

RF EXPOSURE REPORT

REPORT NO.: SA140213C04

MODEL NO.: FORTIAP-221Cxxxxxx,
FAP-221Cxxxxxx (where "x" can be used
as "A-Z", or "0-9", or "-", or blank for software
changes or marketing purposes only)

FCC ID: TVE-121402

IC: 7280B-121402

RECEIVED: Feb. 13, 2014

TESTED: Feb. 18 ~ Feb. 25, 2014

ISSUED: Feb. 25, 2014

APPLICANT: Fortinet Inc.

ADDRESS: 899 Kifer Road Sunnyvale, CA 94086, USA

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

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Vil., Lin Kou Dist.,
New Taipei City, Taiwan (R.O.C.)

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei
Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

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 unless 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.

TABLE OF CONTENTS

RELEASE CONTROL RECORD	3
1. CERTIFICATION	4
2. RF EXPOSURE.....	5
2.1 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE).....	5
2.2 MPE CALCULATION FORMULA	6
2.3 CLASSIFICATION	6
2.4 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER.....	7



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA140213C04	Original release	Feb. 25, 2014

1. CERTIFICATION

PRODUCT: Security Wireless Access Point
FORTIAP-221Cxxxxxx, FAP-221Cxxxxxx (where "x" can
MODEL: be used as "A-Z", or "0-9", or "-", or blank for software changes or
marketing purposes only)
BRAND: Fortinet
APPLICANT: Fortinet Inc.
TEST SAMPLE: ENGINEERING SAMPLE
STANDARDS: FCC Part 2 (Section 2.1091)
FCC OET Bulletin 65, Supplement C (01-01)
IEEE C95.1
RSS-102 Issue 4 (2010-12)

The above equipment (Model: FORTIAP-221C) 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 : Celine Chou , **DATE** : Feb. 25, 2014
Celine Chou / Specialist

APPROVED BY : Ken Liu , **DATE** : Feb. 25, 2014
Ken Liu / Senior Manager

2. RF EXPOSURE

2.1 LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

For FCC Part 2 (Section 2.1091)

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

For RSS-102 Issue 4 (2010-12)

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (A/m)	POWER DENSITY (W/m ²)	AVERAGE TIME (minutes)
LIMITS FOR GENERAL POPULATION / UNCONTROLLED EXPOSURE				
300-1500	...	...	F/150	6
1500-100,000	...	...	10	6

F = Frequency in MHz

2.2 MPE CALCULATION FORMULA

For FCC Part 2 (Section 2.1091)

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

where

P_d = power density in mW/cm^2

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

For RSS-102 Issue 4 (2010-12)

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

where

P_d = power density in W/m^2

P_{out} = output power to antenna in W

G = gain of antenna in linear scale

π = 3.1416

R = distance between observation point and center of the radiator in meter

2.3 CLASSIFICATION

For FCC Part 2 (Section 2.1091)

The antenna of this product, under normal use condition, is at least 22cm away from the body of the user. So, this device is classified as **Mobile Device**.

For RSS-102 Issue 4 (2010-12)

The antenna of this product, under normal use condition, is at least 0.22m away from the body of the user. So, this device is classified as **Mobile Device**.

2.4 CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For FCC Part 2 (Section 2.1091)

EUT

FREQUENCY BAND (MHz)	MAX POWER (dBm)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
2412-2462	29.98	5.79	22	0.621	1
5180-5240	16.74	7.52	22	0.044	1
5745-5825	23.87	7.52	22	0.226	1

NOTE:

- 2.4GHz: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] = 5.79$
- 5GHz: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] = 7.52$

802.11 ac Module

FREQUENCY BAND (MHz)	MAX POWER (dBm)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/cm ²)	LIMIT (mW/cm ²)
5180-5240	16.99	8.76	22	0.062	1
5745-5825	24.70	8.76	22	0.365	1

NOTE: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20})^2 / 2] = 8.76\text{dBi}$

CONCLUSION:

Both of the EUT & 802.11 ac Module can transmit simultaneously, the formula of calculated the MPE is:

$CPD_1 / LPD_1 + CPD_2 / LPD_2 + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

EUT WLAN 2.4G + 802.11 ac Module WLAN 5.0G = $0.621 + 0.365 = 0.986$

Therefore, the maximum calculation of this situation is 0.985, which is less than the "1" limit.

For RSS-102 Issue 4 (2010-12)

EUT

FREQUENCY BAND (MHz)	MAX POWER (dBm)	ANTENNA GAIN (dBi)	DISTANCE (m)	POWER DENSITY (W/m ²)	LIMIT (W/m ²)
2412-2462	29.98	5.79	0.2	6.208	10
5180-5240	16.74	7.52	0.2	0.438	10
5745-5825	23.87	7.52	0.2	2.264	10

NOTE:

- 2.4GHz: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] = 5.79$
- 5GHz: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] = 7.52$

802.11 ac Module

FREQUENCY BAND (MHz)	MAX POWER (dBm)	ANTENNA GAIN (dBi)	DISTANCE (m)	POWER DENSITY (W/m ²)	LIMIT (W/m ²)
5180-5240	16.99	8.76	0.2	0.618	10
5745-5825	24.70	8.76	0.2	3.647	10

NOTE: Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20})^2 / 2] = 8.76\text{dBi}$

CONCLUSION:

Both of the EUT & 802.11 ac Module can transmit simultaneously, the formula of calculated the MPE is:

$CPD1 / LPD1 + CPD2 / LPD2 + \dots \text{etc.} < 10$

CPD = Calculation power density

LPD = Limit of power density

EUT WLAN 2.4G + 802.11 ac Module WLAN 5.0G = 6.208 + 3.647 = 9.855

Therefore, the maximum calculation of this situation is 0.985, which is less than the "10" limit.