FCC Test Report

Client Name	:	**Rocket Drones**
Client Address	:	**260 south tarragona street,Suite 240-B, Pensacola, Florida, 32502, United States**
Product Name	:	**Launch Controller**
Report Date	:	**Sept. 16, 2022**

Shenzhen Anbotek Compliance Laboratory Limited

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TEST REPORT

Applicant	:	Rocket Drones
Manufacturer	:	Shenzhen Baida Moxing Co.,Ltd.
Product Name	:	Launch Controller
Model No.	:	Launch Controller
Trade Mark	:	ROCKET DRONES
Rating(s)	:	Input: 5V⎓ (with DC 3.7V, 2000mAh battery inside)

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	Aug. 23, 2022
Date of Test	Aug. 23~Sept. 16, 2022
Prepared by	Nian xiu Chen (Nianxiu Chen)
Approved & Authorized Signer	Kingkong Jin (Kingkong Jin)

Revision History

Report Version	Description	Issued Date
R00	Original Issue.	Sept. 16, 2022

1. General Information

1.1. Client Information

Applicant	:	Rocket Drones
Address	:	260 south tarragona street,Suite 240-B, Pensacola, Florida, 32502, United States
Manufacturer	:	Shenzhen Baida Moxing Co.,Ltd.
Address	:	B1702A, Block ABCD, Building 3, Phase 1, Tian'an Cloud Park, Gangtou Community, Bantian Street, Longgang District, Shenzhen, China
Factory	:	Shenzhen Humming Technology Co.ltd
Address	:	6, building B, Zone C,Shangxue Technology Industrial City, Snowing residents' group,Xinxue community,Bantian Street, Longgang District, Shenzhen, China

1.2. Description of Device (EUT)

Product Name	:	Launch Controller
Model No.	:	Launch Controller
Trade Mark	:	ROCKET DRONES
Test Power Supply	:	AC 120V, 60Hz for adapter/ DC 3.7V battery inside
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)
Adapter	:	N/A
RF Specification		
Operation Mode	:	☐ DSSS ☒ FHSS
Operation Frequency	:	2404~2474.2MHz
Number of Channel	:	235 Channels
Modulation Type	:	GFSK
Antenna Type	:	Monopole antenna
Antenna Gain(Peak)	:	2.09dBi (Provided by customer)
Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.		

1.3. Auxiliary Equipment Used During Test

Description	Rating(s)
Adapter	M/N: A2023 Input: AC 100-240V, 0.7A, 50-60Hz USB1 Output: DC 5V, 2.4A USB2 Output: DC 5V, 2.4A

1.4. Description of Test Configuration

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
01	**2404.0**	35	2414.2	69	2424.4	103	2434.6	137	2444.8	171	2455.0	205	2465.2
02	2404.3	36	2414.5	70	2424.7	104	2434.9	138	2445.1	172	2455.3	206	2465.5
03	2404.6	37	2414.8	71	2425.0	105	2435.2	139	2445.4	173	2455.6	207	2465.8
04	2404.9	38	2415.1	72	2425.3	106	2435.5	140	2445.7	174	2455.9	208	2466.1
05	2405.2	39	2415.4	73	2425.6	107	2435.8	141	2446.0	175	2456.2	209	2466.4
06	2405.5	40	2415.7	74	2425.9	108	2436.1	142	2446.3	176	2456.5	210	2466.7
07	2405.8	41	2416.0	75	2426.2	109	2436.4	143	2446.6	177	2456.8	211	2467.0
08	2406.1	42	2416.3	76	2426.5	110	2436.7	144	2446.9	178	2457.1	212	2467.3
09	2406.4	43	2416.6	77	2426.8	111	2437.0	145	2447.2	179	2457.4	213	2467.6
10	2406.7	44	2416.9	78	2427.1	112	2437.3	146	2447.5	180	2457.7	214	2467.9
11	2407.0	45	2417.2	79	2427.4	113	2437.6	147	2447.8	181	2458.0	215	2468.2
12	2407.3	46	2417.5	80	2427.7	114	2437.9	148	2448.1	182	2458.3	216	2468.5
13	2407.6	47	2417.8	81	2428.0	115	2438.2	149	2448.4	183	2458.6	217	2468.8
14	2407.9	48	2418.1	82	2428.3	116	2438.5	150	2448.7	184	2458.9	218	2469.1
15	2408.2	49	2418.4	83	2428.6	117	2438.8	151	2449.0	185	2459.2	219	2469.4
16	2408.5	50	2418.7	84	2428.9	**118**	**2439.1**	152	2449.3	186	2459.5	220	2469.7
17	2408.8	51	2419.0	85	2429.2	119	2439.4	153	2449.6	187	2459.8	221	2470.0
18	2409.1	52	2419.3	86	2429.5	120	2439.7	154	2449.9	188	2460.1	222	2470.3
19	2409.4	53	2419.6	87	2429.8	121	2440.0	155	2450.2	189	2460.4	223	2470.6
20	2409.7	54	2419.9	88	2430.1	122	2440.3	156	2450.5	190	2460.7	224	2470.9
21	2410.0	55	2420.2	89	2430.4	123	2440.6	157	2450.8	191	2461.0	225	2471.2
22	2410.3	56	2420.5	90	2430.7	124	2440.9	158	2451.1	192	2461.3	226	2471.5
23	2410.6	57	2420.8	91	2431.0	125	2441.2	159	2451.4	193	2461.6	227	2471.8

