Test Report

FCC ID: 2AU7H-JHA-976

Date of issue: Nov. 22, 2019

Report number:	MTi19101809-4E1
Sample description:	Car Fast Wireless Charger
Model(s):	JHA-976, C125
Applicant:	Shenzhen Longgang Jianhuida Plastics Electronic Co., Ltd.
Address:	2F, Block A, No7. Industrial Zone, Dawan Benkang Road, Dakang Community, Yuanshan Street, Longgang District, Shenzhen, China.
Date of test:	Oct. 24, 2019 – Nov. 22, 2019

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

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Test Result Certification

Applicant's name:	Shenzhen Longgang Jianhuida Plastics Electronic Co., Ltd.
Address:	2F, Block A, No7. Industrial Zone, Dawan Benkang Road, Dakang Community, Yuanshan Street, Longgang District, Shenzhen, China.
Manufacture's name:	DONGGUAN CHUANGLONG ELECTRONICS LIMITED
Address:	King Long industrial district, xiekeng village, qingxi town, Dongguan city, Guangdong China
Product name:	Car Fast Wireless Charger
Trademark:	N/A
Model name:	JHA-976, C125
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	Nov. 22, 2019
Reviewed by:	Blue. Zheng	Nov. 22, 2019
Approved by:	Smith Chen	Nov. 22, 2019

1 GENERAL INFORMATION

1.1 Feature of equipment under test (EUT)

Product name:	Car Fast Wireless Charger
Model name:	JHA-976, C125
Model difference:	All the model are the same circuit and RF module, except the model No..
Operation frequency:	115–205 kHz
Modulation type:	Load modulation
Antenna type:	Coil Antenna
Power supply:	DC 9V from adapter
Battery:	N/A
Adapter information:	N/A

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	Charging+ TX

Note1: 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.

Note2: EUT is tested under full load and belongs to the worst mode.

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	EQ-24BCN	/	Huizhou Dongyang Yienbi Electronics Co., Ltd.
Load	/	/	/

1.5 Measurement Uncertainty

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

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 %

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 List

Channel	Frequency (kHz)
Low	115
Middle	158
High	205

2.2 Test channel

Channel	Frequency (kHz)
Middle	158

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	2019/04/16	2020/04/15
MTI-E042	ESG Series Analog signal generator	Agilent	E4421B	GB40051240	2019/05/21	2020/05/20
MTI-E044	Thermometer clock humidity monitor	-	HTC-1	/	2019/04/17	2020/04/16
MTI-E062	Log Periodic Antenna	Schwarzbeck	VUSLP 9111B	#312	2018/04/11	2020/04/10
MTI-E063	Log Periodic Dipole Array Antenna	ETS-LINDGREN	3148B	00224524	2018/04/11	2020/04/10
MTI-E065	Amplifier	EMtrace	RP06A	00117	2019/04/29	2020/04/28
MTI-E071	PXA Signal Analyzer	Agilent	N9030A	MY51350296	2019/10/25	2020/10/24
MTI-E076	EMI Test Receiver	Rohde&schwarz	ESIB26	100273	2019/04/16	2020/04/15
MTI-E078	Synthesized Sweeper	Agilent	83752A	3610A01957	2019/04/16	2020/04/15
MTI-E079	DC Power Supply	Agilent	E3632A	MY40027695	2019/04/16	2020/04/15
MTI-E093	Artificial mains network	3ctest	LISN J50	ES3911805	2019/04/16	2020/04/15
MTI-E096	Power amplifier	Space-Dtroniccs	EWLNA0118G-P40	1852001	2019/04/29	2020/04/28
MTI-E097	Current Probe	SOLAR ELECTRONICS CO.	9207-1	220095-1	2019/04/17	2020/04/16
MTI-E098	Loop Sensor	SOLAR ELECTRONICS CO.	7334-1	220095-2	2019/04/21	2020/04/20
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.

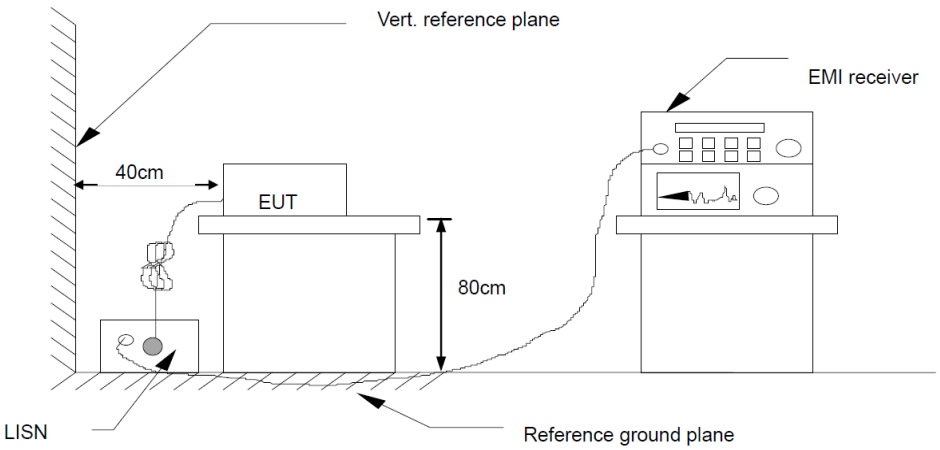
Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

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.

