# Intermec Technologies Corporation

# 1000CP01S
# 1000CP02S
# 1001CP01S

EMC Test Report

**Report No. ITRM0249**

Report Prepared By

NORTHWEST EMC

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

NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

# Certificate of Test

## Last Date of Test: August 24, 2011
## Intermec Technologies Corporation
## Model: 1000CP01S, 1000CP02S, 1001CP01S

| Emissions | | | |
|---|---|---|---|
| **Test Description** | **Specification** | **Test Method** | **Pass/Fail** |
| Effective Radiated Power (ERP) | FCC 22H:2011 | ANSI/TIA/EIA-603-C-2004 | **Pass** |
| Effective Radiated Power (EIRP) | FCC 24E:2011 | ANSI/TIA/EIA-603-C-2004 | **Pass** |
| Effective Radiated Power (EIRP) | FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 | **Pass** |
| Out of Band Emissions | FCC 22H:2011 | ANSI/TIA/EIA-603-C-2004 | **Pass** |
| Out of Band Emissions | FCC 24E:2011 | ANSI/TIA/EIA-603-C-2004 | **Pass** |
| Out of Band Emissions | FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 | **Pass** |

| 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.
41 Tesla Ave., Irvine, CA 92618

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 (Site filing #2834B-1).

**Approved By:**

*Donald Facteau, IS Manager*

NVLAP

**NVLAP Lab Code: 200676-0**

***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 Number | Description | Date | Page Number |
|---|---|---|---|
| 00 | None | | |

## Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

# Accreditations and Authorizations

## 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 National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. NVLAP is administered by the National Institute of Standards and Technology (NIST), an agency of the U.S. Commerce Department. 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-Gen, Issue 2 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. (*Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2, Brooklyn Park: 2834E-1)*

## 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.

## 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).

# Accreditations and Authorizations

## 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, G-84, C-2687, T-1658, and R-2318, Irvine: R-1943, G-85, C-2766, and T-1659, Sultan: R-871, G-83, C-3265, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634).*

## 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 (US0017).

## 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

## KCC

Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157, Brooklyn Park: US0175)*

## VIETNAM

Vietnam MIC has approved Northwest EMC as an accredited test lab. Per Decision No. 194/QD-QLCL (dated December 15, 2009), Northwest EMC test reports can be used for Vietnam approval submissions.

## SCOPE

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

# Northwest EMC Locations



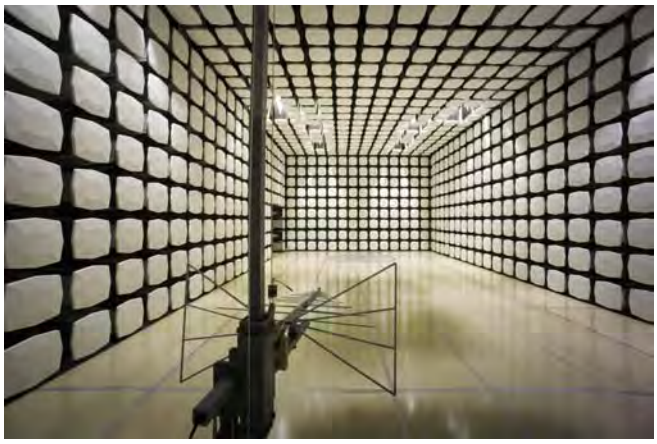
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

California
Labs OC01-OC13
41 Tesla
Irvine, CA 92618
(949) 861-8918

Minnesota
Labs MN01-MN08
9349 W Broadway Ave.
Brooklyn Park,
MN 55445
(763) 425-2281

Washington
Labs SU01-SU07
14128 339th Ave. SE
Sultan, WA 98294
(360) 793-8675

New York
Labs WA01-WA04
4939 Jordan Rd.
Elbridge, NY 13060
(315) 685-0796



## Party Requesting the Test

| | |
|---|---|
| **Company Name:** | Intermec Technologies Corporation |
| **Address:** | 6001 36th Avenue West |
| **City, State, Zip:** | Everett, WA 98203-1264 |
| **Test Requested By:** | Wayne Rieger |
| **Model:** | 1000CP01S, 1000CP02S, 1001CP01S |
| **First Date of Test:** | 8/1/2011 |
| **Last Date of Test:** | 8/24/2011 |
| **Receipt Date of Samples:** | 8/1/2011 |
| **Equipment Design Stage:** | Production |
| **Equipment Condition:** | No Damage |

## Information Provided by the Party Requesting the Test

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

Handheld computers containing the two radio modules, the Intermec Model RC12 and the Sierra Wireless MC8355, each with their own integral antenna.

The Sierra Wireless MC8355 is a UMTS radio operating in the Cellular, PCS, and AWS bands.

The Intermec Model RC12 radio module is an 802.11a/b/g/n – Bluetooth radio.

**Testing Objective:**

To demonstrate compliance of the UMTS radio with the radiated power and radiated out of band emissions requirements of FCC 22H, FCC 24E, and FCC 27. The antenna port direct-connect measurements are documented in a separate report.

FCC compliance of the RC12 radio module is documented in separate reports.

## CONFIGURATION 1 ITRM0249

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Handheld Computer, CN70 | Intermec Technologies Corp | 1000CP01S | 178U1191029 |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Power Supply | Intermec Technologies Corp | AE39 | 02061000875 |
| RS232 SNAP-ON | Intermec Technologies Corp | 225-768-001 | HDIP D-SUB, A3 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| AC Power | No | 1.8m | No | Power Supply | AC Mains |
| DC Leads | No | 1.8m | Yes | SNAPON | Power Supply |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

## CONFIGURATION 2 ITRM0249

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Handheld Computer, CN70e | Intermec Technologies Corp | 1000CP02S | 178U1191038 |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Power Supply | Intermec Technologies Corp | AE39 | 02061000875 |
| RS232 SNAP-ON | Intermec Technologies Corp | 225-768-001 | HDIP D-SUB, A3 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| AC Power | No | 1.8m | No | Power Supply | AC Mains |
| DC Leads | No | 1.8m | Yes | SNAPON | Power Supply |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

## CONFIGURATION 3 ITRM0249

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Handheld Computer, CK70 | Intermec Technologies Corp | 1001CP01S | 178U1191003 |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Power Supply | Intermec Technologies Corp | AE39 | 02061000875 |
| RS232 SNAP-ON | Intermec Technologies Corp | 225-768-001 | HDIP D-SUB, A3 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| AC Power | No | 1.8m | No | Power Supply | AC Mains |
| DC Leads | No | 1.8m | Yes | SNAPON | Power Supply |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

## CONFIGURATION 4 ITRM0249

| Software/Firmware Running during test | |
|---|---|
| **Description** | **Version** |
| Windows Mobile | 6.5 |

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Handheld Computer, CN70 | Intermec Technologies Corp | 1000CP01S | 28311047060 |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| RS232 SNAP-ON | Intermec Technologies Corp | 225-768-001 | HDIP D-SUB, A3 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| AC Power | No | 1.8m | No | Power Supply | AC Mains |
| DC Leads | No | 1.8m | Yes | SNAPON | Power Supply |
| RS-232 - USB | No | 0.45m | Yes | SNAPON | Unterminated |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

## CONFIGURATION 5 ITRM0249

| Software/Firmware Running during test | |
|---|---|
| **Description** | **Version** |
| Windows Mobile | 6.5 |

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Handheld Computer, CN70e | Intermec Technologies Corp | 1000CP02S | 178U1191040 |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| RS232 SNAP-ON | Intermec Technologies Corp | 225-768-001 | HDIP D-SUB, A3 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| AC Power | No | 1.8m | No | Power Supply | AC Mains |
| DC Leads | No | 1.8m | Yes | SNAPON | Power Supply |
| RS-232 - USB | No | 0.45m | Yes | SNAPON | Unterminated |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

## CONFIGURATION 6 ITRM0249

| Software/Firmware Running during test | |
|---|---|
| **Description** | **Version** |
| Windows Mobile | 6.5 |

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| Handheld Computer, CK70 | Intermec Technologies Corp | 1001CP01S | 28311047275 |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| RS232 SNAP-ON | Intermec Technologies Corp | 225-768-001 | HDIP D-SUB, A3 |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| AC Power | No | 1.8m | No | Power Supply | AC Mains |
| DC Leads | No | 1.8m | Yes | SNAPON | Power Supply |
| RS-232 - USB | No | 0.45m | Yes | SNAPON | Unterminated |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

| Equipment modifications | | | | | |
|---|---|---|---|---|---|
| Item | Date | Test | Modification | Note | Disposition of EUT |
| 1 | 8/1/2011 | Effective Radiated Power (ERP) | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 2 | 8/3/2011 | Out of Band Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 3 | 8/12/2011 | Effective Radiated Power (EIRP) | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 4 | 8/12/2011 | Out of Band Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 5 | 8/23/2011 | Effective Radiated Power (EIRP) | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 6 | 8/24/2011 | Out of Band Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | Scheduled testing was completed. |

# Effective Radiated Power (ERP)



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 Cell Band, WCDMA |
| Transmitting Cell Band, E-GPRS (EDGE) |
| Transmitting Cell Band, GPRS |

| CHANNELS TESTED |
|---|
| GSM Low = Ch. 128, 824.2 MHz |
| GSM Mid = Ch. 190, 836.6 MHz |
| GSM High = Ch. 251, 848.8 MHz |
| UMTS Low = Ch. 4132, 826.4 MHz |
| UMTS Mid = Ch. 4183, 836.6 MHz |
| UMTS High = Ch. 4233, 846.6 MHz |

| POWER SETTINGS INVESTIGATED |
|---|
| 120VAC/60Hz |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 824 MHz | Stop Frequency | 849 MHz |

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

| TEST EQUIPMENT | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | ID | Last Cal. | Interval |
| Attenuator, 6dB | S.M. Electronics | 18N-06 | AWN | 5/5/2011 | 12 |
| Antenna, Dipole | ETS | 3121C-DB4 | ADH | 3/6/2009 | 36 |
| EV01 Cables | N/A | Bilog Cables | EVA | 6/28/2011 | 12 |
| Spectrum Analyzer | Agilent | E4446A | AAQ | 6/24/2011 | 12 |
| Antenna, Bilog | Teseq | CBL 6141B | AXR | 11/29/2010 | 12 |
| Attenuator, 'Precision N' | S.M. Electronics | SA18N-06/SM4032 | REE | 1/10/2011 | 12 |
| Power Meter | Gigatronics | 8651A | SPM | 1/7/2010 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |

| MEASUREMENT BANDWIDTHS | | | | |
|---|---|---|---|---|
| | **Frequency Range** | **Peak Data** | **Quasi-Peak Data** | **Average Data** |
| | **(MHz)** | **(kHz)** | **(kHz)** | **(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 |
| Measurements were made using the bandwidths and detectors specified. No video filter was used. | | | | |

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

## TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a dipole antenna. A signal generator was connected to the dipole antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the dipole antenna the effective radiated power for each emission was determined.

NORTHWEST EMC

# Effective Radiated Power (ERP)

PSA 2011.05.11
EMI 2008.1.9

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | 1000CP01S | | | **Work Order:** | ITRM0249 |
| **Serial Number:** | 28311047060 | | | **Date:** | 08/24/11 |
| **Customer:** | Intermec Technologies Corporation | | | **Temperature:** | 24 |
| **Attendees:** | none | | | **Humidity:** | 48% |
| **Project:** | None | | | **Barometric Pres.:** | 30.10 in |
| **Tested by:** | Rod Peloquin | **Power:** | 120VAC/60Hz | **Job Site:** | EV01 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 22.913:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| **Antenna Height(s) (m)** | 1 - 4 | **Test Distance (m)** | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

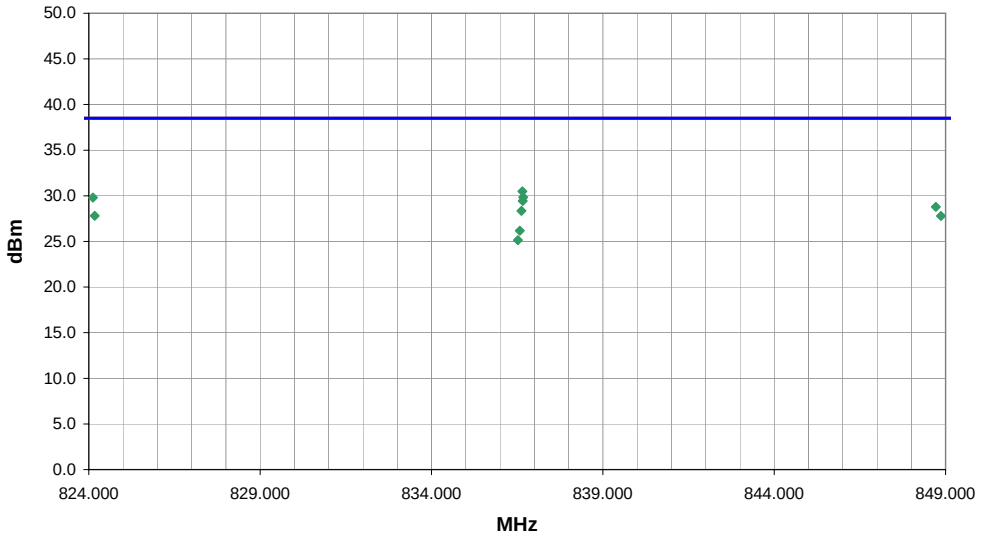
Transmitting Cellular Band, GPRS

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| **Run #** | 1 |
| **Configuration #** | 4 |
| **Results** | Pass |

*Signature*




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | ERP (Watts) | ERP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 836.650 | | | 143.0 | 1.0 | | | H-Bilog | PK | 1.12E+00 | 30.5 | 38.5 | -8.0 | Mid Channel, EUT horizontal |
| 836.675 | | | 244.0 | 1.1 | | | H-Bilog | PK | 9.64E-01 | 29.8 | 38.5 | -8.7 | Mid Channel, EUT on side |
| 824.120 | | | 241.0 | 1.1 | | | H-Bilog | PK | 9.57E-01 | 29.8 | 38.5 | -8.7 | Low Channel, EUT horizontal |
| 836.660 | | | 165.0 | 1.3 | | | V-Bilog | PK | 8.79E-01 | 29.4 | 38.5 | -9.1 | Mid Channel, EUT on side |
| 848.715 | | | 239.0 | 1.1 | | | H-Bilog | PK | 7.55E-01 | 28.8 | 38.5 | -9.7 | High Channel, EUT horizontal |
| 836.625 | | | 25.0 | 1.2 | | | V-Bilog | PK | 6.82E-01 | 28.3 | 38.5 | -10.2 | Mid Channel, EUT vertical |
| 824.175 | | | 169.0 | 1.3 | | | V-Bilog | PK | 6.04E-01 | 27.8 | 38.5 | -10.7 | Low Channel, EUT on side |
| 848.865 | | | 159.0 | 1.2 | | | V-Bilog | PK | 6.00E-01 | 27.8 | 38.5 | -10.7 | High Channel, EUT on side |
| 836.575 | | | 229.0 | 1.7 | | | V-Bilog | PK | 4.15E-01 | 26.2 | 38.5 | -12.3 | Mid Channel, EUT horizontal |
| 836.520 | | | 238.0 | 1.0 | | | H-Bilog | PK | 3.27E-01 | 25.1 | 38.5 | -13.4 | Mid Channel, EUT vertical |

NORTHWEST EMC

# Effective Radiated Power (ERP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1000CP01S | Work Order: | ITRM0249 |
| Serial Number: | 28311047060 | Date: | 08/24/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 24 |
| Attendees: | none | Humidity: | 48% |
| Project: | None | Barometric Pres.: | 30.10 in |
| Tested by: | Ethan Schoonover | Power: 120VAC/60Hz | Job Site: EV01 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 22.913:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

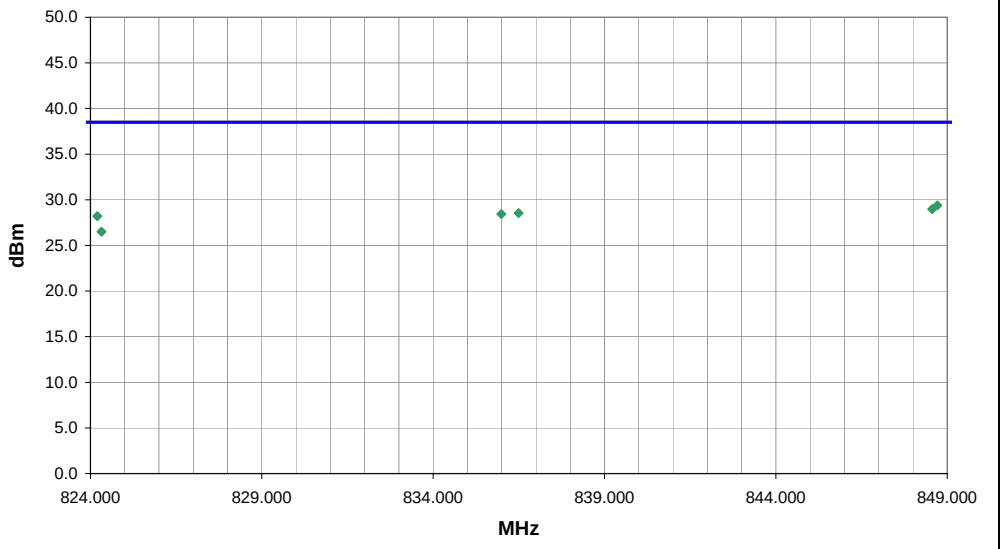
Transmitting Cellular Band, EDGE

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 6 |
| Configuration # | 4 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | ERP (Watts) | ERP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 848.710 | | | 238.0 | 1.0 | | | H-Bilog | PK | 8.67E-01 | 29.4 | 38.5 | -9.1 | High Channel, EUT Horizontal. |
| 848.560 | | | 158.0 | 1.8 | | | V-Bilog | PK | 7.91E-01 | 29.0 | 38.5 | -9.5 | High Channel, EUT On Side. |
| 836.495 | | | 161.0 | 1.0 | | | V-Bilog | PK | 7.14E-01 | 28.5 | 38.5 | -10.0 | Mid Channel, EUT On Side. |
| 835.990 | | | 234.0 | 1.0 | | | H-Bilog | PK | 6.98E-01 | 28.4 | 38.5 | -10.1 | Mid Channel, EUT Horizontal. |
| 824.200 | | | 239.0 | 1.0 | | | H-Bilog | PK | 6.62E-01 | 28.2 | 38.5 | -10.3 | Low Channel, EUT Horizontal. |
| 824.320 | | | 157.0 | 1.0 | | | V-Bilog | PK | 4.48E-01 | 26.5 | 38.5 | -12.0 | Low Channel, EUT On Side. |

NORTHWEST EMC

# Effective Radiated Power (ERP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1000CP01S | Work Order: | ITRM0249 |
| Serial Number: | 28311047060 | Date: | 08/24/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 24 |
| Attendees: | none | Humidity: | 48% |
| Project: | None | Barometric Pres.: | 30.10 in |
| Tested by: | Ethan Schoonover | Power: 120VAC/60Hz | Job Site: EV01 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 22.913:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

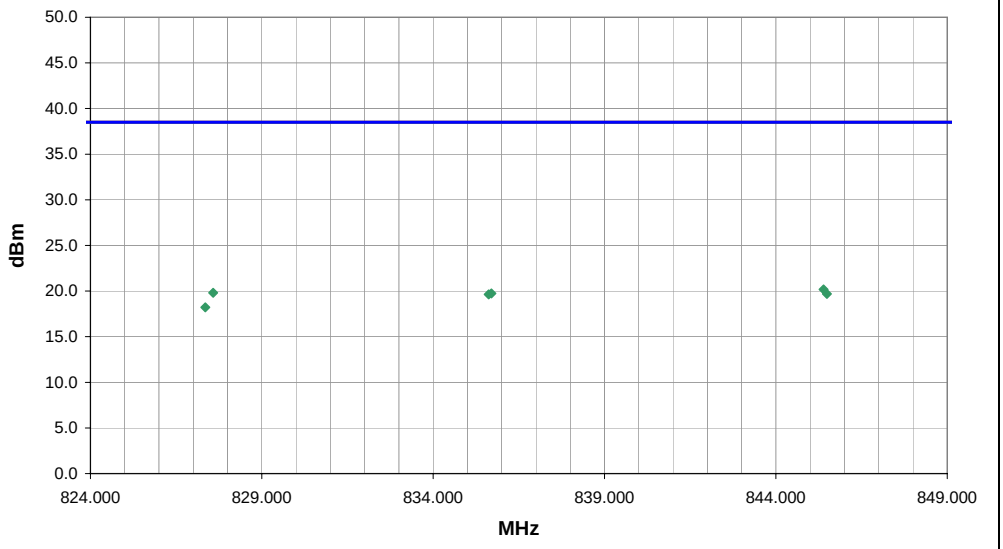
Transmitting Cellular Band, WCDMA

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 7 |
| Configuration # | 4 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | ERP (Watts) | ERP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 845.393 | | | 239.0 | 1.0 | | | H-Bilog | PK | 1.04E-01 | 20.2 | 38.5 | -18.3 | High Channel, EUT Horizontal. |
| 827.583 | | | 243.0 | 1.0 | | | H-Bilog | PK | 9.57E-02 | 19.8 | 38.5 | -18.7 | Low Channel, EUT Horizontal. |
| 835.700 | | | 157.0 | 1.0 | | | V-Bilog | PK | 9.42E-02 | 19.7 | 38.5 | -18.8 | Mid Channel, EUT On Side. |
| 845.487 | | | 153.0 | 1.8 | | | V-Bilog | PK | 9.29E-02 | 19.7 | 38.5 | -18.8 | High Channel, EUT On Side. |
| 835.620 | | | 240.0 | 1.0 | | | H-Bilog | PK | 9.20E-02 | 19.6 | 38.5 | -18.9 | Mid Channel, EUT Horizontal. |
| 827.350 | | | 155.0 | 1.0 | | | V-Bilog | PK | 6.62E-02 | 18.2 | 38.5 | -20.3 | Low Channel, EUT On Side. |

# Effective Radiated Power (ERP)



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 Cell Band, WCDMA |
| Transmitting Cell Band, E-GPRS (EDGE) |
| Transmitting Cell Band, GPRS |

| CHANNELS TESTED |
|---|
| GSM Low = Ch. 128, 824.2 MHz |
| GSM Mid = Ch. 190, 836.6 MHz |
| GSM High = Ch. 251, 848.8 MHz |
| UMTS Low = Ch. 4132, 826.4 MHz |
| UMTS Mid = Ch. 4183, 836.6 MHz |
| UMTS High = Ch. 4233, 846.6 MHz |

| POWER SETTINGS INVESTIGATED |
|---|
| 120VAC/60Hz |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 824 MHz | Stop Frequency | 849 MHz |

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

| TEST EQUIPMENT | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | ID | Last Cal. | Interval |
| Attenuator, 6dB | S.M. Electronics | 18N-06 | AWN | 5/5/2011 | 12 |
| Antenna, Dipole | ETS | 3121C-DB4 | ADH | 3/6/2009 | 36 |
| EV01 Cables | N/A | Bilog Cables | EVA | 6/28/2011 | 12 |
| Spectrum Analyzer | Agilent | E4446A | AAQ | 6/24/2011 | 12 |
| Antenna, Bilog | Teseq | CBL 6141B | AXR | 11/29/2010 | 12 |
| Attenuator, 'Precision N' | S.M. Electronics | SA18N-06/SM4032 | REE | 1/10/2011 | 12 |
| Power Meter | Gigatronics | 8651A | SPM | 1/7/2010 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |

| MEASUREMENT BANDWIDTHS | | | | |
|---|---|---|---|---|
| | **Frequency Range** | **Peak Data** | **Quasi-Peak Data** | **Average Data** |
| | **(MHz)** | **(kHz)** | **(kHz)** | **(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 |
| Measurements were made using the bandwidths and detectors specified. No video filter was used. | | | | |

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

## TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a dipole antenna. A signal generator was connected to the dipole antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the dipole antenna the effective radiated power for each emission was determined.

NORTHWEST EMC

# Effective Radiated Power (ERP)

PSA 2011.05.11
EMI 2008.1.9

| | | | | | |
|---|---|---|---|---|---|
| EUT: | 1000CP02S | | | Work Order: | ITRM0249 |
| Serial Number: | 178U1191040 | | | Date: | 08/24/11 |
| Customer: | Intermec Technologies Corporation | | | Temperature: | 24 |
| Attendees: | none | | | Humidity: | 48% |
| Project: | None | | | Barometric Pres.: | 30.10 in |
| Tested by: | Ethan Schoonover | Power: | 120VAC/60Hz | Job Site: | EV01 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 22.913:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

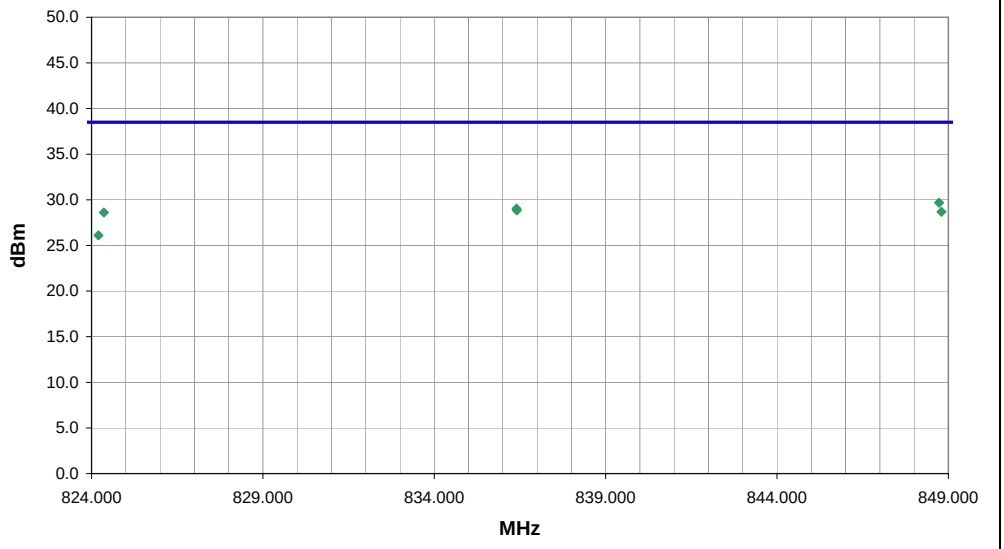
Transmitting Cellular Band, GPRS

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 2 |
| Configuration # | 5 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | ERP (Watts) | ERP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 848.730 | | | 241.0 | 1.0 | | | H-Bilog | PK | 9.29E-01 | 29.7 | 38.5 | -8.8 | High Channel, EUT horizontal. |
| 836.400 | | | 247.0 | 1.0 | | | H-Bilog | PK | 8.02E-01 | 29.0 | 38.5 | -9.5 | Mid Channel, EUT horizontal. |
| 836.410 | | | 174.0 | 1.0 | | | V-Bilog | PK | 7.66E-01 | 28.8 | 38.5 | -9.7 | Mid Channel, EUT on side. |
| 848.800 | | | 172.0 | 1.0 | | | V-Bilog | PK | 7.38E-01 | 28.7 | 38.5 | -9.8 | High Channel, EUT on side. |
| 824.360 | | | 151.0 | 1.0 | | | H-Bilog | PK | 7.26E-01 | 28.6 | 38.5 | -9.9 | Low Channel, EUT horizontal. |
| 824.200 | | | 170.0 | 1.0 | | | V-Bilog | PK | 4.08E-01 | 26.1 | 38.5 | -12.4 | Low Channel, EUT on side. |

NORTHWEST EMC

# Effective Radiated Power (ERP)

PSA 2011.05.11
EMI 2008.1.9

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | 1000CP02S | | | **Work Order:** | ITRM0249 |
| **Serial Number:** | 178U1191040 | | | **Date:** | 08/24/11 |
| **Customer:** | Intermec Technologies Corporation | | | **Temperature:** | 24 |
| **Attendees:** | none | | | **Humidity:** | 48% |
| **Project:** | None | | | **Barometric Pres.:** | 30.10 in |
| **Tested by:** | Ethan Schoonover | **Power:** | 120VAC/60Hz | **Job Site:** | EV01 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 22.913:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| **Antenna Height(s) (m)** | 1 - 4 | **Test Distance (m)** | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

