

FCC TEST REPORT

For

Anker Innovations Limited

Wireless Vertical Ergonomic Mouse

Model No.: A7852M

Prepared For : Anker Innovations Limited
Address : Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon,
Hongkong

Prepared By : Shenzhen Anbotek Compliance Laboratory Limited
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Contents

1. General Information.....	4
1.1. Client Information.....	4
1.2. Description of Device (EUT).....	4
1.3. Auxiliary Equipment Used During Test.....	4
1.4. Description of Test Modes.....	5
1.5. List of Channels.....	5
1.6. Description of Test Setup.....	6
1.7. Test Equipment List.....	7
1.8. Measurement Uncertainty.....	8
1.9. Description of Test Facility.....	8
2. Summary of Test Results.....	9
3. Conducted Emission Test.....	10
3.1. Test Standard and Limit.....	10
3.2. Test Setup.....	10
3.3. Test Procedure.....	10
3.4. Test Data.....	10
4. Radiated Emission and Band Edge.....	11
4.1. Test Standard and Limit.....	11
4.2. Test Setup.....	11
4.3. Test Procedure.....	13
4.4. Test Data.....	13
5. 20dB Bandwidth Test.....	25
5.1. Test Standard and Limit.....	25
5.2. Test Setup.....	25
5.3. Test Procedure.....	25
5.4. Test Data.....	25
6. Antenna Requirement.....	28
6.1. Test Standard and Requirement.....	28
6.2. Antenna Connected Construction.....	28
APPENDIX I -- TEST SETUP PHOTOGRAPH.....	29
APPENDIX II -- EXTERNAL PHOTOGRAPH.....	30
APPENDIX III -- INTERNAL PHOTOGRAPH.....	34

TEST REPORT

Applicant : Anker Innovations Limited
Manufacturer : Anker Innovations Limited
Product Name : Wireless Vertical Ergonomic Mouse
Model No. : A7852M
Trade Mark : **ANKER**
Rating(s) : Input: DC 3V, 10mA "AAA" battery*2

Test Standard(s) : FCC Part15 Subpart C, Paragraph 15.249

Test Method(s) : ANSI C63.10: 2013

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 Test

Jul. 09~20, 2018

Prepared By



(Engineer / Oliay Yang)

Reviewer



(Supervisor / Calvin Liu)

Approved & Authorized Signer



(Manager / Tom Chen)

1. General Information

1.1. Client Information

Applicant	:	Anker Innovations Limited
Address	:	Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hongkong
Manufacturer	:	Anker Innovations Limited
Address	:	Room 1318-19, Hollywood Plaza, 610 Nathan Road, Mongkok, Kowloon, Hongkong

1.2. Description of Device (EUT)

Product Name	:	Wireless Vertical Ergonomic Mouse
Model No.	:	A7852M
Trade Mark	:	
Test Power Supply	:	DC 3V Battery inside
Test Sample No.	:	S1, S2
Product Description	Operation Frequency:	2408-2474MHz
	Number of Channel:	34 Channels
	Modulation Type:	FSK
	Antenna Type:	PCB Antenna
	Antenna Gain(Peak):	-5.35 dBi
Remark: 1)For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual. 2)This report is for 2.4GHz.		

1.3. Auxiliary Equipment Used During Test

Notebook	:	Manufacturer: FUJITSU LIMITED M/N: LH531 S/N: 518127-01R2300775 DC Rating: DC 19V, 4.22A CE , FCC DOC, CCC
	:	Adapter: M/N: ADP-602HA Input: 100V-240V~ 50/60Hz, 1.5A Output: DC 19V, 3.16A

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	Keeping TX mode
Mode 2	CH01
Mode 3	CH17
Mode 4	CH34

For Radiated Emission	
Final Test Mode	Description
Mode 1	Keeping TX mode
Mode 2	CH01
Mode 3	CH17
Mode 4	CH34

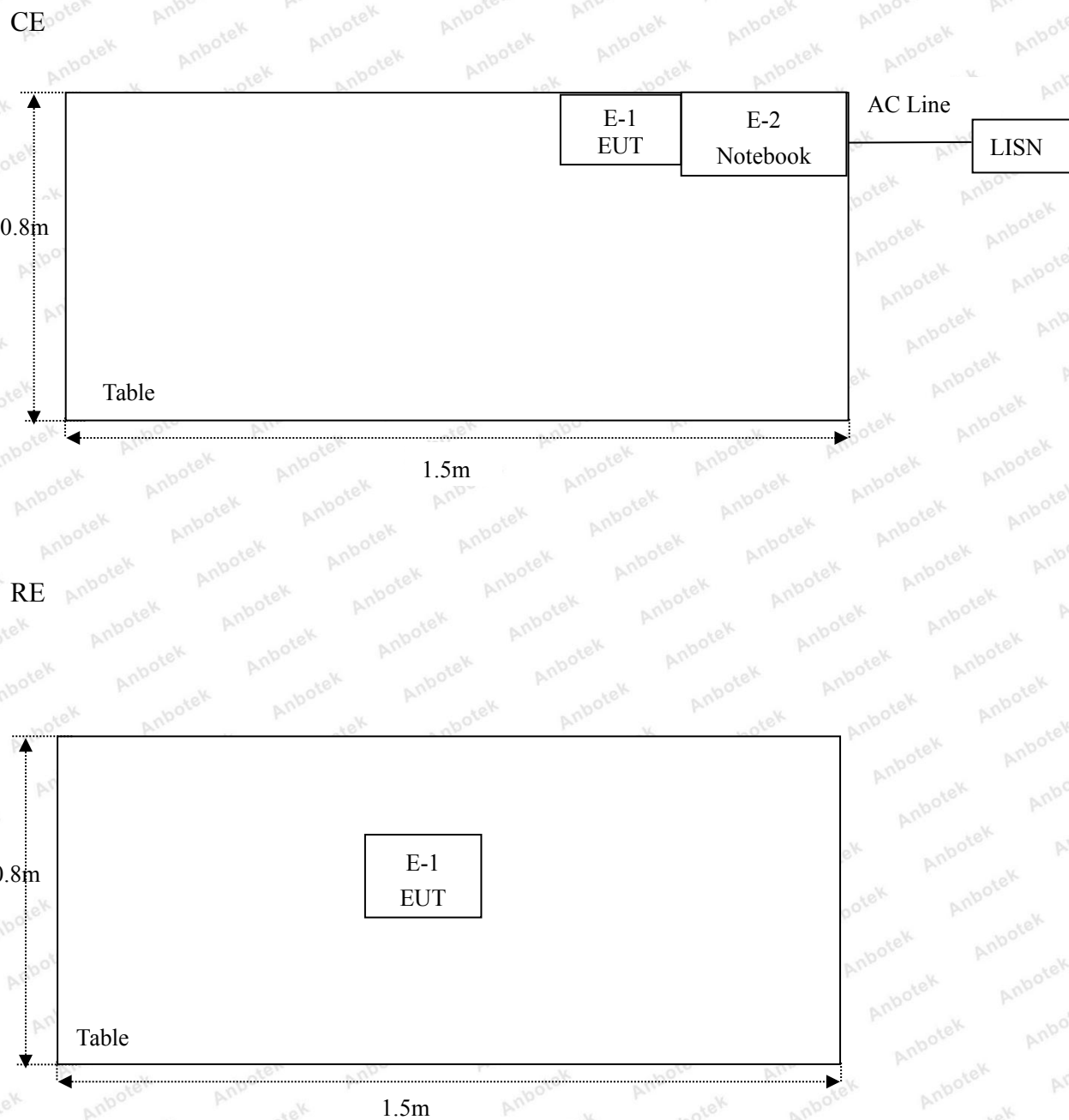
Note:

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.

1.5. List of Channels

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	2408	10	2426	19	2444	28	2462
2	2410	11	2428	20	2446	29	2464
3	2412	12	2430	21	2448	30	2466
4	2414	13	2432	22	2450	31	2468
5	2416	14	2434	23	2452	32	2470
6	2418	15	2436	24	2454	33	2472
7	2420	16	2438	25	2456	34	2474
8	2422	17	2440	26	2458		
9	2424	18	2442	27	2460		

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	Nov. 17, 2017	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 17, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Nov. 17, 2017	1 Year
4.	Spectrum Analysis	Agilent	E4407B	US39390582	Nov. 17, 2017	1 Year
5.	Spectrum Analysis	Agilent	N9038A	MY53227295	Nov. 17, 2017	1 Year
6.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	Nov. 17, 2017	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Nov. 17, 2017	1 Year
8.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Nov. 20, 2017	1 Year
9.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Nov. 20, 2017	1 Year
10.	Loop Antenna	Schwarzbeck	HFH2-Z2	100047	Nov. 17, 2017	1 Year
11.	Horn Antenna	Schwarzbeck	BBHA9170	9170-375	Nov. 17, 2017	1 Year
12.	Pre-amplifier	SONOMA	310N	186860	Nov. 17, 2017	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	Nov. 18, 2017	1 Year
15.	Power Sensor	DAER	RPR3006W	15I00041SN045	Nov. 17, 2017	1 Year
16.	Power Sensor	DAER	RPR3006W	15I00041SN046	Nov. 17, 2017	1 Year
17.	MXA Spectrum Analysis	Agilent	N9020A	MY51170037	Nov. 18, 2017	1 Year
18.	MXG RF Vector Signal Generator	Agilent	N5182A	MY48180656	Nov. 18, 2017	1 Year
19.	Signal Generator	Agilent	E4421B	MY41000743	Nov. 18, 2017	1 Year
20.	DC Power Supply	LW	TPR-6410D	349315	Nov. 01, 2017	1 Year
21.	Constant Temperature Humidity Chamber	Sertep	ZJ-HWHS80B	ZJ-17042804	Nov. 01, 2017	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 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, July 31, 2017.

ISED-Registration No.: 8058A-1

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-1, June 13, 2016.

Test Location

All Emissions tests were performed at Shenzhen Anbotek Compliance Laboratory Limited.
at 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	Antenna Requirement	PASS
15.207	Conducted Emission	N/A
15.249	Radiated Emission	PASS
15.215(c)	20dB Bandwidth	PASS
15.249(c)	Band Edge	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		

3.1. Test Standard and Limit

Remark: (1) *Decreasing linearly with logarithm of the frequency.
(2) The lower limit shall apply at the transition frequency.