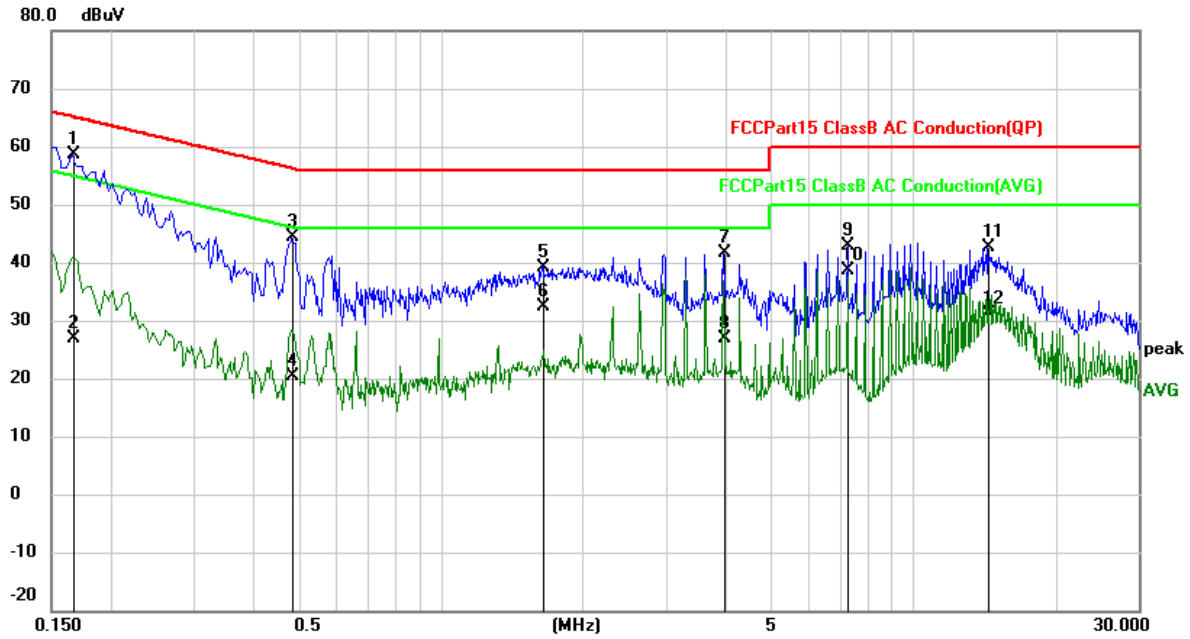
For the actual test configuration, please refer to the related Item – photographs of the test setup.

5.2.3 Test Setup



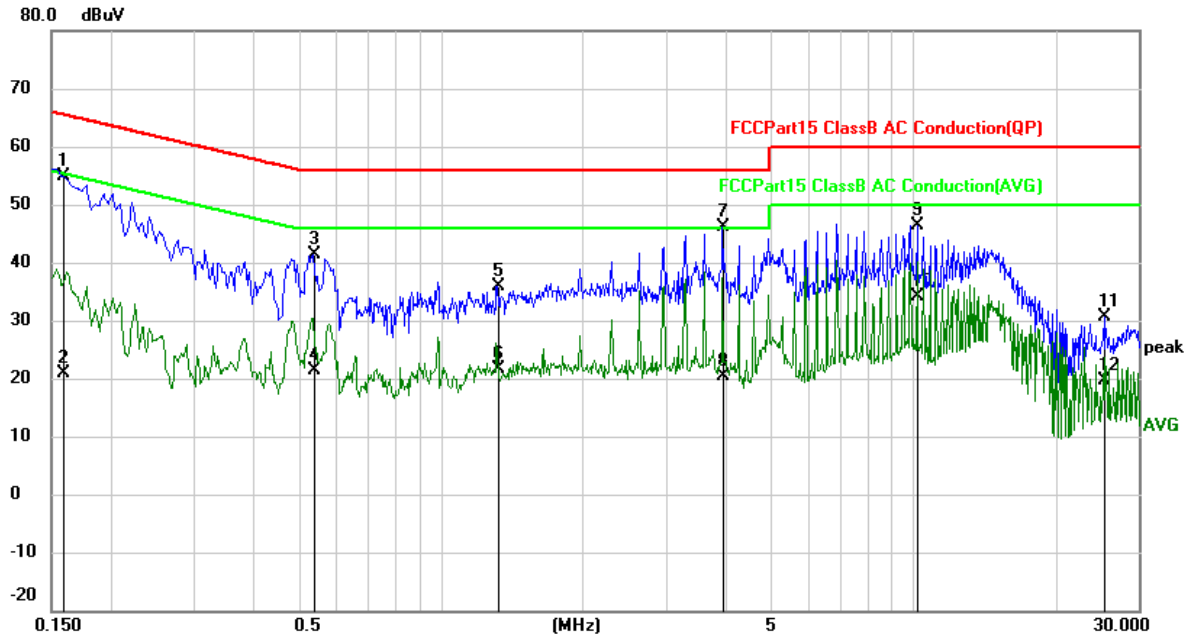
5.2.4 Test Result

EUT:	Car Fast Wireless Charger	Model Name:	JHA-976
Pressure:	101kPa	Phase:	L
Test voltage:	DC 9V from adapter AC 120V/60Hz	Test mode:	Mode 1



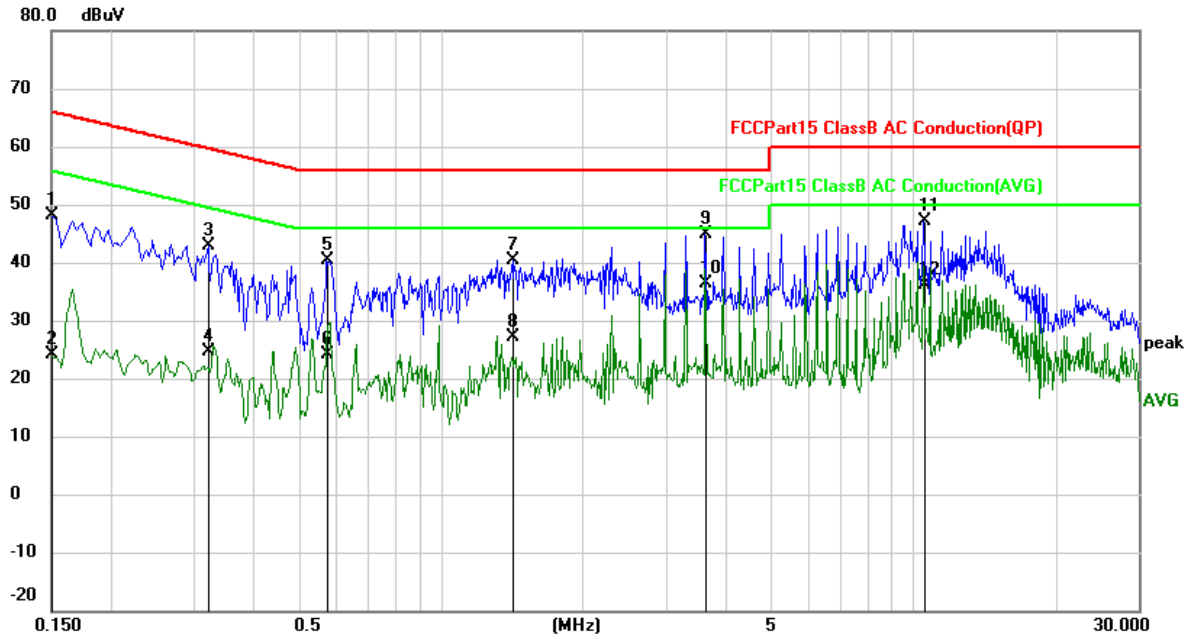
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1660	48.93	9.73	58.66	65.16	-6.50	QP
2		0.1660	17.21	9.73	26.94	55.16	-28.22	AVG
3		0.4860	34.51	9.91	44.42	56.24	-11.82	QP
4		0.4860	10.45	9.91	20.36	46.24	-25.88	AVG
5		1.6420	29.26	9.99	39.25	56.00	-16.75	QP
6		1.6420	22.30	9.99	32.29	46.00	-13.71	AVG
7		3.9660	31.67	10.05	41.72	56.00	-14.28	QP
8		3.9660	16.80	10.05	26.85	46.00	-19.15	AVG
9		7.2580	32.61	10.19	42.80	60.00	-17.20	QP
10		7.2580	28.51	10.19	38.70	50.00	-11.30	AVG
11		14.3820	32.43	10.28	42.71	60.00	-17.29	QP
12		14.3820	20.77	10.28	31.05	50.00	-18.95	AVG

EUT:	Car Fast Wireless Charger	Model Name:	JHA-976
Pressure:	101kPa	Phase:	N
Test voltage:	DC 9V from adapter AC 120V/60Hz	Test mode:	Mode 1



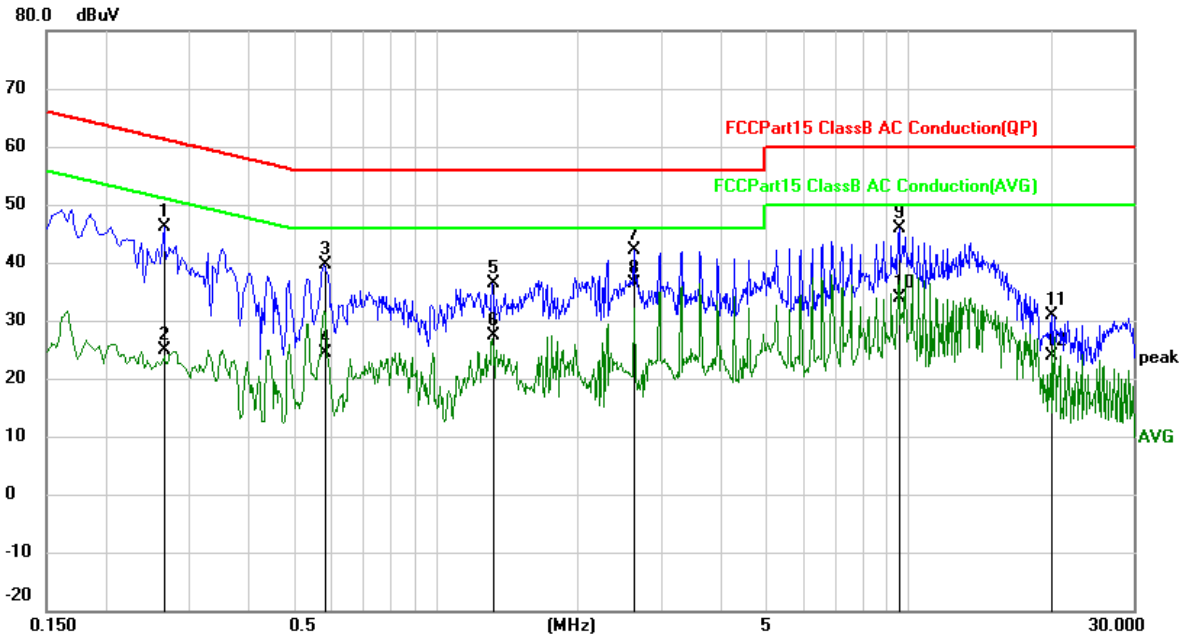
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1590	45.03	9.73	54.76	65.52	-10.76	QP
2		0.1590	11.15	9.73	20.88	55.52	-34.64	AVG
3		0.5380	31.43	9.92	41.35	56.00	-14.65	QP
4		0.5380	11.48	9.92	21.40	46.00	-24.60	AVG
5		1.3220	25.99	9.99	35.98	56.00	-20.02	QP
6		1.3220	11.76	9.99	21.75	46.00	-24.25	AVG
7	*	3.9500	36.16	10.05	46.21	56.00	-9.79	QP
8		3.9500	10.36	10.05	20.41	46.00	-25.59	AVG
9		10.2060	36.09	10.33	46.42	60.00	-13.58	QP
10		10.2060	23.84	10.33	34.17	50.00	-15.83	AVG
11		25.3500	20.19	10.35	30.54	60.00	-29.46	QP
12		25.3500	9.29	10.35	19.64	50.00	-30.36	AVG

