

## Maximum Permissible Exposure (MPE)

### Standard Applicable

According to §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

This is a Fixed Point to Point device, the MPE is required.

According to §1.1310 and §2.1091 RF exposure is calculated.

### Limits for Maximum Permissive Exposure (MPE)

| Frequency Range<br>(MHz)                            | Electric Field<br>Strength (V/m) | Magnetic Field<br>Strength (A/m) | Power Density<br>(mW/cm <sup>2</sup> ) | Averaging Time<br>(minute) |
|---|----------------------------------|----------------------------------|--|----------------------------|
| Limits for General Population/Uncontrolled Exposure |                                  |                                  |  |                            |
| 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                         |
| 1500-15000  | /                                | /                                | 1.0                                    | 30                         |

F = frequency in MHz

\* = Plane-wave equipment power density

### Maximum Permissible Exposure (MPE) Evaluation

The worst case of Average power of 5150-5250MHz HT20 mode: refer to FCC test report for detail measurement date.

Power measurement:

2\*2 MIMO

| Mode    | Freq (MHz) | channel | Output Chain (dBm) |         | Combine Output Power (dBm) | Limit (dBm) | Result |
|---------|------------|---------|--------------------|---------|----------------------------|-------------|--------|
|         |            |         | Chain 0            | chain 1 |                            |             |        |
| 802.11a | 5180       | 36      | 6.09               | 9.25    | 10.96                      | 30          | Pass   |
|         | 5200       | 40      | 6.6                | 9.33    | 11.19                      | 30          | Pass   |
|         | 5240       | 48      | 7.12               | 8.88    | 11.10                      | 30          | Pass   |

Prediction of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

$$S = PG / 4 \pi R^2$$

Where: S = Power density

P = Power input to antenna

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

|  |             |                       |
|--|-------------|-----------------------|
| Maximum peak output power at antenna input terminal: | 11.19       | (dBm)                 |
| Maximum peak output power at antenna input terminal: | 13.15224832 | (mW)                  |
| Duty cycle:  | 100         | (%)                   |
| Maximum Pav :  | 13.15224832 | (mW)                  |
| Antenna gain (typical):                              | 20          | (dBi)                 |
| Maximum antenna gain:                                | 100         | (numeric)             |
| Prediction distance:                                 | 20          | (cm)                  |
| Prediction frequency:                                | 5200        | (MHz)                 |
| MPE limit for uncontrolled exposure at prediction    | 1           | (mW/cm <sup>2</sup> ) |
| Power density at predication frequency at 20 (cm)    | 0.2617884   | (mW/cm <sup>2</sup> ) |

### Measurement Result

The predicted power density level at 20 cm is 0.26179mW/cm<sup>2</sup>. This is below the uncontrolled exposure limit of 1 mW/cm<sup>2</sup> at 5200MHz.