

## RF Exposure Report

**Report No.:** SA111005C22D

**FCC ID:** TVE-0120201

**Test Model:** EMP7618

**Series Model:** EMP7618-FT

**Received Date:** Mar. 07, 2013

**Test Date:** Mar. 22 ~ Apr. 19, 2016

**Issued Date:** Apr. 19, 2016

**Applicant:** Fortinet, Inc.

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**Issued By:** Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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**Test Location:** No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City  
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### Release Control Record

Issue No.	Description	Date Issued
SA111005C22D	Original release.	Apr. 19, 2016

## 1 Certificate of Conformity

**Product:** 802.11 abgn RF Module Card

**Brand:** Fortinet Inc.

**Test Model:** EMP7618

**Series Model:** EMP7618-FT

**Sample Status:** Engineering sample

**Applicant:** Fortinet, Inc.

**Test Date:** Mar. 22 ~ Apr. 19, 2016

**Standards:** FCC Part 2 (Section 2.1091)

KDB 447498 D01 (October 23, 2015)

IEEE C95.1

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 EMC characteristics under the conditions specified in this report.


**Prepared by :**

  
Polly Chien / Specialist

**Date:**

Apr. 19, 2016

**Approved by :**

  
Ken Liu / Senior Manager

**Date:**

Apr. 19, 2016

## 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 <sup>2</sup> )	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

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

where

P<sub>d</sub> = power density in mW/cm<sup>2</sup>

P<sub>out</sub> = 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

### 2.3 Classification

The antenna of this product, under normal use condition, is at least 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

### 3 Calculation Result Of Maximum Conducted Power

#### 2.4G + 5G combo Module

##### 2.4G PIFA antenna + 5G PIFA antenna:

Frequency Band (MHz)	Modulation Mode	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	802.11b	14.02	6.01	20	0.020	1
	802.11g	21.77	6.01	20	0.119	1
	802.11n (20MHz)	21.38	6.01	20	0.109	1
	802.11n (40MHz)	20.18	6.01	20	0.083	1
5180-5240	802.11a	13.39	7.01	20	0.022	1
	802.11n (20MHz)	14.96	7.01	20	0.031	1
	802.11n (40MHz)	16.64	7.01	20	0.046	1
5745-5825	802.11a	13.29	7.01	20	0.021	1
	802.11n (20MHz)	12.10	7.01	20	0.016	1
	802.11n (40MHz)	11.94	7.01	20	0.016	1

##### 2.4G Dipole antenna + 5G Dipole antenna:

Frequency Band (MHz)	Modulation Mode	Max Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2412-2462	802.11b	14.02	6.01	20	0.020	1
	802.11g	21.77	6.01	20	0.119	1
	802.11n (20MHz)	21.38	6.01	20	0.109	1
	802.11n (40MHz)	20.18	6.01	20	0.083	1
5180-5240	802.11a	13.39	9.01	20	0.035	1
	802.11n (20MHz)	14.96	9.01	20	0.050	1
	802.11n (40MHz)	16.64	9.01	20	0.073	1
5745-5825	802.11a	13.29	9.01	20	0.034	1
	802.11n (20MHz)	12.10	9.01	20	0.026	1
	802.11n (40MHz)	11.94	9.01	20	0.025	1

**NOTE:**

## 1. 2.4G:

For PIFA antenna: Directional gain =  $3\text{dBi} + 10\log(2) = 6.01\text{dBi}$

For Dipole antenna: Directional gain =  $3\text{dBi} + 10\log(2) = 6.01\text{dBi}$

## 2. 5G:

For PIFA antenna: Directional gain =  $4\text{dBi} + 10\log(2) = 7.01\text{dBi}$

For Dipole antenna: Directional gain =  $6\text{dBi} + 10\log(2) = 9.01\text{dBi}$

## 3. For max. power, please refer to the original report.

**CONCLUSION:**

Both of the WLAN 2.4G & WLAN 5G can transmit simultaneously, the formula of calculated the MPE is:

$\text{CPD1} / \text{LPD1} + \text{CPD2} / \text{LPD2} + \dots \text{etc.} < 1$

CPD = Calculation power density

LPD = Limit of power density

**2.4G PIFA antenna + 5G PIFA antenna:**

$\text{WLAN 2.4G} + \text{WLAN 5.0G} = 0.119 + 0.046 = 0.165$

**2.4G Dipole antenna + 5G Dipole antenna**

$\text{WLAN 2.4G} + \text{WLAN 5.0G} = 0.119 + 0.073 = 0.192$

Therefore, the maximum calculation of this situation is 0.192, which is less than the "1" limit.

**---END---**