



EMC

Underwriters Laboratories Inc.
1285 Walt Whitman Rd.
Melville, NY 11747

www.ul.com/emc
631-271-6200

Project: 06CA33810
File: MC15284
Date: 7/17/2006
Model: MM-6800
FCC ID: OGSMM6800A

Electromagnetic Compatibility Test Report

For

Applied Wireless Identifications Group

Copyright © 2005 Underwriters Laboratories Inc.

Underwriters Laboratories Inc. authorizes the above-named company to reproduce this Report provided it is reproduced in its entirety.

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

Underwriters Laboratories Inc.
1285 Walt Whitman Rd.
Melville, NY 11747

Tel: (631) 271-6200 Fax: (631)439-6095

**A not-for-profit organization dedicated
to public safety and committed to
quality service for over 100 years**

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*:

Title: **VP, Global Field Operations**
Phone: **408-825-1100**
Fax: **408-782-7402**
E-mail: **d.ferguson@awid.com**

Test Report Date: **7/18/2006**

Product Type: **Proximity Reader**

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

Model Number: **MM-6800**

Sample Serial Number: **Prototype**

Sample Tag Number: **0805048**

Sample Receive Date: **6/28/2006**

EUT Category: **Radio Transmitter**

Testing Start Date: **7/5/2006**

Date Testing Complete: **7/5/2006**

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).

Report Directory

1.0	<i>GENERAL - Product Description</i>	4
1.1	Device Configuration During Test	5
1.2	EUT Operation Modes:	6
1.3	EUT Configuration Modes:	6
1.4	Block Diagram:	7
1.5	Deviations from standard test methods	7
2.0	<i>Conclusion:</i>	9
3.0	<i>FCC Labeling Information</i>	10
	Identification	10
	Compliance information	10
	Labeling	11
	User Information	13
4.0	<i>Calibration of Equipment Used for Measurement</i>	13
5.0	<i>EMISSIONS TEST REGULATIONS</i>	14
	Conducted Emissions Test – Mains	15
	Radiated Emissions Test	22
	Occupied Bandwidth Test	31
Appendix A	33
	Accreditations and Authorizations	33

Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
7/18/2006	Original	--	--

1.0 GENERAL - Product Description

The RFID proximity readers will have an internal microprocessor, 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 integrated circuit in the card. Once energized, the IC goes through an initialization process and begins to reflect selectively 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 card. The identity of the card is then transmitted to the access control panel and/or computer via two data lines in Wiegand format and/or via RS-232 format.

1.1 Device Configuration During Test

1.1.1 Equipment Used During Test:

Use*	Product Type	Manufacturer	Model	Comments
EUT	Prox Reader	AWID	MM-6800	Revision G

* 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	12	-	-	DC	-	None

NOTE: During an initial assessment of the MM-6800, 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 is transmitting and receiving, simultaneously. This device operates with its transmit and receive circuitry on continuously.

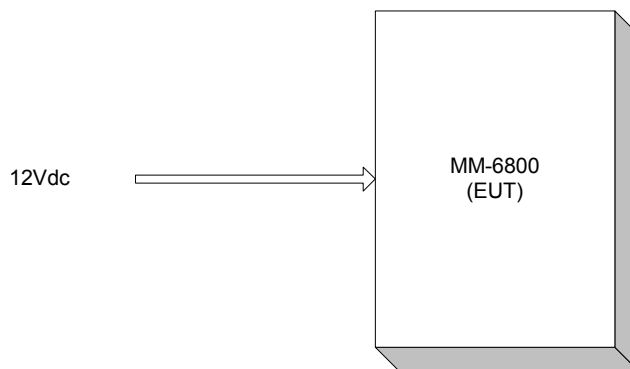
1.3 EUT Configuration Modes:

Mode #	Description
1	MM-6800 is 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.



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

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: 7/5/2006
Test Completion Date: 7/5/2006



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



Joseph Danisi (Ext.23055)
Senior Engineering Associate
International EMC Services
Conformity Assessment Services-3013EMEL

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.

