



1 Cover Page

RF MPE REPORT

Application No.: SHEM1812000124CR
FCC ID: 2APV2-X5S16H
Applicant: Hangzhou Ezviz Software Co., Ltd.
Address of Applicant: Floor 16, Unit B, Building 1, No. 555, Qianmo Road, Binjiang District, Hangzhou City, Zhejiang Province
Manufacturer: Hangzhou Ezviz Software Co., Ltd.
Address of Manufacturer: Floor 16, Unit B, Building 1, No. 555, Qianmo Road, Binjiang District, Hangzhou City, Zhejiang Province
Factory: Hangzhou Hikvision Electronics Co., Ltd.
Address of Factory: No. 299, Qiushi Road, Tonglu Economic Development Zone, Tonglu County, Hangzhou.

Equipment Under Test (EUT):

EUT Name: Network Video Recorder
Model No.: CS-X5S-16H
Trade mark: eZVIZ
Standard(s) : FCC Rules 47 CFR §2.1091
 KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt: 2018-12-20
Date of Test: 2018-12-24 to 2018-12-27
Date of Issue: 2019-03-11

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

Parlan Zhan

Parlan Zhan
E&E Section 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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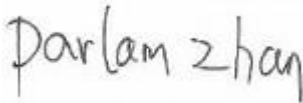
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. Testing Center EMC

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Revision Record			
Version	Description	Date	Remark
00	Original	2019-03-11	/

Authorized for issue by:			
			
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		Bill Wu / Project Engineer	
			
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		Parlam Zhan / Reviewer	



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3 General Information

3.1 General Description of E.U.T.

Power supply:	DC 12V by Adapter Adapter: Model:MSA-C2000IC12.0-24P-US/MSA-C2000IC12.0-24P-JP Input:100-240V~50/60Hz Output:12V 2A
Test voltage:	AC 120V/60Hz
Cable:	DC Cable 1.5m

3.2 Technical Specifications

2.4G:

Antenna Gain	5dBi
Antenna Type	Dipole 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):11 802.11n(HT40):7
Operation Frequency	802.11b/g/n(HT20): 2412MHz to 2462MHz 802.11n(HT40): 2422MHz to 2452MHz



5G:

Antenna Gain	5dBi
Antenna Type	Dipole Antenna
TPC Function	Not Support

Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	802.11a/n(HT20)/ac(HT20)	5180-5240	4
		802.11n(HT40)/ac(HT40)	5190-5230	2
		802.11ac(HT80)	5210	1
	UNII Band III	802.11a/n(HT20)/ac(HT20)	5745-5825	5
		802.11n(HT40)/ac(HT40)	5755-5795	2
		802.11ac(HT80)	5775	1
Modulation Type:	802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)			
Channel Spacing:	802.11a/n(HT20)/ac(HT20): 20MHz 802.11n(HT40)/ac(HT40): 40MHz 802.11ac(HT80): 80MHz			



Selected Test Channel for 802.11a/n(HT20)/ac(HT20)		
Band	Channel	Frequency
U-NII Band I	The lowest channel (CH36)	5180MHz
	The middle channel (CH40)	5200MHz
	The highest channel (CH48)	5240MHz
U-NII Band III	The lowest channel (CH149)	5745MHz
	The middle channel (CH157)	5785MHz
	The highest channel (CH165)	5825MHz

Selected Test Channel for 802.11n(HT40)/ac(HT40)		
Band	Channel	Frequency
U-NII Band I	The lowest channel (CH38)	5190MHz
	The highest channel (CH46)	5230MHz
U-NII Band III	The lowest channel (CH151)	5755MHz
	The highest channel (CH159)	5795MHz

Selected Test Channel for 802.11ac(HT80)		
Band	Channel	Frequency
U-NII Band I	One channel (CH42)	5210MHz
U-NII Band III	One channel (CH155)	5775MHz



3.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shanghai Branch
588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China
Tel: +86 21 6191 5666 Fax: +86 21 6191 5678

No tests were sub-contracted.

3.4 Test Facility

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

- **CNAS (No. CNAS L0599)**

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2005 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.

- **NVLAP (Certificate No. 201034-0)**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the National Voluntary Laboratory Accreditation Program(NVLAP). Certificate No. 201034-0.

- **FCC –Designation Number: CN5033**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN5033. Test Firm Registration Number: 479755.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

IC Registration No.: 8617A-1. CAB identifier: CN0020.

- **VCCI (Member No.: 3061)**

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

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

5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report SHEM181200012401-2.4GHz.

