




Test report No.: 2360564R-RFUSV17S-A

# RF Exposure Report

Product Name	Peplink Pepwave Wireless Product
Trademark	
Model and /or type reference	Dome Pro LR DOM-PRO-LR-5GN-PRM
FCC ID	U8G-P1AX05LR
Applicant's name / address	PISMO LABS TECHNOLOGY LIMITED A8, 5/F, HK Spinners Industrial Building, Phase 6, 481 Castle Peak Road, Cheung Sha Wan, Hong Kong
Manufacturer's name	PISMO LABS TECHNOLOGY LIMITED
Test method requested, standard	KDB 447498 D01 v06 <input checked="" type="checkbox"/> Minimum test separation distance $\geq 20$ cm <input type="checkbox"/> For low power devices
Verdict Summary	IN COMPLIANCE
Documented By (Senior Project Specialist / Joanne Lin)	Joanne Lin
Tested By (Senior Engineer / Jack Hsu)	Jack Hsu
Approved By (Manager / Tim Sung)	Tim Sung
Date of Receipt	2023/06/17
Date of Issue	2023/09/14
Report Version	V1.0

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## Competences and Guarantees

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DEKRA is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA has a calibration and maintenance program for its measurement equipment.

DEKRA guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated in the report and it is based on the knowledge and technical facilities available at DEKRA at the time of performance of the test.

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## General conditions

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1. The test results relate only to the samples tested.
2. The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
3. This report must not be used to claim product endorsement by TAF or any agency of the government.
4. The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
5. Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

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## Revision History

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Report No.	Version	Description	Issued Date
2360564R-RFUSV17S-A	V1.0	Initial issue of report.	2023/09/14

## 1. General Information

### 1.1. EUT Description

Product Name	Peplink Pepwave Wireless Product
Trademark	
Model and /or type reference	Dome Pro LR DOM-PRO-LR-5GN-PRM

Note: For more detailed information please refer to report No.: 2360564R-RFUSV01S-A,  
2360564R-RFUSV03S-A.

The EUT contains two of the same WWAN module, and the detail as below.

Brand Name	Model	FCC ID	Bands	Operating Frequency Range (MHz)	Function			
Quectel	RM520N-GL	XMR2022RM520NGL	WCDMA Band 2	Uplink: 1850 ~ 1910 Downlink: 1930 ~ 1990	WCDMA / HSUPA / HSDPA / DC-HSDPA / HSPA+			
			WCDMA Band 4	Uplink: 1710 ~ 1755 Downlink: 2110 ~ 2115				
			WCDMA Band 5	Uplink: 824 ~ 849 Downlink: 869 ~ 894				
						Bands	Operating Frequency Range (MHz)	Modulation Type
			LTE Band 2	Uplink: 1850 ~ 1910 Downlink: 1930 ~ 1990	QPSK / 16QAM / 64QAM / 256QAM			
			LTE Band 4	Uplink: 1710 ~ 1755 Downlink: 2110 ~ 2115				
			LTE Band 5	Uplink: 824 ~ 849 Downlink: 869 ~ 894				
			LTE Band 7	Uplink: 2500 ~ 2570 Downlink: 2620 ~ 2690				
			LTE Band 12	Uplink: 699 ~ 716 Downlink: 729 ~ 746				
			LTE Band 13	Uplink: 777 ~ 787 Downlink: 746 ~ 756				
			LTE Band 14	Uplink: 788 ~ 798 Downlink: 758 ~ 768				
			LTE Band 17	Uplink: 704 ~ 716 Downlink: 734 ~ 746				
			LTE Band 25	Uplink: 1850 ~ 1915 Downlink: 1930 ~ 1995				
			LTE Band 26 (814 to 824 MHz)	Uplink: 814 ~ 824 Downlink: 859 ~ 869				
			LTE Band 26 (824 to 849 MHz)	Uplink: 824 ~ 849 Downlink: 869 ~ 894				
			LTE Band 30	Uplink: 2305 ~ 2315 Downlink: 2350 ~ 2360				
			LTE Band 38	Uplink: 2570 ~ 2620 Downlink: 2570 ~ 2620				
			LTE Band 41	Uplink: 2496 ~ 2690 Downlink: 2496 ~ 2690				
			LTE Band 42	Uplink: 3450 ~ 3500 Downlink: 3450 ~ 3500				
			LTE Band 43	Uplink: 3700 ~ 3800 Downlink: 3700 ~ 3800				
			LTE Band 48	Uplink: 3550 ~ 3700 Downlink: 3550 ~ 3700				
LTE Band 66	Uplink: 1710 ~ 1780 Downlink: 2110 ~ 2180							
LTE Band 71	Uplink: 663 ~ 698 Downlink: 617 ~ 652							

