

Test Report No:
2340262R-RFUSV17S-A

RF EXPOSURE EVALUATION DECLARATION

Product Name	Peplink Pepwave Wireless Product
Brand Name	 PEPWAVE
Model No.	MAX BR1 Mini M2M MAX-BR1-MINI-M2M-LTE-US-T-PRM MAX-BR1-MINI-M2M-LTEA-US-T-PRM
FCC ID	U8G-P1MT01DB9
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 / Address	PISMO LABS TECHNOLOGY LIMITED A8, 5/F, HK Spinners Industrial Building, Phase 6, 481 Castle Peak Road, Cheung Sha Wan, Hong Kong
Test Method Requested, Standard	FCC CFR Title 47 Part 2.1091 Radiofrequency radiation exposure evaluation: mobile devices.
Verdict Summary	IN COMPLIANCE
Documented By	 Hailey Peng / Senior Engineer
Approved By	 Rueyyan Lin / Supervisor
Date of Receipt	Apr. 12, 2023
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Report Version	V1.0

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Competences and Guarantees

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

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.

Revision History

Version	Description	Issued Date
V1.0	Initial issue of report	May 23, 2023

1. General Information

1.1. EUT Description

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
WiFi 2.4 GHz	2400 ~ 2483.5	2412 ~ 2462	802.11b: DSSS 802.11g/n: OFDM
WiFi 5 GHz	5150 ~ 5250 5725 ~ 5850	5180 ~ 5240 5745 ~ 5825	802.11a/n/ac: OFDM

The EUT contains a WWAN module, and the detail as below.

Cellular Module 1					
Brand Name	Model	FCC ID	Bands	Operating Frequency Range (MHz)	Function
AirPrime	EM7411	N7NEM74B	WCDMA Band 2	Uplink: 1850 ~ 1910 Downlink: 1930 ~ 1990	WCDMA / HSDPA / DC-HSDPA / HSUPA / 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
			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 25	Uplink: 1850 ~ 1915 Downlink: 1930 ~ 1995	
			LTE Band 26	Uplink: 824 ~ 849 Downlink: 859 ~ 894	
			LTE Band 41	Uplink: 2496 ~ 2690 Downlink: 2496 ~ 2690	
			LTE Band 42	Uplink: 3450 ~ 3550 Downlink: 3450 ~ 3550	
			LTE Band 43	Uplink: 3600 ~ 3800 Downlink: 3600 ~ 3800	
			LTE Band 48	Uplink: 3550 ~ 3700 Downlink: 3550 ~ 3700	
			LTE Band 66	Uplink: 1710 ~ 1780 Downlink: 2110 ~ 2200	
			LTE Band 71	Uplink: 663 ~ 698 Downlink: 617 ~ 652	

Cellular Module 2					
Brand Name	Model	FCC ID	Bands	Operating Frequency Range (MHz)	Function
Telit	LE910C4-NF	RI7LE910CXNF	WCDMA Band 2	Uplink: 1850 ~ 1910 Downlink: 1930 ~ 1990	WCDMA / HSDPA / DC-HSDPA / HSUPA / 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
			LTE Band 4	Uplink: 1710 ~ 1755 Downlink: 2110 ~ 2115	
			LTE Band 5	Uplink: 824 ~ 849 Downlink: 869 ~ 894	
			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 66	Uplink: 1710 ~ 1780 Downlink: 2110 ~ 2200	
			LTE Band 71	Uplink: 663 ~ 698 Downlink: 617 ~ 652	

The brand name/model number in the following table are all refer to the identical product.

Brand Name		EUT	Model No.	Cellular Module	
				Brand Name	Model No.
	PEPWAVE	-	MAX BR1 Mini M2M	AirPrime	EM7411
		-		Telit	LE910C4-NF
		1	MAX-BR1-MINI-M2M-LTEA-US-T-PRM	AirPrime	EM7411
		2	MAX-BR1-MINI-M2M-LTE-US-T-PRM	Telit	LE910C4-NF
Assemble different cellular module for the marketing purpose.					

Note: The above EUT information is declared by the manufacturer.

1.2. Test Facility

Laboratory Information

USA : **FCC Registration Number: TW3024**
Canada : **CAB identifier : TW3024**

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: <http://www.dekra.com.tw>

If you have any comments, please don't hesitate to contact us. Our test sites as below:

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
Address	1. No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. 2. No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
Phone number	1. +886-3-582-8001 2. +886-3-582-8001
Fax number	1. +886-3-582-8958 2. +886-3-582-8958
E mail address	info.tw@dekra.com
Website	http://www.dekra.com.tw
Note: Test site number for address 1 includes HC-SR02. Test site number for address 2 includes HC-CB02, HC-CB03, HC-CB04, HC-SR10 and HC-SR12.	

