

MEASUREMENT/TECHNICAL REPORT



**Intermec Technologies Corporation
RF Identification (RFID) 2450 PC Card –5
2.4 GHz Spread Spectrum Transmitter**

REPORT NO: 010312-1

DATE: March 12, 2001

APPENDIX E

THE FOLLOWING PAGES INCLUDE;

AC Conducted Emissions on the following:

2450PCC-5 installed within Dell Laptop
120 VAC operation only (FCC Limit)

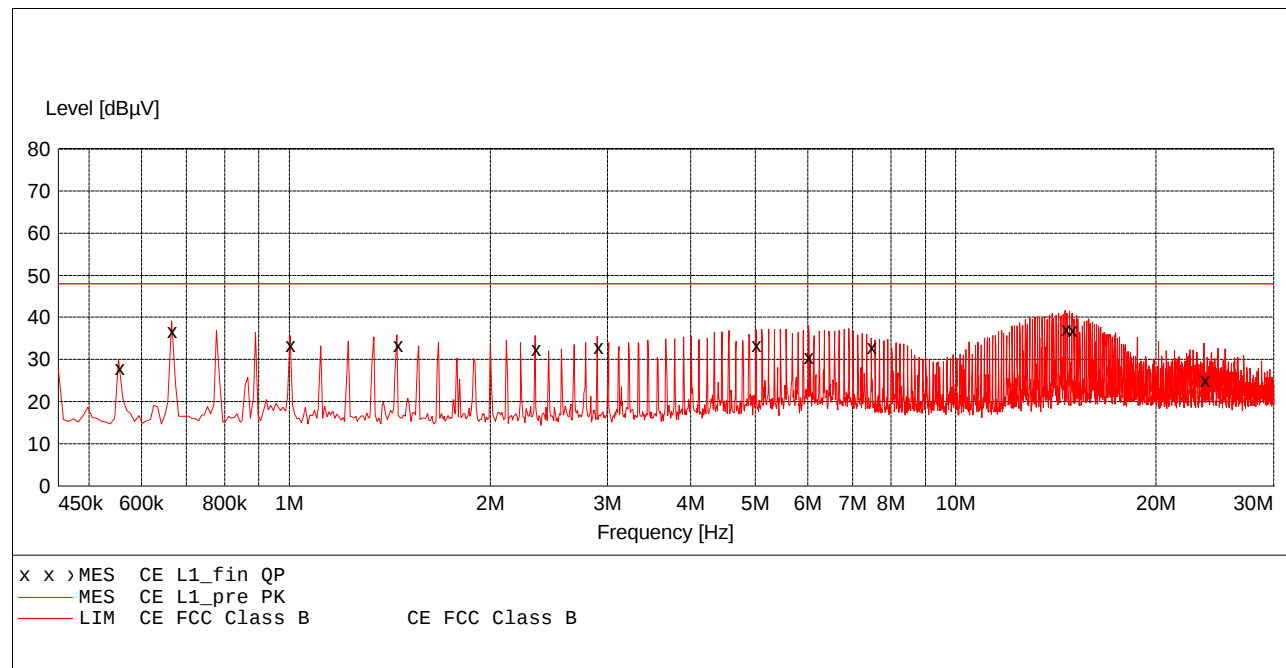
2450PCC-5 installed within Intermec 6110
120 and 230 VAC operation (CISPR 22 Limit)

Intermec Technologies Corporation
Emission Test

EUT: 2450 PC Card-5 RFID / Dell Lap-Top
 Manufacturer / Eng.: Intermec / J Jorgenson
 Operating Condition: FCC Test Program
 Test Site: EMC Lab, Cedar Rapids IA
 Operator: df
 Test Specification: FCC Class B
 Comment: MAX test, L1 Side, 120 VAC
 Start of Test: 3/26/01 / 3:08:59PM

SCAN TABLE: "CE FCC R&S L1"

Short Description:	FCC Voltage	L1 Side				
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
450.0 kHz	30.0 MHz	8.0 kHz	MaxPeak	20.0 ms	10 kHz	C LISN R&S L1



MEASUREMENT RESULT: "CE L1_fin QP"

