

# Intermec Technologies Corporation

## 802MIAG-CV60

October 04, 2004

Report No. ITRM0039

Report Prepared By



[www.nwemc.com](http://www.nwemc.com)

1-888-EMI-CERT

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**EMC Test Report**



22975 NW Evergreen Parkway  
 Suite 400  
 Hillsboro, Oregon 97124

**Certificate of Test**  
**Issue Date: October 04, 2004**  
**Intermec Technologies Corporation**  
**Model: 802MIAG-CV60**

Specification	Emissions	
	Test Method	Pass / Fail
FCC 15.247(a) Occupied Bandwidth:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/> Pass / <input type="checkbox"/> Fail
FCC 15.247(b) Output Power:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/> Pass / <input type="checkbox"/> Fail
FCC 15.247(c) Band Edge Compliance:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/> Pass / <input type="checkbox"/> Fail
FCC 15.247(c) Spurious Conducted Emissions:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/> Pass / <input type="checkbox"/> Fail
FCC 15.247(c) Spurious Radiated Emissions:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/> Pass / <input type="checkbox"/> Fail
FCC 15.247(d) Power Spectral Density:2003	ANSI C63.4:2001	<input checked="" type="checkbox"/> Pass / <input type="checkbox"/> Fail
FCC 15.207:2003 AC Powerline Conducted Emissions	ANSI C63.4:2001	<input checked="" type="checkbox"/> Pass / <input type="checkbox"/> Fail

**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:**

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



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



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



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



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



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



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



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



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



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



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



## SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/scope.asp>

**How important is it to understand performance criteria?**

It is the responsibility of the test laboratory to observe the results of the tests that are performed and to accurately report those results. As the responsible party (manufacturer, importer, etc) it is your responsibility to take those results, compare them against the specifications and standards, then, if appropriate make a declaration of conformity. As the responsible party it makes sense that you are fully aware of the requirements, how your device performs when tested to those requirements, and what information is being used to declare conformity.

To better assist you in making those conformity decisions, Northwest EMC has adopted a very simple, yet very clear performance assessment procedure. The following criteria is used when performing immunity or susceptibility tests:

**Performance Criteria 1:**

- ❑ The EUT exhibited no change in performance when operating as specified by the manufacturer. In this case no changes were observed during the test.
- ❑ In most cases this would be equivalent to Performance Criteria A. When operating the equipment in the modes or configurations specified by the responsible party, monitoring the parameters specified, no changes were observed. Basically nothing happened.

**Performance Criteria 2:**

- ❑ The EUT exhibited a change in performance when operating as specified by the manufacturer. In this case the equipment recovered without any operator intervention. The data sheets will detail the exact phenomena observed.
- ❑ In most cases this would be equivalent to Performance Criteria B. When operating the equipment in the modes or configurations specified by the responsible party, monitoring the parameters specified, changes were observed. The EUT was able to recover from those changes without any operator intervention.

**Performance Criteria 3:**

- ❑ The EUT exhibited a change in performance when operating as specified by the manufacturer. In this case the equipment required some operator intervention in order to recover. This intervention may be in the form of reducing the test levels, changing parameters, or even resetting the system. The data sheets will detail the exact phenomena observed.
- ❑ In most cases this would be equivalent to Performance Criteria C. When operating the equipment in the modes or configurations specified by the responsible party, monitoring the parameters specified, changes were observed. The EUT required some sort of operator intervention to recover. There was no permanent damage and the EUT appeared to function normally after completion test.

**Performance Criteria 4:**

- ❑ The EUT exhibited a change in performance when operating as specified by the manufacturer. In this case the equipment was damaged and would not recover. The data sheets will detail the exact phenomena observed.
- ❑ In most cases there is no specific criterion to compare this to, it typically ends the test. When operating the equipment in the modes or configurations specified by the responsible party, monitoring the parameters specified, changes were observed. There was no recovery; the equipment would no longer function as intended.

Each of the standards and specifications has unique performance criteria. In order to make an accurate assessment, one must compare the test results provided with the specific performance criteria. **To ensure that a responsible party is compliant with the specifications, one must read and understand those specifications. Provided below is a sample performance criteria, taken from EN 50082-1.**

#### EN 50082-1 Performance Criteria

**Performance Criteria A:** *The apparatus shall continue to operate as intended. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.*

**Performance Criteria B:** *The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, then either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.*

**Performance Criteria C:** *Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of controls.*

#### How should a device perform in order for a declaration of conformity to be made?

As already stated, it is the responsible party that must interpret and understand the results in such a way that a declaration of conformity is made. Having said that, we are often asked to render our opinion as to how a device should perform. Our recommendation simply follows the standards, as can be referenced below. Most of the standards and specifications offer the same performance criterion shown below as their requirements.

Test	Performance Criteria typically specified by the Standard	Equivalent Northwest EMC Performance Criteria
ESD	Performance Criteria B	Performance Criteria 1 or 2
Radiated RF	Performance Criteria A	Performance Criteria 1
EFT/Burst	Performance Criteria B	Performance Criteria 1 or 2
Surge	Performance Criteria B	Performance Criteria 1 or 2
Conducted RF	Performance Criteria A	Performance Criteria 1
Magnetic Field	Performance Criteria A	Performance Criteria 1
Voltage Dips and Variations	Performance Criteria B & C	Performance Criteria 1, 2, or 3

### What is measurement uncertainty?

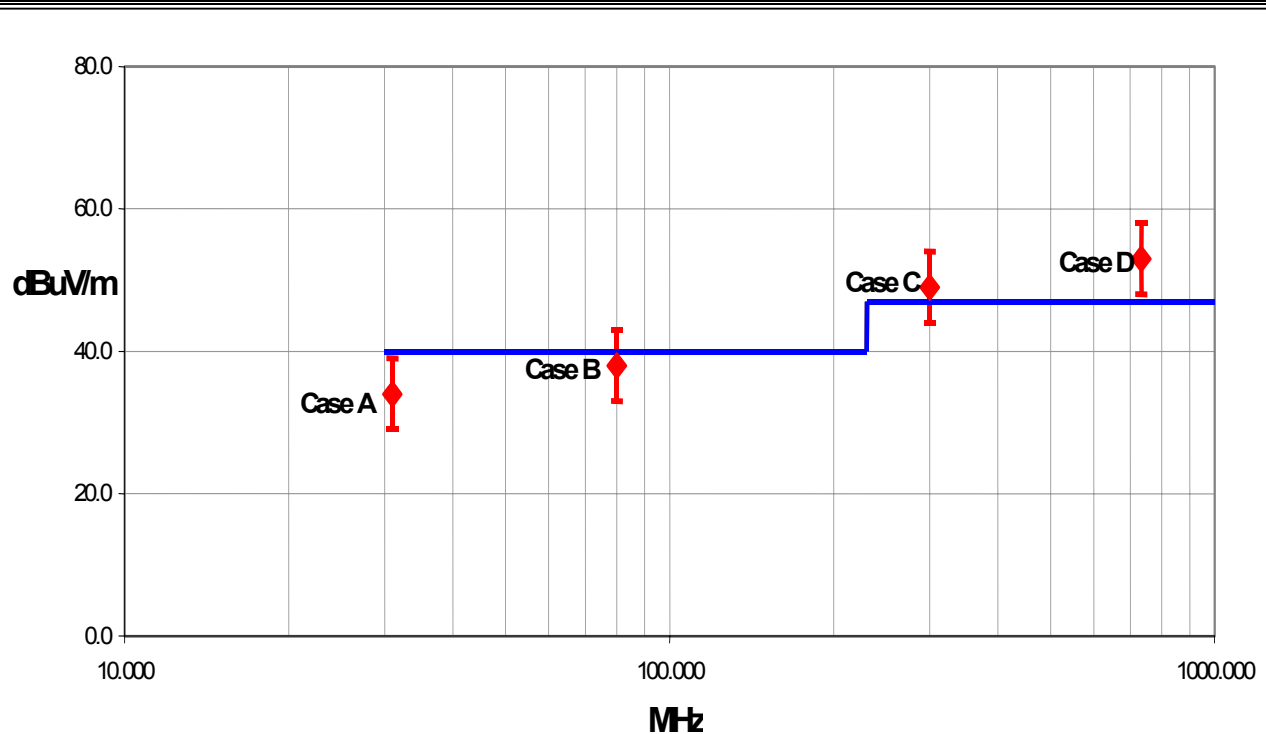
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following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

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

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

### How might measurement uncertainty be applied to test results?

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



#### Test Result Scenarios:

**Case A:** Product complies.

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

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

**Case D:** Product does not comply.



**Radiated Emissions ≤ 1 GHz**

Value (dB)

Test Distance	Probability Distribution	Biconical Antenna		Log Periodic Antenna		Dipole Antenna	
		3m	10m	3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.86	+ 1.82	+ 2.23	+ 1.29	+ 1.31	+ 1.25
		- 1.88	- 1.87	- 1.41	- 1.26	- 1.27	- 1.25
Expanded uncertainty $U$ (level of confidence ≈ 95%)	normal (k=2)	+ 3.72	+ 3.64	+ 4.46	+ 2.59	+ 2.61	+ 2.49
		- 3.77	- 3.73	- 2.81	- 2.52	- 2.55	- 2.49

**Radiated Emissions > 1 GHz**

Value (dB)

Test Distance	Probability Distribution	Without High Pass Filter		With High Pass Filter	
		3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.29	+ 1.29	+ 1.38	+ 1.38
		- 1.25	- 1.25	- 1.35	- 1.35
Expanded uncertainty $U$ (level of confidence ≈ 95%)	normal (k=2)	+ 2.57	+ 2.57	+ 2.76	+ 2.76
		- 2.51	- 2.51	- 2.70	- 2.70

**Conducted Emissions**

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

**Radiated Immunity**

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

**Conducted Immunity**

	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty $U$ (level of confidence ≈ 95 %)	normal (k = 2)	2.10

**Legend**

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

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



**California**

**Orange County Facility**

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



**Oregon**

**Evergreen Facility**

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



**Oregon**

**Trails End Facility**

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



**Washington**

**Sultan Facility**

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

**Party Requesting the Test**

<b>Company Name:</b>	Intermec Technologies Corporation
<b>Address:</b>	550 Second St. SE
<b>City, State, Zip:</b>	Cedar Rapids, IA 52401-2023
<b>Test Requested By:</b>	Scott Holub
<b>Model:</b>	802MIAG-CV60
<b>First Date of Test:</b>	9-1-04
<b>Last Date of Test:</b>	9-7-04
<b>Receipt Date of Samples:</b>	9-1-04
<b>Equipment Design Stage:</b>	Production
<b>Equipment Condition:</b>	No visual damage.

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

<b>Clocks/Oscillators:</b>	Not provided
<b>I/O Ports:</b>	Keyboard, Serial (2), USB (2), Ethernet, Audio Out, Microphone

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

Fork lift mounted communications terminal / data collection PC with 802.11 a/b/g wireless operation.

**Client Justification for EUT Selection:**

Production sample

**Client Justification for Test Selection:**

These tests satisfy the requirements for FCC15.247. Reference Test Report # ITRM0041 for 15.407 test results.

**EUT Photo**

**Equipment modifications**

Item	Test	Date	Modification	Note	Disposition of EUT
1	Occupied Bandwidth	09/02/2004	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.	EUT remained at Northwest EMC.
2	Band Edge Compliance	09/02/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
3	Spurious Conducted Emissions	09/03/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
4	Output Power	09/03/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
5	Power Spectral Density	09/03/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
6	Spurious Radiated Emissions	09/07/2004	No EMI suppression devices were added or modified during this test.	All ports populated on Host PC for this test.	EUT remained at Northwest EMC.
7	AC Powerline Conducted Emissions	09/07/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
8	Radiated Emissions	09/07/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
9	Conducted Emissions	09/07/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.

**Justification**

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

**Channels in Specified Band Investigated:**

Low
Mid
High

**Operating Modes Investigated:**

Single channel continuous transmit
------------------------------------

**Data Rates Investigated:**

1 Mbps (802.11b)
5.5 Mbps (802.11b)
11 Mbps (802.11b)
6 Mbps (802.11g)
36 Mbps (802.11g)
54 Mbps (802.11g)

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

Maximum default
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**Power Input Settings Investigated:**

120 VAC, 60 Hz.
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**Other Settings Investigated:**

802.11(b)
802.11(g)

**Software\Firmware Applied During Test**

<b>Exercise software</b>	Continuous Transmit-Receive (cTxRx)	<b>Version</b>	2.3.0.0
<b>Description</b>			
The system was tested using special software developed to test all functions of the device during the test.			

EUT and Peripherals			
Description	Manufacturer	Model/Part Number	Serial Number
Host Device	Intermec Technologies Corporation	CV60	02932
Keyboard	Cherry	G84-4110PPAUS/00	C 000435 J50
Mouse (USB)	Belkin	F8E201-USB 29U0	211006039
DC Power Supply	Skynet	SNP-PA57	035228227
EUT- 802.11(a)/(b)/(g) radio 802MIAG-CV60	PRISM	3886	000DF01504A8

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	Yes	2.0	PA	DC Power Supply	Host Device
AC Power	No	2.0	No	DC Power Supply	AC Power
Keyboard	PA	1.6	PA	Keyboard	Host Device
Mouse (USB)	PA	1.2	PA	Mouse (USB)	Host Device
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

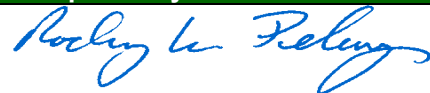
Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

### Test Description

**Requirement:** Per 47 CFR 15.247(a)(2), the 6 dB bandwidth of a direct sequence channel must be at least 500kHz. The measurement is made with the spectrum analyzer's resolution bandwidth set to 100kHz, and the video bandwidth set to greater than or equal to the resolution bandwidth.

**Configuration:** 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 using direct sequence modulation.

Completed by:



# EMISSIONS DATA SHEET

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>			


<b>COMMENTS</b>			

<b>EUT OPERATING MODES</b>			
Modulated by PRBS at 1 Mbps data rate, 802.11(b) modulation scheme			

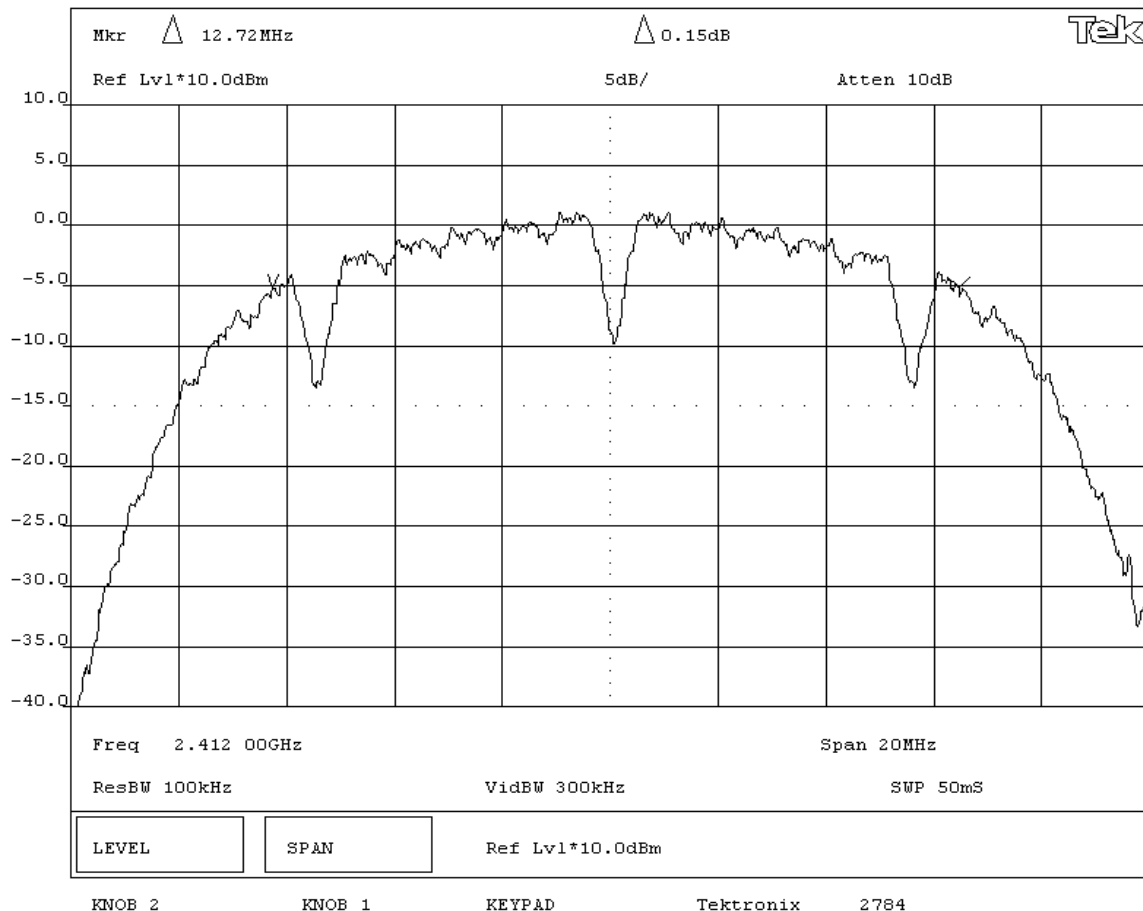
<b>DEVIATIONS FROM TEST STANDARD</b>			
None			

<b>REQUIREMENTS</b>			
The minimum 6dB bandwidth is 500KHz			

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	12.75 MHz

<b>SIGNATURE</b>	
 Tested By: _____	

<b>DESCRIPTION OF TEST</b>	
<b>Occupied Bandwidth - Low Channel - 802.11(b) 1 Mbps</b>	



EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>


<b>COMMENTS</b>

<b>EUT OPERATING MODES</b>
Modulated by PRBS at 1 Mbps data rate, 802.11(b) modulation scheme

