Avnera

RF-WHTIB (Sender)

March 07, 2007

Report No. AVNE0008.1

Report Prepared By

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

EMC Test Report

NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Issue Date: March 7, 2007
Avnera
Model: RF-WHTIB (Sender)

Emissions				
Test Description	**Specification**	**Test Method**	**Pass**	**Fail**
AC Powerline Conducted Emissions	FCC 15.207:2006	ANSI C63.4:2003	☒	☐
Occupied Bandwidth	FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074	☒	☐
Output Power	FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074	☒	☐
Band Edge Compliance	FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074	☒	☐
Spurious Radiated Emissions	FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074	☒	☐
Power Spectral Density	FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074	☒	☐
Spurious Conducted Emissions	FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074	☒	☐

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: (503) 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:

Donald 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		

Accreditations and Authorizations

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

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 TUV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TUV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TUV's current Listing of CARAT Laboratories, available from TUV. A certificate was issued to represent that this laboratory continues to meet TUV'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).

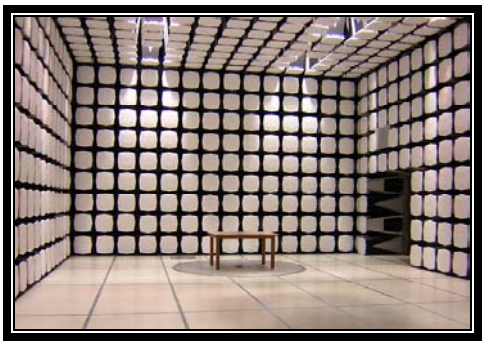
VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. *(Registration Numbers. - Hillsboro: C-1071, R-1025, C-2687, T-289, and R-2318, Irvine: R-1943,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

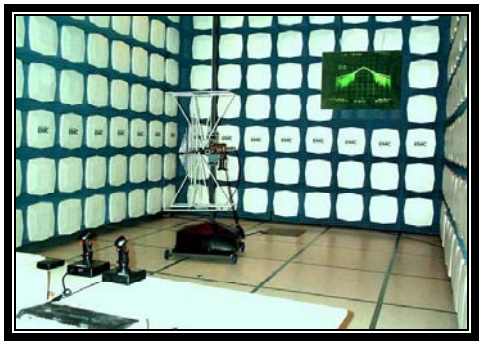
SCOPE

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:	Avnera
Address:	16505 NW Bethany Ct, Suite 100
City, State, Zip:	Beaverton, OR 97006
Test Requested By:	Ward Ramsdell
Model:	RF-WHTIB (Sender)
First Date of Test:	March 3, 2007
Last Date of Test:	March 6, 2007
Receipt Date of Samples:	March 3, 2007
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

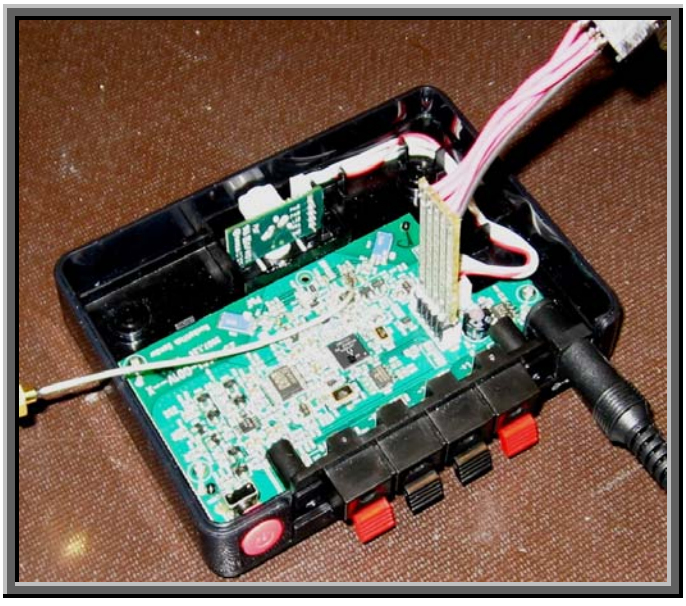
Functional Description of the EUT (Equipment Under Test):

A consumer audio transmission device comprised of two separate units using a nearly identical radio.

Testing Objective:

These tests were selected to satisfy the requirements for TCB certification under 15.247.

EUT Photo



CONFIGURATION 1 AVNE0008

Software/Firmware Running during test	
Description	**Version**
AWAconfig	v1.24

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT - RF-WHTIB (Sender)	Avnera	RF-WHTIB(Sender)	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	Avnera	PLR-050060	None
USB - SPI Adapter	Total Phase	Aardvark	2237-061748

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Test PC	Dell	D600	6XGDX41

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Leads	No	1.85m	PA	AC Adapter	EUT - RF-WHTIB (Sender)
USB Cable	Yes	1.85m	No	USB - SPI Adapter	Test PC
SPI Adapter Cable	No	0.2m	No	EUT - RF-WHTIB (Sender)	USB - SPI Adapter
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 3 AVNE0008

Software/Firmware Running during test	
Description	**Version**
AWAconfig	v1.24

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT - RF-WHTIB (Sender)	Avnera	RF-WHTIB(Sender)	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC Adapter	Avnera	PLR-050060	None
USB - SPI Adapter	Total Phase	Aardvark	2237-061748

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Test PC	Dell	D600	6XGDX41

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Leads	No	1.85m	PA	AC Adapter	EUT - RF-WHTIB (Sender)
USB Cable	Yes	1.85m	No	USB - SPI Adapter	Test PC
SPI Adapter Cable	No	0.2m	No	EUT - RF-WHTIB (Sender)	USB - SPI Adapter
Speaker wire (x4)	No	1.0m	No	EUT - RF-WHTIB (Sender)	unterminated
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 5 AVNE0008

Software/Firmware Running during test	
Description	**Version**
AWAconfig	v1.24

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT - RF-WHTIB (Sender)	Avnera	RF-WHTIB(Sender)	None

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Power supply	CUI Stack	DV-51AAT	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
USB - SPI Adapter	Total Phase	Aardvark	2237-061748
Test PC	Dell	D600	6XGDX41

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB Cable	Yes	1.85m	No	USB - SPI Adapter	Test PC
SPI Adapter Cable	No	0.2m	No	EUT - RF-WHTIB (Sender)	USB - SPI Adapter
Speaker wire (x4)	No	1.0m	No	EUT - RF-WHTIB (Sender)	unterminated
DC Leads	No	1.8m	No	Power Supply	EUT - RF-WHTIB (Sender)
AC Cable	No	2.0m	No	Power Supply	AC Mains
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	3/3/2007	Spurious Conducted 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	3/3/2007	Output Power	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	3/3/2007	Band Edge Compliance	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	3/3/2007	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.
5	3/3/2007	Power Spectral Density	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.
6	3/5/2007	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.
7	3/6/2007	Ac Powerline Conducted Emissions	Modified from delivered configuration. Initial or No Modification	Sender power supply was switched to CUI Stack M/N: DV-51AAT. Modification done by Holly Ashkannejhad.	EUT remained at Northwest EMC following the test.

SPURIOUS RADIATED EMISSIONS

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, Antenna 2
Transmitting, Antenna 1

CHANNELS INVESTIGATED
low channel
mid channel
high channel

POWER SETTINGS INVESTIGATED
120VAC/60Hz

FREQUENCY RANGE INVESTIGATED			
Start Frequency	30 MHz	Stop Frequency	26 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 cables g,h,j			EVB	12/29/2006	13
EV01 cables c,g, h			EVA	12/29/2006	13
High Pass Filter	Micro-Tronics	HPM50111	HFO	12/29/2006	13
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	12/29/2006	13
Pre-Amplifier	Miteq	AM-1616-1000	AOL	12/29/2006	13
Antenna, Horn	EMCO	3115	AHC	8/24/2006	12
Antenna, Biconilog	EMCO	3141	AXE	12/28/2005	24

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 highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.4:2003). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

NORTHWEST EMC

SPURIOUS RADIATED EMISSIONS

PSA 2007.01.31
EMI 2006.12.20

EUT:	RF-WHTIB (Sender)	Work Order:	AVNE0008
Serial Number:	None	Date:	03/05/07
Customer:	Avnera	Temperature:	22
Attendees:	None	Humidity:	31%
Project:	None	Barometric Pres.:	29.85
Tested by:	Rod Peloquin	Power: 120VAC/60Hz	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074

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

COMMENTS

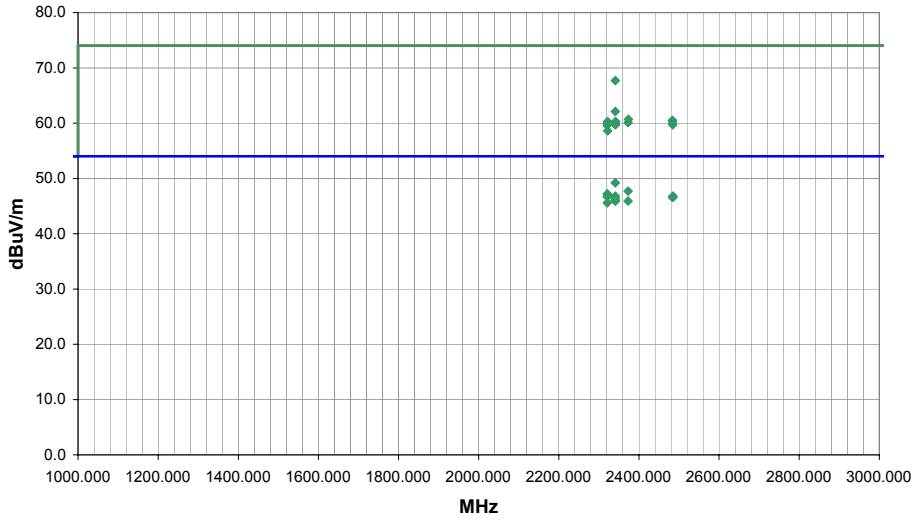
EUT OPERATING MODES

Transmitting

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	2		
Configuration #	3		
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
2341.053	28.0	1.2	78.0	1.0	0.0	20.0	H-Horn	AV	0.0	49.2	54.0	-4.8	Low Channel, Antenna 2, EUT horizontal
2373.060	26.4	1.3	133.0	1.2	0.0	20.0	H-Horn	AV	0.0	47.7	54.0	-6.3	Low Channel, Antenna 2
2340.910	46.5	1.2	281.0	1.2	0.0	20.0	H-Horn	PK	0.0	67.7	74.0	-6.3	Low Channel, Antenna 2, EUT on side
2321.117	26.2	1.0	209.0	1.3	0.0	20.0	H-Horn	AV	0.0	47.2	54.0	-6.8	High Channel, Antenna 2, EUT on side
2321.160	26.1	1.0	221.0	1.2	0.0	20.0	H-Horn	AV	0.0	47.1	54.0	-6.9	High Channel, Antenna 2
2341.123	25.6	1.2	-1.0	1.5	0.0	20.0	V-Horn	AV	0.0	46.8	54.0	-7.2	Low Channel, Antenna 2, EUT on end
2484.694	24.7	2.1	218.0	1.1	0.0	20.0	H-Horn	AV	0.0	46.8	54.0	-7.2	High Channel, Antenna 2
2321.053	25.7	1.0	191.0	1.1	0.0	20.0	V-Horn	AV	0.0	46.7	54.0	-7.3	High Channel, Antenna 2, EUT on side
2484.034	24.5	2.1	67.0	1.1	0.0	20.0	H-Horn	AV	0.0	46.6	54.0	-7.4	High Channel, Antenna 2, EUT on side
2484.194	24.5	2.1	231.0	1.1	0.0	20.0	V-Horn	AV	0.0	46.6	54.0	-7.4	High Channel, Antenna 2
2484.294	24.5	2.1	173.0	1.5	0.0	20.0	V-Horn	AV	0.0	46.6	54.0	-7.4	High Channel, Antenna 2, EUT on side
2341.020	25.2	1.2	281.0	1.2	0.0	20.0	H-Horn	AV	0.0	46.4	54.0	-7.6	Low Channel, Antenna 2, EUT on side
2340.907	24.8	1.2	315.0	1.4	0.0	20.0	V-Horn	AV	0.0	46.0	54.0	-8.0	Low Channel, Antenna 2, EUT on side
2341.133	24.8	1.2	64.0	1.0	0.0	20.0	V-Horn	AV	0.0	46.0	54.0	-8.0	Low Channel, Antenna 2, EUT horizontal
2341.003	24.7	1.2	30.0	1.3	0.0	20.0	H-Horn	AV	0.0	45.9	54.0	-8.1	Low Channel, Antenna 2, EUT on end
2372.950	24.6	1.3	232.0	1.1	0.0	20.0	V-Horn	AV	0.0	45.9	54.0	-8.1	Low Channel, Antenna 2
2321.217	24.6	1.0	300.0	1.2	0.0	20.0	V-Horn	AV	0.0	45.6	54.0	-8.4	High Channel, Antenna 2
2340.990	40.9	1.2	78.0	1.0	0.0	20.0	H-Horn	PK	0.0	62.1	74.0	-11.9	Low Channel, Antenna 2, EUT horizontal

NORTHWEST EMC

SPURIOUS RADIATED EMISSIONS

PSA 2007.01.31
EMI 2006.12.20

EUT:	RF-WHTIB (Sender)			Work Order:	AVNE0008
Serial Number:	None			Date:	03/05/07
Customer:	Avnera			Temperature:	22
Attendees:	None			Humidity:	31%
Project:	None			Barometric Pres.:	29.85
Tested by:	Rod Peloquin	Power:	120VAC/60Hz	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	0

COMMENTS

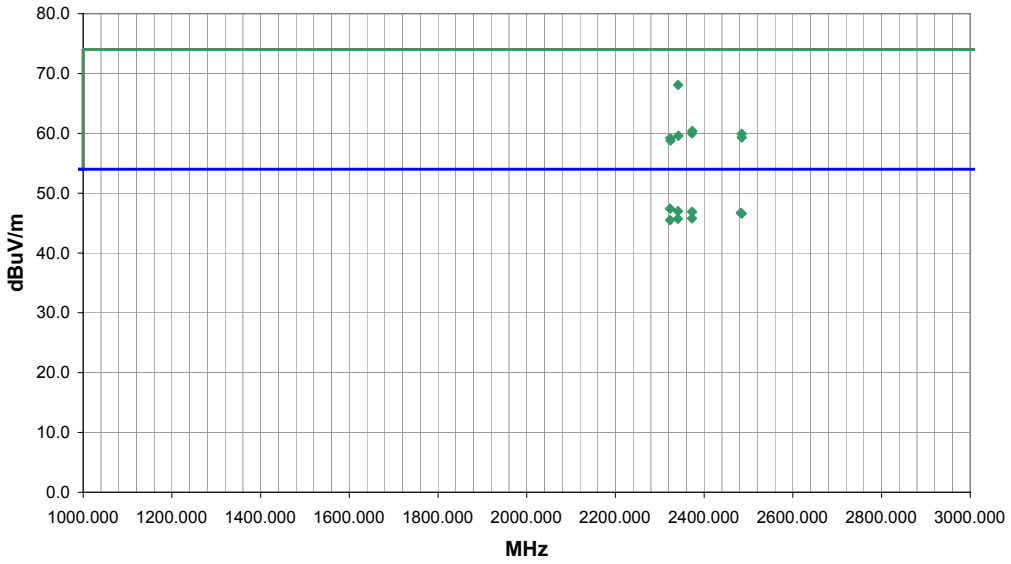
EUT OPERATING MODES

Transmitting

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	3		
Configuration #	3		
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
2341.230	46.9	1.2	325.0	1.3	0.0	20.0	H-Horn	PK	0.0	68.1	74.0	-5.9	Low Channel, Antenna 1
2323.083	26.4	1.0	43.0	1.0	0.0	20.0	H-Horn	AV	0.0	47.4	54.0	-6.6	High Channel, Antenna 1
2341.087	25.8	1.2	325.0	1.3	0.0	20.0	H-Horn	AV	0.0	47.0	54.0	-7.0	Low Channel, Antenna 1
2373.103	25.6	1.3	29.0	1.2	0.0	20.0	H-Horn	AV	0.0	46.9	54.0	-7.1	Low Channel, Antenna 1
2482.854	24.6	2.1	27.0	1.1	0.0	20.0	H-Horn	AV	0.0	46.7	54.0	-7.3	High Channel, Antenna 1
2484.677	24.5	2.1	325.0	1.5	0.0	20.0	V-Horn	AV	0.0	46.6	54.0	-7.4	High Channel, Antenna 1
2372.790	24.5	1.3	280.0	1.2	0.0	20.0	V-Horn	AV	0.0	45.8	54.0	-8.2	Low Channel, Antenna 1
2340.963	24.5	1.2	260.0	1.1	0.0	20.0	V-Horn	AV	0.0	45.7	54.0	-8.3	Low Channel, Antenna 1
2323.322	24.5	1.0	173.0	1.0	0.0	20.0	V-Horn	AV	0.0	45.5	54.0	-8.5	High Channel, Antenna 1
2373.293	39.1	1.3	29.0	1.2	0.0	20.0	H-Horn	PK	0.0	60.4	74.0	-13.6	Low Channel, Antenna 1
2372.587	38.7	1.3	280.0	1.2	0.0	20.0	V-Horn	PK	0.0	60.0	74.0	-14.0	Low Channel, Antenna 1
2484.784	37.8	2.1	27.0	1.1	0.0	20.0	H-Horn	PK	0.0	59.9	74.0	-14.1	High Channel, Antenna 1
2341.840	38.4	1.2	260.0	1.1	0.0	20.0	V-Horn	PK	0.0	59.6	74.0	-14.4	Low Channel, Antenna 1
2485.004	37.2	2.1	325.0	1.5	0.0	20.0	V-Horn	PK	0.0	59.3	74.0	-14.7	High Channel, Antenna 1
2323.585	38.2	1.0	43.0	1.0	0.0	20.0	H-Horn	PK	0.0	59.2	74.0	-14.8	High Channel, Antenna 1
2324.257	37.8	1.0	173.0	1.0	0.0	20.0	V-Horn	PK	0.0	58.8	74.0	-15.2	High Channel, Antenna 1

NORTHWEST EMC

SPURIOUS RADIATED EMISSIONS

PSA 2007.01.31
EMI 2006.12.20

EUT:	RF-WHTIB (Sender)	Work Order:	AVNE0008
Serial Number:	None	Date:	03/05/07
Customer:	Avnera	Temperature:	22
Attendees:	None	Humidity:	31%
Project:	None	Barometric Pres.:	29.85
Tested by:	Rod Peloquin	Power: 120VAC/60Hz	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074

TEST PARAMETERS

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

COMMENTS

EUT OPERATING MODES

Transmitting, Antenna 1

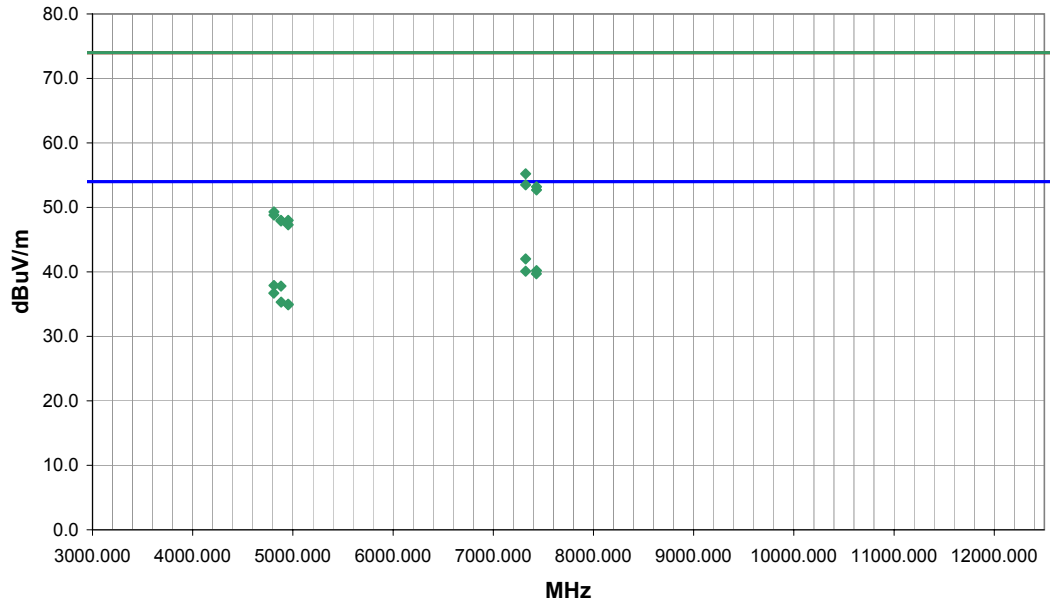
DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	4
Configuration #	3
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
7323.190	26.8	15.2	234.0	2.0	0.0	0.0	V-Horn	AV	0.0	42.0	54.0	-12.0	Mid Channel
7430.823	24.7	15.5	224.0	1.0	0.0	0.0	V-Horn	AV	0.0	40.2	54.0	-13.8	High Channel
7323.203	24.9	15.2	138.0	1.0	0.0	0.0	H-Horn	AV	0.0	40.1	54.0	-13.9	Mid Channel
7429.553	24.2	15.5	121.0	1.0	0.0	0.0	H-Horn	AV	0.0	39.7	54.0	-14.3	High Channel
4810.103	28.6	9.3	14.0	1.0	0.0	0.0	V-Horn	AV	0.0	37.9	54.0	-16.1	Low Channel
4880.410	28.3	9.5	58.0	1.0	0.0	0.0	H-Horn	AV	0.0	37.8	54.0	-16.2	Mid Channel
4809.990	27.4	9.3	58.0	1.0	0.0	0.0	H-Horn	AV	0.0	36.7	54.0	-17.3	Low Channel
4882.080	25.8	9.5	224.0	1.0	0.0	0.0	V-Horn	AV	0.0	35.3	54.0	-18.7	Mid Channel
7323.480	40.0	15.2	234.0	2.0	0.0	0.0	V-Horn	PK	0.0	55.2	74.0	-18.8	Mid Channel
4953.063	25.0	10.0	38.0	1.0	0.0	0.0	V-Horn	AV	0.0	35.0	54.0	-19.0	High Channel
4953.097	24.9	10.0	269.0	1.0	0.0	0.0	H-Horn	AV	0.0	34.9	54.0	-19.1	High Channel
7323.613	38.3	15.2	138.0	1.0	0.0	0.0	H-Horn	PK	0.0	53.5	74.0	-20.5	Mid Channel
7431.263	37.7	15.5	224.0	1.0	0.0	0.0	V-Horn	PK	0.0	53.2	74.0	-20.8	High Channel
7431.657	37.2	15.5	121.0	1.0	0.0	0.0	H-Horn	PK	0.0	52.7	74.0	-21.3	High Channel
4810.380	40.0	9.3	14.0	1.0	0.0	0.0	V-Horn	PK	0.0	49.3	74.0	-24.7	Low Channel
4810.467	39.5	9.3	58.0	1.0	0.0	0.0	H-Horn	PK	0.0	48.8	74.0	-25.2	Low Channel
4881.750	38.5	9.5	224.0	1.0	0.0	0.0	V-Horn	PK	0.0	48.0	74.0	-26.0	Mid Channel
4953.080	38.0	10.0	269.0	1.0	0.0	0.0	H-Horn	PK	0.0	48.0	74.0	-26.0	High Channel
4881.550	38.4	9.5	58.0	1.0	0.0	0.0	H-Horn	PK	0.0	47.9	74.0	-26.1	Mid Channel
4953.107	37.3	10.0	38.0	1.0	0.0	0.0	V-Horn	PK	0.0	47.3	74.0	-26.7	High Channel

