



TEST REPORT

REPORT NUMBER: I22W00019-MPE-Rev2

ON

Type of Equipment: Wi-Fi Module
Type of Designation: W82
Manufacturer: SIMCom Wireless Solutions Limited
Brand Name: SIMCom
FCC ID: 2AJYU-8XN0002

ACCORDING TO

FCC CFR 47 Part 2.1091 《Radiofrequency radiation exposure evaluation: mobile devices》

FCC CFR 47 Part1.1310 《Radiofrequency radiation exposure limits》

Chongqing Academy of Information and Communication Technology

Month date, year

Jun. 5th, 2023

Signature

Xiang Luoyong

Director

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of Chongqing Academy of Information and Communications Technology.



Revision Version

Report Number	Revision	Date	Memo
I22W00019-MPE	00	2023-3-3	Initial creation of test report
I22W00019-MPE-Rev1	01	2023-6-5	First change of test report
I22W00019-MPE-Rev2	02	2023-6-5	Second change of test report
Note: This version has changed tune up power of antenna 0 and antenna 1 for WIFI 5.1G~5.8G , MIMO WIFI 2.4G , MIMO WIFI 5.1G~5.8G, and MIMO WIFI 6G, also recalculated the power density.			



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1. Test Laboratory

1.1. Testing Location

Company Name:	Chongqing Academy of Information and Communications Technology
Address:	No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

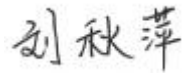
1.2. Testing Environment

Normal Temperature:	21.3℃
Relative Humidity:	65.0%

1.3. Project Data

Testing Start Date:	2023-3-3
Testing End Date:	2023-3-3

1.4. Signature



2023-6-5

Liu Qiuping
(Prepared this test report)

Date



2023-6-5

Yu Chun
(Reviewed this test report)

Date



2023-6-5

Xiang Luoyong
Director of the laboratory
(Approved this test report)

Date

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2. Client Information

2.1. Applicant Information

Company Name:	SIMCom Wireless Solutions Limited
Address /Post:	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai, China
Telephone:	862131575100
Fax:	--
Email:	Yongsheng Li@simcom.com
Contact Person:	Yongsheng Li

2.2. Manufacturer Information

Company Name:	SIMCom Wireless Solutions Limited
Address /Post:	SIMCom Headquarters Building, Building 3, No.289 Linhong Road, Changning District, Shanghai, China
Telephone:	862131575100
Fax:	--
Email:	Yongsheng Li@simcom.com
Contact Person:	Yongsheng Li

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

EUT Description:	Wi-Fi Module
Model name:	W82
WIFI 2.4G :	2412-2462MHz
WIFI 5.1G~5.8G:	UNII-1,UNII-2A, UNII-2C
WIFI 5.8G:	UNII-3
WIFI 6G :	UNII-5, UNII-6, UNII-7, UNII-8
Note: Photographs of EUT are shown in ANNEX A of this test report.	

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
S1	SN: MP0622033CCC290	V1.01	V1.0.01	2022-3-4

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

EUT ID*	SN	Description
NA	NA	NA

*AE ID: is used to identify the test sample in the lab internally.

4. Reference Documents

4.1. Applicable Standards

The MPE report was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 2.1091.

FCC CFR 47 Part 2.1091: Radiofrequency radiation exposure evaluation: mobile devices

4.2. Test Limits

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

MPE for the upper tier (people in controlled environments)

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
300-1500	--	--	f/300	6
1500-100000	--	--	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
1500-100000	--	--	1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

For the DUT, the limits for the general public when an RF safety program is unavailable.

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5. Test Results

5.1. Tune Up Power

Frequency Band	Highest Averaged Tune Up Power (dBm)	Antenna Gain(dBi)
Antenna 0: WIFI 2.4G	21	2.97
Antenna 0: WIFI 5.1G~5.8G	11	3.94
Antenna 0: WIFI 5.8G	12.5	3.52
Antenna 0: WIFI 6G	15.5	3.99
Antenna 1: WIFI 2.4G	21	2.97
Antenna 1: WIFI 5.1G~5.8G	11.5	3.94
Antenna 1: WIFI 5.8G	12.5	3.52
Antenna 1: WIFI 6G	14	3.99
MIMO WIFI 2.4G	17.51	5.98
MIMO WIFI 5.1G~5.8G	14.25	6.95
MIMO WIFI 5.8G	15.51	6.53
MIMO WIFI 6G	17.78	7.00

5.2. Calculation Information

For conservative evaluation consideration, only maximum power of each frequency band based on the tighter limits respectively are used to calculate the boundary power density.

Based on the FCC KDB 447498 D01 and 47 CFR §2.1091, the DUT is evaluated as a mobile device.

