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631-271-6200

Project:	06CA39734
File:	MC15284
Date:	10/3/2006
Model:	MPR-5005
FCC ID:	OGSMPR5005

Electromagnetic Compatibility Test Report

For

Applied Wireless Identifications Group

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Test Report Details

Tests Performed By:	**Underwriters Laboratories Inc.** **1285 Walt Whitman Rd.** **Melville, NY 11747**
Tests Performed For:	**Applied Wireless Identifications Group** **382 Rte. 59, Sec. 292** **Monsey, NY 10952**
Applicant Contact:	**Dave Fergueson**
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Phone:	**408-825-1100**
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Test Report Date:	**10/3/2006**
Product Type:	**Proximity Reader**
Product standards	**FCC Part 15, Subpart B & C, RSS-GEN, RSS-210**
Model Number:	**MPR-5005**
Sample Serial Number:	**Prototype**
Sample Receive Date:	**8/3/2006**
EUT Category:	**Radio Transmitter**
Testing Start Date:	**8/3/2006**
Date Testing Complete:	**9/8/2006**
Overall Results:	**PASS**

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP, A2LA, or any agency of the US government.

This report may contain test results that are not covered by the NVLAP or A2LA accreditation. The scope of accreditation is limited to the specific tests that are listed on the NVLAP and/or A2LA websites referenced at the end of this report.

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Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
9/20/2006	Original Release	--	--
10/3/2006	Misc. revisions	M. Antola	--

1.0 G E N E R A L - Product Description

AWID's MPR-5005 reader is a Radio Frequency IDentification (RFID) reader operating at 125kHz with Ethernet or RS-232 I/O interface. It has an internal power converter, allowing it to work with a wide range of supply inputs without affecting its performance.

The MPR-5005 readers are delivered with the following components and accessories:

- Antenna: MPR-5007 (single antenna) or MPR-5011A/B (dual antenna)
- Power supply: Input = 110 VAC ~ 240VAC, 48~63Hz. Output: 12 VDC, 1 A

RF Cables: Two 6-foot cables are included with MPR-5011A/B antenna. RF cable is connected to the MPR-5007 Antenna.

NOTE: The MPR-5005 uses detatchable antennas with the system. Only these two antennas (MPR5011A/B and MPR-5007) are permitted to be used with the MPR-5005 system. The RF output of the MPR-5005 is 1.9W at 125kHz and uses ASK modulation. The gain of each antenna very low: below -60dBi for the MPR-5007 and below –69dBi for the MPR5011A/B.

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1.1 Device Configuration During Test

1.1.1 Equipment Used During Test:

Use*	Product Type	Manufacturer	Model	Comments
EUT	Prox Reader	AWID	MPR-5005	None
EUT	Single Antenna	AWID	MPR-5007	None
EUT	Dual Antennas	AWID	MPR-5011A/B	None
EUT	Power Adapter	AWID	PWR118RA1203B01	None
ACC	Laptop	IBM	Type 2373	None

* Use = EUT - Equipment Under Test, ACC - Accessory (Not Subjected to Test), or SIM - Simulator (Not Subjected to Test)

1.1.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
0	Enclosure	N/E	-	-	None
1	Mains	AC	No	No	None
2	Ethernet	I/O	Yes	Yes	None
3	RS-232	I/O	No	No	None

*AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
I/O = Signal Input or Output Port (Not Involved in Process Control)
PMC = Process Measurement and Control Port

1.1.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description
0.125	Carrier Frequency
16	Reference Clock

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1.1.4 Power Interface:

Mode #	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
Rated	110-240	-	-	AC 48-63Hz	1	None
1	120	-	-	AC-60Hz	1	None

NOTE: During an initial assessment of the MPR-5005, it was determined that the amplitude of carrier frequency's field strength is unaffected with any input voltage variation. The voltage was varied between 85% and 115% of the rated and the transmit field strength was monitored using a receive antenna and spectrum analyzer. As a result, testing was performed at only one voltage (120Vac).

1.2 EUT Operation Modes:

Mode #	Description
1	EUT is transmitting and receiving, simultaneously. This device operates with its transmit and receive circuitry on continuously.

1.3 EUT Configuration Modes:

Mode #	Description
1	MPR-5005 is powered via 120Vac power source. Single antenna connected.
2	MPR-5005 is powered via 120Vac power source. Dual antennas connected.

NOTE: It was determined during Radiated Emissions that testing using the Ethernet interface, as opposed to the RS-232 interface, simulated the worse case configuration. Therefore, all testing was performed while communicating through the Ethernet connection.

"The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report"

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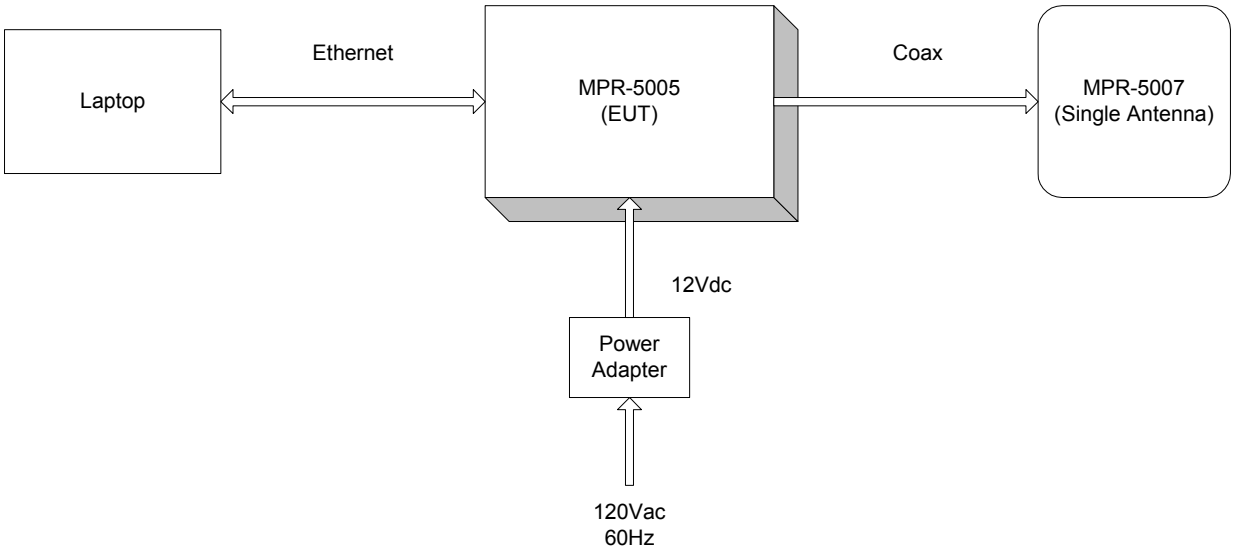
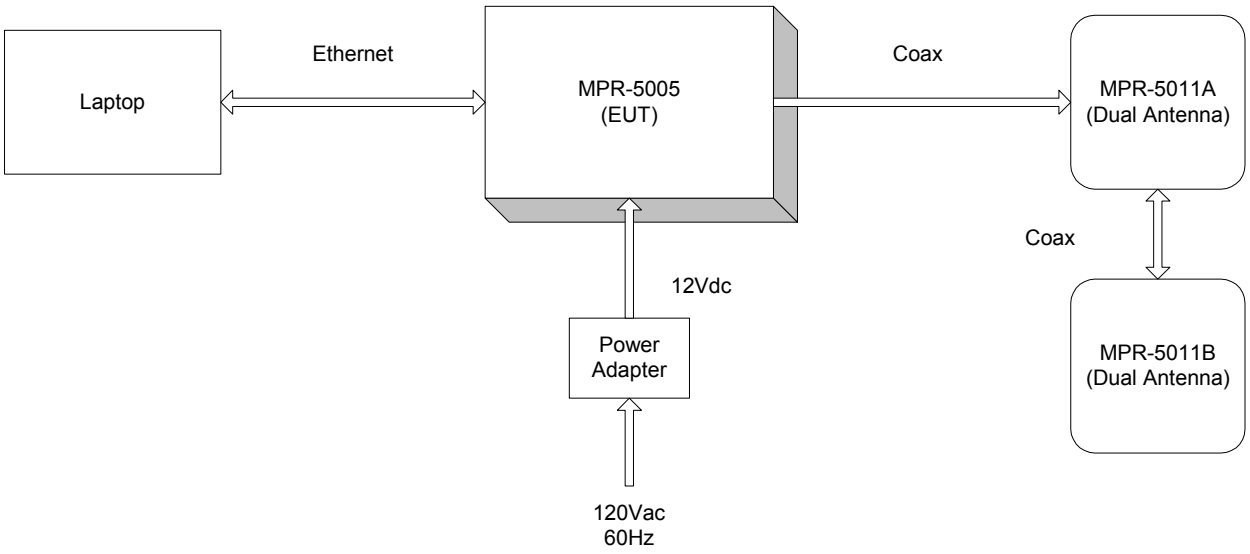
1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.

Configuration Mode 1



Configuration Mode 2



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1.5 Deviations from standard test methods

Not Applicable

1.6 Device Modifications Necessary for Compliance

Not Applicable.

1.7 Test Summary

Product Standards	FCC Part 15, Subpart B & C, RSS-GEN, RSS-210

Summary of EMC Emission Tests	Standard	Test Name	Limit	Result
	FCC Part 15, Subpart B	Radiated Emissions	Class A	1
	FCC Part 15, Subpart C	Radiated Emissions	Section 15.209	1
	FCC Part 15, Subpart C	Conducted Emissions	Section 15.207	1
	RSS-210	Radiated Emissions	Class A	1

Remarks:

1) Compliant – Indicates no modifications required for compliance.
2) Modifications required to comply as described in Section 1.6

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2.0 Conclusion:

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

The equipment under test has met the technical requirements as defined under section 5.0

Test Start Date: 8/3/2006
Test Completion Date: 9/8/2006

Michael Antola (Ext.23053)
Project Engineer
International EMC Services
Conformity Assessment Services-3013EMEL

Robert DeLisi(Ext.22452)
Principal Engineer - EMC
International EMC Services
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Only those products bearing the UL Mark should be considered as being covered by UL.

3.0 FCC Labeling Information

Identification.

Devices Subject to Verification

In 47 CFR, Part 2, **§ 2.954**:

> "Devices subject only to verification shall be uniquely identified by the person responsible for marketing or importing the equipment within the United States. However, the identification shall not be of a format which could be confused with the FCC Identifier required on certified, notified or type accepted equipment. The importer or manufacturer shall maintain adequate identification records to facilitate positive identification for each verified device."

Devices Subject to Declaration of Conformity

In 47 CFR, Part 2, **§ 2.1074**:

> "Devices subject only to a Declaration of Conformity shall be uniquely identified by the responsible party. This identification shall not be of a format which could be confused with the FCC Identifier required on certified, notified, type accepted or type approved equipment. The responsible party shall maintain adequate identification records to facilitate positive identification for each device."

Compliance information

§ 2.1077 Compliance information.
(a) If a product must be tested and authorized under a Declaration of Conformity, a compliance information statement shall be supplied with the product at the time of marketing or importation, containing the following information:

(1) Identification of the product, e.g., name and model number;

(2) A statement, similar to that contained in § 15.19(a)(3) of this chapter, that the product complies with part 15 of this chapters; and

(3) The identification, by name, address and telephone number, of the responsible party, as defined in § 2.909.

The responsible party for a Declaration of Conformity must be located within the United States.

(c) The compliance information statement shall be included in the user's manual or as a separate sheet.

§ 15.19(a)(3):

> " All other devices shall bear the following statement in a conspicuous location on the device: This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation."

Only those products bearing the UL Mark should be considered as being covered by UL.

Labeling.

Labeling Certification or Verification

In addition to the requirements in Part 2 of this CFR 47 (See **1.6.1 Identification** above), a device subject to certification or verification shall be labeled as follows:

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

> This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

(2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

> This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:

> This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

Declaration of Conformity Labeling

In addition to the requirements in Part 2 of CFR 47 (See **1.6.1 Identification** above), a device subject to authorization under a Declaration of Conformity shall be labeled as follows:

The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Section 2.1074 of this chapter and the following logo:

If the product is authorized based on testing of the product or system:

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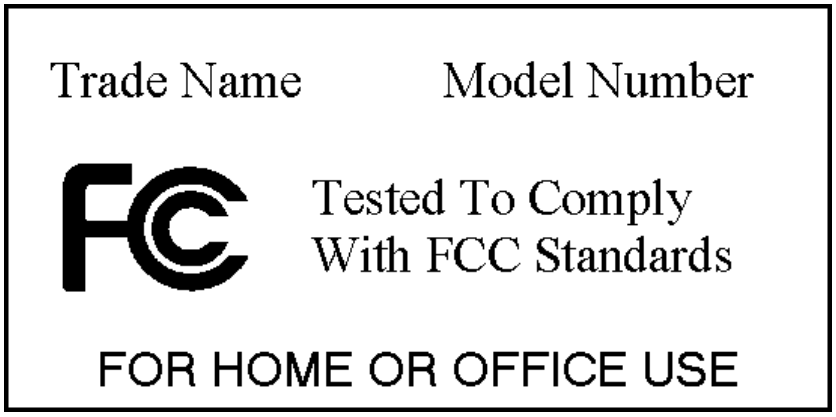

Alternate label format for small devices:

The text shown in ***bold-face italics*** may be placed in a prominent location in the instruction manual or pamphlet supplied to the user.

