

Masimo Corporation

Rad-87

Report No. MASI0063.1

Report Prepared By



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

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EMC Test Report

Certificate of Test
Last Date of Test: October 4, 2010
Masimo Corporation
Model: Rad-87

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Spurious Radiated Emissions	FCC 15.407:2010	ANSI C63.10:2009	Pass
AC Powerline Conducted Emissions	FCC 15.407:2010	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.
41 Tesla Ave.
Irvine, CA 92618

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 #2834B-2).

Approved By:



Don Facteau, IS Manager



NVLAP Lab Code: 200676-0

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 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
NVLAP LAB CODE 200881-0

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, 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.



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, 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-1784, 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). 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)



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



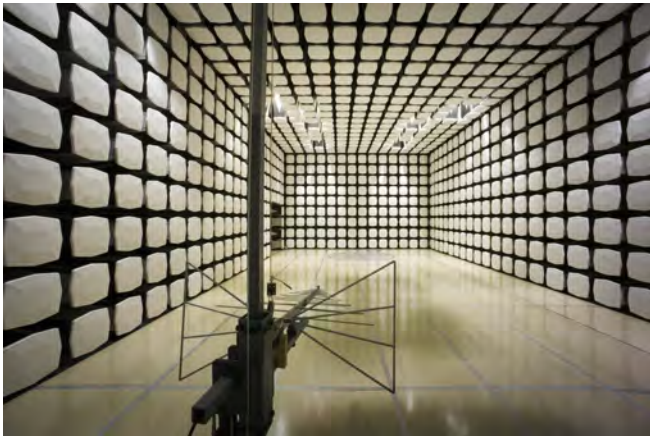
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

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:	Masimo Corporation
Address:	40 Parker
City, State, Zip:	Irvine, CA 92618
Test Requested By:	Paul Lewandowski
Model:	Rad-87
First Date of Test:	August 27, 2010
Last Date of Test:	October 4, 2010
Receipt Date of Samples:	August 25, 2010
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

One 802.11a/b/g radio module installed in a medical monitoring device that will be connected to hospital wireless network. Radio module previously certified under FCC ID: N6C-SXSDCAG

Testing Objective:

Seeking to demonstrate compliance under FCC 15.407 for operation in the 5.2 GHz band

CONFIGURATION 1 MASI0063**Software/Firmware Running during test**

Description	Version
RadioCfg SX-560	1.0.0.1

EUT

Description	Manufacturer	Model/Part Number	Serial Number
Pulse CO-Oximeter	Masimo Corporation	Rad-87	R02384

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Cable	Yes	2.8m	No	Pulse CO-Oximeter	AC Mains
MS-200 Compatible cable	No	2.0m	No	Pulse CO-Oximeter	Unterminated
Serial Cable	Yes	1.8m	Yes	Pulse CO-Oximeter	Laptop
Ground Cable	Yes	2.0m	No	Pulse CO-Oximeter	Ground
Audio Cable	Yes	4.6m	Yes	Pulse CO-Oximeter	Unterminated

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	8/27/2010	AC Powerline 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	10/4/2010	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.

MODES OF OPERATION

Ch. 48, 5240 MHz
Ch. 36, 5180 MHz,

POWER SETTINGS INVESTIGATED

120VAC/60Hz

FREQUENCY RANGE INVESTIGATED

Start Frequency	1 GHz	Stop Frequency	40 GHz
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CLOCKS AND OSCILLATORS

5180 MHz, 5240 MHz

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	HGC	11/20/2009	13
Pre-Amplifier	Miteq	JS4-26004000-50-5A	AON	8/19/2009	16
Antenna, Horn	EMCO	3160-10	AHI	NCR	0
OC floating Cable	N/A	26-40 GHz RE Cable	OCU	8/19/2009	16
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOI	5/3/2010	13
Antenna, Horn	EMCO	3160-09	AHN	NCR	0
OC floating Cable	N/A	18-26GHz RE Cables	OCK	5/3/2010	13
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVP	12/21/2009	13
Antenna, Horn	EMCO	3160-08	AHK	NCR	0
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVL	4/11/2010	13
Antenna, Horn	ETS	3160-07	AHX	NCR	0
OC11 Cables	N/A	12-18GHz RE Cables	OCS	4/11/2010	13
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVJ	9/10/2009	13
Antenna, Horn	EMCO	3115	AHB	9/11/2009	24
OC11 Cables	N/A	1-8GHz RE Cables	OCR	3/19/2010	13
Spectrum Analyzer	Agilent	E4440A	AFA	2/9/2010	12

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

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. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4. The measurement uncertainty estimation is available upon request.

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT were tested. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. Measurements were made to satisfy the three requirements of 47 CFR 15.407: Field strength under 1GHz, Restricted Bands of 47 CFR 15.205, and EIRP of 47 CFR 15.407. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2009). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

The amplitude and frequency of the highest emissions were noted. The EUT was then replaced with a ½ wave dipole that was successively tuned to each of the highest spurious emissions. A signal generator was connected to the dipole (horn antenna for frequencies above 1GHz), and its output was adjusted to match the level previously noted for each frequency. The output of the signal generator was recorded, and by factoring in the cable loss to the dipole antenna (or horn) and its gain (dBi); the effective radiated power for each radiated spurious emission was determined.

