

Medea Design Group Inc., aka Music Sciences

Model 3000A

June 18, 2007

Report No. MUSI0007.1

Report Prepared By



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

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EMC Test Report

Certificate of Test
Issue Date: June 18, 2007
Medea Design Group Inc., aka Music Sciences
Model: Model 3000A

Emissions				
Test Description	Specification	Test Method	Pass	Fail
AC Powerline Conducted Emissions	FCC 15.107:2006	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Spurious Radiated Emissions	FCC 15.249:2006	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Absolute Gain & 3 dB Beamwidth	FCC 15.249:2006	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Field Strength of Fundamental	FCC 15.249:2006	ANSI C63.4:2003	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Field Strength of Harmonics	FCC 15.249:2006	ANSI C63.4:2003	<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:



Don Facteau, IS Manager

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

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

Revision Number	Description	Date	Page Number
00	None		

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



NVLAP: Northwest EMC, Inc. is 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.



NVLAP LAB CODE 200629-0
NVLAP LAB CODE 200630-0
NVLAP LAB CODE 200676-0
NVLAP LAB CODE 200761-0

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



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



TÜV Product Service: Included in 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: R-1943, C-2766, and T-298, 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.



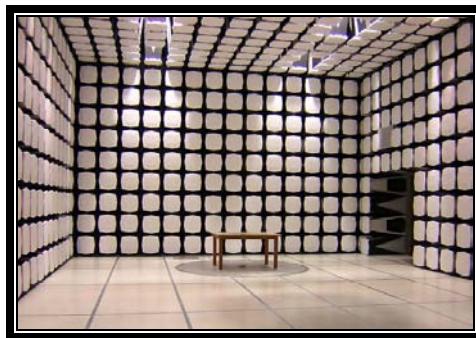
GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from 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:	Medea Design Group Inc., aka Music Sciences
Address:	1590 Murphy Pkwy
City, State, Zip:	Eagan, MN 55122
Test Requested By:	Don Moses
Model:	Model 3000A
First Date of Test:	June 4, 2007
Last Date of Test:	June 8, 2007
Receipt Date of Samples:	June 4, 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):**

24 GHz radio transceiver that transmits multiple digital audio channels in one scrambled digital audio data stream by means of FSK modulation on a 24.16GHz RF signal, point-to-point in one direction.

Testing Objective:

Seeking TCB authorization under FCC 15.249.

CONFIGURATION 1 MUSI0007

EUT					
Description		Manufacturer		Model/Part Number	Serial Number
EUT Transmitter (1)		Medea Design Group Inc., aka Music Sciences		3000A	Unknown
17 dBi Horn Antenna (Internal)		Unknown		6100	Unknown

Remote Equipment Outside of Test Setup Boundary

Description		Manufacturer		Model/Part Number	Serial Number
Audio Module - Tx		Medea Design Group Inc., aka Music Sciences		Unknown	Unknown
Power Supply - Tx		Phihong		PSA65U-240	C22401384AS

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
PoE	No	3m	No	Audio module	EUT
DC	No	1.2m	Yes	Audio module - Tx	Power Supply - Tx
AC	No	2.0m	No	Power Supply - Tx	AC Mains

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

CONFIGURATION 2 MUSI0007

EUT					
Description		Manufacturer		Model/Part Number	Serial Number
EUT Transmitter (2)		Medea Design Group Inc., aka Music Sciences		3000A	Unknown
Parabolic Dish Antenna		Unknown		Unknown	Unknown

Remote Equipment Outside of Test Setup Boundary

Description		Manufacturer		Model/Part Number	Serial Number
Audio Module - Tx		Medea Design Group Inc., aka Music Sciences		Unknown	Unknown
Power Supply - Tx		Phihong		PSA65U-240	C22401384AS

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
PoE	No	3m	No	Audio module	EUT
DC	No	1.2m	Yes	Audio module - Tx	Power Supply - Tx
AC	No	2.0m	No	Power Supply - Tx	AC Mains

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

CONFIGURATION 3 MUSI0007

EUT					
Description	Manufacturer	Model/Part Number	Serial Number		
EUT Receiver	Medea Design Group Inc., aka Music Sciences	3000A	Unknown		

Remote Equipment Outside of Test Setup Boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
Audio Module - Rx	Medea Design Group Inc., aka Music Sciences	Unknown	Unknown		
Power Supply - Rx	Phihong	PSA65U-240	C22401385A6		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
PoE	No	3m	No	Audio module	EUT
DC	No	1.2m	Yes	Audio module - Rx	Power Supply - Rx
AC	No	2.0m	No	Power Supply - Rx	AC Mains

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

CONFIGURATION 4 MUSI0007

EUT					
Description	Manufacturer	Model/Part Number	Serial Number		
17 dBi Horn Antenna (Internal)	Unknown	6100	Unknown		
EUT Transmitter - with notch filter (1)	Medea Design Group Inc., aka Music Sciences	3000A	Unknown		

Remote Equipment Outside of Test Setup Boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
Audio Module - Tx	Medea Design Group Inc., aka Music Sciences	Unknown	Unknown		
Power Supply - Tx	Phihong	PSA65U-240	C22401384AS		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
PoE	No	3m	No	Audio module	EUT
DC	No	1.2m	Yes	Audio module - Tx	Power Supply - Tx
AC	No	2.0m	No	Power Supply - Tx	AC Mains

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

CONFIGURATION 5 MUSI0007

EUT					
Description	Manufacturer		Model/Part Number	Serial Number	
EUT Transmitter (2)	Medea Design Group Inc., aka Music Sciences		3000A	Unknown	
Parabolic Dish Antenna	Unknown		Unknown	Unknown	

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
Audio Module - Tx	Medea Design Group Inc., aka Music Sciences	Unknown	Unknown
Power Supply - Rx	Phihong	PSA65U-240	C22401385A6

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC	No	1.2m	Yes	Audio module - Tx	Power Supply - Tx
AC	No	2.0m	No	Power Supply - Tx	AC Mains
PoE	No	1m	No	Audio module	EUT

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

CONFIGURATION 6 MUSI0007

EUT					
Description	Manufacturer		Model/Part Number	Serial Number	
EUT Receiver	Medea Design Group Inc., aka Music Sciences		3000A	Unknown	
17 dBi Horn Antenna (Internal)	Unknown		6100	Unknown	

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
Audio Module - Rx	Medea Design Group Inc., aka Music Sciences	Unknown	Unknown
Power Supply - Rx	Phihong	PSA65U-240	C22401385A6

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC	No	1.2m	Yes	Audio module - Rx	Power Supply - Rx
AC	No	2.0m	No	Power Supply - Rx	AC Mains
PoE	No	1m	No	Audio module	EUT

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	6/4/2007	Field Strength of Fundamental – Dish Antenna	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	6/5/2007	Field Strength of Fundamental - Horn antenna	Modified from delivered configuration. Initial or No Modification	Lowered gain by inserting an attenuator. Modification done by Don Moses.	EUT remained at Northwest EMC following the test.
3	6/5/2007	Harmonics of the 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	6/6/2007	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.
5	6/7/2007	Receiver Spurious Emissions	Modified from delivered configuration. Initial or No Modification	Added extra conductive foam internal on I/O end and improved grounding and shielding on ends and top. Added waveguide filter on antenna. Modification done by Don Moses.	EUT remained at Northwest EMC following the test.
6	6/8/2007	AC Power Conducted 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 24.16 GHz

POWER SETTINGS INVESTIGATED

Power over Ethernet

FREQUENCY RANGE INVESTIGATED

Start Frequency 24.05 GHz Stop Frequency 24.25 GHz

CLOCKS AND OSCILLATORS

24.16 GHz, 465 MHz, 6 GHz

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
EV01 Cable D			EVD	3/30/2006	15
Antenna, Horn	EMCO	3160-09	AHG	NCR	0
Spectrum Analyzer	Agilent	E4446A	AAT	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

The antenna to be used with the EUT were tested. The EUT was transmitting and/or receiving while set at it's single operating channel and single operating mode. 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).

Field Strength of the Fundamental

EUT: Model 3000A

Work Order: MUSI0007

Serial Number: Unknown

Date: 06/04/07

Customer: Medea Design Group Inc., aka Music Sciences

Temperature: 23

Attendees: Don Moses

Humidity: 48%

Project: None

Barometric Pres.: 29.93

Tested by: Holly Ashkannejhad

Job Site: EV01

TEST SPECIFICATIONS

Test Method

FCC 15.249:2006

ANSI C63.4:2003

TEST PARAMETERS

Antenna Height(s) (m) 1 - 4

Test Distance (m)

3

COMMENTS

Parabolic dish with > 33 dBi gain

EUT OPERATING MODES

Transmitting 24.16 GHz

DEVIATIONS FROM TEST STANDARD

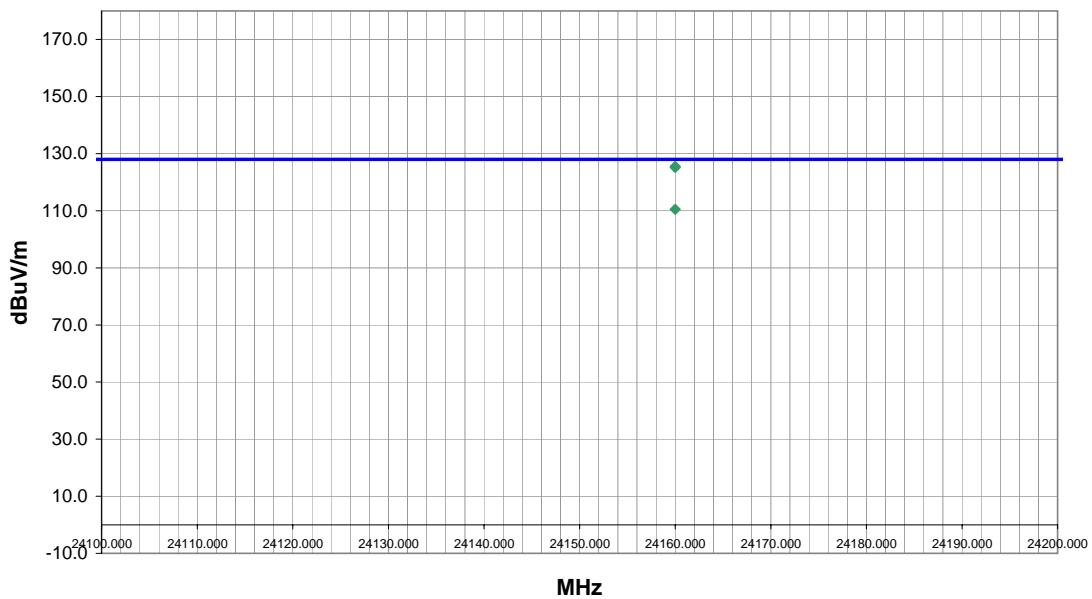
No deviations.

Run # 2

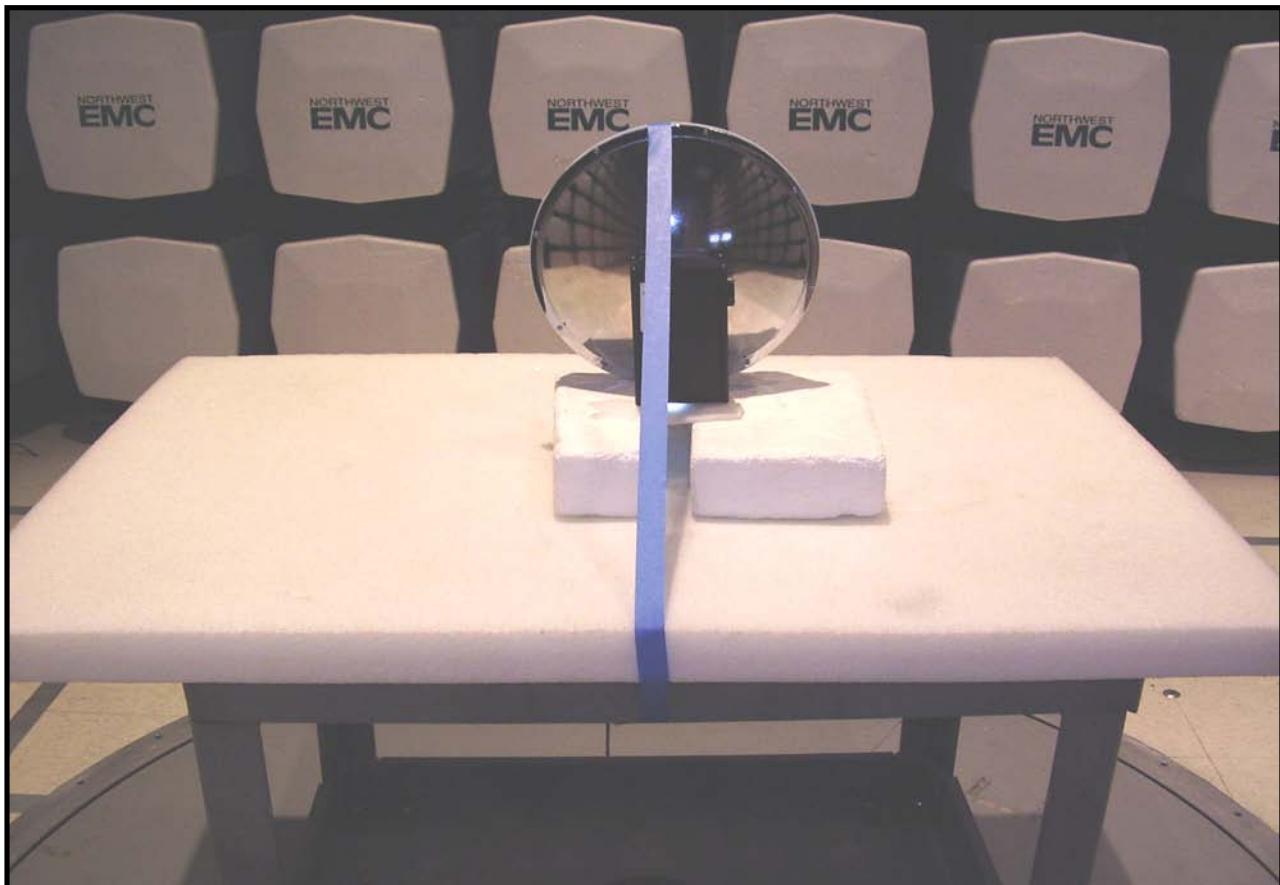
Configuration # 2

Results Pass

Signature

Holly Ashkannejhad

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
24160.000	79.0	46.5	361.0	1.0	3.0	0.0	V-High Horr	PK	0.0	125.5	128.0	-2.5	EUT vertical
24160.000	78.7	46.5	361.0	1.0	3.0	0.0	H-High Horr	PK	0.0	125.2	128.0	-2.8	EUT on side
24160.000	64.0	46.5	360.0	1.0	3.0	0.0	H-High Horr	PK	0.0	110.5	128.0	-17.5	EUT vertical





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 single channel

POWER SETTINGS INVESTIGATED

120V/60Hz

SAMPLE CALCULATIONS

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Receiver	Rohde & Schwartz	ESCI	ARG	12/7/2006	13
EV07 cable d			EVG	4/17/2007	13
Attenuator	Tektronix	011-0059-02	ATC	12/27/2006	13
High Pass Filter	TTE	H97-100K-50-720B	HFX	8/22/2006	13
LISN	Solar	9252-50-R-24-BNC	LIP	12/20/2006	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	0.2
0.15 - 30.0	10.0	9.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0	120.0
Above 1000	1000.0	N/A	N/A	1000.0

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

MEASUREMENT UNCERTAINTY

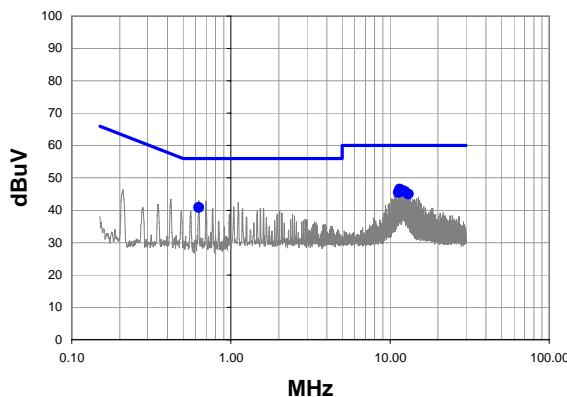
Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated 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

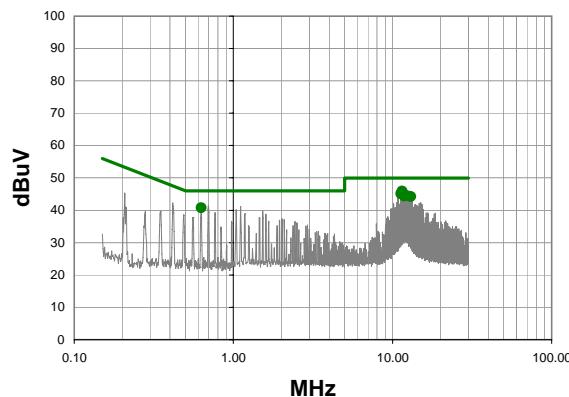
Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50Ω.

