

TEST REPORT

Report No.: BCTC2407145086E

Applicant: Shenzhen Wellturn Technology Co., Ltd

Product Name: GPS Outdoor Wireless Dog Fence System

Test Model: F820

Tested Date: 2024-07-30 to 2024-08-05

Issued Date: 2024-08-05

Shenzhen BCTC Testing Co., Ltd.



FCC ID: 2ATOXF820

Product Name: GPS Outdoor Wireless Dog Fence System
Trademark: N/A
Model/Type Reference: F820
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: 2024-07-30
Sample tested Date: 2024-07-30 to 2024-08-05
Issue Date: 2024-08-05
Report No.: BCTC2407145086E
Test Standards: 47 CFR FCC Part 15 Subpart B
Test Results: PASS

Tested by:



Tang Changyu/ 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

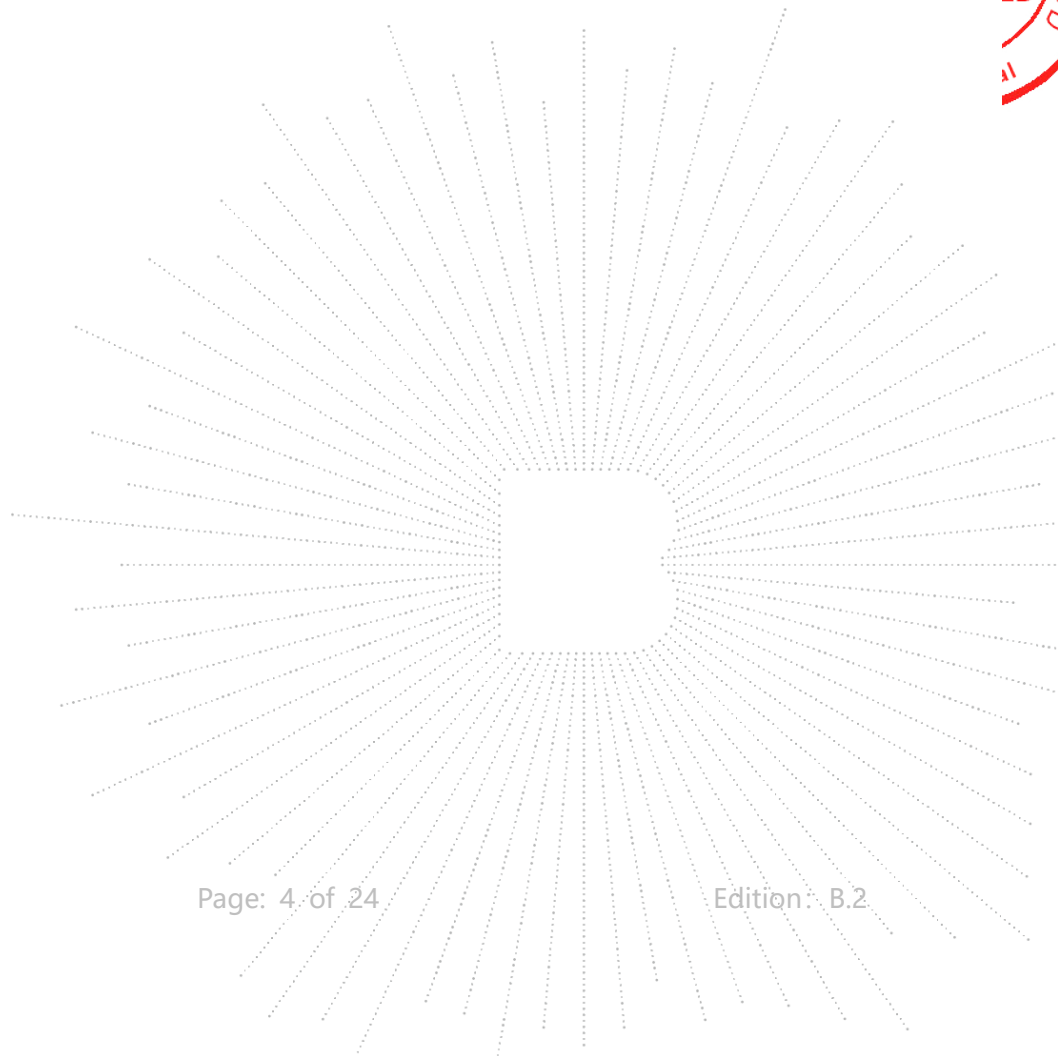
Report No.	Issue Date	Description	Approved
BCTC2407145086E	2024-08-05	Original	Valid

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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

CO., LTD.

