# Intermec Technologies Corporation

# IM5

October 26, 2005

Report No. ITRM0091

**Report Prepared By** 



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

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#### Certificate of Test Issue Date: October 26, 2005 Intermec Technologies Corporation Model: IM5

	Emissions			
Test Description	Specification	Test Method	Pass	Fail
Band Edge Compliance	FCC 15.247(d) Band Edge Compliance:2005-9	ANSI C63.4:2003	$\boxtimes$	
Occupied Bandwidth	FCC 15.247(a) Occupied Bandwidth:2005-04	ANSI C63.4:2003	$\boxtimes$	
Output Power	FCC 15.247(b) Output Power:2005-9	ANSI C63.4:2003	$\boxtimes$	
Spurious Conducted Emissions	FCC 15.247(d) Spurious Conducted Emissions:2005-9	ANSI C63.4:2003	$\boxtimes$	
Spurious Radiated Emissions	FCC 15.247(d) Spurious Radiated Emissions:2005-9	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:
ADU.K.P
Greg Kiemel, Director of Engineering

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

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



Revision Number	Description	Date	Page Number
00	None		



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

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

**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.





200630-0

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

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

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

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

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

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

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







BSMI





Revision 03/18/05

NEMKO



#### 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.



Case D: Product does not comply.



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

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

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

Radiated Immunity			
	Probability	Value	
	Distribution	(+/- dB)	
Combined standard uncertainty <i>uc(y)</i>	normal	1.05	
Expanded uncertainty <b>U</b>	normal $(k - 2)$	2 11	
(level of confidence $\approx$ 95 %)	$\operatorname{Hormal}\left( R=2\right)$	2.11	

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

#### Legend

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

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





California – Orange County Facility Labs OC01 – OC13

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





#### Oregon – Evergreen Facility Labs EV01 – EV10

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





Washington – Sultan Facility Labs SU01 – SU07

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



# **Product Description**

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:	IM5	
First Date of Test:	October 17, 2005	
Last Date of Test:	e of Test: October 20, 2005	
Receipt Date of Samples:	of Samples: October 17, 2005	
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):

RFID Reader operating in the 902-928MHz bands.

#### Client Justification for EUT Selection:

Not Provided

#### **Client Justification for Test Selection:**

These tests satisfy the requirements for a Class 2 Permissive Change to approve software changes to the previously certified IM5, FCC ID: EHARFID915IM5. The EUT has full modular approval as a mobile device.



		E	quipment mo	odifications	
Item	Date	Test	Modification	Note	Disposition of EUT
1	10/17/2005	Occupied Bandwidth	Same configuration as delivered.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	10/17/2005	Band Edge Compliance	Same configuration as delivered.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	10/17/2005	Spurious Conducted Emissions	Same configuration as delivered.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	10/18/2005	Output Power	Modified from delivered configuration.	This was on a second test sample, customer had to adjust the power lookup table within the firmware to adjust down the power for passing data. Modification done by Scott Holub.	EUT remained at Northwest EMC following the test.
5	10/18/2005	Spurious Radiated Emissions	Modified from delivered configuration.	No EMI modifications were performed. However, testing was performed on a different unit than was initially used, due to equipment problems. Modification done by Scott Holub	EUT remained at Northwest EMC following the test.
6	10/20/2005	Spurious Radiated Emissions	Same configuration as delivered.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.



#### Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Low
Mid
High

**Operating Modes Investigated:** No Hop

Data Rates Investigated: Maximum (40kBps)

**Output Power Setting(s) Investigated:** Maximum

**Power Input Settings Investigated:** 

120VAC/60Hz

Software\Firmware Applied During Test						
Exercise software	CTI AppVer 1.2.1 Build 25	Version	Firmware v3.09			
Description						
The system was tested using special software developed to test all functions of the device during the test.						

EUT and Peripherals							
Description	Manufacturer	Model/Part Number	Serial Number				
EUT - RFiD reader	Intermec Technologies Corporation	IM5	19210509078				
Notebook PC	Dell	Latitude LM TS30G	K0204A				
Notebook PC Power Supply	Dell	TSA8	None				
DC Power Supply	MagTech	SPU24-104	01290800				

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	2.0	No	DC Power Supply	EUT - RFiD reader
AC Power	No	1.8	No	DC Power Supply	AC Mains
Serial	Yes	1.75	No	EUT - RFiD reader	Notebook PC
DC Leads	No	1.2	PA	Notebook PC Power Supply	Notebook PC
AC Power	No	1.9	No	Notebook PC Power Supply	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Measurement Equipment						
Description	Manufacturer	Model	Identifier	Last Cal	Interval	
Spectrum Analyzer	Hewlett-Packard	8593E	AAN	12/15/2004	12 mo	

#### **Test Description**

**<u>Requirement</u>**: Per 47 CFR 15.247(a)(1), the 20 dB bandwidth of a hopping channel must be less than or equal to the channel separation. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have 20 dB bandwidths up to 1.5 times the channel separation, provided the systems operate with an output power no greater than 125 mW.

Per 47 CFR 15.247(a)(1)(I-iii), the maximum 20 dB bandwidth for frequency hopping systems operating in the 902-928 MHz band is 500 kHz. The maximum 20 dB bandwidth for frequency hopping systems operating in the 5725 – 5850 MHz band is 1 MHz.

The measurement is made with the spectrum analyzer's resolution bandwidth set to  $\geq$ 1% of the 20dB bandwidth, and the video bandwidth set to greater than or equal to the resolution bandwidth.

<u>Configuration</u>: The occupied bandwidth was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode.

Completed by:	
Rochen la	Relena
0	0'

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EUT: IM5							Work Order:	ITRM0091
erial Number: 19210509078							Date:	10/17/05
Customer: Intermec Tech	nologies Corporation						Temperature:	70 °F
Attendees: Scott Holub				Tes	ted by: Rod Pel	oquin	Humidity	49% RH
omer Ref. No.: None					Power: 120VAC	/60Hz	Job Site:	EV06
ECIFICATIONS		Veer				ANEL COD :	v	2002
CALCULATIONS	a)	rear: 2005			nethou: DA 00-7	UJ, ANOI UD3.4	rear:	2003
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ERATING MODES		na a spectrum a	nuryzer.					
ed 40 kbps data rate								
ONS FROM TEST STANDARD	)							
EMENTS								
FR 15.247(a)(1), the 20 dB bar	ndwidth of the frequen	cy hopping char	nels in the 902	- 928 MHz band	shall be less tha	in or equal to the	carrier frequency se	paration. In no c
greater than 500 kHz.						-		
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PTION OF TEST								
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	OCCOPIED				Rev E 01/30
EUT: IM5				Work Order:	ITRM0091
Serial Number: 19210509078				Date:	10/17/05
Customer: Intermec Technologies C	orporation	<b>. .</b>		Temperature:	70 °F
Attendees: Scott Holub		Tested by: Rod Pel	oquin /60Hz	Humidity:	49% RH EV06
SPECIFICATIONS		1 Ower. 120VAC		565 GRE.	
Specification: 47 CFR 15.247(a)	Year: 2005	Method: DA 00-7	05, ANSI C63.4	Year:	2003
IENTS					
red with a direct connection between the	RF output and a spectrum analyzer.				
ated 40 kbps data rate					
TIONS FROM TEST STANDARD					
CFR 15.247(a)(1). the 20 dB bandwidth of	the frequency hopping channels in the 9	02 - 928 MHz band shall be less	than or equal to the	e carrier frequency	v separation. In
an it be greater than 500 kHz.	nopping mannels in the s	vv			,
TS		BANDWIDTH			
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Tested By:	·				
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C	OCCUP	IED BAN	DWIDTH			Rev E 01/ <u>30</u>
EUT: IM5					Work Order:	ITRM0091
Serial Number: 19210509078					Date:	10/17/05
Customer: Intermec Technologies	Corporation		Tostod by Bod D-I	oquin	Temperature:	70 °F
omer Ref. No.: None			Power: 120VAC	/60Hz	Job Site:	49% KH EV06
PECIFICATIONS					tob one.	
Specification: 47 CFR 15.247(a)	Year: 2005		Method: DA 00-7	05, ANSI C63.4	Year:	2003
E CALCULATIONS						
ENTS	25					
PERATING MODES	le RF output and a spectrum ana	lyzer.				
TIONS FROM TEST STANDARD						
REMENTS						
CFR 15.247(a)(1), the 20 dB bandwidth an it be greater than 500 kHz.	of the frequency hopping channe	els in the 902 - 928 MH	z band shall be less	than or equal to	the carrier frequency	y separation. In
тѕ		BANDWID	тн			
TURE		157.5 kHz				
Roch I. P.o.	len					
Tested By:	T					
	0dB Bandwidth - H	ligh Channel	- 40 kbps D	ata Rate		
		<u> </u>				
09:31:16 OCT 17, 20 ///	05				MKR 1	57.5 kHz
REF 35.0 dBm	#AT 30 d1	В				.19 dB
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# **Output Power**

#### Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Low
Mid
High

**Operating Modes Investigated:** No Hop

Data Rates Investigated: Maximum (40kBps)

**Output Power Setting(s) Investigated:** Maximum

**Power Input Settings Investigated:** 

120VAC/60Hz

Software\Firmware Applied During Test						
Exercise software	CTI AppVer 1.2.1 Build 25	Version	Firmware v3.09			
Description						
The system was tested using special software developed to test all functions of the device during the test.						

EUT and Peripherals							
Description	Manufacturer	Model/Part Number	Serial Number				
EUT - RFiD reader	Intermec Technologies Corporation	IM5	19210509018				
Notebook PC	Dell	Latitude LM TS30G	K0204A				
Notebook PC Power Supply	Dell	TSA8	None				
DC Power Supply	MagTech	SPU24-104	01290800				

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	2.0	No	DC Power Supply	EUT - RFiD reader
AC Power	No	1.8	No	DC Power Supply	AC Mains
Serial	Yes	1.75	No	EUT - RFiD reader	Notebook PC
DC Leads	No	1.2	PA	Notebook PC Power Supply	Notebook PC
AC Power	No	1.9	No	Notebook PC Power Supply	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Measurement Equipment							
Description	Manufacturer	Model	Identifier	Last Cal	Interval		
Spectrum Analyzer	Hewlett-Packard	8593E	AAN	12/15/2004	12 mo		
Signal Generator	Hewlett Packard	8341B	TGN	02/07/2005	13 mo		
Power Meter	Hewlett Packard	E4418A	SPA	07/23/2004	24 mo		
Power Sensor	Hewlett-Packard	8481H	SPB	07/23/2004	24 mo		

#### **Test Description**

**<u>Requirement</u>**: Per 47 CFR 15.247(b)(1-2), the peak output power shall be measured. For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

The measurement is made using a spectrum analyzer using the following settings:

- Resolution bandwidth set to greater than the 6 dB bandwidth of the modulated carrier, and
- The video bandwidth set to greater than or equal to the resolution bandwidth.

