

TEST REPORT

FCC ID:2ATOXF800

Product Name: GPS Outdoor Wireless Dog Fence System
Trademark: N/A
Model Number: F800
Prepared For: Shenzhen Wellturn Technology Co., Ltd
Address: Rm 6001, Block 3, Yilida BL, Nanshan Avenue, Nanshan District, Shenzhen City, China
Manufacturer: Shenzhen Wellturn Technology Co., Ltd
Address: Rm 6001, Block 3, Yilida BL, Nanshan Avenue, Nanshan District, Shenzhen City, China
Prepared By: Shenzhen BCTC Testing Co., Ltd.
Address: BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China
Sample Received Date: 2022-04-21
Sample tested Date: 2022-04-21 to 2022-05-10
Issue Date: 2022-05-12
Report No.: BCTC2204553482E
Test Standards: 47 CFR FCC Part 15 Subpart B
Test Results: PASS

Tested by:



Jeff Fu/ Project Handler

Approved by:



Zero Zhou/Reviewer



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(Note: N/A means not applicable)

1. VERSION

Report No.	Issue Date	Description	Approved
BCTC2204553482E	2022-05-12	Original	Valid

2. TEST SUMMARY

The Product has been tested according to the following specifications:

Standard	Test Item	Test result
FCC 15.107	Conducted Emission	Pass
FCC 15.109	Radiated Emission	Pass

3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the Product as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

Test item	Value (dB)
Conducted Emission (150kHz-30MHz)	3.20
Radiated Emission(30MHz~1GHz)	4.80
Radiated Emission(1GHz~18GHz)	4.90

4. RODUCT INFORMATION AND TEST SETUP

4.1 Product Information

Model/Type reference: F800

Model differences: N/A

GPS: Support

Hardware Version: N/A

Software Version: N/A

Operation Frequency: GPS: 1.57542GHz

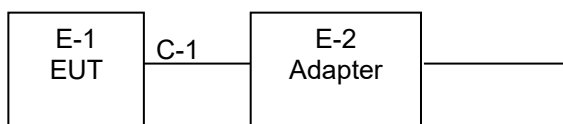
Antenna Type: Internal antenna

Ratings: DC 5V From Adapter, Output: DC3.7V From Battery

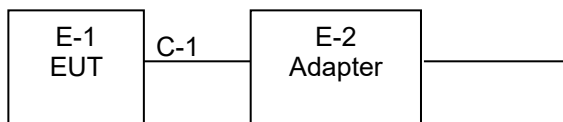
4.2 Test Setup Configuration

See test photographs attached in *EUT TEST SETUP PHOTOGRAPHS* for the actual connections between Product and support equipment.

Conducted Emission:



Radiated Spurious Emission



4.3 Support Equipment

No.	Device Type	Brand	Model	Series No.	Data Cable	Power Cord
1.	Adapter	N/A	BCTC001	N/A	Auxiliary	Adapter

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	0.5M	DC cable unshielded

Notes:

- All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.4 Test Mode

Test item	Test Mode	Test Voltage
Conducted Emissions	Charging	AC 120V/60Hz
Radiated mission	Charging	AC 120V/60Hz
Radiated mission	GPS	DC 3.7V

5. TEST FACILITY AND TEST INSTRUMENT USED

5.1 Test Facility

All measurement facilities used to collect the measurement data are located at BCTC Building & 1-2F, East of B Building, Pengzhou Industrial, Fuyuan 1st Road, Qiaotou Community, Fuyong Street, Bao'an District, Shenzhen, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

