



element

Masimo Corporation

Masimo Wireless Charger

FCC 15.209:2024

RSS-216 Issue 2:2016+A1:2020

RSS-Gen Issue 5:2018+A1:2019+A2:2021

Inductive Radio

Report: MASI0919.0 Rev. 1, Issue Date: March 21, 2024



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CERTIFICATE OF TEST



Last Date of Test: January 9, 2024
Masimo Corporation
EUT: Masimo Wireless Charger

Radio Equipment Testing

Standards

Specification	Method
FCC 15.209:2024	ANSI C63.10:2013
RSS-216 Issue 2:2016+A1:2020	
RSS-Gen Issue 5:2018+A1:2019+A2:2021	

Guidance

Notice 2020 - DRS0023

Results

Test Description	Result	FCC Section(s)	RSS Section(s)	ANSI C63.10 Section(s)	Comments
Powerline Conducted Emissions	Pass	15.207	N/A	6.2	
Conducted Emissions (WPT)	Pass	N/A	RSS-216 6.2.2.1	N/A	
Radiated Emissions (WPT)	Pass	N/A	RSS-216 6.2.2.2	N/A	
Field Strength of Fundamental	Pass	15.209	N/A	6.4	
Spurious Radiated Emissions Less than 30MHz	Pass	15.209	N/A	6.4, 6.5	
Spurious Radiated Emissions Greater than 30MHz	Pass	15.209	N/A	6.4, 6.5	
Occupied Bandwidth (99%)	Pass	N/A	RSS-Gen 6.7	6.9.3	

Deviations From Test Standards

None

Approved By:

Johnny Candelas, Operations Manager

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. 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. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

CERTIFICATE OF TEST



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REVISION HISTORY



Revision Number	Description	Date (yyyy-mm-dd)	Page Number
01	Updated spec year of FCC 15.209 to 2024	2024-03-20	1, 3
	Updated test description for OBW		42

ACCREDITATIONS AND AUTHORIZATIONS



United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Each laboratory is accredited by A2LA to ISO / IEC 17025, and as a product certifier to ISO / IEC 17065 which allows Element to certify transmitters to FCC and IC specifications.

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Recognized as an EU Notified Body validated for the EMCD and RED Directives.

United Kingdom

BEIS – Recognized by the UK as an Approved Body under the UK Radio Equipment and UK EMC Regulations.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

SCOPE

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

[California](#)

[Minnesota](#)

[Oregon](#)

[Texas](#)

[Washington](#)

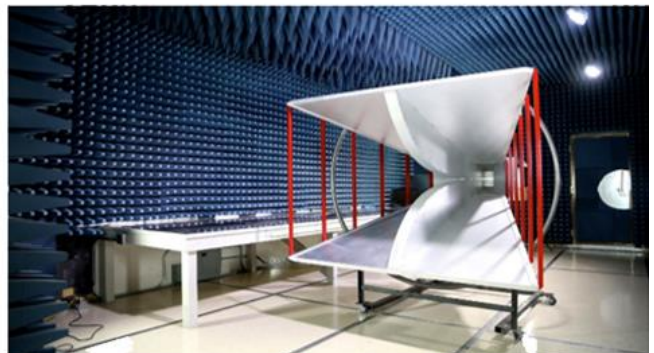
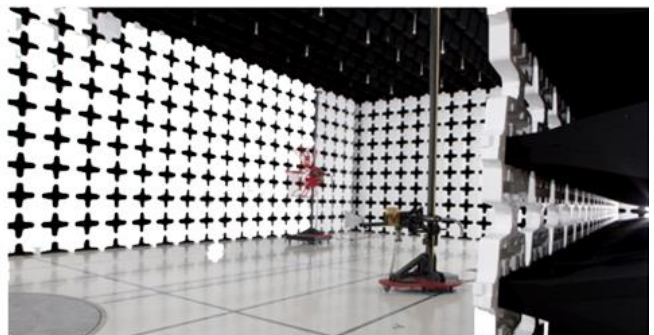
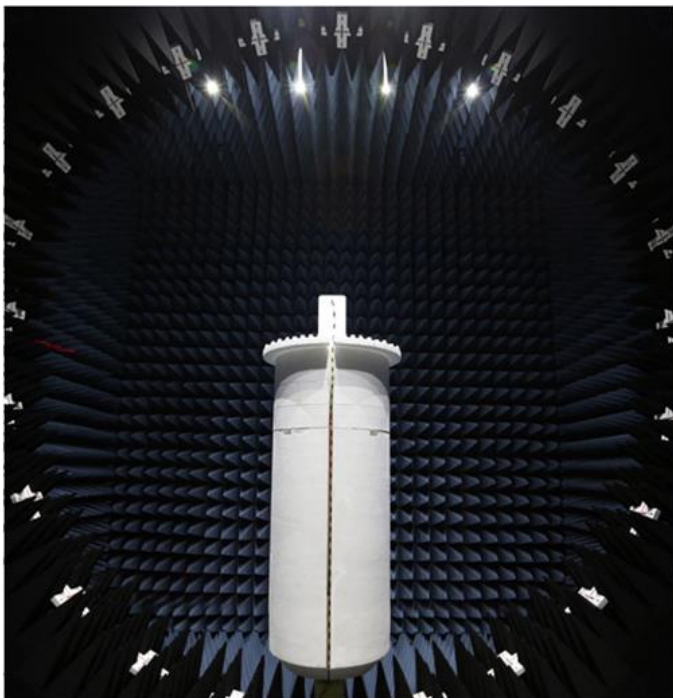
FACILITIES

Testing was performed at the following location(s)

	Location	Labs ⁽¹⁾	Address	A2LA ⁽²⁾	ISED ⁽³⁾	BSMI ⁽⁴⁾	VCCI ⁽⁵⁾	CAB ⁽⁶⁾	FDA ⁽⁷⁾
<input checked="" type="checkbox"/>	California	OC01-17	41 Tesla Irvine, CA 92618 (949) 861-8918	3310.04	2834B	SL2-IN-E-1154R	A-0029	US0158	TL-55
<input type="checkbox"/>	Minnesota	MN01-11	9349 W Broadway Ave. Brooklyn Park, MN 55445 (612) 638-5136	3310.05	2834E	SL2-IN-E-1152R	A-0109	US0175	TL-57
<input type="checkbox"/>	Oregon	EV01-12	6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	3310.02	2834D	SL2-IN-E-1017	A-0108	US0017	TL-56
<input type="checkbox"/>	Texas	TX01-09	3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	3310.03	2834G	SL2-IN-E-1158R	A-0201	US0191	TL-54
<input type="checkbox"/>	Washington	NC01-05	19201 120th Ave NE Bothell, WA 98011 (425) 984-6600	3310.06	2834F	SL2-IN-E-1153R	A-0110	US0157	TL-67
<input type="checkbox"/>	Offsite	N/A	See Product Description	N/A	N/A	N/A	N/A	N/A	N/A

See data sheets for specific labs

- (1) The lab designations denote individual rooms within each location. (OC01, OC02, OC03, etc.)
- (2) A2LA Certificate No.
- (3) ISED Company No.
- (4) BSMI No.
- (5) VCCI Site Filing No.
- (6) CAB Identifier. Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA
- (7) FDA ASCA No.



