TEST REPORT

Report No.:	BCTC2411184229-2E
Applicant:	Shenzhen Wellturn Technology Co., Ltd
Product Name:	Wireless Electronic Pet Fence
Test Model:	F900 Plus
Tested Date:	2024-11-26 to 2024-12-25
Issued Date:	2024-12-25

Shenzhen BCTC Testing Co., Ltd.

FCC ID: 2ATOX-F900TX

Product Name:	Wireless Electronic Pet Fence
Trademark:	N/A
Model/Type reference:	F900 Plus F900, F910, F910 Plus, F910 Pro
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:	2024-11-26
Sample tested Date:	2024-11-26 to 2024-12-25
Issue Date:	2024-12-25
Report No.:	BCTC2411184229-2E
Test Standards:	FCC Part15.519 ANSI C63.10-2013
Test Results:	PASS
Remark:	This is UWB radio test report.

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.

Table of Content

1. Version

Report No.	Issue Date	Description	Approved
BCTC2411184229-2E	2024-12-25	Original	Valid

2. Test Summary

The Product has been tested according to the following specifications:

No.	Test Parameter	Clause No.	Results
1	Conducted Emission	15.207	PASS
2	Shutoff Timing Requirement	15.519(a)(1)	PASS
3	UWB Operation bandwidth	15.503 (a)(d), 15.519(b)	PASS
4	Radiated Emissions	15.209, 15.519(c)(d)	PASS
5	Peak Emission in a 50 MHz bandwidth	15.519(e)	PASS
6	Antenna Requirement	15.203/15.519(a)(2)	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.

No.	Item	Uncertainty
1	3m chamber Radiated spurious emission(30MHz-1GHz)	U=4.3dB
2	3m chamber Radiated spurious emission(9KHz-30MHz)	U=3.7dB
3	3m chamber Radiated spurious emission(1GHz-18GHz)	U=4.5dB
4	3m chamber Radiated spurious emission(18GHz-40GHz)	U=3.34dB
5	Conducted Emission (150kHz-30MHz)	U=3.20dB
6	Conducted Adjacent channel power	U=1.38dB
7	Conducted output power uncertainty Above 1G	U=1.576dB
8	Conducted output power uncertainty below 1G	U=1.28dB
9	humidity uncertainty	U=5.3%
10	Temperature uncertainty	U=0.59℃

4. Product Information and Test Setup

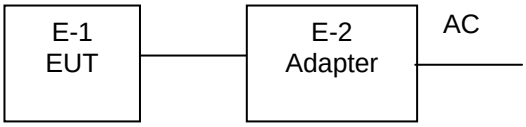
4.1 Product Information

Model/Type Reference:	F900 Plus F900, F910, F910 Plus, F910 Pro
Model Differences:	All the model are the same circuit and RF module, except model names and appearance of the color.
Hardware Version:	N/A
Software Version:	N/A
Type of Modulation:	BPSK
Operation Frequency:	3993.6 MHz
Antenna installation:	Chip antenna
Antenna Gain:	2.3 dBi 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

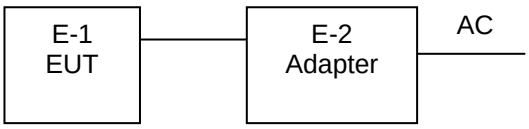
4.2 Test Setup Configuration

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
E-1	Wireless Electronic Pet Fence	N/A	F900 Plus	N/A	N/A
E-2	N/A	N/A	N/A	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
N/A	N/A	N/A	0.6M	N/A

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 Channel List

Channel List	
Channel	Frequency (MHz)
01	3993.6

4.5 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.

For All Mode	Description	Modulation Type
Mode 1	Link mode (Conducted emission and Radiated emission)	

Notes:
1. The measurements are performed at the highest, middle, lowest available channels.
2. The measurements are performed at all Bit Rate of Transmitter, the worst data was reported

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

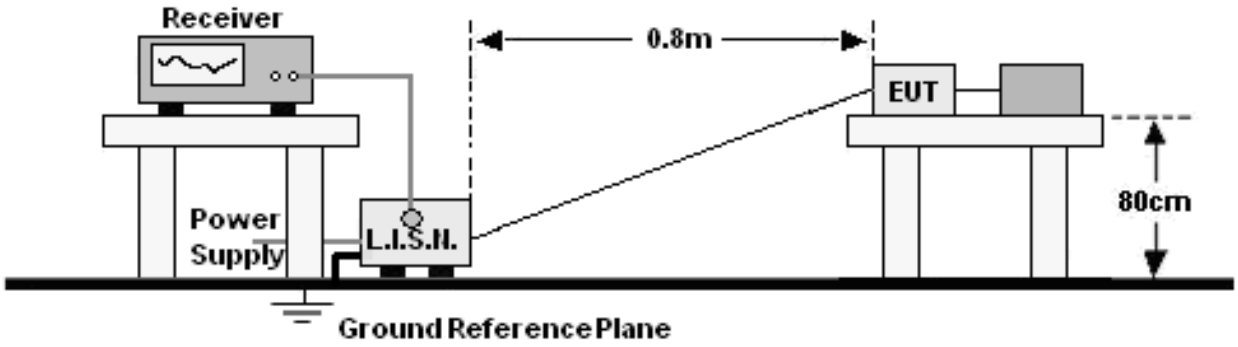
Conducted Emissions Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Receiver	R&S	ESR3	102075	May 16, 2024	May 15, 2025
LISN	R&S	ENV216	101375	May 16, 2024	May 15, 2025
Software	Frad	EZ-EMC	EMC-CON 3A1	\	\
Pulse limiter	Schwarzbeck	VTSD9561-F	01323	May 16, 2024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

RF Conducted Test					
Equipment	**Manufacturer**	**Model#**	**Serial#**	**Last Cal.**	**Next Cal.**
Power meter	Keysight	E4419	\	May 16, 2024	May 15, 2025
Power Sensor (AV)	Keysight	E9300A	\	May 16, 2024	May 15, 2025
Signal Analyzer20kHz-26.5GHz	Keysight	N9020A	MY49100060	May 16, 2024	May 15, 2025
Spectrum Analyzer9kHz-40GHz	R&S	FSP40	100363	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 15, 2023	May 14, 2026
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_01G18G-45dB	SK2021040901	May 16, 2024	May 15, 2025
Horn Antenna	Schwarzbeck	BBHA9120D	1541	May 21, 2024	May 20, 2025
Amplifier(18GHz-40GHz)	MITEQ	TTA1840-35-HG	2034381	May 16, 2024	May 15, 2025
Horn Antenn(18GHz-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

Frequency (MHz)	Limit (dBuV)	
	Quas-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

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

6.3 Test procedure

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

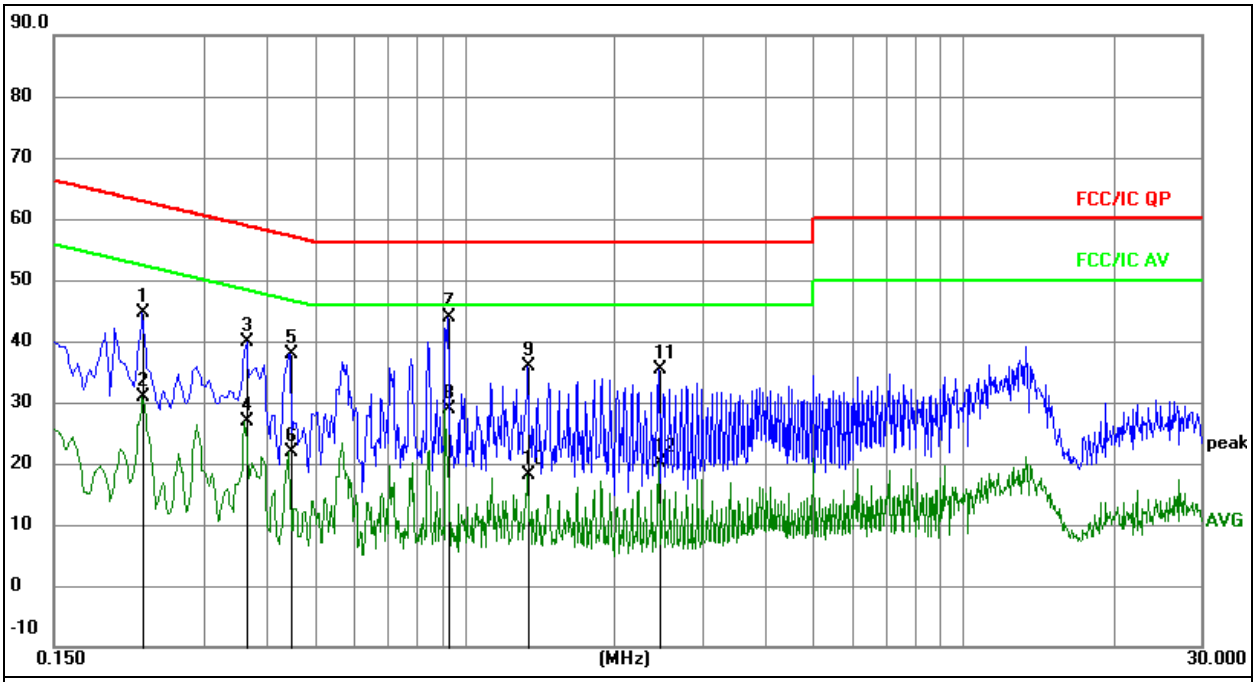
a. The Product was placed on a nonconductive table 0.8 m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane, and connected to the main through Line Impedance Stability Network (L.I.S.N).
b. The RBW of the receiver was set at 9 kHz in 150 kHz ~ 30MHz with Peak 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.
c. For each frequency whose maximum record was higher or close to limit, measure its QP and AVG values and record.

