Stratos Product Development Group

Netguard Reusable

June 14, 2007

Report No. STRA0004.3

Report Prepared By

NORTHWEST EMC

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: June 14, 2007
Stratos Product Development Group
Model: Netguard Reusable

Emissions				
Test Description	**Specification**	**Test Method**	**Pass**	**Fail**
Radiated Emissions	FCC 15.109(g) (CISPR 22:1997):2006 Class A	ANSI C63.4:2003	☒	☐
Spurious Radiated Emissions	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	☒	☐
Band Edge Compliance	FCC 15.247:2006 DTS	ANSI C63.4:2003, KDB No. 558074	☒	☐
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	☒	☐
Power Spectral Density	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

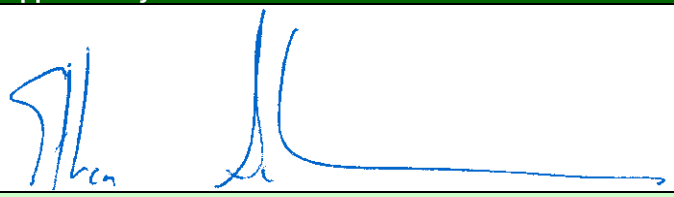
The measurement facility used to collect the data is located at:

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

Phone: (503) 844-4066 Fax: 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:



Ethan Schoonover, Sultan Lab 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 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).

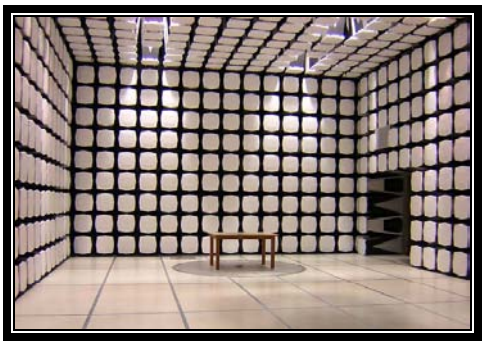
VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. *(Registration Numbers. - Hillsboro: C-1071, R-1025, C-2687, T-289, and R-2318, Irvine: R-1943,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

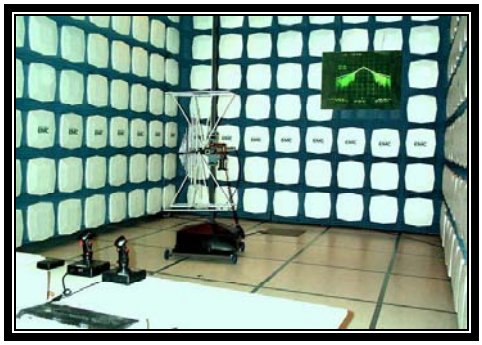
SCOPE

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:	Stratos Product Development Group
Address:	2401 Elliott Ave., 5th Floor
City, State, Zip:	Seattle, WA 98121
Test Requested By:	George Stone
Model:	Netguard Reusable
First Date of Test:	May 17, 2007
Last Date of Test:	May 30, 2007
Receipt Date of Samples:	May 14, 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):
DSSS radio operating at 2.4 GHz. Used in hospitals to broadcast ECG data.

Testing Objective:
Demonstrate compliance under FCC 15.247.

EUT Photo

CONFIGURATION 3 STRA0004

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Patient Monitor	Stratos Product Development Group	NetGuard Reusable	00A037FFF800017

CONFIGURATION 6 STRA0004

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT - Patient Monitor	Stratos Product Development Group	NetGuard Reuseable	00A037FFF800050

CONFIGURATION 7 STRA0004

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Access Point	Stratos Product Development Group	NetGuard Access Point	00A037FFF8000C2

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
PoE Power Injector	Ault Korea Corp.	PW180KB 4800F01	Unknown
Switch	Netgear	FS605	1FM1713D01949
Switch AC Adapter	Netgear	DSA-9R-05 AUS	Unknown
Laptop AC Adapter	Sony	PCGA-ACX1	0006A0802412P
Laptop	Sony	PCG-5201	28308530 3102575

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
AC power	No	0.5m	No	POE power adapter	AC Mains
PoE	No	3.0m	No	EUT	PoE Power injector
LAN	No	1.0m	No	PoE Power Injector	Switch
LAN	No	1.0m	No	Switch	Laptop
DC	No	1.3m	No	Switch	Switch AC Adapter
AC	No	1.8m	No	Laptop AC Adapter	AC Mains
DC	No	1.4m	No	Laptop	Laptop AC Adapter
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 10 STRA0004

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
EUT - Patient Monitor	Stratos Product Development Group	NetGuard Reuseable	00A037FFF800040

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Test fixture, Reuseable	Stratos Product Development Group	DCP-0081	N/a
Battery holder	Stratos Product Development Group	N/a	N/a

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	5/17/2007	Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	5/29/2007	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	5/29/2007	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.
4	5/29/2007	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.
5	5/29/2007	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	5/29/2007	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.
7	5/30/2007	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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

Search mode.

Debug version of RF print software

MODE USED FOR FINAL DATA

Search mode.

POWER SETTINGS INVESTIGATED

Battery

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	1 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 c,g, h			EVA	12/29/2006	13
Pre-Amplifier	Miteq	AM-1616-1000	AOL	12/29/2006	13
Antenna, Biconilog	EMCO	3141	AXE	12/28/2005	24
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2006	13

MEASUREMENT BANDWIDTHS

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

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

MEASUREMENT UNCERTAINTY

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

NORTHWEST EMC

RADIATED EMISSIONS DATA SHEET

PSA 2007.05.07
EMI 2006.12.20

EUT:	NetGuard Reuseable			Work Order:	STRA0004
Serial Number:	00A037FFF800050			Date:	05/17/07
Customer:	Stratos Product Development Group			Temperature:	23
Attendees:	Brian Read			Humidity:	32%
Project:	None			Barometric Pres.:	30.15
Tested by:	Holly Ashkannejhad	Power:	Battery	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.109(g) (CISPR 22:1997):2006 Class A	ANSI C63.4:2003

TEST PARAMETERS			
Antenna Height(s) (m)	1 - 4	Test Distance (m)	5

COMMENTS

EUT OPERATING MODES

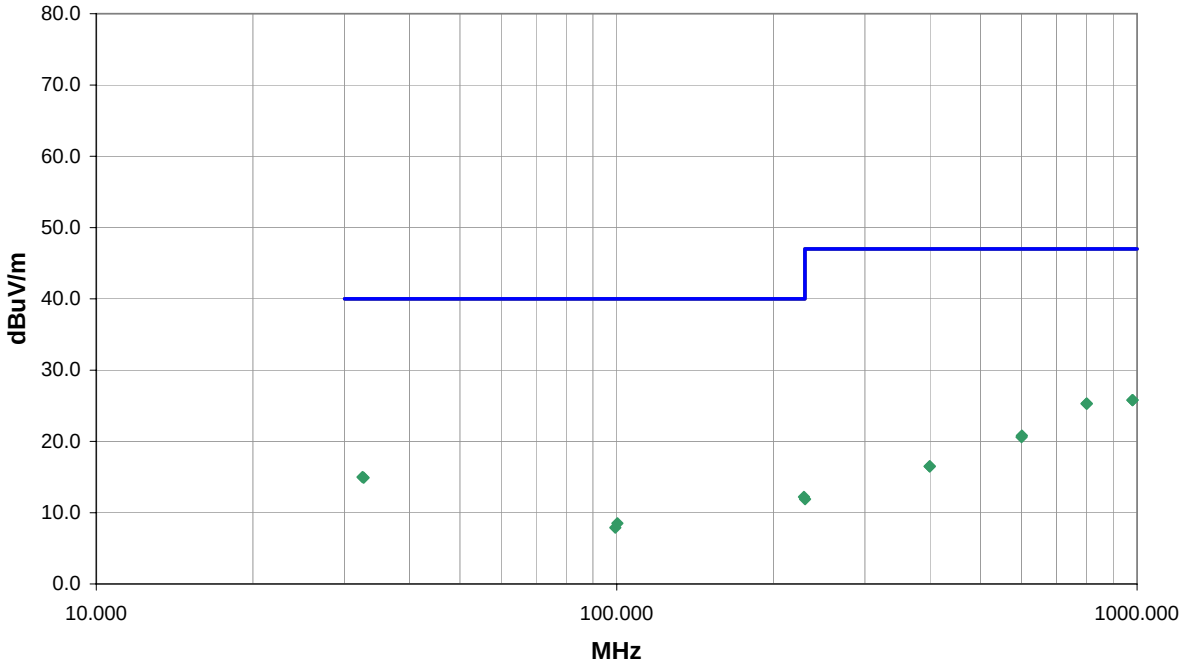
Search mode.

DEVIATIONS FROM TEST STANDARD

No deviations.

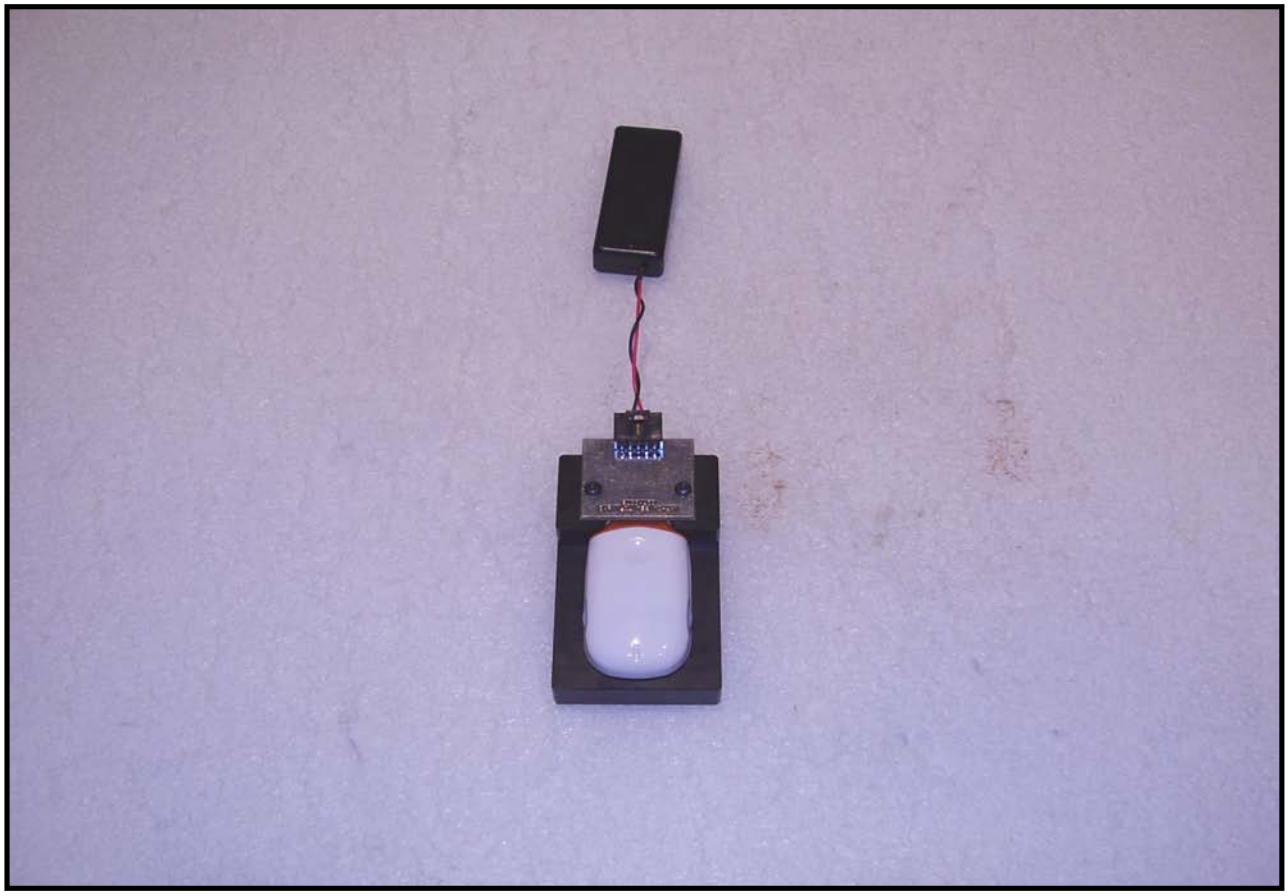
Run #	1
Configuration #	6
Results	Pass

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)
979.932	13.6	12.2	193.0	1.0	5.0	0.0	V-Bilog	QP	0.0	25.8	47.0	-21.2
980.527	13.6	12.2	106.0	1.0	5.0	0.0	H-Bilog	QP	0.0	25.8	47.0	-21.2
799.765	13.7	11.6	266.0	1.0	5.0	0.0	H-Bilog	QP	0.0	25.3	47.0	-21.7
800.448	13.7	11.6	270.0	1.0	5.0	0.0	V-Bilog	QP	0.0	25.3	47.0	-21.7
32.490	13.9	1.1	71.0	1.7	5.0	0.0	H-Bilog	QP	0.0	15.0	40.0	-25.0
32.649	13.9	1.0	215.0	2.8	5.0	0.0	V-Bilog	QP	0.0	14.9	40.0	-25.1
600.799	13.7	7.1	340.0	1.0	5.0	0.0	H-Bilog	QP	0.0	20.8	47.0	-26.2
599.884	13.7	6.9	208.0	1.0	5.0	0.0	V-Bilog	QP	0.0	20.6	47.0	-26.4
229.098	14.5	-2.3	322.0	1.0	5.0	0.0	V-Bilog	QP	0.0	12.2	40.0	-27.8
399.630	13.8	2.7	359.0	2.4	5.0	0.0	H-Bilog	QP	0.0	16.5	47.0	-30.5
399.647	13.8	2.7	346.0	1.0	5.0	0.0	V-Bilog	QP	0.0	16.5	47.0	-30.5
100.284	14.9	-6.4	45.0	1.0	5.0	0.0	V-Bilog	QP	0.0	8.5	40.0	-31.5
99.386	14.3	-6.4	204.0	1.0	5.0	0.0	H-Bilog	QP	0.0	7.9	40.0	-32.1
230.194	14.1	-2.2	180.0	1.0	5.0	0.0	H-Bilog	QP	0.0	11.9	47.0	-35.1


