

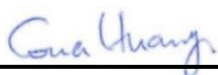
RF EXPOSURE EVALUATION REPORT

FCC ID : U8G-P1AX13
Equipment : Peplink Pepwave Wireless Product
Brand Name : 
PEP WAVE
Model Name : MAX HD1 Dome Pro
MAX-HD1-DOM-PRO-5GH
MAX HD2 Dome Pro
MAX-HD2-DOM-PRO-LTEA-Q
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.

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



Approved by: Cona Huang / Deputy Manager



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History of this test report

Report No.	Version	Description	Issued Date
FA261637	Rev. 01	Initial issue of report	Apr. 21, 2023

1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Peplink Pepwave Wireless Product
Brand Name	
Model Name	MAX HD1 Dome Pro MAX-HD1-DOM-PRO-5GH MAX HD2 Dome Pro MAX-HD2-DOM-PRO-LTEA-Q
FCC ID	U8G-P1AX13
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 ~ 5850 MHz
Mode	WLAN: 802.11a/b/g/n/ac/ax HT20/HT40/VHT20/VHT40/VHT80/HE20/HE40/HE80
EUT Stage	Identical Prototype
Remark: 1. The either one WWAN will intergrate into this host, the WWAN information as follow, Sim-Tx ananlys with WWAN as section 4.2. 2. When the device operated in AP mode and client mode, that the device support different output power, in this report the maximum output power between AP mode and Client mode is used as a conservative assessment.	

Integrated WWAN Module 1	
EUT Type	Radio Module
Brand Name	Sierra
Model Name	EM9191
FCC ID	N7NEM91
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 41: 2496 MHz ~ 2690 MHz LTE Band 42: 3450 MHz ~ 3550 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: 3450MHz ~ 3550MHz, 3700 MHz ~ 3980 MHz 5G NR n78: 3450MHz ~ 3550MHz, 3700 MHz ~ 3800 MHz
Mode	RMC 12.2Kbps HSDPA HSUPA DC-HSDPA HSPA+(16QAM uplink is supported) LTE: QPSK, 16QAM, 64QAM, 256QAM DFT-s-OFDM (Pi/2 BPSK/QPSK/16QAM/64QAM/256QAM) CP-OFDM (QPSK/16QAM/64QAM/256QAM)



Integrated WWAN Module 2	
EUT Type	Radio Module
Brand Name	Telit
Model Name	LN920A12-WW
FCC ID	RI7LN920
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 26 Part 90: 814 MHz ~ 824 MHz LTE Band 30: 2305 MHz ~ 2315 MHz LTE Band 38: 2570 MHz ~ 2620 MHz LTE Band 41: 2500 MHz ~ 2690 MHz LTE Band 48: 3550 MHz ~ 3700 MHz LTE Band 66: 1710 MHz ~ 1780 MHz LTE Band 71: 663 MHz ~ 698 MHz
Mode	HSDPA HSUPA LTE: QPSK, 16QAM, 64QAM, 256QAM

Reviewed by: Jason Wang

Report Producer: Paula Chen

2. Maximum RF average output power among production units

<EM9191>

Mode		Maximum Transmit Power Level (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
	Band 12	24
	Band 13	24
	Band 14	24
	Band 17	24
	Band 25	24
	Band 26	24
	Band 30	24
	Band 41	24
	Band 41 HPUE	26
	Band 42	24
	Band 48	24
	Band 66	24
	Band 71	24
5G NR	n2	24.5
	n5	24.5
	n7	24.5
	n12	24.5
	n25	24.5
	n41	24.5
	n66	24.5
	n71	24.5
	n77	24.5
	n78	24.5

<LN920A12-WW>

Mode		Maximum Transmit Power Level (dBm)
WCDMA	Band II	24.50
	Band IV	24.50
	Band V	24.50
LTE	Band 2	23.50
	Band 4	23.50
	Band 5	23.50
	Band 7	23.50
	Band 12	23.50
	Band 13	23.50
	Band 14	23.50
	Band 17	23.50
	Band 25	23.50
	Band 26	23.50
	Band 26 Part 90	23.50
	Band 30	23.00
	Band 38	23.50
	Band 41	23.50
	Band 41 HPUE	26.50
	Band 48	22.00
	Band 66	23.50
	Band 71	23.50
	Band 5C	24.00
	Band 7C	24.00
	Band 38C	23.50
	Band 41C	24.00

<WLAN>

WLAN	Mode	Maximum output power
	WLAN 2.4G	25.27
	WLAN 5.2G	24.76
	WLAN 5.8G	24.10

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:

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

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

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

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

- (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. Radio Frequency Radiation Exposure Evaluation

