FCC REPORT

Applicant:	Xiamen Paperang Technology Co.,Ltd.
Address of Applicant:	Room 3124,Xuanye Building, Pioneer Park, Xiamen Torch High-tech Zone, Fujian, China

Equipment Under Test (EUT)

Product Name:	Thermal Printer
Model No.:	P3,P3L,P3S,PAPERANG P3,PAPERANG-P3,P3B2,P3Y2,P3A2,P3Z2,P3N2,P3S2,P3C2,P3W2,P3X2
Trade mark:	PAPERANG
FCC ID:	2APWO-P3W2
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247
Date of sample receipt:	30 Mar., 2022
Date of Test:	14 Apr., 2022~13 May, 2022
Date of report issued:	30 May, 2022
Test Result:	PASS *

* In the configuration tested, the EUT complied with the standards specified above.

1 Modified Information

Version No.	Date	Description
00	*30 May, 2022*	*Original*

Tested by: Leo Zhang ***Date:*** 30 May, 2022

Leo Zhang/ Engineer

Reviewed by: ***Date:*** 30 May, 2022

Louis Ye/Manager

2 Contents

Page

3 Test Summary

Test Items	Section in CFR 47	Result
Antenna requirement	15.203&15.247 (b)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(3)	Pass
6dB Emission Bandwidth 99% Occupied Bandwidth	15.247 (a)(2)	Pass
Power Spectral Density	15.247 (e)	Pass
Band Edge	15.247(d)	Pass
Spurious Emission	15.205&15.209	Pass

Remark:

1. *Pass: The EUT complies with the essential requirements in the standard.*
2. *N/A: Not Applicable.*
3. *The cable insertion loss used by "RF Output Power" and other conduction measurement items is 1dB (provided by the customer).*

Test Method:	*ANSI C63.10-2013* *KDB 558074 D01 15.247 Meas Guidance v05r02*

4 General Information

4.1 Client Information

Applicant:	Xiamen Paperang Technology Co.,Ltd.
Address:	Room 3124,Xuanye Building,Pioneer Park,Xiamen Torch High-tech Zone,Fujian,China
Manufacturer:	Xiamen Paperang Technology Co.,Ltd.
Address:	Room 3124,Xuanye Building,Pioneer Park,Xiamen Torch High-tech Zone,Fujian,China

4.2 General Description of E.U.T.

Product Name:	Thermal Printer
Model No.:	P3,P3L,P3S,PAPERANG P3,PAPERANG-P3,P3B2,P3Y2,P3A2,P3Z2, P3N2,P3S2,P3C2,P3W2,P3X2
Operation Frequency:	2402-2480 MHz
Channel numbers:	40
Channel separation:	2 MHz
Modulation technology:	GFSK
Data speed :	1Mbps
Antenna Type:	PCB Antenna
Antenna gain:	0dBi
Power supply:	Battery
AC adapter:	N/A
Differences of series model:	Only the model name and appearance color are different between each model, others are the same, the difference does not affect the safety and electromagnetic compatibility performance of the product, so full tests were performed on the model P3W2.

Operation Frequency each of channel

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
0	2402MHz	10	2422MHz	20	2442MHz	30	2462MHz
1	2404MHz	11	2424MHz	21	2444MHz	31	2464MHz
2	2406MHz	12	2426MHz	22	2446MHz	32	2466MHz
3	2408MHz	13	2428MHz	23	2448MHz	33	2468MHz
4	2410MHz	14	2430MHz	24	2450MHz	34	2470MHz
5	2412MHz	15	2432MHz	25	2452MHz	35	2472MHz
6	2414MHz	16	2434MHz	26	2454MHz	36	2474MHz
7	2416MHz	17	2436MHz	27	2456MHz	37	2476MHz
8	2418MHz	18	2438MHz	28	2458MHz	38	2478MHz
9	2420MHz	19	2440MHz	29	2460MHz	39	2480MHz

Note:
In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test. Channel No. 0, 19& 39 were selected as Lowest, Middle and Highest channel.

4.3 Test environment andtest mode

Operating Environment:	
Temp.erature:	24.0 °C
Humi.dity:	54 % RH
Atmospheric Pressure:	1010 mbar
Test mode:	
Transmitting mode	Keep the EUT in continuous transmitting with modulation
The sample was placed 0.8m(below 1GHz)/1.5m(above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. Duty cycle setting during the transmission is 100% with maximum power setting for all modulations.	

4.4 Description of Support Units

The EUT has been tested as an independent unit.

4.5 Measurement Uncertainty

Parameters	Expanded Uncertainty
Conducted Output Power	±1.7 dB (k=2)
Occupied Bandwidth	1.3%
Conducted Spurious Emission	±1.9 dB (k=2)
Conducted Emission (150kHz ~ 30MHz)	±2.8 dB (k=2)
Radiated Emission (9kHz ~ 30MHz)	±2.5 dB (k=2)
Radiated Emission (30MHz ~ 1000MHz)	±4.1 dB (k=2)
Radiated Emission (1GHz ~ 18GHz)	±5.6 dB (k=2)
Radiated Emission (18GHz ~ 40GHz)	±4.8 dB (k=2)

4.6 Additions to, deviations, or exclusions from the method

No

4.7 Laboratory Facility

The test facility is recognized, certified, or accredited by the following organizations:

●FCC - Designation No.: CN1279

Jianyan Testing Group Co., Ltd. has been accredited as a testing laboratory by FCC(Federal Communications Commission). The test firm Registration No. is 892155.

●ISED – CAB identifier.: CN0102

Jianyan Testing Group Co., Ltd. has been recognized by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with ISED#:26114.

●A2LA - Registration No.: 5568.01

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017General requirements for the competence of testing and calibration laboratories. The test scope can be found as below link: https://portal.a2la.org/scopepdf/5568-01.pdf

4.8 Laboratory Location

JianYan Testing Group Co., Ltd.
Address: No.760, Fengling Road, Tong'an District, Xiamen, Fujian, China
Tel: +86-592-2273071, Fax:+86-592-2273700
Email: info-JYTee@lets.com, Website: http://www.lets.com/

4.9 Test Instruments list

Radiated Disturbances:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
3m SAC	BOST	CHC-966	966-1#	2019-12-27	2022-12-26
EMI Test Receiver	Rohde & Schwarz	ESR 3	102329	2021-07-29	2022-07-28
SpectrumAnalyzer	Rohde & Schwarz	FSV40-N	102175	2022-03-01	2023-02-28
Loop Antenna	ETS	6502	00235114	2022-03-05	2023-03-04
BiConiLog Antenna	SCHWARZBECK	VULB 9163	1105	2021-12-05	2022-12-04
BiConiLog Antenna	SCHWARZBECK	VULB 9168	1066	2022-03-05	2023-03-04
Horn Antenna	SCHWARZBECK	BBHA 9120 D	911	2022-03-05	2023-03-04
Pre-amplifier	SCHWARZBECK	BBV9743	00009	2021-07-29	2022-07-28
Pre-amplifier	SCHWARZBECK	BBV9718C	00014	2022-03-01	2023-02-28
EMI Test Software	Farad	EZ-EMC	Version: V.EMCE-3A1		

Conducted Emission:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
EMI Test Receiver	Rohde & Schwarz	ESR 3	102330	2021-07-29	2022-07-28
LISN	Rohde & Schwarz	ENV 216	102240	2021-07-29	2022-07-28
LISN	AFJ/Italy	LS16C\10	16012020470	2021-06-22	2022-06-21
EMI Test Software	Farad	EZ-EMC	Version: V.EMCE-3A1		

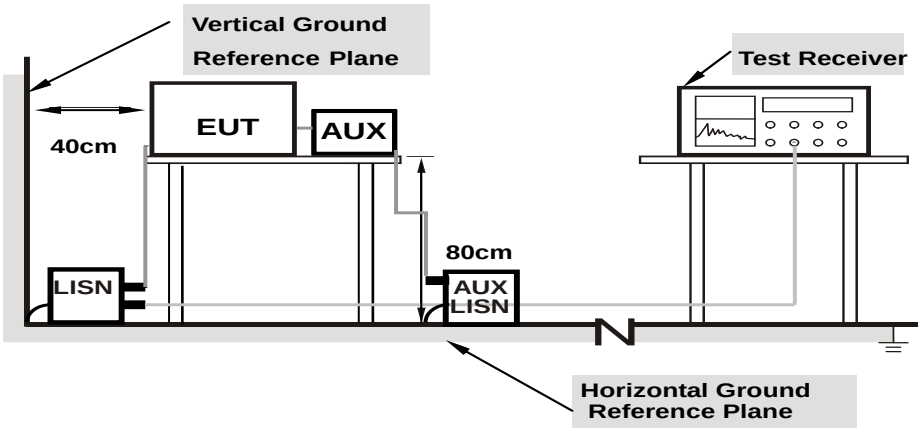
Conducted method:					
Test Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date (mm-dd-yy)**	**Cal. Due date (mm-dd-yy)**
Signal Generator	Agilent	N5181	MY49060122	2022-03-01	2023-02-28
Specture Analyzer	R&S	FSV40-N	102175	2022-03-01	2023-02-28
Wideband Radio Communication Tester	R&S	CMW500	145852	2022-03-01	2023-02-28
Signal Generator	Agilent	N5182A	MY51004823	2022-03-01	2023-02-28
Power Sensor	Keysight	U2021XA	MY54320004	2022-03-01	2023-02-28
Test Software	MWRFTEST	MTS 8310	Version: 2.0.0.0		

5 Test results andMeasurement Data

5.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203 /247(b)
15.203 requirement: 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. 15.247(b) (4) requirement: (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.	
E.U.T Antenna:	
The Bluetooth antenna is an Internal antenna which permanently attached, and the best case gain of the antenna is 0 dBi.	

