Idmicro, INC.

Model 4120R

November 17, 2004

Report No. IDMI0005

Report Prepared By

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

EMC Test Report

NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Issue Date: November 17, 2004
Idmicro, INC.
Model: 4120R

Emissions			
Specification	**Test Method**	**Pass**	**Fail**
FCC 15.207 AC Powerline Conducted Emissions:2004	ANSI C63.4:2003	☒	☐
FCC 15.247(a) Occupied Bandwidth:2004	ANSI C63.4:2003	☒	☐
FCC 15.247(a)(1) Channel Spacing:2004	ANSI C63.4:2003	☒	☐
FCC 15.247(a)(1) Dwell Time:2004	ANSI C63.4:2003	☒	☐
FCC 15.247(a)(1) Number of Hopping Frequencies:2004	ANSI C63.4:2003	☒	☐
FCC 15.247(b) Output Power:2004	ANSI C63.4:2003	☒	☐
FCC 15.247(d) Band Edge Compliance:2004	ANSI C63.4:2003	☒	☐
FCC 15.247(d) Spurious Conducted Emissions:2004	ANSI C63.4:2003	☒	☐
FCC 15.247(d) Spurious Radiated Emissions:2004	ANSI C63.4:2003	☒	☐
FCC 15.247(e) Power Spectral Density:2004	ANSI C63.4:2003	☒	☐

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:

Don Facteau, IS Manager

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

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

Revision 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 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

Accreditations and Authorizations

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

Northwest EMC

Explanation of Northwest EMC Performance Criteria

Revision 03/24/03

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?

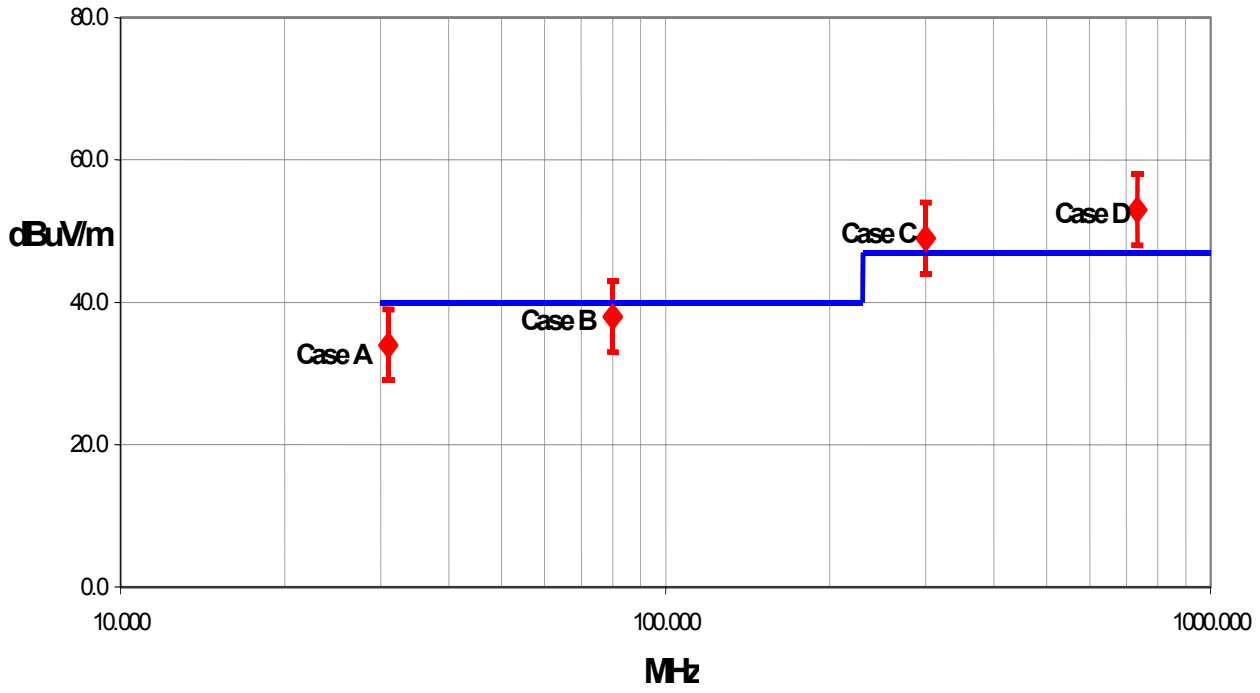
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following 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)					
	Probability Distribution	Biconical Antenna		Log Periodic Antenna		Dipole Antenna	
Test Distance		3m	10m	3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.86 - 1.88	+ 1.82 - 1.87	+ 2.23 - 1.41	+ 1.29 - 1.26	+ 1.31 - 1.27	+ 1.25 - 1.25
Expanded uncertainty ***U*** (level of confidence ≈ 95%)	normal (k=2)	+ 3.72 - 3.77	+ 3.64 - 3.73	+ 4.46 -2.81	+ 2.59 - 2.52	+ 2.61 - 2.55	+ 2.49 - 2.49

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

Conducted Emissions		
	Probability Distribution	Value (+/- dB)
Combined standard uncertainty ***uc(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 ***uc(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 ***uc(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, uc(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 339th Ave. SE
Sultan, WA 98294
(888) 364-2378
FAX (360) 793-2536

Party Requesting the Test	
Company Name:	Idmicro, INC.
Address:	1019 Pacific Avenue, 13th Floor
City, State, Zip:	Tacoma, WA 98402
Test Requested By:	Tom Kearns
Model:	2.4 GHz RFID Reader
First Date of Test:	11-02-2004
Last Date of Test:	11-08-2004
Receipt Date of Samples:	11-02-2004
Equipment Design Stage:	Production
Equipment Condition:	No visual damage.

Information Provided by the Party Requesting the Test

Clocks/Oscillators:	Not provided at time of test
I/O Ports:	Serial, I/O ports, Transmit (6 ports), Receive (6 ports),

Functional Description of the EUT (Equipment Under Test):
2.4 GHz RFID reader.

Client Justification for EUT Selection:
The product is a representative production sample.

Client Justification for Test Selection:
These tests are for FCC certification under a Class 2 permissive change.

EUT Photo

Equipment modifications					
Item	Test	Date	Modification	Note	Disposition of EUT
1	Spurious Radiated Emissions	11/02/2004 11/03/2004	The following EMI suppression devices were added during this test: Screen and conductive foam on outside of box over fan.	Modified from delivered configuration. Modifications made by Tom Kearns of IDmicro	EUT remained at Northwest EMC.
2	Spurious Conducted Emissions	11/03/2004 11/04/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
3	Peak Conducted Output Power	11/04/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
4	Band Edge Compliance	11/04/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
5	Occupied Bandwidth	11/04/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
6	Power Spectral Density	11/04/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
7	Number of hopping frequencies	11/04/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
8	Channel Spacing	11/04/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
9	Dwell Time	11/04/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.
10	AC Powerline Conducted Emissions	11/08/2004	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:
Hopping

Operating Modes Investigated:
Return Link (FHSS)

Data Rates Investigated:
Maximum

Output Power Setting(s) Investigated:
Maximum

Power Input Settings Investigated:
120 VAC, 60 Hz.

Software\Firmware Applied During Test			
Exercise software	MSAssist	**Version**	V4.3.1
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**
2.4 GHz RFID Reader (EUT)	IDmicro	IDM4120R	32695
EUT Power Supply	Power General	CPA3-40-5290	none
Notebook PC	Hewlett Packard	HP Pavilion	TW02602673
Notebook Power Supply	EDAC	EA1060B	none

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	PA	2.0	PA	EUT Power Supply	AC Mains
DC Power	PA	2.0	PA	EUT Power Supply	2.4 GHz RFID Reader (EUT)
AC Power	PA	2.0	PA	Notebook Power Supply	AC Mains
DC Power	PA	2.0	PA	Notebook Power Supply	Notebook PC
Serial	Yes	1.6	No	Notebook PC	2.4 GHz RFID Reader (EUT)
Serial	Yes	1.6	No	2.4 GHz RFID Reader (EUT)	Unterminated
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

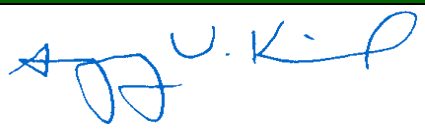
Measurement Equipment					
Description	**Manufacturer**	**Model**	**Identifier**	**Last Cal**	**Interval**
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

Requirement: Per 47 CFR 15.247(a)(1), the hopping channel carrier frequencies must be separated by a minimum of 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. The measurement is made with the spectrum analyzer's resolution bandwidth set to greater than or equal to 1% of the span, and the video bandwidth set to greater than or equal to the resolution bandwidth.

Configuration: The carrier frequency separation was measured between two adjacent hopping channels. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

Completed by:



NORTHWEST EMC

EMISSIONS DATA SHEET

Rev BETA 01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.247(a)(1)	Year:	2004	Method:	DA 00-705, ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

COMMENTS

Maximum 20 dB bandwidth of hopping channel is 23 kHz

EUT OPERATING MODES

Frequency Hopping Mode

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

The hopping channel carrier frequencies shall be separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