EUT: Rad-87	Work Order: MASI0063
Serial Number: R02384	Date: 09/30/10
Customer: Masimo Corporation	Temperature: 22C
Attendees: None	Humidity: 49%
Project: None	Barometric Pres.: 1010MB
Tested by: Jaemi Suh	Power: 120VAC/60Hz
	Job Site: OC10

TEST SPECIFICATIONS	Test Method
FCC 15.407:2010	ANSI C63.10:2009

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

COMMENTS

Ant.1, Chan 36, 5180 MHz, Speed 6, 36, 54 Mbps. Transmitting

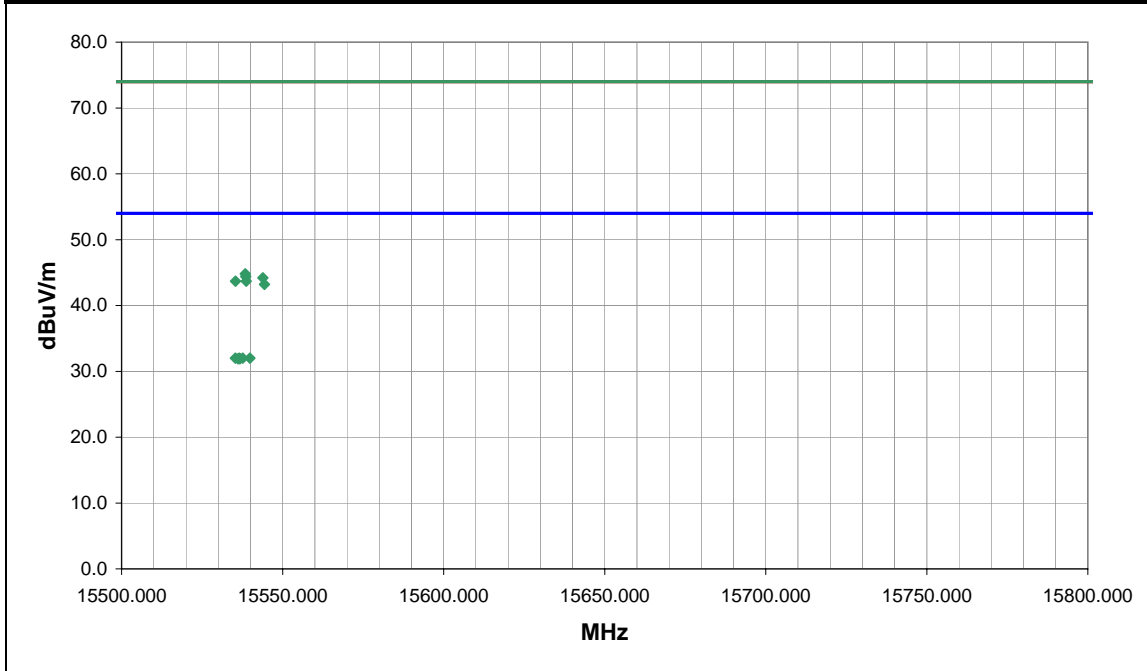
EUT OPERATING MODES

Ch. 36, 5180 MHz,

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1	Signature 
Configuration #	1	
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
15535.330	28.7	3.3	102.0	1.0	3.0	0.0	H-Horn	AV	0.0	32.0	54.0	-22.0	36 Mbps
15536.570	28.7	3.3	241.0	3.6	3.0	0.0	V-Horn	AV	0.0	32.0	54.0	-22.0	36 Mbps
15537.610	28.7	3.3	360.0	1.0	3.0	0.0	H-Horn	AV	0.0	32.0	54.0	-22.0	6 Mbps
15539.830	28.7	3.3	355.0	3.6	3.0	0.0	V-Horn	AV	0.0	32.0	54.0	-22.0	6 Mbps
15536.180	28.6	3.3	354.0	1.0	3.0	0.0	H-Horn	AV	0.0	31.9	54.0	-22.1	54 Mbps
15536.710	28.6	3.3	173.0	3.6	3.0	0.0	V-Horn	AV	0.0	31.9	54.0	-22.1	54 Mbps
15538.420	41.5	3.3	360.0	1.0	3.0	0.0	H-Horn	PK	0.0	44.8	74.0	-29.2	6 Mbps
15538.530	41.1	3.3	241.0	3.6	3.0	0.0	V-Horn	PK	0.0	44.4	74.0	-29.6	36 Mbps
15543.880	40.9	3.3	102.0	1.0	3.0	0.0	H-Horn	PK	0.0	44.2	74.0	-29.8	36 Mbps
15535.380	40.4	3.3	354.0	1.0	3.0	0.0	H-Horn	PK	0.0	43.7	74.0	-30.3	54 Mbps
15538.720	40.4	3.3	173.0	3.6	3.0	0.0	V-Horn	PK	0.0	43.7	74.0	-30.3	54 Mbps
15544.380	39.9	3.3	355.0	3.6	3.0	0.0	V-Horn	PK	0.0	43.2	74.0	-30.8	6 Mbps

EUT: Rad-87	Work Order: MASI0063
Serial Number: R02384	Date: 09/30/10
Customer: Masimo Corporation	Temperature: 22C
Attendees: None	Humidity: 49%
Project: None	Barometric Pres.: 1010MB
Tested by: Jaemi Suh	Power: 120VAC/60Hz
	Job Site: OC10

