

FCC TEST REPORT

Client Name : Yawboard Limited

Address : 2 Sandrocks Lodge, Rocky Lane, Haywards Heath, West
Sussex, RH16 4RW, UK

Product Name : Electric Scooter

Date : Sept. 09, 2021

Shenzhen Anbotech Compliance Laboratory Limited



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TEST REPORT

Applicant : Yawboard Limited

Manufacturer : Shenzhen Jointech Electronics Co.,Ltd

Product Name : Electric Scooter

Model No. : Yawboard All-Terrain

Trade Mark :  YAWBOARD

Rating(s) : Input: DC 5V, 1A(with DC 3.7V, 800mAh battery inside)

Test Standard(s) : FCC Part15 Subpart C, Section 15.247

Test Method(s) : ANSI C63.10: 2020, KDB558074 D01 DTS Meas Guidance v05r02

The device described above is tested by Shenzhen Anbotech 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 Anbotech 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 Anbotech Compliance Laboratory Limited.

Date of Receipt

Jul. 26, 2021

Date of Test

Jun. 26~Aug. 30, 2021

Prepared By



(Ella Liang)

Approved & Authorized Signer



(Kingkong Jin)

1. General Information

1.1. Client Information

Applicant	:	Yawboard Limited
Address	:	2 Sandrocks Lodge, Rocky Lane, Haywards Heath, West Sussex, RH16 4RW, UK
Manufacturer	:	Shenzhen Jointech Electronics Co.,Ltd
Address	:	6/F, Building 2, Weijie Tech Park, Dalang Street, Longhua District, Shenzhen,Guangdong, China
Factory	:	Shenzhen Jointech Electronics Co.,Ltd
Address	:	6/F, Building 2, Weijie Tech Park, Dalang Street, Longhua District, Shenzhen,Guangdong, China

1.2. Description of Device (EUT)

Product Name	:	Electric Scooter	
Model No.	:	Yawboard All-Terrain	
Trade Mark	:	 YAWBOARD	
Test Power Supply	:	AC 120V, 60Hz for adapter / AC 240V, 60Hz for adapter DC 3.7V Battery inside	
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)	
Product Description	:	Operation Frequency:	2402~2481Hz
	:	Number of Channel:	74 Channels
	:	Modulation Type:	GFSK
	:	Antenna Type:	FPC Antenna
	:	Antenna Gain(Peak):	2 dBi

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

Adapter	:	M/N: A2023 Input: AC 100-240V 0.7A 50-60Hz USB1 Output: DC 5V 2.4A USB2 Output: DC 5V 2.4A
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1.4. Description of Test Modes

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description	
Mode 1	CH01	TX+ Charging Mode/TX Only
Mode 2	CH37	
Mode 3	CH74	

Note:

- (1) The measurements are performed at the highest, middle, lowest available channels.
- (2)The data rate was set in 1Mbps for radiated emission due to the highest RF output power.

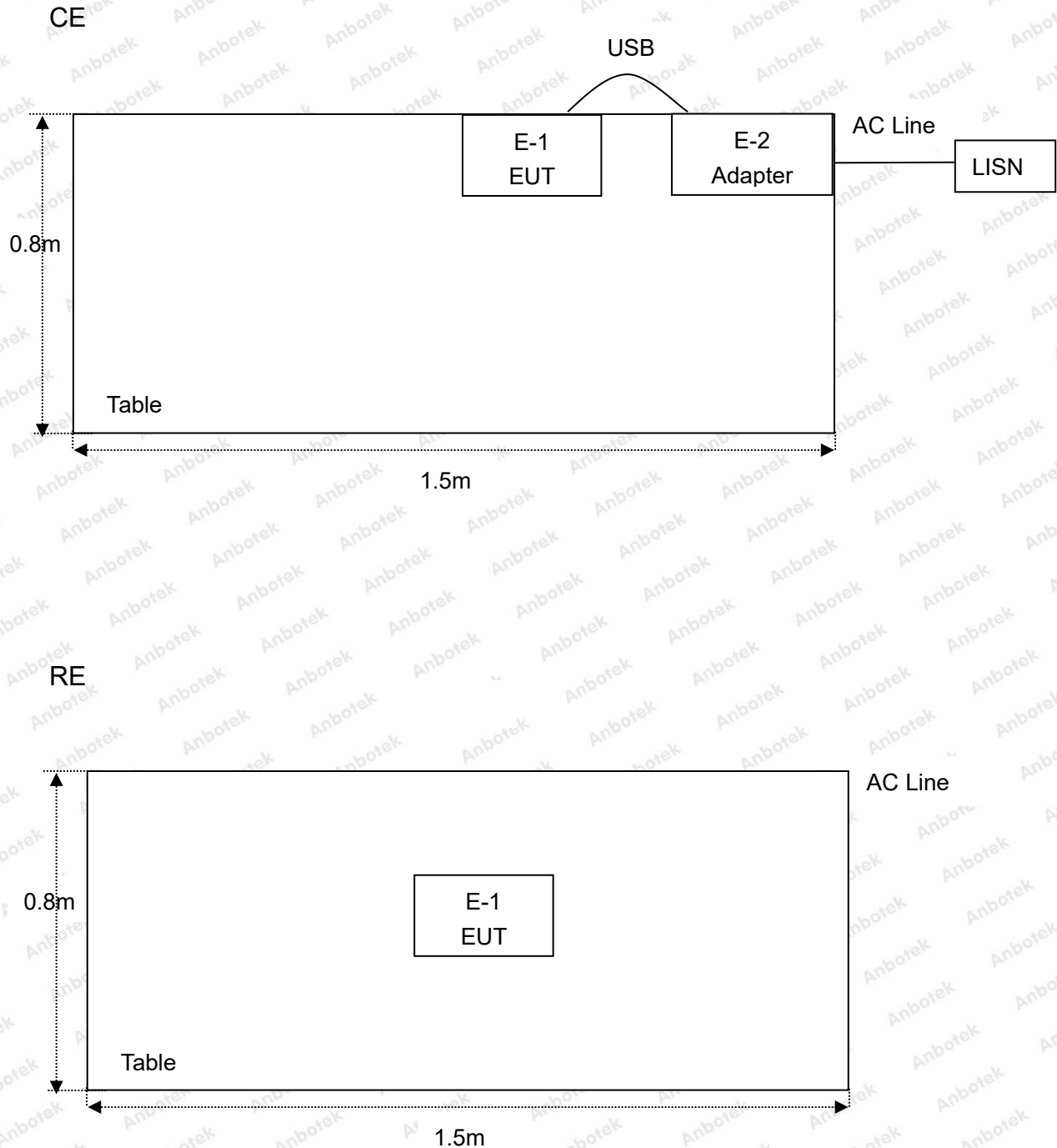
1.5. List of channels

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
01	2402	18	2421	35	2438	52	2457	69	2476
02	2403	19	2422	36	2439	53	2458	70	2477
03	2404	20	2423	37	2442	54	2459	71	2478
04	2405	21	2424	38	2443	55	2460	72	2479
05	2406	22	2425	39	2444	56	2463	73	2480
06	2407	23	2426	40	2445	57	2464	74	2481
07	2408	24	2427	41	2446	58	2465		
08	2409	25	2428	42	2447	59	2466		
09	2410	26	2429	43	2448	60	2467		
10	2411	27	2430	44	2449	61	2468		
11	2412	28	2431	45	2450	62	2469		
12	2413	29	2432	46	2451	63	2470		
13	2414	30	2433	47	2452	64	2471		
14	2415	31	2434	48	2453	65	2472		
15	2416	32	2435	49	2454	66	2473		
16	2417	33	2436	50	2455	67	2474		
17	2418	34	2437	51	2456	68	2475		

Note:

1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.
2. EUT built-in battery-powered, fully-charged battery use of the test battery.

1.6. Description Of Test Setup



1.7. 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. 26, 2020	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 26, 2020	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 26, 2020	1 Year
4.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 26, 2020	1 Year
5.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 26, 2020	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Oct. 26, 2020	1 Year
7.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 02, 2020	2 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 02, 2020	2 Year
9.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Nov. 02, 2020	2 Year
10.	Horn Antenna	A-INFO	LB-180400-K F	J211060628	Nov. 02, 2020	2 Year
11.	Pre-amplifier	SONOMA	310N	186860	Oct. 26, 2020	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. 26, 2020	1 Year
14.	Power Sensor	DAER	RPR3006W	15I00041SN045	Oct. 26, 2020	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN046	Oct. 26, 2020	1 Year
16.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 26, 2020	1 Year
17.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 26, 2020	1 Year
18.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 26, 2020	1 Year
19.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 26, 2020	1 Year
20.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80B	N/A	Oct. 26, 2020	1 Year

1.8. Measurement Uncertainty

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

1.9. Description of Test Facility

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

FCC-Registration No.: 184111

Shenzhen Anbotech 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, September 30, 2020.

ISED-Registration No.: 8058A

Shenzhen Anbotech 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, September 30, 2020.

Test Location

Shenzhen Anbotech 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

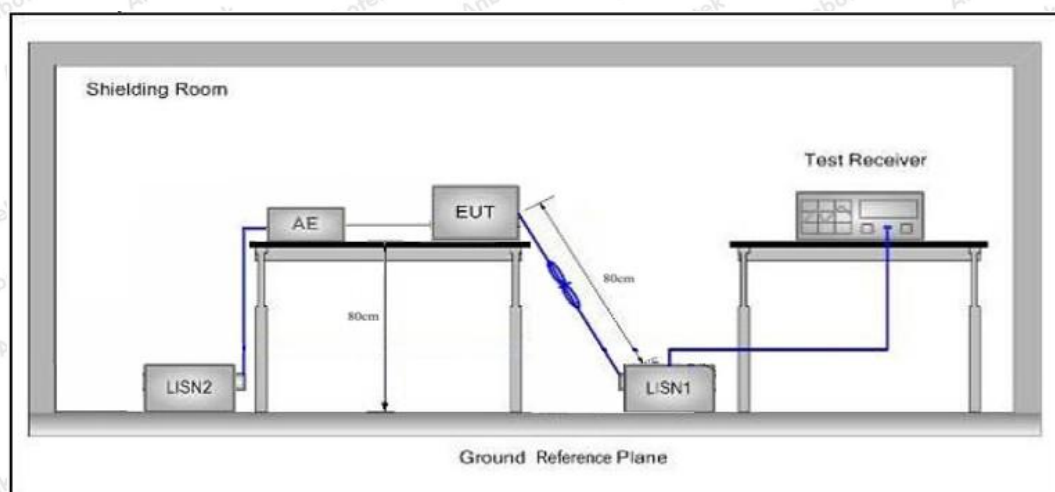
Standard Section	Test Item	Result
15.203/15.247(c)	Antenna Requirement	PASS
15.207	Conducted Emission	PASS
15.205/15.209	Spurious Emission	PASS
15.247(b)(3)	Conducted Peak Output Power	PASS
15.247(a)(2)	6dB Occupied Bandwidth	PASS
15.247(e)	Power Spectral Density	PASS
15.247(d)	Band Edge	PASS
Remark: "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.

