# Intermec Technologies Corporation

# **DRCB**

January 15, 2008

Report No. INMC0415.1

Report Prepared By



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

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22975 NW Evergreen Parkway Suite 400 Hillsboro, Oregon 97124

#### **Certificate of Test**

Issue Date: January 15, 2008
Intermec Technologies Corporation
Model: DRCB

| Emissions                   |                       |                                |           |  |
|-----------------------------|-----------------------|--------------------------------|-----------|--|
| Test Description            | Specification         | Test Method                    | Pass/Fail |  |
| Spurious Radiated Emissions | FCC 15.247 (DTS):2006 | ANSI C63.4:2003 KDB No. 558074 | Pass      |  |

| Modifications made to the product            |  |
|--|--|
| 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:

Ethan Schoonover, Sultan Lab Manager



NVLAP Lab Code: 200630-0

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 History**

Revision 05/05/03

| Revision<br>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 accredited 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 2004/108/EC, and ANSI C63.4. 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.



**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 TUV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TUV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TUV's current Listing of CARAT Laboratories, available from TUV. A certificate was issued to represent that this laboratory continues to meet TUV's CARAT Program requirements. Certificate No. USA0604C.



**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).



**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, R-1025, C-2687, T-289, and R-2318, Irvine: R-1943, C-2766, and T-298, Sultan: R-871, C-1784, and T-294).



**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



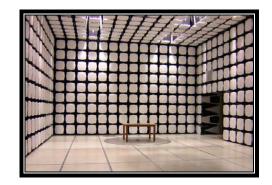
**MIC:** Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157)



#### SCOPE

For details on the Scopes of our Accreditations, please visit: http://www.nwemc.com/scope.asp





### 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 – EV11

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





### Washington – Sultan Facility Labs SU01 – SU07

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

## **Product Description**

Rev 11/17/06

#### **Party Requesting the Test**

| Company Name:                  | Intermec Technologies Corporation |
|--------------------------------|-----------------------------------|
| Address: 6001 36th Avenue West |                                   |
| City, State, Zip:              | Everett, WA 98203-1264            |
| Test Requested By:             | Sean MacKellar                    |
| Model:                         | DRCB                              |
| First Date of Test:            | December 17, 2007                 |
| Last Date of Test:             | December 19, 2007                 |
| Receipt Date of Samples:       | December 11, 2007                 |
| Equipment Design Stage:        | Production                        |
| <b>Equipment Condition:</b>    | No Damage                         |

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

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

The EUT is a previously certified 802.11 b/g radio module that has a new PA.

#### **Testing Objective:**

These tests were compliance of the radio to the spurious radiated emissions requirements of FCC 15.247.

# Configurations

Revision 9/21/05

## **CONFIGURATION 1 INMC0415**

| Software/Firmware Running during test |      |  |  |  |
|---------------------------------------|------|--|--|--|
| <b>Description</b> Version            |      |  |  |  |
| DOS batch files                       | None |  |  |  |

| EUT                       |                                   |                   |                 |  |
|---------------------------|-----------------------------------|-------------------|-----------------|--|
| Description               | Manufacturer                      | Model/Part Number | Serial Number   |  |
| EUT - 802.11(b)/(g) radio | Intermec Technologies Corporation | DRCB              | R07E64800017C01 |  |

| Peripherals in test setup boundary                       |                       |               |                |  |
|--|-----------------------|---------------|----------------|--|
| Description Manufacturer Model/Part Number Serial Number |                       |               |                |  |
| PCMCIA Extender Board                                    | Twin Industries       | None          | None           |  |
| Host PC  | Dell                  | Latitude C640 | 175T721        |  |
| AC Adapter   | Dell                  | AA20031       | 16291-13D-03SP |  |
| Antenna Array - CV30                                     | Intermec Technologies | MA3-388       | None           |  |

| Cables   |        |            |         |              |              |
|--|--------|------------|---------|--------------|--------------|
| Cable Type   | Shield | Length (m) | Ferrite | Connection 1 | Connection 2 |
| DC Power   | PA     | 1.85m      | Yes     | AC Adapter   | Host PC      |
| AC Mains   | No     | 1.85m      | No      | AC Adapter   | AC Mains     |
| PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown. |        |            |         |              |              |

