



FCC ID TEST REPORT

FCC ID:2BDDWWF3511

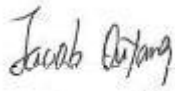
Prepared for : Thortron Technology Incorporated Co Ltd
Address : 12F., No.166 Fuxing N.Rd., Taipei 10487, Taiwan
Trade Name : WFCO
E.U.T : Power Pro Control System
Model Number : WF-3511

Prepared by : Keyway Testing Technology(Guangdong) Co., Ltd.
Address : Room 2102, Building 6, Dongyi Intelligent Equipment
New Energy Vehicle Park, No.30 of Tangxia District,
Dongshen Road, Tangxia Town, Dongguan City,
Guangdong province, China

Tel: 86-769-87182258
Fax: 86-769-87181058

Report No. : 2025102706643193-00
Date of Test: : Oct. 17 ~ 27, 2025
Date of Report : Oct. 28, 2025



Applicant:	Thortron Technology Incorporated Co Ltd	
Address:	12F., No.166 Fuxing N.Rd., Taipei 10487, Taiwan	
Manufacturer 1:	Jeytron Technology Co Ltd	
Address:	16 Gaoli 5th Rd Tang Xia Town Dong Guan Guang Dong China	
Manufacturer 2:	Thortron Technology Incorporated Co., Ltd.	
Address:	No.2-33, Rong'an Rd.,Luzhu Dist.,Taoyuan City,Taiwan	
E.U.T:	Power Pro Control System	
Test Model:	WF-3511	
Trade Name:	WFCO	
Date of Receipt:	Oct. 17, 2025	
Date of Test:	Oct. 17 ~ 27, 2025	
Test Specification :	FCC CFR47 Part 15 Section 15.247 ANSI C63.10:2020	
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied. Issue Date: Oct. 28, 2025	
Tested by:	Reviewed by:	Authorized by:
		
Jacob Ouyang/Engineer	Billy Zeng / Supervisor	Cherry Chen / Manager
Abbreviations: OK/P=passed fail/F=failed N/A=not applicable E.U.T=equipment under tested		
<i>This device described above has been tested by Keyway, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report. This report shall not be reproduced except in full, without the written approval of Keyway, this document may be altered or revised by Keyway, personal only, and shall be noted in the revision of the document.</i>		



Revision Record				
Version	Chapter	Date	Modifier	Remark
00	/	Oct. 28, 2025	/	Original



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1 Test Summary

Test Items	Test Requirement	Result
Conduct Emission	15.207	N/A
Radiated Spurious Emissions	15.205(a) 15.209 15.247(d)	PASS
Conducted Spurious Emission	15.247(d)	PASS
Band edge	15.247(d) 15.205(a)	PASS
6dB&99% Bandwidth	15.247(a)(2)	PASS
Maximum Peak Output Power	15.247(b)(3)	PASS
Power Spectral Density	15.247(e)	PASS
Antenna Requirement	15.203 15.247 (b)(4)	PASS

Remark:

“N/A” denotes test is not applicable in this Test Report.



2 GENERAL PRODUCT INFORMATION

2.1 Description of Device (EUT)

Product Name:	Power Pro Control System
Trademark	WFCO
Test Model No.:	WF-3511
Sample ID:	33000254423
Sample(s) Status:	Engineer sample
Model No.:	N/A
Model Difference:	N/A
Operation Frequency:	2402-2480MHz
Number of Channel:	40 channels
Type of Modulation:	GFSK
Antenna installation:	Internal Antenna
Antenna Gain:	2.57dBi
Power supply	Power 1:12VDC, 50A Max. Power 2:12VDC, 20A Max.
Hardware Version	WF-3511 Voice -R01(20250822)
Software Version	2.1.1.01
Remark: the Antenna gain is provided by customer from Antenna spec. and the laboratory will not be responsible for the accumulated calculation results which covers the information provided by the applicant.	

Remark: The information in this section is provided by the applicant or manufacturer, Kayway is not liable to the accuracy, suitability, reliability or/and integrity of the information.



2.2 Channel List

The EUT has been tested under its typical operating condition.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting. Only the worst case data were reported.

The EUT has been associated with peripherals pursuant to ANSI C63.10:2020 and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: radiation (9 KHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

The details of test channels and bandwidth were for RF conductive measurement.

Frequency and Channel list :

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	14	2430	28	2458
01	2404	15	2432	29	2460
02	2406	16	2434	30	2462
03	2408	17	2436	31	2464
04	2410	18	2438	32	2466
05	2412	19	2440	33	2468
06	2414	20	2442	34	2470
07	2416	21	2444	35	2472
08	2418	22	2446	36	2474
09	2420	23	2448	37	2476
10	2422	24	2450	38	2478
11	2424	25	2452	39	2480
12	2426	26	2454		
13	2428	27	2456		

Test Frequency and Channel :

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	19	2440	39	2480



2.3 Test Mode

Transmitting mode	Keep the EUT in continuously transmitting mode.
Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.	

