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[www.ul.com/emc](http://www.ul.com/emc)  
631-271-6200

Project:	06CA31069
File:	MC15284
Date:	8/30/2006
Model:	MR-1824
FCC ID:	OGSMR1824A

# **Electromagnetic Compatibility Test Report**

## **For**

### **Applied Wireless Identifications Group**

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Project Number: 06CA31069  
Model Number: MR-1824

File Number MC15284

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FCC ID: OGSMR1824A

## Test Report Details

Tests Performed By: **Underwriters Laboratories Inc.**  
**1285 Walt Whitman Rd.**  
**Melville, NY 11747**

Tests Performed For: **Applied Wireless Identifications Group**  
**382 Route 59 Sec 292**  
**Monsey, NY 10952**

Applicant Contact: **Mr. Dave Ferguson**  
Contact Signature\*:

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Test Report Date: **8/30/2006**

Product Type: **Proximity Reader**

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

Model Number: **MR-1824**

Sample Serial Number: **Prototype**

Sample Tag Number: **0798979**

Sample Receive Date: **6/12/2006**

EUT Category: **Radio Transmitter**

Testing Start Date: **6/14/2006**

Date Testing Complete: **8/21/2006**

**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.

\*Signature required for products covered by FCC Declaration of Conformity or Verification in accordance with record retention requirements in FCC Rules 2.955(x) or 2.1057(x).

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## Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
8/21/2006	Original	--	--
8/30/2006	Misc. Revisions	M. Antola	--

### 1.0 G E N E R A L - Product Description

The RFID proximity readers will have an internal micro-controller, a transmitter, a receiver and a shared transmit/receive antenna. During normal operation, the transmitter sends out an electromagnetic wave to establish a zone of surveillance. When a card enters this zone, the electromagnetic energy from the reader begins to energize the IC in the card. Once energized, the IC goes through an initialization process and begins to selectively reflect the electromagnetic energy to reveal its identity. The receiving circuits in the reader sense and decode this reflected signal and hence determine the identity of the tag. The identity of the tag is then transmitted to the access control panel and/or computer via two data lines in Wiegand format.

## 1.1 Device Configuration During Test

### 1.1.1 Equipment Used During Test:

Use*	Product Type	Manufacturer	Model	Comments
EUT	Proximity Reader	AWID	MR-1824	None
EUT	Power Adapter	AWID	PS12-1A	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	DC	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

### 1.1.4 Power Interface:

Mode #	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
Rated	5-12	-	-	DC	-	None
1	120	-	-	AC-60Hz	1	None
2	12	-	-	DC	-	None

NOTE: During an initial assessment of the MR-1824, the input voltage was varied between 85% and 115% of the rated. It was determined that the amplitude of carrier frequency's field strength is greatest at 12Vdc. As a result, testing was performed at this worse-case voltage only.

### 1.2 EUT Operation Modes:

Mode #	Description
1	EUT transmitting and receiving, simultaneously. These devices operate with its transmit and receive circuitry on continuously.

### 1.3 EUT Configuration Modes:

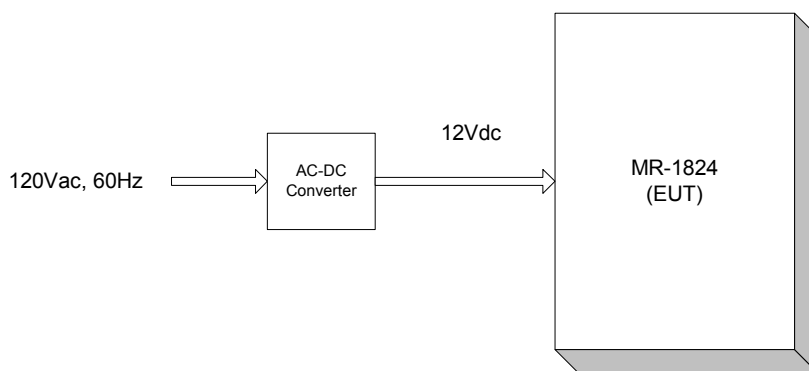
Mode #	Description
1	MR-1824 powered via 120Vac power adapter, which provides 12Vdc to the EUT.
2	MR-1824 powered via 12Vdc linear regulated DC power source.

"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"

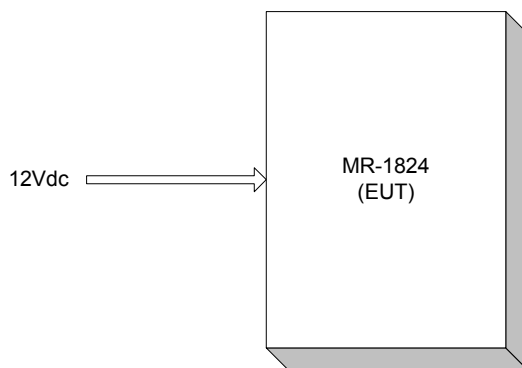
## 1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.

### Configuration Mode 1



### Configuration Mode 2



## 1.5 Deviations from standard test methods

Not Applicable

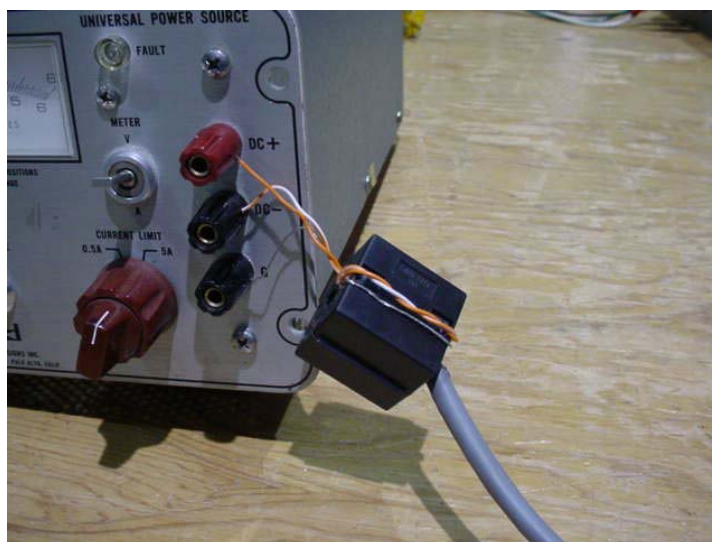
## 1.6 Device Modifications Necessary for Compliance

For Conducted Emissions:

Configuration Mode 1 – Added two (2) ferrites (Fair-Rite, Part Number: 0444164181, or equivalent) to input power cable. See photo



Configuration Mode 2 – Added one (1) ferrite (Fair-Rite, Part Number: 0444164181, or equivalent) to DC lines. See photo





## 1.7 Test Summary

<b>Product Standards</b>	FCC Part 15, Subpart B; FCC Part 15, Subpart C; RSS-210; RSS-GEN
--------------------------	--

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	2
	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

## 2.0 Conclusion:

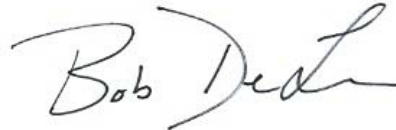
The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to 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: 6/14/2006  
Test Completion Date: 8/21/2006



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Principal Engineer  
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### 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.”

## 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.

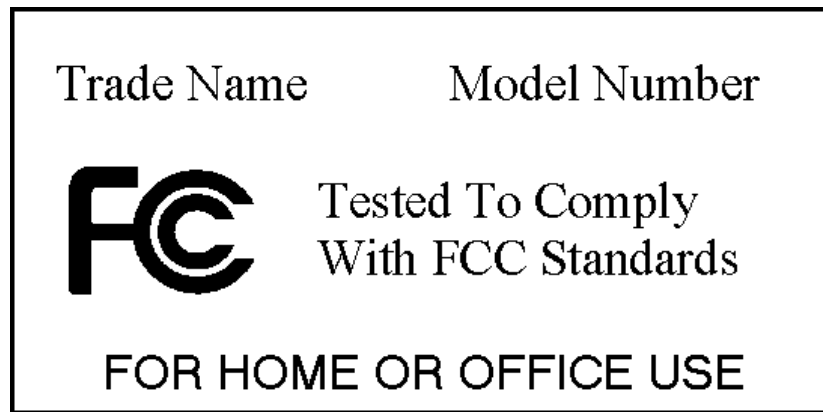
(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, 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

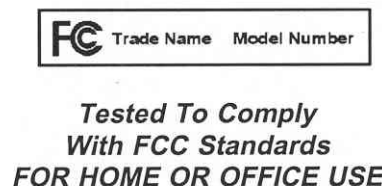
In addition to the requirements in Part 2 of CFR 47 (See **1.6.1 Identification** above), a device subject to authorization under a Declaration of Conformity shall be labeled as follows:

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:



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.

