

# **FCC Test Report**

Test report
On Behalf of
Intracom Asia Co., Ltd.
For
Wireless mouse
Model No.: M7008

**FCC ID: 2ADQY-180795MS** 

Prepared For: Intracom Asia Co., Ltd.

4F., No.77, Sec. 1, Xintai 5th Rd., Xizhi Dist., New Taipei City 221, Taiwan

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: Aug. 19, 2024~Aug. 26, 2024

Date of Report: Aug. 26, 2024

Report Number: HK2408194737-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



# **Test Result Certification**

Applicant's name .....: Intracom Asia Co., Ltd.

221, Taiwan

Manufacturer's Name .....: Guangzhou Maipai Electronics Co., Ltd.

Room 201, 301, 401, No.689, Shinan Road, Xianchong Village,

Qiaonan Street, Panyu District of Guangzhou, China

**Product description** 

Trade Mark: N/A

Product name ...... Wireless mouse

Model and/or type reference : M7008

FCC Rules and Regulations Part 15 Subpart C Section 15.249

Report No.: HK2408194737-E

**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 ...... Aug. 19, 2024~Aug. 26, 2024

Date of Issue ...... Aug. 26, 2024

Test Result ..... Pass

Testing Engineer :

(Len Liao)

len lian

Technical Manager

Man

(Sliver Wan)

Authorized Signatory:

Jason Www

(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

27



9. Photos of the EUT

**Table of Contents** Page 1. Test Summary 5 1.1 . Test Procedures and Results 1.2 . Information of the Test Laboratory 1.3 . Measurement Uncertainty 5 2 . General Information 6 2.1 . General Description of EUT 2.2 . Operation of EUT During Testing 2.3 . Description of Test Setup 2.4. Description of Support Units 2.5. Measurement Instruments List 10 Conducted Emissions Test 11 3.1. Conducted Power Line Emission Limit 11 3.2. Test Setup 11 3.3. Test Procedure 11 3.4. Test Result 12 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 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

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 4 of 27

Report No.: HK2408194737-E

# \*\* Modified History \*\*

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Aug. 26, 2024	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 cannon 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.



# 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

## 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 cannon 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

# 2. General Information

# 2.1. General Description of EUT

. 1/4	the state of the s	N. N. C.	111
Equipment:	Wireless mouse	O HU	(I) HOP
Model Name:	M7008	ESTING	
Series Model:	N/A	HUAKTE	TESTING
Model Difference:	N/A		HUAN
FCC ID:	2ADQY-180795MS		
Antenna Type:	PCB Antenna	45	ING TESTING OF
Antenna Gain:	-4.62dBi	HUAK	WIA.
Operation frequency:	2402-2480MHz		
Number of Channels:	40CH	TING	TING
Modulation Type:	GFSK	HUAK TES	HUAKTES.
Power Source:	DC 1.5V From Battery	TESTING	-
Power Rating:	DC 1.5V From Battery	HUAN	HUANTESTING

#### Note:

- 1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
- 2. Antenna gain Refer to the antenna specifications.
- 3. The cable loss data is obtained from the supplier.
- 4. The test results in the report only apply to the tested sample.

TEICATION

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 cannon 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.





# 2.1.1. Carrier Frequency of Channels

100	(Dire	40.	a I Pir	No.	4181
Mary William		Description o	f Channel:	O HO	0
Channel	Frequency (MHz)	· · · Channel		Channel	Frequency (MHz)
UAKTE 1	2402	15	2430	29	2458
2	2404	16	2432	30	2460
3	2406	17 17	2434	31	2462
4 HUAKTE	2408	18	2436	32	2464
5	2410	19	2438	33	2466
6	2412	20	2440	34	2468
11 The Total of th	2414	21	2442	35	2470
8	2416	22	2444	36	2472
9	2418	23	2446	37	2474
10	2420	24	2448	38	2476
11	2422	25	2450	39	2478
12	2424	26	2452	40	2480
13	2426	27	2454	HIME	75 MG
14 @ HUME W	2428	28	2456		D HOW.

