

Whites Electronics, Inc.

Matrix 100

February 09, 2007

Report No. WHIT0025

Report Prepared By



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

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EMC Test Report

Certificate of Test
Issue Date: February 09, 2007
Whites Electronics, Inc.
Model: Matrix 100

Emissions				
Test Description	Specification	Test Method	Pass	Fail
Radiated Emissions	FCC 15.109:2006	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Radiated Emissions	FCC 15.209:2006	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Field Strength of Fundamental	FCC 15.209:2006	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Occupied Bandwidth	RSS-Gen, Issue 1:2005	RSS-212, Issue 1 (Provisional):1999	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Modifications made to the product
See the Modifications section of this report

Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
22975 NW Evergreen Parkway, Suite 400
Hillsboro, OR 97124

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada.

Approved By:



Greg Kiemel, Director of Engineering

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

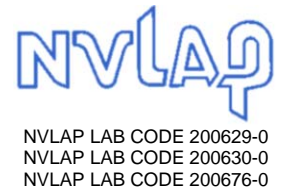
Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested,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

Revision Number	Description	Date	Page Number
00	None		

FCC: Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.



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



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



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



TÜV Product Service: Included in TÜV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TÜV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TÜV's current Listing of CARAT Laboratories, available from TÜV. A certificate was issued to represent that this laboratory continues to meet TÜV's CARAT Program requirements. Certificate No. USA0604C.



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



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



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



VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071, R-1025, C-2687, T-289, and R-2318, Irvine: C-2094 and R-1943, Sultan: R-871, C-1784, and T-294.*)



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



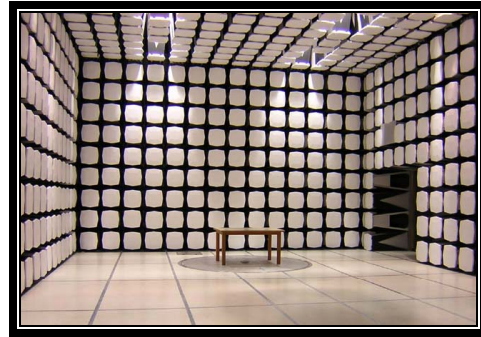
GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from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



SCOPE

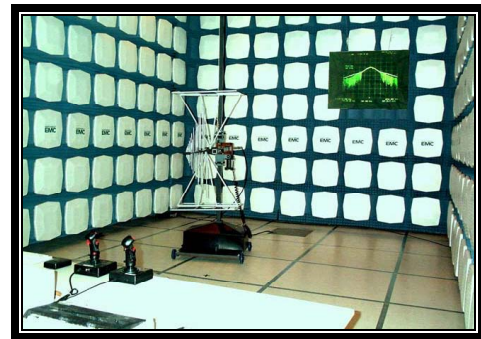
For details on the Scopes of our Accreditations, please visit:

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



**California – Orange County Facility
Labs OC01 – OC13**

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



**Oregon – Evergreen Facility
Labs EV01 – EV11**

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



**Washington – Sultan Facility
Labs SU01 – SU07**

14128 339th Ave. SE Sultan, WA 98294
(888) 364-2378

Party Requesting the Test

Company Name:	Whites Electronics, Inc.
Address:	1011 Pleasant Valley Drive
City, State, Zip:	Sweet Home, OR 97386
Test Requested By:	Charles Tucharth
Model:	Matrix 100
First Date of Test:	February 4, 2007
Last Date of Test:	February 6, 2007
Receipt Date of Samples:	January 25, 2007
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test**Functional Description of the EUT (Equipment Under Test):**

The Matrix 100 is a 125 kHz radio used in a hand-held metal detector. The detector is used in security applications.

Testing Objective:

Seeking TCB certification under 15.209.

CONFIGURATION 1 WHIT0025**EUT**

Description	Manufacturer	Model/Part Number	Serial Number
Security Handheld Metal Detector	White's Electronics	Matrix 100	Unknown

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
Earbuds	White's Electronics	Unknown	Unknown

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Audio	No	1.0m	No	Handheld Metal Detector	Earbuds
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	2/4/2007	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	2/5/2007	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	2/5/2007	Field Strength of Fundamental	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	2/6/2007	Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Transmitting in a typical mode

FREQUENCY RANGE INVESTIGATED

Fundamental Frequency 122.5 kHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2006	13
Antenna, Loop	EMCO	6502	AOA	5/4/2005	24
EV01 cables c,g, h			EVA	12/29/2006	13

MEASUREMENT BANDWIDTHS

	Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The EUT was transmitting while set at the only operating channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003).

Per FCC 15.31(f)(2), the measurement results were extrapolated to the specification distance by making measurements at 3 and 5 meter test distances on the same radial to determine the proper extrapolation factor.

EUT: Matrix 100	Work Order: WHIT0025
Serial Number: None	Date: 02/05/07
Customer: Whites Electronics, Inc.	Temperature: 22
Attendees: None	Humidity: 31%
Project: None	Barometric Pres.: 30.12
Tested by: Rod Peloquin	Power: Battery
	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.209:2006	ANSI C63.4:2003