## 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.

## 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
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.

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
1,2	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	%



### Limits

Frequency (MHz)	Limit (dB $\mu$ V)	
	Quasi-Peak	Average
0.15 to 0.5	66-56	56-46
0.5 to 5	56	46
5 to 30	60	50

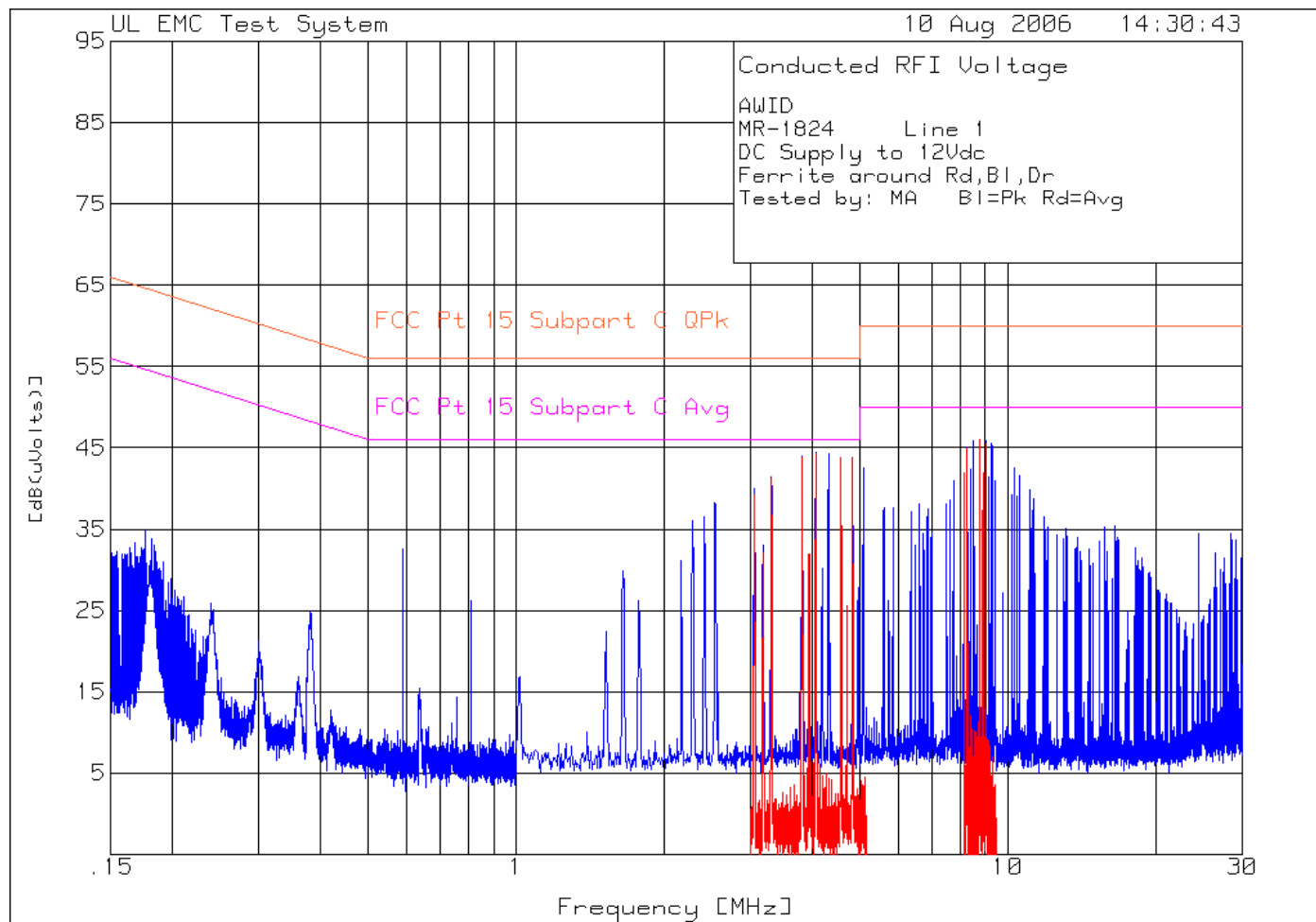
### RESULTS

Ambient Conditions at the time of test.	Value	Value	Units
Temperature:	21.0	25.0	°C
Humidity:	28.0	39.0	%RH
Test Date	10 August 2006	21 August 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
EMI Spectrum Analyzer	Agilent Technologies	E7402A	ME5B-123	03 Oct 05	31 Oct 06
50 $\Omega$ LISN	Solar Electronics	9252-50-R-24-BNC	ME5A-636	20 Oct 05	31 Oct 06
50 $\Omega$ LISN	EMCO	EC-3825/2	ME5-629	16 Nov 05	30 Nov 06
Transient Limiter	Hewlett Packard	11947A	ME5A-444	25 Jan 06	31 Jan 07
Transient Limiter	Hewlett Packard	11947A	ME5A-443	25 Jan 06	31 Jan 07
Hygrometer/ Thermometer	Oakton	35710-10	36034	10 May 06	31 May 07

Test Accessories Used					
Description	Manufacturer	Model	Identifier	Char/ Valid Date	Due
Measurement Software	UL	UL EMI Software	Version 9.3	20 Mar 06	NA



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AWID  
MR-1824 Line 1  
DC Supply to 12Vdc  
Ferrite around Rd,Bl,Dr  
Tested by: MA Bl=Pk Rd=Avg

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 1 - 30MHz -----									
1	3.04782	30.14 pk	9.9	0	40.04	56	46	-	-
				Margin [dB]		-15.96	-5.96	-	-
2	3.30308	31.53 pk	9.9	0	41.43	56	46	-	-
				Margin [dB]		-14.57	-4.57	-	-
3	3.81358	34.09 pk	9.9	0	43.99	56	46	-	-
				Margin [dB]		-12.01	-2.01	-	-
4	4.06884	34.53 pk	9.9	0	44.43	56	46	-	-
				Margin [dB]		-11.57	-1.57	-	-
5	4.31829	34.37 pk	9.9	0	44.27	56	46	-	-
				Margin [dB]		-11.73	-1.73	-	-
6	4.82879	33.97 pk	9.9	0	43.87	56	46	-	-
				Margin [dB]		-12.13	-2.13	-	-
7	3.0488	27.8 ave	9.9	0	37.7	56	46	-	-
				Margin [dB]		-18.3	-8.3	-	-
8	3.3058	31.35 ave	9.9	0	41.25	56	46	-	-
				Margin [dB]		-14.75	-4.75	-	-
9	3.8148	33.92 ave	9.9	0	43.82	56	46	-	-
				Margin [dB]		-12.18	-2.18	-	-
10	4.0688	34.34 ave	9.9	0	44.24	56	46	-	-
				Margin [dB]		-11.76	-1.76	-	-
11	4.5758	33.39 ave	9.9	0	43.29	56	46	-	-
				Margin [dB]		-12.71	-2.71	-	-
12	4.8308	33.88 ave	9.9	0	43.78	56	46	-	-
				Margin [dB]		-12.22	-2.22	-	-
13	4.7048	15.75 ave	9.9	0	25.65	56	46	-	-
				Margin [dB]		-30.35	-20.35	-	-
14	8.2631	35.13 pk	9.9	0	45.03	60	50	-	-
				Margin [dB]		-14.97	-4.97	-	-
15	8.51836	35.96 pk	9.9	0	45.86	60	50	-	-
				Margin [dB]		-14.14	-4.14	-	-
16	9.02306	36 pk	9.9	0	45.9	60	50	-	-
				Margin [dB]		-14.1	-4.1	-	-
17	9.27831	35.57 pk	9.9	0	45.47	60	50	-	-
				Margin [dB]		-14.53	-4.53	-	-
18	8.1365	32.05 ave	9.9	0	41.95	60	50	-	-
				Margin [dB]		-18.05	-8.05	-	-
19	8.2645	34.97 ave	9.9	0	44.87	60	50	-	-
				Margin [dB]		-15.13	-5.13	-	-
20	8.7725	36.09 ave	9.9	0	45.99	60	50	-	-
				Margin [dB]		-14.01	-4.01	-	-

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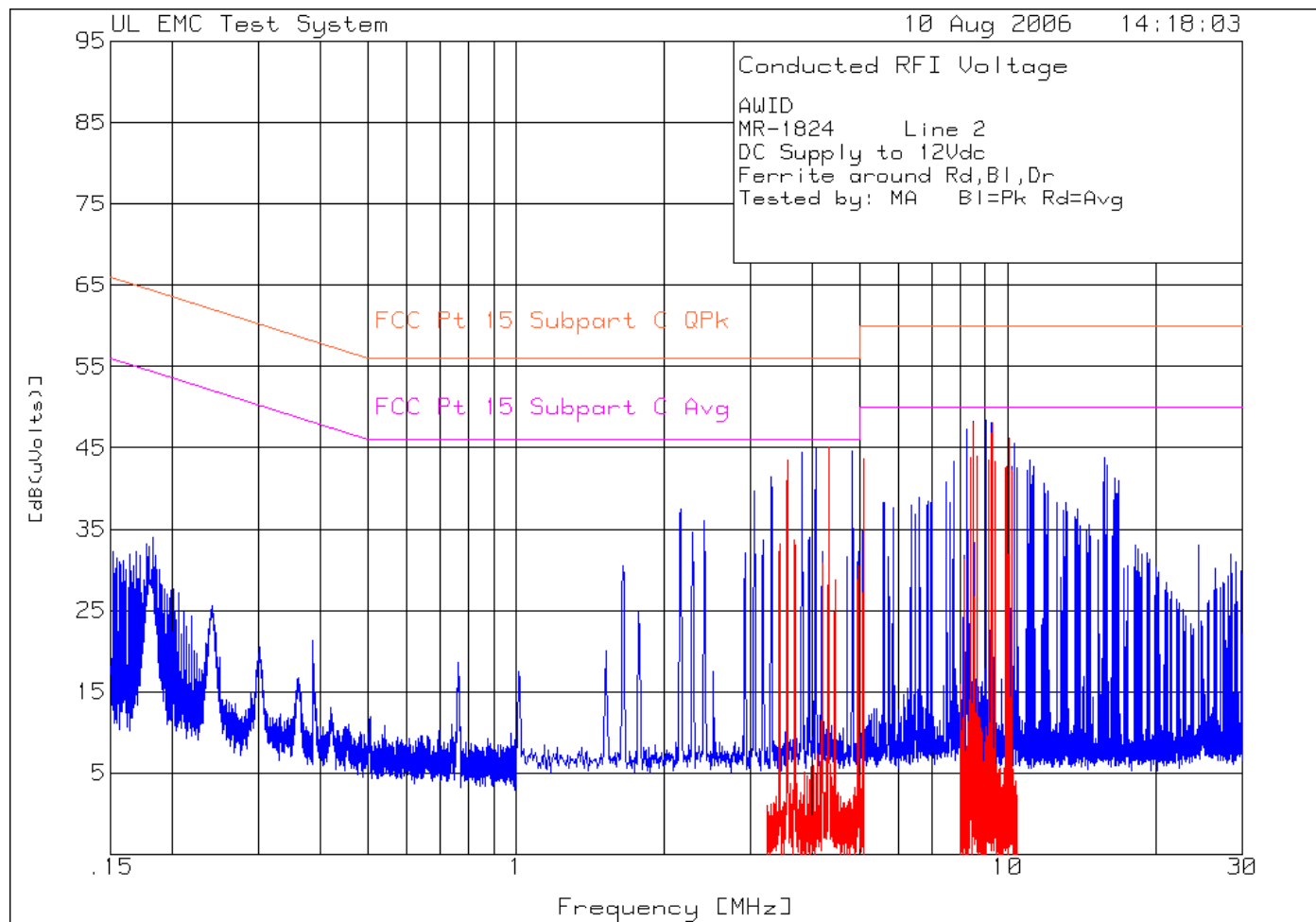
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21	8.8995	31.98 ave	9.9	0	41.88	60	50	-	-
				Margin [dB]		-18.12	-8.12	-	-
22	9.0265	35.71 ave	9.9	0	45.61	60	50	-	-
				Margin [dB]		-14.39	-4.39	-	-

