



RF Exposure Evaluation Report

Application No.: SZCR2103020002AT
Applicant: XIAMENSHI C-CHIP Co., Ltd
Address of Applicant: 1008 Guanyinshan, Operating Center, Siming District, Xiamen, China
Manufacturer: SHENZHENSHI XINZHONGXIN TECHNOLOGY CO., LTD.
Address of Manufacturer: Block 3, Dong Huan Industrial Park, Sha Jing Town, Bao'an District, Shenzhen City, Guangdong, Province, China
Factory: SHENZHENSHI XINZHONGXIN TECHNOLOGY CO., LTD.
Address of Factory: Block 3, Dong Huan Industrial Park, Sha Jing Town, Bao'an District, Shenzhen City, Guangdong, Province, China
Equipment Under Test (EUT):
EUT Name: Bluetooth Module+2.4G WIFI Module
Model No.: C-2S
Trade mark: C-chip
FCC ID: 2AR7VC-2S
Standard(s) : 47 CFR Part 1.1307
47 CFR Part 1.1310
47 CFR Part 2.1091
Date of Receipt: 2021-03-12
Date of Test: 2021-03-25 to 2021-04-11
Date of Issue: 2021-04-28

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

Keny Xu

Keny Xu
EMC Laboratory Manager



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

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2021-04-28		Original

Authorized for issue by:				
				
		Charlie Dai/Project Engineer		
				
		Eric Fu/Reviewer		



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3 General Information

3.1 Details of E.U.T.

Power supply:	DC 5.0V
For BLE:	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V4.2 LE
Modulation Type:	GFSK
Channel Spacing:	2MHz
Data Rate:	1Mb/s
Number of Channels:	40
Antenna Type:	PCB Antenna
Antenna Gain:	0dBi
For 2.4G WIFI	
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK), 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Channel Spacing:	5MHz
Number of Channels:	802.11b/g/n(HT20): 11
Antenna Type:	PCB Antenna
Antenna Gain:	0dBi



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3.2 Description of Support Units

The EUT has been tested as an independent unit.

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:

• **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 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 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.

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

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

CAB identifier: CN0006.

IC#: 4620C.

3.5 Deviation from Standards

None

3.6 Abnormalities from Standard Conditions

None



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4 Radio Spectrum Technical Requirement

4.1 RF Exposure

4.1.1 Test Requirement:

CFR 47 Part 1.1310

Limit:

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in Part1.1307(b)

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	*900/f ²	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

According to IEEE C95.3:2002 section 5.5.1.1, The power density S at a point on the axis at a distance d from a transmitting antenna is given by the Friis free-space transmission formula

$$S = \frac{PG}{4\pi d^2}$$

S = power density (mW/cm²)
P = the net power delivered to the antenna (mW)
G = gain of the antenna in linear scale
d = distance between observation point and center of the radiator (cm)



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4.1.2 EUT RF Exposure Evaluation

For BLE:

Antenna Gain: 0Bi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.0 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Tune-up Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Result
High	2480	6	3.98	0.001	1.0	PASS

Note: Refer to report No. SZCR210302000201 for EUT test Max Conducted Output Power value.

The distance R (5th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

For 2.4 WIFI:

Antenna Gain: 0dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.0 in linear scale.

Output Power into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Tune-up Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm ²)	Limit (mW/cm ²)	Result
High	2462	17	50.12	0.01	1.0	PASS

Note: Refer to report No. SZCR210302000202 for EUT test Max Conducted Output Power value.

The distance R (5th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

Since the conducted output power is well below the SAR low threshold level, so the EUT is considered to comply with SAR requirement without testing.

- End of the Report -



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