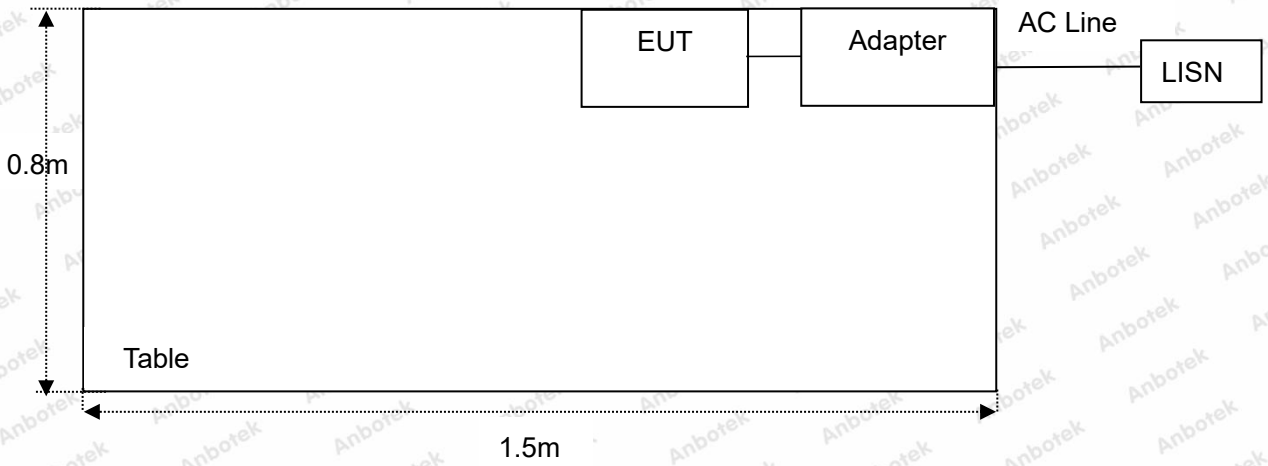
24	2410.9	58	2421.1	92	2431.3	126	2441.5	160	2451.7	194	2461.9	228	2472.1
25	2411.2	59	2421.4	93	2431.6	127	2441.8	161	2452.0	195	2462.2	229	2472.4
26	2411.5	60	2421.7	94	2431.9	128	2442.1	162	2452.3	196	2462.5	230	2472.7
27	2411.8	61	2422.0	95	2432.2	129	2442.4	163	2452.6	197	2462.8	231	2473.0
28	2412.1	62	2422.3	96	2432.5	130	2442.7	164	2452.9	198	2463.1	232	2473.3
29	2412.4	63	2422.6	97	2432.8	131	2443.0	165	2453.2	199	2463.4	233	2473.6
30	2412.7	64	2422.9	98	2433.1	132	2443.3	166	2453.5	200	2463.7	234	2473.9
31	2413.0	65	2423.2	99	2433.4	133	2443.6	167	2453.8	201	2464.0	**235**	**2474.2**
32	2413.3	66	2423.5	100	2433.7	134	2443.9	168	2454.1	202	2464.3	/	/
33	2413.6	67	2423.8	101	2434.0	135	2444.2	169	2454.4	203	2464.6	/	/
34	2413.9	68	2424.1	102	2434.3	136	2444.5	170	2454.7	204	2464.9	/	/

Note:

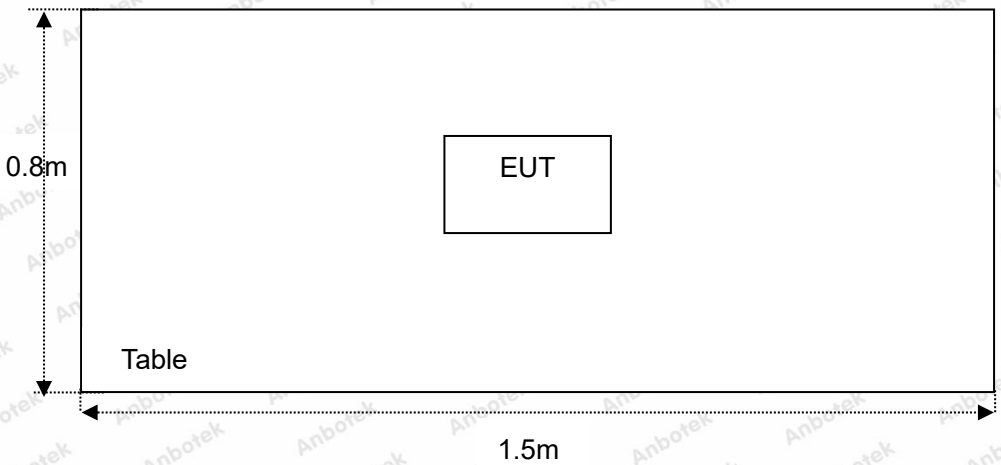
1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.
2. EUT was tested with channel 01, 118 and 235.

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.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	Jul 05, 2022	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 22, 2021	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 22, 2021	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 22, 2021	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 22, 2021	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Oct. 22, 2021	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Oct. 22, 2021	2 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Oct. 22, 2021	2 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Oct. 22, 2021	2 Year
10.	Horn Antenna	A-INFO	LB-180400-KF	J211060628	Oct. 22, 2021	2 Year
11.	Pre-amplifier	SONOMA	310N	186860	Oct. 22, 2021	1 Year
12.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
13.	RF Test Control System	YIHENG	YH3000	2017430	Oct. 22, 2021	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN045	Oct. 22, 2021	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN046	Oct. 22, 2021	1 Year
16.	MXA Spectrum Analysis	KEYSIGHT	N9020A	MY53280032	Oct. 22, 2021	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 22, 2021	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 22, 2021	1 Year
19.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 22, 2021	1 Year
20.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	Oct. 22, 2021	1 Year

1.7. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 3.9 dB (Horizontal)
		Ur = 3.8 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4 dB