Revision 4/28/03

|      | Equipment modifications |                                   |                                      |   |   |
|------|-------------------------|-----------------------------------|--------------------------------------|---|---|
| Item | Date                    | Test                              | Modification                         | Note  | Disposition of EUT                                      |
| 1    | 12/17/2007              | Spurious<br>Radiated<br>Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at<br>Northwest EMC<br>following the test. |
| 2    | 12/19/2007              | Spurious<br>Radiated<br>Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing completed.                            |

## **SPURIOUS RADIATED EMISSIONS**

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

| MODES OF OPERATION              |  |
|---------------------------------|--|
| Transmitting 802.11(b), 1 Mbps  |  |
| Transmitting 802.11(b), 11 Mbps |  |
| Transmitting 802.11(g), 6 Mbps  |  |
| Transmitting 802.11(g), 36 Mbps |  |
| Transmitting 802.11(g), 54 Mbps |  |

| CHANNELS INVESTIGATED              |  |
|------------------------------------|--|
| Low Channel, Channel 1, 2412 MHz   |  |
| Mid Channel, Channel 6, 2437 MHz   |  |
| High Channel, Channel 11, 2462 MHz |  |

#### **POWER SETTINGS INVESTIGATED**

120VAC/60Hz

| FREQUENCY RANGE INVESTIGATED |        |                |        |  |
|------------------------------|--------|----------------|--------|--|
| Start Frequency              | 30 MHz | Stop Frequency | 26 GHz |  |

| TEST EQUIPMENT     |               |                      |     |            |          |
|--------------------|---------------|----------------------|-----|------------|----------|
| Description        | Manufacturer  | Model                | ID  | Last Cal.  | Interval |
| EV01 cables g,h,l  | N/A           | N/A                  | EVF | 10/23/2007 | 13       |
| Pre-Amplifier      | Miteq         | JSD4-18002600-26-8P  | APU | 7/25/2007  | 13       |
| EV01 Cable D       | N/A           | N/A                  | EVD | 7/25/2007  | 13       |
| Antenna, Horn      | EMCO          | 3160-08              | AHK | NCR        | 0        |
| Pre-Amplifier      | Miteq         | AMF-4D-005180-24-10P | APC | 10/23/2007 | 13       |
| EV01 cables g,h,j  | N/A           | N/A                  | EVB | 10/23/2007 | 13       |
| EV01 cables c,g, h | N/A           | N/A                  | EVA | 10/23/2007 | 13       |
| High Pass Filter   | Micro-Tronics | HPM50111             | HFO | 12/29/2006 | 13       |
| Spectrum Analyzer  | Agilent       | E4446A               | AAT | 12/7/2006  | 13       |
| Pre-Amplifier      | Miteq         | AMF-4D-010100-24-10P | APW | 5/10/2007  | 13       |
|                    |               |                      |     |            |          |
|                    |               |                      |     |            |          |
|                    |               |                      |     |            |          |
| Antenna, Horn      | EMCO          | 3115                 | AHC | 8/24/2006  | 24       |
| Pre-Amplifier      | Miteq         | AM-1616-1000         | AOL | 12/29/2006 | 13       |
| Antenna, Biconilog | EMCO          | 3141                 | AXE | 12/28/2005 | 27       |