Work Order:	MUSI0007	Date:	06/08/07	<i>Rodney L. Peloquin</i>
Project:	Unknown	Temperature:	23	
Job Site:	EV07	Humidity:	48	
Serial Number:	None	Barometric Pres.:	29.93	Tested by: Rod Peloquin
EUT:	Model 3000A			
Configuration:	5 - Tx with parabolic dish			
Customer:	Medea Design Group Inc., aka Music Sciences			
Attendees:	Don Moses			
EUT Power:	120V/60Hz			
Operating Mode:	Transmitting single channel			
Deviations:	No deviations.			
Comments:	Highest Gain antenna (Parabolic dish)			
Test Specifications		Class B	Test Method	
FCC 15.107:2006			ANSI C63.4:2003	
Run #	9	Line:	High Line	Ext. Attenuation:
			20	Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



Quasi Peak Data - vs - Quasi Peak Limit

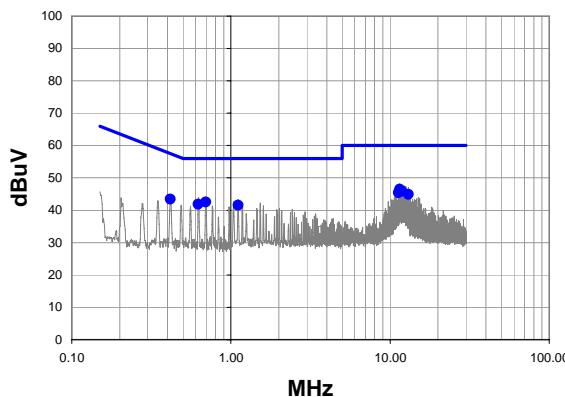
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
11.520	26.0	0.5	46.5	60.0	-13.5
11.810	25.4	0.5	45.9	60.0	-14.1
12.290	25.4	0.5	45.9	60.0	-14.1
11.280	25.0	0.5	45.5	60.0	-14.5
13.010	24.5	0.5	45.0	60.0	-15.0
0.628	20.1	0.7	40.8	56.0	-15.2

Average Data - vs - Average Limit

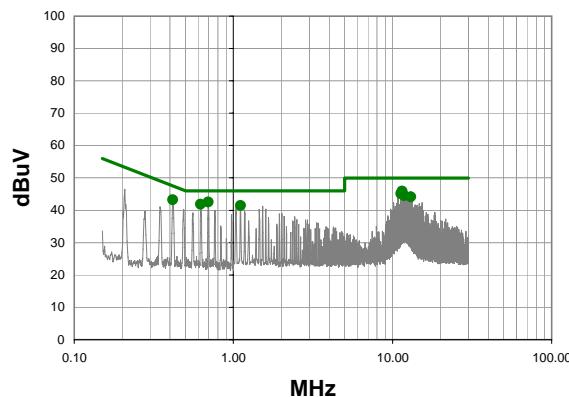
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
11.520	25.4	0.5	45.9	50.0	-4.1
11.280	24.6	0.5	45.1	50.0	-4.9
0.628	20.0	0.7	40.7	46.0	-5.3
12.290	24.0	0.5	44.5	50.0	-5.5
11.810	23.9	0.5	44.4	50.0	-5.6
13.010	23.7	0.5	44.2	50.0	-5.8

Work Order:	MUSI0007	Date:	06/08/07	<i>Rodney L. Peloquin</i>
Project:	Unknown	Temperature:	23	
Job Site:	EV07	Humidity:	48	
Serial Number:	None	Barometric Pres.:	29.93	Tested by: Rod Peloquin
EUT:	Model 3000A			
Configuration:	5 - Tx with parabolic dish			
Customer:	Medea Design Group Inc., aka Music Sciences			
Attendees:	Don Moses			
EUT Power:	120V/60Hz			
Operating Mode:	Transmitting single channel			
Deviations:	No deviations.			
Comments:	Highest Gain antenna (Parabolic dish)			
Test Specifications		Class B	Test Method	
FCC 15.107:2006			ANSI C63.4:2003	
Run #	10	Line:	Neutral	Ext. Attenuation:
				20
				Results
				Pass

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit

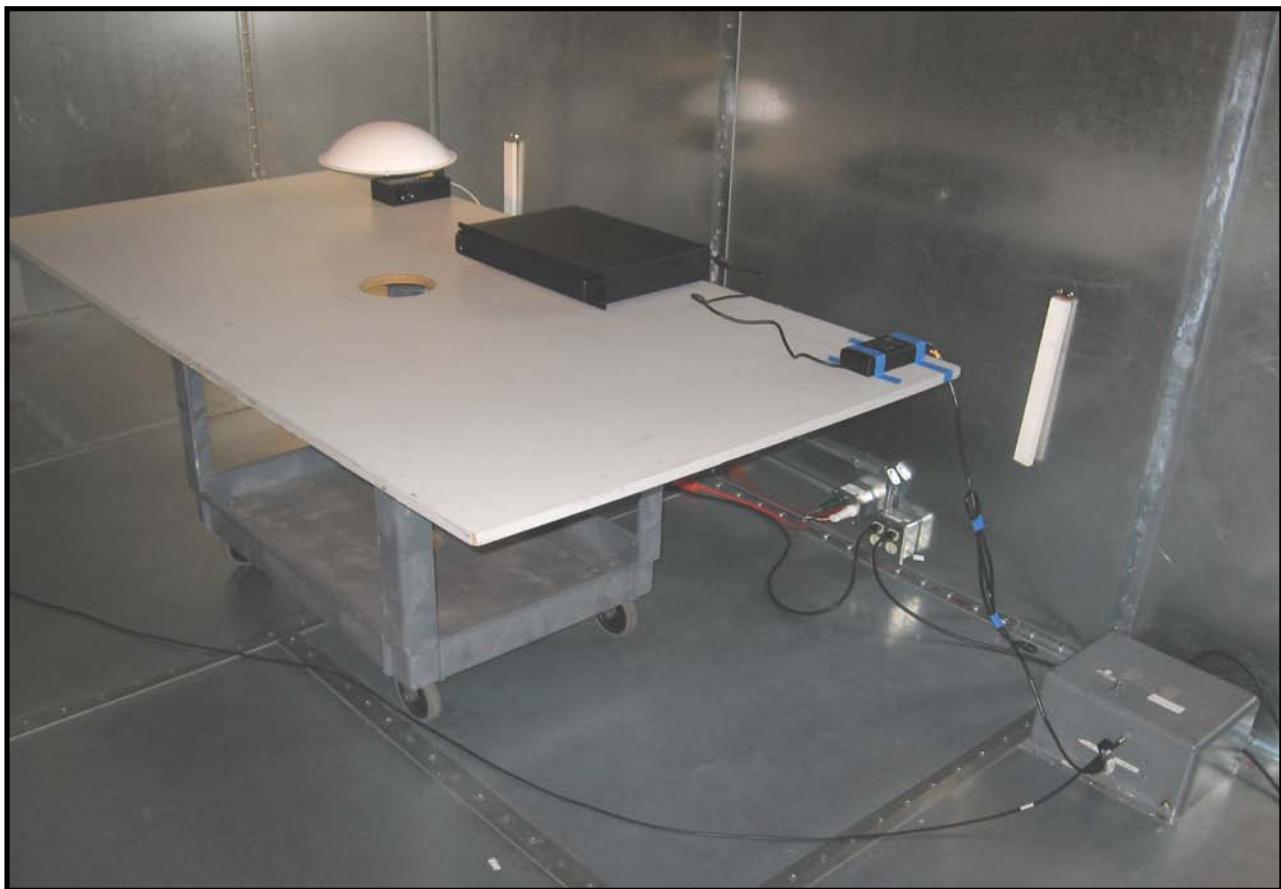


Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.696	21.8	0.7	42.5	56.0	-13.5
11.520	26.0	0.5	46.5	60.0	-13.5
0.417	22.6	0.9	43.5	57.5	-14.0
11.810	25.4	0.5	45.9	60.0	-14.1
0.624	21.1	0.7	41.8	56.0	-14.2
1.112	21.0	0.5	41.5	56.0	-14.5
11.280	24.9	0.5	45.4	60.0	-14.6
13.010	24.4	0.5	44.9	60.0	-15.1

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.696	21.8	0.7	42.5	46.0	-3.5
11.520	25.4	0.5	45.9	50.0	-4.1
0.624	21.1	0.7	41.8	46.0	-4.2
0.417	22.4	0.9	43.3	47.5	-4.2
1.112	20.9	0.5	41.4	46.0	-4.6
11.280	24.6	0.5	45.1	50.0	-4.9
11.810	24.0	0.5	44.5	50.0	-5.5
13.010	23.6	0.5	44.1	50.0	-5.9





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 24.16 GHz

POWER SETTINGS INVESTIGATED

Power over Ethernet

FREQUENCY RANGE INVESTIGATED

Start Frequency 24.05 GHz Stop Frequency 24.25 GHz

CLOCKS AND OSCILLATORS

24.16 GHz, 465 MHz, 6 GHz

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
EV01 Cable D			EVD	3/30/2006	15
Antenna, Horn	EMCO	3160-09	AHG	NCR	0
Spectrum Analyzer	Agilent	E4446A	AAT	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

The antenna to be used with the EUT were tested. The EUT was transmitting and/or receiving while set at its single operating channel and single operating mode. 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).

Field Strength of the Fundamental

EUT: Model 3000A	Work Order: MUSI0007
Serial Number: Unknown	Date: 06/05/07
Customer: Medea Design Group Inc., aka Music Sciences	Temperature: 23
Attendees: Don Moses	Humidity: 48%
Project: None	Barometric Pres.: 29.93
Tested by: Rod Peloquin	Job Site: EV01

TEST SPECIFICATIONS

FCC 15.249:2006	Test Method ANSI C63.4:2003
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TEST PARAMETERS

Antenna Height(s) (m)	1-2	Test Distance (m)	3
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COMMENTS

Model 6100 horn antenna w/ 17 dBi gain: Added waveguide filter to RF path

EUT OPERATING MODES

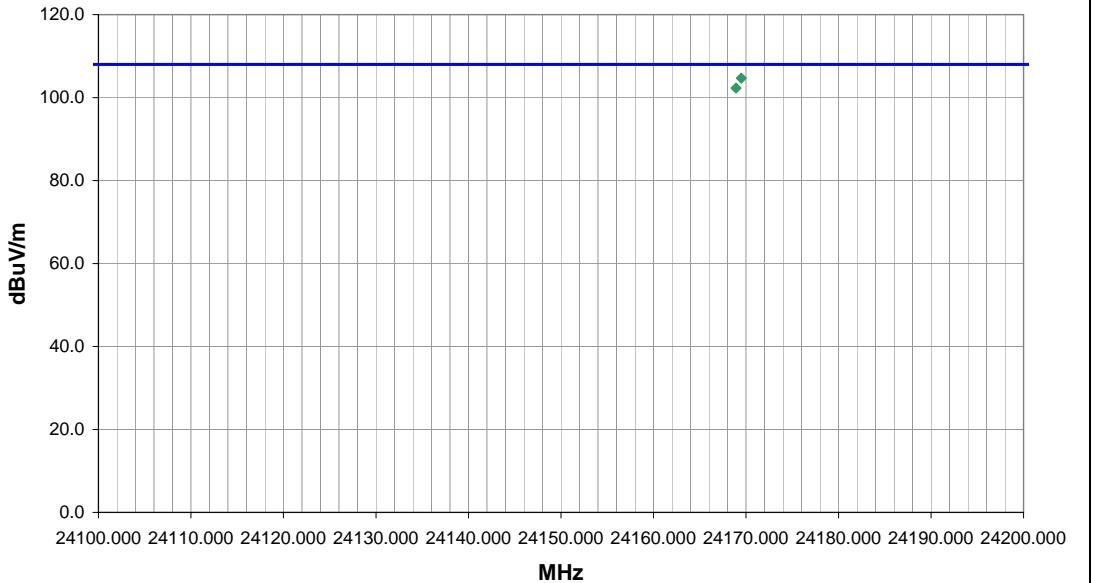
Transmitting 24.16 GHz

DEVIATIONS FROM TEST STANDARD

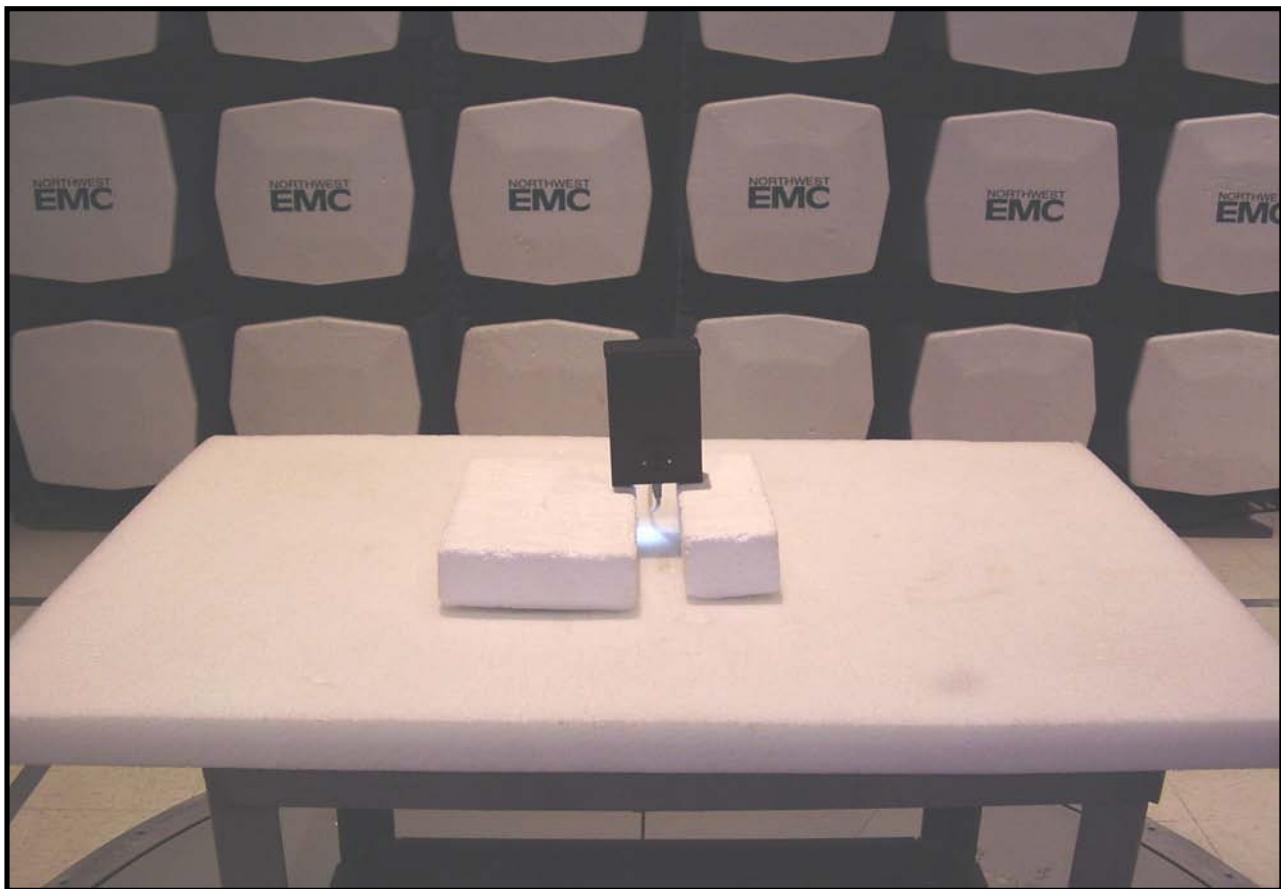
No deviations.

