

Exhibit Q: Spurious Radiated Emissions

FCC ID: HN2WN-5MP01

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Low

Mid

High

Operating Modes Investigated:

Typical

Antennas Investigated:

Highest gain Omni (072760)

Lowest gain of all antennas – ceiling mount (072761)

Highest gain Corner reflector (072762)

Integral Dipole (072664)

Data Rates Investigated:

Lowest (6 Mbit)

Middle (24 Mbit)

Highest (54 Mbit)

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

DC from E-net

120 V, 60 Hz

Enclosures Investigated:

WA22 (plastic)

WA21 (metal)

Frequency Range Investigated

Start Frequency

30 MHz

Stop Frequency

40 GHz

Software\Firmware Applied During Test

Exercise software

AP Monitor

Version

V5.97

Description

A notebook PC controls the radio through a serial port connection on the access point. Hyper Terminal running in Windows 98 address the AP monitor commands for setting the transmit channel and data rate.

Equipment Modifications

No EMI suppression devices were added or modified. The EUT was tested as delivered.

EUT and Peripherals

Description	Manufacturer	Model/Part Number	Serial Number
Omni antenna	Intermec	072760	N/A
Ceiling mount antenna	Intermec	072761	N/A
Corner reflector antenna	Intermec	072762	N/A
Two Integral omni antennas	Intermec	072664	N/A
EUT-802.11(a) radio	Intermec	WN-5MP01	none
Access Point with plastic enclosure	Intermec	WA22	002-087
Access Point with metal enclosure	Intermec	WA21	002-032
Laptop PC (config only)	Gateway	Solo 2500	BC699085606
Remote Power Bridge	Intermec	071579	U01156281006901

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Ethernet cable	No	7.5	No	Remote Power Bridge	WA22 Access Point
Ethernet cable	No	2	No	Laptop	WA21 Access Point
AC power	No	1.9	No	Remote Power Bridge	AC mains
AC power	No	2.0	No	WA21 Access Point	AC mains
Serial cable	Yes	1.5	No	Access Point	Laptop (for setup)
Antenna adapter cable	Yes	.75	No	Access Point	Antennas

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	03/19/2002	12 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	12/03/2001	12 mo
Antenna, Biconilog	EMCO	3141	AXE	12/31/2001	12 mo
Antenna, Horn	EMCO	3115	AHJ	05/23/2002	12 mo
5.25 GHz Notch Filter	K&L Microwave	8N50-5250/X200-0/0	HFK	08/14/02	12 mo
10 GHz High Pass Filter	K&L Microwave	1WP01-1500/E6000-0/0	HFJ	8/09/02	12 mo
Pre-Amplifier	Miteq	AMF-4D-010120-30-10P	AOP	07/09/2002	12 mo
Spectrum Analyzer	Tektronix	2784	AAO	03/08/2001	24 mo
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	01/17/2000	36 mo
Antenna, Horn	EMCO	3160-09	AHG	01/15/2000	36 mo
Pre-Amplifier	Miteq	JS4-26004000-40-SP	APV	06/26/2000	36 mo
Antenna, Horn	EMCO	3160-10	AHI	01/15/2000	36 mo
DC Power Supply	Topward	TPS-2000	TPD	NCR	0 mo

Test Description

Requirement: Per 15.407(b) The peak emissions outside of the frequency bands of operation shall be attenuated in accordance with the limits defined in 15.407 (b)(1-7).

All emissions outside the operational bands shall not exceed an EIRP of -27 dBm/MHz. In addition, the field strength of any spurious emissions or modulation products that fall in a restricted band, as defined in 47 CFR 15.205, shall comply with the following: the peak level must comply with the limits specified in 47 CFR 15.35(b), and the average level (taken with a 10Hz VBW) must comply with the limits specified in 15.209. In addition, all unwanted emissions below 1 GHz must comply with the general field strength limits of 15.209.

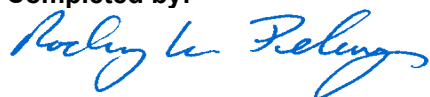
Configuration: The highest gain of each type of antenna to be used with the EUT was tested. In addition, the lowest gain of all the antennas to be used with the EUT was tested. The lowest, middle, and highest data rates were tested. The EUT can be used in either the applicant's WA22 access point or the WA21 access point. The access points are the same except that the WA22 uses a plastic enclosure and the WA21 uses a metal enclosure. The EUT was tested in both enclosures. The EUT can be configured in the access points as a single unit or as a pair. It was tested with just one radio transmitting and with both radios transmitting simultaneously. The EUT was configured for the lowest, middle, and highest channel transmit frequencies.

