

RF EXPOSURE EVALUATION REPORT

FCC ID : U8G-P1AX203

Equipment : Peplink Pepwave Wireless Product

Brand Name :



Model Name : MAX BR2 Pro

MAX-BR2-PRO-5GH-T-PRM

Applicant : PISMO LABS TECHNOLOGY LIMITED

A8, 5/F, HK Spinners Industrial Building, Phase 6,
481 Castle Peak Road, Cheung Sha Wan, Hong Kong

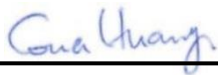
Manufacturer : PISMO LABS TECHNOLOGY LIMITED A8, 5/F, HK
Spinners Industrial Building, Phase 6, 481 Castle
Peak Road, Cheung Sha Wan, Hong Kong

Standard : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part2.1091 and it complies with applicable limit.

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC evaluation.

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Approved by: Cona Huang / Deputy Manager



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History of this test report

Report No.	Version	Description	Issued Date
FA260702	Rev. 01	Initial issue of report	Dec. 16, 2022

**1. Description of Equipment Under Test (EUT)**

Product Feature & Specification	
EUT Type	Peplink Pepwave Wireless Product
Brand Name	 PEP WAVE
Model Name	MAX BR2 Pro MAX-BR2-PRO-5GH-T-PRM
FCC ID	U8G-P1AX203
Integrated WWAN Module	Brand Name: Sierra Model Name: EM9191
Wireless Technology and Frequency Range	WCDMA Band II: 1850 MHz ~ 1910 MHz WCDMA Band IV: 1710 MHz ~ 1755 MHz WCDMA Band V: 824 MHz ~ 849 MHz LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 7: 2500 MHz ~ 2570 MHz LTE Band 12: 699 MHz ~ 716 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 14: 788 MHz ~ 798 MHz LTE Band 17: 704 MHz ~ 716 MHz LTE Band 25: 1850 MHz ~ 1915 MHz LTE Band 26: 814 MHz ~ 849 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3550 MHz ~ 3600 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n7 : 2500 MHz ~ 2570 MHz 5G NR n12 : 699 MHz ~ 716 MHz 5G NR n25 : 1850 MHz ~ 1915 MHz 5G NR n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz 5G NR n77: 3700 MHz ~ 3980 MHz, 3450MHz ~ 3550MHz 5G NR n78: 3700 MHz ~ 3800 MHz, 3450MHz ~ 3550MHz WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.8GHz Band: 5725 MHz ~ 5850 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ (16QAM uplink is not supported) LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM (Pi/2 BPSK / QPSK / 16QAM / 64QAM / 256QAM) CP-OFDM (QPSK / 16QAM / 64QAM / 256QAM) WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/HE20/HE40/HE80
EUT Stage	Identical Prototype

Reviewed by: Jason WangReport Producer: Paula Chen

2. Maximum RF average output power among production units

Mode		Maximum Transmit Power Level (dBm)
WCDMA	B2	24.50
	B4	24.50
	B5	24.50
LTE	B2	24.00
	B4	24.00
	B5	24.00
	B7	24.80
	B12	24.00
	B13	24.00
	B14	24.00
	B17	24.00
	B25	24.00
	B26	24.00
	B30	24.00
	B38	24.80
	B41	24.80
	B41_HPUE	26.00
	B42	24.80
	B48	24.80
	B66	24.00
	B71	24.00
NR	n2	24.50
	n5	24.50
	n7	24.50
	n12	24.50
	n25	24.50
	n41	24.50
	n66	24.50
	n71	24.50
	n77/n78	24.50

Mode		Ant 1+2 Maximum output power
WLAN	WLAN 2.4G	25.28
	WLAN 5G	21.72

3. Determination of exemption

Per 1.1307(b)(3), (i) For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:

- (A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);
- (B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold Pth (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive). Pth is given by:

$$P_{th} \text{ (mW)} = ERP_{20cm} (d / 20)^x \text{ for distance } d \leq 20cm$$

$$P_{th} \text{ (mW)} = ERP_{20cm} \text{ for distance } 20cm < d \leq 40cm$$

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

$$ERP_{20cm} \text{ (mW)} \begin{array}{ll} 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz:} & 2040 f \\ 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz:} & 3060 \end{array}$$

- (C) Or using Table 1 and 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. 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 (1.64 linear value).

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	$3.83 R^2$.
300-1,500	$0.0128 R^2 f$.
1,500-100,000	$19.2 R^2$.

4. RF Exposure Evaluation

General Note:

1. Pi is mean 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
2. Pth is mean the exemption threshold power (Pth) according to the § 1.1307(b)(3)(i)(B) formula for fixed, mobile, or portable RF source i.
3. In this report was used Part1.1307(b)(3)(i)(B) perfrom RF Exposure evaluation
4. The distance of 20cm is for this device.

