RF Exposure Report

Product Name	Secured Network Extension Device
Model No.	FEV-211F, FEV-212F, FEV-211F-AM, FEV-212F-AM (Main model) (for detail model no. refer to section 1.1 EUT Description)
FCC ID	TVE-3317E142
Contains FCC ID	N7NEM75, N7NEM75S

Applicant	Fortinet, Inc.
Address	909 Kifer Road, Sunnyvale, CA 94086, USA

Date of Receipt	Jun. 14, 2022
Date of Declaration	July 12, 2024
Report No.	2260415R-RFUSMPEV02-B
Report Version	V1.0

Testing Laboratory
3023

The test results relate only to the samples tested.
The test results shown in the test report are traceable to the national/international standard through the calibration report of the equipment and evaluated measurement uncertainty herein.
This report must not be used to claim product endorsement by TAF or any agency of the government.
The test report shall not be reproduced without the written approval of DEKRA Testing and Certification Co., Ltd.
Measurement uncertainties evaluated for each testing system and associated connections are given here to provide the system information for reference. Compliance determinations do not take into account measurement uncertainties for each testing system, but are based on the results of the compliance measurement.

Product Name	Secured Network Extension Device	
Applicant	Fortinet, Inc.	
Address	909 Kifer Road, Sunnyvale, CA 94086, USA	
Manufacturer	Fortinet, Inc.	
Model No.	FEV-211F, FEV-212F, FEV-211F-AM, FEV-212F-AM (Main model) (for detail model no. refer to section 1.1 EUT Description)	
FCC ID	TVE-3317E142	
Contains FCC ID	N7NEM75, N7NEM75S	
Trade Name	Fortinet	
Applicable Standard	KDB 447498 D01 v06	☒ Minimum test separation distance ≥ 20 cm ☐ For low power devices
Test Result	Complied	

Documented By : Genie Chang

(Senior Project Specialist / Genie Chang)

Tested By : Ivan Chuang

(Senior Engineer / Ivan Chuang)

Approved By : Tim Sung

(Manager / Tim Sung)

Revision History

Report No.	Version	Description	Issued Date
2260415R-RFUSMPEV02-B	V1.0	Initial issue of report.	July 12, 2024

1. General Information

1.1. EUT Description

Product Name	Secured Network Extension Device
Trade Name	Fortinet
Model No. (Main model)	FEV-211F, FEV-212F FEV-211F-AM, FEV-212F-AM
Model No. (Series model)	FortiExtenderVehicle 211Fxxxxxxxxxx FORTIEXTENDERVEHICLE-211Fxxxxxxxxxx FEV-211Fxxxxxxxxxx FortiExtenderVehicle 212Fxxxxxxxxxx FORTIEXTENDERVEHICLE-212Fxxxxxxxxxx FEV-212Fxxxxxxxxxx FortiExtenderVehicle 211F-AMxxxxxxxxxx FORTIEXTENDERVEHICLE-211F-AMxxxxxxxxxx FEV-211F-AMxxxxxxxxxx FortiExtenderVehicle 212F-AMxxxxxxxxxx FORTIEXTENDERVEHICLE-212F-AMxxxxxxxxxx FEV-212F-AMxxxxxxxxxx (where “x” can be used “A-Z”, or “0-9”, or “-“, or blank for software purposes or marketing purposes only)
FCC ID	TVE-3317E142
Contains FCC ID	N7NEM75, N7NEM75S

Note: For more detailed information please refer to report No.: 2260415R-RFUSBLEV01-A, 2260415R-RFUSWL2V01-A, 2260415R-RFUSWL5V01-A and 2260415R-RFUSWL5V01-B.

1.2. Test Facility

USA	:	FCC Registration Number: TW0033
Canada	:	CAB Identifier Number: TW3023 / Company Number: 26930
Site Description	:	Accredited by TAF Accredited Number: 3023
Test Laboratory	:	DEKRA Testing and Certification Co., Ltd
Address	:	No. 5-22, Ruishukeng Linkou District, New Taipei City, 24451, Taiwan
Performed Location	:	No. 26, Huaya 1st Rd., Guishan Dist.,Taoyuan City 333411, Taiwan, R.O.C.
Phone Number	:	+886-3-275-7255
Fax Number	:	+886-3-327-8031
Email Address	:	info.tw@dekra.com
Website	:	http://www.dekra.com.tw

2. RF Exposure Evaluation

2.1. Standard Applicable

According to KDB 447498 D01 (7.1), A minimum test separation distance ≥ 20 cm is required between the antenna and radiating structures of the device and nearby persons to apply mobile device exposure limits.