6.4 EUT operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

6.5 Test Result

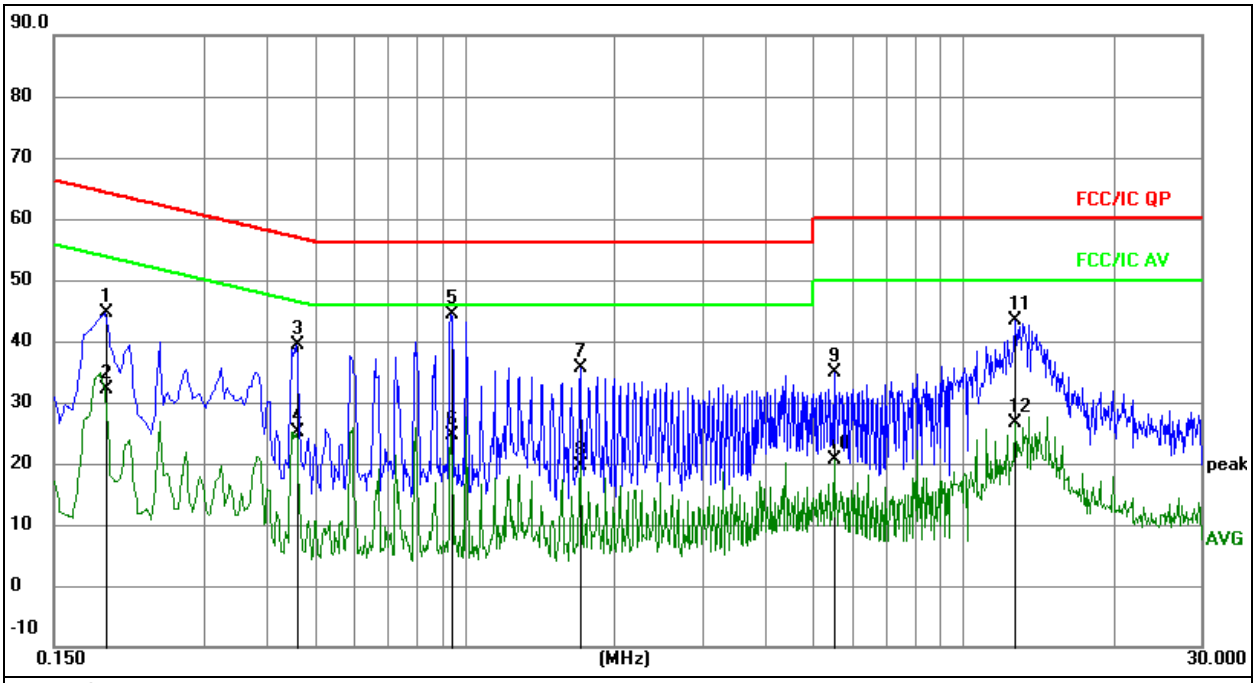
Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101kPa	Phase :	Line
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 1



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	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.2265	24.55	20.07	44.62	62.58	-17.96	QP
2		0.2265	10.72	20.07	30.79	52.58	-21.79	AVG
3		0.3660	19.89	20.08	39.97	58.59	-18.62	QP
4		0.3660	6.76	20.08	26.84	48.59	-21.75	AVG
5		0.4470	17.76	20.08	37.84	56.93	-19.09	QP
6		0.4470	1.82	20.08	21.90	46.93	-25.03	AVG
7	*	0.9240	23.83	20.09	43.92	56.00	-12.08	QP
8		0.9240	8.70	20.09	28.79	46.00	-17.21	AVG
9		1.3380	15.86	20.09	35.95	56.00	-20.05	QP
10		1.3380	-2.04	20.09	18.05	46.00	-27.95	AVG
11		2.4495	15.19	20.11	35.30	56.00	-20.70	QP
12		2.4495	0.02	20.11	20.13	46.00	-25.87	AVG

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101kPa	Phase :	Neutral
Test Voltage :	AC 120V/60Hz	Test Mode:	Mode 1



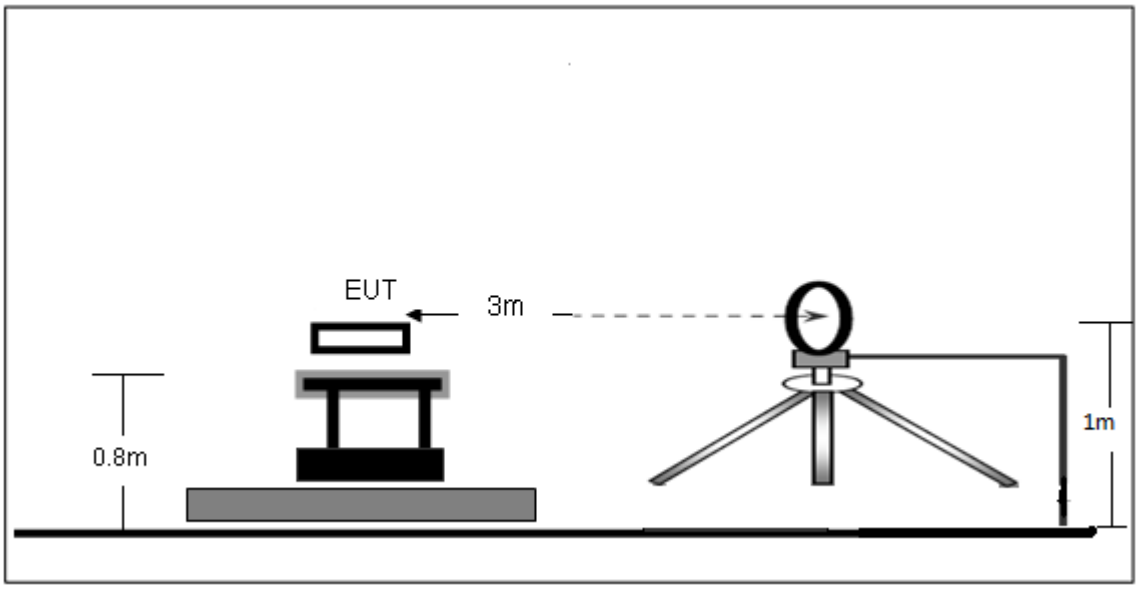
Remark:
1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.
3. Measurement=Reading Level+ Correct Factor
4. Over= Measurement-Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz		dB	dBuV	dBuV	dB	Detector
1		0.1904	24.66	20.07	44.73	64.02	-19.29	QP
2		0.1904	12.11	20.07	32.18	54.02	-21.84	AVG
3		0.4588	19.30	20.08	39.38	56.71	-17.33	QP
4		0.4588	5.10	20.08	25.18	46.71	-21.53	AVG
5	*	0.9381	24.37	20.09	44.46	56.00	-11.54	QP
6		0.9381	4.48	20.09	24.57	46.00	-21.43	AVG
7		1.7071	15.61	20.10	35.71	56.00	-20.29	QP
8		1.7071	-0.47	20.10	19.63	46.00	-26.37	AVG
9		5.5054	14.69	20.15	34.84	60.00	-25.16	QP
10		5.5054	0.41	20.15	20.56	50.00	-29.44	AVG
11		12.7161	23.12	20.25	43.37	60.00	-16.63	QP
12		12.7161	6.32	20.25	26.57	50.00	-23.43	AVG