TEST PARAMETERS
Antenna Height(s) (m) 2 - 4 Test Distance (m) 3

COMMENTS

EUT OPERATING MODES

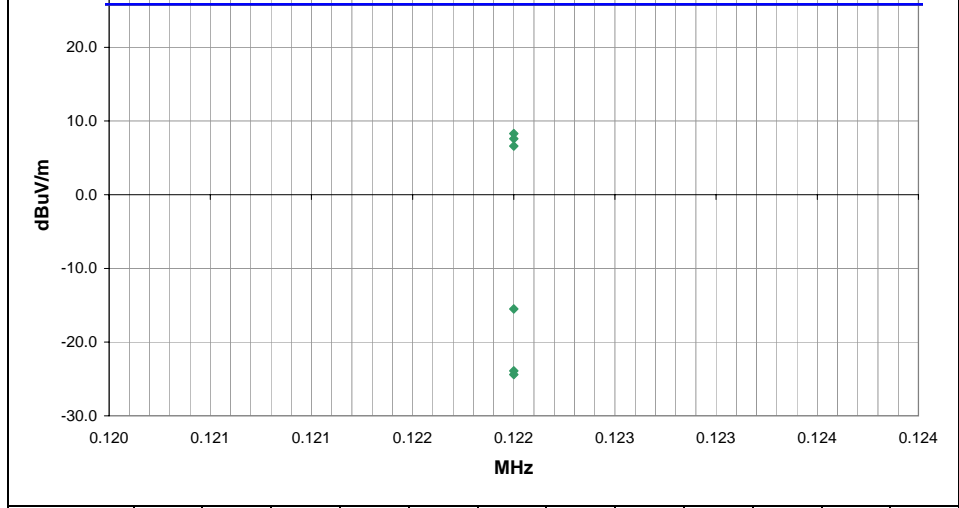
Transmitting

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	3
Configuration #	1

Results Pass NVLAP Lab Code 200630-0 *Signature*



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
0.122	64.3	10.7	334.0	2.2	3.0	0.0	See Notes	AV	66.7	8.3	25.8	-17.5	Perp. to EUT, Par. to Gnd. EUT on side
0.122	64.5	10.7	260.0	2.0	3.0	0.0	See Notes	AV	67.6	7.6	25.8	-18.2	Perp. to EUT, Perp. to Gnd. EUT on side
0.122	64.4	10.7	253.0	2.0	3.0	0.0	See Notes	AV	68.5	6.6	25.8	-19.2	Perp. to EUT, Perp. to Gnd. EUT Vertical
0.122	64.0	10.7	331.0	2.0	3.0	0.0	See Notes	AV	90.2	-15.5	25.8	-41.3	Par. to EUT, Perp. to Gnd. EUT on side
0.122	64.6	10.7	168.0	2.0	3.0	0.0	See Notes	AV	99.2	-23.9	25.8	-49.7	Par. to EUT, Perp. to Gnd. EUT Vertical
0.122	63.2	10.7	161.0	2.3	3.0	0.0	See Notes	AV	98.3	-24.4	25.8	-50.2	Perp. to EUT, Par. to Gnd. EUT Vertical
0.122	57.7	10.7	360.0	2.0	3.0	0.0	See Notes	AV	112.7	-44.3	25.8	-70.1	Perp. to EUT, Par. to Gnd. EUT Horizontal

EUT: Matrix 100	Work Order: WHIT0025
Serial Number: None	Date: 02/05/07
Customer: Whites Electronics, Inc.	Temperature: 22
Attendees: None	Humidity: 31%
Project: None	Barometric Pres.: 30.12
Tested by: Rod Peloquin	Power: Battery
	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.209:2006	ANSI C63.4:2003

TEST PARAMETERS
Antenna Height(s) (m) 2 - 4 Test Distance (m) 5

COMMENTS

EUT OPERATING MODES

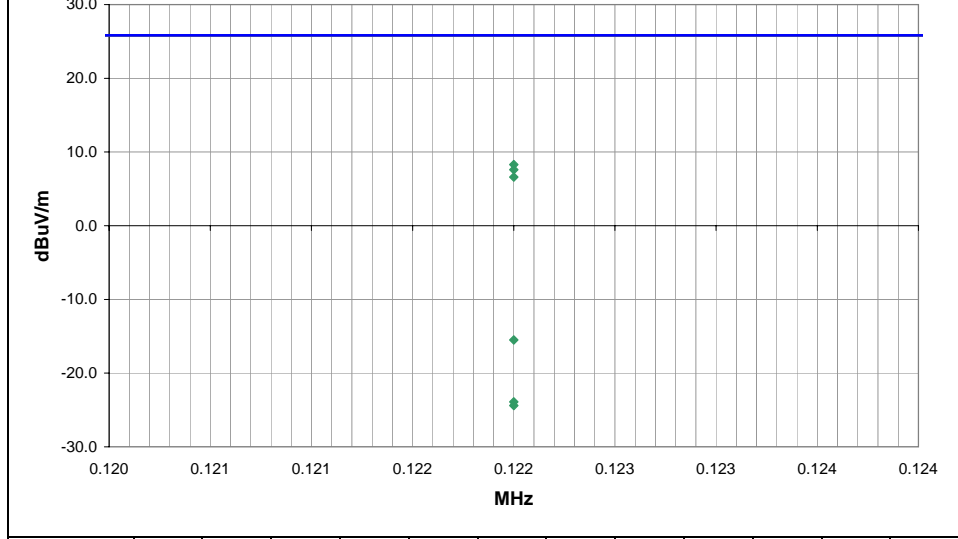
Transmitting

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	4
Configuration #	1
Results	Pass

NVLAP Lab Code 200630-0 *Signature*



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
0.122	56.9	10.7	258.0	2.2	5.0	0.0	See Notes	AV	59.3	8.3	25.8	-17.5	Perp. to EUT, Par. to Gnd. EUT on side
0.122	57.0	10.7	261.0	2.0	5.0	0.0	See Notes	AV	60.1	7.6	25.8	-18.2	Perp. to EUT, Perp. to Gnd. EUT on side
0.122	56.8	10.7	246.0	2.0	5.0	0.0	See Notes	AV	60.9	6.6	25.8	-19.2	Perp. to EUT, Perp. to Gnd. EUT Vertical
0.122	54.0	10.7	338.0	2.0	5.0	0.0	See Notes	AV	80.2	-15.5	25.8	-41.3	Par. to EUT, Perp. to Gnd. EUT on side
0.122	53.6	10.7	169.0	2.0	5.0	0.0	See Notes	AV	88.2	-23.9	25.8	-49.7	Par. to EUT, Perp. to Gnd. EUT Vertical
0.122	52.3	10.7	164.0	2.9	5.0	0.0	See Notes	AV	87.4	-24.4	25.8	-50.2	Perp. to EUT, Par. to Gnd. EUT Vertical
0.122	45.2	10.7	342.0	2.0	5.0	0.0	See Notes	AV	100.2	-44.3	25.8	-70.1	Perp. to EUT, Par. to Gnd. EUT Horizontal

