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RADIO TEST REPORT

Report No: STS2206167H01

Issued for

SIMCom Wireless Solutions Limited

Building 3, No.289 Linhong Road, Shanghai, China

Product Name:	LPWA MODULE
Brand Name:	SIMCom
Model Name:	SIM7080G
Series Model:	N/A
FCC ID:	2AJYU-8VC0002
Test Standard:	FCC 47CFR §2.1091

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Test Report Certification

Applicant's Name : SIMCom Wireless Solutions Limited

Address : Building 3, No.289 Linhong Road, Shanghai, China

Manufacturer's Name : SIMCom Wireless Solutions Limited

Address : Building 3, No.289 Linhong Road, Shanghai, China

Product Description

Product Name : LPWA MODULE

Brand Name : SIMCom

Model Name : SIM7080G

Series Model : N/A

Standards : FCC 47CFR §2.1091

447498 D04 Interim General RF Exposure Guidance v01

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Date of Test :

Date of receipt of test item : 22 June 2022

Date (s) of performance of tests : 22 June 2022 ~ 06 July 2022

Date of Issue : 20 July 2022

Test Result : **Pass**

Testing Engineer :

(Chris Chen)

Technical Manager :

(Sean She)

Authorized Signatory :

(Bovey Yang)





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Revision History

Rev.	Issue Date	Report No.	Effect Page	Contents
00	06 July 2022	STS2206167H01	ALL	Initial Issue
01	20 July 2022	STS2206167H01	ALL	Update applicant address, manufacturer address, product name, software version number.





1. GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF THE EUT

Product Name	LPWA MODULE										
Brand Name	SIMCom										
Model Name	SIM7080G										
Series Model	N/A										
Model Difference	N/A										
Product Description	<p>The EUT is NB/GNSS MODULE</p> <table border="1"><tr><td>Operation Frequency:</td><td>CAT-M LTE Band 2:1850~1910MHz CAT-M LTE Band 4:1710~1755MHz CAT-M LTE Band 12:699~716MHz CAT-M LTE Band 13:777~787MHz CAT-M LTE Band 25:1850~1915MHz CAT-M LTE Band 26:814~849MHz NB-IOT Band 2:1850~1910MHz NB-IOT Band 4:1710~1755MHz NB-IOT Band 5:824~849MHz NB-IOT Band 12:699~716MHz NB-IOT Band 13:777~787MHz NB-IOT Band 71:663~698MHz</td><td></td></tr><tr><td>Modulation Type:</td><td>CAT-M/ NB-IOT: BPSK /QPSK</td></tr><tr><td>Antenna gain:</td><td>CAT-M B2/B25: 9.85dBi, CAT-M B4: 10.85dBi, CAT-M B12: 6.61dBi, CAT-M B13: 8.02dBi, CAT-M B26: 6.29dBi, NB-IOT B2: 10.85dBi, NB-IOT B4: 11.31dBi, NB-IOT B5: 8.28dBi, NB-IOT B12: 7.57dBi, NB-IOT B13: 8.46dBi, NB-IOT B71: 7.77dBi</td></tr><tr><td>Antenna Designation:</td><td>External Antenna</td></tr></table>	Operation Frequency:	CAT-M LTE Band 2:1850~1910MHz CAT-M LTE Band 4:1710~1755MHz CAT-M LTE Band 12:699~716MHz CAT-M LTE Band 13:777~787MHz CAT-M LTE Band 25:1850~1915MHz CAT-M LTE Band 26:814~849MHz NB-IOT Band 2:1850~1910MHz NB-IOT Band 4:1710~1755MHz NB-IOT Band 5:824~849MHz NB-IOT Band 12:699~716MHz NB-IOT Band 13:777~787MHz NB-IOT Band 71:663~698MHz		Modulation Type:	CAT-M/ NB-IOT: BPSK /QPSK	Antenna gain:	CAT-M B2/B25: 9.85dBi, CAT-M B4: 10.85dBi, CAT-M B12: 6.61dBi, CAT-M B13: 8.02dBi, CAT-M B26: 6.29dBi, NB-IOT B2: 10.85dBi, NB-IOT B4: 11.31dBi, NB-IOT B5: 8.28dBi, NB-IOT B12: 7.57dBi, NB-IOT B13: 8.46dBi, NB-IOT B71: 7.77dBi	Antenna Designation:	External Antenna	
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Antenna Designation:	External Antenna										
Power Rating:	Input: DC 3.8V										
Hardware version number:	V1.03										
Software version number:	R1951.04										

1.2 TEST FACTORY

SHENZHEN STS TEST SERVICES CO., LTD

Add. : A 1/F, Building B, Zhuoke Science Park, No.190 Chongqing Road, HepingShequ, Fuyong Sub-District, Bao'an District, Shenzhen, Guang Dong, China

FCC test Firm Registration Number: 625569

IC test Firm Registration Number: 12108A

A2LA Certificate No.: 4338.01

Shenzhen STS Test Services Co., Ltd.



