

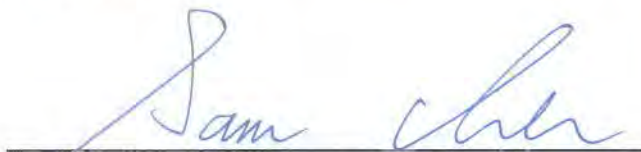


RADIO EXPOSURE TEST REPORT

FCC ID : QXO-AP4000
Equipment : Access Point
Brand Name : Extreme Networks
Model Name : AP4000
Applicant : Extreme Networks, Inc.
6480 Via Del Oro, San Jose, CA 95119
Manufacturer : Extreme Networks, Inc.
6480 Via Del Oro, San Jose, CA 95119
Standard : 47 CFR Part 2.1091

The product was received on May 13, 2021, and testing was started from May 21, 2021 and completed on Aug. 31, 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 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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History of this test report

Report No.	Version	Description	Issued Date
FA151220-03	01	Initial issue of report	Sep. 09, 2021



Summary of Test Result

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

Reference to Sporton Project No.: 151220

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: Sam Chen

Report Producer: Sharon Jiang



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)
5GHz WLAN	5150-5250 5725-5850	5180-5240 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)
6E WLAN	5925-7125	5955-7095	802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK
IEEE802.15.4	2400-2483.5	2405-2480	O-QPSK

1.2 Antenna Information

Ant.	Radio	Model Name	Antenna Type	Connector	Gain (dBi)
1	1, 2	N/A	PIFA	I-PEX	Note 1
2	1, 2	N/A	PIFA	I-PEX	
3	3	N/A	PIFA	I-PEX	
4	3	N/A	PIFA	I-PEX	
5	3	N/A	PIFA	I-PEX	
6	3	N/A	PIFA	I-PEX	
7	4	N/A	PIFA	I-PEX	



Ant.	WLAN 2.4GHz Port	WLAN 5GHz UNII 1~3 Port	Scanning radio (WLAN 2.4GHz) Port	Scanning radio (5GHz UNII 1~3) Port	Scanning radio (6E UNII 5~8) Port	Bluetooth / IEEE802.15.4 Port
1	2	2	-	-	-	-
2	1	1	-	-	-	-
3	-	-	2	2	-	-
4	-	-	1	1	-	-
5	-	-	-	-	1	-
6	-	-	-	-	2	-
7	-	-	-	-	-	1

Note 1:

Ant.	Gain (dBi)			
	WLAN 2.4GHz	Scanning radio (WLAN 2.4GHz)	Bluetooth	IEEE802.15.4
1	4	-	-	-
2	3.61	-	-	-
3	-	5.20	-	-
4	-	5.32	-	-
5	-	-	-	-
6	-	-	-	-
7	-	-	5.26	5.26



Ant.	WLAN 5GHz UNII 1~3				Scanning radio (5GHz UNII 1~3)				Scanning radio (6E UNII 5~8)			
	Band 1	Band 2	Band 3	Band 4	Band 1	Band 2	Band 3	Band 4	Band 5	Band 6	Band 7	Band 8
1	5.14	5.14	4.23	4.43	-	-	-	-	-	-	-	-
2	4.53	4.53	3.49	3.08	-	-	-	-	-	-	-	-
3	-	-	-	-	5.91	5.91	5.39	5.80	-	-	-	-
4	-	-	-	-	5.11	5.11	5.11	5.62	-	-	-	-
5	-	-	-	-	-	-	-	-	4.34	4.56	4.56	4.50
6	-	-	-	-	-	-	-	-	4.88	5.25	5.25	5.05

Ant.	Radio	Directional Gain (dBi)									
		WLAN 2.4GHz		5GHz Band 1		5GHz Band 2		5GHz Band 3		5GHz Band 4	
		2T1S	2T2S	2T1S	2T2S	2T1S	2T2S	2T1S	2T2S	2T1S	2T2S
1	1, 2	4.7	1.87	3.77	1.20	3.36	1.37	3.85	1.42	2.96	1.05
2											

Note 2: The EUT has seven antennas.

Note 3: The above information was declared by manufacturer.

Note 4: Radio 1, 2: Maximum Directional Gain following KDB662911 D03.

Note 5: Radio 3: Maximum Directional Gain following KDB662911 D01.

For Radio 1

For 2.4GHz:

For IEEE 802.11b/g/n/VHT/ax mode (1TX, 2TX/2RX):

For 1TX

The EUT supports the antenna with TX diversity functions.

Both Port 1 and Port 2 support transmit and receive functions, but only one of them will be used at one time.

The Port 1 generated the worst case, so it was selected to test and record in the report.

For 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 1~3:

For IEEE 802.11a/n/ac/ax mode (1TX, 2TX/2RX):

For 1TX

The EUT supports the antenna with TX diversity functions.

Both Port 1 and Port 2 support transmit and receive functions, but only one of them will be used at one time.

The Port 1 generated the worst case, so it was selected to test and record in the report.

For 2TX/2RX

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

Port 1 and Port 2 could transmit/receive simultaneously.