Distance Adjustment Factor for Radiated Emissions below 30 MHz

Method: Per 47 CFR 15.31(f)(2), the data was extrapolated based upon a the measured fall-off (at each frequency / polarity).

EUT: Matrix 100

S/N:

Date: 2/6/2007

Job Number: WHIT0025

Average Detector - 15.209(d)

RBW = 100 Hz - ANSI C63.4-2003, 4.2

Frequency (MHz)	Loop Antenna Polarity	EUT Orientation	Test Distance (meters)	Adjusted Level (dBuV/m)	Fall-Off from 3 to 5 m (dB)	Extrapolation Factor for Specification Limit (dB / decade)	Test Distance of Spec. Limit (meters)	Distance Adjustment Factor (dB)
0.1225	Par/EUT, Perp/Gnd	Vertical	3	75.3	11.0	49.6	300.0	99.2
			5	64.3				88.2
0.1225	Perp/EUT, Perp/Gnd	On side	3	75.2	7.5	33.8	300.0	67.6
			5	67.7				60.1
0.1225	Perp/EUT, Perp/Gnd	Vertical	3	75.1	7.6	34.3	300.0	68.5
			5	67.5				60.9
0.1225	Perp/EUT, Par./Gnd	On side	3	75.0	7.4	33.4	300.0	66.7
			5	67.6				59.3
0.1225	Par/EUT, Perp/Gnd	On side	3	74.7	10.0	45.1	300.0	90.2
			5	64.7				80.2
0.1225	Perp/EUT, Par./Gnd	Vertical	3	73.9	10.9	49.1	300.0	98.3
			5	63.0				87.4
0.1225	Perp/EUT, Par./Gnd	Horizontal	3	68.4	12.5	56.3	300.0	112.7
			5	55.9				100.2
0.1225	Par/EUT, Par./Gnd	Horizontal	3	64.8	24.7	111.3	300.0	222.7
			5	40.1				198.0





Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2006	13
Antenna, Loop	EMCO	6502	AOA	5/4/2005	24
EV01 cables c,g, h			EVA	12/29/2006	13

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The occupied bandwidth was measured with the EUT configured for continuous modulated operation at its single transmit frequency. The spectrum analyzer's resolution bandwidth was $\geq 1\%$ of the 20dB bandwidth and the video bandwidth was at least 3 times the resolution bandwidth. Since the EUT has an integral antenna, a near field probe was used to couple the transmit signal to the input of the spectrum analyzer.

EMC

OCCUPIED BANDWIDTH

EUT:	Matrix 100	Work Order:	WHIT0025
Serial Number:	None	Date:	02/05/07
Customer:	Whites Electronics, Inc.	Temperature:	22°C
Attendees:	None	Humidity:	32%
Project:	None	Barometric Pres.:	30.14
Tested by:	Rod Peloquin	Power:	Battery
		Job Site:	EV01

TEST SPECIFICATIONS		Test Method	
RSS-Gen, Issue 1:2005		RSS-212, Issue 1 (Provisional):1999	

COMMENTS

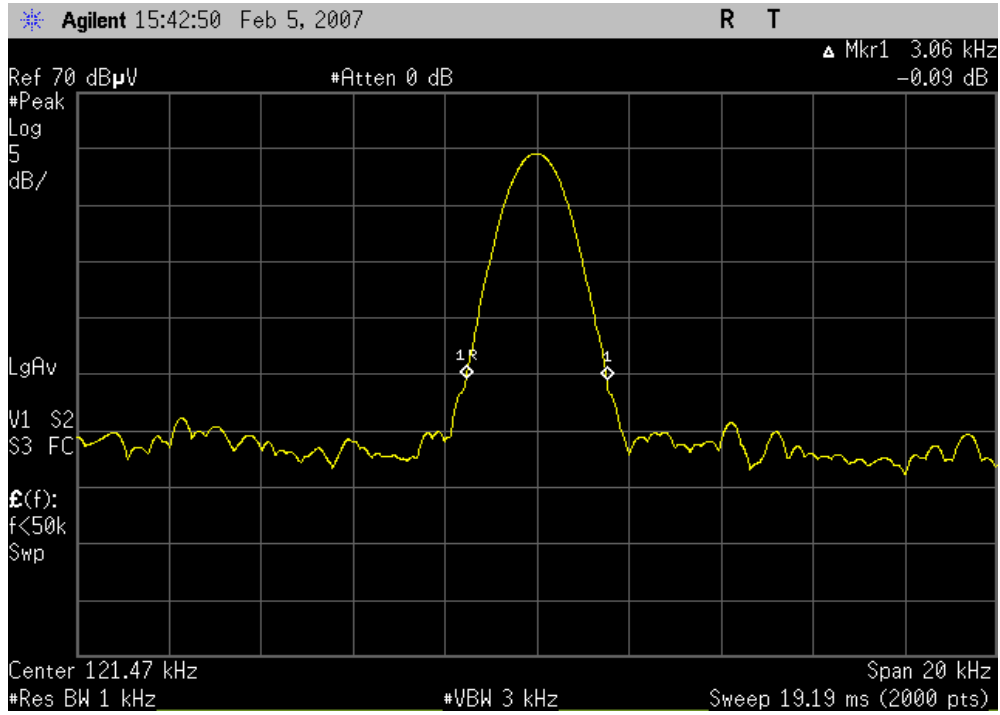
Receive loop antenna is parallel to EUT, and perpendicular to the ground

