Intermec Technologies Corporation

2011B and ABTM3 with PW40 Bluetooth Enabled Printer

December 10, 2004

Report No. ITRM0051.1

Report Prepared By



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

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22975 NW Evergreen Parkway Suite 400 Hillsboro, Oregon 97124

Certificate of Test

Issue Date: December 10, 2004
Intermec Technologies Corporation
Model: 2011B and ABTM3 with PW40 Bluetooth Enabled Printer

	Emissions		
Specification	Test Method	Pass	Fail
FCC 15.247(d) Spurious Radiated Emissions:2004 (Simultaneous Transmit)	ANSI C63.4:2003	\boxtimes	

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

Test Facility

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

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

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

This site has been fully described in a report filed with and accepted by the FCC (Federal

Communications Commission) and Industry Canada.

Approved By:

Jonal Manager

Don Facteau, IS Manager

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

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

Revision History

Revision 05/05/03

Revision Number	Description	Date	Page Number
00	None		

EMC

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





NVLAP: Northwest EMC, Inc. is recognized under the United States Department of Commerce, National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 89/336/EEC, ANSI C63.4, MIL-STD 461E, DO-160D and SAE J1113. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada. Accreditation has been granted to Northwest EMC, Inc. under Certificate Numbers: 200629-0, 200630-0, and 200676-0.



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



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



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



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



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



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



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



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



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



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



SCOPE

What is measurement uncertainty?

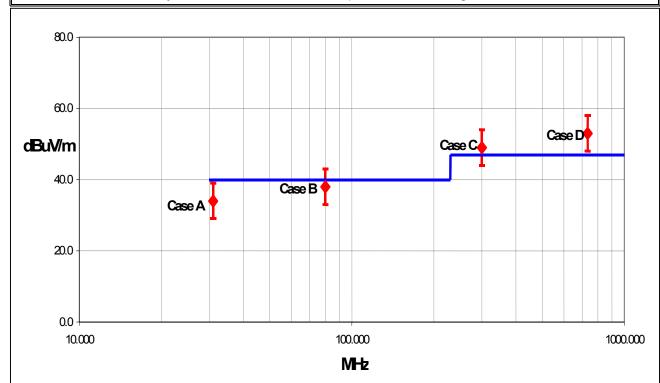
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following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

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

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

How might measurement uncertainty be applied to test results?

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



Test Result Scenarios:

Case A: Product complies.

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

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

Case D: Product does not comply.



Radiated Emissions ≤ 1 GHz		Value (dB)				
	Probability	Bico	nical	Log Pe	eriodic	D	ipole
	Distribution	Distribution Antenna		Ante	enna	An	tenna
Test Distance		3m	10m	3m	10m	3m	10m
Combined standard	normal	+ 1.86	+ 1.82	+ 2.23	+ 1.29	+ 1.31	+ 1.25
uncertainty u _c (y)		- 1.88	- 1.87	- 1.41	- 1.26	- 1.27	- 1.25
Expanded uncertainty <i>U</i>	normal (k=2)	+ 3.72	+ 3.64	+ 4.46	+ 2.59	+ 2.61	+ 2.49
(level of confidence ≈ 95%)		- 3.77	- 3.73	-2.81	- 2.52	- 2.55	- 2.49

Radiated Emissions > 1 GHz	Value (dB)		
	Probability Distribution	Without High Pass Filter	With High Pass Filter
Combined standard uncertainty $u_c(y)$	normal	+ 1.29 - 1.25	+ 1.38 - 1.35
Expanded uncertainty <i>U</i> (level of confidence ≈ 95%)	normal (k=2)	+ 2.57 - 2.51	+ 2.76 2.70

Conducted Emissions		
	Probability	Value
	Distribution	(+/- dB)
Combined standard uncertainty <i>uc(y)</i>	normal	1.48
Expanded uncertainty U (level of confidence ≈ 95 %)	normal (k = 2)	2.97

Radiated Immunity		
	Probability	Value
	Distribution	(+/- dB)
Combined standard uncertainty uc(y)	normal	1.05
Expanded uncertainty <i>U</i> (level of confidence ≈ 95 %)	normal (k = 2)	2.11

Conducted Immunity					
	Probability	Value			
	Distribution	(+/- dB)			
Combined standard uncertainty <i>uc(y)</i>	normal	1.05			
Expanded uncertainty <i>U</i>	normal (k = 2)	2.10			
(level of confidence ≈ 95 %)	Hormai (K – 2)	2.10			

Legend

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

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

Facilities



California

Orange County Facility

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



Oregon

Evergreen Facility

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



Oregon

Trails End Facility

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



Washington

Sultan Facility

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

Product Description

Revision 10/3/03

Party Requesting the Test	
Company Name:	Intermec Technologies Corporation
Address:	550 Second St. SE
City, State, Zip:	Cedar Rapids, IA 52401-2023
Test Requested By:	Scott Holub
Model:	2011B and ABTM3 with PW40 Bluetooth Enabled Printer
First Date of Test:	11-13-2004
Last Date of Test:	11-29-2004
Receipt Date of Samples:	11-06-2004
Equipment Design Stage:	Production
Equipment Condition:	No visual damage.

Information Provided by the Party Requesting the Test

Clocks/Oscillators:	Not provided.
I/O Ports:	Serial

Functional Description of the EUT (Equipment Under Test):

The 2011B 802.11b and the ABTM3 Bluetooth modules are used in Intermec's 700C handheld computer. The 700C can be used in the cradle of Intermec's PW40 Bluetooth enabled printer.

Client Justification for EUT Selection:

Not Provided

Client Justification for Test Selection:

These tests satisfy the requirements for a Class II Permissive Change to allow the co-location of the 2011B and ABTM3 modules with the PW40 printer.

EUT Photo



Revision 4/28/03

	Equipment modifications					
Item	Test	Date	Modification	Note	Disposition of EUT	
1	Spurious Radiated Emissions	11/06/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test. Tested in standalone mode.	EUT remained at Northwest EMC.	
2	Spurious Radiated Emissions (Bluetooth, 802.11b, CDMA)	11/13/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test. Tested in standalone mode.	EUT remained at Northwest EMC.	
3	Spurious Radiated Emissions (Bluetooth, 802.11b, GSM)	11/29/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test. Tested in standalone mode.	EUT remained at Northwest EMC.	

Revision 10/1/03

Justification

The EUTs are previously certified, co-located radio modules installed inside Intermec's Handheld Computer, Model 700C and Intermec's Bluetooth enabled printer, Model PW40. The 700C contains a GSM radio (FCC ID: EHA700C-SMC45-1), a 802.11b radio (FCC ID: HN22011B-2), and a Bluetooth radio (FCC ID: HN2ABTM3-3). The PW40 contains a Bluetooth radio (FCCID: EHABTS080-1). The 700C can be installed in the PW40's cradle. This test demonstrates compliance with FCC 15.247(d) emissions limits while the co-located radios are transmitting simultaneously. Each radio transmits through its own antenna.

All possible combinations of harmonic emissions from the GSM, 802.11(b), and Bluetooth radios were compared numerically. It was determined that there were no possible coincidental harmonics below 1 GHz. All the radios were configured for simultaneous transmission at the channels specified below:

Channels in Specified Band Investigated:				
802.11(b):	1,11			
Bluetooth:	2, 11, 67, 80			
GSM:	516, 606			

Operating Modes Investigated:

Bluetooth Radio in PW40 with 700C in cradle:

Simultaneous transmission of Bluetooth Channel 11, 802.11(b) Channel 1, & GSM Channel 516
Simultaneous transmission of Bluetooth Channel 67, 802.11(b) Channel 11, & GSM Channel 516
Simultaneous transmission of Bluetooth Channel 2, 802.11(b) Channel 1, & GSM Channel 606
Simultaneous transmission of Bluetooth Channel 80, 802.11(b) Channel 11, & GSM Channel 606

Data Rates Investigated:

Maximum

Antennas Investiga	Antennas Investigated:				
802.11(b): 2011B integral antenna (internal to 700C)					
GSM:	SMC45				
Bluetooth:	Integral PCB trace, ABTM3 (internal to 700C)				
Bluetooth:	Bluetooth: Integral PCB trace, (internal to PW40)				

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

120 VAC, 60 Hz.

Frequency Range Invest	igated		
Start Frequency	1 GHz	Stop Frequency	26 GHz

Revision 10/1/03

Software\Firmware Applied During Test										
Exercise software	Blue Test 802.11 Agency Test PhoneUtility	Version	Unknown							
Description										

The system was tested using special test software to exercise the functions of the device during the testing such as channels, power, and modulation during simultaneous transmission.

EUT and Peripherals			
Description	Manufacturer	Model/Part Number	Serial Number
Bluetooth Radio in Printer	Intermec Technologies Corporation	8520-00080	Unknown
EUT – Bluetooth Enabled Printer	Intermec Technologies Corporation	PW40	4898184
AC Adapter	Ault Inc.	PW160	Unknown
Handheld Computer	Intermec Technologies Corporation	700C	05400400868
Bluetooth Radio in 700C	Intermec Technologies Corporation	ABTM3	N/A
802.11(b) Radio in 700C	Intermec Technologies Corporation	2011B	N/A
GSM/GPRS Radio in 700C	Intermec Technologies Corporation	SMC45	N/A

Remote Equipment Outside of Test Setup Boundary											
Description Manufacturer Model/Part Number Serial Number											
Remote laptop	Remote laptop Dell TS30G Unknown										
Equipment isolated from the	Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary										

Cables										
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2					
DC Leads	PA	1.0	Yes	EUT- Bluetooth Enabled Printer	Power Adapter					
AC Power	No	1.2	No	Power Adapter	AC Mains					
Serial	PA	1.2	PA	EUT- Bluetooth Enabled Printer	Laptop					
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.										