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



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AWID  
MR-1824 Line 2  
DC Supply to 12Vdc  
Ferrite around Rd,Bl,Dr  
Tested by: MA Bl=Pk Rd=Avg

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 1 - 30MHz -----									
1	3.04782	29.72 pk	9.9	0	39.62	56	46	-	-
				Margin [dB]		-16.38	-6.38	-	-
2	3.30308	31.52 pk	9.9	0	41.42	56	46	-	-
				Margin [dB]		-14.58	-4.58	-	-
3	3.81358	34.5 pk	9.9	0	44.4	56	46	-	-
				Margin [dB]		-11.6	-1.6	-	-
4	4.06884	35.06 pk	9.9	0	44.96	56	46	-	-
				Margin [dB]		-11.04	-1.04	-	-
5	4.82879	34.68 pk	9.9	0	44.58	56	46	-	-
				Margin [dB]		-11.42	-1.42	-	-
6	3.5595	33.55 ave	9.9	0	43.45	56	46	-	-
				Margin [dB]		-12.55	-2.55	-	-
7	3.6865	23.82 ave	9.9	0	33.72	56	46	-	-
				Margin [dB]		-22.28	-12.28	-	-
8	4.3225	35.24 ave	9.9	0	45.14	56	46	-	-
				Margin [dB]		-10.86	-1.86	-	-
9	5.0855	33.77 ave	9.9	0	43.67	60	50	-	-
				Margin [dB]		-16.33	-6.33	-	-
10	3.4325	23.31 ave	9.9	0	33.21	56	46	-	-
				Margin [dB]		-22.79	-12.79	-	-
11	4.1955	20.86 ave	9.9	0	30.76	56	46	-	-
				Margin [dB]		-25.24	-15.24	-	-
12	4.4495	18.85 ave	9.9	0	28.75	56	46	-	-
				Margin [dB]		-27.25	-17.25	-	-
13	4.9585	20.62 ave	9.9	0	30.52	56	46	-	-
				Margin [dB]		-25.48	-15.48	-	-
14	8.2631	37.42 pk	9.9	0	47.32	60	50	-	-
				Margin [dB]		-12.68	-2.68	-	-
15	8.51836	38.38 pk	9.9	0	48.28	60	50	-	-
				Margin [dB]		-11.72	-1.72	-	-
16	9.02306	38.57 pk	9.9	0	48.47	60	50	-	-
				Margin [dB]		-11.53	-1.53	-	-
17	10.29932	35.61 pk	10	0	45.61	60	50	-	-
				Margin [dB]		-14.39	-4.39	-	-
18	9.27831	38.23 pk	9.9	0	48.13	60	50	-	-
				Margin [dB]		-11.87	-1.87	-	-
19	8.39073	32.96 pk	9.9	0	42.86	60	50	-	-
				Margin [dB]		-17.14	-7.14	-	-
20	9.15069	33.34 pk	9.9	0	43.24	60	50	-	-
				Margin [dB]		-16.76	-6.76	-	-

21	10.1717	32.82 pk	9.9	0	42.72	60	50	-	-
				Margin [dB]		-17.28	-7.28	-	-
22	8.5174	38.19 ave	9.9	0	48.09	60	50	-	-
				Margin [dB]		-11.91	-1.91	-	-
23	8.3904	33.91 ave	9.9	0	43.81	60	50	-	-
				Margin [dB]		-16.19	-6.19	-	-
24	8.6454	34.12 ave	9.9	0	44.02	60	50	-	-
				Margin [dB]		-15.98	-5.98	-	-
25	9.1534	33.64 ave	9.9	0	43.54	60	50	-	-
				Margin [dB]		-16.46	-6.46	-	-
26	9.2804	38.12 ave	9.9	0	48.02	60	50	-	-
				Margin [dB]		-11.98	-1.98	-	-
27	9.4074	33.39 ave	9.9	0	43.29	60	50	-	-
				Margin [dB]		-16.71	-6.71	-	-
28	9.9164	32.78 ave	9.9	0	42.68	60	50	-	-
				Margin [dB]		-17.32	-7.32	-	-
29	10.0434	36.33 ave	9.9	0	46.23	60	50	-	-
				Margin [dB]		-13.77	-3.77	-	-
30	10.1694	31.85 ave	9.9	0	41.75	60	50	-	-
				Margin [dB]		-18.25	-8.25	-	-

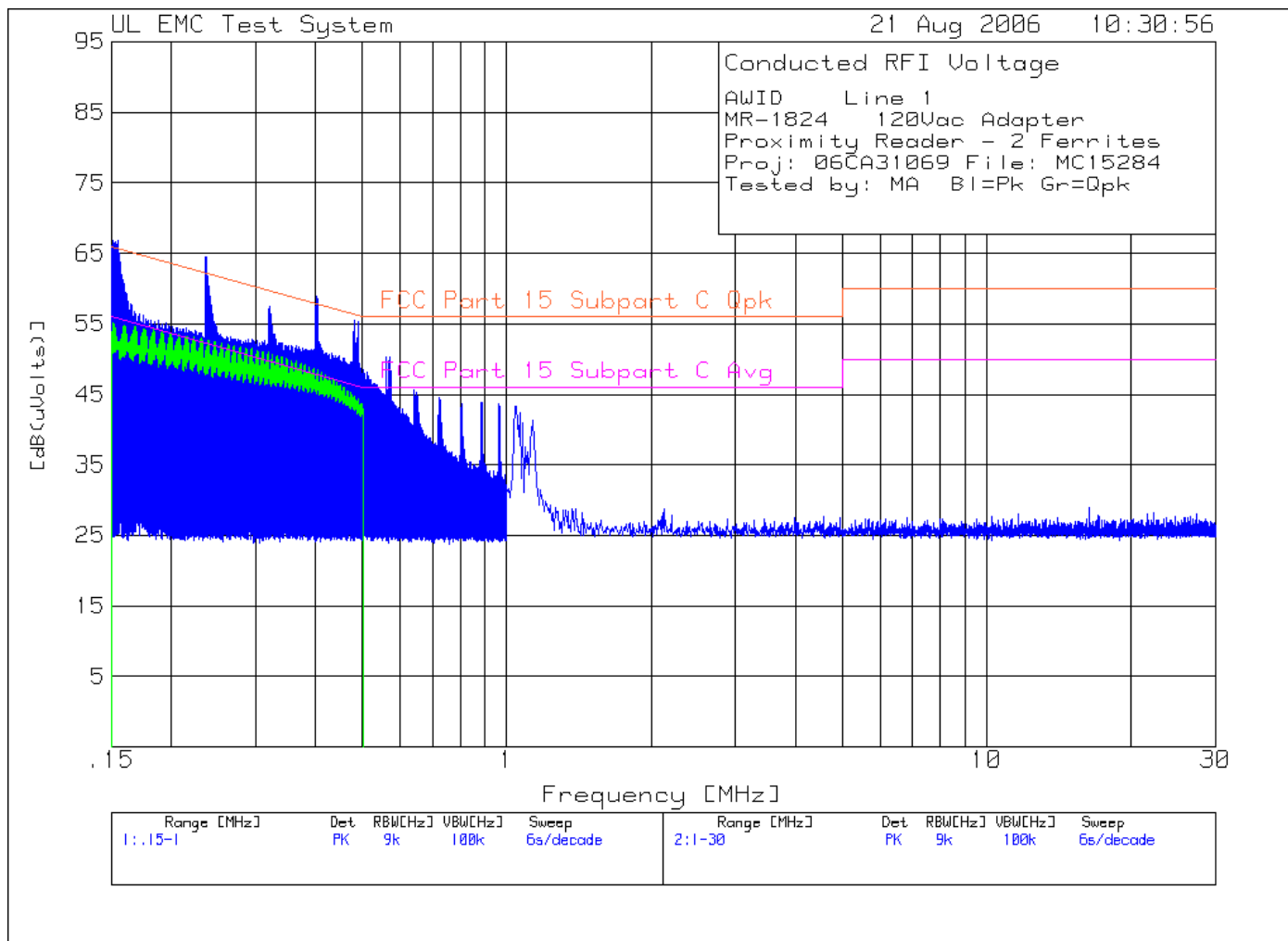
LIMIT 1: FCC Pt 15 Subpart C QPk  
LIMIT 2: FCC Pt 15 Subpart C Avg  
LIMIT 3: NONE  
LIMIT 4: NONE  
LIMIT 5: NONE  
LIMIT 6: NONE

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



**Conducted Emissions Test Setup (150kHz - 30MHz)**





Project Number: 06CA31069  
Model Number: MR-1824

File Number MC15284

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FCC ID: OGSMR1824A

AWID Line 1  
MR-1824 120Vac Adapter  
Proximity Reader - 2 Ferrites  
Proj: 06CA31069 File: MC15284  
Tested by: MA Bl=Pk Gr=Qpk

