RF Exposure Report

Report No.:	SA170720C12
FCC ID:	TVE-291BB033
Test Model:	FortiAP U422EV
Series Model:	FortiAP U422EVxxxxxx, FAP-U422EVxxxxxx, FORTIAP-U422EVxxxxxx (where “x” can be used as “A-Z”, or “0-9”, or “-“, or blank for marketing purposes only)
Received Date:	Jul. 20, 2017
Test Date:	Sep. 13 ~ Oct. 05, 2017
Issued Date:	Oct. 23, 2017
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.)

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
SA170720C12	Original release.	Oct. 23, 2017

1 Certificate of Conformity

Product:	Secured Wireless Access Point
Brand:	Fortinet Inc.
Test Model:	FortiAP U422EV
Series Model:	FortiAP U422EVxxxxxx, FAP-U422EVxxxxxx, FORTIAP-U422EVxxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for marketing purposes only)
Sample Status:	Engineering sample
Applicant:	Fortinet Inc.
Test Date:	Sep. 13 ~ Oct. 05, 2017
Standards:	FCC Part 2 (Section 2.1091) KDB 447498 D01 General RF Exposure Guidance v06 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 : Celine Chou , **Date:** Oct. 23, 2017

Celine Chou / Specialist

Approved by : Ken Liu , **Date:** Oct. 23, 2017

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 42cm away from the body of the user. So, this device is classified as Mobile Device.

3 Calculation Result of Maximum Conducted Power

Function	Frequency Band (MHz)	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
WLAN	CDD Mode					
	2412-2462	28.82	11.02	42	0.435	1
	5180-5240	23.44	13.02	42	0.200	1
	5260-5320	20.41	13.02	42	0.099	1
	5500-5720	21.02	13.02	42	0.114	1
	5745-5825	27.65	13.02	42	0.526	1
	Beamforming Mode					
	2412-2462	20.81	11.02	42	0.069	1
	5180-5240	17.42	13.02	42	0.050	1
	5260-5320	14.39	13.02	42	0.025	1
	5500-5720	15.00	13.02	42	0.029	1
	5745-5825	21.55	13.02	42	0.129	1
BT	2402-2480	-0.22	5.77	42	0.0002	1
BT LE	2402-2480	3.54	5.77	42	0.0004	1

Note:
2.4GHz: Directional gain = 5dBi + 10log(4) = 11.02dBi
5GHz: Directional gain = 7dBi + 10log(4) = 13.02dBi

Frequency Band	Max Power (dBm)			Total Power (dBm)	Power Limit (dBm)
	WLAN	BT	BT LE		
2.4GHz	28.82	-0.22	-	28.83	30
2.4GHz	28.82	-	3.54	28.83	30

Conclusion:

2.4GHz & 5GHz & BT or 2.4GHz & 5GHz & BT LE technology can transmit at same time.

BT and BT LE cannot transmit simultaneously.

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

1. WALN 2.4GHz + WALN 5GHz + BT = 0.435 + 0.526 + 0.0002 = 0.961
2. WALN 2.4GHz + WALN 5GHz + BT LE = 0.435 + 0.526 + 0.0004 = 0.961

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

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