EMC
EMC
EMC
NORTHWEST
EMC



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 low channel
Transmitting mid channel
Transmitting high channel

POWER SETTINGS INVESTIGATED
Battery

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
High Pass Filter	Micro-Tronics	HPM50111	HFO	12/29/2006	13
EV01 Cable D			EVD	3/30/2006	15
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	3/23/2006	17
Antenna, Horn	EMCO	3160-09	AHG	NCR	0
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APC	5/10/2007	13
EV01 cables g,h,I			EVF	5/10/2007	13
Antenna, Horn	EMCO	3160-08	AHK	NCR	0
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
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
Spectrum Analyzer	Agilent	E4446A	AAT	12/7/2006	13

MEASUREMENT BANDWIDTHS

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

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

MEASUREMENT UNCERTAINTY

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

TEST DESCRIPTION

The 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

RADIATED EMISSIONS DATA SHEET

PSA 2007.05.07
EMI 2006.12.20

EUT:	Netguard Reusable	Work Order:	STRA0004
Serial Number:	00A037FFFF800017	Date:	05/30/07
Customer:	Stratos Product Development Group	Temperature:	24
Attendees:	Brian Read	Humidity:	31%
Project:	None	Barometric Pres.:	29.99
Tested by:	Holly Ashkannejhad	Power: Battery	Job Site: EV01

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

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

COMMENTS

EUT OPERATING MODES

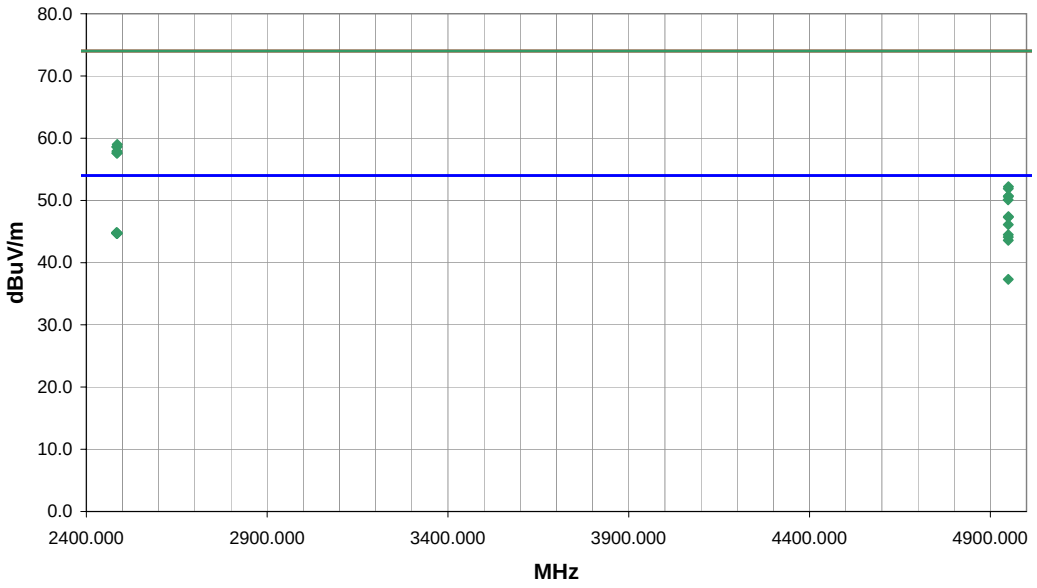
Transmitting high channel

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	19
Configuration #	3
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
4949.784	39.4	8.0	161.0	1.0	3.0	0.0	H-Horn	AV	0.0	47.4	54.0	-6.6	EUT vertical
4949.773	38.1	8.0	151.0	1.0	3.0	0.0	H-Horn	AV	0.0	46.1	54.0	-7.9	EUT horizontal
2483.207	24.4	0.4	142.0	1.0	3.0	20.0	H-Horn	AV	0.0	44.8	54.0	-9.2	EUT horizontal
2483.822	24.4	0.4	360.0	1.6	3.0	20.0	V-Horn	AV	0.0	44.8	54.0	-9.2	EUT horizontal
2484.851	24.4	0.4	136.0	1.6	3.0	20.0	V-Horn	AV	0.0	44.8	54.0	-9.2	EUT on side
2483.624	24.3	0.4	77.0	1.0	3.0	20.0	H-Horn	AV	0.0	44.7	54.0	-9.3	EUT on side
2484.926	24.3	0.4	188.0	1.6	3.0	20.0	V-Horn	AV	0.0	44.7	54.0	-9.3	EUT vertical
2485.463	24.3	0.4	155.0	2.6	3.0	20.0	H-Horn	AV	0.0	44.7	54.0	-9.3	EUT vertical
4949.760	36.5	8.0	325.0	1.0	3.0	0.0	V-Horn	AV	0.0	44.5	54.0	-9.5	EUT horizontal
4949.757	36.1	8.0	20.0	1.0	3.0	0.0	V-Horn	AV	0.0	44.1	54.0	-9.9	EUT on side
4949.751	35.6	8.0	227.0	1.0	3.0	0.0	H-Horn	AV	0.0	43.6	54.0	-10.4	EUT on side
2485.286	38.6	0.4	77.0	1.0	3.0	20.0	H-Horn	PK	0.0	59.0	74.0	-15.0	EUT on side
2483.852	38.2	0.4	360.0	1.6	3.0	20.0	V-Horn	PK	0.0	58.6	74.0	-15.4	EUT horizontal
2484.908	38.2	0.4	142.0	1.0	3.0	20.0	H-Horn	PK	0.0	58.6	74.0	-15.4	EUT horizontal
2484.596	37.5	0.4	188.0	1.6	3.0	20.0	V-Horn	PK	0.0	57.9	74.0	-16.1	EUT vertical
2483.876	37.2	0.4	136.0	1.6	3.0	20.0	V-Horn	PK	0.0	57.6	74.0	-16.4	EUT on side
2485.379	37.2	0.4	155.0	2.6	3.0	20.0	H-Horn	PK	0.0	57.6	74.0	-16.4	EUT vertical
4949.709	29.3	8.0	319.0	1.0	3.0	0.0	V-Horn	AV	0.0	37.3	54.0	-16.7	EUT vertical
4950.102	44.2	8.0	161.0	1.0	3.0	0.0	H-Horn	PK	0.0	52.2	74.0	-21.8	EUT vertical
4949.660	43.9	8.0	151.0	1.0	3.0	0.0	H-Horn	PK	0.0	51.9	74.0	-22.1	EUT horizontal

NORTHWEST EMC

RADIATED EMISSIONS DATA SHEET

PSA 2007.05.07
EMI 2006.12.20

EUT:	Netguard Reusable	Work Order:	STRA0004
Serial Number:	00A037FFFF800017	Date:	05/30/07
Customer:	Stratos Product Development Group	Temperature:	24
Attendees:	Brian Read	Humidity:	31%
Project:	None	Barometric Pres.:	29.99
Tested by:	Holly Ashkannejhad	Power: Battery	Job Site: EV01

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

TEST PARAMETERS

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

COMMENTS

EUT OPERATING MODES

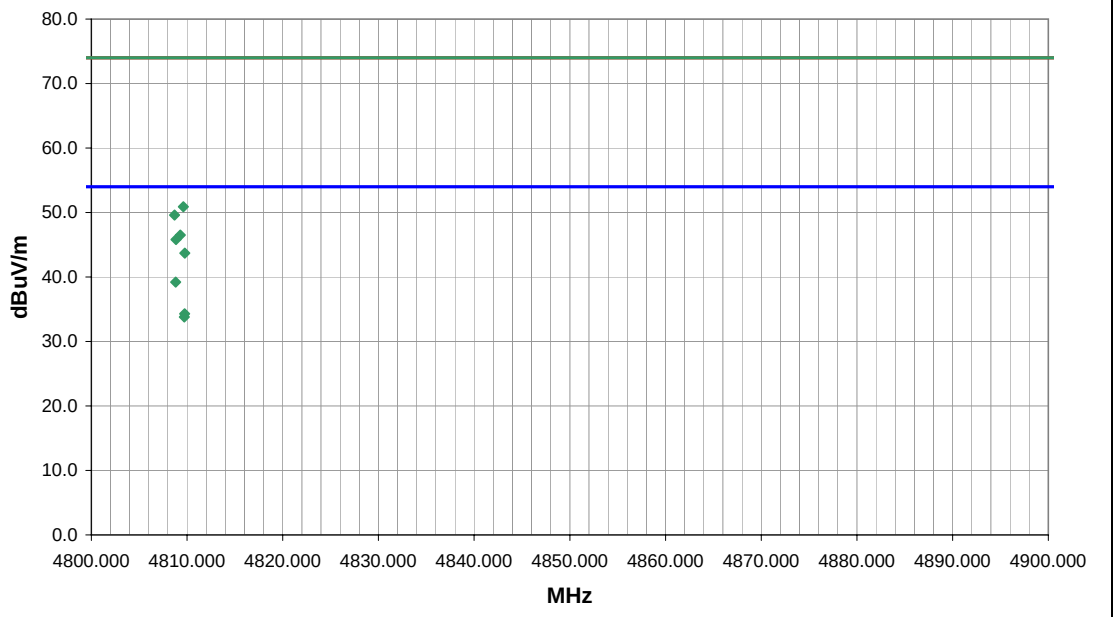
Transmitting low channel

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	20
Configuration #	3
Results	Pass

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
4809.770	36.3	7.4	177.0	1.0	3.0	0.0	H-Horn	AV	0.0	43.7	54.0	-10.3	EUT vertical
4808.803	31.8	7.4	359.0	1.0	3.0	0.0	V-Horn	AV	0.0	39.2	54.0	-14.8	EUT vertical
4809.747	26.9	7.4	47.0	2.3	3.0	0.0	H-Horn	AV	0.0	34.3	54.0	-19.7	EUT on side
4809.707	26.4	7.4	112.0	1.1	3.0	0.0	V-Horn	AV	0.0	33.8	54.0	-20.2	EUT on side
4809.617	43.5	7.4	177.0	1.0	3.0	0.0	H-Horn	PK	0.0	50.9	74.0	-23.1	EUT vertical
4808.687	42.2	7.4	359.0	1.0	3.0	0.0	V-Horn	PK	0.0	49.6	74.0	-24.4	EUT vertical
4809.300	39.1	7.4	47.0	2.3	3.0	0.0	H-Horn	PK	0.0	46.5	74.0	-27.5	EUT on side
4808.847	38.4	7.4	112.0	1.1	3.0	0.0	V-Horn	PK	0.0	45.8	74.0	-28.2	EUT on side

NORTHWEST EMC

RADIATED EMISSIONS DATA SHEET

PSA 2007.05.07
EMI 2006.12.20

EUT:	Netguard Reusable			Work Order:	STRA0004
Serial Number:	00A037FFFF800017			Date:	05/30/07
Customer:	Stratos Product Development Group			Temperature:	24
Attendees:	Brian Read			Humidity:	31%
Project:	None			Barometric Pres.:	29.99
Tested by:	David Divergigelis	Power:	Battery	Job Site:	EV01