# 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 cannon 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.



2.3. Description of Test Setup

Operation of EUT during testing:

EUT

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



2.4. Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item Equipment		nt Trade Mark Model/Type No.		Specification	Remark	
TESTI G	Wireless mouse	N/A	M7008	N/A	EUT	
	OKTESTING	MIN HU ANG	AX TESTING	O HUAR	N. TESTING	
3	(a) W	a)G	(a) 110	.6	HO.	

#### Note:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
- 3. For conducted measurements (Occupied Bandwidth), the antenna of EUT is connected to the test equipment via temporary antenna connector, the antenna connector is soldered on the antenna port of EUT, and the temporary antenna connector is listed in the Test Instruments.

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



# 2.5. Measurement Instruments List

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	L.I.S.N.	R&S	ENV216	HKE-002	2024/02/20	1 Year
2	L.I.S.N.	R&S	ENV216	HKE-059	2024/02/20	1 Year
3	EMI Test Receiver	R&S	ESR	HKE-005	2024/02/20	1 Year
4	Spectrum analyzer	Agilent	N9020A	HKE-025	2024/02/20	1 Year
5	Spectrum analyzer	R&S	FSV3044	HKE-126	2024/02/20	1 Year
6	Preamplifier	EMCI	EMC051845S	HKE-006	2024/02/20	1 Year
7	Preamplifier	Schwarzbeck	BBV 9743	HKE-016	2024/02/20	1 Year
8	Preamplifier	A.H. Systems	SAS-574	HKE-182	2024/02/20	1 Year
9	6d Attenuator	Pasternack	6db	HKE-184	2024/02/20	1 Year
10	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	2024/02/20	1 Year
11 11	Broadband Antenna	Schwarzbeck	VULB9168	HKE-167	2024/02/21	2 Year
12	COM-POWER		AL-130R	HKE-014	2024/02/21	2 Year
13	Horn Antenna	Schwarzbeck	9120D	HKE-013	2024/02/21	2 Year
14	EMI Test Software	Tonscend	JS32-CE 2.5.0.6	HKE-081	ESTING	Me DHO
15	EMI Test Software	Tonscend	JS32-RE 5.0.0	HKE-082	O m	1
16	RF Automatic control unit	Tonscend	JS0806-2	HKE-060	2024/02/20	1 Year
17	High pass filter unit	Tonscend	JS0806-F	HKE-055	2024/02/20	1 Year
18	Wireless Communication Test Set	R&S	CMU200	HKE-026	2024/02/20	1 Year
19	Wireless Communication Test Set	R&S	CMW500	HKE-027	2024/02/20	1 Year
20	High-low temperature chamber	Guangke	HT-80L	HKE-118	2024/06/10	1 Year
21	Temperature and humidity meter	Boyang	HTC-1	HKE-075	2024/06/10	1 Year
22	RF Test Software	Tonscend	JS1120-3 Version 3.3.23	HKE-083	1	I I
23	10dB Attenuator	Schwarzbeck	VTSD9561F	HKE-153	2024/02/20	1 Year
24	RSE Test Software	Tonscend	JS36-RSE 5. 0.0	HKE-184	1	/

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 cannon 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.



### Conducted Emissions Test

#### 3.1. Conducted Power Line Emission Limit

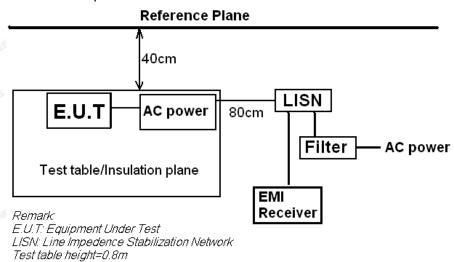
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following.

Fraguenav	M	aximum RF L	ine Voltage (d	BμV)	
Frequency (MHz)	CLAS	SS A	CLASS B		
(111112)	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	

<sup>\*</sup> 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 / keyboard 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 / keyboard 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 / keyboard.
- 7. Analyzer / keyboard 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



3.4. Test Result

Not applicable.

Note: EUT power 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 cannon 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.



