

RF Exposure Report

Report No.: SABDYS-WTW-P20100799

FCC ID: TVE-3417T0696

Test Model: FAP-231F

Series Model: FortiAP 231Fxxxxxx, FAP-231Fxxxxxx, FORTIAP-231Fxxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only)

Received Date: Oct. 30, 2020

Test Date: Nov. 03 ~ Nov. 19, 2020

Issued Date: Nov. 27, 2020

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 / 788550 / TW0003
Designation Number:



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

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-P20100799	Original release	Nov. 27, 2020

1 Certificate of Conformity

Product: Secured Wireless Access Point

Brand: Fortinet

Test Model: FAP-231F

Series Model: FortiAP 231Fxxxxxx, FAP-231Fxxxxxx, FORTIAP-231Fxxxxxx (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. 03 ~ Nov. 19, 2020

Standards: FCC Part 2 (Section 2.1091)

References Test KDB 447498 D01 General RF Exposure Guidance v06

Guidance: 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. 27, 2020
Polly Chien / Specialist

Approved by : Bruce Chen , **Date:** Nov. 27, 2020
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 21cm 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 Average Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm ²)	Limit (mW/cm ²)
WLAN					
2G traffic radio (Radio 1): CDD Mode					
2412-2462	25.69	7.91	21	0.413	1
5G traffic radio (Radio 2): CDD Mode					
5180-5240	25.82	8.51	21	0.489	1
5260-5320	23.94	8.51	21	0.317	1
5500-5720	23.96	8.51	21	0.319	1
5745-5825	24.49	8.51	21	0.360	1
2G traffic radio (Radio 1): Beamforming Mode					
2412-2462	22.52	7.91	21	0.199	1
5G traffic radio (Radio 2): Beamforming Mode					
5180-5240	22.69	8.51	21	0.238	1
5260-5320	20.93	8.51	21	0.159	1
5500-5720	20.95	8.51	21	0.159	1
5745-5825	21.48	8.51	21	0.180	1
Scanning radio (Radio 3): CDD Mode					
2412-2462	21.11	4.00	21	0.059	1
5180-5240	21.65	5.10	21	0.085	1
5260-5320	19.16	5.10	21	0.048	1
5500-5720	21.13	5.10	21	0.076	1
5745-5825	21.59	5.10	21	0.084	1
BT LE					
2402-2480	11.27	3.6	21	0.006	1
Zigbee					
2405-2475	11.13	3.6	21	0.005	1

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

Note:

1. Directional gain:

2.4GHz Band: Directional gain = 4.90dBi + 10log(2) = 7.91dBi

5GHz: Directional gain = 5.50dBi + 10log(2) = 8.51dBi

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.

Conclusion:

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

The simultaneous operation mode was determined by client.

No	Mode
1	2G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) +BLE =0.413/1+0.489/1+0.085/1+0.006/1=0.993
2	2G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) +Zigbee =0.413/1+0.489/1+0.085/1+0.005/1=0.992
3	5GHz traffic radio (Radio 2)+ 2G Scanning radio (Radio 3) + BLE =0.489/1+0.059/+0.006/1=0.554
4	5GHz traffic radio (Radio 2)+ 2G Scanning radio (Radio 3) + Zigbee =0.489/1+0.059/+0.005/1=0.553

*5GHz traffic radio (Radio 2) and 5G Scanning radio (Radio 3) cannot transmit in the same band at same time.

2G traffic radio (Radio 1) and 2G Scanning radio (Radio 3) cannot transmit at same time.

2G traffic radio (Radio 1) and Zigbee and BT technologies cannot transmit at same time.

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

---END---