

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.

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

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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 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

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

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

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

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

$$\text{WLAN 2.4G} + \text{WLAN 5.0G} = 0.407 + 0.498 = 0.905 < 1$$

External antenna

$$\text{WLAN 2.4G} + \text{WLAN 5.0G} = 0.450 + 0.270 = 0.720 < 1$$

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

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