

RF EXPOSURE EVALUATION REPORT

FCC ID : U8G-P1AX02
Equipment : PEPWAVE / peplink Wireless Product
Brand Name : PEPWAVE / peplink
Model Name : MAX BR1 5G
MAX-BR1-5GD-T
MAX-BR1-5GH-T
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 Part 2.1091 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.

The results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full



Approved by: Cona Huang / Deputy Manager



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1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	PEPWAVE / peplink Wireless Product
Brand Name	PEPWAVE / peplink
Model Name	MAX BR1 5G MAX-BR1-5GD-T MAX-BR1-5GH-T
FCC ID	U8G-P1AX02
Integrated WWAN module 1	Brand Name: Sierra wireless 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 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 n41 : 2496 MHz ~ 2690 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+ LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM
Integrated WWAN module 2	Brand Name: THALES DIS AIS Model Name: MV31-W
Wireless Technology and Frequency Range	LTE Band 2: 1850 MHz ~ 1910 MHz LTE Band 4: 1710 MHz ~ 1755 MHz LTE Band 5: 824 MHz ~ 849 MHz LTE Band 13: 777 MHz ~ 787 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz 5G NR n2 : 1850 MHz ~ 1910 MHz 5G NR n5 : 824 MHz ~ 849 MHz 5G NR n66 : 1710 MHz ~ 1780 MHz 5G NR n71 : 663 MHz ~ 698 MHz
Mode	LTE: QPSK, 16QAM, 64QAM, 256QAM 5G NR: DFT-s-OFDM/CP-OFDM, Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM



Product Feature & Specification	
WLAN Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.8GHz Band: 5725 MHz ~ 5825 MHz
Mode	WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/HE20/HE40/HE80
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

Reviewed by: Jason Wang

Report Producer: Wan Liu

2. Maximum RF average output power among production units
<EM9191>

Mode		Maximum Average power(dBm)
WCDMA	Band II	24.5
	Band IV	24.5
	Band V	24.5
LTE	Band 2	24
	Band 4	24
	Band 5	24
	Band 7	24.8
	Band 12	24
	Band 13	24
	Band 17	24
	Band 25	24
	Band 26	24
	Band 30	24
	Band 38	24.8
	Band 41	24.8
	Band 41 HPUE	26
5G NR	Band 66	24
	Band 71	24
	n2	24
	n5	24
	n41	24.5
	n66	24
	n71	24

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Mode		Maximum Average power(dBm)
LTE	Band 2	26
	Band 4	26
	Band 5	25
	Band 13	24
	Band 48	21
	Band 66	26
5G NR	n2	26.5
	n5	26.5
	n66	26.5
	n71	26.5

<WLAN>

	Mode	Maximum Average Power (dBm)
2.4GHz WLAN	802.11b	24.5
	802.11g	24.5
	802.11n-HT20	24
	802.11ac-VHT20	23
	802.11ax-HE20	23
	802.11n-HT40	20
	802.11ac-VHT40	20
	802.11ax-HE40	20
5GHz WLAN	802.11a	26.5
	802.11n-HT20	26
	802.11ac-VHT20	24.5
	802.11ax-HE20	24.5
	802.11n-HT40	24
	802.11ac-VHT40	24
	802.11ax-HE40	24
	802.11ac-VHT80	23.5
	802.11ax-HE80	23.5



3. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
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
300-1500			f/300	6
1500-100,000			5	6
(B) 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
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 23 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna



4. Radio Frequency Radiation Exposure Evaluation

4.1. Standalone Power Density Calculation

<EM9191>

Band	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 23cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
WCDMA Band 2	2.14	24.50	26.64	0.46	461.32	0.069	1.000	0.069
WCDMA Band 4	2.56	24.50	27.06	0.51	508.16	0.076	1.000	0.076
WCDMA Band 5	2.34	24.50	26.84	0.48	483.06	0.073	0.536	0.136
LTE Band 2	2.14	24.00	26.14	0.41	411.15	0.062	1.000	0.062
LTE Band 4	2.56	24.00	26.56	0.45	452.90	0.068	1.000	0.068
LTE Band 5	2.34	24.00	26.34	0.43	430.53	0.065	0.549	0.118
LTE Band 7	4.38	24.80	29.18	0.83	827.94	0.125	1.000	0.125
LTE Band 12	1.50	24.00	25.50	0.35	354.81	0.053	0.466	0.115
LTE Band 13	1.50	24.00	25.50	0.35	354.81	0.053	0.518	0.103
LTE Band 17	1.50	24.00	25.50	0.35	354.81	0.053	0.469	0.114
LTE Band 25	2.14	24.00	26.14	0.41	411.15	0.062	1.000	0.062
LTE Band 26	2.34	24.00	26.34	0.43	430.53	0.065	0.543	0.119
LTE Band 30	3.58	24.00	27.58	0.57	572.80	0.086	1.000	0.086
LTE Band 38	3.58	24.80	28.38	0.69	688.65	0.104	1.000	0.104
LTE Band 41	4.38	24.80	29.18	0.83	827.94	0.125	1.000	0.125
LTE Band 41 HPUE	4.38	26.00	30.38	1.09	1091.44	0.164	1.000	0.164
LTE Band 66	2.56	24.00	26.56	0.45	452.90	0.068	1.000	0.068
LTE Band 71	1.50	24.00	25.50	0.35	354.81	0.053	0.442	0.121
NR n2	2.14	24.00	26.14	0.41	411.15	0.062	1.000	0.062
NR n5	2.34	24.00	26.34	0.43	430.53	0.065	0.549	0.118
NR n41	4.38	24.50	28.88	0.77	772.68	0.116	1.000	0.116
NR n66	2.56	24.00	26.56	0.45	452.90	0.068	1.000	0.068
NR n71	1.50	24.00	25.50	0.35	354.81	0.053	0.442	0.121

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Band	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 23cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
LTE Band 2	2.14	26.00	28.14	0.65	651.63	0.098	1.000	0.098
LTE Band 4	2.56	26.00	28.56	0.72	717.79	0.108	1.000	0.108
LTE Band 5	2.34	25.00	27.34	0.54	542.00	0.082	0.549	0.148
LTE Band 13	1.50	24.00	25.50	0.35	354.81	0.053	0.518	0.103
LTE Band 48	1.65	21.00	22.65	0.18	184.08	0.028	1.000	0.028
LTE Band 66	2.56	26.00	28.56	0.72	717.79	0.108	1.000	0.108
NR n2	2.14	26.00	28.14	0.65	651.63	0.098	1.000	0.098
NR n5	2.34	25.00	27.34	0.54	542.00	0.082	0.549	0.148
NR n66	2.56	24.00	26.56	0.45	452.90	0.068	1.000	0.068
NR n71	1.50	21.00	22.50	0.18	177.83	0.027	0.442	0.061

<WLAN>

Band	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 23cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
WLAN2.4GHz Band	2.44	24.5	26.94	0.49	494.31	0.074	1.000	0.074
WLAN5GHz Band	4.73	26.5	31.23	1.33	1327.39	0.200	1.000	0.200



4.2. Collocated Power Density Calculation

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WWAN Power Density / Limit	5G NR Power Density / Limit	WLAN2.4GHz Power Density / Limit	WLAN5GHz Power Density / Limit	Σ (Power Density / Limit)
0.164	0.121	0.074	0.200	0.559

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WWAN Power Density / Limit	5G NR Power Density / Limit	WLAN2.4GHz Power Density / Limit	WLAN5GHz Power Density / Limit	Σ (Power Density / Limit)
0.148	0.148	0.074	0.200	0.570

Note:

1. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN
2. Considering the WWAN module collocation with the WLAN transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 4 collocated transmitters is compliant

Conclusion:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.