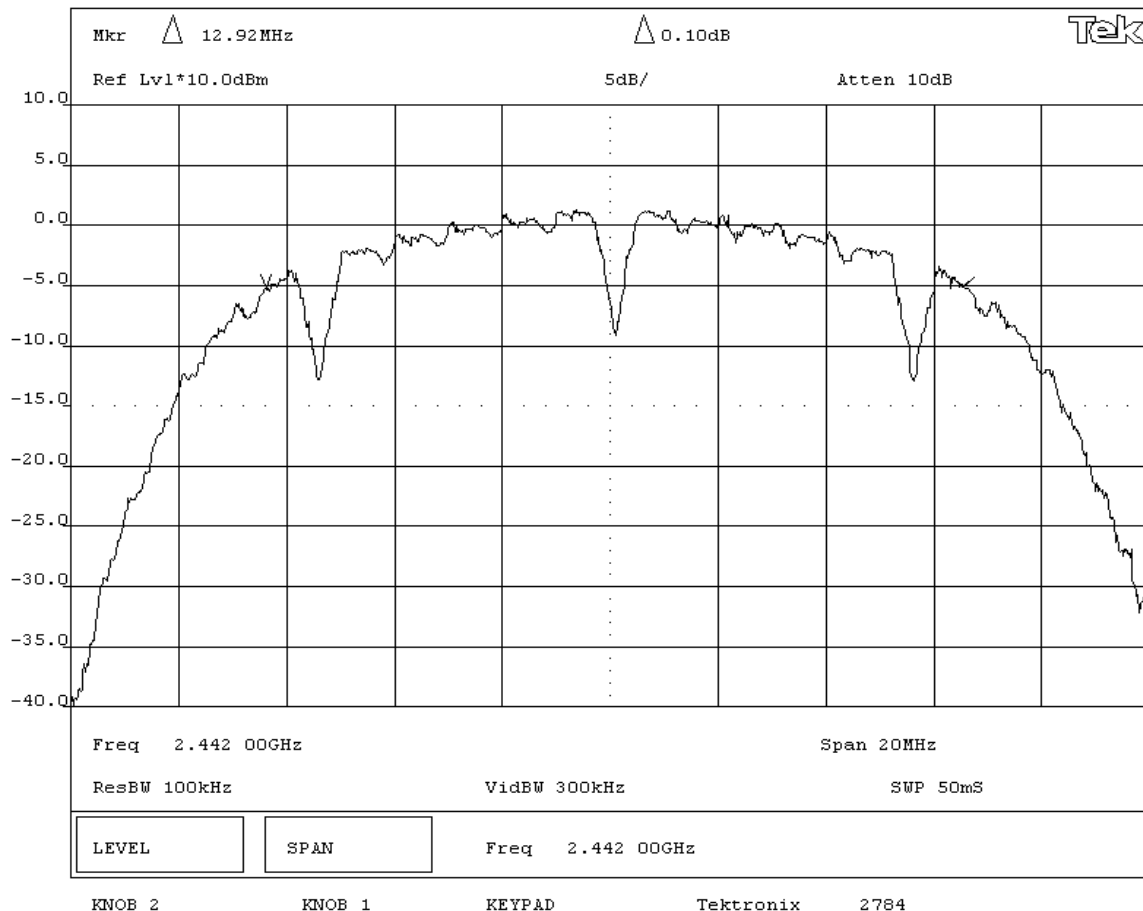
<b>DEVIATIONS FROM TEST STANDARD</b>
None

<b>REQUIREMENTS</b>
The minimum 6dB bandwidth is 500KHz

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	12.92 MHz

<b>SIGNATURE</b>
 Tested By: _____

<b>DESCRIPTION OF TEST</b>
<b>Occupied Bandwidth - Mid Channel - 802.11(b) 1 Mbps</b>





EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>

<b>COMMENTS</b>

<b>EUT OPERATING MODES</b>
Modulated by PRBS at 1 Mbps data rate, 802.11(b) modulation scheme

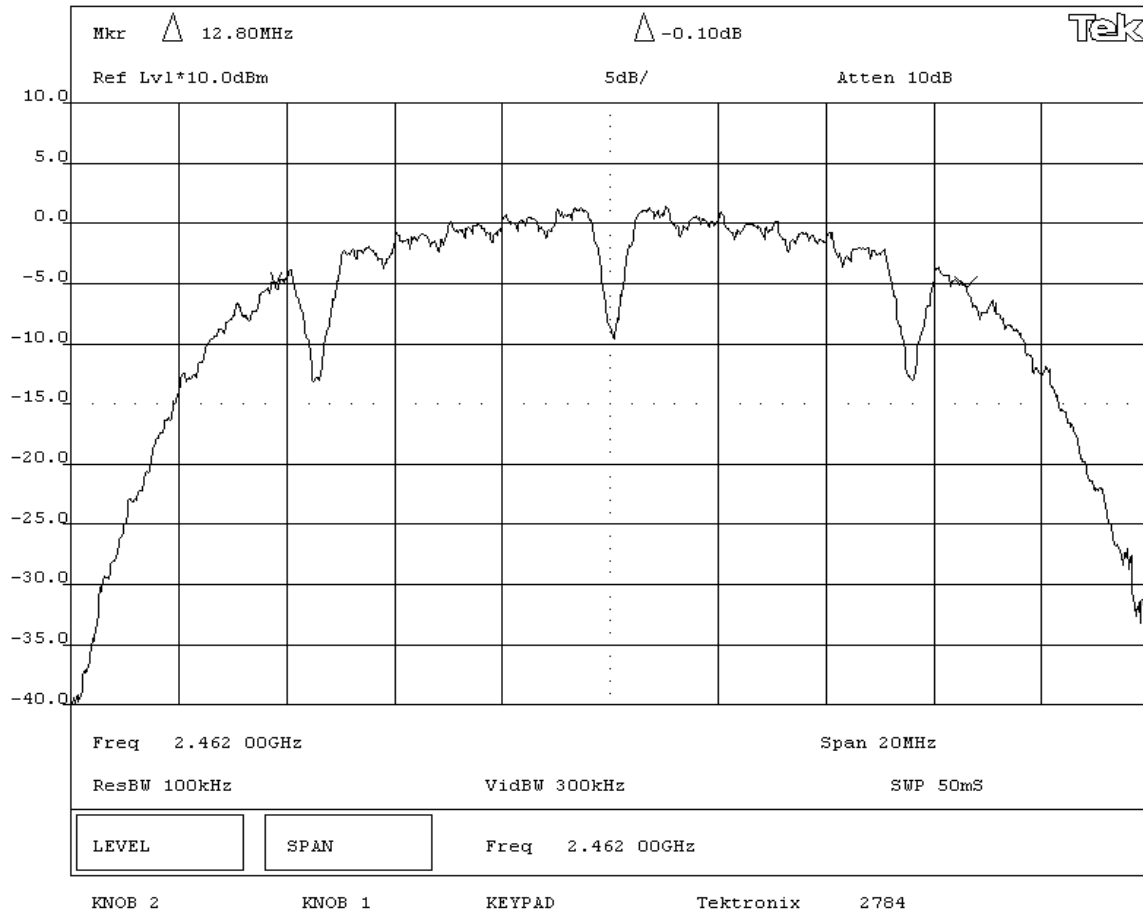
<b>DEVIATIONS FROM TEST STANDARD</b>
None

<b>REQUIREMENTS</b>
The minimum 6dB bandwidth is 500KHz

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	12.8 MHz

<b>SIGNATURE</b>
<i>Rod Peloquin</i>
Tested By: _____

<b>DESCRIPTION OF TEST</b>
<b>Occupied Bandwidth - High Channel - 802.11(b) 1 Mbps</b>



EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>


<b>COMMENTS</b>

<b>EUT OPERATING MODES</b>
Modulated by PRBS at 5.5 Mbps data rate, 802.11(b) modulation scheme

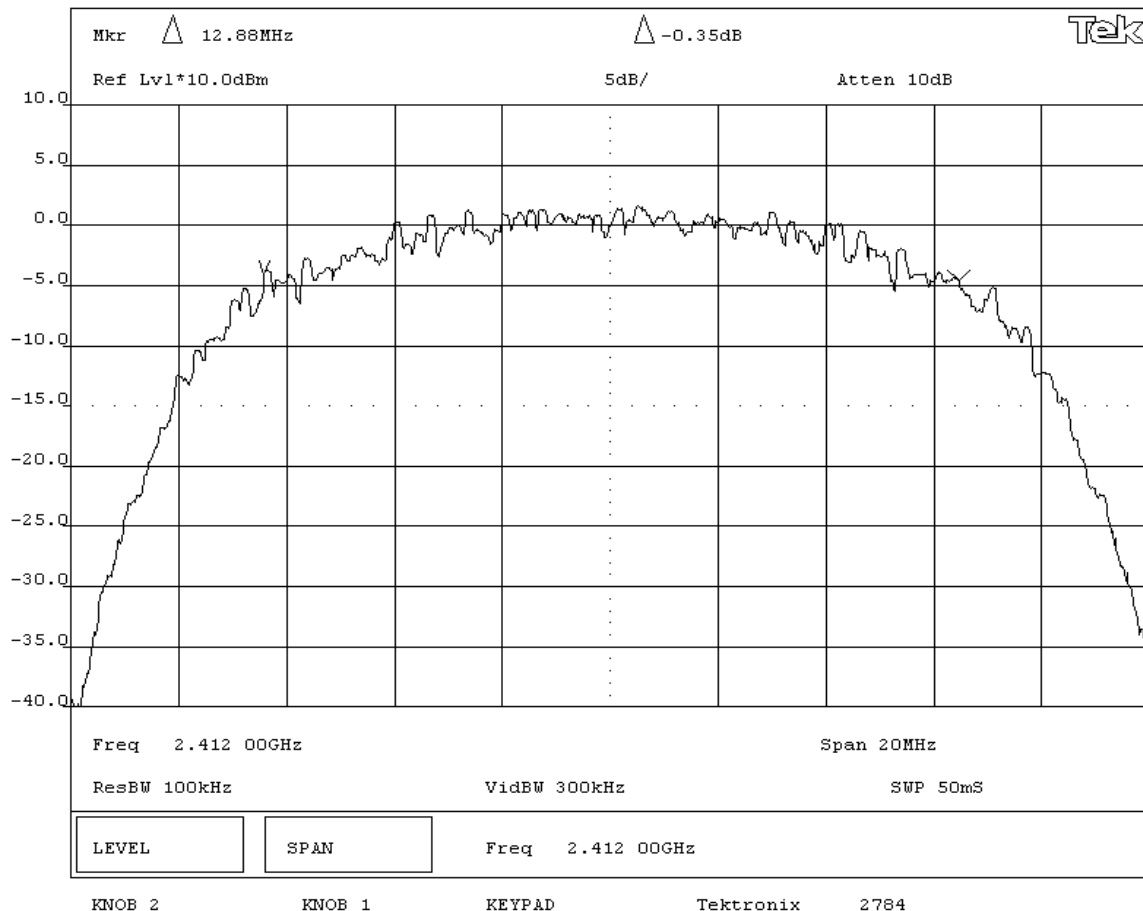
<b>DEVIATIONS FROM TEST STANDARD</b>
None

<b>REQUIREMENTS</b>
The minimum 6dB bandwidth is 500KHz

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	12.88 MHz

<b>SIGNATURE</b>
 Tested By: _____

<b>DESCRIPTION OF TEST</b>
<b>Occupied Bandwidth - Low Channel - 802.11(b) 5.5 Mbps</b>



# EMISSIONS DATA SHEET

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>			

<b>COMMENTS</b>			

<b>EUT OPERATING MODES</b>			
Modulated by PRBS at 5.5 Mbps data rate, 802.11(b) modulation scheme			

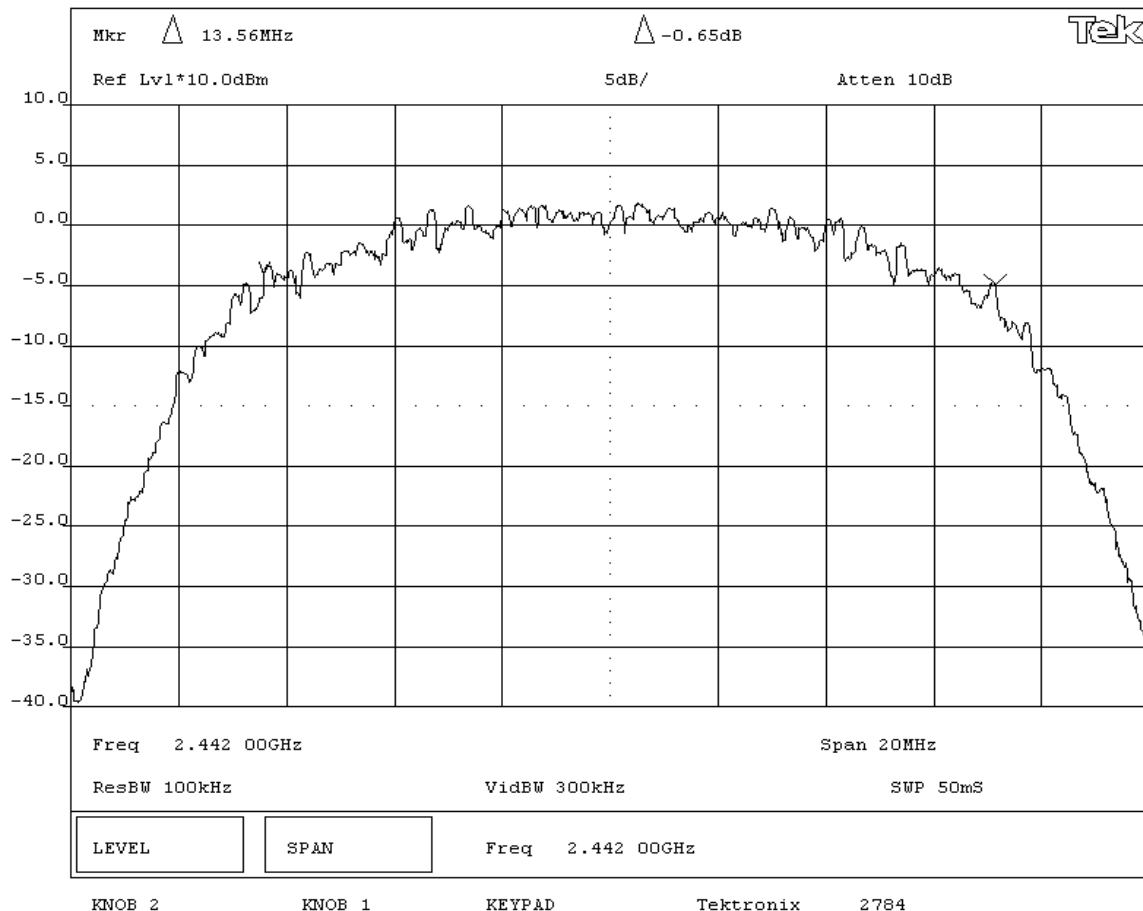
<b>DEVIATIONS FROM TEST STANDARD</b>			
None			

<b>REQUIREMENTS</b>			
The minimum 6dB bandwidth is 500KHz			

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	13.56 MHz

<b>SIGNATURE</b>	
 Tested By: _____	

<b>DESCRIPTION OF TEST</b>	
<b>Occupied Bandwidth - Mid Channel - 802.11(b) 5.5 Mbps</b>	



# EMISSIONS DATA SHEET

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>

<b>COMMENTS</b>

<b>EUT OPERATING MODES</b>
Modulated by PRBS at 5.5 Mbps data rate, 802.11(b) modulation scheme

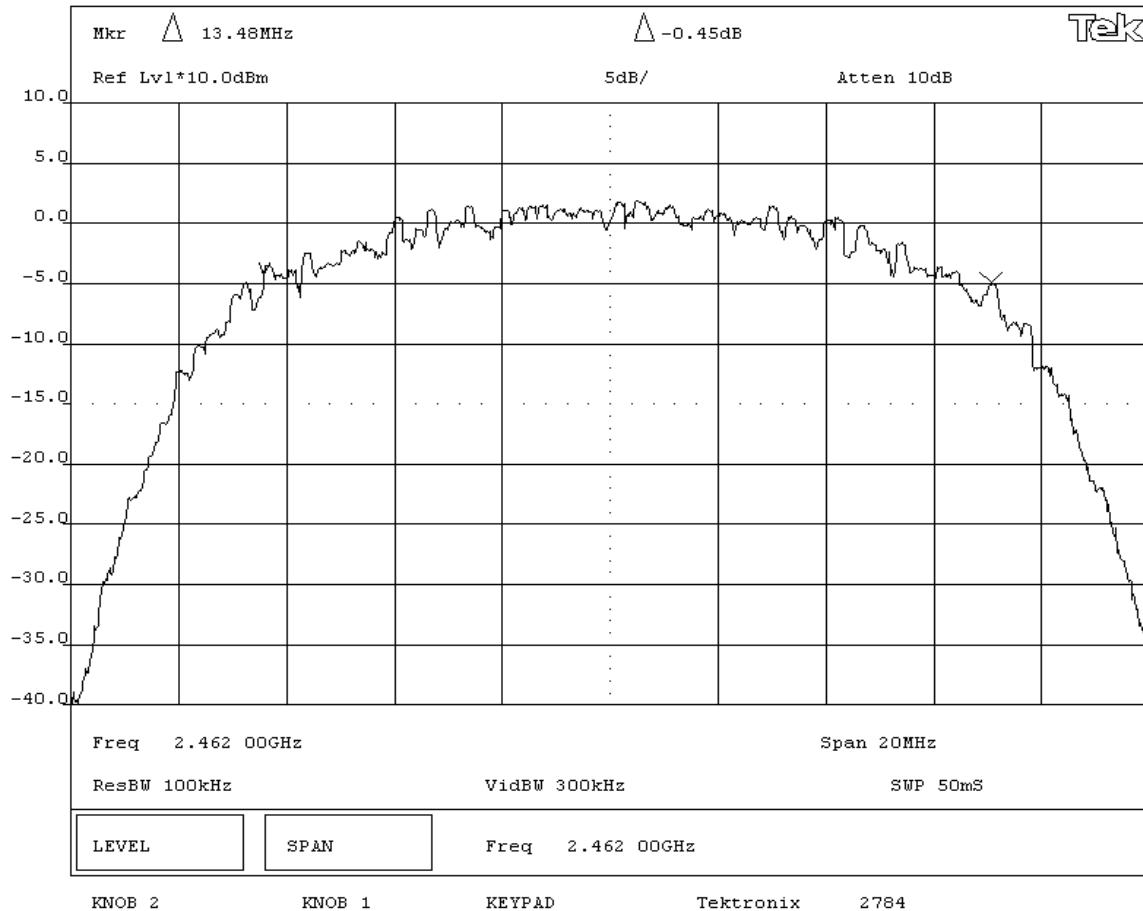
<b>DEVIATIONS FROM TEST STANDARD</b>
None

