FCC TEST REPORT

FCC ID: 2AP2N-WA02

On Behalf of

Shenzhen Esorun Technology Co.,LTD

iWatch wireless charger

Model No.: WA02, WM01

Prepared for	:	Shenzhen Esorun Technology Co.,LTD
Address	:	Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone, Taoyuan Community, Dalang Street, Longhua District, Shenzhen

Prepared By	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

Report Number	:	A2207165-C03-R05
Date of Receipt	:	July 18, 2022
Date of Test	:	July 18, 2022–August 18, 2022
Date of Report	:	August 18, 2022
Version Number	:	V0

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TEST REPORT DECLARATION

Applicant	:	Shenzhen Esorun Technology Co.,LTD
Address	:	Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone, Taoyuan Community, Dalang Street, Longhua District, Shenzhen
Manufacturer	:	Shenzhen Esorun Technology Co.,LTD
Address	:	Room 226, Building A, B, C, Zone B, Yuanfen Industrial Zone, Taoyuan Community, Dalang Street, Longhua District, Shenzhen
EUT Description	:	iWatch wireless charger
		(A) Model No. : WA02, WM01
		(B) Trademark : **ESORUN**

Measurement Standard Used:

FCC CFR Title 47 Part 15 Subpart C Section 15.209

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed full responsibility for the accuracy and completeness of test. Also, this report shows that the EUT is technically compliant with the FCC CFR Title 47 Part 15 Subpart C Section 15.209 requirements.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....…..:	Yannis Wen Project Engineer	Yannis Wen
Approved by (name + signature)…....:	Jack Xu Project Manager	Jack Xu
Date of issue…… ……..:	August 18, 2022	

Revision History

Revision	Issue Date	Revisions	Revised By
V0	August 18, 2022	Initial released Issue	Yannis Wen

1. Test Result Summary

Requirement	CFR 47 Section	Result
Antenna requirement	§15.203	PASS
AC Power Line Conducted Emission	§15.207	PASS
Spurious Emission	§15.209(a)(f)	PASS
Occupied Bandwidth	§15.215 (c)	PASS

Note:

1. PASS: Test item meets the requirement.

2. Fail: Test item does not meet the requirement.

3. N/A: Test case does not apply to the test object.

4. The test result judgment is decided by the limit of test standard.

2. General Information

2.1. Description of Device (EUT)

EUT Name	:	iWatch wireless charger
Model No.	:	WA02, WM01
DIFF.	:	There is no difference between the models except the model name. So all the test were performed on the model WA02.
Trademark	:	**ESORUN**
Power supply	:	Power from adapter
EUT information	:	Input : 5V ⎓ 1A Output :2W
Operation frequency	:	325KHz
Modulation	:	MSK
Antenna Type	:	Coil Antenna, Maximum Gain is 0dBi (This value is supplied by applicant).
Software version	:	V1.0
Hardware version	:	V1.0
Intend use environment	:	Residential, commercial and light industrial environment

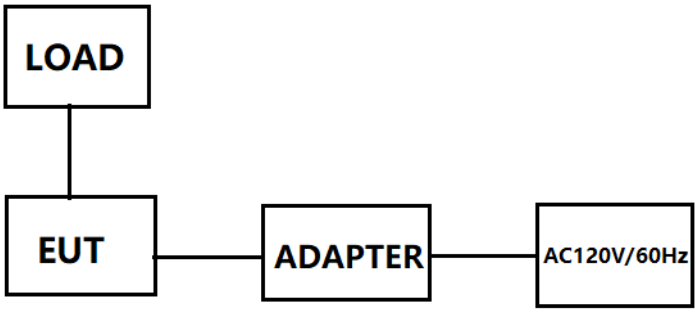
2.2. Accessories of Device (EUT)

Accessories1 : /
Manufacturer : /
Model : /
Ratings : /

2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification
1	BlitzForce PD Pioneer 65W 2-Port Wall Charger	BlitzForce.	BZ-PC001	--	--
2	Wireless load	--	--	--	--

2.4. Block Diagram of Connection between EUT and Simulators



2.5. Description of Test Modes

Channel	Frequency (KHz)
1	325

2.6. Test Conditions

Items	Required	Actual
Temperature range:	15-35℃	24℃
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	98kPa

2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission
Registration Number: 293961

July 15, 2019 Certificated by IC
Registration Number: CN0085

2.8. Measurement Uncertainty

(95% confidence levels, k=2)

Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	1.63dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.74dB(Polarize: V)
	3.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for radio frequency	5.06×10^{-8}GHz
Uncertainty for conducted RF Power	0.40dB
Uncertainty for temperature	0.2℃
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

2.9. Test Equipment List

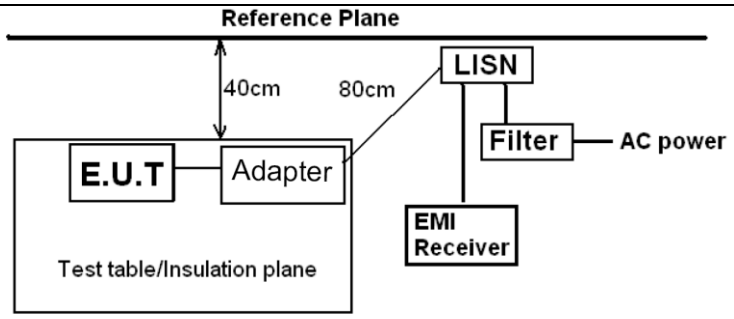
Equipment	Manufacture	Model No.	Firmware version	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	/	N/A	2020.09.02	3Year
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	2.3	102137	2021.08.25	1Year
Spectrum analyzer	Agilent	N9020A	A.14.16	MY499100060	2021.08.25	1Year
Receiver	ROHDE&SCHWARZ	ESR	2.28 SP1	1316.3003K03-102082-Wa	2021.08.25	1Year
Receiver	R&S	ESCI	4.42 SP1	101165	2021.08.25	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	/	VULB 9168#627	2021.08.30	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	/	2106	2021.08.30	2Year
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	/	00059	2021.08.30	2Year
RF Cable	Resenberger	Cable 1	/	RE1	2021.08.25	1Year
RF Cable	Resenberger	Cable 2	/	RE2	2021.08.25	1Year
RF Cable	Resenberger	Cable 3	/	CE1	2021.08.25	1Year
Pre-amplifier	HP	HP8347A	/	2834A00455	2021.08.25	1Year
Pre-amplifier	Agilent	8449B	/	3008A02664	2021.08.25	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	/	8126-466	2021.08.25	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	101043	2021.08.25	1 Year
Horn Antenna	SCHWARZBECK	BBHA9170	/	00946	2021.08.30	2 Year
Preamplifier	SKET	LNPA_1840-50	/	SK2018101801	2021.08.25	1 Year
Power Meter	Agilent	E9300A	/	MY41496628	2021.08.25	1 Year
Power Sensor	DARE	RPR3006W	/	15100041SNO91	2021.08.25	1 Year
Temp. & Humid. Chamber	Weihuang	WHTH-1000-40-880	/	100631	2022.04.22	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	/	20140927-6	2021.08.25	1 Year
Adjustable attenuator	MWRFtest	N/A	/	N/A	N/A	N/A
10dB Attenuator	Mini-Circuits	DC-6G	/	N/A	N/A	N/A