The diagram illustrates the setup of a Shielding Room for EMC testing. Key components and their arrangement are as follows:

- Shielding Room:** The entire setup is enclosed within a room designed to prevent electromagnetic interference.
- Ground Reference Plane:** A horizontal plane at the base of the setup, used as a common reference for grounding.
- Test Receiver:** A device used to measure the electromagnetic emissions from the EUT.
- EUT (Equipment Under Test):** The device being tested, positioned on a table.
- AE (Antenna):** An antenna connected to the EUT, positioned at a height of 80cm from the Ground Reference Plane.
- LISN1 (Line Impedance Stabilization Network):** A component connected to the EUT and the Test Receiver, positioned at a distance of 90cm from the EUT.
- LISN2 (Line Impedance Stabilization Network):** A component connected to the AE and the Ground Reference Plane.

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 C63.10-2013 on Conducted Emission Measurement.

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

The EUT is powered by DC 3V Battery inside, so there is no need to conduct this test.

4. Radiated Emission and Band Edge

4.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.209 and 15.205				
	Frequency (MHz)	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
Test Limit	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.

Test Standard	FCC Part15 C Section 15.249					
	Frequency (MHz)	Field Strength of fundamental ((millivolts /meter)	Field Strength of Harmonics (microvolts/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
Test Limit	2400~2483.5	50	-	114.0	Peak	3
	2400~2483.5	50	-	94.0	Average	3
	2400~2483.5	-	500	74.0	Peak	3
	2400~2483.5	-	500	54.0	Average	3

Remark:

(1) 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

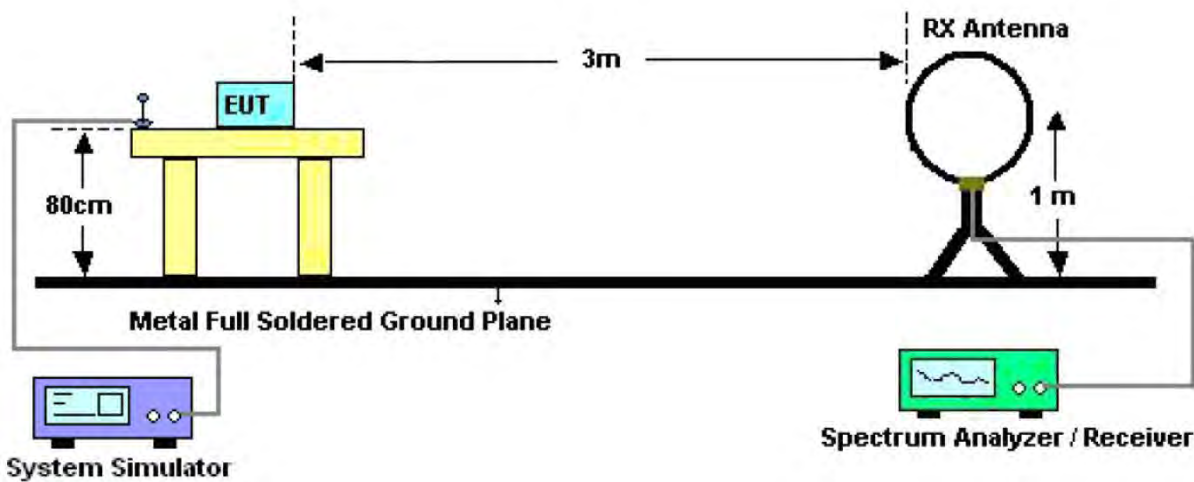


Figure 2. 30MHz to 1GHz

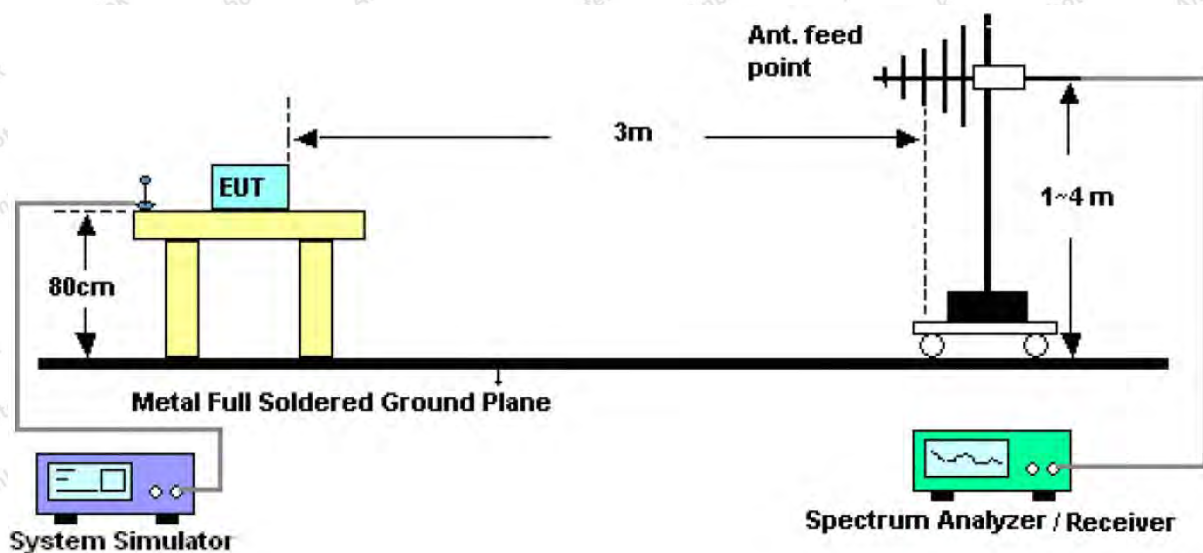
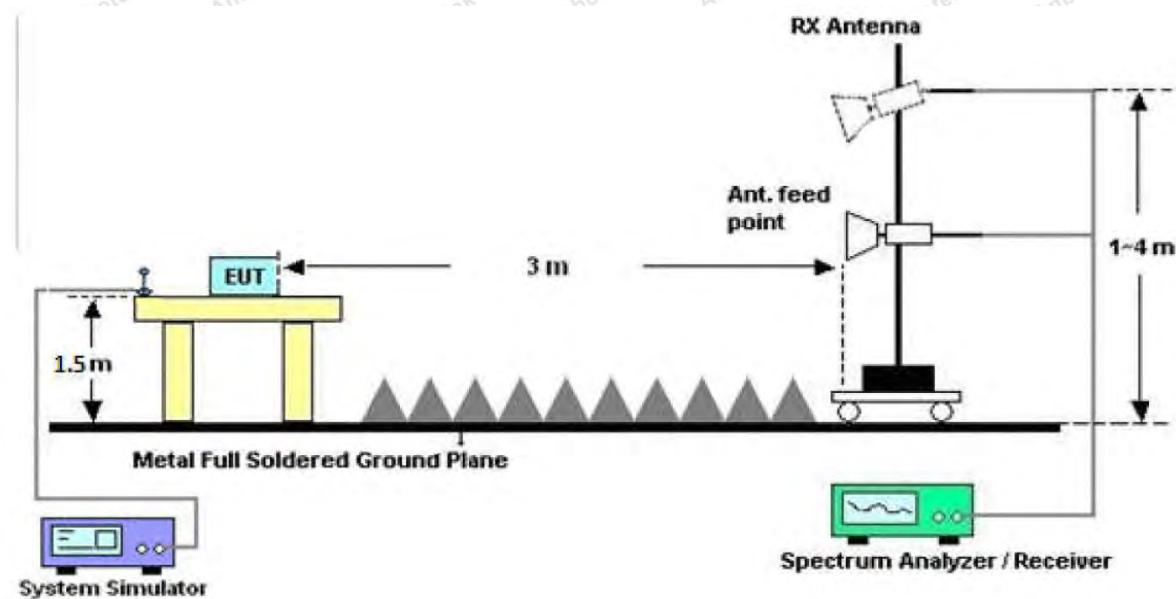


Figure 3. Above 1 GHz



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

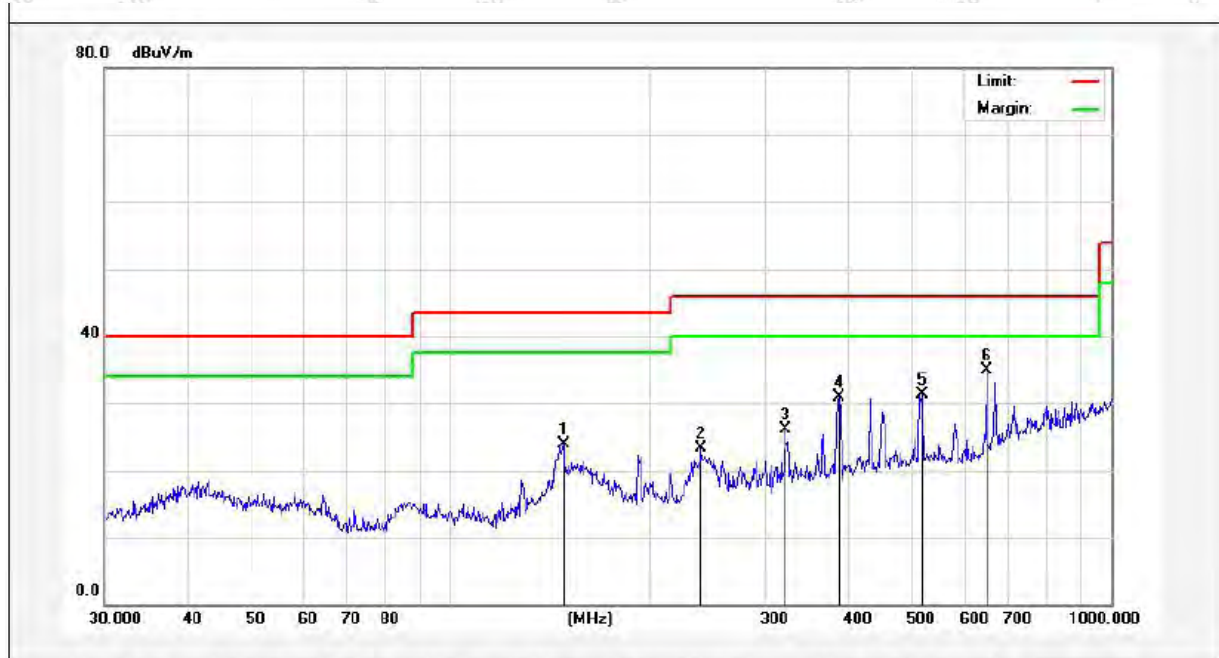
PASS

During the test, Pre-scan all 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.

