

INTERMEC Technologies Corporation

802MIG2 in CK31/CK31NI

June 15, 2005

Report No. INMC0228

Report Prepared By



www.nwemc.com
1-888-EMI-CERT

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EMC Test Report



22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test
Issue Date: June 15, 2005
INTERMEC Technologies Corporation
Model: 802MIG2 in CK31/CK31NI

Emissions			
Specification	Test Method	Pass	Fail
FCC 15.247(d) Spurious Radiated Emissions:2005-04	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Modifications made to the product

See the Modifications section of this report

Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
22975 NW Evergreen Parkway, Suite 400
Hillsboro, OR 97124

Phone: (503) 844-4066
Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada.

Approved By:

Don Facteau, IS Manager

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested, the specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision Number	Description	Date	Page Number
00	None		

FCC: Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.



NVLAP: Northwest EMC, Inc. is recognized under the United States Department of Commerce, National Institute of Standards and Technology, and National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 89/336/EEC, ANSI C63.4, MIL-STD 461E, DO-160D and SAE J1113. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.



200629-0
200630-0
200676-0

Industry Canada: Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS 212, Issue 1 (Provisional) and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements.



CAB: Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.



TÜV Product Service: Included in TÜV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TÜV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TÜV's current Listing of CARAT Laboratories, available from TÜV. A certificate was issued to represent that this laboratory continues to meet TÜV's CARAT Program requirements. Certificate No. USA0401C.



TÜV Rheinland: Authorized to carryout EMC tests by order and under supervision of TÜV Rheinland. This authorization is based on "Conditions for EMC-Subcontractors" of November 1992.



NEMKO: Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).



Technology International: Assessed in accordance with ISO Guide 25 defining the general international requirements for the competence of calibration and testing laboratories and with ITI assessment criteria LACO196. Based upon that assessment, Interference Technology International, Ltd., has granted approval for specifications implementing the EU Directive on EMC (89/336/EEC and amendments). The scope of the approval was provided on a Schedule of Assessment supplied with the certificate and is available upon request.



Australia/New Zealand: The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).



VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071 and R-1025, Irvine: C-2094 and R-1943, Newberg: C-1877 and R-1760, Sultan: R-871, C-1784 and R-1761*).



BSMI: Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement. License No.SL2-IN-E-1017.



GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification



SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/scope.asp>

What is measurement uncertainty?

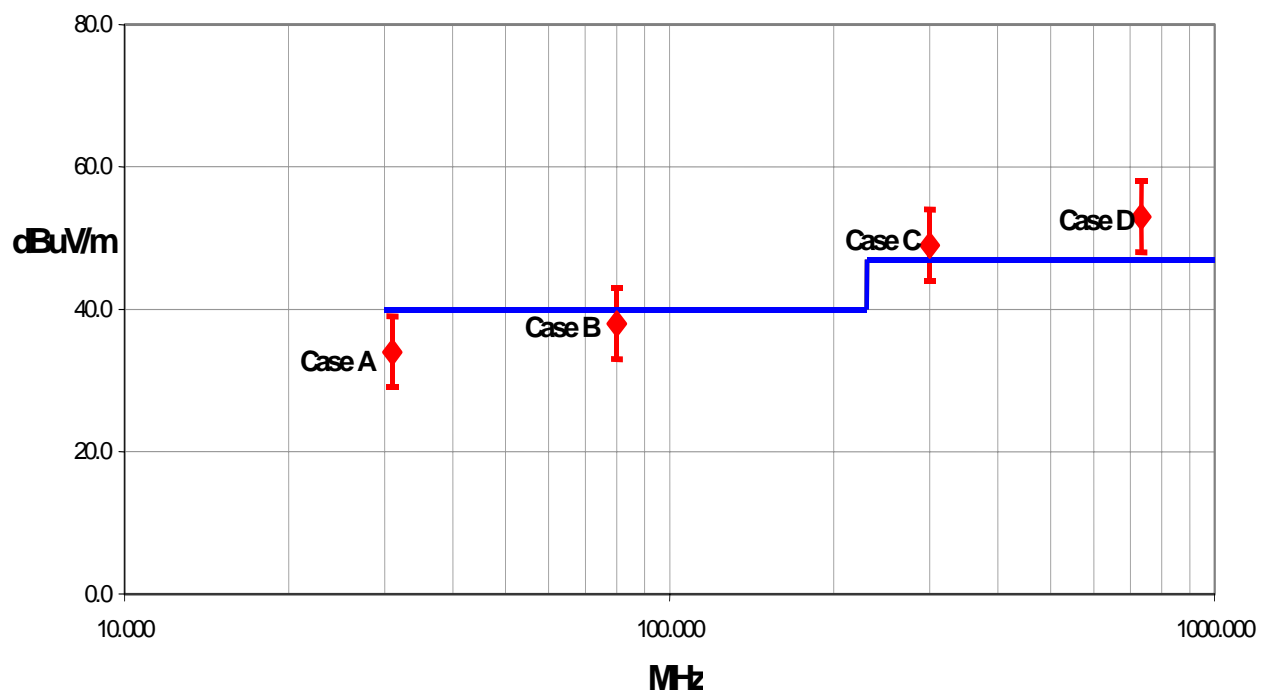
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following statement of measurement uncertainty is used to reflect the accuracy of the measured result as compared with its “true” value. In the case of transient tests (ESD, EFT, Surge, Voltage Dips and Interruptions), the test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements.

The following documents were the basis for determining the uncertainty levels of our measurements:

- “ISO Guide to the Expression of Uncertainty in Measurements”, October 1993
- “NIS81: The Treatment of Uncertainty in EMC Measurements”, May 1994
- “IEC CISPR 16-3 A1 f1 Ed.1: Radio-interference measurements and statistical techniques”, December 2000

How might measurement uncertainty be applied to test results?

If the diamond marks the measured value for the test and the vertical bars bracket the range of + and – measurement uncertainty, then test results can be interpreted from the diagram below.

**Test Result Scenarios:**

Case A: Product complies.

Case B: Product conditionally complies. It is not possible to say with 95% confidence that the product complies.

Case C: Product conditionally does not comply. It is not possible to say with 95% confidence that the product does not comply.

Case D: Product does not comply.

Radiated Emissions ≤ 1 GHz

Value (dB)

Test Distance	Probability Distribution	Biconical Antenna		Log Periodic Antenna		Dipole Antenna	
		3m	10m	3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.86 - 1.88	+ 1.82 - 1.87	+ 2.23 - 1.41	+ 1.29 - 1.26	+ 1.31 - 1.27	+ 1.25 - 1.25
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k=2)	+ 3.72 - 3.77	+ 3.64 - 3.73	+ 4.46 - 2.81	+ 2.59 - 2.52	+ 2.61 - 2.55	+ 2.49 - 2.49

Radiated Emissions > 1 GHz

Value (dB)

Test Distance	Probability Distribution	Without High Pass Filter		With High Pass Filter	
		3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.29 - 1.25	+ 1.38 - 1.35	+ 1.29 - 1.25	+ 1.38 - 1.35
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k=2)	+ 2.57 - 2.51	+ 2.76 - 2.70	+ 2.57 - 2.51	+ 2.76 - 2.70

Conducted Emissions

Test Distance	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.48
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k = 2)	2.97

Radiated Immunity

Test Distance	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k = 2)	2.11

Conducted Immunity

Test Distance	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty U (level of confidence $\approx 95\%$)	normal (k = 2)	2.10

Legend

$u_c(y)$ = square root of the sum of squares of the individual standard uncertainties

U = combined standard uncertainty multiplied by the coverage factor: k . This defines an interval about the measured result that will encompass the true value with a confidence level of approximately 95%. If a higher level of confidence is required, then $k=3$ (CL of 99.7%) can be used. Please note that with a coverage factor of one, $u_c(y)$ yields a confidence level of only 68%.

