

FCC TEST REPORT

Client Name : Jiangsu JWT Electronics Shares CO.,Ltd

Address : 12, Luen Fat Industrial Park, 199 Tong Yuan Road,
Suzhou Industrial Park, Suzhou, China

Product Name : 2.4G Transceiver module

Date : Oct. 19, 2021

Shenzhen Anbotech Compliance Laboratory Limited



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TEST REPORT

Applicant : Jiangsu JWT Electronics Shares CO.,Ltd
Manufacturer : Jiangsu JWT Electronics Shares CO.,Ltd
Product Name : 2.4G Transceiver module
Model No. : JRF201103-1_V1.1
Trade Mark : N.A.
Rating(s) : DC 3.3V

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

Sept. 22, 2021

Date of Test

Sept. 22~Oct. 13, 2021

Prepared By



(Ella Liang)

Approved & Authorized Signer



(Kingkong Jin)

1. General Information

1.1. Client Information

Applicant	:	Jiangsu JWT Electronics Shares CO.,Ltd
Address	:	12, Luen Fat Industrial Park, 199 Tong Yuan Road, Suzhou Industrial Park, Suzhou, China
Manufacturer	:	Jiangsu JWT Electronics Shares CO.,Ltd
Address	:	12, Luen Fat Industrial Park, 199 Tong Yuan Road, Suzhou Industrial Park, Suzhou, China
Factory	:	Jiangsu JWT Electronics Shares CO.,Ltd
Address	:	12, Luen Fat Industrial Park, 199 Tong Yuan Road, Suzhou Industrial Park, Suzhou, China

1.2. Description of Device (EUT)

Product Name	:	2.4G Transceiver module	
Model No.	:	JRF201103-1_V1.1	
Trade Mark	:	N.A.	
Test Power Supply	:	DC 3.3V by Debug board	
Test Sample No.	:	1-2-1(Normal Sample), 1-2-2(Engineering Sample)	
Product Description	:	Operation Frequency:	2402~2480MHz
	:	Number of Channel:	79 Channels
	:	Modulation Type:	GFSK
	:	Antenna Type:	PCB Antenna
	:	Antenna Gain(Peak):	1.96 dBi(Provided by customer)
	:	Adapter:	N.A.

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

MacBook Air	:	Model: A1466 Input: 14.85V/3.05A CMIIT ID:C02HXB48DRVC
Adapter	:	Input: AC 100-240V, 1A, 50-60Hz Output: 14.85V/3.05A
Debug board	:	Manufacturer: Jiangsu JWT Electronics Shares CO.,Ltd.

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	CH00	TX Only
Mode 2	CH39	
Mode 3	CH78	

Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

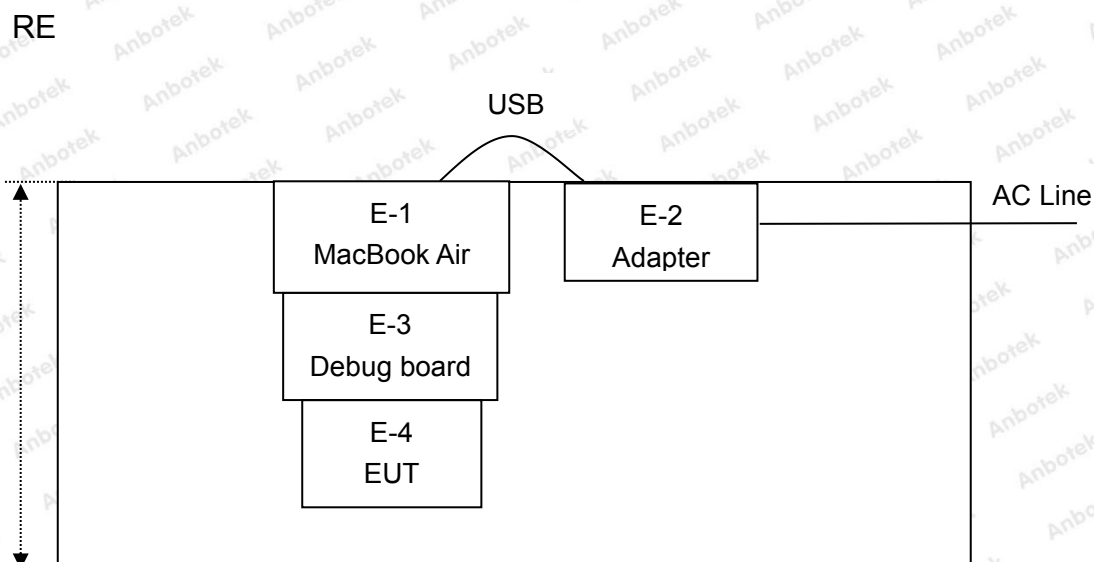
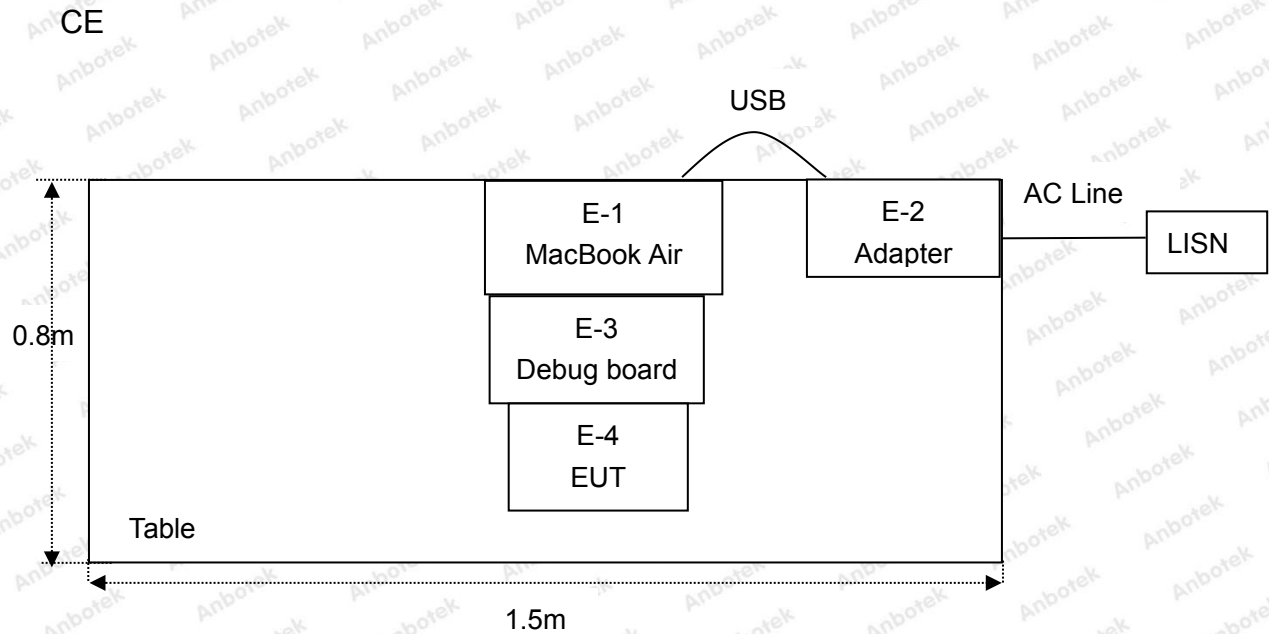
1.5. List of channels

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	1	2403	2	2404	3	2405	4	2406
5	2407	6	2408	7	2409	8	2410	9	2411
10	2412	11	2413	12	2414	13	2415	14	2416
15	2417	16	2418	17	2419	18	2420	19	2421
20	2422	21	2423	22	2424	23	2425	24	2426
25	2427	26	2428	27	2429	28	2430	29	2431
30	2432	31	2433	32	2434	33	2435	34	2436
35	2437	36	2438	37	2439	38	2440	39	2441
40	2442	41	2443	42	2444	43	2445	44	2446
45	2447	46	2448	47	2449	48	2450	49	2451
50	2452	51	2453	52	2454	53	2455	54	2456
55	2457	56	2458	57	2459	58	2460	59	2461
60	2462	61	2463	62	2464	63	2465	64	2466
65	2467	66	2468	67	2469	68	2470	69	2471
70	2472	71	2473	72	2474	73	2475	74	2476
75	2477	76	2478	77	2479	78	2480	/	/

Note:

1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.

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.	Three Phase V-type Artificial Power Network	CYBERTEK	EM5040DT	E215040DT001	Jul 05, 2021	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Oct. 26, 2020	1 Year
4.	EMI Test Receiver	Rohde & Schwarz	ESR26	101481	Oct. 26, 2020	1 Year
5.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Oct. 26, 2020	1 Year
6.	MAX Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 26, 2020	1 Year
7.	Preamplifier	SKET Electronic	BK1G18G30 D	KD17503	Oct. 26, 2020	1 Year
8.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 02, 2020	2 Year
9.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 02, 2020	2 Year
10.	Loop Antenna	Schwarzbeck	FMZB1519B	00053	Nov. 02, 2020	2 Year
11.	Horn Antenna	A-INFO	LB-180400-K F	J211060628	Nov. 02, 2020	2 Year
12.	Pre-amplifier	SONOMA	310N	186860	Oct. 26, 2020	1 Year
13.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
14.	RF Test Control System	YIHENG	YH3000	2017430	Oct. 26, 2020	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN045	Oct. 26, 2020	1 Year
16.	Power Sensor	DAER	RPR3006W	15I00041SN046	Oct. 26, 2020	1 Year
17.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Oct. 26, 2020	1 Year
18.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Oct. 26, 2020	1 Year
19.	Signal Generator	Agilent	E4421B	MY41000743	Oct. 26, 2020	1 Year
20.	DC Power Supply	IVYTECH	IV3605	1804D360510	Oct. 26, 2020	1 Year
21.	Constant Temperature Humidity Chamber	ZHONGJIAN	ZJ-KHWS80 B	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.

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.

