FCC TEST REPORT

For

SHENZHEN VIEW SECU TECH CO.,LIMITED

2.4GHz Wireless Mouse

Model No.: H-ML45, H-ML3, H-ML156, H-ML6, H-ML13, H-ML14, H-ML19, H-ML22, H-ML25, H-ML34, H-ML46, H-ML76, H-ML104, H-ML153, H-ML155

Prepared For	:	SHENZHEN VIEW SECU TECH CO.,LIMITED
Address	:	2/F, Building 17, 3RD Area, Cuigang industrial Park, Fuyong Town, BaoAn District, ShenZhen, China

Prepared By	:	Shenzhen Anbotek Compliance Laboratory Limited
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Report Number	:	R0217060261W
Date of Test	:	Jul. 28~Sept. 25, 2017
Date of Report	:	Sept. 25, 2017

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TEST REPORT

Applicant	:	SHENZHEN VIEW SECU TECH CO.,LIMITED
Manufacturer	:	SHENZHEN VIEW SECU TECH CO.,LIMITED
Product Name	:	2.4GHz Wireless Mouse
Model No.	:	H-ML45, H-ML3, H-ML156, H-ML6, H-ML13, H-ML14, H-ML19, H-ML22, H-ML25, H-ML34, H-ML46, H-ML76, H-ML104, H-ML153, H-ML155
Trade Mark	:	N.A.
Rating(s)	:	Input DC 5V 300mA (Battery DC 3.7V 300mAh inside)

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. 28~Sept. 25, 2017

Prepared by : Winkey Wang

(Tested Engineer / Winkey Wang)

Reviewer : : Tangcy. T.

(Project Manager / Tangcy. T)

Approved & Authorized Signer : : Tom Chen

(Manager / Tom Chen)

1. General Information

1.1. Client Information

Applicant	:	SHENZHEN VIEW SECU TECH CO.,LIMITED
Address	:	2/F, Building 17, 3RD Area, Cuigang industrial Park, Fuyong Town, BaoAn District, ShenZhen, China
Manufacturer	:	SHENZHEN VIEW SECU TECH CO.,LIMITED
Address	:	2/F, Building 17, 3RD Area, Cuigang industrial Park, Fuyong Town, BaoAn District, ShenZhen, China

1.2. Description of Device (EUT)

Product Name	:	2.4GHz Wireless Mouse	
Model No.	:	H-ML45, H-ML3, H-ML156, H-ML6, H-ML13, H-ML14, H-ML19, H-ML22, H-ML25, H-ML34, H-ML46, H-ML76, H-ML104, H-ML153, H-ML155 (Note: All samples are the same except the model number and colour, so we prepare "H-ML45" for test only.)	
Trade Mark	:	N.A.	
Test Power Supply	:	AC 120V, 60Hz for adapter / AC 240V, 60Hz for adapter DC 3.7V By Battery	
Product Description	:	Operation Frequency:	2402.65-2480.65MHz
		Number of Channel:	16 Channels
		Modulation Type:	GFSK
		Antenna Type:	PCB Antenna
		Antenna Gain(Peak):	-1 dBi
		Hardware Version:	V1.0
		Software Version:	V1.0
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	:	Manufacturer: ZTE M/N: STC-A2050I1000USBA-C S/N: 201202102100876 Input: 100-240V~50/60Hz 0.3A Output: DC 5V, 1000mA
USB Cable	:	Non-Shielded, 80cm

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	CH09
Mode 4	CH16

For Conducted Emission	
Final Test Mode	Description
Mode 1	Keeping TX mode

For Radiated Emission	
Final Test Mode	Description
Mode 2	CH01
Mode 3	CH09
Mode 4	CH16

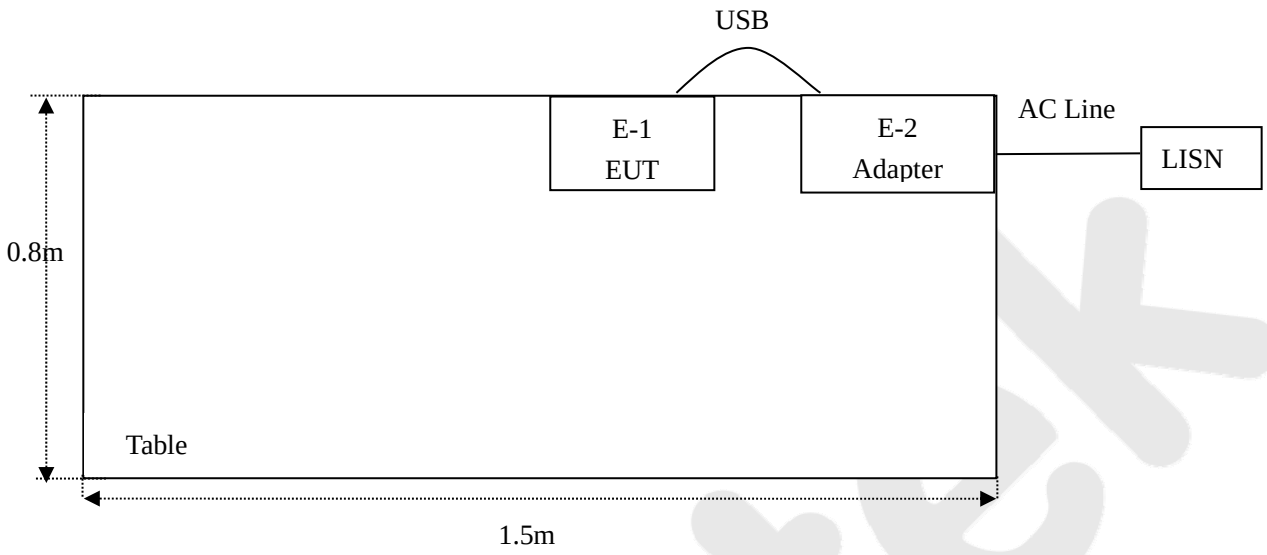
Note:
1. The engineering test program was provided and the EUT was programmed to be in continuously transmitting mode.
2. EUT built-in battery-powered, fully-charged battery use of the test battery.

1.5. List of Channels

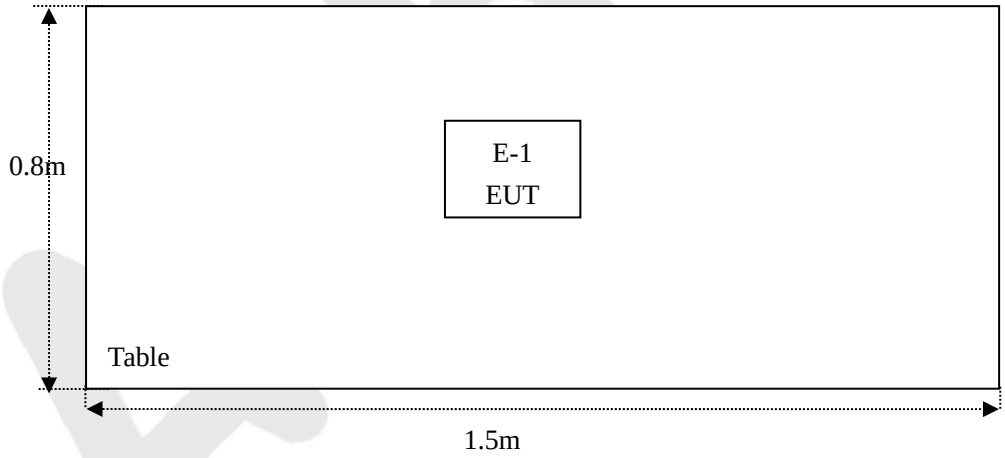
Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
1	2402.65	5	2422.65	9	2441.65	13	2463.65
2	2407.65	6	2426.65	10	2445.65	14	2466.65
3	2414.65	7	2436.65	11	2453.65	15	2473.65
4	2419.65	8	2439.65	12	2459.65	16	2480.65

1.6. Description of Test Setup

CE



RE



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	May 27, 2017	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	May 27, 2017	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	May 27, 2017	1 Year
4.	Spectrum Analysis	Agilent	E4407B	US39390582	May 27, 2017	1 Year
5.	Spectrum Analysis	Agilent	N9038A	MY53227295	May 27, 2017	1 Year
6.	Spectrum Analysis	Agilent	N9020A	MY51170037	May 27, 2017	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	May 27, 2017	1 Year
8.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	May 31, 2017	1 Year
9.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	May 31, 2017	1 Year
10.	Loop Antenna	Schwarzbeck	HFH2-Z2	100047	Apr. 03, 2017	1 Year
11.	Horn Antenna	Schewarzbeck	BBHA9170	9170-375	May 27, 2017	1 Year
12.	Pre-amplifier	SONOMA	310N	186860	May 27, 2017	1 Year
13.	Preamplifier	SKET Electronic	BK1G18G30D	KD17503	May 27, 2017	1 Year
14.	Pre-amplifier	SKET Electronic	BK1G40G50A	KD25352	May 27, 2017	1 Year
15.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A
16.	Test Cable (9KHz-30MHz)	/	RF-001	/	May 27, 2017	1 Year
17.	Test Cable (30MHz-1GHz)	/	RF-002	/	May 27, 2017	1 Year
18.	Test Cable (1-18GHz)	/	RF-003	/	May 27, 2017	1 Year
19.	High Test Cable (1G-40GHz)	/	RF-004	/	May 27, 2017	1 Year
20.	Temporary Antenna Connector	GEPU	RF-075	/	/	/

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

1.8. Measurement Uncertainty

Radiation Uncertainty	:	Ur = 4.1 dB (Horizontal)
		Ur = 4.3 dB (Vertical)
Conduction Uncertainty	:	Uc = 3.4dB

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 registed 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 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

2. Summary of Test Results

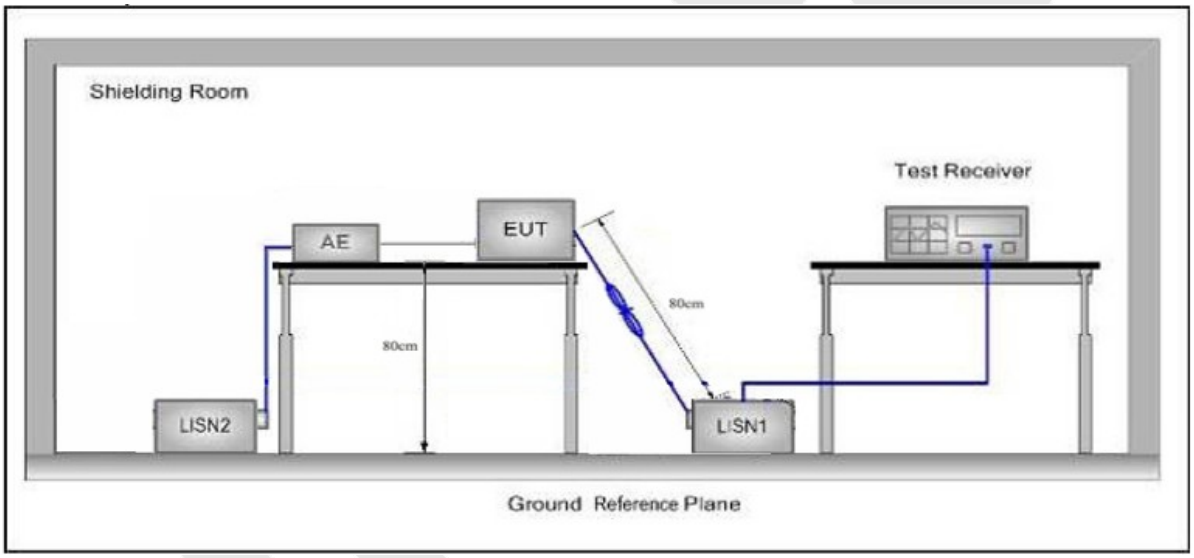
Standard Section	Test Item	Result
15.203	Antenna Requirement	PASS
15.207	Conducted Emission	PASS
15.249	Radiated Emission	PASS
15.215(c)	20dB Bandwidth	PASS
15.249(c)	Band Edge	PASS
Remark: "N/A" is an abbreviation for Not Applicable.		

3. 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 C63.10-2013 on Conducted Emission Measurement.