NORTHWEST EMC

SPURIOUS RADIATED EMISSIONS

PSA 2007.01.31
EMI 2006.12.20

EUT:	RF-WHTIB (Sender)			Work Order:	AVNE0008
Serial Number:	None			Date:	03/05/07
Customer:	Avnera			Temperature:	22
Attendees:	None			Humidity:	31%
Project:	None			Barometric Pres.:	29.85
Tested by:	Rod Peloquin	Power:	120VAC/60Hz	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247 (DTS):2006	ANSI C63.4:2003 KDB No. 558074

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

COMMENTS

EUT OPERATING MODES

Transmitting, Antenna 2

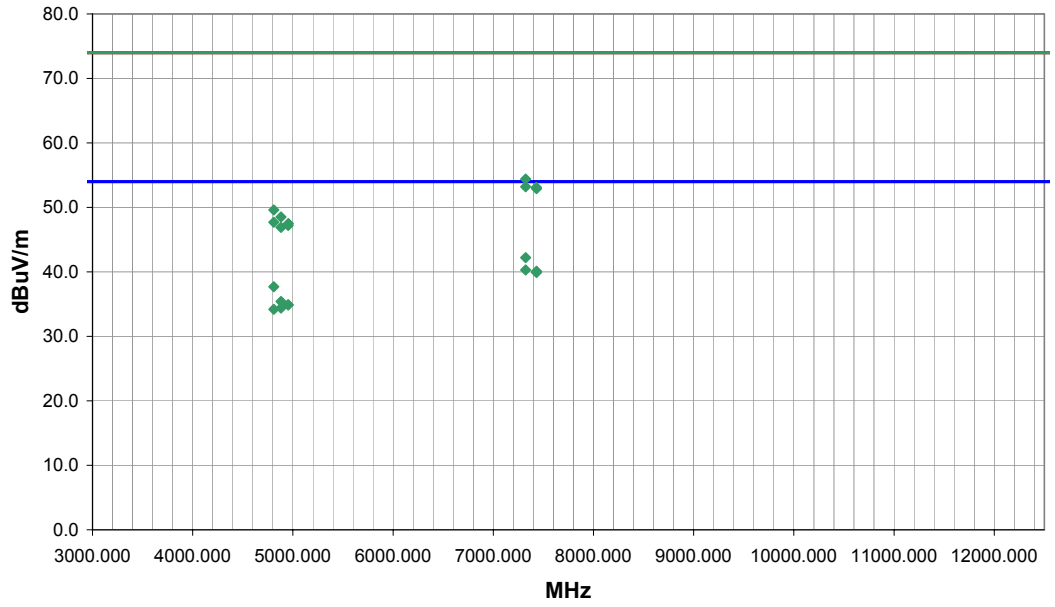
DEVIATIONS FROM TEST STANDARD

No deviations.

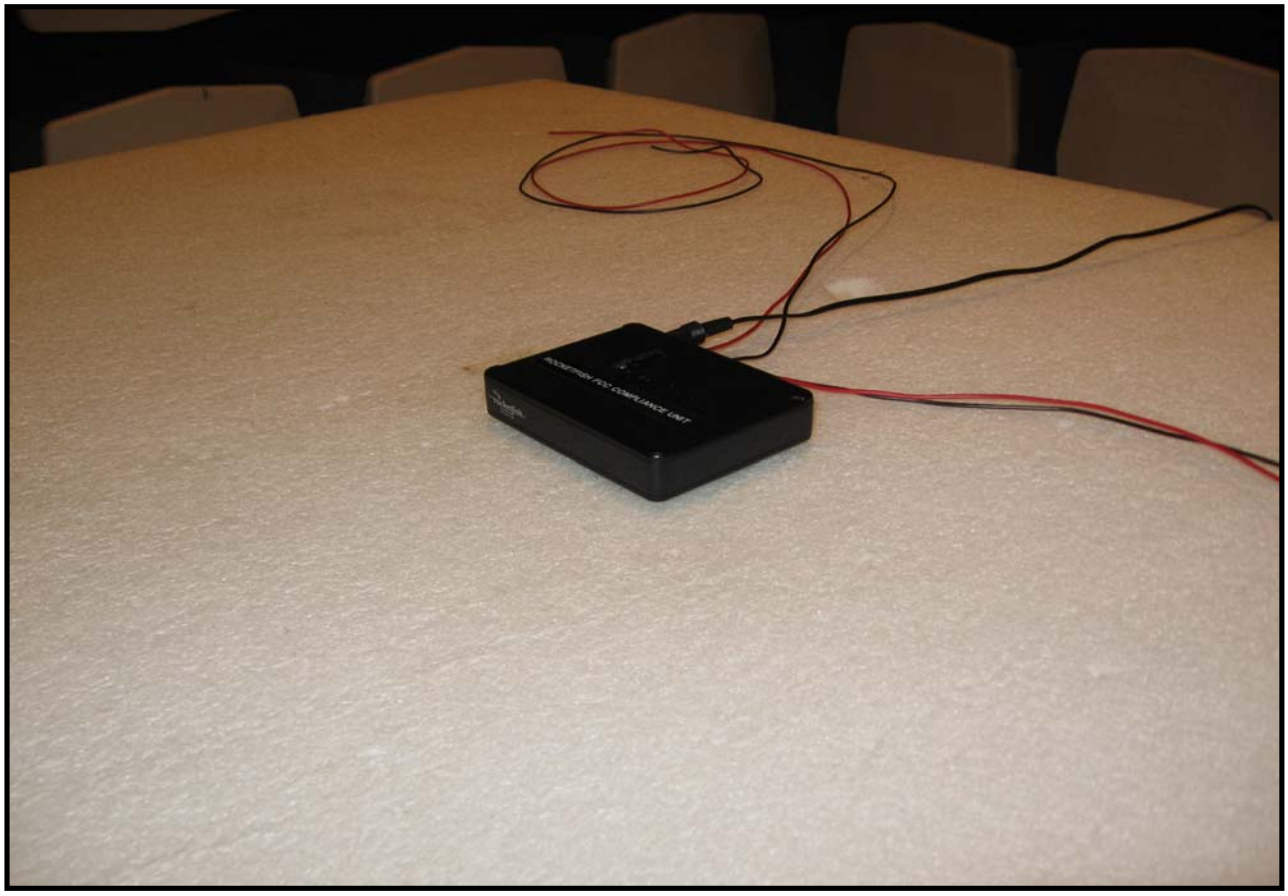
Run #	5
Configuration #	3
Results	Pass

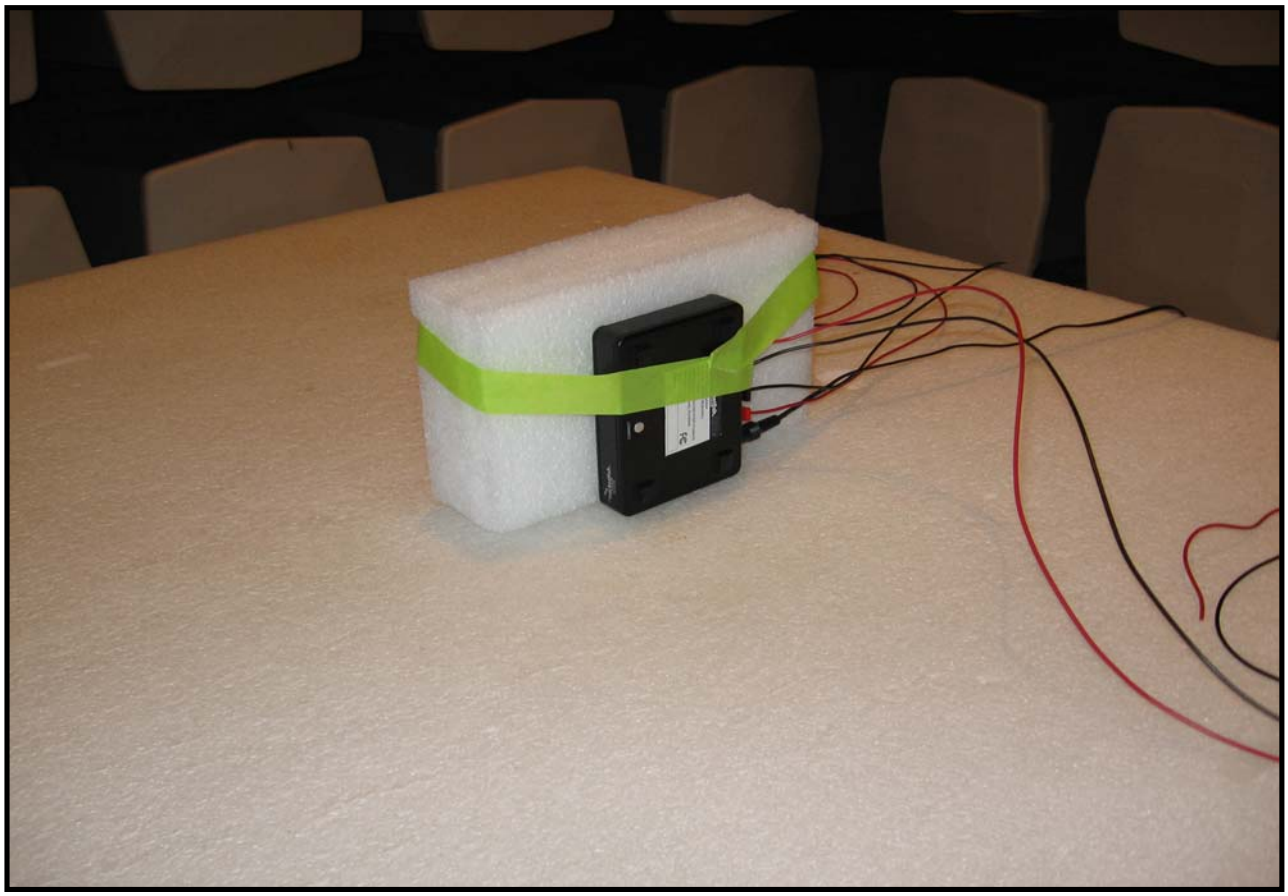
NVLAP Lab Code 200630-0

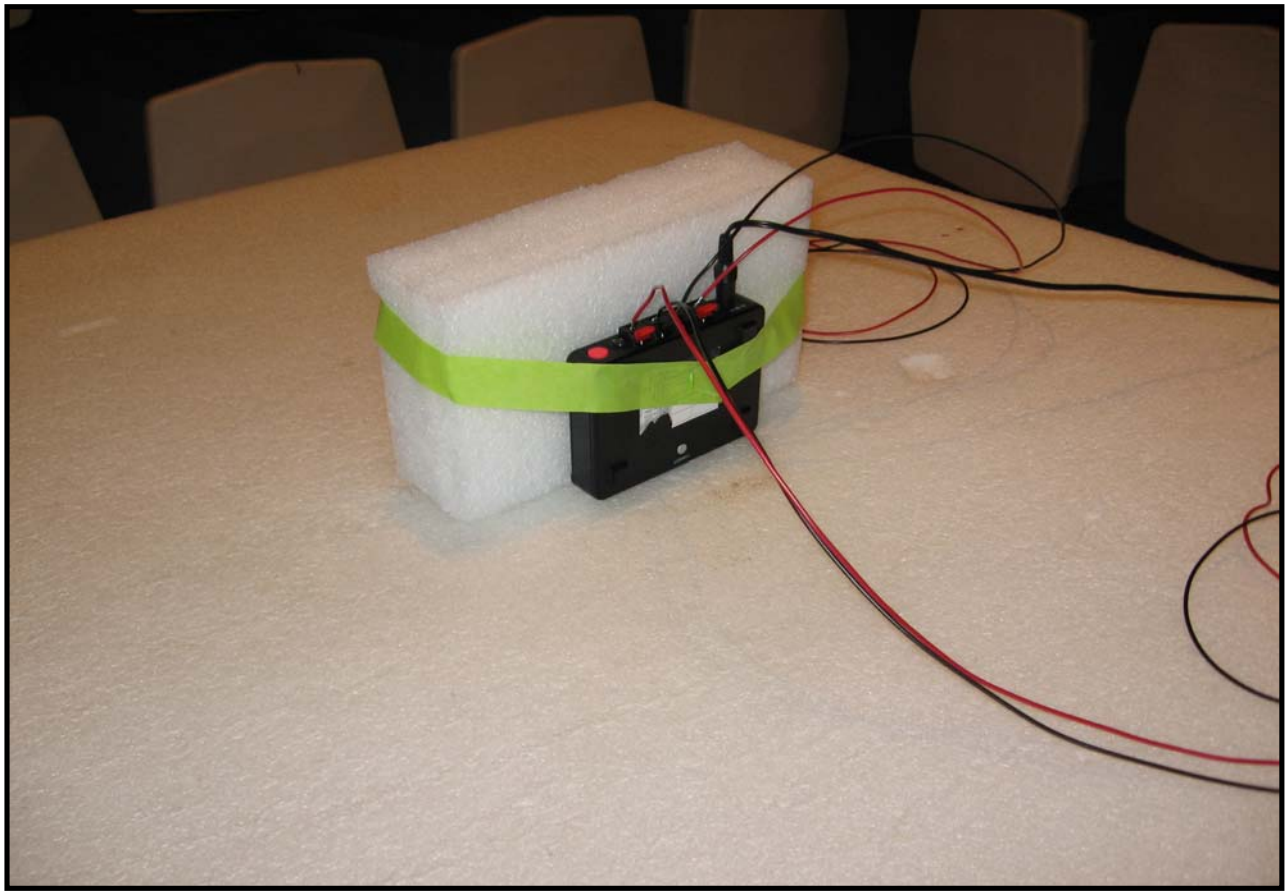
Signature



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
7323.163	27.0	15.2	226.0	1.9	0.0	0.0	V-Horn	AV	0.0	42.2	54.0	-11.8	Mid Channel
7323.353	25.1	15.2	203.0	1.0	0.0	0.0	H-Horn	AV	0.0	40.3	54.0	-13.7	Mid Channel
7430.877	24.6	15.5	289.0	1.6	0.0	0.0	V-Horn	AV	0.0	40.1	54.0	-13.9	High Channel
7431.110	24.4	15.5	210.0	1.0	0.0	0.0	H-Horn	AV	0.0	39.9	54.0	-14.1	High Channel
4810.073	28.4	9.3	21.0	1.0	0.0	0.0	V-Horn	AV	0.0	37.7	54.0	-16.3	Low Channel
4881.940	25.9	9.5	268.0	1.0	0.0	0.0	H-Horn	AV	0.0	35.4	54.0	-18.6	Mid Channel
4953.127	24.9	10.0	234.0	1.0	0.0	0.0	V-Horn	AV	0.0	34.9	54.0	-19.1	High Channel
4953.330	24.9	10.0	277.0	1.0	0.0	0.0	H-Horn	AV	0.0	34.9	54.0	-19.1	High Channel
7323.283	39.2	15.2	226.0	1.9	0.0	0.0	V-Horn	PK	0.0	54.4	74.0	-19.6	Mid Channel
4881.870	24.9	9.5	359.0	1.5	0.0	0.0	V-Horn	AV	0.0	34.4	54.0	-19.6	Mid Channel
4809.807	24.9	9.3	359.0	1.9	0.0	0.0	H-Horn	AV	0.0	34.2	54.0	-19.8	Low Channel
7323.063	38.0	15.2	203.0	1.0	0.0	0.0	H-Horn	PK	0.0	53.2	74.0	-20.8	Mid Channel
7430.217	37.6	15.5	289.0	1.6	0.0	0.0	V-Horn	PK	0.0	53.1	74.0	-20.9	High Channel
7431.223	37.4	15.5	210.0	1.0	0.0	0.0	H-Horn	PK	0.0	52.9	74.0	-21.1	High Channel
4809.933	40.3	9.3	21.0	1.0	0.0	0.0	V-Horn	PK	0.0	49.6	74.0	-24.4	Low Channel
4881.780	39.0	9.5	268.0	1.0	0.0	0.0	H-Horn	PK	0.0	48.5	74.0	-25.5	Mid Channel
4809.130	38.4	9.3	359.0	1.9	0.0	0.0	H-Horn	PK	0.0	47.7	74.0	-26.3	Low Channel
4953.820	37.5	10.0	234.0	1.0	0.0	0.0	V-Horn	PK	0.0	47.5	74.0	-26.5	High Channel
4953.357	37.2	10.0	277.0	1.0	0.0	0.0	H-Horn	PK	0.0	47.2	74.0	-26.8	High Channel
4881.003	37.4	9.5	359.0	1.5	0.0	0.0	V-Horn	PK	0.0	46.9	74.0	-27.1	Mid Channel







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
Attenuator	Pasternack	PE7005-20	AUN	2/6/2007	13
Power Sensor	Gigatronics	80701A	SPL	9/19/2006	12
Power Meter	Gigatronics	8651A	SPM	9/19/2006	12
Attenuator	Pasternack	PE7005-20	AUN	2/6/2007	13
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2006	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 set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode.