Revision 10/1/03

Measurement Equipmen	nt				
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/23/2003	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/23/2003	13 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	12/23/2003	13 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	02/05/2004	13 mo
Antenna, Horn	EMCO	3115	AHC	09/07/2004	12 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24- 10P	APJ	01/05/2004	13 mo
Antenna, Horn	EMCO	3160-09	AHG	NCR	NA
Pre-Amplifier	Miteq	JSD4-18002600-26- 8P	APU	10/08/2003	12 mo
Antenna, Horn	EMCO	3160-08	AHK	NCR	NA
Pre-Amplifier	Miteq	AMF-4D-005180-24- 10P	APC	10/08/2003	12 mo
Attenuator		2082-6148-20	ATE	02/03/2004	13 mo
High Pass Filter	Micro-Tronics	HPM50111	HFO	04/13/2004	13 mo
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo
GSM/DCS/PCS MS Test Set	Hewlett-Packard	8922M	N/A	NCR	NA
GSM/DCS/PCS RF Interface	Hewlett-Packard	83220E	N/A	NCR	NA
Antenna, Horn	EMCO	3115	AHF	03/18/2004	24 mo
Signal Generator	Hewlett Packard	8341B	TGN	01/23/2004	13 mo
Antenna, Dipole (ADAA included)	Roberts	Roberts	ADA	12/27/2002	24 mo

Test Description

Requirement: Per 15.247(d), the field strength of any spurious emissions or modulation products that fall in a restricted band, as defined in 15.205, is measured. The peak level must comply with the limits specified in 15.35(b). The average level (taken with a 10Hz VBW) must comply with the limits specified in 15.209.

<u>Configuration:</u> The EUTs are previously certified, co-located radio modules installed inside Intermec's Handheld Computer, Model 700C and Intermec's Bluetooth enabled printer, Model PW40. The 700C contains a GSM radio (FCC ID: EHA700C-SMC45-1), a 802.11b radio (FCC ID: HN22011B-2), and a Bluetooth radio (FCC ID: HN2ABTM3-3). The PW40 contains a Bluetooth radio (FCCID: EHABTS080-1). The 700C can be installed in the PW40's cradle. This test demonstrates compliance with FCC 15.247(d) emissions limits while the co-located radios are transmitting simultaneously. Each radio transmits through its own antenna.

Revision 10/1/03

Simultaneous Transmission:

The following is an excerpt from the FCC / TCB Training Q & A, October 2002, Day 2, Question 7:

Assuming that the radios do not share an antenna, only radiated tests for simultaneous transmission is required. If the radios share an antenna, antenna conducted measurements would also be required. Only one set of worst case simultaneous transmission data is going to be requested to be submitted at this time. The test engineer should indicate the worst case condition and provide justification as to why the worst case condition was chosen. The grantee should be reminded that even if the FCC requests one set of data, they are responsible for compliance for all modes of simultaneous transmission.

All possible combinations of harmonic emissions from the GSM, 802.11(b), and Bluetooth radios were compared numerically. It was determined that there were no possible coincidental harmonics below 1 GHz. The frequency range from 1 GHz to 26 GHz was investigated for channel combinations that would produce coincidental harmonics. Compliance with the restricted band at 2483.5 – 2500 MHz was also measured.

All the radios were configured for simultaneous transmission at the channels specified in the previous pages. The highest gain antennas to be used with the radios were tested. The spectrum was scanned throughout the specified range. While scanning, emissions from the radios were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antennas in three orthogonal axes, and adjusting the measurement antenna height and polarization (per ANSI C63.4:2003). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

Bandwidths Used for Me	asurements		
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 m	nade using the bandwidths	and detectors specified. No	video filter was used.

Holy Arling

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

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

COMMENTS

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EUT OPERATING MODES

Bluetooth 11 in PW40. Bluetooth 11, 802.11b 1, GSM 516 (PCS) in 700C.

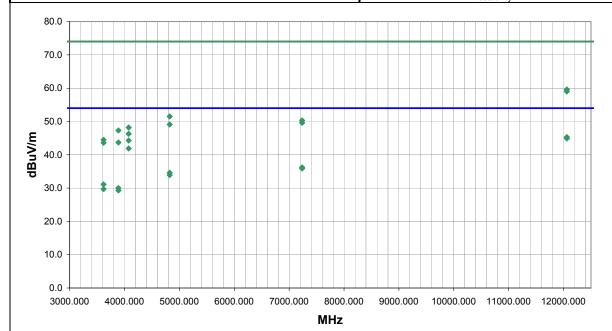
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS Run #
Pass 41

Other

ATU. K.P.



						External			Distance			Compared to
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)
12060.030	25.1	20.2	127.0	1.3	3.0	0.0	H-Horn	AV	0.0	45.3	54.0	-8.7
12060.030	24.7	20.2	115.0	1.2	3.0	0.0	V-Horn	AV	0.0	44.9	54.0	-9.
4075.955	41.9	2.4	22.0	1.3	3.0	0.0	H-Horn	AV	0.0	44.3	54.0	-9.
4075.955	39.5	2.4	208.0	1.2	3.0	0.0	V-Horn	AV	0.0	41.9	54.0	-12.
7236.039	26.1	10.1	243.0	1.4	3.0	0.0	V-Horn	AV	0.0	36.2	54.0	-17.8
7236.039	25.8	10.1	243.0	1.8	3.0	0.0	H-Horn	AV	0.0	35.9	54.0	-18.
4824.030	31.3	3.3	258.0	1.5	3.0	0.0	V-Horn	AV	0.0	34.6	54.0	-19.
4824.030	30.6	3.3	120.0	2.2	3.0	0.0	H-Horn	AV	0.0	33.9	54.0	-20.
3618.020	30.3	0.8	14.0	1.3	3.0	0.0	H-Horn	AV	0.0	31.1	54.0	-22.
3888.960	28.1	1.9	20.0	1.3	3.0	0.0	H-Horn	AV	0.0	30.0	54.0	-24.
3618.020	28.9	0.8	322.0	1.2	3.0	0.0	V-Horn	AV	0.0	29.7	54.0	-24.
3888.960	27.4	1.9	179.0	1.2	3.0	0.0	V-Horn	AV	0.0	29.3	54.0	-24.
12060.030	39.4	20.2	115.0	1.2	3.0	0.0	V-Horn	PK	0.0	59.6	74.0	-14.
12060.030	38.8	20.2	127.0	1.3	3.0	0.0	H-Horn	PK	0.0	59.0	74.0	-15.
4824.030	48.2	3.3	258.0	1.5	3.0	0.0	V-Horn	PK	0.0	51.5	74.0	-22.
7236.039	40.2	10.1	243.0	1.8	3.0	0.0	H-Horn	PK	0.0	50.3	74.0	-23.
7236.039	39.5	10.1	243.0	1.4	3.0	0.0	V-Horn	PK	0.0	49.6	74.0	-24.
4824.030	45.8	3.3	120.0	2.2	3.0	0.0	H-Horn	PK	0.0	49.1	74.0	-24.
4075.955	45.8	2.4	22.0	1.3	3.0	0.0	H-Horn	PK	0.0	48.2	74.0	-25.
3888.960	45.4	1.9	20.0	1.3	3.0	0.0	H-Horn	PK	0.0	47.3	74.0	-26.
4075.955	43.9	2.4	208.0	1.2	3.0	0.0	V-Horn	PK	0.0	46.3	74.0	-27.

						External			Distance			Compared to
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)
3618.020	43.7	0.8	14.0	1.3	3.0	0.0	H-Horn	PK	0.0	44.5	74.0	-29.5
3888.960	41.8	1.9	179.0	1.2	3.0	0.0	V-Horn	PK	0.0	43.7	74.0	-30.3
3618.020	42.8	0.8	322.0	1.2	3.0	0.0	V-Horn	PK	0.0	43.6	74.0	-30.4

NORTHWEST **RADIATED EMISSIONS DATA SHEET EMC** Work Order: ITRM0051 Date: 11/21/04 EUT: PW40 Bluetooth Enabled Printer Serial Number: 4898184 Customer: Intermec Technologies Corporation Temperature: 19 Attendees: none Humidity: 34% Cust. Ref. No.: Barometric Pressure 30.32 Tested by: Greg Kiemel Power: 120VAC/60Hz Job Site: EV01 TEST SPECIFICATIONS Specification: FCC 15.247(d) Spurious Radiated Emissions Method: ANSI C63.4 Year: 2004 Year: 2003 SAMPLE CALCULATIONS

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

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

COMMENTS

Simultanoous transmission

EUT OPERATING MODES

Bluetooth 67 in PW40. Bluetooth 67, 802.11b 11, GSM 516 (PCS) in 700C.

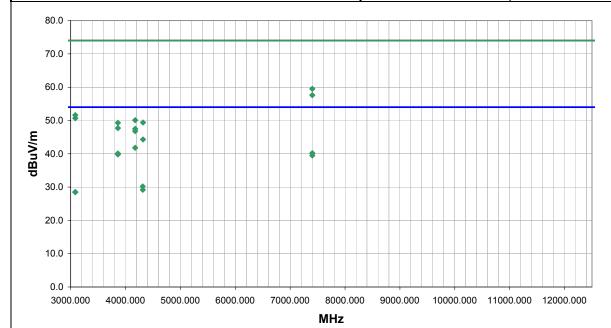
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS Run#
Pass 42

Other

ATU. K.P.



