

MEASUREMENT/TECHNICAL REPORT



Intermec Technologies Corporation

IF6 RFID Transmitter

FCC ID: EHARFID915PCC-6 (IC: 1223A-RFIDPCC6)

REPORT NO: 041116-1

DOC. NO.: 577-501-207

REPORT NO: 041116-1

DATE: November 16, 2004

Appendix D

RF EXPOSURE, MPE CALCULATION

Page 2-4 Collocated RF Exposure Calculations

**Intermec
Technologies
Corporation**

Systems and Solutions
550 Second St SE
Cedar Rapids, IA 52401
Dave Fry MS GR05
EMC Engineer
tel 319 846-2415
fax 319 846-2475
Dave.Fry@Intermec.com

Date: January 24, 2005

Ref. FCC ID: EHARFID915PCC-6
IC: 1223A-RFIDPCC6

To Whom It May Concern:

Intermec Technologies Corporation hereby declares that our Model IF6 for Radio Frequency Identification (RFID) FHSS transceiver operating at 902-928 MHz is described as the equipment under test (EUT). This EUT is categorically excluded from routine environmental evaluation for RF exposure by its classification as a Part 15.247 mobile radio. Their exclusion is listed in 47 CFR 1.1307, therefore the EUT is categorically excluded from routine environmental evaluation per 47 CFR 2.1091(c).

The attached tables show MPE evaluation of the IF6. Each radio band has specific a maximum permissible exposure (MPE) as stated in 47 CFR 1.1310. Refer to the limits shown in the calculation tables for details.

The general calculation for exposure at a distance of 20-cm (8-inch) distance is shown in the equation below.

$$S = (PG)/4 \pi R^2$$

Where: S = power density (mW/cm²)

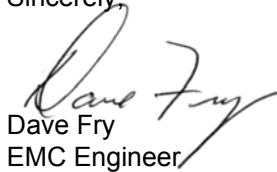
P = power input to the antenna (mW)

G = linear power gain relative to an isotropic radiator

R = distance to the center of the radiation of the antenna (20 cm = limit for MPE estimates)

Solving for S, the maximum power densities 20 cm from the transmitting antennas are contained within the following pages.

Sincerely,

A handwritten signature in black ink, appearing to read "Dave Fry", is positioned above the printed name and title.

Dave Fry
EMC Engineer

MAXIMUM PERMISSIVE EXPOSURE, MPE CALCULATOR

915 RFID with 4.4 dBi antenna, Kathrien

MPE Calculator				dBi	4.40
			dBd + 2.17 = dBi	dBi to dBd	2.17
TX Frequency (MHz)	915	Watts	1	Antenna Gain dBd	2.23
Cable Losses dB	0	dBm	30.000000		
Calculated ERP (mW)		1671.090614		radiated (ERP) dBm	32.230
Calculated EIRP (mW)		2754.228703		radiated (EIRP) dBm	34.400

Occupational Limit
3.05 mW/cm²

General Public Limit
0.61 mW/cm²

$$\frac{\text{EIRP}}{4 \pi d^2} = \text{mW/cm}^2$$

d = cm EIRP=mW

TX Frequency (MHz)	
wavelength	
meters	cm
0.327868852	32.787

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

MPE uses EIRP for calculations. EIRP is based on TX power added to the antenna gain in dBi.
dBi = dB gain compared to an isotropic radiator

*

EIRP (watts)	Distance (cm)	Distance (Meters)	Distance (inches)	mW/cm ²
2754.229	100.00	1.0000	39.37	0.02192
2754.229	75.00	0.7500	29.53	0.03896
2754.229	50.00	0.5000	19.69	0.08767
2754.229	40.00	0.4000	15.75	0.13698
2754.229	35.00	0.3500	13.78	0.17892
2754.229	30.00	0.3000	11.81	0.24353
2754.229	25.00	0.2500	9.84	0.35068
2754.229	22.50	0.2250	8.86	0.43294
2754.229	20.00	0.2000	7.87	0.54794
2754.229	17.50	0.1750	6.89	0.71567
2754.229	15.00	0.1500	5.91	0.97411
2754.229	14.75	0.1475	5.81	1.00741
2754.229	14.50	0.1450	5.71	1.04245
2754.229	14.25	0.1425	5.61	1.07935
2754.229	14.00	0.1400	5.51	1.11824
2754.229	13.75	0.1375	5.41	1.15927
2754.229	13.50	0.1350	5.31	1.20260
2754.229	13.25	0.1325	5.22	1.24841
2754.229	13.00	0.1300	5.12	1.29689
2754.229	12.75	0.1275	5.02	1.34825
2754.229	12.50	0.1250	4.92	1.40272
2754.229	12.25	0.1225	4.82	1.46056
2754.229	12.00	0.1200	4.72	1.52205
2754.229	11.75	0.1175	4.63	1.58750
2754.229	11.50	0.1150	4.53	1.65727
2754.229	11.25	0.1125	4.43	1.73175
2754.229	11.00	0.1100	4.33	1.81136