Label text and information should be in a size of type large enough to be readily legible, consistent with the dimensions of the equipment and the label. However, the type size for the text is not required to be larger than eight point.

When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (b)(1) of this section on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be displayed on the device.

The label shall not be a stick-on, paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase, as described in Section 2.925(d) of this chapter. “Permanently affixed” means that the label is etched, engraved, stamped, silk-screened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.

Only those products bearing the UL Mark should be considered as being covered by UL.

User Information.

In 47 CFR, Part 15, **§ 15.21 Information to user**:
"The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment."

In 47 CFR, Part 15, **§ 15.105 Information to the user**:
Class A Devices
"(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense."

Class B Devices
"(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help*

"(d) For systems incorporating several digital devices, the statement shown in paragraph (a) or (b) of this section needs to be contained only in the instruction manual for the main control unit."

4.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

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5.0 EMISSIONS TEST REGULATIONS

The emissions tests were performed according to following regulations:

---------- United States ----------

FCC Part 15, Subpart B, Class A	Code of Federal Regulations, Part 15, Subpart B, Radio Frequency Devices: 2006
FCC Part 15, Subpart C, Section 15.207 & 15.209	Code of Federal Regulations, Part 15, Subpart C, Radio Frequency Devices: 2006

---------- International ----------

RSS-210, Issue 6	Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment; September 2005
RSS-GEN, Issue 1	General Requirements and Information for the Certification of Radiocommunication Equipment; September 2005

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be recorded at the time the test is conducted.

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150

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TEST TITLE: Conducted Emissions Test – Mains

METHOD

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. For all equipment, except floor-standing equipment, the EUT was located 40cm from a vertical conducting surface. All power was connected to the system through Line Impedance Stabilization Networks (LISN) and distance between the EUT and the LISN was 80cm or more. Conducted voltage measurements on mains lines were made at the output of the LISN. Conducted Current measurements on I/O lines are made with the current probe.

One fully configured sample was scanned over the following frequency range

Frequency range on each side of line	Measurement Point	
150kHz to 30MHz	Voltage	Mains

Mode*		
Power	Operation	Configuration
1	1	1,2

*See Power Interface EUT Operating Modes and Configurations for details

Spectrum Analyzer Settings				
Measurement Frequency	Preliminary Peak Scan		Final Detection	
	Resolution Bandwidth	Video Bandwidth	Quasi-Peak Bandwidth	Average Video Bandwidth
9kHz to 150kHz	10kHz	10kHz	200Hz	1Hz
150kHz to 30MHz	100kHz	100kHz	9kHz	1Hz

The following test parameters shall be established prior to test.

Parameter	Value	Units
Laboratory Ambient Temperature	10 to 40	°C
Relative Humidity	10 to 90	%

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Limits

Frequency (MHz)	Limit (dBµV)	
	Quasi-Peak	Average
0.15 to 0.5	66-56	56-46
0.5 to 5	56	46
5 to 30	60	50

RESULTS

Ambient Conditions at the time of test.	Value	Units
Temperature:	20.0	°C
Humidity:	47.0	%RH
Test Date	06 September 2006	

The results of this test **complied** with the requirements.

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwarz	ESIB 26	ME5B-081	11 Oct 05	31 Oct 06
50Ω LISN	Solar Electronics	9252-50-R-24-BNC	ME5A-636	20 Oct 05	31 Oct 06
Transient Limiter	Hewlett Packard	11947A	ME5A-444	25 Jan 06	31 Jan 07
Hygrometer/Temp/Barometer	Cole Parmer	99760	6268	15 Aug 06	15 Aug 07

Test Accessories Used					
Description	Manufacturer	Model	Identifier	Char/ Valid Date	Due
Measurement Software	UL	UL EMI Software	Version 9.3	06 June 06	NA

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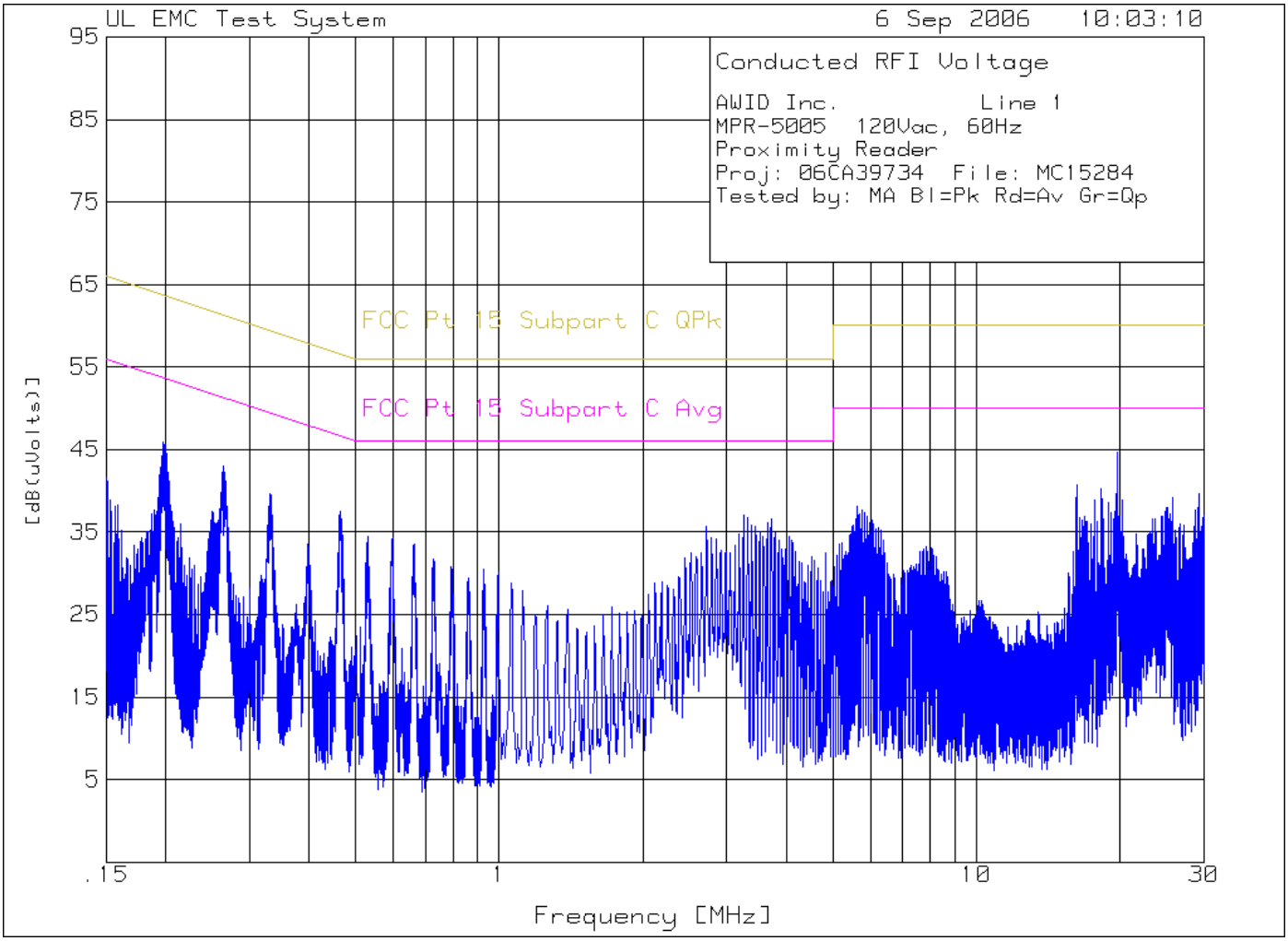

Dual Antenna Configuration

Only those products bearing the UL Mark should be considered as being covered by UL.

AWID Inc. Line 1
MPR-5005 120Vac, 60Hz
Proximity Reader
Proj: 06CA39734 File: MC15284
Tested by: MA Bl=Pk Rd=Av Gr=Qp

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
Range: 1 .15 - 1MHz									
1	.19777	35.96 pk	10	0	45.96	63.7	53.7	-	-
				Margin [dB]		-17.74	-7.74	-	-
2	.26509	33.05 pk	9.9	0	42.95	61.3	51.3	-	-
				Margin [dB]		-18.35	-8.35	-	-
Range: 2 1 - 30MHz									
3	3.25087	27.14 pk	9.9	0	37.04	56	46	-	-
				Margin [dB]		-18.96	-8.96	-	-
4	3.71496	26.66 pk	9.9	0	36.56	56	46	-	-
				Margin [dB]		-19.44	-9.44	-	-
5	5.63516	28.18 pk	9.9	0	38.08	60	50	-	-
				Margin [dB]		-21.92	-11.92	-	-
6	19.70887	34.67 pk	10	0	44.67	60	50	-	-
				Margin [dB]		-15.33	-5.33	-	-

LIMIT 1: FCC Pt 15 Subpart C QPk
LIMIT 2: FCC Pt 15 Subpart C Avg
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
ave - denotes average detection
tm - Trace Math Result

Only those products bearing the UL Mark should be considered as being covered by UL.

AWID Inc. Line 1
MPR-5005 120Vac, 60Hz
Proximity Reader
Proj: 06CA39734 File: MC15284
Tested by: MA Bl=Pk Rd=Av Gr=Qp

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
Range: 2 1 - 30MHz								
19.7098	29.02 ave	10	0	39.02	60	50	-	-
			Margin [dB]:		-20.98	-10.98	-	-

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
ave - denotes average detection

LIMIT 1: FCC Pt 15 Subpart C QPk
LIMIT 2: FCC Pt 15 Subpart C Avg
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

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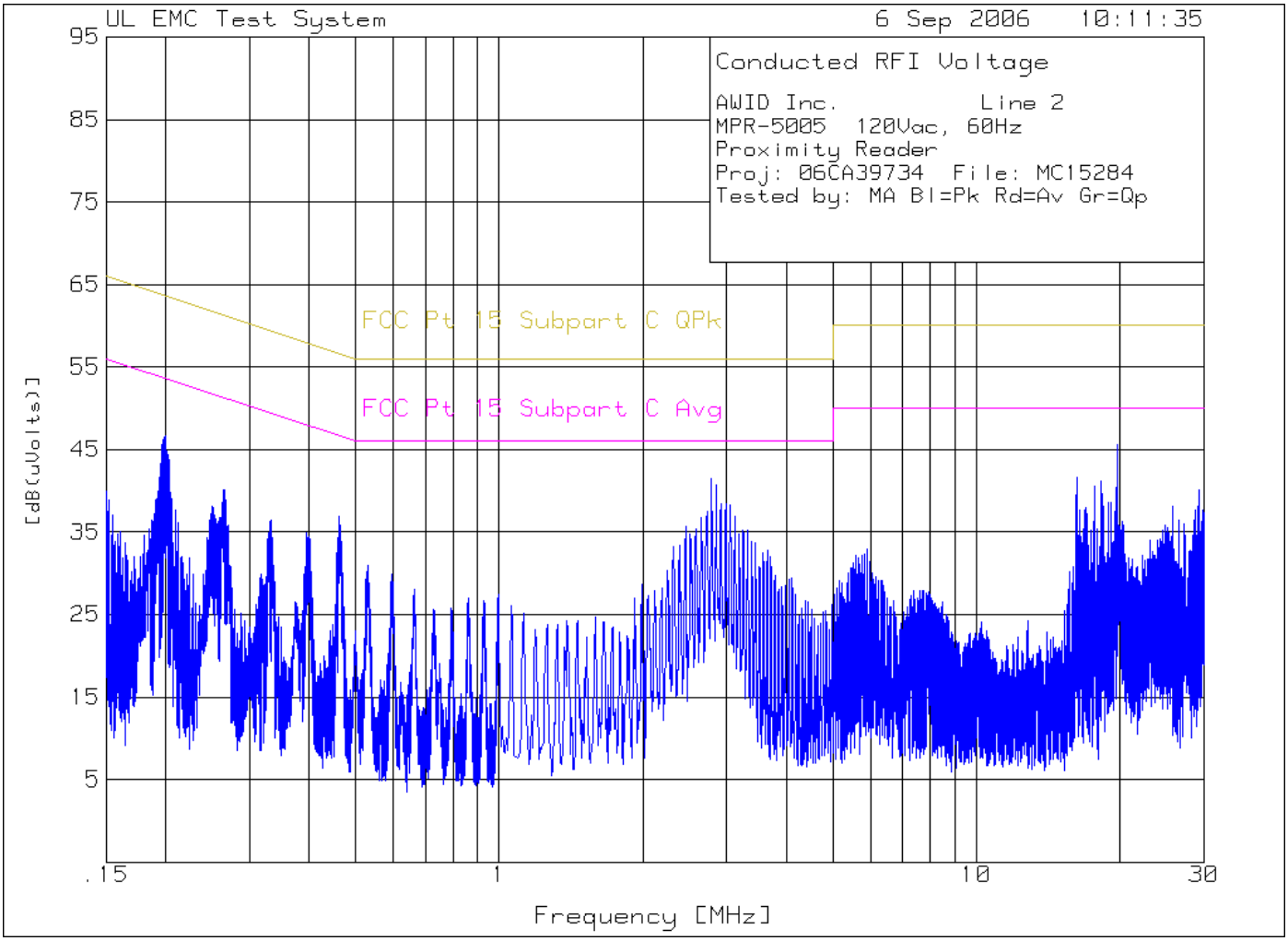


Dual Antenna Configuration

Only those products bearing the UL Mark should be considered as being covered by UL.