3/26/01 3:19PM

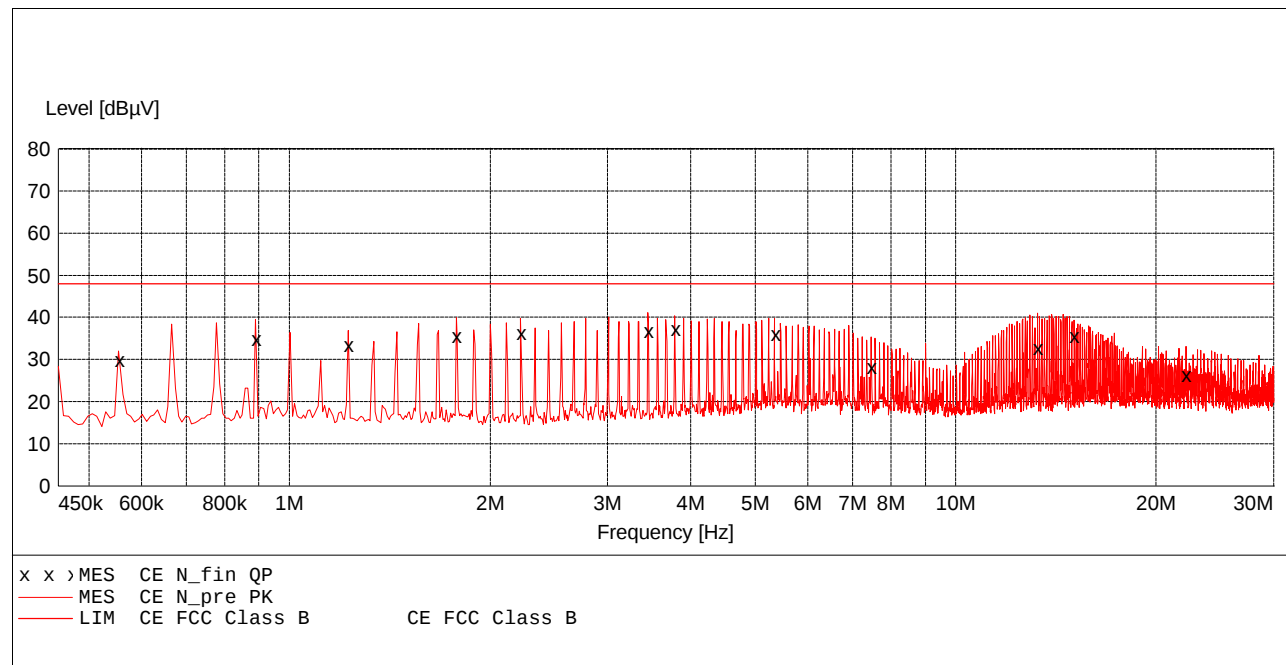
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.554000	28.00	10.10	48.00	20.00	L1	GND
0.666000	36.90	10.10	48.00	11.10	L1	GND
1.002000	33.40	10.20	48.00	14.60	L1	GND
1.450000	33.60	10.20	48.00	14.40	L1	GND
2.338000	32.50	10.20	48.00	15.50	L1	GND
2.898000	33.00	10.30	48.00	15.00	L1	GND
5.010000	33.40	10.60	48.00	14.60	L1	GND
6.010000	30.60	10.70	48.00	17.40	L1	GND
7.466000	33.20	10.80	48.00	14.80	L1	GND
14.594000	37.30	11.30	48.00	10.70	L1	GND
14.930000	37.00	11.30	48.00	11.00	L1	GND
23.602000	25.30	11.90	48.00	22.70	L1	GND

Intermec Technologies Corporation
Emission Test

EUT: 2450 PC Card-5 RFID / Dell Lap-Top
 Manufacturer / Eng.: Intermec / J Jorgenson
 Operating Condition: FCC test program
 Test Site: EMC Lab, Cedar Rapids IA
 Operator: df
 Test Specification: FCC Class B
 Comment: MAX test, N Side, 120 VAC
 Start of Test: 3/26/01 / 3:25:08PM

SCAN TABLE: "CE FCC R&S N"

Short Description:	FCC Voltage N Side					
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
450.0 kHz	30.0 MHz	8.0 kHz	MaxPeak	20.0 ms	10 kHz	C LISN R&S N



MEASUREMENT RESULT: "CE N_fin QP"

3/26/01 3:34PM

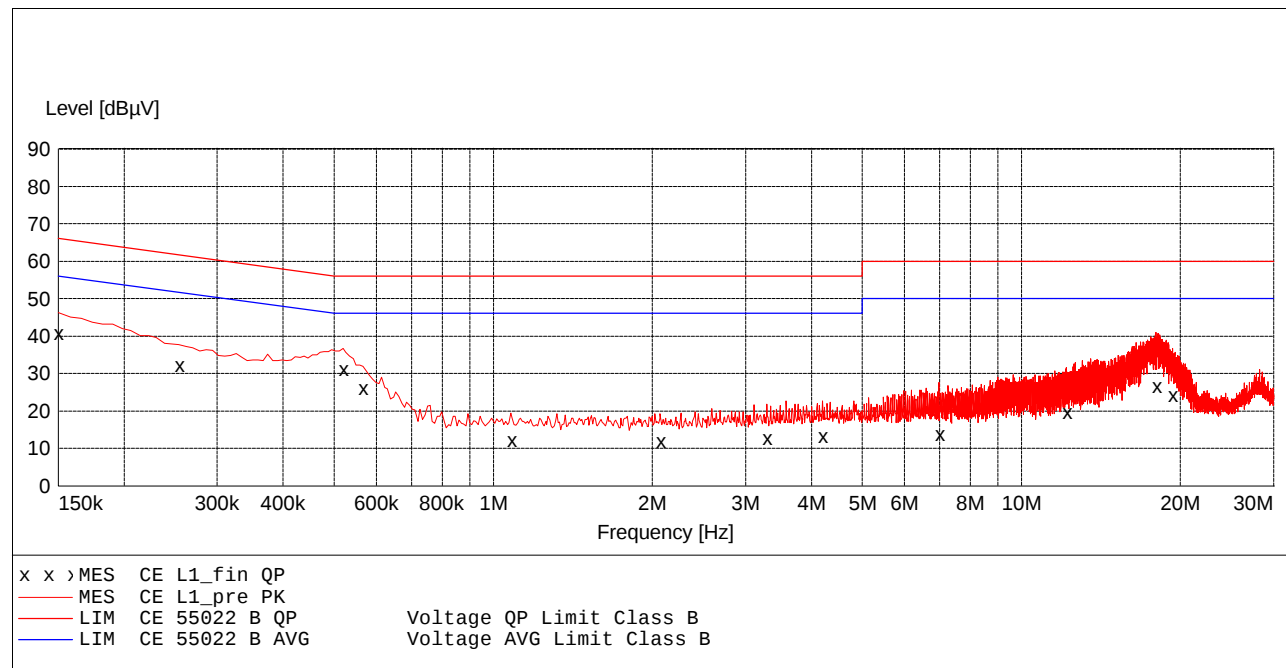
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.554000	29.90	10.10	48.00	18.10	N	GND
0.890000	35.00	10.20	48.00	13.00	N	GND
1.226000	33.40	10.20	48.00	14.60	N	GND
1.778000	35.80	10.20	48.00	12.20	N	GND
2.226000	36.30	10.10	48.00	11.70	N	GND
3.450000	36.70	10.40	48.00	11.30	N	GND
3.786000	37.40	10.60	48.00	10.60	N	GND
5.346000	36.20	10.60	48.00	11.80	N	GND
7.458000	28.30	10.80	48.00	19.70	N	GND
13.250000	32.60	11.00	48.00	15.40	N	GND
15.042000	35.80	11.20	48.00	12.20	N	GND
22.162000	26.50	11.70	48.00	21.50	N	GND