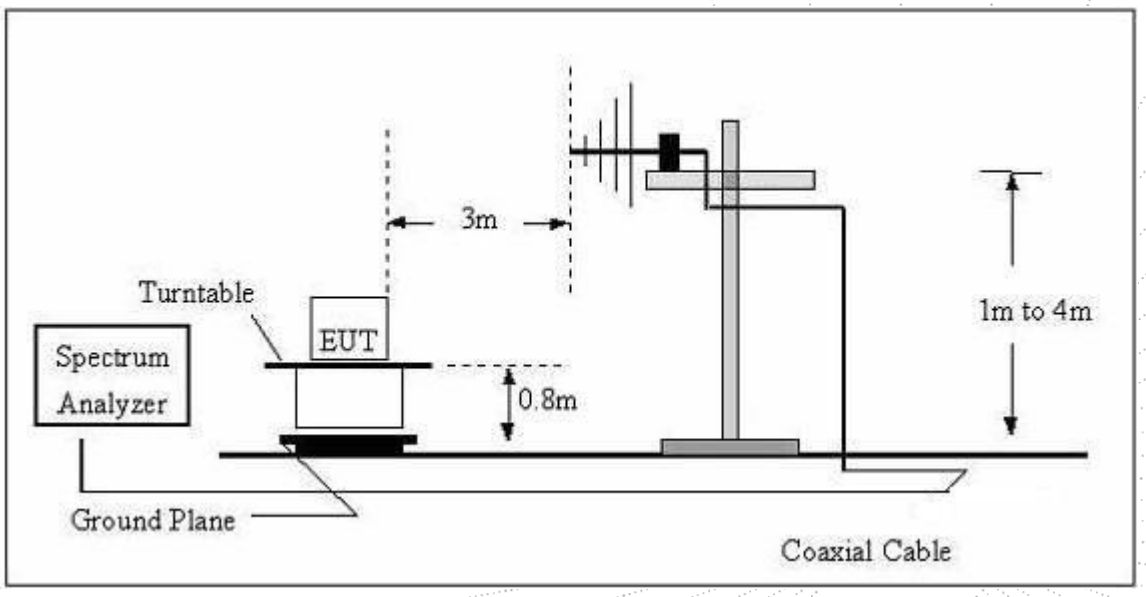
7. Radiated Emissions

7.1 Block Diagram Of Test Setup

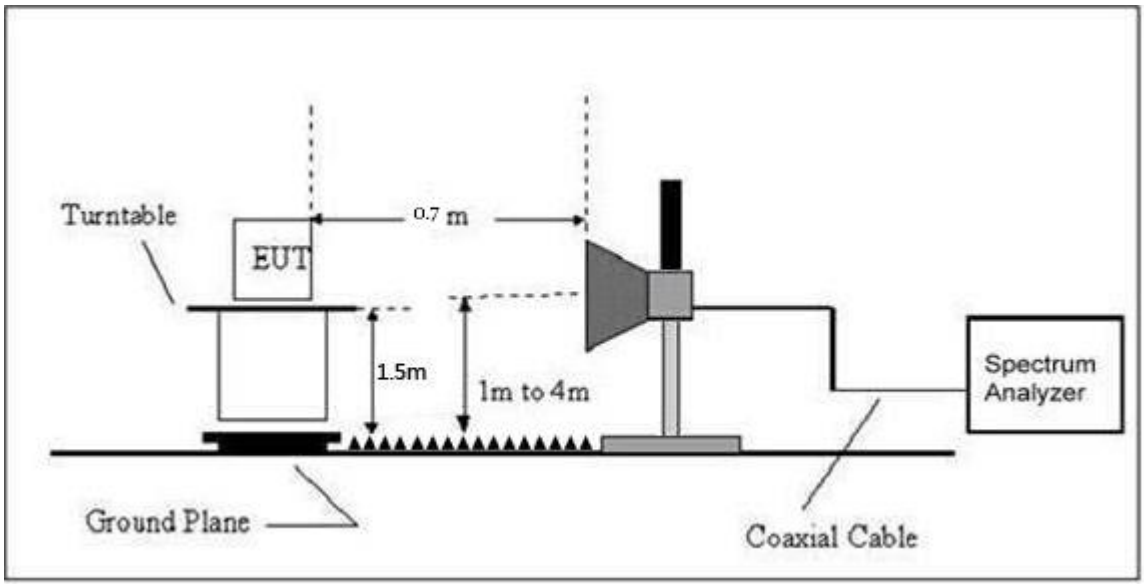
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



7.2 Limit

The radiated emissions at or below 960 MHz from a device operating under the provisions of this section shall not exceed the emission levels in § 15.209. The radiated emissions above 960 MHz from a device operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of 1 MHz:

Frequency in MHz	EIRP in dBm
960–1610	-75.3
1610–1990	-63.3
1990–3100	-61.3
3100–10600	-41.3
Above 10600	-61.3

In addition to the radiated emission limits specified in the table in paragraph (c) of this section, UWB transmitters operating under the provisions of this section shall not exceed the following average limits when measured using a resolution bandwidth of no less than 1 kHz:

Frequency in MHz	EIRP in dBm
1164–1240	-85.3
1559–1610	-85.3

Frequency Range of Radiated Measurement

(a) For an intentional radiator the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to at least the frequency shown in this paragraph:

(1) If the intentional radiator operates below 10 GHz: to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
(2) If the intentional radiator operates at or above 10 GHz and below 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 100 GHz, whichever is lower.
(3) If the intentional radiator operates at or above 30 GHz: to the fifth harmonic of the highest fundamental frequency or to 200 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
(4) If the intentional radiator operates at or above 95 GHz: To the third harmonic of the highest fundamental frequency or to 750 GHz, whichever is lower, unless specified otherwise elsewhere in the rules.
(5) If the intentional radiator contains a digital device, regardless of whether this digital device controls the functions of the intentional radiator or the digital device is used for additional control or function purposes other than to enable the operation of the intentional radiator, the frequency range shall be investigated up to the range specified in paragraphs (a) (1)through (4) of this section or the range applicable to the digital device, as shown in paragraph (b)(1) of this section, whichever is the higher frequency range of investigation.

7.3 Test procedure

Receiver Parameter	Setting
Attenuation	Auto
9kHz~150kHz	RBW 200Hz for QP
150kHz~30MHz	RBW 9kHz for QP
30MHz~1000MHz	RBW 120kHz for QP

Spectrum Parameter	Setting
Above 960MHz in non GPS band	RBW 1 MHz /VBW 3 MHz for Average
Above 960MHz in GPS band	RBW 1 kHz /VBW 3 kHz for Average

Below 1GHz test procedure as below:
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Above 1GHz test procedure as below:
a. The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rota table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
g. Test the EUT in the lowest channel, the middlest channel, the Highest channel.
Note:
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

7.4 EUT Operating Conditions

The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

7.5 Test Result

Below 30MHz

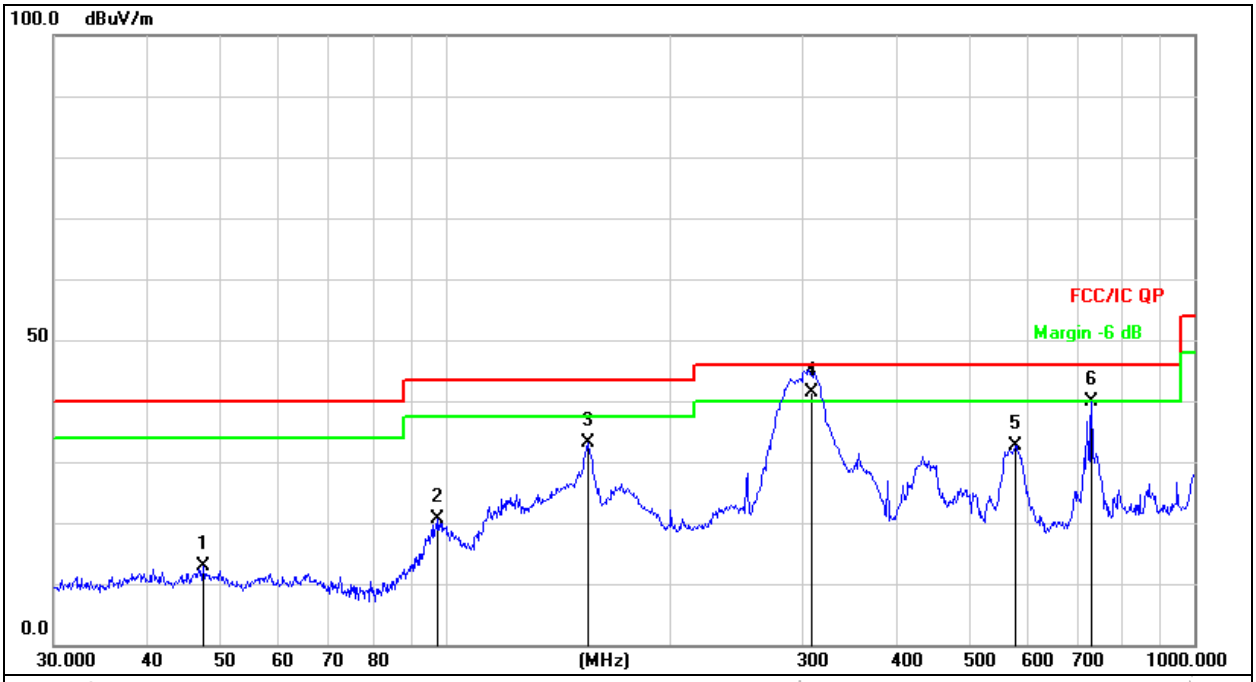
Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC 120V 60Hz, DC 3.7V
Test Mode:	Mode 1	Polarization:	---

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

Note:
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =40 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

Between 30MHz – 1GHz

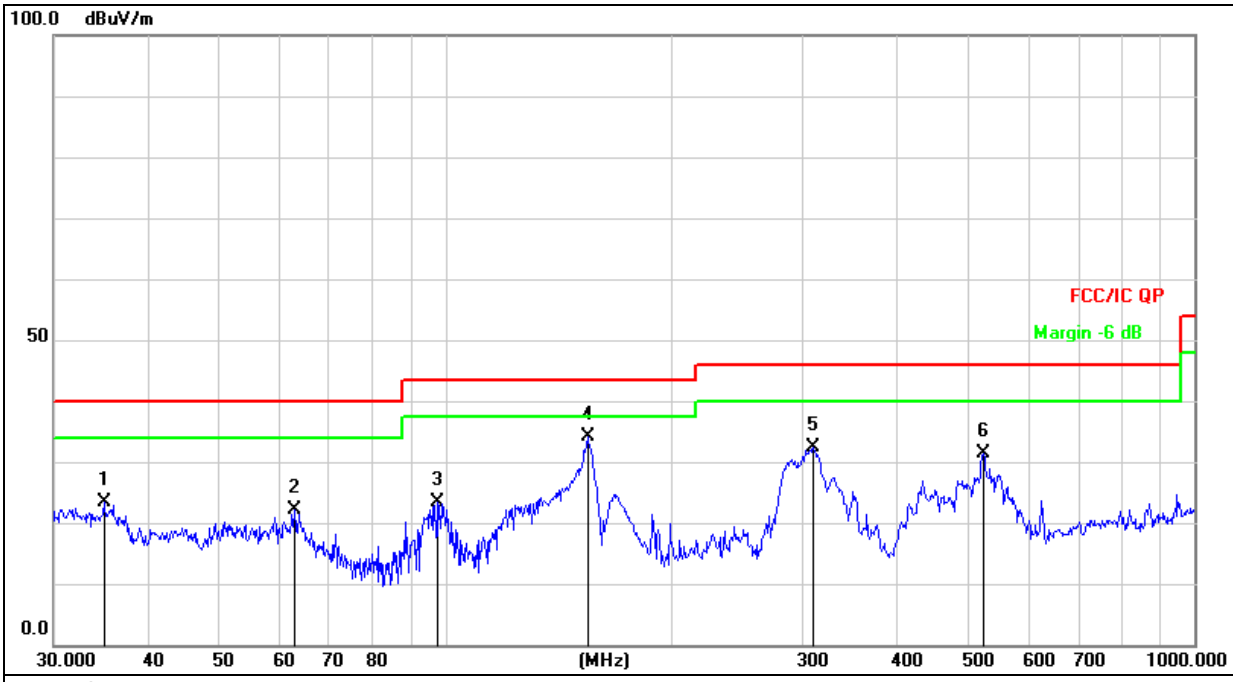
Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 2（The Worse data）	Remark:	N/A