Freq	Amplitude	Factor	Azimuth	Height	Distance	External Attenuation	Polarity	Detector	Distance Adjustment	Adjusted	Spec. Limit	Compared Spec.
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)
4175.955	45.1	2.4	244.0	1.2	3.0	0.0	V-Horn	AV	0.0	47.5	54.0	-6
4175.955	39.4	2.4	192.0	1.2	3.0	0.0	H-Horn	AV	0.0	41.8	54.0	-12
7404.273	29.1	11.1	113.0	1.6	3.0	0.0	V-Horn	AV	0.0	40.2	54.0	-13
3862.027	38.4	1.7	27.0	1.4	3.0	0.0	V-Horn	AV	0.0	40.1	54.0	-13
3862.027	38.1	1.7	57.0	1.3	3.0	0.0	H-Horn	AV	0.0	39.8	54.0	-14
7404.273	28.4	11.1	340.0	1.1	3.0	0.0	H-Horn	AV	0.0	39.5	54.0	-14
4313.652	27.7	2.5	267.0	1.2	3.0	0.0	V-Horn	AV	0.0	30.2	54.0	-23
4314.192	26.7	2.5	30.0	1.3	3.0	0.0	H-Horn	AV	0.0	29.2	54.0	-24
3085.091	28.1	0.4	201.0	1.4	3.0	0.0	H-Horn	AV	0.0	28.5	54.0	-25
3085.091	28.1	0.4	360.0	1.6	3.0	0.0	V-Horn	AV	0.0	28.5	54.0	-25
7404.273	48.4	11.1	113.0	1.6	3.0	0.0	V-Horn	PK	0.0	59.5	74.0	-14
7404.273	46.5	11.1	340.0	1.1	3.0	0.0	H-Horn	PK	0.0	57.6	74.0	-16
3085.091	51.2	0.4	201.0	1.4	3.0	0.0	H-Horn	PK	0.0	51.6	74.0	-22
3085.091	50.3	0.4	360.0	1.6	3.0	0.0	V-Horn	PK	0.0	50.7	74.0	-23
4175.955	47.7	2.4	244.0	1.2	3.0	0.0	V-Horn	PK	0.0	50.1	74.0	-23
4318.632	46.9	2.5	267.0	1.2	3.0	0.0	V-Horn	PK	0.0	49.4	74.0	-24
3862.027	47.6	1.7	27.0	1.4	3.0	0.0	V-Horn	PK	0.0	49.3	74.0	-24
3862.027	46.0	1.7	57.0	1.3	3.0	0.0	H-Horn	PK	0.0	47.7	74.0	-2
4175.955	44.4	2.4	192.0	1.2	3.0	0.0	H-Horn	PK	0.0	46.8	74.0	-2
4318.632	41.8	2.5	30.0	1.3	3.0	0.0	H-Horn	PK	0.0	44.3	74.0	-2

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

COMMENTS

Simultaneous transmission

EUT OPERATING MODES

Bluetooth 67 in PW40. Bluetooth 67, 802.11b 11, GSM 516 (PCS) in 700C.

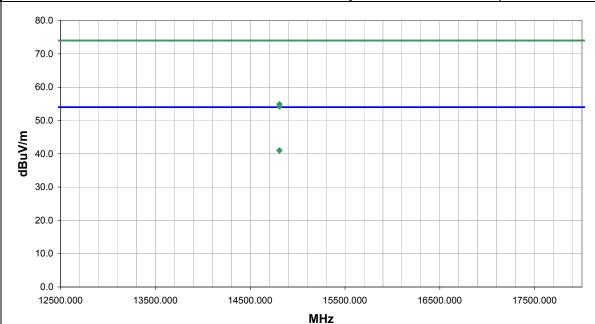
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS Run #
Pass 43

Other

Tested By:



						External			Distance			Compared to
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)
14807.840	27.0	14.0	187.0	2.2	3.0	0.0	H-Horn	AV	0.0	41.0	54.0	-13.0
14807.840	27.0	14.0	35.0	1.2	3.0	0.0	V-Horn	AV	0.0	41.0	54.0	-13.0
14807.840	40.9	14.0	35.0	1.2	3.0	0.0	V-Horn	PK	0.0	54.9	74.0	-19.1
14807.840	40.2	14.0	187.0	2.2	3.0	0.0	H-Horn	PK	0.0	54.2	74.0	-19.8

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

COMMENTS

Simultanoous transmission

EUT OPERATING MODES

Bluetooth 11 in PW40. Bluetooth 11, 802.11b 1, GSM 516 (PCS) in 700C.

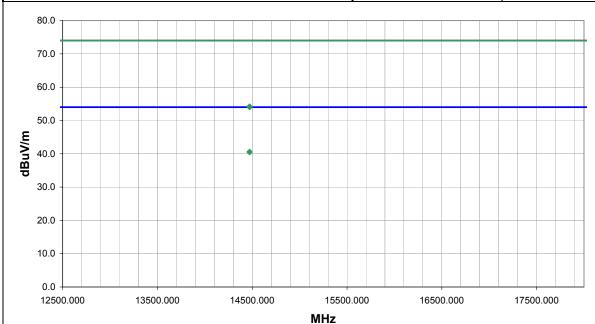
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS Run #
Pass 44

Other

ADU. K.P.



						External			Distance			Compared to
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)
14472.000	26.8	13.8	204.0	3.0	3.0	0.0	H-Horn	AV	0.0	40.6	54.0	-13.4
14472.000	26.7	13.8	308.0	2.3	3.0	0.0	V-Horn	AV	0.0	40.5	54.0	-13.5
14472.000	40.4	13.8	204.0	3.0	3.0	0.0	H-Horn	PK	0.0	54.2	74.0	-19.8
14472.000	40.2	13.8	308.0	2.3	3.0	0.0	V-Horn	PK	0.0	54.0	74.0	-20.0

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

COMMENTS

Cimultana aug tuanamia alau

EUT OPERATING MODES

Bluetooth 2 in PW40. Bluetooth 2, 802.11b 1, GSM 606 (PCS) in 700C.

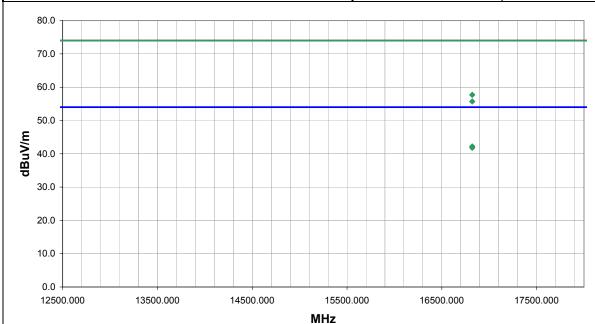
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS Run #
Pass 45

Other

ADU. K.P.



						External			Distance			Compared to
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)
16821.000	27.3	14.9	178.0	1.2	3.0	0.0	V-Horn	AV	0.0	42.2	54.0	-11.8
16821.000	26.9	14.9	190.0	1.2	3.0	0.0	H-Horn	AV	0.0	41.8	54.0	-12.2
16821.000	42.8	14.9	178.0	1.2	3.0	0.0	V-Horn	PK	0.0	57.7	74.0	-16.3
16821.000	40.8	14.9	190.0	1.2	3.0	0.0	H-Horn	PK	0.0	55.7	74.0	-18.3

RADIATED EMISSIONS DATA SHEET EMC Work Order: ITRM0051 Date: 11/24/04 EUT: PW40 Bluetooth Enabled Printer Serial Number: 4898184 Customer: Intermec Technologies Corporation Temperature: 19 Attendees: none Humidity: 34% Cust. Ref. No.: Barometric Pressure 30.32 Tested by: Rod Peloquin Power: 120VAC/60Hz Job Site: EV01 TEST SPECIFICATIONS Specification: FCC 15.247(d) Spurious Radiated Emissions Method: ANSI C63.4 Year: 2004 Year: 2003 SAMPLE CALCULATIONS

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

COMMENTS

Simultaneous transmission

EUT OPERATING MODES

Bluetooth 11 in PW40. Bluetooth 11, 802.11b 1, GSM 516 (PCS) in 700C.

DEVIATIONS FROM TEST STANDARD

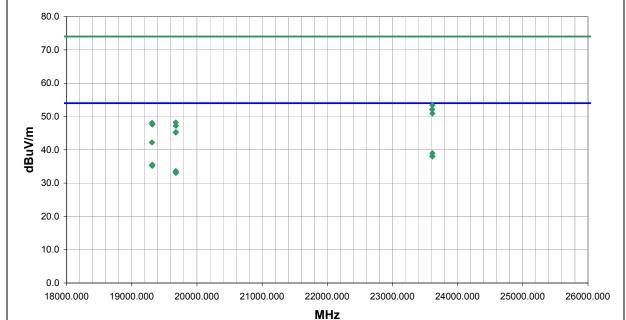
No deviations.