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

TEST PARAMETERS

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

COMMENTS

EUT OPERATING MODES

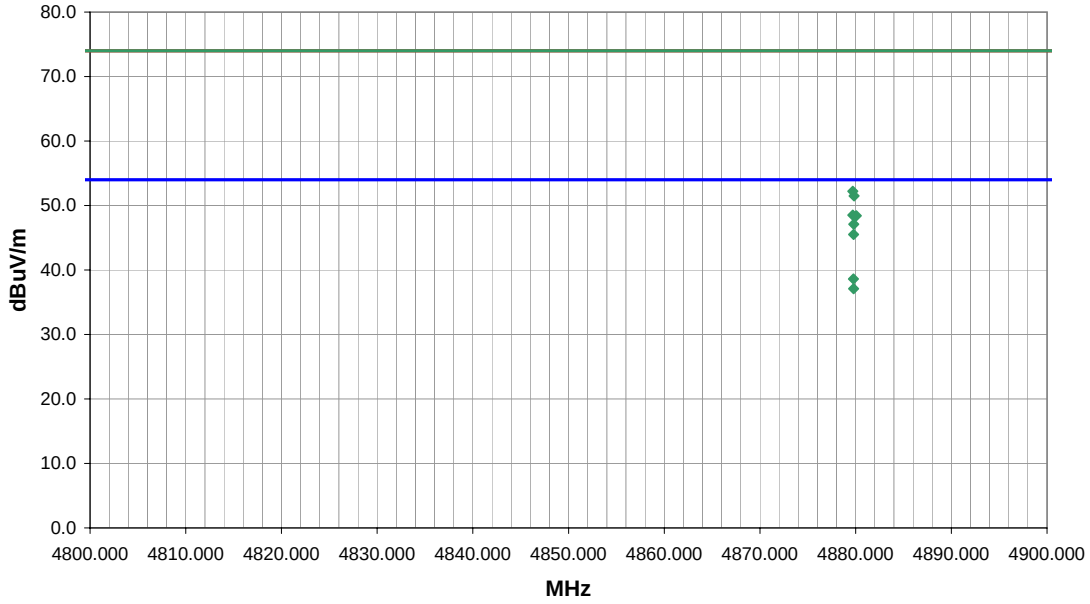
Transmitting mid channel

DEVIATIONS FROM TEST STANDARD

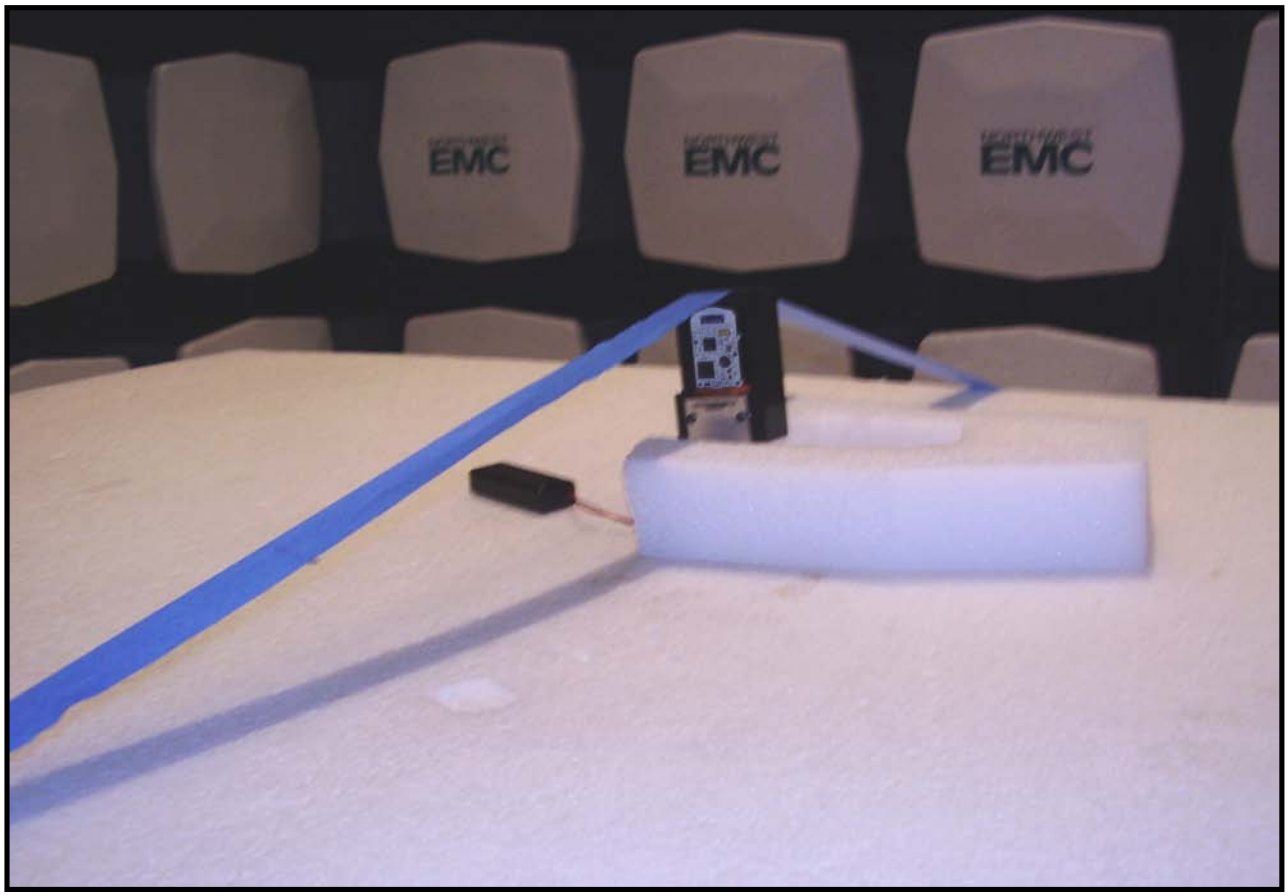
No deviations.

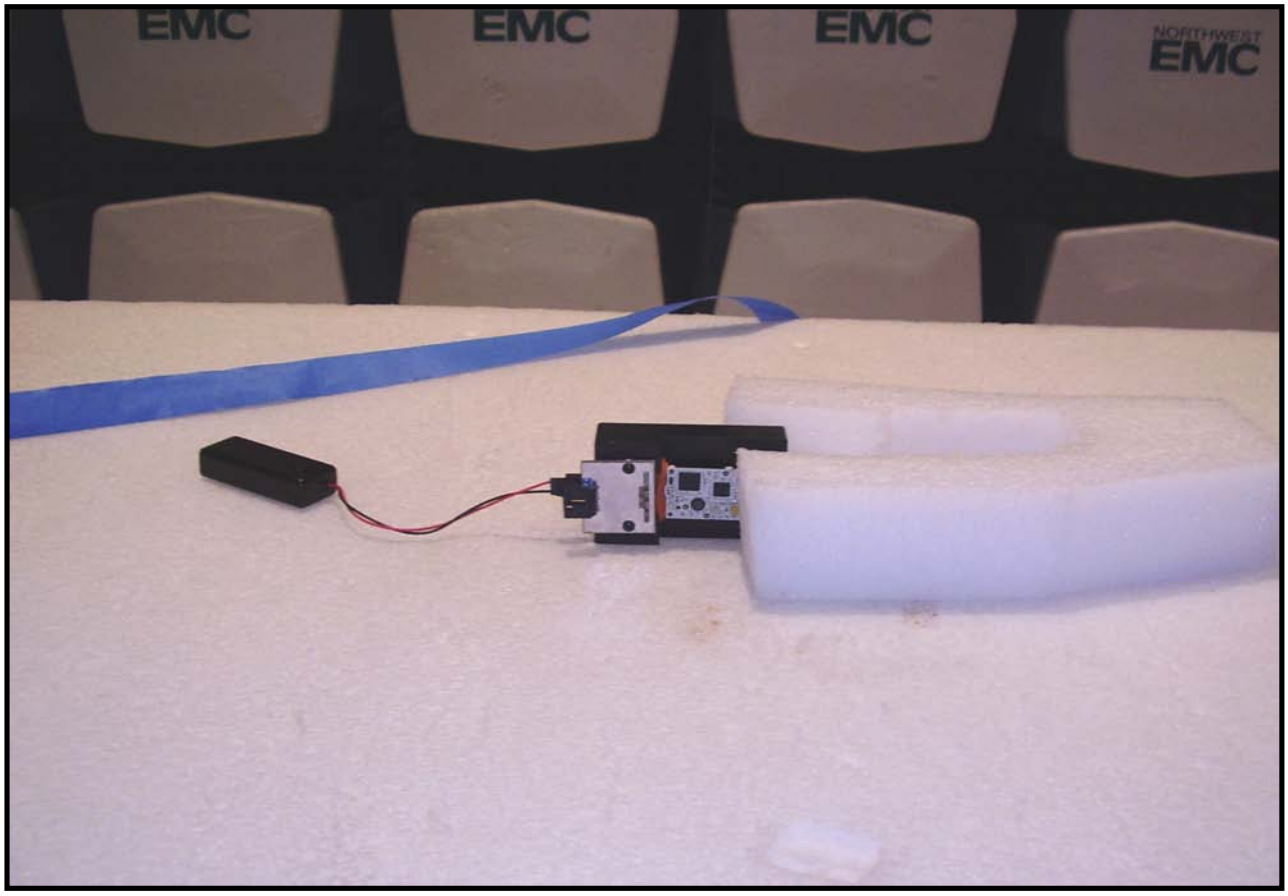
Run #	21
Configuration #	3
Results	Pass

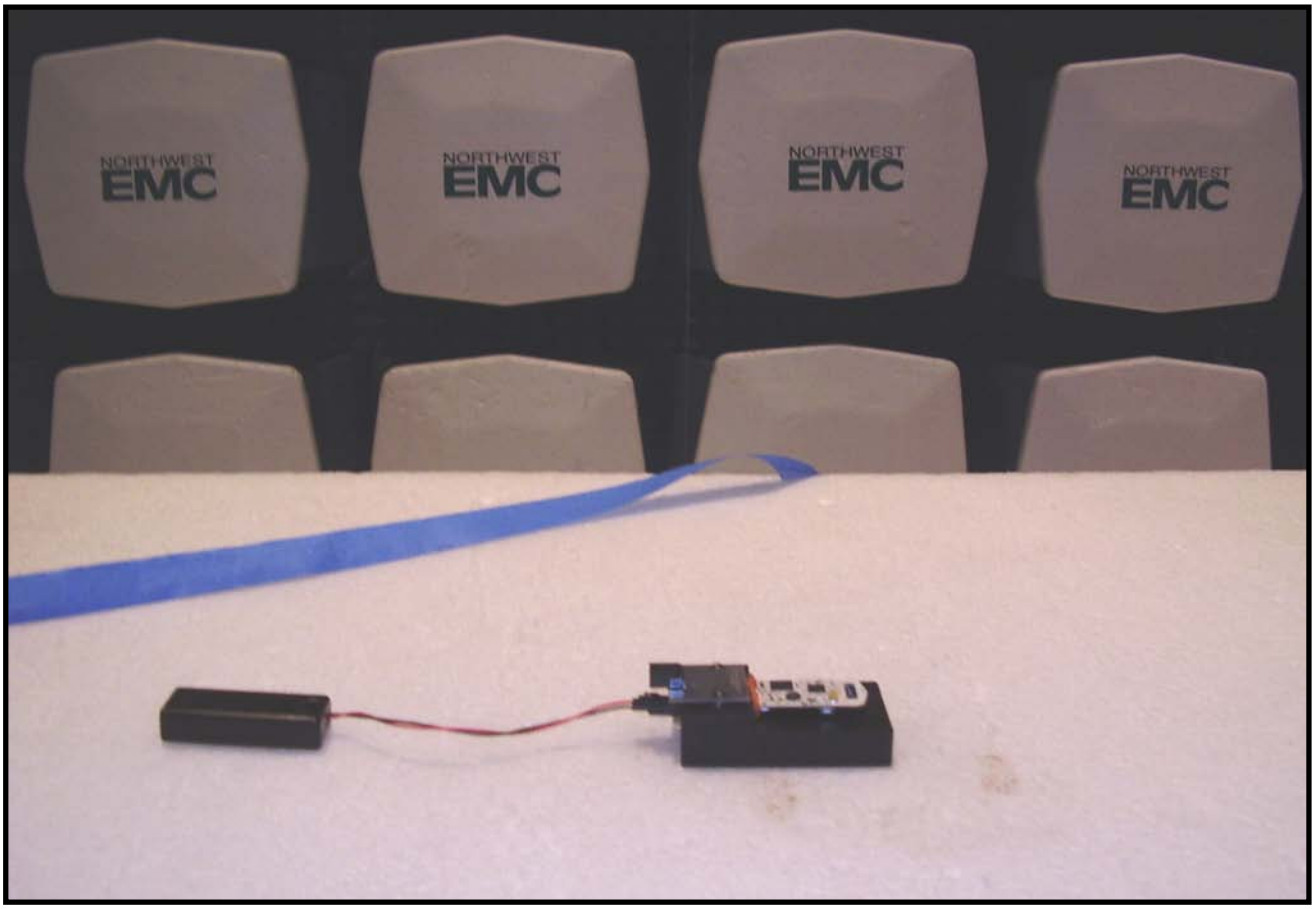
Signature



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
4879.797	39.4	7.7	333.0	1.0	3.0	0.0	V-Horn	AV	0.0	47.1	54.0	-6.9	EUT on side
4879.783	37.8	7.7	176.0	1.0	3.0	0.0	H-Horn	AV	0.0	45.5	54.0	-8.5	EUT Vertical
4879.777	30.9	7.7	18.0	1.0	3.0	0.0	V-Horn	AV	0.0	38.6	54.0	-15.4	EUT Vertical
4879.780	29.4	7.7	222.0	1.0	3.0	0.0	H-Horn	AV	0.0	37.1	54.0	-16.9	EUT on side
4879.710	44.5	7.7	333.0	1.0	3.0	0.0	V-Horn	PK	0.0	52.2	74.0	-21.8	EUT on side
4879.843	43.8	7.7	176.0	1.0	3.0	0.0	H-Horn	PK	0.0	51.5	74.0	-22.5	EUT Vertical
4879.707	40.8	7.7	222.0	1.0	3.0	0.0	H-Horn	PK	0.0	48.5	74.0	-25.5	EUT on side
4880.070	40.7	7.7	18.0	1.0	3.0	0.0	V-Horn	PK	0.0	48.4	74.0	-25.6	EUT Vertical


EMC
EMC
EMC


EMC
EMC
EMC
NORTHWEST
EMC


NORTHWEST
EMC
NORTHWEST
EMC
NORTHWEST
EMC
NORTHWEST
EMC

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
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2006	13
Power Meter	Gigatronics	8651A	SPM	9/19/2006	12
Power Sensor	Gigatronics	80701A	SPL	9/19/2006	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

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.