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		47.4917	27.05	-14.11	12.94	40.00	-27.06	QP
2		97.7982	36.93	-16.25	20.68	43.50	-22.82	QP
3		154.8204	52.31	-19.07	33.24	43.50	-10.26	QP
4	*	308.0380	54.33	-12.96	41.37	46.00	-4.63	QP
5		576.6443	41.29	-8.59	32.70	46.00	-13.30	QP
6		729.3582	45.19	-5.29	39.90	46.00	-6.10	QP

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 2（The Worse data）	Remark:	N/A

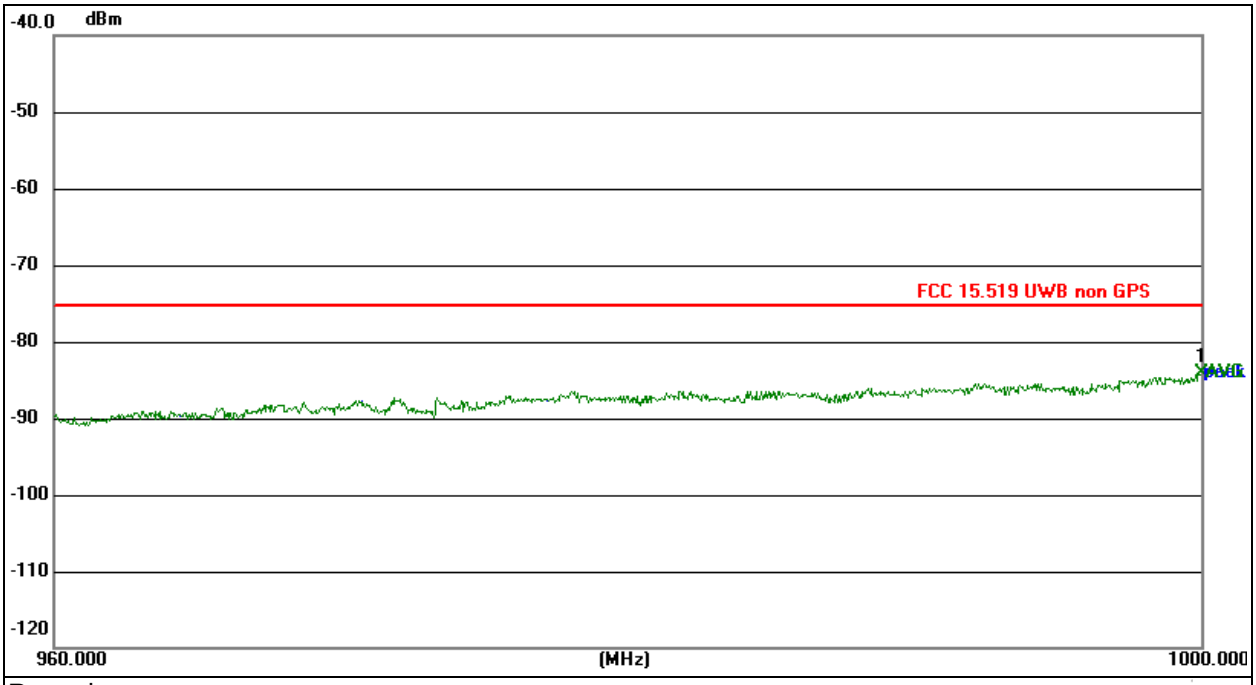


Remark:
1.Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement=Reading Level+ Correct Factor
3. Over= Measurement-Limit

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	Detector
1		35.0048	39.05	-15.68	23.37	40.00	-16.63	QP
2		62.8708	38.22	-16.04	22.18	40.00	-17.82	QP
3		97.4560	39.80	-16.30	23.50	43.50	-20.00	QP
4	*	154.8204	53.16	-19.07	34.09	43.50	-9.41	QP
5		309.9977	45.23	-12.89	32.34	46.00	-13.66	QP
6		522.7180	40.86	-9.41	31.45	46.00	-14.55	QP

Spurious radiated emission above 960MHz in non GPS band:
960MHz-1GHz:

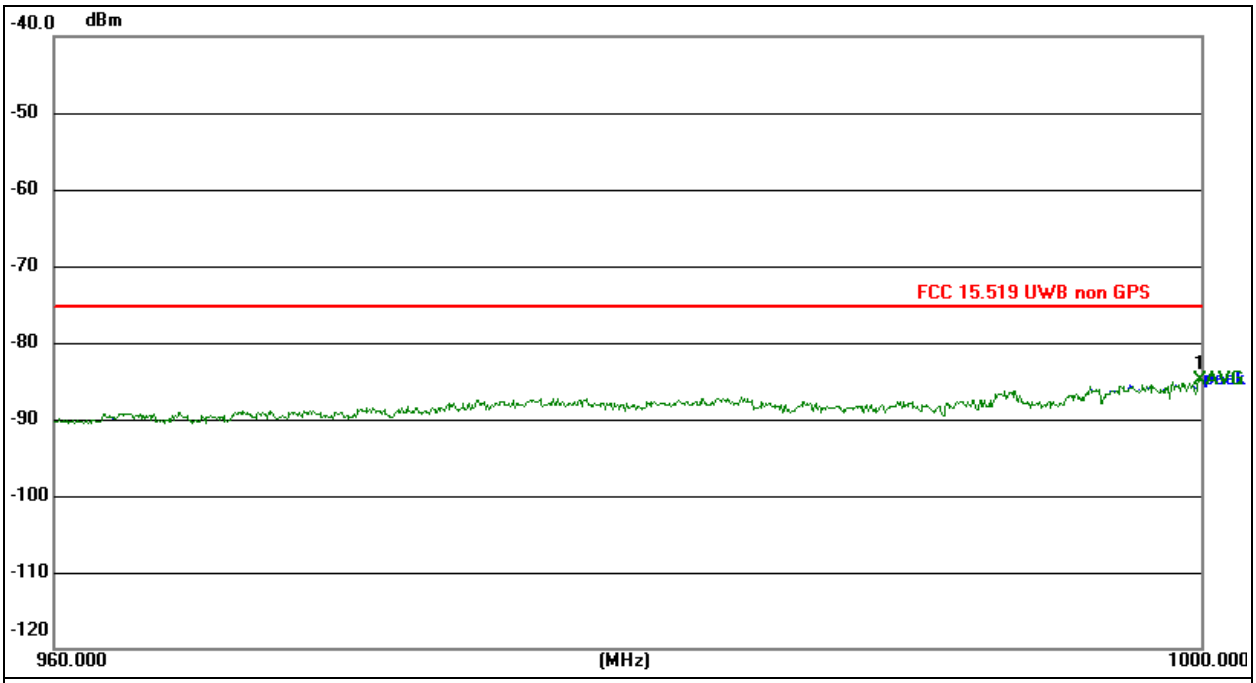
Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 1	Remark:	N/A



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

No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1 *	1000.0000	-87.81	3.70	-84.11	-75.30	-8.81	AVG

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 1	Remark:	N/A

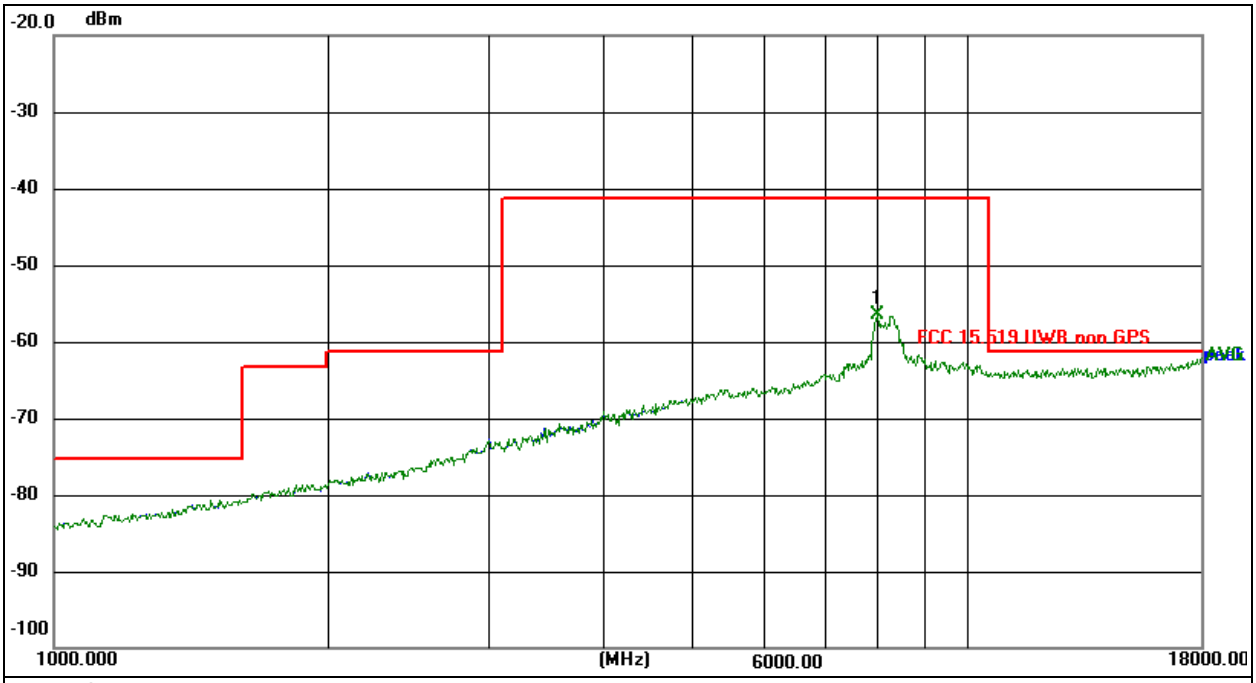


Remark:
1.Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement=Reading Level+ Correct Factor
3. Over= Measurement-Limit