For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.4:1992). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Bandwidths Used for Measurements

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 – 0.15	1.0	0.2	0.2
0.15 – 30.0	10.0	9.0	9.0
30.0 – 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0
<i>Measurements were made using the bandwidths and detectors specified. No video filter was used.</i>			

Completed by:



EUT: WN-5MP01			Work Order: INMC0024
Serial Number:			Date: 08/19/02
Customer: INTERMEC Corporation			Temperature: 72
Attendees: None			Humidity: 38%
Cust. Ref. No.:			Barometric Pressure: 30
Tested by: Rod Peloquin		Power: DC from E-net	Job Site: EV01

TEST SPECIFICATIONS

Specification:	FCC Part 15.407(b)(6) / FCC Part 15.205 / 15.209	Year:	2002
Method:	ANSI C63.4	Year:	1992

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS

Corner mount antenna

EUT OPERATING MODES

Transmitting radio b

DEVIATIONS FROM TEST STANDARD

No deviations.

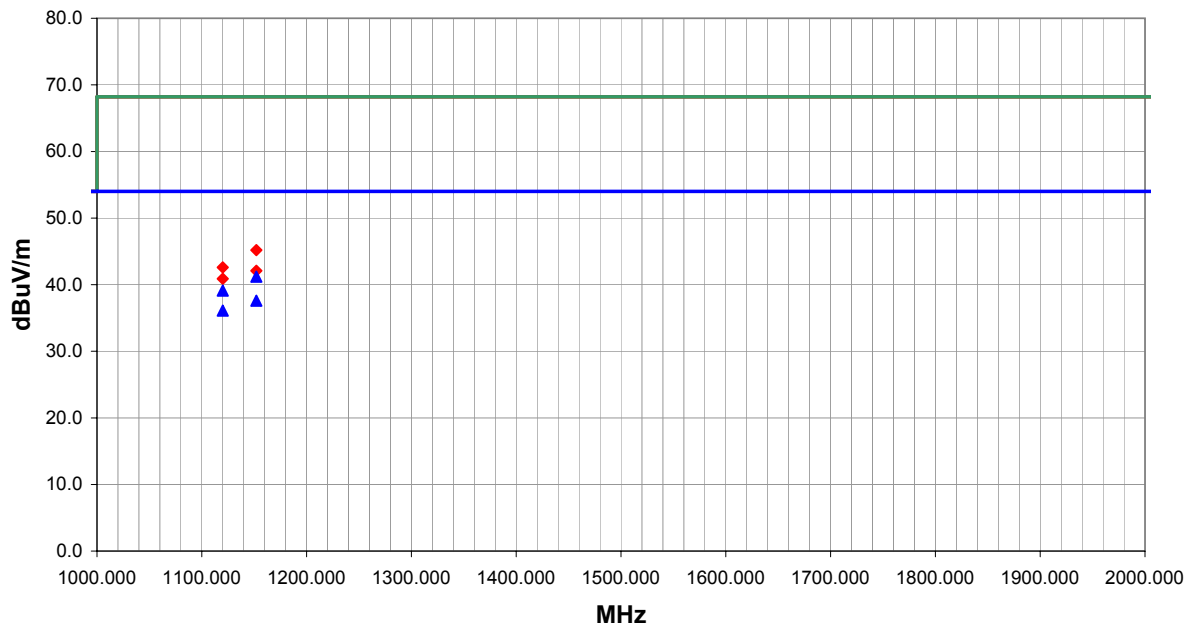
RESULTS

Pass	3	4
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Other	
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Rocky in Feeling

Tested By:



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	
													Comments
1152.000	47.3	-6.1	0.0	1.3	3.0	0.0	V-Horn	AV	0.0	41.2	54.0	-12.8	"High Channel"
1120.000	45.5	-6.4	313.0	1.1	3.0	0.0	V-Horn	AV	0.0	39.1	54.0	-14.9	"High Channel"
1152.000	43.7	-6.1	60.0	1.1	3.0	0.0	H-Horn	AV	0.0	37.6	54.0	-16.4	"High Channel"
1120.000	42.5	-6.4	309.0	1.6	3.0	0.0	H-Horn	AV	0.0	36.1	54.0	-17.9	"High Channel"
1152.000	51.3	-6.1	0.0	1.3	3.0	0.0	V-Horn	PK	0.0	45.2	68.2	-23.0	"High Channel"
1120.000	49.0	-6.4	313.0	1.1	3.0	0.0	V-Horn	PK	0.0	42.6	68.2	-25.6	"High Channel"
1152.000	48.2	-6.1	60.0	1.1	3.0	0.0	H-Horn	PK	0.0	42.1	68.2	-26.1	"High Channel"
1120.000	47.3	-6.4	309.0	1.6	3.0	0.0	H-Horn	PK	0.0	40.9	68.2	-27.3	"High Channel"

EUT: WN-5MP01			Work Order:	INMC0024
Serial Number:			Date:	08/21/02
Customer:	INTERMEC Corporation		Temperature:	75 F
Attendees:	None		Humidity:	44%
Cust. Ref. No.:			Barometric Pressure	30.01
Tested by:	Rod Peloquin	Power:	DC from E-net	Job Site:
				EV01

TEST SPECIFICATIONS

Specification:	FCC Part 15.407(b)(1-4)	Year:	Current 47CFR
Method:	ANSI C63.4	Year:	2000

SAMPLE CALCULATIONS

EIRP = Signal Generator Output (dBm) - Cable Loss(dB) + Gain of Reference Antenna (dBi)

COMMENTS

See notes

EUT OPERATING MODES

See notes

DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS

Pass		19
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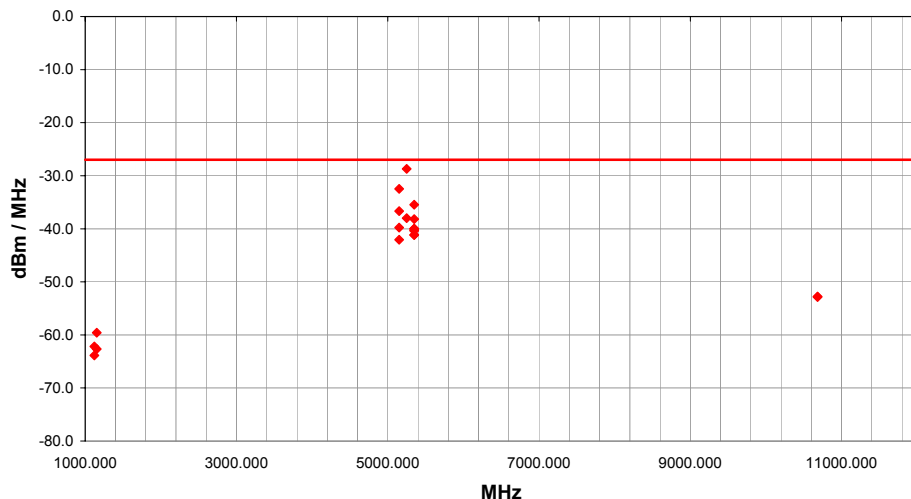
1.000		

Other	1.2
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Other

Rocky to Feeling

Tested By:



Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector		EIRP (dBm/MHz)	Spec. Limit (dBm/MHz)	Compared to		Comments
												Spec. (dB)		
5250.000			258.0	1.1			V-Horn	PK		-28.7	-27.0	-1.7		"Corner mount antenna, low channel, 6Mbps data rate"
5150.000			201.0	1.0			V-Horn	PK		-32.5	-27.0	-5.5		"Integral antennas, low channel, 6Mbps data rate"
5350.000			236.0	1.0			V-Horn	PK		-35.5	-27.0	-8.5		"Integral antenna, high channel, 6Mbps data rate"
5150.000			194.0	1.0			V-Horn	PK		-36.7	-27.0	-9.7		"Integral antenna, low channel, 54Mbps data rate"
5250.000			255.0	1.0			H-Horn	PK		-38.0	-27.0	-11.0		"Corner mount antenna, low channel, 6Mbps data rate"
5350.000			243.0	1.0			V-Horn	PK		-38.2	-27.0	-11.2		"Corner mount antenna, high channel, 6Mbps data rate"
5150.000			146.0	1.1			H-Horn	PK		-39.8	-27.0	-12.8		"Integral antennas, low channel, 6Mbps data rate"
5350.000			256.0	1.0			V-Horn	PK		-40.0	-27.0	-13.0		"Corner mount antenna, high channel, 54Mbps data rate"
5350.000			199.0	1.0			H-Horn	PK		-40.0	-27.0	-13.0		"Corner mount antenna, high channel, 54Mbps data rate"
5350.000			180.0	1.1			H-Horn	PK		-40.3	-27.0	-13.3		"Integral antenna, high channel, 6Mbps data rate"
5350.000			360.0	1.0			H-Horn	PK		-40.4	-27.0	-13.4		"Corner mount antenna, high channel, 6Mbps data rate"
5350.000			80.0	1.1			H-Horn	PK		-41.2	-27.0	-14.2		"Integral antenna, high channel, 54Mbps data rate"
5350.000			295.0	1.0			V-Horn	PK		-41.2	-27.0	-14.2		"Integral antenna, high channel, 54Mbps data rate"
5150.000			141.0	1.1			H-Horn	PK		-42.1	-27.0	-15.1		"Integral antennas, low channel, 54Mbps data rate"
10681.750			20.0	1.2			V-Horn	PK		-52.8	-27.0	-25.8		"Corner mount antenna, high channel, 6Mbps data rate"
10681.750			180.0	1.1			H-Horn	PK		-52.9	-27.0	-25.9		"Corner mount antenna, high channel, 6Mbps data rate"
1152.000			0.0	1.3			V-Horn	PK		-59.6	-27.0	-32.6		"Corner mount antenna, high channel, 6Mbps data rate"
1120.000			313.0	1.1			V-Horn	PK		-62.2	-27.0	-35.2		"Corner mount antenna, high channel, 6Mbps data rate"
1152.000			60.0	1.1			H-Horn	PK		-62.7	-27.0	-35.7		"Corner mount antenna, high channel, 6Mbps data rate"
1120.000			309.0	1.6			H-Horn	PK		-63.9	-27.0	-36.9		"Corner mount antenna, high channel, 6Mbps data rate"

Effective Radiated Power Data Sheet

EUT: WN-5MP01	Work Order: INMC0045
Serial Number:	Date: 10/12/02
Customer: INTERMEC Corporation	Temperature: 72
Attendees: None	Humidity: 32%
Cust. Ref. No.:	Barometric Pressure: 30.41
Tested by: Rod Peloquin	Power: DC from E-net
	Job Site: EV01

TEST SPECIFICATIONS

Specification: FCC Part 15.407(b)(1-4)	Year: 2000
Method: ANSI C63.4	Year: 1992

SAMPLE CALCULATIONS

EIRP = Signal Generator Output (dBm) - Cable Loss (dB) + Gain of Reference Antenna (dBi)

