

# RF Exposure Evaluation Declaration

Product Name : GSM/GPRS Module  
Model No. : SIM800C  
FCC ID: UDV- SIM800C

Applicant : Shanghai Simcom Ltd  
Address : SIM Technology Building, No.633, Jinzhong  
Road, Changning District, Shanghai, P.R. China

Date of Receipt : 02-09-2015  
Issued Date : 02-12-2015  
Report No. : UL15820150209FCC041-2  
Report Version : V1.0

The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standard through the calibration of the equipment and evaluated measurement uncertainty herein.

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Report No. : UL15820150209FCC041-2

Product Name : GSM/GPRS Module  
Applicant : Shanghai Simcom Ltd  
Address : SIM Technology Building, No.633, Jinzhong Road, Changning District, Shanghai, P.R. China  
Manufacturer : Shanghai Simcom Wireless Solution Ltd.  
Address : SIM Technology Building, No.633, Jinzhong Road, Changning District, Shanghai, P.R. China  
Model No. : SIM800C  
EUT Voltage : MIN: 3.6V, NOR: 4.0V, MAX: 4.2V  
Brand Name : SIMCom  
Applicable Standard : FCC's Rules (47 C.F.R. § 1.1310 and 2.1091)  
Test Result : Complied  
Performed Location : Unilab (Shanghai) Co.,Ltd.  
FCC 2.948 register number is 714465  
No.1350, Lianxi Road, Pudong New District, Shanghai, China  
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## 1. EUT Description

Product Name:	GSM/GPRS Module
Model Name:	SIM800C
Hardware Version:	V1.02
Software Version:	SIM800 R14.18
RF Exposure Environment:	Uncontrolled
<b>GSM/ EDGE</b>	
Support Band:	GSM850/PCS1900
GPRS Class:	12
Tx Frequency Range:	GSM 850: 824.2MHz to 848.8MHz PCS 1900: 1850.2MHz to 1909.8MHz
Rx Frequency Range:	GSM 850: 869.2MHz to 893.8MHz PCS 1900: 1930.2MHz to 1989.8MHz
Type of modulation:	GMSK for GSM/GPRS
Antenna Type:	Connector
Antenna Peak Gain:	GSM 850: 3.0dBi PCS 1900: 3.0dBi

## 2. RF Exposure Evaluation

### 2.1 Limits

According to FCC 1.1310: 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 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range(MHz)	Electric Filed Strength (V/m)	Magnetic Filed Strength (A/m)	Power Density (mW/cm2)	Average Time (Minutes)
<b>(A) Limits for Occupation/Control Exposures</b>				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
<b>(B) Limits for General Occupation/UnControlled Exposures</b>				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

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

Where

$P_d$  = power density in  $\text{mW/cm}^2$

$P_{out}$  = output power to antenna in mW

$G$  = gain of antenna in linear scale

$\pi = 3.1416$

$R$  = distance between observation point and center of the radiator in cm

$P_d$  is the limit of MPE, 1  $\text{mW/cm}^2$ . 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.

### 2.2. Test Procedure

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

The temperature and related humidity: 22°C and 45% RH.

## 2.3. Test Result of RF Exposure Evaluation

This device is evaluated by mobile device with general population/uncontrolled exposure condition  
For this device, the calculation is using the most conservative values, and the results are as follows:

Test Mode	Antenna Gain (dBi)	Maximum Output Power (dBm)	Average Power (dBm)	Average EIRP (mW)	Calculated RF Exposure at d = 20cm (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
GSM 850	3.0	35	29	794.33	0.16	0.55
PCS 1900	3.0	32	26	398.11	0.08	1.00

The averaged power calculated method are shown as below:  
Averaged power=Maximum burst averaged power(1 Tx Slot)-9dB  
Duty cycle =12.5%  
AverageEIRP Power=Average Power+Antenna Gain

Test Mode	ERP (dBm)	EIRP (dBm)	Peak EIRP (mW)	Average EIRP (mW)	Calculated RF Exposure at d = 20cm (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
GSM 850	34.89	37.04	5058.25	636.80	0.13	0.55
PCS 1900	-----	31.85	1531.09	192.75	0.04	1.00

The frame-averaged power calculated method are shown as below:  
AverageEIRP=Peak EIRP-9dB  
Duty cycle =12.5%

This device can pass RF exposure limit.