



FCC TEST REPORT

**Test report
On Behalf of
Shenzhen Hongjiayi Electronics Co., Ltd.
For
mouse**

**Model No.: M508, M511, M522, M521, M525, M601, M602, M603,
M701, M707, M708, M503, M702, M520, M523**

FCC ID: 2ARMW-M508

**Prepared For : Shenzhen Hongjiayi Electronics Co., Ltd.
3rd Flr, Bldg B, Shajing West Industrial Park Bao'an District, Shenzhen, 518000
China**

**Prepared By : Shenzhen HUAK Testing Technology Co., Ltd.
1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping,
Fuhai Street, Bao'an District, Shenzhen, Guangdong, China**

Date of Test: May. 06, 2022 ~ Jun. 20, 2022

Date of Report: Jun. 20, 2022

Report Number: HK2205061875-3E



TEST RESULT CERTIFICATION

Applicant's name : Shenzhen Hongjiayi Electronics Co., Ltd.

Address : 3rd Flr, Blg B, Shajing West Industrial Park Bao'an District, Shenzhen, 518000 China

Manufacture's Name : Shenzhen Hongjiayi Electronics Co., Ltd.

Address : 3rd Flr, Blg B, Shajing West Industrial Park Bao'an District, Shenzhen, 518000 China

Product description

Trade Mark: N/A

Product name : mouse

Model and/or type reference : M508, M511, M522, M521, M525, M601, M602, M603, M701, M707, M708, M503, M702, M520, M523

FCC Rules and Regulations Part 15 Subpart C Section 15.249

Standards : ANSI C63.10: 2013

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen HUAK Testing Technology Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen HUAK Testing Technology Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

Date of Test

Date (s) of performance of tests : **May. 06, 2022 ~ Jun. 20, 2022**

Date of Issue : **Jun. 20, 2022**

Test Result : **Pass**

Testing Engineer : 

(Gary Qian)

Technical Manager : 

(Eden Hu)

Authorized Signatory : 

(Jason Zhou)

**Table of Contents**

	Page
1 . TEST SUMMARY	5
1.1 . Test Procedures and Results	5
1.2 . Information of the Test Laboratory	5
1.3 . Measurement Uncertainty	5
2 . GENERAL INFORMATION	6
2.1 . General Description of EUT	6
2.2 . Operation of EUT During Testing	7
2.3 . Description of Test Setup	8
2.4 . Measurement Instruments List	9
3 . CONDUCTED EMISSIONS TEST	10
3.1. Conducted Power Line Emission Limit	10
3.2. Test Setup	10
3.3. Test Procedure	10
3.4. Test Result	11
4. RADIATED EMISSION TEST	13
4.1. Radiation Limit	13
4.2. Test Setup	13
4.3. Test Procedure	14
4.4. Test Result	14
5. BAND EDGE	20
5.1. Limits	20
5.2. Test Procedure	20
5.3. Test Result	21
6. OCCUPIED BANDWIDTH MEASUREMENT	23
6.1. Test Setup	23
6.2. Test Procedure	23
6.3. Measurement Equipment Used	23
6.4. Test Result	23
7. ANTENNA REQUIREMENT	25
8. PHOTOGRAPH OF TEST	26
9. PHOTOS OF THE EUT	28

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

**** Modified History ****

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Jun. 20, 2022	Jason Zhou

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



1. TEST SUMMARY

1.1. Test Procedures and Results

DESCRIPTION OF TEST	SECTION NUMBER	RESULT
CONDUCTED EMISSIONS TEST	15.207	COMPLIANT
RADIATED EMISSION TEST	15.249(a)/15.209	COMPLIANT
BAND EDGE	15.249(d)/15.205	COMPLIANT
OCCUPIED BANDWIDTH MEASUREMENT	15.215 (c)	COMPLIANT
ANTENNA REQUIREMENT	15.203	COMPLIANT

1.2. Information of the Test Laboratory

Shenzhen HUAK Testing Technology Co., Ltd.

Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

Testing Laboratory Authorization:

A2LA Accreditation Code is 4781.01.

FCC Designation Number is CN1229.

Canada IC CAB identifier is CN0045.

CNAS Registration Number is L9589.

1.3. Measurement Uncertainty

Measurement Uncertainty

Conducted Emission Expanded Uncertainty	= 2.71dB, k=2
Radiated emission expanded uncertainty(9kHz-30MHz)	= 3.90dB, k=2
Radiated emission expanded uncertainty(30MHz-1000MHz)	= 3.90dB, k=2
Radiated emission expanded uncertainty(Above 1GHz)	= 4.28dB, k=2



2. GENERAL INFORMATION

2.1. General Description of EUT

Equipment:	mouse
Model Name:	M508
Series Model:	M511, M522, M521, M525, M601, M602, M603, M701, M707, M708, M503, M702, M520, M523
Model Difference:	All model's the function, software and electric circuit are the same, only with a product model named different. Test sample model: M508
FCC ID:	2ARMW-M508
Antenna Type:	PCB Antenna
Antenna Gain:	1.87dBi
Operation frequency:	2403-2480MHz
Number of Channels:	16CH
Modulation Type:	GFSK
Power Source:	DC 5V From USB or DC 1.5V From Battery
Power Rating:	DC 5V From USB or DC 1.5V From Battery

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



2.1.1. Carrier Frequency of Channels

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2403	9	2441
2	2407	10	2445
3	2414	11	2453
4	2419	12	2459
5	2422	13	2463
6	2426	14	2466
7	2436	15	2473
8	2439	16	2480

2.2. Operation of EUT During Testing

Operating Mode

The mode is used: **Transmitting mode**

Low Channel: 2403MHz

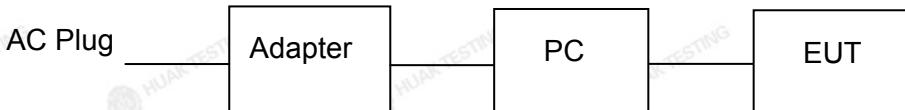
Middle Channel: 2441MHz

High Channel: 2480MHz



2.3. Description of Test Setup

Operation of EUT during Conducted testing:



Operation of EUT during Radiation testing:



PC information

Model: TP00067A

Input: DC20V, 2.25-3.25A

Output: 5VDC, 0.5A

The sample was placed (0.8m below 1GHz, 1.5m above 1GHz) above the ground plane of 3m chamber. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating the turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages. The worst case is X position.



