



No. 1 Workshop, M-10, Middle section, Science & Technology Park,  
Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053

Fax: +86 (0) 755 2671 0594

Email: ee.shenzhen@sgs.com

Report No.: SZEM180100100002

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## **RF Exposure Evaluation Report**

<b>Application No.:</b>	SZEM1801001000RG
<b>Applicant:</b>	Shanghai Simcom Wireless Solutions Limited
<b>Manufacturer:</b>	Shanghai Simcom Wireless Solutions Limited
<b>Factory:</b>	Shanghai Simcom Wireless Solutions Limited
<b>Product Name:</b>	LTE-FDD MODULE
<b>Model No.(EUT):</b>	SIM7600V-H , SIM7600V-H miniPCIE
<b>Trade Mark:</b>	SIMCom
<b>FCC ID:</b>	2AJYU-201802
<b>Standards:</b>	47 CFR Part 2(2017) 47 CFR Part 22 subpart H(2017) 47 CFR Part 24 subpart E(2017) 47 CFR Part 27 subpart C(2017)
<b>Date of Receipt:</b>	2018-02-18
<b>Date of Test:</b>	2018-02-20 to 2018-03-21
<b>Date of Issue:</b>	2018-04-08

<b>Test Result:</b>	<b>PASS*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Derek Yang  
Wireless Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

## 2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2018-04-08		Original

Authorized for issue by:			
		 Mike Hu	2018-04-08
		Mike Hu /Project Engineer	
		 Jim Huang	2018-04-08
		Jim Huang /Reviewer	

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### 3 General Information

#### 3.1 Client Information

Applicant:	Shanghai Simcom Wireless Solutions Limited
Address of Applicant:	SIM Technology Building, No.633, Jinzhong Rd, Changning District, Shanghai, P.R.China
Manufacturer:	Shanghai Simcom Wireless Solutions Limited
Address of Manufacturer:	SIM Technology Building, No.633, Jinzhong Rd, Changning District, Shanghai, P.R.China
Factory:	Shanghai Simcom Wireless Solutions Limited
Address of Factory:	SIM Technology Building, No.633, Jinzhong Rd, Changning District, Shanghai, P.R.China

#### 3.2 General Description of EUT

Product Name:	LTE-FDD MODULE
Model No.:	SIM7600V-H · SIM7600V-H miniPCIE
Trade Mark:	SIMCom
Antenna Gain:	LTE B2: 1.87dBi; LTE B4: 3.12dBi; LTE B5: 0.91dBi; LTE B13: 2.23dBi

#### 3.3 Test Mode

Test Mode	Test Modes Description
LTE/TM1	LTE system, QPSK modulation
LTE/TM2	LTE system, 16QAM modulation

NOTE: The test mode(s) are selected according to relevant radio technology specifications.

### **3.4 Test Location**

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China  
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

### **3.5 Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

- CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- VCCI**

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- Industry Canada (IC)**

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

### **3.6 Deviation from Standards**

None.

### **3.7 Abnormalities from Standard Conditions**

None.

### **3.8 Other Information Requested by the Customer**

None.

## 4 RF Exposure Evaluation

### 4.1 RF Exposure Compliance Requirement

#### 4.1.1 Limits

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

F=frequency in MHz

\*=Plane-wave equivalent power density

RF exposure compliance will need to be determined with respect to 1.1307(c) and (d) of the FCC rules. The emissions should be within the limits at 300kHz in Table 1 of 1.1310(use the 300kHz limits for 150kHz:614V/m,1.63A/m).

Friis Formula

Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * R^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = 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

$P_d$  is 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.

#### 4.1.2 Test Procedure

Software provided by client enabled the EUT to transmit data at lowest, middle and highest channel individually.

#### 4.1.3 EUT RF Exposure Evaluation

##### For LTE Band 2/4/5/13

Antenna Gain: 1.87 dBi / 3.12 dBi / 0.91 dBi / 2.23 dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 2.0 / 2.0 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Operating Band	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )	Result
Band 2	1850.7	25.7	371.5352291	0.1137	1.0	PASS
Band 4	1710.7	25.7	371.5352291	0.1516	1.0	PASS
Band 5	824.7	25.7	371.5352291	0.0911	0.5498	PASS
Band 13	779.5	25.7	371.5352291	0.1235	0.5197	PASS

Note: Refer to report No. SZEM180100100001 for EUT test Max Conducted Peak Output Power value.

The distance (4th column) calculated from the Friis transmission formula is far greater than 20 cm separation requirement.