

RF EXPOSURE REPORT

CERTIFICATE OF CONFORMITY

FCC Rule Part: FCC Part 2 (Section 2.1091)

Report No.: MFBCIC-WTW-P24100659 R1

FCC ID: U8G-P1MT01

Product: Peplink Pepwave Wireless Product

Brand:  **PEPWAVE**

Model No.: MAX BR1 Mini

Series Model: MAX-BR1-MINI-LTE-US-T-PRM, MAX-BR1-MINI-LTEA-US-T-PRM,
MAX-BR1-MINI-LTE-US-DC-T-PRM, MAX-BR1-MINI-LTEA-US-DC-T-PRM, AP One
Rugged, APO-AC-RUG

Received Date: 2024/10/29

Test Date: 2024/11/21

Issued Date: 2024/12/23

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

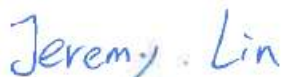
Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan

Test Location: No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan

FCC Registration / 788550 / TW0003

Designation Number:

Approved by:



, **Date:**

2024/12/23

Jeremy Lin / Project Engineer

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Prepared by : Lena Wang / Specialist

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Release Control Record

Issue No.	Description	Date Issued
MFBCIC-WTW-P24100659	Original release.	2024/12/11
MFBCIC-WTW-P24100659 R1	Revise LTE Band 43 antenna gain	2024/12/23

1 Certificate

Product: Peplink Pepwave Wireless Product

Brand: 

Test Model: MAX BR1 Mini

Series Model: MAX-BR1-MINI-LTE-US-T-PRM, MAX-BR1-MINI-LTEA-US-T-PRM,
MAX-BR1-MINI-LTE-US-DC-T-PRM, MAX-BR1-MINI-LTEA-US-DC-T-PRM, AP One Rugged,
APO-AC-RUG

Sample Status: Engineering sample

Applicant: PISMO LABS TECHNOLOGY LIMITED

Test Date: 2024/11/21

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.

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

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 (Evaluated_k term) should be used to determine exemption for simultaneous transmission according to Formula below,

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

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 $\lambda/2\pi$ 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.

3 Test Results

Environmental Conditions:	25°C, 60% RH	Tested By:	Ted
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For Single RF Source

MPE-based Exemption §1.1307(b)(3)(i)(B)							
Operation Mode	Frequency Band (MHz)	Average Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
WLAN 2.4 GHz	2412-2462	176.604	3.15	222.331	20	3060	Pass
WLAN 5 GHz	5180-5320 5500-5825	147.231	4.76	268.534	20	3060	Pass

Note:

1. The WLAN average power refer to report No.:FR250205A & FR250205B & FR250205C.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

For WWAN module: EC25-AFXD

For Single RF Source

MPE-based Exemption §1.1307(b)(3)(i)(B)							
Operation Mode	Frequency Band (MHz)	Average Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
WCDMA Band II	1852.4-1907.5	316.228	3.87	469.894	20	3060	Pass
WCDMA Band IV	1712.4-1752.6	316.228	4.03	487.529	20	3060	Pass
WCDMA Band V	826.4-846.6	316.228	2.94	379.315	20	1685.856	Pass
LTE Band 2	1850.7-1909.3	316.228	3.87	469.894	20	3060	Pass
LTE Band 4	1710.7-1754.3	316.228	4.03	487.529	20	3060	Pass
LTE Band 5	824.7-848.3	316.228	2.94	379.315	20	1682.388	Pass
LTE Band 12	699.7-715.3	316.228	3.44	425.599	20	1427.388	Pass
LTE Band 13	779.5-784.5	316.228	3.78	460.257	20	1590.18	Pass
LTE Band 14	709.5-795.5	316.228	3.78	460.257	20	1447.38	Pass
LTE Band 66	1710.7-1779.3	316.228	4.03	487.529	20	3060	Pass
LTE Band 71	665.5-695.5	316.228	3.44	425.599	20	1357.62	Pass

Note:

1. The WWAN average power refer to WWAN module (Quectel / EC25-AFXD;FCC ID:XMR202008EC25AFXD) certified report.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

For WWAN module: EM7411

MPE-based Exemption §1.1307(b)(3)(i)(B)							
Operation Mode	Frequency Band (MHz)	Average Power (mW)	Antenna Gain (dBi)	Maximum ERP (mW)	Distance (cm)	Limit Threshold (mW)	Test Result
WCDMA Band II	1852.4-1907.5	251.189	3.87	373.251	20	3060	Pass
WCDMA Band IV	1712.4-1752.6	251.189	4.03	387.258	20	3060	Pass
WCDMA Band V	826.4-846.6	251.189	2.94	301.301	20	1685.856	Pass
LTE Band 2	1850.7-1909.3	251.189	3.87	373.251	20	3060	Pass
LTE Band 4	1710.7-1754.3	251.189	4.03	387.258	20	3060	Pass
LTE Band 5	824.7-848.3	251.189	2.94	301.301	20	1682.388	Pass
LTE Band 7	2502.5-2567.5	251.189	3.12	314.051	20	3060	Pass
LTE Band 12	699.7-715.3	251.189	3.44	338.065	20	1427.388	Pass
LTE Band 13	779.5-784.5	251.189	3.78	365.595	20	1590.18	Pass
LTE Band 14	709.5-795.5	251.189	3.78	365.595	20	1447.38	Pass
LTE Band 25	1850.7-1914.3	251.189	3.87	373.251	20	3060	Pass
LTE Band 26	814.7-823.3	251.189	2.94	301.301	20	1661.988	Pass
LTE Band 41	2502.5-2687.5	251.189	3.12	314.051	20	3060	Pass
LTE Band 42	3552.5-3597.5	251.189	1.5	216.272	20	3060	Pass
LTE Band 43	3602.5-3697.5	251.189	-1.5	108.393	20	3060	Pass
LTE Band 48	3552.5-3697.5	251.189	1.5	216.272	20	3060	Pass
LTE Band 66	1710.7-1779.3	251.189	4.03	387.258	20	3060	Pass
LTE Band 71	665.5-695.5	251.189	3.44	338.065	20	1357.62	Pass

Note:

1. The WWAN average power refer to WWAN module (Sierra / EM7411; FCC ID:N7NEM74B) certified report.
2. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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	222.331	3060	0.073	0.479	1	Pass
WLAN 5 GHz	5180-5320 5500-5825	268.534	3060	0.088			
LTE Band 14	709.5-795.5	460.257	1447.38	0.318			

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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