

RF Exposure Report

Report No.: SABDYS-WTW-P20110362A

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, 2020 ~ Mar. 08, 2021

Issued Date: Mar. 22, 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



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Table of Contents

Release Control Record	3
1 Certificate of Conformity	4
2 RF Exposure	5
2.1 Limits for Maximum Permissible Exposure (MPE).....	5
2.2 MPE Calculation Formula	5
2.3 Classification	5
3 Calculation Result of Maximum Conducted Power	6

Release Control Record

Issue No.	Description	Date Issued
SABDYS-WTW-P20110362A	Original release	Mar. 22, 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, 2020 ~ Mar. 08, 2021

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:** Mar. 22, 2021
Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** Mar. 22, 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

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

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 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
	5260-5320	19.79	13.11	36	0.120	1
	5500-5720	19.74	13.11	36	0.118	1
	5745-5825	25.71	13.11	36	0.468	1
	Beamforming Mode					
	5180-5240	22.45	13.11	36	0.221	1
	5260-5320	16.78	13.11	36	0.060	1
	5500-5720	16.73	13.11	36	0.059	1
	5745-5825	22.70	13.11	36	0.234	1
Scanning radio (Radio 3)	2412-2462	21.09	3.84	36	0.019	1
	5180-5240	20.34	4.92	36	0.021	1
	5260-5320	21.43	4.92	36	0.026	1
	5500-5720	20.53	4.92	36	0.022	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:

- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.
- 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 = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/2] = 13.24\text{dBi}$

Radio 2:

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

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:

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

CPD = Calculation power density

LPD = Limit of power density

- 2G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) + BLE = $0.482 / 1 + 0.468 / 1 + 0.026 / 1 + 0.003 / 1 = 0.979$
- 2G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) + Zigbee = $0.482 / 1 + 0.468 / 1 + 0.026 / 1 + 0.003 / 1 = 0.979$
- 5GHz traffic radio (Radio 2) + 2G Scanning radio (Radio 3) + BLE = $0.468 / 1 + 0.019 / 1 + 0.003 / 1 = 0.490$
- 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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