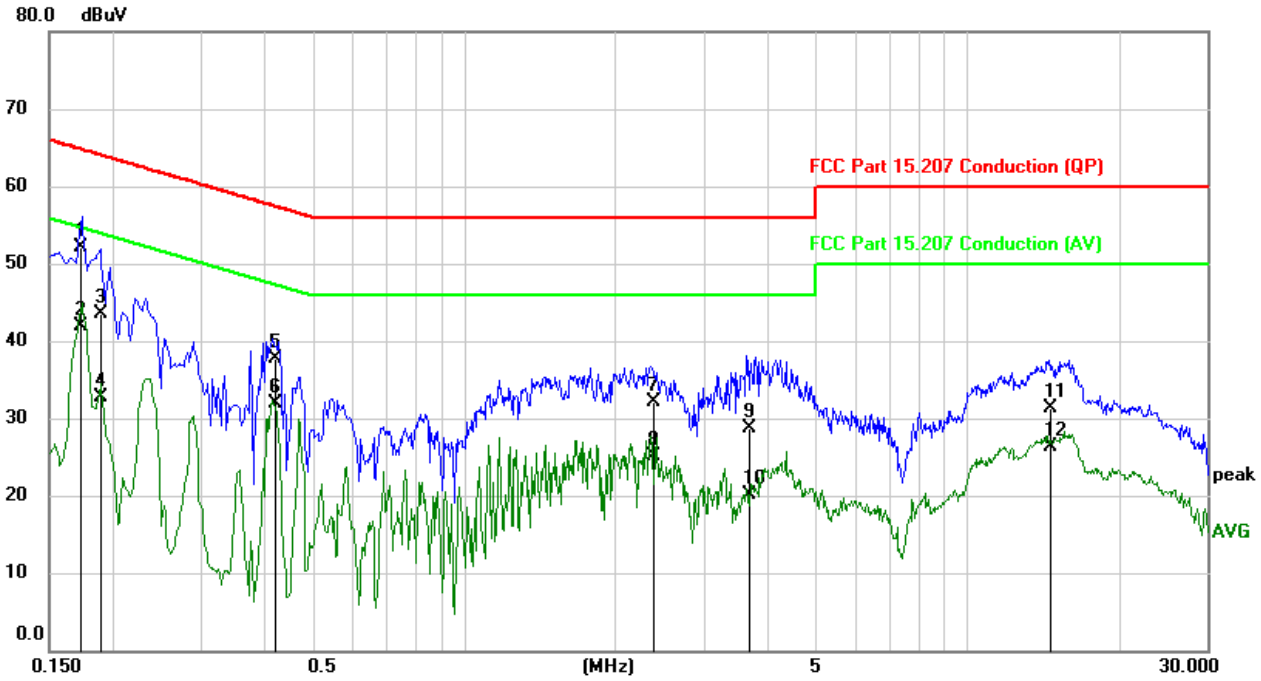
5.2 Conducted Emission

<table>
<tr><td>Test Requirement:</td><td colspan="3">FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Frequency Range:</td><td colspan="3">150 kHz to 30MHz</td></tr>
<tr><td>Class / Severity:</td><td colspan="3">Class B</td></tr>
<tr><td>Receiver setup:</td><td colspan="3">RBW=9kHz, VBW=30kHz</td></tr>
<tr><td rowspan="5">Limit:</td><td rowspan="2">Frequency range (MHz)</td><td colspan="2">Limit (dBuV)</td></tr>
<tr><td>Quasi-peak</td><td>Average</td></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
<tr><td colspan="3">* Decreases with the logarithm of the frequency.</td></tr>
<tr><td>Test procedure:</td><td colspan="3">1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.), which provides a 50ohm/50uH coupling impedance for the measuring equipment.
2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs).
3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10(latest version) on conducted measurement.</td></tr>
<tr><td>Test setup:</td><td colspan="3"> 

Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes</td></tr>
<tr><td>Test Instruments:</td><td colspan="3">Refer to section 4.9 for details</td></tr>
<tr><td>Test mode:</td><td colspan="3">Charging + BLE Link.</td></tr>
<tr><td>Test results:</td><td colspan="3">Pass</td></tr>
</table>

Measurement Data:

Product model:	P3W2	**Test result:**	pass
Test by:	Leo Zhang	**Test mode:**	Charging + BLE Link.
Test voltage:	120Vac, 60 Hz	**Phase:**	Line (N)
Environment:	Temp.: 23.9℃ Humi.: 55%		



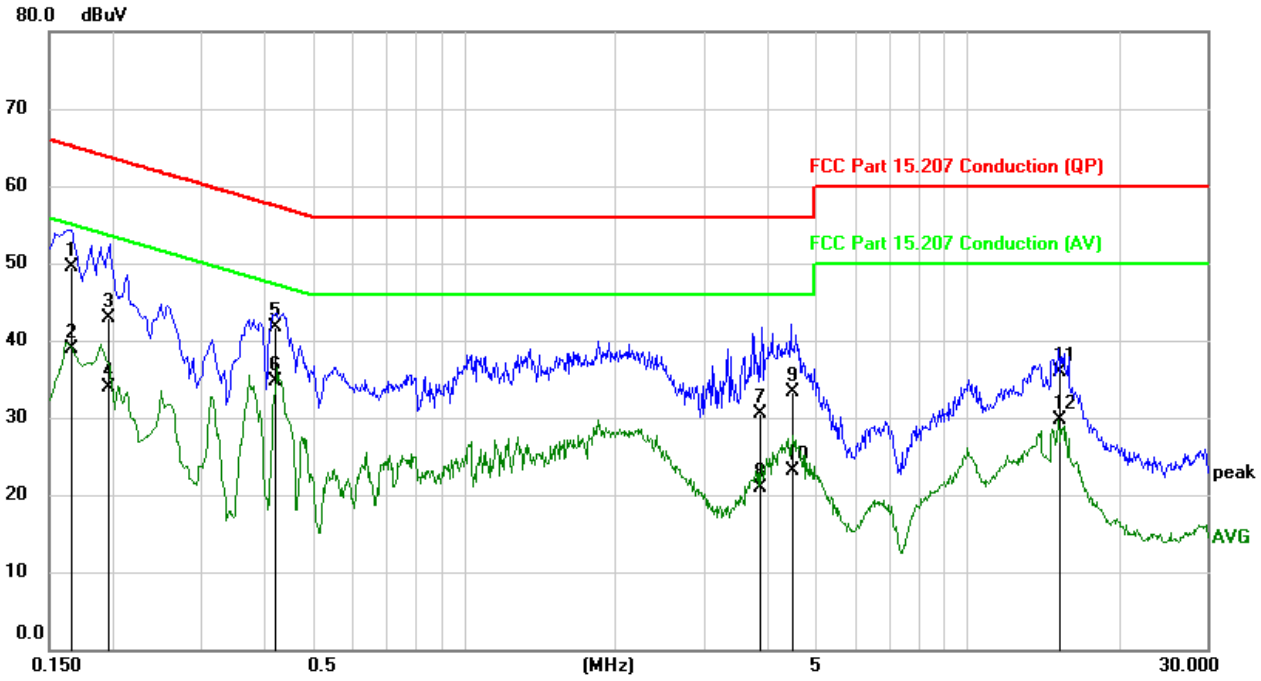
(Plot A:N Phase)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	0.1723	42.41	9.79	52.20	64.85	-12.65	QP
2		0.1723	32.11	9.79	41.90	54.85	-12.95	AVG
3		0.1888	33.63	9.80	43.43	64.09	-20.66	QP
4		0.1888	22.92	9.80	32.72	54.09	-21.37	AVG
5		0.4194	27.76	9.86	37.62	57.46	-19.84	QP
6		0.4194	22.10	9.86	31.96	47.46	-15.50	AVG
7		2.3715	22.17	9.87	32.04	56.00	-23.96	QP
8		2.3715	15.18	9.87	25.05	46.00	-20.95	AVG
9		3.6767	18.84	9.90	28.74	56.00	-27.26	QP
10		3.6767	10.19	9.90	20.09	46.00	-25.91	AVG
11		14.5248	21.32	10.05	31.37	60.00	-28.63	QP
12		14.5248	16.21	10.05	26.26	50.00	-23.74	AVG

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Cable Loss.*

Product model:	P3W2	Test result:	pass
Test by:	Leo Zhang	Test mode:	Charging + BLE Link.
Test voltage:	120Vac, 60 Hz	Phase:	Line (L)
Environment:	Temp.: 23.9℃ Humi.: 55%		



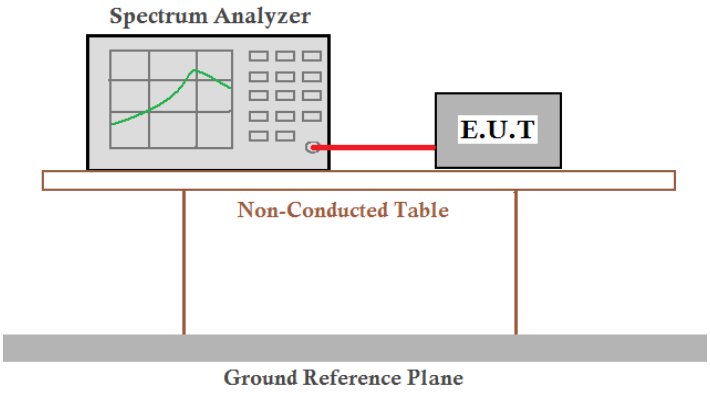
(Plot B:L Phase)

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1654	39.78	9.79	49.57	65.19	-15.62	QP
2		0.1654	29.12	9.79	38.91	55.19	-16.28	AVG
3		0.1962	33.20	9.80	43.00	63.77	-20.77	QP
4		0.1962	24.01	9.80	33.81	53.77	-19.96	AVG
5		0.4203	31.81	9.86	41.67	57.44	-15.77	QP
6	*	0.4203	24.88	9.86	34.74	47.44	-12.70	AVG
7		3.8680	20.64	9.89	30.53	56.00	-25.47	QP
8		3.8680	11.02	9.89	20.91	46.00	-25.09	AVG
9		4.4787	23.47	9.88	33.35	56.00	-22.65	QP
10		4.4787	13.22	9.88	23.10	46.00	-22.90	AVG
11		15.1539	25.83	10.05	35.88	60.00	-24.12	QP
12		15.1539	19.58	10.05	29.63	50.00	-20.37	AVG