DEVIATIONS FROM TEST STANDARD

Configuration #	1	Signature <i>Rodney L. Peloquin</i>
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	Value	Limit	Results
OCCUPIED BANDWIDTH	3.06 kHz	N/A	N/A

OCCUPIED BANDWIDTH		
Result: N/A	Value: 3.06 kHz	Limit: N/A





Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Transmitting, typical operating mode

POWER SETTINGS INVESTIGATED

Battery

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	1 GHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
EV11 cables a,b,c			EVL	4/5/2006	13
Pre-Amplifier	Miteq	AM-1551	AOY	4/5/2006	13
Antenna, Biconilog	EMCO	3142	AXB	12/28/2006	24
Spectrum Analyzer	Agilent	E4443A	AAS	12/7/2006	13

MEASUREMENT BANDWIDTHS

	Frequency Range	Peak Data	Quasi-Peak Data	Average Data
	(MHz)	(kHz)	(kHz)	(kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level will be detected. This requires the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search is utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT.

Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance shall be 3 meters or 10 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the antenna clears the ground surface by at least 25 cm.

EUT: Matrix 100	Work Order: WHIT0025
Serial Number: None	Date: 02/06/07
Customer: Whites Electronics, Inc.	Temperature: 22
Attendees: None	Humidity: 31%
Project: None	Barometric Pres.: 30.06
Tested by: Holly Ashkannejhad	Power: Battery
	Job Site: EV11

TEST SPECIFICATIONS	Test Method
FCC 15.109:2006	ANSI C63.4:2003
CISPR 22:2006 Class B	CISPR 22:2006

