R.F Exposure/Safety Calculation for MRU – CELL/ESMR

The E.U.T. is rack or wall mounted. The typical distance between the E.U.T. and the general population is >100cm.

Calculation of Maximum Permissible Exposure (MPE)

Based on Section 1.1310 Requirements

(a) FCC limit at 870.2 MHz is: $f/1500 = 0.58 \frac{mW}{cm^2}$

(b) FCC limit at 863.2 MHz is: $f/1500 = 0.58 \frac{mW}{cm^2}$

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

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

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

P_t- Transmitted Peak Power (worst case)

G_T- Antenna Gain, 12.5dBi= 17.8 numeric

R- Distance from Transmitter 100 cm

(d) Peak power density at worst case continuous transmission:

Band	Modulation	Pt (dBm)	Pt (mW)	Antenna type	G_T (dBi)	G_T numeric	R (cm)	S_{AV} (mW/cm^2)	Spec (mW/cm^2)
CELL	LTE 64QAM	31.6	1445	External	12.5	17.8	100	0.204681	0.58
	GSM	32.3	1698	External	12.5	17.8	100	0.240518	0.58
	W-CDMA	31.4	1380	External	12.5	17.8	100	0.195474	0.58
ESMR	LTE 64QAM	30.4	1097	External	12.5	17.8	100	0.155388	0.58
	GSM	31.4	1380	External	12.5	17.8	100	0.195474	0.58
	W-CDMA	30.9	1230	External	12.5	17.8	100	0.174227	0.58

(e) This is below the FCC limit.