<u>Configuration</u>: The peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode.

**De Facto EIRP Limit:** Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36dBm.

Completed by:	
Rochyle	Peling

EMC		OUTPUT	POWER				Rev BETA 01/30/01
EUT:	IM5				Work Order:	ITRM0091	
Serial Number:	19210509078				Date:	10/18/05	
Customer:	Intermec Technologies Corporat	tion			Temperature:	70 °F	
Attendees:	Scott Holub		Tested by:	Rod Peloquin	Humidity:	49% RH	
Customer Ref. No.:	None	lone Power: 120VAC/60Hz			Job Site:	EV06	
TEST SPECIFICATION	NS						
Specification:	47 CFR 15.247(b)	Year: 2005	Method:	DA 00-705, ANSI C63.4	Year:	2003	
SAMPLE CALCULATI	ONS						
COMMENTS							
COMMENTS							
FUT OPERATING MO	DES						
Modulated 40 kbps da	ata rate						
DEVIATIONS FROM T	EST STANDARD						
None							
REQUIREMENTS							
The maximum peak c	onducted output power for freque	ency hopping systems operating i	n the 902 - 928 MHz ba	and, with at least 50 hop	ping channels, shall	not excced	1 watt.
RESULTS			AMPLITUDE				
Pass			979.49 mW				
SIGNATURE							
Tested By:	Portry te Releng						
DESCRIPTION OF TE	ST						
	Output Power - Low Channel - 40 kbps Data Rate						



EMC		OUTPUT	POWER			Rev BETA 01/30/01	
EUT:	IM5				Work Order:	ITRM0091	
Serial Number:	19210509078				Date:	10/18/05	
Customer:	Intermec Technologies Corporat	ion			Temperature:	70 °F	
Attendees:	Scott Holub		Tested by:	Rod Peloquin	Humidity:	49% RH	
Customer Ref. No.:	None	one Power: 120VAC/60Hz			Job Site:	EV06	
TEST SPECIFICATION	NS						
Specification:	47 CFR 15.247(b)	Year: 2005	Method:	DA 00-705, ANSI C63.4	Year:	2003	
SAMPLE CALCULATI	IONS						
COMMENTS							
	250						
EUT OPERATING MO	DES						
Modulated 40 kbps da	ata rate						
DEVIATIONS FROM T	EST STANDARD						
REQUIREMENTS							
The maximum neak a	anduated autnut newar for fragu	anay hanning systems anarsting i	n the 002 028 MHz h	and with at least E0 hor	ning channels, chall	not avaged 1 watt	
The maximum peak c	onducted output power for freque	ancy nopping systems operating in	n the 902 - 920 MHz Da	and, with at least 50 hop	phily channels, shan	not exceed 1 watt.	
RESULTS			AMPLITUDE				
Pass			990.83 mW				
SIGNATURE							
Tested By:	Porting to Reling	<u>ح</u>					
DESCRIPTION OF TE	ST						
	Output Power - Mid Channel - 40 kbps Data Rate						



CENTER 915.000 MHz

SPAN 2.000 MHz

EMC		OUTPUT	POWER				Rev BETA 01/30/01
EUT:	IM5				Work Order:	ITRM0091	
Serial Number:	19210509078				Date:	10/18/05	
Customer:	Intermec Technologies Corpora	tion			Temperature:	70 °F	
Attendees:	Scott Holub		Tested by:	Rod Peloquin	Humidity:	49% RH	
Customer Ref. No.:	None Power: 120VAC/60Hz			120VAC/60Hz	Job Site:	EV06	
TEST SPECIFICATION	NS						
Specification:	47 CFR 15.247(b)	Year: 2005	Method:	DA 00-705, ANSI C63.4	Year:	2003	
SAMPLE CALCULATI	ONS						
COMMENTS							
COMMENTO							
FUT OPERATING MO	DES						
Modulated 40 kbps da	ata rate						
<b>DEVIATIONS FROM T</b>	EST STANDARD						
None							
REQUIREMENTS							
The maximum peak c	onducted output power for freque	ency hopping systems operating in	n the 902 - 928 MHz ba	and, with at least 50 hop	ping channels, shall	not excced	1 1 watt.
RESULTS			AMPLITUDE				
Pass			981.75 mW				
SIGNATURE							
Tested By:	Pochy to Releng	<del>ک</del>					
DESCRIPTION OF TE	ST						
	Output Power - High Channel - 40 kbps Data Rate						



CENTER 927.500 MHz

SPAN 2.000 MHz



#### Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Low
High

**Operating Modes Investigated:** No Hop

Data Rates Investigated: Maximum (40kBps)

Output Power Setting(s) Investigated: Maximum

Power Input Settings Investigated: 120VAC/60Hz

Software\Firmware Applied During Test					
Exercise software	CTI AppVer 1.2.1 Build 25	Version	Firmware v3.09		
Description					
The system was tested using special software developed to test all functions of the device during the test.					

EUT and Peripherals						
Description	Manufacturer	Model/Part Number	Serial Number			
EUT - RFiD reader	Intermec Technologies Corporation	IM5	19210509078			
Notebook PC	Dell	Latitude LM TS30G	K0204A			
Notebook PC Power Supply	Dell	TSA8	None			
DC Power Supply	MagTech	SPU24-104	01290800			

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	2.0	No	DC Power Supply	EUT - RFiD reader
AC Power	No	1.8	No	DC Power Supply	AC Mains
Serial	Yes	1.75	No	EUT - RFiD reader	Notebook PC
DC Leads	No	1.2	PA	Notebook PC Power Supply	Notebook PC
AC Power	No	1.9	No	Notebook PC Power Supply	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Measurement Equipment							
Description	Manufacturer	Model	Identifier	Last Cal	Interval		
Spectrum Analyzer	Hewlett-Packard	8593E	AAN	12/15/2004	12 mo		

#### **Test Description**

**Requirement**: Per 47 CFR 15.247(d), in any 100 kHz bandwidth outside the authorized band, the maximum level of radio frequency power must be at least 20dB down from the highest emission level within the authorized band. The measurement is made with the spectrum analyzer's resolution bandwidth set to 100 kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

**Configuration**: The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to low and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode. The channels closest to the band edges were selected. The spectrum was scanned across each band edge from 5 MHz below the band edge to 5 MHz above the band edge.

Completed by:	
Rocky le	Peling

NODTUNEOT						
EMC		BAND EDGE	E COMPLIA	NCE		Rev BETA 01/30/01
EUT:	IM5				Work Order:	ITRM0091
Serial Number:	19210509078				Date:	10/17/05
Customer:	Intermec Technologies Corp	oration			Temperature:	70 °F
Attendees:	Scott Holub		Tested by:	Rod Peloquin	Humidity:	49% RH
Customer Ref. No.:	None Power: 120VAC/60Hz			Job Site:	EV06	
TEST SPECIFICATION	IS					
Specification:	47 CFR 15.247(d)	Year: 2005	Method:	DA 00-705, ANSI C63.4	Year:	2003
SAMPLE CALCULATIO	ONS					
COMMENTS						
EUT OPERATING MOI	DES					
Modulated 40 kbps da	ita rate					
DEVIATIONS FROM T	EST STANDARD					
None						
REQUIREMENTS						
Maximum level of any	spurious emission at the edg	ge of the authorized band is 20 dB	down from the fundamenta			
RESULTS			AMPLITUDE			
Pass			-48.03 dB			
SIGNATURE						
Tested By:	Porting te Reley					
DESCRIPTION OF TES	ST					
	Band E	dge Compliance - L	ow Channel - 4	) khns Data R	ate	



EUT	IM5		Work Order:	ITRM0091					
Serial Number:	19210509078	Date:	10/17/05						
Customer:	Intermec Technologies Corporation		Temperature:	70 °F					
Attendees:	Scott Holub	Tested by: Rod Peloguin	Humidity:	49% RH					
Customer Ref. No.:	None	Power: 120VAC/60Hz	Job Site:	EV06					
TEST SPECIFICATION	IS								
Specification:	47 CFR 15.247(d) Year: 2005	Method: DA 00-705, ANSI C63.4	Year:	2003					
SAMPLE CALCULATION	NS								
COMMENTS									
EUT OPERATING MOD	DES								
Modulated 40 kbps dat	ta rate								
DEVIATIONS FROM TE	EST STANDARD								
None									
REQUIREMENTS									
Maximum level of any	spurious emission at the edge of the authorized band is 20 dB down	from the fundamental							
RESULTS		AMPLITUDE							
Pass		-47.06 dB							
Signature Nochy le Relenze									
DESCRIPTION OF TES	ST								
	Band Edge Compliance - Higl	h Channel - 40 kbps Data	Rate						



#RES BW 100 kHz

#VBW 300 kHz

SWP 20.0 msec



#### Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Low
Mid
High

**Operating Modes Investigated:** No Hop

Data Rates Investigated: Maximum (40kBps)

**Output Power Setting(s) Investigated:** Maximum

**Power Input Settings Investigated:** 

120VAC/60Hz

Software\Firmware Applied During Test						
Exercise software	CTI AppVer 1.2.1 Build 25	Version	Firmware v3.09			
Description						
The system was tested using special software developed to test all functions of the device during the test.						

EUT and Peripherals			
Description	Manufacturer	Model/Part Number	Serial Number
EUT - RFiD reader	Intermec Technologies Corporation	IM5	19210509078
Notebook PC	Dell	Latitude LM TS30G	K0204A
Notebook PC Power Supply	Dell	TSA8	None
DC Power Supply	MagTech	SPU24-104	01290800

Cables							
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2		
DC Leads	No	2.0	No	DC Power Supply	EUT - RFiD reader		
AC Power	No	1.8	No	DC Power Supply	AC Mains		
Serial	Yes	1.75	No	EUT - RFiD reader	Notebook PC		
DC Leads	No	1.2	PA	Notebook PC Power Supply	Notebook PC		
AC Power	No	1.9	No	Notebook PC Power Supply	AC Mains		
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.							