NORTHWEST EMC

OCCUPIED BANDWIDTH

XMit 2006.11.13

EUT:	RF-WHTIB (Sender)			**Work Order:**	AVNE0008
Serial Number:	None			**Date:**	03/03/07
Customer:	Avnera			**Temperature:**	21°C
Attendees:	None			**Humidity:**	35%
Project:	None			**Barometric Pres.:**	30.47
Tested by:	Rod Peloquin	**Power:**	120VAC/60Hz	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074

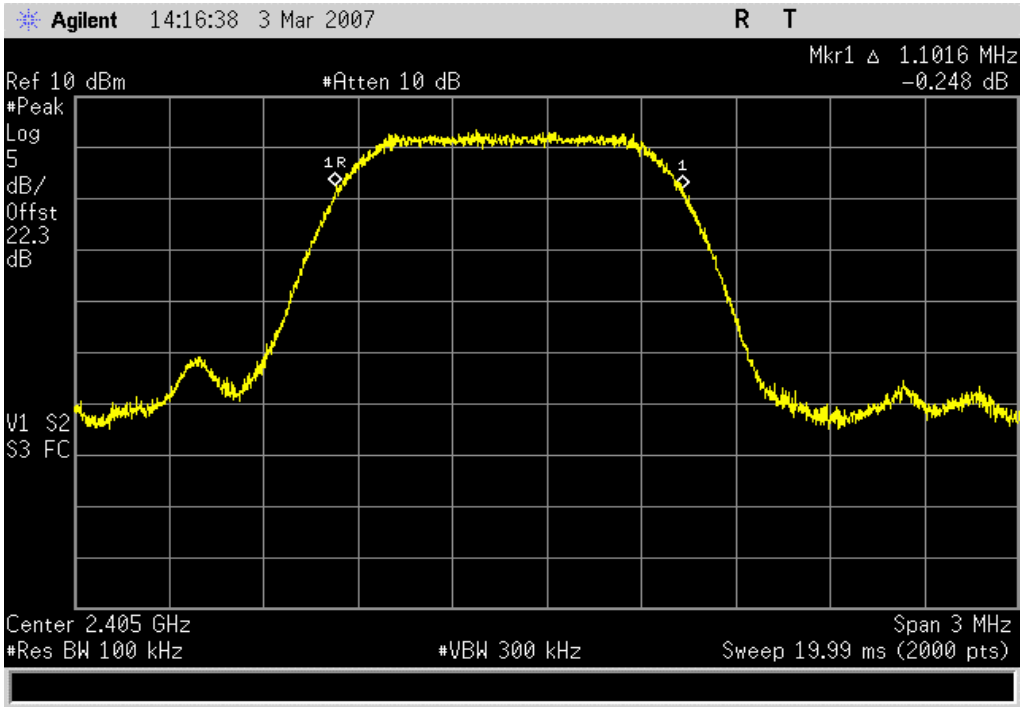
COMMENTS

DEVIATIONS FROM TEST STANDARD

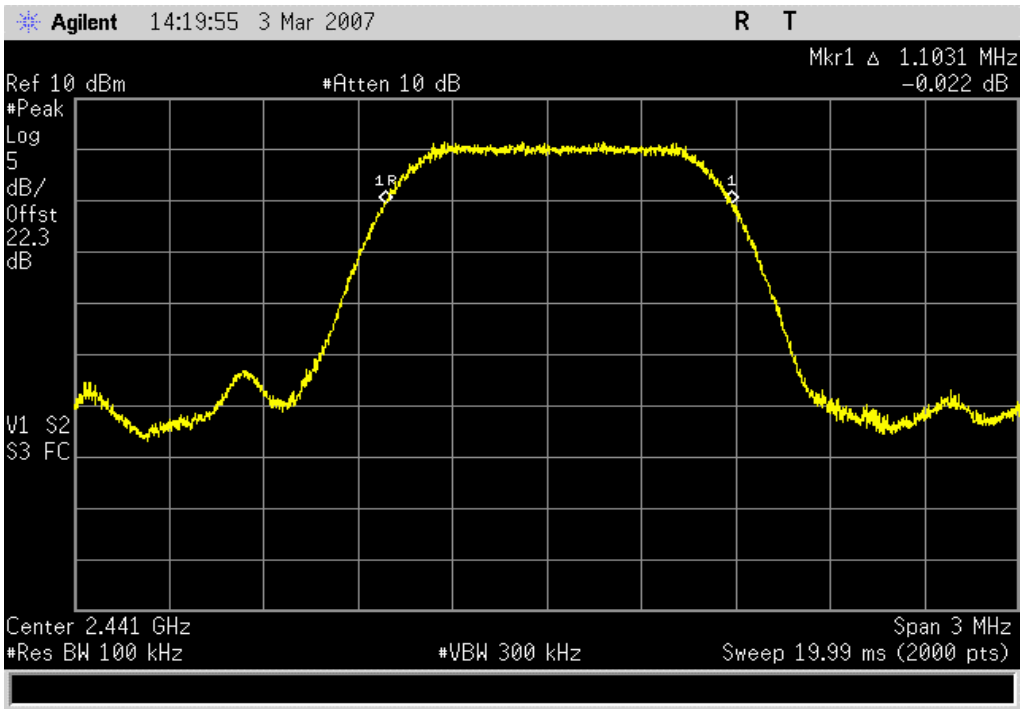
Configuration #	1	Signature

	Value	Limit	Results
Low Channel	1.1016 MHz	> 500 kHz	Pass
Mid Channel	1.1031 MHz	> 500 kHz	Pass
High Channel	1.0970 MHz	> 500 kHz	Pass

Low Channel					
Result:	Pass	**Value:**	1.1016 MHz	**Limit:**	> 500 kHz

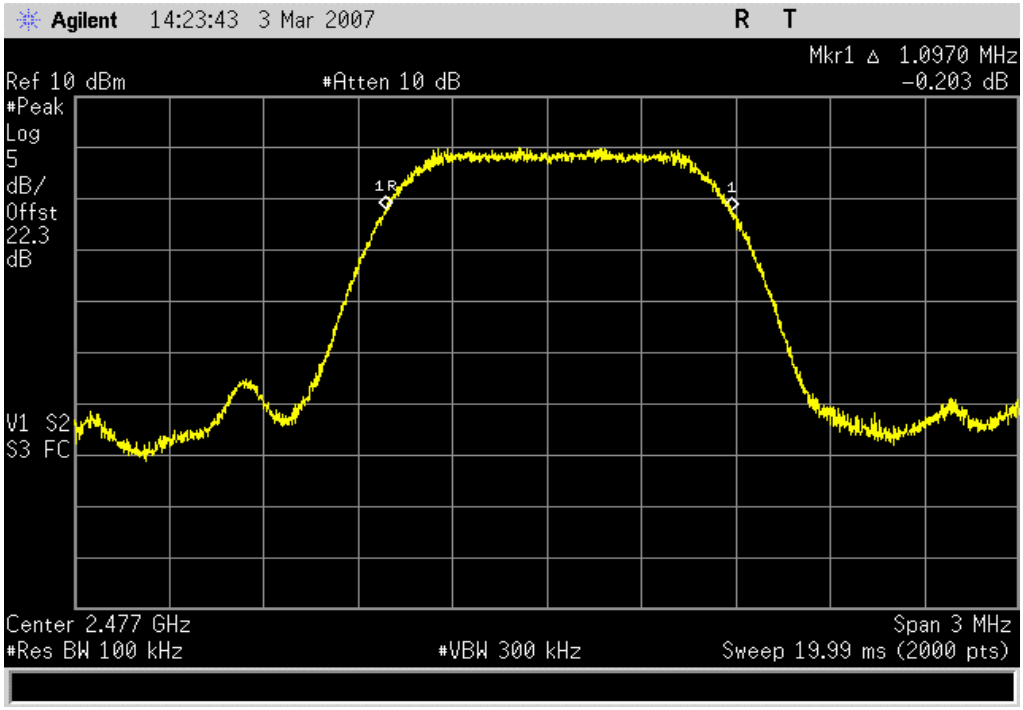


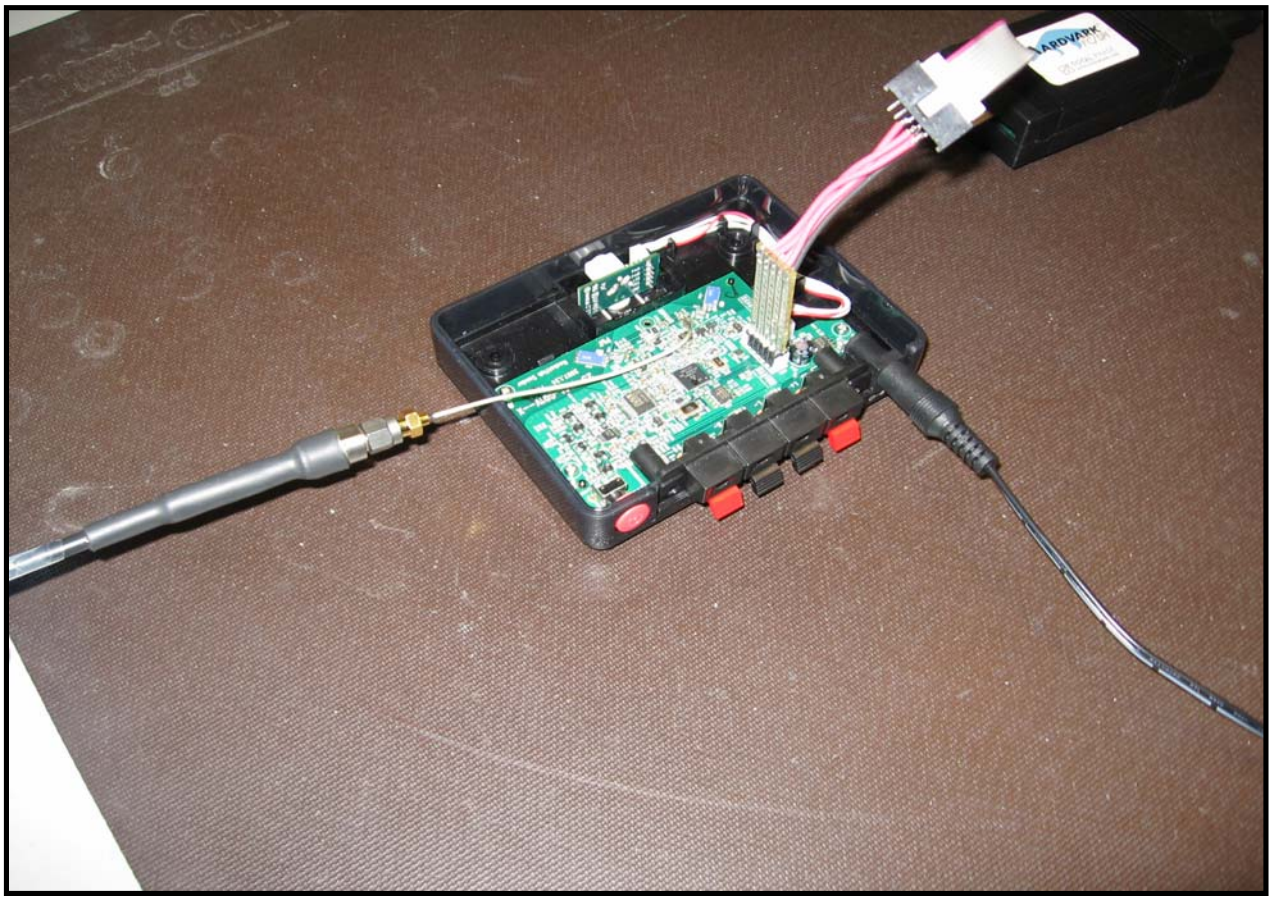
Mid Channel					
Result:	Pass	**Value:**	1.1031 MHz	**Limit:**	> 500 kHz



OCCUPIED BANDWIDTH

High Channel					
Result:	Pass	**Value:**	1.0970 MHz	**Limit:**	> 500 kHz





OUTPUT POWER

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
Attenuator	Pasternack	PE7005-20	AUN	2/6/2007	13
Power Meter	Gigatronics	8651A	SPM	9/19/2006	12
Power Sensor	Gigatronics	80701A	SPL	9/19/2006	12
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2006	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 peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting at its maximum data rate in a no hop mode.

De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36dBm.

NORTHWEST EMC

OUTPUT POWER

XMit 2006.11.13

EUT:	RF-WHTIB (Sender)			Work Order:	AVNE0008
Serial Number:	None			Date:	03/03/07
Customer:	Avnera			Temperature:	21°C
Attendees:	None			Humidity:	36%
Project:	None			Barometric Pres.:	30.47
Tested by:	Rod Peloquin	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074

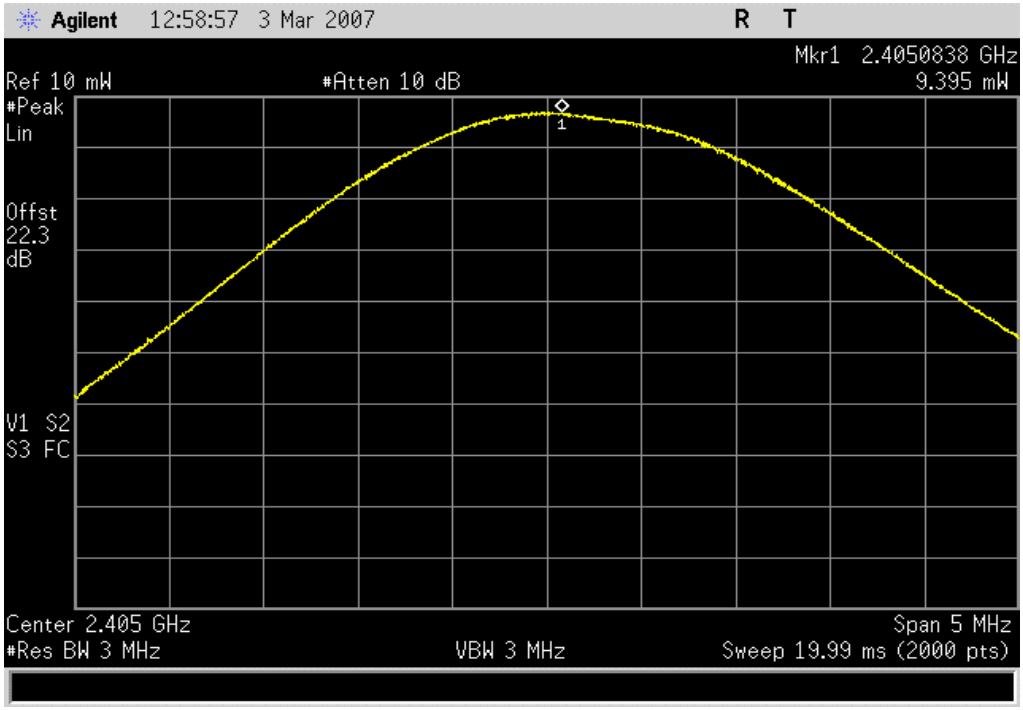
COMMENTS

DEVIATIONS FROM TEST STANDARD

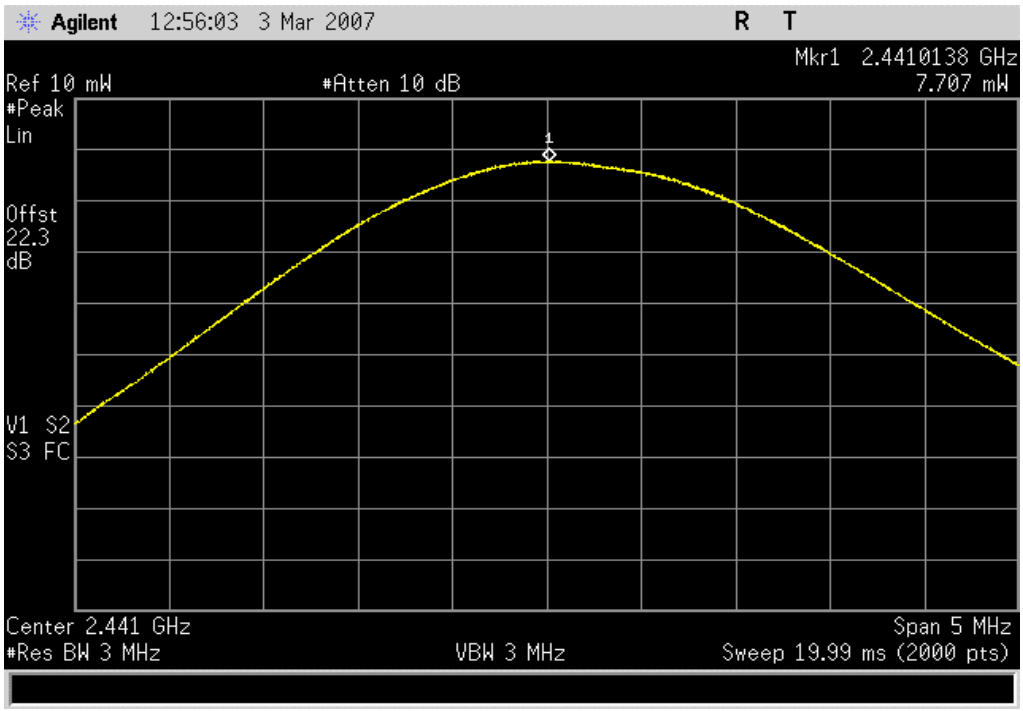
Configuration #	1	Signature

	Value	Limit	Results
Low Channel	9.40 mW	1 W	Pass
Mid Channel	7.71 mW	1 W	Pass
High Channel	6.47 mW	1 W	Pass

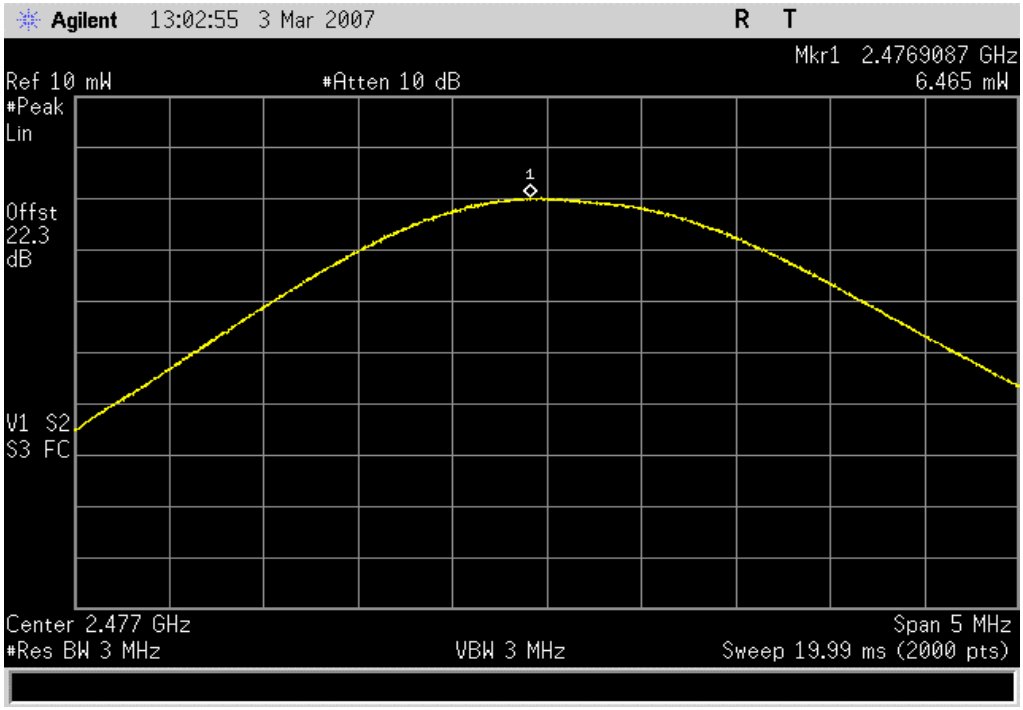
Low Channel					
Result:	Pass	**Value:**	9.40 mW	**Limit:**	1 W

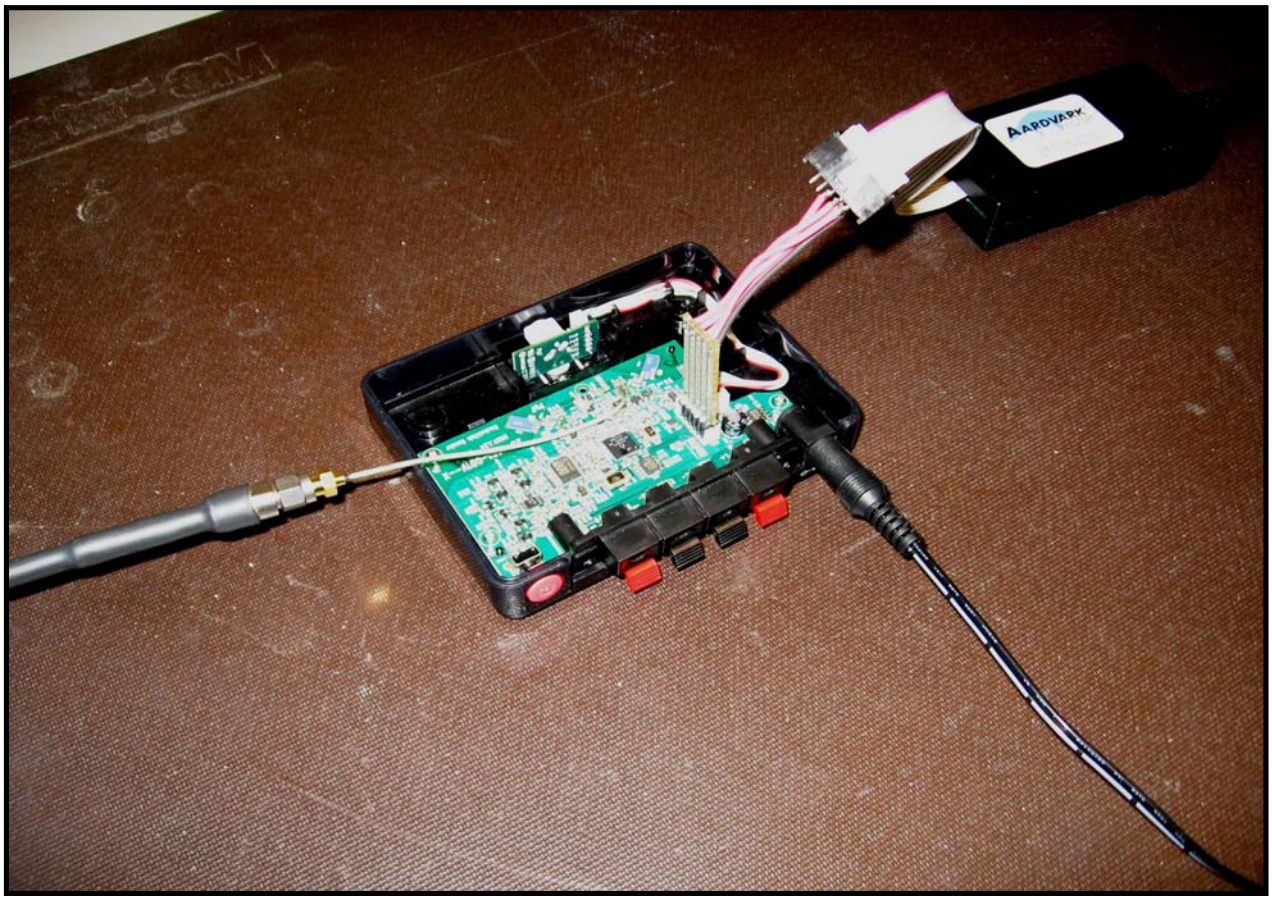


Mid Channel					
Result:	Pass	**Value:**	7.71 mW	**Limit:**	1 W



High Channel					
Result:	Pass	**Value:**	6.47 mW	**Limit:**	1 W




AAPDVAPX

BAND EDGE COMPLIANCE

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
Attenuator	Pasternack	PE7005-20	AUN	2/6/2007	13
Power Sensor	Gigatronics	80701A	SPL	9/19/2006	12
Power Meter	Gigatronics	8651A	SPM	9/19/2006	12
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2006	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 requirements of FCC 15.247(d) for emissions at least 20dB below the carrier in any 100kHz bandwidth outside the allowable band was measured with the EUT set to low and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate using direct sequence modulation. The channels closest to the band edges were selected. The spectrum was scanned across each band edge from 10 MHz below the band edge to 10 MHz above the band edge.