TEST PARAMETERS	
Antenna Height(s) (m) 1 - 4	Test Distance (m) 10

COMMENTS

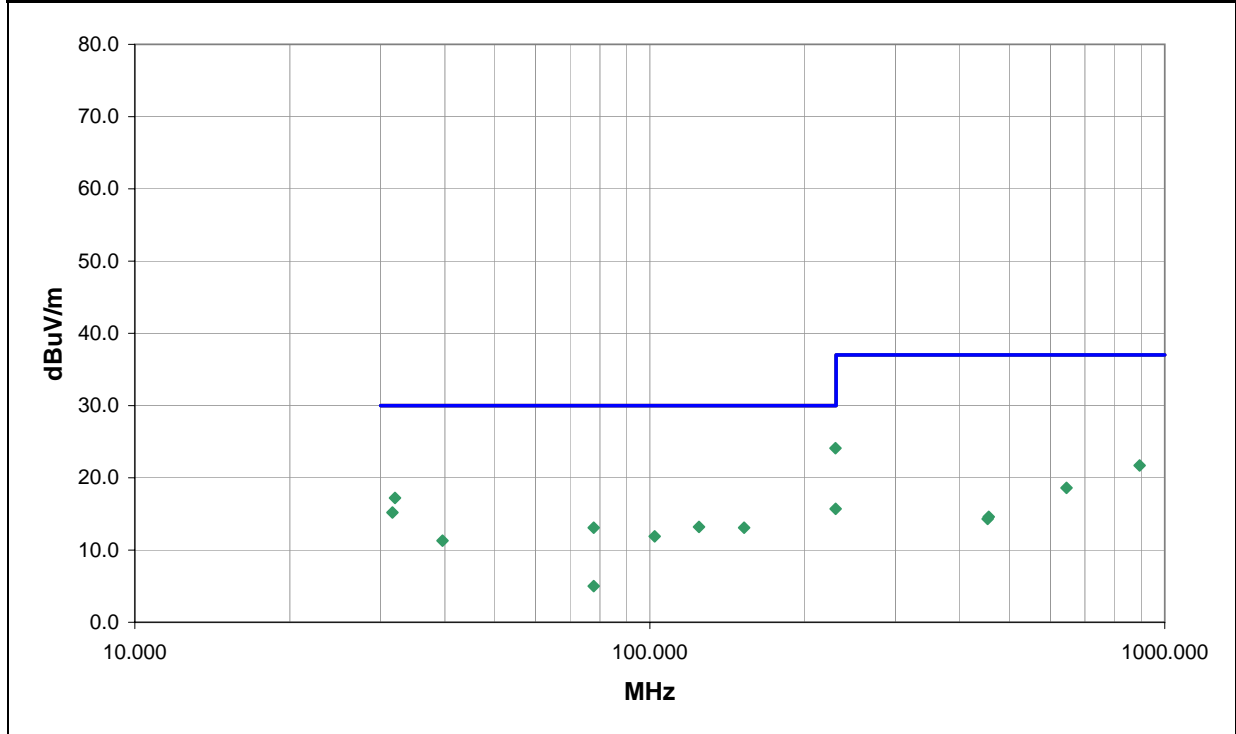
EUT OPERATING MODES

Transmitting, typical operating mode

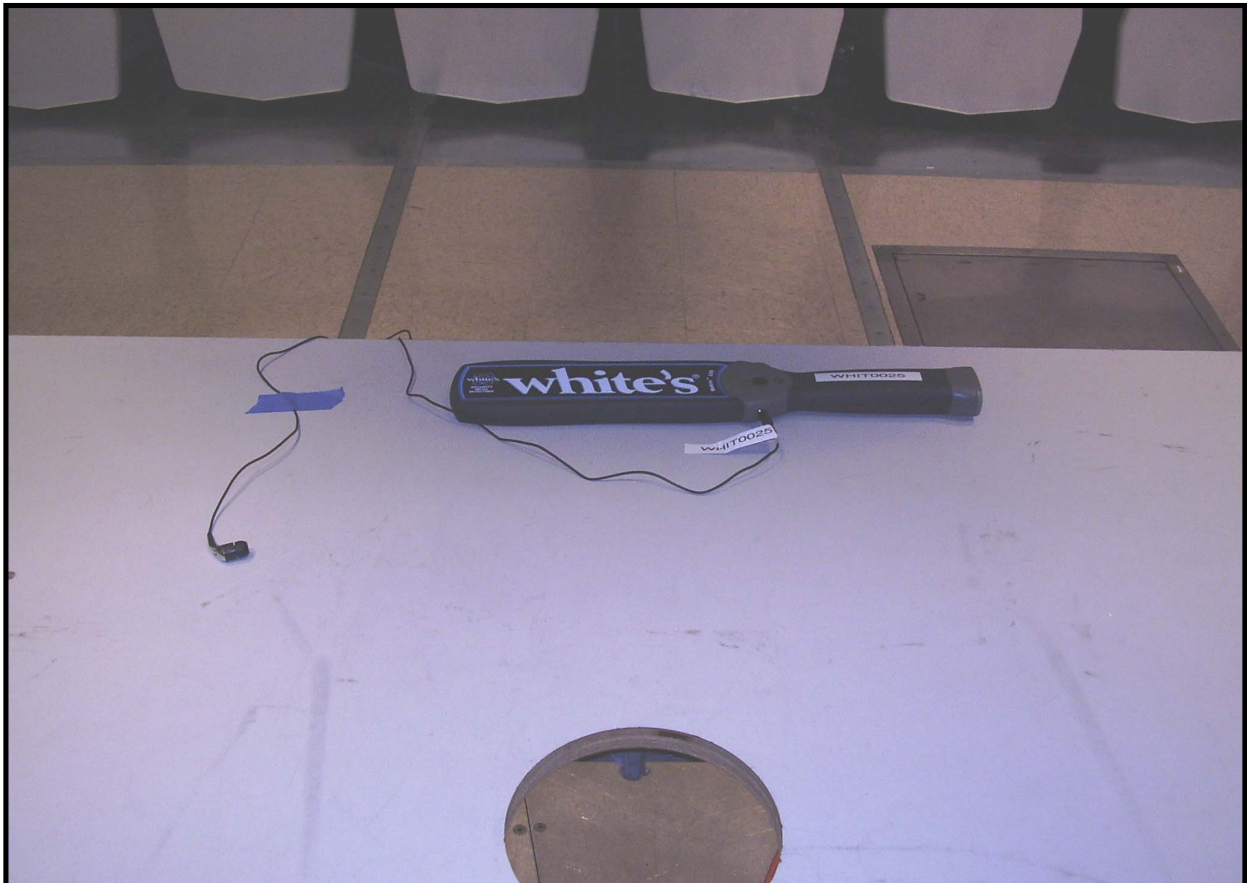
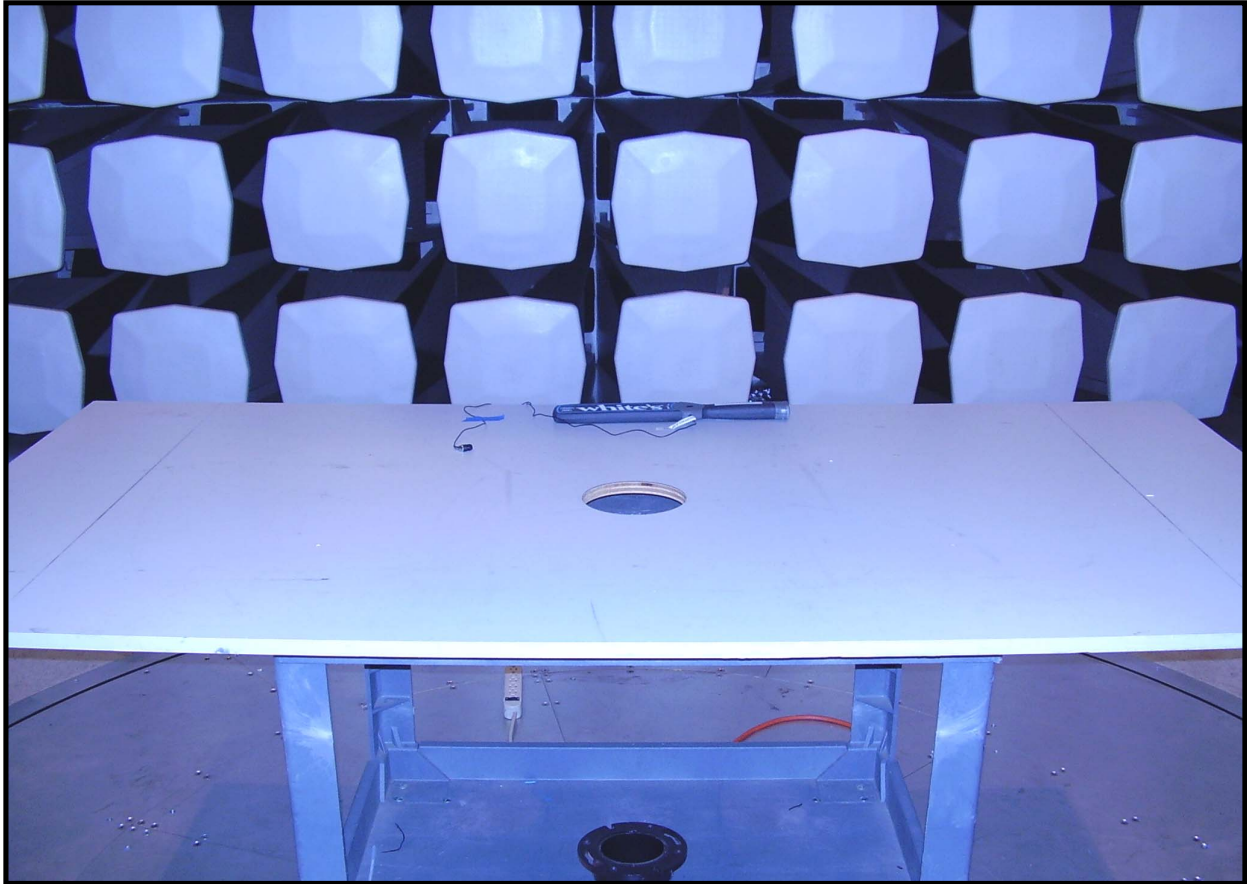
DEVIATIONS FROM TEST STANDARD

