

1 Cover Page

RF Exposure Evaluation Report

Application No.: SHEM2107007422CR
FCC ID: 2AVYF-IPC-BX6L
IC: 25954-IPCBX6L
Applicant: Hangzhou Huacheng Network Technology Co.,Ltd.
Address of Applicant: No.2930, Nanhuan Road, Binjiang District, Hangzhou, China
Manufacturer: Hangzhou Huacheng Network Technology Co.,Ltd.
Address of Manufacturer: No.2930, Nanhuan Road, Binjiang District, Hangzhou, China
Equipment Under Test (EUT):
EUT Name: CONSUMER CAMERA
Model No.: IPC-B46LN
Add Model No.: IPC-B46LP,IPC-B46LN-CAN,IPC-B46LP-White,IPC-B46LN-White,IPC-B46LN-imou,IPC-B46LP-imou,IPC-B46LN-White-CAN,IPC-B46LP-White-imou,IPC-B46LN-White-imou,IPC-B46LN-White-imou-CAN
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: 2021-07-08
Date of Test: 2021-07-13 to 2021-11-08
Date of Issue: 2021-11-08

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

Parlam Zhan

Parlam 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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For IC Model No.: IPC-B46LN-CAN, IPC-B46LN-imou-CAN, IPC-B46LN-White-CAN, IPC-B46LN-White-imou-CAN, IPC-B46LN-White



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Revision Record			
Version	Description	Date	Remark
00	Original	2021-11-08	/

Authorized for issue by:			
		<i>Michael Niu</i>	
		_____ Micheal Niu / Project Engineer	
		<i>Parlam Zhan</i>	
		_____ Parlam Zhan / Reviewer	



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3 General Information

3.1 General Description of E.U.T.

Power supply:	DC 3.6V by Rechargeable Lithium-Ion Battery charged by DC 5V Adapter Battery Model: FRB20 Nominal Voltage: 3.6V Rated Capacity: 6000mAh/21.6Wh Limited Charging Voltage: 4.2V
Serial Number:	7D0C50DAAZ62FA8
Firmware Version:	V2.800.0000000.3.R.210516

3.2 Technical Specifications

2.4GHz

Antenna Gain:	Ant 1: 1.55dBi (Provided by the manufacturer) Ant 2: 1.55dBi (Provided by the manufacturer)
Antenna Type:	PCB 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

5GHz

Operation Frequency:	Band	Mode	Frequency Range(MHz)	Number of channels
	UNII Band I	802.11a/n(HT20)	5180-5240	4
	UNII Band II-A	802.11a/n(HT20)	5260-5320	4
	UNII Band II-C	802.11a/n(HT20)	5500-5700	11
	UNII Band III	802.11a/n(HT20)	5745-5825	5
Modulation Type:	802.11a: OFDM (64QAM, 16QAM, QPSK, BPSK) 802.11n: OFDM (BPSK, QPSK, 16QAM, 64QAM)			
Channel Spacing:	802.11a/n(HT20): 20MHz			
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: MCS0-7			
Antenna Gain:	Ant 1:3.58dBi(Provided by manufacturer)			



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	Ant 2:3.58dBi(Provided by manufacturer)
Antenna Type:	Antenna 1: PCB Antenna Antenna 2: PCB Antenna



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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.

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 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

For 5G device, the limit of worse case is 4.53W



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5 Measurement and Calculation

5.1 Maximum transmit power

2.4GHz for FCC

The Power Data is based on the RF Test Report SHEM210700742201

Test Mode	Channel	Antenna 1 Power[dBm]	Antenna 2 Power[dBm]	Antenna 1 Power[mW]	Antenna 2 Power[mW]
11B	2412	18.30	18.55	67.61	71.61
11B	2437	17.75	18.11	59.57	64.71
11B	2462	17.63	17.54	57.94	56.75
11G	2412	18.38	18.41	68.87	69.34
11G	2437	17.85	18.16	60.95	65.46
11G	2462	17.84	17.55	60.81	56.89
11N20SISO	2412	17.01	16.81	50.23	47.97
11N20SISO	2437	17.56	16.83	57.02	48.19
11N20SISO	2462	17.14	16.77	51.76	47.53



