

FCC RF Exposure Requirements

General information:

Device category: Mobile per Part 2.1091

Environment: Uncontrolled Exposure

Mobile devices that operate under Part 15.247 of this chapter are subject to environmental evaluation for RF exposure prior to equipment authorization.

Antenna:

The manufacturer does specify an antenna with a gain of 2.15 dBi to be used with this device.

This device has provisions for operation in as a handheld device only.

Configuration	Antenna p/n	Type	Freq. Band	Max. Gain (dBi)
mobile	Any	omni	2400 MHz	2.15

Operating configuration and exposure conditions:

The conducted output power is 1.0 Watts. Typical use qualifies for a maximum duty cycle factor of <50%.

MPE Calculation:

The minimum separation distance is calculated as follows:

The limit for general uncontrolled exposure environment above 1500 MHz is 1.0 mW/cm^2 .

Channel frequency: 2440 MHz

The conducted power output is 1.0 Watt.

Antenna gain was taken as 2.15 dBi

50% Duty cycle

In the example below 50% duty cycle correction was taken. The compliance distance 8 cm.

The device is used in normal operation the antenna never gets even this close.

$W := 1$ power in Watts

$D := 1$ Duty Factor in decimal % (1=100%)

1 for FM

$E := 15$ exposure time in minutes

$U := 30$ (use 6 for controlled and 30 for uncontrolled)

$$W_{exp} := W \cdot D \cdot \left(\frac{E}{U} \right)$$

$$PC := \left(\frac{E}{U} \right) \cdot 100$$

$W_{exp} = 0.5$ Watts

$PC = 50$ % on time

$P_o := 500$ mWatts

$f := 1500$ Frequency in MHz

$dBd := 0. - .0$ antenna gain in dBd

$G1 := dBd + 2.15$ gain in dBi

$$S := \frac{f}{1500} \quad \text{power density limit for uncontrolled exposure}$$

$G1 = 2.15$ dBi

$S = 1$

$CL := 0$ dB coax loss

$G := G1 - CL$

$$G_n := 10^{\frac{G}{10}} \quad \text{gain numeric}$$

$G_n = 1.641$ dB

$$R := \sqrt{\frac{(P_o \cdot G_n)}{(4 \cdot \pi \cdot S)}}$$

$R = 8.079$ distance in centimeters
required for compliance

$$\text{inches} := \frac{R}{2.54}$$

inches = 3.181

Conclusion:

The device complies with the MPE requirements by providing a safe separation distance of 8 cm between the antenna, including any radiating structure, and any persons when normally operated.