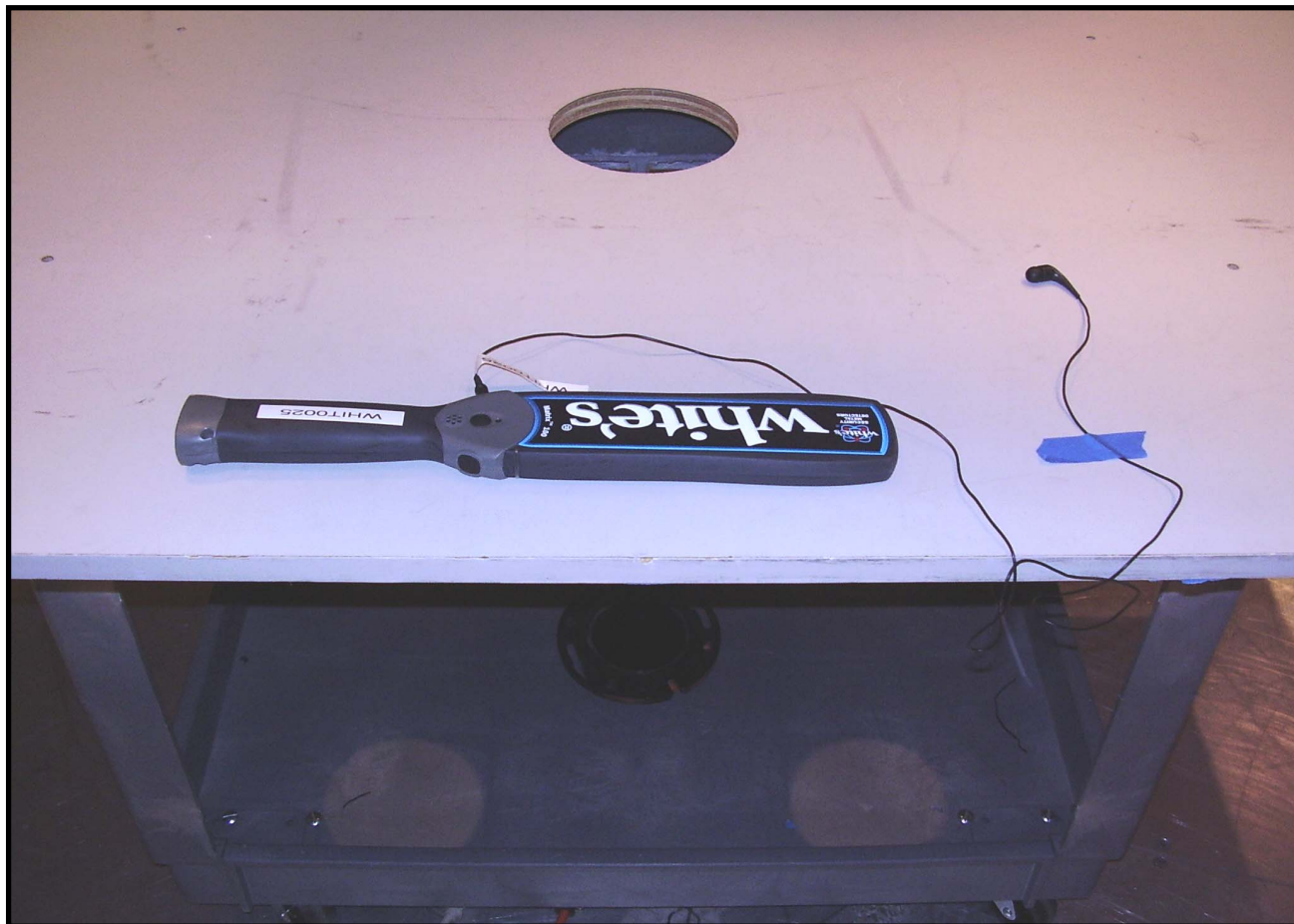
No deviations.

Run #	1	NVLAP Lab Code 200630-0	Signature <i>Holly Ashkannejhad</i>
Configuration #	1		
Results	Pass		