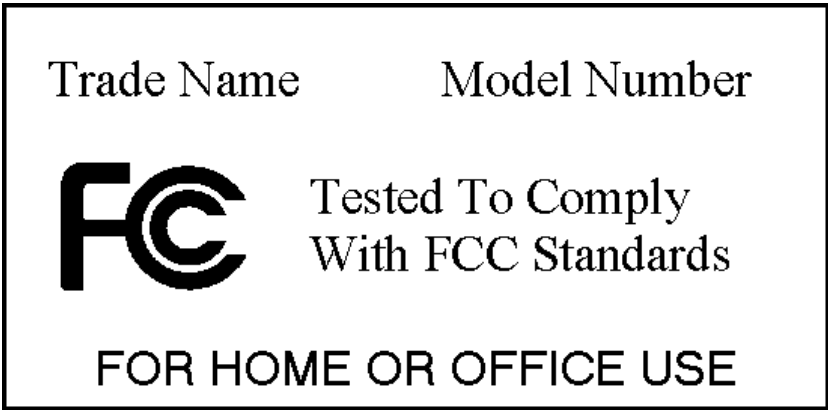
(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively,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

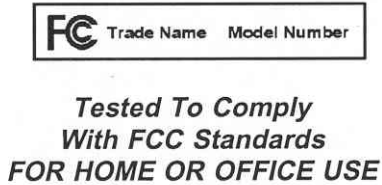
In addition to the requirements in Part 2 of CFR 47 (See **1.6.1 Identification** above), a device subject to authorization under a Declaration of Conformity shall be labeled as follows:

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
-------------------------	------------	----------------------	---------	---------------------------	-----------