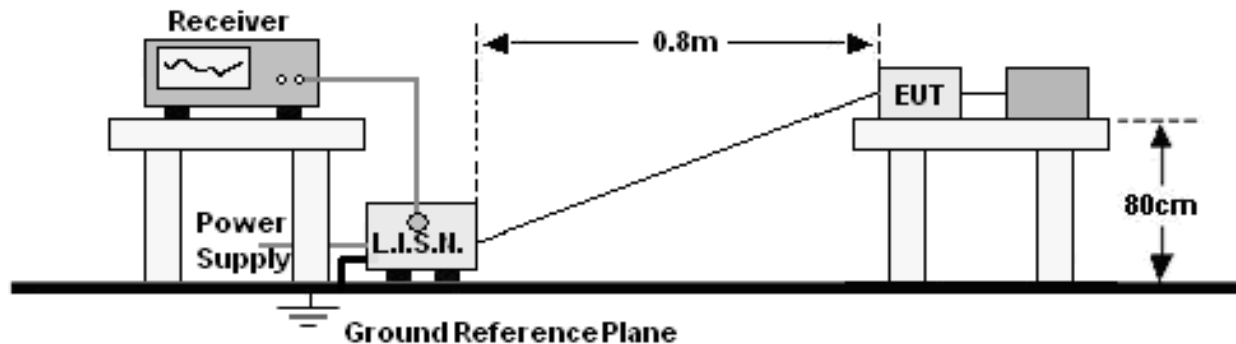
5.2 Test Instrument Used

Radiated Emissions Test (966 Chamber#01)					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
966 chamber	ChengYu	966 Room	966	Jun. 06. 2020	Jun. 05, 2023
Receiver	R&S	ESRP	101154	May 28, 2021	May 27, 2022
Receiver	R&S	ESR3	102075	May 28, 2021	May 27, 2022
Amplifier	SKET	LAPA_01G18 G-45dB	\	May 28, 2021	May 27, 2022
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 28, 2021	May 27, 2022
TRILOG Broadband Antenna	schwarzbeck	VULB9163	942	Jun. 01, 2021	May 31, 2022
Horn Antenna	schwarzbeck	BBHA9120D	1541	Jun. 02, 2021	Jun. 01, 2022
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

Conducted Emissions Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR3	102075	May 28, 2021	May 27, 2022
LISN	R&S	ENV216	101375	May 28, 2021	May 27, 2022
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\
Attenuator	\	10dB DC-6GHz	1650	May 28, 2021	May 27, 2022

6. CONDUCTED EMISSIONS

6.1 Block Diagram Of Test Setup



6.2 Limit

Limits for Conducted emissions at the mains ports of Class B MME

Frequency range (MHz)	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56*	56 to 46*
0,50 to 5	56	46
5 to 30	60	50

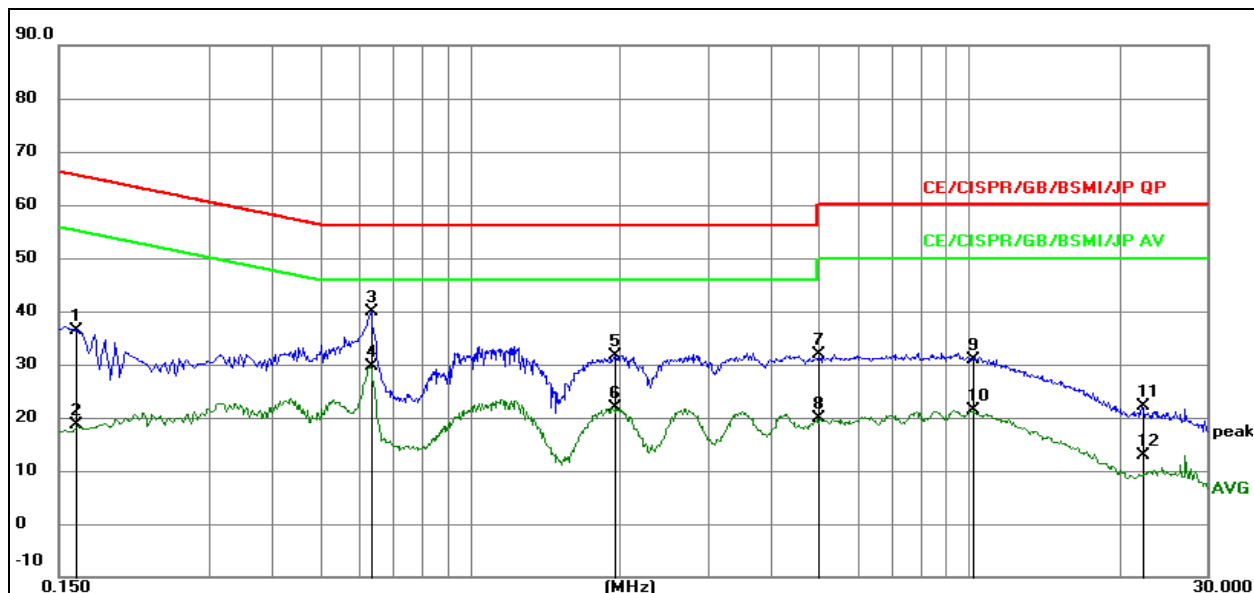
Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

6.3 Test procedure

- The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
- The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak and AVG detector in Max Hold mode. Run the receiver's pre-scan to record the maximum disturbance generated from Product in all power lines in the full band.
- For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Phase :	Line
Test Mode:	Charging	Remark:	N/A