MEASUREMENT UNCERTAINTY



Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found in the table below. A lab specific value may also be found in the applicable test description section. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.1 dB	-5.1 dB
AC Powerline Conducted Emissions (dB)	3.2 dB	-3.2 dB

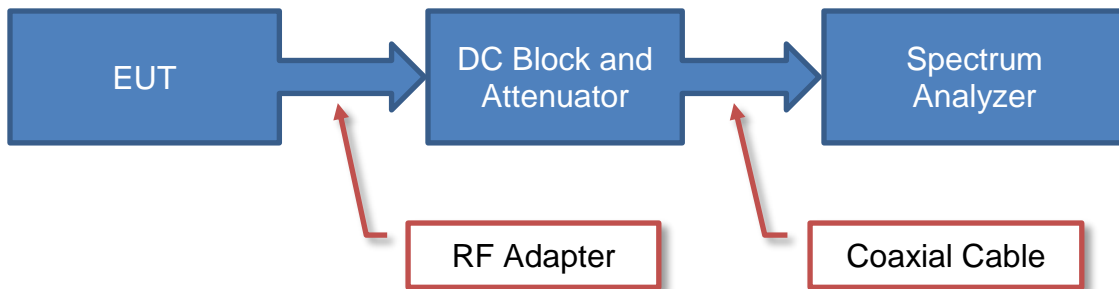
TEST SETUP BLOCK DIAGRAMS

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

Unless otherwise stated, measurements were made using the bandwidths and detectors specified. No video filter was used.

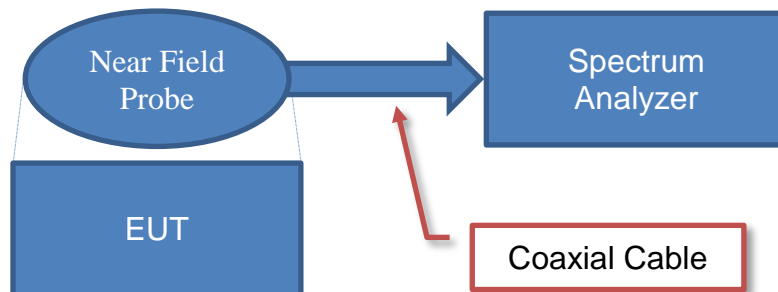
Antenna Port Conducted Measurements



Sample Calculation (logarithmic units)

$$\begin{array}{r}
 \text{Measured Value} \\
 71.2
 \end{array}
 =
 \begin{array}{r}
 \text{Measured Level} \\
 42.6
 \end{array}
 +
 \begin{array}{r}
 \text{Reference Level Offset} \\
 28.6
 \end{array}$$

Near Field Test Fixture Measurements

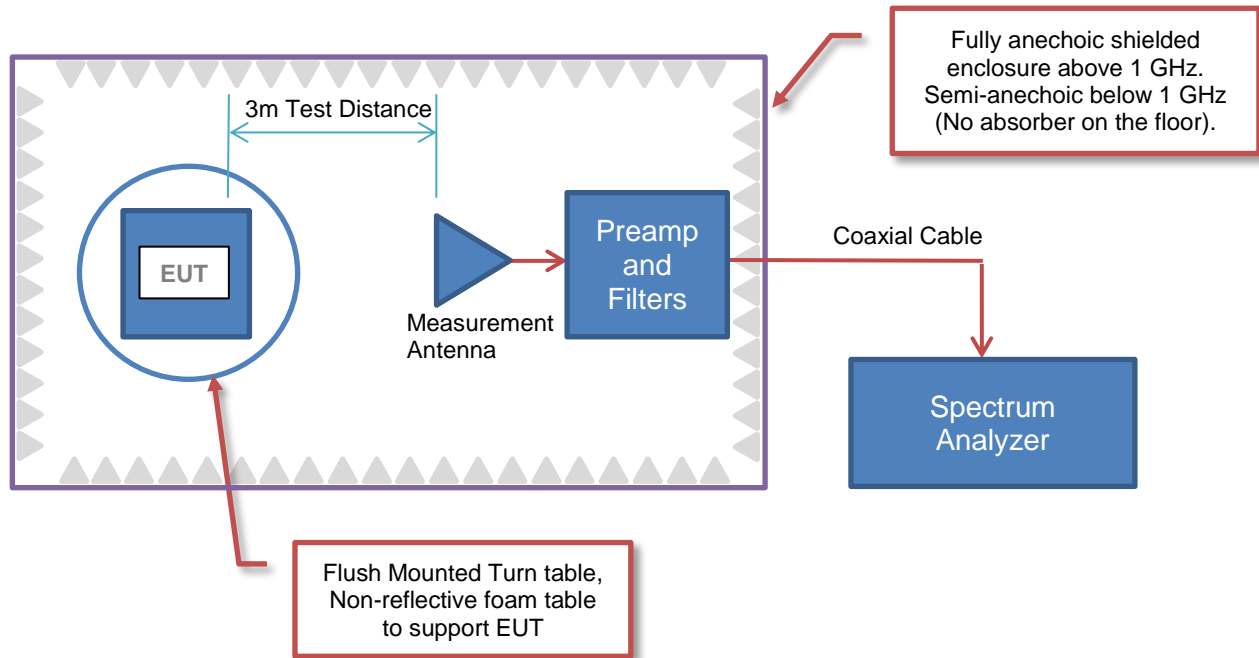


Sample Calculation (logarithmic units)

$$\begin{array}{r}
 \text{Measured Value} \\
 71.2
 \end{array}
 =
 \begin{array}{r}
 \text{Measured Level} \\
 42.6
 \end{array}
 +
 \begin{array}{r}
 \text{Reference Level Offset} \\
 28.6
 \end{array}$$