EUT:	Car Fast Wireless Charger	Model Name:	JHA-976
Pressure:	101kPa	Phase:	L
Test voltage:	DC 9V 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		0.1500	38.45	9.73	48.18	66.00	-17.82	QP
2		0.1500	14.33	9.73	24.06	56.00	-31.94	AVG
3		0.3220	33.16	9.78	42.94	59.66	-16.72	QP
4		0.3220	14.84	9.78	24.62	49.66	-25.04	AVG
5		0.5740	30.42	9.93	40.35	56.00	-15.65	QP
6		0.5740	14.29	9.93	24.22	46.00	-21.78	AVG
7		1.4220	30.35	9.99	40.34	56.00	-15.66	QP
8		1.4220	17.17	9.99	27.16	46.00	-18.84	AVG
9		3.6380	34.93	10.04	44.97	56.00	-11.03	QP
10	*	3.6380	26.22	10.04	36.26	46.00	-9.74	AVG
11		10.5340	36.77	10.32	47.09	60.00	-12.91	QP
12		10.5340	25.69	10.32	36.01	50.00	-13.99	AVG

EUT:	Car Fast Wireless Charger	Model Name:	JHA-976
Pressure:	101kPa	Phase:	N
Test voltage:	DC 9V 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		0.2660	36.36	9.74	46.10	61.24	-15.14	QP
2		0.2660	15.02	9.74	24.76	51.24	-26.48	AVG
3		0.5820	29.68	9.93	39.61	56.00	-16.39	QP
4		0.5820	14.55	9.93	24.48	46.00	-21.52	AVG
5		1.3180	26.39	9.99	36.38	56.00	-19.62	QP
6		1.3180	17.41	9.99	27.40	46.00	-18.60	AVG
7		2.6340	32.06	10.02	42.08	56.00	-13.92	QP
8	*	2.6340	26.30	10.02	36.32	46.00	-9.68	AVG
9		9.5659	35.47	10.31	45.78	60.00	-14.22	QP
10		9.5659	23.56	10.31	33.87	50.00	-16.13	AVG
11		20.1259	20.63	10.21	30.84	60.00	-29.16	QP
12		20.1259	13.79	10.21	24.00	50.00	-26.00	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.

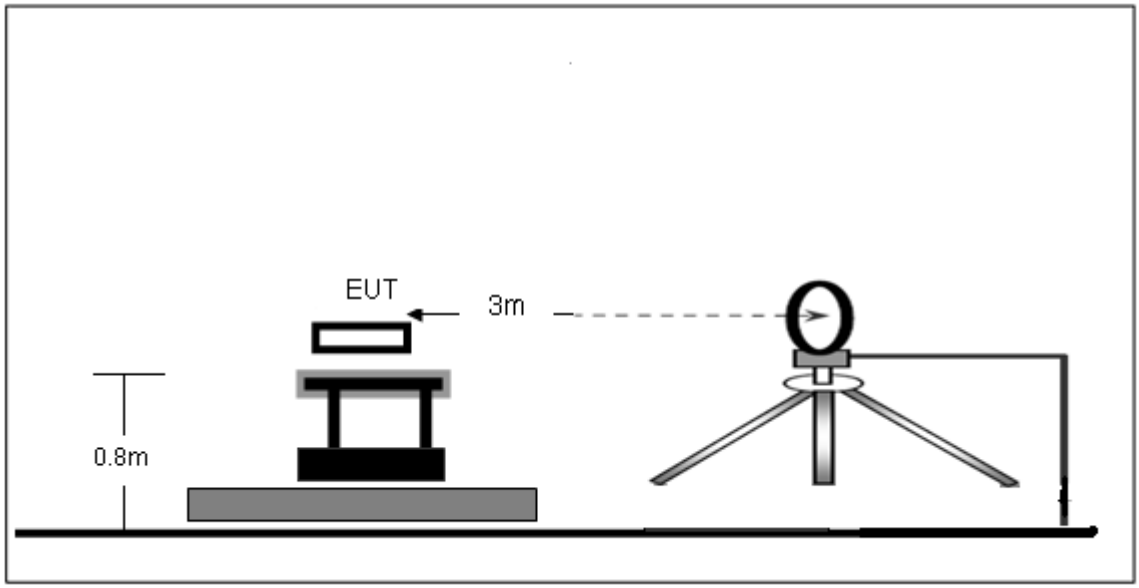
g. For the radiated emission test above 1GHz:
Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with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