AWID Inc. Line 2
MPR-5005 120Vac, 60Hz
Proximity Reader
Proj: 06CA39734 File: MC15284
Tested by: MA Bl=Pk Rd=Av Gr=Qp

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
Range: 1 .15 - 1MHz									
1	.20015	36.64 pk	10	0	46.64	63.6	53.6	-	-
				Margin [dB]		-16.96	-6.96	-	-
2	.26424	30.23 pk	9.9	0	40.13	61.3	51.3	-	-
				Margin [dB]		-21.17	-11.17	-	-
Range: 1 1 - 30MHz									
3	2.78097	31.56 pk	9.9	0	41.46	56	46	-	-
				Margin [dB]		-14.54	-4.54	-	-
4	2.85058	30.74 pk	9.9	0	40.64	56	46	-	-
				Margin [dB]		-15.36	-5.36	-	-
5	2.9144	28.5 pk	9.9	0	38.4	56	46	-	-
				Margin [dB]		-17.6	-7.6	-	-
6	2.98401	28.54 pk	9.9	0	38.44	56	46	-	-
				Margin [dB]		-17.56	-7.56	-	-
7	3.04202	28.38 pk	9.9	0	38.28	56	46	-	-
				Margin [dB]		-17.72	-7.72	-	-
8	19.70887	35.61 pk	10	0	45.61	60	50	-	-
				Margin [dB]		-14.39	-4.39	-	-
9	16.22815	31.68 pk	10	0	41.68	60	50	-	-
				Margin [dB]		-18.32	-8.32	-	-

LIMIT 1: FCC Pt 15 Subpart C QPk
LIMIT 2: FCC Pt 15 Subpart C Avg
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
ave - denotes average detection
tm - Trace Math Result

Only those products bearing the UL Mark should be considered as being covered by UL.

AWID Inc. Line 2
MPR-5005 120Vac, 60Hz
Proximity Reader
Proj: 06CA39734 File: MC15284
Tested by: MA Bl=Pk Rd=Av Gr=Qp

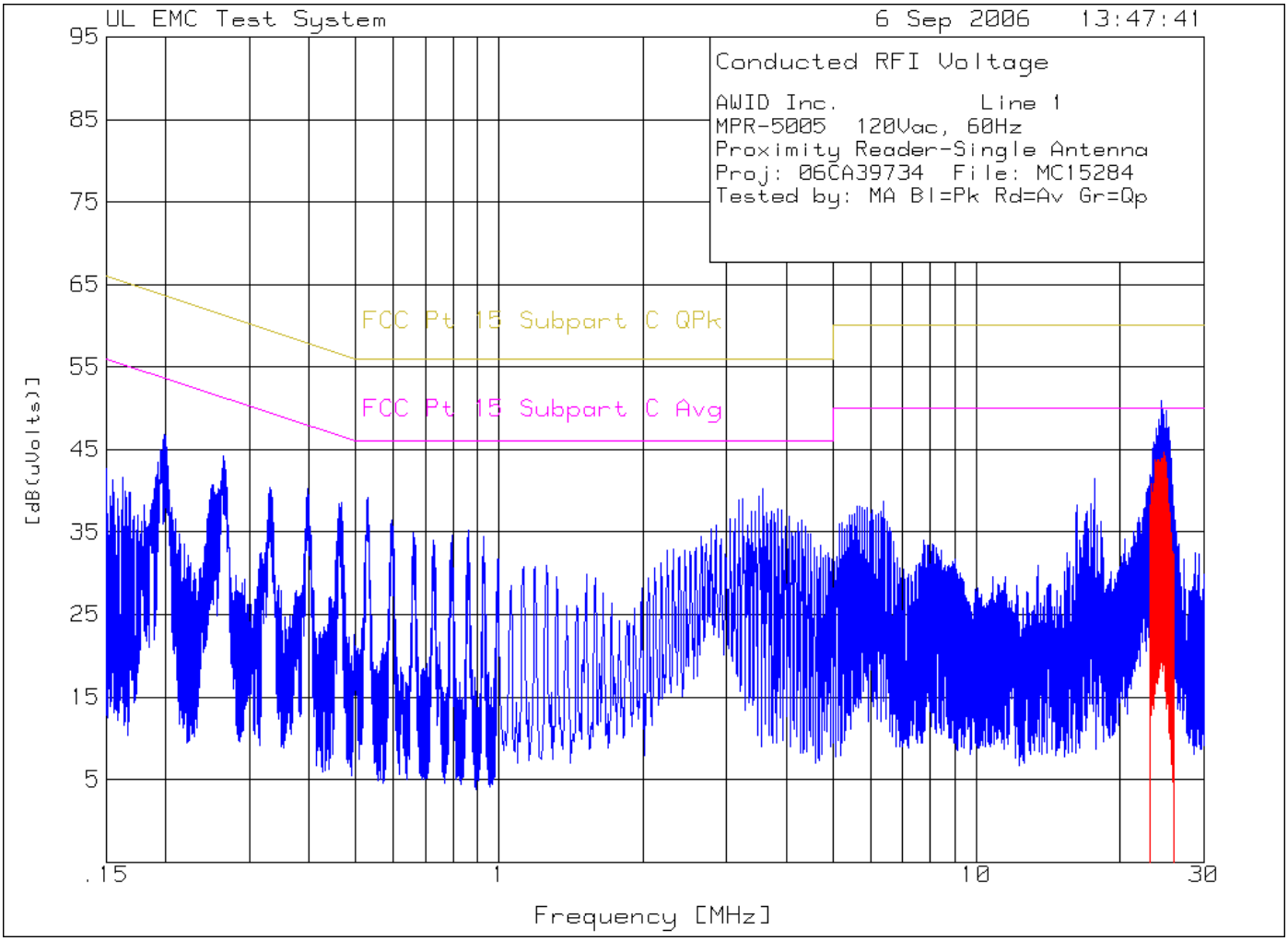
Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
Range: 1 .15 - 1MHz								
.19892	22.9 ave	10	0	32.9	63.7	53.7	-	-
			Margin [dB]:		-30.8	-20.8	-	-
.26545	21.48 ave	9.9	0	31.38	61.3	51.3	-	-
			Margin [dB]:		-29.92	-19.92	-	-
Range: 1 1 - 30MHz								
2.78764	20.08 ave	9.9	0	29.98	56	46	-	-
			Margin [dB]:		-26.02	-16.02	-	-
2.85406	19.61 ave	9.9	0	29.51	56	46	-	-
			Margin [dB]:		-26.49	-16.49	-	-
2.92069	17.06 ave	9.9	0	26.96	56	46	-	-
			Margin [dB]:		-29.04	-19.04	-	-
2.98687	13.69 ave	9.9	0	23.59	56	46	-	-
			Margin [dB]:		-32.41	-22.41	-	-
3.05215	13.22 ave	9.9	0	23.12	56	46	-	-
			Margin [dB]:		-32.88	-22.88	-	-
19.7098	30.61 ave	10	0	40.61	60	50	-	-
			Margin [dB]:		-19.39	-9.39	-	-

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
ave - denotes average detection

LIMIT 1: FCC Pt 15 Subpart C QPk
LIMIT 2: FCC Pt 15 Subpart C Avg
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

Only those products bearing the UL Mark should be considered as being covered by UL.



Only those products bearing the UL Mark should be considered as being covered by UL.

AWID Inc. Line 1
MPR-5005 120Vac, 60Hz
Proximity Reader-Single Antenna
Proj: 06CA39734 File: MC15284
Tested by: MA Bl=Pk Rd=Av Gr=Qp

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
Range: 1 .15 - 1MHz									
1	.19862	36.83 pk	10	0	46.83	63.7	53.7	-	-
				Margin [dB]		-16.87	-6.87	-	-
2	.2639	34.26 pk	9.9	0	44.16	61.3	51.3	-	-
				Margin [dB]		-17.14	-7.14	-	-
3	.33173	30.4 pk	10	0	40.4	59.4	49.4	-	-
				Margin [dB]		-19	-9	-	-
4	.39735	30.24 pk	10	0	40.24	57.9	47.9	-	-
				Margin [dB]		-17.66	-7.66	-	-
5	.52995	29.23 pk	10	0	39.23	56	46	-	-
				Margin [dB]		-16.77	-6.77	-	-
6	.46688	28.59 pk	10	0	38.59	56.6	46.6	-	-
				Margin [dB]		-18.01	-8.01	-	-
Range: 1 1 - 30MHz									
7	3.17545	28.96 pk	9.9	0	38.86	56	46	-	-
				Margin [dB]		-17.14	-7.14	-	-
8	3.24506	29.13 pk	9.9	0	39.03	56	46	-	-
				Margin [dB]		-16.97	-6.97	-	-
9	3.50612	29.37 pk	9.9	0	39.27	56	46	-	-
				Margin [dB]		-16.73	-6.73	-	-
11	3.84259	27.98 pk	9.9	0	37.88	56	46	-	-
				Margin [dB]		-18.12	-8.12	-	-
12	4.05143	27.05 pk	9.9	0	36.95	56	46	-	-
				Margin [dB]		-19.05	-9.05	-	-
13	3.37849	27.55 pk	9.9	0	37.45	56	46	-	-
				Margin [dB]		-18.55	-8.55	-	-
14	3.04782	26.71 pk	9.9	0	36.61	56	46	-	-
				Margin [dB]		-19.39	-9.39	-	-
15	23.58407	35.82 pk	10	0	45.82	60	50	-	-
				Margin [dB]		-14.18	-4.18	-	-
16	23.81032	37.63 pk	10	0	47.63	60	50	-	-
				Margin [dB]		-12.37	-2.37	-	-
17	23.97855	36.68 pk	10	0	46.68	60	50	-	-
				Margin [dB]		-13.32	-3.32	-	-
18	24.14099	38.57 pk	10	0	48.57	60	50	-	-
				Margin [dB]		-11.43	-1.43	-	-
19	24.35563	40.92 pk	10	0	50.92	60	50	-	-
				Margin [dB]		-9.08	.92	-	-
20	24.55867	39.92 pk	10	0	49.92	60	50	-	-
				Margin [dB]		-10.08	-.08	-	-
21	24.6921	39.29 pk	10	0	49.29	60	50	-	-
				Margin [dB]		-10.71	-.71	-	-

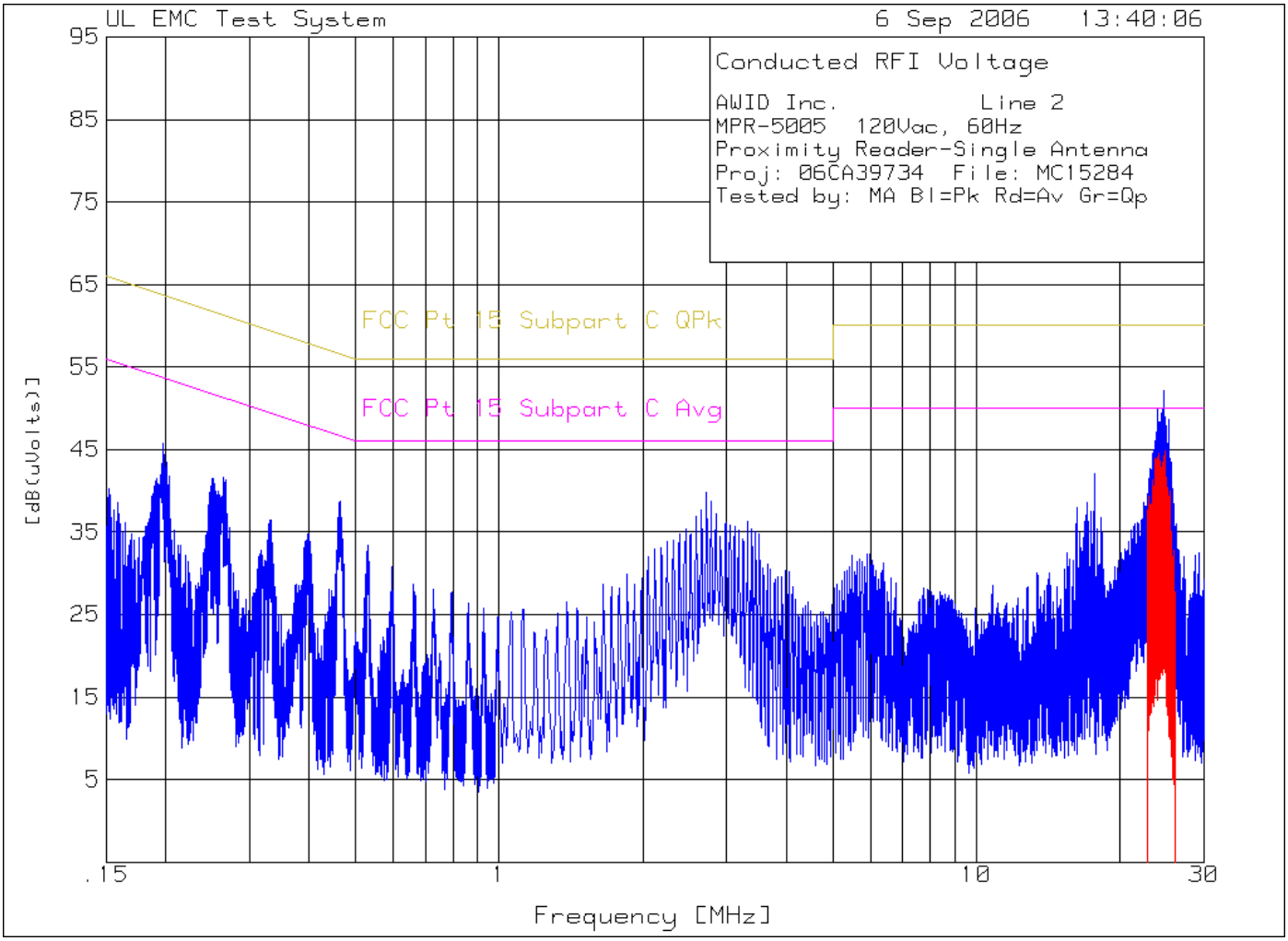
Only those products bearing the UL Mark should be considered as being covered by UL.