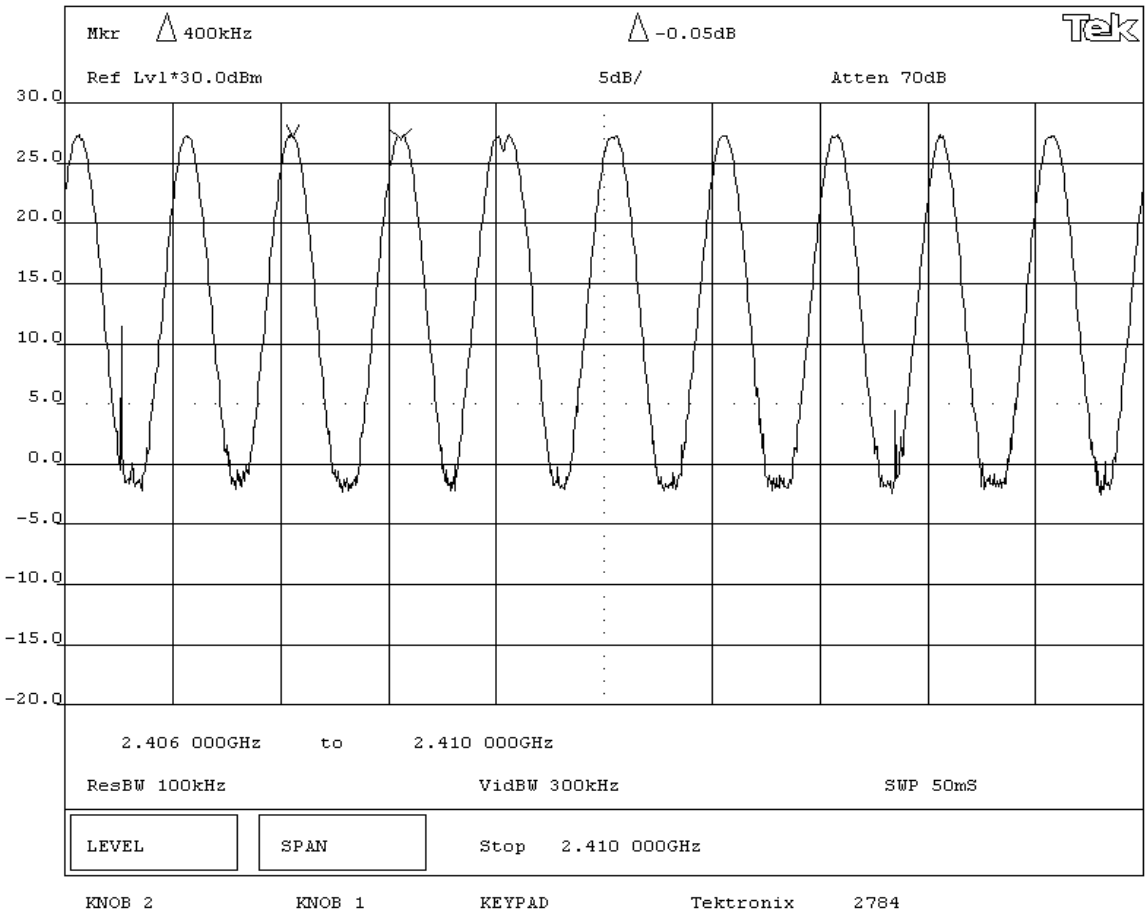
RESULTS	CHANNEL SPACING
Pass	400 kHz

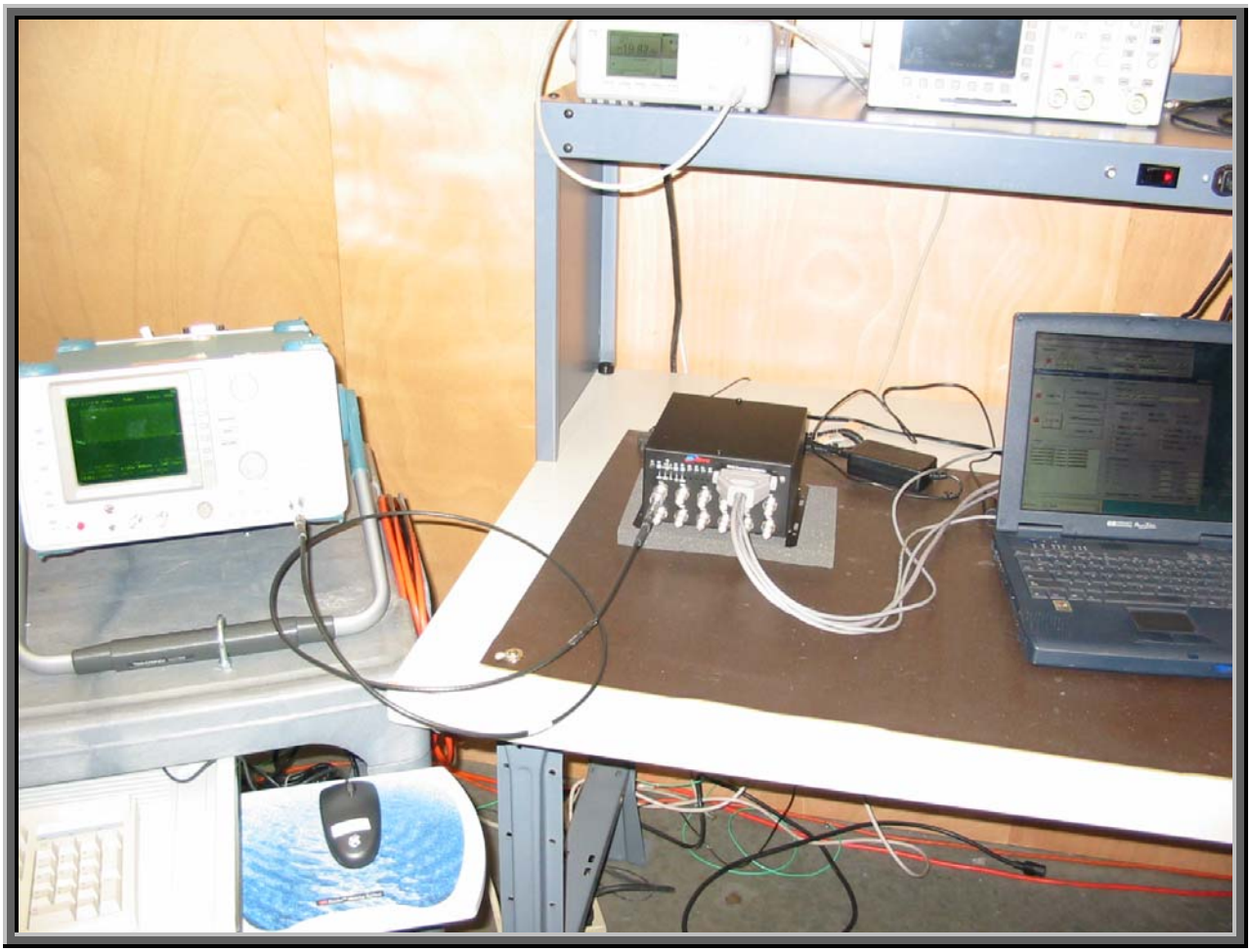
SIGNATURE

Tested By: A.J. U.K.P

DESCRIPTION OF TEST

Carrier Frequency Separation





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:
Hopping

Operating Modes Investigated:
Return Link (FHSS)

Data Rates Investigated:
Maximum

Output Power Setting(s) Investigated:
Maximum

Power Input Settings Investigated:
120 VAC, 60 Hz.

Software\Firmware Applied During Test			
Exercise software	MSAssist	**Version**	V4.3.1
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**
2.4 GHz RFID Reader (EUT)	IDmicro	IDM4120R	32695
EUT Power Supply	Power General	CPA3-40-5290	none
Notebook PC	Hewlett Packard	HP Pavilion	TW02602673
Notebook Power Supply	EDAC	EA1060B	none

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	PA	2.0	PA	EUT Power Supply	AC Mains
DC Power	PA	2.0	PA	EUT Power Supply	2.4 GHz RFID Reader (EUT)
AC Power	PA	2.0	PA	Notebook Power Supply	AC Mains
DC Power	PA	2.0	PA	Notebook Power Supply	Notebook PC
Serial	Yes	1.6	No	Notebook PC	2.4 GHz RFID Reader (EUT)
Serial	Yes	1.6	No	2.4 GHz RFID Reader (EUT)	Unterminated
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

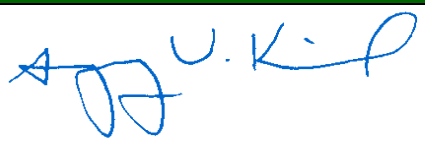
Measurement Equipment					
Description	**Manufacturer**	**Model**	**Identifier**	**Last Cal**	**Interval**
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo

Test Description

Requirement: Per 47 CFR 15.247(a)(1)(iii), the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a period in seconds equal to the number of hopping channels employed multiplied by 0.4. Seventy-Five hopping channels are used in each band, so the test period is 30 seconds. The measurement is made with the spectrum analyzer's span set to zero. The measurement is made in two steps. First, the sweep speed is adjusted to capture the pulse width or dwell time of a single transmission. Then, the sweep speed is set to 30 seconds to count the number of transmissions during that period. The dwell time of a single transmission multiplied by the number of transmissions during a 30 second period equals the average time of occupancy during a 30 second period.

Configuration: The average dwell time per hopping channel was measured at one hopping channel. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

Completed by:



NORTHWEST EMC

EMISSIONS DATA SHEET

Rev BETA 01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.247(a)(1)(iii)	Year:	2003	Method:	DA 00-705, ANSI C63.4	Year:	1992

SAMPLE CALCULATIONS

Total Dwell time = (Dwell Time during a single transmission) X (Number of transmissions during a 30 second period)

COMMENTS

75 Hopping channels

EUT OPERATING MODES

Frequency Hopping Mode

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a period in seconds equal to the number of hopping channels employed multiplied by 0.4.

