



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

SZEMC-TRF-01 Rev. A/1

Report No.: SZCR231100354203

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RF Exposure Evaluation Report

Application No.: SZCR2311003542AT
Applicant: Shanghai Sunmi Technology Co., Ltd.
Address of Applicant: Room 505, No.388, Song Hu Road, Yang Pu District, 200433 Shanghai, China
Manufacturer: Shanghai Sunmi Technology Co., Ltd.
Address of Manufacturer: Room 505, No.388, Song Hu Road, Yang Pu District, Shanghai, China
Product Name: Hyper Wi-Fi Module
Model No.: NSC1-00
Trade Mark: SUNMI
FCC ID: 2AH25NSC100
Standards: 47 CFR Part 1.1307
47 CFR Part 1.1310
47 CFR Part 2.1091
Date of Receipt: 2023-11-06
Date of Test: 2023-11-07 to 2023-12-12
Date of Issue: 2023-12-12

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

Keny Xu
EMC Laboratory Manager



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

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1 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023-12-12		Original

Authorized for issue by:			
		<i>Edison Li</i>	
		Edison Li /Project Engineer	
		<i>Eric Fu</i>	
		Eric Fu /Reviewer	



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3 General Information

3.1 General Description

Power supply:	DC 3.3V
Operation Frequency:	903.5MHz-926.5MHz (1MHz Channel Bandwidth) 905MHz-925MHz (2MHz Channel Bandwidth) 906MHz-922MHz (4MHz Channel Bandwidth)
Modulation Type:	OFDM with BPSK/QPSK/16QAM/64QAM
Number of Channels:	24 Channels for 802.11ah(1MHz Channel Bandwidth) 11 Channels for 802.11ah(2MHz Channel Bandwidth) 5 Channels for 802.11ah(4MHz Channel Bandwidth)
Rate:	0.15 to 3.0Mbps for 802.11ah(1MHz Channel Bandwidth) 0.65 to 6.5Mbps for 802.11ah(2MHz Channel Bandwidth) 1.35 to 13.5Mbps for 802.11ah(4MHz Channel Bandwidth)
Antenna Type:	FPC Antenna
Antenna Gain:	3dBi

Remark:The information in this section is provided by the applicant or manufacturer, SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.



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3.2 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, Nanshan District, Shenzhen, Guangdong, China
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

3.3 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 (Member No. 1937)**

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.

Shenzhen EMC laboratory 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: CN1336**

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

Designation Number: CN1336. Test Firm Registration Number: 787754.

• **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.

3.4 Deviation from Standards

None.

3.5 Abnormalities from Standard Conditions

None.





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3.6 Other Information Requested by the Customer

None.



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4 RF Exposure Evaluation

4.1 RF Exposure Compliance Requirement

4.1.1 Limits

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 Exposures				
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
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	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
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

For Uncontrolled Environment, the MPE limit of 300MHz to 1500MHz is f/1500 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



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4.1.3 EUT RF Exposure Evaluation

1) Test Results

For 802.11ah:

The max tune-up tolerance power Into Antenna & RF Exposure Evaluation Distance:

Type	Ch. Band (MHz)	Test Freq. (MHz)	Max Antenna Gain (dBi)	Max Antenna Gain (Numeric)	Max tune-up Tolerance power (dBm)	Max tune-up Tolerance Power to Antenna (mW)	Power Density at R=20cm (mW/cm ²)	Limit (mW/cm ²)	Result
802.11ah	1	903.5	3	2.00	25.00	316.23	0.1255	0.6023	PASS
802.11ah	1	915.5	3	2.00	25.00	316.23	0.1255	0.6103	PASS
802.11ah	1	926.5	3	2.00	25.00	316.23	0.1255	0.6177	PASS
802.11ah	2	905	3	2.00	25.00	316.23	0.1255	0.6033	PASS
802.11ah	2	915	3	2.00	25.00	316.23	0.1255	0.6100	PASS
802.11ah	2	925	3	2.00	25.00	316.23	0.1255	0.6167	PASS
802.11ah	4	906	3	2.00	25.00	316.23	0.1255	0.6040	PASS
802.11ah	4	914	3	2.00	25.00	316.23	0.1255	0.6093	PASS
802.11ah	4	922	3	2.00	25.00	316.23	0.1255	0.6147	PASS

Note: Refer to the manual for maximum declared power values.

The distancer (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

the MPE limit of 300MHz to 1500MHz is f/1500 mW/cm².

-End of Report-



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