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

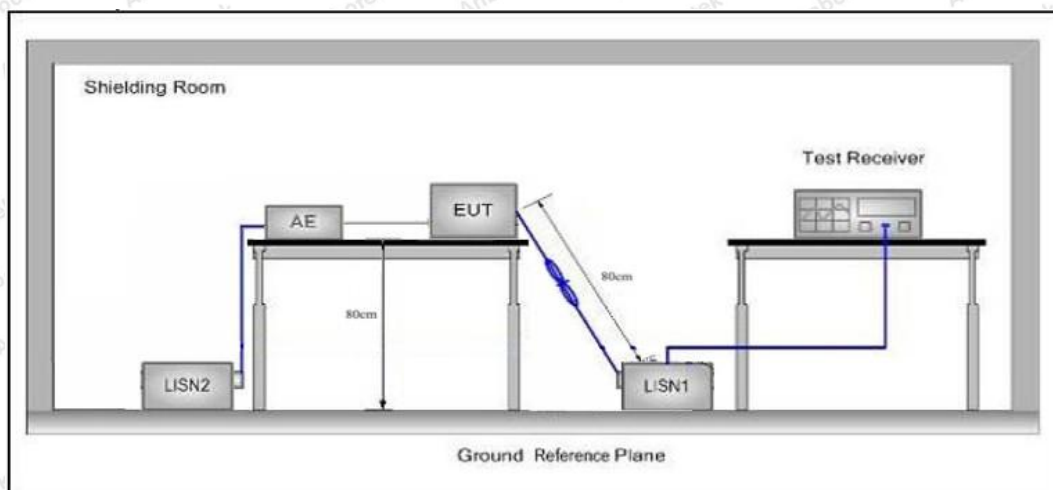
Standard Section	Test Item	Result
15.203/15.247(c)	Antenna Requirement	PASS
15.207	Conducted Emission	PASS
15.205/15.209	Spurious Emission	PASS
15.247(b)(3)	Conducted Peak Output Power	PASS
15.247(a)(2)	6dB Occupied Bandwidth	PASS
15.247(e)	Power Spectral Density	PASS
15.247(d)	Band Edge	PASS
Remark: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

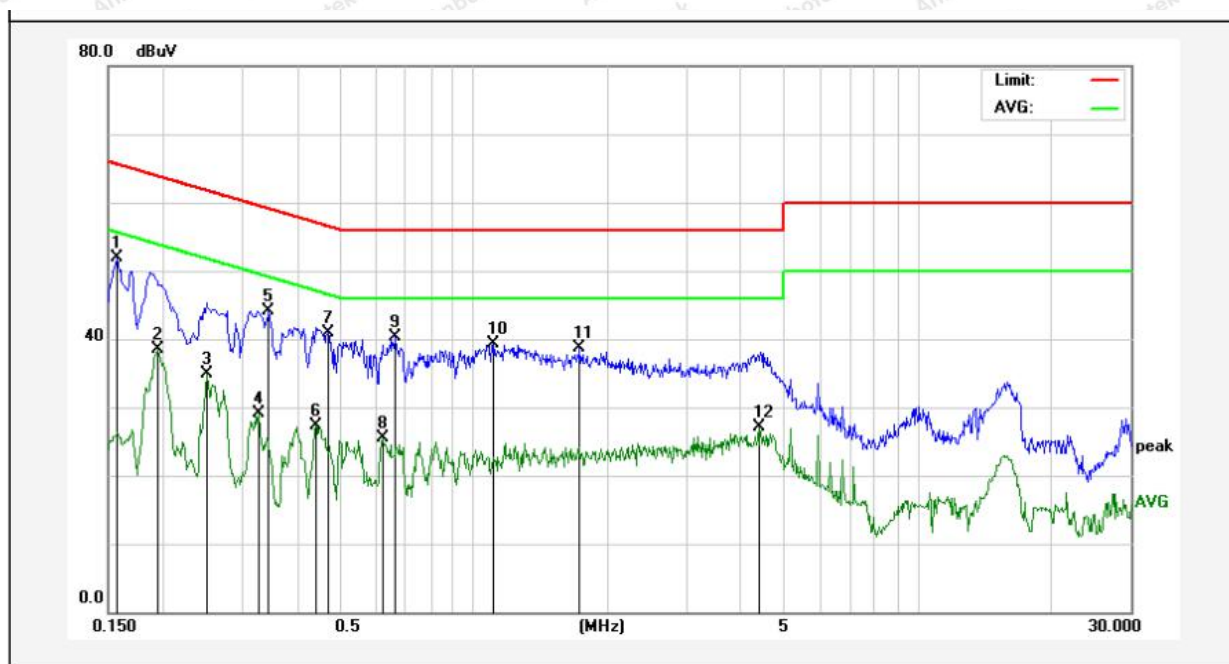
The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

During the test, pre-scan all modes, and found the “Low CH00” which is the worst case, only the worst case is recorded in the report.

Conducted Emission Test Data

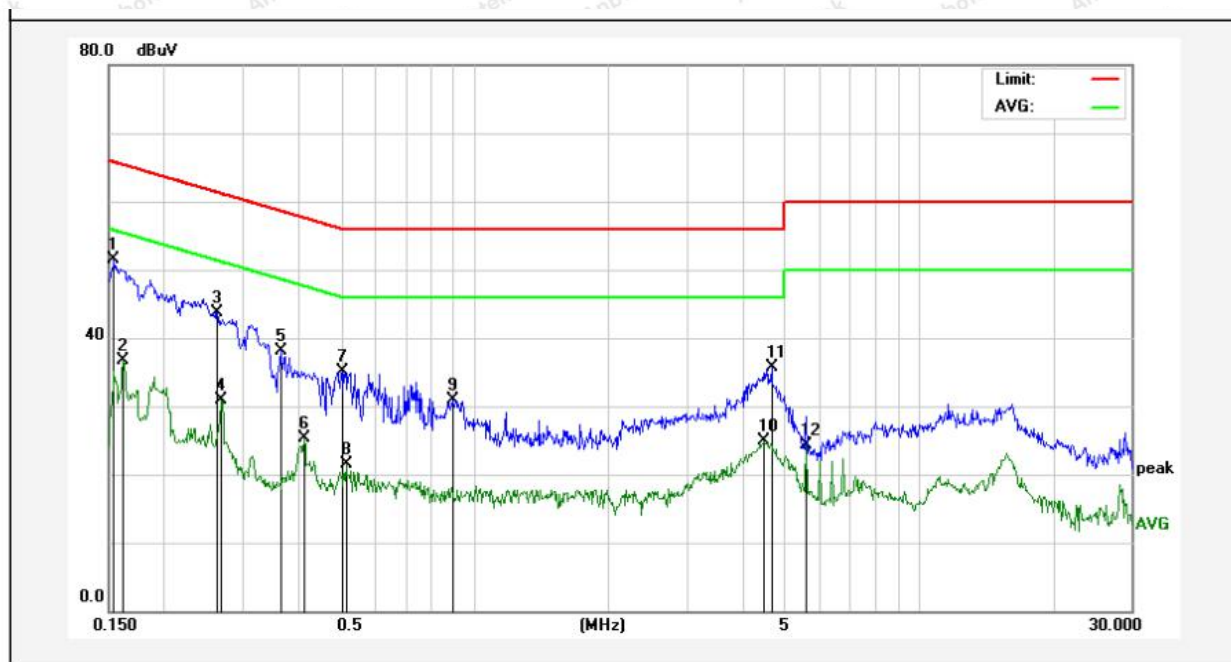
Test Site: 1# Shielded Room
Operating Condition: CH00
Test Specification: DC 3.3V by Debug board
Comment: Live Line
Tem.: 24.3°C Hum.: 46%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1580	41.78	10.12	51.90	65.56	-13.66	QP	
2	0.1940	28.48	10.12	38.60	53.86	-15.26	AVG	
3	0.2500	24.83	10.12	34.95	51.75	-16.80	AVG	
4	0.3268	18.92	10.12	29.04	49.53	-20.49	AVG	
5	0.3460	33.97	10.12	44.09	59.06	-14.97	QP	
6	0.4420	17.23	10.13	27.36	47.02	-19.66	AVG	
7	0.4700	30.81	10.14	40.95	56.51	-15.56	QP	
8	0.6220	15.31	10.15	25.46	46.00	-20.54	AVG	
9	0.6660	30.13	10.15	40.28	56.00	-15.72	QP	
10	1.1100	29.25	10.15	39.40	56.00	-16.60	QP	
11	1.7300	28.62	10.13	38.75	56.00	-17.25	QP	
12	4.3620	17.02	10.11	27.13	46.00	-18.87	AVG	

Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: CH00
Test Specification: DC 3.3V by Debug board
Comment: Neutral Line
Tem.: 24.3°C Hum.: 46%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV)	Over Limit (dB)	Detector	Remark
1	0.1539	41.36	10.12	51.48	65.78	-14.30	QP	
2	0.1620	26.68	10.12	36.80	55.36	-18.56	AVG	
3	0.2630	33.59	10.13	43.72	61.33	-17.61	QP	
4	0.2700	20.77	10.13	30.90	51.12	-20.22	AVG	
5	0.3659	27.97	10.12	38.09	58.59	-20.50	QP	
6	0.4138	15.24	10.12	25.36	47.57	-22.21	AVG	
7	0.5020	24.93	10.15	35.08	56.00	-20.92	QP	
8	0.5140	11.28	10.15	21.43	46.00	-24.57	AVG	
9	0.8900	20.83	10.15	30.98	56.00	-25.02	QP	
10	4.4778	14.70	10.11	24.81	46.00	-21.19	AVG	
11	4.6619	25.55	10.11	35.66	56.00	-20.34	QP	
12	5.5696	14.28	10.11	24.39	50.00	-25.61	AVG	

Note: The EUT received input Voltage DC 3.3V from Debug board, and the Debug board received DC 5V from MacBook Air.