For Scanning radio 3

For 2.4GHz:

For IEEE 802.11b/g/n/VHT/ax mode (2TX/2RX):

For 5GHz UNII 1~3:

For IEEE 802.11a/n/ac/ax 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 6E UNII 5~8 (1TX, 2TX/2RX):

For 1TX

The EUT supports the antenna with TX diversity functions.

Both Port 1 and Port 2 support transmit and receive functions, but only one of them will be used at one time.

The Port 2 generated the worst case, so it was selected to test and record in the report.

For 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 4

Bluetooth / IEEE802.15.4 (1TX/1RX):

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

1.3 Accessories

Accessories
Cradle*1

1.4 Table for Radio function

Radio	WLAN 2.4GHz	5GHz UNII 1, 3	Scanning radio (WLAN 2.4GHz / 5GHz UNII 1, 3 / 6E (UNII 5~8))	Bluetooth / IEEE802.15.4
1	V (AP, Bridge, Mesh)	-	-	-
2	-	V AP for UNII 1, 3 Bridge, Mesh for UNII 1, 3	-	-
3	-	-	V (AP)	-
4	-	-	-	V

Note: The above information was declared by manufacturer.



1.5 Table for EUT support function

Function
AP
Bridge
Mesh

Note: The above information was declared by manufacturer.

1.6 Test Mode

Test Mode	Description
1	Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_2.4GHz + Radio 4_Bluetooth
2	Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_2.4GHz + Radio 4_802.15.4
3	Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_5GHz + Radio 4_Bluetooth
4	Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_5GHz + Radio 4_802.15.4
5	Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_6E + Radio 4_Bluetooth
6	Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_6E + Radio 4_802.15.4

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 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 25 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

Radio 1

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)
2.4G;G1D-1T1S	4.00	25.37	29.37	0.50	29.87	0.97051	25	0.12357	1.00000
2.4G;D1D-1T1S	4.00	22.96	26.96	0.50	27.46	0.55719	25	0.07094	1.00000
2.4G;G1D-2T1S	4.00	27.46	31.46	0.50	31.96	1.57036	25	0.19994	1.00000
2.4G;D1D-2T1S	4.00	25.46	29.46	0.50	29.96	0.99083	25	0.12615	1.00000
2.4G;D1D-2T2S	1.87	24.89	26.76	0.50	27.26	0.53211	25	0.06775	1.00000

Radio 2

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-1T1S	5.14	24.88	30.02	0.50	30.52	1.12720	25	0.14352	1.00000
5.8G;D1D-1T1S	4.43	25.43	29.86	0.50	30.36	1.08643	25	0.13832	1.00000
5.2G;D1D-2T1S	5.14	27.39	32.53	0.50	33.03	2.00909	25	0.25580	1.00000
5.8G;D1D-2T1S	4.43	27.96	32.39	0.50	32.89	1.94536	25	0.24769	1.00000
5.2G;D1D-2T2S	1.20	26.53	27.73	0.50	28.23	0.66527	25	0.08470	1.00000
5.8G;D1D-2T2S	1.05	28.01	29.06	0.50	29.56	0.90365	25	0.11505	1.00000

Radio 3

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)
2.4G;G1D-2T1S	5.32	27.17	32.49	0.50	32.99	1.99067	25	0.25345	1.00000
2.4G;D1D-2T1S	5.32	24.35	29.67	0.50	30.17	1.03992	25	0.13240	1.00000
2.4G;D1D-2T2S	5.26	24.51	29.77	0.50	30.27	1.06414	25	0.13549	1.00000
5.2G;D1D-2T1S	5.91	26.95	32.86	0.50	33.36	2.16770	25	0.27599	1.00000
5.8G;D1D-2T1S	5.80	29.50	35.30	0.50	35.80	3.80189	25	0.48406	1.00000
5.2G;D1D-2T2S	5.53	26.64	32.17	0.50	32.67	1.84927	25	0.23545	1.00000
5.8G;D1D-2T2S	5.71	29.47	35.18	0.50	35.68	3.69828	25	0.47087	1.00000
6.2G;D1D-1T1S	4.88	-	25.51	0.50	26.01	0.39902	25	0.05080	1.00000
6.4G;D1D-1T1S	5.25	-	26.33	0.50	26.83	0.48195	25	0.06136	1.00000
6.7G;D1D-1T1S	5.25	-	26.04	0.50	26.54	0.45082	25	0.05740	1.00000
7.0G;D1D-1T1S	5.05	-	23.58	0.50	24.08	0.25586	25	0.03258	1.00000
6.2G;D1D-2T1S	7.63	-	26.29	0.50	26.79	0.47753	25	0.06080	1.00000
6.4G;D1D-2T1S	7.93	-	26.16	0.50	26.66	0.46345	25	0.05901	1.00000
6.7G;D1D-2T1S	7.93	-	26.28	0.50	26.78	0.47643	25	0.06066	1.00000
7.0G;D1D-2T1S	7.79	-	25.15	0.50	25.65	0.36728	25	0.04676	1.00000



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)
6.2G;D1D-2T2S	4.62	-	25.98	0.50	26.48	0.44463	25	0.05661	1.00000
6.4G;D1D-2T2S	4.92	-	26.04	0.50	26.54	0.45082	25	0.05740	1.00000
6.7G;D1D-2T2S	4.92	-	26.24	0.50	26.74	0.47206	25	0.06010	1.00000
7.0G;D1D-2T2S	4.78	-	23.75	0.50	24.25	0.26607	25	0.03388	1.00000

Radio 4

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)
2.4G;BT-LE	5.26	4.31	9.57	0.50	10.07	0.01016	25	0.00129	1.00000
802.15.4	5.26	4.47	9.73	0.50	10.23	0.01054	25	0.00134	1.00000

Simultaneous Transmission Analysis Mode:

Test Mode 1: Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_2.4GHz + Radio 4_Bluetooth

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)	Ratio (S/Limit)
2.4G;G1D-2T1S	4.00	27.46	31.46	0.50	31.96	1.57036	25	0.19994	1.00000	0.19994
5.2G;D1D-2T1S	5.14	27.39	32.53	0.50	33.03	2.00909	25	0.25580	1.00000	0.25580
2.4G;G1D-2T1S	5.32	27.17	32.49	0.50	32.99	1.99067	25	0.25345	1.00000	0.25345
2.4G;BT-LE	5.26	4.31	9.57	0.50	10.07	0.01016	25	0.00129	1.00000	0.00129
									Sum Ratio	0.71048
									Ratio Limit	1

Test Mode 2: Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_2.4GHz + Radio 4_802.15.4

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)	Ratio (S/Limit)
2.4G;G1D-2T1S	4.00	27.46	31.46	0.50	31.96	1.57036	25	0.19994	1.00000	0.19994
5.2G;D1D-2T1S	5.14	27.39	32.53	0.50	33.03	2.00909	25	0.25580	1.00000	0.25580
2.4G;G1D-2T1S	5.32	27.17	32.49	0.50	32.99	1.99067	25	0.25345	1.00000	0.25345
802.15.4	5.26	4.47	9.73	0.50	10.23	0.01054	25	0.00134	1.00000	0.00134
									Sum Ratio	0.71053
									Ratio Limit	1



Test Mode 3: Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_5GHz + Radio 4_Bluetooth

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)	Ratio (S/Limit)
2.4G;G1D-2T1S	4.00	27.46	31.46	0.50	31.96	1.57036	25	0.19994	1.00000	0.19994
5.2G;D1D-2T1S	5.14	27.39	32.53	0.50	33.03	2.00909	25	0.25580	1.00000	0.25580
5.8G;D1D-2T1S	5.80	29.50	35.30	0.50	35.80	3.80189	25	0.48406	1.00000	0.48406
2.4G;BT-LE	5.26	4.31	9.57	0.50	10.07	0.01016	25	0.00129	1.00000	0.00129
									Sum Ratio	0.94109
									Ratio Limit	1

Test Mode 4: Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_5GHz + Radio 4_802.15.4

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)	Ratio (S/Limit)
2.4G;G1D-2T1S	4.00	27.46	31.46	0.50	31.96	1.57036	25	0.19994	1.00000	0.19994
5.2G;D1D-2T1S	5.14	27.39	32.53	0.50	33.03	2.00909	25	0.25580	1.00000	0.25580
5.8G;D1D-2T1S	5.80	29.50	35.30	0.50	35.80	3.80189	25	0.48406	1.00000	0.48406
802.15.4	5.26	4.47	9.73	0.50	10.23	0.01054	25	0.00134	1.00000	0.00134
									Sum Ratio	0.94114
									Ratio Limit	1

Test Mode 5: Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_6E + Radio 4_Bluetooth

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)	Ratio (S/Limit)
2.4G;G1D-2T1S	4.00	27.46	31.46	0.50	31.96	1.57036	25	0.19994	1.00000	0.19994
5.2G;D1D-2T1S	5.14	27.39	32.53	0.50	33.03	2.00909	25	0.25580	1.00000	0.25580
6.4G;D1D-1T1S	5.25	-	26.33	0.50	26.83	0.48195	25	0.06136	1.00000	0.06136
2.4G;BT-LE	5.26	4.31	9.57	0.50	10.07	0.01016	25	0.00129	1.00000	0.00129
									Sum Ratio	0.51839
									Ratio Limit	1

Test Mode 6: Radio 1_2.4GHz + Radio 2_5GHz + Scanning radio 3_6E + Radio 4_802.15.4

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)	Ratio (S/Limit)
2.4G;G1D-2T1S	4.00	27.46	31.46	0.50	31.96	1.57036	25	0.19994	1.00000	0.19994
5.2G;D1D-2T1S	5.14	27.39	32.53	0.50	33.03	2.00909	25	0.25580	1.00000	0.25580
6.4G;D1D-1T1S	5.25	-	26.33	0.50	26.83	0.48195	25	0.06136	1.00000	0.06136
802.15.4	5.26	4.47	9.73	0.50	10.23	0.01054	25	0.00134	1.00000	0.00134
									Sum Ratio	0.51844
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

—————THE END—————