

1 Cover Page

RF Exposure Evaluation Report

Application No.: SHEM2106005826CR
FCC ID: 2APV2-CSA3W
IC: 23928-CSA3W
Applicant: Hangzhou Ezviz Software Co., Ltd.
Address of Applicant: Room 302, Unit B, Building 2,399 Danfeng Road, Binjiang District, Hangzhou, Zhejiang
Manufacturer: Hangzhou Ezviz Software Co., Ltd.
Address of Manufacturer: Room 302, Unit B, Building 2,399 Danfeng Road, Binjiang District, Hangzhou, Zhejiang
Equipment Under Test (EUT):
EUT Name: Home Gateway
Model No.: CS-A3
Trade mark: EZVIZ
Standard(s) : FCC Rules 47 CFR §2.1091
 KDB447498 D01 General RF Exposure Guidance v06
 RSS-102 Issue 5 Amendment 1 (February 2, 2021)
Date of Receipt: 2021-06-11
Date of Test: 2021-06-11 to 2021-06-15
Date of Issue: 2021-06-15

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Parlan Zhan

Parlan Zhan
Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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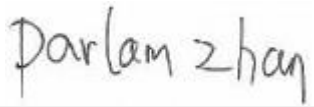


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Report No.: SHEM210600582603

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Revision Record			
Version	Description	Date	Remark
00	Original	2021-06-15	/

Authorized for issue by:			
			
		Micheal Niu / Project Engineer	
			
		Parlam Zhan / Reviewer	



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3 General Information

3.1 General Description of E.U.T.

Power supply:	DC 5V by Adapter
Serial Number:	DQ3510809
Firmware Version:	V1.1.4

3.2 Technical Specifications

2.4G

Antenna Gain:	2.6dBi (Provided by the manufacturer)
Antenna Type:	FPC Antenna
Channel Spacing:	5MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK) 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz

Zigbee

Antenna Gain:	2.1dBi (Provided by the manufacturer)
Antenna Type:	FPC Antenna
Channel Spacing:	5MHz
Modulation Type:	O-QPSK
Number of Channels:	16
Operation Frequency:	2405MHz to 2480MHz



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3.3 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

3.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L4354)**

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017

General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01

Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 2541.01)**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

- **FCC (Designation Number: CN1172)**

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory.

Designation Number: CN1172.

- **ISED (CAB identifier: CN0072)**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 2324E

- **VCCI (Member No.: 1938)**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1600, C-1707, T-1499, G-10216 respectively.



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4 Test Standards and Limits

4.1 FCC Radiofrequency radiation exposure limits:

According to §1.1310, the limit for general population/uncontrolled exposures

Frequency	Power density(mW/cm ²)	Averaging time(minutes)
300MHz~1.5GHz	f/1500	30
1.5GHz~100GHz	1.0	30

4.2 IC Radiofrequency radiation exposure limits:

According to RSS-102 section 2.5.2, RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows:

below 20 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance);

- at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $4.49/f^{0.5}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance);
- at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than $1.31 \times 10^{-2} f^{0.6834}$ W (adjusted for tune-up tolerance), where f is in MHz;
- at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance).

For 2.4G device, the limit of worse case is 2.68 W



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5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHEM210600582601& SHEM210600582602

2.4G

Test Mode	Test Channel	Ant	Power [dBm]	Power [mW]
11B	2412	Ant1	17.61	57.68
11B	2437	Ant1	17.15	51.88
11B	2462	Ant1	17.05	50.70
11G	2412	Ant1	17.69	58.75
11G	2437	Ant1	17.23	52.84
11G	2462	Ant1	17.14	51.76
11N20SISO	2412	Ant1	17.55	56.89
11N20SISO	2437	Ant1	17.16	52.00
11N20SISO	2462	Ant1	17.07	50.93

Zigbee

Test Mode	Test Channel	Ant	Power [dBm]	Power [mW]
Zigbee	2405	Ant1	12.89	19.45
	2440	Ant1	12.87	19.36
	2480	Ant1	12.67	18.49





5.2 MPE Calculation

For FCC:

According to the formula $S=P/4\pi R^2$, we can calculate S which is MPE.

Note:

- 1) P (mW)
- 2) R = distance to the center of radiation of antenna (in meter) = 20cm
- 3) MPE limit = 1mW/cm²

2.4G WIFI

The max. antenna gain is 2.6 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
58.75	1.820	20	0.02127	1	Pass

Zigbee

The max. antenna gain is 2.1 dBi

Max. Conducted Power P(mW)	Gain in Linear Scale G	Operation Distance R(cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Result
19.45	1.622	20	0.00628	1	Pass

2.4G WIFI and ZigBee modules can simultaneous transmitting, so the maximum rate of MPE is $0.02127/1 + 0.00628/1 = 0.02755 \leq 1.0$ and then the EUT is not need to conduct SAR measurement.

For IC:

2.4G WIFI

$$E.I.R.P. = P \times G = 0.05875 \times 1.820 = 0.107W < 2.68W$$

Zigbee

$$E.I.R.P. = P \times G = 0.01945 \times 1.622 = 0.032W < 2.68W$$

2.4G WIFI and ZigBee modules can simultaneous transmitting, so the maximum rate of MPE is $0.107/2.68 + 0.032/2.68 = 0.052 \leq 1$ and then the EUT is not need to SAR measurement.

--End of the Report--



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