

FCC Test Report

Test Report
On Behalf of
Shenzhen Lichi Technology Co., Ltd.
For
Remote Control
Model No.: ZC176A-1

FCC ID: 2BFJK-ZC176A-1

Prepared for: Shenzhen Lichi Technology Co., Ltd.

Room 206, Building A, Dormitory Building, Zone A, Baoan Internet Industry Base,

Haoye Community, Xixiang Street, Baoan District, Shenzhen 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: Mar. 05, 2024 ~ Mar. 12, 2024

Date of Report: Mar. 12, 2024

Report Number: HK2403040939-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...... Shenzhen Lichi Technology Co., Ltd.

Room 206, Building A, Dormitory Building, Zone A, Baoan Internet

Report No.: HK2403040939-E

Address Industry Base, Haoye Community, Xixiang Street, Baoan District,

Shenzhen City, China

Manufacturer's Name Shenzhen Lichi Technology Co., Ltd.

Room 206, Building A, Dormitory Building, Zone A, Baoan Internet

Address Industry Base, Haoye Community, Xixiang Street, Baoan District,

Shenzhen City, China

Product Description

Trade Mark.....: N/A

Product Name.....: Remote Control

Model and/or type reference ..: ZC176A-1

FCC Part15 Subpart C 2017, Section 15.231

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 of Issue...... Mar. 12, 2024

Test Result Pass

Testing Engineer :

(Len Liao)

Technical Manager

Wan

(Sliver Wan)

Authorized Signatory :

(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





1 . Test Summary	
1.1 Test Facility	5
1.2 Information of the Test Laboratory	CTESTIN C
1.3 Measurement Uncertainty	
2. General Information	6
2.1. Description of Device (EUT)	6
2.2. List of Channels	
2.3. Description of Test Setup	
2.4. Description of Support Units	
2.5. Test Equipment List	
3. Conducted Emission Test	10
3.1 Conducted Power Line Emission Limit	
3.2 Test Setup	10
3.3 Test Procedure	10
3.4 Test Data	11
4. Radiated Emissions	12
4.1. Standard Applicable	12
4.2. Test Procedure	12
4.3. Corrected Amplitude & Margin Calculation	14
4.4. Environmental Conditions	14
4.5. Test Data	14
5. 20dB Occupy Bandwidth Test	18
5.1. Standard Applicable	18
5.2. Test Procedure	18
5.3. Test Data	18
6. Transmission Time	19
6.1. Standard Applicable	
6.2. Test Procedure	19
6.3. Environmental Conditions	19
6.4. Test Data	20
7. Duty Cycle	21
7.1. Standard Applicable	21
7.2. Test Procedure	
7.3. Introduction to PDCF Reference:	21
7.4. Test Data	22
8. Antenna Connected Construction	
9. Photograph of Test	25
10. Photos of the EUT	

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.





** Modified History **

Report No.: HK2403040939-E

Revision	Description	Issued Data	Remark
Revision 1.0	Initial Test Report Release	Mar. 12, 2024	Jason Zhou
ED. WAKTED	- MAKTES.	AKTED UNAKTE	- JUAK TES
(3)	(a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c		(i)

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

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



1. Test Summary

1.1 Test Facility

Standard Section	Test Item	Result
15.203	Antenna Requirement	PASS
15.207	Conducted Emission	N/A
15.205/15.209/15.231(b)	Spurious Emission	PASS
15.231(c)	20dB Occupied Bandwidth	PASS
15.231(a)	Deactivation Testing	PASS

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	HUAKTE .	HUAKTE
Parameter	Conditions	Uncertainty
Occupied Bandwidth	Conducted	±1.5%
Conducted Spurious Emission	Conducted	±2.17dB
Transmission Time	Conducted	±5%
Conducted Emissions	Conducted	±2.88dB
Transmitter Spurious Emissions	Radiated	±5.1dB

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. General Information

2.1. Description of Device (EUT)

Product Name	MG	Remote Control			
Model No.	:	ZC176A-1	MINN HINN		
Series Models	:	N/A	TING		
Model Difference	:	N/A MARCH	NG HUARTE		
Trade Mark	:	N/A			
Test Power Supply	:	DC 3V from Battery	"IAN TESTING"		
TESTING	G	Operation Frequency:	433.911MHz		
		Number of Channel:	1 Channels		
Product Description	:	Modulation Type:	ASK		
Description	MG	Antenna Type:	PCB Antenna		
		Antenna Gain(Peak):	OdBi Municipal Market		

Remark: 1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.



