

RF Exposure Limits

Transmitters operating under 15.249 must be operated in a manner that ensures the public is not exposed to RF energy levels in excess of the commission's guidelines. Based on the transmitter power and maximum antenna gain (see calculation below) the minimum separation distance was calculated to determine the distance for acceptable MPE power density levels to meet both the Occupational/Controlled Exposure and the General Population/Uncontrolled Exposure requirements of FCC Part 1.1310. The calculation below uses the more stringent General Population MPE Limits.

Field strength to power calculations from ANSI C63.10

E = Measured Electric Field Strength = 93.2 dBuV/M *

d = Radiated test Measurement Distance = 3 Meters

EIRP Log = E + 20log(d) - 104.7

EIRP Log = 93.2 + 20log(3) - 104.7

EIRP Log = -1.96 dBm

EIRP Linear = 0.000637 W

Gain = Max Power Gain of Antenna = -4.2 dBi = 0.38 Numeric

Power = EIRP Linear / Gain Numeric

Power = 0.000637 / 0.38

Power = Max Power Input to Antenna = 0.0017 mW

D = Minimum Separation Distance in cm

S = Max allowed Power Density in mW/cm²

Per 1.1310 For the Frequency of 2400 MHz S = 1 mW/cm²

$$1 \text{ mW/cm}^2 = \frac{0.0017 \times 0.38}{4 \times (3.14) \times D^2} = \frac{0.000646}{12.56 \times D^2}$$

$$D^2 = \frac{0.000646}{12.56 \times 1}$$

$$D = \sqrt{0.000051} = 0.007 \text{ cm}$$

* Field strength used is the maximum measured peak value



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