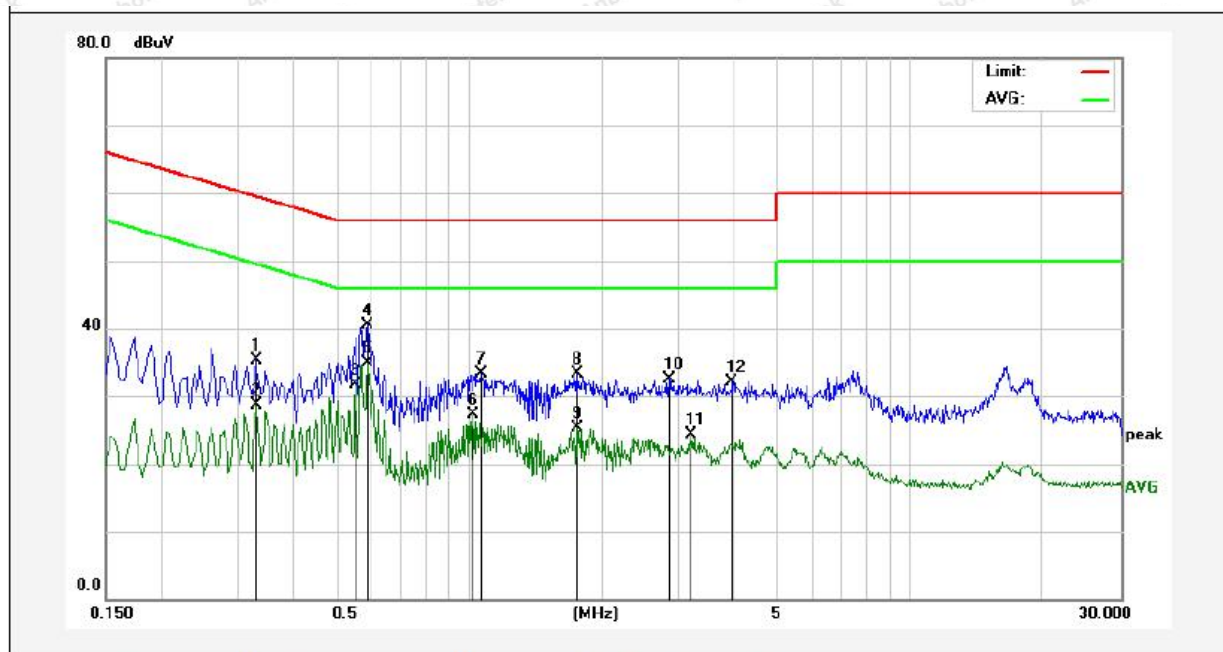
The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

During the test, pre-scan all modes, and found the “low CH” which is the worst case, only the worst case is recorded in the report.

Conducted Emission Test Data

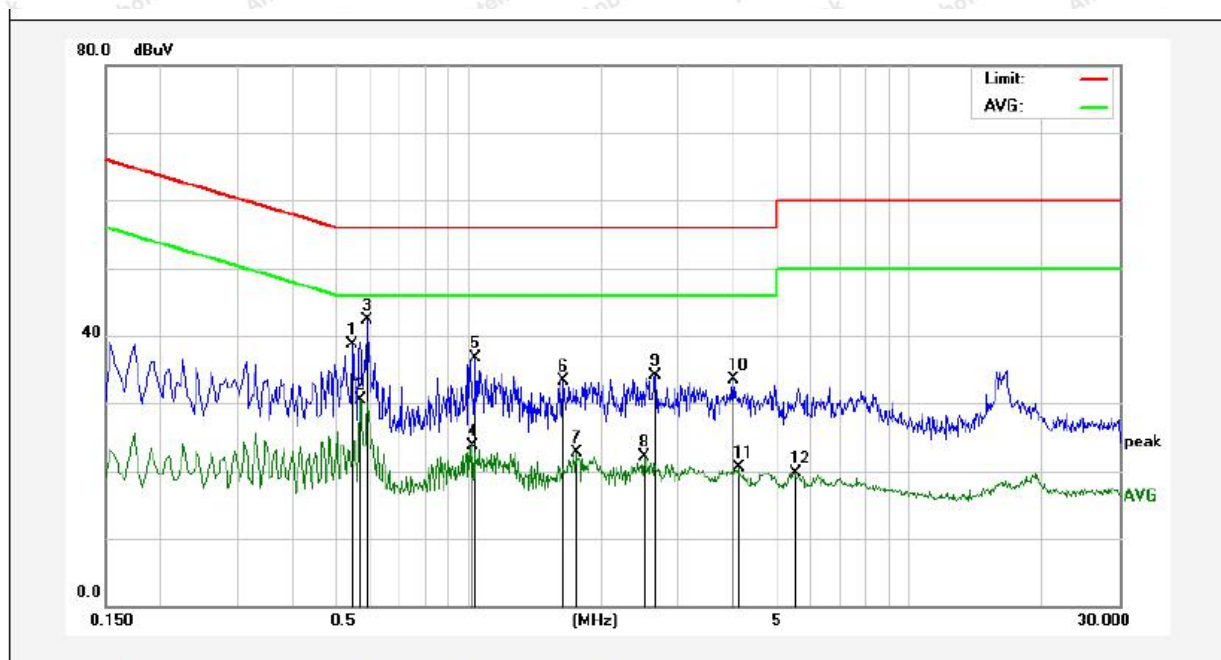
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 240V, 60Hz for adapter
Comment: Live Line
Tem.: 24.9°C Hum.: 48%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.3300	15.31	19.90	35.21	59.45	-24.24	QP	
2	0.3300	8.75	19.90	28.65	49.45	-20.80	AVG	
3	0.5540	11.75	20.00	31.75	46.00	-14.25	AVG	
4	0.5899	20.43	20.01	40.44	56.00	-15.56	QP	
5	0.5899	14.94	20.01	34.95	46.00	-11.05	AVG	
6	1.0220	7.21	20.12	27.33	46.00	-18.67	AVG	
7	1.0660	13.17	20.12	33.29	56.00	-22.71	QP	
8	1.7580	13.09	20.14	33.23	56.00	-22.77	QP	
9	1.7580	5.19	20.14	25.33	46.00	-20.67	AVG	
10	2.8540	12.44	20.16	32.60	56.00	-23.40	QP	
11	3.2060	4.18	20.16	24.34	46.00	-21.66	AVG	
12	3.9500	12.02	20.18	32.20	56.00	-23.80	QP	

Conducted Emission Test Data

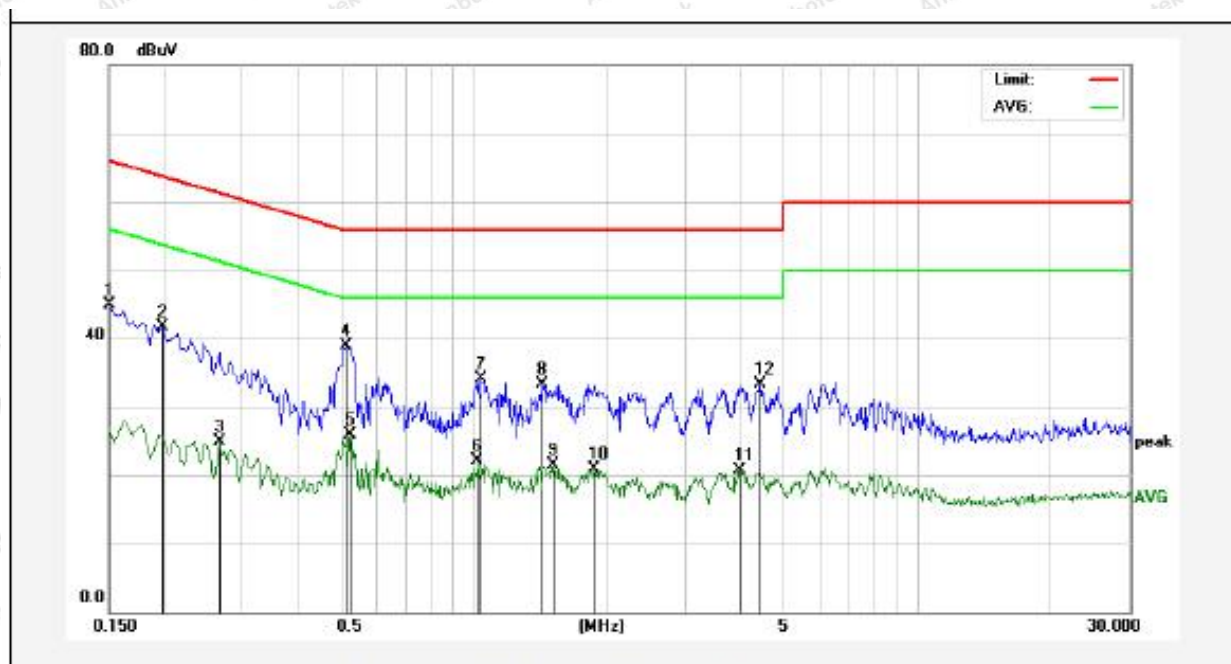
Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 240V, 60Hz for adapter
Comment: Neutral Line
Tem.: 24.9°C Hum.: 48%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.5460	18.63	19.99	38.62	56.00	-17.38	QP	
2	0.5700	10.52	20.00	30.52	46.00	-15.48	AVG	
3	0.5899	22.24	20.01	42.25	56.00	-13.75	QP	
4	1.0220	3.52	20.12	23.64	46.00	-22.36	AVG	
5	1.0420	16.54	20.12	36.66	56.00	-19.34	QP	
6	1.6380	13.10	20.13	33.23	56.00	-22.77	QP	
7	1.7540	2.49	20.14	22.63	46.00	-23.37	AVG	
8	2.5020	2.05	20.15	22.20	46.00	-23.80	AVG	
9	2.6580	14.00	20.15	34.15	56.00	-21.85	QP	
10	3.9860	13.35	20.18	33.53	56.00	-22.47	QP	
11	4.1060	0.27	20.18	20.45	46.00	-25.55	AVG	
12	5.4780	-0.61	20.22	19.61	50.00	-30.39	AVG	