2.4. Measurement Instruments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	L.I.S.N. Artificial Mains Network	R&S	ENV216	HKE-002	Feb. 18, 2022	1 Year
2.	Receiver	R&S	ESCI 7	HKE-010	Feb. 18, 2022	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 18, 2022	1 Year
4.	Spectrum analyzer	R&S	FSP40	HKE-025	Feb. 18, 2022	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 18, 2022	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Feb. 18, 2022	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESCI 7	HKE-010	Feb. 18, 2022	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Feb. 18, 2022	1 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Feb. 18, 2022	1 Year
10.	Horn Antenna	Schwarzbeck	9120D	HKE-013	Feb. 18, 2022	1 Year
11.	Pre-amplifier	EMCI	EMC051845S E	HKE-015	Feb. 18, 2022	1 Year
12.	Pre-amplifier	Agilent	83051A	HKE-016	Feb. 18, 2022	1 Year
13.	EMI Test Software EZ-EMC	Tonscend	JY3120-B Version	HKE-083	N/A	N/A
14.	Power Sensor	Agilent	E9300A	HKE-086	Feb. 18, 2022	1 Year
15.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 18, 2022	1 Year
16.	Signal generator	Agilent	N5182A	HKE-029	Feb. 18, 2022	1 Year
17.	Signal Generator	Agilent	83630A	HKE-028	Feb. 18, 2022	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 09, 2021	3 Year
19.	Hight gain antenna	Schwarzbeck	LB-180400KF	HKE-054	Feb. 18, 2022	1 Year

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.



3. CONDUCTED EMISSIONS TEST

3.1. Conducted Power Line Emission Limit

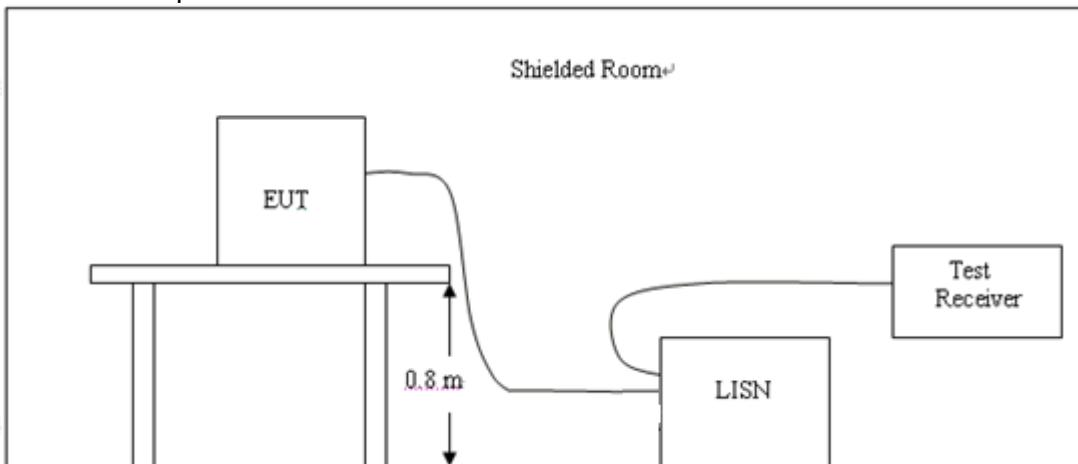
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following.

Frequency (MHz)	Maximum RF Line Voltage (dB μ V)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

* Decreasing linearly with the logarithm of the frequency.

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2. Test Setup



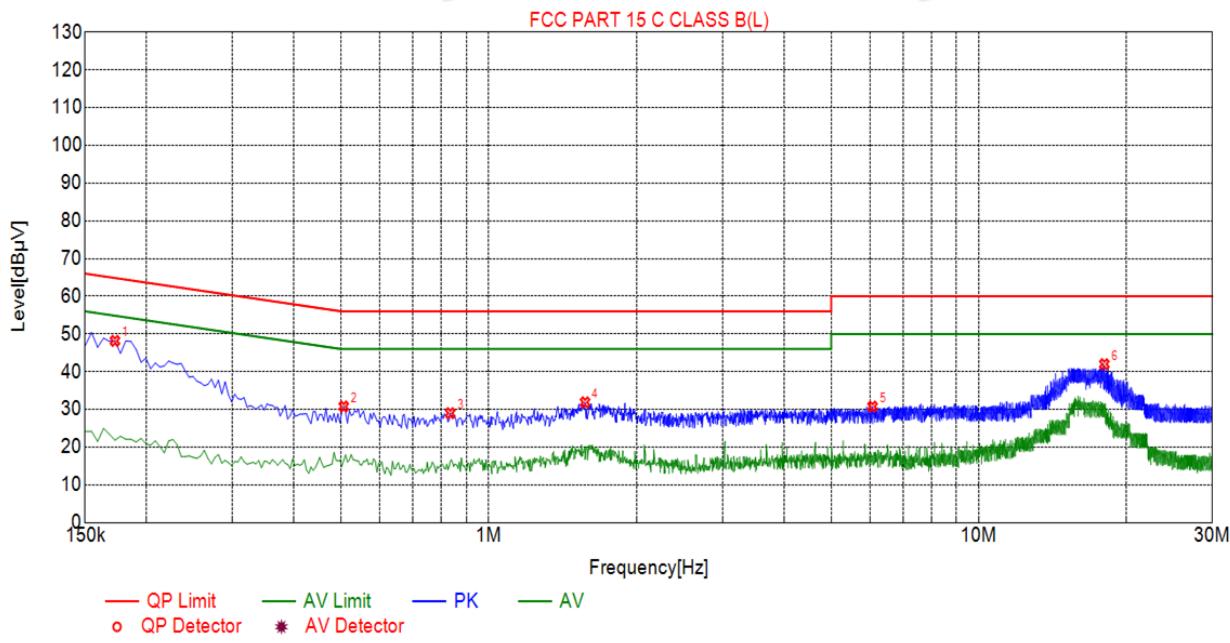
3.3. Test Procedure

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10.
2. Support equipment, if needed, was placed as per ANSI C63.10.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10.
4. If a EUT received DC power from the USB Port of Notebook PC, the PC's adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.