<b>REQUIREMENTS</b>
The minimum 6dB bandwidth is 500KHz

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	13.48 MHz

<b>SIGNATURE</b>
 Tested By: _____

<b>DESCRIPTION OF TEST</b>
<b>Occupied Bandwidth - High Channel - 802.11(b) 5.5 Mbps</b>



EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>			

<b>COMMENTS</b>			

**EUT OPERATING MODES**

Modulated by PRBS at maximum data rate, 802.11(b) modulation scheme

**DEVIATIONS FROM TEST STANDARD**

None

**REQUIREMENTS**

The minimum 6dB bandwidth is 500KHz

<b>RESULTS</b>	<b>BANDWIDTH</b>
----------------	------------------

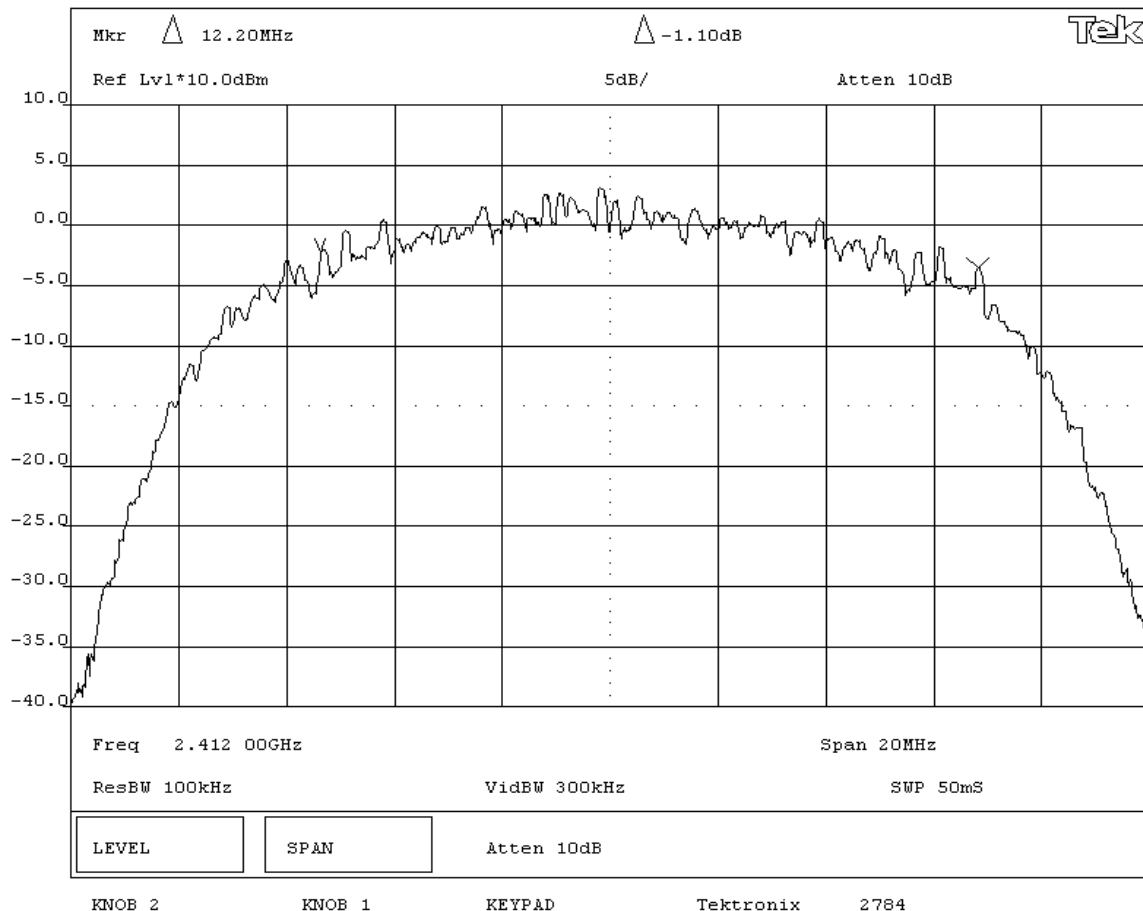
Pass 12.2 MHz

**SIGNATURE**

Tested By: *Rodney Le Pelouin*

**DESCRIPTION OF TEST**

**Occupied Bandwidth - Low Channel - 802.11(b) 11 Mbps**



NORTHWEST  
**EMC**

# EMISSIONS DATA SHEET

Rev BETA  
01/30/01

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz
	Job Site: EV06

TEST SPECIFICATIONS			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

SAMPLE CALCULATIONS

**COMMENTS**

**EUT OPERATING MODES**

Modulated by PRBS at maximum data rate, 802.11(b) modulation scheme

**DEVIATIONS FROM TEST STANDARD**

None

**REQUIREMENTS**

The minimum 6dB bandwidth is 500KHz

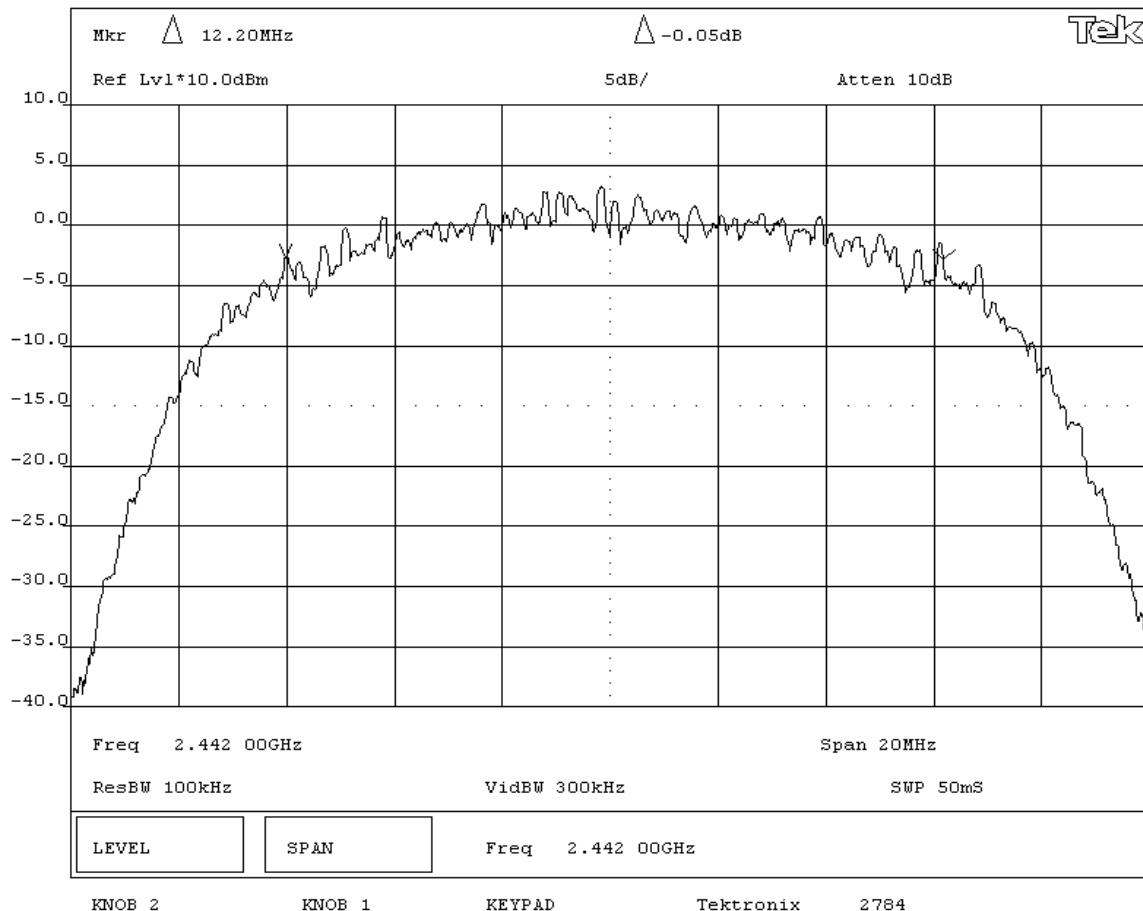
<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	12.2 MHz

**SIGNATURE**

Tested By: *Rodney Le Pelouin*

**DESCRIPTION OF TEST**

**Occupied Bandwidth - Mid Channel - 802.11(b) 11 Mbps**



# EMISSIONS DATA SHEET

EUT: 802MIAG-CV60		Work Order: ITRM0039
Serial Number: 000DF01504A8		Date: 09/02/04
Customer: INTERMEC Technologies		Temperature: 72 degrees F
Attendees: None	Tested by: Rod Peloquin	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>			

**COMMENTS**

**EUT OPERATING MODES**

Modulated by PRBS at maximum data rate, 802.11(b) modulation scheme

**DEVIATIONS FROM TEST STANDARD**

None

**REQUIREMENTS**

The minimum 6dB bandwidth is 500KHz

**RESULTS**

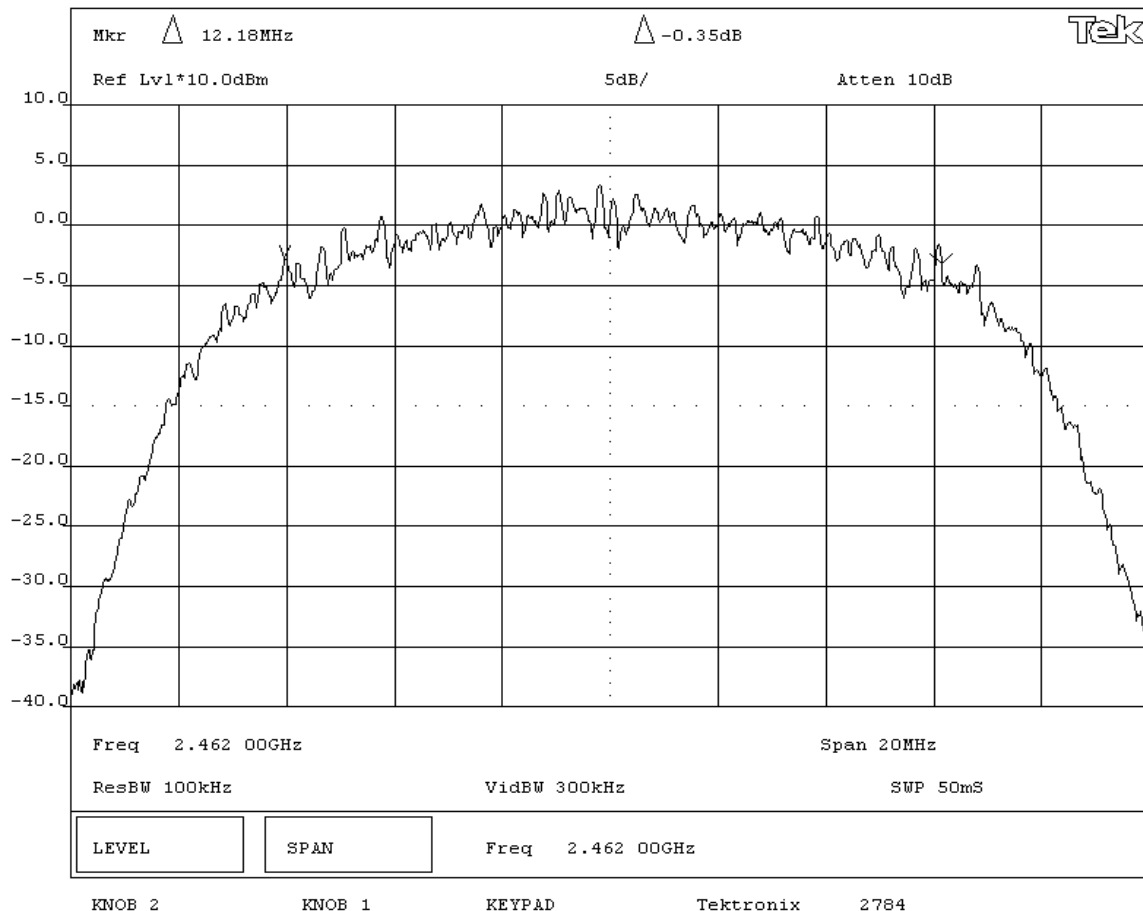
Pass	BANDWIDTH
	12.18 MHz

**SIGNATURE**

Tested By: *Rod Peloquin*

**DESCRIPTION OF TEST**

**Occupied Bandwidth - High Channel - 802.11(b) 11 Mbps**



EUT: 802MIAG-CV60		Work Order: ITRM0039	
Serial Number: 000DF01504A8		Date: 09/02/04	
Customer: INTERMEC Technologies		Temperature: 72 degrees F	
Attendees: None		Humidity: 43% RH	
Customer Ref. No.: N/A	Tested by: Rod Peloquin	Power: 120VAC/60Hz	
Job Site: EV06			

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>			


<b>COMMENTS</b>			

<b>EUT OPERATING MODES</b>			
Modulated by PRBS at indicated data rate, 802.11(g) modulation scheme.			

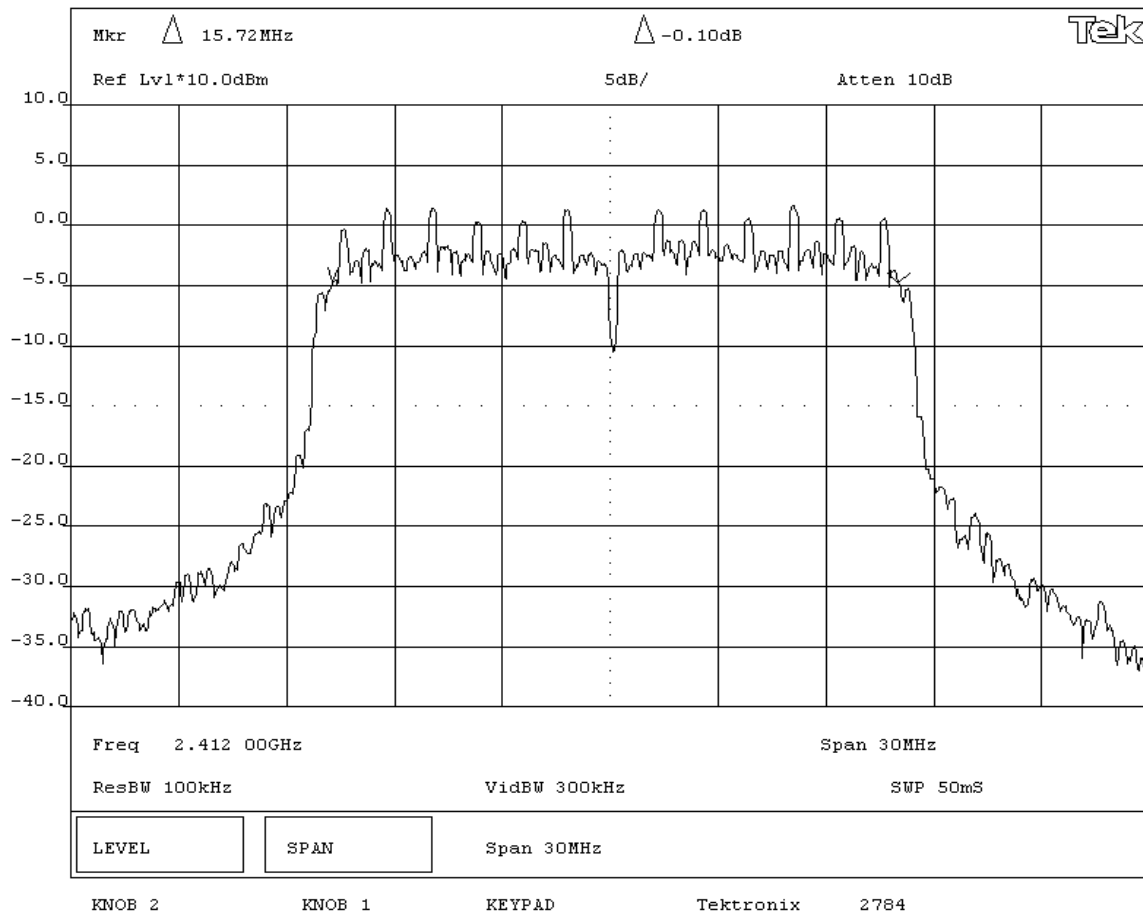
<b>DEVIATIONS FROM TEST STANDARD</b>			
None			

<b>REQUIREMENTS</b>			
The minimum 6dB bandwidth is 500KHz			

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	15.72 MHz

<b>SIGNATURE</b>	
 Tested By: _____	

<b>DESCRIPTION OF TEST</b>	
<b>Occupied Bandwidth - Low Channel - 802.11(g) 6 Mbit</b>	