RESULTS Run#
Pass 46

Other

Rolly le Relengs

Tested By:



	1	1		1		External			Distance			Compared to
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)		Dottooloi	(dB)	dBuV/m	dBuV/m	(dB)
23612.000	28.7	10.3	150.0	1.0	3.0	0.0	V-High Horr	AV	0.0	39.0	54.0	-15.0
23609.000	27.8	10.3	-1.0	1.0	3.0		V-High Horr		0.0	38.1	54.0	-15.9
23612.000	27.7	10.3	69.0	1.0	3.0	0.0	H-High Horr	AV	0.0	38.0	54.0	-16.0
19314.500	27.5	8.0	304.0	1.5	3.0	0.0	H-High Horr	AV	0.0	35.5	54.0	-18.5
19310.000	27.4	8.0	304.0	1.5	3.0	0.0	H-High Horr	AV	0.0	35.4	54.0	-18.6
19310.000	27.3	8.0	247.0	1.0	3.0	0.0	V-High Horr	AV	0.0	35.3	54.0	-18.7
19314.500	27.2	8.0	166.0	1.0	3.0	0.0	V-High Horr	AV	0.0	35.2	54.0	-18.8
19674.000	25.0	8.6	242.0	1.0	3.0	0.0	V-High Horr	AV	0.0	33.6	54.0	-20.4
23612.000	43.1	10.3	150.0	1.0	3.0	0.0	V-High Horr	PK	0.0	53.4	74.0	-20.6
19674.000	24.6	8.6	352.0	1.4	3.0	0.0	H-High Horr	AV	0.0	33.2	54.0	-20.8
19676.500	24.5	8.6	327.0	1.5	3.0	0.0	H-High Horr	AV	0.0	33.1	54.0	-20.9
19676.500	24.5	8.6	58.0	1.0	3.0	0.0	V-High Horr	AV	0.0	33.1	54.0	-20.9
23609.000	41.8	10.3	-1.0	1.0	3.0	0.0	V-High Horr	PK	0.0	52.1	74.0	-21.9
23612.000	40.6	10.3	69.0	1.0	3.0	0.0	H-High Horr		0.0	50.9	74.0	-23.1
19674.000	39.6	8.6	242.0	1.0	3.0	0.0	√-High Horr	PK	0.0	48.2	74.0	-25.8
19310.000	40.1	8.0	247.0	1.0	3.0	0.0	√-High Horr		0.0	48.1	74.0	-25.9
19314.500	39.7	8.0	304.0	1.5	3.0		H-High Horr		0.0	47.7	74.0	-26.3
19314.500	39.6	8.0	166.0	1.0	3.0		V-High Horr		0.0	47.6	74.0	-26.4
19676.500	38.6	8.6	327.0	1.5	3.0		H-High Horr		0.0	47.2	74.0	-26.8
19676.500	36.7	8.6	58.0	1.0	3.0		√-High Horr		0.0	45.3	74.0	-28.7
19674.000	36.6	8.6	352.0	1.4	3.0	0.0	H-High Horr	PK	0.0	45.2	74.0	-28.8

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit	Compared to Spec. (dB)
19310.000	34.2	8.0	304.0	1.5	3.0	0.0	H-High Horr	PK	0.0	42.2	74.0	-31.8

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

COMMENTS

Simultaneous transmission

EUT OPERATING MODES

Bluetooth 80 in PW40. Bluetooth 80, 802.11b 11, GSM 606 (PCS) in 700C.

DEVIATIONS FROM TEST STANDARD

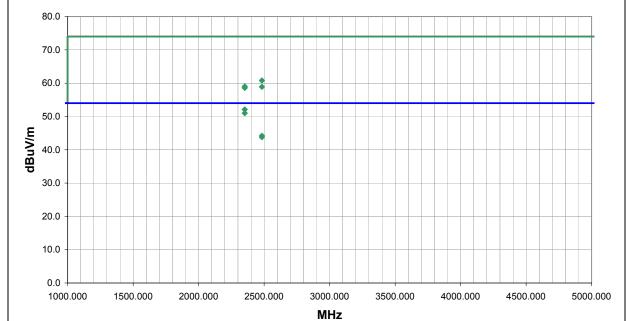
No deviations.

RESULTS Run #
Pass 51

Other

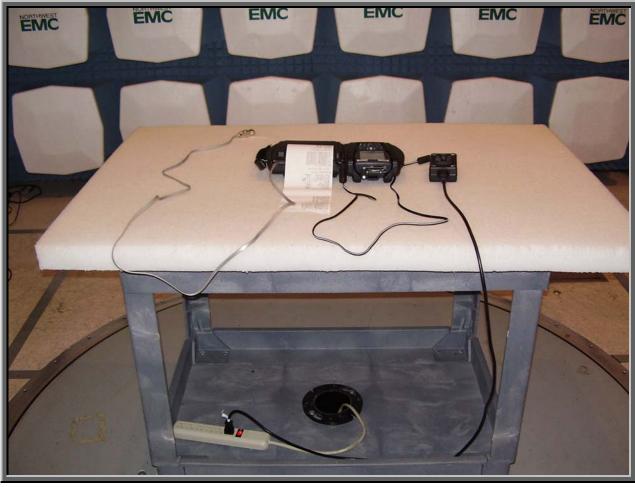
Roeley le Relengs

Tested By:



						External			Distance			Compared to	
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.	
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)	
2352.000	22.6	29.5	11.0	1.0	3.0	0.0	V-Horn	AV	0.0	52.1	54.0	-1.9	
2352.000	21.5	29.5	127.0	1.4	3.0	0.0	H-Horn	AV	0.0	51.0	54.0	-3.0	
2483.500	14.5	29.7	183.0	1.0	3.0	0.0	H-Horn	AV	0.0	44.2	54.0	-9.8	
2483.500	14.1	29.7	80.0	1.2	3.0	0.0	V-Horn	AV	0.0	43.8	54.0	-10.2	
2483.500	31.1	29.7	183.0	1.0	3.0	0.0	H-Horn	PK	0.0	60.8	74.0	-13.2	
2352.000	29.5	29.5	11.0	1.0	3.0	0.0	V-Horn	PK	0.0	59.0	74.0	-15.0	
2483.500	29.2	29.7	80.0	1.2	3.0	0.0	V-Horn	PK	0.0	58.9	74.0	-15.1	
2352.000	29.1	29.5	127.0	1.4	3.0	0.0	H-Horn	PK	0.0	58.6	74.0	-15.4	











Revision 10/1/03

Justification

The EUTs are previously certified, co-located radio modules installed inside Intermec's Handheld Computer, Model 700C and Intermec's Bluetooth enabled printer, Model PW40. The 700C contains a CDMA radio (FCC ID: HN2SB555-2), a 802.11b radio (FCC ID: HN22011B-2), and a Bluetooth radio (FCC ID: HN2ABTM3-3). The PW40 contains a Bluetooth radio (FCCID: EHABTS080-1). The 700C can be installed in the PW40's cradle. This test demonstrates compliance with FCC 15.247(d) emissions limits while the co-located radios are transmitting simultaneously. Each radio transmits through its own antenna.

All possible combinations of harmonic emissions from the CDMA, 802.11(b), and Bluetooth radios were compared numerically. It was determined that there were no possible coincidental harmonics below 1 GHz. All the radios were configured for simultaneous transmission at the channels specified below:

Channels in Specif	Channels in Specified Band Investigated:								
802.11(b): 1,11									
CDMA (Cellular):	54, 55, 395, 467								
CDMA (PCS):	1, 35, 1153								
Bluetooth:	5, 11, 62, 68, 79								

Operating Modes Investigated:

Bluetooth Radio in PW40 with 700C in cradle:

Simultaneous transmission of Bluetooth Channel 11, 802.11(b) Channel 1, & CDMA PCS Channel 1
Simultaneous transmission of Bluetooth Channel 11, 802.11(b) Channel 1, & CDMA PCS Channel 1153
Simultaneous transmission of Bluetooth Channel 68, 802.11(b) Channel 11, & CDMA PCS Channel 35
Simultaneous transmission of Bluetooth Channel 62, 802.11(b) Channel 11, & CDMA PCS Channel 1153
Simultaneous transmission of Bluetooth Channel 11, 802.11(b) Channel 1, & CDMA Cellular Channel 467
Simultaneous transmission of Bluetooth Channel 5, 802.11(b) Channel 1, & CDMA Cellular Channel 395
Simultaneous transmission of Bluetooth Channel 79, 802.11(b) Channel 11, & CDMA Cellular Channel 55
Simultaneous transmission of Bluetooth Channel 79, 802.11(b) Channel 11, & CDMA Cellular Channel 54

Data Rates Investigated:

Maximum

Antennas Investigated:								
802.11(b):	2011B integral antenna (internal to 700C)							
CDMA (Cellular):	805-606-102 Dual Band CDMA 900/1900MHz Antenna (SB555) (external to 700C)							
CDMA (PCS):	805-666-204 Single Band CDMA 1900MHz Antenna (SB555) (external to 700C)							
Bluetooth:	Integral PCB trace, ABTM3 (internal to 700C)							
Bluetooth:	Integral PCB trace, (internal to PW40)							

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

120 VAC, 60 Hz.

Revision 10/1/03

Frequency Range Investigated								
Start Frequency	1 GHz	Stop Frequency	26 GHz					

Software\Firmware Applied During Test									
Exercise software	Blue Test FCC_Smart 802.11 Agency Test	Version	Unknown						
Description									
	sing special test software to power, and modulation dur		•						

EUT and Peripherals			
Description	Manufacturer	Model/Part Number	Serial Number
Bluetooth Radio in Printer	Intermec Technologies Corporation	8520-00080	Unknown
EUT – Bluetooth Enabled Printer	Intermec Technologies Corporation	PW40	4898184
AC Adapter	Ault Inc.	PW160	Unknown
Handheld Computer	Intermec Technologies Corporation	700C	05400400873
Bluetooth Radio in 700C	Intermec Technologies Corporation	ABTM3	N/A
802.11(b) Radio in 700C	Intermec Technologies Corporation	2011B	N/A
CDMA Radio in 700C	Intermec Technologies Corporation	SB555	Unknown

Remote Equipment Outside of Test Setup Boundary										
Description	Manufacturer	Model/Part Number	Serial Number							
Remote laptop	Dell	TS30G1	Unknown							
Equipment isolated from the	Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary									

Cables										
Cable Type Shiel		Length (m)	Ferrite	Connection 1	Connection 2					
DC Leads	PA	1.0	Yes	EUT- Bluetooth Enabled Printer	Power Adapter					
AC Power	No	1.2	No	Power Adapter	AC Mains					
Serial	PA	1.2	PA	EUT- Bluetooth Enabled Printer	Laptop					
PA = Cable is permar	PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.									

