

FCC §15.247 (i) & §1.1307 (b) (1) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 1.1307 (b)(1), 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

Limits for General Population/Uncontrolled Exposure

| 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

Result

Calculated Formulary:

Predication of MPE limit at a given distance

$$S = \frac{PG}{4\pi R^2}$$

S = 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)

For simultaneously transmit system, the calculated power density should comply with:

$$\sum_i \frac{S_i}{S_{Limit,i}} \leq 1$$

| Mode | Antenna Gain | | Conducted Power | | Evaluation Distance (cm) | Power Density (mW/cm ²) | MPE Limit (mW/cm ²) |
|-----------------|--------------|-----------|-----------------|--------|--------------------------|-------------------------------------|---------------------------------|
| | (dBi) | (numeric) | (dBm) | (mW) | | | |
| LTE (BAND II) | 2 | 1.58 | 24 | 251.19 | 20 | 0.08 | 1 |
| LTE (BAND IV) | 2 | 1.58 | 24 | 251.19 | 20 | 0.08 | 1 |
| LTE (BAND XII) | 2 | 1.58 | 24 | 251.19 | 20 | 0.08 | 0.466 |
| WCDMA (BAND II) | 2 | 1.58 | 23.5 | 223.87 | 20 | 0.07 | 1 |
| WCDMA (BAND IV) | 2 | 1.58 | 23.5 | 223.87 | 20 | 0.07 | 1 |
| WCDMA (BAND V) | 2 | 1.58 | 23.5 | 223.87 | 20 | 0.07 | 0.549 |
| WIFI | 1 | 1.26 | 7.5 | 5.62 | 20 | 0.0014 | 1 |

$$\sum_i \frac{S_i}{S_{Limit,i}} = 0.0014/1 + 0.08/0.466 = 0.17 < 1$$

Note: To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliance