



RF EXPOSURE REPORT

REPORT NO.: SA111005C22

MODEL NO.: EMP7618-FT, EMP7618

FCC ID: TVE-0120201

RECEIVED: Oct. 05, 2011

TESTED: Nov. 10, 2011

ISSUED: Nov. 30, 2011

APPLICANT: Fortinet, Inc.

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ISSUED BY: Bureau Veritas Consumer Products Services
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
SA111005C22	Original release	Nov. 30, 2011

1. CERTIFICATION

PRODUCT: 802.11 abgn RF Module Card
BRAND NAME: Fortinet
MODEL NO.: EMP7618-FT, EMP7618
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: Fortinet, Inc.
TESTED: Nov. 10, 2011
STANDARDS: FCC Part 2 (Section 2.1091)
FCC OET Bulletin 65, Supplement C (01-01)
IEEE C95.1

The above equipment (Model: EMP7618-FT) 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:** Nov. 30, 2011
(Claire Kuan, Specialist)

APPROVED BY :  , **DATE:** Nov. 30, 2011
(May Chen, Deputy 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

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

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 20cm away from the body of the user. So, this device is classified as **Mobile Device**.

5. ANTENNA GAIN

There are three sets antennas provided to this EUT, please refer to the following table:

Set	Transmitter Circuit	ANTENNA TYPE	ANTENNA CONNECTOR	GAIN (dBi)	
				2.4GHz BAND	5.0GHz BAND
1	Chain (0)	Dipole	RSMA	2	4.5
	Chain (1)	Dipole	RSMA	2	4.5
2	Chain (0)	Dipole	RSMA	2	1
	Chain (1)	Dipole	RSMA	2	1
3	Chain (0)	Dipole	RSMA	2	2
	Chain (1)	Dipole	RSMA	2	2

From above antennas, **Set 1** was chosen for final test.

The EUT incorporates CDD function with 802.11a, 802.11b, 802.11g.

6. CALCULATION RESULT OF MAXIMUM CONDUCTED POWER

For 15.247(2.4GHz):

802.11b:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2412-2462	41.6	5	20	0.026	1.00

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$
 Effective Legacy Gain (dBi) = 5

802.11g:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2412-2462	423.0	5	20	0.266	1.00

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$
 Effective Legacy Gain (dBi) = 5

802.11n(20MHz):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2412-2462	390.4	2	20	0.123	1.00

802.11n(40MHz):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
2422-2452	135.3	2	20	0.043	1.00

For 15.247(5GHz):

802.11a:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5745 ~ 5825	219.3	7.5	20	0.245	1.00

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$
 Effective Legacy Gain (dBi) = 7.5

802.11n(20MHz):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5745 ~ 5825	234.5	4.5	20	0.131	1.00

802.11n(40MHz):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5755 ~ 5795	290.9	4.5	20	0.163	1.00

For 15.407(5GHz):

802.11a:

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5180-5240	21.9	7.5	20	0.025	1.00

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$
 Effective Legacy Gain (dBi) = 7.5

802.11n(20MHz):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5180-5240	31.4	4.5	20	0.018	1.00

802.11n(40MHz):

FREQUENCY BAND (MHz)	MAX POWER (mW)	ANTENNA GAIN (dBi)	DISTANCE (cm)	POWER DENSITY (mW/ cm ²)	LIMIT (mW/cm ²)
5190-5230	46.9	4.5	20	0.026	1.00

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