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RF Exposure Evaluation Report

Report No. : CQASZ20210500030EX-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

Manufacturer: Chengdu Huaxin Zhiyun Technology Co., Ltd.

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

Equipment Under Test (EUT):

Product: Binocular people flow counter terminal

Model No.: HX-CCD16

Brand Name: Huaxinzhiyun

FCC ID: 2AYE6-HX-CCD16

47 CFR Part 1.1307

Standards: 47 CFR Part 1.1310

KDB447498D01 General RF Exposure Guidance v06

Date of Test: May 10, 2021 -- May 24, 2021

Date of Issue: June 15, 2021

Test Result : **PASS**

Tested By:

Lewis Zhou

(Lewis Zhou)

Reviewed By:

Jun Li

(Jun Li)

Approved By:

Sheek Luo

(Sheek Luo)



1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20210500030EX-02	Rev.01	Initial report	June 15, 2021

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3 General Information

3.1 Client Information

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

3.2 General Description of EUT

Product Name:	Binocular people flow counter terminal
Test Model No.:	HX-CCD16
Trade Mark:	Huaxinzhiyun
Hardware Version:	V2.0
Software Version:	V1.2
Product Type:	☐ Mobile ☐ Portable ☒ Fix Location
Power Supply:	DC12V from adapter or others (12V power supply)

3.3 General Description of 2.4G WIFI

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(H40): 2422MHz~2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7
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 IEEE for 802.11n(HT40): OFDM
Antenna Type	FPC Antenna
Antenna Gain	0dBi Max

4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

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 ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f ²)	6
30–300	61.4	0.163	1.0	6
300–1500			f/300	6
1500–100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f ²)	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/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

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

P_d is the limit of MPE, 1 mW/cm². 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 Evaluation standalone operations

For WIFI:

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.0 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Measurement Data

802.11b mode					
Test channel	Antenna	Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	ANT1	15.98	16±1	17	50.119
Middle(2437MHz)	ANT1	15.26	16±1	17	50.119
Highest(2462MHz)	ANT1	15.24	16±1	17	50.119
802.11g mode					
Test channel	Antenna	Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	ANT1	15.46	15±1	16	39.811
Middle(2437MHz)	ANT1	15.46	15±1	16	39.811
Highest(2462MHz)	ANT1	15.18	15±1	16	39.811
802.11n(HT20) SISO mode					
Test channel	Antenna	Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2412MHz)	ANT1	14.09	14±1	15	31.623
Middle(2437MHz)	ANT1	14.23	14±1	15	31.623
Highest(2462MHz)	ANT1	14.02	14±1	15	31.623
802.11n(HT40) SISO mode					
Test channel	Antenna	Output Power (dBm)	Tune up tolerance (dBm)	Maximum tune-up Power	
				(dBm)	(mW)
Lowest(2422MHz)	ANT1	13.12	13±1	14	25.119
Middle(2437MHz)	ANT1	13.41	13±1	14	25.119
Highest(2452MHz)	ANT1	13.26	13±1	14	25.119

Test worst case

Maximum tune-up Power (mW)	Antenna Gain (dBi)	Power Density at R = 20 cm (mW/cm ²)	Limit	Result
50.119	0	0.00997	1.0	PASS

Note: 1) Refer to report No. : CQASZ20210500030EX-01 for EUT test Max Conducted Output Power value.

2) $P_d = (P_{out} * G) / (4 * \pi * R^2) = (50.119 * 1.00) / (4 * 3.1416 * 20^2) = 0.00997 \text{ mW/cm}^2$

3) EUT wifi2.4G module is more than 20cm away from the human body