Test Mode	Channel	Antenna 0 Power[dBm]	Antenna 1 Power[dBm]	MIMO Power[dBm]	Antenna 0 Power[mW]	Antenna 1 Power[mW]	MIMO Power[mW]
11B	2412	12.53	13.97	NA	17.91	24.95	NA
11B	2437	12.70	13.90	NA	18.62	24.55	NA
11B	2462	9.78	13.37	NA	9.51	21.73	NA
11G	2412	13.04	11.71	NA	20.14	14.83	NA
11G	2437	11.26	13.40	NA	13.37	21.88	NA
11G	2462	12.65	12.73	NA	18.41	18.75	NA
11N20SISO	2412	11.89	11.25	14.59	15.45	13.34	28.77
11N20SISO	2437	11.42	13.52	15.61	13.87	22.49	36.39
11N20SISO	2462	10.95	12.93	15.06	12.45	19.63	32.06
11N40SISO	2422	12.17	11.83	15.01	16.48	15.24	31.70
11N40SISO	2437	12.04	12.64	15.36	16.00	18.37	34.36
11N40SISO	2452	13.05	14.10	16.62	20.18	25.70	45.92



The Power Data is based on the RF Test Report SHEM181200012402-5GHz.

Test Mode	Test Channel	Antenna 0 Power[dBm]	Antenna 1 Power[dBm]	MIMO Power[dBm]	Antenna 0 Power[mW]	Antenna 1 Power[mW]	MIMO Power[mW]
11A	5180	15.69	16.03	NA	37.07	40.09	N/A
11A	5220	15.03	15.63	NA	31.84	36.56	N/A
11A	5240	14.97	15.73	NA	31.41	37.41	N/A
11A	5745	12.03	13.62	NA	15.96	23.01	N/A
11A	5785	11.82	13.05	NA	15.21	20.18	N/A
11A	5825	12.18	12.92	NA	16.52	19.59	N/A
11N20	5180	14.09	14.15	17.13	25.64	26.00	51.64
11N20	5220	13.04	13.95	16.53	20.14	24.83	44.98
11N20	5240	13.24	14.11	16.71	21.09	25.76	46.88
11N20	5745	11.32	12.65	15.05	13.55	18.41	31.99
11N20	5785	10.95	12.44	14.77	12.45	17.54	29.99
11N20	5825	11.33	12.20	14.80	13.58	16.60	30.20
11N40	5190	13.98	13.66	16.83	25.00	23.23	48.19
11N40	5230	12.98	13.46	16.24	19.86	22.18	42.07
11N40	5755	10.32	11.61	14.02	10.76	14.49	25.23
11N40	5795	10.34	11.55	14.00	10.81	14.29	25.12
11AC20	5180	13.04	13.10	16.08	20.14	20.42	40.55
11AC20	5220	12.32	12.65	15.50	17.06	18.41	35.48
11AC20	5240	12.21	12.86	15.56	16.63	19.32	35.97
11AC20	5745	9.82	11.62	13.82	9.59	14.52	24.10
11AC20	5785	9.57	11.39	13.58	9.06	13.77	22.80
11AC20	5825	9.81	11.23	13.59	9.57	13.27	22.86
11AC40	5190	11.41	10.6	14.03	13.84	11.48	25.29
11AC40	5230	10.17	10.16	13.18	10.40	10.38	20.80
11AC40	5755	8.83	10.98	13.05	7.64	12.53	20.18
11AC40	5795	8.89	10.96	13.06	7.74	12.47	20.23
11AC80	5210	10.37	9.87	13.14	10.89	9.71	20.61
11AC80	5775	9.94	10.21	13.09	9.86	10.50	20.37

5.2 MPE Calculation

The best case gain of the antenna is 8dBi(MIMO). 8dB logarithmic terms convert to numeric result is nearly 6.31.

For 2.4GHz WiFi:

The Max Conducted average Output Power is 16.62dBm (45.92 mW);

For 5GHz WiFi:

The Max Conducted average Output Power is 17.13dBm (51.64 mW);

For FCC:

According to the formula $S = \frac{PG}{4R^2\pi}$, we can calculate S which is MPE.

Note:

- 1) P (Watts) = Power Input to antenna = $10^{\frac{dBm}{10}} / 1000$
- 2) G (Antenna gain in numeric) = $10^{(Antenna\ gain\ in\ dBi / 10)}$
- 3) R = distance to the center of radiation of antenna (in meter) = 20cm
- 4) MPE limit = 1mW/cm²

For 2.4G WiFi:

$$S = \frac{PG}{4R^2\pi} = \frac{45.92 \times 6.31}{4 \times 400 \times 3.14} = 0.058 \text{ mW/cm}^2$$

For 5G WiFi:

$$S = \frac{PG}{4R^2\pi} = \frac{51.64 \times 6.31}{4 \times 400 \times 3.14} = 0.065 \text{ mW/cm}^2$$

2.4G WiFi and 5G WiFi modules can simultaneous transmitting, so the maximum rate of MPE is

$$\frac{0.058}{1.0} + \frac{0.065}{1.0} = 0.123 \leq 1.0. \text{ according to the KDB447498 section 7.2 determine the device is}$$

exclusion from SAR test

--End of the Report--