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

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

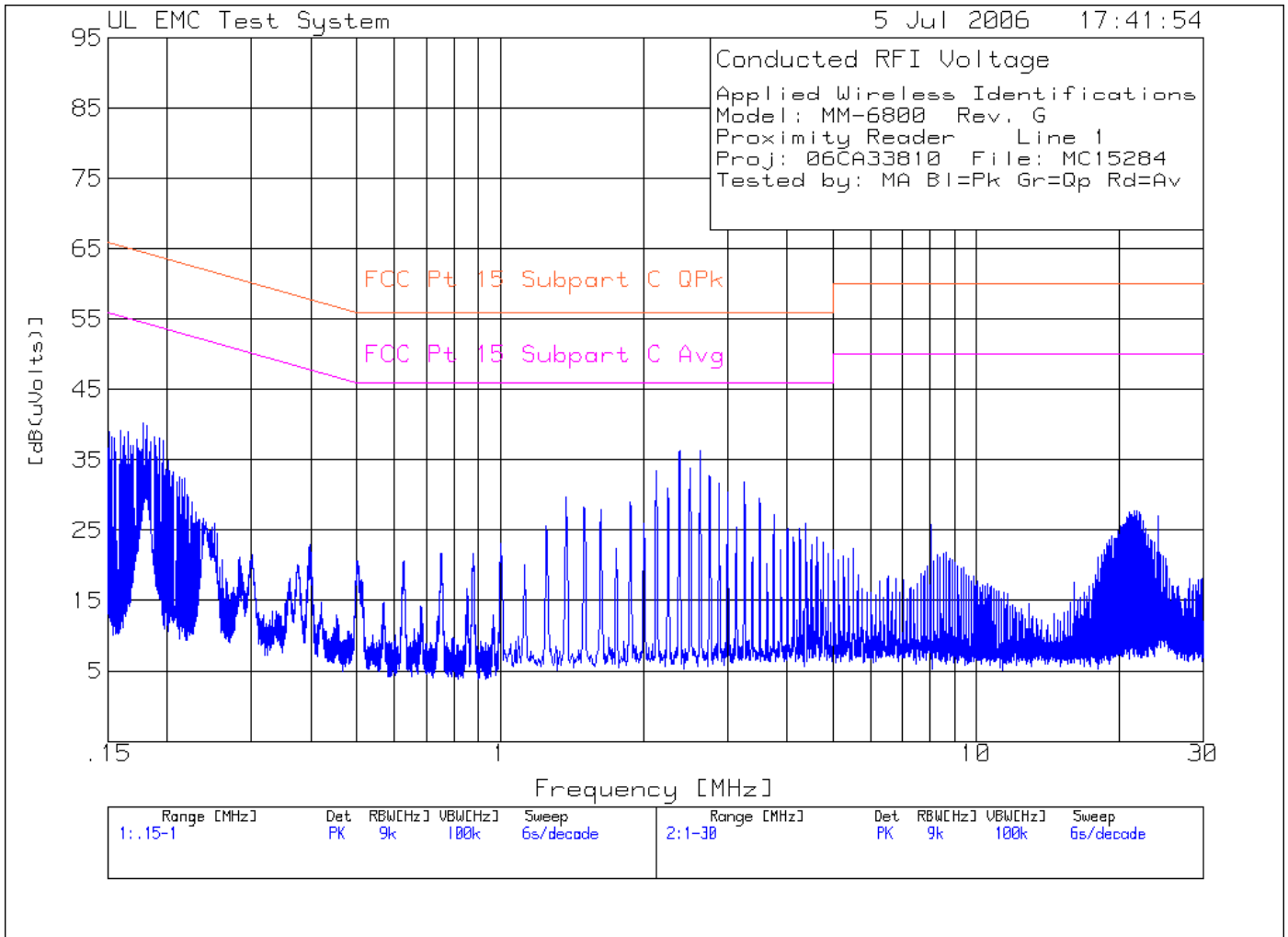
RESULTS

Ambient Conditions at the time of test.	Value	Units
Temperature:	21.0	°C
Humidity:	28.0	%RH
Test Date	05 July 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/ 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



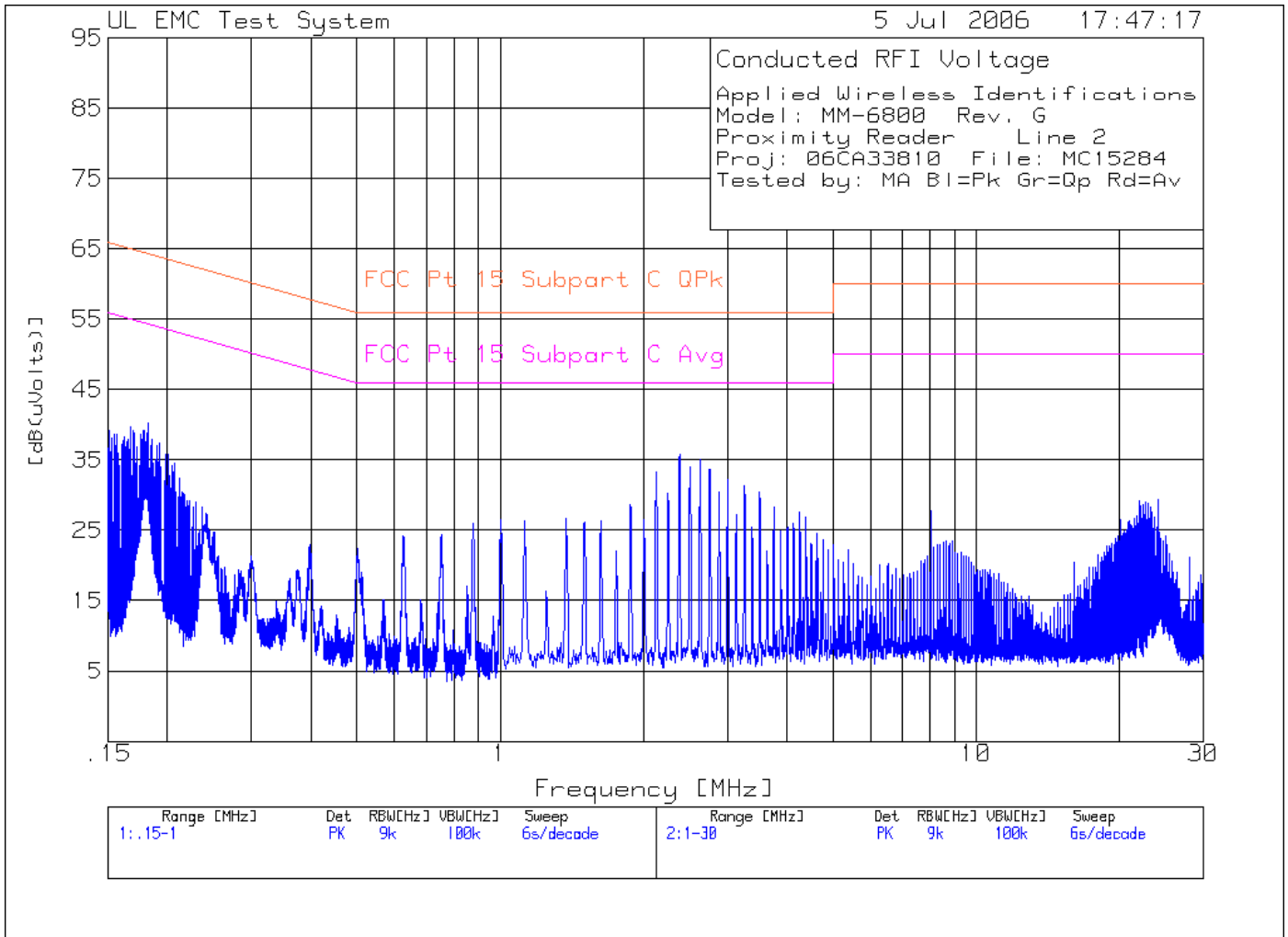
Applied Wireless Identifications
 Model: MM-6800 Rev. G
 Proximity Reader Line 1
 Proj: 06CA33810 File: MC15284
 Tested by: MA Bl=Pk Gr=Qp Rd=Av