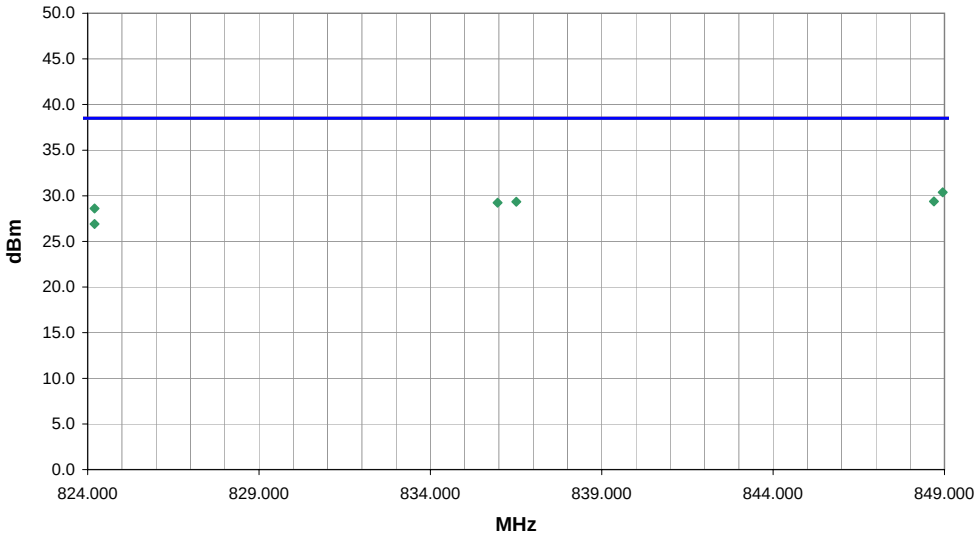
Transmitting Cellular Band, EDGE

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| **Run #** | 5 |
| **Configuration #** | 5 |
| **Results** | Pass |

*Signature*




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | ERP (Watts) | ERP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 848.950 | | | 236.0 | 1.0 | | | H-Bilog | PK | 1.09E+00 | 30.4 | 38.5 | -8.1 | High Channel, EUT Horizontal |
| 848.690 | | | 154.0 | 1.8 | | | V-Bilog | PK | 8.67E-01 | 29.4 | 38.5 | -9.1 | High Channel, EUT On Side. |
| 836.505 | | | 232.0 | 1.0 | | | H-Bilog | PK | 8.59E-01 | 29.3 | 38.5 | -9.2 | Mid Channel, EUT Horizontal |
| 835.960 | | | 157.0 | 1.0 | | | V-Bilog | PK | 8.39E-01 | 29.2 | 38.5 | -9.3 | Mid Channel, EUT On Side. |
| 824.200 | | | 235.0 | 1.0 | | | H-Bilog | PK | 7.26E-01 | 28.6 | 38.5 | -9.9 | Low Channel, EUT Horizontal |
| 824.200 | | | 159.0 | 1.0 | | | V-Bilog | PK | 4.91E-01 | 26.9 | 38.5 | -11.6 | Low Channel, EUT On Side. |

NORTHWEST EMC

# Effective Radiated Power (ERP)

PSA 2011.05.11
EMI 2008.1.9

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | 1000CP02S | | | **Work Order:** | ITRM0249 |
| **Serial Number:** | 178U1191040 | | | **Date:** | 08/24/11 |
| **Customer:** | Intermec Technologies Corporation | | | **Temperature:** | 24 |
| **Attendees:** | none | | | **Humidity:** | 48% |
| **Project:** | None | | | **Barometric Pres.:** | 30.10 in |
| **Tested by:** | Ethan Schoonover | **Power:** | 120VAC/60Hz | **Job Site:** | EV01 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 22.913:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| **Antenna Height(s) (m)** | 1 - 4 | **Test Distance (m)** | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

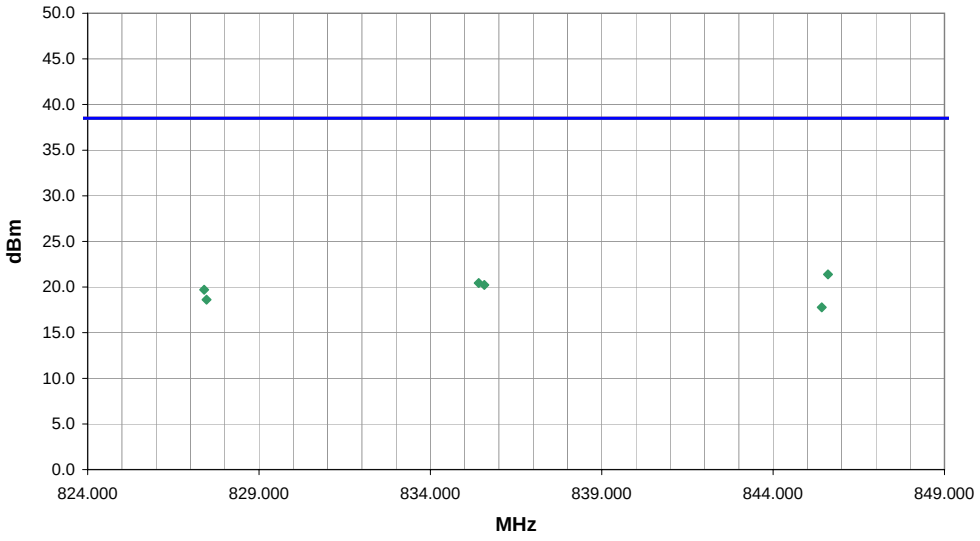
Transmitting Cellular Band, WCDMA

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| **Run #** | 8 |
| **Configuration #** | 5 |
| **Results** | Pass |

*Signature*




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | ERP (Watts) | ERP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 845.603 | | | 244.0 | 1.0 | | | H-Bilog | PK | 1.37E-01 | 21.4 | 38.5 | -17.1 | High Channel, EUT Horizontal |
| 835.410 | | | 245.0 | 1.0 | | | H-Bilog | PK | 1.11E-01 | 20.4 | 38.5 | -18.1 | Mid Channel, EUT Horizontal |
| 835.573 | | | 159.0 | 1.0 | | | V-Bilog | PK | 1.06E-01 | 20.2 | 38.5 | -18.3 | Mid Channel, EUT On Side. |
| 827.397 | | | 244.0 | 1.0 | | | H-Bilog | PK | 9.35E-02 | 19.7 | 38.5 | -18.8 | Low Channel, EUT Horizontal |
| 827.467 | | | 159.0 | 1.0 | | | V-Bilog | PK | 7.26E-02 | 18.6 | 38.5 | -19.9 | Low Channel, EUT On Side. |
| 845.417 | | | 108.0 | 1.8 | | | V-Bilog | PK | 6.00E-02 | 17.8 | 38.5 | -20.7 | High Channel, EUT On Side. |

# Effective Radiated Power (ERP)



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 Cell Band, WCDMA |
| Transmitting Cell Band, E-GPRS (EDGE) |
| Transmitting Cell Band, GPRS |

| CHANNELS TESTED |
|---|
| GSM Low = Ch. 128, 824.2 MHz |
| GSM Mid = Ch. 190, 836.6 MHz |
| GSM High = Ch. 251, 848.8 MHz |
| UMTS Low = Ch. 4132, 826.4 MHz |
| UMTS Mid = Ch. 4183, 836.6 MHz |
| UMTS High = Ch. 4233, 846.6 MHz |

| POWER SETTINGS INVESTIGATED |
|---|
| 120VAC/60Hz |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 824 MHz | Stop Frequency | 849 MHz |

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

| TEST EQUIPMENT | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | ID | Last Cal. | Interval |
| Attenuator, 6dB | S.M. Electronics | 18N-06 | AWN | 5/5/2011 | 12 |
| Antenna, Dipole | ETS | 3121C-DB4 | ADH | 3/6/2009 | 36 |
| EV01 Cables | N/A | Bilog Cables | EVA | 6/28/2011 | 12 |
| Spectrum Analyzer | Agilent | E4446A | AAQ | 6/24/2011 | 12 |
| Antenna, Bilog | Teseq | CBL 6141B | AXR | 11/29/2010 | 12 |
| Attenuator, 'Precision N' | S.M. Electronics | SA18N-06/SM4032 | REE | 1/10/2011 | 12 |
| Power Meter | Gigatronics | 8651A | SPM | 1/7/2010 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |

| MEASUREMENT BANDWIDTHS | | | | |
|---|---|---|---|---|
| | **Frequency Range** | **Peak Data** | **Quasi-Peak Data** | **Average Data** |
| | **(MHz)** | **(kHz)** | **(kHz)** | **(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 |
| Measurements were made using the bandwidths and detectors specified. No video filter was used. | | | | |

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

## TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a dipole antenna. A signal generator was connected to the dipole antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the dipole antenna the effective radiated power for each emission was determined.

NORTHWEST EMC

# Effective Radiated Power (ERP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1001CP01S | Work Order: | ITRM0249 |
| Serial Number: | 28311047275 | Date: | 08/24/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 24 |
| Attendees: | none | Humidity: | 48% |
| Project: | None | Barometric Pres.: | 30.10 in |
| Tested by: | Ethan Schoonover | Power: 120VAC/60Hz | Job Site: EV01 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 22.913:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

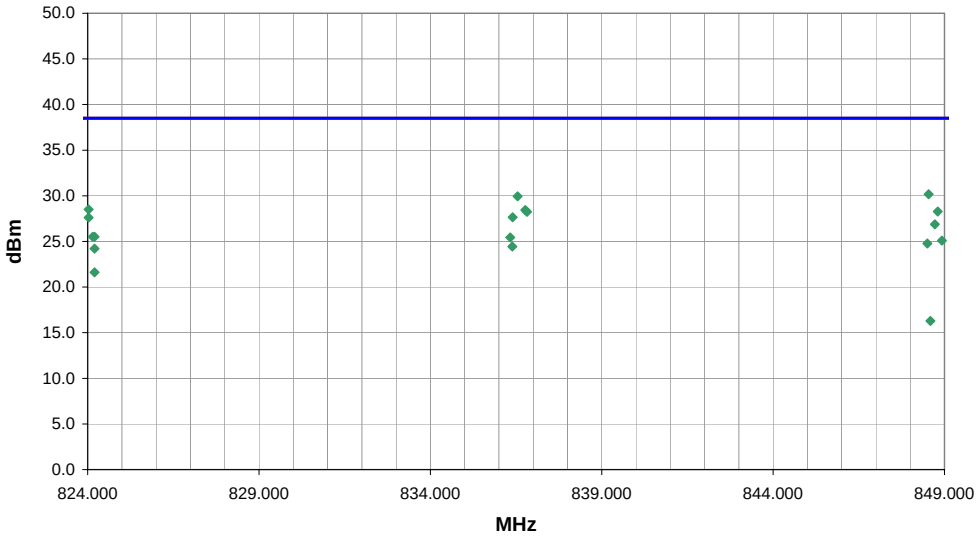
Transmitting Cellular Band, GPRS

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 3 |
| Configuration # | 6 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | ERP (Watts) | ERP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 848.540 | | | 140.0 | 1.0 | | | H-Bilog | PK | 1.04E+00 | 30.2 | 38.5 | -8.3 | High Channel, EUT On Side. |
| 836.545 | | | 147.0 | 1.0 | | | H-Bilog | PK | 9.86E-01 | 29.9 | 38.5 | -8.6 | Mid Channel, EUT On Side. |
| 824.030 | | | 150.0 | 1.0 | | | H-Bilog | PK | 7.10E-01 | 28.5 | 38.5 | -10.0 | Low Channel, EUT On Side. |
| 836.770 | | | 152.0 | 1.0 | | | H-Bilog | PK | 6.98E-01 | 28.4 | 38.5 | -10.1 | High Channel, EUT Horizontal |
| 848.805 | | | 149.0 | 1.0 | | | H-Bilog | PK | 6.73E-01 | 28.3 | 38.5 | -10.2 | High Channel, EUT Horizontal |
| 836.820 | | | 151.0 | 1.0 | | | V-Bilog | PK | 6.67E-01 | 28.2 | 38.5 | -10.3 | Mid Channel, EUT Vertical |
| 836.400 | | | 161.0 | 1.0 | | | V-Bilog | PK | 5.81E-01 | 27.6 | 38.5 | -10.9 | Mid Channel, EUT On Side. |
| 824.030 | | | 156.0 | 1.0 | | | H-Bilog | PK | 5.77E-01 | 27.6 | 38.5 | -10.9 | Low Channel, EUT Horizontal |
| 848.720 | | | 168.0 | 1.7 | | | V-Bilog | PK | 4.88E-01 | 26.9 | 38.5 | -11.6 | High Channel, EUT Vertical |
| 824.200 | | | 104.0 | 1.0 | | | H-Bilog | PK | 3.56E-01 | 25.5 | 38.5 | -13.0 | Low Channel, EUT Vertical |
| 824.150 | | | 154.0 | 1.0 | | | V-Bilog | PK | 3.56E-01 | 25.5 | 38.5 | -13.0 | Low Channel, EUT Vertical |
| 836.330 | | | 142.0 | 1.0 | | | H-Bilog | PK | 3.50E-01 | 25.4 | 38.5 | -13.1 | Mid Channel, EUT Vertical |
| 848.925 | | | 316.0 | 1.6 | | | V-Bilog | PK | 3.22E-01 | 25.1 | 38.5 | -13.4 | High Channel, EUT Horizontal |
| 848.500 | | | 108.0 | 1.0 | | | H-Bilog | PK | 3.01E-01 | 24.8 | 38.5 | -13.7 | High Channel, EUT Vertical |
| 836.390 | | | 20.0 | 1.0 | | | V-Bilog | PK | 2.78E-01 | 24.4 | 38.5 | -14.1 | Mid Channel, EUT Horizontal |
| 824.200 | | | 342.0 | 1.6 | | | V-Bilog | PK | 2.64E-01 | 24.2 | 38.5 | -14.3 | Low Channel, EUT Horizontal |
| 824.200 | | | 76.0 | 1.0 | | | V-Bilog | PK | 1.45E-01 | 21.6 | 38.5 | -16.9 | Low Channel, EUT On Side. |
| 848.590 | | | 231.0 | 1.4 | | | V-Bilog | PK | 4.25E-02 | 16.3 | 38.5 | -22.2 | High Channel, EUT On Side. |

NORTHWEST EMC

# Effective Radiated Power (ERP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1001CP01S | Work Order: | ITRM0249 |
| Serial Number: | 28311047275 | Date: | 08/24/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 24 |
| Attendees: | none | Humidity: | 48% |
| Project: | None | Barometric Pres.: | 30.10 in |
| Tested by: | Ethan Schoonover | Power: 120VAC/60Hz | Job Site: EV01 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 22.913:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

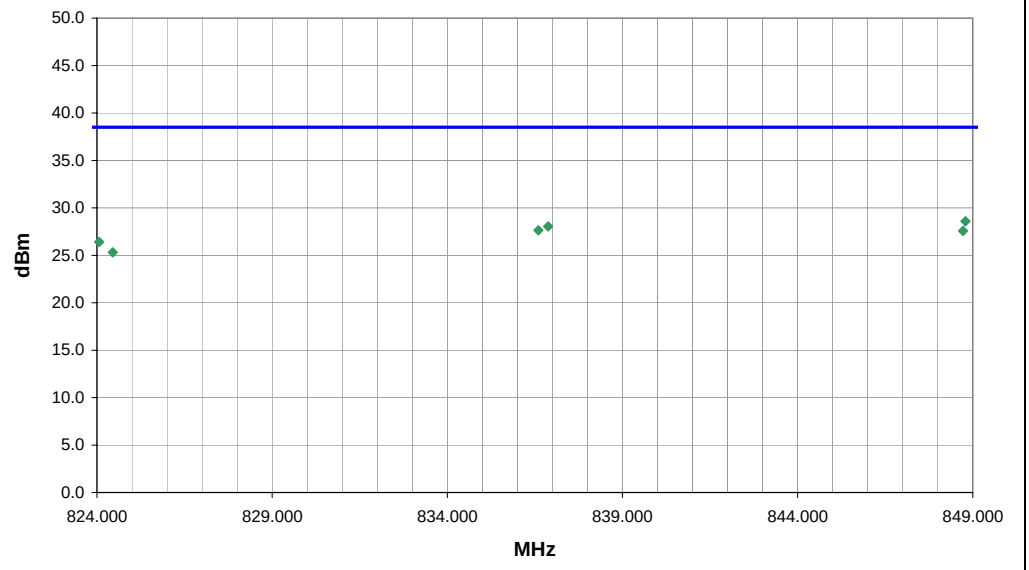
Transmitting Cellular Band, EDGE

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 4 |
| Configuration # | 6 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | ERP (Watts) | ERP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 848.790 | | | 208.0 | 1.7 | | | V-Bilog | PK | 7.21E-01 | 28.6 | 38.5 | -9.9 | High Channel, EUT Vertical |
| 836.880 | | | 194.0 | 1.0 | | | V-Bilog | PK | 6.37E-01 | 28.0 | 38.5 | -10.5 | Mid Channel, EUT Vertical |
| 836.600 | | | 143.0 | 1.0 | | | H-Bilog | PK | 5.81E-01 | 27.6 | 38.5 | -10.9 | Mid Channel, EUT Horz |
| 848.720 | | | 277.0 | 1.0 | | | H-Bilog | PK | 5.73E-01 | 27.6 | 38.5 | -10.9 | High Channel, EUT Horz |
| 824.065 | | | 144.0 | 1.0 | | | H-Bilog | PK | 4.38E-01 | 26.4 | 38.5 | -12.1 | Low Channel, EUT Horz |
| 824.450 | | | 140.0 | 1.0 | | | V-Bilog | PK | 3.40E-01 | 25.3 | 38.5 | -13.2 | Low Channel, EUT Vertical |

NORTHWEST EMC

# Effective Radiated Power (ERP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1001CP01S | Work Order: | ITRM0249 |
| Serial Number: | 28311047275 | Date: | 08/24/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 24 |
| Attendees: | none | Humidity: | 48% |
| Project: | None | Barometric Pres.: | 30.10 in |
| Tested by: | Ethan Schoonover | Power: 120VAC/60Hz | Job Site: EV01 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 22.913:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

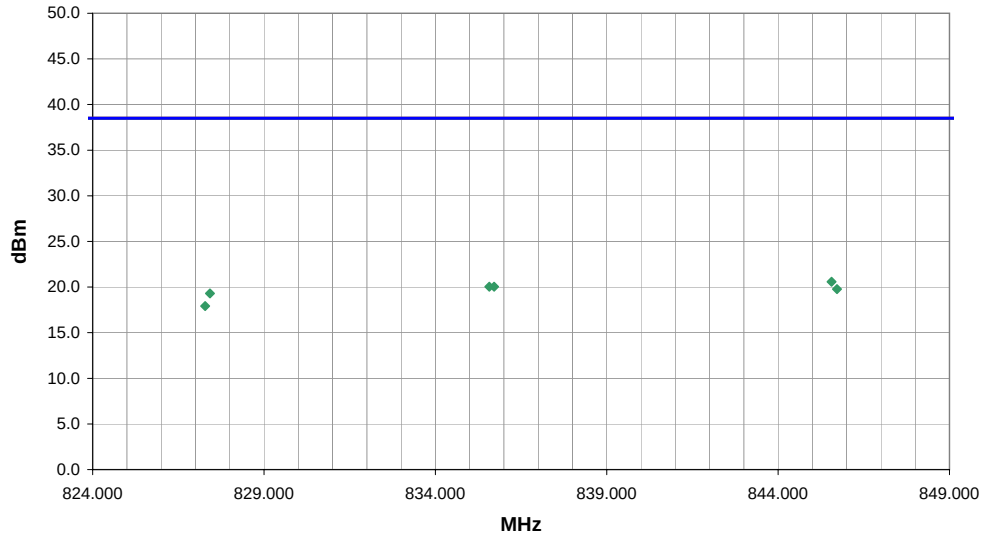
Transmitting Cellular Band, WCDMA

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 9 |
| Configuration # | 6 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | ERP (Watts) | ERP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 845.557 | | | 195.0 | 1.0 | | | H-Bilog | PK | 1.14E-01 | 20.6 | 38.5 | -17.9 | High Channel, EUT Horizontal |
| 835.573 | | | 195.0 | 1.0 | | | H-Bilog | PK | 1.01E-01 | 20.0 | 38.5 | -18.5 | Mid Channel, EUT Horizontal |
| 835.713 | | | 320.0 | 1.0 | | | V-Bilog | PK | 1.01E-01 | 20.0 | 38.5 | -18.5 | Mid Channel, EUT Vertical |
| 845.720 | | | -1.0 | 1.8 | | | V-Bilog | PK | 9.51E-02 | 19.8 | 38.5 | -18.7 | High Channel, EUT Vertical |
| 827.420 | | | 195.0 | 1.0 | | | H-Bilog | PK | 8.53E-02 | 19.3 | 38.5 | -19.2 | Low Channel, EUT Horizontal |
| 827.280 | | | 318.0 | 1.0 | | | V-Bilog | PK | 6.18E-02 | 17.9 | 38.5 | -20.6 | Low Channel, EUT Vertical |

# Effective Radiated Power (EIRP)



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 PCS Band, WCDMA |
| Transmitting PCS Band, E-GPRS (EDGE) |
| Transmitting PCS Band, GPRS |

| CHANNELS TESTED |
|---|
| GSM Low = Ch. 512, 1850.2 MHz |
| GSM Mid = Ch. 661, 1880 MHz |
| GSM High = Ch. 810, 1909.8 MHz |
| UMTS Low = Ch. 9262, 1852.4 MHz |
| UMTS Mid = Ch. 9400, 1880 MHz |
| UMTS High = Ch. 9538, 1907.6 MHz |

| POWER SETTINGS INVESTIGATED |
|---|
| 120VAC/60Hz |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 1850 MHz | Stop Frequency | 1910 MHz |

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

| TEST EQUIPMENT | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | ID | Last Cal. | Interval |
| Spectrum Analyzer | Agilent | E4440A | AAW | 4/19/2011 | 12 |
| Antenna, Horn | ETS | 3115 | AIB | 9/8/2010 | 24 |
| EV12 Cables | N/A | Double Ridge Horn Cables | EVT | 11/22/2010 | 12 |
| Antenna, Horn | EMCO | 3115 | AHE | 10/22/2009 | 24 |
| Attenuator, 'Precision N' | S.M. Electronics | SA18N-06/SM4032 | REE | 1/10/2011 | 12 |
| Power Meter | Gigatronics | 8651A | SPM | 1/7/2010 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |

| MEASUREMENT BANDWIDTHS | | | |
|---|---|---|---|
| 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 |
| Measurements were made using the bandwidths and detectors specified. No video filter was used. | | | |

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

## TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

NORTHWEST EMC

# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1000CP01S | Work Order: | ITRM0249 |
| Serial Number: | 28311047060 | Date: | 08/23/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 24 |
| Attendees: | None | Humidity: | 49% |
| Project: | None | Barometric Pres.: | 30.05 in |
| Tested by: | Rod Peloquin | Power: 120VAC/60Hz | Job Site: EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 24.232:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

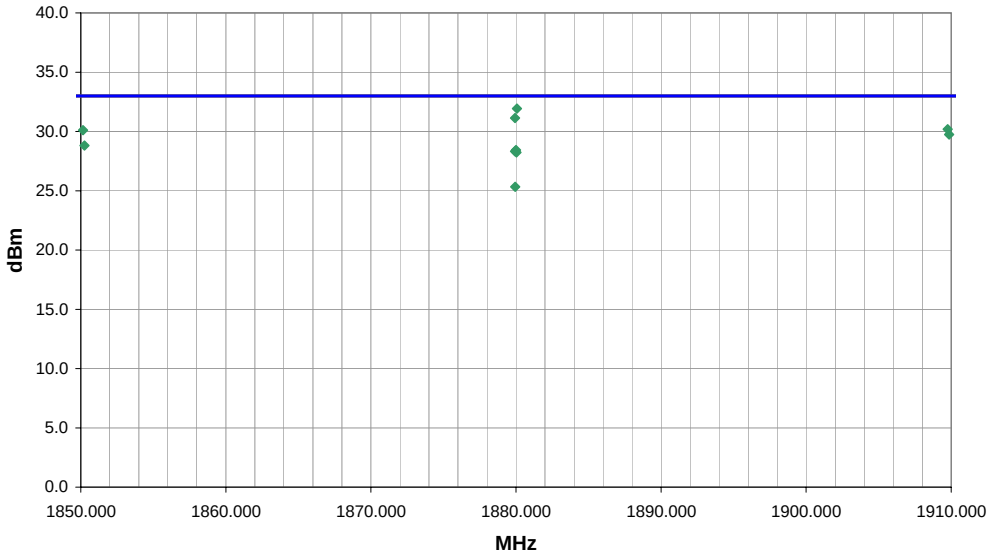
Transmitting PCS Band, GPRS

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 1 |
| Configuration # | 4 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1880.067 | | | 229.0 | 1.2 | | | H-Horn | PK | 1.56E+00 | 31.9 | 33.0 | -1.1 | Mid Channel, EUT vertical |
| 1879.933 | | | 279.0 | 1.0 | | | V-Horn | PK | 1.30E+00 | 31.1 | 33.0 | -1.9 | Mid Channel, EUT on side |
| 1909.758 | | | 236.0 | 1.5 | | | H-Horn | PK | 1.04E+00 | 30.2 | 33.0 | -2.8 | High Channel, EUT vertical |
| 1850.158 | | | 236.0 | 1.3 | | | V-Horn | PK | 1.03E+00 | 30.1 | 33.0 | -2.9 | Low Channel, EUT on side |
| 1909.854 | | | 233.0 | 1.8 | | | V-Horn | PK | 9.44E-01 | 29.8 | 33.0 | -3.3 | High Channel, EUT on side |
| 1850.250 | | | 226.0 | 1.6 | | | H-Horn | PK | 7.60E-01 | 28.8 | 33.0 | -4.2 | Low Channel, EUT vertical |
| 1880.000 | | | 270.0 | 1.6 | | | V-Horn | PK | 6.97E-01 | 28.4 | 33.0 | -4.6 | Mid Channel, EUT vertical |
| 1879.935 | | | 127.0 | 1.2 | | | H-Horn | PK | 6.81E-01 | 28.3 | 33.0 | -4.7 | Mid Channel, EUT horizontal |
| 1880.030 | | | 148.0 | 1.3 | | | V-Horn | PK | 6.65E-01 | 28.2 | 33.0 | -4.8 | Mid Channel, EUT horizontal |
| 1879.950 | | | 179.0 | 1.0 | | | H-Horn | PK | 3.41E-01 | 25.3 | 33.0 | -7.7 | Mid Channel, EUT on side |

NORTHWEST EMC

# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1000CP01S | Work Order: | ITRM0249 |
| Serial Number: | 28311047060 | Date: | 08/23/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 22 |
| Attendees: | None | Humidity: | 38% |
| Project: | None | Barometric Pres.: | 1002.3 |
| Tested by: | Rod Peloquin | Power: 120VAC/60Hz | Job Site: EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 24.232:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

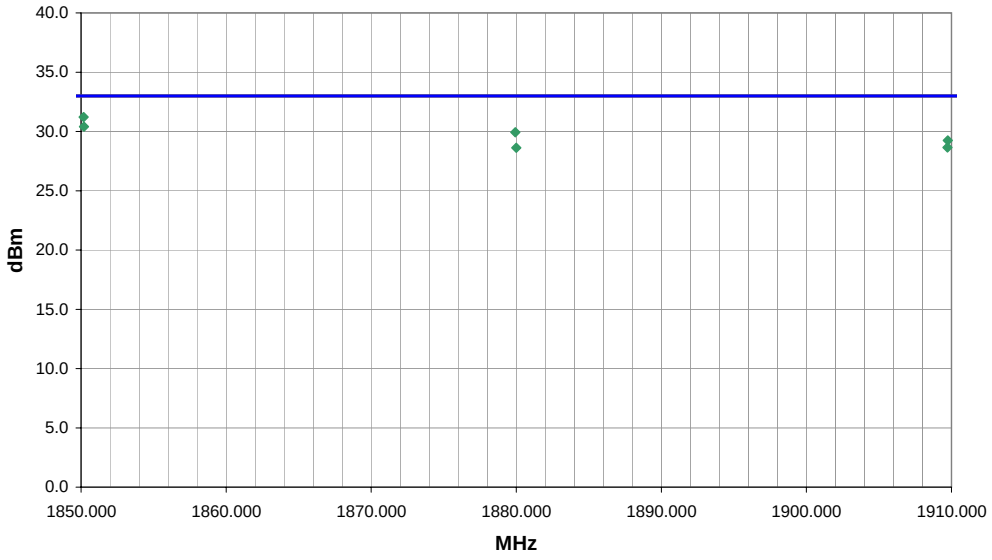
Transmitting PCS Band, E-GPRS (EDGE)