Notes:

1. *An initial pre-scan was performed on the line and neutral lines with peak detector.*
2. *Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.*
3. *Final Level =Receiver Read level + LISN Factor + Cable Loss.*

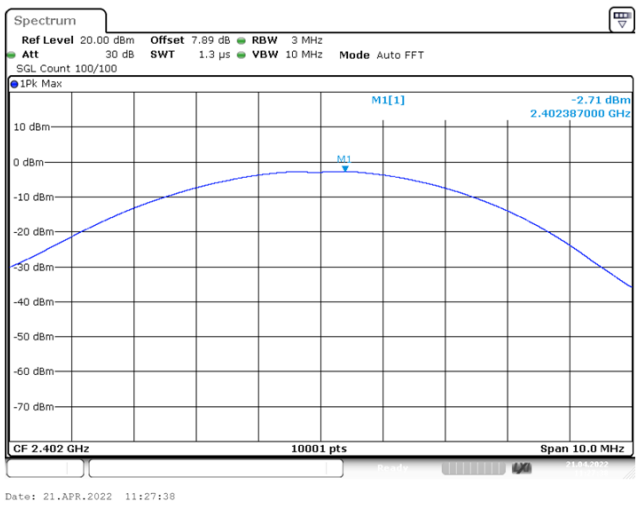
5.3 Conducted Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(3)
Limit:	30dBm
Test setup:	
Test Instruments:	Refer to section 4.9 for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed

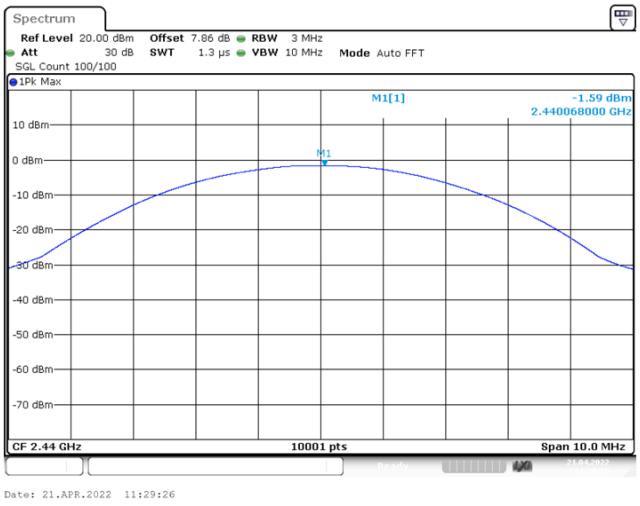
Measurement Data:

Test CH	Maximum Conducted Output Power (dBm)	Limit(dBm)	Result
Lowest	-2.706	30.00	Pass
Middle	-1.589		
Highest	-1.468		

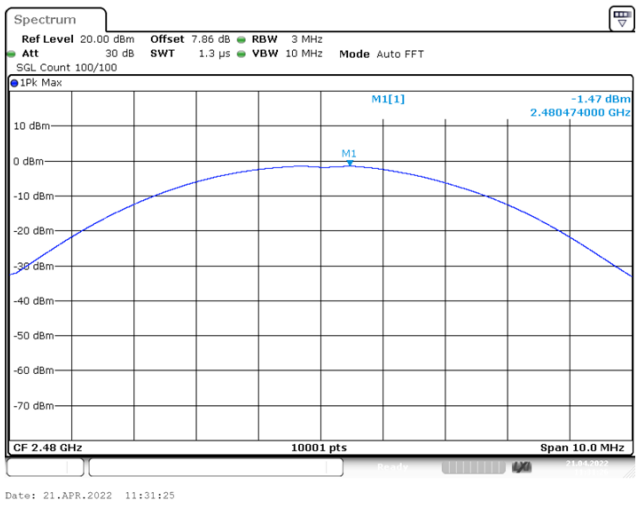
Test plot as follows:



Lowest channel



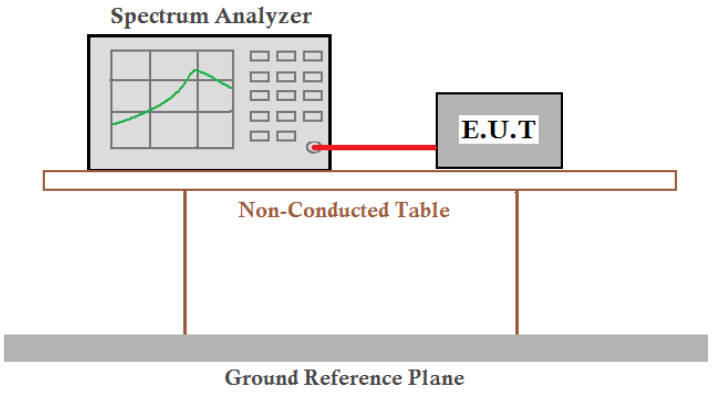
Middle channel



Highest channel

/

5.4 Occupy Bandwidth

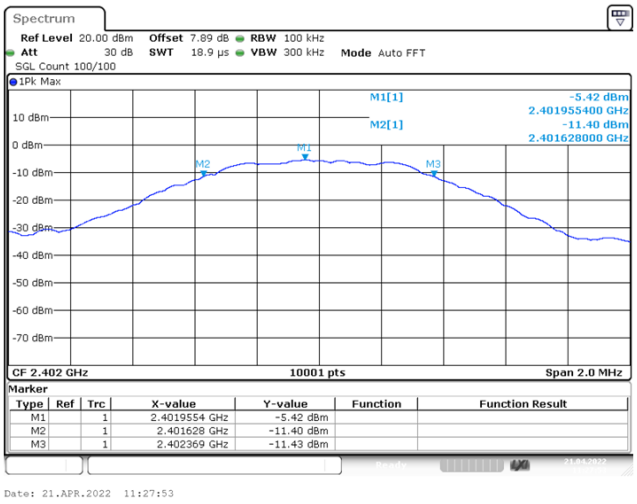
Test Requirement:	FCC Part15 C Section 15.247 (a)(2)
Limit:	>500kHz
Test setup:	
Test Instruments:	Refer to section 4.9 for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed

Measurement Data:

Test CH	6dB Emission Bandwidth (MHz)	Limit(kHz)	Result
Lowest	0.741	>500	Pass
Middle	0.699		
Highest	0.709		
Test CH	99% Occupy Bandwidth (MHz)	Limit(kHz)	Result
Lowest	1.147	N/A	N/A
Middle	1.158		
Highest	1.164		

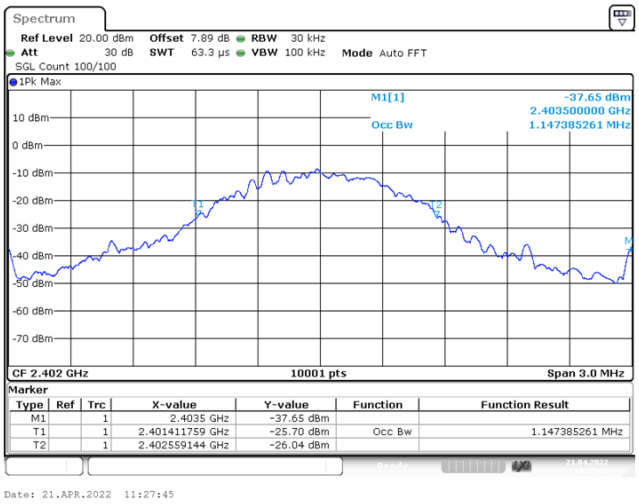
Test plot as follows:

6dB EBW

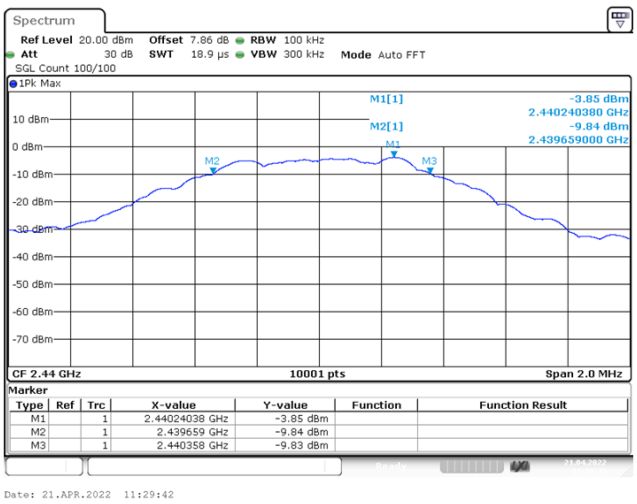


Lowest channel

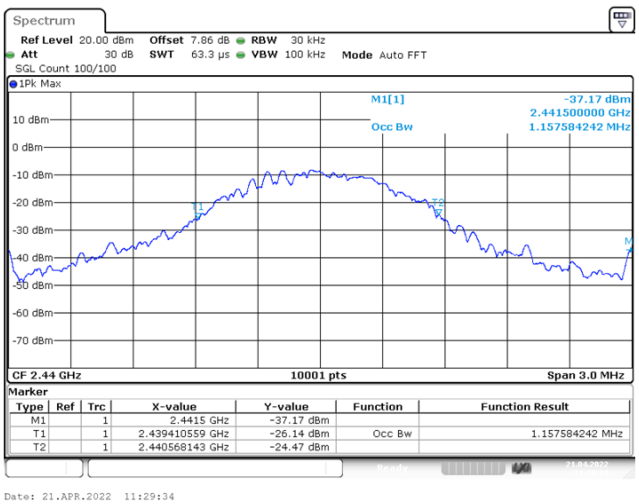
99% OBW



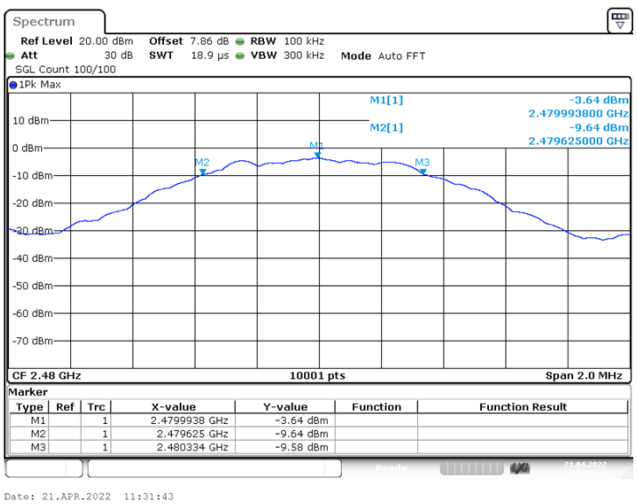
Lowest channel



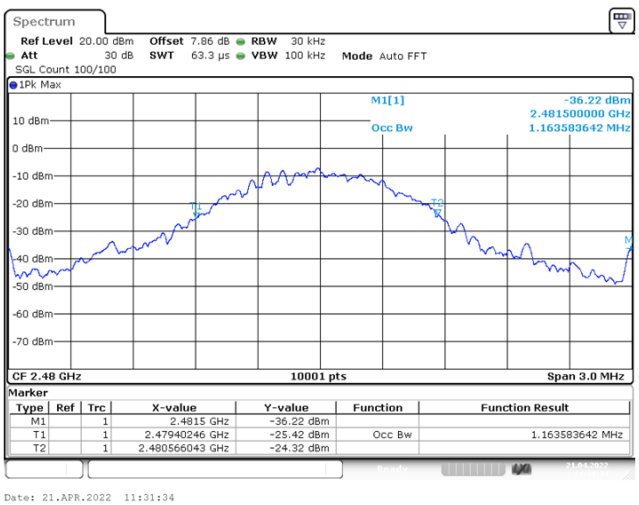
Middle channel



Middle channel

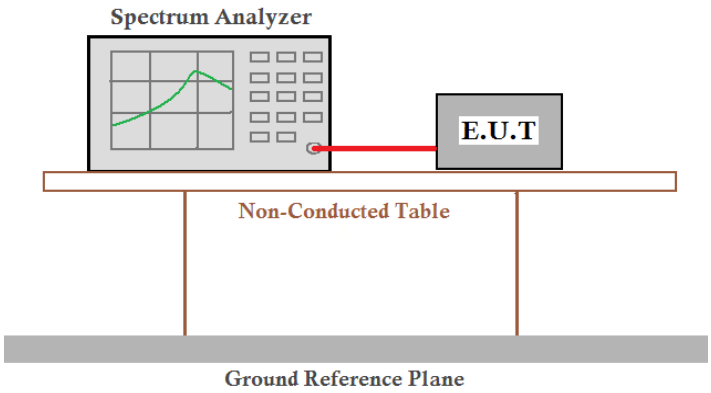


Highest channel



Highest channel

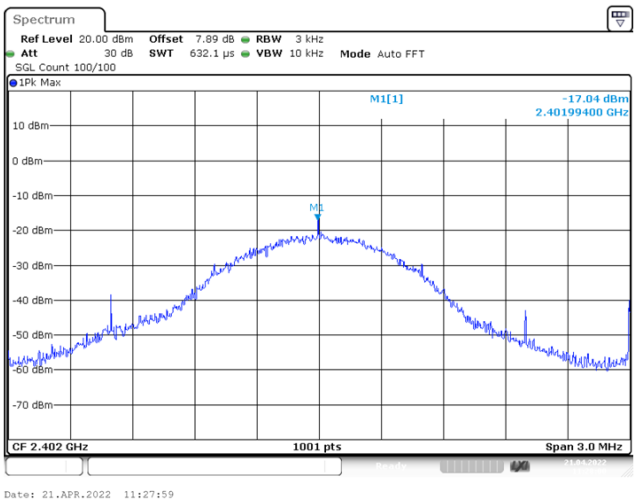
5.5 Power Spectral Density

Test Requirement:	FCC Part15 C Section 15.247 (e)
Limit:	8dBm/3kHz
Test setup:	
Test Instruments:	Refer to section 4.9 for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed

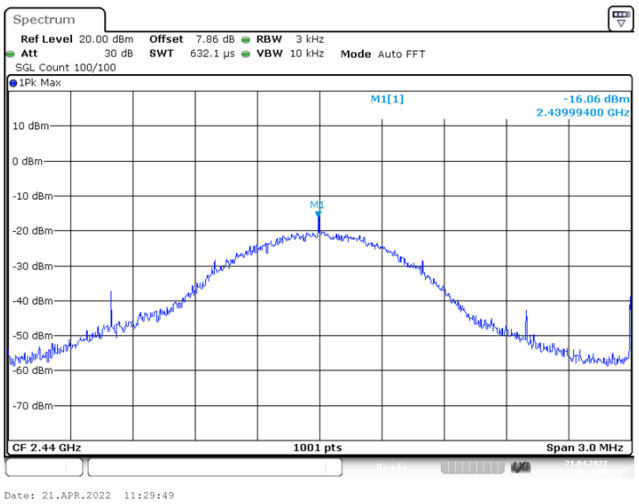
Measurement Data:

Test CH	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Lowest	-17.036	8.00	Pass
Middle	-16.062		
Highest	-15.666		

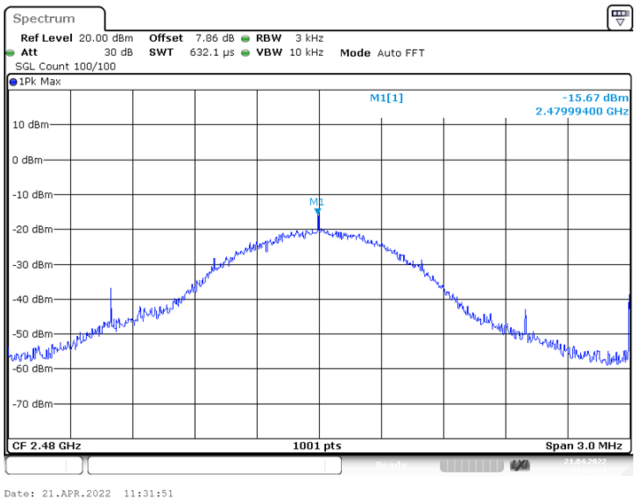
Test plots as follow:



Lowest channel



Middle channel

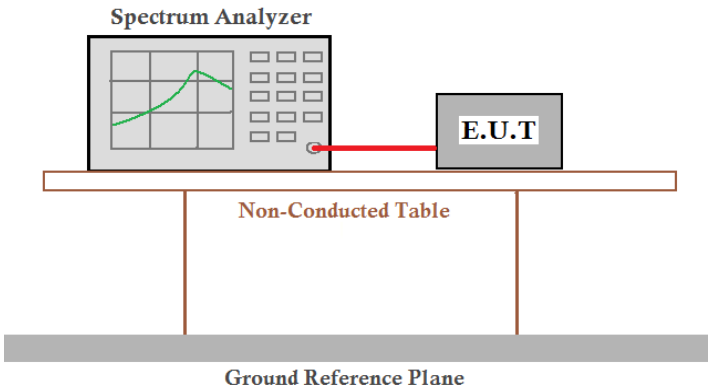


Highest channel

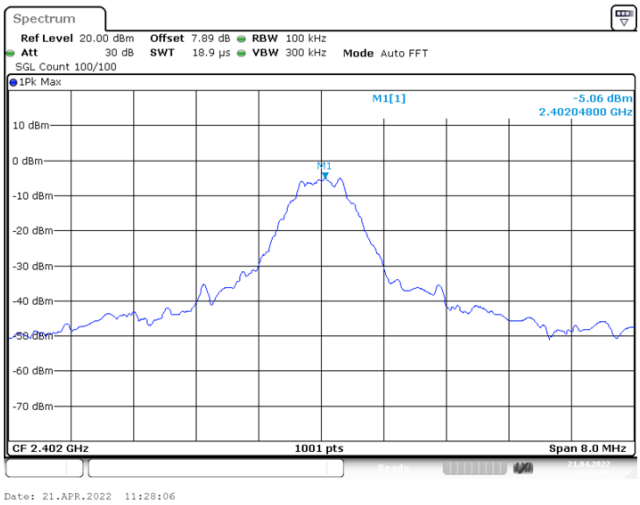
/

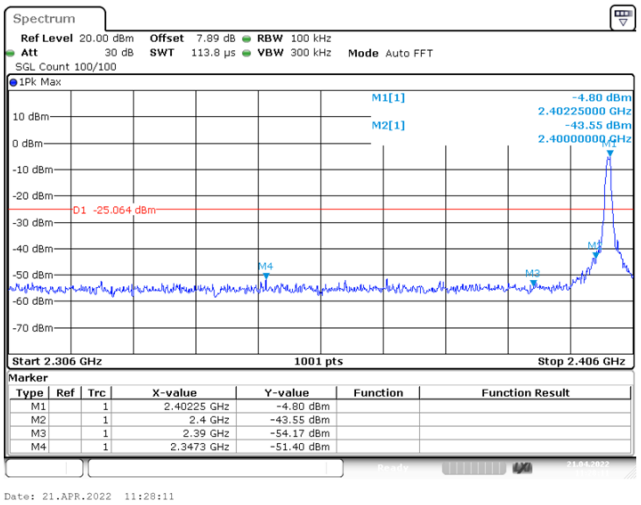
5.6 Band Edge

5.6.1 Conducted Emission Method

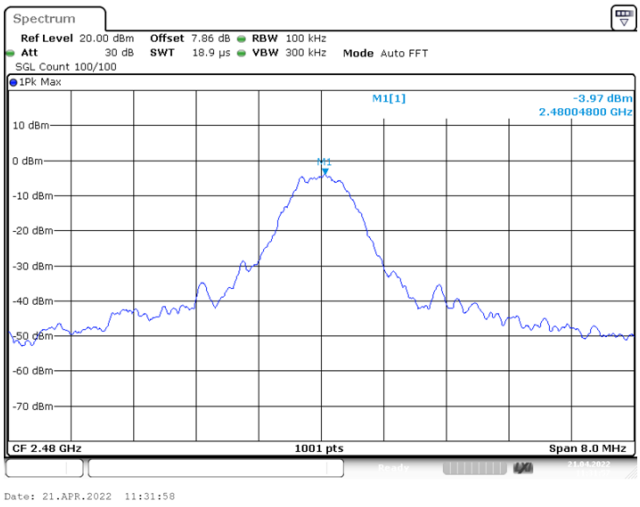
Test Requirement:	FCC Part15 C Section 15.247 (d)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spreadspectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 4.9 for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed

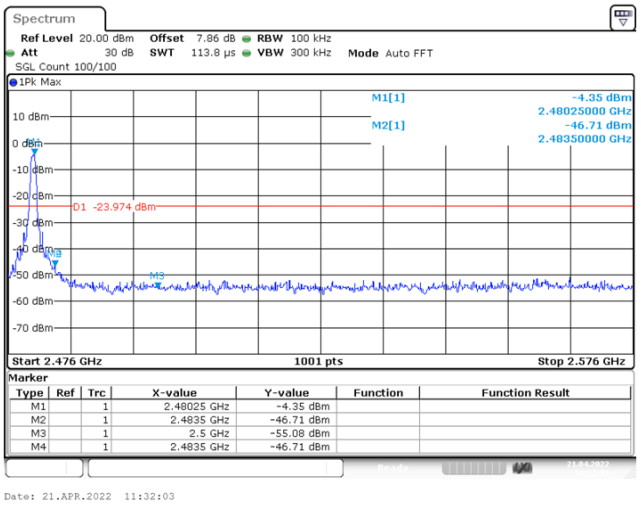
Test plots as follow:





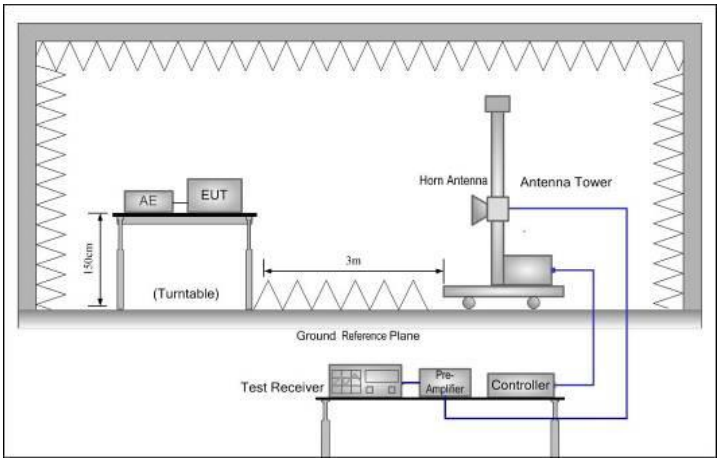
Lowest channel



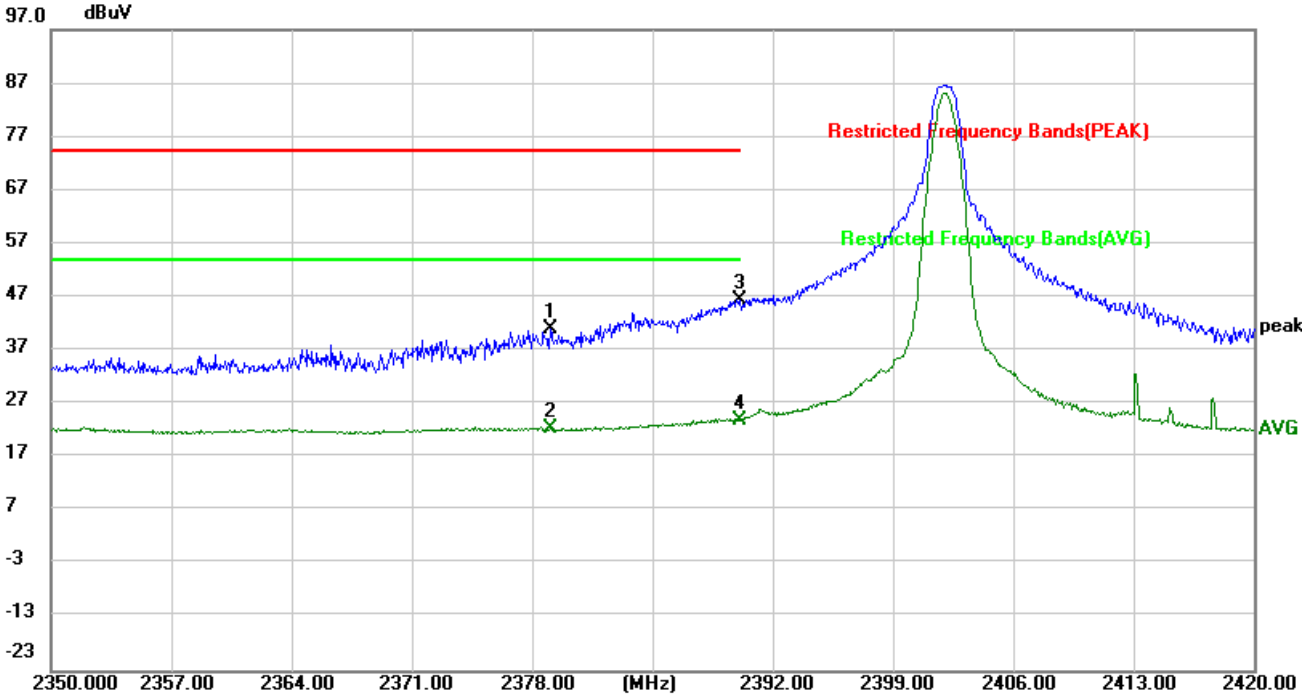


Highest channel

5.6.2 Radiated Emission Method

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.205 and 15.209</td></tr>
<tr><td>Test Frequency Range:</td><td>2380 MHz to 2410 MHz and 2465MHz to 2520 MHz</td></tr>
<tr><td>TestDistance:</td><td>3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>RMS</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.00</td><td>Average Value</td></tr>
<tr><td>74.00</td><td>Peak Value</td></tr>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>1. The EUT was placed on the top of a rotating table 1.5 meters above the groundat a 3 meter camber. The table was rotated 360 degrees todetermine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, whichwas mounted on the top of a variable-height antenna tower.
3. 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.
4. For each suspected emission, the EUT was arranged to its worst case and thenthe antenna was tuned to heights from 1 meter to 4 meters and the rotatablewas turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limitspecified, then testing could be stopped and the peak values of the EUT wouldbe reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified andthen reported in a data sheet.</td></tr>
<tr><td>Test setup:</td><td> 
</td></tr>
<tr><td>Test Instruments:</td><td>Refer to section 4.9 for details</td></tr>
<tr><td>Test mode:</td><td>Refer to section 4.3 for details</td></tr>
<tr><td>Test results:</td><td>Passed</td></tr>
</table>

Product Name:	Thermal Printer	Product Model:	P3W2
Test By:	Leo Zhang	Test mode:	BLE Tx mode
Test Channel:	Lowest channel	Polarization:	Vertical
Test Voltage:	DC7.4V	Environment:	Temp.:23.8℃ Humi.: 52%

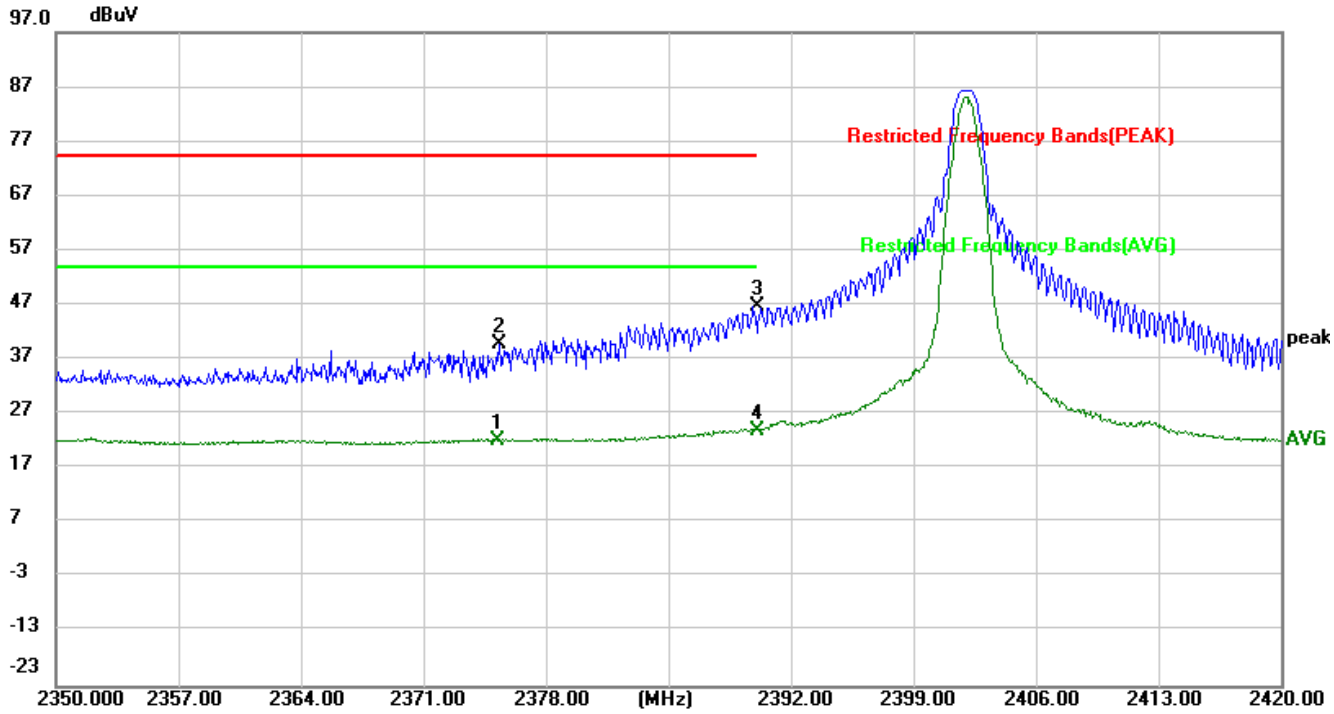


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		2379.050	42.11	-1.19	40.92	74.00	33.08	peak
2		2379.050	23.50	-1.19	22.31	54.00	31.69	AVG
3	*	2390.000	47.56	-1.17	46.39	74.00	27.61	peak
4		2390.000	25.23	-1.17	24.06	54.00	29.94	AVG