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	.15177	45.1 qp	10	0	55.1	65.9	55.9	-	-
				Margin [dB]		-10.8	-.8	-	-
2	.16016	44.77 qp	10	0	54.77	65.5	55.5	-	-
				Margin [dB]		-10.73	-.73	-	-
3	.16766	44.58 qp	10	0	54.58	65.1	55.1	-	-
				Margin [dB]		-10.52	-.52	-	-
4	.17605	44.3 qp	10	0	54.3	64.7	54.7	-	-
				Margin [dB]		-10.4	-.4	-	-
5	.18355	44.17 qp	10	0	54.17	64.3	54.3	-	-
				Margin [dB]		-10.13	-.13	-	-
6	.19194	43.96 qp	10	0	53.96	64	54	-	-
				Margin [dB]		-10.04	-.04	-	-
7	.19945	43.74 qp	9.9	0	53.64	63.6	53.6	-	-
				Margin [dB]		-9.96	.04	-	-
8	.20784	43.63 qp	9.9	0	53.53	63.3	53.3	-	-
				Margin [dB]		-9.77	.23	-	-
9	.21534	43.25 qp	10	0	53.25	63	53	-	-
				Margin [dB]		-9.75	.25	-	-
10	.22373	43.17 qp	10	0	53.17	62.7	52.7	-	-
				Margin [dB]		-9.53	.47	-	-
11	.23124	42.92 qp	10	0	52.92	62.4	52.4	-	-
				Margin [dB]		-9.48	.52	-	-
12	.23963	42.71 qp	10	0	52.71	62.1	52.1	-	-
				Margin [dB]		-9.39	.61	-	-
13	.25464	42.35 qp	10	0	52.35	61.6	51.6	-	-
				Margin [dB]		-9.25	.75	-	-
14	.27053	41.98 qp	10	0	51.98	61.1	51.1	-	-
				Margin [dB]		-9.12	.88	-	-
15	.27892	41.81 qp	10	0	51.81	60.8	50.8	-	-
				Margin [dB]		-8.99	1.01	-	-
16	.29481	41.48 qp	10	0	51.48	60.4	50.4	-	-
				Margin [dB]		-8.92	1.08	-	-
17	.30982	41.02 qp	10	0	51.02	60	50	-	-
				Margin [dB]		-8.98	1.02	-	-
18	.32572	40.58 qp	10	0	50.58	59.6	49.6	-	-
				Margin [dB]		-9.02	.98	-	-
19	.34073	40.32 qp	10	0	50.32	59.2	49.2	-	-
				Margin [dB]		-8.88	1.12	-	-
20	.35574	39.85 qp	10	0	49.85	58.8	48.8	-	-
				Margin [dB]		-8.95	1.05	-	-

21	.37252	39.38 qp	10	0	49.38	58.4	48.4	-	-
				Margin [dB]		-9.02	.98	-	-
22	.38753	38.92 qp	10	0	48.92	58.1	48.1	-	-
				Margin [dB]		-9.18	.82	-	-
23	.40342	38.44 qp	10	0	48.44	57.8	47.8	-	-
				Margin [dB]		-9.36	.64	-	-
24	.41932	37.8 qp	10	0	47.8	57.5	47.5	-	-
				Margin [dB]		-9.7	.3	-	-
25	.43609	36.81 qp	10	0	46.81	57.1	47.1	-	-
				Margin [dB]		-10.29	-.29	-	-
26	.45861	36.13 qp	9.9	0	46.03	56.7	46.7	-	-
				Margin [dB]		-10.67	-.67	-	-
27	.4745	35.24 qp	9.9	0	45.14	56.4	46.4	-	-
				Margin [dB]		-11.26	-1.26	-	-
28	.48951	34.29 qp	10	0	44.29	56.2	46.2	-	-
				Margin [dB]		-11.91	-1.91	-	-
29	.56086	40.24 pk	10	0	50.24	56	46	-	-
				Margin [dB]		-5.76	4.24	-	-
30	.5704	40.26 pk	10	0	50.26	56	46	-	-
				Margin [dB]		-5.74	4.26	-	-
31	.64036	35.62 pk	10	0	45.62	56	46	-	-
				Margin [dB]		-10.38	-.38	-	-
32	.65011	35.29 pk	10	0	45.29	56	46	-	-
				Margin [dB]		-10.71	-.71	-	-
33	.72494	34.71 pk	9.9	0	44.61	56	46	-	-
				Margin [dB]		-11.39	-1.39	-	-
34	.8072	33.78 pk	9.9	0	43.68	56	46	-	-
				Margin [dB]		-12.32	-2.32	-	-
35	.88458	33.97 pk	9.9	0	43.87	56	46	-	-
				Margin [dB]		-12.13	-2.13	-	-
36	.9626	33.83 pk	9.9	0	43.73	56	46	-	-
				Margin [dB]		-12.27	-2.27	-	-
39	.15466	56.77 pk	10	0	66.77	65.7	55.7	-	-
				Margin [dB]		1.07	11.07	-	-
40	.15106	56.74 pk	10	0	66.74	65.9	55.9	-	-
				Margin [dB]		.84	10.84	-	-
41	.2365	54.54 pk	9.9	0	64.44	62.2	52.2	-	-
				Margin [dB]		2.24	12.24	-	-
42	.32045	47.5 pk	10	0	57.5	59.7	49.7	-	-
				Margin [dB]		-2.2	7.8	-	-
43	.40143	49 pk	10	0	59	57.8	47.8	-	-
				Margin [dB]		1.2	11.2	-	-
44	.48136	45.47 pk	10	0	55.47	56.3	46.3	-	-
				Margin [dB]		-.83	9.17	-	-

Project Number: 06CA31069  
Model Number: MR-1824

File Number MC15284

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FCC ID: OGSMR1824A

Range: 2 1 - 30MHz -----									
37	1.05064	33.42 pk	9.9	0	43.32	56	46	-	-
				Margin [dB]		-12.68	-2.68	-	-
38	1.13021	31.39 pk	9.9	0	41.29	56	46	-	-
				Margin [dB]		-14.71	-4.71	-	-

LIMIT 1: FCC Part 15 Subpart C Qpk  
LIMIT 2: FCC Part 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

Project Number: 06CA31069  
Model Number: MR-1824

File Number MC15284

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FCC ID: OGSMR1824A

AWID Line 1  
MR-1824 120Vac Adapter  
Proximity Reader - 2 Ferrites  
Proj: 06CA31069 File: MC15284  
Tested by: MA Bl=Pk Gr=Qpk

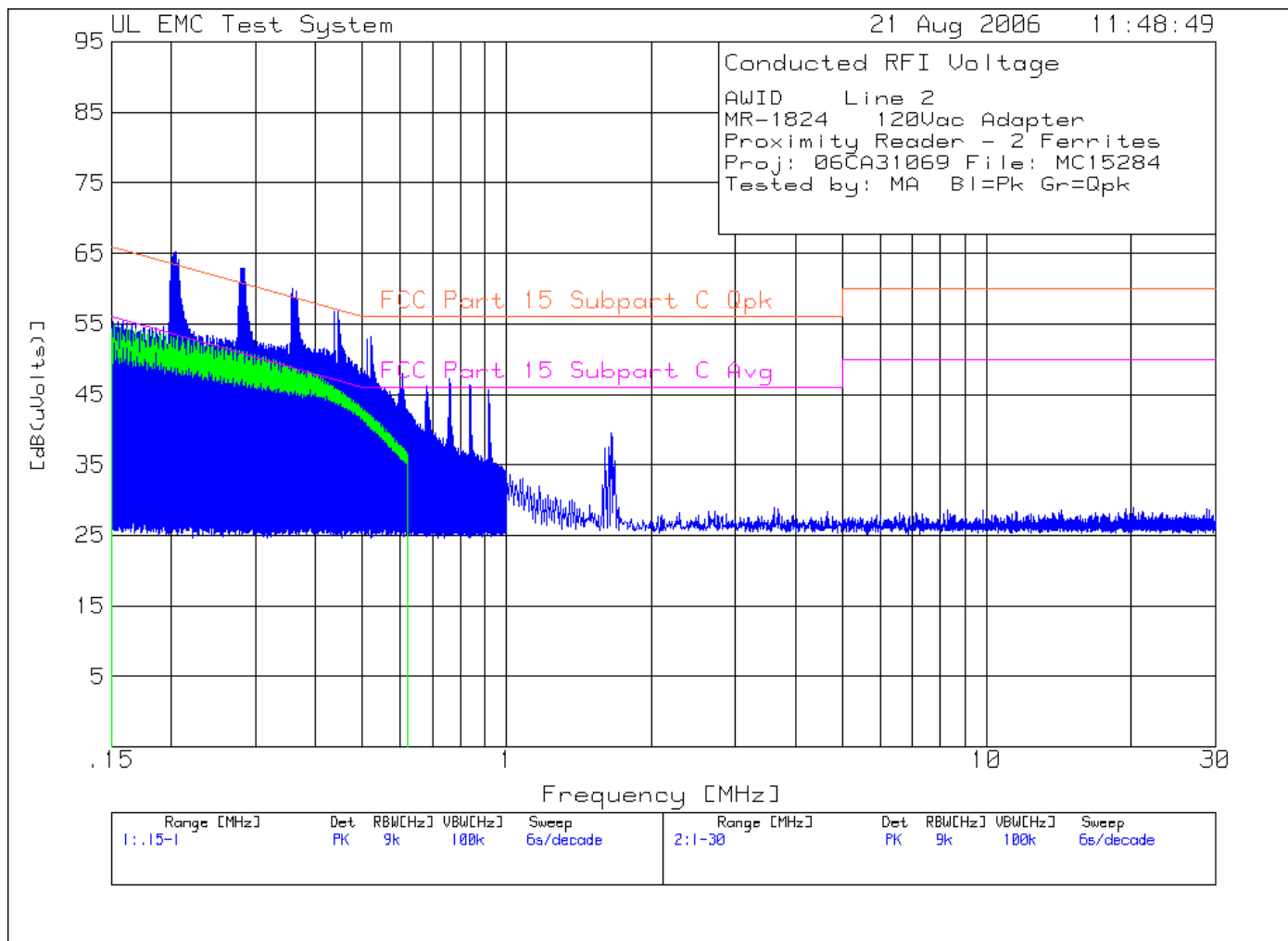
Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
=====								
Range: 1 .15 - 1MHz								
.15177	1.91 ave	10	0	11.91	65.9	55.9	-	-
			Margin [dB]:		-53.99	-43.99	-	-
.16016	2.31 ave	10	0	12.31	65.5	55.5	-	-
			Margin [dB]:		-53.19	-43.19	-	-
.16766	5.7 ave	10	0	15.7	65.1	55.1	-	-
			Margin [dB]:		-49.4	-39.4	-	-
.17605	1.65 ave	10	0	11.65	64.7	54.7	-	-
			Margin [dB]:		-53.05	-43.05	-	-
.18355	.99 ave	10	0	10.99	64.3	54.3	-	-
			Margin [dB]:		-53.31	-43.31	-	-
.19194	2.48 ave	10	0	12.48	64	54	-	-
			Margin [dB]:		-51.52	-41.52	-	-
.19945	1.31 ave	9.9	0	11.21	63.6	53.6	-	-
			Margin [dB]:		-52.39	-42.39	-	-
.20784	1.11 ave	9.9	0	11.01	63.3	53.3	-	-
			Margin [dB]:		-52.29	-42.29	-	-
.21534	.89 ave	10	0	10.89	63	53	-	-
			Margin [dB]:		-52.11	-42.11	-	-
.22373	1 ave	10	0	11	62.7	52.7	-	-
			Margin [dB]:		-51.7	-41.7	-	-
.23124	.81 ave	10	0	10.81	62.4	52.4	-	-
			Margin [dB]:		-51.59	-41.59	-	-
.23963	1.61 ave	10	0	11.61	62.1	52.1	-	-
			Margin [dB]:		-50.49	-40.49	-	-
.25464	.89 ave	10	0	10.89	61.6	51.6	-	-
			Margin [dB]:		-50.71	-40.71	-	-
.27053	.94 ave	10	0	10.94	61.1	51.1	-	-
			Margin [dB]:		-50.16	-40.16	-	-
.27892	.4 ave	10	0	10.4	60.8	50.8	-	-
			Margin [dB]:		-50.4	-40.4	-	-
.29481	.34 ave	10	0	10.34	60.4	50.4	-	-
			Margin [dB]:		-50.06	-40.06	-	-
.30982	.38 ave	10	0	10.38	60	50	-	-
			Margin [dB]:		-49.62	-39.62	-	-
.32572	.37 ave	10	0	10.37	59.6	49.6	-	-
			Margin [dB]:		-49.23	-39.23	-	-
.34073	.35 ave	10	0	10.35	59.2	49.2	-	-
			Margin [dB]:		-48.85	-38.85	-	-

