



Shenzhen Huaxia Testing Technology Co., Ltd

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640

Fax: +86-755-26648637

Website: www.cqa-cert.com

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Test Report

Report No. : CQASZ20190600034EX-01

Applicant: JMTek Industries(Shenzhen) Co., Ltd.

Address of Applicant: 14G, Innovation Tech Building, Quanzhi Science and Technology innovation Park, ShaJing Street, Baoan District, ShenZhen, China

Manufacturer: JMTek Industries(Shenzhen) Co., Ltd.

Address of Manufacturer: 14G, Innovation Tech Building, Quanzhi Science and Technology innovation Park, ShaJing Street, Baoan District, ShenZhen, China

Equipment Under Test (EUT):

Product: Wireless Charger

Model No.: WPC420-10W

Brand Name: N/A

FCC ID: 2APU5-WPC420-10W

Standards: 47 CFR Part 15, Subpart C

Date of Test: Jun. 24, 2019 to Jun. 28, 2019

Date of Issue: Jul. 01, 2019

Test Result : **PASS***

Tested By:

Tom Chen

(Tom Chen)

Reviewed By:

Aaron Ma

(Aaron Ma)

Approved By:

Jack Ai

(Jack Ai)



* In the configuration tested, the EUT complied with the standards specified above.

The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20190600034EX-01	Rev.01	Initial report	Jul. 01, 2019

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215 (c)	ANSI C63.10 2013	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.209	ANSI C63.10 2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.209	ANSI C63.10 2013	PASS

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4 General Information

4.1 Client Information

Applicant:	JMTek Industries(Shenzhen) Co., Ltd.
Address of Applicant:	14G, Innovation Tech Building, Quanzhi Science and Technology innovation Park, ShaJing Street, Baoan District, ShenZhen, China
Manufacturer:	JMTek Industries(Shenzhen) Co., Ltd.
Address of Manufacturer:	14G, Innovation Tech Building, Quanzhi Science and Technology innovation Park, ShaJing Street, Baoan District, ShenZhen, China

4.2 General Description of EUT

Product Name:	Wireless Charger
Model No.:	WPC420-10W
Trade Mark:	N/A
Hardware Version:	/
Software Version:	/
Operation Frequency:	114.3KHz
Modulation Type:	Induction
Antenna Type:	Loop coil antenna
Antenna Gain:	0 dBi
Charger Information:	Input: 5V $\pm$ 2A; 9V $\pm$ 1.67A Wireless Output: 5V $\pm$ 1A(5W), 9V $\pm$ 1.1A(10W) USB Output: 5V $\pm$ 1A Max

Note: For more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

4.3 Test Environment

Operating Environment:	
Temperature:	25.0 °C
Humidity:	53 % RH
Atmospheric Pressure:	1001mbar
Test Mode:	
Mode a	Wireless charging Mode at 9V(Full load)
Mode b	Wireless charging Mode at 9V(Half load)
Mode c	Wireless charging Mode at 9V(Null load)
Mode d	Wireless charging Mode at 5V((Full load)
Mode e	Wireless charging Mode at 5V(Half load)
Mode f	Wireless charging Mode at 5V(Null load)
Note: The mode a was the worst case and only the data of the worst case record in this report	

4.4 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.	emark	FCC certification
Adapter	Samsung	EP-TA50CBC	Provide by client	Verification
Adapter	HUAWEI	HW-050450C00	Provide by client	Verification
Wireless electronic Load	-	-	Provide by client	-

4.5 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CQA laboratory is reported:

No.	Item	Uncertainty	Notes
1	Radiated Emission (Below 1GHz)	±5.12dB	(1)
2	Radiated Emission (Above 1GHz)	±4.60dB	(1)
3	Conducted Disturbance (0.15~30MHz)	±3.34dB	(1)
4	Radio Frequency	3×10^{-8}	(1)
5	Duty cycle	0.6 %.	(1)
6	Occupied Bandwidth	1.1%	(1)
7	RF conducted power	0.86dB	(1)
8	RF power density	0.74	(1)
9	Conducted Spurious emissions	0.86dB	(1)
10	Temperature test	0.8℃	(1)
11	Humidity test	2.0%	(1)
12	Supply voltages	0.5 %.	(1)
13	time	0.6 %.	(1)
14	Frequency Error	5.5 Hz	(1)

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

4.6 Test Location

Shenzhen Huaxia Testing Technology Co., Ltd,

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

4.7 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L5785)**

CNAS has accredited Shenzhen Huaxia Testing Technology Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 4742.01)**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

- **FCC Registration No.: 522263**

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

4.8 Deviation from Standards

None.

