FCC Test Report

Applicant	:	**Huizhou Intelligent Energy Co., Ltd.**
Address	:	**8-9/F,Bldg.E2,Qunyi Industrial Park,Sanhe Avenue, Tonghu Town, Zhongkai High-tech Zone, HuiZhou, 516039, China**
Product Name	:	**PORTABLE POWER STATION**
Report Date	:	**Aug. 24, 2023**

Shenzhen Anbotek Compliance Laboratory Limited

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TEST REPORT

Applicant	:	Huizhou Intelligent Energy Co., Ltd.
Manufacturer	:	Huizhou Intelligent Energy Co., Ltd.
Product Name	:	PORTABLE POWER STATION
Test Model No.	:	RC1000
Reference Model No.	:	N/A
Trade Mark	:	N/A
Rating(s)	:	Please see page 7.

Test Standard(s)	:	**FCC Part15 Subpart C, Section 15.247**
Test Method(s)	:	**ANSI C63.10: 2020**

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of receipt	Jul. 26, 2023
Date of Test	Jul. 26 ~ Aug. 16, 2023
Prepared by	Nianxiu Chen (Nianxiu Chen)
Approved & Authorized Signer	Edward pan (Edward Pan)

Revision History

Report Version	Description	Issued Date
R00	Original Issue.	Aug. 24, 2023

Address:1/F.,Building D,Sogood Science and Technology Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.
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Hotline 400-003-0500
www.anbotek.com.cn

1. General Information

1.1. Client Information

Applicant	:	Huizhou Intelligent Energy Co., Ltd.
Address	:	8-9/F,Bldg.E2,Qunyi Industrial Park,Sanhe Avenue, Tonghu Town, Zhongkai High-tech Zone, HuiZhou, 516039, China
Manufacturer	:	Huizhou Intelligent Energy Co., Ltd.
Address	:	8-9/F,Bldg.E2,Qunyi Industrial Park,Sanhe Avenue, Tonghu Town, Zhongkai High-tech Zone, HuiZhou, 516039, China
Factory	:	Huizhou Intelligent Energy Co., Ltd.
Address	:	8-9/F,Bldg.E2,Qunyi Industrial Park,Sanhe Avenue, Tonghu Town, Zhongkai High-tech Zone, HuiZhou, 516039, China

1.2. Description of Device (EUT)

Product Name	:	PORTABLE POWER STATION
Test Model No.	:	RC1000
Reference Model No.	:	N/A
Trade Mark	:	N/A
Test Power Supply	:	AC 120V, 60Hz/ DC 22.2V Battery inside
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Adapter	:	N/A
RF Specification		
Operation Mode	:	☒ BT BDR ☒ BT EDR
Operation Frequency	:	2402~2480MHz
Number of Channel	:	79 Channels
Modulation Type	:	GFSK, π/4-DQPSK, 8-DPSK
Antenna Type	:	PCB Antenna
Antenna Gain(Peak)	:	-0.58 dBi (Provided by customer)
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		

Rating(s):

PORTABLE POWER STATION

- Type: RC1000
- Battery Capacity: 22.2V, 45Ah/999Wh
- AC Input: 96V-130V~5A, 50/60Hz, 500W
- DC Input: 12V-26V⎓6.25A, 155W Max
- PV Input: 12V-26V⎓8A, 155W Max
- AC Output: Pure Sine Wave, 110V~60Hz, 1000W
- DC Output ×4 + Cigarette Lighter Socket Output: Total 12V⎓10A
- USB-A Output ×3: 5V⎓2.1A, 10.5W Max
- USB-A Output ×2: 5V⎓3A, 9V⎓2A, 12V⎓1.5A, 18W Max
- USB-C Output: 5V/9V/12V/15V/20V⎓3A, 60W Max
- Operating Temp: 14 to 104°F (-10 to 40°C)
- Charging Temp: 32 to 104°F (0 to 40°C)
- Manufacturer: Huizhou Intelligent Energy Co., Ltd.
- Date Code:

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.
FCC ID: 2BASNRC1000MV1000

CE FC PSE RoHs UN38.3 Li-ion

MADE IN CHINA

⚠ WARNING!

- Do not short-circuit the unit. To avoid short-circuiting, keep the unit away from all metal objects (e.g.coins, hair-pins, keys, etc.) .
- Do not heat the unit, or dispose of it in fire, water or other liquids. Keep away from high temperatures.
- Do not expose the unit to direct sunlight. Keep away from high humidity, dusty places.
- Do not disassemble or reassemble this unit.
- Do not drop and place heavy objects on, or allow strong impact to this unit.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- The unit may become hot when charging. This is normal. Be careful when handling.
- Use the unit properly to avoid electronic shock.
- The product is only used for emergency power station, it can not replace the standard DC or AC power of household appliances or digital products.
- Do not overcharge the internal battery. See Instruction Manual.

⚠ AVERTISSEMENT!

- Ne court-circuitez pas l'appareil. Pour éviter tout court-circuit, éloignez l'appareil de tout objet mé tallique (par exemple, pièces de monnaie, épingles à cheveux, clés, etc.).
- Ne chauffez pas l'appareil et ne le jetez pas dans le feu, l'eau ou d'autres liquides. Tenir à l'écart des températures élevées. N'exposez pas l'appareil à la lumière directe du soleil.
- Tenir à l'écart des endroits humides et poussiéreux.
- Ne démontez pas et ne réassemblez pas cet appareil.
- Ne laissez pas tomber, ne placez pas d'objets lourds dessus et ne laissez pas de chocs violents sur cet appareil.
- Cet appareil n'est pas destiné à être utilisé par des personnes(y compris des enfants) ayant des capacités physiques, sensorielles ou mentales réduites, ou un manque d'expérience et de connaissances, à moins qu'elles n'aient reçu une supervision ou des instructions concernant.
- L'utilisation de l'appareil par une personne responsable de leur sécurité.
- Les enfants doivent être surveillés pour s'assurer qu'ils ne jouent pas avec l'appareil.
- L'appareil peut devenir chaud pendant la charge. C'est normal. Soyez prudent lors de la manipulation.
- Utilisez l'appareil correctement pour éviter les chocs électroniques. Le produit n'est utilisé que pour la centrale électrique de secours, il ne peut pas remplacer l'alimentation CC ou CA standard des appareils ménagers ou des produits numériques.
- Ne pas surcharger la batterie interne. Consulter le manuel d'utilisation.