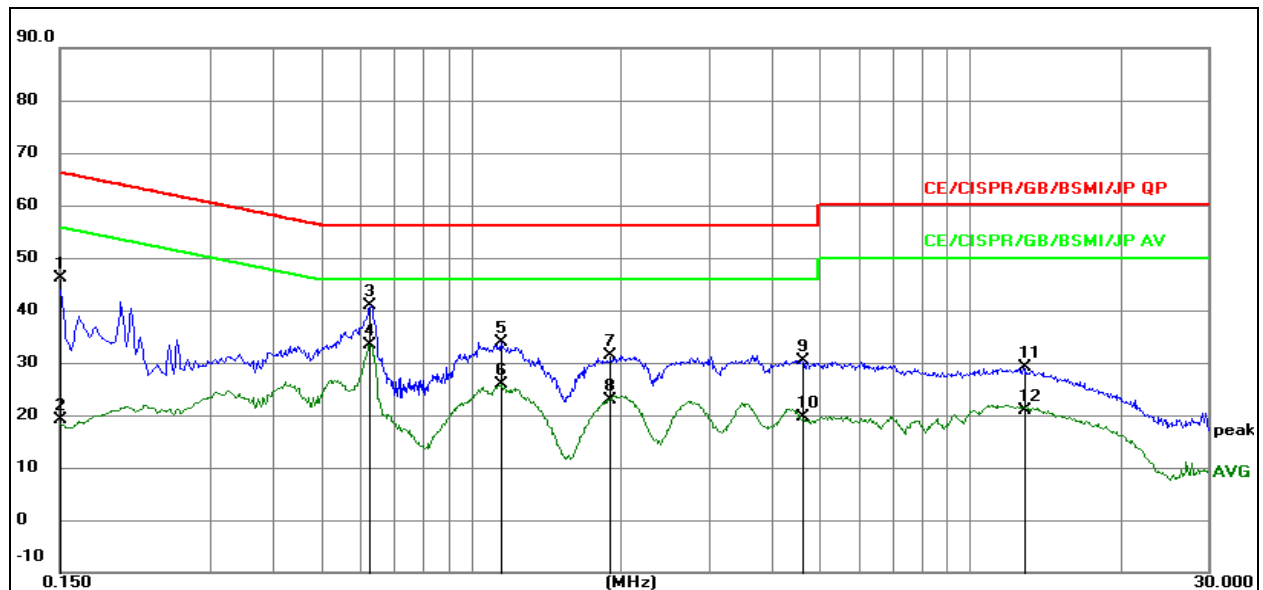


Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement=Reading Level+ Correct Factor
4. Over=Measurement-Limit

No.	Mk.	Freq. MHz	Reading Level dB	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.1624	16.82	19.60	36.42	65.34	-28.92	QP
2		0.1624	-0.87	19.60	18.73	55.34	-36.61	AVG
3	*	0.6305	20.16	19.61	39.77	56.00	-16.23	QP
4		0.6305	9.95	19.61	29.56	46.00	-16.44	AVG
5		1.9489	12.11	19.62	31.73	56.00	-24.27	QP
6		1.9489	2.24	19.62	21.86	46.00	-24.14	AVG
7		4.9782	12.06	19.70	31.76	56.00	-24.24	QP
8		4.9782	0.28	19.70	19.98	46.00	-26.02	AVG
9		10.1791	11.06	19.79	30.85	60.00	-29.15	QP
10		10.1791	1.60	19.79	21.39	50.00	-28.61	AVG
11		22.1801	2.27	19.74	22.01	60.00	-37.99	QP
12		22.1801	-6.96	19.74	12.78	50.00	-37.22	AVG

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101KPa	Phase :	N
Test Mode:	Charging	Remark:	N/A



Remark:

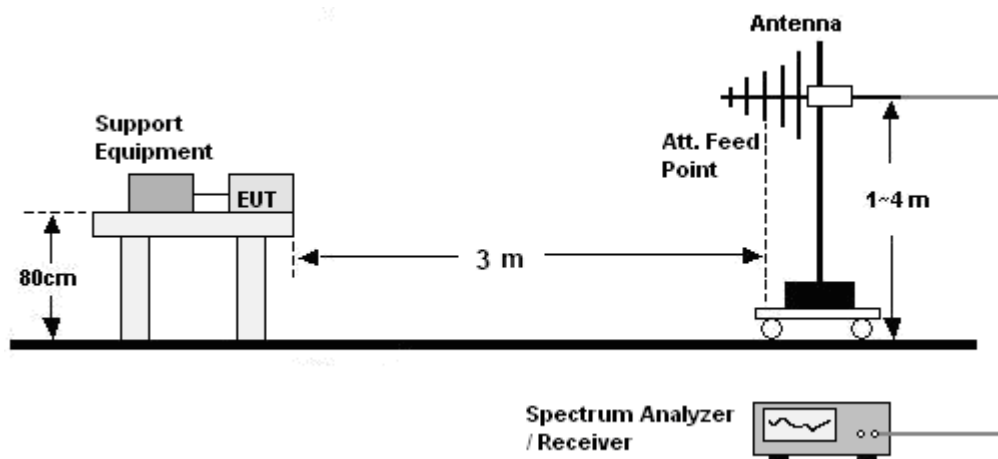
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement=Reading Level+ Correct Factor
4. Over=Measurement-Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Detector
		MHz		dB	dBuV	dBuV	dB	
1		0.1500	26.42	19.60	46.02	66.00	-19.98	QP
2		0.1500	-0.49	19.60	19.11	56.00	-36.89	AVG
3		0.6270	21.36	19.61	40.97	56.00	-15.03	QP
4	*	0.6270	13.71	19.61	33.32	46.00	-12.68	AVG
5		1.1490	14.25	19.62	33.87	56.00	-22.13	QP
6		1.1490	6.30	19.62	25.92	46.00	-20.08	AVG
7		1.8960	11.72	19.62	31.34	56.00	-24.66	QP
8		1.8960	3.31	19.62	22.93	46.00	-23.07	AVG
9		4.6050	10.71	19.69	30.40	56.00	-25.60	QP
10		4.6050	0.05	19.69	19.74	46.00	-26.26	AVG
11		12.7995	9.43	19.78	29.21	60.00	-30.79	QP
12		12.7995	1.01	19.78	20.79	50.00	-29.21	AVG

