

FCC§1.1307& §2.1091 – MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart §2.1051 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 Range | Antenna Gain | | Output Power | | Evaluation Distance | Power Density | MPE Limit |
|----------|-----------------|--------------|-----------|--------------|--------|---------------------|-----------------------|-----------------------|
| | (MHz) | (dBi) | (numeric) | (dBm) | (mW) | (cm) | (mW/cm ²) | (mW/cm ²) |
| GPRS 850 | 824.2-848.8 | 4.91 | 3.10 | 27 | 501.19 | 20 | 0.3088 | 0.55 |
| GPRS1900 | 1850.2-1909.8 | 3.63 | 2.31 | 23 | 199.53 | 20 | 0.0916 | 1 |

| Number of Time slot | 1 | 2 |
|--|-------|--------|
| Duty Cycle | 1:8.3 | 1:4.15 |
| Time based Ave. power compared to slotted Ave. power | -9 dB | -6 dB |

Note: The target output power:

GPRS 850: 1 slot 32.5±1dBm, 2slot 32±1dBm max average power 27dBm

GPRS 1900: 1 slot 29±1dBm, 2slot 28±1dBm max average power 23dBm

Which declared by the manufacturer.

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