NORTHWEST  
**EMC**

# EMISSIONS DATA SHEET

Rev BETA  
01/30/01

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

**SAMPLE CALCULATIONS**

**COMMENTS**


**EUT OPERATING MODES**  
Modulated by PRBS at indicated data rate, 802.11(g) modulation scheme.

**DEVIATIONS FROM TEST STANDARD**  
None

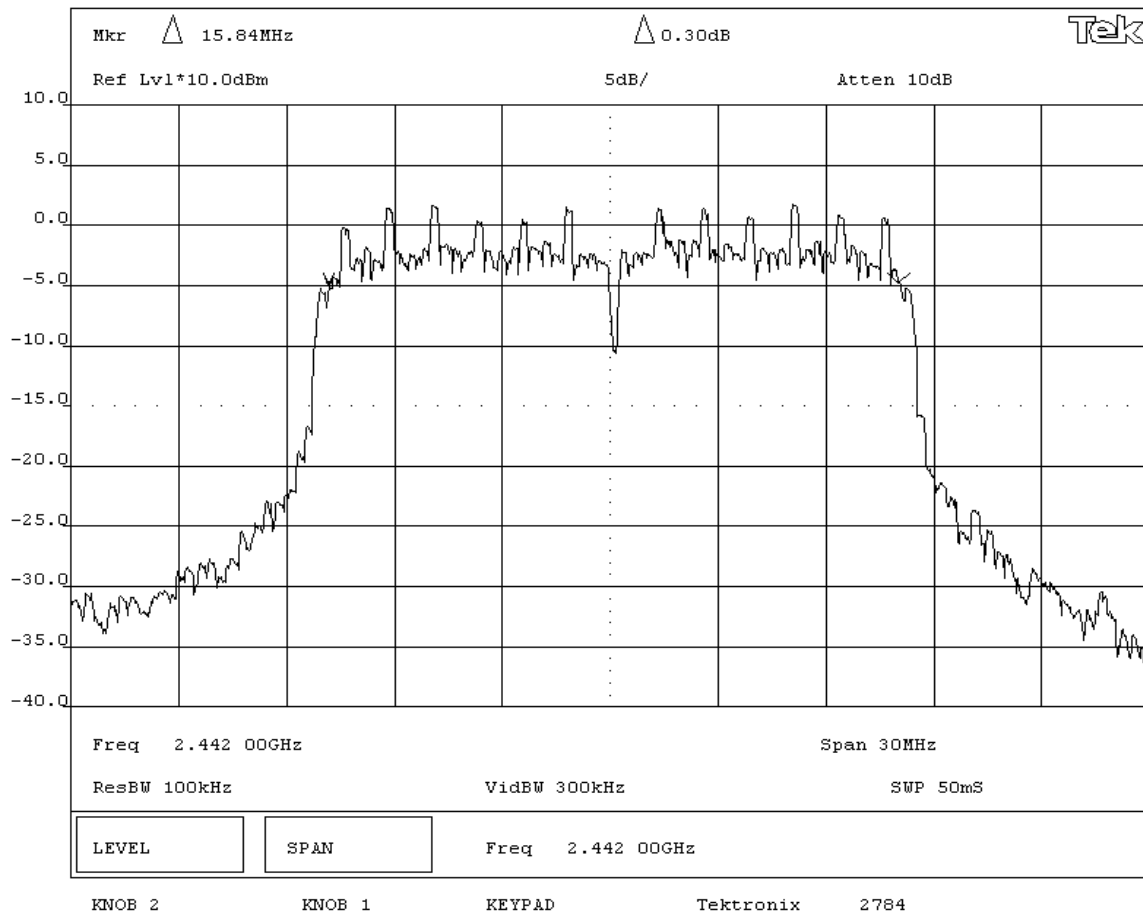
**REQUIREMENTS**  
The minimum 6dB bandwidth is 500KHz

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	15.84 MHz

**SIGNATURE**

Tested By: 

**DESCRIPTION OF TEST**  
**Occupied Bandwidth - Mid Channel - 802.11(g) 6 Mbit**



NORTHWEST  
**EMC**

# EMISSIONS DATA SHEET

Rev BETA  
01/30/01

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz
Tested by: Rod Peloquin	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

**SAMPLE CALCULATIONS**

**COMMENTS**

**EUT OPERATING MODES**  
Modulated by PRBS at indicated data rate, 802.11(g) modulation scheme.

**DEVIATIONS FROM TEST STANDARD**  
None

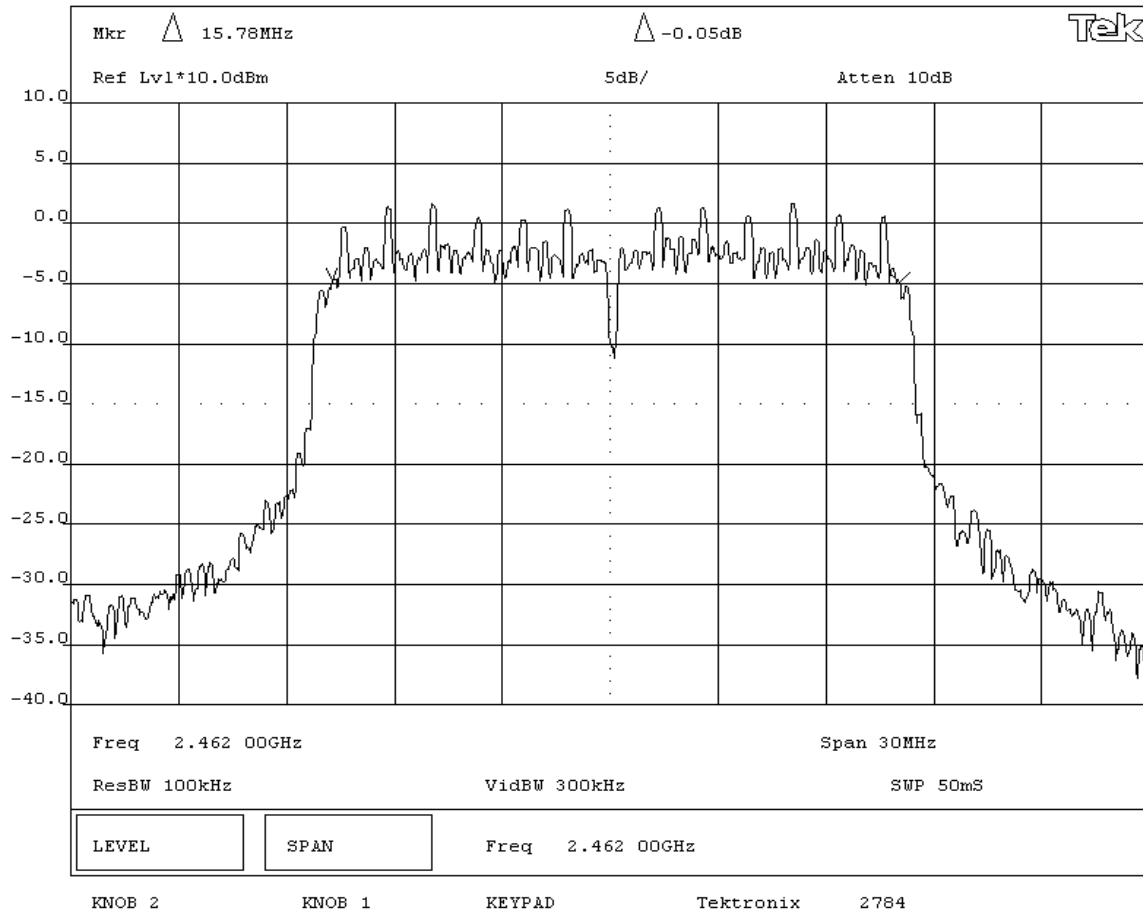
**REQUIREMENTS**  
The minimum 6dB bandwidth is 500KHz

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	15.78 MHz

**SIGNATURE**

Tested By: *Rod Peloquin*

**DESCRIPTION OF TEST**  
**Occupied Bandwidth - High Channel - 802.11(g) 6 Mbit**



NORTHWEST  
**EMC**

# EMISSIONS DATA SHEET

Rev BETA  
01/30/01

EUT: 802MIAG-CV60		Work Order: ITRM0039
Serial Number: 000DF01504A8		Date: 09/02/04
Customer: INTERMEC Technologies		Temperature: 72 degrees F
Attendees: None	Tested by: Rod Peloquin	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>			

<b>COMMENTS</b>			

<b>EUT OPERATING MODES</b>			
Modulated by PRBS at indicated data rate, 802.11(g) modulation scheme.			

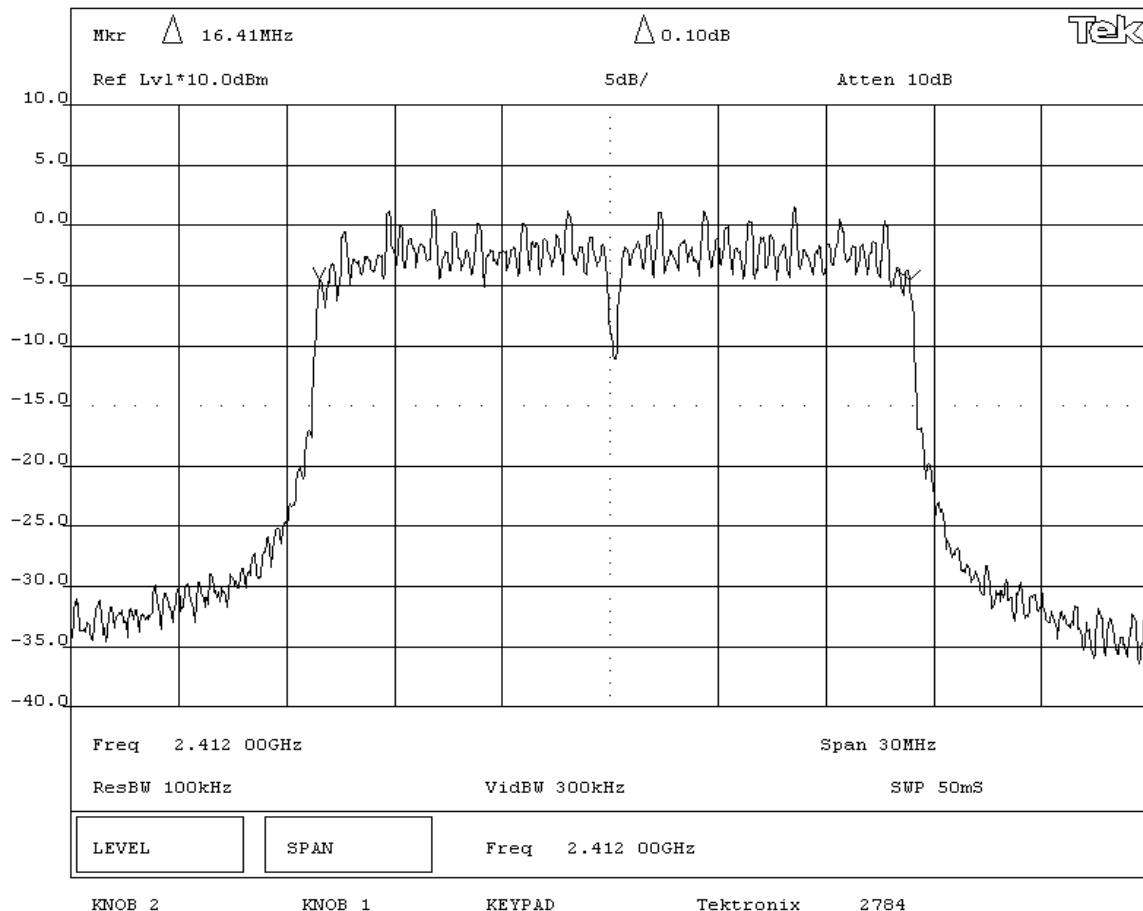
<b>DEVIATIONS FROM TEST STANDARD</b>			
None			

<b>REQUIREMENTS</b>			
The minimum 6dB bandwidth is 500KHz			

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	16.41 MHz

<b>SIGNATURE</b>	
 Tested By: _____	

<b>DESCRIPTION OF TEST</b>	
<b>Occupied Bandwidth - Low Channel - 802.11(g) 36 Mbit</b>	



NORTHWEST  
**EMC**

# EMISSIONS DATA SHEET

Rev BETA  
01/30/01

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>			

<b>COMMENTS</b>			

<b>EUT OPERATING MODES</b>			
Modulated by PRBS at indicated data rate, 802.11(g) modulation scheme.			

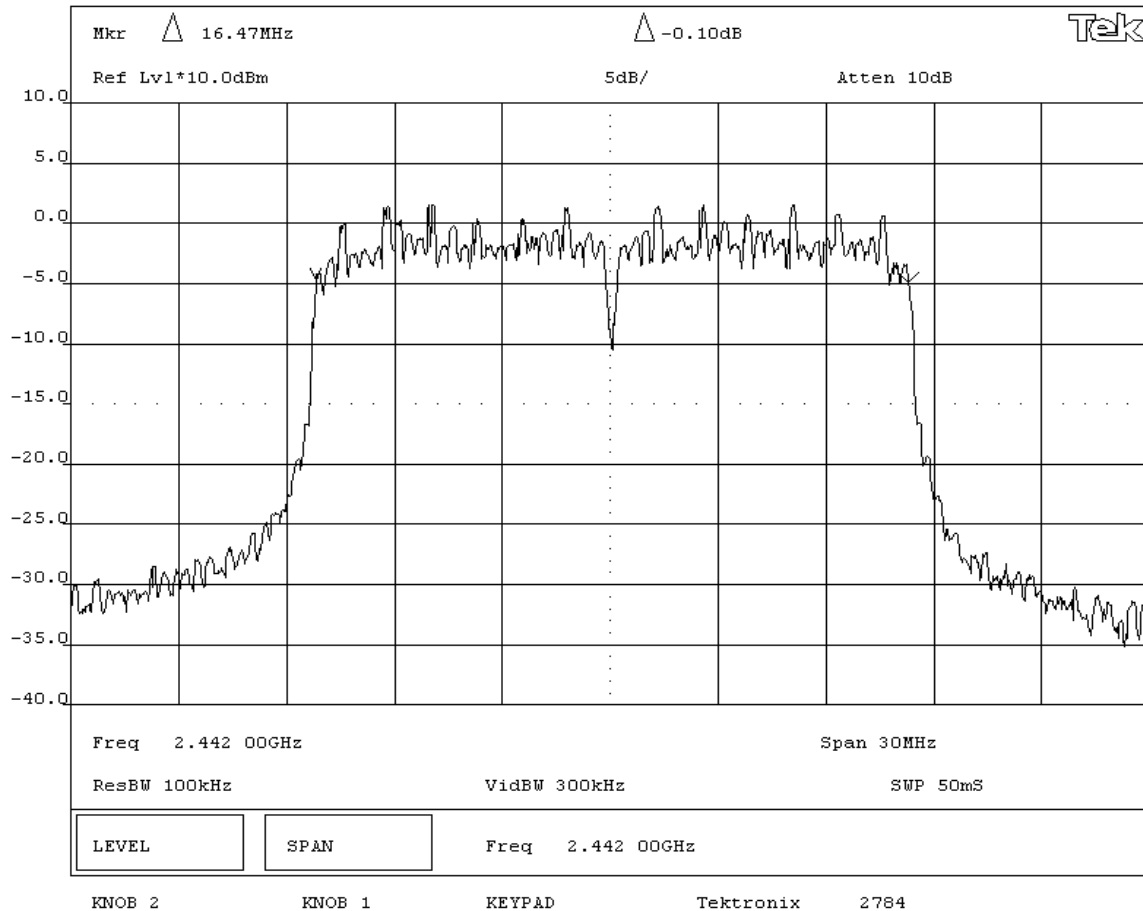
<b>DEVIATIONS FROM TEST STANDARD</b>			
None			

<b>REQUIREMENTS</b>			
The minimum 6dB bandwidth is 500KHz			

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	16.47 MHz

<b>SIGNATURE</b>			
			
Tested By: _____			

<b>DESCRIPTION OF TEST</b>			
<b>Occupied Bandwidth - Mid Channel - 802.11(g) 36 Mbit</b>			



EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>

**COMMENTS**

**EUT OPERATING MODES**

Modulated by PRBS at indicated data rate, 802.11(g) modulation scheme.