TEST SPECIFICATIONS	Test Method
FCC 15.407:2010	ANSI C63.10:2009

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

COMMENTS
Ant.1, Chan 48, 5240 MHz, Speed 6, 36, 54 Mbps. Transmitting

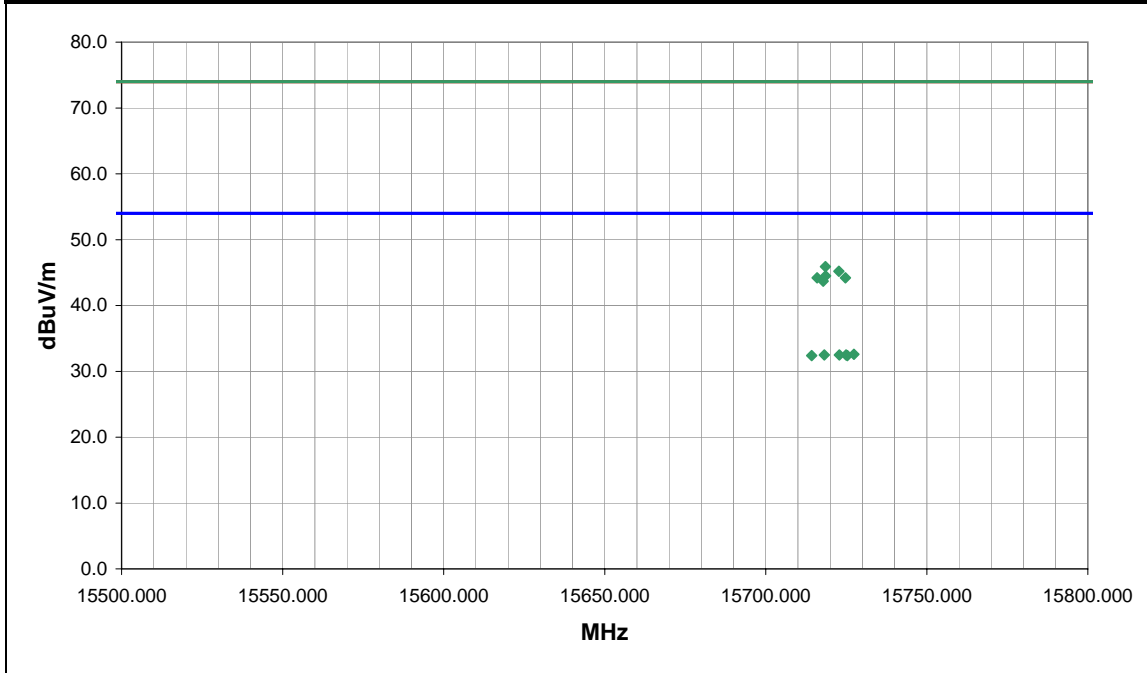
EUT OPERATING MODES

Ch. 48, 5240 MHz

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	2	 Signature
Configuration #	1	
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
15727.390	28.6	4.0	151.0	2.4	3.0	0.0	V-Horn	AV	0.0	32.6	54.0	-21.4	6 Mbps
15718.160	28.5	4.0	352.0	1.0	3.0	0.0	H-Horn	AV	0.0	32.5	54.0	-21.5	6 Mbps
15722.830	28.5	4.0	251.0	3.0	3.0	0.0	V-Horn	AV	0.0	32.5	54.0	-21.5	54 Mbps
15724.920	28.5	4.0	0.0	2.8	3.0	0.0	H-Horn	AV	0.0	32.5	54.0	-21.5	36 Mbps
15714.270	28.4	4.0	244.0	2.8	3.0	0.0	H-Horn	AV	0.0	32.4	54.0	-21.6	54 Mbps
15725.340	28.4	4.0	193.0	2.4	3.0	0.0	V-Horn	AV	0.0	32.4	54.0	-21.6	36 Mbps
15718.520	41.9	4.0	193.0	2.4	3.0	0.0	V-Horn	PK	0.0	45.9	74.0	-28.1	36 Mbps
15722.680	41.2	4.0	0.0	2.8	3.0	0.0	H-Horn	PK	0.0	45.2	74.0	-28.8	36 Mbps

EUT:	Rad-87	Work Order:	MASI0063
Serial Number:	R02384	Date:	10/04/10
Customer:	Masimo Corporation	Temperature:	22C
Attendees:	None	Humidity:	49%
Project:	None	Barometric Pres.:	1010MB
Tested by:	Jaemi Suh	Power:	120VAC/60Hz
		Job Site:	OC06

TEST SPECIFICATIONS Test Method

FCC 15.407:2010	ANSI C63.10:2009
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TEST PARAMETERS

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

Ant 1, Chan 36, 5180 MHz & Chan 48, 5240 MHz, Speed 6 Mbps.

