

# FCC Test Report

**Test Report  
On Behalf of  
Shantou Xiongxin Technology Co., Ltd.**

**For  
2.4G Remote Control Classic Steam Track Train**

**Model No.: 699-137A, 699-138A, 699-139A, 699-140A, 699-145A, 699-146A,  
699-147A, 699-148A**

**FCC ID: 2BOWI-699-137A**

**Prepared For:** Shantou Xiongxin Technology Co., Ltd.

No. 1, Xinxiang Dijiao Road, front of Hezhou Village, Dongli Town, Chenghai District, Shantou City, 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:** Jul. 31, 2025 ~ Aug. 11, 2025

**Date of Report:** Aug. 11, 2025

**Report Number:** HK2507314229-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 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

**Shenzhen HUAK Testing Technology Co., Ltd.** Tel.: +86-0755-2302 9901 E-mail: [info@huak.com](mailto:info@huak.com) Web.: [www.huak.com](http://www.huak.com)

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

## Test Result Certification

**Applicant's Name** ..... : Shantou Xiongxin Technology Co., Ltd.  
Address ..... : No. 1, Xinxiang Dijiao Road, front of Hezhou Village, Dongli Town, Chenghai District, Shantou City, China

**Manufacturer's Name** ..... : Shantou Xiongxin Technology Co., Ltd.  
Address ..... : No. 1, Xinxiang Dijiao Road, front of Hezhou Village, Dongli Town, Chenghai District, Shantou City, China

### Product Description

Trade Mark ..... : N/A  
Product Name ..... : 2.4G Remote Control Classic Steam Track Train  
Model and/or Type Reference... : 699-137A, 699-138A, 699-139A, 699-140A, 699-145A, 699-146A, 699-147A, 699-148A

### FCC Rules and Regulations Part 15 Subpart C Section 15.249

**Standards** ..... : **ANSI C63.10: 2020**

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 ..... : **Jul. 31, 2025 ~ Aug. 11, 2025**

Date of Issue ..... : **Aug. 11, 2025**

Test Result ..... : **Pass**

Testing Engineer



(Len Liao)

Technical Manager



(Sliver Wan)

Authorized Signatory



(Jason Zhou)

## Table of Contents

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 Carrier Frequency of Channels		7
2.3 Operation of EUT during Testing		7
2.4 Description of Test Setup		8
2.5 Description of Support Units		9
2.5 Measurement Instruments List		10
3 . AC Conducted Emissions Test		11
3.1 AC 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
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. Photographs 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 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.



**HUAK TESTING**

HUAK TESTING

HUAK TESTING

HUAK TESTING

HUAK TESTING

**\*\* Modified History \*\***

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Aug. 11, 2025	Jason Zhou

HUAK TESTING

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

**Shenzhen HUAK Testing Technology Co., Ltd.** Tel.: +86-0755-2302 9901 E-mail: [info@huak.com](mailto:info@huak.com) Web.: [www.huak.com](http://www.huak.com)

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



**HUAK TESTING**

HUAK TESTING

## 1. Test Summary

### 1.1 Test Procedures and Results

DESCRIPTION OF TEST	SECTION NUMBER	RESULT
AC 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 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

**Shenzhen HUAK Testing Technology Co., Ltd.** Tel.: +86-0755-2302 9901 E-mail: [info@huak.com](mailto:info@huak.com) Web.: [www.huak.com](http://www.huak.com)

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



## HUAK TESTING

## 2. General Information

## 2.1 General Description of EUT

Equipment:	2.4G Remote Control Classic Steam Track Train
Model Name:	699-137A
Series Model(s):	699-138A, 699-139A, 699-140A, 699-145A, 699-146A, 699-147A, 699-148A
Model Difference:	All model's the function, software and electric circuit are the same, only the product color, accessories and model named different. Test sample model: 699-137A.
FCC ID:	2BOWI-699-137A
Antenna Type:	PCB antenna
Antenna Gain:	-6.93dBi
Operation Frequency:	2410-2473MHz
Number of Channels:	3CH
Modulation Type:	GFSK
Power Source:	DC3V from Battery
Power Rating:	DC3V from Battery
Note:	<p>1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.</p> <p>2. Antenna gain Refer to the antenna specifications.</p> <p>3. The cable loss data is obtained from the supplier.</p> <p>4. The test results in the report only apply to the tested sample.</p>

---

**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.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

Shenzhen HUAK Testing Technology Co., Ltd., Tel : +86-0755-2302 9901 E-mail: info@huak.com Web : www.huak.com

