1 Cover Page

RF MPE REPORT

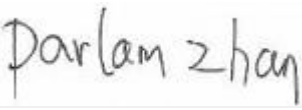
Application No.:	SHEM1906014338CR
FCC ID:	2ARXS-ZAPC
Applicant:	Hangzhou Zkong Networks Co., Ltd.
Address of Applicant:	Room 1208-1210, 17 Block 57, Baiyang Street Science Park Road, Hangzhou Economic and Technological Development Zone, Zhejiang Province
Manufacturer:	Hangzhou Zkong Networks Co., Ltd.
Address of Manufacturer:	Room 1208-1210, 17 Block 57, Baiyang Street Science Park Road, Hangzhou Economic and Technological Development Zone, Zhejiang Province
Factory:	Zhejiang Sunparl Information Technology Co., Ltd.
Address of Factory:	No. 19, Xinxing Road, Haining Lianhang Economic Zone, Zhejiang, China
Equipment Under Test (EUT):	
EUT Name:	Bluetooth Wireless Base Station
Model No.:	ZAP-C
Trade Mark:	Zkong
Standard(s) :	FCC Rules 47 CFR §2.1091 KDB447498 D01 General RF Exposure Guidance v06 RSS-102 Issue 5 (March 2015)
Date of Receipt:	2019-06-20
Date of Test:	2019-06-27 to 2019-08-15
Date of Issue:	2019-08-19
Test Result:	**Pass***

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

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.

Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2019-08-19	/

Authorized for issue by:				
				
		Vincent Zhu / Project Engineer		
				
		Parlam Zhan / Reviewer		

2 Contents

3 General Information

3.1 General Description of E.U.T.

Power supply:	DC 48V by POE POE: Model.:G1081-480-032 Input:100-240V~50/60Hz 0.5A MAX Output:48V 0.32A
Test voltage:	AC 120V 60Hz
Cable:	AC Cable 0.5m for POE

3.2 Technical Specifications

BLE

Antenna Gain	5 dBi
Antenna Type	Integral Antenna
Channel Spacing	2MHz
Modulation Type	GFSK
Number of Channels	40
Operation Frequency	2402MHz to 2480MHz

2.4GHz

Antenna Gain	Antenna 1:4 dBi, Antenna 2:4 dBi Directional gain:7 dBi
Antenna Type	Antenna 1: Integral Antenna, Antenna 2: Integral 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

5GHz

Antenna Gain	Antenna 1:5 dBi, Antenna 2:5 dBi Directional gain:8 dBi
Antenna Type	Antenna 1: Integral Antenna, Antenna 2: Integral Antenna
Operation Frequency:	802.11a/n(HT20)/ac(HT20): 5180-5240MHz 802.11n(HT40)/ac(HT40): 5190-5230MHz
Modulation Technique:	OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK) Remark: 256QAM for 802.11 ac only
Data Rate:	802.11a: 6/9/12/18/24/36/48/54Mbps 802.11n: MCS0-7 802.11ac: MCS0-9
Number of Channel:	802.11 a/n(HT20)/ac(HT20): 4 Channel 36, 40, 44, 48 802.11 n(HT40)/ac(HT40): 2 Channel 38, 46

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 SHEM90601433801 & SHEM90601433802 & SHEM90601433803

BLE

Test Mode	Test Frequency (MHz)	Output Power (dBm)	Reading Power (mW)
BLE	2402	-6.12	0.24
	2442	-5.27	**0.30**
	2480	-5.43	0.29

2.4GHz

Test Mode	Channel	Antenna 1 Power[dBm]	Antenna 2 Power[dBm]	MIMO Power[dBm]	Antenna 1 Power[mW]	Antenna 2 Power[mW]	MIMO Power[mW]
11B	2412	13.92	13.91	NA	24.66	24.60	NA
11B	2437	14.17	14.78	NA	26.12	**30.06**	NA
11B	2462	13.83	14.50	NA	24.15	28.18	NA
11G	2412	13.12	12.16	NA	20.51	16.44	NA
11G	2437	13.03	11.78	NA	20.09	15.07	NA
11G	2462	12.74	11.67	NA	18.79	14.69	NA
11N20MIMO	2412	11.08	10.20	13.67	12.82	10.47	**23.28**
11N20MIMO	2437	10.85	9.83	13.38	12.16	9.62	21.78
11N20MIMO	2462	10.49	9.67	13.11	11.19	9.27	20.46
11N40MIMO	2422	10.98	9.30	13.23	12.53	8.51	21.04
11N40MIMO	2437	10.87	9.28	13.16	12.22	8.47	20.70
11N40MIMO	2452	10.36	9.34	12.89	10.86	8.59	19.45

5GHz

Test Mode	Test Channel	Antenna1 Power[dBm]	Antenna 2 Power[dBm]	MIMO Power[dBm]	Antenna 1 Power[mW]	Antenna 2 Power[mW]	MIMO Power[mW]
11A	5180	10.88	11.77	NA	12.25	**15.03**	NA
11A	5220	10.03	11.35	NA	10.07	13.65	NA
11A	5240	10.69	10.86	NA	11.72	12.19	NA
11N20	5180	9.99	10.37	13.19	9.98	10.89	**20.84**
11N20	5220	9.07	9.59	12.35	8.07	9.10	17.18
11N20	5240	8.7	9.77	12.28	7.41	9.48	16.90
11N40	5190	9.26	9.03	12.16	8.43	8.00	16.44
11N40	5230	9.22	9.08	12.16	8.36	8.09	16.44
11AC20	5180	8.94	9.38	12.18	7.83	8.67	16.52
11AC20	5220	7.64	8.44	11.07	5.81	6.98	12.79
11AC20	5240	7.76	8.23	11.01	5.97	6.65	12.62
11AC40	5190	8.26	8.03	11.16	6.70	6.35	13.06
11AC40	5230	8.24	7.39	10.85	6.67	5.48	12.16

5.2 MPE Calculation

For FCC:

According to the formula S=P/4πR², 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

BLE

The max. antenna gain is 5 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
0.3	3.162	20	0.00019	1	Pass

For 2.4G WiFi:

The max. antenna gain is 4 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
30.06	2.512	20	0.01502	1	Pass

In MIMO mode:

The max. antenna gain is 7 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
23.28	5.012	20	0.02321	1	Pass

For 5G WiFi:

The max. antenna gain is 5 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
15.03	3.162	20	0.00946	1	Pass

In MIMO mode:

The max. antenna gain is 8 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
20.84	6.310	20	0.02616	1	Pass

The BLE and the WiFi modules can simultaneous transmitting at frequency 2.4GHz band.But the maximum rate of MPE is 0.00019/1.0+0.023/1.0+0.026/1.0=0.049<=1.0. according to the KDB447498 section 7.2 determine the device is exclusion from SAR test.

5.3 Conclusion

EUT complies with FCC Rules 47 CFR §2.1091 requirement.

--End of the Report--