**California****Orange County Facility****Labs OC01 – OC13**

41 Tesla Ave.
Irvine, CA 92618
(888) 364-2378
FAX (503) 844-3826

**Oregon****Evergreen Facility****Labs EV01 – EV10**

22975 NW Evergreen Pkwy.
Suite 400
Hillsboro, OR 97124
(503) 844-4066
FAX (503) 844-3826

**Oregon****Trails End Facility****Labs TE01 – TE03**

30475 NE Trails End Lane
Newberg, OR 97132
(503) 844-4066
FAX (503) 537-0735

**Washington****Sultan Facility****Labs SU01 – SU07**

14128 339th Ave. SE
Sultan, WA 98294
(888) 364-2378
FAX (360) 793-2536

Party Requesting the Test

Company Name:	Intermec Technologies Corporation
Address:	6001 36th Avenue West
City, State, Zip:	Everett, WA 98203
Test Requested By:	Katie Molina
Model:	802MIG2 in CK31/CK31NI
First Date of Test:	June 10, 2005
Last Date of Test:	June 13, 2005
Receipt Date of Samples:	June 10, 2004
Equipment Design Stage:	Production
Equipment Condition:	No visual damage.

Information Provided by the Party Requesting the Test

Clocks/Oscillators:	Not provided at the time of test
I/O Ports:	Docking station for host device (CK31) has DC input, Serial, USB, LAN

Functional Description of the EUT (Equipment Under Test):

FCC certified 802.11 b/g radio module (HN2CK31MIG2) for use in Intermec's hand held scanner, Model CK31/CK31NI.

Client Justification for EUT Selection:

Representative of a production unit.

Client Justification for Test Selection:

A new, slightly higher gain antenna was tested for spurious radiated emissions. This test report will be used to support a FCC Class 2 Permissive change application for FCC ID: HN2CK31MIG2



Equipment modifications					
Item	Test	Date	Modification	Note	Disposition of EUT
1	Radiated Spurious Emissions	06/13/2005	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.	EUT remained at Northwest EMC.

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:

High

Mid

Low

Operating Modes Investigated:

802.11(b) and 802.11(g)

Configurations Investigated:

With and without the docking station. Docking station was determined to be the worst-case configuration.

Antennas Investigated:

Intermec P/N: 075452-001, PIFA (Planar Inverted F Antenna), Located inside (Integral to) the host unit

Data Rates Investigated:

802.11(b) 1Mbps and 11Mbps

802.11(g) 6Mbps, 36Mbps, and 54Mbps

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

120 VAC, 60 Hz.

Frequency Range Investigated**Start Frequency**

30 MHz

Stop Frequency

25 GHz

Software\Firmware Applied During Test**Exercise software**

FCCTEST

Version

1/1/2005

Description

The system was tested using special software to exercise the functions of the device during the testing including mode, data rate, and channel.

EUT and Peripherals			
Description	Manufacturer	Model/Part Number	Serial Number
802.11(b)/(g) Radio - EUT	Intermec Technologies Corporation	802MIG2	Unknown
Handheld Computer – Host Device	Intermec Technologies Corporation	CK31/CK31NI	Unknown
AC Adapter	Intermec Technologies Corporation	073573	6098381
Docking Station	Intermec Technologies Corporation	AD1	20890400380

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	PA	1.2	Yes	Docking Station	AC Adapter
AC Power	No	2.0	No	AC Adapter	AC Mains
Serial	Yes	1.0	No	Docking Station	Unterminated
USB	Yes	1.3	No	Docking Station	Unterminated
LAN	No	1.3	No	Docking Station	Unterminated
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

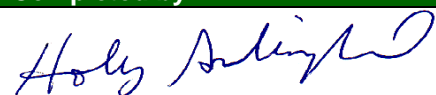
Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Antenna, Horn	EMCO	3115	AHC	09/07/2004	12 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APJ	05/05/2005	3 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	03/01/2005	13 mo
Spectrum Analyzer	Agilent	E4446A	AAQ	04/08/2005	13 mo
Attenuator	Coaxicom	66702 5910-20	RBJ	02/25/2005	13 mo
High Pass Filter	Micro-Tronics	HPM50111	HFO	03/09/2005	13 mo
Antenna, Horn	EMCO	3160-08	AHK	NCR	NA
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APC	02/17/2005	13 mo
Antenna, Horn	EMCO	3160-09	AHG	NCR	NA
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	02/15/2005	13 mo


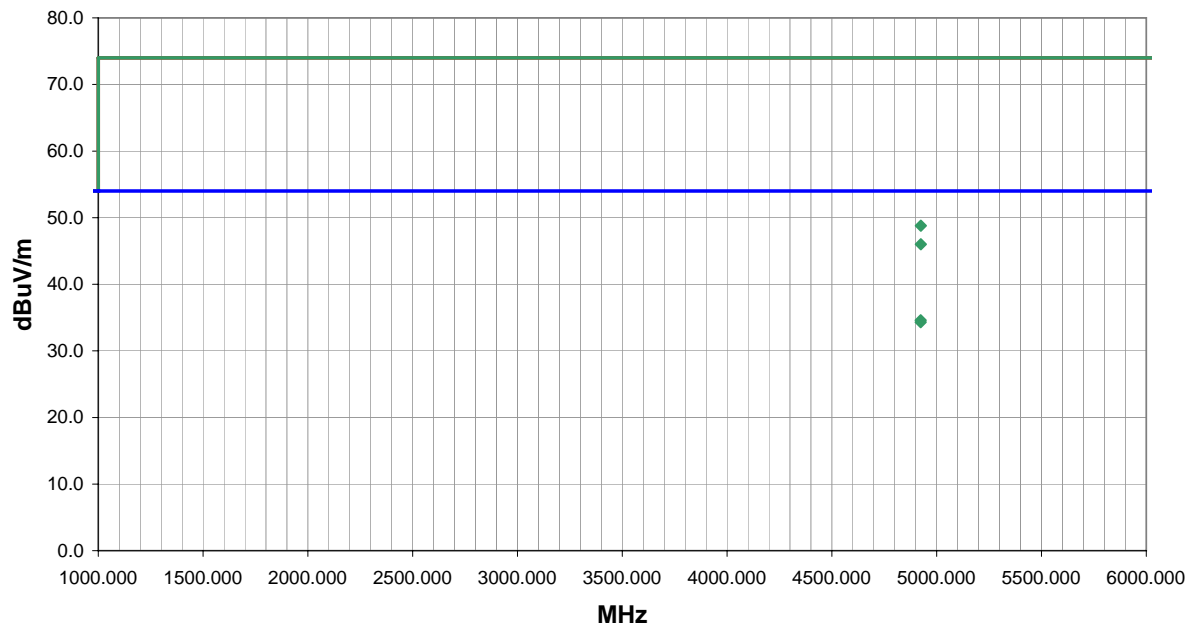
Test Description

Requirement: The field strength of any spurious emissions or modulation products that fall in a restricted band, as defined in 47 CFR 15.205, is measured. The peak level must comply with the limits specified in 47 CFR 15.35(b). The average level (taken with a 10Hz VBW) must comply with the limits specified in 15.209.