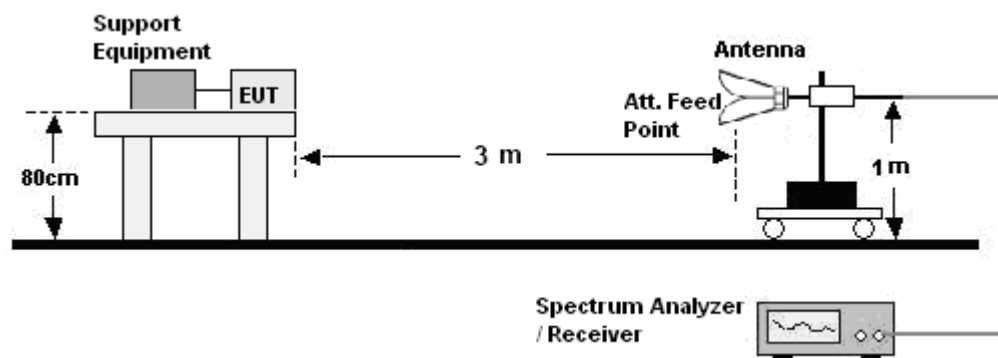
7. RADIATION EMISSION TEST

7.1 Block Diagram Of Test Setup

30MHz ~ 1GHz:



Above 1GHz:



7.2 Limit

Limits for Class B devices

Frequency (MHz)	limits at 3m dB(μV/m)		
	QP Detector	PK Detector	AV Detector
30-88	40.0	--	--
88-216	43.5	--	--
216-960	46.0	--	--
960 to 1000	54.0	--	--
Above 1000	--	74.0	54.0

Note: The lower limit shall apply at the transition frequencies.

7.3 Test Procedure

30MHz ~ 1GHz:

- a. The Product was placed on the nonconductive turntable 0.8 m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 120 kHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to QP Detector and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Above 1GHz:

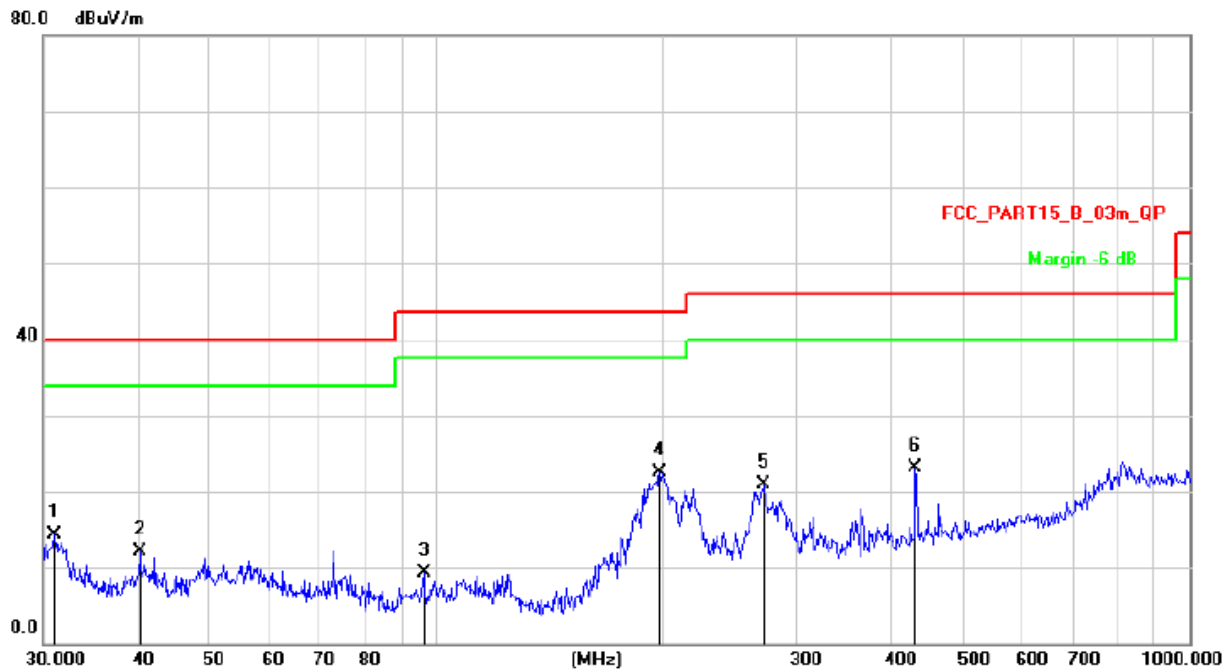
- a. The Product was placed on the non-conductive turntable 0.8m above the ground at a chamber.
- b. Set the spectrum analyzer/receiver in Peak detector, Max Hold mode, and 1MHz RBW. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.
- c. For each frequency whose maximum record was higher or close to limit, measure its AV value: rotate the turntable from 0 to 360 degrees to find the degree where Product radiated the maximum emission, then set the test frequency analyzer/receiver to AV value and specified bandwidth with Maximum Hold Mode, and record the maximum value.