Measurement Equipment							
Description	Manufacturer	Model	Identifier	Last Cal	Interval		
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo		

#### **Test Description**

**Requirement**: Per 47 CFR 15.247(d), in any 100 kHz bandwidth outside the authorized band, the maximum level of radio frequency power must be at least 20dB down from the highest emission level within the authorized band. The measurement is made with the spectrum analyzer's resolution bandwidth set to 100 kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

**Configuration**: The spurious RF conducted emissions were measured with the EUT set to low, medium, and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency.

Completed by: Rochy Le Releng

NORTHWEST								
EMC		EMISSIONS	DATA SHEET		Rev BETA 01/30/01			
EUT:	IM5			Work Order:	ITRM0091			
Serial Number:	19210509078			Date:	10/17/05			
Customer:	Intermec Technologies Corporatio	n		Temperature:	70 °F			
Attendees:	Scott Holub		Tested by: Rod Peloquin	Humidity:	49% RH			
Customer Ref. No.:	None		Power: 120VAC/60Hz	Job Site:	EV06			
TEST SPECIFICATION	S							
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method: DA 00-705, ANSI C63.4	Year:	2003			
SAMPLE CALCULATIC	INS							
COMMENTS								
EUT OPERATING MOD	ES							
Modulated 40 kbps dat	a rate							
DEVIATIONS FROM TE	ST STANDARD							
None								
REQUIREMENTS								
Maximum level of any	spurious emission outside of the a	uthorized band is 20 dB down from	the fundamental					
RESULTS								
Pass								
SIGNATURE								
Tested By:	Nochy Le Pielings Tested BV:							
DESCRIPTION OF TES	т							
DESCRIPTION OF TES	Antonno Oraci	wated Countered First		- 2011-				
	Antenna Cond	lucted Spurious Em	issions - Low Channel OMF	IZ-3GHZ				

### Antenna Conducted Spurious Emissions - Low Channel 0MHz-3GHz

	Mkr 🛆	906MHz		68.50dв						
30.0	Ref Lvl*:	30.OdBm	ν.	,		10dB/		Atten 200	dB	
20.0										
20.0										
10.0						:				
0.0						:				
-10.Q						· ·				
-20.Q						· · · · · · · ·				
-30.Q						:				
-40.Q							¥			
-50.Q	have a start and the start and the	with appression	noffelongeforner groefel	Kuzensensensensensensensensensensensensense	veledered	: Minnunalaphi	re-	wyelengerstaathaan mitat	which and a second	mathing
-60.Q										
-70.0										
	OMHz		to	3.0	OOGHz					
	ResBW 10	OkHz		V:	idBW 3003	kHz		SWP	1.75	
	LEVEL		SPAN	м	cr 1.8	18GHz				
	KNOB 2		KNOB 1	KI	EYPAD	Т	ektronix	2784		

NORTHWEST								
EMC	EMISSIONS	DATA SHEET	Rev BETA 01/30/01					
EUT:	IM5		Work Order: ITRM0091					
Serial Number:	19210509078		Date: 10/17/05					
Customer:	Intermec Technologies Corporation		Temperature: 70 °F					
Attendees:	Scott Holub	Tested by: Rod Peloquin	Humidity: 49% RH					
Customer Ref. No.:	None	Power: 120VAC/60Hz	Job Site: EV06					
TEST SPECIFICATION	IS							
Specification:	47 CFR 15.247(d) Year: 2005-04	Method: DA 00-705, ANSI C63.4	Year: 2003					
SAMPLE CALCULATI	ONS							
COMMENTS								
EUT OPERATING MO	DES							
Modulated 40 kbps da	ata rate							
DEVIATIONS FROM T	EST STANDARD							
None								
REQUIREMENTS	convious emission sutside of the sutherized hand is 20 dB down	from the fundamental						
Maximum level of any	spurious emission outside of the authorized band is 20 dB down	irom the fundamental						
RESULTS								
Pass								
Rocky le Felings								
Tested By:	V							
DESCRIPTION OF TES	ST							
	Antonna Conducted Sourious Em	issions - Low Channel 3GL						
	Antenna Conducted Spurious Emissions - Low Channel 3GHZ-6.5GHZ							

Antenna Conducted Spurious Emissions - Low Channel 3GHz-6.5GHz

											Tek
30.0	Ref Lvl <sup>;</sup>	30.OdBm				10d	в/		Atten 20	dB	
						:					
20.0						:					
10.Q						:					
0.0						•					
-10.Q											
-20.Q											
-30.Q											
-40.Q											
-50.0	mandap/marka	mmharacanterm	en waarden waarden	wayerwaylagetectivaterrande	ward	nthennenheithe	Marye Armond Armond	eathrough work and	where we are the second s	wayaloodhaa wa	innerstandhright
- 60 0											
-00.0											
-70.0	2.990	)GHz	to	6.5	OOGHz	2					<u> </u>
	ResBW 10	)0kHz		V:	idBW	300kHz			SWP	2.05	
	LEVEL		SPAN	St	trt	2.990G	Hz				
	KINOB 2		KNOB 1	KI	EYPAD		Te	ktronix	2784		

NORTHWEST								
EMC		EMISSIONS [	DATA SH	EET		Rev BETA 01/30/01		
EUT:	IM5				Work Order:	ITRM0091		
Serial Number:	19210509078				Date:	10/17/05		
Customer:	Intermec Technologies Corporation	1			Temperature:	70 °F		
Attendees:	Scott Holub		Tested by:	Rod Peloquin	Humidity:	49% RH		
Customer Ref. No.:	None		Power:	120VAC/60Hz	Job Site:	EV06		
TEST SPECIFICATION	IS							
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method:	DA 00-705, ANSI C63.4	Year:	2003		
SAMPLE CALCULATI	ONS							
COMMENTS								
EUT OPERATING MO	DES							
Modulated 40 kbps da	ita rate							
DEVIATIONS FROM T	EST STANDARD							
None								
REQUIREMENTS		with a mineral learned in 20 d.D. damas from	m the fundamental					
Maximum level of any	spurious emission outside of the at	uthorized band is 20 dB down fro	m the fundamental					
RESULTS								
Pass								
SIGNATURE								
	Rocky te Relings							
Tested By:								
DESCRIPTION OF TES	ST							
	Antenna Conduct	ed Spurious Emis	sions - Low	Channel 6 5G	Hz-10GHz			

Antenna Conducted Spurious Emissions - Low Channel 6.5GHz-10GHz

											Tek
30.0	Ref Lvl	*30.OdBm				10dB	/		Atten 200	iB	
						:					
20.0						:					
10.Q											
0.Q											
-10.Q											
-20.Q											
-30.Q						•					
-40.Q											
-50.0	, here is a superior of the second	and the and the state	angen router and	Malasanipelatarplaningst-	meren a	ntweeter the Annual Construction	Munhwhata		epierekory, jejereko	www.weiter	under Apple Barely and a start
-60.0											
-70.Q						•					
	6.499	∋GHz	to	10.0	OOGHz	:					
	ResBW 10	DOkHz			idBW :	300kHz			SWP	2.05	
	LEVEL		SPAN	S1	trt	6.499GH	z				
	KINOB 2		KNOB 1	KI	EYPAD		Te	ktronix	2784		

EMC	EMISSIONS	DATA SHEET		Rev BETA 01/30/01						
EUT:	IM5		Work Order:	ITRM0091						
Serial Number:	19210509078		Date:	10/17/05						
Customer:	Intermec Technologies Corporation		Temperature:	70 °F						
Attendees:	Scott Holub	Tested by: Rod Peloquin	Humidity:	49% RH						
Customer Ref. No.:	None	Job Site:	EV06							
TEST SPECIFICATION	IS									
Specification:	47 CFR 15.247(d) Year: 2005-04	Method: DA 00-705, ANSI C63.4	Year:	2003						
SAMPLE CALCULATI	ONS									
COMMENTS										
EUT OPERATING MO	DES									
Modulated 40 kbps da	ita rate									
DEVIATIONS FROM T	EST STANDARD									
None										
REQUIREMENTS										
Maximum level of any	spurious emission outside of the authorized band is 20 dB dow	n from the fundamental								
RESULTS										
Pass										
SIGNATURE										
Rocky te Releng										
reated by:	iested by: P									
DESCRIPTION OF TES	ST									
	Antenna Conducted Spurious I	Emissions - Mid Channel 0M	Hz-3GHz							

#### Antenna Conducted Spurious Emissions - Mid Channel 0MHz-3GHz

	Mkr 🛆	921MHz		∆-66.00aB TC								
30.0	Ref Lvl <sup>;</sup>	30.0dBm	,	7		10dB,	/		Atten 200	цВ		
						•						
20.0						•						
10.0						•						
0.0						:						
-10.0												
-20.Q						· · · · · ·						
-30.Q						•						
-40.Q						•		Υ				
-50.0	www.	www.unalistudatud	walker	  herelatestriceseester	a litera a	11120,20479,4440,0000	n half make	an a	ayddaeywraithaethau phau	mahanananan	Apropriate and the optimistic of the optimistic	
00.0						•						
-60.0												
-70.Q												
	OMHz		to	3.0	OOGHz	Ξ						
	ResBW 10	OkHz		V:	idBW	300kHz			SWP	1.75		
	LEVEL		SPAN		trt	OMHz						
	KNOB 2		KNOB 1	к	EYPAD		Te	ktronix	2784			

NORTHWEST								
FMC	EMISSIONS	5 DATA SHEET		Rev BETA				
EUT:	IM5		Work Order: ITF	RM0091				
Serial Number:	19210509078		Date: 10/	/17/05				
Customer:	Intermec Technologies Corporation		Temperature: 70	°F				
Attendees:	Scott Holub	Tested by: Rod Peloquin	Humidity: 49	% RH				
Customer Ref. No.:	None	Job Site: EV	'06					
TEST SPECIFICATION	S							
Specification:	47 CFR 15.247(d) Year: 2005-04	Method: DA 00-705, ANSI C63.4	4 Year: 200	03				
SAMPLE CALCULATIO	ONS							
COMMENTS								
EUT OPERATING MOD	DES							
Modulated 40 kbps da	ta rate							
DEVIATIONS FROM T	EST STANDARD							
None								
REQUIREMENTS								
Maximum level of any	spurious emission outside of the authorized band is 20 dB dow	n from the fundamental						
RESULTS								
Pass								
SIGNATURE								
Porty le Reling								
Tested By:	÷ V							
DESCRIPTION OF TES	T							
DESCRIPTION OF TES	Antonno Conducted Courieuro F	missions Mid Channel 201						
	Antenna Conducted Spurious El	missions - Mid Channel 3GF	12-0.3GHZ					