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

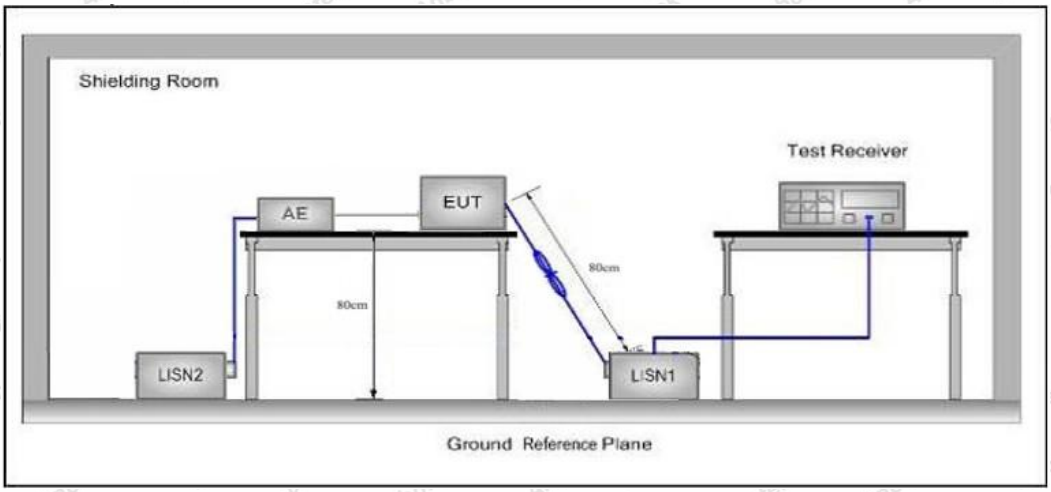
Standard Section	Test Item	Result
15.203/15.247(c)	Antenna Requirement	PASS
15.207	Conducted Emission	PASS
15.205/15.209	Spurious Emission	PASS
15.247(b)(1)	Conducted Peak Output Power	PASS
15.247(a)(1)	20dB Occupied Bandwidth	PASS
15.247(a)(1)	Carrier Frequencies Separation	PASS
15.247(a)(1)(iii)	Number 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

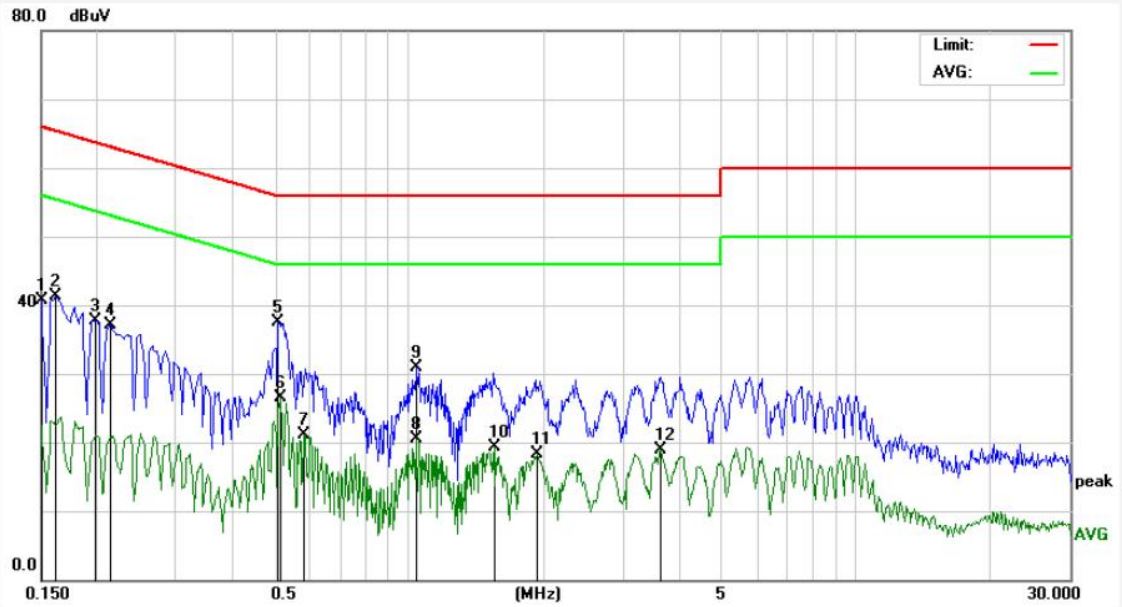
During the test, pre-scan all modes, only the worst case is recorded in the report.

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

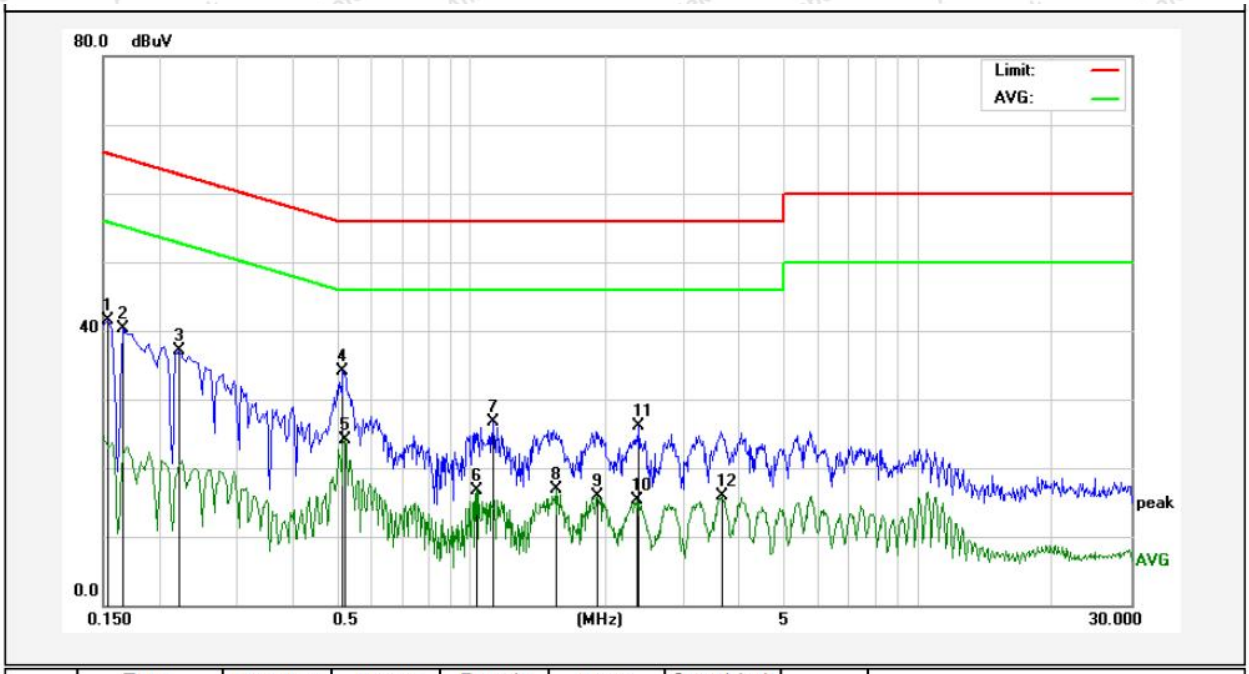
Test Site:	1# Shielded Room
Operating Condition:	Low CH (2404MHz)
Test Specification:	AC 120V, 60Hz for adapter
Comment:	Live Line
Temp.(℃)/Hum.(%RH):	22.8℃/48%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1500	31.04	9.69	40.73	65.99	-25.26	QP	
2	0.1620	31.51	9.70	41.21	65.36	-24.15	QP	
3	0.1980	28.08	9.71	37.79	63.69	-25.90	QP	
4	0.2140	27.49	9.71	37.20	63.04	-25.84	QP	
5	0.5100	27.77	9.76	37.53	56.00	-18.47	QP	
6	0.5140	16.74	9.76	26.50	46.00	-19.50	AVG	
7	0.5820	11.34	9.76	21.10	46.00	-24.90	AVG	
8	1.0339	10.81	9.74	20.55	46.00	-25.45	AVG	
9	1.0420	21.15	9.74	30.89	56.00	-25.11	QP	
10	1.5580	9.51	9.73	19.24	46.00	-26.76	AVG	
11	1.9300	8.55	9.72	18.27	46.00	-27.73	AVG	
12	3.6580	9.15	9.74	18.89	46.00	-27.11	AVG	