Test Results (30~1000MHz)

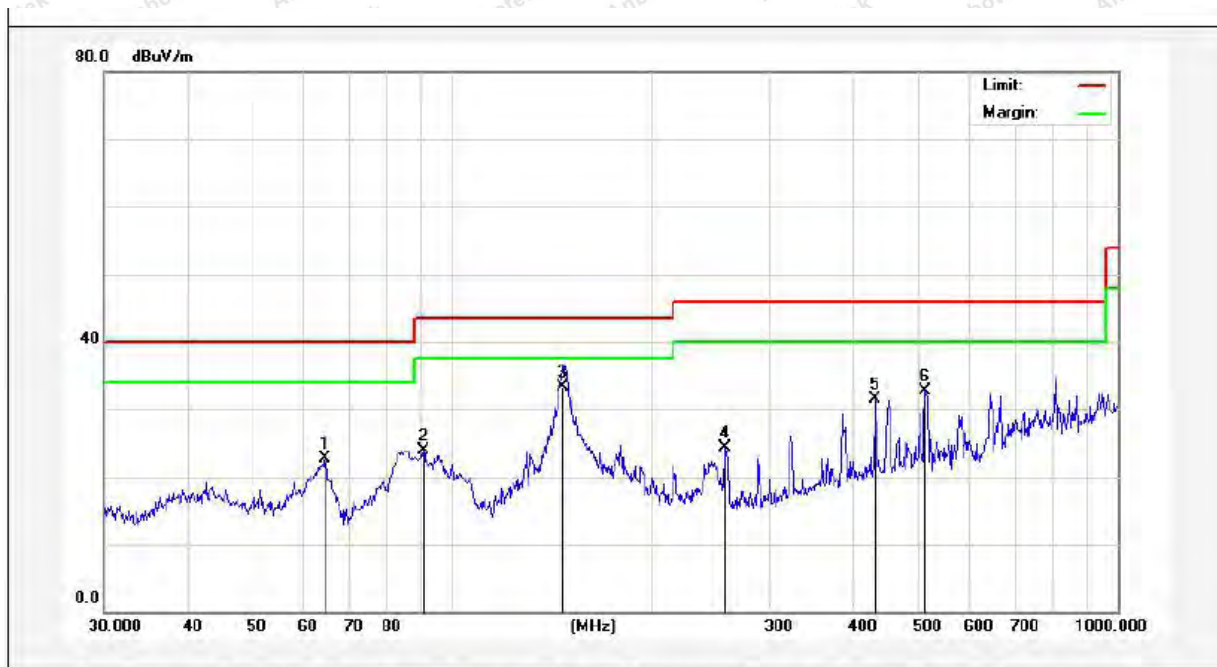
Job No.: SZAWW180709002-01 Temp.(°C)/Hum.(%RH): 23.3°C/54%RH
Standard: FCC PART 15C Power Source: DC 3V Battery inside
Test Mode: Mode 1 Polarization: Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	148.4410	45.25	-21.36	23.89	43.50	-19.61	QP	300	56	
2	239.9874	40.81	-17.49	23.32	46.00	-22.68	QP	300	77	
3	321.0608	41.22	-15.20	26.02	46.00	-19.98	QP	300	123	
4	387.9920	44.03	-13.11	30.92	46.00	-15.08	QP	300	167	
5	517.2480	42.31	-11.00	31.31	46.00	-14.69	QP	300	223	
6	647.3856	44.90	-9.92	34.98	46.00	-11.02	QP	300	331	

Test Results (30~1000MHz)

Job No.: SZAWW180709002-01 Temp.(°C)/Hum.(%RH): 23.3°C/54%RH
Standard: FCC PART 15C Power Source: DC 3V Battery inside
Test Mode: Mode 1 Polarization: Vertical



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	64.4331	40.35	-17.66	22.69	40.00	-17.31	QP	300	78	
2	90.5374	41.04	-17.06	23.98	43.50	-19.52	QP	300	124	
3	146.8877	50.62	-17.38	33.24	43.50	-10.26	QP	300	166	
4	257.4222	37.85	-13.58	24.27	46.00	-21.73	QP	300	258	
5	432.5457	42.67	-11.24	31.43	46.00	-14.57	QP	300	311	
6	513.6331	43.36	-10.72	32.64	46.00	-13.36	QP	300	360	

Test Results (1GHz-25GHz)

Test Mode: CH01 (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
2408.0000	94.25	31.12	2.18	35.33	92.22	114.00	-21.78	V	Peak
2408.0000	85.22	31.12	2.18	35.33	83.19	94.00	-10.81	V	AVG
4816.0000	47.01	34.01	2.58	34.65	48.95	74.00	-25.05	V	Peak
4816.0000	42.55	34.01	2.58	34.65	44.49	54.00	-9.51	V	AVG
7224.0000	43.21	36.16	2.97	35.07	47.27	74.00	-26.73	V	Peak
7224.0000	33.57	36.16	2.97	35.07	37.63	54.00	-16.37	V	AVG
9632.0000	*								
12040.0000	*								
14448.0000	*								
16856.0000	*								
2408.0000	91.24	31.12	2.18	35.33	89.21	114.00	-24.79	H	Peak
2408.0000	80.36	31.12	2.18	35.33	78.33	94.00	-15.67	H	AVG
4816.0000	45.54	34.01	2.58	34.65	47.48	74.00	-26.52	H	Peak
4816.0000	38.22	34.01	2.58	34.65	40.16	54.00	-13.84	H	AVG
7224.0000	40.00	36.16	2.97	35.07	44.06	74.00	-29.94	H	Peak
7224.0000	34.57	36.16	2.97	35.07	38.63	54.00	-15.37	H	AVG
9632.0000	*								
12040.0000	*								
14448.0000	*								
16856.0000	*								

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: CH17 (Middle 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
2440.0000	93.22	31.12	2.20	34.51	92.03	114.00	-21.97	V	Peak
2440.0000	88.12	31.22	2.20	34.51	87.03	94.00	-6.97	V	AVG
4880.0000	46.51	34.98	2.49	34.14	49.84	74.00	-24.16	V	Peak
4880.0000	42.55	34.98	2.49	34.14	45.88	54.00	-8.12	V	AVG
7320.0000	37.85	36.01	3.01	34.56	42.31	74.00	-31.69	V	Peak
7320.0000	32.55	36.01	3.01	34.56	37.01	54.00	-16.99	V	AVG
9760.0000	*								
12200.0000	*								
14640.0000	*								
17080.0000	*								
2440.0000	90.21	31.12	2.20	34.51	89.02	114.00	-24.98	H	Peak
2440.0000	74.58	31.12	2.20	34.51	73.39	94.00	-20.61	H	AVG
4880.0000	43.21	34.98	2.49	34.14	46.54	74.00	-27.46	H	Peak
4880.0000	36.54	34.98	2.49	34.14	39.87	54.00	-14.13	H	AVG
7320.0000	38.21	36.01	3.01	34.56	42.67	74.00	-31.33	H	Peak
7320.0000	30.55	36.01	3.01	34.56	35.01	54.00	-18.99	H	AVG
9760.0000	*								
12200.0000	*								
14640.0000	*								
17080.0000	*								

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: CH34 (High 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
2474.0000	95.21	31.65	2.23	36.07	93.02	114.00	-20.98	V	Peak
2474.0000	85.21	31.65	2.23	36.07	83.02	94.00	-10.98	V	AVG
4948.0000	51.32	35.06	2.60	34.93	54.05	74.00	-19.95	V	Peak
4948.0000	42.66	35.06	2.60	34.93	45.39	54.00	-8.61	V	AVG
7422.0000	38.95	36.19	3.12	35.11	43.15	74.00	-30.85	V	Peak
7422.0000	34.56	36.19	3.12	35.11	38.76	54.00	-15.24	V	AVG
9896.0000	*								
12370.0000	*								
14844.0000	*								
17318.0000	*								
2474.0000	90.58	31.65	2.23	36.07	88.39	114.00	-25.61	H	Peak
2474.0000	74.65	31.65	2.23	36.07	72.46	94.00	-21.54	H	AVG
4948.0000	45.33	35.06	2.60	34.93	48.06	74.00	-25.94	H	Peak
4948.0000	38.54	35.06	2.60	34.93	41.27	54.00	-12.73	H	AVG
7422.0000	41.52	36.19	3.12	35.11	45.72	74.00	-28.28	H	Peak
7422.0000	33.96	36.19	3.12	35.11	38.16	54.00	-15.84	H	AVG
9896.0000	*								
12370.0000	*								
14844.0000	*								
17318.0000	*								

Note:

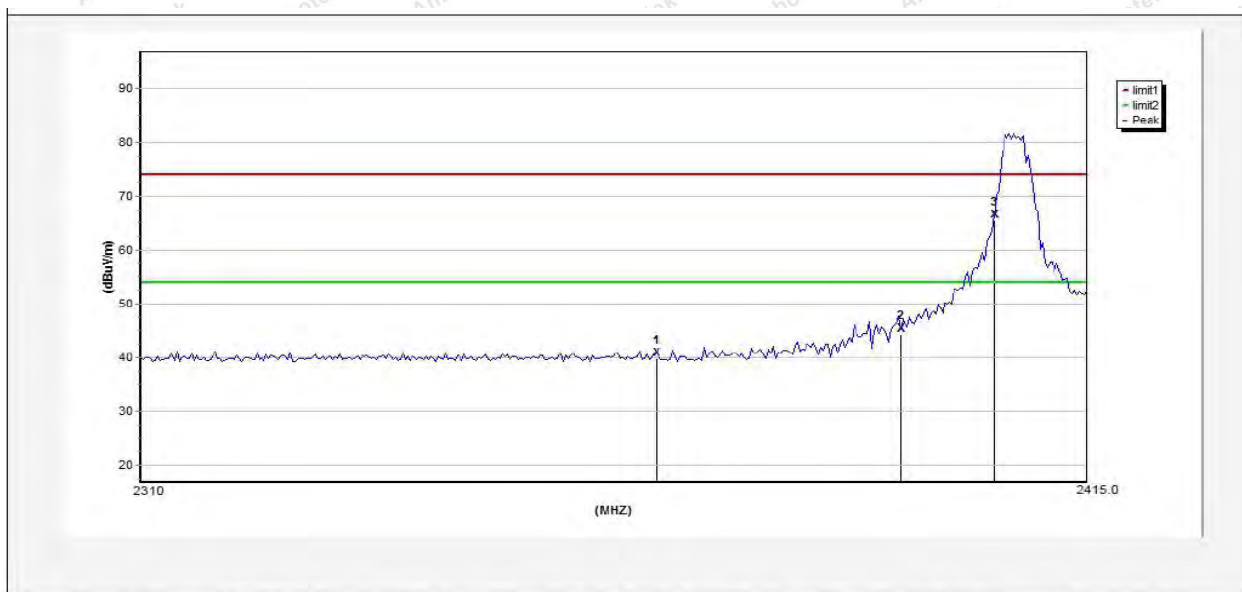
1. Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor
2. “*” means the test results were attenuated more than 20dB below the permissible limits, so the results don't record in the report.

