

# RF Exposure Evaluation Declaration

Product Name : GSM/GPRS+GPS Module

Model No. : SIM868

FCC ID: UDV-201607

Applicant : Shanghai Simcom Ltd.

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

Date of Receipt : 06-29-2016

Test Date : 07-01-2016~07-09-2015

Issued Date : 07-21-2016

Report No. : UL15820160629FCC004-2

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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Applicant : Shanghai Simcom Ltd.  
Address : SIM Technology Building, No.633, Jinzhong Road, Changning District, Shanghai, P.R. China  
Manufacturer : Shanghai Simcom Ltd.  
Address : SIM Technology Building, No.633, Jinzhong Road, Changning District, Shanghai, P.R. China  
Model No. : SIM868  
EUT Voltage : MIN: 3.4V, NOR: 3.8V, MAX: 4.2V  
Brand Name : SIMCom  
FCC ID: UDV-201607  
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  
TEL:+86-21-5027-5125 FAX:+86-21-5027-7862

Prepared by :



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Reviewed by :



(Senior Engineer: Forest Cao)

Approved by :



(Supervisor Engineer: Eva Wang)

## 1. EUT Description

Product Name:	GSM/GPRS+GPS Module
Model Name:	SIM868
Hardware Version:	V1.02
Software Version:	SIM800 R14.18
RF Exposure Environment:	Uncontrolled
<b>GSM / GPRS</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:	External, separate RF-connector
Antenna Peak Gain:	GSM 850: 2.5dBi PCS 1900: 2.5dBi

## 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/cm <sup>2</sup> )	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:  $22^\circ\text{C}$  and 53 %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 (dBd)	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	0	----	35	28.5	707.9	0.14	0.55
GPRS 850	0	----	35	28.5	707.9	0.14	0.55
PCS 1900	----	2.5	32	25.5	354.8	0.07	1.00
GPRS 1900	----	2.5	32	25.5	354.8	0.07	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%  
Average EIRP Power=Average Power + Antenna Gain

This device can pass RF exposure limit.

---END OF THE REPORT---