

SonoSite

Wireless Remote

Report No. SONO0118.2

Report Prepared By



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

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EMC Test Report



22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test
Last Date of Test: February 09, 2009
SonoSite
Model: Wireless Remote

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Spurious Radiated Emissions	FCC 15.247 (DTS):2009	ANSI C63.4:2003 KDB No. 558074	Pass

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 (Site filing #2834D-1).

Approved By:

Don Facteau, IS Manager



NVLAP Lab Code: 200630-0

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 2004/108/EC, and ANSI C63.4. 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-Gen, Issue 2 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. (*Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2*)



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.



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 (US0017). 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



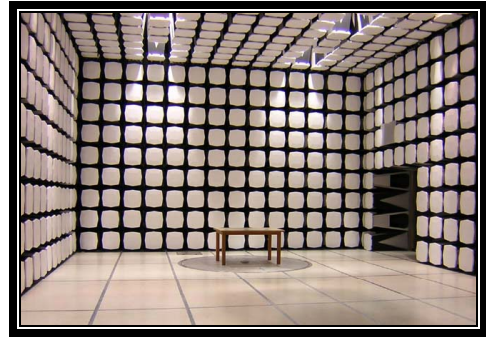
KCC: Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157*)



SCOPE

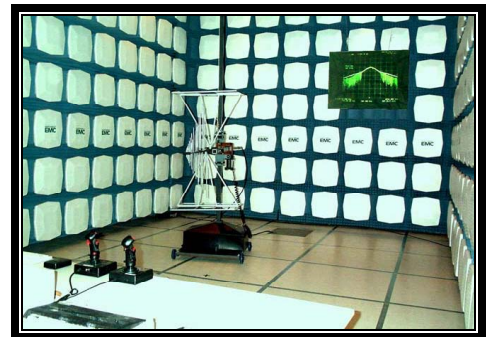
For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/accreditations/>



**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:	SonoSite
Address:	21919 30th Drive SE
City, State, Zip:	Bothell, WA 98021
Test Requested By:	Jake Reisenbichler
Model:	Wireless Remote
First Date of Test:	February 9, 2009
Last Date of Test:	February 9, 2009
Receipt Date of Samples:	February 5, 2009
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

Bluetooth radio module contained in a Wireless Remote Control. The remote is for use with medical ultrasound equipment.

Testing Objective:

To demonstrate compliance of the Bluetooth radio with FCC 15.247 radiated emissions requirements. This module was previously certified, but it has no shielding. Testing was required to show compliance in the remote.

EUT Photo



CONFIGURATION 7 SONO0118**EUT**

Description	Manufacturer	Model/Part Number	Serial Number
Remote Control - Bluetooth	SonoSite	P09684-03	03FBM1

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	Yes	1.2m	No	Remote Control - Bluetooth	Unterminated
Audio Cable	No	1.2m	No	Remote Control - Bluetooth	Terminated
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	2/9/2009	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was complete.

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

MODE USED FOR FINAL DATA

Transmitting

POWER SETTINGS INVESTIGATED

Battery

POWER SETTINGS USED FOR FINAL DATA

Battery

FREQUENCY RANGE INVESTIGATED

Start Frequency	30MHz	Stop Frequency	26.5GHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E44440A	AFA	11/14/2008	12
EV01 Cables		18-26GHz Standard Gain Horn Cable	EVD	12/2/2008	13
EV01 Cables		Standard Gain Horns Cables	EVF	11/13/2008	13
EV01 Cables		Double Ridge Horn Cables	EVB	5/19/2008	13
EV01 Cables		Bilog Cables	EVA	5/19/2008	13
High Pass Filter	Micro-Tronics	HPM50111	HFO	5/21/2008	13
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	12/2/2008	13
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	6/30/2008	13
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVC	6/30/2008	13
Pre-Amplifier	Miteq	AMF-4D-010100-24-10P	APW	5/19/2008	13
Pre-Amplifier	Miteq	AM-1616-1000	AOL	5/19/2008	13
Antenna, Horn	EMCO	3160-09	AHG	NCR	0
Antenna, Horn	ETS	3160-08	AHV	NCR	0
Antenna, Horn	ETS	3160-07	AHU	NCR	0
Antenna, Horn	EMCO	3115	AHC	8/12/2008	24
Antenna, Biconilog	EMCO	3141	AXE	1/15/2008	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