#### **MEASUREMENT UNCERTAINTY**

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct

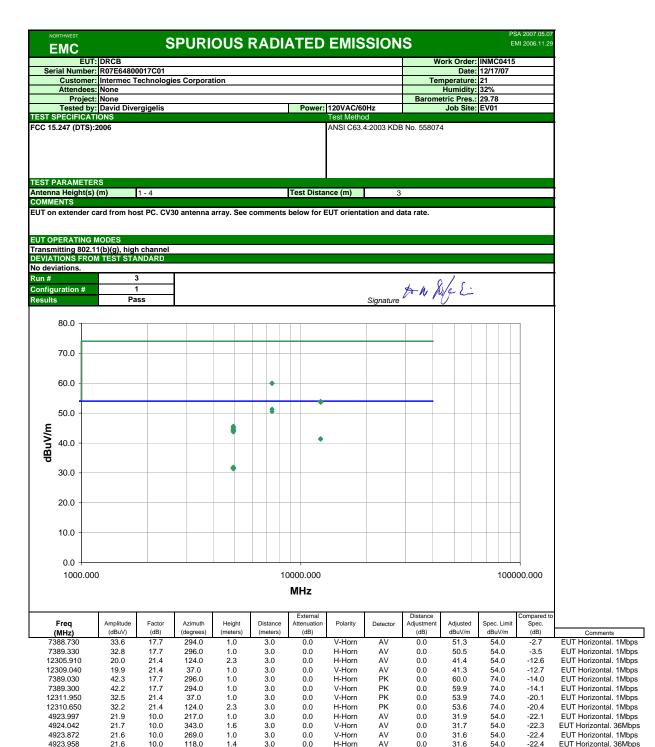
#### **TEST DESCRIPTION**

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 the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