Conducted Emission Test Data

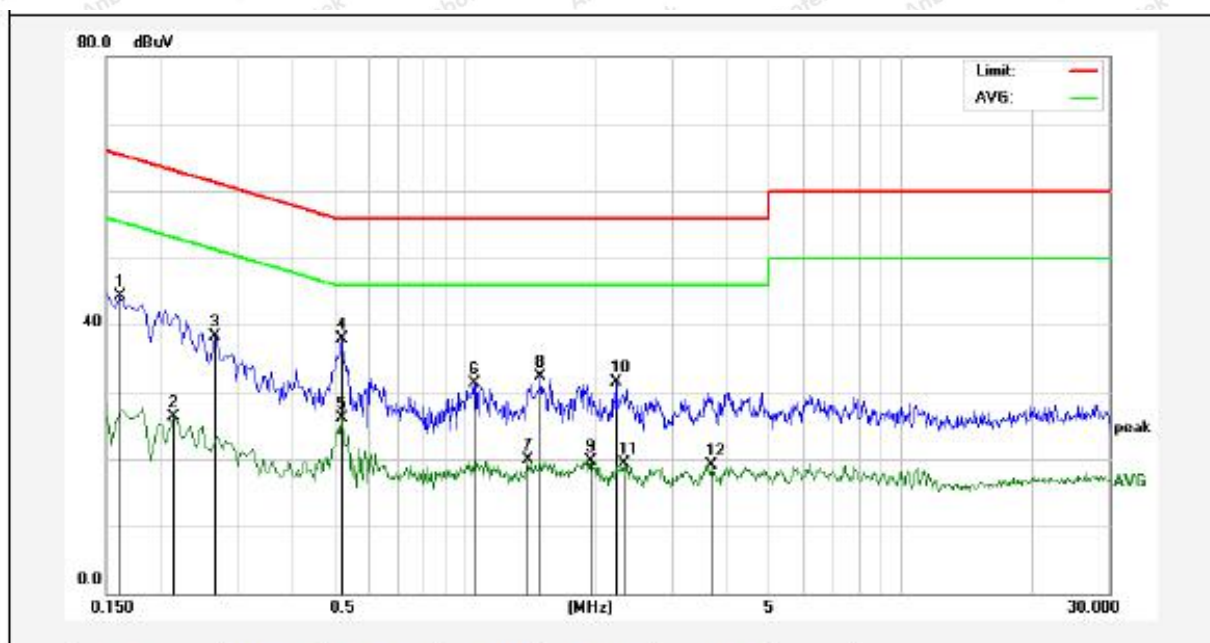
Test Site: 1# Shielded Room
 Operating Condition: Mode 1
 Test Specification: AC 120V, 60Hz for adapter
 Comment: Live Line
 Tem.: 24.9°C Hum.: 48%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1500	24.97	19.90	44.87	65.99	-21.12	QP	
2	0.1980	21.88	19.90	41.78	63.69	-21.91	QP	
3	0.2660	5.10	19.89	24.99	51.24	-26.25	AVG	
4	0.5180	18.99	19.99	38.98	56.00	-17.02	QP	
5	0.5260	5.82	19.99	25.81	46.00	-20.19	AVG	
6	1.0180	1.93	20.12	22.05	46.00	-23.95	AVG	
7	1.0420	13.98	20.12	34.10	56.00	-21.90	QP	
8	1.4299	13.13	20.13	33.26	56.00	-22.74	QP	
9	1.5060	1.44	20.13	21.57	46.00	-24.43	AVG	
10	1.8620	0.73	20.14	20.87	46.00	-25.13	AVG	
11	3.9780	0.48	20.18	20.66	46.00	-25.34	AVG	
12	4.4300	13.08	20.19	33.27	56.00	-22.73	QP	

Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: Mode 1
Test Specification: AC 120V, 60Hz for adapter
Comment: Neutral Line
Tem.: 24.9°C Hum.: 48%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1620	24.49	19.90	44.39	65.36	-20.97	QP	
2	0.2140	6.44	19.90	26.34	53.04	-26.70	AVG	
3	0.2660	18.37	19.89	38.26	61.24	-22.98	QP	
4	0.5220	17.83	19.99	37.82	56.00	-18.18	QP	
5	0.5220	6.04	19.99	26.03	46.00	-19.97	AVG	
6	1.0500	11.21	20.12	31.33	56.00	-24.67	QP	
7	1.3940	-0.14	20.13	19.99	46.00	-26.01	AVG	
8	1.4940	12.23	20.13	32.36	56.00	-23.64	QP	
9	1.9460	-0.43	20.14	19.71	46.00	-26.29	AVG	
10	2.2139	11.35	20.14	31.49	56.00	-24.51	QP	
11	2.3220	-0.89	20.15	19.26	46.00	-26.74	AVG	
12	3.6620	-1.00	20.17	19.17	46.00	-26.83	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

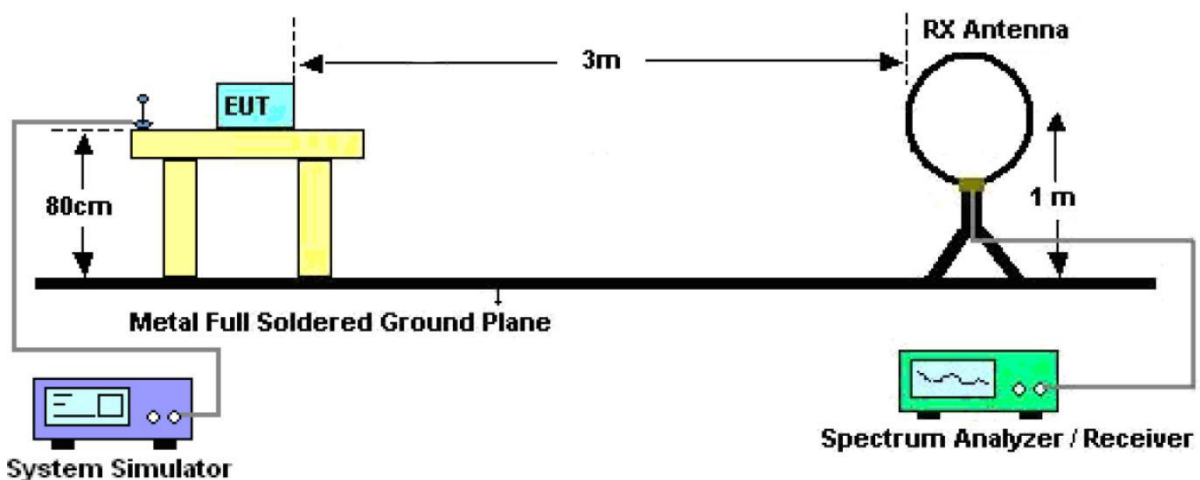


Figure 1. Below 30MHz

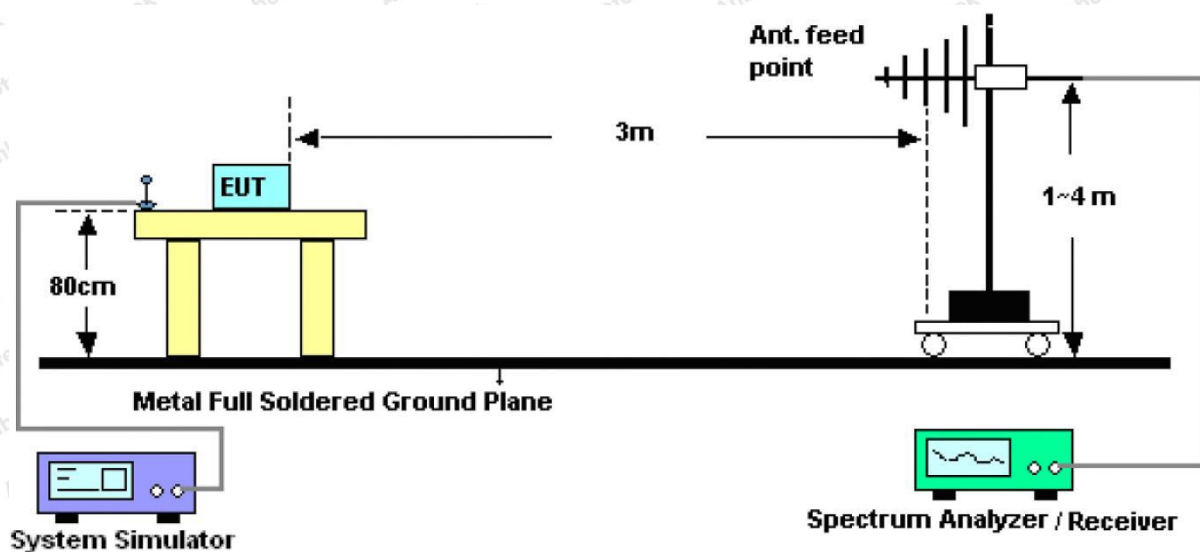


Figure 2. 30MHz to 1GHz

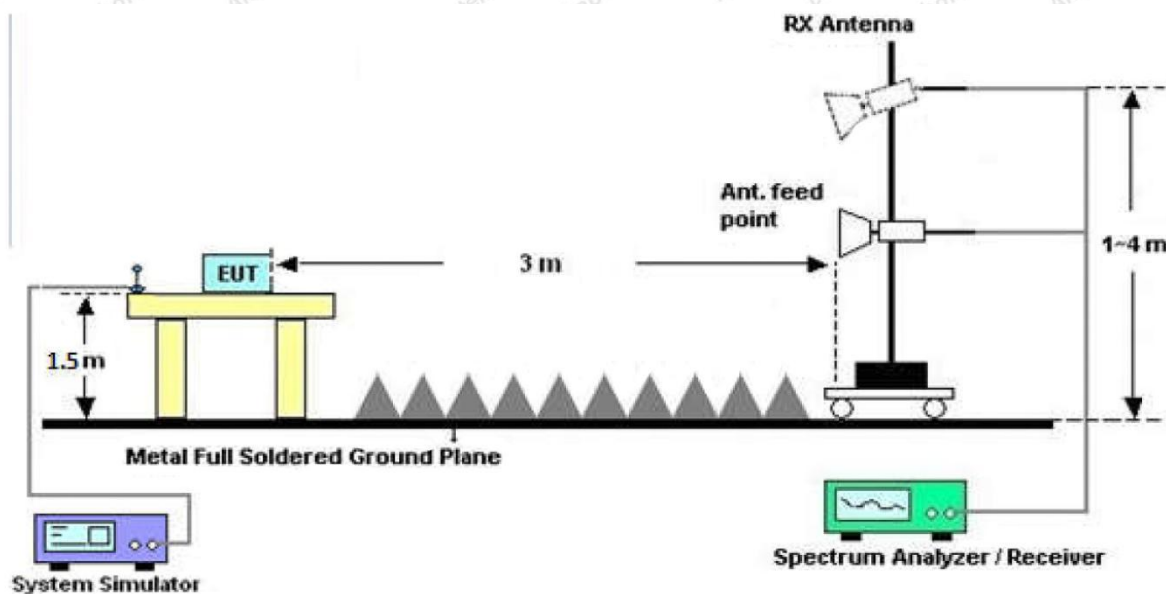


Figure 3. Above 1 GHz

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 = 100kHz, 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.

RBW = 1MHz, VBW = 10Hz, Detector= Average, Trace mode= Max hold, Sweep- auto couple.

4.4. Test Data

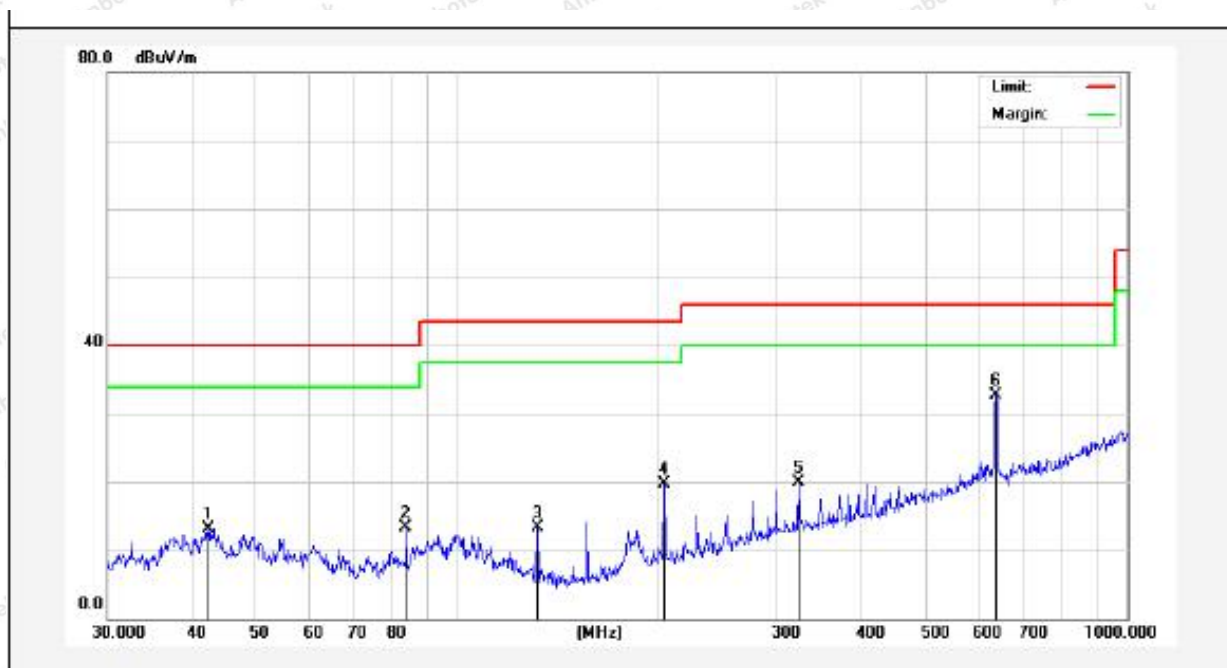
PASS

During the test, pre-scan all the modes, and found the low channel (TX) which is the worst case, only the worst case is recorded in the report.

