# RF Exposure Report

**Report No.:** SA160219C14B

**FCC ID:** TVE-28166011

**Test Model:** FAP-421E, FAP-423E

**Series Model:** FortiAP 421Exxxxxx, FAP-421Exxxxxx, FORTIAP-421Exxxxxx, FortiAP 423Exxxxxx, FAP-423Exxxxxx, FORTIAP-423Exxxxxx (where "x" can be used as "A-Z" or "0-9" or "-" or blank for software changes or marketing purposes only)

**Received Date:** Oct. 19, 2016

**Issued Date:** Dec .23, 2016

**Applicant:** Fortinet Inc.

**Address:** 899 Kifer Road Sunnyvale, CA 94086 USA

**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

**Lab Address:** No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.

**Test Location:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

## Table of Contents

**Release Control Record**

| Issue No. | Description | Date Issued |
|---|---|---|
| SA160219C14B | Original release. | Dec. 23, 2016 |

## 1    Certificate of Conformity

|  |  |
|---|---|
| **Product:** | Secured Wireless Access Point |
| **Brand:** | Fortinet Inc. |
| **Test Model:** | FAP-421E, FAP-423E |
| **Series Model:** | FortiAP 421Exxxxxx, FAP-421Exxxxxx, FORTIAP-421Exxxxxx, FortiAP 423Exxxxxx, FAP-423Exxxxxx, FORTIAP-423Exxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only) |
| **Sample Status:** | Engineering sample |
| **Applicant:** | Fortinet Inc. |
| **Standards:** | FCC Part 2 (Section 2.1091) |
| | KDB 447498 D01 (October 23, 2015) |
| | IEEE C95.1 |

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**Prepared by :** _____ , **Date:** _____Dec. 23, 2016_____
Pettie Chen / Senior Specialist

**Approved by :** _____ , **Date:** _____Dec. 23, 2016_____
Ken Liu / Senior Manager

## 2 RF Exposure

### 2.1 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) |
|---|---|---|---|---|
| Limits For General Population / Uncontrolled Exposure | | | | |
| 300-1500 | … | … | F/1500 | 30 |
| 1500-100,000 | … | … | 1.0 | 30 |

F = Frequency in MHz

### 2.2 MPE Calculation Formula

Pd = (Pout*G) / (4*pi*r$^2$)

where

Pd = power density in mW/cm$^2$

Pout = 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

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 31cm away from the body of the user. So, this device is classified as **Mobile Device**.

## 3  Calculation Result of Maximum Conducted Power

| Frequency Band (MHz) | Max Power (dBm) | Antenna Gain (dBi) | Distance (cm) | Power Density (mW/cm$^2$) | Limit (mW/cm$^2$) |
|---|---|---|---|---|---|
| Internal antenna | | | | | |
| CDD mode | | | | | |
| 2412-2462 | 26.91 | 10.00 | 31 | 0.407 | 1 |
| 5180-5240 | 24.71 | 11.86 | 31 | 0.376 | 1 |
| 5260-5320 | 21.28 | 11.86 | 31 | 0.171 | 1 |
| 5500-5720 | 23.83 | 11.86 | 31 | 0.307 | 1 |
| 5745-5825 | 25.93 | 11.86 | 31 | 0.498 | 1 |
| Beamforming mode | | | | | |
| 2412-2462 | 23.56 | 10.00 | 31 | 0.188 | 1 |
| 5180-5240 | 23.05 | 11.86 | 31 | 0.256 | 1 |
| 5260-5320 | 15.26 | 11.86 | 31 | 0.043 | 1 |
| 5500-5720 | 17.81 | 11.86 | 31 | 0.077 | 1 |
| 5745-5825 | 22.93 | 11.86 | 31 | 0.249 | 1 |
| External antenna | | | | | |
| CDD mode | | | | | |
| 2412-2462 | 26.91 | 10.44 | 31 | 0.450 | 1 |
| 5180-5240 | 24.71 | 9.20 | 31 | 0.204 | 1 |
| 5260-5320 | 21.28 | 9.20 | 31 | 0.092 | 1 |
| 5500-5720 | 23.83 | 9.20 | 31 | 0.166 | 1 |
| 5745-5825 | 25.93 | 9.20 | 31 | 0.270 | 1 |
| Beamforming mode | | | | | |
| 2412-2462 | 23.56 | 10.44 | 31 | 0.208 | 1 |
| 5180-5240 | 23.05 | 9.20 | 31 | 0.139 | 1 |
| 5260-5320 | 15.26 | 9.20 | 31 | 0.023 | 1 |
| 5500-5720 | 17.81 | 9.20 | 31 | 0.042 | 1 |
| 5745-5825 | 22.93 | 9.20 | 31 | 0.135 | 1 |

Note:
Internal antenna 2412~2462MHz: Directional gain = 3.98dBi + 10log(4) = 10.00dBi
Internal antenna 5180~5825MHz: Directional gain = 5.84dBi + 10log(4) = 11.86dBi
External antenna 2412~2462MHz: Directional gain = 4.42dBi + 10log(4) = 10.44dBi
External antenna 5180~5825MHz: Directional gain = 3.18dBi + 10log(4) = 9.20dBi

**CONCULSION:**

Both of the WLAN 2.4G & WLAN 5G can transmit simultaneously, the formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

Internal antenna

WLAN 2.4G + WLAN 5.0G = 0.407 + 0.498 = 0.905 < 1

External antenna

WLAN 2.4G + WLAN 5.0G = 0.450 + 0.270 = 0.720 < 1

Therefore the maximum calculations of above situations are less than the "1" limit.

**---END---**