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
229.329	45.9	-21.8	340.0	3.5	10.0	0.0	H-Bilog	QP	0.0	24.1	30.0	-5.9
32.007	33.7	-16.5	93.0	3.5	10.0	0.0	H-Bilog	QP	0.0	17.2	30.0	-12.8
229.526	37.5	-21.8	281.0	3.4	10.0	0.0	V-Bilog	QP	0.0	15.7	30.0	-14.3
31.650	31.5	-16.3	0.0	2.3	10.0	0.0	V-Bilog	QP	0.0	15.2	30.0	-14.8
893.977	30.8	-9.1	257.0	1.5	10.0	0.0	H-Bilog	QP	0.0	21.7	37.0	-15.3
124.616	40.1	-26.9	138.0	3.8	10.0	0.0	H-Bilog	QP	0.0	13.2	30.0	-16.8
152.509	38.4	-25.3	246.0	1.0	10.0	0.0	H-Bilog	QP	0.0	13.1	30.0	-16.9
77.815	40.6	-27.5	360.0	3.5	10.0	0.0	H-Bilog	QP	0.0	13.1	30.0	-16.9
102.213	38.9	-27.0	170.0	3.5	10.0	0.0	H-Bilog	QP	0.0	11.9	30.0	-18.1
644.403	30.9	-12.3	0.0	3.5	10.0	0.0	H-Bilog	QP	0.0	18.6	37.0	-18.4
39.577	31.4	-20.1	124.0	3.5	10.0	0.0	H-Bilog	QP	0.0	11.3	30.0	-18.7
455.157	30.2	-15.6	141.0	3.5	10.0	0.0	H-Bilog	QP	0.0	14.6	37.0	-22.4
452.845	30.0	-15.7	158.0	3.5	10.0	0.0	H-Bilog	QP	0.0	14.3	37.0	-22.7
77.796	32.5	-27.5	77.0	3.3	10.0	0.0	V-Bilog	QP	0.0	5.0	30.0	-25.0





Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

MODES OF OPERATION

Transmitting

POWER SETTINGS INVESTIGATED

Battery

FREQUENCY RANGE INVESTIGATED

Start Frequency	9 kHz	Stop Frequency	30 MHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna, Loop	EMCO	6502	AOA	5/4/2005	24
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2006	13

MEASUREMENT BANDWIDTHS

	Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
	0.01 - 0.15	1.0	0.2	0.2
	0.15 - 30.0	10.0	9.0	9.0
	30.0 - 1000	100.0	120.0	120.0
	Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

MEASUREMENT UNCERTAINTY

Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements. The measurement uncertainty for any test is available upon request.

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting at its only available channel. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT in 3 orthogonal planes (per ANSI C63.4:2003).

Per FCC 15.31(f)(2), the measurement results were extrapolated to the specification distance by making measurements at 3 and 5 meter test distances on the same radial to determine the proper extrapolation factor.

EUT: Matrix 100	Work Order: WHIT0025
Serial Number: None	Date: 02/04/07
Customer: Whites Electronics, Inc.	Temperature: 19
Attendees: None	Humidity: 33%
Project: None	Barometric Pres.: 30.25
Tested by: Greg Kiemel	Power: Battery
	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.209:2006	ANSI C63.4:2003

TEST PARAMETERS	
Antenna Height(s) (m) 2 - 4	Test Distance (m) 3

COMMENTS

EUT OPERATING MODES

Transmitting

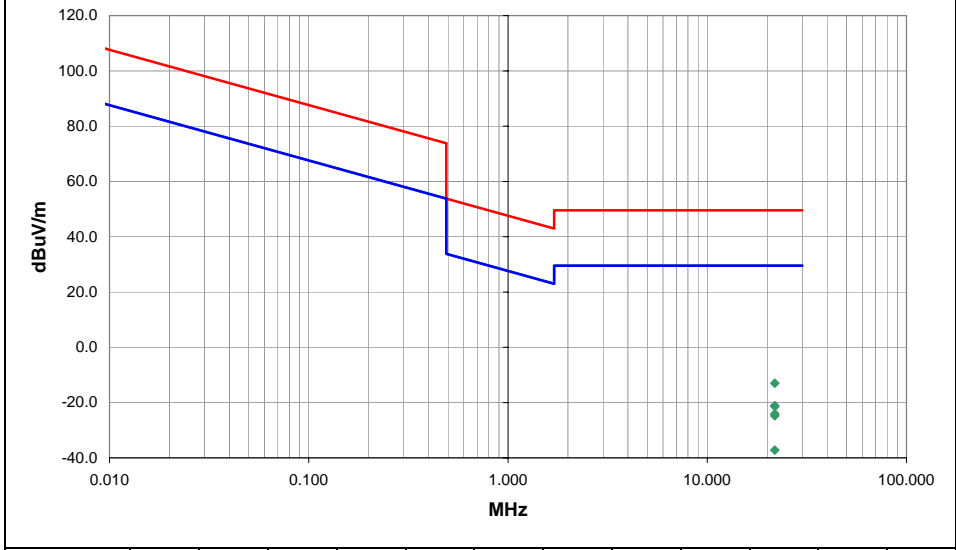
DEVIATIONS FROM TEST STANDARD

No deviations.

Run # 1

Configuration # 1

Results Pass NVLAP Lab Code 200630-0 Signature *JKP*



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
21.844	29.8	9.9	340.0	4.0	3.0	0.0	See notes	QP	64.5	-24.8	29.5	-54.3	Perp. to EUT, Perp. to Gnd. EUT Horiz.
21.840	28.7	9.9	160.0	4.0	3.0	0.0	See notes	QP	60.0	-21.4	29.5	-50.9	Perp. to EUT, Par. to Gnd. EUT Vertical
21.840	28.0	9.9	347.0	4.0	3.0	0.0	See notes	QP	59.0	-21.1	29.5	-50.6	Perp. to EUT, Perp. to Gnd. EUT Vertical
21.843	26.7	9.9	134.0	4.0	3.0	0.0	See notes	QP	49.6	-13.0	29.5	-42.5	Perp. to EUT, Par. to Gnd. EUT Horiz.
21.844	21.4	9.9	301.0	4.0	3.0	0.0	See notes	QP	68.5	-37.2	29.5	-66.7	Par. to EUT, Perp. to Gnd. EUT Horiz.
21.839	18.3	9.9	302.0	4.0	3.0	0.0	See notes	QP	52.3	-24.1	29.5	-53.6	Par. to EUT, Perp. to Gnd. EUT Vertical

