Test Report No: 2440306R-RFUSV16S-A

TEST REPORT
FCC Rules&Regulations

Product Name	Peplink Pepwave Wireless Product
Brand Name	peplink PEPWAVE
Model No.	MAX BR1 Mini MAX-BR1-MINI-LTE-US-T-PRM BR1 Mini
Contains FCC ID	U8G-P1MT01
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	FCC CFR Title 47 Part 15 Subpart C Section 15.247 FCC CFR Title 47 Part 15 Subpart E Section 15.407 ANSI C63.10-2013
Verdict Summary	IN COMPLIANCE
Documented By Ida Tung	Ida Tung
Tested by Ivan Chuang	Ivan Chuang
Approved By Steven Tsai	Steven Tsai
Date of Receipt	2024/04/11
Date of Issue	2024/06/25
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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The results presented in this Test Report apply only to the particular item under test established in this document.

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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	2024/06/25

Summary of Test Result

Report Clause	Test Items	Result (PASS/FAIL)	Remark
3	Radiated Emission	PASS	-

Comments and Explanations
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1. General Information

1.1. EUT Description

Contains FCC ID	WWAN	XMR202008EC25AFXD

Note: For more detailed information please refer to the original module report.

Accessories Information					
No.	Equipment Name	Brand Name	Model No.	Rating	Remark
1	Adapter	DVE	DSA-24PFS-12 FUS 120200	INPUT: AC 100-240V ~ 50/60Hz, 0.8A OUTPUT: +12.0V⎓2.0A, 24.0W	With power cable, Non-shielded, 1.5m
2	DC Cable	Usmart	43025-4P-3.35M	N/A	Non-shielded, 3.35m
3	GPS Antenna	Master Wave	98335KSAF000	N/A	Type: Directional Shielded, 5m
4	GPS Antenna	Sense Energy	NP004	N/A	Type: Directiona Shielded, 5m

The difference for each model is shown as below:

Model No.	Description
MAX BR1 Mini	All models are electrically identical, different model names are for marketing purpose.
MAX-BR1-MINI-LTE-US-T-PRM	
BR1 Mini	

From the above models, model: MAX BR1 Mini was selected as representative model for the test and its data was recorded in this report.

Antenna Information				
Item.	Brand Name	Model No.	Type	Gain (dBi)
1	YUAN CHEN	ACA-0040-6G1A1-A10	Omni-directional	3.15 dBi for 2.4 GHz 3.29 dBi for 5.150-5.250 GHz 4.76 dBi for 5.725-5.850 GHz
2				
3	INPAQ	DAM-D13-S1-N0-000-08-20	Omni-directional	2.39 dBi for WCDMA Band 2 1.98 dBi for WCDMA Band 4 2.92 dBi for WCDMA Band 5 2.39 dBi for LTE Band 2 1.98 dBi for LTE Band 4 2.92 dBi for LTE Band 5 3.58 dBi for LTE Band 12 3.66 dBi for LTE Band 13 3.78 dBi for LTE Band 14 1.98 dBi for LTE Band 66 3.44 dBi for LTE Band 71
4				

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

1.2. EUT Information

EUT Power Type	Power Port: 10V~30V DC 802.3at PoE

1.3. Testing Location Information

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

Ambient conditions in the laboratory:

Performed Item	Items	Required	Actual	Test Date
Radiated Emission	Temperature (°C)	10~40 °C	24.7 °C	2024/04/29~2024/04/30
	Humidity (%RH)	10~90 %	51.0 %	

1.4. Measurement Uncertainty

Uncertainties have been calculated according to the DEKRA internal document with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2).