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

Test Results (30~1000MHz)

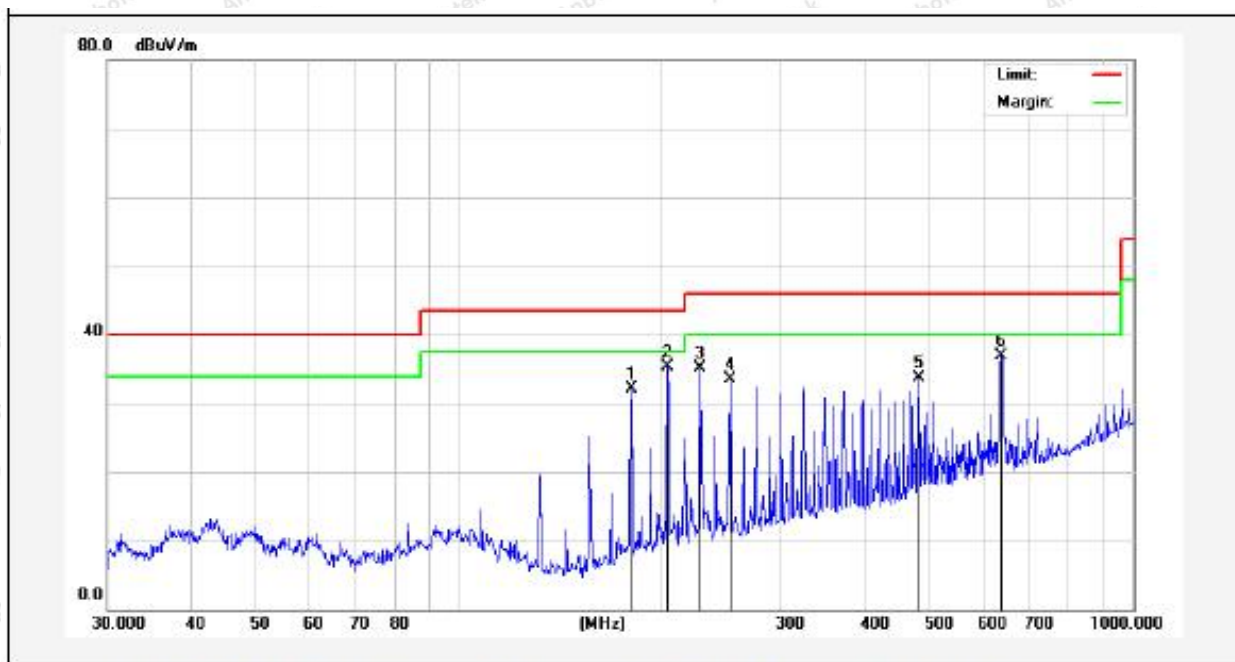
Test Mode: Mode 1
Power Source: DC 3.7V Battery inside
Polarization: Vertical
Temp.(°C)/Hum.(%RH): 24.9°C/45%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	42.4508	26.98	-13.84	13.14	40.00	-26.86	peak			
2	83.8156	30.24	-17.03	13.21	40.00	-26.79	peak			
3	131.7577	32.75	-19.51	13.24	43.50	-30.26	peak			
4	203.5228	36.68	-17.06	19.62	43.50	-23.88	peak			
5	323.3204	32.56	-12.74	19.82	46.00	-26.18	peak			
6	636.1340	39.46	-6.80	32.66	46.00	-13.34	peak			

Test Results (30~1000MHz)

Test Mode: Mode 1
Power Source: DC 3.7V Battery inside
Polarization: Horizontal
Temp.(°C)/Hum.(%RH): 24.9°C/45%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	180.0165	52.84	-20.83	32.01	43.50	-11.49	peak			
2	203.5228	55.09	-19.79	35.30	43.50	-8.20	peak			
3	227.6906	54.38	-19.30	35.08	46.00	-10.92	peak			
4	252.0627	52.10	-18.65	33.45	46.00	-12.55	peak			
5	480.5276	44.53	-10.85	33.68	46.00	-12.32	peak			
6	636.1340	43.75	-6.80	36.95	46.00	-9.05	peak			

Test Results (1GHz-25GHz)

Test Mode: CH01					Test channel: Lowest			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4804.00	38.17	34.04	6.58	34.09	44.70	74.00	-29.30	V
7206.00	32.40	37.11	7.73	34.50	42.74	74.00	-31.26	V
9608.00	31.98	39.31	9.23	34.79	45.73	74.00	-28.27	V
12010.00	*					74.00		V
14412.00	*					74.00		V
4804.00	42.63	34.04	6.58	34.09	49.16	74.00	-24.84	H
7206.00	34.24	37.11	7.73	34.50	44.58	74.00	-29.42	H
9608.00	31.48	39.31	9.23	34.79	45.23	74.00	-28.77	H
12010.00	*					74.00		H
14412.00	*					74.00		H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4804.00	26.82	34.04	6.58	34.09	33.35	54.00	-20.65	V
7206.00	20.99	37.11	7.73	34.50	31.33	54.00	-22.67	V
9608.00	20.02	39.31	9.23	34.79	33.77	54.00	-20.23	V
12010.00	*					54.00		V
14412.00	*					54.00		V
4804.00	31.15	34.04	6.58	34.09	37.68	54.00	-16.32	H
7206.00	23.22	37.11	7.73	34.50	33.56	54.00	-20.44	H
9608.00	19.82	39.31	9.23	34.79	33.57	54.00	-20.43	H
12010.00	*					54.00		H
14412.00	*					54.00		H

Test Results (1GHz-25GHz)

Test Mode: CH37					Test channel: Middle			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4884.00	36.90	34.38	6.69	34.09	43.88	74.00	-30.12	V
7326.00	31.56	37.22	7.78	34.53	42.03	74.00	-31.97	V
9768.00	31.23	39.46	9.35	34.80	45.24	74.00	-28.76	V
12210.00	*					74.00		V
14652.00	*					74.00		V
4884.00	41.10	34.38	6.69	34.09	48.08	74.00	-25.92	H
7326.00	33.28	37.22	7.78	34.53	43.75	74.00	-30.25	H
9768.00	30.61	39.46	9.35	34.80	44.62	74.00	-29.38	H
12210.00	*					74.00		H
14652.00	*					74.00		H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4884.00	25.80	34.38	6.69	34.09	32.78	54.00	-17.69	V
7326.00	20.30	37.22	7.78	34.53	30.77	54.00	-20.84	V
9768.00	19.40	39.46	9.35	34.80	33.41	54.00	-18.47	V
12210.00	*					54.00		V
14652.00	*					54.00		V
4884.00	29.98	34.38	6.69	34.09	36.96	54.00	-13.03	H
7326.00	22.45	37.22	7.78	34.53	32.92	54.00	-18.40	H
9768.00	19.10	39.46	9.35	34.80	33.11	54.00	-18.41	H
12210.00	*					54.00		H
14652.00	*					54.00		H

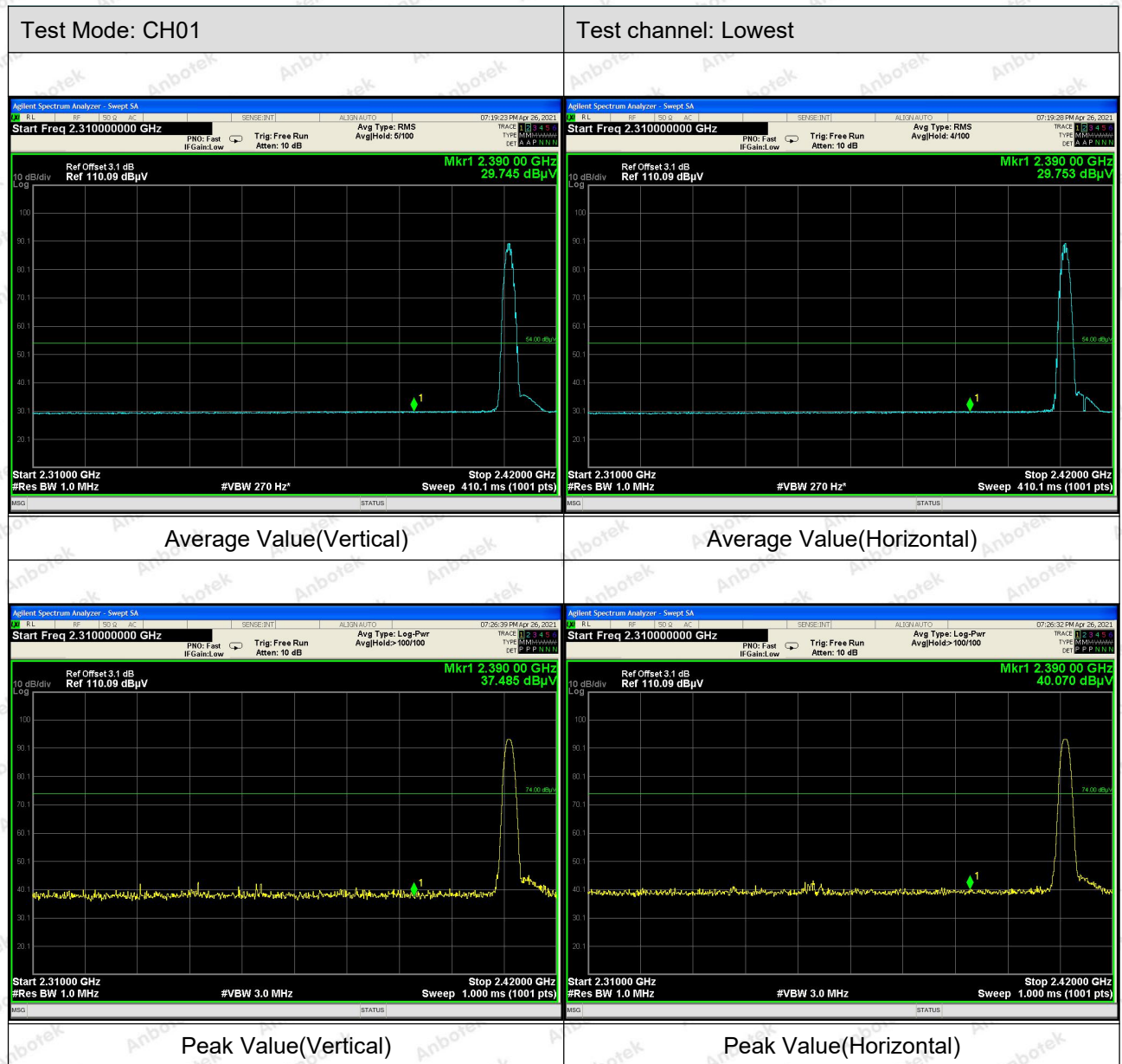
Test Results (1GHz-25GHz)