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	.15935	29.11 pk	10	0	39.11	65.5	55.5	-	-
				Margin [dB]		-26.39	-16.39	-	-
2	.16564	29.06 pk	10	0	39.06	65.2	55.2	-	-
				Margin [dB]		-26.14	-16.14	-	-
3	.17805	30.21 pk	10	0	40.21	64.6	54.6	-	-
				Margin [dB]		-24.39	-14.39	-	-
4	.18128	29.97 pk	10	0	39.97	64.4	54.4	-	-
				Margin [dB]		-24.43	-14.43	-	-
5	.19267	28.07 pk	10	0	38.07	63.9	53.9	-	-
				Margin [dB]		-25.83	-15.83	-	-

Range: 1 1 - 30MHz -----									
6	2.38069	26.43 pk	9.9	0	36.33	56	46	-	-
				Margin [dB]		-19.67	-9.67	-	-
7	2.63014	26.42 pk	9.9	0	36.32	56	46	-	-
				Margin [dB]		-19.68	-9.68	-	-
8	21.68128	17.77 pk	10	0	27.77	60	50	-	-
				Margin [dB]		-32.23	-22.23	-	-

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



Applied Wireless Identifications
 Model: MM-6800 Rev. G
 Proximity Reader Line 2
 Proj: 06CA33810 File: MC15284
 Tested by: MA Bl=Pk Gr=Qp Rd=Av

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	.16768	29.66 pk	10	0	39.66	65.1	55.1	-	-
				Margin [dB]		-25.44	-15.44	-	-
2	.18213	30.27 pk	9.9	0	40.17	64.4	54.4	-	-
				Margin [dB]		-24.23	-14.23	-	-
3	.1925	27.44 pk	10	0	37.44	63.9	53.9	-	-
				Margin [dB]		-26.46	-16.46	-	-

Range: 1 1 - 30MHz -----									
4	2.12543	23.3 pk	9.9	0	33.2	56	46	-	-
				Margin [dB]		-22.8	-12.8	-	-
5	2.38069	25.96 pk	9.9	0	35.86	56	46	-	-
				Margin [dB]		-20.14	-10.14	-	-
6	2.63014	25.24 pk	9.9	0	35.14	56	46	-	-
				Margin [dB]		-20.86	-10.86	-	-
7	2.75196	23.72 pk	9.9	0	33.62	56	46	-	-
				Margin [dB]		-22.38	-12.38	-	-
8	22.05836	19.2 pk	10	0	29.2	60	50	-	-
				Margin [dB]		-30.8	-20.8	-	-

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

TEST TITLE: Radiated Emissions Test

METHOD

Measurements were made in a 10-meter semi-anechoic chamber that complies to ANSI C63.4.

In the frequency range of 30 to 1000MHz, 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.

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

Electric fields:	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 (dBµV/m)
	Quasi-Peak
0.009 to 0.090	128.5 – 93.8
0.490 to 1.705	73.8 – 62.97
1.705 to 30	69.5
30 to 88	39
88 to 216	43.5
216 to 960	46.4
960 to 1000	49.5