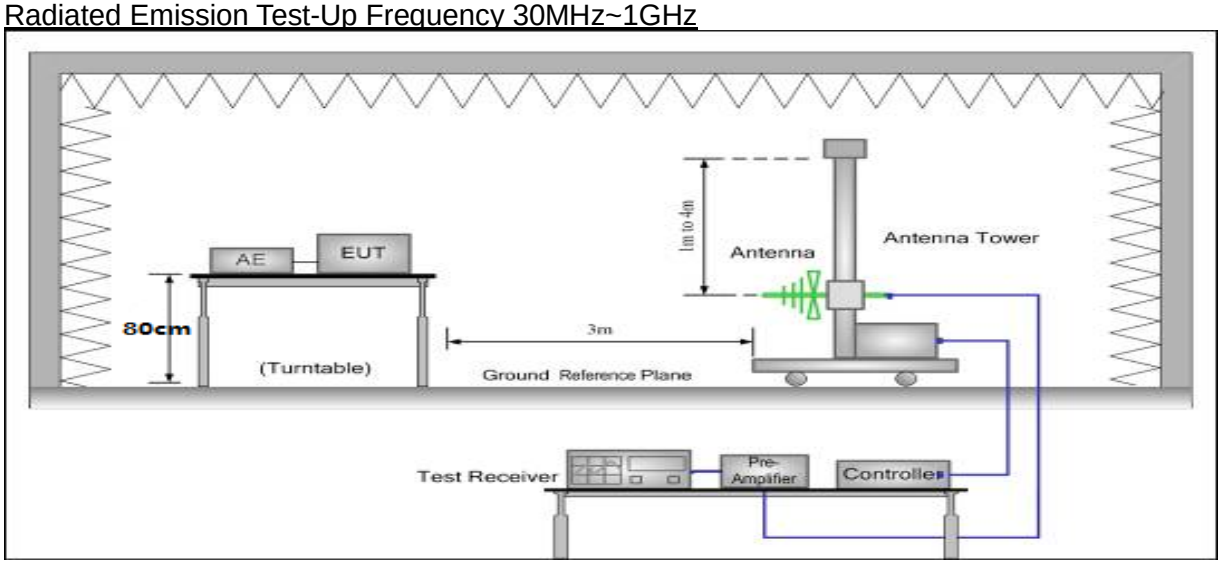
Note: Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

5.3.3 Test Setup

Radiated Emission Test-Up Frequency Below 30MHz



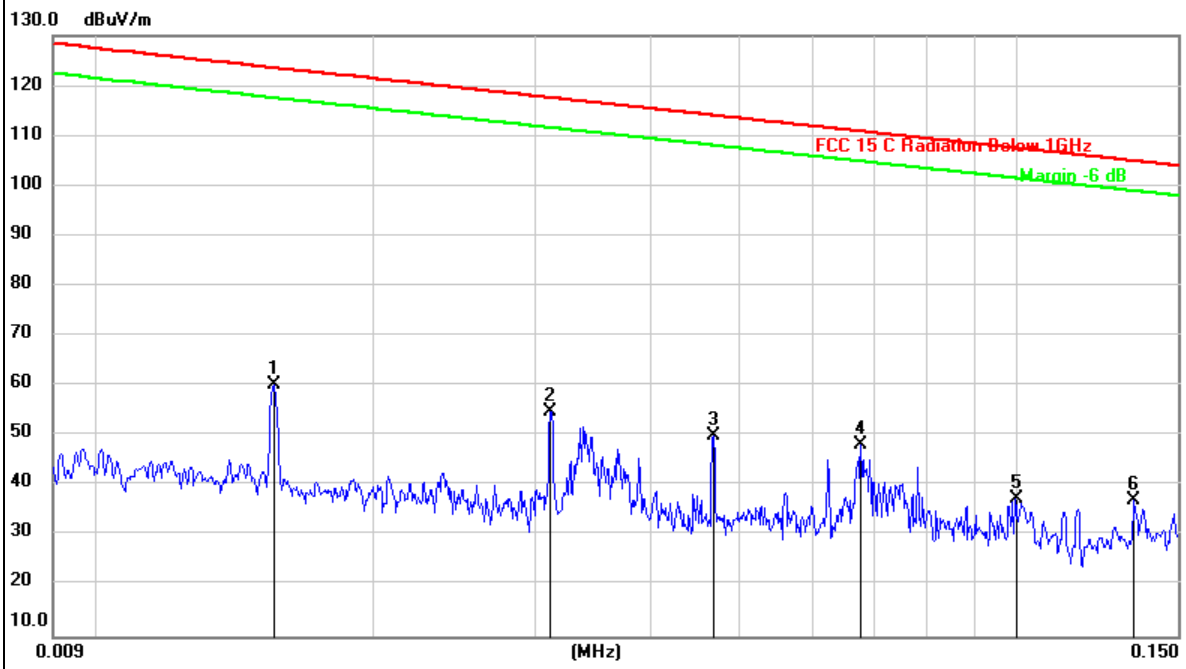
Radiated Emission Test-Up Frequency 30MHz~1GHz



5.3.4 Test Result

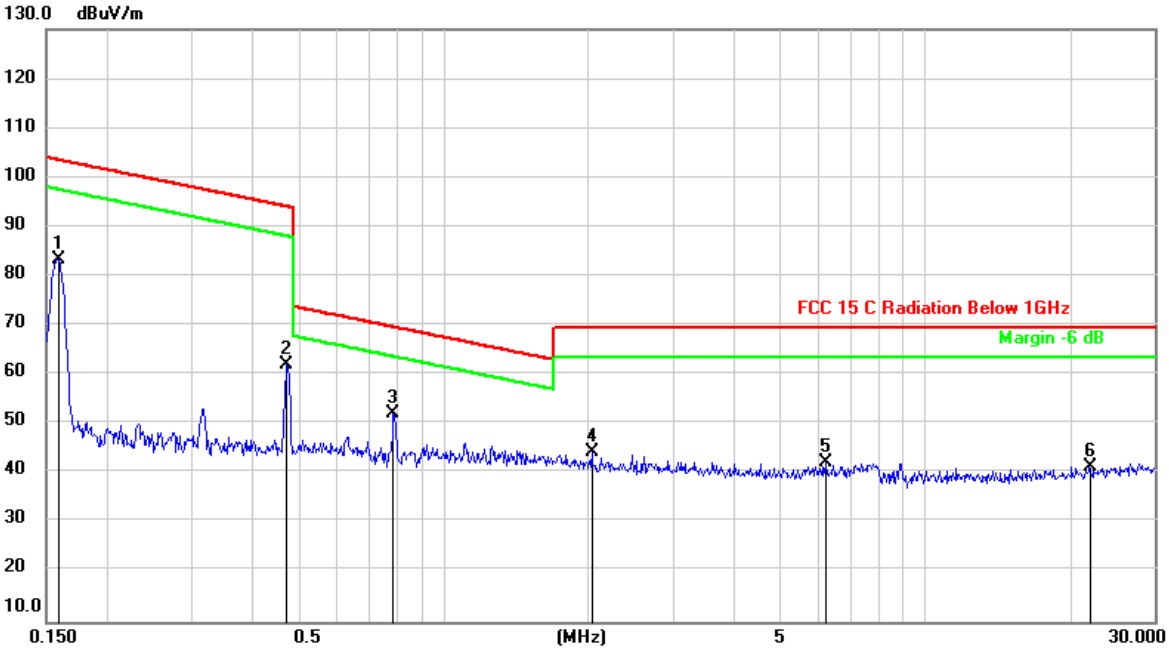
Frequency range (9kHz – 30MHz)