3.4. Test Result

Test Specification: Line



Suspected List

NO.	Freq. [MHz]	Level [dB μ V]	Factor [dB]	Limit [dB μ V]	Margin [dB]	Reading [dB μ V]	Detector	Type
1	0.1725	48.16	20.04	64.84	16.68	28.12	PK	L
2	0.5055	30.77	20.04	56.00	25.23	10.73	PK	L
3	0.8340	29.00	20.06	56.00	27.00	8.94	PK	L
4	1.5720	31.88	20.11	56.00	24.12	11.77	PK	L
5	6.0720	30.75	20.23	60.00	29.25	10.52	PK	L
6	18.0510	41.99	20.03	60.00	18.01	21.96	PK	L

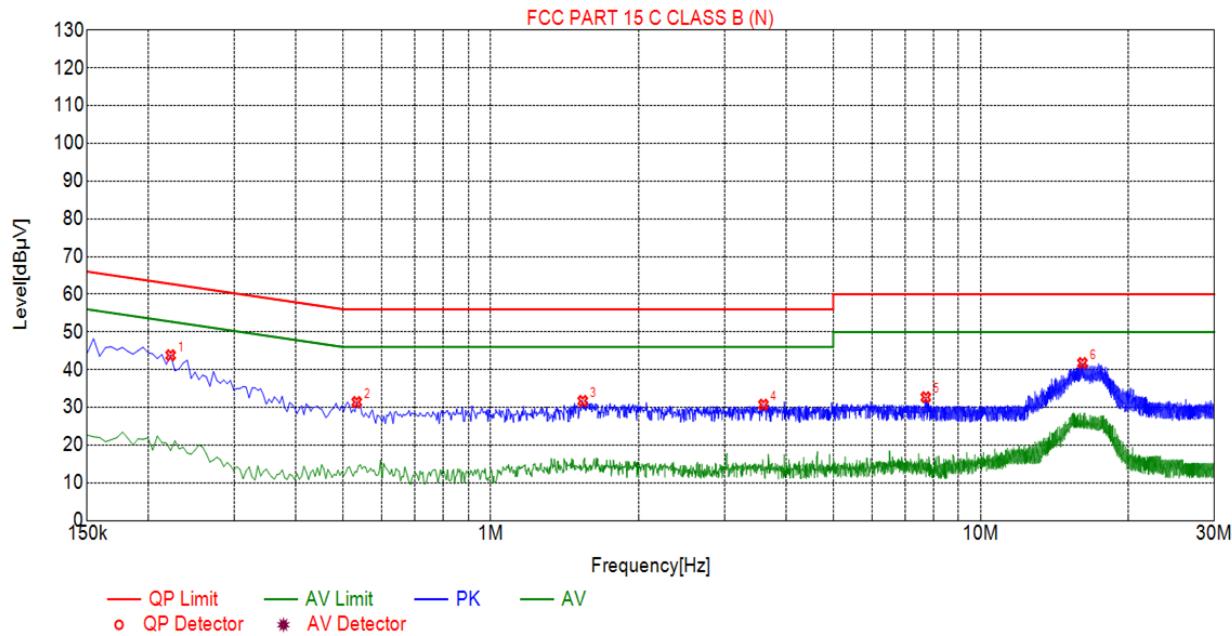
Remark: Margin = Limit – Level

Correction factor = Cable loss + LISN insertion loss

Level=Test receiver reading + correction factor



Test Specification: Neutral



Suspected List

NO.	Freq. [MHz]	Level [dBμV]	Factor [dB]	Limit [dBμV]	Margin [dB]	Reading [dBμV]	Detector	Type
1	0.2220	43.83	20.04	62.74	18.91	23.79	PK	N
2	0.5325	31.42	20.05	56.00	24.58	11.37	PK	N
3	1.5405	31.71	20.11	56.00	24.29	11.60	PK	N
4	3.6015	30.73	20.25	56.00	25.27	10.48	PK	N
5	7.7280	32.69	20.17	60.00	27.31	12.52	PK	N
6	16.1340	41.76	19.98	60.00	18.24	21.78	PK	N

Remark: Margin = Limit – Level

Correction factor = Cable loss + LISN insertion loss

Level=Test receiver reading + correction factor



4. RADIATED EMISSION TEST

4.1. Radiation Limit

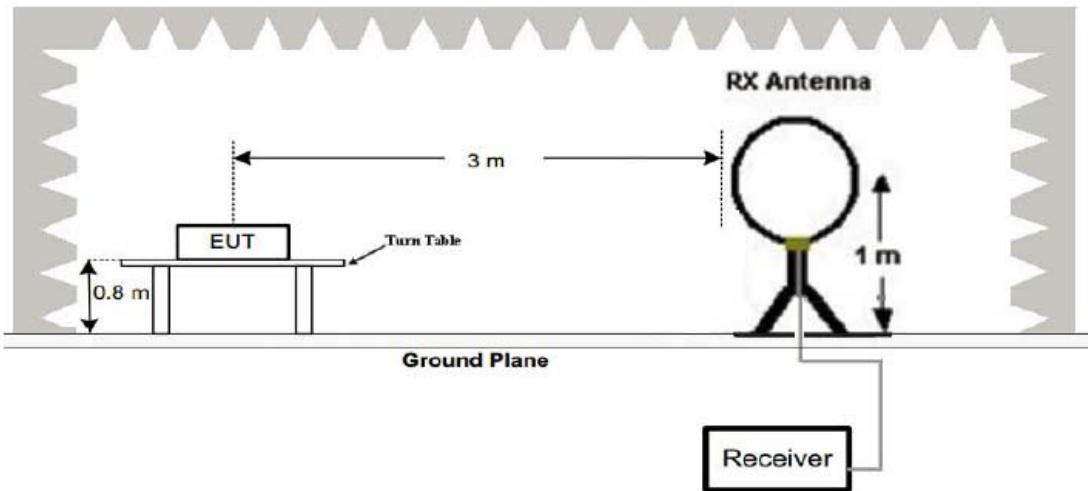
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dB μ V/m)	Radiated (μ V/m)
0.009-0.490	300	20log 2400/F (kHz)	2400/F (kHz)
0.490-1.705	30	20log 24000/F (kHz)	24000/F (kHz)
1.705-30	30	20log 30	30
30-88	3	40	100
88-216	3	43.5	150
216-960	3	46	200
Above 960	3	54	500