Test Item	Uncertainty
Radiated Emission	9 kHz~30 MHz: ±3.88 dB 30 MHz~1 GHz: ±4.42 dB 1 GHz~18 GHz: ±4.28 dB 18 GHz~40 GHz: ±3.90 dB

1.5. List of Test Equipment

For Radiated Measurements / HY-CB03

	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
V	Loop Antenna	AMETEK	HLA6121	56736	2023/05/23	2024/05/22
V	Bi-Log Antenna	SCHWARZBECK	VULB9168	9168-0675	2023/08/09	2025/08/08
V	Horn Antenna	Com-Power	AH-840	101100	2023/10/02	2025/10/01
V	Horn Antenna	RF SPIN	DRH18-E	210507A18ES	2023/05/11	2024/05/10
V	Pre-Amplifier	SGH	SGH0301-9	20211007-11	2024/01/10	2025/01/09
V	Pre-Amplifier	SGH	PRAMP118	20200701	2024/01/10	2025/01/09
V	Pre-Amplifier	EMCI	EMC05820SE	980310	2024/01/10	2025/01/09
V	Pre-Amplifier	EMCI	EMC184045SE	980369	2024/01/10	2025/01/09
V	Coaxial Cable	EMCI	EMC102-KM-KM-600	1160314	2024/01/10	2025/01/09
V	Coaxial Cable	EMCI	EMC102-KM-KM-7000	170242	2024/01/10	2025/01/09
V	Filter	MICRO TRONICS	BRM50702	G269	2024/01/05	2025/01/04
V	Filter	MICRO TRONICS	BRM50716	G196	2024/01/05	2025/01/04
V	EMI Test Receiver	R&S	ESR3	102793	2023/12/11	2024/12/10
V	Spectrum Analyzer	R&S	FSV3044	101114	2024/02/21	2025/02/20
V	Coaxial Cable	SGH	SGH18	2021005-1	2024/01/10	2025/01/09
V	Coaxial Cable	SGH	SGH18	202108-4	2024/01/10	2025/01/09
V	Coaxial Cable	SGH	HA800	GD20110223-1	2024/01/10	2025/01/09
V	Coaxial Cable	SGH	HA800	GD20110222-3	2024/01/10	2025/01/09
V	Universal Radiocommunication tester	R&S	CMU200	113574	2023/07/07	2024/07/06
V	UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY59321672	2023/05/30	2024/05/29

Note:

1. Bi-Log Antenna and Horn Antenna (AH-840) is calibrated every two years, the other equipments are calibrated every one year.
2. The test instruments marked with “V” are used to measure the final test results.
3. Test Software Version: e3 230303 dekra V9.

2. Test Configuration of EUT

2.1. Test Condition

EUT Operational Condition	
Testing Voltage	AC 120V/60Hz to DC 12V (AC Adapter) 802.3at PoE

2.2. Test Frequency Mode

Test Software Version	QA Tx tool / ver.4.03

2.3. Worst Case Measurement Configuration

Test Mode	Mode 1 (Simultaneous transmit)	TX_a_5180MHz+LTE_B4_20M_QPSK_1RB0_CH20175
		TX_a_5180MHz+WCDMA_B4_CH1413
		TX_g_2437MHz+LTE_B4_20M_QPSK_1RB0_CH20175
		TX_g_2437MHz+TX_a_5180MHz+LTE_B4_20M_QPSK_1RB0_CH20175
		TX_g_2437MHz+TX_a_5180MHz+WCDMA_B4_CH1413
		TX_g_2437MHz+WCDMA_B4_CH1413

Note:

1. Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. There consider simultaneous transmit (co-location) based on KDB 996369 D02 Question 1 and KDB 996369 D04 for Radiated Emission.
3. The Wi-Fi is referred to report No.: FR250205A, FR250205B and FR250205C from SPORTON and WWAN is referred to the certified module certificate.