Revision 10/1/03

Measurement Equipme	nt				
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/23/2003	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/23/2003	13 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	12/23/2003	13 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Pre-Amplifier	Amplifier Research	LN1000A	APS	02/05/2004	13 mo
Antenna, Horn	EMCO	3115	AHC	09/07/2004	12 mo
Pre-Amplifier	Miteq	AMF-4D-005180-24- 10P	APJ	01/05/2004	13 mo
Antenna, Horn	EMCO	3160-09	AHG	NCR	NA
Pre-Amplifier	Miteq	JSD4-18002600-26- 8P	APU	10/08/2003	12 mo
Antenna, Horn	EMCO	3160-08	AHK	NCR	NA
Pre-Amplifier	Miteq	AMF-4D-005180-24- 10P	APC	10/08/2003	12 mo
Attenuator		2082-6148-20	ATE	02/03/2004	13 mo
High Pass Filter	Micro-Tronics	HPM50111	HFO	04/13/2004	13 mo
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

Requirement: Per 15.247(d), the field strength of any spurious emissions or modulation products that fall in a restricted band, as defined in 15.205, is measured. The peak level must comply with the limits specified in 15.35(b). The average level (taken with a 10Hz VBW) must comply with the limits specified in 15.209.

<u>Configuration:</u> The EUTs are previously certified, co-located radio modules installed inside Intermec's Handheld Computer, Model 700C and Intermec's Bluetooth enabled printer, Model PW40. The 700C contains a CDMA radio (FCC ID: HN2SB555-2), a 802.11b radio (FCC ID: HN22011B-2), and a Bluetooth radio (FCC ID: HN2ABTM3-3). The PW40 contains a Bluetooth radio (FCCID: EHABTS080-1). The 700C can be installed in the PW40's cradle. This test demonstrates compliance with FCC 15.247(d) emissions limits while the co-located radios are transmitting simultaneously. Each radio transmits through its own antenna.

Simultaneous Transmission:

The following is an excerpt from the FCC / TCB Training Q & A, October 2002, Day 2, Question 7:

Assuming that the radios do not share an antenna, only radiated tests for simultaneous transmission is required. If the radios share an antenna, antenna conducted measurements would also be required. Only one set of worst case simultaneous transmission data is going to be requested to be submitted at this time. The test engineer should indicate the worst case condition and provide justification as to why the worst case condition was chosen. The grantee should be reminded that even if the FCC requests one set of data, they are responsible for compliance for all modes of simultaneous transmission.

Revision 10/1/03

All possible combinations of harmonic emissions from the CDMA, 802.11(b), and Bluetooth radios were compared numerically. It was determined that there were no possible coincidental harmonics below 1 GHz. The frequency range from 1 GHz to 26 GHz was investigated for channel combinations that would produce coincidental harmonics. Compliance with the restricted band at 2483.5 – 2500 MHz was also measured.

All the radios were configured for simultaneous transmission at the channels specified in the previous pages. The highest gain antennas to be used with the radios were tested. The spectrum was scanned throughout the specified range. While scanning, emissions from the radios were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antennas in three orthogonal axes, and adjusting the measurement antenna height and polarization (per ANSI C63.4:2003). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

Bandwidths Used for Me	asurements		
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 r	nade using the bandwidths	and detectors specified. No	video filter was used.

Completed by:

Holy Aliny

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

COMMENTS

Simultanoous Transmission

EUT OPERATING MODES

Bluetooth 11 on PW40. Bluetooth 11, 802.11(b) 1 and CDMA (cellular) 467 on 700C

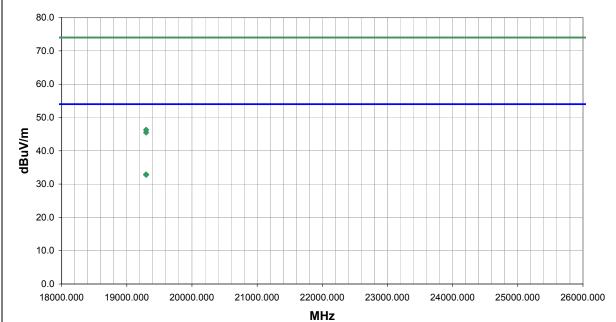
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS Run # 8

Other

Holy Aligher
Tested By:



						External			Distance			Compared to	1
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.	
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)	
19296.000	24.9	8.0	-4.0	1.0	3.0	0.0	H-High Horr	AV	0.0	32.9	54.0	-21.1	•
19296.000	24.8	8.0	363.0	1.0	3.0	0.0	√-High Horr	AV	0.0	32.8	54.0	-21.2	
19296.000	38.3	8.0	-4.0	1.0	3.0	0.0	H-High Horr	PK	0.0	46.3	74.0	-27.7	
19296.000	37.5	8.0	363.0	1.0	3.0	0.0	√-High Horr	PK	0.0	45.5	74.0	-28.5	

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

COMMENTS

Simultanoous Transmission

EUT OPERATING MODES

Bluetooth 5 on PW40. Bluetooth 5, 802.11(b) 1 and CDMA (cellular) 395 on 700C

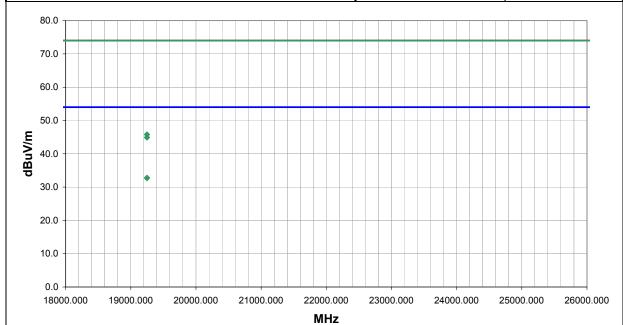
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS Run # 9

Other

Holy Arlight



						External			Distance			Compared to	1
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.	
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)	
19248.000	25.0	7.8	-3.0	1.0	3.0	0.0	√-High Horr	AV	0.0	32.8	54.0	-21.2	•
19248.000	24.9	7.8	363.0	1.0	3.0	0.0	√-High Horr	AV	0.0	32.7	54.0	-21.3	
19248.000	38.0	7.8	-3.0	1.0	3.0	0.0	V-High Horr	PK	0.0	45.8	74.0	-28.2	
19248.000	37.1	7.8	363.0	1.0	3.0	0.0	√-High Horr	PK	0.0	44.9	74.0	-29.1	

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

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

COMMENTS

EUT OPERATING MODES

Bluetooth 79 on PW40. Bluetooth 79, 802.11(b) 1 and CDMA (cellular) 55 on 700C

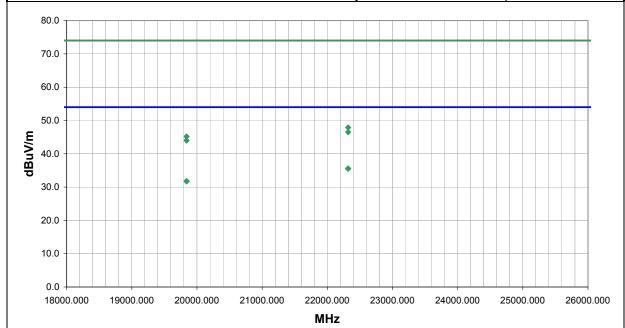
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS 10 Pass

Other

Holy Saling Tested By:



						External			Distance			Compared to	
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.	
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)	
22320.000	26.4	9.2	362.0	1.0	3.0	0.0	V-High Horr	AV	0.0	35.6	54.0	-18.4	
22320.000	26.3	9.2	-2.0	1.0	3.0	0.0	H-High Horr	AV	0.0	35.5	54.0	-18.5	
19840.000	22.9	8.9	0.0	1.0	3.0	0.0	H-High Horr	AV	0.0	31.8	54.0	-22.2	
19840.000	22.8	8.9	362.0	1.0	3.0	0.0	V-High Horr	AV	0.0	31.7	54.0	-22.3	
22320.000	38.7	9.2	362.0	1.0	3.0	0.0	V-High Horr	PK	0.0	47.9	74.0	-26.1	
22320.000	37.3	9.2	-2.0	1.0	3.0	0.0	H-High Horr	PK	0.0	46.5	74.0	-27.5	
19840.000	36.3	8.9	0.0	1.0	3.0	0.0	H-High Horr	PK	0.0	45.2	74.0	-28.8	
19840.000	35.1	8.9	362.0	1.0	3.0	0.0	√-High Horr	PK	0.0	44.0	74.0	-30.0	

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

COMMENTS

Simultanoous Transmission

EUT OPERATING MODES

Bluetooth 11 on PW40. Bluetooth 11, 802.11(b) 1 and CDMA (PCS) 1153 on 700C

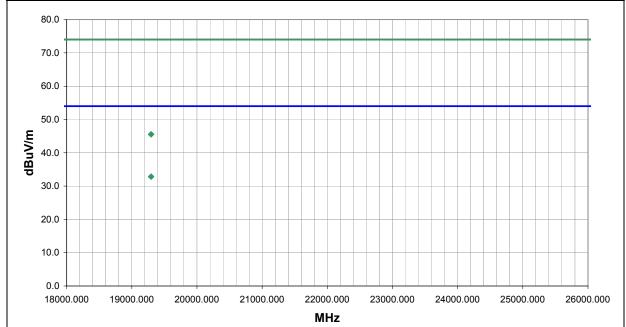
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS Run #
Pass 11

