

# Intermec Technologies Corporation

## 802MIG2 in CK31/CK31NI

November 16, 2004

Report No. INMC0142 Rev 01

Report Prepared By



[www.nwemc.com](http://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: November 16, 2004  
Intermec Technologies Corporation  
802MIG2 in CK31/CK31NI

		Emissions	
Specification	Test Method	Pass	Fail
FCC 15.247(d):2004 Radiated Spurious Emissions	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>

**Modifications made to the product**  
See the Modifications section of this report

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.*

<b>Revision Number</b>	<b>Description</b>	<b>Date</b>	<b>Page Number</b>
01	Corrected EUT Model Number	11/21/04	1,2,11,14,16-22
01	Added Model numbers for two peripherals	11/21/04	14
01	Corrected spec limit details	11/21/04	2, 16-22

**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, 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. Accreditation has been granted to Northwest EMC, Inc. under Certificate Numbers: 200629-0, 200630-0, and 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 Nos. - 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?

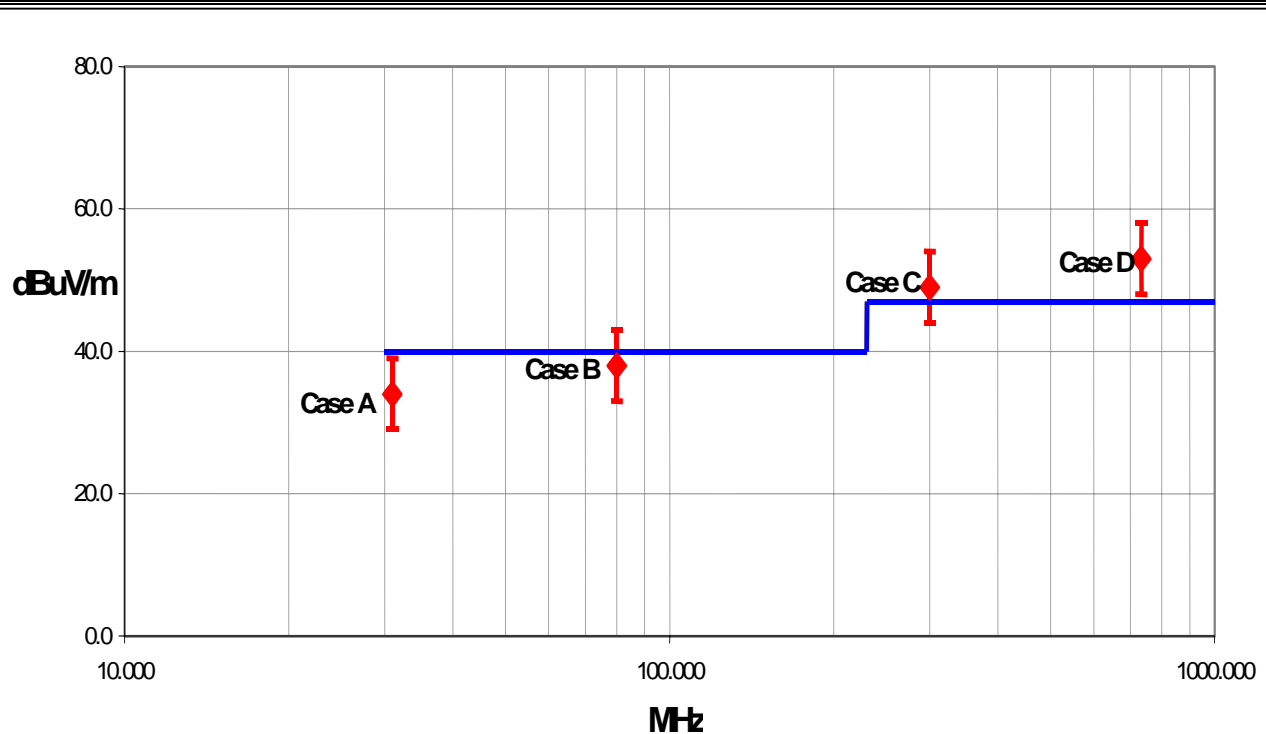
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following 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	+ 1.82	+ 2.23	+ 1.29	+ 1.31	+ 1.25
		- 1.88	- 1.87	- 1.41	- 1.26	- 1.27	- 1.25
Expanded uncertainty $U$ (level of confidence ≈ 95%)	normal (k=2)	+ 3.72	+ 3.64	+ 4.46	+ 2.59	+ 2.61	+ 2.49
		- 3.77	- 3.73	- 2.81	- 2.52	- 2.55	- 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	+ 1.29	+ 1.38	+ 1.38
		- 1.25	- 1.25	- 1.35	- 1.35
Expanded uncertainty $U$ (level of confidence ≈ 95%)	normal (k=2)	+ 2.57	+ 2.57	+ 2.76	+ 2.76
		- 2.51	- 2.51	- 2.70	- 2.70