TEST SETUP BLOCK DIAGRAMS

Emissions Measurements



Sample Calculation (logarithmic units)

Radiated Emissions:

Measured Level (Amplitude)	Factor			Distance Adjustment Factor	External Attenuation	Field Strength
	Antenna Factor	Cable Factor	Amplifier Gain			
42.6	28.6	3.1	40.8	0.0	0.0	33.5

42.6 + 28.6 + 3.1 - 40.8 + 0.0 + 0.0 = 33.5

Conducted Emissions:

Measured Level (Amplitude)	Factor		External Attenuation	Adjusted Level
	Transducer Factor	Cable Factor		
26.7	0.3	0.1	20.0	47.1

26.7 + 0.3 + 0.1 + 20.0 = 47.1

Radiated Power (ERP/EIRP) – Substitution Method:

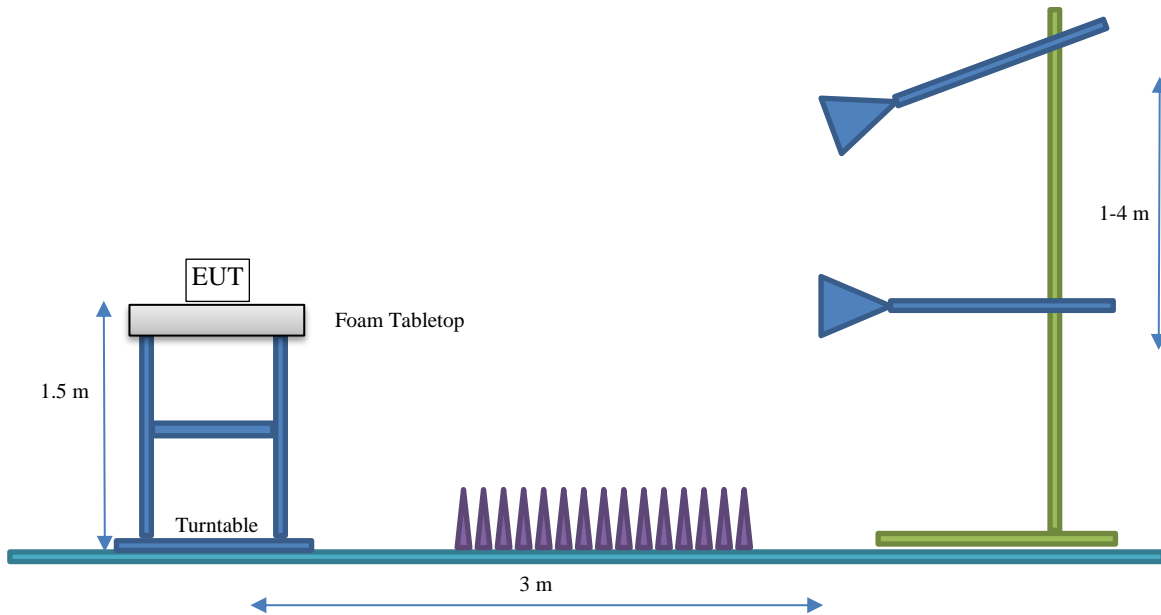
Measured Level into Substitution Antenna (Amplitude dBm)	Substitution Antenna Factor (dBi)	EIRP to ERP (if applicable)	Measured power (dBm ERP/EIRP)
10.0	6.0	2.15	13.9/16.0

10.0 + 6.0 - 2.15 = 13.9/16.0

TEST SETUP BLOCK DIAGRAMS

Bore Sighting (>1GHz)

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.



PRODUCT DESCRIPTION

Client and Equipment under Test (EUT) Information

Company Name:	Masimo Corporation
Address:	52 Discovery
City, State, Zip:	Irvine, CA 92618
Test Requested By:	Anami Joshi
EUT:	Masimo Wireless Charger
First Date of Test:	December 5, 2023
Last Date of Test:	January 9, 2024
Receipt Date of Samples:	December 5, 2023
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Masimo Wireless Charger is intended to charge Masimo wearable devices such as Masimo W1 medical watch. The charger will be included in device packaging and can also be purchased as a replacement accessory. Under RSS-216, this WPT device is Type 3 (Cat I) as subassembly of the source.

Testing Objective:

To demonstrate compliance of the inductive portion of the device to FCC Part 15.209 specifications and the Wireless Power Transfer Device to ISED specifications as called out in RSS-216.

CONFIGURATIONS



Configuration MASI0919-1

Software/Firmware Running During Test	
Description	Version
Firmware	V0001

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Masimo Wireless Charger	Masimo Corporation	29575	ENG0001

Peripherals in Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Watch	Masimo Corporation	STK6	FD00008099
AC Adapter	Masimo Corporation	NY-PW0G6-05001000	3101827

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB C Power Cable	No	1.5m	No	Pill Charger	AC Mains

POWER SETTINGS AND ANTENNAS



The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information. The power settings below reflect the maximum power that the EUT is allowed to transmit at during normal operation.

ANTENNA INFORMATION

Type	Modulation Type	Provided by:	Frequency Range (kHz)	Dimensions
Embedded Loop Antenna, 12 Turns	FSK	Masimo	110-200	21.8mm x 21.8mm

The EUT was tested using the power settings provided by the manufacturer which were based upon:

- Test software settings Test software/firmware installed on EUT: V0001
- Rated power settings

POWER SETTING

Radio	Frequency Range (kHz)	Power Setting (W)
WPT	110-200	1.5

*Power is set internally through product firmware at the default maximum.