Add : 1-2/F, Building B2, Junfeng Zhongcheng Zhibao Innovation Park, Heping, Fuhai Street, Bao'an District, Shenzhen, Guangdong, China. Tel: +86-0755-2522 5501 E-mail: info@nuak.com Web: www.nuak.com

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

## 2.2 Carrier Frequency of Channels

Channel	Frequency (MHz)
1	2410
2	2437
3	2473

## 2.3 Operation of EUT during Testing

## Operating Mode

The mode is used: **Transmitting mode**

Low Channel: 2410MHz

Middle Channel: 2437MHz

High Channel: 2473MHz





## HUAK TESTING

## 2.5 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	Trade Mark	Model/Type No.	Specification	Note
1	2.4G Remote Control Classic Steam Track Train	N/A	699-137A HUAK TESTING	N/A HUAK TESTING	EUT
IG					
					
					
					
	HUAK TESTING				

**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 (Output Power, 6dB Emission Bandwidth, Power Spectral Density, Spurious Emissions), 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.





### 3. AC Conducted Emissions Test

#### 3.1 AC Conducted Power Line Emission Limit

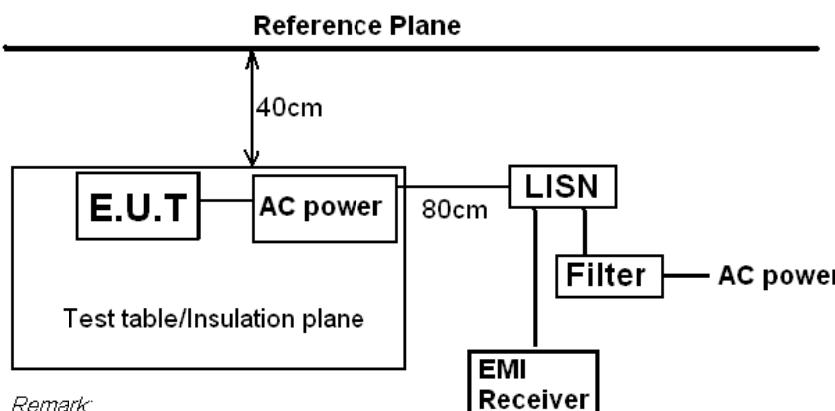
For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following.

Frequency (MHz)	Maximum RF Line Voltage (dB $\mu$ 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



Remark:

E.U.T: Equipment Under Test

LISN: Line Impedance Stabilization Network

Test table height=0.8m

#### 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

Not applicable.

Note: EUT power supply by Battery Powered, so this test item not applicable.







**HUAK TESTING**  
HUAK TESTING

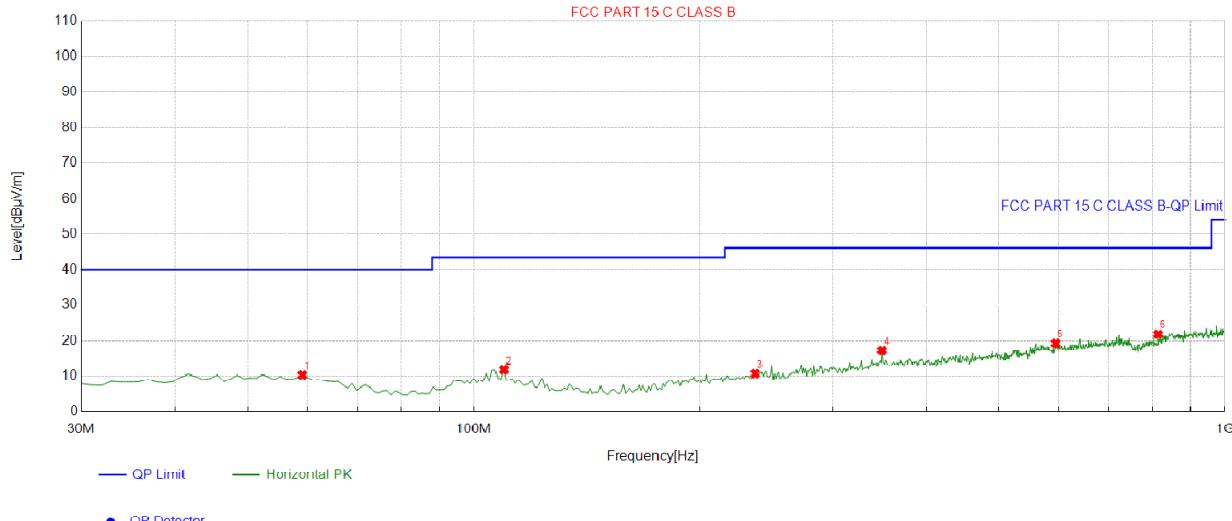
HUAK TESTING

HUAK TESTING

HUAK TESTING

Below 1GHz Test Results:

Antenna polarity: H



Suspected List									
NO.	Freq. [MHz]	Factor [dB]	Reading [dBμV/m]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Polarity
1	59.1291	-13.54	23.79	10.25	40.00	29.75	100	122	Horizontal
2	109.6196	-14.22	25.93	11.71	43.50	31.79	100	169	Horizontal
3	236.8168	-13.80	24.45	10.65	46.00	35.35	100	180	Horizontal
4	349.4494	-10.04	27.31	17.27	46.00	28.73	100	173	Horizontal
5	595.1051	-4.80	24.06	19.26	46.00	26.74	100	337	Horizontal
6	814.5445	-3.34	25.24	21.90	46.00	24.10	100	322	Horizontal

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



**HUAK TESTING**

HUAK TESTING



HUAK TESTING



HUAK TESTING



HUAK TESTING



HUAK TESTING



HUAK TESTING



HUAK TESTING

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

**Shenzhen HUAK Testing Technology Co., Ltd.** Tel.: +86-0755-2302 9901 E-mail: [info@huak.com](mailto:info@huak.com) Web.: [www.huak.com](http://www.huak.com)

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

## Above 1 GHz Test Results

CH Low (2410MHz)

Horizontal:

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2410	103.36	-5.84	97.52	114	16.48	peak
2410	85.96	-5.84	80.12	94	13.88	AVG
4820	53.61	-3.64	49.97	74	24.03	peak
4820	42.79	-3.64	39.15	54	14.85	AVG
7230	52.33	-0.95	51.38	74	22.62	peak
7230	41.06	-0.95	40.11	54	13.89	AVG

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

Vertical:

Frequency (MHz)	Meter Reading (dB $\mu$ V)	Factor (dB)	Emission Level (dB $\mu$ V/m)	Limits (dB $\mu$ V/m)	Margin (dB)	Detector Type
2410	103.52	-5.84	97.68	114	16.32	peak
2410	88.62	-5.84	82.78	94	11.22	AVG
4820	51.27	-3.64	47.63	74	26.37	peak
4820	41.25	-3.64	37.61	54	16.39	AVG
7230	53.33	-0.95	52.38	74	21.62	peak
7230	41.98	-0.95	41.03	54	12.97	AVG

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

**HUAK TESTING**

HUAK TESTING

CH Middle (2437MHz)

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
2437	105.26	-5.71	99.55	114	14.45	peak
2437	77.19	-5.71	71.48	94	22.52	AVG
4874	53.04	-3.51	49.53	74	24.47	peak
4874	42.36	-3.51	38.85	54	15.15	AVG
7311	51.28	-0.82	50.46	74	23.54	peak
7311	43.54	-0.82	42.72	54	11.28	AVG

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

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
2437	102.33	-5.71	96.62	114	17.38	peak
2437	78.52	-5.71	72.81	94	21.19	AVG
4874	53.16	-3.51	49.65	74	24.35	peak
4874	43.33	-3.51	39.82	54	14.18	AVG
7311	54.19	-0.82	53.37	74	20.63	peak
7311	43.28	-0.82	42.46	54	11.54	AVG

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 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

**Shenzhen HUAK Testing Technology Co., Ltd.** Tel.: +86-0755-2302 9901 E-mail: [info@huak.com](mailto:info@huak.com) Web.: [www.huak.com](http://www.huak.com)

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



## HUAK TESTING

## CH High (2473MHz)

Horizontal:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
2473	104.58	-5.65	98.93	114	15.07	peak
2473	84.51	-5.65	78.86	94	15.14	AVG
4946	53.27	-3.43	49.84	74	24.16	peak
4946	43.21	-3.43	39.78	54	14.22	AVG
7419	53.99	-0.75	53.24	74	20.76	peak
7419	36.68	-0.75	35.93	54	18.07	AVG

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

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
2473	102.67	-5.65	97.02	114	16.98	peak
2473	81.25	-5.65	75.6	94	18.4	AVG
4946	54.36	-3.43	50.93	74	23.07	peak
4946	45.36	-3.43	41.93	54	12.07	AVG
7419	52.87	-0.75	52.12	74	21.88	peak
7419	41.22	-0.75	40.47	54	13.53	AVG

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

---

### Remarks:

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<sub>UV</sub>/m(PK Value) <93.98(AV Limit), at harmonic 53.20 dB<sub>UV</sub>/m(PK Value) <54 dB<sub>UV</sub>/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 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.