Antenna Conducted Spurious Emissions - Mid Channel 3GHz-6.5GHz

					Tek
30.0	Ref Lv1*30.0d	lBm	10dB/	Atten 2	OdB
20.0					
10.0					
0.0					
-10.0					
-20.Q					
-30.Q			· · · · · ·		
-40.Q					
50.0	Allowerson hand a market	worther when when more disk of an Half	manhaman and an and the second and the second s	makety and shall a barred a shall and	and second an and a second second second
-30.0					
-60.Q			· · ·		
-70.Q			:		
	2.990GHz	to	6.500GHz		
	ResBW 100kHz		VidBW 300kHz	នឃា	9 2.0S
	LEVEL	SPAN	Strt 2.990GHz		
	KNOB 2	KNOB 1	KEYPAD	Tektronix 2784	

NORTHWEST									
EMC	EM	ISSIONS [	DATA SH	EET		Rev BETA 01/30/01			
EUT:	IM5				Work Order:	ITRM0091			
Serial Number:	19210509078				Date:	10/17/05			
Customer:	Intermec Technologies Corporation				Temperature:	70 °F			
Attendees:	Scott Holub		Tested by:	Rod Peloquin	Humidity:	49% RH			
Customer Ref. No.:	None	120VAC/60Hz	Job Site:	EV06					
TEST SPECIFICATION	IS								
Specification:	47 CFR 15.247(d) Yea	ar: 2005-04	Method:	DA 00-705, ANSI C63.4	Year:	2003			
SAMPLE CALCULATI	ONS								
COMMENTS									
EUT OPERATING MO	DES								
Modulated 40 kbps da	ta rate								
DEVIATIONS FROM T	EST STANDARD								
None									
REQUIREMENTS									
Maximum level of any	spurious emission outside of the authorize	ed band is 20 dB down fro	m the fundamental						
RESULTS									
Pass									
SIGNATURE									
Rocky Le Reling									
Tested By:									
DESCRIPTION OF TES	ST								
	Antenna Conducted S	Spurious Emis	sions - Mid (	Channel 6.5G	Hz-10GHz				
1									

Antenna Conducted Spurious Emissions - Mid Channel 6.5GHz-10GHz

										Tek
30.0	Ref Lvl <sup>;</sup>	*30.OdBm				10dB/		Atten 200	зВ	
20.0										
20.0										
10.0						•				
0.0										
-10.Q										
-20.Q						· · · · · · · ·				
-30.Q						•				
-40.Q						-				
-50.0	and reading the strategy and	, and international production of the second sec	approved and the	have to reply the second	and the	for many providence	Handow Marker Marker	er and the second second	ywydłyn paława w sawa sawa sawa sawa sawa sawa sa	enneddwraidwraid ango
-60 0										
-00.0										
-70.0	6.499	9GHz	to	10.0	OOGH2	5	1	1	1	L
	ResBW 100kHz V		/idBW 300kHz			SWP	2.05			
	LEVEL		SPAN	s	trt	6.499GHz				
	KNOB 2		KNOB 1	K	EYPAD	Τe	ektronix	2784		

NORTHWEST	EMISSIONS								
EMC	EIVIISSIUNS	DATA SHEET	Rev BETA 01/30/01						
EUT:	IM5		Work Order: ITRM0091						
Serial Number:	19210509078		Date: 10/17/05						
Customer:	Intermec Technologies Corporation		Temperature: 70 °F						
Attendees:	Scott Holub	Tested by: Rod Peloquin	Humidity: 49% RH						
Customer Ref. No.:	None	Job Site: EV06							
TEST SPECIFICATION	IS								
Specification:	47 CFR 15.247(d) Year: 2005-04	Method: DA 00-705, ANSI C63.4	Year: 2003						
SAMPLE CALCULATI	ONS								
COMMENTS									
EUT OPERATING MO	DES								
Modulated 40 kbps da	ata rate								
DEVIATIONS FROM T	EST STANDARD								
None									
REQUIREMENTS									
Maximum level of any	spurious emission outside of the authorized band is 20 dB down	rom the fundamental							
RESULTS									
Pass									
SIGNATURE									
Rocky le Releng									
Tested By:	Tested By:								
DESCRIPTION OF TEST									
	Antenna Conducted Spurious Em	vissions - High Channel OM	Hz-3GHz						

## Antenna Conducted Spurious Emissions - High Channel 0MHz-3GHz

	Mkr 🛆	933MHz	33MHz 🛆 -65.50dB								
30.0	Ref Lvl	*30.OdBm				10dB/		Atten 200	1B		
				ľ							
20.0											
10.0											
0.0											
-10.0											
-20.0											
-30.0											
-40.0							Y				
-50.0	wyshipper a freedow	rdy provident and	ernansantaharanatad	Kapanetheran	when	: hurrisressenserations	any descenter	muradoration and the optim	weller warden when	galdyn, minner o ar an	
-60.0											
70.0											
-70.0	OMHz	I	to	3.0	OOGHz		1	I		<u> </u>	
	ResBW 10	OOkHz		v	idBW 3(	OOkHz		SWP	1.75		
	LEVEL		SPAN	S1	trt (	OMHz					
	KNOB 2		KNOB 1	KI	EYPAD	Te	ktronix	2784			

NORTHWEST									
FMC		EMISSIONS D	DATA SH	EET		Rev BETA			
EUT	IM5				Work Order:	01/30/01			
Serial Number:	10210500078				Date:	10/17/05			
Gustomor:	Intermos Technologies Corporation				Tomporaturo:	70 °E			
Attendees:	Scott Holub		Tostod by:	Rod Pologuin	Lumiditu:	10 F			
Customer Ref. No :	None		lob Site:	43% KH					
TEST SPECIFICATION	IS	1207A0/00112	oob one.	2000					
Specification:	47 CER 15 247(d)	Year: 2005-04	Method:	DA 00-705 ANSI C63 4	Year	2003			
SAMPLE CALCULATI	ONS	1001. 2000 04	inctriou.	DA 00 100, ANOI 000.4	reur.	2000			
COMMENTS									
EUT OPERATING MO	DES								
Modulated 40 kbps da	ita rate								
<b>DEVIATIONS FROM T</b>	EST STANDARD								
None									
REQUIREMENTS									
Maximum level of any	spurious emission outside of the au	thorized band is 20 dB down from	m the fundamental						
RESULTS									
Pass									
SIGNATURE									
Portug la Reling									
Tested By:	Tested By:								
DESCRIPTION OF TES	ST								
	Antenna Conduct	ed Spurious Emis	sions - High	Channel 3G	17-6 5GHz				
		eu Spurious Erris	SIGHS - HIGH	Channel SGr	12-0.3002				

Antenna Conducted Spurious Emissions - High Channel 3GHz-6.5GHz

					Tek
30.0	Ref Lv1*30.0	dBm	10dB/	Atten 20	dB
20.0					
10.0					
0.0					
-10.0					
-20.0					
-30.0			:		
-40.Q				h Marian	and wanted and the second and the se
-50.Q	nerester opposition with restricted the state of the stat	have been a second and the second and the second	alle and a set of the second	and which a second with a state of the second s	
-60.0					
70.0					
-70.Q	2.990GHz	to	6.500GHz	II	
	ResBW 100kHz		VidBW 300kHz	SWP	2.05
	LEVEL	SPAN	Strt 2.990GHz		
1	KINOB 2	KNOB 1	KEYPAD Te	ktronix 2784	

NORTHWEST	_									
EMC	E	MISSIONS L	DATA SHE	:EI		Rev BETA 01/30/01				
EUT:	IM5				Work Order:	ITRM0091				
Serial Number:	19210509078				Date:	10/17/05				
Customer:	Intermec Technologies Corporation				Temperature:	70 °F				
Attendees:	Scott Holub		Tested by: F	od Peloquin	Humidity:	49% RH				
Customer Ref. No.:	None	20VAC/60Hz	Job Site:	EV06						
TEST SPECIFICATION	IS									
Specification:	47 CFR 15.247(d)	Year: 2005-04	Method:	A 00-705, ANSI C63.4	Year:	2003				
SAMPLE CALCULATION	ONS									
COMMENTS										
EUT OPERATING MOI	DES									
Modulated 40 kbps da	ta rate									
DEVIATIONS FROM T	EST STANDARD									
None										
REQUIREMENTS		anima di hana di a 20 dD davum fua	m the fundamental							
Maximum level of any	spurious emission outside of the autho	orized band is 20 dB down fro	om the fundamental							
RESULTS										
Pass										
SIGNATURE	1									
	Rocky to Reling									
Tested By:										
DESCRIPTION OF TES	T									
	Antenna Conducted	d Spurious Emis	sions - High C	hannel 6.5G	Hz-10GHz					

Antenna Conducted Spurious Emissions - High Channel 6.5GHz-10GHz

											Tek
30.0	Ref Lvl*	30.0dBm				10dB/			Atten 200	1B	
20.0											
20.0						: :					
10.0						· · · · · · · · · · · · · · · · · · ·					
0.0											
-10.Q						· ·	_				
-20.Q						· · · · · · · ·					
-30.Q						· ·					
-40.Q											
-50.Q	erestant which and	48/18 <sup>4/144</sup> 110940-14440014	And a strategy and the state of	the (n-comparison the south and the south an	w <b>.4</b> 4.447.,	monorigination	white	president of the second of the	operatives appendix the	whensuppherments	handerstander
-60.0											
-70.0						•					
	6.499	GHz	to	10.0	OOGHz	:					
	ResBW 100kHz		v	/idBW 300kHz				SWP	2.05		
	LEVEL		SPAN	SI	trt	6.499GHz					
	KNOB 2		KNOB 1	KI	EYPAD		Tektı	conix	2784		



#### Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Low
Mid
High

#### **Operating Modes Investigated:** No Hop

#### Antennas Investigated: Mobile Mark Patch Antenna, M/N: PN10-915RCP1, Intermec Part # 805-629-001 Maxrad Patch Antenna, M/N: MP8906, Intermec Part #805-610-001 Intermec Patch Antenna, M/N: ITA915017, Intermec Part #ITA915017

#### Data Rates Investigated:

Maximum (40kBps)

#### Output Power Setting(s) Investigated: Maximum

#### Power Input Settings Investigated: 120VAC/60Hz

Frequency Range Invest	gated		
Start Frequency	30 MHz	Stop Frequency	10 GHz

Software\Firmware Applied During Test										
Exercise software	CTI AppVer 1.2.1 Build 25	Version	Firmware v3.09							
Description										
The system was tested us	ing special software develo	ped to test all functions of t	he device during the test.							