22	24.91255	39.77 pk	10	0	49.77	60	50	-	-
				Margin [dB]		-10.23	-.23	-	-
23	25.01117	39.39 pk	10	0	49.39	60	50	-	-
				Margin [dB]		-10.61	-.61	-	-
24	25.11559	37.6 pk	10	0	47.6	60	50	-	-
				Margin [dB]		-12.4	-2.4	-	-
25	25.24322	37.77 pk	10	0	47.77	60	50	-	-
				Margin [dB]		-12.23	-2.23	-	-
26	25.45786	36.01 pk	10	0	46.01	60	50	-	-
				Margin [dB]		-13.99	-3.99	-	-
27	23.32302	35.05 pk	10	0	45.05	60	50	-	-
				Margin [dB]		-14.95	-4.95	-	-
28	23.318	29.79 ave	10	0	39.79	60	50	-	-
				Margin [dB]		-20.21	-10.21	-	-
29	23.65	33.82 ave	10	0	43.82	60	50	-	-
				Margin [dB]		-16.18	-6.18	-	-
30	23.758	33.08 ave	10	0	43.08	60	50	-	-
				Margin [dB]		-16.92	-6.92	-	-
31	23.977	33.74 ave	10	0	43.74	60	50	-	-
				Margin [dB]		-16.26	-6.26	-	-
32	24.088	33.78 ave	10	0	43.78	60	50	-	-
				Margin [dB]		-16.22	-6.22	-	-
33	24.305	33.41 ave	10	0	43.41	60	50	-	-
				Margin [dB]		-16.59	-6.59	-	-
34	24.523	33.93 ave	10	0	43.93	60	50	-	-
				Margin [dB]		-16.07	-6.07	-	-
35	24.631	34.65 ave	10	0	44.65	60	50	-	-
				Margin [dB]		-15.35	-5.35	-	-
36	24.856	34.23 ave	10	0	44.23	60	50	-	-
				Margin [dB]		-15.77	-5.77	-	-
37	24.964	33.47 ave	10	0	43.47	60	50	-	-
				Margin [dB]		-16.53	-6.53	-	-
38	25.07	31.47 ave	10	0	41.47	60	50	-	-
				Margin [dB]		-18.53	-8.53	-	-
39	25.179	29.82 ave	10	0	39.82	60	50	-	-
				Margin [dB]		-20.18	-10.18	-	-
40	25.289	28.38 ave	10	0	38.38	60	50	-	-
				Margin [dB]		-21.62	-11.62	-	-
41	25.511	24.43 ave	10	0	34.43	60	50	-	-
				Margin [dB]		-25.57	-15.57	-	-

LIMIT 1: FCC Pt 15 Subpart C QPk
LIMIT 2: FCC Pt 15 Subpart C Avg

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
ave - denotes average detection
tm - Trace Math Result

Only those products bearing the UL Mark should be considered as being covered by UL.



Only those products bearing the UL Mark should be considered as being covered by UL.

AWID Inc. Line 2
MPR-5005 120Vac, 60Hz
Proximity Reader-Single Antenna
Proj: 06CA39734 File: MC15284
Tested by: MA Bl=Pk Rd=Av Gr=Qp

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
Range: 1 .15 - 1MHz									
1	.19811	35.75 pk	10	0	45.75	63.7	53.7	-	-
				Margin [dB]		-17.95	-7.95	-	-
2	.25064	31.61 pk	9.9	0	41.51	61.7	51.7	-	-
				Margin [dB]		-20.19	-10.19	-	-
3	.26492	31.79 pk	9.9	0	41.69	61.3	51.3	-	-
				Margin [dB]		-19.61	-9.61	-	-
4	.46382	28.79 pk	10	0	38.79	56.6	46.6	-	-
				Margin [dB]		-17.81	-7.81	-	-
Range: 1 1 - 30MHz									
5	2.58953	26.94 pk	9.9	0	36.84	56	46	-	-
				Margin [dB]		-19.16	-9.16	-	-
6	2.64754	27.83 pk	9.9	0	37.73	56	46	-	-
				Margin [dB]		-18.27	-8.27	-	-
7	2.71716	29.83 pk	9.9	0	39.73	56	46	-	-
				Margin [dB]		-16.27	-6.27	-	-
8	2.78097	28.83 pk	9.9	0	38.73	56	46	-	-
				Margin [dB]		-17.27	-7.27	-	-
9	2.84478	27.24 pk	9.9	0	37.14	56	46	-	-
				Margin [dB]		-18.86	-8.86	-	-
10	2.98401	26.24 pk	9.9	0	36.14	56	46	-	-
				Margin [dB]		-19.86	-9.86	-	-
11	3.31468	26.32 pk	9.9	0	36.22	56	46	-	-
				Margin [dB]		-19.78	-9.78	-	-
12	23.68849	35.98 pk	10	0	45.98	60	50	-	-
				Margin [dB]		-14.02	-4.02	-	-
13	23.92054	39.97 pk	10	0	49.97	60	50	-	-
				Margin [dB]		-10.03	-.03	-	-
14	24.24541	38.3 pk	10	0	48.3	60	50	-	-
				Margin [dB]		-11.7	-1.7	-	-
15	24.34983	39.33 pk	10	0	49.33	60	50	-	-
				Margin [dB]		-10.67	-.67	-	-
16	24.57028	39.78 pk	10	0	49.78	60	50	-	-
				Margin [dB]		-10.22	-.22	-	-
17	24.6921	42.2 pk	10	0	52.2	60	50	-	-
				Margin [dB]		-7.8	2.2	-	-
18	24.79072	38.89 pk	10	0	48.89	60	50	-	-
				Margin [dB]		-11.11	-1.11	-	-
19	25.02277	37.81 pk	10	0	47.81	60	50	-	-
				Margin [dB]		-12.19	-2.19	-	-
20	25.23161	38.56 pk	10	0	48.56	60	50	-	-
				Margin [dB]		-11.44	-1.44	-	-

Only those products bearing the UL Mark should be considered as being covered by UL.

21	25.34764	37.59 pk	10	0	47.59	60	50	-	-
				Margin [dB]		-12.41	-2.41	-	-
22	23.6495	33.95 ave	10	0	43.95	60	50	-	-
				Margin [dB]		-16.05	-6.05	-	-
23	23.7575	33.75 ave	10	0	43.75	60	50	-	-
				Margin [dB]		-16.25	-6.25	-	-
24	23.8665	33.53 ave	10	0	43.53	60	50	-	-
				Margin [dB]		-16.47	-6.47	-	-
25	24.0875	34.47 ave	10	0	44.47	60	50	-	-
				Margin [dB]		-15.53	-5.53	-	-
26	23.9755	34.06 ave	10	0	44.06	60	50	-	-
				Margin [dB]		-15.94	-5.94	-	-
27	24.1955	33.64 ave	10	0	43.64	60	50	-	-
				Margin [dB]		-16.36	-6.36	-	-
28	24.4115	32.79 ave	10	0	42.79	60	50	-	-
				Margin [dB]		-17.21	-7.21	-	-
29	24.6305	34.14 ave	10	0	44.14	60	50	-	-
				Margin [dB]		-15.86	-5.86	-	-
30	24.8555	34.79 ave	10	0	44.79	60	50	-	-
				Margin [dB]		-15.21	-5.21	-	-
31	24.9645	31.58 ave	10	0	41.58	60	50	-	-
				Margin [dB]		-18.42	-8.42	-	-
32	25.0715	30.43 ave	10	0	40.43	60	50	-	-
				Margin [dB]		-19.57	-9.57	-	-
33	25.1765	30.2 ave	10	0	40.2	60	50	-	-
				Margin [dB]		-19.8	-9.8	-	-
34	25.2935	29.34 ave	10	0	39.34	60	50	-	-
				Margin [dB]		-20.66	-10.66	-	-
35	25.4015	29.97 ave	10	0	39.97	60	50	-	-
				Margin [dB]		-20.03	-10.03	-	-

LIMIT 1: FCC Pt 15 Subpart C QPk
LIMIT 2: FCC Pt 15 Subpart C Avg
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
ave - denotes average detection
tm - Trace Math Result

Only those products bearing the UL Mark should be considered as being covered by UL.

Conducted Emissions Test Setup (150kHz – 30MHz)

Only those products bearing the UL Mark should be considered as being covered by UL.

TEST TITLE: Radiated Emissions Test

METHOD

Measurements were made in a 10-meter semi-anechoic chamber that complies to ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at 1, 2, 3 and 4 meter heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.

In the frequency range of 9kHz to 30MHz, preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at 1 meter height. An active loop antenna was rotated at 0º, 45°, 90º, and 135° points about the vertical axis. Peak scans were taken for each test configuration. For the 30-meter measurements, the fundamental and one spurious frequency were measured. The antenna was rotated about its axis to determine worse-case azimuth.

One fully configured sample was scanned over the following frequency range:

Electric fields:	125kHz & 500kHz	(30 meter measurement distance)
	9kHz - 30MHz	(3 meter measurement distance)
	30MHz - 1GHz	(10 meter measurement distance)

Mode*		
Power	Operation	Configuration
1	1	1,2

*See Power Interface EUT Operating Modes and Configurations for details

Spectrum Analyzer Settings				
Measurement Frequency	Preliminary Peak Scan		Final Detection	
	Resolution Bandwidth	Video Bandwidth	Quasi-Peak Bandwidth	Average Video Bandwidth
9kHz to 150kHz	10kHz	1MHz	200Hz	1Hz
150kHz to 30MHz	100kHz	1MHz	9kHz	1Hz
30 to 1000MHz	1MHz	1MHz	120kHz	1Hz

The following test parameters shall be established prior to test.

Parameter	Value	Units
Laboratory Ambient Temperature	10 to 40	°C
Relative Humidity	10 to 90	%

Only those products bearing the UL Mark should be considered as being covered by UL.

Limits

Frequency (MHz)	Limit (dBµV/m)	Measurement Distance (m)
0.009 to 0.090	48.5 – 13.8	300
0.490 to 1.705	33.8 – 22.97	30
1.705 to 30	29.5	30
30 to 88	39	3
88 to 216	43.5	3
216 to 960	46.4	3
960 to 1000	49.5	3

RESULTS

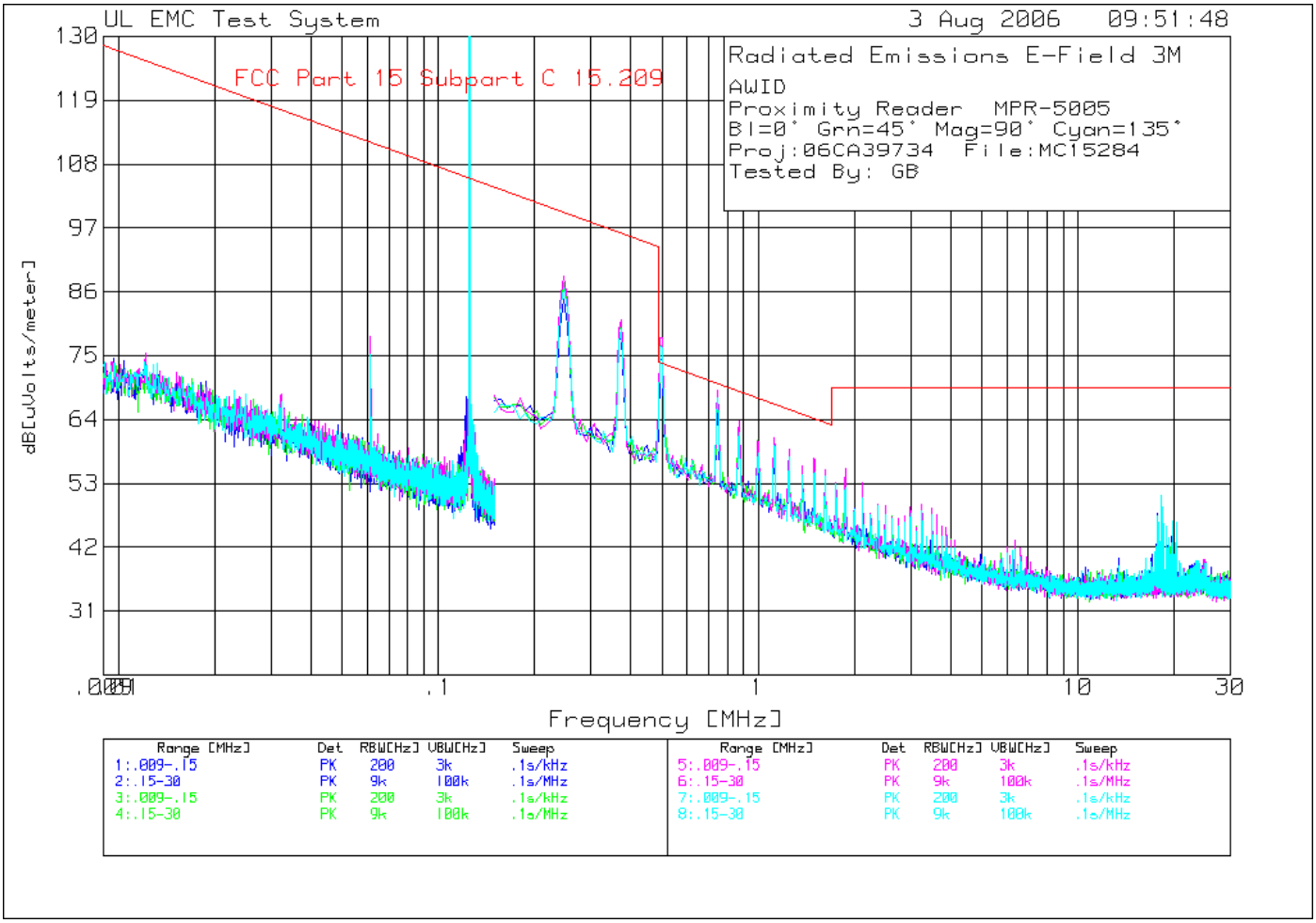
Ambient Conditions at the time of test.	Value	Value	Units
Temperature:	20.0	19.5	°C
Humidity:	36.0	48.0	%RH
Test Date	03 August 2005	06 September 2006	

The results of this test **complied** with the requirements.