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

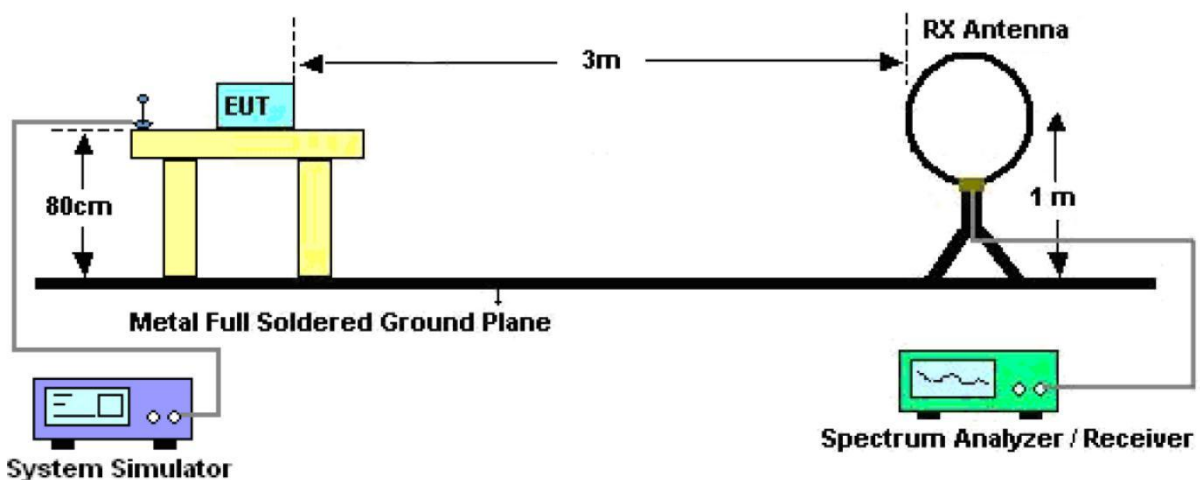


Figure 1. Below 30MHz

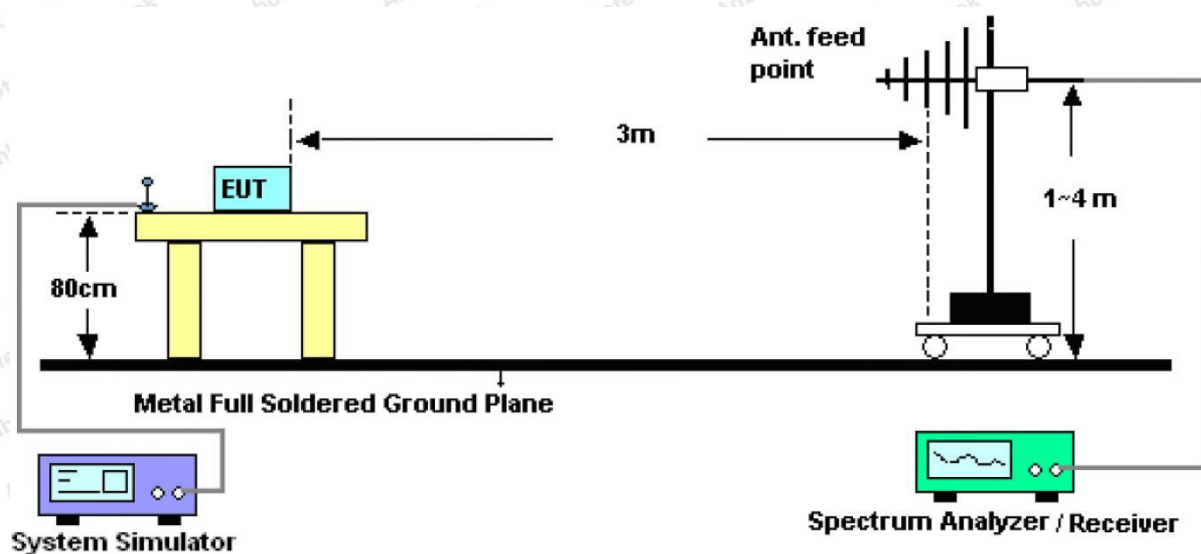


Figure 2. 30MHz to 1GHz

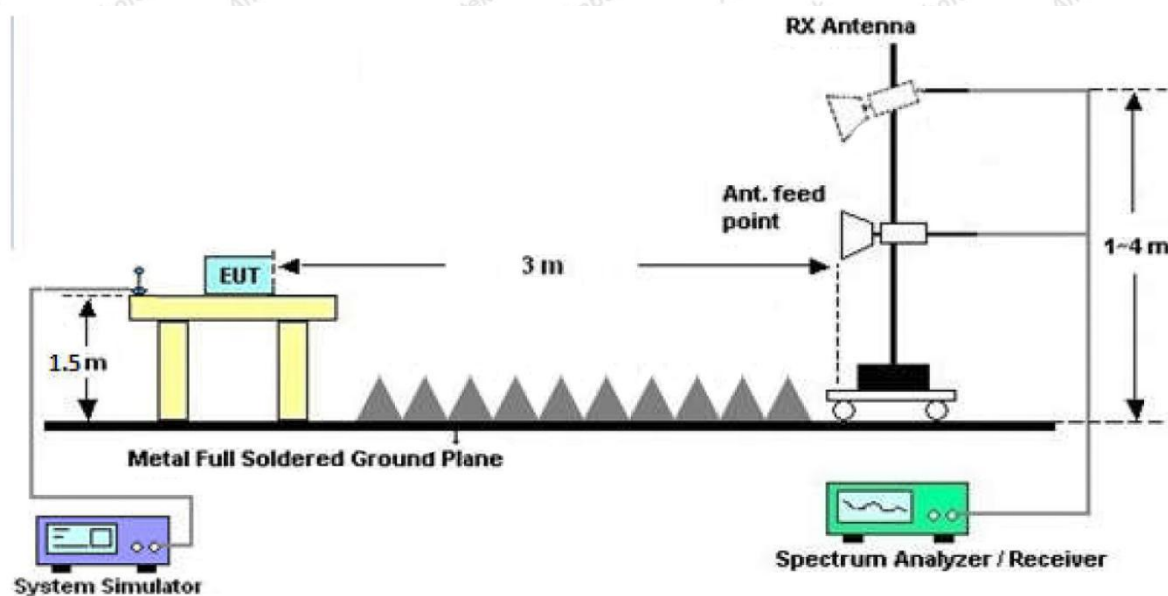


Figure 3. Above 1 GHz

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

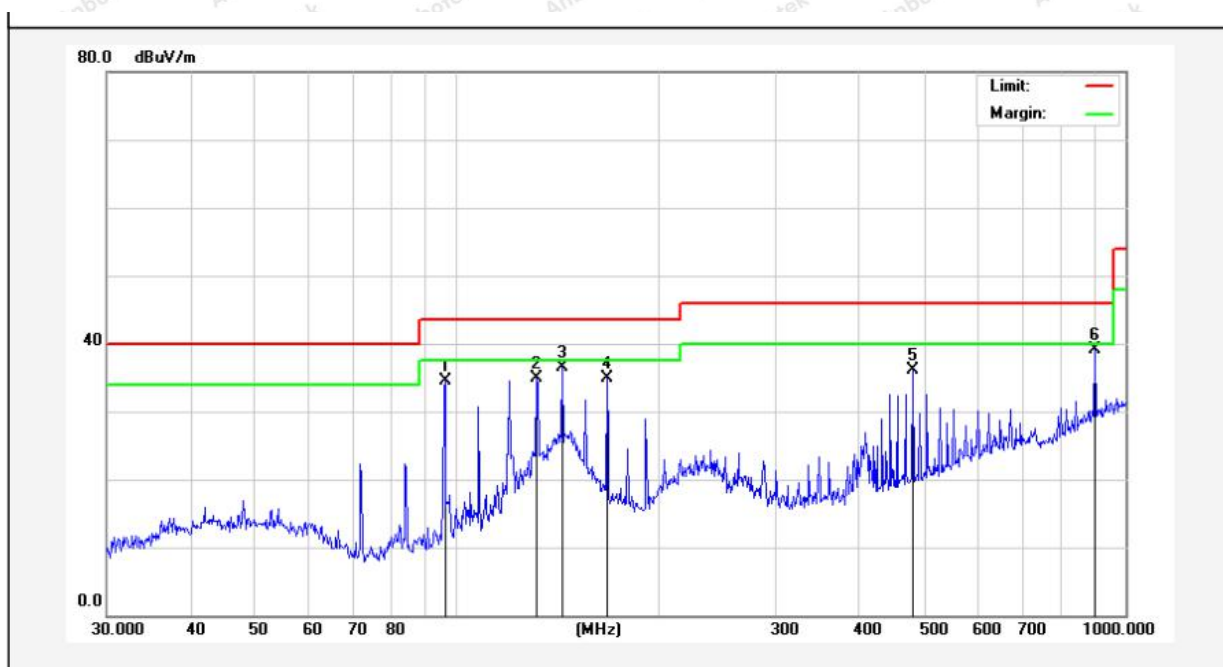
During the test, pre-scan all the modes, and found the Low CH00 (TX) which is the worst case, only the worst case is recorded in the report.

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)

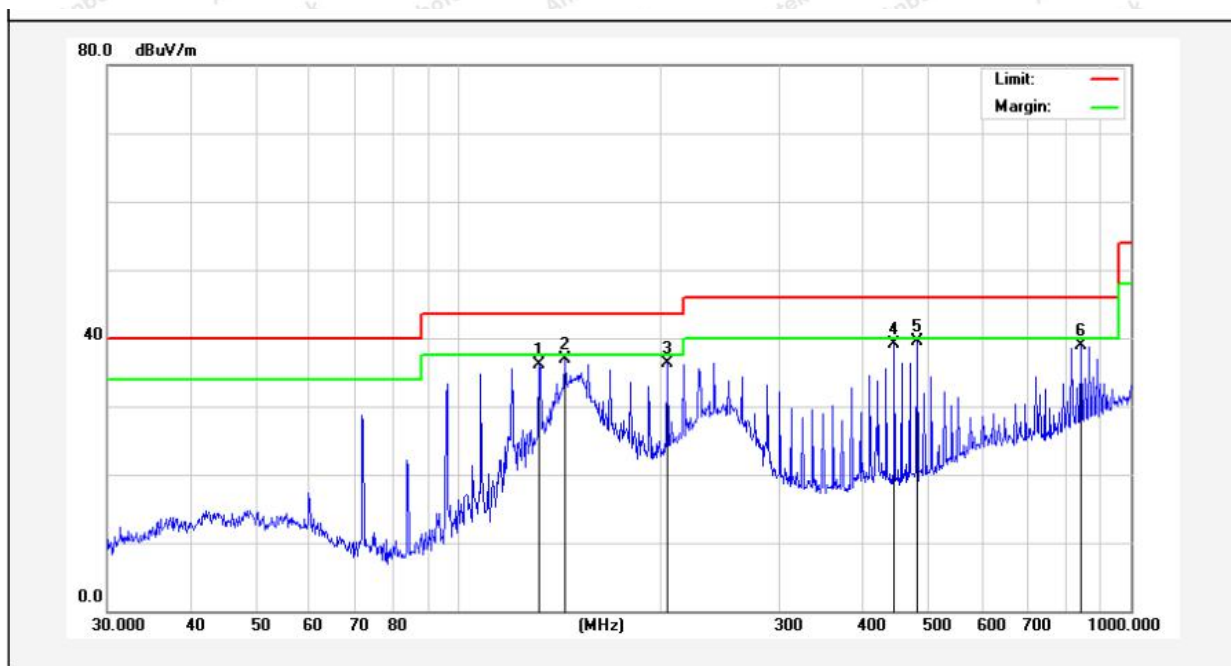
Test Mode: CH00
Power Source: DC 3.3V by Debug board
Polarization: Vertical
Temp.(°C)/Hum.(%RH): 22.8°C/52%RH



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	96.0986	49.73	-15.21	34.52	43.50	-8.98	QP	100	0	
2	131.7572	54.34	-19.51	34.83	43.50	-8.67	QP	100	360	
3	143.8291	56.45	-20.00	36.45	43.50	-7.05	QP	100	0	
4	167.8240	53.89	-18.96	34.93	43.50	-8.57	QP	100	360	
5	480.5276	45.37	-9.21	36.16	46.00	-9.84	QP	100	0	
6	900.1471	40.78	-1.70	39.08	46.00	-6.92	QP	100	360	

Test Results (30~1000MHz)

Test Mode: CH00
Power Source: DC 3.3V by Debug board
Polarization: Horizontal
Temp.(°C)/Hum.(%RH): 22.8°C/52%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	131.7572	56.67	-20.52	36.15	43.50	-7.35	QP	100	0	
2	143.8291	57.65	-20.84	36.81	43.50	-6.69	QP	100	360	
3	204.2375	56.05	-19.78	36.27	43.50	-7.23	QP	100	0	
4	444.8514	51.33	-12.14	39.19	46.00	-6.81	QP	100	360	
5	480.5276	50.36	-10.85	39.51	46.00	-6.49	QP	100	0	
6	842.1295	42.32	-3.33	38.99	46.00	-7.01	QP	100	360	

Note: The EUT received input Voltage DC 3.3V from Debug board, and the Debug board received DC 5V from MacBook Air.

Test Results (1GHz-25GHz)

Test Mode: Low channel									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
4804.0000	47.22	34.01	2.56	34.71	49.08	74.00	-24.92	V	Peak
4804.0000	38.70	34.01	2.56	34.71	40.56	54.00	-13.44	V	AVG
7206.0000	48.48	36.16	2.98	35.15	52.47	74.00	-21.53	V	Peak
7206.0000	36.78	36.16	2.98	35.15	40.77	54.00	-13.23	V	AVG
9608.0000	*								
12010.0000	*								
14412.0000	*								
16814.0000	*								
4804.0000	47.44	34.01	2.56	34.71	49.30	74.00	-24.70	H	Peak
4804.0000	38.22	34.01	2.56	34.71	40.08	54.00	-13.92	H	AVG
7206.0000	45.02	36.16	2.98	35.15	49.01	74.00	-24.99	H	Peak
7206.0000	37.18	36.16	2.98	35.15	41.17	54.00	-12.83	H	AVG
9608.0000	*								
12010.0000	*								
14412.0000	*								
16814.0000	*								

Note:

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.