Conducted Emission Test Data

Test Site:	1# Shielded Room
Operating Condition:	Low CH (2404MHz)
Test Specification:	AC 120V, 60Hz for adapter
Comment:	Neutral Line
Temp.(℃)/Hum.(%RH):	22.8℃/48%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1539	31.72	9.70	41.42	65.78	-24.36	QP	
2	0.1660	30.51	9.70	40.21	65.15	-24.94	QP	
3	0.2220	27.33	9.71	37.04	62.74	-25.70	QP	
4	0.5180	24.33	9.76	34.09	56.00	-21.91	QP	
5	0.5220	14.33	9.76	24.09	46.00	-21.91	AVG	
6	1.0300	7.06	9.74	16.80	46.00	-29.20	AVG	
7	1.1180	16.88	9.74	26.62	56.00	-29.38	QP	
8	1.5460	7.21	9.73	16.94	46.00	-29.06	AVG	
9	1.9180	6.12	9.72	15.84	46.00	-30.16	AVG	
10	2.3580	5.52	9.72	15.24	46.00	-30.76	AVG	
11	2.3740	16.45	9.72	26.17	56.00	-29.83	QP	
12	3.6500	6.20	9.74	15.94	46.00	-30.06	AVG	

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

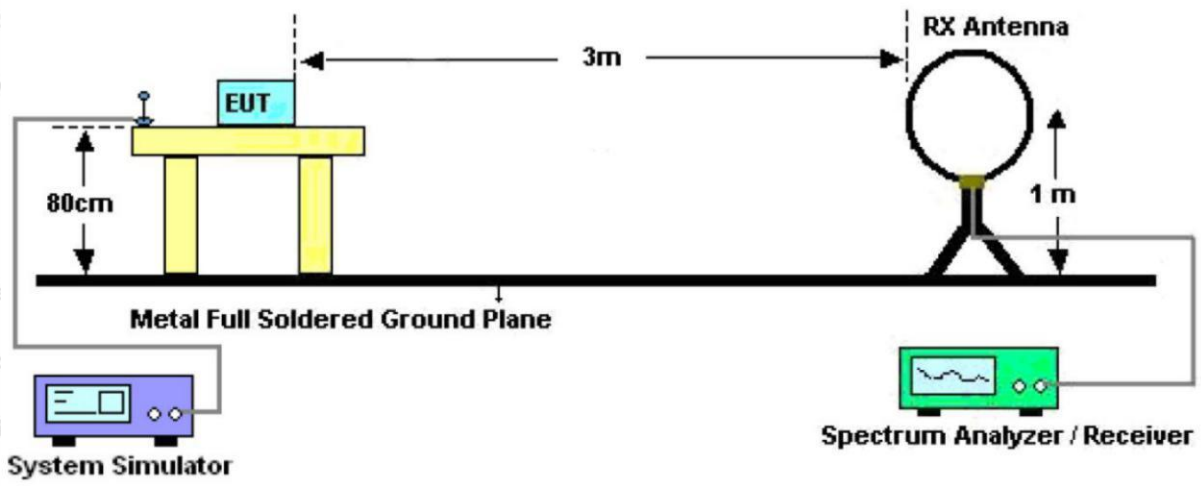


Figure 1. Below 30MHz

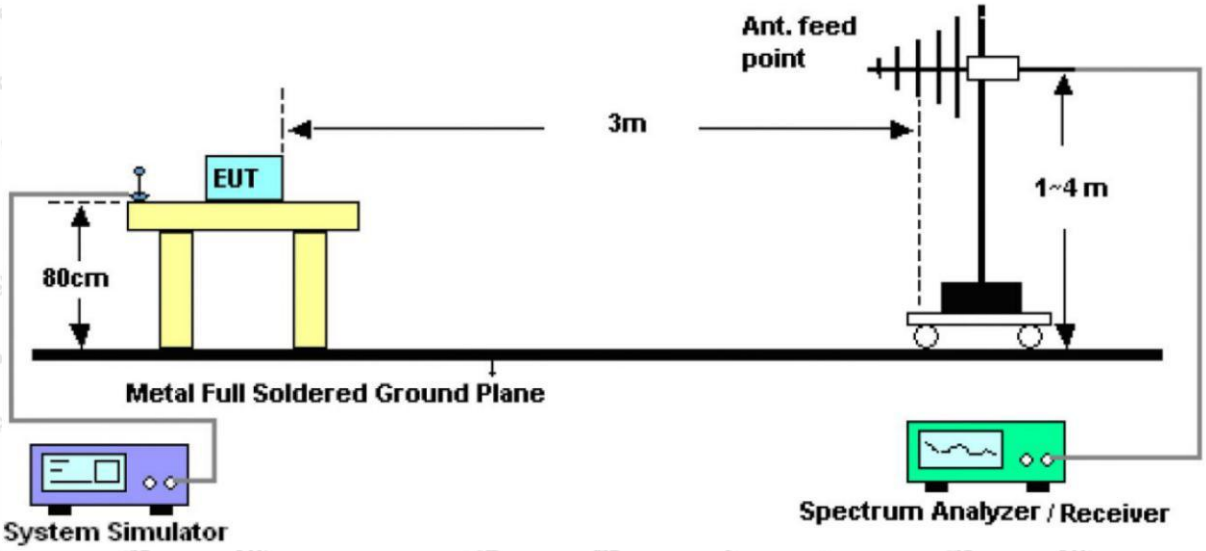


Figure 2. 30MHz to 1GHz

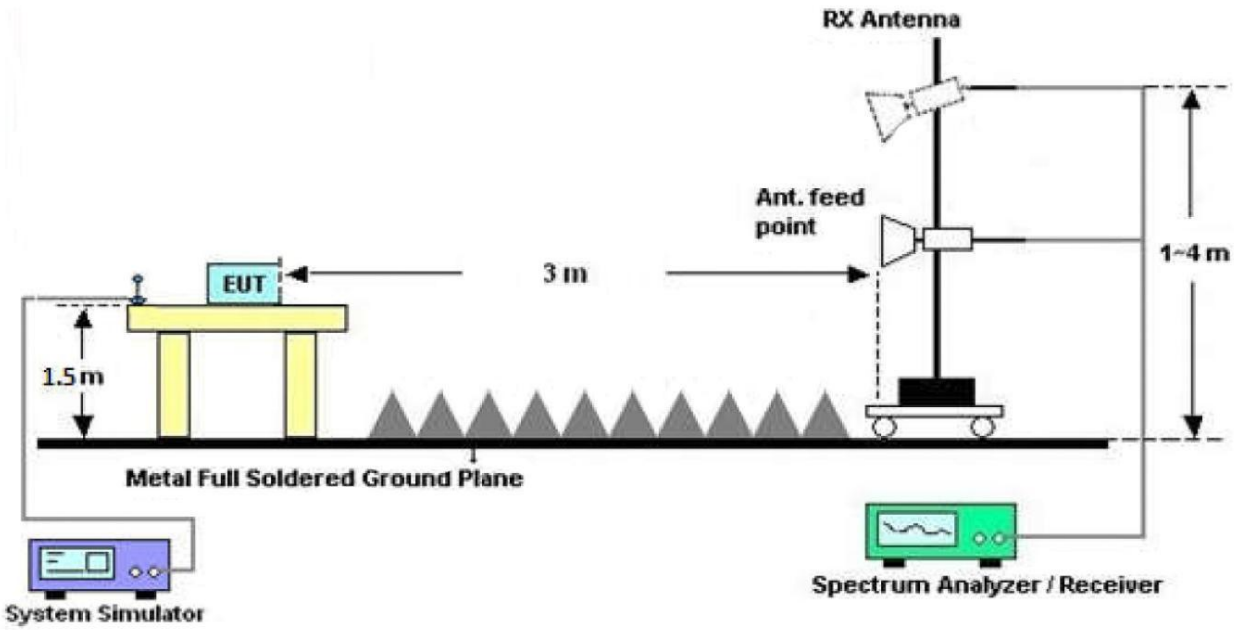


Figure 3. Above 1 GHz

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 =1MHz, 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

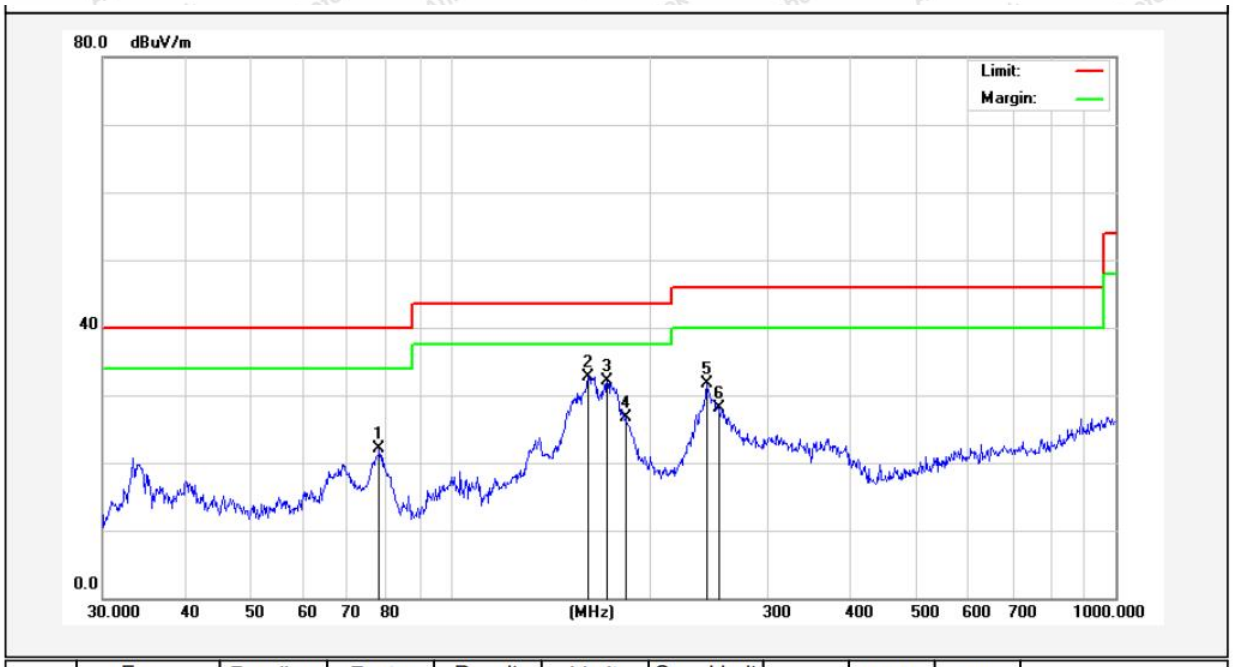
During the test, Pre-scan all kind of the place mode (X-axis, Y-axis, Z-axis), and found the X-axis is the worst case.