NORTHWEST EMC

OCCUPIED BANDWIDTH

XMit 2007.03.30

EUT:	NetGuard Patient Reuseable			**Work Order:**	STRA0004
Serial Number:	00A037FFFF800040			**Date:**	05/29/07
Customer:	Stratos Product Development Group			**Temperature:**	23°C
Attendees:	Brian Read			**Humidity:**	31%
Project:	None			**Barometric Pres.:**	30.23
Tested by:	Rod Peloquin	**Power:**	3 VDC	**Job Site:**	EV06

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

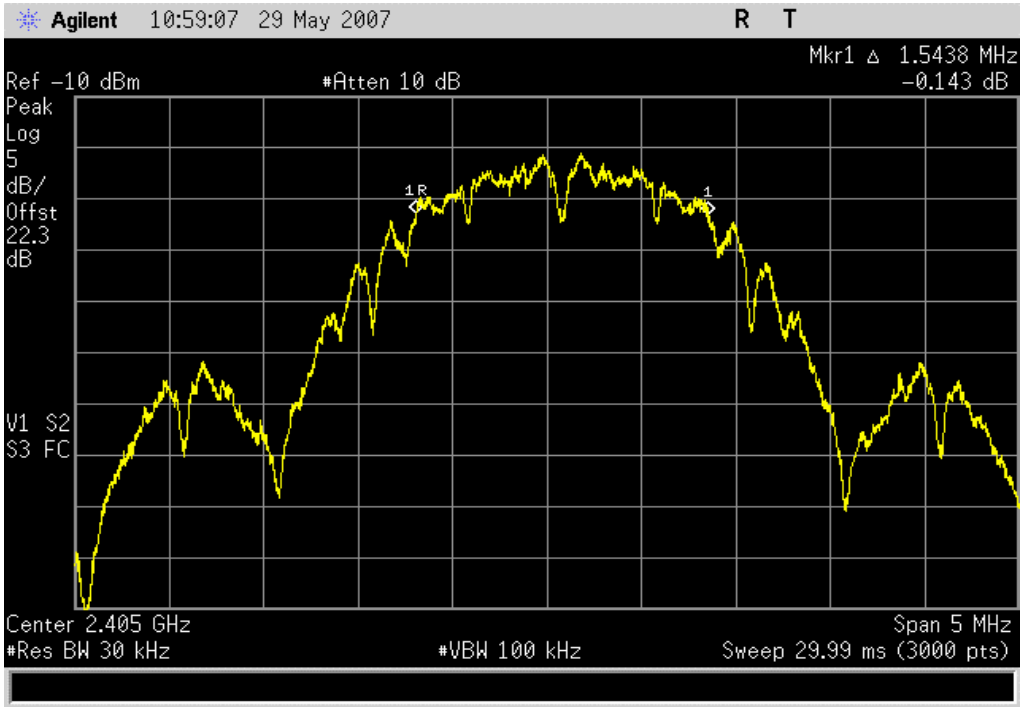
COMMENTS

DEVIATIONS FROM TEST STANDARD

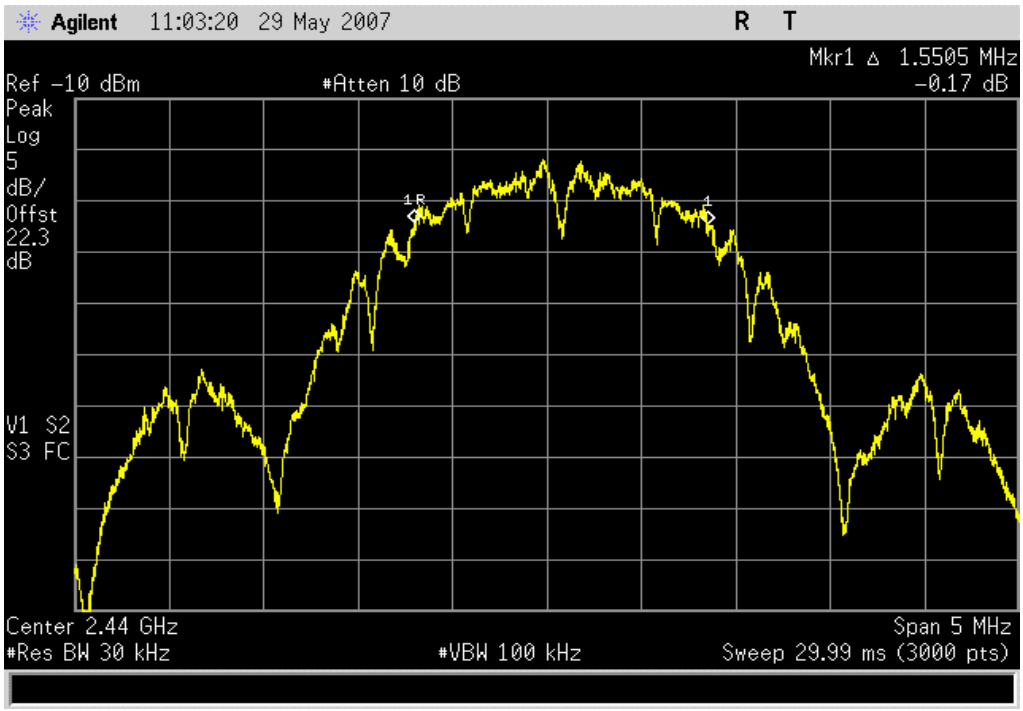
Configuration #	10	Signature

	Value	Limit	Results
Low Channel	1.54 MHz	≥ 500 kHz	Pass
Mid Channel	1.55 MHz	≥ 500 kHz	Pass
High Channel	1.55 MHz	≥ 500 kHz	Pass

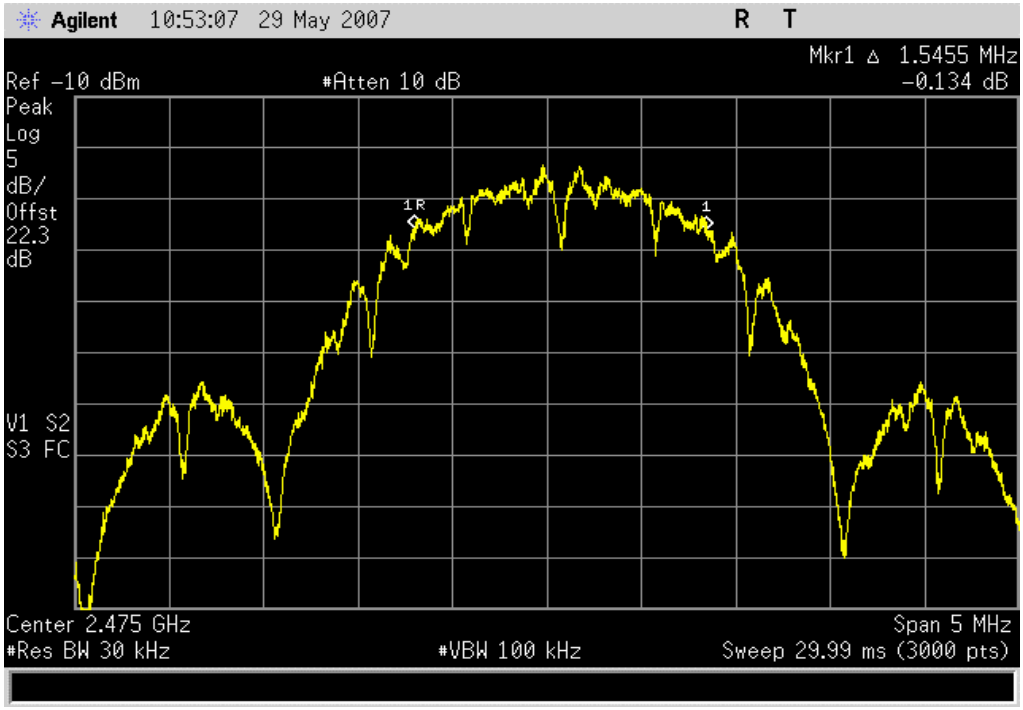
Low Channel					
Result:	Pass	**Value:**	1.54 MHz	**Limit:**	≥ 500 kHz



Mid Channel					
Result:	Pass	**Value:**	1.55 MHz	**Limit:**	≥ 500 kHz



High Channel					
Result:	Pass	**Value:**	1.55 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
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2006	13
Power Meter	Gigatronics	8651A	SPM	9/19/2006	12
Power Sensor	Gigatronics	80701A	SPL	9/19/2006	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

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.

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 2007.03.30

EUT:	NetGuard Reuseable			**Work Order:**	STRA0004
Serial Number:	00A037FFFF800040			**Date:**	05/29/07
Customer:	Stratos Product Development Group			**Temperature:**	24°C
Attendees:	Brian Read			**Humidity:**	32%
Project:	None			**Barometric Pres.:**	30.23
Tested by:	Rod Peloquin	**Power:**	3 VDC	**Job Site:**	EV06

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

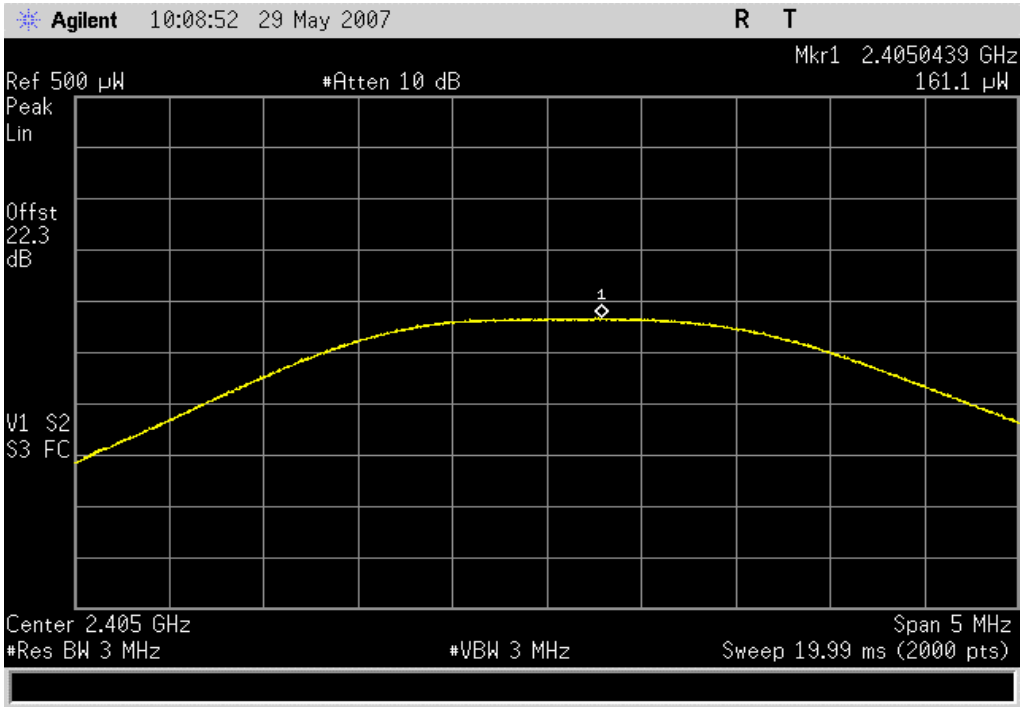
COMMENTS

DEVIATIONS FROM TEST STANDARD

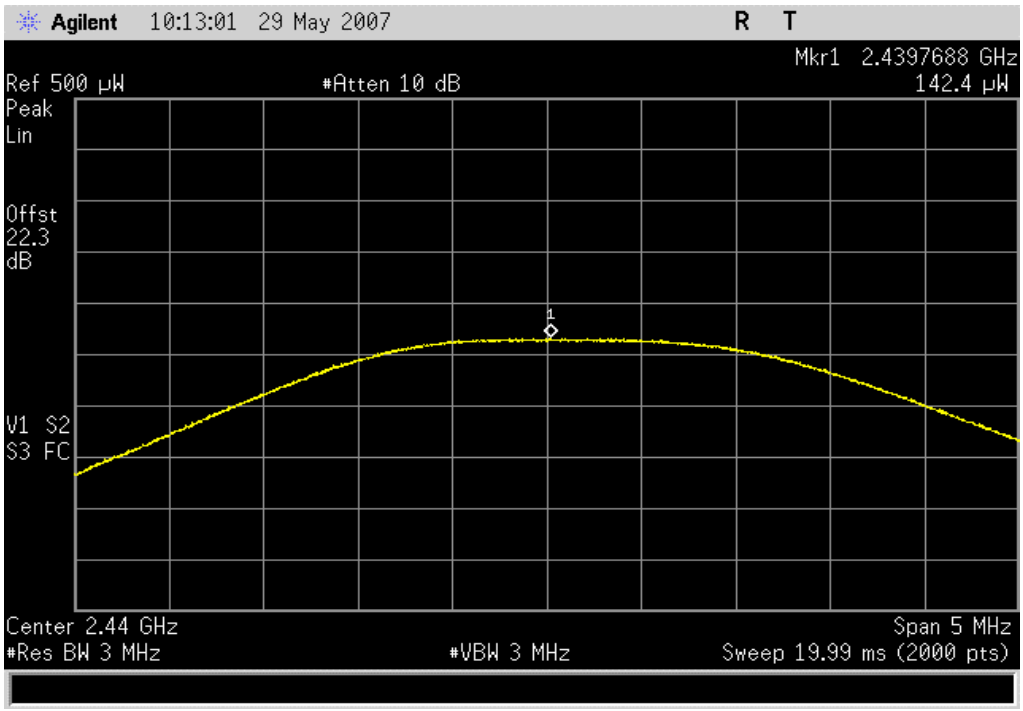
Configuration #	10	Signature

	Value	Limit	Results
Low Channel	0.161 mW	1 W	Pass
Mid Channel	0.142 mW	1 W	Pass
High Channel	0.124 mW	1 W	Pass

