

# RF Exposure Evaluation Declaration

Product Name : Module

Model No. : SIM5215A

FCC ID : UDV-1009092010007

IC : 8460A-20100909007

Applicant : Shanghai Simcom Ltd.

Address : Building A, SIM Technology Building, No. 633, Jinzhong  
Road, Changning Disrict, Shanghai P.R. China 200335

Date of Receipt : Sep. 14, 2010

Issued Date : Sep. 21, 2010

Report No. : 109S016R-RF-US

Report Version : V2.1

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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## Test Report Certification

Issued Date : Sep. 21, 2010  
Report No. : 109S016R-RF-US

# QuieTek

Product Name : Module  
Applicant : Shanghai Simcom Ltd.  
Address : Building A, SIM Technology Building, No. 633, Jinzhong Road, Changning Disdrict, Shanghai P.R. China 200335  
Manufacturer : Shanghai Simcom Ltd.  
Address : Building A, SIM Technology Building, No. 633, Jinzhong Road, Changning Disdrict, Shanghai P.R. China 200335  
Model No. : SIM5215A  
FCC ID : UDV-1009092010007  
IC : 8460A-20100909007  
EUT Voltage : 3.4-4.2V  
Trade Name : SIMCom  
Applicable Standard : FCC OET 65  
Test Result : Complied  
Performed Location : Suzhou EMC Laboratory  
No.99 Hongye Rd., Suzhou Industrial Park Loufeng  
Hi-Tech Development Zone., Suzhou, China  
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FCC Registration Number: 800392

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## Laboratory Information

We, **QuieTek Corporation**, are an independent EMC and safety consultancy that was established the whole facility in our laboratories. The test facility has been accredited/accepted(audited or listed) by the following related bodies in compliance with ISO 17025, EN 45001 and specified testing scope:

<b>Taiwan R.O.C.</b>	:	<b>BSMI, NCC, TAF</b>
<b>Germany</b>	:	<b>TUV Rheinland</b>
<b>Norway</b>	:	<b>Nemko, DNV</b>
<b>USA</b>	:	<b>FCC, NVLAP</b>
<b>Japan</b>	:	<b>VCCI</b>

The related certificate for our laboratories about the test site and management system can be downloaded from QuieTek Corporation's Web Site : <http://www.quietek.com/tw/ctg/cts/accreditations.htm>  
The address and introduction of QuieTek Corporation's laboratories can be founded in our Web site : <http://www.quietek.com/>

If you have any comments, Please don't hesitate to contact us. Our contact information is as below:

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## 1. RF Exposure Evaluation

### 1.1. 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 Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (Minutes)
<b>(A) Limits for Occupational/ Control Exposures</b>				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
<b>(B) Limits for General Population/ 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 mW/cm<sup>2</sup>

$P_{out}$  = 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 mW/cm<sup>2</sup>. 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.

## 1.2. 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: 18°C and 78% RH.

## 1.3. Test Result of RF Exposure Evaluation

### 1.3.1. Conducted Power Analysis

Table 1: Duty Cycle of TDMA Signal

No. of timeslots	1	2	3	4
Duty Cycle	1 : 8	1 : 4	1 : 2.66	1 : 2
Timebased avg. power compared to slotted avg. power	-9 dB	-6 dB	-4.25 dB	-3 dB

The following table shows the conducted power measured and time based average power calculated:

Table 2

Frequency Band	Modulation	Timeslots	Power Measured (dBm)	Time based average power (Calculated)
GSM850	GMSK	1	32.55	<b>23.55</b>
GSM850	GMSK	2	29.24	23.24
GSM850	GMSK	3	27.35	23.10
GSM850	GMSK	4	25.84	22.84
GSM850	8PSK	1	26.61	<b>17.61</b>
GSM850	8PSK	2	23.43	17.43
GSM850	8PSK	3	21.58	17.33
GSM850	8PSK	4	20.38	17.38
PCS1900	GMSK	1	28.96	<b>19.96</b>
PCS1900	GMSK	2	25.86	19.86
PCS1900	GMSK	3	23.92	19.67
PCS1900	GMSK	4	22.84	19.84
PCS1900	8PSK	1	24.73	<b>15.73</b>
PCS1900	8PSK	2	21.48	15.48
PCS1900	8PSK	3	19.82	15.57
PCS1900	8PSK	4	18.35	15.35
FDD II	QPSK	---	22.75	<b>22.75</b>
FDD V	QPSK	---	23.54	<b>23.54</b>

### 1.3.2. Host Platform Analysis

The MPE calculation was performed for the maximum antenna gain maybe used of stand-alone condition. According to FCC Part2.1091(c) requirement, the maximum ERP (below 1.5GHz) is 1.5W and (above 1.5GHz) is 3W. Conjunction with FCC Part22H&24E requirements, the following table shows the maximum antenna gain allowed for stand-alone situation.

According to FCC rules, maximum ERP allowed is 7W (38.45dBm) for Part22H, maximum EIRP is 2W (33dBm) for Part24E.

Table 3

System	Mode	Frequency (MHz)	Conducted Power (dBm)	Antenna Gain (dBi)	Duty Cycle (%)	PAR (dB)	EIRP (dBm)
GSM850	GPRS	824.2~848.8	32.55	8.05	12.5	9	31.60
GSM850	8PSK	824.2~848.8	26.61	8.05	12.5	9	25.66
PCS1900	GPRS	1850.2~1909.8	28.96	4.04	12.5	9	24.00
PCS1900	8PSK	1850.2~1909.8	24.73	4.04	12.5	9	19.77
FDD II	QPSK	1852.4 - 1907.6	22.75	8.05	---	---	30.80
FDD V	QPSK	826.4 - 846.6	23.54	4.04	---	---	27.58

### 1.3.3. MPE Evaluation Result

The device used should cover the following conditions:

- 1) The antenna-to-user distance of all transmitters(for example: WLAN, Bluetooth) above is 20cm or larger;
- 2) The maximum antenna gain of the device does not exceed the values listed in table 3.

Note: other antennas of different communication systems may be installed in the host platform as long as they are not collocated to the device antenna (distance > 20cm).

Test Mode	Frequency Band (MHz)	EIRP (dBm)	Distance (cm)	Power Density Seq (mW/cm <sup>2</sup> )	MPE Limit (mW/cm <sup>2</sup> )
GPRS850	824 ~ 849	31.60	20	0.29	0.55
GPRS850	824 ~ 849	25.66	20	0.07	0.55
GPRS1900	1850 ~ 1910	24.00	20	0.05	1.00
GPRS1900	1850 ~ 1910	19.77	20	0.02	1.00
FDD II	1850 ~ 1910	30.80	20	0.24	1.00
FDD V	824 ~ 849	27.58	20	0.11	0.55