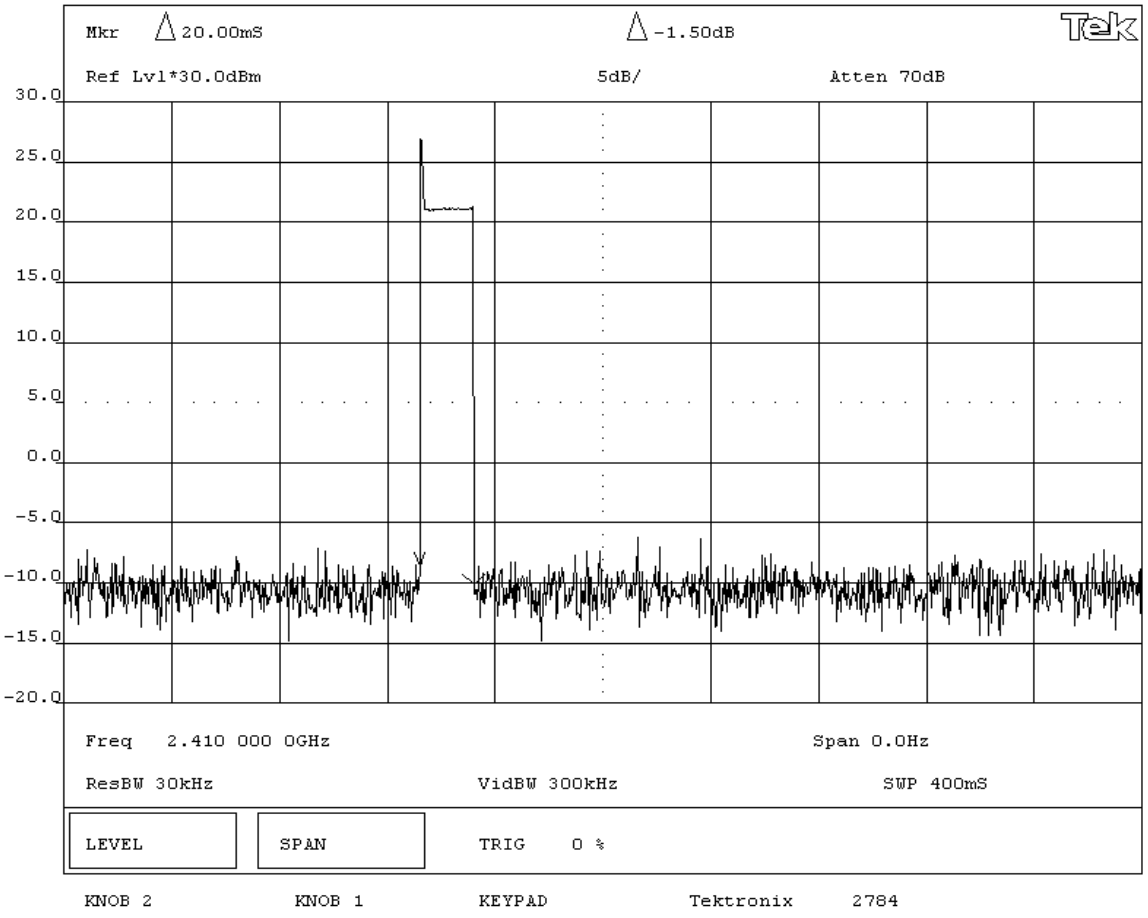
RESULTS	Dwell Time of a Single Transmission
Pass	0.02 seconds

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Dwell Time of a Single Transmission



NORTHWEST EMC

EMISSIONS DATA SHEET

BETA 01/30/

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.247(a)(1)(iii)	Year:	2003	Method:	DA 00-705, ANSI C63.4	Year:	1992

SAMPLE CALCULATIONS

Total Dwell time = (Dwell Time during a single transmission) X (Number of transmissions during a 30 second period)

COMMENTS

75 Hopping channels

EUT OPERATING MODES

Frequency Hopping Mode

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a period in seconds equal to the number of hopping channels employed multiplied by 0.4.

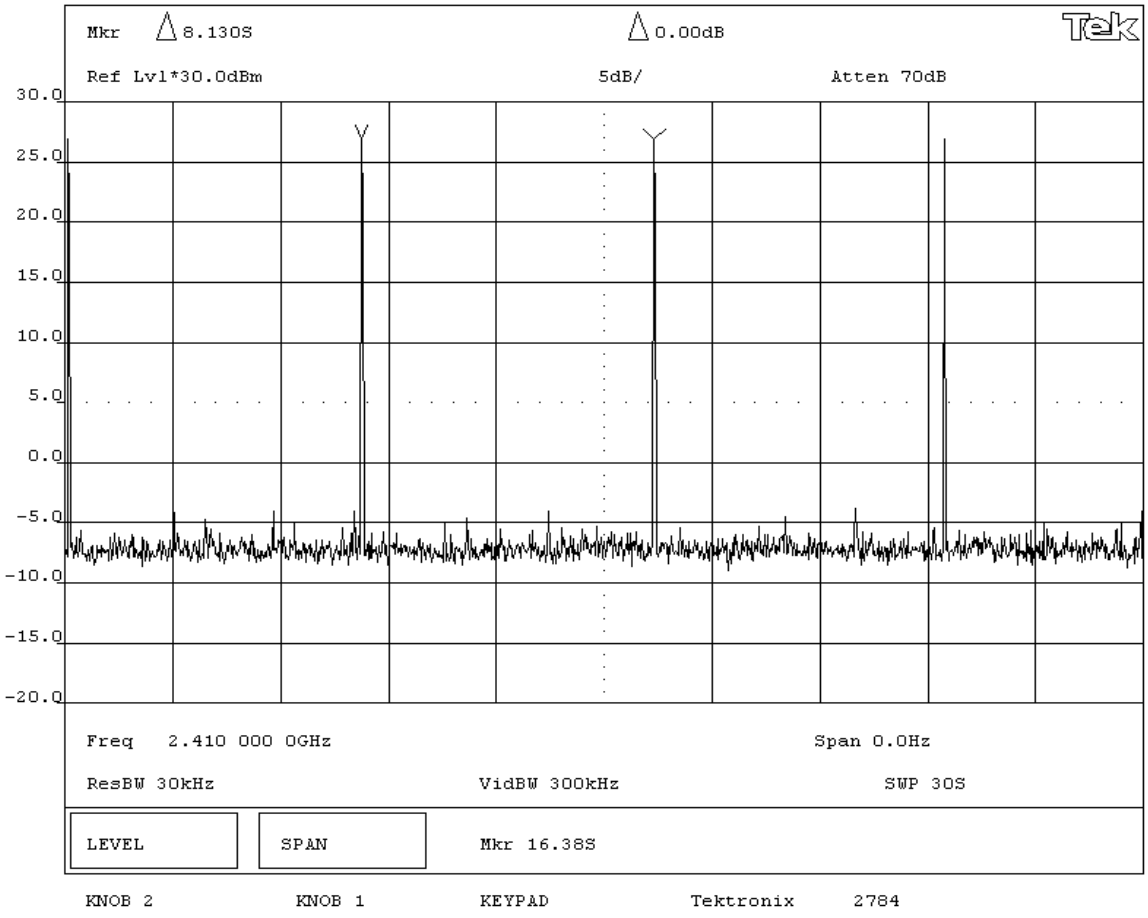
RESULTS	Total Dwell Time in 30 second period	NUMBER OF TRANSMISSIONS DURING A 30 SECOND PERIOD
Pass	0.08 seconds	4

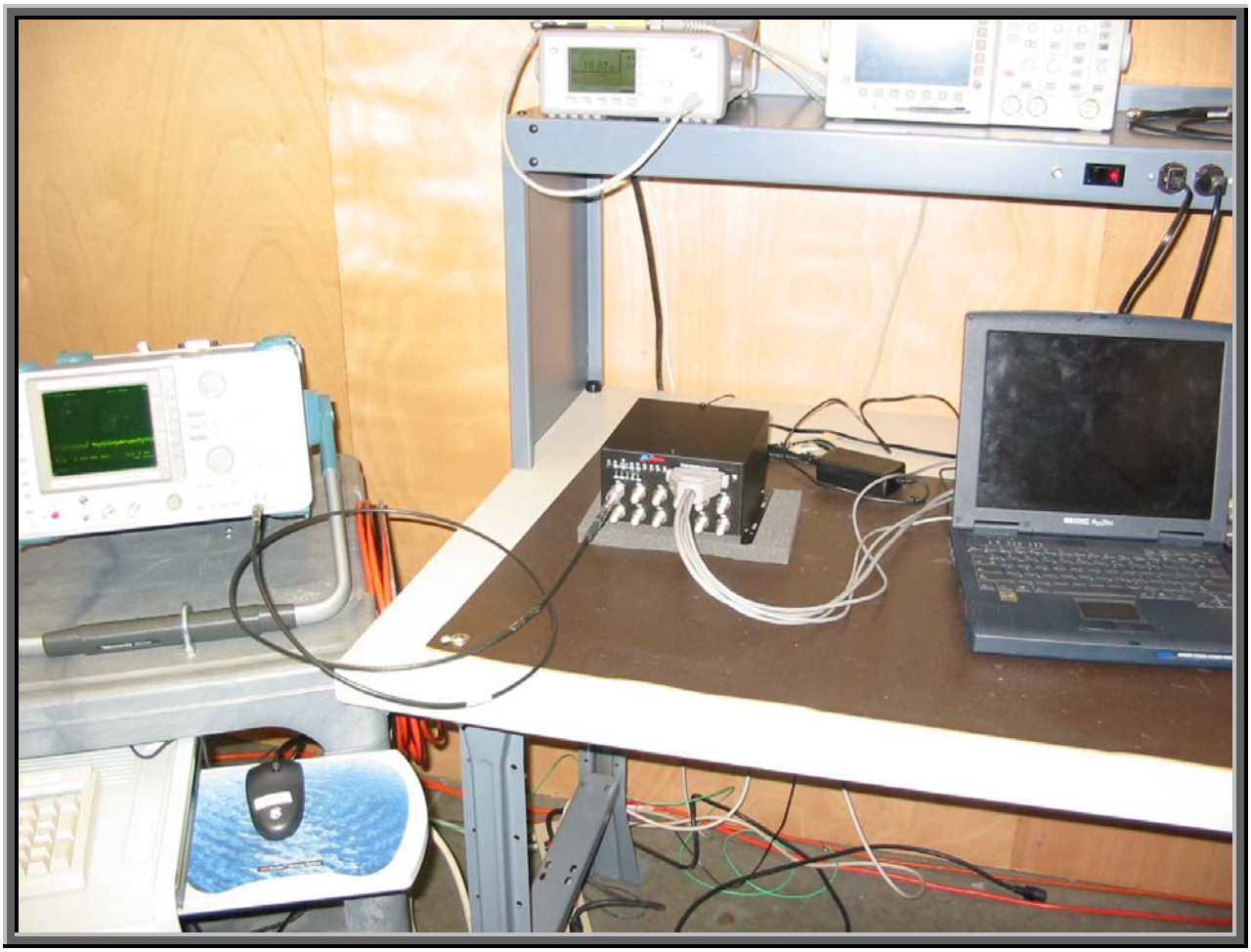
SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Time of Occupancy (Dwell Time) - Number of transmissions during a 30 second period





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:
Hopping

Operating Modes Investigated:
Return Link (FHSS)

Data Rates Investigated:
Maximum

Output Power Setting(s) Investigated:
Maximum

Power Input Settings Investigated:
120 VAC, 60 Hz.