2.4. Tested System Details

<Power by adapter>

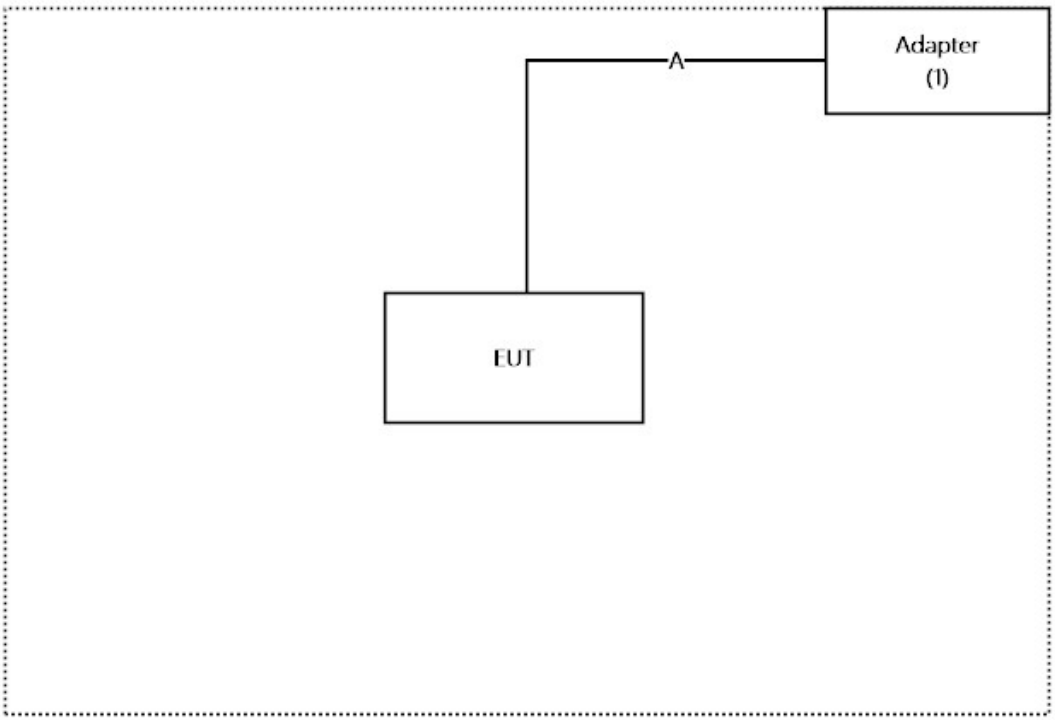
No.	Equipment	Brand Name	Model No.	Serial No.
1	Adapter	DVE	DSA-24PFS-12 FUS 120200	N/A

<Power by PoE>

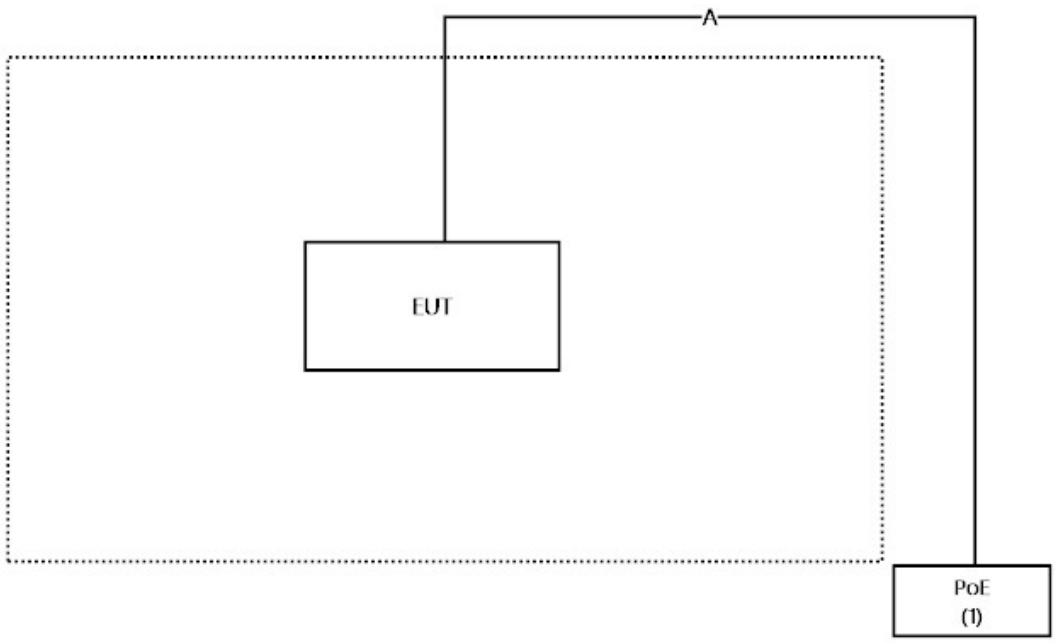
No.	Equipment	Brand Name	Model No.	Serial No.
1	PoE	BILLION	BP035-560054QAX	N/A