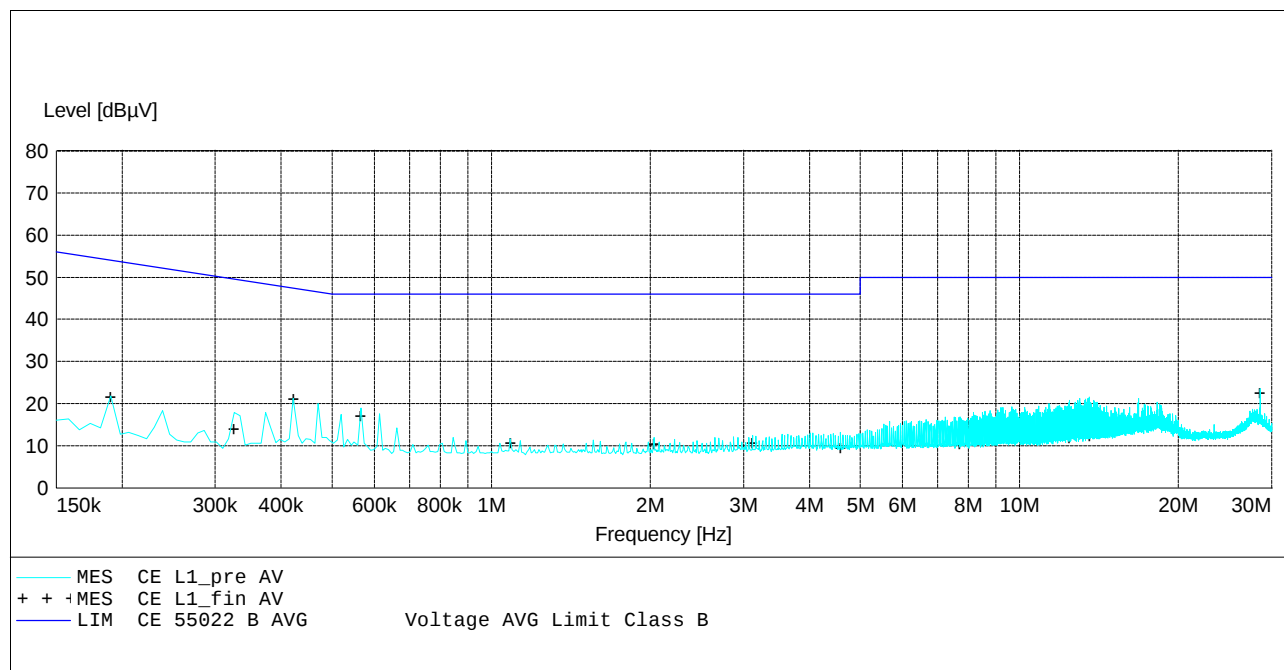
Intermec Technologies Corporation
Emission Test

EUT: 2540PCC-5 within 6110 and UMEC charger
 Manufacturer / Eng.: Intermec / J.Jorgenson
 Operating Condition: emissions test program
 Test Site: EMC Lab, Cedar Rapids IA
 Operator: df
 Test Specification: CISPR 22 Class B
 Comment: MAX test, L1 Side, 120 VAC
 Start of Test: 4/18/01 / 1:41:01PM

SCAN TABLE: "CE R&S L1"

Short Description:			EN 55022 Voltage L1 Side			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	8.0 kHz	MaxPeak Average	20.0 ms	10 kHz	C LISN R&S L1