Radiated Band Edge:

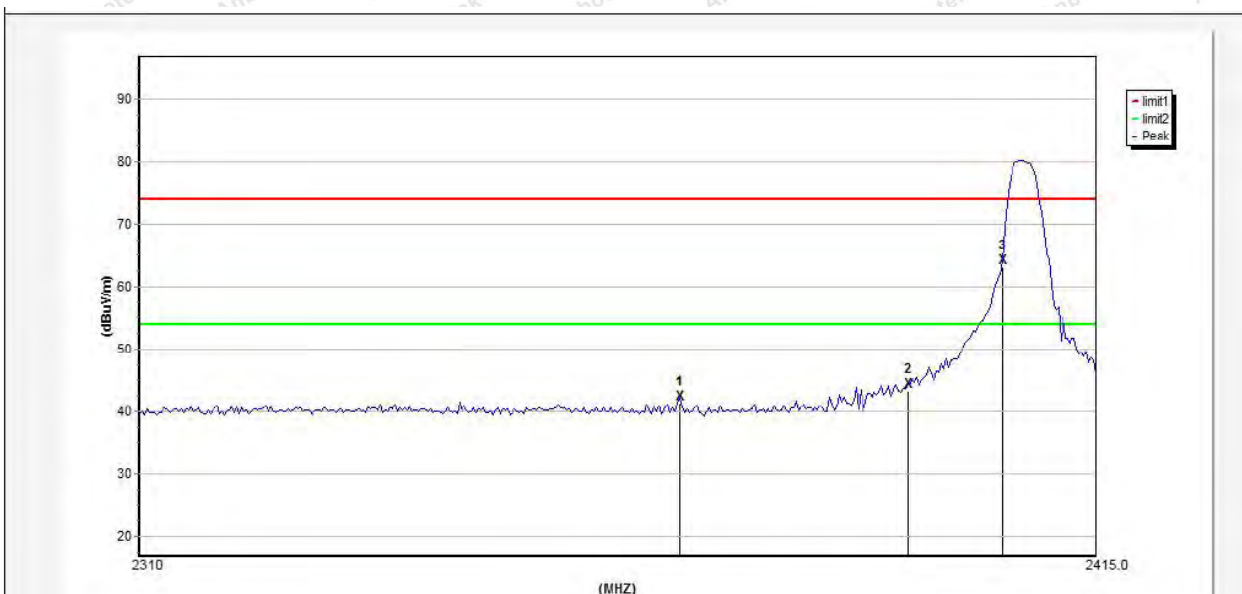
Test Mode: CH01

Test channel: Lowest

Peak Value

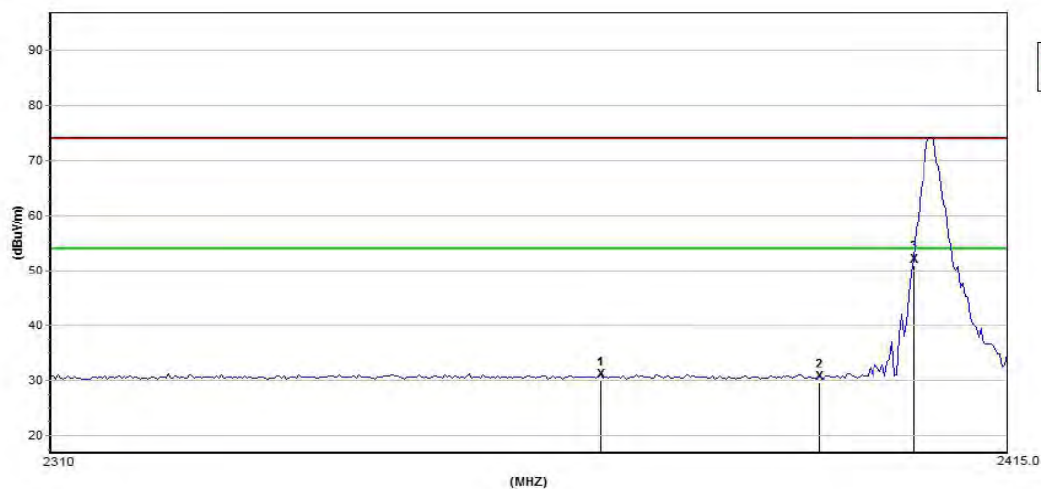


No.	Freq. (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Amp. (dB/m)	Cable (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)
1	2364.0000	43.36	-2.57	9.42	9.42	40.79	74.00	-33.21	peak	---	---
2	2390.0000	47.92	-2.51	9.55	9.55	45.41	74.00	-28.59	peak	---	---
3	2400.0000	68.92	-2.49	9.6	9.6	66.43	74.00	-7.57	peak	---	---

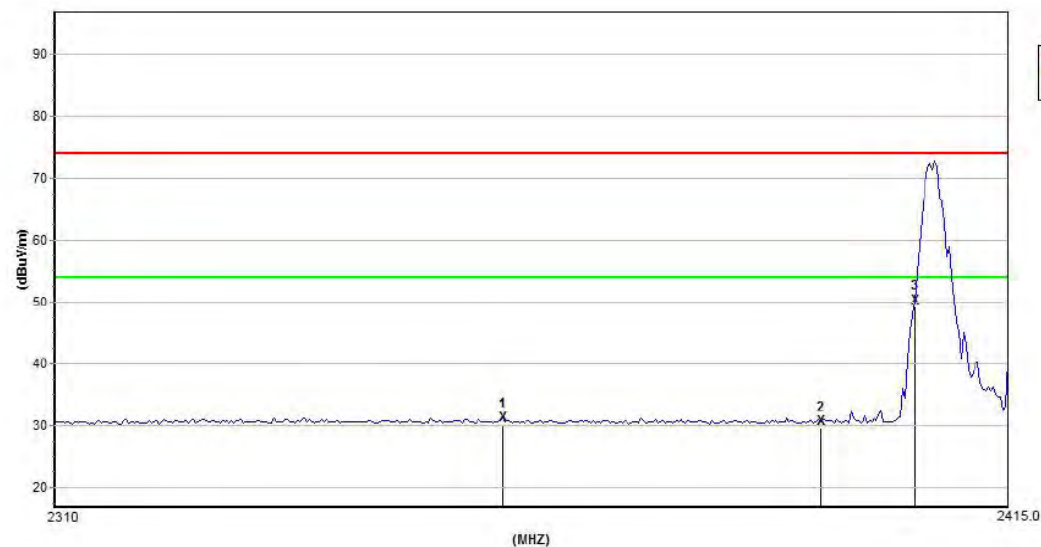


No.	Freq. (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Amp. (dB/m)	Cable (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)
1	2366.0000	44.88	-2.57	9.43	9.43	42.31	74.00	-31.69	peak	---	---
2	2390.0000	46.88	-2.51	9.55	9.55	44.37	74.00	-29.63	peak	---	---
3	2400.0000	66.74	-2.49	9.6	9.6	64.25	74.00	-9.75	peak	---	---

Average Value



No.	Freq. (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Amp. (dB/m)	Cable (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)
1	2367.0000	33.64	-2.57	9.43	9.43	31.07	54.00	-22.93	AVG	---	---
2	2390.0000	33.04	-2.51	9.55	9.55	30.53	54.00	-23.47	AVG	---	---
3	2400.0000	54.40	-2.49	9.6	9.6	51.91	54.00	-2.09	AVG	---	---

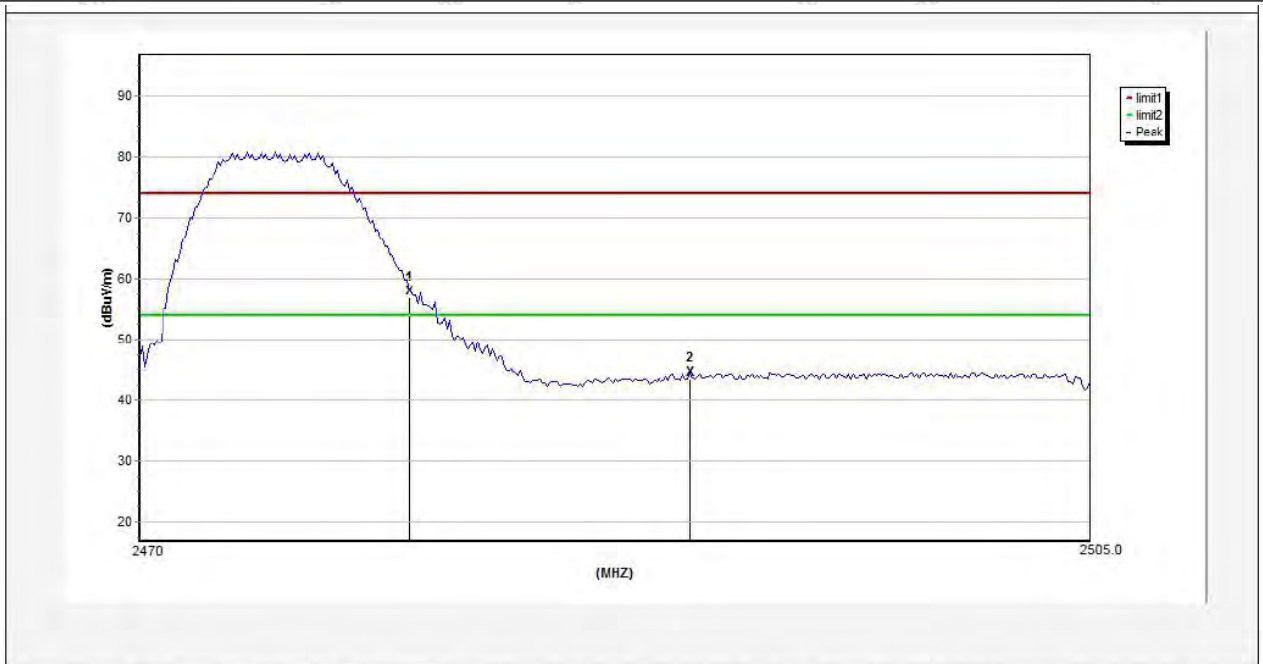


No.	Freq. (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Amp. (dB/m)	Cable (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)
1	2356.5000	33.85	-2.59	9.38	9.38	31.26	54.00	-22.74	AVG	---	---
2	2390.0000	33.23	-2.51	9.55	9.55	30.72	54.00	-23.28	AVG	---	---
3	2400.0000	52.75	-2.49	9.6	9.6	50.26	54.00	-3.74	AVG	---	---