### 4. Radiated Emission Test

### 4.1. Radiation Limit

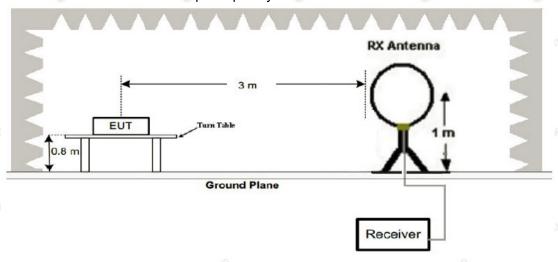
For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBµV/m)	Radiated (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	3	54	500

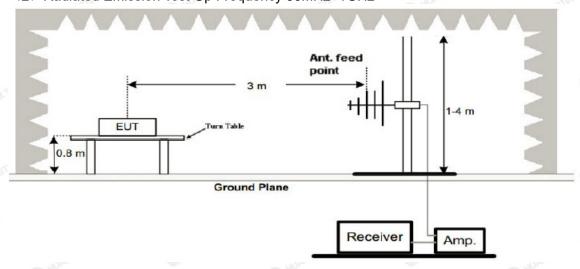
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

### 4.2. Test Setup

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

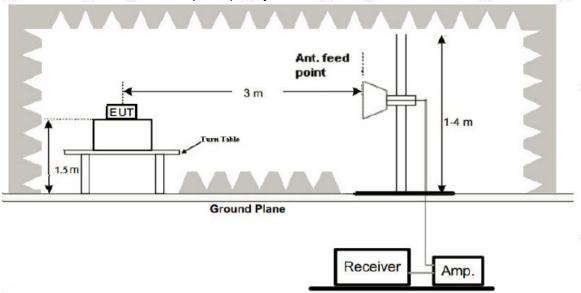


### (2) Radiated Emission Test-Up Frequency 30MHz~1GHz



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 cannon 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.
- 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

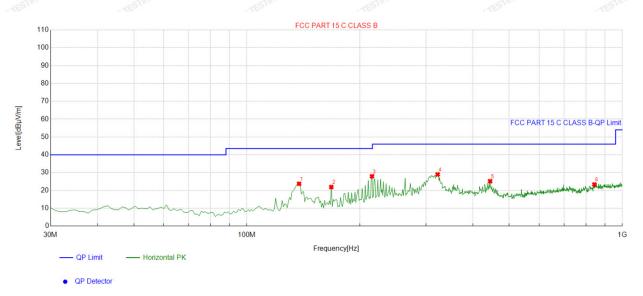
All the test modes completed for test. The worst case of Radiated Emission is Low channel; the test data of this mode was reported.

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 cannon 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



Below 1GHz Test Results:

Antenna polarity: H



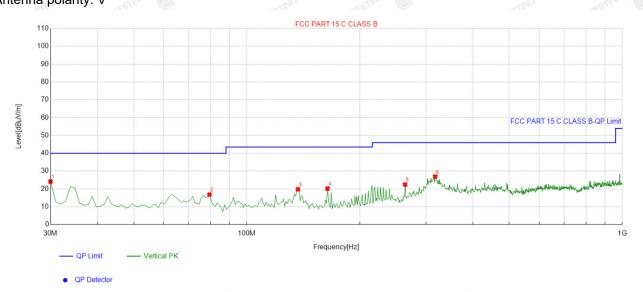
3	Suspe	Suspected List										
Ī		Freq.	Factor	Reading	Level	Limit	Margin	Height	Angle			
3	NO.	[MHz]	[dB]	[dBµV/m]	[dBµV/m]	[dBµV/m]	[dB]	[cm]	[°]	Polarity		
	1	137.77777	-17.87	41.60	23.73	43.50	19.77	100	113	Horizontal		
	2	167.87787	-17.31	39.23	21.92	43.50	21.58	100	134	Horizontal		
Ę	3	215.45545	-14.72	42.65	27.93	43.50	15.57	100	72	Horizontal		
	4	322.26226	-11.12	40.10	28.98	46.00	17.02	100	256	Horizontal		
	5	444.60460	-8.64	33.83	25.19	46.00	20.81	100	259	Horizontal		
	6	842.70270	-1.79	25.13	23.34	46.00	22.66	100	239	Horizontal		

Remark: Factor = Cable loss + Antenna factor + Attenuator – 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.