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2023-12-05	Powerline Conducted Emissions	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2023-12-05	Conducted Emissions (WPT)	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2023-12-06	Radiated Emissions (WPT) Less than 30MHz	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2023-12-06	Field Strength of Fundamental	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2023-12-08	Spurious Radiated Emissions Greater than 30MHz	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2023-12-08	Spurious Radiated Emissions Less than 30MHz	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2023-12-06	Radiated Emissions (WPT) Greater than 30MHz	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2024-01-09	Occupied Bandwidth (99%)	Tested as delivered to test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWERLINE CONDUCTED EMISSIONS



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. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. 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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Gauss Instruments	TDEMI 30M	ARO	2023-04-25	2024-04-25
Cable - Conducted Cable Assembly	Northwest EMC	OCP, HFP, AWC	OCPA	2023-03-07	2024-03-07
LISN	Solar Electronics	9252-50-24-BNC	LIA	2023-09-12	2024-09-12
Power Supply	Pacific Power	3120AFX-2L	SMT	NCR	NCR

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.2 dB	-3.2 dB

CONFIGURATIONS INVESTIGATED

MASI0919-1

MODES INVESTIGATED

Inductively charging Masimo Watch

POWERLINE CONDUCTED EMISSIONS



EUT:	Masimo Wireless Charger	Work Order:	MASI0919
Serial Number:	ENG0001	Date:	2023-12-05
Customer:	Masimo Corporation	Temperature:	19.1°C
Attendees:	Anami Joshi	Relative Humidity:	54.1%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Luis Flores	Job Site:	OC06
Power:	110VAC/60Hz	Configuration:	MASI0919-1

TEST SPECIFICATIONS

Specification: Equipment Class B FCC 15.209:2023	Method: ANSI C63.10:2013
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TEST PARAMETERS

Run #:	1	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

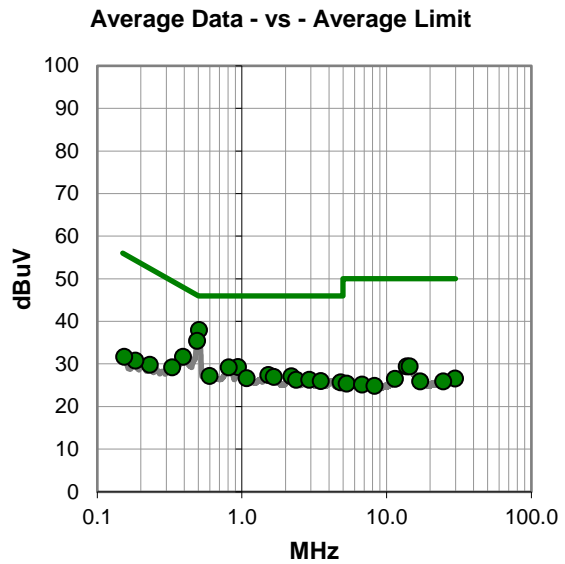
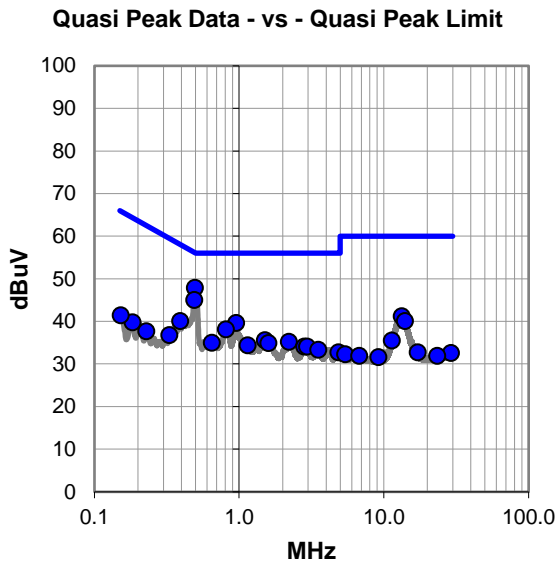
Spacer added between Watch and Charger to increase charging power.

EUT OPERATING MODES

Inductively charging Masimo Watch

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #1

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.495	28.0	19.9	47.9	56.1	-8.2
0.489	25.1	19.9	45.0	56.2	-11.2
0.953	19.6	20.0	39.6	56.0	-16.4
0.391	20.2	19.9	40.1	58.0	-17.9
0.808	18.1	20.0	38.1	56.0	-17.9
13.283	20.3	20.9	41.2	60.0	-18.8
13.960	19.1	21.0	40.1	60.0	-19.9
1.503	15.5	20.1	35.6	56.0	-20.4
2.202	15.1	20.1	35.2	56.0	-20.8
0.646	15.0	20.0	35.0	56.0	-21.0
1.596	14.8	20.1	34.9	56.0	-21.1
1.145	14.4	20.0	34.4	56.0	-21.6
2.814	13.9	20.2	34.1	56.0	-21.9
2.942	13.9	20.2	34.1	56.0	-21.9
0.329	16.8	20.0	36.8	59.5	-22.7
3.521	13.1	20.2	33.3	56.0	-22.7
4.860	12.3	20.4	32.7	56.0	-23.3
0.184	19.7	20.1	39.8	64.3	-24.5
11.381	14.6	20.9	35.5	60.0	-24.5
0.152	21.2	20.2	41.4	65.9	-24.5
0.228	17.7	20.0	37.7	62.5	-24.8
17.105	11.4	21.3	32.7	60.0	-27.3
29.107	10.2	22.4	32.6	60.0	-27.4
5.409	11.9	20.4	32.3	60.0	-27.7
6.751	11.4	20.5	31.9	60.0	-28.1

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.506	18.1	19.9	38.0	46.0	-8.0
0.489	15.5	19.9	35.4	46.2	-10.8
0.391	11.8	19.9	31.7	48.0	-16.3
0.939	9.3	20.0	29.3	46.0	-16.7
0.808	9.2	20.0	29.2	46.0	-16.8
1.525	7.3	20.1	27.4	46.0	-18.6
0.597	7.3	19.9	27.2	46.0	-18.8
2.198	7.0	20.1	27.1	46.0	-18.9
1.662	6.9	20.1	27.0	46.0	-19.0
1.076	6.7	20.0	26.7	46.0	-19.3
2.365	6.1	20.2	26.3	46.0	-19.7
2.912	6.1	20.2	26.3	46.0	-19.7
3.508	5.8	20.2	26.0	46.0	-20.0
0.329	9.2	20.0	29.2	49.5	-20.3
4.817	5.3	20.4	25.7	46.0	-20.3
13.800	8.4	21.0	29.4	50.0	-20.6
14.404	8.4	21.0	29.4	50.0	-20.6
0.231	9.8	20.0	29.8	52.4	-22.6
29.716	4.2	22.4	26.6	50.0	-23.4
0.184	10.7	20.1	30.8	54.3	-23.5
11.404	5.6	20.9	26.5	50.0	-23.5
0.153	11.5	20.2	31.7	55.8	-24.1
17.100	4.6	21.3	25.9	50.0	-24.1
24.606	4.0	21.9	25.9	50.0	-24.1
5.306	5.0	20.4	25.4	50.0	-24.6

CONCLUSION

Pass

Tested By

POWERLINE CONDUCTED EMISSIONS



EUT:	Masimo Wireless Charger	Work Order:	MASI0919
Serial Number:	ENG0001	Date:	2023-12-05
Customer:	Masimo Corporation	Temperature:	19.1°C
Attendees:	Anami Joshi	Relative Humidity:	54.1%
Customer Project:	None	Bar. Pressure (PMSL):	1019 mb
Tested By:	Luis Flores	Job Site:	OC06
Power:	110VAC/60Hz	Configuration:	MASI0919-1

TEST SPECIFICATIONS

Specification: Equipment Class B FCC 15.209:2023	Method: ANSI C63.10:2013
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TEST PARAMETERS

Run #:	2	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

Spacer added between Watch and Charger to increase charging power.

