

**FCC §15.247 (i) & §1.1310 & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

**Applicable Standard**

According to subpart 15.247(i) and subpart §1.1310, 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.

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

| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                                      |                                      |  |                                 |
|--|--------------------------------------|--------------------------------------|--|---------------------------------|
| <b>Frequency Range (MHz)</b>                                   | <b>Electric Field Strength (V/m)</b> | <b>Magnetic Field Strength (A/m)</b> | <b>Power Density (mW/cm<sup>2</sup>)</b> | <b>Averaging Time (minutes)</b> |
| 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;

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

**Calculation formula:**

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<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, the power gain factor, is normally numeric gain;

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

**Calculated Data:**

| <b>Mode</b>  | <b>Frequency (MHz)</b> | <b>Antenna Gain</b> |                  | <b>Conducted output power including Tune-up Tolerance</b> |             | <b>Evaluation Distance (cm)</b> | <b>Power Density (mW/cm<sup>2</sup>)</b> | <b>MPE Limit (mW/cm<sup>2</sup>)</b> |
|--------------|------------------------|---------------------|------------------|---|-------------|---------------------------------|--|--------------------------------------|
|              |                        | <b>(dBi)</b>        | <b>(numeric)</b> | <b>(dBm)</b>  | <b>(mW)</b> |                                 |  |                                      |
| WLAN         | 2412-2462              | 2.6                 | 1.82             | 22.5  | 177.83      | 20.00                           | 0.064                                    | 1.0                                  |
| Bluetooth LE | 2402-2480              | 2.6                 | 1.82             | 5   | 3.16        | 20.00                           | 0.001                                    | 1.0                                  |

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