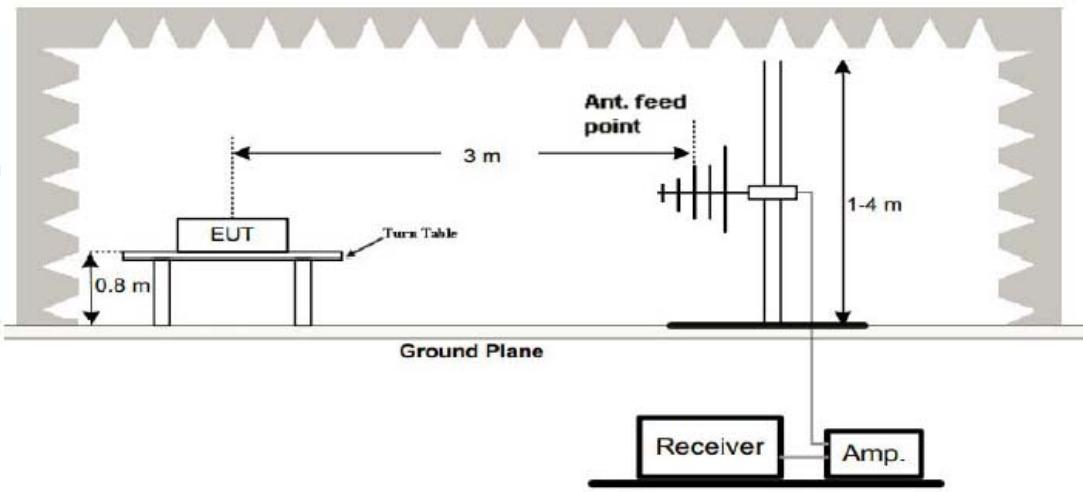
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

4.2. Test Setup

(1) Radiated Emission Test-Up Frequency Below 30MHz



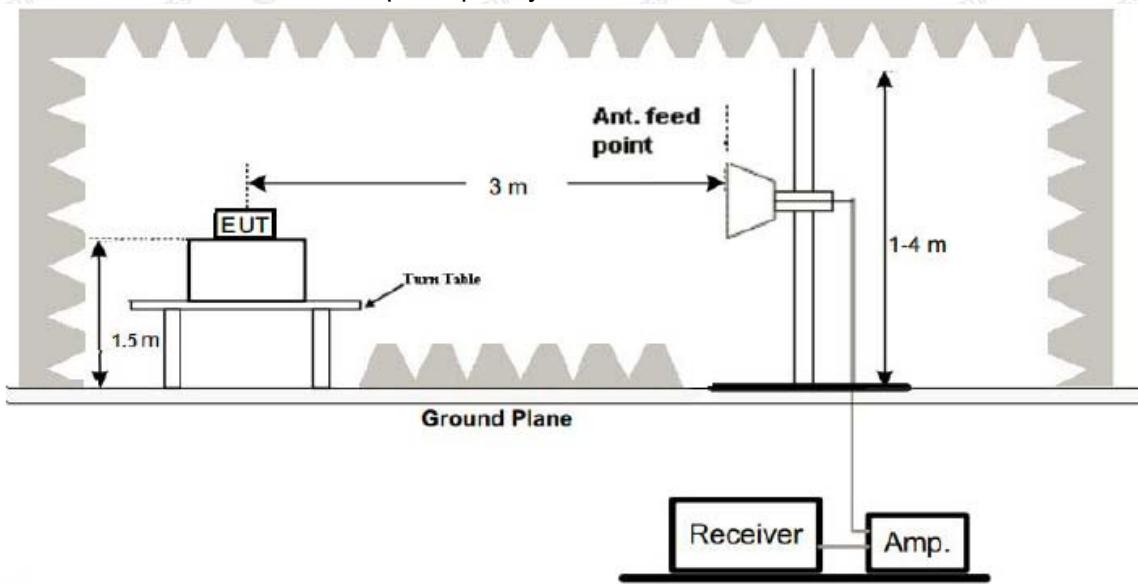
(2) Radiated Emission Test-Up Frequency 30MHz~1GHz



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>



(3) Radiated Emission Test-Up Frequency Above 1GHz



4.3. Test Procedure

1. Below 1GHz measurement the EUT is placed on turntable which is 0.8m above ground plane. And above 1GHz measurement EUT was placed on low permittivity and low tangent turn table which is 1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The test frequency range from 9KHz to 25GHz per FCC PART 15.33(a).

Note:

For battery operated equipment, the equipment tests shall be performed using a new battery.

4.4. Test Result

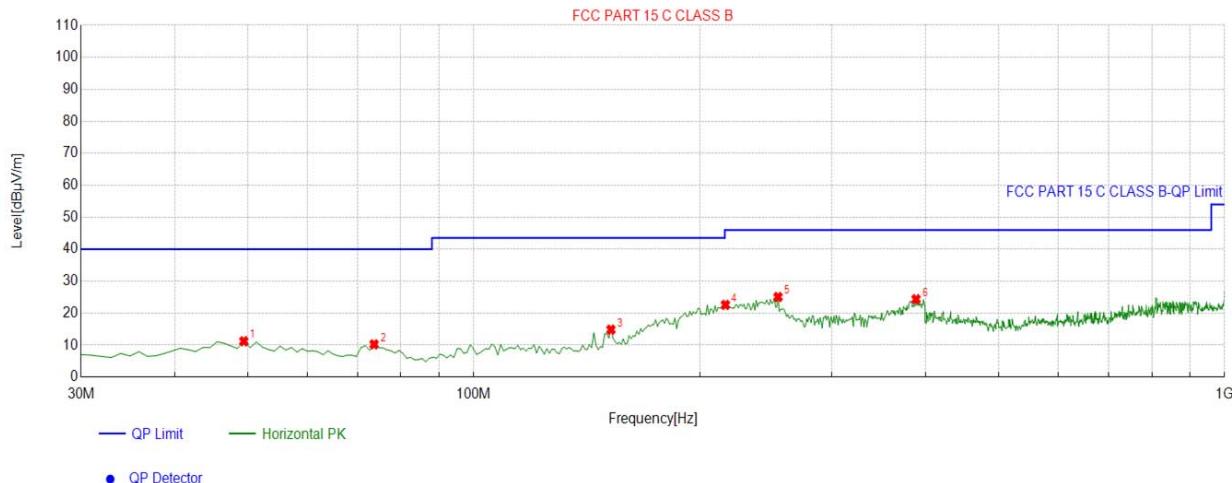
PASS

All the test modes completed for test. The worst case of Radiated Emission is CH 01; the test data of this mode was reported.