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

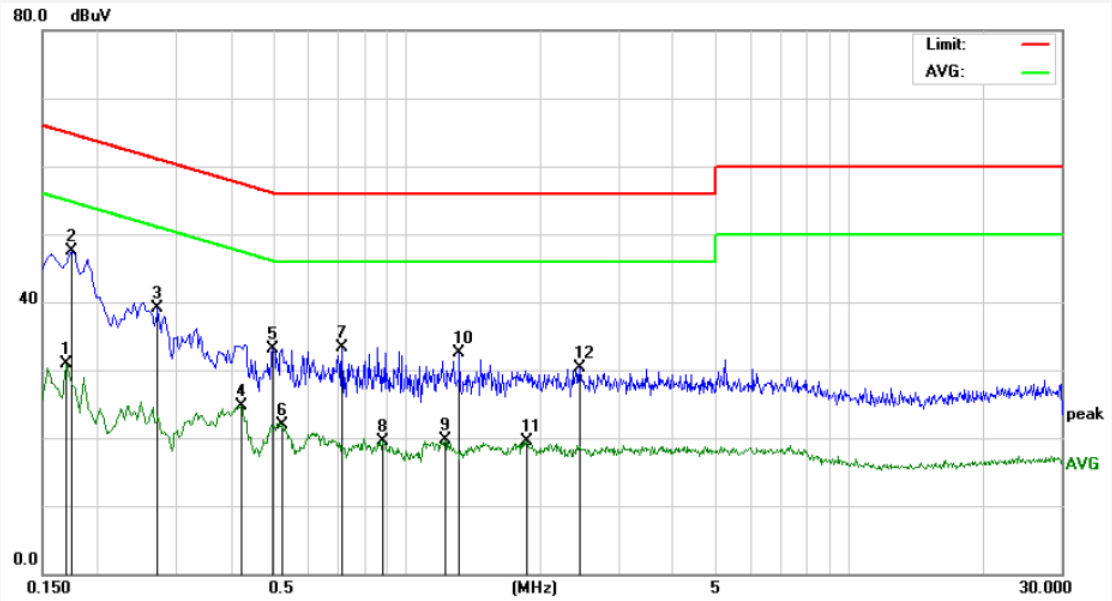
The frequency range from 150kHz to 30MHz is checked.

3.4. Test Data

Please to see the following pages

Conducted Emission Test Data

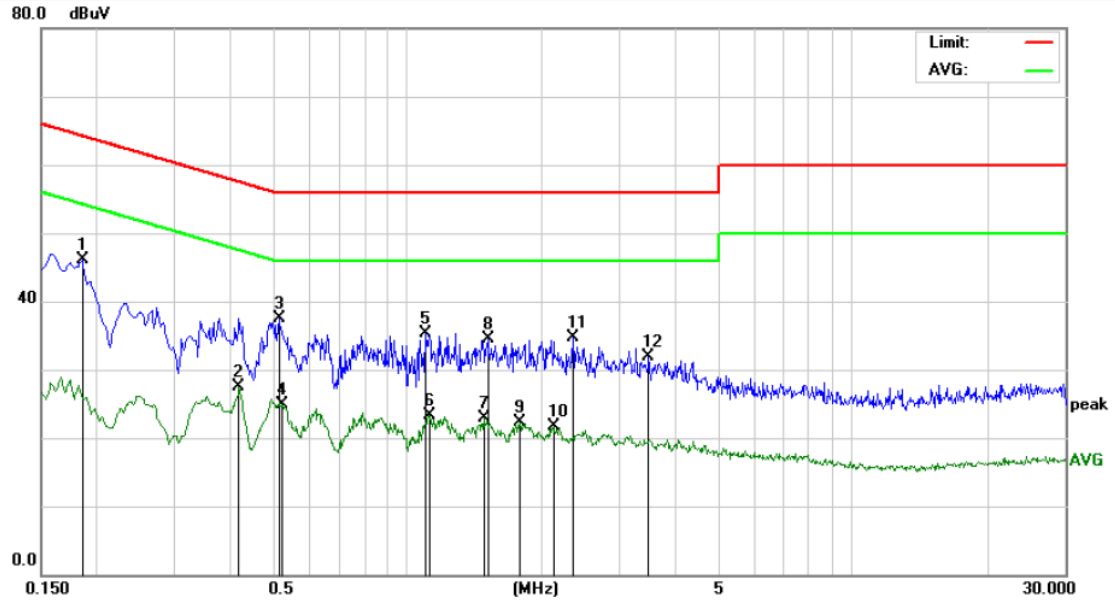
Test Site: 1# Shielded Room
Operating Condition: Keeping TX mode
Test Specification: AC 120V, 60Hz for adapter
Comment: Live Line
Tem.:25℃ Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.1700	11.04	19.90	30.94	54.96	-24.02	AVG	
2	0.1740	27.65	19.90	47.55	64.76	-17.21	QP	
3	0.2740	19.30	19.89	39.19	60.99	-21.80	QP	
4	0.4220	4.81	19.94	24.75	47.41	-22.66	AVG	
5	0.4980	13.14	19.98	33.12	56.03	-22.91	QP	
6	0.5220	1.92	19.99	21.91	46.00	-24.09	AVG	
7	0.7140	13.36	20.04	33.40	56.00	-22.60	QP	
8	0.8820	-0.58	20.09	19.51	46.00	-26.49	AVG	
9	1.2220	-0.48	20.12	19.64	46.00	-26.36	AVG	
10	1.3099	12.46	20.13	32.59	56.00	-23.41	QP	
11	1.8620	-0.57	20.14	19.57	46.00	-26.43	AVG	
12	2.4580	10.09	20.15	30.24	56.00	-25.76	QP	

Conducted Emission Test Data

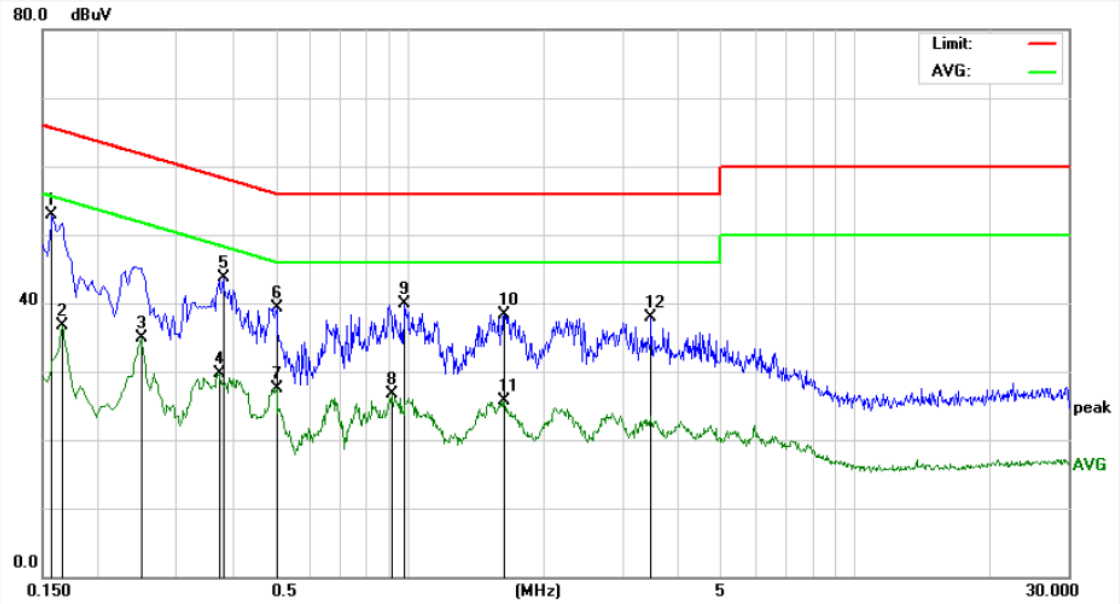
Test Site:	1# Shielded Room
Operating Condition:	Keeping TX mode
Test Specification:	AC 120V, 60Hz for adapter
Comment:	Neutral Line
	Tem.:25℃ Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.1860	26.24	19.90	46.14	64.21	-18.07	QP	
2	0.4180	7.51	19.94	27.45	47.49	-20.04	AVG	
3	0.5140	17.51	19.98	37.49	56.00	-18.51	QP	
4	0.5220	4.88	19.99	24.87	46.00	-21.13	AVG	
5	1.0980	15.19	20.12	35.31	56.00	-20.69	QP	
6	1.1220	3.23	20.12	23.35	46.00	-22.65	AVG	
7	1.4819	2.81	20.13	22.94	46.00	-23.06	AVG	
8	1.5140	14.30	20.13	34.43	56.00	-21.57	QP	
9	1.7900	2.24	20.14	22.38	46.00	-23.62	AVG	
10	2.1220	1.52	20.14	21.66	46.00	-24.34	AVG	
11	2.3500	14.47	20.15	34.62	56.00	-21.38	QP	
12	3.4740	11.79	20.17	31.96	56.00	-24.04	QP	

Conducted Emission Test Data

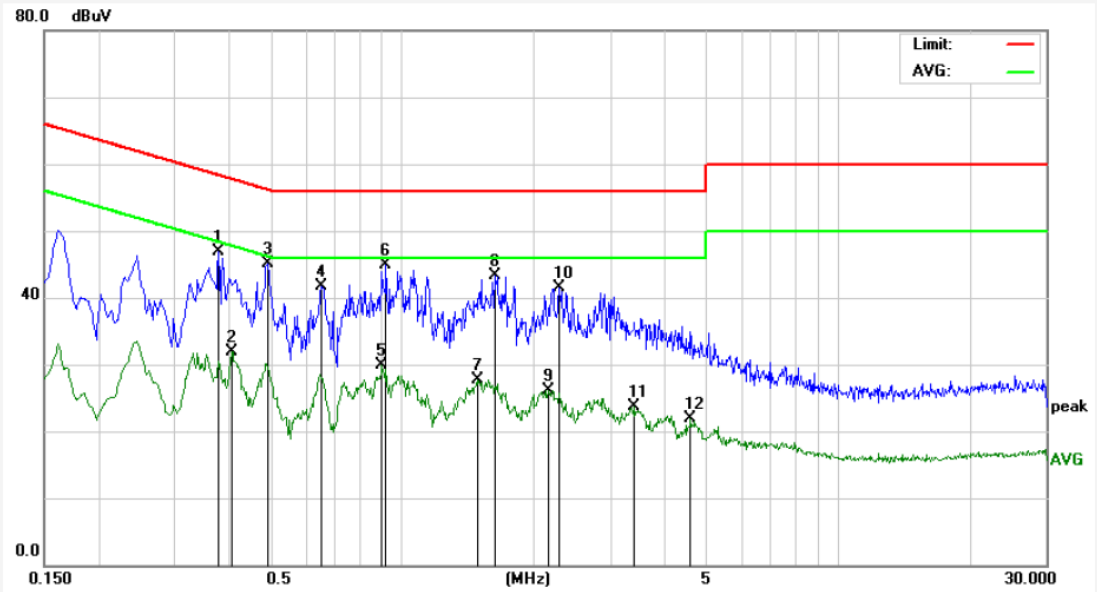
Test Site:	1# Shielded Room
Operating Condition:	Keeping TX mode
Test Specification:	AC 240V, 60Hz for adapter
Comment:	Live Line
	Tem.:25℃ Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.1580	32.97	19.90	52.87	65.56	-12.69	QP	
2	0.1660	16.74	19.90	36.64	55.15	-18.51	AVG	
3	0.2500	14.94	19.89	34.83	51.75	-16.92	AVG	
4	0.3740	9.71	19.92	29.63	48.41	-18.78	AVG	
5	0.3820	23.80	19.93	43.73	58.23	-14.50	QP	
6	0.5020	19.36	19.98	39.34	56.00	-16.66	QP	
7	0.5020	7.45	19.98	27.43	46.00	-18.57	AVG	
8	0.9100	6.56	20.10	26.66	46.00	-19.34	AVG	
9	0.9780	19.76	20.11	39.87	56.00	-16.13	QP	
10	1.6340	18.19	20.13	38.32	56.00	-17.68	QP	
11	1.6340	5.56	20.13	25.69	46.00	-20.31	AVG	
12	3.4860	17.68	20.17	37.85	56.00	-18.15	QP	

Conducted Emission Test Data

Test Site: 1# Shielded Room
Operating Condition: Keeping TX mode
Test Specification: AC 240V, 60Hz for adapter
Comment: Neutral Line
Tem.:25℃ Hum.:50%



No.	Freq. (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit dBuV	Over Limit (dB)	Detector	Remark
1	0.3780	26.95	19.93	46.88	58.32	-11.44	QP	
2	0.4060	11.90	19.94	31.84	47.73	-15.89	AVG	
3	0.4900	25.15	19.98	45.13	56.17	-11.04	QP	
4	0.6540	21.68	20.03	41.71	56.00	-14.29	QP	
5	0.8980	9.85	20.09	29.94	46.00	-16.06	AVG	
6	0.9140	24.79	20.10	44.89	56.00	-11.11	QP	
7	1.4860	7.51	20.13	27.64	46.00	-18.36	AVG	
8	1.6340	23.09	20.13	43.22	56.00	-12.78	QP	
9	2.1580	6.06	20.14	26.20	46.00	-19.80	AVG	
10	2.2900	21.35	20.15	41.50	56.00	-14.50	QP	
11	3.4020	3.55	20.17	23.72	46.00	-22.28	AVG	
12	4.5860	1.66	20.20	21.86	46.00	-24.14	AVG	

4. Radiated 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.

Test Standard	FCC Part15 C Section 15.249					
Test Limit	Frequency (MHz)	Field Strength of fundamental ((millivolts /meter)	Field Strength of Harmonics (microvolts/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	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