EUT and Peripherals			
Description	Manufacturer	Model/Part Number	Serial Number
EUT - RFiD reader	Intermec Technologies Corporation	IM5	19210509018
DC Power Supply	MagTech	SPU24-104	01290800
Patch Antenna	Mobile Mark	PN10-915RCPI (Intermec Part #805-62	Unknown
Patch Antenna	Maxrad	MP8906 (Intermec Part #805-610-001)	Unknown
Antenna - Card programmer	Intermec Technologies Corporation	ITA915017	Unknown

Remote Equipment Outside of Test Setup Boundary											
Description	Manufacturer	Model/Part Number	Serial Number								
Notebook PC	Dell	Latitude LM TS30G	K0204A								
Notebook PC Power Supply	Dell	TSA8	none								
Equipment isolated from the EUT so as not to co	ontribute to the measureme	nt result is considered to be outside the	ne test setup boundary								

Cables										
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2					
DC Leads	No	2.0	No	DC Power Supply	EUT - RFiD reader					
AC Power	No	1.8	No	DC Power Supply	AC Mains					
Serial	Yes	3.0	No EUT - RFiD reader Notebook PC							
DC Leads	No	1.2	PA	Notebook PC Power Supply	Notebook PC					
AC Power	No	1.9	No	Notebook PC Power Supply	AC Mains					
Antenna	Yes	3.3	No	EUT - RFID reader	Patch Antenna (Mobile Mark)					
Antenna	Yes	1.4	No	EUT - RFID reader	Patch Antenna (Maxrad)					
Antenna	Yes	1.4	No	EUT - RFID reader	Card reader (Intermec)					
PA = Cable is p	PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.									

Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Agilent	E4446A	AAQ	06/15/2005	13 mo
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo
Antenna, Horn	EMCO	3115	AHC	08/30/2005	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	AOL	08/02/2005	13 mo
Pre-Amplifier	Miteq	AMF-4D-010100-24- 10P	APW	08/02/2005	13 mo
Low Pass Filter 0-425 MHz	Micro-Tronics	LPM50003	LFB	09/28/2005	13 mo
High Pass Filter 1.2 - 18 GHz	Micro-Tronics	HPM50108	HFV	09/28/2005	13 mo
.5-1 GHz Notch Filter	K&L Microwave	3TNF-500/1000-N/N	HFT	08/04/2005	13 mo



#### **Test Description**

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

**Configuration**: The highest gain of each type of antenna to be used and the lowest gain overall were tested with the EUT. Previous FCC testing of Sinclair SRL-441U Log antenna excluded it from being tested at this time. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

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
	and a section of the hand while the	and detections an edited. No	and a second second second

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

Completed by: Holy Arlingh

	ST		RA		ED E	MISSI	<b>IONS</b>	DATA	SHE	ET		PS	SA 2005.10.04 MI 2005.10.11
	EUT-	IM5								W	ork Order	ITRM0091	
Serial Nu	imber:	192105090	78								Date:	10/18/05	
Cust	tomer:	Intermec T	echnologi	es Corpora	tion					Ten	nperature:	23	
Atter	ndees:	None									Humidity:	45%	
P	roject:	None					Derrer	4001/40	011-	Barometric	Pressure	30.05	
TEST SPECI	EICATI	HOILY ASH	kannejnad				Power:	Test Meth	od		Job Site:	EV01	
FCC 15.247(c	d) Spur	ious Radia	ted Emissi	ons:2005-9				ANSI C63	4.2003				
100 13.247(	u) opui			0113.2003-0	,			ANOI 000.	4.2000				
	METER	s											
Antenna Hei	abt(s) (	(m)	1 - 1				Test Dista	nce (m)	3				
COMMENTS	gin(0) (	,	1 7				Tool Diola		Ū				
Mobile Mark	Patch	Antenna, Ir	ntermec Pa	rt # 805-62	9-001.								
		,,,											
EUT OPERA	TING M	IODES											
Transmit low	v chanr	nel, no hop											
DEVIATIONS No doviction	FROM	FIEST STA	INDARD										
Run #	з. 	1											
Configuratio	n#					11 1	A lin	2					
Results		Pa	SS		Signature	Holy /	Juli						
80.0													_
00.0													
													-
70.0													
60.0													_
50.0	-												_
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<b>5</b> 40.0		*									2		
뜅													
30.0													
30.0													
20.0	-												
10.0	-												
0.0							_						
250	00.000		300	0.000		3500.00	0	40	00.000		4500.00	00	
							MHz						
							-						
						1	External		1	Distance		1	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)
2707.57	2	43.5	1.4	79.0	1.9	3.0	0.0	V-Horn	AV	0.0	44.9	54.0	-9.1
2707.55	2	42.8	1.4	92.0	1.9	3.0	0.0	V-Horn	AV	0.0	44.2	54.0	-9.8
2707.60	99 96	42.3	1.4 5 7	96.0	1.9 1.9	3.0	0.0	V-Horn	AV AV	0.0	43.7 41 4	54.0	-10.3
4512.02	.0 24	33.1	5.7	129.0	1.8	3.0	0.0	H-Horn	AV	0.0	38.8	54.0	-12.0
4512.62	25	32.9	5.7	23.0	1.8	3.0	0.0	V-Horn	AV	0.0	38.6	54.0	-15.4
2707.59	97	37.1	1.4	142.0	3.6	3.0	0.0	H-Horn	AV	0.0	38.5	54.0	-15.5
2707.60	)1	36.1	1.4	136.0	3.6	3.0	0.0	H-Horn	AV	0.0	37.5	54.0	-16.5
4512.63	80	31.6	5.7	63.0	1.8	3.0	0.0	H-Horn	AV	0.0	37.3	54.0	-16.7
4512.57	<u></u>	31.3	5.7	168.0	1.8	3.0	0.0	V-Horn	AV	0.0	37.0	54.0	-17.0
2101.52 4512 63	.5 17	30.4 30.8	1.4	132.U 38.0	3.0 1.8	3.U 3.0	0.0	N-Horn	AV AV	0.0	30.8 36.5	54.U 54.0	-17.2
2707.65	 54	52.6	1.4	79.0	1.9	3.0	0.0	V-Horn	PK	0.0	54.0	74.0	-20.0
2707.44	10	51.3	1.4	92.0	1.9	3.0	0.0	V-Horn	PK	0.0	52.7	74.0	-21.3
2707.50	8	50.9	1.4	96.0	1.9	3.0	0.0	V-Horn	PK	0.0	52.3	74.0	-21.7
4512.58	32	43.6	5.7	124.0	1.8	3.0	0.0	H-Horn	PK	0.0	49.3	74.0	-24.7
4512.49	96	42.5	5.7	129.0	1.8	3.0	0.0	H-Horn	PK	0.0	48.2	74.0	-25.8
4512.54	HU NG	41.9	5.7	23.0	1.8	3.0	0.0	V-Horn	PK	0.0	47.6	74.0	-26.4
4012.02 4512.02	.0 '1	41.7 41.0	5.7	03.0 168.0	1.0	3.0 3.0	0.0	V-Horn	PK	0.0	47.4 46.7	74.0 74.0	-20.0 -27.3
2707.42	.2	45.1	1.4	142.0	3.6	3.0	0.0	H-Horn	PK	0.0	46.5	74.0	-27.5

						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)
2707.569	44.6	1.4	136.0	3.6	3.0	0.0	H-Horn	PK	0.0	46.0	74.0	-28.0
4512.613	40.0	5.7	38.0	1.8	3.0	0.0	V-Horn	PK	0.0	45.7	74.0	-28.3
2707.350	43.7	1.4	132.0	3.6	3.0	0.0	H-Horn	PK	0.0	45.1	74.0	-28.9
2707.350	43.7	1.4	132.0	3.6	3.0	0.0	H-Horn	PK	0.0	45.1	74.0	-28.9

N	orthwest			R/	ADIAT	ED E	MISSI	ONS	DATA	SHE	ET		P	SA 2005.10.04 MI 2005.10.11
	EL	JT:	IM5								W	ork Order:	ITRM0091	
Se	rial Numb	er:	192 <u>10</u> 509	078								Date:	10/18/05	
	Custom	er:	Intermec	Technolog	ies Corpora	tion					Ter	nperature:	23	
	Attende	es:	None									Humidity:	45%	
	Proje	ect:	None	kannaihad				Bower	1201/10 4	2011-7	Barometri	C Pressure	30.05	
TEST	SPECIFIC	ATI	DNS	kannejnau				Power:	Test Metho	od		Job Sile.		
FCC 1	5.247(d) S	pur	ous Radi	ated Emiss	ions:2005-9	9			ANSI C63	4:2003				
TEST	PARAMET	TER	S											
Anten	na Height	(s) (	m)	1 - 4				Test Dista	nce (m)	3				
COMN	IENTS													
Mobile	Mark Pat	ch /	Antenna, I	ntermec Pa	art # 805-62	9-001.								
Transi DEVIA	mit mid ch TIONS FR	anr ROM	el, no ho TEST ST	o. ANDARD										
Run #	viations.			2										
Confic	juration #						11 0	1 linh-	0					
Result	s		P	ass	1	Signature	Holy )	and						
						<u> </u>								
	80.0													
	70.0													
	60.0 -													
	50.0													•
HBuV/m	40.0 -													•
	30.0 -	•												
	20.0													
	10.0													
	0.0 +		00000	000 010	000 00		0500.000	0700.00		000 41	00.000		4500.00	
	2700.0	000	2900.0	00 310	0.000 33	800.000	3500.000	3700.00 MHz	0 3900	.000 41	00.000 4	1300.000	4500.00	0
	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)
4	575.122	_	35.1	5.8	212.0	1.8	3.0	0.0	H-Horn	AV	0.0	40.9	54.0	-13.1
4	575.163		32.8	5.8	84.0	1.8	3.0	0.0	V-Horn	AV	0.0	38.6	54.0	-15.4
2	575 020		33.3 44 R	1.5 5.9	77.0 212.0	2.2	3.U 3.0	0.0	V-Horn H-Horn	AV	0.0	34.8 50 6	54.0 74.0	-19.2
4	745.072		-++.0 29.0	5.0 1.5	5.0	2.8	3.0	0.0	H-Horn	AV	0.0	30.5	54 0	-23.4
4	574.978		42.3	5.8	84.0	1.8	3.0	0.0	V-Horn	PK	0.0	48.1	74.0	-25.9
2	745.231		43.5	1.5	77.0	2.2	3.0	0.0	V-Horn	PK	0.0	45.0	74.0	-29.0
2	744.863		39.1	1.5	5.0	2.8	3.0	0.0	H-Horn	PK	0.0	40.6	74.0	-33.4