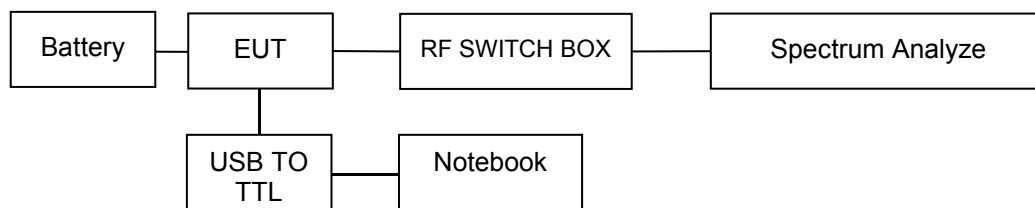
Test Software	MP_Kit_RTL11n_8723DS_SDIO_v1.09
Power level setup	1

2.4 Test Setup Configuration

Radiated Emission



RF Conducted Test





3 TEST SITES

3.1 Test Facilities

Site Description

EMC Lab. : Certificated by CMA
 Registration No.: 202319016955
 Date of registration: July 23, 2024

 Certificated by CNAS
 Registration No.: CNAS L5783
 Date of registration: March 07, 2025

 Certificated by A2LA
 Certificate Number:7404.01
 Valid To: March 31.2027

 FCC Designation No.: CN1412
 Has been recognized to perform compliance testing on equipment
 subject to the Commission's Declaration of Conformity (DoC) and
 Certification rules.

 ISED (Company No.: 33959)
 The Company Number is 21320 and the test lab Conformity
 Assessment Body Identifier (CABID) is CN0186

 Certificated by VCCI
 Member No.3498
 R-20091:G-20277:966 Chamber 2 Below 1 G
 G-20277:966 Chamber 2 above 1 G
 C-20064:Conducted Emissions at Mains ports
 T-20120:Conducted Emissions at Wired network port
 Date of Valid until: Step. 19, 2027

Name of Firm : Keyway Testing Technology (Guangdong) Co., Ltd.

Site Location : Room 2102, Building 6, Dongyi Intelligent Equipment New ,
 Energy Vehicle Park, No.30 of Tangxia, District, Dongshen
 Road, Tangxia Town, Dongguan City, Guangdong province, China

3.2 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95 %.

Parameter	Uncertainty
RF output power, conducted	$\pm 1.0\text{dB}$
Power Spectral Density, conducted	$\pm 2.2\text{dB}$
Radio Frequency	$\pm 1 \times 10^{-6}$
Bandwidth	$\pm 1.5 \times 10^{-6}$
Duty Cycle	$\pm 2\%$
Spurious emissions, conducted	$\pm 0.21\text{dB}$
Temperature	$\pm 1^{\circ}\text{C}$
Humidity	$\pm 5\%$
DC and low frequency voltages	$\pm 3\%$
Conducted Emissions (150kHz~30MHz)	$\pm 3.64\text{dB}$
Radiated Emission(9KHz~30MHz)	$\pm 4.51\text{dB}$
Radiated Emission(30MHz~1GHz)	$\pm 5.03\text{dB}$
Radiated Emission(1GHz~25GHz)	$\pm 4.74\text{dB}$
Radiated Emission(25GHz~40GHz)	$\pm 3.38\text{dB}$

**3.3 List of Test and Measurement Instruments**

Equipment	Manufacturer	Model No.	Serial No.	Date of Cal.	Valid until
For conducted emission at the mains terminals and signal port test 944 Shielded Room					
Test Software	FARAD	EZ-EMC Ver.FARAD-3A1+	KWET-089	/	/
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr 14, 25	Apr 13, 26
ArtificialMains Network	Rohde&Schwarz	ENV216	101314	Mar 05, 25	Mar 04, 26
RF Cable	FUJIKURA	3D-2W	KWET-030	Apr 14, 25	Apr 13, 26
Socket	Gongniu	KWET-003A1	KWET-003A1	Feb 21, 25	Feb 20, 26
For radiated emission test (30MHz-1GHz)966 Chamber 2					
Test Software	FARAD	EZ-EMC Ver.FARAD-3A1+	KWET-087	/	/
EMI Test Receiver	Rohde&Schwarz	ESCI	101178	Apr 14, 25	Apr 13, 26
TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00829	May 10, 25	May 09, 26
3m Semi-anechoic Chamber	YIHENDIANZI	966	YH-KW-966-02	Mar 07, 26	Mar 06, 29
RF Cable	EMC Instruments	EMCCFD400-NM-NM-2000	240307	Apr 14, 25	Apr 13, 26
RF Cable	EMC Instruments	EMCCFD400-NM-NM-9000	240309	Apr 14, 25	Apr 13, 26
For radiated emission test (Above 1GHz)966 Chamber 2					
Test Software	FARAD	EZ-EMC Ver.FARAD-3A1+	KWET-087	/	/
EMI Test Receiver	Rohde&Schwarz	ESCI	101178	Apr 14, 25	Apr 13, 26
Spectrum Analyzer	Agilent	N9020A	MY56070279	Apr 14, 25	Apr 13, 26
Spectrum analyzer	R&S	FSV 40	101059	Nov 06, 25	Nov 05, 26
Horn Antenna	DAZE	ZN30701	11003	Jul 27, 25	Jul 26, 26
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	1368	May 16, 25	May 15, 26
Signal Amplifier	WCS Technology	DLNA-18000-40000	KWET-138	Apr 19, 25	Apr 18, 26
3m anechoic Chamber	YIHENDIANZI	966	YH-KW-966-02	Mar 07, 25	Mar 06, 29
RF Cable(1G-18GHz)	EMC Instruments	EMC105-SM-SM-1000	240301	Apr 14, 25	Apr 13, 26
RF Cable(1G-18GHz)	EMC Instruments	EMC105-SM-SM-2000	240302	Apr 14, 25	Apr 13, 26
RF Cable(1G-18GHz)	EMC Instruments	EMC105-SM-SM-9000	240303	Apr 14, 25	Apr 13, 26
RF Cable(18G-40GHz)	WCS Technology	CA360P-29M29M-1M	W2415130001	Apr 14, 25	Apr 13, 26
RF Cable(18G-40GHz)	WCS Technology	CA360P-29M29M-9M	W2415110001	Apr 14, 25	Apr 13, 26
For conducted emission test (RF)					
MXG Signal Analyzer	Agilent	N9020A	MY56070279	Apr 14, 25	Apr 13, 26
RF SWITCH BOX	CSKJ	SMU-1003	KWET-047	Apr 14, 25	Apr 13, 26
Attenuator	R&S	ESH3-Z2	102696	Apr 14, 25	Apr 13, 26
Power Meter	Agilent	E4418B	MY41294414	May 15, 25	May 14, 26
RF sma cable	Keysight	ULC-1m-SMSM+	1623	May 15, 25	May 14, 26