RC1000M V1.0.00 / 3.06.04.0449

1.3. Auxiliary Equipment Used During Test

Description	Rating(s)
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1.4. Description of Test Configuration

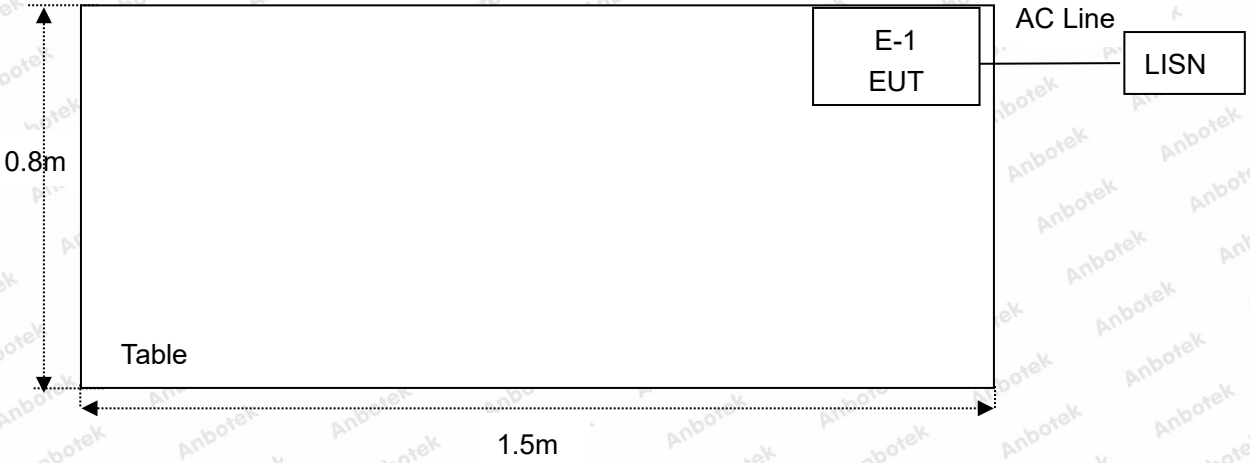
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
00	**2402**	17	2419	34	2436	51	2453	68	2470
01	2403	18	2420	35	2437	52	2454	69	2471
02	2404	19	2421	36	2438	53	2455	70	2472
03	2405	20	2422	37	2439	54	2456	71	2473
04	2406	21	2423	38	2440	55	2457	72	2474
05	2407	22	2424	**39**	**2441**	56	2458	73	2475
06	2408	23	2425	40	2442	57	2459	74	2476
07	2409	24	2426	41	2443	58	2460	75	2477
08	2410	25	2427	42	2444	59	2461	76	2478
09	2411	26	2428	43	2445	60	2462	77	2479
10	2412	27	2429	44	2446	61	2463	**78**	**2480**
11	2413	28	2430	45	2447	62	2464		
12	2414	29	2431	46	2448	63	2465		
13	2415	30	2432	47	2449	64	2466		
14	2416	31	2433	48	2450	65	2467		
15	2417	32	2434	49	2451	66	2468		
16	2418	33	2435	50	2452	67	2469		

Note:

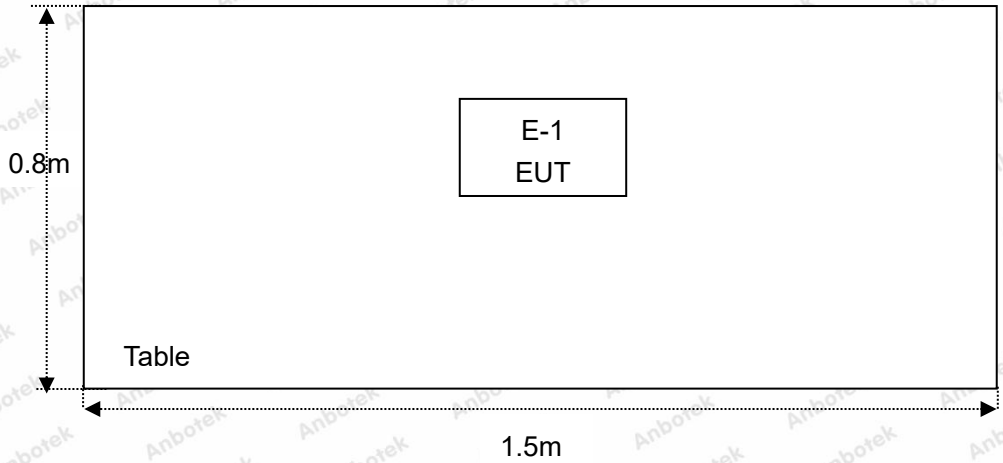
1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.
2. EUT was tested with channel 0, 39 and 78.

1.5. Description Of Test Setup

CE



RE



1.6. Test Equipment List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	Rohde & Schwarz	ENV216	100055	Oct. 23, 2022	1 Year
2.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	Jul. 05, 2023	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 13, 2022	1 Year
4.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 23, 2022	1 Year
5.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2022	1 Year
6.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 13, 2022	1 Year
7.	EMI Preamplifier	SKET Electronic	LNPA-0118G-45	SKET-PA-002	Oct. 13, 2022	1 Year
8.	Double Ridged Horn Antenna	SCHWARZBECK	BBHA 9120D	02555	Oct. 16, 2022	3 Year
9.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	345	Oct. 23, 2022	3 Year
10.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Oct. 23, 2022	1 Year
11.	Horn Antenna	A-INFO	LB-180400-KF	J211060628	Oct. 23, 2022	1 Year
12.	Pre-amplifier	SONOMA	310N	186860	Oct. 23, 2022	1 Year
13.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
14.	MXA Spectrum Analysis	KEYSIGHT	N9020A	MY53280032	Oct. 13, 2022	1 Year
15.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 13, 2022	1 Year
16.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 13, 2022	1 Year
17.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 22, 2022	1 Year
18.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	Oct. 19, 2022	1 Year
19.	Power Meter	Agilent	N1914A	MY50001102	Oct.26, 2022	1 Year

1.7. Measurement Uncertainty

Parameter	Uncertainty
Conducted emissions (AMN 150kHz~30MHz)	3.8dB
Occupied Bandwidth	925Hz
Conducted Output Power	0.76dB
Conducted Spurious Emission	1.24dB
Radiated spurious emissions (Below 30MHz)	3.53dB
Radiated spurious emissions (30MHz~1GHz)	Horizontal: 3.92dB; Vertical: 4.52dB
Radiated spurious emissions (above 1GHz)	1G-6GHz: 4.78dB; 6G-18GHz: 4.88dB 18G-40GHz: 5.68dB
This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

1.8. Description of Test Facility

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

FCC-Registration No.: 184111

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No. 184111.

ISED-Registration No.: 8058A

Shenzhen Anbotek Compliance Laboratory Limited, EMC Laboratory has been registered and fully described in a report filed with the (ISED) Innovation, Science and Economic Development Canada. The acceptance letter from the ISED is maintained in our files. Registration 8058A.