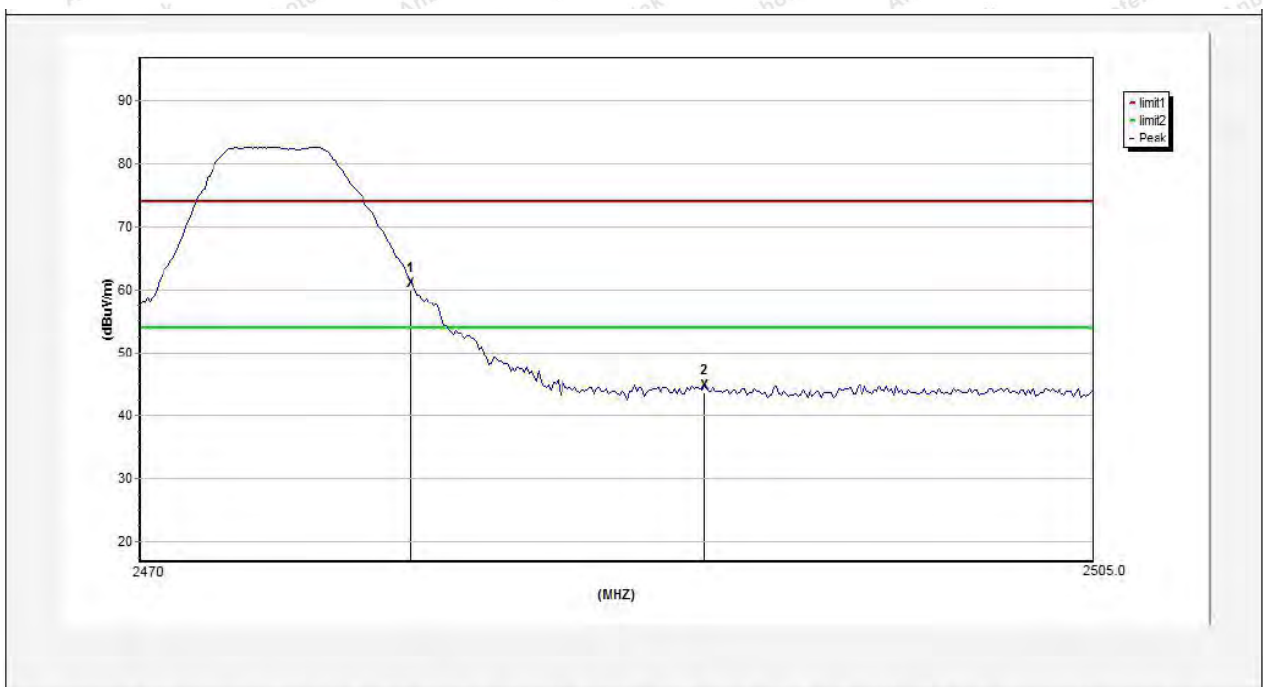
Test Mode: CH34

Test channel: Highest

Peak Value

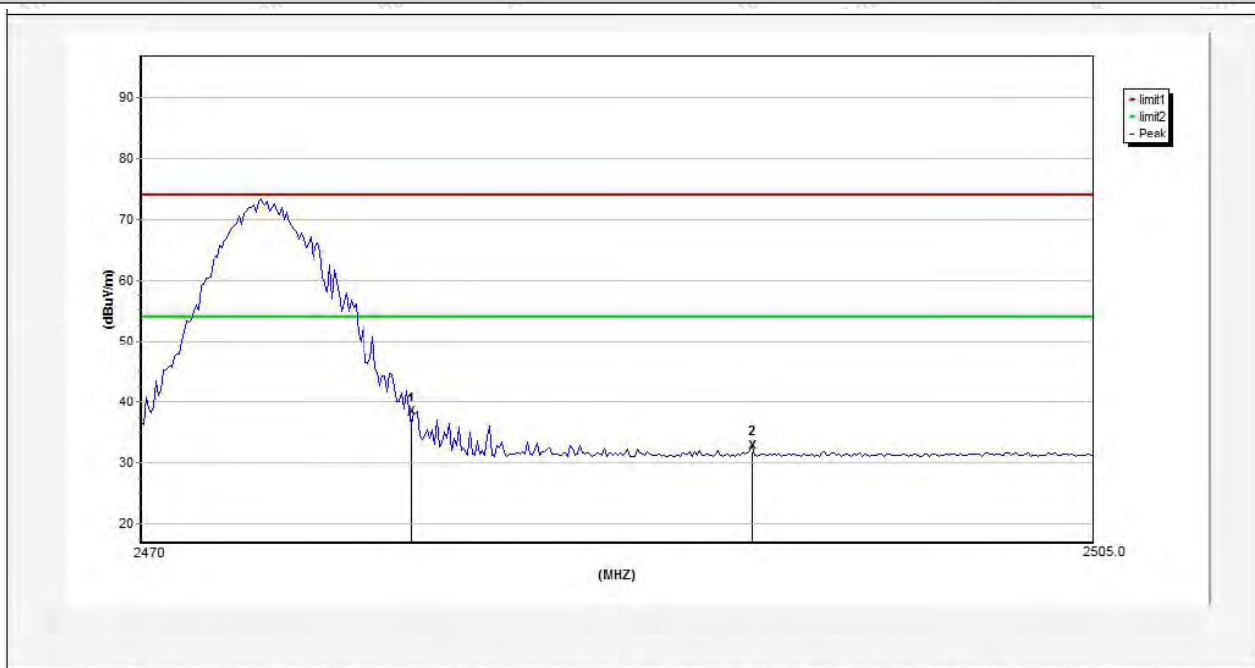


No.	Freq. (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Amp. (dB/m)	Cable (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)
1	2483.5000	60.17	-2.31	10.01	10.01	57.86	74.00	-16.14	peak	---	---
2	2490.2820	46.89	-2.29	10.04	10.04	44.60	74.00	-29.40	peak	---	---

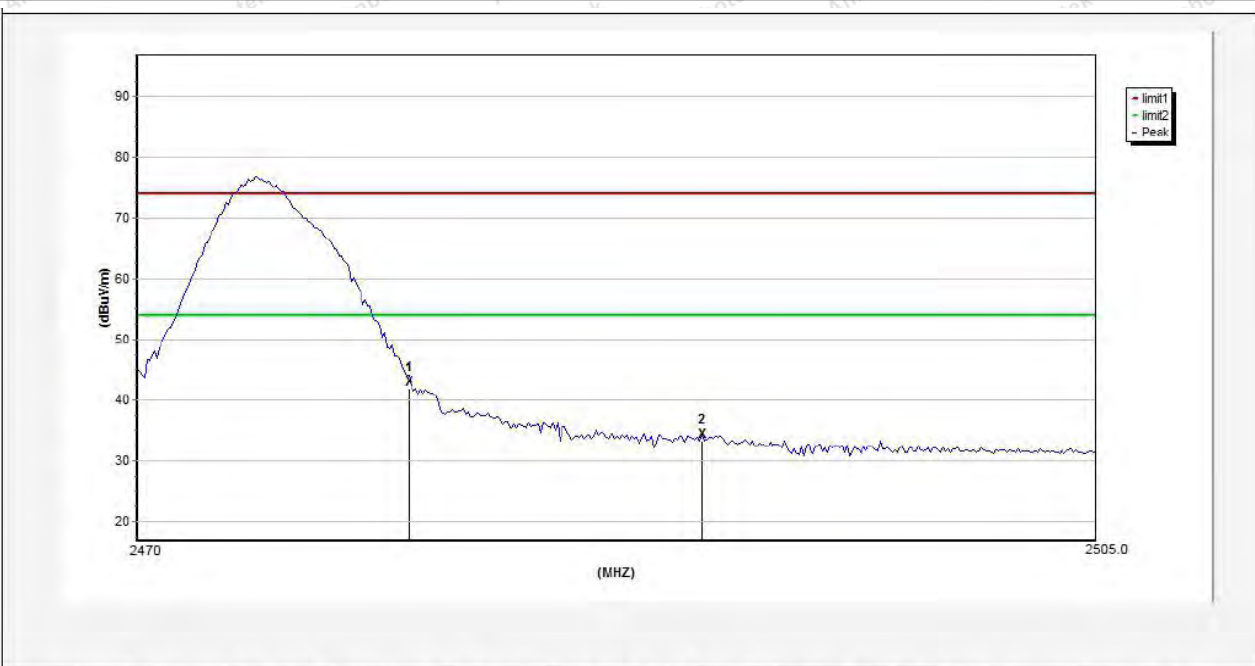


No.	Freq. (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Amp. (dB/m)	Cable (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)
1	2483.5000	63.37	-2.31	10.01	10.01	61.06	74.00	-12.94	peak	---	---
2	2490.5700	47.13	-2.29	10.04	10.04	44.84	74.00	-29.16	peak	---	---

Average Value



No.	Freq. (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Amp. (dB/m)	Cable (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)
1	2483.5000	40.56	-2.31	10.01	10.01	38.25	54.00	-15.75	AVG	---	---
2	2491.7200	35.03	-2.29	10.05	10.05	32.74	54.00	-21.26	AVG	---	---

