

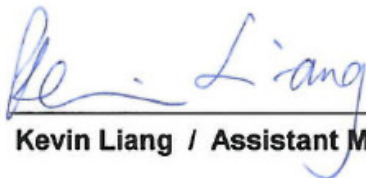
# Maximum Permissible Exposure

**Equipment** : 802.11abgn Wireless Mini PCI  
**Brand Name** : Fortinet  
**Model No.** : WMIR-200N, WMIR-200Nv2  
**FCC ID** : TVE-06836  
**Standard** : ANSI/IEEE C95.1  
**Applicant** : Fortinet, Inc.  
899 Kifer Road Sunnyvale California 94086 United States  
**Manufacturer** : SparkLAN Communications, Inc  
8F., No. 257, Sec. 2, Tiding Blvd., Neihu District,  
Taipei City 11493, Taiwan

The product sample received on Mar. 30, 2016 and completely tested on May 16, 2016. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI/IEEE C95.1 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by:

  
Kevin Liang / Assistant Manager





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# 1 Human Exposure Assessment

## 1.1 Maximum Permissible Exposure

### 1.1.1 Limit of Maximum Permissible Exposure

| Limits for Occupational / Controlled Exposure                       |                                   |                                   |  |  |
|---|-----------------------------------|-----------------------------------|--|--|
| Frequency Range (MHz)   | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
| 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  |
| Limits for General Population / Uncontrolled Exposure               |                                   |                                   |  |  |
| Frequency Range (MHz)   | Electric Field Strength (E) (V/m) | Magnetic Field Strength (H) (A/m) | Power Density (S) (mW/ cm <sup>2</sup> ) | Averaging Time  E  <sup>2</sup> , H  <sup>2</sup> or S (minutes) |
| 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   |
| Note 1: f = frequency in MHz ; *Plane-wave equivalent power density |                                   |                                   |  |  |
| Note 2: For the applicable limit, see FCC 1.1310                    |                                   |                                   |  |  |

### 1.1.2 MPE Calculation Method

$$S = \frac{PG}{4\pi R^2}$$

S = power density (in appropriate units, e.g. mW/cm<sup>2</sup>)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units, e.g., cm)



1.1.3 Result of Maximum Permissible Exposure (2.4GHz)

| Worst Maximum RF Output Power Result                     |                 |  |          |            |                                 |
|--|-----------------|--|----------|------------|---------------------------------|
| Exposure Environment                                     |                 | General Population / Uncontrolled Exposure |          |            |                                 |
| Separation Distance (cm)                                 |                 | 20   |          |            |                                 |
| Condition  |                 | RF Output Power (dBm)                      |          |            |                                 |
| Modulation Mode  | N <sub>TX</sub> | Sum Chain                                  | DG (dBi) | EIRP Power | PD (S)<br>(mW/cm <sup>2</sup> ) |
| b  | 1               | 22.17                                      | 2.5      | 24.67      | 0.0583                          |
| Maximum Permissible Exposure Limit (mW/cm <sup>2</sup> ) |                 |  |          |            | 1                               |
| Note 1: N <sub>TX</sub> = Number of Transmit Chains      |                 |  |          |            |                                 |

1.1.4 Result of Maximum Permissible Exposure (5.2GHz)

| RF General Information 5150~5250MHz  |                           |                     |                |  |                       |
|--|---------------------------|---------------------|----------------|--|-----------------------|
| Frequency Range (MHz)  | IEEE Std. 802.11 Protocol | Ch. Frequency (MHz) | Channel Number | Number of Transmit Chains (N <sub>TX</sub> ) | RF Output Power (dBm) |
| 5150-5250  | a                         | 5180-5240           | 36-48 [4]      | 1  | 15.63                 |
| 5150-5250  | n (HT20)                  | 5180-5240           | 36-48 [4]      | 2  | 16.35                 |
| 5150-5250  | n (HT40)                  | 5190-5230           | 38-46 [2]      | 2  | 10.69                 |
| Note 1: RF output power specifies that Maximum Conducted (Average) Output Power. |                           |                     |                |  |                       |

| Worst Maximum RF Output Power Result                     |                 |  |              |           |          |            |                                 |
|--|-----------------|--|--------------|-----------|----------|------------|---------------------------------|
| Exposure Environment                                     |                 | General Population / Uncontrolled Exposure |              |           |          |            |                                 |
| Separation Distance (cm)                                 |                 | 20   |              |           |          |            |                                 |
| Condition  |                 | RF Output Power (dBm)                      |              |           |          |            |                                 |
| Modulation Mode  | N <sub>TX</sub> | Chain-Port 1                               | Chain-Port 2 | Sum Chain | DG (dBi) | EIRP Power | PD (S)<br>(mW/cm <sup>2</sup> ) |
| n (HT20)   | 1               | 13.63                                      | 13.03        | 16.35     | 5        | 21.35      | 0.02715                         |
| Maximum Permissible Exposure Limit (mW/cm <sup>2</sup> ) |                 |  |              |           |          |            | 1                               |
| Note 1: N <sub>TX</sub> = Number of Transmit Chains      |                 |  |              |           |          |            |                                 |



1.1.5 Result of Maximum Permissible Exposure (5.8GHz)

| RF General Information 5725 MHz – 5850 MHz |                           |                     |                |  |                       |
|--|---------------------------|---------------------|----------------|--|-----------------------|
| Frequency Range (MHz)                      | IEEE Std. 802.11 Protocol | Ch. Frequency (MHz) | Channel Number | Number of Transmit Chains (N <sub>TX</sub> ) | RF Output Power (dBm) |
| 5725-5850                                  | a                         | 5745-5825           | 149-165 [5]    | 1  | 14.85                 |
| 5725-5850                                  | n(HT20)                   | 5745-5825           | 149-165 [5]    | 2  | 19.96                 |
| 5725-5850                                  | n(HT40)                   | 5755-5795           | 151-159 [2]    | 2  | 18.53                 |

Note 1: RF output power specifies that Maximum Conducted (Average) Output Power.

| Worst Maximum RF Output Power Result                     |                 |  |              |           |          |            |                              |
|--|-----------------|--|--------------|-----------|----------|------------|------------------------------|
| Exposure Environment                                     |                 | General Population / Uncontrolled Exposure |              |           |          |            |                              |
| Separation Distance (cm)                                 |                 | 20   |              |           |          |            |                              |
| Condition  |                 | RF Output Power (dBm)                      |              |           |          |            |                              |
| Modulation Mode  | N <sub>TX</sub> | Chain-Port 1                               | Chain-Port 2 | Sum Chain | DG (dBi) | EIRP Power | PD (S) (mW/cm <sup>2</sup> ) |
| n(HT20)  | 2               | 14.69                                      | 18.43        | 19.96     | 5.00     | 24.96      | 0.06235                      |
| Maximum Permissible Exposure Limit (mW/cm <sup>2</sup> ) |                 |  |              |           |          |            | 1                            |

Note 1: N<sub>TX</sub> = Number of Transmit Chains