

Page 1 of 26

# FCC TEST REPORT

Test report On Behalf of Guangzhou Maipai Electronics Co.,Ltd. For Wireless mouse Model No.: M7026

FCC ID: 2AFVEM7026

Prepared For :

: Guangzhou Maipai Electronics Co.,Ltd.

Room 202,No.94,Shinan Road,Xianchong Village, Qiaonan Street,Panyu District, Guangzhou, 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:
 Jan. 02, 2023 ~ Jan. 10, 2023

 Date of Report:
 Jan. 10, 2023

 Report Number:
 HK2301040017-E

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 cannont 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



Page 2 of 26

# TEST RESULT CERTIFICATION

Applicant's name:	Guangzhou Maipai Electronics Co.,Ltd.
Address:	Room 202,No.94,Shinan Road,Xianchong Village, Qiaonan Street,Panyu District, Guangzhou, China
Manufacture's Name	Guangzhou Maipai Electronics Co.,Ltd.
Address:	Room 202,No.94,Shinan Road,Xianchong Village, Qiaonan Street,Panyu District, Guangzhou, China

### Product description

Trade Mark:	N/A
Trade Mark.	IN/A
Product name:	Wireless mouse
Model and/or type reference :	M7026
Standards:	FCC Rules and Regulations Part 15 Subpart C Section 15.249 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:	Jan. 02, 2023 ~ Jan. 10, 2023
Date of Issue	Jan. 10, 2023
Test Result	Pass

Testing Engineer

Gang Dia

(Gary Qian)

Technical Manager

OM

(Eden Hu)

Authorized Signatory:

ason Uwu

(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 cannont 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

HUAK TESTING

### Page 3 of 26

NG

¦К

	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
TESTING 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
O <sup>mum</sup> 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
TESTING 4	. RADIATED EMISSION TEST	12
	4.1. Radiation Limit	12
	4.2. Test Setup	12
	4.3. Test Procedure	13
	4.4. Test Result	13
6 6	. BAND EDGE	19
	5.1. Limits	19
	5.2. Test Procedure	19
	5.3. Test Result	20
E CONTRACTOR	. OCCUPIED BANDWIDTH MEASUREMENT	22
	6.1. Test Setup	22
	6.2. Test Procedure	www. 22
	6.3. Measurement Equipment Used	22
	6.4. Test Result	22
HUNT	. ANTENNA REQUIREMENT	24
8	. PHOTOGRAPH OF TEST	25
g	. PHOTOS OF THE EUT	26

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 cannont 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 \*\*

	Initial Test Report Rel		n. 10, 2023	Jason Zhou
A TESTING	HUAKTESTING	HUAN TESTING	HUAKTESTING	HUAKTESTIN

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 cannont 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



Page 5 of 26

### **1. TEST SUMMARY**

### 1.1. Test Procedures and Results

DESCRIPTION OF TEST	SECTION NUMBER	RESULT				
CONDUCTED EMISSIONS TEST	15.207	N/A				
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				
Remark: "N/A" is an abbreviation for Not Applicable.						

### 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

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 cannont 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.



FICATION

### 2. GENERAL INFORMATION

2.1.General Description of EUT

Equipment:	Wireless mouse	STING	STING
Model Name:	M7026	HUAK	HUAR
Series Model:	N/A	Glass	Ŷ
Model Difference:	N/A	UNAK TESTIN	TING
FCC ID:	2AFVEM7026		HUAKTES
Antenna Type:	PCB Antenna	STING	9
Antenna Gain:	-4.62dBi		NG SING OF
Operation frequency:	2402-2480MHz	HUAK TES	HUAKIL
Number of Channels:	40CH		<i></i>
Modulation Type:	GFSK		
Power Source:	DC 3V from Battery	O HUAK TESTING	HUAKTESTIC
Power Rating:	DC 3V from Battery	NKTESTING	a)G

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 cannont 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



Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
TING	2402	11	2420	21	2440	31	2460
2	2404	12	2422	22	2442	32	2462
3	2406	13	2424	23	2444	33	2464
ESTIME 4	2408	14	2426	24	2446	34	2466
5	2410	15	2428	25	2448	35	2468
6	2412	16	2430	26	2450	36	2470
7	2414	17	2432	27	2452	37	2472
8 5 100	2416	18	2434	28	2454	38	2474
9	2418	19	2436	29	2456	39	2476
10	2420	20	2438	30	2458	40	2478

### 2.1.1.Carrier Frequency of Channels

2.2. Operation of EUT during Testing

Operating Mode The mode is used: **Transmitting mode** Low Channel: 2402MHz Middle Channel: 2440MHz High Channel: 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 cannont 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



Page 8 of 26

### 2.3.Description of Test Setup

Operation of EUT during 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.

