

TEST REPORT

Applicant: NETPRISMA INC.
Address: 1301 6th Ave., Seattle, Washington State, 98101-2304, United States
Equipment Type: LTE Cat M1 Module
Model Name: PCUL11-LD1
Brand Name: Vrileg
FCC ID: 2BEY3PCUL11LD1A
Test Standard: 47 CFR Part 2.1091
KDB 447498 D04 v01
Sample Arrival Date: Nov. 14, 2023
Test Date: Nov. 14, 2023 - Dec. 01, 2023
Date of Issue: May 22, 2024

ISSUED BY:

Shenzhen BALUN Technology Co., Ltd.

Tested by: Xiong Lining

Checked by: Xu Rui

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(Testing Director)

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Revision History

<u>Version</u>	<u>Issue Date</u>	<u>Revisions Content</u>
<u>Rev. 01</u>	<u>Jan. 11, 2024</u>	<u>Initial Issue</u>
<u>Rev. 02</u>	<u>May 11, 2024</u>	<u>Updated model name, brand name, FCC ID, applicant and manufacturer information.</u>
		<u>Updated power data for Band2/19/25.</u>
<u>Rev. 03</u>	<u>May 22, 2024</u>	<u>Updated section 5 ASSESSMENT RESULT.</u>

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shenzhen BALUN Technology Co., Ltd.
Address	Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Phone Number	+86 755 6685 0100

1.2 Test Location

Name	Shenzhen BALUN Technology Co., Ltd.
Location	☒ Block B, 1/F, Baisha Science and Technology Park, Shahe Xi Road, Nanshan District, Shenzhen, Guangdong Province, P. R. China
	☐ 1/F, Building B, Ganghongji High-tech Intelligent Industrial Park, No. 1008, Songbai Road, Yangguang Community, Xili Sub-district, Nanshan District, Shenzhen, Guangdong Province, P. R. China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1196.

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	NETPRISMA INC.
Address	1301 6th Ave., Seattle, Washington State, 98101-2304, United States

2.2 Manufacturer Information

Manufacturer	NETPRISMA INC.
Address	1301 6th Ave., Seattle, Washington State, 98101-2304, United States

2.3 General Description for Equipment under Test (EUT)

EUT Name	LTE Cat M1 Module
Model Name Under Test	PCUL11-LD1
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	R2.1
Software Version	PCUL11LD1BL0501
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.4 Technical Information

Network and Wireless connectivity	4G Network FDD LTE-M1 Band 2/4/5/12/13/18/19/25/26/66/85
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The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	LTE-M1		
Frequency Range	LTE-M1 Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE-M1 Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	LTE-M1 Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE-M1 Band 12	TX: 699 ~ 716 MHz	RX: 729 ~ 746 MHz
	LTE-M1 Band 13	TX: 777 ~ 787 MHz	RX: 746 ~ 756 MHz
	LTE-M1 Band 18	TX: 814~ 824 MHz	RX: 860 ~ 869 MHz
		TX: 824~ 830 MHz	RX: 869 ~ 875 MHz
	LTE-M1 Band 19	TX: 830 ~ 845 MHz	RX: 875 ~ 890 MHz
	LTE-M1 Band 25	TX: 1850 ~ 1915 MHz	RX: 1930 ~ 1995 MHz
	LTE-M1 Band 26	TX: 814 ~ 824 MHz	RX: 859 ~ 869 MHz
		TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE-M1 Band 85	TX: 698 ~ 716 MHz	RX:728 ~ 746 MHz
Antenna Type	WWAN	External Antenna	
Exposure Category	General Population/Uncontrolled Exposure		
Product Type	Mobile Device		

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1091	Radiofrequency radiation exposure evaluation: mobile devices
2	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01

4 DEVICE CATEGORY AND LEVELS LIMITS

Mobile Device:

CFR Title 47 §2.1091(b)

(b) For purposes of this section, 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 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons.

FCC KDB 447498 D04 General RF Exposure Guidance v01 Limit

Evaluation of compliance with the exposure limits in § 1.1310 is necessary if the ERP of the device is greater than ERP_{20cm} in Formula (B.1) [repeated from § 2.1091(c)(1) and § 1.1307(b)(1)(i)(B)].

$$P_{th} \text{ (mW)} = ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases} \quad (\text{B.1})$$

If the ERP is not easily obtained, then the available maximum time-averaged power may be used (i. e., without consideration of ERP only 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.

SAR-based exemptions are constant at separation distances between 20 cm and 40 cm to avoid discontinuities in the threshold when transitioning between SAR-based and MPE-based exemption criteria at 40 cm, considering the importance of reflections.

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW).

