



Engineering Solutions & Electromagnetic Compatibility Services

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: Pulsed Radar

2 List of Antennas Operating Configurations and Test Conditions

FCC 15.256 Antenna 77 GHz	Antenna Gain (dBi)
36mm Threaded Encapsulated Horn Antenna	24.3

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

Antenna Type	Worst-case EIRP Antenna-Gain (dBi)	Numeric Gain	Highest 50 MHz EIRP Power (dBm)	Antenna Terminal Power (Watt)
36mm Threaded Encapsulated Horn Antenna	24.3	269.2	28.1	0.0024

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.

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

$$d = \text{SQRT} ((\text{EIRP (mw)} / S * 4\text{PI}))$$

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



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MPE Calculation for 36 mm Threaded Encapsulated Horn Antenna:

MPE Calculation solving for distance (d) for 36mm (24.3 dBi) antenna using worst-case power of 0.0024 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
<u>Gain = 269.2 Numeric</u>	24.3 dBi
<u>Power = 0.0024 mW</u>	3.8 dBm
Duty % = 100	0 dB
<u>EIRP = 646.1 mW</u>	28.1 dBm
<u>d (cm) = 7.2 cm</u>	<u>S (20cm) = 0.129 mW/cm²</u>