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	P3W2
Test By:	Leo Zhang	Test mode:	BLE Tx mode
Test Channel:	Lowest channel	Polarization:	Horizontal
Test Voltage:	DC7.4V	Environment:	Temp.: 23.8℃ Humi.: 52%



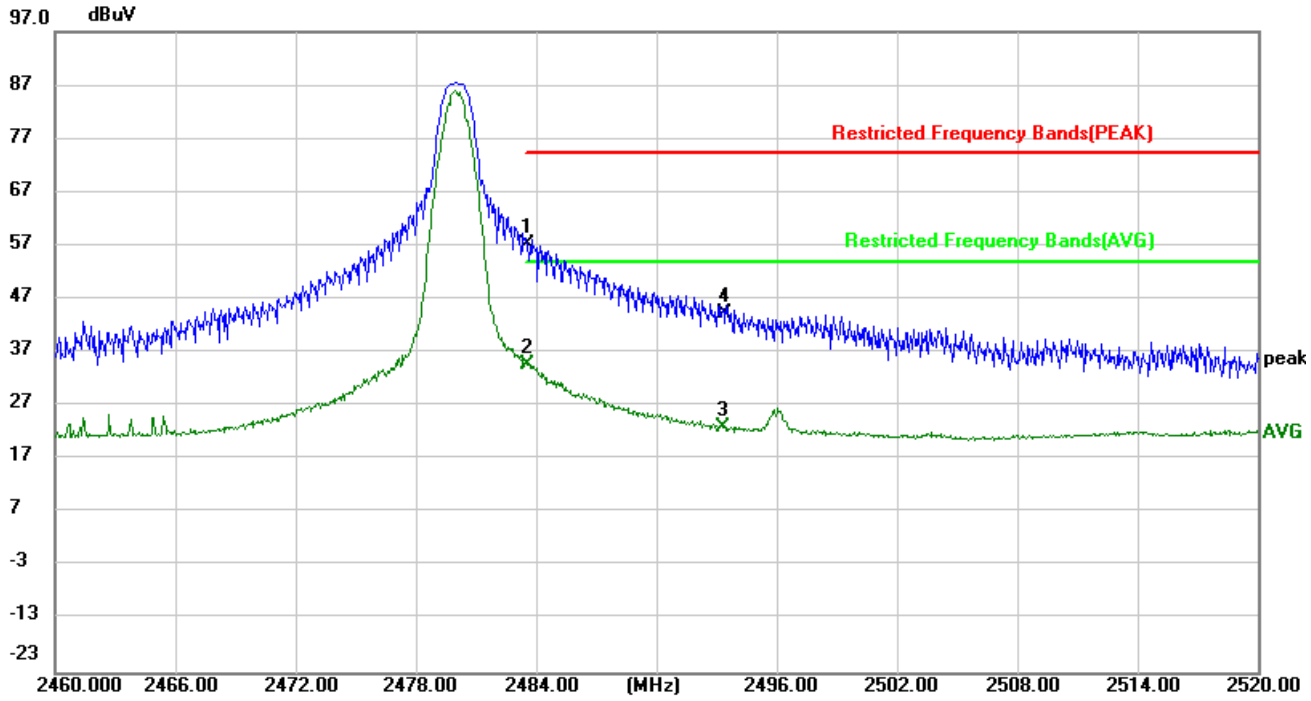
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		2375.200	23.43	-1.19	22.24	54.00	31.76	AVG
2		2375.340	40.90	-1.19	39.71	74.00	34.29	peak
3	*	2390.000	48.07	-1.17	46.90	74.00	27.10	peak
4		2390.000	25.01	-1.17	23.84	54.00	30.16	AVG

Remark:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

2. The emission levels of other frequencies are very lower than the limit and not show in test report.

Product Name:	Thermal Printer	Product Model:	P3W2
Test By:	Leo Zhang	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Vertical
Test Voltage:	DC7.4V	Environment:	Temp.: 23.8℃ Humi.: 52%

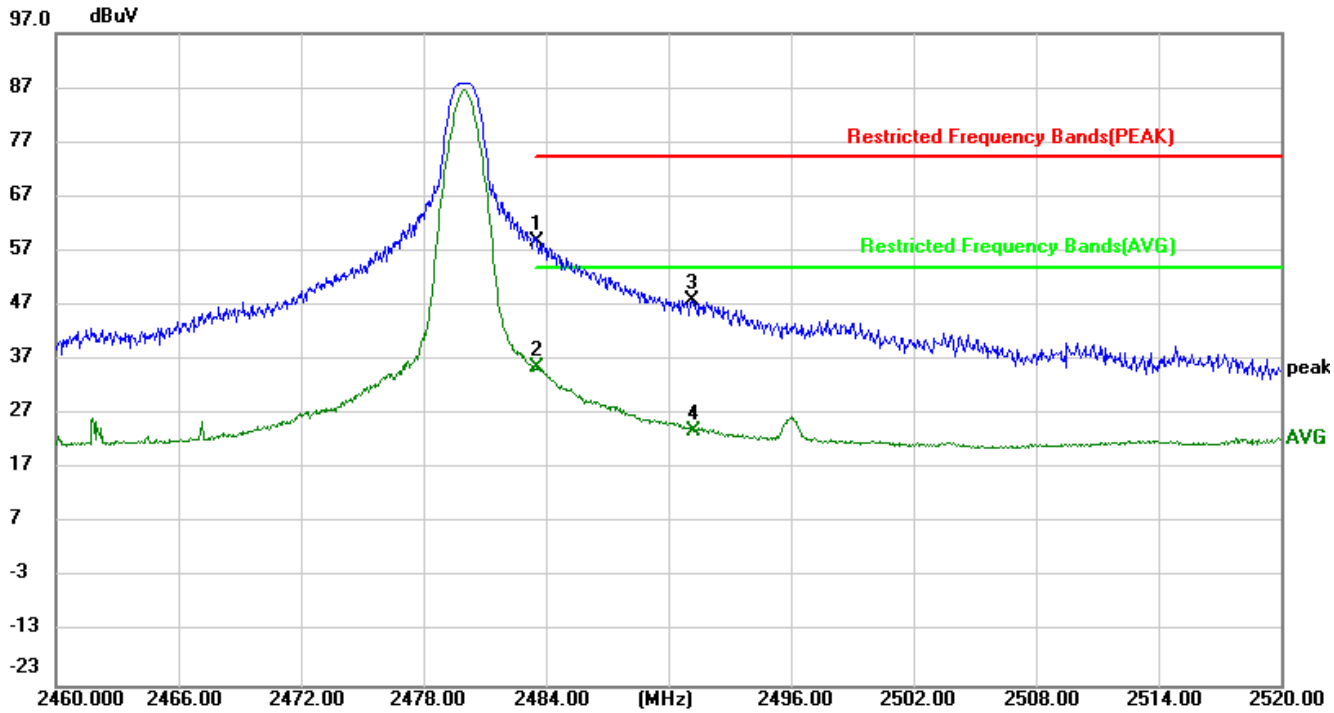


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	2483.500	58.30	-1.00	57.30	74.00	16.70	peak
2		2483.500	35.70	-1.00	34.70	54.00	19.30	AVG
3		2493.300	23.95	-0.99	22.96	54.00	31.04	AVG
4		2493.360	45.25	-0.99	44.26	74.00	29.74	peak

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	P3W2
Test By:	Leo Zhang	Test mode:	BLE Tx mode
Test Channel:	Highest channel	Polarization:	Horizontal
Test Voltage:	DC7.4V	Environment:	Temp.: 23.8℃ Humi.: 52%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1	*	2483.500	59.90	-1.00	58.90	74.00	15.10	peak
2		2483.500	36.61	-1.00	35.61	54.00	18.39	AVG
3		2491.140	48.90	-0.99	47.91	74.00	26.09	peak
4		2491.260	24.93	-0.99	23.94	54.00	30.06	AVG

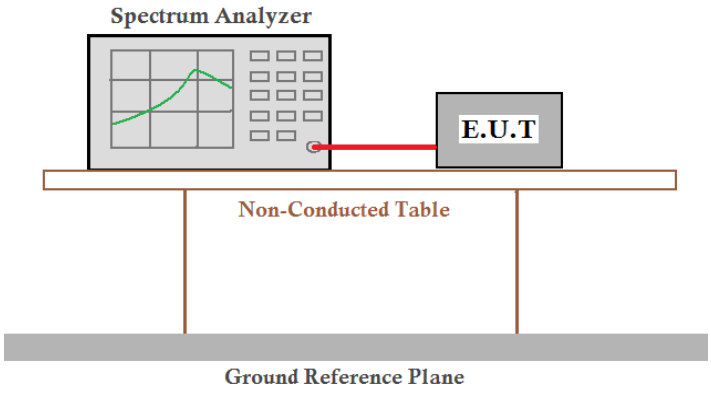
Remark:

1. Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.

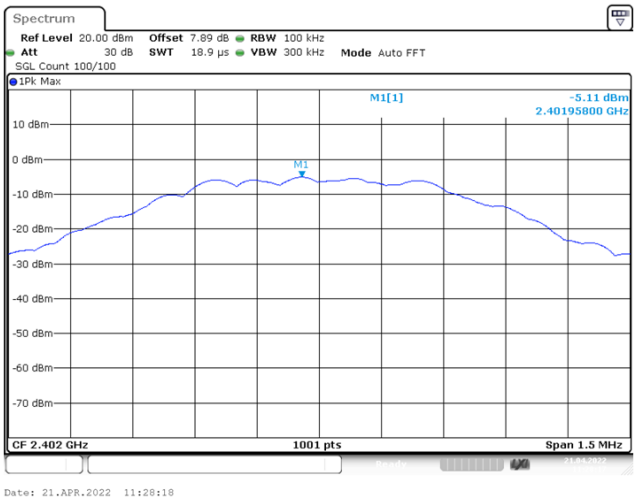
2. The emission levels of other frequencies are very lower than the limit and not show in test report.