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwarz	ESIB 40	34968	28 Nov 05	28 Nov 06
EMI Spectrum Analyzer	Agilent Technologies	E7402A	ME5B-123	03 Oct 05	31 Oct 06
Biconical Antenna	Ailtech	94455-1	ME5-439	19 Dec 05	31 Dec 06
Log Periodic Antenna	EMCO	3146	ME5-451	14 Dec 05	31 Dec 06
Active Loop	EMCO	6507	ME5A-288	21 June 06	30 June 07
Passive Loop	Electrometrics	EM-6872	AT0036	27 Mar 06	27 Mar 07
Passive Loop	Electrometrics	EM-6871	AT0037	27 Mar 06	27 Mar 07
Hygrometer/Temp	Oakton	35710-10	36034	10 May 06	31 May 07
Hygrometer/Temp/Barometer	Cole Parmer	99760	6268	15 Aug 06	15 Aug 07

Test Accessories Used					
Description	Manufacturer	Model	Identifier	Char/ Valid Date	Due
10k-1.3GHz Pre-Amp	Hewlett Packard	8447D	ME7A-758	17 Aug 06	17 Aug 07
10-Meter Chamber	TDK/Lindgren	FACT 5	NA	May 2006	--
Measurement Software	UL	UL EMI Software	Version 9.3	06 June 06	NA

Only those products bearing the UL Mark should be considered as being covered by UL.



Single Antenna Configuration

Only those products bearing the UL Mark should be considered as being covered by UL.

AWID
Proximity Reader MPR-5005
Bl=0° Grn=45° Mag=90° Cyan=135°
Proj:06CA39734 File:MC15284
Tested By: GB

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Range: 2 .009 - .15MHz									
1	.12507	95.41 pk	20	16.2	131.61	105.7	-	-	-
	Azimuth:5	Height:140 Horz		Margin [dB]		25.91	-	-	-
Range: 2 .15 - 30MHz									
2	.50083	42.72 pk	20	15.4	78.12	73.6	-	-	-
	Azimuth:181	Height:140 Horz		Margin [dB]		4.52	-	-	-
3	.74715	33.79 pk	20	15.2	68.99	70.1	-	-	-
	Azimuth:354	Height:140 Horz		Margin [dB]		-1.11	-	-	-
4	.87405	28.45 pk	20	15.2	63.65	68.8	-	-	-
	Azimuth:6	Height:140 Horz		Margin [dB]		-5.15	-	-	-
5	1.12037	25.42 pk	20.1	15.4	60.92	66.6	-	-	-
	Azimuth:1	Height:140 Horz		Margin [dB]		-5.68	-	-	-
6	1.49359	21.93 pk	20.1	15.3	57.33	64.1	-	-	-
	Azimuth:61	Height:140 Horz		Margin [dB]		-6.77	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
ave - denotes average detection
tm - Trace Math Result

Only those products bearing the UL Mark should be considered as being covered by UL.

AWID
Proximity Reader MPR-5005
Bl=0° Grn=45° Mag=90° Cyan=135°
Proj:06CA39734 File:MC15284
Tested By: GB

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Range: 1 .15 - 30MHz								
.7506	31.66 qp	20	15.2	66.86	70.1	-	-	-
Azimuth: 267	Height:113 Horz		Margin [dB]:		-3.24	-	-	-
.5002	39.17 qp	20	15.4	74.57	73.6	-	-	-
Azimuth: 77	Height:129 Horz		Margin [dB]:		.97	-	-	-
.877	27.43 qp	20	15.2	62.63	68.7	-	-	-
Azimuth: 205	Height:140 Horz		Margin [dB]:		-6.07	-	-	-
1.1266	20.58 qp	20.1	15.4	56.08	66.6	-	-	-
Azimuth: 93	Height:117 Horz		Margin [dB]:		-10.52	-	-	-
Range: 2 .009 - .15MHz								
.125	97.1 av	20	16.2	133.3	105.7	-	-	-
Azimuth: 195	Height:134 Horz		Margin [dB]:		27.6	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector

Only those products bearing the UL Mark should be considered as being covered by UL.

Measurements @ 30M

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AWID
 Proximaty Reader  MPR-5005
Proj:06me39734  File:mc15284
 Tested By: MA   Single Antenna
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Fundamental

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Range:1 .123 - .127MHz								
.125	56.05 ave	0	16.2	72.25	65.6	-	-	-
			Margin [dB]:		6.65	-	-	-

Spurious

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Range:1 .47 - .55MHz								
.49024	72.62 qp	-23.6	15.4	64.42	65.6	-	-	-
			Margin [dB]:		-1.18	-	-	-

```
LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector
qp - Quasi-Peak detector
av - average detector
avlg - average log detection
ave - average detection
cav - CISPR average detection
```

NOTE: The above measurement was taken at the maximum antenna and EUT azimuth.

Fundamental Measurement Extrapolation to 300M

125kHz @ 3M = 133dBµV/m
125kHz @ 30M = 72.25dBµV/m

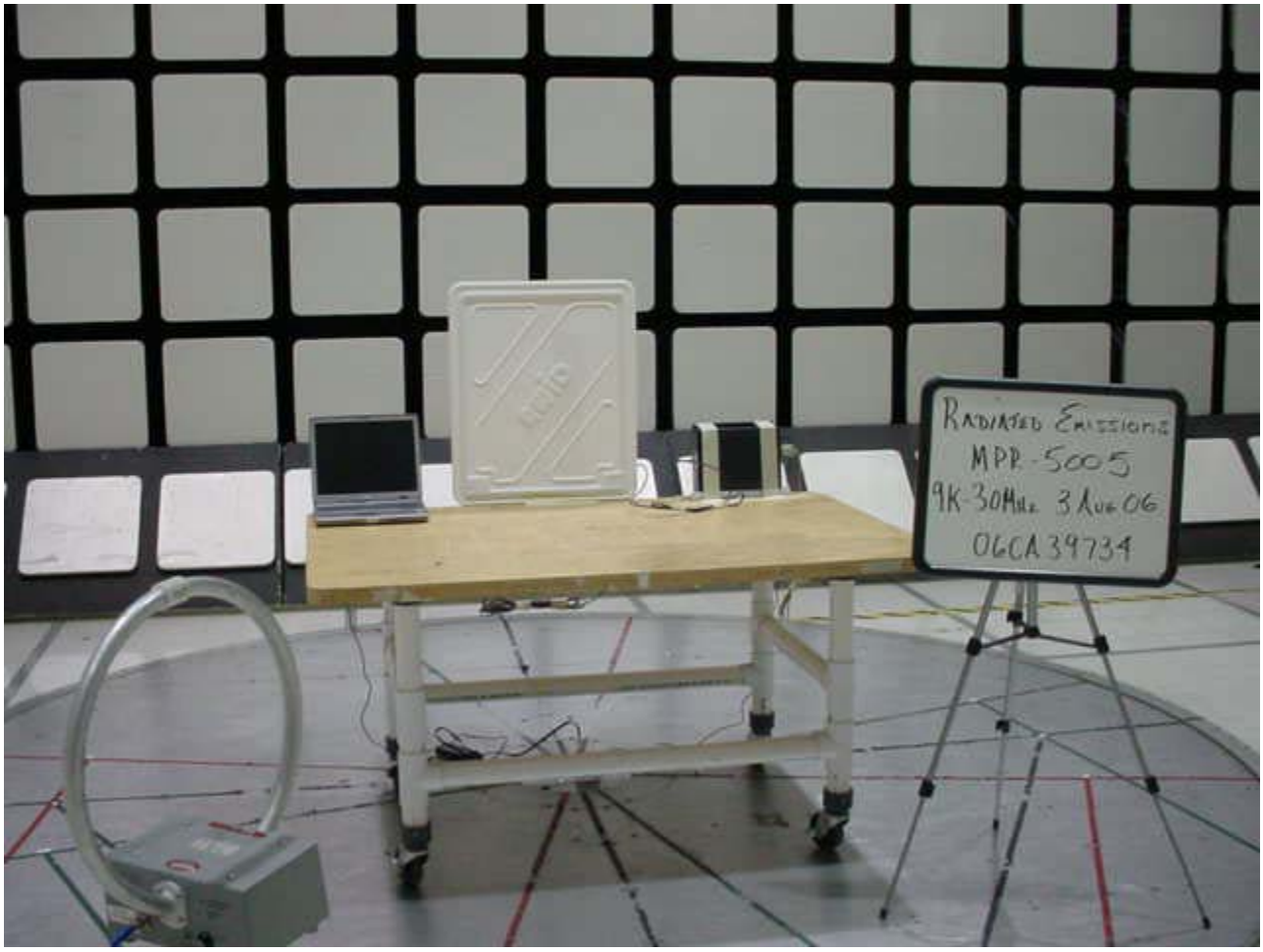
Extrapolation => 133 – 72.25 = 60.75dB/decade

125kHz @ 300M = 72.25 – 60.75 = 11.5dBµV/m

125kHz Limit @ 300M = 25.6dBµV/m

Margin = 11.5 – 25.6 = **-14.1**

Only those products bearing the UL Mark should be considered as being covered by UL.

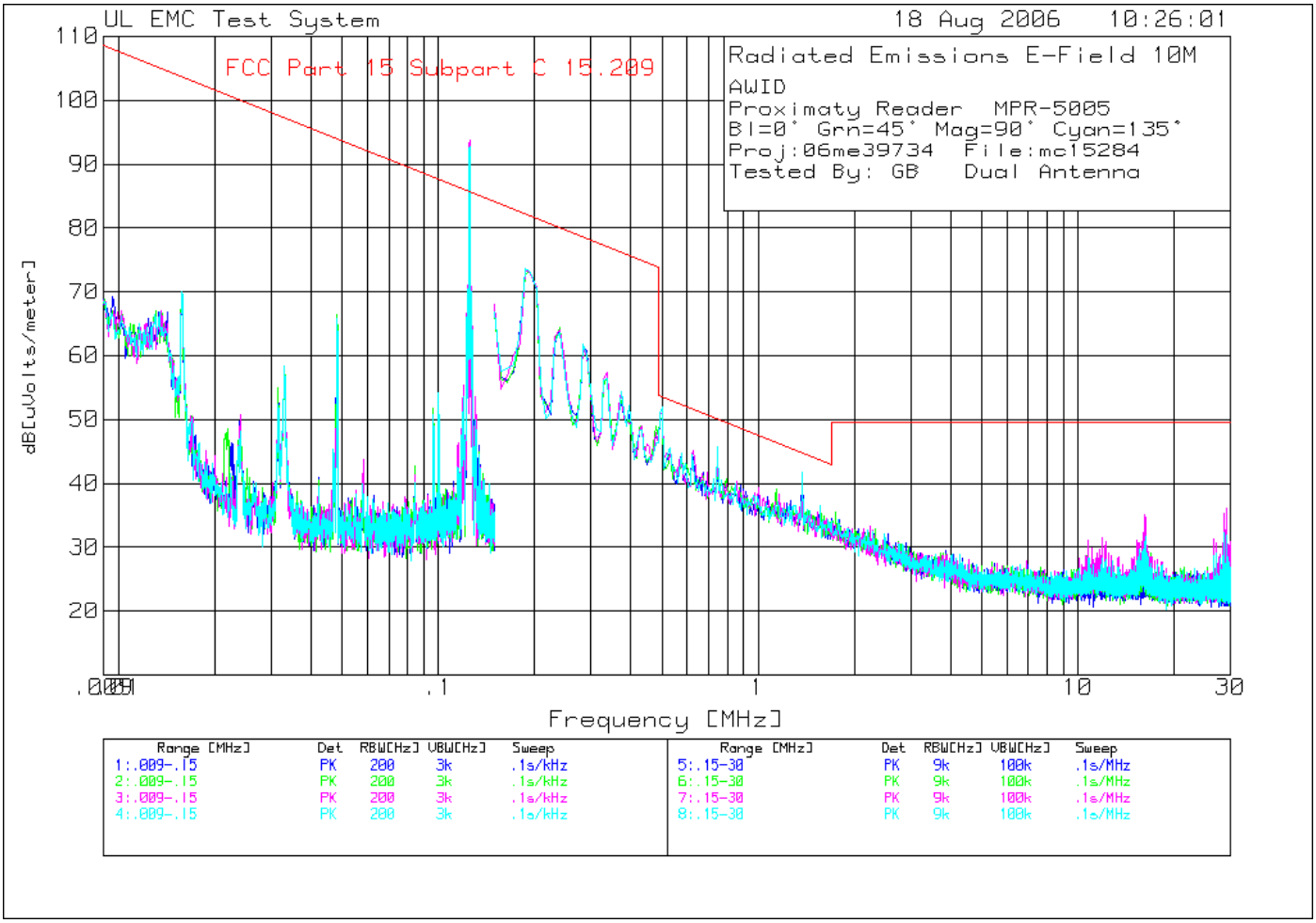


Radiated Emissions Test Setup (9kHz – 30MHz)

Only those products bearing the UL Mark should be considered as being covered by UL.