Test Mode: Middle channel									
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.	Detector
4882.0000	48.39	34.98	2.49	34.14	51.72	74.00	-22.28	V	Peak
4882.0000	40.83	34.98	2.49	34.14	44.16	54.00	-9.84	V	AVG
7323.0000	47.49	36.01	3.01	34.56	51.95	74.00	-22.05	V	Peak
7323.0000	37.78	36.01	3.01	34.56	42.24	54.00	-11.76	V	AVG
9764.0000	*								
12205.0000	*								
14646.0000	*								
17087.0000	*								
4882.0000	50.84	34.98	2.49	34.14	54.17	74.00	-19.83	H	Peak
4882.0000	40.11	34.98	2.49	34.14	43.44	54.00	-10.56	H	AVG
7323.0000	48.39	36.01	3.01	34.56	52.85	74.00	-21.15	H	Peak
7323.0000	35.17	36.01	3.01	34.56	39.63	54.00	-14.37	H	AVG
9764.0000	*								
12205.0000	*								
14646.0000	*								
17087.0000	*								

Note:

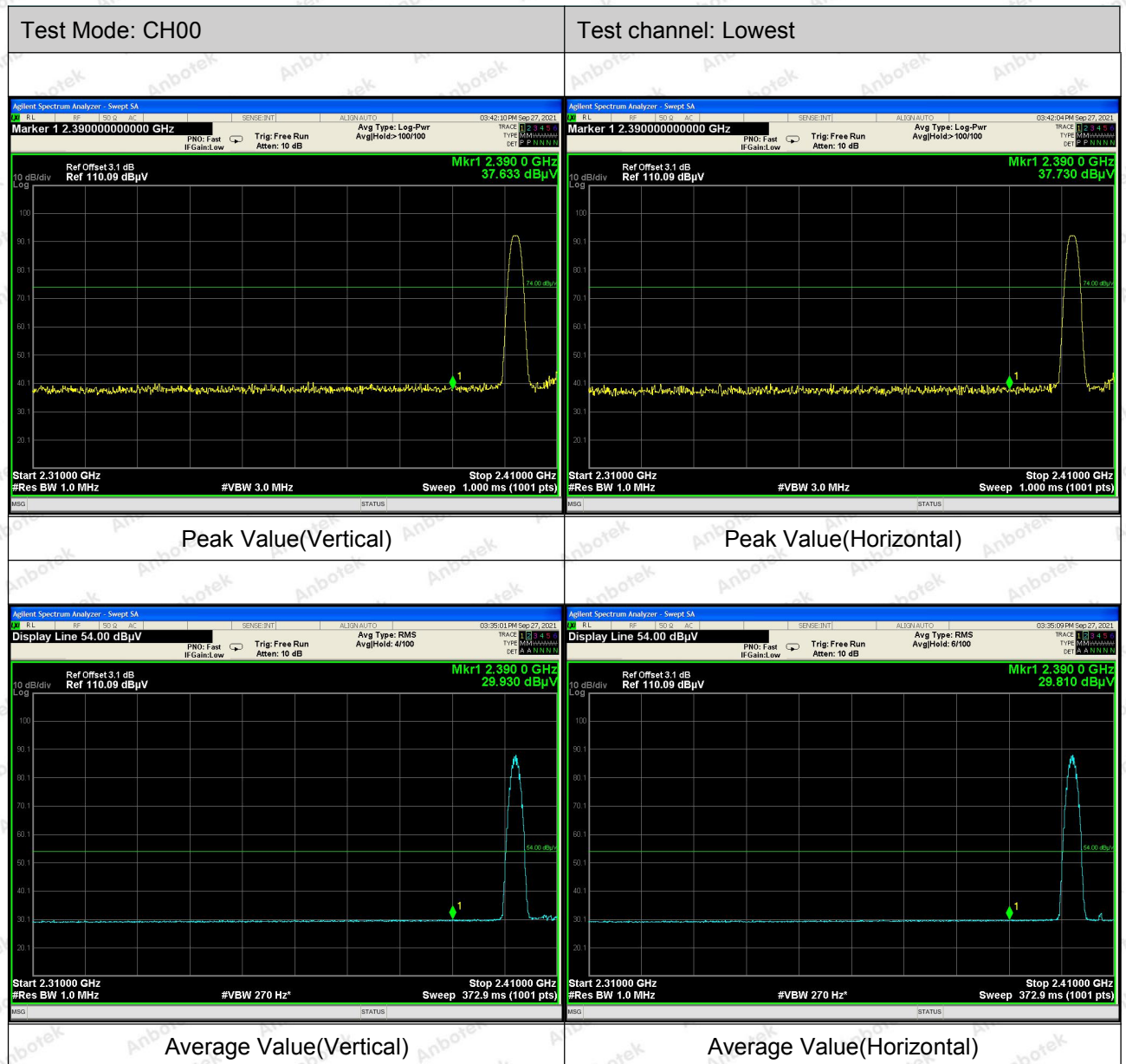
1. Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. "*" means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.

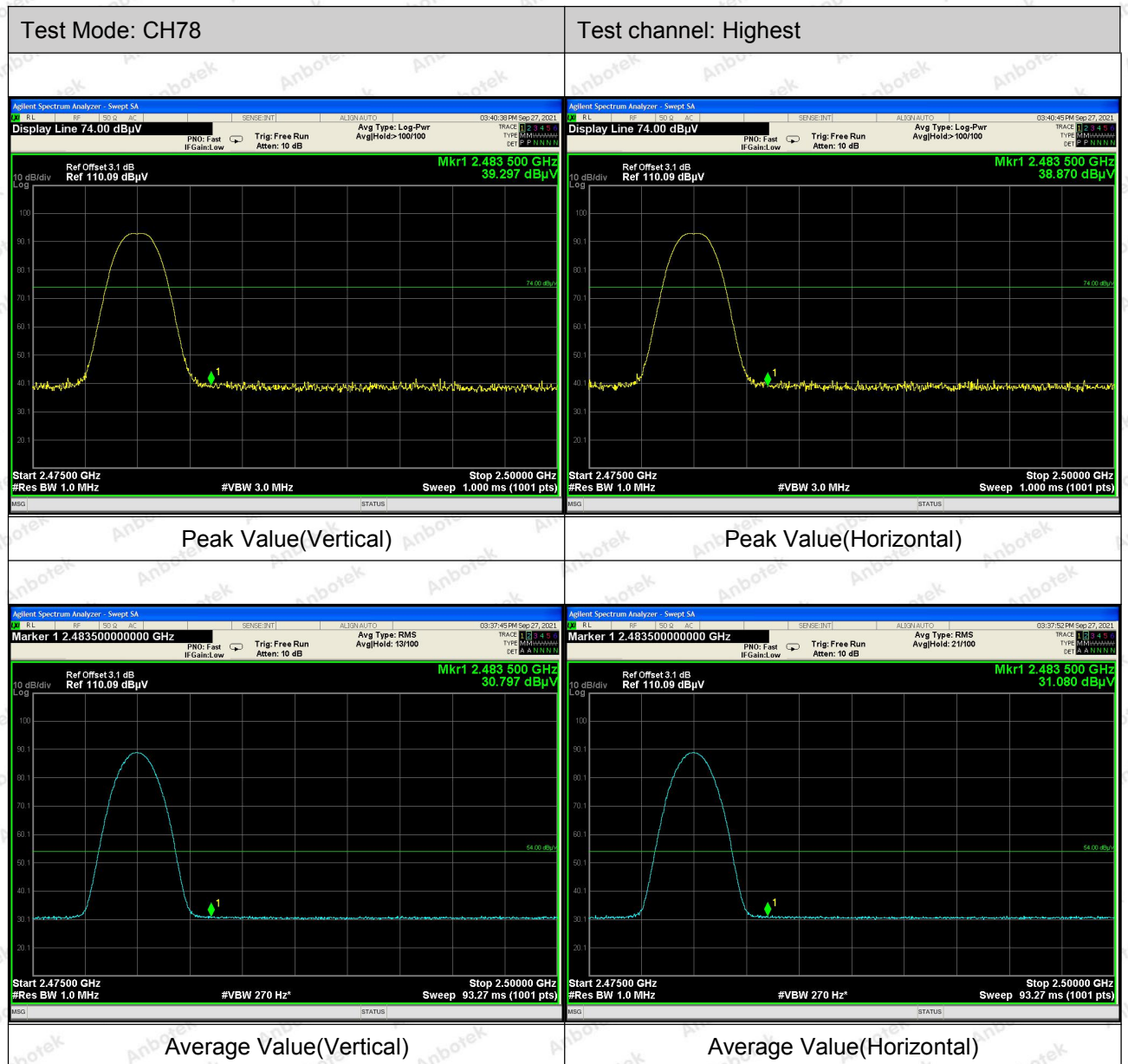
Test Mode: High channel									
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.	Detector
4960.0000	47.42	35.10	2.52	34.87	50.17	74.00	-23.83	V	Peak
4960.0000	40.13	35.10	2.52	34.87	42.88	54.00	-11.12	V	AVG
7440.0000	48.29	36.18	3.18	34.96	52.69	74.00	-21.31	V	Peak
7440.0000	35.53	36.18	3.18	34.96	39.93	54.00	-14.07	V	AVG
9920.0000	*								
12400.0000	*								
14880.0000	*								
17360.0000	*								
4940.0000	50.01	35.10	2.52	34.87	52.76	74.00	-21.24	H	Peak
4940.0000	40.66	35.10	2.52	34.87	43.41	54.00	-10.59	H	AVG
7410.0000	48.07	36.18	3.18	34.96	52.47	74.00	-21.53	H	Peak
7410.0000	38.62	36.18	3.18	34.96	43.02	54.00	-10.98	H	AVG
9880.0000	*								
12350.0000	*								
14820.0000	*								
17290.0000	*								

Note:

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:



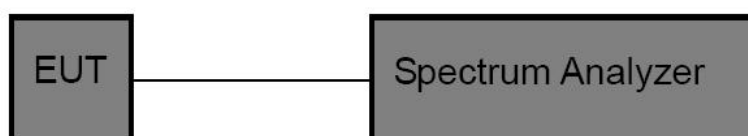


5. Maximum Peak Output Power Test

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.