Other

Holy Aligher
Tested By:



						External			Distance			Compared to	
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.	
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)	
19296.000	24.9	8.0	362.0	1.0	3.0	0.0	H-High Horr	AV	0.0	32.9	54.0	-21.1	-
19296.000	24.8	8.0	-3.0	1.0	3.0	0.0	√-High Horr	AV	0.0	32.8	54.0	-21.2	
19296.000	37.6	8.0	-3.0	1.0	3.0	0.0	V-High Horr	PK	0.0	45.6	74.0	-28.4	
19296.000	37.5	8.0	362.0	1.0	3.0	0.0	-High Horr	PK	0.0	45.5	74.0	-28.5	

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

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

COMMENTS

EUT OPERATING MODES

Bluetooth 69 on PW40. Bluetooth 69 802.11(b) 11 and CDMA (PCS) 35 on 700C

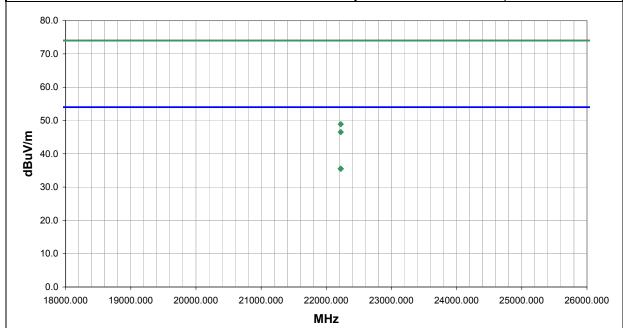
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS Run # 12

Other

Holy Aligher
Tested By:



						External			Distance			Compared to	i
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.	ĺ
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)	ĺ
22221.000	26.5	9.0	0.0	1.0	3.0	0.0	H-High Horr	AV	0.0	35.5	54.0	-18.5	•
22221.000	26.5	9.0	362.0	1.0	3.0	0.0	H-High Horr	AV	0.0	35.5	54.0	-18.5	
22221.000	39.9	9.0	0.0	1.0	3.0	0.0	H-High Horr	PK	0.0	48.9	74.0	-25.1	
22221.000	37.5	9.0	362.0	1.0	3.0	0.0	-High Horr	PK	0.0	46.5	74.0	-27.5	

NORTHWEST		RADIA	TED	EMIS	10122	NS D	ATA	SHE	ET_		RI df-
	PW40 Blue	tooth Enabled Pri								ITRM0051	10/22/20
Serial Number	4898184									11/13/04	
Customer Attendees		echnologies Corp	oration					Tei	mperature: Humidity:		
Cust. Ref. No.								Barometri	c Pressure		
	Holly Ashk	annejhad			Power:	120VAC/60)Hz		Job Site:	EV01	
T SPECIFICAT Specification		(d) Spurious Rad	ated Emission	15					Year:	2004	
	ANSI C63.4		utou Elillooioi						Year:		
IPLE CALCUL											
	-	 Measured Level + Ant Measured Level + Tr 				-		+ External Atten	uation		
MENTS											
Itaneous Transmi	ssion										
OPERATING		000 44(h) 44 d ODM	(DOO) 4450 7	200							
ootn 62 on PW40.	Bluetooth 62,	302.11(b) 11 and CDM	(PCS) 1153 on 7	000							
IATIONS FRO	M TEST STA	NDARD									
viations.											
ULTS										Run #	3
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. 500.000	1000.000	2000.000	2000.000	. 30		5500.00	0	20.000	.550.00	30	55.000
					External			Distance			Compare
Freq	Amplitude (dBuV)	Factor Azimut		Distance (meters)	Attenuation	Polarity	Detector	Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Spec. (dB)
(MHz) 2483.500		(dB) (degree 32.0 25		(meters)	(dB) 0 0.0	H-Horn	AV	-9.5	38.0		(dB) -1
		32.0 129		1.0		V-Horn	AV	-9.5	36.8	54.0	-1
2483.500	1 1.0	02.0 12.	1.0		0.0			0.0		0	

NORTHWEST **RADIATED EMISSIONS DATA SHEET EMC** EUT: PW40 Bluetooth Enabled Printer Work Order: ITRM0051 Date: 11/13/04 Serial Number: 4898184 Customer: Intermec Technologies Corporation Temperature: 66 Attendees: none Humidity: 45% Cust. Ref. No.: Barometric Pressure 30.33 Tested by: Holly Ashkannejhad Power: 120VAC/60Hz Job Site: EV01 TEST SPECIFICATIONS Specification: FCC 15.247(d) Spurious Radiated Emissions Method: ANSI C63.4 Year: 2004 Year: 2003 SAMPLE CALCULATIONS

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

COMMENTS

EUT OPERATING MODES

Bluetooth 11 in PW40. Bluetooth 11, 802.11b 1, and CDMA (cellular) 467 in 700C.

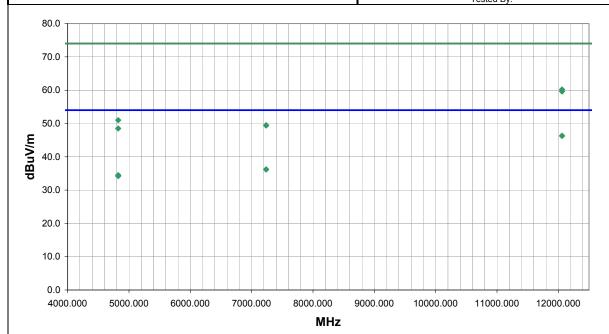
DEVIATIONS FROM TEST STANDARD

No deviations.

RESULTS 14 Pass

Other

Holy Saling Tested By:



_						External			Distance			Compared to
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)
12060.000	26.1	20.2	292.0	1.2	3.0	0.0	V-Horn	AV	0.0	46.3	54.0	-7.7
12060.000	26.1	20.2	53.0	1.7	3.0	0.0	H-Horn	AV	0.0	46.3	54.0	-7.7
12060.000	40.0	20.2	292.0	1.2	3.0	0.0	V-Horn	PK	0.0	60.2	74.0	-13.8
12060.000	39.4	20.2	53.0	1.7	3.0	0.0	H-Horn	PK	0.0	59.6	74.0	-14.4
7236.000	26.1	10.1	336.0	1.3	3.0	0.0	H-Horn	AV	0.0	36.2	54.0	-17.8
7236.000	26.1	10.1	18.0	1.2	3.0	0.0	V-Horn	AV	0.0	36.2	54.0	-17.8
4824.000	31.2	3.3	242.0	1.2	3.0	0.0	V-Horn	AV	0.0	34.5	54.0	-19.5
4824.000	30.9	3.3	206.0	1.3	3.0	0.0	H-Horn	AV	0.0	34.2	54.0	-19.8
4824.000	47.7	3.3	242.0	1.2	3.0	0.0	V-Horn	PK	0.0	51.0	74.0	-23.0
7236.000	39.4	10.1	18.0	1.2	3.0	0.0	V-Horn	PK	0.0	49.5	74.0	-24.5
7236.000	39.3	10.1	336.0	1.3	3.0	0.0	H-Horn	PK	0.0	49.4	74.0	-24.6
4824.000	45.2	3.3	206.0	1.3	3.0	0.0	H-Horn	PK	0.0	48.5	74.0	-25.5

RADIATED EMISSIONS DATA SHEET EMC EUT: PW40 Bluetooth Enabled Printer Work Order: ITRM0051 Date: 11/14/04 Serial Number: 4898184 Customer: Intermec Technologies Corporation Temperature: 66 Attendees: none Humidity: 45% Cust. Ref. No.: Barometric Pressure 30.33 Tested by: Dean Ghizzone Power: 120VAC/60Hz Job Site: EV01 TEST SPECIFICATIONS Specification: FCC 15.247(d) Spurious Radiated Emissions Method: ANSI C63.4 Year: 2004 Year: 2003 SAMPLE CALCULATIONS Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator COMMENTS **EUT OPERATING MODES** Bluetooth 5 in PW40. Bluetooth 5, 802.11b 1, and CDMA (cellular) 395 in 700C. DEVIATIONS FROM TEST STANDARD None RESULTS 15 Pass Other Clear Myon Tested By: 80.0 70.0 60.0 50.0 dBuV/m 40.0 30.0 20.0 10.0 0.0 4000.000 6000.000 7000.000 8000.000 5000.000 9000.000 10000.000 11000.000 12000.000

						External			Distance			Compared to	ı
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.	l
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)	l
4075.974	48.2	2.4	157.0	1.5	3.0	0.0	V-Horn	AV	0.0	50.6	54.0	-3.4	
4075.974	46.2	2.4	351.0	1.3	3.0	0.0	H-Horn	AV	0.0	48.6	54.0	-5.4	
4075.974	50.1	2.4	157.0	1.5	3.0	0.0	V-Horn	PK	0.0	52.5	74.0	-21.5	
4075.974	48.3	2.4	351.0	1.3	3.0	0.0	H-Horn	PK	0.0	50.7	74.0	-23.3	

