



RADIO EXPOSURE TEST REPORT

FCC ID : TVE-251019

Equipment : Secured Wireless Access Point

Brand Name : FORTINET

Model Name : FortiAP 231KDxxxxxxxxx, FAP-231KDxxxxxxxxx,
FORTIAP-231KDxxxxxxxxx
(Please refer to section 1.3 for detailed information)

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

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

Standard : 47 CFR Part 2.1091

The product was received on Apr. 01, 2026, and testing was started from Apr. 09, 2026 and completed on Jul. 17, 2026. We, Sporton International Inc. Hsinchu 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. Hsinchu Laboratory, the test report shall not be reproduced except in full.

Approved by: Sam Chen

Sporton International Inc. Hsinchu Laboratory

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History of this test report

TEL : 886-3-656-9065
FAX : 886-3-656-9085
Report Template No.: CB-A1_1 Ver1.1

Page Number : 3 of 10
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Report Version : 02



Summary of Test Result

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

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacture who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the chapter "Measurement Uncertainty".

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

Reviewed by: Sam Chen

Report Producer: Muse Chan



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) VHT: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
5GHz WLAN	5150-5250 5250-5350 5470-5725 5725-5850 5725-5895	5180-5250 5250-5320 5500-5720 5745-5825 5815-5885	802.11a/n: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ac: OFDM (BPSK, QPSK, 16QAM, 64QAM, 256QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
6GHz WLAN	5925-7125	5955-7115	802.11a: OFDM (BPSK, QPSK, 16QAM, 64QAM) 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM) 802.11be: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM, 4096QAM)
Bluetooth	2400-2483.5	2402-2480	LE: GFSK
Zigbee	2400-2483.5	2405-2480	O-QPSK



1.2 Antenna Information

Ant.	Port				Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz	WLAN 6GHz	Bluetooth / Zigbee					
1	1	1	-	-	Grand-Tek	2034G00000390	Dipole	MHF I	Note
2	2	2	-	-	Grand-Tek	2034G00000400	Dipole	MHF I	
3	-	-	1	-	Grand-Tek	203CG00000190	Dipole	MHF I	
4	-	-	2	-	Grand-Tek	203CG00000200	Dipole	MHF I	
5	-	-	-	1	Grand-Tek	2039G00000100	PIFA	MHF I	

Note 1:

Antenna Gain (dBi)										
Ant.	WLAN 2.4GHz		WLAN 5GHz							
			5150 MHz		5350 MHz		5500 MHz		5850 MHz	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	6.0	5.5	5.6	5.3	5.2	5.2	5.3	5.1	5.4	5.2
2	6.0	5.5	5.6	5.5	5.4	5.3	5.4	5.3	6.0	5.6

Antenna Gain (dBi)				
Ant.	WLAN 6GHz		Bluetooth / Zigbee	
	Max	Min	Max	Min
3	6.3	5.3	-	-
4	6.2	5.0	-	-
5	-	-	5.2	4.2

Note 2: The above information was declared by manufacturer.

Note 3: Directional gain information

Type	Maximum Output Power	Power Spectral Density
Non-BF	Directional gain = Max.gain + array gain. For power measurements on IEEE 802.11 devices Array Gain = 0 dB (i.e., no array gain) for N ANT ≤ 4	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{ANT}} \left[\sum_{k=1}^{N_{ANT}} g_{j,k} \right]^2}{N_{ANT}} \right]$
BF	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{ANT}} \left[\sum_{k=1}^{N_{ANT}} g_{j,k} \right]^2}{N_{ANT}} \right]$	$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{ANT}} \left[\sum_{k=1}^{N_{ANT}} g_{j,k} \right]^2}{N_{ANT}} \right]$

Ex.

Directional Gain (NSS1) formula :

$$DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{ANT}} \left[\sum_{k=1}^{N_{ANT}} g_{j,k} \right]^2}{N_{ANT}} \right]$$

$$NSS1(g1,1) = 10^{G1/20} ; NSS1(g1,2) = 10^{G2/20} ; NSS1(g1,3) = 10^{G3/20} ; NSS1(g1,4) = 10^{G4/20}$$

$$g_{j,k} = (NSS1(g1,1) + NSS1(g1,2) + NSS1(g1,3) + NSS1(g1,4))^2$$

$$DG = 10 \log[(NSS1(g1,1) + NSS1(g1,2) + NSS1(g1,3) + NSS1(g1,4))^2 / N_{ANT}] \Rightarrow 10 \log[(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2 / N_{ANT}]$$

$$2.4G \ G1 = 6 \text{ dBi} ; G2 = 6 \text{ dBi} ; DG = 9.01 \text{ dBi}$$

$$5G \text{ UNII-1} \ G1 = 5.6 \text{ dBi} ; G2 = 5.6 \text{ dBi} ; DG = 8.61 \text{ dBi}$$

$$5G \text{ UNII-2A} \ G1 = 5.2 \text{ dBi} ; G2 = 5.4 \text{ dBi} ; DG = 8.31 \text{ dBi}$$

$$5G \text{ UNII-2C} \ G1 = 5.3 \text{ dBi} ; G2 = 5.4 \text{ dBi} ; DG = 8.36 \text{ dBi}$$

$$5G \text{ UNII-3} \ G1 = 5.4 \text{ dBi} ; G2 = 6 \text{ dBi} ; DG = 8.72 \text{ dBi}$$

For 2.4GHz function

For IEEE 802.11 b/g/n/VHT/ax/be (2TX/2RX):

Port 1~2 can be used as transmitting/receiving antenna.