Brand Name	Model	FCC ID	Bands	Operating Frequency Range (MHz)	Function
Quectel	RM520N-GL	XMR2022RM520NGL	NR Band n2	Uplink: 1850 ~ 1910 Downlink: 1930 ~ 1990	BPSK / QPSK / 16QAM / 64QAM / 256QAM
			NR Band n5	Uplink: 824 ~ 849 Downlink: 869 ~ 894	
			NR Band n7	Uplink: 2500 ~ 2570 Downlink: 2620 ~ 2690	
			NR Band n12	Uplink: 699 ~ 716 Downlink: 729 ~ 746	
			NR Band n13	Uplink: 777 ~ 787 Downlink: 746 ~ 756	
			NR Band n14	Uplink: 788 ~ 798 Downlink: 758 ~ 768	
			NR Band n25	Uplink: 1850 ~ 1915 Downlink: 1930 ~ 1995	
			NR Band n26 (814 to 824 MHz)	Uplink: 814 ~ 824 Downlink: 859 ~ 869	
			NR Band n26 (824 to 849 MHz)	Uplink: 824 ~ 849 Downlink: 869 ~ 894	
			NR Band n30	Uplink: 2305 ~ 2315 Downlink: 2350 ~ 2360	
			NR Band n38	Uplink: 2570 ~ 2620 Downlink: 2570 ~ 2620	
			NR Band n41	Uplink: 2496 ~ 2690 Downlink: 2496 ~ 2690	
			NR Band n48	Uplink: 3550 ~ 3700 Downlink: 3550 ~ 3700	
			NR Band n66	Uplink: 1710 ~ 1780 Downlink: 2110 ~ 2180	
			NR Band n70	Uplink: 1695 ~ 1710 Downlink: 1995 ~ 2020	
			NR Band n71	Uplink: 663 ~ 698 Downlink: 617 ~ 652	
NR Band n77	Uplink: 3700 ~ 3980 Downlink: 3700 ~ 3980 Uplink: 3450 ~ 3550 Downlink: 3450 ~ 3550				
NR Band n78	Uplink: 3700 ~ 3800 Downlink: 3700 ~ 3800 Uplink: 3450 ~ 3550 Downlink: 3450 ~ 3550				

## 2. Test Facility

USA	FCC Registration Number: TW0033
Canada	CAB Identifier Number: TW3023 / Company Number: 26930

Site Description	Accredited by TAF
	Accredited Number: 3023

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
	Linkou Laboratory
Address	No.5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan, R.O.C
Performed Location	No. 26, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan, R.O.C.
Phone Number	+886-3-275-7255
Fax Number	+886-3-327-8031

### 3. RF Exposure Evaluation

#### 3.1. Standard Applicable

According to KDB 447498 D01 (7.1), A minimum test separation distance  $\geq 20$  cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits.

#### 3.2. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

##### LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm <sup>2</sup> )	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/ Uncontrolled Exposures				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	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

Friis Formula

Friis transmission formula:  $P_d = (P_{out} * G) / (4 * \pi * r^2)$

Where

$P_d$  = power density in mW/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

R = distance between observation point and center of the radiator in cm

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is  $\leq 1.0$



## 3.3. Test Result of RF Exposure Evaluation

Product Name	Peplink Pepwave Wireless Product
Test Item	RF Exposure Evaluation

Band	E.I.R.P (dBm)	E.I.R.P (mW)	Power Density at R = 38 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2.4 GHz	35.970	3953.666	0.218	1.000
5 GHz (U-NII-1)	29.680	928.966	0.051	1.000
5 GHz (U-NII-3)	35.940	3926.449	0.216	1.000

