# 5. RF EXPOSURE EVALUATION

## 5.1 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

### 5.1.1 Applicable Standard

FCC §95.3385 & §1.1310 & §2.1091

Regardless of the power density levels permitted under this subpart, devices operating under the provisions of this subpart are subject to the radiofrequency radiation exposure requirements specified in §§ 1.1307(b), 2.1091, and 2.1093 of this chapter, as appropriate. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

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 levels in excess of the Commission's guidelines. See §1.1307(b)(1) of this chapter.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

| (B) Limits for General Population/Uncontrolled Exposure | | | | |
|---|---|---|---|---|
| **Frequency Range (MHz)** | **Electric Field Strength (V/m)** | **Magnetic Field Strength (A/m)** | **Power Density ($mW/cm^2$)** | **Averaging Time (minutes)** |
| 0.3–1.34 | 614 | 1.63 | *(100) | 30 |
| 1.34–30 | 824/f | 2.19/f | *(180/$f^2$) | 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;

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

### 5.1.2 Procedure

Prediction of power density at the distance of the applicable MPE limit
$S = PG/4\pi R^2$ = power density (in appropriate units, e.g. $mW/cm^2$);
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, the power gain factor, is normally numeric gain;
R = distance to the center of radiation of the antenna (appropriate units, e.g., cm);

## 5.2 Measurement Result

| **Frequency (GHz)** | **EIRP Average Output power including Tune-up Tolerance** | | **Evaluation Distance (cm)** | **Power Density ($mW/cm^2$)** | **MPE Limit ($mW/cm^2$)** |
|---|---|---|---|---|---|
| | **(dBm)** | **(mW)** | | | |
| 77.50-78.70 | 27 | 501 | 20 | 0.1 | 1 |

**Result:** The device meet FCC MPE at 20 cm distance.