EUT:	Car Fast Wireless Charger	Model Name:	JHA-976
Pressure:	101kPa	Test mode:	Mode 1
Test voltage:	DC 9V 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	39.79	20.33	60.12	123.57	-63.45	peak
2	*	0.0312	34.63	20.33	54.96	117.59	-62.63	peak
3		0.0469	29.68	20.28	49.96	114.07	-64.11	peak
4		0.0678	28.10	20.13	48.23	110.88	-62.65	peak
5		0.0998	17.67	19.67	37.34	107.54	-70.20	peak
6		0.1344	17.29	19.81	37.10	104.97	-67.87	peak

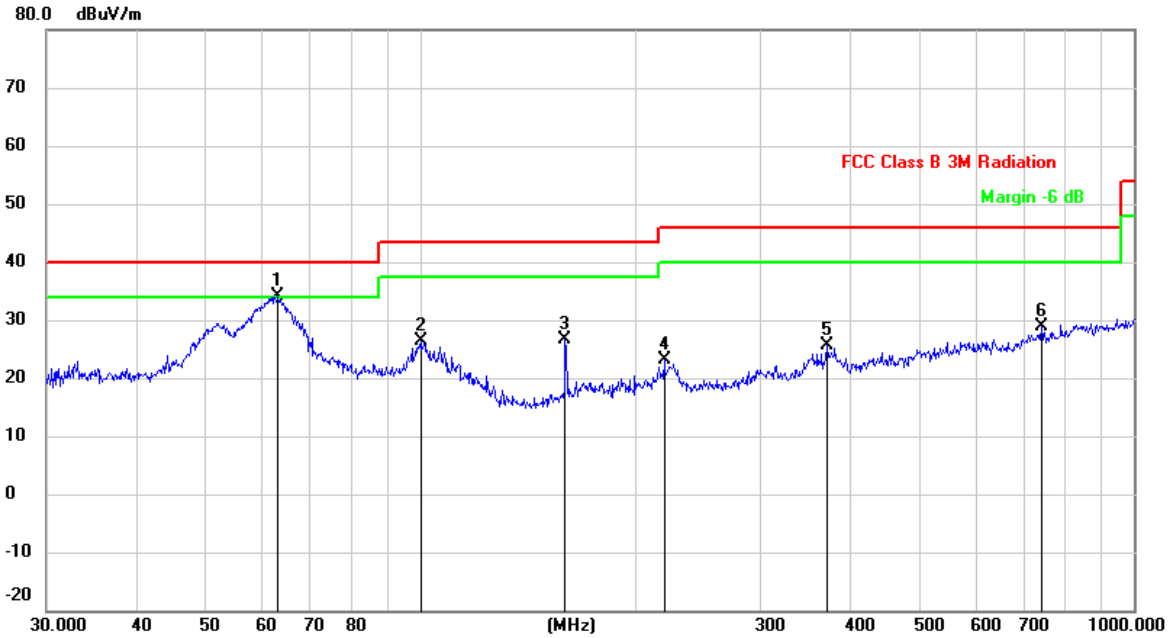
EUT:	Car Fast Wireless Charger	Model Name:	JHA-976
Pressure:	101kPa	Test mode:	Mode 1
Test voltage:	DC 9V from adapter AC 120V/60Hz		



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dBuV/m	dBuV/m	dBuV/m	dB	Detector
1		0.1582	63.54	19.85	83.39	103.59	-20.20	peak
2		0.4736	41.97	20.12	62.09	94.09	-32.00	peak
3	*	0.7876	32.29	19.92	52.21	69.69	-17.48	peak
4		2.0333	23.95	20.27	44.22	69.50	-25.28	peak
5		6.2189	21.97	20.14	42.11	69.50	-27.39	peak
6		21.9463	20.22	21.23	41.45	69.50	-28.05	peak

