

TEST REPORT

Report No.: BCTC2411670995E

Applicant: Shenzhen Wellturn Technology Co., Ltd

Product Name: GPS Outdoor Wireless Dog Fence System

Test Model: F830 PLUS

Tested Date: 2024-11-20 to 2024-11-26

Issued Date: 2024-11-26

Shenzhen BCTC Testing Co., Ltd.



FCC ID: 2ATOX-F830PLUS

Product Name: GPS Outdoor Wireless Dog Fence System

Trademark: N/A

Model/Type Reference: F830 PLUS
F830

Prepared For: Shenzhen Wellturn Technology Co., Ltd

Address: Room 606, Building F, Lvkai Zhihui Park, Liuxian 2nd Road, 71 District, Xin'an Street, Bao'an District, Shenzhen City, China

Manufacturer: Shenzhen Wellturn Technology Co., Ltd

Address: Room 606, Building F, Lvkai Zhihui Park, Liuxian 2nd Road, 71 District, Xin'an Street, Bao'an District, Shenzhen City, China

Prepared By: Shenzhen BCTC Testing Co., Ltd.

Address: 1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

Sample Received Date: 2024-11-20

Sample Tested Date: 2024-11-20 to 2024-11-26

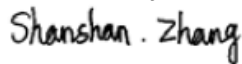
Issue Date: 2024-11-26

Report No.: BCTC2411670995E

Test Standards: 47 CFR FCC Part 15 Subpart B

Test Results: PASS

Tested by:



Shanshan. Zhang / Project Handler

Approved by:



Zero Zhou/Reviewer

The test report is effective only with both signature and specialized stamp. This result(s) shown in this report refer only to the sample(s) tested. Without written approval of Shenzhen BCTC Testing Co., Ltd, this report can't be reproduced except in full. The tested sample(s) and the sample information are provided by the client.

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(Note: N/A means not applicable)

1. Version

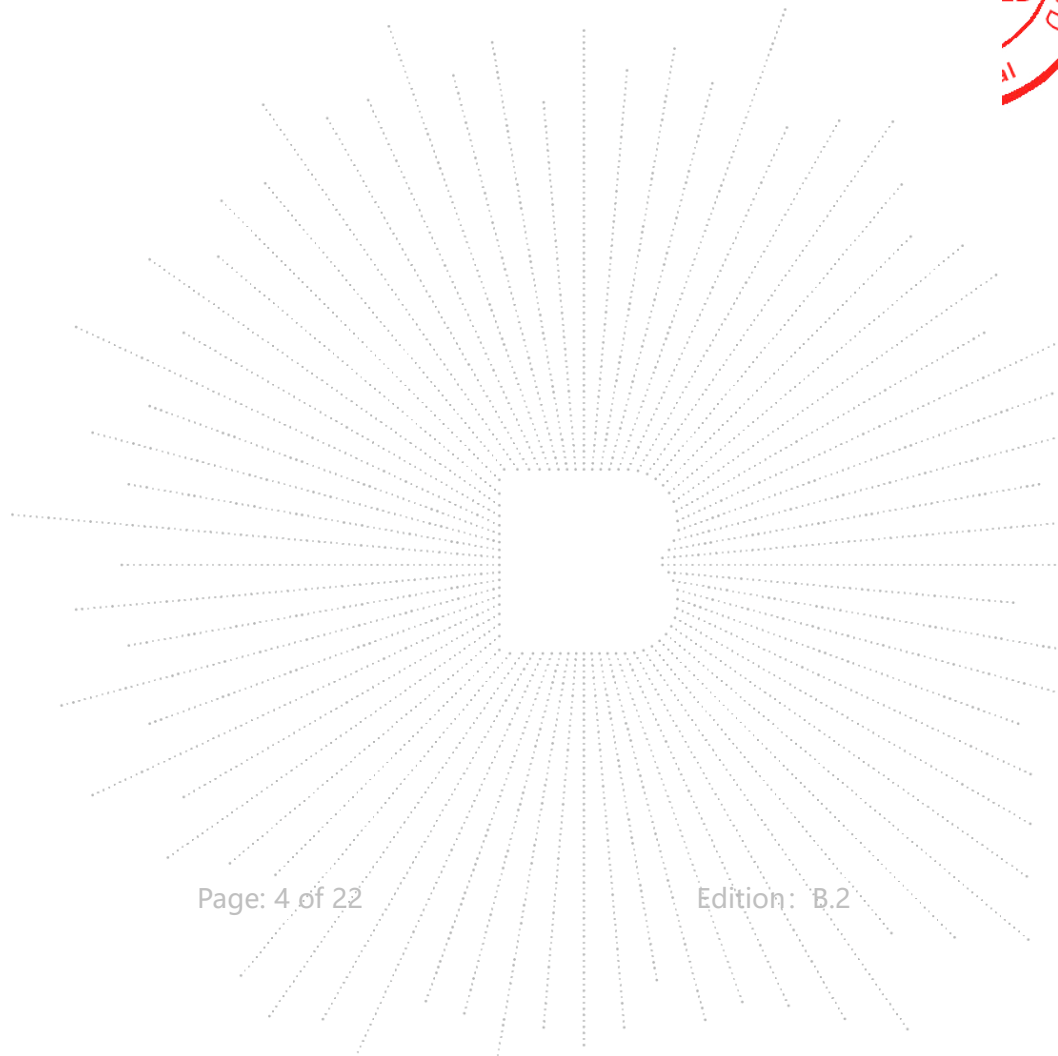
Report No.	Issue Date	Description	Approved
BCTC2411670995E	2024-11-26	Original	Valid

