FCC RADIO EXPOSURE TEST REPORT

FCC ID	:	Z8H89FT0024
Equipment	:	ePMP3000
Brand Name	:	Cambium Networks
Model Name	:	ePMP3000
Applicant	:	Cambium Networks Inc. 3800 Golf Road, Suite 360 Rolling Meadows, IL 60008, USA
Manufacturer	:	Cambium Networks Inc. 3800 Golf Road, Suite 360 Rolling Meadows, IL 60008, USA
Standard	:	47 CFR Part 2.1091

The product was received on Mar. 21, 2018, and testing was started from Mar. 21, 2018 and completed on Dec. 27, 2018. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

The test 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: Cliff Chang

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Report Template No.: CB Ver1.0

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Photographs of EUT v02

History of this test report

Report No.	Version	Description	Issued Date
FA7N2420-04	01	Initial issue of report	Nov. 16, 2018
FA7N2420-04	02	Changing the approval to full modular approval from end product approval.	Nov. 29, 2018
FA7N2420-04	03	Adding the set 2 antenna (Dipole antenna, 2dBi). The Performance Checking: Maximum Permissible Exposure.	Dec. 28, 2018

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
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.

Reviewed by: Cliff Chang

Report Producer: Cindy Peng

1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	**Frequency Range (MHz)**	**Operating Frequency (MHz)**	**Modulation Type**
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)

1.1.1 Antenna Information

Set	Ant.	Port	Brand	Model Name	Type	Connector	Gain (dBi)
1	1	1	Cambium	ePMP3000	Array	Reversed-SMA	18
		2	Cambium	ePMP3000	Array	Reversed-SMA	18
		3	Cambium	ePMP3000	Array	Reversed-SMA	18
		4	Cambium	ePMP3000	Array	Reversed-SMA	18
Set	**Ant.**	**Port**	**Brand**	**Model Name**	**Type**	**Connector**	**Gain (dBi)**
2	2	1	ABRACON	APAMS-121	Dipole	Reversed-SMA	2
	3	2	ABRACON	APAMS-121	Dipole	Reversed-SMA	2
	4	3	ABRACON	APAMS-121	Dipole	Reversed-SMA	2
	5	4	ABRACON	APAMS-121	Dipole	Reversed-SMA	2

Note 1: The above information was declared by manufacturer.

Note 2: The EUT has two sets of antenna.

Note 3: Set 1 antenna has one antenna, and it has four connectors.

Note 4: Set 1 antenna array gain is 0dBi.

Note 5: Set 2 antenna contains four antennas.

1.2 Testing Location

Testing Location			
☐	HWA YA	ADD :	No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
		TEL :	886-3-327-3456 FAX : 886-3-327-0973
☒	JHUBEI	ADD :	No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.
		TEL :	886-3-656-9065 FAX : 886-3-656-9085

Test site Designation No. TW0006 with FCC.

Test site registered number IC 4086D with Industry Canada.

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	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)*	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

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm²)	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)*	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

2.2 MPE Calculation Method

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

E (V/m) = $\frac{\sqrt{30 \times P \times G}}{d}$ Power Density: *Pd* (W/m²) = $\frac{E^2}{377}$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

Pd = $\frac{30 \times P \times G}{377 \times d^2}$

2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

For Set 1 antenna:

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)
5.2G;D1D	18.00	14.85	32.85	0.50	33.35	2.16272	20	0.43026	1.00000
5.8G;D1D	18.00	17.89	35.89	0.11	36.00	3.98107	20	0.79201	1.00000

For Set 2 antenna:

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm^2)	S Limit (mW/cm^2)
5.2G;D1D	2.00	19.63	21.63	0.50	22.13	0.16331	20	0.03249	1.00000
5.8G;D1D	2.00	29.74	31.74	0.50	32.24	1.67494	20	0.33322	1.00000

THE END