

RF EXPOSURE REPORT

REPORT NO.: SA141024C24

FORTIAP-224Dxxxxxx, FortiAP-224Dxxxxxx,

MODEL NO.: FAP-224Dxxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank)

FCC ID: TVE-24122013

RECEIVED: Oct. 24, 2014

TESTED: Nov. 25, 2014

ISSUED: Dec. 15, 2014

APPLICANT: Fortinet Inc.

ADDRESS: 899 Kifer Road Sunnyvale, CA 94086, USA

ISSUED BY: Bureau Veritas Consumer Products Services (H.K.) Ltd.,
Taoyuan Branch Hsin Chu Laboratory

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Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

TEST LOCATION (1): No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung
Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

TEST LOCATION (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung
Lin Hsiang, Hsin Chu Hsien 307, Taiwan, R.O.C.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA141024C24	Original release	Dec. 15, 2014

1. CERTIFICATION

PRODUCT: Secured Wireless Access Point

BRAND NAME: Fortinet

MODEL NO.: FORTIAP-224Dxxxxxx, FortiAP-224Dxxxxxx,
FAP-224Dxxxxxx (where "x" can be used as
"A-Z" , or "0-9" , or "- " , or blank)

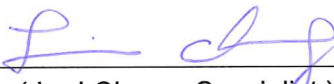
TEST SAMPLE: ENGINEERING SAMPLE

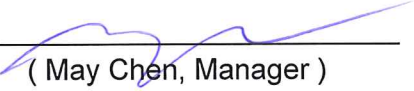
APPLICANT: Fortinet Inc.

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STANDARDS: FCC Part 2 (Section 2.1091)
KDB 447498 D03
IEEE C95.1

The above equipment (Model: FAP-224D) 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 EMC characteristics under the conditions specified in this report.

Prepared By :  , **Date:** Dec. 15, 2014
(Lori Chung, Specialist)

Approved By :  , **Date:** Dec. 15, 2014
(May Chen, Manager)

2. RF EXPOSURE LIMIT

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

3. MPE CALCULATION FORMULA

$$P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$$

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

4. CLASSIFICATION

The antenna of this product, under normal use condition, is at least 25cm away from the body of the user. So, this device is classified as **Mobile Device**.

5. ANTENNA GAIN

The antennas provided to the EUT, please refer to the following table:

For 2.4GHz used						
Ant. No.	Transmitter Circuit	Model No.	Ant. Gain (dBi) Include cable loss	Frequency range (MHz to MHz)	Ant. Type	Connector Type
1	Chain (0)	98141MRSX003	5	2400~2483.5	Dipole	R-SMA
2	Chain (1)	98141MRSX003	5	2400~2483.5	Dipole	R-SMA
For 5GHz used						
Ant. No.	Transmitter Circuit	Model No.	Ant. Gain (dBi) Include cable loss	Frequency range (MHz to MHz)	Ant. Type	Connector Type
1	Chain (0)	98141URSX002	5	5150~5850	Dipole	R-SMA
2	Chain (1)	98141URSX002	5	5150~5850	Dipole	R-SMA

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For 15.247:

802.11b:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412 ~ 2462	59.78	8.01	25	0.04814	1

Directional gain = 5dBi + 10log(2) = 8.01dBi

802.11g:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412 ~ 2462	589.39	8.01	25	0.47458	1

Directional gain = 5dBi + 10log(2) = 8.01dBi

802.11n (HT20):

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412 ~ 2462	651.287	8.01	25	0.52442	1

Directional gain = 5dBi + 10log(2) = 8.01dBi

802.11n (HT40):

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2422 ~ 2452	366.933	8.01	25	0.29546	1

Directional gain = 5dBi + 10log(2) = 8.01dBi

For 15.407:

802.11a:

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5745 - 5825	103.561	8.01	25	0.08339	1

Directional gain = 5dBi + 10log(2) = 8.01dBi

802.11n (HT20)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5745 - 5825	112.877	8.01	25	0.09089	1

Directional gain = 5dBi + 10log(2) = 8.01dBi

802.11n (HT40)

FREQUENCY (MHz)	CONDUCTED POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5755 - 5795	76.775	8.01	25	0.06182	1

Directional gain = 5dBi + 10log(2) = 8.01dBi

CONCLUSION:

Both of the 2.4GHz and 5GHz WLAN can transmit simultaneously, the formula of calculated the MPE is:

$$CPD_1 / LPD_1 + CPD_2 / LPD_2 +etc. < 1$$

CPD = Calculation power density

LPD = Limit of power density

Therefore, the worst-case situation is $0.52442 / 1 + 0.09089 / 1 = 0.615$, which is less than "1". This confirmed that the device comply with FCC 1.1310 MPE limit.

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