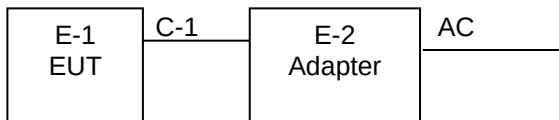
4. Roduct Information And Test Setup

4.1 Product Information

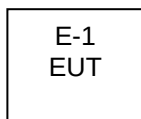
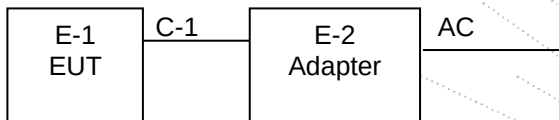
Model/Type reference:	F820
Model differences:	N/A
GPS:	Support (Test receive only)
Hardware Version:	N/A
Software Version:	N/A
Operation Frequency:	GPS: 1.57542GHz
Antenna Type:	GPS: Internal antenna GPS: 0 dBi
Antenna Gain:	Remark: ☒ The antenna gain of the product comes from the antenna report provided 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 3.7V From Battery, DC 5V From USB

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	---	CD122	---	---

Item	Shielded Type	Ferrite Core	Length	Note
C-1	N/A	N/A	0.5M	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	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

FCC Designation Number: CN1212

ISED Registered No.: 23583

ISED CAB identifier: CN0017

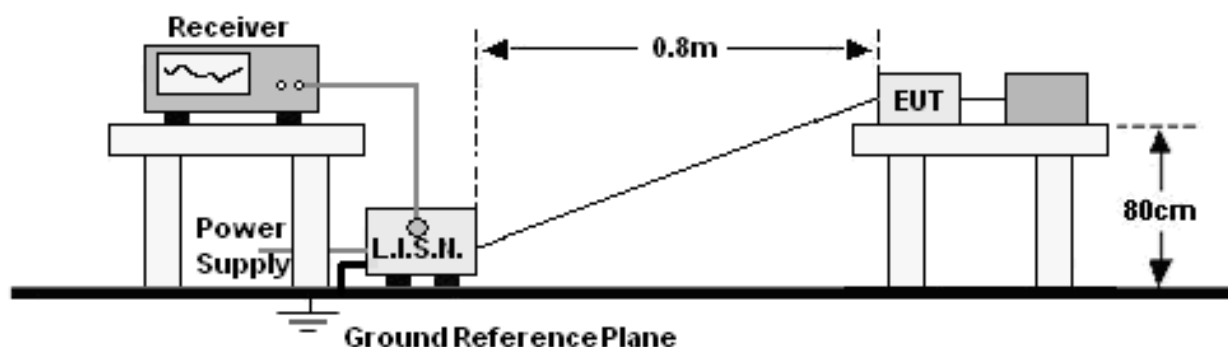
5.2 Test Instrument Used

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

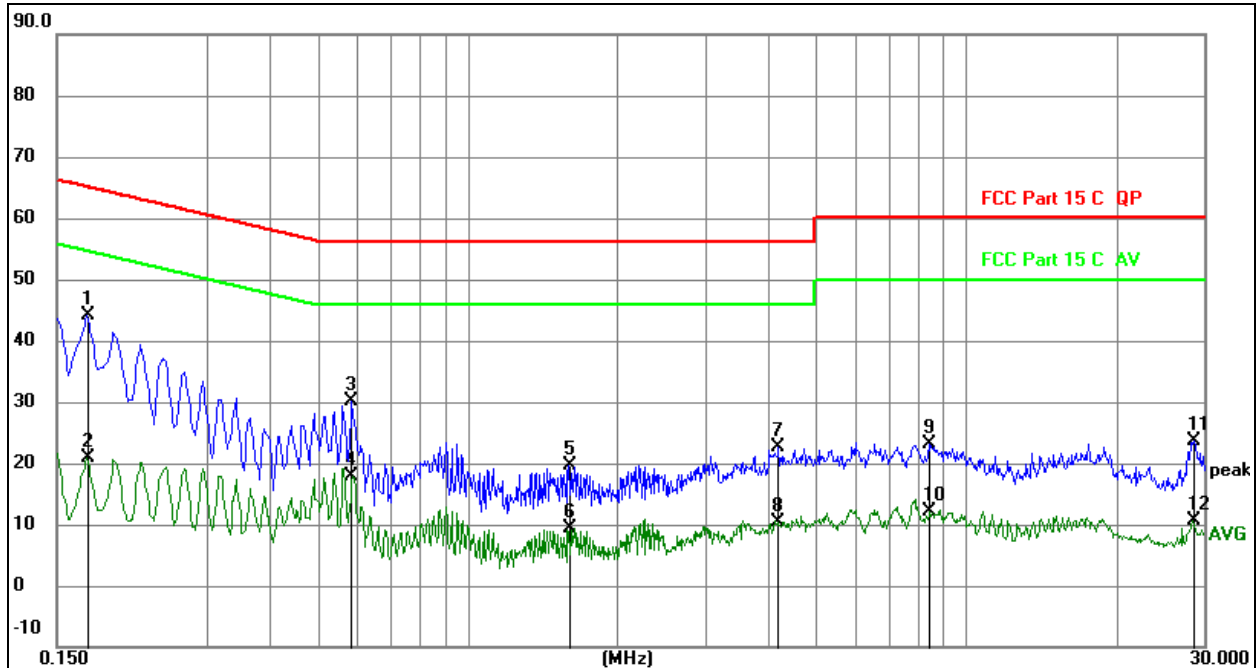
Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

