

Appendix A: RF Exposure - FCC Rules and Regulations Part 1.1307, 1.1310, 2.1091, 2.1093

1 General Information

Environment: General Population/Uncontrolled Exposure
Device category: Level Probing Radar
Modulation Type/Mode: FMCW

2 Antenna Operating Configurations and Test Conditions

FCC 15.256 Antenna	Antenna Gain (dBi)
36mm Threaded Integrated Horn Antenna	24.3

Note: Worst-case antenna gain used for RF Exposure calculations in the tables below.

Antenna Type	Worst-case EIRP Antenna-Gain (dBi)	Numeric Gain	Highest 50 MHz EIRP Power (dBm)	Antenna Terminal Power (Watt)
36mm Threaded Integrated Horn Antenna	24.3	269.2	26.1	0.0015

3 MPE Calculation

The maximum distance from the antenna at which MPE is met or exceeded d, in centimeters, is calculated from the power density S, in mW/cm², transmit power P in mW, and the transmit antenna numeric gain G. The limit for general population/uncontrolled exposure from 1500-100000 MHz is 1mW/cm².

$$S = \text{EIRP (mW)} / (4 \cdot \pi \cdot d^2)$$

$$d = \text{SQRT} ((\text{EIRP (mw)}) / (S \cdot 4\pi))$$

where: S = Power density (mW/cm²); EIRP = Effective Isotropic Radiated Power (mW); d = distance

MPE Calculation solving for distance (d) for 36mm threaded integrated horn (24.3 dBi) antenna using a conducted power of 0.0015 W. The RF exposure calculation below is for the FCC 15.256 report and the FCC 15.209 report representing the worst-case RF Exposure distance and power density at 20cm.

Linear	Log
Gain = 269.2 Numeric	24.3 dBi
Power = 1.51 mW	1.8 dBm
Duty % = 100	0 dB
EIRP = 407.4 mW	33.7 dBm
d (cm) = 5.7cm	S (20cm) = 0.081 mW/cm ²