**HUAK TESTING**

HUAK TESTING

## 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 conducted RF band edge was measured by using a spectrum analyzer. Set span wide enough to capture the highest in-band emission and the emission at the band edge. Set RBW to 1MHz and VBW to 3MHz, to measure the conducted peak band edge.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

**Shenzhen HUAK Testing Technology Co., Ltd.** Tel.: +86-0755-2302 9901 E-mail: [info@huak.com](mailto:info@huak.com) Web.: [www.huak.com](http://www.huak.com)

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

**HUAK TESTING**

HUAK TESTING

**PASS****5.3 Test Result**

Radiated Band Edge Test:

Operation Mode: TX CH Low (2410MHz)

Horizontal (Worst case):

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
2310	53.26	-5.81	47.45	74	26.55	peak
2310	/	-5.81	/	54	/	AVG
2390	55.98	-5.84	50.14	74	23.86	peak
2390	/	-5.84	/	54	/	AVG
2400	54.18	-5.84	48.34	74	25.66	peak
2400	/	-5.84	/	54	/	AVG

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

Vertical:

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
2310	56.12	-5.81	50.31	74	23.69	peak
2310	/	-5.81	/	54	/	AVG
2390	53.98	-5.84	48.14	74	25.86	peak
2390	/	-5.84	/	54	/	AVG
2400	54.25	-5.84	48.41	74	25.59	peak
2400	/	-5.84	/	54	/	AVG

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 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

**Shenzhen HUAK Testing Technology Co., Ltd.** Tel.: +86-0755-2302 9901 E-mail: [info@huak.com](mailto:info@huak.com) Web.: [www.huak.com](http://www.huak.com)

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



Operation Mode: TX CH High (2473MHz)

### Horizontal (Worst case):

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
2483.50	56.12	-5.65	50.47	74	23.53	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	53.87	-5.65	48.22	74	25.78	peak
2500.00	/	-5.65	/	54	/	AVG

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

Vertical:

Frequency	Reading Result	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dB $\mu$ V)	(dB)	(dB $\mu$ V/m)	(dB $\mu$ V/m)	(dB)	
2483.50	54.13	-5.65	48.48	74	25.52	peak
2483.50	/	-5.65	/	54	/	AVG
2500.00	53.78	-5.65	48.13	74	25.87	peak
2500.00	/	-5.65	/	54	/	AVG

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

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 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

## 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= 62KHz, 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 HUAK TESTING	20dB Bandwidth HUAK TESTING (MHz)	Result
2410 MHz	1.233	<b>PASS</b>
2437 MHz	1.229	<b>PASS</b>
2473 MHz	1.235	<b>PASS</b>



The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.



**HUAK TESTING**  
HUAK TESTING



HUAK TESTING



HUAK TESTING



HUAK TESTING



HUAK TESTING



HUAK TESTING



HUAK TESTING

The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

**Shenzhen HUAK Testing Technology Co., Ltd.** Tel.: +86-0755-2302 9901 E-mail: [info@huak.com](mailto:info@huak.com) Web.: [www.huak.com](http://www.huak.com)

