

# R.F Exposure/Safety Calculation for CPE8000-PRO-1D-3.x

The E.U.T. is pole mounted.

Calculation of Maximum Permissible Exposure (MPE)  
Based on FCC Section 1.1309 Requirements

1) FCC limit at 3657 MHz:  $1 \frac{mW}{cm^2}$

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

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

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

P<sub>t</sub>- Transmitted Peak Power (worst case)

G<sub>T</sub>- Antenna Gain, dBi

R- Distance from Transmitter

3) The calculated minimum distance between the EUT antenna and the general public is:

Operation Frequency (MHz)	Modulation	Pt (dBm)	Pt (mW)	Antenna Type	G <sub>T</sub> (dBi)	G <sub>T</sub> numeric	R (cm)	S (mW/cm <sup>2</sup> )
3652.5	QPSK	20.0	100	External	15.0	31.6	50	0.100586
	16QAM	20.4	110	External	15.0	31.6	50	0.110645
	64QAM	20.4	110	External	15.0	31.6	50	0.110645
3675.0	QPSK	20.2	105	External	15.0	31.6	50	0.105615
	16QAM	20.2	105	External	15.0	31.6	50	0.105615
	64QAM	20.1	102	External	15.0	31.6	50	0.102598
3697.5	QPSK	20.4	110	External	15.0	31.6	50	0.110645
	16QAM	20.2	105	External	15.0	31.6	50	0.105615
	64QAM	20.1	102	External	15.0	31.6	50	0.102598

**5MHz Bandwidth**

Operation Frequency (MHz)	Modulation	Pt (dBm)	Pt (mW)	Antenna Type	G <sub>T</sub> (dBi)	G <sub>T</sub> numeric	R (cm)	S (mW/cm <sup>2</sup> )
3655.0	QPSK	23.3	214	External	15.0	31.6	50	0.215254
	16QAM	23.3	214	External	15.0	31.6	50	0.215254
	64QAM	22.5	178	External	15.0	31.6	50	0.179043
3675.0	QPSK	23.6	229	External	15.0	31.6	50	0.230342
	16QAM	23.5	224	External	15.0	31.6	50	0.225312
	64QAM	23.6	229	External	15.0	31.6	50	0.230342
3695.0	QPSK	23.4	219	External	15.0	31.6	50	0.220283
	16QAM	23.6	229	External	15.0	31.6	50	0.230342
	64QAM	23.4	219	External	15.0	31.6	50	0.220283

**10MHz Bandwidth**

Operation Frequency (MHz)	Modulation	Pt (dBm)	Pt (mW)	Antenna Type	G <sub>T</sub> (dBi)	G <sub>T</sub> numeric	R (cm)	S (mW/cm <sup>2</sup> )
3657.5	QPSK	23.9	246	External	15.0	31.6	50	0.247441
	16QAM	23.2	209	External	15.0	31.6	50	0.210225
	64QAM	23.5	224	External	15.0	31.6	50	0.225312
3675.0	QPSK	23.4	219	External	15.0	31.6	50	0.220283
	16QAM	23.2	209	External	15.0	31.6	50	0.210225
	64QAM	23.4	219	External	15.0	31.6	50	0.220283
3692.5	QPSK	23.4	219	External	15.0	31.6	50	0.220283
	16QAM	23.5	224	External	15.0	31.6	50	0.225312
	64QAM	23.7	234	External	15.0	31.6	50	0.235371

**15MHz Bandwidth**

Operation Frequency (MHz)	Modulation	Pt (dBm)	Pt (mW)	Antenna Type	G <sub>T</sub> (dBi)	G <sub>T</sub> numeric	R (cm)	S (mW/cm <sup>2</sup> )
3660.0	QPSK	23.4	219	External	15.0	31.6	50	0.220283
	16QAM	23.3	214	External	15.0	31.6	50	0.215254
	64QAM	23.3	214	External	15.0	31.6	50	0.215254
3675.0	QPSK	23.7	234	External	15.0	31.6	50	0.235371
	16QAM	23.3	214	External	15.0	31.6	50	0.215254
	64QAM	23.5	224	External	15.0	31.6	50	0.225312
3690.0	QPSK	23.5	224	External	15.0	31.6	50	0.225312
	16QAM	23.7	234	External	15.0	31.6	50	0.235371
	64QAM	23.3	214	External	15.0	31.6	50	0.215254

**20MHz Bandwidth**

4) The E.U.T. meets the limits of FCC Section 1.1309.