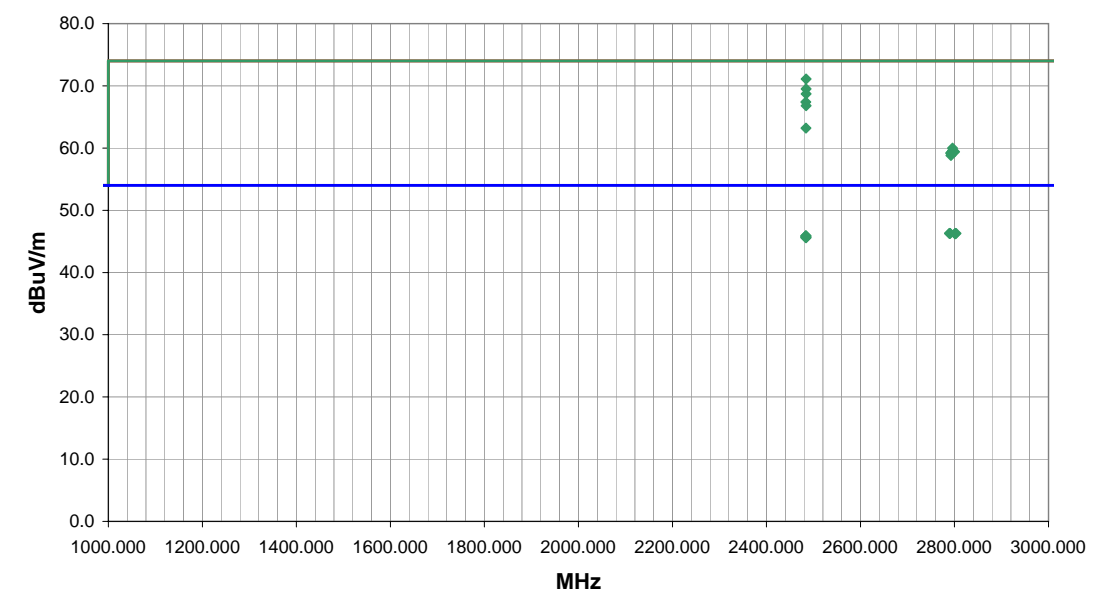
Measurements were made using the bandwidths and detectors specified. No video filter was used.


