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Report No.: SHEM170400212704
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1 Cover Page

RF MPE REPORT

Application No.:	SHEM1704002127CR
Applicant:	Apollo Tech USA Inc.
FCC ID:	2AML4-MOCAM720
Equipment Under Test (EUT): NOTE: The following sample(s) was/were submitted and identified by the client as	
Product Name:	Dual Band Wifi Video Camera
Model No.(EUT):	MOCAM-720-01
Add Model No.:	MOGA-001
Standards:	FCC Rules 47 CFR §2.1091 KDB447498 D01 General RF Exposure Guidance v06
Date of Receipt:	2017-04-17
Date of Test:	2017-06-13 to 2017-06-16
Date of Issue:	2017-06-16
Test Result:	Pass*

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



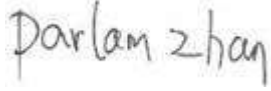
Parlam Zhan
E&E Section Manager
SGS-CSTC (Shanghai) Co., Ltd.

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		2017-06-16		Original

Authorized for issue by:			
Tested By	 _____ Vincent Zhu /Project Engineer	2017-06-16 _____ Date	
Checked By	 _____ Parlam Zhan /Reviewer	2017-06-16 _____ Date	



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3 General Information

3.1 Client Information

Applicant:	Apollo Tech USA Inc.
Address of Applicant:	Tech USA Inc. 8608 Utica Ave #220 Rancho Cucamonga, CA 91730
Manufacturer:	Apollo Tech USA Inc.
Address of Manufacturer:	Tech USA Inc. 8608 Utica Ave #220 Rancho Cucamonga, CA 91730
Factory:	1. Hangzhou Hikvision Technology Co., Ltd. 2. Hangzhou Hikvision Electronics Co., Ltd.
Address of Factory:	1. No.700, Dongliu Road, Binjiang District, Hangzhou City, Zhejiang, 310052, China 2. No.299, Qiushi Road, Tonglu Economic Development Zone, Tonglu County, Hangzhou, Zhejiang, 310052, China.

3.1 General Description of E.U.T.

Product Description:	Fixed product with WiFi function
Rated Input:	DC 5V via adapter
Test Voltage:	AC 120V 60Hz for adapter

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3.2 Technical Specifications

Operation Frequency:	2.4GHz WiFi: 802.11 b/g/n(HT20): 2412MHz~2462MHz 802.11 n(HT40): 2422MHz~2452MHz 5GHz WiFi: 802.11a/n(HT20)/ac(HT20): 5180-5240MHz, 5745MHz-5825MHz 802.11n(HT40)/ac(HT40): 5190-5230MHz, 5755MHz-5795MHz 802.11ac(HT80): 5210MHz, 5775MHz
Modulation Technique:	2.4GHz WiFi: 802.11 b: DSSS(CCK, DQPSK, DBPSK) 802.11 g/n(HT20)/n(HT40): OFDM(64QAM, 16QAM, QPSK, BPSK) 5GHz WiFi: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK) Remark: 256QAM for 802.11 ac only
Data Rate:	2.4GHz WiFi: 802.11 b: 1/2/5.5/11Mbps 802.11 g: 6/9/12/18/24/36/48/54Mbps 802.11n(HT20)/n(HT40): MCS0-MCS7 5GHz WiFi: 802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: MCS0-7 802.11ac: MCS0-9
Number of Channel:	2.4GHz WiFi: 802.11 b/g/n(HT20): 11 802.11 n(HT40): 7 5GHz WiFi: 802.11 a/n(HT20)/ac(HT20): 9 Channel 36, 40, 44, 48, 149, 153, 157, 161, 165 802.11 n(HT40)/ac(HT40): 4 Channel 38, 46, 151, 159 802.11 ac(HT80): 2 Channel 42, 155
Antenna Type:	Antenna :PIFA Antenna
Antenna Gain:	2.4 dBi for 2.4GHz WiFi 0.4 dBi for 5GHz WiFi

3.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.

588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China

Tel: +86 21 6191 5666

Fax: +86 21 6191 5678

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.

- **FCC – Registration No.: 402683**

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered and fully described in a report filed with the Federal Communications Commission (FCC). The acceptance letter from the FCC is maintained in our files. Registration No.: 402683.

- **Industry Canada (IC) – IC Assigned Code: 8617A**

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 8617A-1.

- **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-3868, C-4336, T-2221, G-830 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 SHEM170400212702 & SHEM170400212703

Test Mode	Channel	Power(dBm)	Power(mW)
11B	2412	20.89	122.74
11B	2437	21.16	130.62
11B	2462	20.74	118.58
11G	2412	22.45	175.79
11G	2437	22.99	199.07
11G	2462	22.24	167.49
11N20SISO	2412	22.66	184.50
11N20SISO	2437	23.19	208.45
11N20SISO	2462	22.47	176.60
11N40SISO	2422	23.14	206.06
11N40SISO	2437	22.98	198.61
11N40SISO	2452	22.61	182.39

Test Mode	Test Channel	Level [dBm]	10log(1/x) Factor [dB]	Power [dBm]	Power [mW]
11A	5180	13.52	0.320310371213077	13.84	24.21
11A	5220	11.36	0.320310371213077	11.68	14.72
11A	5240	11.1	0.320310371213077	11.42	13.87
11A	5745	9.19	0.320310371213077	8.69	7.40
11A	5785	9.45	0.320310371213077	8.74	7.48
11A	5825	8.3	0.320310371213077	9.92	9.82
11AC20	5180	12.71	2.43059763953276	15.14	32.66
11AC20	5220	11.9	2.43059763953276	14.33	27.10
11AC20	5240	11.02	2.43059763953276	13.45	22.13
11AC20	5745	8.99	2.39728339457937	11.33	13.58
11AC20	5785	9.09	2.39728339457937	10.44	11.07
11AC20	5825	7.92	2.43059763953276	10.14	10.33
11AC40	5190	11.96	3.49304020239389	15.45	35.08
11AC40	5230	10.8	3.49304020239389	14.29	26.85
11AC40	5755	9.12	3.42466112442014	12.48	17.70
11AC40	5795	9.15	3.49304020239389	12.42	17.46
11N20	5180	12.97	2.21848749616356	15.19	33.04
11N20	5220	11.06	2.24608028303388	13.31	21.43
11N20	5240	10.6	2.21848749616356	12.82	19.14
11N20	5745	8.44	2.21848749616356	12.22	16.67
11N20	5785	8.67	2.21848749616356	11.13	12.97
11N20	5825	7.43	2.21848749616356	11.19	13.15
11N40	5190	11.8	3.23306390375133	15.03	31.84
11N40	5230	10.85	3.23306390375133	14.08	25.59
11N40	5755	8.88	3.29383113599674	13.9	24.55
11N40	5795	8.82	3.23306390375133	13.97	24.95
11AC80	5210	11.96	4.51242171426296	16.47	44.36
11AC80	5775	8.95	4.51242171426296	14	25.12

5.2 MPE Calculation

The Max Conducted Peak Output Power is 23.19dBm (208.45mW);

The best case gain of the antenna is 2.4dBi. 2.4dB logarithmic terms convert to numeric result is nearly 1.74.

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

$$S = \frac{PG}{4R^2\pi} = \frac{208.45 \times 1.74}{4 \times 400 \times 3.14} = 0.07219 \text{ mW/cm}^2$$

The 2.4GHz and the 5GHz modules can't simultaneous transmitting, according to the KDB447498 section 7.1 determine the device is exclusion from SAR test.

6 EUT Constructional Details

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

--End of the Report--