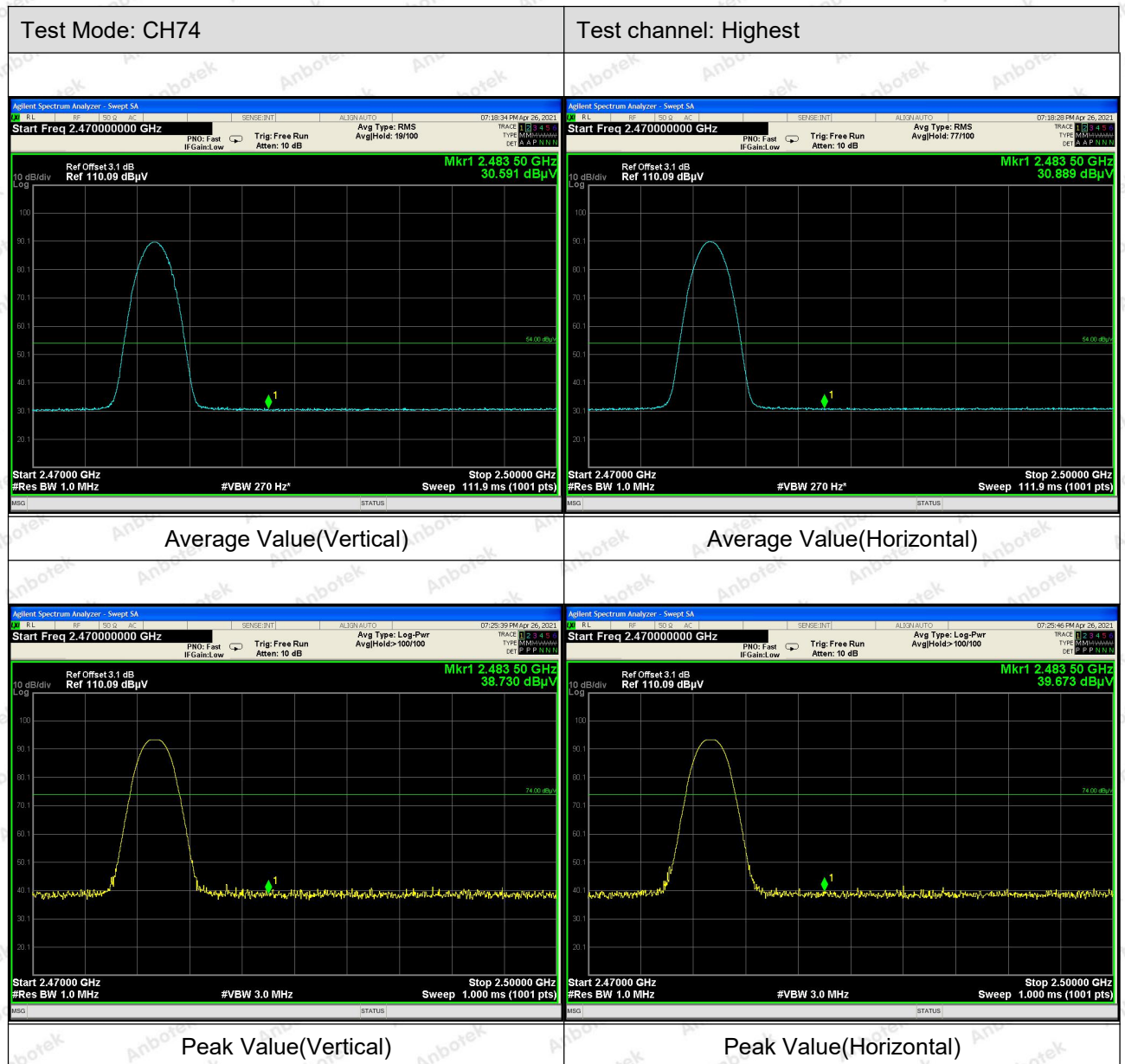
Test Mode: CH74					Test channel: Highest			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4962.00	36.51	34.72	6.79	34.09	43.93	74.00	-30.07	V
7443.00	31.31	37.34	7.82	34.57	41.90	74.00	-32.10	V
9924.00	31.00	39.62	9.46	34.81	45.27	74.00	-28.73	V
12405.00	*					74.00		V
14886.00	*					74.00		V
4962.00	40.64	34.72	6.79	34.09	48.06	74.00	-25.94	H
7443.00	32.99	37.34	7.82	34.57	43.58	74.00	-30.42	H
9924.00	30.35	39.62	9.46	34.81	44.62	74.00	-29.38	H
12405.00	*					74.00		H
14886.00	*					74.00		H
Average Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
4962.00	25.54	34.72	6.79	34.09	32.96	54.00	-21.04	V
7443.00	20.12	37.34	7.82	34.57	30.71	54.00	-23.29	V
9924.00	19.25	39.62	9.46	34.81	33.52	54.00	-20.48	V
12405.00	*					54.00		V
14886.00	*					54.00		V
4962.00	29.69	34.72	6.79	34.09	37.11	54.00	-16.89	H
7443.00	22.25	37.34	7.82	34.57	32.84	54.00	-21.16	H
9924.00	18.92	39.62	9.46	34.81	33.19	54.00	-20.81	H
12405.00	*					54.00		H
14886.00	*					54.00		H

Remark:

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



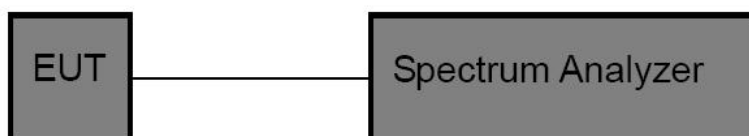


5. Maximum Peak Output Power Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (b)(3)
Test Limit	30dBm

5.2. Test Setup



5.3. Test Procedure

This procedure shall be used when the measurement instrument has available a resolution bandwidth that is greater than the DTS bandwidth.

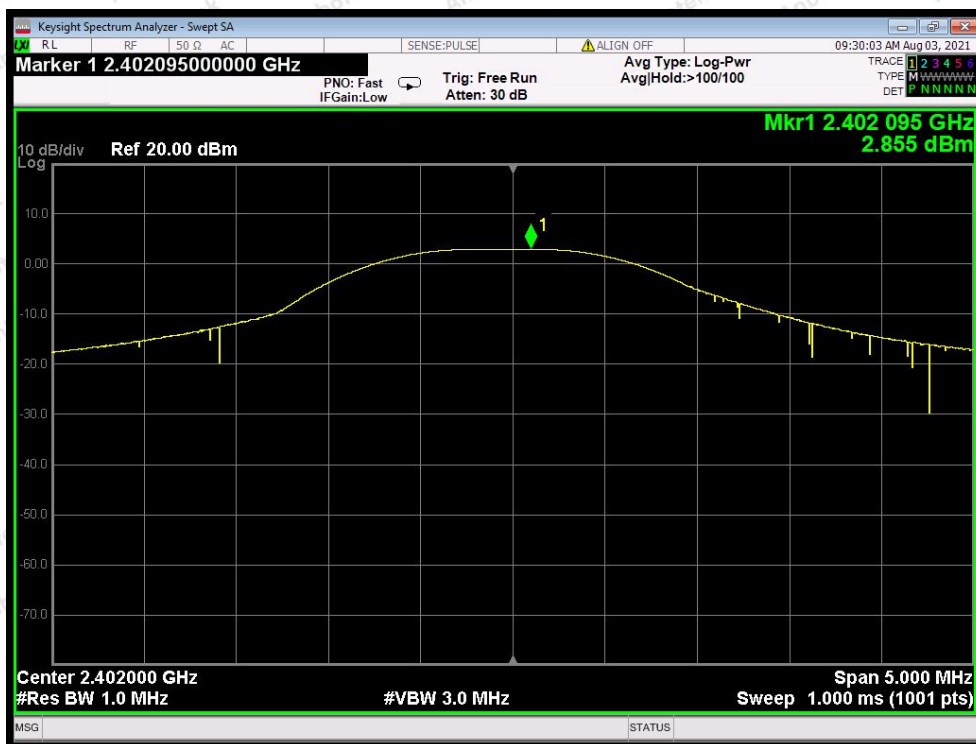
1. Set the RBW $\geq$ DTS bandwidth.
2. Set the VBW $\geq 3 \times$ RBW.
3. Set the span $\geq 3 \times$ RBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use peak marker function to determine the peak amplitude level.

5.4. Test Data

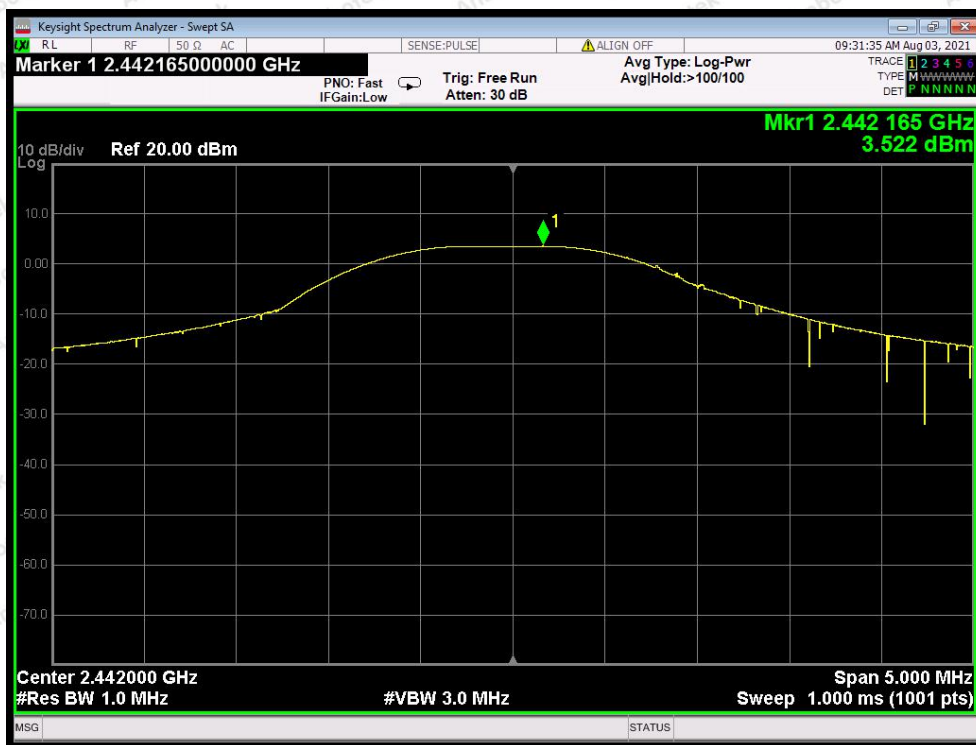
Test Item	:	Max. peak output power
Test Voltage	:	AC 230V, 60Hz for Adapter
Test Result	:	PASS