Ş	Suspected List									
		Freq.	Factor	Reading	Level	Limit	Margin	Height	Angle	
N	NO.	[MHz]	[dB]	[dBµV/m]	[dBµV/m]	[dBµV/m]	[dB]	[cm]	[°]	Polarity
1	1	30	-15.74	39.90	24.16	40.00	15.84	100	97	Vertical
	2	79.51952	-18.01	34.84	16.83	40.00	23.17	100	125	Vertical
	3	136.80680	-17.67	37.45	19.78	43.50	23.72	100	264	Vertical
3	4	163.99399	-17.59	37.81	20.22	43.50	23.28	100	21	Vertical
	5	264.00400	-13.15	35.59	22.44	46.00	23.56	100	149	Vertical
	6	317.40740	-11.32	38.24	26.92	46.00	19.08	100	194	Vertical

Remark: Factor = Cable loss + Antenna factor + Attenuator – 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)		
HART	HUAR	HUAN		
VIESTIE	<del></del>	TESTING -		
TING TESTING WHITE	TING TSTING OF HILL	TING STING		
HUAK !	HUAK TES HUAK	HUAKTES HUAKTES		

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.

# 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	101.39	-5.84	95.55	114	-18.45	peak
2402	83.89	-5.84	78.05	94	-15.95	AVG
4804	55.13	-3.64	51.49	74	-22.51	peak
4804	43.32	-3.64	39.68	54	-14.32	AVG
7206	52.47	-0.95	51.52	74	-22.48	peak
7206	40.21	-0.95	39.26	54	-14.74	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; 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
2402	101.93	-5.84	96.09	114	-17.91	peak
2402	82.41	-5.84	76.57	94	-17.43	AVG
4804	53.37	-3.64	49.73	74	-24.27	peak
4804	43.65	-3.64	40.01	54	-13.99	AVG
7206	51.95	-0.95	51 MARS	74	-23	peak
7206	40.83	-0.95	39.88	54	-14.12	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; 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 cannon 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.

# CH Middle (2440MHz)

# Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2440	103.94	-5.71	98.23	114	-15.77	peak
2440	75.03	-5.71	69.32	94	-24.68	AVG
4880	56.71	-3.51	53.2	74 TESTING	-20.8	peak
4880	44.88	-3.51	41.37	54	-12.63	AVG
7320	52.37	-0.82	51.55	74	-22.45	peak
7320	42.35	-0.82	41.53	54	-12.47	AVG

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

# Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type
2440	105.02	-5.71	99.31	114	-14.69	peak
2440	82.11	-5.71	76.4	94	-17.6	AVG
4880	52.33	-3.51	48.82	74	-25.18	peak
4880	43.38	-3.51	39.87	54	-14.13	AVG
7320	51.72	-0.82	50.9	74	-23.1	peak
7320	41.69	-0.82	40.87	54	-13.13	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; 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 cannon 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.



# CH High (2480MHz) Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	√ (dBμV/m)	(dBµV/m)	(dB)	Туре
2480	104.41	-5.65	98.76	114	-15.24	peak
2480	77.57	-5.65	71.92	94	-22.08	AVG
4960	51.03	-3.43	47.6	74	-26.4	peak
4960	44.28	-3.43	40.85	54	-13.15	AVG
7440	50.22	-0.75	49.47	74	-24.53	peak
7440	42.63	-0.75	41.88	54	-12.12	AVG

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

### Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type
2480	106.69	-5.65	101.04	114	-12.96	peak
2480	81.77	-5.65	76.12	94	-17.88	AVG
4960	55.17	-3.43	51.74	74	-22.26	peak
4960	42.94	-3.43	39.51	54	-14.49	AVG
7440	54.04	-0.75	53.29	74	-20.71	peak
7440	40.74	-0.75	39.99	54	-14.01	AVG

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

#### 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 keyboard 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 73.16dBuV/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.