MEASUREMENT RESULT: "CE L1_fin QP"

4/18/01 1:57PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150000	40.80	10.00	66.00	25.20	L1	GND
0.254000	32.30	10.00	61.60	29.30	L1	GND
0.518000	31.30	10.10	56.00	24.70	L1	GND
0.566000	26.40	10.10	56.00	29.60	L1	GND
1.078000	12.40	10.20	56.00	43.60	L1	GND
2.070000	12.20	10.10	56.00	43.80	L1	GND
3.294000	12.80	10.50	56.00	43.20	L1	GND
4.190000	13.30	10.60	56.00	42.70	L1	GND
6.974000	14.00	10.70	60.00	46.00	L1	GND
12.166000	19.70	11.10	60.00	40.30	L1	GND
17.966000	26.80	11.70	60.00	33.20	L1	GND
19.294000	24.20	11.60	60.00	35.80	L1	GND

MEASUREMENT RESULT: "CE L1_fin AV"

4/18/01 1:57PM

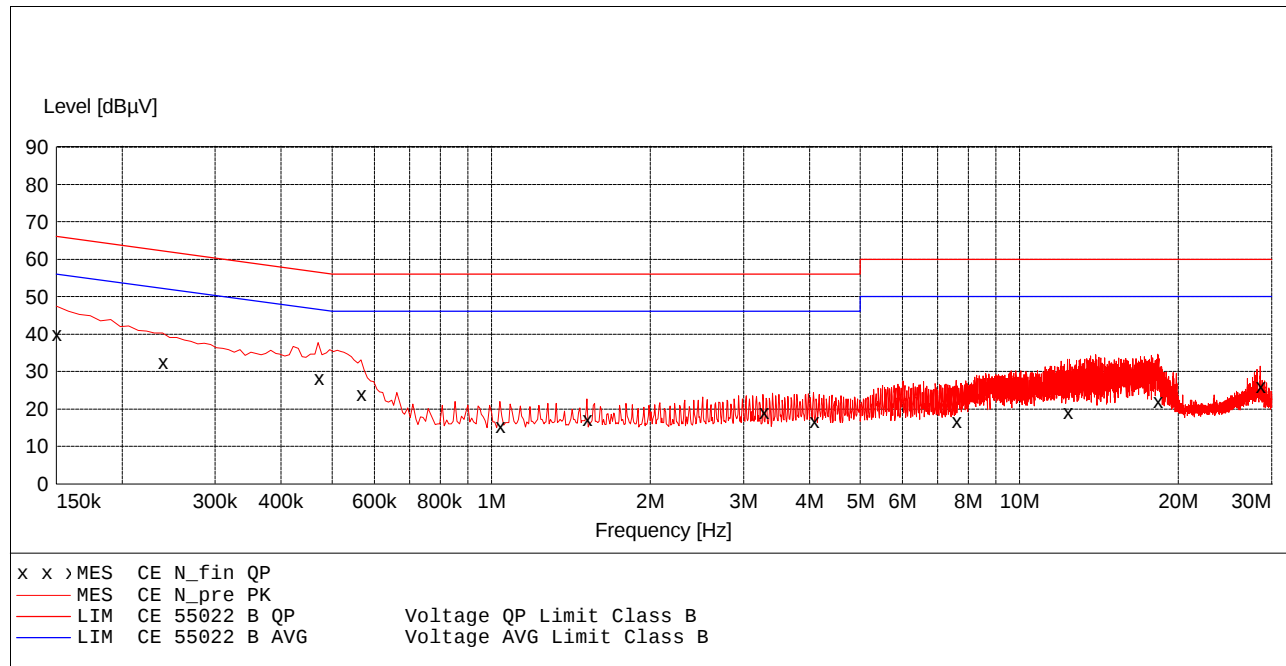
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.190000	21.60	10.10	54.00	32.50	L1	GND
0.326000	14.00	10.00	49.60	35.50	L1	GND
0.422000	21.10	10.10	47.40	26.30	L1	GND
0.566000	17.20	10.10	46.00	28.80	L1	GND
1.086000	10.80	10.20	46.00	35.20	L1	GND
2.030000	10.50	10.10	46.00	35.50	L1	GND
3.118000	10.80	10.40	46.00	35.20	L1	GND
4.582000	9.60	10.60	46.00	36.40	L1	GND
7.702000	10.40	10.80	50.00	39.60	L1	GND
12.382000	11.90	11.10	50.00	38.10	L1	GND
13.566000	12.50	11.20	50.00	37.50	L1	GND
28.510000	22.50	12.20	50.00	27.50	L1	GND

