



# RF Exposure Evaluation Report

**Application No.:** SZEM2011011885CR  
**Applicant:** Fortinet Inc.  
**Address of Applicant:** 899 Kifer Road, Sunnyvale CA 94086, USA  
**Manufacturer:** Fortinet Inc.  
**Address of Manufacturer:** 899 Kifer Road, Sunnyvale CA 94086, USA

**Equipment Under Test (EUT):**  
**Product Name:** Secure Network Extension Device  
**Model No.:** FortiExtender 200Fxxxxxx, FORTIEXTENDER-200Fxxxxxx,  
 FEX-200Fxxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for  
 software changes or marketing purposes only) ♣

♣ Please refer to section 4.1 of this report which indicates which model was  
 actually tested and which were electrically identical.

**Trade Mark:** FORTINET  
**FCC ID:** TVE-111M01  
**Standards:** 47 CFR Part 1.1307  
 47 CFR Part 1.1310  
 47 CFR Part 2.1091

**Date of Receipt:** 2020-11-23  
**Date of Test:** 2020-11-30 to 2020-12-30  
**Date of Issue:** 2020-12-31

<b>Test Result :</b>	<b>PASS*</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Keny Xu  
 EMC Laboratory Manager



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## 2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2020-12-31		Original

Authorized for issue by:			
		<i>Damon Su</i>	
		<hr/>	
		<b>Damon Su/Project Engineer</b>	
		<i>Eric Fu</i>	
		<hr/>	
		<b>Eric Fu/Reviewer</b>	



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## 4 General Information

### 4.1 General Description of EUT

Rated voltage:	DC 12V
Test voltage:	AC 120V
Power adapter:	Model No.:WB-12G12R Input: 100-240V 50/60Hz, 0.3A Output: 12V 1A.
For BT	
Operation Frequency:	2402MHz to 2480MHz
Spectrum Spread Technology:	Frequency Hopping Spread Spectrum(FHSS)
Bluetooth Version:	V5.0 Dual mode
Modulation Type:	GFSK, pi/4DQPSK, 8DPSK
Number of Channels:	79
Channel Spacing:	1MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	2.38dBi
For BLE	
Operation Frequency:	2402MHz to 2480MHz
Bluetooth Version:	V5.0 Dual mode
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	2MHz
Antenna Type:	PIFA Antenna
Antenna Gain:	2.38dBi

#### Declaration of EUT Family Grouping:

Model No.: FortiExtender 200Fxxxxxx, FORTIEXTENDER-200Fxxxxxx,

FEX-200Fxxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only)

Only the model FEX-200F was tested, since according to the declaration from the applicant, the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, with only difference on model names, software(the software Software does not affect RF performance) and marketing purposes.



## 4.2 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China  
518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

## 4.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 3816.01)**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

- **VCCI**

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

- **FCC –Designation Number: CN1178**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

## 4.4 Deviation from Standards

None.

## 4.5 Abnormalities from Standard Conditions

None.

## 4.6 Other Information Requested by the Customer

None.



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## 5 RF Exposure Evaluation

### 5.1 RF Exposure Compliance Requirement

#### 5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

**TABLE 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> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3–3.0 .....	614	1.63	*(100)	6
3.0–30 .....	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30–300 .....	61.4	0.163	1.0	6
300–1500 .....	.....	.....	f/300	6
1500–100,000 .....	.....	.....	5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3–1.34 .....	614	1.63	*(100)	30
1.34–30 .....	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300 .....	27.5	0.073	0.2	30
300–1500 .....	.....	.....	f/1500	30
1500–100,000 .....	.....	.....	1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission formula:  $Pd = (Pout \cdot G) / (4 \cdot \pi \cdot R^2)$

Where

Pd = power density in mW/cm<sup>2</sup>

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

Pd id the limit of MPE, 1 mW/cm<sup>2</sup>. If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

#### 5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.



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### 4.1.3 EUT RF Exposure Evaluation

**For BT:**

Antenna Gain: 2.38dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.73 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
Lowest	2402	14.92	31.05	0.0107	1.0	PASS

Note: Refer to report No. SZEM201101188502 for EUT test Max Conducted Peak Output Power value. The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

**For BLE:**

Antenna Gain: 2.38dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.73 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm <sup>2</sup> )	Limit	Result
Lowest	2402	14.63	29.04	0.010	1.0	PASS

Note: Refer to report No. SZEM201101188503 for EUT test Max Conducted Peak Output Power value. The distance r (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.

- End of the Report -