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



HUAK TESTING

Page 24 of 28

Report No.: HK2507314229-E

CH: 2437MHz



CH: 2473MHz



## 7. Antenna Requirements

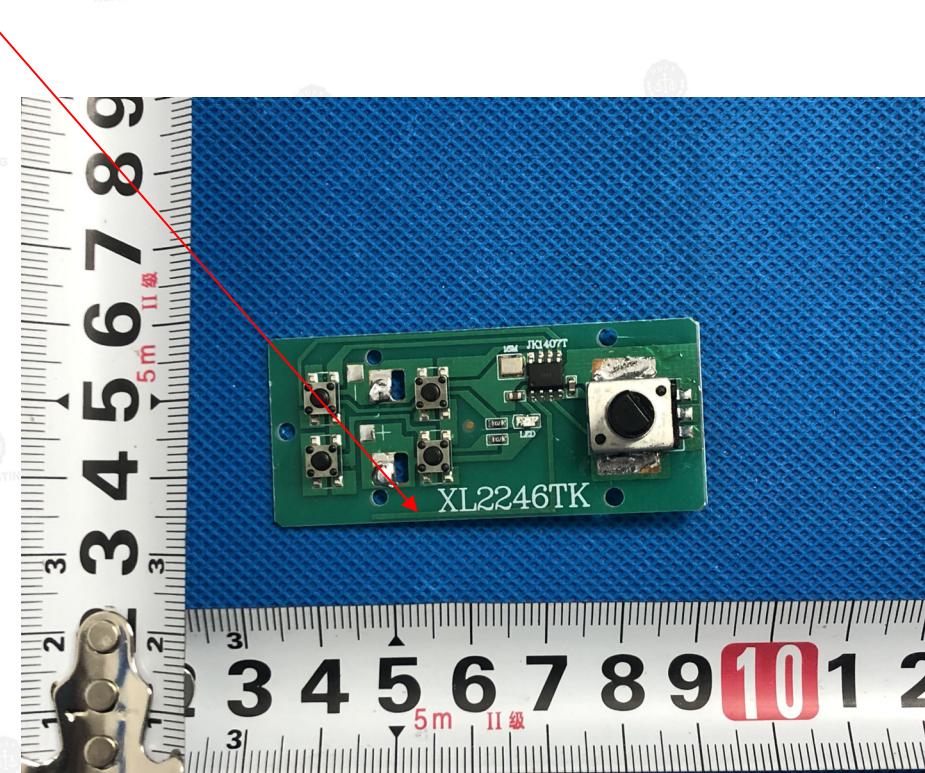
## Standard Applicable

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, is a permanently attached antenna on the PCB. It conforms to the standard requirements. The directional gains of antenna used for transmitting is -6.93dB.

## Antenna





HUAK TESTING

HUAK TESTING

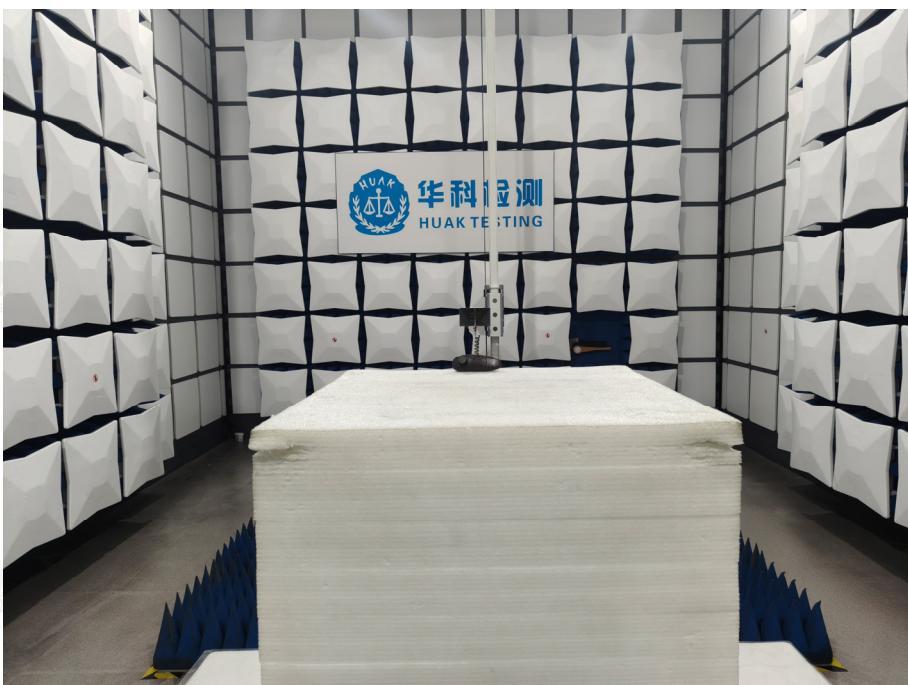
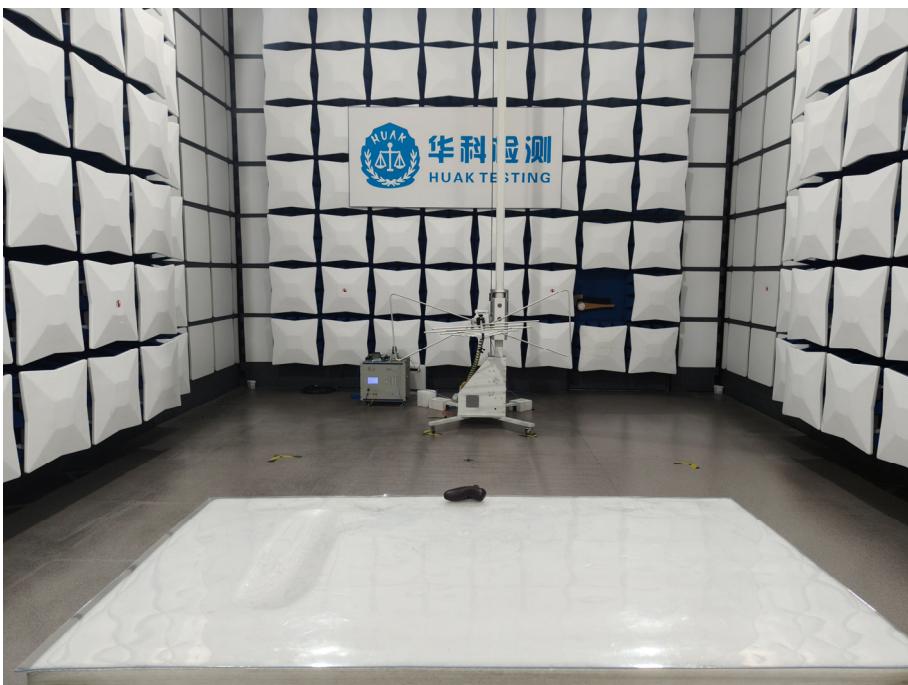


