Full

TEST REPORT

No. I17D00219-SRD06

For

Client : Shanghai Simcom Ltd.

Production : LTE-FDD/HSPA MODULE

Model Name : SIM7600A

FCC ID: UDV-201709

Hardware Version: V1.02

Software Version: B02V01

Issued date: 2017-07-09

Note:

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of ECIT Shanghai.

Test Laboratory:

ECIT Shanghai, East China Institute of Telecommunications

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Revision Version

Report Number	Revision	Date	Memo
I17D00219-SRD06	00	2017-07-09	Initial creation of test report

CONTENTS

1. Test Laboratory

1.1. Testing Location

Company Name:	ECIT Shanghai, East China Institute of Telecommunications
Address:	7-8F, G Area, No. 668, Beijing East Road, Huangpu District, Shanghai, P. R. China
Postal Code:	200001
Telephone:	(+86)-021-63843300
Fax:	(+86)-021-63843301
FCC Registration NO.:	489729

1.2. Testing Environment

Normal Temperature:	15-35℃
Extreme Temperature:	-10/+55℃
Relative Humidity:	25-75%

1.3. Project data

Project Leader:	Zhou Yan
Testing Start Date:	2016-06-03
Testing End Date:	2016-06-17
Testing Start Date:	2017-06-21 (N06 for RSE)
Testing End Date:	2017-06-27 (N06 for RSE)

1.4. Signature

Yang Dejun
(Prepared this test report)

Ding Li
(Reviewed this test report)

Zheng Zhongbin
Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name:	Shanghai Simcom Ltd.
Address:	SIM Technology Building.,No.633, Jinzhong Rd,Changning District, Shanghai, P.R.China
Contact:	yongsheng.li
Telephone:	021-32523134

2.2. Manufacturer Information

Company Name:	Shanghai Simcom Ltd.
Address:	SIM Technology Building.,No.633, Jinzhong Rd,Changning District, Shanghai, P.R.China
Contact:	yongsheng.li
Telephone:	021-32523134

3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

EUT Description	LTE-FDD/HSPA MODULE
Model name	SIM7600A
FCC ID	UDV-201709
Frequency	WCDMA Band II/V LTE FDD2/4/12
Extreme Temperature	-10/+55℃
Nominal Voltage	3.8V
Extreme High Voltage	4.2V
Extreme Low Voltage	3.4V

Note: Photographs of EUT are shown in ANNEX A of this test report.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version	Date of receipt
N06	861475030055224	V1.02	B02V01	2017-06-21

*EUT ID: is used to identify the test sample in the lab internally.

3.3. Internal Identification of AE used during the test

AE ID*	Description	SN
AE1	RF cable	---
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*AE ID: is used to identify the test sample in the lab internally.

3.4. Statements

The product name SIM7600A, supporting WCDMA/DC-HSDPA/LTE, manufactured by Shanghai Simcom Ltd. is a variant product for testing. According to the variant description, All the test results please refer to I16D00113-RFA-01_V1, I16Z41276-GTE01 and BL-SZ1690342-501 except the worse case of Band 2, Band 4 and Band 12' RSE.

ECIT has verified that the compliance of the tested device specified in section 5 of this test report is successfully evaluated according to the procedure and test methods as defined in type certification requirement listed in section 5 of this test report.

4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
FCC Part 22	PUBLIC MOBILE SERVICES	2014
FCC Part 24	PERSONAL COMMUNICATIONS SERVICES	2014
FCC Part 27	MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES	2014
ANSI/TIA-603-E	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards	2016
ANSI C63.4	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014
KDB 971168 D01	Measurement Guidance for Certification of Licensed Digital Transmitters	v02r02

5. SUMMARY OF TEST RESULTS

LTE Band 2

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	24.232(c)	A.1	N/A
2	Emission Limit	24.238(a), 2.1051	A.2	Pass
3	Frequency Stability	24.235, 2.1055	A.3	N/A
4	Occupied Bandwidth	2.1049(h)(i)	A.4	N/A
5	Emission Bandwidth	24.238(a)	A.5	N/A
6	Band Edge Compliance	24.238(a)	A.6	N/A
7	Conducted Spurious Emission	24.238, 2.1057	A.7	N/A
8	Peak to Average Power Ratio	24.232 (d)	A.8	N/A

LTE Band 4

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	27.50(d)(4)	A.1	N/A
2	Emission Limit	27.53(h), 2.1051	A.2	Pass
3	Frequency Stability	27.54, 2.1055	A.3	N/A
4	Occupied Bandwidth	2.1049(h)(i)	A.4	N/A
5	Emission Bandwidth	27.53(h)	A.5	N/A
6	Band Edge Compliance	27.53(h)	A.6	N/A
7	Conducted Spurious Emission	27.53(h), 2.1057	A.7	N/A
8	Peak to Average Power Ratio	27.50(a)	A.8	N/A