N	IORTHWEST		RA		ED E	MISS	IONS	DATA	SHE	ET		P	SA 2005.10.04 MI 2005.10.11
	EUT:	IM5								W	ork Order:	ITRM0091	
Se	rial Number:	192105090	78								Date:	10/18/05	
	Customer:	Intermec T	echnologi	es Corpora	tion					Ter	nperature:	23	
	Attendees:	None								Parametri	Humidity:	45%	
-	Tested by:	Holly Ash	anneihad				Power:	120VAC 6	0Hz	Darometrie	Job Site	EV01	
TEST	SPECIFICATI	ONS	annojnaa				T OWER.	Test Metho	d		005 0110.		
FCC 1	5.247(d) Spur	ious Radia	ted Emiss	ions:2005-9	)			ANSI C63.4	4:2003				
TEST	PARAMETER	S											
Anten	na Height(s) (	m)	1 - 4				Test Dista	nce (m)	3				
COMN	IENTS												
Mobile	e Mark Patch	Antenna, Ir	ntermec Pa	rt # 805-62	9-001.								
EUT O Transi DEVIA	PERATING M mit high chan TIONS FROM	IODES nel, no hoj I TEST STA	D. NDARD										
No de	viations.												
Run #		3	3			20.000		0					
Config	guration #			4	Ciarrat	Holes 1	stigh	2					
Result	IS	Ра	55		Signature	11.01							
	80.0												
	70.0												
	60.0												
	50.0												
BuV/m	40.0												
q	30.0											•	
	20.0												
	10.0												
	0.0		2100	000 3300			2700.000	2000.000			000 450		
	2700.000	2900.00	JU 3100.	000 3300	5.000 35	.00.000	MHz	3900.000	4100.0	4300.	UUU 40U	0.000 47	
	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)
4	637.639	31.2	5.9	84.0	2.6	3.0	0.0	V-Horn	AV	0.0	37.1	54.0	-16.9
2	782.529	33.7	1.7	59.0	1.9	3.0	0.0	V-Horn	AV	0.0	35.4	54.0	-18.6
4	637.657	29.5	5.9	29.0	2.0	3.0	0.0	H-Horn	AV	0.0	35.4	54.0	-18.6
2	637 410	27.8	1./	15.0 84.0	2.9	3.U 3.0	0.0	H-Horn	AV	0.0	29.5 48.2	54.0 74.0	-24.5
4	637.713	40.5	5.9	29.0	2.0	3.0	0.0	H-Horn	PK	0.0	46.4	74.0	-25.6
2	782.469	42.6	1.7	59.0	1.9	3.0	0.0	V-Horn	PK	0.0	44.3	74.0	-29.7
2	782.638	38.4	1.7	15.0	2.9	3.0	0.0	H-Horn	PK	0.0	40.1	74.0	-33.9

N	ORTHWEST				<b>D</b> -4		A <b>T</b>			- 1.	116									1.1.5		5-						F	SA 2005.10.04
E E	EMC				RA	D	AI	E	ינ			22		Л	vS		DA	ľ	13	FIL	2 E								MI 2005.10.11
	EU	Г: IM5																					V	Vork	(Or	der:	ITRI	4009 <sup>,</sup>	
Se	rial Numbe	r: 192	105090	78																			_		D	ate:	10/1	9/05	
	Attendee	r: Inte	ermec I	echn	ologi	es Co	rpora	ation															Ie	mp L	erat	ure:	23		
	Proiec	t: Nor	1e 1e																		В	aror	netri	ic P	ress	sure	30.0	5	
	Tested b	y: Roo	d Peloq	uin										Ρ	owe	er:	120VA	C/6	0Hz					J	ob S	Site:	EV0	1	
TEST	SPECIFICA	TIONS	3													_	Test M	ethe	bd										
FCC 1	PARAMETERS																ANSI (	263.	4:200	03									
TEST I	PARAMETE	RS ) (m)		1 - 4									Т	est	Dis	tar	nce (m	)	1		3								
COMM	ENTS	, (,																/			0								
Card F	teader Antenna, Intermec Part # ITA915017																												
EUT O	PERATING	MOD	ES																										
Transr DEVIA	nit Low cha TIONS FRO	annel, DM TE	no hop ST STA	NDA	RD																								
No dev	viations.	_				_					~						~				_								
Run #	uration #	_	4							/	lor	hum	1	_	Re	lı	na												
Result	uration #s Pass Siau										gnature																		
		Signature V																											
	80.0																												
														-															-
	70.0																												
	60.0 -																												
	50.0				-																								
E	50.0													٠															
3uV/	40.0				•		•	•						•															_
db	30.0									\$																			
	00.0																												
	20.0																												
	10.0																												
	0.0																												
	1000.0	00	2000.0	00	300	0.00	0	400	0.00	0	50	00.0	000	)	60	00.	.000	7	.000	000	8	000	.00	0	90	000.	000	10	000.000
													N	ИН	łz														
			<u> </u>					1		-			1	Ext	ternal	1					1	Dista	nce	1					Compared to
	Freq (MHz)	An (0	nplitude dBuV)	Fac (d	tor B)	Azir (deg	nuth rees)	+ (m	leight neters)		Dista (met	ance ters)	A	Atter	nuatic dB)	n	Polar	ity	De	tector	A	djust (dE	ment 3)	A	Adjus dBuV	ted //m	Spe dB	c. Limit uV/m	Spec. (dB)
2	707.530	4	44.0	1.	4	67	7.0		1.6		3	.0		C	0.0		V-Ho	n		AV		0.	0		45.	4	5	4.0	-8.6
2	707.583	4	41.7 41.5	1.	4	91	1.0		1.6		3	.0		0	0.0		V-Ho	orn		AV		0.	0		43.	1	5	4.0	-10.9
2	707.514	-	+1.5 41.1	1.	4	23 27	0.0		1.3		3	.0		r r	).0 ).0		V-HC	orn		AV		0.	0		42. 42	9 5	0	4.0	-11.1
5	415.095	;	31.3	7.	9	14	8.0		1.2		3	.0		C	0.0		V-Ho	orn		AV		0.	0		39.	2	5	4.0	-14.8
5	415.125	;	30.4	7.	9	31	8.0		1.2		3	.0		C	0.0		V-Ho	n		AV		0.	0		38.	3	5	4.0	-15.7
5	415.136	:	30.1	7.	9	12	6.0		1.4		3	.0		C	0.0		H-Ho	n		AV		0.	0		38.	0	5	4.0	-16.0
4	512.613	:	31.9	5.	7	16	1.0		1.2		3	0.0		0	0.0		V-Ho	n	,	4V ^\/		0.	U O		37.	б 7	5	4.0	-16.4
5	+15.098 707 573		∠o.o 35.3	7. 1	9 4	-14	0.0		1.∠ 3.0		3	0		r r	) () ) ()		v-HC H-Hc	orn		πv AV		0.	0		36	' 7	5	4.0 4.0	-17.3
5	415.069		28.0	7.	9	21	.0 4.0		1.2		3	.0		0	).0		V-Ho	orn		AV		0.	0		35.	9	5	4.0	-18.1
3	610.078	;	31.0	4	3	29	1.0		3.0		3	.0		C	0.0		H-Ho	orn		AV		0.	0		35.	3	5	4.0	-18.7
4	512.596	:	29.5	5.	7	10	3.0		1.2		3	.0		C	0.0		V-Ho	rn		AV		0.	0		35.	2	5	4.0	-18.8
4	512.585	:	28.3	5.	7	13	7.0		1.2		3.	.0		C	0.0		V-Ho	rn		AV		0.	0		34.	0	5	4.0	-20.0

2707.507

2707.244

2707.542

2707.472

3610.009

5415.196

28.0

51.5

50.3

49.3

49.1

25.3

39.7

5.7

1.4

1.4

1.4

1.4

4.3

7.9

155.0

67.0

91.0

237.0

270.0

85.0

318.0

2.2

1.6

1.6

1.3

1.3

1.2

1.2

3.0

3.0

3.0

3.0

3.0

3.0

3.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

H-Horn

V-Horn

V-Horn

V-Horn

V-Horn

V-Horn

V-Horn

AV

ΡK

ΡK

ΡK

ΡK

AV

ΡK

0.0

0.0

0.0

0.0

0.0

0.0

0.0

33.7

52.9

51.7

50.7

50.5

29.6

47.6

54.0

74.0

74.0

74.0

74.0

54.0

74.0

-20.3

-21.1 -22.3

-23.3

-23.5

-24.4

-26.4

						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)
5414.868	39.3	7.9	140.0	1.2	3.0	0.0	V-Horn	PK	0.0	47.2	74.0	-26.8
5414.852	39.1	7.9	148.0	1.2	3.0	0.0	V-Horn	PK	0.0	47.0	74.0	-27.0
5415.428	39.0	7.9	126.0	1.4	3.0	0.0	H-Horn	PK	0.0	46.9	74.0	-27.1
5415.243	38.6	7.9	214.0	1.2	3.0	0.0	V-Horn	PK	0.0	46.5	74.0	-27.5
4512.596	40.8	5.7	103.0	1.2	3.0	0.0	V-Horn	PK	0.0	46.5	74.0	-27.5
4512.487	40.7	5.7	161.0	1.2	3.0	0.0	V-Horn	PK	0.0	46.4	74.0	-27.6
3610.091	40.5	4.3	291.0	3.0	3.0	0.0	H-Horn	PK	0.0	44.8	74.0	-29.2
2707.569	43.2	1.4	-1.0	3.0	3.0	0.0	H-Horn	PK	0.0	44.6	74.0	-29.4
4512.686	38.4	5.7	137.0	1.2	3.0	0.0	V-Horn	PK	0.0	44.1	74.0	-29.9
4512.329	38.3	5.7	155.0	2.2	3.0	0.0	H-Horn	PK	0.0	44.0	74.0	-30.0
3610.009	38.2	4.3	85.0	1.2	3.0	0.0	V-Horn	PK	0.0	42.5	74.0	-31.5

