

MPE R.F Exposure Calculation

Typical use of the E.U.T. is defining a location zone. The typical placement of the E.U.T. is wall mounted. The typical distance between the E.U.T. and the user is 0.2 m.

Calculation of Maximum Permissible Exposure (MPE) Based on Section 1.1307(b)(1) Requirements

(a) FCC limits at 2445 MHz is: $1 \frac{mW}{cm^2}$

Using table 1 of Section 1.1310 limit for general population/uncontrolled exposures, the above level is an average over 30 minutes.

(b) The power density produced by the E.U.T. is

$$S = \frac{P_t G_t}{4\pi R^2}$$

P_t- Transmitted Power 23.0 dBm Peak = 199.5 mw

G_T- Antenna Gain, 2 dBi = 1.58 (Numeric)

R- Distance from Transmitter using 0.2 m

(c) Transmitter peak power using source based time averaging of 20 % maximum, 20 msec “ON” time, “OFF” + “ON” time 100 msec:

$$P_t = \frac{199.5 \times 20}{100} = 39.9 mW$$

(d) The peak power density (time averaging) is :

$$S_p = \frac{39.9 \times 1.58}{4\pi(20)^2} = 12.5 \times 10^{-3} \frac{mW}{cm^2}$$

(e) In the worst case, 4 transceivers transmitting at the same time, the peak power density (time averaging) is :

$$S_p = 12.5 \times 10^{-3} \times 4 = 50 \times 10^{-3} \frac{mW}{cm^2}$$