Band	E.I.R.P (dBm)	E.I.R.P (mW)	Power Density at R = 38 cm (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WCDMA Band 2	30.00	1000.000	0.055	1.000
WCDMA Band 4	26.92	492.040	0.027	1.000
WCDMA Band 5	31.40	1380.384	0.076	0.549
LTE B2/CA_2C	30.00	1000.000	0.055	1.000
LTE B4	26.92	492.040	0.027	1.000
LTE B5/CA_5B	31.40	1380.384	0.076	0.549
LTE B7/CA_7C	30.00	1000.000	0.055	1.000
LTE B12	31.00	1258.925	0.069	0.466
LTE B13	31.00	1258.925	0.069	0.518
LTE B14	31.00	1258.925	0.069	0.525
LTE B17	31.00	1258.925	0.069	0.469
LTE B25	30.00	1000.000	0.055	1.000
LTE B26(814-824)	31.40	1380.384	0.076	0.543
LTE B26(824-849)	31.40	1380.384	0.076	0.549
LTE B30	20.00	100.000	0.006	1.000
LTE B38/CA_38C	30.00	1000.000	0.055	1.000
LTE B41/CA_41C	30.00	1000.000	0.055	1.000
LTE B42/42C(3450-3550)	19.35	86.099	0.005	1.000
LTE B43(3700-3800)	19.35	86.099	0.005	1.000
LTE B48/CA_48C	19.50	89.125	0.005	1.000
LTE B66	26.92	492.040	0.027	1.000
LTE B71	31.00	1258.925	0.069	0.442
5G NR n2	30.00	1000.000	0.055	1.000
5G NR n5	31.40	1380.384	0.076	0.549
5G NR n7	30.00	1000.000	0.055	1.000
5G NR n12	31.00	1258.925	0.069	0.466
5G NR n13	31.00	1258.925	0.069	0.518
5G NR n14	31.00	1258.925	0.069	0.525
5G NR n25	30.00	1000.000	0.055	1.000
5G NR n26(814-824)	31.40	1380.384	0.076	0.543
5G NR n26(824-849)	31.40	1380.384	0.076	0.549
5G NR n30	20.00	100.000	0.006	1.000
5G NR n38	30.00	1000.000	0.055	1.000
5G NR n41	30.00	1000.000	0.055	1.000
5G NR n48	19.50	89.125	0.005	1.000
5G NR n66	26.92	492.040	0.027	1.000
5G NR n70	26.88	487.528	0.027	1.000
5G NR n71	31.00	1258.925	0.069	0.442
5G NR n77	19.35	86.099	0.005	1.000
5G NR n78	19.35	86.099	0.005	1.000

Co-location
<p><b>Conclusion:</b>                      The formula of calculated the MPE is:  <math>CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} &lt; 1</math>                      CPD = Calculation power density                      LPD = Limit of power density</p> <p>WiFi 2.4 GHz function + WiFi 5 GHz function + WWAN module 1: WCDMA function + WWAN module 2: WCDMA function = <math>0.218 + 0.216 + 0.138 + 0.138 = 0.710</math>, therefore the maximum calculations of above situations are less than the “1” limit.</p> <p>WiFi 2.4 GHz function + WiFi 5 GHz function + WWAN module 1: LTE function + WWAN module 2: LTE function = <math>0.218 + 0.216 + 0.157 + 0.157 = 0.748</math>, therefore the maximum calculations of above situations are less than the “1” limit.</p> <p>WiFi 2.4 GHz function + WiFi 5 GHz function + WWAN module 1: 5G NR function + WWAN module 2: 5G NR function = <math>0.218 + 0.216 + 0.157 + 0.157 = 0.748</math>, therefore the maximum calculations of above situations are less than the “1” limit.</p> <p>WiFi 2.4 GHz function + WiFi 5 GHz function + WWAN module 1: LTE function + WWAN module 2: 5G NR function = <math>0.218 + 0.216 + 0.157 + 0.157 = 0.748</math>, therefore the maximum calculations of above situations are less than the “1” limit.</p>

Results	PASS
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Note: The Wi-Fi conducted output power is refer to report No.: 2360564R-RFUSV01S-A, 2360564R-RFUSV03S-A from the DEKRA and WWAN maximum conducted output power is referred to the module documents.