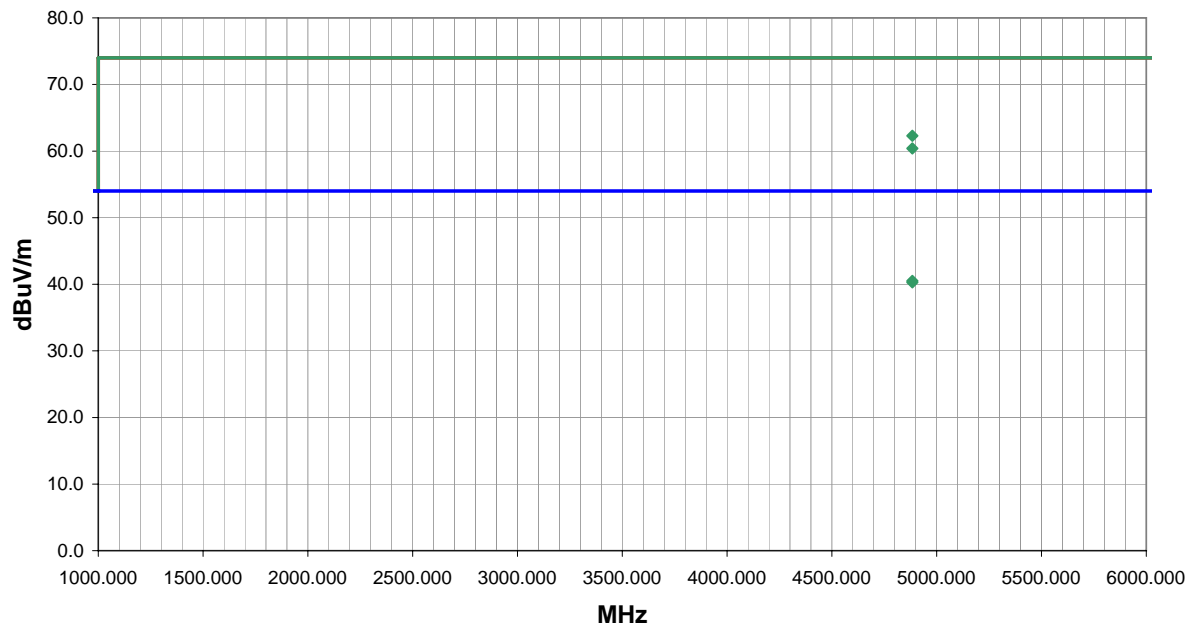
Configuration: The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands 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 C63.4:2003). A preamp and high pass 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>			


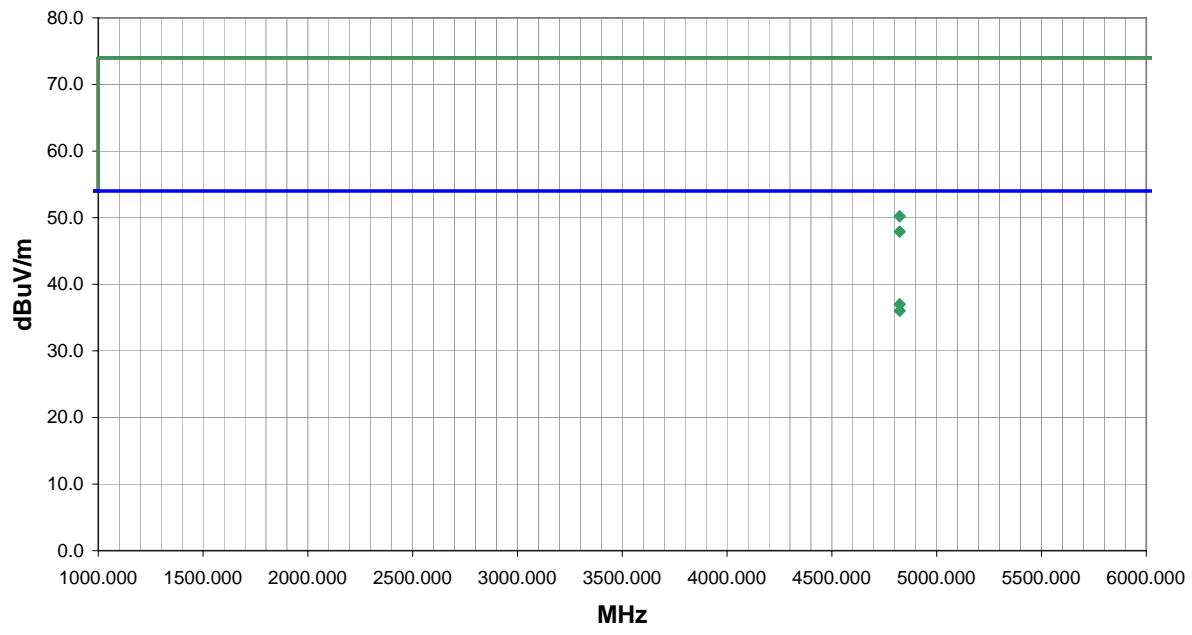
Completed by:

NORTHWEST EMC		RADIATED EMISSIONS DATA SHEET										PSA 2005.6.9 BETA EMI 2005.6.7	
EUT: 802MIG2		Work Order: INMC0228											
Serial Number:		Date: 06/10/05											
Customer: INTERMEC Technologies Corporation		Temperature: 24											
Attendees: none		Humidity: 43%											
Configuration ID:		Barometric Pressure: 29.95											
Tested by: Holly Ashkannejhad		Power: 120VAC, 60Hz		Job Site: EV01									
TEST SPECIFICATIONS												Test Method	
FCC 15.247(d) Spurious Radiated Emissions:2005-04												ANSI C63.4:2003	
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													
CK31/CK31NI charging in the AD1 dock.													
EUT OPERATING MODES													
Transmitting 802.11(b), 11Mbps, high channel													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
RESULTS		Pass		<div style="text-align: center;">  </div>									
Test Distance (m)		3											
Run #		2											
Configuration ID:													
													
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)	
4923.966	28.3	6.3	223.0	1.0	3.0	0.0	V-Horn	AV	0.0	34.6	54.0	-19.4	
4923.992	28.0	6.3	170.0	1.1	3.0	0.0	H-Horn	AV	0.0	34.3	54.0	-19.7	
4924.511	42.5	6.3	170.0	1.1	3.0	0.0	H-Horn	PK	0.0	48.8	74.0	-25.2	
4924.790	39.7	6.3	223.0	1.0	3.0	0.0	V-Horn	PK	0.0	46.0	74.0	-28.0	

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DEVIATIONS FROM TEST STANDARD												
No deviations.												
RESULTS		Pass										
Test Distance (m)		3										
Run #		3										
Configuration ID:		Tested By: <i>Holly Ashkannejhad</i>										
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)
12311.220	20.0	17.2	56.0	3.9	3.0	0.0	V-Horn	AV	0.0	37.2	54.0	-16.8
12312.020	19.8	17.2	102.0	1.0	3.0	0.0	H-Horn	AV	0.0	37.0	54.0	-17.0
7387.595	22.0	12.0	254.0	3.2	3.0	0.0	V-Horn	AV	0.0	34.0	54.0	-20.0
7388.466	22.0	12.0	317.0	3.4	3.0	0.0	H-Horn	AV	0.0	34.0	54.0	-20.0
12310.090	33.4	17.2	102.0	1.0	3.0	0.0	H-Horn	PK	0.0	50.6	74.0	-23.4
12308.910	33.0	17.2	56.0	3.9	3.0	0.0	V-Horn	PK	0.0	50.2	74.0	-23.8
7387.371	35.3	12.0	254.0	3.2	3.0	0.0	V-Horn	PK	0.0	47.3	74.0	-26.7
7385.852	35.1	12.0	317.0	3.4	3.0	0.0	H-Horn	PK	0.0	47.1	74.0	-26.9

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COMMENTS													
CK31/CK31NI charging in the AD1 dock.													
EUT OPERATING MODES													
Transmitting 802.11(b), 11Mbps, mid channel													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
RESULTS		Pass		<div style="text-align: center;">  </div>									
Test Distance (m)		3											
Run #		5											
Configuration ID:													
													