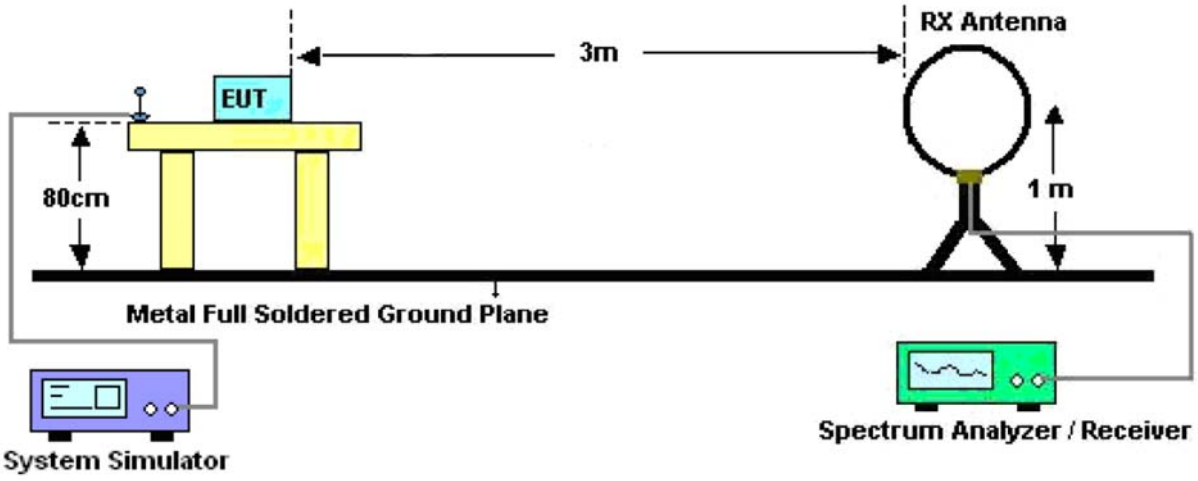


Figure 2. 30MHz to 1GHz

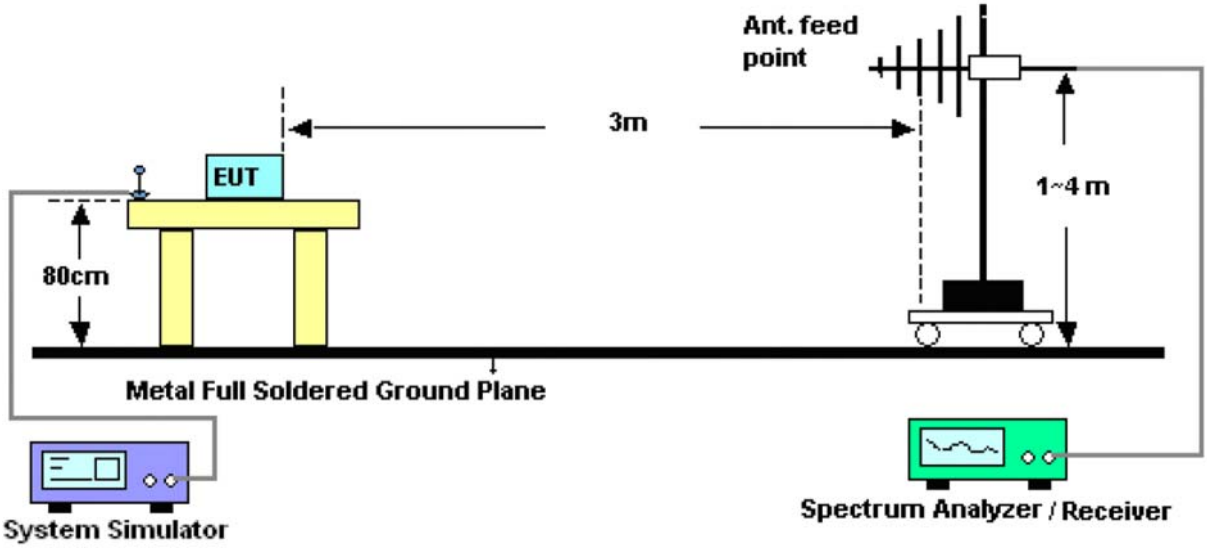
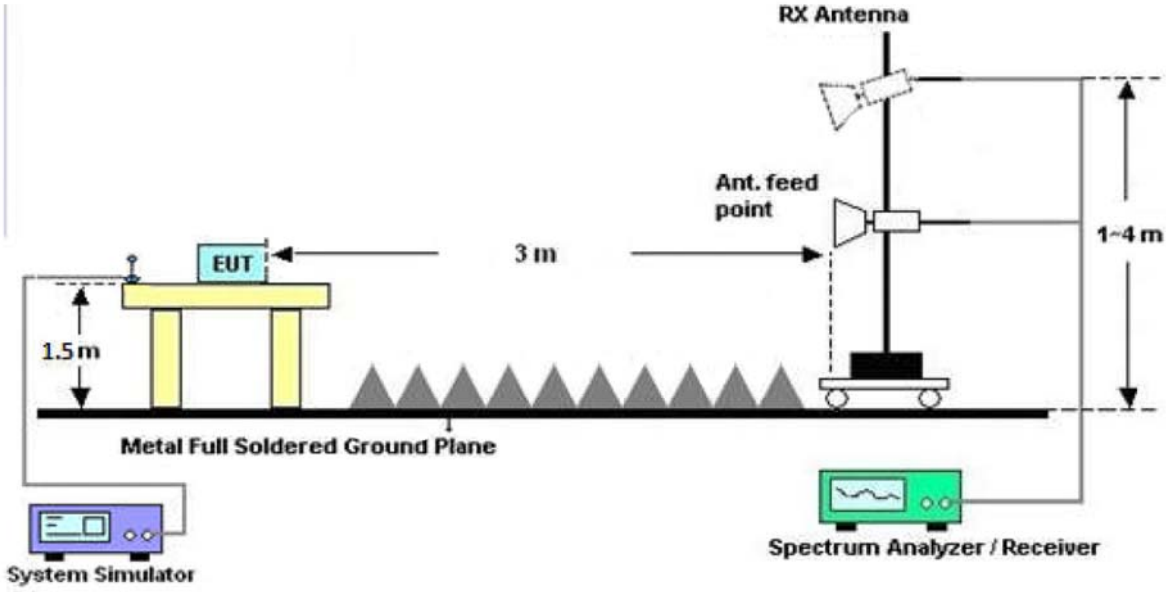


Figure 3. Above 1 GHz



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.

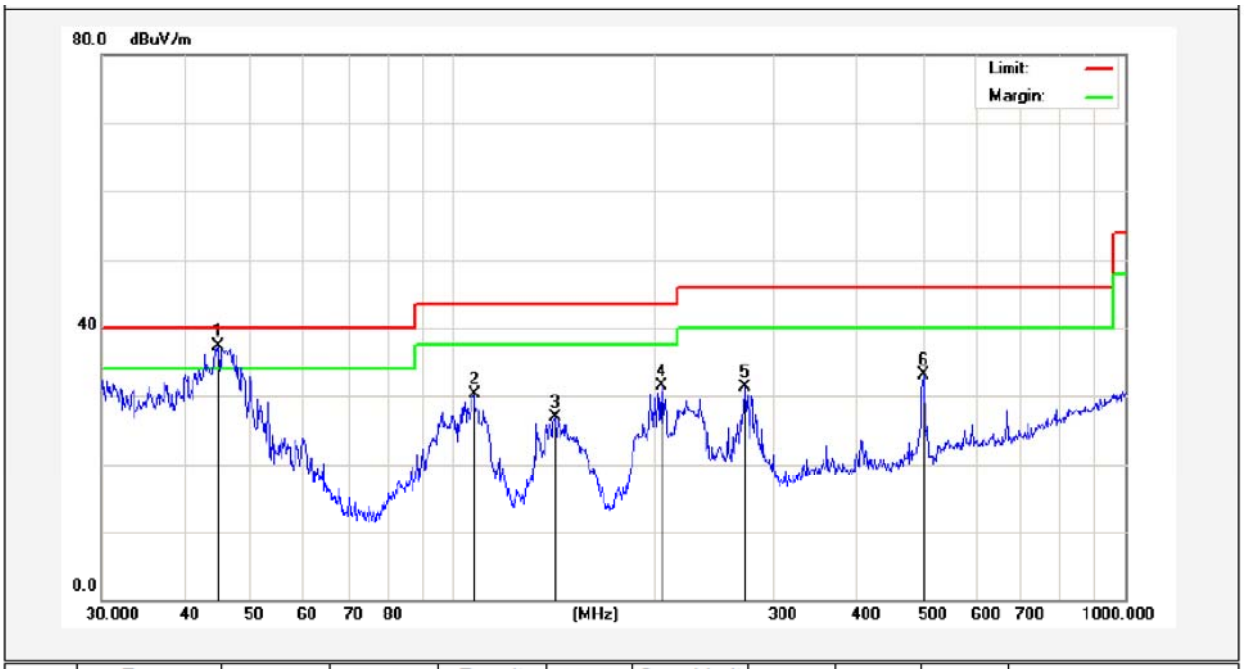
Test Results (30~1000MHz)

Job No.:	0217060261W	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 3.7V
Test Mode:	TX Mode Lowest CH	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	35.3750	44.45	-13.99	30.46	40.00	-9.54	QP	300	49	
2	54.4515	44.04	-14.88	29.16	40.00	-10.84	QP	300	87	
3	94.7600	47.48	-21.10	26.38	43.50	-17.12	QP	300	112	
4	147.4036	42.87	-23.38	19.49	43.50	-24.01	QP	300	174	
5	204.9550	48.95	-20.68	28.27	43.50	-15.23	QP	300	256	
6	272.2776	43.38	-18.52	24.86	46.00	-21.14	QP	300	91	

Test Results (30~1000MHz)

Job No.:	0217060261W	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 3.7V
Test Mode:	TX Mode Lowest CH	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	44.7433	49.46	-12.23	37.23	40.00	-2.77	QP	300	21	
2	107.5100	45.91	-15.66	30.25	43.50	-13.25	QP	300	54	
3	141.8262	45.43	-18.47	26.96	43.50	-16.54	QP	300	120	
4	204.2376	47.28	-15.71	31.57	43.50	-11.93	QP	300	210	
5	272.2776	45.99	-14.75	31.24	46.00	-14.76	QP	300	341	
6	501.1789	44.02	-10.94	33.08	46.00	-12.92	QP	300	84	

Test Results (30~1000MHz)

Job No.:	0217060261W	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 3.7V
Test Mode:	TX Mode Middle CH	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	35.3750	42.95	-13.99	28.96	40.00	-11.04	QP	300	77	
2	46.1779	40.54	-12.86	27.68	40.00	-12.32	QP	300	64	
3	94.7600	46.48	-21.10	25.38	43.50	-18.12	QP	300	241	
4	196.5098	50.87	-20.89	29.98	43.50	-13.52	QP	300	56	
5	272.2776	45.88	-18.52	27.36	46.00	-18.64	QP	300	88	
6	499.4245	37.72	-10.96	26.76	46.00	-19.24	QP	300	322	

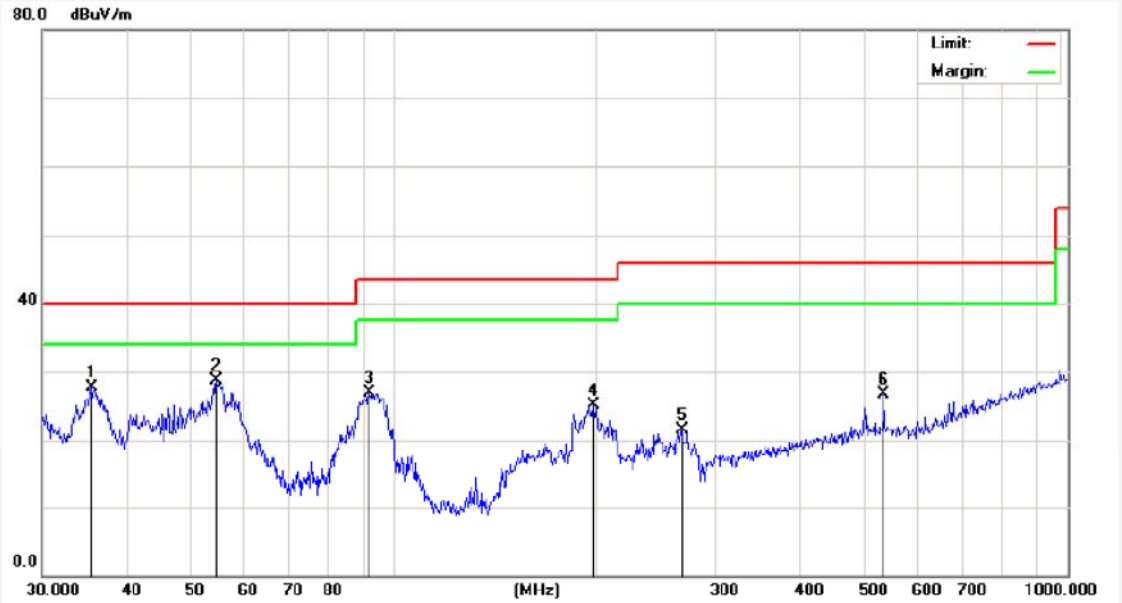
Test Results (30~1000MHz)

