

§1.1310 and §2.1091 - RF EXPOSURE

According to §1.1307, 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.

According to §1.1310 and §2.1091 RF exposure is calculated.

Limits for Maximum Permissible Exposure (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minute)
Limits for Occupational Population/Controlled 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

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: 20 (dBm)

Maximum peak output power at antenna input terminal: 100 (mW)

Prediction distance: 20 (cm)

Predication frequency: 815 (MHz)

Antenna Gain (typical): 3 (dBi)

antenna gain: 2 (numeric)

Power density at predication frequency at 20 cm: 0.04 (mW/cm²)

MPE limit for uncontrolled exposure at prediction frequency: 0.54 (mW/cm²)

Downlink:

Maximum peak output power at antenna input terminal: 20 (dBm)

Maximum peak output power at antenna input terminal: 100 (mW)

Prediction distance: 20 (cm)

Predication frequency: 860 (MHz)

Antenna Gain (typical): 0 (dBi)

antenna gain: 1 (numeric)

Power density at predication frequency at 20 cm: 0.02 (mW/cm²)

MPE limit for uncontrolled exposure at prediction frequency: 0.57 (mW/cm²)

Test Result

For Uplink, Its power density level at 20 cm is 0.04mW/cm², which is below the uncontrolled exposure limit of 0.54mW/cm² at 815 MHz.

For Downlink, Its power density level at 20 cm is 0.02mW/cm², which is below the uncontrolled exposure limit of 0.57mW/cm² at 860 MHz.