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:	Low CH (2404MHz)
Power Source:	DC 3.7V battery inside
Polarization:	Horizontal
Temp.(℃)/Hum.(%RH):	24.1℃/48%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	78.1389	44.98	-22.85	22.13	40.00	-17.87	QP			
2	160.9089	56.70	-23.99	32.71	43.50	-10.79	QP			
3	171.9946	55.57	-23.52	32.05	43.50	-11.45	QP			
4	183.2005	49.67	-23.04	26.63	43.50	-16.87	QP			
5	242.5253	53.39	-21.62	31.77	46.00	-14.23	QP			
6	252.9482	49.38	-21.24	28.14	46.00	-17.86	QP			

Test Results (30~1000MHz)

Test Mode: Low CH (2404MHz)

Power Source: DC 3.7V battery inside

Polarization: Vertical

Temp.(℃)/Hum.(%RH): 24.1℃/48%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	39.7146	40.62	-14.71	25.91	40.00	-14.09	QP			
2	50.4089	36.13	-15.92	20.21	40.00	-19.79	QP			
3	77.8654	47.74	-19.55	28.19	40.00	-11.81	QP			
4	174.4241	52.37	-20.89	31.48	43.50	-12.02	QP			
5	186.4409	48.08	-20.30	27.78	43.50	-15.72	QP			
6	942.1305	32.30	-5.74	26.56	46.00	-19.44	QP			

Test Results (1GHz-25GHz)

Test channel: Lowest						
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4808.00	30.18	15.27	45.45	74.00	-28.55	Vertical
7212.00	31.28	18.09	49.37	74.00	-24.63	Vertical
9616.00	32.75	23.76	56.51	74.00	-17.49	Vertical
12020.00	*			74.00		Vertical
14424.00	*			74.00		Vertical
4808.00	30.52	15.27	45.79	74.00	-28.21	Horizontal
7212.00	31.13	18.09	49.22	74.00	-24.78	Horizontal
9616.00	29.87	23.76	53.63	74.00	-20.37	Horizontal
12020.00	*			74.00		Horizontal
14424.00	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
4808.00	19.56	15.27	34.83	54.00	-19.17	Vertical
7212.00	20.31	18.09	38.40	54.00	-15.60	Vertical
9616.00	21.77	23.76	45.53	54.00	-8.47	Vertical
12020.00	*			54.00		Vertical
14424.00	*			54.00		Vertical
4808.00	18.87	15.27	34.14	54.00	-19.86	Horizontal
7212.00	20.19	18.09	38.28	54.00	-15.72	Horizontal
9616.00	19.18	23.76	42.94	54.00	-11.06	Horizontal
12020.00	*			54.00		Horizontal
14424.00	*			54.00		Horizontal

Test Results (1GHz-25GHz)

Test channel: Middle						
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4878.20	30.20	15.42	45.62	74.00	-28.38	Vertical
7317.30	31.13	18.02	49.15	74.00	-24.85	Vertical
9756.40	31.76	23.80	55.56	74.00	-18.44	Vertical
12195.50	*			74.00		Vertical
14634.60	*			74.00		Vertical
4878.20	30.22	15.42	45.64	74.00	-28.36	Horizontal
7317.30	31.12	18.02	49.14	74.00	-24.86	Horizontal
9756.40	29.57	23.80	53.37	74.00	-20.63	Horizontal
12195.50	*			74.00		Horizontal
14634.60	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
4878.20	19.29	15.42	34.71	54.00	-19.29	Vertical
7317.30	20.41	18.02	38.43	54.00	-15.57	Vertical
9756.40	21.63	23.80	45.43	54.00	-8.57	Vertical
12195.50	*			54.00		Vertical
14634.60	*			54.00		Vertical
4878.20	18.78	15.42	34.20	54.00	-19.80	Horizontal
7317.30	19.75	18.02	37.77	54.00	-16.23	Horizontal
9756.40	19.69	23.80	43.49	54.00	-10.51	Horizontal
12195.50	*			54.00		Horizontal
14634.60	*			54.00		Horizontal

Test Results (1GHz-25GHz)