RESULTS

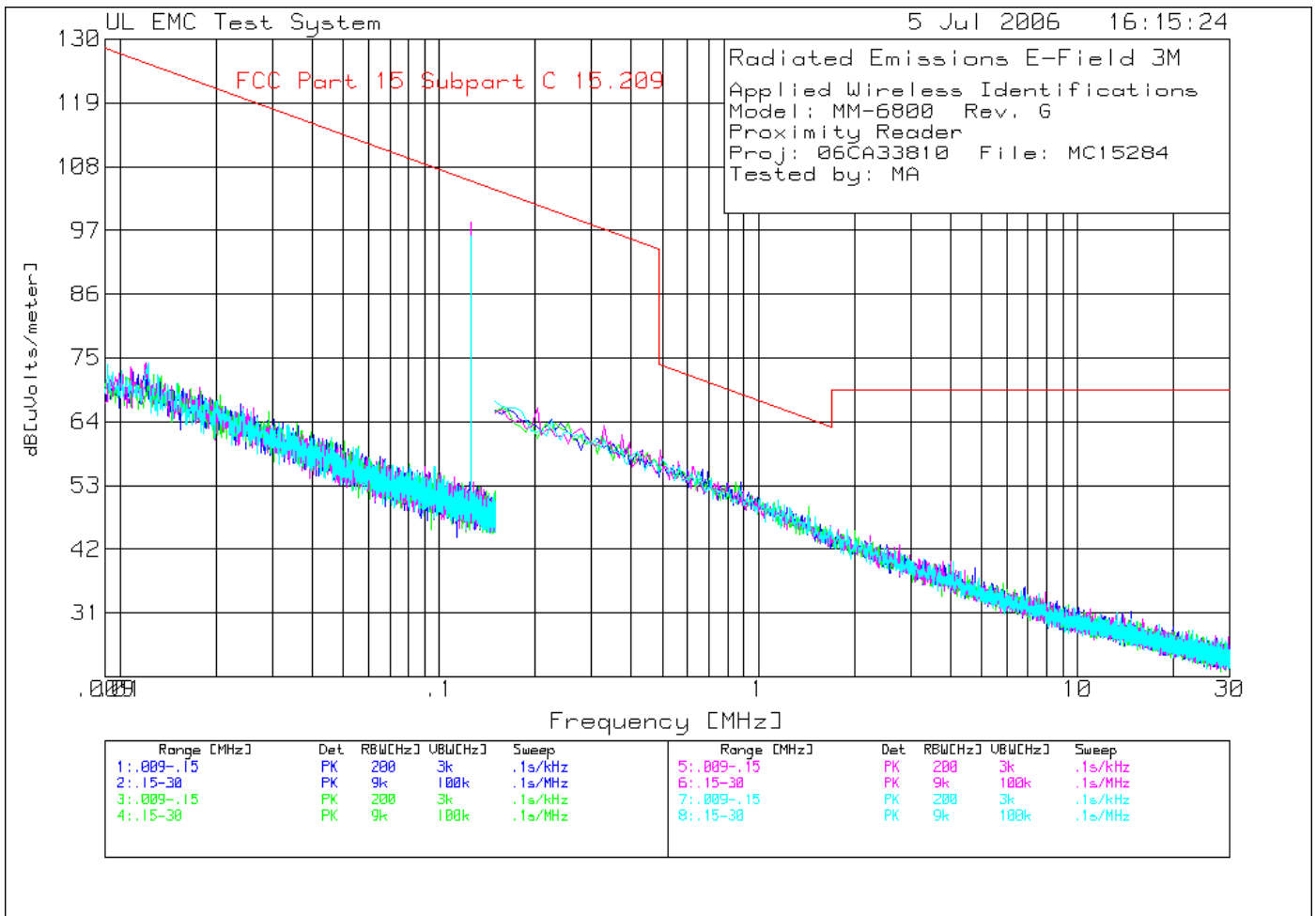
Ambient Conditions at the time of test.	Value	Units
Temperature:	21.0	°C
Humidity:	28.0	%RH
Test Date	05 July 2006	

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.

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwarz	ESIB 40	34968	28 Nov 05	28 Nov 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	11 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



Scan Color Code

- Blue = 0° antenna angle
- Green = 45° antenna angle
- Magenta = 90° antenna angle
- Cyan = 135° antenna angle

Applied Wireless Identifications
 Model: MM-6800 Rev. G
 Proximity Reader
 Proj: 06CA33810 File: MC15284
 Tested by: MA

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	.12535	77.56 pk	0	16.2	93.76	105.6	-	-	-
	Azimuth:285	Height:100	Horz	Margin [dB]		-11.84	-	-	-

Range: 3 .009 - .15MHz -----									
2	.12535	80.34 pk	0	16.2	96.54	105.6	-	-	-
	Azimuth:224	Height:119	Horz	Margin [dB]		-9.06	-	-	-

Range: 2 .15 - 30MHz -----									
9	1.44134	33.96 pk	.1	15.3	49.36	64.4	-	-	-
	Azimuth:31	Height:119	Horz	Margin [dB]		-15.04	-	-	-