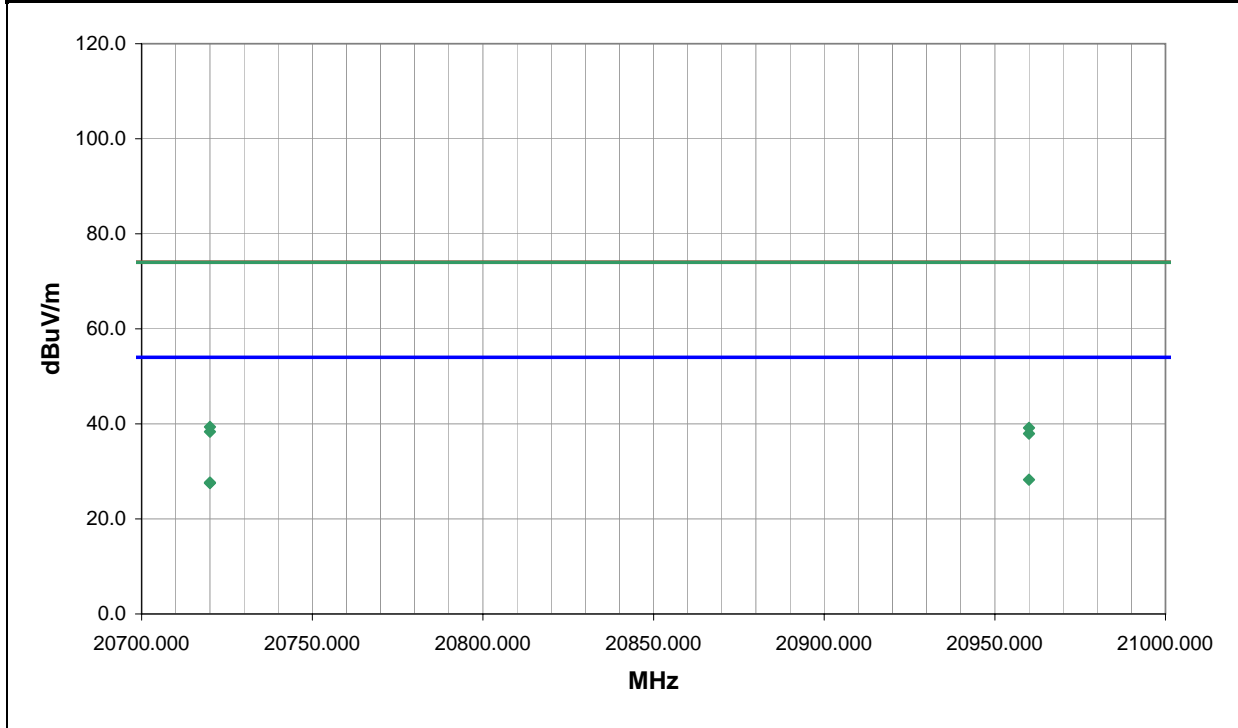
EUT OPERATING MODES

Chan 36 & Chan 48.

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	11	 Signature
Configuration #	1	
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)
20960.000	37.5	0.3	0.0	1.0	1.0	0.0	-I-High Horr	AV	-9.5	28.3	54.0	-25.7
20720.000	36.9	0.3	0.0	1.0	1.0	0.0	v-High Horr	AV	-9.5	27.7	54.0	-26.3
20720.000	36.8	0.3	0.0	1.0	1.0	0.0	-I-High Horr	AV	-9.5	27.6	54.0	-26.4
20720.000	48.6	0.3	0.0	1.0	1.0	0.0	-I-High Horr	PK	-9.5	39.4	74.0	-34.6
20960.000	48.4	0.3	0.0	1.0	1.0	0.0	v-High Horr	PK	-9.5	39.2	74.0	-34.8
20720.000	47.6	0.3	0.0	1.0	1.0	0.0	v-High Horr	PK	-9.5	38.4	74.0	-35.6
20960.000	47.2	0.3	0.0	1.0	1.0	0.0	-I-High Horr	PK	-9.5	38.0	74.0	-36.0

EUT: Rad-87	Work Order: MASI0063
Serial Number: R02384	Date: 09/30/10
Customer: Masimo Corporation	Temperature: 22C
Attendees: None	Humidity: 49%
Project: None	Barometric Pres.: 1010MB
Tested by: Jaemi Suh	Power: 120VAC/60Hz
	Job Site: OC10

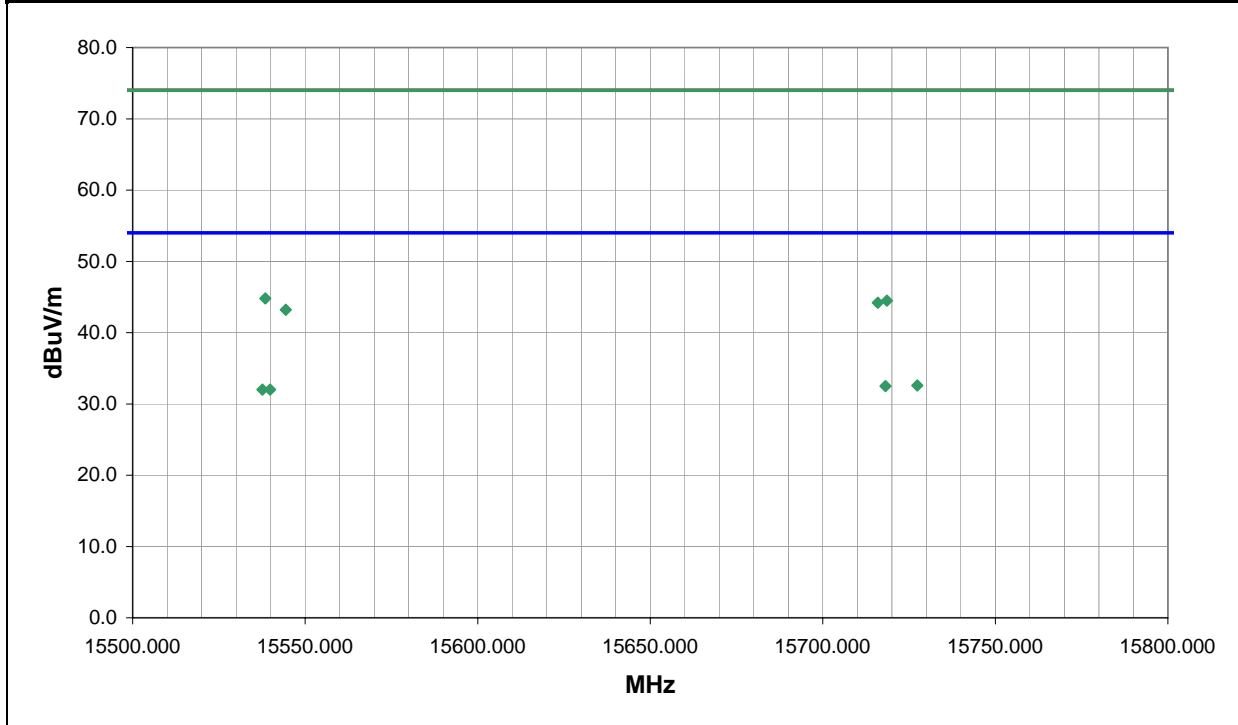
TEST SPECIFICATIONS	Test Method
FCC 15.407:2010	ANSI C63.10:2009

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

COMMENTS
Ant. 2 Chan 36 & 48 Speed 6 Mbps. Transmitting

EUT OPERATING MODES
Ch. 36 & 48
DEVIATIONS FROM TEST STANDARD
No deviations.