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EZ-EMC	EZ	Alpha-3A1
CE	EZ-EMC	EZ	Alpha-3A1
RF-CE	MTS 8310	MW	V2.0.0.0

3. Test Results and Measurement Data

3.1. Conducted Emission

3.1.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Frequency Range:</td><td>150 kHz to 30 MHz</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9 kHz, VBW=30 kHz, Sweep time=auto</td></tr>
<tr><td>Limits:</td><td>
<table>
<tr><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
</td></tr>
<tr><td>Test Setup:</td><td> 

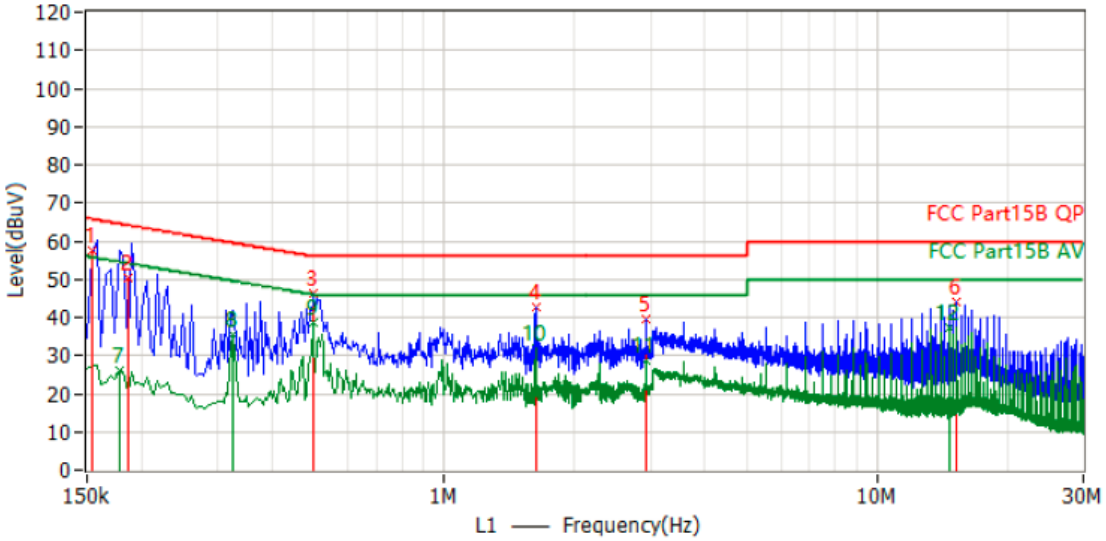
Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test Mode:</td><td>Transmitting Mode</td></tr>
<tr><td>Test Procedure:</td><td>1. The E.U.T is connected to an adapter through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.</td></tr>
<tr><td>Test Result:</td><td>PASS</td></tr>
</table>

3.1.2. Test Data

Please refer to following diagram for individual

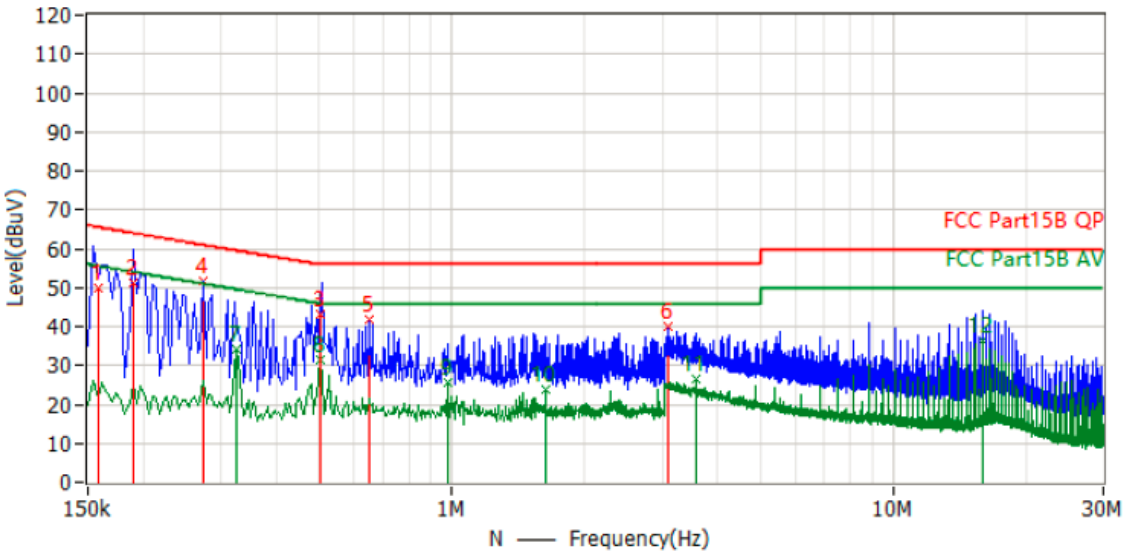
Test Mode	:	Output 2W
Test Result	:	**PASS**
Note:	The test results are listed in next pages. All test modes has been tested, this report only reflected the worst mode.(Output 2W) If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector and quasi-peak detector need not be carried out. If the limits for the measurement with the average detector are met when using a receiver with a quasi-peak detector, the test unit shall be deemed to meet both limits and the measurement with the average detector need not be carried out.	