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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

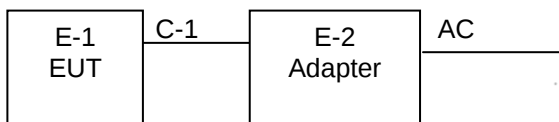
4. Roduct Information And Test Setup

4.1 Product Information

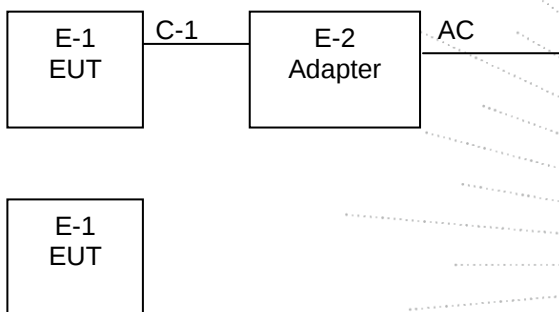
Model/Type Reference:	F830 PLUS F830
Model Differences:	All the model are the same circuit and RF module, except model names and appearance of the color.
GPS:	Support (Test receive only)
Hardware Version:	N/A
Software Version:	N/A
Operation Frequency:	GPS: 1.57542GHz
Antenna Type:	GPS: Internal antenna GPS: 0 dBi
Antenna Gain:	Remark: ☒ The antenna gain of the product comes from the antenna report provided by the customer, and the test data is affected by the customer information. ☐ The antenna gain of the product is provided by the customer, and the test data is affected by the customer information.
Ratings:	DC 5V from adapter or DC 3.7V 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.	Note
1.	Adapter	Hoco.	N18	---	---

Item	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	0.8m	DC cable unshielded

Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. 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 Emissions	Charging	AC 120V/60Hz
	GPS Working	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 Shenzhen BCTC Testing Co., Ltd. Address:1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4 and CISPR 16-1-1 other equivalent standards.

FCC Test Firm Registration Number: 712850

A2LA certificate registration number is: CN1212

ISED Registered No.: 23583

ISED CAB identifier: CN0017

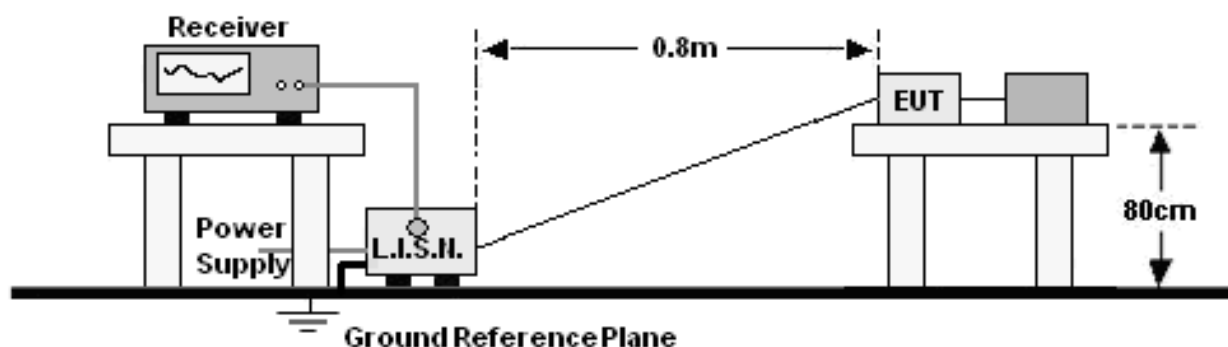
5.2 Test Instrument Used

Conducted Emissions Test					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025
LISN	R&S	ENV216	101375	May 16, 2024	May 15, 2025
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\
Pulse limiter	Schwarzbeck	VTSD9561-F	01323	May 16, 2024	May 15, 2025

Radiated Emissions Test (966 Chamber01)					
Equipment	Manufacturer	Model#	Serial#	Last Cal.	Next Cal.
966 chamber	ChengYu	966 Room	966	May 16, 2024	May 15, 2025
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025
Receiver	R&S	ESRP	101154	May 16, 2024	May 15, 2025
Amplifier	Schwarzbeck	BBV9744	9744-0037	May 16, 2024	May 15, 2025
TRILOG Broadband Antenna	Schwarzbeck	VULB9163	942	May 21, 2024	May 20, 2025
Loop Antenna(9KHz-30MHz)	Schwarzbeck	FMZB1519B	00014	May 21, 2024	May 20, 2025
Amplifier	SKET	LAPA_01G18 G-45dB	SK2021040901	May 16, 2024	May 15, 2025
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 21, 2024	May 20, 2025
Amplifier(18G Hz-40GHz)	MITEQ	TTA1840-35-HG	2034381	May 16, 2024	May 15, 2025
Horn Antenna(18G Hz-40GHz)	Schwarzbeck	BBHA9170	00822	May 21, 2024	May 20, 2025
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	100363	May 16, 2024	May 15, 2025
Software	Frad	EZ-EMC	FA-03A2 RE	\	\