.35574	.19 ave	10	0	10.19	58.8	48.8	-	-
			Margin [dB]:		-48.61	-38.61	-	-
.37252	-.04 ave	10	0	9.96	58.4	48.4	-	-
			Margin [dB]:		-48.44	-38.44	-	-
.38753	.37 ave	10	0	10.37	58.1	48.1	-	-
			Margin [dB]:		-47.73	-37.73	-	-
.40342	-.08 ave	10	0	9.92	57.8	47.8	-	-
			Margin [dB]:		-47.88	-37.88	-	-
.41932	-.17 ave	10	0	9.83	57.5	47.5	-	-
			Margin [dB]:		-47.67	-37.67	-	-
.43609	-.09 ave	10	0	9.91	57.1	47.1	-	-
			Margin [dB]:		-47.19	-37.19	-	-
.45861	-.17 ave	9.9	0	9.73	56.7	46.7	-	-
			Margin [dB]:		-46.97	-36.97	-	-
.4745	-.6 ave	9.9	0	9.3	56.4	46.4	-	-
			Margin [dB]:		-47.1	-37.1	-	-
.48951	-.59 ave	10	0	9.41	56.2	46.2	-	-
			Margin [dB]:		-46.79	-36.79	-	-
.56086	-1.13 ave	10	0	8.87	56	46	-	-
			Margin [dB]:		-47.13	-37.13	-	-
.5704	-1.25 ave	10	0	8.75	56	46	-	-
			Margin [dB]:		-47.25	-37.25	-	-
.64036	-1.59 ave	10	0	8.41	56	46	-	-
			Margin [dB]:		-47.59	-37.59	-	-
.65011	-1.66 ave	10	0	8.34	56	46	-	-
			Margin [dB]:		-47.66	-37.66	-	-
.72494	-1.93 ave	9.9	0	7.97	56	46	-	-
			Margin [dB]:		-48.03	-38.03	-	-
.8072	-2.09 ave	9.9	0	7.81	56	46	-	-
			Margin [dB]:		-48.19	-38.19	-	-
.88458	-2.33 ave	9.9	0	7.57	56	46	-	-
			Margin [dB]:		-48.43	-38.43	-	-
.9626	-2.47 ave	9.9	0	7.43	56	46	-	-
			Margin [dB]:		-48.57	-38.57	-	-
Range: 2 1 - 30MHz								
1.05064	-2.55 ave	9.9	0	7.35	56	46	-	-
			Margin [dB]:		-48.65	-38.65	-	-
1.13021	-3.01 ave	9.9	0	6.89	56	46	-	-
			Margin [dB]:		-49.11	-39.11	-	-

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 Part 15 Subpart C Qpk  
LIMIT 2: FCC Part 15 Subpart C Avg



Project Number: 06CA31069  
Model Number: MR-1824

File Number MC15284

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FCC ID: OGSMR1824A

AWID Line 2  
MR-1824 120Vac Adapter  
Proximity Reader - 2 Ferrites  
Proj: 06CA31069 File: MC15284  
Tested by: MA Bl=Pk Gr=Qpk

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	.15236	44.7 qp	10	0	54.7	65.9	55.9	-	-
				Margin [dB]		-11.2	-1.2	-	-
2	.15709	44.51 qp	10	0	54.51	65.6	55.6	-	-
				Margin [dB]		-11.09	-1.09	-	-
3	.1683	44.21 qp	10	0	54.21	65	55	-	-
				Margin [dB]		-10.79	-.79	-	-
4	.16358	44.2 qp	10	0	54.2	65.3	55.3	-	-
				Margin [dB]		-11.1	-1.1	-	-
5	.17303	43.97 qp	10	0	53.97	64.8	54.8	-	-
				Margin [dB]		-10.83	-.83	-	-
6	.17952	43.89 qp	10	0	53.89	64.5	54.5	-	-
				Margin [dB]		-10.61	-.61	-	-
7	.18424	43.8 qp	10	0	53.8	64.3	54.3	-	-
				Margin [dB]		-10.5	-.5	-	-
8	.19074	43.45 qp	10	0	53.45	64	54	-	-
				Margin [dB]		-10.55	-.55	-	-
9	.19546	43.54 qp	10	0	53.54	63.8	53.8	-	-
				Margin [dB]		-10.26	-.26	-	-
10	.20018	43.14 qp	10	0	53.14	63.6	53.6	-	-
				Margin [dB]		-10.46	-.46	-	-
11	.20668	43.13 qp	10	0	53.13	63.3	53.3	-	-
				Margin [dB]		-10.17	-.17	-	-
12	.2114	43.05 qp	10	0	53.05	63.2	53.2	-	-
				Margin [dB]		-10.15	-.15	-	-
13	.21789	42.91 qp	9.9	0	52.81	62.9	52.9	-	-
				Margin [dB]		-10.09	-.09	-	-
14	.22262	42.74 qp	10	0	52.74	62.7	52.7	-	-
				Margin [dB]		-9.96	.04	-	-
15	.23383	42.51 qp	10	0	52.51	62.3	52.3	-	-
				Margin [dB]		-9.79	.21	-	-
16	.24977	42.07 qp	10	0	52.07	61.8	51.8	-	-
				Margin [dB]		-9.73	.27	-	-
17	.26099	41.68 qp	10	0	51.68	61.4	51.4	-	-
				Margin [dB]		-9.72	.28	-	-
18	.27221	41.55 qp	9.9	0	51.45	61.1	51.1	-	-
				Margin [dB]		-9.65	.35	-	-
19	.28343	40.99 qp	10	0	50.99	60.7	50.7	-	-
				Margin [dB]		-9.71	.29	-	-
20	.29287	40.79 qp	9.9	0	50.69	60.4	50.4	-	-
				Margin [dB]		-9.71	.29	-	-