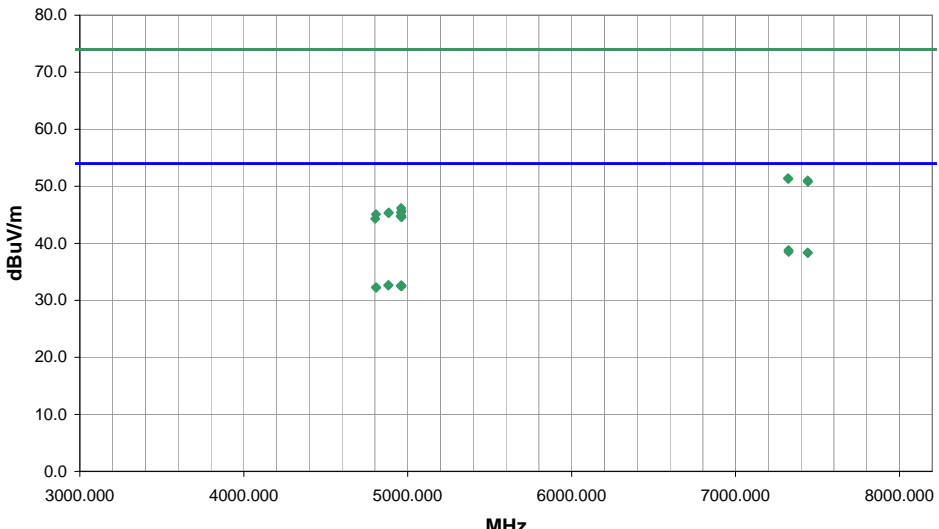
MEASUREMENT UNCERTAINTY

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		SPURIOUS RADIATED EMISSIONS		PSA 2007.07.21 EMI 2008.7.3									
EMC													
EUT: Wireless Remote				Work Order: SONO0119									
Serial Number: 03FBM1				Date: 02/09/09									
Customer: SonoSite				Temperature: 19.95									
Attendees: None				Humidity: 30%									
Project: None				Barometric Pres.: 1013.8									
Tested by: Jennifer Herrett				Power: Battery									
				Job Site: EV01									
TEST SPECIFICATIONS				Test Method									
FCC 15.247 (DTS):2009				ANSI C63.4:2003, KDB No. 558074									
TEST PARAMETERS													
Antenna Height(s) (m)		1 - 4		Test Distance (m) 3									
COMMENTS													
None													
EUT OPERATING MODES													
Transmitting high channel													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
Run #		1											
Configuration #		7											
Results		Pass											
													
													
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
2484.353	48.9	2.2	173.0	1.2	3.0	20.0	H-Horn	PK	0.0	71.1	74.0	-2.9	EUT horizontal
2484.290	47.3	2.2	179.0	1.0	3.0	20.0	V-Horn	PK	0.0	69.5	74.0	-4.5	EUT on side
2484.437	46.5	2.2	209.0	1.0	3.0	20.0	V-Horn	PK	0.0	68.7	74.0	-5.3	EUT horizontal
2483.762	45.2	2.2	213.0	1.1	3.0	20.0	H-Horn	PK	0.0	67.4	74.0	-6.6	EUT on side
2484.178	44.6	2.2	89.0	1.0	3.0	20.0	V-Horn	PK	0.0	66.8	74.0	-7.2	EUT vertical
2789.423	23.2	3.1	201.0	1.0	3.0	20.0	V-Horn	AV	0.0	46.3	54.0	-7.7	EUT vertical
2789.673	23.2	3.1	84.0	2.9	3.0	20.0	H-Horn	AV	0.0	46.3	54.0	-7.7	EUT on side
2790.623	23.2	3.1	234.0	1.0	3.0	20.0	V-Horn	AV	0.0	46.3	54.0	-7.7	EUT horizontal
2801.623	23.2	3.1	172.0	2.9	3.0	20.0	H-Horn	AV	0.0	46.3	54.0	-7.7	EUT horizontal
2803.189	23.2	3.1	59.0	1.0	3.0	20.0	V-Horn	AV	0.0	46.3	54.0	-7.7	EUT on side
2801.289	23.1	3.1	34.0	2.9	3.0	20.0	H-Horn	AV	0.0	46.2	54.0	-7.8	EUT vertical
2483.526	23.7	2.2	179.0	1.0	3.0	20.0	V-Horn	AV	0.0	45.9	54.0	-8.1	EUT on side
2484.093	23.7	2.2	173.0	1.2	3.0	20.0	H-Horn	AV	0.0	45.9	54.0	-8.1	EUT horizontal
2483.999	23.6	2.2	209.0	1.0	3.0	20.0	V-Horn	AV	0.0	45.8	54.0	-8.2	EUT horizontal
2483.559	23.5	2.2	213.0	1.1	3.0	20.0	H-Horn	AV	0.0	45.7	54.0	-8.3	EUT on side
2483.908	23.4	2.2	-1.0	2.8	3.0	20.0	H-Horn	AV	0.0	45.6	54.0	-8.4	EUT vertical
2483.996	23.4	2.2	89.0	1.0	3.0	20.0	V-Horn	AV	0.0	45.6	54.0	-8.4	EUT vertical
2484.070	41.0	2.2	-1.0	2.8	3.0	20.0	H-Horn	PK	0.0	63.2	74.0	-10.8	EUT vertical
2795.656	36.9	3.1	59.0	1.0	3.0	20.0	V-Horn	PK	0.0	60.0	74.0	-14.0	EUT on side
2796.173	36.5	3.1	34.0	2.9	3.0	20.0	H-Horn	PK	0.0	59.6	74.0	-14.4	EUT vertical