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	Spec. (dB)	Compared to Spec. (dB)
4883.936	56.1	6.2	162.0	1.2	3.0	0.0	H-Horn	PK	0.0	62.3	74.0	-11.7	
4883.690	34.3	6.2	162.0	1.2	3.0	0.0	H-Horn	AV	0.0	40.5	54.0	-13.5	
4884.020	54.2	6.2	169.0	1.3	3.0	0.0	V-Horn	PK	0.0	60.4	74.0	-13.6	
4884.020	34.1	6.2	169.0	1.3	3.0	0.0	V-Horn	AV	0.0	40.3	54.0	-13.7	

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7325.170	36.6	11.9	217.0	1.4	3.0	0.0	V-Horn	AV	0.0	48.5	54.0	-5.5
7325.260	35.6	11.9	130.0	1.1	3.0	0.0	H-Horn	AV	0.0	47.5	54.0	-6.5
12210.550	28.9	17.1	99.0	2.1	3.0	0.0	H-Horn	AV	0.0	46.0	54.0	-8.0
12214.020	27.2	17.1	189.0	1.2	3.0	0.0	V-Horn	AV	0.0	44.3	54.0	-9.7
7329.610	47.2	11.8	217.0	1.4	3.0	0.0	V-Horn	PK	0.0	59.0	74.0	-15.0
7328.270	45.1	11.8	130.0	1.1	3.0	0.0	H-Horn	PK	0.0	56.9	74.0	-17.1
12205.670	39.2	17.1	99.0	2.1	3.0	0.0	H-Horn	PK	0.0	56.3	74.0	-17.7
12214.020	36.4	17.1	189.0	1.2	3.0	0.0	V-Horn	PK	0.0	53.5	74.0	-20.5

NORTHWEST EMC		RADIATED EMISSIONS DATA SHEET										PSA 2005.6.9 BETA EMI 2005.6.7	
EUT: 802MIG2		Work Order: INMC0228											
Serial Number:		Date: 06/11/05											
Customer: INTERMEC Technologies Corporation		Temperature: 24											
Attendees: none		Humidity: 43%											
Configuration ID:		Barometric Pressure: 29.95											
Tested by: Holly Ashkannejhad		Power: 120VAC, 60Hz		Job Site: EV01									
TEST SPECIFICATIONS												Test Method	
FCC 15.247(d) Spurious Radiated Emissions:2005-04												ANSI C63.4:2003	
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													
CK31/CK31NI charging in the AD1 dock.													
EUT OPERATING MODES													
Transmitting 802.11(b), 11Mbps, low channel													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
RESULTS		Pass		<div style="text-align: center;">  </div>									
Test Distance (m)		3											
Run #		7											
Configuration ID:													
													
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)	
4824.009	31.2	5.8	181.0	1.2	3.0	0.0	V-Horn	AV	0.0	37.0	54.0	-17.0	
4823.985	30.2	5.8	155.0	1.2	3.0	0.0	H-Horn	AV	0.0	36.0	54.0	-18.0	
4823.838	44.4	5.8	155.0	1.2	3.0	0.0	H-Horn	PK	0.0	50.2	74.0	-23.8	
4824.009	42.1	5.8	181.0	1.2	3.0	0.0	V-Horn	PK	0.0	47.9	74.0	-26.1	

EUT: 802MIG2		Work Order: INMC0228	
Serial Number:		Date: 06/11/05	
Customer: INTERMEC Technologies Corporation		Temperature: 23	
Attendees: none		Humidity: 43%	
Configuration ID:		Barometric Pressure: 29.95	
Tested by: Holly Ashkannejhad		Power: 120VAC, 60Hz	
		Job Site: EV01	
TEST SPECIFICATIONS			
FCC 15.247(d) Spurious Radiated Emissions:2005-04		ANSI C63.4:2003	
Test Method			

ANSI C63.4:2003

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

CK31/CK31NI charging in the AD1 dock.

EUT OPERATING MODES

Transmitting mid channel, see comments for configuration

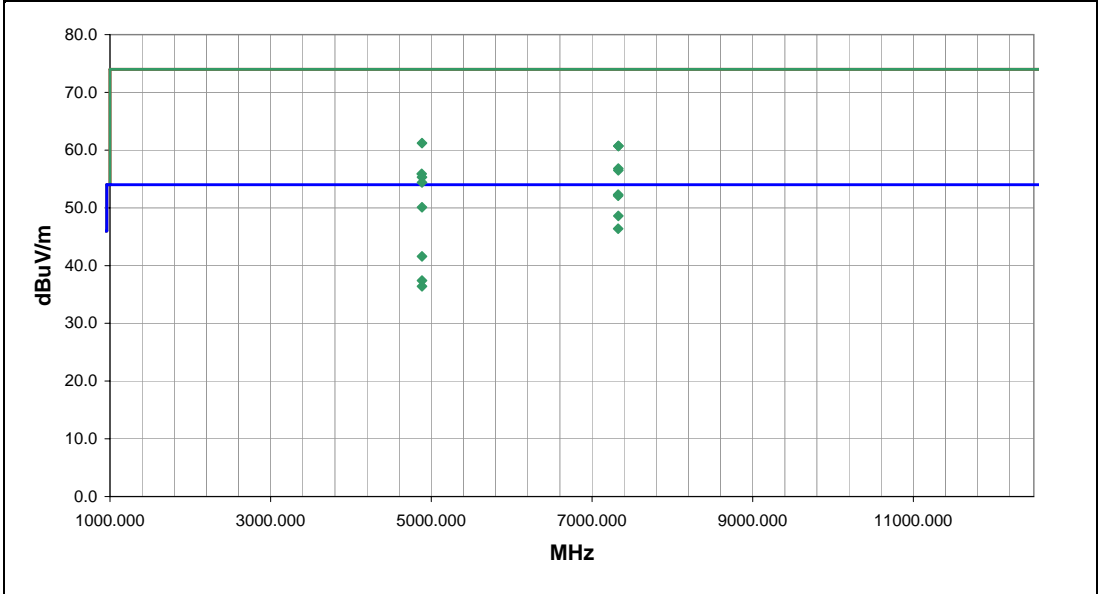
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS

Test Distance (m)	Pass
Run #	3
Configuration ID:	9

Tested By: *Holly Ashkannejhad*



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
7325.197	40.4	11.9	175.0	154.0	3.0	0.0	H-Horn	AV	0.0	52.3	54.0	-1.7	802.11(b), 1Mbit
7325.200	40.2	11.9	216.0	100.0	3.0	0.0	V-Horn	AV	0.0	52.1	54.0	-1.9	802.11(b), 1Mbit
4883.999	43.9	6.2	152.0	120.0	3.0	0.0	H-Horn	AV	0.0	50.1	54.0	-3.9	802.11(b), 1Mbit
7327.310	36.7	11.9	215.0	100.0	3.0	0.0	V-Horn	AV	0.0	48.6	54.0	-5.4	802.11(g) 6Mbits
7325.080	34.5	11.9	183.0	208.0	3.0	0.0	H-Horn	AV	0.0	46.4	54.0	-7.6	802.11(g) 6Mbits
4883.984	35.4	6.2	167.0	0.0	3.0	0.0	V-Horn	AV	0.0	41.6	54.0	-12.4	802.11(b), 1Mbit
4884.137	55.0	6.2	152.0	120.0	3.0	0.0	H-Horn	PK	0.0	61.2	74.0	-12.8	802.11(b), 1Mbit
7328.110	48.9	11.8	215.0	100.0	3.0	0.0	V-Horn	PK	0.0	60.7	74.0	-13.3	802.11(g) 6Mbits
7330.520	48.9	11.8	183.0	208.0	3.0	0.0	H-Horn	PK	0.0	60.7	74.0	-13.3	802.11(g) 6Mbits
4884.030	31.2	6.2	159.0	120.0	3.0	0.0	H-Horn	AV	0.0	37.4	54.0	-16.6	802.11(g) 6Mbits
7327.362	45.0	11.8	175.0	154.0	3.0	0.0	H-Horn	PK	0.0	56.8	74.0	-17.2	802.11(b), 1Mbit
7327.110	44.7	11.8	216.0	100.0	3.0	0.0	V-Horn	PK	0.0	56.5	74.0	-17.5	802.11(b), 1Mbit
4884.020	30.2	6.2	185.0	135.0	3.0	0.0	V-Horn	AV	0.0	36.4	54.0	-17.6	802.11(g) 6Mbits
4880.240	49.7	6.2	159.0	120.0	3.0	0.0	H-Horn	PK	0.0	55.9	74.0	-18.1	802.11(g) 6Mbits
4883.885	49.1	6.2	167.0	0.0	3.0	0.0	V-Horn	PK	0.0	55.3	74.0	-18.7	802.11(b), 1Mbit
4884.020	48.2	6.2	185.0	135.0	3.0	0.0	V-Horn	PK	0.0	54.4	74.0	-19.6	802.11(g) 6Mbits

