



# TEST REPORT

REPORT NUMBER: I22W00018-MPE

ON

**Type of Equipment:** 4G Module  
**Type of Designation:** SIM7912A  
**Manufacturer:** SIMCom Wireless Solutions Limited  
**Brand Name:** SIMCom  
**FCC ID:** 2AJYU-8XM0001

## 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*

May,18,2022

*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**

<b>Report Number</b>	<b>Revision</b>	<b>Date</b>	<b>Memo</b>
I22W00018-MPE	00	2022-5-18	Initial creation of test report



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## 1. Test Laboratory

### 1.1. Testing Location

Company Name:	Chongqing Academy of Information and Communications Technology
Address:	Building C, Technology Innovation Center, No.8, Yuma Road, Chayuan New Area, Nan'an District, Chongqing, People's Republic of China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

### 1.2. Testing Environment

Normal Temperature:	21.3°C
Relative Humidity:	65.0%

### 1.3. Project Data

Testing Start Date:	2022-5-18
Testing End Date:	2022-5-18


### 1.4. Signature



2022-5-18

Wang Chengyu  
(Prepared this test report)


Date



2022-5-18

Wang Lili  
(Reviewed this test report)

Date



2022-5-18

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
Country:	CHINA
Telephone:	86 2131575100
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
Country:	CHINA
Telephone:	86 2131575100
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:	4G Module
Model name:	SIM7912A
WCDMA Frequency Band:	Band 2/4/5
LTE Frequency Band:	Band2/4/5/7/12/13/14/17/25/26/41/66/71/CA_7C/CA_41C
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
S10	864542050016090	V1.02	V2110B01X12M42A-LGA	2022-3-2

\*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 <sup>2</sup> )	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 <sup>2</sup> )*	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 <sup>2</sup> )*	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.



## 5. Test Results

### 5.1. RF Power Output

Frequency Band	Highest Averaged Power Output(dBm)	Highest Frame-Averaged Output Power (dBm)	Antenna Gain(dBi)
WCDMA Band 2	25.00	25.00	1.5
WCDMA Band 4	25.00	25.00	1
WCDMA Band 5	25.00	25.00	0.5
LTE Band2	25.00	25.00	1.5
LTE Band4	25.00	25.00	0.5
LTE Band5	25.00	25.00	0.5
LTE Band7	25.00	25.00	1
LTE Band12	25.00	25.00	0
LTE Band13	25.00	25.00	0
LTE Band14	25.00	25.00	0
LTE Band17	25.00	25.00	0
LTE Band25	25.00	25.00	1.5
LTE Band26	25.00	25.00	0.5
LTE Band41	25.00	25.00	1
LTE Band66	25.00	25.00	1.5
LTE Band71	25.00	25.00	0
LTE Band CA_7C	25.00	25.00	1
LTE Band CA_41C	25.00	25.00	1

Notes:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

2) According to the conducted power as above, the measurements are performed with 1Txslots for 850MHz and 1900MHz.

3) Disclaimers: The Highest Power Output and antenna gain in the above table are provided by the customer

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## 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

Frequency range	Limit(mW/cm <sup>2</sup> )	Results(mW/cm <sup>2</sup> )	Verdict
WCDMA Band 2	1.00	0.09	PASS
WCDMA Band 4	1.00	0.08	PASS
WCDMA Band 5	0.55	0.07	PASS
LTE Band2	1.00	0.09	PASS
LTE Band4	1.00	0.07	PASS
LTE Band5	0.55	0.07	PASS
LTE Band7	1.00	0.08	PASS
LTE Band12	0.47	0.06	PASS
LTE Band13	0.52	0.06	PASS
LTE Band14	0.53	0.06	PASS
LTE Band17	0.47	0.06	PASS
LTE Band25	1.00	0.09	PASS
LTE Band26	0.54	0.07	PASS
LTE Band41	1.00	0.08	PASS
LTE Band66	1.00	0.08	PASS
LTE Band71	0.44	0.06	PASS
LTE Band CA_7C	1.00	0.08	PASS
LTE Band CA_41C	1.00	0.08	PASS

#### 5.4. Result of WCDMA Band 2

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1852.40 MHz~1907.60 MHz; The maximum conducted is 25.00 dBm. The maximum gain is 1.50 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.41 numeric)

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

$$S=(316.23*1.41)/(4\pi*20^2)=0.09 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm<sup>2</sup> limit for uncontrolled exposure.

#### 5.5. Result of WCDMA Band 4

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1712.4 MHz~1752.6 MHz; The maximum conducted is 25.00 dBm. The maximum gain is 1.00 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.26 numeric)

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

$$S=(316.23*1.26)/(4\pi*20^2)=0.08 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm<sup>2</sup> limit for uncontrolled exposure.

#### 5.6. Result of WCDMA Band 5

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 826.4 MHz ~ 846.6 MHz; The maximum conducted is 25.00 dBm. The maximum gain is 0.50 dBi. Therefore, maximum limit for general public RF exposure: 826.4/1500=0.55 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.12 numeric)

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

$$S=(316.23*1.12)/(4\pi*20^2)=0.07 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.55 mW/cm<sup>2</sup> limit for uncontrolled exposure.

