



# RADIO EXPOSURE TEST REPORT

**FCC ID** : Z8H89FT0065

**Equipment** : ePMP 4500 5 GHz 8x8 Integrated Access Point Radio /  
ePMP 4500C 5GHz Access Point Radio

**Brand Name** : Cambium Networks

**Model Name** : ePMP 4500 5 GHz 8x8 Integrated Access Point Radio /  
ePMP 4500C 5GHz Access Point Radio

**Model Number** : C058940P122A / C058940P112A

**Applicant** : Cambium Networks Inc.  
3800 Golf Road, Suite 360 Rolling Meadows, IL 60008, USA

**Manufacturer** : Cambium Networks, Ltd.  
Ashburton, TQ13 7UP, UK

**Standard** : 47 CFR Part 2.1091

The product was received on Sep. 10, 2021, and testing was started from Sep. 24, 2021 and completed on Nov. 05, 2021. We, Sporton International Inc. Hsinchu 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 test results in this variant report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

**Sporton International Inc. Hsinchu Laboratory**  
No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)



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### Photographs of EUT v01



### History of this test report

Report No.	Version	Description	Issued Date
FA093027-02	01	Initial issue of report	Jun. 16, 2023
FA093027-02	02	1. Revising the antenna Information on section 1.2 2. Revising the description on section 1.6	Jul. 03, 2023



## Summary of Test Result

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

**Conformity Assessment Condition:**

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

**Disclaimer:**

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

**Reviewed by: Sam Chen**

**Report Producer: Vicky Huang**



# 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 5250-5350 5470-5725 5725-5850	5180-5240 5260-5320 5500-5700 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
4.9GHz	4940-4990	4942.5-4987.5	QPSK



### 1.2 Antenna Information

Ant. Set	Port		Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Support Band
	Radio 1 (TX/RX)	Radio 2 (RX)						
1	5	-	Cambium	5GHz 8x8 Sector Antenna	Sector	MCX	18	5GHz UNII1~3 and 4.9GHz
	6	-						
	7	-						
	8	-						
	1	-						
	2	1						
	3	2						
	4	-						
2	5	-	Cambium	5GHz Dipole Antenna	Dipole	MCX	2	5GHz UNII1, 3 and 4.9GHz
	6	-						
	7	-						
	8	-						
	1	-						
	2	1						
	3	2						
	4	-						

Note 1: The above information was declared by manufacturer.

**For Radio 1:**

**For IEEE 802.11a/n/ac/ax (8TX/8RX):**

Port 1, Port 2, Pot 3, Port 4, Port 5, Port 6, Port 7 and Port 8 can be used as transmitting/receiving antenna.

Port 1, Port 2, Pot 3, Port 4, Port 5, Port 6, Port 7 and Port 8 could transmit/receive simultaneously.

**For Radio 2:**

**For IEEE 802.11a/n/ac/ax (2RX)**

Port 1 and Port 2 can be used as receiving antenna.

Port 1 and Port 2 could receive simultaneously.

Note 2: The arrangement of antennas is MIMO with cross-polarized.

The vertical and horizontal antennas are well designed to be paired with H-V interlaced.

Thus, the array gain is 0dBi.



### 1.3 Accessories

N/A

### 1.4 Table for Multiple Listing

The model names in the following table are all refer to the identical product.

Equipment Name / Model Name	Model Number	Description
ePMP 4500 5 GHz 8x8 Integrated Access Point Radio	C058940P122A	All the models are identical, the difference model served as marketing strategy.
ePMP 4500C 5GHz Access Point Radio	C058940P112A	

Note 1: From the above models, model: ePMP 4500 5 GHz 8x8 Integrated Access Point Radio was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

### 1.5 Table for EUT Wireless Function

Radio	Function
1	5GHz, 4.9GHz-Transmitter/Receiver function
2	5GHz (Scan Radio)-Only receiver function
3	GPS

### 1.6 Table for Permissive Change

This product is an extension of original one reported under Sporton project number: FA093027-01

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Adding 5GHz UNII 2A, UNII 2C (5250~5350 MHz, 5470~5725 MHz) for Antenna Set 1 only.	MPE test.

Note: Maximum Permissible Exposure of 5GHz UNII 1, UNII 3 and 4.9GHz are based on original test report.

### 1.7 Testing Location

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
Test site Designation No. TW3787 with FCC.	
Conformity Assessment Body Identifier (CABID) TW3787 with ISED.	



## 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/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
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
300-1500	-	-	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/ cm <sup>2</sup> )	Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes)
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
300-1500	-	-	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 88 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

**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

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm <sup>2</sup> )	S Limit (mW/cm <sup>2</sup> )
5.2G;D1D	18.00	17.96	35.96	0.03	35.99	3.97192	88	0.04081	1.00000
5.3G;D1D	18.00	11.96	29.96	0.03	29.99	0.99770	88	0.01025	1.00000
5.6G;D1D	18.00	11.95	29.95	0.04	29.99	0.99770	88	0.01025	1.00000
5.8G;D1D	21.00	14.98	35.98	0.01	35.99	3.97192	88	0.04081	1.00000
4.9G	18.00	25.32	43.32	0.50	43.82	24.09905	88	0.24764	1.00000

MPE Exemption Option C							
Frequency (MHz)	$\lambda/2\pi$ (m)	R (m)	Tune-up EIRP (dBm)	Tune-up ERP (dBm)	Tune-up ERP (W)	ERP Threshold (W)	MPE Exemption
5230	0.0091	0.88	35.99	33.84	2.421	14.868	Complies
5785	0.0082		35.48	33.33	2.153	14.868	Complies
4950	0.0096		43.82	41.67	14.689	14.868	Complies

Note: The above antenna gain was declared by manufacturer.

—————THE END—————