Intermec
Technologies Corporation
EMC Test Laboratory
Cedar Rapids, IA

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MAXIMUM PERMISSIVE EXPOSURE, MPE CALCULATOR
2450 RFID with 3.5 dBi antenna, Intermec PN 805-576-001

MPE Calculator

					dBi	3.50
				dBd + 2.17 = dBi	dBi to dBd	2.17
TX Frequency (MHz)	2450	Watts	1	Antenna Gain dBd		1.33
Cable Losses dB	0	dBm	30.000000	radiated (ERP) dBm		31.330
				radiated (EIRP) dBm		33.500
Calculated ERP (mW)		1358.313447		radiated (EIRP) watts		2.239

Ocupational Limit
5.0 mW/cm ^{2}

General Public Limit
1.0 mW/cm ^{2}

$$\frac{ERP}{4 \Uparrow d^2} = mw/cm^2$$

d = cm ERP=mW

TX Frequency (MHz) wavelength	
meters	cm
0.12244898	12.245

FCC radiofrequency radiation exposure limits 1.1310			
Freq. MHz	occ.limit		public limit
300-1,500	f/1500		f/300
1,500-10,000	5		1

MPE uses ERP for calculations. ERP is based on TX power added to the antenna gain in dBd.
dBd = dB gain compared to an dipole antenna.

ERP (watts)	Distance (cm)	Distance (Meters)	Distance (inches)		mW/cm ^{2}
1358.313	100.0	1.000	39.37		0.01081
1358.313	75.0	0.750	29.53		0.01922
1358.313	50.0	0.500	19.69		0.04324
1358.313	40.0	0.400	15.75		0.06756
1358.313	30.0	0.300	11.81		0.12010
1358.313	20.0	0.200	7.87		0.27023
1358.313	19.0	0.190	7.48		0.29942
1358.313	18.0	0.180	7.09		0.33361
1358.313	17.0	0.170	6.69		0.37402
1358.313	16.0	0.160	6.30		0.42223
1358.313	15.0	0.150	5.91		0.48041
1358.313	14.0	0.140	5.51		0.55149
1358.313	13.0	0.130	5.12		0.63959
1358.313	12.5	0.125	4.92		0.69178
1358.313	12.0	0.120	4.72		0.75063
1358.313	11.5	0.115	4.53		0.81732
1358.313	11.0	0.110	4.33		0.89332
1358.313	10.5	0.105	4.13		0.98042
1358.313	10.0	0.100	3.94		1.08091