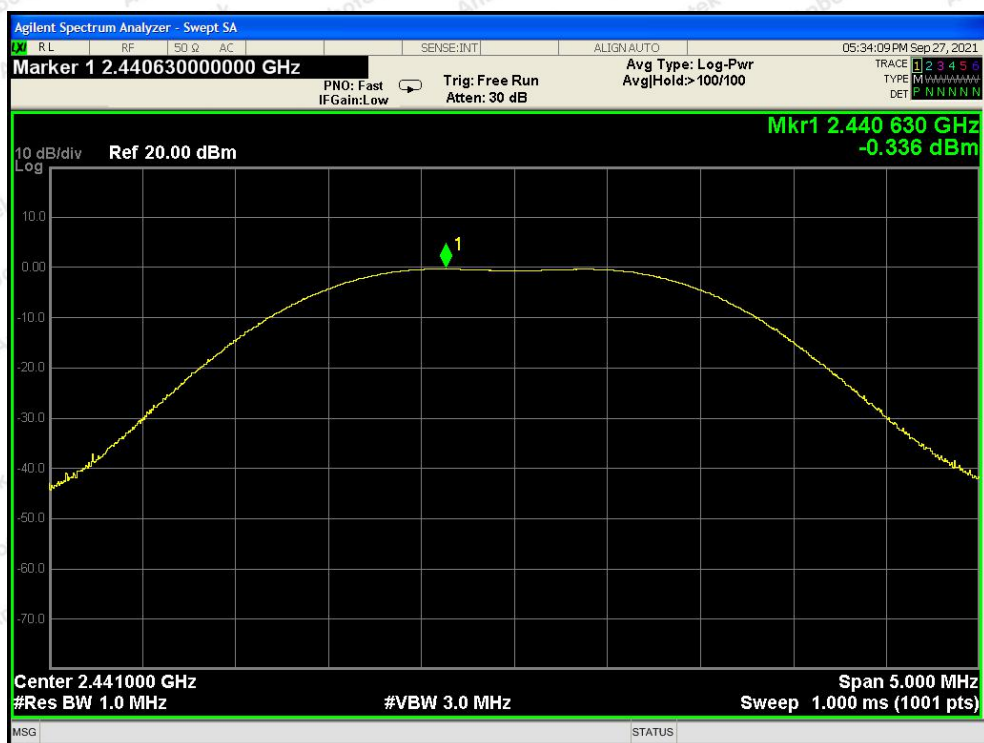
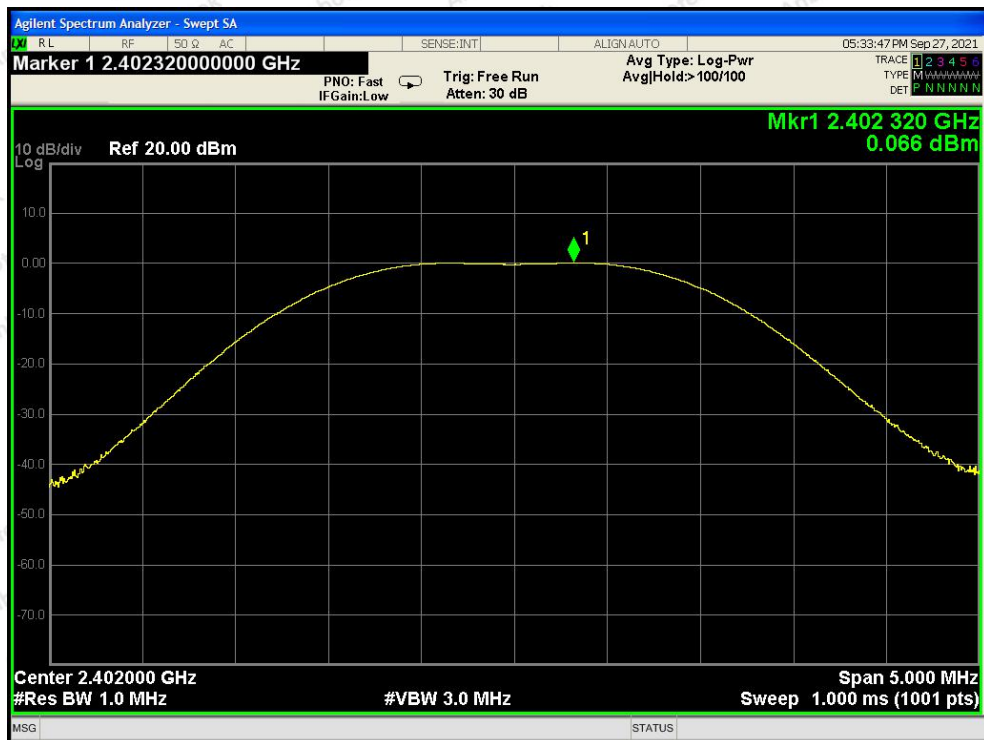
1. Set the RBW $\geq$ DTS bandwidth.
2. Set the VBW $\geq 3 \times$ RBW.
3. Set the span $\geq 3 \times$ RBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use peak marker function to determine the peak amplitude level.

5.4. Test Data

Test Item	:	Max. peak output power
Test Voltage	:	DC 3.3V by Debug board
Test Result	:	PASS

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

Channel	Peak Power output (dBm)	Limit (dBm)	Results
Low	0.066	30	PASS
Middle	-0.336	30	PASS
High	-0.576	30	PASS





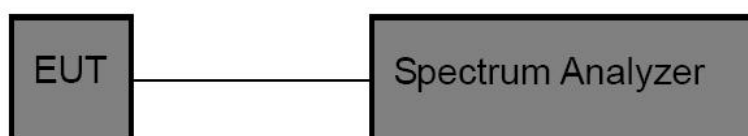
CH: High

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 3.3V by Debug board

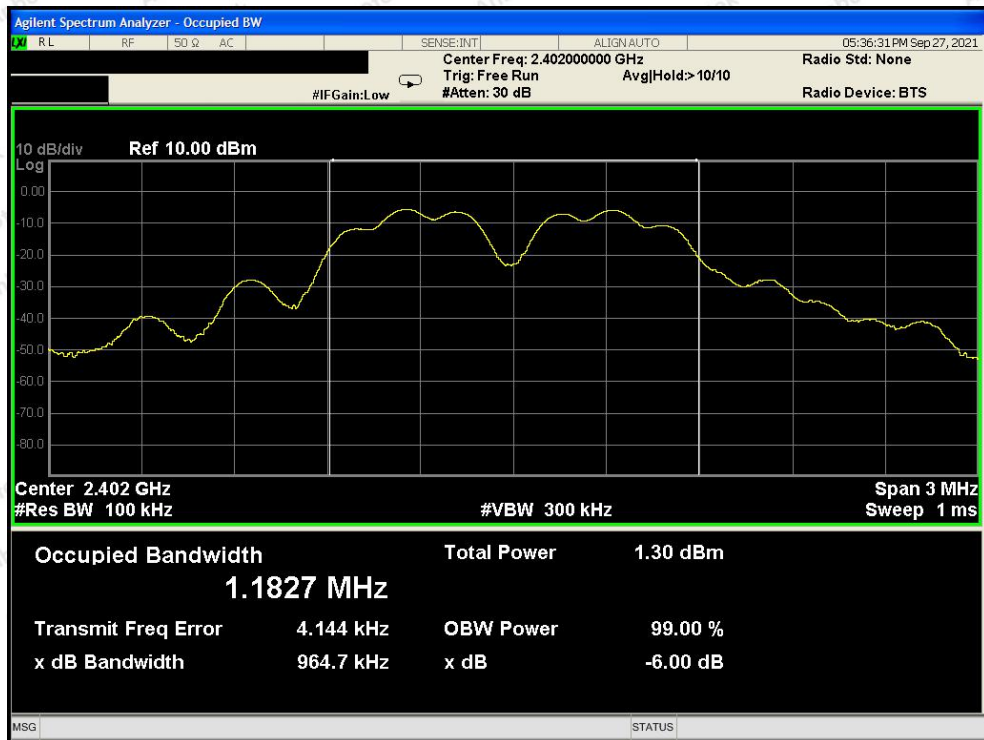
Test Result : PASS

Test Mode : CH Low ~ CH High

Temperature : 25℃

Humidity : 55%RH

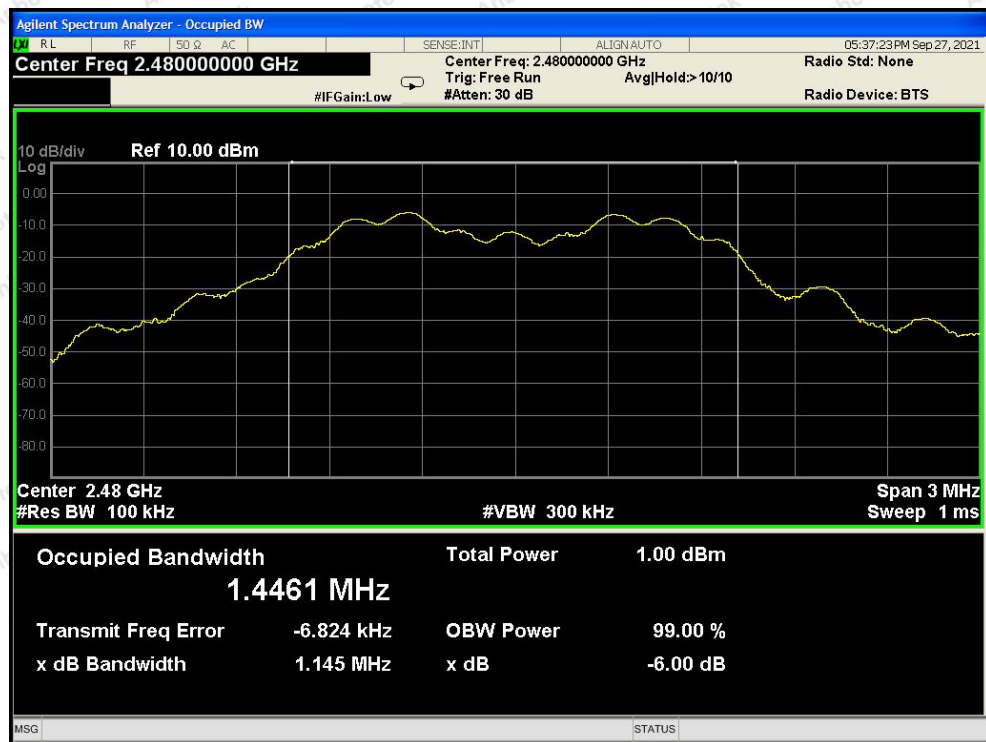
Channel	Bandwidth (kHz)	Limit (kHz)	Results
Low	964.7	>500	PASS
Middle	1098		PASS
High	1145		PASS



CH: Low



CH: Middle



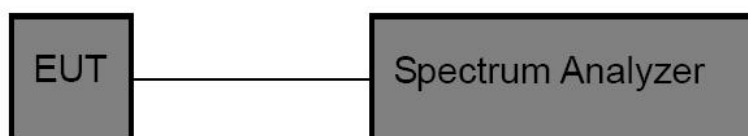
CH: High

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 3.3V by Debug board
Test Result	: PASS

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

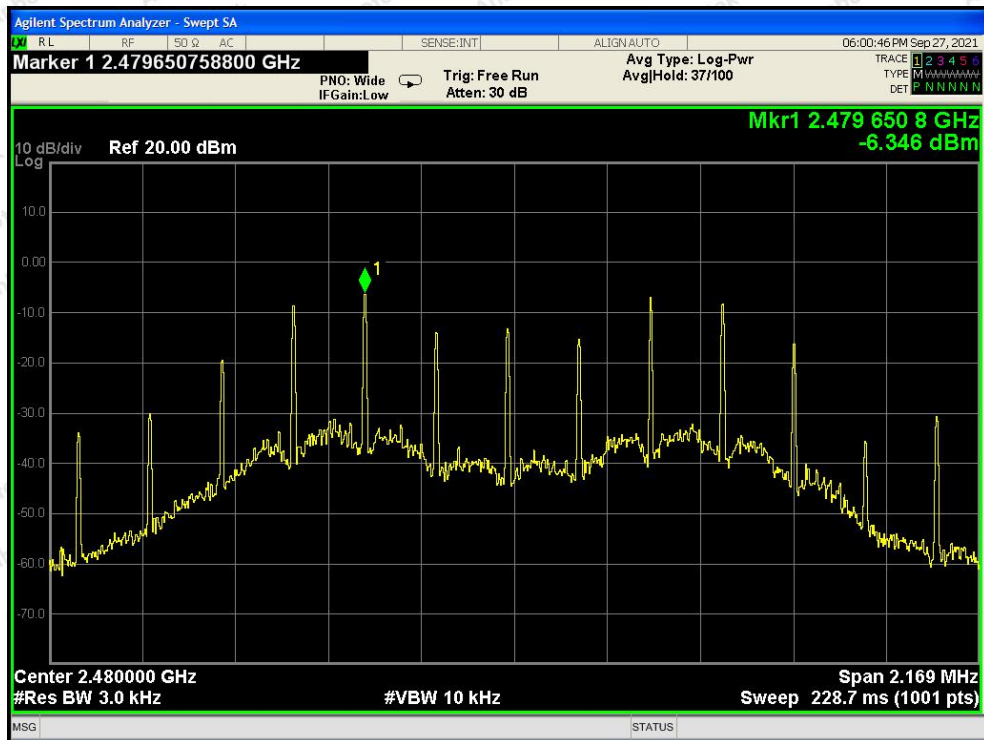
Channel	PSD (dBm/3KHz)	Limit (dBm/3KHz)	Results
Low	-5.959	8.00	PASS
Middle	-5.890	8.00	PASS
High	-6.346	8.00	PASS



CH: Low



CH: Middle



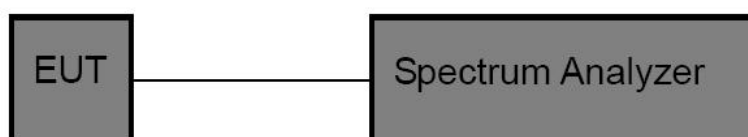
CH: High

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 in 15.209(a).