Run #	7
Configuration #	4
Results	Pass

Rodney L. Peloquin
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
24169.500	58.2	46.5	360.0	1.3	0.0	0.0	I-High Horr	PK	0.0	104.7	108.0	-3.3	EUT horizontal
24168.920	55.8	46.5	360.0	1.2	0.0	0.0	V-High Horr	PK	0.0	102.3	108.0	-5.7	EUT on side







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
Duplexer	OML, Inc.	DPL26			
Mixer	OML, Inc.	M19HWD			
Horn Antenna	OML, Inc.	M19RH			
Mixer	OML, Inc.	M12HWD			
Horn Antenna	OML, Inc.	M12RH			
Mixer	OML, Inc.	M08HWD			
Horn Antenna	OML, Inc.	M08RH			

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 with an unmodulated carrier. The testing was done at distances closer than 3m as called out in the data sheets. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna orientation and polarization, and manipulating the EUT and EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003). The specification limit was adjusted for the closer test distances at 20 dB per decade as called out in the following table:

	Spec limit				
3m	20 cm	10 cm	5 cm	2 cm	
Average	68	91.5	97.5	103.6	111.5
Peak	88	111.5	117.5	123.6	131.5

The analyzer display was offset with the value of the test equipment losses (mixers, duplexers, and cables) specific to each band and the antenna factor per the following table:

Freq (MHz)	Antenna Gain (dBi)	Antenna Factor (dB/m)	Mixer / Duplexer loss (dB)	Analyzer Offset (dB)
48320.00	24.00	39.90	31.78	71.68
72480.00	24.00	43.42	46.89	90.31
96640.00	24.00	45.92	50.00	95.92

FIELD STRENGTH OF HARMONICS

EUT: Model 3000A	Work Order: MUSI0007
Serial Number: Unknown	Date: 06/05/07
Customer: Music Sciences	Temperature: 23°C
Attendees: None	Humidity: 39%
Project: None	Barometric Pres.: 29.93
Tested by: Rod Peloquin	Job Site: EV01

TEST SPECIFICATIONS

FCC 15.249:2006	Test Method
	ANSI C63.4:2003

COMMENTS

Transmitting 24.16 GHz with > 33 dBi parabolic dish

DEVIATIONS FROM TEST STANDARD

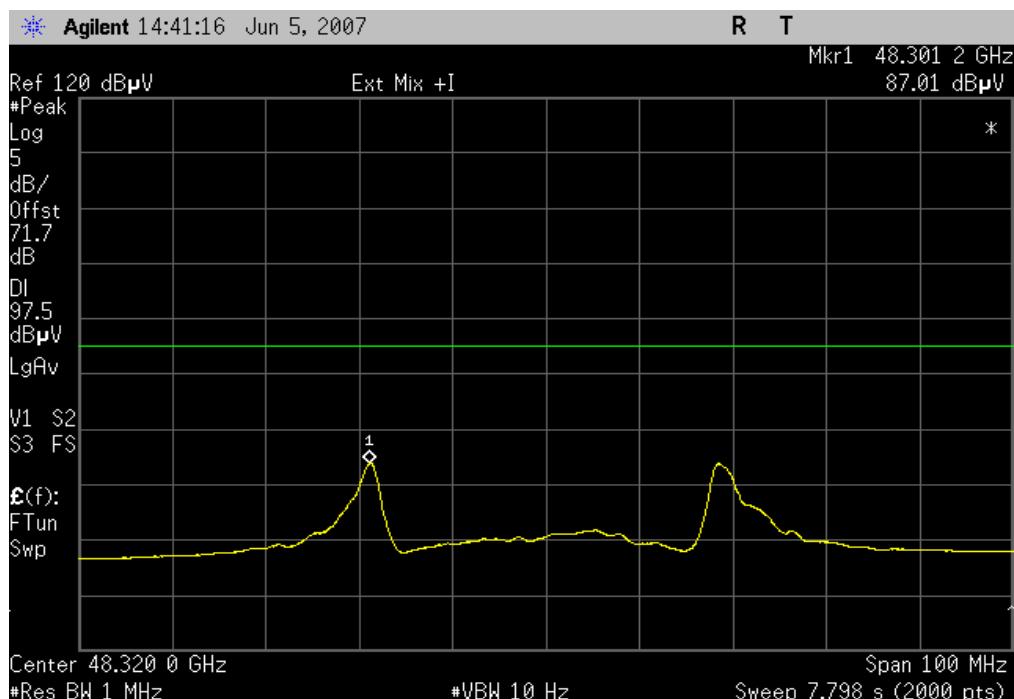
Testing was completed at a distance closer than 3m. Specification limit was extrapolated for the closer test distances.

Configuration #	1	Signature		
				

		Value	Limit	Results
2nd Harmonic	Average	87.01 dB μ V/m	97.5 dB μ V/m @ 10 cm	Pass
	Peak	100.28 dB μ V/m	117.5 dB μ V/m @ 10 cm	Pass
3rd Harmonic	Average	98.26 dB μ V/m	103.6 dB μ V/m @ 5 cm	Pass
	Peak	112.45 dB μ V/m	123.6 dB μ V/m @ 5 cm	Pass
4th Harmonic	Average	104.94 dB μ V/m	111.5 dB μ V/m @ 2 cm	Pass
	Peak	118.40 dB μ V/m	131.5 dB μ V/m @ 2 cm	Pass