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 2 |
| Configuration # | 4 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1850.175 | | | 210.0 | 1.3 | | | H-Horn | PK | 1.32E+00 | 31.2 | 33.0 | -1.8 | Low Channel, EUT vertical |
| 1850.196 | | | 293.0 | 1.3 | | | V-Horn | PK | 1.10E+00 | 30.4 | 33.0 | -2.6 | Low Channel, EUT on side |
| 1879.938 | | | 282.0 | 1.0 | | | V-Horn | PK | 9.84E-01 | 29.9 | 33.0 | -3.1 | Mid Channel, EUT on side |
| 1909.742 | | | 272.0 | 1.3 | | | V-Horn | PK | 8.41E-01 | 29.3 | 33.0 | -3.8 | High Channel, EUT on side |
| 1909.729 | | | 181.0 | 1.2 | | | H-Horn | PK | 7.33E-01 | 28.7 | 33.0 | -4.4 | High Channel, EUT vertical |
| 1880.004 | | | 206.0 | 1.2 | | | H-Horn | PK | 7.29E-01 | 28.6 | 33.0 | -4.4 | Mid Channel, EUT vertical |

NORTHWEST EMC

# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1000CP01S | Work Order: | ITRM0249 |
| Serial Number: | 28311047060 | Date: | 08/23/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 22 |
| Attendees: | None | Humidity: | 38% |
| Project: | None | Barometric Pres.: | 1002.3 |
| Tested by: | Rod Peloquin | Power: 120VAC/60Hz | Job Site: EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 24.232:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

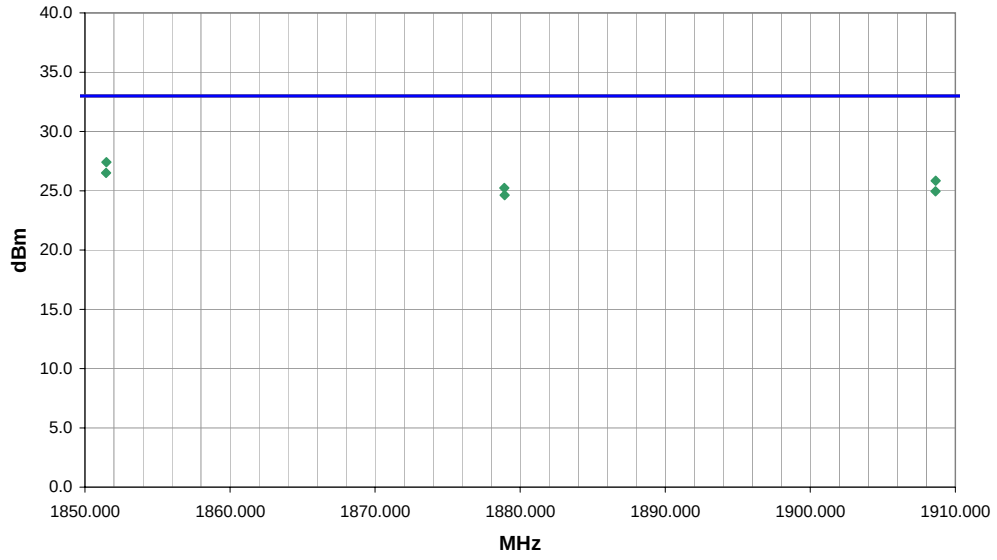
Transmitting PCS Band, WCDMA

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 3 |
| Configuration # | 4 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1851.480 | | | 215.0 | 1.3 | | | H-Horn | PK | 5.51E-01 | 27.4 | 33.0 | -5.6 | Low Channel, EUT Vertical |
| 1851.460 | | | 242.0 | 1.3 | | | V-Horn | PK | 4.48E-01 | 26.5 | 33.0 | -6.5 | Low Channel, EUT on side |
| 1908.640 | | | 248.0 | 1.7 | | | V-Horn | PK | 3.85E-01 | 25.9 | 33.0 | -7.2 | High Channel, EUT on side |
| 1878.910 | | | 250.0 | 1.3 | | | V-Horn | PK | 3.33E-01 | 25.2 | 33.0 | -7.8 | Mid Channel, EUT on side |
| 1908.630 | | | 186.0 | 1.2 | | | H-Horn | PK | 3.13E-01 | 25.0 | 33.0 | -8.1 | High Channel, EUT Vertical |
| 1878.930 | | | 183.0 | 1.3 | | | H-Horn | PK | 2.90E-01 | 24.6 | 33.0 | -8.4 | Mid Channel, EUT Vertical |

# Effective Radiated Power (EIRP)



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 PCS Band, E-GPRS (EDGE) |
| Transmitting PCS Band, GPRS |
| Transmitting PCS Band, WCDMA |

| CHANNELS TESTED |
|---|
| GSM Low = Ch. 512, 1850.2 MHz |
| GSM Mid = Ch. 661, 1880 MHz |
| GSM High = Ch. 810, 1909.8 MHz |
| UMTS Low = Ch. 9262, 1852.4 MHz |
| UMTS Mid = Ch. 9400, 1880 MHz |
| UMTS High = Ch. 9538, 1907.6 MHz |

| POWER SETTINGS INVESTIGATED |
|---|
| 120VAC/60Hz |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 1850 MHz | Stop Frequency | 1910 MHz |

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

| TEST EQUIPMENT | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | ID | Last Cal. | Interval |
| Spectrum Analyzer | Agilent | E4440A | AAW | 4/19/2011 | 12 |
| Antenna, Horn | ETS | 3115 | AIB | 9/8/2010 | 24 |
| EV12 Cables | N/A | Double Ridge Horn Cables | EVT | 11/22/2010 | 12 |
| Antenna, Horn | EMCO | 3115 | AHE | 10/22/2009 | 24 |
| Attenuator, 'Precision N' | S.M. Electronics | SA18N-06/SM4032 | REE | 1/10/2011 | 12 |
| Power Meter | Gigatronics | 8651A | SPM | 1/7/2010 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |

| MEASUREMENT BANDWIDTHS | | | | |
|---|---|---|---|---|
| | **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 |
| Measurements were made using the bandwidths and detectors specified. No video filter was used. | | | | |

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

## TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

NORTHWEST EMC

# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1000CP02S | Work Order: | ITRM0249 |
| Serial Number: | 178U1191040 | Date: | 08/23/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 22 |
| Attendees: | none | Humidity: | 38% |
| Project: | None | Barometric Pres.: | 1002.3 |
| Tested by: | Ethan Schoonover | Power: 120VAC/60Hz | Job Site: EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 24.232:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

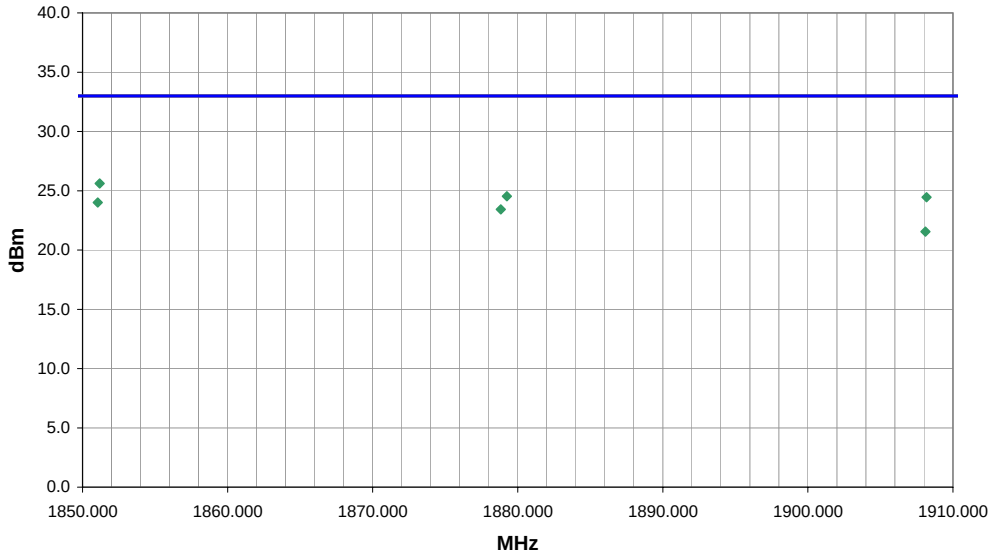
Transmitting PCS Band, WCDMA

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 4 |
| Configuration # | 5 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1851.180 | | | 81.0 | 1.2 | | | H-Horn | PK | 3.64E-01 | 25.6 | 33.0 | -7.4 | Low Channel, EUT Vertical. |
| 1879.250 | | | 40.0 | 1.9 | | | H-Horn | PK | 2.84E-01 | 24.5 | 33.0 | -8.5 | Mid Channel, EUT vert. |
| 1908.180 | | | 78.0 | 1.2 | | | H-Horn | PK | 2.79E-01 | 24.5 | 33.0 | -8.6 | High Channel, EUT Vertical. |
| 1851.050 | | | 235.0 | 1.1 | | | V-Horn | PK | 2.52E-01 | 24.0 | 33.0 | -9.0 | Low Channel, EUT on side. |
| 1878.830 | | | 55.0 | 1.3 | | | H-Horn | PK | 2.20E-01 | 23.4 | 33.0 | -9.6 | Mid Channel, EUT on side. |
| 1908.100 | | | 236.0 | 1.5 | | | V-Horn | PK | 1.43E-01 | 21.6 | 33.0 | -11.5 | High Channel, EUT on side. |

NORTHWEST EMC

# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1000CP02S | Work Order: | ITRM0249 |
| Serial Number: | 178U1191040 | Date: | 08/23/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 22 |
| Attendees: | none | Humidity: | 38% |
| Project: | None | Barometric Pres.: | 1002.3 |
| Tested by: | Ethan Schoonover | Power: 120VAC/60Hz | Job Site: EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 24.232:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

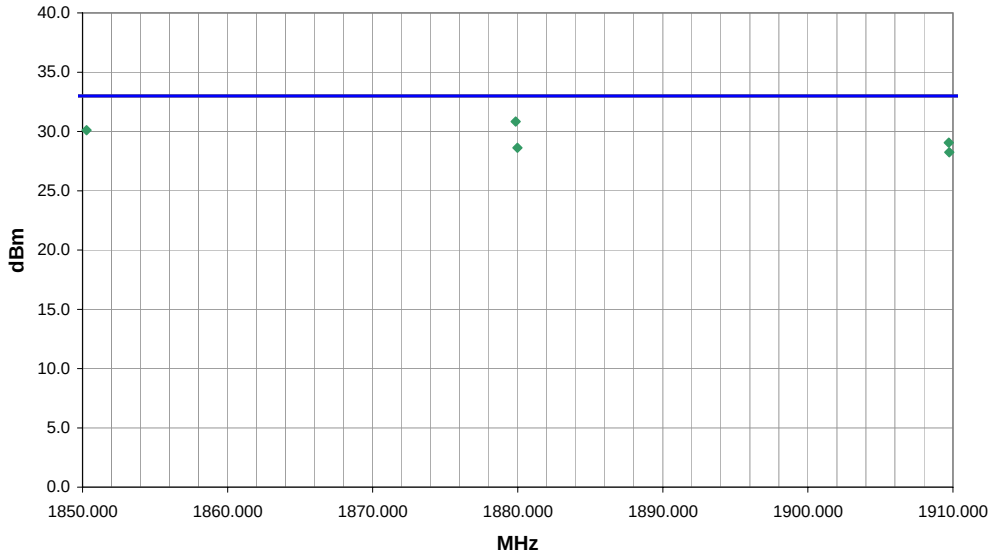
Transmitting PCS Band, GPRS

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 5 |
| Configuration # | 5 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1879.860 | | | 238.0 | 1.6 | | | H-Horn | PK | 1.21E+00 | 30.8 | 33.0 | -2.2 | Mid Channel, EUT Vertical. |
| 1850.280 | | | 208.0 | 1.2 | | | H-Horn | PK | 1.03E+00 | 30.1 | 33.0 | -2.9 | Low Channel, EUT Vertical. |
| 1909.710 | | | 219.0 | 1.2 | | | V-Horn | PK | 8.04E-01 | 29.1 | 33.0 | -4.0 | High Channel, EUT on side. |
| 1849.820 | | | 237.0 | 1.1 | | | V-Horn | PK | 7.43E-01 | 28.7 | 33.0 | -4.3 | Low Channel, EUT on side. |
| 1879.980 | | | 177.0 | 1.3 | | | V-Horn | PK | 7.29E-01 | 28.6 | 33.0 | -4.4 | Mid Channel, EUT on side. |
| 1909.750 | | | 195.0 | 1.5 | | | H-Horn | PK | 6.68E-01 | 28.3 | 33.0 | -4.8 | High Channel, EUT Vertical. |

NORTHWEST EMC

# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1000CP02S | Work Order: | ITRM0249 |
| Serial Number: | 178U1191040 | Date: | 08/23/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 22 |
| Attendees: | none | Humidity: | 38% |
| Project: | None | Barometric Pres.: | 1002.3 |
| Tested by: | Ethan Schoonover | Power: 120VAC/60Hz | Job Site: EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 24.232:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

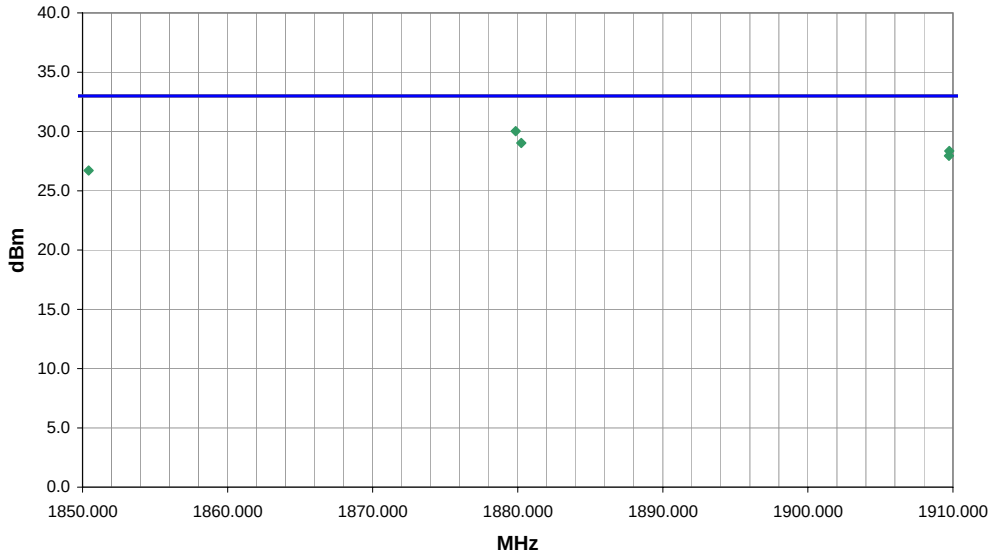
Transmitting PCS Band, E-GPRS (EDGE)

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 6 |
| Configuration # | 5 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1849.980 | | | 210.0 | 1.2 | | | H-Horn | PK | 1.05E+00 | 30.2 | 33.0 | -2.8 | Low Channel, EUT Vertical. |
| 1879.860 | | | 234.0 | 1.5 | | | H-Horn | PK | 1.01E+00 | 30.0 | 33.0 | -3.0 | Mid Channel, EUT Vertical. |
| 1880.240 | | | 162.0 | 1.2 | | | V-Horn | PK | 8.00E-01 | 29.0 | 33.0 | -4.0 | Mid Channel, EUT on side. |
| 1909.750 | | | 201.0 | 1.5 | | | H-Horn | PK | 6.84E-01 | 28.4 | 33.0 | -4.7 | High Channel, EUT Vertical. |
| 1909.720 | | | 159.0 | 1.2 | | | V-Horn | PK | 6.24E-01 | 28.0 | 33.0 | -5.1 | High Channel, EUT on side. |
| 1850.420 | | | 202.0 | 1.1 | | | V-Horn | PK | 4.69E-01 | 26.7 | 33.0 | -6.3 | Low Channel, EUT on side. |

# Effective Radiated Power (EIRP)



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 PCS Band, WCDMA |
| Transmitting PCS Band, E-GPRS (EDGE) |
| Transmitting PCS Band, GPRS |

| CHANNELS TESTED |
|---|
| GSM Low = Ch. 512, 1850.2 MHz |
| GSM Mid = Ch. 661, 1880 MHz |
| GSM High = Ch. 810, 1909.8 MHz |
| UMTS Low = Ch. 9262, 1852.4 MHz |
| UMTS Mid = Ch. 9400, 1880 MHz |
| UMTS High = Ch. 9538, 1907.6 MHz |

| POWER SETTINGS INVESTIGATED |
|---|
| 120VAC/60Hz |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 1850 MHz | Stop Frequency | 1910 MHz |

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

| TEST EQUIPMENT | | | | | |
|---|---|---|---|---|---|
| Description | Manufacturer | Model | ID | Last Cal. | Interval |
| Spectrum Analyzer | Agilent | E4440A | AAW | 4/19/2011 | 12 |
| Antenna, Horn | ETS | 3115 | AIB | 9/8/2010 | 24 |
| EV12 Cables | N/A | Double Ridge Horn Cables | EVT | 11/22/2010 | 12 |
| Antenna, Horn | EMCO | 3115 | AHE | 10/22/2009 | 24 |
| Attenuator, 'Precision N' | S.M. Electronics | SA18N-06/SM4032 | REE | 1/10/2011 | 12 |
| Power Meter | Gigatronics | 8651A | SPM | 1/7/2010 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |

| MEASUREMENT BANDWIDTHS | | | |
|---|---|---|---|
| **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 |
| Measurements were made using the bandwidths and detectors specified. No video filter was used. | | | |

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

## TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

NORTHWEST **EMC**

# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | 1001CP01S | | | **Work Order:** | ITRM0249 |
| **Serial Number:** | 28311047275 | | | **Date:** | 08/23/11 |
| **Customer:** | Intermec Technologies Corporation | | | **Temperature:** | 22 |
| **Attendees:** | none | | | **Humidity:** | 38% |
| **Project:** | None | | | **Barometric Pres.:** | 1002.3 |
| **Tested by:** | Ethan Schoonover | **Power:** | 120VAC/60Hz | **Job Site:** | EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 24.232:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| **Antenna Height(s) (m)** | 1 - 4 | **Test Distance (m)** | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

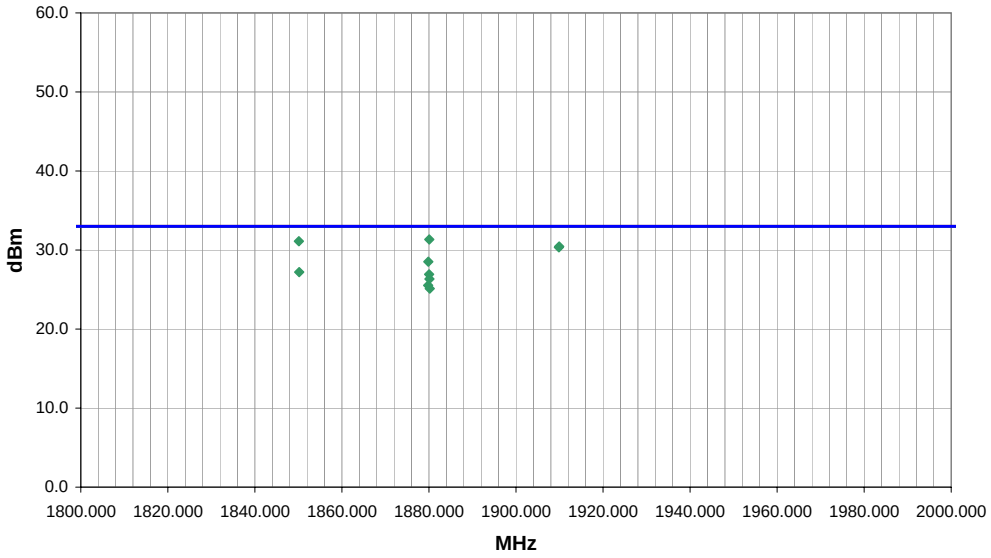
Transmitting PCS Band, GPRS

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| **Run #** | 7 |
| **Configuration #** | 6 |
| **Results** | Pass |

*Signature*




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1880.070 | | | 160.0 | 1.3 | | | V-Horn | PK | 1.36E+00 | 31.3 | 33.0 | -1.7 | Mid Channel, EUT OnSide. |
| 1850.100 | | | 199.0 | 1.2 | | | H-Horn | PK | 1.29E+00 | 31.1 | 33.0 | -1.9 | Low Channel, EUT Vertical. |
| 1909.940 | | | 169.0 | 1.1 | | | V-Horn | PK | 1.11E+00 | 30.5 | 33.0 | -2.6 | High Channel, EUT On Side. |
| 1909.860 | | | 201.0 | 1.5 | | | H-Horn | PK | 1.08E+00 | 30.4 | 33.0 | -2.7 | High Channel, EUT Vertical. |
| 1879.860 | | | 143.0 | 1.1 | | | H-Horn | PK | 7.13E-01 | 28.5 | 33.0 | -4.5 | Mid Channel, EUT Vertical. |
| 1850.170 | | | 189.0 | 1.1 | | | V-Horn | PK | 5.26E-01 | 27.2 | 33.0 | -5.8 | Low Channel, EUT On side. |
| 1880.030 | | | 256.0 | 2.2 | | | V-Horn | PK | 4.93E-01 | 26.9 | 33.0 | -6.1 | Mid Channel, EUT Vertical. |
| 1880.120 | | | 32.0 | 1.3 | | | V-Horn | PK | 4.30E-01 | 26.3 | 33.0 | -6.7 | Mid Channel, EUT Horz. |
| 1879.800 | | | 216.0 | 1.6 | | | H-Horn | PK | 3.57E-01 | 25.5 | 33.0 | -7.5 | Mid Channel, EUT On Side. |
| 1880.200 | | | 66.0 | 1.0 | | | H-Horn | PK | 3.26E-01 | 25.1 | 33.0 | -7.9 | Mid Channel, EUT Horz. |

NORTHWEST **EMC**

# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | 1001CP01S | | | **Work Order:** | ITRM0249 |
| **Serial Number:** | 28311047275 | | | **Date:** | 08/23/11 |
| **Customer:** | Intermec Technologies Corporation | | | **Temperature:** | 22 |
| **Attendees:** | none | | | **Humidity:** | 38% |
| **Project:** | None | | | **Barometric Pres.:** | 1002.3 |
| **Tested by:** | Ethan Schoonover | **Power:** | 120VAC/60Hz | **Job Site:** | EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 24.232:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| **Antenna Height(s) (m)** | 1 - 4 | **Test Distance (m)** | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

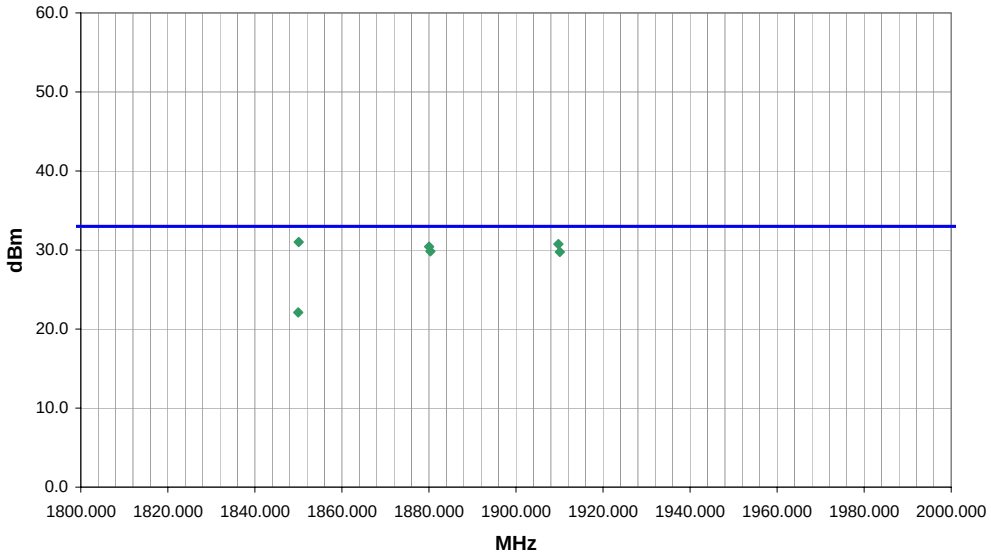
Transmitting PCS Band, E-GPRS (EDGE)

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| **Run #** | 8 |
| **Configuration #** | 6 |
| **Results** | Pass |

*Signature*




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1850.080 | | | 174.0 | 1.2 | | | H-Horn | PK | 1.26E+00 | 31.0 | 33.0 | -2.0 | Low Channel, EUT Vertical. |
| 1909.760 | | | 180.0 | 1.1 | | | V-Horn | PK | 1.19E+00 | 30.8 | 33.0 | -2.3 | High Channel, EUT On Side. |
| 1880.020 | | | 183.0 | 1.2 | | | V-Horn | PK | 1.10E+00 | 30.4 | 33.0 | -2.6 | Mid Channel, EUT On Side. |
| 1880.340 | | | 223.0 | 1.1 | | | H-Horn | PK | 9.62E-01 | 29.8 | 33.0 | -3.2 | Mid Channel, EUT Vertical. |
| 1910.060 | | | 223.0 | 1.5 | | | H-Horn | PK | 9.44E-01 | 29.8 | 33.0 | -3.3 | High Channel, EUT Vertical. |
| 1849.960 | | | 187.0 | 1.0 | | | V-Horn | PK | 1.63E-01 | 22.1 | 33.0 | -10.9 | Low Channel, EUT On Side. |

NORTHWEST EMC

# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1001CP01S | Work Order: | ITRM0249 |
| Serial Number: | 28311047275 | Date: | 08/23/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 22 |
| Attendees: | none | Humidity: | 38% |
| Project: | None | Barometric Pres.: | 1002.3 |
| Tested by: | Ethan Schoonover | Power: 120VAC/60Hz | Job Site: EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 24.232:2011 | TIA/EIA-603-B:2002 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

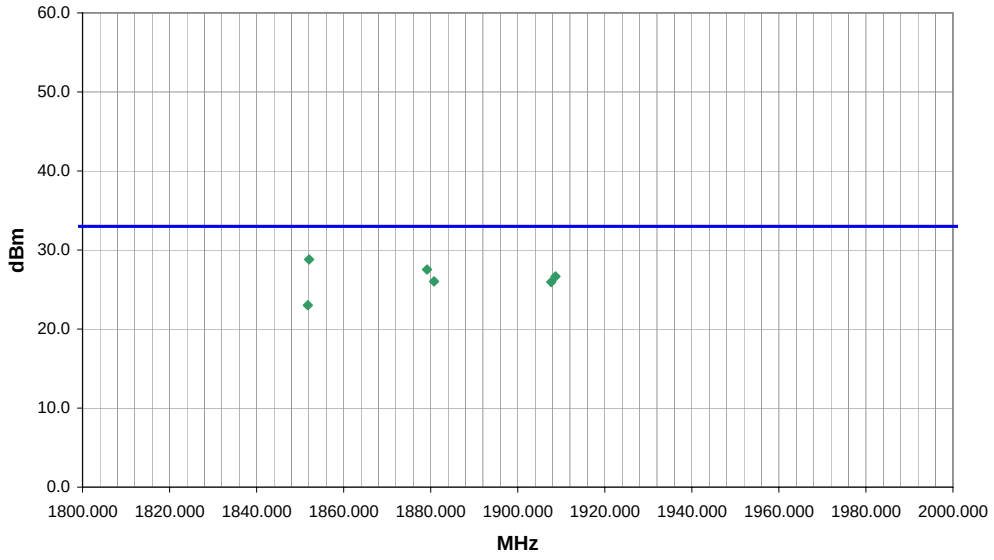
Transmitting PCS Band, WCDMA

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 9 |
| Configuration # | 6 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1852.060 | | | 170.0 | 1.2 | | | H-Horn | PK | 7.60E-01 | 28.8 | 33.0 | -4.2 | Low Channel, EUT Vertical. |
| 1879.160 | | | 184.0 | 1.2 | | | V-Horn | PK | 5.66E-01 | 27.5 | 33.0 | -5.5 | Mid Channel, EUT On Side |
| 1908.660 | | | 190.0 | 1.1 | | | V-Horn | PK | 4.62E-01 | 26.7 | 33.0 | -6.4 | High Channel, EUT On Side |
| 1880.780 | | | 212.0 | 1.1 | | | H-Horn | PK | 4.01E-01 | 26.0 | 33.0 | -7.0 | Mid Channel, EUT Vertical. |
| 1907.680 | | | 209.0 | 1.5 | | | H-Horn | PK | 3.94E-01 | 26.0 | 33.0 | -7.1 | High Channel, EUT Vertical. |
| 1851.760 | | | 241.0 | 1.0 | | | V-Horn | PK | 2.00E-01 | 23.0 | 33.0 | -10.0 | Low Channel, EUT On Side |