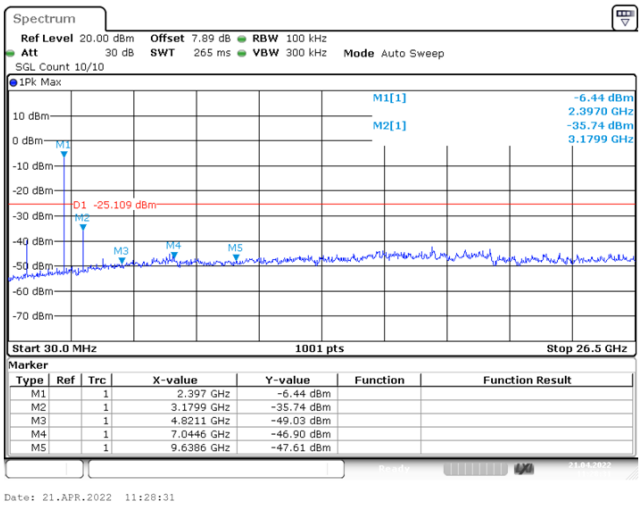
5.7 Spurious Emission

5.7.1 Conducted Emission Method

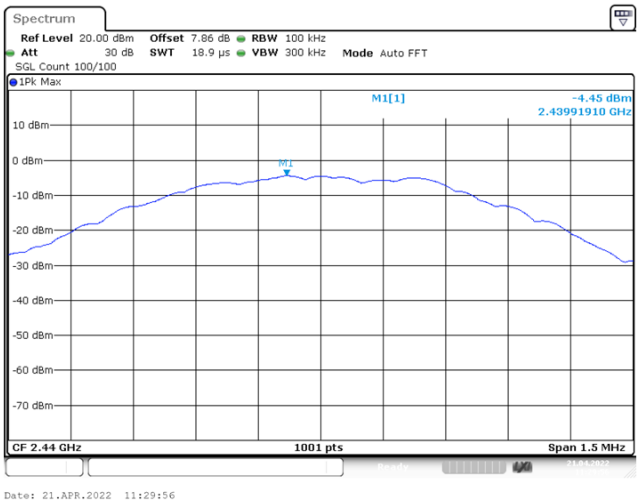
Test Requirement:	FCC Part15 C Section 15.247 (d)
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spreadspectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.
Test setup:	
Test Instruments:	Refer to section 4.9 for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed

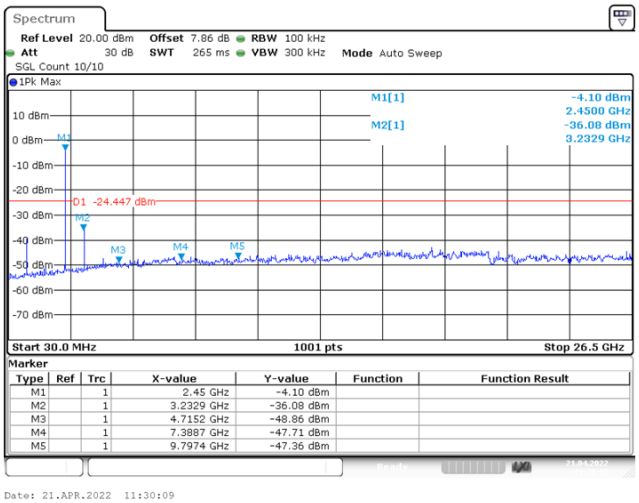
Test plot as follows:



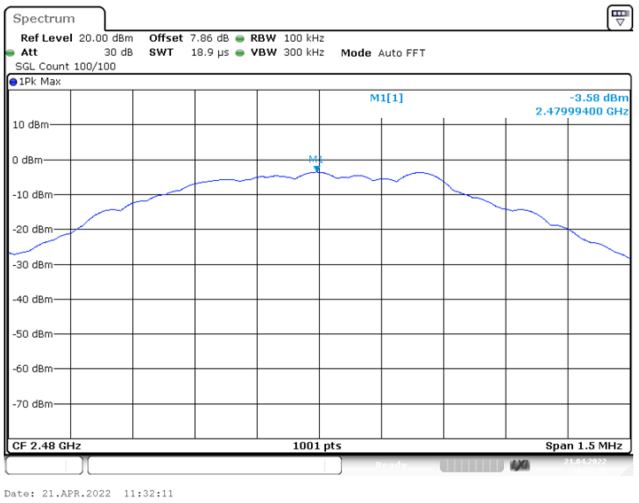


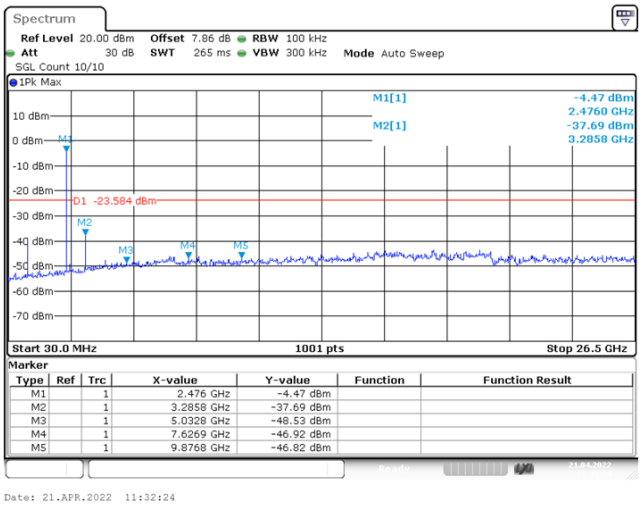
Lowest Channel





Middle channel

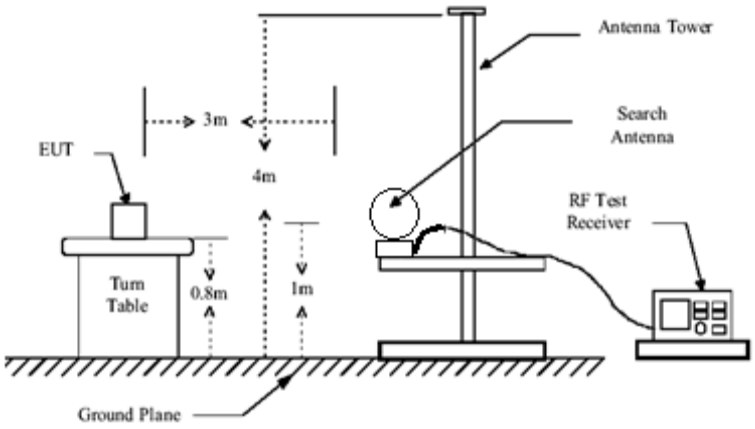




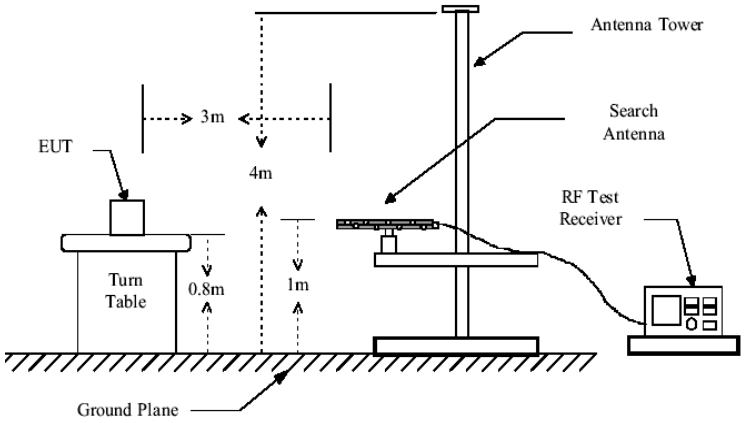
Highest Channel

5.7.2 Radiated Emission Method

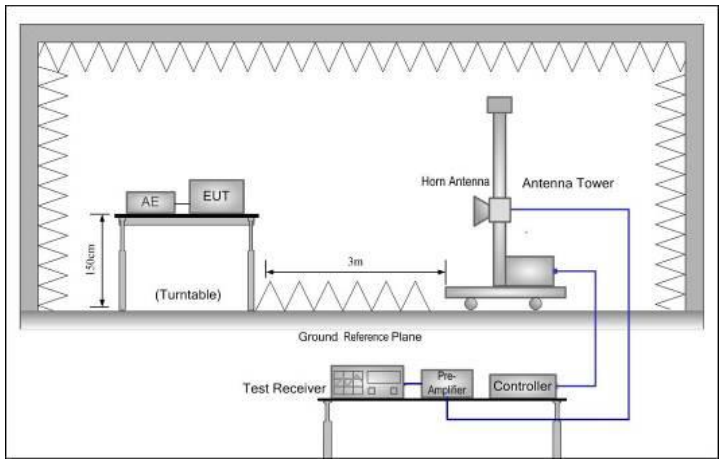
<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.205 and15.209</td></tr>
<tr><td>Test Frequency Range:</td><td>9kHz to 25GHz</td></tr>
<tr><td>TestDistance:</td><td>3m</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>9kHz-150kHz</td><td>Quasi-peak</td><td>200Hz</td><td>600Hz</td><td>Quasi-peak Value</td></tr>
<tr><td>150kHz-30MHz</td><td>Quasi-peak</td><td>9kHz</td><td>30kHz</td><td>Quasi-peak Value</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>120KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>RMS</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency (MHz)</td><td>Limit (uV/m @3m)</td><td>Distance (m)</td></tr>
<tr><td>0.009-0.490</td><td>2400/F(kHz)</td><td>300</td></tr>
<tr><td>0.490-1.705</td><td>24000/F(kHz)</td><td>30</td></tr>
<tr><td>1.705-30</td><td>30</td><td>30</td></tr>
<tr><td>30-88</td><td>100</td><td>3</td></tr>
<tr><td>88-216</td><td>150</td><td>3</td></tr>
<tr><td>216-960</td><td>200</td><td>3</td></tr>
<tr><td>Above 1GHz</td><td>500</td><td>3</td></tr>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>1. The EUT was placed on the top of a rotating table 0.8m(below 1GHz)/1.5m(above 1GHz) above the groundat a 3 meter camber. The table was rotated 360 degrees todetermine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, whichwas mounted on the top of a variable-height antenna tower.
3. 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.
4. For each suspected emission, the EUT was arranged to its worst case and thenthe antenna was tuned to heights from 1 meter to 4 meters and the rotatablewas turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and SpecifiedBandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limitspecified, then testing could be stopped and the peak values of the EUT wouldbe reported. Otherwise the emissions that did not have 10dB margin would bere-tested one by one using peak, quasi-peak or average method as specified andthen reported in a data sheet.</td></tr>
<tr><td>Test setup:</td><td>Below 1GHz(9KHz~30MHz)</td></tr>
</table>