RF sma cable	Keysight	ULC-1m-SMSM+	1623	May 15, 25	May 14, 26
RF sma cable	Keysight	ULC-1.5FT-SMSM+	1623	May 15, 25	May 14, 26
RF sma cable	Keysight	ULC-1.5FT-SMSM+	1623	May 15, 25	May 14, 26
Coupler	Keysight	ZHDC-10-63-S+	SF331801603	May 15, 25	May 14, 26
Test Software	CSKJ	CS-305X	KWET-149	/	/



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Power Pro Control System	WFCO	WF-3511	N/A	EUT
E-2	Notebook	lenovo	B40-80	MP07F6JD	Auxiliary
E-3	USB TO TTL	MH	USB to TTL	N/A	Auxiliary

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.

4 Conducted Emission

Test Requirement:	: FCC CFR 47 Part 15 Section 15.207
Test Method	: ANSI C63.10:2020
Test Result	: N/A
Frequency Range	: 150kHz to 30MHz
Class/Severity	: Class B

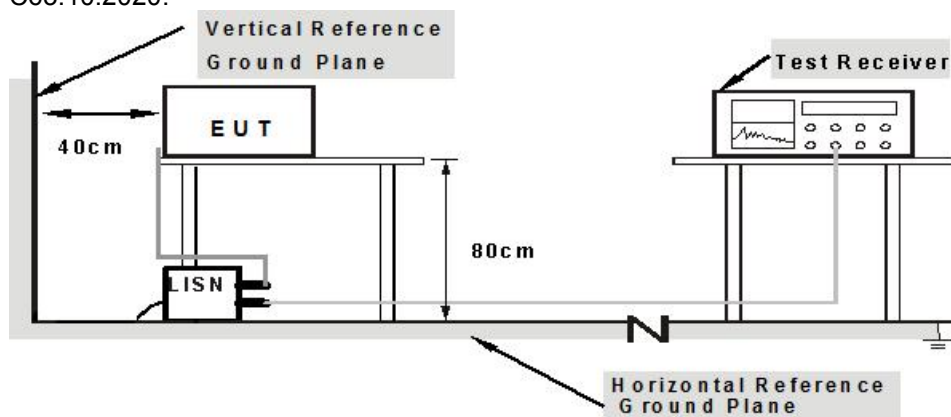
4.1 E.U.T. Operation

Operating Environment :

Temperature	: 23°C
Humidity	: 54 % RH
Atmospheric Pressure	: 1015Pa

4.2 EUT Setup

The conducted emission tests were performed using the setup accordance with the ANSI C63.10:2020.



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

4.3 Measurement Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured was complete.

4.4 Conducted Emission Limit

Conducted Emission

Frequency(MHz)	Quasi-peak	Average
0.15-0.5	66-56	56-46
0.5-5.0	56	46
5.0-30.0	60	50

Note:

1. The lower limit shall apply at the transition frequencies
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.5 Measurement Description

The maximised peak emissions from the EUT was scanned and measured for both the Live and Neutral Lines. Quasi-peak & average measurements were performed if peak emissions were within 6dB of the average limit line.

4.6 Conducted Emission Test Result

Not Applicable.