LTE Band 12

Items	Test Name	Clause in FCC rules	Section in this report	Verdict
1	Output Power	27.50(c)(10)	A.1	N/A
2	Emission Limit	27.53(g), 2.1051	A.2	Pass
3	Frequency Stability	27.54, 2.1055	A.3	N/A
4	Occupied Bandwidth	2.1049(h)(i)	A.4	N/A
5	Emission Bandwidth	27.53(g)	A.5	N/A
6	Band Edge Compliance	27.53(g)	A.6	N/A
7	Conducted Spurious Emission	27.53(g), 2.1057	A.7	N/A
8	Peak to Average Power Ratio	27.50(a)	A.8	N/A

6. Test Equipment Utilized

Climate chamber

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Cal.interval
1	Climate chamber	SH-641	92012011	ESPEC	2016-01-07	2 Year

Radiated emission test system

The test equipment and ancillaries used are as follows.

No.	Equipment	Model	Serial Number	Manufacturer	Calibration date	Cal.interval
1	Universal Radio Communication Tester	CMW500	104178	R&S	2017-05-11	1 Year
2	Test Receiver	ESU40	100307	R&S	2017-05-11	1 Year
3	Trilog Antenna	VULB9163	VULB9163-515	Schwarzbeck	2014-11-05	3 Year
4	Double Ridged Guide Antenna	ETS-3117	135890	ETS	2017-01-11	3 Year
5	2-Line V-Network	ENV216	101380	R&S	2017-05-11	1 Year
6	Substitution Antenna	ETS-3117	00135890	ETS	2017-01-11	3 Year
7	RF Signal Generator	SMF100A	102314	R&S	2017-05-11	1 Year
8	Substitution Antenna	VUBA9117	9117-266	Schwarzbeck	2017-08-18	3 Year
9	Amplifier	SCU03	10009	R&S	2017-01-05	1 Year

10	Amplifier	NTWPA-008610F	12023024	Rflight	2017-01-05	1 Year
11	Attenuators	BW-N3W5+	/	MCL	2017-01-05	1 Year

Conducted test system

No.	Name	Type	SN	Manufacture	Calibration date	Cal.interval
1	Vector Signal Analyser	FSQ26	101096	Rohde&Schwarz	2017-05-11	1 Year
2	Wireless communication comprehensive tester	CMW500	115828	Rohde&Schwarz	2016-11-17	1 Year
3	DC Power Supply	ZUP60-14	LOC-220Z006-0007	TDL-Lambda	2017-05-11	1 Year

Software

Name	Version
Eagle FCC LTE auto test system	V3.0
EMC32	V9.15

7. Test Environment

Shielding Room1 (6.0 meters×3.0 meters×2.7 meters) did not exceed following limits along the conducted RF performance testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 20%, Max. = 75 %
Shielding effectiveness	> 100 dB
Ground system resistance	< 0.5 Ω

Control room did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =25 %, Max. =75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber1 (6.9 meters×10.9 meters×5.4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. = 25 %, Max. = 75 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 10 kΩ
Ground system resistance	< 0.5 Ω
VSWR	Between 0 and 6 dB, from 1GHz to 18GHz
Site Attenuation Deviation	Between -4 and 4 dB,30MHz to 1GHz
Uniformity of field strength	Between 0 and 6 dB, from 80MHz to 3000 MHz

ANNEX A. MEASUREMENT RESULTS

ANNEX A.1. EMISSION LIMT

Reference

FCC: CFR 2.1051, 22.917,24.238(a), 27.53(g), 27.53(h) , 27.53(m).

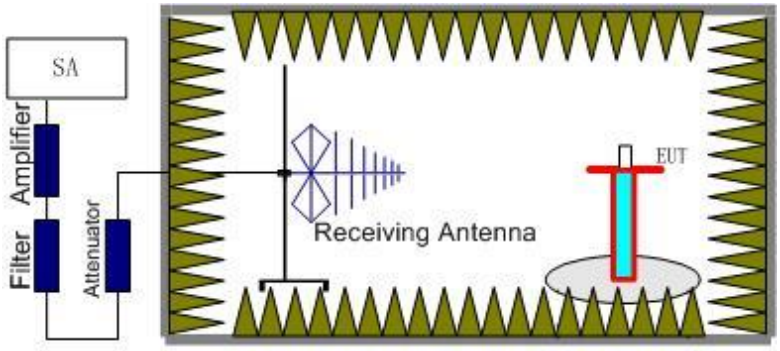
A.1.1 Measurement Method

The measurements procedures in TIA-603E-2016 are used. This measurement is carried out in fully-anechoic chamber FAC-3.

