FCC RADIO EXPOSURE TEST REPORT

FCC ID	:	QXO-AP510I
Equipment	:	802.11ax Access Point
Brand Name	:	Extreme Networks
Model Name	:	AP560i
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 Feb. 15, 2019, and testing was started from Feb. 19, 2019 and completed on Mar. 13, 2019. 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 variant 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: Sam Chen

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FA8O1739-07	01	Initial issue of report	Apr. 10, 2019

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: 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) 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)
Bluetooth	2400-2483.5	2402-2480	LE: DSSS (GFSK)
Thread	2400-2483.5	2405-2480	Thread: O-QPSK (250kbps)

1.1.1 Table for Class II Change

This product is an extension of original one reported under Sporton project number: FA8O1739-01

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

Modifications	Performance Checking
Adding a model name: AP560i Based on above modification. 1. Adding the outdoor function. 2. Changing the EUT case. 3. Removing USB Port. 4. Power Supply: From PoE only.	Outdoor 5GHz Band 1 MPE only.

Note: Others MPE results were based on original report.

1.1.2 Table for Multiple Listing

The EUT has three radios, the information as following table:

Radio	Function		
	WLAN 2.4GHz	WLAN 5GHz	Bluetooth/Thread
1	V	V	-
2	-	V	-
3	-	-	V

1.1.3 Table for EUT support function

Function	Support Type	Support Band
AP	Master	WLAN 2.4GHz/Bluetooth/Thread/WLAN 5GHz Band 1~4
Client	Slave without Radar Detection (Sensor Mode)	WLAN 2.4GHz/Bluetooth/Thread/WLAN 5GHz Band 1+4
Bridge	Master	WLAN 2.4GHz/Bluetooth/Thread/WLAN 5GHz Band 1+4
Mesh	Master	WLAN 2.4GHz/Bluetooth/Thread/WLAN 5GHz Band 1+4

Note: The above information was declared by manufacturer.

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 4086B with Industry Canada.Maximum Permissible Exposure

1.3 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 MPE Calculation Method

The MPE was calculated at 26 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 = $\frac{30 \times P \times G}{377 \times d^2}$

2.1 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

For Indoor 5GHz Band 1

For WLAN Function:

Test Mode: 1T1S

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 (Radio 1)	5.89	21.09	26.98	0.50	27.48	0.55976	26	0.06589	1
5.2G;D1D (Radio 2)	4.57	19.62	24.19	0.50	24.69	0.29444	26	0.03466	1

Test Mode: 2T2S

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 (Radio 1)	5.63	24.09	29.72	0.50	30.22	1.05196	26	0.12383	1
5.2G;D1D (Radio 2)	4.49	22.10	26.59	0.50	27.09	0.51168	26	0.06023	1

Test Mode: 4T1S

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 (Radio 1)	11.59	24.30	35.89	0.10	35.99	3.97192	26	0.46756	1
5.2G;D1D (Radio 2)	10.81	24.56	35.37	0.50	35.87	3.86367	26	0.45481	1

Test Mode: 4T4S

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 (Radio 1)	5.58	26.52	32.10	0.50	32.60	1.81970	26	0.21421	1
5.2G;D1D (Radio 2)	4.79	25.03	29.82	0.50	30.32	1.07647	26	0.12672	1

For Outdoor

For WLAN Function:

Test Mode: 1T1S

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 (Radio 1)	5.89	14.95	20.84	0.5	21.34	0.13614	26	0.01603	1
5.2G;D1D (Radio 2)	4.57	16.38	20.95	0.06	21.01	0.12618	26	0.01485	1

Test Mode: 2T2S

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 (Radio 1)	5.63	15.35	20.98	0.5	21.48	0.1406	26	0.01655	1
5.2G;D1D (Radio 2)	4.49	16.50	20.99	0.01	21.00	0.12589	26	0.01482	1

Test Mode: 4T1S

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 (Radio 1)	11.59	9.4	20.99	0.5	21.49	0.14093	26	0.01659	1
5.2G;D1D (Radio 2)	10.81	10.11	20.92	0.07	20.99	0.12560	26	0.01479	1

Test Mode: 4T4S

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 (Radio 1)	5.58	15.36	20.94	0.5	21.44	0.13932	26	0.0164	1
5.2G;D1D (Radio 2)	4.79	16.18	20.97	0.02	20.99	0.12560	26	0.01479	1

For Indoor and Outdoor 5GHz Band 4, 2.4GHz, Bluetooth and Thread

For WLAN Function:

Test Mode: 1T1S

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 (Radio 1)	3.90	22.93	26.83	0.50	27.33	0.54075	26	0.06366	1
5.8G;D1D (Radio 1)	5.89	21.47	27.36	0.50	27.86	0.61094	26	0.07192	1
5.8G;D1D (Radio 2)	4.57	22.84	27.41	0.50	27.91	0.61802	26	0.07275	1

Test Mode: 2T2S

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;D1D (Radio 1)	3.87	23.17	27.04	0.50	27.54	0.56754	26	0.06681	1
5.8G;D1D (Radio 1)	5.63	24.48	30.11	0.50	30.61	1.15080	26	0.13547	1
5.8G;D1D (Radio 2)	4.49	25.94	30.43	0.50	30.93	1.23880	26	0.14583	1

Test Mode: 4T1S

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 (Radio 1)	3.90	28.09	31.99	0.50	32.49	1.77419	26	0.20885	1
5.8G;D1D (Radio 1)	11.59	24.40	35.99	0.01	36.00	3.98107	26	0.46863	1
5.8G;D1D (Radio 2)	10.81	25.16	35.97	0.02	35.99	3.97192	26	0.46757	1

Test Mode: 4T4S

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;D1D (Radio 1)	3.76	25.11	28.87	0.50	29.37	0.86497	26	0.10182	1
5.8G;D1D (Radio 1)	5.58	27.49	33.07	0.50	33.57	2.27510	26	0.26781	1
5.8G;D1D (Radio 2)	4.79	28.38	33.17	0.50	33.67	2.32809	26	0.27405	1

For Bluetooth Function:

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 (Radio 3)	4.40	1.67	6.07	0.50	6.57	0.00454	26	0.00053	1

For Thread Function:

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 (Radio 3)	4.40	1.92	6.32	0.50	6.82	0.00481	26	0.00057	1

Simultaneous Transmission Analysis Mode:

For Indoor and Outdoor:

Mode 1: WLAN 2.4GHz (Radio 1) + WLAN 5GHz (Radio 2) + Bluetooth (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)	Ratio (S/Limit)
2.4G;G1D (Radio 1)	3.90	28.09	31.99	0.50	32.49	1.77419	26	0.20885	1	0.20885
5.8G;D1D (Radio 2)	10.81	25.16	35.97	0.02	35.99	3.97192	26	0.46756	1	0.46756
2.4G;BT (Radio 3)	4.40	1.67	6.07	0.50	6.57	0.00454	26	0.00053	1	0.00053
									Sum Ratio	0.67694
									Ratio Limit	1

Mode 2: WLAN 5GHz (Radio 1) + WLAN 5GHz (Radio 2) + Bluetooth (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)	Ratio (S/Limit)
5.8G;D1D (Radio 1)	11.59	24.40	35.99	0.01	36.00	3.98107	26	0.46863	1	0.46863
5.8G;D1D (Radio 2)	10.81	25.16	35.97	0.02	35.99	3.97192	26	0.46756	1	0.46756
2.4G;BT (Radio 3)	4.40	1.67	6.07	0.50	6.57	0.00454	26	0.00053	1	0.00053
									Sum Ratio	0.93672
									Ratio Limit	1

Mode 3: WLAN 2.4GHz (Radio 1) + WLAN 5GHz (Radio 2) + Thread (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)	Ratio (S/Limit)
2.4G;G1D (Radio 1)	3.90	28.09	31.99	0.50	32.49	1.77419	26	0.20885	1	0.20885
5.8G;D1D (Radio 2)	10.81	25.16	35.97	0.02	35.99	3.97192	26	0.46756	1	0.46756
2.4G;D1D (Radio 3)	4.40	1.92	6.32	0.50	6.82	0.00481	26	0.00057	1	0.00057
									Sum Ratio	0.67698
									Ratio Limit	1

Mode 4: WLAN 5GHz (Radio 1) + WLAN 5GHz (Radio 2) + Thread (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)	Ratio (S/Limit)
5.8G;D1D (Radio 1)	11.59	24.40	35.99	0.01	36.00	3.98107	26	0.46863	1	0.46863
5.8G;D1D (Radio 2)	10.81	25.16	35.97	0.02	35.99	3.97192	26	0.46756	1	0.46756
2.4G;G1D (Radio 3)	4.40	1.92	6.32	0.50	6.82	0.00481	26	0.00057	1	0.00057
									Sum Ratio	0.93676
									Ratio Limit	1

Note: The above antenna gain was declared by manufacturer.

———THE END———