5 Radiated Spurious Emissions

Test Requirement : FCC CFR47 Part 15 Section 15.209 & 15.247
 Test Method : ANSI C63.10:2020
 Test Result : PASS
 Measurement Distance : 3m
 Limit : See the follow table

Frequency (MHz)	Field Strength		Field Strength Limit at 3m Measurement Dist	
	uV/m	Distance (m)	uV/m	dBuV/m
0.009 ~ 0.490	$2400/F(\text{kHz})$	300	$10000 * 2400/F(\text{kHz})$	$20\log^{(2400/F(\text{kHz}))} + 80$
0.490 ~ 1.705	$24000/F(\text{kHz})$	30	$100 * 24000/F(\text{kHz})$	$20\log^{(24000/F(\text{kHz}))} + 40$
1.705 ~ 30	30	30	$100 * 30$	$20\log^{(30)} + 40$
30 ~ 88	100	3	100	$20\log^{(100)}$
88 ~ 216	150	3	150	$20\log^{(150)}$
216 ~ 960	200	3	200	$20\log^{(200)}$
Above 960	500	3	500	$20\log^{(500)}$

5.1 EUT Operation

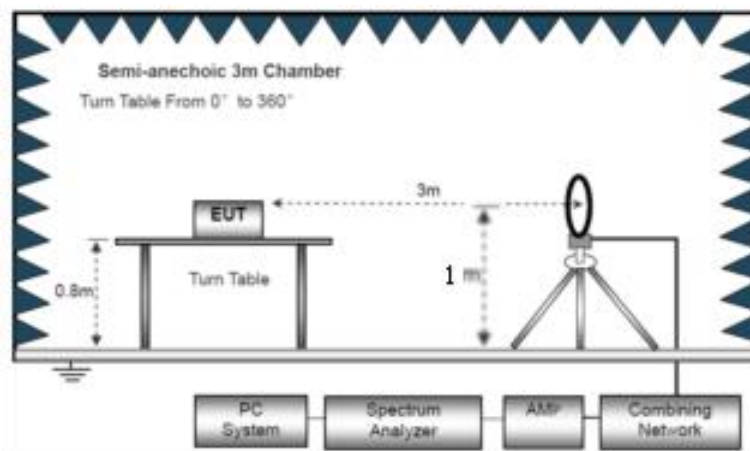
Operating Environment :

Temperature : 24 °C
 Humidity : 56% RH
 Atmospheric Pressure : 1015Pa
 Test Voltage : DC 12V from battery

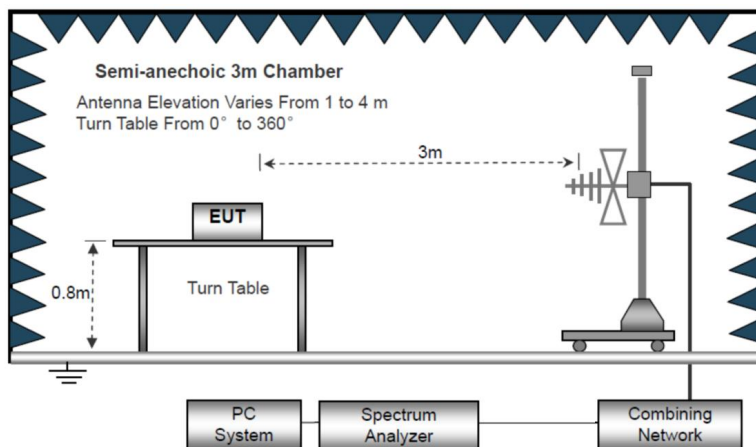
5.2 Test Setup

The radiated emission tests were performed in the 3m Semi- Anechoic Chamber test site

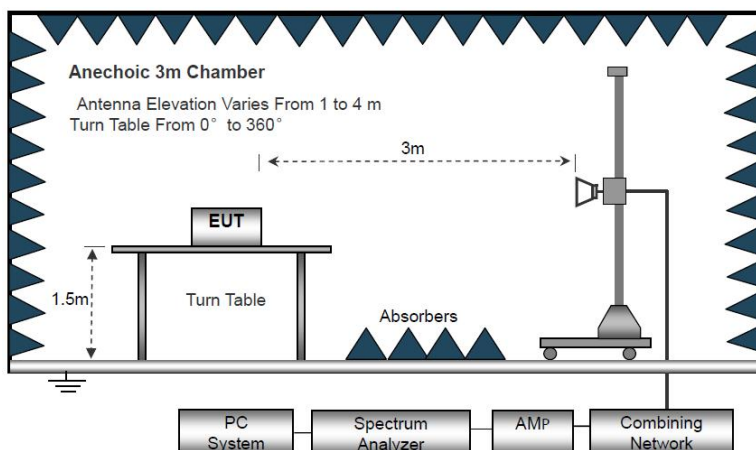
The test setup for emission measurement below 30MHz.



The test setup for emission measurement from 30 MHz to 1 GHz.



The test setup for emission measurement above 1 GHz.



5.3 Spectrum Analyzer Setup

Below 30MHz			
IF Bandwidth	:	10kHz	
Resolution Bandwidth	:	10kHz	
Video Bandwidth	:	10kHz	
30MHz ~ 1GHz			
Detector	:	PK	QP
Resolution Bandwidth	:	100kHz	120kHz
Video Bandwidth	:	300kHz	300kHz
Above 1GHz			
Detector	:	PK	AV
Resolution Bandwidth	:	1MHz	1MHz
Video Bandwidth	:	3MHz	10Hz

5.4 Test Procedure

- Below 1000MHz, The EUT was placed on a turn table which is 0.8m above ground plane, And above 1000MHz, The EUT was placed on a styrofoam table which is 1.5m above ground plane.
- The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
- EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions. The spectrum was investigated from the lowest radio frequency signal generated in the device, without going below 9 kHz, up to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.
- Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- Repeat above procedures until the measurements for all frequencies are complete.
- The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.
- The test above 1GHz must be use the fully anechoic room, and the test below 1GHz use the half anechoic room
- The radiation measurements are tested under 3-axes(X,Y,Z) position(X denotes lying on the table, Y denotes side stand and Z denotes vertical stand), After pre-test, It was found that the worse radiation emission was get at the X position. So the data shown was the X position only.



