

Geissler Companies, LLC

Whisper Veterinary Stethoscope Model 100

Report No. LGPD0048.1

Report Prepared By



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

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EMC Test Report

Certificate of Test

Last Date of Test: November 23, 2011

Geissler Companies, LLC

Model: Whisper Veterinary Stethoscope

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Field Strength of Fundamental	FCC 15.249:2011	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.249:2011	ANSI C63.10:2009	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.
9349 W Broadway Ave.
Brooklyn Park, MN 55445

Phone: (763) 425-2281 Fax: (763) 424-3469

This site has been fully described in a report (Site filing #2834E-1). filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada

Approved By:



Tim O'Shea, Operations Manager



NVLAP Lab Code: 200881-0

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		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.



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 National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. NVLAP is administered by the National Institute of Standards and Technology (NIST), an agency of the U.S. Commerce Department. 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.

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, Brooklyn Park: 2834E-1*)

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.

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).



Accreditations and Authorizations

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, G-84, C-2687, T-1658, and R-2318, Irvine: R-1943, G-85, C-2766, and T-1659, Sultan: R-871, G-83, C-3265, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634.*)

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).

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, Brooklyn Park: US0175*)

VIETNAM

Vietnam MIC has approved Northwest EMC as an accredited test lab. Per Decision No. 194/QD-QLCL (dated December 15, 2009), Northwest EMC test reports can be used for Vietnam approval submissions.

SCOPE

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

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



Northwest EMC Locations



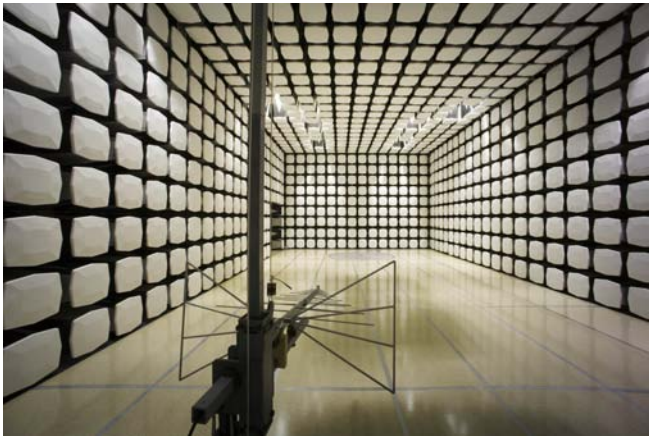
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

California
Labs OC01-OC13
41 Tesla
Irvine, CA 92618
(949) 861-8918

Minnesota
Labs MN01-MN08
9349 W Broadway Ave.
Brooklyn Park,
MN 55445
(763) 425-2281

Washington
Labs SU01-SU07
14128 339th Ave. SE
Sultan, WA 98294
(360) 793-8675

New York
Labs WA01-WA04
4939 Jordan Rd.
Elbridge, NY 13060
(315) 685-0796



Party Requesting the Test

Company Name:	Geissler Companies, LLC
Address:	15665 Medina Rd.
City, State, Zip:	Minneapolis, MN 55447
Test Requested By:	Steve Lewis – Logic Product Development
Model:	Whisper Veterinary Stethoscope
First Date of Test:	November 22, 2011
Last Date of Test:	November 22, 2011
Receipt Date of Samples:	November 22, 2011
Equipment Design Stage:	Prototype
Equipment Condition:	No Damage

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

Veterinary Stethoscope

Testing Objective:

To demonstrate compliance to FCC 15.249 specifications

CONFIGURATION 1 LGPD0048**Software/Firmware Running during test**

Description	Version
Branch Stethoscope_transmitter_RF_Test_Realistic_TX_Duty_Cycle	None

EUT

Description	Manufacturer	Model/Part Number	Serial Number
Whisper Veterinary Stethoscope	Logic Product Development	100	1

Peripherals in test setup boundary

Description	Manufacturer	Model/Part Number	Serial Number
Headphones	Sony	MDR-NC6	None

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Audio	No	1.5m	No	Headphones	Whisper Veterinary Stethoscope

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	11/22/2011	Field Strength of Fundamental	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	11/22/2011	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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

MODES OF OPERATION

Transmitting 1 Mbps, Low Ch 2.402 GHz, Mid Ch 2.440 GHz, High Ch 2.478 GHz (See Comments)

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

LGPD0048 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	2400 MHz	Stop Frequency	2483.5 MHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
MN05 Cables	ESM Cable Corp.	uble Ridge Guide Horn Cab	MNI	10/18/2011	12
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	24
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	12 mo

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 IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting and while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT and EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009).