8.2. Test Setup



8.3. Test Procedure

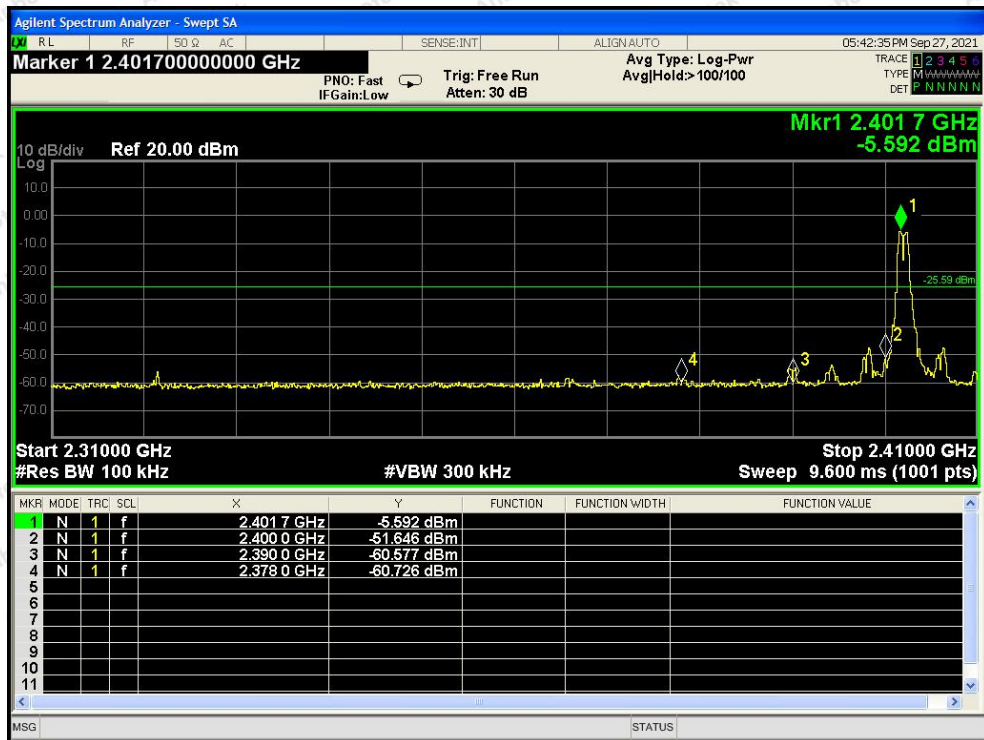
Using the following spectrum analyzer setting:

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 Voltage	:	DC 3.3V by Debug board
Test Result	:	PASS

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

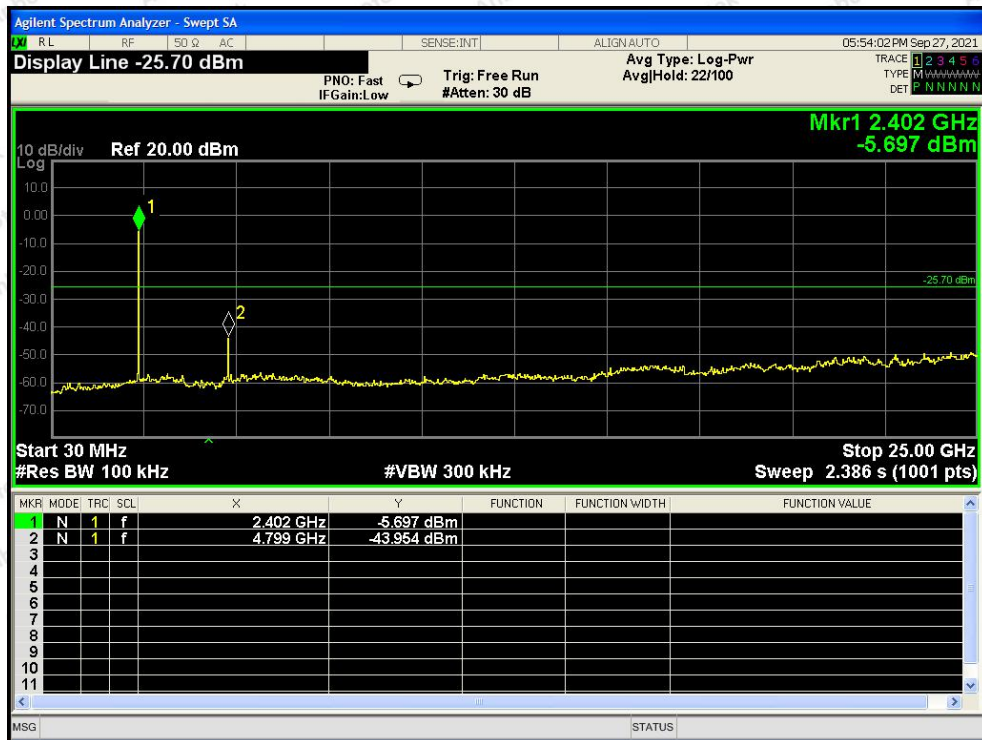


CH: Low

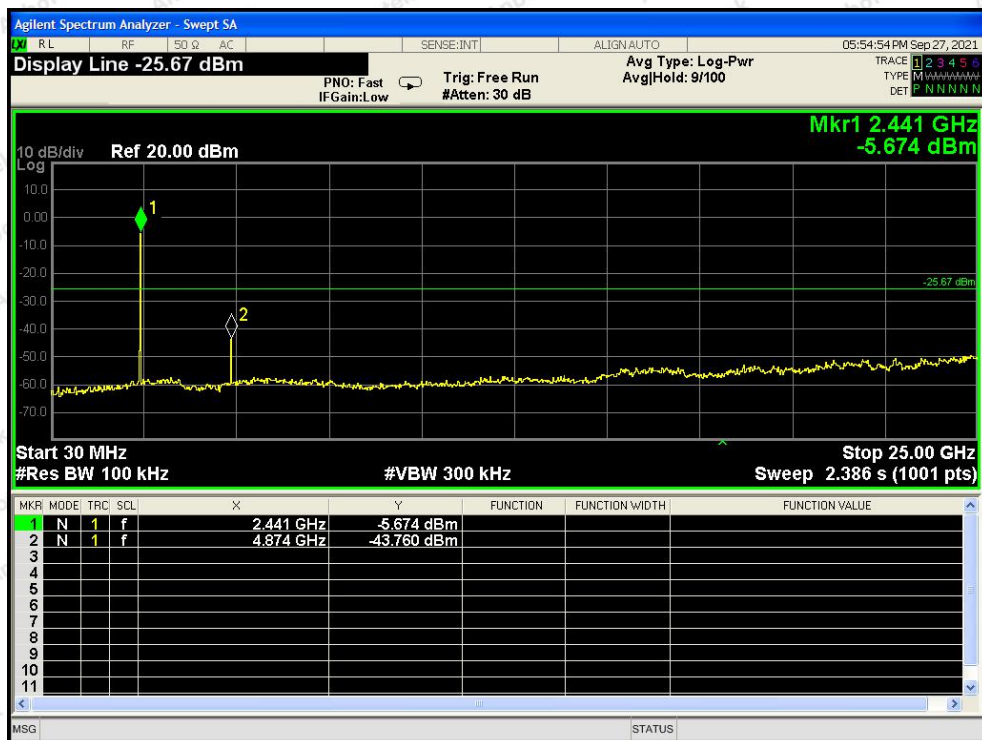


CH: High

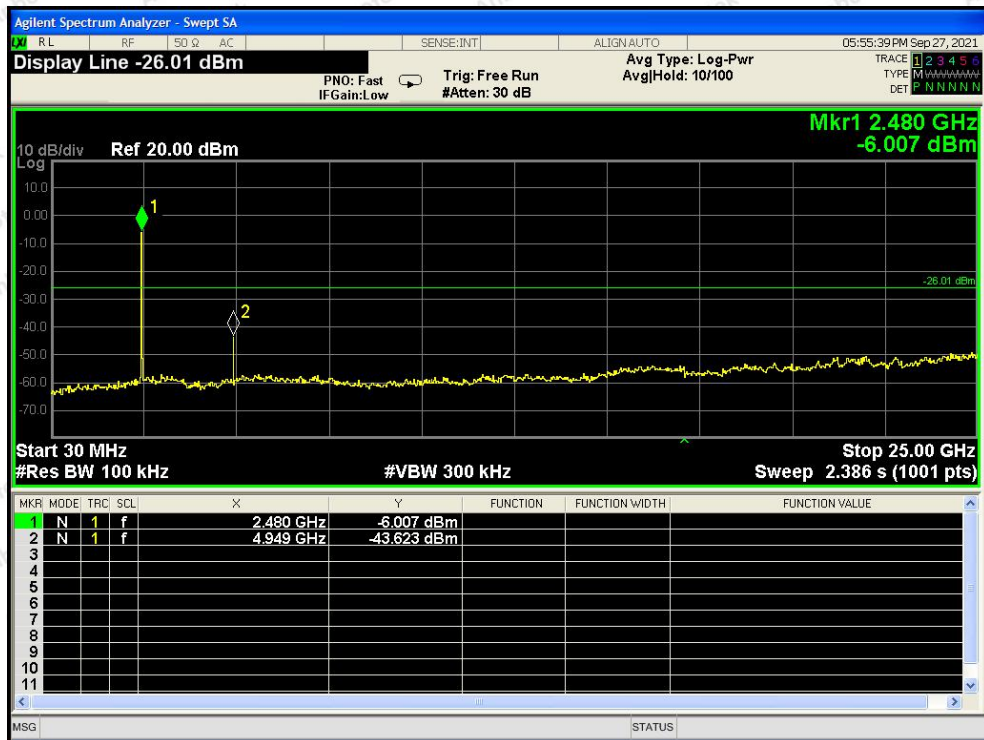
Conducted Emission Method



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 PCB antenna which permanently attached, and the best case gain of the antenna is 1.96 dBi . It complies with the standard requirement.

APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Conducted Emission Measurement

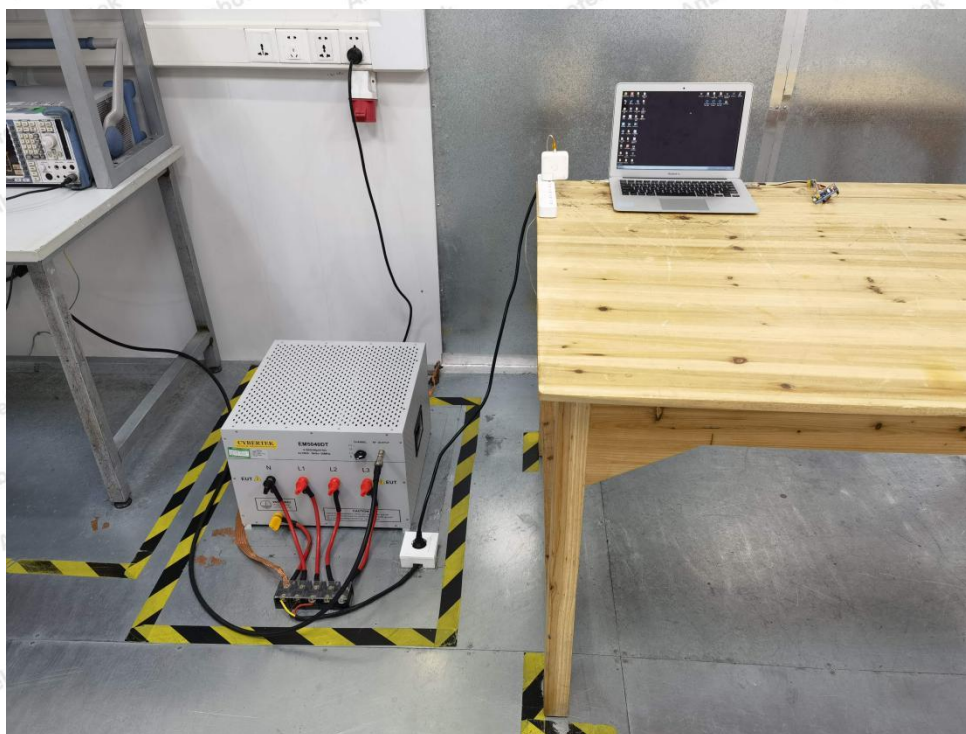
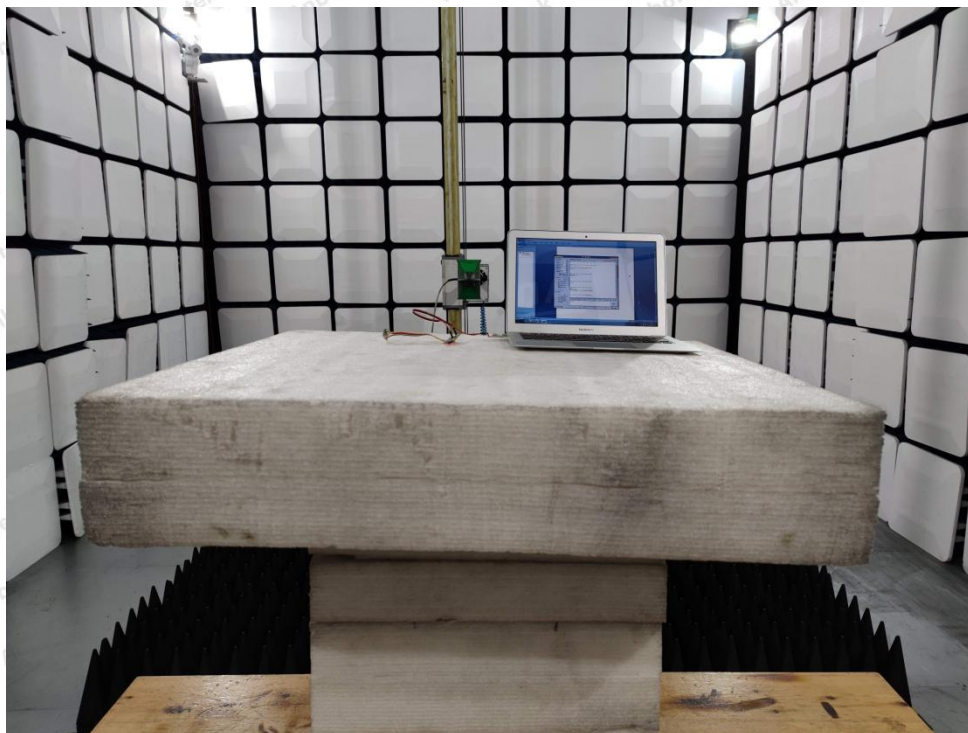
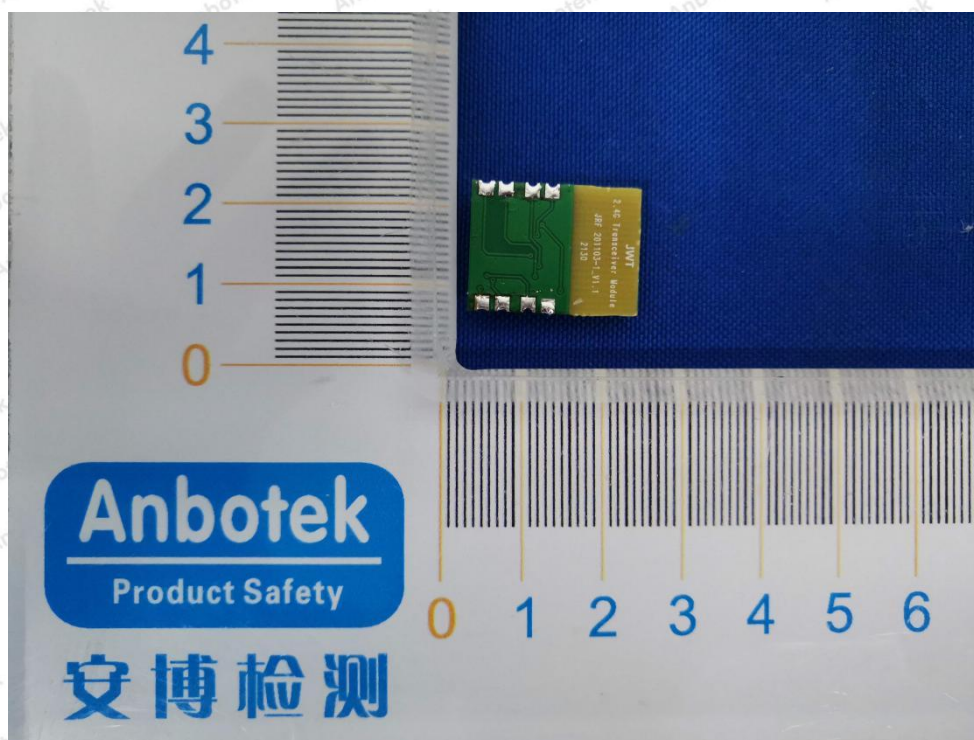
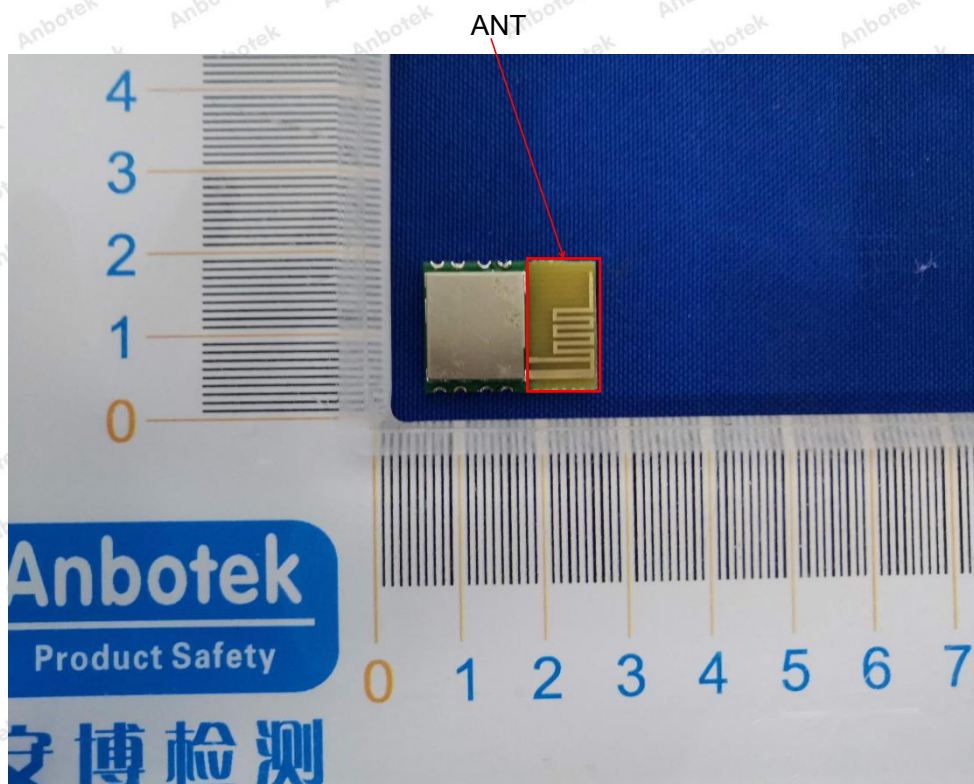
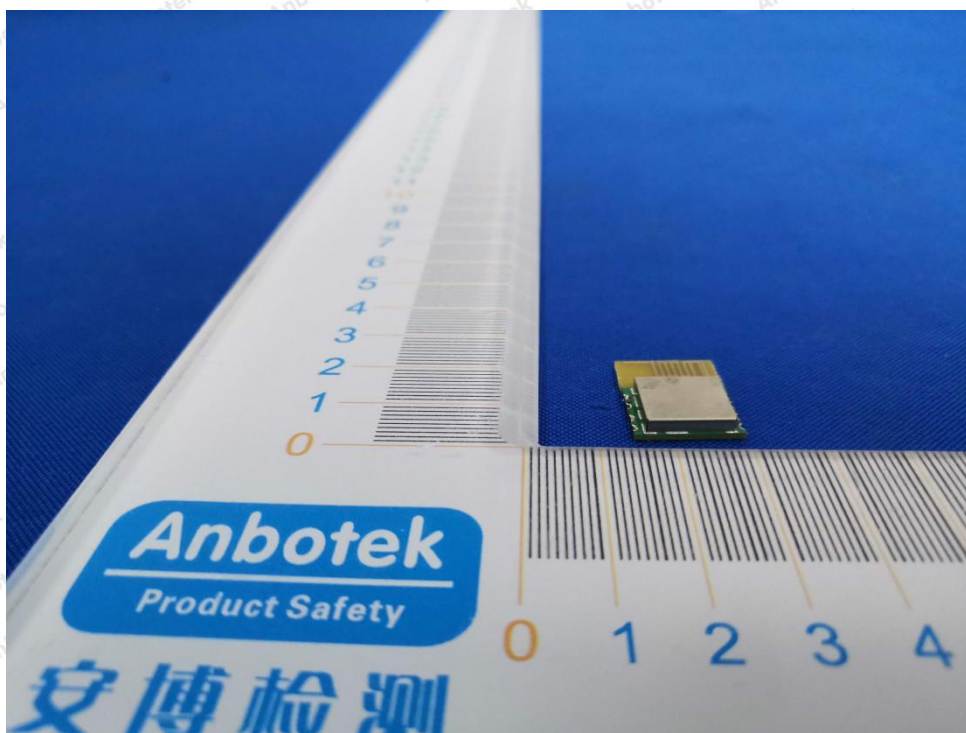
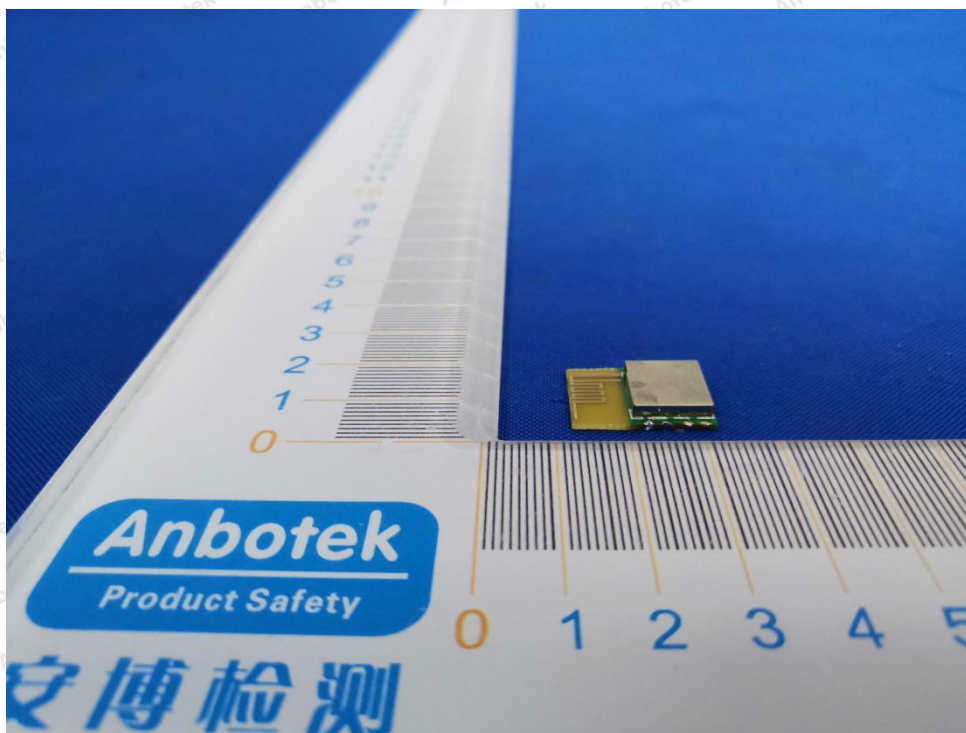