MHz

RADIATED EMISSIONS DATA SHEET EMC Work Order: ITRM0051 EUT: PW40 Bluetooth Enabled Printer Date: 11/14/04 Serial Number: 4898184 Customer: Intermec Technologies Corporation Temperature: 66 Attendees: none Humidity: 45% Cust. Ref. No.: Barometric Pressure 30.33 Power: 120VAC/60Hz Tested by: Dean Ghizzone Job Site: EV01 Specification: FCC 15.247(d) Spurious Radiated Emissions Year: 2004 Method: ANSI C63.4 Year: 2003 SAMPLE CALCULATIONS Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator **EUT OPERATING MODES** Bluetooth 79 in PW40. Bluetooth 79, 802.11b 11, and CDMA (cellular) 55 in 700C. DEVIATIONS FROM TEST STANDARD None RESULTS 16 Pass Other Clear Myon Tested By: 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0 4000.000 5000.000 6000.000 7000.000 8000.000 9000.000 10000.000 11000.000 12000.000 External Distance Compared to Amplitude Distance Spec, Limit Frea Factor Azimuth Height Attenuation Polarity Detector Adjustment Adjusted Spec. (dBuV) (dB) (degrees) (meters) (meters) (dB) (dB) dBuV/m dBuV/m (dB) (MHz) 4176.027 42.2 110.0 1.6 3.0 0.0 H-Horn 0.0 44.6 54.0 -9.4 12400.000 23.8 20.8 60.0 2.6 0.0 V-Horn ΑV 0.0 44.6 54.0 -9.4 54.0 4176.027 42.0 2.4 79.0 1.3 3.0 0.0 V-Horn ΑV 0.0 44.4 -9.6 12400.000 23.1 20.8 58.0 1.3 3.0 0.0 H-Horn ΑV 0.0 43.9 54.0 -10.1 12400.000 37.5 20.8 60.0 0.0 V-Horn PΚ 58.3 74.0 2.6 3.0 0.0 -15.7 12400.000 37.3 20.8 58.0 0.0 H-Horn PK -15.9 1.3 3.0 0.0 58.1 74.0 7440.000 26.2 11.1 157.0 1.5 3.0 0.0 H-Horn ΑV 0.0 37.3 54.0 -16.77440.000 26.1 11.1 228.0 1.2 3.0 0.0 V-Horn ΑV 0.0 37.2 54.0 -16.8 4959.630 32.9 3.6 217.0 1.2 3.0 0.0 V-Horn ΑV 0.0 36.5 54.0 -17.5 4959.630 31.0 3.6 209.0 1.2 3.0 0.0 H-Horn ΑV 0.0 34.6 54.0 -19.4 7440.000 39.6 11.1 157.0 1.5 3.0 0.0 H-Horn 0.0 50.7 74.0 -23.3 7440.000 39.4 228.0 1.2 3.0 0.0 V-Horn PΚ 0.0 50.5 74.0 -23.5 11.1 4176.027 47.8 2.4 110.0 1.6 3.0 0.0 H-Horn PΚ 0.0 50.2 74.0 -23.8

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	THWEST MC		RA	DIAT	ED E	MIS	1012	NS D	ATA	SHE	ET		REV df4.4 10/22/2004
	EUT:	PW40 Blue	tooth Enak	oled Printer						٧	Vork Order:		
Ser	ial Number:	4898184 Intermec To	achnologic	e Corporat	ion					To	Date:	11/14/04	
	Attendees:		inioiogie	.a corporat						16	Humidity:		
Cu	st. Ref. No.:						_			Barometri	ic Pressure	30.33	
TEST SE	Tested by: PECIFICATI	Dean Ghizz	one				Power:	120VAC/60)Hz		Job Site:	EV01	
		FCC 15.247	(d) Spurio	us Radiate	d Emission	s					Year:	2004	
241121		ANSI C63.4	,								Year:	2003	
	E CALCULA ed Emissions:		= Measured L	evel + Antenna	Factor + Cabl	e Factor - An	nplifier Gain + D	istance Adius	tment Factor	+ External Atter	nuation		
		Adjusted Level						-		- External 7 tter	1441011		
Simultane	NTS ous transmiss	ion											
	ERATING M	IODES Bluetooth 79, 8	02.11b 11. ar	nd CDMA (cell	ular) 54 in 700	C.							
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None	· 0											D #	
RESULT Pass	5											Run #	7
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	req (Hz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
(2483.500	54.9	-2.2	31.0	1.4	3.0	20.0	H-Horn	PK	0.0	72.7	74.0	-1.3
	2087.997 2483.500	35.6 34.3	-3.3 -2.2	216.0 32.0	1.3 1.4	3.0 3.0	20.0 20.0	H-Horn H-Horn	AV AV	0.0 0.0	52.3 52.1	54.0 54.0	-1.7 -1.9
	2087.997	34.3	-3.3	210.0	1.4	3.0	20.0	V-Horn	AV	0.0	51.1	54.0	-1.9 -2.9
	2483.500	27.5	-2.2	211.0	2.0	3.0	20.0	V-Horn	AV	0.0	45.3	54.0	-8.7
	2087.997	43.3	-3.3	216.0	1.3	3.0	20.0	H-Horn	PK	0.0	60.0	74.0	-14.0
	2087.997	43.2	-3.3	210.0	1.2	3.0	20.0	V-Horn	PK	0.0	59.9	74.0	-14.1

NORTHWEST EMC		RA	DIAT	ED E	EMIS	SIOI	NS D	ATA	SHE	ΕT		REV df4.4 10/22/2004
EUT	T: PW40 Blue	etooth Enal	bled Printe	r					٧	Vork Order:	ITRM0051	
Serial Numbe											11/14/04	
	r: Intermec 1	Technologic	es Corpora	tion					Те	mperature:		
Attendees Cust. Ref. No									Rarometr	Humidity: ic Pressure		
	/: Dean Ghiz	zone				Power:	120VAC/6	0Hz	Daionieu	Job Site:		
TEST SPECIFICA												
Specification	n: FCC 15.24	7(d) Spuric	us Radiate	d Emission	s					Year:	2004	
	: ANSI C63.	4								Year:	2003	
SAMPLE CALCUL				5 1 .O.			- A II		- I I I I I I I I I I I I I I I I I I I			
Radiated Emission Conducted Emission	•								External Atter	nuation		
COMMENTS	s. Adjusted Leve	si – ivicasurcu	Level - Hallsc	dicer ractor r	Sable Attenue	ation ractor r L	Atemai Attem	uatoi				
Simultaneous transmi												
Bluetooth 11 in PW40.		802.11b 1, and	d CDMA (PCS) 1 in 700C.								
DEVIATIONS FRO	M TEST STA	ANDARD										
RESULTS Pass											Run #	8
Other												
Other								Clean	M	Spore		
								•	Teste	d By:		
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00.0												
70.0												
70.0												
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
4076.03		2.4	276.0	1.3	3.0		V-Horn	AV	0.0	44.4	54.0	-9.6
4076.03		2.4	344.0 151.0	1.3 1.4	3.0		H-Horn H-Horn	AV AV	0.0 0.0	44.1 36.1	54.0 54.0	-9.9 -17.0
7236.00 7236.00		10.1 10.1	151.0 276.0	1.4 1.2	3.0 3.0		H-Horn V-Horn	AV AV	0.0	36.1 36.1	54.0 54.0	-17.9 -17.9
4823.82		3.3	235.0	1.5	3.0		V-Horn	AV	0.0	34.5	54.0 54.0	-17.9
4823.82		3.3	12.0	1.2	3.0		H-Horn	AV	0.0	33.9	54.0	-20.1
4823.82		3.3	235.0	1.5	3.0		V-Horn	PK	0.0	49.7	74.0	-24.3
7236.00		10.1	151.0	1.4	3.0		H-Horn	PK	0.0	49.4	74.0	-24.6
7236.00			276.0	1.2	3.0		V-Horn	PK	0.0	49.3	74.0	-24.7
4823.82	5 45.6	3.3	12.0	1.2	3.0		H-Horn	PK	0.0	48.9	74.0	-25.1
4076.03		2.4	276.0	1.3	3.0		V-Horn	PK	0.0	47.7	74.0	-26.3
4076.03	0 45.0	2.4	344.0	1.3	3.0	0.0	H-Horn	PK	0.0	47.4	74.0	-26.6

