RF Exposure Report

Report No.:	SABDYS-WTW-P20110362
FCC ID:	TVE-3617T01066
Test Model:	FAP-234F
Series Model:	FortiAP 234Fxxxxxx, FAP-234Fxxxxxx, FORTIAP-234Fxxxxxx (Where "x" can be used as "A-Z", or "0-9", or “-", or blank for software changes or marketing purposes only)
Received Date:	Nov. 11, 2020
Test Date:	Nov. 16 ~ Dec. 31, 2020
Issued Date:	Jan. 27, 2021
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

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
SABDYS-WTW-P20110362	Original release	Jan. 27, 2021

1 Certificate of Conformity

Product:	Secured Wireless Access Point
Brand:	Fortinet
Test Model:	FAP-234F
Series Model:	FortiAP 234Fxxxxxx, FAP-234Fxxxxxx, FORTIAP-234Fxxxxxx (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:	Nov. 16 ~ Dec. 31, 2020
Standards:	FCC Part 2 (Section 2.1091) IEEE C95.3 -2002
References Test Guidance:	KDB 447498 D01 General RF Exposure Guidance v06

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 : Celine Chou , **Date:** Jan. 27, 2021

Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** Jan. 27, 2021

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 36cm 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)	Max AV Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm^2)	Limit (mW/cm^2)
2G traffic radio (Radio 1)	CDD Mode					
	2412-2462	25.71	13.24	36	0.482	1
	Beamforming Mode					
	2412-2462	22.34	13.24	36	0.222	1
5GHz traffic radio (Radio 2)	CDD Mode					
	5180-5240	25.46	13.11	36	0.442	1
	5745-5825	25.71	13.11	36	0.468	1
	Beamforming Mode					
	5180-5240	22.45	13.11	36	0.221	1
	5745-5825	22.70	13.11	36	0.234	1
5G Scanning radio (Radio 3)	2412-2462	21.09	3.84	36	0.019	1
	5180-5240	20.34	4.92	36	0.021	1
	5745-5825	20.12	4.92	36	0.020	1
BT LE	2402-2480	12.23	4.99	36	0.003	1
Zigbee	2405-2480	12.22	4.99	36	0.003	1

Note:
1. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
2. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

Radio 1:

2.4GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2] = 13.24$dBi

Radio 2:

5GHz: Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/2] = 13.11$dBi

Frequency Band (MHz)	Max AV Power (dBm)					Total Power (dBm)	Power Limit (dBm)
	Radio 1	Radio 2	Radio 3	BT LE	Zigbee		
2.4GHz	25.71	-	-	12.23	-	25.90	30.00
	25.71	-	-	-	12.22	25.90	30.00
	-	-	21.09	12.23	-	21.62	30.00
	-	-	21.09	-	12.22	21.62	30.00

Conclusion:

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

1. 2G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) + BLE = 0.482 / 1 + 0.468 / 1 + 0.021 / 1 + 0.003 / 1 = 0.974
2. 2G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) + Zigbee = 0.482 / 1 + 0.468 / 1 + 0.021 / 1 + 0.003 / 1 = 0.974
3. 5GHz traffic radio (Radio 2) + 2G Scanning radio (Radio 3) + BLE = 0.468 / 1 + 0.019 / 1 + 0.003 / 1 = 0.490
4. 5GHz traffic radio (Radio 2) + 2G Scanning radio (Radio 3) + Zigbee = 0.468 / 1 + 0.019 / 1 + 0.003 / 1 = 0.490

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

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