Below 1GHz(30MHz~1GHz)



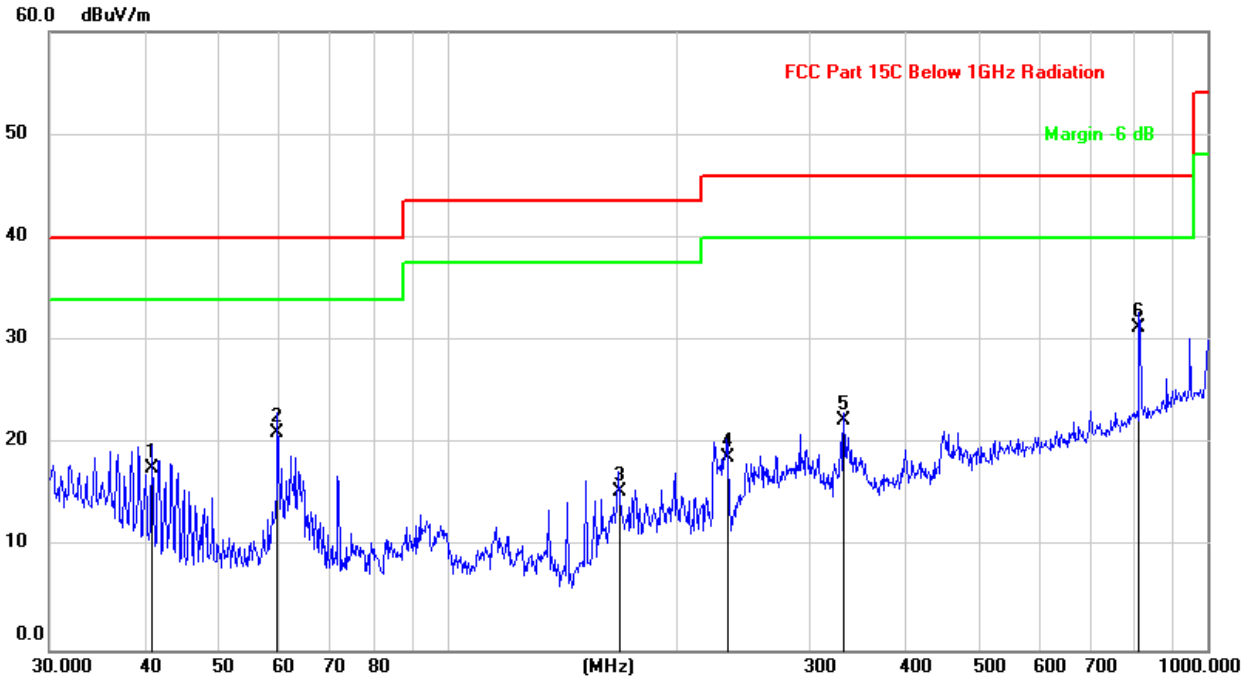
Above 1GHz



Test Instruments:	Refer to section 5.9for details
Test mode:	Refer to section 4.3 for details
Test results:	Passed
Remark:	1. Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the Y-axis is the worst case. 2. 9 kHz to 30MHz is too low, so only shows the data of above 30MHz in this report.

Measurement Data(worst case):
Below 1GHz:

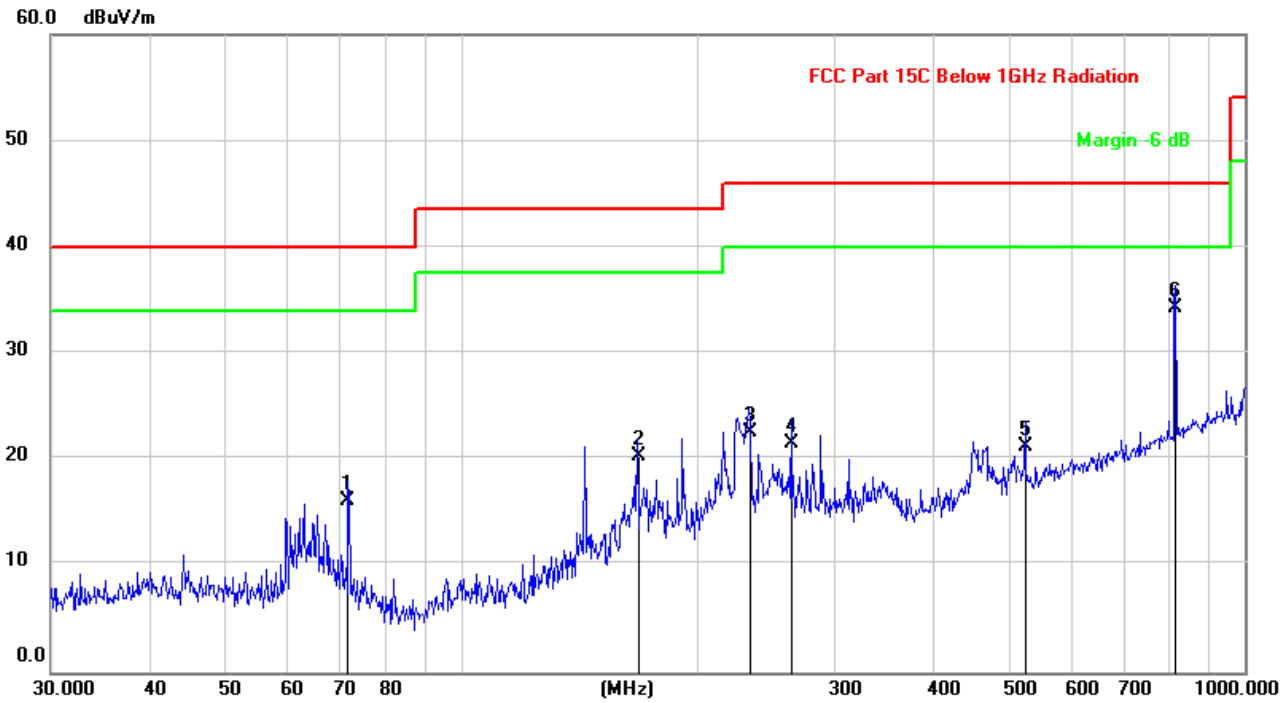
Product Name:	Thermal Printer	**Product Model:**	P3W2
Test By:	Leo Zhang	**Test mode:**	BLE Tx mode
Test Frequency:	30 MHz ~ 1 GHz	**Polarization:**	Vertical
Test Voltage:	DC7.4V	**Environment:**	Temp.: 23.6℃ Humi.: 48%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		40.8446	32.57	-14.92	17.65	40.00	-22.35	QP
2		59.8588	37.20	-16.14	21.06	40.00	-18.94	QP
3		167.8243	31.99	-16.69	15.30	43.50	-28.20	QP
4		233.3487	31.85	-13.23	18.62	46.00	-27.38	QP
5		332.5187	32.57	-10.27	22.30	46.00	-23.70	QP
6	*	813.1115	32.18	-0.92	31.26	46.00	-14.74	QP

Remark:
1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Product Name:	Thermal Printer	Product Model:	P3W2
Test By:	Leo Zhang	Test mode:	BLETx mode
Test Frequency:	30 MHz ~ 1 GHz	Polarization:	Horizontal
Test Voltage:	DC7.4V	Environment:	Temp.: 23.6℃ Humi.: 48%



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		71.8320	33.59	-17.47	16.12	40.00	-23.88	QP
2		167.8243	37.05	-16.69	20.36	43.50	-23.14	QP
3		233.3487	35.82	-13.23	22.59	46.00	-23.41	QP
4		263.8190	33.78	-12.25	21.53	46.00	-24.47	QP
5		524.5541	27.25	-6.05	21.20	46.00	-24.80	QP
6	*	815.9678	35.09	-0.87	34.22	46.00	-11.78	QP

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

Above 1GHz:

Test channel: Lowest channel						
Detector: PeakValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	35.48	7.54	43.02	74.00	-30.98	Vertical
4804.00	38.79	7.54	46.33	74.00	-27.67	Horizontal
Detector: AverageValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4804.00	22.44	7.54	29.98	54.00	-24.02	Vertical
4804.00	24.26	7.54	31.80	54.00	-22.20	Horizontal
Test channel: Middle channel						
Detector: PeakValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4882.00	33.99	7.79	41.78	74.00	-32.22	Vertical
4882.00	35.72	7.79	43.51	74.00	-30.49	Horizontal
Detector: AverageValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4884.00	22.53	7.79	30.32	54.00	-23.68	Vertical
4884.00	21.99	7.79	29.78	54.00	-24.22	Horizontal
Test channel: Highest channel						
Detector: PeakValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	33.85	8.06	41.91	74.00	-32.09	Vertical
4960.00	35.36	8.06	43.42	74.00	-30.58	Horizontal
Detector: AverageValue						
Frequency (MHz)	Read Level (dBuV)	Correct Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4960.00	22.39	8.06	30.45	54.00	-23.55	Vertical
4960.00	22.68	8.06	30.74	54.00	-23.26	Horizontal

Remark:

1. *Final Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor.*
2. *The emission levels of other frequencies are very lower than the limit and not show in test report.*

------End of report------