



RF Exposure Evaluation Declaration

FCC ID: 2APJ4-SLM156
Applicant: MeiG Smart Technology Co., Ltd
Product: CAT-M Module
Model No.: SLM156
Brand Name: MEIGLink
FCC Rule Part(s) FCC Part 2.1091
Test Procedure KDB 447498 D04 Interim General RF Exposure
Guidance v01
Result: Complies

Reviewed By:

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Approved By:

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The test results relate only to the samples tested.

The test results shown in the test report are traceable to the national/international standards through the calibration of the equipment and evaluated measurement uncertainty herein.

The test report shall not be reproduced except in full without the written approval of MRT Technology (Suzhou) Co., Ltd.

Revision History

Report No.	Version	Description	Issue Date	Note
2205RSU044-U7	Rev. 01	Initial Report	2023-04-21	Valid

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1.4. Product Information

Product Name	CAT-M Module
Model No.	SLM156
IMEI	Conducted Measurement: 868510050004513 Radiated Measurement: 868510050007318
Operating Temperature	-35 ~ 75 °C
Hardware Version	SLM156_V1.01_PCB
Software Version	SLM156_5.0.12_EQ100
Power Type	3.3 ~ 4.2Vdc, typical 3.8Vdc
GSM Specification	
Band	GSM850, PCS1900
Modulation	GMSK, 8PSK
E-UTRA Specification	
Single Band	Cat M Band 2, 4, 5, 12, 13, 14, 25, 26, 66 NB-IoT Band 2, 4, 5, 12, 13, 25, 26, 66, 71
Modulation	Cat M: Uplink up to 16QAM, Downlink up to 16QAM NB-IoT: Uplink BPSK, QPSK; Downlink QPSK
Remark: The information of EUT was provided by the manufacturer, and the accuracy of the information shall be the responsibility of the manufacturer.	

1.5. Antenna Details

Frequency Range (MHz)	Antenna Type	Max Peak Gain (dBi)
1850 ~ 1910	PCB Antenna	0.78
1710 ~ 1755		-0.10
824 ~ 849		0.44
699 ~ 716		1.72
777 ~ 787		1.59
788 ~ 798		0.66
1850 ~ 1915		0.71
814 ~ 849		0.49
1710 ~ 1780		-0.10
663 ~ 698		-2.38

Note: All antenna information (Antenna type and Peak Gain) is provided by the manufacturer.

1.6. Device Classification

According to the user manual, the antenna of this device is at least 20cm away from the body of the user, this device is classified as a **Mobile Device**. Therefore, the RF exposure evaluation requirements of FCC Part 2.1091 for mobile device exposure conditions subject to MPE limits.

2. RF Exposure Evaluation

2.1. Test Limits

According to FCC Part 2.1091, A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 cm is normally maintained between the RF source's radiating structure(s) and the body of the user or nearby persons.

According to FCC Part 1.1307(b)(3)(i)(C), 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.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

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
300-1500	0.0128 R ² f
1500-100,000	19.2 R ²

f = frequency in MHz, R = minimum separation distance in meters.

According to FCC Part 1.1307(b)(3)(ii)(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.

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

2.2. Test Result

Product	CAT-M Module
Test Item	RF Exposure Evaluation

Test Mode	Frequency Range (MHz)	Max. Tune-up Power (dBm)	Max. Antenna Gain (dBi)	EIRP (dBm)	ERP (W)	Compliance Distance (R) (m)	Threshold ERP (W)	Result
GSM 850	824.2~848.8	25.0	0.44	25.44	0.2133	0.20	0.422	Pass
PCS 1900	1850.2~1909.8	22.0	0.78	22.78	0.1156	0.20	0.768	Pass
Cat M Band 2	1850.7~1909.3	23.0	0.78	23.78	0.1455	0.20	0.768	Pass
Cat M Band 4	1710.7~1754.3	23.0	-0.10	22.90	0.1189	0.20	0.768	Pass
Cat M Band 5	824.7~848.3	23.0	0.44	23.44	0.1346	0.20	0.422	Pass
Cat M Band 12	699.7~715.3	23.0	1.72	24.72	0.1807	0.20	0.358	Pass
Cat M Band 13	779.5~784.5	23.0	1.59	24.59	0.1754	0.20	0.399	Pass
Cat M Band 14	790.5~795.5	23.0	0.66	23.66	0.1416	0.20	0.405	Pass
Cat M Band 25	1850.7~1914.3	23.0	0.71	23.71	0.1432	0.20	0.768	Pass
Cat M Band 26	814.7~848.3	23.0	0.49	23.49	0.1361	0.20	0.417	Pass
Cat M Band 66	1710.7~1779.3	23.0	-0.10	22.90	0.1189	0.20	0.768	Pass
NB-IoT Band 2	1850.2~1909.8	23.0	0.78	23.78	0.1455	0.20	0.768	Pass
NB-IoT Band 4	1710.2~1754.8	23.0	-0.10	22.90	0.1189	0.20	0.768	Pass
NB-IoT Band 5	824.2~848.8	23.0	0.44	23.44	0.1346	0.20	0.422	Pass
NB-IoT Band 12	699.2~715.8	23.0	1.72	24.72	0.1807	0.20	0.358	Pass
NB-IoT Band 13	777.2~786.8	23.0	1.59	24.59	0.1754	0.20	0.398	Pass
NB-IoT Band 25	1850.2~1914.8	23.0	0.71	23.71	0.1432	0.20	0.768	Pass
NB-IoT Band 26	814.2~823.8	23.0	0.49	23.49	0.1361	0.20	0.417	Pass
NB-IoT Band 66	1710.2~1779.8	23.0	-0.10	22.90	0.1189	0.20	0.768	Pass
NB-IoT Band 71	663.2~697.8	23.0	-2.38	20.62	0.0703	0.20	0.340	Pass

Note:

1. EIRP (dBm) = Max. Tune-up Power (dBm) + Max. Antenna Gain (dBi)
2. ERP (W) = $10^{[ERP \text{ (dBm)} - 30]/10} = 10^{[EIRP \text{ (dBm)} - 2.15 \text{ (dB)} - 30]/10}$

Therefore, this device meets the RF Exposure requirements when it is installed and operated with a minimum distance of 20cm between the radiator and user.

The End