

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

### **Applicable Standard**

According to subpart §2.1091 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.

Calculated Formulary:

Predication of MPE limit at a given distance

$S = PG/4\pi R^2$  = 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:**

Mode	Frequency Range	Antenna Gain		Output Power		Evaluation Distance	Power Density	MPE Limit
	(MHz)	(dBi)	(numeric)	(dBm)	(mW)	(cm)	(mW/cm <sup>2</sup> )	(mW/cm <sup>2</sup> )
GPRS 850	824.2-848.8	1.54	1.43	25.5	354.81	20	0.1006	0.55
GPRS1900	1850.2-1909.8	2.91	1.95	22.0	158.49	20	0.0616	1.0

Number of Time slot	1	2
Duty Cycle	1:8	1:4
Time based Ave. power compared to slotted Ave. power	-9 dB	-6 dB

**Note:** The target output power:

GPRS 850: 1 slot  $31.5 \pm 0.5$ dBm, 2slot  $31 \pm 0.5$ dBm max average power 25.5dBm

GPRS 1900: 1 slot  $29 \pm 0.5$ dBm, 2slot  $27 \pm 1$ dBm max average power 22.0dBm

which declared by the manufacturer.

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