TEST REPORT

No. 2013SR02092

For

Client : **Shanghai SIMCom Wireless**

Solutions Co.,Ltd.

Production : **GSM/GPRS(850/900/1800/1900MHz)+BT**

Wireless Data Module

Model Name : **SIM800**

Hardware Version: **V2.01**

Software Version: **SIM800 R13.08**

Issued date: **2014-01-07**

FCC ID: **UDV-201314**

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 ECIT Shanghai.

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

Add: 7F, G Area, No.668, Beijing East Road, Huangpu District, Shanghai, P. R. China

Tel: (+86)-021-63843300, E-Mail: welcome@ecit.org.cn

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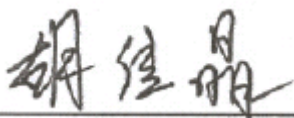
1. Test Laboratory

1.1. Testing Location

Company Name:	ECIT Shanghai, East China Institute of Telecommunications
Address:	7F, G Area,No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China
Postal Code:	200001
Telephone:	86-21-63843300
Fax:	86-21-63843301
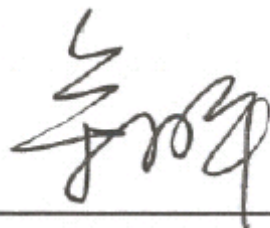
1.2. Project data

Project Leader:	Gong Yujuan
Testing Start Date:	Jan 2, 2014
Testing End Date:	Jan 3, 2014

1.3. Signature

Hu Jiajing
(Testing Engineer)

Yu Naiping
(Reviewed this test report)

Zheng Zhongbin
Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Shanghai SIMCom Wireless Solutions Co.,Ltd.
Address /Post:	Building A,SIM Technology Building,No.633,Jinzhong Road,Changning District,Shanghai R.R.China
Country:	China
Telephone:	86-021-32523300
Postal Code:	200335
Contact	Wu Feiping

2.2. Manufacturer Information

Company Name:	Shenyang Simcom Technology Ltd.
Address /Post:	No.37, Shenbei Rd, Shenbei New Aear, Shenyang,P.R.China
Country:	China
Telephone:	86-024-88922222
Postal Code:	/
Contact	/

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

3.1. About EUT

EUT Description	GSM/GPRS(850/900/1800/1900MHz)+BT Wireless Data Module
Model name	SIM800
GSM Frequency Band	GSM835/GSM900/GSM1800/GSM1900
Antenna Type	Internal Antenna
FCC ID:	UDV-201314

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:
S1	IMEI:N/A	V2.01	SIM800 R13.08

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

Note: the EUT has no earphone.

3.3. Internal Identification of AE used during the test

AE ID*	Description	Model	SN	Manufacturer
AE1	N/A	N/A	N/A	N/A
AE2	N/A	N/A	N/A	N/A

*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.
The limits standard is based on the Council Recommendation 1999/519/EC.
FCC CFR 47, Part 2, FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS, Oct 1,2011
Section 2.1091   Radiofrequency radiation exposure evaluation: mobile devices, Oct 1,2011

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.

Limits for Occupational / Controlled Exposure

Frequency Range [MHz]	Electric Field Strength (E) [V/m]	Magnetic Field Strength (H) [A/m]	Power Density (S) [mW/cm2]	Averaging Times |E|2, |H|2 or S [miniutes]
0.3 – 3.0	614	1.63	(100)*	6
3.0 – 30	1824/f	4.89/f	(900/f)*	6
30 – 300	61.4	0.163	1.0	6
300 – 1500	--	--	F/300	6
1500 - 100000	--	--	5	6

Limits for General Population / Uncontrolled Exposure

Frequency Range [MHz]	Electric Field Strength (E) [V/m]	Magnetic Field Strength (H) [A/m]	Power Density (S) [mW/cm2]	Averaging Times |E|2, |H|2 or S [miniutes]
0.3 – 1.34	614	1.63	(100)*	30
1.34 – 30	824/f	2.19/f	(180/f)*	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 General Population / Uncontrolled Exposure are applicable.

5. Test Results

5.1. Conducted RF Power Output

Table 5.1: The Conducted Power For GPRS 4TS 835MHz and 1900MHz

GPRS 4TS 835MHz	Conducted Power (dBm)		
	Channel 128 (824.2MHz)	Channel 190 (836.6MHz)	Channel 251 (848.8MHz)
	27.36	27.11	27.18
GPRS 4TS 1900MHz	Conducted Power (dBm)		
	Channel 512 (1850.2MHz)	Channel 661 (1880MHz)	Channel 810 (1909.8MHz)
	24.29	24.04	24.12

Table 5.2: Tolerance Power For GPRS 4TS 835MHz and 1900MHz

GPRS 4TS 835MHz	Conducted Power (dBm)		
	Channel 128 (824.2MHz)	Channel 190 (836.6MHz)	Channel 251 (848.8MHz)
	25.0~29.0	25.0~29.0	25.0~29.0
GPRS 4TS 1900MHz	Conducted Power (dBm)		
	Channel 512 (1850.2MHz)	Channel 661 (1880MHz)	Channel 810 (1909.8MHz)
	23.0~25.0	23.0~25.0	23.0~25.0