Run #	3	Signature 
Configuration #	1	
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)
15727.390	28.6	4.0	151.0	2.4	3.0	0.0	V-Horn	AV	0.0	32.6	54.0	-21.4
15718.160	28.5	4.0	352.0	1.0	3.0	0.0	H-Horn	AV	0.0	32.5	54.0	-21.5
15718.570	40.5	4.0	151.0	2.4	3.0	0.0	V-Horn	PK	0.0	44.5	74.0	-29.5
15715.950	40.2	4.0	352.0	1.0	3.0	0.0	H-Horn	PK	0.0	44.2	74.0	-29.8
15537.610	28.7	3.3	360.0	1.0	3.0	0.0	H-Horn	AV	0.0	32.0	54.0	-22.0
15539.830	28.7	3.3	355.0	3.6	3.0	0.0	V-Horn	AV	0.0	32.0	54.0	-22.0
15538.420	41.5	3.3	360.0	1.0	3.0	0.0	H-Horn	PK	0.0	44.8	74.0	-29.2
15544.380	39.9	3.3	355.0	3.6	3.0	0.0	V-Horn	PK	0.0	43.2	74.0	-30.8

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

Radio: 5.18GHz, Channel: 36 , Data rate: 6 , antenna port: 1

Radio: 5.24GHz, Channel: 48 , Data rate: 6 , antenna port: 1

POWER SETTINGS INVESTIGATED

120VAC/60Hz

CONFIGURATIONS INVESTIGATED

MASI0063-1

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
LISN	Solar	9252-50-24-BNC	LIB	5/5/2010	12 mo
Attenuator	Pasternack	6N10W-20	AWC	1/27/2010	13 mo
High Pass Filter	TTE	H97-100K-50-720B	HFP	3/8/2010	13 mo
OC06 Cables	N/A	Telecom Cables	OCP	3/8/2010	13 mo
OC06 Cables	N/A	CE Cables	OCM	3/8/2010	13 mo
Receiver	Rohde & Schwarz	ESCI	ARF	3/30/2010	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 bandwidths and detectors specified. No video filter 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

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 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm.

EMC

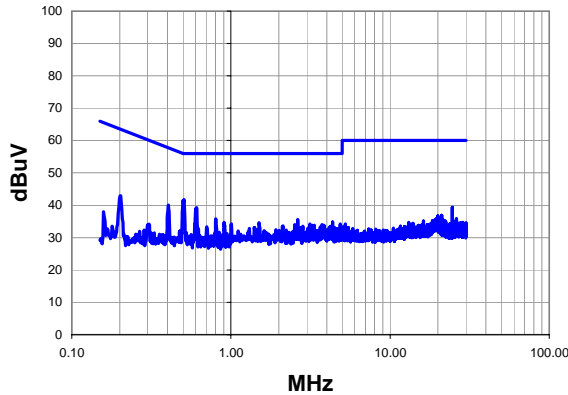
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MASI0063	Date:	08/27/10	<i>Marty Martin</i> Tested by: Marty Martin
Project:	None	Temperature:	22C	
Job Site:	OC06	Humidity:	49	
Serial Number:	R02384	Barometric Pres.:	1010MB	
EUT:	Rad-87			
Configuration:	MASI0063-1			
Customer:	Masimo Corporation			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Radio: 5.15GHz, Channel: 36 , Data rate: 6 , antenna port: 1			
Deviations:	None			
Comments:	Transmit Mode.			

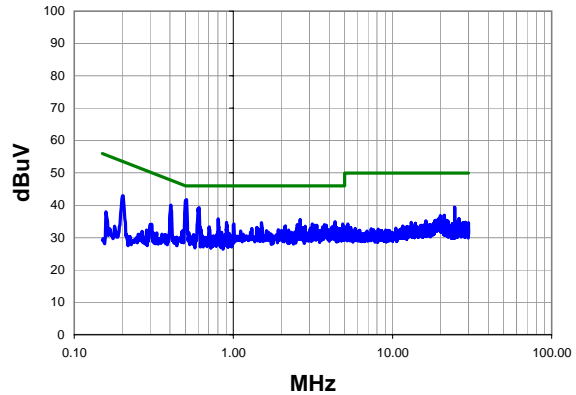
Test Specifications FCC 15.407:2010	Test Method ANSI C63.10:2009
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Run #	14	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Peak Data - vs - Quasi Peak Limit