2. FCC 47CFR §2.1091 REQUIREMENT

2.1 TEST STANDARDS

Follow the maximum permissible exposure (MPE) limits specified in 447498 D04 Interim General Radio Frequency Exposure Guidelines v01. The gain of the antenna used in the product was extracted from the supplied antenna data sheet and the maximum total power input to the antenna was also measured. Calculate the distance from the product to the MPE limit by the formula.

2.2 LIMIT

For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

(A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of Part 1.1307. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);

(B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold P_{th} (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by:

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);



(C) Or using below table and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least $\lambda/2\pi$, where λ is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of $\lambda/4$ or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

RF Source frequency (MHz)	Threshold ERP(watts)
0.3-1.34	1,920 R ² .
1.34-30	3,450 R ² /f ² .
30-300	3.83 R ² .
300-1,500	0.0128 R ² f.
1,500-100,000	19.2R ² .



For multiple RF sources: Multiple RF sources are exempt if:

(A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of Part 1.1307. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).

(B) in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure\ Limit_k} \leq 1$$

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of Part 1.1307 for $P_{th,i}$, including existing exempt transmitters and those being added.

b = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of Part 1.1307 for Threshold ERP, including existing exempt transmitters and those being added.

c = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

P_i = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source i at a distance between 0.5 cm and 40 cm (inclusive).

$P_{th,i}$ = the exemption threshold power ($P_{th,i}$) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source i .

ERP_j = the ERP of fixed, mobile, or portable RF source j .

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source j , at a distance of at least $\lambda/2\pi$ according to the applicable formula of paragraph (b)(3)(i)(C) of Part 1.1307.

$Evaluated_k$ = the maximum reported SAR or MPE of fixed, mobile, or portable RF source k either in the device or at the transmitter site from an existing evaluation at the location of exposure.

$Exposure\ Limit_k$ = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source k , as applicable from § 1.1310.



2.3 TEST RESULT

Turn up

Mode	Detector	Turn up Power
CAT-M Band 2	AV	24±1
CAT-M Band 4	AV	23±1
CAT-M Band 12	AV	24±1
CAT-M Band 13	AV	23±1
CAT-M Band 25	AV	24±1
CAT-M Band 26	AV	25±1
NB-IoT Band 2	AV	23±1
NB-IoT Band 4	AV	21±1
NB-IoT Band 5	AV	23±1
NB-IoT Band 12	AV	23±1
NB-IoT Band 13	AV	20±1
NB-IoT Band 71	AV	21±1



Protocol	Fre. (GHz)	Separation distance (cm)	Max Turn up power (dBm)	ANT Gain (dBi)	Max EIRP (dBm)	Max EIRP (mW)	Limit (mW)	Ratio	Result
CAT-M Band 2	1.8600	20	25.00	9.85	34.85	3054.92	3060	0.998	Pass
CAT-M Band 4	1.7325	20	24.00	10.85	34.85	3054.92	3060	0.998	Pass
CAT-M Band 12	0.7110	20	25.00	6.61	31.61	1448.77	1450	0.999	Pass
CAT-M Band 13	0.7820	20	24.00	8.02	32.02	1592.21	1595	0.998	Pass
CAT-M Band 25	1.9050	20	25.00	9.85	34.85	3054.92	3060	0.998	Pass
CAT-M Band 26	0.8315	20	26.00	6.29	32.29	1694.34	1696	0.999	Pass
NB-IoT Band 2	1.9000	20	24.00	10.85	34.85	3054.92	3060	0.998	Pass
NB-IoT Band 4	1.7325	20	22.00	11.31	33.31	2142.89	3060	0.700	Pass
NB-IoT Band 5	0.8290	20	24.00	8.28	32.28	1690.44	1691	1.000	Pass
NB-IoT Band 12	0.7040	20	24.00	7.57	31.57	1435.49	1436	1.000	Pass
NB-IoT Band 13	0.7820	20	21.00	8.46	29.46	883.08	1595	0.555	Pass
NB-IoT Band 71	0.6830	20	22.00	7.77	29.77	948.42	1393	0.681	Pass

Note: The Maximum power is less than the limit, complies with the exemption requirements.

*****END OF THE REPORT*****