**Conducted Emissions**

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

**Radiated Immunity**

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

**Conducted Immunity**

	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty $U$ (level of confidence ≈ 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**

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



**Oregon**

**Evergreen Facility**

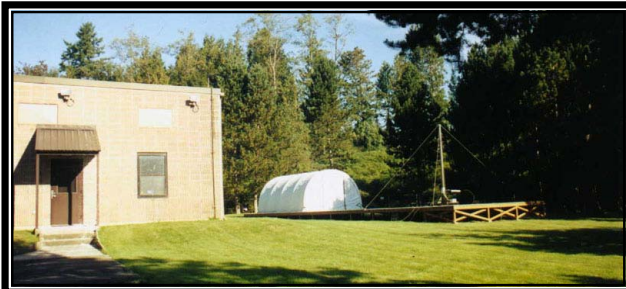
22975 NW Evergreen Pkwy.,  
Suite 400  
Hillsboro, OR 97124  
(503) 844-4066  
FAX (503) 844-3826



**Oregon**

**Trails End Facility**

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



**Washington**

**Sultan Facility**

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



**Party Requesting the Test**

<b>Company Name:</b>	Intermec Technologies Corporation
<b>Address:</b>	6001 36th Avenue West
<b>City, State, Zip:</b>	Everett, WA 98203
<b>Test Requested By:</b>	Katie Molina
<b>Model:</b>	802MIG2 in CK31/CK31NI
<b>First Date of Test:</b>	August 10, 2004
<b>Last Date of Test:</b>	August 11, 2004
<b>Receipt Date of Samples:</b>	August 10, 2004
<b>Equipment Design Stage:</b>	Production
<b>Equipment Condition:</b>	No visual damage.

**Information Provided by the Party Requesting the Test**

<b>Clocks/Oscillators:</b>	2400 – 2483.5 MHz
<b>I/O Ports:</b>	None

**Functional Description of the EUT (Equipment Under Test):**

PCMCIA Radio (FCC 15.247, 802.11b/g)
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**Client Justification for EUT Selection:**

Not Provided
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**Client Justification for Test Selection:**

Testing required for Class 2 Permissive change
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**Equipment modifications**

Item	Test	Date	Modification	Note	Disposition of EUT
1	Spurious Radiated Emissions	08/11/2004	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:**

Low
Mid
High

**Operating Modes Investigated:**

Typical for both IEEE 802.11(b) and IEEE 802.11(g)
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**Data Rates Investigated:**

6 Mbit
36 Mbit
54 Mbit
1 Mbit
11 Mbit

**Power Input Settings Investigated:**

120 VAC, 60 Hz.
Battery

**Frequency Range Investigated**

<b>Start Frequency</b>	30 MHz	<b>Stop Frequency</b>	26.5 GHz
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**Software\Firmware Applied During Test**

<b>Exercise software</b>	FCCTEST.EXE	<b>Version</b>	Unknown
<b>Description</b>			
The system was tested using special software developed to test all functions of the device during the test.			

EUT and Peripherals			
Description	Manufacturer	Model/Part Number	Serial Number
PCMCIA Radio	Intermec Technologies Corporation	802MIG2	Unknown
Host Device	Intermec Technologies Corporation	CK31/CK31NI	HH21
Docking station	Intermec Technologies Corporation	AD1	09890400117
DC Power Supply	Intermec Technologies Corporation	073573	0000419
CAC Reader & Adapter	Intermec Technologies Corporation	074102	N/A
Serial Adapter	Intermec Technologies Corporation	074144	N/A

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Serial	Yes	1.0	No	Serial Adapter or Docking station	Unterminated
Ethernet	No	1.3	No	Docking station	Unterminated
USB	Yes	1.25	No	Docking station	Unterminated
DC Power	No	1.9	Yes	DC Power Supply	Docking station
AC Power	No	1.8	No	DC Power Supply	AC Power

Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/23/2003	13 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	02/05/2004	13 mo
Antenna, Horn	EMCO	3115	AHC	09/18/2003	12 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APJ	01/05/2004	13 mo
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	10/08/2003	12 mo
Antenna, Horn	EMCO	3160-09	AHG	NCR	NA
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APC	10/08/2003	12 mo
Antenna, Horn	EMCO	3160-08	AHK	NCR	NA
High Pass Filter	Micro-Tronics	HPM50111	HFO	04/13/2004	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:



EUT: CK31/CK31NI	Work Order: INMC0142
Serial Number:	Date: 08/10/04
Customer: INTERMEC Technologies Corporation	Temperature: 75
Attendees: none	Humidity: 42%
Cust. Ref. No.: N/A	Barometric Pressure: 29.97
Tested by: Rod Peloquin	Power: Battery
	Job Site: EV01

