



RADIO EXPOSURE TEST REPORT

FCC ID : Z8H89FT0087

Equipment : X7-53X Wi-Fi 7 Indoor Access Point

Brand Name : Cambium Networks

Model Name : X7-53X

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 Jun. 25, 2024, and testing was started from Jul. 03, 2024 and completed on May 21, 2025. 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 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

[illegible]



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: Wendy Pan



1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850 5725-5895	5180-5250 5250-5320 5500-5720 5745-5825 5815-5885	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) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK
Zigbee	2400-2483.5	2405-2480	O-QPSK



1.2 Antenna Information

Ant.	Port	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	Modes of Operation
1	1	ACCTON	RFMTA202028IMLB901-1	Dipole	I-PEX	Note 1	WLAN 2.4GHz (Radio 1)
2	2	ACCTON	RFMTA202028IMLB901-2	Dipole	I-PEX		WLAN 2.4GHz (Radio 1)
3	1	ACCTON	RFMTA202028IMLB901-3	Dipole	I-PEX		WLAN 5GHz UNII 1-4 (Radio 2)
4	2	ACCTON	RFMTA202028IMLB901-4	Dipole	I-PEX		WLAN 5GHz UNII 1-4 (Radio 2)
5	3	ACCTON	RFMTA202028IMLB901-5	Dipole	I-PEX		WLAN 5GHz UNII 1-4 (Radio 2)
6	4	ACCTON	RFMTA202028IMLB901-6	Dipole	I-PEX		WLAN 5GHz UNII 1-4 (Radio 2)
7	1	ACCTON	GT128V007S-001-1	On board chip	N/A		Bluetooth or Zigbee (Radio 3)

Note 1:

Ant.	Antenna Gain (dBi)				
	WLAN 2.4GHz (Radio 1)				
	2.4GHz	2.45GHz		2.4835GHz	
1	5.18	5.54		4.85	
2	4.30	4.91		4.16	
Ant.	WLAN 5GHz UNII 1-4 (Radio 2)				
	5.2GHz	5.3GHz	5.6GHz	5.785GHz	5.885GHz
	3	4.53	4.73	5.43	5.95
4	4.42	4.45	5.71	4.41	4.4
5	4.41	4.77	3.91	3.44	3.28
6	4.30	4.6	3.73	4.00	4.35
Bluetooth or Zigbee (Radio 3)					
7	4.3				

Item	Directional Gain (dBi)				
	WLAN 2.4GHz (Radio 1)				
	2.4GHz		2.45GHz		2.4835GHz
2T1S	6.91		6.86		6.04
2T2S	5.18		5.54		4.85
Item	WLAN 5GHz UNII 1-4 (Radio 2)				
	5.2GHz	5.3GHz	5.6GHz	5.785GHz	5.885GHz
	4T1S	8.62	9.31	9.18	8.43
4T2S	5.62	6.31	6.18	5.95	5.05
4T4S	4.53	4.77	5.71	5.95	4.4

Note 2: The above information (excepting Ant. 1-6 antenna gain and directional gain) was declared by manufacturer.

Note 3: Radio 1~2: Maximum Directional Gain following KDB662911 D03.

For Radio 1:

For 2.4GHz IEEE 802.11b/g/n/VHT/ax/be mode (2TX/2RX)

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

Port 1 and Port 2 could transmit/receive simultaneously.

**For Radio 2:****For 5GHz (UNII 1-4) IEEE 802.11a/n/ac/ax/be mode (4TX/4RX)**

Port 1, Port 2, Port 3 and Port 4 can be used as transmitting/receiving antenna.

Port 1, Port 2, Port 3 and Port 4 could transmit/receive simultaneously.

For Radio 3:**For Bluetooth or Zigbee mode (1TX/1RX)**

Only Port 1 can be used as transmitting/receiving antenna.

1.3 Table for Radio function

Radio \ Function	WLAN 2.4GHz	WLAN 5GHz	Bluetooth	Zigbee
1	V	-	-	-
2	-	V (UNII 1-4)	-	-
3	-	-	V	V

Note: The above information was declared by manufacturer.

