

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 891.5 MHz is: $f / 1500 = 0.596 \frac{mW}{cm^2}$

(c) (ESMR) FCC limit at 864.5 MHz is: $f / 1500 = 0.576 \frac{mW}{cm^2}$

(d) (PCS) FCC limit at 1932.5 MHz is: $1 \frac{mW}{cm^2}$

(e) (AWS) FCC limit at 2111.25 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	46.8	External	12.5	17.8	50	0.026516	0.596
	GSM	44.7	External	12.5	17.8	50	0.025327	0.596
	W-CDMA	47.9	External	12.5	17.8	50	0.02714	0.596
ESMR	LTE 64QAM	47.9	External	12.5	17.8	50	0.02714	0.576
	GSM	45.7	External	12.5	17.8	50	0.025893	0.576
	W-CDMA	46.8	External	12.5	17.8	50	0.026516	0.576
PCS	LTE 64QAM	151	External	12.5	17.8	50	0.085555	1
	GSM	118	External	12.5	17.8	50	0.066858	1
	W-CDMA	151	External	12.5	17.8	50	0.085555	1
LTE	LTE 64QAM	42.7	External	12.5	17.8	50	0.024193	0.498
	LTE 16QAM	43.7	External	12.5	17.8	50	0.02476	0.498
	LTE QPSK	45.7	External	12.5	17.8	50	0.025893	0.498
AWS	LTE 64QAM	138	External	12.5	17.8	50	0.07819	1
	GSM	159	External	12.5	17.8	50	0.090088	1
	W-CDMA	141	External	12.5	17.8	50	0.079889	1

(d) This is below the FCC limit.