Pol	Line



No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Factor dB	Detector	Polar
1	154.000 kHz	65.8	57.6	-8.2	9.7	QP	L1
2	186.000 kHz	64.2	50.2	-14.0	9.7	QP	L1
3*	502.000 kHz	56.0	46.2	-9.8	9.8	PK	L1
4*	1.630 MHz	56.0	42.7	-13.3	9.9	PK	L1
5*	2.934 MHz	56.0	39.6	-16.4	9.9	PK	L1
6*	15.334 MHz	60.0	43.9	-16.1	10.1	PK	L1
7*	178.000 kHz	54.6	25.9	-28.7	9.7	AV	L1
8*	326.000 kHz	49.6	35.6	-13.9	9.7	AV	L1
9*	498.000 kHz	46.0	38.7	-7.3	9.8	AV	L1
10*	1.630 MHz	46.0	31.8	-14.2	9.9	AV	L1
11*	2.934 MHz	46.0	28.9	-17.1	9.9	AV	L1
12*	14.682 MHz	50.0	37.4	-12.6	10.1	AV	L1

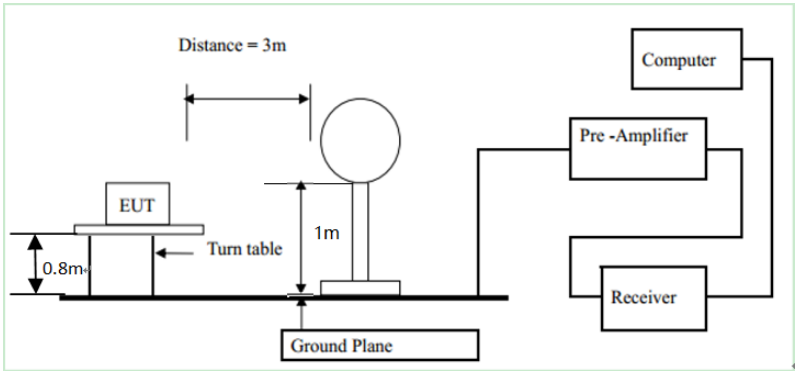
Pol	Neutral



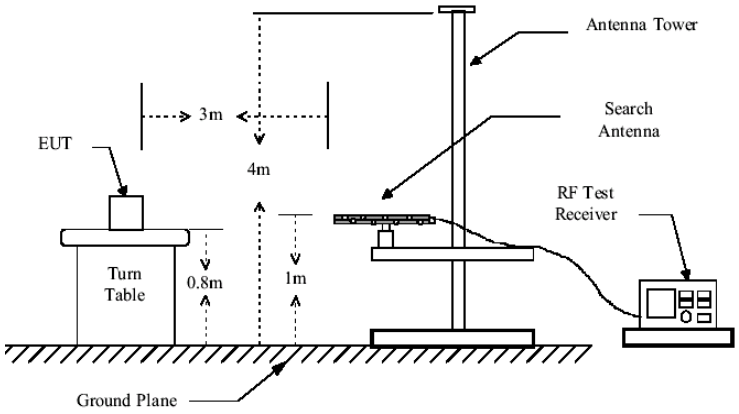
No.	Frequency	Limit dBuV	Level dBuV	Delta dB	Factor dB	Detector	Polar
1	158.000 kHz	65.6	50.0	-15.6	9.7	QP	N
2	190.000 kHz	64.0	51.1	-13.0	9.7	QP	N
3	506.000 kHz	56.0	43.1	-12.9	9.7	QP	N
4*	274.000 kHz	61.0	51.7	-9.3	9.7	PK	N
5*	650.000 kHz	56.0	41.6	-14.4	9.7	PK	N
6*	3.098 MHz	56.0	39.8	-16.2	9.9	PK	N
7*	326.000 kHz	49.6	34.0	-15.5	9.7	AV	N
8*	506.000 kHz	46.0	31.3	-14.7	9.7	AV	N
9*	982.000 kHz	46.0	25.5	-20.5	9.7	AV	N
10*	1.638 MHz	46.0	24.0	-22.0	9.8	AV	N
11*	3.594 MHz	46.0	26.7	-19.3	9.9	AV	N
12*	16.002 MHz	50.0	36.6	-13.4	10.0	AV	N

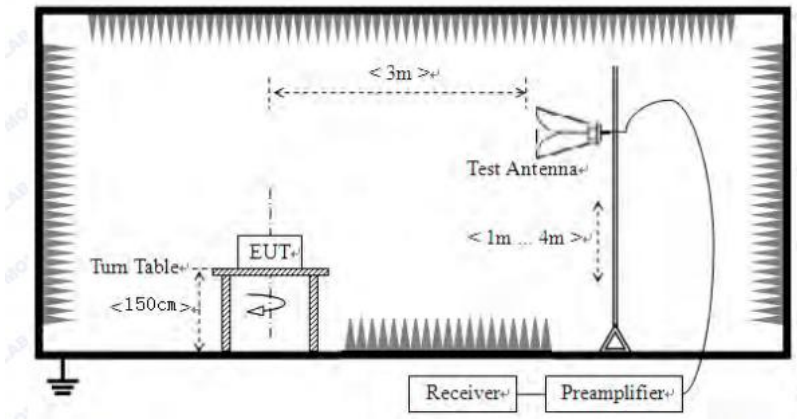
3.2. Radiated Spurious Emission Measurement