	HWEST MC		RA	DIAT	ED E	EMIS	1012	NS D	ATA	SHE	ΕT		REV df4.4 10/22/2004
	EUT:	PW40 Blu	etooth Enal	bled Printer	r					٧	Vork Order:	ITRM0051	
Seri	al Number:											11/14/04	
			Technologie	es Corpora	tion					Те	mperature:		
	Attendees: st. Ref. No.:	none								Rarometr	Humidity: ic Pressure		
Cus		Dean Ghiz	zzone				Power:	120VAC/6	0Hz	Daionieu	Job Site:		
TEST SP	ECIFICAT												
Sp	ecification:	FCC 15.24	17(d) Spurio	us Radiate	d Emission	s					Year:	2004	
		ANSI C63	.4								Year:	2003	
	CALCULA			1 . 4 .	F 4 . 0.1					- I I I I I I I I I I I I I I I I I I I			
							nplifier Gain + D ation Factor + E			External Atter	nuation		
COMMEN		Adjusted 201	or modeliou	LOVOI - Trainoc	addir addor	Sabio / Ittoriae	MOIT GOLOT - L	Acomai / Com	autoi				
	us transmis												
	RATING I 11 in PW40.		802.11b 1, and	d CDMA (PCS) 1153 in 700C								
	ONS FROM	N TEST ST	ANDARD										
None RESULT	9											Run#	
Pass	3												9
1 400												<u> </u>	
Other									Clean	M	1/on		
										Teste	d By:		
00.0													
80.0 -													
70.0 -													
60.0 -													
-												*	<u> </u>
50.0 -	•	*										•	
40.0 -	*												
30.0 -		*											
20.0 -													
10.0 -													
0.0 -													
4000	0.000	5000.000	6000.	000 7	000.000	8000.0	00 900	00.000	10000.00	0 1100	0.000	12000.000	
(M	req IHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
	12060.000			175.0	3.3	3.0	0.0 0.0	H-Horn	AV AV	0.0 0.0	45.5 45.4	54.0	-8.5
	12060.000 4075.996			261.0 345.0	1.2 1.3	3.0 3.0	0.0	V-Horn H-Horn	AV AV	0.0	45.4 42.4	54.0 54.0	-8.6 -11.6
	4075.996			275.0	1.3	3.0	0.0	V-Horn	AV	0.0	39.6	54.0	-11.6
	12060.000			175.0	3.3	3.0	0.0	H-Horn	PK	0.0	59.3	74.0	-14.7
	12060.000			261.0	1.2	3.0	0.0	V-Horn	PK	0.0	58.7	74.0	-15.3
	4824.040			237.0	1.5	3.0	0.0	V-Horn	AV	0.0	34.2	54.0	-19.8
	4824.040			194.0	1.3	3.0	0.0	H-Horn	AV	0.0	32.7	54.0	-21.3
	4824.040			237.0	1.5	3.0	0.0	V-Horn	PK	0.0	49.3	74.0	-24.7
	4824.040			194.0	1.3	3.0	0.0	H-Horn	PK	0.0	47.6	74.0	-26.4
	4075.996			275.0	1.2	3.0	0.0	V-Horn	PK	0.0	47.4	74.0	-26.6
	4075.996	44.9	2.4	345.0	1.3	3.0	0.0	H-Horn	PK	0.0	47.3	74.0	-26.7

	THWEST			R/	\DIA	TE	ו ח	=ML	22		NS E	ATA	SHE	FT.		REV df4.4
E	MC						ו כ		JJ		10 L	AIA				10/22/2004
0	!=! N!			luetooth En	abled Prir	nter							V	Vork Order:		
Ser			4898184 Intermed	: Technolog	nies Corno	oration							Te	mperature:	11/14/04 66	
		dees:		<i>3</i> 1001111010;	3100 GOI P.	Ji diloli								Humidity:		
Cu	st. Ref	. No.:											Barometr	ic Pressure		
TECT OF			Dean Gr	nizzone						Power:	120VAC/	60Hz		Job Site:	EV01	
TEST SP				247(d) Spur	ious Radi	ated Em	issior	ıs						Year:	2004	
			ANSI C6		TOUG TRUGE	atou Em	100101							Year:		
SAMPLE																
				-							-	ustment Factor	+ External Atte	nuation		
COMME		SSIONS.	Adjusted Li	evel = Measure	u Level + 112	insuucei Fa	actor +	Cable Atten	luation i	ractor + E	xternal Atte	luatoi				
Simultane		nsmiss	ion													
EUT OPE																
Bluetooth	68 in P	W40. B	luetooth 6	8, 802.11b 11,	and CDMA	(PCS) 35 ir	1 700C.									
DEVIATI None	ONS	FROM	TEST S	TANDARD												
RESULT	S														Run#	
Pass															2	0
Other																
Cuioi												Clean	12	Spore		
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4000	0.000		5000.00	0 600	0.000	7000.0	000	8000.	.000	900	00.000	10000.00	00 1100	0.000	12000.000	
_			A m = = 1" .		*		ab.	D:-4-		xternal	D-1- "	F	Distance	ا استاله ۵	Con- II "	Compared to
	req (Hz)		Amplitude (dBuV)	e Factor (dB)	Azimuth (degrees		ight ters)	Distance (meters)		enuation (dB)	Polarity	Detector	Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Spec. (dB)
, ,,,,		5.989	42			, ,	1.1	3.		0.0	V-Horn	AV	0.0	44.6	54.0	-9.4
		5.989	40			9.0	1.6	3.		0.0	H-Horn	AV	0.0	43.3	54.0	-10.7
		7.000	27				1.3	3.		0.0	H-Horn	AV	0.0	38.8	54.0	-15.2
		7.000 7.000	26 40			5.0 5.0	1.6 1.3	3. 3.		0.0	V-Horn H-Horn	AV PK	0.0 0.0	37.6 51.4	54.0 74.0	-16.4 -22.6
		7.000	40			5.0	1.6	3.		0.0	V-Horn	PK	0.0	51.4	74.0	-22.8
		5.989	46			9.0	1.6	3.		0.0	H-Horn	PK	0.0	49.3	74.0	-24.7
		5.989	46				1.1	3.			V-Horn	PK	0.0	48.7	74.0	-25.3

	HWEST		RA	DIAT	ED E	EMIS	SIOI	NS D	ATA	SHE	ΕT		REV df4.4 10/22/2004
		PW40 BI	uetooth Enal	bled Printer	r					W	/ork Order:	ITRM0051	
Seri	al Number:											11/14/04	
	Customer	Intermec	Technologi	es Corpora	tion					Te	mperature:		
	Attendees										Humidity:		
Cus	t. Ref. No.:									Barometri	c Pressure		
on		Dean Gh	izzone				Power:	120VAC/6	0Hz		Job Site:	EV01	
	ECIFICAT		247(d) Spurio	uo Bodiete	d Emission						Year:	2004	
эp		ANSI C6		us Naulate	u Ellissioi	13					Year:		
SAMPLE	CALCUL		0.4								rour.	2000	
			gth = Measured L	evel + Antenna	a Factor + Cab	le Factor - An	nplifier Gain + D	Distance Adjus	stment Factor	+ External Atter	nuation		
Conducte	ed Emissions	: Adjusted Le	vel = Measured	Level + Transd	lucer Factor +	Cable Attenua	tion Factor + E	xternal Attenu	uator				
COMMEN													
Simultaneo	us transmis	sion											
	RATING I		1, 802.11b 1, and	d CDMA (BCS)) 1 in 700C								
				JDIIIA (F 00)	, 1000.								
DEVIATION None	ONS FROI	M TEST ST	TANDARD										
RESULT	S											Run#	
Pass												2.	1
Other									1		,		
									Clean	120	you		
										Teste	d By:		
80.0 -													
-													+
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00.0													
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1250	0.000	1	3500.000	1	14500.000		15500.00	U	16500	.000	1750	00.000	
		•								,			
F.	roa	Amplitude	Factor	Azimuth	Height	Dietonoo	External	Polority	Dotostar	Distance	Adjusted		Compared to Spec.
	req IHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	Attenuation (dB)	Polarity	Detector	Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Spec. (dB)
	14472.000			129.0	1.2	3.0	0.0	V-Horn	AV	0.0	40.6	54.0	-13.4
	14472.000			264.0	1.3	3.0	0.0	H-Horn	AV	0.0	40.5	54.0	-13.5
	14472.000			129.0	1.2	3.0	0.0	V-Horn	PK	0.0	54.2	74.0	-19.8
	14472.000	40.	2 13.8	264.0	1.3	3.0	0.0	H-Horn	PK	0.0	54.0	74.0	-20.0

RADIATED EMISSIONS DATA SHEET EMC EUT: PW40 Bluetooth Enabled Printer Work Order: ITRM0051 Date: 11/14/04 Serial Number: 4898184 Customer: Intermec Technologies Corporation Temperature: 66 Attendees: none Humidity: 45% Cust. Ref. No.: Barometric Pressure 30.33 Tested by: Dean Ghizzone Power: 120VAC/60Hz Job Site: EV01 TEST SPECIFICATIONS Specification: FCC 15.247(d) Spurious Radiated Emissions Method: ANSI C63.4 Year: 2004 Year: 2003 SAMPLE CALCULATIONS Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator COMMENTS

EUT OPERATING MODES

Bluetooth 11 in PW40. Bluetooth 11, 802.11b 1, and CDMA (cellular) 467 in 700C.

DEVIATIONS FROM TEST STANDARD

RESULTS

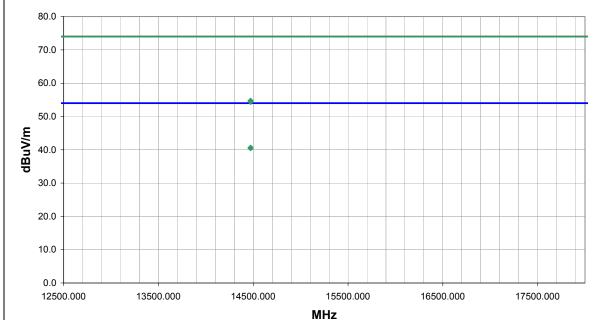
Pass 22

Other

None

Clear Myon

Tested By:



						External			Distance			Compared to
Freq	Amplitude	Factor	Azimuth	Height	Distance	Attenuation	Polarity	Detector	Adjustment	Adjusted	Spec. Limit	Spec.
(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)
14472.000	26.8	13.8	128.0	1.2	3.0	0.0	V-Horn	AV	0.0	40.6	54.0	-13.4
14472.000	26.7	13.8	234.0	1.3	3.0	0.0	H-Horn	AV	0.0	40.5	54.0	-13.5
14472.000	40.9	13.8	128.0	1.2	3.0	0.0	V-Horn	PK	0.0	54.7	74.0	-19.3
14472.000	40.6	13.8	234.0	1.3	3.0	0.0	H-Horn	PK	0.0	54.4	74.0	-19.6