Table 5.3: The Conducted Power For BT

GSM 1900MHz	Conducted Power (dBm)		
	Channel 0 (2402MHz)	Channel 39 (2441MHz)	Channel 78 (2480MHz)
	6.05	6.32	6.12

Table 5.4: Tolerance Power For BT

GSM 1900MHz	Conducted Power (dBm)		
	Channel 512 (1850.2MHz)	Channel 661 (1880MHz)	Channel 810 (1909.8MHz)
	6.0~8.0	6.0~8.0	6.0~8.0

5.2. Calculation Information

From the antenna specifications provided by the applicant, the antenna gain is 3 dBi in GSM 835MHz and 2dBi in GSM 1900MHz and 2dBi in BT.

So 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.

5.3. Result of GSM835

Test Results: MPE Limit Calculation: the EUT's operating frequencies @ 824.2 – 848.8 MHz; as per the original test report the highest power is GSM835, Low channel 128. The maximum tune up procedure power is 29.0 dBm . The maximum gain is 3dBi.The resulted power density at a distance of 20cm can be deducted as follows:

$$EIRP=29.0+3 =32.0 \text{ dBm}=1584.89 \text{ mW}$$

$$\text{Power Density}=EIRP*\text{Duty Cycle}/(4 \pi R^2)=1584.89*(4/8)/(4* \pi *20^2)=0.158 \text{ mW/cm}^2$$

Where Duty Cycle is 4/8 and R is 20cm.

The MPE limit for Occupational/Controlled Exposure is shown in the FCC KDB 447498 D01 and 47 CFR §2.1091, can be calculated as follows:

$$\text{MPE limit} = 824.2/1500 = 0.549 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore the DUT in this band is compliant with the FCC rules on RF exposure.

5.4. Result of GSM1900

Test Results: MPE Limit Calculation: the EUT's operating frequencies @ 1850.2 – 1909.8 MHz; as per the original test report the highest power is GSM1900, Low channel 512. The maximum tune up procedure power is 25.0 dBm . The maximum gain is 2 dBi. The resulted power density at a distance of 20cm can be deducted as follows:

$$EIRP=25.0+2=27.0 \text{ dBm}=501.19 \text{ mW}$$

$$\text{Power Density}=EIRP*\text{Duty Cycle}/(4 \pi R^2)=501.19*(4/8)/(4* \pi *20^2)=0.050 \text{ mW/cm}^2$$

Where Duty Cycle is 4/8 and R is 20cm.

The MPE limit for Occupational/Controlled Exposure is shown in the FCC KDB 447498 D01 and 47 CFR §2.1091, can be calculated as follows:

$$\text{MPE limit} = 1 \text{ mW/cm}^2$$

As we can see the resulted power density is below the MPE limit, therefore the DUT in this band is compliant with the FCC rules on RF exposure.

5.5. Result of BT

Test Results: MPE Limit Calculation: the EUT's operating frequencies @ 2402-2480 MHz; as per the original test report the highest power is BT, Middle channel 39. The maximum tune up procedure power is 8.0 dBm . The maximum gain is 2 dBi. The resulted power density at a distance of 20cm can be deducted as follows:

$$EIRP = 8.0 + 2 = 10.0 \ dBm = 10 \ mW$$

$$Power \ Density = EIRP * Duty \ Cycle/(4 \pi R^2) = 10*1/(4* \pi *20^2) = 0.002 \ mW/cm^2$$

Where Duty Cycle is 1 and R is 20cm.

The MPE limit for Occupational/Controlled Exposure is shown in the FCC KDB 447498 D01 and 47 CFR §2.1091, can be calculated as follows:

$$MPE \ limit = 1 \ mW/cm^2$$

As we can see the resulted power density is below the MPE limit, therefore the DUT in this band is compliant with the FCC rules on RF exposure.

Note: π=3.1416

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6. Evaluation Of Simultaneous

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneous transmitting antennas incorporated in a host device, based on the calculated/estimated, numerically modeled or measured field strengths or power density, is ≤ 1.0. The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to MPE limit, at the test frequency.

6.1. MPE Ratio Result of 835MHz

MPE ratio=Power Density/MPE Limit=0.158/0.549=0.288

6.2. MPE Ratio Result of 1900MHz

MPE ratio=Power Density/MPE Limit=0.050/1=0.050

6.3. MPE Ratio Result of BT

MPE ratio=Power Density/MPE Limit=0.002/1=0.002

So, The sum of the MPE ratios for all simultaneous transmitting antennas is as following:

Table 6.1: Simultaneous Transmission with BT

Simult Tx	835MHz MPE Ratio	BT MPE Ratio	SUM
Power Density	0.288	0.002	0.290

Simult Tx	1900MHz MPE Ratio	BT MPE Ratio	SUM
Power Density	0.050	0.002	0.052

According to the sum value result, we can draw the conclusion that: the simultaneous transmission do not need to evaluate.

So the product is under the MPE limits. All is pass.

END OF REPORT