1. R.F Exposure/Safety Calculation

Typical uses of the E.U.T. are tracking of children in amusement parks, security personnel in enterprises, hospital patients, and many more . The E.U.T. is typically worn on a wristband. The typical distance between the E.U.T. and the user in the worst case application, is <2.5 cm.

Calculation of Maximum Permissible Exposure (MPE)

Based on Section 1.1307(b)(1) Requirements

(a) FCC limits at 2437 MHz is: $1\dfrac{mW}{cm^2}$

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 355mw (Peak)

G$_T$- Antenna Gain, -1 dBi = 0.9

R- Distance from Transmitter using 1cm worst case

(c) The peak power density is :

$$S_p = \frac{355}{4\pi(1)^2} = 2.25\frac{mW}{cm^2}$$

(d) The duty cycle of transmission in actual worst case is 500 microsecond "on" and
1 second "Off".

The average power , source based time average , (100 msec. time window)is:

$$P_{AV} = \frac{355 \times 0.5}{100} = 1.77 mW$$

(e) The averaged power density of the E.U.T. is:

$$S_{AV} = \frac{1.77}{4\pi(1)^2} = 0.141\frac{mW}{cm^2}$$

(f) This is 1 order of magnitude below the FCC limit.