Test Mode	:	CH Low ~ CH High
Temperature	:	25°C
Humidity	:	55%RH

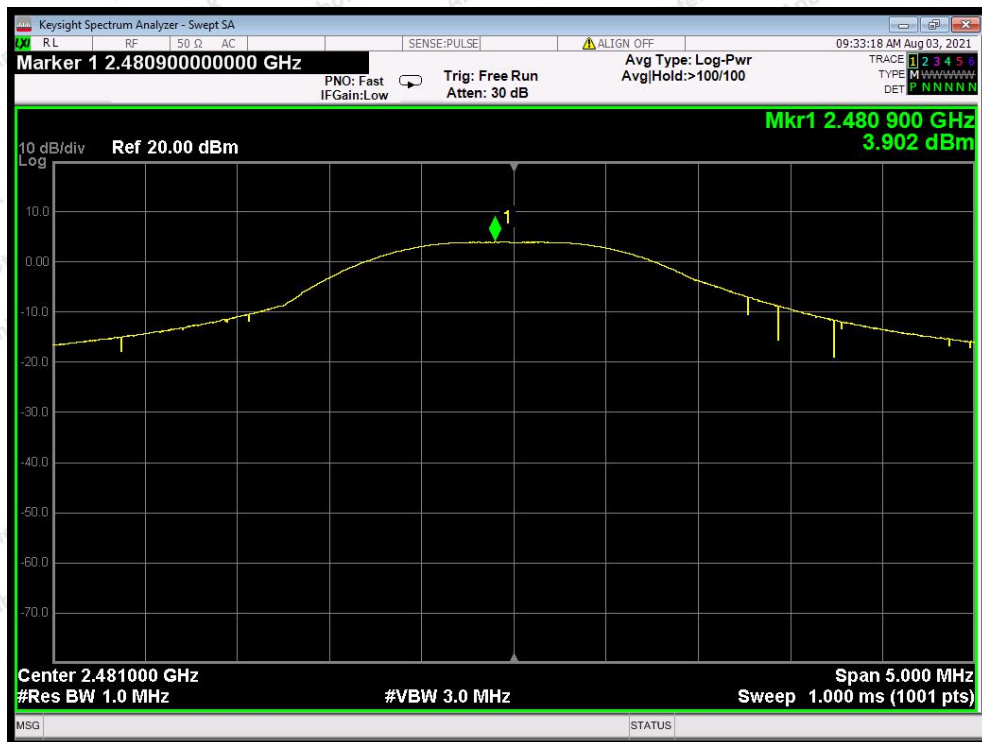
Channel Frequency (MHz)	Peak Power output (dBm)	Limit (dBm)	Results
2402	2.855	30	PASS
2442	3.522	30	PASS
2481	3.902	30	PASS



CH: Low



CH: Middle



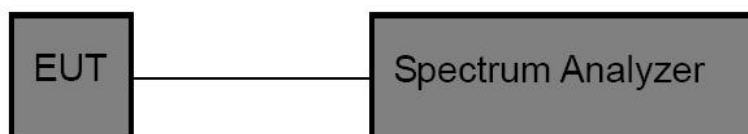
CH: High

6. 6DB Occupy Bandwidth Test

6.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (a)(2)
Test Limit	>500kHz

6.2. Test Setup



6.3. Test Procedure

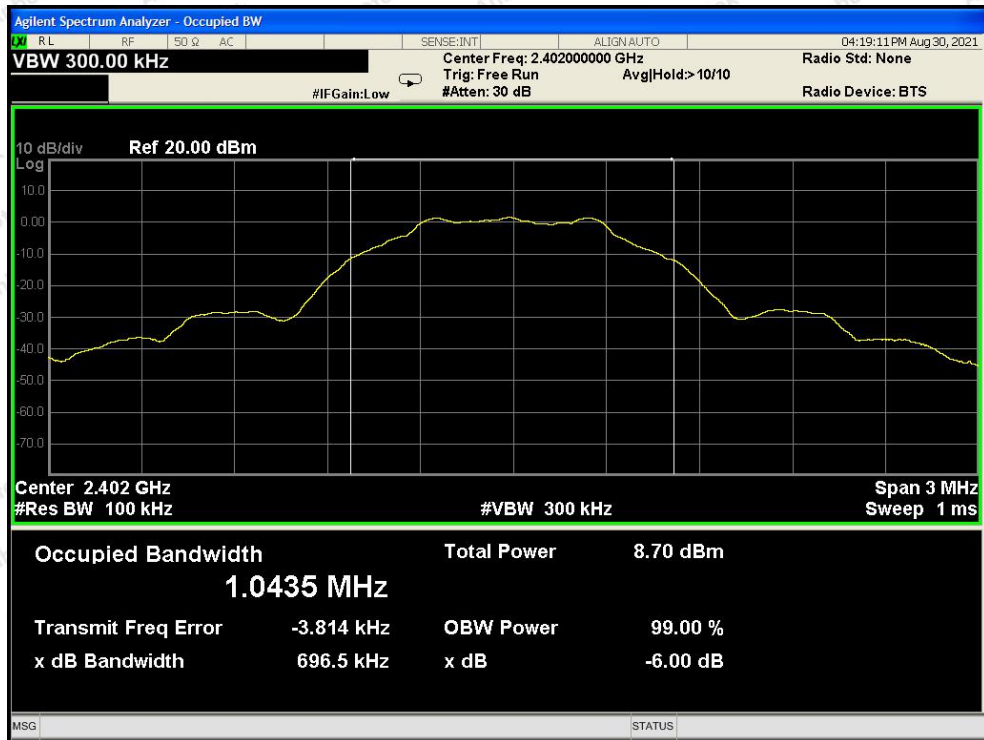
1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:
 RBW = 100kHz, VBW $\geq$ 3*RBW =300kHz,
 Detector= Peak
 Trace mode= Max hold.
 Sweep- auto couple.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

6.4. Test Data

Test Item : 6dB Bandwidth
 Test Voltage : DC 3.7V Battery inside
 Test Result : PASS

Test Mode : CH Low ~ CH High
 Temperature : 25℃
 Humidity : 55%RH

Channel	Frequency(MHz)	Bandwidth (kHz)	Limit (kHz)	Results
Low	2402	696.5	>500	PASS
Middle	2442	688.9		PASS
High	2481	691.8		PASS



CH: Low



CH: Middle



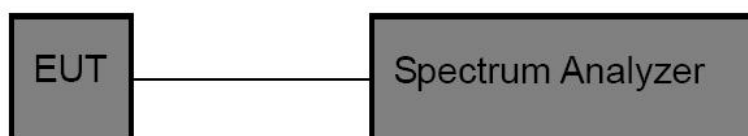
CH: High

7. Power Spectral Density Test

7.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.247 (e)
Test Limit	8dBm/3KHz

7.2. Test Setup



7.3. Test Procedure

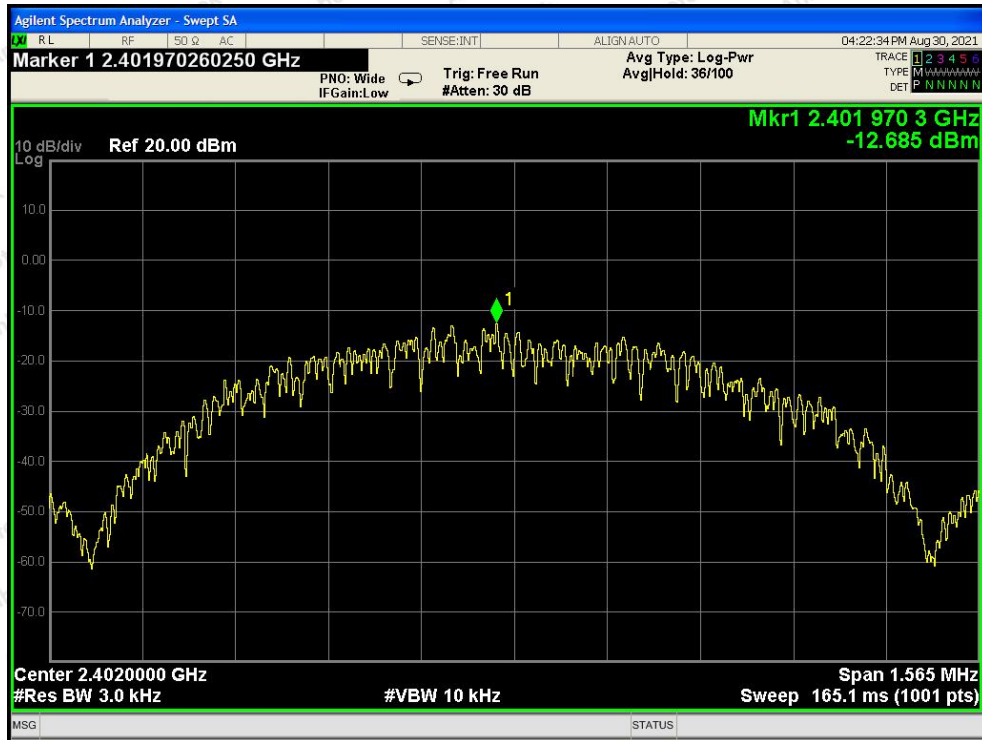
1. Place the EUT on the table and set it in transmitting mode. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
2. Set the spectrum analyzer as RBW = 3kHz, VBW = 10kHz, Span = 1.5xDTSS BW
3. Record the max. reading.
4. Repeat the above procedure until the measurements for all frequencies are completed.

7.4. Test Data

Test Item	: Power Spectral Density
Test Voltage	: DC 3.7V Battery inside
Test Result	: PASS

Test Mode	: CH Low ~ CH High
Temperature	: 25℃
Humidity	: 55%RH

Channel	Frequency (MHz)	PSD (dBm/3KHz)	Limit (dBm/3KHz)	Results
Low	2402	-12.685	8.00	PASS
Middle	2442	-15.353	8.00	PASS
High	2481	-13.768	8.00	PASS





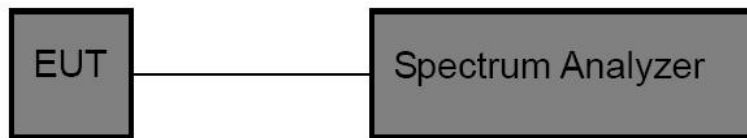
CH: High

8. 100kHz Bandwidth of Frequency Band Edge Requirement

8.1. 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 is 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 in15.209(a).