3.2.1. Test Specification

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10: 2013</td></tr>
<tr><td>Frequency Range:</td><td>9 kHz to 25 GHz</td></tr>
<tr><td>Measurement Distance:</td><td>3 m</td></tr>
<tr><td>Antenna Polarization:</td><td>Horizontal & Vertical</td></tr>
<tr><td>Operation mode:</td><td>Refer to item 4.1</td></tr>
<tr><td>Receiver Setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>9kHz-150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>1kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>Peak</td><td>1MHz</td><td>10Hz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Field Strength (microvolts/meter)</td><td>Measurement Distance (meters)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(KHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(KHz)</td><td>30</td></tr>
<tr><td>1.705-30</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>3</td></tr>
<tr><td>Above 960</td><td>500</td><td>3</td></tr>
</table>
<table>
<tr><td>Frequency</td><td>Field Strength (microvolts/meter)</td><td>Measurement Distance (meters)</td><td>Detector</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>500</td><td>3</td><td>Average</td></tr>
<tr><td>5000</td><td>3</td><td>Peak</td></tr>
</table>
</td></tr>
<tr><td>Test setup:</td><td>For radiated emissions below 30MHz
 

30MHz to 1GHz</td></tr>
</table>

<table>
<tr>
<td></td>
<td>


Above 1GHz


</td>
</tr>
<tr>
<td>Test Procedure:</td>
<td>1. For the radiated emission test below 1GHz:
The EUT was placed on a turntable with 0.8 meter above ground. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high PASS filter are used for the test in order to get better signal level.
For the radiated emission test above 1GHz:
Place the measurement antenna on a turntable with 1.5 meter above ground, which is 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. 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.
2. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
3. For measurement below 1GHz, If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using</td>
</tr>
</table>

	the quasi-peak detector and reported. 4. Use the following spectrum analyzer settings: (1) Span shall wide enough to fully capture the emission being measured; (2) Set RBW=100 kHz for f < 1 GHz; VBW ≥RBW; Sweep = auto; Detector function = peak; Trace = max hold; (3) Set RBW = 1 MHz, VBW= 3MHz for f □ 1 GHz for peak measurement. For average measurement: VBW = 10 Hz, when duty cycle is no less than 98 percent. VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.
Test mode:	Refer to section 4.1 for details
Test results:	PASS

3.2.2. Test Data

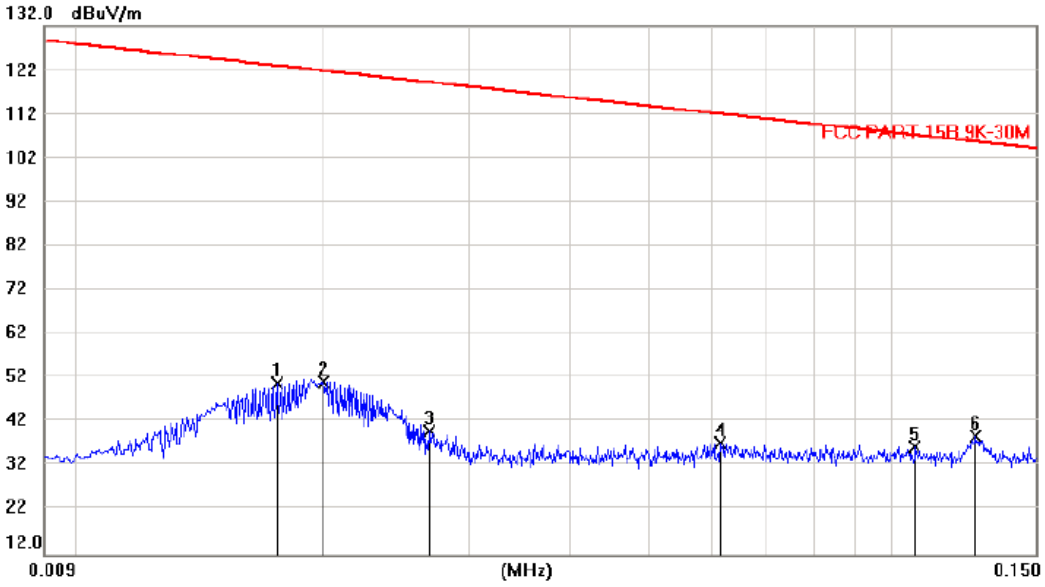
Please refer to following diagram for individual

Frequency Range	:	9KHz~30MHz
Test Mode	:	TX: 325kHz
Test Results	:	**PASS**

Note: 1. The test results are listed in next pages.

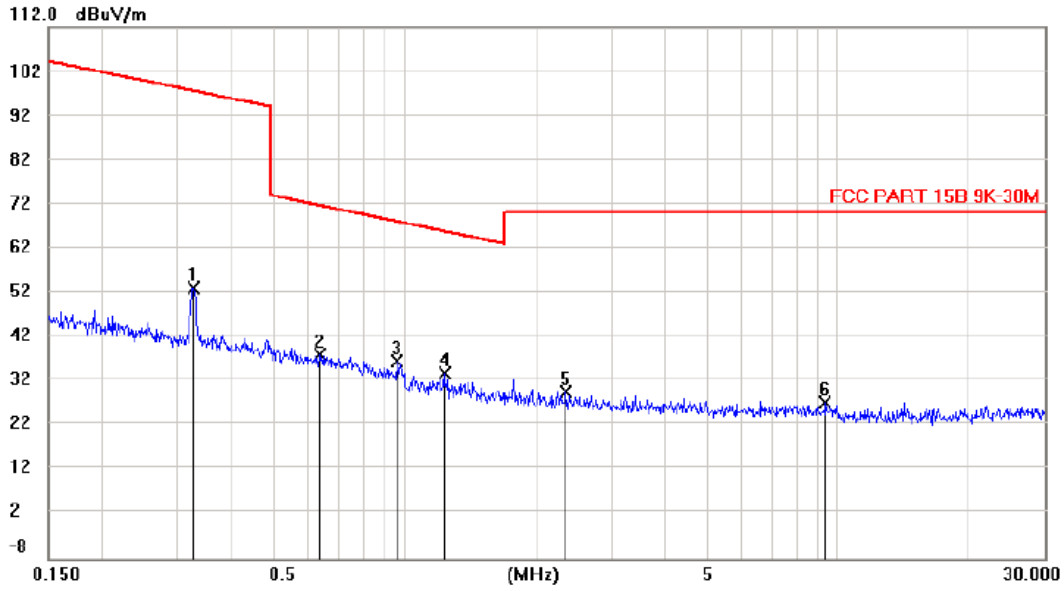
2. This mode is worst case mode, so this report only reflected the worst mode.