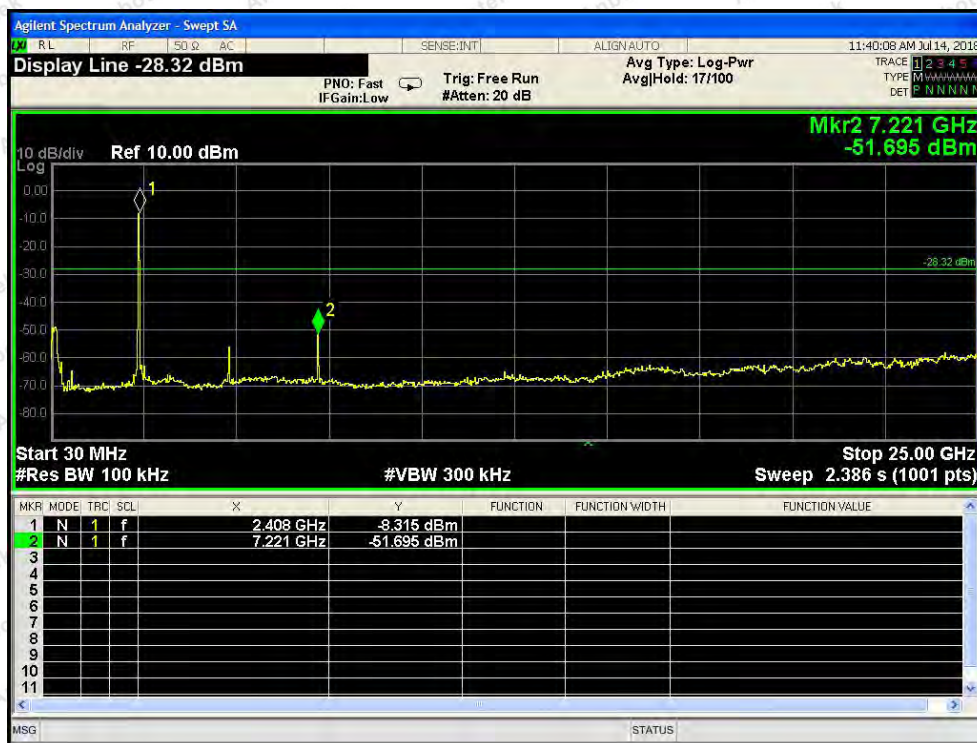


No.	Freq. (MHz)	Reading (dBuV/m)	Antenna (dB/m)	Amp. (dB/m)	Cable (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)
1	2483.5000	45.30	-2.31	10.01	10.01	42.99	54.00	-11.01	AVG	---	---
2	2490.5120	36.69	-2.29	10.04	10.04	34.40	54.00	-19.60	AVG	---	---

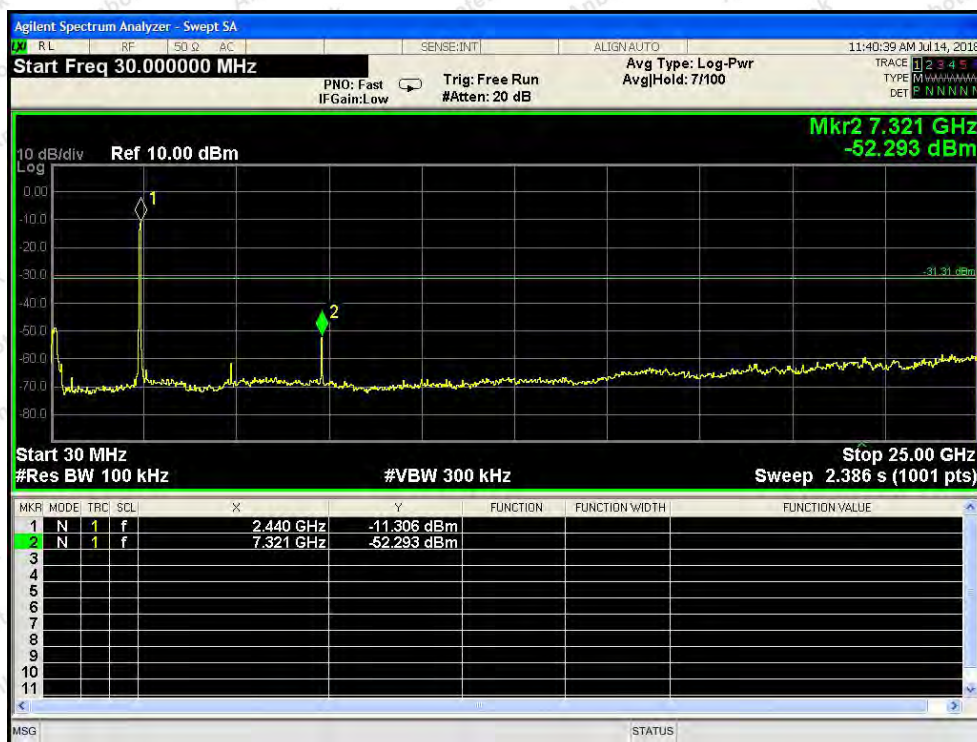
Remark:

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

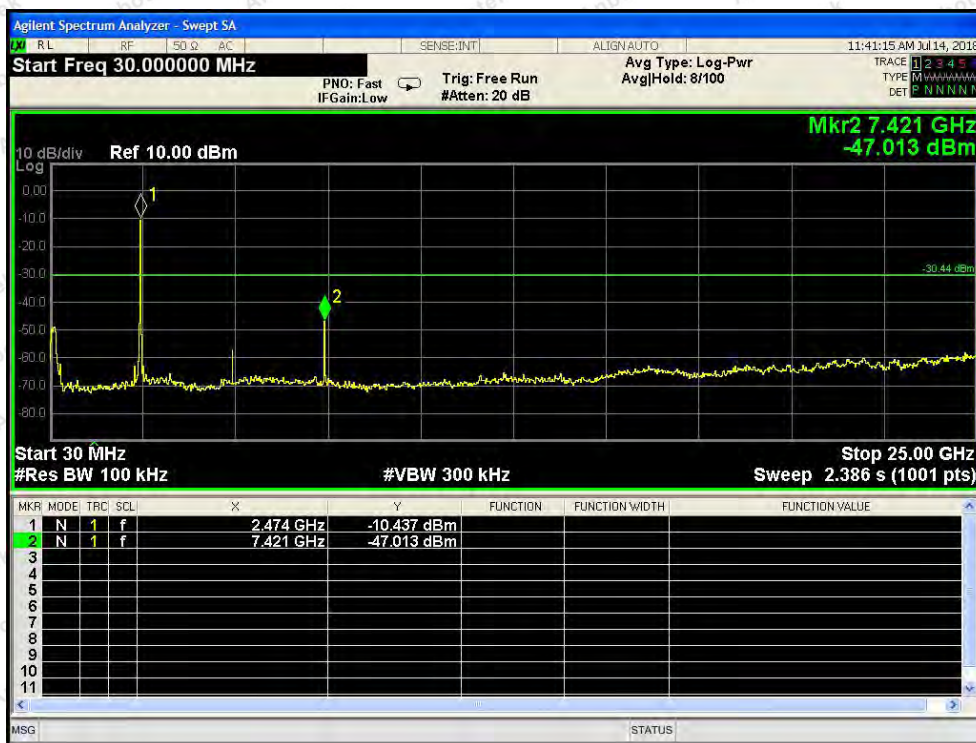
Conducted Emission Method



CH: Low



CH: Middle



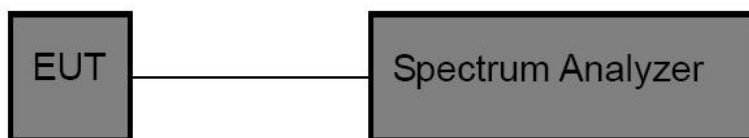
CH: High

5. 20dB Bandwidth Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.249
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5.2. Test Setup



5.3. Test Procedure

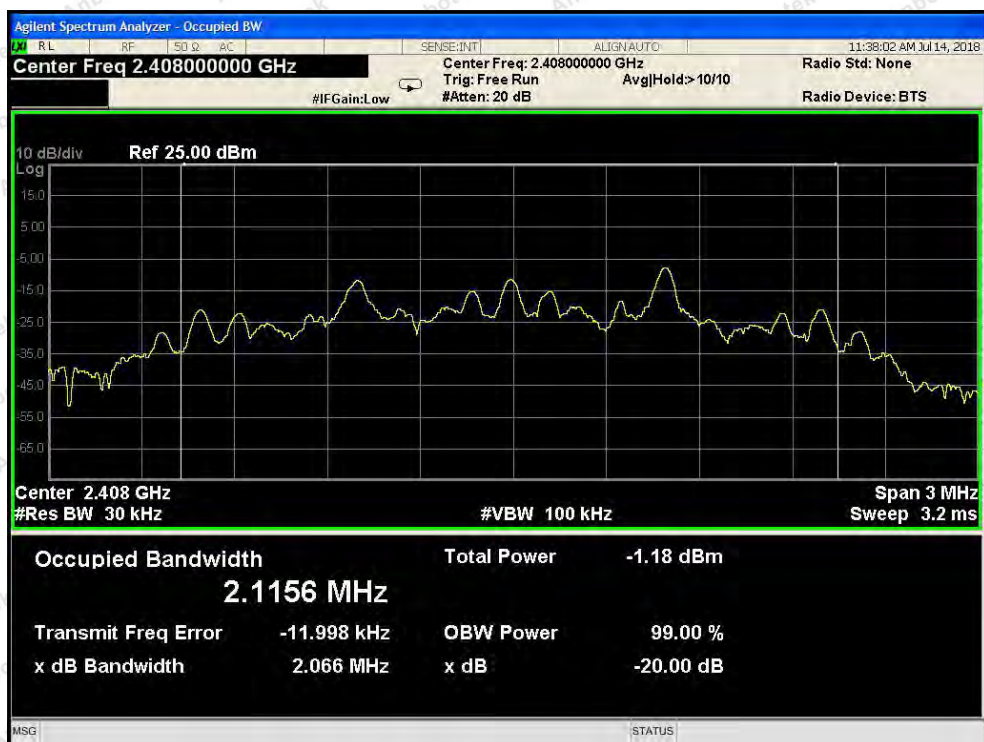
1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:
 RBW = 30kHz, VBW ≥ 3*RBW = 100kHz,
 Detector = Average
 Trace mode = Max hold.
 Sweep - auto couple.
4. Mark the peak frequency and -20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

