



## 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 Antennas 78 GHz	Antenna Gain (dBi)
36mm Threaded Encapsulated 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 Encapsulated Horn Antenna	24.3	269.2	19.3	0.00032

#### 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/cm<sup>2</sup>, 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/cm<sup>2</sup>.

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

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

where: S = Power density (mW/cm<sup>2</sup>); EIRP = Effective Isotropic Radiated Power (mW); d = distance



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**MPE Calculation for 36mm Threaded Encapsulated Horn Antenna:**

MPE Calculation solving for distance (d) for 36mm threaded encapsulated horn (24.3 dBi) antenna using worst-case power of 0.0029 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 = 0.00032 W</u>	-5.0 dBm
Duty % = 100	0 dB
<u>EIRP = 85.1 mW</u>	19.3 dBm
<u>d (cm) = 2.6 cm</u>	<u>S (20cm) = 0.017 mW/cm<sup>2</sup></u>