NORTHWEST										PSA 2007.07.21			
EMC										SPURIOUS RADIATED EMISSIONS			
EUT: Wireless Remote										Work Order: SONO0119			
Serial Number: 03FBM1										Date: 02/09/09			
Customer: SonoSite										Temperature: 19.95			
Attendees: None										Humidity: 30%			
Project: None										Barometric Pres.: 1013.8			
Tested by: Jennifer Herrett					Power: Battery					Job Site: EV01			
TEST SPECIFICATIONS										Test Method			
FCC 15.247 (DTS):2009										ANSI C63.4:2003, KDB No. 558074			
TEST PARAMETERS													
Antenna Height(s) (m)				1 - 4				Test Distance (m)		3			
COMMENTS													
None													
EUT OPERATING MODES													
Transmitting													
DEVIATIONS FROM TEST STANDARD													
No deviations.													
Run #		2											
Configuration #		7											
Results		Pass											
													
													
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
7322.987	23.2	15.6	209.0	2.3	3.0	0.0	V-Horn	AV	0.0	38.8	54.0	-15.2	Mid Channel, EUT on side
7323.293	22.9	15.6	140.0	1.6	3.0	0.0	H-Horn	AV	0.0	38.5	54.0	-15.5	Mid Channel, EUT on side
7440.200	22.6	15.8	237.0	1.0	3.0	0.0	H-Horn	AV	0.0	38.4	54.0	-15.6	High Channel, EUT on side
7440.973	22.5	15.8	186.0	1.0	3.0	0.0	V-Horn	AV	0.0	38.3	54.0	-15.7	High Channel, EUT on side
4882.600	22.9	9.8	5.0	1.0	3.0	0.0	V-Horn	AV	0.0	32.7	54.0	-21.3	Mid Channel, EUT on side
4881.667	22.8	9.8	194.0	2.3	3.0	0.0	H-Horn	AV	0.0	32.6	54.0	-21.4	Mid Channel, EUT on side
4959.707	22.4	10.2	52.0	1.0	3.0	0.0	V-Horn	AV	0.0	32.6	54.0	-21.4	High Channel, EUT on side
4960.440	22.4	10.2	279.0	2.1	3.0	0.0	H-Horn	AV	0.0	32.6	54.0	-21.4	High Channel, EUT on side
4959.453	22.4	10.1	208.0	1.0	3.0	0.0	V-Horn	AV	0.0	32.5	54.0	-21.5	High Channel, EUT horizontal
4960.627	22.4	10.1	174.0	2.1	3.0	0.0	H-Horn	AV	0.0	32.5	54.0	-21.5	High Channel, EUT horizontal
4960.653	22.4	10.1	167.0	2.0	3.0	0.0	H-Horn	AV	0.0	32.5	54.0	-21.5	High Channel, EUT vertical
4961.133	22.4	10.1	359.0	1.8	3.0	0.0	V-Horn	AV	0.0	32.5	54.0	-21.5	High Channel, EUT vertical
4806.173	22.8	9.5	55.0	1.0	3.0	0.0	H-Horn	AV	0.0	32.3	54.0	-21.7	Low Channel, EUT on side
4807.360	22.7	9.5	272.0	1.0	3.0	0.0	V-Horn	AV	0.0	32.2	54.0	-21.8	Low Channel, EUT on side
7319.533	35.8	15.6	140.0	1.6	3.0	0.0	H-Horn	PK	0.0	51.4	74.0	-22.6	Mid Channel, EUT on side
7321.347	35.7	15.6	209.0	2.3	3.0	0.0	V-Horn	PK	0.0	51.3	74.0	-22.7	Mid Channel, EUT on side
7439.960	35.2	15.8	237.0	1.0	3.0	0.0	H-Horn	PK	0.0	51.0	74.0	-23.0	High Channel, EUT on side
7441.307	35.0	15.8	186.0	1.0	3.0	0.0	V-Horn	PK	0.0	50.8	74.0	-23.2	High Channel, EUT on side
4959.853	36.1	10.1	359.0	1.8	3.0	0.0	V-Horn	PK	0.0	46.2	74.0	-27.8	High Channel, EUT vertical
4963.080	35.6	10.1	52.0	1.0	3.0	0.0	V-Horn	PK	0.0	45.7	74.0	-28.3	High Channel, EUT on side

