RF EXPOSURE REPORT

CERTIFICATE OF CONFORMITY

FCC Rule Part:	**FCC Part 2 (Section 2.1091)**
Report No.:	MFBCIC-WTW-P24100653A
FCC ID:	U8G-P1AX02
Product:	Peplink Pepwave Wireless Product
Brand:	peplink PEPWAVE
Model No.:	MAX BR1 Pro 5G
Series Model:	MAX-BR1-PRO-5GK-T-PRM
Received Date:	2024/10/29
Test Date:	2024/12/4
Issued Date:	2025/6/9
Applicant:	PISMO LABS TECHNOLOGY LIMITED
Address:	A8, 5/F, HK Spinners Industrial Building, Phase 6, 481 Castle Peak Road, Cheung Sha Wan, Hong Kong
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan
FCC Registration / Designation Number:	788550 / TW0003

Approved by: Jeremy Lin , **Date:** **2025/6/9**

Jeremy Lin / Project Engineer

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Prepared by : Pettie Chen / Senior Specialist

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Release Control Record

Issue No.	Description	Date Issued
MFBCIC-WTW-P24100653A	Original release.	2025/6/9

1 Certificate

Product:	Peplink Pepwave Wireless Product
Brand:	peplink PEPWAVE
Test Model:	MAX BR1 Pro 5G
Series Model:	MAX-BR1-PRO-5GK-T-PRM
Sample Status:	Prototype
Applicant:	PISMO LABS TECHNOLOGY LIMITED
Test Date:	2024/12/4
FCC Rule Part:	FCC Part 2 (Section 2.1091)
Standard:	KDB 447498 D04 Interim General RF Exposure Guidance v01

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

2 Applicable RF Exposure Limit

§ 1.1310 Radiofrequency radiation exposure limits.

(a) Specific absorption rate (SAR) shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in § 1.1307(b) of this part within the frequency range of 100 kHz to 6 GHz (inclusive).
(b) The SAR limits for occupational/controlled exposure are 0.4 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 8 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit for occupational/controlled exposure is 20 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 6 minutes to determine compliance with occupational/controlled SAR limits.
(c) The SAR limits for general population/uncontrolled exposure are 0.08 W/kg, as averaged over the whole body, and a peak spatial-average SAR of 1.6 W/kg, averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the parts of the human body treated as extremities, such as hands, wrists, feet, ankles, and pinnae, where the peak spatial-average SAR limit is 4 W/kg, averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). Exposure may be averaged over a time period not to exceed 30 minutes to determine compliance with general population/uncontrolled SAR limits.

(e) Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields

➢ Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
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
300-1,500	…	…	f/1500	<30
1,500-100,000	…	…	1.0	<30

f = frequency in MHz. * = Plane-wave equivalent power density.

➢ Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm^2)	Average Time (minutes)
Limits For General Population / Uncontrolled 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
300-1,500			f/300	<6
1,500-100,000			5	<6

f = frequency in MHz. * = Plane-wave equivalent power density.

MPE-based Exemption – §1.1307(b)(3)(i)(B)

- For mobile devices that are not exempt per Table 1 of §1.1307(b)(1)(i)(C) and device at distances from 20 cm to 40 cm and in 0.3 GHz to 6 GHz. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power.

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

Fixed RF sources operating in the same time-averaging period – §1.1307(b)(3)(ii)(B)

- Either SAR-based or MPE-based exemption may be considered for test exemption for fixed, mobile, or portable device exposure conditions; therefore, the contributions from each exemption in conjunction with the measured SAR (Evaluatedk term) should be used to determine exemption for simultaneous transmission according to Formula below,

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

The sum of the ratios of the applicable terms for SAR-based, MPE-based and measured SAR or MPE should be less than 1, to determine simultaneous transmission exposure compliance.

Where:

a = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for P_{th}, 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.

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

$ERP_{th,j}$ = exemption threshold ERP for fixed, mobile, or portable RF source *j*, at a distance of at least λ/2π according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

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 of this chapter.

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

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).

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

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.

MPE-based Exemption – §1.1307(b)(3)(i)(C)

- 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. The MPE-based test exemption condition is in terms of ERP, defined as the product of the maximum antenna gain and the delivered maximum time-averaged power.
- Table applies to any RF source (i.e. single fixed, mobile, and portable transmitters) and specifies power and distance criteria for each of the five frequency ranges used for the MPE limits.

RF Source frequency (MHz)	Minimum Distance		Threshold ERP (watts)
	$\lambda_L/2\pi$	$\lambda_H/2\pi$	
0.3-1.34	159 m–35.6 m		1,920 R^2.
1.34-30	35.6 m–1.6 m		3,450 R^2/f^2.
30-300	1.6 m–159 mm		3.83 R^2.
300-1,500	159 mm–31.8 mm		0.0128 R^2f.
1,500-100,000	31.8 mm–0.5 mm		19.2 R^2.
R must be at least λ/2π, where λ is the free-space operating wavelength in meters.			