COMMENTS

High channel, corner mount antennas

EUT OPERATING MODES

Transmitting on both radios

DEVIATIONS FROM TEST STANDARD

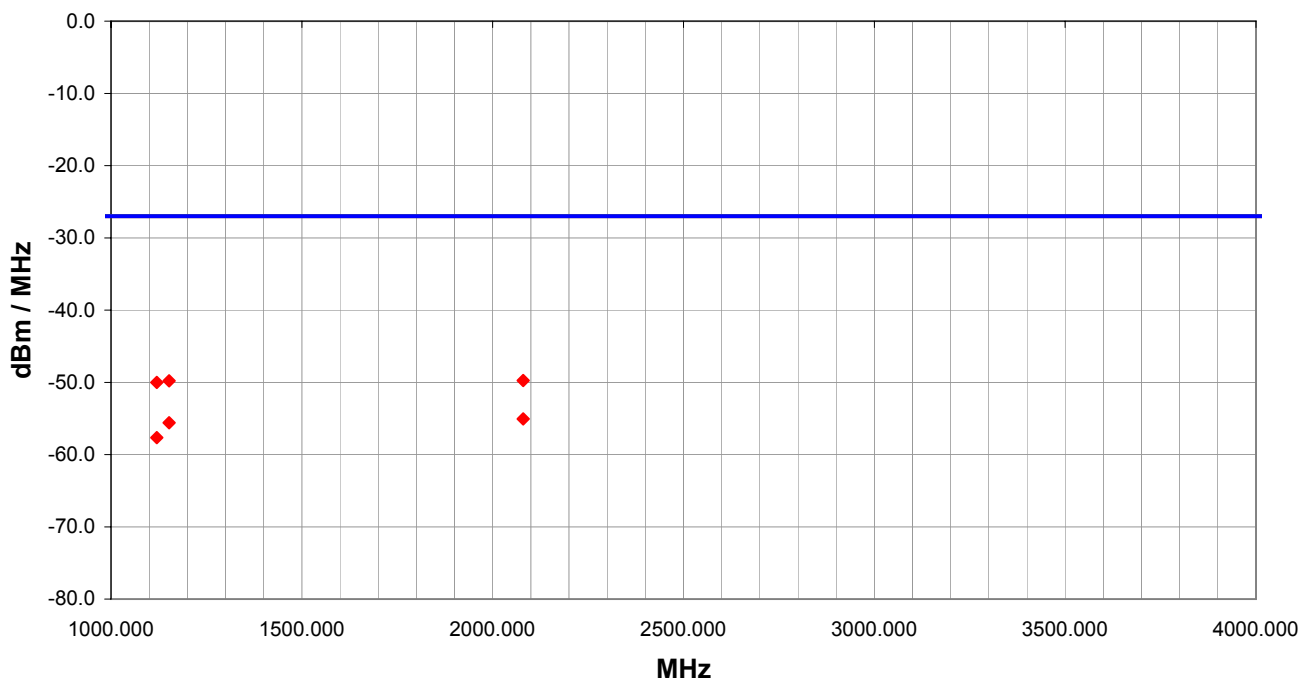
No deviations.

RESULTS	Test Distance (m)	Run #
Pass		2

Other

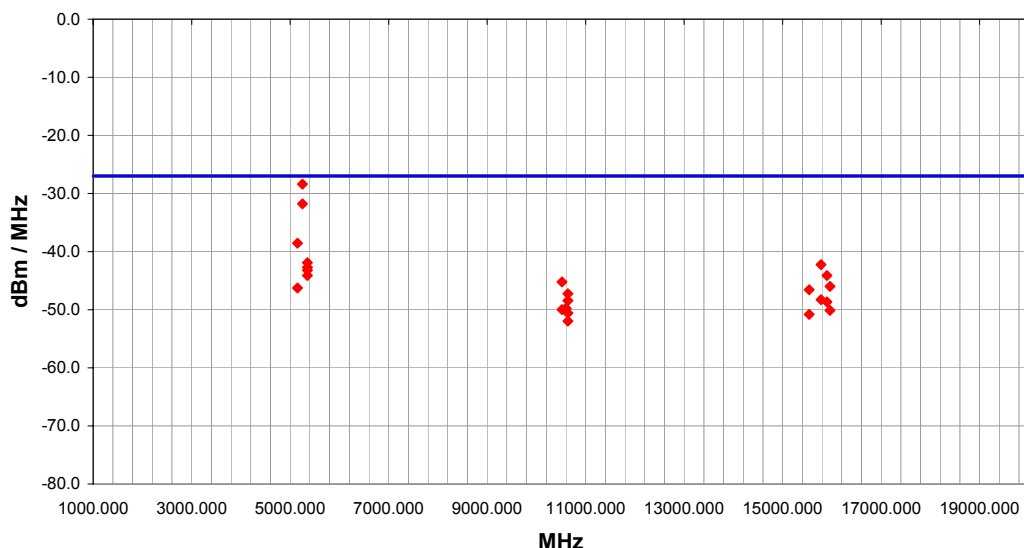
Rodry L. Peloquin

Tested By:

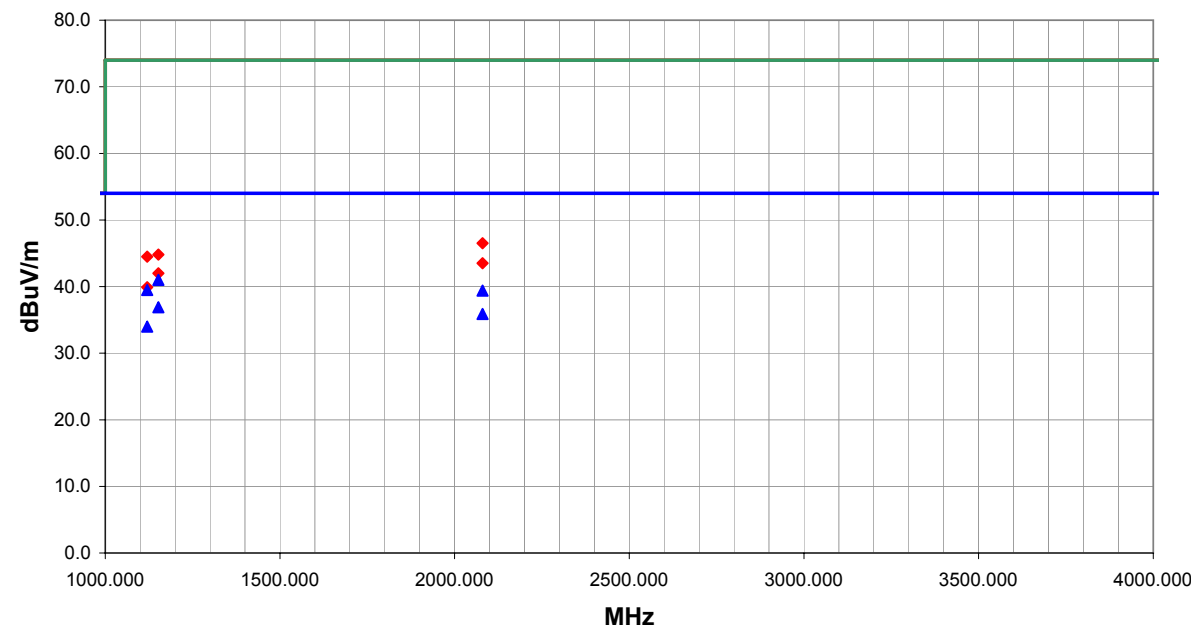


Freq (MHz)			Azimuth (degrees)	Height (meters)		Polarity	Detector		EIRP (dBm/MHz)	Spec. Limit (dBm/MHz)	Compared to Spec. (dB)
2080.000			134.0	1.5		V-Horn	PK		-49.7	-27.0	-22.7
1152.000			195.0	1.4		V-Horn	PK		-49.8	-27.0	-22.8
1120.000			279.0	1.2		V-Horn	PK		-50.0	-27.0	-23.0
2080.000			125.0	2.8		H-Horn	PK		-55.1	-27.0	-28.1
1152.000			174.0	1.3		H-Horn	PK		-55.6	-27.0	-28.6
1120.000			299.0	1.1		H-Horn	PK		-57.6	-27.0	-30.6

Effective Radiated Power Data Sheet



Freq (MHz)			Azimuth (degrees)	Height (meters)			Polarity	Detector		EIRP (dBm/MHz)	Spec. Limit (dBm/MHz)	Compared to Spec. (dB)	Comments
5250.000			165.0	1.0			V-Horn	PK		-28.4	-27.0	-1.4	"low channel, corner mount antennas"
5250.000			135.0	1.0			H-Horn	PK		-31.8	-27.0	-4.8	"low channel, corner mount antennas"
5150.000			0.0	1.1			V-Horn	PK		-38.5	-27.0	-11.5	"low channel, dipole antennas"
5350.000			350.0	1.0			V-Horn	PK		-41.9	-27.0	-14.9	"high channel, dipole antennas"
5350.000			190.0	1.0			H-Horn	PK		-43.2	-27.0	-16.2	"high channel, corner mount antennas"
5350.000			200.0	1.2			V-Horn	PK		-42.7	-27.0	-15.7	"high channel, corner mount antennas"
5350.000			0.0	1.0			H-Horn	PK		-44.1	-27.0	-17.1	"high channel, dipole antennas"
5150.000			0.0	1.0			H-Horn	PK		-46.3	-27.0	-19.3	"low channel, dipole antennas"
10520.000			135.0	1.3			V-Horn	PK		-45.2	-27.0	-18.2	"low channel, corner mount antennas"
15780.000			185.0	1.0			H-Horn	PK		-42.2	-27.0	-15.2	"low channel, corner mount antennas"
15900.000			180.0	1.0			H-Horn	PK		-44.1	-27.0	-17.1	"mid channel, corner mount antennas"
10600.000			170.0	1.1			V-Horn	PK		-49.8	-27.0	-22.8	"mid channel, corner mount antennas"
10640.000			90.0	1.3			H-Horn	PK		-47.2	-27.0	-20.2	"high channel, ceiling mount antennas"
10640.000			135.0	1.0			V-Horn	PK		-50.6	-27.0	-23.6	"high channel, corner mount antennas"
15960.000			175.0	1.0			H-Horn	PK		-46.0	-27.0	-19.0	"high channel, corner mount antennas"
15540.000			45.0	1.0			V-Horn	PK		-46.6	-27.0	-19.6	"low channel, dipole antennas"
10640.000			95.0	1.3			H-Horn	PK		-48.4	-27.0	-21.4	"high channel, corner mount antennas"
10640.000			260.0	1.0			V-Horn	PK		-52.0	-27.0	-25.0	"high channel, ceiling mount antennas"
10600.000			140.0	1.2			H-Horn	PK		-49.8	-27.0	-22.8	"mid channel, corner mount antennas"
10520.000			135.0	1.0			H-Horn	PK		-50.0	-27.0	-23.0	"low channel, corner mount antennas"
15780.000			140.0	1.0			V-Horn	PK		-48.3	-27.0	-21.3	"low channel, corner mount antennas"
15900.000			170.0	1.0			V-Horn	PK		-48.7	-27.0	-21.7	"mid channel, corner mount antennas"
15960.000			180.0	1.0			V-Horn	PK		-50.1	-27.0	-23.1	"high channel, corner mount antennas"
15540.000			225.0	1.0			H-Horn	PK		-50.8	-27.0	-23.8	"low channel, dipole antennas"