Below 1GHz Test Results:

Antenna polarity: H

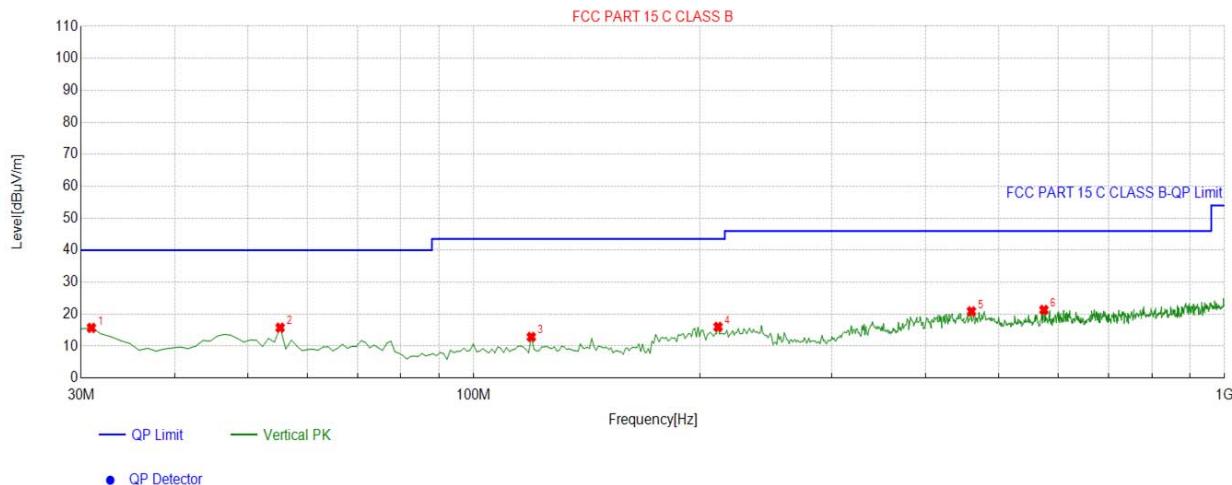


Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	49.4194	-13.65	24.85	11.20	40.00	28.80	100	2	Horizontal
2	73.6937	-18.33	28.56	10.23	40.00	29.77	100	327	Horizontal
3	152.3423	-20.44	35.27	14.83	43.50	28.67	100	66	Horizontal
4	216.4264	-14.65	37.23	22.58	46.00	23.42	100	62	Horizontal
5	254.2943	-13.45	38.49	25.04	46.00	20.96	100	81	Horizontal
6	388.2883	-10.68	35.03	24.35	46.00	21.65	100	264	Horizontal

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level



Antenna polarity: V



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dB μ V/m]	Level [dB μ V/m]	Limit [dB μ V/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	30.9710	-16.30	31.99	15.69	40.00	24.31	100	33	Vertical
2	55.2452	-14.44	30.21	15.77	40.00	24.23	100	124	Vertical
3	119.3293	-16.99	29.86	12.87	43.50	30.63	100	41	Vertical
4	211.5716	-14.76	30.76	16.00	43.50	27.50	100	360	Vertical
5	460.1401	-8.66	29.52	20.86	46.00	25.14	100	291	Vertical
6	574.7147	-6.49	27.80	21.31	46.00	24.69	100	311	Vertical

Remark: Factor = Cable loss + Antenna factor – Preamplifier; Level = Reading + Factor; Margin = Limit – Level

Harmonics and Spurious Emissions

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m (dB μ V/m)	Limit@3m (dB μ V/m)
--	--	--
--	--	--
--	--	--
--	--	--

Note: 1. Emission Level=Reading+ Cable loss+ Antenna factor-Amp factor.

2. The emission levels are 20 dB below the limit value, which are not reported. It is deemed to comply with the requirement.



Above 1 GHz Test Results:
CH Low (2403MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2403	106.07	-5.84	100.23	114	-13.77	peak
2403	80.28	-5.84	74.44	94	-19.56	AVG
4806	56.18	-3.64	52.54	74	-21.46	peak
4806	42.91	-3.64	39.27	54	-14.73	AVG
7209	52.36	-0.95	51.41	74	-22.59	peak
7209	40.55	-0.95	39.6	54	-14.4	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2403	105.88	-5.84	100.04	114	-13.96	peak
2403	81.2	-5.84	75.36	94	-18.64	AVG
4806	57.25	-3.64	53.61	74	-20.39	peak
4806	41.89	-3.64	38.25	54	-15.75	AVG
7209	49.69	-0.95	48.74	74	-25.26	peak
7209	38.05	-0.95	37.1	54	-16.9	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



CH Middle (2441MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2441	104.88	-5.71	99.17	114	-14.83	peak
2441	77.52	-5.71	71.81	94	-22.19	AVG
4882	54.33	-3.51	50.82	74	-23.18	peak
4882	41.62	-3.51	38.11	54	-15.89	AVG
7323	52.53	-0.82	51.71	74	-22.29	peak
7323	38.45	-0.82	37.63	54	-16.37	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2441	103.22	-5.71	97.51	114	-16.49	peak
2441	80.4	-5.71	74.69	94	-19.31	AVG
4882	56.47	-3.51	52.96	74	-21.04	peak
4882	41.90	-3.51	38.39	54	-15.61	AVG
7323	50.04	-0.82	49.22	74	-24.78	peak
7323	39.67	-0.82	38.85	54	-15.15	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



CH High (2480MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2480	105.85	-5.65	100.2	114	-13.8	peak
2480	81.27	-5.65	75.62	94	-18.38	AVG
4960	53.50	-3.43	50.07	74	-23.93	peak
4960	39.30	-3.43	35.87	54	-18.13	AVG
7440	49.17	-0.75	48.42	74	-25.58	peak
7440	38.01	-0.75	37.26	54	-16.74	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2480	101.93	-5.65	96.28	114	-17.72	peak
2480	80.58	-5.65	74.93	94	-19.07	AVG
4960	53.33	-3.43	49.9	74	-24.1	peak
4960	41.72	-3.43	38.29	54	-15.71	AVG
7440	52.62	-0.75	51.87	74	-22.13	peak
7440	38.77	-0.75	38.02	54	-15.98	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark :

- (1) Measuring frequencies from 1 GHz to the 25 GHz.
- (2) "F" denotes fundamental frequency; "H" denotes spurious frequency; "E" denotes band edge frequency.
- (3) * denotes emission frequency which appearing within the Restricted Bands specified in provision of 15.205, then the general radiated emission limits in 15.209 apply.
- (4) The emissions are attenuated more than 20dB below the permissible limits are not record in the report.
- (5) The IF bandwidth of EMI Test Receiver between 30MHz to 1GHz was 120KHz, 1 MHz for measuring above 1 GHz, below 30MHz was 10KHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- (6) When the test results of Peak Detected below the limits of Average Detected, the Average Detected is not need completed. For example: Top Channel at Fundamental 73.16dB μ V/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dB μ V/m(PK Value) <54 dB μ V/m(AV Limit), the Average Detected not need to completed.
- (7) All modes of operation were investigated and the worst-case emissions are reported.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>



5. BAND EDGE

5.1. Limits

FCC PART 15.249(d) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in §15.209, whichever is the lesser attenuation.

5.2. Test Procedure

The band edge compliance of RF radiated emission should be measured by following the guidance in ANSI C63.10 with respect to maximizing the emission by rotating the EUT, measuring the emission while the EUT is situated in three orthogonal planes (if appropriate), adjusting the measurement antenna height and polarization etc. Set RBW to 1MHz and VBM to 3MHz to measure the peak field strength and set RBW to 1MHz and VBW to 10Hz to measure the average radiated field strength.



5.3. Test Result

PASS**Radiated Band Edge Test:**

Operation Mode: TX CH Low (2403MHz)

Horizontal (Worst case)

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2310	57.56	-5.81	51.75	74	-22.25	peak
2310	/	-5.81	/	54	/	AVG
2390	56.38	-5.84	50.54	74	-23.46	peak
2390	/	-5.84	/	54	/	AVG
2400	55.32	-5.84	49.48	74	-24.52	peak
2400	/	-5.84	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Meter Reading (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2310	57.17	-5.81	51.36	74	-22.64	peak
2310	/	-5.81	/	54	/	AVG
2390	56.49	-5.84	50.65	74	-23.35	peak
2390	/	-5.84	/	54	/	AVG
2400	55.03	-5.84	49.19	74	-24.81	peak
2400	/	-5.84	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.



Operation Mode: TX CH High (2480MHz)
Horizontal (Worst case)

Frequency (MHz)	Reading Result (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2483.50	56.14	-5.65	50.49	74	-23.51	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	55.87	-5.65	50.22	74	-23.78	peak
2500.00	/	-5.65	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Vertical:

Frequency (MHz)	Reading Result (dB μ V)	Factor (dB)	Emission Level (dB μ V/m)	Limits (dB μ V/m)	Margin (dB)	Detector Type
2483.50	56.06	-5.65	50.41	74	-23.59	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	55.23	-5.65	49.58	74	-24.42	peak
2500.00	/	-5.65	/	54	/	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier.

Remark: All the other emissions not reported were too low to read and deemed to comply with FCC limit.



6. OCCUPIED BANDWIDTH MEASUREMENT

6.1. Test Setup

Same as Radiated Emission Measurement

6.2. Test Procedure

1. The EUT was placed on a turn table which is 0.8m above ground plane.
2. Set EUT as normal operation.
3. Based on ANSI C63.10 section 6.9.2: RBW= 20KHz. VBW= 62 KHz, Span=3MHz.
4. The useful radiated emission from the EUT was detected by the spectrum analyzer with peak detector.

6.3. Measurement Equipment Used

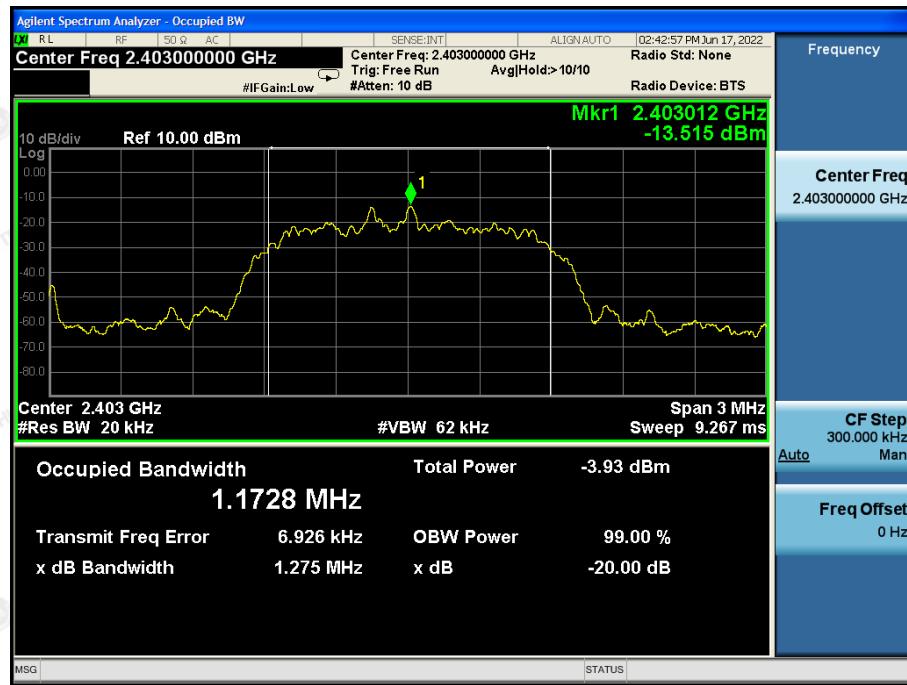
Same as Radiated Emission Measurement

6.4. Test Result

PASS

Frequency	20dB Bandwidth (MHz)	Result
2403 MHz	1.275	PASS
2441 MHz	1.275	PASS
2480 MHz	1.281	PASS