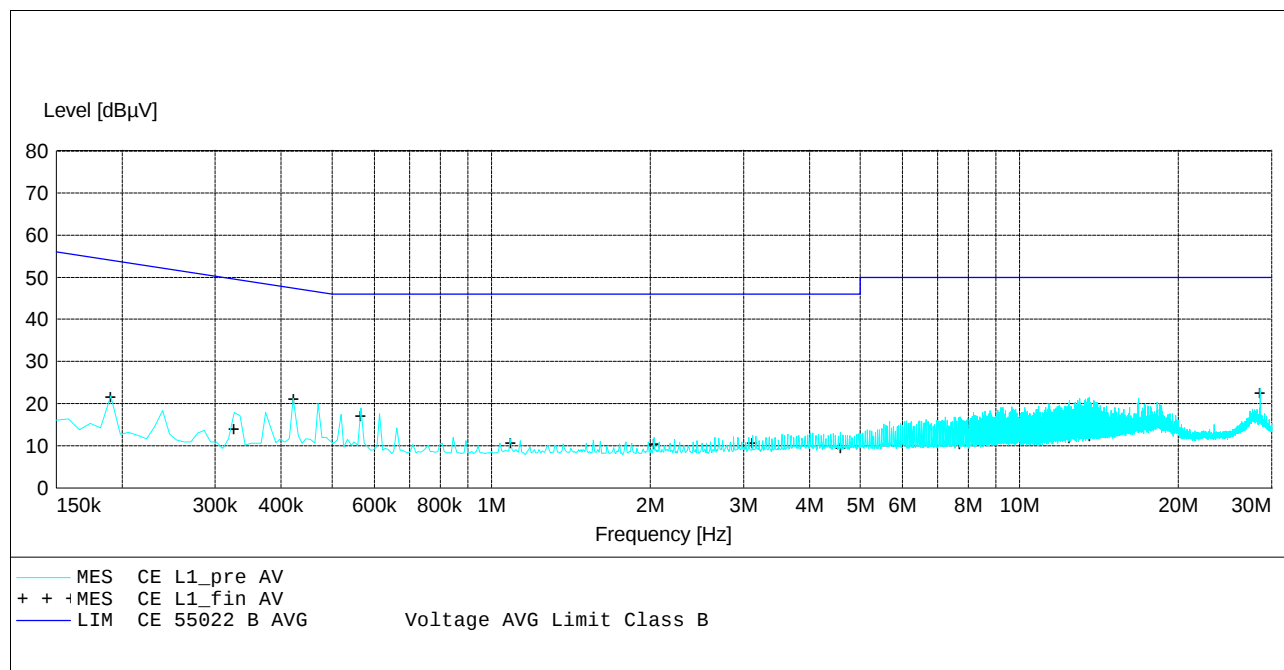
Intermec Technologies Corporation
Emission Test

EUT: 2540PCC-5 within 6110 and UMEC charger
Manufacturer / Eng.: Intermec / J.Jorgenson
Operating Condition: emissions test program
Test Site: EMC Lab, Cedar Rapids IA
Operator: df
Test Specification: CISPR 22 Class B
Comment: MAX test, N Side, 120 VAC
Start of Test: 4/18/01 / 2:04:35PM

SCAN TABLE: "CE R&S N"

Short Description:			EN 55022 Voltage N Side			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	8.0 kHz	MaxPeak Average	20.0 ms	10 kHz	C LISN R&S N





MEASUREMENT RESULT: "CE N_fin QP"

4/18/01 2:21PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150000	40.10	10.00	66.00	25.90	N	GND
0.238000	32.60	10.10	62.20	29.60	N	GND
0.470000	28.40	10.10	56.50	28.10	N	GND
0.566000	24.00	10.10	56.00	32.00	N	GND
1.038000	15.40	10.20	56.00	40.60	N	GND
1.518000	17.30	10.20	56.00	38.70	N	GND
3.270000	19.30	10.40	56.00	36.70	N	GND
4.070000	16.90	10.60	56.00	39.10	N	GND
7.574000	16.90	10.80	60.00	43.10	N	GND
12.310000	19.10	11.00	60.00	40.90	N	GND
18.238000	22.20	11.50	60.00	37.80	N	GND
28.510000	26.20	12.10	60.00	33.80	N	GND

MEASUREMENT RESULT: "CE N_fin AV"

