

Maximum Permissible Exposure to RF (MPE), CFR 1.1310 (e)

The maximum exposure level to the public from the RF power of the EUT shall not exceed a power density, **S** as per the respective limits in Table 1 below, at a distance, d, of 20 cm (Mobile condition) from the EUT.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

Therefore, for:

MPE at 433.92 MHz:

Limit: 0.29 mW/cm²

$$\text{EIRP (dBm)} = \text{E(dBuV/m)} + 20 \log(\mathbf{D}) - 104.8 = 85.3 \text{ dBuV/m} + (20 \log(3)) - 104.8 = -9.95 \text{ dBm}$$

D= 3 m test distance.

$$\text{Peak Power (Watts)} = 0.0001 \text{ W}$$

$$d = \text{RF Exposure Distance} = 20 \text{ cm} = 0.2 \text{ m}$$

$$\begin{aligned} \mathbf{S} &= (\mathbf{PG} / 4\pi d^2) = \text{EIRP} / 4A = 0.0001 / 4 * \pi * 0.2 * 0.2 \\ &= 0.0001 / 0.5027 = 0.0002 \text{ W/m}^2 \\ &= (0.0002 \text{ W/m}^2) (1\text{m}^2/\text{W}) (0.1 \text{ mW/cm}^2) \\ &= 0.00002 \text{ mW/cm}^2 \end{aligned}$$

which is << less than $S = 0.29 \text{ mW/cm}^2$