Test Location

Shenzhen Anbotek Compliance Laboratory Limited.
1/F, Building D, Sogood Science and Technology Park, Sanwei community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.518102

2. Summary of Test Results

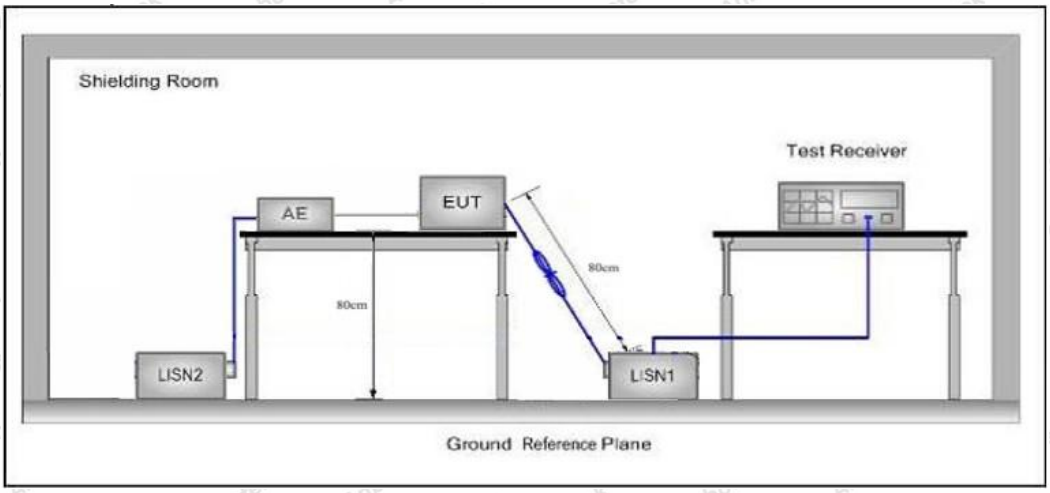
Standard Section	Test Item	Result
15.203/15.247(c)	Antenna Requirement	PASS
15.207	Conducted Emission	PASS
15.205/15.209	Spurious Emission	PASS
15.247(b)(1)	Conducted Peak Output Power	PASS
15.247(a)(1)	20dB Occupied Bandwidth	PASS
15.247(a)(1)	Carrier Frequencies Separation	PASS
15.247(a)(1)(iii)	Number of Hopping Channel	PASS
15.247(a)(1)(iii)	Dwell Time	PASS
15.247(d)	Band Edge	PASS
Remark: “N/A” is an abbreviation for Not Applicable.		

3. Conducted Emission Test

3.1. Test Standard and Limit

Test Standard	FCC Part15 Section 15.207		
Test Limit	Frequency	Maximum RF Line Voltage (dBuV)	
		Quasi-peak Level	Average Level
	150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
	500kHz~5MHz	56	46
	5MHz~30MHz	60	50
Remark: (1) *Decreasing linearly with logarithm of the frequency. (2) The lower limit shall apply at the transition frequency.			

3.2. Test Setup



3.3. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10: 2020 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9kHz.

The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

PASS

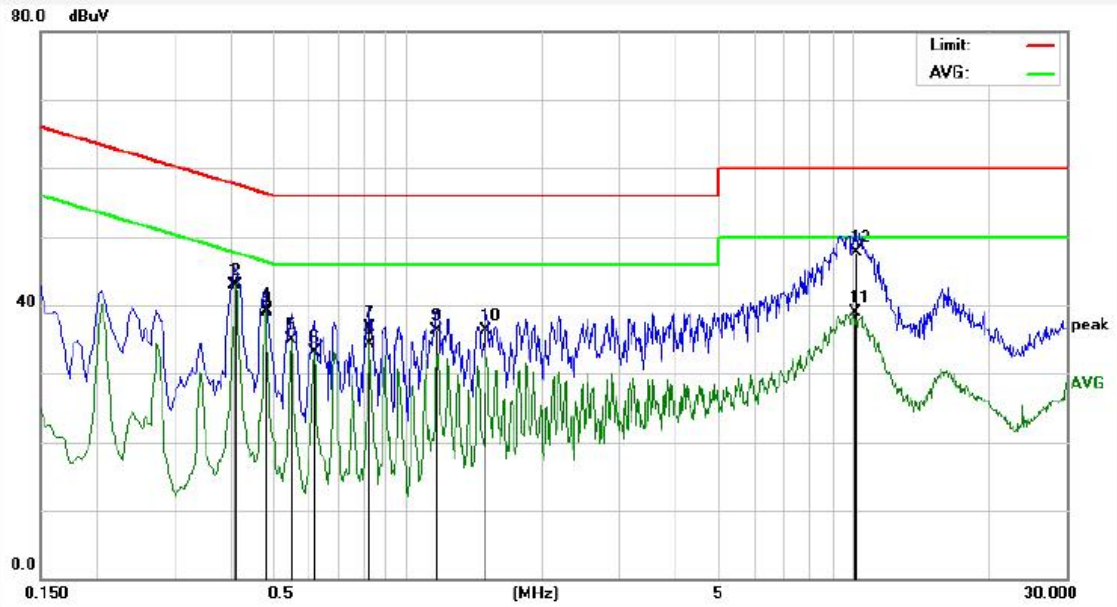
During the test, pre-scan all modes, only the worst case is recorded in the report.

AC conducted emission pre-test at both at AC 120V/60Hz and AC 240V/60Hz modes, recorded worst case AC 120V/60Hz.

Please to see the following pages.

Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: GFSK (2441MHz)
Test Specification: AC 120V, 60Hz
Comment: Live Line
Temp.(℃)/Hum.(%RH): 23.5℃/45%RH