3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		0.0174	29.51	21.31	50.82	122.9	-72.08	peak			
2		0.0200	29.99	21.25	51.24	121.6	-70.45	peak			
3		0.0268	19.04	21.08	40.12	119.1	-79.04	peak			
4		0.0613	17.25	20.07	37.32	112.0	-74.68	peak			
5		0.1066	16.77	19.73	36.50	107.2	-70.71	peak			
6	*	0.1266	18.84	19.87	38.71	105.7	-67.01	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		0.3253	33.18	19.95	53.13	97.55	-44.42	peak			
2		0.6388	18.19	19.78	37.97	71.66	-33.69	peak			
3	*	0.9601	16.46	19.98	36.44	68.07	-31.63	peak			
4		1.2313	13.71	20.06	33.77	65.87	-32.10	peak			
5		2.3526	9.29	20.34	29.63	70.00	-40.37	peak			
6		9.3287	5.57	21.54	27.11	70.00	-42.89	peak			

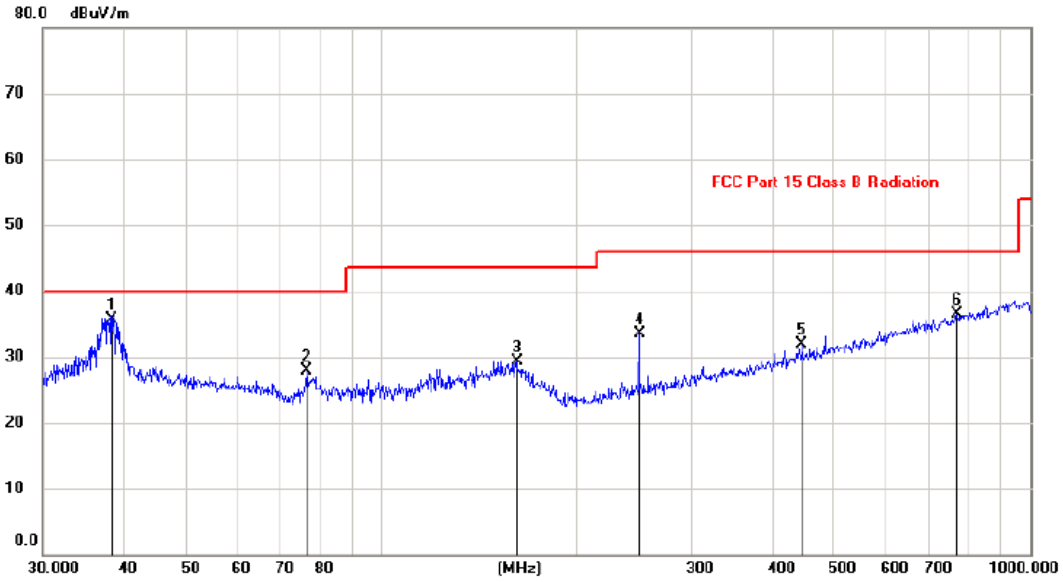
Note:1. *:Maximum data; x:Over limit; l:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Frequency Range	:	30MHz~1000MHz
Test Mode	:	Output 2W
Test Results	:	**PASS**
Note:	1. The test results are listed in next pages. 2. All test modes has been tested, this report only reflected the worst mode. (Charging+10W) 3. If the limits for the measurement with the average detector are met when using a receiver with a peak detector, the test unit shall be deemed to meet both limits and the measurement with the quasi-peak detector need not be carried out.	

Frequency Range	:	Above 1GHz			
EUT	:	/	Test Date	:	/
M/N	:	/	Temperature	:	/
Test Engineer	:	/	Humidity	:	/
Test Mode	:	/			
Test Results	:	N/A			
Note:	1. The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz. So the frequency rang above 1GHz radiation test not applicable.				

30MHz-1GHz

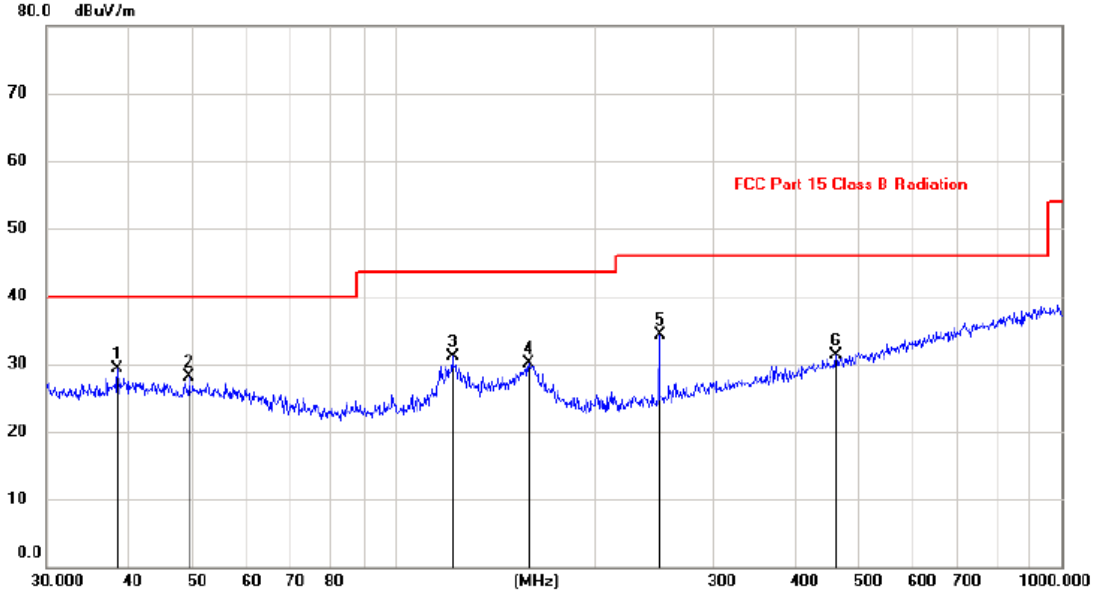
Pol	Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	38.4267	21.47	14.28	35.75	40.00	-4.25	QP			
2		76.6127	17.52	10.30	27.82	40.00	-12.18	peak			
3		161.6158	14.56	14.84	29.40	43.50	-14.10	peak			
4		249.9723	20.83	12.68	33.51	46.00	-12.49	peak			
5		446.2185	14.48	17.45	31.93	46.00	-14.07	peak			
6		771.7868	13.66	22.79	36.45	46.00	-9.55	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Pol	Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1	*	38.3967	14.97	14.26	29.23	40.00	-10.77	peak			
2		49.2730	14.08	13.99	28.07	40.00	-11.93	peak			
3		122.2432	18.08	13.10	31.18	43.50	-12.32	peak			
4		158.8069	15.20	14.99	30.19	43.50	-13.31	peak			
5		249.9723	21.69	12.68	34.37	46.00	-11.63	peak			
6		459.1144	13.56	17.65	31.21	46.00	-14.79	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