4/18/01 2:21PM

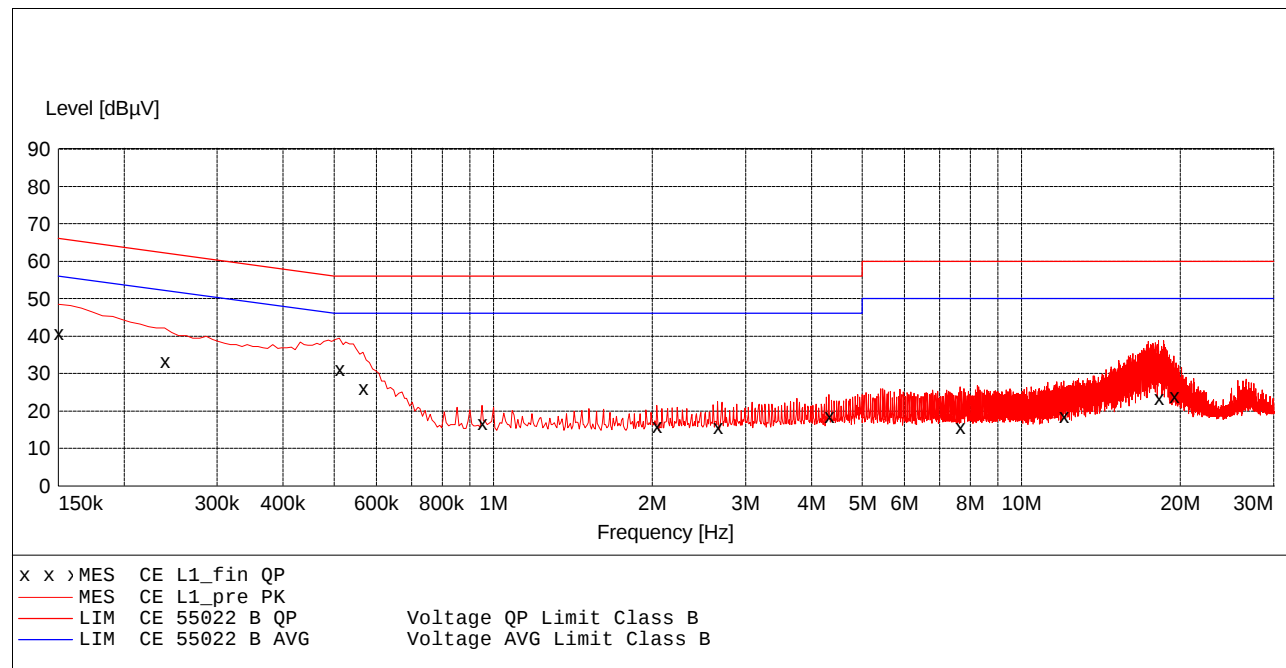
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.190000	21.00	10.10	54.00	33.10	N	GND
0.334000	15.50	10.00	49.40	33.80	N	GND
0.470000	19.90	10.10	46.50	26.60	N	GND
0.566000	14.50	10.10	46.00	31.50	N	GND
1.278000	14.30	10.20	46.00	31.70	N	GND
2.086000	14.40	10.10	46.00	31.60	N	GND
3.270000	15.80	10.40	46.00	30.20	N	GND
3.790000	15.30	10.60	46.00	30.70	N	GND
7.910000	16.20	10.80	50.00	33.80	N	GND
9.190000	17.40	10.70	50.00	32.60	N	GND
13.742000	18.40	11.10	50.00	31.60	N	GND
28.510000	22.70	12.10	50.00	27.30	N	GND

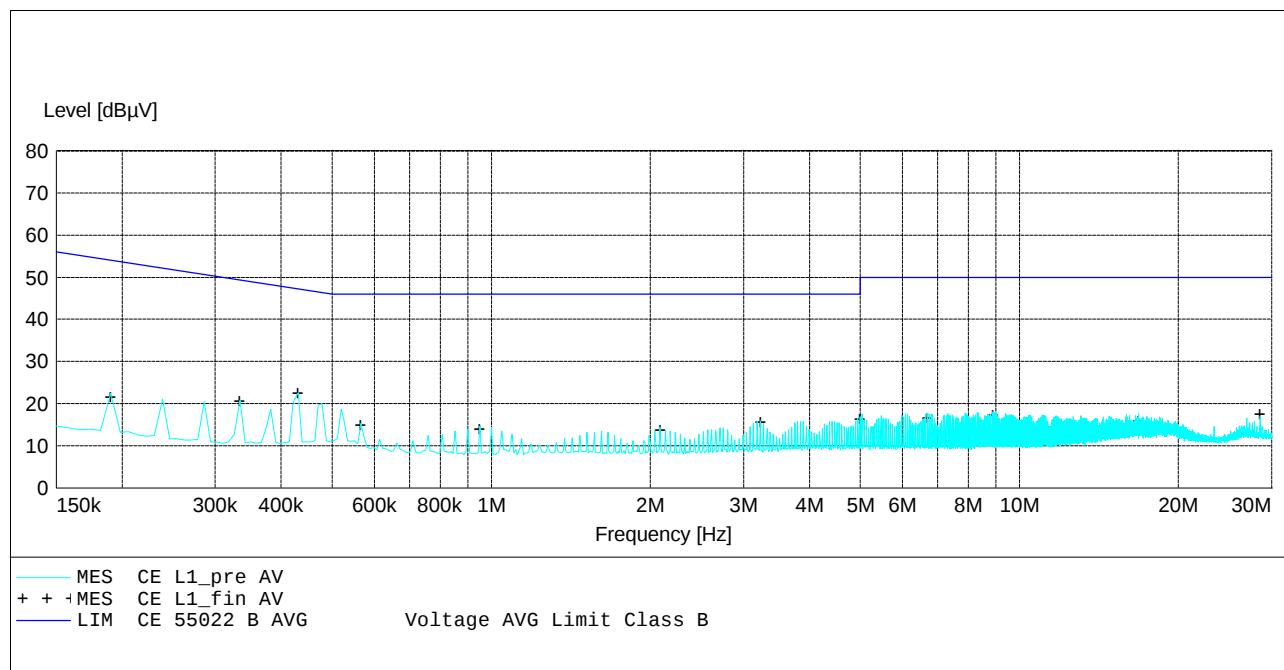
Intermec Technologies Corporation
Emission Test

