# RF Exposure/Safety (FCC)

Typical use of the E.U.T. is as a sensor hub.

The typical placement of the E.U.T. is on a surface. The typical distance between the E.U.T. and the user is at least 20 cm.

Calculation of Maximum Permissible Exposure (MPE)

Based on FCC Section 1.1310 Requirements

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

(b) FCC limit at 2402 MHz is:

$$1\frac{mW}{cm^2}$$

(c) FCC limit at 847.8 MHz is: f/1500 =0.565 $\frac{mW}{cm^2}$

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

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

$P_t$- Maximum Output Power = 8dbm, 6.3mW

$G_T$- Antenna Gain, 1.7 dBi = 1.48 numeric

R- Distance from Transmitter using 20cm worst case

(e) The peak power density of the EUT is:

$$S = \frac{(6.3\ x\ 1.48)}{4\pi(20)^2} = 0.002\ \frac{mW}{cm^2}$$

(f) This is below the FCC limit.

(g) The MPE for FCC ID: QIPBGS2 is

| COMM System | Mode | Reference Frequency | EIRP (dBm) | Distance (cm) | Power Density Seq (mW/cm²) |
|---|---|---|---|---|---|
| GSM 850 | GSM/GPRS | 847.8 | 2259.436 | 20 | 0.4495 |

(h) This is below the FCC limit.

**Co-location calculations**

(i) $\sum$MPE = 0.45 $\frac{mW}{cm^2}$+ 0.002 $\frac{mW}{cm^2}$ = 0.457 $\frac{mW}{cm^2}$ which is less than the limit @847MHz of 0.565 $\frac{mW}{cm^2}$

Additionally,

$$\sum \frac{S_{eqn}}{S_{\lim n}} = \frac{S_{eq1}}{S_{\lim 1}} + \frac{S_{eq2}}{S_{\lim 2}} \leq 1$$

$$\sum \frac{S_{eqn}}{S_{\lim n}} = \frac{0.45}{0.565} + \frac{0.002}{1} = 0.796 + 0.002 = 0.798 \leq 1$$

(j) This is below the FCC limit.