

9 FCC §1.1307(b)(1) & §2.1091 – RF Exposure Information

9.1 Applicable Standard

According to FCC §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

9.2 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): 20.84

Maximum peak output power at antenna input terminal (mW): 121.3389

Prediction distance (cm): 20

Prediction frequency (MHz): 836.52

Antenna Gain, typical (dBi): 3.0

Antenna Gain, typical (numeric): 2.0

Power density at predication frequency and distance (mW/cm²): 0.0482

MPE limit for uncontrolled exposure at predication frequency (mW/cm²): 0.5577

Cellular Band Downlink

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>13.78</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>23.87811</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>891.6</u>
<u>Antenna Gain, typical (dBi):</u>	<u>3.0</u>
<u>Antenna Gain, typical (numeric):</u>	<u>2.0</u>
<u>Power density at predication frequency and distance (mW/cm²):</u>	<u>0.0095</u>
<u>MPE limit for uncontrolled exposure at predication frequency (mW/cm²):</u>	<u>0.5944</u>

PCS Band Uplink

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>20.98</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>125.3141</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>1880.0</u>
<u>Antenna Gain, typical (dBi):</u>	<u>5.0</u>
<u>Antenna Gain, typical (numeric):</u>	<u>3.2</u>
<u>Power density at predication frequency and distance (mW/cm²):</u>	<u>0.0798</u>
<u>MPE limit for uncontrolled exposure at predication frequency (mW/cm²):</u>	<u>1.0</u>

PCS Band Downlink

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>13.98</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>25.00345</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>1989.8</u>
<u>Antenna Gain, typical (dBi):</u>	<u>5.0</u>
<u>Antenna Gain, typical (numeric):</u>	<u>3.2</u>
<u>Power density at predication frequency and distance (mW/cm²):</u>	<u>0.0159</u>
<u>MPE limit for uncontrolled exposure at predication frequency (mW/cm²):</u>	<u>1.0</u>

Results

For uplink and downlink, the highest power density levels at 20 cm are below the MPE uncontrolled exposure limit.