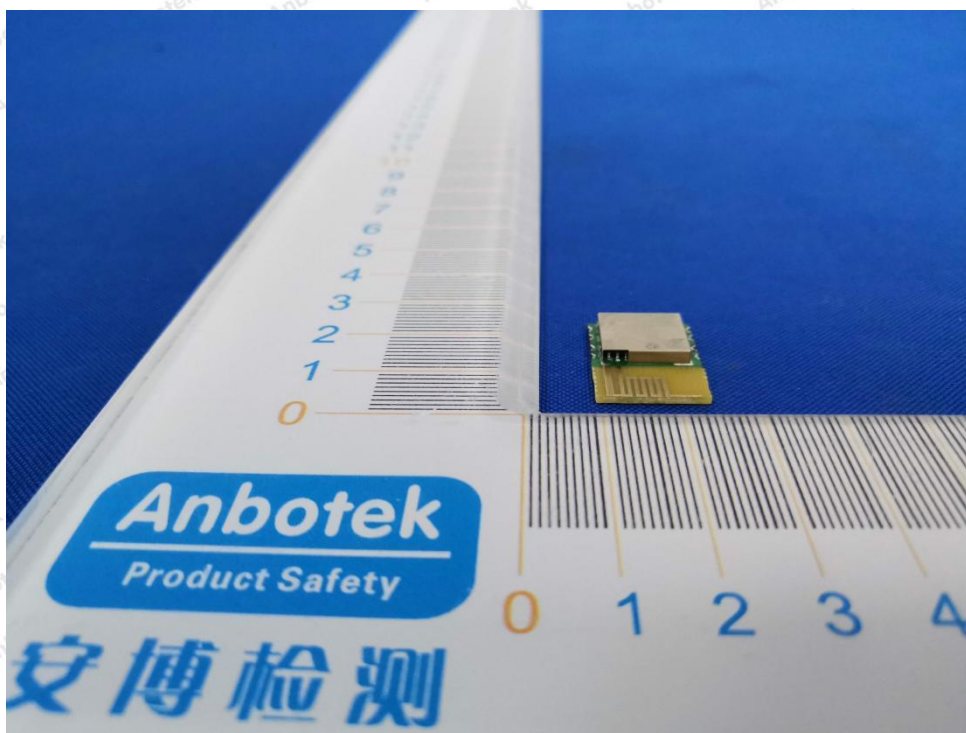
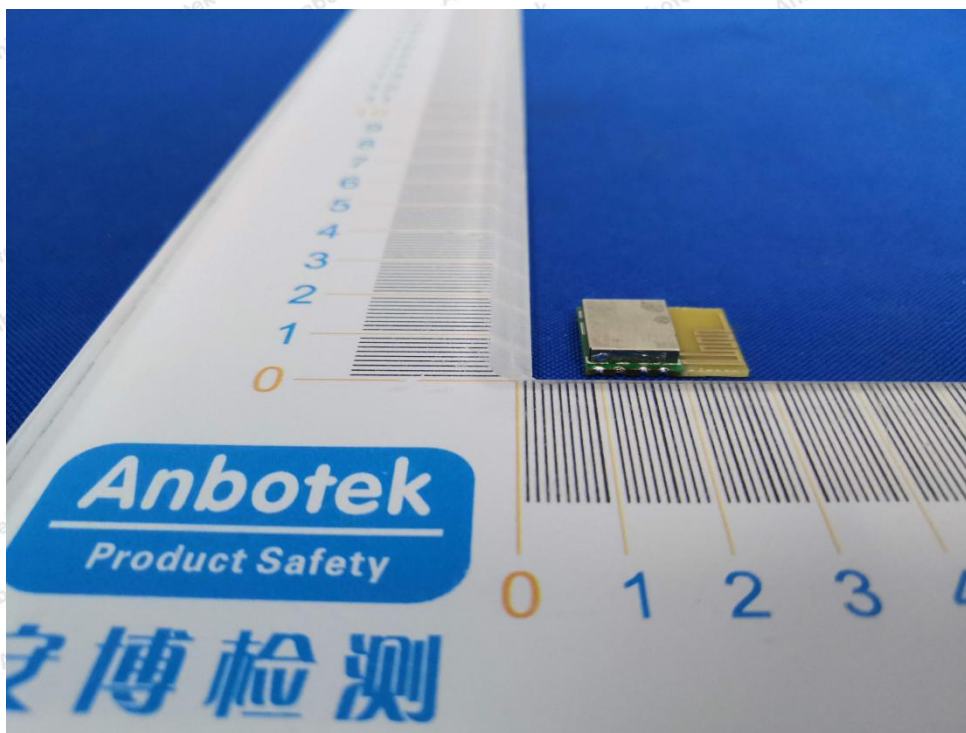
Photo of Radiation Emission Test

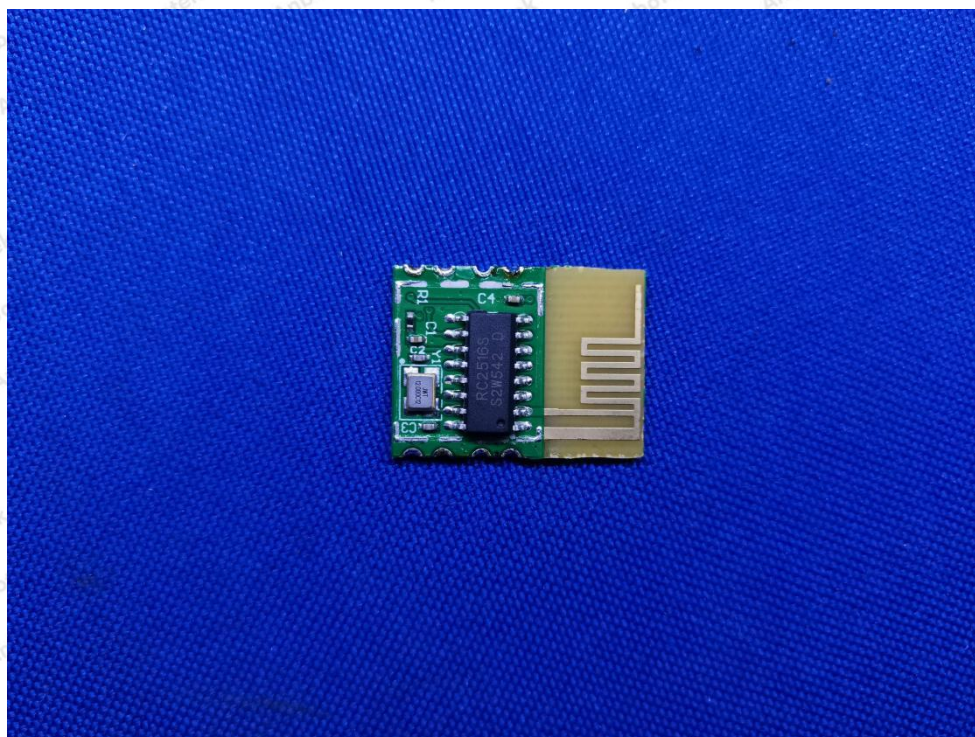
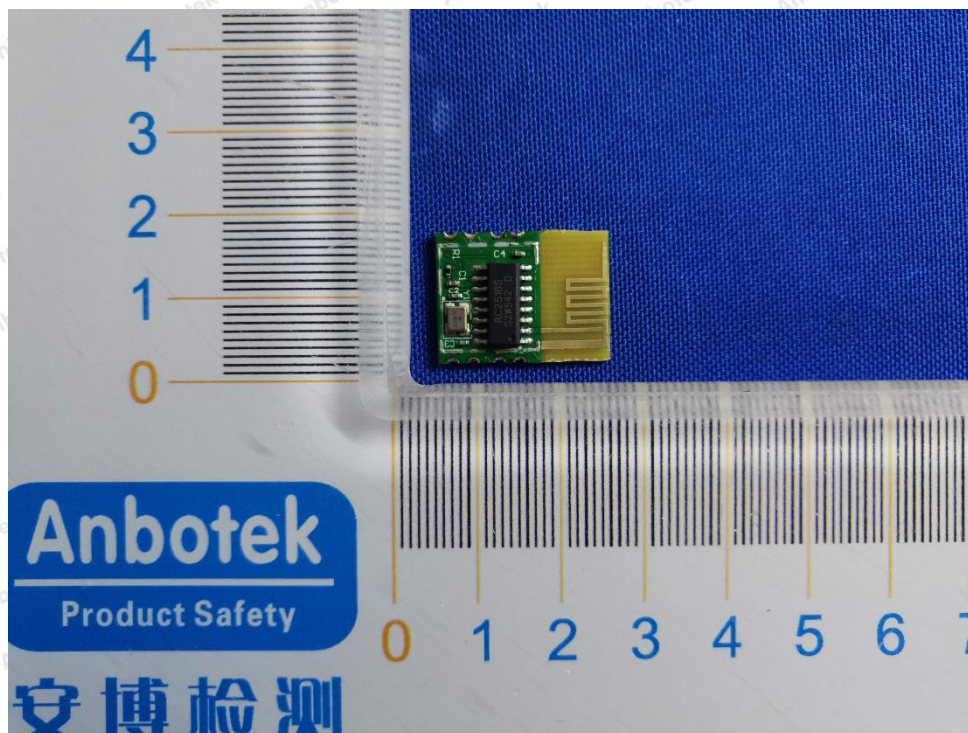




APPENDIX II -- EUT PHOTOGRAPH







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

Shenzhen Anbotech Compliance Laboratory Limited

Address: 1/F., Building D, Sogood Science and Technology Park, Sanwei Community, Hangcheng Street, Bao'an District, Shenzhen, Guangdong, China.

Tel: (86) 755-26066440 Fax: (86) 755-26014772 Email: service@anbotech.com

Code: AB-RF-05-a



Hotline

400-003-0500

www.anbotech.com