Remark:

The highest frequency of the internal sources of the EUT is 8GHz, so the measurement shall to 40 GHz.

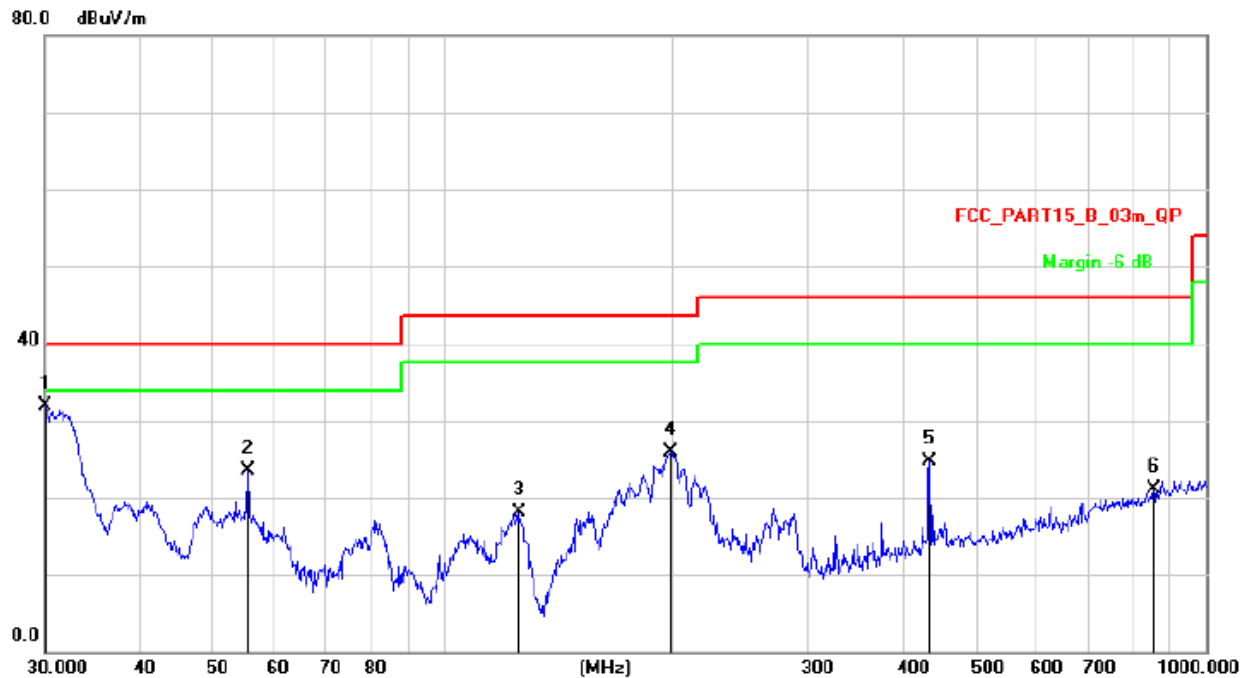
7.4 Test Result

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Horizontal
Test Voltage :	AC 120V/60Hz	Test Mode:	Charging



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		31.0706	31.34	-17.08	14.26	40.00	-25.74	QP
2		40.2757	27.41	-15.39	12.02	40.00	-27.98	QP
3		96.0986	26.31	-16.99	9.32	43.50	-34.18	QP
4	*	197.8928	38.96	-16.43	22.53	43.50	-20.97	QP
5		272.2776	35.46	-14.46	21.00	46.00	-25.00	QP
6		432.5457	33.51	-10.36	23.15	46.00	-22.85	QP

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Vertical
Test Voltage :	AC 120V/60Hz	Test Mode:	Charging