NORTHWEST EMC

BAND EDGE COMPLIANCE

XMit 2006.11.13

EUT:	RF-WHTIB (Sender)			Work Order:	AVNE0008
Serial Number:	None			Date:	03/03/07
Customer:	Avnera			Temperature:	21°C
Attendees:	None			Humidity:	35%
Project:	None			Barometric Pres.:	30.47
Tested by:	Rod Peloquin	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074

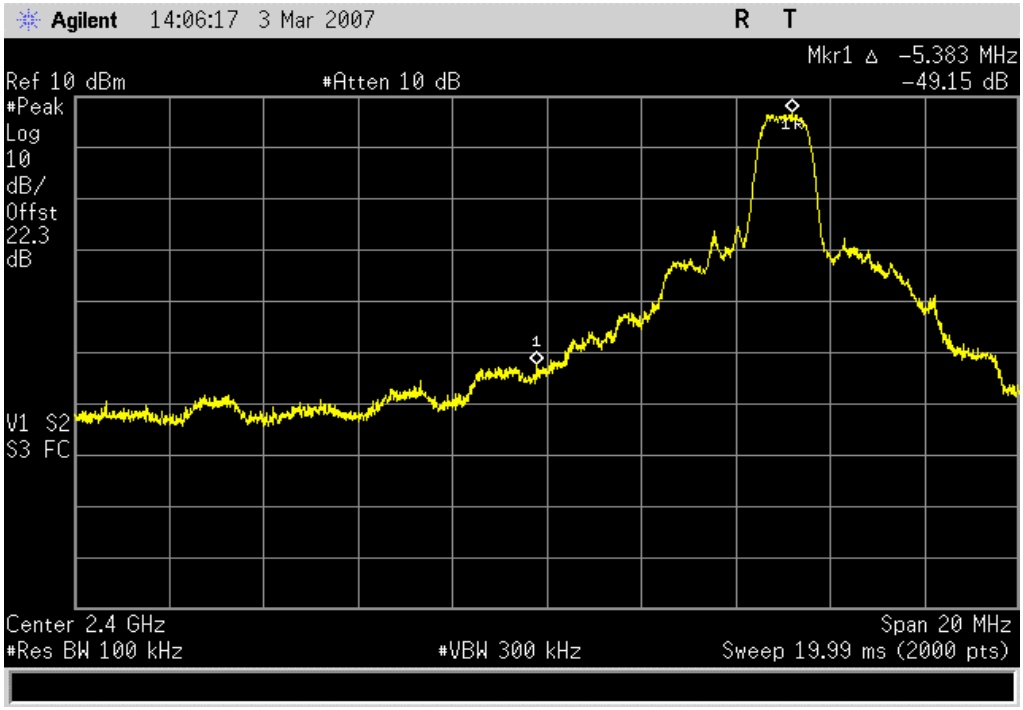
COMMENTS

DEVIATIONS FROM TEST STANDARD

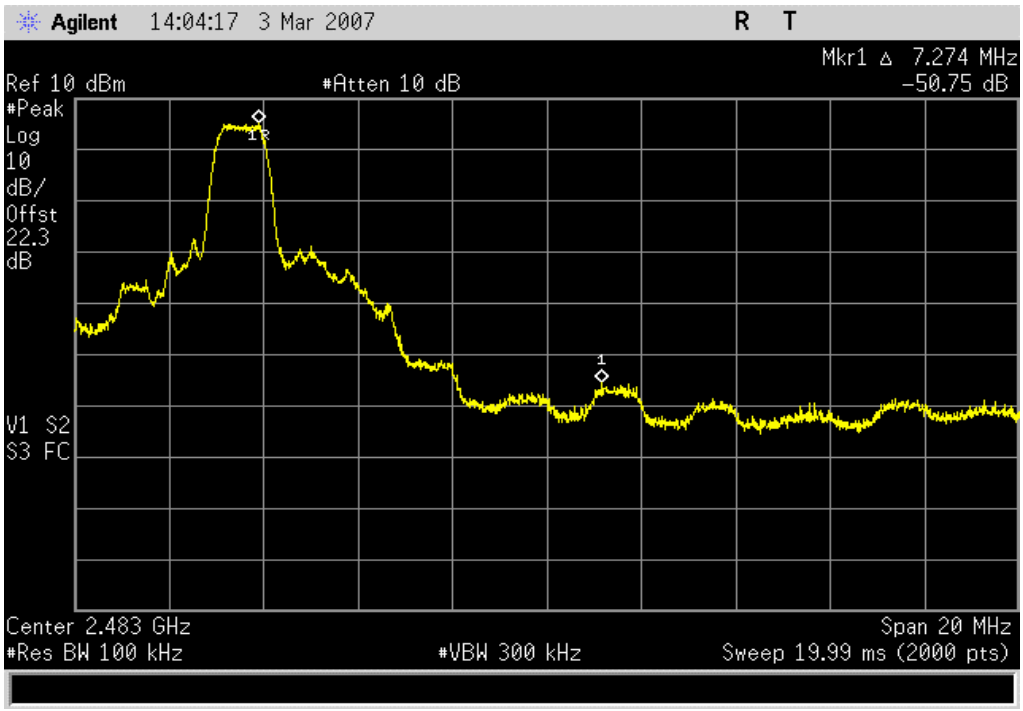
Configuration #	1	Signature

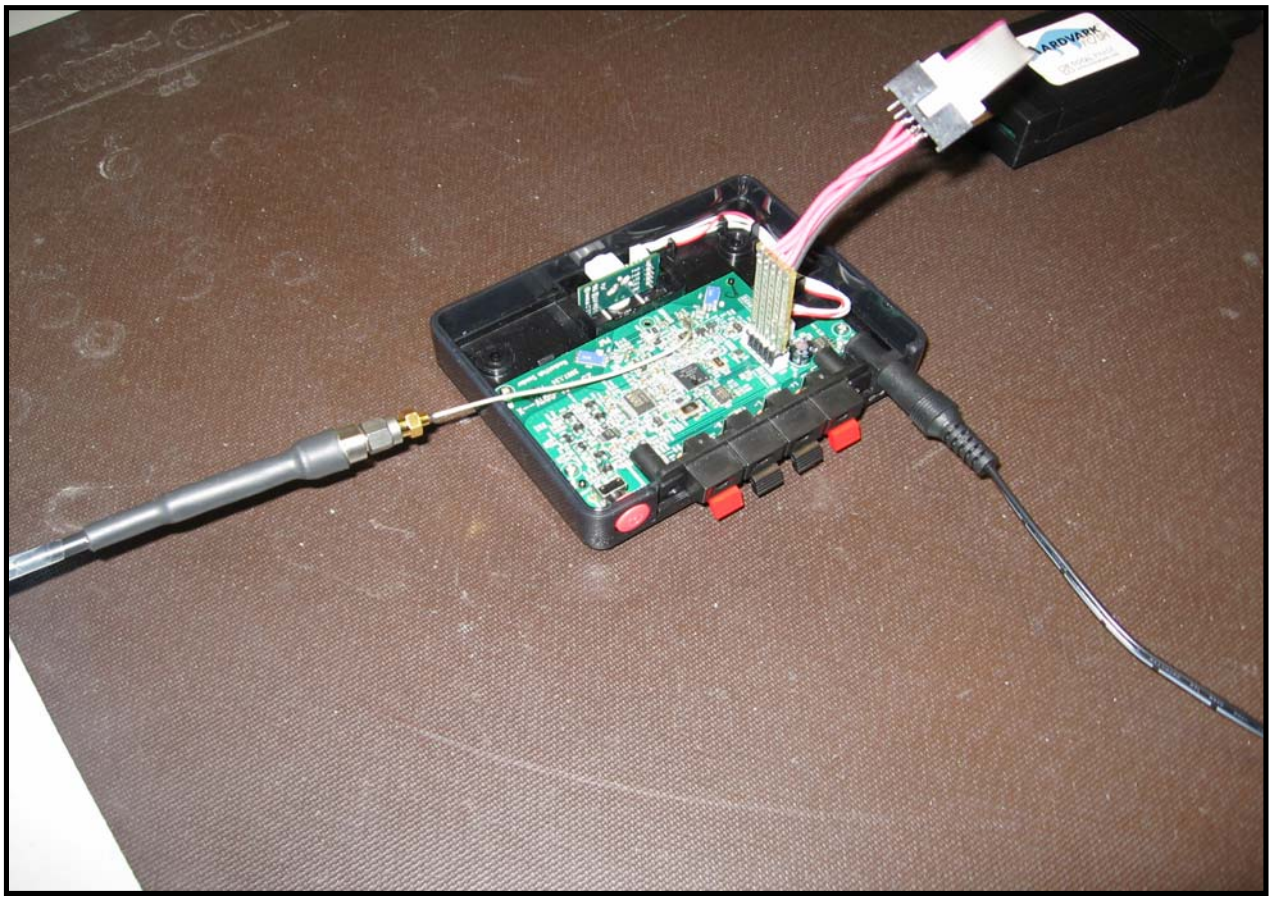
	Value	Limit	Results
Low Channel	-49.2 dBc	≤ -20 dBc	Pass
High Channel	-50.8 dBc	≤ -20 dBc	Pass

Low Channel					
Result:	Pass	**Value:**	-49.2 dBc	**Limit:**	≤ -20 dBc



High Channel					
Result:	Pass	**Value:**	-50.8 dBc	**Limit:**	≤ -20 dBc





SPURIOUS CONDUCTED EMISSIONS

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
Attenuator	Pasternack	PE7005-20	AUN	2/6/2007	13
Power Meter	Gigatronics	8651A	SPM	9/19/2006	12
Power Sensor	Gigatronics	80701A	SPL	9/19/2006	12
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2006	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 spurious RF conducted emissions were measured with the EUT set to low, medium, and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate using direct sequence modulation. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

NORTHWEST EMC

SPURIOUS CONDUCTED EMISSIONS

XMit 2006.11.13

EUT:	RF-WHTIB (Sender)			Work Order:	AVNE0008
Serial Number:	None			Date:	03/03/07
Customer:	Avnera			Temperature:	213°C
Attendees:	None			Humidity:	36%
Project:	None			Barometric Pres.:	30.47
Tested by:	Rod Peloquin	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074

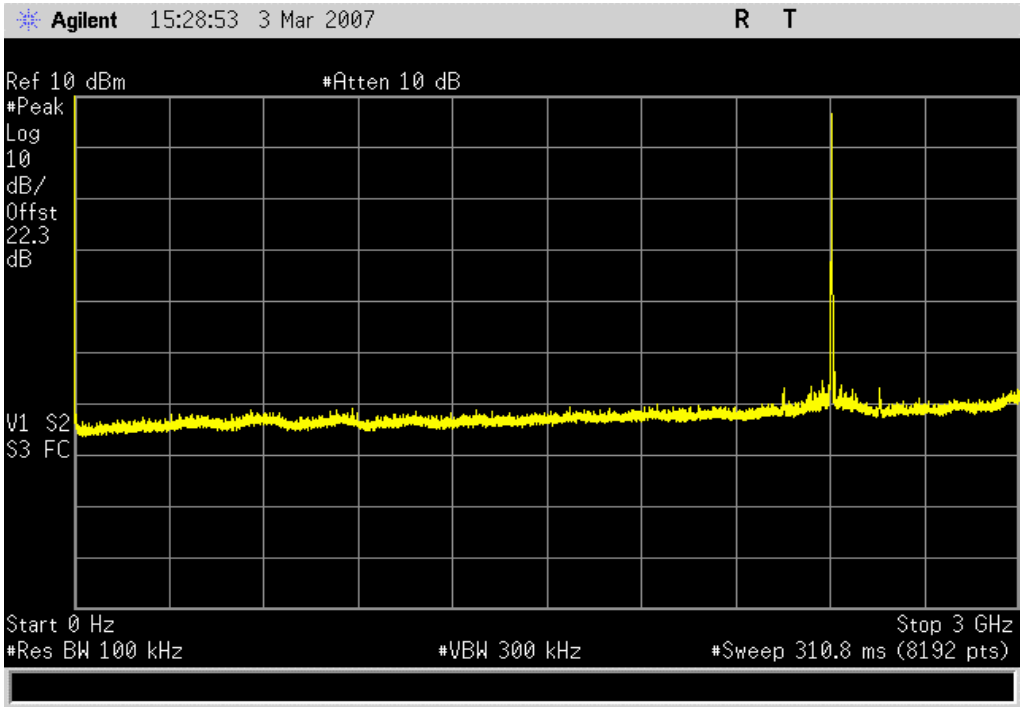
COMMENTS

DEVIATIONS FROM TEST STANDARD

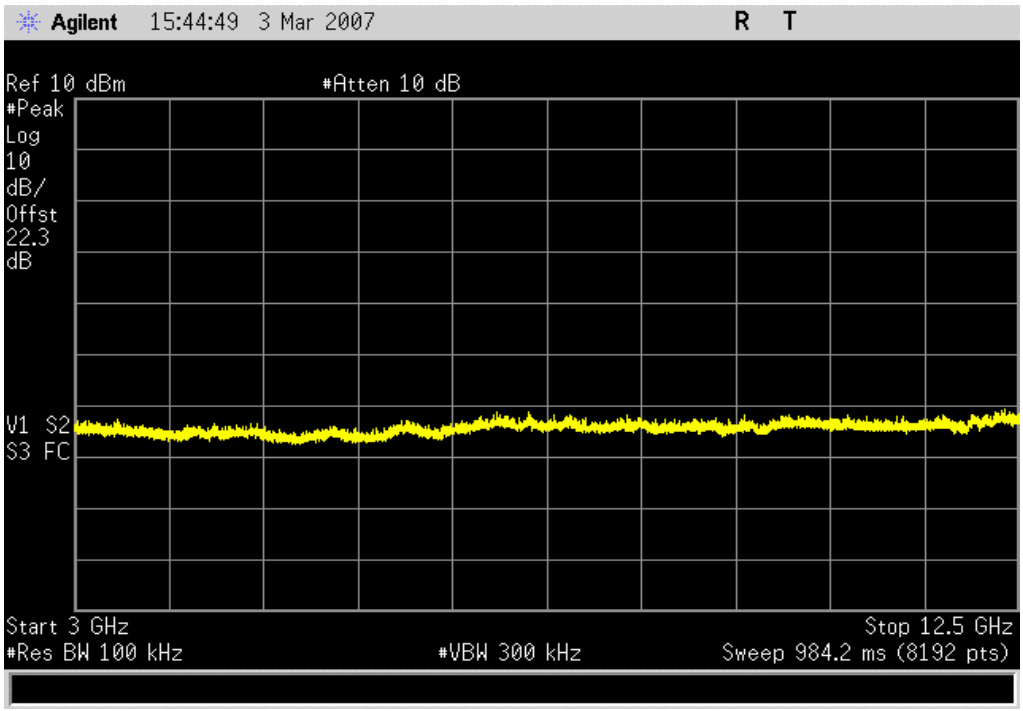
Configuration #	1	Signature

		Value	Limit	Results
Low Channel				
	0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
	3 - 12.5 GHz	< -40 dBc	≤ -20 dBc	Pass
	12.5 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass
Mid Channel				
	0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
	3 - 12.5 GHz	< -40 dBc	≤ -20 dBc	Pass
	12.5 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass
High Channel				
	0 - 3 GHz	< -40 dBc	≤ -20 dBc	Pass
	3 - 12.5 GHz	< -40 dBc	≤ -20 dBc	Pass
	12.5 - 25 GHz	< -40 dBc	≤ -20 dBc	Pass

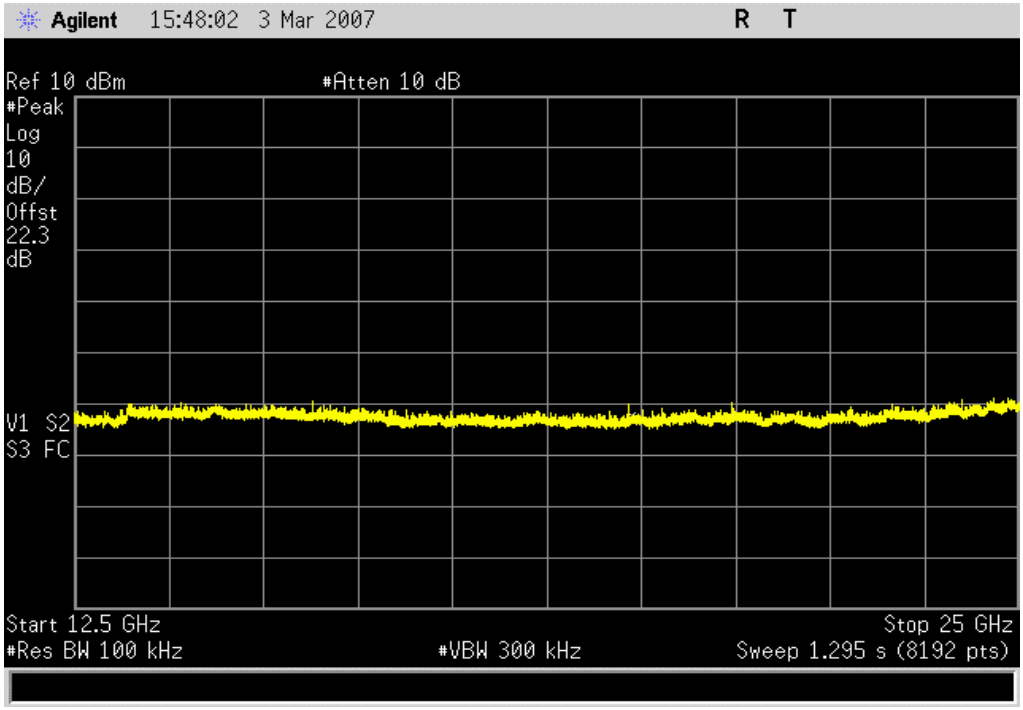
Low Channel, 0 - 3 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



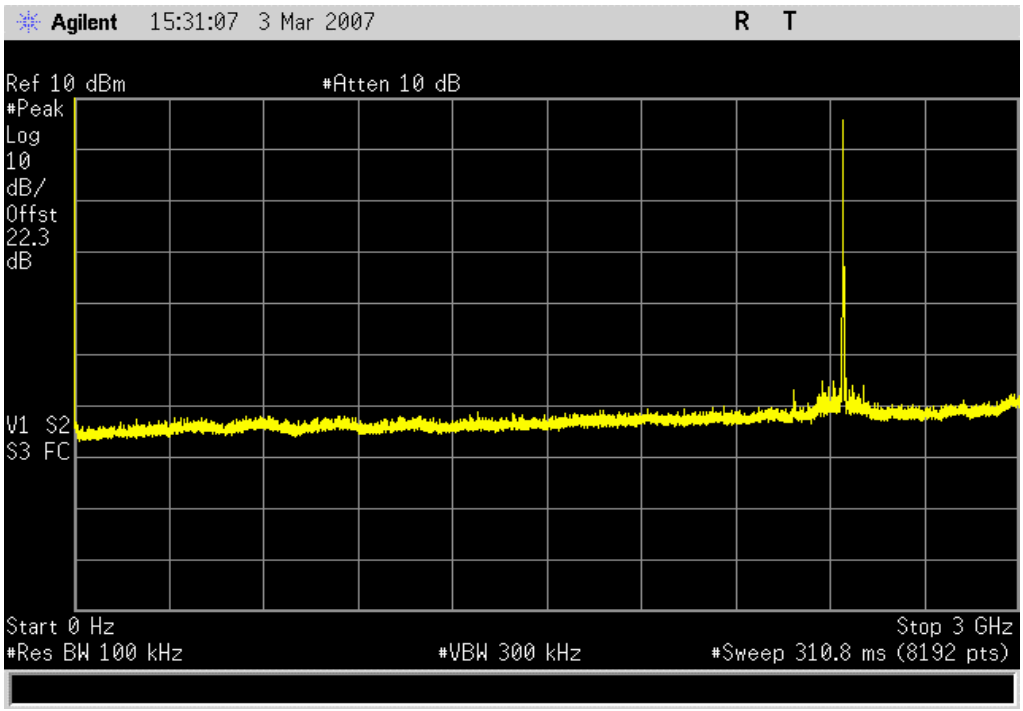
Low Channel, 3 - 12.5 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