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### 5.7. Result of LTE Band 2

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1850.0 MHz ~ 1909.9MHz; The maximum conducted is 25.00 dBm. The maximum gain is 1.50 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.41 numeric)

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

$$S=(316.23*1.41)/(4 \pi *20^2)=0.09 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.8. Result of LTE Band 4

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1710.0 MHz ~ 1754.9MHz; The maximum conducted is 25.00 dBm. The maximum gain is 0.50 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.12 numeric)

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

$$S=(316.23*1.12)/(4 \pi *20^2)=0.07 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.9. Result of LTE Band 5

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 824.0 MHz ~ 848.9 MHz; The maximum conducted is 25.00 dBm. The maximum gain is 0.50 dBi. Therefore, maximum limit for general public RF exposure: 824.00/1500=0.55 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.12 numeric)

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

$$S=(316.23*1.12)/(4 \pi *20^2)=0.07 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.55 mW/cm<sup>2</sup> limit for uncontrolled exposure.

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### 5.10. Result of LTE Band 7

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 2500.00 MHz~2569.9 MHz; The maximum conducted is 25.00 dBm. The maximum gain is 1.00 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.26 numeric)

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

$$S=(316.23*1.26)/(4\pi*20^2)=0.08 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.11. Result of LTE Band CA\_7C

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 2500.00 MHz~2569.9 MHz; The maximum conducted is 25.00 dBm. The maximum gain is 1.00 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.26 numeric)

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

$$S=(316.23*1.26)/(4\pi*20^2)=0.08 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.12. Result of LTE Band 12

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 699.00 MHz~715.90 MHz; The maximum conducted is 25.00 dBm. The maximum gain is 0.00 dBi. Therefore, maximum limit for general public RF exposure: 699.00/1500=0.47 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.00 numeric)

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

$$S=(316.23*1.00)/(4\pi*20^2)=0.06 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.47 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.13. Result of LTE Band 13

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 777.00 MHz~786.90 MHz; The maximum conducted is 25.70 dBm. The maximum gain is 0.00 dBi. Therefore, maximum limit for general public RF exposure: 777.00/1500=0.52 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.00 numeric)

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

$$S=(316.23*1.00)/(4\pi*20^2)=0.06 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.52 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.14. Result of LTE Band 14

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 788.00 MHz~797.90 MHz; The maximum conducted is 25.00 dBm. The maximum gain is 0.00 dBi. Therefore, maximum limit for general public RF exposure: 788.00/1500=0.53 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.00 numeric)

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

$$S=(316.23*1.00)/(4\pi*20^2)=0.06 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.53 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.15. Result of LTE Band 17

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 704.0 MHz~715.9MHz; The maximum conducted is 25.00 dBm. The maximum gain is 0.00 dBi. Therefore, maximum limit for general public RF exposure: 704.0/1500=0.47 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.00 numeric)

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

$$S=(316.23*1.00)/(4\pi*20^2)=0.06 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.47 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.16. Result of LTE Band 25

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1850.00 MHz~1914.90 MHz; The maximum conducted is 25.00 dBm. The maximum gain is 1.50 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.41 numeric)

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

$$S=(316.23*1.41)/(4 \pi *20^2)=0.09 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.17. Result of LTE Band 26

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 814.00 MHz~848.90 MHz; The maximum conducted is 25.00 dBm. The maximum gain is 0.50 dBi. Therefore, maximum limit for general public RF exposure: 814/1500=0.54 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.12 numeric)

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

$$S=(316.23*1.12)/(4 \pi *20^2)=0.07 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.54 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.18. Result of LTE Band 41

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 2496.0 MHz~2689.9MHz; The maximum conducted is 25.00 dBm. The maximum gain is 1.00 dBi. Therefore, maximum limit for general public RF exposure: 1.00mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.26 numeric)

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

$$S=(316.23*1.26)/(4 \pi *20^2)=0.08 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm<sup>2</sup> limit for uncontrolled exposure.

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### 5.19. Result of LTE Band CA\_41C

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 2496.0 MHz ~ 2689.9MHz; The maximum conducted is 25.00 dBm. The maximum gain is 1.00 dBi. Therefore, maximum limit for general public RF exposure: 1.00mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.26 numeric)

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

$$S=(316.23*1.26)/(4 \pi *20^2)=0,08 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.0 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.20. Result of LTE Band 66

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1710.0 MHz ~ 1779.9MHz; The maximum conducted is 25.00 dBm. The maximum gain is 1.00 dBi. Therefore, maximum limit for general public RF exposure: 1.00 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.26 numeric)

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

$$S=(316.23*1.26)/(4 \pi *20^2)=0.08 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.00 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.21. Result of LTE Band 71

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 663.00 MHz ~ 697.90 MHz; The maximum conducted is 25.00 dBm. The maximum gain is 0.00 dBi. Therefore, maximum limit for general public RF exposure: 663.00/1500=0.44 mW/cm<sup>2</sup>.

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

P= input power of the antenna (316.23 mW)

G = antenna gain (1.00 numeric)

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

$$S=(316.23*1.00)/(4 \pi *20^2)=0.06 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.44 mW/cm<sup>2</sup> limit for uncontrolled exposure.



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ANNEX A: EUT photograph  
See the document "4G Module Photos".

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

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