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

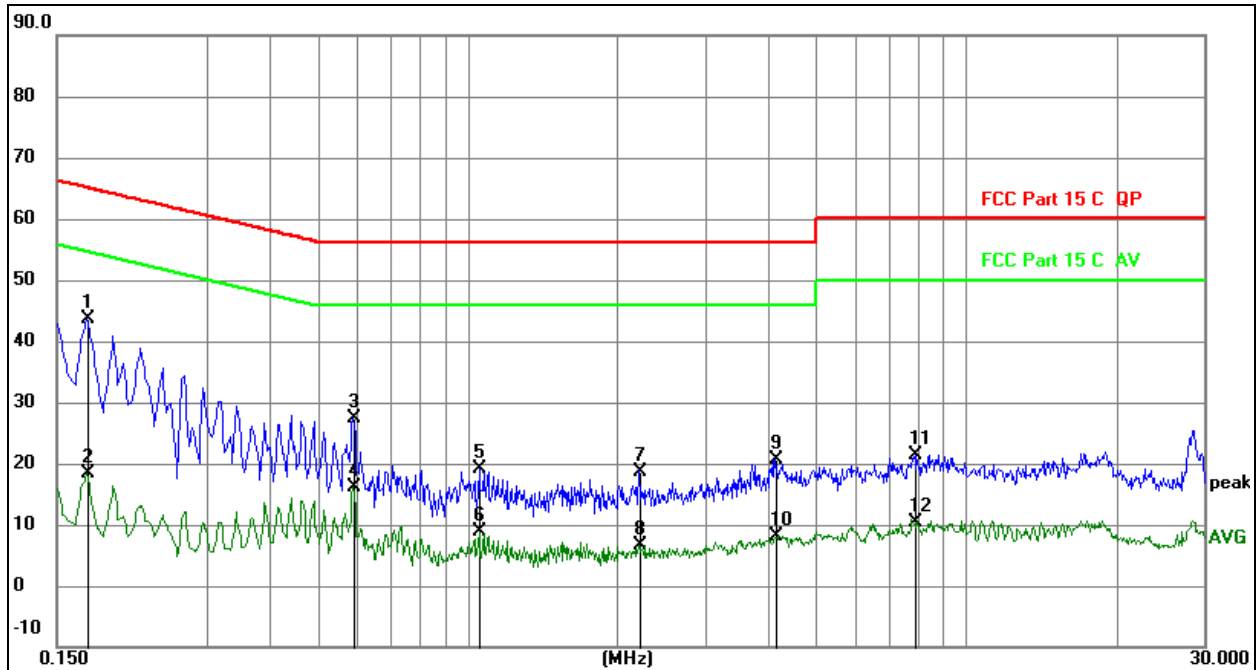


Remark:

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	*	0.1722	24.04	20.07	44.11	64.85	-20.74	QP
2		0.1722	0.84	20.07	20.91	54.85	-33.94	AVG
3		0.5854	9.95	20.08	30.03	56.00	-25.97	QP
4		0.5854	-2.21	20.08	17.87	46.00	-28.13	AVG
5		1.5935	-0.59	20.10	19.51	56.00	-36.49	QP
6		1.5935	-10.69	20.10	9.41	46.00	-36.59	AVG
7		4.2018	2.59	20.14	22.73	56.00	-33.27	QP
8		4.2018	-9.67	20.14	10.47	46.00	-35.53	AVG
9		8.4115	2.92	20.16	23.08	60.00	-36.92	QP
10		8.4115	-8.15	20.16	12.01	50.00	-37.99	AVG
11		28.6030	3.43	20.28	23.71	60.00	-36.29	QP
12		28.6030	-9.69	20.28	10.59	50.00	-39.41	AVG

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



Remark:

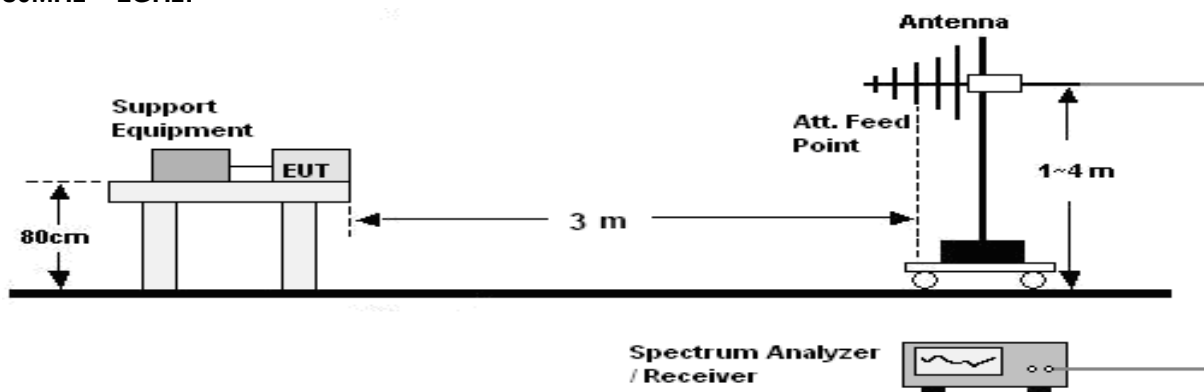
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement=Reading Level+ Correct Factor
4. Over=Measurement-Limit