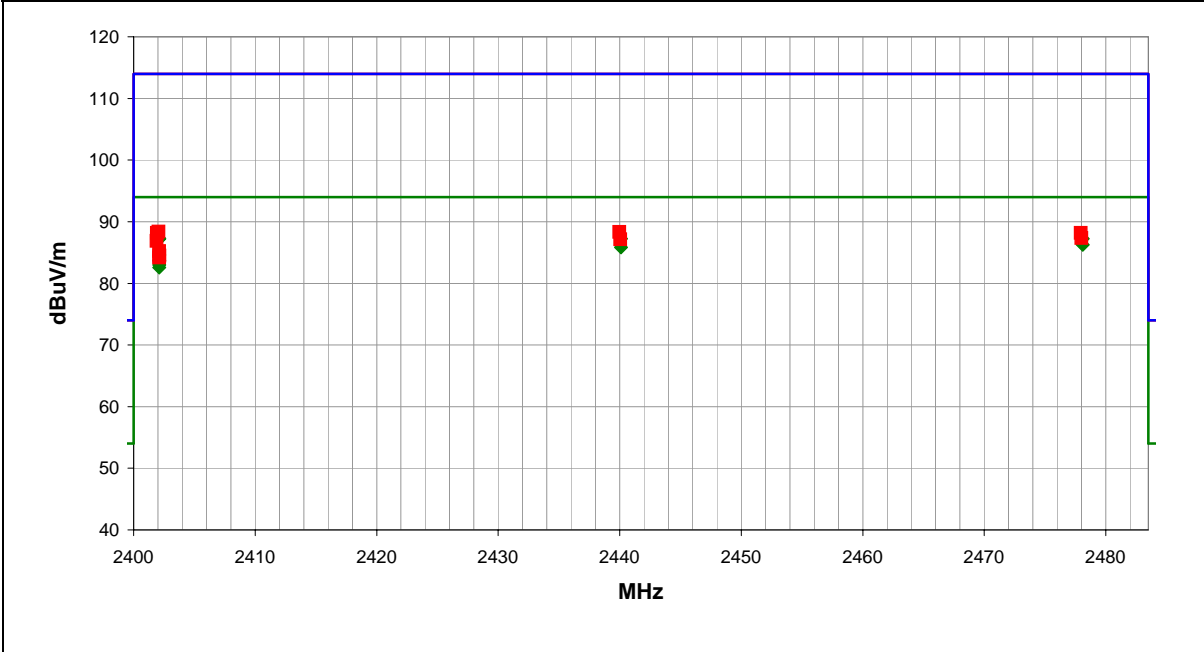
EMC

Field Strength of Fundamental

Work Order:	LGPD0048	Date:	11/22/11	<i>Trevor Bults</i>	
Project:	None	Temperature:	23.34 °C		
Job Site:	MN05	Humidity:	20% RH		
Serial Number:	1	Barometric Pres.:	1027.1 mbar		
				Tested by:	Bryan Weller
EUT:	Whisper Veterinary Stethoscope				
Configuration:	1				
Customer:	Logic Product Development				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Transmitting 1 Mbps, Low Ch 2.402 GHz, Mid Ch 2.440 GHz, High Ch 2.478 GHz (See Comments)				
Deviations:	None				
Comments:	None				

