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

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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 Guidance:	KDB 447498 D01 General RF Exposure Guidance v06
	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^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 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/cm²)	Limit (mW/cm²)
WLAN					
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
BT LE					
2402-2480	3.89	4.71	44	0.0003	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.
3. Directional gain:
   Model: FAP-431F
   2G traffic radio
   2.4GHz Band: Directional Gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/4]$ = 11.27dBi
   5180-5240MHz: Directional Gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/4]$=11.51dBi
   5260-5320MHz: Directional Gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/4]$=11.51dBi
   5500-5720MHz: Directional Gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/4]$=11.99dBi
   5745-5825MHz: Directional Gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \cdots + 10^{GN/20})^2/4]$=11.35dBi
4. The above Max Power is Tune-up Power which client declaried.

Model: FAP-433F

Frequency Band (MHz)	Max Average Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm²)	Limit (mW/cm²)
WLAN					
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
BT LE					
2402-2480	3.89	4.71	44	0.0003	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.
3. 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
4. The above Max Power is Tune-up Power which client declaried.

Conclusion:

The formula of calculated the MPE is:

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

Model: FAP-431F

2G traffic radio + 5GHz traffic radio + Scanning radio (5G) + BT

= 0.541 / 1 + 0.448 / 1 + 0.002 / 1 + 0.0003 / 1 = 0.9913 < 1

Model: FAP-433F

2G traffic radio + 5GHz traffic radio + Scanning radio (5G) + BT

= 0.335 / 1 + 0.593 / 1 + 0.003 / 1 + 0.0003 / 1 = 0.9313 < 1

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

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