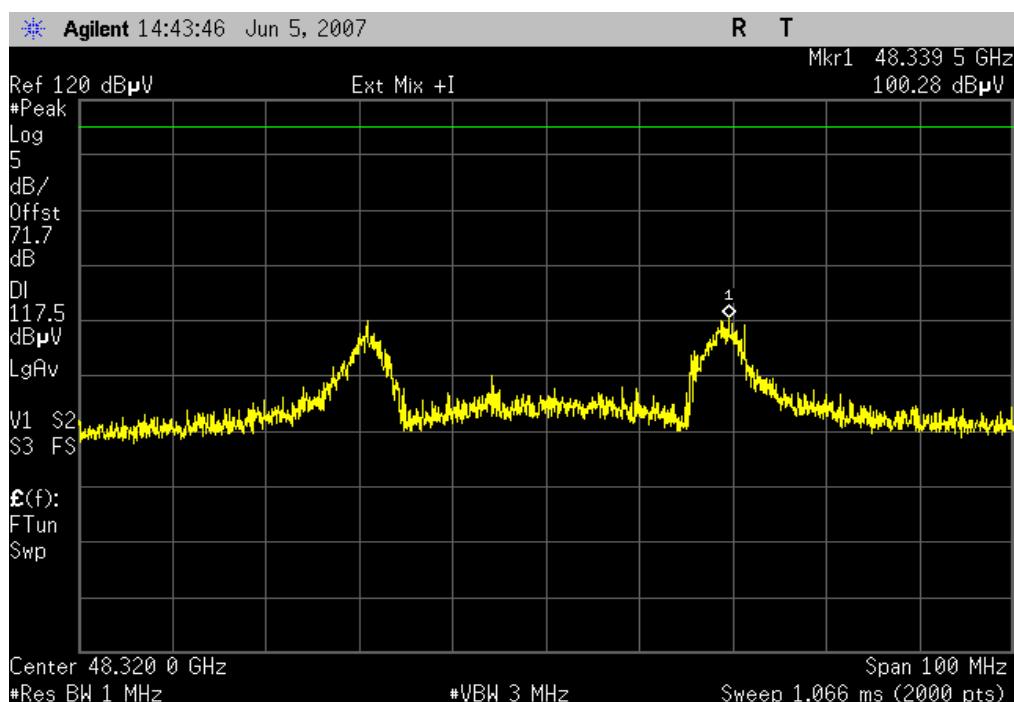
2nd Harmonic, Average

Result: Pass

Value: 87.01 dB μ V/mLimit: 97.5 dB μ V/m @ 10 cm

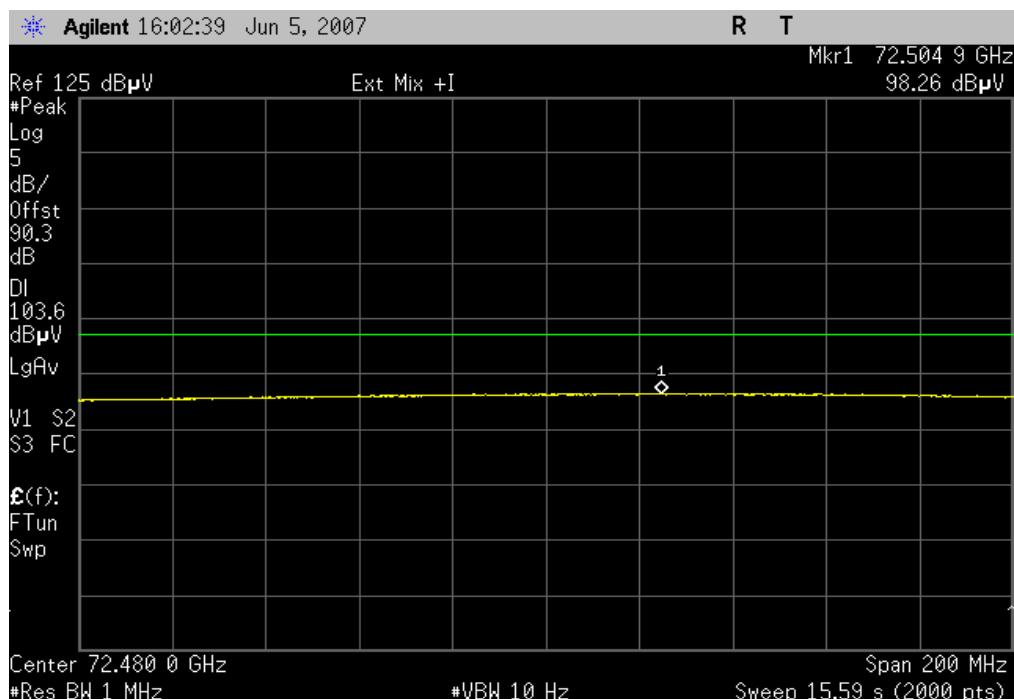
2nd Harmonic, Peak

Result: Pass

Value: 100.28 dB μ V/mLimit: 117.5 dB μ V/m @ 10 cm

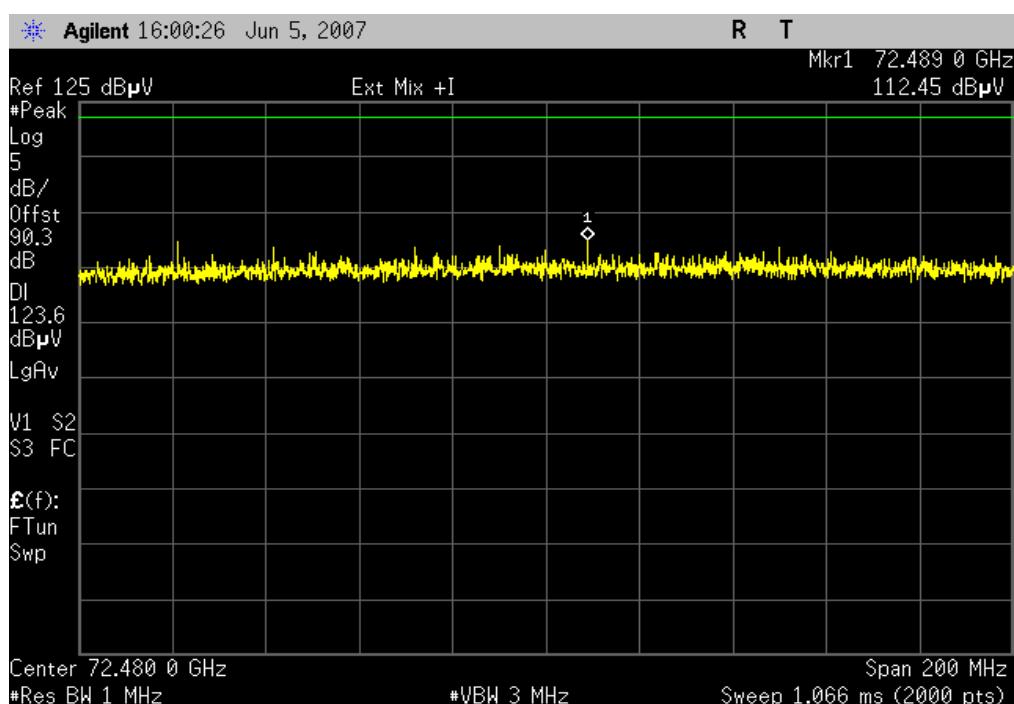
3rd Harmonic, Average

Result: Pass

Value: 98.26 dB μ V/mLimit: 103.6 dB μ V/m @ 5 cm

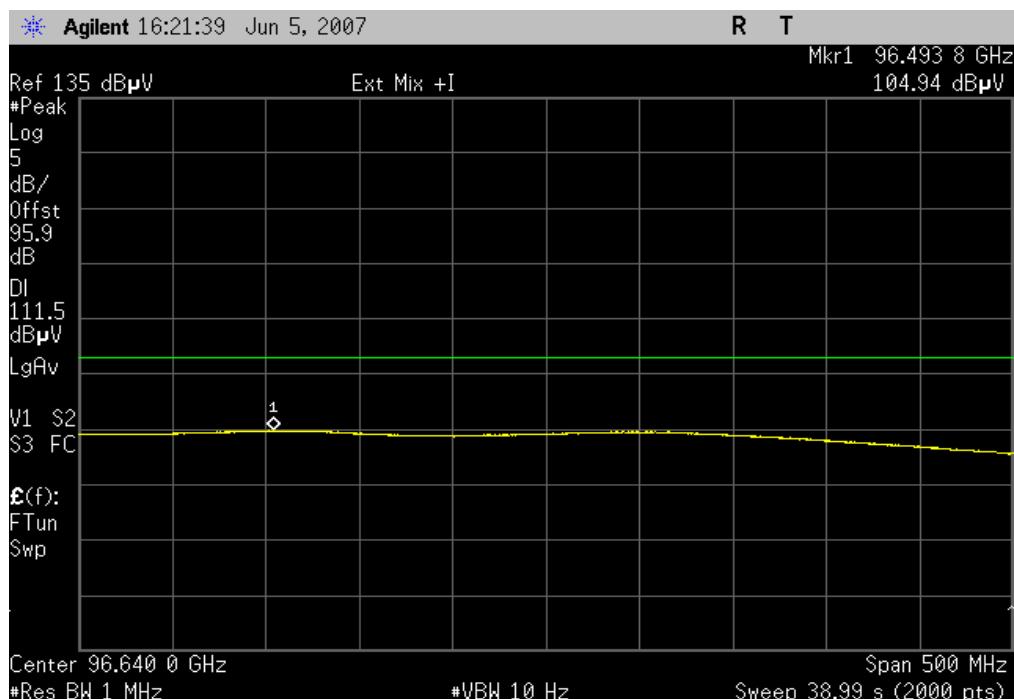
3rd Harmonic, Peak

Result: Pass

Value: 112.45 dB μ V/mLimit: 123.6 dB μ V/m @ 5 cm

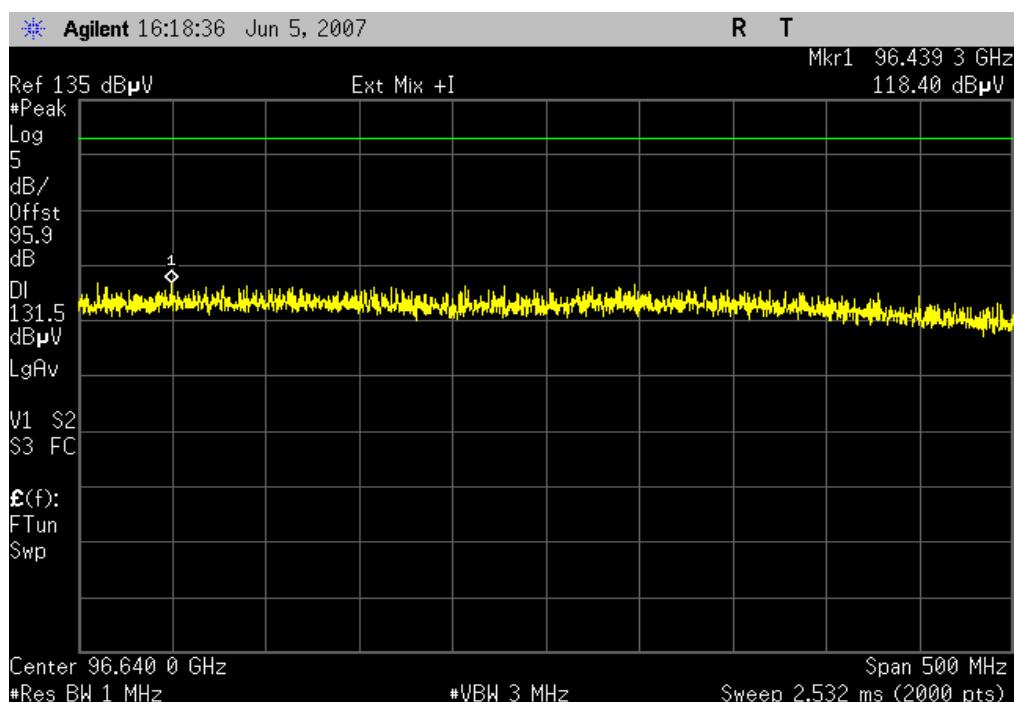
4th Harmonic, Average

Result: Pass

Value: 104.94 dB μ V/mLimit: 111.5 dB μ V/m @ 2 cm

4th Harmonic, Peak

Result: Pass

Value: 118.40 dB μ V/mLimit: 131.5 dB μ V/m @ 2 cm



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
Duplexer	OML, Inc.	DPL26			
Mixer	OML, Inc.	M19HWD			
Horn Antenna	OML, Inc.	M19RH			
Mixer	OML, Inc.	M12HWD			
Horn Antenna	OML, Inc.	M12RH			
Mixer	OML, Inc.	M08HWD			
Horn Antenna	OML, Inc.	M08RH			

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 with an unmodulated carrier. The testing was done at distances closer than 3m as called out in the data sheets. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna orientation and polarization, and manipulating the EUT and EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003). The specification limit was adjusted for the closer test distances at 20 dB per decade as called out in the following table:

	Spec limit				
	3m	20 cm	10 cm	5 cm	2 cm
Average	68	91.5	97.5	103.6	111.5
Peak	88	111.5	117.5	123.6	131.5

The analyzer display was offset with the value of the test equipment losses (mixers, duplexers, and cables) specific to each band and the antenna factor per the following table:

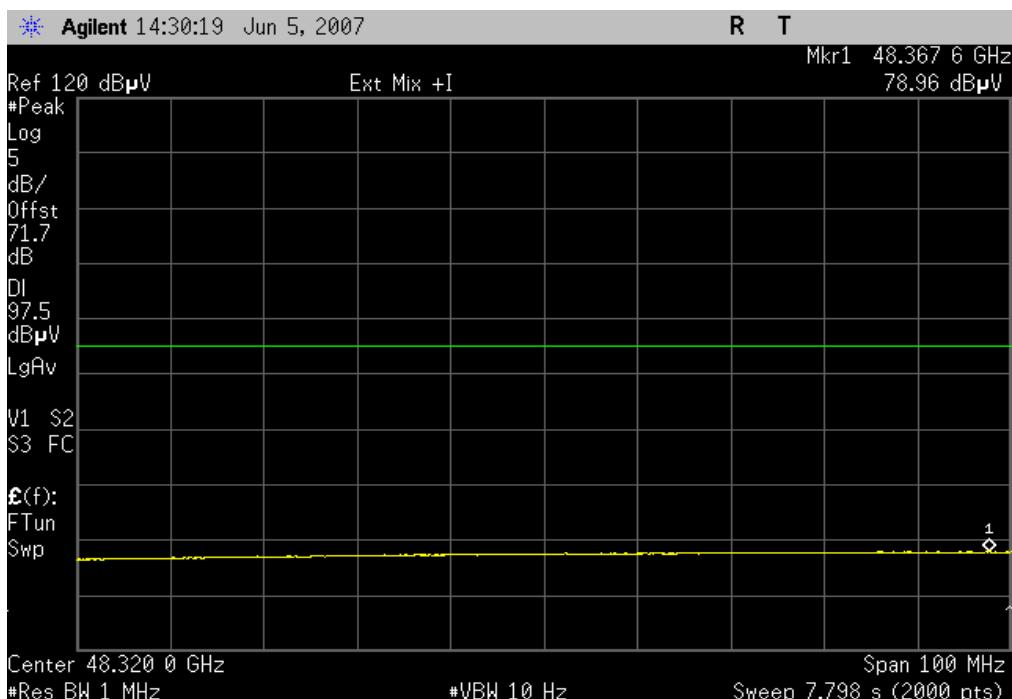
Freq (MHz)	Antenna Gain (dBi)	Antenna Factor (dB/m)	Mixer / Duplexer loss (dB)	Analyzer Offset (dB)
48320.00	24.00	39.90	31.78	71.68
72480.00	24.00	43.42	46.89	90.31
96640.00	24.00	45.92	50.00	95.92

FIELD STRENGTH OF HARMONICS

EUT: Model 3000A	Work Order: MUSI0007			
Serial Number: Unknown	Date: 06/05/07			
Customer: Music Sciences	Temperature: 23°C			
Attendees: None	Humidity: 39%			
Project: None	Barometric Pres.: 29.93			
Tested by: Rod Peloquin	Job Site: EV01			
TEST SPECIFICATIONS				
FCC 15.249:2006				
ANSI C63.4:2003				
COMMENTS				
Transmitting 24.16 GHz with internal horn antenna and waveguide notch filter				
DEVIATIONS FROM TEST STANDARD				
Testing was completed at a distance closer than 3m. Specification limit was extrapolated for the closer test distances.				
Configuration #	1			
<i>Rod Peloquin</i> Signature				
		Value	Limit	Results
2nd Harmonic	Average	78.96 dB μ V/m	97.5 dB μ V/m @ 10 cm	Pass
	Peak	92.98 dB μ V/m	117.5 dB μ V/m @ 10 cm	Pass
3rd Harmonic	Average	98.28 dB μ V/m	103.6 dB μ V/m @ 5 cm	Pass
	Peak	112.61 dB μ V/m	123.6 dB μ V/m @ 5 cm	Pass
4th Harmonic	Average	104.93 dB μ V/m	111.5 dB μ V/m @ 2 cm	Pass
	Peak	118.8 dB μ V/m	131.5 dB μ V/m @ 2 cm	Pass

