



Radio Exposure Evaluation Report

FCC ID : TVE-3417T0966

Equipment : Secured Wireless Access Point

Brand Name : FORTINET

Model Name : FortiAP 23JFxxxxxx, FAP-23JFxxxxxx,
FORTIAP-23JFxxxxxx
(where "x" can be "A-Z", or "0-9", or "-", or blank for software purposes or marketing purposes only)

Applicant : Fortinet, Inc.
899 Kifer Road, Sunnyvale, CA 94086, USA

Manufacturer : Fortinet, Inc.
899 Kifer Road, Sunnyvale, CA 94086, USA

Standard : 47 CFR Part 2.1091

The product was received on Oct. 27, 2020, and testing was started from Nov. 03, 2020 and completed on Jan. 21, 2021. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in 47 CFR Part 2.1091 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



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Photographs of EUT V01



History of this test report

Report No.	Version	Description	Issued Date
FA002618	01	Initial issue of report	Feb. 03, 2021



Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
2	-	Exposure evaluation	PASS	-

Declaration of Conformity:

The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.

Comments and Explanations:

The EUT supports beamforming and CDD modes, and the CDD mode is the worse case. Therefore, all test items are evaluated in the report. The beamforming mode only evaluateds the output power.

Reviewed by: Sam Tsai

Report Producer: Debby Hung



1 General Description

1.1 EUT General Information

RF General Information			
Evaluation Mode	Frequency Range (MHz)	Operating Frequency (MHz)	Modulation Type
2.4GHz WLAN	2400-2483.5	2412-2462	802.11b: DSSS (DBPSK, DQPSK, CCK) 802.11g/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
5GHz WLAN	5150-5250 5725-5850	5180-5240 5745-5825	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM)
Bluetooth	2400-2483.5	2402-2480	LE: DSSS (GFSK)
ZigBee	2400-2483.5	2405-2480	DSSS (O-QPSK)

1.2 Accessories

Accessories				
BRACKET WALL JACK	Brand Name	Enrack	Model Name	6002Ad953000

Reminder: Regarding to more detail and other information, please refer to user manual.

1.3 Table for Multiple Listing

The brand/model names in the following table are all refer to the identical product.

Brand Name	Model Name	Description
FORTINET	FortiAP 23JFxxxxxx	All the models are identical, the difference model for difference brand served as marketing strategy.
	FAP-23JFxxxxxx	
	FORTIAP-23JFxxxxxx	

1.4 Testing Location

Testing Location			
<input checked="" type="checkbox"/>	HWA YA	ADD : No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)	
		TEL : 886-3-327-3456	FAX : 886-3-327-0973
Test site Designation No. TW1190 with FCC.			
<input type="checkbox"/>	JHUBEI	ADD : No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County, Taiwan (R.O.C.)	
		TEL : 886-3-656-9065	FAX : 886-3-656-9085
Test site Designation No. TW0006 with FCC.			

2 Maximum Permissible Exposure

2.1 Limit of Maximum Permissible Exposure

(A) Limits for Occupational / Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842 / f	4.89 / f	(900 / f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	F/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population / Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/ cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	F/1500	30
1500-100,000	-	-	1.0	30

Note: f = frequency in MHz ; *Plane-wave equivalent power density

2.2 MPE Calculation Method

The MPE was calculated at 23 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d} \qquad \text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

E = Electric field (V/m)

P = RF output power (W)

G = EUT Antenna numeric gain (numeric)

d = Separation distance between radiator and human body (m)

The formula can be changed to

$$Pd = \frac{30 \times P \times G}{377 \times d^2}$$



2.3 Calculated Result and Limit

Exposure Environment: General Population / Uncontrolled Exposure

Radio 0:2.4G+ Radio 1:5G+ Radio 2:2.4G+Bluetooth Function

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	7.18	26.13	33.31	0.00	33.31	2.14289	23	0.32236	1.00000	0.32236
5.2G;D1D	7.36	28.63	35.99	0.00	35.99	3.97192	23	0.59750	1.00000	0.59750
2.4G;G1D	3.99	20.58	24.57	0.00	24.57	0.28642	23	0.04309	1.00000	0.04309
2.4G;BT-LE	3.63	11.79	15.42	0.00	15.42	0.03483	23	0.00524	1.00000	0.00524
									Sum Ratio	0.96819
									Ratio Limit	1

Radio 0:2.4G+ Radio 1:5G+ Radio 2:5G+ Bluetooth Function

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	7.18	26.13	33.31	0.00	33.31	2.14289	23	0.32236	1.00000	0.32236
5.2G;D1D	7.36	28.63	35.99	0.00	35.99	3.97192	23	0.59750	1.00000	0.59750
5.2G;D1D	4.16	21.90	26.06	0.00	26.06	0.40365	23	0.06072	1.00000	0.06072
2.4G;BT-LE	3.63	11.79	15.42	0.00	15.42	0.03483	23	0.00524	1.00000	0.00524
									Sum Ratio	0.98582
									Ratio Limit	1

Radio 0:2.4G+ Radio 1:5G+ Radio 2:2.4G+Zigbee Function

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	7.18	26.13	33.31	0.00	33.31	2.14289	23	0.32236	1.00000	0.32236
5.2G;D1D	7.36	28.63	35.99	0.00	35.99	3.97192	23	0.59750	1.00000	0.59750
2.4G;G1D	3.99	20.58	24.57	0.00	24.57	0.28642	23	0.04309	1.00000	0.04309
2.4G;G1D	3.63	11.65	15.28	0.00	15.28	0.03373	23	0.00507	1.00000	0.00507
									Sum Ratio	0.96802
									Ratio Limit	1

Radio 0:2.4G+ Radio 1:5G+ Radio 2:5G+Zigbee Function

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Tune-up EIRP (W)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	7.18	26.13	33.31	0.00	33.31	2.14289	23	0.32236	1.00000	0.32236
5.2G;D1D	7.36	28.63	35.99	0.00	35.99	3.97192	23	0.59750	1.00000	0.59750
5.2G;D1D	4.16	21.90	26.06	0.00	26.06	0.40365	23	0.06072	1.00000	0.06072
2.4G;G1D	3.63	11.65	15.28	0.00	15.28	0.03373	23	0.00507	1.00000	0.00507
									Sum Ratio	0.98565
									Ratio Limit	1

—————THE END—————