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 cannont 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



NG

¦К °PR

### 2.4.Measurement Instruments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
KTEST	L.I.S.N.	WAK TEST.	- HUAK TEST	HUAKT	Est.	K TESIN
1.	Artificial Mains	R&S	ENV216	HKE-002	Feb. 18, 2022	1 Year
	Network	TESTING			3	~
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
4.6	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	<sup>0</sup> 1 Year
10.	Horn Antenna	Schewarzbeck	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	Feb. 18, 2022	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 cannont 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



### 3. CONDUCTED EMISSIONS TEST

### 3.1. Conducted Power Line Emission Limit

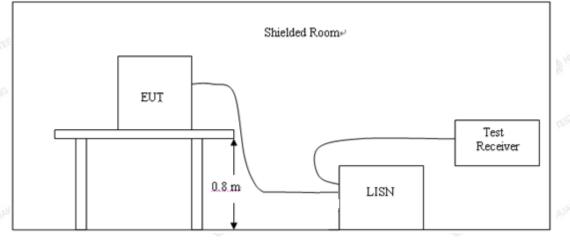
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following.

Frequency (MHz)	N	Maximum RF Line Voltage (dBµV)				
	CLA	CLASS A		CLASS B		
(11112)	Q.P.	Ave.	Q.P.	Ave.		
0.15 - 0.50	79	66	<mark>66-56*</mark>	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/60Hzpower 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.

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 cannont 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



Page 11 of 26

Report No.: HK2301040017-E

3.4. Test Result

Not applicable. Note: EUT powers supply by DC Power, so this test item not applicable.

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 cannont 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

FICATION



### 4. RADIATED EMISSION TEST

#### 4.1. Radiation Limit

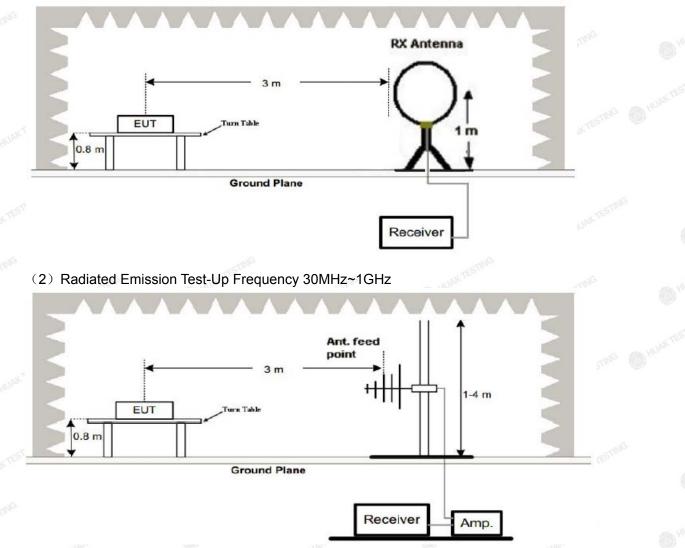
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency	Distance	Radiated	Radiated
(MHz)	(Meters)	(dBµV/m)	(µV/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	HUM 3	54	500
100 112	2010	CAW MADE	100

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

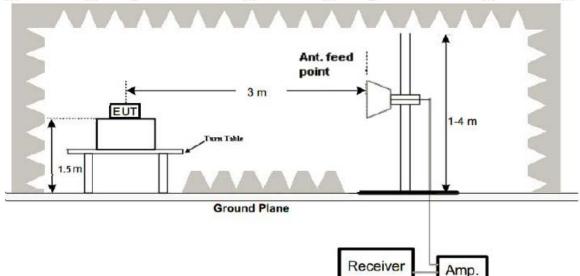


The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity 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



#### (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 to25GHz 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.

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 cannont 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

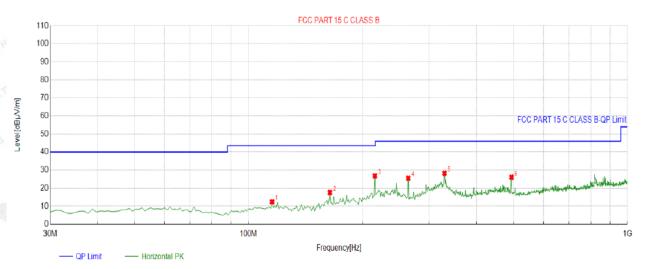


Page 14 of 26

E F

#### Below 1GHz Test Results:

Antenna polarity: H



QP Detector

Suspe	cted List								
NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	115.4454	-15.02	27.43	12.41	43.50	31.09	100	228	Horizontal
2	163.9940	-17.19	34.80	17.61	43.50	25.89	100	88	Horizontal
3	215.4555	-14.43	41.27	26.84	43.50	16.66	100	69	Horizontal
4	264.0040	-12.71	38.28	25.57	46.00	20.43	100	47	Horizontal
5	329.0591	-11.59	39.87	28.28	46.00	17.72	100	182	Horizontal
6	494.1241	-7.29	33.34	26.05	46.00	19.95	100	37	Horizontal