4.9 Other Information Requested by the Customer

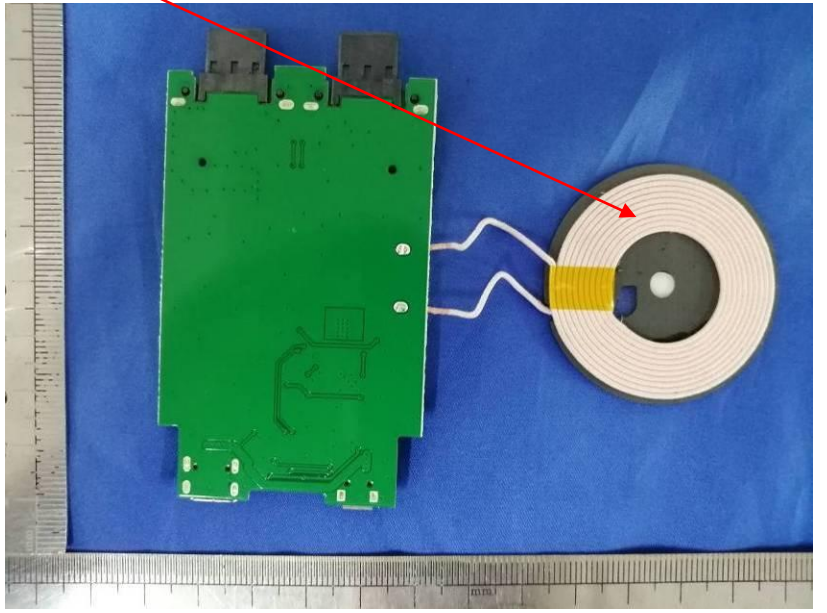
None.

4.10 Equipment List

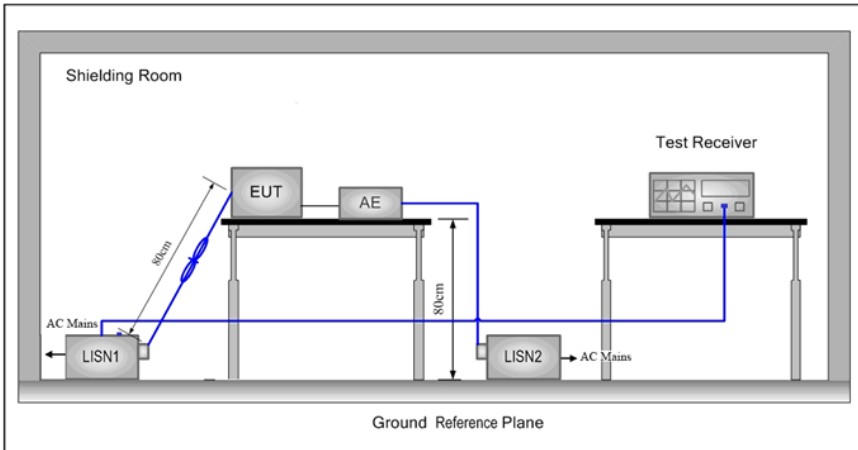
Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2018/09/26	2019/09/25
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2018/09/26	2019/09/25
Loop antenna	Schwarzbeck	FMZB1516	CQA-065	2018/10/28	2020/10/27
Bilog Antenna	R&S	HL562	CQA-011	2018/09/26	2020/09/25
Coaxial Cable (Below 1GHz)	CQA	N/A	C020	2018/09/26	2019/09/25
EMI Test Receiver	R&S	ESPI3	CQA-013	2018/09/26	2019/09/25
LISN	R&S	ENV216	CQA-003	2018/11/05	2019/11/04
Coaxial cable	CQA	N/A	CQA-C009	2018/09/26	2019/09/25

5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
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, 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. 15.247(b) (4) requirement: The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
EUT Antenna:	Loop coil antenna  The antenna is Loop coil Antenna. The best case gain of the antenna is 0 dBi.