No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1 *	999.9600	-88.61	3.70	-84.91	-75.30	-9.61	AVG

1GHz-18GHz:

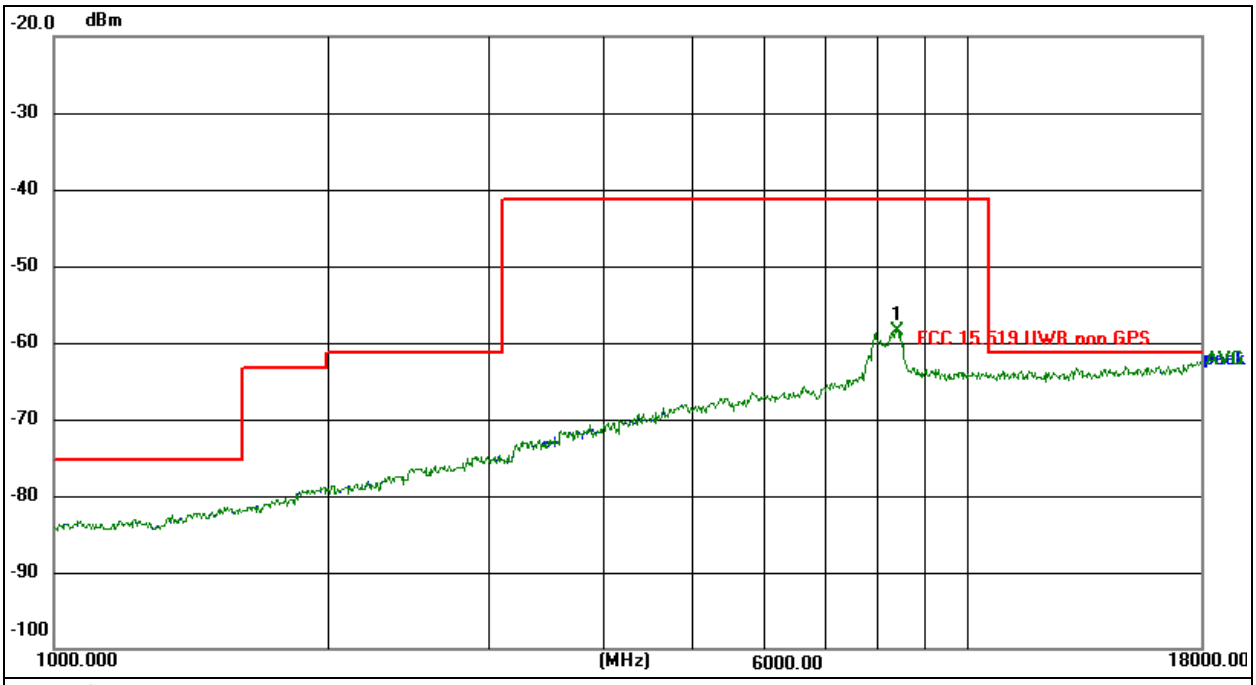
Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 1	Remark:	N/A



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

No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1 *	7987.000	-53.94	-2.63	-56.57	-41.30	-15.27	AVG

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 1	Remark:	N/A



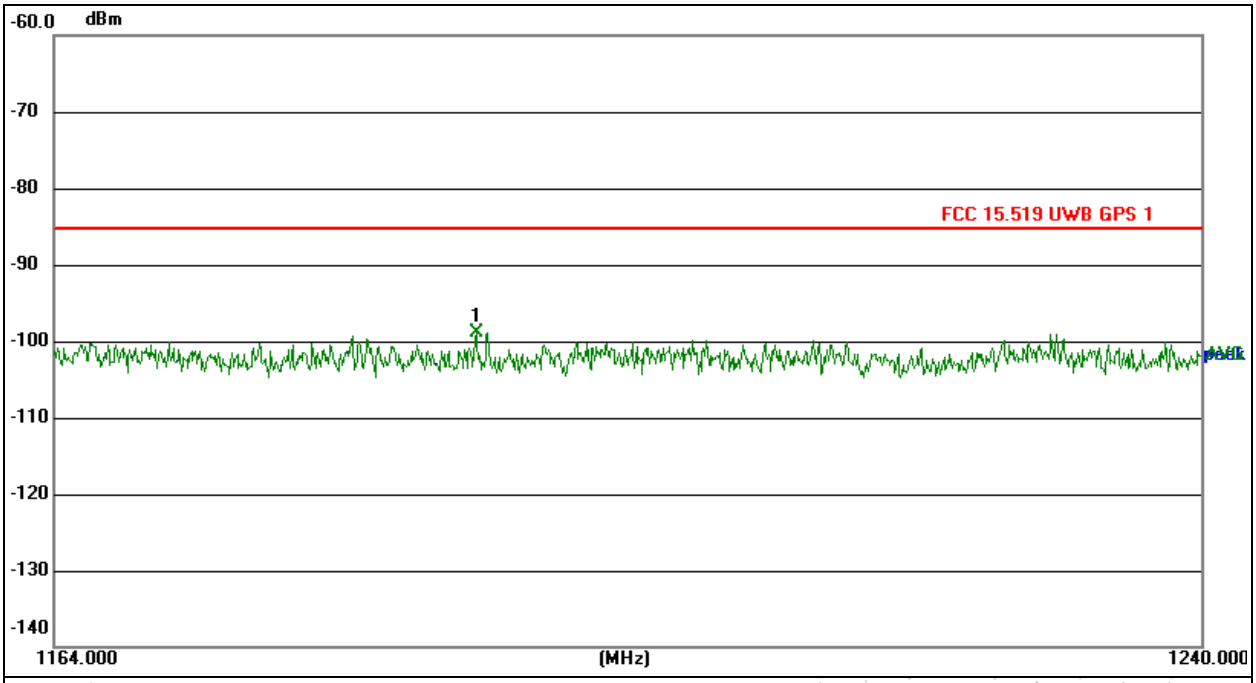
Remark:
1.Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement=Reading Level+ Correct Factor
3. Over= Measurement-Limit

No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1 *	8378.000	-55.80	-2.65	-58.45	-41.30	-17.15	AVG

Note: The 18GHz-40GHz amplitude of spurious emissions that are attenuated by more than 20dB below the permissible value has no need to be reported.

Spurious radiated emission in GPS band:
1164MHz-1240MHz:

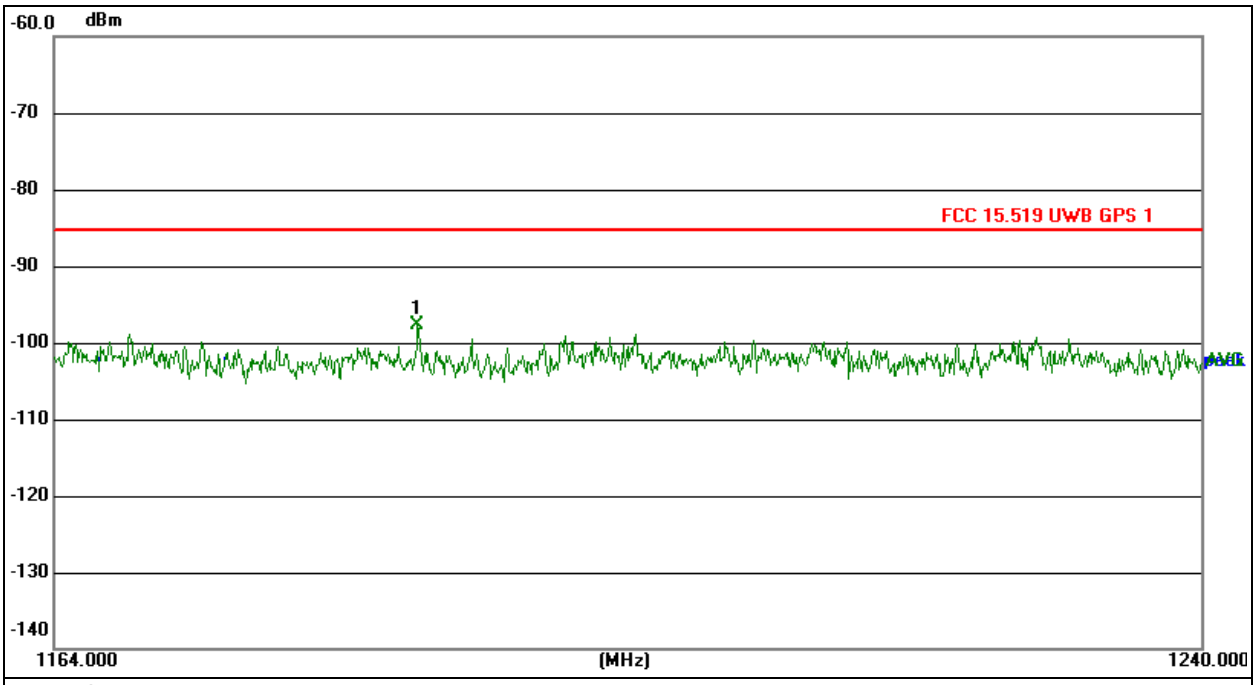
Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 1	Remark:	N/A