# Effective Radiated Power (EIRP)



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 AWS 1700 Band, WCDMA |

| CHANNELS TESTED |
|---|
| AWS Low = Ch. 1312, 1712.4 MHz |
| AWS Mid = Ch.1427, 1735.4 MHz |
| AWS High = Ch. 1513, 1752.6 MHz |

| POWER SETTINGS INVESTIGATED |
|---|
| 120VAC/60Hz |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 1710 MHz | Stop Frequency | 1755 MHz |

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

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4440A | AAW | 4/19/2011 | 12 |
| Antenna, Horn | ETS | 3115 | AIB | 9/8/2010 | 24 |
| Antenna, Horn | EMCO | 3115 | AHE | 10/22/2009 | 24 |
| EV12 Cables | N/A | Double Ridge Horn Cables | EVT | 11/22/2010 | 12 |
| Attenuator, 'Precision N' | S.M. Electronics | SA18N-06/SM4032 | REE | 1/10/2011 | 12 |
| Power Meter | Gigatronics | 8651A | SPM | 1/7/2010 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |

**MEASUREMENT BANDWIDTHS**

| | 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 |
| Measurements were made using the bandwidths and detectors specified. No video filter was used. | | | | |

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

## TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

NORTHWEST EMC

# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1000CP01S | Work Order: | ITRM0249 |
| Serial Number: | 28311047060 | Date: | 08/24/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 22 |
| Attendees: | none | Humidity: | 38% |
| Project: | None | Barometric Pres.: | 1002.3 |
| Tested by: | Rod Peloquin | Power: 120VAC/60Hz | Job Site: EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

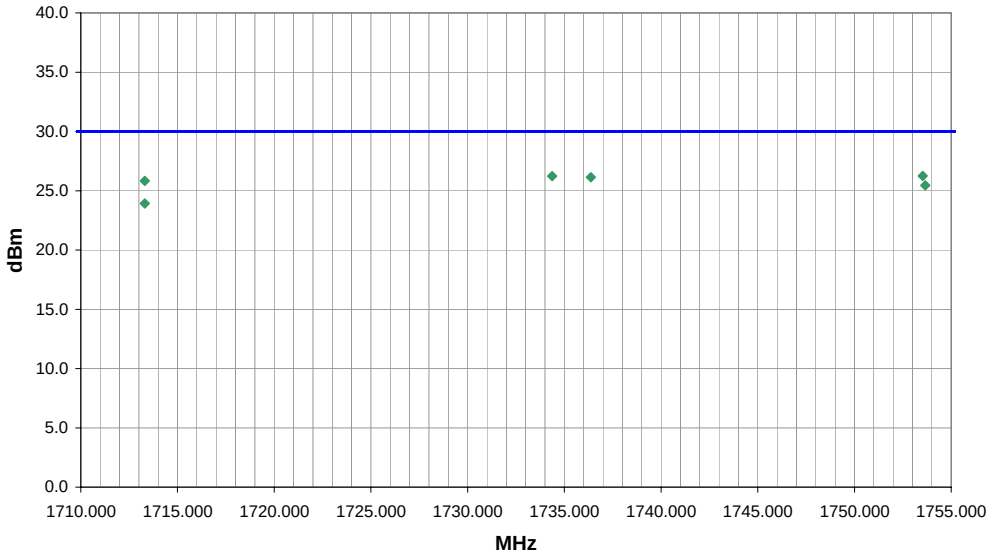
Transmitting AWS 1700 Band, WCDMA

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 11 |
| Configuration # | 4 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1753.530 | | | 54.0 | 1.0 | | | V-Horn | PK | 4.22E-01 | 26.3 | 30.0 | -3.8 | High Channel, EUT vertical |
| 1734.370 | | | 262.0 | 1.0 | | | H-Horn | PK | 4.21E-01 | 26.2 | 30.0 | -3.8 | Mid Channel, EUT on side |
| 1736.370 | | | 24.0 | 1.0 | | | V-Horn | PK | 4.11E-01 | 26.1 | 30.0 | -3.9 | Mid Channel, EUT vertical |
| 1713.310 | | | 259.0 | 1.0 | | | H-Horn | PK | 3.83E-01 | 25.8 | 30.0 | -4.2 | Low Channel, EUT on side |
| 1753.660 | | | 262.0 | 1.0 | | | H-Horn | PK | 3.51E-01 | 25.5 | 30.0 | -4.6 | High Channel, EUT on side |
| 1713.310 | | | 29.0 | 1.0 | | | V-Horn | PK | 2.47E-01 | 23.9 | 30.0 | -6.1 | Low Channel, EUT vertical |

# Effective Radiated Power (EIRP)



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 AWS 1700 Band, WCDMA |

| CHANNELS TESTED |
|---|
| AWS Low = Ch. 1312, 1712.4 MHz |
| AWS Mid = Ch.1427, 1735.4 MHz |
| AWS High = Ch. 1513, 1752.6 MHz |

| POWER SETTINGS INVESTIGATED |
|---|
| 120VAC/60Hz |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 1710 MHz | Stop Frequency | 1755 MHz |

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

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4440A | AAW | 4/19/2011 | 12 |
| Antenna, Horn | ETS | 3115 | AIB | 9/8/2010 | 24 |
| Antenna, Horn | EMCO | 3115 | AHE | 10/22/2009 | 24 |
| EV12 Cables | N/A | Double Ridge Horn Cables | EVT | 11/22/2010 | 12 |
| Attenuator, 'Precision N' | S.M. Electronics | SA18N-06/SM4032 | REE | 1/10/2011 | 12 |
| Power Meter | Gigatronics | 8651A | SPM | 1/7/2010 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |

**MEASUREMENT BANDWIDTHS**

| | 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 |
| Measurements were made using the bandwidths and detectors specified. No video filter was used. | | | | |

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

## TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

NORTHWEST EMC

# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1000CP02S | Work Order: | ITRM0249 |
| Serial Number: | 178U1191040 | Date: | 08/24/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 22 |
| Attendees: | none | Humidity: | 38% |
| Project: | None | Barometric Pres.: | 1002.3 |
| Tested by: | Rod Peloquin | Power: 120VAC/60Hz | Job Site: EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

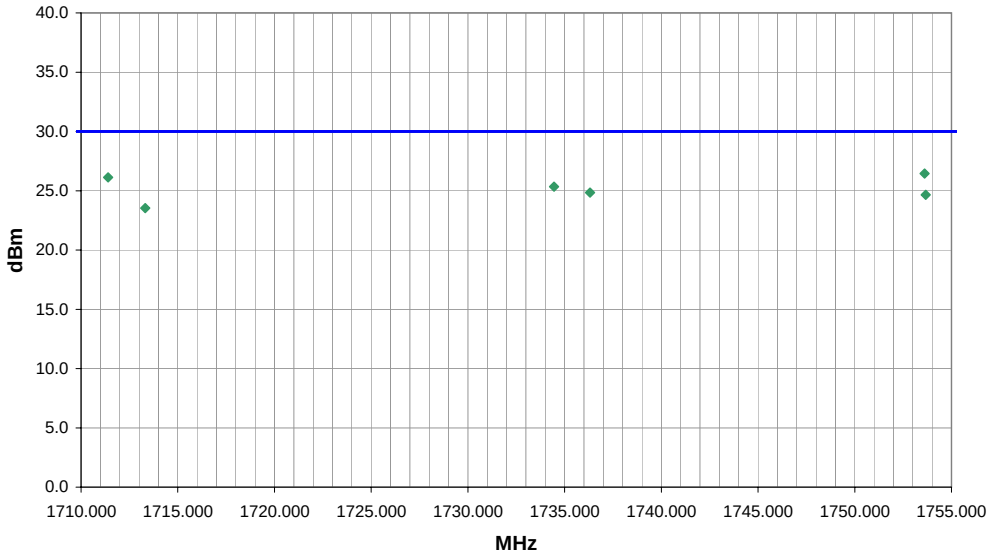
Transmitting AWS 1700 Band, WCDMA

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 12 |
| Configuration # | 5 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1753.610 | | | 26.0 | 1.0 | | | V-Horn | PK | 4.42E-01 | 26.5 | 30.0 | -3.6 | High Channel, EUT vertical |
| 1711.400 | | | 260.0 | 1.0 | | | H-Horn | PK | 4.10E-01 | 26.1 | 30.0 | -3.9 | Low Channel, EUT on side |
| 1734.450 | | | 256.0 | 1.0 | | | H-Horn | PK | 3.42E-01 | 25.3 | 30.0 | -4.7 | Mid Channel, EUT on side |
| 1736.310 | | | 23.0 | 1.0 | | | V-Horn | PK | 3.05E-01 | 24.8 | 30.0 | -5.2 | Mid Channel, EUT vertical |
| 1753.670 | | | 259.0 | 1.0 | | | H-Horn | PK | 2.92E-01 | 24.7 | 30.0 | -5.4 | High Channel, EUT on side |
| 1713.320 | | | 46.0 | 1.0 | | | V-Horn | PK | 2.25E-01 | 23.5 | 30.0 | -6.5 | Low Channel, EUT vertical |

# Effective Radiated Power (EIRP)



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 AWS 1700 Band, WCDMA |

| CHANNELS TESTED |
|---|
| AWS Low = Ch. 1312, 1712.4 MHz |
| AWS Mid = Ch.1427, 1735.4 MHz |
| AWS High = Ch. 1513, 1752.6 MHz |

| POWER SETTINGS INVESTIGATED |
|---|
| 120VAC/60Hz |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 1710 MHz | Stop Frequency | 1755 MHz |

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

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Spectrum Analyzer | Agilent | E4440A | AAW | 4/19/2011 | 12 |
| EV12 Cables | N/A | Double Ridge Horn Cables | EVT | 11/22/2010 | 12 |
| Antenna, Horn | ETS | 3115 | AIB | 9/8/2010 | 24 |
| Antenna, Horn | EMCO | 3115 | AHE | 10/22/2009 | 24 |
| Attenuator, 'Precision N' | S.M. Electronics | SA18N-06/SM4032 | REE | 1/10/2011 | 12 |
| Power Meter | Gigatronics | 8651A | SPM | 1/7/2010 | 24 |
| Power Sensor | Gigatronics | 80701A | SPL | 7/8/2011 | 24 |
| MXG Vector Signal Generator | Agilent | N5182A | TIF | NCR | 0 |

**MEASUREMENT BANDWIDTHS**

| 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 |

Measurements were made using the bandwidths and detectors specified. No video filter was used.

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

## TEST DESCRIPTION

The fundamental emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height (1-4 meters) and polarization and manipulating the EUT antenna in 3 orthogonal planes The antennas to be used with the EUT were tested. The EUT was transmitting while set at the lowest channel, a middle channel, and the highest channel available. The amplitude and frequency were noted. The EUT was then replaced with a horn antenna. A signal generator was connected to the horn antenna and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the gain (dBi) of the horn antenna the effective radiated power for each emission was determined.

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# Effective Radiated Power (EIRP)

PSA 2011.05.11
EMI 2008.1.9

| | | | |
|---|---|---|---|
| EUT: | 1001CP01S | Work Order: | ITRM0249 |
| Serial Number: | 28311047275 | Date: | 08/23/11 |
| Customer: | Intermec Technologies Corporation | Temperature: | 22 |
| Attendees: | none | Humidity: | 38% |
| Project: | None | Barometric Pres.: | 1002.3 |
| Tested by: | Ethan Schoonover | Power: 120VAC/60Hz | Job Site: EV12 |

| TEST SPECIFICATIONS | Test Method |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| TEST PARAMETERS | | | |
|---|---|---|---|
| Antenna Height(s) (m) | 1 - 4 | Test Distance (m) | 3 |

**COMMENTS**

None

**EUT OPERATING MODES**

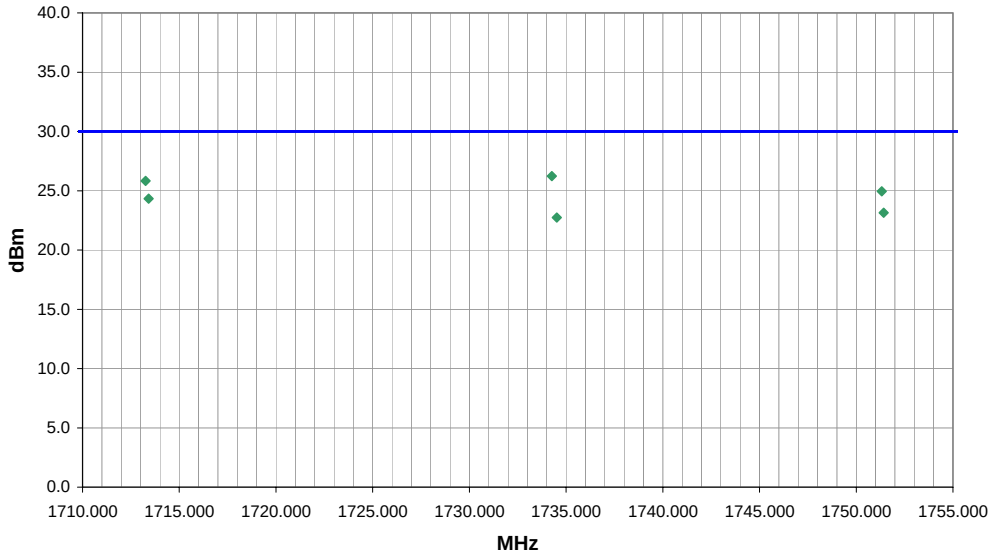
Transmitting AWS 1700 Band, WCDMA

**DEVIATIONS FROM TEST STANDARD**

No deviations.

| | |
|---|---|
| Run # | 10 |
| Configuration # | 6 |
| Results | Pass |

Signature




| Freq (MHz) | | | Azimuth (degrees) | Height (meters) | | | Polarity | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1734.260 | | | 167.0 | 1.0 | | | V-Horn | PK | 4.21E-01 | 26.2 | 30.0 | -3.8 | Mid Channel, EUT On Side |
| 1713.260 | | | 173.0 | 1.0 | | | H-Horn | PK | 3.83E-01 | 25.8 | 30.0 | -4.2 | Low Channel, EUT Vertical. |
| 1751.320 | | | 122.0 | 1.0 | | | V-Horn | PK | 3.13E-01 | 25.0 | 30.0 | -5.1 | High Channel, EUT On Side |
| 1713.420 | | | 164.0 | 1.0 | | | V-Horn | PK | 2.71E-01 | 24.3 | 30.0 | -5.7 | Low Channel, EUT On Side |
| 1751.420 | | | 213.0 | 1.3 | | | H-Horn | PK | 2.07E-01 | 23.2 | 30.0 | -6.9 | High Channel, EUT Vertical. |
| 1734.520 | | | 102.0 | 1.3 | | | H-Horn | PK | 1.88E-01 | 22.7 | 30.0 | -7.3 | Mid Channel, EUT Vertical. |

# Out of Band Emissions - Part 22H

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

| MODES OF OPERATION |
|---|
| Transmitting Cellular Band, WCDMA Rel99 |
| Transmitting Cellular Band, GPRS |
| Transmitting Cellular Band, E-GPRS |

| POWER SETTINGS INVESTIGATED |
|---|
| 110VAC/60Hz |

| CONFIGURATIONS INVESTIGATED |
|---|
| ITRM0249 - 1 |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 9 GHz |

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

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Antenna, Horn | EMCO | 3115 | AHA | 10/22/2009 | 24 mo |
| Universal Radio Communication Tester | Rohde & Schwarz | CMU200 | BSW | NCR | 0 mo |
| High Pass Filter 1.2-18 GHz | Micro-Tronics | HPM50108 | HFW | 3/17/2010 | 24 mo |
| Antenna, Biconilog | EMCO | 3142 | AXB | 3/28/2011 | 12 mo |
| OC10 Cables | N/A | 10kHz-1GHz RE Cables | OCH | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AM-1064-9079 | AOO | 6/28/2011 | 12 mo |
| Antenna, Horn | EMCO | 3115 | AHB | 3/8/2011 | 24 mo |
| Pre-Amplifier | Miteq | AMF-4D-010120-30-10P-1 | AOP | 6/24/2011 | 12 mo |
| OC10 Cables | N/A | 1-8GHz RE Cables | OCJ | 6/10/2011 | 12 mo |
| Spectrum Analyzer | Agilent | E4446A | AAY | 1/11/2011 | 12 mo |
| Signal Generator | Agilent | E8257D | TGU | 1/26/2011 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Antenna, Dipole | EMCO | 3121C | ADF | NCR | 0 mo |

**MEASUREMENT BANDWIDTHS**

| 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 |

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

## TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. 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. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

The final measurements must be made utilizing the substitution method described above

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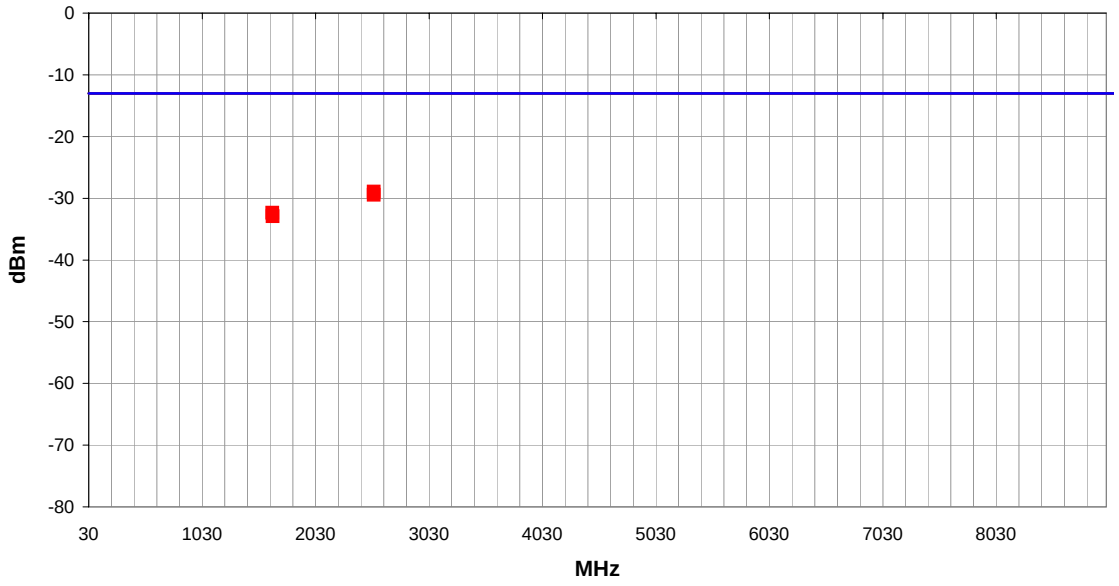
# Out of Band Emissions - Part 22H

PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.06.23

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/02/11 | | |
| **Project:** | None | **Temperature:** | 22.95 | | |
| **Job Site:** | OC10 | **Humidity:** | 49.21 | | |
| **Serial Number:** | 178U1191029 | **Barometric Pres.:** | 1021.4 | **Tested by:** | Jaemi Suh |
| **EUT:** | 1000CP01S | | | | |
| **Configuration:** | 1 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting Cellular Band, WCDMA Rel99 | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 22H:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 21 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2543.480 | | | 1.0 | 357.0 | | | Vert | PK | 1.28E-06 | -28.9 | -13.0 | -15.9 | High Channel, EUT on Side |
| 2543.927 | | | 1.0 | 100.0 | | | Horz | PK | 1.14E-06 | -29.4 | -13.0 | -16.4 | High Channel, EUT Vertical |
| 1650.240 | | | 1.0 | 346.0 | | | Vert | PK | 5.85E-07 | -32.3 | -13.0 | -19.3 | Low Channel, EUT on Side |
| 1650.953 | | | 1.0 | 83.0 | | | Horz | PK | 5.09E-07 | -32.9 | -13.0 | -19.9 | Low Channel, EUT Vertical |

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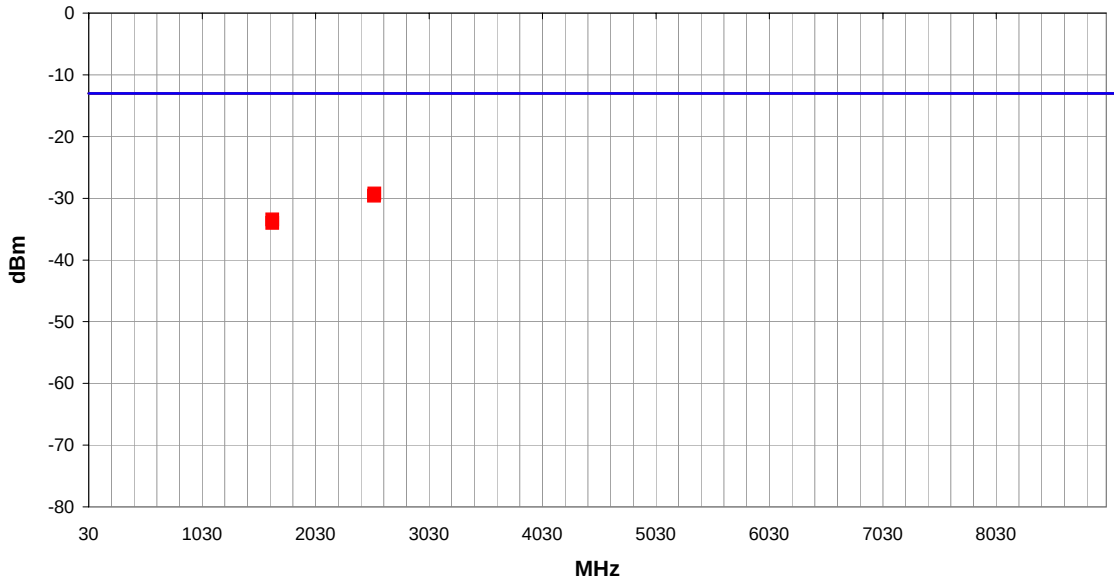
# Out of Band Emissions - Part 22H

PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.06.23

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/03/11 | | |
| **Project:** | None | **Temperature:** | 22.95 | | |
| **Job Site:** | OC10 | **Humidity:** | 49.21 | | |
| **Serial Number:** | 178U1191029 | **Barometric Pres.:** | 1021.4 | **Tested by:** | Jaemi Suh |
| **EUT:** | 1000CP01S | | | | |
| **Configuration:** | 1 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting Cellular Band, GPRS | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 22H:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 22 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2547.753 | | | 1.0 | 145.0 | | | Vert | PK | 1.19E-06 | -29.2 | -13.0 | -16.2 | High Channel, EUT Vertical |
| 2546.980 | | | 2.1 | 107.0 | | | Horz | PK | 1.09E-06 | -29.6 | -13.0 | -16.6 | High Channel, EUT On Side |
| 1649.280 | | | 2.4 | 111.0 | | | Vert | PK | 4.54E-07 | -33.4 | -13.0 | -20.4 | Low Channel, EUT Vertical |
| 1647.907 | | | 1.0 | 176.0 | | | Horz | PK | 3.95E-07 | -34.0 | -13.0 | -21.0 | Low Channel, EUT on Side |

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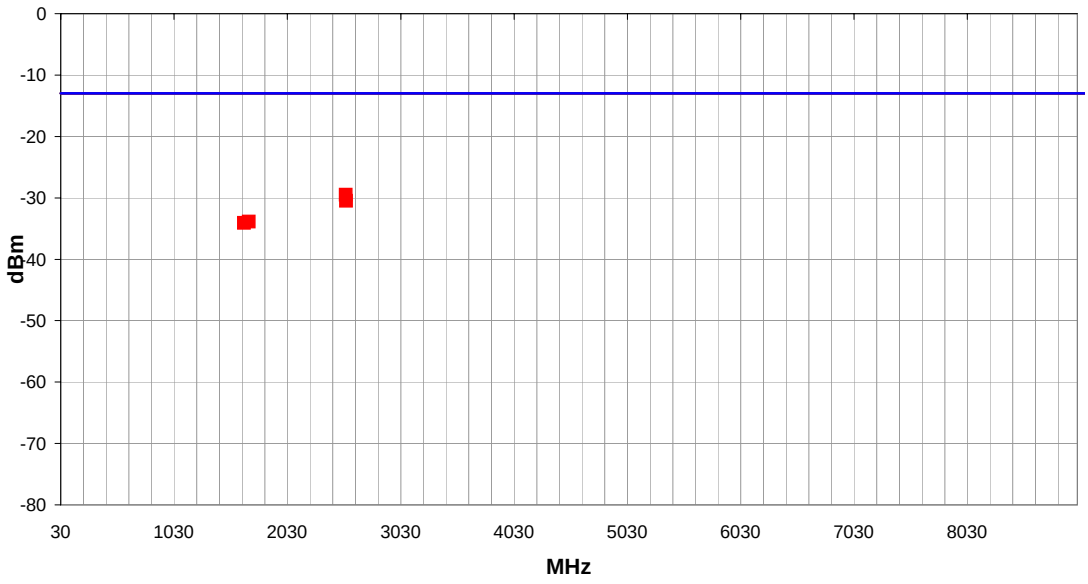
## Out of Band Emissions - Part 22H

PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.06.23

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/11/11 | | |
| **Project:** | None | **Temperature:** | 22.95 | | |
| **Job Site:** | OC10 | **Humidity:** | 49.21 | | |
| **Serial Number:** | 178U1191029 | **Barometric Pres.:** | 1021.4 | **Tested by:** | Jaemi Suh |
| **EUT:** | 1000CP01S | | | | |
| **Configuration:** | 1 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting Cellular Band, E-GPRS | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 22H:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 23 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2546.307 | | | 1.0 | 49.0 | | | Vert | PK | 1.12E-06 | -29.5 | -13.0 | -16.5 | High Channel, EUT Vertical |
| 2547.573 | | | 1.0 | 353.0 | | | Horz | PK | 8.90E-07 | -30.5 | -13.0 | -17.5 | High Channel, EUT on side |
| 1689.580 | | | 1.0 | 101.0 | | | Vert | PK | 4.10E-07 | -33.9 | -13.0 | -20.9 | High Channel, EUT Vertical |
| 1647.393 | | | 2.7 | 167.0 | | | Horz | PK | 3.90E-07 | -34.1 | -13.0 | -21.1 | High Channel, EUT on side |

# Out Of Band Emissions - Part 22H

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

| MODES OF OPERATION |
|---|
| Transmitting Cellular Band, WCDMA Rel99 |
| Transmitting Cellular Band, GPRS |
| Transmitting Cellular Band, E-GPRS |

| POWER SETTINGS INVESTIGATED |
|---|
| 110VAC/60Hz |

| CONFIGURATIONS INVESTIGATED |
|---|
| ITRM0249 - 2 |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 9 GHz |

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

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Antenna, Horn | EMCO | 3115 | AHA | 10/22/2009 | 24 mo |
| Universal Radio Communication | Rohde & Schwarz | CMU200 | BSW | NCR | 0 mo |
| High Pass Filter 1.2-18 GHz | Micro-Tronics | HPM50108 | HFW | 3/17/2010 | 24 mo |
| Antenna, Biconilog | EMCO | 3142 | AXB | 3/28/2011 | 12 mo |
| OC10 Cables | N/A | 10kHz-1GHz RE Cables | OCH | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AM-1064-9079 | AOO | 6/28/2011 | 12 mo |
| Antenna, Horn | EMCO | 3115 | AHB | 3/8/2011 | 24 mo |
| Pre-Amplifier | Miteq | AMF-4D-010120-30-10P-1 | AOP | 6/24/2011 | 12 mo |
| OC10 Cables | N/A | 1-8GHz RE Cables | OCJ | 6/10/2011 | 12 mo |
| Spectrum Analyzer | Agilent | E4446A | AAY | 1/11/2011 | 12 mo |
| Signal Generator | Agilent | E8257D | TGU | 1/26/2011 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Antenna, Dipole | EMCO | 3121C | ADF | NCR | 0 mo |

**MEASUREMENT BANDWIDTHS**

| | 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 |

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

## TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. 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. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

The final measurements must be made utilizing the substitution method described above