8.2. Test Setup



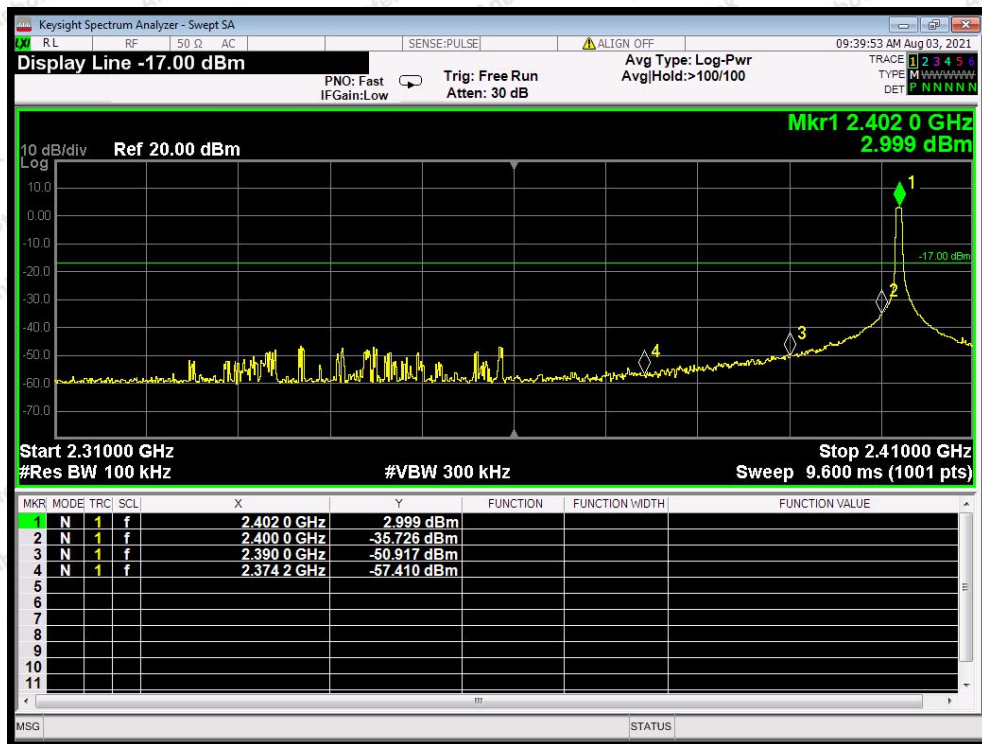
8.3. Test Procedure

Using the following spectrum analyzer setting:

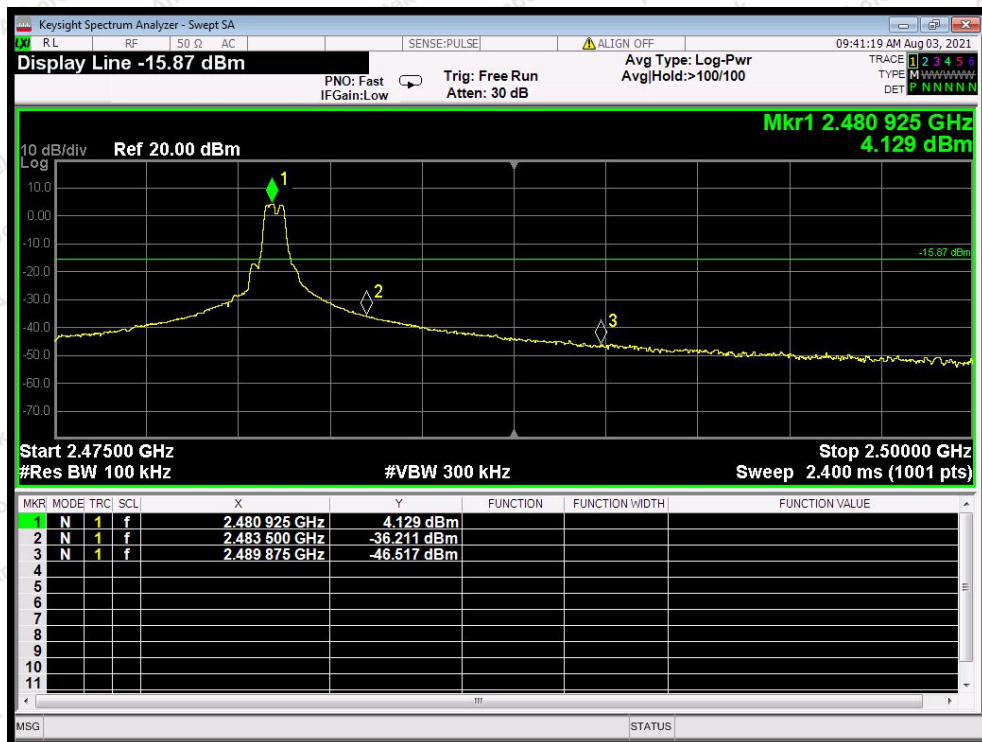
1. Set the RBW = 100KHz.
2. Set the VBW = 300KHz.
3. Sweep time = auto couple.
4. Detector function = peak.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.

8.4. Test Data

Test Item	: Band edge	Test Mode	: CH Low ~ CH High
Test Voltage	: DC 3.7V Battery inside	Temperature	: 25℃
Test Result	: PASS	Humidity	: 55%RH

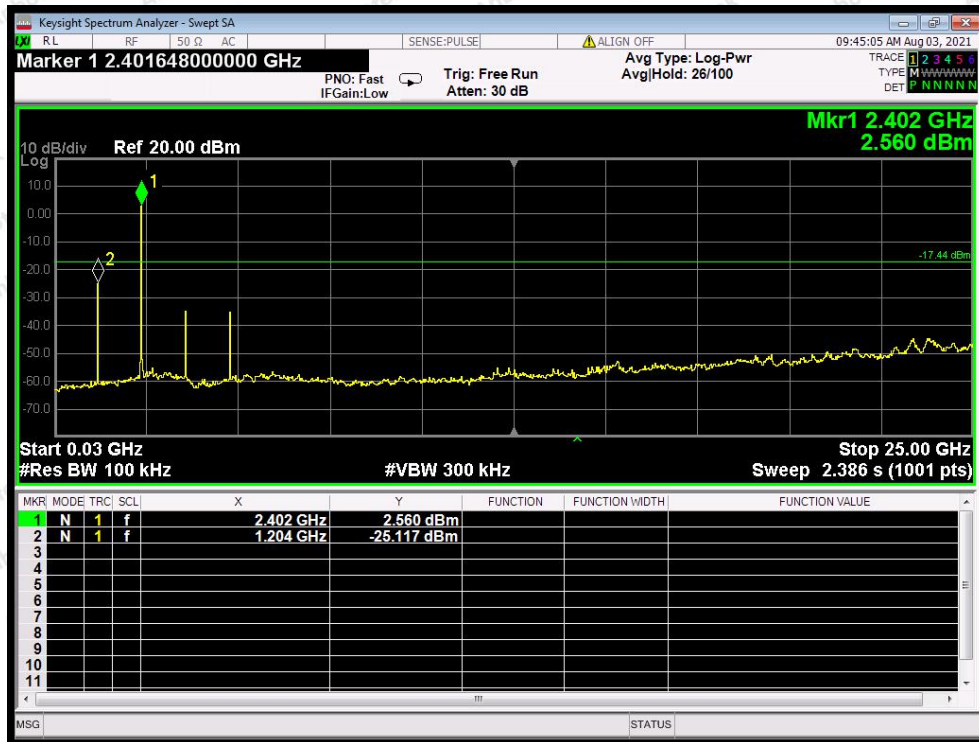


CH: Low

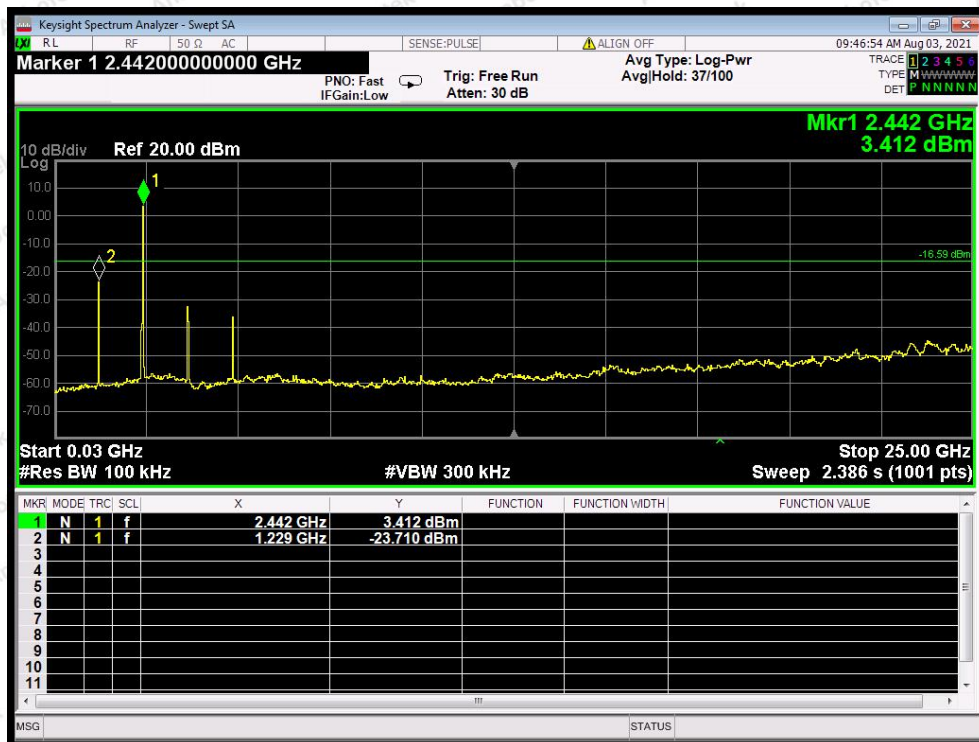


CH: High

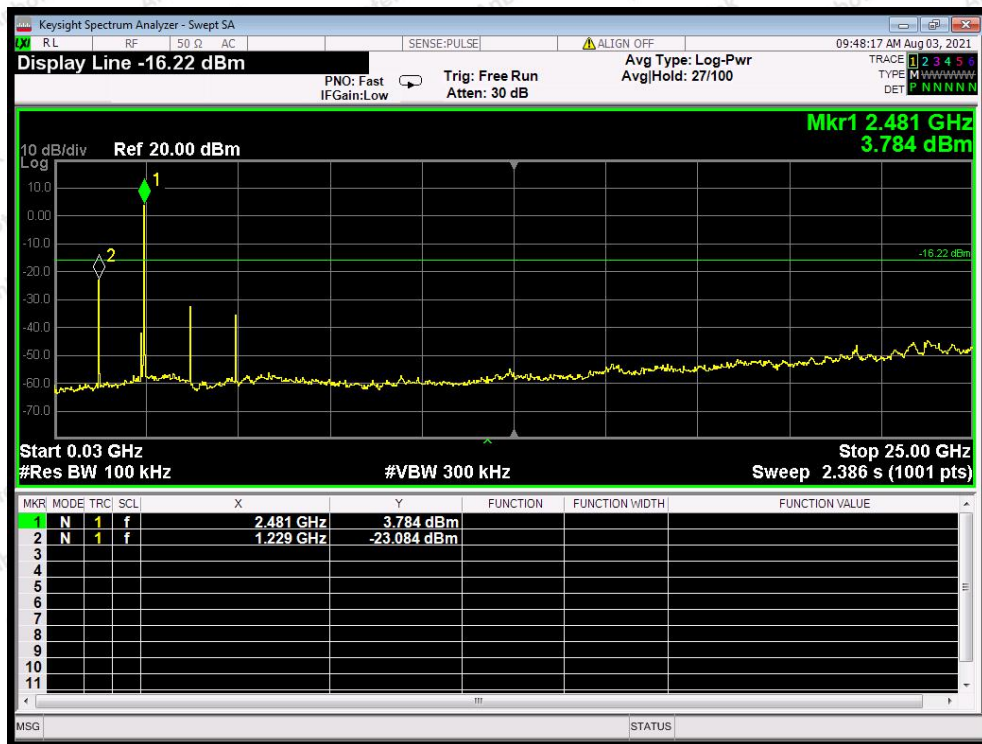
Conducted Emission Method



CH: Low



CH: Middle



CH: High

9. Antenna Requirement

9.1. 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.