Report No.: HK2403040939-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.



2.2. List of Channels

Chan	Channal	Freq.	Note
Channel	(MHz)	(Modulation Type)	
01		433.911	ASK

2.3. Description of Test Setup

Operatio	n of EUT during R	adiation testing:		
		EUT		
		HUAKTESTING		

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

Report No.: HK2403040939-E

Item	Equipment	Trade Mark	Model/Type No.	Specification	Note
1	Remote Control	N/A	ZC176A-1	N/A	EUT
6	HUAKTE	(a)	HUAK TEL	M. HUAKTE	

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.

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



2.5. Test Equipment List

	III AM					
Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
ESTING	L.I.S.N. Artificial Mains Network	R&S	ENV216	HKE-002	Feb. 20, 2024	1 Year
٥ 2 .	Receiver	R&S	ESR-7	HKE-005	Feb. 20, 2024	1 Year
3.	RF automatic control unit	Tonscend	JS0806-2	HKE-060	Feb. 20, 2024	1 Year
4.	Spectrum analyzer	R&S	FSP40	HKE-025	Feb. 20, 2024	1 Year
5.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 20, 2024	1 Year
6.	Preamplifier	Schwarzbeck	BBV 9743	HKE-006	Feb. 20, 2024	1 Year
7.	EMI Test Receiver	Rohde & Schwarz	ESR-7	HKE-010	Feb. 20, 2024	1 Year
8.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	HKE-012	Feb. 21, 2024	2 Year
9.	Loop Antenna	Schwarzbeck	FMZB 1519 B	HKE-014	Feb. 21, 2024	2 Year
10.	Horn Antenna	Schewarzbeck	9120D	HKE-013	Feb. 21, 2024	2 Year
11.	Pre-amplifier	EMCI	EMC051845 SE	HKE-015	Feb. 20, 2024	1 Year
12.	Pre-amplifier	Agilent	83051A	HKE-016	Feb. 20, 2024	1 Year
13.	EMI Test Software EZ-EMC	Tonscend	JS1120-B Version	HKE-083	N/A	N/A
14.	Power Sensor	Agilent	E9300A	HKE-086	Feb. 20, 2024	1 Year
15.	Spectrum analyzer	Agilent	N9020A	HKE-048	Feb. 20, 2024	1 Year
16.	Signal generator	Agilent	N5182A	HKE-029	Feb. 20, 2024	1 Year
17.	Signal Generator	Agilent	83630A	HKE-028	Feb. 20, 2024	1 Year
18.	Shielded room	Shiel Hong	4*3*3	HKE-039	Dec. 09, 2021	3 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.



3. Conducted Emission Test

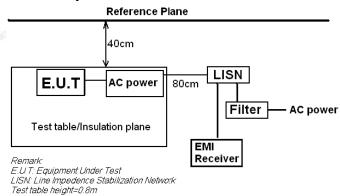
3.1 Conducted Power Line Emission Limit

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

Eroguenev	М	aximum RF Li	m RF Line Voltage (dBμV)			
Frequency (MHz)	CLAS	SS A	CLASS B			
(11112)	Q.P.	Ave.	Q.P.	Ave.		
0.15 - 0.50	79	66	66-56*	56-46*		
0.50 - 5.00	73	60	56	46		
5.00 - 30.0	73	60	60	50		

^{*} Decreasing linearly with the logarithm of the frequency
For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

3.2 Test Setup



3.3 Test Procedure

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

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 Data

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 cannot be reproduced except in full with our prior written permission. The more details and the authenticity of the report will be confirmed at http://www.cer-mark.com.

4. Radiated Emissions

4.1. Standard Applicable

According to §15.231(b), the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental (microvolts/meter)	Field Strength of Spurious Emissions (microvolts/meter)
40.66 - 40.70	2.250	225
70 - 130	1,250	125
130 - 174	1,250 to 3,750 **	125 to 375 **
174 - 260	3,750	375
260 - 470	3,750 to 12,500 **	375 to 1,250 **
Above 470	12,500	1,250

^{**} linear interpolations

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in §15.209, whichever limit permits a higher field strength.