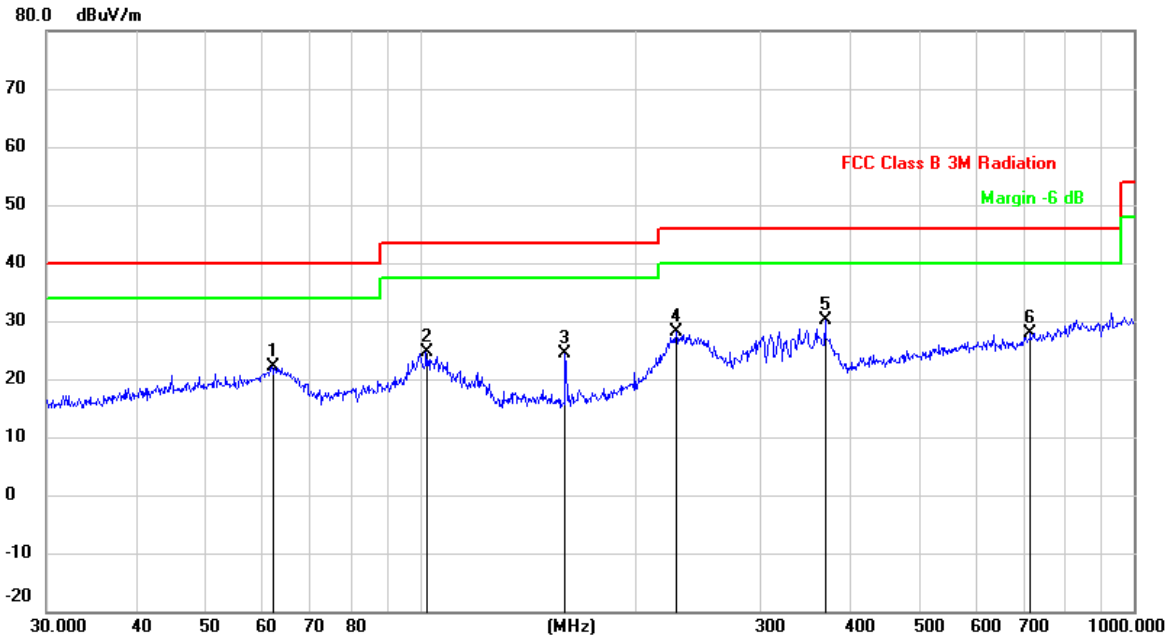
Frequency range (30MHz – 1GHz)

EUT:	Car Fast Wireless Charger	Model Name:	JHA-976
Pressure:	101kPa	Polarization:	Vertical
Test voltage:	DC 9V 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	*	63.3132	42.76	-8.70	34.06	40.00	-5.94	QP
2		100.2286	34.06	-7.78	26.28	43.50	-17.22	QP
3		159.7844	36.90	-10.29	26.61	43.50	-16.89	QP
4		219.8449	29.94	-6.92	23.02	46.00	-22.98	QP
5		372.0045	29.59	-3.88	25.71	46.00	-20.29	QP
6		742.2587	27.61	1.17	28.78	46.00	-17.22	QP

EUT:	Car Fast Wireless Charger	Model Name:	JHA-976
Pressure:	101kPa	Polarization:	Horizontal
Test voltage:	DC 9V 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		61.9951	30.72	-8.51	22.21	40.00	-17.79	QP
2		102.0014	32.51	-7.79	24.72	43.50	-18.78	QP
3		159.7844	34.74	-10.29	24.45	43.50	-19.05	QP
4		228.4904	34.74	-6.73	28.01	46.00	-17.99	QP
5	*	369.4047	34.08	-3.87	30.21	46.00	-15.79	QP
6		716.6820	26.96	0.82	27.78	46.00	-18.22	QP

5.4 Occupied bandwidth

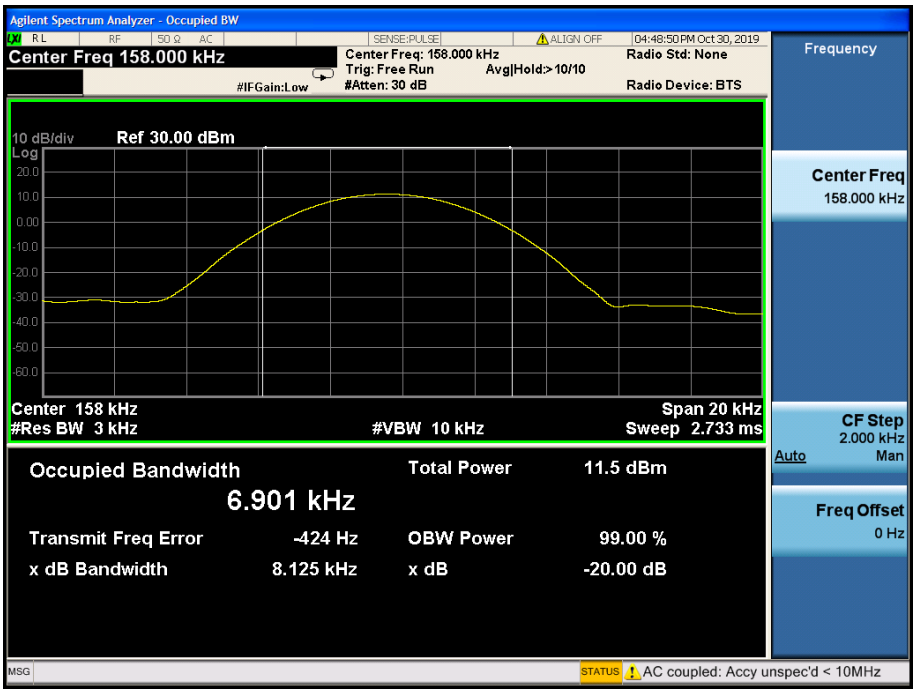
5.4.1 Test method

Use the following spectrum analyzer settings:
Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
RBW ≥1% of the 20 dB bandwidth
VBW ≥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.