Radiated Emissions Test Setup (30M Measurement)

Only those products bearing the UL Mark should be considered as being covered by UL.



Only those products bearing the UL Mark should be considered as being covered by UL.

AWID
Proximaty Reader MPR-5005
Bl=0° Grn=45° Mag=90° Cyan=135°
Proj:06me39734 File:mc15284
Tested By: GB Dual Antenna

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Range: 3 .009 - .15MHz									
1	.12507	37.35 pk	0	56.4	93.75	85.7	-	-	-
	Azimuth:75			Margin [dB]		8.05	-	-	-
Range: 5 .15 - 30MHz									
4	1.37416	20.2 pk	-23.5	45	41.7	44.8	-	-	-
	Azimuth:140			Margin [dB]		-3.1	-	-	-
Range: 7 .15 - 30MHz									
5	.62772	17.97 pk	-23.6	50.8	45.17	51.6	-	-	-
	Azimuth:165			Margin [dB]		-6.43	-	-	-
6	16.1686	23.56 pk	-23.1	34.6	35.06	49.5	-	-	-
	Azimuth:80			Margin [dB]		-14.44	-	-	-
Range: 8 .15 - 30MHz									
2	.50083	22.94 pk	-23.6	52.6	51.94	53.6	-	-	-
	Azimuth:327			Margin [dB]		-1.66	-	-	-
3	.74715	19.89 pk	-23.6	49.5	45.79	50.1	-	-	-
	Azimuth:199			Margin [dB]		-4.31	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
ave - denotes average detection
tm - Trace Math Result

Only those products bearing the UL Mark should be considered as being covered by UL.

AWID
Proximaty Reader MPR-5005
Bl=0° Grn=45° Mag=90° Cyan=135°
Proj:06me39734 File:mc15284
Tested By: GB Dual Antenna

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Range: 1 .009 - .15MHz								
.125	37.34 ave	0	56.4	93.74	85.7	-	-	-
Azimuth: 49			Margin [dB]:		8.04	-	-	-
Range: 6 .15 - 30MHz								
.5004	21.71 qp	-23.6	52.6	50.71	53.6	-	-	-
Azimuth: 50			Margin [dB]:		-2.89	-	-	-
Range: 7 .15 - 30MHz								
.6268	16.03 qp	-23.6	50.8	43.23	51.7	-	-	-
Azimuth: 48			Margin [dB]:		-8.47	-	-	-
1.3751	19.45 qp	-23.5	45	40.95	44.8	-	-	-
Azimuth: 1			Margin [dB]:		-3.85	-	-	-
Range: 8 .15 - 30MHz								
.7501	16.56 qp	-23.6	49.5	42.46	50.1	-	-	-
Azimuth: 75			Margin [dB]:		-7.64	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector

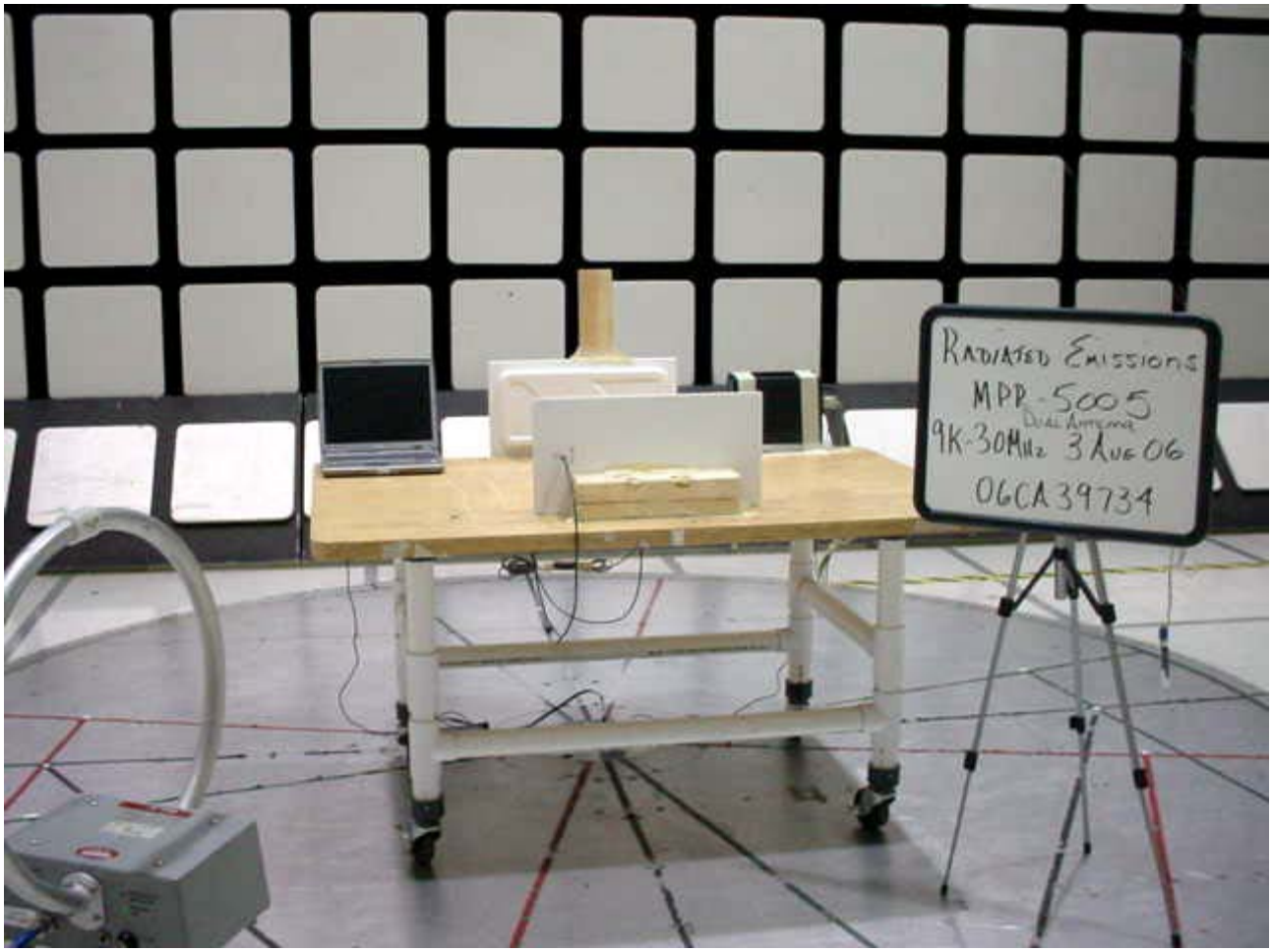
Only those products bearing the UL Mark should be considered as being covered by UL.

Measurement of Fundamental @ 30M

```
AWID
 Proximaty Reader  MPR-5005
Proj:06me39734  File:mc15284
Tested By: MA   Dual Antenna

  Test     Meter     Gain/Loss  Transducer  Level  Limit:1      2       3       4
Frequency  Reading    Factor     Factor  dB[uVolts/meter]
 [MHz]     [dB(uV)]     [dB]      [dB]
================================================================================
Range:1 .123 - .127MHz
.12501    48.31 ave      0         16.2      64.51   65.6        -       -       -
                              Margin [dB]:         -1.09       -       -       -


LIMIT 1: FCC Part 15 Subpart C 15.209
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - average detector
avlg - average log detection
ave - average detection
cav - CISPR average detection
```

NOTE: The above measurement was taken at the maximum antenna and EUT azimuth.

Only those products bearing the UL Mark should be considered as being covered by UL.

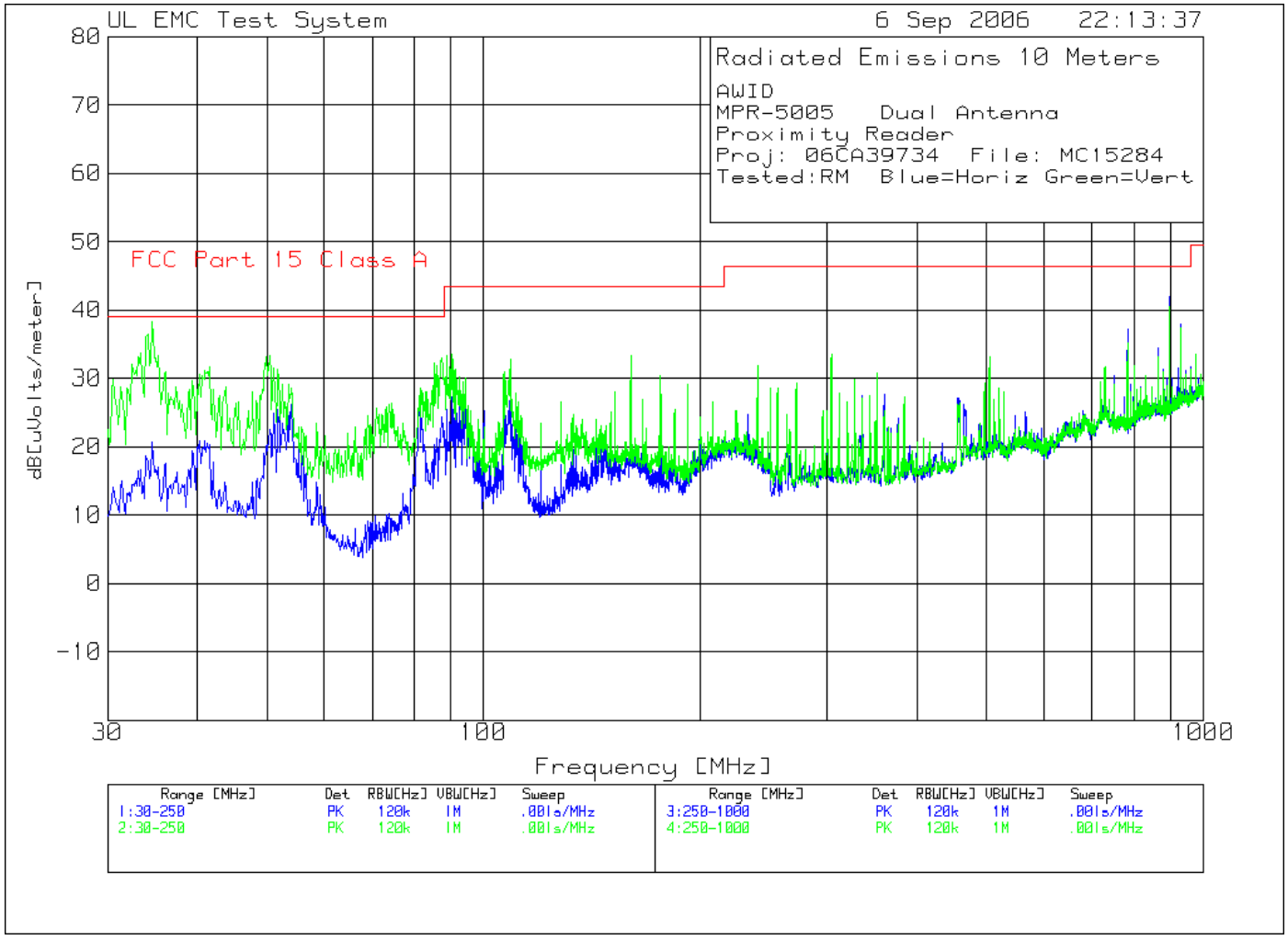


Radiated Emissions Test Setup (9kHz – 30MHz)

Only those products bearing the UL Mark should be considered as being covered by UL.

Radiated Emissions Test Setup (30M Measurement)

Only those products bearing the UL Mark should be considered as being covered by UL.



Only those products bearing the UL Mark should be considered as being covered by UL.