2. RF Exposure Evaluation

2.1. Test Limit

(A) Test Limit for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
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) Test Limit for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
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

Note: f = frequency in MHz; *Plane-wave equivalent power density

Power Density (S) is calculated by the following formula:

$$S = (P \cdot G) / 4\pi R^2$$

where:

S = power density (in appropriate units, e.g. mW/ cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

π = 3.1416

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)

2.2. Test Result of RF Exposure Evaluation

Exposure Environment: General Population / Uncontrolled Exposure

<For EUT 1>

Evaluation Mode	E.I.R.P (dBm)	E.I.R.P (mW)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Test Result (PASS/FAIL)
WiFi 2.4 GHz	24.92	310.456	0.062	1.000	PASS
WiFi 5 GHz Band 1	21.30	234.423	0.047	1.000	PASS
WiFi 5 GHz Band 4	25.83	382.825	0.076	1.000	PASS
WCDMA Band 2	27.87	612.350	0.122	1.000	PASS
WCDMA Band 4	28.03	635.331	0.126	1.000	PASS
WCDMA Band 5	27.24	529.663	0.105	0.549	PASS
LTE Band 2	27.87	612.350	0.122	1.000	PASS
LTE Band 4	28.03	635.331	0.126	1.000	PASS
LTE Band 5	27.24	529.663	0.105	0.549	PASS
LTE Band 7	26.46	442.588	0.088	1.000	PASS
LTE Band 12	27.44	554.626	0.110	0.466	PASS
LTE Band 13	27.78	599.791	0.119	0.518	PASS
LTE Band 14	27.78	599.791	0.119	0.525	PASS
LTE Band 25	27.87	612.350	0.122	1.000	PASS
LTE Band 26	26.94	494.311	0.098	0.549	PASS
LTE Band 41	26.57	453.942	0.090	1.000	PASS
LTE Band 42	21.85	153.109	0.030	1.000	PASS
LTE Band 43	21.90	154.882	0.031	1.000	PASS
LTE Band 48	21.85	153.109	0.030	1.000	PASS
LTE Band 66	28.03	635.331	0.126	1.000	PASS
LTE Band 71	27.44	554.626	0.110	0.442	PASS

Distance (cm): 20 for Maximum Permissible Exposure.

Co-location
Conclusion: The formula of calculated the MPE is: CPD1 / LPD1 + CPD2 / LPD2 +etc. < 1 CPD = Calculation power density LPD = Limit of power density 1. WiFi 2.4 GHz + WiFi 5 GHz + WWAN module: WCDMA function = $0.062 + 0.076 + 0.192 = 0.330$, therefore the maximum calculations of above situations are less than the "1" limit. 2. WiFi 2.4 GHz + WiFi 5 GHz + WWAN module: LTE function = $0.062 + 0.076 + 0.250 = 0.388$, therefore the maximum calculations of above situations are less than the "1" limit.

Note:

- The above EUT information is declared by the manufacturer.
- The results are evaluated using the maximum power.

<For EUT 2>

Evaluation Mode	E.I.R.P (dBm)	E.I.R.P (mW)	Power Density (mW/cm ²)	Limit (mW/cm ²)	Test Result (PASS/FAIL)
WiFi 2.4 GHz	24.92	310.456	0.062	1.000	PASS
WiFi 5 GHz Band 1	21.30	234.423	0.047	1.000	PASS
WiFi 5 GHz Band 4	25.83	382.825	0.076	1.000	PASS
WCDMA Band 2	28.87	770.903	0.153	1.000	PASS
WCDMA Band 4	29.03	799.834	0.159	1.000	PASS
WCDMA Band 5	27.94	622.300	0.124	0.549	PASS
LTE Band 2	28.87	770.903	0.153	1.000	PASS
LTE Band 4	29.03	799.834	0.159	1.000	PASS
LTE Band 5	27.94	622.300	0.124	0.549	PASS
LTE Band 12	28.44	698.232	0.139	0.466	PASS
LTE Band 13	28.78	755.092	0.150	0.518	PASS
LTE Band 14	28.78	755.092	0.150	0.525	PASS
LTE Band 66	29.03	799.834	0.159	1.000	PASS
LTE Band 71	28.44	698.232	0.139	0.442	PASS

Distance (cm): 20 for Maximum Permissible Exposure.

Co-location
Conclusion: The formula of calculated the MPE is: CPD1 / LPD1 + CPD2 / LPD2 +etc. < 1 CPD = Calculation power density LPD = Limit of power density 1. WiFi 2.4 GHz + WiFi 5 GHz + WWAN module; WCDMA function = $0.062 + 0.076 + 0.225 = 0.363$, therefore the maximum calculations of above situations are less than the "1" limit. 2. WiFi 2.4 GHz + WiFi 5 GHz + WWAN module; LTE function = $0.062 + 0.076 + 0.314 = 0.452$, therefore the maximum calculations of above situations are less than the "1" limit.

Note:

1. The above EUT information is declared by the manufacturer.
2. The results are evaluated using the maximum power.