

RF exposure calculation

Regulation

FCC Part 15.247(i) Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines. See § 1.1307(b)(1) of this Chapter.

MPE calculation to FCC ID: PTSPURDTR100U

These equations are generally accurate in the far field of an antenna but will over predict power density in the near field, where they could be used for making a “worst case” prediction.

$$S = PG/4\pi R^2$$

where S = power density (in appropriate units, e.g. mW/cm^2)

P = power input to the antenna (in appropriate units e.g. mW)

G = power gain of the antenna in the direction of interest relative to the isotropic radiator

R = distance to the center of radiation of the antenna (appropriate units e.g. cm)

Or

$$S = \text{EIRP}/(4\pi R^2)$$

where EIRP = equivalent isotropically radiated power

Calculation:

(Calculated for max. EIRP)

EIRP: 18.8 dBm = 75.86 mW

calculated at distance of 20 cm:

$$\text{power density} = 75.86 / (4\pi \cdot 20^2) = \mathbf{0.0151 \text{ mW/cm}^2}$$

Limit:

0.451 mW/ cm² is the reference level for general public exposure according to the OET Bulletin 65, Edition 97-01 Table 1.