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(μV)	
	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

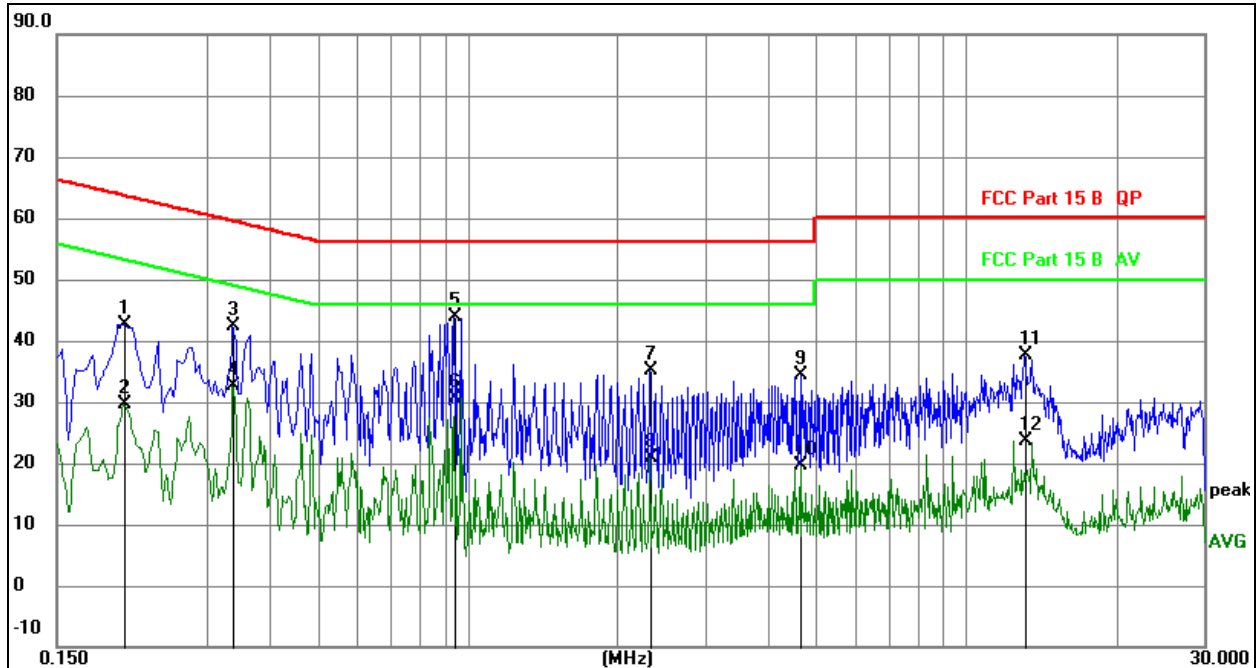
Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

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%RH
Pressure:	101KPa	Phase :	Line
Test Mode:	Charging	Test Voltage:	AC 120V/60Hz

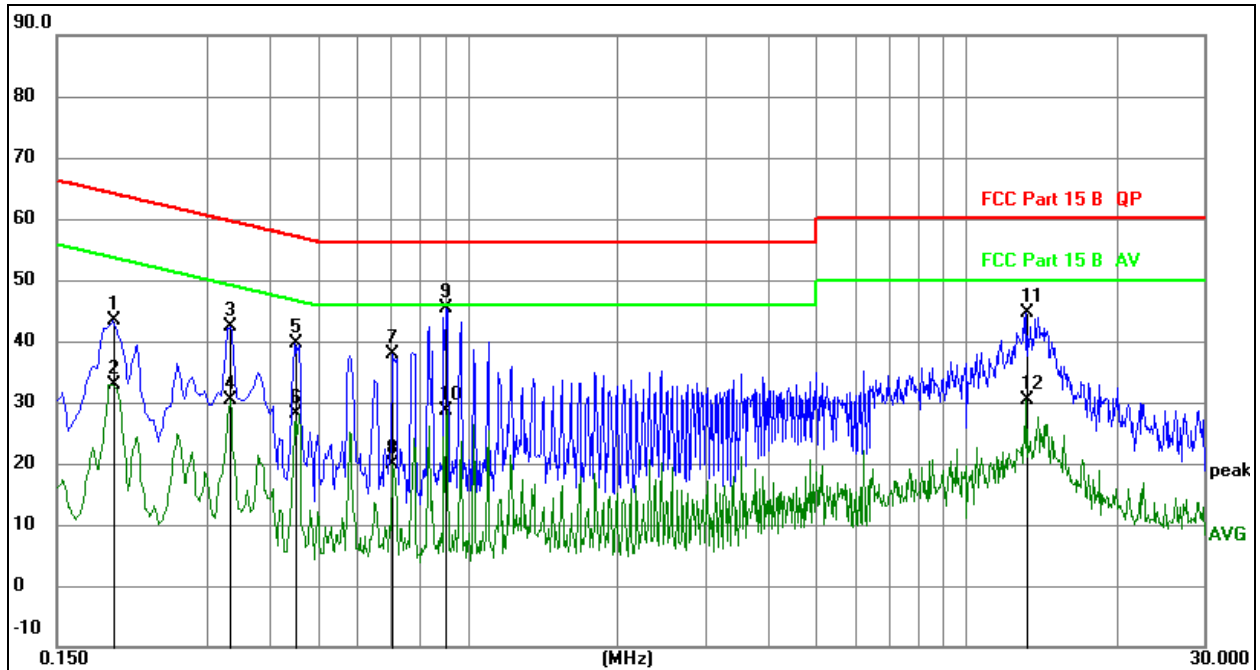


Remark:

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	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1		0.2040	22.62	20.07	42.69	63.45	-20.76	QP
2		0.2040	9.58	20.07	29.65	53.45	-23.80	AVG
3		0.3390	22.34	20.07	42.41	59.23	-16.82	QP
4		0.3390	12.62	20.07	32.69	49.23	-16.54	AVG
5	*	0.9420	23.78	20.09	43.87	56.00	-12.13	QP
6		0.9420	10.63	20.09	30.72	46.00	-15.28	AVG
7		2.3280	14.94	20.11	35.05	56.00	-20.95	QP
8		2.3280	0.65	20.11	20.76	46.00	-25.24	AVG
9		4.6545	14.19	20.14	34.33	56.00	-21.67	QP
10		4.6545	-0.58	20.14	19.56	46.00	-26.44	AVG
11		13.0785	17.30	20.26	37.56	60.00	-22.44	QP
12		13.0785	3.38	20.26	23.64	50.00	-26.36	AVG

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


Remark:

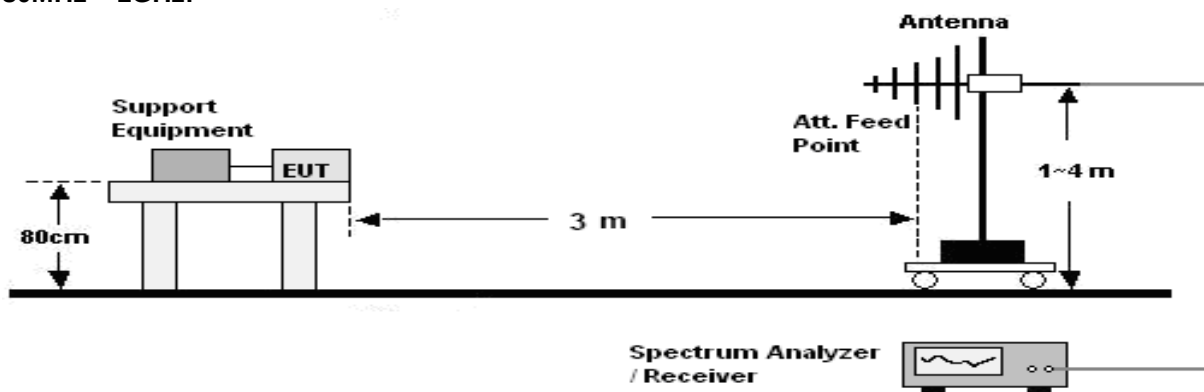
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement=Reading Level+ Correct Factor
4. Over=Measurement-Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1945	23.36	20.07	43.43	63.84	-20.41	QP
2		0.1945	12.80	20.07	32.87	53.84	-20.97	AVG
3		0.3338	22.39	20.07	42.46	59.36	-16.90	QP
4		0.3338	10.33	20.07	30.40	49.36	-18.96	AVG
5		0.4492	19.64	20.08	39.72	56.89	-17.17	QP
6		0.4492	7.97	20.08	28.05	46.89	-18.84	AVG
7		0.7047	17.88	20.09	37.97	56.00	-18.03	QP
8		0.7047	-0.12	20.09	19.97	46.00	-26.03	AVG
9	*	0.9039	25.35	20.09	45.44	56.00	-10.56	QP
10		0.9039	8.60	20.09	28.69	46.00	-17.31	AVG
11		13.1966	24.32	20.26	44.58	60.00	-15.42	QP
12		13.1966	10.04	20.26	30.30	50.00	-19.70	AVG

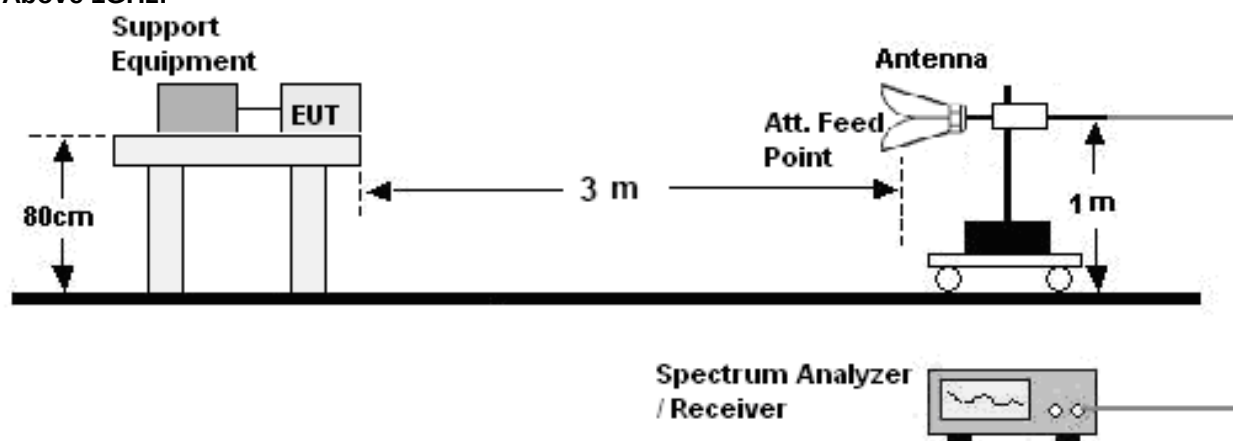
7. Radiation Emission Test

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:

- The Product was placed on the nonconductive turntable 0.8 m above the ground at a chamber.
- 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.
- 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:

- The Product was placed on the non-conductive turntable 0.8m above the ground at a chamber.
- 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.
- 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:

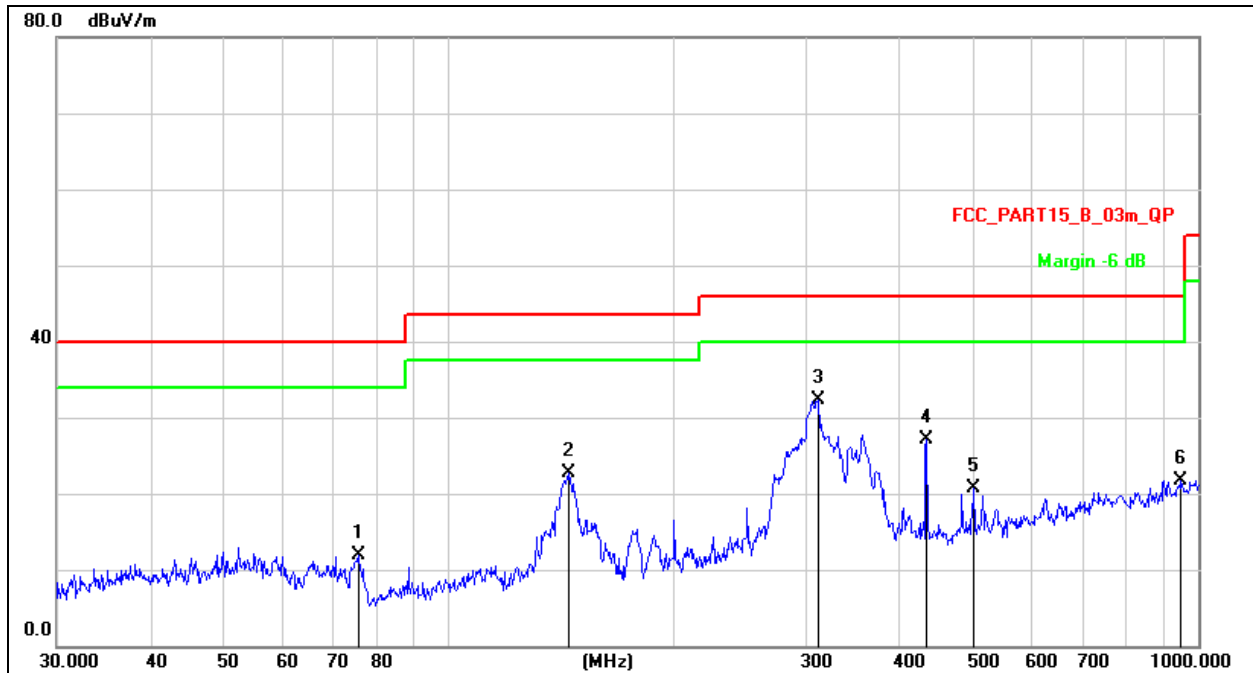
The highest frequency of the internal sources of the EUT is 1.57542GHz, so the measurement shall to 8 GHz.



7.4 Test Result

30MHz ~ 1GHz

Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Charging(Worst mode)	Test Voltage:	AC 120V/60Hz



Remark:

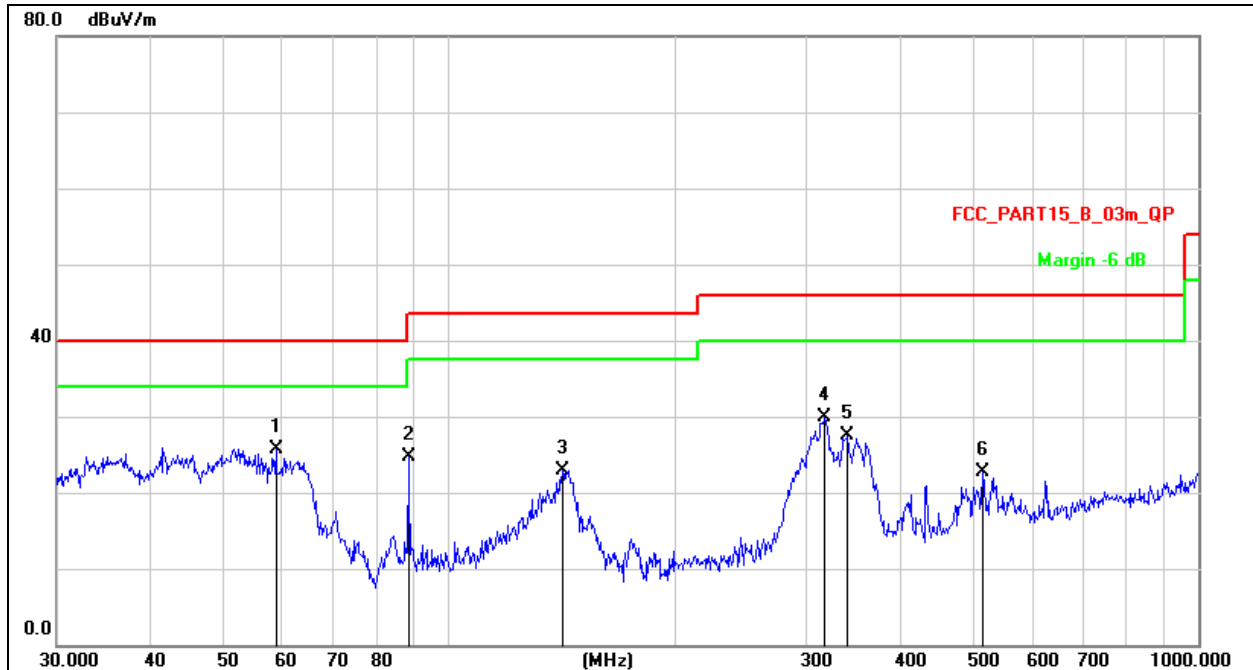
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

2. Measurement = Reading Level + Correct Factor

3. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		75.7114	30.99	-19.00	11.99	40.00	-28.01	QP
2		144.3348	41.69	-19.03	22.66	43.50	-20.84	QP
3	*	311.0867	45.13	-12.85	32.28	46.00	-13.72	QP
4		434.0651	37.24	-10.17	27.07	46.00	-18.93	QP
5		501.1790	29.35	-8.65	20.70	46.00	-25.30	QP
6		948.7610	24.71	-2.94	21.77	46.00	-24.23	QP

Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Charging(Worst mode)	Test Voltage:	AC 120V/60Hz



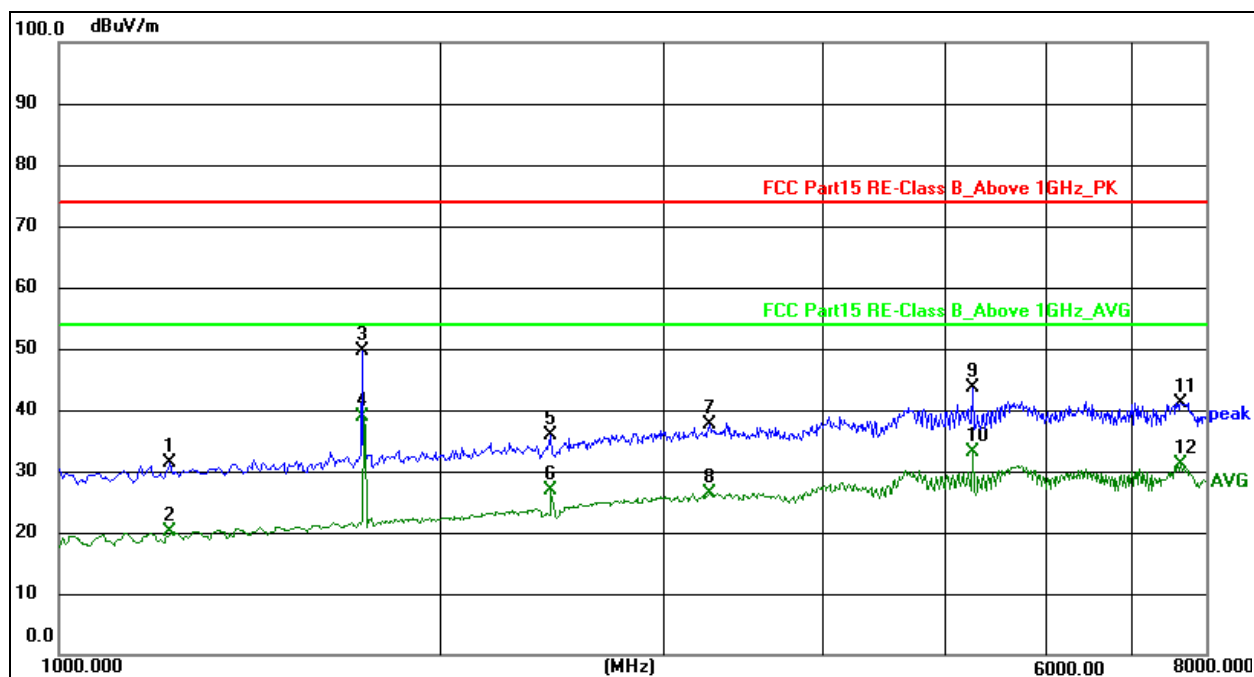
Remark:

1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement = Reading Level + Correct Factor
3. Over = Measurement - Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	58.8185	40.85	-15.09	25.76	40.00	-14.24	QP
2		88.3421	42.41	-17.79	24.62	43.50	-18.88	QP
3		141.8262	41.79	-18.86	22.93	43.50	-20.57	QP
4		317.7010	42.62	-12.62	30.00	46.00	-16.00	QP
5		340.7817	39.22	-11.80	27.42	46.00	-18.58	QP
6		515.4374	31.90	-9.16	22.74	46.00	-23.26	QP