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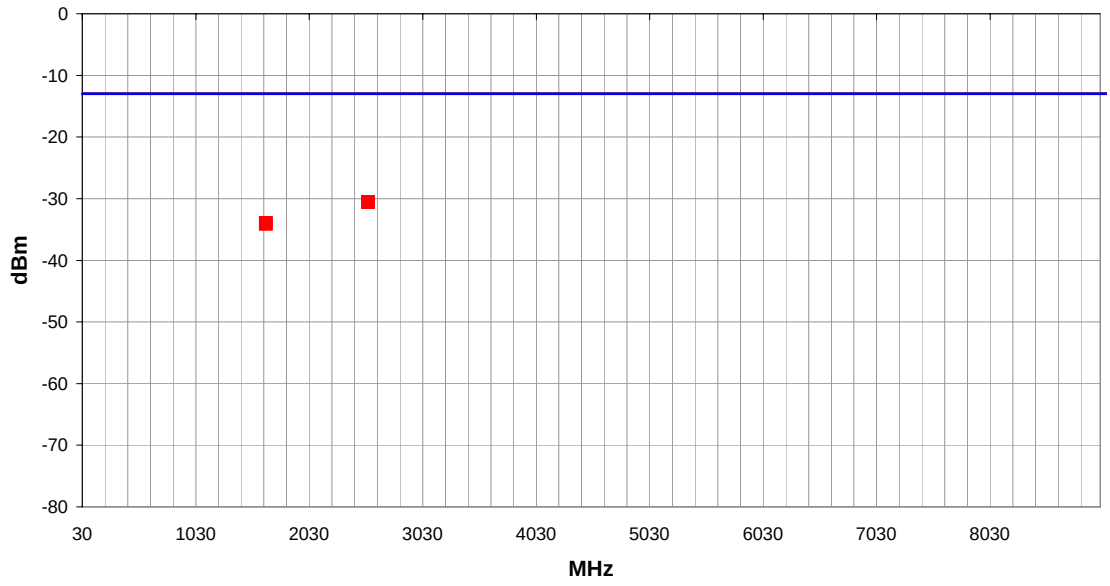
# Out Of Band Emissions - Part 22H

PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.06.23

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/11/11 | | |
| **Project:** | None | **Temperature:** | 22.9 | | |
| **Job Site:** | OC10 | **Humidity:** | 48.83 | | |
| **Serial Number:** | 178U1191038 | **Barometric Pres.:** | 1012.4 | **Tested by:** | Jaemi Suh |
| **EUT:** | 1000CP02S | | | | |
| **Configuration:** | 2 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting Cellular Band, E-GPRS | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 22H:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 18 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2546.920 | | | 2.4 | 3.0 | | | Horz | PK | 8.77E-07 | -30.6 | -13.0 | -17.6 | High Channel, EUT on side |
| 2546.873 | | | 1.8 | 230.0 | | | Vert | PK | 8.74E-07 | -30.6 | -13.0 | -17.6 | High Channel, EUT Vertical |
| 1648.193 | | | 1.0 | 123.0 | | | Vert | PK | 4.03E-07 | -33.9 | -13.0 | -20.9 | Low Channel, EUT Vertical |
| 1647.393 | | | 2.7 | 167.0 | | | Horz | PK | 3.90E-07 | -34.1 | -13.0 | -21.1 | Low Channel, EUT on side |

NORTHWEST
**EMC**

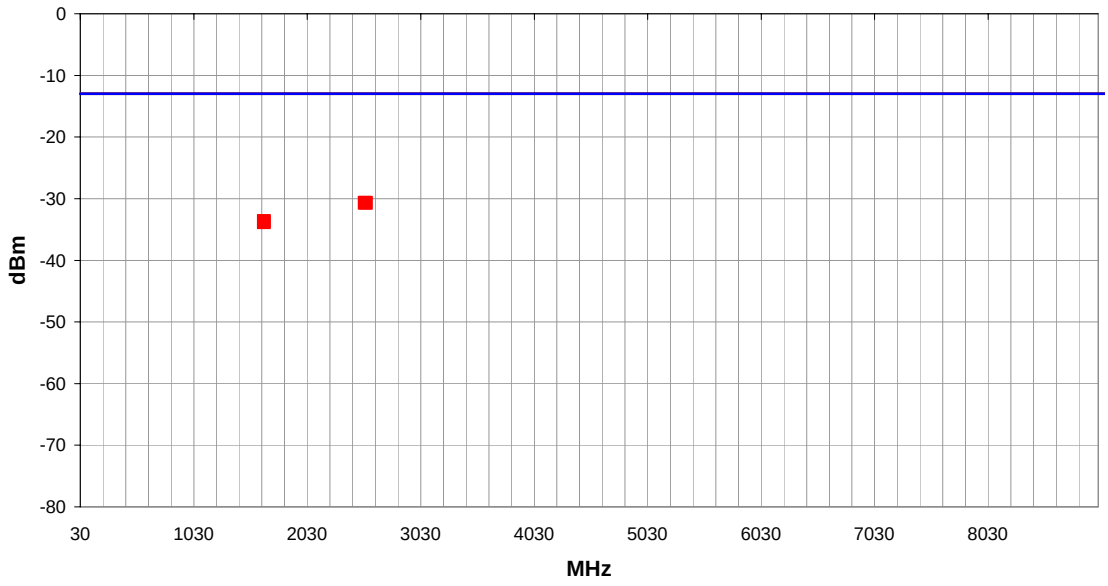
# Out Of Band Emissions - Part 22H

PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.06.23

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/11/11 | | |
| **Project:** | None | **Temperature:** | 22.9 | | |
| **Job Site:** | OC10 | **Humidity:** | 48.83 | | |
| **Serial Number:** | 178U1191038 | **Barometric Pres.:** | 1012.4 | **Tested by:** | Jaemi Suh |
| **EUT:** | 1000CP02S | | | | |
| **Configuration:** | 2 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting Cellular Band, GPRS | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 22H:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 19 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2546.860 | | | 1.0 | 74.0 | | | Vert | PK | 8.58E-07 | -30.7 | -13.0 | -17.7 | High Channel, EUT Vertical |
| 2536.440 | | | 2.6 | 55.0 | | | Horz | PK | 8.52E-07 | -30.7 | -13.0 | -17.7 | High Channel, EUT on side |
| 1648.393 | | | 1.0 | 170.0 | | | Horz | PK | 4.32E-07 | -33.6 | -13.0 | -20.6 | Low Channel, EUT on side |
| 1648.073 | | | 1.2 | 119.0 | | | Vert | PK | 4.12E-07 | -33.9 | -13.0 | -20.9 | Low Channel, EUT Vertical |

NORTHWEST

# EMC

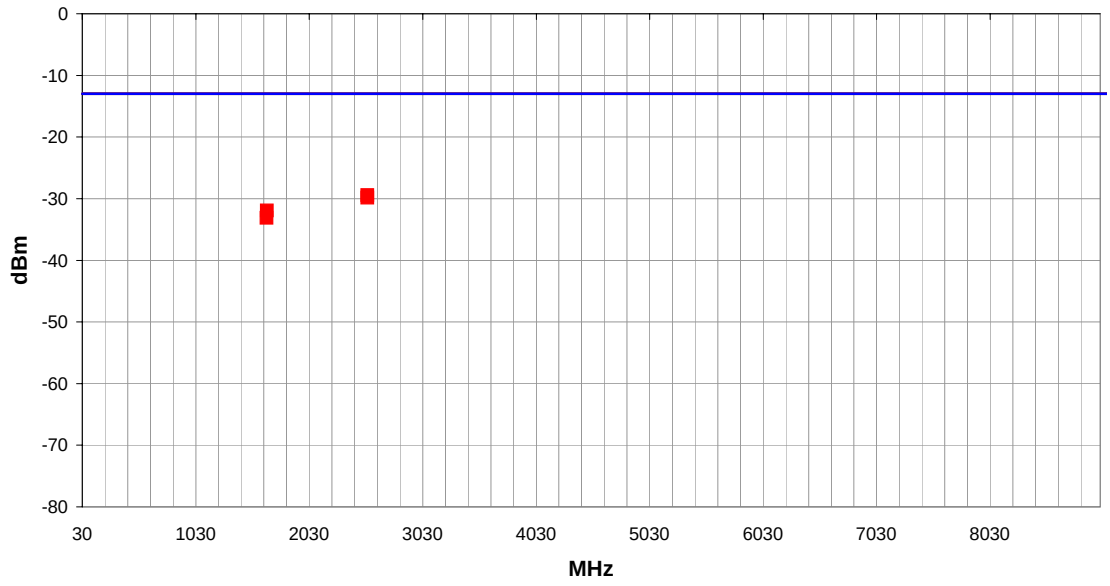
## Out Of Band Emissions - Part 22H

PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.06.23

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/03/11 | | |
| **Project:** | None | **Temperature:** | 22.9 | | |
| **Job Site:** | OC10 | **Humidity:** | 48.83 | | |
| **Serial Number:** | 178U1191038 | **Barometric Pres.:** | 1012.4 | **Tested by:** | Jaemi Suh |
| **EUT:** | 1000CP02S | | | | |
| **Configuration:** | 2 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting Cellular Band, WCDMA Rel 99 | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 22H:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 20 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2542.753 | | | 1.0 | 145.0 | | | Vert | PK | 1.14E-06 | -29.4 | -13.0 | -16.4 | High Channel, EUT Vertical |
| 2542.980 | | | 2.1 | 107.0 | | | Horz | PK | 1.04E-06 | -29.8 | -13.0 | -16.8 | High Channel, EUT On Side |
| 1655.800 | | | 1.0 | 70.0 | | | Horz | PK | 6.41E-07 | -31.9 | -13.0 | -18.9 | Mid Channel, EUT on Side |
| 1655.453 | | | 1.0 | 169.0 | | | Horz | PK | 4.87E-07 | -33.1 | -13.0 | -20.1 | High Channel, EUT on Side |

# Out of Band Emissions - Part 22H

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

| MODES OF OPERATION |
|---|
| Transmitting Cellular Band,WCMDA Rel 99 |
| Transmitting Cellular Band, E-GPRS |
| Transmitting Cellular Band, GPRS (GMSK) |

| POWER SETTINGS INVESTIGATED |
|---|
| 110VAC/60Hz |

| CONFIGURATIONS INVESTIGATED |
|---|
| ITRM0249 - 3 |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 9 GHz |

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

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Antenna, Horn | EMCO | 3115 | AHA | 10/22/2009 | 24 mo |
| Universal Radio Communication | Rohde & Schwarz | CMU200 | BSW | NCR | 0 mo |
| High Pass Filter 1.2-18 GHz | Micro-Tronics | HPM50108 | HFW | 3/17/2010 | 24 mo |
| Antenna, Biconilog | EMCO | 3142 | AXB | 3/28/2011 | 12 mo |
| OC10 Cables | N/A | 10kHz-1GHz RE Cables | OCH | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AM-1064-9079 | AOO | 6/28/2011 | 12 mo |
| Antenna, Horn | EMCO | 3115 | AHB | 3/8/2011 | 24 mo |
| Pre-Amplifier | Miteq | AMF-4D-010120-30-10P-1 | AOP | 6/24/2011 | 12 mo |
| OC10 Cables | N/A | 1-8GHz RE Cables | OCJ | 6/10/2011 | 12 mo |
| Spectrum Analyzer | Agilent | E4446A | AAY | 1/11/2011 | 12 mo |
| Signal Generator | Agilent | E8257D | TGU | 1/26/2011 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Antenna, Dipole | EMCO | 3121C | ADF | NCR | 0 mo |

**MEASUREMENT BANDWIDTHS**

| | 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 |

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

## TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. 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. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

The final measurements must be made utilizing the substitution method described above.

NORTHWEST
# EMC

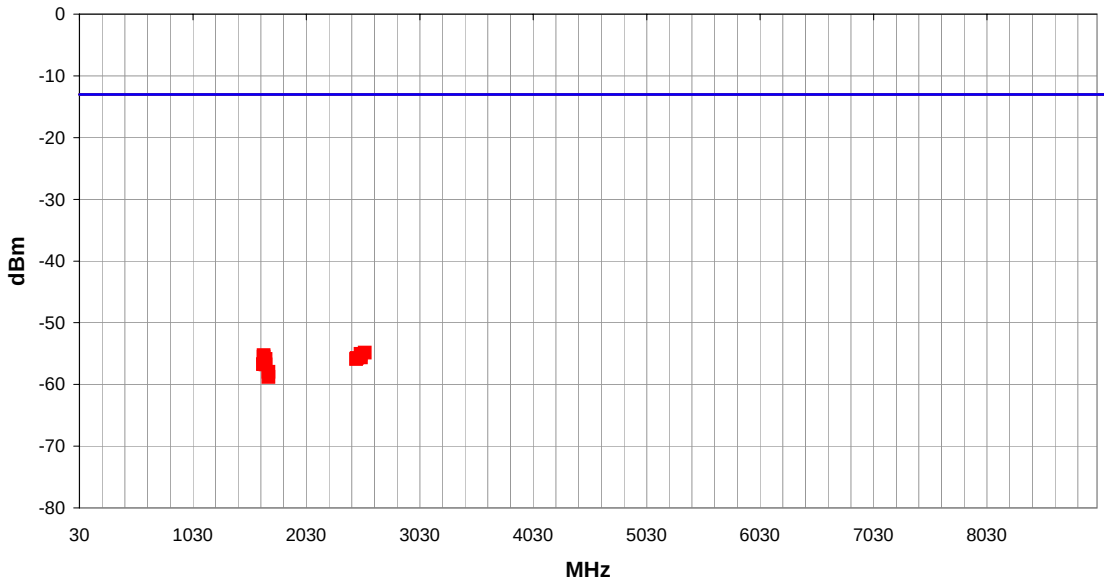
## Out of Band Emissions - Part 22H

PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.06.23

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/03/11 | | |
| **Project:** | None | **Temperature:** | 24.29 | | |
| **Job Site:** | OC10 | **Humidity:** | 51.24 | | |
| **Serial Number:** | 178U1191003 | **Barometric Pres.:** | 1012.4 | **Tested by:** | Jaemi Suh |
| **EUT:** | 1001CP01S | | | | |
| **Configuration:** | 3 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting Cellular Band, GPRS (GMSK) | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 22H:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 24 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2545.347 | | | 1.0 | 189.0 | | | Vert | PK | 3.27E-09 | -54.9 | -13.0 | -41.9 | High Channel, EUT Vertical |
| 1649.833 | | | 1.0 | 285.0 | | | Horz | PK | 2.14E-09 | -56.7 | -13.0 | -43.7 | Low Channel, EUT on Side |
| 1655.220 | | | 1.1 | 300.0 | | | Horz | PK | 2.98E-09 | -55.3 | -13.0 | -42.3 | High Channel, EUT on Side |
| 1654.853 | | | 1.0 | 250.0 | | | Vert | PK | 2.80E-09 | -55.5 | -13.0 | -42.5 | Low Channel, EUT Vertical |
| 2511.720 | | | 2.4 | 358.0 | | | Horz | PK | 2.72E-09 | -55.7 | -13.0 | -42.7 | Mid Channel, EUT on Side |
| 2474.507 | | | 1.0 | 66.0 | | | Vert | PK | 2.66E-09 | -55.8 | -13.0 | -42.8 | Low Channel, EUT Vertical |
| 2470.607 | | | 1.0 | 107.0 | | | Horz | PK | 2.59E-09 | -55.9 | -13.0 | -42.9 | Low Channel, EUT on Side |
| 1672.987 | | | 1.0 | 126.0 | | | Horz | PK | 2.58E-09 | -55.9 | -13.0 | -42.9 | Mid Channel, EUT on Side |
| 2510.607 | | | 1.6 | 273.0 | | | Vert | PK | 3.12E-09 | -55.1 | -13.0 | -42.1 | Mid Channel, EUT Vertical |
| 1672.887 | | | 1.0 | 284.0 | | | Vert | PK | 2.09E-09 | -56.8 | -13.0 | -43.8 | Mid Channel, EUT Vertical |
| 1697.767 | | | 1.0 | 206.0 | | | Vert | PK | 1.60E-09 | -58.0 | -13.0 | -45.0 | High Channel, EUT Vertical |
| 1695.920 | | | 1.0 | 174.0 | | | Horz | PK | 1.33E-09 | -58.8 | -13.0 | -45.8 | High Channel, EUT on Side |

NORTHWEST
# EMC

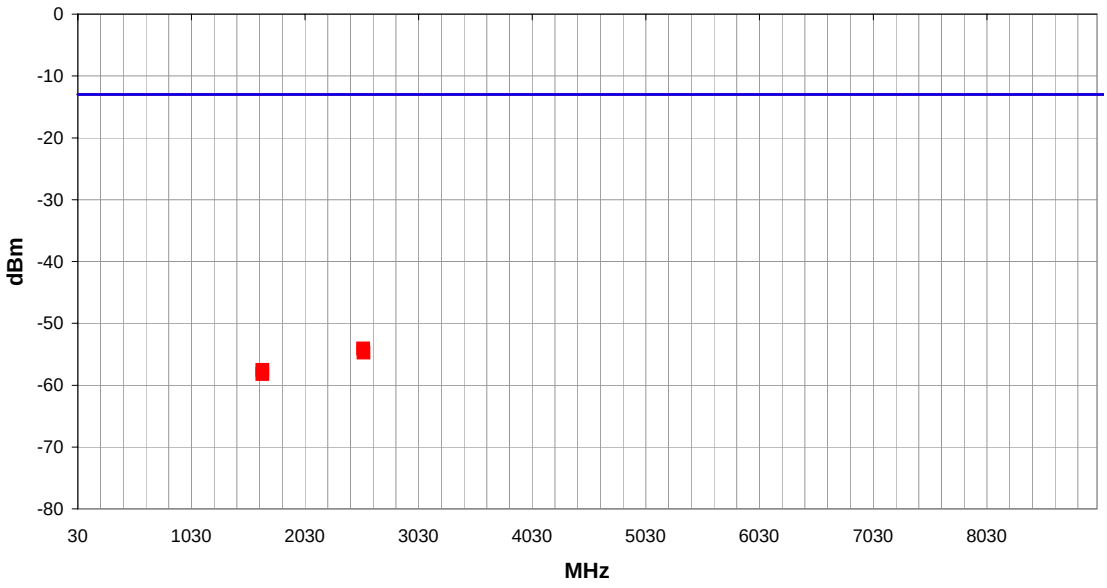
## Out of Band Emissions - Part 22H

PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.06.23

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/02/11 | | |
| **Project:** | None | **Temperature:** | 24.29 | | |
| **Job Site:** | OC10 | **Humidity:** | 51.24 | | |
| **Serial Number:** | 178U1191003 | **Barometric Pres.:** | 1012.4 | **Tested by:** | Jaemi Suh |
| **EUT:** | 1001CP01S | | | | |
| **Configuration:** | 3 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting Cellular Band, E-GPRS | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 22H:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 25 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2542.927 | | | 1.0 | 261.0 | | | Horz | PK | 3.92E-09 | -54.1 | -13.0 | -41.1 | High Channel, EUT Vertical |
| 2543.673 | | | 1.2 | 142.0 | | | Vert | PK | 3.34E-09 | -54.8 | -13.0 | -41.8 | High Channel, EUT on side |
| 1655.220 | | | 3.7 | 40.0 | | | Vert | PK | 1.77E-09 | -57.5 | -13.0 | -44.5 | Low Channel, EUT Vertical |
| 1654.853 | | | 1.0 | 194.0 | | | Horz | PK | 1.51E-09 | -58.2 | -13.0 | -45.2 | Low Channel, EUT on side |

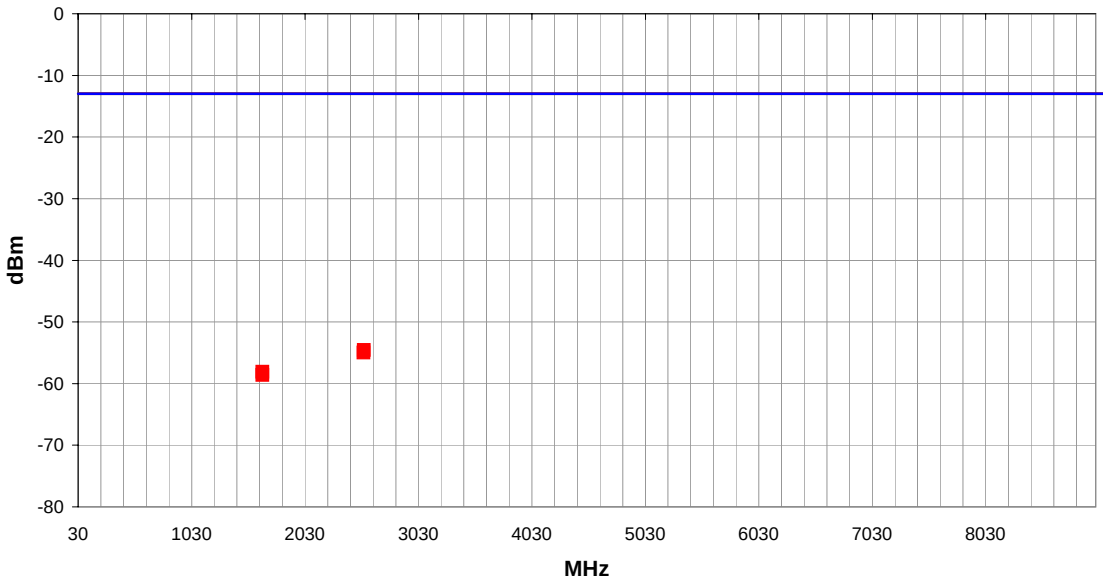
# Out of Band Emissions - Part 22H



| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/03/11 | | |
| **Project:** | None | **Temperature:** | 24.29 | | |
| **Job Site:** | OC10 | **Humidity:** | 51.24 | | |
| **Serial Number:** | 178U1191003 | **Barometric Pres.:** | 1012.4 | **Tested by:** | Jaemi Suh |
| **EUT:** | 1001CP01S | | | | |
| **Configuration:** | 3 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting Cellular Band, WCMDA Rel 99 | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 22H:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 26 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2547.753 | | | 1.0 | 145.0 | | | Vert | PK | 3.51E-09 | -54.5 | -13.0 | -41.5 | High Channel, EUT Vertical |
| 2544.980 | | | 2.1 | 107.0 | | | Horz | PK | 3.19E-09 | -55.0 | -13.0 | -42.0 | High Channel, EUT On Side |
| 1655.220 | | | 2.4 | 111.0 | | | Vert | PK | 1.55E-09 | -58.1 | -13.0 | -45.1 | Low Channel, EUT Vertical |
| 1654.853 | | | 1.0 | 176.0 | | | Horz | PK | 1.37E-09 | -58.6 | -13.0 | -45.6 | Low Channel, EUT on Side |

# Out of Band Emissions - Part 24E

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

| MODES OF OPERATION |
|---|
| Transmitting PCS Band, E-GPRS (EDGE) |
| Transmitting PCS Band, GPRS (GMSK) |
| Transmitting PCS Band, WCDMA |

| POWER SETTINGS INVESTIGATED |
|---|
| 110VAC/60Hz |

| CONFIGURATIONS INVESTIGATED |
|---|
| ITRM0249 - 1 |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 18 GHz |

**SAMPLE CALCULATIONS**

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

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Antenna, Horn | EMCO | 3115 | AHA | 10/22/2009 | 24 mo |
| Universal Radio Communication Tester | Rohde & Schwarz | CMU200 | BSW | NCR | 0 mo |
| High Pass Filter 1.2-18 GHz | Micro-Tronics | HPM50108 | HFW | 3/17/2010 | 24 mo |
| Pre-Amplifier | Miteq | AMF-6F-12001800-30-10P | AOF | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-08 | AHT | NCR | 0 mo |
| Pre-Amplifier | Miteq | AMF-6F-08001200-30-10P | AOE | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-07 | AHR | NCR | 0 mo |
| OC 10 Cables | N/A | 12-18GHz RE Cables | OCO | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AMF-4D-010120-30-10P-1 | AOP | 6/24/2011 | 12 mo |
| Antenna, Horn | EMCO | 3115 | AHB | 3/8/2011 | 24 mo |
| OC10 Cables | N/A | 1-8GHz RE Cables | OCJ | 6/10/2011 | 12 mo |
| Antenna, Biconilog | EMCO | 3142 | AXB | 3/28/2011 | 12 mo |
| OC10 Cables | N/A | 10kHz-1GHz RE Cables | OCH | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AM-1064-9079 | AOO | 6/28/2011 | 12 mo |
| Spectrum Analyzer | Agilent | E4446A | AAY | 1/11/2011 | 12 mo |
| Signal Generator | Agilent | E8257D | TGU | 1/26/2011 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Antenna, Dipole | EMCO | 3121C | ADF | NCR | 0 mo |

**MEASUREMENT BANDWIDTHS**

| 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 |

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

**MEASUREMENT UNCERTAINTY**

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**TEST DESCRIPTION**

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. 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. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

The final measurements must be made utilizing the substitution method described above

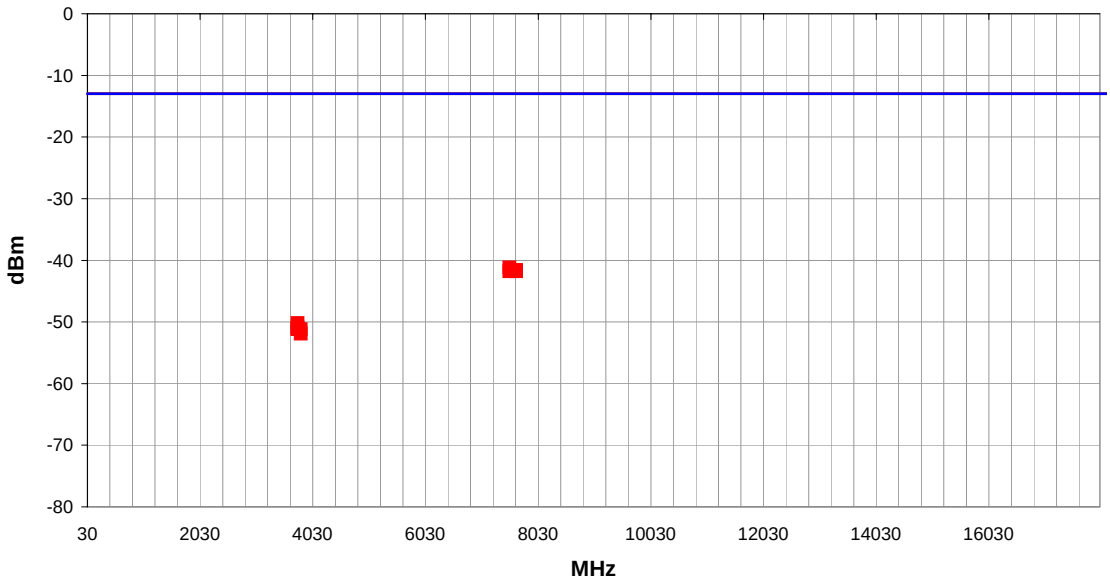
# Out of Band Emissions - Part 24E



| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/12/11 | | |
| **Project:** | None | **Temperature:** | 22 °C | | |
| **Job Site:** | OC10 | **Humidity:** | 46.24% RH | | |
| **Serial Number:** | 178U1191029 | **Barometric Pres.:** | 1014.4 mbar | **Tested by:** | Jaemi Suh |
| **EUT:** | 1000CP01S | | | | |
| **Configuration:** | 1 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting PCS Band, GPRS (GMSK) | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 24 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7519.793 | | | 1.0 | 255.0 | | | Vert | PK | 7.61E-08 | -41.2 | -13.0 | -28.2 | Mid Channel, EUT Vertical |
| 7640.127 | | | 1.0 | 356.0 | | | Horz | PK | 6.94E-08 | -41.6 | -13.0 | -28.6 | High Channel, EUT Vertical |
| 7639.520 | | | 1.0 | 335.0 | | | Vert | PK | 6.63E-08 | -41.8 | -13.0 | -28.8 | High Channel, EUT Vertical |
| 7519.080 | | | 1.0 | 311.0 | | | Horz | PK | 6.63E-08 | -41.8 | -13.0 | -28.8 | Mid Channel, EUT Horizontal |
| 3762.000 | | | 1.0 | 240.0 | | | Horz | PK | 9.55E-09 | -50.2 | -13.0 | -37.2 | Mid Channel, EUT Horizontal |
| 3760.847 | | | 2.9 | 242.0 | | | Vert | PK | 8.12E-09 | -50.9 | -13.0 | -37.9 | Mid Channel, EUT Vertical |
| 3760.333 | | | 1.0 | 132.0 | | | Horz | PK | 7.76E-09 | -51.1 | -13.0 | -38.1 | Mid Channel, EUT on side |
| 3760.180 | | | 3.0 | 210.0 | | | Vert | PK | 7.61E-09 | -51.2 | -13.0 | -38.2 | Mid Channel, EUT on side |
| 3819.113 | | | 1.0 | 304.0 | | | Horz | PK | 7.61E-09 | -51.2 | -13.0 | -38.2 | High Channel, EUT Horizontal |
| 3820.273 | | | 2.8 | 150.0 | | | Vert | PK | 6.46E-09 | -51.9 | -13.0 | -38.9 | High Channel, EUT Vertical |