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

No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1 *	1191.436	-78.93	-19.92	-98.85	-85.30	-13.55	AVG

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 1	Remark:	N/A

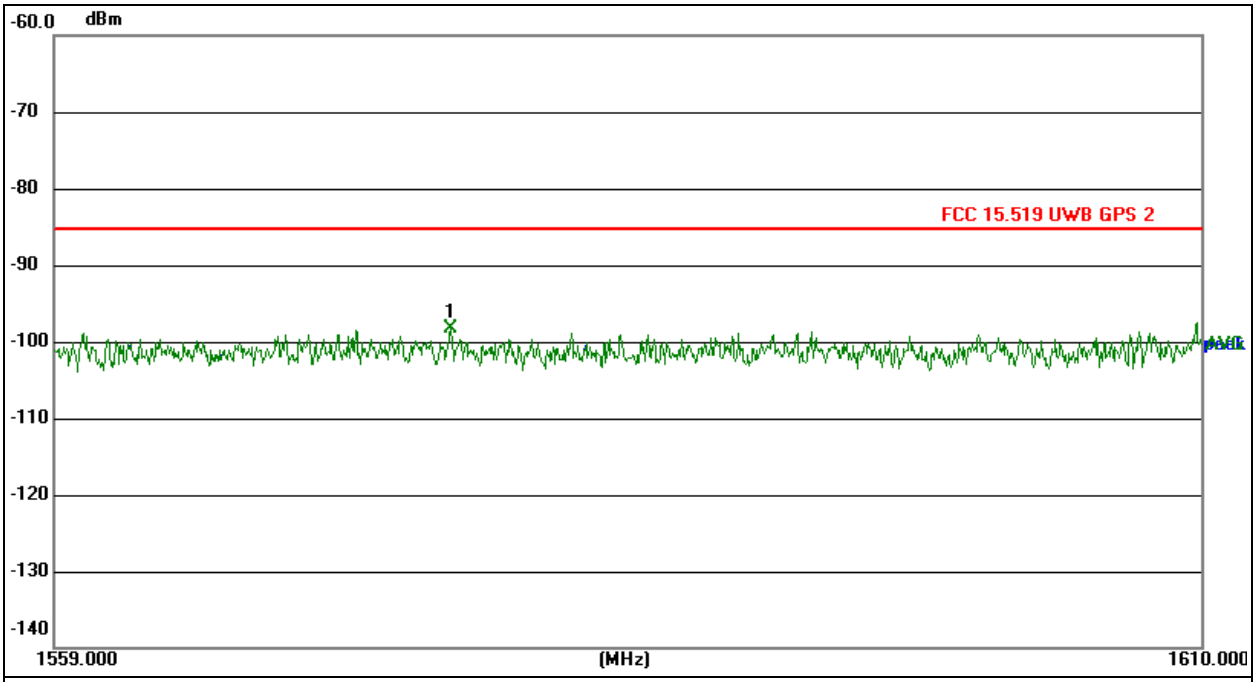


Remark:
1.Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement=Reading Level+ Correct Factor
3. Over= Measurement-Limit

No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1 *	1187.636	-77.76	-19.92	-97.68	-85.30	-12.38	AVG

1559MHz-1610MHz:

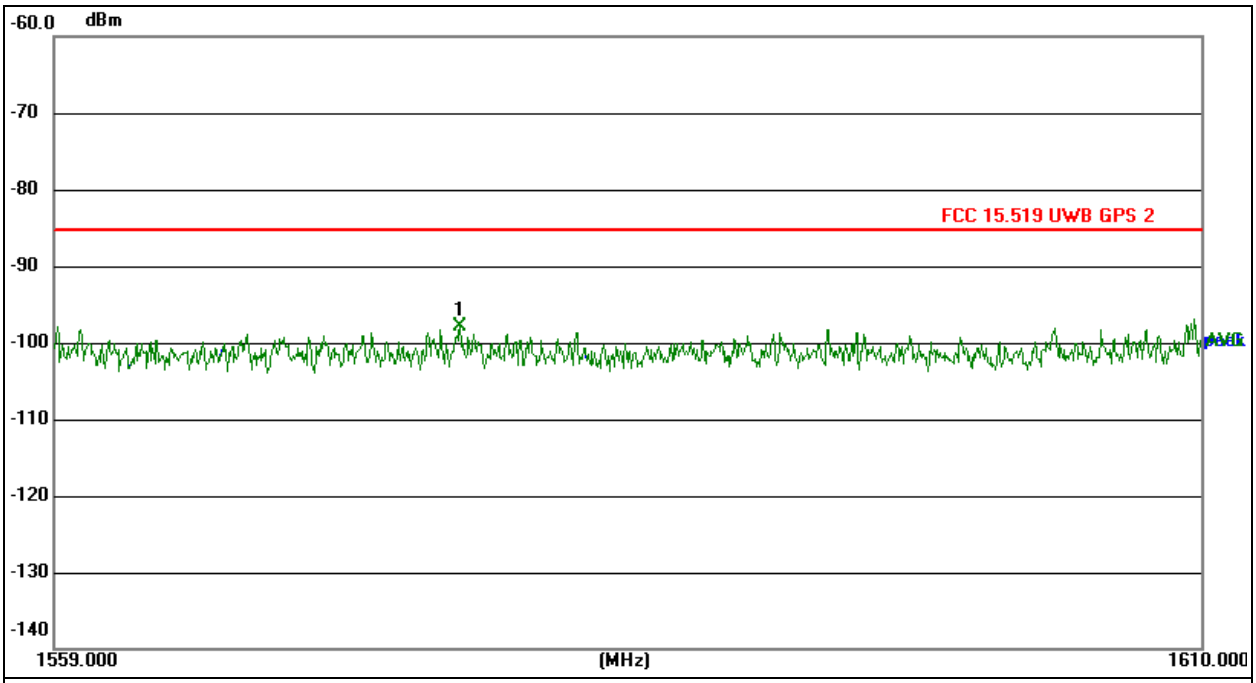
Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Horizontal
Test Mode:	Mode 1	Remark:	N/A



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

No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1 *	1576.493	-78.97	-19.26	-98.23	-85.30	-12.93	AVG

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Phase :	Vertical
Test Mode:	Mode 1	Remark:	N/A

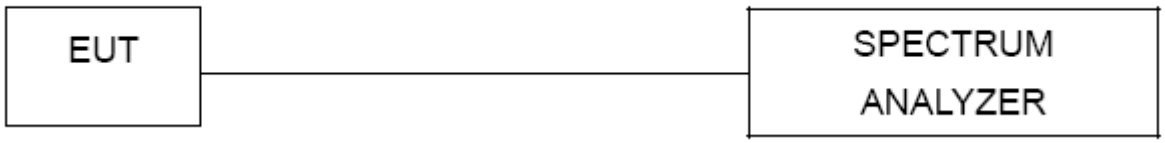


Remark:
1.Factor = Antenna Factor + Cable Loss – Pre-amplifier.
2. Measurement=Reading Level+ Correct Factor
3. Over= Measurement-Limit

No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1 *	1576.901	-78.68	-19.26	-97.94	-85.30	-12.64	AVG

8. Shutoff Timing Requirement

8.1 Block Diagram Of Test Setup



8.2 Limit

A UWB device operating under the provisions of this section shall transmit only when it is sending information to an associated receiver. The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received. An acknowledgment of reception must continue to be received by the UWB intentional radiator at least every 10 seconds or the UWB device must cease transmitting.

8.3 Test procedure

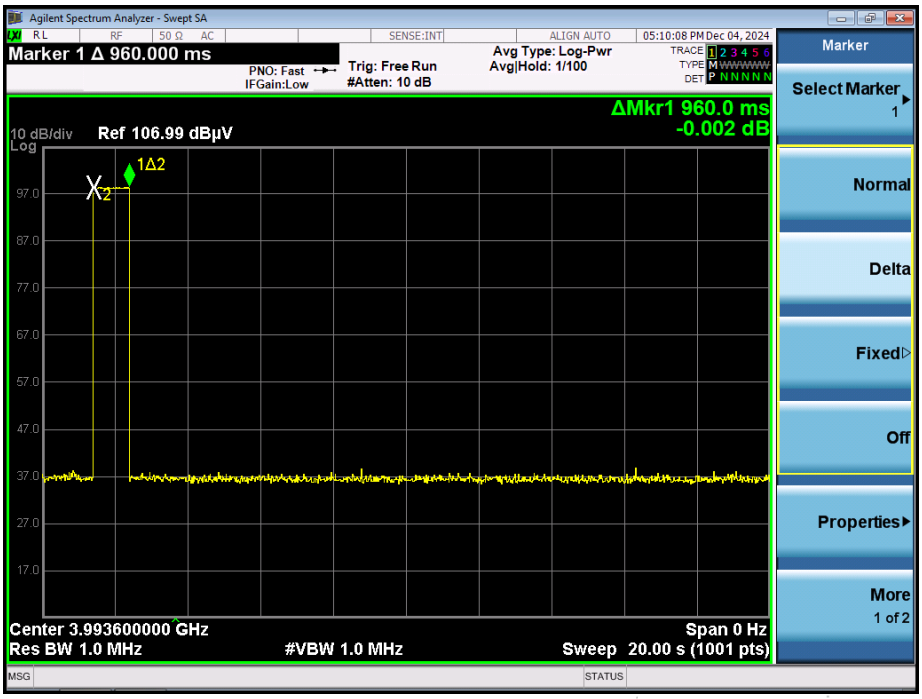
1. Set the EUT in normal operating mode.
2. RBW/VBW=1MHz/1MHz.
3. SWT=20S

8.4 EUT Operating Conditions

The EUT tested system was configured as the statements of 4.4 Unless otherwise a special operating condition is specified in the follows during the testing.