| NORTHWE<br>EM   | С   |  | S                | PURI          | ous        | RADIA      | ATED                    | EMIS             | SION       |                        |              |              | PSA 2007.05.07<br>EMI 2006.11.29 |  |
|---|---|--|------------------|---------------|------------|------------|-------------------------|------------------|------------|------------------------|--------------|--------------|----------------------------------|--|
| Sprial N  |   | DRCB   | 0017001          |               |            |            |                         |                  |            | Wo                     | ork Order:   | : INMC04     |                                  |  |
|   |   | Pr: R07E64800017C01 Date: Pr: Intermec Technologies Corporation Temperature: |                  |               |            |            |                         |                  |            |                        |              |              | -                                |  |
|   | endees:   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
|   | Project:  |  |                  |               |            |            |                         |                  |            | Barome                 | tric Pres.:  |              |                                  |  |
|   |   | David Dive   | rgigelis         |               |            |            | Power:                  | 120VAC/60        |            |                        | Job Site:    | : EV01       |                                  |  |
|   | ECIFICATIONS         Test Method           47 (DTS):2006         ANSI C63.4:2003 KDB No. 558074 |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| 1 00 10.241   | 7.101 OUX.4.200 NDD 110. 300014   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| TEST PARA   | METER   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
|   |   |  | 1 - 1            |               |            |            | Test Distan             | nce (m)          | 3          |                        |              |              |                                  | ł  |
| Antenna Height(s) (m) 1 - 4 Test Distance (m) 3  COMMENTS |   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| EUT on exte   |   |  | st PC. CV3       | 0 antenna a   | array. See | comments   | below for E             | UT orienta       | tion and d | ata rate.              |              |              |                                  |  |
| EUT OPERA<br>Transmittin<br>DEVIATION                     | g 802.11<br>S FROM  | (b)(g), low  | channel<br>NDARD |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| No deviation  | ns.   |  | 1                |               |            |            |                         |                  |            |                        | ,            |              |                                  | +  |
| Run #   | on #  | 1  |                  |               |            |            |                         |                  |            | 4 4 8                  | /. (.        |              |                                  |  |
| Configuration Results                                     | on #  | Pa   |                  |               |            |            |                         |                  | Signature  | pr N &                 | 19 6         |              |                                  |  |
| results   |   |  | -                |               |            |            |                         |                  | Signature  |                        |              |              |                                  | <u> </u>   |
| 80.0  | o   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| 70.   | , —   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| 70.0  | <sup>1</sup>  |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
|   |   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| 60.0  | o <del> </del>  |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
|   |   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
|   | . 💳   |  |                  |               |            |            | *                       |                  |            |                        |              |              |                                  |  |
| 50.0  | 0   |  |                  |               | •          | •          |                         |                  |            |                        |              |              |                                  |  |
| Ę   |   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| <b>w//ng</b> p  | o 📙   |  |                  |               |            |            | •                       |                  |            |                        |              |              |                                  |  |
| <u> </u>  | Ĭ   |  |                  |               |            | •          |                         |                  |            |                        |              |              |                                  |  |
| _   |   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| 30.0  | 0 +   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
|   |   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| 20.0  | o 🗕   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
|   | Ĭ   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
|   |   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| 10.0  | 0 +   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
|   |   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
| 0.0   | ا   |  |                  |               |            |            |                         |                  |            |                        |              |              |                                  |  |
|   | 000.000   |  |                  |               |            | 10         | 000.000                 |                  |            |                        |              | 10           | 000.000                          |  |
