

4 §1.1307(b) (1) & §2.1091 - RF EXPOSURE

4.1 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 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

f = frequency in MHz

* = Plane-wave equivalent power density

4.2 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

CDMA

Uplink:

Maximum peak output power at antenna input terminal (dBm): 22.00

Maximum peak output power at antenna input terminal (mW): 158.49

Prediction distance (cm): 25

Prediction frequency (MHz): 836.40

Antenna Gain, typical (dBi): 9

Maximum Antenna Gain (numeric): 7.943

Power density at predication frequency and distance (mW/cm²): 0.160

MPE limit for uncontrolled exposure at predication frequency (mW/cm²): 0.5576

Downlink:

Maximum peak output power at antenna input terminal (dBm):	<u>21.99</u>
Maximum peak output power at antenna input terminal (mW):	<u>158.12</u>
Prediction distance (cm):	<u>25</u>
Prediction frequency (MHz):	<u>881.4</u>
Antenna Gain, typical (dBi):	<u>9</u>
Maximum Antenna Gain (numeric):	<u>7.943</u>
Power density at predication frequency and distance (mW/cm ²):	<u>0.16</u>
MPE limit for uncontrolled exposure at predication frequency (mW/cm ²):	<u>0.5876</u>

GSM

Uplink:

Maximum peak output power at antenna input terminal (dBm):	<u>26.99</u>
Maximum peak output power at antenna input terminal (mW):	<u>500.03</u>
Prediction distance (cm):	<u>25</u>
Prediction frequency (MHz):	<u>836.6</u>
Antenna Gain, typical (dBi):	<u>9</u>
Maximum Antenna Gain (numeric):	<u>7.943</u>
Power density at predication frequency and distance (mW/cm ²):	<u>0.51</u>
MPE limit for uncontrolled exposure at predication frequency (mW/cm ²):	<u>0.5577</u>

Downlink:

Maximum peak output power at antenna input terminal (dBm):	<u>26.95</u>
Maximum peak output power at antenna input terminal (mW):	<u>495.45</u>
Prediction distance (cm):	<u>25</u>
Prediction frequency (MHz):	<u>881.6</u>
Antenna Gain, typical (dBi):	<u>9</u>
Maximum Antenna Gain (numeric):	<u>7.943</u>
Power density at predication frequency and distance (mW/cm ²):	<u>0.50</u>
MPE limit for uncontrolled exposure at predication frequency (mW/cm ²):	<u>0.5877</u>

4.3 Test Result

The device is compliant with the requirement MPE limit for uncontrolled exposure at predication frequency 0.5877 mW/cm². The maximum power density at the distance of 25 cm was 0.51 mW/cm². Thus, the requirement of at least 25 cm required by the manufacturer is in compliance with the MPE requirement.