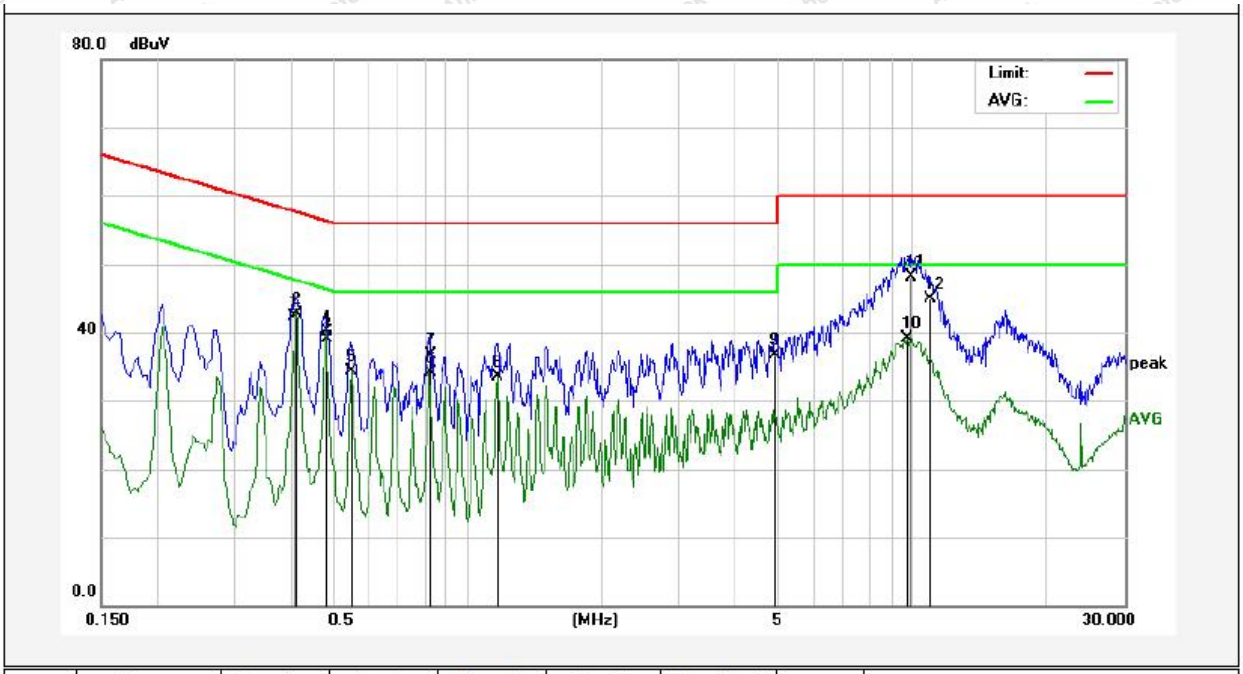


No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.4100	33.15	9.76	42.91	57.65	-14.74	QP	
2	0.4140	33.15	9.77	42.92	47.57	-4.65	AVG	
3	0.4820	29.08	9.82	38.90	56.30	-17.40	QP	
4	0.4820	29.50	9.82	39.32	46.30	-6.98	AVG	
5	0.5500	25.10	9.84	34.94	46.00	-11.06	AVG	
6	0.6180	23.35	9.85	33.20	46.00	-12.80	AVG	
7	0.8220	26.93	9.84	36.77	56.00	-19.23	QP	
8	0.8220	24.56	9.84	34.40	46.00	-11.60	AVG	
9	1.1620	26.45	9.85	36.30	56.00	-19.70	QP	
10	1.5020	26.40	9.84	36.24	56.00	-19.76	QP	
11	10.0620	29.17	9.82	38.99	50.00	-11.01	AVG	
12	10.1459	37.89	9.82	47.71	60.00	-12.29	QP	

Note: Result = Reading + Factor Over Limit = Result - Limit

Conducted Emission Test Data

Test Site:	1# Shielded Room
Operating Condition:	GFSK (2441MHz)
Test Specification:	AC 120V, 60Hz
Comment:	Neutral Line
Temp.(℃)/Hum.(%RH):	23.5℃/45%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.4100	32.48	9.76	42.24	57.65	-15.41	QP	
2	0.4140	33.00	9.77	42.77	47.57	-4.80	AVG	
3	0.4820	29.36	9.82	39.18	56.30	-17.12	QP	
4	0.4820	30.21	9.82	40.03	46.30	-6.27	AVG	
5	0.5500	24.48	9.84	34.32	46.00	-11.68	AVG	
6	0.8220	24.21	9.84	34.05	46.00	-11.95	AVG	
7	0.8300	26.78	9.84	36.62	56.00	-19.38	QP	
8	1.1660	23.69	9.84	33.53	46.00	-12.47	AVG	
9	4.9179	26.96	9.77	36.73	56.00	-19.27	QP	
10	9.7459	29.36	9.82	39.18	50.00	-10.82	AVG	
11	9.9219	38.33	9.82	48.15	60.00	-11.85	QP	
12	11.0139	35.12	9.85	44.97	60.00	-15.03	QP	

Note: Result = Reading + Factor Over Limit = Result - Limit

4. Radiation Spurious Emission and Band Edge

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
Test Limit	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz~0.490MHz	2400/F(kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F(kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz~88MHz	100	40.0	Quasi-peak	3
	88MHz~216MHz	150	43.5	Quasi-peak	3
	216MHz~960MHz	200	46.0	Quasi-peak	3
	960MHz~1000MHz	500	54.0	Quasi-peak	3
	Above 1000MHz	500	54.0	Average	3
		-	74.0	Peak	3

Remark:
(1)The lower limit shall apply at the transition frequency.
(2) 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