No.	Mk.	Freq. MHz	Reading Level	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector
1	*	0.1725	23.59	20.07	43.66	64.84	-21.18	QP
2		0.1725	-1.81	20.07	18.26	54.84	-36.58	AVG
3		0.5909	7.40	20.08	27.48	56.00	-28.52	QP
4		0.5909	-3.85	20.08	16.23	46.00	-29.77	AVG
5		1.0544	-0.93	20.09	19.16	56.00	-36.84	QP
6		1.0544	-11.30	20.09	8.79	46.00	-37.21	AVG
7		2.2064	-1.35	20.10	18.75	56.00	-37.25	QP
8		2.2064	-13.41	20.10	6.69	46.00	-39.31	AVG
9		4.1415	0.42	20.14	20.56	56.00	-35.44	QP
10		4.1415	-12.05	20.14	8.09	46.00	-37.91	AVG
11		7.9080	1.27	20.16	21.43	60.00	-38.57	QP
12		7.9080	-9.88	20.16	10.28	50.00	-39.72	AVG

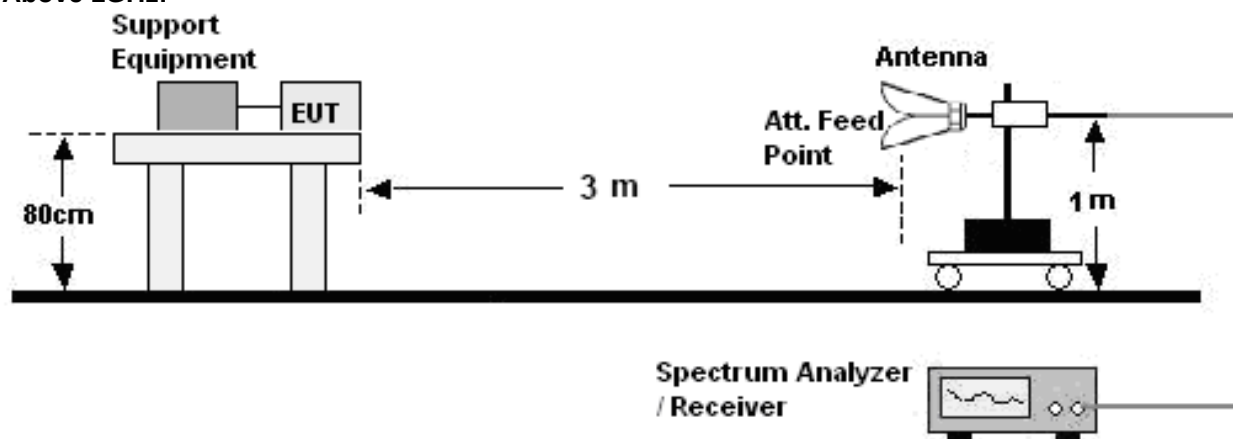
7. Radiation Emission Test

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:

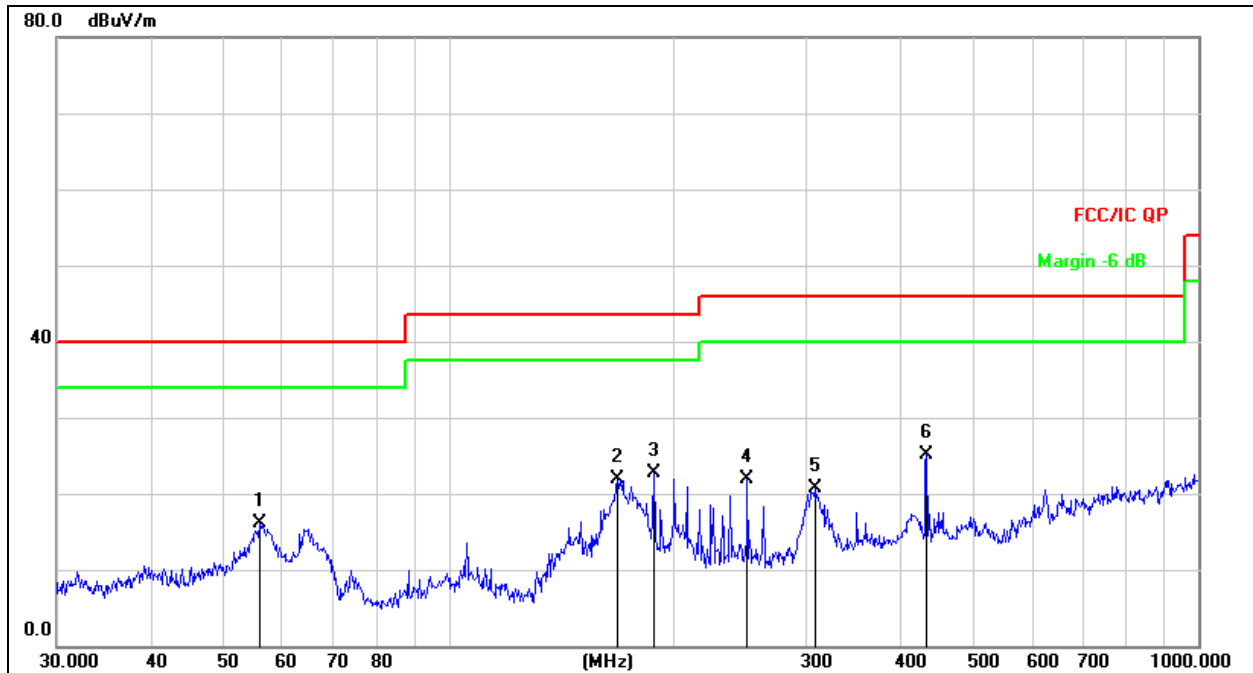
The highest frequency of the internal sources of the EUT is 1.57542GHz, so the measurement shall to 8 GHz.