Test Specifications	Test Method
FCC 15.249:2011	ANSI C63.10:2009

Run #	4	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2402.100	53.6	33.7	2.2	353.0	3.0	0.0	Horz	AV	0.0	87.3	94.0	-6.7	EUT on side, Low channel
2478.107	53.1	34.2	1.7	275.0	3.0	0.0	Horz	AV	0.0	87.3	94.0	-6.7	EUT on side, high channel
2440.100	53.3	33.9	2.2	192.0	3.0	0.0	Horz	AV	0.0	87.2	94.0	-6.8	EUT on side, mid channel
2402.100	53.5	33.7	1.0	139.0	3.0	0.0	Horz	AV	0.0	87.2	94.0	-6.8	EUT Horizontal, Low channel
2478.100	52.1	34.2	1.0	199.0	3.0	0.0	Vert	AV	0.0	86.3	94.0	-7.7	EUT Vertical, high channel
2440.100	51.9	33.9	1.0	67.0	3.0	0.0	Vert	AV	0.0	85.8	94.0	-8.2	EUT Vertical, Mid Channel
2402.100	50.9	33.7	1.0	132.0	3.0	0.0	Vert	AV	0.0	84.6	94.0	-9.4	EUT Vertical, Low Channel
2402.100	50.0	33.7	1.0	87.0	3.0	0.0	Vert	AV	0.0	83.7	94.0	-10.3	EUT on side, Low channel
2402.107	49.3	33.7	1.0	40.0	3.0	0.0	Horz	AV	0.0	83.0	94.0	-11.0	EUT Vertical, Low Channel
2402.100	48.9	33.7	1.0	247.0	3.0	0.0	Vert	AV	0.0	82.6	94.0	-11.4	EUT Horizontal, Low channel
2402.047	54.7	33.7	2.2	353.0	3.0	0.0	Horz	PK	0.0	88.4	114.0	-25.6	EUT on side, Low channel
2439.980	54.4	33.9	2.2	192.0	3.0	0.0	Horz	PK	0.0	88.3	114.0	-25.7	EUT on side, mid channel
2401.933	54.5	33.7	1.0	139.0	3.0	0.0	Horz	PK	0.0	88.2	114.0	-25.8	EUT Horizontal, Low channel
2477.940	54.0	34.2	1.7	275.0	3.0	0.0	Horz	PK	0.0	88.2	114.0	-25.8	EUT on side, high channel
2478.000	53.2	34.2	1.0	199.0	3.0	0.0	Vert	PK	0.0	87.4	114.0	-26.6	EUT Vertical, high channel
2440.053	53.2	33.9	1.0	67.0	3.0	0.0	Vert	PK	0.0	87.1	114.0	-26.9	EUT Vertical, Mid Channel
2401.900	53.2	33.7	1.0	132.0	3.0	0.0	Vert	PK	0.0	86.9	114.0	-27.1	EUT Vertical, Low Channel
2402.107	51.5	33.7	1.0	87.0	3.0	0.0	Vert	PK	0.0	85.2	114.0	-28.8	EUT on side, Low channel
2402.133	50.8	33.7	1.0	40.0	3.0	0.0	Horz	PK	0.0	84.5	114.0	-29.5	EUT Vertical, Low Channel
2402.100	50.5	33.7	1.0	247.0	3.0	0.0	Vert	PK	0.0	84.2	114.0	-29.8	EUT Horizontal, Low channel

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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Transmitting 1 Mbps, Low Ch - 2402 MHz, Mid Ch - 2440 MHz, High Ch - 2478 MHz (See comments).

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

LGPD0048 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	25 GHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator, 20 dB, 'SMA'	SM Electronics	SA6-20	REO	7/1/2011	12 mo
Low Pass Filter	Micro-Tronics	LPM50004	HGK	7/9/2010	24 mo
High Pass Filter	Micro-Tronics	HPM50111	HGQ	7/9/2010	24 mo
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	4/15/2011	12 mo
Antenna, Horn	ETS	3160-09	AHG	NCR	0 mo
MN05 Cables	N/A	18-26GHz Standard Gain Horn Cable	EVD	4/15/2011	12 mo
Antenna, Horn	ETS	3160-07	AXP	NCR	0 mo
Antenna, Horn	ETS Lindgren	3160-08	AIQ	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	7/1/2011	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	7/1/2011	12 mo
MN05 Cables	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	7/1/2011	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	10/18/2011	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	7/1/2011	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	AVY	7/1/2011	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	2/2/2011	12 mo
Antenna, Biconilog	ETS Lindgren	3142D	AXN	12/30/2009	24 mo
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	12 mo

MEASUREMENT BANDWIDTHS

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

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

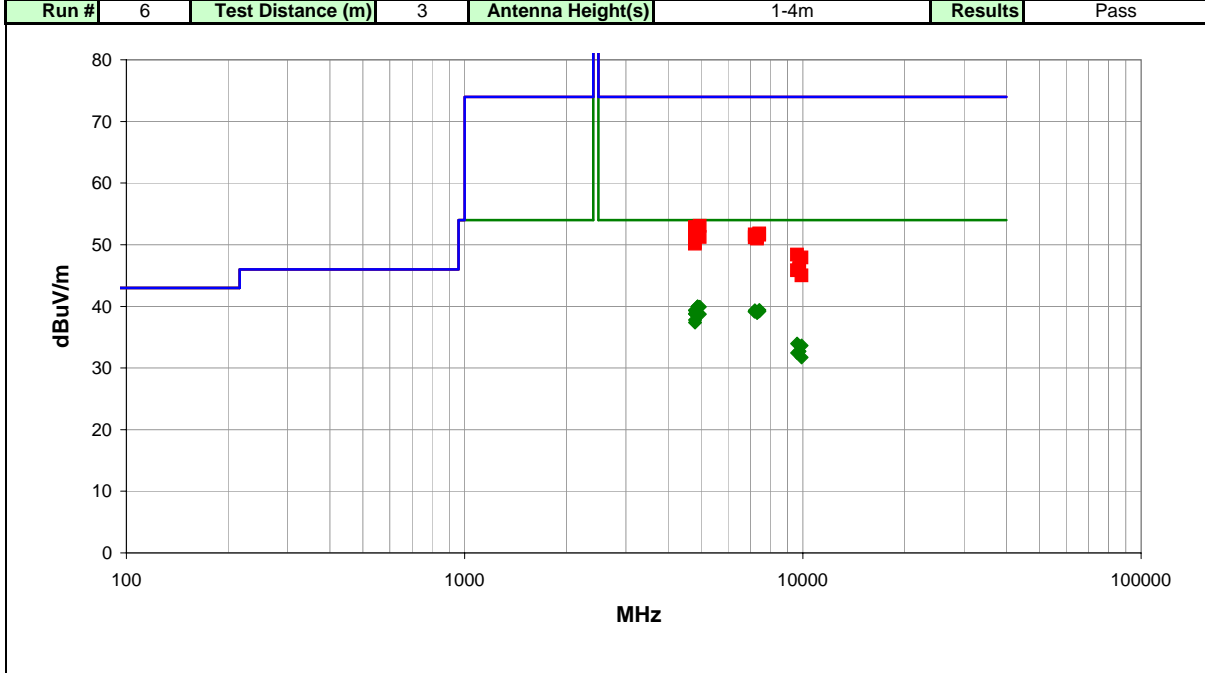
The antennas to be used with the EUT were tested. The EUT was transmitting and receiving while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