NC	DRTHWEST		<b>D</b> .(						DAT						PS	A 2005.10.04
E	MC		R/		ED E	MISSI	O	45	DAI	A SH	381				EN	MI 2005.10.11
0	EUT:	IM5	70									W	ork Orde	ITRM	0091	
Ser	Customer:	Intermec T	i o echnoloai	es Corpor	ation							Ter	Date	23 10/19	//05	
	Attendees:	None			-								Humidity	: 45%		
	Project: Tested by:	None Rod Pelog	uin				Р	ower.	120VAC	/60Hz	Bare	ometrio	Job Site	e 30.05	5	
TEST S	SPECIFICATI	ONS						5461.	Test Me	thod			JOD OIL			
FCC 15	5.247(d) Spur	ious Radia	ted Emiss	ions:2005	-9				ANSI C6	63.4:2003						
TEST P	PARAMETER	S	4 4				Teet	Diete	noo (m)		2					
COMM	ENTS	m)	1 - 4				Test	Dista	nce (m)		3					
Card R	eader Anten	na, Interme	ec Part # IT	A915017												
EUT OF Transm DEVIAT	PERATING M nit Mid chanr	IODES nel, no hop														
No dev	viations.			T												
Run # Confia	uration #		•			Rochunt	2 3	Relu	39							
Results	S	Pa	SS		Signature	0		0	15							
	80.0															
	70.0 -															
	60.0															_
<u>د</u>	50.0		•			\$										-
dBuV	40.0		•													_
	30.0		•													-
	20.0															_
	10.0															_
	0.0	2000 (	00 200		4000.000	5000.00	 	6000		7000.000					100	
	1000.000	2000.0	500 300		+000.000	5000.00	MF	- soot		,000.000	000	.000	, 9000		100	00.000
	Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	Ext Atter	ternal nuation dB)	Polarity	Detector	Dis Adju	stance ustment (dB)	Adjusted dBuV/m	Spec dBu	. Limit IV/m	Compared to Spec. (dB)
45	575.097	33.4	5.8	72.0	1.2	3.0	0	0.0	V-Horr	n AV		0.0	39.2	54	1.0	-14.8
40 45	575.114	32.0 31.3	5.8	93.0 65.0	1.1	3.0	(	).0 ).0	H-Horr	n AV		0.0	36.6	54 54	+.0 4.0	-16.9
27	745.077	34.3	1.5	73.0	1.5	3.0	C	0.0	V-Horr	n AV		0.0	35.8	54	1.0	-18.2
27 45	(45.052 575.120	33.8 29.3	1.5 5.8	78.0 156 0	1.3 1.8	3.0 3.0	( r	).() ).()	V-Horr H-Horr	ו AV AV		0.0 0.0	35.3 35 1	54 54	1.0 1.0	-18.7 -18.9
27	745.047	29.7	1.5	131.0	2.3	3.0	0	0.0	H-Horr	n AV		0.0	31.2	54	1.0	-22.8
45	575.172 745.061	42.8	5.8 1.5	72.0	1.2	3.0	(	0.0	V-Horr	ו PK איז איז		0.0	48.6 29.1	74	1.0 1.0	-25.4
45	575.269	42.0	5.8	103.0	1.2	3.0	(	).0 ).0	V-Horr	n PK		0.0	47.8	74	1.0	-26.2

45.4

40.9

44.6

39.7

40.5

40.4

2745.092

4575.120

2744.785

4574.800

2744.684

2744.797

1.5

5.8

1.5

5.8

1.5

1.5

78.0

65.0

73.0

156.0

127.0

131.0

1.3

1.8

1.5

1.8

2.7

2.3

3.0

3.0

3.0

3.0

3.0

3.0

0.0

0.0

0.0

0.0

0.0

0.0

V-Horn

H-Horn

V-Horn

H-Horn

H-Horn

H-Horn

ΡK

ΡK

ΡK

ΡK

ΡK

ΡK

0.0

0.0

0.0

0.0

0.0

0.0

46.9

46.7

46.1

45.5

42.0

41.9

74.0

74.0

74.0

74.0

74.0

74.0

-27.1

-27.3

-27.9

-28.5

-32.0

-32.1

N	ORTHWEST												PS	A 2005.10.04
	EMC			RA	DIAT	ED EI	MISS	ONS	DATA	SHE	ET		E	VI 2005.10.11
	E	UT:	IM5								Wo	ork Order:	ITRM0091	
Se	rial Num	ber:	192105090	78								Date:	10/19/05	_
	Attende	ner:	Intermec T	ecnnologi	es Corpora	ation					Ten	perature: Humidity	45%	
	Proj	ect:	None					•			Barometric	Pressure	30.05	
11-10-1	Tested	by:	Rod Peloq	uin				Power:	120VAC/60	)Hz		Job Site:	EV01	
FCC 1	5.247(d) 9	Spuri	ious Radia	ted Emissi	ons:2005-	9			ANSI C63 4	4:2003				
TEST	PARAME	TER	S											
Anten	na Heigh	t(s) (	m)	1 - 4				Test Distar	nce (m)	3	} 			
Card F	Reader A	ntenr	na, Interme	c Part # IT	A915017									
EUT O Transr DEVIA	PERATIN mit High ( TIONS FI	NG M chan ROM	ODES nel, no hop TEST STA	). NDARD										
No dev	viations.	_							,					
Kun # Config	juration #	ŧ	6	,			Rochin L	'n Relen	3					
Result	s		Pa	SS	L	Signature	0-	Ŭ	13					
	80.0													
	70.0 -													_
	60.0 -						•							_
٤	50.0	+				•	•							
dBuV/	40.0	_				<ul> <li>▲</li> <li>↓</li> <li>↓</li></ul>								
	30.0 -			+ + +		•								
	20.0	+											+ + +	_
	10.0												+ + +	_
	0.0 +													_
	1000.	.000	2000.0	000 300	00.000	4000.000	5000.00	00 6000 MHz	.000 70	000.000	8000.000	9000.	000 100	00.000
	Freq		Amplitude	Factor	Azimuth	Height	Distance	External Attenuation	Polarity	Detector	Distance Adjustment	Adjusted	Spec. Limit	Compared to Spec.
4	(MHz) 637.643		(dBuV) 39.5	(dB) 5.9	(aegrees) 76 0	(meters) 1 2	(meters) 3.0	(dB) 0.0	V-Horn	AV	(dB) 0.0	авиV/m 45.4	авиV/m 54 0	(dB) -8.6
2	782.574		40.3	1.7	82.0	1.3	3.0	0.0	V-Horn	AV	0.0	42.0	54.0	-12.0
4	637.562		34.9 34 7	5.9	79.0 101.0	1.3 1 4	3.0 3.0	0.0	H-Horn	AV AV	0.0	40.8 40.6	54.0	-13.2 -13.4
4	637.605		53.1	5.9 5.9	76.0	1.4	3.0 3.0	0.0	V-Horn	PK	0.0	-+0.0 59.0	54.0 74.0	-13.4 -15.0
2	782.610		36.4	1.7	62.0	2.1	3.0	0.0	V-Horn	AV	0.0	38.1	54.0	-15.9
2	637 650		33.7 28.0	1.7 5 0	124.0 143.0	2.2	3.0	0.0	H-Horn H-Horn	AV AV	0.0	35.4	54.0	-18.6 -20.1
4	710.029		29.1	4.7	91.0	1.2	3.0	0.0	V-Horn	AV	0.0	33.8	54.0	-20.2
2 ⊿	782.560 637 459		30.9 46 4	1.7 5 9	342.0 101.0	2.2 1 4	3.0 3.0	0.0	H-Horn V-Horn	AV PK	0.0	32.6 52.3	54.0 74.0	-21.4 -21.7