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

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 cannont 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



le:

Antenna polarity: V



Cuere este d Liet

	Suspe	cieu Lisi								
ł	NO.	Freq. [MHz]	Factor [dB]	Reading [dBµV/m]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
	1	64.9550	-14.59	29.13	14.54	40.00	25.46	100	231	Vertical
5	2	93.1131	-16.73	35.97	19.24	43.50	24.26	100	328	Vertical
	3	163.9940	-17.19	38.19	21.00	43.50	22.50	100	24	Vertical
	4	215.4555	-14.43	33.81	19.38	43.50	24.12	100	223	Vertical
1	5	329.0591	-11.59	35.05	23.46	46.00	22.54	100	345	Vertical
	6	493.1532	-7.36	32.78	25.42	46.00	20.58	100	202	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 (dBµV/m)	Limit@3m (dBµV/m)
TIN	3. 	TESTING	TESTING
	WKTESTING OHU	TESTING INTESTING	HUAN WKTESTING
	O ***	6 0 <sup>m</sup>	
ĺ	- WANTEST		KTESIN

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.

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 cannont 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



# Above 1 GHz Test Results: CH Low (2402MHz)

### Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2402	100.65	-5.84	94.81	114 MUAN	-19.19	peak
2402	85.03	-5.84	79.19	94	-14.81	AVG
4804	54.19	-3.64	50.55	74	-23.45	peak
4804	42.38	-3.64	38.74	54	-15.26	AVG
7206	53.49	-0.95	52.54	74	-21.46	peak
7206	40.97	-0.95	40.02	54	-13.98	AVG

### Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m) 🛸	(dB)	Туре
2402	96.55	-5.84	90.71	114	-23.29	peak
2402	85.16	-5.84	79.32	94	-14.68	AVG
4804	53.26	-3.64	49.62	74	-24.38	peak
4804	42.37	-3.64	38.73	54	-15.27	AVG
<sup>%6</sup> 7206	53.16	-0.95	52.21	<sup>NG</sup> 74	-21.79	peak
7206	43.19	-0.95	42.24	54	-11.76	AVG

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 cannont 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



C

# CH Middle (2440MHz)

### Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detecto
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2440	97.34	-5.71	91.63	114	-22.37	peak
2440	83.16	-5.71	77.45	94	-16.55	AVG
4880	54.16	-3.51	50.65	74	-23.35	peak
4880	42.16	-3.51	38.65	54	-15.35	AVG
7320	52.11	-0.82	51.29	74	-22.71	peak
7320	41.38	-0.82	40.56	54	-13.44	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level – Limit

# Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2440	96.16	-5.71	90.45	114	-23.55	peak
2440	82.34	-5.71	76.63	94	-17.37	AVG
4880	54.16	-3.51	50.65	74	-23.35	peak
4880	41.25	-3.51	37.74	54	-16.26	AVG
7320	50.38	-0.82	49.56	74	-24.44	peak
7320	43.08	-0.82	42.26	54	-11.74	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level – Limit

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 cannont 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



CH High (2480MHz)

## Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Datastan
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
2480	95.28	-5.65	89.63	114	-24.37	peak
2480	86.34	-5.65	80.69	94	-13.31	AVG
4960	56.37	-3.43	52.94	74	-21.06	peak
4960	41.08	-3.43	37.65	54	-16.35	AVG
7440	54.38	-0.75	53.63	74	-20.37	peak
7440	43.16	-0.75	42.41	54	-11.59	AVG

### Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Dutation
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
2480	96.35	-5.65	90.7	114	-23.3	peak
2480	84.15	-5.65	78.5	94	-15.5	AVG
4960	54.25	-3.43	50.82	74	-23.18	peak
4960	43.69	-3.43	40.26	54	-13.74	AVG
7440	51.17	-0.75	50.42	74	-23.58	peak
7440	41.98	-0.75	41.23	54 St	-12.77	AVG

### 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 1MHzand video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1MHzand video bandwidth of test receiver/spectrum analyzer is 10Hz. The resolution bandwidth of test receiver/spectrum analyzer is 10Hz.