<b>TEST SPECIFICATIONS</b>	
Specification: FCC 15.247(d) Spurious Radiated Emissions	Year: 2004
Method: ANSI C63.4	Year: 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**

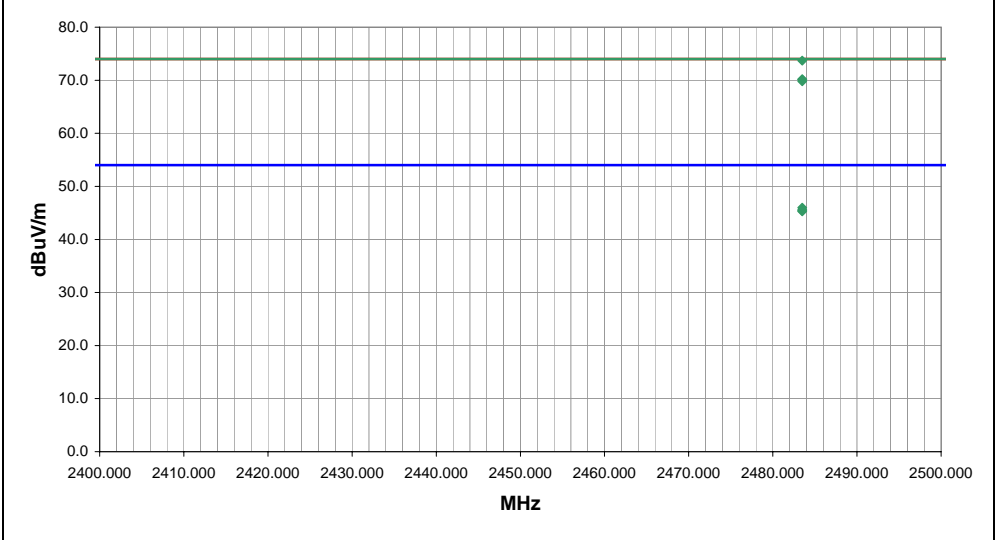
**EUT OPERATING MODES**  
 802.11(b), high channel

**DEVIATIONS FROM TEST STANDARD**  
 No deviations.

<b>RESULTS</b>	Run #
Pass	3

Other

*Rod Peloquin*  
 \_\_\_\_\_  
 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
2483.500	56.2	-2.5	228.0	1.1	3.0	20.0	H-Horn	PK	0.0	73.7	74.0	-0.3	11 Mbps
2483.500	52.7	-2.5	12.0	1.2	3.0	20.0	V-Horn	PK	0.0	70.2	74.0	-3.8	11 Mbps
2483.500	52.6	-2.5	245.0	1.3	3.0	20.0	H-Horn	PK	0.0	70.1	74.0	-3.9	1 Mbps
2483.500	52.3	-2.5	10.0	1.1	3.0	20.0	V-Horn	PK	0.0	69.8	74.0	-4.2	1 Mbps
2483.500	28.5	-2.5	228.0	1.1	3.0	20.0	H-Horn	AV	0.0	46.0	54.0	-8.0	11 Mbps
2483.500	28.1	-2.5	245.0	1.3	3.0	20.0	H-Horn	AV	0.0	45.6	54.0	-8.4	1 Mbps
2483.500	27.9	-2.5	10.0	1.1	3.0	20.0	V-Horn	AV	0.0	45.4	54.0	-8.6	1 Mbps
2483.500	27.8	-2.5	12.0	1.2	3.0	20.0	V-Horn	AV	0.0	45.3	54.0	-8.7	11 Mbps

NORTHWEST **EMC RADIATED EMISSIONS DATA SHEET** REV d4.2 08/10/2004

EUT: CK31/CK31NI	Work Order: INMC0142
Serial Number:	Date: 08/10/04
Customer: INTERMEC Technologies Corporation	Temperature: 79
Attendees: none	Humidity: 42%
Cust. Ref. No.: N/A	Barometric Pressure: 29.9
Tested by: Holly Ashkannejhad	Power: Battery
	Job Site: EV01

**TEST SPECIFICATIONS**

Specification: FCC 15.247(d) Spurious Radiated Emissions	Year: 2004
Method: ANSI C63.4	Year: 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**

Battery powered. No cradle.

**EUT OPERATING MODES**

802.11(g), 6Mbps

**DEVIATIONS FROM TEST STANDARD**

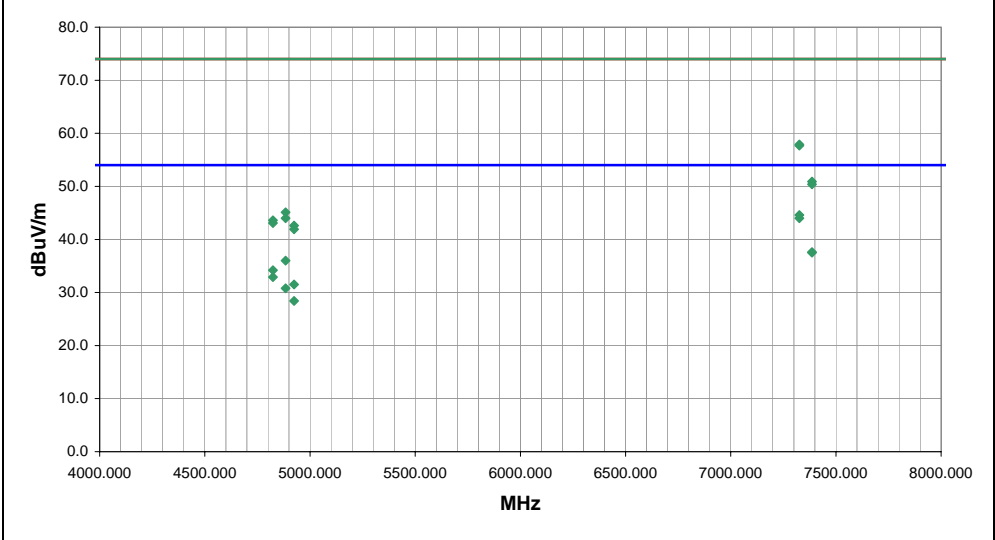
No deviations.

**RESULTS**

Pass	Run # 5
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Other

*Holly Ashkannejhad*  
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
7326.000	34.0	10.6	178.0	1.6	3.0	0.0	V-Horn	AV	0.0	44.6	54.0	-9.4	Mid Channel
7326.000	33.4	10.6	270.0	1.8	3.0	0.0	H-Horn	AV	0.0	44.0	54.0	-10.0	Mid channel
7326.000	47.3	10.6	270.0	1.8	3.0	0.0	H-Horn	PK	0.0	57.9	74.0	-16.1	Mid channel
7326.000	47.1	10.6	178.0	1.6	3.0	0.0	V-Horn	PK	0.0	57.7	74.0	-16.3	Mid Channel
7386.000	26.8	10.8	198.0	1.2	3.0	0.0	V-Horn	AV	0.0	37.6	54.0	-16.4	High Channel
7386.000	26.7	10.8	284.0	2.5	3.0	0.0	H-Horn	AV	0.0	37.5	54.0	-16.5	High Channel
4884.000	32.3	3.7	307.0	1.9	3.0	0.0	H-Horn	AV	0.0	36.0	54.0	-18.0	Mid channel
4824.000	30.8	3.4	311.0	2.2	3.0	0.0	H-Horn	AV	0.0	34.2	54.0	-19.8	Low channel
4824.000	29.5	3.4	338.0	1.1	3.0	0.0	V-Horn	AV	0.0	32.9	54.0	-21.1	Low channel
4924.000	27.8	3.7	238.0	1.2	3.0	0.0	V-Horn	AV	0.0	31.5	54.0	-22.5	High Channel
7386.000	40.1	10.8	284.0	2.5	3.0	0.0	H-Horn	PK	0.0	50.9	74.0	-23.1	High Channel
4884.000	27.1	3.7	5.0	1.2	3.0	0.0	V-Horn	AV	0.0	30.8	54.0	-23.2	Mid Channel
7386.000	39.6	10.8	198.0	1.2	3.0	0.0	V-Horn	PK	0.0	50.4	74.0	-23.6	High Channel
4924.000	24.7	3.7	131.0	1.3	3.0	0.0	H-Horn	AV	0.0	28.4	54.0	-25.6	High Channel
4884.000	41.4	3.7	307.0	1.9	3.0	0.0	H-Horn	PK	0.0	45.1	74.0	-28.9	Mid channel
4884.000	40.3	3.7	5.0	1.2	3.0	0.0	V-Horn	PK	0.0	44.0	74.0	-30.0	Mid Channel
4824.000	40.2	3.4	311.0	2.2	3.0	0.0	H-Horn	PK	0.0	43.6	74.0	-30.4	Low channel
4824.000	39.7	3.4	338.0	1.1	3.0	0.0	V-Horn	PK	0.0	43.1	74.0	-30.9	Low channel
4924.000	38.9	3.7	238.0	1.2	3.0	0.0	V-Horn	PK	0.0	42.6	74.0	-31.4	High Channel
4924.000	38.2	3.7	131.0	1.3	3.0	0.0	H-Horn	PK	0.0	41.9	74.0	-32.1	High Channel

NORTHWEST **EMC RADIATED EMISSIONS DATA SHEET** REV d4.2 08/10/2004

EUT: CK31/CK31NI	Work Order: INMC0142
Serial Number:	Date: 08/10/04
Customer: INTERMEC Technologies Corporation	Temperature: 75
Attendees: none	Humidity: 42%
Cust. Ref. No.: N/A	Barometric Pressure: 29.97
Tested by: Holly Ashkannejhad	Power: Battery
	Job Site: EV01