4.2. Test Setup

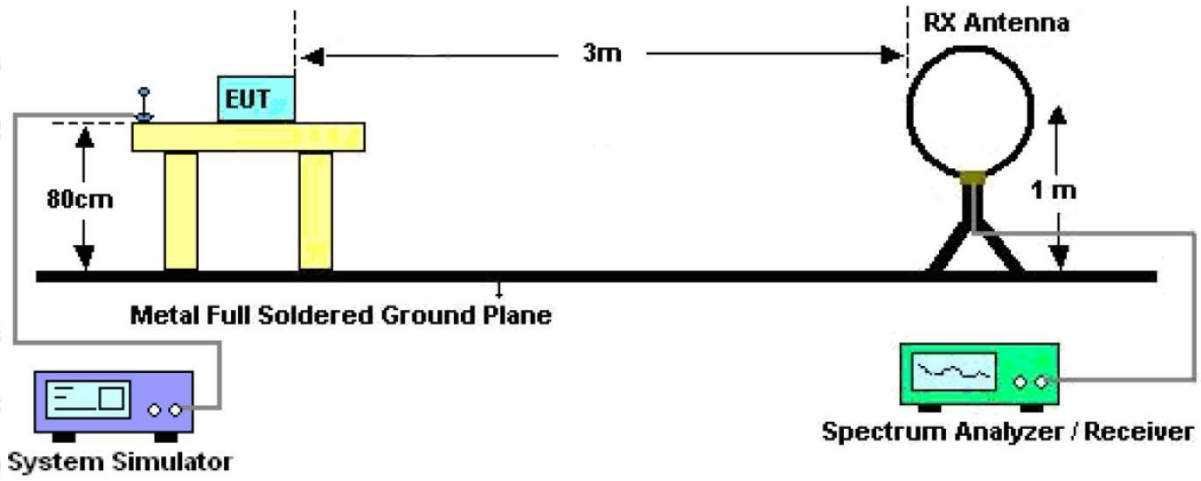


Figure 1. Below 30MHz

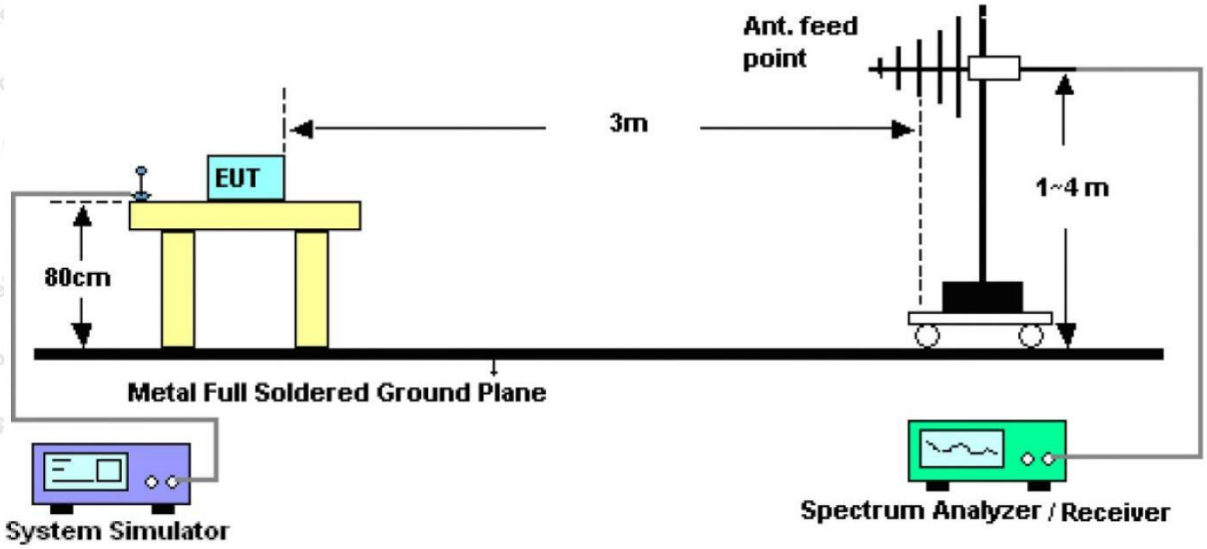


Figure 2. 30MHz to 1GHz

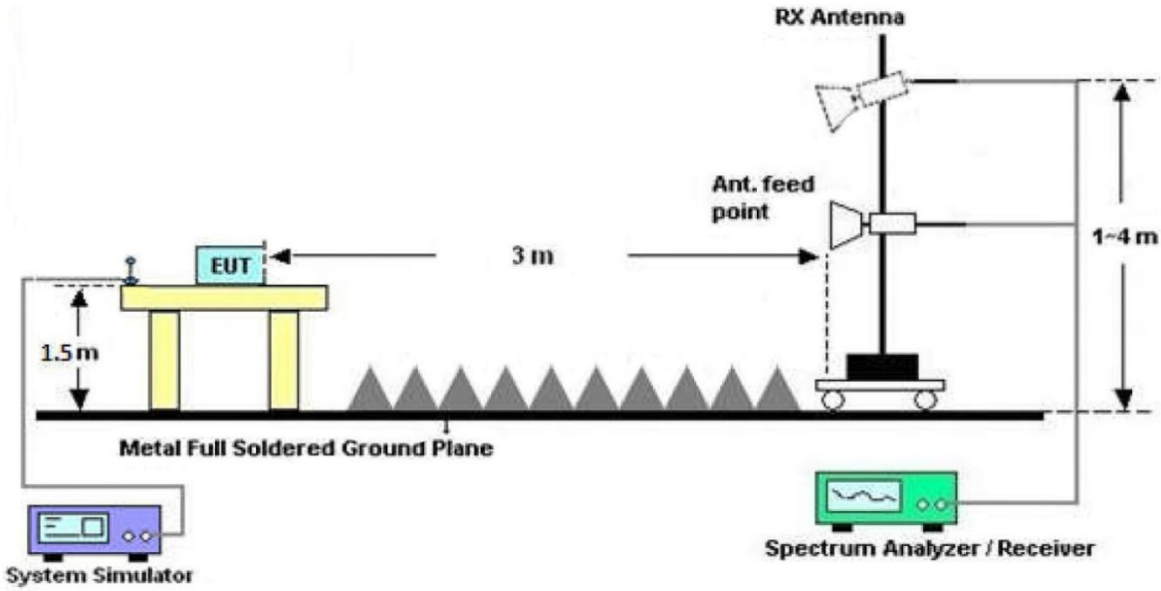


Figure 3. Above 1 GHz

4.3. Test Procedure

For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane.

The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna which is mounted on a antenna tower. The antenna can be moved up and down from 1 to 4 meters to find out the maximum emission level. Rotated the EUT through three orthogonal axes to determine the maximum emissions, both horizontal and vertical polarization of the antenna are set on test. The EUT is tested in 9*6*6 Chamber. The device is evaluated in xyz orientation.

For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

For 9kHz to 150kHz, Set the spectrum analyzer as:

RBW = 200Hz, VBW =1kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 150kHz to 30MHz, Set the spectrum analyzer as:

RBW = 9KHz, VBW =30kHz, Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For 30MHz to 1000MHz, Set the spectrum analyzer as:

RBW = 120kHz, VBW =300kHz,Detector= Quasi-Peak, Trace mode= Max hold, Sweep- auto couple.

For above 1GHz,Set the spectrum analyzer as:

RBW =1MHz, VBW =3MHz, Detector= Peak, Trace mode= Max hold, Sweep- auto couple.

For average measurement: use duty cycle correction factor method (DCCF)

Average level = Peak level + DCCF

4.4. Test Data

PASS

During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

The test results of 9kHz-30MHz was attenuated more than 20dB below the permissible limits, so the results don't record in the report.

During the test, pre-scan all modes, only the worst case is recorded in the report.

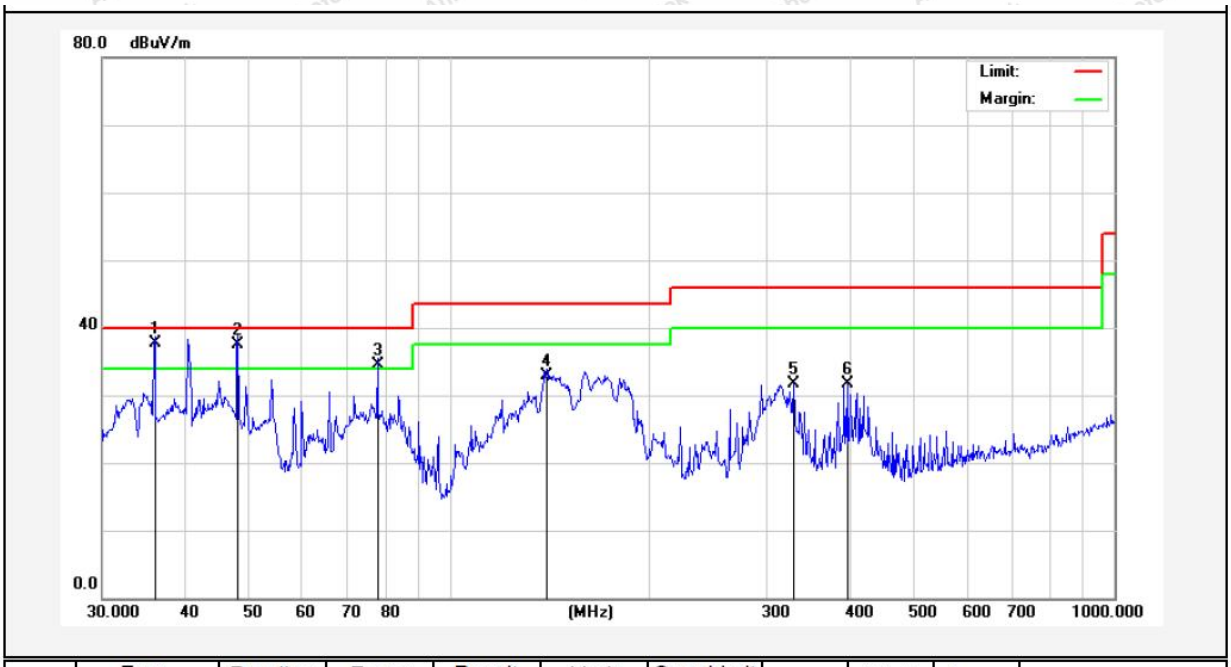
Test Results (30~1000MHz)