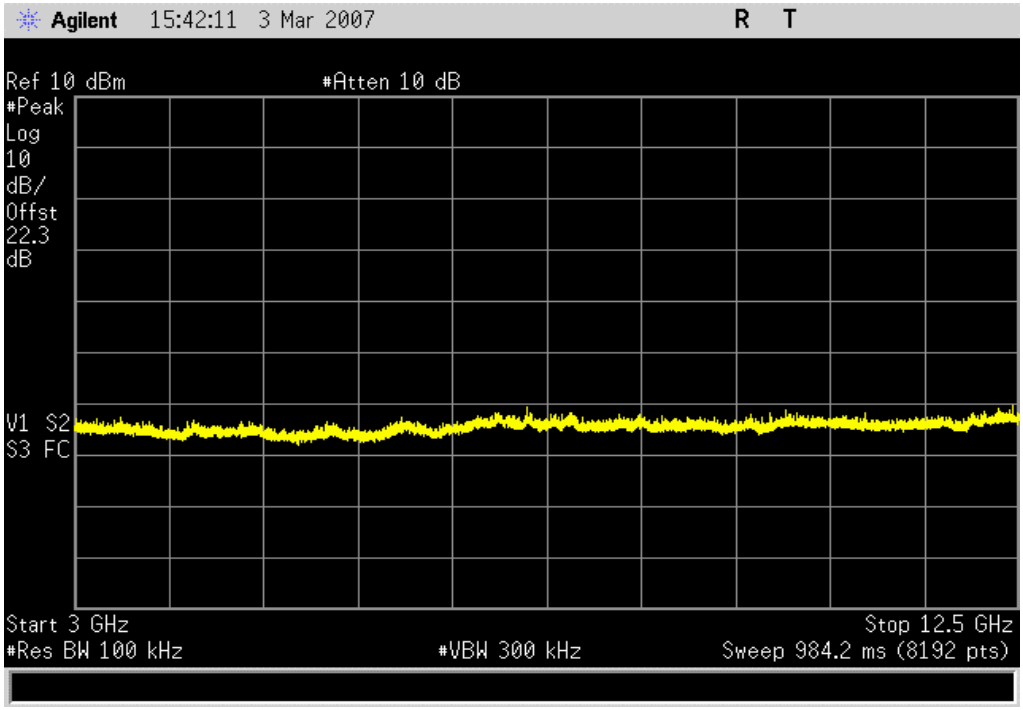
Low Channel, 12.5 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



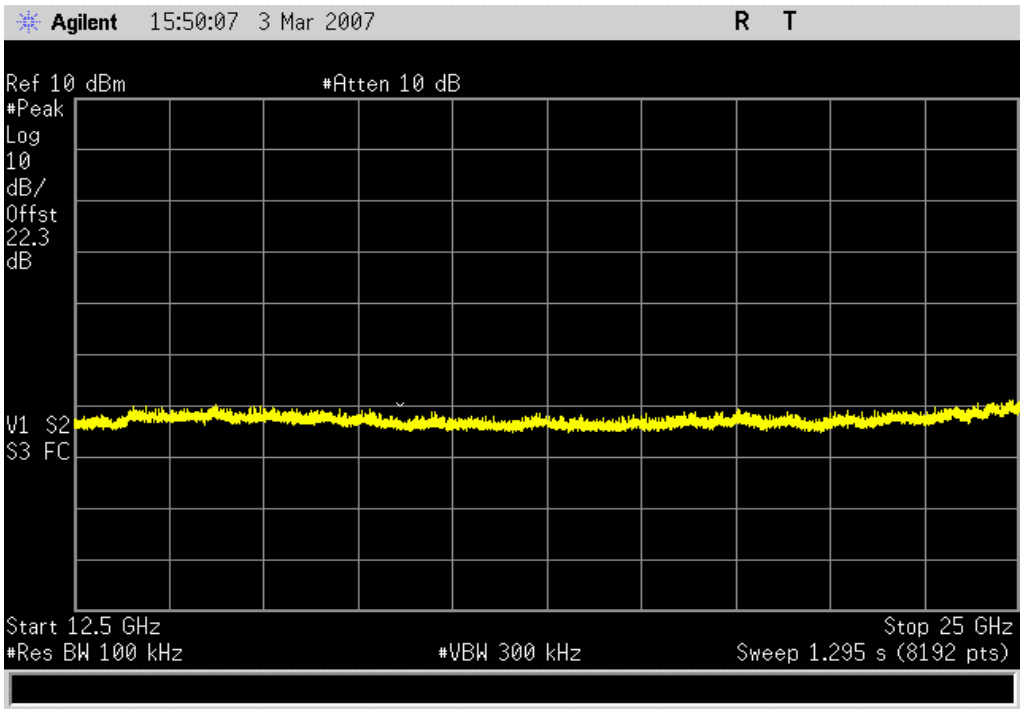
Mid Channel, 0 - 3 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



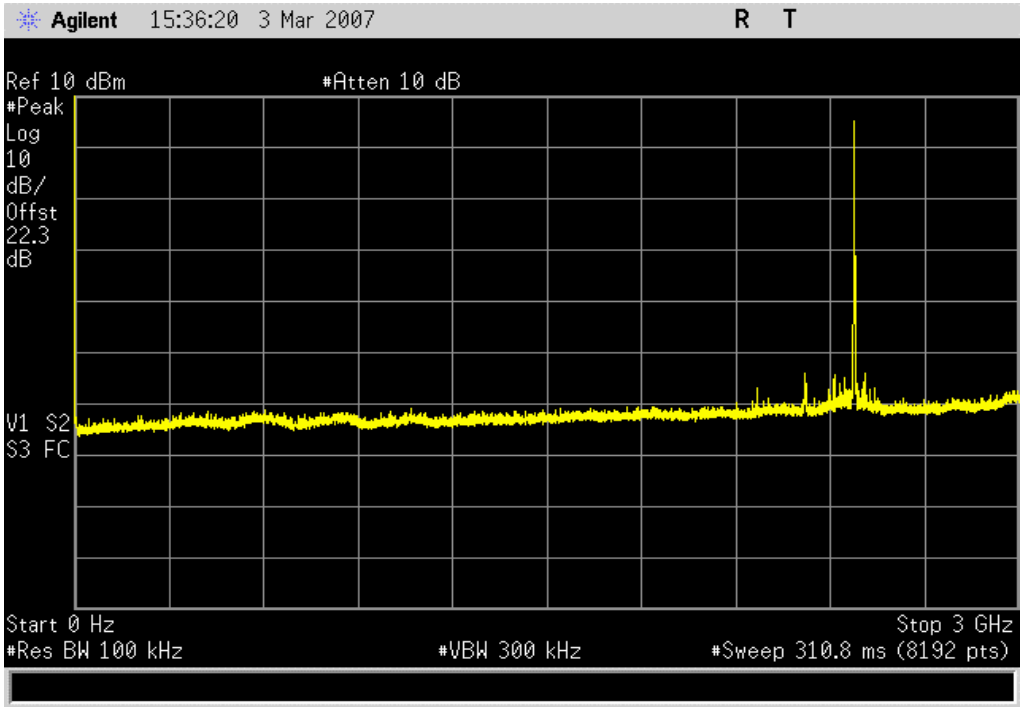
Mid Channel, 3 - 12.5 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



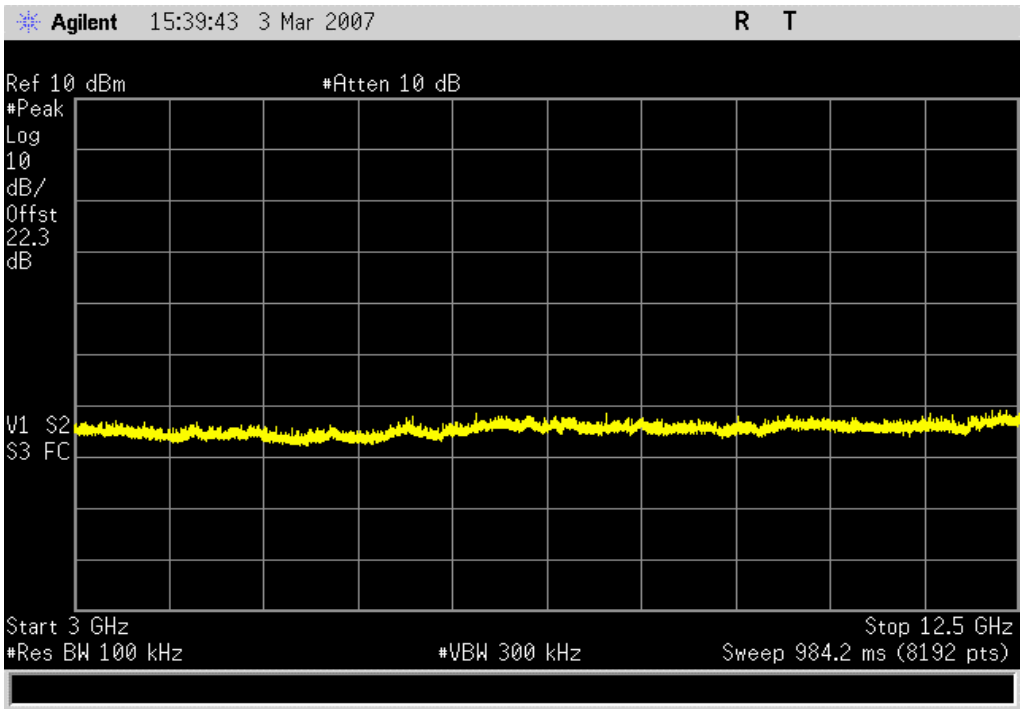
Mid Channel, 12.5 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



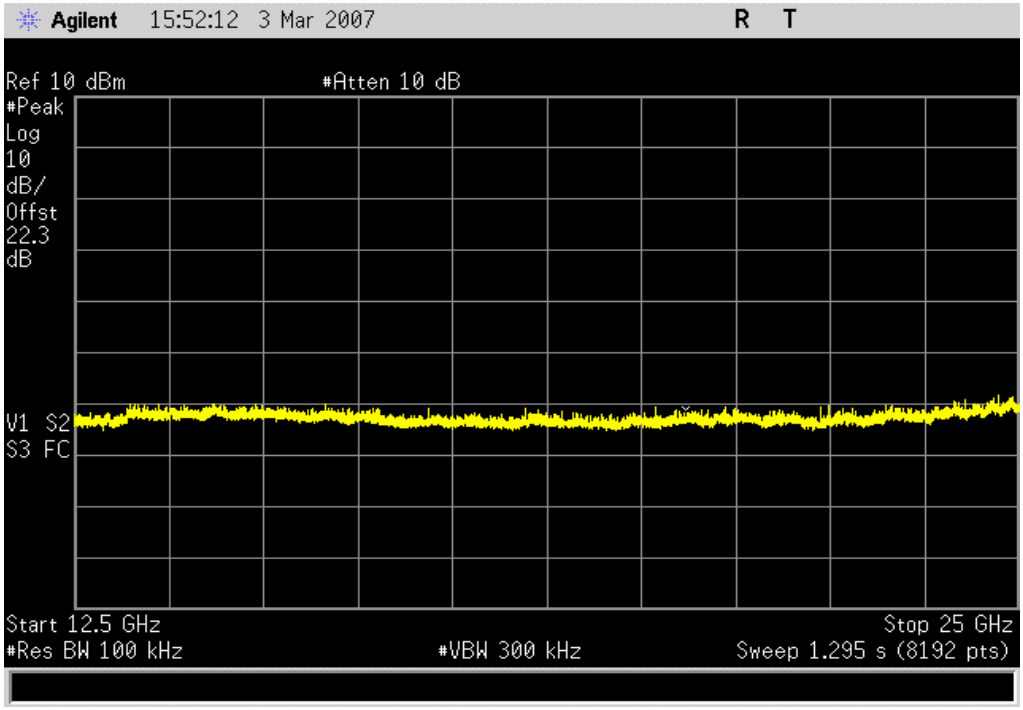
High Channel, 0 - 3 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc

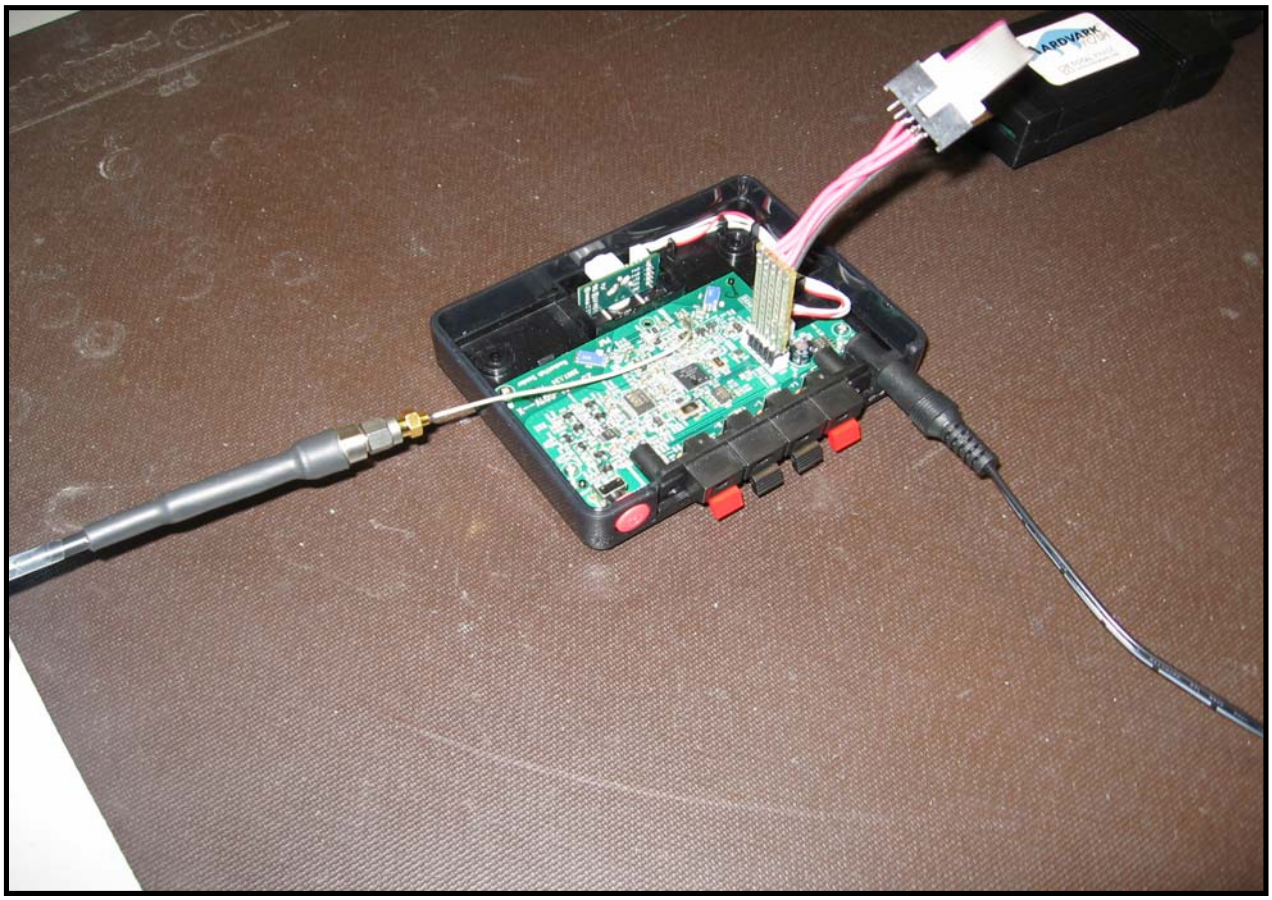


High Channel, 3 - 12.5 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc



High Channel, 12.5 - 25 GHz					
Result:	Pass	**Value:**	< -40 dBc	**Limit:**	≤ -20 dBc





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
Attenuator	Pasternack	PE7005-20	AUN	2/6/2007	13
Power Meter	Gigatronics	8651A	SPM	9/19/2006	12
Power Sensor	Gigatronics	80701A	SPL	9/19/2006	12
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2006	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 peak power spectral density measurements were measured with the EUT set to low, mid, and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at its maximum data rate using direct sequence modulation. Per the procedure outlined in FCC 97-114, the spectrum analyzer was used as follows:

> The emission peak(s) were located and zoom in on within the passband. The resolution bandwidth was set to 3 kHz, the video bandwidth was set to greater than or equal to the resolution bandwidth. The sweep speed was set equal to the span divided by 3 kHz (sweep = (SPAN/3 kHz)). For example, given a span of 1.5 MHz, the sweep should be 1.5 x 10^6 ÷ 3 x 10^3 = 500 seconds. External attenuation was used and added to the reading. The following FCC procedure was used for modifying the power spectral density measurements:

"If the spectrum line spacing cannot be resolved on the available spectrum analyzer, the noise density function on most modern conventional spectrum analyzers will directly measure the noise power density normalized to a 1 Hz noise power bandwidth. Add 34.8 dB for correction to 3 kHz."

NORTHWEST EMC

POWER SPECTRAL DENSITY

XMit 2006.11.13

EUT:	RF-WHTIB (Sender)			Work Order:	AVNE0008
Serial Number:	None			Date:	03/03/07
Customer:	Avnera			Temperature:	21°C
Attendees:	None			Humidity:	36%
Project:	None			Barometric Pres.:	30.47
Tested by:	Rod Peloquin	Power:	120VAC/60Hz	Job Site:	EV06

TEST SPECIFICATIONS	Test Method
FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074

COMMENTS

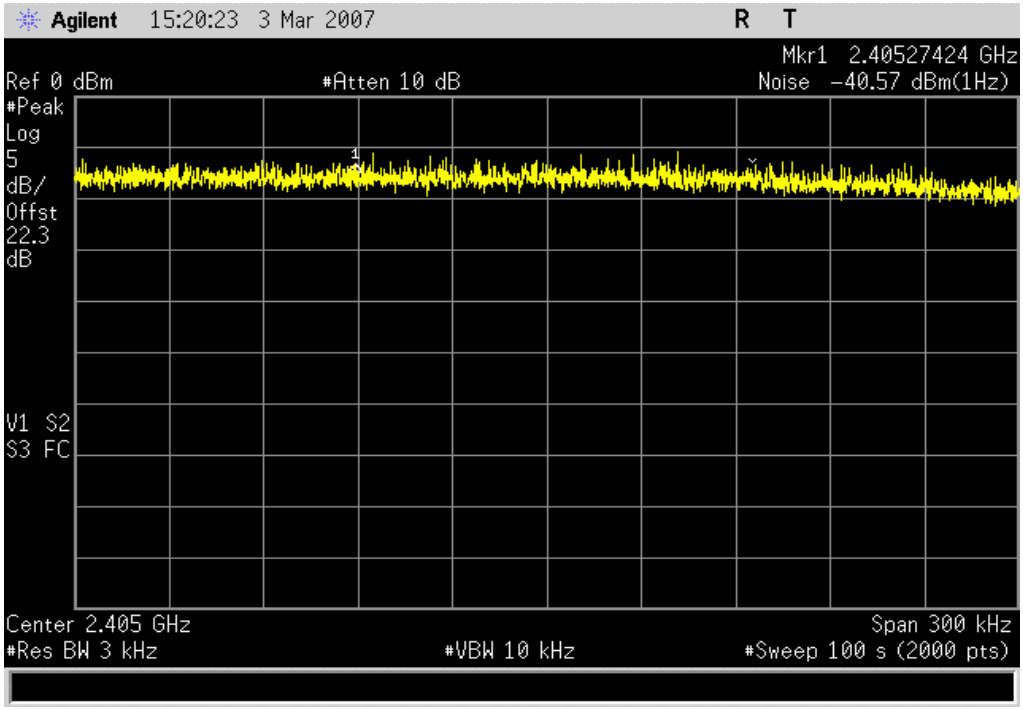
34.8 dB correction added to results to normalized analyzer marker noise function to 3 kHz

DEVIATIONS FROM TEST STANDARD

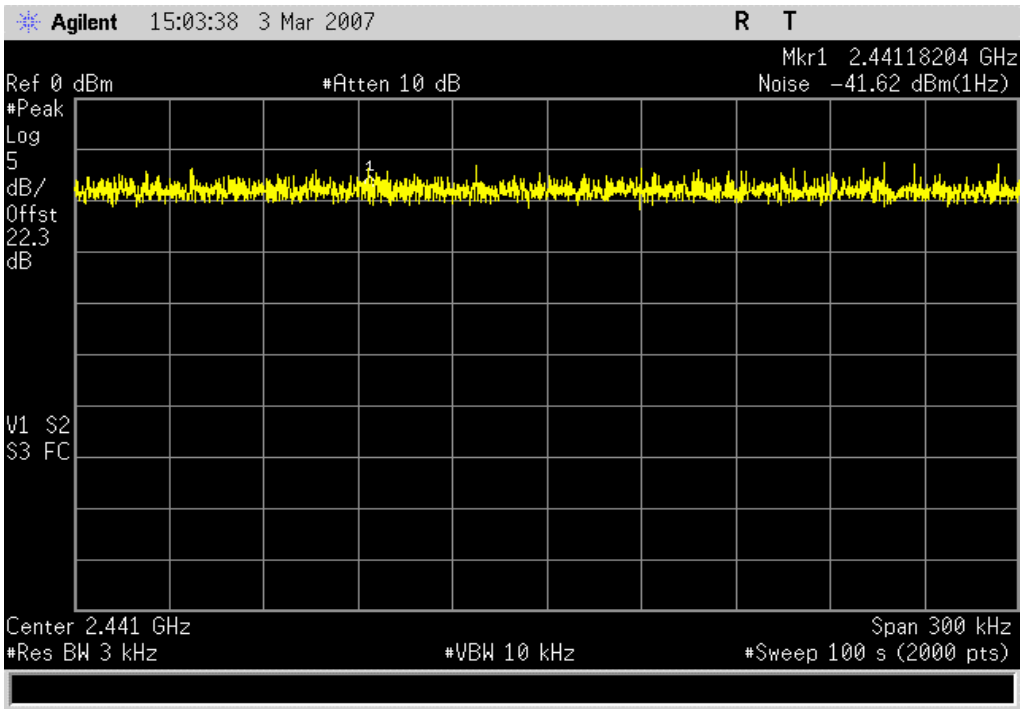
Configuration #	1	Signature

	Value	Limit	Results
Low Channel	-5.77 dBm / 3 kHz	8 dBm / 3 kHz	Pass
Mid Channel	-6.82 dBm / 3 kHz	8 dBm / 3 kHz	Pass
High Channel	-7.35 dBm / 3 kHz	8 dBm / 3 kHz	Pass

