

§15.247 (i), § 1.1310 - MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Limit

According to §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.

Radio frequency radiation exposure was calculated based on § 1.1310 limits.

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/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f\2\)	6
30-300.	61.4	0.163	1.0	6
300-1500	/	/	f/300	6
1500-100,000	/	/	5	6

f = frequency in MHz

* = Plane-wave equivalent power density

Test Data

Prediction 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

R = distance to the center of radiation of the antenna

802.11a mode (Antenna model: TQWTD-1700-5.5V):

Maximum peak output power at antenna input terminal: 19.49 dBm

Maximum peak output power at antenna input terminal: 88.92 mW

Prediction distance: 20 cm

Prediction frequency: 5745 MHz

Antenna gain (actual): 17 dBi

Antenna gain (numeric): 50.12

Power density at the predication frequency at 20 cm: 0.89 mW/ cm²

802.11b mode (Antenna model: XPTX1412-QX):

Maximum peak output power at antenna input terminal: 20.09 dBm
Maximum peak output power at antenna input terminal: 102.09 mW
Prediction distance: 20 cm
Prediction frequency: 2437 MHz
Antenna gain (actual): 12 dBi
Antenna gain (numeric): 15.85
Power density at the predication frequency at 20 cm: 0.32 mW/cm²

802.11b mode (Antenna model: SPDG14T):

Maximum peak output power at antenna input terminal: 20.09 dBm
Maximum peak output power at antenna input terminal: 102.09 mW
Prediction distance: 20 cm
Prediction frequency: 2437MHz
Antenna gain (actual): 11 dBi
Antenna gain (numeric): 12.59
Power density at the predication frequency at 20 cm: 0.26 mW/cm²

802.11g mode (Antenna model: XPTX1412-QX):

Maximum peak output power at antenna input terminal: 19.69 dBm
Maximum peak output power at antenna input terminal: 93.11 mW
Prediction distance: 20 cm
Prediction frequency: 2437 MHz
Antenna gain (actual): 12 dBi
Antenna gain (numeric): 15.85
Power density at the predication frequency at 20 cm: 0.29 mW/cm²

802.11g mode (Antenna model: XPTX1412-QX):

Maximum peak output power at antenna input terminal: 19.69 dBm
Maximum peak output power at antenna input terminal: 93.11 mW
Prediction distance: 20 cm
Prediction frequency: 2437 MHz
Antenna gain (actual): 11 dBi
Antenna gain (numeric): 12.59
Power density at the predication frequency at 20 cm: 0.23 mW/cm²

Results: All of above results are compliance with the limit of 1.0 mW/cm² at 20 cm distance.