5.5 Summary of Test Results

Test Frequency: 9KHz-30MHz

Freq. (MHz)	Ant.Pol. H/V	Emission Level (dBuV/m)	Limit 3m (dBuV/m)	Over (dB)
--	--	--	--	>20

Note:

The amplitude of spurious emission that is attenuated by more than 20dB below the permissible limit has no need to be reported.

Distance extrapolation factor = $40\log(\text{Specific distance} / \text{test distance})$ (dB);

Limit line = Specific limits (dBuV) + distance extrapolation factor.

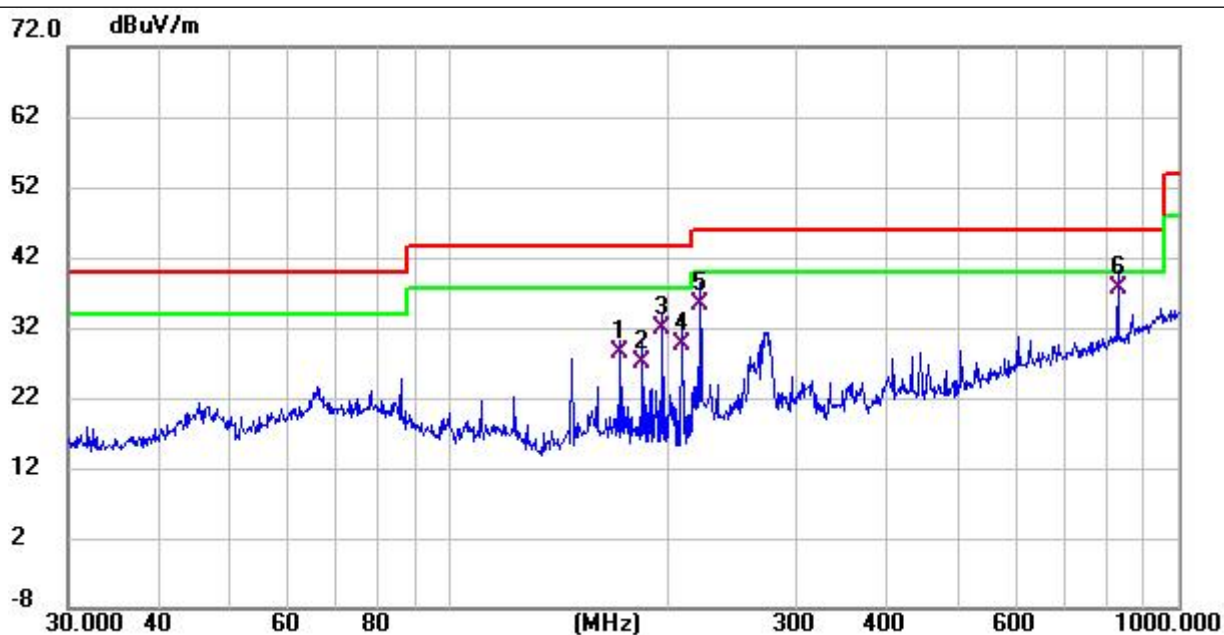
Test Frequency: 30MHz ~ 1GHz

All the modulation modes were tested the data of the worst mode (TX GFSK Low Channel) are recorded in the following pages and the others modulation methods do not exceed the limits.

Please refer to the following test plots:



M/N : WF-3511
Operation Mode : TX GFSK Low Channel
Test Voltage : DC 3.7V from battery
Test Specification : Vertical



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	171.995	15.76	12.65	28.41	43.50	-15.09	QP
2	184.490	15.35	11.61	26.96	43.50	-16.54	QP
3	196.510	20.87	10.87	31.74	43.50	-11.76	QP
4	209.313	18.61	11.04	29.65	43.50	-13.85	QP
5	221.392	23.71	11.57	35.28	46.00	-10.72	QP
6 *	827.493	12.23	25.33	37.56	46.00	-8.44	QP

