R.F Exposure/Safety Calculation for RAU-5X

The E.U.T. is rack or wall mounted. The typical distance between the E.U.T. and the general population is >50cm.

Calculation of Maximum Permissible Exposure (MPE)
Based on Section 1.1310 Requirements

(a) (LTE) FCC limit at 747 MHz is: $f/1500 = 0.498 \frac{mW}{cm^2}$

(b) (CELL) FCC limit at 874.2 MHz is: $f/1500 = 0.583 \frac{mW}{cm^2}$

(c) (ESMR) FCC limit at 867.8 MHz is: $f/1500 = 0.579 \frac{mW}{cm^2}$

(d) (PCS) FCC limit at 1993.8 MHz is: $1 \frac{mW}{cm^2}$

(e) (AWS) FCC limit at 2178.8 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 Peak Power (worst case)

G_T- Antenna Gain, 12.5dBi= 17.8 numeric

R- Distance from Transmitter 50 cm

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

Band	Modulation	Pt (mW)	Antenna type	G_T (dBi)	G_T numeric	R (cm)	S_{AV} (mW/cm^2)	Spec (mW/cm^2)
CELL	LTE 64QAM	43.7	External	12.5	17.8	50	0.02476	0.583
	GSM	42.7	External	12.5	17.8	50	0.024193	0.583
	W-CDMA	39.8	External	12.5	17.8	50	0.02255	0.583
ESM R	LTE 64QAM	45.7	External	12.5	17.8	50	0.025893	0.579
	GSM	38.9	External	12.5	17.8	50	0.02204	0.579
	W-CDMA	34.7	External	12.5	17.8	50	0.019661	0.579
PCS	LTE 64QAM	159.0	External	12.5	17.8	50	0.090088	1
	GSM	126.0	External	12.5	17.8	50	0.071391	1
	W-CDMA	151.0	External	12.5	17.8	50	0.085555	1
LTE	LTE 64QAM	46.8	External	12.5	17.8	50	0.026516	0.498
	LTE 16QAM	46.8	External	12.5	17.8	50	0.026516	0.498
	LTE QPSK	47.9	External	12.5	17.8	50	0.02714	0.498
AWS	LTE 64QAM	112.0	External	12.5	17.8	50	0.063458	1
	GSM	126.0	External	12.5	17.8	50	0.071391	1
	W-CDMA	141.0	External	12.5	17.8	50	0.079889	1

(d) This is below the FCC limit.