

## RF Exposure Report

**Report No.:** SA191111C01B

**FCC ID:** TVE-4617T06785

**Test Model:** FAP-431F, FAP-433F

**Series Model:** FortiAP 431Fxxxxxx, FAP-431Fxxxxxx, FORTIAP-431Fxxxxxx, FortiAP 433Fxxxxxx, FAP-433Fxxxxxx, FORTIAP-433Fxxxxxx (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, 2019

**Test Date:** Jan. 04 ~ Jun. 05, 2020

**Issued Date:** Jun. 20, 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 /  
Designation Number:** 788550 / TW0003



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 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.

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### Release Control Record

Issue No.	Description	Date Issued
SA191111C01B	Original release	Jun. 20, 2020

## 1 Certificate of Conformity

**Product:** Secured Wireless Access Point

**Brand:** Fortinet

**Test Model:** FAP-431F, FAP-433F

**Series Model:** FortiAP 431Fxxxxxx, FAP-431Fxxxxxx, FORTIAP-431Fxxxxxx, FortiAP 433Fxxxxxx, FAP-433Fxxxxxx, FORTIAP-433Fxxxxxx (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:** Jan. 04 ~ Jun. 05, 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 :** Pettie Chen , **Date:** Jun. 20, 2020  
Pettie Chen / Senior Specialist

**Approved by :** Bruce Chen , **Date:** Jun. 20, 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 <sup>2</sup> )	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<sup>2</sup>

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 44cm away from the body of the user. So, this device is classified as **Mobile Device**.

### 3 Calculation Result of Maximum Conducted Power

#### Model: FAP-431F

Frequency Band (MHz)	Max Average Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
<b>WLAN</b>					
traffic radio: CDD Mode					
2412-2462	29.92	11.27	44	0.541	1
5180-5240	28.56	11.51	44	0.418	1
5260-5320	23.54	11.51	44	0.131	1
5500-5720	23.52	11.99	44	0.146	1
5745-5825	29.02	11.35	44	0.448	1
traffic radio: Beamforming Mode					
2412-2462	24.71	11.27	44	0.163	1
5180-5240	24.38	11.51	44	0.160	1
5260-5320	17.75	11.51	44	0.035	1
5500-5720	17.60	11.99	44	0.037	1
5745-5825	24.64	11.35	44	0.163	1
Scanning radio: CDD Mode					
2412-2462	12.35	5.22	44	0.002	1
5180-5240	12.28	5.06	44	0.002	1
5260-5320	12.24	5.06	44	0.002	1
5500-5720	12.26	5.09	44	0.002	1
5745-5825	12.28	5.14	44	0.002	1
<b>BT LE</b>					
2402-2480	3.89	4.71	44	0.0003	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.
- Directional gain:  
**Model: FAP-431F**  
**2G traffic radio**  
 2.4GHz Band: Directional Gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4]$  = 11.27dBi  
 5180-5240MHz: Directional Gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4]$  = 11.51dBi  
 5260-5320MHz: Directional Gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4]$  = 11.51dBi  
 5500-5720MHz: Directional Gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4]$  = 11.99dBi  
 5745-5825MHz: Directional Gain =  $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2/4]$  = 11.35dBi
- The above Max Power is Tune-up Power which client declared.

**Model: FAP-433F**

Frequency Band (MHz)	Max Average Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
<b>WLAN</b>					
traffic radio: CDD Mode					
2412-2462	29.09	10.02	44	0.335	1
5180-5240	27.29	12.03	44	0.351	1
5260-5320	23.05	12.03	44	0.132	1
5500-5720	23.30	12.20	44	0.146	1
5745-5825	29.37	12.22	44	0.593	1
traffic radio: Beamforming Mode					
2412-2462	25.90	10.02	44	0.161	1
5180-5240	23.72	12.03	44	0.154	1
5260-5320	17.07	12.03	44	0.033	1
5500-5720	17.30	12.20	44	0.037	1
5745-5825	23.08	12.22	44	0.139	1
Scanning radio: CDD Mode					
2412-2462	12.21	5.22	44	0.002	1
5180-5240	12.23	6.01	44	0.003	1
5260-5320	12.12	6.01	44	0.003	1
5500-5720	12.14	6.18	44	0.003	1
5745-5825	12.08	6.20	44	0.003	1
<b>BT LE</b>					
2402-2480	3.89	4.71	44	0.0003	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.
- Directional gain:  
**Model: FAP-433F**  
**2G traffic radio**  
 2.4GHz Band: Directional Gain = 4dBi + 10log(4) = 10.02dBi  
 5180-5240MHz: Directional Gain = 6.01dBi + 10log(4) = 12.03dBi  
 5260-5320MHz: Directional Gain = 6.01dBi + 10log(4) = 12.03dBi  
 5500-5720MHz: Directional Gain = 6.18dBi + 10log(4) = 12.20dBi  
 5745-5825MHz: Directional Gain = 6.20dBi + 10log(4) = 12.22dBi
- The above Max Power is Tune-up Power which client declared.

**Conclusion:**

The formula of calculated the MPE is:

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

CPD = Calculation power density

LPD = Limit of power density

**Model: FAP-431F**

$$\begin{aligned} & 2\text{G traffic radio} + 5\text{GHz traffic radio} + \text{Scanning radio (5G)} + \text{BT} \\ & = 0.541 / 1 + 0.448 / 1 + 0.002 / 1 + 0.0003 / 1 = 0.9913 < 1 \end{aligned}$$

**Model: FAP-433F**

$$\begin{aligned} & 2\text{G traffic radio} + 5\text{GHz traffic radio} + \text{Scanning radio (5G)} + \text{BT} \\ & = 0.335 / 1 + 0.593 / 1 + 0.003 / 1 + 0.0003 / 1 = 0.9313 < 1 \end{aligned}$$

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

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