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)
0.507	21.6	20.1	41.7	56.0	-14.3
0.607	19.2	20.1	39.3	56.0	-16.7
0.405	20.0	20.1	40.1	57.8	-17.7
0.803	15.7	20.1	35.8	56.0	-20.2
2.632	15.4	20.2	35.6	56.0	-20.4
24.580	17.8	21.6	39.4	60.0	-20.6
0.201	22.8	20.1	42.9	63.6	-20.7
4.352	14.5	20.3	34.8	56.0	-21.2
0.905	14.6	20.1	34.7	56.0	-21.3
1.504	14.5	20.1	34.6	56.0	-21.4
1.008	14.1	20.1	34.2	56.0	-21.8
3.136	14.0	20.2	34.2	56.0	-21.8
4.856	13.9	20.3	34.2	56.0	-21.8
2.520	13.9	20.2	34.1	56.0	-21.9
3.744	13.8	20.2	34.0	56.0	-22.0
3.848	13.6	20.3	33.9	56.0	-22.1
3.240	13.6	20.2	33.8	56.0	-22.2
3.344	13.6	20.2	33.8	56.0	-22.2
2.120	13.5	20.1	33.6	56.0	-22.4
2.832	13.3	20.2	33.5	56.0	-22.5

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.507	21.6	20.1	41.7	46.0	-4.3
0.607	19.2	20.1	39.3	46.0	-6.7
0.405	20.0	20.1	40.1	47.8	-7.7
0.803	15.7	20.1	35.8	46.0	-10.2
2.632	15.4	20.2	35.6	46.0	-10.4
24.580	17.8	21.6	39.4	50.0	-10.6
0.201	22.8	20.1	42.9	53.6	-10.7
4.352	14.5	20.3	34.8	46.0	-11.2
0.905	14.6	20.1	34.7	46.0	-11.3
1.504	14.5	20.1	34.6	46.0	-11.4
1.008	14.1	20.1	34.2	46.0	-11.8
3.136	14.0	20.2	34.2	46.0	-11.8
4.856	13.9	20.3	34.2	46.0	-11.8
2.520	13.9	20.2	34.1	46.0	-11.9
3.744	13.8	20.2	34.0	46.0	-12.0
3.848	13.6	20.3	33.9	46.0	-12.1
3.240	13.6	20.2	33.8	46.0	-12.2
3.344	13.6	20.2	33.8	46.0	-12.2
2.120	13.5	20.1	33.6	46.0	-12.4
2.832	13.3	20.2	33.5	46.0	-12.5

EMC

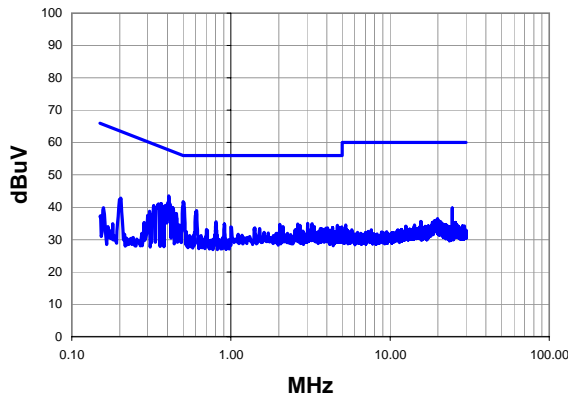
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MASI0063	Date:	08/27/10	<i>Marty Martin</i> Tested by: Marty Martin
Project:	None	Temperature:	22C	
Job Site:	OC06	Humidity:	49	
Serial Number:	R02384	Barometric Pres.:	1010MB	
EUT:	Rad-87			
Configuration:	MASI0063-1			
Customer:	Masimo Corporation			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Radio: 5.15GHz, Channel: 36 , Data rate: 6 , antenna port: 1			
Deviations:	None			
Comments:	Transmit Mode.			

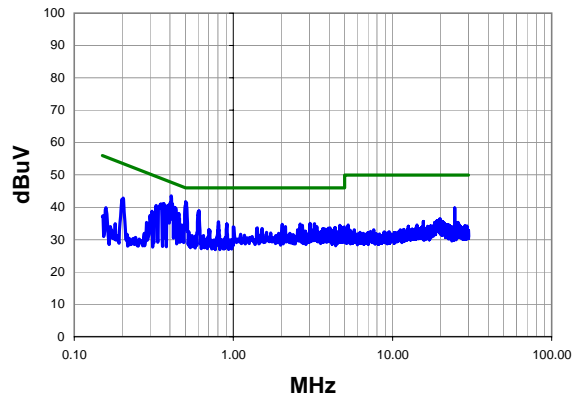
Test Specifications FCC 15.407:2010	Test Method ANSI C63.10:2009
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Run #	13	Line:	High Line	Ext. Attenuation:	20	Results	Pass
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Peak Data - vs - Quasi Peak Limit



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)
0.407	23.4	20.1	43.5	57.7	-14.2
0.502	21.6	20.1	41.7	56.0	-14.3
0.398	20.8	20.1	40.9	57.9	-17.0
0.607	18.9	20.1	39.0	56.0	-17.0
0.424	19.9	20.1	40.0	57.4	-17.4
0.434	19.7	20.1	39.8	57.2	-17.4
0.366	21.0	20.1	41.1	58.6	-17.5
0.386	20.5	20.1	40.6	58.1	-17.5
0.351	20.9	20.1	41.0	58.9	-17.9
0.374	20.1	20.1	40.2	58.4	-18.2
0.454	18.0	20.1	38.1	56.8	-18.7
0.327	20.5	20.1	40.6	59.5	-18.9
24.580	18.2	21.6	39.8	60.0	-20.2
0.806	15.4	20.1	35.5	56.0	-20.5
0.203	22.7	20.1	42.8	63.5	-20.7
3.032	14.8	20.2	35.0	56.0	-21.0
3.232	14.7	20.2	34.9	56.0	-21.1
0.910	14.7	20.1	34.8	56.0	-21.2
2.632	14.6	20.2	34.8	56.0	-21.2
0.308	18.7	20.1	38.8	60.0	-21.2