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

Compliance with the provisions of §15.205 shall be demonstrated using the measurement instrumentation specified in that section.

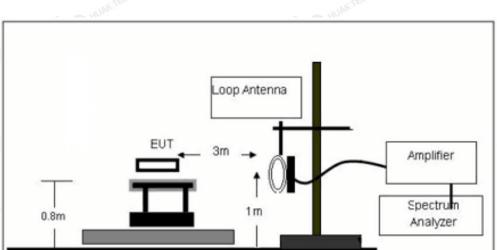
4.2. Test Procedure

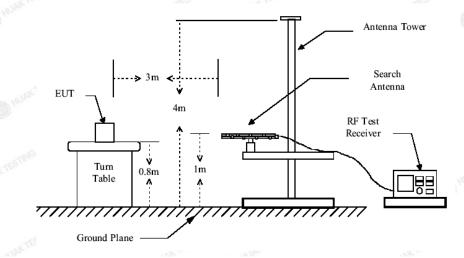
The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.231(b) and FCC Part 15.209 Limit.

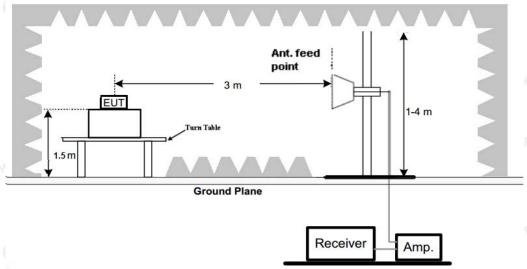
AFICATION.

Report No.: HK2403040939-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 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







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.



4.3. Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading +Ant.Loss +Cab. Loss - Ampl.Gain

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit. The equation for margin calculation is as follows:

Margin = Corr. Ampl. - FCC Part15C Limit

4.4. Environmental Conditions

20711	20711		
21℃			
50%	-a)G	AKTESTING	200
1011 mbar	HUAKTESTIN	(a) 110.	HUAN TESTIN
	50%	50%	50%

4.5. Test Data

According to the data below, the FCC Part 15.205, 15.209 and 15.231 standards, and had the worst margin of:

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

(Fundamental 433.911MHz)

No.	Frequency	Reading	Corr.	Duty cycle	Result	Limit	Margin	Deg.	Height	Polarity	Remark
	MHz	dBuV/m	Factor (dB)	Factor (dB)	dBuV/m	dBuV/m	dB	(°)	(cm)		
1	433.9110	77.8	12.33	N/A	90.13	100.8	-10.67	177	100	Н	Peak
2	433.9110	N/A	N/A	-8.42	81.71	80.83	0.88	177	100	Н	AV
3	433.9110	80.9	12.33	N/A	93.23	100.8	-7.57	177	100	V HUAY	Peak
4	433.9110	N/A	N/A	-8.42	84.81	80.83	3.98	117	100	V	AV

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



Radiated Emission
Antenna polarity: H



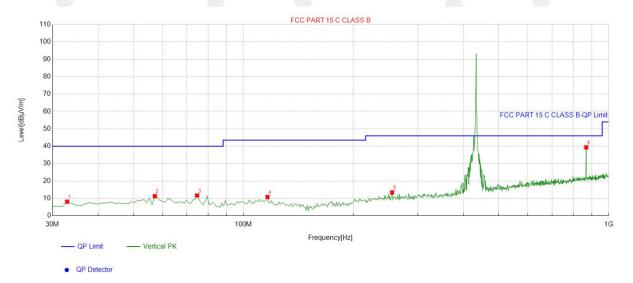
Su	Suspected List									
		Freq.	Factor	Reading	Level	Limit	Margin	Height	Angle	
N	Ο.	[MHz]	[dB]	[dBµV/m]	[dBµV/m]	[dBµV/m]	[dB]	[cm]	[°]	Polarity
	1	38.738739	-15.54	23.22	7.68	40.00	32.32	100	6	Horizontal
	2	55.245245	-14.32	24.04	9.72	40.00	30.28	100	66	Horizontal
	3	101.85185	-15.01	24.75	9.74	43.50	33.76	100	91	Horizontal
4	4	206.71671	-14.61	25.11	10.50	43.50	33.00	100	80	Horizontal
	5	305.75575	-11.90	25.32	13.42	46.00	32.58	100	14	Horizontal
	6	867.94794	-1.02	39.71	38.69	46.00	7.31	100	25	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 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.