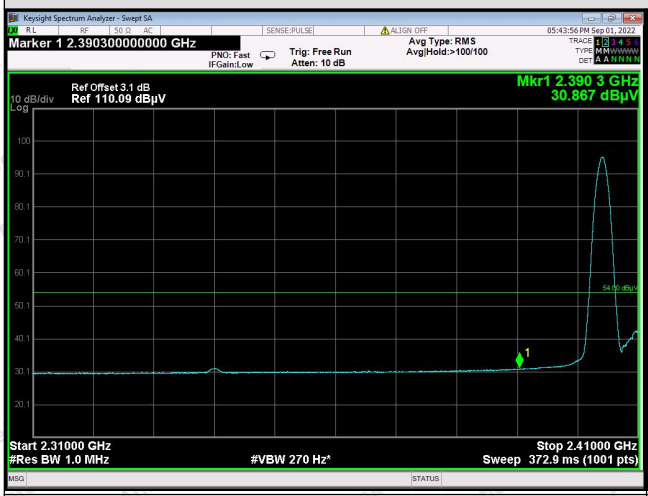
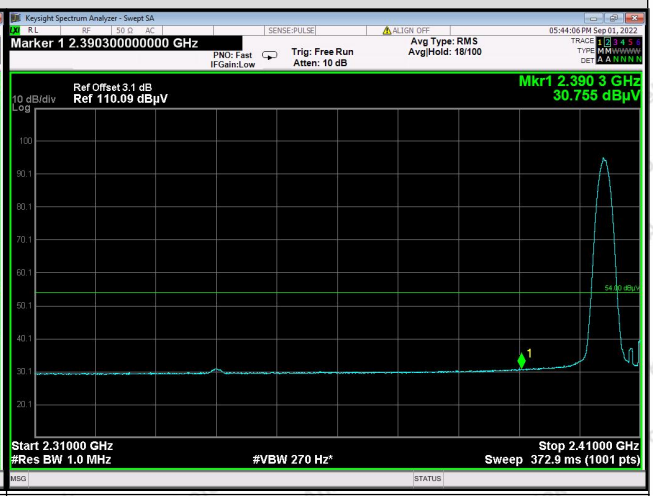
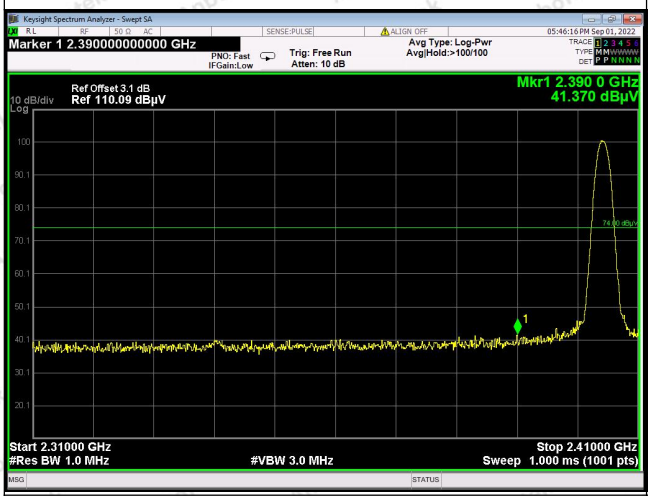
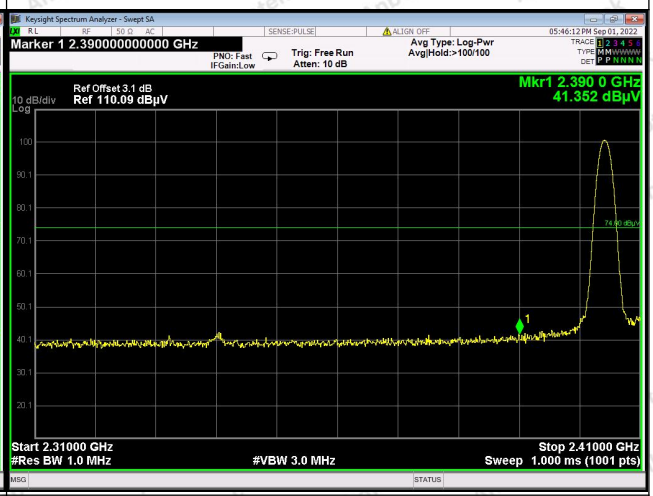
Test channel: Highest						
Peak value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
4948.40	30.47	15.58	46.05	74.00	-27.95	Vertical
7422.60	31.14	17.93	49.07	74.00	-24.93	Vertical
9896.80	32.31	23.83	56.14	74.00	-17.86	Vertical
12371.00	*			74.00		Vertical
14845.20	*			74.00		Vertical
4948.40	30.29	15.58	45.87	74.00	-28.13	Horizontal
7422.60	31.15	17.93	49.08	74.00	-24.92	Horizontal
9896.80	30.25	23.83	54.08	74.00	-19.92	Horizontal
12371.00	*			74.00		Horizontal
14845.20	*			74.00		Horizontal
Average value:						
Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	polarization
4948.40	20.41	15.58	35.99	54.00	-18.01	Vertical
7422.60	21.42	17.93	39.35	54.00	-14.65	Vertical
9896.80	22.18	23.83	46.01	54.00	-7.99	Vertical
12371.00	*			54.00		Vertical
14845.20	*			54.00		Vertical
4948.40	20.22	15.58	35.80	54.00	-18.20	Horizontal
7422.60	21.12	17.93	39.05	54.00	-14.95	Horizontal
9896.80	19.59	23.83	43.42	54.00	-10.58	Horizontal
12371.00	*			54.00		Horizontal
14845.20	*			54.00		Horizontal

Remark:

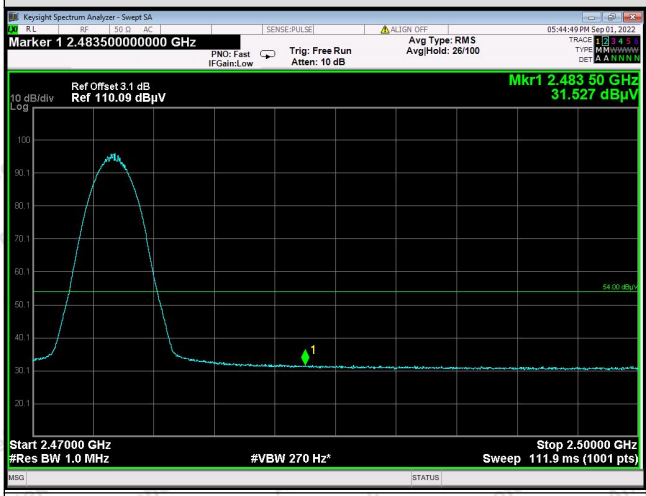
1. Result =Reading + Factor

2. “*” means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.

