

## 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.)



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**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 <sup>2</sup> )	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

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

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

### 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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
<b>Internal antenna</b>					
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
<b>External antenna</b>					
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

**CONCLUSION:**

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

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 1$

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---**