

# RF Exposure Evaluation Declaration

Product Name: WCDMA\EDGE\GPRS\GSM module

Model No. : SIM5320J

Applicant: Shanghai SIMCom Ltd.

Address: SIM Technology Building, No. 633 Jinzhong Road, Changning

District, Shanghai, P.R. China

Date of Receipt: 04-13-2017

Test Date: 04-20-2017~04-23-2017

Issued Date: 04-24-2017

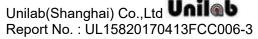
Report No.: UL15820170413FCC006-3

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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Manufacturer: Shanghai SIMCom Ltd.

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

Model No.: SIM5320J

EUT Voltage: MIN: 3.4V, NOR:3.8V, MAX: 4.2V

Brand Name: SIMCom

FCC ID: UDV-1703022017008

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, Shangha, China

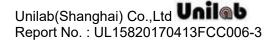
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TEL:+86-21-5027-5125 FAX:+86-21-5027-7862

Prepared by:	
, ,	(Technical Engineer: Wayne Wu)
Reviewed by :	Forest cao
	(Senior Engineer: Forest Cao)
Approved by :	Eva wang
•	(SupervisorEngineer: Eva Wang)



Product Name:	WCDMA\EDGE\GPRS\GSM module			
Model Name:	SIM5320J			
Hardware Version:	V1.03			
Software Version:	SIM5320E_V1.5			
RF Exposure Environment:	Uncontrolled			
GSM/ GPRS				
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 8PSK for EGPRS			
Antenna Type:	Connector			
Antenna Peak Gain:	GSM 850:2dBi PCS 1900:2dBi			
WCDMA				
Support Band:	WCDMA Band V			
Tx FrequencyRange:	WCDMA Band V: 824MHz ~849MHz			
Rx FrequencyRange:	WCDMA Band V: 869MHz ~894MHz			
Type of modulation:	WCDMA(UMTS): QPSK&16QAM			
Antenna Type:	Connector			
AntennaPeak Gain:	WCDMA Band V: 2dBi			



# 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	Electric	Magnetic	Power Density	Reference Period		
(MHz)	FieldStrength	FieldStrength	(mW/cm <sup>2</sup> )	(minutes)		
, ,	(V/m)	(A/m)	, ,	, ,		
(A) Limits for Occupational/Controlled Exposure						
0.3-3.0	614	1.63	*100	6		
3.0-30	1842/f	4.89/f	*900/ <i>f</i> ²	6		
30-300	61.4	0.163	1.0	6		
300-1,500	-	-	f/300	6		
1,500-100,000	-	-	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/ <i>f</i> ²	30		
30-300	27.5	0.073	0.2	30		
300-1,500	-	-	f/1500	30		
1,500-100,000	-	-	1.0	30		
f = frequency in MHz * = Plane-wave equivalent power density						

Friis Formula

Friis transmission formula:  $Pd = (Pout*G)/(4*Pi*R^2)$ 

Where

Pd = power density in mW/cm<sup>2</sup>

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

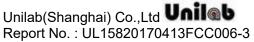
R = distance between observation point and center of the radiator in cm

Pd id 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.

## 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°Cand 56%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/cm²)	FCC MPE Limit (mW/cm²)
GSM 850	2.0	33.75	24.75	473.15	0.0941	0.55
GPRS 850,1Tx Slot	2.0	33.75	24.75	473.15	0.0941	0.55
EGPRS 850,1Tx Slot	2.0	27.75	18.75	118.85	0.0236	0.55
PCS 1900	2.0	30.75	21.75	237.14	0.0472	1.00
GPRS 1900,1Tx Slot	2.0	30.75	21.75	237.14	0.0472	1.00
EGPRS 1900,1Tx Slot	2.0	26.75	17.75	94.41	0.0188	1.00
WCDMA Band V	2.0	23.5	23.5	354.81	0.0706	0.55

The averaged power calculated method are shown as below:

Averaged power=Maximum burst averaged power (1 Tx Slot) - (10lg(1/8))dB

Averaged power=Maximum burst averaged power (2 Tx Slot) - (10lg(2/8))dB

Averaged power=Maximum burst averaged power (3 Tx Slot) - (10lg(3/8))dB

Averaged power=Maximum burst averaged power (4 Tx Slot) - (10lg(4/8))dB

AverageEIRP Power=Average Power+Antenna Gain

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Test Mode	ERP (dBm)	EIRP (dBm)	Maximum Output Power (mW)	Calculated RF Exposure at d = 20cm (mW/cm²)	FCC MPE Limit (mW/cm²)
GSM 850		32.85	1927.52	0.3835	0.55
GPRS 850,1Tx Slot		32.84	1923.09	0.3826	0.55
EGPRS 850,1Tx Slot		27.00	501.19	0.0997	0.55
PCS 1900	29.15	31.30	1348.96	0.2684	1.00
GPRS 1900,1Tx Slot	29.16	31.31	1352.07	0.2690	1.00
EGPRS 1900,1Tx Slot	26.31	28.46	701.46	0.1396	1.00
WCDMA Band V		23.64	231.21	0.0460	0.55

This device can pass RF exposure limit.

---END OF THE REPORT---