4.1. RF Exposure evaluation

General Note:

1. P_i 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. P_{th} is mean the exemption threshold power (P_{th}) 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) perform RF Exposure evaluation
4. The distance of 20cm is for this device

<EM9191>

Band	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Maximum EIRP (dBm)	Maximum ERP (dBm)	Maximum EIRP (mW)	Maximum ERP (mW)	P_{th}	P_{th} (mW)	Part1.1307 option(b) Threshold (mW)	Part1.1307 option(b) P/ P_{th}
WCDMA Band II	3.05	24.50	27.55	25.40	568.85	346.74	25.40	346.74	3060.000	0.113
WCDMA Band IV	2.40	24.50	26.90	24.75	489.78	298.54	24.75	298.54	3060.000	0.098
WCDMA Band V	1.70	24.50	26.20	24.05	416.87	254.10	24.50	281.84	1680.960	0.168
LTE Band 2	3.05	24.00	27.05	24.90	506.99	309.03	24.90	309.03	3060.000	0.101
LTE Band 4	2.40	24.00	26.40	24.25	436.52	266.07	24.25	266.07	3060.000	0.087
LTE Band 5	1.70	24.00	25.70	23.55	371.54	226.46	24.00	251.19	1680.960	0.149
LTE Band 7	3.12	24.00	27.12	24.97	515.23	314.05	24.97	314.05	3060.000	0.103
LTE Band 12	0.80	24.00	24.80	22.65	302.00	184.08	24.00	251.19	1425.960	0.176
LTE Band 13	1.80	24.00	25.80	23.65	380.19	231.74	24.00	251.19	1585.080	0.158
LTE Band 14	1.80	24.00	25.80	23.65	380.19	231.74	24.00	251.19	1607.520	0.156
LTE Band 17	0.80	24.00	24.80	22.65	302.00	184.08	24.00	251.19	1436.160	0.175
LTE Band 25	3.05	24.00	27.05	24.90	506.99	309.03	24.90	309.03	3060.000	0.101
LTE Band 26	1.70	24.00	25.70	23.55	371.54	226.46	24.00	251.19	1680.960	0.149
LTE Band 30	-2.10	24.00	21.90	19.75	154.88	94.41	24.00	251.19	3060.000	0.082
LTE Band 41	3.12	24.00	27.12	24.97	515.23	314.05	24.97	314.05	3060.000	0.103
LTE Band 41_HPUE	3.12	26.00	29.12	26.97	816.58	497.74	26.97	497.74	3060.000	0.163
LTE Band 42	5.20	24.00	29.20	27.05	831.76	506.99	27.05	506.99	3060.000	0.166
LTE Band 48	-2.10	24.00	21.90	19.75	154.88	94.41	24.00	251.19	3060.000	0.082
LTE Band 66	2.40	24.00	26.40	24.25	436.52	266.07	24.25	266.07	3060.000	0.087
LTE Band 71	0.80	24.00	24.80	22.65	302.00	184.08	24.00	251.19	1352.520	0.186
5G NR n2	3.05	24.50	27.55	25.40	568.85	346.74	25.40	346.74	3060.000	0.113
5G NR n5	1.70	24.50	26.20	24.05	416.87	254.10	24.50	281.84	1680.960	0.168
5G NR n7	3.12	24.50	27.62	25.47	578.10	352.37	25.47	352.37	3060.000	0.115
5G NR n12	0.80	24.50	25.30	23.15	338.84	206.54	24.50	281.84	1425.960	0.198
5G NR n25	3.05	24.50	27.55	25.40	568.85	346.74	25.40	346.74	3060.000	0.113
5G NR n41	3.12	24.50	27.62	25.47	578.10	352.37	25.47	352.37	3060.000	0.115
5G NR n66	2.40	24.50	26.90	24.75	489.78	298.54	24.75	298.54	3060.000	0.098
5G NR n71	0.80	24.50	25.30	23.15	338.84	206.54	24.50	281.84	1352.520	0.208
5G NR n77	5.50	24.50	30.00	27.85	1000.00	609.54	27.85	609.54	3060.000	0.199
5G NR n78	5.50	24.50	30.00	27.85	1000.00	609.54	27.85	609.54	3060.000	0.199