# Out of Band Emissions - Part 24E

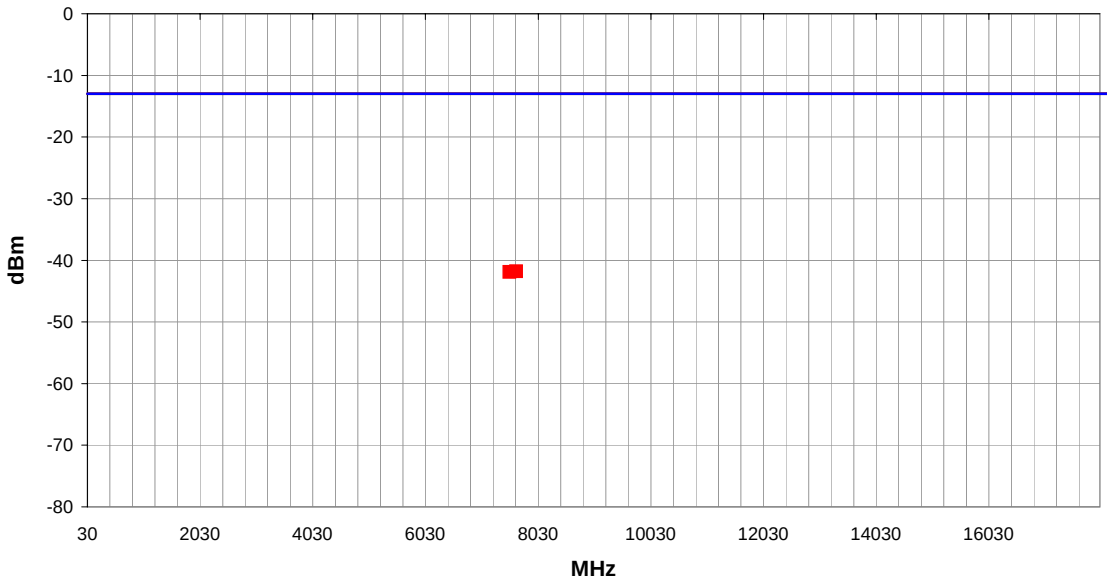


| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/12/11 | | |
| **Project:** | None | **Temperature:** | 22 °C | | |
| **Job Site:** | OC10 | **Humidity:** | 46.24% RH | | |
| **Serial Number:** | 178U1191029 | **Barometric Pres.:** | 1014.4 mbar | **Tested by:** | Jaemi Suh |

| | |
|---|---|
| **EUT:** | 1000CP01S |
| **Configuration:** | 1 |
| **Customer:** | Intermec Technologies Corporation |
| **Attendees:** | None |
| **EUT Power:** | 110VAC/60Hz |
| **Operating Mode:** | Transmitting PCS Band, E-GPRS (EDGE) |
| **Deviations:** | None |
| **Comments:** | None |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 26 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|



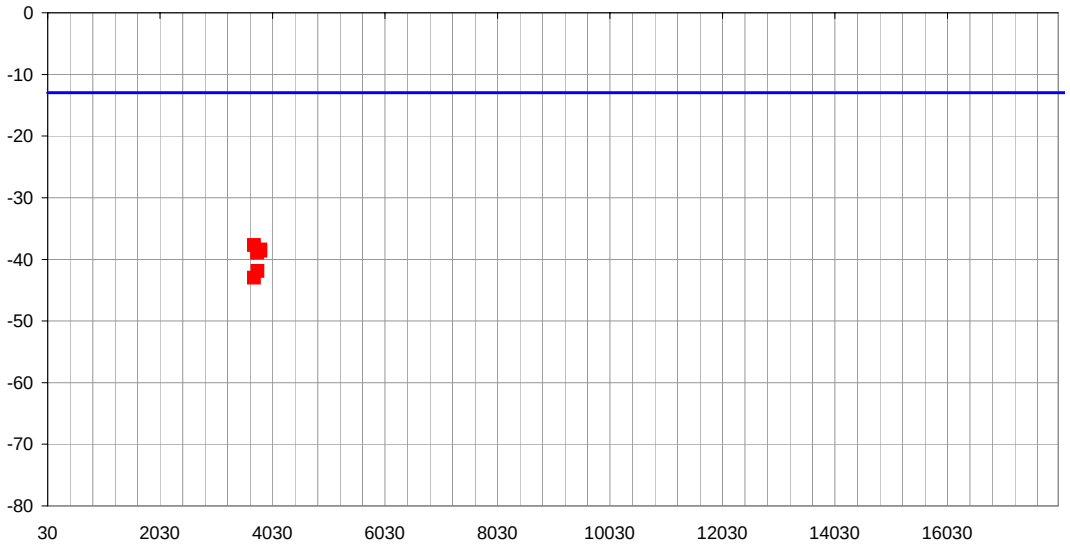

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7638.740 | | | 1.0 | 85.0 | | | Vert | PK | 6.64E-08 | -41.8 | -13.0 | -28.8 | High Channel, EUT Vertical |
| 7520.147 | | | 1.0 | 30.0 | | | Horz | PK | 6.49E-08 | -41.9 | -13.0 | -28.9 | Mid Channel, EUT Vertical |

# Out of Band Emissions - Part 24E

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC10 | Humidity: | 49% RH | | |
| Serial Number: | 178U1191029 | Barometric Pres.: | 1111 mbar | Tested by: | Jaemi Suh |
| EUT: | 1000CP01S | | | | |
| Configuration: | 1 - CONFIGURATION 1 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA PCS Band. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 35 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|



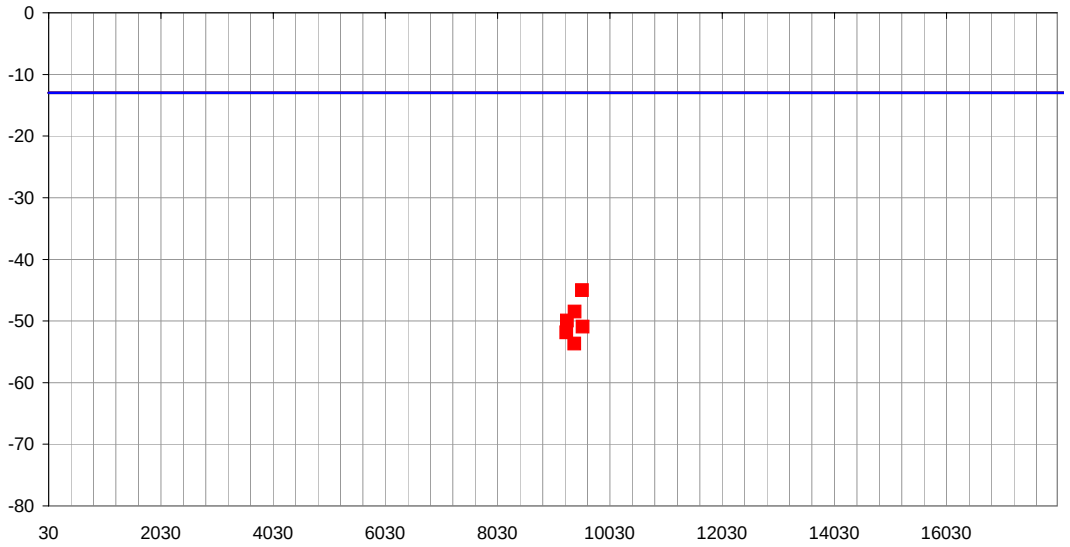

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3702.450 | | | 1.0 | 64.0 | | | Horz | PK | 1.71E-07 | -37.7 | -13.0 | -24.7 | Low Channel, X-Axis |
| 3813.167 | | | 1.0 | 42.0 | | | Vert | PK | 1.44E-07 | -38.4 | -13.0 | -25.4 | High Channel, X-Axis |
| 3812.467 | | | 1.0 | 47.0 | | | Horz | PK | 1.38E-07 | -38.6 | -13.0 | -25.6 | High Channel, X-Axis |
| 3758.390 | | | 1.2 | 69.0 | | | Horz | PK | 1.28E-07 | -38.9 | -13.0 | -25.9 | Mid Channel, X-Axis |
| 3761.464 | | | 1.2 | 191.0 | | | Vert | PK | 6.45E-08 | -41.9 | -13.0 | -28.9 | Mid Channel, X-Axis |
| 3702.367 | | | 1.0 | 36.0 | | | Vert | PK | 5.03E-08 | -43.0 | -13.0 | -30.0 | Low Channel, X-Axis |

# Out of Band Emissions - Part 24E

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC10 | Humidity: | 49% RH | | |
| Serial Number: | 178U1191029 | Barometric Pres.: | 1111 mbar | Tested by: | Jaemi Suh |
| EUT: | 1000CP01S | | | | |
| Configuration: | 1 - CONFIGURATION 1 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA PCS Band. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 36 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9532.230 | | | 1.0 | 4.0 | | | Vert | PK | 3.15E-08 | -45.0 | -13.0 | -32.0 | High Channel, X-Axis |
| 9404.700 | | | 1.2 | 1.0 | | | Vert | PK | 1.42E-08 | -48.5 | -13.0 | -35.5 | Mid Channel, X-Axis |
| 9266.090 | | | 1.2 | 297.0 | | | Horz | PK | 1.02E-08 | -49.9 | -13.0 | -36.9 | Low Channel, X-Axis |
| 9544.230 | | | 1.0 | 121.0 | | | Horz | PK | 8.12E-09 | -50.9 | -13.0 | -37.9 | High Channel, X-Axis |
| 9256.520 | | | 1.2 | 12.0 | | | Vert | PK | 6.55E-09 | -51.8 | -13.0 | -38.8 | Low Channel, X-Axis |
| 9396.300 | | | 1.0 | 17.0 | | | Horz | PK | 4.29E-09 | -53.7 | -13.0 | -40.7 | Mid Channel, X-Axis |

# Out of Band Emissions - Part 24E

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

| MODES OF OPERATION |
|---|
| Transmitting PCS Band, E-GPRS (EDGE) |
| Transmitting PCS Band, GPRS (GMSK) |
| Transmitting PCS Band, WCDMA |

| POWER SETTINGS INVESTIGATED |
|---|
| 110VAC/60Hz |

| CONFIGURATIONS INVESTIGATED |
|---|
| ITRM0249 - 2 |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 18 GHz |

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

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Antenna, Horn | EMCO | 3115 | AHA | 10/22/2009 | 24 mo |
| Universal Radio Communication Tester | Rohde & Schwarz | CMU200 | BSW | NCR | 0 mo |
| High Pass Filter 1.2-18 GHz | Micro-Tronics | HPM50108 | HFW | 3/17/2010 | 24 mo |
| Pre-Amplifier | Miteq | AMF-6F-12001800-30-10P | AOF | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-08 | AHT | NCR | 0 mo |
| Pre-Amplifier | Miteq | AMF-6F-08001200-30-10P | AOE | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-07 | AHR | NCR | 0 mo |
| OC 10 Cables | N/A | 12-18GHz RE Cables | OCO | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AMF-4D-010120-30-10P-1 | AOP | 6/24/2011 | 12 mo |
| Antenna, Horn | EMCO | 3115 | AHB | 3/8/2011 | 24 mo |
| OC10 Cables | N/A | 1-8GHz RE Cables | OCJ | 6/10/2011 | 12 mo |
| Antenna, Biconilog | EMCO | 3142 | AXB | 3/28/2011 | 12 mo |
| OC10 Cables | N/A | 10kHz-1GHz RE Cables | OCH | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AM-1064-9079 | AOO | 6/28/2011 | 12 mo |
| Spectrum Analyzer | Agilent | E4446A | AAY | 1/11/2011 | 12 mo |
| Signal Generator | Agilent | E8257D | TGU | 1/26/2011 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Antenna, Dipole | EMCO | 3121C | ADF | NCR | 0 mo |

**MEASUREMENT BANDWIDTHS**

| 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 |

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

## TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. 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. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

The final measurements must be made utilizing the substitution method described above

NORTHWEST
# EMC

## Out of Band Emissions - Part 24E

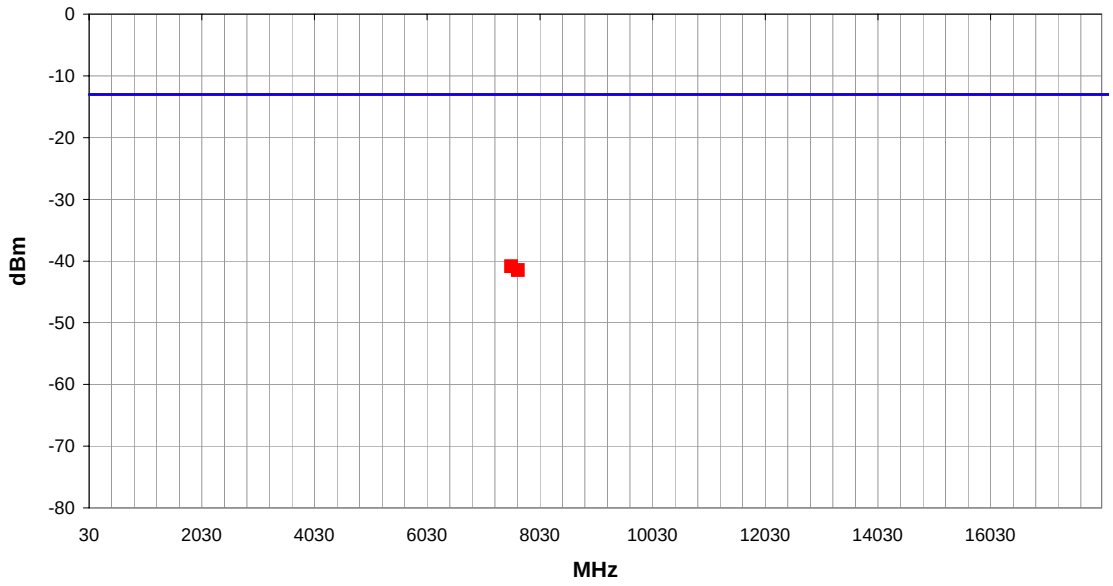
PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/12/11 | | |
| **Project:** | None | **Temperature:** | 22 °C | | |
| **Job Site:** | OC10 | **Humidity:** | 46.24% RH | | |
| **Serial Number:** | 178U1191038 | **Barometric Pres.:** | 1014.4 mbar | **Tested by:** | Jaemi Suh |

| | |
|---|---|
| **EUT:** | 1000CP02S |
| **Configuration:** | 2 |
| **Customer:** | Intermec Technologies Corporation |
| **Attendees:** | None |
| **EUT Power:** | 110VAC/60Hz |
| **Operating Mode:** | Transmitting PCS Band, GPRS (GMSK) |
| **Deviations:** | None |
| **Comments:** | None |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 26 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7520.853 | | | 1.0 | 150.0 | | | Horz | PK | 8.17E-08 | -40.9 | -13.0 | -27.9 | Mid Channel, EUT Vertical |
| 7639.527 | | | 3.7 | 1.0 | | | Vert | PK | 7.11E-08 | -41.5 | -13.0 | -28.5 | High Channel, EUT Vertical |

NORTHWEST
# EMC

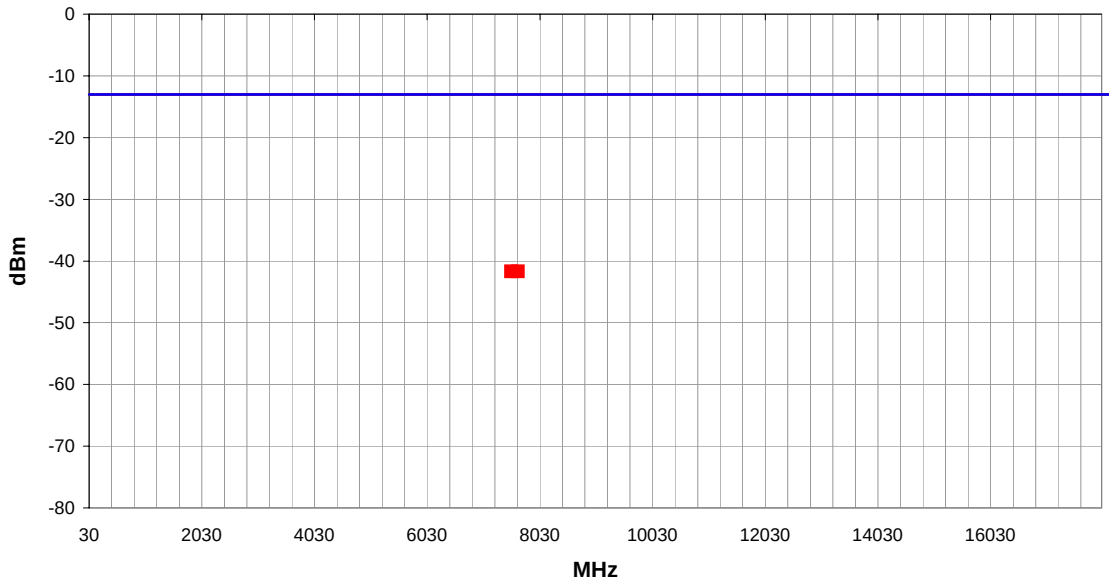
## Out of Band Emissions - Part 24E

PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/12/11 | | |
| **Project:** | None | **Temperature:** | 22 °C | | |
| **Job Site:** | OC10 | **Humidity:** | 46.24% RH | | |
| **Serial Number:** | 178U1191038 | **Barometric Pres.:** | 1014.4 mbar | **Tested by:** | Jaemi Suh |
| **EUT:** | 1000CP02S | | | | |
| **Configuration:** | 2 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting PCS Band, E-GPRS (EDGE) | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 27 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|



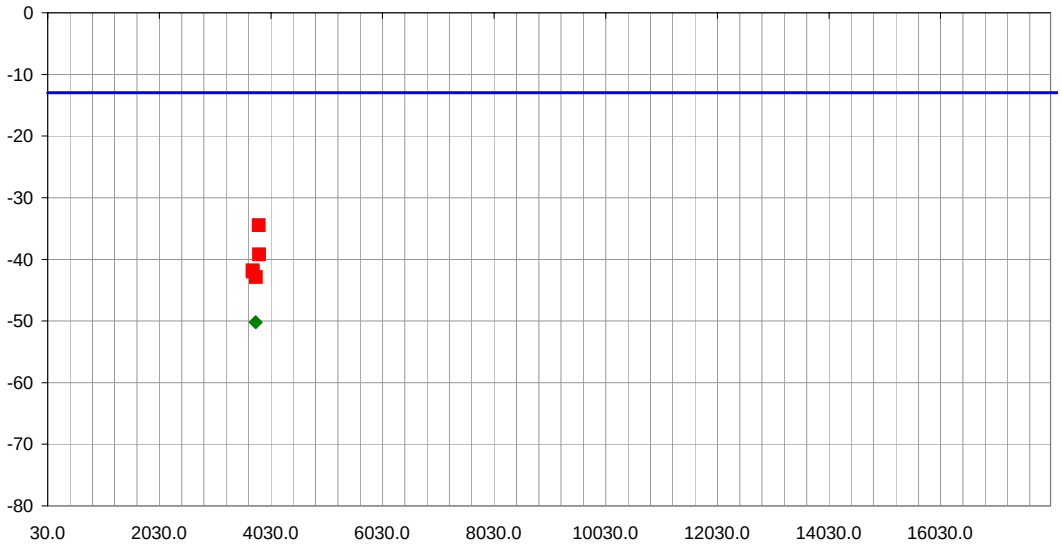

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7520.813 | | | 3.2 | 197.0 | | | Vert | PK | 6.78E-08 | -41.7 | -13.0 | -28.7 | Mid Channel, EUT Vertical |
| 7639.473 | | | 3.1 | 354.0 | | | Horz | PK | 6.78E-08 | -41.7 | -13.0 | -28.7 | High Channel, EUT Vertical |

# Out of Band Emissions - Part 24E

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC10 | Humidity: | 49% RH | | |
| Serial Number: | 178U1191038 | Barometric Pres.: | 1111 mbar | Tested by: | Jaemi Suh |
| EUT: | 1000CP02S | | | | |
| Configuration: | 2 - CONFIGURATION 2 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA PCS Band. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 37 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|



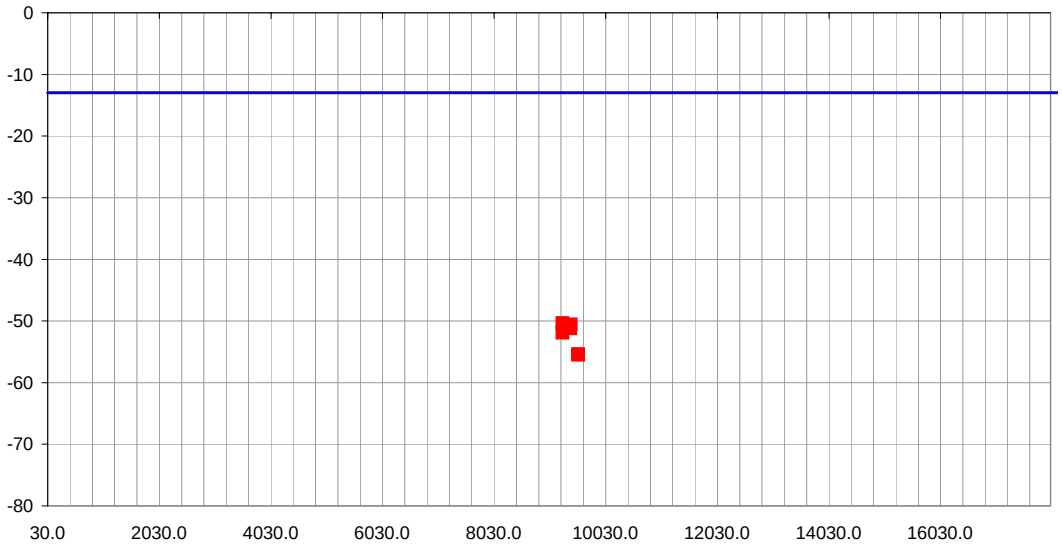

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3817.173 | | | 1.2 | 51.0 | | | Horz | PK | 3.55E-07 | -34.5 | -13.0 | -21.5 | High Channel, X-Axis |
| 3817.318 | | | 1.2 | 53.0 | | | Vert | PK | 1.20E-07 | -39.2 | -13.0 | -26.2 | High Channel, X-Axis |
| 3703.367 | | | 1.0 | 71.0 | | | Horz | PK | 6.65E-08 | -41.8 | -13.0 | -28.8 | Low Channel, X-Axis |
| 3703.217 | | | 1.0 | 26.0 | | | Vert | PK | 6.34E-08 | -42.0 | -13.0 | -29.0 | Low Channel, X-Axis |
| 3760.933 | | | 1.0 | 63.0 | | | Vert | PK | 5.12E-08 | -42.9 | -13.0 | -29.9 | Mid Channel, X-Axis |
| 3758.713 | | | 1.7 | 173.0 | | | Horz | PK | 9.51E-09 | -50.2 | -13.0 | -37.2 | Mid Channel, X-Axis |

# Out of Band Emissions - Part 24E

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC10 | Humidity: | 49% RH | | |
| Serial Number: | 178U1191038 | Barometric Pres.: | 1111 mbar | Tested by: | Jaemi Suh |
| EUT: | 1000CP02S | | | | |
| Configuration: | 2 - CONFIGURATION 2 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA PCS Band. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 38 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9257.677 | | | 1.2 | 326.0 | | | Vert | PK | 9.26E-09 | -50.3 | -13.0 | -37.3 | Low Channel, X-Axis |
| 9406.330 | | | 1.0 | 6.0 | | | Horz | PK | 8.78E-09 | -50.6 | -13.0 | -37.6 | Mid Channel, X-Axis |
| 9396.070 | | | 1.0 | 1.0 | | | Vert | PK | 7.64E-09 | -51.2 | -13.0 | -38.2 | Mid Channel, X-Axis |
| 9258.527 | | | 1.2 | 117.0 | | | Horz | PK | 6.41E-09 | -51.9 | -13.0 | -38.9 | Low Channel, X-Axis |
| 9536.360 | | | 1.0 | 359.0 | | | Horz | PK | 2.88E-09 | -55.4 | -13.0 | -42.4 | High Channel, X-Axis |
| 9536.060 | | | 1.0 | 263.0 | | | Vert | PK | 2.81E-09 | -55.5 | -13.0 | -42.5 | High Channel, X-Axis |

# Out of Band Emissions - Part 24E

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

| MODES OF OPERATION |
|---|
| Transmitting PCS Band, E-GPRS (EDGE) |
| Transmitting PCS Band, GPRS (GMSK) |
| Transmitting PCS Band, WCDMA |

| POWER SETTINGS INVESTIGATED |
|---|
| 110VAC/60Hz |

| CONFIGURATIONS INVESTIGATED |
|---|
| ITRM0249 - 3 |

| FREQUENCY RANGE INVESTIGATED | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 18 GHz |

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

**TEST EQUIPMENT**

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| Antenna, Horn | EMCO | 3115 | AHA | 10/22/2009 | 24 mo |
| Universal Radio Communication Tester | Rohde & Schwarz | CMU200 | BSW | NCR | 0 mo |
| High Pass Filter 1.2-18 GHz | Micro-Tronics | HPM50108 | HFW | 3/17/2010 | 24 mo |
| Pre-Amplifier | Miteq | AMF-6F-12001800-30-10P | AOF | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-08 | AHT | NCR | 0 mo |
| Pre-Amplifier | Miteq | AMF-6F-08001200-30-10P | AOE | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-07 | AHR | NCR | 0 mo |
| OC 10 Cables | N/A | 12-18GHz RE Cables | OCO | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AMF-4D-010120-30-10P-1 | AOP | 6/24/2011 | 12 mo |
| Antenna, Horn | EMCO | 3115 | AHB | 3/8/2011 | 24 mo |
| OC10 Cables | N/A | 1-8GHz RE Cables | OCJ | 6/10/2011 | 12 mo |
| Antenna, Biconilog | EMCO | 3142 | AXB | 3/28/2011 | 12 mo |
| OC10 Cables | N/A | 10kHz-1GHz RE Cables | OCH | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AM-1064-9079 | AOO | 6/28/2011 | 12 mo |
| Spectrum Analyzer | Agilent | E4446A | AAY | 1/11/2011 | 12 mo |
| Signal Generator | Agilent | E8257D | TGU | 1/26/2011 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Antenna, Dipole | EMCO | 3121C | ADF | NCR | 0 mo |

**MEASUREMENT BANDWIDTHS**

| 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 |

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

## TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. 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. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

The final measurements must be made utilizing the substitution method described above

NORTHWEST

# EMC

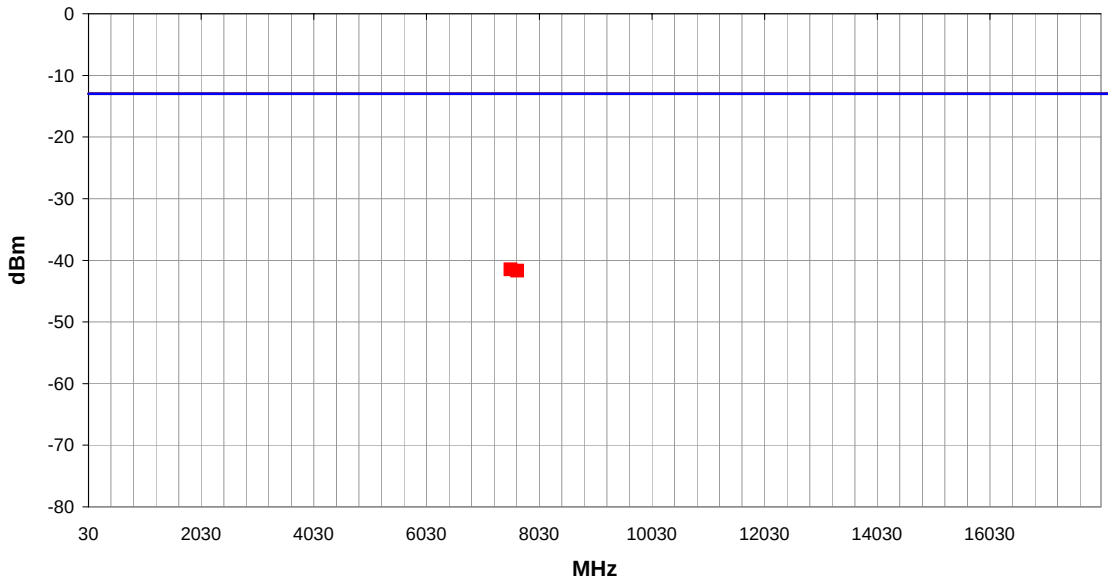
## Out of Band Emissions - Part 24E

PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/12/11 | | |
| **Project:** | None | **Temperature:** | 22 °C | | |
| **Job Site:** | OC10 | **Humidity:** | 46.24% RH | | |
| **Serial Number:** | 178U1191003 | **Barometric Pres.:** | 1014.4 mbar | **Tested by:** | Jaemi Suh |
| **EUT:** | 1001CP01S | | | | |
| **Configuration:** | 3 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | Transmitting Cellular Band, GPRS (GMSK) | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 25 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7520.527 | | | 3.7 | 1.0 | | | Vert | PK | 7.11E-08 | -41.5 | -13.0 | -28.5 | Mid Channel, EUT Vertical |
| 7639.813 | | | 3.2 | 197.0 | | | Vert | PK | 6.78E-08 | -41.7 | -13.0 | -28.7 | High Channel, EUT Horizontal |