Port 1~2 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11 a/n/ac/ax/be (2TX/2RX):

Port 1~2 can be used as transmitting/receiving antenna.

Port 1~2 could transmit/receive simultaneously.

For 6GHz function:

For IEEE 802.11 a/ax/be (2TX/2RX):

Port 1~2 can be used as transmitting/receiving antenna.

Port 1~2 could transmit/receive simultaneously.

For Bluetooth/Zigbee function (1TX/1RX):

Only Port 1 can be used as transmitting antenna.



1.3 Table for Multiple Listing

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

Model Name	Description	Remark
FortiAP 231KDxxxxxxxxxx	All the models are identical, the difference model served as marketing strategy.	Where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only.
FAP-231KDxxxxxxxxxx		
FORTIAP-231KDxxxxxxxxxx		

Note 1: From the above models, model: FAP-231KD was selected as representative model for the test and its data was recorded in this report.

Note 2: The above information was declared by manufacturer.

1.4 Accessories

Accessories
Desktop Stand*1
Wall mount bracket*1
Bottom Cap*1

1.5 Testing Location

Testing Location Information	
Test Lab. : Sporton International Inc. Hsinchu Laboratory	
Hsinchu	ADD: No.8, Ln. 724, Bo'ai St., Zhubei City, Hsinchu County 302010, Taiwan (R.O.C.)
(TAF: 3787)	TEL: 886-3-656-9065 FAX: 886-3-656-9085
	Test site Designation No. TW3787 with FCC.
	Conformity Assessment Body Identifier (CABID) TW3787 with ISCED.



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 27 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$E \text{ (V/m)} = \frac{\sqrt{30 \times P \times G}}{d}$$

$$\text{Power Density: } Pd \text{ (W/m}^2\text{)} = \frac{E^2}{377}$$

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

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	9.01	26.60	35.61	0.38	35.99	27	0.43357	1.00000	0.43357
5.2G;D1D	8.61	27.00	35.61	0.38	35.99	27	0.43357	1.00000	0.43357
5.3G;D1D	8.31	21.64	29.95	0.02	29.97	27	0.10841	1.00000	0.10841
5.6G;D1D	8.36	21.59	29.95	0.02	29.97	27	0.10841	1.00000	0.10841
5.8G;D1D	8.72	27.18	35.90	0.09	35.99	27	0.43357	1.00000	0.43357
5.81G;D1D	8.72	27.18	35.90	0.09	35.99	27	0.43357	1.00000	0.43357
6.2G;D1D	-	-	29.05	0.50	29.55	27	0.09842	1.00000	0.09842
6.4G;D1D	-	-	27.98	0.50	28.48	27	0.07692	1.00000	0.07692
6.7G;D1D	-	-	27.02	0.50	27.52	27	0.06167	1.00000	0.06167
7.0G;D1D	-	-	28.34	0.50	28.84	27	0.08357	1.00000	0.08357
2.4G;BT-LE	5.20	18.19	23.39	0.50	23.89	27	0.02673	1.00000	0.02673
Zigbee	5.20	18.27	23.47	0.50	23.97	27	0.02723	1.00000	0.02723

Simultaneous Transmission Analysis Mode:

Test Mode 1: WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz + Bluetooth

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	9.01	26.60	35.61	0.38	35.99	27	0.43357	1.00000	0.43357
5.8G;D1D	8.72	27.18	35.90	0.09	35.99	27	0.43357	1.00000	0.43357
6.2G;D1D	-	-	29.05	0.50	29.55	27	0.09842	1.00000	0.09842
2.4G;BT-LE	5.20	18.19	23.39	0.50	23.89	27	0.02673	1.00000	0.02673
Sum S/Limit Ratio	0.99229								
Ratio Limit	1								

Test Mode 2: WLAN 2.4GHz + WLAN 5GHz + WLAN 6GHz + Zigbee

Mode	DG (dBi)	Power (dBm)	EIRP (dBm)	Tolerance (dB)	Tune-up EIRP (dBm)	Distance (cm)	S (mW/cm ²)	S Limit (mW/cm ²)	Ratio (S/Limit)
2.4G;D1D	9.01	26.60	35.61	0.38	35.99	27	0.43357	1.00000	0.43357
5.8G;D1D	8.72	27.18	35.90	0.09	35.99	27	0.43357	1.00000	0.43357
6.2G;D1D	-	-	29.05	0.50	29.55	27	0.09842	1.00000	0.09842
Zigbee	5.20	18.27	23.47	0.50	23.97	27	0.02723	1.00000	0.02723
Sum S/Limit Ratio	0.99279								
Ratio Limit	1								