Job No.:	0217060261W	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 3.7V
Test Mode:	TX Mode Middle CH	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	37.6798	48.71	-12.19	36.52	40.00	-3.48	QP	300	47	
2	45.5347	47.25	-12.56	34.69	40.00	-5.31	QP	300	65	
3	102.7192	49.63	-15.73	33.90	43.50	-9.60	QP	300	79	
4	133.1511	45.14	-18.02	27.12	43.50	-16.38	QP	300	211	
5	232.5318	44.52	-14.47	30.05	46.00	-15.95	QP	300	253	
6	501.1788	43.52	-10.94	32.58	46.00	-13.42	QP	300	345	

Test Results (30~1000MHz)

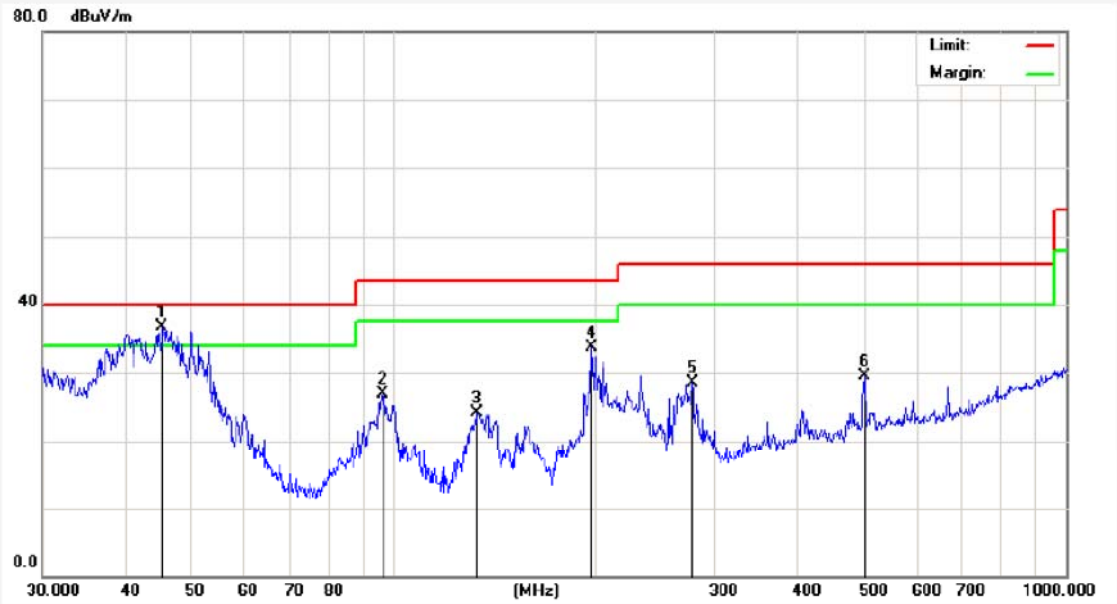
Job No.:	0217060261W	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 3.7V
Test Mode:	TX Mode Highest CH	Polarization:	Horizontal



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	35.6240	41.61	-13.81	27.80	40.00	-12.20	QP	300	24	
2	54.4515	43.54	-14.88	28.66	40.00	-11.34	QP	300	56	
3	91.8161	49.20	-22.21	26.99	43.50	-16.51	QP	300	78	
4	197.8925	46.08	-20.88	25.20	43.50	-18.30	QP	300	110	
5	267.5455	40.21	-18.71	21.50	46.00	-24.50	QP	300	122	
6	533.8318	37.66	-11.05	26.61	46.00	-19.39	QP	300	277	

Test Results (30~1000MHz)

Job No.:	0217060261W	Temp.(℃)/Hum.(%RH):	24.3℃/55%RH
Standard:	FCC PART 15C	Power Source:	DC 3.7V
Test Mode:	TX Mode Highest CH	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	45.2165	49.19	-12.43	36.76	40.00	-3.24	QP	300	41	
2	96.0986	42.94	-15.97	26.97	43.50	-16.53	QP	300	23	
3	133.1511	42.14	-18.02	24.12	43.50	-19.38	QP	300	78	
4	196.5098	49.60	-15.89	33.71	43.50	-9.79	QP	300	98	
5	278.0668	43.56	-15.11	28.45	46.00	-17.55	QP	300	132	
6	501.1788	40.52	-10.94	29.58	46.00	-16.42	QP	300	265	

Test Results (1GHz-25GHz)

Test Mode: CH01 (Low 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
2402.6500	94.00	31.09	2.10	35.23	91.96	114.00	-22.04	V	Peak
2402.6500	85.68	31.09	2.10	35.23	83.64	94.00	-10.36	V	AVG
4805.3000	48.47	33.98	2.49	34.54	50.40	74.00	-23.60	V	Peak
4805.3000	42.54	33.98	2.49	34.54	44.47	54.00	-9.53	V	AVG
7207.9500	41.20	36.01	2.78	34.89	45.10	74.00	-28.90	V	Peak
7207.9500	35.96	36.01	2.78	34.89	39.86	54.00	-14.14	V	AVG
9610.6000	*								
12013.2500	*								
14415.9000	*								
16818.5500	*								
2402.6500	92.65	31.09	2.10	35.23	90.61	114.00	-23.39	H	Peak
2402.6500	84.52	31.09	2.10	35.23	82.48	94.00	-11.52	H	AVG
4805.3000	45.96	33.98	2.49	34.54	47.89	74.00	-26.11	H	Peak
4805.3000	37.21	33.98	2.49	34.54	39.14	54.00	-14.86	H	AVG
7207.9500	42.14	36.01	2.78	34.89	46.04	74.00	-27.96	H	Peak
7207.9500	35.00	36.01	2.78	34.89	38.90	54.00	-15.10	H	AVG
9610.6000	*								
12013.2500	*								
14415.9000	*								
16818.5500	*								

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: CH09 (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
2441.6500	93.52	31.12	2.20	34.51	92.33	114.00	-21.67	V	Peak
2441.6500	88.30	31.22	2.20	34.51	87.21	94.00	-6.79	V	AVG
4883.3000	48.90	34.98	2.49	34.14	52.23	74.00	-21.77	V	Peak
4883.3000	42.63	34.98	2.49	34.14	45.96	54.00	-8.04	V	AVG
7324.9500	40.21	36.01	3.01	34.56	44.67	74.00	-29.33	V	Peak
7324.9500	35.21	36.01	3.01	34.56	39.67	54.00	-14.33	V	AVG
9766.6000	*								
12208.2500	*								
14649.9000	*								
17091.5500	*								
2441.6500	87.36	31.12	2.20	34.51	86.17	114.00	-27.83	H	Peak
2441.6500	80.22	31.12	2.20	34.51	79.03	94.00	-14.97	H	AVG
4883.3000	46.54	34.98	2.49	34.14	49.87	74.00	-24.13	H	Peak
4883.3000	38.22	34.98	2.49	34.14	41.55	54.00	-12.45	H	AVG
7324.9500	34.63	36.01	3.01	34.56	39.09	74.00	-34.91	H	Peak
7324.9500	33.96	36.01	3.01	34.56	38.42	54.00	-15.58	H	AVG
9766.6000	*								
12208.2500	*								
14649.9000	*								
17091.5500	*								

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: CH16 (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
2480.6500	94.21	31.66	2.23	36.08	92.02	114.00	-21.98	V	Peak
2480.6500	88.45	31.66	2.23	36.08	86.26	94.00	-7.74	V	AVG
4961.3000	49.21	35.06	2.61	34.94	51.94	74.00	-22.06	V	Peak
4961.3000	43.41	35.06	2.61	34.94	46.14	54.00	-7.86	V	AVG
7441.9500	42.93	36.20	3.12	35.12	47.13	74.00	-26.87	V	Peak
7441.9500	35.69	36.20	3.12	35.12	39.89	54.00	-14.11	V	AVG
9922.6000	*								
12403.2500	*								
14883.9000	*								
17364.5500	*								
2480.6500	91.54	31.66	2.23	36.08	89.35	114.00	-24.65	H	Peak
2480.6500	82.14	31.66	2.23	36.08	79.95	94.00	-14.05	H	AVG
4961.3000	45.55	35.06	2.61	34.94	48.28	74.00	-25.72	H	Peak
4961.3000	44.23	35.06	2.61	34.94	46.96	54.00	-7.04	H	AVG
7441.9500	39.56	36.20	3.12	35.12	43.76	74.00	-30.24	H	Peak
7441.9500	35.10	36.20	3.12	35.12	39.30	54.00	-14.70	H	AVG
9922.6000	*								
12403.2500	*								
14883.9000	*								
17364.5500	*								

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:					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.
2390.00	51.63	29.15	3.41	34.01	50.18	74.00	-23.82	V
2400.00	53.03	29.16	3.43	34.01	51.61	74.00	-22.39	V
2390.00	50.40	29.15	3.41	34.01	48.95	74.00	-25.05	H
2400.00	53.92	29.16	3.43	34.01	52.50	74.00	-21.50	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.
2390.00	40.77	29.15	3.41	34.01	39.32	54.00	-14.68	V
2400.00	43.96	29.16	3.43	34.01	42.54	54.00	-11.46	V
2390.00	41.22	29.15	3.41	34.01	39.77	54.00	-14.23	H
2400.00	42.96	29.16	3.43	34.01	41.54	54.00	-12.46	H

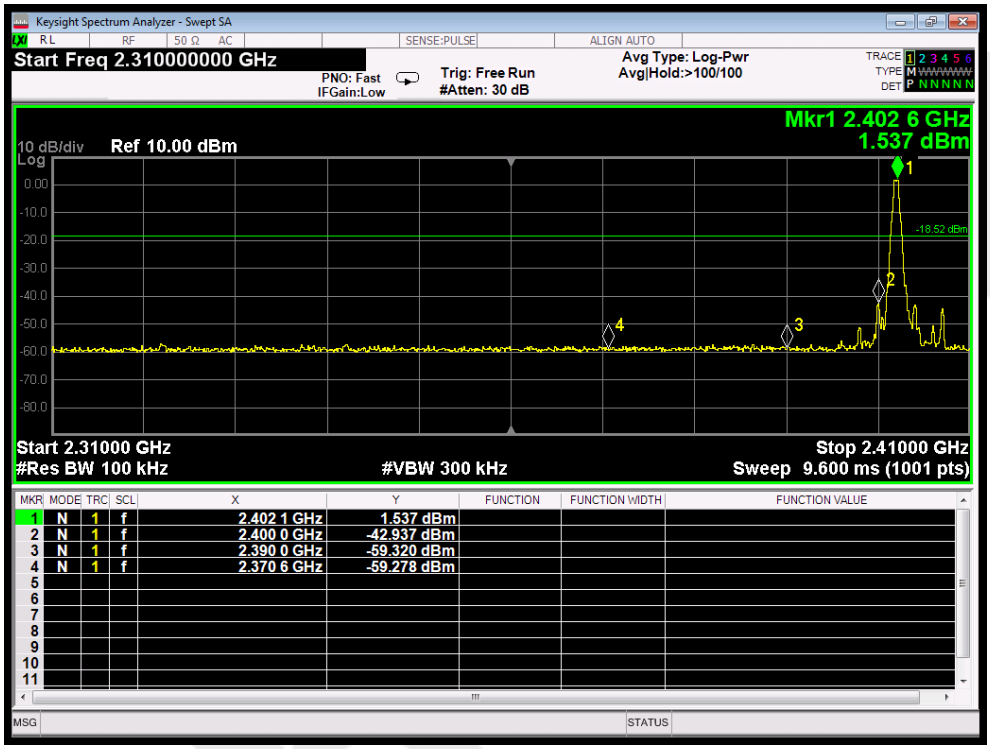
Test Mode:					Test channel: Highest			
Peak Value								
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Pol.
2483.50	55.22	29.28	3.53	34.03	54.00	74.00	-20.00	V
2500.00	51.71	29.30	3.56	34.03	50.54	74.00	-23.46	V
2483.50	56.33	29.28	3.53	34.03	55.11	74.00	-18.89	H
2500.00	54.78	29.30	3.56	34.03	53.61	74.00	-20.39	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.
2483.50	43.63	29.28	3.53	34.03	42.41	54.00	-11.59	V
2500.00	40.44	29.30	3.56	34.03	39.27	54.00	-14.73	V
2483.50	40.23	29.28	3.53	34.03	39.01	54.00	-14.99	H
2500.00	37.10	29.30	3.56	34.03	35.93	54.00	-18.07	H

Remark:

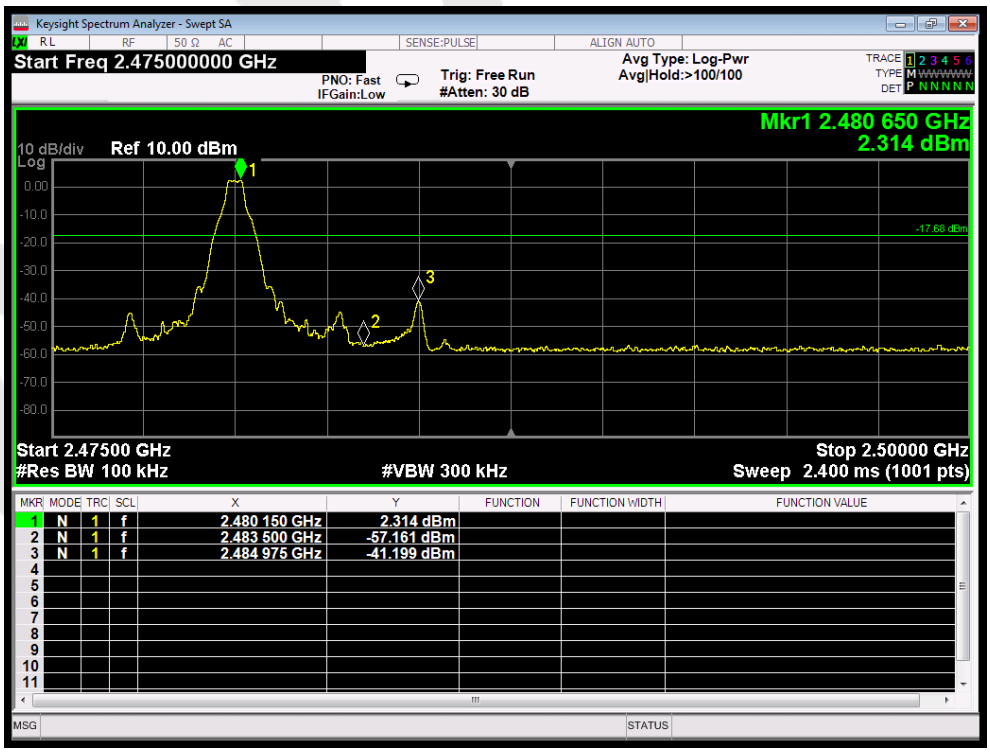
1. Level =Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

Conducted band edge

Frequency Band (MHz)	Delta Peak toBand Emission (dBc)	Limit (dBc)	Results
2400	44.474	>20	PASS
2483.5	59.475	>20	PASS

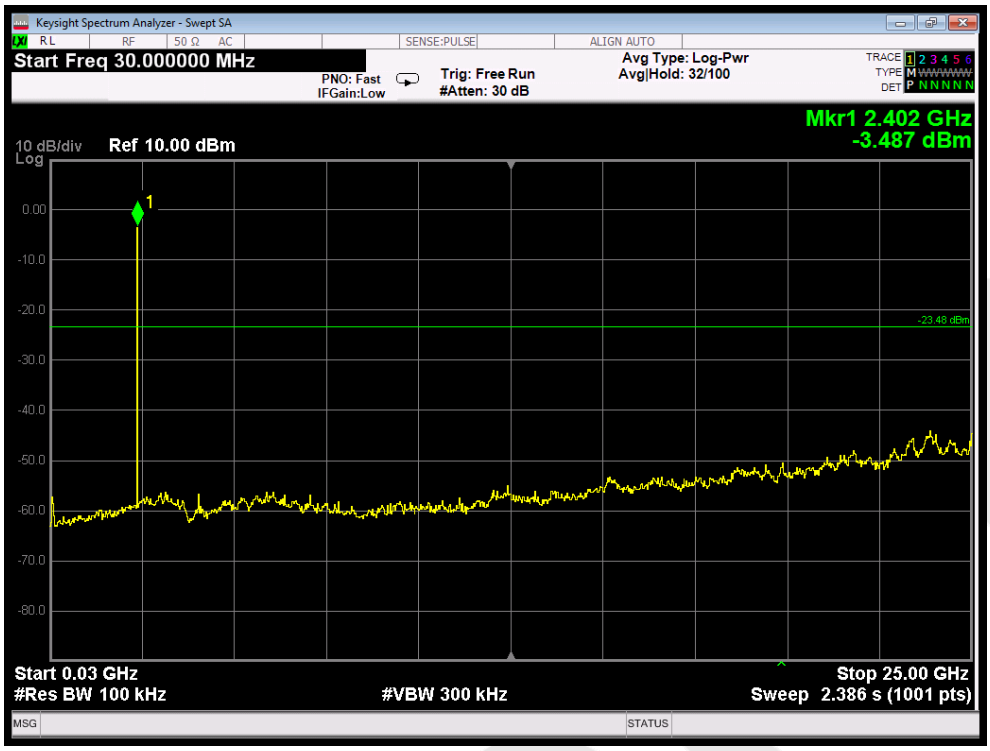


Lowest

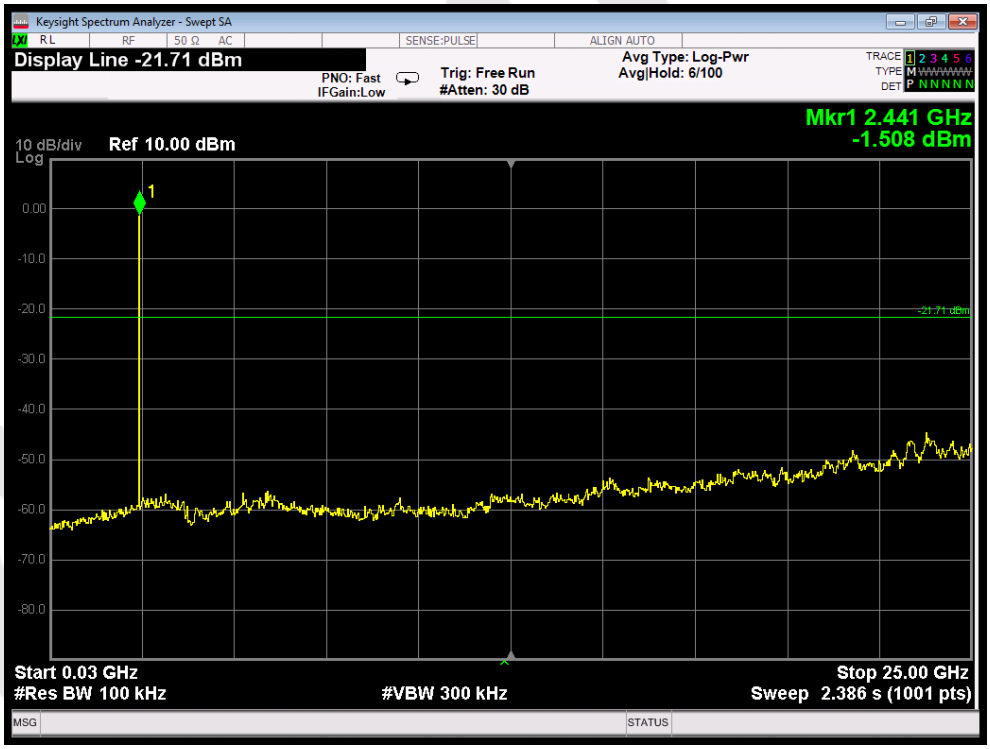


Highest

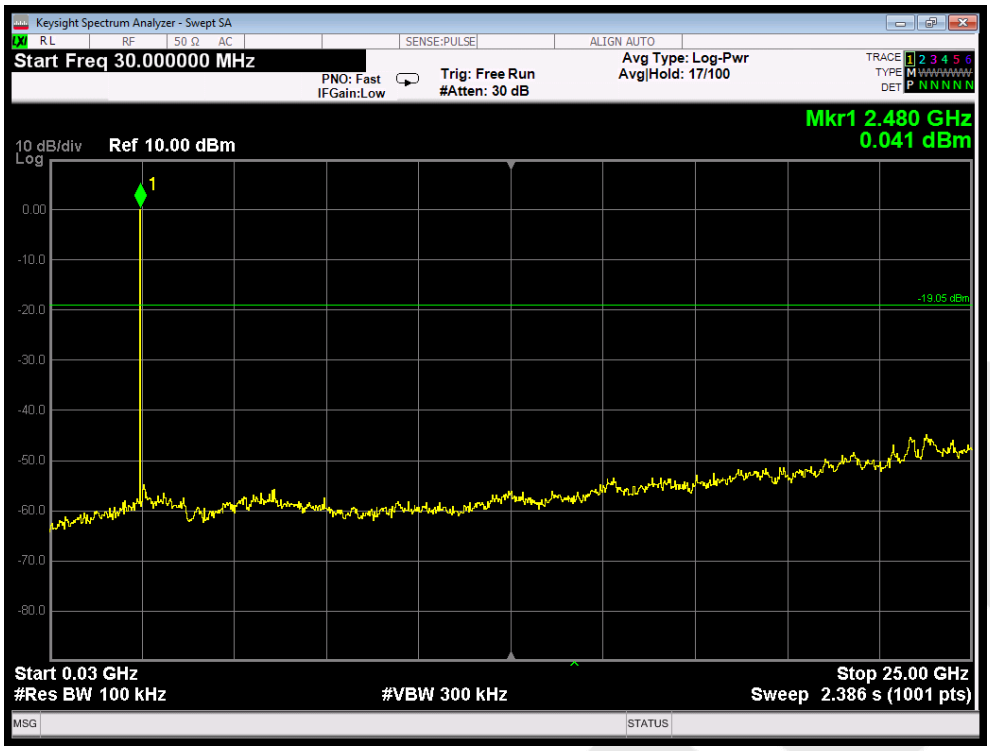
Conducted Emission Method



CH: Low



CH: Middle


Keysight Spectrum Analyzer - Swept SA
Start Freq 30.000000 MHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 30 dB
Avg Type: Log-Pwr
Avg|Hold: 17/100
Mkr1 2.480 GHz
0.041 dBm
10 dB/div
Ref 10.00 dBm
-19.05 dBm
Start 0.03 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 25.00 GHz
Sweep 2.386 s (1001 pts)

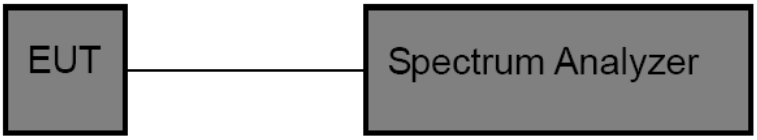
CH: High

5. 20dB Bandwidth Test

5.1. Test Standard and Limit

Test Standard	FCC Part15 C Section 15.249

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 = 100kHz, VBW⩾3*RBW =300kHz,

Detector= Average

Trace mode= Max hold.

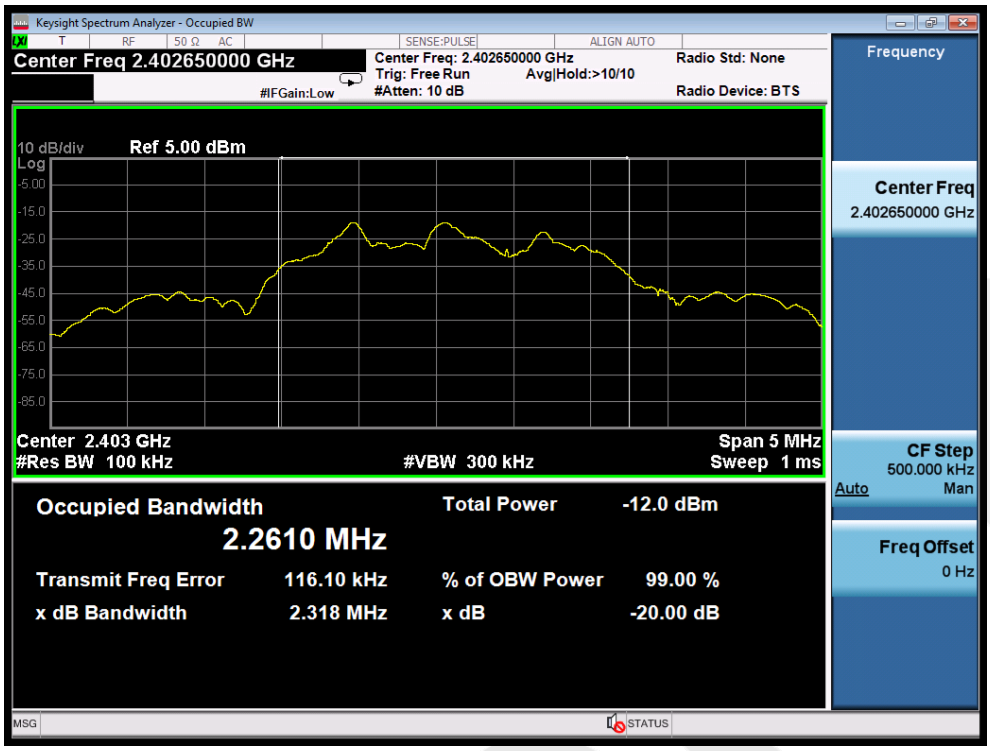
Sweep- auto couple.