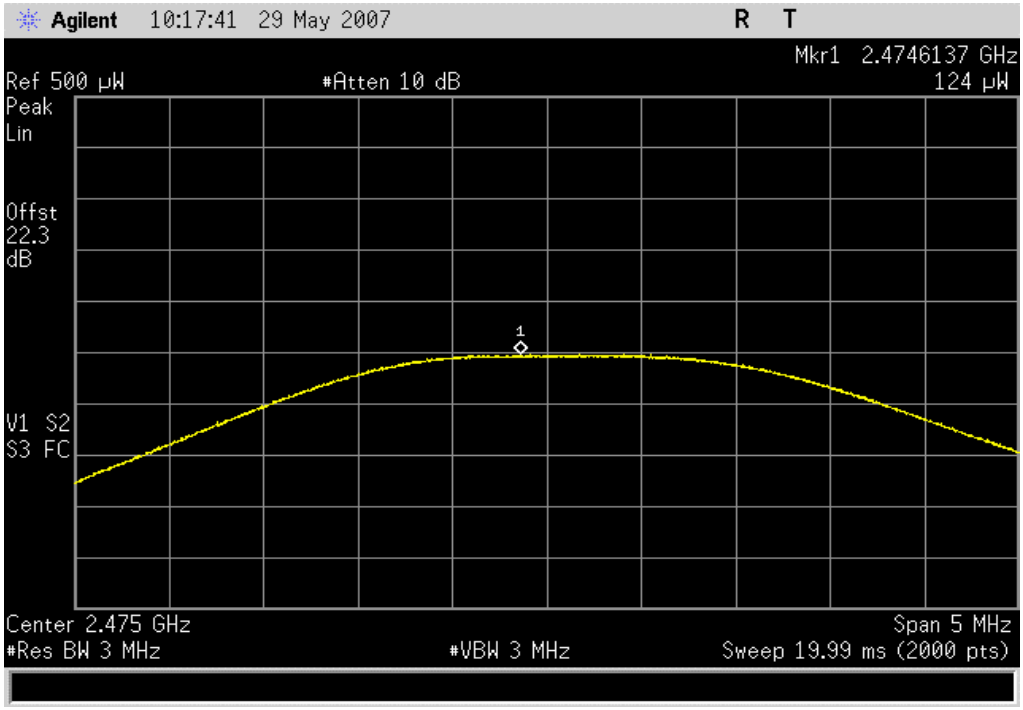
Low Channel					
Result:	Pass	**Value:**	0.161 mW	**Limit:**	1 W



Mid Channel					
Result:	Pass	**Value:**	0.142 mW	**Limit:**	1 W



High Channel					
Result:	Pass	**Value:**	0.124 mW	**Limit:**	1 W



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
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2006	13
Power Meter	Gigatronics	8651A	SPM	9/19/2006	12
Power Sensor	Gigatronics	80701A	SPL	9/19/2006	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

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 2007.03.30

EUT:	NetGuard Reusable			Work Order:	STRA0004
Serial Number:	00A037FFFF800040			Date:	05/29/07
Customer:	Stratos Product Development Group			Temperature:	24°C
Attendees:	Brian Read			Humidity:	32%
Project:	None			Barometric Pres.:	30.23
Tested by:	Rod Peloquin	Power:	3 VDC	Job Site:	EV06

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

COMMENTS

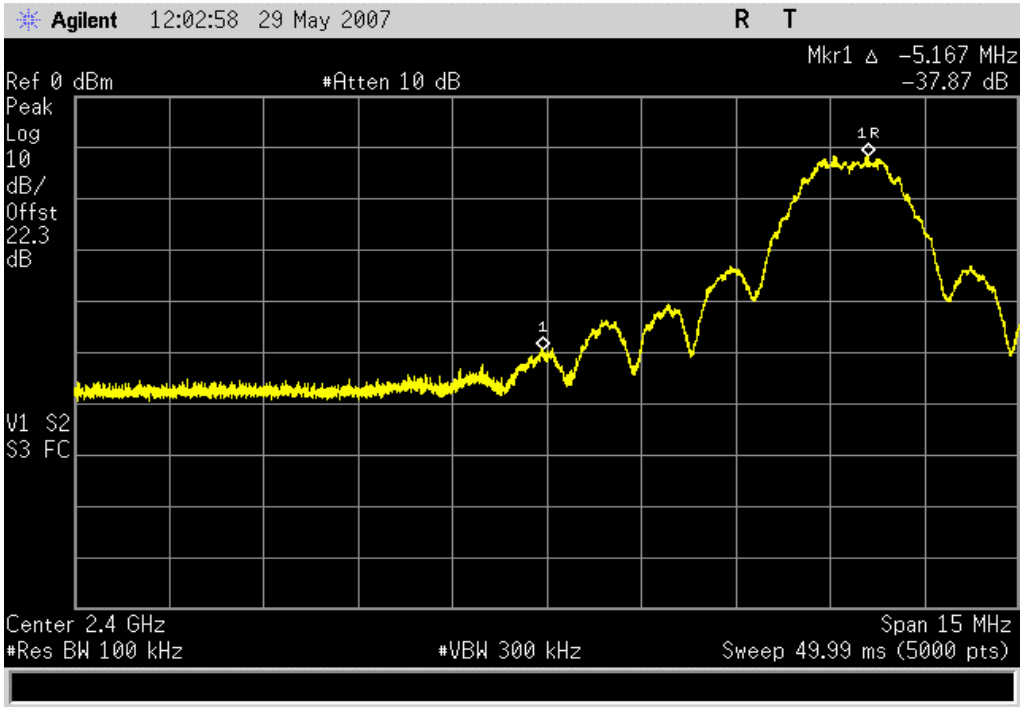
DEVIATIONS FROM TEST STANDARD

Configuration #	10	Signature

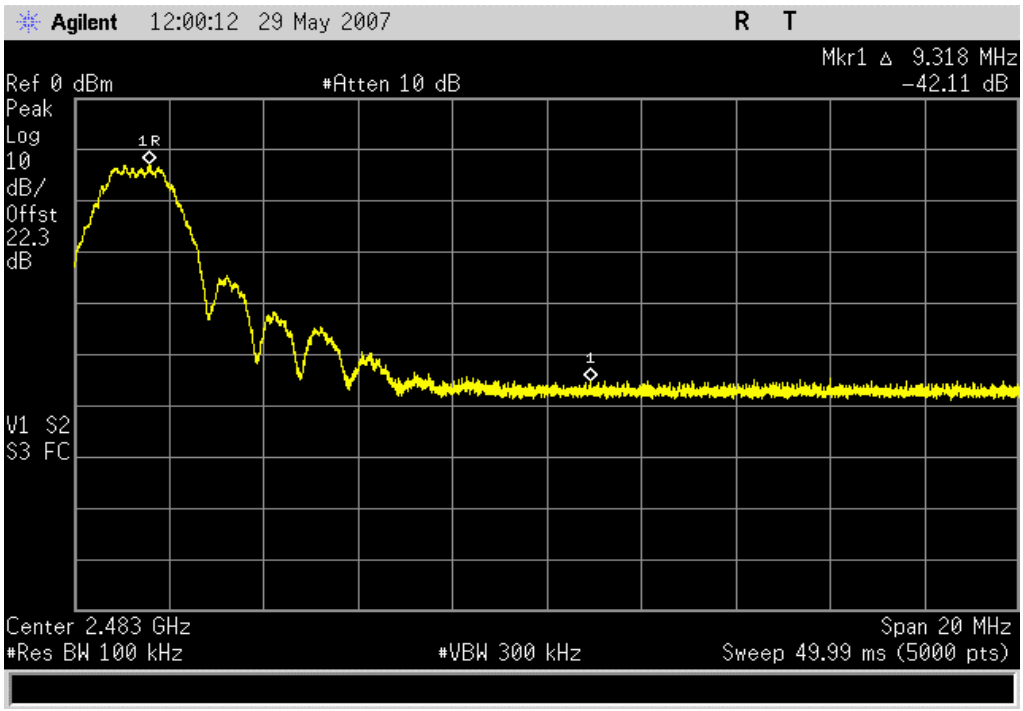
	Value	Limit	Results
Low Channel	-37.87 dB	≤ - 20 dBc	Pass
High Channel	-42.11 dB	≤ - 20 dBc	Pass

BAND EDGE COMPLIANCE

Low Channel					
Result:	Pass	**Value:**	-37.87 dB	**Limit:**	≤ - 20 dBc



High Channel					
Result:	Pass	**Value:**	-42.11 dB	**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
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2006	13
Power Meter	Gigatronics	8651A	SPM	9/19/2006	12
Power Sensor	Gigatronics	80701A	SPL	9/19/2006	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

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. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

NORTHWEST EMC

SPURIOUS CONDUCTED EMISSIONS

XMit 2007.03.30

EUT:	NetGuard Reuseable			**Work Order:**	STRA0004
Serial Number:	00A037FFFF800040			**Date:**	05/29/07
Customer:	Stratos Product Development Group			**Temperature:**	24°C
Attendees:	Brian Read			**Humidity:**	31%
Project:	None			**Barometric Pres.:**	30.23
Tested by:	Rod Peloquin	**Power:**	3 VDC	**Job Site:**	EV06

