RF Exposure Evaluation Declaration

Product Name : LTE/WCDMA Module

Model No. : SIM7100A

FCC ID : UDV-SIM7100A

Applicant : Shanghai Simcom Ltd.

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

Date of Receipt : 11-17-2014

Test Date : 11-17-2014~12-16-2014

Issued Date : 12-16-2014

Report No. : UL15820141117FCC036-4

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Product Name :	LTE/WCDMA 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. :	SIM7100A
EUT Voltage :	MIN: 3.4V, NOR: 3.8V, MAX: 4.2V
Brand Name :	SIMCom
FCC ID:	UDV-SIM7100A
Applicable Standard :	FCC OET Bulletin 65 Supplement C (Edition 01-01)
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 TEL:+86-21-5027-5125/FAX:+86-21-5027-7862

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Approved By : Eva wang
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1. EUT Description

Product Name:	LTE/WCDMA Module
Model Name:	SIM7100A
Hardware Version:	V1.03
Software Version:	SIM7100A_V1.0
RF Exposure Environment:	Uncontrolled
LTE	
Support Band:	LTE Band Ⅱ
Tx Frequency Range:	LTE Band Ⅱ:1850MHz ~1910MHz
Rx Frequency Range:	LTE Band Ⅱ:1930MHz ~1990MHz
Type of modulation:	LTE: QPSK,16-QAM
Antenna Type:	Connector
Antenna Peak Gain:	LTE Band Ⅱ: 3.4dBi
Support Band:	LTE Band Ⅳ
Tx Frequency Range:	LTE Band Ⅳ:1710MHz ~1755MHz
Rx Frequency Range:	LTE Band Ⅳ:2110MHz ~2155MHz
Type of modulation:	LTE: QPSK,16-QAM
Antenna Type:	Connector
Antenna Peak Gain:	LTE Band Ⅳ: 1.9dBi
Support Band:	LTE Band V
Tx Frequency Range:	LTE Band V: 824MHz ~849MHz
Rx Frequency Range:	LTE Band V: 869MHz ~894MHz
Type of modulation:	LTE: QPSK,16-QAM
Antenna Type:	Connector
Antenna Peak Gain:	LTE Band V: 2.8dBi
Support Band:	LTE Band XVII
Tx Frequency Range:	LTE Band XVII: 704MHz ~716MHz
Rx Frequency Range:	LTE Band XVII: 734MHz ~746MHz
Type of modulation:	LTE: QPSK,16-QAM
Antenna Type:	Connector
Antenna Peak Gain:	LTE Band XVII: 1dBi
WCDMA	
Support Band:	WCDMA Band Ⅱ
Tx FrequencyRange:	WCDMA Band Ⅱ: 1850MHz ~1910MHz

Rx FrequencyRange:	WCDMA Band Ⅱ: 1930MHz ~1990MHz
Type of modulation:	WCDMA(UMTS): QPSK
Antenna Type:	Connector
AntennaPeak Gain:	WCDMA Band Ⅱ: 3.4dBi
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
Antenna Type:	Connector
AntennaPeak Gain:	WCDMA Band V: 2.8dBi

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: 22℃and 45％ 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)	Maximum Output Power (mW)	Calculated RF Exposure at d = 20cm (mW/cm2)	MPE Limit (mW/cm2)
WCDMA 850	2.8	25	602.56	0.12	0.55
WCDMA 1900	3.4	25	691.83	0.14	1.00
Duty cycle =100%					

Test Mode	Band Width（MHz）	Antenna Gain (dBi)	Maximum Output Power (dBm)	Maximum Output Power (mW)	Calculated RF Exposure at d = 20cm (mW/cm2)	MPE Limit (mW/cm2)
LTE Band 2	1.4	3.4	25.7	812.83	0.16	1.00
	3	3.4	25.7	812.83	0.16	
	5	3.4	25.7	812.83	0.16	
	10	3.4	25.7	812.83	0.16	
	15	3.4	25.7	812.83	0.16	
	20	3.4	25.7	812.83	0.16	
LTE Band 4	1.4	1.9	25.7	575.44	0.11	1.00
	3	1.9	25.7	575.44	0.11	
	5	1.9	25.7	575.44	0.11	
	10	1.9	25.7	575.44	0.11	
	15	1.9	25.7	575.44	0.11	
	20	1.9	25.7	575.44	0.11	
LTE Band 5	1.4	2.8	25.7	707.95	0.14	0.55
	3	2.8	25.7	707.95	0.14	
	5	2.8	25.7	707.95	0.14	
	10	2.8	25.7	707.95	0.14	
LTE Band 17	5	1.0	25.7	467.74	0.09	0.47
	10	1.0	25.7	467.74	0.09	
Duty cycle =100%						

Test Mode	ERP (dBm)	EIRP (dBm)	Peak EIRP (mW)	Calculated RF Exposure at d = 20cm (mW/cm2)	MPE Limit (mW/cm2)
WCDMA 850	24.85	27.00	501.19	0.10	0.55
WCDMA 1900	----	24.23	264.85	0.05	1.00
Duty cycle =100%					

Test Mode	Band Width（MHz）	ERP (dBm)	EIRP (dBm)	Maximum Output Power (mW)	Calculated RF Exposure at d = 20cm (mW/cm2)	MPE Limit (mW/cm2)
LTE Band 2	1.4	---	23.96	248.89	0.05	1.00
	3	---	23.76	237.68	0.05	
	5	---	23.87	243.78	0.05	
	10	---	23.88	244.34	0.05	
	15	---	23.74	236.59	0.05	
	20	---	23.88	244.34	0.05	
LTE Band 4	1.4	---	23.35	216.27	0.04	1.00
	3	---	23.32	214.78	0.04	
	5	---	23.57	227.51	0.05	
	10	---	23.30	213.80	0.04	
	15	---	23.40	218.78	0.04	
	20	---	23.30	213.80	0.04	
LTE Band 5	1.4	24.96	27.11	514.04	0.10	0.55
	3	25.02	27.17	521.19	0.10	
	5	25.12	27.27	533.33	0.11	
	10	25.20	27.35	543.25	0.11	
LTE Band 17	5	23.25	25.40	346.74	0.07	0.47
	10	23.14	25.29	338.06	0.07	
Duty cycle =100%						

This device can pass RF exposure limit.