NORTHWEST

# EMC

## Out of Band Emissions - Part 24E

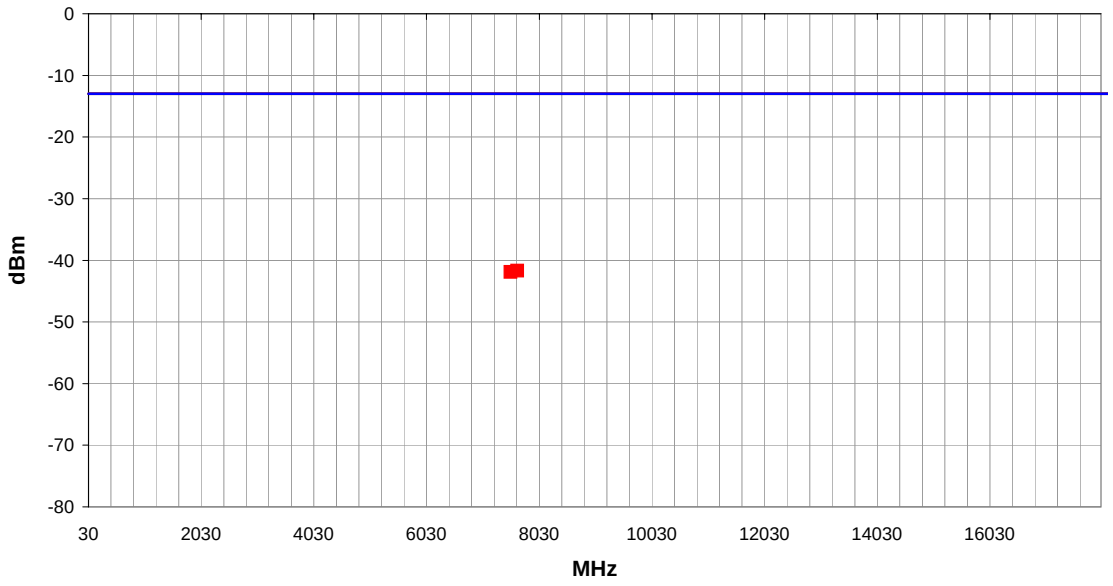
PSA-ESCI 2011.07.26
PSA-ESCI Version 2011.05.10

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/12/11 | | |
| **Project:** | None | **Temperature:** | 22 °C | | |
| **Job Site:** | OC10 | **Humidity:** | 46.24% RH | | |
| **Serial Number:** | 178U1191003 | **Barometric Pres.:** | 1014.4 mbar | **Tested by:** | Jaemi Suh |

| | |
|---|---|
| **EUT:** | 1001CP01S |
| **Configuration:** | 3 |
| **Customer:** | Intermec Technologies Corporation |
| **Attendees:** | None |
| **EUT Power:** | 110VAC/60Hz |
| **Operating Mode:** | Transmitting Cellular Band, E-GPRS (EDGE) |
| **Deviations:** | None |
| **Comments:** | None |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C 2004 |

| **Run #** | 26 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|



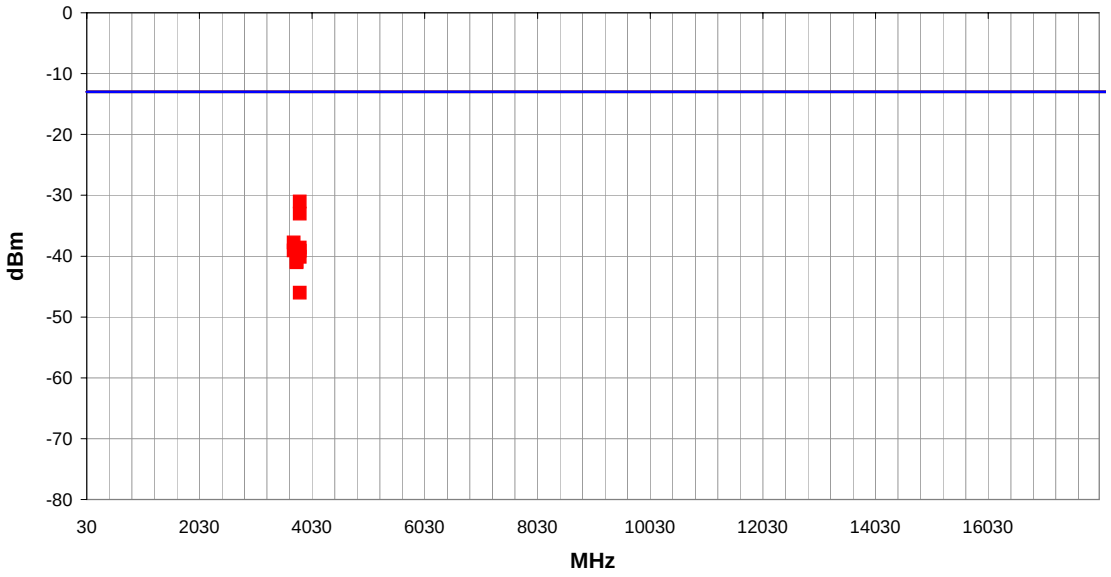

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7639.473 | | | 3.1 | 354.0 | | | Horz | PK | 6.78E-08 | -41.7 | -13.0 | -28.7 | High Channel, EUT Vertical |
| 7520.147 | | | 1.0 | 30.0 | | | | PK | 6.49E-08 | -41.9 | -13.0 | -28.9 | Mid Channel, EUT Horizontal |

# Out of Band Emissions - Part 24E

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC10 | Humidity: | 49% RH | | |
| Serial Number: | 178U1191003 | Barometric Pres.: | 1111 mbar | Tested by: | Jaemi Suh |
| EUT: | 1001CP01S | | | | |
| Configuration: | 3 - CONFIGURATION 3 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA PCS Band. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 33 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|



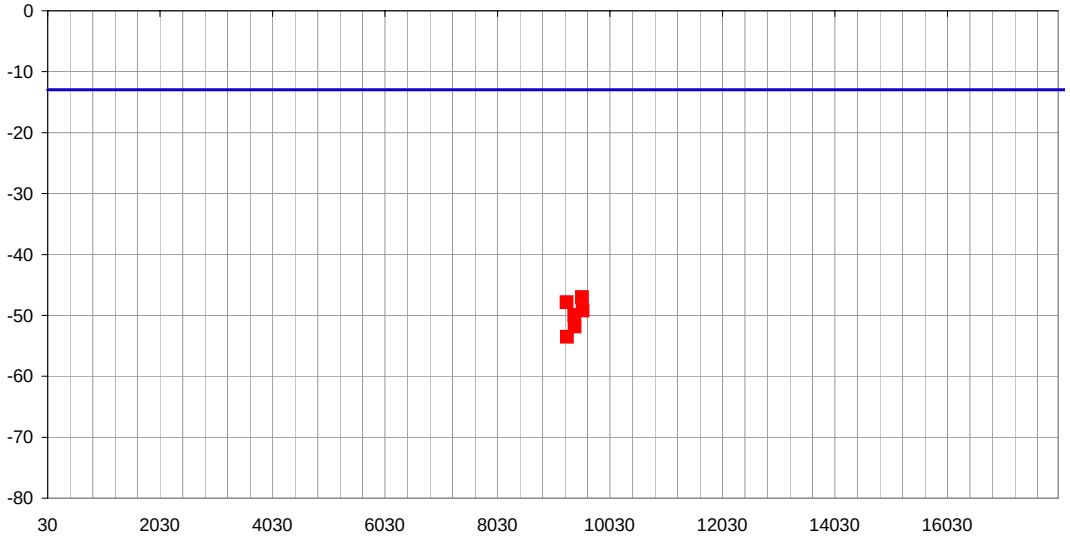

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3812.583 | | | 1.5 | 2.0 | | | Horz | PK | 7.93E-07 | -31.0 | -13.0 | -18.0 | High Channel, X-Axis |
| 3812.233 | | | 1.0 | 316.0 | | | Vert | PK | 5.00E-07 | -33.0 | -13.0 | -20.0 | High Channel, X-Axis |
| 3703.313 | | | 1.2 | 312.0 | | | Vert | PK | 1.67E-07 | -37.8 | -13.0 | -24.8 | Low Channel, X-Axis |
| 3812.289 | | | 1.2 | 37.0 | | | Horz | PK | 1.38E-07 | -38.6 | -13.0 | -25.6 | High Channel, Y-Axis |
| 3703.106 | | | 1.2 | 289.0 | | | Horz | PK | 1.24E-07 | -39.1 | -13.0 | -26.1 | Low Channel, X-Axis |
| 3812.439 | | | 1.3 | 293.0 | | | Vert | PK | 1.23E-07 | -39.1 | -13.0 | -26.1 | High Channel, Z-Axis |
| 3812.366 | | | 1.2 | 350.0 | | | Horz | PK | 9.75E-08 | -40.1 | -13.0 | -27.1 | High Channel, Z-Axis |
| 3757.550 | | | 1.1 | 40.0 | | | Horz | PK | 8.08E-08 | -40.9 | -13.0 | -27.9 | Mid Channel, X-Axis |
| 3758.583 | | | 1.0 | 297.0 | | | Vert | PK | 7.91E-08 | -41.0 | -13.0 | -28.0 | Mid Channel, X-Axis |
| 3812.423 | | | 1.9 | 150.0 | | | Vert | PK | 2.51E-08 | -46.0 | -13.0 | -33.0 | High Channel, Y-Axis |

# Out of Band Emissions - Part 24E

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC10 | Humidity: | 49% RH | | |
| Serial Number: | 178U1191003 | Barometric Pres.: | 1111 mbar | Tested by: | Jaemi Suh |
| EUT: | 1001CP01S | | | | |
| Configuration: | 2 - CONFIGURATION 2 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA PCS Band | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 24E:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 34 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9534.000 | | | 1.0 | 352.0 | | | Vert | PK | 1.99E-08 | -47.0 | -13.0 | -34.0 | High Channel, X-Axis |
| 9258.470 | | | 1.2 | 16.0 | | | Vert | PK | 1.65E-08 | -47.8 | -13.0 | -34.8 | Low channel, X-Axis |
| 9542.430 | | | 1.0 | 345.0 | | | Horz | PK | 1.20E-08 | -49.2 | -13.0 | -36.2 | High Channel, X-Axis |
| 9398.700 | | | 1.0 | 359.0 | | | Vert | PK | 1.01E-08 | -50.0 | -13.0 | -37.0 | Mid Channel, X-Axis |
| 9404.130 | | | 1.0 | 199.0 | | | Horz | PK | 6.51E-09 | -51.9 | -13.0 | -38.9 | Mid Channel, X-Axis |
| 9262.900 | | | 1.0 | 347.0 | | | Horz | PK | 4.44E-09 | -53.5 | -13.0 | -40.5 | Low Channel, X-Axis |

# Out of Band Emissions - Part 27

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

## MODES OF OPERATION

| |
|---|
| WCDMA AWS Band. Low Channel, 1712.4 MHz |
| WCDMA AWS Band. Mid Channel, 1735.4 MHz |
| WCDMA AWS Band. High Channel, 1752.6 MHz |

## AXIS INVESTIGATED

| |
|---|
| X-Axis, Y-Axis, Z-Axis |

## POWER SETTINGS INVESTIGATED

| |
|---|
| 110VAC/60Hz |

## CONFIGURATIONS INVESTIGATED

| |
|---|
| 1 - CONFIGURATION 1 |

## FREQUENCY RANGE INVESTIGATED

| | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 26 GHz |

## SAMPLE CALCULATIONS

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

## TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| OC10 Cables | N/A | Double Ridge Horn Cables | N/A | N/A | 0 mo |
| Universal Radio Communication Tester | Rohde & Schwarz | CMU200 | BSW | NCR | 0 mo |
| Antenna, Horn (DRG) | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Pre-Amplifier | Miteq | AMF-6F-18002650-25-10P | AOI | 4/29/2011 | 12 mo |
| Antenna, Horn | EMCO | 3160-09 | AHN | NCR | 0 mo |
| OC floating Cable | N/A | 18-26GHz RE Cables | OCK | 4/29/2011 | 12 mo |
| Pre-Amplifier | Miteq | AMF-6F-12001800-30-10P | AOF | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-08 | AHT | NCR | 0 mo |
| Pre-Amplifier | Miteq | AMF-6F-08001200-30-10P | AOE | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-07 | AHR | NCR | 0 mo |
| OC 10 Cables | N/A | 12-18GHz RE Cables | OCO | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AMF-4D-010120-30-10P-1 | AOP | 6/24/2011 | 12 mo |
| Antenna, Horn | EMCO | 3115 | AHB | 3/8/2011 | 24 mo |
| OC10 Cables | N/A | 1-8GHz RE Cables | OCJ | 6/10/2011 | 12 mo |
| Antenna, Biconilog | EMCO | 3142 | AXB | 3/28/2011 | 12 mo |
| OC10 Cables | N/A | 10kHz-1GHz RE Cables | OCH | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AM-1064-9079 | AOO | 6/28/2011 | 12 mo |
| Spectrum Analyzer | Agilent | E4446A | AAY | 1/11/2011 | 12 mo |
| Signal Generator | Agilent | E8257D | TGU | 1/26/2011 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Antenna, Dipole | EMCO | 3121C | ADF | NCR | 0 mo |

## MEASUREMENT BANDWIDTHS

| 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 |

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

## TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. 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. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

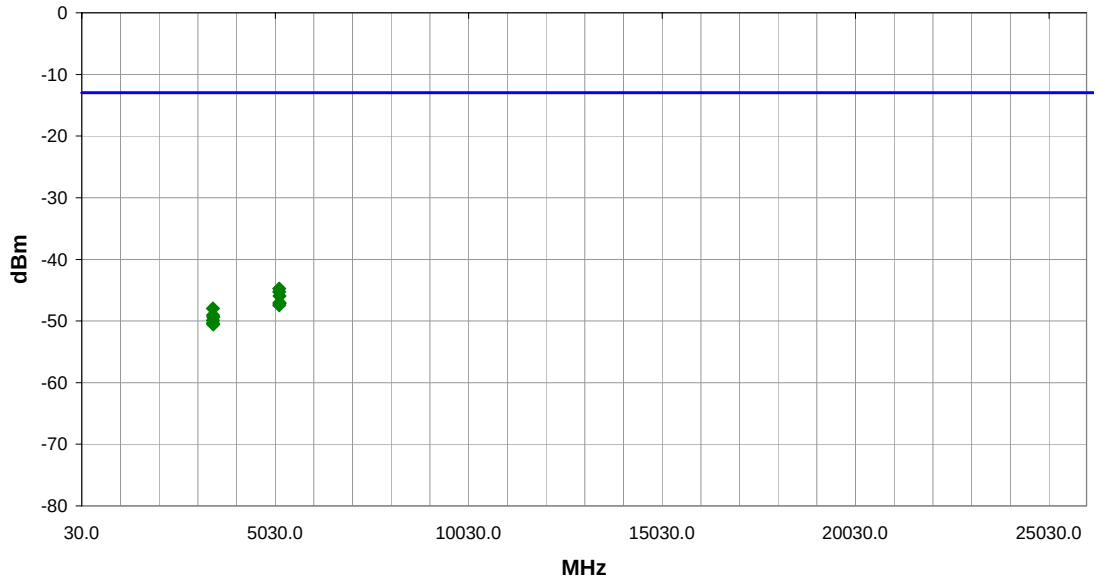
The final measurements must be made utilizing the substitution method described above

# Out of Band Emissions - Part 27

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC11 | Humidity: | 42% RH | | |
| Serial Number: | 178U1191029 | Barometric Pres.: | 1111 mbar | Tested by: | Jeremiah Darden |
| EUT: | 1000CP01S | | | | |
| Configuration: | 1 - CONFIGURATION 1 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA AWS Band. Low Channel. 1712.4 MHz. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 25 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|



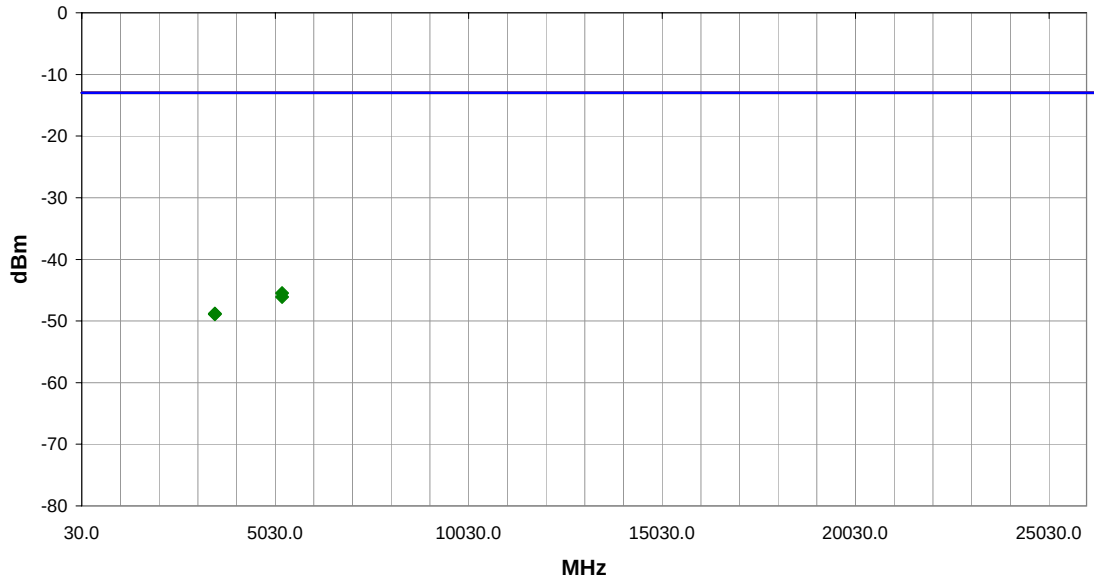

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5136.093 | | | 1.0 | 62.0 | | | Vert | PK | 3.34E-08 | -44.8 | -13.0 | -31.8 | Z |
| 5135.793 | | | 1.0 | 5.0 | | | Horz | PK | 2.98E-08 | -45.3 | -13.0 | -32.3 | Z |
| 5138.860 | | | 2.5 | 210.0 | | | Vert | PK | 2.54E-08 | -45.9 | -13.0 | -32.9 | X |
| 5139.153 | | | 1.0 | 113.0 | | | Horz | PK | 1.97E-08 | -47.0 | -13.0 | -34.0 | Y |
| 5138.027 | | | 1.0 | 134.0 | | | Vert | PK | 1.93E-08 | -47.2 | -13.0 | -34.2 | Y |
| 5135.627 | | | 2.4 | 305.0 | | | Horz | PK | 1.79E-08 | -47.5 | -13.0 | -34.5 | X |
| 3423.160 | | | 1.0 | 128.0 | | | Vert | PK | 1.59E-08 | -48.0 | -13.0 | -35.0 | Y |
| 3423.640 | | | 1.0 | 359.0 | | | Horz | PK | 1.24E-08 | -49.1 | -13.0 | -36.1 | X |
| 3426.613 | | | 1.0 | 120.0 | | | Vert | PK | 1.15E-08 | -49.4 | -13.0 | -36.4 | X |
| 3423.007 | | | 1.0 | 104.0 | | | Horz | PK | 1.03E-08 | -49.9 | -13.0 | -36.9 | Y |
| 3422.940 | | | 1.8 | 215.0 | | | Vert | PK | 9.16E-09 | -50.4 | -13.0 | -37.4 | Z |
| 3426.433 | | | 1.0 | 355.0 | | | Horz | PK | 8.76E-09 | -50.6 | -13.0 | -37.6 | Z |

# Out of Band Emissions - Part 27

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/24/11 | | |
| **Project:** | None | **Temperature:** | 22 °C | | |
| **Job Site:** | OC11 | **Humidity:** | 42% RH | | |
| **Serial Number:** | 178U1191029 | **Barometric Pres.:** | 1111 mbar | **Tested by:** | Jeremiah Darden |
| **EUT:** | 1000CP01S | | | | |
| **Configuration:** | 1 - CONFIGURATION 1 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | WCDMA AWS Band. Mid Channel. 1735.4 MHz. | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| **Run #** | 26 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|



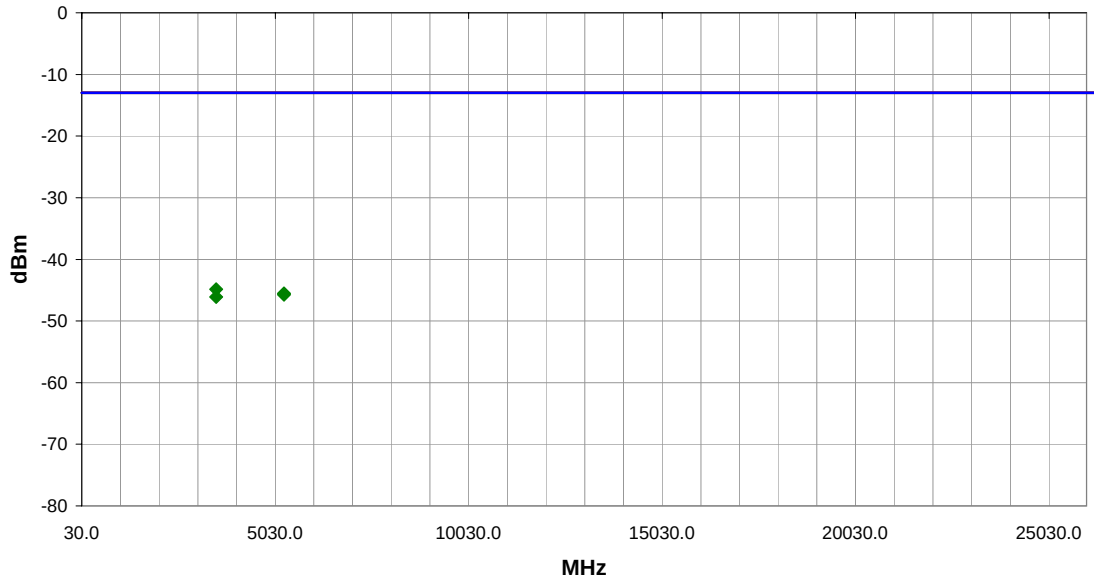

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5207.147 | | | 1.0 | 68.0 | | | Vert | PK | 2.84E-08 | -45.5 | -13.0 | -32.5 | Z |
| 5204.947 | | | 1.0 | 4.0 | | | Horz | PK | 2.46E-08 | -46.1 | -13.0 | -33.1 | Z |
| 3469.500 | | | 1.0 | 8.0 | | | Vert | PK | 1.32E-08 | -48.8 | -13.0 | -35.8 | Z |
| 3469.013 | | | 1.0 | 24.0 | | | Horz | PK | 1.29E-08 | -48.9 | -13.0 | -35.9 | Z |

# Out of Band Emissions - Part 27

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | ITRM0249 | **Date:** | 08/24/11 | | |
| **Project:** | None | **Temperature:** | 22 °C | | |
| **Job Site:** | OC11 | **Humidity:** | 42% RH | | |
| **Serial Number:** | 178U1191029 | **Barometric Pres.:** | 1111 mbar | **Tested by:** | Jeremiah Darden |
| **EUT:** | 1000CP01S | | | | |
| **Configuration:** | 1 - CONFIGURATION 1 | | | | |
| **Customer:** | Intermec Technologies Corporation | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 110VAC/60Hz | | | | |
| **Operating Mode:** | WCDMA AWS Band. High Channel. 1752.6 MHz. | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | None | | | | |

| **Test Specifications** | **Test Method** |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| **Run #** | 27 | **Test Distance (m)** | 3 | **Antenna Height(s)** | 1-4m | **Results** | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3503.820 | | | 1.0 | 68.0 | | | Vert | PK | 3.25E-08 | -44.9 | -13.0 | -31.9 | Z |
| 5257.147 | | | 1.0 | 176.0 | | | Vert | PK | 2.80E-08 | -45.5 | -13.0 | -32.5 | Z |
| 5258.967 | | | 1.0 | 306.0 | | | Horz | PK | 2.68E-08 | -45.7 | -13.0 | -32.7 | Z |
| 3503.753 | | | 2.2 | 217.0 | | | Horz | PK | 2.47E-08 | -46.1 | -13.0 | -33.1 | Z |

# Out of Band Emissions - Part 27

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

## MODES OF OPERATION

| |
|---|
| WCDMA AWS Band. Low Channel, 1712.4 MHz |
| WCDMA AWS Band. Mid Channel, 1735.4 MHz |
| WCDMA AWS Band. High Channel, 1752.6 MHz |

## AXIS INVESTIGATED

| |
|---|
| X-Axis, Y-Axis, Z-Axis |

## POWER SETTINGS INVESTIGATED

| |
|---|
| 110VAC/60Hz |

## CONFIGURATIONS INVESTIGATED

| |
|---|
| 2 - CONFIGURATION 2 |

## FREQUENCY RANGE INVESTIGATED

| | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 26 GHz |

## SAMPLE CALCULATIONS

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

## TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| OC10 Cables | N/A | Double Ridge Horn Cables | N/A | N/A | 0 mo |
| Universal Radio Communication Tester | Rohde & Schwarz | CMU200 | BSW | NCR | 0 mo |
| Antenna, Horn (DRG) | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Pre-Amplifier | Miteq | AMF-6F-18002650-25-10P | AOI | 4/29/2011 | 12 mo |
| Antenna, Horn | EMCO | 3160-09 | AHN | NCR | 0 mo |
| OC floating Cable | N/A | 18-26GHz RE Cables | OCK | 4/29/2011 | 12 mo |
| Pre-Amplifier | Miteq | AMF-6F-12001800-30-10P | AOF | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-08 | AHT | NCR | 0 mo |
| Pre-Amplifier | Miteq | AMF-6F-08001200-30-10P | AOE | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-07 | AHR | NCR | 0 mo |
| OC 10 Cables | N/A | 12-18GHz RE Cables | OCO | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AMF-4D-010120-30-10P-1 | AOP | 6/24/2011 | 12 mo |
| Antenna, Horn | EMCO | 3115 | AHB | 3/8/2011 | 24 mo |
| OC10 Cables | N/A | 1-8GHz RE Cables | OCJ | 6/10/2011 | 12 mo |
| Antenna, Biconilog | EMCO | 3142 | AXB | 3/28/2011 | 12 mo |
| OC10 Cables | N/A | 10kHz-1GHz RE Cables | OCH | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AM-1064-9079 | AOO | 6/28/2011 | 12 mo |
| Spectrum Analyzer | Agilent | E4446A | AAY | 1/11/2011 | 12 mo |
| Signal Generator | Agilent | E8257D | TGU | 1/26/2011 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Antenna, Dipole | EMCO | 3121C | ADF | NCR | 0 mo |

## MEASUREMENT BANDWIDTHS

| 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 |

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

## TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. 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. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