Test Mode: GFSK (2441MHz)

Power Source: DC 22.2V Battery inside

Polarization: Vertical

Temp.(℃)/Hum.(%RH): 22.5℃/50%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	36.0007	54.27	-16.63	37.64	40.00	-2.36	QP			
2	47.9940	52.94	-15.48	37.46	40.00	-2.54	QP			
3	77.8654	53.96	-19.55	34.41	40.00	-5.59	QP			
4	139.8508	55.17	-22.17	33.00	43.50	-10.50	QP			
5	329.0390	47.25	-15.53	31.72	46.00	-14.28	QP			
6	396.2415	46.13	-14.48	31.65	46.00	-14.35	QP			

Note: Result = Reading + Factor Over Limit = Result - Limit

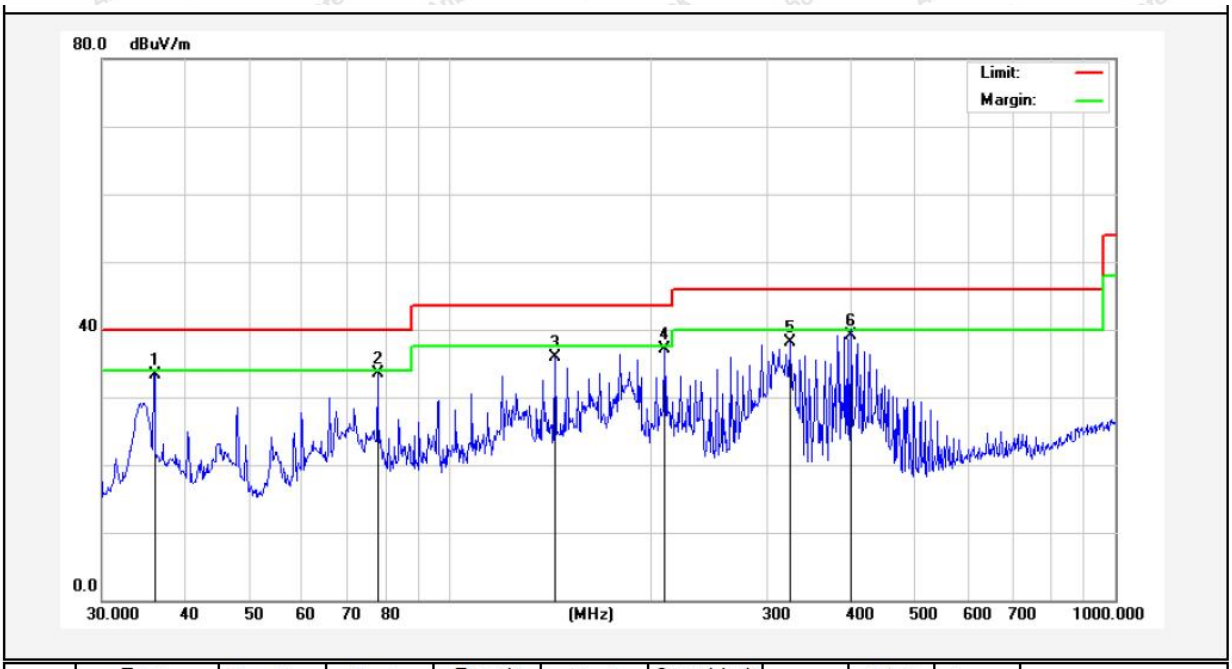
Test Results (30~1000MHz)

Test Mode: GFSK (2441MHz)

Power Source: DC 22.2V Battery inside

Polarization: Horizontal

Temp.(℃)/Hum.(%RH): 22.5℃/50%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	36.0007	51.32	-17.96	33.36	40.00	-6.64	QP			
2	77.8654	56.29	-22.77	33.52	40.00	-6.48	QP			
3	143.8295	58.87	-22.99	35.88	43.50	-7.62	QP			
4	210.0482	59.20	-22.16	37.04	43.50	-6.46	QP			
5	324.4561	54.67	-16.59	38.08	46.00	-7.92	QP			
6	400.4319	55.16	-16.14	39.02	46.00	-6.98	QP			

Note: Result = Reading + Factor Over Limit = Result - Limit

Test Results (1GHz-25GHz)

Test Mode: CH00			Test channel: Lowest			
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
4804.00	28.17	15.27	43.44	74.00	-30.56	Vertical
7206.00	29.16	18.09	47.25	74.00	-26.75	Vertical
9608.00	30.33	23.76	54.09	74.00	-19.91	Vertical
12010.00	*			74.00		Vertical
14412.00	*			74.00		Vertical
4804.00	28.46	15.27	43.73	74.00	-30.27	Horizontal
7206.00	29.70	18.09	47.79	74.00	-26.21	Horizontal
9608.00	28.66	23.76	52.42	74.00	-21.58	Horizontal
12010.00	*			74.00		Horizontal
14412.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
4804.00	17.55	15.27	32.82	54.00	-21.18	Vertical
7206.00	18.19	18.09	36.28	54.00	-17.72	Vertical
9608.00	19.35	23.76	43.11	54.00	-10.89	Vertical
12010.00	*			54.00		Vertical
14412.00	*			54.00		Vertical
4804.00	16.81	15.27	32.08	54.00	-21.92	Horizontal
7206.00	18.76	18.09	36.85	54.00	-17.15	Horizontal
9608.00	17.97	23.76	41.73	54.00	-12.27	Horizontal
12010.00	*			54.00		Horizontal
14412.00	*			54.00		Horizontal

Test Results (1GHz-25GHz)