NORTHWEST EMC		RADIATED EMISSIONS DATA SHEET		PSA 2005.6.9 BETA EMI 2005.6.7								
EUT: 802MIG2			Work Order: INMC0228									
Serial Number:			Date: 06/11/05									
Customer: INTERMEC Technologies Corporation			Temperature: 23									
Attendees: none			Humidity: 43%									
Configuration ID:			Barometric Pressure: 29.95									
Tested by: Holly Ashkannejhad		Power: 120VAC, 60Hz	Job Site: EV01									
TEST SPECIFICATIONS			Test Method									
FCC 15.247(d) Spurious Radiated Emissions:2005-04			ANSI C63.4:2003									
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												
CK31/CK31NI charging in the AD1 dock.												
EUT OPERATING MODES												
Transmitting 802.11(b), 11Mbps, low channel												
DEVIATIONS FROM TEST STANDARD												
No deviations.												
RESULTS		Pass										
Test Distance (m)		3										
Run #		10										
Configuration ID:		Tested By: <i>Holly Ashkannejhad</i>										
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)
19295.910	32.6	8.9	144.0	1.0	3.0	0.0	V-High Horr	AV	0.0	41.5	54.0	-12.5
19295.880	31.9	8.9	145.0	1.0	3.0	0.0	V-High Horr	AV	0.0	40.8	54.0	-13.2
19298.790	39.0	8.9	144.0	1.0	3.0	0.0	V-High Horr	PK	0.0	47.9	74.0	-26.1
19298.700	38.7	8.9	145.0	1.0	3.0	0.0	V-High Horr	PK	0.0	47.6	74.0	-26.4

NORTHWEST EMC		RADIATED EMISSIONS DATA SHEET		PSA 2005.6.9 BETA EMI 2005.6.7								
EUT: 802MIG2		Work Order: INMC0228										
Serial Number:		Date: 06/11/05										
Customer: INTERMEC Technologies Corporation		Temperature: 23										
Attendees: none		Humidity: 43%										
Configuration ID:		Barometric Pressure: 29.95										
Tested by: Holly Ashkannejhad		Power: 120VAC, 60Hz		Job Site: EV01								
TEST SPECIFICATIONS		Test Method										
FCC 15.247(d) Spurious Radiated Emissions:2005-04		ANSI C63.4:2003										
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												
CK31/CK31NI charging in the AD1 dock.												
EUT OPERATING MODES												
Transmitting 802.11(b), 11Mbps, mid channel												
DEVIATIONS FROM TEST STANDARD												
No deviations.												
RESULTS		Pass										
Test Distance (m)		3										
Run #		11										
Configuration ID:		Tested By: <i>Holly Ashkannejhad</i>										
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)
19535.910	29.4	9.4	137.0	1.0	3.0	0.0	V-High Horr	AV	0.0	38.8	54.0	-15.2
19535.850	28.2	9.4	134.0	1.0	3.0	0.0	I-High Horr	AV	0.0	37.6	54.0	-16.4
19538.910	37.0	9.4	134.0	1.0	3.0	0.0	I-High Horr	PK	0.0	46.4	74.0	-27.6
19537.880	36.6	9.4	137.0	1.0	3.0	0.0	V-High Horr	PK	0.0	46.0	74.0	-28.0

NORTHWEST EMC		RADIATED EMISSIONS DATA SHEET		PSA 2005.6.9 BETA EMI 2005.6.7								
EUT: 802MIG2		Work Order: INMC0228										
Serial Number:		Date: 06/11/05										
Customer: INTERMEC Technologies Corporation		Temperature: 23										
Attendees: none		Humidity: 43%										
Configuration ID:		Barometric Pressure: 29.95										
Tested by: Holly Ashkannejhad		Power: 120VAC, 60Hz		Job Site: EV01								
TEST SPECIFICATIONS			Test Method									
FCC 15.247(d) Spurious Radiated Emissions:2005-04			ANSI C63.4:2003									
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												
CK31/CK31NI charging in the AD1 dock.												
EUT OPERATING MODES												
Transmitting 802.11(b), 11Mbps, high channel												
DEVIATIONS FROM TEST STANDARD												
No deviations.												
RESULTS		Pass										
Test Distance (m)		3										
Run #		12										
Configuration ID:		Tested By: <i>Holly Ashkannejhad</i>										
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)
19695.940	27.0	9.6	129.0	2.0	3.0	0.0	I-High Horr	AV	0.0	36.6	54.0	-17.4
19695.820	26.8	9.6	187.0	2.0	3.0	0.0	V-High Horr	AV	0.0	36.4	54.0	-17.6
19695.990	36.1	9.6	129.0	2.0	3.0	0.0	I-High Horr	PK	0.0	45.7	74.0	-28.3
19693.290	36.0	9.6	187.0	2.0	3.0	0.0	V-High Horr	PK	0.0	45.6	74.0	-28.4

NORTHWEST

EMI

RADIATED EMISSIONS DATA SHEET

PSA 2005.6.9 BETA
EMI 2005.7.13

EUT: 802MIG2		Work Order: INMC0228	
Serial Number:		Date: 06/13/05	
Customer: INTERMEC Technologies Corporation		Temperature: 23	
Attendees: none		Humidity: 40%	
Configuration ID:		Barometric Pressure 29.95	
Tested by: Rod Peloquin		Power: 120VAC, 60Hz	
		Job Site: EV01	

TEST SPECIFICATIONS

Test Method

FCC 15.247(d) Spurious Radiated Emissions:2005-04

ANSI C63.4:2003

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


CK31/CK31NI charging in the AD1 dock.

EUT OPERATING MODES

Transmitting 802.11

DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS	Pass	<div>Tested By: </div>
Test Distance (m)	3	
Run #	16	
Configuration ID:		