Software\Firmware Applied During Test			
Exercise software	MSAssist	**Version**	V4.3.1
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**
2.4 GHz RFID Reader (EUT)	IDmicro	IDM4120R	32695
EUT Power Supply	Power General	CPA3-40-5290	none
Notebook PC	Hewlett Packard	HP Pavilion	TW02602673
Notebook Power Supply	EDAC	EA1060B	none

Number of Hopping Frequencies

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	PA	2.0	PA	EUT Power Supply	AC Mains
DC Power	PA	2.0	PA	EUT Power Supply	2.4 GHz RFID Reader (EUT)
AC Power	PA	2.0	PA	Notebook Power Supply	AC Mains
DC Power	PA	2.0	PA	Notebook Power Supply	Notebook PC
Serial	Yes	1.6	No	Notebook PC	2.4 GHz RFID Reader (EUT)
Serial	Yes	1.6	No	2.4 GHz RFID Reader (EUT)	Unterminated
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(b)(1), for greater than 0.125 Watt operation, frequency hopping systems in the 2400 - 2483.5 MHz band shall use at least 75 non- overlapping hopping channels.

Configuration: The number of hopping frequencies was measured across the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

During professional installation, the EUT is configured to operate in one of three bands. The number of hopping channels was measured for each band.

Completed by:

NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	CFR 47 Part 15.247(b)(1)	Year:	2004	Method:	DA 00-705, ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Frequency Hopping Mode

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

For greater than 0.125 Watt operation, frequency hopping systems in the 2400 - 2483.5 MHz band shall use at least 75 non- overlapping hopping channels.

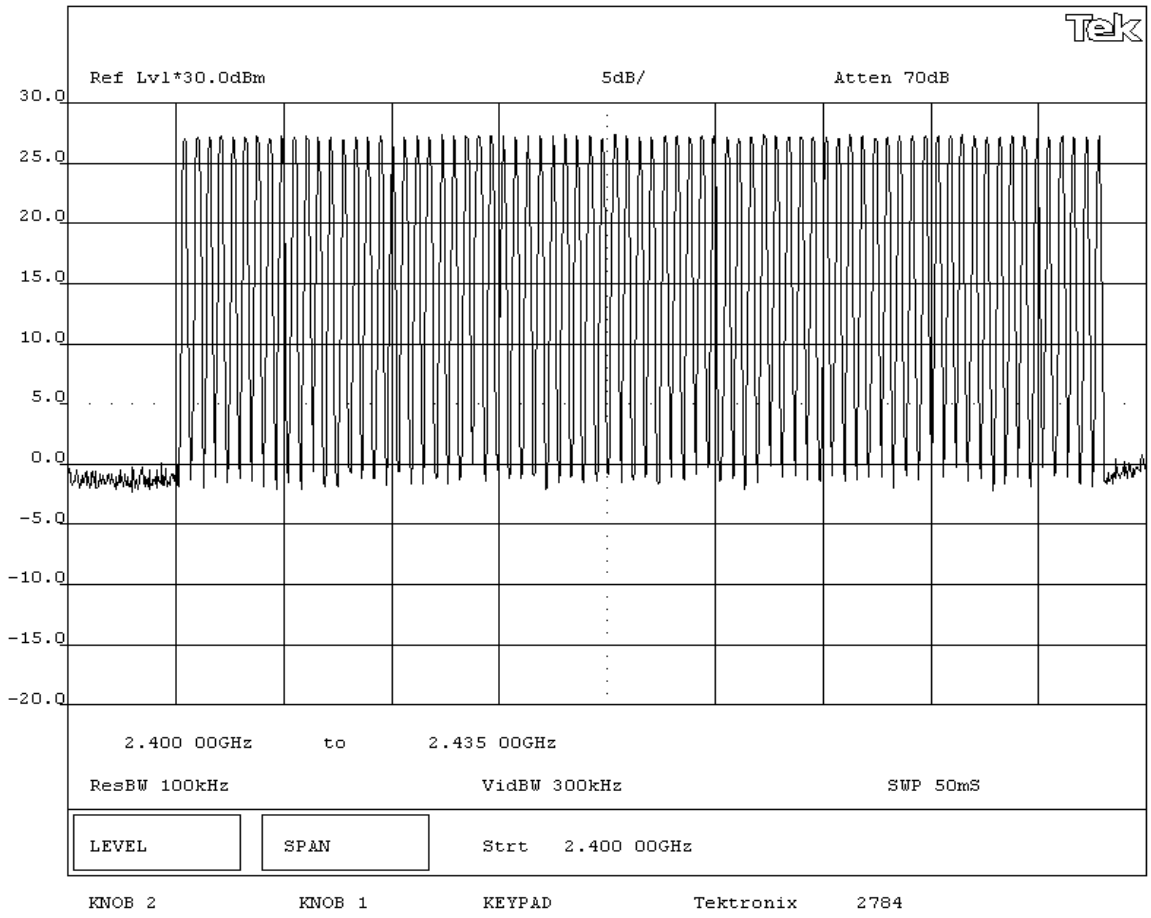
RESULTS	NUMBER OF HOPPING FREQUENCIES
Pass	75

SIGNATURE

Tested By: A.J. U.K.P

DESCRIPTION OF TEST

HOPPING CHANNELS - Low Band



NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	CFR 47 Part 15.247(b)(1)	Year:	2004	Method:	DA 00-705, ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Frequency Hopping Mode

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

For greater than 0.125 Watt operation, frequency hopping systems in the 2400 - 2483.5 MHz band shall use at least 75 non- overlapping hopping channels.

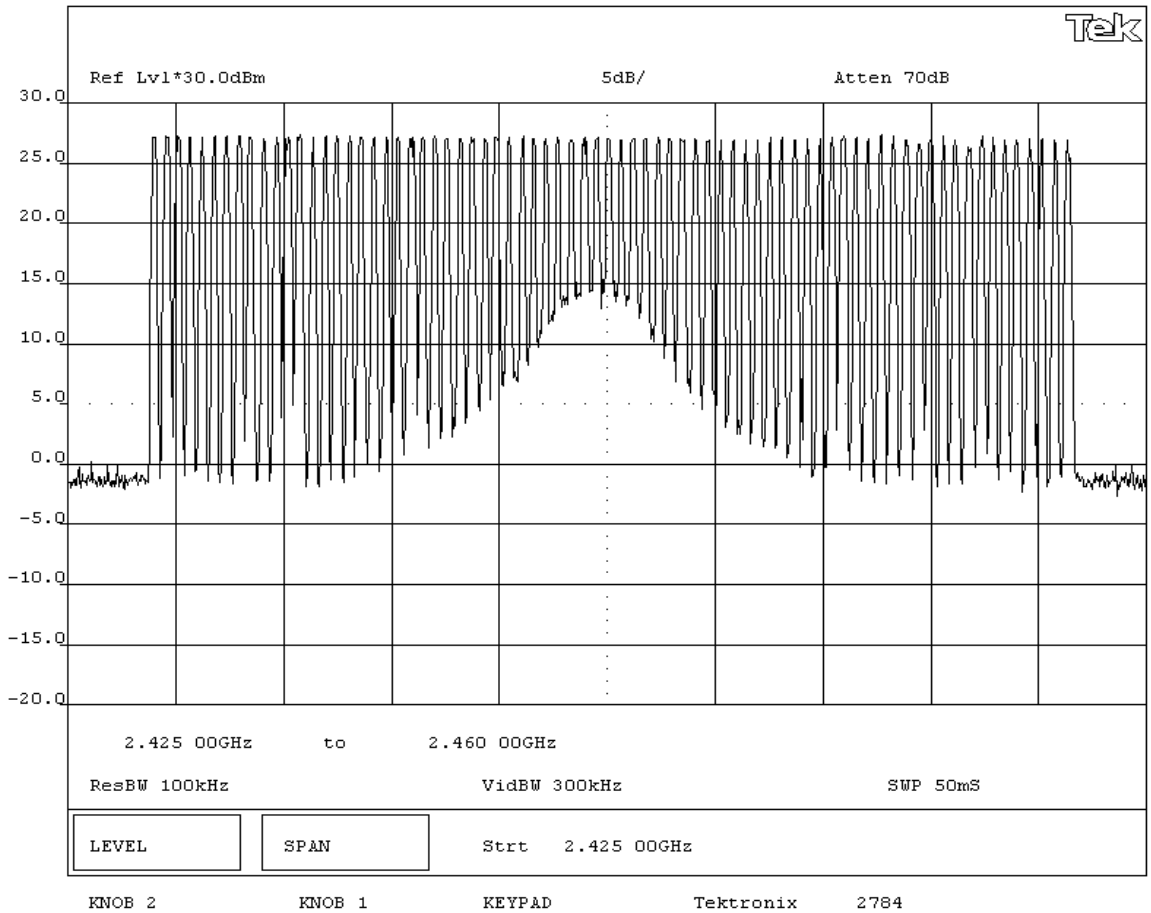
RESULTS	NUMBER OF HOPPING FREQUENCIES
Pass	75

SIGNATURE

Tested By: A.J. U.K.P

DESCRIPTION OF TEST

HOPPING CHANNELS - Mid Band



NORTHWEST
EMC

EMISSIONS DATA SHEET

Rev BETA
01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	CFR 47 Part 15.247(b)(1)	Year: 2004	Method:	DA 00-705, ANSI C63.4	Year: 2003

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Frequency Hopping Mode

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

For greater than 0.125 Watt operation, frequency hopping systems in the 2400 - 2483.5 MHz band shall use at least 75 non- overlapping hopping channels.