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases} \quad (\text{B. 2})$$

where

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

and f is in GHz, d is the separation distance (cm), and $ERP_{20 \text{ cm}}$ is per Formula (B.1). The example values shown in Table B.2 are for illustration only.

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)										
		5	10	15	20	25	30	35	40	45	50
300		39	65	88	110	129	148	166	184	201	217
450		22	44	67	89	112	135	158	180	203	226
835		9	25	44	66	90	116	145	175	207	240
1900		3	12	26	44	66	92	122	157	195	236
2450		3	10	22	38	59	83	111	143	179	219
3600		2	8	18	32	49	71	96	125	158	195
5800		1	6	14	25	40	58	80	106	136	169

5 ASSESSMENT RESULT

5.1 Output Power

LTE-M1							
Mode	Band2	Band4	Band5	Band12	Band13	Band 18 (815-824MHz)	Band 18 (824-830MHz)
Conducted Power (dBm)	20.43	20.11	20.18	20.44	20.65	20.59	20.53
Antenna Gain (dBi)	1.59	2.00	2.53	3.95	4.45	3.19	2.53
EIRP/ERP (dBm)	23.61	22.11	20.56	22.24	22.95	21.63	20.91
Note: This report listed the worst case power value, please refer to BL-SZ23B0626-501 report for more details.							

LTE-M1						
Mode	Band19	Band25	LTE Band26 (part22)	LTE Band26 (part90)	Band66	Band85
Conducted Power (dBm)	20.34	20.04	20.32	20.25	20.64	20.57
Antenna Gain (dBi)	2.29	1.59	2.53	3.19	2.00	3.95
EIRP/ERP (dBm)	20.48	21.63	20.70	21.29	22.64	22.37
Note: This report listed the worst case power value, please refer to BL-SZ23B0626-501 report for more details.						

5.2 Tune-up power

Mode	Conducted Power Range (dBm)	EIRP Range (dBm)	ERP Range (dBm)
LTE-M1 Band2	[20.00, 22.00]	[21.59, 23.59]	[19.44, 21.44]
LTE-M1 Band4	[19.00, 21.00]	[21.00, 23.00]	[18.85, 20.85]
LTE-M1 Band5	[19.00, 21.00]	/	[19.38, 21.38]
LTE-M1 Band12	[19.00, 21.00]	/	[20.80, 22.80]
LTE-M1 Band13	[19.00, 21.00]	/	[21.30, 23.30]
LTE-M1 Band 18 (815-824MHz)	[19.00, 21.00]	/	[20.04, 22.04]
LTE-M1 Band 18 (815-824MHz)	[19.00, 21.00]	/	[19.38, 21.38]
LTE-M1 Band19	[19.00, 21.00]	/	[19.14, 21.14]
LTE-M1 Band25	[19.00, 21.00]	[20.59, 22.59]	[18.44, 20.44]
LTE-M1 Band26 (part22)	[19.00, 21.00]	/	[19.38, 21.38]
LTE-M1 Band26 (part90)	[19.00, 21.00]	/	[20.04, 22.04]
LTE-M1 Band66	[19.00, 21.00]	[21.00, 23.00]	[18.85, 20.85]
LTE-M1 Band85	[19.00, 21.00]	/	[20.80, 22.80]

Note1: ERP= EIRP -2.15dB.

Note2: According KDB 447498 D04, used the greater of maximum conducted power and ERP to compare with the threshold value Pth.

5.3 RF Exposure Evaluation Result

Evolution mode	Maximum power (dBm)	Maximum power (mw)	Distance (mm)	Threshold Power (mW)	Verdict
LTE-M1 Band2	22.00	158.49	200	3060.00	Pass
LTE-M1 Band4	21.00	125.89	200	3060.00	Pass
LTE-M1 Band5	21.38	137.40	200	1680.96	Pass
LTE-M1 Band12	22.80	190.55	200	1425.96	Pass
LTE-M1 Band13	23.30	213.80	200	1585.08	Pass
LTE-M1 Band 18 (815-824MHz)	22.04	159.96	200	1662.60	Pass
LTE-M1 Band 18 (824-830MHz)	21.38	137.40	200	1680.96	Pass
LTE-M1 Band19	21.14	130.02	200	1693.20	Pass
LTE-M1 Band25	21.00	125.89	200	3060.00	Pass
LTE-M1 Band26 (part22)	21.38	137.40	200	1680.96	Pass
LTE-M1 Band26 (part90)	22.04	159.96	200	1660.56	Pass
LTE-M1 Band66	21.00	125.89	200	1291.32	Pass
LTE-M1 Band85	22.80	190.55	200	1423.92	Pass

5.4 Conclusion

This EUT is deemed to comply with the reference level limits, therefore the basic restrictions are compliant with human exposure limits.

Statement

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