EUT: 2540PCC-5 within 6110 and UMEC charger
 Manufacturer / Eng.: Intermec / J.Jorgenson
 Operating Condition: emissions test program
 Test Site: EMC Lab, Cedar Rapids IA
 Operator: df
 Test Specification: CISPR 22 Class B
 Comment: MAX test, L1 Side, 230 VAC
 Start of Test: 4/18/01 / 2:45:24PM

SCAN TABLE: "CE R&S L1"

Short Description:			EN 55022 Voltage L1 Side			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	8.0 kHz	MaxPeak Average	20.0 ms	10 kHz	C LISN R&S L1





MEASUREMENT RESULT: "CE L1_fin QP"

4/18/01 3:02PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150000	40.80	10.00	66.00	25.20	L1	GND
0.238000	33.30	10.10	62.20	28.90	L1	GND
0.510000	31.30	10.10	56.00	24.70	L1	GND
0.566000	26.40	10.10	56.00	29.60	L1	GND
0.950000	16.70	10.20	56.00	39.30	L1	GND
2.038000	16.10	10.10	56.00	39.90	L1	GND
2.654000	16.00	10.20	56.00	40.00	L1	GND
4.318000	18.60	10.60	56.00	37.40	L1	GND
7.638000	16.00	10.80	60.00	44.00	L1	GND
12.006000	18.80	11.10	60.00	41.20	L1	GND
18.174000	23.50	11.70	60.00	36.50	L1	GND
19.414000	24.10	11.60	60.00	35.90	L1	GND

MEASUREMENT RESULT: "CE L1_fin AV"

4/18/01 3:02PM

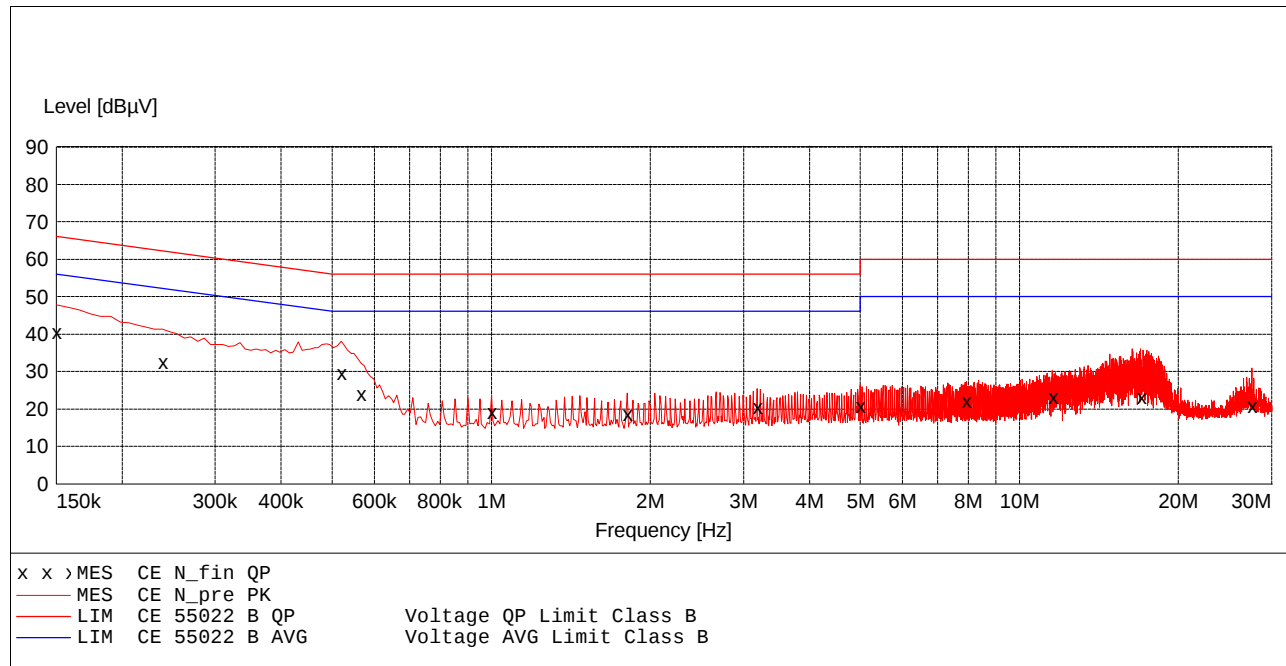
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.190000	21.80	10.10	54.00	32.30	L1	GND
0.334000	20.70	10.00	49.40	28.60	L1	GND
0.430000	22.70	10.10	47.30	24.60	L1	GND
0.566000	14.90	10.10	46.00	31.10	L1	GND
0.950000	14.20	10.20	46.00	31.80	L1	GND
2.086000	13.70	10.10	46.00	32.30	L1	GND
3.230000	15.60	10.40	46.00	30.40	L1	GND
4.982000	16.50	10.60	46.00	29.50	L1	GND
6.694000	16.80	10.70	50.00	33.20	L1	GND
8.878000	17.30	10.80	50.00	32.70	L1	GND
16.758000	15.90	11.50	50.00	34.10	L1	GND
28.510000	17.50	12.20	50.00	32.50	L1	GND