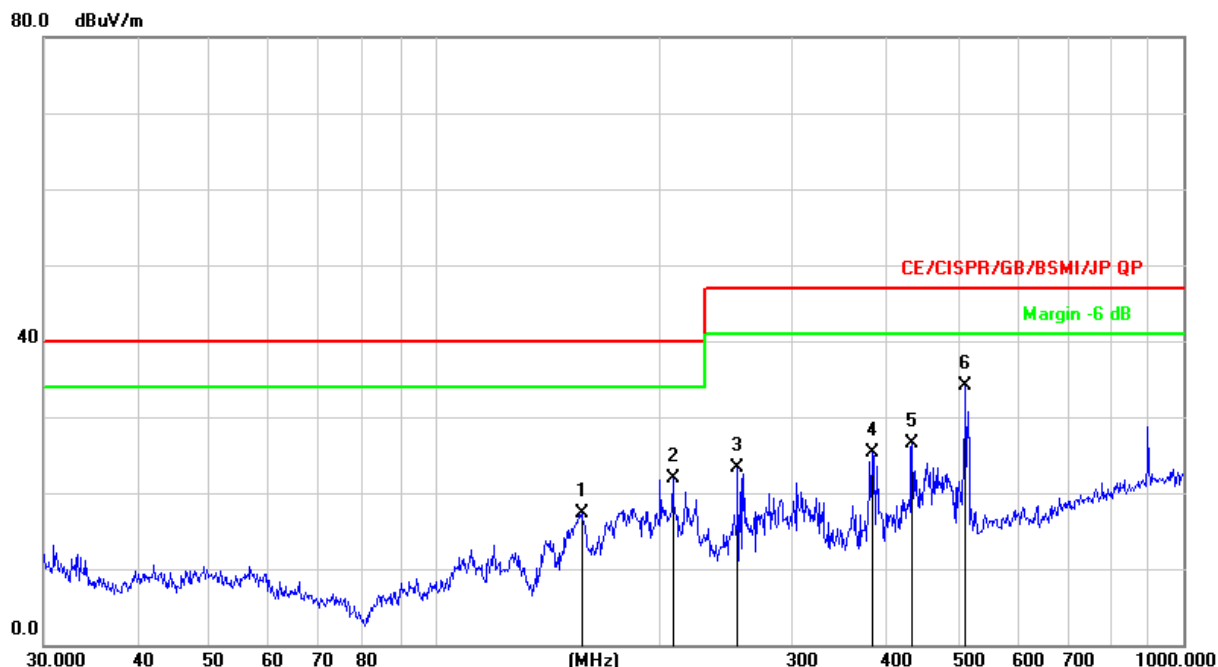


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	
		MHz	Level	Factor	ment			Detector
			dBuV	dB	dBuV/m	dB/m	dB	
1	*	30.1053	49.17	-17.26	31.91	40.00	-8.09	QP
2		55.4147	38.96	-15.42	23.54	40.00	-16.46	QP
3		125.8863	35.97	-17.95	18.02	43.50	-25.48	QP
4		198.5879	42.38	-16.39	25.99	43.50	-17.51	QP
5		434.0650	35.06	-10.33	24.73	46.00	-21.27	QP
6		854.0247	23.51	-2.44	21.07	46.00	-24.93	QP

Remark:

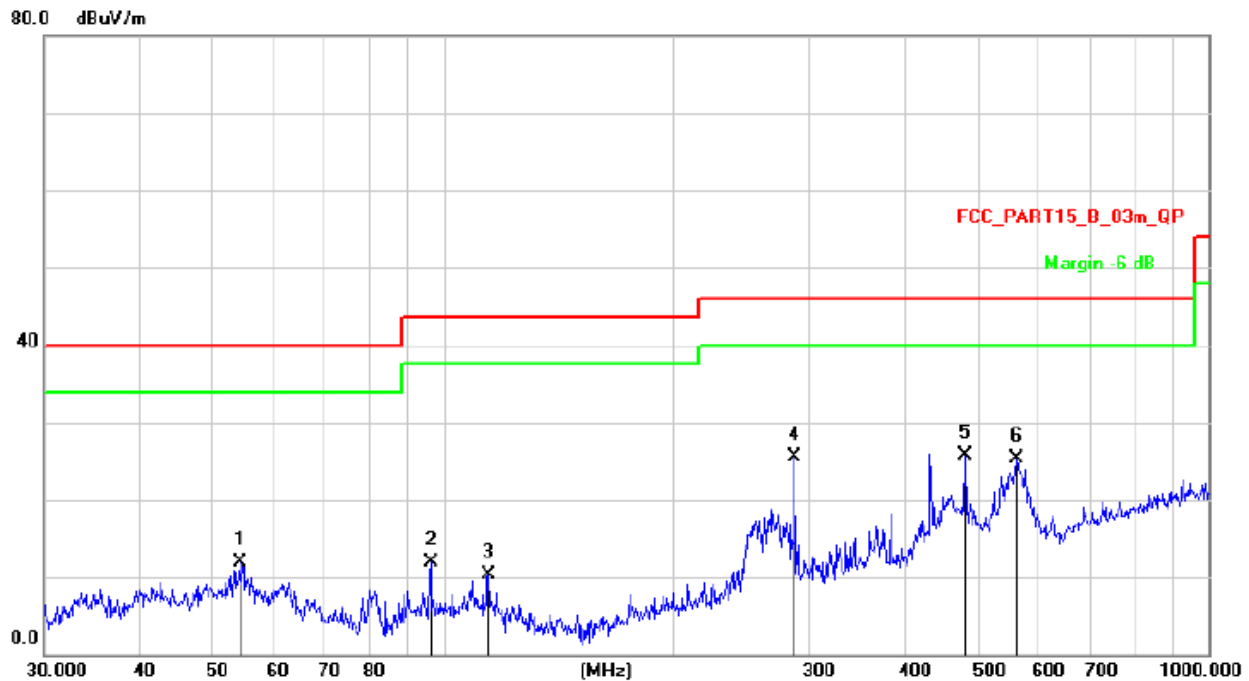
Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Horizontal
Test Voltage :	DC 3.7V	Test Mode:	GPS



