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# RF Exposure Evaluation Report

**Report No.:** CQASZ20201200045EX-02  
**Applicant:** Chengdu Huaxin Zhiyun Technology Co., Ltd.  
**Address of Applicant:** 1-4021, Science Park, West District, University of Electronic Science and technology, No. 88, Tianchen Road, Chengdu, China  
**Equipment Under Test (EUT):**  
**EUT Name:** Infrared people counter  
**Model No.:** HX-HE1, HX-HE2, HX-HE3  
**Test Model No.:** HX-HE1  
**Brand Name:** Infrared people counter  
**FCC ID:** HX-HE1, HX-HE2, HX-HE3  
**Standards:** 47 CFR Part 1.1307  
47 CFR Part 1.1310  
KDB447498D01 General RF Exposure Guidance v06  
**Date of Receipt:** Nov. 28, 2020  
**Date of Test:** Nov. 28, 2020 to Dec. 11, 2020  
**Date of Issue:** Dec. 28, 2020  
**Test Result:** PASS\*

\*In the configuration tested, the EUT complied with the standards specified above

**Tested By:**

Jun Li

(Jun Li)

**Reviewed By:**

Ares Liu

(Ares Liu)

**Approved By:**

Sheek Luo

(Sheek Luo)



## 1 Version

### Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20201200045EX-02	Rev.01	Initial report	Dec. 28, 2020

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### 3 General Information

#### 3.1 Client Information

Applicant:	Chengdu Huaxinzhiyun Technology.,Ltd
Address of Applicant:	1-4021, Science Park, West District, University of Electronic Science and technology, No. 88, Tianchen Road, Chengdu, China
Manufacturer:	Chengdu Huaxinzhiyun Technology.,Ltd
Address of Manufacturer:	1-4021, Science Park, West District, University of Electronic Science and technology, No. 88, Tianchen Road, Chengdu, China

#### 3.2 General Description of EUT

Product Name:	Infrared people counter
Model No.:	HX-HE1
Trade Mark:	Huaxinzhiyun
Hardware version:	V1.0
Software version:	V2.5
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE for 802.11g : OFDM IEEE for 802.11n(HT20): OFDM
Product Type:	<input type="checkbox"/> Mobile <input type="checkbox"/> Portable <input checked="" type="checkbox"/> Fix Location
Test Software of EUT:	RF test (manufacturer declare )
Antenna Type	PCB Antenna
Antenna Gain	0dBi
Power Supply:	AC 120V 50/60Hz
Adapter Information:	/

## 4 MPE Evaluation

### 4.1 RF Exposure Compliance Requirement

#### 4.1.1 Limitst

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300 .....	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

#### 4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

### 4.1.3 EUT RF Exposure

#### 1) For 2.4G WIFI

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

#### Measurement Data

802.11b mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	11.61	11.5±1	12.5	17.783
Middle(2437MHz)	10.40	9.5±1	10.5	11.220
Highest(2462MHz)	9.62	9.5±1	10.5	11.220
802.11g mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	9.24	8.5±1	9.5	8.913
Middle(2437MHz)	9.27	8.5±1	9.5	8.913
Highest(2462MHz)	8.06	7.5±1	8.5	7.079
802.11n(HT20)mode				
Test channel	Average Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
			(dBm)	(mW)
Lowest(2412MHz)	9.42	8.5±1	9.5	8.913
Middle(2437MHz)	9.43	8.5±1	9.5	8.913
Highest(2462MHz)	8.06	7.5±1	8.5	7.079

The worst case:

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
17.783	0	0.0035	1.0	PASS

Note: 1) Refer to report No. CQASZ20201200045EX-01 for EUT test Max Conducted Average Output Power value.

2)  $P_d = (P_{out} * G) / (4 * \pi * R^2) = (17.783 * 1.0) / (4 * 3.1416 * 20^2) = 0.0035$