



RF Exposure Evaluation Declaration

Product Name : Wireless Access Point

Model No. : AP460SC

FCC ID : QXO-AP460SC

Applicant : Extreme Networks, Inc

Address : 6480 Via Del Oro, San Jose, CA 95119

Date of Receipt : May. 11, 2020

Issued Date : Aug. 19, 2020

Report No. : 2032034R-RF-US-P20V02

Report Version : V1.0

The test results presented in this report relate only to the object tested.

The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to account the uncertainty associated with the measurement result, unless the specification, standard or customer have special requirements

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Test Report Certification

Issued Date: Aug. 19, 2020

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Product Name : Wireless Access Point
Applicant : Extreme Networks, Inc
Address : 6480 Via Del Oro, San Jose, CA 95119
Manufacturer : Extreme Networks, Inc
Address : 6480 Via Del Oro, San Jose, CA 95119
Model No. : AP460SC
Brand : Extreme Networks
FCC ID : QXO-AP460SC
EUT Voltage : DC 37~57V
Applicable Standard : KDB 447498D01V06
FCC Part1.1310
Test Result : Complied
Performed Location : DEKRA Testing and Certification (Suzhou) Co., Ltd.
No.99 Hongye Rd., Suzhou Industrial Park, Suzhou,
215006, Jiangsu, China
TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
FCC Designation Number: CN1199

Documented By :



(Project Assistant: Kitty Li)

Reviewed By :



(Technical Supervisor: Frank He)

Approved By :



(Supervisor: Jack Zhang)

1. RF Exposure Evaluation

1.1. Limits

According to FCC 1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in 1.1307(b)

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Average Time (Minutes)
(A) Limits for Occupational/ Control Exposures				
300-1500	--	--	F/300	6
1500-100,000	--	--	5	6
(B) Limits for General Population/ Uncontrolled Exposures				
300-1500	--	--	F/1500	6
1500-100,000	--	--	1	30

F= Frequency in MHz

Friis Formula

Friis transmission formula: $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

Where

P_d = power density in mW/cm²

P_{out} = output power to antenna in mW

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in cm

P_d is the limit of MPE, 1 mW/cm². If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

1.2. Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

The temperature and related humidity: 18°C and 78% RH.

1.3. Test Result of RF Exposure Evaluation

Product	:	Wireless Access Point
Test Item	:	RF Exposure Evaluation
Test Site	:	AC-6

Note: Model AP460SC have two antenna configurations called AP460S6C and AP460S12C, they are the same except the antenna type and antenna gain. We evaluated AP460S6C for conducted test item, AP460S6C, AP460S12C for radiated test item and conducted emission, shown in the report is the worst data of AP460S6C, AP460S12C.

Antenna Information:

BLE:

AP460S6C:

Antenna Model No.	N/A					
Antenna Manufacturer	N/A					
Antenna Delivery	☒	1*TX+1*RX	☐	2*TX+2*RX	☐	3*TX+3*RX
Antenna Technology	☒	SISO				
	☐	MIMO	☐	Basic methodology		
			☐	Sectorized antenna systems		
			☐	Cross-polarized antennas		
			☐	Unequal antenna gains, with equal transmit powers		
			☐	Spatial Multiplexing		
			☐	Cyclic Delay Diversity (CDD)		
Antenna Type	PIFA					
Antenna 3(Radio 3) Gain	7.90 dBi					

AP460S12C:

Antenna Model No.	N/A				
Antenna Manufacturer	N/A				
Antenna Delivery	☒	1*TX+1*RX	☐	2*TX+2*RX	☐ 3*TX+3*RX
Antenna Technology	☒	SISO			
	☐	MIMO	☐	Basic methodology	
			☐	Sectorized antenna systems	
			☐	Cross-polarized antennas	
			☐	Unequal antenna gains, with equal transmit powers	
			☐	Spatial Multiplexing	
			☐	Cyclic Delay Diversity (CDD)	
Antenna Type	PIFA				
Antenna 3(Radio 3) Gain	6.63 dBi				