5.4. Test Data

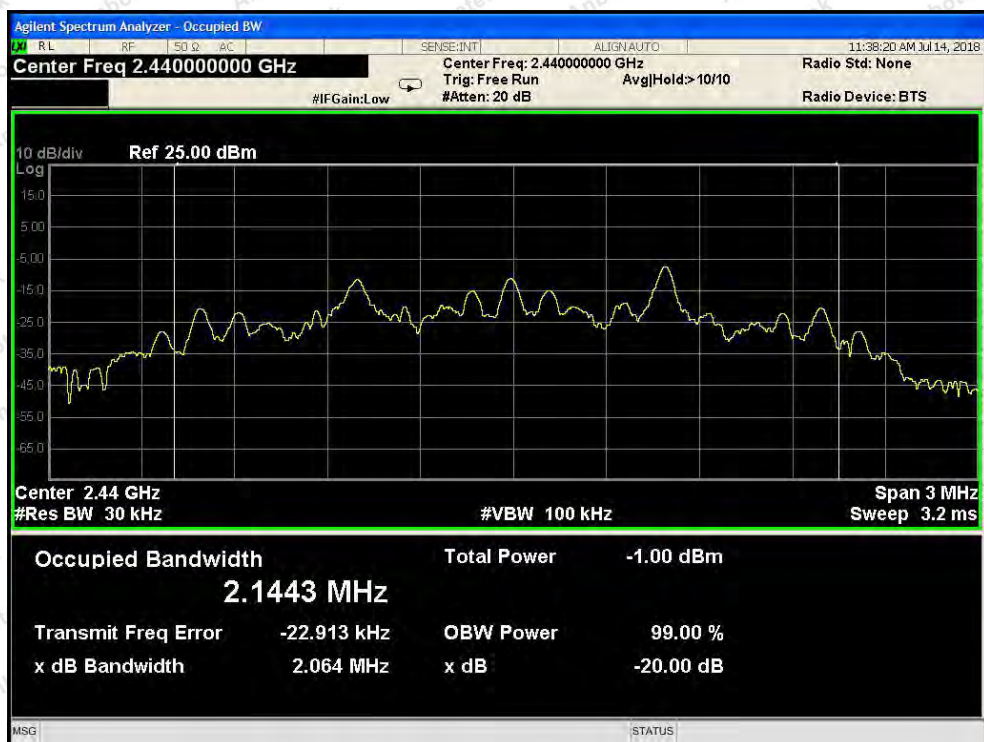
Test Item : 20dB Bandwidth
 Test Voltage : DC 3V Battery inside
 Test Result : PASS

Test Mode : Mode 1
 Temperature : 24°C
 Humidity : 55%RH

Frequency (MHz)	Bandwidth (kHz)	Result
2408MHZ	2066	PASS
2440MHZ	2064	PASS
2474MHZ	2089	PASS



Test Mode: Low



Test Mode: Middle



Test Mode: High

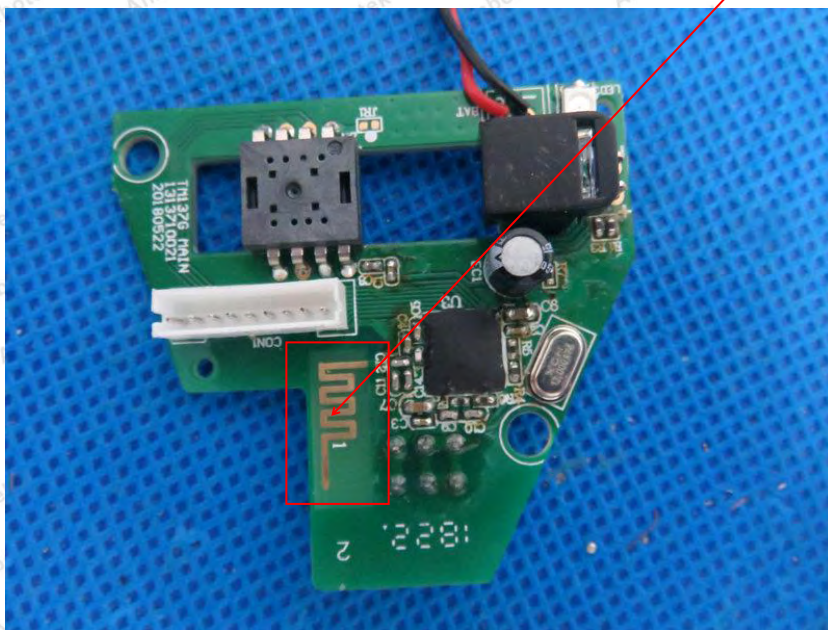
6. Antenna Requirement

6.1. Test Standard and Requirement

Test Standard	FCC Part15 Section 15.203
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.

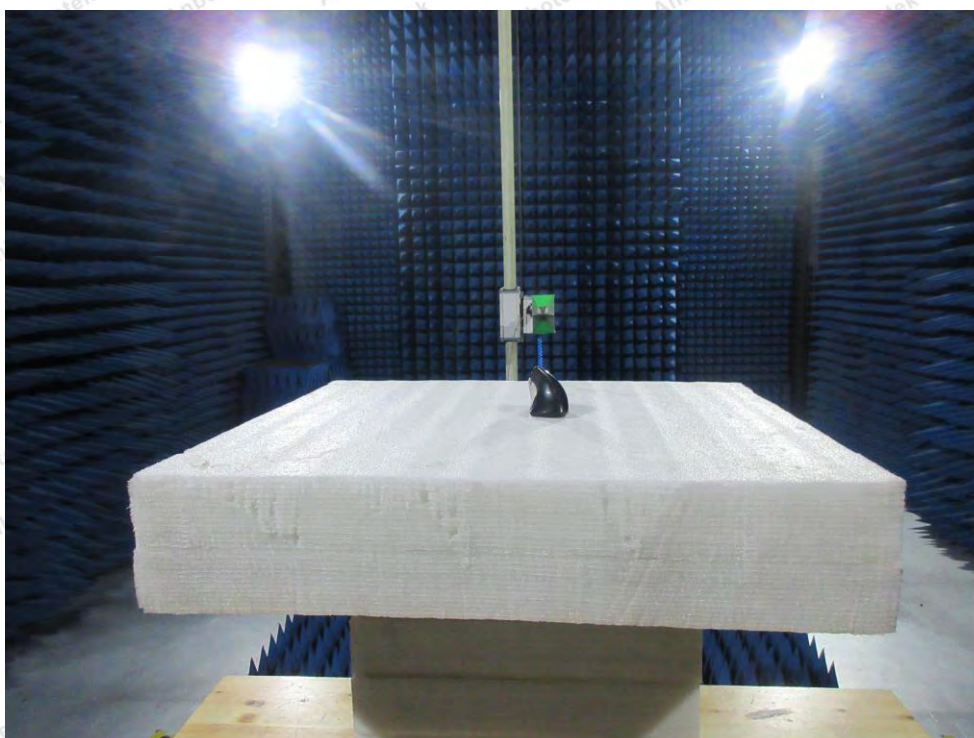
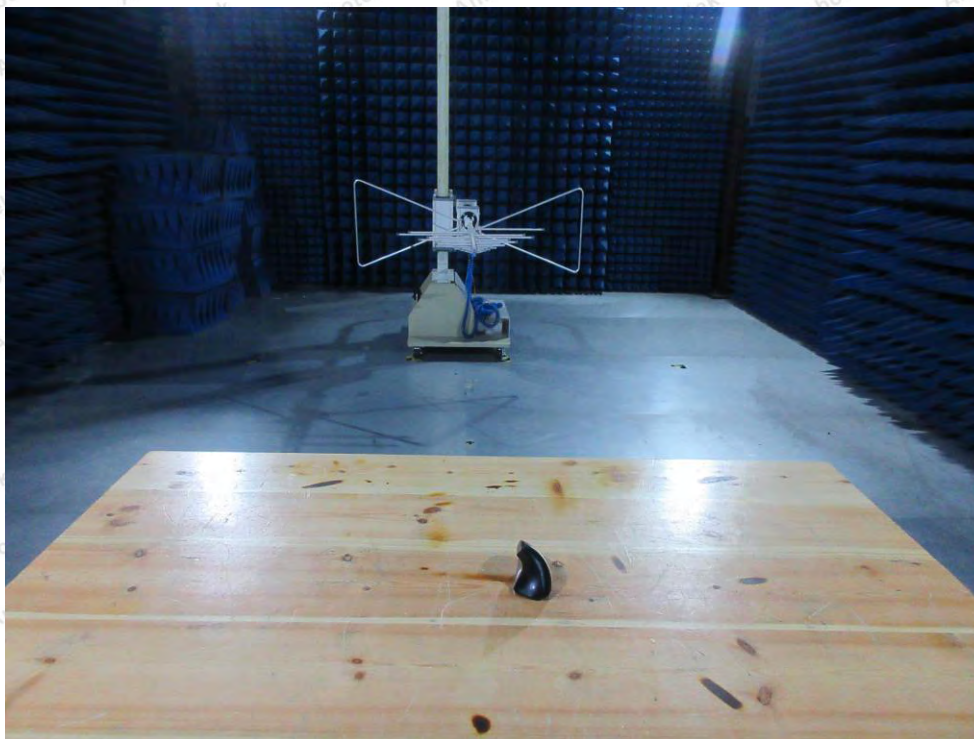
6.2. Antenna Connected Construction

The antenna is a PCB Antenna which permanently attached, and the best case gain of the antenna is -5.35 dBi. It complies with the standard requirement.