| 10  | ,00.000   |  |                  |               |            | 10         | MHz                     |                  |            |                        |              | 10           | 0000.000                         |  |
|   |   |  |                  |               |            |            |                         |                  | •          |                        |              |              |                                  | 1  |
| Freq  |   | Amplitude  | Factor           | Azimuth       | Height     | Distance   | External<br>Attenuation | Polarity         | Detector   | Distance<br>Adjustment | Adjusted     | Spec. Lir    | Compared to<br>nit Spec.         | 1  |
| (MHz  | )   | (dBuV)   | (dB)             | (degrees)     | (meters)   | (meters)   | (dB)                    | -                |            | (dB)                   | dBuV/m       | dBuV/n       | n (dB)                           | Comments   |
| 12060.7   |   | 20.2   | 20.6             | 105.0         | 1.0        | 3.0        | 0.0                     | H-Horn           | AV         | 0.0                    | 40.8         | 54.0         |                                  | EUT Horizontal. 36Mbps                           |
| 12061.6<br>7236.2   |   | 20.1<br>20.7   | 20.6<br>16.8     | 19.0<br>102.0 | 1.0<br>1.5 | 3.0<br>3.0 | 0.0<br>0.0              | V-Horn<br>H-Horn | AV<br>AV   | 0.0<br>0.0             | 40.7<br>37.5 | 54.0<br>54.0 | -13.3<br>-16.5                   | EUT Horizontal. 36Mbps<br>EUT Horizontal. 36Mbps |
| 7237.4  |   | 20.7   | 16.8             | 301.0         | 1.6        | 3.0        | 0.0                     | V-Horn           | AV         | 0.0                    | 37.5         | 54.0         | -16.5                            | EUT Horizontal. 36Mbps                           |
| 12059.0   |   | 33.9   | 20.6             | 19.0          | 1.0        | 3.0        | 0.0                     | V-Horn           | PK         | 0.0                    | 54.5         | 74.0         | -19.5                            | EUT Horizontal. 36Mbps                           |
| 12060.2   |   | 32.8   | 20.6             | 105.0         | 1.0        | 3.0        | 0.0                     | H-Horn           | PK         | 0.0                    | 53.4         | 74.0         | -20.6                            | EUT Horizontal. 36Mbps                           |
| 4823.9<br>4824.0  |   | 22.6<br>22.3   | 9.6<br>9.6       | 215.0<br>-1.0 | 1.0<br>1.0 | 3.0<br>3.0 | 0.0<br>0.0              | H-Horn<br>H-Horn | AV<br>AV   | 0.0<br>0.0             | 32.2<br>31.9 | 54.0<br>54.0 | -21.8<br>-22.1                   | EUT on end. 1Mbps<br>EUT Horizontal. 1Mbps       |
| 4823.9  |   | 22.0   | 9.6              | 168.0         | 1.0        | 3.0        | 0.0                     | H-Horn           | AV         | 0.0                    | 31.6         | 54.0         | -22.4                            | EUT Vertical. 1Mbps                              |
| 7235.8  |   | 34.5   | 16.8             | 102.0         | 1.5        | 3.0        | 0.0                     | H-Horn           | PK         | 0.0                    | 51.3         | 74.0         | -22.7                            | EUT Horizontal. 36Mbps                           |
| 4823.8  |   | 21.5   | 9.6              | 239.0         | 1.7        | 3.0        | 0.0                     | V-Horn           | AV         | 0.0                    | 31.1         | 54.0         | -22.9                            | EUT Vertical. 1Mbps                              |
| 4823.9<br>4824.0  |   | 21.5<br>21.5   | 9.6<br>9.6       | -1.0<br>152.0 | 1.0<br>1.0 | 3.0<br>3.0 | 0.0<br>0.0              | H-Horn<br>V-Horn | AV<br>AV   | 0.0<br>0.0             | 31.1<br>31.1 | 54.0<br>54.0 | -22.9<br>-22.9                   | EUT Horizontal. 36Mbps<br>EUT Horizontal. 1Mbps  |
| 4824.0<br>4823.9  |   | 21.5   | 9.6              | -1.0          | 1.0        | 3.0        | 0.0                     | v-Horn<br>H-Horn | AV         | 0.0                    | 31.1         | 54.0<br>54.0 | -22.9<br>-23.0                   | EUT Horizontal. 1Mbps EUT Horizontal. 54Mbps     |
| 4823.9  |   | 21.4   | 9.6              | 209.0         | 3.3        | 3.0        | 0.0                     | V-Horn           | AV         | 0.0                    | 31.0         | 54.0         | -23.0                            | EUT on end. 1Mbps                                |
| 4824.2  | 20  | 21.4   | 9.6              | 63.0          | 2.7        | 3.0        | 0.0                     | H-Horn           | AV         | 0.0                    | 31.0         | 54.0         | -23.0                            | EUT Horizontal. 6Mbps                            |
| 4822.0  | 80  | 21.3   | 9.6              | 288.0         | 1.0        | 3.0        | 0.0                     | V-Horn           | AV         | 0.0                    | 30.9         | 54.0         | -23.1                            | EUT Horizontal. 54Mbps                           |
| 4822.6  |   | 21.3   | 9.6              | 360.0         | 1.0        | 3.0        | 0.0                     | V-Horn           | AV         | 0.0                    | 30.9         | 54.0         | -23.1                            | EUT Horizontal, 6Mbps                            |
| 4822.9<br>4823.4  |   | 21.3<br>21.3   | 9.6<br>9.6       | 360.0<br>-1.0 | 1.0<br>1.7 | 3.0<br>3.0 | 0.0<br>0.0              | V-Horn<br>V-Horn | AV<br>AV   | 0.0<br>0.0             | 30.9<br>30.9 | 54.0<br>54.0 | -23.1<br>-23.1                   | EUT Horizontal. 36Mbps<br>EUT Horizontal. 11Mbps |
| .525.7  | -   |  | 0.0              |               |            | 0.0        | 0.0                     |                  |            | 0.0                    | 20.0         | 57.0         | _0.1                             |  |

