

## **§1.1307(b)(1) & §2.1091 - RF EXPOSURE**

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According to §15.247(b)(4) and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

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

### Limits for General Population/Uncontrolled Exposure

| Frequency Range (MHz)                               | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm <sup>2</sup> ) | Averaging Time (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                      |
| 1500-100,000  | /                             | /                             | 1.0                                 | 30                      |

f = frequency in MHz

\* = Plane-wave equivalent power density

### **MPE Prediction**

Predication 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

2412 – 2462 MHz:

Maximum peak output power at antenna input terminal: 23.84(dBm)

Maximum peak output power at antenna input terminal: 242.10 (mW)

Predication frequency: 2400 (MHz)

Antenna Gain (typical): 24 (dBi)

antenna gain: 251.2 (numeric)

Prediction distance: 70(cm)

Power density at predication frequency at 70 cm: 0.99 (mW/cm<sup>2</sup>)

MPE limit for uncontrolled exposure at prediction frequency: 1.0 (mW/cm<sup>2</sup>)

*5.2 – 5.3 GHz*

Maximum peak output power at antenna input terminal: 5.98(dBm)

Maximum peak output power at antenna input terminal: 3.96 (mW)

Predication frequency: 5000 (MHz)

Antenna Gain (typical): 32 (dBi)

antenna gain: 1584.9 (numeric)

Prediction distance: 25 (cm)

Power density at predication frequency at 25 cm: 0.80 (mW/cm<sup>2</sup>)

MPE limit for uncontrolled exposure at prediction frequency: 1.0 (mW/cm<sup>2</sup>)

### **Test Result**

The EUT is of fixed outdoor installation, point -to-point or point-to-multipoint. 1mW/cm<sup>2</sup> limit applies. The prediction distance for the 2.4G Hz antenna is 70cm. The prediction distance for the 5G Hz antenna is 25cm.