7.4 Test Result

30MHz ~ 1GHz

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

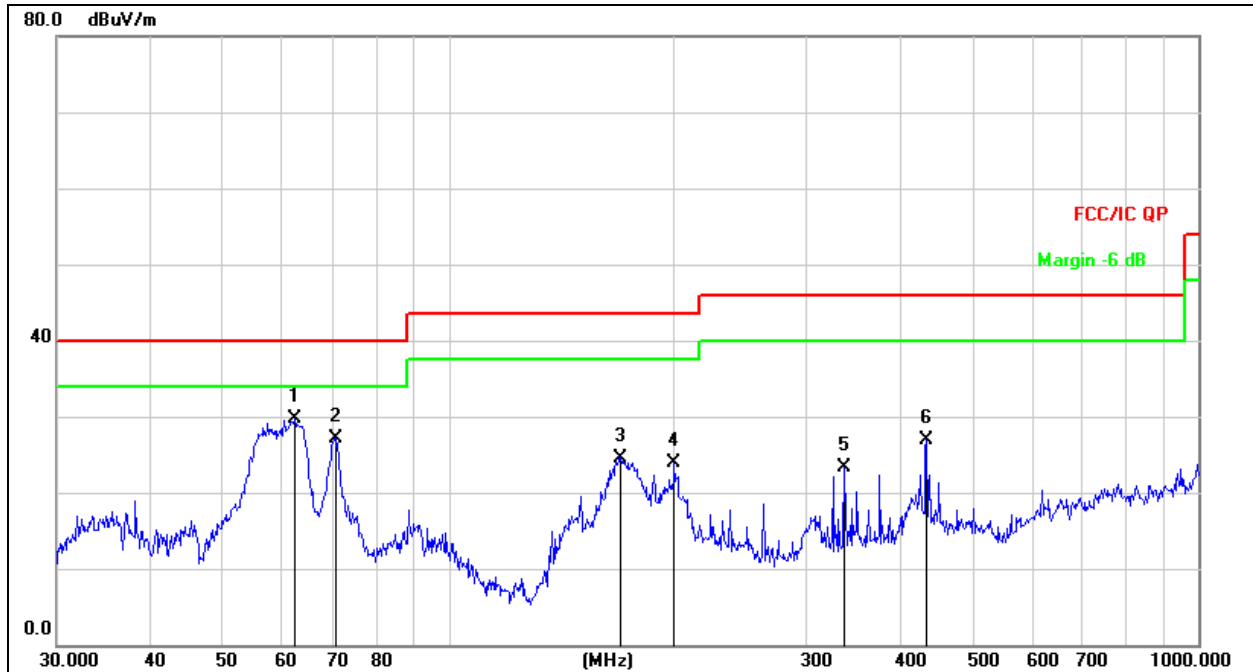


Remark:

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

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dB/m	Over dB	Detector
1		56.0007	30.72	-14.71	16.01	40.00	-23.99	QP
2		167.8243	39.97	-18.11	21.86	43.50	-21.64	QP
3	*	187.7530	39.39	-16.63	22.76	43.50	-20.74	QP
4		250.3012	36.26	-14.28	21.98	46.00	-24.02	QP
5		308.9126	33.63	-12.93	20.70	46.00	-25.30	QP
6		434.0651	35.25	-10.17	25.08	46.00	-20.92	QP

