

Exposure limit according to §15.247(i)

The smoke detector is classified as a mobile device.

The FCC limit for power density for general population/uncontrolled exposure is $f/1500$ mW/cm² for 300 – 1500 MHz frequency range:

$$P = 912.75/1500 = 0.61 \text{ mW/cm}^2$$

The power density **P (mW/cm²) = $P_T / 4\pi r^2$**

P_T is the transmitted power, which is equal to the peak transmitter output power 11.37 dBm plus maximum antenna gain (-2) dBi, the maximum equivalent isotropically radiated power EIRP is

$$P_T = 11.37 \text{ dBm} + (-2) \text{ dBi} = 9.37 \text{ dBm} = 8.7 \text{ mW}.$$

The power density at 20 cm (minimum safe distance, required for mobile devices), calculated as follows:

$$\text{Compliance with FCC limit: } 8.7 \text{ mW} / 4\pi (20 \text{ cm})^2 = 0.002 \text{ mW/cm}^2 \ll 0.61 \text{ mW/cm}^2$$

General public cannot be exposed to dangerous RF level.