MPE Calculation page

	Model:	TT23	Test Number:	241125		
MPE Calculator	RF Exposure uses EIRP for calculation. EIRP is based on TX power added to the antenna gain in dBi.					
	dBi = dB gain compared to an isotropic radiator.					
	S = power density in mW/cm^2					
		Transmitter Output power (dBm)	53.94			
		Transmitter Output power (mW)	247,742.21			
Output Power for % duty Cycle operation (Watts)	1		247.7422		Antenna Gain (dBi)	2.2
	Output Power for 1% duty Cycle operation (Watts)		2.48		Antenna Gain (Numeric)	1.66
Tx Frequency (MHz)	1090	Calcualtion power (Watts)	2.48	dBd + 2.17 = dBi	dBi to dBd	2.2
					Antenna Gain (dBd)	0.03
Cable Loss (dB)	0.0	Adjusted Power (dBm)	33.94		Antenna minus cable (dBi)	2.20
	Calculated ERP (mw)	2494.595			EIRP = Po(dBM) + Gain (dB)	
	Calculated EIRP (mw)	4111.497			Radiated (EIRP) dBm	36.140
					ERP = EIRP - 2.17 dB	
					Radiated (ERP) dBm	33.970

Power density (S) mW/cm^2 = EIRP / (4 p r^2)

r (cm) EIRP (mW)

	Occupational Limit	FCC radio frequency radiation exposure limits per 1.1310		
3.633333333	mW/cm^2	Frequency (MHz)	Occupational Limit (mW/cm^2)	Public Limit (mW/cm^2)
36	W/m^2	30-300	1	0.2
	General Public Limit	300-1,500	f/300	f/1500
0.726666667	mW/cm^2	1,500-10,000	5	1
7	W/m^2			

	Occupational Limit			
$0.6455f^{0.5}$	W/m^2	IC radio frequency radiation exposure limits per RSS-102		
26.5	W/m^2	Frequency (MHz)	Occupational Limit (W/m^2)	Public Limit (W/m^2)
	General Public Limit	100-6,000	$0.6455f^{0.5}$	
$0.02619f^{0.6834}$	W/m^2	6,000-15,000	50	
3.1	W/m^2	48-300		1.291
		300-6,000		$0.02619f^{0.6834}$
		6,000-15,000	50	10

f = Transmit Frequecny (MHz)			f (MHz) =	1090 MHz
P_T = Power Input to Antenna (mW)			P_T (mW) =	247,742.2058 mW
Duty cycle (percentage of operation)			% =	1 %
P_A = Adjusted Power due to Duty cycle or Cable Loss (mW)			P_A (mW) =	2,477.42 mW
G_N = Numeric Gain of the Antenna			GN (numeric) =	2.17 numeric
S_{20} = Power Density of device at 20cm (mW/m^2)		$S_{20}=(P_AG_N)/(4\pi R_{20})^2$	S_{20} (mW/m^2) =	1.07 mW/m^2
S_{20} = Power Density of device at 20cm (W/m^2)		$S_{20}=(P_AG_N)/(4\pi R_{20})^2$	S_{20} (W/m^2) =	10.70 W/m^2
S_L = Power Density Limit (W/m^2)			S_L (W/m^2)=	7.267 W/m^2
R_C = Minimum distance to the Radiating Element for Compliance (cm)		$R_C=\sqrt{(P_AG_N/4\pi S_L)}$	R_C (cm) =	24.3 cm
S_C = Power Density of the device at the Compliance Distance R_C (W/m^2)		$S_C=(P_AG_N)/(4\pi R_C)^2$	S_C (W/m^2) =	7.27 W/m^2
R_{20} = 20cm			R20=	20 cm
		For Complaince with General Population Limit		24.3 cm
		Or in Meters for Complaince with General Population Limits		0.24 Meters