



TEST REPORT

REPORT NUMBER: I21W00031

ON

Type of Equipment: LTE Cat.1 cellular module

Type of Designation: SLM320-L

Manufacturer: MeiG Smart Technology Co., Ltd

FCC ID: 2APJ4-SLM320-L

ACCORDING TO

FCC CFR 47 Part 2.1091 《Radiofrequency radiation exposure evaluation: mobile devices》

FCC CFR 47 Part1.1310 《Radiofrequency radiation exposure limits》

Chongqing Academy of Information and Communication Technology

Month date, year

Sep,13,2021

Signature

Xiang Luoyong

Director

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 Chongqing Academy of Information and Communications Technology.



Revision Version

Report Number	Revision	Date	Memo
I21W00031	01	2021-09-13	Initial creation of test report



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ANNEX A: EUT PHOTOGRAPH..... 11

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1. Test Laboratory

1.1. Testing Location

Company Name:	Chongqing Academy of Information and Communications Technology
Address:	No. 8, Yuma Road, Chayuan New City, Nan'an District, Chongqing, P. R. China
Postal Code:	401336
Telephone:	0086-23-88069965
Fax:	0086-23-88608777

1.2. Testing Environment

Normal Temperature:	21.3°C
Relative Humidity:	65%

1.3. Project Data

Testing Start Date:	2021-09-13
Testing End Date:	2021-09-13

1.4. Signature



2021-09-13

Fu Bohao
(Prepared this test report)


Date



2021-09-13

Wang Lili
(Reviewed this test report)

Date



2021-09-13

Xiang Luoyong
Director of the laboratory
(Approved this test report)

Date

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2. Client Information

2.1. Applicant Information

Company Name:	MeiG Smart Technology Co., Ltd
Address /Post:	3/F, No.88, Qinjiang Road, Xuhui District, Shanghai
Telephone:	021-54278676
Fax:	--
Email:	louxinwei@meigsmart.com
Contact Person:	louxinwei

2.2. Manufacturer Information

Company Name:	MeiG Smart Technology Co., Ltd
Address /Post:	3/F, No.88, Qinjiang Road, Xuhui District, Shanghai
Telephone:	021-54278676
Fax:	--
Email:	louxinwei@meigsmart.com
Contact Person:	louxinwei

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

3.1. About EUT

Description:	LTE Cat.1 cellular module
Model name:	SLM320-L
GSM Frequency Band	850/1900
LTE Frequency Band	Band2/4/5/7
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
S4	M320L16AHB071 800060	SLM320LA_MB_ V1.00_PCB	SLM320LA_68B3A22_2 0210710_V21_T01	2021-08-23

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

3.3. Internal Identification of AE used during the test

EUT ID*	SN	Description
NA	NA	NA

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

4. Reference Documents

4.1. Applicable Standards

The MPE report was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 2.1091.

FCC CFR 47 Part 2.1091: Radiofrequency radiation exposure evaluation: mobile devices

4.2. Test Limits

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 0.2m normally can be maintained between the user and the device.

MPE for the upper tier (people in controlled environments)

Frequency Range [MHz]	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100000	--	--	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100000	--	--	1.0	30

Note: f=frequency in MHz; *Plane-wave equivalent power density

For the DUT, the limits for the general public when an RF safety program is unavailable.

5. Test Results

5.1. RF Power Output

Frequency Band	Highest Averaged Power Output(dBm)	Highest Frame-Averaged Output Power (dBm)	Antenna Gain(dBi)
GPRS 850 1TS	33.80	24.77	3.5
GPRS 1900 1TS	30.30	21.27	3.3
LTE Band 2	23.08	23.08	3.5
LTE Band 4	23.39	23.39	3.9
LTE Band 5	23.88	23.88	3.5
LTE Band 7	23.69	23.69	5.1

Notes:

1) Division Factors

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

2) According to the conducted power as above, the measurements are performed with 1Txslots for 850MHz and 1900MHz.

5.2. Calculation Information

For conservative evaluation consideration, only maximum power of each frequency band based on the tighter limits respectively are used to calculate the boundary power density.