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

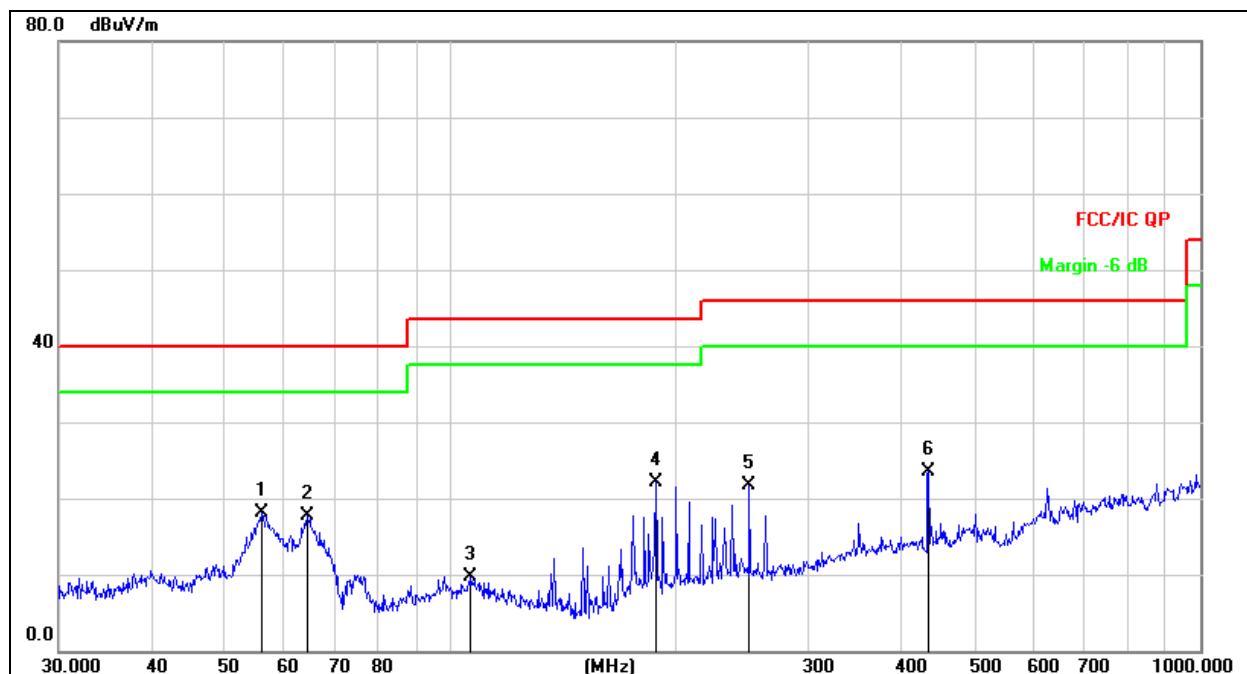


Remark:

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

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	62.4314	45.64	-15.92	29.72	40.00	-10.28	QP
2		70.5836	45.30	-18.10	27.20	40.00	-12.80	QP
3		169.5990	42.58	-17.98	24.60	43.50	-18.90	QP
4		199.9856	39.58	-15.72	23.86	43.50	-19.64	QP
5		337.2155	35.17	-11.93	23.24	46.00	-22.76	QP
6		434.0651	37.08	-10.17	26.91	46.00	-19.09	QP

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

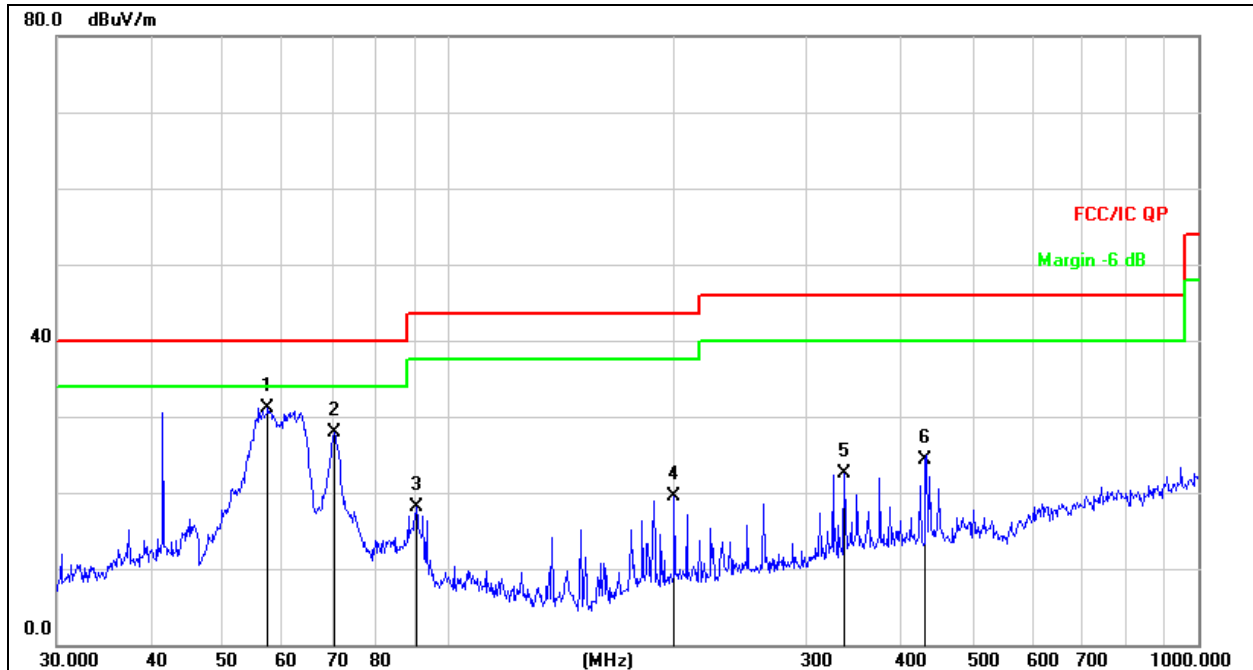


Remark:

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

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		56.0007	32.74	-14.71	18.03	40.00	-21.97	QP
2		64.4331	34.09	-16.47	17.62	40.00	-22.38	QP
3		106.3850	26.11	-16.38	9.73	43.50	-33.77	QP
4	*	187.7530	38.69	-16.63	22.06	43.50	-21.44	QP
5		250.3012	35.89	-14.28	21.61	46.00	-24.39	QP
6		434.0651	33.76	-10.17	23.59	46.00	-22.41	QP

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



Remark:

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

No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1	*	57.3923	46.02	-14.90	31.12	40.00	-8.88	QP
2		70.3365	45.91	-18.06	27.85	40.00	-12.15	QP
3		90.5374	35.48	-17.32	18.16	43.50	-25.34	QP
4		199.9856	35.27	-15.72	19.55	43.50	-23.95	QP
5		337.2155	34.47	-11.93	22.54	46.00	-23.46	QP
6		432.5457	34.48	-10.20	24.28	46.00	-21.72	QP

