

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

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According to §15.247(b)(4) and §1.1307(b)(1), 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 §2.1093 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 <sup>2</sup> )	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 <sup>2</sup> )	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-15000	/	/	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

Up-Link:

Maximum peak output power at antenna input terminal: 24.39 (dBm)

Maximum peak output power at antenna input terminal: 274.79 (mW)

Prediction distance: 27 (cm)

Predication frequency: 1880 (MHz)

Antenna Gain (typical): 15 (dBi)

Maximum antenna gain: 31.62 (numeric)

Power density at predication frequency at 27 cm: 0.9489 (mW/cm<sup>2</sup>)

MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm<sup>2</sup>)

Down-Link:

Maximum peak output power at antenna input terminal: 24.48 (dBm)

Maximum peak output power at antenna input terminal: 280.54 (mW)

Prediction distance: 27 (cm)

Predication frequency: 1960 (MHz)

Antenna Gain (typical): 15 (dBi)

Maximum antenna gain: 31.62 (numeric)

Power density at predication frequency at 27 cm: 0.9688 (mW/cm<sup>2</sup>)

MPE limit for uncontrolled exposure at prediction frequency: 1 (mW/cm<sup>2</sup>)

### **Test Result**

For Up-Link: The predicted power density level at 27 cm is 0.9489 mW/cm<sup>2</sup>. It is below the uncontrolled exposure limit of 1mW/cm<sup>2</sup> at 1880 MHz.

For Down-Link: The predicted power density level at 27 cm is 0.9688 mW/cm<sup>2</sup>. It is below the uncontrolled exposure limit of 1mW/cm<sup>2</sup> at 1960 MHz.