



# RADIO EXPOSURE TEST REPORT

FCC ID : QXO-AP410NB

Equipment : Wireless Access Point

Brand Name :



Model Name : AP410i

Applicant : Extreme Networks, Inc.

6480 Via Del Oro, San Jose, CA 95119, United States

Manufacturer : Extreme Networks, Inc.

6480 Via Del Oro, San Jose, CA 95119, United States

Standard : 47 CFR Part 2.1091

The product was received on Sep. 23, 2019, and testing was started from Sep. 23, 2019 and completed on Oct. 26, 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

TEL : 886-3-656-9065  
FAX : 886-3-656-9085  
Report Template No.: CB-A1\_1 Ver1.1

Page Number : 3 of 10  
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Report Version : 01



## Summary of Test Result

| Report Clause                                                                                                                                                                     | Ref Std. Clause | Test Items          | Result (PASS/FAIL) | Remark |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------------------|--------------------|--------|
| 2                                                                                                                                                                                 | -               | Exposure evaluation | PASS               | -      |
| Note 1: From Sporton Project No.: FA970232 and FA970232-01.<br>Note 2: This is a variant report by removing the external antenna, BT/Thread module. The RF Exposure was verified. |                 |                     |                    |        |

**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: 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)<br>802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) |
| 5GHz WLAN              | 5150-5250<br>5250-5350<br>5470-5725<br>5725-5850 | 5180-5250<br>5250-5320<br>5500-5720<br>5745-5825 | 802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM)<br>802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM)<br>802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)                                 |

## 1.2 Antenna Information

| Ant. | Brand | Model Number (P/N) | Antenna Type | Connector | Antenna Gain (dBi) |           | Remark  |
|------|-------|--------------------|--------------|-----------|--------------------|-----------|---------|
|      |       |                    |              |           | WLAN 2.4GHz        | WLAN 5GHz |         |
| 1    | SENAO | 5718A0474300       | PIFA         | IPEX      | 4.56               | -         | Radio 1 |
| 2    | SENAO | 5718A0475300       | PIFA         | IPEX      | 4.56               | -         | Radio 1 |
| 3    | SENAO | 5718A0476300       | PIFA         | IPEX      | 4.47               | 5.02      | Radio 3 |
| 4    | SENAO | 5718A0477300       | PIFA         | IPEX      | 4.47               | 5.02      | Radio 3 |
| 5    | SENAO | 5718A0478300       | PIFA         | IPEX      | -                  | 5.36      | Radio 2 |
| 6    | SENAO | 5718A0479300       | PIFA         | IPEX      | -                  | 5.36      | Radio 2 |
| 7    | SENAO | 5718A0480300       | PIFA         | IPEX      | -                  | 5.36      | Radio 2 |
| 8    | SENAO | 5718A0481300       | PIFA         | IPEX      | -                  | 5.36      | Radio 2 |

| Beamforming Gain (dBi) |           |           |
|------------------------|-----------|-----------|
| 2TX                    |           | 4TX       |
| WLAN 2.4GHz            | WLAN 5GHz | WLAN 5GHz |
| 3.01                   |           | 6.02      |

Note: The above information was declared by manufacturer.

**For Radio 1:**

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



For 1TX

Only Port 1 can be use as transmitting antenna.

For 2TX

Port 1 and Port 2 can be use as transmitting antenna.

Port 1 and Port 2 could transmit simultaneously.

**For Radio 2:**

**For IEEE 802.11a/n/ac/ax mode (1TX, 2TX, 4TX/4RX):**

For 1TX

Only Port 1 can be use as transmitting antenna.

For 2TX

Port 1 and Port 2 can be use as transmitting antenna.

Port 1 and Port 2 could transmit simultaneously.

For 4TX

Port 1, Port 2, Port 3 and Port 4 can be use as transmitting antenna.

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

For 4RX

Port 1, Port 2, Port 3 and Port 4 can be used as receiving antennas.

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

**For Radio 3:**

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

For 1TX

Only Port 1 can be use as transmitting antenna.

For 2TX

Port 1 and Port 2 can be use as transmitting antenna.

Port 1 and Port 2 could transmit simultaneously.

### 1.3 Accessories

Wall-mounted rack\*1

### 1.4 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 <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-3.0               | 614                               | 1.63                              | *(100)                                   | <6                                                               |
| 3.0-30                | 1842/f                            | 4.89/f                            | *(900/f <sup>2</sup> )                   | <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 <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
|-----------------------|-----------------------------------|-----------------------------------|------------------------------------------|------------------------------------------------------------------|
| 0.3-1.34              | 614                               | 1.63                              | *(100)                                   | <30                                                              |
| 1.34-30               | 824/f                             | 2.19/f                            | *(180/f <sup>2</sup> )                   | <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 31 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 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Test Mode: 1TX

| Mode               | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) |
|--------------------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 2.4G;G1D (Radio 1) | 4.56     | 27.91       | 32.47      | 0.50           | 32.97              | 1.98153          | 31            | 0.16408                 | 1                             |
| 5.2G;D1D (Radio 2) | 5.36     | 23.82       | 29.18      | 0.50           | 29.68              | 0.92897          | 31            | 0.07692                 | 1                             |
| 5.3G;D1D (Radio 2) | 5.36     | 23.76       | 29.12      | 0.50           | 29.62              | 0.91622          | 31            | 0.07587                 | 1                             |
| 5.6G;D1D (Radio 2) | 5.36     | 22.48       | 27.84      | 0.50           | 28.34              | 0.68234          | 31            | 0.05650                 | 1                             |
| 5.8G;D1D (Radio 2) | 5.36     | 25.68       | 31.04      | 0.50           | 31.54              | 1.42561          | 31            | 0.11805                 | 1                             |
| 2.4G;G1D (Radio 3) | 4.47     | 23.28       | 27.75      | 0.50           | 28.25              | 0.66834          | 31            | 0.05534                 | 1                             |
| 5.2G;D1D (Radio 3) | 5.02     | 24.37       | 29.39      | 0.50           | 29.89              | 0.97499          | 31            | 0.08073                 | 1                             |
| 5.3G;D1D (Radio 3) | 5.02     | 23.68       | 28.70      | 0.50           | 29.20              | 0.83176          | 31            | 0.06887                 | 1                             |
| 5.6G;D1D (Radio 3) | 5.02     | 23.61       | 28.63      | 0.50           | 29.13              | 0.81846          | 31            | 0.06777                 | 1                             |
| 5.8G;D1D (Radio 3) | 5.02     | 23.33       | 28.35      | 0.50           | 28.85              | 0.76736          | 31            | 0.06354                 | 1                             |