80.0

70.0

60.0

50.0

40.0

30.0

20.0

10.0

0.0

2400.000

2410.000

2420.000

2430.000

2440.000

2450.000

2460.000

2470.000

2480.000

2490.000

2500.000

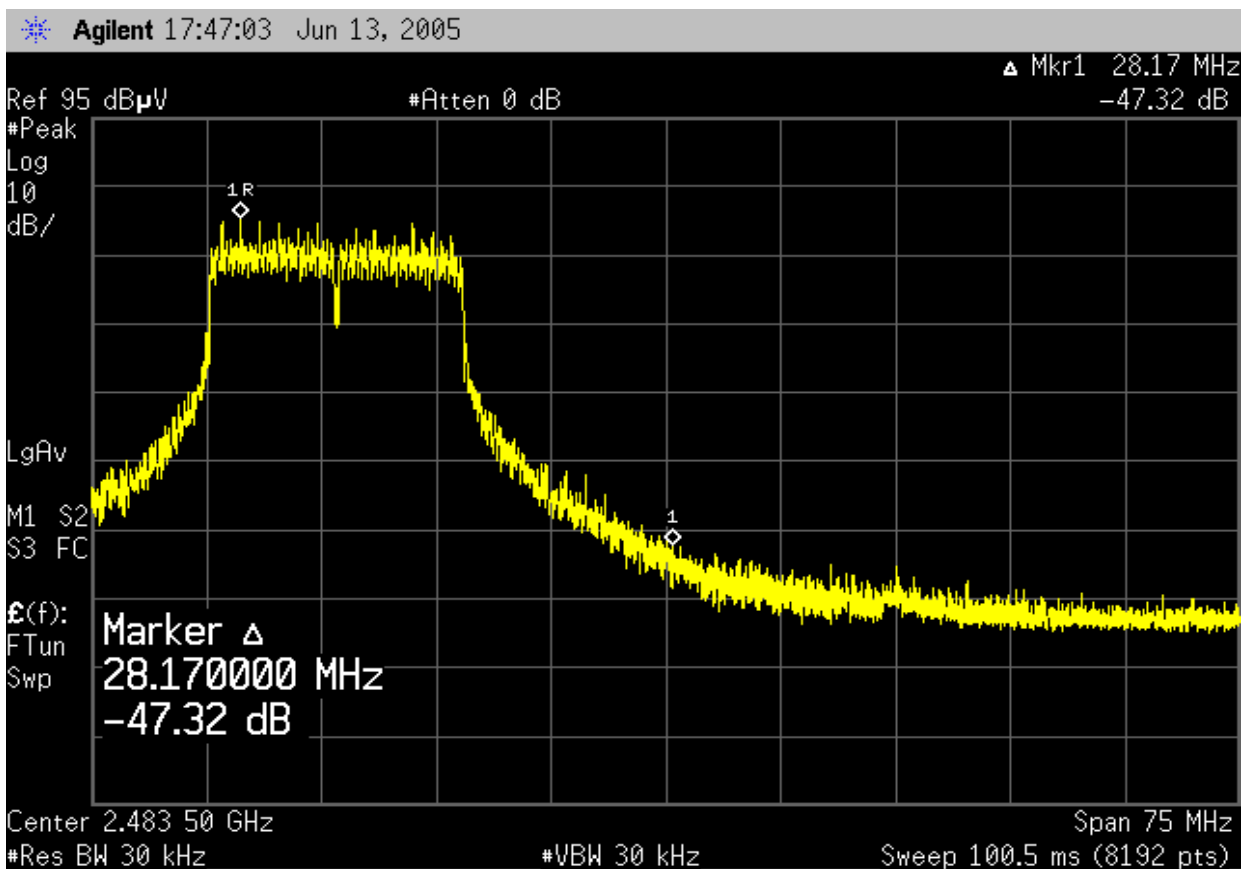
dBuV/m

MHz

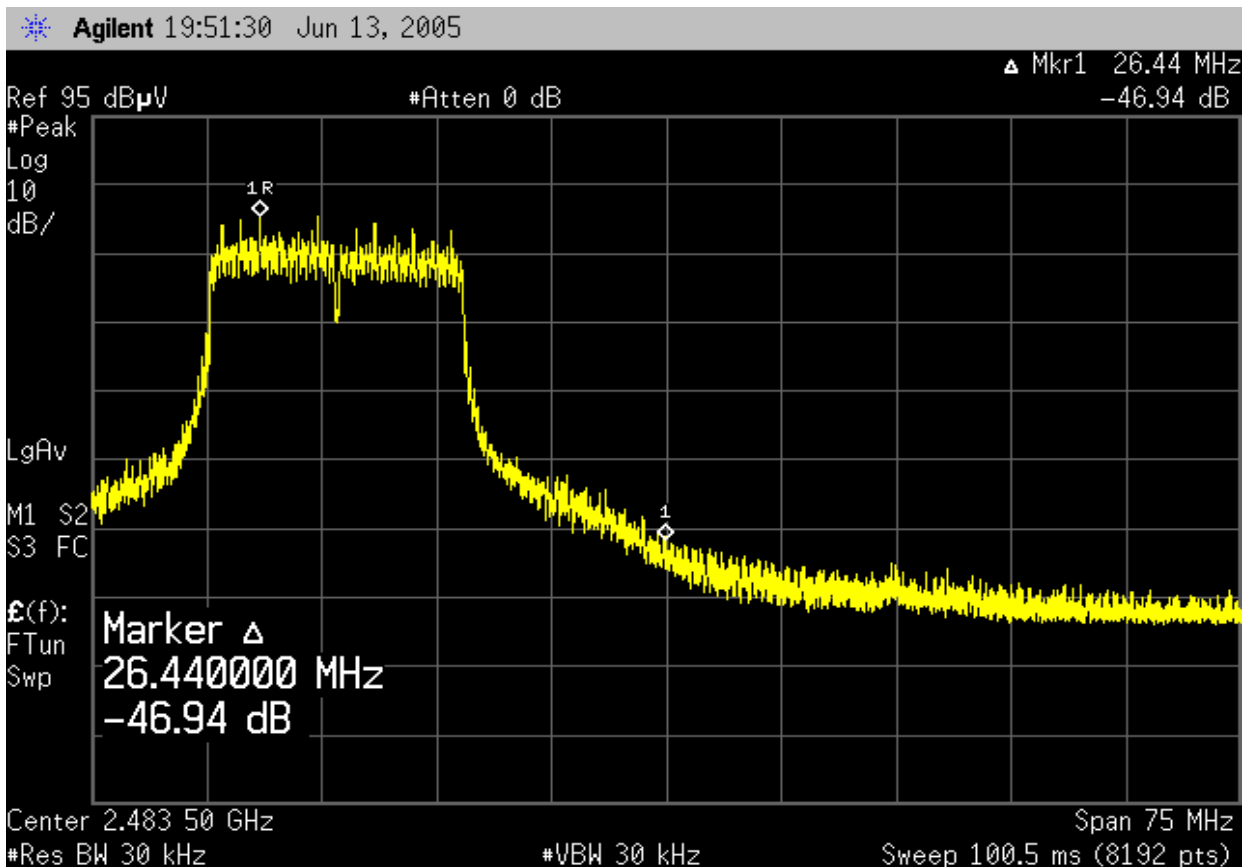
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
2462.000	82.0	-2.3	146.0	1.1	3.0	20.0	V-Horn	AV	0.0	99.7	N/A	N/A	802.11(g), 6Mbps, Fundamental
2483.500	34.7	-2.3	145.0	1.1	3.0	20.0	V-Horn	AV	0.0	52.4	54.0	-1.6	802.11(g), 6Mbps, -47.32 dB marker delta applied
2462.000	91.1	-2.3	146.0	1.1	3.0	20.0	V-Horn	PK	0.0	108.8	N/A	N/A	802.11(g), 6Mbps, Fundamental
2483.500	43.8	-2.3	146.0	1.1	3.0	20.0	V-Horn	PK	0.0	61.5	74.0	-12.5	802.11(g), 6Mbps, -47.32 dB marker delta applied
2462.000	81.8	-2.3	144.0	1.2	3.0	20.0	V-Horn	AV	0.0	99.5	N/A	N/A	802.11(g), 36Mbps, Fundamental
2483.500	34.9	-2.3	186.0	1.2	3.0	20.0	V-Horn	AV	0.0	52.6	54.0	-1.4	802.11(g), 36Mbps, -46.94 dB marker delta applied
2462.000	92.9	-2.3	144.0	1.2	3.0	20.0	V-Horn	PK	0.0	110.6	N/A	N/A	802.11(g), 36Mbps, Fundamental
2483.500	46.0	-2.3	144.0	1.2	3.0	20.0	V-Horn	PK	0.0	63.7	74.0	-10.3	802.11(g), 36Mbps, -46.94 dB marker delta applied
2462.000	78.8	-2.3	59.0	1.3	3.0	20.0	H-Horn	AV	0.0	96.5	N/A	N/A	802.11(g), 36Mbps, Fundamental
2483.500	33.1	-2.3	238.0	1.3	3.0	20.0	H-Horn	AV	0.0	50.8	54.0	-3.2	802.11(g), 36Mbps, -45.68 dB marker delta applied
2462.000	89.7	-2.3	59.0	1.3	3.0	20.0	H-Horn	PK	0.0	107.4	N/A	N/A	802.11(g), 36Mbps, Fundamental
2483.500	44.0	-2.3	59.0	1.3	3.0	20.0	H-Horn	PK	0.0	61.7	74.0	-12.3	802.11(g), 36Mbps, -45.68 dB marker delta applied
2462.000	80.0	-2.3	176.0	1.2	3.0	20.0	V-Horn	AV	0.0	97.7	N/A	N/A	802.11(g), 54Mbps, Fundamental
2483.500	35.7	-2.3	144.0	1.4	3.0	20.0	V-Horn	AV	0.0	53.4	54.0	-0.6	802.11(g), 54Mbps, -44.3 dB marker delta applied