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.407	23.4	20.1	43.5	47.7	-4.2
0.502	21.6	20.1	41.7	46.0	-4.3
0.398	20.8	20.1	40.9	47.9	-7.0
0.607	18.9	20.1	39.0	46.0	-7.0
0.424	19.9	20.1	40.0	47.4	-7.4
0.434	19.7	20.1	39.8	47.2	-7.4
0.366	21.0	20.1	41.1	48.6	-7.5
0.386	20.5	20.1	40.6	48.1	-7.5
0.351	20.9	20.1	41.0	48.9	-7.9
0.374	20.1	20.1	40.2	48.4	-8.2
0.454	18.0	20.1	38.1	46.8	-8.7
0.327	20.5	20.1	40.6	49.5	-8.9
24.580	18.2	21.6	39.8	50.0	-10.2
0.806	15.4	20.1	35.5	46.0	-10.5
0.203	22.7	20.1	42.8	53.5	-10.7
3.032	14.8	20.2	35.0	46.0	-11.0
3.232	14.7	20.2	34.9	46.0	-11.1
0.910	14.7	20.1	34.8	46.0	-11.2
2.632	14.6	20.2	34.8	46.0	-11.2
0.308	18.7	20.1	38.8	50.0	-11.2

EMC

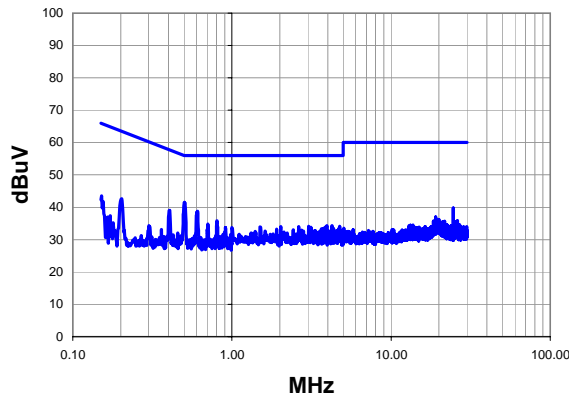
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MASI0063	Date:	08/27/10	<i>Marty Martin</i> Tested by: Marty Martin
Project:	None	Temperature:	22C	
Job Site:	OC06	Humidity:	49	
Serial Number:	R02384	Barometric Pres.:	1010MB	
EUT:	Rad-87			
Configuration:	MASI0063-1			
Customer:	Masimo Corporation			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Radio: 5.24GHz, Channel: 48 , Data rate: 6 , antenna port: 1			
Deviations:	None			
Comments:	Transmit Mode.			

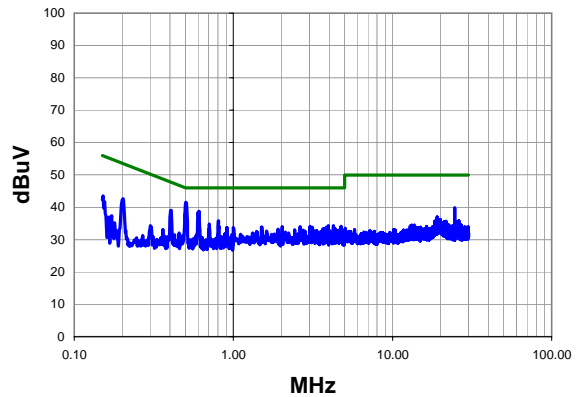
Test Specifications FCC 15.407:2010	Test Method ANSI C63.10:2009
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Run #	15	Line:	Neutral	Ext. Attenuation:	20	Results	Pass
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Peak Data - vs - Quasi Peak Limit



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)
0.504	21.4	20.1	41.5	56.0	-14.5
0.607	18.7	20.1	38.8	56.0	-17.2
0.407	19.0	20.1	39.1	57.7	-18.6
24.580	18.2	21.6	39.8	60.0	-20.2
0.804	15.7	20.1	35.8	56.0	-20.2
0.203	22.5	20.1	42.6	63.5	-20.9
0.706	14.7	20.1	34.8	56.0	-21.2
4.248	14.0	20.3	34.3	56.0	-21.7
3.944	14.0	20.3	34.3	56.0	-21.7
3.032	13.9	20.2	34.1	56.0	-21.9
4.760	13.8	20.3	34.1	56.0	-21.9
2.024	13.9	20.1	34.0	56.0	-22.0
2.624	13.8	20.2	34.0	56.0	-22.0
1.504	13.8	20.1	33.9	56.0	-22.1
3.840	13.6	20.3	33.9	56.0	-22.1
3.136	13.6	20.2	33.8	56.0	-22.2
0.910	13.6	20.1	33.7	56.0	-22.3
1.000	13.6	20.1	33.7	56.0	-22.3
4.728	13.4	20.3	33.7	56.0	-22.3
0.152	23.4	20.1	43.5	65.9	-22.4

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.504	21.4	20.1	41.5	46.0	-4.5
0.607	18.7	20.1	38.8	46.0	-7.2
0.407	19.0	20.1	39.1	47.7	-8.6
24.580	18.2	21.6	39.8	50.0	-10.2
0.804	15.7	20.1	35.8	46.0	-10.2
0.203	22.5	20.1	42.6	53.5	-10.9
0.706	14.7	20.1	34.8	46.0	-11.2
4.248	14.0	20.3	34.3	46.0	-11.7
3.944	14.0	20.3	34.3	46.0	-11.7
3.032	13.9	20.2	34.1	46.0	-11.9
4.760	13.8	20.3	34.1	46.0	-11.9
2.024	13.9	20.1	34.0	46.0	-12.0
2.624	13.8	20.2	34.0	46.0	-12.0
1.504	13.8	20.1	33.9	46.0	-12.1
3.840	13.6	20.3	33.9	46.0	-12.1
3.136	13.6	20.2	33.8	46.0	-12.2
0.910	13.6	20.1	33.7	46.0	-12.3
1.000	13.6	20.1	33.7	46.0	-12.3
4.728	13.4	20.3	33.7	46.0	-12.3
0.152	23.4	20.1	43.5	55.9	-12.4