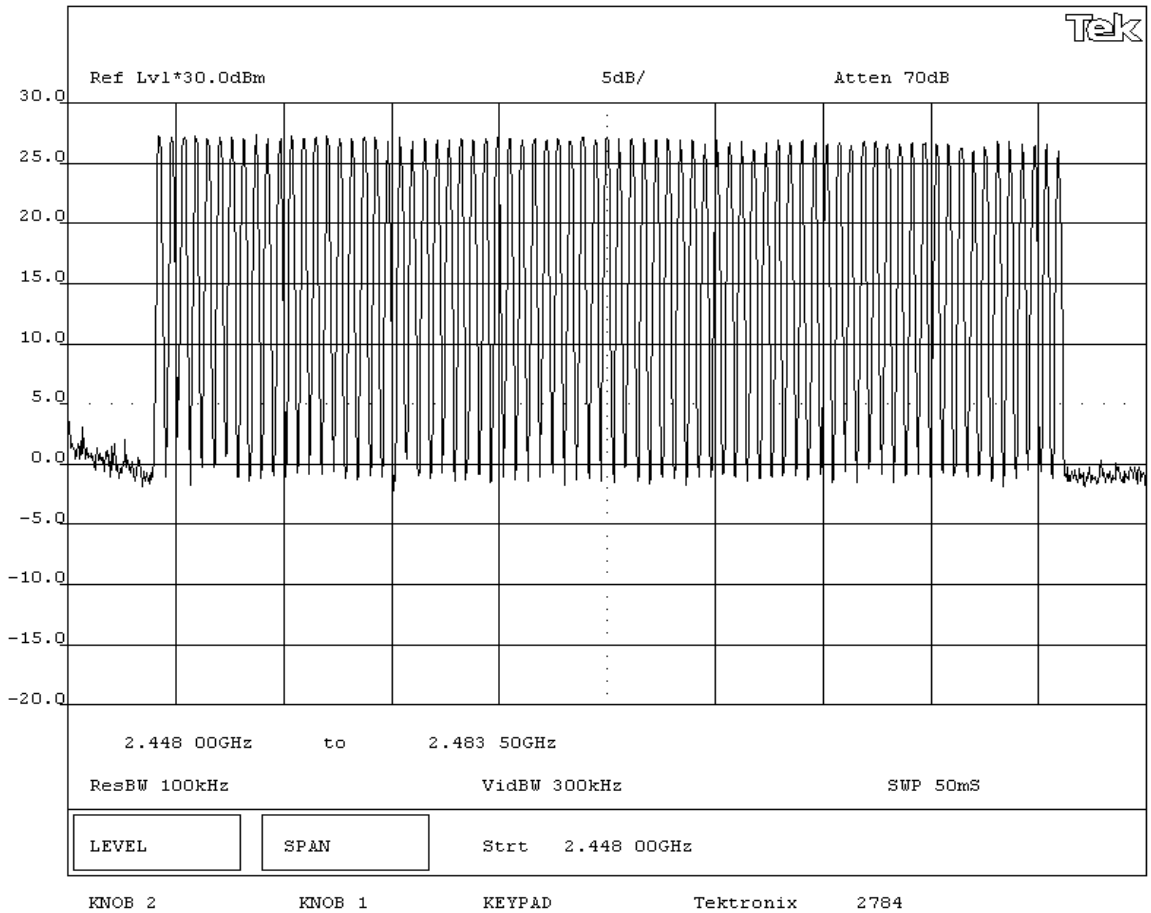
RESULTS	NUMBER OF HOPPING FREQUENCIES
Pass	75

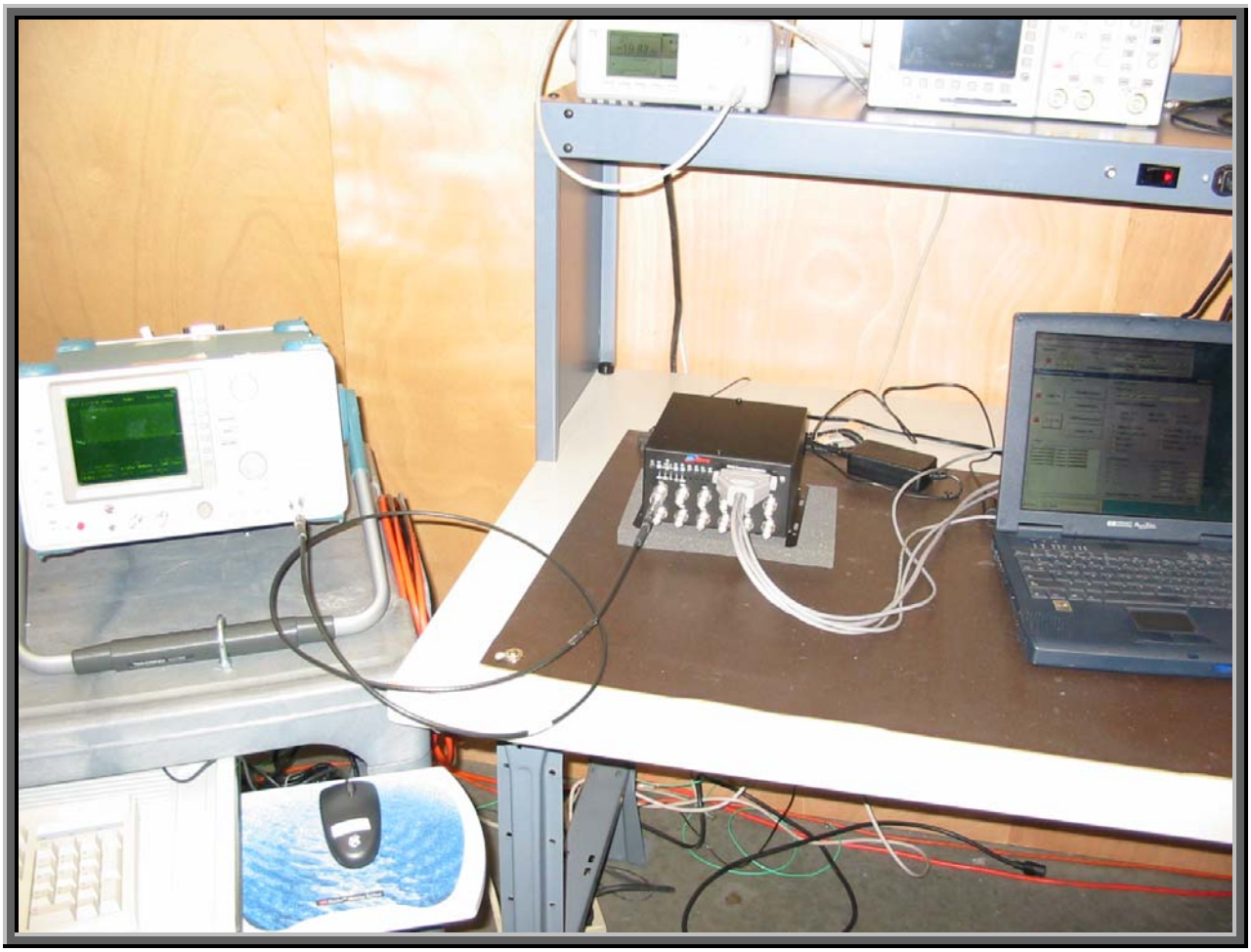
SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

HOPPING CHANNELS - High Band





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:
Return Link (No Hop, FHSS)
Forward Link (DSSS)

Data Rates Investigated:
Maximum

Output Power Setting(s) Investigated:
Maximum

Power Input Settings Investigated:
120 VAC, 60 Hz.

Software\Firmware Applied During Test			
Exercise software	MSAssist	**Version**	V4.3.1
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**
2.4 GHz RFID Reader (EUT)	IDmicro	IDM4120R	32695
EUT Power Supply	Power General	CPA3-40-5290	none
Notebook PC	Hewlett Packard	HP Pavilion	TW02602673
Notebook Power Supply	EDAC	EA1060B	none

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	PA	2.0	PA	EUT Power Supply	AC Mains
DC Power	PA	2.0	PA	EUT Power Supply	2.4 GHz RFID Reader (EUT)
AC Power	PA	2.0	PA	Notebook Power Supply	AC Mains
DC Power	PA	2.0	PA	Notebook Power Supply	Notebook PC
Serial	Yes	1.6	No	Notebook PC	2.4 GHz RFID Reader (EUT)
Serial	Yes	1.6	No	2.4 GHz RFID Reader (EUT)	Unterminated
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 15.247(a)(1), frequency hopping systems operating with greater than 125 mW in the 2400 - 2483.5 MHz band shall have the 20dB bandwidth of the hopping channel no greater than the channel separation.

Per 15.247(a)(2), DTS systems shall have a minimum 6 dB bandwidth of at least 500 kHz.

Configuration: The 20 dB bandwidth of the return link (FHSS system) 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.

Then the 6 dB bandwidth of the forward link (DSSS system) was measured with the EUT set to its only transmit channel. 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.

Completed by:

NORTHWEST EMC

EMISSIONS DATA SHEET

Rev BETA 01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.247(a)	Year:	2004	Method:	DA 00-705, ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

COMMENTS

The channel separation is 400 kHz

EUT OPERATING MODES

Return link (no hop mode)

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

Frequency hopping systems operating with greater than 125 mW in the 2400 - 2483.5 MHz band shall have the 20dB bandwidth of the hopping channel no greater than the channel separation.

As a DTS system, the minimum 6 dB bandwidth is 500 kHz.

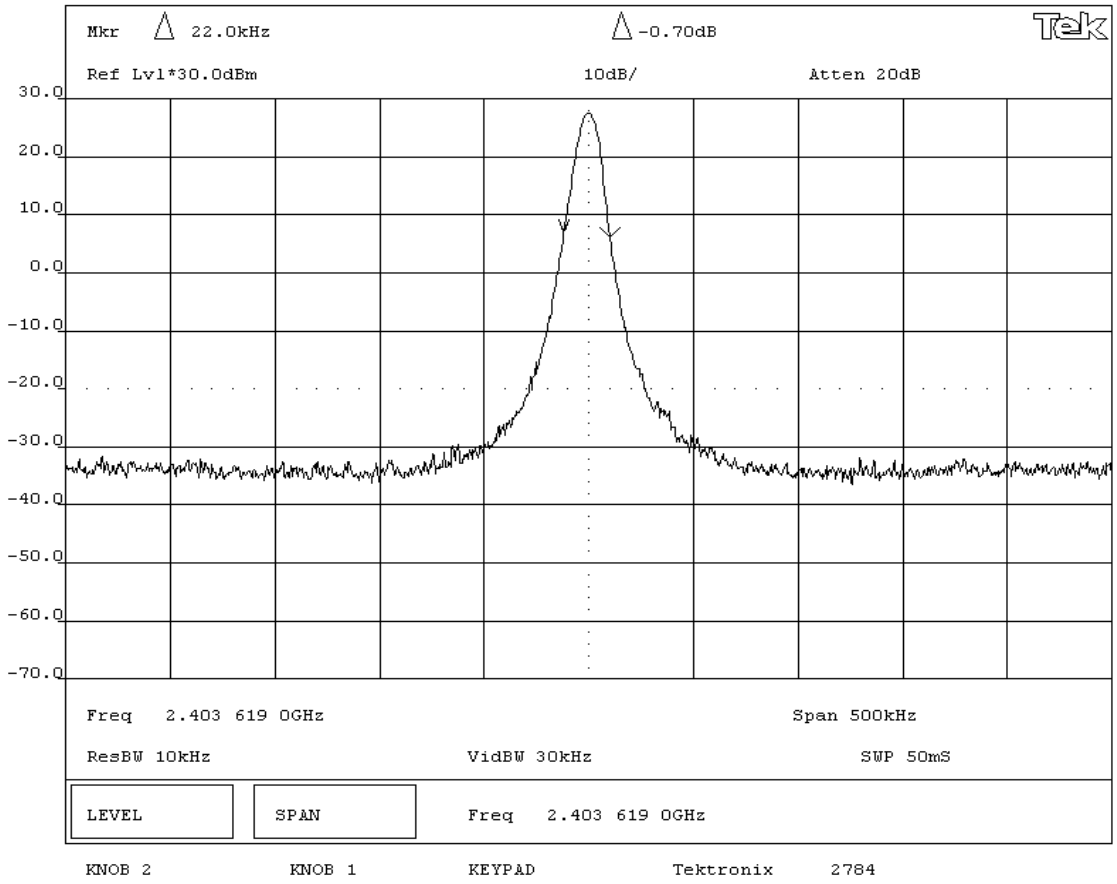
RESULTS	BANDWIDTH
Pass	0.022 MHz

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

20dB Bandwidth - Low Channel



NORTHWEST EMC

EMISSIONS DATA SHEET

Rev BETA 01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.247(a)	Year:	2004	Method:	DA 00-705, ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