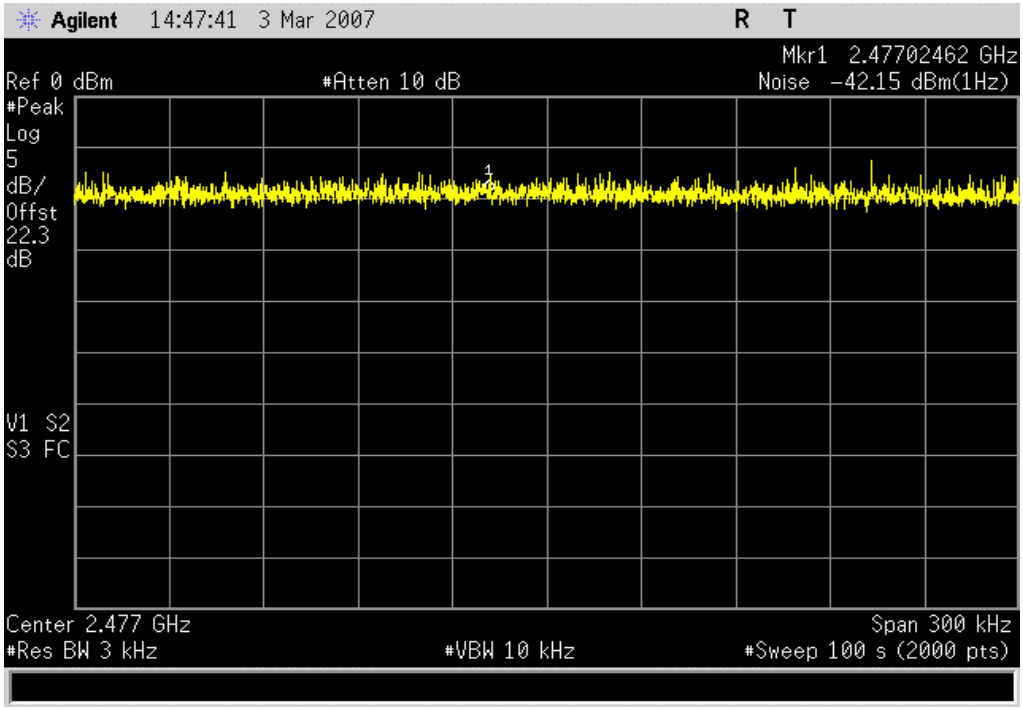
Low Channel					
Result:	Pass	**Value:**	-5.77 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz

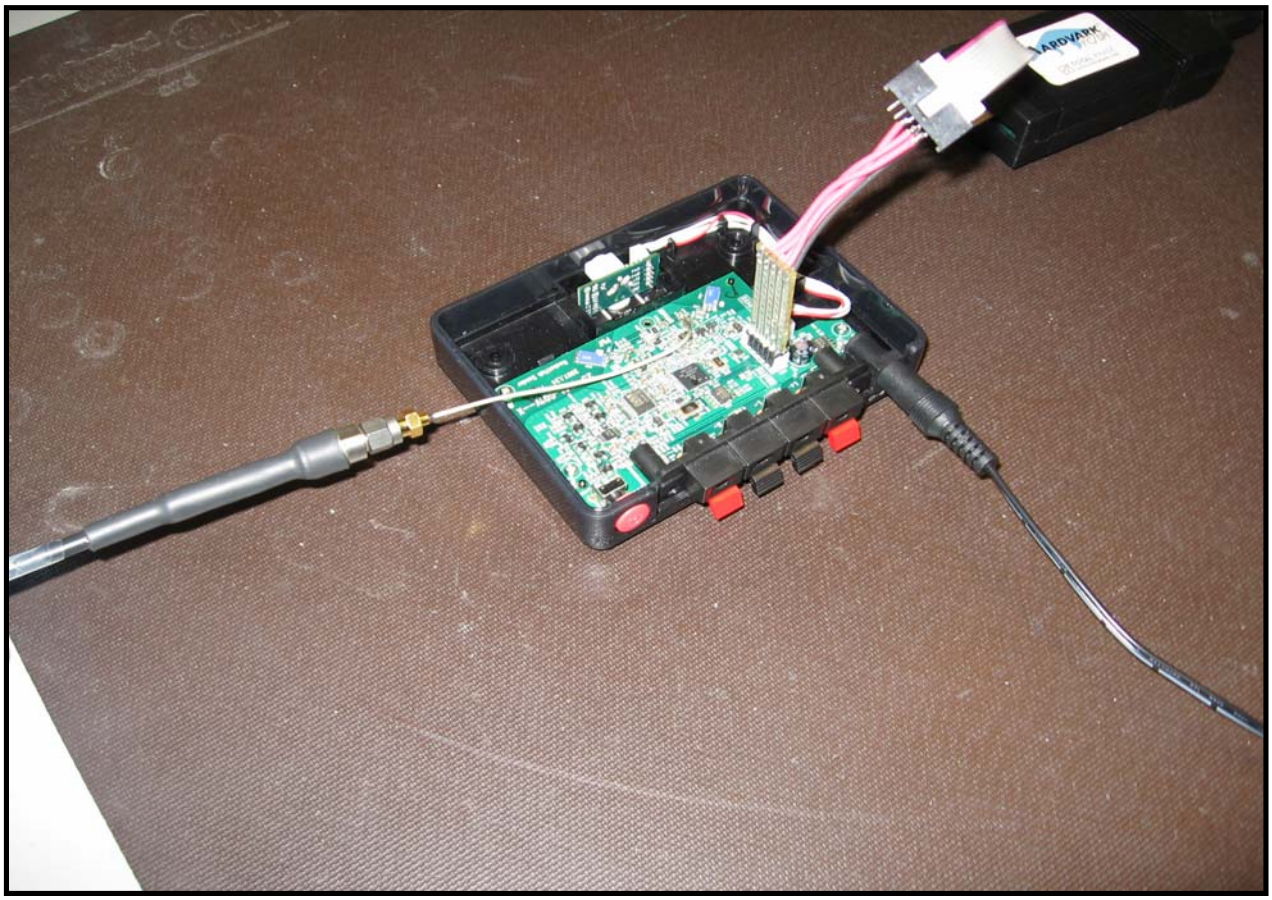


Mid Channel					
Result:	Pass	**Value:**	-6.82 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz



High Channel					
Result:	Pass	**Value:**	-7.35 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz





AC POWERLINE CONDUCTED EMISSIONS

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, antenna 1, low channel. CUI Stack power supply.
Transmitting, antenna 1, mid channel. CUI Stack power supply.
Transmitting, antenna 1, high channel. CUI Stack power supply.
Transmitting, antenna 2, high channel. CUI Stack power supply.
Transmitting, antenna 2, mid channel. CUI Stack power supply.
Transmitting, antenna 2, low channel. CUI Stack power supply.

POWER SETTINGS INVESTIGATED
120VAC/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
High Pass Filter	TTE	H97-100K-50-720B	HFX	8/22/2006	13
Attenuator	Tektronix	011-0059-02	ATC	12/27/2006	13
Receiver	Rohde & Schwartz	ESCI	ARG	12/7/2006	13
EV07 cable d			EVG	3/30/2006	13
LISN	Solar	9252-50-R-24-BNC	LIQ	12/20/2006	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

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.

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

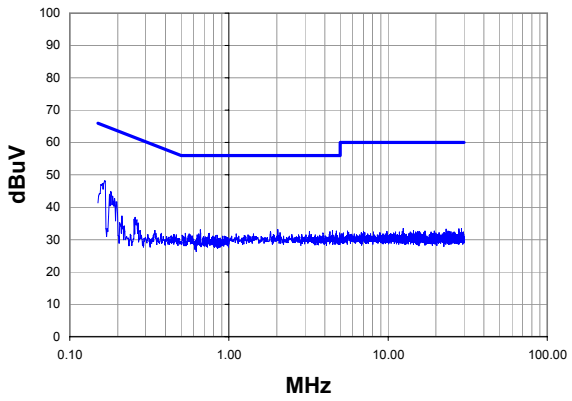
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 2, low channel. CUI Stack power supply.				
Deviations:	No deviations.				
Comments:					

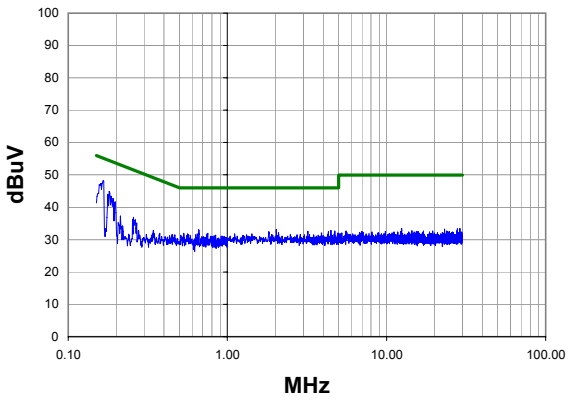
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #	12	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.165	26.5	1.7	48.2	65.2	-17.0
0.181	23.5	1.4	44.9	64.5	-19.6
0.177	22.6	1.5	44.1	64.6	-20.6
0.198	20.6	1.0	41.6	63.7	-22.1
2.032	12.6	0.5	33.1	56.0	-22.9
0.662	12.3	0.7	33.0	56.0	-23.0
4.472	12.3	0.5	32.8	56.0	-23.2
4.736	12.1	0.5	32.6	56.0	-23.4
3.200	12.0	0.5	32.5	56.0	-23.5
1.824	11.9	0.5	32.4	56.0	-23.6
4.304	11.9	0.5	32.4	56.0	-23.6
2.096	11.6	0.5	32.1	56.0	-23.9
3.896	11.6	0.5	32.1	56.0	-23.9
4.944	11.6	0.5	32.1	56.0	-23.9
0.533	11.2	0.8	32.0	56.0	-24.0
0.753	11.3	0.7	32.0	56.0	-24.0
1.112	11.3	0.5	31.8	56.0	-24.2
4.680	11.3	0.5	31.8	56.0	-24.2
0.561	11.0	0.8	31.8	56.0	-24.2
0.646	11.0	0.7	31.7	56.0	-24.3

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.165	26.5	1.7	48.2	55.2	-7.0
0.181	23.5	1.4	44.9	54.5	-9.6
0.177	22.6	1.5	44.1	54.6	-10.6
0.198	20.6	1.0	41.6	53.7	-12.1
2.032	12.6	0.5	33.1	46.0	-12.9
0.662	12.3	0.7	33.0	46.0	-13.0
4.472	12.3	0.5	32.8	46.0	-13.2
4.736	12.1	0.5	32.6	46.0	-13.4
3.200	12.0	0.5	32.5	46.0	-13.5
1.824	11.9	0.5	32.4	46.0	-13.6
4.304	11.9	0.5	32.4	46.0	-13.6
2.096	11.6	0.5	32.1	46.0	-13.9
3.896	11.6	0.5	32.1	46.0	-13.9
4.944	11.6	0.5	32.1	46.0	-13.9
0.533	11.2	0.8	32.0	46.0	-14.0
0.753	11.3	0.7	32.0	46.0	-14.0
1.112	11.3	0.5	31.8	46.0	-14.2
4.680	11.3	0.5	31.8	46.0	-14.2
0.561	11.0	0.8	31.8	46.0	-14.2
0.646	11.0	0.7	31.7	46.0	-14.3

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

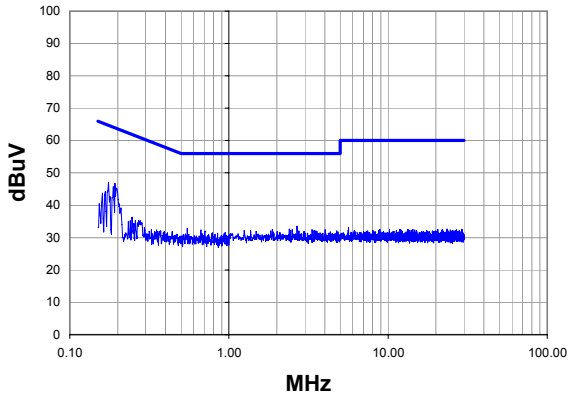
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 2, low channel. CUI Stack power supply.				
Deviations:	No deviations.				
Comments:					

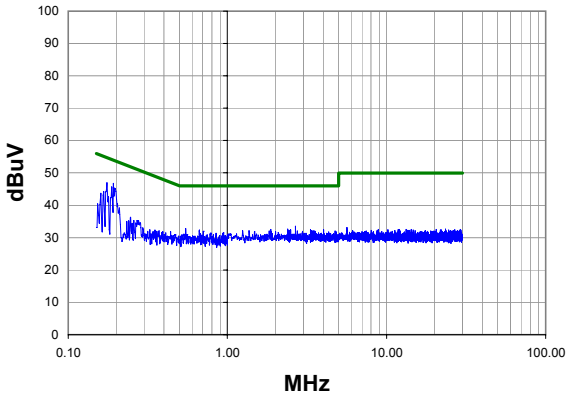
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #	13	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.193	25.6	1.2	46.8	63.9	-17.2
0.176	25.5	1.5	47.0	64.7	-17.7
0.187	24.4	1.3	45.7	64.2	-18.5
0.167	22.6	1.7	44.3	65.1	-20.8
0.160	21.9	1.8	43.7	65.5	-21.8
2.680	13.0	0.5	33.5	56.0	-22.5
0.548	12.1	0.8	32.9	56.0	-23.1
2.392	12.1	0.5	32.6	56.0	-23.4
1.872	12.0	0.5	32.5	56.0	-23.5
2.496	11.9	0.5	32.4	56.0	-23.6
3.328	11.9	0.5	32.4	56.0	-23.6
4.024	11.9	0.5	32.4	56.0	-23.6
0.667	11.6	0.7	32.3	56.0	-23.7
2.440	11.7	0.5	32.2	56.0	-23.8
3.448	11.7	0.5	32.2	56.0	-23.8
1.248	11.6	0.5	32.1	56.0	-23.9
1.368	11.6	0.5	32.1	56.0	-23.9
4.744	11.6	0.5	32.1	56.0	-23.9
0.704	11.3	0.7	32.0	56.0	-24.0
4.328	11.3	0.5	31.8	56.0	-24.2

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.193	25.6	1.2	46.8	53.9	-7.2
0.176	25.5	1.5	47.0	54.7	-7.7
0.187	24.4	1.3	45.7	54.2	-8.5
0.167	22.6	1.7	44.3	55.1	-10.8
0.160	21.9	1.8	43.7	55.5	-11.8
2.680	13.0	0.5	33.5	46.0	-12.5
0.548	12.1	0.8	32.9	46.0	-13.1
2.392	12.1	0.5	32.6	46.0	-13.4
1.872	12.0	0.5	32.5	46.0	-13.5
2.496	11.9	0.5	32.4	46.0	-13.6
3.328	11.9	0.5	32.4	46.0	-13.6
4.024	11.9	0.5	32.4	46.0	-13.6
0.667	11.6	0.7	32.3	46.0	-13.7
2.440	11.7	0.5	32.2	46.0	-13.8
3.448	11.7	0.5	32.2	46.0	-13.8
1.248	11.6	0.5	32.1	46.0	-13.9
1.368	11.6	0.5	32.1	46.0	-13.9
4.744	11.6	0.5	32.1	46.0	-13.9
0.704	11.3	0.7	32.0	46.0	-14.0
4.328	11.3	0.5	31.8	46.0	-14.2

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

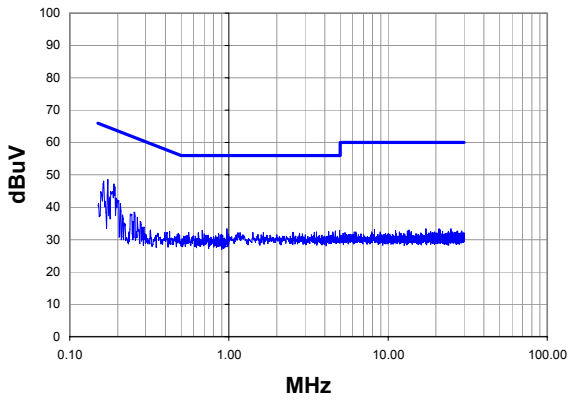
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 2, mid channel. CUI Stack power supply.				
Deviations:	No deviations.				
Comments:					

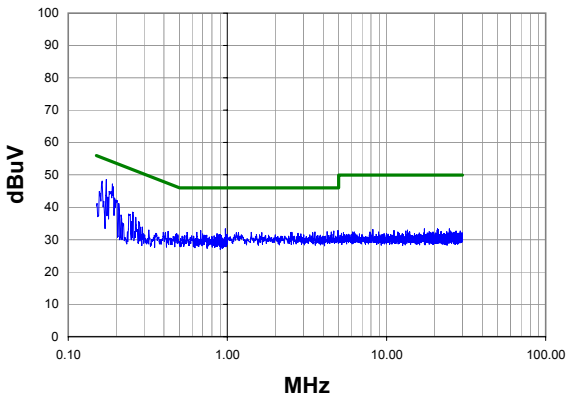
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #	14	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.174	27.0	1.5	48.5	64.8	-16.3
0.189	26.0	1.2	47.2	64.1	-16.9
0.164	26.3	1.7	48.0	65.3	-17.3
0.196	21.7	1.1	42.8	63.8	-21.0
0.177	21.7	1.5	43.2	64.6	-21.5
0.208	20.2	1.0	41.2	63.3	-22.1
0.973	12.8	0.5	33.3	56.0	-22.7
0.254	17.5	1.0	38.5	61.6	-23.2
0.679	12.1	0.7	32.8	56.0	-23.2
4.952	12.3	0.5	32.8	56.0	-23.2
4.656	12.1	0.5	32.6	56.0	-23.4
4.240	11.9	0.5	32.4	56.0	-23.6
4.496	11.9	0.5	32.4	56.0	-23.6
3.544	11.8	0.5	32.3	56.0	-23.7
0.643	11.5	0.7	32.2	56.0	-23.8
1.416	11.7	0.5	32.2	56.0	-23.8
2.504	11.7	0.5	32.2	56.0	-23.8
2.544	11.7	0.5	32.2	56.0	-23.8
3.440	11.7	0.5	32.2	56.0	-23.8
0.558	11.4	0.8	32.2	56.0	-23.8

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.174	27.0	1.5	48.5	54.8	-6.3
0.189	26.0	1.2	47.2	54.1	-6.9
0.164	26.3	1.7	48.0	55.3	-7.3
0.196	21.7	1.1	42.8	53.8	-11.0
0.177	21.7	1.5	43.2	54.6	-11.5
0.208	20.2	1.0	41.2	53.3	-12.1
0.973	12.8	0.5	33.3	46.0	-12.7
0.254	17.5	1.0	38.5	51.6	-13.2
0.679	12.1	0.7	32.8	46.0	-13.2
4.952	12.3	0.5	32.8	46.0	-13.2
4.656	12.1	0.5	32.6	46.0	-13.4
4.240	11.9	0.5	32.4	46.0	-13.6
4.496	11.9	0.5	32.4	46.0	-13.6
3.544	11.8	0.5	32.3	46.0	-13.7
0.643	11.5	0.7	32.2	46.0	-13.8
1.416	11.7	0.5	32.2	46.0	-13.8
2.504	11.7	0.5	32.2	46.0	-13.8
2.544	11.7	0.5	32.2	46.0	-13.8
3.440	11.7	0.5	32.2	46.0	-13.8
0.558	11.4	0.8	32.2	46.0	-13.8

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

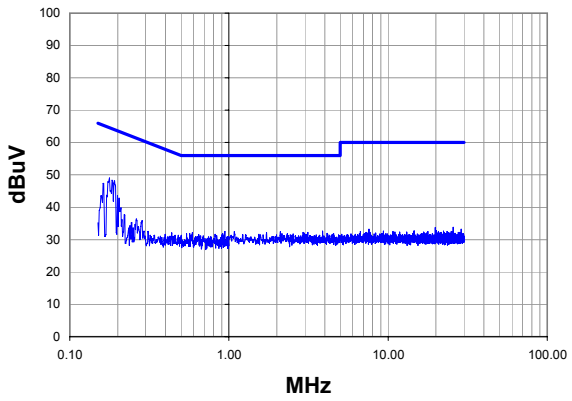
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 2, mid channel. CUI Stack power supply.				
Deviations:	No deviations.				
Comments:					