Above 1GHz:

Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	GPS Working(Worst mode)	Test Voltage:	DC 3.7V



Remark:

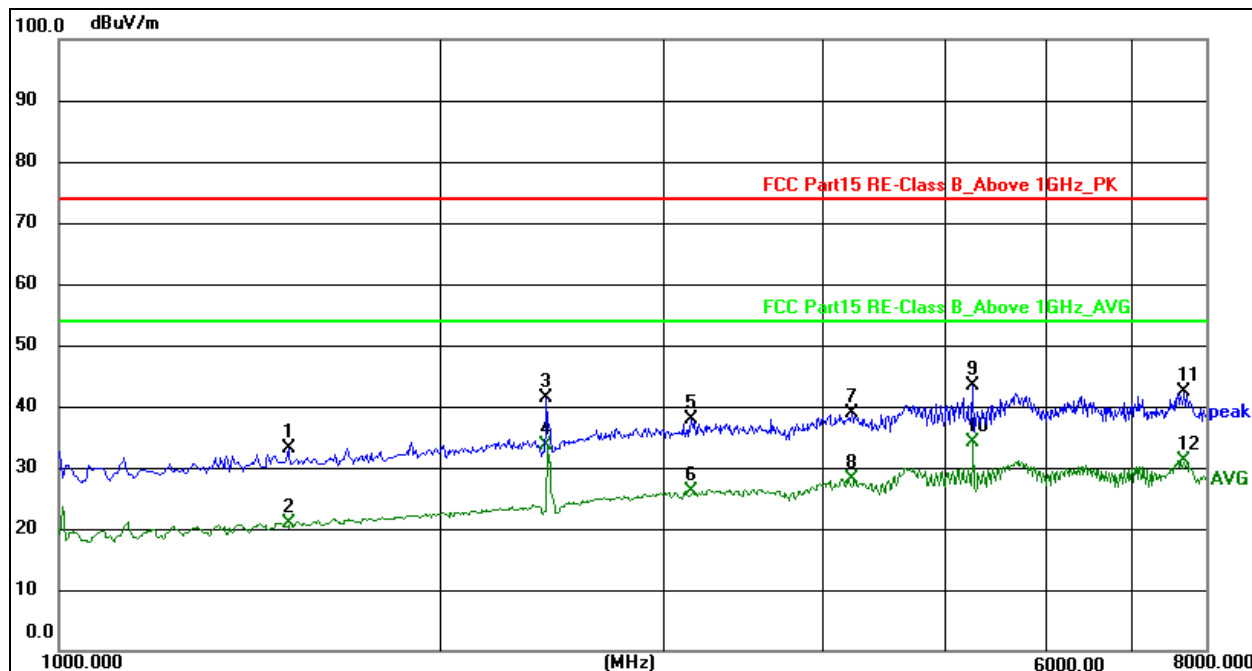
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

2. Measurement = Reading Level + Correct Factor

3. Over = Measurement - Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1224.000	59.91	-28.55	31.36	74.00	-42.64	peak
2	1224.000	48.79	-28.55	20.24	54.00	-33.76	AVG
3	1735.000	76.65	-26.92	49.73	74.00	-24.27	peak
4 *	1735.000	65.88	-26.92	38.96	54.00	-15.04	AVG
5	2442.000	60.69	-24.80	35.89	74.00	-38.11	peak
6	2442.000	51.75	-24.80	26.95	54.00	-27.05	AVG
7	3254.000	60.26	-22.75	37.51	74.00	-36.49	peak
8	3254.000	49.09	-22.75	26.34	54.00	-27.66	AVG
9	5242.000	62.73	-19.19	43.54	74.00	-30.46	peak
10	5242.000	52.37	-19.19	33.18	54.00	-20.82	AVG
11	7650.000	41.21	-20.11	41.10	74.00	-52.90	peak
12	7650.000	31.04	-20.11	30.93	54.00	-43.07	AVG

Temperature:	26 °C	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	GPS Working(Worst mode)	Test Voltage:	DC 3.7V



Remark:

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

2. Measurement = Reading Level + Correct Factor

3. Over = Measurement - Limit

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	1518.000	60.83	-27.61	33.22	74.00	-40.78	peak
2	1518.000	48.51	-27.61	20.90	54.00	-33.10	AVG
3	2421.000	66.15	-24.86	41.29	74.00	-32.71	peak
4	2421.000	58.39	-24.86	33.53	54.00	-20.47	AVG
5	3149.000	60.72	-22.93	37.79	74.00	-36.21	peak
6	3149.000	48.96	-22.93	26.03	54.00	-27.97	AVG
7	4213.000	59.96	-21.06	38.90	74.00	-35.10	peak
8	4213.000	49.21	-21.06	28.15	54.00	-25.85	AVG
9	5242.000	62.63	-19.19	43.44	74.00	-30.56	peak
10 *	5242.000	53.23	-19.19	34.04	54.00	-19.96	AVG
11	7692.000	42.46	-20.12	42.34	74.00	-51.66	peak
12	7692.000	31.01	-20.12	30.89	54.00	-43.11	AVG

