



# RF Exposure Evaluation Declaration

Product Name : Wireless Access Point

Model No. : AP410C

FCC ID : QXO-AP410C

Applicant : Extreme Networks, Inc

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

Date of Receipt : Sep. 20, 2019

Issued Date : Dec. 30, 2019

Report No. : 1992128R-RF-US-P20V01

Report Version : V1.1

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: Dec. 30, 2019

Report No.: 1992128R-RF-US-P20V01



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. : AP410C  
Brand : Extreme Networks  
FCC ID : QXO-AP410C  
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 :

A handwritten signature in black ink that reads 'Kitty Li'.

(Project Assistant: Kitty Li )

Reviewed By :

A handwritten signature in black ink that reads 'Frank he'.

(Senior Engineer: Frank He )

Approved By :

A handwritten signature in black ink that reads 'Jack Zhang'.

( Engineer 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 <sup>2</sup> ) | 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/cm<sup>2</sup>

$P_{out}$  = output power to antenna in mW

G = gain of antenna in linear scale

$\pi$  = 3.1416

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

$P_d$  is the limit of MPE, 1 mW/cm<sup>2</sup>. 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                   |

### Antenna Information:

#### BLE 2.4GHz:

|                      |                                     |           |                          |                                                   |                          |           |
|----------------------|-------------------------------------|-----------|--------------------------|---------------------------------------------------|--------------------------|-----------|
| Antenna Model No.    | N/A                                 |           |                          |                                                   |                          |           |
| Antenna Manufacturer | N/A                                 |           |                          |                                                   |                          |           |
| Antenna Delivery     | <input checked="" type="checkbox"/> | 1*TX+1*RX | <input type="checkbox"/> | 2*TX+2*RX                                         | <input type="checkbox"/> | 3*TX+3*RX |
| Antenna Technology   | <input checked="" type="checkbox"/> | SISO      |                          |                                                   |                          |           |
|                      | <input type="checkbox"/>            | MIMO      | <input type="checkbox"/> | Basic methodology                                 |                          |           |
|                      |                                     |           | <input type="checkbox"/> | Sectorized antenna systems                        |                          |           |
|                      |                                     |           | <input type="checkbox"/> | Cross-polarized antennas                          |                          |           |
|                      |                                     |           | <input type="checkbox"/> | Unequal antenna gains, with equal transmit powers |                          |           |
|                      |                                     |           | <input type="checkbox"/> | Spatial Multiplexing                              |                          |           |
|                      |                                     |           | <input type="checkbox"/> | Cyclic Delay Diversity (CDD)                      |                          |           |
| Antenna Type         | PIFA                                |           |                          |                                                   |                          |           |
| Antenna Gain         | 3.4dBi                              |           |                          |                                                   |                          |           |

**WLAN 2.4GHz:**

|                                     |                                     |                                     |                                     |                                                   |                                    |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|---------------------------------------------------|------------------------------------|
| Antenna Model No.                   | N/A                                 |                                     |                                     |                                                   |                                    |
| Antenna Manufacturer                | N/A                                 |                                     |                                     |                                                   |                                    |
| Antenna Delivery                    | <input checked="" type="checkbox"/> | 1*TX+1*RX                           | <input checked="" type="checkbox"/> | 2*TX+2*RX                                         | <input type="checkbox"/> 3*TX+3*RX |
| Antenna Technology                  | <input checked="" type="checkbox"/> | SISO                                |                                     |                                                   |                                    |
|                                     | <input checked="" type="checkbox"/> | MIMO                                | <input type="checkbox"/>            | Basic methodology                                 |                                    |
|                                     |                                     |                                     | <input type="checkbox"/>            | Sectorized antenna systems                        |                                    |
|                                     |                                     |                                     | <input type="checkbox"/>            | Cross-polarized antennas                          |                                    |
|                                     |                                     |                                     | <input type="checkbox"/>            | Unequal antenna gains, with equal transmit powers |                                    |
|                                     |                                     |                                     | <input checked="" type="checkbox"/> | Spatial Multiplexing                              |                                    |
|                                     |                                     |                                     | <input checked="" type="checkbox"/> | Cyclic Delay Diversity (CDD)                      |                                    |
| Antenna Type                        | PIFA                                |                                     |                                     |                                                   |                                    |
| Antenna Gain(Radio 1)               |                                     |                                     |                                     |                                                   |                                    |
| Antenna Technology                  | Ant Gain (dBi)                      |                                     |                                     |                                                   |                                    |
| Ant 4(Radio 1)                      | 4.00                                |                                     |                                     |                                                   |                                    |
| Antenna Gain(Radio 2)               |                                     |                                     |                                     |                                                   |                                    |
| Antenna Technology                  | Ant Gain (dBi)                      |                                     |                                     |                                                   |                                    |
| <input checked="" type="checkbox"/> | SISO                                | <input checked="" type="checkbox"/> | Ant1 (Radio 2)                      | 3.80                                              |                                    |
| <input checked="" type="checkbox"/> |                                     | Ant2 (Radio 2)                      | 3.90                                |                                                   |                                    |
| <input checked="" type="checkbox"/> | CDD                                 |                                     |                                     | 3.90dBi for Power; 6.91dBi for PSD                |                                    |
| <input checked="" type="checkbox"/> | Beam-forming                        |                                     |                                     | 6.91dBi for Power; 6.91dBi for PSD                |                                    |