V-Horn V-Horn V-Horn V-Horn V-Horn

| EMC                               |  | SPURIOUS RADIATED EMISSIONS EMI 2006.11.29                                       |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
|-----------------------------------|--|--|----------------------|----------------------|--------------------|-------------------|-----|---------------------|------------------|-------------|--------------------|--------------------|-----------------------|----------------|---|
|                                   |  | DRCB   | Work Order: INMC0415 |                      |                    |                   |     |                     |                  |             |                    | 5                  | ı                     |                |   |
| Serial Nun                        | nber:  | R07E64800017C01 Date: 12/17/07   |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
|                                   |  | r: Intermec Technologies Corporation Temperature: 21                             |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
|                                   |  | s: None         Humidity: 32%           tt: None         Barometric Pres.: 29.78 |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
|                                   |  | y: David Divergigelis Power:   120VAC/60Hz Job Site:   EV01                      |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| TEST SPECIFI                      |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| FCC 15.247 (D                     | 15.247 (DTS):2006 ANSI C63.4:2003 KDB No. 558074 |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
|                                   |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| TEST PARAM Antenna Heigl COMMENTS |  |  | 1 - 4                |                      |                    |                   |     | Test Dista          | nce (m)          | 3           |                    |                    |                       |                |   |
| EUT on extend                     | der ca   | rd from ho   | st PC. CV3           | 0 antenna            | array. See         | comme             | nts | below for E         | UT orienta       | ation and d | ata rate.          |                    |                       |                |   |
| EUT OPERATI                       |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| Transmitting 8 DEVIATIONS I       | 802.11<br>FROM                                   | (b)(g), mid  | NDARD                |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| No deviations                     |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| Run #                             |  | - 2  | 2                    |                      |                    |                   |     |                     |                  |             | 0                  | 1.                 |                       |                | 1   |
| Configuration                     | #  | 1  | 1                    |                      |                    |                   |     |                     |                  |             | ton &              | 1/2 Li             |                       |                |   |
| Results                           |  | Pa   | ISS                  |                      |                    |                   |     |                     |                  | Signature   | 1                  | <u> </u>           |                       |                | 1   |
| 80.0                              |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| 80.0                              |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| 70.0                              |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
|                                   |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| 60.0                              |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| 50.0                              |  |  |                      |                      |                    | •                 |     | Ť                   |                  |             |                    |                    |                       |                |   |
| <b>w//ng</b> p                    | 1  |  |                      |                      | *                  | •                 |     | •                   |                  |             |                    |                    |                       |                |   |
| <b>9</b> 30.0 -                   |  |  |                      |                      | *                  |                   |     |                     |                  |             |                    |                    |                       |                |   |
| 20.0                              |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| 20.0                              |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| 10.0                              | 1  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
| 0.0                               |  |  |                      |                      |                    |                   |     |                     |                  |             |                    |                    |                       |                |   |
|                                   | 0.000  |  |                      |                      |                    |                   | 10  | 000.000             |                  |             |                    |                    | 100                   | 000.000        |   |
|                                   |  |  |                      |                      |                    |                   |     | MHz                 |                  |             |                    |                    |                       |                |   |
|                                   |  |  |                      |                      |                    |                   |     | External            |                  |             | Distance           |                    |                       | Compared to    |   |