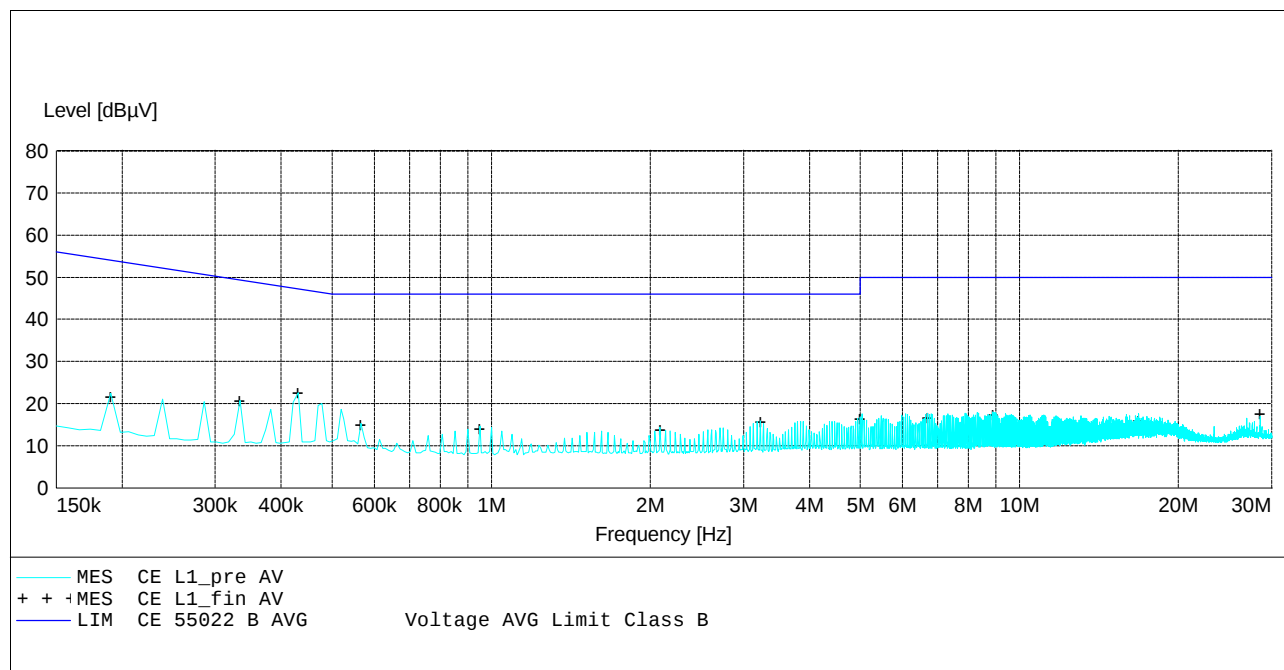
Intermec Technologies Corporation
Emission Test

EUT: 2540PCC-5 within 6110 and UMEC charger
 Manufacturer / Eng.: Intermec / J.Jorgenson
 Operating Condition: emissions test program
 Test Site: EMC Lab, Cedar Rapids IA
 Operator: df
 Test Specification: CISPR 22 Class B
 Comment: MAX test, N Side, 230 VAC
 Start of Test: 4/18/01 / 3:06:44PM

SCAN TABLE: "CE R&S N"

Short Description:			EN 55022 Voltage N Side			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	30.0 MHz	8.0 kHz	MaxPeak Average	20.0 ms	10 kHz	C LISN R&S N





MEASUREMENT RESULT: "CE N_fin QP"

4/18/01 3:26PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150000	40.50	10.00	66.00	25.50	N	GND
0.238000	32.60	10.10	62.20	29.60	N	GND
0.518000	29.50	10.10	56.00	26.50	N	GND
0.566000	24.00	10.10	56.00	32.00	N	GND
0.998000	19.20	10.20	56.00	36.80	N	GND
1.806000	18.60	10.10	56.00	37.40	N	GND
3.182000	20.70	10.30	56.00	35.30	N	GND
4.982000	20.80	10.60	56.00	35.20	N	GND
7.926000	22.20	10.80	60.00	37.80	N	GND
11.534000	23.30	10.90	60.00	36.70	N	GND
16.950000	23.20	11.40	60.00	36.80	N	GND
27.470000	20.80	11.90	60.00	39.20	N	GND

MEASUREMENT RESULT: "CE N_fin AV"

4/18/01 3:26PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.190000	21.80	10.10	54.00	32.30	N	GND
0.334000	21.80	10.00	49.40	27.50	N	GND
0.430000	23.00	10.10	47.30	24.30	N	GND
0.854000	16.80	10.20	46.00	29.20	N	GND
0.950000	18.30	10.20	46.00	27.70	N	GND
2.086000	17.20	10.10	46.00	28.80	N	GND
3.278000	16.80	10.40	46.00	29.20	N	GND
3.326000	15.60	10.40	46.00	30.40	N	GND
5.558000	12.30	10.60	50.00	37.70	N	GND
8.310000	15.00	10.80	50.00	35.00	N	GND
12.678000	12.80	11.00	50.00	37.20	N	GND
28.510000	17.80	12.10	50.00	32.20	N	GND