9.2. Antenna Connected Construction

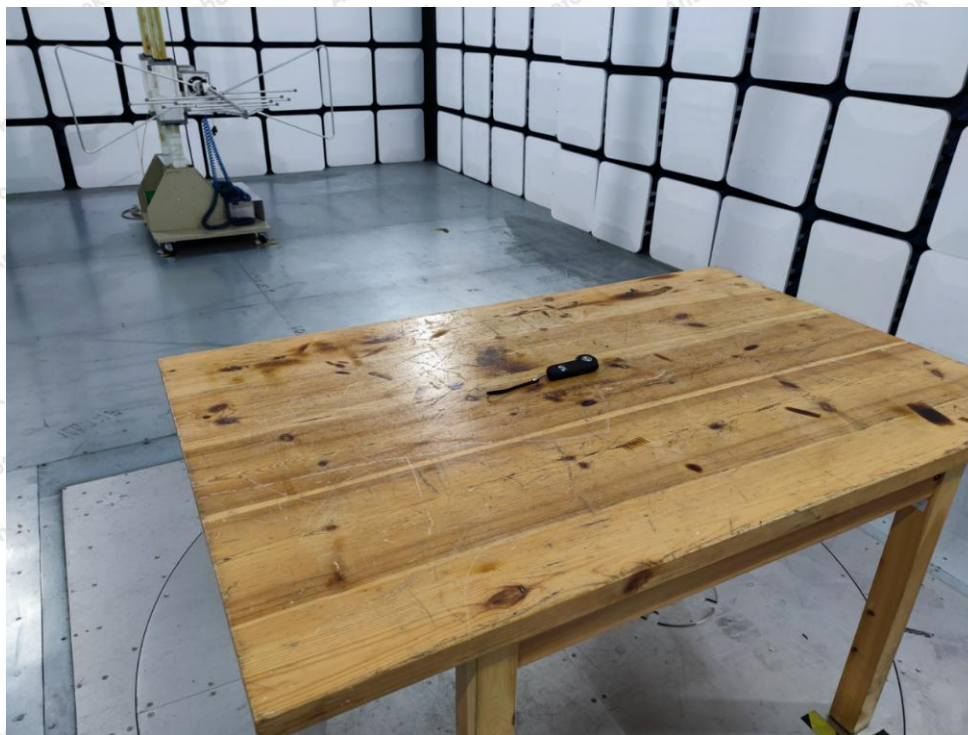
The antenna is a FPC antenna which permanently attached, and the best case gain of the antenna is 2 dBi . It complies with the standard requirement.

APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Conducted Emission Measurement



Photo of Radiation Emission Test





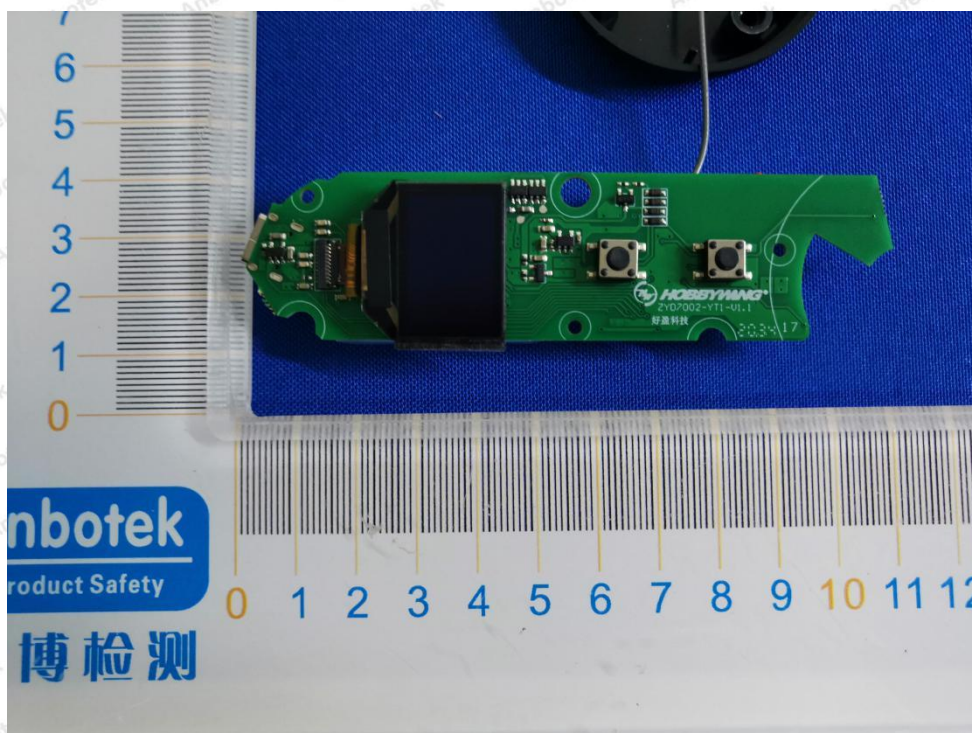
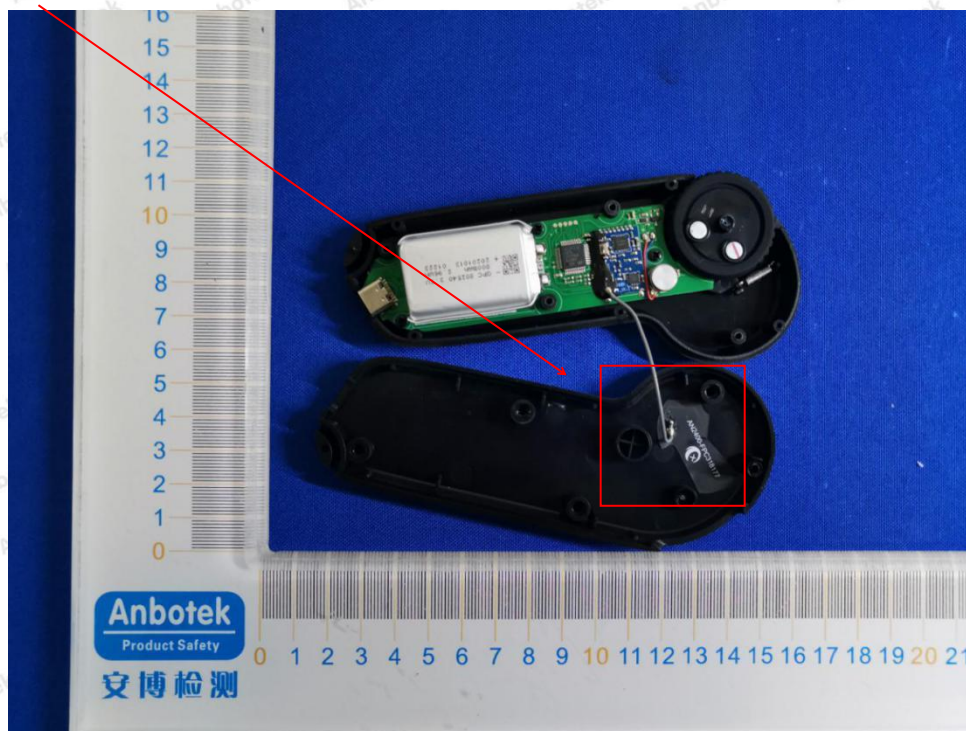
APPENDIX II -- EXTERNAL PHOTOGRAPH

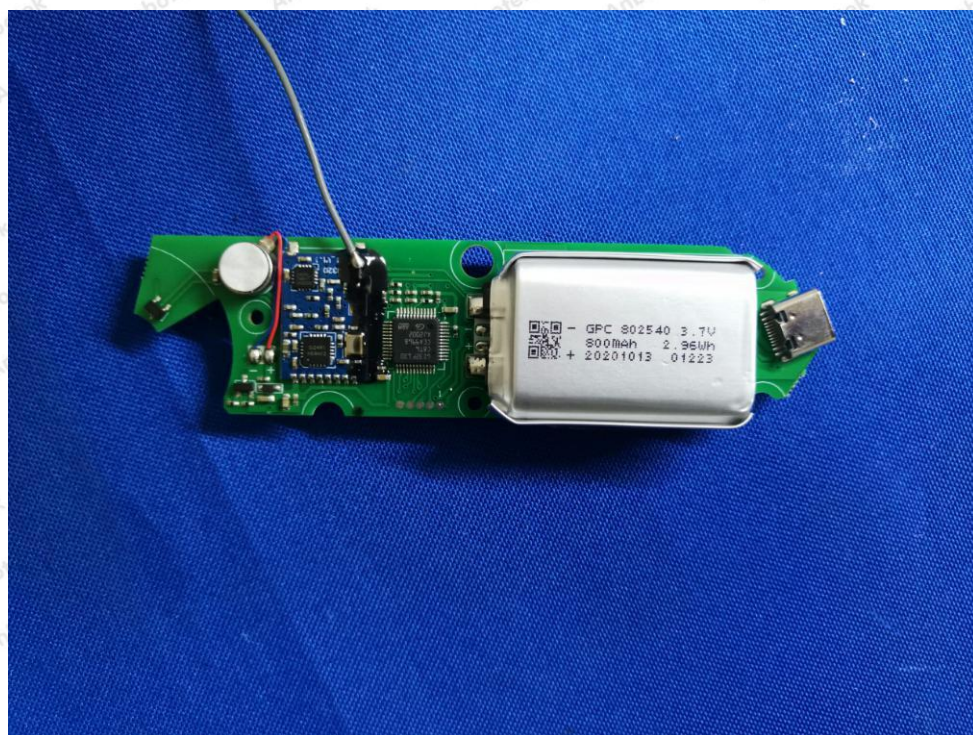


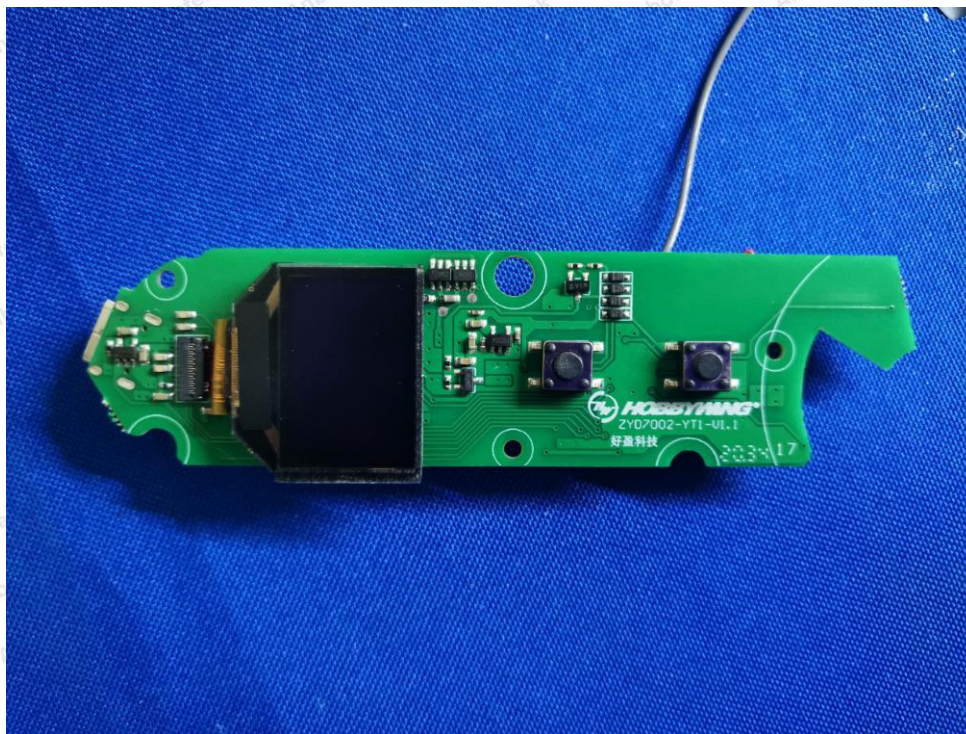


APPENDIX III -- INTERNAL PHOTOGRAPH

ANT







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