4. Mark the peak frequency and –20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

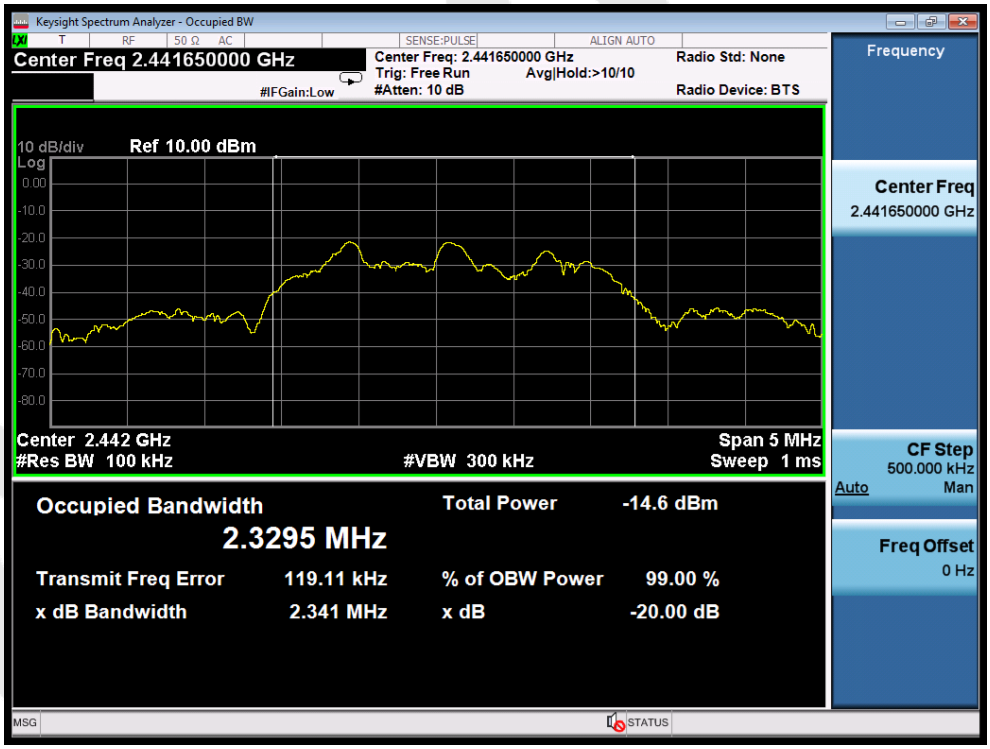
5.4. Test Data

Test Item	:	20dB Bandwidth	Test Mode	:	TX Mode
Test Voltage	:	DC 3.7V	Temperature	:	24℃
Test Result	:	PASS	Humidity	:	55%RH

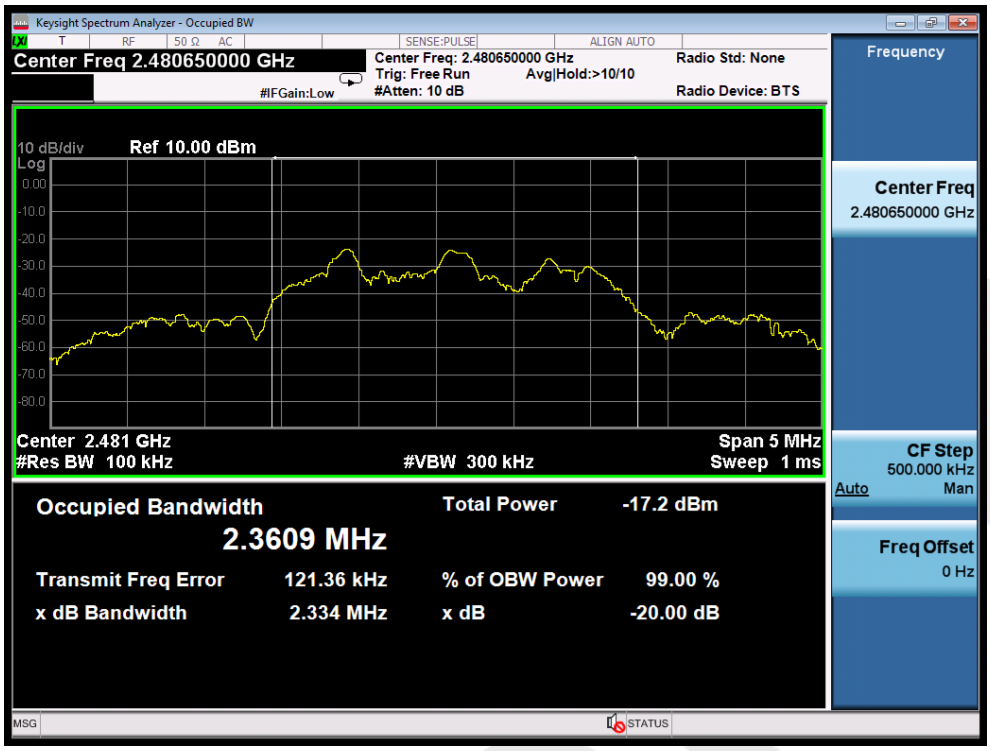
Frequency (MHz)	Bandwidth (kHz)	Result
2402.65MHZ	2318.0	PASS
2441.65MHZ	2341.0	PASS
2480.65MHZ	2334.0	PASS



Test Mode: Low



Test Mode: Middle



Test Mode: High

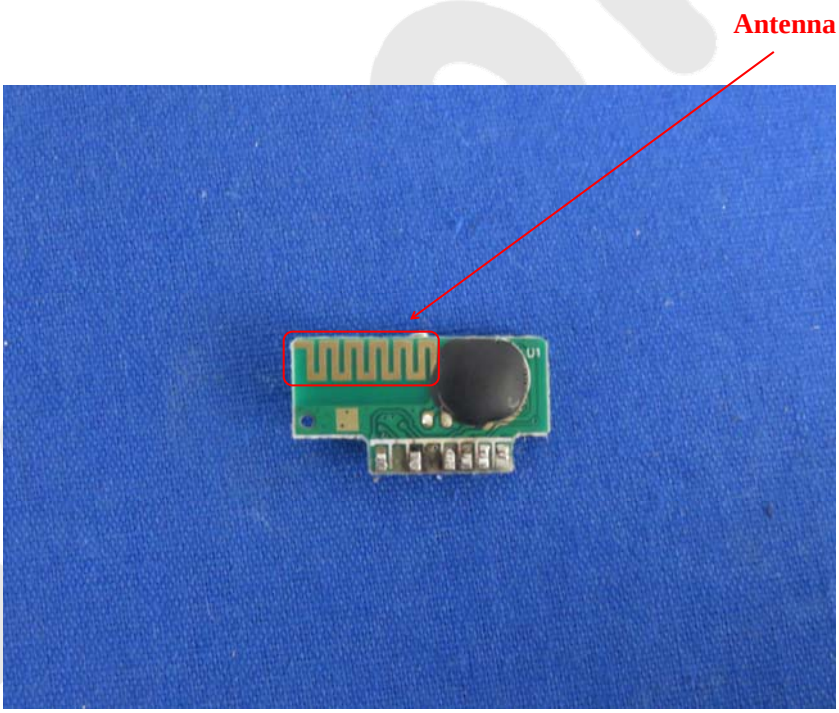
6. Antenna Requirement

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

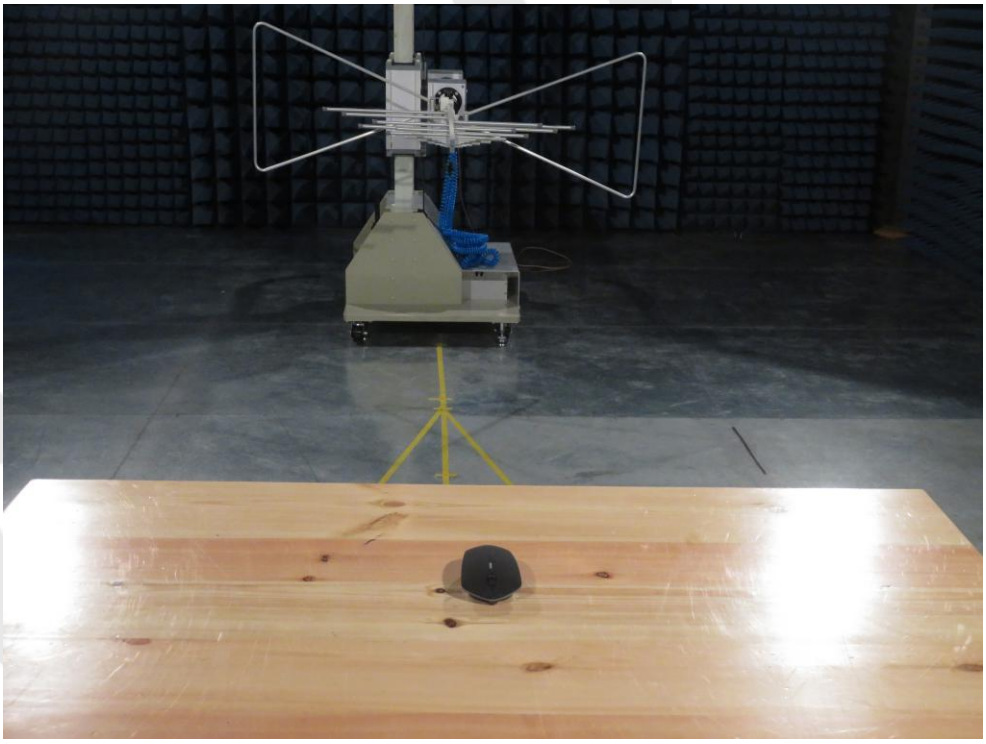
The antenna is a PCB Antenna which permanently attached, and the best case gain of the antenna is -1 dBi. It complies with the standard requirement.