Test Mode: CH39			Test channel: Middle			
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
4882.00	28.19	15.42	43.61	74.00	-30.39	Vertical
7323.00	29.01	18.02	47.03	74.00	-26.97	Vertical
9764.00	29.34	23.80	53.14	74.00	-20.86	Vertical
12205.00	*			74.00		Vertical
14646.00	*			74.00		Vertical
4882.00	28.16	15.42	43.58	74.00	-30.42	Horizontal
7323.00	29.69	18.02	47.71	74.00	-26.29	Horizontal
9764.00	28.36	23.80	52.16	74.00	-21.84	Horizontal
12205.00	*			74.00		Horizontal
14646.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
4882.00	17.28	15.42	32.70	54.00	-21.30	Vertical
7323.00	18.29	18.02	36.31	54.00	-17.69	Vertical
9764.00	19.21	23.80	43.01	54.00	-10.99	Vertical
12205.00	*			54.00		Vertical
14646.00	*			54.00		Vertical
4882.00	16.72	15.42	32.14	54.00	-21.86	Horizontal
7323.00	18.32	18.02	36.34	54.00	-17.66	Horizontal
9764.00	18.48	23.80	42.28	54.00	-11.72	Horizontal
12205.00	*			54.00		Horizontal
14646.00	*			54.00		Horizontal

Test Results (1GHz-25GHz)

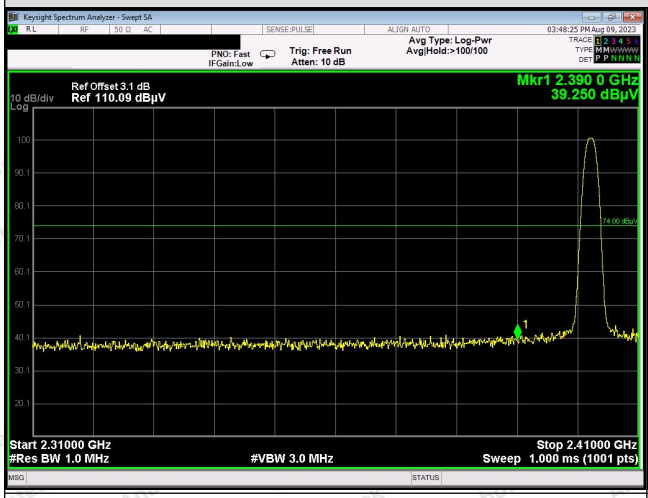
Test Mode: CH78			Test channel: Highest			
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
4960.00	28.46	15.58	44.04	74.00	-29.96	Vertical
7440.00	29.02	17.93	46.95	74.00	-27.05	Vertical
9920.00	29.89	23.83	53.72	74.00	-20.28	Vertical
12400.00	*			74.00		Vertical
14880.00	*			74.00		Vertical
4960.00	28.23	15.58	43.81	74.00	-30.19	Horizontal
7440.00	29.72	17.93	47.65	74.00	-26.35	Horizontal
9920.00	29.04	23.83	52.87	74.00	-21.13	Horizontal
12400.00	*			74.00		Horizontal
14880.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
4960.00	18.40	15.58	33.98	54.00	-20.02	Vertical
7440.00	19.30	17.93	37.23	54.00	-16.77	Vertical
9920.00	19.76	23.83	43.59	54.00	-10.41	Vertical
12400.00	*			54.00		Vertical
14880.00	*			54.00		Vertical
4960.00	18.16	15.58	33.74	54.00	-20.26	Horizontal
7440.00	19.69	17.93	37.62	54.00	-16.38	Horizontal
9920.00	18.38	23.83	42.21	54.00	-11.79	Horizontal
12400.00	*			54.00		Horizontal
14880.00	*			54.00		Horizontal

Remark:

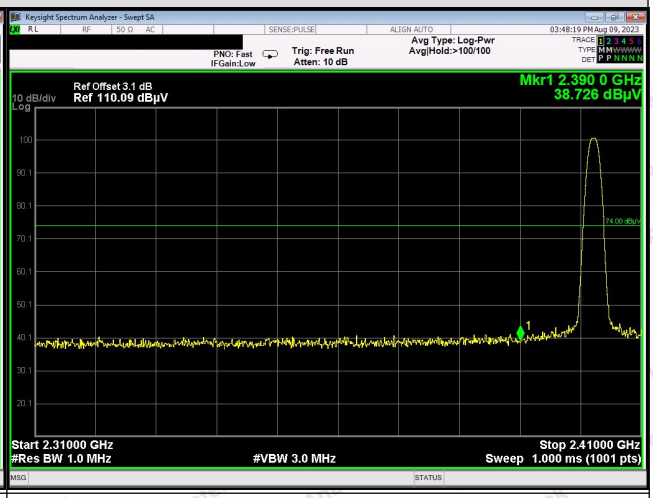
1. During the test, pre-scan the GFSK, π/4QPSK, 8DPSK modulation, and found the GFSK modulation is worse case, the report only record this mode.
2. Result =Reading + Factor
3. "*" means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.

Radiated Band Edge:

Test Mode: Lowest (CH00)

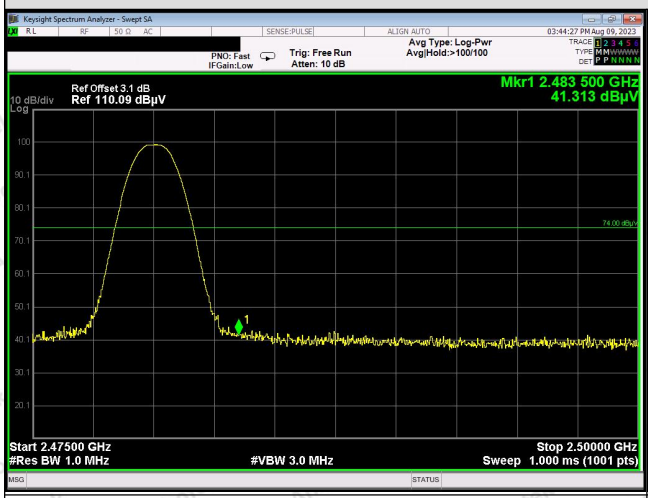


Peak Value(Vertical)

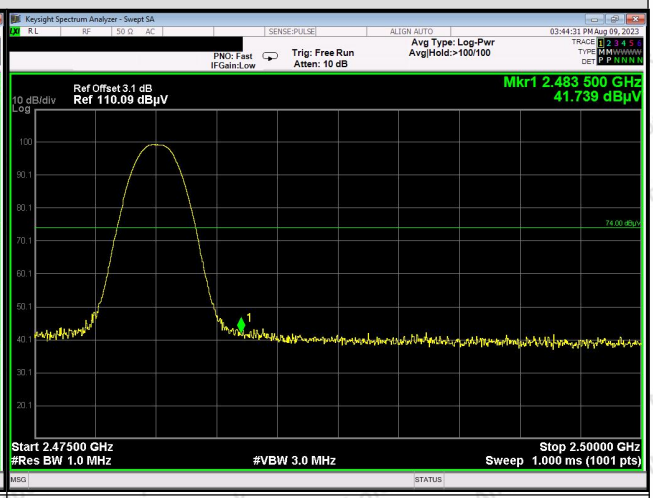


Peak Value(Horizontal)