<b>TEST SPECIFICATIONS</b>	
Specification: FCC 15.247(d) Spurious Radiated Emissions	Year: 2004
Method: ANSI C63.4	Year: 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**

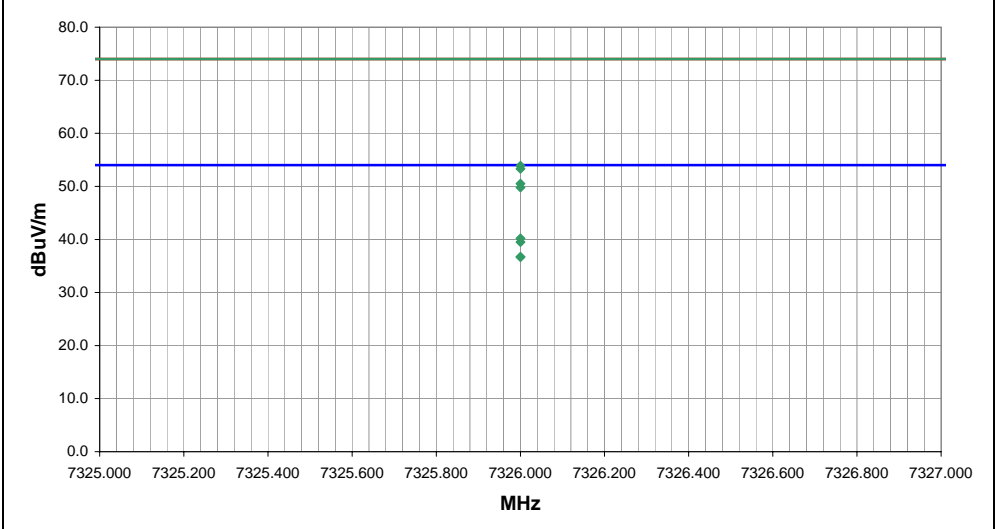
**EUT OPERATING MODES**  
 Transmitting Mid Channel. See comments below for data rate.

**DEVIATIONS FROM TEST STANDARD**  
 No deviations.

<b>RESULTS</b>	Run #
Pass	6

Other

*Holly Ashkannejhad*  
 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
7326.000	29.6	10.6	270.0	2.0	3.0	0.0	H-Horn	AV	0.0	40.2	54.0	-13.8	802.11(g) 36Mbps
7326.000	28.9	10.6	179.0	1.5	3.0	0.0	V-Horn	AV	0.0	39.5	54.0	-14.5	802.11(g) 36Mbps
7326.000	26.1	10.6	246.0	1.2	3.0	0.0	V-Horn	AV	0.0	36.7	54.0	-17.3	802.11(g) 54Mbps
7326.000	26.1	10.6	307.0	1.3	3.0	0.0	H-Horn	AV	0.0	36.7	54.0	-17.3	802.11(g) 54Mbps
7326.000	43.3	10.6	270.0	2.0	3.0	0.0	H-Horn	PK	0.0	53.9	74.0	-20.1	802.11(g) 36Mbps
7326.000	42.7	10.6	179.0	1.5	3.0	0.0	V-Horn	PK	0.0	53.3	74.0	-20.7	802.11(g) 36Mbps
7326.000	39.9	10.6	307.0	1.3	3.0	0.0	H-Horn	PK	0.0	50.5	74.0	-23.5	802.11(g) 54Mbps
7326.000	39.2	10.6	246.0	1.2	3.0	0.0	V-Horn	PK	0.0	49.8	74.0	-24.2	802.11(g) 54Mbps



NORTHWEST **EMC RADIATED EMISSIONS DATA SHEET** REV d4.2 08/10/2004

EUT: CK31/CK31NI	Work Order: INMC0142
Serial Number:	Date: 08/10/04
Customer: INTERMEC Technologies Corporation	Temperature: 75
Attendees: none	Humidity: 42%
Cust. Ref. No.: N/A	Barometric Pressure: 29.97
Tested by: Holly Ashkannejhad	Power: Battery
	Job Site: EV01

**TEST SPECIFICATIONS**

Specification: FCC 15.247(d) Spurious Radiated Emissions	Year: 2004
Method: ANSI C63.4	Year: 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**