21	.31058	40.38 qp	10	0	50.38	60	50	-	-
				Margin [dB]		-9.62	.38	-	-
22	.32003	39.95 qp	10	0	49.95	59.7	49.7	-	-
				Margin [dB]		-9.75	.25	-	-
23	.33125	39.74 qp	10	0	49.74	59.4	49.4	-	-
				Margin [dB]		-9.66	.34	-	-
24	.34719	39.09 qp	10	0	49.09	59	49	-	-
				Margin [dB]		-9.91	.09	-	-
25	.3649	38.59 qp	10	0	48.59	58.6	48.6	-	-
				Margin [dB]		-10.01	-.01	-	-
26	.37611	38.17 qp	10	0	48.17	58.4	48.4	-	-
				Margin [dB]		-10.23	-.23	-	-
27	.39264	37.98 qp	10	0	47.98	58	48	-	-
				Margin [dB]		-10.02	-.02	-	-
28	.40209	37.58 qp	10	0	47.58	57.8	47.8	-	-
				Margin [dB]		-10.22	-.22	-	-
29	.4198	36.96 qp	10	0	46.96	57.5	47.5	-	-
				Margin [dB]		-10.54	-.54	-	-
30	.42925	36.44 qp	10	0	46.44	57.3	47.3	-	-
				Margin [dB]		-10.86	-.86	-	-
31	.68212	36.25 pk	9.9	0	46.15	56	46	-	-
				Margin [dB]		-9.85	.15	-	-
32	.76162	37.23 pk	10	0	47.23	56	46	-	-
				Margin [dB]		-8.77	1.23	-	-
33	.83879	36.52 pk	9.9	0	46.42	56	46	-	-
				Margin [dB]		-9.58	.42	-	-
34	.91829	35.68 pk	10	0	45.68	56	46	-	-
				Margin [dB]		-10.32	-.32	-	-
35	.20067	54.5 pk	10	0	64.5	63.6	53.6	-	-
				Margin [dB]		.9	10.9	-	-
36	.20448	55.14 pk	10	0	65.14	63.4	53.4	-	-
				Margin [dB]		1.74	11.74	-	-
37	.27953	52.95 pk	10	0	62.95	60.8	50.8	-	-
				Margin [dB]		2.15	12.15	-	-
38	.28314	52.82 pk	10	0	62.82	60.7	50.7	-	-
				Margin [dB]		2.12	12.12	-	-
39	.35776	49.92 pk	10	0	59.92	58.8	48.8	-	-
				Margin [dB]		1.12	11.12	-	-
40	.36497	49.58 pk	10	0	59.58	58.6	48.6	-	-
				Margin [dB]		.98	10.98	-	-
41	.4362	46.76 pk	10	0	56.76	57.1	47.1	-	-
				Margin [dB]		-.34	9.66	-	-
42	.44574	46.89 pk	10	0	56.89	57	47	-	-
				Margin [dB]		-.11	9.89	-	-
43	.51146	42.9 pk	10	0	52.9	56	46	-	-
				Margin [dB]		-3.1	6.9	-	-
44	.52248	43.13 pk	10	0	53.13	56	46	-	-
				Margin [dB]		-2.87	7.13	-	-
45	.60601	38.1 pk	9.9	0	48	56	46	-	-
				Margin [dB]		-8	2	-	-

LIMIT 1: FCC Part 15 Subpart C Qpk  
LIMIT 2: FCC Part 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

Project Number: 06CA31069  
Model Number: MR-1824

File Number MC15284

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FCC ID: OGSMR1824A

AWID Line 2  
MR-1824 120Vac Adapter  
Proximity Reader - 2 Ferrites  
Proj: 06CA31069 File: MC15284  
Tested by: MA Bl=Pk Gr=Qpk

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								
.15236	2.1 ave	10	0	12.1	65.9	55.9	-	-
			Margin [dB]:		-53.8	-43.8	-	-
.15709	1.67 ave	10	0	11.67	65.6	55.6	-	-
			Margin [dB]:		-53.93	-43.93	-	-
.1683	4.37 ave	10	0	14.37	65	55	-	-
			Margin [dB]:		-50.63	-40.63	-	-
.16358	2.2 ave	10	0	12.2	65.3	55.3	-	-
			Margin [dB]:		-53.1	-43.1	-	-
.17303	2.23 ave	10	0	12.23	64.8	54.8	-	-
			Margin [dB]:		-52.57	-42.57	-	-
.17952	1.54 ave	10	0	11.54	64.5	54.5	-	-
			Margin [dB]:		-52.96	-42.96	-	-
.18424	1.13 ave	10	0	11.13	64.3	54.3	-	-
			Margin [dB]:		-53.17	-43.17	-	-
.19074	2.07 ave	10	0	12.07	64	54	-	-
			Margin [dB]:		-51.93	-41.93	-	-
.19546	1.98 ave	10	0	11.98	63.8	53.8	-	-
			Margin [dB]:		-51.82	-41.82	-	-
.20018	1.21 ave	10	0	11.21	63.6	53.6	-	-
			Margin [dB]:		-52.39	-42.39	-	-
.20668	1.12 ave	10	0	11.12	63.3	53.3	-	-
			Margin [dB]:		-52.18	-42.18	-	-
.2114	1.02 ave	10	0	11.02	63.2	53.2	-	-
			Margin [dB]:		-52.18	-42.18	-	-
.21789	.96 ave	9.9	0	10.86	62.9	52.9	-	-
			Margin [dB]:		-52.04	-42.04	-	-
.22262	.95 ave	10	0	10.95	62.7	52.7	-	-
			Margin [dB]:		-51.75	-41.75	-	-
.23383	.98 ave	10	0	10.98	62.3	52.3	-	-
			Margin [dB]:		-51.32	-41.32	-	-
.24977	.71 ave	10	0	10.71	61.8	51.8	-	-
			Margin [dB]:		-51.09	-41.09	-	-
.26099	.71 ave	10	0	10.71	61.4	51.4	-	-
			Margin [dB]:		-50.69	-40.69	-	-
.27221	.7 ave	9.9	0	10.6	61.1	51.1	-	-
			Margin [dB]:		-50.5	-40.5	-	-
.28343	.96 ave	10	0	10.96	60.7	50.7	-	-
			Margin [dB]:		-49.74	-39.74	-	-

.29287	.98 ave	9.9	0	10.88	60.4	50.4	-	-
			Margin [dB]:		-49.52	-39.52	-	-
.31058	.33 ave	10	0	10.33	60	50	-	-
			Margin [dB]:		-49.67	-39.67	-	-
.32003	.5 ave	10	0	10.5	59.7	49.7	-	-
			Margin [dB]:		-49.2	-39.2	-	-
.33125	.33 ave	10	0	10.33	59.4	49.4	-	-
			Margin [dB]:		-49.07	-39.07	-	-
.34719	.36 ave	10	0	10.36	59	49	-	-
			Margin [dB]:		-48.64	-38.64	-	-
.3649	.15 ave	10	0	10.15	58.6	48.6	-	-
			Margin [dB]:		-48.45	-38.45	-	-
.37611	.24 ave	10	0	10.24	58.4	48.4	-	-
			Margin [dB]:		-48.16	-38.16	-	-
.39264	.19 ave	10	0	10.19	58	48	-	-
			Margin [dB]:		-47.81	-37.81	-	-
.40209	.09 ave	10	0	10.09	57.8	47.8	-	-
			Margin [dB]:		-47.71	-37.71	-	-
.4198	-.09 ave	10	0	9.91	57.5	47.5	-	-
			Margin [dB]:		-47.59	-37.59	-	-
.42925	-.17 ave	10	0	9.83	57.3	47.3	-	-
			Margin [dB]:		-47.47	-37.47	-	-
.68212	-1.85 ave	9.9	0	8.05	56	46	-	-
			Margin [dB]:		-47.95	-37.95	-	-
.76162	-1.73 ave	10	0	8.27	56	46	-	-
			Margin [dB]:		-47.73	-37.73	-	-
.83879	-2.16 ave	9.9	0	7.74	56	46	-	-
			Margin [dB]:		-48.26	-38.26	-	-
.91829	-2.14 ave	10	0	7.86	56	46	-	-
			Margin [dB]:		-48.14	-38.14	-	-

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 Part 15 Subpart C Qpk  
LIMIT 2: FCC Part 15 Subpart C Avg  
LIMIT 3: NONE  
LIMIT 4: NONE  
LIMIT 5: NONE  
LIMIT 6: NONE



**Conducted Emissions Test Setup (150kHz – 30MHz)**

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 0°, 45°, 90°, and 135° points about the vertical axis. Peak scans were taken for each test configuration. For the 30-meter measurement, only the fundamental frequency was measured (125kHz). 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 Fundamental	(30 meter measurement distance)
	9kHz - 30MHz	(3 meter measurement distance)
	30MHz - 1GHz	(10 meter measurement distance)

Mode*		
Power	Operation	Configuration
1	1	1

\*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	%

#### Limits

Frequency (MHz)	Limit (dB $\mu$ V/m)	Measurement Distance (m)
0.009 to 0.490	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

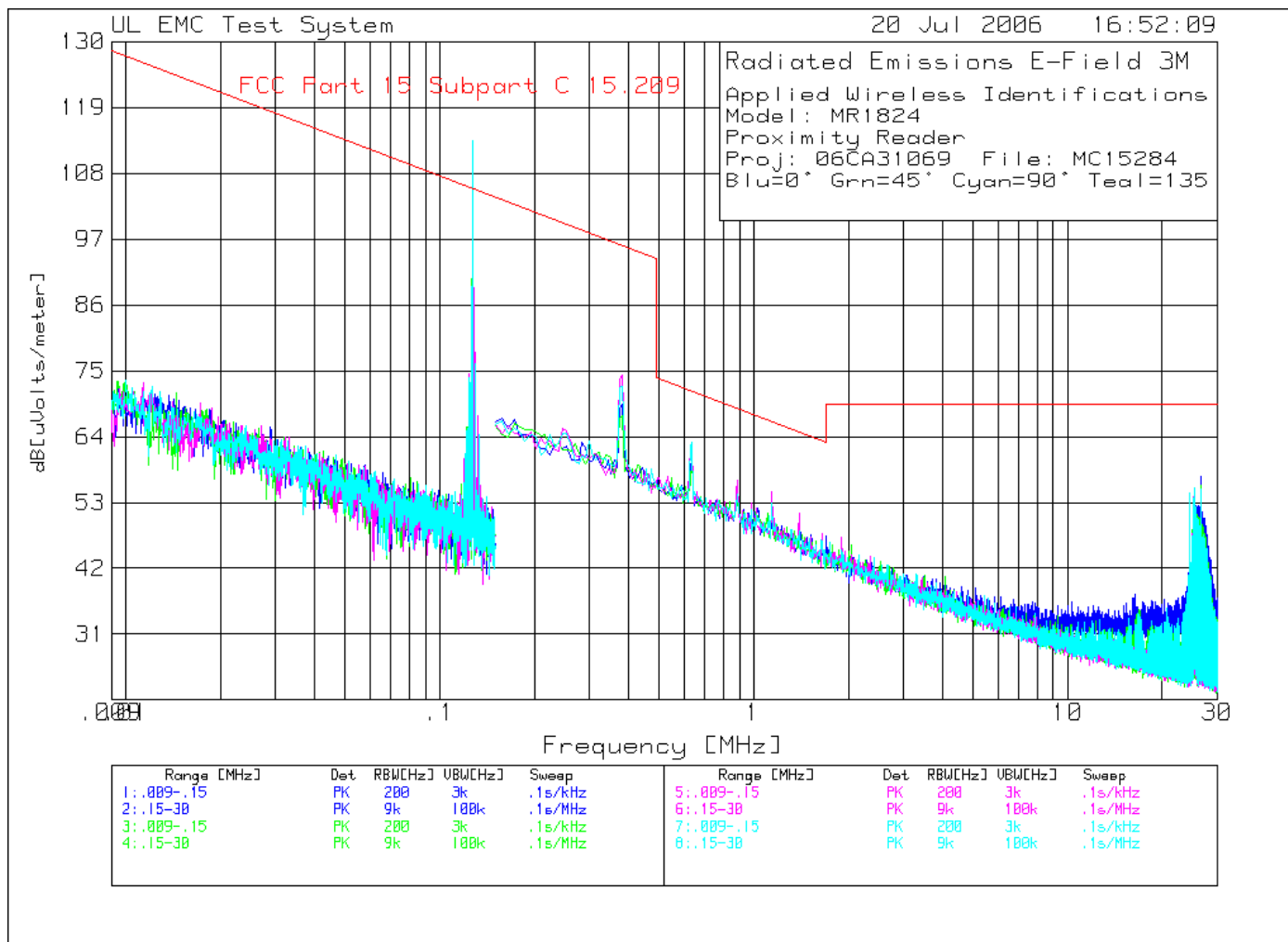
Ambient Conditions at the time of test.	Value	Value	Units
Temperature:	22.5	24.0	°C
Humidity:	42.0	40.0	%RH
Test Date	16 June 2006	20 July 2006	