Test Mode: Highest (CH78)



Peak Value(Vertical)



Peak Value(Horizontal)

Average:

Test Channel	Peak Value (dBuV/m)	DCCF	Average Value (dBuV/m)	Limit (dBuV/m)	Polarization	Verdict
CH00	30.760	-2.29	28.467	54.00	Vertical	Pass
	30.830	-2.29	28.537	54.00	Horizontal	Pass
CH78	33.760	-2.26	31.498	54.00	Vertical	Pass
	33.209	-2.26	30.947	54.00	Horizontal	Pass

Remark:

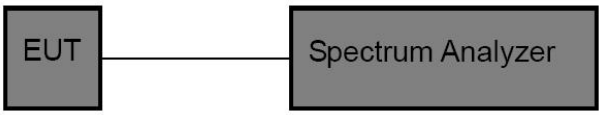
1. During the test, pre-scan the GFSK, π/4QPSK, 8DPSK modulation, and found the GFSK modulation is worse case, the report only record this mode.
2. DCCF=20log(Duty Cycle)
3. Average Value=Peak Value+DCCF

5. Maximum Peak Output Power Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (b)(1)
Test Limit	For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

5.2. Test Setup



5.3. Test Procedure

1. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above,
2. Spectrum Setting:
   RBW > the 20 dB bandwidth of the emission being measured
   Span = approximately 5 times the 20 dB bandwidth, centered on a hopping channel
   VBW ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold

5.4. Test Data

Pass

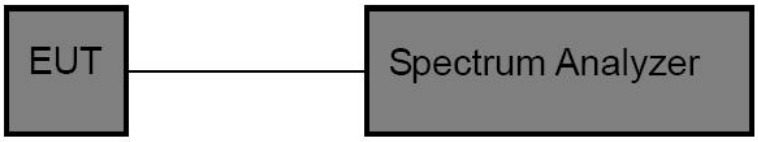
Please refer to Appendix C of the Appendix Test Data.

6. 20dB Occupy Bandwidth Test

6.1. Test Standard

Test Standard	FCC Part15 C Section 15.247 (a)(1)

6.2. Test Setup



6.3. Test Procedure

Using the following spectrum analyzer settings:

1. Span= approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel.
2. Set the RBW ≥1% of the 20 dB bandwidth.
3. Set the VBW ≥RBW
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

6.4. Test Data

Pass

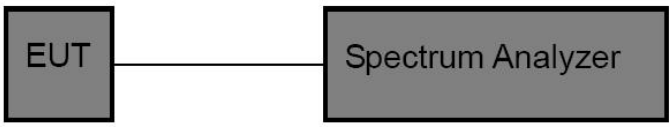
Please refer to Appendix A of the Appendix Test Data.

7. Carrier Frequency Separation Test

7.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)
Test Limit	2/3 of the 20dB bandwidth base on the transmission power is less than 0.125W.

7.2. Test Setup



7.3. Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer settings:

1. Span= Wide enough to capture the peaks of two adjacent channels
2. Set the RBW =approximately 30% of the channel spacing.
3. Set the VBW ≥ RBW.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

7.4. Test Data

Pass

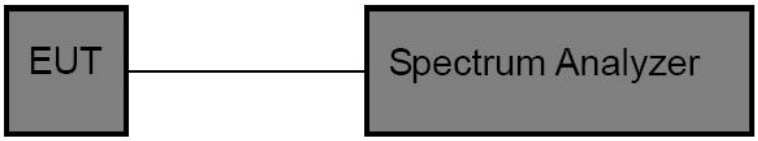
Please refer to Appendix D of the Appendix Test Data.

8. Number of Hopping Channel Test

8.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)(iii)
Test Limit	>15 channels

8.2. Test Setup



8.3. Test Procedure

The EUT must have its hopping function enabled. Using the following spectrum analyzer setting:

1. Span= the frequency band of operation
2. Set the RBW = less than 30% of the channel spacing or the 20 dB bandwidth, whichever is smaller.
3. Set the VBW ≥ RBW.
4. Sweep time = auto couple.
5. Detector function = peak.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

8.4. Test Data

Pass

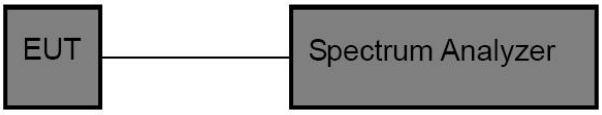
Please refer to Appendix F of the Appendix Test Data.

9. Dwell Time Test

9.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(1)(iii)
Test Limit	0.4 s

9.2. Test Setup



9.3. Test Procedure

The EUT must have its hopping function enabled. Use the following spectrum analyzer settings:

1. Span= zero span, centered on a hopping channel
2. Set the RBW = 1 MHz.
3. Set the VBW ≥ RBW.
4. Sweep time = as necessary to capture the entire dwell time per hopping channel.
5. Detector function = peak.
6. Trace mode = clear write.

9.4. Test Data

Pass

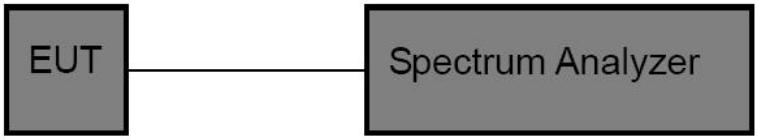
Please refer to Appendix E of the Appendix Test Data.

10. 100kHz Bandwidth of Frequency Band Edge Requirement

10.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (d)
Test Limit	In any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power, 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).

10.2. Test Setup



10.3. Test Procedure

The EUT must have its hopping/Non-hopping function enabled. Using the following spectrum analyzer setting:

1. Set the RBW = 100kHz.
2. Set the VBW = 300kHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

10.4. Test Data

Pass

Please refer to Appendix G & Appendix H of the Appendix Test Data.

11. Antenna Requirement

11.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203 /247(c)
Requirement	1) 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. 2) 15.247(c) (1)(i) requirement: Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

11.2. Antenna Connected Construction

The antenna is PCB Antenna which permanently attached, and the best case gain of the antenna is -0.58dBi. It complies with the standard requirement.

APPENDIX I -- TEST SETUP PHOTOGRAPH

Please refer to separated files Appendix I -- Test Setup Photograph

APPENDIX II -- EXTERNAL PHOTOGRAPH

Please refer to separated files Appendix II -- External Photograph

APPENDIX III -- INTERNAL PHOTOGRAPH

Please refer to separated files Appendix III -- Internal Photograph

---------- End of Report ----------