



# TEST REPORT

**REPORT NUMBER: I21W00047-MPE**

**ON**

**Type of Equipment:** GSM module  
**Type of Designation:** R800C  
**Brand name:** SIMCom  
**Manufacturer:** SIMCom Wireless Solutions Limited  
**FCC ID:** 2AJYU-8SF0001

**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 Communications Technology**

*Month date, year*

*Dec, 16, 2021*

*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>
I21W00047-MPE	00	2021-12-16	Initial creation of test report



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### Chongqing Academy of Information and Communication Technology

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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:	15-35°C
Relative Humidity:	30-60%

### 1.3. Project Data

Testing Start Date:	2021-12-16
Testing End Date:	2021-12-16

### 1.4. Signature



2021-12-16

**FuBohao**  
(Prepared this test report)

**Date**

2021-12-16

**Wang Lili**  
(Reviewed this test report)

**Date**

2021-12-16

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

**Date**

**Chongqing Academy of Information and Communication Technology**

Address: No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China, 401336  
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## 2. Client Information

### 2.1 Applicant Information

Company Name:	SIMCom Wireless Solutions Limited
Address /Post:	6F,BuildingB,SIMTechnologyBuilding,No.633Jinzhong Road,ChangningDistrict,Shanghai,P.R.China
City:	Shanghai
Country:	China
Telephone:	86 21 3157 5182
Fax:	--
Email:	YongshengLi@simcom.com
Contact Person:	Yongsheng Li

### 2.2 Manufacturer Information

Company Name:	--
Address /Post:	--
City:	--
Country:	--
Telephone:	--
Fax:	--
Email:	--
Contact Person:	--

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

#### 3.1. About EUT

Product Name:	GSM module
Model name:	R800C
Brand Name:	SIMCom
GSM Frequency Band	850/1900
Type of modulation	GMSK
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	863070040111295	R800C	R800C R1850	2021-11-30

\*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
B1	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 Power Output(dBm)	Highest Frame-Averaged Output Power (dBm)	Antenna Gain(dBi)
GSM 850	32.5	23.47	0.91
GSM 1900	29.7	20.67	1.87
GPRS 850 1TS	32.5	23.47	0.91
GPRS 1900 1TS	29.7	20.67	1.87
GPRS 850 4TS	32.5	29.49	0.91
GPRS 1900 4TS	29.7	26.69	1.87

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 900MHz and 1800MHz.

## 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
GSM 850	0.55	0.055	PASS
GSM 1900	1.00	0.036	PASS
GPRS 850 1TS	0.55	0.055	PASS
GPRS 1900 1TS	1.00	0.036	PASS
GPRS 850 4TS	0.55	0.218	PASS
GPRS 1900 4TS	1.00	0.143	PASS

#### 5.4. Result of GSM 850

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 824.2 ~ 848.8 MHz; The maximum conducted is 23.47 dBm. The maximum gain is 0.91 dBi. Therefore, maximum limit for general public RF exposure:  $824.2/1500=0.55$  mW/cm<sup>2</sup>.

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

P= input power of the antenna (222.331 mW)

G = antenna gain (1.233 numeric)

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

$$S=(222.331*1.233)/(4\pi*20^2)=0.055 \text{ mW/cm}^2$$

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

#### 5.5. Result of GSM 1900

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1850.2 ~ 1909.8 MHz; The maximum conducted is 20.67 dBm. The maximum gain is 1.87 dBi. Therefore, maximum limit for general public RF exposure: 1 mW/cm<sup>2</sup>.

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

P= input power of the antenna (116.681 mW)

G = antenna gain (1.538 numeric)

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

$$S=(116.681*1.538)/(4\pi*20^2)=0.036 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1 mW/cm<sup>2</sup> limit for uncontrolled exposure.

#### 5.6. Result of GPRS 850 1TS

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 824.2 ~ 848.8 MHz; The maximum conducted is 23.47 dBm. The maximum gain is 0.91 dBi. Therefore, maximum limit for general public RF exposure:  $824.2/1500=0.55$  mW/cm<sup>2</sup>.

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

P= input power of the antenna (222.331 mW)

G = antenna gain (1.233 numeric)

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

$$S=(222.331*1.233)/(4\pi*20^2)=0.055 \text{ mW/cm}^2$$

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

### 5.7. Result of GPRS 1900 1TS

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1850.2 ~ 1909.8 MHz; The maximum conducted is 20.67 dBm. The maximum gain is 1.87 dBi. Therefore, maximum limit for general public RF exposure: 1 mW/cm<sup>2</sup>.

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

P= input power of the antenna (116.681 mW)

G = antenna gain (1.538 numeric)

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

$$S=(116.681*1.538)/(4 \pi*20^2)=0.036 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### 5.8. Result of GPRS 850 4TS

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 824.2 ~ 848.8 MHz; The maximum conducted is 29.49 dBm. The maximum gain is 0.91 dBi. Therefore, maximum limit for general public RF exposure: 824.2/1500=0.55 mW/cm<sup>2</sup>.

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

P= input power of the antenna (889.201 mW)

G = antenna gain (1.233 numeric)

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

$$S=(889.201*1.233)/(4 \pi*20^2)=0.218 \text{ mW/cm}^2$$

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

### 5.9. Result of GPRS 1900 4TS

**Test Results:** MPE Limit Calculation: the EUT'S operating frequencies @ 1850.2 ~ 1909.8 MHz; The maximum conducted is 26.69 dBm. The maximum gain is 1.87 dBi. Therefore, maximum limit for general public RF exposure: 1 mW/cm<sup>2</sup>.

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

P= input power of the antenna (466.659 mW)

G = antenna gain (1.538 numeric)

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

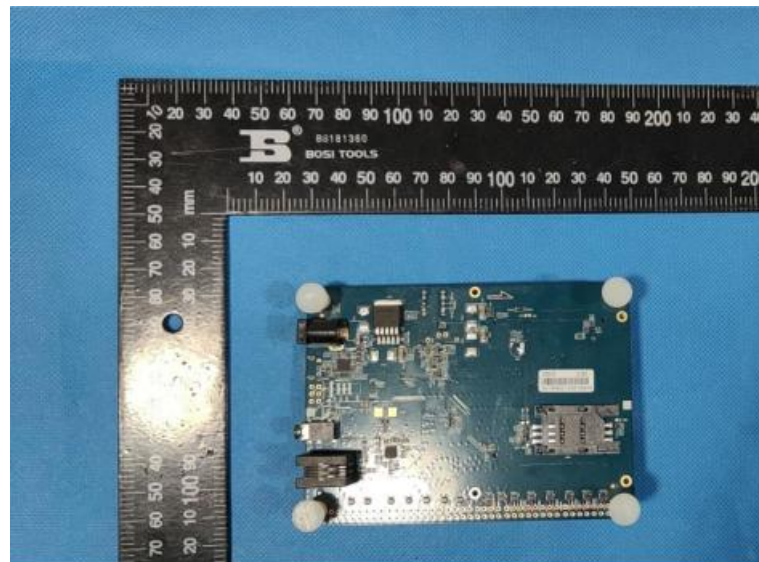
$$S=(466.659*1.538)/(4 \pi*20^2)=0.143 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1 mW/cm<sup>2</sup> limit for uncontrolled exposure.

### ANNEX A: EUT photograph



The EUT of front



The EUT of back

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