**EUT OPERATING MODES**  
 802.11(b). See comments below for data rate and channel.

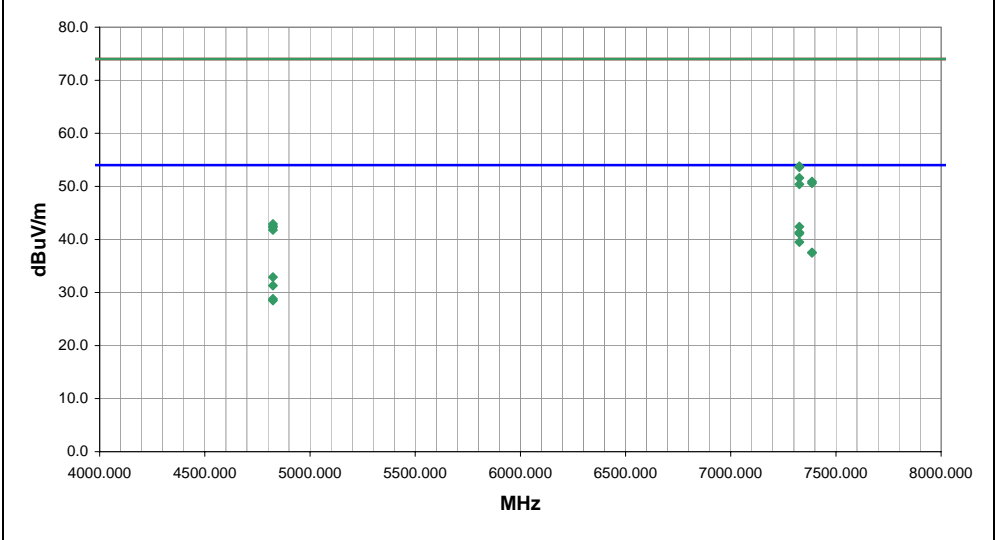
**DEVIATIONS FROM TEST STANDARD**  
 No deviations.

**RESULTS**

Pass	Run # 7
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Other

*Holly Ashkannejhad*  
 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
7326.000	31.8	10.6	195.0	1.4	3.0	0.0	V-Horn	AV	0.0	42.4	54.0	-11.6	1Mbps, Mid Channel
7326.000	30.7	10.6	283.0	1.2	3.0	0.0	V-Horn	AV	0.0	41.3	54.0	-12.7	11 Mbps, Mid Channel
7326.000	30.5	10.6	206.0	1.1	3.0	0.0	H-Horn	AV	0.0	41.1	54.0	-12.9	11 Mbps, Mid Channel
7326.000	28.9	10.6	64.0	1.3	3.0	0.0	H-Horn	AV	0.0	39.5	54.0	-14.5	1Mbps, Mid Channel
7386.000	26.7	10.8	186.0	2.2	3.0	0.0	V-Horn	AV	0.0	37.5	54.0	-16.5	11Mbps, High channel
7386.000	26.7	10.8	98.0	2.7	3.0	0.0	H-Horn	AV	0.0	37.5	54.0	-16.5	11Mbps, High channel
7326.000	43.2	10.6	283.0	1.2	3.0	0.0	V-Horn	PK	0.0	53.8	74.0	-20.2	11 Mbps, Mid Channel
7326.000	43.0	10.6	195.0	1.4	3.0	0.0	V-Horn	PK	0.0	53.6	74.0	-20.4	1Mbps, Mid Channel
4824.000	29.5	3.4	49.0	1.2	3.0	0.0	V-Horn	AV	0.0	32.9	54.0	-21.1	1Mbps, Low Channel
7326.000	41.0	10.6	206.0	1.1	3.0	0.0	H-Horn	PK	0.0	51.6	74.0	-22.4	11 Mbps, Mid Channel
4824.000	27.9	3.4	196.0	1.2	3.0	0.0	V-Horn	AV	0.0	31.3	54.0	-22.7	1 Mbps, High channel
7386.000	40.1	10.8	98.0	2.7	3.0	0.0	H-Horn	PK	0.0	50.9	74.0	-23.1	11Mbps, High channel
7386.000	39.8	10.8	186.0	2.2	3.0	0.0	V-Horn	PK	0.0	50.6	74.0	-23.4	11Mbps, High channel
7326.000	39.8	10.6	64.0	1.3	3.0	0.0	H-Horn	PK	0.0	50.4	74.0	-23.6	1Mbps, Mid Channel
4824.000	25.4	3.4	270.0	1.3	3.0	0.0	H-Horn	AV	0.0	28.8	54.0	-25.2	1 Mbps, High channel
4824.000	25.1	3.4	31.0	3.6	3.0	0.0	H-Horn	AV	0.0	28.5	54.0	-25.5	1Mbps, Low Channel
4824.000	39.5	3.4	49.0	1.2	3.0	0.0	V-Horn	PK	0.0	42.9	74.0	-31.1	1Mbps, Low Channel
4824.000	39.1	3.4	31.0	3.6	3.0	0.0	H-Horn	PK	0.0	42.5	74.0	-31.5	1Mbps, Low Channel
4824.000	38.9	3.4	196.0	1.2	3.0	0.0	V-Horn	PK	0.0	42.3	74.0	-31.7	1 Mbps, High channel
4824.000	38.4	3.4	270.0	1.3	3.0	0.0	H-Horn	PK	0.0	41.8	74.0	-32.2	1 Mbps, High channel