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
2462.000	91.0	-2.3	176.0	1.2	3.0	20.0	V-Horn	PK	0.0	108.7	N/A	N/A	802.11(g), 54Mbps, Fundamental
2483.500	46.7	-2.3	176.0	1.2	3.0	20.0	V-Horn	PK	0.0	64.4	74.0	-9.6	802.11(g), 54Mbps, -44.3 dB marker delta applied
2462.000	77.5	-2.3	86.0	1.3	3.0	20.0	H-Horn	AV	0.0	95.2	N/A	N/A	802.11(g), 54Mbps, Fundamental
2483.500	34.7	-2.3	195.0	1.3	3.0	20.0	H-Horn	AV	0.0	52.4	54.0	-1.6	802.11(g), 54Mbps, -42.83 marker delta applied
2462.000	87.7	-2.3	86.0	1.3	3.0	20.0	H-Horn	PK	0.0	105.4	N/A	N/A	802.11(g), 54Mbps, Fundamental
2483.500	44.9	-2.3	86.0	1.3	3.0	20.0	H-Horn	PK	0.0	62.6	74.0	-11.4	802.11(g), 54Mbps, -42.83 marker delta applied
2483.500	55.4	-2.3	177.0	1.2	3.0	20.0	V-Horn	PK	0.0	73.1	74.0	-0.9	802.11(b), 1Mbps
2483.500	55.3	-2.3	222.0	1.4	3.0	20.0	V-Horn	PK	0.0	73.0	74.0	-1.0	802.11(b), 11Mbps
2483.500	55.1	-2.3	293.0	1.3	3.0	20.0	H-Horn	PK	0.0	72.8	74.0	-1.2	802.11(b), 11Mbps
2483.500	55.0	-2.3	93.0	2.0	3.0	20.0	H-Horn	PK	0.0	72.7	74.0	-1.3	802.11(g), 6Mbps
2483.500	54.1	-2.3	199.0	1.3	3.0	20.0	H-Horn	PK	0.0	71.8	74.0	-2.2	802.11(b), 1Mbps
2483.500	29.3	-2.3	93.0	2.0	3.0	20.0	H-Horn	AV	0.0	47.0	54.0	-7.0	802.11(g), 6Mbps
2483.500	27.9	-2.3	179.0	1.2	3.0	20.0	V-Horn	AV	0.0	45.6	54.0	-8.4	802.11(b), 1Mbps
2483.500	27.2	-2.3	222.0	1.4	3.0	20.0	V-Horn	AV	0.0	44.9	54.0	-9.1	802.11(b), 11Mbps
2483.500	27.0	-2.3	293.0	1.3	3.0	20.0	H-Horn	AV	0.0	44.7	54.0	-9.3	802.11(b), 11Mbps
2483.500	26.8	-2.3	199.0	1.3	3.0	20.0	H-Horn	AV	0.0	44.5	54.0	-9.5	802.11(b), 1Mbps

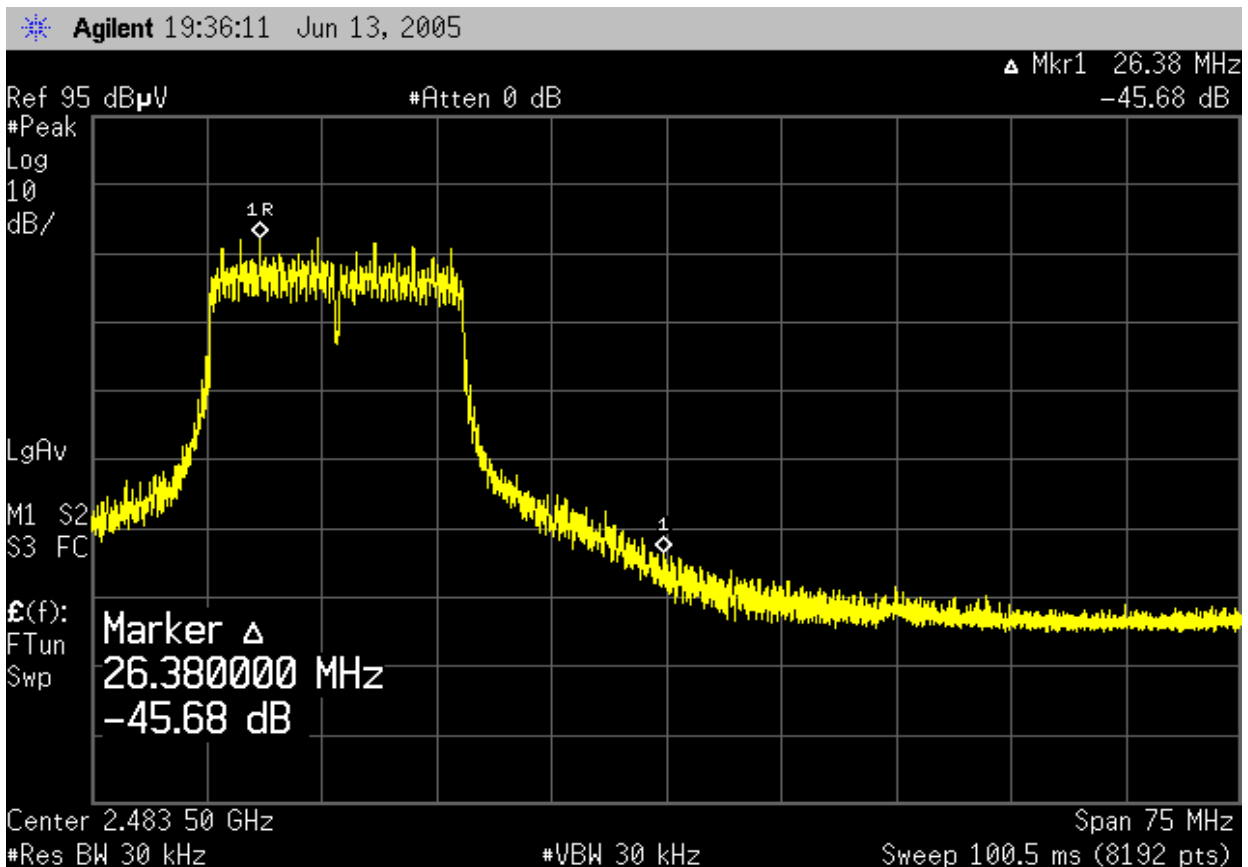
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EUT: 802MIG2		Work Order: INMC0228			
Serial Number:		Date: 06/13/05			
Customer: INTERMEC Technologies Corporation		Temperature: 23			
Attendees: none		Humidity: 40%			
Configuration ID:		Barometric Pressure: 29.95			
Tested by: Rod Peloquin		Power: 120VAC, 60Hz		Job Site: EV01	
TEST SPECIFICATIONS			Test Method		
FCC 15.247(d) Spurious Radiated Emissions: 2005-04			ANSI C63.4:2003		
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					
CK31/CK31NI charging in the AD1 dock.					
EUT OPERATING MODES					
Transmitting 802.11, High Channel					
DEVIATIONS FROM TEST STANDARD					
No deviations.					
Marker Delta - 6Mbps - Vertical					