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		157.0074	36.39	-19.05	17.34	40.00	-22.66	QP
2		207.8501	37.99	-16.12	21.87	40.00	-18.13	QP
3		253.8367	38.33	-15.03	23.30	47.00	-23.70	QP
4		383.9318	36.72	-11.46	25.26	47.00	-21.74	QP
5		434.0651	36.77	-10.33	26.44	47.00	-20.56	QP
6	*	511.8352	42.71	-8.64	34.07	47.00	-12.93	QP

Temperature:	26 °C	Relative Humidity:	54%
Pressure:	101kPa	Phase :	Vertical
Test Voltage :	DC 3.7V	Test Mode:	GPS



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		54.0711	27.28	-15.28	12.00	40.00	-28.00	QP
2		96.0986	28.99	-16.99	12.00	43.50	-31.50	QP
3		114.5146	27.42	-17.21	10.21	43.50	-33.29	QP
4		287.9904	39.44	-13.97	25.47	46.00	-20.53	QP
5	*	480.5276	35.01	-9.34	25.67	46.00	-20.33	QP
6		560.6928	32.73	-7.43	25.30	46.00	-20.70	QP

Remark:

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Above 1GHz:

Polar (H/V)	Frequency (GHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure- ment (dBuV/m)	Limits (dBuV/ m)	Over (dB)	Detector Type
V	1.128	63.2	-14.94	48.26	74.00	-25.74	PK
V	1.192	62.9	-14.86	48.04	74.00	-25.96	PK
V	1.237	63.6	-14.59	49.01	74.00	-24.99	PK
V	2.565	64.1	-13.83	50.27	74.00	-23.73	PK
V	3.878	59.5	-10.17	49.33	74.00	-24.67	PK
V	5.281	59.4	-6.10	53.30	74.00	-20.70	PK
H	1.069	62.6	-14.97	47.63	74.00	-26.37	PK
H	1.332	61.0	-14.26	46.74	74.00	-27.26	PK
H	1.737	62.2	-12.85	49.35	74.00	-24.65	PK
H	2.340	61.5	-13.04	48.46	74.00	-25.54	PK
H	4.563	58.8	-7.16	51.64	74.00	-22.36	PK
H	6.868	53.2	-2.08	51.12	74.00	-22.88	PK

1. Emission Level = Meter Reading + Factor,

Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Over= Emission Level - Limit