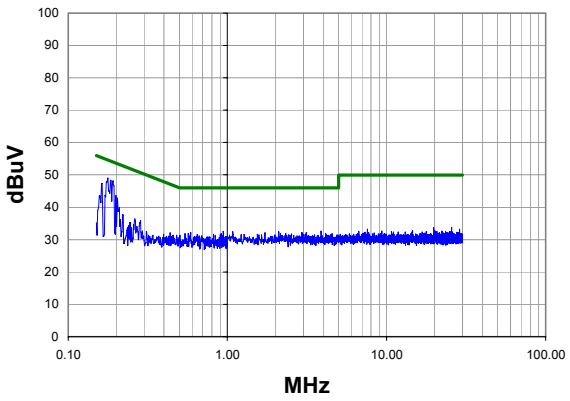
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #	15	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.177	27.6	1.5	49.1	64.6	-15.6
0.191	27.0	1.2	48.2	64.0	-15.8
0.184	27.0	1.3	48.3	64.3	-16.0
0.164	25.7	1.7	47.4	65.3	-17.9
0.199	22.6	1.0	43.6	63.6	-20.0
0.204	21.8	1.0	42.8	63.4	-20.6
3.880	12.1	0.5	32.6	56.0	-23.4
0.942	12.0	0.5	32.5	56.0	-23.5
1.080	11.9	0.5	32.4	56.0	-23.6
2.104	11.9	0.5	32.4	56.0	-23.6
2.928	11.7	0.5	32.2	56.0	-23.8
3.128	11.7	0.5	32.2	56.0	-23.8
0.589	11.4	0.8	32.2	56.0	-23.8
1.728	11.6	0.5	32.1	56.0	-23.9
4.136	11.5	0.5	32.0	56.0	-24.0
0.541	11.1	0.8	31.9	56.0	-24.1
0.568	11.1	0.8	31.9	56.0	-24.1
0.915	11.3	0.6	31.9	56.0	-24.1
2.528	11.3	0.5	31.8	56.0	-24.2
1.544	11.2	0.5	31.7	56.0	-24.3

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.177	27.6	1.5	49.1	54.6	-5.6
0.191	27.0	1.2	48.2	54.0	-5.8
0.184	27.0	1.3	48.3	54.3	-6.0
0.164	25.7	1.7	47.4	55.3	-7.9
0.199	22.6	1.0	43.6	53.6	-10.0
0.204	21.8	1.0	42.8	53.4	-10.6
3.880	12.1	0.5	32.6	46.0	-13.4
0.942	12.0	0.5	32.5	46.0	-13.5
1.080	11.9	0.5	32.4	46.0	-13.6
2.104	11.9	0.5	32.4	46.0	-13.6
2.928	11.7	0.5	32.2	46.0	-13.8
3.128	11.7	0.5	32.2	46.0	-13.8
0.589	11.4	0.8	32.2	46.0	-13.8
1.728	11.6	0.5	32.1	46.0	-13.9
4.136	11.5	0.5	32.0	46.0	-14.0
0.541	11.1	0.8	31.9	46.0	-14.1
0.568	11.1	0.8	31.9	46.0	-14.1
0.915	11.3	0.6	31.9	46.0	-14.1
2.528	11.3	0.5	31.8	46.0	-14.2
1.544	11.2	0.5	31.7	46.0	-14.3

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

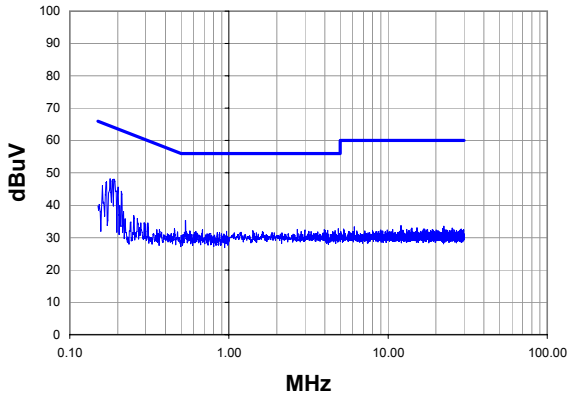
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 2, high channel. CUI Stack power supply.				
Deviations:	No deviations.				
Comments:					

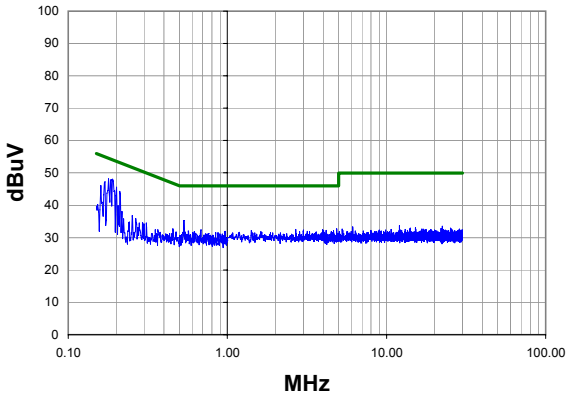
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #	16	**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.189	26.9	1.2	48.1	64.1	-16.0
0.186	26.7	1.3	48.0	64.2	-16.2
0.179	26.7	1.4	48.1	64.5	-16.4
0.170	25.7	1.6	47.3	64.9	-17.6
0.201	24.6	1.0	45.6	63.6	-18.0
0.211	23.3	1.0	44.3	63.2	-18.9
0.160	24.3	1.8	46.1	65.5	-19.4
0.534	14.5	0.8	35.3	56.0	-20.7
4.872	12.2	0.5	32.7	56.0	-23.3
0.206	18.9	1.0	39.9	63.4	-23.5
2.688	12.0	0.5	32.5	56.0	-23.5
0.682	11.7	0.7	32.4	56.0	-23.6
3.976	11.9	0.5	32.4	56.0	-23.6
3.000	11.8	0.5	32.3	56.0	-23.7
4.024	11.8	0.5	32.3	56.0	-23.7
4.168	11.8	0.5	32.3	56.0	-23.7
4.648	11.7	0.5	32.2	56.0	-23.8
1.416	11.6	0.5	32.1	56.0	-23.9
0.568	11.3	0.8	32.1	56.0	-23.9
0.454	11.9	0.8	32.7	56.8	-24.1

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.189	26.9	1.2	48.1	54.1	-6.0
0.186	26.7	1.3	48.0	54.2	-6.2
0.179	26.7	1.4	48.1	54.5	-6.4
0.170	25.7	1.6	47.3	54.9	-7.6
0.201	24.6	1.0	45.6	53.6	-8.0
0.211	23.3	1.0	44.3	53.2	-8.9
0.160	24.3	1.8	46.1	55.5	-9.4
0.534	14.5	0.8	35.3	46.0	-10.7
4.872	12.2	0.5	32.7	46.0	-13.3
0.206	18.9	1.0	39.9	53.4	-13.5
2.688	12.0	0.5	32.5	46.0	-13.5
0.682	11.7	0.7	32.4	46.0	-13.6
3.976	11.9	0.5	32.4	46.0	-13.6
3.000	11.8	0.5	32.3	46.0	-13.7
4.024	11.8	0.5	32.3	46.0	-13.7
4.168	11.8	0.5	32.3	46.0	-13.7
4.648	11.7	0.5	32.2	46.0	-13.8
1.416	11.6	0.5	32.1	46.0	-13.9
0.568	11.3	0.8	32.1	46.0	-13.9
0.454	11.9	0.8	32.7	46.8	-14.1

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

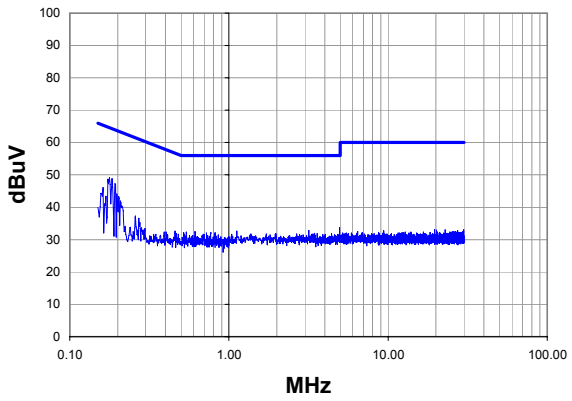
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 2, high channel. CUI Stack power supply.				
Deviations:	No deviations.				
Comments:					

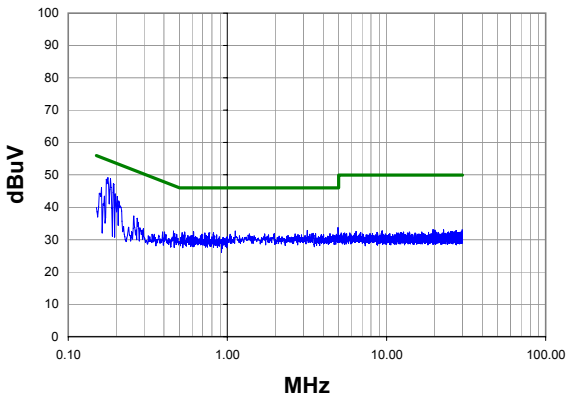
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #	17	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.177	27.7	1.5	49.2	64.6	-15.5
0.184	27.5	1.3	48.8	64.3	-15.5
0.193	26.1	1.2	47.3	63.9	-16.7
0.162	24.3	1.8	46.1	65.4	-19.3
0.198	23.1	1.0	44.1	63.7	-19.6
0.203	22.3	1.0	43.3	63.5	-20.2
0.208	20.9	1.0	41.9	63.3	-21.4
0.169	21.8	1.6	43.4	65.0	-21.6
4.960	13.2	0.5	33.7	56.0	-22.3
3.176	12.3	0.5	32.8	56.0	-23.2
1.120	12.1	0.5	32.6	56.0	-23.4
0.612	11.7	0.7	32.4	56.0	-23.6
0.539	11.6	0.8	32.4	56.0	-23.6
0.820	11.5	0.6	32.1	56.0	-23.9
0.519	11.3	0.8	32.1	56.0	-23.9
0.723	11.4	0.7	32.1	56.0	-23.9
0.765	11.4	0.6	32.0	56.0	-24.0
0.458	11.8	0.8	32.6	56.7	-24.1
1.976	11.4	0.5	31.9	56.0	-24.1
3.584	11.4	0.5	31.9	56.0	-24.1

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.177	27.7	1.5	49.2	54.6	-5.5
0.184	27.5	1.3	48.8	54.3	-5.5
0.193	26.1	1.2	47.3	53.9	-6.7
0.162	24.3	1.8	46.1	55.4	-9.3
0.198	23.1	1.0	44.1	53.7	-9.6
0.203	22.3	1.0	43.3	53.5	-10.2
0.208	20.9	1.0	41.9	53.3	-11.4
0.169	21.8	1.6	43.4	55.0	-11.6
4.960	13.2	0.5	33.7	46.0	-12.3
3.176	12.3	0.5	32.8	46.0	-13.2
1.120	12.1	0.5	32.6	46.0	-13.4
0.612	11.7	0.7	32.4	46.0	-13.6
0.539	11.6	0.8	32.4	46.0	-13.6
0.820	11.5	0.6	32.1	46.0	-13.9
0.519	11.3	0.8	32.1	46.0	-13.9
0.723	11.4	0.7	32.1	46.0	-13.9
0.765	11.4	0.6	32.0	46.0	-14.0
0.458	11.8	0.8	32.6	46.7	-14.1
1.976	11.4	0.5	31.9	46.0	-14.1
3.584	11.4	0.5	31.9	46.0	-14.1

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

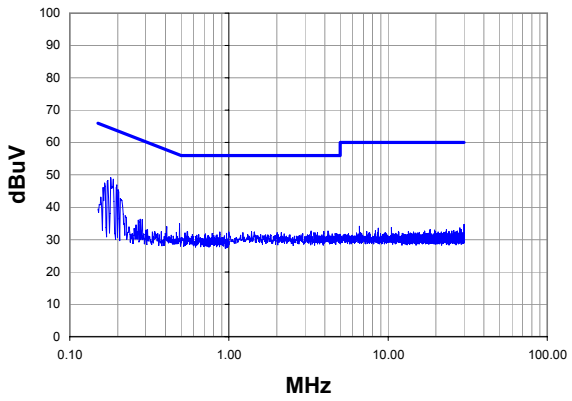
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 1, high channel. CUI Stack power supply.				
Deviations:	No deviations.				
Comments:					

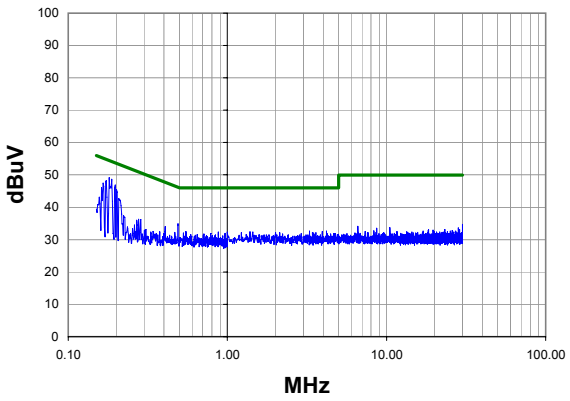
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #	18	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.181	27.8	1.4	49.2	64.5	-15.3
0.174	26.7	1.5	48.2	64.8	-16.6
0.198	25.8	1.0	46.8	63.7	-16.9
0.165	25.8	1.7	47.5	65.2	-17.7
0.201	24.4	1.0	45.4	63.6	-18.2
0.162	24.3	1.8	46.1	65.4	-19.3
0.208	21.7	1.0	42.7	63.3	-20.6
0.488	14.1	0.8	34.9	56.2	-21.3
0.157	21.3	1.9	43.2	65.6	-22.5
3.280	12.1	0.5	32.6	56.0	-23.4
4.200	12.1	0.5	32.6	56.0	-23.4
3.944	12.0	0.5	32.5	56.0	-23.5
0.546	11.7	0.8	32.5	56.0	-23.5
0.550	11.7	0.8	32.5	56.0	-23.5
1.384	11.9	0.5	32.4	56.0	-23.6
0.876	11.8	0.6	32.4	56.0	-23.6
0.407	13.2	0.9	34.1	57.7	-23.6
1.000	11.8	0.5	32.3	56.0	-23.7
3.424	11.7	0.5	32.2	56.0	-23.8
3.592	11.7	0.5	32.2	56.0	-23.8

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.181	27.8	1.4	49.2	54.5	-5.3
0.174	26.7	1.5	48.2	54.8	-6.6
0.198	25.8	1.0	46.8	53.7	-6.9
0.165	25.8	1.7	47.5	55.2	-7.7
0.201	24.4	1.0	45.4	53.6	-8.2
0.162	24.3	1.8	46.1	55.4	-9.3
0.208	21.7	1.0	42.7	53.3	-10.6
0.488	14.1	0.8	34.9	46.2	-11.3
0.157	21.3	1.9	43.2	55.6	-12.5
3.280	12.1	0.5	32.6	46.0	-13.4
4.200	12.1	0.5	32.6	46.0	-13.4
3.944	12.0	0.5	32.5	46.0	-13.5
0.546	11.7	0.8	32.5	46.0	-13.5
0.550	11.7	0.8	32.5	46.0	-13.5
1.384	11.9	0.5	32.4	46.0	-13.6
0.876	11.8	0.6	32.4	46.0	-13.6
0.407	13.2	0.9	34.1	47.7	-13.6
1.000	11.8	0.5	32.3	46.0	-13.7
3.424	11.7	0.5	32.2	46.0	-13.8
3.592	11.7	0.5	32.2	46.0	-13.8

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

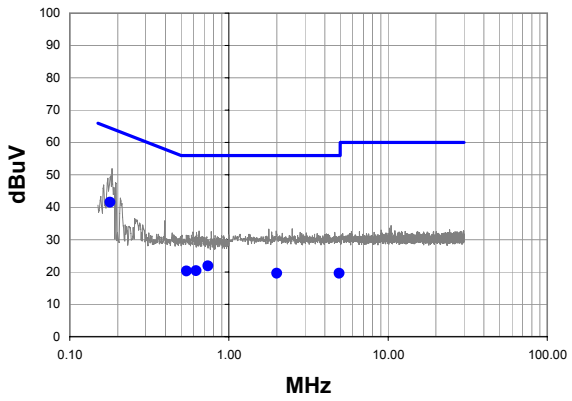
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 1, high channel. CUI Stack power supply.				
Deviations:	No deviations.				
Comments:					

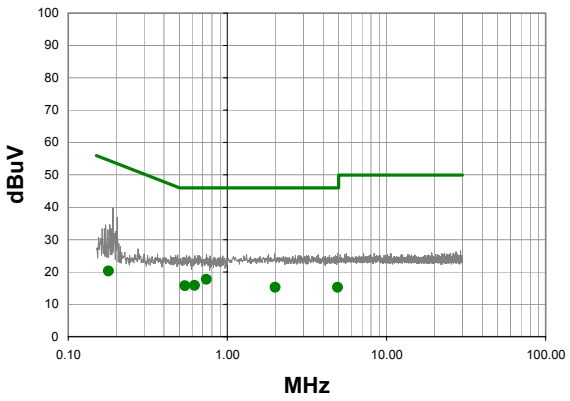
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #	19	**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)
0.179	20.1	1.4	41.5	64.5	-23.0
0.738	1.2	0.7	21.9	56.0	-34.1
0.624	-0.4	0.7	20.3	56.0	-35.7
0.543	-0.5	0.8	20.3	56.0	-35.7
1.996	-0.9	0.5	19.6	56.0	-36.4
4.936	-0.9	0.5	19.6	56.0	-36.4

Average Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.738	-3.0	0.7	17.7	46.0	-28.3
0.624	-4.9	0.7	15.8	46.0	-30.2
0.543	-5.1	0.8	15.7	46.0	-30.3
1.996	-5.3	0.5	15.2	46.0	-30.8
4.936	-5.3	0.5	15.2	46.0	-30.8
0.179	-1.1	1.4	20.3	54.5	-34.2

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

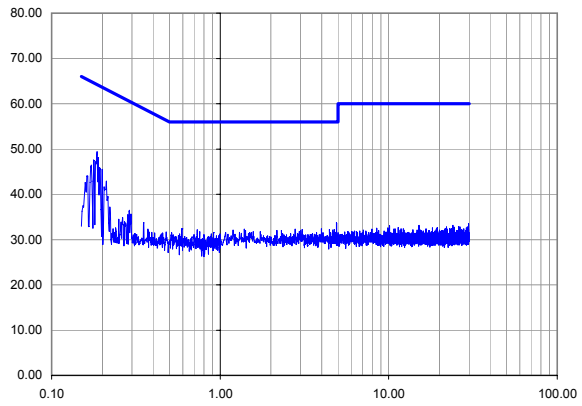
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 1, mid channel. CUI Stack power supply.				
Deviations:	No deviations.				
Comments:					

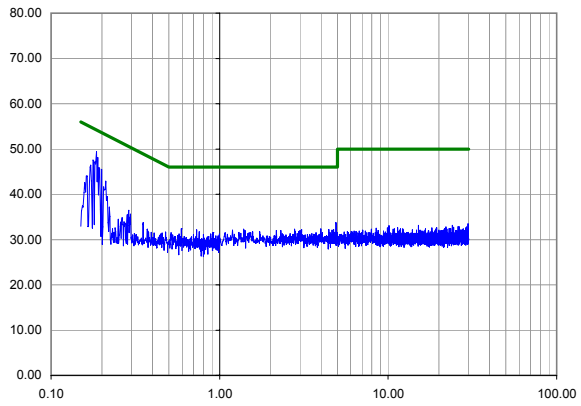
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #		**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Quasi-Peak



Average



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.186	28.1	1.3	49.4	64.2	-14.8
0.189	26.9	1.2	48.1	64.1	-16.0
0.177	26.1	1.5	47.6	64.6	-17.1
0.193	24.7	1.2	45.9	63.9	-18.1
0.199	24.5	1.0	45.5	63.6	-18.1
0.172	24.9	1.6	46.5	64.9	-18.4
0.211	21.9	1.0	42.9	63.2	-20.3
0.162	22.3	1.8	44.1	65.4	-21.3
4.904	13.3	0.5	33.8	56.0	-22.2
3.992	11.9	0.5	32.4	56.0	-23.6
0.592	11.6	0.8	32.4	56.0	-23.6
1.392	11.8	0.5	32.3	56.0	-23.7
2.784	11.8	0.5	32.3	56.0	-23.7
3.064	11.7	0.5	32.2	56.0	-23.8
4.456	11.7	0.5	32.2	56.0	-23.8
4.744	11.7	0.5	32.2	56.0	-23.8
0.730	11.5	0.7	32.2	56.0	-23.8
1.192	11.6	0.5	32.1	56.0	-23.9
2.168	11.5	0.5	32.0	56.0	-24.0
0.289	15.5	0.9	36.4	60.5	-24.1

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.186	28.1	1.3	49.4	54.2	-4.8
0.189	26.9	1.2	48.1	54.1	-6.0
0.177	26.1	1.5	47.6	54.6	-7.1
0.193	24.7	1.2	45.9	53.9	-8.1
0.199	24.5	1.0	45.5	53.6	-8.1
0.172	24.9	1.6	46.5	54.9	-8.4
0.211	21.9	1.0	42.9	53.2	-10.3
0.162	22.3	1.8	44.1	55.4	-11.3
4.904	13.3	0.5	33.8	46.0	-12.2
3.992	11.9	0.5	32.4	46.0	-13.6
0.592	11.6	0.8	32.4	46.0	-13.6
1.392	11.8	0.5	32.3	46.0	-13.7
2.784	11.8	0.5	32.3	46.0	-13.7
3.064	11.7	0.5	32.2	46.0	-13.8
4.456	11.7	0.5	32.2	46.0	-13.8
4.744	11.7	0.5	32.2	46.0	-13.8
0.730	11.5	0.7	32.2	46.0	-13.8
1.192	11.6	0.5	32.1	46.0	-13.9
2.168	11.5	0.5	32.0	46.0	-14.0
0.289	15.5	0.9	36.4	50.5	-14.1