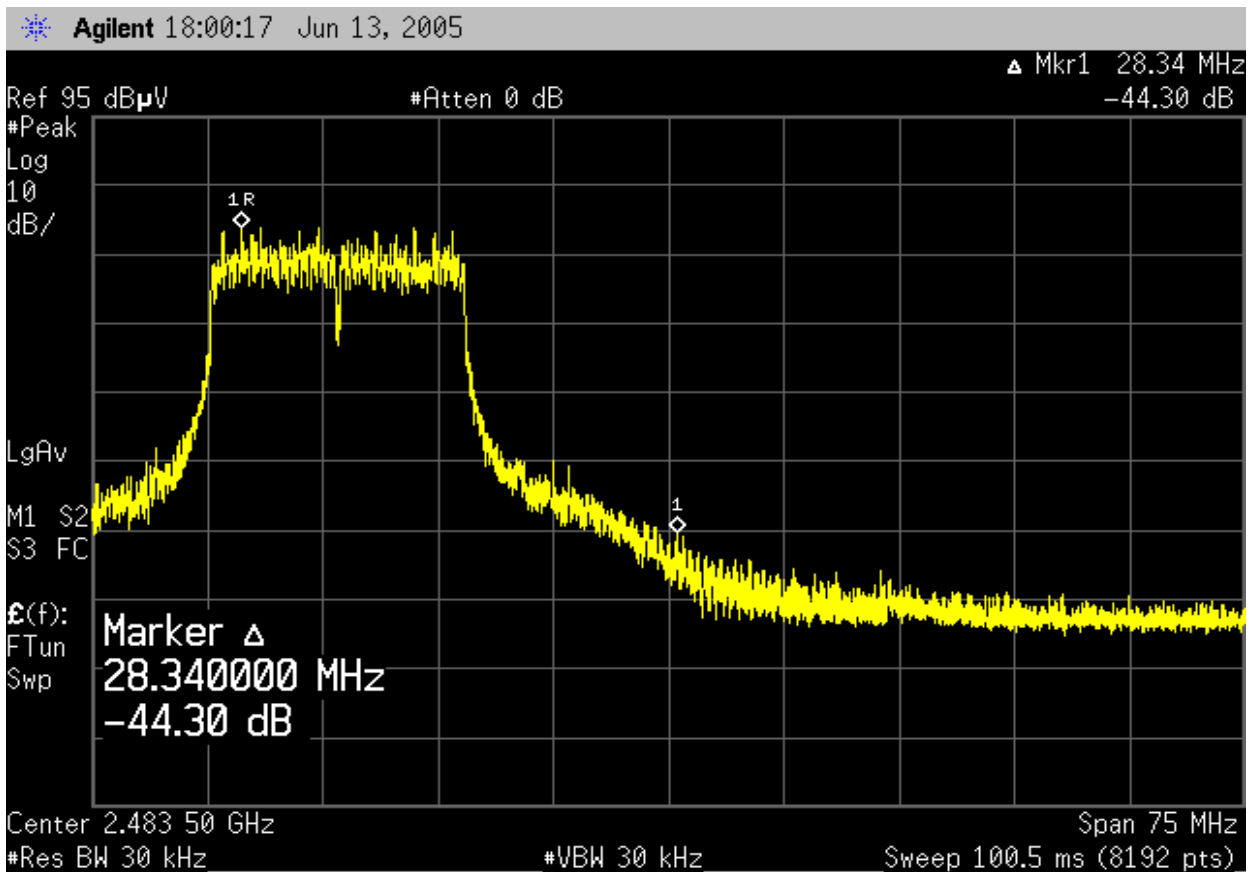
NORTHWEST EMC		RADIATED EMISSIONS DATA SHEET		PSA 2005.6.9 BETA EMI 2005.7.13	
EUT: 802MIG2		Work Order: INMC0228			
Serial Number:		Date: 06/13/05			
Customer: INTERMEC Technologies Corporation		Temperature: 23			
Attendees: none		Humidity: 40%			
Configuration ID:		Barometric Pressure: 29.95			
Tested by: Rod Peloquin		Power: 120VAC, 60Hz		Job Site: EV01	
TEST SPECIFICATIONS			Test Method		
FCC 15.247(d) Spurious Radiated Emissions: 2005-04			ANSI C63.4:2003		
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					
CK31/CK31NI charging in the AD1 dock.					
EUT OPERATING MODES					
Transmitting 802.11, High Channel					
DEVIATIONS FROM TEST STANDARD					
No deviations.					
Marker Delta - 36Mbps - Vertical					



NORTHWEST EMC		RADIATED EMISSIONS DATA SHEET		PSA 2005.6.9 BETA EMI 2005.7.13	
EUT: 802MIG2		Work Order: INMC0228			
Serial Number:		Date: 06/13/05			
Customer: INTERMEC Technologies Corporation		Temperature: 23			
Attendees: none		Humidity: 40%			
Configuration ID:		Barometric Pressure: 29.95			
Tested by: Rod Peloquin		Power: 120VAC, 60Hz		Job Site: EV01	
TEST SPECIFICATIONS			Test Method		
FCC 15.247(d) Spurious Radiated Emissions:2005-04			ANSI C63.4:2003		
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					
CK31/CK31NI charging in the AD1 dock.					
EUT OPERATING MODES					
Transmitting 802.11, High Channel					
DEVIATIONS FROM TEST STANDARD					
No deviations.					
Marker Delta - 36Mbps - Horizontal					



NORTHWEST EMC		RADIATED EMISSIONS DATA SHEET		PSA 2005.6.9 BETA EMI 2005.7.13	
EUT: 802MIG2		Work Order: INMC0228			
Serial Number:		Date: 06/13/05			
Customer: INTERMEC Technologies Corporation		Temperature: 23			
Attendees: none		Humidity: 40%			
Configuration ID:		Barometric Pressure: 29.95			
Tested by: Rod Peloquin		Power: 120VAC, 60Hz		Job Site: EV01	
TEST SPECIFICATIONS			Test Method		
FCC 15.247(d) Spurious Radiated Emissions: 2005-04			ANSI C63.4:2003		
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					
CK31/CK31NI charging in the AD1 dock.					
EUT OPERATING MODES					
Transmitting 802.11, High Channel					
DEVIATIONS FROM TEST STANDARD					
No deviations.					
Marker Delta - 54Mbps - Vertical					



NORTHWEST EMC		RADIATED EMISSIONS DATA SHEET		PSA 2005.6.9 BETA EMI 2005.7.13	
EUT: 802MIG2		Work Order: INMC0228			
Serial Number:		Date: 06/13/05			
Customer: INTERMEC Technologies Corporation		Temperature: 23			
Attendees: none		Humidity: 40%			
Configuration ID:		Barometric Pressure: 29.95			
Tested by: Rod Peloquin		Power: 120VAC, 60Hz		Job Site: EV01	
TEST SPECIFICATIONS			Test Method		
FCC 15.247(d) Spurious Radiated Emissions:2005-04			ANSI C63.4:2003		
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					
CK31/CK31NI charging in the AD1 dock.					
EUT OPERATING MODES					
Transmitting 802.11, High Channel					
DEVIATIONS FROM TEST STANDARD					
No deviations.					
Marker Delta - 54Mbps - Horizontal					