5.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) 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.		
Test Setup:			
Test Results:	Pass		

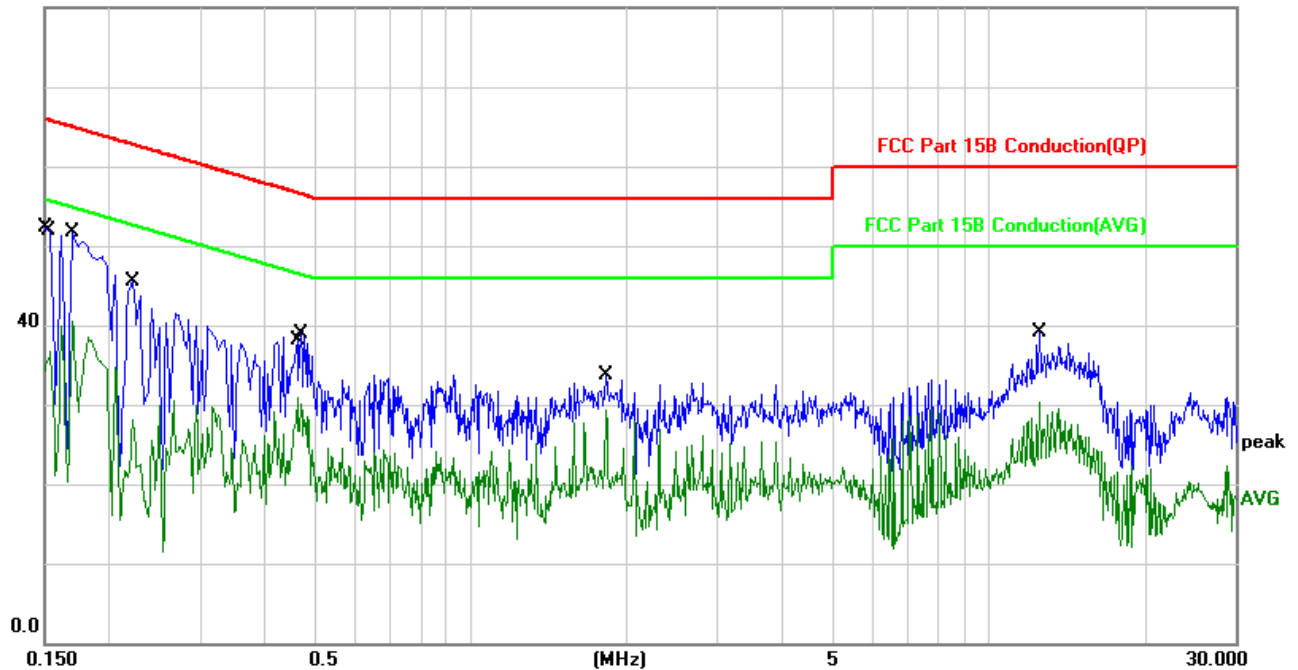
Measurement Data

the worst case

Mode a:

L line:

80.0 dBuV



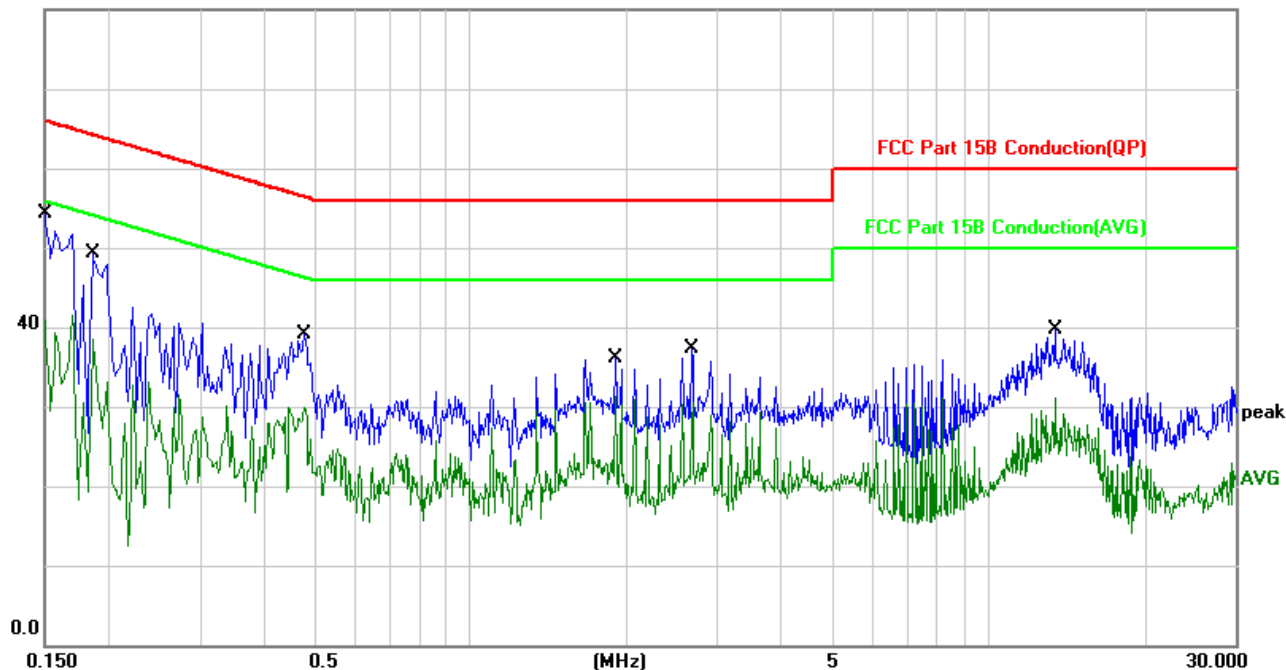
No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1500	52.34	-0.13	52.21	65.99	-13.78	QP	
2		0.1539	36.79	-0.13	36.66	55.78	-19.12	AVG	
3	*	0.1700	51.74	-0.13	51.61	64.96	-13.35	QP	
4		0.1700	40.55	-0.13	40.42	54.96	-14.54	AVG	
5		0.2220	45.58	-0.12	45.46	62.74	-17.28	QP	
6		0.2220	28.18	-0.12	28.06	52.74	-24.68	AVG	
7		0.4620	30.86	-0.02	30.84	46.66	-15.82	AVG	
8		0.4700	38.97	-0.02	38.95	56.51	-17.56	QP	
9		1.8260	33.85	-0.22	33.63	56.00	-22.37	QP	
10		1.8260	29.53	-0.22	29.31	46.00	-16.69	AVG	
11		12.5420	39.23	-0.14	39.09	60.00	-20.91	QP	
12		12.5420	30.40	-0.14	30.26	50.00	-19.74	AVG	