(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 73.16dBuV/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dBuV/m(PK Value) <54 dBuV/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 cannont 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.



### Page 19 of 26

### 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 ANSIC63.10 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.

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 cannont 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



### PASS

Radiated Band Edge Test: Operation Mode: TX CH Low (2402MHz) Horizontal (Worst case)

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2310	54.03	-5.81	48.22	74	-25.78	peak
2310	NG OH	-5.81	1	54	1	AVG
2390	55.82	-5.84	49.98	74	-24.02	peak
2390	/	-5.84	1	54	1	AVG
2400	56.29	-5.84	50.45	74	-23.55	peak
2400	MAKTESIN	-5.84	I MAK TESN	54	KTESIN /	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level – Limit

#### Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2310	54.19	-5.81	48.38	74	-25.62	peak
2310	Inno	-5.81	5746 /	si <sup>6</sup> 54	-csmv9	AVG
2390	56.34	-5.84	50.5	74	-23.5	peak
<sub>o</sub> 2390	/	-5.84	/	54	TING /	AVG
2400	55.28	-5.84	49.44	74 MARY	-24.56	peak
2400	1	-5.84	() HOL	54	101	AVG

Remark: Factor = Antenna Factor + Cable Loss – Pre-amplifier; Level = Reading + Factor; Margin = Level – Limit

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 cannont 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



### Page 21 of 26

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

~STILL	~STN *	~5	D C	511	~S\"	~51"
Frequency	Reading Result	Factor	Emission Level	Limits	Margin	
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	- Detector Type
2483.50	55.08	-5.65	49.43	74	-24.57	peak
2483.50	1	-5.65	C HUM	54	1	AVG
2500.00	56.34	-5.65	50.69	74 MARTES	-23.31	peak
2500.00	TESTING OF	-5.65	STING / TES	54	STING	AVG

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Turne
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
2483.50	56.34	-5.65	50.69	74	-23.31	peak
2483.50	stile OH	-5.65	- 1 - S	54	1	AVG
2500.00	54.18	-5.65	48.53	74	-25.47	peak
2500.00	/	-5.65	/	54	1	AVG

Remark: Factor = Antenna Factor + Cable Loss - Pre-amplifier; Level = Reading + Factor; Margin = Level - Limit

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

Remark:

1. If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

 In restricted bands of operation, the spurious emissions below the permissible value more than 20dB.

3. The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be 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 cannont 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



#### 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=20 KHz. VBW=62 KHz, Span=6MHz.
  - 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

20dB Bandwidth (MHz)	Result
2.019	PASS
2.025	PASS
2.032	PASS
	(MHz) 2.019 2.025

### CH: 2402MHz



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 cannont 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



### CH: 2440MHz



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 cannont 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.



# **HUAK TESTING**

#### Page 24 of 26

### 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 have non-standard antenna jack. It conforms to the standard requirements. The directional gains of antenna used for transmitting is -4.62dBi.

### <u>ANTENNA</u>



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 cannont 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

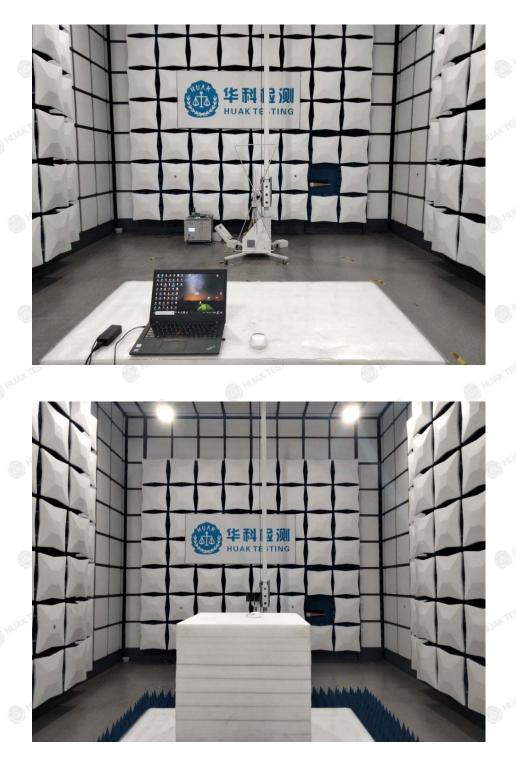


Page 25 of 26

Report No.: HK2301040017-E

# 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 cannont 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



ACATIA

# 9. PHOTOS OF THE EUT

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

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

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 cannont 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