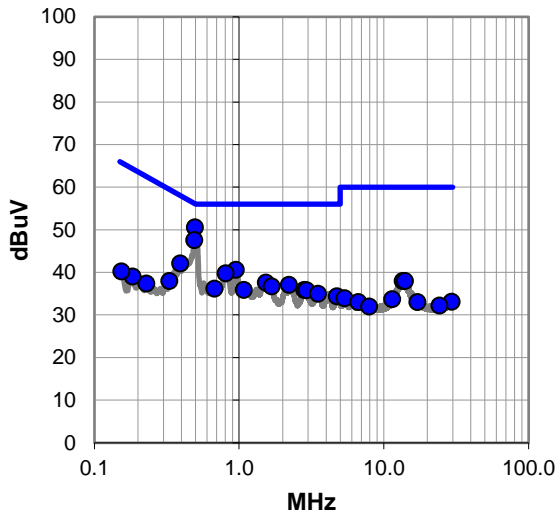
EUT OPERATING MODES

Inductively charging Masimo Watch

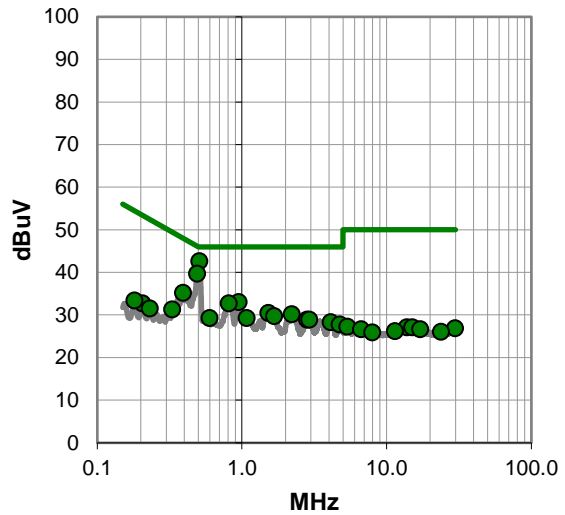
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



POWERLINE CONDUCTED EMISSIONS



RESULTS - Run #2

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.495	30.7	19.9	50.6	56.1	-5.5
0.489	27.7	19.9	47.6	56.2	-8.6
0.950	20.6	20.0	40.6	56.0	-15.4
0.391	22.2	19.9	42.1	58.0	-15.9
0.806	19.8	20.0	39.8	56.0	-16.2
1.529	17.5	20.1	37.6	56.0	-18.4
2.202	17.0	20.1	37.1	56.0	-18.9
1.674	16.6	20.1	36.7	56.0	-19.3
0.675	16.2	20.0	36.2	56.0	-19.8
1.078	15.9	20.0	35.9	56.0	-20.1
2.816	15.7	20.2	35.9	56.0	-20.1
2.912	15.6	20.2	35.8	56.0	-20.2
3.510	14.8	20.2	35.0	56.0	-21.0
0.329	18.0	20.0	38.0	59.5	-21.5
4.723	14.1	20.3	34.4	56.0	-21.6
13.502	17.1	20.9	38.0	60.0	-22.0
13.954	17.0	21.0	38.0	60.0	-22.0
0.228	17.4	20.0	37.4	62.5	-25.1
0.184	18.9	20.1	39.0	64.3	-25.3
0.153	20.0	20.2	40.2	65.8	-25.6
5.350	13.5	20.4	33.9	60.0	-26.1
11.401	12.8	20.9	33.7	60.0	-26.3
29.400	10.7	22.4	33.1	60.0	-26.9
6.670	12.5	20.5	33.0	60.0	-27.0
17.096	11.7	21.3	33.0	60.0	-27.0

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.507	22.7	19.9	42.6	46.0	-3.4
0.489	19.8	19.9	39.7	46.2	-6.5
0.391	15.3	19.9	35.2	48.0	-12.8
0.948	13.0	20.0	33.0	46.0	-13.0
0.808	12.7	20.0	32.7	46.0	-13.3
1.525	10.4	20.1	30.5	46.0	-15.5
2.204	10.1	20.1	30.2	46.0	-15.8
1.668	9.6	20.1	29.7	46.0	-16.3
0.597	9.4	19.9	29.3	46.0	-16.7
1.076	9.3	20.0	29.3	46.0	-16.7
2.811	8.7	20.2	28.9	46.0	-17.1
2.916	8.7	20.2	28.9	46.0	-17.1
4.096	8.0	20.3	28.3	46.0	-17.7
0.329	11.3	20.0	31.3	49.5	-18.2
4.738	7.5	20.3	27.8	46.0	-18.2
0.205	12.7	20.0	32.7	53.4	-20.7
0.231	11.5	20.0	31.5	52.4	-20.9
0.181	13.3	20.1	33.4	54.5	-21.1
5.351	6.9	20.4	27.3	50.0	-22.7
13.800	6.1	21.0	27.1	50.0	-22.9
14.998	6.0	21.1	27.1	50.0	-22.9
29.702	4.5	22.4	26.9	50.0	-23.1
6.670	6.2	20.5	26.7	50.0	-23.3
17.100	5.4	21.3	26.7	50.0	-23.3
11.397	5.3	20.9	26.2	50.0	-23.8

CONCLUSION

Pass

Tested By

CONDUCTED EMISSIONS (WPT)



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. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. 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. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Receiver	Gauss Instruments	TDEMI 30M	ARO	2023-04-25	2024-04-25
Cable - Conducted Cable Assembly	Northwest EMC	OCP, HFP, AWC	OCPA	2023-03-07	2024-03-07
LISN	Solar Electronics	9252-50-24-BNC	LIA	2023-09-12	2024-09-12
Power Supply	Pacific Power	3120AFX-2L	SMT	NCR	NCR