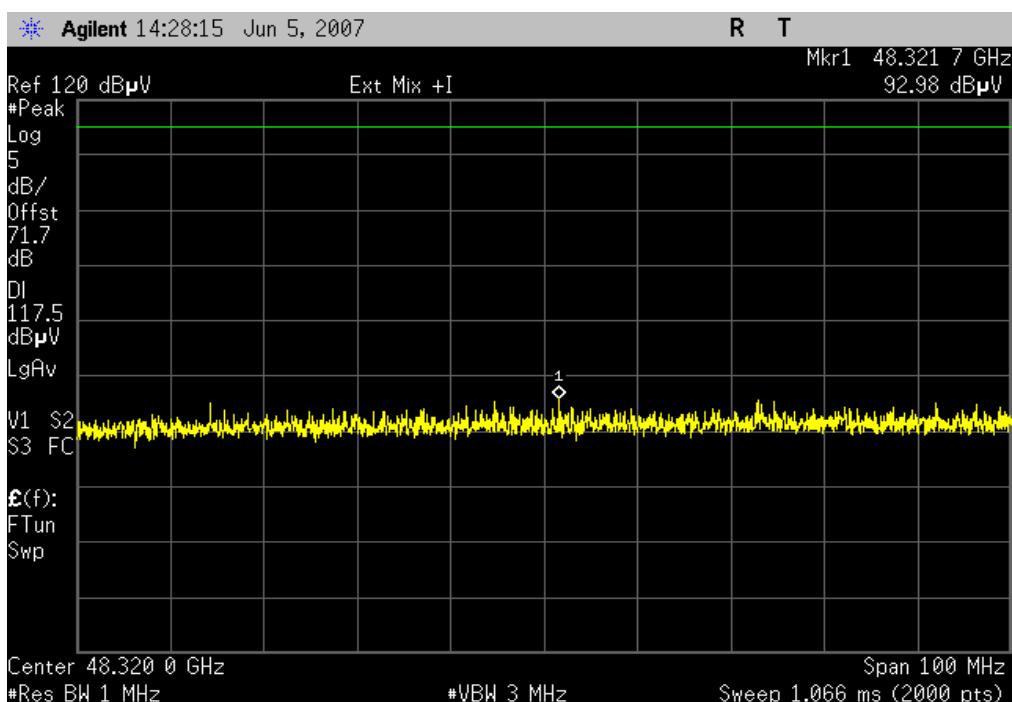
2nd Harmonic, Average

Result: Pass

Value: 78.96 dB μ V/mLimit: 97.5 dB μ V/m @ 10 cm

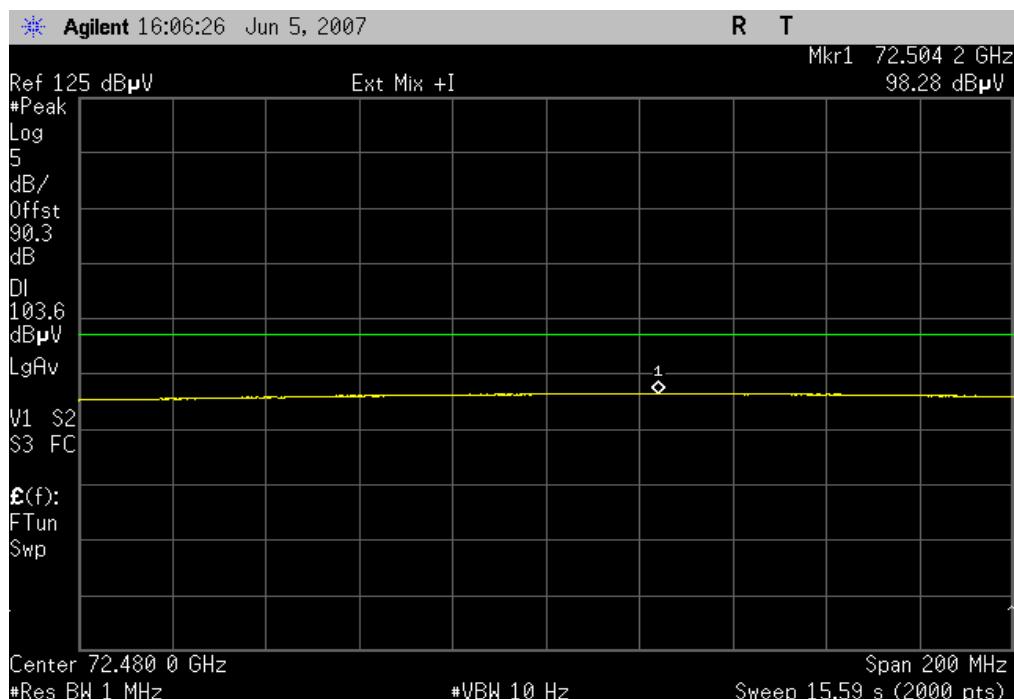
2nd Harmonic, Peak

Result: Pass

Value: 92.98 dB μ V/mLimit: 117.5 dB μ V/m @ 10 cm

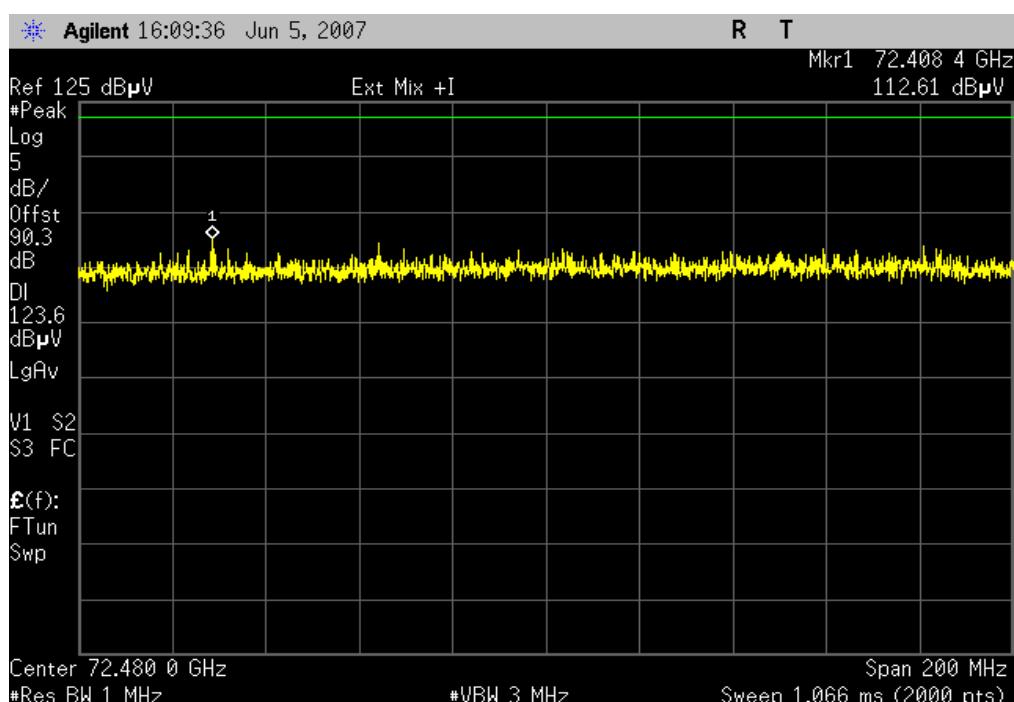
3rd Harmonic, Average

Result: Pass

Value: 98.28 dB μ V/mLimit: 103.6 dB μ V/m @ 5 cm

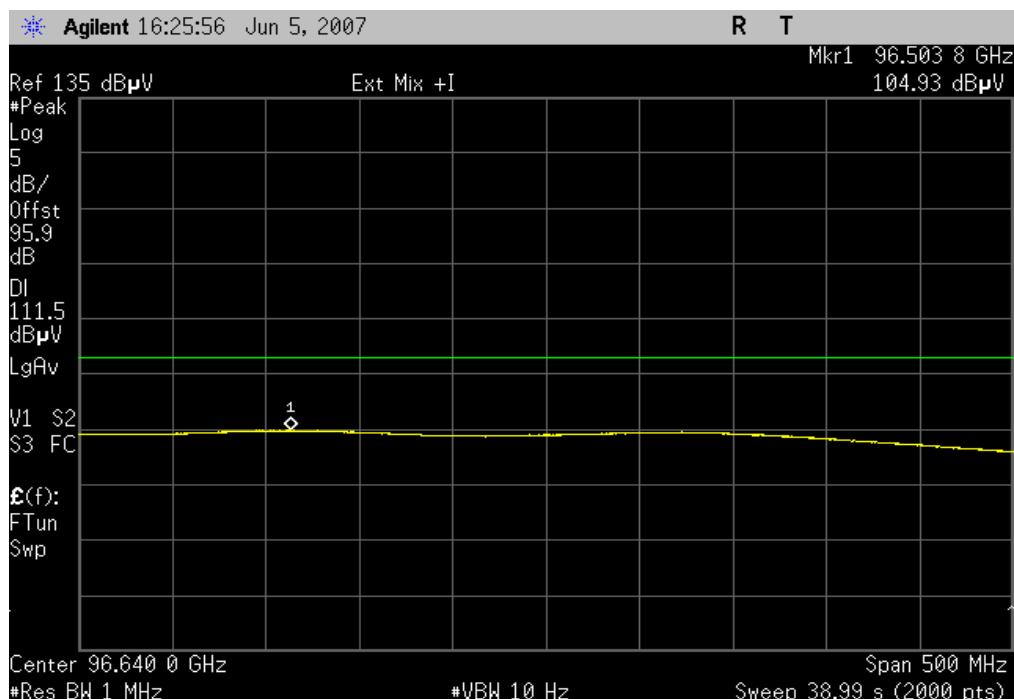
3rd Harmonic, Peak

Result: Pass

Value: 112.61 dB μ V/mLimit: 123.6 dB μ V/m @ 5 cm

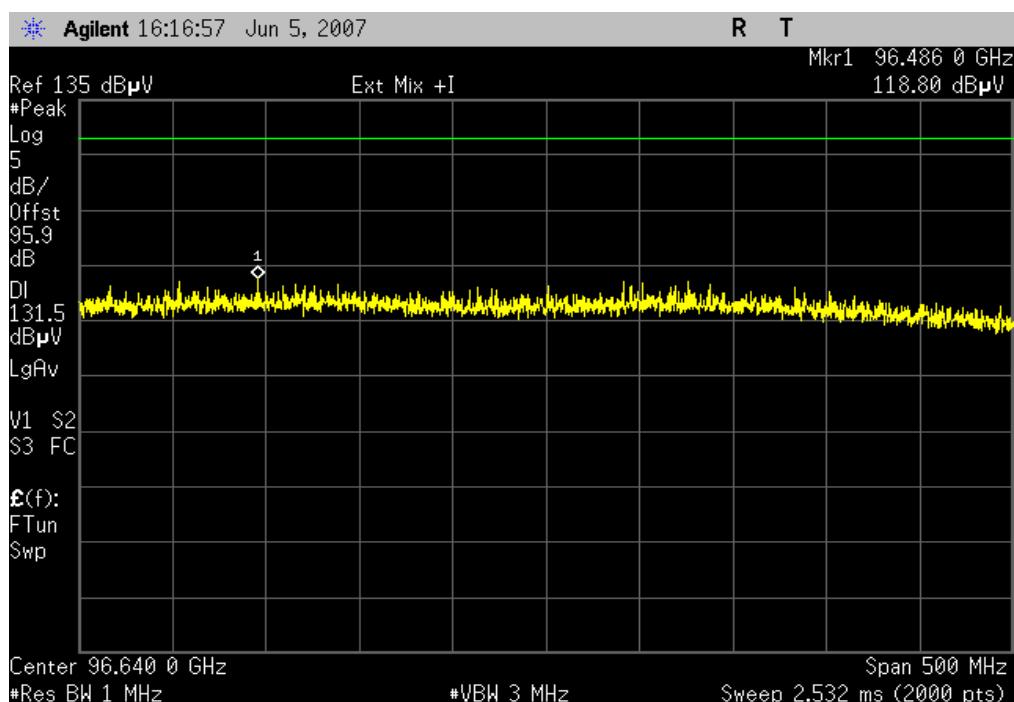
4th Harmonic, Average

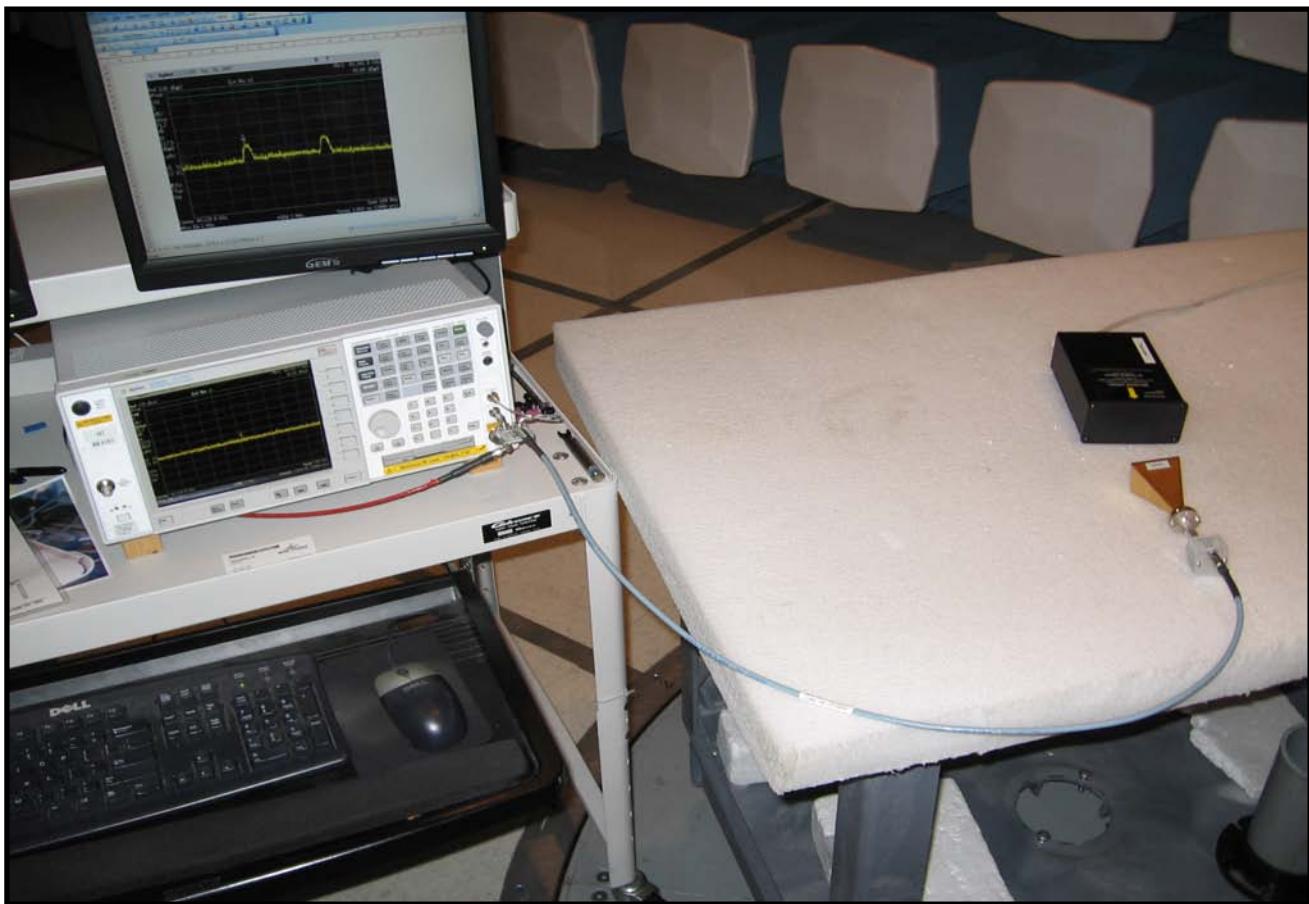
Result: Pass

Value: 104.93 dB μ V/mLimit: 111.5 dB μ V/m @ 2 cm

4th Harmonic, Peak

Result: Pass

Value: 118.8 dB μ V/mLimit: 131.5 dB μ V/m @ 2 cm



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	E4407B	AAU	12/8/2006	13
AC Power Source	Instek	APS-9050	TPK	NCR	0
Chamber Temp. & Humidity Controller	ESZ / Eurotherm	Dimension II	TBC	7/31/2006	12
Chamber, Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZH-32-2-2-H/AC	TBA	7/31/2006	12

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

Variation of Supply Voltage

The primary supply voltage was varied from 85% to 115% of nominal. The EUT can only be operated from the public AC mains, so an AC lab supply was used to vary the supply voltage from 115% to 85% of 120 V, 60 Hz.

Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-20° to +50° C) and at 10°C intervals.

Measurements were made at the single transmit frequency. The measurement was made using a direct connection to a spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

FREQUENCY STABILITY

EUT:	Model 3000A	Work Order:	MUSI0007
Serial Number:	Unknown	Date:	06/08/07
Customer:	Medea Design Group Inc., aka Music Sciences	Temperature:	24°C
Attendees:	None	Humidity:	32%
Project:	N/A	Barometric Pres.:	30.04
Tested by:	Rod Peloquin	Power:	120V/60Hz (nominal)
TEST SPECIFICATIONS		Test Method	
FCC 15.249:2006		ANSI C63.4:2003	
COMMENTS			
DEVIATIONS FROM TEST STANDARD			
Configuration #	7	 <i>Rod Peloquin</i> Signature	

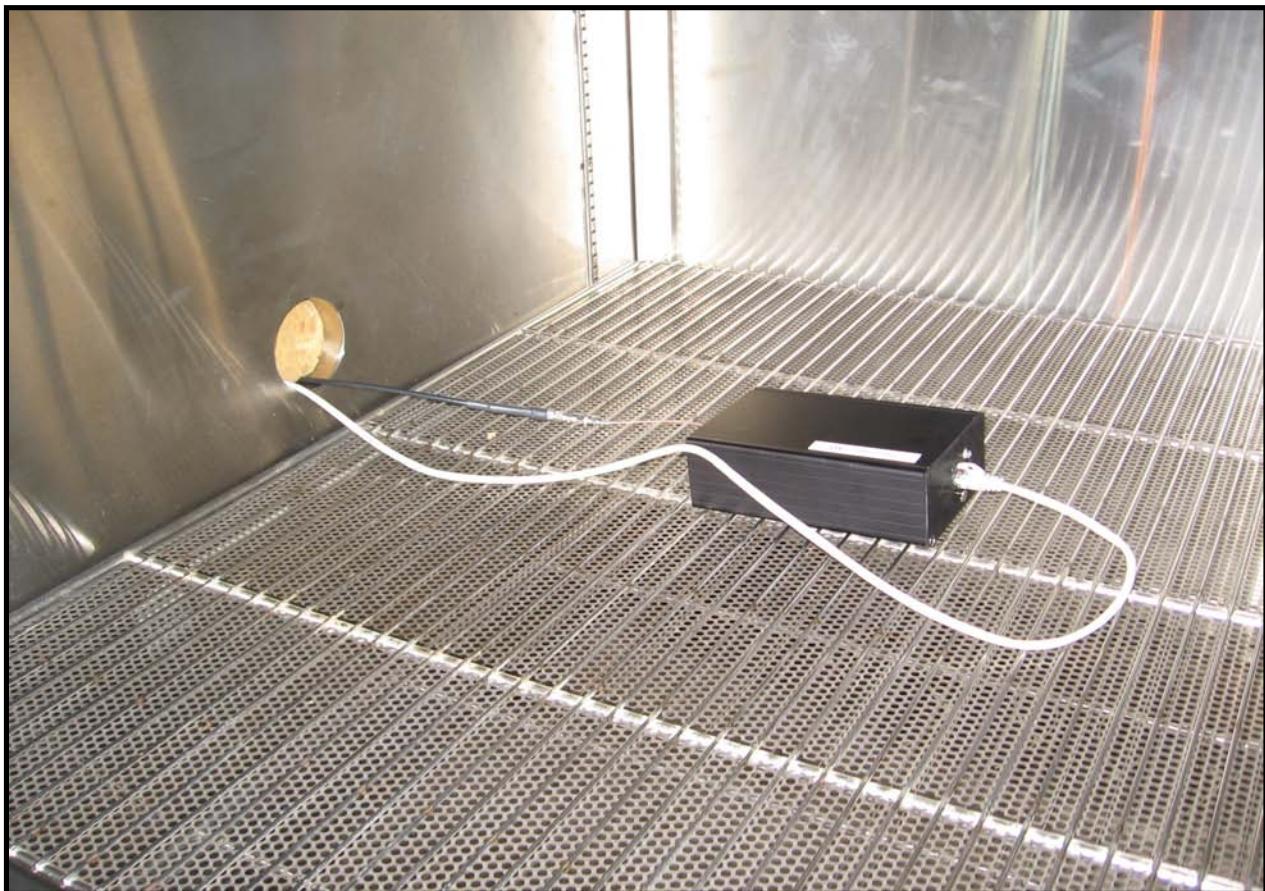
Sheet
Link

Frequency Stability with Variation of Ambient Temperature (Primary Supply = 120 VAC)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)	Specification (%)
50	24160.000000	24160.011566	0.000048%	0.001%
40	24160.000000	24160.003855	0.000016%	0.001%
30	24160.000000	24160.002776	0.000011%	0.001%
20	24160.000000	24160.000985	0.000004%	0.001%
10	24160.000000	24160.000780	0.000003%	0.001%
0	24160.000000	24159.997338	0.000011%	0.001%
-10	24160.000000	24159.996058	0.000016%	0.001%
-20	24160.000000	24160.001180	0.000005%	0.001%

Frequency Stability with Variation of Battery Voltage (Ambient Temperature = 20°C)

Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (%)	Specification (%)
138 (115%)	24160.000000	24160.000964	0.0000040%	0.001%
132 (110%)	24160.000000	24160.000964	0.0000040%	0.001%
126 (105%)	24160.000000	24160.000970	0.0000040%	0.001%
120 (100%)	24160.000000	24160.000985	0.0000041%	0.001%
114 (95%)	24160.000000	24160.000958	0.0000040%	0.001%
108 (90%)	24160.000000	24160.000960	0.0000040%	0.001%
102 (85%)	24160.000000	24160.000960	0.0000040%	0.001%





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 24.16 GHz

POWER SETTINGS INVESTIGATED

Power over Ethernet

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	100 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
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2006	13
Pre-Amplifier	Miteq	AM-1616-1000	AOL	12/29/2006	13
Antenna, Biconilog	EMCO	3141	AXE	12/28/2005	24
EV01 cables c,g, h			EVA	12/29/2006	13
EV01 cables g,h,j			EVB	5/10/2007	13
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	5/10/2007	13
Antenna, Horn	EMCO	3115	AHC	8/24/2006	12
EV01 cables g,h,l			EVF	5/10/2007	13
Antenna, Horn	EMCO	3115	AHC	8/24/2006	12
Antenna, Horn	EMCO	3160-08	AHK	NCR	0
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	3/23/2006	17
Antenna, Horn	EMCO	3160-09	AHG	NCR	0
EV01 Cable D			EVD	3/30/2006	15
Pre-Amplifier	Miteq	JS4-26004000-40-8P	APV	5/15/2006	13
Pre-Amplifier	Miteq	JS4-26004000-50-5A	AON	5/15/2006	13
Antenna, Horn	EMCO	3160-10	AHI	NCR	0
EV01 cable B			EVE	3/30/2006	15
Duplexer	OML, Inc.	DPL26			
Mixer	OML, Inc.	M19HWD			
Horn Antenna	OML, Inc.	M19RH			
Mixer	OML, Inc.	M12HWD			
Horn Antenna	OML, Inc.	M12RH			
Mixer	OML, Inc.	M08HWD			
Horn Antenna	OML, Inc.	M08RH			

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	0.2
0.15 - 30.0	10.0	9.0	9.0	9.0
30.0 - 1000	100.0	120.0	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.