8. EUT Photographs

EUT Photo 1



EUT Photo 2



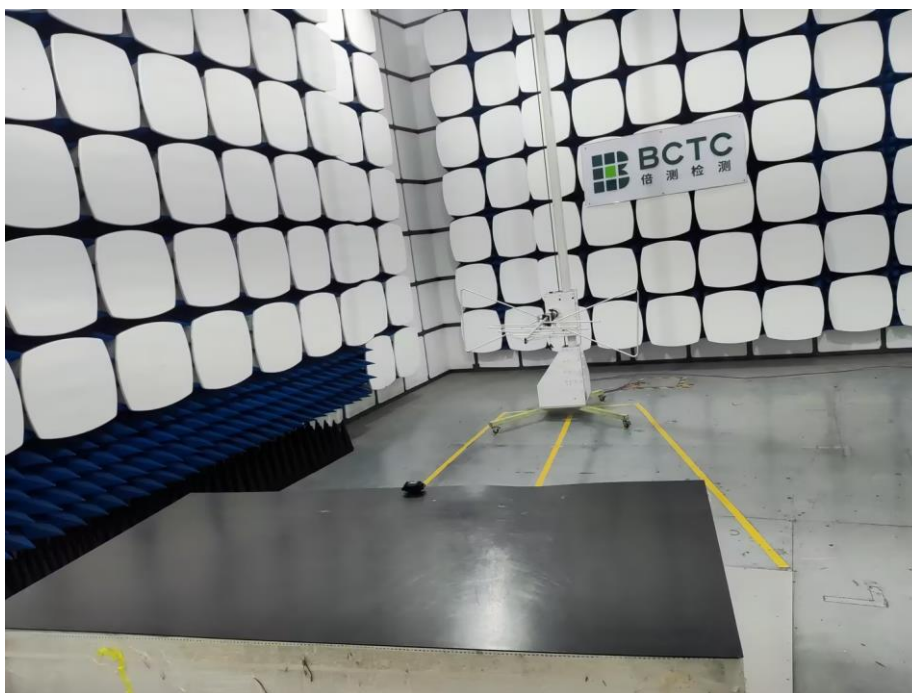
NOTE: Appendix-Photographs Of EUT Constructional Details

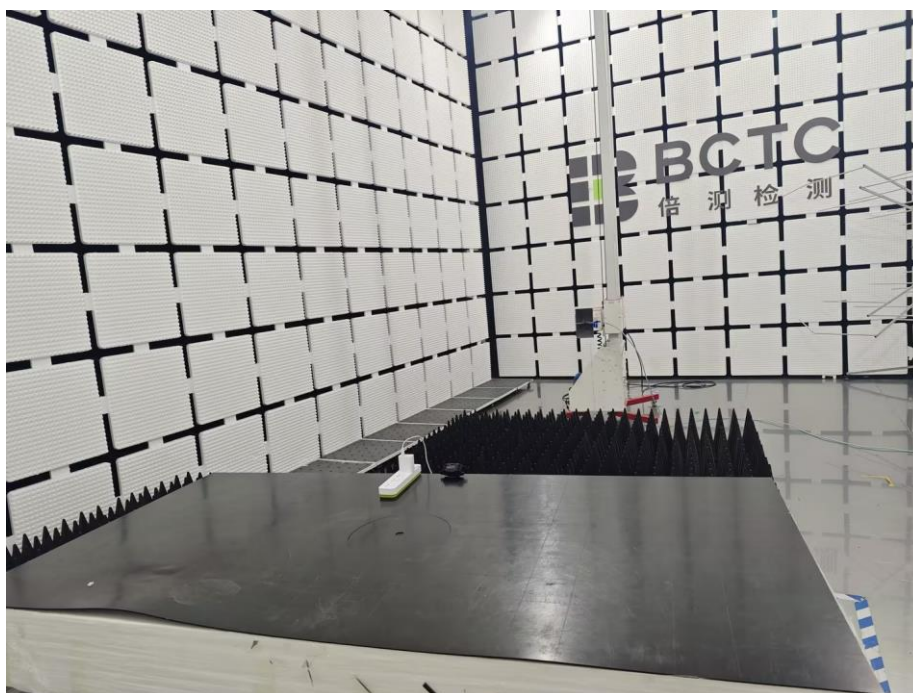
9. EUT Test Setup Photographs

Conducted emissions



Radiated emission





STATEMENT

1. The equipment lists are traceable to the national reference standards.
2. The test report can not be partially copied unless prior written approval is issued from our lab.
3. The test report is invalid without the "special seal for inspection and testing".
4. The test report is invalid without the signature of the approver.
5. The test process and test result is only related to the Unit Under Test.
6. Sample information is provided by the client and the laboratory is not responsible for its authenticity.
7. The quality system of our laboratory is in accordance with ISO/IEC17025.
8. If there is any objection to this test report, the client should inform issuing laboratory within 15 days from the date of receiving test report.

Address:

1-2/F., Building B, Pengzhou Industrial Park, No.158, Fuyuan 1st Road, Zhancheng, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, China

TEL: 400-788-9558

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***** END *****