AWID
MPR-5005 Dual Antenna
Proximity Reader
Proj: 06CA39734 File: MC15284
Tested:RM Blue=Horiz Green=Vert

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Vertical 30 - 250MHz ----------									
1	34.5497	52.76 pk	-27.8	13.4	38.36	39	-	-	-
	Azimuth:199	Height:100 Vert		Margin [dB]		-.64	-	-	-
2	41.5944	46.36 pk	-27.7	13	31.66	39	-	-	-
	Azimuth:358	Height:100 Vert		Margin [dB]		-7.34	-	-	-
3	50.4003	49.72 pk	-27.5	11.1	33.32	39	-	-	-
	Azimuth:358	Height:100 Vert		Margin [dB]		-5.68	-	-	-
4	90.3202	50 pk	-26.9	10.5	33.6	43.5	-	-	-
	Azimuth:40	Height:100 Vert		Margin [dB]		-9.9	-	-	-
5	160.0333	43.08 pk	-26.1	16.4	33.38	43.5	-	-	-
	Azimuth:199	Height:100 Vert		Margin [dB]		-10.12	-	-	-
Horizontal 250 - 1000MHz ----------									
6	784.3563	40.04 pk	-23.1	20.2	37.14	46.4	-	-	-
	Azimuth:223	Height:249 Horz		Margin [dB]		-9.26	-	-	-
7	896.431	42.21 pk	-22.5	22.2	41.91	46.4	-	-	-
	Azimuth:312	Height:399 Horz		Margin [dB]		-4.49	-	-	-
8	928.4524	37.21 pk	-22.1	22.9	38.01	46.4	-	-	-
	Azimuth:312	Height:399 Horz		Margin [dB]		-8.39	-	-	-
Vertical 250 - 1000MHz ----------									
9	304.036	42.99 pk	-24.2	14.8	33.59	46.4	-	-	-
	Azimuth:3	Height:100 Vert		Margin [dB]		-12.81	-	-	-
10	784.3563	38.11 pk	-23.1	20.2	35.21	46.4	-	-	-
	Azimuth:226	Height:250 Vert		Margin [dB]		-11.19	-	-	-
11	896.431	40.82 pk	-22.5	22.2	40.52	46.4	-	-	-
	Azimuth:315	Height:100 Vert		Margin [dB]		-5.88	-	-	-
12	928.4524	36.62 pk	-22.1	22.9	37.42	46.4	-	-	-
	Azimuth:315	Height:250 Vert		Margin [dB]		-8.98	-	-	-

LIMIT 1: FCC Part 15 Class A
LIMIT 2: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
ave - denotes average detection
tm - Trace Math Result

Only those products bearing the UL Mark should be considered as being covered by UL.

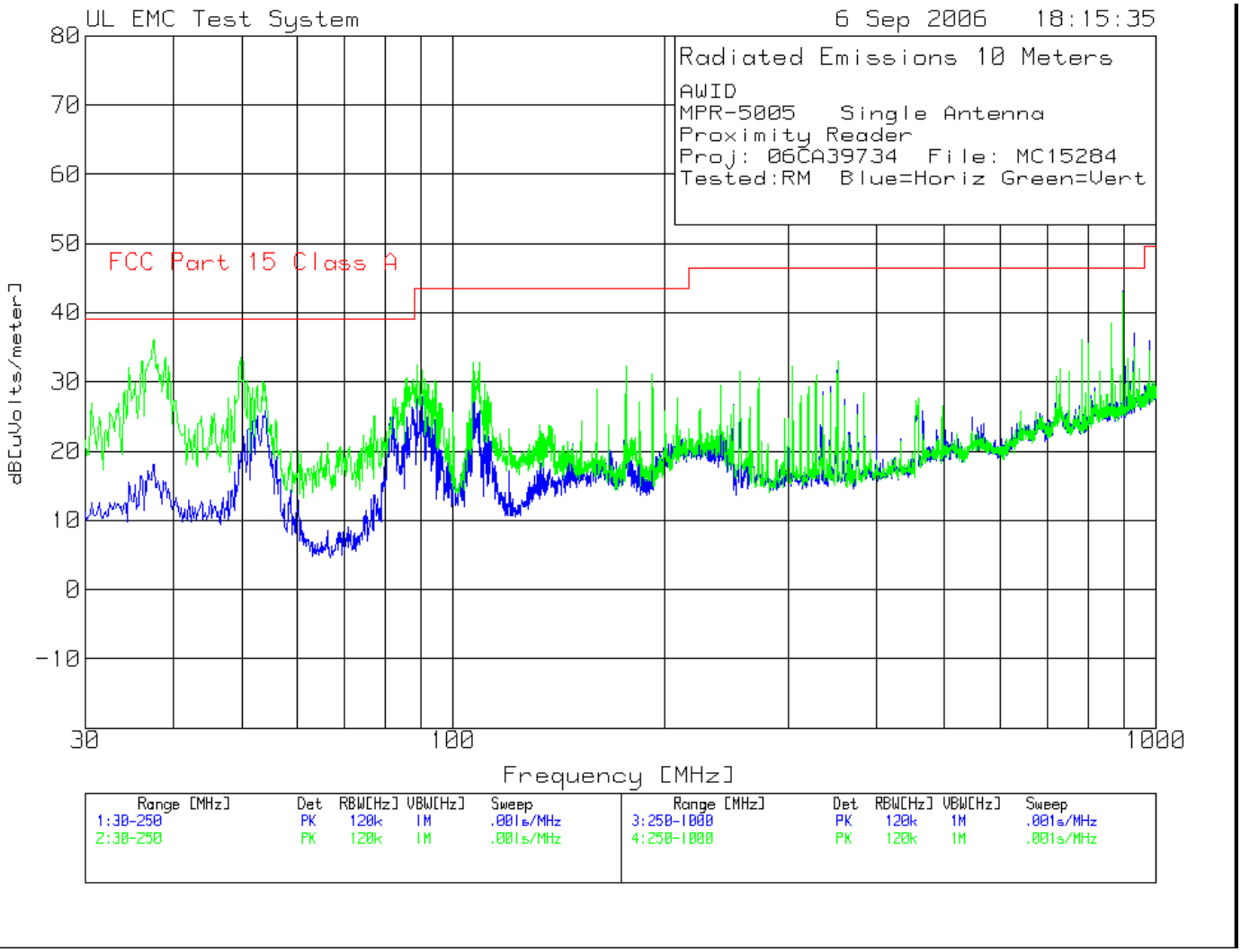
AWID
MPR-5005 Dual Antenna
Proximity Reader
Proj: 06CA39734 File: MC15284
Tested:RM Blue=Horiz Green=Vert

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Vertical 30 - 250MHz								
34.6535	51.7 qp	-27.8	13.4	37.3	39	-	-	-
Azimuth: 185	Height:103	Vert		Margin [dB]:	-1.7	-	-	-
49.8549	48.4 qp	-27.5	11.2	32.1	39	-	-	-
Azimuth: 88	Height:107	Vert		Margin [dB]:	-6.9	-	-	-
Horizontal 250 - 1000MHz								
896.0571	42.01 qp	-22.5	22.2	41.71	46.4	-	-	-
Azimuth: 160	Height:123	Horz		Margin [dB]:	-4.69	-	-	-
Vertical 250 - 1000MHz								
896.0629	40.77 qp	-22.5	22.2	40.47	46.4	-	-	-
Azimuth: 123	Height:106	Vert		Margin [dB]:	-5.93	-	-	-

LIMIT 1: FCC Part 15 Class A
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector

Only those products bearing the UL Mark should be considered as being covered by UL.



Only those products bearing the UL Mark should be considered as being covered by UL.

AWID
MPR-5005 Single Antenna
Proximity Reader
Proj: 06CA39734 File: MC15284
Tested:RM Blue=Horiz Green=Vert

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Vertical 30 - 250MHz ----------									
1	34.5497	46.55 pk	-27.8	13.4	32.15	39	-	-	-
	Azimuth:358	Height:101 Vert		Margin [dB]		-6.85	-	-	-
2	36.0173	47.43 pk	-27.8	13.4	33.03	39	-	-	-
	Azimuth:358	Height:101 Vert		Margin [dB]		-5.97	-	-	-
3	37.485	50.6 pk	-27.8	13.4	36.2	39	-	-	-
	Azimuth:358	Height:101 Vert		Margin [dB]		-2.8	-	-	-
4	38.9526	47.77 pk	-27.7	13.4	33.47	39	-	-	-
	Azimuth:40	Height:101 Vert		Margin [dB]		-5.53	-	-	-
5	39.3929	46.68 pk	-27.7	13.3	32.28	39	-	-	-
	Azimuth:320	Height:101 Vert		Margin [dB]		-6.72	-	-	-
6	49.8132	49.71 pk	-27.5	11.3	33.51	39	-	-	-
	Azimuth:16	Height:101 Vert		Margin [dB]		-5.49	-	-	-
7	50.4003	49.31 pk	-27.5	11.1	32.91	39	-	-	-
	Azimuth:0	Height:101 Vert		Margin [dB]		-6.09	-	-	-
8	88.8526	49.08 pk	-26.9	10.3	32.48	43.5	-	-	-
	Azimuth:40	Height:250 Vert		Margin [dB]		-11.02	-	-	-
9	90.3202	48.07 pk	-26.9	10.5	31.67	43.5	-	-	-
	Azimuth:280	Height:250 Vert		Margin [dB]		-11.83	-	-	-
10	106.7578	49.13 pk	-26.8	10.4	32.73	43.5	-	-	-
	Azimuth:40	Height:250 Vert		Margin [dB]		-10.77	-	-	-
11	108.8125	49.17 pk	-26.7	10.4	32.87	43.5	-	-	-
	Azimuth:80	Height:250 Vert		Margin [dB]		-10.63	-	-	-
12	176.0307	43.66 pk	-25.8	14.4	32.26	43.5	-	-	-
	Azimuth:344	Height:101 Vert		Margin [dB]		-11.24	-	-	-
Horizontal 250 - 1000MHz ----------									
13	896.431	43.44 pk	-22.5	22.2	43.14	46.4	-	-	-
	Azimuth:312	Height:100 Horz		Margin [dB]		-3.26	-	-	-
14	928.4524	36.33 pk	-22.1	22.9	37.13	46.4	-	-	-
	Azimuth:312	Height:399 Horz		Margin [dB]		-9.27	-	-	-
Vertical 250 - 1000MHz ----------									
15	864.4097	38.52 pk	-22.6	22.6	38.52	46.4	-	-	-
	Azimuth:16	Height:249 Vert		Margin [dB]		-7.88	-	-	-
16	896.431	43.28 pk	-22.5	22.2	42.98	46.4	-	-	-
	Azimuth:136	Height:101 Vert		Margin [dB]		-3.42	-	-	-
17	928.4524	34.14 pk	-22.1	22.9	34.94	46.4	-	-	-
	Azimuth:314	Height:249 Vert		Margin [dB]		-11.46	-	-	-
18	976.4844	32.47 pk	-21.7	23.7	34.47	49.5	-	-	-
	Azimuth:16	Height:249 Vert		Margin [dB]		-15.03	-	-	-

Only those products bearing the UL Mark should be considered as being covered by UL.

LIMIT 1: FCC Part 15 Class A
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - denotes average log detection
ave - denotes average detection
tm - Trace Math Result

Only those products bearing the UL Mark should be considered as being covered by UL.

AWID
MPR-5005 Single Antenna
Proximity Reader
Proj: 06CA39734 File: MC15284
Tested:RM Blue=Horiz Green=Vert

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
Vertical 30 - 250MHz								
36.1515	47.93 qp	-27.8	13.4	33.53	39	-	-	-
Azimuth: 248	Height:152 Vert			Margin [dB]:	-5.47	-	-	-
37.5376	49.79 qp	-27.8	13.4	35.39	39	-	-	-
Azimuth: 270	Height:175 Vert			Margin [dB]:	-3.61	-	-	-
38.9553	46.9 qp	-27.7	13.4	32.6	39	-	-	-
Azimuth: 213	Height:102 Vert			Margin [dB]:	-6.4	-	-	-
49.85	48.65 qp	-27.5	11.2	32.35	39	-	-	-
Azimuth: 67	Height:122 Vert			Margin [dB]:	-6.65	-	-	-
50.4423	47.74 qp	-27.5	11.1	31.34	39	-	-	-
Azimuth: 80	Height:105 Vert			Margin [dB]:	-7.66	-	-	-
Horizontal 250 - 1000MHz								
896.0673	43.79 qp	-22.5	22.2	43.49	46.4	-	-	-
Azimuth: 273	Height:106 Horz			Margin [dB]:	-2.91	-	-	-
Vertical 250 - 1000MHz								
896.0653	40.9 qp	-22.5	22.2	40.6	46.4	-	-	-
Azimuth: 101	Height:111 Vert			Margin [dB]:	-5.8	-	-	-
896.0653	40.89 qp	-22.5	22.2	40.59	46.4	-	-	-
Azimuth: 101	Height:111 Vert			Margin [dB]:	-5.81	-	-	-