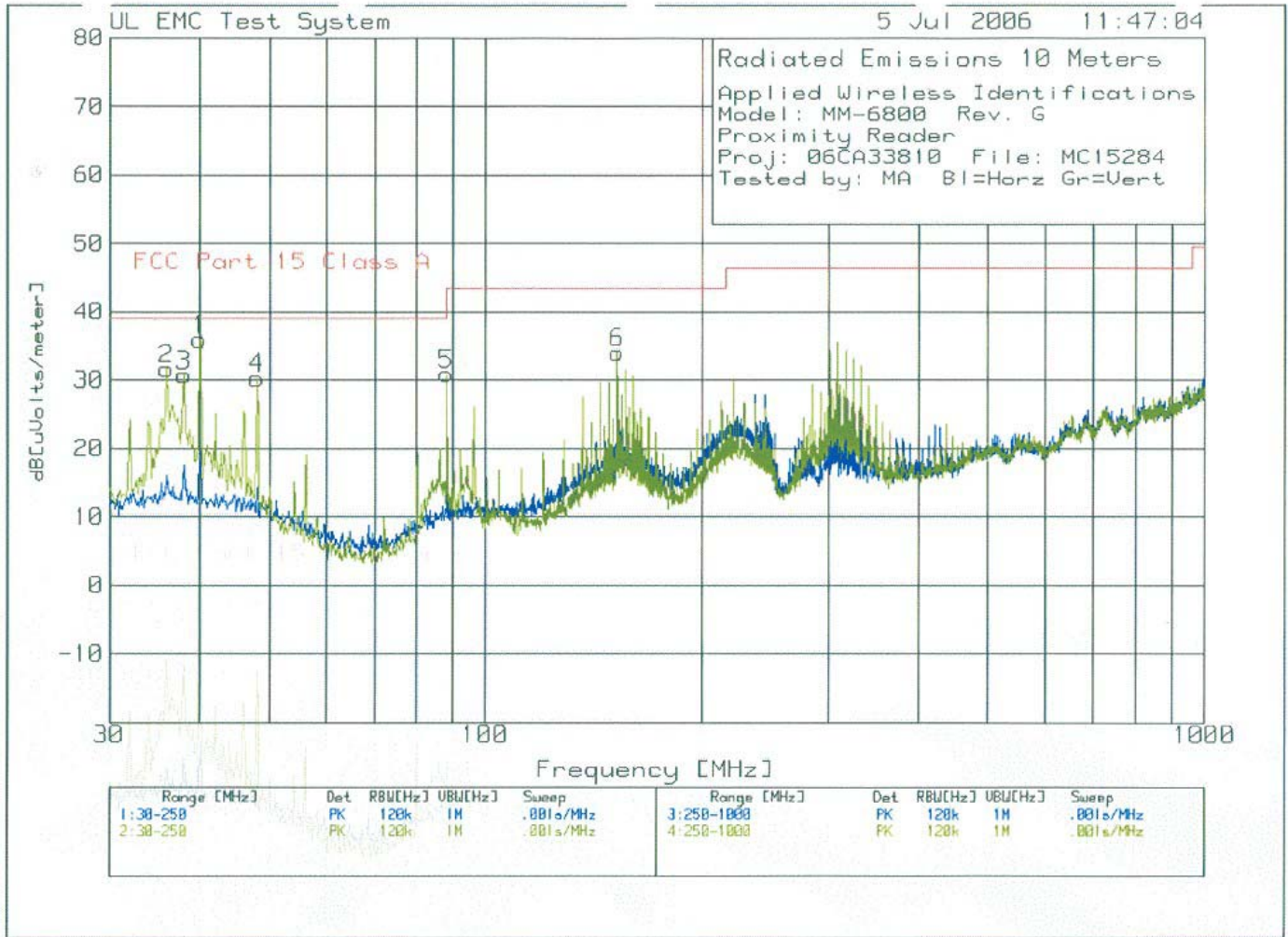
Range: 5 .009 - .15MHz -----									
3	.12535	82.17 pk	0	16.2	98.37	105.6	-	-	-
	Azimuth:210	Height:139	Horz	Margin [dB]		-7.23	-	-	-

Range: 2 .15 - 30MHz -----									
5	.20225	50.86 pk	0	15.4	66.26	101.5	-	-	-
	Azimuth:0	Height:139	Horz	Margin [dB]		-35.24	-	-	-
6	.32915	47.93 pk	0	15.4	63.33	97.3	-	-	-
	Azimuth:6	Height:139	Horz	Margin [dB]		-33.97	-	-	-
7	.37393	46.32 pk	0	15.4	61.72	96.1	-	-	-
	Azimuth:209	Height:139	Horz	Margin [dB]		-34.38	-	-	-
8	.49336	43.76 pk	0	15.4	59.16	73.7	-	-	-
	Azimuth:239	Height:139	Horz	Margin [dB]		-14.54	-	-	-