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.2 dB	-3.2 dB

CONFIGURATIONS INVESTIGATED

MASI0919-1

MODES INVESTIGATED

Inductively charging Masimo Watch

CONDUCTED EMISSIONS (WPT)



EUT:	Masimo Wireless Charger	Work Order:	MASI0919
Serial Number:	ENG0001	Date:	2024-02-09
Customer:	Masimo Corporation	Temperature:	20.2°C
Attendees:	None	Relative Humidity:	50.7%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mb
Tested By:	Luis Flores	Job Site:	OC10
Power:	110VAC/60Hz	Configuration:	MASI0919-1

TEST SPECIFICATIONS

Specification:	Method:
RSS-216 Issue 2:2016+A1:2020	ANSI C63.10:2013

TEST PARAMETERS

Run #:	12	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

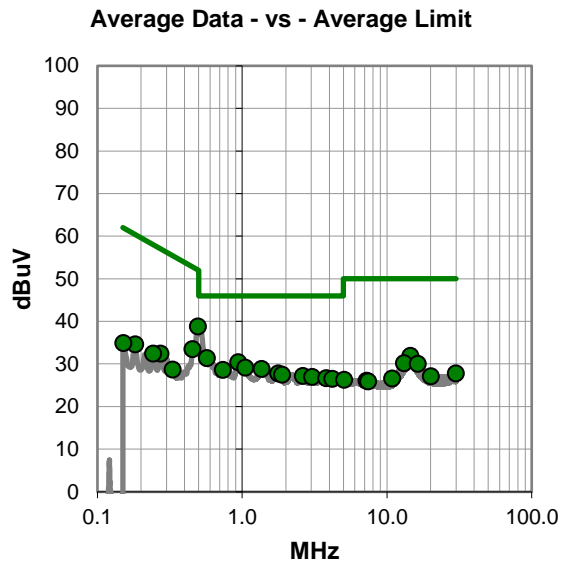
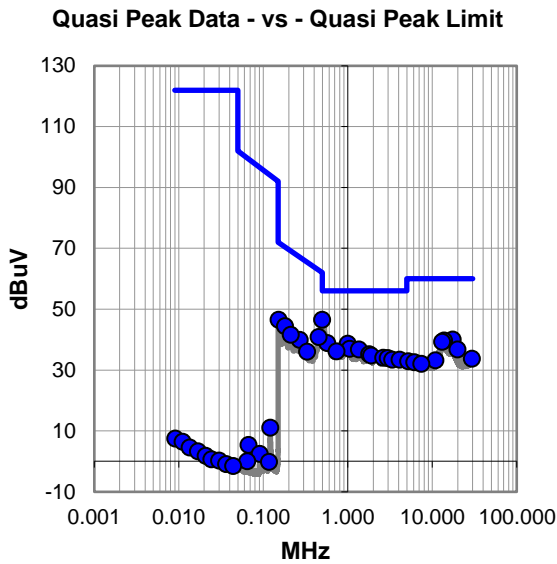
Spacer added between Watch and Charger to increase charging power.

EUT OPERATING MODES

Inductively charging Masimo Watch

DEVIATIONS FROM TEST STANDARD

None



CONDUCTED EMISSIONS (WPT)



RESULTS - Run #12

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.496	26.6	19.9	46.5	62.1	-15.6
0.571	19.0	19.9	38.9	56.0	-17.1
1.000	18.7	20.0	38.7	56.0	-17.3
1.053	17.0	20.0	37.0	56.0	-19.0
1.355	16.7	20.1	36.8	56.0	-19.2
0.737	16.1	20.0	36.1	56.0	-19.9
17.463	18.7	21.3	40.0	60.0	-20.0
13.829	18.7	21.0	39.7	60.0	-20.3
13.101	18.4	20.9	39.3	60.0	-20.7
1.784	15.1	20.1	35.2	56.0	-20.8
1.885	14.7	20.1	34.8	56.0	-21.2
0.452	21.0	19.9	40.9	62.8	-21.9
2.626	13.8	20.2	34.0	56.0	-22.0
2.962	13.7	20.2	33.9	56.0	-22.1
3.356	13.2	20.2	33.4	56.0	-22.6
4.100	13.1	20.3	33.4	56.0	-22.6
19.897	15.4	21.4	36.8	60.0	-23.2
0.152	26.3	20.2	46.5	71.9	-25.4
0.181	24.3	20.1	44.4	70.5	-26.1
29.470	11.3	22.4	33.7	60.0	-26.3
10.913	12.5	20.7	33.2	60.0	-26.8
5.202	12.5	20.4	32.9	60.0	-27.1
0.271	19.9	20.0	39.9	67.1	-27.2
6.151	12.1	20.5	32.6	60.0	-27.4
0.213	21.6	20.0	41.6	69.1	-27.5

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.495	18.9	19.9	38.8	52.1	-13.3
0.571	11.5	19.9	31.4	46.0	-14.6
0.937	10.4	20.0	30.4	46.0	-15.6
1.052	9.1	20.0	29.1	46.0	-16.9
1.358	8.7	20.1	28.8	46.0	-17.2
0.734	8.6	20.0	28.6	46.0	-17.4
14.473	10.8	21.1	31.9	50.0	-18.1
1.775	7.7	20.1	27.8	46.0	-18.2
1.886	7.4	20.1	27.5	46.0	-18.5
2.631	7.0	20.2	27.2	46.0	-18.8
3.046	6.8	20.2	27.0	46.0	-19.0
0.454	13.6	19.9	33.5	52.8	-19.3
3.798	6.4	20.3	26.7	46.0	-19.3
4.195	6.2	20.3	26.5	46.0	-19.5
13.096	9.3	20.9	30.2	50.0	-19.8
16.281	8.8	21.2	30.0	50.0	-20.0
29.836	5.4	22.4	27.8	50.0	-22.2
20.065	5.7	21.4	27.1	50.0	-22.9
10.852	5.9	20.7	26.6	50.0	-23.4
5.066	5.9	20.4	26.3	50.0	-23.7
7.236	5.5	20.6	26.1	50.0	-23.9
7.395	5.3	20.6	25.9	50.0	-24.1
0.272	12.4	20.0	32.4	57.1	-24.7
0.243	12.4	20.0	32.4	58.0	-25.6
0.182	14.5	20.1	34.6	60.4	-25.8

CONCLUSION

Pass

Tested By

CONDUCTED EMISSIONS (WPT)