EMC

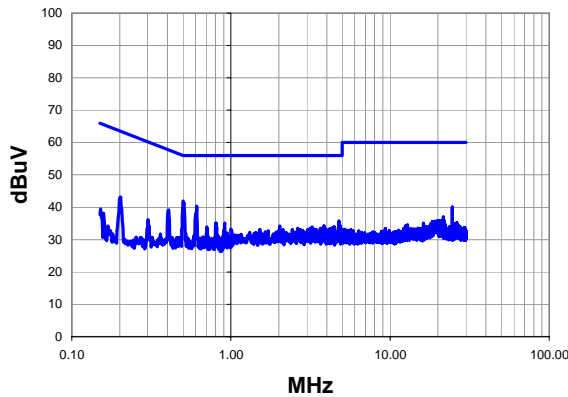
AC POWERLINE CONDUCTED EMISSIONS

Work Order:	MASI0063	Date:	08/27/10	<i>Marty Martin</i> Tested by: Marty Martin
Project:	None	Temperature:	22C	
Job Site:	OC06	Humidity:	49	
Serial Number:	R02384	Barometric Pres.:	1010MB	
EUT:	Rad-87			
Configuration:	MASI0063-1			
Customer:	Masimo Corporation			
Attendees:	None			
EUT Power:	120VAC/60Hz			
Operating Mode:	Radio: 5.24GHz, Channel: 48 , Data rate: 6 , antenna port: 1			
Deviations:	None			
Comments:	Transmit Mode.			

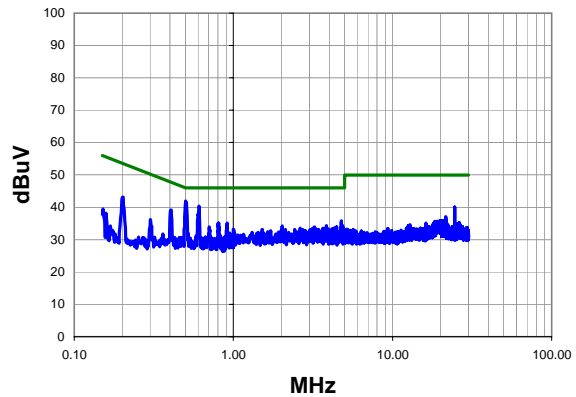
Test Specifications FCC 15.407:2010	Test Method ANSI C63.10:2009
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Run #	16	Line: High Line	Ext. Attenuation: 20	Results	Pass
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Peak Data - vs - Quasi Peak Limit



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)
0.502	21.8	20.1	41.9	56.0	-14.1
0.609	20.3	20.1	40.4	56.0	-15.6
0.407	19.1	20.1	39.2	57.7	-18.5
24.580	18.5	21.6	40.1	60.0	-19.9
4.768	15.5	20.3	35.8	56.0	-20.2
0.201	23.0	20.1	43.1	63.6	-20.5
0.803	15.0	20.1	35.1	56.0	-20.9
0.913	15.0	20.1	35.1	56.0	-20.9
3.848	14.1	20.3	34.4	56.0	-21.6
2.024	14.1	20.1	34.2	56.0	-21.8
4.864	13.9	20.3	34.2	56.0	-21.8
0.704	13.8	20.1	33.9	56.0	-22.1
3.240	13.7	20.2	33.9	56.0	-22.1
4.456	13.6	20.3	33.9	56.0	-22.1
4.360	13.4	20.3	33.7	56.0	-22.3
2.632	13.3	20.2	33.5	56.0	-22.5
3.144	13.3	20.2	33.5	56.0	-22.5
3.648	13.3	20.2	33.5	56.0	-22.5
4.256	13.1	20.3	33.4	56.0	-22.6
3.744	13.1	20.2	33.3	56.0	-22.7

Peak Data - vs - Average Limit

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.502	21.8	20.1	41.9	46.0	-4.1
0.609	20.3	20.1	40.4	46.0	-5.6
0.407	19.1	20.1	39.2	47.7	-8.5
24.580	18.5	21.6	40.1	50.0	-9.9
4.768	15.5	20.3	35.8	46.0	-10.2
0.201	23.0	20.1	43.1	53.6	-10.5
0.803	15.0	20.1	35.1	46.0	-10.9
0.913	15.0	20.1	35.1	46.0	-10.9
3.848	14.1	20.3	34.4	46.0	-11.6
2.024	14.1	20.1	34.2	46.0	-11.8
4.864	13.9	20.3	34.2	46.0	-11.8
0.704	13.8	20.1	33.9	46.0	-12.1
3.240	13.7	20.2	33.9	46.0	-12.1
4.456	13.6	20.3	33.9	46.0	-12.1
4.360	13.4	20.3	33.7	46.0	-12.3
2.632	13.3	20.2	33.5	46.0	-12.5
3.144	13.3	20.2	33.5	46.0	-12.5
3.648	13.3	20.2	33.5	46.0	-12.5
4.256	13.1	20.3	33.4	46.0	-12.6
3.744	13.1	20.2	33.3	46.0	-12.7