**WLAN 5GHz:**

|                                     |                                     |                                     |                                     |                                                   |                                     |           |                                     |           |  |  |
|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|---------------------------------------------------|-------------------------------------|-----------|-------------------------------------|-----------|--|--|
| Antenna Model No.                   | N/A                                 |                                     |                                     |                                                   |                                     |           |                                     |           |  |  |
| Antenna Manufacturer                | N/A                                 |                                     |                                     |                                                   |                                     |           |                                     |           |  |  |
| Antenna Delivery                    | <input checked="" type="checkbox"/> | 1*TX+1*RX                           | <input checked="" type="checkbox"/> | 2*TX+2*RX                                         | <input checked="" type="checkbox"/> | 3*TX+3*RX | <input checked="" type="checkbox"/> | 4*TX+4*RX |  |  |
| Antenna Technology                  | <input checked="" type="checkbox"/> | SISO                                |                                     |                                                   |                                     |           |                                     |           |  |  |
|                                     | <input checked="" type="checkbox"/> | MIMO                                | <input type="checkbox"/>            | Basic methodology                                 |                                     |           |                                     |           |  |  |
|                                     |                                     |                                     | <input type="checkbox"/>            | Sectorized antenna systems                        |                                     |           |                                     |           |  |  |
|                                     |                                     |                                     | <input type="checkbox"/>            | Cross-polarized antennas                          |                                     |           |                                     |           |  |  |
|                                     |                                     |                                     | <input type="checkbox"/>            | Unequal antenna gains, with equal transmit powers |                                     |           |                                     |           |  |  |
|                                     |                                     |                                     | <input checked="" type="checkbox"/> | Spatial Multiplexing                              |                                     |           |                                     |           |  |  |
|                                     |                                     |                                     | <input checked="" type="checkbox"/> | Cyclic Delay Diversity (CDD)                      |                                     |           |                                     |           |  |  |
| Antenna Type                        | PIFA                                |                                     |                                     |                                                   |                                     |           |                                     |           |  |  |
| Antenna Gain(Radio 1)               |                                     |                                     |                                     |                                                   |                                     |           |                                     |           |  |  |
| Antenna Technology                  | Ant Gain (dBi)                      |                                     |                                     |                                                   |                                     |           |                                     |           |  |  |
| Ant 4(Radio 1)                      | 3.3                                 |                                     |                                     |                                                   |                                     |           |                                     |           |  |  |
| Antenna Gain(Radio 2)               |                                     |                                     |                                     |                                                   |                                     |           |                                     |           |  |  |
| Antenna Technology                  | Ant Gain (dBi)                      |                                     |                                     |                                                   |                                     |           |                                     |           |  |  |
| <input checked="" type="checkbox"/> | SISO                                | <input checked="" type="checkbox"/> | Ant1 (Radio 2)                      | 4.5                                               |                                     |           |                                     |           |  |  |
| <input checked="" type="checkbox"/> |                                     | Ant2 (Radio 2)                      | 4.7                                 |                                                   |                                     |           |                                     |           |  |  |
| <input checked="" type="checkbox"/> | CDD                                 |                                     |                                     | 4.7dBi for Power; 7.71dBi for PSD                 |                                     |           |                                     |           |  |  |
| <input checked="" type="checkbox"/> | Beam-forming                        |                                     |                                     | 7.71dBi for Power; 7.71dBi for PSD                |                                     |           |                                     |           |  |  |