COMMENTS

The channel separation is 400 kHz

EUT OPERATING MODES

Return link (no hop mode)

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

Frequency hopping systems operating with greater than 125 mW in the 2400 - 2483.5 MHz band shall have the 20dB bandwidth of the hopping channel no greater than the channel separation.
As a DTS system, the minimum 6 dB bandwidth is 500 kHz.

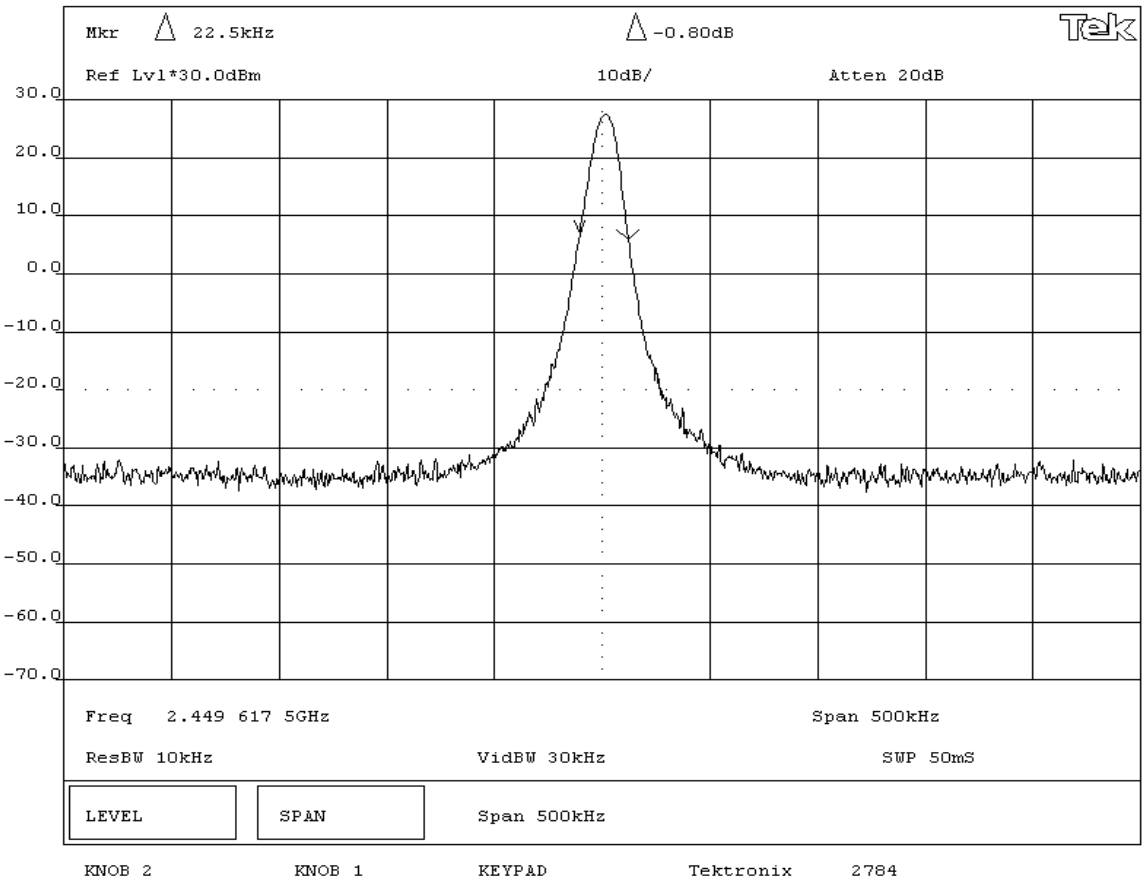
RESULTS	BANDWIDTH
Pass	.0225 MHz

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

20dB Bandwidth - Mid Channel



NORTHWEST EMC

EMISSIONS DATA SHEET

Rev BETA 01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.247(a)	Year:	2004	Method:	DA 00-705, ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

COMMENTS

The channel separation is 400 kHz

EUT OPERATING MODES

Return link (no hop mode)

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

Frequency hopping systems operating with greater than 125 mW in the 2400 - 2483.5 MHz band shall have the 20dB bandwidth of the hopping channel no greater than the channel separation.
As a DTS system, the minimum 6 dB bandwidth is 500 kHz.

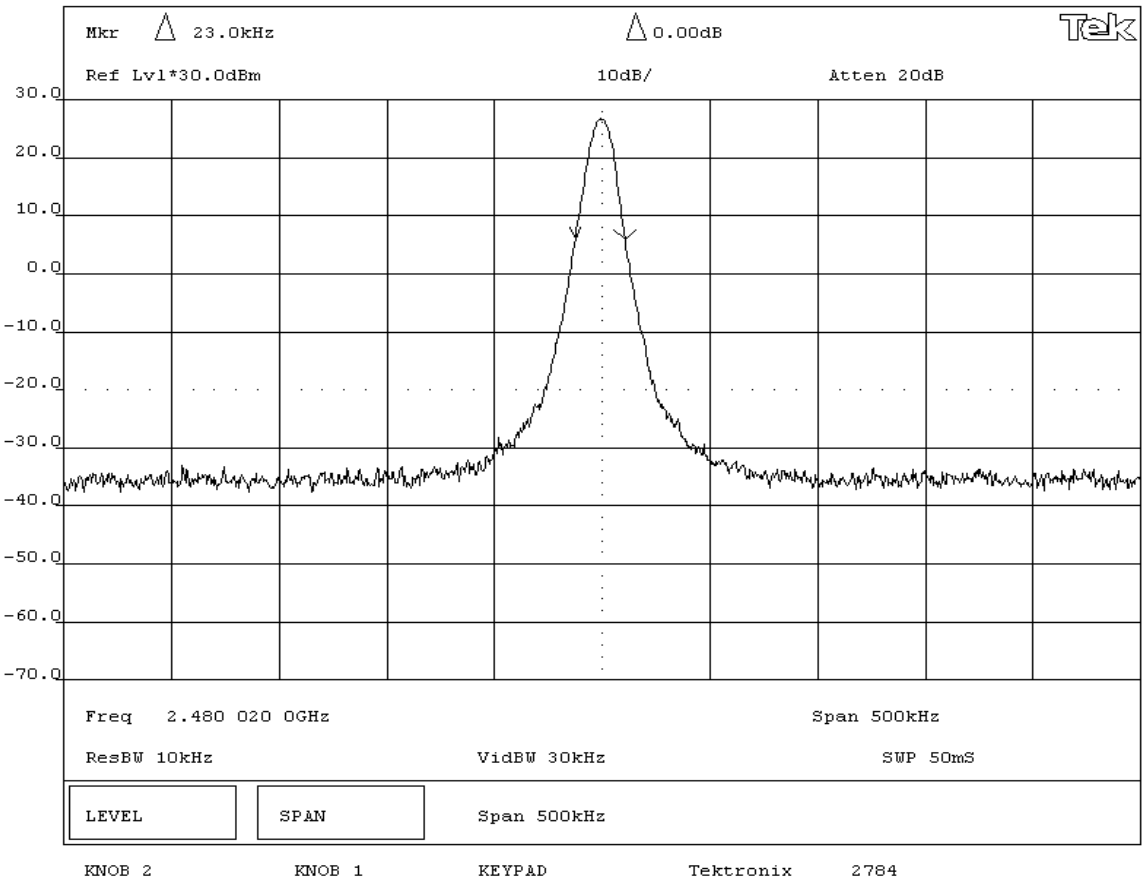
RESULTS	BANDWIDTH
Pass	0.023 MHz

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

20dB Bandwidth - High Channel



NORTHWEST EMC

EMISSIONS DATA SHEET

Rev BETA 01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.247(a)	Year:	2004	Method:	DA 00-705, ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Forward link (DSSS mode)

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

Frequency hopping systems operating with greater than 125 mW in the 2400 - 2483.5 MHz band shall have the 20dB bandwidth of the hopping channel no greater than the channel separation.
As a DTS system, the minimum 6 dB bandwidth is 500 kHz.

