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.
Address:	899 Kifer Road Sunnyvale, CA 94086 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

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

Polly Chien / Specialist

Approved by : _____ , **Date:** Apr. 19, 2016

Ken Liu / Senior Manager

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^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

2.2 MPE Calculation Formula

$Pd = (Pout*G) / (4*pi*r^2)$

where

Pd = power density in mW/cm^2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 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^2)	Limit (mW/cm^2)
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^2)	Limit (mW/cm^2)
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 = 3dBi + 10log(2) = 6.01dBi
   For Dipole antenna: Directional gain = 3dBi + 10log(2) = 6.01dBi
2. 5G:
   For PIFA antenna: Directional gain = 4dBi + 10log(2) = 7.01dBi
   For Dipole antenna: Directional gain = 6dBi + 10log(2) = 9.01dBi
3. For max. power, please refer to the original report.

CONCULSION:

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

CPD1 / LPD1 + CPD2 / LPD2 + ……etc. < 1

CPD = Calculation power density

LPD = Limit of power density

2.4G PIFA antenna + 5G PIFA antenna:

WLAN 2.4G + WLAN 5.0G = 0.119 + 0.046 = 0.165

2.4G Dipole antenna + 5G Dipole antenna

WLAN 2.4G + 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.

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