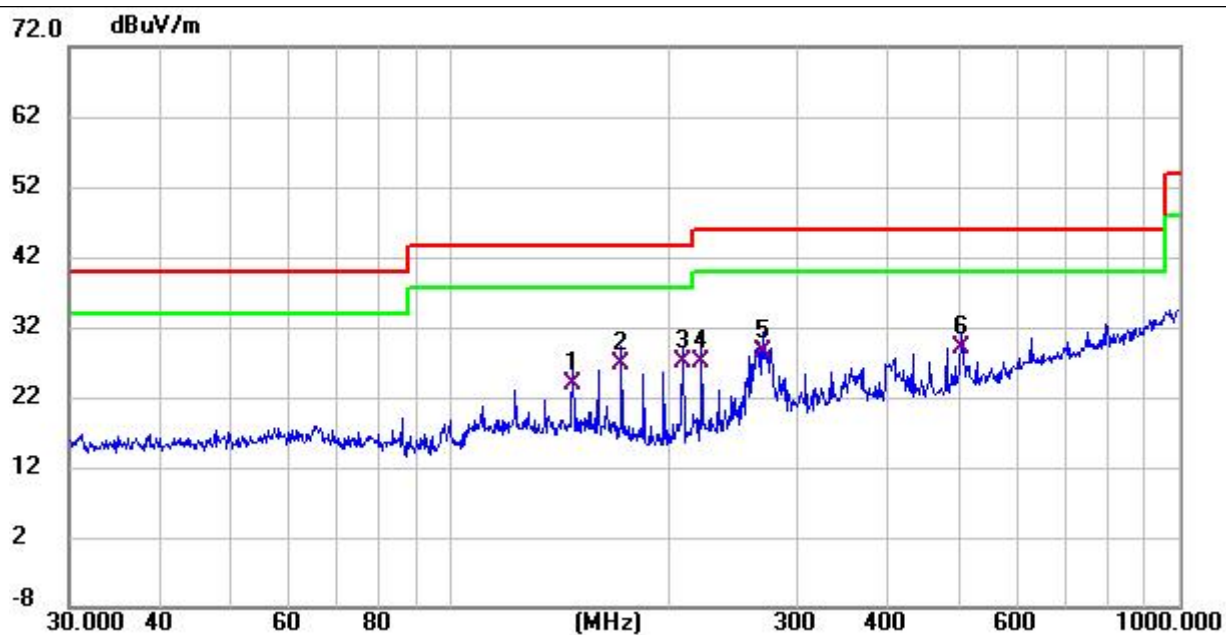
Remark:

Emission Level=Reading+Factor

Factor=Cable Loss+ANT Factor



M/N : WF-3511
Operation Mode : TX GFSK Low Channel
Test Voltage : DC 3.7V from battery
Test Specification : Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	147.404	10.37	13.52	23.89	43.50	-19.61	QP
2	171.995	14.10	12.65	26.75	43.50	-16.75	QP
3 *	208.580	15.94	11.01	26.95	43.50	-16.55	QP
4	221.392	15.37	11.57	26.94	46.00	-19.06	QP
5	269.428	14.83	13.70	28.53	46.00	-17.47	QP
6	504.706	9.52	19.44	28.96	46.00	-17.04	QP

Remark:

Emission Level=Reading+Factor

Factor=Cable Loss+ANT Factor

**Test Frequency: From 1GHz to 25GHz**

Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dB)	Detect or Type
Low Channel:2402MHz									
V	4804.00	54.16	34.12	5.03	32.39	57.46	74	-16.54	PK
V	4804.00	39.31	34.12	5.03	32.39	42.61	54	-11.39	AV
V	7206.00	50.09	32.54	6.29	35.86	59.70	74	-14.30	PK
V	7206.00	36.00	32.54	6.29	35.86	45.61	54	-8.39	AV
V	9608.00	45.32	32.98	7.55	38.4	58.29	74	-15.71	PK
V	9608.00	32.81	32.98	7.55	38.4	45.78	54	-8.22	AV
V	12010.00	40.55	32.09	8.93	39	56.39	74	-17.61	PK
V	12010.00	32.65	32.09	8.93	39	48.49	54	-5.51	AV
H	4804.00	52.00	34.12	5.03	32.39	55.30	74	-18.70	PK
H	4804.00	36.47	34.12	5.03	32.39	39.77	54	-14.23	AV
H	7206.00	48.35	32.54	6.29	35.86	57.96	74	-16.04	PK
H	7206.00	33.88	32.54	6.29	35.86	43.49	54	-10.51	AV
H	9608.00	47.41	32.98	7.55	38.4	60.38	74	-13.62	PK
H	9608.00	29.77	32.98	7.55	38.4	42.74	54	-11.26	AV
H	12010.00	42.37	32.09	8.93	39	58.21	74	-15.79	PK
H	12010.00	28.55	32.09	8.93	39	44.39	54	-9.61	AV



Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dB)	Detect or Type
Middle Channel:2440MHz									
V	4880.00	53.43	30.55	5.77	24.66	53.31	74	-20.69	PK
V	4880.00	43.12	30.55	5.77	24.66	43.00	54	-11.00	AV
V	7320.00	53.43	30.33	6.32	24.55	53.97	74	-20.03	PK
V	7320.00	42.24	30.33	6.32	24.55	42.78	54	-11.22	AV
V	9760.00	54.23	30.85	7.45	24.69	55.52	74	-18.48	PK
V	9760.00	43.78	30.85	7.45	24.69	45.07	54	-8.93	AV
V	12200.00	52.74	31.02	8.99	25.57	56.28	74	-17.72	PK
V	12200.00	42.31	31.02	8.99	25.57	45.85	54	-8.15	AV
H	4880.00	52.11	30.55	5.77	24.66	51.99	74	-22.01	PK
H	4880.00	41.95	30.55	5.77	24.66	41.83	54	-12.17	AV
H	7320.00	54.71	30.33	6.32	24.55	55.25	74	-18.75	PK
H	7320.00	40.88	30.33	6.32	24.55	41.42	54	-12.58	AV
H	9760.00	54.59	30.85	7.45	24.69	55.88	74	-18.12	PK
H	9760.00	43.57	30.85	7.45	24.69	44.86	54	-9.14	AV
H	12200.00	53.54	31.02	8.99	25.57	57.08	74	-16.92	PK
H	12200.00	41.92	31.02	8.99	25.57	45.46	54	-8.54	AV



Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB)	Emission Level (dBuV/m)	Limits (dBuV/ m)	Margin (dB)	Detect or Type
High Channel:2480MHz									
V	4960.00	54.13	30.55	5.77	24.66	54.01	74	-19.99	PK
V	4960.00	45.95	30.55	5.77	24.66	45.83	54	-8.17	AV
V	7440.00	53.76	30.33	6.32	24.55	54.30	74	-19.70	PK
V	7440.00	43.60	30.33	6.32	24.55	44.14	54	-9.86	AV
V	9920.00	55.65	30.85	7.45	24.69	56.94	74	-17.06	PK
V	9920.00	42.56	30.85	7.45	24.69	43.85	54	-10.15	AV
V	12400.00	55.44	31.02	8.99	25.57	58.98	74	-15.02	PK
V	12400.00	43.83	31.02	8.99	25.57	47.37	54	-6.63	AV
H	4960.00	53.39	30.55	5.77	24.66	53.27	74	-20.73	PK
H	4960.00	43.75	30.55	5.77	24.66	43.63	54	-10.37	AV
H	7440.00	54.87	30.33	6.32	24.55	55.41	74	-18.59	PK
H	7440.00	43.80	30.33	6.32	24.55	44.34	54	-9.66	AV
H	9920.00	52.45	30.85	7.45	24.69	53.74	74	-20.26	PK
H	9920.00	44.26	30.85	7.45	24.69	45.55	54	-8.45	AV
H	12400.00	53.33	31.02	8.99	25.57	56.87	74	-17.13	PK
H	12400.00	43.72	31.02	8.99	25.57	47.26	54	-6.74	AV

Note:

1. Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier,

Margin= Emission Level - Limit

2. If peak below the average limit, the average emission was no test.

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



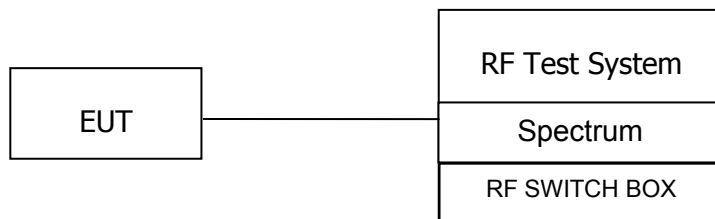
Radiated Band Emission Measurement:

	Polar (H/V)	Frequency (MHz)	Meter Reading (dBuV)	Pre- amplifier (dB)	Cable Loss (dB)	Antenna Factor (dB/m)	Emission level (dBuV/m)	Limit (dBuV/ m)	Margin(d B)	Detecto r Type	Result
GFSK	Low Channel 2402MHz										
	H	2390	56.94	35.17	3.48	27.49	52.74	74	-21.26	PK	PASS
	H	2390	46.64	35.17	3.48	27.49	42.44	54	-11.56	AV	PASS
	H	2400	56.18	35.16	3.49	27.52	52.03	74	-21.97	PK	PASS
	H	2400	47.18	35.16	3.49	27.52	43.03	54	-10.97	AV	PASS
	V	2390	58.24	35.17	3.48	27.49	54.04	74	-19.96	PK	PASS
	V	2390	48.49	35.17	3.48	27.49	44.29	54	-9.71	AV	PASS
	V	2400	54.70	35.16	3.49	27.52	50.55	74	-23.45	PK	PASS
	V	2400	48.11	35.16	3.49	27.52	43.96	54	-10.04	AV	PASS
	High Channel 2480MHz										
	H	2483.5	54.24	35.11	3.56	27.75	50.44	74	-23.56	PK	PASS
	H	2483.5	47.68	35.11	3.56	27.75	43.88	54	-10.12	AV	PASS
	H	2500	58.83	35.1	3.57	27.8	55.10	74	-18.90	PK	PASS
	H	2500	48.41	35.1	3.57	27.8	44.68	54	-9.32	AV	PASS
	V	2483.5	55.94	35.11	3.56	27.75	52.14	74	-21.86	PK	PASS
	V	2483.5	48.54	35.11	3.56	27.75	44.74	54	-9.26	AV	PASS
	V	2500	56.79	35.1	3.57	27.8	53.06	74	-20.94	PK	PASS
	V	2500	45.07	35.1	3.57	27.8	41.34	54	-12.66	AV	PASS
Remark: Emission Level = Meter Reading + Antenna Factor + Cable Loss – Pre-amplifier, Margin= Emission Level - Limit											

6 Conduct Band Edge And Spurious Emissions Measurement

Test Requirement	:	Section 15.247(d) In addition, radiated emissions which fall in the restricted bands. as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).
Test Method	:	ANSI C63.10:2020
Test Limit	:	Regulation 15.247 (d),In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

6.1 Test Setup



6.2 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz, Sweep = auto
Detector function = peak, Trace = max hold

6.3 Test Result

Please see the Appendix III_FCC_Bluetooth_(BLE) test data.