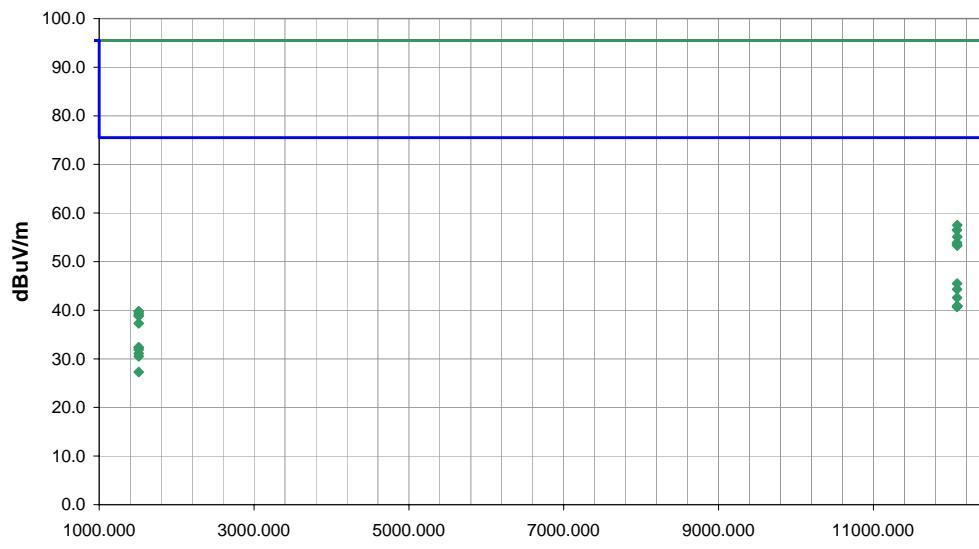
MEASUREMENT UNCERTAINTY

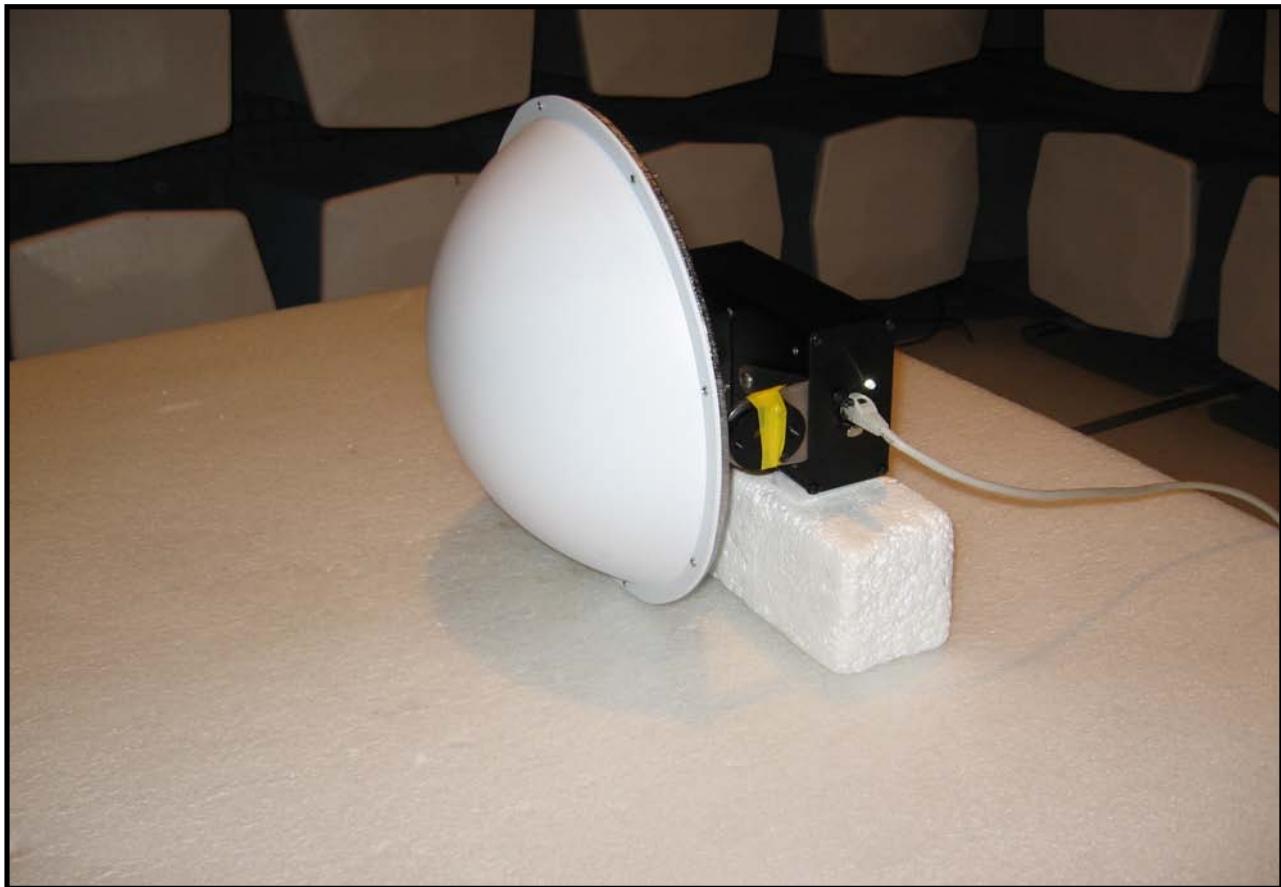
Measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" or theoretically correct value. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. In the case of transient tests our test equipment has been demonstrated 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 on the single 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).

SPURIOUS RADIATED EMISSIONS												EMC		
NORTHWEST												PSA 2007.05.07		
Serial Number: Unknown												Date: 06/04/07		
Customer: Medea Design Group Inc., aka Music Sciences												Temperature: 23		
Attendees: Don Moses												Humidity: 48%		
Project: None												Barometric Pres.: 29.93		
Tested by: Holly Ashkannejhad						Power: Power over Ethernet						Job Site: EV01		
TEST SPECIFICATIONS												Test Method		
FCC 15.249:2006						ANSI C63.4:2003								
TEST PARAMETERS														
Antenna Height(s) (m)			1 - 4			Test Distance (m)			3					
COMMENTS														
Parabolic Dish Antenna														
EUT OPERATING MODES														
Transmitting 24.16 GHz														
DEVIATIONS FROM TEST STANDARD														
No deviations.														
Run #	5								Signature <i>Holly Ashkannejhad</i>					
Configuration #	2													
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)	Comments	
36240.000	68.2	-6.6	259.0	1.0	3.0	0.0	H-High Horr	AV	0.0	61.6	75.5	-13.9	EUT on side	
36240.000	67.4	-6.6	348.0	1.0	3.0	0.0	V-High Horr	AV	0.0	60.8	75.5	-14.7	EUT vertical	
36240.000	67.1	-6.6	343.0	1.0	3.0	0.0	H-High Horr	AV	0.0	60.5	75.5	-15.0	EUT vertical	
36240.000	59.9	-6.6	261.0	1.1	3.0	0.0	V-High Horr	AV	0.0	53.3	75.5	-22.2	EUT on side	
36240.000	77.6	-6.6	259.0	1.0	3.0	0.0	H-High Horr	PK	0.0	71.0	95.5	-24.5	EUT on side	
36240.000	75.7	-6.6	343.0	1.0	3.0	0.0	H-High Horr	PK	0.0	69.1	95.5	-26.4	EUT vertical	
36240.000	75.5	-6.6	348.0	1.0	3.0	0.0	V-High Horr	PK	0.0	68.9	95.5	-26.6	EUT vertical	
36240.000	70.7	-6.6	261.0	1.1	3.0	0.0	V-High Horr	PK	0.0	64.1	95.5	-31.4	EUT on side	

SPURIOUS RADIATED EMISSIONS												PSA 2007.05.07 EMI 2006.12.20																																																																																																																																																																																																																																																																																																					
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EUT: Model 3000A Serial Number: Unknown Customer: Medea Design Group Inc., aka Music Sciences Attendees: None Project: None Tested by: Rod Peloquin						Date: 06/06/07 Temperature: 23 Humidity: 48% Barometric Pres.: 29.93 Job Site: EV01																																																																																																																																																																																																																																																																																																											
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<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Freq (MHz)</th> <th>Amplitude (dBuV)</th> <th>Factor (dB)</th> <th>Azimuth (degrees)</th> <th>Height (meters)</th> <th>Distance (meters)</th> <th>External Attenuation (dB)</th> <th>Polarity</th> <th>Detector</th> <th>Distance Adjustment (dB)</th> <th>Adjusted dBuV/m</th> <th>Spec. Limit dBuV/m</th> <th>Compared to Spec. (dB)</th> <th>Comments</th> </tr> </thead> <tbody> <tr><td>12079.840</td><td>29.2</td><td>16.3</td><td>77.0</td><td>1.8</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>AV</td><td>0.0</td><td>45.5</td><td>75.5</td><td>-30.0</td><td>EUT typical orientation</td></tr> <tr><td>12079.590</td><td>28.0</td><td>16.3</td><td>124.0</td><td>1.7</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>AV</td><td>0.0</td><td>44.3</td><td>75.5</td><td>-31.2</td><td>EUT horizontal</td></tr> <tr><td>12080.050</td><td>26.3</td><td>16.3</td><td>183.0</td><td>1.0</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>AV</td><td>0.0</td><td>42.6</td><td>75.5</td><td>-32.9</td><td>EUT horizontal</td></tr> <tr><td>12080.130</td><td>24.6</td><td>16.3</td><td>306.0</td><td>1.8</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>AV</td><td>0.0</td><td>40.9</td><td>75.5</td><td>-34.6</td><td>EUT on side</td></tr> <tr><td>12084.160</td><td>24.5</td><td>16.3</td><td>106.0</td><td>3.9</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>AV</td><td>0.0</td><td>40.8</td><td>75.5</td><td>-34.7</td><td>EUT on side</td></tr> <tr><td>12078.230</td><td>24.4</td><td>16.3</td><td>168.0</td><td>3.2</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>AV</td><td>0.0</td><td>40.7</td><td>75.5</td><td>-34.8</td><td>EUT typical orientation</td></tr> <tr><td>12081.970</td><td>41.2</td><td>16.3</td><td>80.0</td><td>1.9</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>PK</td><td>0.0</td><td>57.5</td><td>95.5</td><td>-38.0</td><td>EUT typical orientation</td></tr> <tr><td>12079.400</td><td>40.2</td><td>16.3</td><td>124.0</td><td>1.7</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>PK</td><td>0.0</td><td>56.5</td><td>95.5</td><td>-39.0</td><td>EUT horizontal</td></tr> <tr><td>12082.490</td><td>38.8</td><td>16.3</td><td>183.0</td><td>1.0</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>PK</td><td>0.0</td><td>55.1</td><td>95.5</td><td>-40.4</td><td>EUT horizontal</td></tr> <tr><td>12078.240</td><td>37.6</td><td>16.3</td><td>306.0</td><td>1.8</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>PK</td><td>0.0</td><td>53.9</td><td>95.5</td><td>-41.6</td><td>EUT on side</td></tr> <tr><td>12078.180</td><td>37.2</td><td>16.3</td><td>106.0</td><td>3.9</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>PK</td><td>0.0</td><td>53.5</td><td>95.5</td><td>-42.0</td><td>EUT on side</td></tr> <tr><td>12081.810</td><td>37.0</td><td>16.3</td><td>168.0</td><td>3.2</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>PK</td><td>0.0</td><td>53.3</td><td>95.5</td><td>-42.2</td><td>EUT typical orientation</td></tr> <tr><td>1510.013</td><td>36.1</td><td>-3.7</td><td>176.0</td><td>1.5</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>AV</td><td>0.0</td><td>32.4</td><td>75.5</td><td>-43.1</td><td>EUT typical orientation</td></tr> <tr><td>1510.008</td><td>36.0</td><td>-3.7</td><td>167.0</td><td>1.6</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>AV</td><td>0.0</td><td>32.3</td><td>75.5</td><td>-43.2</td><td>EUT on side</td></tr> <tr><td>1509.988</td><td>35.6</td><td>-3.7</td><td>200.0</td><td>1.4</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>AV</td><td>0.0</td><td>31.9</td><td>75.5</td><td>-43.6</td><td>EUT horizontal</td></tr> <tr><td>1510.016</td><td>34.8</td><td>-3.7</td><td>133.0</td><td>1.3</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>AV</td><td>0.0</td><td>31.1</td><td>75.5</td><td>-44.4</td><td>EUT horizontal</td></tr> <tr><td>1510.003</td><td>34.2</td><td>-3.7</td><td>115.0</td><td>1.2</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>AV</td><td>0.0</td><td>30.5</td><td>75.5</td><td>-45.0</td><td>EUT typical orientation</td></tr> <tr><td>1509.996</td><td>31.0</td><td>-3.7</td><td>92.0</td><td>1.0</td><td>3.0</td><td>0.0</td><td>H-Horn</td><td>AV</td><td>0.0</td><td>27.3</td><td>75.5</td><td>-48.2</td><td>EUT on side</td></tr> <tr><td>1510.043</td><td>43.5</td><td>-3.7</td><td>167.0</td><td>1.6</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>PK</td><td>0.0</td><td>39.8</td><td>95.5</td><td>-55.7</td><td>EUT on side</td></tr> <tr><td>1509.825</td><td>43.4</td><td>-3.7</td><td>176.0</td><td>1.5</td><td>3.0</td><td>0.0</td><td>V-Horn</td><td>PK</td><td>0.0</td><td>39.7</td><td>95.5</td><td>-55.8</td><td>EUT typical orientation</td></tr> </tbody> </table>												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	12079.840	29.2	16.3	77.0	1.8	3.0	0.0	H-Horn	AV	0.0	45.5	75.5	-30.0	EUT typical orientation	12079.590	28.0	16.3	124.0	1.7	3.0	0.0	H-Horn	AV	0.0	44.3	75.5	-31.2	EUT horizontal	12080.050	26.3	16.3	183.0	1.0	3.0	0.0	V-Horn	AV	0.0	42.6	75.5	-32.9	EUT horizontal	12080.130	24.6	16.3	306.0	1.8	3.0	0.0	H-Horn	AV	0.0	40.9	75.5	-34.6	EUT on side	12084.160	24.5	16.3	106.0	3.9	3.0	0.0	V-Horn	AV	0.0	40.8	75.5	-34.7	EUT on side	12078.230	24.4	16.3	168.0	3.2	3.0	0.0	V-Horn	AV	0.0	40.7	75.5	-34.8	EUT typical orientation	12081.970	41.2	16.3	80.0	1.9	3.0	0.0	H-Horn	PK	0.0	57.5	95.5	-38.0	EUT typical orientation	12079.400	40.2	16.3	124.0	1.7	3.0	0.0	H-Horn	PK	0.0	56.5	95.5	-39.0	EUT horizontal	12082.490	38.8	16.3	183.0	1.0	3.0	0.0	V-Horn	PK	0.0	55.1	95.5	-40.4	EUT horizontal	12078.240	37.6	16.3	306.0	1.8	3.0	0.0	H-Horn	PK	0.0	53.9	95.5	-41.6	EUT on side	12078.180	37.2	16.3	106.0	3.9	3.0	0.0	V-Horn	PK	0.0	53.5	95.5	-42.0	EUT on side	12081.810	37.0	16.3	168.0	3.2	3.0	0.0	V-Horn	PK	0.0	53.3	95.5	-42.2	EUT typical orientation	1510.013	36.1	-3.7	176.0	1.5	3.0	0.0	V-Horn	AV	0.0	32.4	75.5	-43.1	EUT typical orientation	1510.008	36.0	-3.7	167.0	1.6	3.0	0.0	V-Horn	AV	0.0	32.3	75.5	-43.2	EUT on side	1509.988	35.6	-3.7	200.0	1.4	3.0	0.0	V-Horn	AV	0.0	31.9	75.5	-43.6	EUT horizontal	1510.016	34.8	-3.7	133.0	1.3	3.0	0.0	H-Horn	AV	0.0	31.1	75.5	-44.4	EUT horizontal	1510.003	34.2	-3.7	115.0	1.2	3.0	0.0	H-Horn	AV	0.0	30.5	75.5	-45.0	EUT typical orientation	1509.996	31.0	-3.7	92.0	1.0	3.0	0.0	H-Horn	AV	0.0	27.3	75.5	-48.2	EUT on side	1510.043	43.5	-3.7	167.0	1.6	3.0	0.0	V-Horn	PK	0.0	39.8	95.5	-55.7	EUT on side	1509.825	43.4	-3.7	176.0	1.5	3.0	0.0	V-Horn	PK	0.0	39.7	95.5	-55.8	EUT typical orientation
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																																																																																																																																																																																																																																																																																																				
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12084.160	24.5	16.3	106.0	3.9	3.0	0.0	V-Horn	AV	0.0	40.8	75.5	-34.7	EUT on side																																																																																																																																																																																																																																																																																																				
12078.230	24.4	16.3	168.0	3.2	3.0	0.0	V-Horn	AV	0.0	40.7	75.5	-34.8	EUT typical orientation																																																																																																																																																																																																																																																																																																				
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12078.180	37.2	16.3	106.0	3.9	3.0	0.0	V-Horn	PK	0.0	53.5	95.5	-42.0	EUT on side																																																																																																																																																																																																																																																																																																				
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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 24.16 GHz