| Antenna Gain(Radio 3)               |                  |                                                    |                                      |
|-------------------------------------|------------------|----------------------------------------------------|--------------------------------------|
| Antenna Technology                  |                  |                                                    | Ant Gain (dBi)                       |
| <input checked="" type="checkbox"/> | SISO             | <input checked="" type="checkbox"/> Ant3 (Radio 3) | 4.7                                  |
|                                     |                  | <input checked="" type="checkbox"/> Ant5 (Radio 3) | 4.6                                  |
|                                     |                  | <input checked="" type="checkbox"/> Ant6 (Radio 3) | 4.6                                  |
|                                     |                  | <input checked="" type="checkbox"/> Ant7 (Radio 3) | 4.7                                  |
| <input checked="" type="checkbox"/> | 2*2 CDD          |                                                    | 4.7dBi for Power; 7.71dBi for PSD    |
| <input checked="" type="checkbox"/> | 2*2 Beam-forming |                                                    | 7.71dBi for Power; 7.71dBi for PSD   |
| <input checked="" type="checkbox"/> | 4*4 CDD          |                                                    | 4.7dBi for Power; 10.72dBi for PSD   |
| <input checked="" type="checkbox"/> | 4*4 Beam-forming |                                                    | 10.72dBi for Power; 10.72dBi for PSD |

Note: 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)

## Power Density

### Standalone modes:

#### AP410C:

| Wireless Radio    | Test Mode         | Frequency Band (MHz)      | Maximum EIRP (dBm) | Power Density at R = 20cm (mW/cm <sup>2</sup> ) | Power Density Limit at R = 20 cm (mW/cm <sup>2</sup> ) |
|-------------------|-------------------|---------------------------|--------------------|-------------------------------------------------|--------------------------------------------------------|
| Radio 3           | BLE               | 2400 ~ 2483.5             | 9.79               | 0.002                                           | 1.0                                                    |
| Radio 1           | 802.11b/g/n/ac/ax | 2400 ~ 2483.5             | 26.93              | 0.098                                           | 1.0                                                    |
| Radio 2           | 802.11b/g/n/ac/ax | 2400 ~ 2483.5             | 31.8               | 0.301                                           | 1.0                                                    |
| Radio 1           | 802.11a/n/ac/ax   | 5150 ~ 5250 & 5725 ~ 5850 | 23.76              | 0.047                                           | 1.0                                                    |
| Radio 2           | 802.11a/n/ac/ax   | 5150 ~ 5250               | 29.63              | 0.183                                           | 1.0                                                    |
| Radio 3 Full band | 802.11a/n/ac/ax   | 5150 ~ 5250 & 5725 ~ 5850 | 34.61              | 0.575                                           | 1.0                                                    |
| Radio 3 High band | 802.11a/n/ac/ax   | 5725 ~ 5850               | 33.83              | 0.481                                           | 1.0                                                    |



**Simultaneous transmission:**

| Wireless Configure                                               | Frequency Range (MHz) | Maximum EIRP (dBm) |         |         |      | Limit of Power Density S(mW/cm <sup>2</sup> ) | Power Density S at R = 20 cm (mW/cm <sup>2</sup> ) |         |         |       | 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               | 26.93              | 31.8    | 34.61   | 9.79 | 1.0                                           | 0.098                                              | 0.301   | 0.575   | 0.002 | 0.976 | 1     |
| Radio 1 + Radio 2(5GHz Low Band) + Radio 3(5GHz High Band) + BLE | 2.4G+5G               | 26.93              | 29.63   | 33.83   | 9.79 | 1.0                                           | 0.098                                              | 0.183   | 0.481   | 0.002 | 0.763 | 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 20cm for installed for Wireless Access Point without any other radio equipment.

\_\_\_\_\_ The End \_\_\_\_\_