3710.051

2782.618

2782.093

3710.083

4637.431

2782.360

3709.655

2782.535

46.4

25.9

48.2

45.4

42.2

39.8

42.4

38.0

40.3

79.0

145.0

82.0

62.0

91.0

143.0

124.0

145.0

342.0

5.9

4.7

1.7

1.7

4.7

5.9

1.7

4.7

1.7

3.0

3.0

3.0

3.0

3.0

3.0

3.0

3.0

3.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

1.3

1.2

1.3

2.1

1.2

1.3

2.2 1.2

2.2

H-Horn

H-Horn

V-Horn

V-Horn

V-Horn

H-Horn

H-Horn

H-Horn

H-Horn

ΡK

AV

ΡK

ΡK

ΡK

ΡK

ΡK

ΡK

ΡK

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

52.3

30.6

49.9

47.1

46.9

45.7

44.1

42.7

42.0

74.0

54.0

74.0

74.0

74.0

74.0

74.0

74.0

74.0

-21.7

-23.4

-24.1

-26.9

-27.1

-28.3

-29.9

-31.3

-32.0

N			R	ADIAT	ED E	MISS	IONS		SHE	ET		F	PSA 2005.10.04 EMI 200 <u>5.10.11</u>
	EMC	IME			EPE						ork Order	TDMOGO	4
Se	EUI: rial Number:	IM5 192105090	78							vv	Ork Order: Date:	10/20/05	1
	Customer:	Intermec T	rechnolog	jies Corpora	tion					Ter	nperature	23	
	Attendees:	None									Humidity	45%	
	Project:	None	annaiha	4			Bower	1201/ 10/	∩⊔	Barometric	Pressure	30.21	
TEST	SPECIFICATI	ONS	kannejnad	1			Power:	Test Metho	od		Job Sile.	EVUI	
FCC 1	5.247(d) Spur	ious Radia	ted Emis	sions:2005-9	)			ANSI C63.	4:2003				
TEST	PARAMETER	S	4 4				Test Dista						
COMM	na Height(S)	m)	1 - 4				Test Dista	nce (m)	3	)			
Maxra	d patch anter	nna. Interm	ec part #	805-610-001									
maxia	a paton antoi	ina, interm	oo purt #		•								
EUI C	mit low chang	ioDES nel, no hon	-										
DEVIA	TIONS FROM	I TEST STA	NDARD										
No de	viations.	-		1									
Run #	uration #		/	_		.1 .	NI: 11	2					
Result	ts	Pa	ISS		Sianature	Holy /	Julyer						
	80.0												
	70.0												
	60.0												
			•					•					
	50.0												
E													
Ž	40.0												
Б			•										
σ											<b>i</b>		
	30.0												
	20.0												
	10.0												
	0.0												
	2000.000	2500	0.000	3000.000	3500	.000	4000.000	4500.0	000 5	000.000	5500.0	00 6	000.000
							MU-						
				- <u>-</u>		T	<b>E</b> .4		r	Dist	-	T	0
	Freq	Amplitude	Factor	Azimuth	Height	Distance	External Attenuation	Polarity	Detector	Distance Adjustment	Adjusted	Spec. Limit	Compared to t Spec.
	(MHz)	(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)			(dB)	dBuV/m	dBuV/m	(dB)
2	707.548	42.1	1.4	76.0	1.2	3.0	0.0	V-Horn	AV	0.0	43.5	54.0	-10.5
4	512.624	31.5 34.2	5.7 5.7	241.0 349.0	1.7	3.U 3.0	0.0	⊓-⊓orn V-Horn	AV AV	0.0	43.2 39 9	54.0 54.0	-10.8 -14 1
2	707.623	35.0	1.4	9.0	2.3	3.0	0.0	H-Horn	AV	0.0	36.4	54.0	-17.6
5	415.072	27.5	7.9	197.0	1.5	3.0	0.0	H-Horn	AV	0.0	35.4	54.0	-18.6
5	415.117	25.4	7.9	57.0	1.2	3.0	0.0	V-Horn	AV	0.0	33.3	54.0	-20.7
2	512.624	51.5 46.8	1.4 5.7	76.0 241 0	1.2	3.0 3.0	0.0	v-Horn H-Horn	PK PK	0.0	52.9 52.5	74.0 74.0	-21.1 -21.5
4	512.641	41.8	5.7	349.0	1.3	3.0	0.0	V-Horn	PK	0.0	47.5	74.0	-26.5

2707.373

5414.696

5414.256

45.5

38.8

36.1

1.4

7.9

7.9

9.0

197.0

57.0

2.3

1.5

1.2

3.0

3.0

3.0

0.0

0.0

0.0

H-Horn

H-Horn

V-Horn

ΡK

ΡK

ΡK

0.0

0.0

0.0

46.9

46.7

44.0

74.0

74.0

74.0

-27.1

-27.3

-30.0

N	IORTHWEST				F	RA	D	AT	ΈI	) E	Μ	IS	SI	0	NS	5	DA	<b>\T</b>	A	Sł	ΙE	ET							PSA EM	2005.10.04 12005.10.11
	I	EUT:	IM5																				٧	Norl	k Or	der	ITF	MOC	091	
Se	rial Num	ber:	192105	0907	78																				C	)ate:	10/	20/0	5	
	Custo	mer:	Interme	ec Te	echnol	ogie	es Co	rpora	ation														Te	emp	erat	ure	23			
	Attend	ees:	None																			Pare	motr		umi	dity	45	% 21		
	Tester	d by:	Holly A	shk	anneih	ad								F	ow	er:	120\	AC/	60	Hz		Daro	meu	J	ob	Site	= 30.	<u>21</u> 01		
TEST	SPECIFI	CATI	ONS	SIIK	annejn	au									011	. 10	Test	Met	hoo					0	0.0	one		01		
FCC 1	5.247(d)	Spur	ious Ra	diat	ed Em	issi	ons:	2005-9	9								ANS	I C63	3.4	:2003										
TEST	PARAME	ETER	S																											
Anten	na Heigh	nt(s) (	m)		1 - 4									Tes	t Dis	star	nce (	(m)			3									
COMN	IENTS																													
Maxra	d patch :	anter	ina, Inte	erme	ec part	# 8(	05-61	0-001	•																					
Transi DEVIA	mit mid o TIONS F	chan ROM	nel, no l TEST	nop. STA	NDAR	D																								
Run #	viations.			8												*		0												
Confic	uration	#		-								11	le	A	le	-	Ľ													
Result	ts			Pas	s				Siqi	nature	2	40	0	1.		1														
	80.0 -																													
	70.0 -																													-
	60.0 -																													_
E	50.0 -	•																												
dBuV	40.0 -	•																											•	<u> </u>
	30.0 -	•																												_
	20.0 -																													_
	10.0 -																													_
	00																													
	2700	.000	290	0.00	00 3	100	.000	33	300.0	000	35	0.00	00	3	700	.00	0	390	0.0	000	410	0.00	00	430	0.0	000	45	500.	000	
														M	Hz															
	Freq (MHz)		Amplitu (dBuV	de )	Facto (dB)	r	Azi (deg	muth rees)	H (m	eight eters)	C (	)istano meter	ce rs)	E> Atte	kterna enuati (dB)	il on	Po	larity		Deteo	ctor	Dis Adju (1	tance stment dB)	t J	Adjus dBu\	sted //m	Sp d	ec. Li BuV/r	mit n	Compared to Spec. (dB)
4	575.085		35.2		5.8		13	9.0		1.4		3.0			0.0		V-I	Horn		A١	/	C	0.0		41	.0		54.0		-13.0
4	5/5.134		34.8		5.8 4 r		21	4.0		1.3		3.0			0.0		H-l	Horn		A\	/ /	(	0.0		40	.6 7		54.0		-13.4
2	575 028		35.2 47 1		1.5 5.8		21 21	5.0 4 ∩		ı.∠ 1.3		3.0			0.0		V-I H-I	Horn			' (	ſ	) () ) ()		52	2		ວ4.0 74 ∩		-17.3 -20.8
2	745.092		31.1		1.5		5	.0	:	2.6		3.0			0.0		H-I	Horn		A۱	/	0			32	.6		 54.0		-21.4
4	575.349		44.7		5.8		13	9.0		1.4		3.0			0.0		V-I	Horn		Pł	(	0	0.0		50	.5		74.0		-23.5
2	745.064		44.7		1.5		8	6.0		1.2		3.0			0.0		V-I	Horn		Pł	(	0	0.0		46	.2		74.0		-27.8
2	744.899		41.4		1.5		5	.0	:	2.6		3.0			0.0		H-I	Horn		Pł	(	C	0.0		42	.9		74.0		-31.1

	0.07							_					DO	A 2005 10 04
N				R	ADIAT	ED E	MISS	IONS	DATA	SHE	ET		EN	/I 2005.10.04
			INC										TDMACO	
6.	rial Nur	EUT:	IM5	178							W	ork Order:	10/20/05	
30	Custo	mer:	Intermec	 Technoloa	ies Corpora	tion					Ter	nperature	23	
	Atten	dees:	None									Humidity	45%	
	Pro	ject:	None						4001/4 0/-		Barometrie	C Pressure	30.21	
TEST	Teste	d by:	Holly Ash	kannejhad				Power:	120VAC/6 Test Metho	uHz		Job Site:	EV01	
FCC 1	5.247(d)	Spu	rious Radia	ated Emiss	ions:2005-9	)			ANSI C63.	4:2003				
TEOT			0											
Anton	ARAM	ETER ht(s)	(m)	1 - 4				Test Disto	nce (m)	2				
COMM	ENTS	nu(s) (	(11)	1 - 4				rest Dista		3	, 			
Maxra	d patch	anter	nna, Interm	nec part # 8	305-610-001									
	•													
FUT O	PFRAT													
Transr	nit hiah	chan	nel, no ho	р.										
DEVIA	TIONS	FROM	I TEST ST	ANDARD										
No dev	/iations													
Run #	uration	#		9	4		11 0.	Alin	N					
Result	s anon	#	P	ass	1	Signature	Hou	1 10- 1						
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	270	0.000	3200.0	00 370	0.000 42	00.000	4700.000	5200.00	0 5700.0	000 620	0.000 67	700.000	7200.000	
	-				_			MLI-						
								IVITIZ						
				1			1	<u> </u>		1		1	· · · ·	_
	Frea		Amplitude	Factor	Azimuth	Heiaht	Distance	External Attenuation	Polarity	Detector	Distance Adjustment	Adjusted	Spec. Limit	Compared to Spec.
	(MHz)		(dBuV)	(dB)	(degrees)	(meters)	(meters)	(dB)	. Liuny	20100101	(dB)	dBuV/m	dBuV/m	(dB)
7	420.111		25.7	13.8	182.0	1.4	3.0	0.0	V-Horn	AV	0.0	39.5	54.0	-14.5
4	637.640		31.3	5.9	131.0	1.2	3.0	0.0	V-Horn	AV	0.0	37.2	54.0	-16.8
7	420.101 637 597		21.9 20.2	13.8 5 0	78.0 88.0	1.0 1 4	3.0	0.0	H-Horn	AV AV	0.0	35.7	54.0 54.0	-18.3 -18.0
4	782.603		29.2 30.7	1.7	84.0	1.4	3.0 3.0	0.0	V-Horn	AV	0.0	32.4	54.0 54.0	-10.9
7	419.215		37.6	13.8	182.0	1.4	3.0	0.0	V-Horn	PK	0.0	51.4	74.0	-22.6
7	420.420		34.6	13.8	78.0	1.0	3.0	0.0	H-Horn	PK	0.0	48.4	74.0	-25.6

0.0

0.0

0.0

0.0

0.0

V-Horn H-Horn

H-Horn

V-Horn

H-Horn

ΡK

AV

ΡK

ΡK

ΡK

0.0

0.0

0.0

0.0

0.0

47.3

27.1

45.1

40.9

38.2

74.0 54.0

74.0

74.0

74.0

-26.7 -26.9

-28.9

-33.1

-35.8

4637.688 2782.538 4637.415

2782.490

2782.315

41.4

25.4

39.2

39.2

36.5

5.9

1.7

5.9

1.7

1.7

131.0

210.0

88.0

84.0

210.0

1.2

1.0

1.4

1.5

1.0

3.0

3.0

3.0

3.0

3.0