Range: 7 .009 - .15MHz -----									
4	.12535	79.79 pk	0	16.2	95.99	105.6	-	-	-
	Azimuth:150	Height:159	Horz	Margin [dB]		-9.61	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

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



Applied Wireless Identifications
 Model: MM-6800 Rev. G
 Proximity Reader
 Proj: 06CA33810 File: MC15284
 Tested by: MA

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	39.98	50.35 pk	-27.7	13.3	35.95	39	-	-	-
	Azimuth:113	Height:101	Vert	Margin [dB]		-3.05	-	-	-
2	36.0173	46.03 pk	-27.8	13.4	31.63	39	-	-	-
	Azimuth:318	Height:101	Vert	Margin [dB]		-7.37	-	-	-
3	38.072	44.99 pk	-27.7	13.4	30.69	39	-	-	-
	Azimuth:195	Height:101	Vert	Margin [dB]		-8.31	-	-	-
4	48.052	46 pk	-27.5	11.8	30.3	39	-	-	-
	Azimuth:237	Height:101	Vert	Margin [dB]		-8.7	-	-	-
5	88.1187	47.47.86 pk	-26.9	10.3	30.87	43.5	-	-	-
	Azimuth:154	Height:101	Vert	Margin [dB]		-12.63	-	-	-
6	152.4016	43.78 pk	-26.2	16.5	34.08	43.5	-	-	-
	Azimuth:1	Height:101	Vert	Margin [dB]		-9.42	-	-	-

LIMIT 1: FCC Part 15 Class A

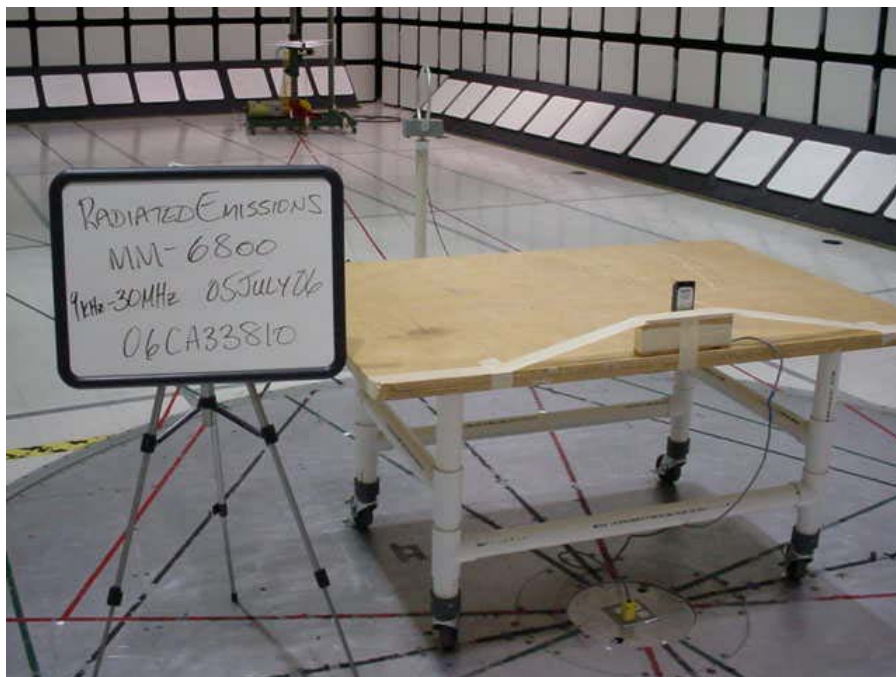
- pk - Peak detector
- qp - Quasi-Peak detector
- av - Average detector
- avlg - denotes average log detection
- ave - denotes average detection
- tm - Trace Math Result

Applied Wireless Identifications
 Model: MM-6800 Rev. G
 Proximity Reader
 Proj: 06CA33810 File: MC15284
 Tested by: MA

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	-----							
40.0875	50.23	qp	-27.7	13.3	35.83	39	-	-
Azimuth:239	Height:103	Vert	Margin [dB]			-3.17	-	-

LIMIT 1: FCC Part 15 Class A

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



Radiated Emissions Test Setup (9kHz – 30MHz)



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.