**Test Mode: 2TX**

| Mode               | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) |
|--------------------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 2.4G;G1D (Radio 1) | 7.57     | 26.01       | 33.58      | 0.50           | 34.08              | 2.55859          | 31            | 0.21186                 | 1                             |
| 5.2G;D1D (Radio 2) | 5.36     | 26.29       | 31.65      | 0.50           | 32.15              | 1.64059          | 31            | 0.13585                 | 1                             |
| 5.3G;D1D (Radio 2) | 5.36     | 23.96       | 29.32      | 0.50           | 29.82              | 0.95940          | 31            | 0.07944                 | 1                             |
| 5.6G;D1D (Radio 2) | 5.36     | 23.96       | 29.32      | 0.50           | 29.82              | 0.95940          | 31            | 0.07944                 | 1                             |
| 5.8G;D1D (Radio 2) | 5.36     | 28.91       | 34.27      | 0.50           | 34.77              | 2.99916          | 31            | 0.24835                 | 1                             |
| 2.4G;G1D (Radio 3) | 7.48     | 23.99       | 31.47      | 0.50           | 31.97              | 1.57398          | 31            | 0.13033                 | 1                             |
| 5.2G;D1D (Radio 3) | 8.03     | 25.82       | 33.85      | 0.50           | 34.35              | 2.72270          | 31            | 0.22545                 | 1                             |
| 5.3G;D1D (Radio 3) | 8.03     | 21.83       | 29.86      | 0.13           | 29.99              | 0.99770          | 31            | 0.08261                 | 1                             |
| 5.6G;D1D (Radio 3) | 8.03     | 21.92       | 29.95      | 0.04           | 29.99              | 0.99770          | 31            | 0.08261                 | 1                             |
| 5.8G;D1D (Radio 3) | 8.03     | 24.32       | 32.35      | 0.50           | 32.85              | 1.92752          | 31            | 0.15961                 | 1                             |

**Test Mode: 4TX**

| Mode               | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) |
|--------------------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|
| 5.2G;D1D (Radio 2) | 11.38    | 24.48       | 35.86      | 0.13           | 35.99              | 3.97192          | 31            | 0.32889                 | 1                             |
| 5.3G;D1D (Radio 2) | 11.38    | 18.56       | 29.94      | 0.05           | 29.99              | 0.99770          | 31            | 0.08261                 | 1                             |
| 5.6G;D1D (Radio 2) | 11.38    | 18.57       | 29.95      | 0.04           | 29.99              | 0.99770          | 31            | 0.08261                 | 1                             |
| 5.8G;D1D (Radio 2) | 11.38    | 24.55       | 35.93      | 0.06           | 35.99              | 3.97192          | 31            | 0.32889                 | 1                             |



## Simultaneous Transmission Analysis Mode: Radio 1 + Radio 2 + Radio 3 (2.4GHz)

| Mode     | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) | Ratio (S/Limit) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|-----------------|
| 2.4G;G1D | 7.57     | 26.01       | 33.58      | 0.50           | 34.08              | 2.55859          | 31            | 0.21186                 | 1                             | 0.21186         |
| 5.8G;D1D | 11.38    | 24.55       | 35.93      | 0.06           | 35.99              | 3.97192          | 31            | 0.32889                 | 1                             | 0.32889         |
| 2.4G;G1D | 7.48     | 23.99       | 31.47      | 0.50           | 31.97              | 1.57398          | 31            | 0.13033                 | 1                             | 0.13033         |
|          |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.67108         |
|          |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |

## Simultaneous Transmission Analysis Mode: Radio 1 + Radio 2 + Radio 3 (5GHz)

| Mode     | DG (dBi) | Power (dBm) | EIRP (dBm) | Tolerance (dB) | Tune-up EIRP (dBm) | Tune-up EIRP (W) | Distance (cm) | S (mW/cm <sup>2</sup> ) | S Limit (mW/cm <sup>2</sup> ) | Ratio (S/Limit) |
|----------|----------|-------------|------------|----------------|--------------------|------------------|---------------|-------------------------|-------------------------------|-----------------|
| 2.4G;G1D | 7.57     | 26.01       | 33.58      | 0.50           | 34.08              | 2.55859          | 31            | 0.21186                 | 1                             | 0.21186         |
| 5.8G;D1D | 11.38    | 24.55       | 35.93      | 0.06           | 35.99              | 3.97192          | 31            | 0.32889                 | 1                             | 0.32889         |
| 5.2G;D1D | 8.03     | 25.82       | 33.85      | 0.50           | 34.35              | 2.72270          | 31            | 0.22545                 | 1                             | 0.22545         |
|          |          |             |            |                |                    |                  |               |                         | Sum Ratio                     | 0.76620         |
|          |          |             |            |                |                    |                  |               |                         | Ratio Limit                   | 1               |

Note: The above antenna gain was declared by manufacturer.

————THE END————