APPENDIX I-- TEST SETUP PHOTOGRAPH

Photo of Radiation Emission Test



APPENDIX II -- EXTERNAL PHOTOGRAPH

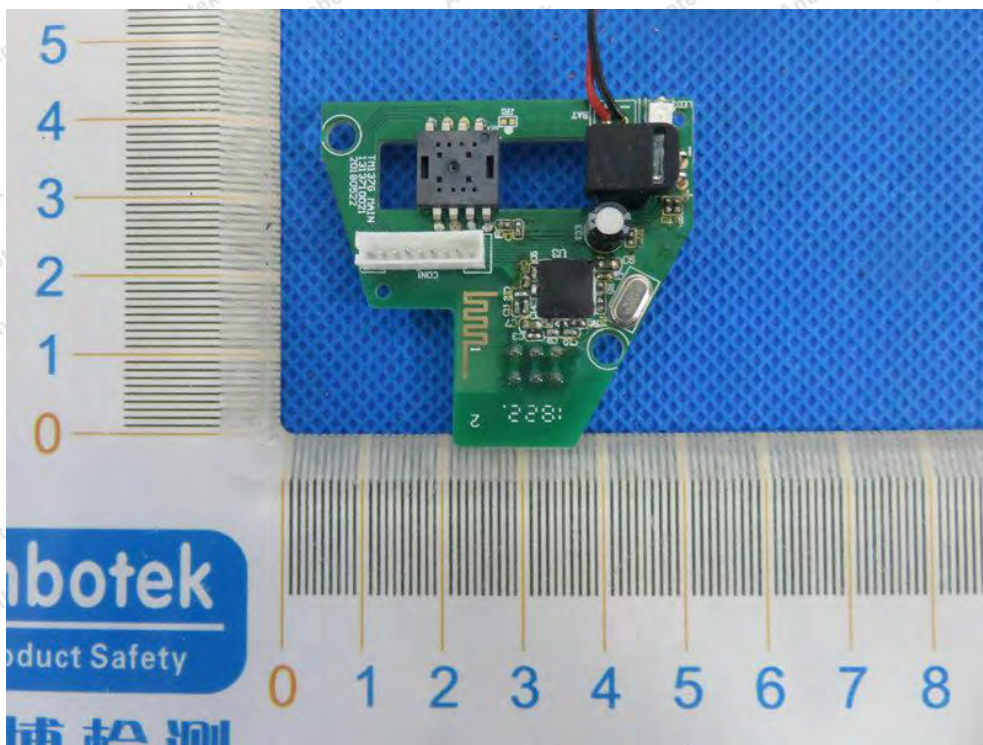


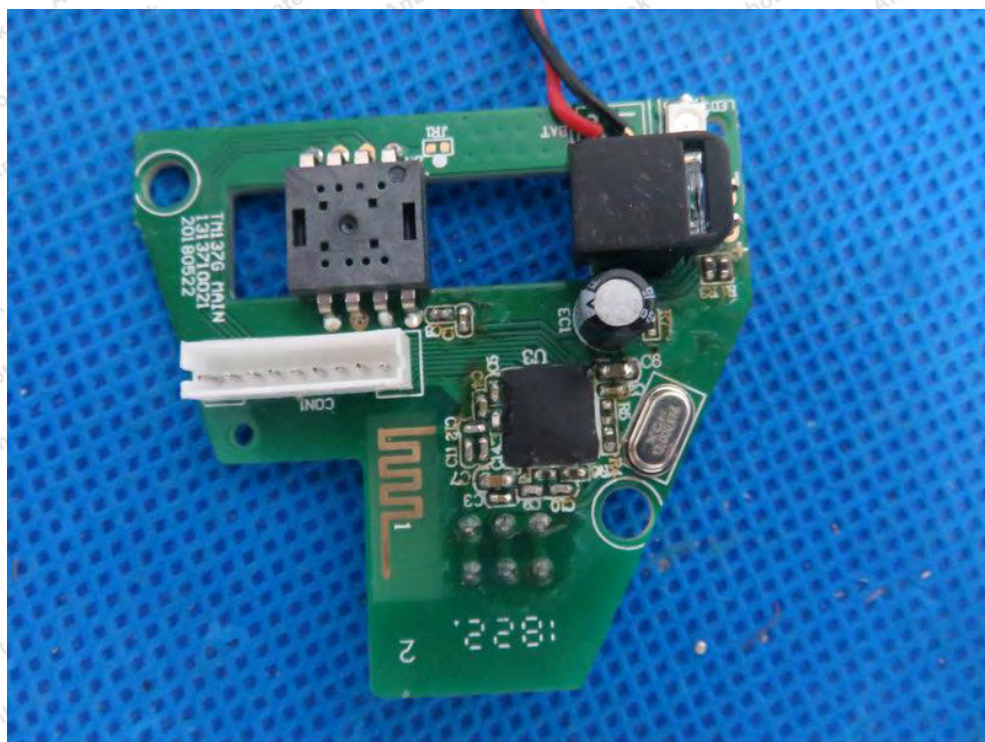
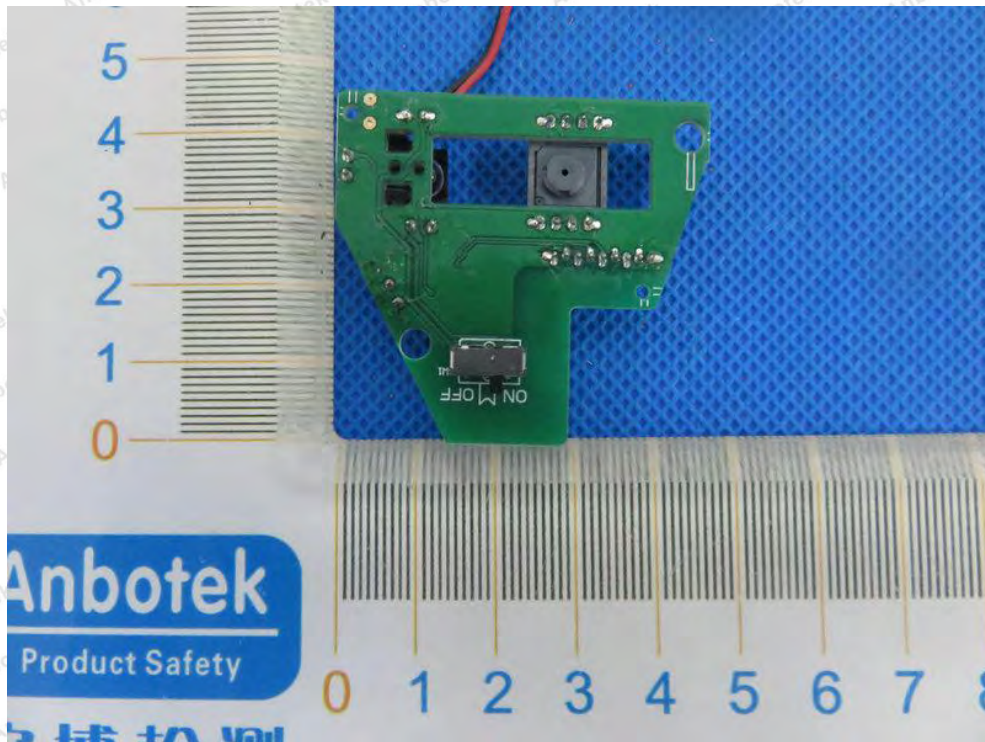


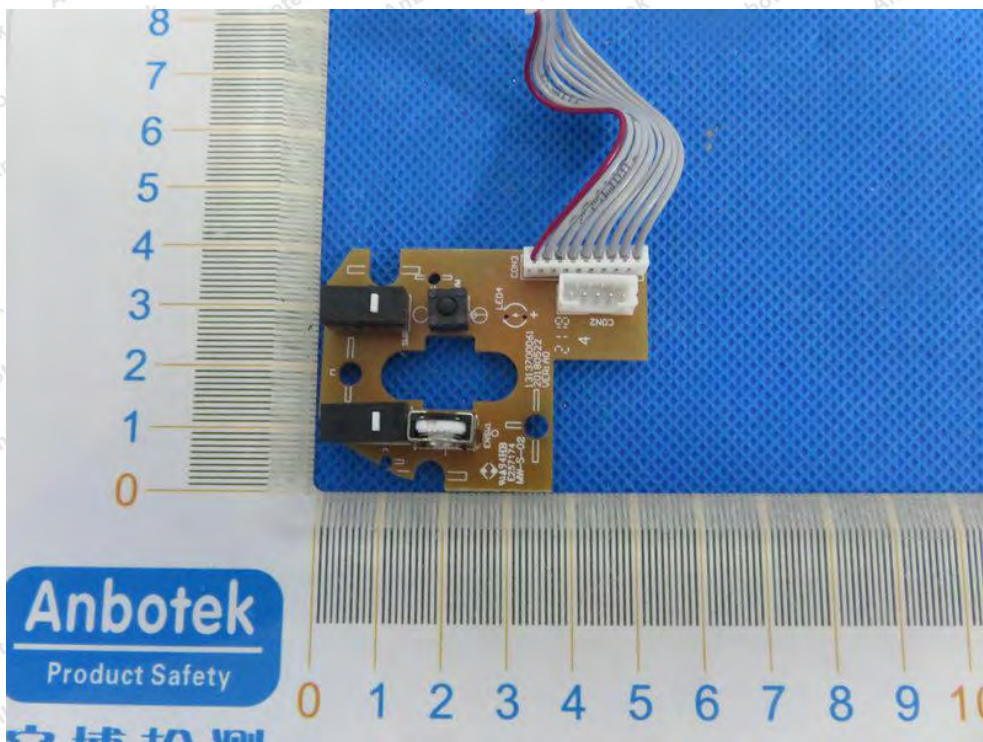
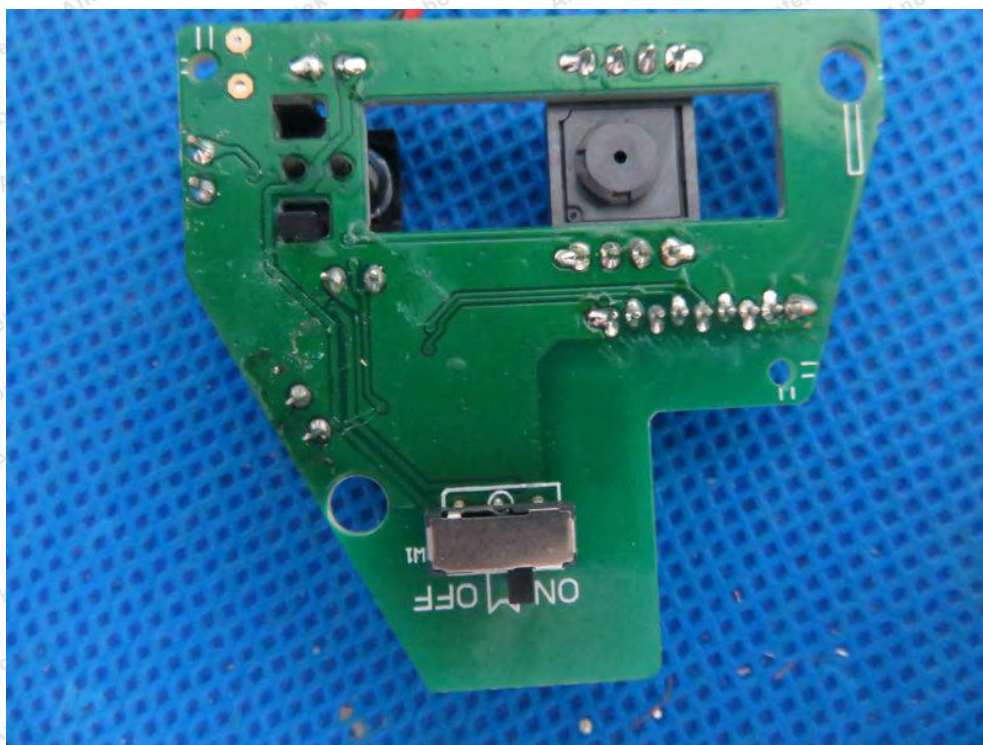




APPENDIX III -- INTERNAL PHOTOGRAPH









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