POWER SETTINGS INVESTIGATED

Power over Ethernet from A/D converter

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	100 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
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2006	13
Pre-Amplifier	Miteq	AM-1616-1000	AOL	12/29/2006	13
Antenna, Biconilog	EMCO	3141	AXE	12/28/2005	24
EV01 cables c,g, h			EVA	12/29/2006	13
EV01 cables g,h,j			EVB	5/10/2007	13
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	5/10/2007	13
Antenna, Horn	EMCO	3115	AHC	8/24/2006	12
EV01 cables g,h,l			EVF	5/10/2007	13
Antenna, Horn	EMCO	3115	AHC	8/24/2006	12
Antenna, Horn	EMCO	3160-08	AHK	NCR	0
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	3/23/2006	17
Antenna, Horn	EMCO	3160-09	AHG	NCR	0
EV01 Cable D			EVD	3/30/2006	15
Pre-Amplifier	Miteq	JS4-26004000-40-8P	APV	5/15/2006	13
Pre-Amplifier	Miteq	JS4-26004000-50-5A	AON	5/15/2006	13
Antenna, Horn	EMCO	3160-10	AHI	NCR	0
EV01 cable B			EVE	3/30/2006	15
Duplexer	OML, Inc.	DPL26			
Mixer	OML, Inc.	M19HWD			
Horn Antenna	OML, Inc.	M19RH			
Mixer	OML, Inc.	M12HWD			
Horn Antenna	OML, Inc.	M12RH			
Mixer	OML, Inc.	M08HWD			
Horn Antenna	OML, Inc.	M08RH			

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	0.2
0.15 - 30.0	10.0	9.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0	120.0
Above 1000	1000.0	N/A		1000.0

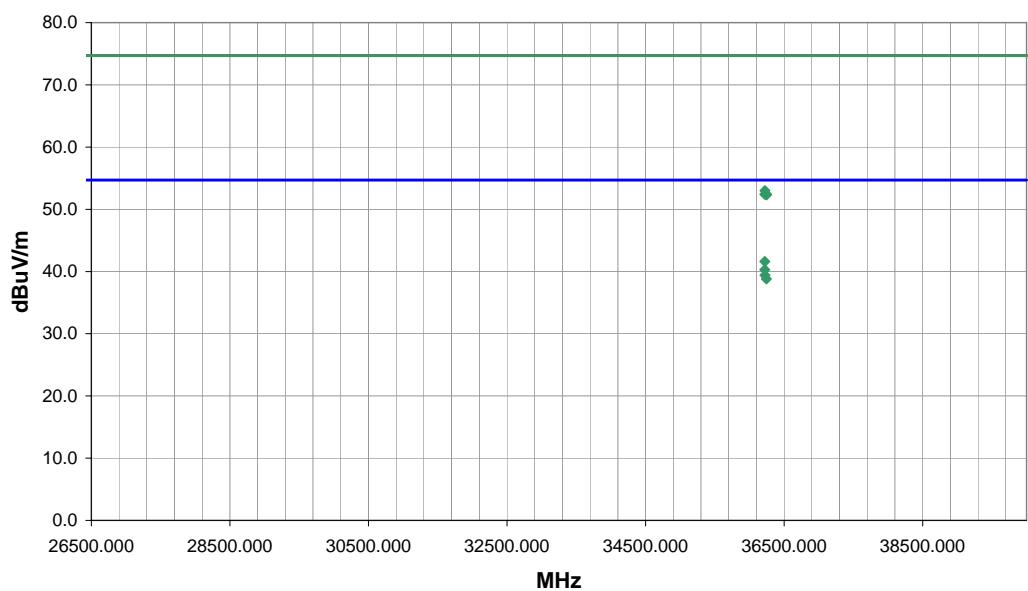
Measurements were made using the bandwidths and detectors specified. No video filter was used.

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 on the single 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).

SPURIOUS RADIATED EMISSIONS												PSA 2007.05.07	EMI 2006.12.20																																																																																																																													
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Results	Pass																																																																																																																																									
 <p>The graph plots dBuV/m on the y-axis (0.0 to 80.0) against MHz on the x-axis (26500.000 to 38500.000). A horizontal blue line is drawn at 54.7 dBuV/m. Three green diamond data points are plotted at approximately 36221.770 MHz, with values around 53.0, 40.5, and 39.0 dBuV/m.</p>																																																																																																																																										
<table border="1"> <thead> <tr> <th>Freq (MHz)</th> <th>Amplitude (dBuV)</th> <th>Factor (dB)</th> <th>Azimuth (degrees)</th> <th>Height (meters)</th> <th>Distance (meters)</th> <th>External Attenuation (dB)</th> <th>Polarity</th> <th>Detector</th> <th>Distance Adjustment (dB)</th> <th>Adjusted dBuV/m</th> <th>Spec. Limit dBuV/m</th> <th>Compared to Spec. (dB)</th> <th>Comments</th> </tr> </thead> <tbody> <tr> <td>36221.770</td> <td>48.1</td> <td>-6.5</td> <td>205.0</td> <td>1.2</td> <td>3.0</td> <td>0.0</td> <td>V-High Horr</td> <td>AV</td> <td>0.0</td> <td>41.6</td> <td>54.7</td> <td>-13.1</td> <td>EUT horizontal</td> </tr> <tr> <td>36221.770</td> <td>46.8</td> <td>-6.5</td> <td>360.0</td> <td>1.1</td> <td>3.0</td> <td>0.0</td> <td>I-High Horr</td> <td>AV</td> <td>0.0</td> <td>40.3</td> <td>54.7</td> <td>-14.4</td> <td>EUT horizontal</td> </tr> <tr> <td>36222.600</td> <td>46.0</td> <td>-6.6</td> <td>112.0</td> <td>1.3</td> <td>3.0</td> <td>0.0</td> <td>I-High Horr</td> <td>AV</td> <td>0.0</td> <td>39.4</td> <td>54.7</td> <td>-15.3</td> <td>EUT on side</td> </tr> <tr> <td>36243.920</td> <td>45.3</td> <td>-6.5</td> <td>47.0</td> <td>1.3</td> <td>3.0</td> <td>0.0</td> <td>V-High Horr</td> <td>AV</td> <td>0.0</td> <td>38.8</td> <td>54.7</td> <td>-15.9</td> <td>EUT on side</td> </tr> <tr> <td>36223.350</td> <td>59.5</td> <td>-6.5</td> <td>205.0</td> <td>1.2</td> <td>3.0</td> <td>0.0</td> <td>V-High Horr</td> <td>PK</td> <td>0.0</td> <td>53.0</td> <td>74.7</td> <td>-21.7</td> <td>EUT horizontal</td> </tr> <tr> <td>36220.830</td> <td>59.0</td> <td>-6.6</td> <td>47.0</td> <td>1.3</td> <td>3.0</td> <td>0.0</td> <td>V-High Horr</td> <td>PK</td> <td>0.0</td> <td>52.4</td> <td>74.7</td> <td>-22.3</td> <td>EUT on side</td> </tr> <tr> <td>36247.520</td> <td>59.0</td> <td>-6.6</td> <td>112.0</td> <td>1.3</td> <td>3.0</td> <td>0.0</td> <td>I-High Horr</td> <td>PK</td> <td>0.0</td> <td>52.4</td> <td>74.7</td> <td>-22.3</td> <td>EUT on side</td> </tr> <tr> <td>36244.600</td> <td>58.8</td> <td>-6.5</td> <td>360.0</td> <td>1.1</td> <td>3.0</td> <td>0.0</td> <td>I-High Horr</td> <td>PK</td> <td>0.0</td> <td>52.3</td> <td>74.7</td> <td>-22.4</td> <td>EUT horizontal</td> </tr> </tbody> </table>													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	36221.770	48.1	-6.5	205.0	1.2	3.0	0.0	V-High Horr	AV	0.0	41.6	54.7	-13.1	EUT horizontal	36221.770	46.8	-6.5	360.0	1.1	3.0	0.0	I-High Horr	AV	0.0	40.3	54.7	-14.4	EUT horizontal	36222.600	46.0	-6.6	112.0	1.3	3.0	0.0	I-High Horr	AV	0.0	39.4	54.7	-15.3	EUT on side	36243.920	45.3	-6.5	47.0	1.3	3.0	0.0	V-High Horr	AV	0.0	38.8	54.7	-15.9	EUT on side	36223.350	59.5	-6.5	205.0	1.2	3.0	0.0	V-High Horr	PK	0.0	53.0	74.7	-21.7	EUT horizontal	36220.830	59.0	-6.6	47.0	1.3	3.0	0.0	V-High Horr	PK	0.0	52.4	74.7	-22.3	EUT on side	36247.520	59.0	-6.6	112.0	1.3	3.0	0.0	I-High Horr	PK	0.0	52.4	74.7	-22.3	EUT on side	36244.600	58.8	-6.5	360.0	1.1	3.0	0.0	I-High Horr	PK	0.0	52.3	74.7	-22.4	EUT horizontal
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SPURIOUS RADIATED EMISSIONS												PSA 2007.05.07	EMI 2006.12.20		
EMC															
EUT: Model 3000A Serial Number: Unknown Customer: Medea Design Group Inc., aka Music Sciences Attendees: None Project: None Tested by: Rod Peloquin								Work Order: MUSI0007 Date: 06/06/07 Temperature: 23 Humidity: 48% Barometric Pres.: 29.93 Power: Power over Ethernet Job Site: EV01							
TEST SPECIFICATIONS												Test Method			
FCC 15.249:2006								ANSI C63.4:2003							
TEST PARAMETERS															
Antenna Height(s) (m)				1 - 4				Test Distance (m)				3			
COMMENTS												Model 6100 Antenna with 17 dBi gain with waveguide filter			
EUT OPERATING MODES												Transmitting 24.16 GHz			
DEVIATIONS FROM TEST STANDARD												No deviations.			
Run #	10									<i>Rodney L. Peloquin</i>			Signature		
Configuration #	4														
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)	Comments		
12079.840	25.6	16.3	144.0	1.6	3.0	0.0	V-Horn	AV	0.0	41.9	54.7	-12.8	EUT vertical		
12079.540	25.3	16.4	170.0	1.5	3.0	0.0	H-Horn	AV	0.0	41.7	54.7	-13.0	EUT on side		
12079.990	24.9	16.3	203.0	1.6	3.0	0.0	V-Horn	AV	0.0	41.2	54.7	-13.5	EUT on side		
12079.490	24.8	16.3	148.0	1.6	3.0	0.0	V-Horn	AV	0.0	41.1	54.7	-13.6	EUT horizontal		
12079.550	24.8	16.3	14.0	1.5	3.0	0.0	H-Horn	AV	0.0	41.1	54.7	-13.6	EUT vertical		
12088.960	24.7	16.4	89.0	1.3	3.0	0.0	H-Horn	AV	0.0	41.1	54.7	-13.6	EUT horizontal		
4530.014	31.7	6.6	148.0	1.2	3.0	0.0	V-Horn	AV	0.0	38.3	54.7	-16.4	EUT on side		
4529.981	31.6	6.6	128.0	1.0	3.0	0.0	H-Horn	AV	0.0	38.2	54.7	-16.5	EUT horizontal		
4530.022	29.4	6.6	179.0	1.4	3.0	0.0	H-Horn	AV	0.0	36.0	54.7	-18.7	EUT on side		
4529.989	28.7	6.6	154.0	1.2	3.0	0.0	V-Horn	AV	0.0	35.3	54.7	-19.4	EUT horizontal		
12082.700	38.6	16.3	144.0	1.6	3.0	0.0	V-Horn	PK	0.0	54.9	74.7	-19.8	EUT vertical		
12084.510	38.5	16.3	89.0	1.3	3.0	0.0	H-Horn	PK	0.0	54.8	74.7	-19.9	EUT horizontal		
4529.871	27.9	6.6	169.0	1.0	3.0	0.0	H-Horn	AV	0.0	34.5	54.7	-20.2	EUT vertical		
12079.040	38.1	16.3	14.0	1.5	3.0	0.0	H-Horn	PK	0.0	54.4	74.7	-20.3	EUT vertical		
12081.980	38.0	16.3	148.0	1.6	3.0	0.0	V-Horn	PK	0.0	54.3	74.7	-20.4	EUT horizontal		
12084.080	37.7	16.3	170.0	1.5	3.0	0.0	H-Horn	PK	0.0	54.0	74.7	-20.7	EUT on side		
4529.994	27.4	6.6	151.0	1.0	3.0	0.0	V-Horn	AV	0.0	34.0	54.7	-20.7	EUT vertical		
12080.440	37.6	16.3	203.0	1.6	3.0	0.0	V-Horn	PK	0.0	53.9	74.7	-20.8	EUT on side		
4530.037	40.1	6.6	148.0	1.2	3.0	0.0	V-Horn	PK	0.0	46.7	74.7	-28.0	EUT on side		
4529.764	40.0	6.6	151.0	1.0	3.0	0.0	V-Horn	PK	0.0	46.6	74.7	-28.1	EUT vertical		