2.5. Configuration of Tested System

Connection Diagram – Power by adapter



Signal Cable Type		Signal cable Description
A	Power Cable	Non-shielded, 1.5m

Connection Diagram – Power by PoE


Signal Cable Type		Signal cable Description
A	LAN Cable	Non-shielded, 10m

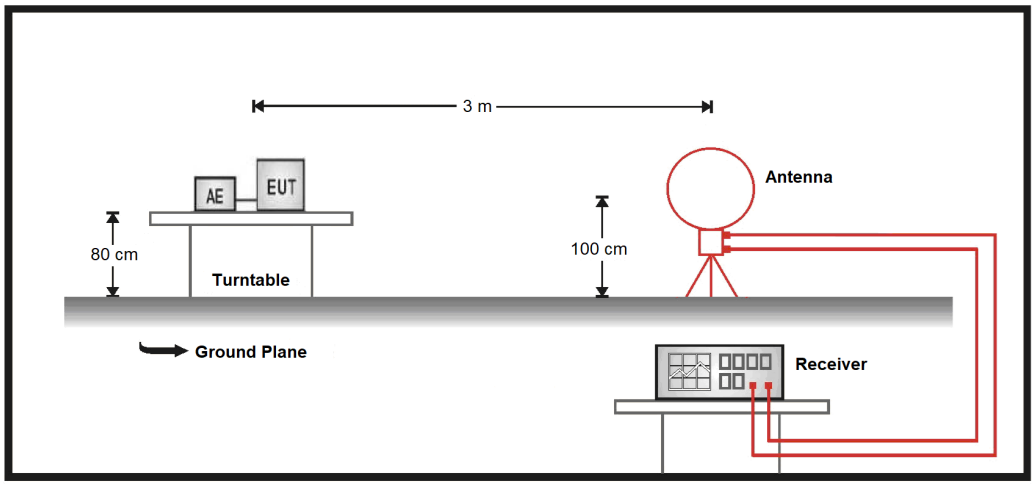
2.6. EUT Operating Procedures

1.	Setup the EUT as shown in Section 2.5.
2.	Execute software “QA Tx tool / ver.4.03” on the EUT.
3.	Configure the test mode.
4.	Verify that the EUT works properly.