<LN920A12-WW>

Band	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Maximum EIRP (dBm)	Maximum ERP (dBm)	Maximum EIRP (mW)	Maximum ERP (mW)	P _{th}	P _{th} (mW)	Part1.1307 option(b) Threshold (mW)	Part1.1307 option(b) P/P _{th}
WCDMA Band II	3.05	24.50	27.55	25.40	568.85	346.74	25.40	346.74	3060.000	0.113
WCDMA Band IV	2.40	24.50	26.90	24.75	489.78	298.54	24.75	298.54	3060.000	0.098
WCDMA Band V	1.70	24.50	26.20	24.05	416.87	254.10	24.50	281.84	1680.960	0.168
LTE Band 2	3.05	23.50	26.55	24.40	451.86	275.42	24.40	275.42	3060.000	0.090
LTE Band 4	2.40	23.50	25.90	23.75	389.05	237.14	23.75	237.14	3060.000	0.077
LTE Band 5	1.70	23.50	25.20	23.05	331.13	201.84	23.50	223.87	1680.960	0.133
LTE Band 7	3.12	23.50	26.62	24.47	459.20	279.90	24.47	279.90	3060.000	0.091
LTE Band 12	0.80	23.50	24.30	22.15	269.15	164.06	23.50	223.87	1425.960	0.157
LTE Band 13	1.80	23.50	25.30	23.15	338.84	206.54	23.50	223.87	1585.080	0.141
LTE Band 14	1.80	23.50	25.30	23.15	338.84	206.54	23.50	223.87	1607.520	0.139
LTE Band 17	0.80	23.50	24.30	22.15	269.15	164.06	23.50	223.87	1436.160	0.156
LTE Band 25	3.05	23.50	26.55	24.40	451.86	275.42	24.40	275.42	3060.000	0.090
LTE Band 26	1.70	23.50	25.20	23.05	331.13	201.84	23.50	223.87	1680.960	0.133
LTE Band 26 Part 90	1.70	23.50	25.20	23.05	331.13	201.84	23.50	223.87	1660.560	0.135
LTE Band 30	-2.10	23.00	20.90	18.75	123.03	74.99	23.00	199.53	3060.000	0.065
LTE Band 38	3.12	23.50	26.62	24.47	459.20	279.90	24.47	279.90	3060.000	0.091
LTE Band 41	3.12	23.50	26.62	24.47	459.20	279.90	24.47	279.90	3060.000	0.091
LTE Band 41 HPUE	3.12	26.50	29.62	27.47	916.22	558.47	27.47	558.47	3060.000	0.183
LTE Band 48	-2.10	22.00	19.90	17.75	97.72	59.57	22.00	158.49	3060.000	0.052
LTE Band 66	2.40	23.50	25.90	23.75	389.05	237.14	23.75	237.14	3060.000	0.077
LTE Band 71	0.80	23.50	24.30	22.15	269.15	164.06	23.50	223.87	1352.520	0.166
LTE Band 5C	1.70	24.00	25.70	23.55	371.54	226.46	24.00	251.19	1680.960	0.149
LTE Band 7C	3.12	24.00	27.12	24.97	515.23	314.05	24.97	314.05	3060.000	0.103
LTE Band 38C	3.12	23.50	26.62	24.47	459.20	279.90	24.47	279.90	3060.000	0.091
LTE Band 41C	3.12	24.00	27.12	24.97	515.23	314.05	24.97	314.05	3060.000	0.103

<WLAN>

Band	Antenna Gain (dBi)	Maximum Conducted Power (dBm)	Maximum EIRP (dBm)	Maximum ERP (dBm)	Maximum EIRP (mW)	Maximum ERP (mW)	P _{th}	P _{th} (mW)	Part1.1307 option(b) Threshold (mW)	Part1.1307 option(b) P/P _{th}
WLAN2.4GHz	4.50	25.27	29.77	27.62	948.42	578.10	27.62	578.10	3060.000	0.189
WLAN5GHz	5.90	24.76	30.66	28.51	1164.13	709.58	28.51	709.58	3060.000	0.232

**4.2. Sim-Tx analysis****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 (*Evaluatedk* 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.
3. For EM9191 that LTE B71 and FR1 n71 are chosen for Sim-Tx analysis with WLAN operation, due to the highest P/Pth ratio among all LTE and FR1 mode when EN-DC mode is active.

<EM9191 + WLAN>

EN-DC		WLAN 2.4GHz P/Pth Ratio	WLAN 5GHz P/Pth Ratio	Σ (Pi/Pth Ratio) of LTE + 5G NR + WLAN
Maximum LTE Pi/Pth Ratio	Maximum 5G NR Pi/Pth Ratio			
0.186	0.208	0.189	0.232	0.815

<LN920A12-WW + WLAN>

WWAN 1 LN920A12-WW P/Pth Ratio	WWAN 2 LN920A12-WW P/Pth Ratio	WLAN 2.4GHz P/Pth Ratio	WLAN 5GHz P/Pth Ratio	Σ (P/Pth Ratio) of WWAN + WLAN
0.183	0.183	0.189	0.232	0.787

Conclusion:

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