1.3.1 Table for EUT Operation Function

Mode	Operation Function
1	R1: 2.4GHz + R2: 5GHz + R3: Bluetooth
2	R1: 2.4GHz + R2: 5GHz + R3: Zigbee

Note1: The R means Radio.

Note2: The above information was declared by manufacturer.



1.4 Accessories

Accessories
Wall-mounted rack 1*1
Wall-mounted rack 2*1

1.5 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 2.1091
- ♦ KDB 447498 D04 Interim General RF Exposure Guidance v01

The following reference test guidance is not within the scope of accreditation of TAF.

- ♦ 47 CFR Part 1.1307
- ♦ 47 CFR Part 1.1310

1.6 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 ISCED.



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 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) 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 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

2.2 MPE Calculation Method

The MPE was calculated at 51 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

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

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 MPE Exemption

Option (A): 1.1307(b)(3)(i)(A): Available maximum time-averaged power is < 1 mW

Option (B): 1.1307(b)(3)(i)(B): Device operates between 300 MHz and 6 GHz and the maximum time-averaged power or effective radiated power (ERP), whichever is greater, <= P_{th}.

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left(\frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

d = the separation distance (cm);

Option (C): 1.1307(b)(3)(i)(C): ERP is below a threshold calculated based on the distance

R between the person and the antenna / radiating structure, where $R > \lambda / 2 \pi$.

Single RF Sources Subject to Routine Environmental Evaluation	
RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	$1,920 R^2$.
1.34-30	$3,450 R^2/f^2$.
30-300	$3.83 R^2$.
300-1,500	$0.0128 R^2 f$.
1,500-100,000	$19.2 R^2$.
Note: R is in meters, f is in MHz.	



2.4 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

For Radio 1:

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;G1D	5.54	29.78	33.17	0.50	2328.091	51	C	4994.0	0.4664

For Radio 2:

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
5.2G;D1D	8.62	27.23	33.70	0.14	2421.029	51	C	4994.0	0.4850
5.3G;D1D	9.31	20.49	27.65	0.19	608.135	51	C	4994.0	0.1218
5.6G;D1D	9.18	20.77	27.80	0.04	608.135	51	C	4994.0	0.1218
5.8G;D1D	8.43	27.53	33.81	0.03	2421.029	51	C	4994.0	0.4850
5.81G;D1D	4.40	31.38	33.63	0.21	2421.029	51	C	4994.0	0.4850

For Radio 3:

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;BT-LE	4.30	19.34	21.49	0.50	158.125	51	C	4994.0	0.0317
2.4G;G1D Zigbee	4.30	19.01	21.16	0.50	146.555	51	C	4994.0	0.0199

**Simultaneous Transmission Analysis****Mode 1: R1: 2.4GHz + R2: 5GHz Full Band + R3: Bluetooth**

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;G1D	5.54	29.78	33.17	0.50	2328.091	51	C	4994.0	0.4664
5.8G;D1D	8.43	27.53	33.81	0.03	2421.029	51	C	4994.0	0.4850
2.4G;BT-LE	4.30	19.34	21.49	0.50	158.125	51	C	4994.0	0.0317
Sum TL Ratio_C	0.9831								
Ratio Limit	1								

Mode 2: R1: 2.4GHz + R2: 5GHz Full Band + R3: Zigbee

Mode	DG (dBi)	Power (dBm)	ERP (dBm)	Tolerance (dB)	Tune-up ERP (mW)	Distance (cm)	Option	TL ERP (mW)	TL Ratio
2.4G;G1D	5.54	29.78	33.17	0.50	2328.091	51	C	4994.0	0.4664
5.8G;D1D	8.43	27.53	33.81	0.03	2421.029	51	C	4994.0	0.4850
2.4G;G1D Zigbee	4.30	19.01	21.16	0.50	146.555	51	C	4994.0	0.0294
Sum TL Ratio_C	0.9808								
Ratio Limit	1								

Note: The above information (excepting Ant. 1-6 antenna gain and directional gain) was declared by manufacturer.

—THE END—