# 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.

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 cannon 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

# 5.3. Test Result

### **PASS**

Radiated Band Edge Test:

Operation Mode: TX CH Low (2402MHz)

Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Туре
2310	56.03	-5.81	50.22	74 FETTING	-23.78	peak
2310	KIESTYG OF	-5.81	STING / YEST	54	TEING	AVG
2390	55.18	-5.84	49.34	74	-24.66	peak
2390	1	-5.84	1	54	/	AVG
2400	52.46	-5.84	46.62	<sup>miG</sup> 74	-27.38	peak
2400	HOM	-5.84	10 HONG	54	1	AVG

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

### Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Type
2310	55.38	-5.81	49.57	<sub>NG</sub> 74	-24.43	peak
2310	HUAKTE	-5.81	HURKER	54	Market 1	AVG
2390	53.69	-5.84	47.85	74	-26.15	peak
2390	TESTING /	-5.84	1 TESTING	54	/	AVG
2400	51.02	-5.84	45.18	74	-28.82	peak
2400	1	-5.84	1	54	1	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; 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.



Operation Mode: TX CH High (2480MHz)

Horizontal

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Data stan Tuna
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
2483.50	55.82	-5.65	50.17	74	-23.83	peak
2483.50	1	-5.65	1	54	<sub>10</sub> 1	AVG
2500.00	52.79	-5.65	47.14	74	-26.86	peak
2500.00	HUAK	-5.65	WHIAK I	54	HUAY TE	AVG

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

### Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Datastar Typa
(MHz)	(dBµV)	(dB)	(dBµV/m)	(dBµV/m)	(dB)	Detector Type
2483.50	53.78	-5.65	48.13	74	-25.87	peak
2483.50	HINK I	-5.65	O HUAK IL	54	HUAY TES	AVG
2500.00	50.22	-5.65	44.57	74	-29.43	peak
2500.00	LING	-5.65	6 I	54	TETING	AVG

Remark: Factor = Cable loss + Antenna factor + Attenuator – Preamplifier; 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.
- 2. 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.co



# 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=5MHz.
- 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
2402 MHz	2.013	PASS
2440 MHz	2.022	PASS
2480 MHz	2.030	PASS

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.



### 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 cannon 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.



# 7. Antenna Requirement

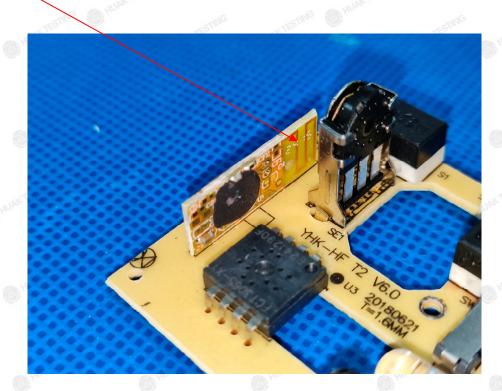
### **Standard Applicable**

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 -4.62dBi.

### **Antenna**

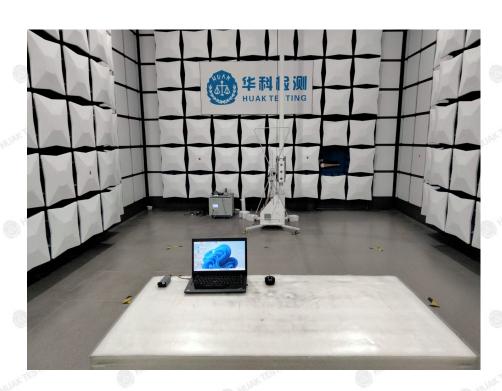


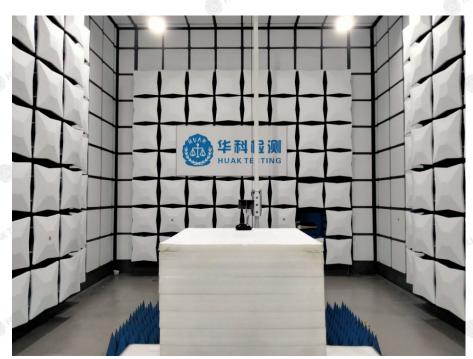
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannon be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.



# 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 cannon 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.



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.