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

NOTE: In the frequency range of 30 – 1000MHz, all the emissions present are neither harmonics nor spurs of the 125kHz fundamental frequency. This radiated emissions data represent the unit tested without the use of the ferrite reference in Section 1.6. Spot checks were made to confirm that these ferrites did not have and adverse effect on the final measurements.

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwarz	ESIB 40	34968	29 Nov 05	29 Nov 06
EMI Spectrum Analyzer	Agilent Technologies	E7402A	ME5B-123	07 Oct 05	31 Oct 06
Biconical Antenna	Ailtech	94455-1	ME5-439	14 Dec 05	31 Dec 06
Log Periodic Antenna	EMCO	3146	ME5-451	19 Dec 05	31 Dec 06
Active Loop	EMCO	6507	ME5A-288	21 June 06	30 June 07
Hygrometer/ Thermometer	Oakton	35710-10	36034	10 May 06	31 May 07

Test Accessories Used					
Description	Manufacturer	Model	Identifier	Char/ Valid Date	Due
10k-1.3GHz Pre-Amp	Hewlett Packard	8447D	ME7A-758	20 Dec 05	20 Dec 06
10-Meter Chamber	TDK/Lindgren	FACT 5	NA	May 2006	--
Measurement Software	UL	UL EMI Software	Version 9.3	20 Mar 06	NA





Project Number: 06CA31069  
Model Number: MR-1824

File Number MC15284

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FCC ID: OGSMR1824A

Applied Wireless Identifications  
Model: MR1824  
Proximity Reader  
Proj: 06CA31069 File: MC15284  
Blu=0° Grn=45° Cyan=90° Teal=135

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: 1 .009 - .15MHz -----									
1	.12719	97.13 pk	0	16.2	113.33	105.5	-	-	-
	Azimuth:75	Height:100	Horz	Margin	[dB]	7.83	-	-	-
Range: 2 .15 - 30MHz -----									
2	.3814	53.92 pk	0	15.4	69.32	96	-	-	-
	Azimuth:6	Height:100	Horz	Margin	[dB]	-26.68	-	-	-
3	.63519	46.13 pk	0	15.2	61.33	71.5	-	-	-
	Azimuth:202	Height:100	Horz	Margin	[dB]	-10.17	-	-	-
4	26.44708	40.48 pk	.6	16.3	57.38	69.5	-	-	-
	Azimuth:270	Height:100	Horz	Margin	[dB]	-12.12	-	-	-
Range: 3 .009 - .15MHz -----									
5	.12721	97.21 pk	0	16.2	113.41	105.5	-	-	-
	Azimuth:60	Height:119	Horz	Margin	[dB]	7.91	-	-	-
Range: 4 .15 - 30MHz -----									
6	.3814	52.01 pk	0	15.4	67.41	96	-	-	-
	Azimuth:6	Height:119	Horz	Margin	[dB]	-28.59	-	-	-
7	.63519	44.92 pk	0	15.2	60.12	71.5	-	-	-
	Azimuth:54	Height:119	Horz	Margin	[dB]	-11.38	-	-	-
8	25.05124	37.05 pk	.6	16.2	53.85	69.5	-	-	-
	Azimuth:62	Height:119	Horz	Margin	[dB]	-15.65	-	-	-
Range: 5 .009 - .15MHz -----									
9	.12721	97.22 pk	0	16.2	113.42	105.5	-	-	-
	Azimuth:354	Height:140	Horz	Margin	[dB]	7.92	-	-	-
Range: 6 .15 - 30MHz -----									
10	.3814	58.79 pk	0	15.4	74.19	96	-	-	-
	Azimuth:152	Height:140	Horz	Margin	[dB]	-21.81	-	-	-
11	.63519	47.95 pk	0	15.2	63.15	71.5	-	-	-
	Azimuth:213	Height:140	Horz	Margin	[dB]	-8.35	-	-	-
12	25.30503	36.75 pk	.6	16.2	53.55	69.5	-	-	-
	Azimuth:116	Height:140	Horz	Margin	[dB]	-15.95	-	-	-
Range: 7 .009 - .15MHz -----									
13	.12721	97.22 pk	0	16.2	113.42	105.5	-	-	-
	Azimuth:359	Height:159	Horz	Margin	[dB]	7.92	-	-	-