EMC

Spurious Radiated Emissions

Work Order:	LGPD0048	Date:	11/22/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	23.27 °C	
Job Site:	MN05	Humidity:	21.1% RH	
Serial Number:	1	Barometric Pres.:	1027.1 mbar	
EUT:	Whisper Veterinary Stethoscope			
Configuration:	1			
Customer:	Logic Product Development			
Attendees:	None			
EUT Power:	Battery			
Operating Mode:	Transmitting 1 Mbps, Low Ch - 2402 MHz, Mid Ch - 2440 MHz, High Ch - 2478 MHz (See comments).			
Deviations:	None			
Comments:	Device configured with Normal duty cycle.			

Test Specifications FCC 15.249:2011	Test Method ANSI C63.10:2009						
Run #	6	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4879.929	35.3	4.7	1.0	258.0	3.0	0.0	Horz	AV	0.0	40.0	54.0	-14.0	EUT on Side, Mid
4879.947	35.3	4.7	1.0	257.0	3.0	0.0	Vert	AV	0.0	40.0	54.0	-14.0	EUT on Side, Mid
4956.235	35.0	4.9	1.1	156.0	3.0	0.0	Horz	AV	0.0	39.9	54.0	-14.1	EUT on Side, High
7434.533	26.8	12.6	1.7	355.0	3.0	0.0	Vert	AV	0.0	39.4	54.0	-14.6	EUT on Side, High
4803.902	35.0	4.4	1.0	321.0	3.0	0.0	Horz	AV	0.0	39.4	54.0	-14.6	EUT on Side, Low
4803.896	35.0	4.4	1.2	360.0	3.0	0.0	Horz	AV	0.0	39.4	54.0	-14.6	EUT Horizontal, Low
7205.775	27.8	11.6	1.0	75.0	3.0	0.0	Vert	AV	0.0	39.4	54.0	-14.6	EUT on Side, Low
7433.992	26.6	12.6	1.0	82.0	3.0	0.0	Horz	AV	0.0	39.2	54.0	-14.8	EUT on Side, High
7204.583	27.6	11.6	3.0	183.0	3.0	0.0	Horz	AV	0.0	39.2	54.0	-14.8	EUT on Side, Low
7321.550	26.9	12.1	2.7	171.0	3.0	0.0	Horz	AV	0.0	39.0	54.0	-15.0	EUT on Side, Mid
7322.083	26.8	12.1	1.0	265.0	3.0	0.0	Vert	AV	0.0	38.9	54.0	-15.1	EUT on Side, Mid
4803.922	34.4	4.4	1.4	87.0	3.0	0.0	Vert	AV	0.0	38.8	54.0	-15.2	EUT on Side, Low
4803.902	34.4	4.4	1.0	359.0	3.0	0.0	Horz	AV	0.0	38.8	54.0	-15.2	EUT Vertical, Low
4956.219	33.8	4.9	1.0	268.0	3.0	0.0	Vert	AV	0.0	38.7	54.0	-15.3	EUT on Side, High
4803.909	33.4	4.4	1.0	243.0	3.0	0.0	Vert	AV	0.0	37.8	54.0	-16.2	EUT Vertical, Low
4803.902	33.0	4.4	1.0	12.0	3.0	0.0	Vert	AV	0.0	37.4	54.0	-16.6	EUT Horizontal, Low
9607.727	43.6	-9.6	1.3	84.0	3.0	0.0	Vert	AV	0.0	34.0	54.0	-20.0	EUT on Side, Low
9912.365	42.4	-8.8	1.6	268.0	3.0	0.0	Horz	AV	0.0	33.6	54.0	-20.4	EUT on Side, High
4956.644	48.1	4.9	1.1	156.0	3.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	EUT on Side, High
4803.896	48.5	4.4	1.2	360.0	3.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	EUT Horizontal, Low