WLAN 2.4GHz:**AP460S6C:**

Antenna Model No.	N/A				
Antenna Manufacturer	N/A				
Antenna Delivery	☒	1*TX+1*RX	☒	2*TX+2*RX	☐ 3*TX+3*RX
Antenna Technology	☒	SISO			
	☒	MIMO	☐	Basic methodology	
			☐	Sectorized antenna systems	
			☐	Cross-polarized antennas	
			☐	Unequal antenna gains, with equal transmit powers	
			☒	Spatial Multiplexing	
			☒	Cyclic Delay Diversity (CDD)	
Antenna Type	PIFA				
Antenna Gain(Radio 1)					
Antenna Technology	Ant Gain (dBi)				
Ant 4(Radio 1)	7.83				
Antenna Gain(Radio 2)					
Antenna Technology	Ant Gain (dBi)				
☒	SISO	☒	Ant1 (Radio 2)	7.88	
☒		Ant2 (Radio 2)	7.88		
☒	CDD		7.88 dBi for Power; 10.89 dBi for PSD		
☒	Beam-forming		10.89 dBi for Power; 10.89 dBi for PSD		

AP460S12C:

Antenna Model No.	N/A				
Antenna Manufacturer	N/A				
Antenna Delivery	☒	1*TX+1*RX	☒	2*TX+2*RX	☐ 3*TX+3*RX
Antenna Technology	☒	SISO			
	☒	MIMO	☐	Basic methodology	
			☐	Sectorized antenna systems	
			☐	Cross-polarized antennas	
			☐	Unequal antenna gains, with equal transmit powers	
			☒	Spatial Multiplexing	
			☒	Cyclic Delay Diversity (CDD)	
Antenna Type	PIFA				
Antenna Gain(Radio 1)					
Antenna Technology	Ant Gain (dBi)				
Ant 4(Radio 1)	5.53				
Antenna Gain(Radio 2)					
Antenna Technology	Ant Gain (dBi)				
☒	SISO	☒	Ant1 (Radio 2)	7.12	
☒		Ant2 (Radio 2)	6.16		
☒	CDD			7.12 dBi for Power; 10.13 dBi for PSD	
☒	Beam-forming			10.13 dBi for Power; 10.13 dBi for PSD	

WLAN 5GHz:**AP460S6C:**

Antenna Model No.	N/A									
Antenna Manufacturer	N/A									
Antenna Delivery	☒	1*TX+1*RX	☒	2*TX+2*RX	☒	3*TX+3*RX	☒	4*TX+4*RX		
Antenna Technology	☒	SISO								
	☒	MIMO	☐	Basic methodology						
			☐	Sectorized antenna systems						
			☐	Cross-polarized antennas						
			☐	Unequal antenna gains, with equal transmit powers						
			☒	Spatial Multiplexing						
			☒	Cyclic Delay Diversity (CDD)						
Antenna Type	PIFA									
Antenna Gain(Radio 1)										
Antenna Technology	Ant Gain (dBi)									
Ant 4(Radio 1)	6.46									
Antenna Gain(Radio 2)										
Antenna Technology	Ant Gain (dBi)									
☒	SISO	☒	Ant1 (Radio 2)	7.77						
☒		Ant2 (Radio 2)	7.79							
☒	CDD			7.79dBi for Power; 10.80dBi for PSD						
☒	Beam-forming			10.80dBi for Power; 10.80dBi for PSD						

Antenna Gain(Radio 3)				
Antenna Technology			Ant Gain (dBi)	
☒	SISO	☒	Ant3 (Radio 3)	7.84
		☒	Ant5 (Radio 3)	8.06
		☒	Ant6 (Radio 3)	7.91
		☒	Ant7 (Radio 3)	7.65
☒	2*2 CDD			8.06dBi for Power; 11.07dBi for PSD
☒	2*2 Beam-forming			11.07dBi for Power; 11.07dBi for PSD
☒	4*4 CDD			8.06dBi for Power; 14.08dBi for PSD
☒	4*4 Beam-forming			14.08dBi for Power; 14.08dBi for PSD

AP460S12C:

Antenna Model No.	N/A									
Antenna Manufacturer	N/A									
Antenna Delivery	☒	1*TX+1*RX	☒	2*TX+2*RX	☒	3*TX+3*RX	☒	4*TX+4*RX		
Antenna Technology	☒	SISO								
	☒	MIMO	☐	Basic methodology						
			☐	Sectorized antenna systems						
			☐	Cross-polarized antennas						
			☐	Unequal antenna gains, with equal transmit powers						
			☒	Spatial Multiplexing						
			☒	Cyclic Delay Diversity (CDD)						
Antenna Type	PIFA									
Antenna Gain(Radio 1)										
Antenna Technology	Ant Gain (dBi)									
Ant 4(Radio 1)	5.54									
Antenna Gain(Radio 2)										
Antenna Technology	Ant Gain (dBi)									
☒	SISO	☒	Ant1 (Radio 2)	6.36						
☒		Ant2 (Radio 2)	6.11							
☒	CDD			6.36dBi for Power; 9.37dBi for PSD						
☒	Beam-forming			9.37dBi for Power; 9.37dBi for PSD						

Antenna Gain(Radio 3)				
Antenna Technology			Ant Gain (dBi)	
☒	SISO	☒	Ant3 (Radio 3)	6.25
		☒	Ant5 (Radio 3)	6.15
		☒	Ant6 (Radio 3)	5.37
		☒	Ant7 (Radio 3)	5.31
☒	2*2 CDD			6.25dBi for Power; 9.26dBi for PSD
☒	2*2 Beam-forming			9.26dBi for Power; 9.26dBi for PSD
☒	4*4 CDD			6.25dBi for Power; 12.27dBi for PSD
☒	4*4 Beam-forming			12.27dBi for Power; 12.27dBi for PSD

Note1: The device supports 3 radios, radio 1(1*1 2.4GHz & 1*1 5GHz full band); radio 2(2*2 2.4GHz & 2*2 5GHz low band); radio 3(4*4 5GHz full band & 1*1 BLE), and radio 2 & 3 can works with Dual 2.4GHz & 5GHz mode and Dual 5GHz mode. As the 5GHz high band filter is different between two modes, additional Radio 3 5GHz high band mode is tested for compliance.

Dual 2.4GHz & 5GHz mode: Radio 2(2.4GHz 2*2) + Radio 3(5GHz full band 4*4)

Dual 5GHz mode: Radio 2(5GHz low band 2*2) + Radio 3(5GHz high band 4*4)

Note2: Radio 3 1*1 and 3*3 power will follow 2*2 and 4*4 power setting, so only 2*2 and 4*4 data are tested.

Power Density

Standalone modes:

AP460SC:

Wireless Radio	Test Mode	Frequency Band (MHz)	Maximum EIRP (dBm)	Power Density at R = 25 cm (mW/cm ²)	Power Density Limit at R = 25 cm (mW/cm ²)
Radio 3	BLE	2400 ~ 2483.5	11.82	0.002	1.0
Radio 1	802.11b/g/n/ax	2400 ~ 2483.5	30.59	0.146	1.0
Radio 2	802.11b/g/n/ax	2400 ~ 2483.5	33.68	0.297	1.0
Radio 1	802.11a/n/ac/ax	5150 ~ 5350 5470 ~ 5725 5725 ~ 5850	26.29	0.054	1.0
Radio 2	802.11a/n/ac/ax	5150 ~ 5350	26.95	0.063	1.0
Radio 3 Full band	802.11a/n/ac/ax	5150 ~ 5350 5470 ~ 5725 5725 ~ 5850	35.76	0.480	1.0
Radio 3 High band	802.11a/n/ac/ax	5470 ~ 5725 5725 ~ 5850	35.66	0.469	1.0

Simultaneous transmission:

Wireless Configure	Frequency Range (MHz)	Maximum EIRP (dBm)				Limit of Power Density S(mW/cm ²)	Power Density S at R = 25 cm (mW/cm ²)				Rate	Limit
		Radio 1	Radio 2	Radio 3	BLE		Radio 1	Radio 2	Radio 3	BLE		
Radio 1 + Radio 2(2.4GHz Only) + Radio 3(5GHz Full Band) + BLE	2.4G+5G	30.59	33.68	35.76	11.82	1.0	0.146	0.297	0.480	0.002	0.925	1
Radio 1 + Radio 2(5GHz Low Band) + Radio 3(5GHz High Band) + BLE	2.4G+5G	30.59	26.95	35.66	11.82	1.0	0.146	0.063	0.469	0.002	0.680	1

The EUT support simultaneously transmit with Radio 1 + Radio 2+ Radio 3 + BLE.

The worst combination should be shown in the report. The simultaneously safety distance is 25cm for installed for Wireless Access Point without any other radio equipment.

_____ The End _____