

## 5. RF EXPOSURE EVALUATION

### 5.1 Applicable Standard

According to 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/cm <sup>2</sup> ) | Averaging Time (minutes) |
| 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.

### 5.2 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);

### 5.3 Calculated Data:

| Operation Modes | Frequency (MHz) | Antenna Gain |           | Conducted output power including Tune-up Tolerance |         | Evaluation Distance (cm) | Power Density (mW/cm <sup>2</sup> ) | MPE Limit (mW/cm <sup>2</sup> ) |
|-----------------|-----------------|--------------|-----------|----------------------------------------------------|---------|--------------------------|-------------------------------------|---------------------------------|
|                 |                 | (dBi)        | (numeric) | (dBm)                                              | (mW)    |                          |                                     |                                 |
| GSM850          | 824-849         | -0.04        | 0.99      | 33.0                                               | 1995.26 | 20                       | 0.393                               | 0.549                           |
| PCS1900         | 1850-1910       | 0.59         | 1.15      | 30.5                                               | 1122.02 | 20                       | 0.256                               | 1                               |

Note: The tune up power was declared by applicant.

Result: The device meet FCC MPE at 20 cm distance