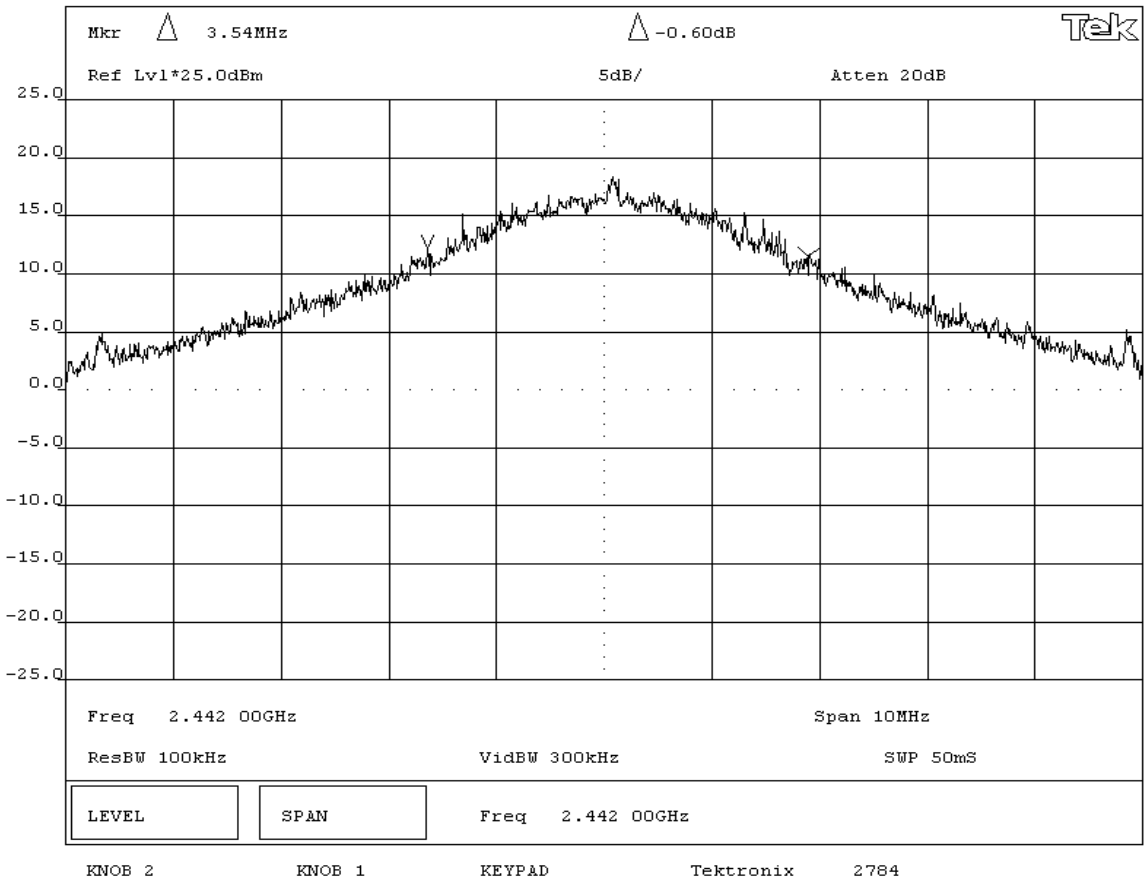
RESULTS	BANDWIDTH
Pass	3.54 MHz

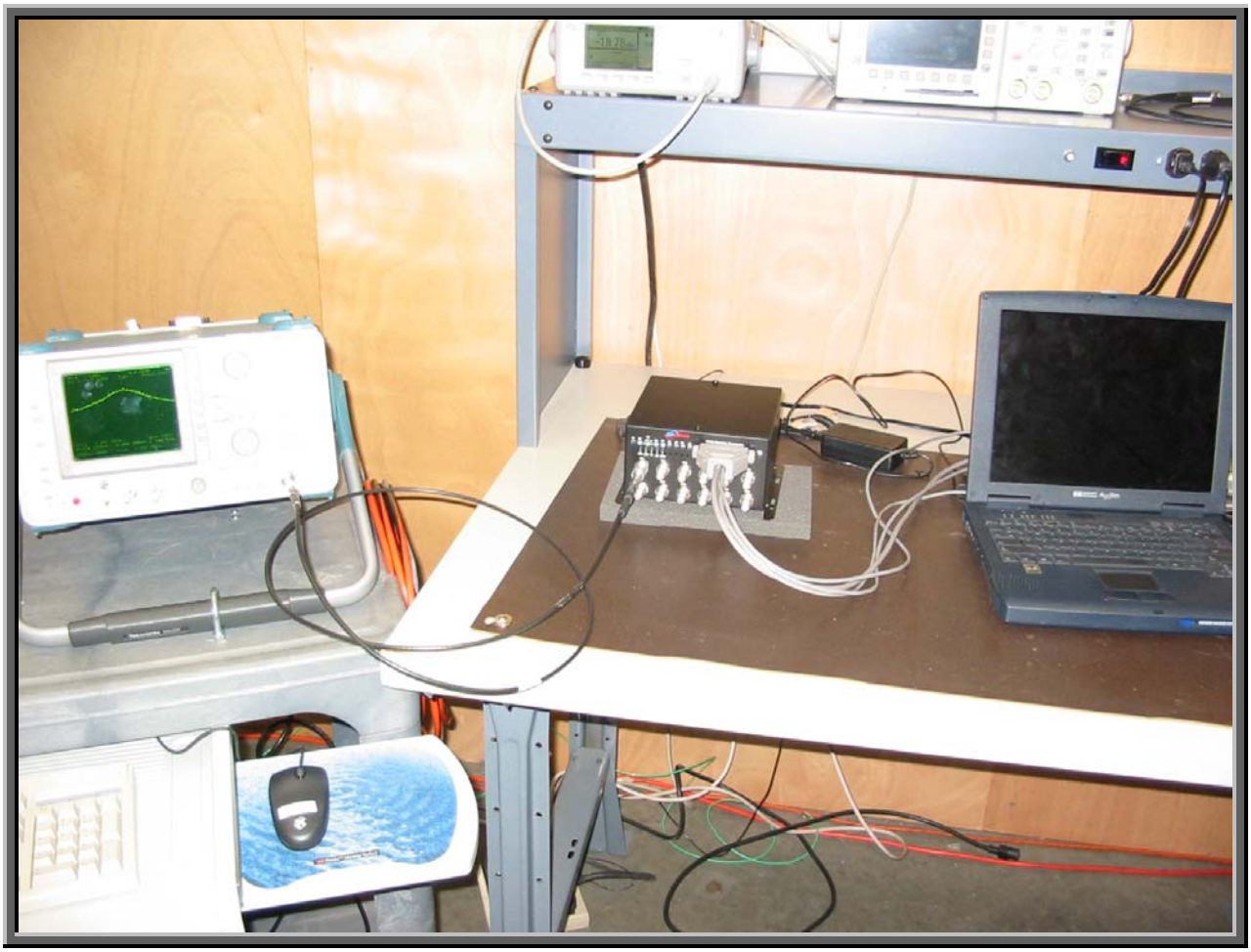
SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

6 dB Bandwidth





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:
Return Link (No Hop, FHSS)
Forward Link (DSSS)

Data Rates Investigated:
Maximum

Output Power Setting(s) Investigated:
Maximum

Power Input Settings Investigated:
120 VAC, 60 Hz.

Software\Firmware Applied During Test			
Exercise software	MSAssist	**Version**	V4.3.1
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**
2.4 GHz RFID Reader (EUT)	IDmicro	IDM4120R	32695
EUT Power Supply	Power General	CPA3-40-5290	none
Notebook PC	Hewlett Packard	HP Pavilion	TW02602673
Notebook Power Supply	EDAC	EA1060B	none

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	PA	2.0	PA	EUT Power Supply	AC Mains
DC Power	PA	2.0	PA	EUT Power Supply	2.4 GHz RFID Reader (EUT)
AC Power	PA	2.0	PA	Notebook Power Supply	AC Mains
DC Power	PA	2.0	PA	Notebook Power Supply	Notebook PC
Serial	Yes	1.6	No	Notebook PC	2.4 GHz RFID Reader (EUT)
Serial	Yes	1.6	No	2.4 GHz RFID Reader (EUT)	Unterminated
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**
RF Detector	RLC Electronics	CR-133-R	ZZA	NCR	NA
Oscilloscope	Tektronix	TDS 3052	TOF	07/21/2004	12 mo
Signal Generator	Hewlett Packard	8341B	TGN	01/23/2004	13 mo
Power Amplifier	Amplifier Research	25S1G4A	TRO	NCR	NA
Power Meter	Hewlett Packard	E4418A	SPA	07/23/2004	24 mo
Power Sensor	Hewlett-Packard	8481H	SPB	07/23/2004	24 mo

Test Description

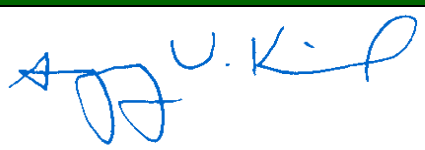
Requirement: Per 47 CFR 15.247(b)(3), the maximum peak output power must not exceed 1 Watt.

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 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 and power amplifier, tuned to the transmit frequency, were 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 amplifier. The measurement was made on each of the six transmit antenna ports.

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

Completed by:



NORTHWEST EMC

EMISSIONS DATA SHEET

Rev BETA 01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.247(b)	Year: 2004	Method: DA 00-705, ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

FHSS (no hop) and DSSS Modes

DEVIATIONS FROM TEST STANDARD

None

REQUIREMENTS

Maximum peak conducted output power does not exceed 1 Watt

RESULTS	AMPLITUDE
Pass	550.81 mW

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Output Power

TX1

Frequency (MHz)	Channel	Peak Power (dBm)	Peak Power (mW)	Spec (mW)
2403.6	Low FHSS	27.14	517.61	1000.0
2449.6	Mid FHSS	27.41	550.81	1000.0
2480.2	High FHSS	26.91	490.91	1000.0
2442.0	DSSS	26.62	459.20	1000.0

TX2

Frequency (MHz)	Channel	Peak Power (dBm)	Peak Power (mW)	Spec (mW)
2403.6	Low FHSS	26.83	481.95	1000.0
2449.6	Mid FHSS	27.16	520.00	1000.0
2480.2	High FHSS	27.01	502.34	1000.0
2442.0	DSSS	26.92	492.04	1000.0

TX3

Frequency (MHz)	Channel	Peak Power (dBm)	Peak Power (mW)	Spec (mW)
2403.6	Low FHSS	26.58	454.99	1000.0
2449.6	Mid FHSS	26.67	464.52	1000.0
2480.2	High FHSS	26.86	485.29	1000.0
2442.0	DSSS	26.92	492.04	1000.0