NORTHWEST		Spurious Radiated Emissions		REV d3.01 09/20/2002								
EUT: WN-5MP01		Work Order: INMC0045										
Serial Number:		Date: 10/12/02										
Customer: INTERMEC Corporation		Temperature: 72										
Attendees: None		Humidity: 32%										
Cust. Ref. No.:		Barometric Pressure: 30.41										
Tested by: Rod Peloquin		Power: DC from E-net		Job Site: EV01								
TEST SPECIFICATIONS												
Specification: FCC Part 15.407(b)(6) / FCC Part 15.205 / 15.209				Year: 2000								
Method: ANSI C63.4				Year: 1992								
SAMPLE CALCULATIONS												
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation												
Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator												
COMMENTS												
High channel, corner mount antennas												
EUT OPERATING MODES												
Transmitting on both radios												
DEVIATIONS FROM TEST STANDARD												
No deviations.												
RESULTS				Test Distance (m)								
Pass				3								
				Run #								
				2								
Other				 Tested By:								
												
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
1152.000	47.2	-6.2	195.0	1.4	3.0	0.0	V-Horn	AV	0.0	41.0	54.0	-13.0
1120.000	46.0	-6.5	279.0	1.2	3.0	0.0	V-Horn	AV	0.0	39.5	54.0	-14.5
2080.000	39.8	-0.4	134.0	1.5	3.0	0.0	V-Horn	AV	0.0	39.4	54.0	-14.6
1152.000	43.1	-6.2	174.0	1.3	3.0	0.0	H-Horn	AV	0.0	36.9	54.0	-17.1
2080.000	36.3	-0.4	125.0	2.8	3.0	0.0	H-Horn	AV	0.0	35.9	54.0	-18.1
1120.000	40.5	-6.5	299.0	1.1	3.0	0.0	H-Horn	AV	0.0	34.0	54.0	-20.0
2080.000	46.9	-0.4	134.0	1.5	3.0	0.0	V-Horn	PK	0.0	46.5	74.0	-27.5
1152.000	51.0	-6.2	195.0	1.4	3.0	0.0	V-Horn	PK	0.0	44.8	74.0	-29.2
1120.000	51.0	-6.5	279.0	1.2	3.0	0.0	V-Horn	PK	0.0	44.5	74.0	-29.5
2080.000	43.9	-0.4	125.0	2.8	3.0	0.0	H-Horn	PK	0.0	43.5	74.0	-30.5
1152.000	48.2	-6.2	174.0	1.3	3.0	0.0	H-Horn	PK	0.0	42.0	74.0	-32.0
1120.000	46.4	-6.5	299.0	1.1	3.0	0.0	H-Horn	PK	0.0	39.9	74.0	-34.1