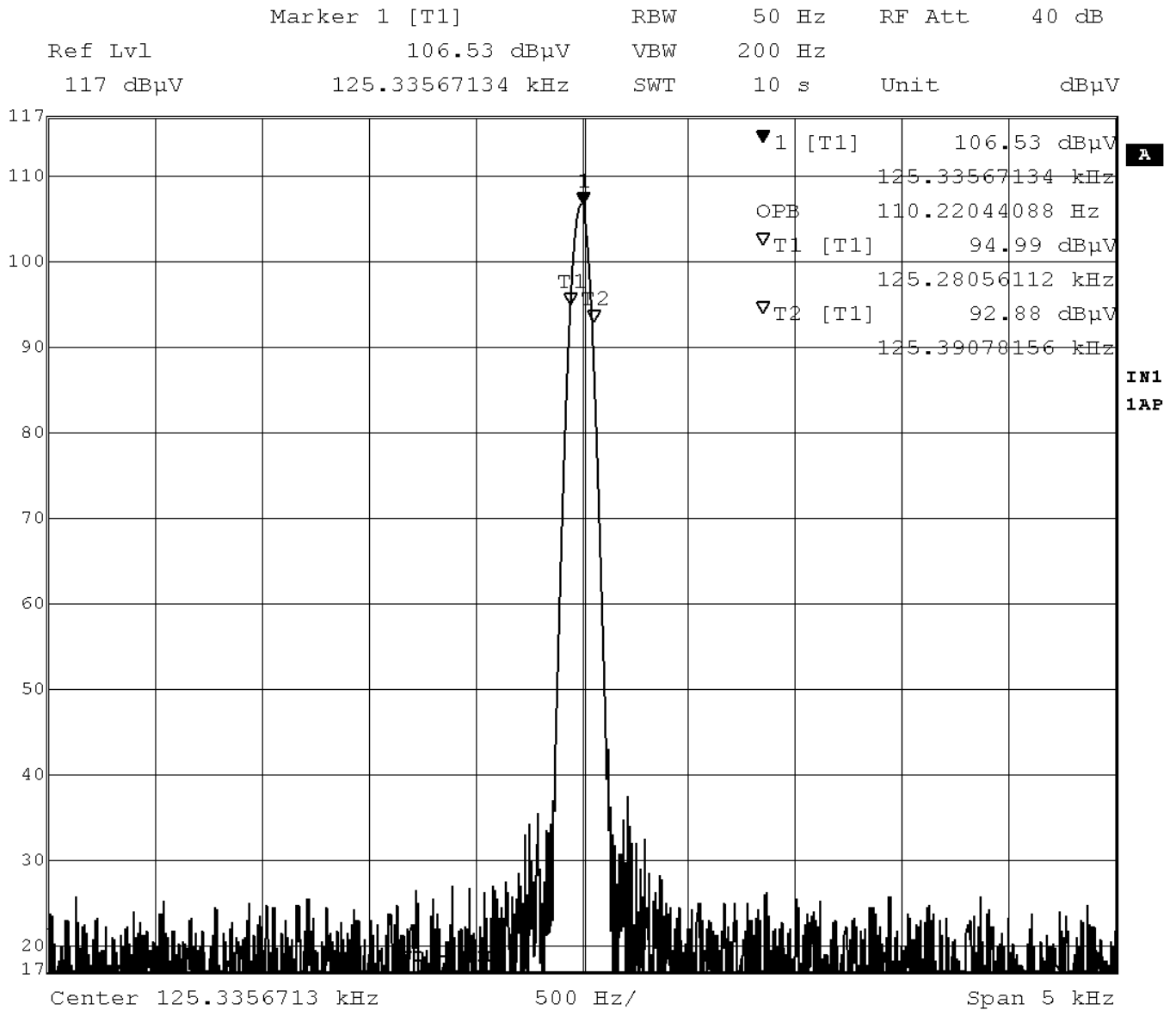
Parameter	Value	Units
Laboratory Ambient Temperature	10 to 40	°C
Relative Humidity	10 to 90	%

RESULTS

Ambient Conditions at the time of test.	Value	Units
Temperature:	21.0	°C
Humidity:	42.0	%RH

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: MM-6800
 Comment A: 99 Percent BW
 Date: 5.JUL.2006 17:19:48

Measured Occupied Bandwidth = 110Hz

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.

U.S. Identifier Number: US0113