Antenna polarity: V



Susp	Suspected List									
	Freq.	Factor	Reading	Level	Limit	Margin	Height	Angle		
NO.	[MHz]	[dB]	[dBµV/m]	[dBµV/m]	[dBµV/m]	[dB]	[cm]	[°]	Polarity	
1	32.912913	-16.48	24.61	8.13	40.00	31.87	100	1	Vertical	
2	57.187187	-14.41	25.70	11.29	40.00	28.71	100	39	Vertical	
3	74.664665	-16.60	28.25	11.65	40.00	28.35	100	14	Vertical	
4	116.41641	-15.11	25.90	10.79	43.50	32.71	100	14	Vertical	
5	255.26526	-13.02	26.44	13.42	46.00	32.58	100	6	Vertical	
6	867.94794	-1.02	40.37	39.35	46.00	6.65	100	36	Vertical	

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 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.

Above 1GHz Horizontal

No.	Frequency	Reading	Corr.	Duty cycle	Result	Limit	Margin	Deg.	Height	Remark
	MHz	dBuV/m	Factor (dB)	Factor (dB)	dBuV/m	dBuV/m	dB	(°)	(cm)	
[©] 1	1301.7	26.12	25.83	N/A	51.95	74	-22.05	11 ^{11/3} 41	100	Peak
	1301.7	1	10	-8.42	43.53	54	-10.47	306	100	Ave
2	1735.6	27.06	27.25	N/A	54.31	74	-19.69	204	100	Peak
	1735.6	JUG (HANKLE	-8.42	45.89	54	-8.11	87	100	Ave

Vertical

No.	Frequency	Reading	Corr.	Duty cycle	Result	Limit	Margin	Deg.	Height	Remark
	MHz	dBuV/m	Factor (dB)	Factor (dB)	dBuV/m	dBuV/m	dB	(°)	(cm)	
1	1301.7	26.86	25.83	N/A	52.69	₃ 74	-21.31	151	100	Peak
	1301.7	1		-8.42	44.27	54	-9.73	74	100	Ave
2	1735.6	27.15	27.25	∞ N/A	54.4	74	-19.6	332	100	Peak
	1735.6	-STING (HUM	-8.42	45.98	54	-8.02	51	100	Ave

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics, which above 5th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

The fundamental frequency is 433.911MHz, so the fundamental and spurious emissions radiated limit base on the the operating frequency 433.911MHz.

Frequency Range (9 kHz-30MHz)

Frequency (MHz)	Level@3m	(dΒμV/m	Limit@3m (dBµV/m)		
TESTING - KTESTING		STING KTESTING	.	TESTING WIES	
Sc.	HUAK.	HUM	@\ [\]	UNK HUM	
			-		

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



5. 20dB Occupy Bandwidth Test

5.1. Standard Applicable

According to FCC Part 15.231(c), The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. Bandwidth is determined at the points 20 dB down from the modulated carrier.

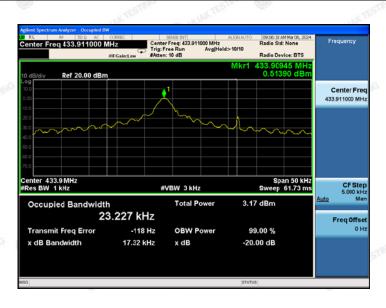
5.2. Test Procedure

With the EUT's antenna attached, the EUT's 20dB Bandwidth power was received by the test antenna, which was connected to the spectrum analyzer with the START, and STOP frequencies set to the EUT's operation band.

Temperature:	21℃	
Relative Humidity:	52%	
ATM Pressure:	1011 mbar	HUAKTESTIN

5.3. Test Data

Freq. (MHz)	Modulation Type	Bandwidth (kHz)	Limit (kHz)	Results
433.911	ASK	17.32	<1084.8	PASS



AFICATION.