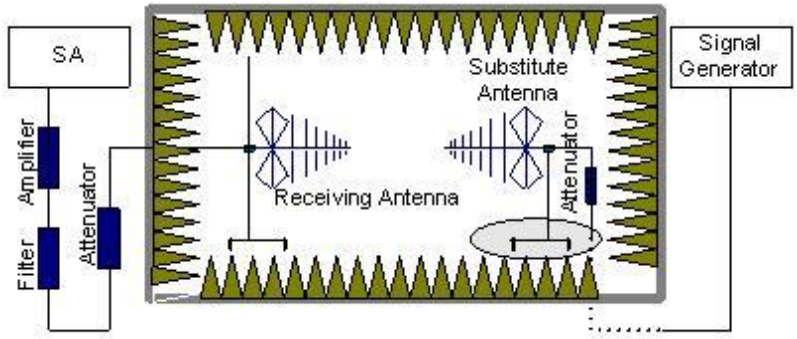
The spectrum was scanned from 30 MHz to the 10th harmonic of the highest frequency generated within the equipment, which is the transmitted carrier. The resolution bandwidth is set 1MHz as outlined in Part 22.917,Part 24.238(a), Part 27.53(g), Part 27.53(h), Part 27.53(m). The spectrum was scanned with the mobile station transmitting at carrier frequencies that pertain to low, mid and high channels of the LTE Bands 2, 4, 12,.

The procedure of radiated spurious emissions is as follows:

1. EUT was placed on a 1.5 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 1.5m. The test setup refers to figure below. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all non-harmonic and harmonics of the transmit frequency through the 10th harmonic were measured with peak detector.



2. The EUT is then put into continuously transmitting mode at its maximum power level during the test. And the maximum value of the receiver should be recorded as (Pr).
3. The EUT shall be replaced by a substitution antenna. The test setup refers to figure below.



In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna. Adjust the level of the signal generator output until the value of the receiver reaches the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.

4. The Path loss (P_{pl}) between the Signal Source with the Substitution Antenna and the Substitution Antenna Gain (G_a) should be recorded after test.
   An amplifier should be connected in for the test.
   The Path loss (P_{pl}) is the summation of the cable loss and the gain of the amplifier.
   The measurement results are obtained as described below:
   Power (EIRP)=P_{Mea}+ P_{pl} + G_a
5. This value is EIRP since the measurement is calibrated using an antenna of known gain (unit: dBi) and known input power.
6. ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP -2.15dB.

A.1.2 Measurement Limit

Part 22.917,Part 24.238(a), Part 27.53(g), Part 27.53(h), Part 27.53(m) all specify that the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10 log(P) dB. The specification that emissions shall be attenuated below the transmitter power (P) by at least 43 + 10 log (P) dB, translates in the relevant power range (1 to 0.001 W) to -13 dBm. At 1 W the specified minimum attenuation becomes 43 dB and relative to a 30 dBm (1 W) carrier becomes a limit of -13 dBm. At 0.001 W (0 dBm) the minimum attenuation is 13 dB, which again yields a limit of -13 dBm. In this way a translation of the specification from relative to absolute terms is carried out.

A.1.3 Measurement Results

7. Radiated emissions measurements were made only at the upper, middle, and lower carrier frequencies of the LTE Bands 2, 4, 12. It was decided that measurements at these three carrier frequencies would be sufficient to demonstrate compliance with emissions limits because it was seen that all the significant spurs occur well outside the band and no radiation was seen from a carrier in one block of the LTE Bands 2, 4, 12 into any of the other blocks.

The equipment must still, however, meet emissions requirements with the carrier at all frequencies over which it is capable of operating and it is the manufacturer's responsibility to verify this. The evaluated frequency range is from 30MHz to 26GHz.

Note: We only test the worse case

LTE Band 2, 1.4MHz, QPSK, Channel 18607

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit （dBm）	Margin(dB)	Polarization
3700.4	-42.31	6.6	6.2	-42.71	-13	29.71	V
5550.8	-46.62	8.2	9.7	-45.12	-13	32.12	V
7808	-54.86	9.9	15.6	-49.16	-13	36.16	V
9802	-51.61	11	18	-44.61	-13	31.61	V
14801	-45.86	14.3	23.5	-36.66	-13	23.66	V
17589.8	-39.3	15.5	20.4	-34.4	-13	21.4	H