2.2. Limits

According to FCC 1.1310: 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 1.1307(b)

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)
(A) Limits for Occupational/ Control Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f2)	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/ Uncontrolled Exposures				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f2)	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

F= Frequency in MHz

Friis Formula

Friis transmission 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

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0

2.3. Test Result of RF Exposure Evaluation

Product : Secured Network Extension Device
Test Item : RF Exposure Evaluation
Model No. : FEV-211F-AM Series, FEV-212F-AM Series

Band	Frequency (MHz)	E.I.R.P (dBm)	E.I.R.P (mW)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)
Bluetooth	2402	7.75	5.957	0.001	1.000
WLAN 2.4GHz	2437	31.06	1276.439	0.254	1.000
WLAN 5GHz	5240	31.79	1510.080	0.300	1.000
WCDMA B2	1850 - 1910	27.98	628.058	0.125	1.000
WCDMA B4	1710 - 1755	29.22	835.603	0.166	1.000
WCDMA B5	824 - 849	25.83	382.825	0.076	0.549
LTE B2	1850 - 1910	27.98	628.058	0.125	1.000
LTE B4	1710 - 1755	29.22	835.603	0.166	1.000
LTE B5	824 - 849	25.83	382.825	0.076	0.549
LTE B7	2500 - 2570	28.65	732.825	0.146	1.000
LTE B12	699 - 716	25.50	354.813	0.071	0.466
LTE B13	777 -787	27.03	504.661	0.100	0.518
LTE B14	788 - 798	27.03	504.661	0.100	0.525
LTE B26	814 - 849	25.830	382.825	0.076	0.543
LTE B30	2305 - 2315	23.840	242.103	0.048	1.000
LTE B41	2496 - 2690	28.650	732.825	0.146	1.000
LTE B48	3550 - 3700	22.930	196.336	0.039	1.000
LTE B66	1710 - 1780	29.220	835.603	0.166	1.000

Note: The WLAN conducted output power is refer to report No.: 2260415R-RFUSBLEV01-A, 2260415R-RFUSWL2V01-A, 2260415R-RFUSWL5V01-A and 2260415R-RFUSWL5V01-B from the DEKRA. And the WWAN conducted power is refer to original module report (FCC ID: N7NEM75S).

Calculations for Multi-Transmitter

For FEV-211F-AM Series

Mode	Ratios	Summary Result	Limit
BT	0.001	0.749	1
WLAN 2.4GHz	0.254		
WLAN 5GHz	0.300		
WWAN	0.194		

Ratios = Power Density / Power Density Limit

For FEV-212F-AM Series

Mode	Ratios	Summary Result	Limit
BT	0.001	0.943	1
WLAN 2.4GHz	0.254		
WLAN 5GHz	0.300		
WWAN 1	0.194		
WWAN 2	0.194		

Ratios = Power Density / Power Density Limit

Results	PASS

Product : Secured Network Extension Device
Test Item : RF Exposure Evaluation
Model No. : FEV-211F Series, FEV-212F Series

Band	Frequency (MHz)	E.I.R.P (dBm)	E.I.R.P (mW)	Power Density at R = 20 cm (mW/cm2)	Limit (mW/cm2)
Bluetooth	2402	7.75	5.957	0.001	1.000
WLAN 2.4GHz	2437	31.06	1276.439	0.254	1.000
WLAN 5GHz	5240	31.79	1510.080	0.300	1.000
WCDMA B2	1850 - 1910	27.98	628.058	0.125	1.000
WCDMA B4	1710 - 1755	29.22	835.603	0.166	1.000
WCDMA B5	824 - 849	25.83	382.825	0.076	0.549
LTE B2	1850 - 1910	27.98	628.058	0.125	1.000
LTE B4	1710 - 1755	29.22	835.603	0.166	1.000
LTE B5	824 - 849	25.83	382.825	0.076	0.549
LTE B7	2500 - 2570	28.65	732.825	0.146	1.000
LTE B12	699 - 716	25.50	354.813	0.071	0.466
LTE B13	777 -787	27.03	504.661	0.100	0.518
LTE B26	814 - 849	25.830	382.825	0.076	0.543
LTE B41	2496 - 2690	28.650	732.825	0.146	1.000
LTE B48	3550 - 3700	22.930	196.336	0.039	1.000
LTE B66	1710 - 1780	29.220	835.603	0.166	1.000

Note: The WLAN conducted output power is refer to report No.: 2260415R-RFUSBLEV01-A, 2260415R-RFUSWL2V01-A, 2260415R-RFUSWL5V01-A and 2260415R-RFUSWL5V01-B from the DEKRA. And the WWAN conducted power is refer to original module report (FCC ID: N7NEM75).

Calculations for Multi-Transmitter

For FEV-211F Series

Mode	Ratios	Summary Result	Limit
BT	0.001	0.749	1
WLAN 2.4GHz	0.254		
WLAN 5GHz	0.300		
WWAN	0.194		

Ratios = Power Density / Power Density Limit

For FEV-212F Series

Mode	Ratios	Summary Result	Limit
BT	0.001	0.943	1
WLAN 2.4GHz	0.254		
WLAN 5GHz	0.300		
WWAN 1	0.194		
WWAN 2	0.194		

Ratios = Power Density / Power Density Limit

Results	PASS