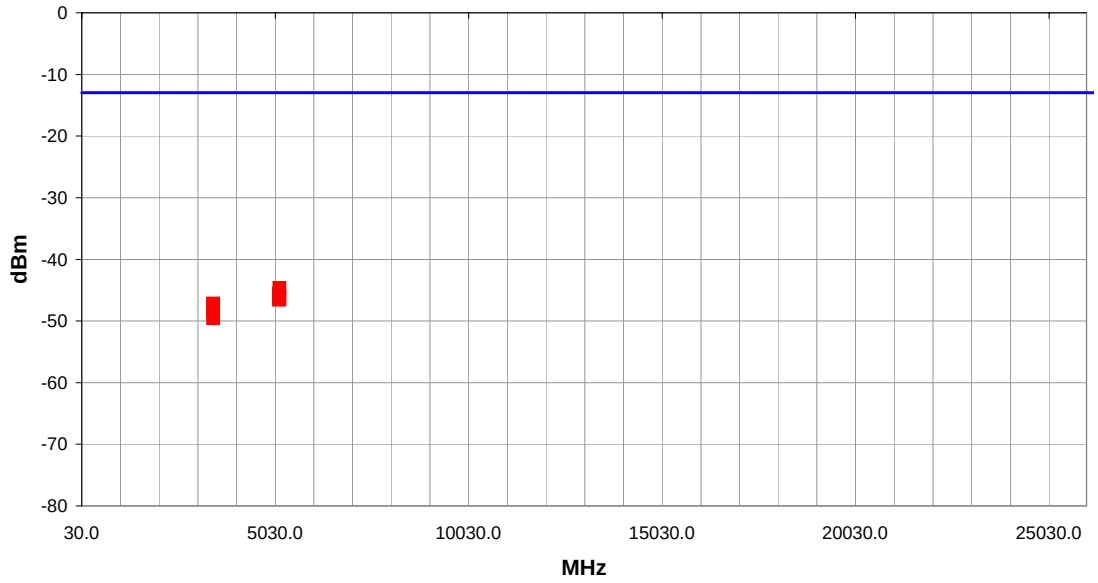
The final measurements must be made utilizing the substitution method described above

# Out of Band Emissions - Part 27

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC11 | Humidity: | 42% RH | | |
| Serial Number: | 178U1191038 | Barometric Pres.: | 1111 mbar | Tested by: | Jeremiah Darden |
| EUT: | 1000CP02S | | | | |
| Configuration: | 2 - CONFIGURATION 2 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA AWS Band. Low Channel. 1712.4 MHz. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 36 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|



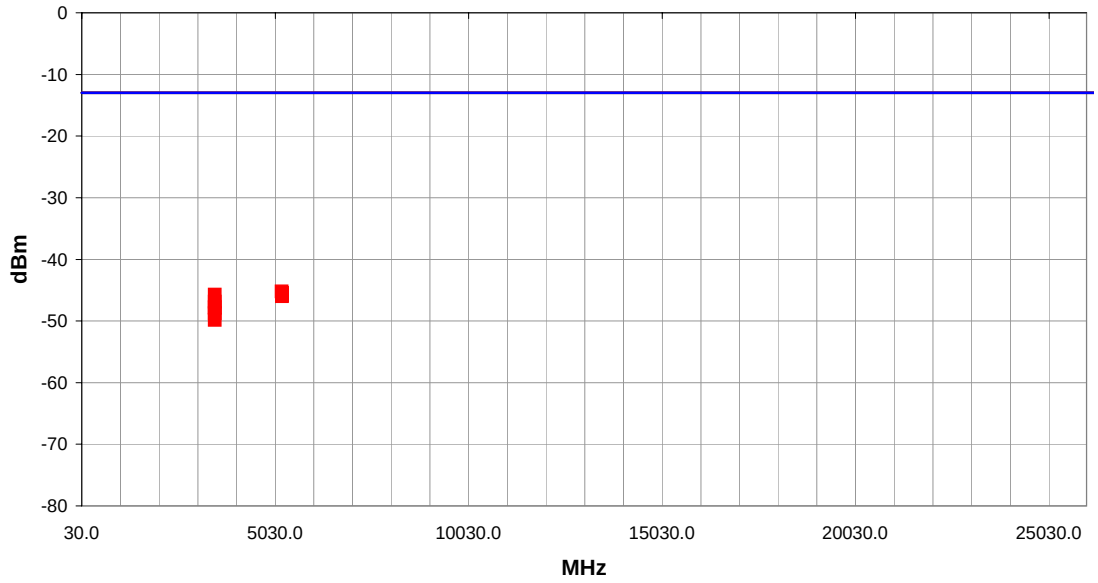

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5137.447 | | | 1.0 | 137.0 | | | Horz | PK | 3.43E-08 | -44.7 | -13.0 | -31.7 | Y |
| 5135.307 | | | 1.3 | 103.0 | | | Vert | PK | 2.78E-08 | -45.6 | -13.0 | -32.6 | Y |
| 5138.873 | | | 2.4 | 235.0 | | | Horz | PK | 2.48E-08 | -46.0 | -13.0 | -33.0 | Z |
| 5136.893 | | | 2.7 | 359.0 | | | Vert | PK | 2.31E-08 | -46.4 | -13.0 | -33.4 | X |
| 5138.307 | | | 1.0 | 109.0 | | | Vert | PK | 2.27E-08 | -46.4 | -13.0 | -33.4 | Z |
| 5136.513 | | | 1.0 | 324.0 | | | Horz | PK | 2.21E-08 | -46.6 | -13.0 | -33.6 | X |
| 3426.067 | | | 1.0 | 60.0 | | | Horz | PK | 1.91E-08 | -47.2 | -13.0 | -34.2 | Y |
| 3426.527 | | | 1.9 | 18.0 | | | Vert | PK | 1.83E-08 | -47.4 | -13.0 | -34.4 | Y |
| 3426.173 | | | 1.0 | 265.0 | | | Horz | PK | 1.55E-08 | -48.1 | -13.0 | -35.1 | X |
| 3426.227 | | | 1.4 | 234.0 | | | Horz | PK | 1.45E-08 | -48.4 | -13.0 | -35.4 | Z |
| 3426.740 | | | 1.5 | 310.0 | | | Vert | PK | 1.39E-08 | -48.6 | -13.0 | -35.6 | Z |
| 3425.767 | | | 1.0 | 187.0 | | | Vert | PK | 1.10E-08 | -49.6 | -13.0 | -36.6 | X |

# Out of Band Emissions - Part 27

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC11 | Humidity: | 42% RH | | |
| Serial Number: | 178U1191038 | Barometric Pres.: | 1111 mbar | Tested by: | Jeremiah Darden |
| EUT: | 1000CP02S | | | | |
| Configuration: | 2 - CONFIGURATION 2 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA AWS Band. Mid Channel. 1735.4 MHz. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 37 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|



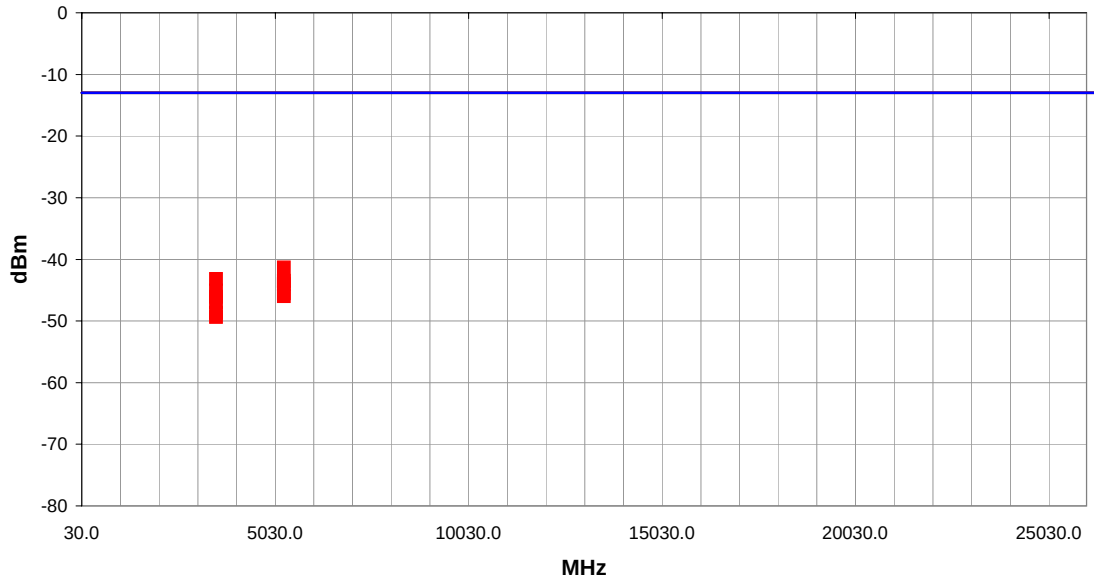

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5203.220 | | | 2.2 | 47.0 | | | Horz | PK | 3.02E-08 | -45.2 | -13.0 | -32.2 | Z |
| 5206.960 | | | 1.7 | 86.0 | | | Vert | PK | 2.83E-08 | -45.5 | -13.0 | -32.5 | Z |
| 5203.833 | | | 1.6 | 284.0 | | | Vert | PK | 2.82E-08 | -45.5 | -13.0 | -32.5 | X |
| 3472.180 | | | 1.0 | 28.0 | | | Horz | PK | 2.67E-08 | -45.7 | -13.0 | -32.7 | Y |
| 5204.893 | | | 3.5 | 79.0 | | | Horz | PK | 2.64E-08 | -45.8 | -13.0 | -32.8 | Y |
| 5207.127 | | | 1.0 | 72.0 | | | Horz | PK | 2.59E-08 | -45.9 | -13.0 | -32.9 | X |
| 5205.553 | | | 1.0 | 342.0 | | | Vert | PK | 2.52E-08 | -46.0 | -13.0 | -33.0 | Y |
| 3468.913 | | | 1.0 | 176.0 | | | Vert | PK | 2.06E-08 | -46.9 | -13.0 | -33.9 | Z |
| 3468.960 | | | 1.0 | 220.0 | | | Horz | PK | 1.68E-08 | -47.8 | -13.0 | -34.8 | Z |
| 3472.100 | | | 1.0 | 228.0 | | | Vert | PK | 1.61E-08 | -47.9 | -13.0 | -34.9 | X |
| 3469.293 | | | 1.0 | 295.0 | | | Horz | PK | 1.33E-08 | -48.8 | -13.0 | -35.8 | X |
| 3469.147 | | | 2.4 | 70.0 | | | Vert | PK | 1.03E-08 | -49.9 | -13.0 | -36.9 | Y |

# Out of Band Emissions - Part 27

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC11 | Humidity: | 42% RH | | |
| Serial Number: | 178U1191038 | Barometric Pres.: | 1111 mbar | Tested by: | Jeremiah Darden |
| EUT: | 1000CP02S | | | | |
| Configuration: | 2 - CONFIGURATION 2 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA AWS Band. High Channel. 1752.6 MHz. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 39 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5259.713 | | | 1.5 | 88.0 | | | Horz | PK | 7.39E-08 | -41.3 | -13.0 | -28.3 | Y |
| 3503.927 | | | 1.0 | 151.0 | | | Vert | PK | 4.81E-08 | -43.2 | -13.0 | -30.2 | Y |
| 5259.540 | | | 1.0 | 134.0 | | | Vert | PK | 4.45E-08 | -43.5 | -13.0 | -30.5 | Y |
| 5258.920 | | | 1.3 | 50.0 | | | Horz | PK | 4.45E-08 | -43.5 | -13.0 | -30.5 | Z |
| 5259.780 | | | 1.0 | 300.0 | | | Vert | PK | 3.97E-08 | -44.0 | -13.0 | -31.0 | X |
| 3507.087 | | | 1.7 | 171.0 | | | Horz | PK | 3.12E-08 | -45.1 | -13.0 | -32.1 | Y |
| 5257.287 | | | 2.1 | 6.0 | | | Vert | PK | 2.80E-08 | -45.5 | -13.0 | -32.5 | Z |
| 5258.180 | | | 1.0 | 238.0 | | | Horz | PK | 2.50E-08 | -46.0 | -13.0 | -33.0 | X |
| 3503.793 | | | 2.0 | 171.0 | | | Vert | PK | 2.47E-08 | -46.1 | -13.0 | -33.1 | Z |
| 3506.647 | | | 1.0 | 10.0 | | | Vert | PK | 2.02E-08 | -47.0 | -13.0 | -34.0 | X |
| 3503.420 | | | 1.8 | 226.0 | | | Horz | PK | 1.36E-08 | -48.7 | -13.0 | -35.7 | X |
| 3503.887 | | | 1.0 | 88.0 | | | Horz | PK | 1.15E-08 | -49.4 | -13.0 | -36.4 | Z |

# Out of Band Emissions - Part 27

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

## MODES OF OPERATION

| |
|---|
| WCDMA AWS Band. Low Channel, 1712.4 MHz |
| WCDMA AWS Band. Mid Channel, 1735.4 MHz |
| WCDMA AWS Band. High Channel, 1752.6 MHz |

## AXIS INVESTIGATED

| |
|---|
| X-Axis, Y-Axis, Z-Axis |

## POWER SETTINGS INVESTIGATED

| |
|---|
| 110VAC/60Hz |

## CONFIGURATIONS INVESTIGATED

| |
|---|
| 3 - CONFIGURATION 3 |

## FREQUENCY RANGE INVESTIGATED

| | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 26 GHz |

## SAMPLE CALCULATIONS

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

## TEST EQUIPMENT

| Description | Manufacturer | Model | ID | Last Cal. | Interval |
|---|---|---|---|---|---|
| OC10 Cables | N/A | Double Ridge Horn Cables | N/A | N/A | 0 mo |
| Universal Radio Communication Tester | Rohde & Schwarz | CMU200 | BSW | NCR | 0 mo |
| Antenna, Horn (DRG) | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Pre-Amplifier | Miteq | AMF-6F-18002650-25-10P | AOI | 4/29/2011 | 12 mo |
| Antenna, Horn | EMCO | 3160-09 | AHN | NCR | 0 mo |
| OC floating Cable | N/A | 18-26GHz RE Cables | OCK | 4/29/2011 | 12 mo |
| Pre-Amplifier | Miteq | AMF-6F-12001800-30-10P | AOF | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-08 | AHT | NCR | 0 mo |
| Pre-Amplifier | Miteq | AMF-6F-08001200-30-10P | AOE | 11/17/2010 | 12 mo |
| Antenna, Horn | ETS | 3160-07 | AHR | NCR | 0 mo |
| OC 10 Cables | N/A | 12-18GHz RE Cables | OCO | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AMF-4D-010120-30-10P-1 | AOP | 6/24/2011 | 12 mo |
| Antenna, Horn | EMCO | 3115 | AHB | 3/8/2011 | 24 mo |
| OC10 Cables | N/A | 1-8GHz RE Cables | OCJ | 6/10/2011 | 12 mo |
| Antenna, Biconilog | EMCO | 3142 | AXB | 3/28/2011 | 12 mo |
| OC10 Cables | N/A | 10kHz-1GHz RE Cables | OCH | 6/24/2011 | 12 mo |
| Pre-Amplifier | Miteq | AM-1064-9079 | AOO | 6/28/2011 | 12 mo |
| Spectrum Analyzer | Agilent | E4446A | AAY | 1/11/2011 | 12 mo |
| Signal Generator | Agilent | E8257D | TGU | 1/26/2011 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3115 | AIR | 5/26/2011 | 24 mo |
| Antenna, Dipole | EMCO | 3121C | ADF | NCR | 0 mo |

## MEASUREMENT BANDWIDTHS

| 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 |

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

## MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

## TEST DESCRIPTION

The highest gain antenna to be used with the EUT was tested for final measurements. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. 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. A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

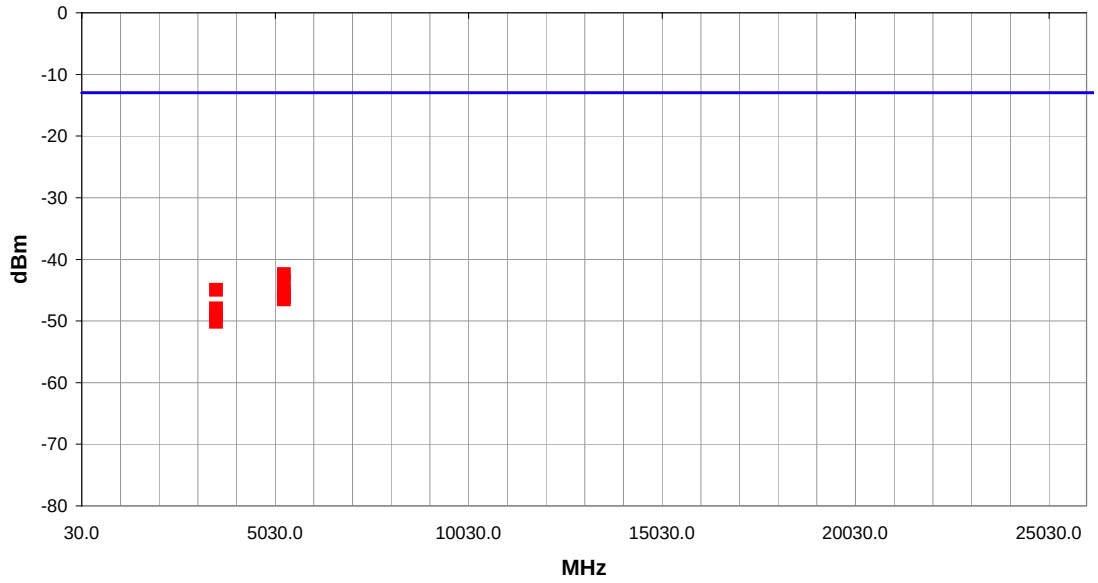
The final measurements must be made utilizing the substitution method described above

# Out of Band Emissions - Part 27

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC10 | Humidity: | 42% RH | | |
| Serial Number: | 178U1191003 | Barometric Pres.: | 1111 mbar | Tested by: | Jeremiah Darden |
| EUT: | 1001CP01S | | | | |
| Configuration: | 3 - CONFIGURATION 3 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA AWS Band. High Channel. 1752.6 MHz. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 38 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|



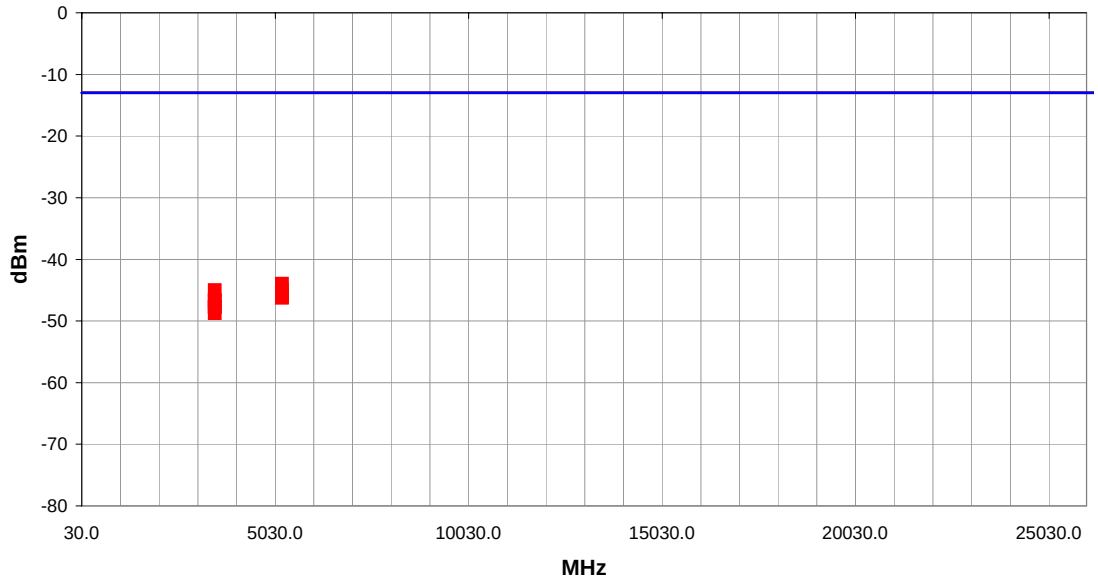

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5259.733 | | | 1.0 | 64.0 | | | Horz | PK | 5.74E-08 | -42.4 | -13.0 | -29.4 | Y |
| 5255.867 | | | 1.3 | 133.0 | | | Vert | PK | 4.54E-08 | -43.4 | -13.0 | -30.4 | Y |
| 3506.580 | | | 2.0 | 94.0 | | | Horz | PK | 3.19E-08 | -45.0 | -13.0 | -32.0 | Z |
| 5256.700 | | | 1.0 | 12.0 | | | Vert | PK | 2.93E-08 | -45.3 | -13.0 | -32.3 | X |
| 5256.633 | | | 1.0 | 79.0 | | | Vert | PK | 2.74E-08 | -45.6 | -13.0 | -32.6 | Z |
| 5256.147 | | | 2.8 | 143.0 | | | Horz | PK | 2.44E-08 | -46.1 | -13.0 | -33.1 | Z |
| 5258.733 | | | 3.4 | 320.0 | | | Horz | PK | 2.23E-08 | -46.5 | -13.0 | -33.5 | X |
| 3503.953 | | | 1.0 | 17.0 | | | Horz | PK | 1.59E-08 | -48.0 | -13.0 | -35.0 | X |
| 3507.167 | | | 1.0 | 351.0 | | | Vert | PK | 1.27E-08 | -49.0 | -13.0 | -36.0 | Z |
| 3503.767 | | | 1.3 | 12.0 | | | Vert | PK | 1.27E-08 | -49.0 | -13.0 | -36.0 | X |
| 3506.807 | | | 1.0 | 309.0 | | | Horz | PK | 1.16E-08 | -49.4 | -13.0 | -36.4 | Y |
| 3504.827 | | | 2.4 | 205.0 | | | Vert | PK | 9.62E-09 | -50.2 | -13.0 | -37.2 | Y |

# Out of Band Emissions - Part 27

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC10 | Humidity: | 42% RH | | |
| Serial Number: | 178U1191003 | Barometric Pres.: | 1111 mbar | Tested by: | Jeremiah Darden |
| EUT: | 1001CP01S | | | | |
| Configuration: | 3 - CONFIGURATION 3 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA AWS Band. Mid Channel. 1735.4 MHz. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 42 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|



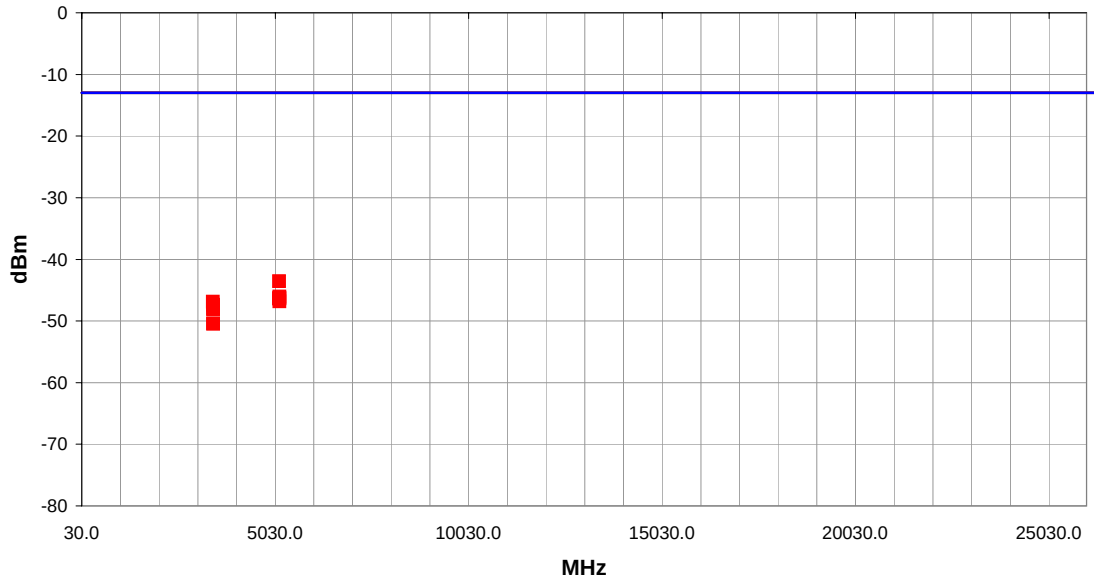

| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5206.628 | | | 1.0 | 143.0 | | | Horz | PK | 4.00E-08 | -44.0 | -13.0 | -31.0 | Y |
| 5207.797 | | | 1.0 | 333.0 | | | Vert | PK | 3.18E-08 | -45.0 | -13.0 | -32.0 | X |
| 3472.566 | | | 1.2 | 171.0 | | | Vert | PK | 3.14E-08 | -45.0 | -13.0 | -32.0 | Y |
| 5205.677 | | | 1.0 | 203.0 | | | Vert | PK | 2.70E-08 | -45.7 | -13.0 | -32.7 | Y |
| 5204.240 | | | 1.3 | 115.0 | | | Horz | PK | 2.64E-08 | -45.8 | -13.0 | -32.8 | Z |
| 5205.453 | | | 1.8 | 250.0 | | | Vert | PK | 2.46E-08 | -46.1 | -13.0 | -33.1 | Z |
| 5207.813 | | | 4.0 | 316.0 | | | Horz | PK | 2.36E-08 | -46.3 | -13.0 | -33.3 | X |
| 3469.167 | | | 1.0 | 34.0 | | | Vert | PK | 2.21E-08 | -46.6 | -13.0 | -33.6 | Z |
| 3472.037 | | | 1.0 | 83.0 | | | Horz | PK | 2.12E-08 | -46.7 | -13.0 | -33.7 | Y |
| 3472.365 | | | 1.2 | 41.0 | | | Vert | PK | 1.72E-08 | -47.6 | -13.0 | -34.6 | X |
| 3472.573 | | | 1.0 | 164.0 | | | Horz | PK | 1.68E-08 | -47.7 | -13.0 | -34.7 | X |
| 3468.827 | | | 1.0 | 59.0 | | | Horz | PK | 1.33E-08 | -48.8 | -13.0 | -35.8 | Z |

# Out of Band Emissions - Part 27

| | | | | | |
|---|---|---|---|---|---|
| Work Order: | ITRM0249 | Date: | 08/24/11 | | |
| Project: | None | Temperature: | 22 °C | | |
| Job Site: | OC10 | Humidity: | 42% RH | | |
| Serial Number: | 178U1191003 | Barometric Pres.: | 1111 mbar | Tested by: | Jeremiah Darden |
| EUT: | 1001CP01S | | | | |
| Configuration: | 3 - CONFIGURATION 3 | | | | |
| Customer: | Intermec Technologies Corporation | | | | |
| Attendees: | None | | | | |
| EUT Power: | 110VAC/60Hz | | | | |
| Operating Mode: | WCDMA AWS Band. Low Channel. 1712.4 MHz. | | | | |
| Deviations: | None | | | | |
| Comments: | None | | | | |

| Test Specifications | Test Method |
|---|---|
| FCC 27:2011 | ANSI/TIA/EIA-603-C-2004 |

| Run # | 43 | Test Distance (m) | 3 | Antenna Height(s) | 1-4m | Results | Pass |
|---|---|---|---|---|---|---|---|




| Freq (MHz) | | | Antenna Height (meters) | Azimuth (degrees) | | | Polarity/ Transducer Type | Detector | EIRP (Watts) | EIRP (dBm) | Spec. Limit (dBm) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5135.200 | | | 1.0 | 144.0 | | | Horz | PK | 4.40E-08 | -43.6 | -13.0 | -30.6 | Y |
| 5137.807 | | | 1.0 | 344.0 | | | Vert | PK | 2.48E-08 | -46.1 | -13.0 | -33.1 | X |
| 5138.687 | | | 1.0 | 132.0 | | | Horz | PK | 2.37E-08 | -46.2 | -13.0 | -33.2 | X |
| 5138.460 | | | 1.0 | 68.0 | | | Vert | PK | 2.32E-08 | -46.3 | -13.0 | -33.3 | Z |
| 5135.467 | | | 1.6 | 264.0 | | | Vert | PK | 2.31E-08 | -46.4 | -13.0 | -33.4 | Y |
| 5137.880 | | | 3.9 | 325.0 | | | Horz | PK | 2.07E-08 | -46.9 | -13.0 | -33.9 | Z |
| 3423.187 | | | 1.0 | 176.0 | | | Vert | PK | 2.05E-08 | -46.9 | -13.0 | -33.9 | Y |
| 3426.607 | | | 1.0 | 34.0 | | | Horz | PK | 1.83E-08 | -47.4 | -13.0 | -34.4 | Z |
| 3426.380 | | | 1.0 | 64.0 | | | Vert | PK | 1.55E-08 | -48.1 | -13.0 | -35.1 | Z |
| 3426.327 | | | 1.0 | 84.0 | | | Horz | PK | 1.55E-08 | -48.1 | -13.0 | -35.1 | Y |
| 3426.087 | | | 1.0 | 268.0 | | | Vert | PK | 9.15E-09 | -50.4 | -13.0 | -37.4 | X |
| 3425.160 | | | 2.3 | 28.0 | | | Horz | PK | 8.94E-09 | -50.5 | -13.0 | -37.5 | X |