Above 1GHz:

Polar (H/V)	Frequenc y (GHz)	Reading Level (dBuV/m)	Correct Factor (dB)	Measure- ment (dBuV/m)	Limits (dBuV/m)	Over (dB)	Detector Type
V	1.114	80.46	-28.55	51.91	74.00	-22.09	PK
V	1.114	68.22	-28.55	39.67	54.00	-14.33	AV
V	1.187	79.49	-28.39	51.10	74.00	-22.90	PK
V	1.187	71.89	-28.39	43.50	54.00	-10.50	AV
V	1.224	80.77	-28.31	52.46	74.00	-21.54	PK
V	1.224	74.11	-28.31	45.80	54.00	-8.20	AV
V	2.555	80.99	-24.94	56.05	74.00	-17.95	PK
V	2.555	65.12	-24.94	43.25	54.00	-10.75	PK
V	3.864	75.67	-21.87	53.80	74.00	-20.20	AV
V	3.864	63.55	-21.87	41.68	54.00	-12.32	AV
V	5.273	69.56	-19.46	50.10	74.00	-23.90	PK
V	5.273	59.84	-19.46	40.38	54.00	-13.62	AV
H	1.052	79.78	-28.69	51.09	74.00	-22.91	PK
H	1.052	68.67	-28.69	39.98	54.00	-14.02	AV
H	1.324	80.54	-28.09	52.45	74.00	-21.55	PK
H	1.324	71.67	-28.09	43.58	54.00	-10.42	AV
H	1.722	82.83	-27.21	55.62	74.00	-18.38	PK
H	1.722	73.85	-27.21	46.64	54.00	-7.36	AV
H	2.336	80.12	-25.59	54.53	74.00	-19.47	PK
H	2.336	71.78	-25.59	46.19	54.00	-7.81	AV
H	4.562	73.34	-20.48	52.86	74.00	-21.14	PK
H	4.562	62.71	-20.48	42.23	54.00	-11.77	AV
H	6.852	68.80	-15.44	53.36	74.00	-20.64	PK
H	6.852	58.67	-15.44	43.23	54.00	-10.77	AV

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

2. Note: 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



NOTE: Appendix-Photographs Of EUT Constructional Details

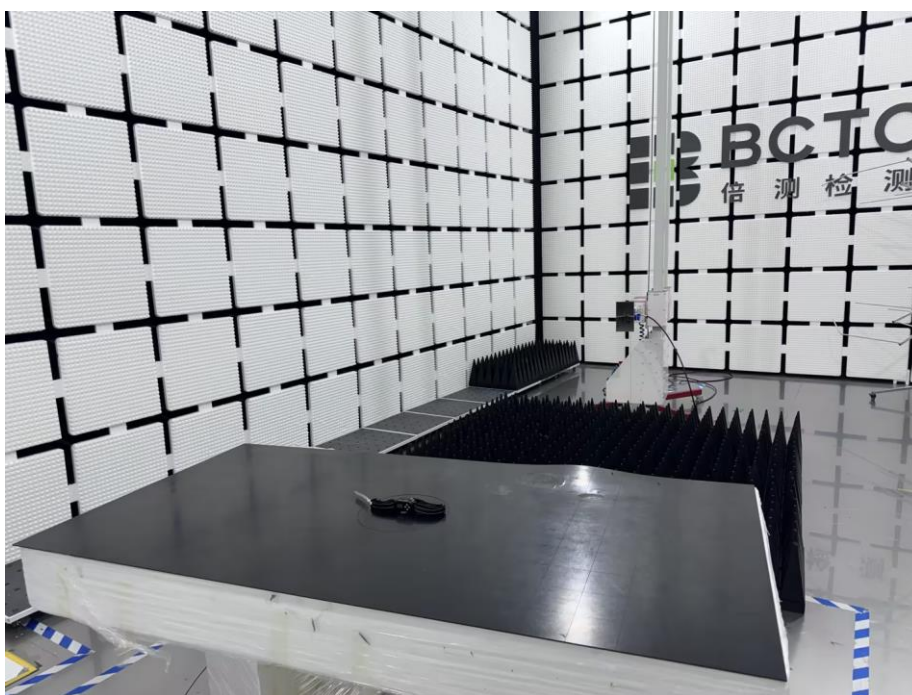
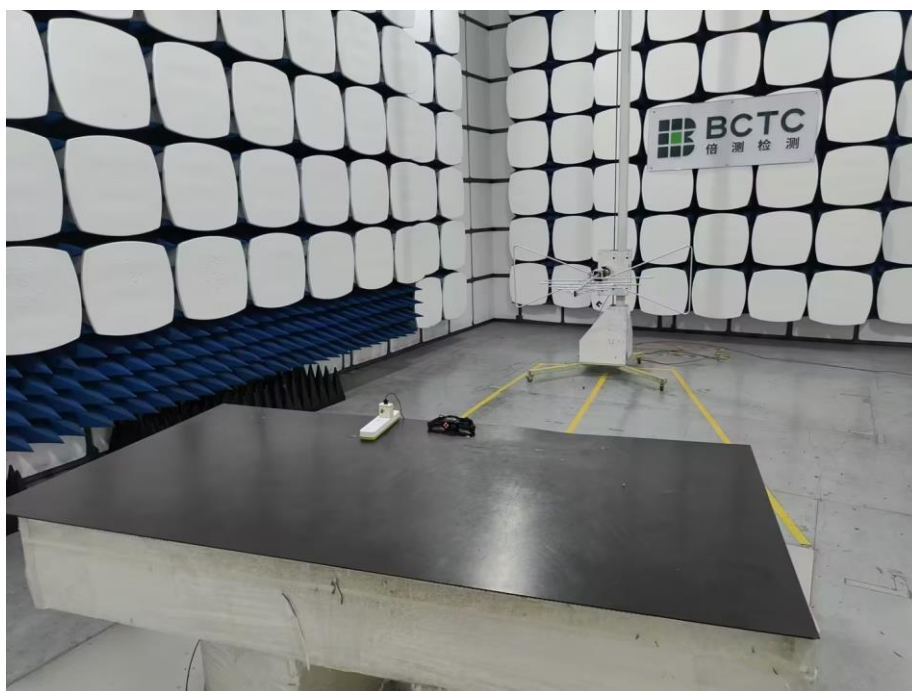
9. EUT Test Setup Photographs