3 Test Results

Environmental Conditions:	25°C, 60% RH	Tested By:	Chris Lin

5GNR

MPE-based Exemption §1.1307(b)(3)(i)(C)					
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
NR Band 2	1852.5-1907.5	281.19	20	3060	Pass
NR Band 5	826.5-846.5	294.442	20	1686.06	Pass
NR Band 7	2502.5-2567.5	470.977	20	3060	Pass
NR Band 12	701.5-713.5	216.272	20	1431.06	Pass
NR Band 13	779.5-784.5	216.272	20	1590.18	Pass
NR Band 14	790.5-795.5	177.419	20	1612.62	Pass
NR Band 25	1852.5-1912.5	281.19	20	3060	Pass
NR Band 26_Part 22	826.5-846.5	262.422	20	1686.06	Pass
NR Band 26_Part 90	816.5-821.5	262.422	20	1665.66	Pass
NR Band 30	2307.5-2312.5	277.332	20	3060	Pass
NR Band 38	2575-2615	439.542	20	3060	Pass
NR Band 41	2501.01-2685	1327.394	20	3060	Pass
NR Band 48	3555-3694.98	30.549	20	3060	Pass
NR Band 66	1712.5-1777.5	309.742	20	3060	Pass
NR Band 71	665.5-695.5	242.661	20	1357.62	Pass
NR Band 77_Part 27O	3705-3975	342.768	20	3060	Pass
NR Band 77_Part 27Q	3455.01-3544.98	76.384	20	3060	Pass
NR Band 78_Part 27Q	3455.01-3544.98	76.384	20	3060	Pass

Note:

1. This report is issued as a supplementary report. The differences compared with the original report are adding CPU DDR4 DRAM, PoE input feature and eMMC components. Therefore, only the RF Output Power, AC Power Conducted Emissions and Unwanted Emissions tests had been an addendum test to this report.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
3. The WWAN average power refer to WWAN module (Brand: Telit, Model: FN990A40-HP, FCC ID: RI7FN990A40HP) certified report.
4. After technical evaluation, the verification data results of LTE B43 are covered by LTE B48. After technical evaluation, the verification data results of 5G NR n78 (Part 27O, 3700 ~ 3800MHz) are covered by 5G NR n77.

LTE

MPE-based Exemption §1.1307(b)(3)(i)(C)					
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
LTE Band 2	1850.7-1909.3	250.611	20	768	Pass
LTE Band 4	1710.7-1754.3	276.058	20	768	Pass
LTE Band 5	824.7-848.3	262.422	20	422.246	Pass
LTE Band 7	2502.5-2567.5	419.76	20	768	Pass
LTE Band 12	699.7-715.3	216.272	20	358.246	Pass
LTE Band 13	779.5-784.5	216.272	20	399.104	Pass
LTE Band 14	790.5-795.5	177.419	20	404.736	Pass
LTE Band 17	706.5-713.5	216.272	20	361.728	Pass
LTE Band 25	1850.7-1914.3	250.611	20	768	Pass
LTE Band 26_Part 22	824.7-848.3	262.422	20	422.246	Pass
LTE Band 26_Part 90	814.7-823.3	262.422	20	417.126	Pass
LTE Band 30	2307.5-2312.5	277.332	20	768	Pass
LTE Band 38	2572.5-2617.5	349.141	20	768	Pass
LTE Band 41	2502.5-2687.5	746.449	20	768	Pass
LTE Band 42_Part 27Q	3452.5-3547.5	17.1	20	768	Pass
LTE Band 42_Part 96	3552.5-3597.5	17.1	20	768	Pass
LTE Band 48	3552.5-3697.5	30.549	20	768	Pass
LTE Band 66	1710.7-1779.3	276.058	20	768	Pass
LTE Band 71	665.5-695.5	216.272	20	340.736	Pass

Note:
1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The WWAN average power refer to WWAN module (Brand: Telit, Model: FN990A40-HP, FCC ID: RI7FN990A40HP) certified report.
3. After technical evaluation, the verification data results of LTE B43 are covered by LTE B48. After technical evaluation, the verification data results of 5G NR n78 (Part 27O, 3700 ~ 3800MHz) are covered by 5G NR n77.

WCDMA

MPE-based Exemption §1.1307(b)(3)(i)(C)					
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
WCDMA II	1852.4-1907.6	281.19	20	768	Pass
WCDMA IV	1712.4-1752.6	309.742	20	768	Pass
WCDMA V	826.4-846.6	294.442	20	423.116	Pass

Note:
1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The WWAN average power refer to WWAN module (Brand: Telit, Model: FN990A40-HP, FCC ID: RI7FN990A40HP) certified report.

Co-location

For Single RF Source

MPE-based Exemption §1.1307(b)(3)(i)(B)					
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
WLAN 2.4 GHz	2412-2462	282.488	20	3060	Pass
WLAN 5 GHz	5180-5240 5745-5825	765.597	20	3060	Pass
LTE Band 41	2502.5-2687.5	746.449	20	3060	Pass

Note:
1. After evaluation, the WiFi/WWAN antennas was used with the highest gain as the representative antenna for testing.
2. Regarding the evaluation of the maximum exposure, the above operation mode is a representative mode selected after evaluation and based on the Maximum ratio.

For Multiple RF Sources (Simultaneous Operations)

Multiple RF Sources (Simultaneous Operations)							
Exemption Evaluation					Sum of Ratios	Limit of Ratios	Test Result
Operation Mode	Frequency Band (MHz)	Maximum ERP (mW)	Limit Threshold (mW)	Ratio			
WLAN 2.4 GHz	2412-2462	282.488	3060	0.092	0.586	1	Pass
WLAN 5 GHz	5180-5240 5745-5825	765.597	3060	0.25			
LTE Band 41	2502.5-2687.5	746.449	3060	0.244			

Note:
1. After evaluation, the WiFi/WWAN antennas was used with the highest gain as the representative antenna for testing.
2. Regarding the evaluation of the maximum exposure, the above operation mode is a representative mode selected after evaluation and based on the Maximum ratio.

4 Conclusion

Source-base time average power is below Exemption Criteria and/or Routine Evaluation MPE thresholds, therefore the device is compliant FCC RF exposure requirement.

5 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@bureauveritas.com
Web Site: http://ee.bureauveritas.com.tw

The address and road map of all our labs can be found in our web site also.

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