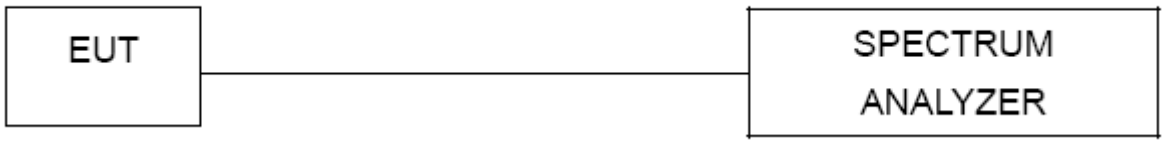
8.5 Test Result

Transmitting time	Limit
0.96 S	10 S



9. UWB Operation Bandwidth

9.1 Block Diagram Of Test Setup



9.2 Limit

UWB bandwidth. For the purpose of this subpart, the UWB bandwidth is the frequency band bounded by the points that are 10 dB below the highest radiated emission, as based on the complete transmission system including the antenna. The upper boundary is designated fH and the lower boundary is designated fL. The frequency at which the highest radiated emission occurs is designated fM.
Ultra-wideband (UWB) transmitter. An intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or greater than 500 MHz, regardless of the fractional bandwidth.
The UWB bandwidth of a UWB system operating under the provisions of this section must be contained between 3100 MHz and 10,600 MHz.

9.3 Test procedure

A UWB transmitter is defined as "an intentional radiator that, at any point in time, has a fractional bandwidth equal to or greater than 0.20 or has a UWB bandwidth equal to or great than 500 MHz, regardless of the fractional bandwidth.
The frequency at which the maximum power level is measured with the peak detector is designated fM. The peak power measurements shall be made using a spectrum analyzer or EMI receiver with a 1 MHz resolution bandwidth and a video bandwidth of 1 MHz or greater. The instrument shall be set to peak detection using the maximum-hold trace mode. The outermost 1 MHz segments above and below fM, where the peak power falls by 10 dB relative to the level at fM, are designated as fH and fL, respectively:
a) For the lowest frequency bound fL, the emission is searched from a frequency lower than fM that has, by inspection, a peak power much lower than 10 dB less than the power at fM and increased toward fM until the peak power indicates 10 dB less than the power at fM. The frequency of that segment is recorded.
b) This process is repeated for the highest frequency bound fH, beginning at a frequency higher than fM that has, by inspection, a peak power much lower than 10 dB below the power at fM. The frequency of that segment is recorded.
c) The two recorded frequencies represent the highest fH and lowest fL bounds of the UWB transmission, and the −10 dB bandwidth (B − 10) is defined as (fH − fL).82 The center frequency (fc) is mathematically determined from (fH − fL) / 2.
d) The fractional bandwidth is defined as 2(fH − fL) / (fH + fL).
e) Determine whether the −10 dB bandwidth (fH − fL) is ≥500 MHz, or whether the fractional bandwidth 2(fH − fL) / (fH + fL) is ≥0.2.

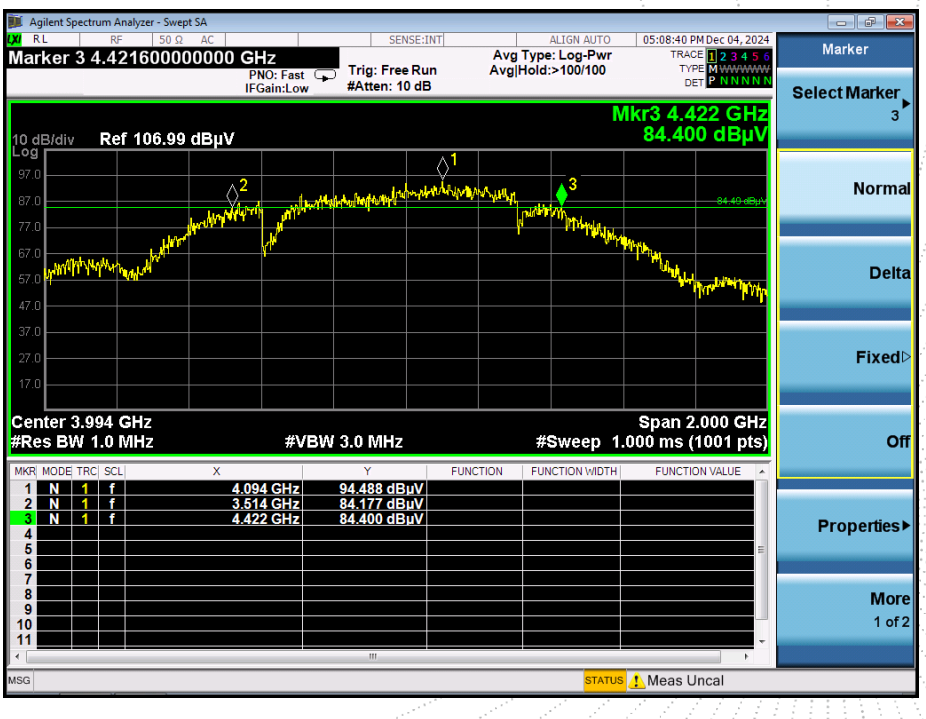
9.4 EUT Operating Conditions

The EUT tested system was configured as the statements of 4.4 Unless otherwise a special operating condition is specified in the follows during the testing.

9.5 Test Result

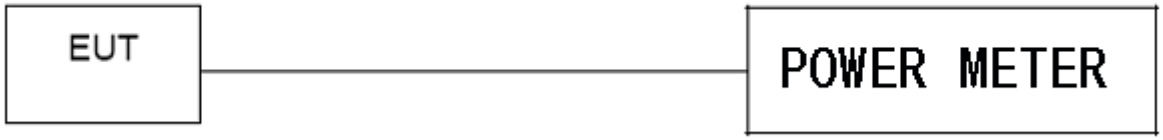
Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC120V/60Hz

Item		Result	Limit (MHz)
FM(MHz)	The highest emission frequency	4094	/
FL(MHz)	10dB below the highest emission	3514	>3100
FH(MHz)	10dB above the highest emission	4422	<10600
FC(MHz)	(FH + FL)/2	3968	/
10dB bandwidth(MHz)	FH - FL	908	≥500
Fractional bandwidth	2(FH - FL)/ (FH + FL)	0.229	/



10. Peak Emission In A 50 Mhz Bandwidth

10.1 Block Diagram Of Test Setup



10.2 Limit

There is a limit on the peak level of the emissions contained within a 50 MHz bandwidth centered on the frequency at which the highest radiated emission occurs, fM. That limit is 0 dBm EIRP. It is acceptable to employ a different resolution bandwidth, and a correspondingly different peak emission limit, following the procedures described in § 15.521.

10.3 Test Procedure

The spectral characterization of a UWB device shall begin with a peak-detected radiated measurement because the results obtained from this measurement could preclude the need for subsequent average measurements. For example, if the data collected from the peak-power measurement show that the radiated emissions levels are equal to, or less than, the applicable emissions limit, then these data are adequate to determine compliance. This is predicated on the fact that the average levels are always less than, or equal to, the peak signal level.
The peak detector of the instrument is selected and the maximum hold feature activated. The RBW is set to 1 MHz and the VBW is set to at least 1 MHz (3 MHz is recommended).

10.4 EUT Operating Conditions

The EUT tested system was configured as the statements of 4.4 Unless otherwise a special operating condition is specified in the follows during the testing.