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

N line:

80.0 dBuV

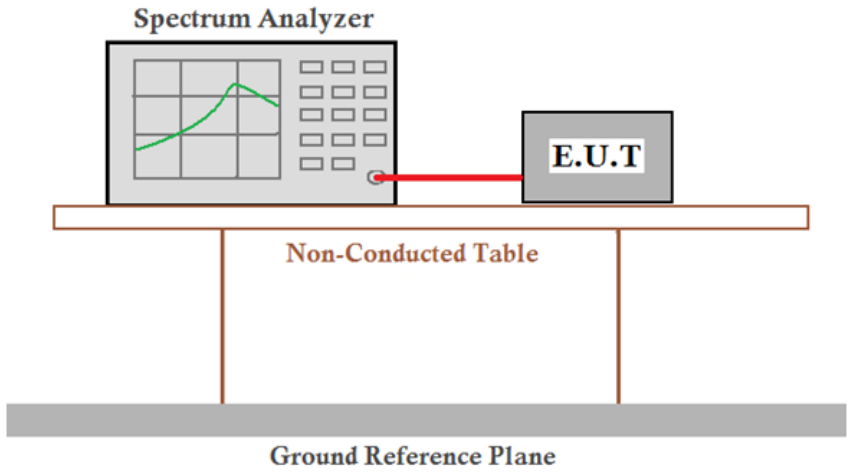


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	*	0.1500	54.36	-0.13	54.23	65.99	-11.76	QP	
2		0.1500	40.96	-0.13	40.83	55.99	-15.16	AVG	
3		0.1860	49.48	-0.13	49.35	64.21	-14.86	QP	
4		0.1860	38.63	-0.13	38.50	54.21	-15.71	AVG	
5		0.4780	39.06	-0.03	39.03	56.37	-17.34	QP	
6		0.4780	29.89	-0.03	29.86	46.37	-16.51	AVG	
7		1.9020	36.32	-0.22	36.10	56.00	-19.90	QP	
8		1.9020	31.47	-0.22	31.25	46.00	-14.75	AVG	
9		2.6780	37.43	-0.17	37.26	56.00	-18.74	QP	
10		2.6820	30.75	-0.17	30.58	46.00	-15.42	AVG	
11		13.4740	39.86	-0.16	39.70	60.00	-20.30	QP	
12		13.4740	31.19	-0.16	31.03	50.00	-18.97	AVG	

Remark:

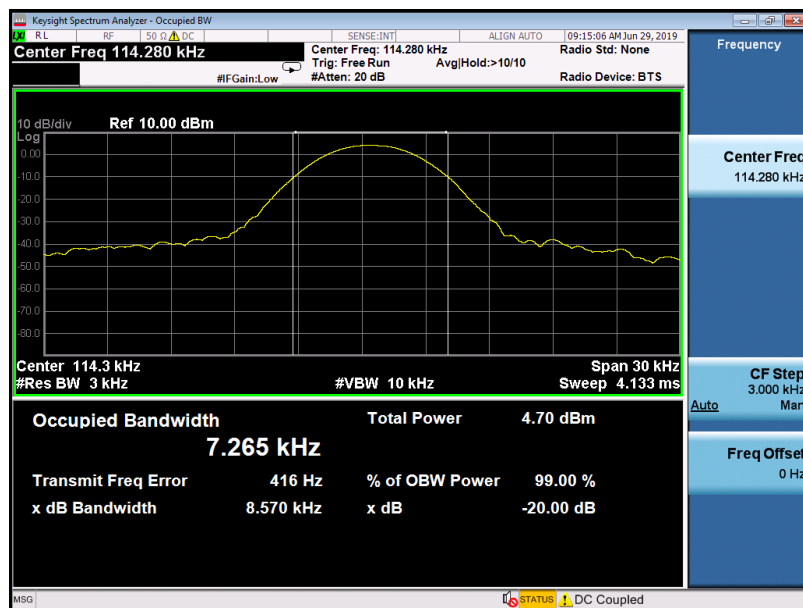
1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

5.3 20dB Occupy Bandwidth

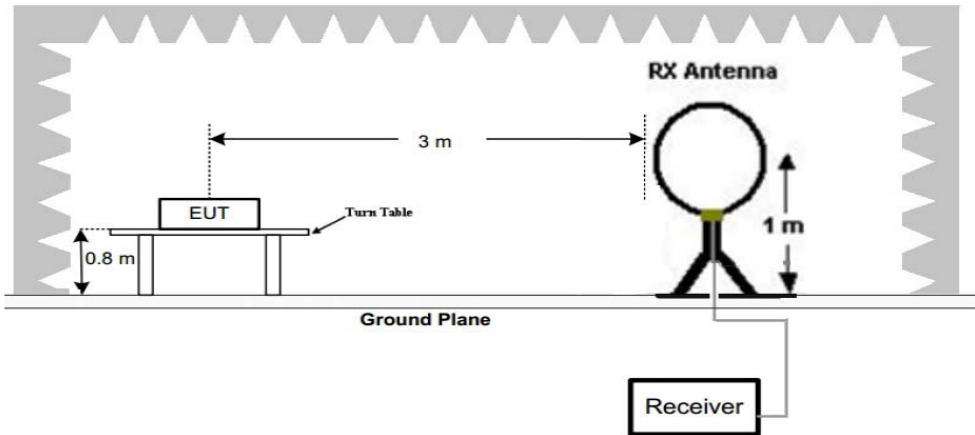
Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10 2013
Test Setup:	 Remark: Offset=Cable loss+ attenuation factor.
Test Results:	Pass

Measurement Data

Mode a		
Test Frequency (KHz)	20dB Occupy Bandwidth (kHz)	Result
114.3	8.570	Pass



5.4 Radiated Spurious Emission

Test Requirement:	47 CFR Part 15C Section 15.209				
Test Method:	ANSI C63.10 2013				
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30kHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30kHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30kHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30kHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300kHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit:	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.					
Test Setup:	 Figure 1. Below 30MHz				