Report No.: HK2403040939-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 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.



6. Transmission Time

6.1. Standard Applicable

According to FCC Part 15.231(a), the transmitter shall be complied the following requirements:

- (1) A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.
- (2) A transmitter activated automatically shall cease transmission within 5 seconds after activation.
- (3) Periodic transmissions at regular predetermined intervals are not permitted. However, polling or supervision transmissions, including data, to determine system integrity of transmitters used in security or safety applications are allowed if the total duration of transmissions does not exceed more than two seconds per hour for each transmitter. There is no limit on the number of individual transmissions, provided the total transmission time does not exceed two seconds per hour.

6.2. Test Procedure

With the EUT's antenna attached, the EUT's output signal was received by the test antenna, which was connected to the spectrum analyzer. Set the center frequency to 433.911MHz, than set the spectrum analyzer to Zero Span for the release time reading. During the testing, the switch was released then the EUT automatically deactivated.

6.3. Environmental Conditions

Temperature:	20℃
Relative Humidity:	52%
ATM Pressure:	1011 mbar

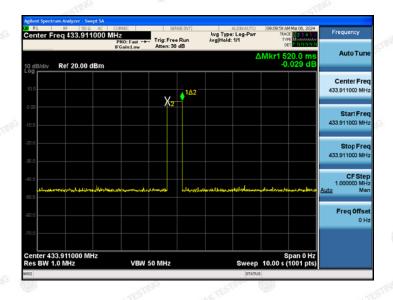
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity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



6.4. Test Data

Transmission Type	Test Frequency MHz	Transmission Time seconds	Limit s	Result
Manually	433.911	0.52	5	PASS

Please refer the following plot.



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. Duty Cycle

7.1. Standard Applicable

According to FCC Part 15.231(b)(2) and 15.35 (c), For pulse operation transmitter, the averaging pulsed emissions are calculated by peak value of measured emission plus duty cycle factor.

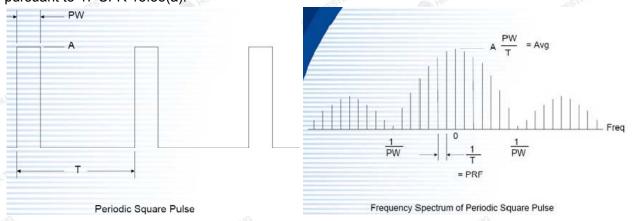
7.2. Test Procedure

- 1) The EUT was placed on a turntable which is 0.8m above ground plane.
- 2) Set EUT operating in continuous transmitting mode
- 3) Set Test Receiver into spectrum analyzer mode, Tune the spectrum analyzer to the transmitter carrier frequency, and set the spectrum analyzer resolution bandwidth(RBW) to 1000kHz and video bandwidth(VBW) to 1000kHz, Span was set to 0Hz.
- 4) The Duty Cycle was measured and recorded.

7.3. Introduction to PDCF Reference:

(§15.35 Measurement detector functions and bandwidths.)

1) Part 15 of the FCC Rules provides for the operation of low power communication devices without an individual license (e.g., intrusion detectors, pulsed water tank level gauges, etc.), subject to certain requirements. Some of these devices use extremely narrow pulses to generate wideband emissions, which are measured to determine compliance with the rules. These measurements are typically performed with a receiver or spectrum analyzer. Depending on a number of factors (e.g., resolution bandwidth, pulse width, etc.), the spectrum analyzer may not always display the true peak value of the measured emission. This effect, called "pulse desensitization," relates to the capabilities of the measuring instrument. For the measurement and reporting of the true peak of pulsed emissions, it may be necessary to apply a "pulse desensitization correction factor" (PDCF) to the measured value, pursuant to 47 CFR 15.35(a).



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



If using spectrum analyzer to measure pulse signal, it have to make sure the RBW use is at least 2/PW. •When RBW is less than 2/PW, you are able to measure the true peak level of the pulse signal. If this is the case,

Report No.: HK2403040939-E

PDCF is required to compensate to determine true peak value.

