RF Exposure Report

Report No.:	SA190624C08A
FCC ID:	TVE-37176T0464
Test Model:	FAP-231E
Series Model:	FortiAP 231Exxxxxx, FAP-231E xxxxxx, FORTIAP-231E xxxxxx (where “x” can be used as “A-Z”, or “-0-9”, or “-“, or blank for software changes or marketing purposes only)
Received Date:	Sep. 10, 2019
Test Date:	Sep. 17 ~ Nov. 11, 2019
Issued Date:	Nov. 11, 2019
Applicant:	Fortinet Inc.
Address:	899 Kifer Road Sunnyvale, CA 94086 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN
FCC Registration / Designation Number:	788550 / TW0003

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Release Control Record

Issue No.	Description	Date Issued
SA190624C08A	Original release.	Nov. 11, 2019

1 Certificate of Conformity

Product:	Wireless Access Point
Brand:	Fortinet
Test Model:	FAP-231E
Series Model:	FortiAP 231Exxxxxx, FAP-231E xxxxxx, FORTIAP-231E xxxxxx (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.
Test Date:	Sep. 17 ~ Nov. 11, 2019
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 IEEE C95.3 -2002

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 RF characteristics under the conditions specified in this report.

Prepared by : Polly Chien , **Date:** Nov. 11, 2019

Polly Chien / Specialist

Approved by : Bruce Chen , **Date:** Nov. 11, 2019

Bruce Chen / Senior Project Engineer

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 26cm away from the body of the user. So, this device is classified as Mobile Device.

3 Calculation Result of Maximum Conducted Power

Radio	Frequency Band (MHz)	Mode	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
1	WLAN 2412~2462	CDD	24.61	7.71	26	0.201	1
		Beamforming	21.60	7.71	26	0.100	1
3	WLAN 2412~2462	CDD	24.15	8.61	26	0.222	1
		Beamforming	21.07	8.61	26	0.109	1
1	WLAN 5500~5720	CDD	23.79	8.51	26	0.200	1
		Beamforming	20.78	8.51	26	0.100	1
1	WLAN 5745~5825	CDD	27.02	8.51	26	0.421	1
		Beamforming	24.01	8.51	26	0.210	1
2	WLAN 5180~5240	CDD	26.14	8.51	26	0.343	1
		Beamforming	23.13	8.51	26	0.172	1
2	WLAN 5260~5320	CDD	23.78	8.51	26	0.199	1
		Beamforming	20.77	8.51	26	0.100	1
2	WLAN 5500~5720	CDD	23.79	8.51	26	0.200	1
		Beamforming	20.78	8.51	26	0.100	1
2	WLAN 5745~5825	CDD	26.58	8.51	26	0.380	1
		Beamforming	23.57	8.51	26	0.190	1
-	BT LE 4.0 2402~2480	-	2.29	5.10	26	0.001	1
-	BT LE 5.0 2402~2480	-	5.92	5.10	26	0.001	1

Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

Radio 1: 2412~2462MHz Max. Directional Gain = 4.70dBi + 10log(2) = 7.71dBi
Radio 3: 2412~2462MHz Max. Directional Gain = 5.60dBi + 10log(2) = 8.61dBi
Radio 1: 5500~5825MHz Max. Directional Gain = 5.50dBi + 10log(2) = 8.51dBi
Radio 2: 5180~5825MHz Max. Directional Gain = 5.50dBi + 10log(2) = 8.51dBi

Conclusion:
The formula of calculated the MPE is:
CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1
CPD = Calculation power density
LPD = Limit of power density

1. Radio 1 (2.4GHz) + Radio 2 (5GHz) + BLE
   = 0.201 / 1 + 0.380 / 1 + 0.001 / 1 = 0.582 < 1
2. Radio 1 (5GHz Band 4) + Radio 2 (5GHz Band 1) + Radio 3 (2.4GHz) + BLE
   = 0.421 / 1 + 0.343 / 1 + 0.222 / 1 + 0.001 / 1 = 0.987 < 1
3. Radio 1 (5GHz Band 4) + Radio 2 (5GHz Band 1) + BLE
   = 0.421 / 1 + 0.343 / 1 + 0.001 / 1 = 0.765 < 1

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