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

COMMENTS

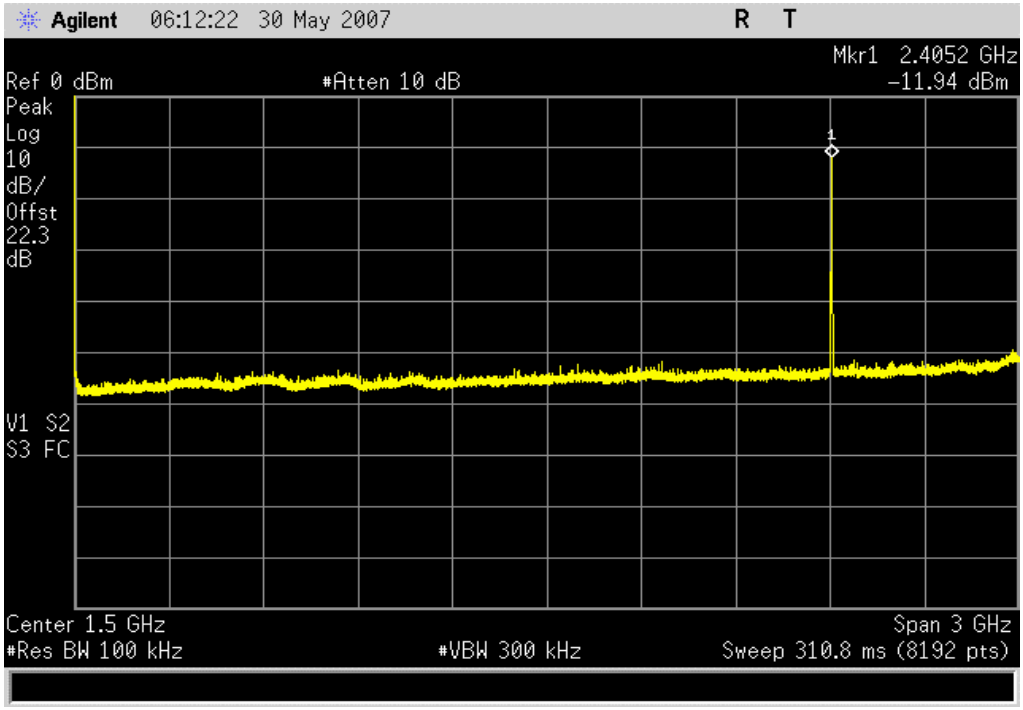
DEVIATIONS FROM TEST STANDARD

Configuration #	10	Signature

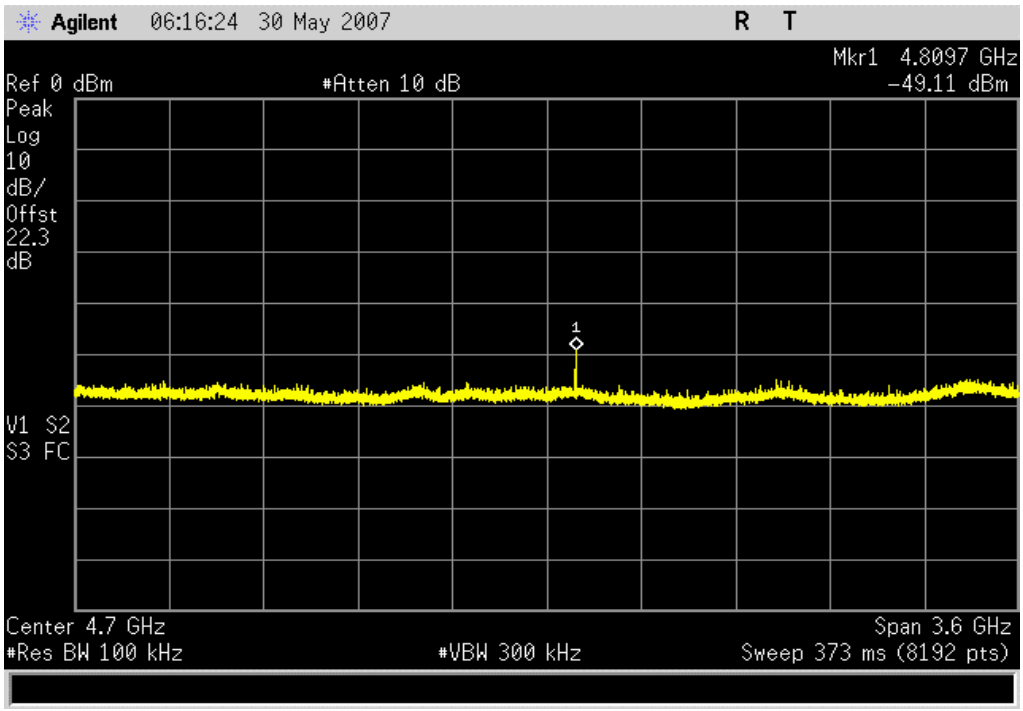
		Value	Limit	Results
Low Channel				
	0 - 3 GHz	< -30 dBc	≤ -20 dBc	Pass
	2.9 GHz - 6.5 GHz	< -30 dBc	≤ -20 dBc	Pass
	6.5 GHz - 12.8 GHz	< -30 dBc	≤ -20 dBc	Pass
	12.8 GHz - 25 GHz	< -30 dBc	≤ -20 dBc	Pass
Mid Channel				
	0 - 3 GHz	< -30 dBc	≤ -20 dBc	Pass
	2.9 GHz - 6.5 GHz	< -30 dBc	≤ -20 dBc	Pass
	6.5 GHz - 12.8 GHz	< -30 dBc	≤ -20 dBc	Pass
	12.8 GHz - 25 GHz	< -30 dBc	≤ -20 dBc	Pass
High Channel				
	0 - 3 GHz	< -30 dBc	≤ -20 dBc	Pass
	2.9 GHz - 6.5 GHz	-31.32 dBc	≤ -20 dBc	Pass
	6.5 GHz - 12.8 GHz	< -30 dBc	≤ -20 dBc	Pass
	12.8 GHz - 25 GHz	< -30 dBc	≤ -20 dBc	Pass

SPURIOUS CONDUCTED EMISSIONS

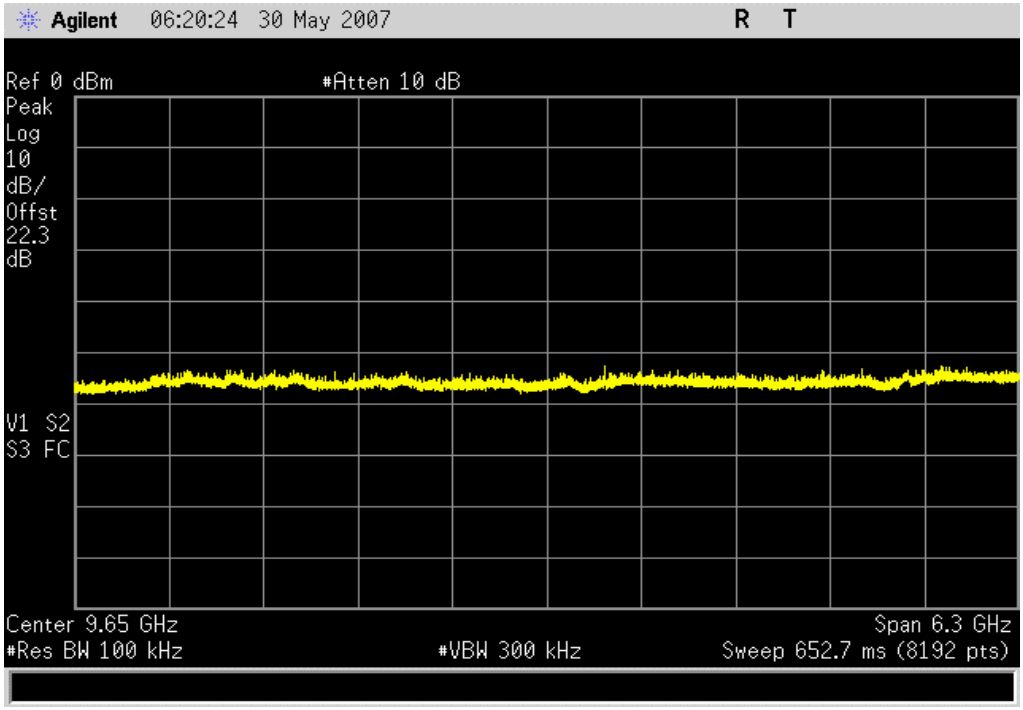
Low Channel, 0 - 3 GHz					
Result:	Pass	**Value:**	< -30 dBc	**Limit:**	≤ -20 dBc



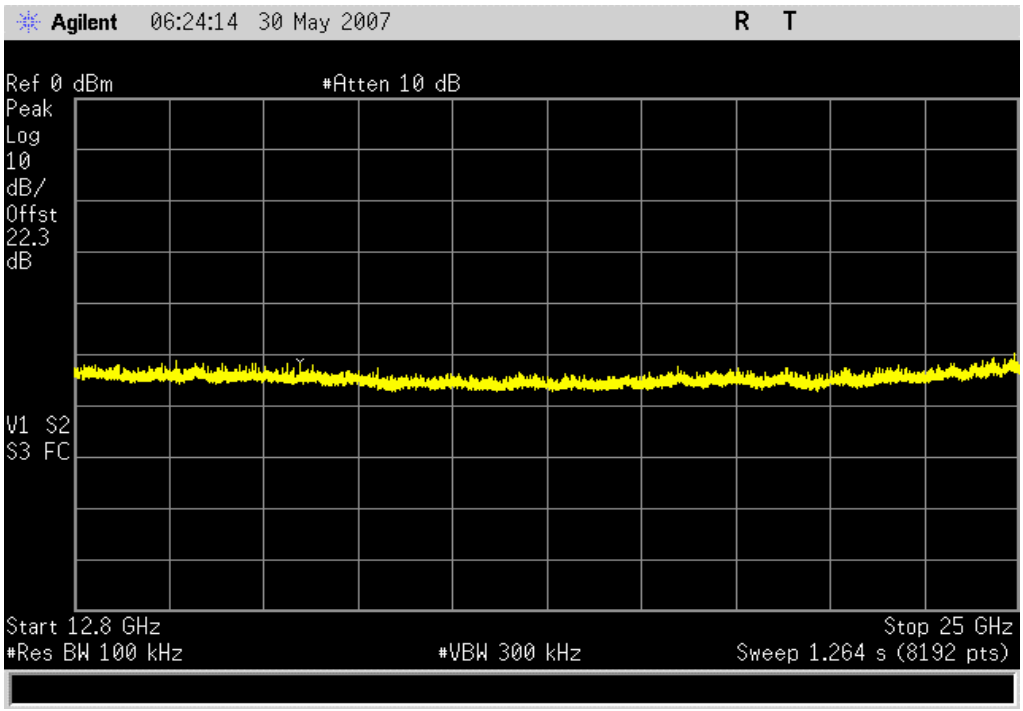
Low Channel, 2.9 GHz - 6.5 GHz					
Result:	Pass	**Value:**	< -30 dBc	**Limit:**	≤ -20 dBc



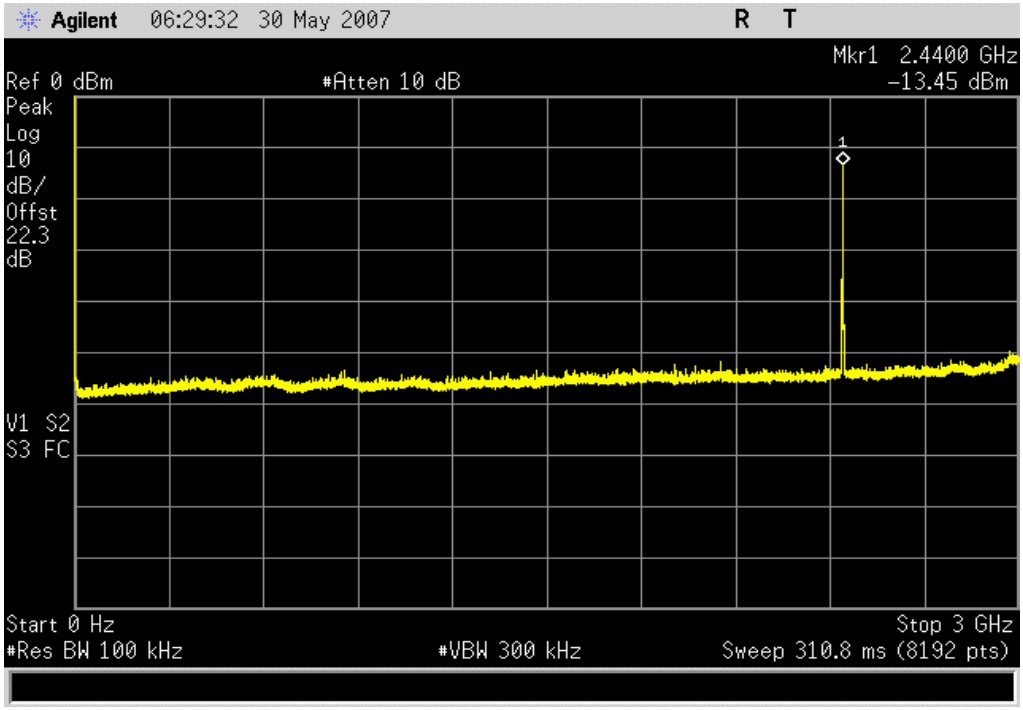
Low Channel, 6.5 GHz - 12.8 GHz					
Result:	Pass	**Value:**	< -30 dBc	**Limit:**	≤ -20 dBc



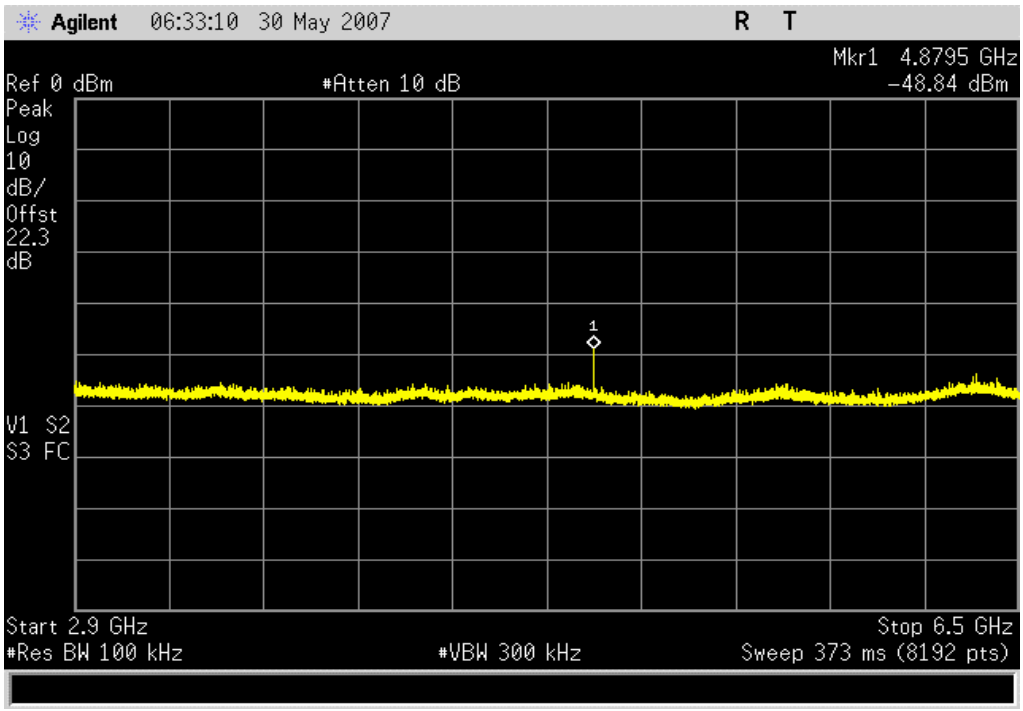
Low Channel, 12.8 GHz - 25 GHz					
Result:	Pass	**Value:**	< -30 dBc	**Limit:**	≤ -20 dBc