EUT: Matrix 100	Work Order: WHIT0025
Serial Number: None	Date: 02/04/07
Customer: Whites Electronics, Inc.	Temperature: 19
Attendees: None	Humidity: 33%
Project: None	Barometric Pres.: 30.25
Tested by: Greg Kiemel	Power: Battery
	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.209:2006	ANSI C63.4:2003

TEST PARAMETERS	
Antenna Height(s) (m) 2 - 4	Test Distance (m) 5

COMMENTS

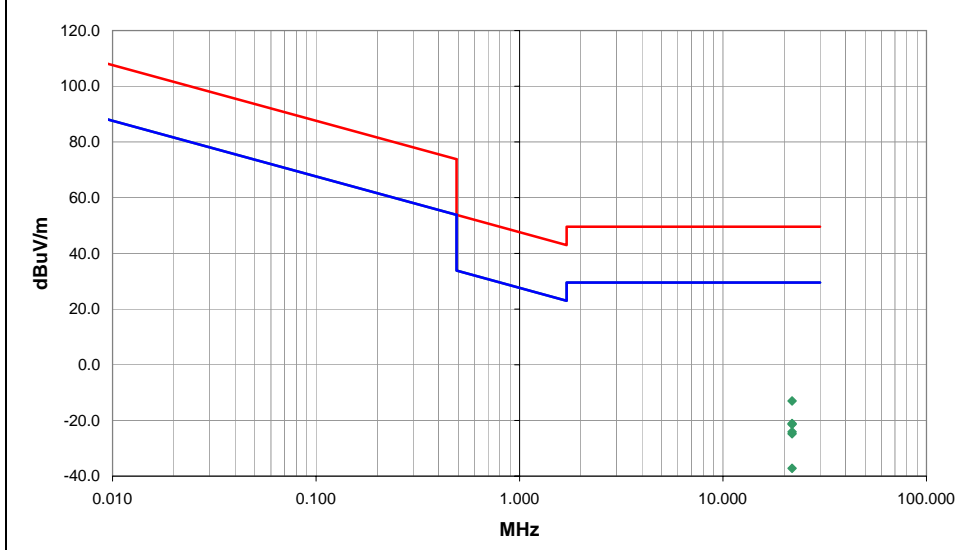
EUT OPERATING MODES
Transmitting

DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	2
Configuration #	1
Results	Pass

NVLAP Lab Code 200630-0

Signature *Greg Kiemel*



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
21.837	15.7	9.9	136.0	4.0	5.0	0.0	See notes	QP	38.6	-13.0	29.5	-42.5	Perp. to EUT, Par. to Gnd. EUT Horiz
21.837	15.5	9.9	340.0	4.0	5.0	0.0	See notes	QP	50.2	-24.8	29.5	-54.3	Perp. to EUT, Perp. to Gnd. EUT Horiz
21.835	15.4	9.9	160.0	4.0	5.0	0.0	See notes	QP	46.7	-21.4	29.5	-50.9	Perp. to EUT, Par. to Gnd. EUT Vert.
21.835	14.9	9.9	342.0	4.0	5.0	0.0	See notes	QP	45.9	-21.1	29.5	-50.6	Perp. to EUT, Perp. to Gnd. EUT Vert.
21.834	6.7	9.9	305.0	4.0	5.0	0.0	See notes	QP	40.7	-24.1	29.5	-53.6	Par. to EUT, Perp. to Gnd. EUT Vert.
21.836	6.2	9.9	300.0	4.0	5.0	0.0	See notes	QP	53.3	-37.2	29.5	-66.7	Par. to EUT, Perp. to Gnd. EUT Horiz

Distance Adjustment Factor for Radiated Emissions below 30 MHz

Method: Per 47 CFR 15.31(f)(2), a test distance correction factor was applied to the measurement data based upon the measured fall-off (at each frequency / polarity).

EUT: Matrix 100
S/N: none
Date: 2/4/2007
Job Number: WHIT0025

Frequency (MHz)	Loop Antenna Polarity	EUT Orientation	Test Distance (meters)	Adjusted Level (dBuV/m)	Fall-Off from 3 to 5 m (dB)	Extrapolation Factor for Specification Limit (dB / decade)	Test Distance of Spec. Limit (meters)	Distance Adjustment Factor (dB)
21.8440	Perp. EUT / Perp. Gnd	Horiz	3	39.7	14.3	64.5	30.0	64.5
			5	25.4				50.2
21.8400	Perp. EUT/ Par. Gnd	Vert.	3	38.6	13.3	60.0	30.0	60.0
			5	25.3				46.7
21.8400	Perp. EUT / Perp. Gnd	Vert.	3	37.9	13.1	59.0	30.0	59.0
			5	24.8				45.9
21.8430	Perp. EUT/ Par. Gnd	Horiz.	3	36.6	11.0	49.6	30.0	49.6
			5	25.6				38.6
21.8440	Par. EUT/ Perp. Gnd	Horiz.	3	31.3	15.2	68.5	30.0	68.5
			5	16.1				53.3
21.8390	Par. EUT/ Perp. Gnd	Vert.	3	28.2	11.6	52.3	30.0	52.3
			5	16.6				40.7





Attestation by the Responsible Party

Regulatory authorities require the "Responsible Party" to retain the test report. The test report must include the name and signature of an official of the Responsible Party.

To satisfy this requirement, the Responsible Party should complete the following attestation and maintain a copy with the test report:

Test Report #: _____ Test Date(s): _____

Model(s): _____ Responsible Party: _____

As an official of the Responsible Party, I attest that the product tested is representative of all production units bearing the same Model number(s)

Name: _____ Position: _____

Signature: _____ Date: _____

Additional information regarding product labeling and user manual information can be found at www.nwemc.com.