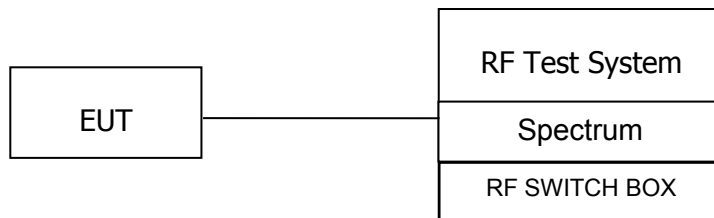
7 6dB&99% Bandwidth Measurement

Test Requirement : FCC CFR47 Part 15 Section 15.247

Test Method : ANSI C63.10:2020

Test Limit Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

7.1 Test Setup



7.2 Test Procedure

For 6dB Bandwidth Measurement

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 100kHz, VBW = 300kHz

For 99% Bandwidth Measurement

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: RBW = 1%-5% OBW, VBW $\geq$ 3RBW

7.3 Test Result

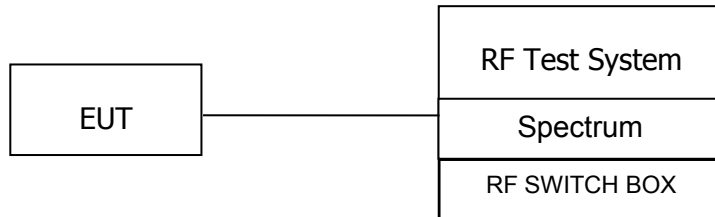
Please see the Appendix III_FCC_Bluetooth_(BLE) test data.



8 Maximum Peak Output Power

Test Requirement	:	FCC CFR47 Part 15 Section 15.247 (b)(3)
Test Method	:	ANSI C63.10:2020
Test Limit	:	Regulation 15.247 (b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power.

8.1 Test Setup



8.2 Test Procedure

The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.

Set to the maximum power setting and enable the EUT transmit continuously.

Measure the conducted output power and record the results in the test report.

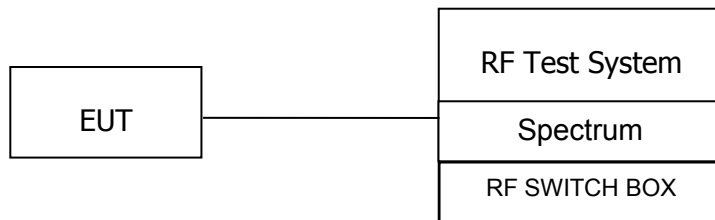
8.3 Test Result

Please see the Appendix III_FCC_Bluetooth_(BLE) test data.

9 Power Spectral density

Test Requirement	: FCC CFR47 Part 15 Section 15.247 (e)
Test Method	: ANSI C63.10:2020
Test Limit	: Regulation 15.247(f) The power spectral density conducted from the intentional radiator to the antenna due to the digital modulation operation of the hybrid system, with the frequency hopping operation turned off, shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

9.1 Test Setup



9.2 Test Procedure

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 3kHz. VBW = 9.1kHz, Span = 1.5 times the DTS channel bandwidth(6 dB bandwidth). Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section Submit this plot.

9.3 Test Result

Please see the Appendix III_FCC_Bluetooth_(BLE) test data.



10 On Time and Duty Cycle

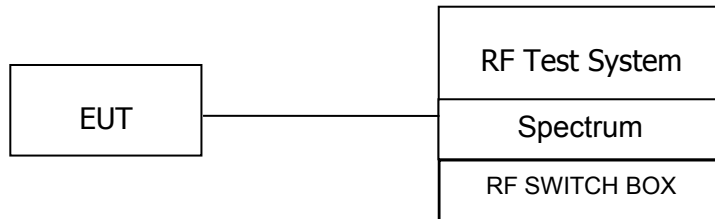
10.1 Standard Applicable

None: for reporting purpose only.

10.2 Measuring Instruments and Setting

Please refer to equipment's list in this report. The following table is the setting of the spectrum analyzer.

10.3 Test Setup



10.4 Test Procedures

1. Set the centre frequency of the spectrum analyzer to the transmitting frequency;
2. Set the span=0MHz, RBW=8MHz, VBW=8MHz, Sweep time=3.333ms;
3. Detector = RMS;
4. Trace mode = Single hold.

10.5 EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

10.6 Test result

Please see the Appendix III_FCC_Bluetooth_(BLE) test data.



11 Antenna Application

11.1 Antenna Requirement

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.247 (b)(4), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

11.2 Result

The EUT'S antenna, permanent attached antenna, is Internal Antenna. The antenna's gain is 2.57dBi, and meets the requirement.



12 APPENDIX I --Test Setup Photos

Reference to the attachment for details.



13 APPENDIX II --EUT Photos

Reference to the attachment for details.

*****THE END REPORT*****