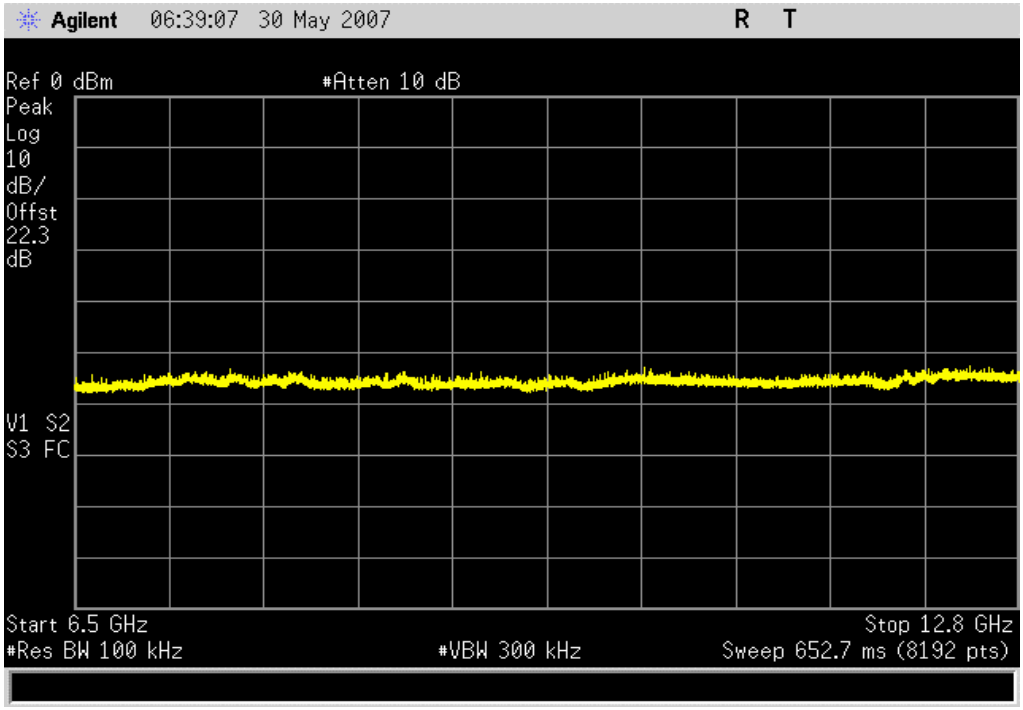
Mid Channel, 0 - 3 GHz					
Result:	Pass	**Value:**	< -30 dBc	**Limit:**	≤ -20 dBc



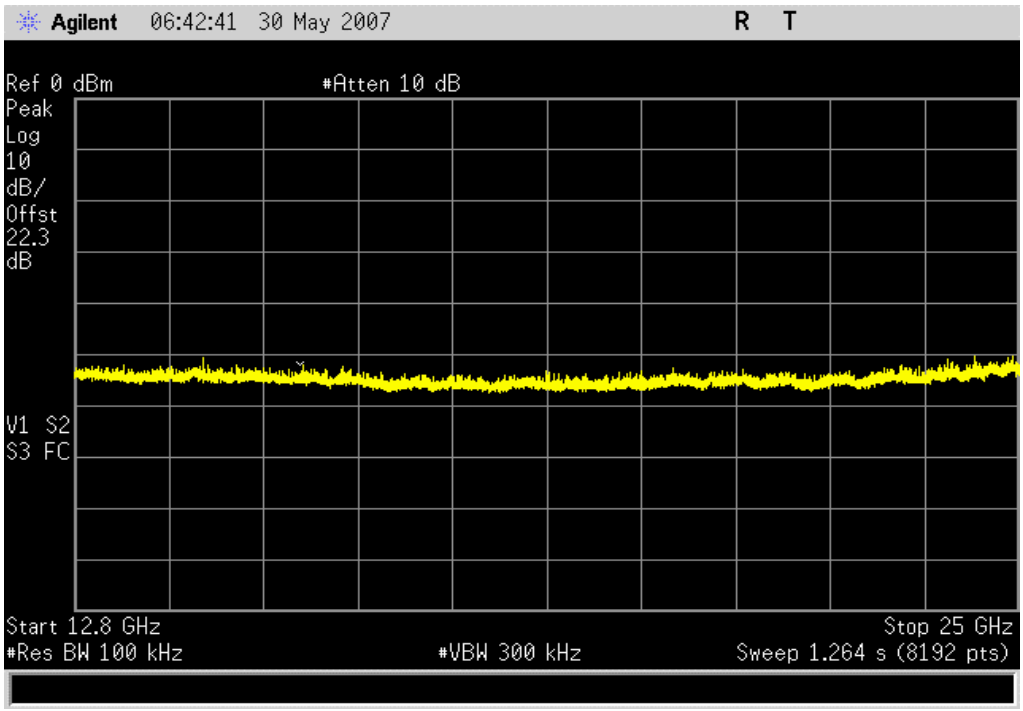
Mid Channel, 2.9 GHz - 6.5 GHz					
Result:	Pass	**Value:**	< -30 dBc	**Limit:**	≤ -20 dBc



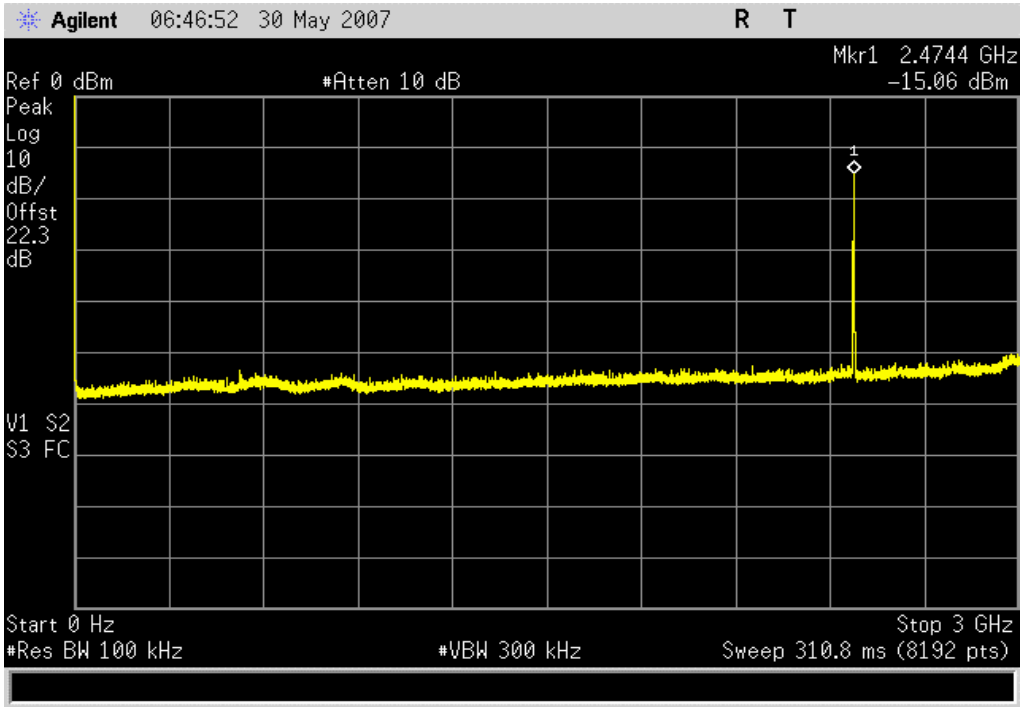
Mid Channel, 6.5 GHz - 12.8 GHz					
Result:	Pass	**Value:**	< -30 dBc	**Limit:**	≤ -20 dBc



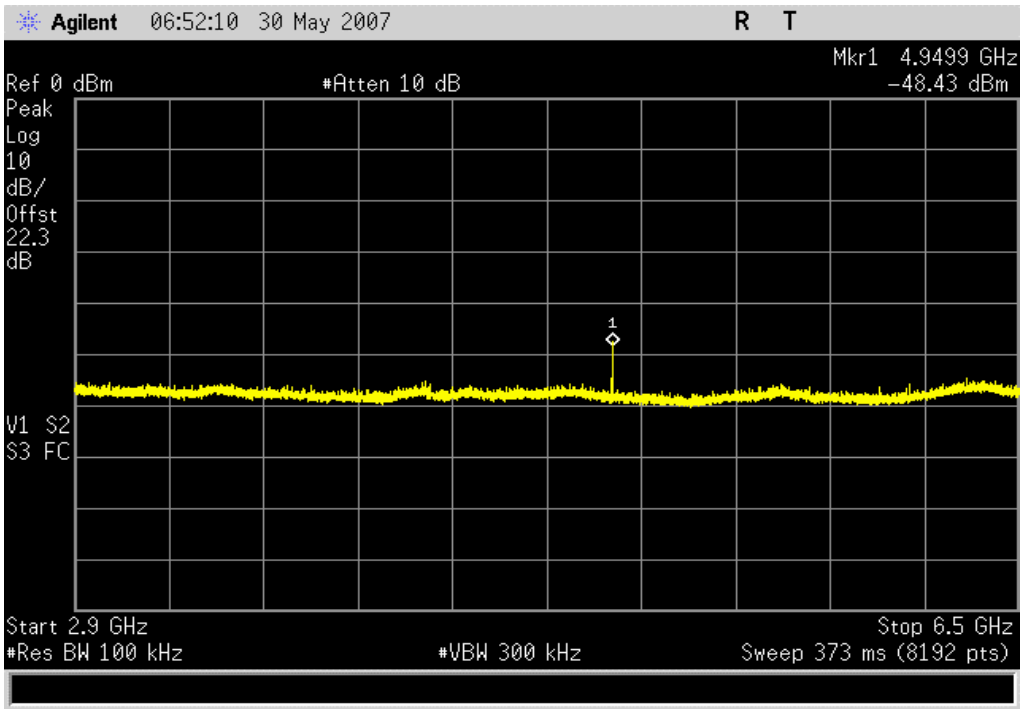
Mid Channel, 12.8 GHz - 25 GHz					
Result:	Pass	**Value:**	< -30 dBc	**Limit:**	≤ -20 dBc



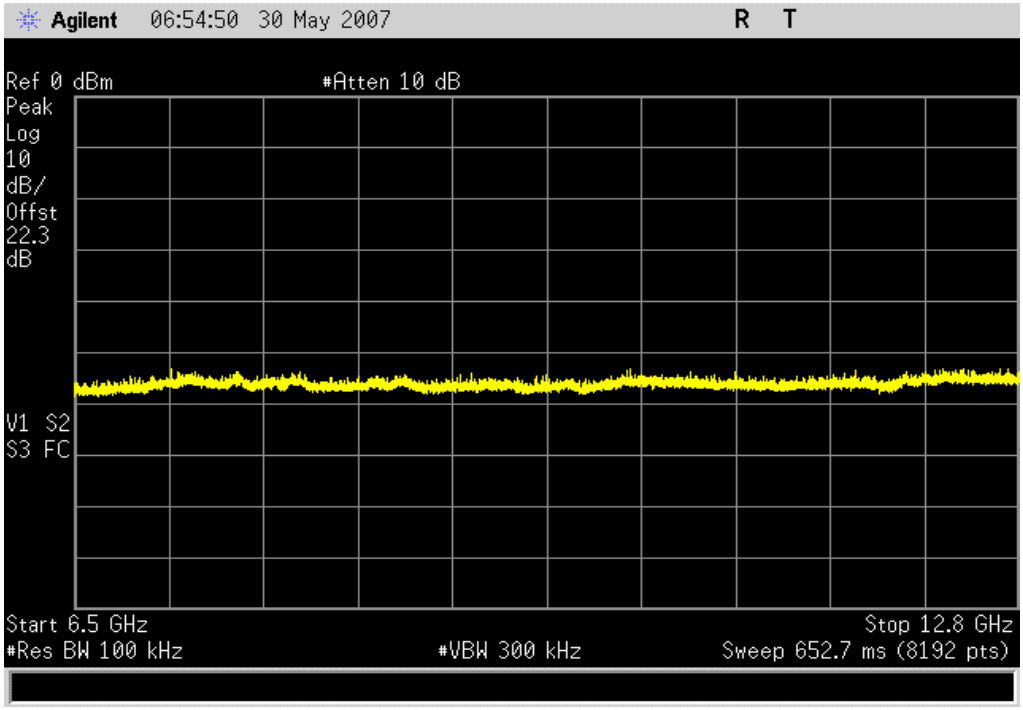
High Channel, 0 - 3 GHz					
Result:	Pass	**Value:**	< -30 dBc	**Limit:**	≤ -20 dBc