**DEVIATIONS FROM TEST STANDARD**

None

**REQUIREMENTS**

The minimum 6dB bandwidth is 500KHz

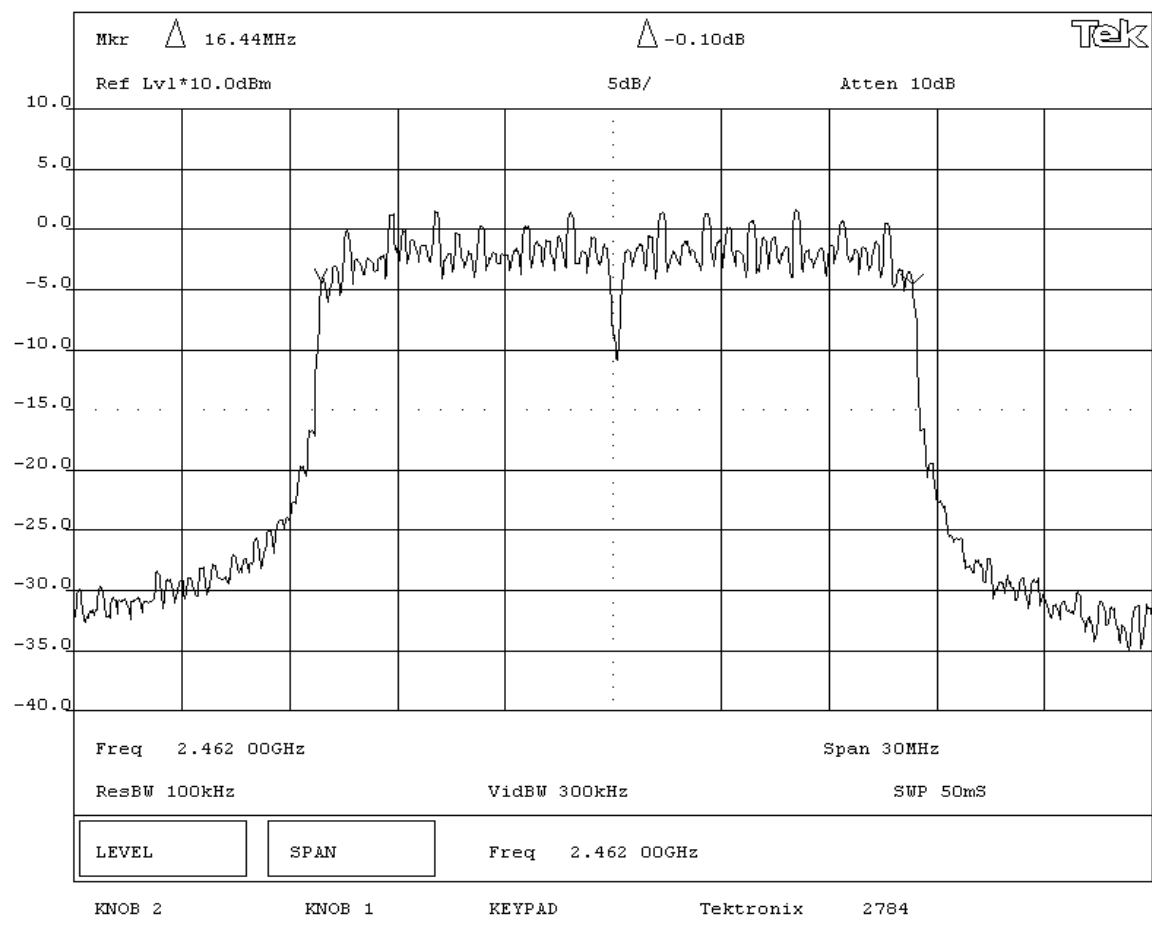
<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	16.44 MHz

**SIGNATURE**

Tested By: *Rodry Le Pelouin*

**DESCRIPTION OF TEST**

**Occupied Bandwidth - High Channel - 802.11(g) 36 Mbit**



# EMISSIONS DATA SHEET

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>
----------------------------

<b>COMMENTS</b>
-----------------

**EUT OPERATING MODES**  
Modulated by PRBS at indicated data rate, 802.11(g) modulation scheme.

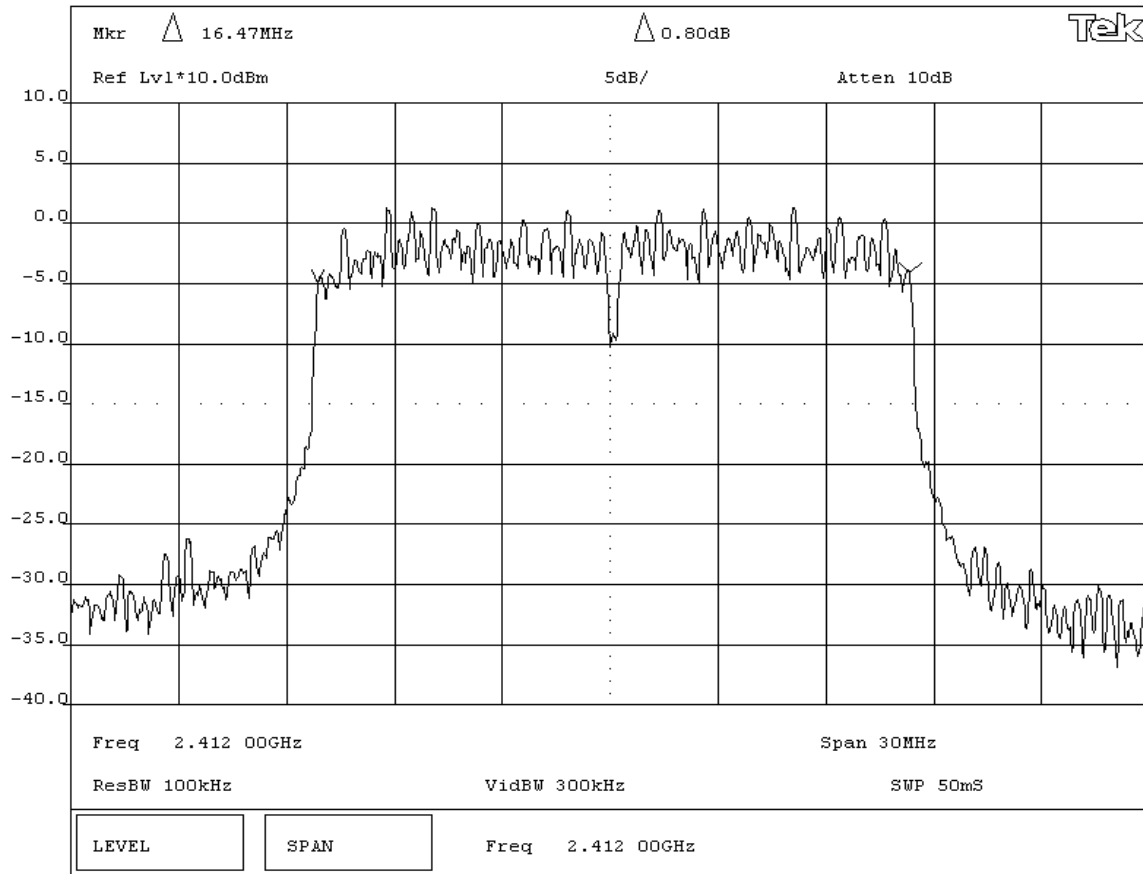
**DEVIATIONS FROM TEST STANDARD**  
None

**REQUIREMENTS**  
The minimum 6dB bandwidth is 500KHz

<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	16.47 MHz

**SIGNATURE**  
*Rodney Le Pelley*  
Tested By: \_\_\_\_\_

**DESCRIPTION OF TEST**  
**Occupied Bandwidth - Low Channel - 802.11(g) 54 Mbit**



EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>

**COMMENTS**

**EUT OPERATING MODES**

Modulated by PRBS at indicated data rate, 802.11(g) modulation scheme.

**DEVIATIONS FROM TEST STANDARD**

None

**REQUIREMENTS**

The minimum 6dB bandwidth is 500KHz

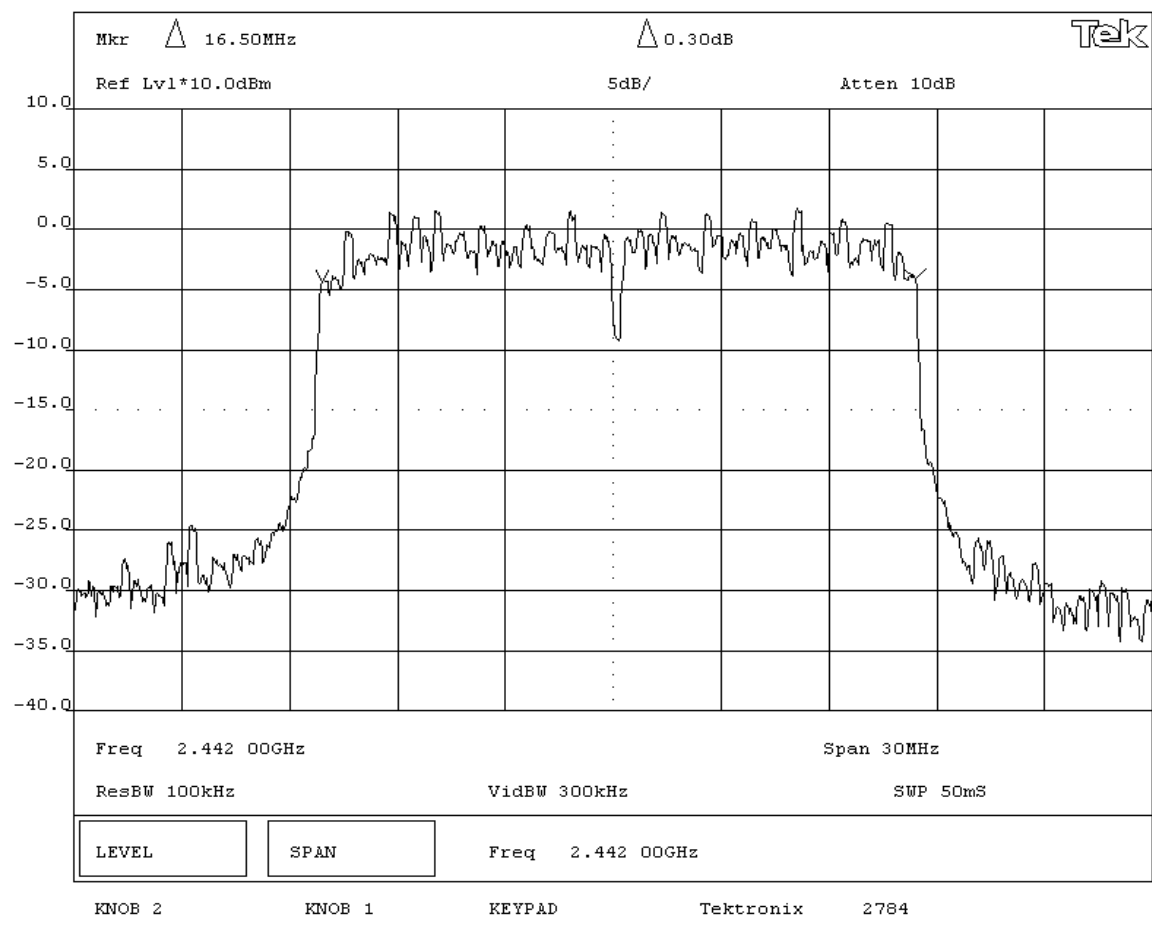
<b>RESULTS</b>	<b>BANDWIDTH</b>
Pass	16.5 MHz

**SIGNATURE**

Tested By: *Rod Peloquin*

**DESCRIPTION OF TEST**

**Occupied Bandwidth - Mid Channel - 802.11(g) 54 Mbit**



NORTHWEST  
**EMC**

# EMISSIONS DATA SHEET

Rev BETA  
01/30/01

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992
<b>SAMPLE CALCULATIONS</b>			

**COMMENTS**

**EUT OPERATING MODES**

Modulated by PRBS at indicated data rate, 802.11(g) modulation scheme.

**DEVIATIONS FROM TEST STANDARD**

None

**REQUIREMENTS**

The minimum 6dB bandwidth is 500KHz

**RESULTS**

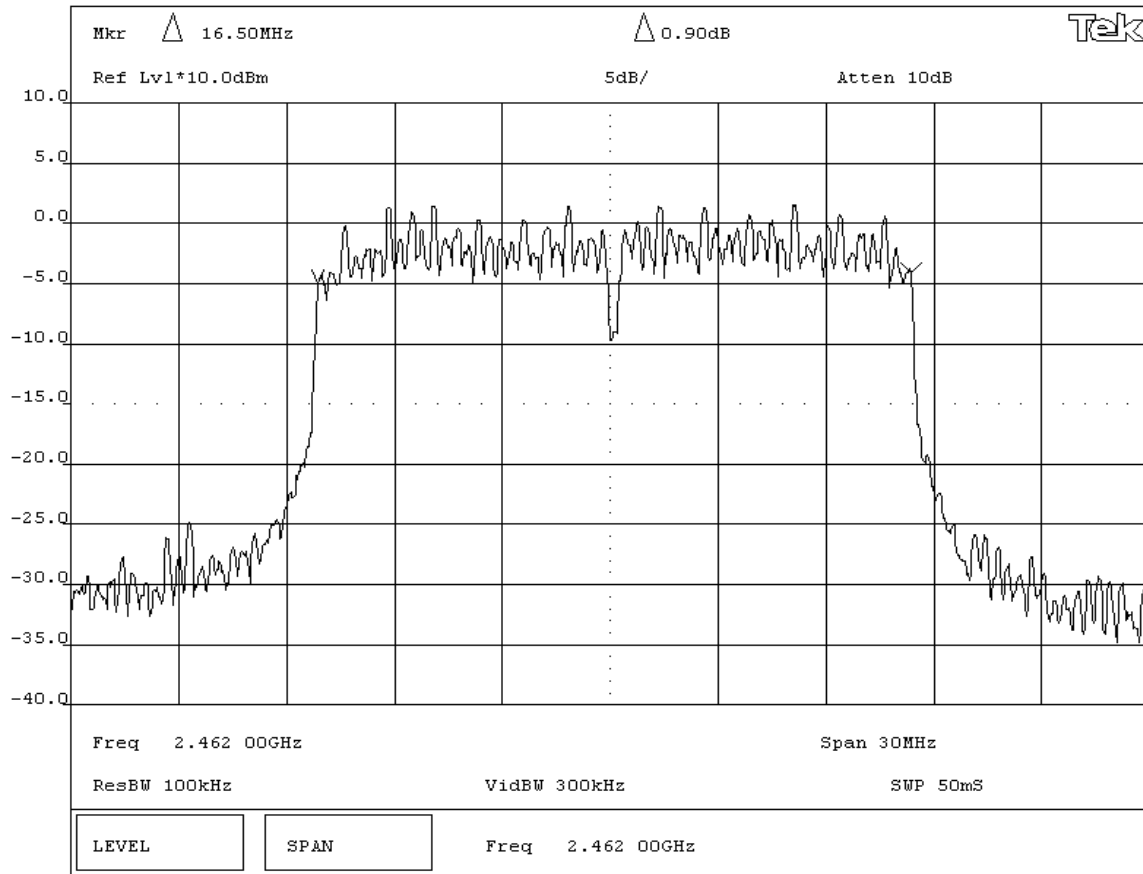
Pass BANDWIDTH 16.5 MHz

**SIGNATURE**

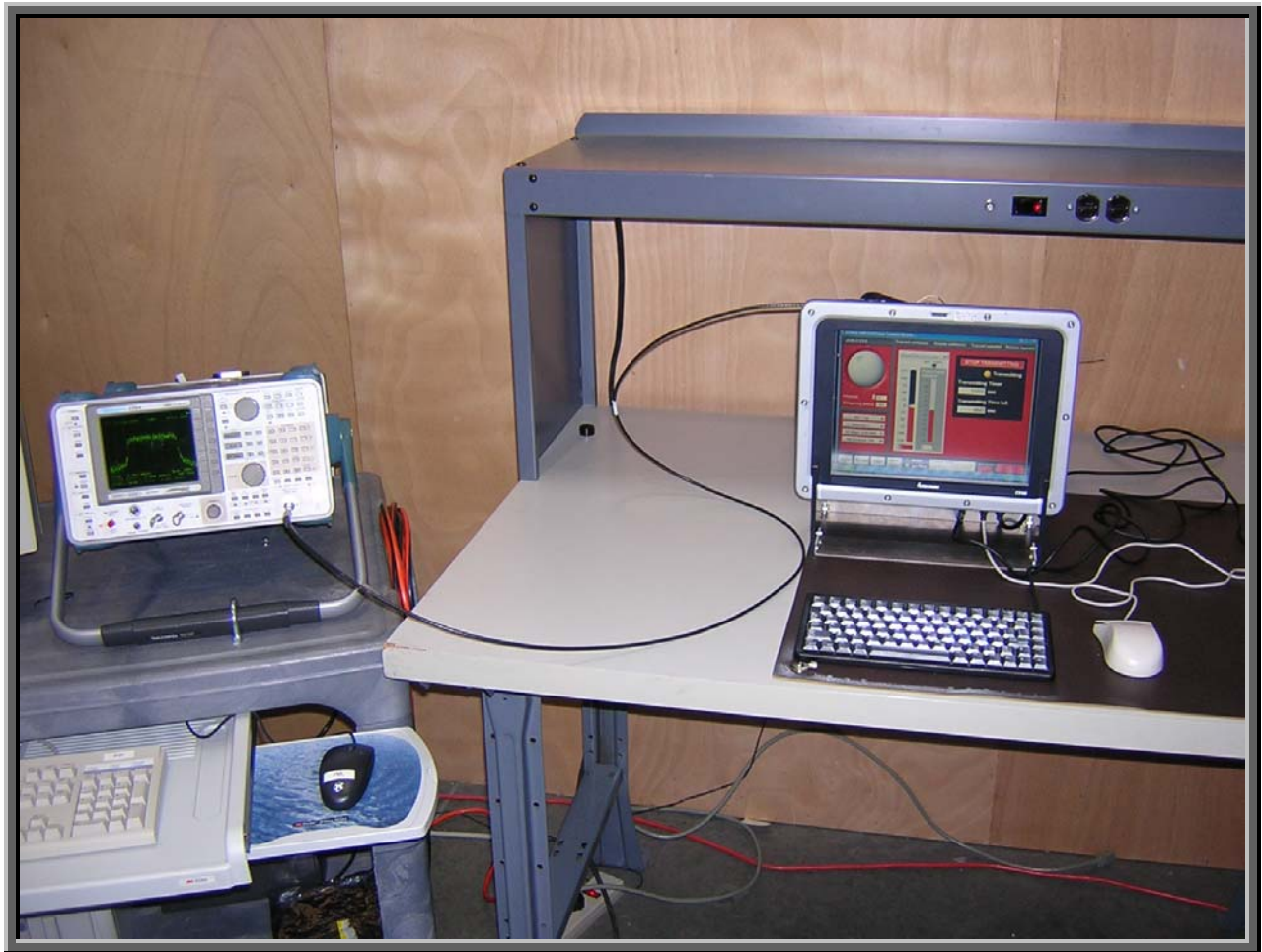
Tested By: *Rod Peloquin*

**DESCRIPTION OF TEST**

**Occupied Bandwidth - High Channel - 802.11(g) 54 Mbit**







**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:**

Single channel continuous transmit
------------------------------------

**Data Rates Investigated:**

1 Mbps (802.11b)
5.5 Mbps (802.11b)
11 Mbps (802.11b)
6 Mbps (802.11g)
36 Mbps (802.11g)
54 Mbps (802.11g)

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

Maximum default
-----------------

**Power Input Settings Investigated:**

120 VAC, 60 Hz.
-----------------

**Other Settings Investigated:**

802.11(b)
802.11(g)

**Software\Firmware Applied During Test**

<b>Exercise software</b>	Continuous Transmit-Receive (cTxRx)	<b>Version</b>	2.3.0.0
<b>Description</b>			
The system was tested using special software developed to test all functions of the device during the test.			