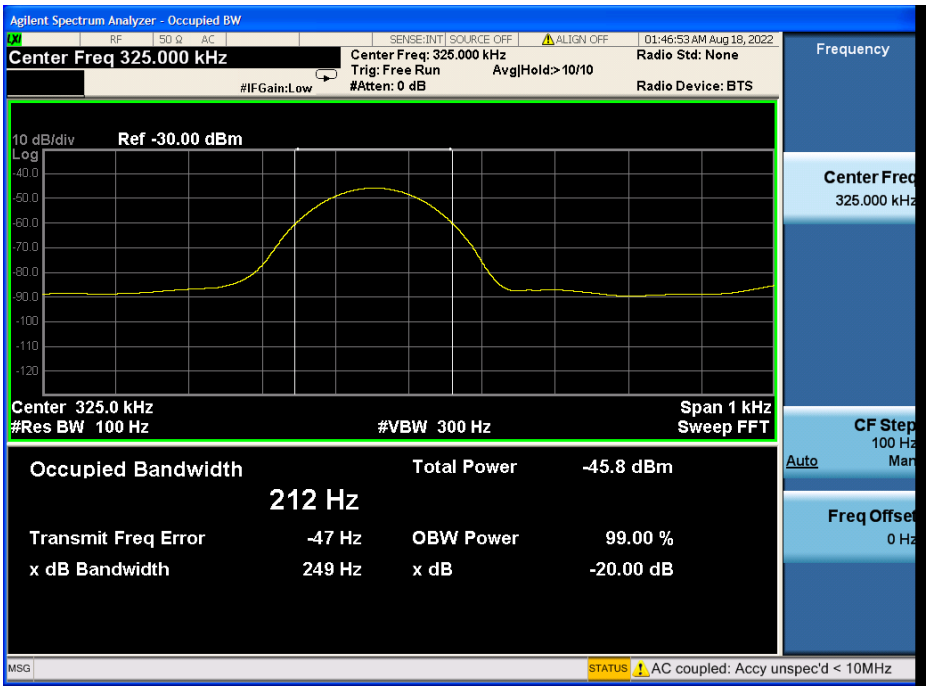
3.3. Test Specification

Test Requirement:	FCC Part15 C Section 15.215(c)
Test Method:	ANSI C63.10: 2013
Limit:	N/A
Test Procedure:	1. According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. 2. Set to the maximum power setting and enable the EUT transmit continuously. 3. Use the following spectrum analyzer settings for 20dB Bandwidth measurement. Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel; RBW≥1% of the 20 dB bandwidth; VBW≥RBW; Sweep = auto; Detector function = peak; Trace = max hold. 4. Measure and record the results in the test report.
Test setup:	
Test Mode:	Refer to section 4.1 for details
Test results:	PASS

3.3.1. Test Data

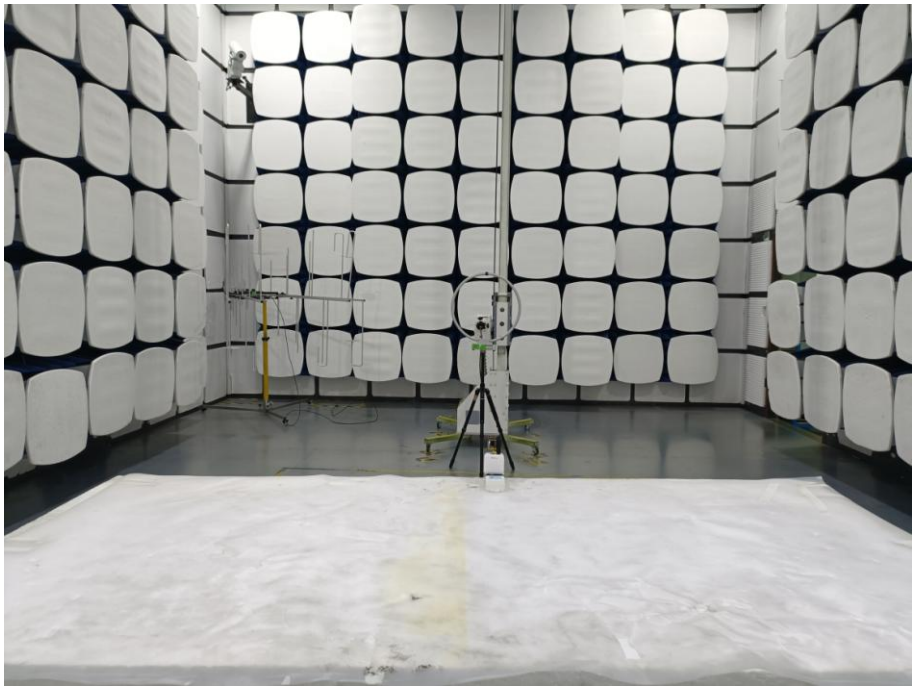
Frequency(KHz)	20dB Occupy Bandwidth (Hz)	Limit (kHz)	Conclusion
325	249	---	PASS