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5GHz for FCC

The Power Data is based on the RF Test Report SHEM210700742202

Test Mode	Tx Type	Test Channel	Antenna 1 Power[dBm]	Antenna 2 Power[dBm]	Antenna 1 Power[mW]	Antenna 2 Power[mW]
802.11a	SISO	5180	11.93	11.64	15.60	14.59
	SISO	5200	11.96	11.19	15.70	13.15
	SISO	5240	10.94	10.42	12.42	11.02
	SISO	5260	12.29	11.63	16.94	14.55
	SISO	5300	12.34	10.98	17.14	12.53
	SISO	5320	11.96	11.71	15.70	14.83
	SISO	5500	11.51	12.83	14.16	19.19
	SISO	5580	12.71	13.30	18.66	21.38
	SISO	5700	12.54	12.23	17.95	16.71
	SISO	5745	11.55	11.38	14.29	13.74
	SISO	5785	11.32	11.44	13.55	13.93
	SISO	5825	11.01	11.19	12.62	13.15
802.11n(HT20)	SISO	5180	12.38	11.96	17.30	15.70
	SISO	5200	11.65	10.05	14.62	10.12
	SISO	5240	11.05	9.41	12.74	8.73
	SISO	5260	12.09	11.63	16.18	14.55
	SISO	5300	12.22	12.17	16.67	16.48
	SISO	5320	11.94	11.49	15.63	14.09
	SISO	5500	11.51	12.71	14.16	18.66
	SISO	5580	12.72	12.47	18.71	17.66
	SISO	5700	12.44	12.21	17.54	16.63
	SISO	5745	11.50	11.19	14.13	13.15
	SISO	5785	11.16	10.41	13.06	10.99
	SISO	5825	10.93	10.40	12.39	10.96



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5GHz EIRP for IC

Test Mode	Tx Type	Test Channel	Measured Output Power (dBm)		EIRP (dBm)		EIRP (mw)	
			Ant 1	Ant 2	Ant 1	Ant 2	Ant 1	Ant 2
802.11a	SISO	5180	11.93	11.64	15.51	15.22	35.56	33.27
	SISO	5200	11.96	11.19	15.54	14.77	35.81	29.99
	SISO	5240	10.94	10.42	14.52	14.00	28.31	25.12
	SISO	5260	12.29	11.63	15.87	15.21	38.64	33.19
	SISO	5300	12.34	10.98	15.92	14.56	39.08	28.58
	SISO	5320	11.96	11.71	15.54	15.29	35.81	33.81
	SISO	5500	11.51	12.83	15.09	16.41	32.28	43.75
	SISO	5580	12.71	13.30	16.29	16.88	42.56	48.75
	SISO	5700	12.54	12.23	16.12	15.81	40.93	38.11
	SISO	5745	11.55	11.38	15.13	14.96	32.58	31.33
	SISO	5785	11.32	11.44	14.90	15.02	30.90	31.77
	SISO	5825	11.01	11.19	14.59	14.77	28.77	29.99
802.11n(HT20)	SISO	5180	12.38	11.96	15.96	15.54	39.45	35.81
	SISO	5200	11.65	10.05	15.23	13.63	33.34	23.07
	SISO	5240	11.05	9.41	14.63	12.99	29.04	19.91
	SISO	5260	12.09	11.63	15.67	15.21	36.90	33.19
	SISO	5300	12.22	12.17	15.80	15.75	38.02	37.58
	SISO	5320	11.94	11.49	15.52	15.07	35.65	32.14
	SISO	5500	11.51	12.71	15.09	16.29	32.28	42.56
	SISO	5580	12.72	12.47	16.30	16.05	42.66	40.27
	SISO	5700	12.44	12.21	16.02	15.79	39.99	37.93
	SISO	5745	11.50	11.19	15.08	14.77	32.21	29.99
	SISO	5785	11.16	10.41	14.74	13.99	29.79	25.06
	SISO	5825	10.93	10.40	14.51	13.98	28.25	25.00



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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/cm²

For 2.4G WiFi – Antenna1:

The max. antenna gain is		1.55	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
68.87	1.429	20	0.01958	1	Pass

For 2.4G WiFi - Antenna2:

The max. antenna gain is		1.55	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
71.61	1.429	20	0.02036	1	Pass



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For 5G WiFi - Antenna1:

The max. antenna gain is		3.58	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
18.71	2.280	20	0.00849	1	Pass

For 5G WiFi - Antenna2:

The max. antenna gain is		3.58	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
21.38	2.280	20	0.00970	1	Pass

2.4G WiFi and 5G WiFi can simultaneous transmitting, so the maximum rate of MPE is $0.0204/1.0+0.0097/1.0=0.0301 \leq 1.0$. according to the KDB447498 section 7.2 determine the device is exclusion from SAR test.

For IC:

For 2.4GHz WiFi SISO mode:

Antenna 1:E.I.R.P.= $P \times G = 0.06887 \times 1.429 = 0.098W < 2.68W$

Antenna 2:E.I.R.P.= $P \times G = 0.07161 \times 1.429 = 0.102W < 2.68W$

For 5GHz WiFi SISO mode:

Antenna 1:E.I.R.P.= $P \times G = 0.01871 \times 2.280 = 0.043W < 4.53W$

Antenna 2:E.I.R.P.= $P \times G = 0.02138 \times 2.280 = 0.049W < 4.53W$

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

$0.102/2.68+0.049/4.53=0.0489 \leq 1$

So the device is exclusion from SAR test

--End of the Report--



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Attention: To check the authenticity of testing /inspection report & certificate, please contact us at telephone: (86-755) 8307 1443, or email: CN.Doccheck@sgs.com
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