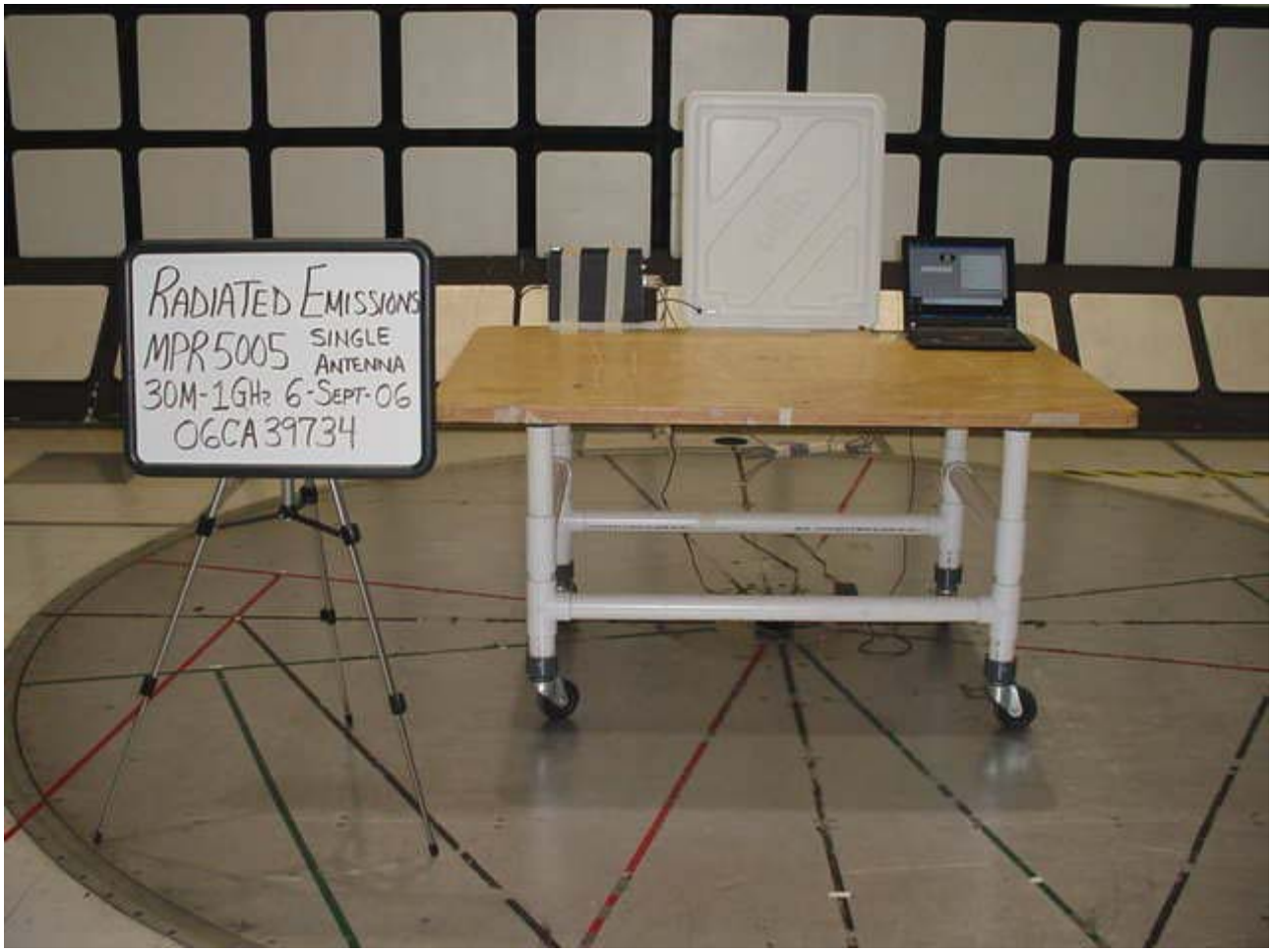
LIMIT 1: FCC Part 15 Class A
LIMIT 2: NONE
LIMIT 3: NONE
LIMIT 4: NONE
LIMIT 5: NONE
LIMIT 6: NONE

pk - Peak detector
qp - Quasi-Peak detector
av - Average detector
avlg - Average log detector
ave - Average detector

Only those products bearing the UL Mark should be considered as being covered by UL.

Radiated Emissions Test Setup (30-1000MHz)

Only those products bearing the UL Mark should be considered as being covered by UL.



Radiated Emissions Test Setup (30-1000MHz)

Only those products bearing the UL Mark should be considered as being covered by UL.

TEST TITLE: Occupied Bandwidth Test

METHOD

The EUT was tested per RSS-210 as a radiated measurement. The transmitter was positioned in front of the receive antenna, which was connected to the input of the measurement spectrum analyzer.

The 99% occupied bandwidth function of the EMI receiver was used to make this measurement.

Mode*		
Power	Operation	Configuration
1	1	1,2

*See Power Interface EUT Operating Modes and Configurations for details

The following test parameters shall be established prior to test.

Parameter	Value	Units
Laboratory Ambient Temperature	10 to 40	°C
Relative Humidity	10 to 90	%

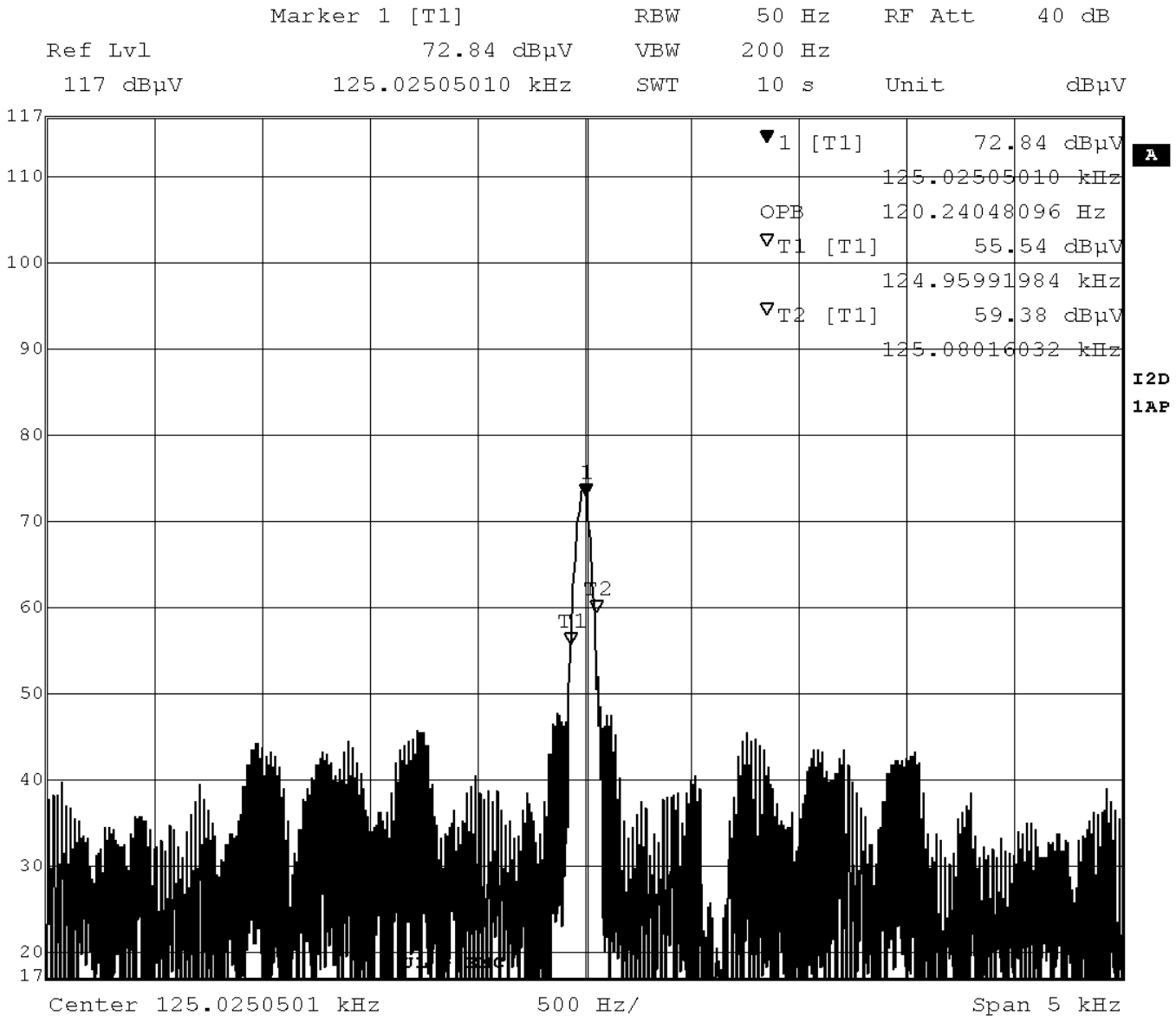
RESULTS

Ambient Conditions at the time of test.	Value	Units
Temperature:	20.0	°C
Humidity:	36.0	%RH
Test Date	25 August 2006	

The results of this test **complied** with the requirements.

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Loop Antenna	Electrometrics	EM-6872	AT0036	27 Mar 06	27 Mar 07
EMI Receiver	Rohde & Schwarz	ESIB 26	ME5B-081	11 Oct 05	31 Oct 06
Hygrometer/ Thermometer	Oakton	35710-10	36034	10 May 06	31 May 07

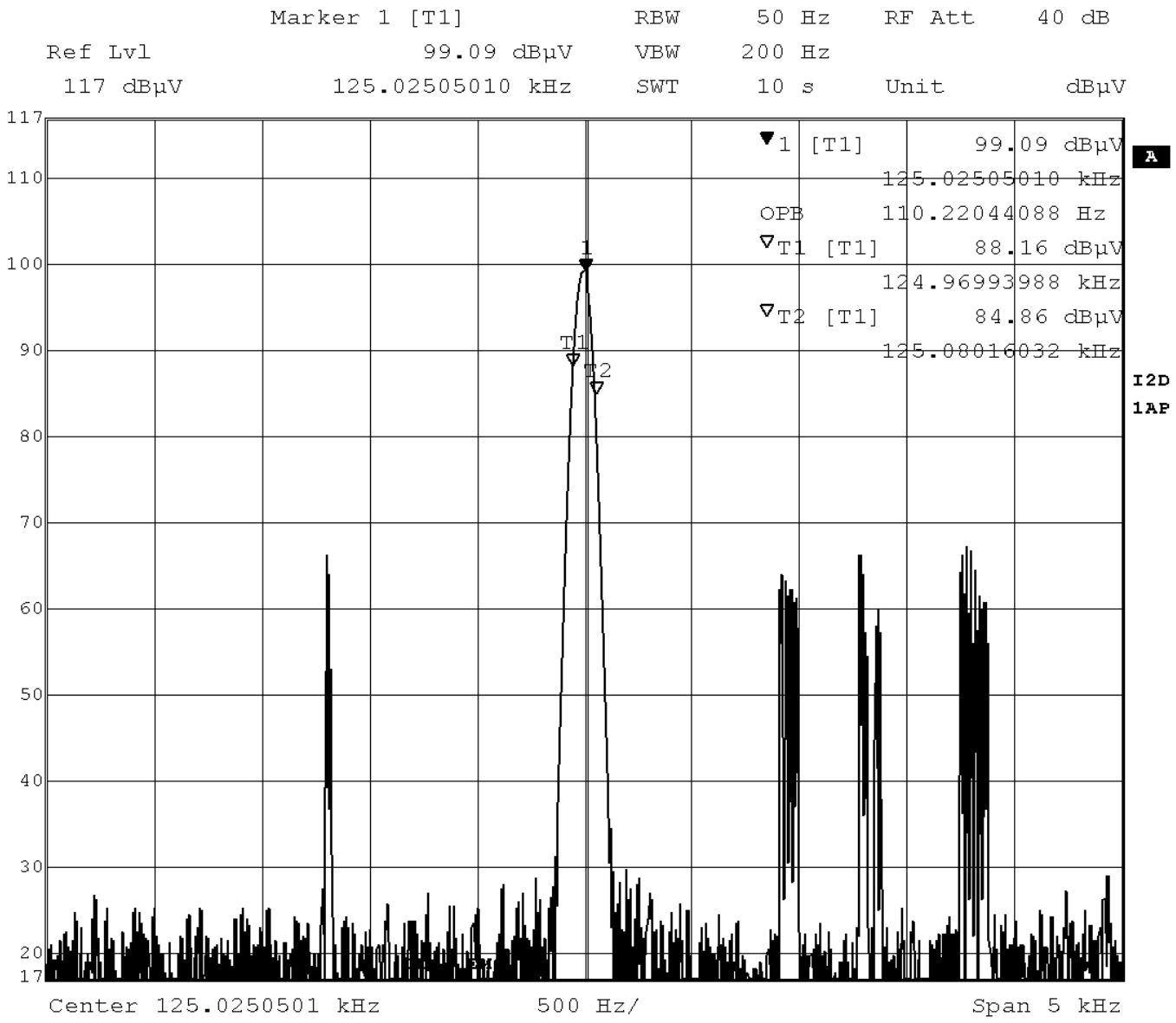
Only those products bearing the UL Mark should be considered as being covered by UL.



Title: Model: MPR-5005
Comment A: 99 Percent BW
Date: 25.AUG.2006 14:00:58

Occupied Bandwidth (Dual Antenna) = 120Hz

Only those products bearing the UL Mark should be considered as being covered by UL.



Title: Model: MPR-5005
Comment A: 99 Percent BW
Date: 25.AUG.2006 13:41:52

Occupied Bandwidth (Single Antenna) = 110Hz

Only those products bearing the UL Mark should be considered as being covered by UL.

Appendix A

Accreditations and Authorizations

NVLAP Lab code: 100255-0

NVLAP: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC EN17025 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. For a full scope listing see http://ts.nist.gov/ts/htdocs/210/214/scopes/1002550.htm

FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland and accepted in a letter dated September 24, 1997 (Ref. No. 91040).

Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2181

VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: (Radiated Emissions) R-797, (Conducted Emissions) C-832, C-833, C-834 and (Conducted Emissions - Telecommunications Ports) T-160.

Only those products bearing the UL Mark should be considered as being covered by UL.

ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).

NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.
NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).
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Only those products bearing the UL Mark should be considered as being covered by UL.