EUT and Peripherals			
Description	Manufacturer	Model/Part Number	Serial Number
Host Device	Intermec Technologies Corporation	CV60	02932
Keyboard	Cherry	G84-4110PPAUS/00	C 000435 J50
Mouse (USB)	Belkin	F8E201-USB 29U0	211006039
DC Power Supply	Skynet	SNP-PA57	035228227
EUT- 802.11(a)/(b)/(g) radio 802MIAG-CV60	PRISM	3886	000DF01504A8

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	Yes	2.0	PA	DC Power Supply	Host Device
AC Power	No	2.0	No	DC Power Supply	AC Power
Keyboard	PA	1.6	PA	Keyboard	Host Device
Mouse (USB)	PA	1.2	PA	Mouse (USB)	Host Device
<b>PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.</b>					

Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo
Power Meter	Hewlett Packard	E4418A	SPA	07/23/2004	24 mo
Power Sensor	Hewlett-Packard	8481H	SPB	07/23/2004	24 mo
Oscilloscope	Tektronix	TDS 3052	TOF	07/21/2004	12 mo
Signal Generator	Hewlett Packard	8341B	TGN	01/23/2004	13 mo
RF Detector	RLC Electronics	CR-133-R	ZZA	NCR	NA

### Test Description

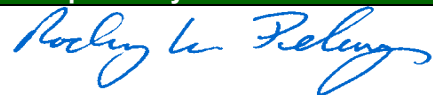
**Requirement:** Per 47 CFR 15.247(b)(3), the maximum peak output power must not exceed 1 Watt.

**Configuration:** The peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The EUT was transmitting at its maximum output power. The data rate of the radio was varied to determine the level that produced the highest output power.

The measurement was made using a direct connection between the RF output of the EUT and a RF detector diode. The DC output of the diode was measured with the oscilloscope. The signal generator, tuned to the transmit frequency, was then substituted for the EUT. The CW output of the signal generator was adjusted until the DC output of the RF detector diode match the peak level produced when connected to the EUT. To further reduce measurement error, the power meter and sensor were then used to measure the output power level of the signal generator.

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

Completed by:



EUT:	802MIAG-CV60	Work Order:	ITRM0039
Serial Number:	000DF01504A8	Date:	09/03/04
Customer:	INTERMEC Technologies	Temperature:	72 degrees F
Attendees:	None	Tested by:	Rod Peloquin
Customer Ref. No.:	N/A	Power:	120VAC/60Hz
		Humidity:	43% RH
		Job Site:	EV06

<b>TEST SPECIFICATIONS</b>			
Specification:	47 CFR 15.247(b)(3)	Year:	Most Current
Method:	FCC 97-114, ANSI C63.4	Year:	1992

<b>SAMPLE CALCULATIONS</b>			

<b>COMMENTS</b>			

**EUT OPERATING MODES**

Modulated by PRBS at indicated data rate, at maximum output power. 802.11(b) modulation scheme.

**DEVIATIONS FROM TEST STANDARD**

None

**REQUIREMENTS**

Maximum peak conducted output power does not exceed 1 Watt

<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	32.6 mW

**SIGNATURE**

Tested By: 

**DESCRIPTION OF TEST**

**Output Power - Low, Mid, & High Channels**

**Data Rate = 1 Mbit**

Frequency (MHz)	Power (mW)
2412	30.3
2442	32.0
2462	32.6

**Data Rate = 5.5 Mbit**

Frequency (MHz)	Power (mW)
2412	30.3
2442	32.4
2462	32.2

**Data Rate = 11 Mbit**

Frequency (MHz)	Power (mW)
2412	30.3
2442	31.3
2462	32.2

EUT:	802MIAG-CV60	Work Order:	ITRM0039
Serial Number:	000DF01504A8	Date:	09/03/04
Customer:	INTERMEC Technologies	Temperature:	72 degrees F
Attendees:	None	Tested by:	Rod Peloquin
Customer Ref. No.:	N/A	Power:	120VAC/60Hz
		Humidity:	43% RH
		Job Site:	EV06

## TEST SPECIFICATIONS

Specification:	47 CFR 15.247(b)(3)	Year:	Most Current	Method:	FCC 97-114, ANSI C63.4	Year:	1992
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## SAMPLE CALCULATIONS

## COMMENTS

## EUT OPERATING MODES

Modulated by PRBS at indicated data rate, at maximum output power. 802.11(g) modulation scheme.

## DEVIATIONS FROM TEST STANDARD

None

## REQUIREMENTS

Maximum peak conducted output power does not exceed 1 Watt

## RESULTS

## AMPLITUDE

Pass

55.1 mW

## SIGNATURE

Tested By: 

## DESCRIPTION OF TEST

Output Power - Low, Mid, & High Channels

## Data Rate = 6 Mbit

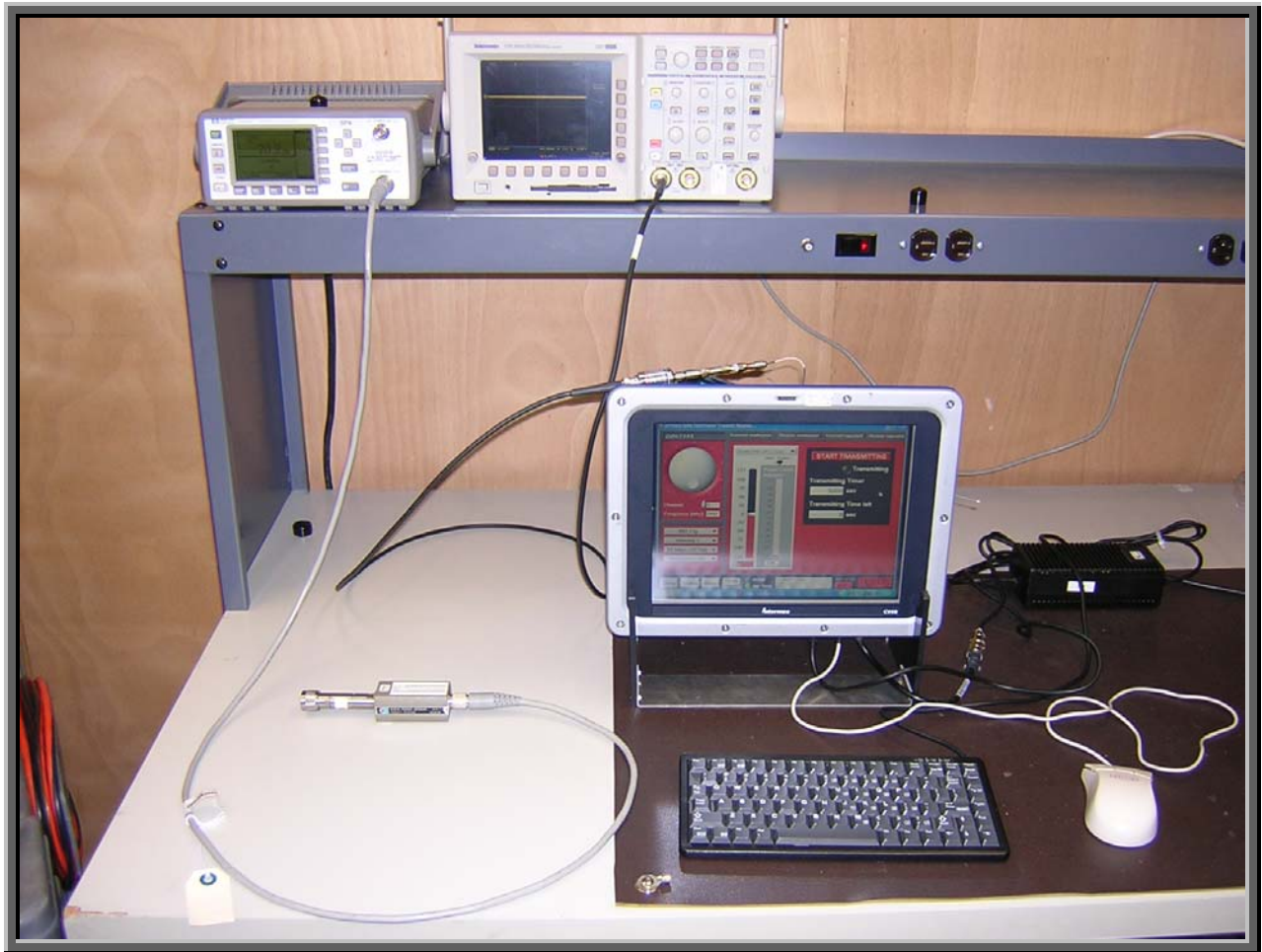
Frequency (MHz)	Power (mW)
2412	44.8
2442	46.8
2462	47.6

## Data Rate = 36 Mbit

Frequency (MHz)	Power (mW)
2412	49.8
2442	52.5
2462	53.9

## Data Rate = 54 Mbit

Frequency (MHz)	Power (mW)
2412	50.9
2442	53.1
2462	55.1



**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:**

Single channel continuous transmit

**Data Rates Investigated:**

1 Mbps (802.11b)

5.5 Mbps (802.11b)

11 Mbps (802.11b)

6 Mbps (802.11g)

36 Mbps (802.11g)

54 Mbps (802.11g)

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

Maximum default

**Power Input Settings Investigated:**

120 VAC, 60 Hz.

**Other Settings Investigated:**

802.11(b)

802.11(g)

**Software\Firmware Applied During Test**

Exercise software	Continuous Transmit-Receive (cTxRx)	Version	2.3.0.0
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
Host Device	Intermec Technologies Corporation	CV60	02932
Keyboard	Cherry	G84-4110PPAUS/00	C 000435 J50
Mouse (USB)	Belkin	F8E201-USB 29U0	211006039
DC Power Supply	Skynet	SNP-PA57	035228227
EUT- 802.11(a)/(b)/(g) radio 802MIAG-CV60	PRISM	3886	000DF01504A8

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	Yes	2.0	PA	DC Power Supply	Host Device
AC Power	No	2.0	No	DC Power Supply	AC Power
Keyboard	PA	1.6	PA	Keyboard	Host Device
Mouse (USB)	PA	1.2	PA	Mouse (USB)	Host Device
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	02/26/2003	24 mo

### Test Description

**Requirement:** Per 47 CFR 15.247(c), 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 using direct sequence modulation. The channels closest to the band edges were selected. The spectrum was scanned across each band edge from 25 MHz below the band edge to 25 MHz above the band edge.

Completed by:



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

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

**SAMPLE CALCULATIONS**

**COMMENTS**

**EUT OPERATING MODES**  
 Modulated by PRBS at 1 Mbps data rate, 802.11(b) modulation scheme

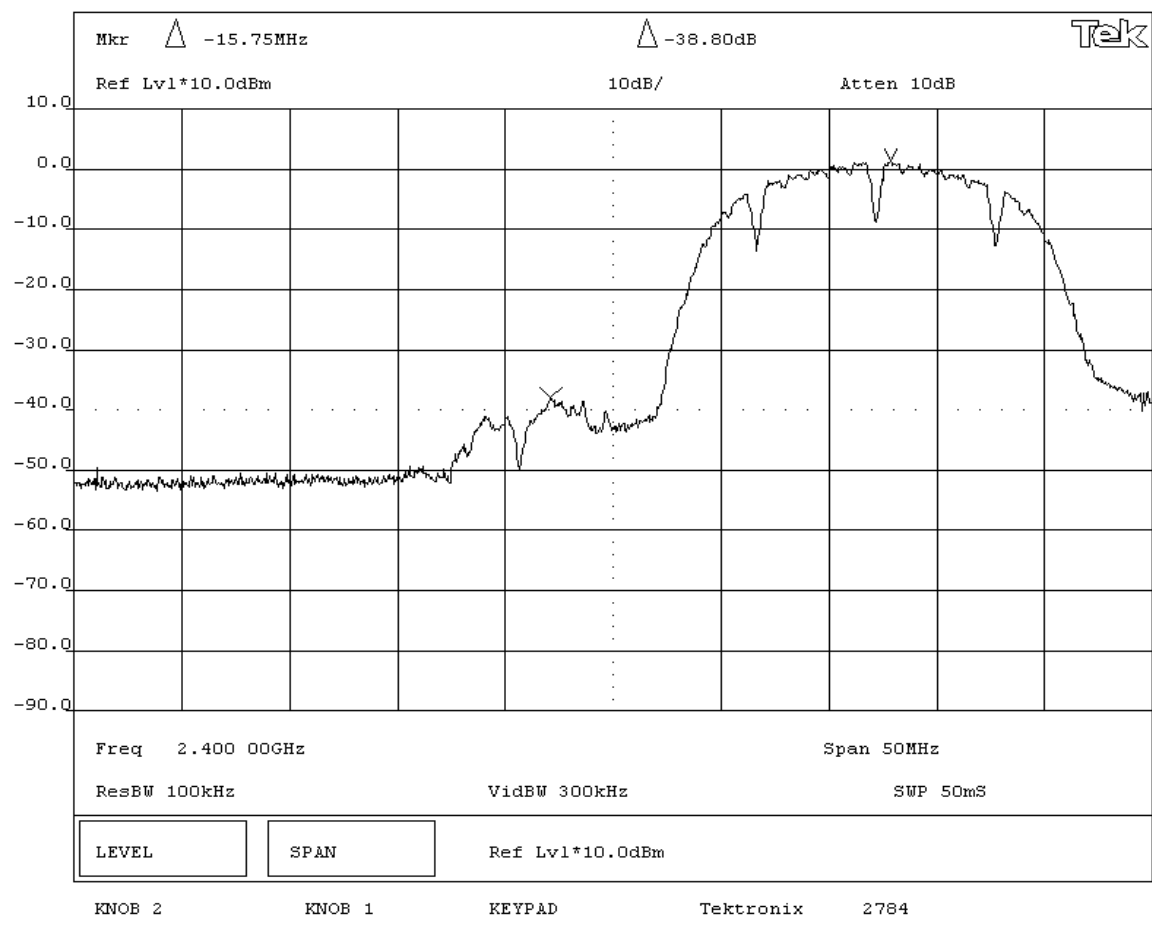
**DEVIATIONS FROM TEST STANDARD**  
 None

**REQUIREMENTS**  
 Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.

<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	-38.8 dB

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

**DESCRIPTION OF TEST**  
**Band Edge Compliance - Low Channel - 802.11(b) 1 Mbps**



NORTHWEST  
**EMC**

# EMISSIONS DATA SHEET

Rev BETA  
01/30/01

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>			

<b>COMMENTS</b>			

<b>EUT OPERATING MODES</b>			
Modulated by PRBS at 1 Mbps data rate, 802.11(b) modulation scheme			

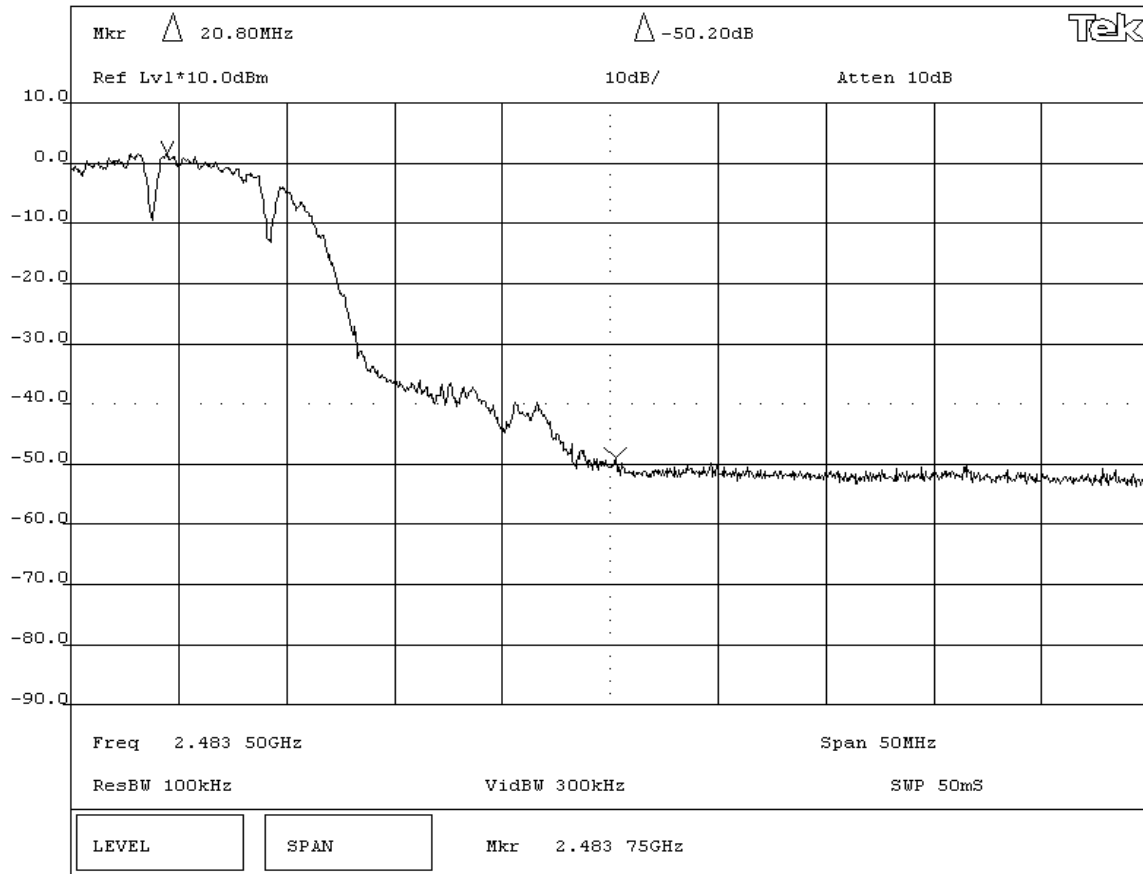
<b>DEVIATIONS FROM TEST STANDARD</b>			
None			

<b>REQUIREMENTS</b>			
Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.			