Pulse desensitization:

PW =29250usec (0.6* 13+ 1.65*13), Period=67500usec, Level=A

RBW>2/PW=0.068K, 1/T=0.15K

NOTE: 2 / PW < RBW, first don't need

2). For the actual test, please refer to the ANSI C63.10, Annex C refer to section 5 for more detail

7.4. Test Data

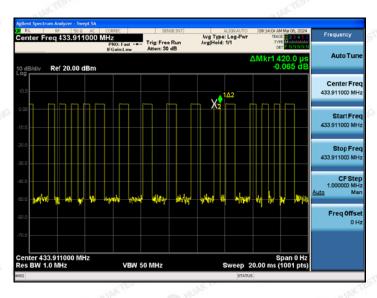
Type of Pulse	Width of Pulse ms	Quantity of Pulse	Transmission Time	Total Time(T _{on}) ms
Pulse 1	0.42	54	22.68	Munut.
Pulse 2	0.64	19	12.16	34.84

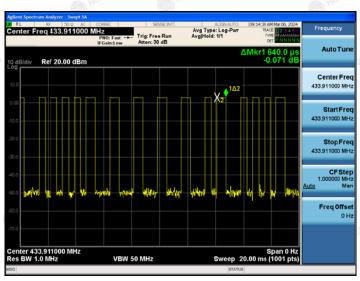
J.P.	Test Period (T _p)	Total Time (Ton)	Duty Cycle			
	ms	ms	%	dB		
	91.90	34.84	37.91	-8.42		

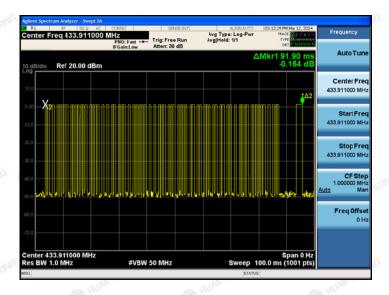
Remark: Duty Cycle Factor=20*log (Duty Cycle)

Please refer to the attached test plots

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







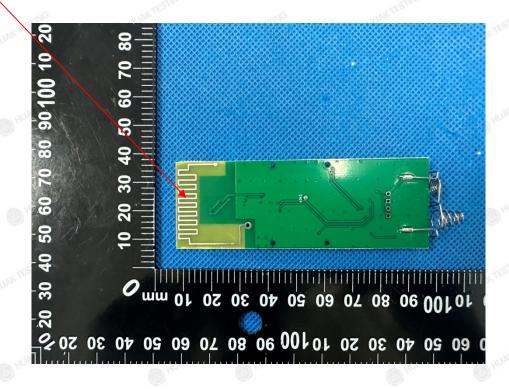
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannon be reproduced except in full with our prior written permission. The more details and the authenticity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



8. 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 0dBi.

<u>Antenna</u>



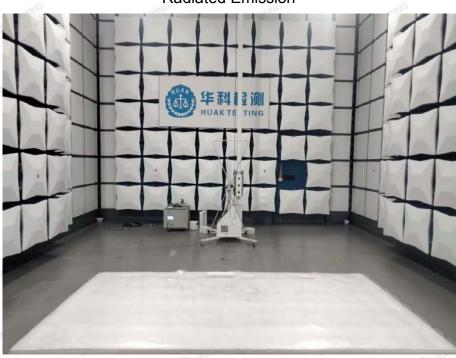
The results shown in this test report refer only to the sample(s) tested unless otherwise stated and the sample(s) are retained for 30 days only. The document is issued by HUAK, this document cannont be reproduced except in full with our prior written permission. The more details and the authenticity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

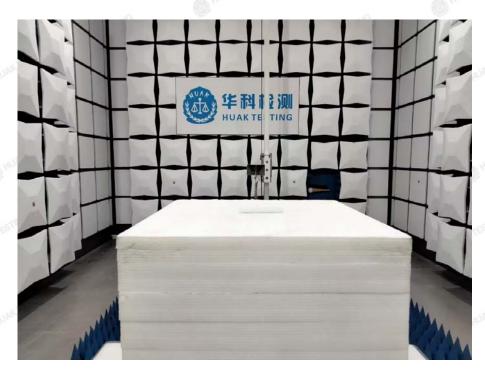


9. Photograph of Test



Report No.: HK2403040939-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.



10. Photos of the EUT

Reference to the report: ANNEX A of External photos and ANNEX B of Internal photos

*****End of 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 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.