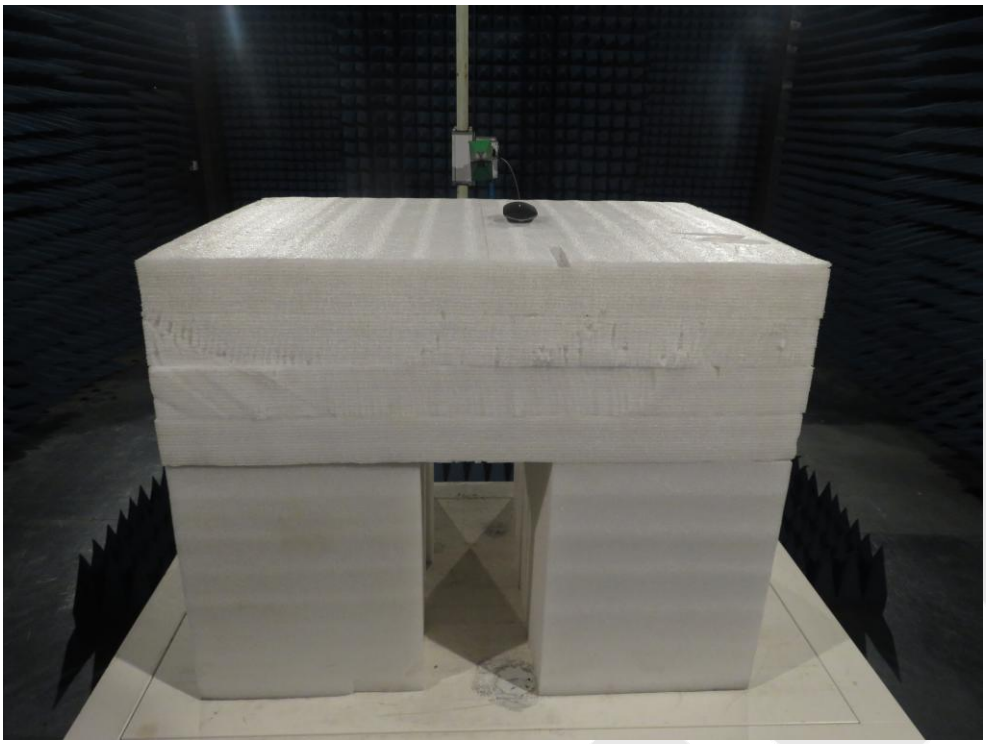


APPENDIX I -- TEST SETUP PHOTOGRAPH

Photo of Conducted Emission Measurement

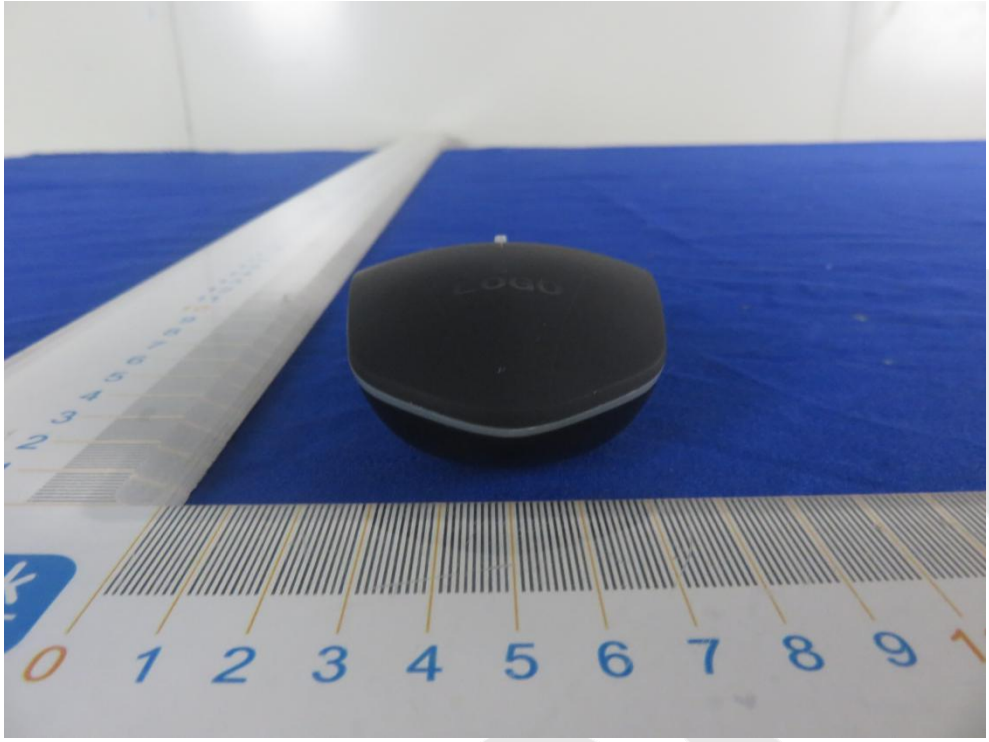
Photo of Radiation Emission Test

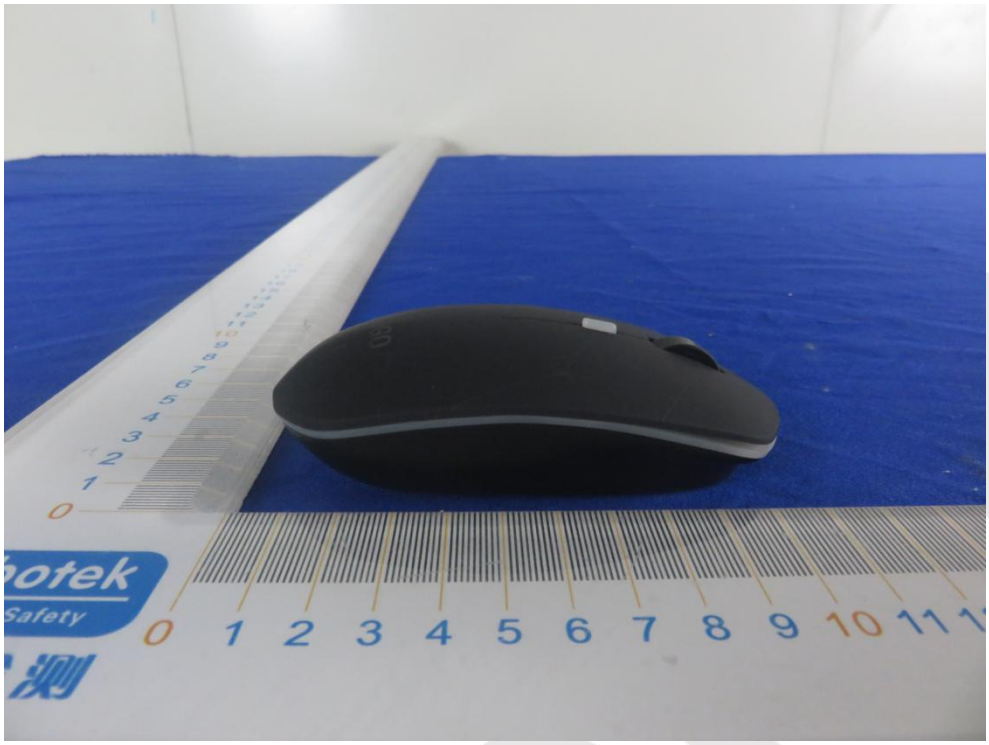




APPENDIX II -- EXTERNAL PHOTOGRAPH

Anbotek
Product Safety

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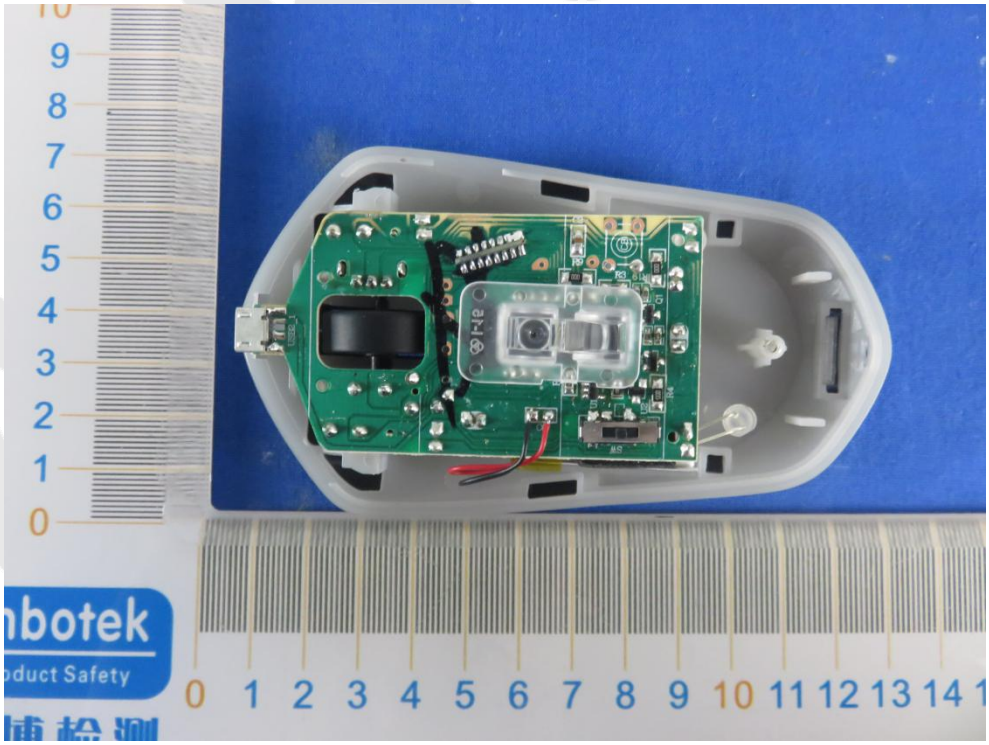
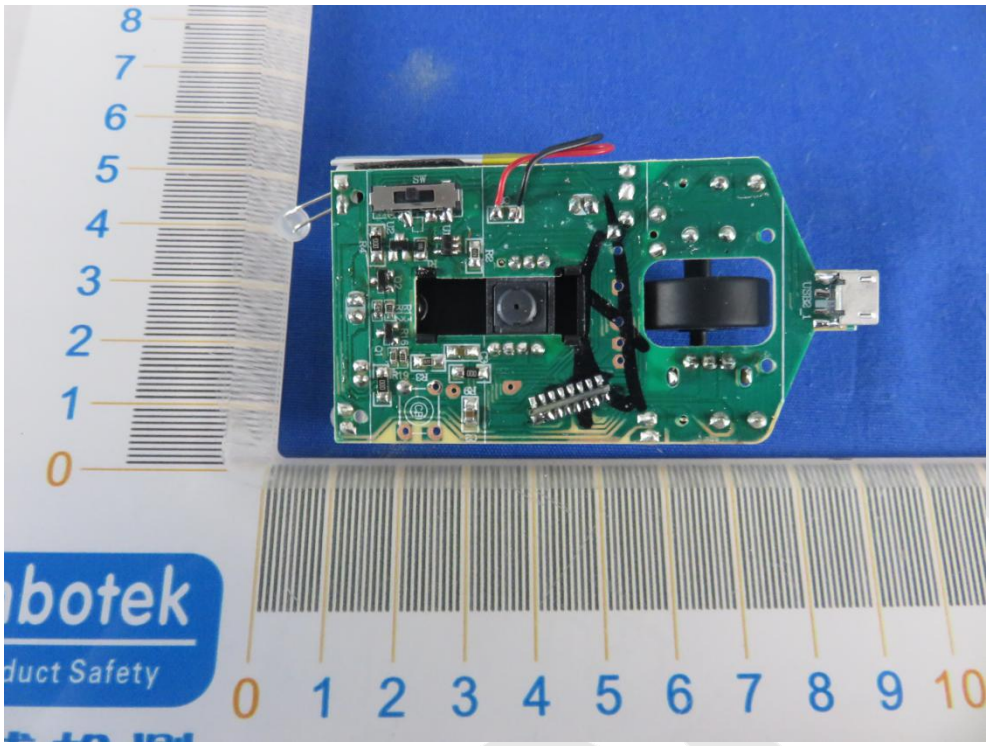
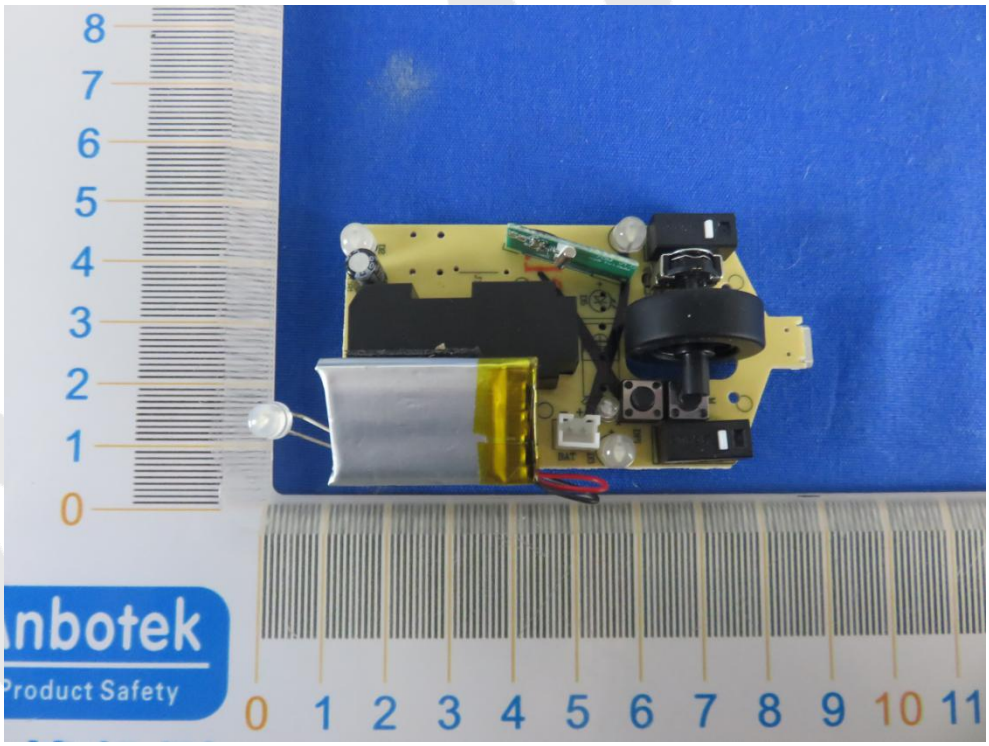
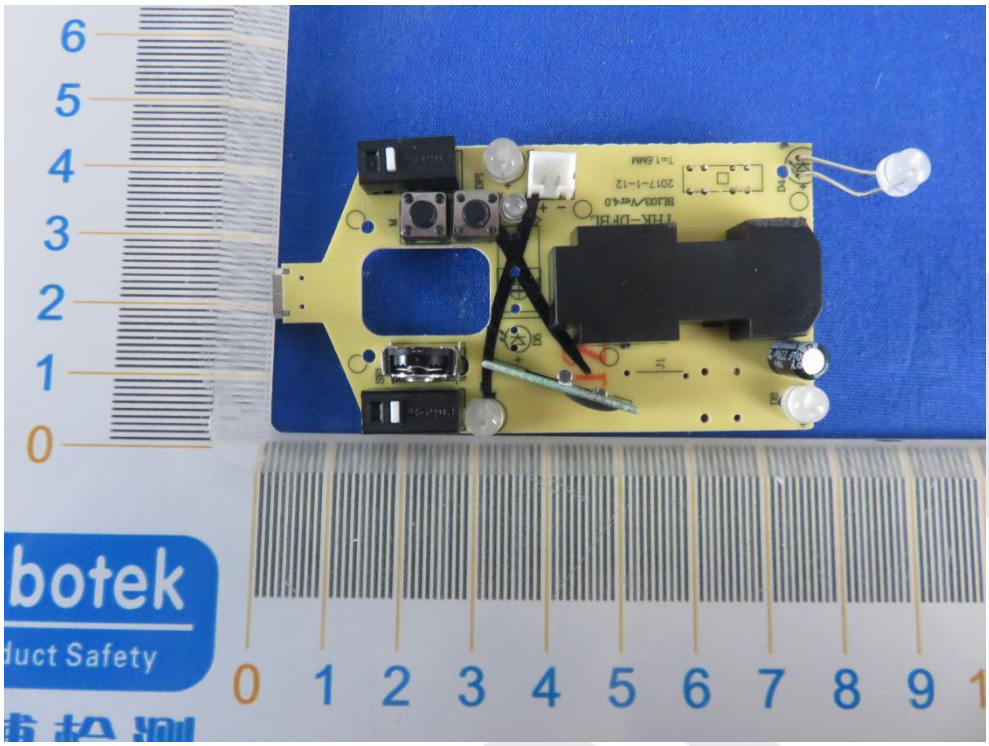
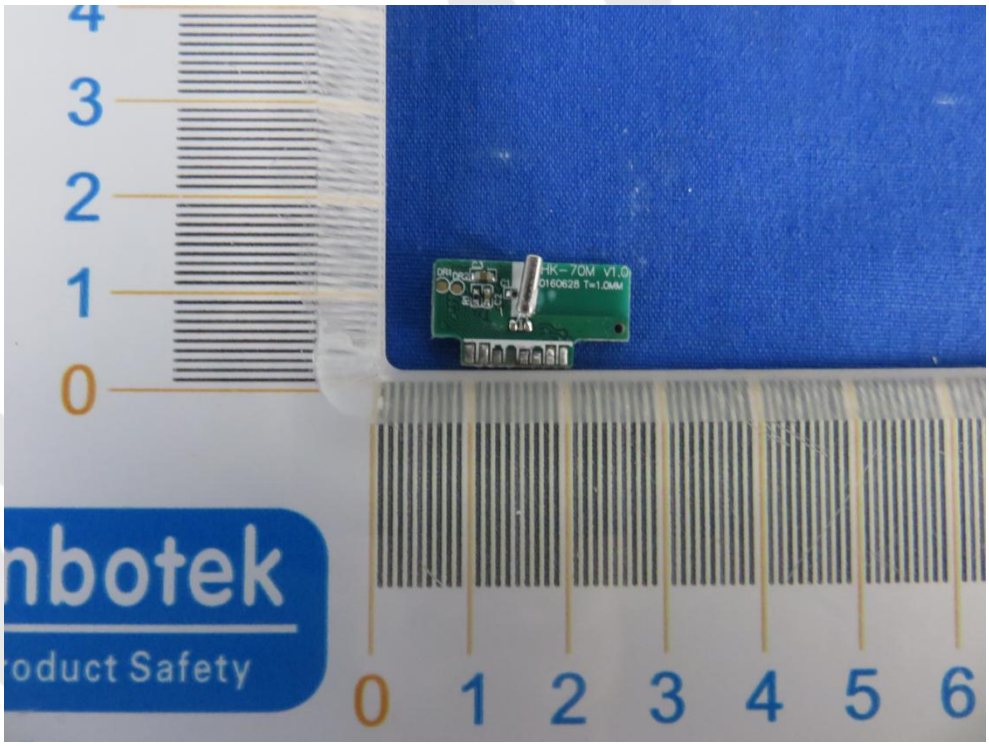
APPENDIX III -- INTERNAL PHOTOGRAPH