EUT:	Pill Charger	Work Order:	MASI0919
Serial Number:	ENG0001	Date:	2024-02-09
Customer:	Masimo Corporation	Temperature:	20.2°C
Attendees:	None	Relative Humidity:	50.7%
Customer Project:	None	Bar. Pressure (PMSL):	1017 mb
Tested By:	Luis Flores	Job Site:	OC10
Power:	110VAC/60Hz	Configuration:	MASI0919-1

TEST SPECIFICATIONS

Specification:	Method:
RSS-216 Issue 2:2016+A1:2020	ANSI C63.10:2013

TEST PARAMETERS

Run #:	9	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

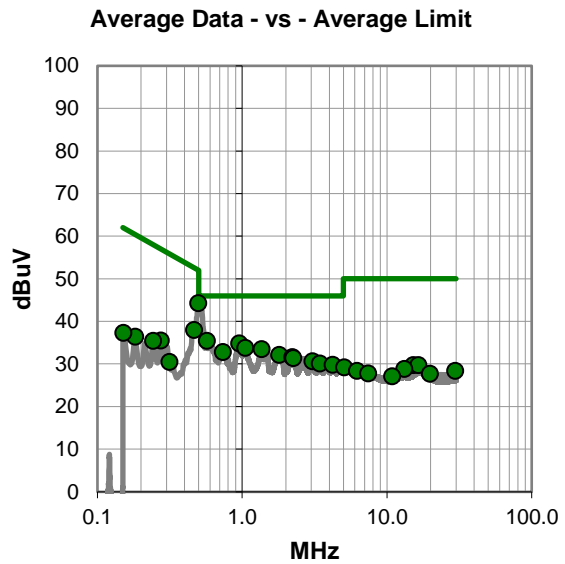
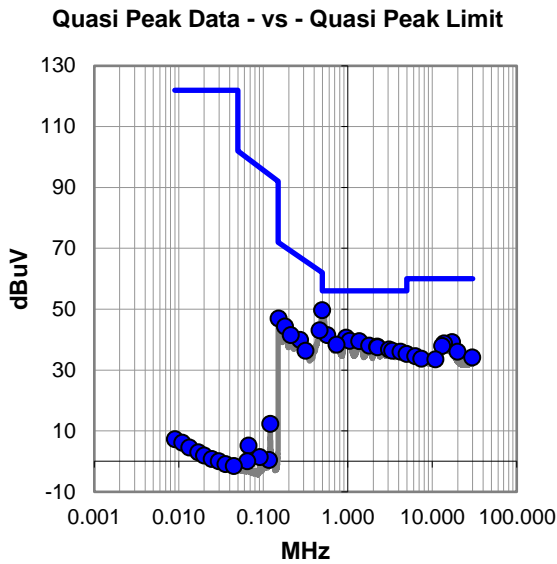
Spacer added between Watch and Charger to increase charging power.

EUT OPERATING MODES

Inductively charging Masimo Watch

DEVIATIONS FROM TEST STANDARD

None



CONDUCTED EMISSIONS (WPT)



RESULTS - Run #9

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.496	29.8	19.9	49.7	62.1	-12.4
0.570	21.6	19.9	41.5	56.0	-14.5
0.953	20.7	20.0	40.7	56.0	-15.3
1.050	19.6	20.0	39.6	56.0	-16.4
1.361	19.4	20.1	39.5	56.0	-16.5
0.734	18.3	20.0	38.3	56.0	-17.7
1.793	17.9	20.1	38.0	56.0	-18.0
2.224	17.6	20.1	37.7	56.0	-18.3
2.257	17.3	20.2	37.5	56.0	-18.5
3.067	16.6	20.2	36.8	56.0	-19.2
0.464	23.2	19.9	43.1	62.6	-19.5
3.354	16.2	20.2	36.4	56.0	-19.6
4.224	15.7	20.3	36.0	56.0	-20.0
4.988	14.9	20.4	35.3	56.0	-20.7
17.180	17.9	21.3	39.2	60.0	-20.8
13.817	17.8	21.0	38.8	60.0	-21.2
13.089	17.0	20.9	37.9	60.0	-22.1
19.892	14.6	21.4	36.0	60.0	-24.0
0.152	26.8	20.2	47.0	71.9	-24.9
6.290	14.1	20.5	34.6	60.0	-25.4
29.607	11.7	22.4	34.1	60.0	-25.9
0.181	24.2	20.1	44.3	70.5	-26.2
7.391	13.1	20.6	33.7	60.0	-26.3
10.852	12.8	20.7	33.5	60.0	-26.5
0.274	19.9	20.0	39.9	67.0	-27.1

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.496	24.4	19.9	44.3	52.1	-7.8
0.571	15.5	19.9	35.4	46.0	-10.6
0.954	14.8	20.0	34.8	46.0	-11.2
1.052	13.8	20.0	33.8	46.0	-12.2
1.361	13.4	20.1	33.5	46.0	-12.5
0.737	12.8	20.0	32.8	46.0	-13.2
1.805	12.0	20.1	32.1	46.0	-13.9
2.214	11.5	20.1	31.6	46.0	-14.4
0.464	18.1	19.9	38.0	52.6	-14.6
2.257	11.2	20.2	31.4	46.0	-14.6
3.057	10.4	20.2	30.6	46.0	-15.4
3.437	9.9	20.2	30.1	46.0	-15.9
4.224	9.5	20.3	29.8	46.0	-16.2
15.191	8.6	21.1	29.7	50.0	-20.3
16.456	8.5	21.2	29.7	50.0	-20.3
5.062	8.8	20.4	29.2	50.0	-20.8
13.161	7.9	20.9	28.8	50.0	-21.2
0.274	15.5	20.0	35.5	57.0	-21.5
6.217	7.9	20.5	28.4	50.0	-21.6
29.621	6.0	22.4	28.4	50.0	-21.6
7.414	7.2	20.6	27.8	50.0	-22.2
19.828	6.3	21.4	27.7	50.0	-22.3
0.243	15.4	20.0	35.4	58.0	-22.6
10.852	6.4	20.7	27.1	50.0	-22.9
0.182	16.3	20.1	36.4	60.4	-24.0

CONCLUSION

Pass

Tested By

RADIATED EMISSIONS WPT (LESS THAN 30 MHz)



TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

The fundamental carrier of the EUT was 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 polarization (per ANSI C63.10). A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity. The reference point of the loop antenna was maintained at 1m above the ground plane during the testing.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