2. Note: PK value is lower than the Average value limit, So average didn't record.

The amplitude of emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

8. EUT PHOTOGRAPHS

EUT Photo 1



EUT Photo 2

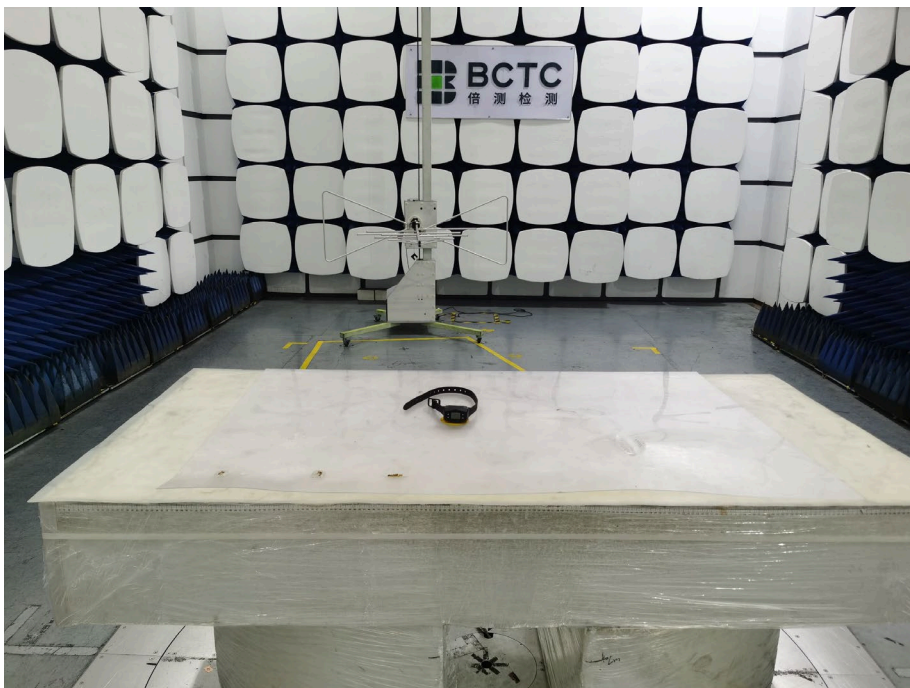


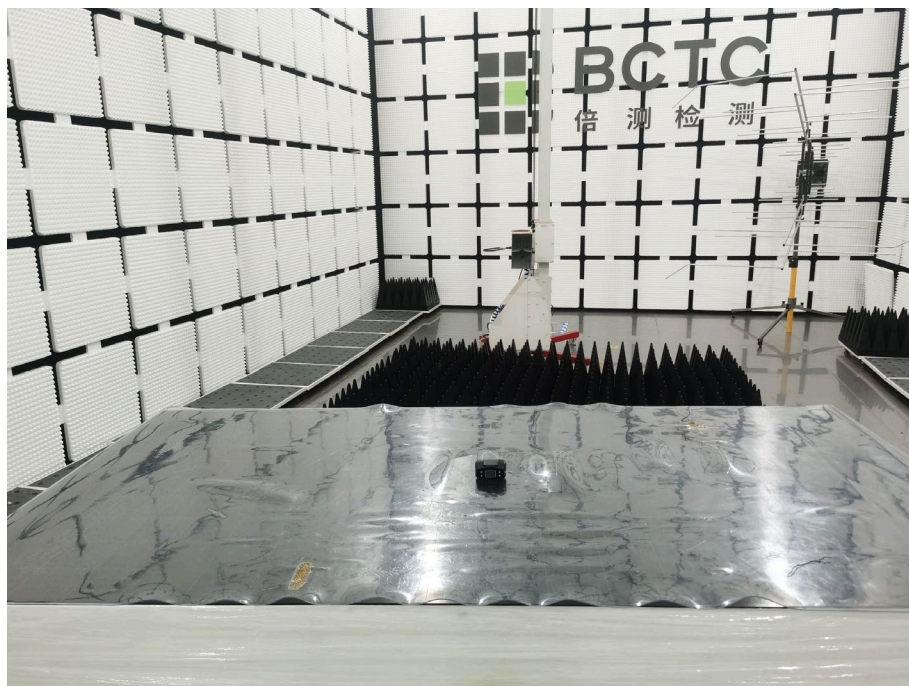
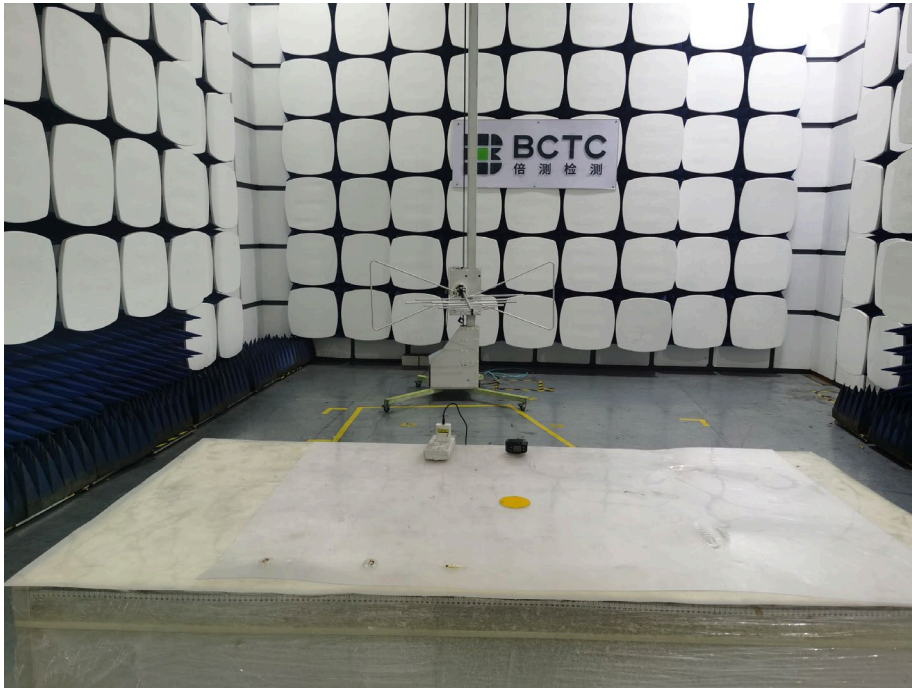
9. EUT TEST SETUP PHOTOGRAPHS

Conducted emissions



Radiated emission





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