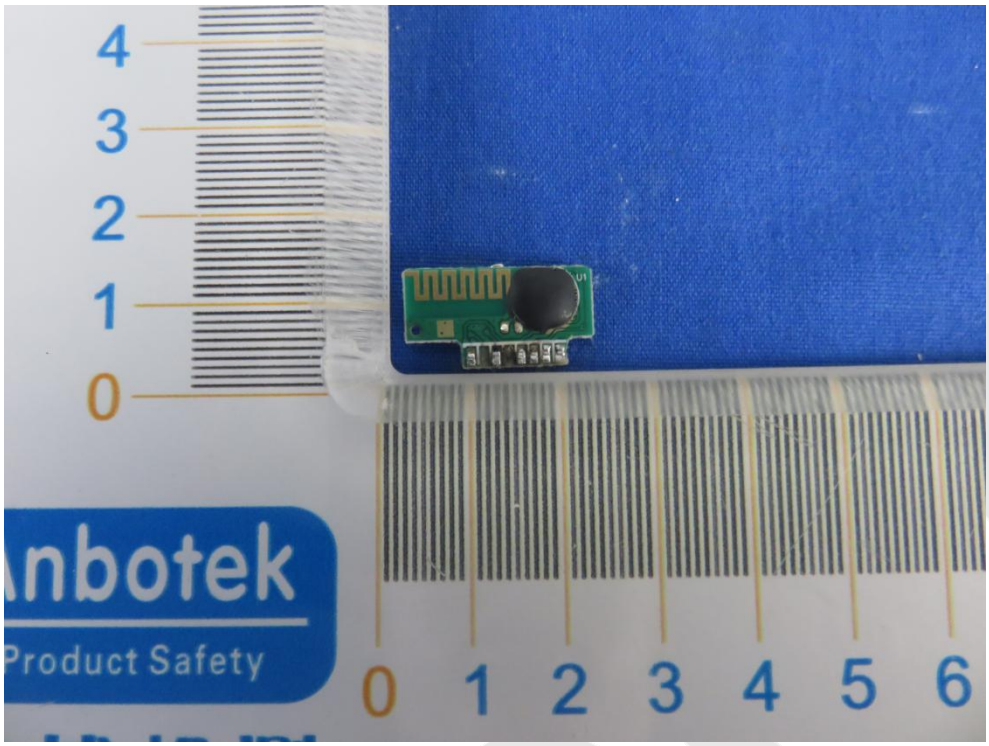








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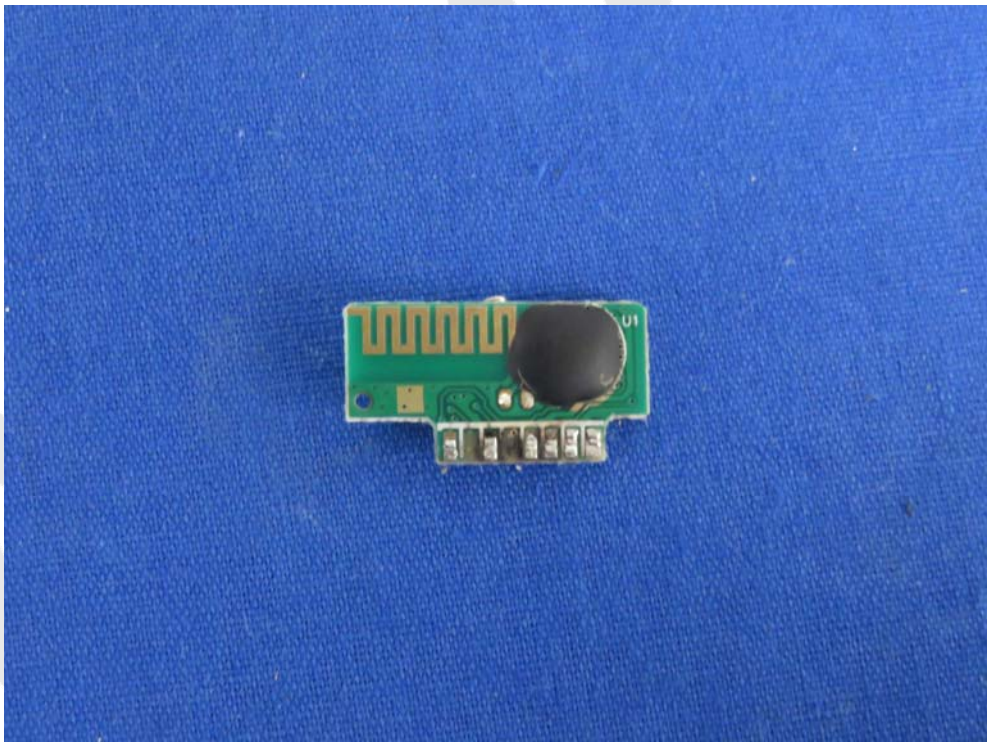

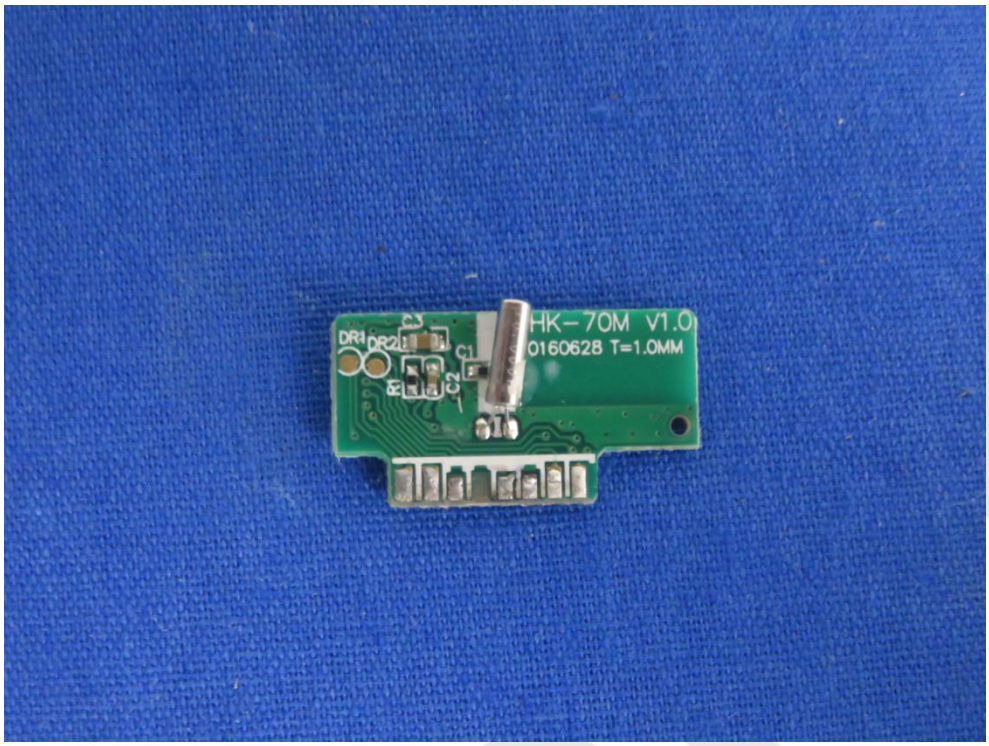
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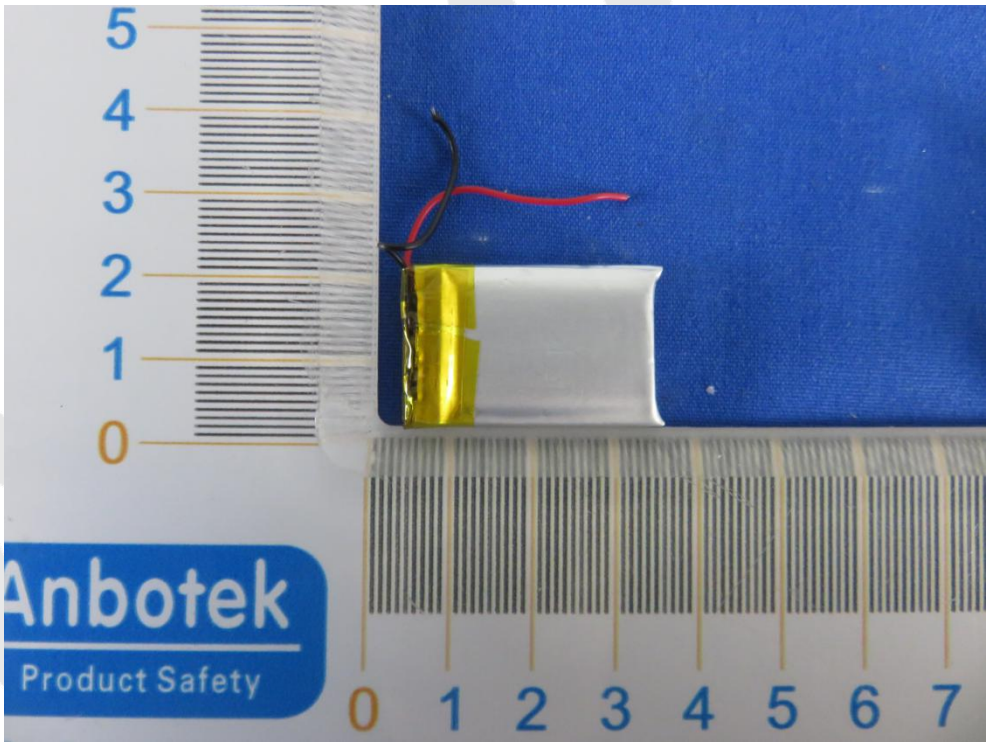
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