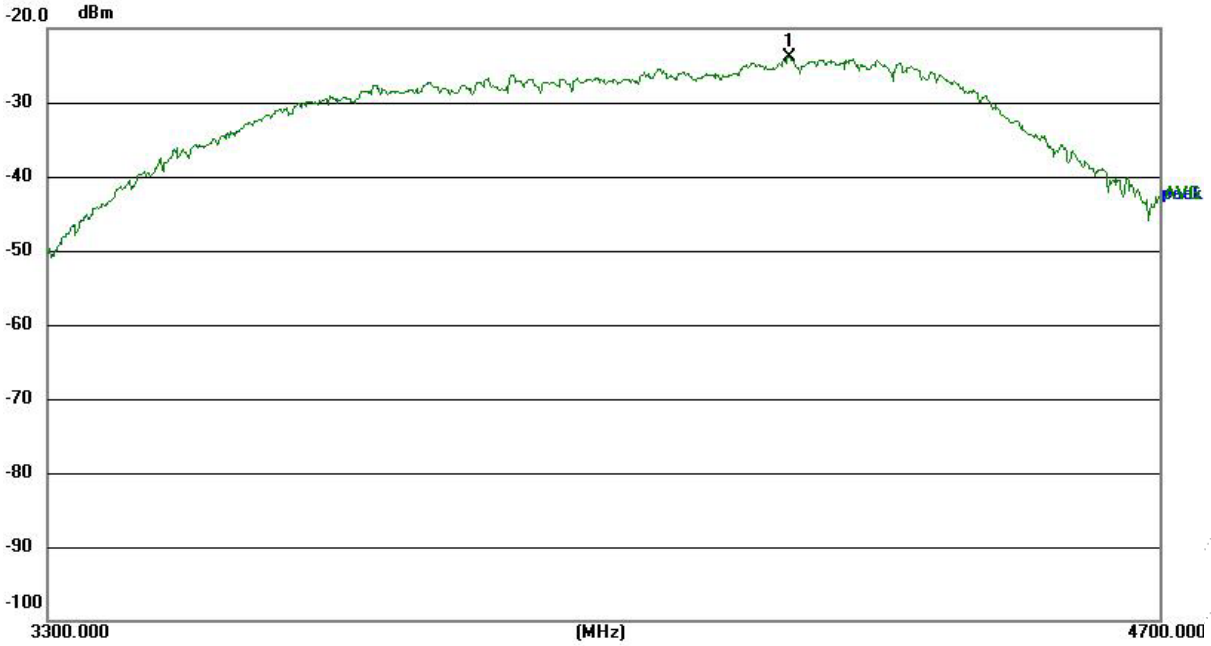
10.5 Test Result

Temperature:	26 ℃	Relative Humidity:	54%RH
Pressure:	101KPa	Test Voltage:	AC120V/60Hz

Direction	Frequency(MHz)	Reading level E (dBm) RBW=8MHz	E (dBm) RBW=50MHz	Limit (dBm/50MHz)
Horizontal	3993.6	-23.94	-7.94	0
Vertical	3993.6	-33.47	-17.47	0

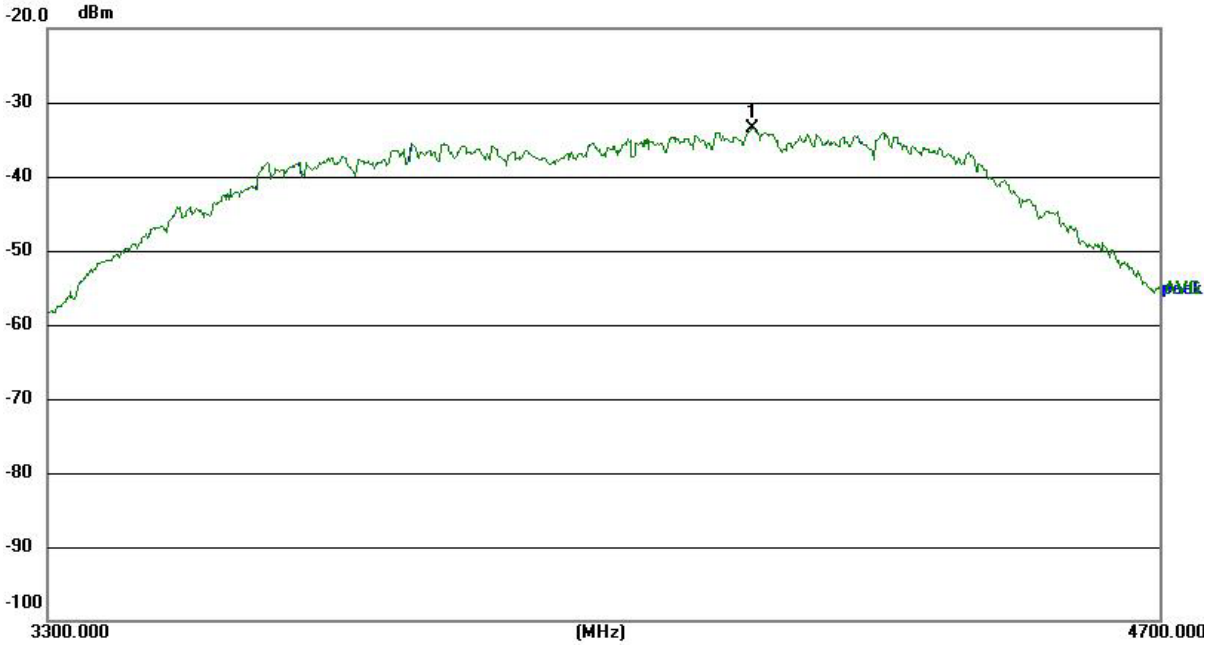
Note: the correct factor of RBW 8MHz to 50MHz is 20 log (50MHz/8 MHz) =16
The test distance is 3m.

Horizontal:



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1 *	4179.200	-11.84	-12.10	-23.94	16.00	-7.94	peak

Vertical:



No.	Frequency (MHz)	Reading (dBm)	Factor (dB)	Level (dBm)	Limit (dBm)	Margin (dB)	Detector
1 *	4130.200	-21.27	-12.20	-33.47	0.00	-33.47	peak

11. Antenna Requirement

11.1 Limit

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.

11.1 Test Result

The EUT antenna is Chip antenna, non-removable; fulfill the requirement of this section.

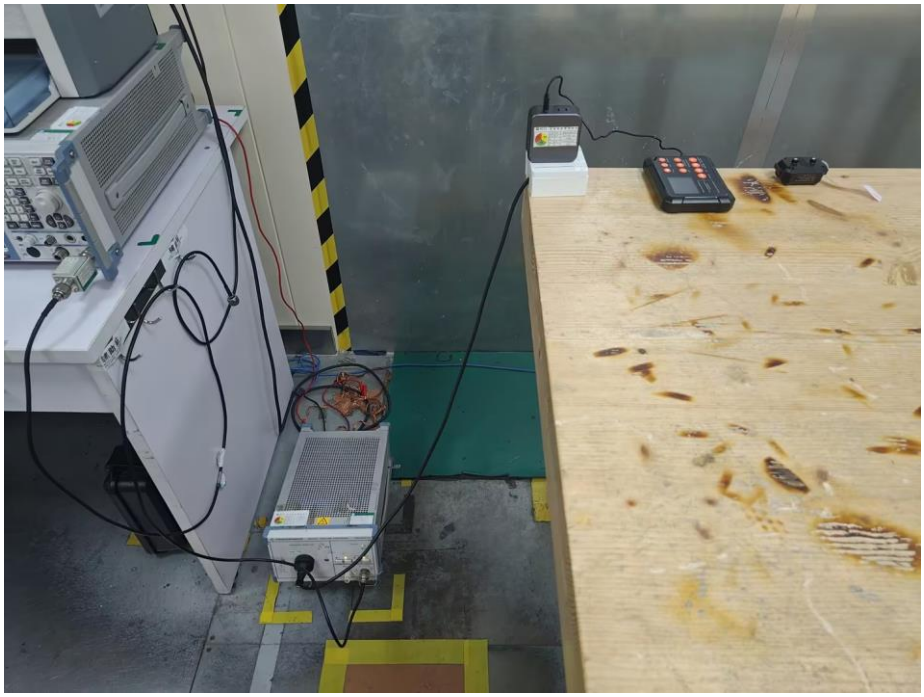
12. EUT Photographs

EUT Photo

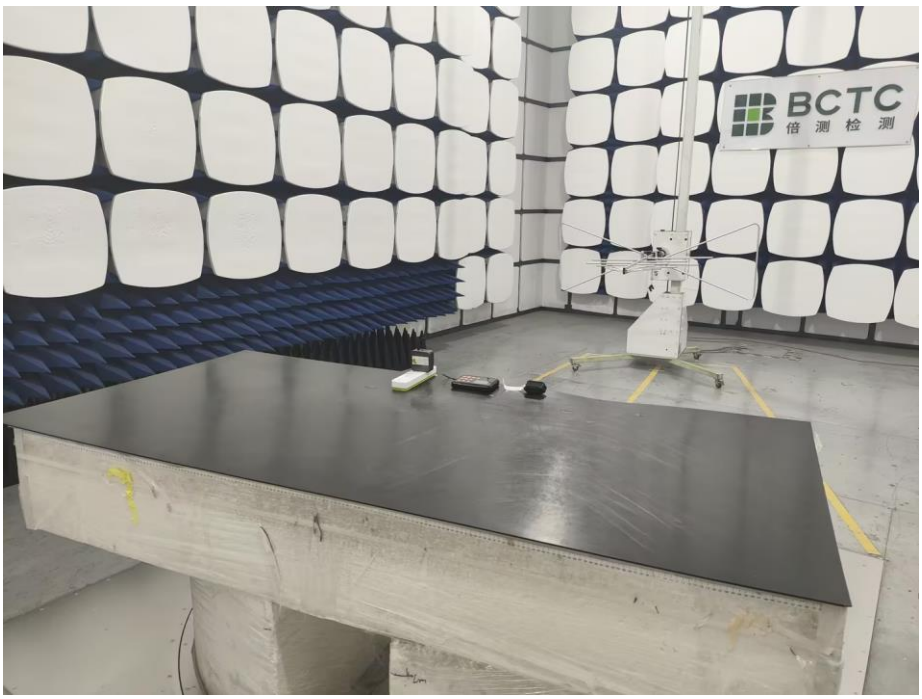
NOTE: Appendix-Photographs Of EUT Constructional Details

13. EUT Test Setup Photographs

Conducted emissions Photo



Radiated Measurement Photos



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.

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

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