

## 11 §1.1307(b) (1) & §2.1091 - RF EXPOSURE

### 11.1 Applicable Standard

According to §1.1310 and §2.1091 (Mobile Devices) RF exposure is calculated.

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 (minute)
<b>Limits for General Population/Uncontrolled Exposure</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

### 11.2 MPE Prediction

Predication of MPE limit at a given distance

Equation from page 18 of OET Bulletin 65, Edition 97-01

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

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

#### Uplink:

Maximum peak output power at antenna input terminal (dBm):	<u>26.58</u>
Maximum peak output power at antenna input terminal (mW):	<u>454.99</u>
Prediction distance (cm):	<u>45</u>
Prediction frequency (MHz):	<u>813.5</u>
Antenna Gain, typical (dBi):	<u>14</u>
Maximum Antenna Gain (numeric):	<u>25.12</u>
Power density at predication frequency and distance (mW/cm <sup>2</sup> ):	<u>0.4492</u>
MPE limit for uncontrolled exposure at predication frequency (mW/cm <sup>2</sup> ):	<u>0.5423</u>

**Downlink:**

Maximum peak output power at antenna input terminal (dBm):	<u>27.20</u>
Maximum peak output power at antenna input terminal (mW):	<u>524.81</u>
Prediction distance (cm):	<u>45</u>
Prediction frequency (MHz):	<u>858.5</u>
Antenna Gain, typical (dBi):	<u>14</u>
Maximum Antenna Gain (numeric):	<u>25.12</u>
Power density at predication frequency and distance (mW/cm <sup>2</sup> ):	<u>0.5181</u>
MPE limit for uncontrolled exposure at predication frequency (mW/cm <sup>2</sup> ):	<u>0.5723</u>

**11.3 Test Result**

The device is compliant with the requirement MPE limit for uncontrolled exposure at predication frequency 0.5423 mW/cm<sup>2</sup> and 0.5723 mW/cm<sup>2</sup>. The maximum power density at the distance of 45 cm was 0.4492 mW/cm<sup>2</sup> and 0.5181 mW/cm<sup>2</sup>. Thus, the requirement of at least 45 cm required by the manufacturer is in compliance with the MPE requirement.