



## 1 Cover Page

# RF Exposure Evaluation Report

**Application No.:** SHEM2107007951CR  
**FCC ID:** 2APV2-CSC3N1H2  
**IC:** 23928-CSC3N1H2  
**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:** Smart Home Camera  
**Model No.:** CS-C3N (A0-1H2WFL)(4mm)  
**Add Model No:** CS-C3N,  
CS-C3N (A0-1H2WFL)(2.8mm)  
**For IC Model No.:** CS-C3N (A0-1H2WFL)(2.8mm),  
CS-C3N (A0-1H2WFL)(4mm)  
**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:** 2021-07-21  
**Date of Test:** 2021-07-29 to 2021-08-09  
**Date of Issue:** 2021-08-24

|                     |              |
|---------------------|--------------|
| <b>Test Result:</b> | <b>Pass*</b> |
|---------------------|--------------|

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

Parlan Zhan

Parlan Zhan  
E&E Section Manager

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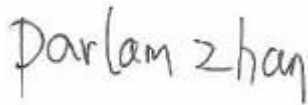
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| Revision Record |             |            |        |
|-----------------|-------------|------------|--------|
| Version         | Description | Date       | Remark |
| 00              | Original    | 2021-08-24 | /      |
|                 |             |            |        |
|                 |             |            |        |

|                          |  |  |  |
|--------------------------|--|--|--|
| 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:     | 12V=1A,9W Max |
| Serial Number:    | G32698464     |
| Software Version: | V5.3.0        |

#### 3.2 Technical Specifications

##### 2.4GHz

|                      |  |
|----------------------|--|
| Antenna Gain:        | Antenna 1:2.3dBi(Provided by manufacturer)<br>Antenna 1:2.3dBi(Provided by manufacturer)<br>Directional gain:5.31dBi |
| Antenna Type:        | Antenna 1:Dipole Antenna<br>Antenna 2:Dipole Antenna   |
| Channel Spacing:     | 5MHz   |
| Modulation Type:     | 802.11b: DSSS (CCK, DQPSK, DBPSK)<br>802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)                                      |
| Number of Channels:  | 802.11b/g/n(HT20):11<br>802.11n(HT40):7  |
| Operation Frequency: | 802.11b/g/n(HT20): 2412MHz to 2462MHz<br>802.11n(HT40): 2422MHz to 2452MHz   |



### 3.3 Stest 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.

CAB Identifier: CN0072.

• **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-20134, R-11600, C-11707, T-11499, 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 <sup>2</sup> ) | 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 band, 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 SHEM210700795101

| Test Mode | Channel | Antenna 1<br>Power[dBm] | Antenna 2<br>Power[dBm] | MIMO<br>Power[dBm] | Antenna 1<br>Power[mW] | Antenna 2<br>Power[mW] | MIMO<br>Power[mW] |
|-----------|---------|-------------------------|-------------------------|--------------------|------------------------|------------------------|-------------------|
| 11B       | 2412    | 17.56                   | 17.35                   | NA                 | 57.02                  | 54.33                  | N/A               |
| 11B       | 2437    | 17.70                   | 17.55                   | NA                 | 58.88                  | 56.89                  | N/A               |
| 11B       | 2462    | 17.23                   | 16.94                   | NA                 | 52.84                  | 49.43                  | N/A               |
| 11G       | 2412    | 17.89                   | 18.04                   | NA                 | <b>61.52</b>           | <b>63.68</b>           | N/A               |
| 11G       | 2437    | 17.76                   | 17.95                   | NA                 | 59.70                  | 62.37                  | N/A               |
| 11G       | 2462    | 17.57                   | 17.58                   | NA                 | 57.15                  | 57.28                  | N/A               |
| 11N20MIMO | 2412    | 15.56                   | 15.98                   | 18.79              | 35.97                  | 39.63                  | <b>75.68</b>      |
| 11N20MIMO | 2437    | 15.52                   | 15.89                   | 18.72              | 35.65                  | 38.82                  | 74.47             |
| 11N20MIMO | 2462    | 15.40                   | 15.57                   | 18.50              | 34.67                  | 36.06                  | 70.79             |



## 5.2 MPE Calculation

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/cm<sup>2</sup>

For 2.4G WiFi –Antenna1:

The max. antenna gain is 2.3 dBi

| Max. Conducted Power P(mW) | Gain in Linear Scale G | Operation Distance R(cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Result |
|----------------------------|------------------------|--------------------------|-------------------------------------|-----------------------------|--------|
| 61.52                      | 1.698                  | 20                       | 0.02078                             | 1                           | Pass   |

For 2.4G WiFi –Antenna2:

The max. antenna gain is 2.3 dBi

| Max. Conducted Power P(mW) | Gain in Linear Scale G | Operation Distance R(cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Result |
|----------------------------|------------------------|--------------------------|-------------------------------------|-----------------------------|--------|
| 63.68                      | 1.698                  | 20                       | 0.02151                             | 1                           | Pass   |

In MIMO mode:

The max. antenna gain is 5.31 dBi

| Max. Conducted Power P(mW) | Gain in Linear Scale G | Operation Distance R(cm) | Power Density (mW/cm <sup>2</sup> ) | Limit (mW/cm <sup>2</sup> ) | Result |
|----------------------------|------------------------|--------------------------|-------------------------------------|-----------------------------|--------|
| 75.68                      | 3.396                  | 20                       | 0.05113                             | 1                           | Pass   |

So the device is exclusion from SAR test



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For IC

For 2.4GHz WiFi SISO mode:

The Max Conducted Peak Output Power are 61.52mW and 63.68mW. The best case gain of the antenna is 2.3dBi. 2.3dBi logarithmic terms convert to numeric result is nearly 1.698

According to the formula. calculate the EIRP test result:

Antenna 1:E.I.R.P.=  $P \times G = 0.06152 \times 1.698 = 0.1W < 2.68W$

Antenna 2:E.I.R.P.=  $P \times G = 0.06368 \times 1.698 = 0.11W < 2.68W$

For 2.4GHz WiFi MIMO mode:

The Max Conducted Peak Output Power is 75.68mW. The best case gain of the antenna is 5.31dBi. 5.31dBi logarithmic terms convert to numeric result is nearly 3.396

According to the formula. calculate the EIRP test result:

MIMO mode: E.I.R.P.=  $P \times G = 0.07568 \times 3.396 = 0.26W < 2.68W$

So the device is exclusion from SAR test

**--End of the Report--**