SPURIOUS RADIATED EMISSIONS

EUT: Model 3000A	Work Order: MUSI0007
Serial Number: Unknown	Date: 06/06/07
Customer: Medea Design Group Inc., aka Music Sciences	Temperature: 23
Attendees: None	Humidity: 48%
Project: None	Barometric Pres.: 29.93
Tested by: Rod Peloquin	Power over Ethernet
	Job Site: EV01

TEST SPECIFICATIONS

FCC 15.249:2006	ANSI C63.4:2003
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TEST PARAMETERS

Antenna Height(s) (m)	1 - 4	Test Distance (m)	3
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COMMENTS

Model 6100 Antenna with 17 dBi gain with waveguide filter

EUT OPERATING MODES

Transmitting 24.16 GHz

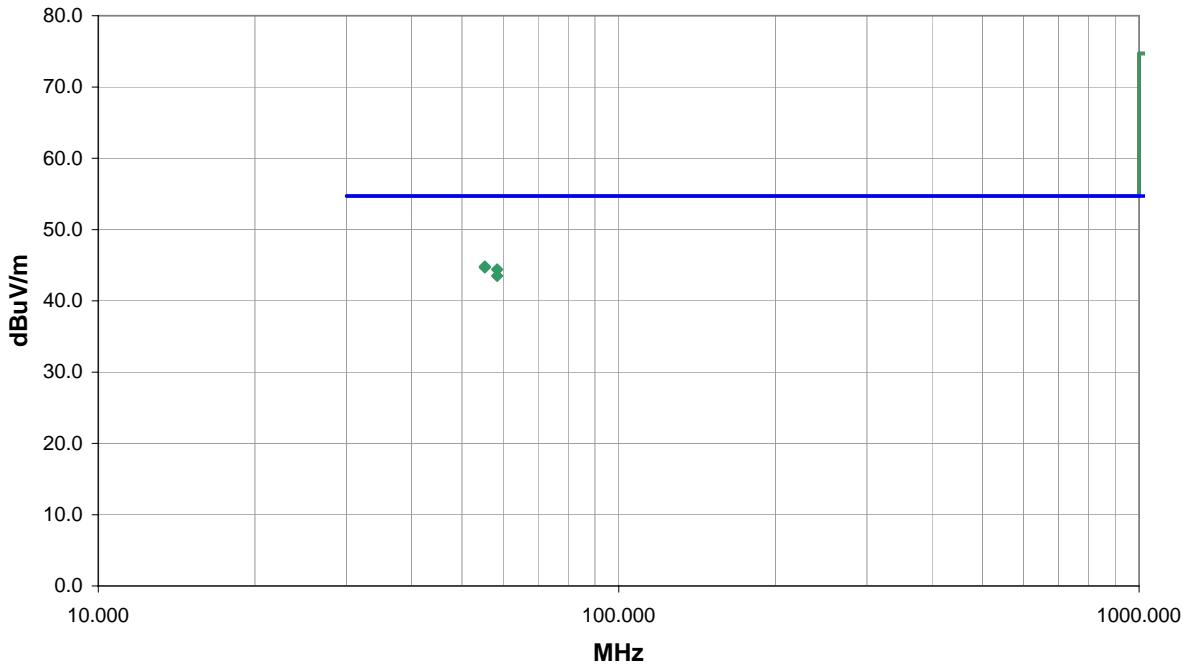
DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	11
Configuration #	4
Results	Pass

Signature

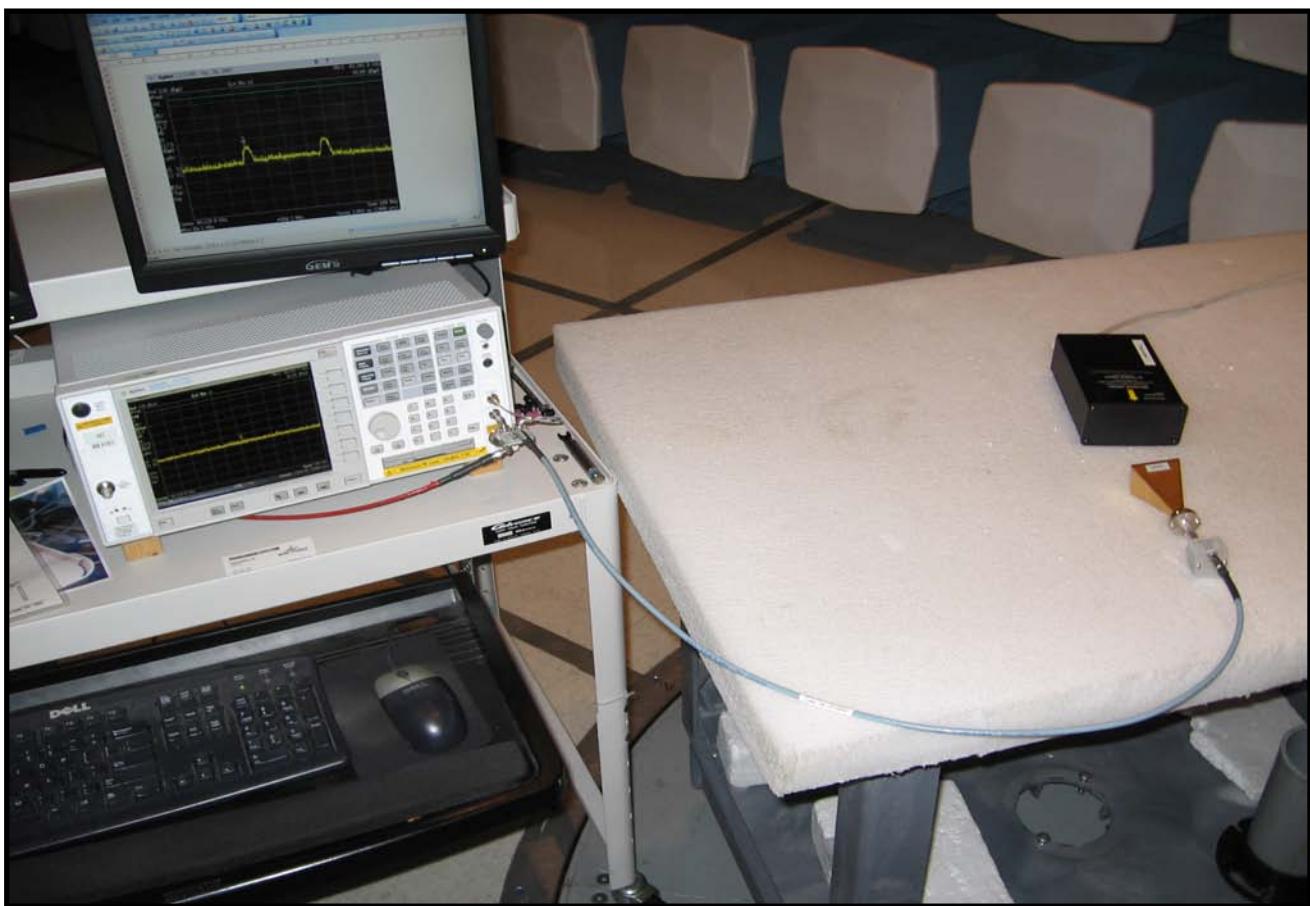
Roddy L. Peloquin



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)
55.306	50.4	-5.6	316.0	1.0	3.0	0.0	V-Bilog	QP	0.0	44.8	54.7	-9.9
55.308	50.3	-5.6	13.0	1.0	3.0	0.0	V-Bilog	QP	0.0	44.7	54.7	-10.0
58.403	50.5	-6.1	360.0	1.4	3.0	0.0	V-Bilog	QP	0.0	44.4	54.7	-10.3
58.404	49.6	-6.1	30.0	1.4	3.0	0.0	V-Bilog	QP	0.0	43.5	54.7	-11.2







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 24.16 GHz

POWER SETTINGS INVESTIGATED

Power over Ethernet

FREQUENCY RANGE INVESTIGATED

Start Frequency 24.05 GHz Stop Frequency 24.25 GHz

CLOCKS AND OSCILLATORS

24.16 GHz, 465 MHz, 6 GHz

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
EV01 Cable D			EVD	3/30/2006	15
Antenna, Horn	EMCO	3160-09	AHG	NCR	0
Spectrum Analyzer	Agilent	E4446A	AAT	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 trans

TEST DESCRIPTION

The antenna to be used with the EUT was tested. The EUT was transmitting while set at its single operating channel and single operating mode. The fundamental emission from the EUT was 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). At the orientation that produced the highest emission, a polar plot was made to identify the antenna lobe that produced the highest gain. A zoom scan was then performed to measure the absolute gain and 3 dB bandwidth.

NORTHWEST
EMC

Absolute Gain & 3 dB Beamwidth

PSA 2007.01.31
EMI 2006.12.20

EUT: 24.16 GHz Antenna

Work Order: MUSI0006

Serial Number: None

Date: 04/20/07

Customer: Music Sciences

Temperature: 22

Attendees: None

Humidity: 30%

Project: None

Barometric Pres.: 30.12

Tested by: Rod Peloquin

Job Site: EV11

TEST SPECIFICATIONS

FCC 15.249: 2006

Test Method

ANSI C63.4: 2003

TEST PARAMETERS

Antenna Height(s) (m)

Test Distance (m)

3

COMMENTS

AUT at 1.8m

EUT OPERATING MODES

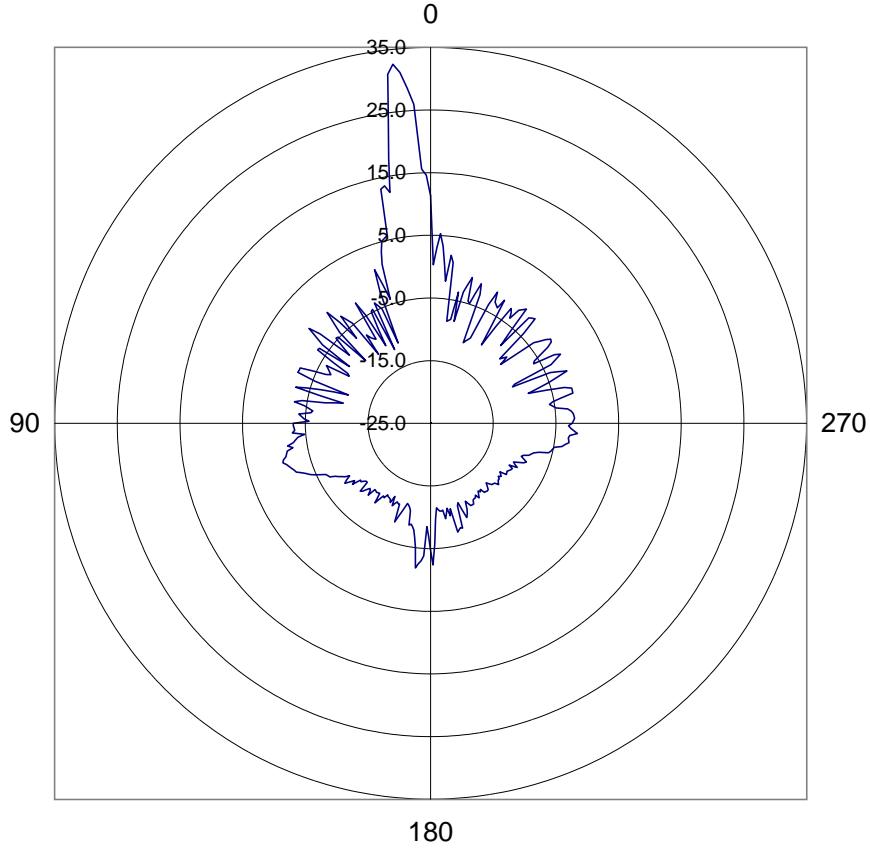
DEVIATIONS FROM TEST STANDARD

Run #	7
Configuration #	4
Results	Pass

Signature



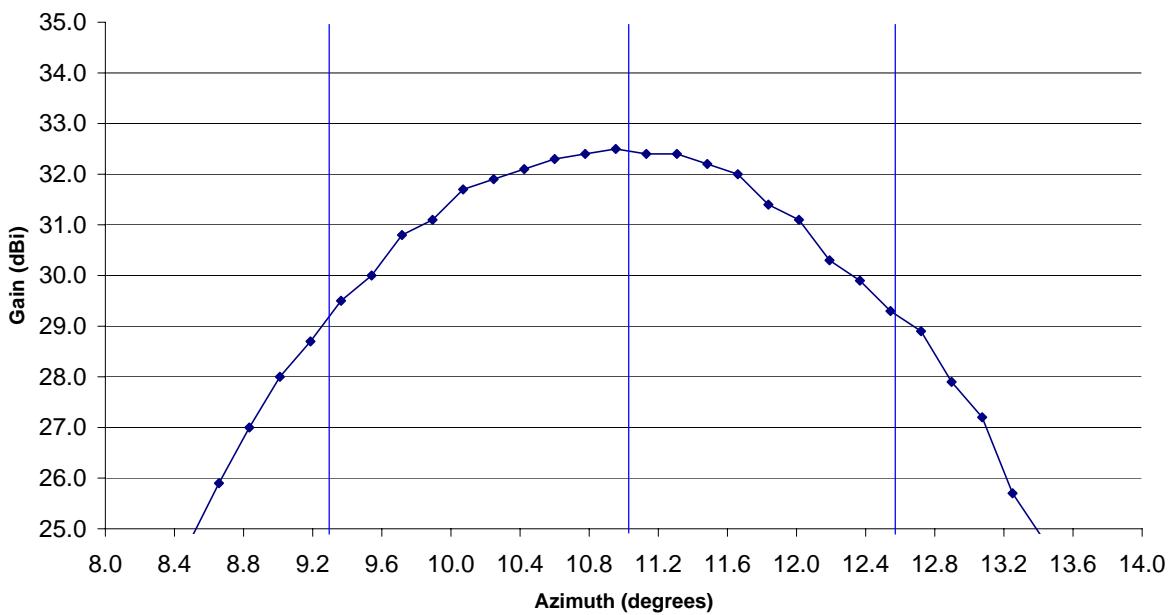
Coarse Polar Plot

Absolute
Gain of AUT

Frequency 24160.00
Measurement Antenna Polarity Horizontal
Antenna Under Test (AUT) Polarity Horizontal

EUT:	24.16 GHz Antenna	Work Order:	MUSI0006
Serial Number:	None	Date:	04/20/07
Customer:	Music Sciences	Temperature:	22
Attendees:	None	Humidity:	30%
Project:	None	Barometric Pres.:	30.12
Tested by:	Rod Peloquin	Job Site:	EV11
TEST SPECIFICATIONS		Test Method	
FCC 15.249: 2006		ANSI C63.4: 2003	
TEST PARAMETERS			
Antenna Height(s) (m)		Test Distance (m)	
COMMENTS			
AUT at 1.8m			
EUT OPERATING MODES			
DEVIATIONS FROM TEST STANDARD			
Run #	7	 Signature	
Configuration #	4		
Results	Pass		

Zoom Scan of Beamwidth
Gain = 32.5 dBi, 3db Beam Width = 3.18 degrees



Frequency 24160.00
Measurement Antenna Polarity Horizontal
Antenna Under Test (AUT) Polarity Horizontal