Project Number: 06CA31069  
Model Number: MR-1824

File Number MC15284

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```
Range: 8 .15 - 30MHz -----
14 .3814      56.95 pk      0      15.4      72.35      96      -      -      -
    Azimuth:116 Height:159 Horz      Margin [dB]      -23.65      -      -      -
15 .63519     47.92 pk      0      15.2      63.12      71.5      -      -      -
    Azimuth:207 Height:159 Horz      Margin [dB]      -8.38      -      -      -
16 26.44708   38.3 pk      .6      16.3      55.2      69.5      -      -      -
    Azimuth:299 Height:159 Horz      Margin [dB]      -14.3      -      -      -
```

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

Project Number: 06CA31069  
Model Number: MR-1824

File Number MC15284

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FCC ID: OGSMR1824A

# Applied Wireless Identifications

Model: MR1824

Proximity Reader

Proj: 06CA31069 File: MC15284

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							
.127	44.9 pk	0	16.2	61.1	65.5	-	-	-
			Margin	[dB]:	-4.4	-	-	-

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

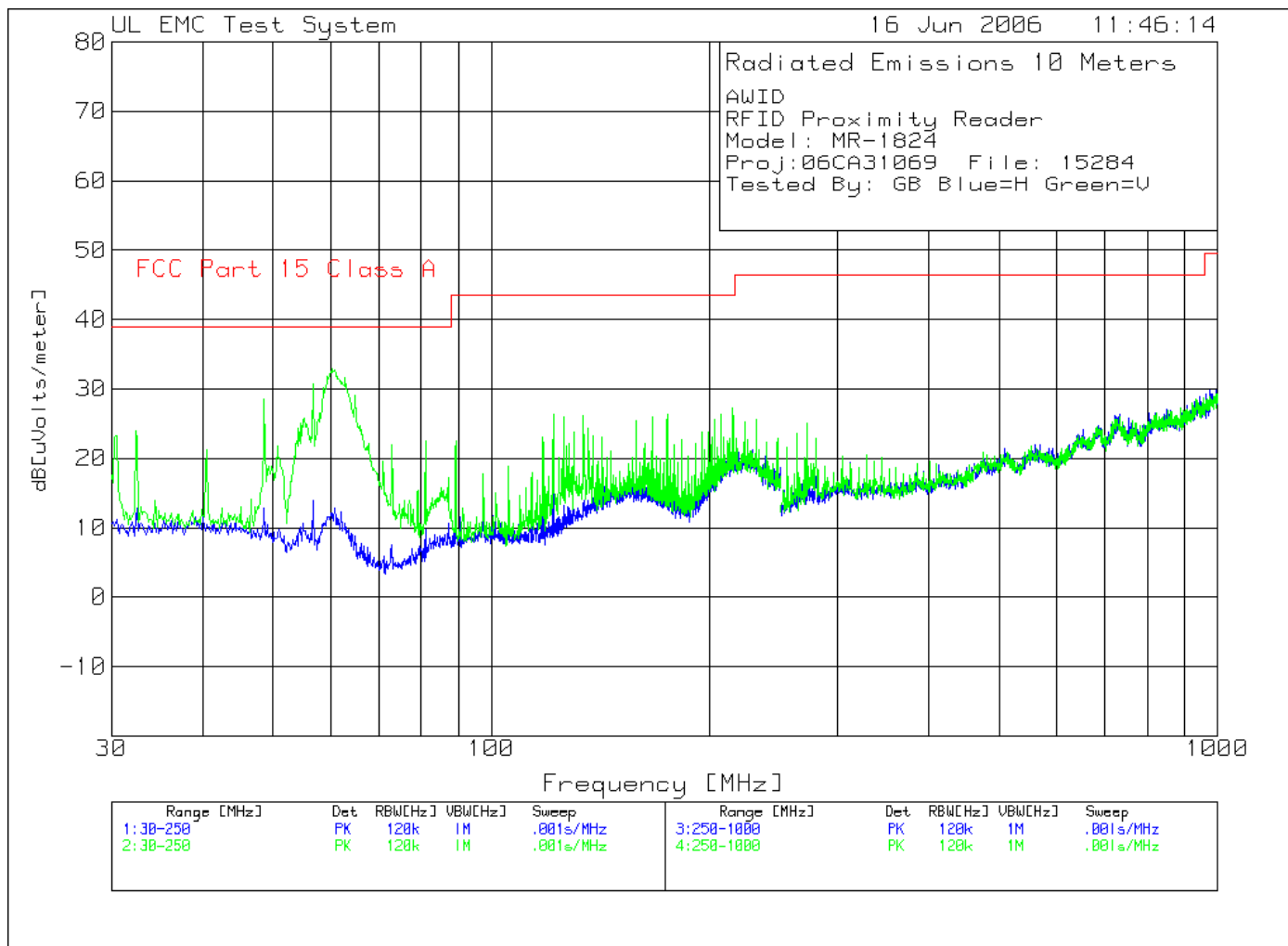
qp - Quasi-Peak detector

av - Average detector

avlg - Average log detector

ave - Average detector

NOTE: The initial 9kHz to 30MHz scan was performed at a distance of 3M within a 10M chamber. Final measurements of the carrier frequency were made outside at a distance of 30M. This is representative of the worse-case antenna angle.



AWID  
RFID Proximity Reader  
Model: MR-1824  
Proj:06CA31069 File: 15284  
Tested By: GB Blue=H Green=V

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	32.3482	38.55 pk	-27.8	13.2	23.95	39	-	-	-
	Azimuth:170	Height:249	Vert	Margin [dB]		-15.05	-	-	-
2	40.567	35.67 pk	-27.7	13.2	21.17	39	-	-	-
	Azimuth:217	Height:101	Vert	Margin [dB]		-17.83	-	-	-
3	48.6391	44.37 pk	-27.5	11.7	28.57	39	-	-	-
	Azimuth:217	Height:101	Vert	Margin [dB]		-10.43	-	-	-
4	56.7111	49.31 pk	-27.4	8.8	30.71	39	-	-	-
	Azimuth:344	Height:249	Vert	Margin [dB]		-8.29	-	-	-
5	60.3803	52.77 pk	-27.3	7.4	32.87	39	-	-	-
	Azimuth:347	Height:249	Vert	Margin [dB]		-6.13	-	-	-
6	81.074	40.86 pk	-27.1	8.8	22.56	39	-	-	-
	Azimuth:312	Height:249	Vert	Margin [dB]		-16.44	-	-	-

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

Project Number: 06CA31069  
Model Number: MR-1824

File Number MC15284

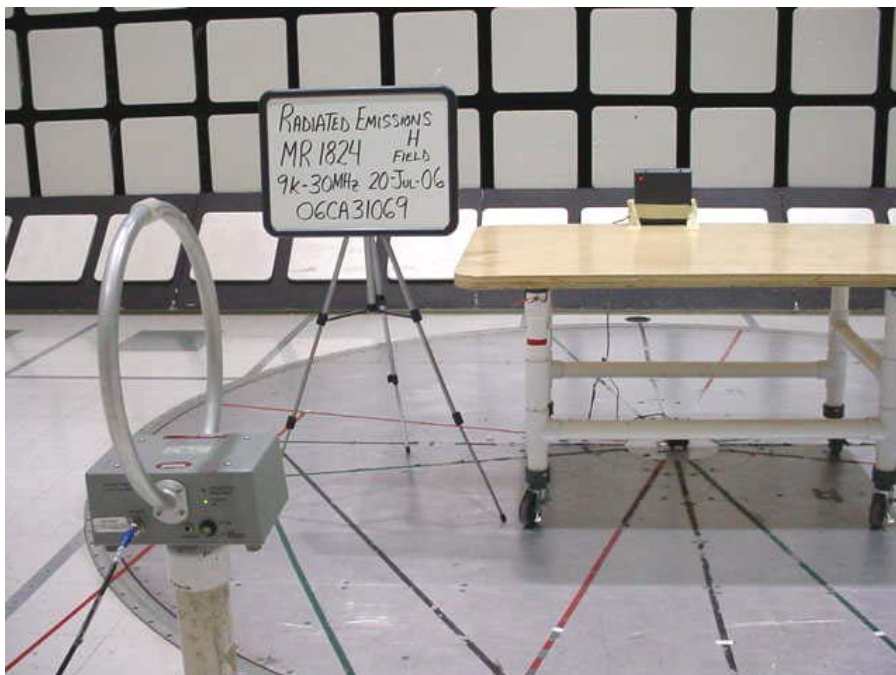
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FCC ID: OGSMR1824A

AWID  
RFID Proximity Reader  
Model: MR-1824  
Proj:06CA31069 File: 15284  
Tested By: GB Blue=H Green=V

Test	Meter	Gain/Loss	Transducer	Level	Limit:1	2	3	4
Frequency	Reading	Factor	Factor	dB[uVolts/meter]				
[MHz]	[dB(uV)]	[dB]	[dB]					
=====								
Vertical 30 - 250MHz								
60.3952	50.83 qp	-27.3	7.4	30.93	39	-	-	-
Azimuth: 37	Height:258	Vert		Margin [dB]:	-8.07	-	-	-

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



**Radiated Emissions Test Setup 9kHz – 30MHz**



**Radiated Emissions Test Setup – 30M Measurement**





**Radiated Emissions Test Setup 30 – 1000MHz**

TEST TITLE: Occupied Bandwidth Test

#### METHOD

The EUT was tested per ANSI C63.4: 2001 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

\*See Power Interface EUT Operating Modes and Configurations for details

The following test parameters shall be established prior to test.

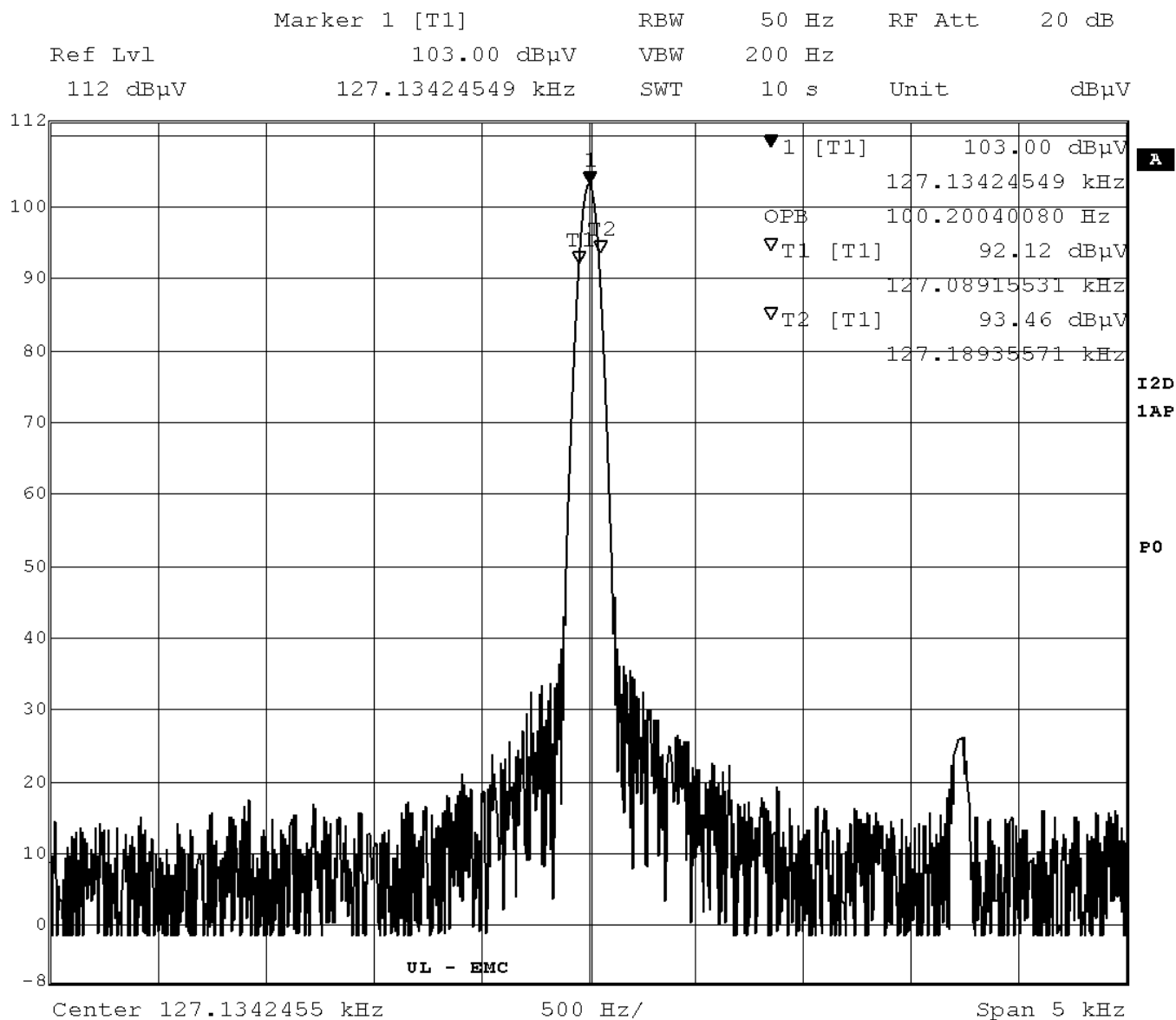
Parameter	Value	Units
Laboratory Ambient Temperature	10 to 40	°C
Relative Humidity	10 to 90	%

#### RESULTS

Ambient Conditions at the time of test.	Value	Units
Temperature:	21.0	°C
Humidity:	42.0	%RH
Test Date	16 Jun 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	31 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



Title: Model: MR-1824  
Comment A: 99 Percent BW  
Date: 16.JUN.2006 11:24:04

Measured Occupied Bandwidth = 100Hz

## 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.



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).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6.

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