CH: 2403MHz



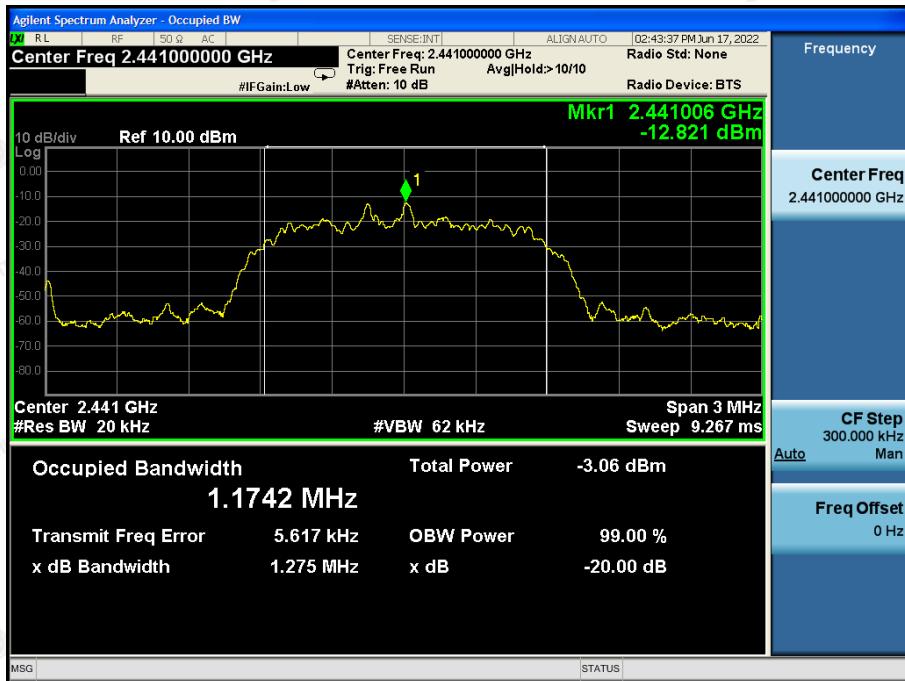
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

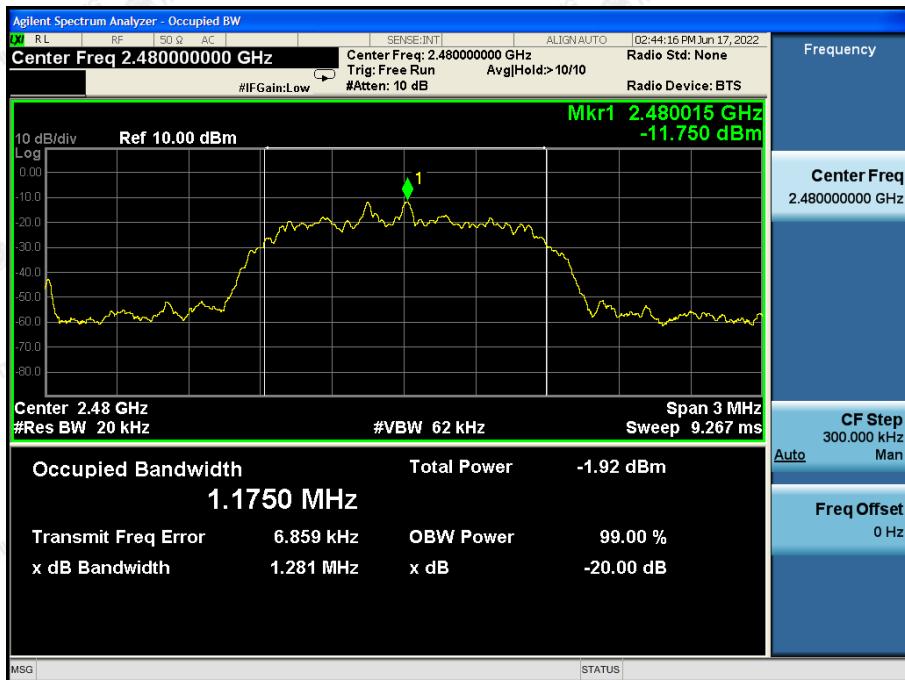
Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



CH: 2441MHz



CH: 2480MHz



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China



7. ANTENNA REQUIREMENT

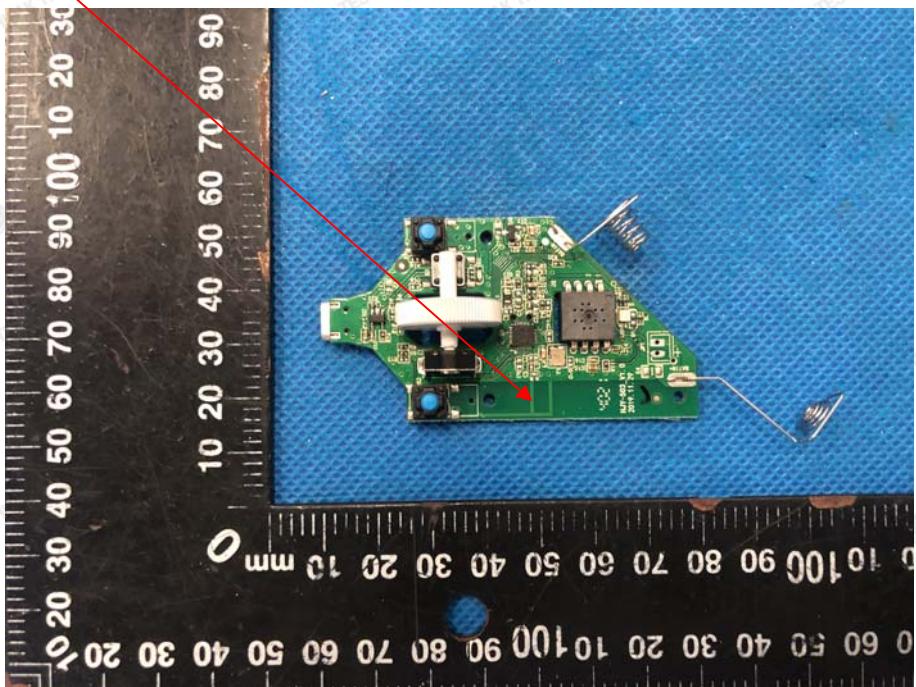
Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, 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.

Antenna Connected Construction

The antenna used in this product is a PCB Antenna, which permanently attached. It conforms to the standard requirements. The directional gains of antenna used for transmitting is 1.87dBi.