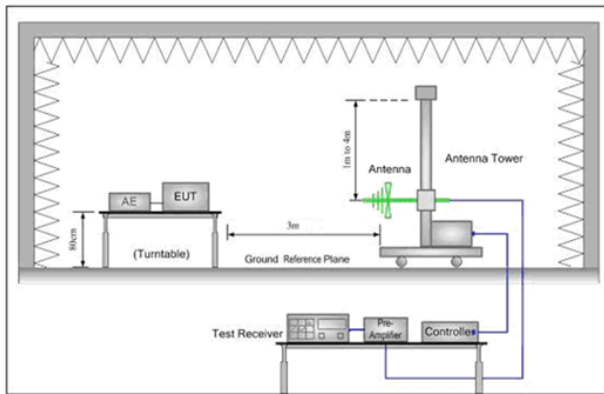


Figure 2. 30MHz to 1GHz

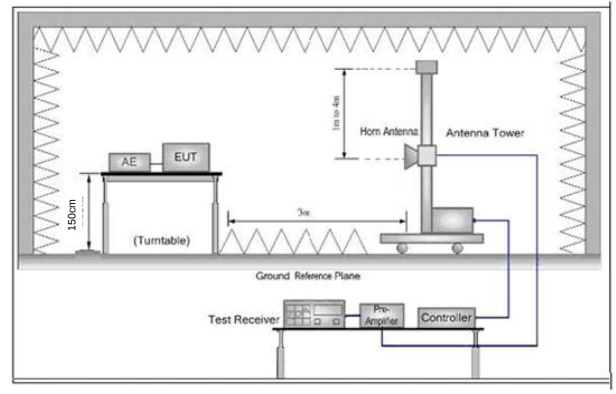


Figure 3. Above 1 GHz

Test Procedure:	1. The EUT was placed on a turn table which is 0.8m above ground plane. 2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT 3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. 4. Repeat above procedures until all frequency measurements have been completed.
Test Results:	Pass

Radiated Emission below 9K~30MHz	
the worst case	
Test mode:	Mode a

Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) Peak	Limit dB(uV/m) Average	Margin dB	Pass/Fail
0.1143	50.15	19.65	69.8	106.44	36.64	50.15	Pass
0.1143	48.42	19.65	68.07	106.44	38.37	48.42	Pass

Note: No other emissions found between lowest internal used/generated frequencies to 30MHz. The peak level of the emission is less than the average limit, so the average level shall be less than the limit without test.

Radiated Emission below 1GHz

30MHz~1GHz, the worst case

Test mode:

Mode a

Vertical

80.0 dBuV/m



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1	*	30.0000	35.18	-4.90	30.28	40.00	-9.72	QP		
2		50.0566	42.88	-18.52	24.36	40.00	-15.64	QP		
3		121.1231	45.03	-12.45	32.58	43.50	-10.92	QP		
4		164.3301	39.94	-13.14	26.80	43.50	-16.70	QP		
5		251.1804	41.48	-12.83	28.65	46.00	-17.35	QP		
6		318.8170	35.33	-10.99	24.34	46.00	-21.66	QP		

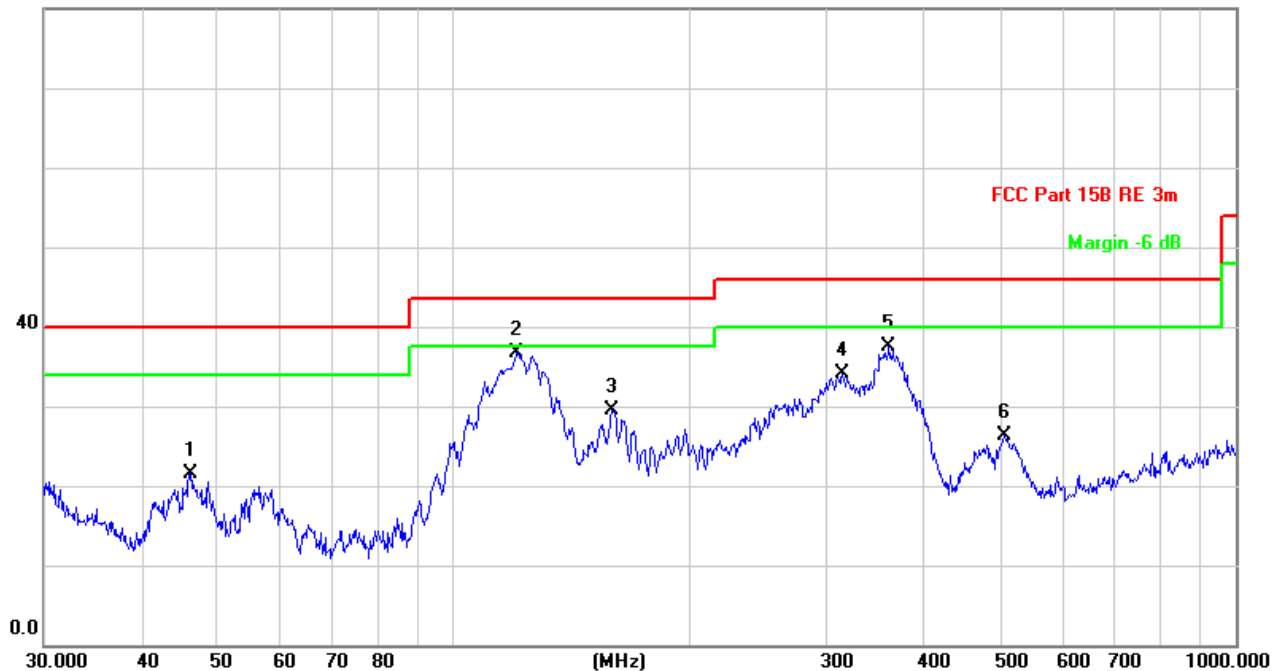
30MHz~1GHz, the worst case

Test mode:

Mode a

Horizontal

80.0 dBuV/m



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB/m	dBuV/m	dBuV/m	dB	cm	degree	Comment
1		46.1779	37.48	-15.92	21.56	40.00	-18.44	QP		
2	*	120.6991	49.37	-12.58	36.79	43.50	-6.71	QP		
3		159.2251	42.48	-13.02	29.46	43.50	-14.04	QP		
4		314.3765	44.78	-10.70	34.08	46.00	-11.92	QP		
5		360.4476	47.14	-9.57	37.57	46.00	-8.43	QP		
6		506.4791	32.52	-6.16	26.36	46.00	-19.64	QP		

6 Photographs - EUT Test Setup

6.1 Radiated Spurious Emission Setup photos

9KHz~30MHz



30MHz~1GHz



6.2 Conducted Emission Setup photos



7 Photographs - EUT Constructional Details

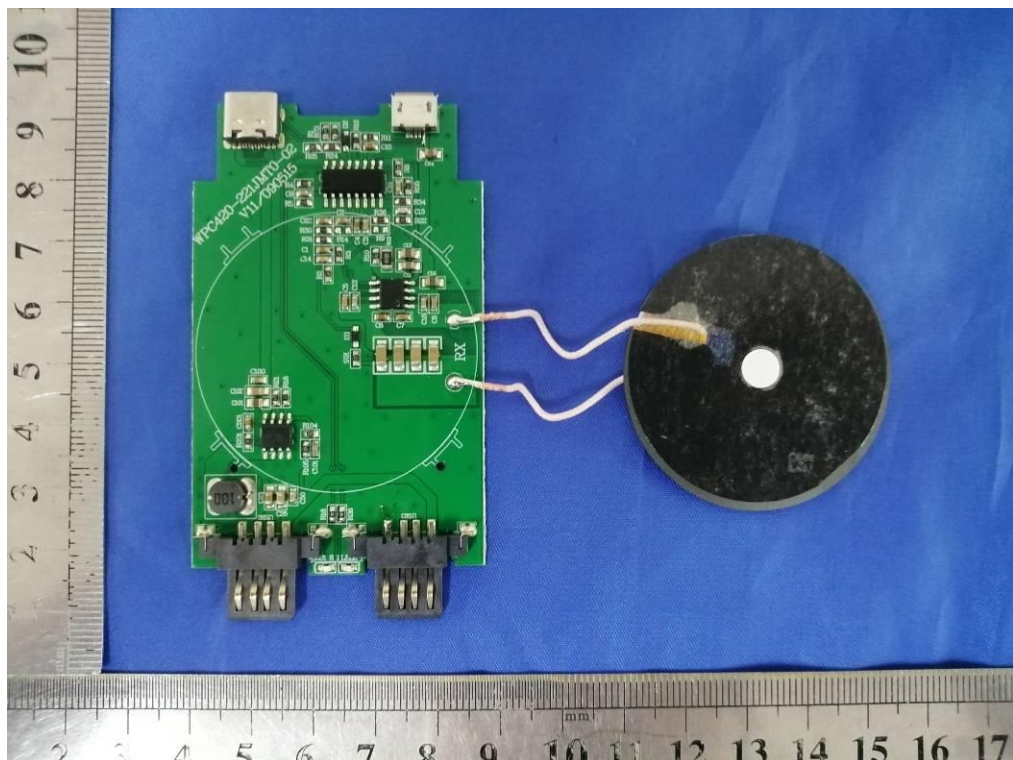
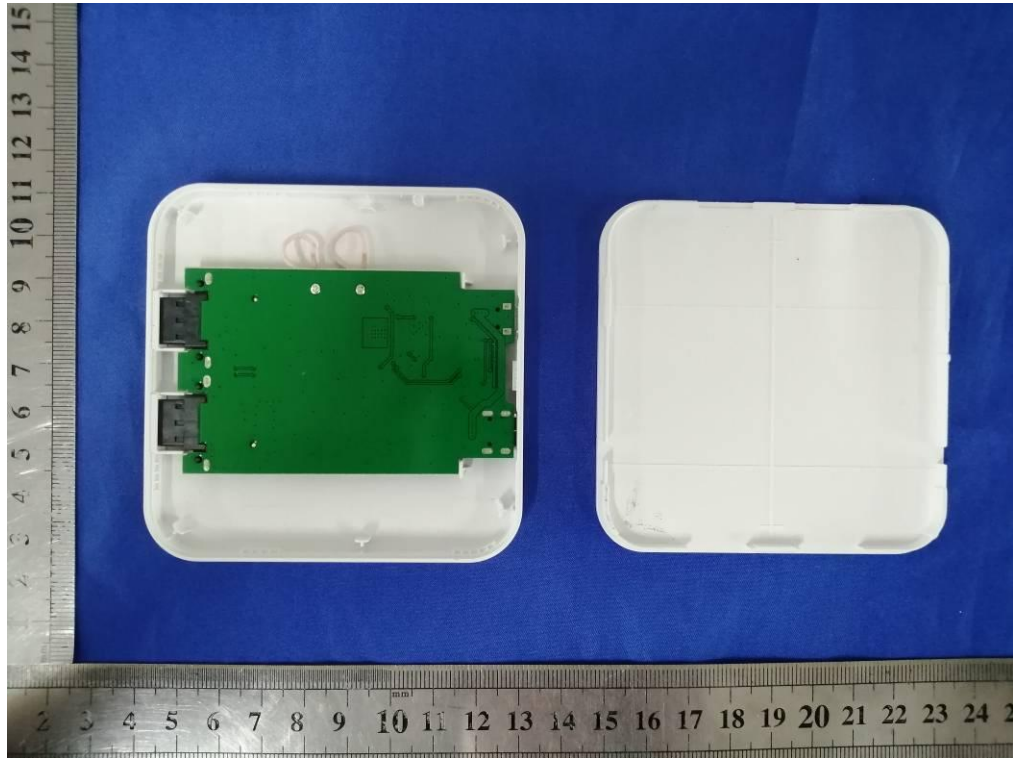
External Photos of EUT