## 8. Photographs of Test

Page 26 of 28

Report No.: HK2507314229-E

### 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 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

**Shenzhen HUAK Testing Technology Co., Ltd.** Tel.: +86-0755-2302 9901 E-mail: [info@huak.com](mailto:info@huak.com) Web.: [www.huak.com](http://www.huak.com)

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

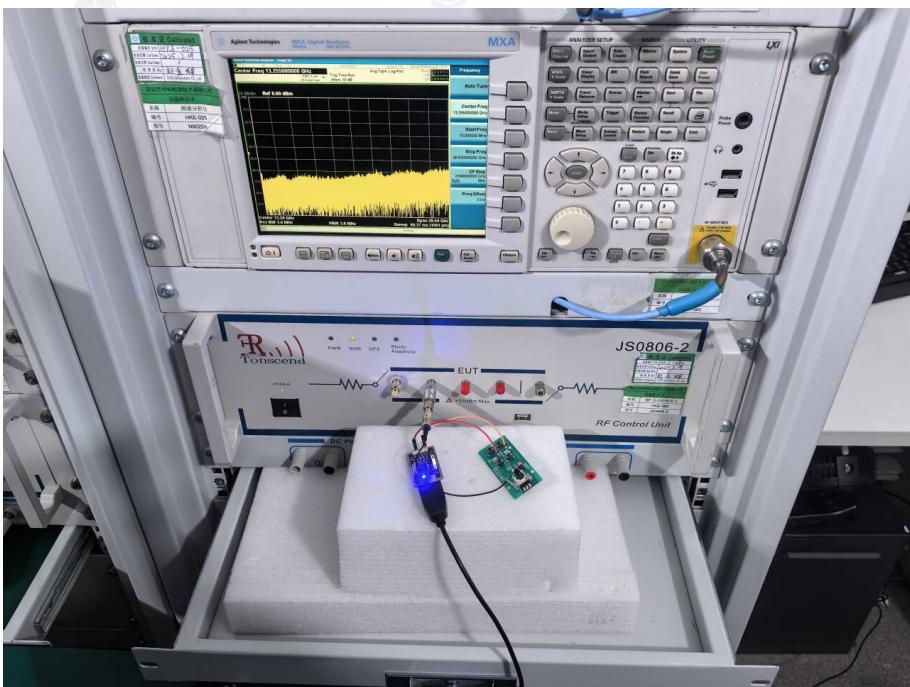


HUAK TESTING

Page 27 of 28

Report No.: HK2507314229-E

## RF 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 15 days only. The document is issued by Shenzhen HUAK Testing Technology Co., Ltd., this document cannot be reproduced except in full with our prior written permission.

**Shenzhen HUAK Testing Technology Co., Ltd.** Tel.: +86-0755-2302 9901 E-mail: [info@huak.com](mailto:info@huak.com) Web.: [www.huak.com](http://www.huak.com)

Add.: 1-2/F., Building B2, Junfeng Zhongcheng Zhizao Innovation Park, Heping, 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-----