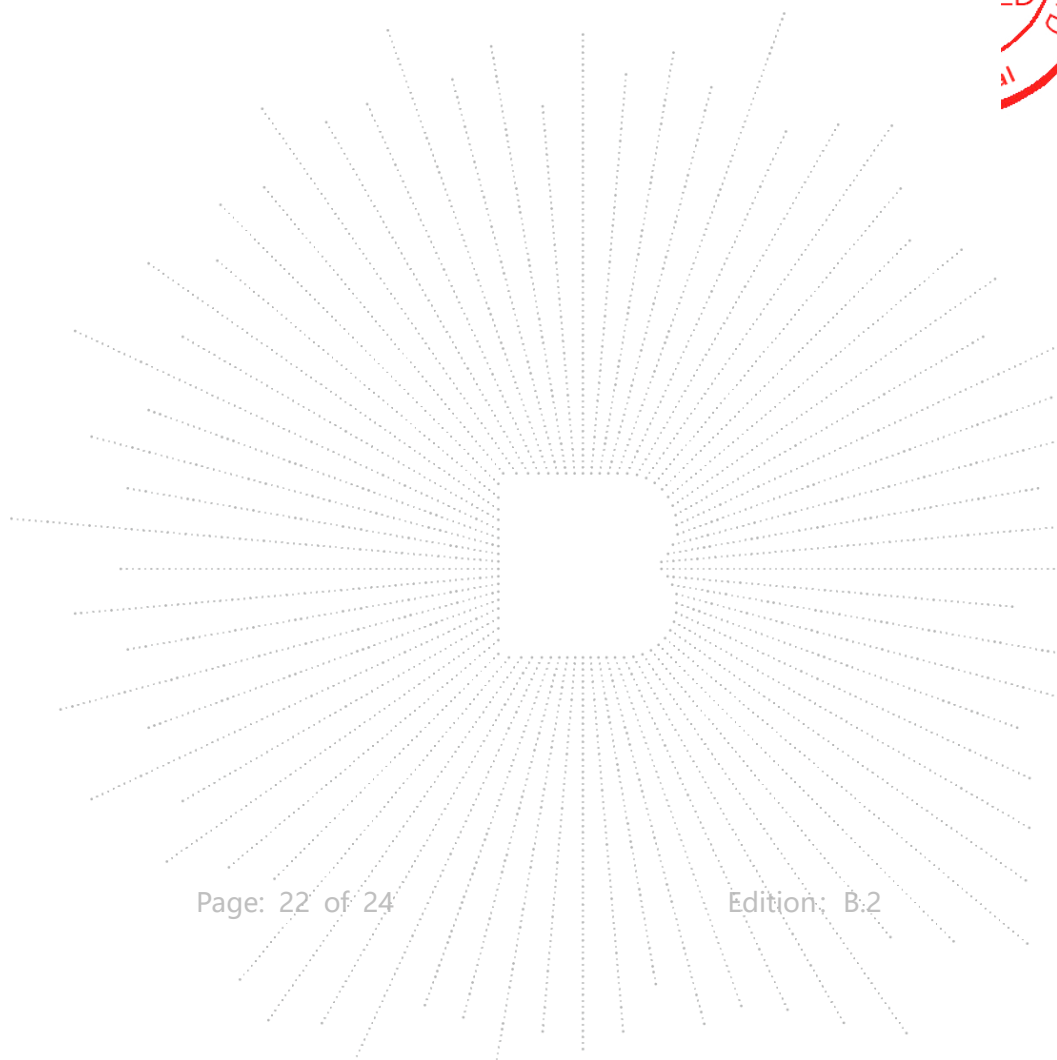
Conducted emissions



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

P.C.: 518103

FAX: 0755-33229357

Website: <http://www.chnbctc.com>

Consultation E-mail: bctc@bctc-lab.com.cn

Complaint/Advice E-mail: advice@bctc-lab.com.cn

※※※※※ END ※※※※※