RF Exposure Evaluation Declaration

Product Name : GSM/GPRS/EDGE/UMTS/HSDPA Terminal

Model No. : T5320A

FCC ID: UDV-2013060302

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

Date of Receipt : 26/05/2013

Issued Date : 14/06/2013

Report No. : UL15820130524FCC/PTCRB23-6

Report Version : V1.0

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Unilab

Product Name :	GSM/GPRS/EDGE/UMTS/HSDPA Terminal
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. :	T5320A
EUT Voltage	MIN: 5.0V, NOR: 5.0V, MAX: 30.0V
Brand Name :	SIMCom
Applicable Standard :	FCC OET Bulletin 65 Supplement C (Edition 01-01)
Test Result :	Complied
Performed Location :	Unilab (Shanghai) Co.,Ltd. No.1350, Lianxi Road, Pudong New District, Shangha, China TEL:+86-21-5027-5125/FAX:+86-21-5027-5126-876

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1. EUT Description

Product Name:	GSM/GPRS/EDGE/UMTS/HSDPA Terminal
Model Name:	T5320A
Hardware Version:	V1.03
Software Version:	SIM5320A_V1.5
RF Exposure Environment:	Uncontrolled
GSM/ GPRS	
Support Band:	GSM850/PCS1900
Tx Frequency Range:	GSM 850: 824MHz ~849MHz PCS 1900: 1850MHz ~1910MHz
Rx Frequency Range:	GSM 850: 869MHz ~894MHz PCS 1900: 1930MHz ~1990MHz
Type of modulation:	GMSK for GSM and GPRS
Antenna Type:	external
Antenna Peak Gain:	GSM 850: 2.0dBi DCS 1900: 2.0dBi
EDEG	
Support Band:	GSM850/PCS1900
GPRS Class:	12
Tx Frequency Range:	GSM 850: 824MHz ~849MHz PCS 1900: 1850MHz ~1910MHz
Rx Frequency Range:	GSM 850: 869MHz ~894MHz PCS 1900: 1930MHz ~1990MHz
Type of modulation:	8PSK for EDEG
Antenna Type:	external
Antenna Peak Gain:	GSM 850: 2.0dBi DCS 1900: 2.0dBi
UMTS	
Support Band:	WCDMA Band Ⅱ / V
Tx Frequency Range:	WCDMA Band Ⅱ: 1850MHz ~1910MHz WCDMA Band V: 824MHz ~849MHz
Rx Frequency Range:	WCDMA Band Ⅱ: 1930MHz ~1990MHz WCDMA Band V: 869MHz ~894MHz
Type of modulation:	WCDMA(UMTS): QPSK
Antenna Type:	external
Antenna Peak Gain:	WCDMA Band Ⅱ: 2.0dBi
HSDPA	
Support Band:	WCDMA Band Ⅱ / V
Tx Frequency Range:	WCDMA Band Ⅱ: 1850MHz ~1910MHz WCDMA Band V: 824MHz ~849MHz
Rx Frequency Range:	WCDMA Band Ⅱ: 1930MHz ~1990MHz WCDMA Band V: 869MHz ~894MHz
Type of modulation:	WCDMA(UMTS): QPSK
Antenna Type:	external
Antenna Peak Gain:	WCDMA Band V: 2.0dBi
Component	
AC Adapter:	Model Name: P12-050200 EU
	Input: AC 100-240V 50/60Hz
	Output: DC 5V/2A

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)
(A)Limits for Occupation/Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B)Limits for General Occupation/UnControlled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: Pd = (Pout*G)/(4*pi*r2)

Where

Pd = power density in mW/cm2

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/cm2 . 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: 18℃and 78％ RH.

2.3.Test Result of RF Exposure Evaluation

2.3.1. Conducted Power Analysis

GPRS850/1900

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	-9dB	-6dB	-4.25dB	-3dB

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

Frequency Band	Modulation	Timeslots	Avg. Burst Power (dBm)	Time based average power(Calculated)
GPRS 850	GMSK	1	31.56	22.56
GPRS 850	GMSK	2	30.76	24.76
GPRS 850	GMSK	3	29.26	25.01
GPRS 850	GMSK	4	28.74	25.44
GPRS1900	GMSK	1	27.42	18.42
GPRS 1900	GMSK	2	27.01	21.01
GPRS 1900	GMSK	3	26.18	21.93
GPRS 1900	GMSK	4	25.88	22.88
EGPRS 850	GMSK	1	30.51	21.51
EGPRS 850	GMSK	2	29.66	23.66
EGPRS 850	GMSK	3	27.91	23.66
EGPRS 850	GMSK	4	27.14	24.14
EGPRS1900	GMSK	1	26.22	17.22
EGPRS 1900	GMSK	2	26.31	20.31
EGPRS 1900	GMSK	3	25.58	21.37
EGPRS 1900	GMSK	4	24.98	21.98

WCDMA Band Ⅱ:

Channel No.	Frequency (MHz)	Modulation	Avg.Burst Power (dBm)
9262	1852.4	QPSK	22.67
9400	1880.0	QPSK	22.66
9538	1907.6	QPSK	22.60

WCDMA Band V:

Channel No.	Frequency (MHz)	Modulation	Avg.Burst Power (dBm)
4132	826.4	QPSK	22.21
4182	836.4	QPSK	22.29
4233	846.6	QPSK	22.41

HSDPA 1900:

Channel No.	Frequency (MHz)	Modulation	Avg.Burst Power (dBm)
9262	1852.4	QPSK	21.37
9400	1880.0	QPSK	22.15
9538	1907.6	QPSK	22.22

HSDPA 850:

Channel No.	Frequency (MHz)	Modulation	Avg.Burst Power (dBm)
4132	826.4	QPSK	22.36
4182	836.4	QPSK	22.21
4233	846.6	QPSK	22.31

Antenna Gain:

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2dBi for 824~894MHz GSM850 band; 2dBi for 1850~1990MHz PCS1900 band;2dBi for 1850MHz ~1910MHz WCDMA Band Ⅱ. 2dBi for 1850MHz ~1910MHz WCDMA Band V

Output Power into Antenna & RF Exposure Evaluation Distance:

Test Mode	Frequency Band (MHz)	Maixmum Output Power to Antenna(mW)	Power Density at R = 20cm (mW/cm2)	MPE Limit (mW/cm2)
GSM 850	824~849	1548.81	0.49	0.55
GSM 1900	1850~1910	885.12	0.28	1.00
EDGE 850	824~849	174.51	0.09	0.55
EDGE 1900	1850~1910	136.57	0.05	1.00
GPRS 850	824~849	173.73	0.11	0.55
GPRS 1900	1850~1910	138.03	0.05	1.00
WCDMA Band Ⅱ	1850~1910	169.43	0.06	0.55
WCDMA Band V	824~849	169.43	0.06	1.00
HSDPA 850	824~849	172.18	0.05	0.55
HSDPA 1900	1850~1910	166.72	0.05	1.00