TX4

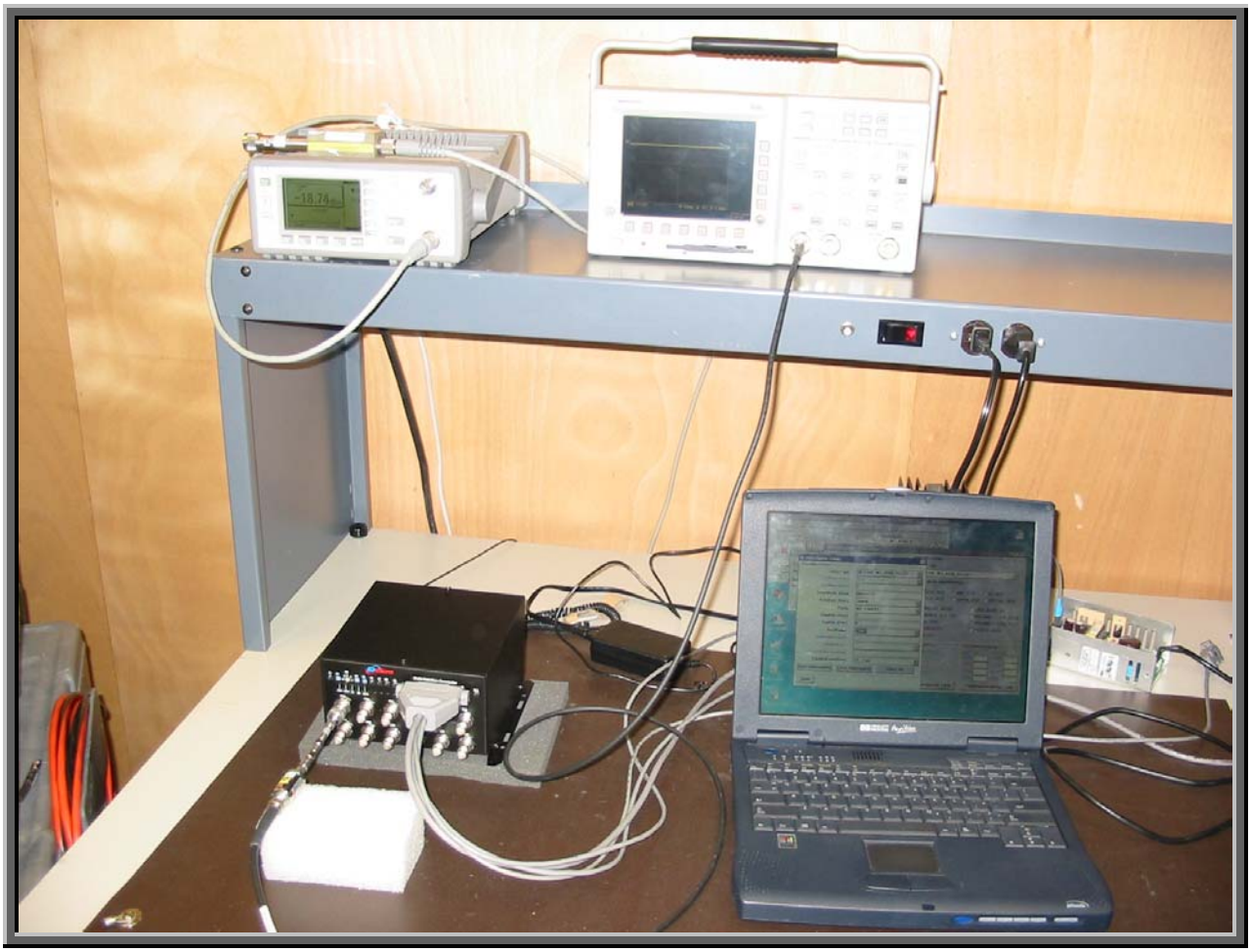
Frequency (MHz)	Channel	Peak Power (dBm)	Peak Power (mW)	Spec (mW)
2403.6	Low FHSS	26.23	419.76	1000.0
2449.6	Mid FHSS	26.67	464.52	1000.0
2480.2	High FHSS	26.86	485.29	1000.0
2442.0	DSSS	26.87	486.41	1000.0

TX5

Frequency (MHz)	Channel	Peak Power (dBm)	Peak Power (mW)	Spec (mW)
2403.6	Low FHSS	27.06	508.16	1000.0
2449.6	Mid FHSS	27.26	532.11	1000.0
2480.2	High FHSS	26.91	490.91	1000.0
2442.0	DSSS	27.02	503.50	1000.0

TX6

Frequency (MHz)	Channel	Peak Power (dBm)	Peak Power (mW)	Spec (mW)
2403.6	Low FHSS	26.82	480.84	1000.0
2449.6	Mid FHSS	27.26	532.11	1000.0
2480.2	High FHSS	27.01	502.34	1000.0
2442.0	DSSS	26.62	459.20	1000.0



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:
Return Link (No Hop, FHSS)

Data Rates Investigated:
Maximum

Output Power Setting(s) Investigated:
Maximum

Power Input Settings Investigated:
120 VAC, 60 Hz.

Software\Firmware Applied During Test			
Exercise software	MSAssist	**Version**	V4.3.1
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**
2.4 GHz RFID Reader (EUT)	IDmicro	IDM4120R	32695
EUT Power Supply	Power General	CPA3-40-5290	none
Notebook PC	Hewlett Packard	HP Pavilion	TW02602673
Notebook Power Supply	EDAC	EA1060B	none

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC Power	PA	2.0	PA	EUT Power Supply	AC Mains
DC Power	PA	2.0	PA	EUT Power Supply	2.4 GHz RFID Reader (EUT)
AC Power	PA	2.0	PA	Notebook Power Supply	AC Mains
DC Power	PA	2.0	PA	Notebook Power Supply	Notebook PC
Serial	Yes	1.6	No	Notebook PC	2.4 GHz RFID Reader (EUT)
Serial	Yes	1.6	No	2.4 GHz RFID Reader (EUT)	Unterminated
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

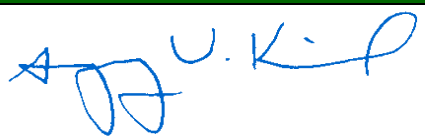
Test Description

Requirement: Per 47 CFR 15.247(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 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.

The band edge was not measured for DSSS mode because in that mode, there is only one transmit channel at 2442 MHz. The spurious conducted emissions plots and occupied bandwidth plots are sufficient to demonstrate compliance of DSSS mode with this band edge requirement.

Completed by:



NORTHWEST EMC

EMISSIONS DATA SHEET

Rev BETA 01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
Serial Number:	32695			Date:	11/04/04
Customer:	Idmicro, INC.			Temperature:	68
Attendees:	Tom Kearns	Tested by:	Greg Kiemel	Humidity:	40%
Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.247(d)	Year:	2004	Method:	DA 00-705, ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Return link (no hop mode)

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

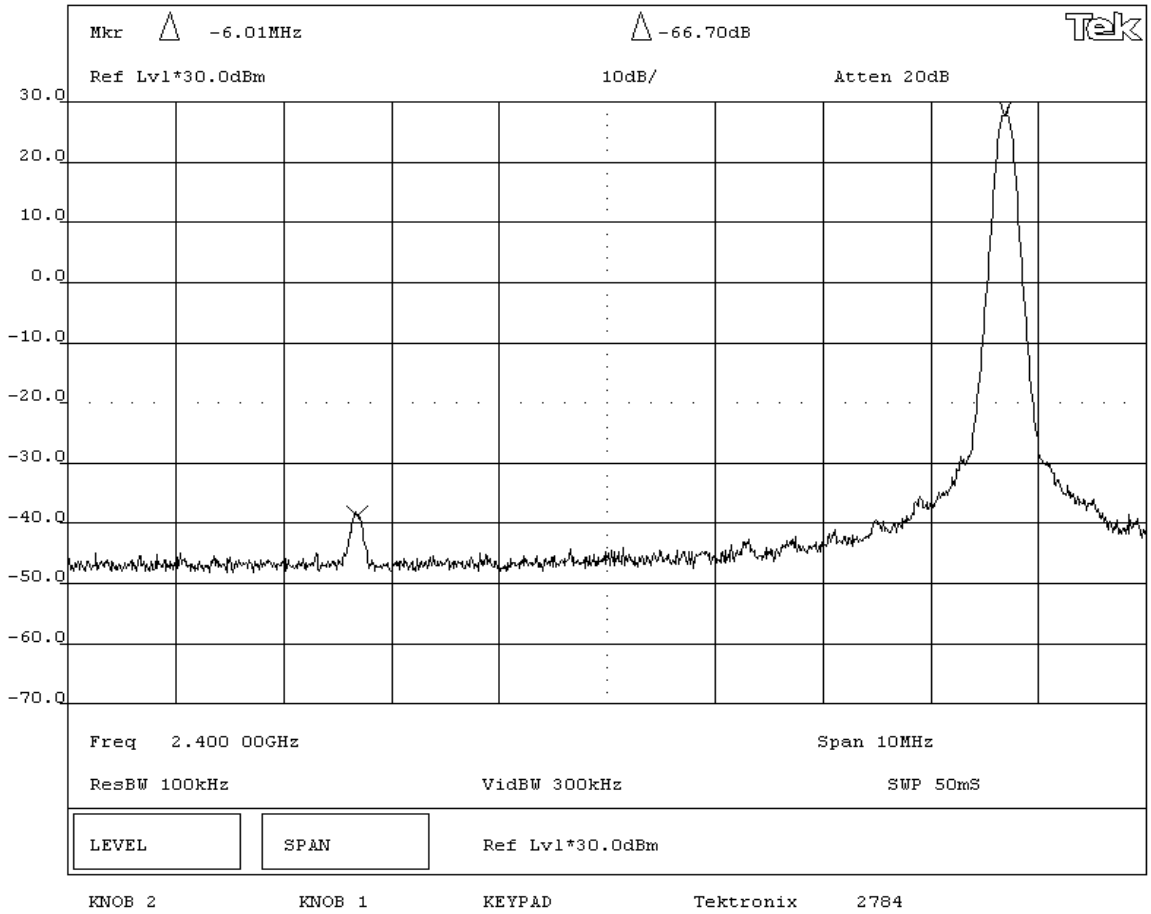
RESULTS	AMPLITUDE
Pass	-66.7 dB

SIGNATURE

Tested By: _____

DESCRIPTION OF TEST

Band Edge Compliance - Low Channel



NORTHWEST EMC

EMISSIONS DATA SHEET

Rev BETA 01/30/01

EUT:	2.4 GHz RFID Reader			Work Order:	IDMI0005
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Customer Ref. No.:	N/A	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS

Specification:	47 CFR 15.247(d)	Year:	2004	Method:	DA 00-705, ANSI C63.4	Year:	2003

SAMPLE CALCULATIONS

COMMENTS

EUT OPERATING MODES

Return link (no hop mode)

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

RESULTS	AMPLITUDE
Pass	-70.7 dB

SIGNATURE

Tested By: A.J. U.K.P

DESCRIPTION OF TEST

Band Edge Compliance - High Channel