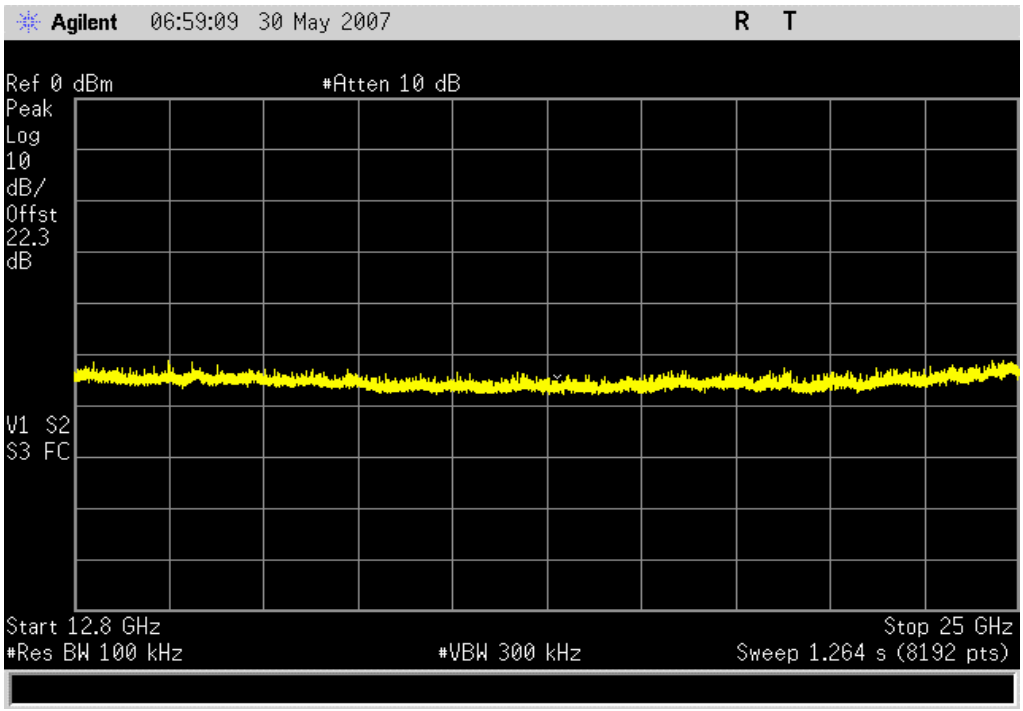
High Channel, 2.9 GHz - 6.5 GHz					
Result:	Pass	**Value:**	-31.32 dBc	**Limit:**	≤ -20 dBc

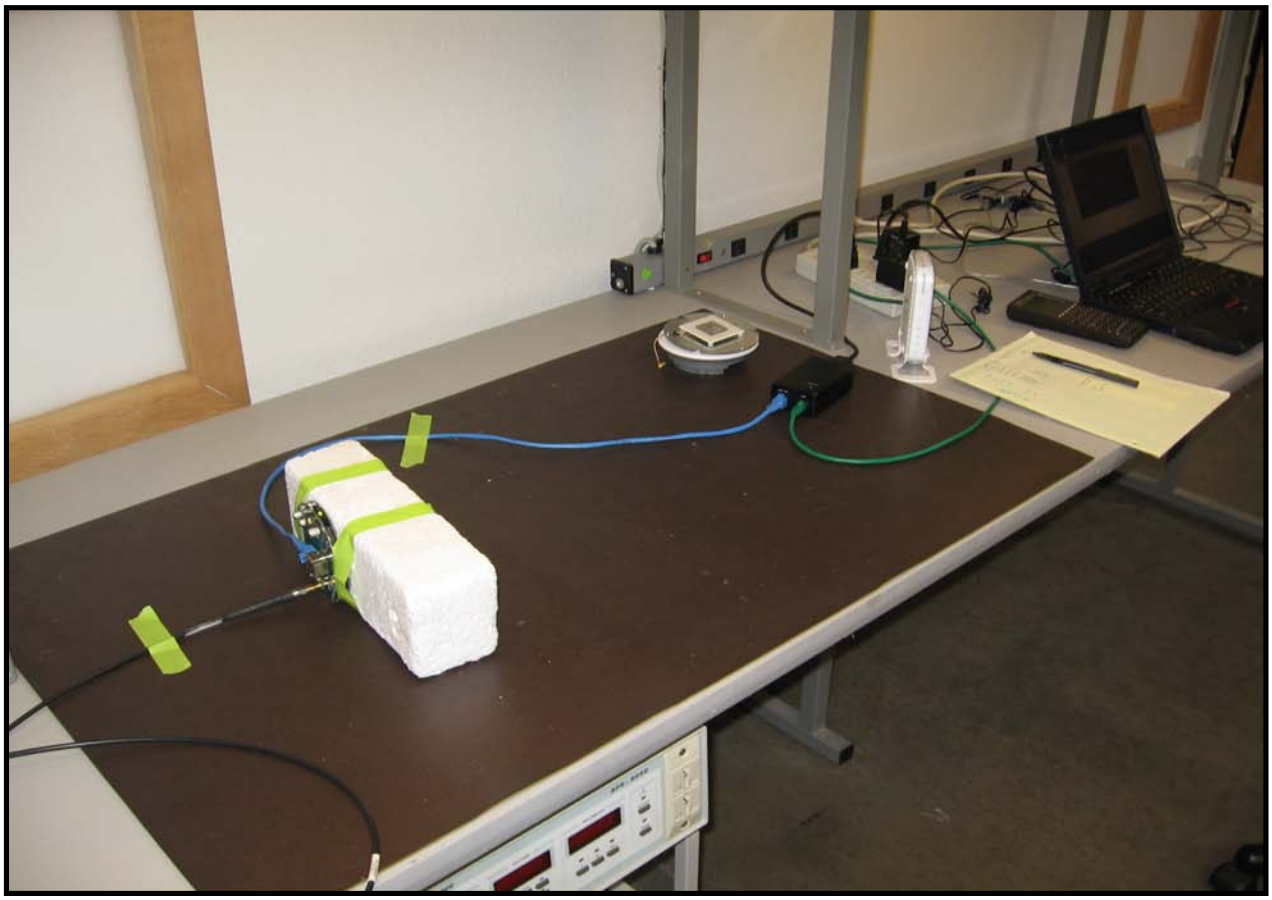


High Channel, 6.5 GHz - 12.8 GHz					
Result:	Pass	**Value:**	< -30 dBc	**Limit:**	≤ -20 dBc



High Channel, 12.8 GHz - 25 GHz					
Result:	Pass	**Value:**	< -30 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
Signal Generator	Hewlett-Packard	8648D	TGC	12/7/2006	13
Power Meter	Gigatronics	8651A	SPM	9/19/2006	12
Power Sensor	Gigatronics	80701A	SPL	9/19/2006	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

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. 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 2007.03.30

EUT:	NetGuard Reuseable			Work Order:	STRA0004
Serial Number:	00A037FFFF800040			Date:	05/29/07
Customer:	Stratos Product Development Group			Temperature:	24°C
Attendees:	Brian Read			Humidity:	32%
Project:	None			Barometric Pres.:	30.23
Tested by:	Rod Peloquin	Power:	3 VDC	Job Site:	EV06

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

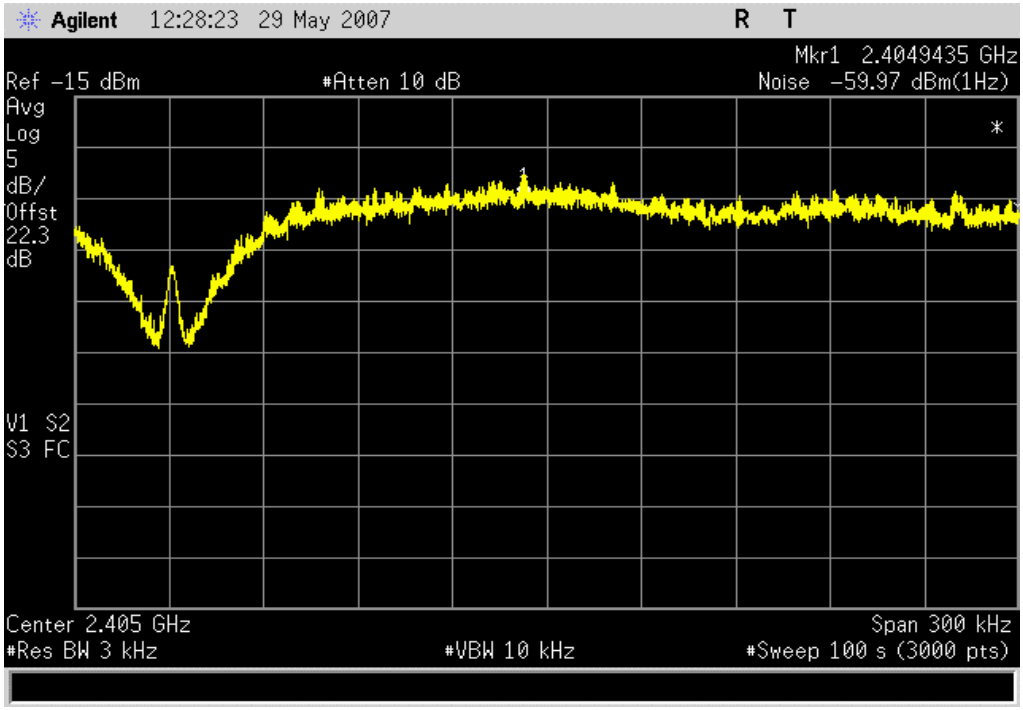
COMMENTS

DEVIATIONS FROM TEST STANDARD

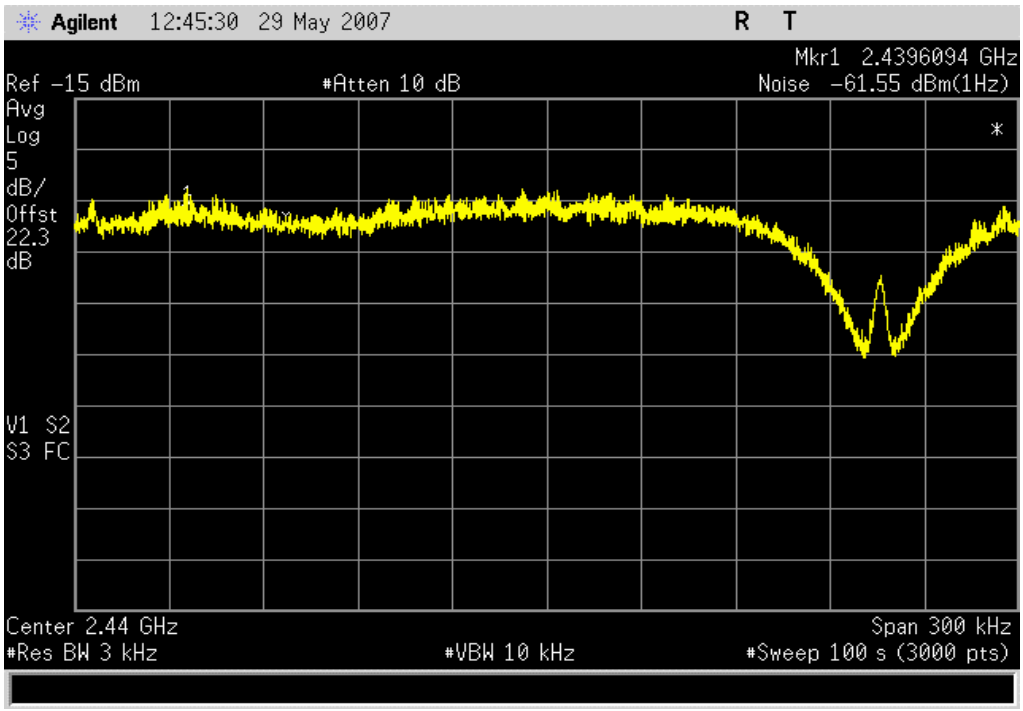
Configuration #	10	Signature

	Value	Limit	Results
Low Channel	-25.17 dBm / 3 kHz	8 dBm / 3 kHz	Pass
Mid Channel	-26.75 dBm / 3 kHz	8 dBm / 3 kHz	Pass
High Channel	-25.87 dBm / 3 kHz	8 dBm / 3 kHz	Pass

Low Channel					
Result:	Pass	**Value:**	-25.17 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz



Mid Channel					
Result:	Pass	**Value:**	-26.75 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz



High Channel					
Result:	Pass	**Value:**	-25.87 dBm / 3 kHz	**Limit:**	8 dBm / 3 kHz