

4 FCC §1.1310 & §2.1091 - RF Exposure Information

4.1 Applicable Standards

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 ²)	Averaging Time (minute)
Limits for General Population/Uncontrolled Exposure				
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

Note: f = frequency in MHz

* = Plane-wave equivalent power density

4.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from 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

Cellular Band

Uplink:

Maximum peak output power at antenna input terminal (dBm):	<u>21.98</u>
Maximum peak output power at antenna input terminal (mW):	<u>157.76</u>
Prediction distance (cm):	<u>20</u>
Prediction frequency (MHz):	<u>828</u>
Maximum Antenna Net Gain (dBi):	<u>6.14</u>
Maximum Antenna Net Gain (numeric):	<u>4.11</u>
Power density at predication frequency and distance (mW/cm ²):	<u>0.129</u>
MPE limit for uncontrolled exposure at predication frequency (mW/cm ²):	<u>0.552</u>

Downlink:

Maximum peak output power at antenna input terminal (dBm):	<u>5.5</u>
Maximum peak output power at antenna input terminal (mW):	<u>3.55</u>
Prediction distance (cm):	<u>20</u>
Prediction frequency (MHz):	<u>884.4</u>
Maximum Antenna Net Gain (dBi):	<u>7.14</u>
Maximum Antenna Net Gain (numeric):	<u>5.18</u>
Power density at predication frequency and distance (mW/cm ²):	<u>0.004</u>
MPE limit for uncontrolled exposure at predication frequency (mW/cm ²):	<u>0.590</u>

PCS Band

Uplink:

Maximum peak output power at antenna input terminal (dBm):	<u>23.5</u>
Maximum peak output power at antenna input terminal (mW):	<u>223.87</u>
Prediction distance (cm):	<u>20</u>
Prediction frequency (MHz):	<u>1866.8</u>
Maximum Antenna Net Gain (dBi):	<u>6.14</u>
Maximum Antenna Net Gain (numeric):	<u>4.11</u>
Power density at predication frequency and distance (mW/cm ²):	<u>0.183</u>
MPE limit for uncontrolled exposure at predication frequency (mW/cm ²):	<u>1.0</u>

Downlink:

Maximum peak output power at antenna input terminal (dBm):	<u>-0.26</u>
Maximum peak output power at antenna input terminal (mW):	<u>0.942</u>
Prediction distance (cm):	<u>20</u>
Prediction frequency (MHz):	<u>1956.8</u>
Maximum Antenna Net Gain (dBi):	<u>7.14</u>
Maximum Antenna Net Gain (numeric):	<u>5.18</u>
Power density at predication frequency and distance (mW/cm ²):	<u>0.001</u>
MPE limit for uncontrolled exposure at predication frequency (mW/cm ²):	<u>1.0</u>

4.3 Test Result

The device complies with the MPE requirements by providing a safe separation distance of 20 cm between the antenna, including any radiating structure, and any persons when normally operated based on the maximum inside antenna net gain of 6.14 dBi, and outside antenna net gain of 7.14 dBi. The proposed RF exposure safety information has been included in the User's Manual.