<b>RESULTS</b>		<b>AMPLITUDE</b>	
Pass		-50.2 dB	

<b>SIGNATURE</b>			
			
Tested By: _____			

<b>DESCRIPTION OF TEST</b>			
<b>Band Edge Compliance - High Channel - 802.11(b) 1 Mbps</b>			



EUT: 802MIAG-CV60		Work Order: ITRM0039	
Serial Number: 000DF01504A8		Date: 09/02/04	
Customer: INTERMEC Technologies		Temperature: 72 degrees F	
Attendees: None		Humidity: 43% RH	
Customer Ref. No.: N/A	Tested by: Rod Peloquin	Power: 120VAC/60Hz	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>			

<b>COMMENTS</b>			

<b>EUT OPERATING MODES</b>			
Modulated by PRBS at 5.5 Mbps data rate, 802.11(b) modulation scheme			

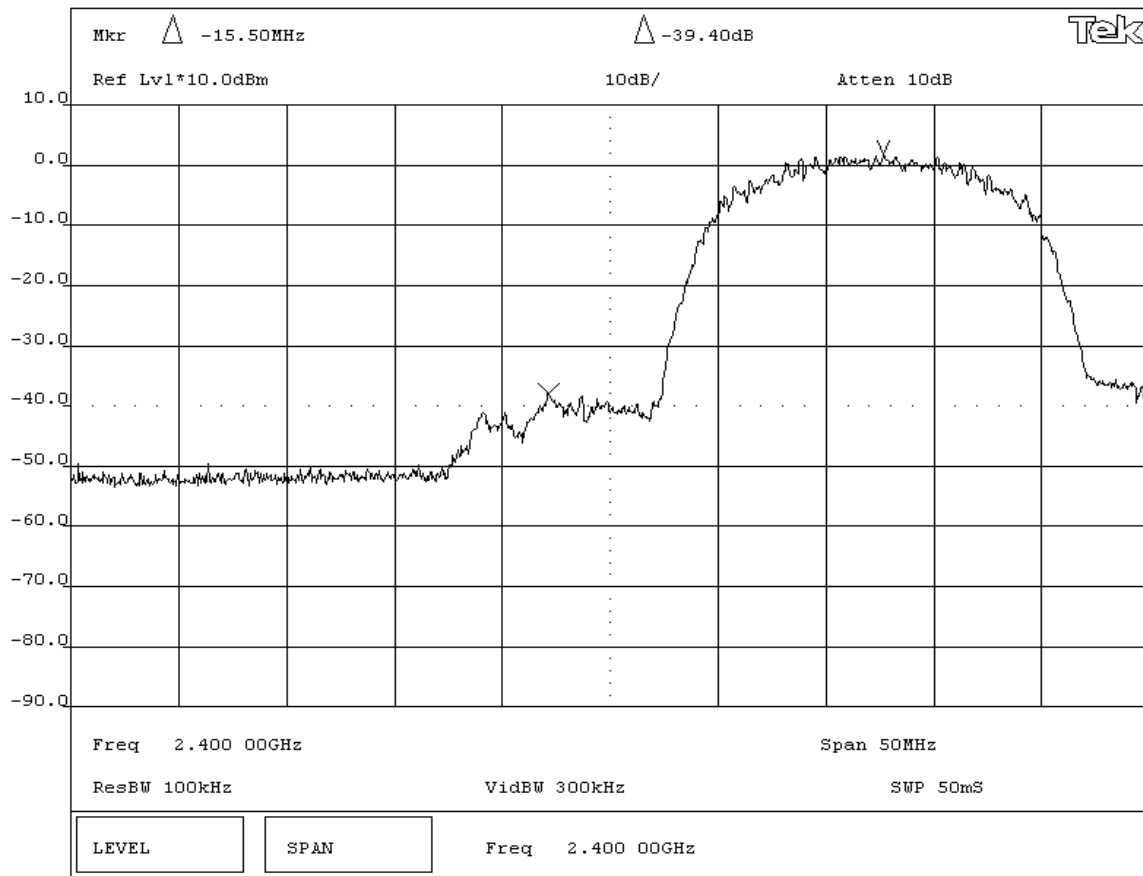
<b>DEVIATIONS FROM TEST STANDARD</b>			
None			

<b>REQUIREMENTS</b>			
Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.			

<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	-39.4 dB

<b>SIGNATURE</b>	
 Tested By: _____	

<b>DESCRIPTION OF TEST</b>	
<b>Band Edge Compliance - Low Channel - 802.11(b) 5.5 Mbps</b>	



NORTHWEST  
**EMC**

# EMISSIONS DATA SHEET

Rev BETA  
01/30/01

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

**SAMPLE CALCULATIONS**

**COMMENTS**

**EUT OPERATING MODES**  
Modulated by PRBS at 5.5 Mbps data rate, 802.11(b) modulation scheme

**DEVIATIONS FROM TEST STANDARD**  
None

**REQUIREMENTS**  
Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.

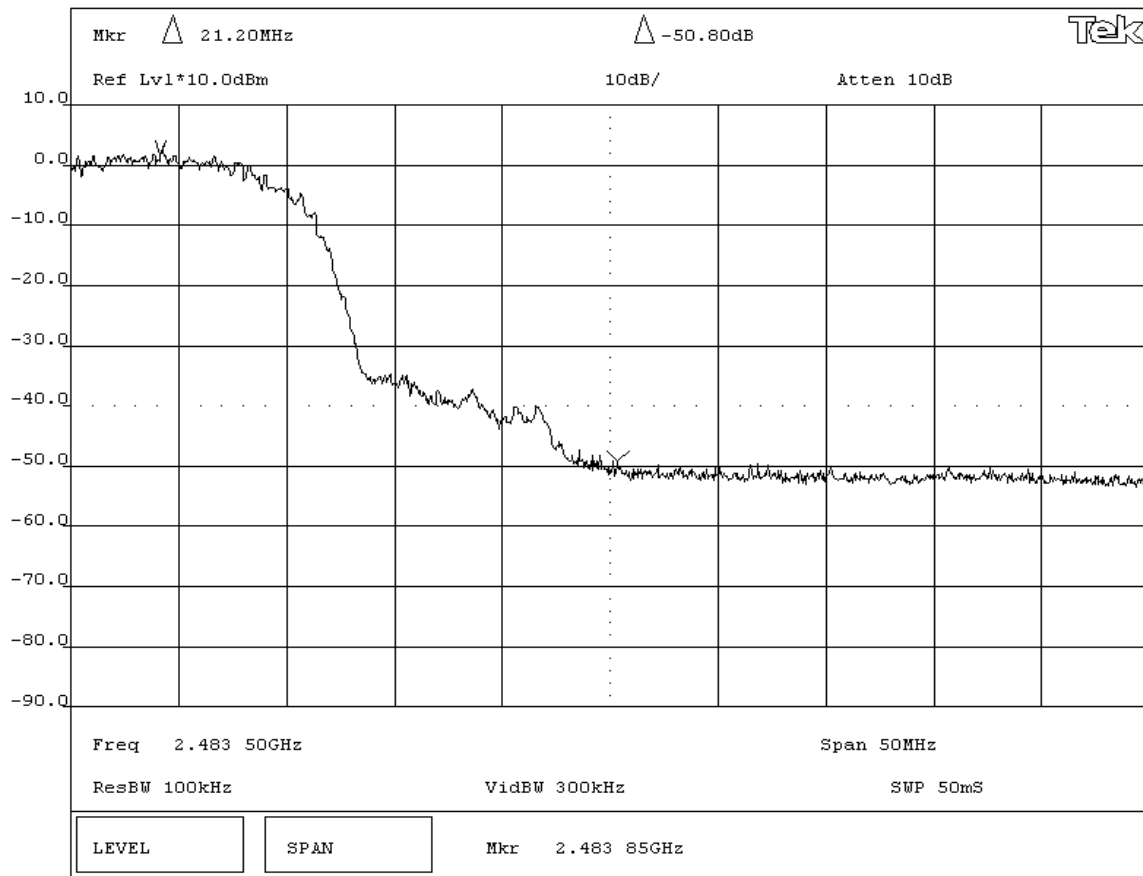
<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	-50.8 dB

**SIGNATURE**

*Rodry Le Pelouin*

Tested By: \_\_\_\_\_

**DESCRIPTION OF TEST**  
**Band Edge Compliance - High Channel - 802.11(b) 5.5 Mbps**



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

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

**SAMPLE CALCULATIONS**

**COMMENTS**

**EUT OPERATING MODES**

Modulated by PRBS at maximum data rate, 802.11(b) modulation scheme

**DEVIATIONS FROM TEST STANDARD**

None

**REQUIREMENTS**

Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.

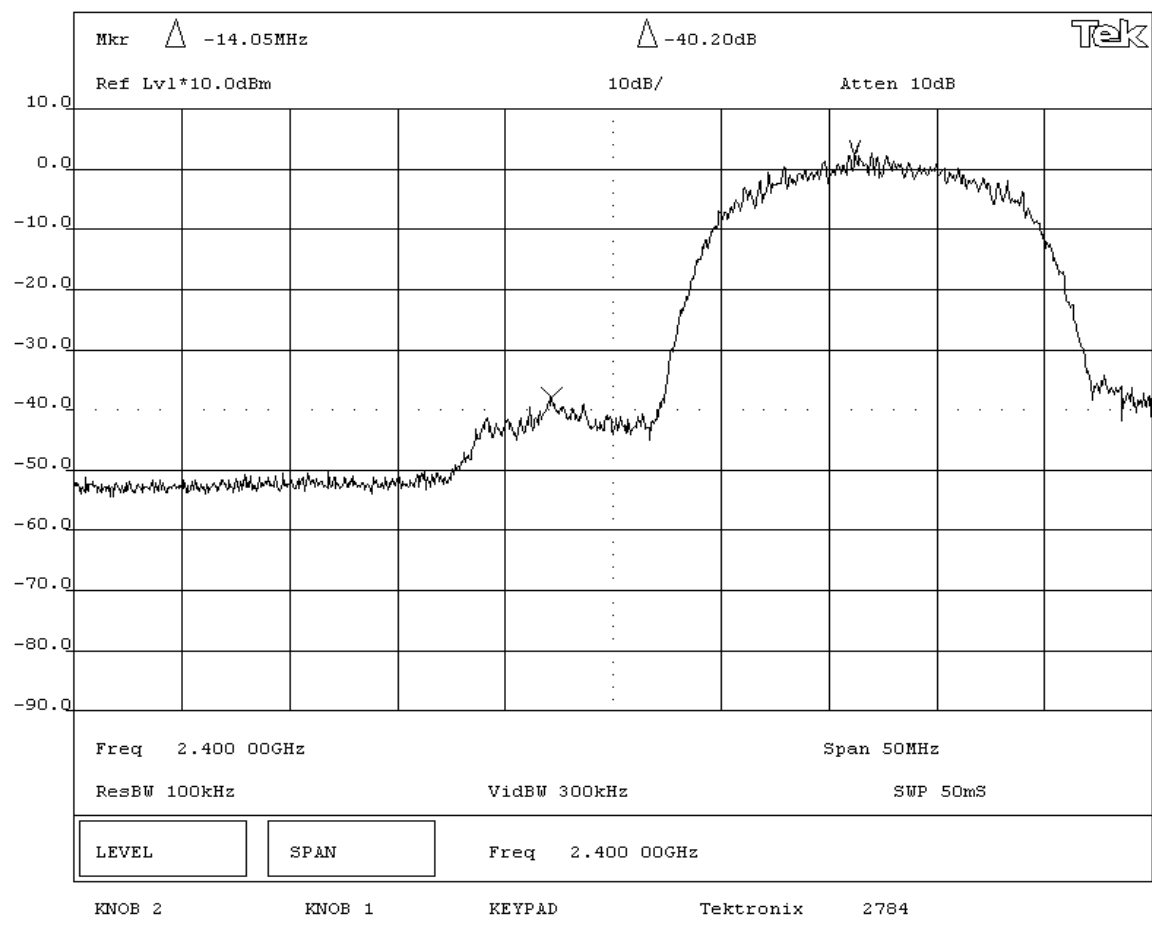
<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	-40.2 dB

**SIGNATURE**

Tested By: *Rod Peloquin*

**DESCRIPTION OF TEST**

**Band Edge Compliance - Low Channel - 802.11(b) 11 Mbps**



NORTHWEST  
**EMC**

# EMISSIONS DATA SHEET

Rev BETA  
01/30/01

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>			

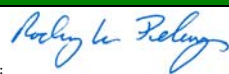
<b>COMMENTS</b>			

<b>EUT OPERATING MODES</b>			
Modulated by PRBS at maximum data rate, 802.11(b) modulation scheme			

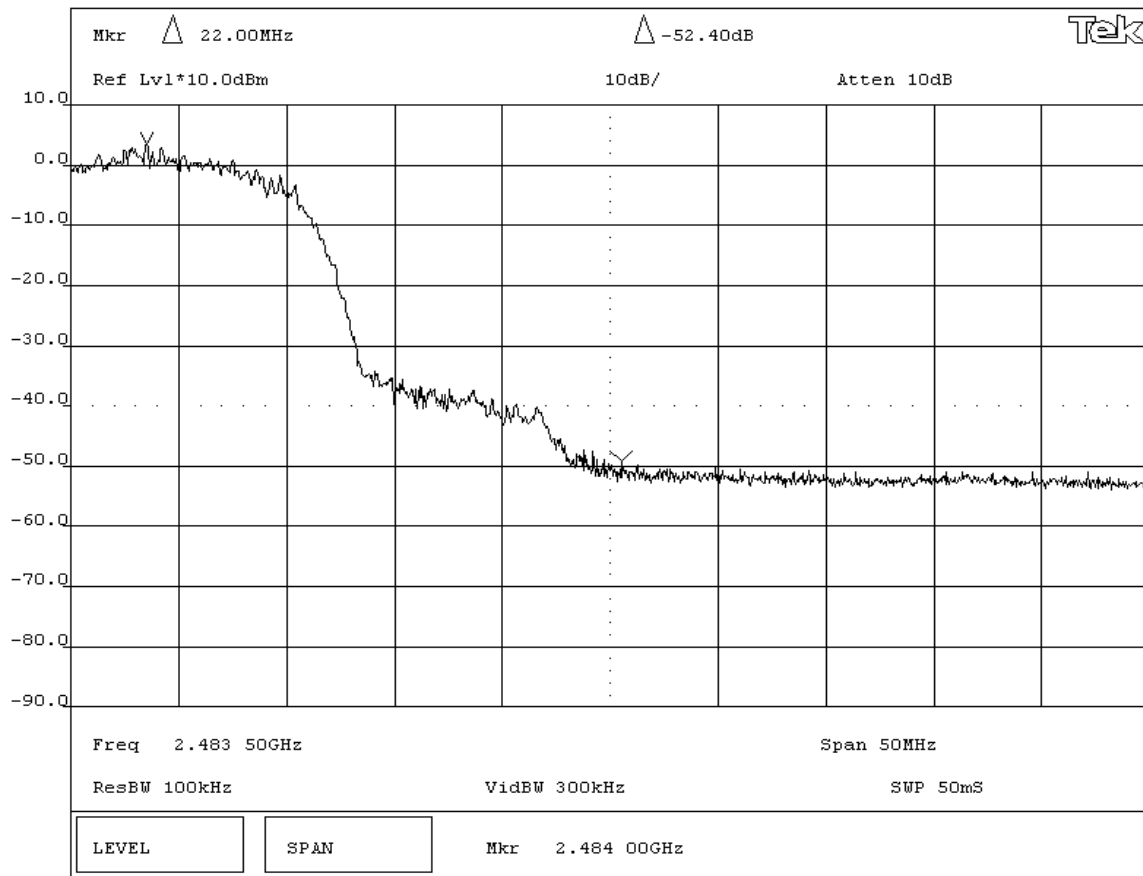
<b>DEVIATIONS FROM TEST STANDARD</b>			
None			

<b>REQUIREMENTS</b>			
Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.			

<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	-52.4 dB

<b>SIGNATURE</b>			
			
Tested By: _____			

<b>DESCRIPTION OF TEST</b>			
<b>Band Edge Compliance - High Channel - 802.11(b) 11 Mbps</b>			



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

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

**SAMPLE CALCULATIONS**

**COMMENTS**

**EUT OPERATING MODES**  
Modulated by PRBS at 6 Mbps data rate, 802.11(g) modulation scheme.

**DEVIATIONS FROM TEST STANDARD**  
None

**REQUIREMENTS**  
Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.

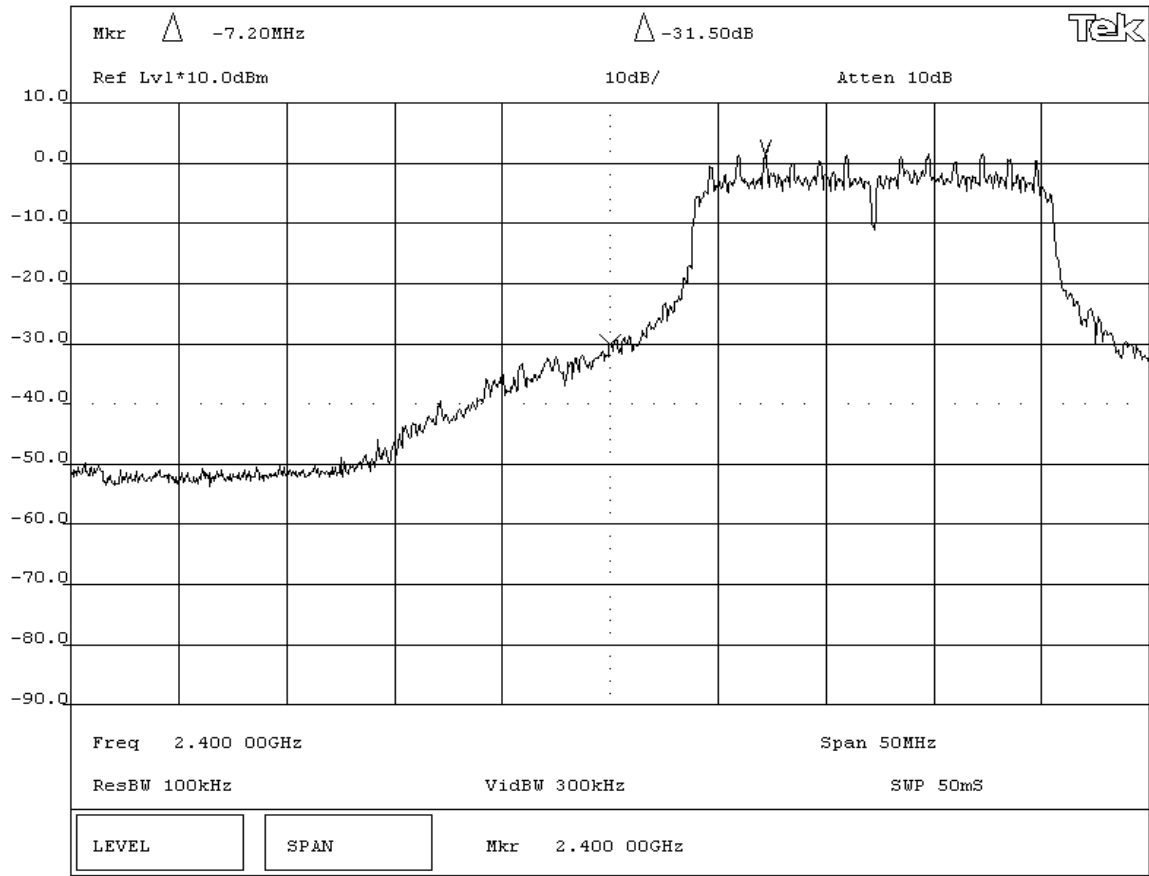
<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	-31.5 dB