Based on the FCC KDB 447498 D01 and 47 CFR §2.1091, the DUT is evaluated as a mobile device.

$$S = \frac{PG}{4\pi d^2}$$

Where

P = Power in Watts

G = Numeric antenna gain

d = Distance in meters

S = Power density in milliwatts / square centimeter

5.3. Results

Frequency range	Limit(mW/cm ²)	Results(mW/cm ²)	Verdict
GPRS 850 1TS	0.550	0.134	Pass
GPRS 1900 1TS	1.000	0.057	Pass
LTE Band 2	1.000	0.091	Pass
LTE Band 4	1.000	0.107	Pass
LTE Band 5	0.549	0.109	Pass
LTE Band 7	1.000	0.151	Pass

5.4. Result of GPRS 850

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 824.2 ~ 848.8 MHz; The maximum conducted is 24.77 dBm. The maximum gain is 3.5 dBi. Therefore, maximum limit for general public RF exposure: $824.2/1500=0.55$ mW/cm².

$$S = \frac{PG}{4\pi r^2}$$

P= input power of the antenna (299.916 mW)

G = antenna gain (2.239 numeric)

r = distance to the center of radiation of antenna (in meter)= 20 cm

$$S=(299.916*2.239)/(4 \pi *20^2)=0.134 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.55 mW/cm² limit for uncontrolled exposure.

5.5. Result of GPRS 1900

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 1850.2 ~ 1909.8 MHz; The maximum conducted is 21.27 dBm. The maximum gain is 3.3 dBi. Therefore, maximum limit for general public RF exposure: 1 mW/cm².

$$S = \frac{PG}{4\pi r^2}$$

P= input power of the antenna (133.968 mW)

G = antenna gain (2.138 numeric)

r = distance to the center of radiation of antenna (in meter)= 20 cm

$$S=(133.968*2.138)/(4 \pi *20^2)=0.057 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1 mW/cm² limit for uncontrolled exposure.

5.6. Result of LTE Band 2

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 1850.0 ~ 1909.9 MHz; The maximum conducted is 23.08 dBm. The maximum gain is 3.5 dBi. Therefore, maximum limit for general public RF exposure: 1.0 mW/cm².

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (203.236 mW)

G = antenna gain (2.239 numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(203.236*2.239)/(4 \pi *20^2)=0.091 \text{ mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1 mW/cm² limit for uncontrolled exposure.

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5.7. Result of LTE Band 4

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 1710.0 ~ 1754.9MHz; The maximum conducted is 23.39 dBm. The maximum gain is 3.9 dBi. Therefore, maximum limit for general public RF exposure: 1.0 mW/cm².

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (218.273 mW)

G = antenna gain (2.455numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(218.273*2.455)/(4 \pi *20^2)=0.107\text{mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.0 mW/cm² limit for uncontrolled exposure.

5.8. Result of LTE Band 5

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 824.0 ~ 848.9 MHz; The maximum conducted is 23.88 dBm. The maximum gain is 3.5 dBi. Therefore, maximum limit for general public RF exposure: 824.0/1500=0.549 mW/cm².

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (244.343 mW)

G = antenna gain (2.239numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(244.343*2.239)/(4 \pi *20^2)=0.109\text{mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 0.549mW/cm² limit for uncontrolled exposure.

5.9. Result of LTE Band 7

Test Results: MPE Limit Calculation: the EUT'S operating frequencies @ 2500.0 ~ 2569.9 MHz; The maximum conducted is 23.69dBm. The maximum gain is 5.1 dBi. Therefore, maximum limit for general public RF exposure: 1.0 mW/cm².

$$S = \frac{PG}{4\pi d^2}$$

P= input power of the antenna (233.884 mW)

G = antenna gain (3.236numeric)

r = distance to the center of radiation of antenna (in meter)=20 cm

$$S=(233.884*3.236)/(4 \pi *20^2)=0.151\text{mW/cm}^2$$

Therefore, at 20 cm the spectral power density is less than the 1.0 mW/cm² limit for uncontrolled exposure.

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ANNEX A: EUT photograph

See the document "SLM320-L -External Photos".

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

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