NORTHWEST  
**EMC RADIATED EMISSIONS DATA SHEET**  
 REV d4.2 08/10/2004

EUT: CK31/CK31NI	Work Order: INMC0142
Serial Number:	Date: 08/11/04
Customer: INTERMEC Technologies Corporation	Temperature: 75
Attendees: none	Humidity: 42%
Cust. Ref. No.: N/A	Barometric Pressure: 30.05
Tested by: Rod Peloquin	Power: Battery
	Job Site: EV01

<b>TEST SPECIFICATIONS</b>	
Specification: FCC 15.247(d) Spurious Radiated Emissions	Year: 2004
Method: ANSI C63.4	Year: 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**

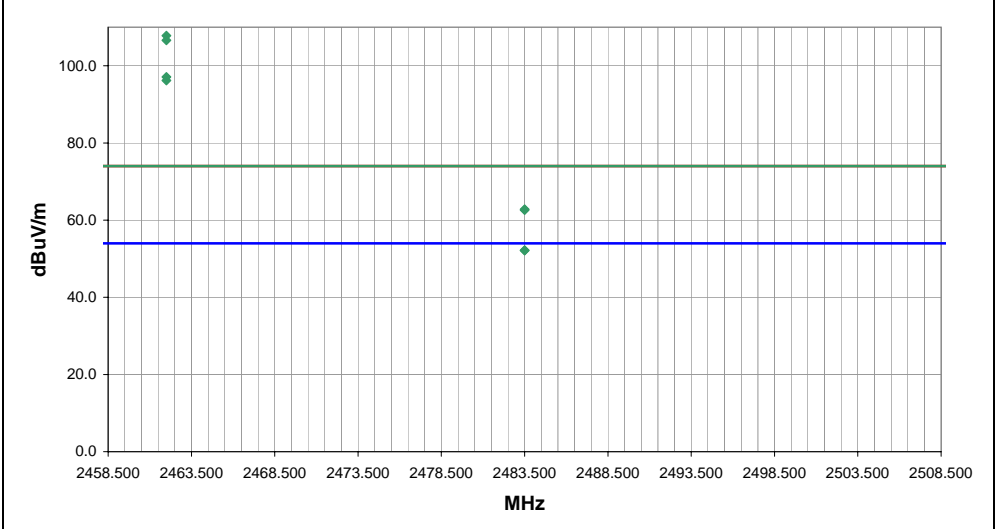
**EUT OPERATING MODES**  
 802.11(g), 54 Mbps, high channel

**DEVIATIONS FROM TEST STANDARD**  
 No deviations.

<b>RESULTS</b>	<b>Run #</b>
Pass	9

Other

*Rod Peloquin*  
 \_\_\_\_\_  
 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
2462.000	78.7	-2.5	78.0	1.1	3.0	20.0	V-Horn	AV	0.0	96.2	N/A	N/A	Fundamental
2483.500	34.7	-2.5	78.0	1.1	3.0	20.0	V-Horn	AV	0.0	52.2	54.0	-1.8	-44.0 dB marker delta applied
2462.000	79.6	-2.5	47.0	1.1	3.0	20.0	H-Horn	AV	0.0	97.1	N/A	N/A	Fundamental
2483.500	34.6	-2.5	47.0	1.1	3.0	20.0	H-Horn	AV	0.0	52.1	54.0	-1.9	-45.0 dB marker delta applied
2462.000	90.3	-2.5	47.0	1.1	3.0	20.0	H-Horn	PK	0.0	107.8	N/A	N/A	Fundamental
2483.500	45.3	-2.5	47.0	1.1	3.0	20.0	H-Horn	PK	0.0	62.8	74.0	-11.2	-45.0 dB marker delta applied
2462.000	89.1	-2.5	78.0	1.1	3.0	20.0	V-Horn	PK	0.0	106.6	N/A	N/A	Fundamental
2483.500	45.1	-2.5	78.0	1.1	3.0	20.0	V-Horn	PK	0.0	62.6	74.0	-11.4	-44.0 dB marker delta applied

**NORTHWEST EMC EMISSIONS DATA SHEET** Rev BETA 01/30/01

CK31/CK31NI CK31G Handheld Terminal (802.11b/g Radio)		Work Order: INMC0142
Serial Number: 000B6B197CAD		Date: 08/11/04
Customer: INTERMEC Technologies Corporation		Temperature: 75
Attendees: None	Tested by: Rod Peloquin	Humidity: 44%
Customer Ref. No.: N/A	Power: Battery	Job Site: EV01

**TEST SPECIFICATIONS**

Specification: FCC 15.247(d)	Year: 2003	Method: ANSI C63.4	Year: 2001
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**SAMPLE CALCULATIONS**  
 Field Strength of fundamental - delta = field strength of band edge