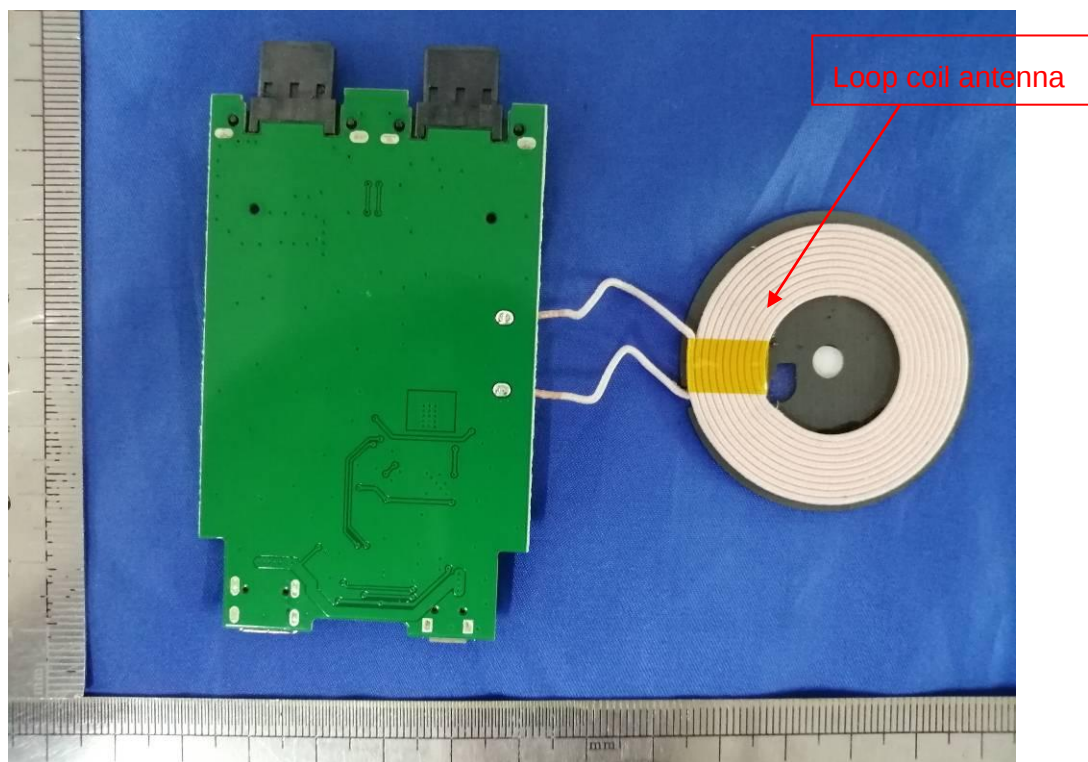






Internal Photos of EUT





The End