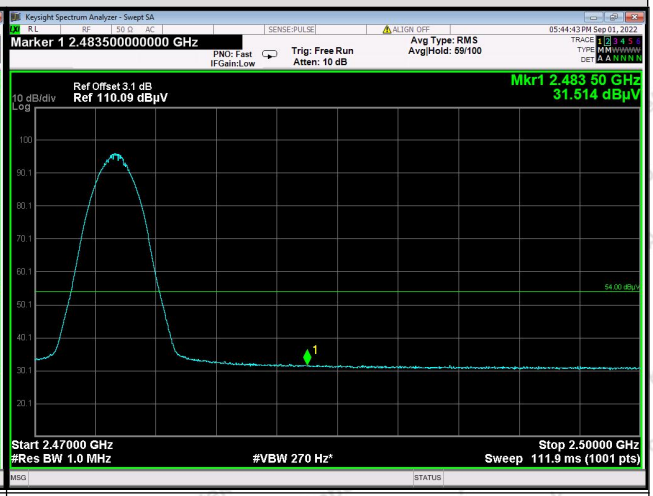
Radiated Band Edge:

Test Mode: Lowest	
	
Average Value(Vertical)	Average Value(Horizontal)
	
Peak Value(Vertical)	Peak Value(Horizontal)

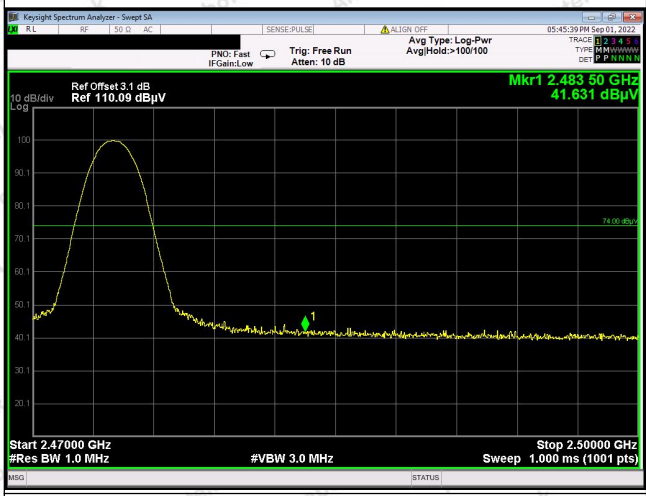
Test Mode: Highest



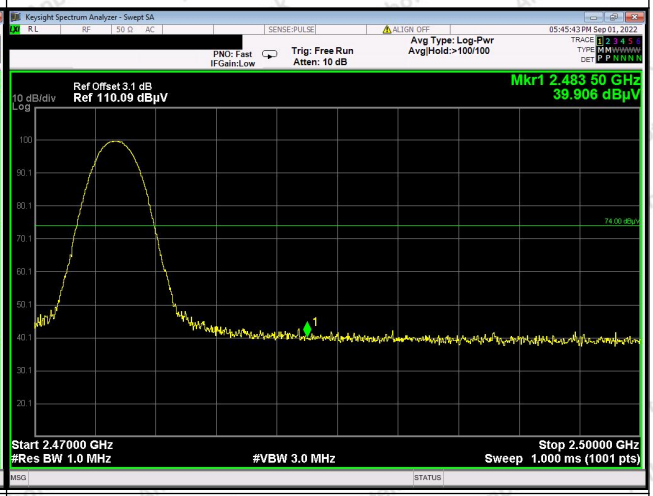
Average Value(Vertical)



Average Value(Horizontal)



Peak Value(Vertical)



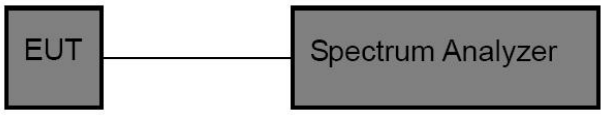
Peak Value(Horizontal)

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

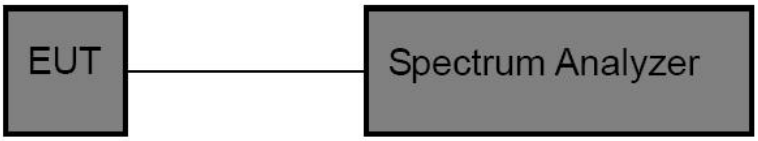
Please refer to Appendix C of the Appendix Test Data.

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

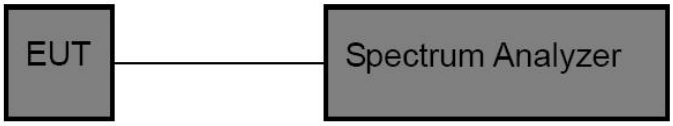
Please refer to Appendix A of the Appendix Test Data.

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

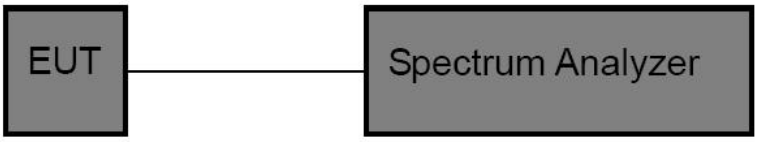
Please refer to Appendix D of the Appendix Test Data.

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

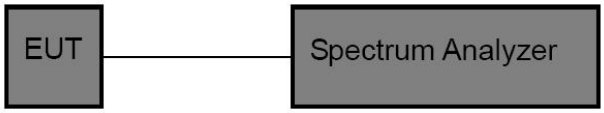
Please refer to Appendix F of the Appendix Test Data.

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 = max hold.
7. Allow trace to fully stabilize.

9.4. Test Data

Pass

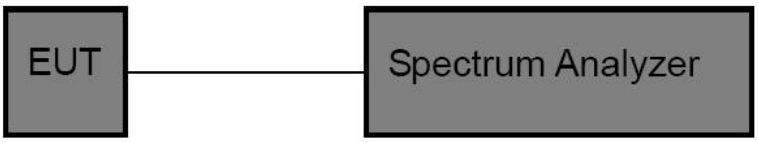
Please refer to Appendix E of the Appendix Test Data.

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 Monopole Antenna which permanently attached, and the best case gain of the antenna is 2.09dBi. 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 ----------