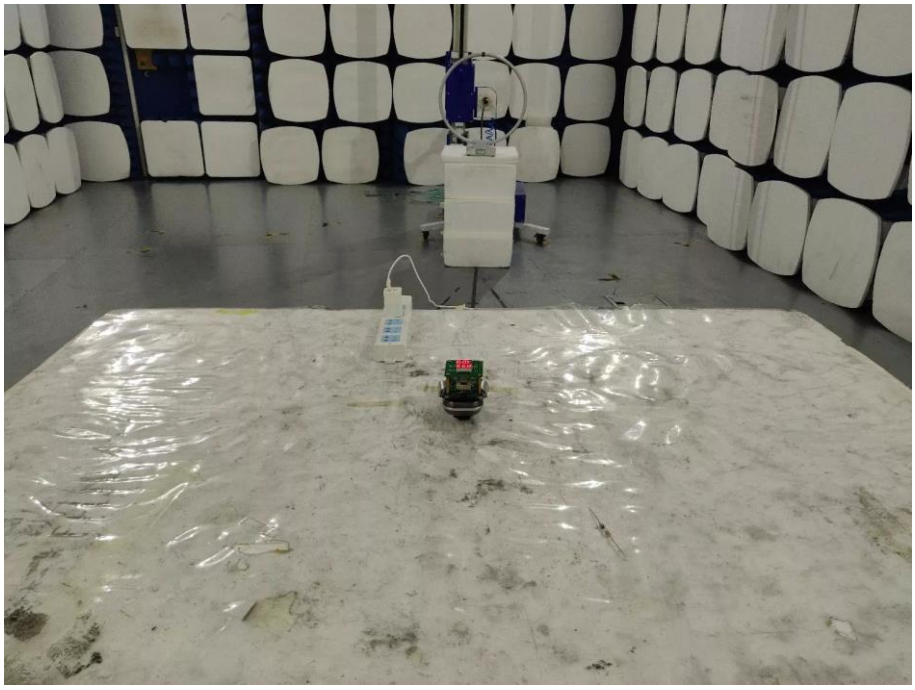
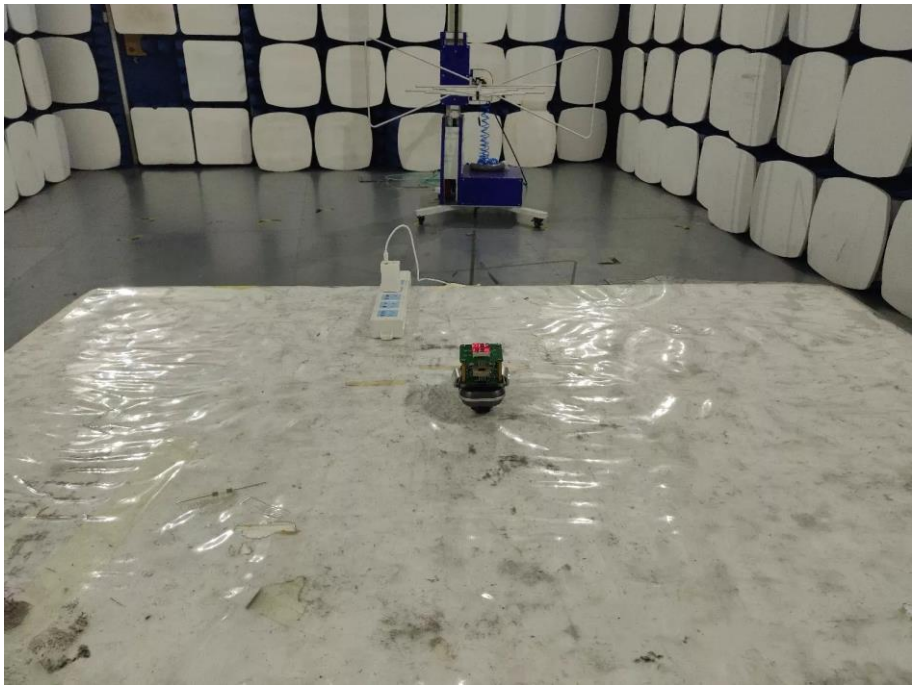
5.4.2 Test result

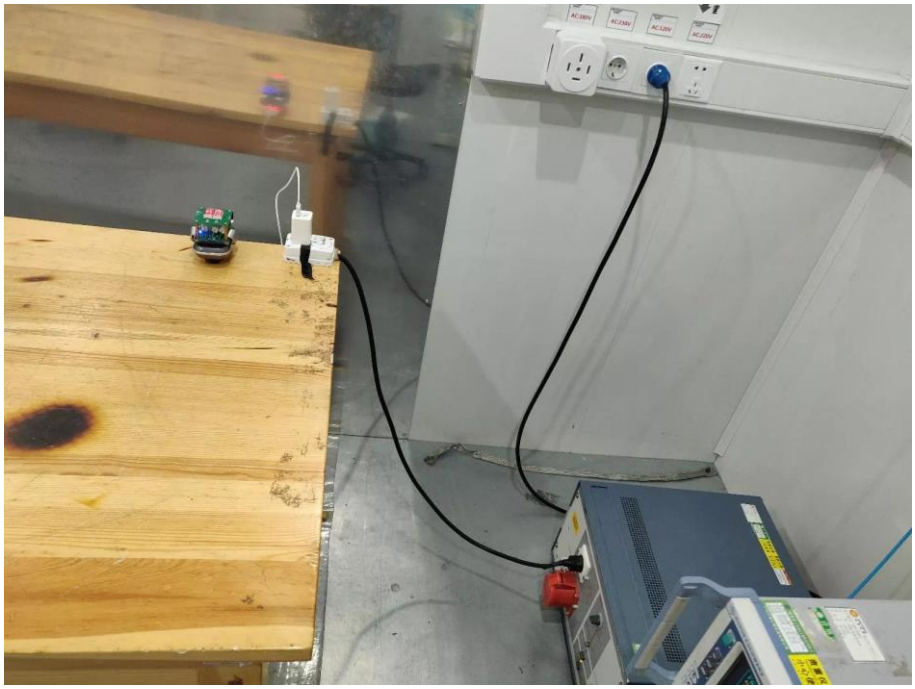
Frequency (kHz)	20dB emission bandwidth (kHz)	99% occupied bandwidth (kHz)
158	8.125	6.901

Test plots as below:



6 Photographs of the Test Setup

Radiated emission



Conducted emission


7 Photographs of the EUT

See the APPENDIX 1: EUT PHOTOS in the report No.: MTi19101809-4E1-1.

----END OF REPORT----