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

Where

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

5.3. Results for single antenna transmission

Frequency range	Limit(mW/cm ²)	Results(mW/cm ²)	Verdict
Antenna 0: WIFI 2.4G	1.00	0.05	PASS
Antenna 0: WIFI 5.1G~5.8G	1.00	0.01	PASS
Antenna 0: WIFI 5.8G	1.00	0.01	PASS
Antenna 0: WIFI 6G	1.00	0.02	PASS
Antenna 1: WIFI 2.4G	1.00	0.05	PASS
Antenna 1: WIFI 5.1G~5.8G	1.00	0.01	PASS
Antenna 1: WIFI 5.8G	1.00	0.01	PASS
Antenna 1: WIFI 6G	1.00	0.01	PASS
MIMO WIFI 2.4G	1.00	0.04	PASS
MIMO WIFI 5.1G~5.8G	1.00	0.03	PASS
MIMO WIFI 5.8G	1.00	0.03	PASS
MIMO WIFI 6G	1.00	0.06	PASS

5.4. Results for simultaneous transmission

Power density /Limit (mW/cm²)				Σ (Power density /Limit) of Antenna 0+ Antenna 1 (mW/cm²)	Verdict
Antenna 0		Antenna 1			
WIFI 2.4G	0.05	WIFI 5.1G~5.8G	0.01	0.06	PASS
		WIFI 5.8G	0.01	0.06	PASS
		WIFI 6G	0.01	0.06	PASS
WIFI 5.1G~5.8G	0.01	WIFI 5.8G	0.01	0.01	PASS

Notes:

1) Σ (Power density /Limit) : This is a summation of [(Power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for Wi-Fi .

2)Considering the simultaneous transmission for Wi-Fi , the aggregated (Power density /Limit) is smaller than1, and MPE collocated transmitters is compliant.

5.5. Result of antenna 0 and antenna 1 WIFI 2.4G

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 2412 MHz ~ 2472 MHz; The maximum conducted is 21 dBm. The maximum gain is 2.97 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm².

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

P= input power of the antenna (mW)

G = antenna gain (numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

S=0.05 mW/cm²

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm² limit for uncontrolled exposure.

5.6. Result of antenna 0 WIFI 5.1G~5.8G

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 5180MHz ~ 5700MHz; The maximum conducted is 11 dBm. The maximum gain is 3.94 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm².

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

P= input power of the antenna (mW)

G = antenna gain (numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

S=0.01 mW/cm²

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm² limit for uncontrolled exposure.

5.7. Result of antenna 1 WIFI 5.1G~5.8G

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 5180MHz ~ 5700MHz; The maximum conducted is 11.5 dBm. The maximum gain is 3.94 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm².

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

P= input power of the antenna (mW)

G = antenna gain (numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

S=0.01 mW/cm²

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm² limit for uncontrolled exposure.

5.8. Result of antenna 0 and antenna 1 WIFI 5.8G

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 5745 MHz ~ 5825MHz; The maximum conducted is 12.5 dBm. The maximum gain is 3.52 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm².

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

P= input power of the antenna (mW)

G = antenna gain (numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

S=0.01 mW/cm²

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm² limit for uncontrolled exposure.

5.9. Result of antenna 0 WIFI 6G

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 5955 MHz ~ 6415MHz; The maximum conducted is 15.5dBm. The maximum gain is 3.99 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm².

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

P= input power of the antenna (mW)

G = antenna gain (numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

S=0.02 mW/cm²

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm² limit for uncontrolled exposure.

5.10. Result of antenna 1 WIFI 6G

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 5955 MHz ~ 6415MHz; The maximum conducted is 14 dBm. The maximum gain is 3.99 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm².

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

P= input power of the antenna (mW)

G = antenna gain (numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

S=0.01 mW/cm²

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm² limit for uncontrolled exposure.

MIMO:**5.11. Result of WIFI 2.4G**

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 2412 MHz ~ 2472 MHz; The maximum conducted is 17.51 dBm. The maximum gain is 5.98 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm².

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

P= input power of the antenna (mW)

G = antenna gain (numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

S=0.04 mW/cm²

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm² limit for uncontrolled exposure.

5.12. Result of WIFI 5.1G~5.8G

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 5180MHz ~ 5700MHz; The maximum conducted is 14.25 dBm. The maximum gain is 6.95 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm².

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

P= input power of the antenna (mW)

G = antenna gain (numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

S=0.03 mW/cm²

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm² limit for uncontrolled exposure.

5.13. Result of WIFI 5.8G

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 5745 MHz ~ 5825MHz; The maximum conducted is 15.51 dBm. The maximum gain is 6.53 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm².

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

P= input power of the antenna (mW)

G = antenna gain (numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

S=0.03 mW/cm²

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm² limit for uncontrolled exposure.

5.14. Result of WIFI 6G

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 5955 MHz ~ 6415MHz; The maximum conducted is 17.78 dBm. The maximum gain is 7.00 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm².

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

P= input power of the antenna (mW)

G = antenna gain (numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

S=0.06 mW/cm²

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm² limit for uncontrolled exposure.



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ANNEX A: EUT photograph

See the document "Wi-Fi Module Photos".

*****END OF REPORT*****

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