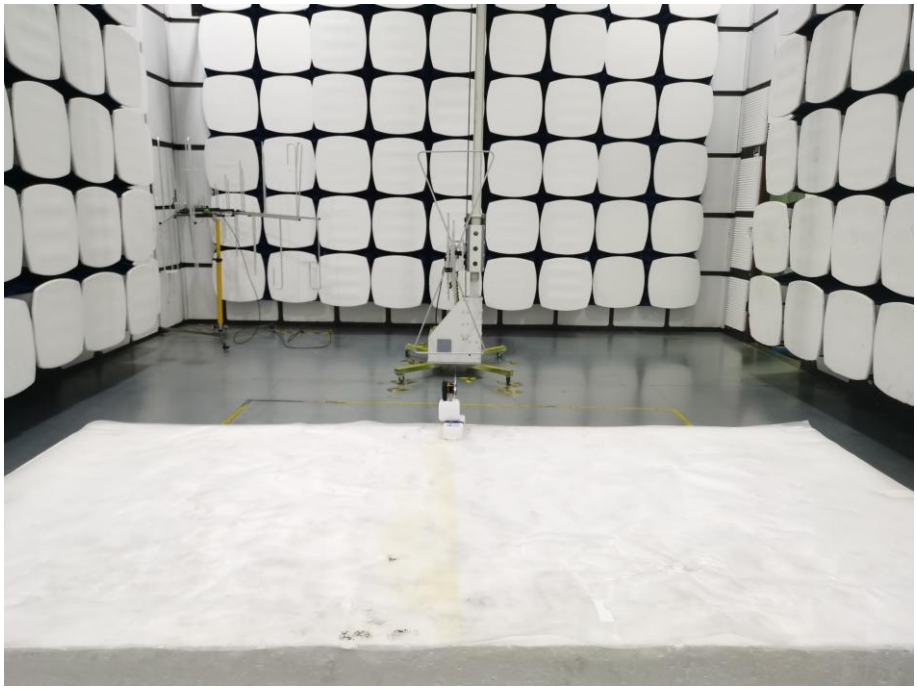
Test plots as follows:



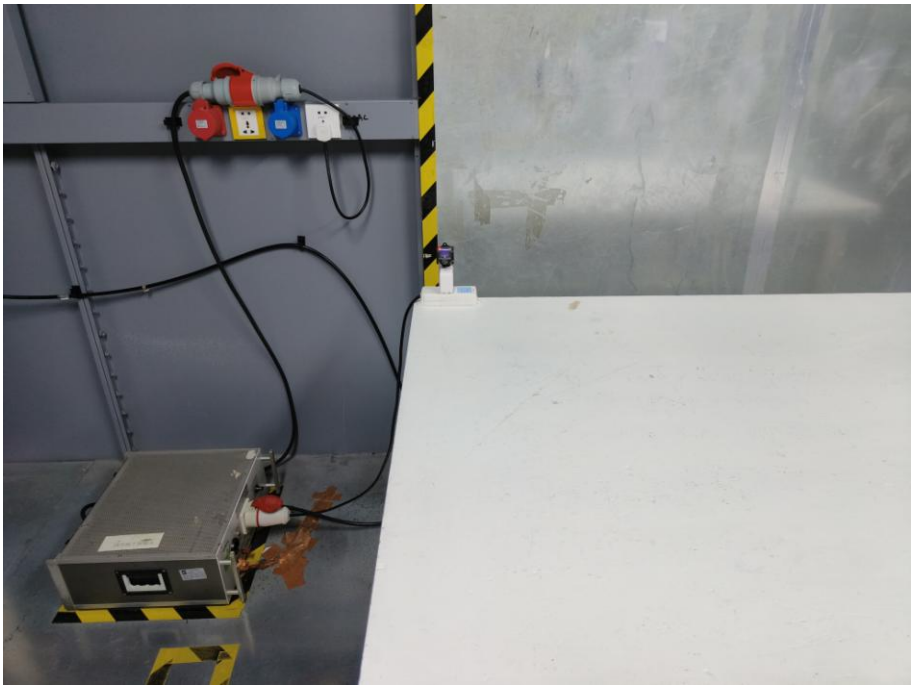
4. Photos of Test Setup

Radiated Emission





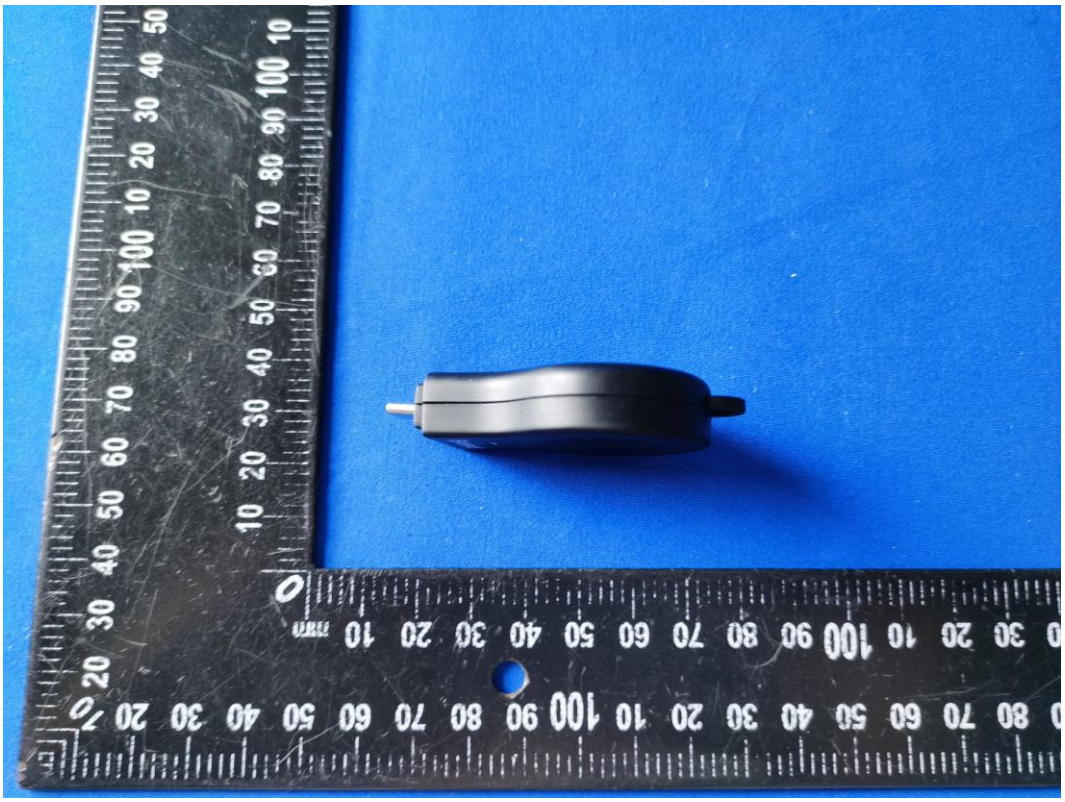
Conducted Emission

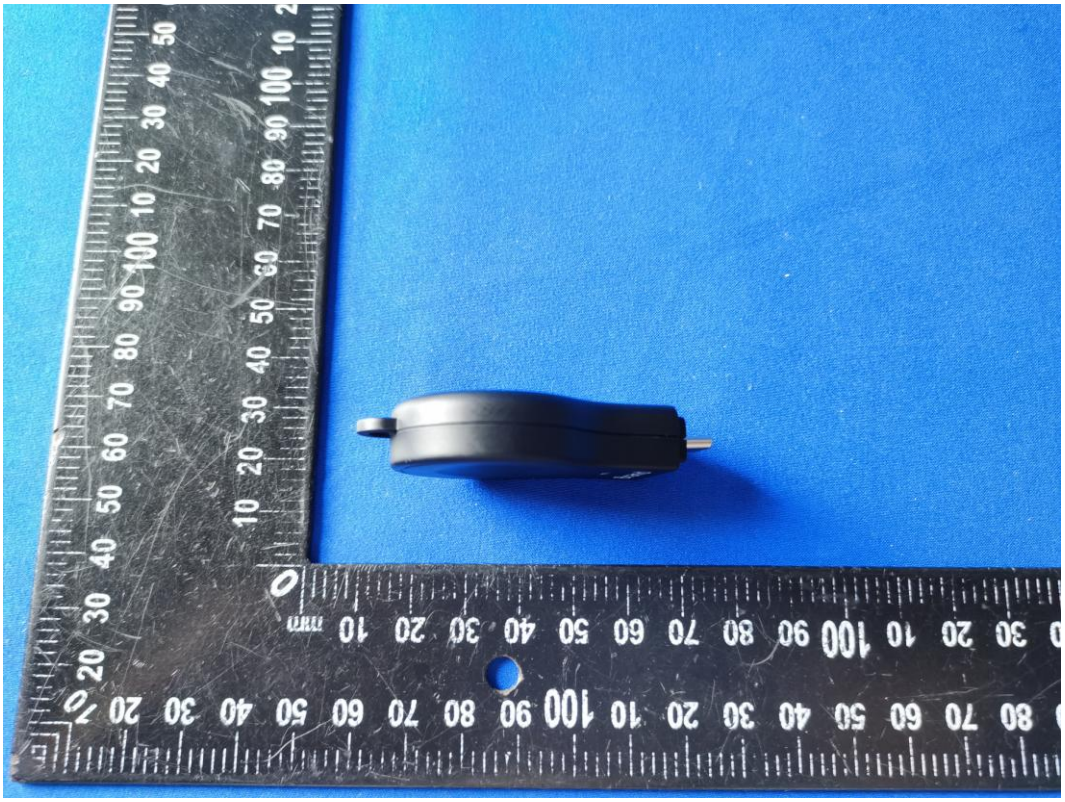


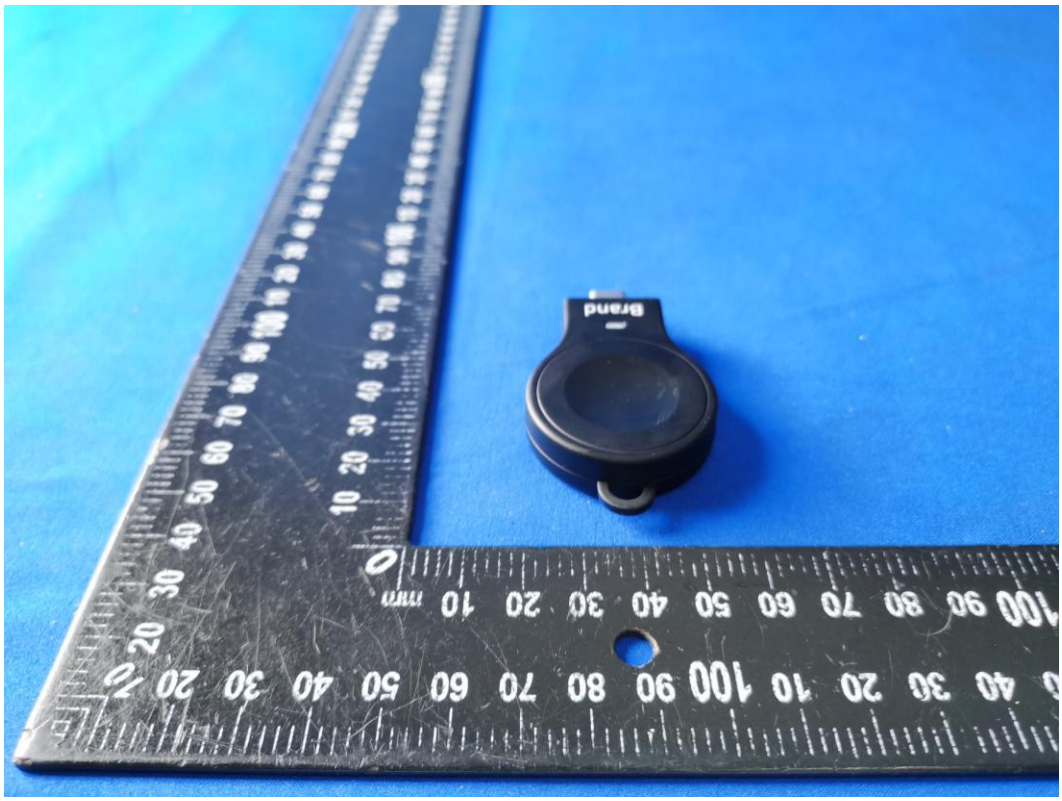
5. Photographs of EUT


Brand


Output:2W
Input:5V/1A







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