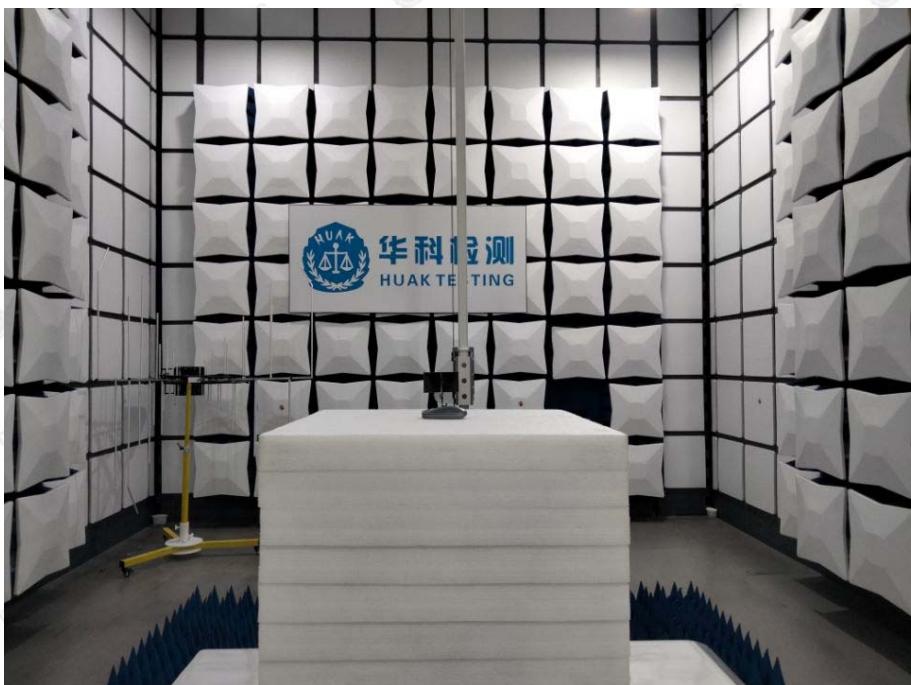
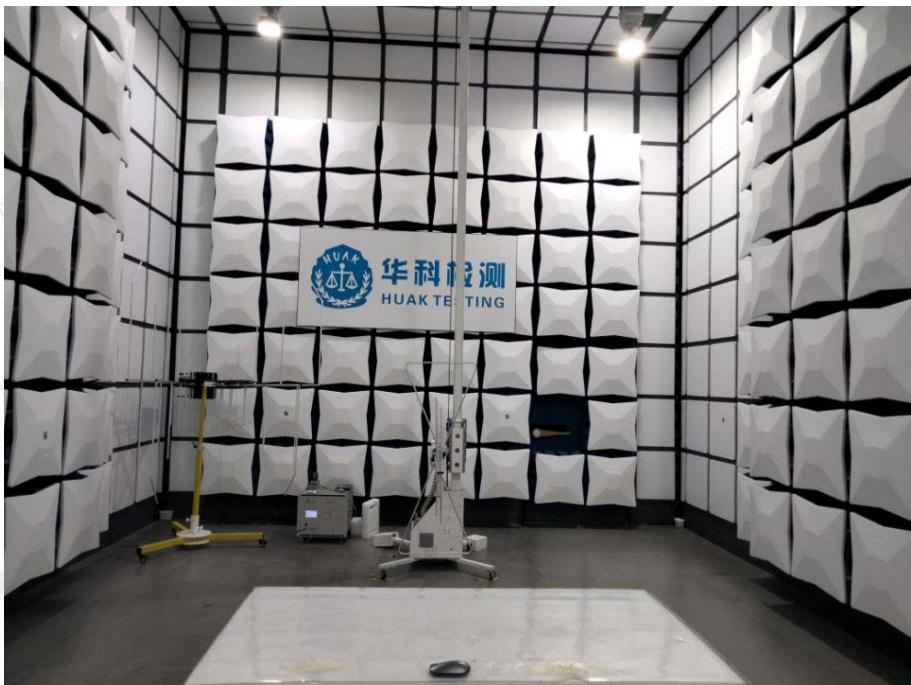
ANTENNA





8. PHOTOGRAPH OF TEST

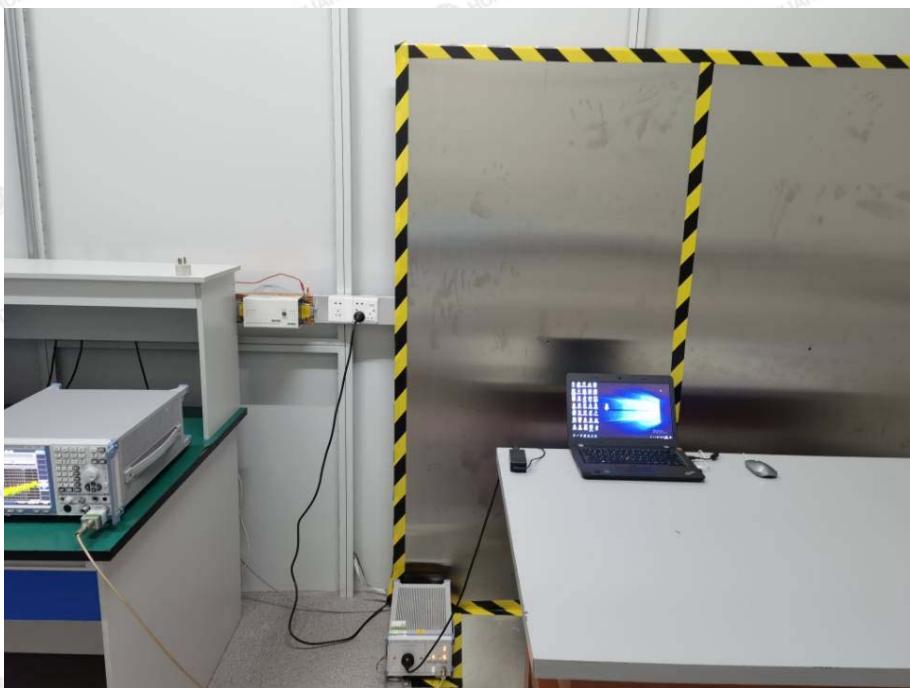
Radiated Emission



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

**Conducted Emission**

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at <http://www.cer-mark.com>.

TEL : +86-755 2302 9901 FAX : +86-755 2302 9901 E-mail : service@cer-mark.com

Add: 1-2F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping Community, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China

**9. PHOTOS OF THE EUT**

Reference to the report: ANNEX A of external photos and ANNEX B of internal photos.

-----End of test report-----

