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1 Cover Page

RF MPE REPORT

Application No.:	SZEM1710010711CR
Applicant:	Amcrest Technologies LLC
FCC ID:	ZZ2AMC026AMC029
IC:	21923-AMC026029
Equipment Under Test (EUT): NOTE: The following sample(s) was/were submitted and identified by the client as	
Product Name:	4MP WiFi Dome Hex Camera
Model No.(EUT):	IP4M-1028B
Add Model No.:	IP4M-1028W, IP2M-851B, IP2M-851W, IP4M-1028W-EU, IP4M-1028B-EU, IP2M-851B-EU, IP2M-851W-EU
Standards:	FCC Rules 47 CFR §2.1091 KDB447498 D01 General RF Exposure Guidance v06 RSS-102 Issue 5 (March 2015)
Date of Receipt:	2017-06-27
Date of Test:	2017-06-28 to 2017-07-05
Date of Issue:	2017-07-20
Test Result:	Pass*

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.



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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Revision Record				
Version	Chapter	Date	Modifier	Remark
00	/	2017-07-20	/	Original

Authorized for issue by:				
Tested By				2017-07-07
		Foray Chen /Project Engineer		Date
Checked By				2017-07-07
		Eric Fu /Reviewer		Date



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3 General Information

3.1 Client Information

Applicant:	Amcrest Technologies LLC
Address of Applicant:	16727 Park Row Dr, Houston, TX 77084
Manufacturer:	Amcrest Technologies LLC
Address of Manufacturer:	16727 Park Row Dr, Houston, TX 77084
Factory:	Zhejiang Dahua Vision Technology Co., Ltd.
Address of Factory:	No.1199, Bin'an Road, Binjiang District, Hangzhou, P.R. China

3.1 General Description of E.U.T.

Product Description:	Fixed product with 2.4G WiFi function
Power Supply:	DC 12V 1A
Test Voltage:	AC 120V 60Hz for Adapte

3.2 Technical Specifications

Operation Frequency:	802.11 b/g/n(HT20): 2412MHz-2462MHz 802.11 n(HT40): 2422MHz-2452MHz
Modulation Technique:	802.11 b DSSS(CCK, DQPSK, DBPSK) 802.11 g/n(HT20)/n(HT40) OFDM(64QAM, 16QAM, QPSK, BPSK)
Data Rate:	802.11b: 1/2/5.5/11Mbps, 802.11g: 6/9/12/18/24/36/48/54Mbps 802.11n: MCS0-15 up to 300Mbps
Number of Channel:	802.11 b/g/n(HT20): 11 802.11 n(HT40) 7
Antenna Type:	Monopole Antenna
Antenna Gain:	2 dBi



3.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China.
518057.

Tel: +86 755 2601 2053

Fax: +86 755 2671 0594

No tests were sub-contracted.

3.4 Test Facility

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

- **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC

Lab 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.

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American
Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd.
have been registered in accordance with the Regulations for Voluntary Control Measures with Registration
No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an
accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical
Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau
of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.



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



5 Measurement and Calculation

5.1 Maximum transmit power

The Power Data is based on the RF Test Report SZEM171001071101

Test Mode	Channel	Power[dBm]	Power[mW]
11B	2412	16.62	45.92
11B	2437	17.01	50.23
11B	2462	17.11	51.40
11G	2412	19.69	93.11
11G	2437	19.79	95.28
11G	2462	20.02	100.46
11N20SISO	2412	18.36	68.55
11N20SISO	2437	19.09	81.10
11N20SISO	2462	19.09	81.10
11N40SISO	2422	19.36	86.30
11N40SISO	2437	19.45	88.10
11N40SISO	2452	19.67	92.68



5.2 MPE Calculation

The Max Conducted Peak Output Power is 20.02dBm (100.46mW);

The best case gain of the antenna is 2dBi. 2dB logarithmic terms convert to numeric result is nearly 1.58.

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) = $10^{(\text{Antenna gain in dBi} / 10)}$

3) R = distance to the center of radiation of antenna (in meter) = 20cm

4) MPE limit = 1mW/cm²

$$S = \frac{PG}{4R^2\pi} = \frac{100.46 \times 1.58}{4 \times 0.2^2 \times 3.14} = 0.0317 \text{ mW/cm}^2$$

For IC:

$$\text{E.I.R.P.} = P \times G = 0.10046 \times 1.58 = 0.159\text{W} < 2.68\text{W}$$

So the device is exclusion from SAR test.

6 EUT Constructional Details

Refer to the < External Photos > & < Internal Photos >.

--End of the Report--