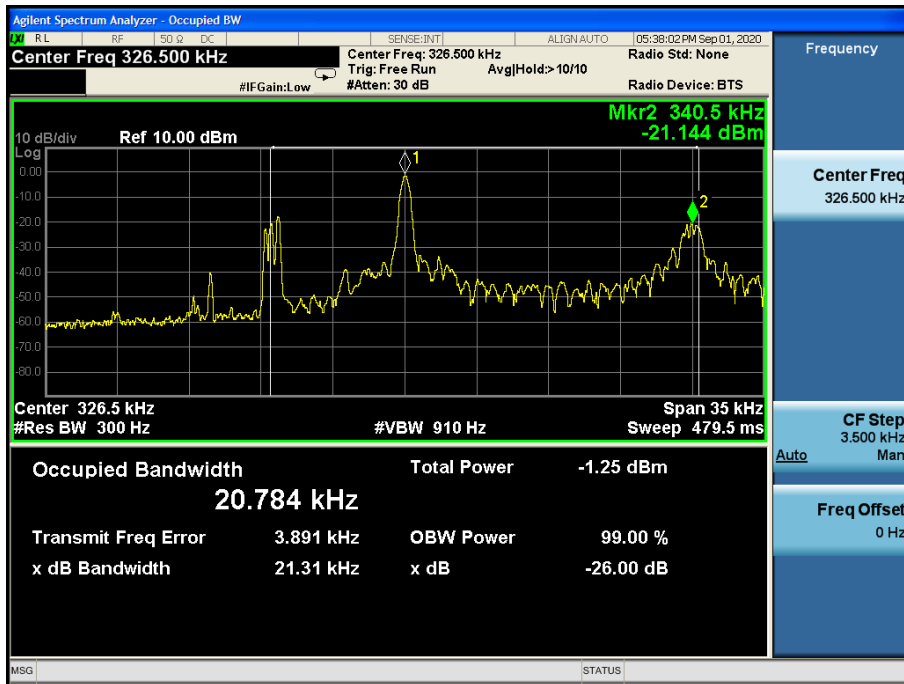
### 5.4.5 Test result

Test plots as below:

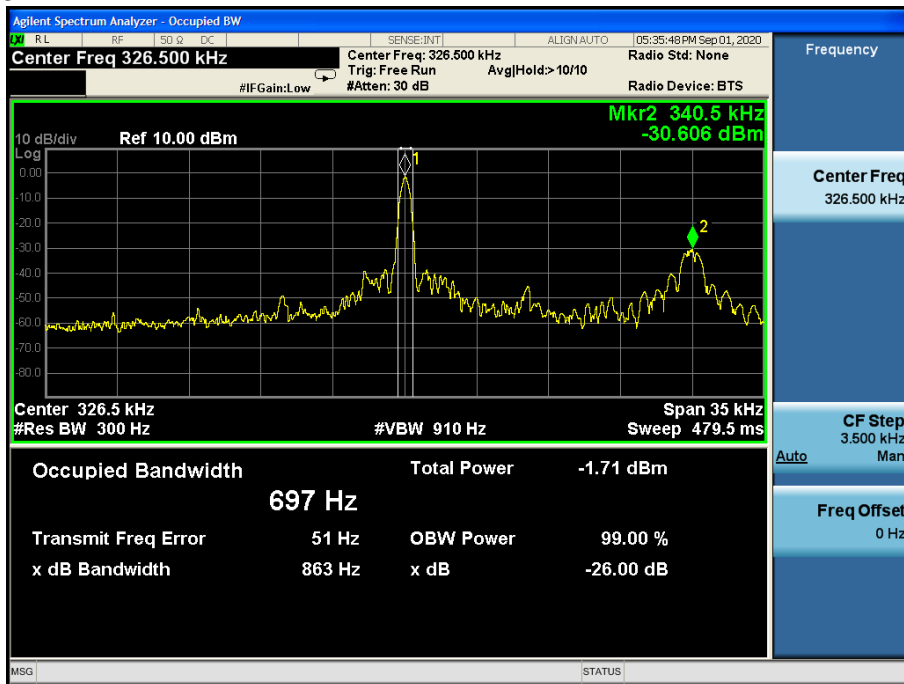
Configuration 1:



Configuration 2:

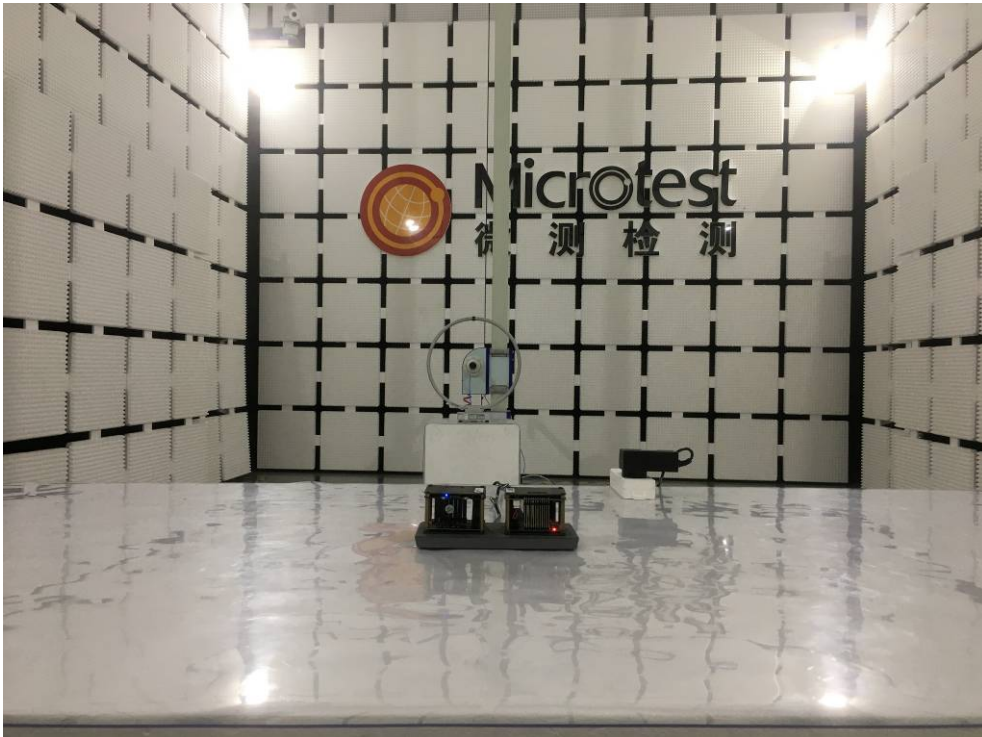


Configuration 3:

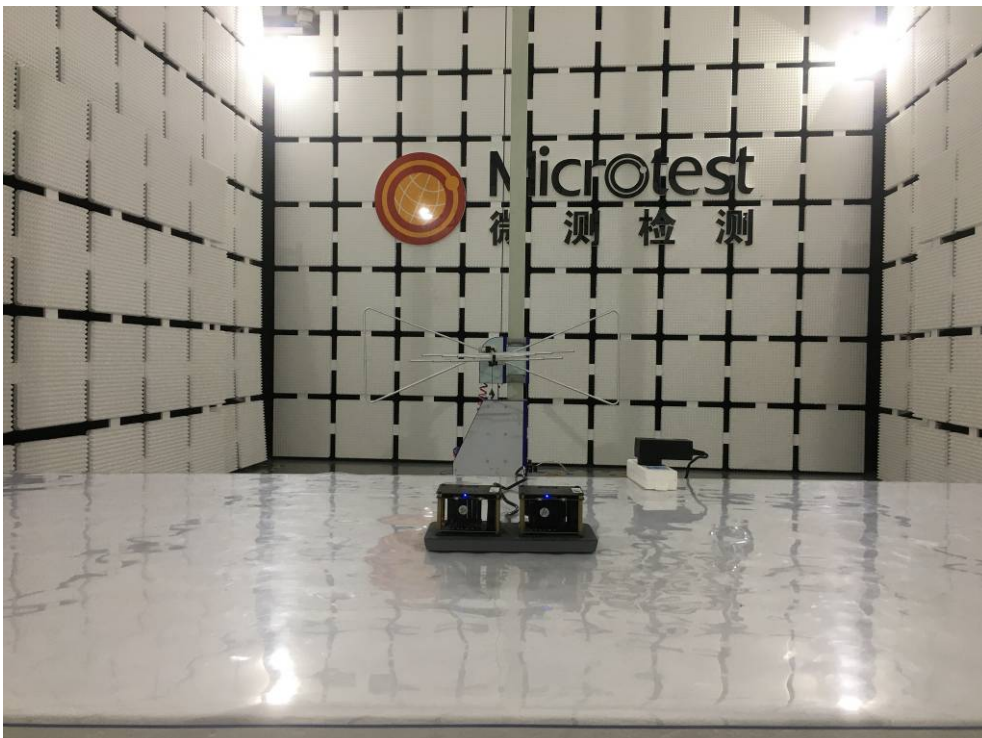


## Photographs of the Test Setup

Radiated emission(Load: 9K-30MHz)



Radiated emission(Load: 30MHz-1GHz)





Radiated emission(Watch: 9K-30MHz)



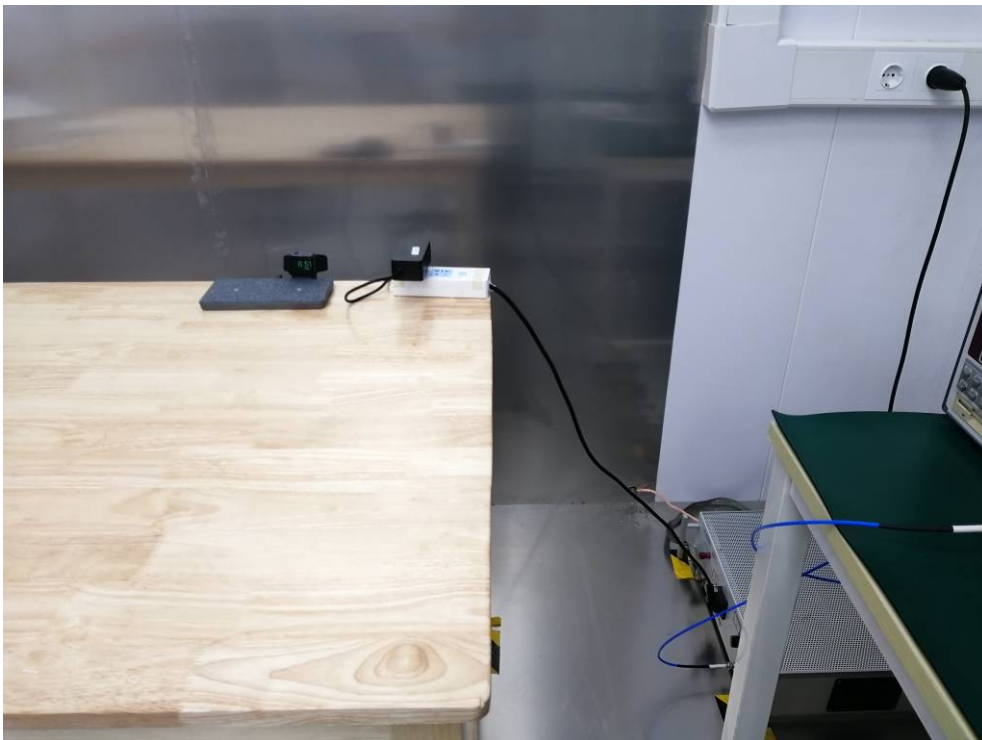
Radiated emission(Watch: 30MHz-1GHz)



Conducted emission(Load)



Conducted emission(Watch)





## **Photographs of the EUT**

See the APPENDIX 1: EUT PHOTOS in the report No.: MTi20073017-4E1-1.

**----END OF REPORT----**