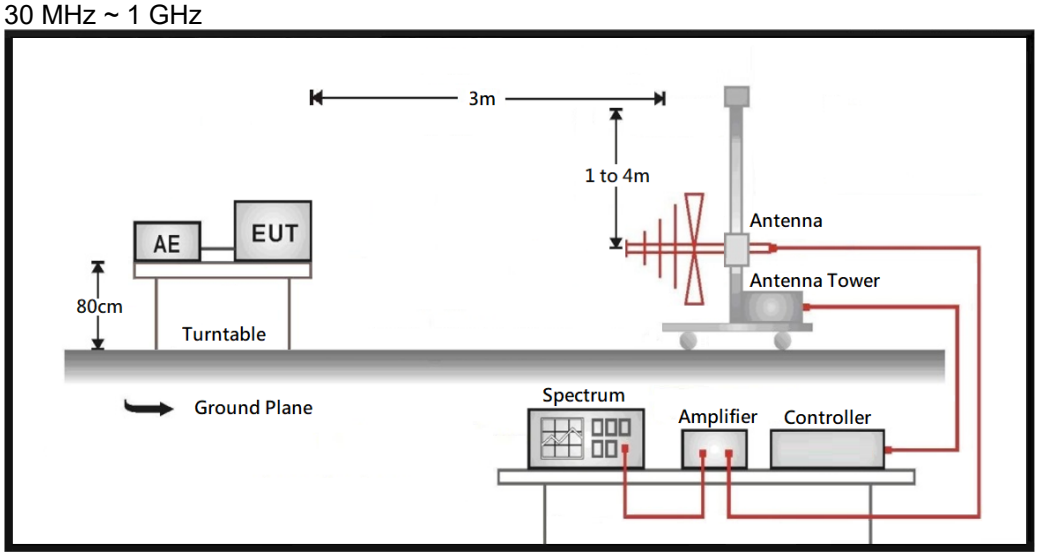
3. Radiated Emission

3.1. Test Setup

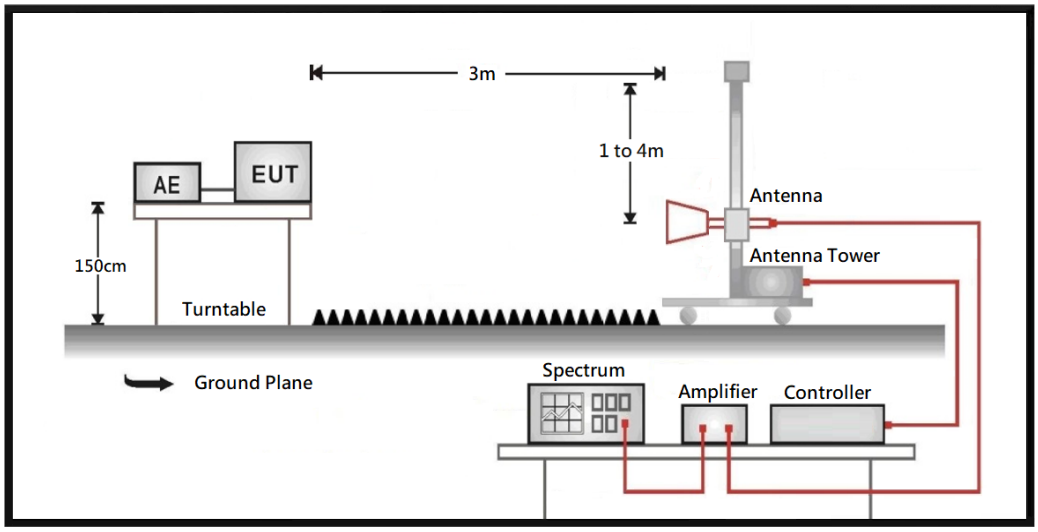
9 kHz ~ 30 MHz



30 MHz ~ 1 GHz



Above 1 GHz



3.2. Test Limit

Frequency (MHz)	Field strength (uV/m)	Field strength (dBuV/m)	Measurement distance (m)
0.009 – 0.490	2400/F(kHz)	20 log (2400/F(kHz))	300
0.490 – 1.705	24000/F(kHz)	20 log (24000/F(kHz))	30
1.705 - 30	30	29.5	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
Above 960	500	54	3

Remarks:

1. Field strength (dBuV/m) = 20 log Field strength (uV/m)
2. In the Above Table, the tighter limit applies at the band edges.
3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

Unwanted Emission out of the restricted bands Test Limit

Frequency (MHz)	EIRP Limit (dBm/MHz)	Equivalent Field Strength (dBuV/m@3m)
5150 – 5250	-27	68.2
5250 – 5350	-27	68.2
5470 – 5725	-27	68.2
5725 – 5850	-27 *1	68.2 *1
	10 *2	105.2 *2
	15.6 *3	110.8 *3
	27 *4	122.2 *4

*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

4. Remark:
5. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:
6. E = $\frac{1000000\sqrt{30P}}{3}$ uV/m, where P is the eirp (Watts).

3.3. Test Procedure

The EUT was setup according to ANSI C63.10: 2013 and tested according to DTS test procedure of KDB 558074.

The EUT and its simulators are placed on a turn table which is 0.8 or 1.5 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.10: 2013 on radiated measurement.

On any frequency or frequencies form 9 kHz(inculde The the lowest oscillator frequency generated within the device up to the 10th harmonic) to 1000 MHz, the limit shown are based on measuring equipment employing a quasi-peak detector function and on any frequency or frequencies above 1000 MHz the radiated limit shown are based upon the use of measurement instrumentation employing an average detector function. When average radiated emission measurement are included emission measurement below 1000 MHz, there also is a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.

The bandwidth below 1 GHz setting on the field strength meter is 120 kHz and above 1 GHz is 1 MHz.

3.4. Test Result of Radiated Emission

Refer as Appendix A