

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) Limits for General Population/Uncontrolled Exposure | | | | |
|--|--------------------------------------|--------------------------------------|--|---------------------------------|
| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density (mW/cm²) | 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.

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4 \pi R^2 =$ power density (in appropriate units, e.g. mW/cm²);

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:

| Mode | Frequency (MHz) | Antenna Gain | | Target Power | | Evaluation Distance (cm) | Power Density (mW/cm²) | MPE Limit (mW/cm²) |
|--------------|------------------------|---------------------|------------------|---------------------|-------------|---------------------------------|--|--------------------------------------|
| | | (dBi) | (numeric) | (dBm) | (mW) | | | |
| 802.11b | 2412 | -1 | 0.794 | 18 | 63.10 | 20 | 0.010 | 1.0 |
| 802.11g | 2412 | -1 | 0.794 | 16 | 39.81 | 20 | 0.006 | 1.0 |
| 802.11n HT20 | 2412 | -1 | 0.794 | 14 | 25.12 | 20 | 0.004 | 1.0 |
| 802.11n HT40 | 2452 | -1 | 0.794 | 14 | 25.12 | 20 | 0.004 | 1.0 |
| BLE | 2402 | -1 | 0.794 | 4 | 2.51 | 20 | 0.001 | 1.0 |

Note: The target output power: 802.11b:17 ± 1dBm,
 802.11g:15 ± 1dBm,
 802.11n:13 ± 1dBm,
 802.11n:13 ± 1dBm,
 BLE:2 ± 2dBm
 which declared by the Manufacturer.

Result: The device meet FCC MPE at 20 cm distance