**SIGNATURE**

*Rod Peloquin*

Tested By: \_\_\_\_\_

**DESCRIPTION OF TEST**  
**Band Edge Compliance - Low Channel - 802.11(g) 6 Mbit**





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

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

**SAMPLE CALCULATIONS**

**COMMENTS**

**EUT OPERATING MODES**  
 Modulated by PRBS at 6 Mbps data rate, 802.11(g) modulation scheme.

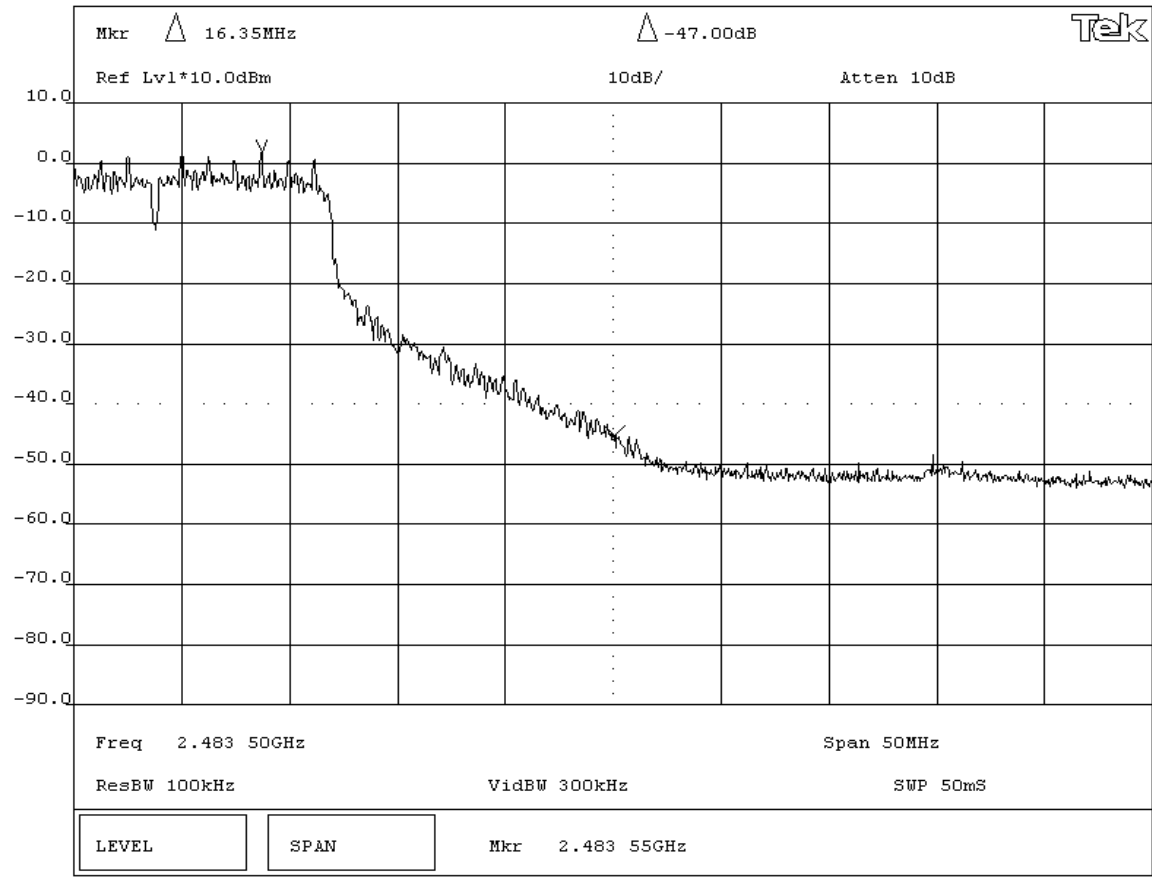
**DEVIATIONS FROM TEST STANDARD**  
 None

**REQUIREMENTS**  
 Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.

<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	-47.0 dB

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

**DESCRIPTION OF TEST**  
**Band Edge Compliance - High Channel - 802.11(g) 6 Mbit**



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

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

**SAMPLE CALCULATIONS**

**COMMENTS**

**EUT OPERATING MODES**  
Modulated by PRBS at 36 Mbps data rate, 802.11(g) modulation scheme.

**DEVIATIONS FROM TEST STANDARD**  
None

**REQUIREMENTS**  
Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.

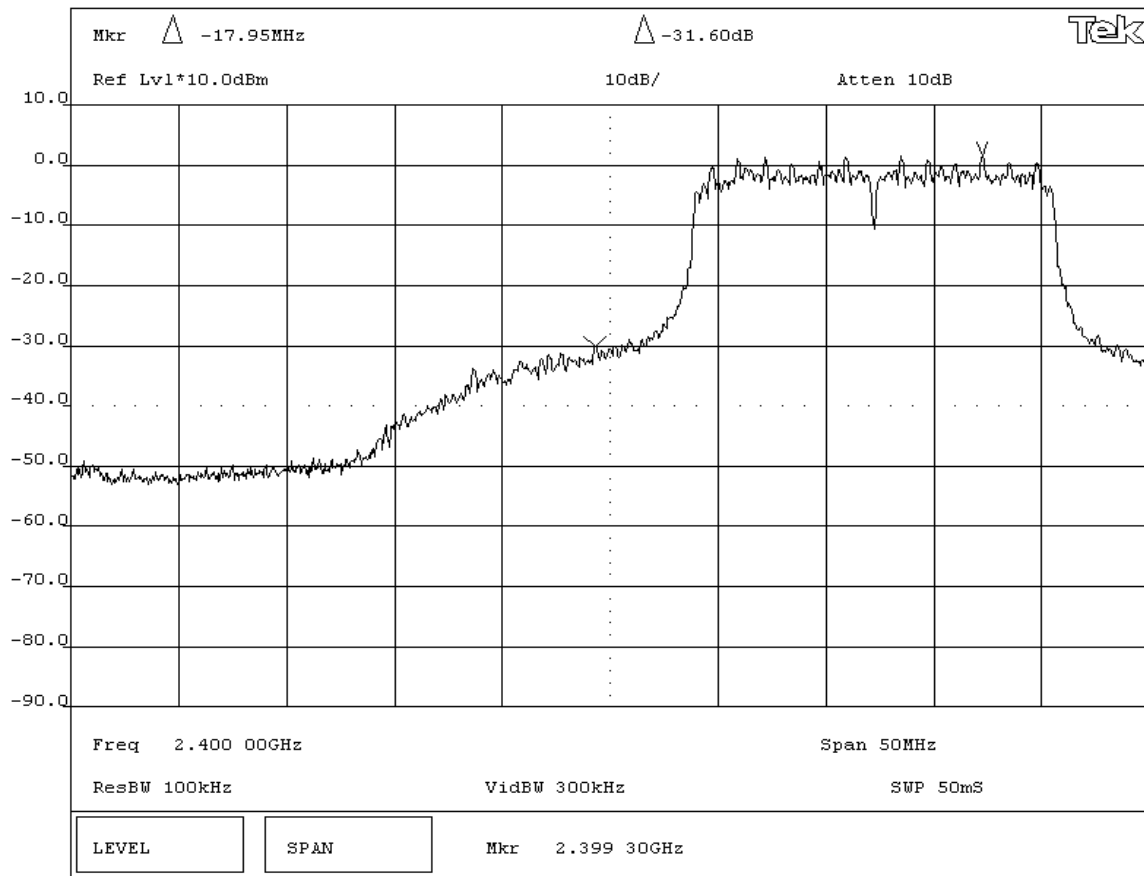
<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	-31.6 dB

**SIGNATURE**

*Rodry Le Pelouin*

Tested By: \_\_\_\_\_

**DESCRIPTION OF TEST**  
**Band Edge Compliance - Low Channel - 802.11(g) 36 Mbit**



EUT: 802MIAG-CV60		Work Order: ITRM0039	
Serial Number: 000DF01504A8		Date: 09/02/04	
Customer: INTERMEC Technologies		Temperature: 72 degrees F	
Attendees: None		Humidity: 43% RH	
Customer Ref. No.: N/A	Tested by: Rod Peloquin	Power: 120VAC/60Hz	
Job Site: EV06			

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>			

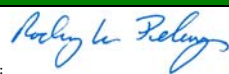
<b>COMMENTS</b>			

<b>EUT OPERATING MODES</b>			
Modulated by PRBS at 36 Mbps data rate, 802.11(g) modulation scheme.			

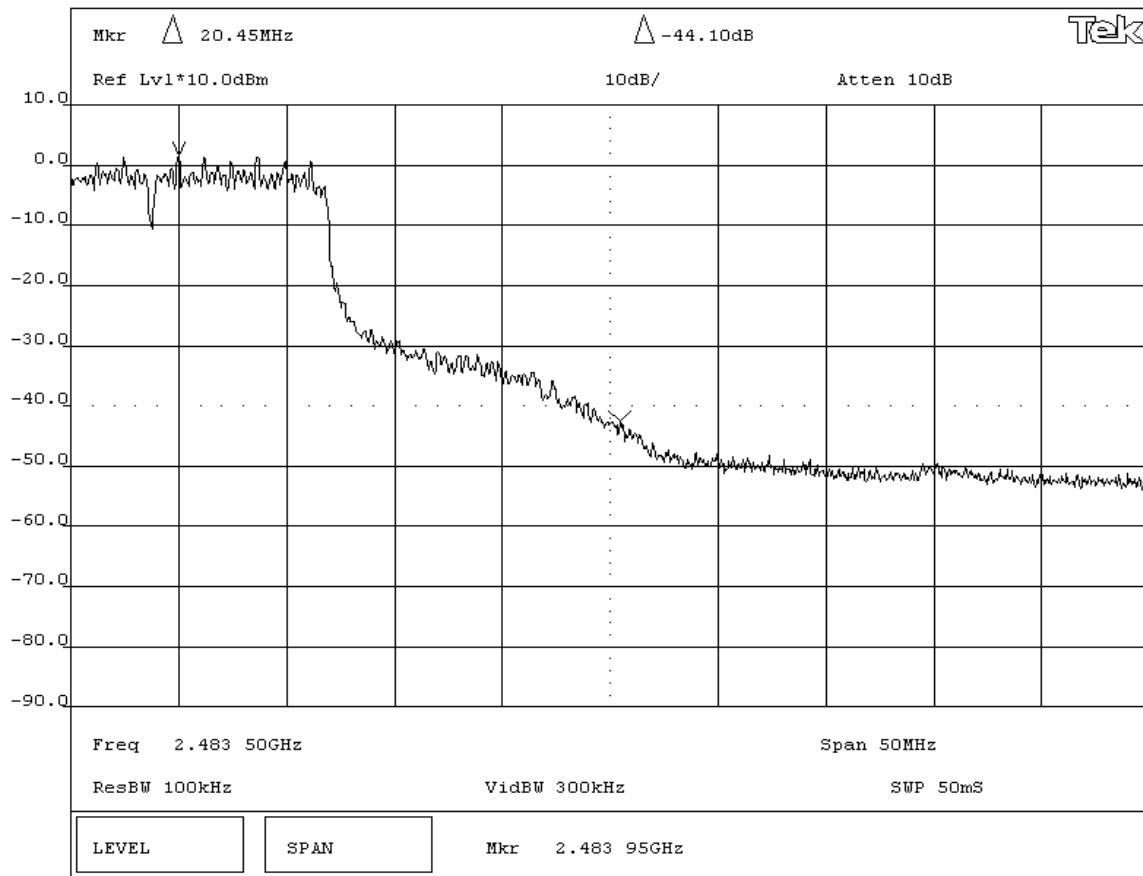
<b>DEVIATIONS FROM TEST STANDARD</b>			
None			

<b>REQUIREMENTS</b>			
Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.			

<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	-44.1 dB

<b>SIGNATURE</b>	
 Tested By: _____	

<b>DESCRIPTION OF TEST</b>
<b>Band Edge Compliance - High Channel - 802.11(g) 36 Mbit</b>



# EMISSIONS DATA SHEET

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Tested by: Rod Peloquin
	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

<b>SAMPLE CALCULATIONS</b>
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<b>COMMENTS</b>
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<b>EUT OPERATING MODES</b>
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Modulated by PRBS at maximum data rate, 802.11(g) modulation scheme.
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<b>DEVIATIONS FROM TEST STANDARD</b>
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None
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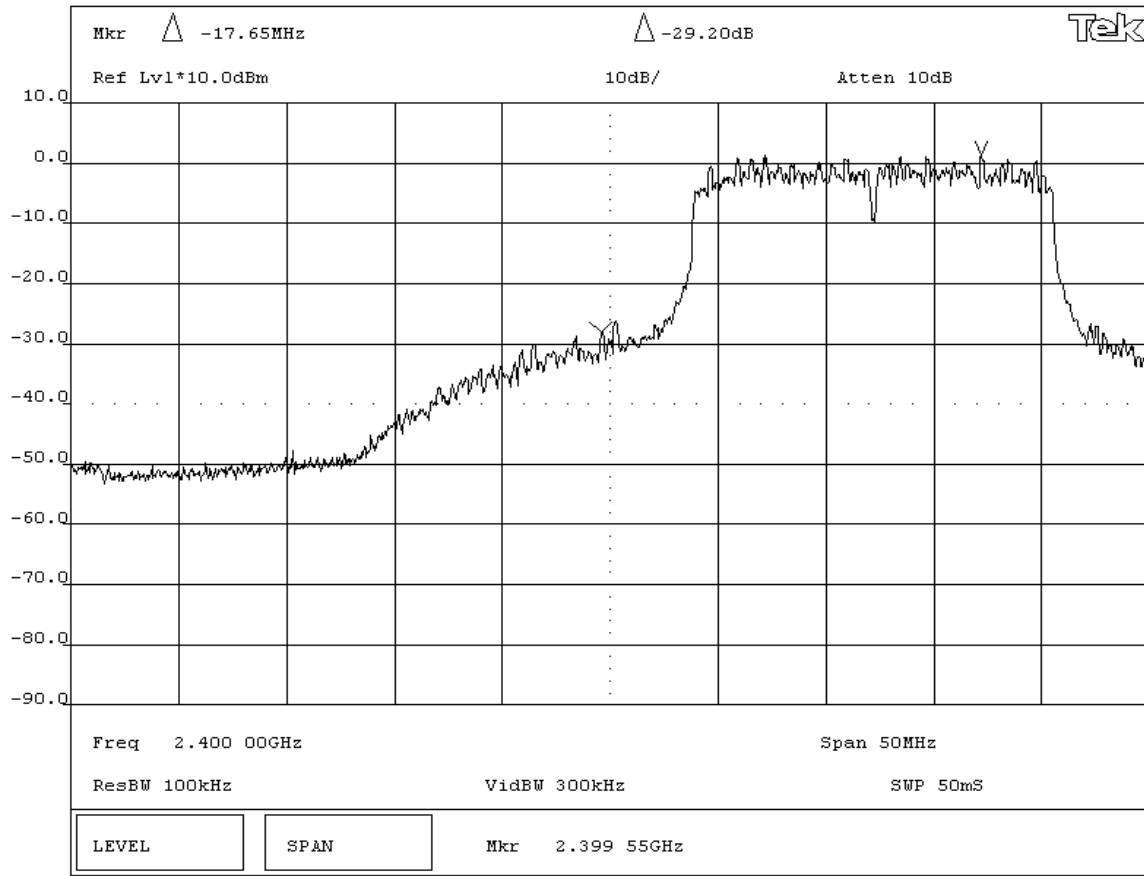
<b>REQUIREMENTS</b>
---------------------

Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.
---

<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	-29.2 dB

<b>SIGNATURE</b>
<i>Rod Peloquin</i>
Tested By: _____

<b>DESCRIPTION OF TEST</b>
<b>Band Edge Compliance - Low Channel - 802.11(g) 54 Mbit</b>



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

EUT: 802MIAG-CV60	Work Order: ITRM0039
Serial Number: 000DF01504A8	Date: 09/02/04
Customer: INTERMEC Technologies	Temperature: 72 degrees F
Attendees: None	Humidity: 43% RH
Customer Ref. No.: N/A	Power: 120VAC/60Hz
	Job Site: EV06

<b>TEST SPECIFICATIONS</b>			
Specification: FCC Part 15.247(a)(2)	Year: 2003	Method: FCC 97-114, ANSI C63.4	Year: 1992

**SAMPLE CALCULATIONS**

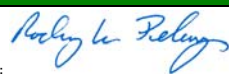
**COMMENTS**

**EUT OPERATING MODES**  
 Modulated by PRBS at maximum data rate, 802.11(g) modulation scheme.

**DEVIATIONS FROM TEST STANDARD**  
 None

**REQUIREMENTS**  
 Maximum level of any spurious emission at the edge of the authorized band is 20 dB down from the fundamental.

<b>RESULTS</b>	<b>AMPLITUDE</b>
Pass	-44.0 dB

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

**DESCRIPTION OF TEST**  
**Band Edge Compliance - High Channel - 802.11(g) 54 Mbit**