| Freq<br>(MHz)                     |  | Amplitude<br>(dBuV)  | Factor<br>(dB)       | Azimuth<br>(degrees) | Height<br>(meters) | Distant<br>(meter |     | Attenuation<br>(dB) | Polarity         | Detector    | Adjustment<br>(dB) | Adjusted<br>dBuV/m | Spec. Limit<br>dBuV/m | Spec.<br>(dB)  | Comments  |
| 7314.183                          |  | 30.4   | 17.2                 | 252.0                | 1.0                | 3.0               |     | 0.0                 | V-Horn           | AV          | 0.0                | 47.6               | 54.0                  | -6.4           | EUT Horizontal. 1Mbps                           |
| 7315.525                          |  | 25.4   | 17.2                 | 289.0                | 1.0                | 3.0               |     | 0.0                 | H-Horn           | AV          | 0.0                | 42.6               | 54.0                  | -11.4          | EUT Horizontal, 1Mbps                           |
| 12186.080<br>12185.880            |  | 20.2<br>20.1   | 21.0<br>21.0         | 292.0<br>69.0        | 1.0<br>1.0         | 3.0<br>3.0        |     | 0.0<br>0.0          | V-Horn<br>H-Horn | AV<br>AV    | 0.0<br>0.0         | 41.2<br>41.1       | 54.0<br>54.0          | -12.8<br>-12.9 | EUT Horizontal. 1Mbps<br>EUT Horizontal. 1Mbps  |
| 7313.300                          |  | 38.6   | 17.2                 | 252.0                | 1.0                | 3.0               |     | 0.0                 | V-Horn           | PK          | 0.0                | 55.8               | 74.0                  | -18.2          | EUT Horizontal. 1Mbps                           |
| 12185.250                         | )  | 33.1   | 21.0                 | 292.0                | 1.0                | 3.0               |     | 0.0                 | V-Horn           | PK          | 0.0                | 54.1               | 74.0                  | -19.9          | EUT Horizontal. 1Mbps                           |
| 7309.608                          |  | 36.8   | 17.2                 | 289.0                | 1.0                | 3.0               |     | 0.0                 | H-Horn           | PK          | 0.0                | 54.0               | 74.0                  | -20.0          | EUT Horizontal. 1Mbps                           |
| 12183.040                         |  | 32.5   | 21.0                 | 69.0                 | 1.0                | 3.0               |     | 0.0                 | H-Horn           | PK          | 0.0                | 53.5               | 74.0                  | -20.5          | EUT Horizontal, 1Mbps                           |
| 4874.347<br>4876.525              |  | 22.7<br>21.5   | 9.8<br>9.8           | 40.0<br>142.0        | 1.0<br>1.0         | 3.0               |     | 0.0<br>0.0          | H-Horn<br>H-Horn | AV<br>AV    | 0.0<br>0.0         | 32.5<br>31.3       | 54.0<br>54.0          | -21.5<br>-22.7 | EUT Horizontal. 1Mbps<br>EUT Horizontal. 11Mbps |
| 4876.617                          |  | 21.5   | 9.8                  | 63.0                 | 3.0                | 3.0<br>3.0        |     | 0.0                 | H-Horn           | AV          | 0.0                | 31.3               | 54.0                  | -22.7<br>-22.7 | EUT Horizontal. 54Mbps                          |
| 4876.617                          |  | 21.5   | 9.8                  | 355.0                | 3.0                | 3.0               |     | 0.0                 | H-Horn           | AV          | 0.0                | 31.3               | 54.0                  | -22.7          | EUT Horizontal. 36Mbps                          |
| 4876.758                          |  | 21.5   | 9.8                  | 129.0                | 2.6                | 3.0               |     | 0.0                 | V-Horn           | AV          | 0.0                | 31.3               | 54.0                  | -22.7          | EUT Horizontal. 11Mbps                          |
| 4876.950                          |  | 21.5   | 9.8                  | 216.0                | 2.6                | 3.0               |     | 0.0                 | V-Horn           | AV          | 0.0                | 31.3               | 54.0                  | -22.7          | EUT Horizontal. 1Mbps                           |
| 4877.225                          |  | 21.5   | 9.8                  | 97.0                 | 3.3                | 3.0               |     | 0.0                 | V-Horn           | AV          | 0.0                | 31.3               | 54.0                  | -22.7          | EUT Horizontal. 36Mbps                          |
| 4874.142                          |  | 21.4   | 9.8                  | 31.0                 | 1.0                | 3.0               |     | 0.0                 | H-Horn           | AV          | 0.0                | 31.2               | 54.0                  | -22.8          | EUT Horizontal, 6Mbps                           |
| 4876.517<br>4874.350              |  | 21.4<br>21.3   | 9.8<br>9.8           | 341.0<br>271.0       | 3.3<br>2.6         | 3.0<br>3.0        |     | 0.0                 | V-Horn<br>V-Horn | AV<br>AV    | 0.0<br>0.0         | 31.2<br>31.1       | 54.0<br>54.0          | -22.8<br>-22.9 | EUT Horizontal. 54Mbps<br>EUT Horizontal. 6Mbps |
| 4874.350<br>4874.220              |  | 35.6   | 9.8                  | 40.0                 | 1.0                | 3.0               |     | 0.0                 | v-Horn<br>H-Horn | PK          | 0.0                | 45.4               | 74.0                  | -22.9<br>-28.6 | EUT Horizontal. 1Mbps                           |
| 4874.792                          |  | 34.3   | 9.8                  | 216.0                | 2.6                | 3.0               |     | 0.0                 | V-Horn           | PK          | 0.0                | 44.1               | 74.0                  | -29.9          | EUT Horizontal. 1Mbps                           |



