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

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Manufacturer : Shanghai SIMCom Ltd.

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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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(SupervisorEngineer: Eva Wang)

1. EUT Description

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 (MHz)	Electric FieldStrength (V/m)	Magnetic FieldStrength (A/m)	Power Density (mW/cm^2)	Reference Period (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/*f*	4.89/*f*	*900/f^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/f^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^2

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^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℃and 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/cm^2)	FCC MPE Limit (mW/cm^2)
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						

Test Mode	ERP (dBm)	EIRP (dBm)	Maximum Output Power (mW)	Calculated RF Exposure at d = 20cm (mW/cm^2)	FCC MPE Limit (mW/cm^2)
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---