<WWAN EM9191>

Band	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Maximum EIRP (dBm)	Maximum ERP (dBm)	Maximum EIRP (mW)	Maximum ERP (mW)	Pi (dBm)	Pi (mW)	Part1.1307 option(b) Threshold (mW)	Part1.1307 option(b) Pi/Pth
WCDMA Band 2	2.12	24.50	26.6	24.47	459.20	279.90	24.50	281.84	3060.000	0.092
WCDMA Band 4	1.84	24.50	26.3	24.19	430.53	262.42	24.50	281.84	3060.000	0.092
WCDMA Band 5	-1.70	24.50	22.8	20.65	190.55	116.14	24.50	281.84	1680.960	0.168
LTE Band 2	2.12	24.00	26.1	23.97	409.26	249.46	24.00	251.19	3060.000	0.082
LTE Band 4	1.84	24.00	25.8	23.69	383.71	233.88	24.00	251.19	3060.000	0.082
LTE Band 5	-1.70	24.00	22.3	20.15	169.82	103.51	24.00	251.19	1680.960	0.149
LTE Band 7	-3.05	24.80	21.8	19.60	149.62	91.20	24.80	302.00	3060.000	0.099
LTE Band 12	-1.91	24.00	22.1	19.94	161.81	98.63	24.00	251.19	1425.960	0.176
LTE Band 13	-1.70	24.00	22.3	20.15	169.82	103.51	24.00	251.19	1585.080	0.158
LTE Band 14	-1.70	24.00	22.3	20.15	169.82	103.51	24.00	251.19	1607.520	0.156
LTE Band 17	-1.91	24.00	22.1	19.94	161.81	98.63	24.00	251.19	1436.160	0.175
LTE Band 25	2.12	24.00	26.1	23.97	409.26	249.46	24.00	251.19	3060.000	0.082
LTE Band 26	-1.70	24.00	22.3	20.15	169.82	103.51	24.00	251.19	1660.560	0.151
LTE Band 30	-3.02	24.00	21.0	18.83	125.31	76.38	24.00	251.19	3060.000	0.082
LTE Band 38	-2.51	24.80	22.3	20.14	169.43	103.28	24.80	302.00	3060.000	0.099
LTE Band 41	-2.51	24.80	22.3	20.14	169.43	103.28	24.80	302.00	3060.000	0.099
LTE Band 41_HPUE	-2.51	26.00	23.5	21.34	223.36	136.14	26.00	398.11	3060.000	0.130
LTE Band 42	-5.02	24.80	19.8	17.63	95.06	57.94	24.80	302.00	3060.000	0.099
LTE Band 48	-5.02	24.80	19.8	17.63	95.06	57.94	24.80	302.00	3060.000	0.099
LTE Band 66	1.84	24.00	25.8	23.69	383.71	233.88	24.00	251.19	3060.000	0.082
LTE Band 71	-1.53	24.00	22.5	20.32	176.60	107.65	24.00	251.19	1352.520	0.186
5G NR n2	2.12	24.50	26.6	24.47	459.20	279.90	24.50	281.84	3060.000	0.092
5G NR n5	-1.70	24.50	22.8	20.65	190.55	116.14	24.50	281.84	1680.960	0.168
5G NR n7	-3.05	24.50	21.5	19.30	139.64	85.11	24.50	281.84	3060.000	0.092
5G NR n12	-1.91	24.50	22.6	20.44	181.55	110.66	24.50	281.84	1425.960	0.198
5G NR n25	2.12	24.50	26.6	24.47	459.20	279.90	24.50	281.84	3060.000	0.092
5G NR n41	-2.51	24.50	22.0	19.84	158.12	96.38	24.50	281.84	3060.000	0.092
5G NR n66	1.84	24.50	26.3	24.19	430.53	262.42	24.50	281.84	3060.000	0.092
5G NR n71	-1.53	24.50	23.0	20.82	198.15	120.78	24.50	281.84	1352.520	0.208
5G NR n77/n78	-4.91	24.50	19.6	17.44	90.99	55.46	24.50	281.84	3060.000	0.092

<WLAN>

Band	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Maximum EIRP (dBm)	Maximum ERP (dBm)	Maximum EIRP (mW)	Maximum ERP (mW)	Pi (dBm)	Pi (mW)	Part1.1307 option(b) Threshold (mW)	Part1.1307 option(b) Pi/Pth
WLAN 2.4GHz Band	2.44	25.28	27.7	25.57	591.56	360.58	25.57	360.58	3060.000	0.118
WLAN 5GHz Band	4.73	21.72	26.5	24.30	441.57	269.15	24.30	269.15	3060.000	0.088



4.1. Collocated assessment

General Note:

1. Either 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) shall be used to determine exemption for simultaneous transmission according to Formula (C.1).
2. The sum of the ratios of the applicable terms for MPE-based and MPE shall be less than 1, to determine WWAN + WLAN simultaneous transmission exposure compliance.

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

WWAN(EM9191) Pi/Pth Ratio	WWAN (EM9191) Pi/Pth Ratio	WLAN 2.4GHz Pi/Pth Ratio	WLAN 5GHz Pi/Pth Ratio	Σ (P/Pth Ratio) of WWAN+ WLAN 2.4GHz + WLAN 5GHz
0.208	0.208	0.118	0.088	0.622

Conclusion:

According to 47 CFR §1.1307, the RF exposure analysis concludes that the RF Exposure is FCC compliant.