LTE Band 2, 1.4MHz, QPSK, Channel 18900

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit （dBm）	Margin(dB)	Polarization
3758.8	-43.61	6.6	6.2	-44.01	-13	31.01	H
5638.8	-42.56	8.3	10	-40.86	-13	27.86	V
7392	-53.12	9.7	14.2	-48.62	-13	35.62	H
9398.8	-53.72	10.7	18.6	-45.82	-13	32.82	V
12731.8	-46.64	12.6	19.2	-40.04	-13	27.04	V
16461.4	-40.08	14.7	20.3	-34.48	-13	21.48	H

LTE Band 2, 1.4MHz, QPSK, Channel 19193

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit （dBm）	Margin(dB)	Polarization
3817.2	-44.57	6.7	6.5	-44.77	-13	31.77	H
5726.4	-39.86	8.5	10.4	-37.96	-13	24.96	H
9146.8	-54.01	10.5	18.4	-46.11	-13	33.11	H
10442.8	-48.42	11.6	17.1	-42.92	-13	29.92	V
12887.2	-46.93	12.9	19.7	-40.13	-13	27.13	V
17917.4	-39.62	16.2	21.8	-34.02	-13	21.02	H

LTE Band 4, 1.4MHz QPSK, Channel 19957

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Margin(dB)	Polarization
3420.4	-40.82	6.3	5.7	-41.42	-13	28.42	V
5187.6	-51.64	8	8.8	-50.84	-13	37.84	V
6840.8	-52.19	9.2	12.5	-48.89	-13	35.89	V
8550.8	-53.6	10.3	18.2	-45.7	-13	32.7	V
13244.2	-46.66	13.3	21.8	-38.16	-13	25.16	H

17211.8	-37.94	16	19.8	-34.14	-13	21.14	V

LTE Band 4, 1.4MHz, QPSK, Channel 20175

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Margin(dB)	Polarization
3464	-43.66	6.4	5.8	-44.26	-13	31.26	V
5196.4	-46.57	8	8.8	-45.77	-13	32.77	V
6842.4	-52.44	9.2	12.5	-49.14	-13	36.14	V
8660.4	-54.85	10.3	18.4	-46.75	-13	33.75	V
10494	-49.36	11.6	17.1	-43.86	-13	30.86	H
16510.4	-39.14	14.6	20.1	-33.64	-13	20.64	H

LTE Band 4, 1.4MHz, QPSK, Channel 20393

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak EIRP(dBm)	Limit （dBm）	Margin(dB)	Polarization
3507.2	-43.06	6.4	6	-43.46	-13	30.46	V
5261.2	-47.8	8	8.7	-47.1	-13	34.1	V
7260	-51.96	9.6	13.7	-47.86	-13	34.86	H
8769.2	-53.08	10.4	18.5	-44.98	-13	31.98	V
12762.6	-46.52	12.6	19.2	-39.92	-13	26.92	V
17948.2	-40.14	16.3	22.1	-34.34	-13	21.34	V

LTE Band 12, 1.4MHz, QPSK, Channel 23017

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit （dBm）	Margin(dB)	Polarization
1398.384615	-45.69	4	2.8	-46.89	-13	33.89	H
2097.692308	-43.31	4.9	3	-45.21	-13	32.21	V
2796.923077	-33.64	5.7	4.2	-35.14	-13	22.14	V
3496	-31.47	6.4	6	-31.87	-13	18.87	V
7004.2	-52.66	9.3	12.9	-49.06	-13	36.06	V
8309.2	-55.41	10.1	17.5	-48.01	-13	35.01	V

LTE Band 12, 1.4MHz, QPSK, Channel 23095

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit （dBm）	Margin(dB)	Polarization
1413.615385	-47.85	4	2.9	-48.95	-13	35.95	H
2120.769231	-45.48	4.9	3	-47.38	-13	34.38	V
2828.076923	-35.8	5.8	4.3	-37.3	-13	24.3	V
3535.2	-34.09	6.4	6	-34.49	-13	21.49	V
7237.9	-52.66	9.6	13.6	-48.66	-13	35.66	V
9084.1	-54.81	10.5	18.4	-46.91	-13	33.91	V

LTE Band 12, 1.4MHz, QPSK, Channel 23173

Frequency(MHz)	P_{Mea}(dBm)	Path Loss	Antenna Gain	Peak ERP(dBm)	Limit （dBm）	Margin(dB)	Polarization
1429.538462	-49.73	4.1	3	-50.83	-13	37.83	H
2144.615385	-42.39	5	3.1	-44.29	-13	31.29	V
2859.615385	-34.36	5.8	4.3	-35.86	-13	22.86	V
3574	-30.85	6.4	6	-31.25	-13	18.25	V
5772.4	-52.88	8.5	10.5	-50.88	-13	37.88	H
7260.1	-51.77	9.6	13.7	-47.67	-13	34.67	V

ANNEX B. Deviations from Prescribed Test Methods

No deviation from Prescribed Test Methods.

************End The Report************