**COMMENTS**  
 Receive Antenna Horizontal, EUT on side.

**EUT OPERATING MODES**  
 802.11(g), 54 Mbps, high channel

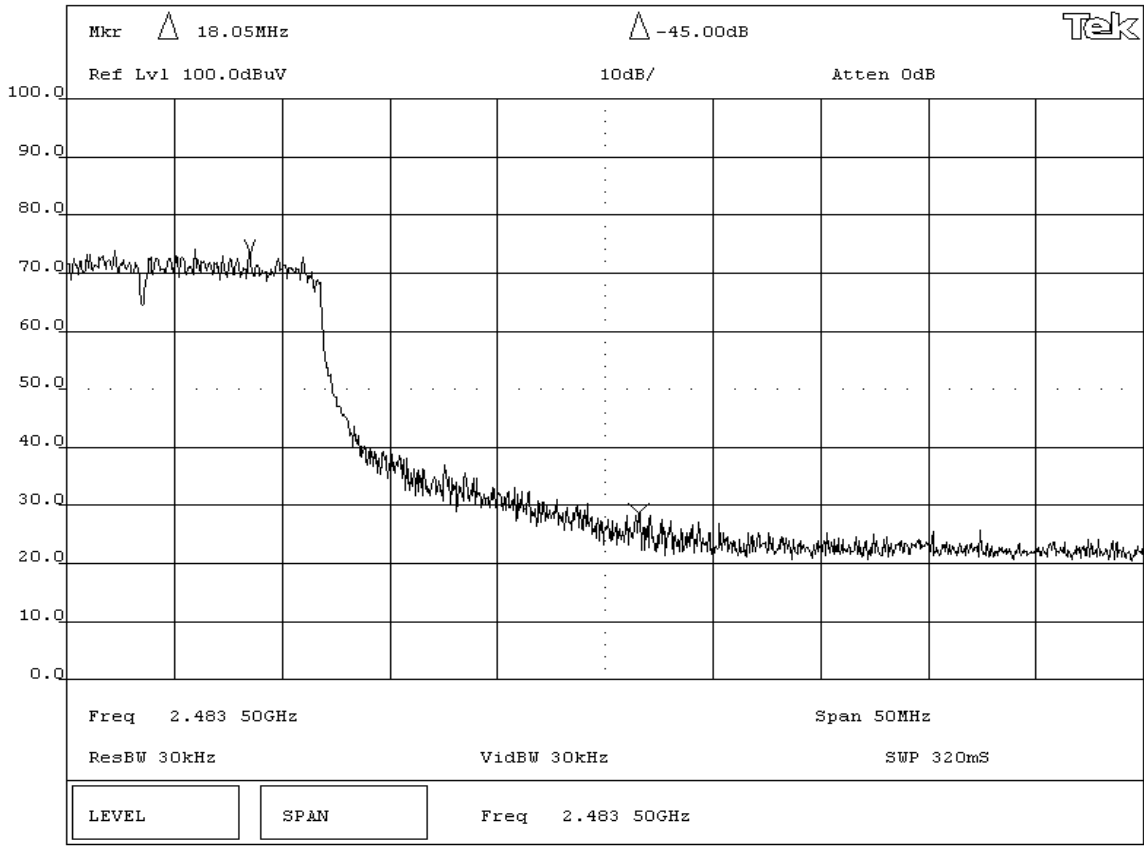
**DEVIATIONS FROM TEST STANDARD**  
 None

**REQUIREMENTS**

**RESULTS** AMPLITUDE  
Marker delta = -45.0 dB

**SIGNATURE**  
  
 Tested By: \_\_\_\_\_

**DESCRIPTION OF TEST**  
**Marker Delta Method**



# EMISSIONS DATA SHEET

CK31/CK31NI CK31G Handheld Terminal (802.11b/g Radio)		Work Order: INMC0142
Serial Number: 000B6B197CAD		Date: 08/11/04
Customer: INTERMEC Technologies Corporation		Temperature: 75
Attendees: None	Tested by: Rod Peloquin	Humidity: 44%
Customer Ref. No.: N/A	Power: Battery	Job Site: EV01

<b>TEST SPECIFICATIONS</b>			
Specification: FCC 15.247(d)	Year: 2003	Method: ANSI C63.4	Year: 2001

**SAMPLE CALCULATIONS**  
Field Strength of fundamental - delta = field strength of band edge


**COMMENTS**  
Receive Antenna Vertical, EUT flat (horizontal).

**EUT OPERATING MODES**  
802.11(g), 54 Mbps, high channel

**DEVIATIONS FROM TEST STANDARD**  
None

**REQUIREMENTS**

**RESULTS** AMPLITUDE  
Marker delta = -44.0 dB

**SIGNATURE**  
  
Tested By: \_\_\_\_\_

**DESCRIPTION OF TEST**  
**Marker Delta Method**