V-Horn

V-Horn

H-Horn

V-Horn

ΑV

 $\mathsf{AV}$ 

ΑV

31.6

31.5

31.5

31.4

0.0

0.0

0.0

0.0

54.0

54.0

54.0

54.0

-22.4

-22.5

-22.5

EUT Horizontal. 11Mbps

EUT Horizontal, 54Mbps

EUT Horizontal. 6Mbps

4924.192

4924.417

4924,600

4923.733

21.6

21.5

21.5

10.0

10.0

10.0

10.0

352.0

18.0

83.0

360.0

1.0

2.5

1.4

3.0

3.0

3.0

3.0

0.0

0.0

0.0

#### **RADIATED EMISSIONS DATA SHEET** EMI 2006.11.2 **EMC** EUT: DRCB Work Order: INMC0415 Serial Number: R07E64800017C01 Date: 12/19/07 Customer: Intermec Technologies Corporation Temperature: 21 Humidity: 32% Barometric Pres.: 29.78 Attendees: None Project: None Tested by: Rod Peloquin Power: 120VAC/60Hz Job Site: EV01 FCC 15.247 (DTS):2006 ANSI C63.4:2003 KDB No. 558074 TEST PARAMETERS Antenna Height(s) (m) Test Distance (m) COMMENTS EUT on extender card from host PC, CV30 antenna array. EUT OPERATING MODES Transmitting 802.11(b)(g), high channel DEVIATIONS FROM TEST STANDARD No deviations Run# Rochy la Rely Configuration # Results Pass Signature 0.08 70.0 60.0 50.0 dBuV/m 40.0 30.0 20.0 10.0 2400.000 2410.000 2420.000 2430.000 2440.000 2450.000 2460.000 2470.000 2480.000 2490.000 2500.000 MHz Amplitude Freq Factor Azimuth Height Distance Polarity Detector Spec. Limit Attenuation Adjustmen Adjusted (dBuV) (dB) (dB) (dB) dBuV/m dBuV/m (dB) (MHz) 27.8 38.0 0.0 H-Horn 50.0 54.0 1 Mbps, EUT vertical 2485.372 1.2 20.0 0.0 -4.0 2485.163 27.2 2.2 5.0 1.5 0.0 V-Horn ΑV 0.0 54.0 1 Mbps, EUT horizontal 20.0 49.4 2485.375 25.9 2.2 40.0 1.2 0.0 20.0 H-Horn ΑV 0.0 48.1 54.0 54.0 -5.9 11 Mbps, EUT vertical 6 Mbps. EUT horizontal 2483.623 25.1 75.0 1.0 0.0 20.0 V-Horn ΑV 0.0 47.3 -6.7 2485.303 24.9 2.2 8.0 1.5 0.0 20.0 V-Horn ΑV 47.1 54.0 11 Mbps, EUT horizontal 0.0 2.2 2.3 1.2 1.2 -7.2 -7.3 54 Mbps, EUT vertical 54 Mbps, EUT vertical 2482 907 44.6 52.0 0.0 20.0 H-Horn PK 0.0 66.8 74.0 24.4 H-Horn AV 54.0 2483.510 52.0 20.0 46.7 0.0 0.0 2484.030 24.4 2.2 28.0 0.0 20.0 H-Horn ΑV 0.0 46.6 54.0 6 Mbps, EUT vertical 2.2 2.2 1.5 1.2 AV AV -7.6 -7.7 6 Mbps, EUT on side 36 Mbps, EUT vertical 2483 500 24.2 163.0 0.0 20.0 H-Horn 0.0 46.4 54.0 24.1 H-Horn 54.0 2483.500 38.0 0.0 20.0 0.0 46.3 2.2 2.2 -7.7 -7.7 2484.367 24.1 1.5 20.0 V-Horn ΑV 46.3 54.0 54 Mbps, EUT horizontal

ΑV

ΑV

 $\mathsf{AV}$ 

ΑV

PK

PK

PK

PK

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

46.3

46.2

46.2

46.2

65.7

65.0

64.7

62.1

54.0

54.0

54.0

54.0

74.0

74.0

74.0

74.0

-7.8

-7.8

-7.8

-9.0

-9.3

-11.9

36 Mbps, EUT horizontal

6 Mbps, EUT vertical

6 Mbps, EUT on side

6 Mbps, EUT vertical

6 Mbps. EUT horizontal

6 Mbps, EUT horizontal

36 Mbps, EUT vertical

6 Mbps, EUT on side

54 Mbps, EUT horizontal

V-Horn

V-Horn

V-Horn

H-Horn

H-Horn

V-Horn

H-Horn

H-Horn

V-Horn

2486.010

2483.563

2484.153

2484.510

2483.733

2483.850

2483.850

2483.763

2485.317

24.1

24.0

24.0

24.0

43.5

42.8

42.5

42.0

39.9

2.2

2.2

2.2

2.2

2.2

2.2

8.0

293.0

73.0

104.0

28.0

75.0

38.0

163.0

8.0

1.5

2.2

2.2

1.0

1.4

1.0

1.2

1.5

0.0

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20.0

20.0

20.0

20.0

20.0

20.0

20.0

## Sprious Radiated Emissions





## Sprious Radiated Emissions