NORTHWEST EMC										SPURIOUS RADIATED EMISSIONS					PSA 2007.07.21 EMI 2008.7.3				
EUT: Wireless Remote										Work Order: SONO0119									
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Customer: SonoSite										Temperature: 19.95									
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Project: None										Barometric Pres.: 1013.8									
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TEST PARAMETERS																			
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COMMENTS																			
None																			
EUT OPERATING MODES																			
Transmitting																			
DEVIATIONS FROM TEST STANDARD																			
No deviations.																			
Run #		3																	
Configuration #		7																	
Results		Pass																	
<div style="text-align: right; margin-right: 50px;"> <i>Jennifer Herrett</i> Signature </div>																			
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						
12405.510	29.1	-2.0	220.0	3.0	3.0	0.0	H-Horn	AV	0.0	27.1	54.0	-26.9	High Channel, EUT on side						
12208.640	29.7	-3.1	89.0	1.0	3.0	0.0	H-Horn	AV	0.0	26.6	54.0	-27.4	Mid Channel, EUT on side						
12207.120	29.6	-3.1	210.0	1.0	3.0	0.0	V-Horn	AV	0.0	26.5	54.0	-27.5	Mid Channel, EUT on side						
12406.270	28.3	-2.0	35.0	1.0	3.0	0.0	V-Horn	AV	0.0	26.3	54.0	-27.7	High Channel, EUT on side						
12003.680	30.4	-4.2	321.0	1.0	3.0	0.0	H-Horn	AV	0.0	26.2	54.0	-27.8	Low Channel, EUT on side						
12004.640	30.2	-4.1	63.0	1.0	3.0	0.0	V-Horn	AV	0.0	26.1	54.0	-27.9	Low Channel, EUT on side						
12403.230	41.7	-2.0	220.0	3.0	3.0	0.0	H-Horn	PK	0.0	39.7	74.0	-34.3	High Channel, EUT on side						
12207.370	42.2	-3.1	89.0	1.0	3.0	0.0	H-Horn	PK	0.0	39.1	74.0	-34.9	Mid Channel, EUT on side						
12007.640	43.1	-4.2	321.0	1.0	3.0	0.0	H-Horn	PK	0.0	38.9	74.0	-35.1	Low Channel, EUT on side						
12208.450	41.9	-3.1	210.0	1.0	3.0	0.0	V-Horn	PK	0.0	38.8	74.0	-35.2	Mid Channel, EUT on side						
12013.910	42.3	-4.2	63.0	1.0	3.0	0.0	V-Horn	PK	0.0	38.1	74.0	-35.9	Low Channel, EUT on side						
12403.560	39.9	-2.0	35.0	1.0	3.0	0.0	V-Horn	PK	0.0	37.9	74.0	-36.1	High Channel, EUT on side						