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

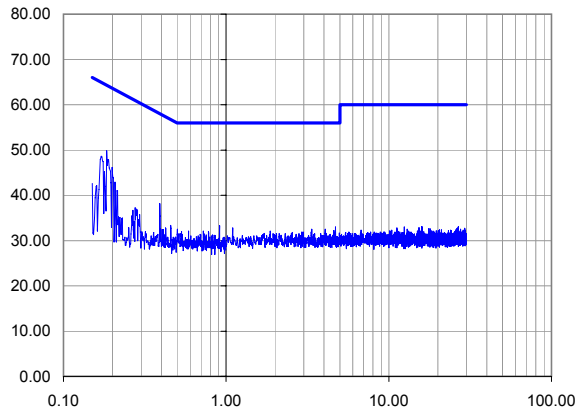
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 1, mid channel. CUI Stack power supply.				
Deviations:	No deviations.				
Comments:					

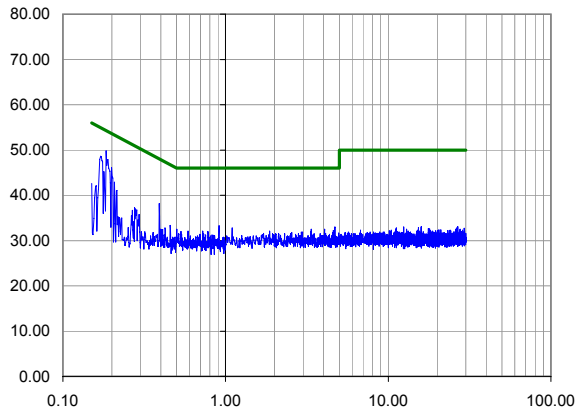
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #		**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Quasi-Peak



Average



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.184	28.5	1.3	49.8	64.3	-14.5
0.170	27.0	1.6	48.6	64.9	-16.3
0.199	25.1	1.0	46.1	63.6	-17.5
0.179	23.8	1.4	45.2	64.5	-19.3
0.391	17.3	0.9	38.2	58.0	-19.9
0.208	21.9	1.0	42.9	63.3	-20.4
0.215	20.1	1.0	41.1	63.0	-21.9
0.912	12.7	0.6	33.3	56.0	-22.7
4.704	12.5	0.5	33.0	56.0	-23.0
1.096	12.3	0.5	32.8	56.0	-23.2
0.160	20.3	1.8	42.1	65.5	-23.4
0.150	20.6	2.0	42.6	66.0	-23.4
0.456	12.5	0.8	33.3	56.8	-23.4
0.502	11.7	0.8	32.5	56.0	-23.5
3.360	12.0	0.5	32.5	56.0	-23.5
4.064	12.0	0.5	32.5	56.0	-23.5
0.276	16.3	1.0	37.3	60.9	-23.7
4.600	11.7	0.5	32.2	56.0	-23.8
1.864	11.6	0.5	32.1	56.0	-23.9
0.725	11.4	0.7	32.1	56.0	-23.9

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.184	28.5	1.3	49.8	54.3	-4.5
0.170	27.0	1.6	48.6	54.9	-6.3
0.199	25.1	1.0	46.1	53.6	-7.5
0.179	23.8	1.4	45.2	54.5	-9.3
0.391	17.3	0.9	38.2	48.0	-9.9
0.208	21.9	1.0	42.9	53.3	-10.4
0.215	20.1	1.0	41.1	53.0	-11.9
0.912	12.7	0.6	33.3	46.0	-12.7
4.704	12.5	0.5	33.0	46.0	-13.0
1.096	12.3	0.5	32.8	46.0	-13.2
0.160	20.3	1.8	42.1	55.5	-13.4
0.150	20.6	2.0	42.6	56.0	-13.4
0.456	12.5	0.8	33.3	46.8	-13.4
0.502	11.7	0.8	32.5	46.0	-13.5
3.360	12.0	0.5	32.5	46.0	-13.5
4.064	12.0	0.5	32.5	46.0	-13.5
0.276	16.3	1.0	37.3	50.9	-13.7
4.600	11.7	0.5	32.2	46.0	-13.8
1.864	11.6	0.5	32.1	46.0	-13.9
0.725	11.4	0.7	32.1	46.0	-13.9

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

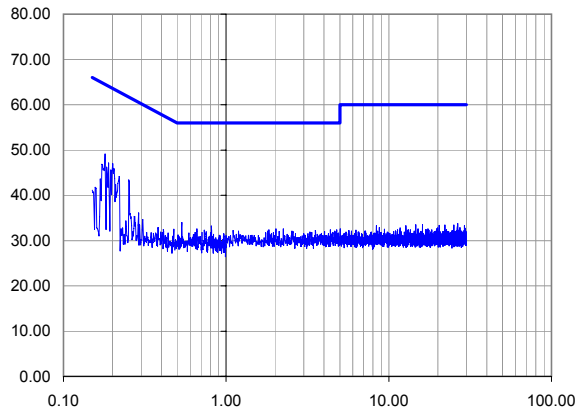
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 1, low channel. CUI Stack power supply.				
Deviations:	No deviations.				
Comments:					

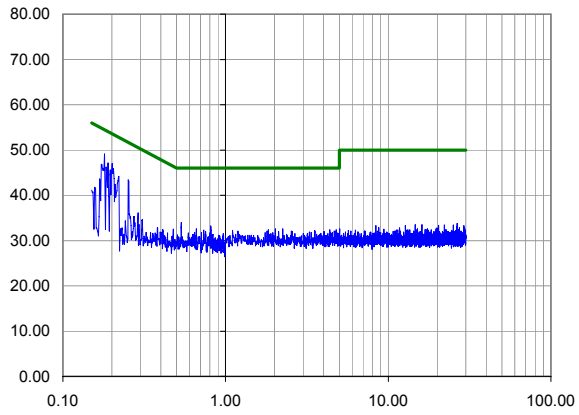
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #		**Line:**	High Line	**Ext. Attenuation:**	20	**Results**	Pass

Quasi-Peak



Average



Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.181	27.7	1.4	49.1	64.5	-15.4
0.201	26.0	1.0	47.0	63.6	-16.6
0.189	25.9	1.2	47.1	64.1	-17.0
0.184	24.9	1.3	46.2	64.3	-18.1
0.196	24.5	1.1	45.6	63.8	-18.2
0.252	22.4	1.0	43.4	61.7	-18.3
0.220	23.2	1.0	44.2	62.8	-18.6
0.169	22.0	1.6	43.6	65.0	-21.4
0.534	13.2	0.8	34.0	56.0	-22.0
0.811	12.6	0.6	33.2	56.0	-22.8
0.660	11.9	0.7	32.6	56.0	-23.4
2.024	12.1	0.5	32.6	56.0	-23.4
2.248	12.1	0.5	32.6	56.0	-23.4
1.832	11.9	0.5	32.4	56.0	-23.6
4.376	11.9	0.5	32.4	56.0	-23.6
4.776	11.9	0.5	32.4	56.0	-23.6
0.735	11.6	0.7	32.3	56.0	-23.7
1.104	11.7	0.5	32.2	56.0	-23.8
3.536	11.7	0.5	32.2	56.0	-23.8
0.157	19.9	1.9	41.8	65.6	-23.9

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.181	27.7	1.4	49.1	54.5	-5.4
0.201	26.0	1.0	47.0	53.6	-6.6
0.189	25.9	1.2	47.1	54.1	-7.0
0.184	24.9	1.3	46.2	54.3	-8.1
0.196	24.5	1.1	45.6	53.8	-8.2
0.252	22.4	1.0	43.4	51.7	-8.3
0.220	23.2	1.0	44.2	52.8	-8.6
0.169	22.0	1.6	43.6	55.0	-11.4
0.534	13.2	0.8	34.0	46.0	-12.0
0.811	12.6	0.6	33.2	46.0	-12.8
0.660	11.9	0.7	32.6	46.0	-13.4
2.024	12.1	0.5	32.6	46.0	-13.4
2.248	12.1	0.5	32.6	46.0	-13.4
1.832	11.9	0.5	32.4	46.0	-13.6
4.376	11.9	0.5	32.4	46.0	-13.6
4.776	11.9	0.5	32.4	46.0	-13.6
0.735	11.6	0.7	32.3	46.0	-13.7
1.104	11.7	0.5	32.2	46.0	-13.8
3.536	11.7	0.5	32.2	46.0	-13.8
0.157	19.9	1.9	41.8	55.6	-13.9

NORTHWEST

EMC

AC POWERLINE CONDUCTED EMISSIONS

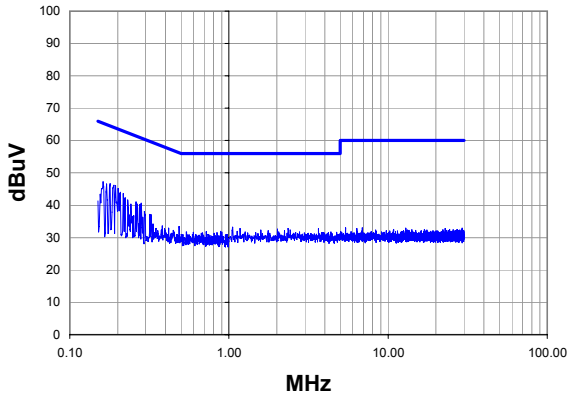
Version 2007.1.29
PSA-ESCI 2007.01.24
NVLAP Lab Code 200630-0

Work Order:	AVNE0008	**Date:**	03/06/07		
Project:	None	**Temperature:**	23		
Job Site:	EV07	**Humidity:**	33		
Serial Number:	None	**Barometric Pres.:**	30.1	**Tested by:**	Holly Ashkannejhad
EUT:	RF-WHTIB (Sender)				
Configuration:	5 - Sender - Conducted Emissions				
Customer:	Avnera				
Attendees:	None				
EUT Power:	120VAC/60Hz				
Operating Mode:	Transmitting, antenna 1, low channel. CUI Stack power supply				
Deviations:	No deviations.				
Comments:					

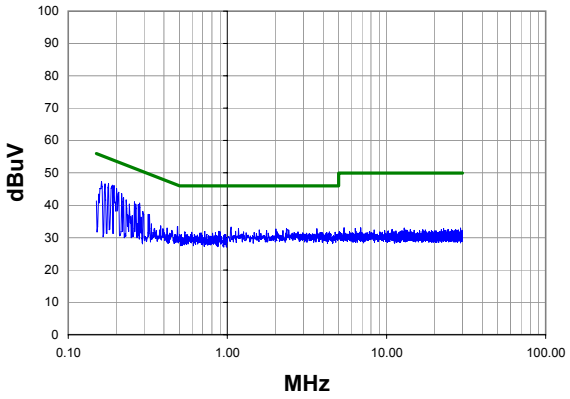
Test Specifications	**Class B**	**Test Method**
FCC 15.207:2006		ANSI C63.4:2003

Run #	32	**Line:**	Neutral	**Ext. Attenuation:**	20	**Results**	Pass

Peak Data - vs - Quasi Peak Limit



Peak Data - vs - Average Limit

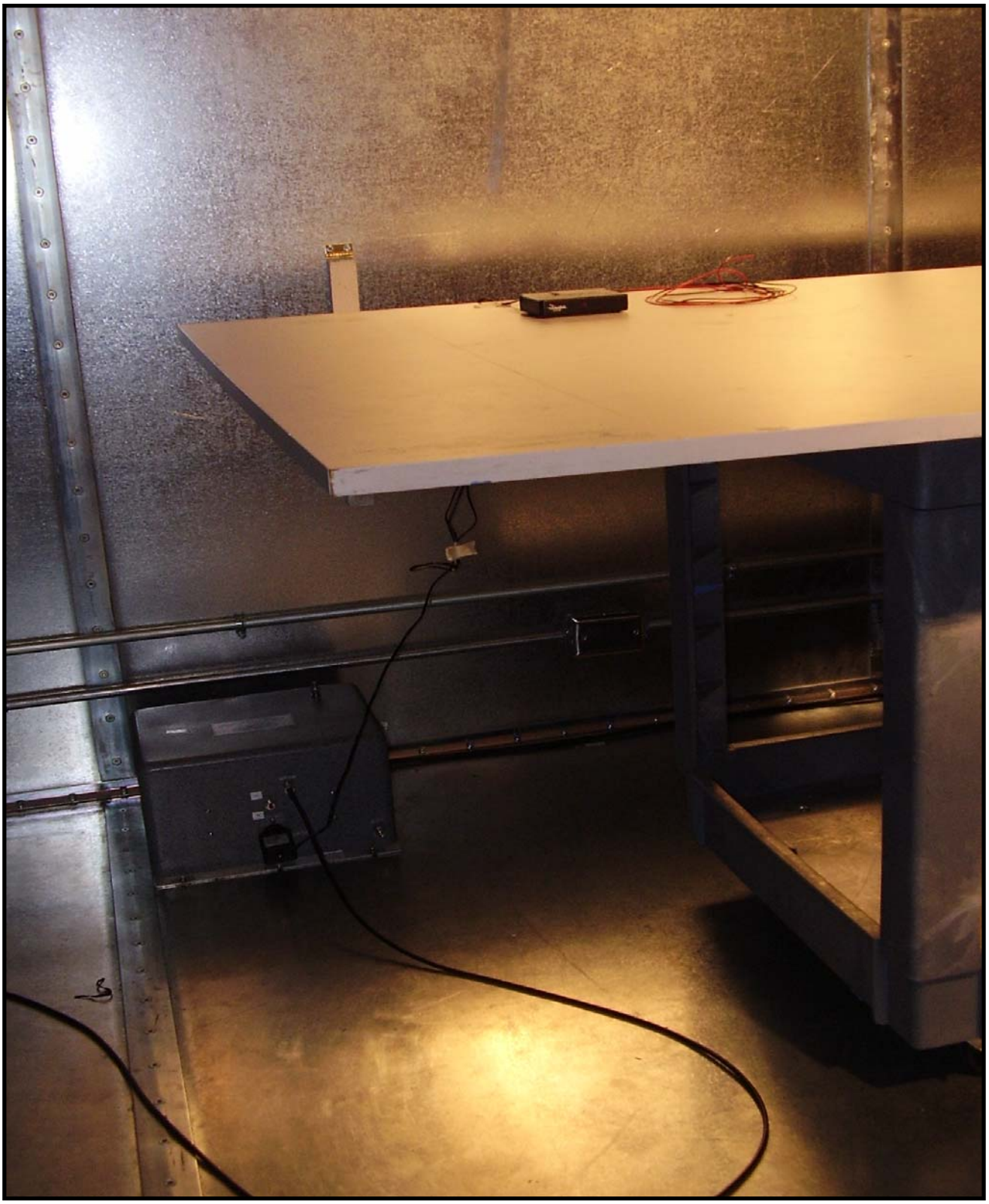


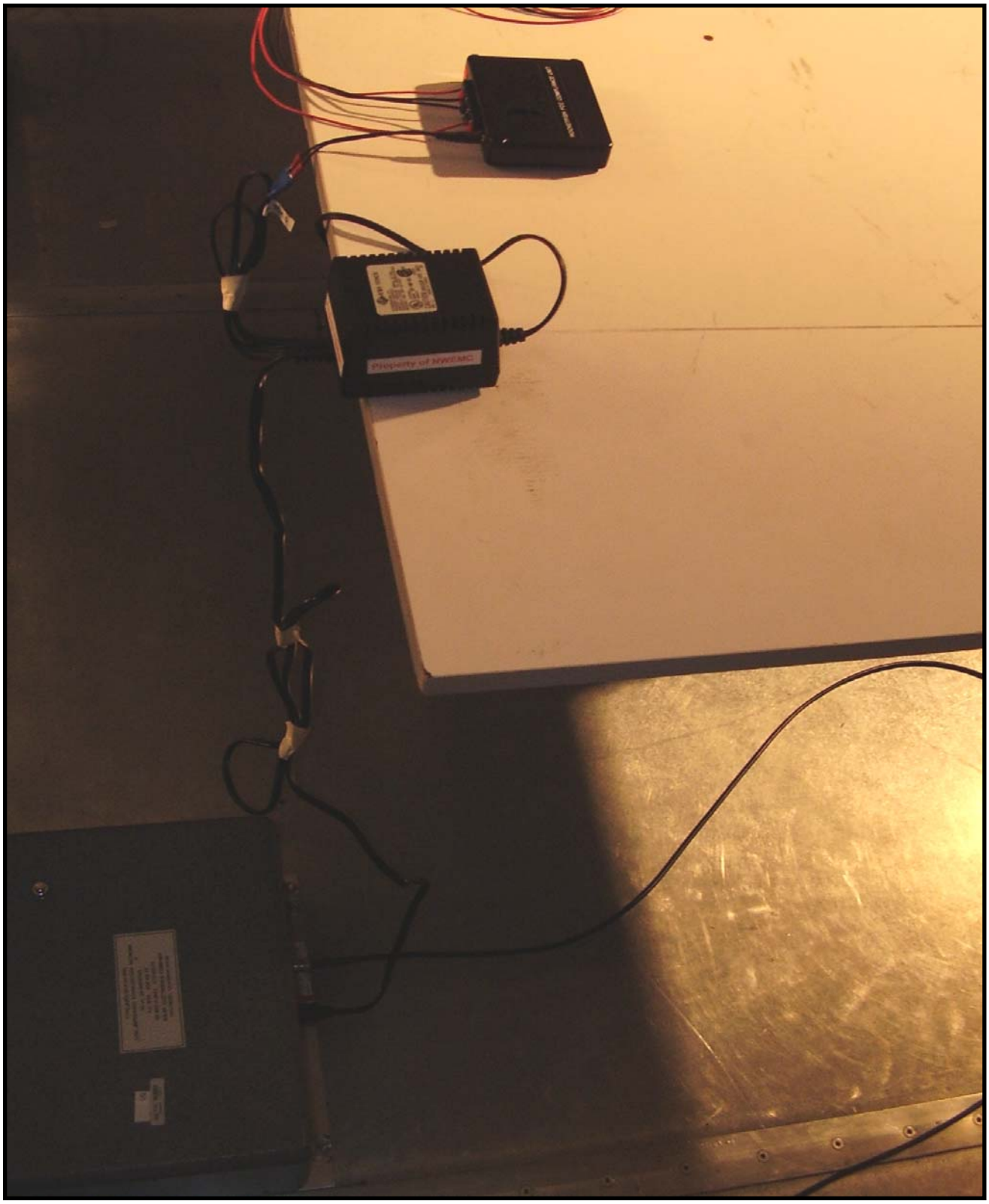
Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.194	25.0	1.1	46.1	63.9	-17.7
0.179	25.3	1.4	46.7	64.5	-17.8
0.189	25.0	1.2	46.2	64.1	-17.9
0.162	25.5	1.8	47.3	65.4	-18.1
0.170	25.0	1.6	46.6	64.9	-18.3
0.201	24.2	1.0	45.2	63.6	-18.4
0.208	23.0	1.0	44.0	63.3	-19.3
0.216	22.6	1.0	43.6	63.0	-19.4
0.281	19.7	0.9	40.6	60.8	-20.1
0.261	20.1	1.0	41.1	61.4	-20.4
0.223	21.3	1.0	42.3	62.7	-20.4
0.276	19.3	1.0	40.3	60.9	-20.7
0.232	20.7	1.0	41.7	62.4	-20.7
0.266	19.4	1.0	40.4	61.3	-20.9
0.242	19.4	1.0	40.4	62.0	-21.7
0.295	17.1	0.9	38.0	60.4	-22.4
0.323	16.2	0.9	37.1	59.6	-22.5
0.318	16.3	0.9	37.2	59.8	-22.5
1.056	12.7	0.5	33.2	56.0	-22.8
0.487	12.6	0.8	33.4	56.2	-22.8

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.194	25.0	1.1	46.1	53.9	-7.7
0.179	25.3	1.4	46.7	54.5	-7.8
0.189	25.0	1.2	46.2	54.1	-7.9
0.162	25.5	1.8	47.3	55.4	-8.1
0.170	25.0	1.6	46.6	54.9	-8.3
0.201	24.2	1.0	45.2	53.6	-8.4
0.208	23.0	1.0	44.0	53.3	-9.3
0.216	22.6	1.0	43.6	53.0	-9.4
0.281	19.7	0.9	40.6	50.8	-10.1
0.261	20.1	1.0	41.1	51.4	-10.4
0.223	21.3	1.0	42.3	52.7	-10.4
0.276	19.3	1.0	40.3	50.9	-10.7
0.232	20.7	1.0	41.7	52.4	-10.7
0.266	19.4	1.0	40.4	51.3	-10.9
0.242	19.4	1.0	40.4	52.0	-11.7
0.295	17.1	0.9	38.0	50.4	-12.4
0.323	16.2	0.9	37.1	49.6	-12.5
0.318	16.3	0.9	37.2	49.8	-12.5
1.056	12.7	0.5	33.2	46.0	-12.8
0.487	12.6	0.8	33.4	46.2	-12.8




Property of NWEMC