- QP = Quasi-Peak Detector
- PK = Peak Detector
- AV = CISPR Average Detector

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Loop	EMCO	6502	AZB	2023-09-06	2025-09-06
Cable	Northwest EMC	3kHz - 1GHz RE Cables	OCB	2023-05-26	2024-05-26
Receiver	Rohde & Schwarz	ESCI	ARG	2023-08-31	2024-08-31

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	1.8 dB	-1.8 dB

FREQUENCY RANGE INVESTIGATED

9 kHz TO 30 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MASI0919-1

MODES INVESTIGATED

Inductive Charging at 150 kHz

RADIATED EMISSIONS WPT (LESS THAN 30 MHz)



EUT:	Masimo Wireless Charger	Work Order:	MASI0919
Serial Number:	ENG0001	Date:	2023-12-06
Customer:	Masimo Corporation	Temperature:	20.3°C
Attendees:	Anami Joshi	Relative Humidity:	47.9%
Customer Project:	None	Bar. Pressure (PMSL):	1018 mb
Tested By:	Mark Baytan	Job Site:	OC08
Power:	110VAC/60Hz	Configuration:	MASI0919-1

TEST SPECIFICATIONS

Specification:	Method:
RSS-216 Issue 2:2016+A1:2020	ANSI C63.10:2013

TEST PARAMETERS

Run #:	2	Test Distance (m):	3	Ant. Height(s) (m):	1(m)
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COMMENTS

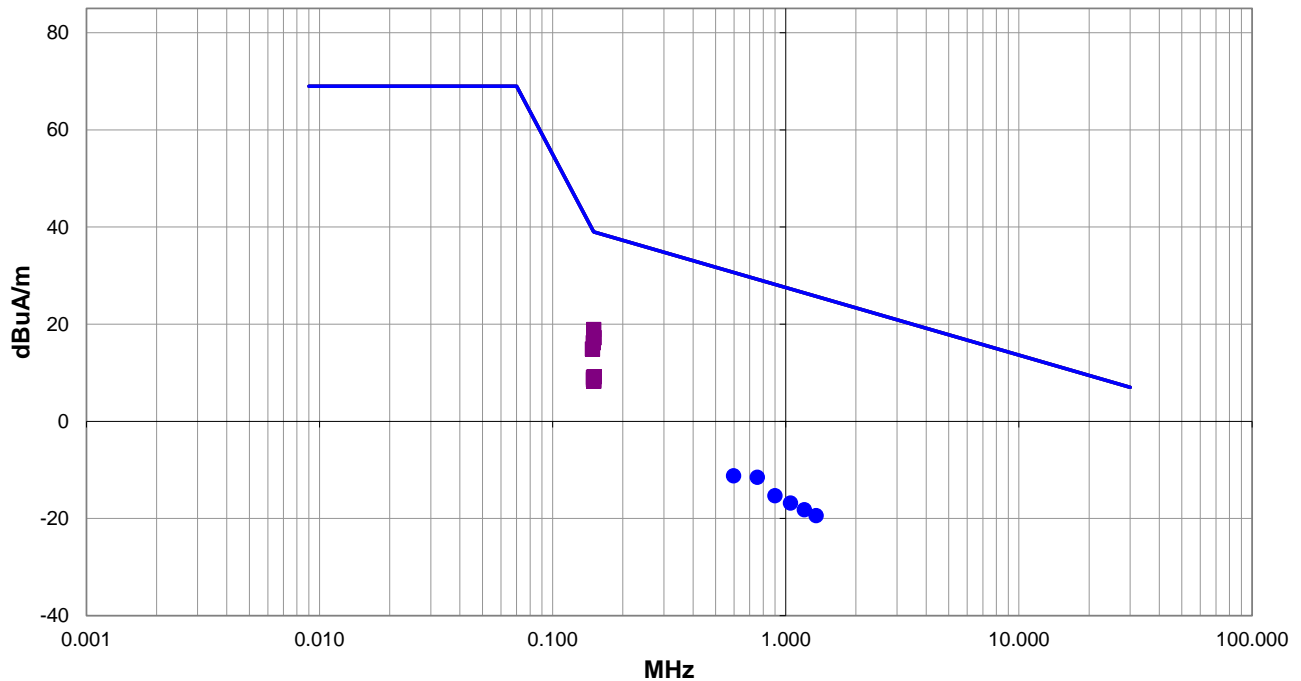
Max duty cycle set at 50%. Spacer added between Watch and Charger to increase charging power. Peak values of the fundamental were used to show compliance versus the quasi-peak limit.

EUT OPERATING MODES

Inductive Charging at 150 kHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 2

■ PK ◆ AV ● QP

RADIATED EMISSIONS WPT (LESS THAN 30 MHz)



RESULTS - Run #2

Freq (MHz)	Amplitude (dBuA)	Factor (dB/m)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuA/m)	Spec. Limit (dBuA/m)	Compared to Spec. (dB)	Comments
0.150	8.7	10.2	1.0	166.0	3.0	0.0	Par to EUT	PK	0.0	18.9	39.0	-20.1	EUT Horz
0.150	7.0	10.2	1.0	202.0	3.0	0.0	Par to GND	PK	0.0	17.2	39.0	-21.8	EUT Horz
0.150	7.0	10.2	1.0	334.0	3.0	0.0	Perp to EUT	PK	0.0	17.2	39.0	-21.8	EUT Vert
0.149	6.0	10.2	1.0	260.0	3.0	0.0	Perp to EUT	PK	0.0	16.2	39.2	-23.0	EUT Horz
0.148	4.7	10.2	1.0	282.0	3.0	0.0	Par to GND	PK	0.0	14.9	39.5	-24.6	EUT Vert
0.150	-1.0	10.2	1.0	119.0	3.0	0.0	Par to GND	PK	0.0	9.2	39.0	-29.8	EUT on Side
0.150	-1.2	10.2	1.0	38.0	3.0	0.0	Par to EUT	PK	0.0	9.0	39.1	-30.1	EUT on Side
0.150	-1.6	10.2	1.0	268.0	3.0	0.0	Perp to EUT	PK	0.0	8.6	39.1	-30.5	EUT on Side
0.150	-1.9	10.2	1.0	108.0	3.0	0.0	Par to EUT	PK	0.0	8.3	39.0	-30.7	EUT Vert
0.755	-21.8	10.3	1.0	67.0	3.0	0.0	Perp to EUT	QP	0.0	-11.5	29.2	-40.7	EUT on Side
0.596	-21.4	10.2	1.0	149.0	3.0	0.0	Perp to EUT	QP	0.0	-11.2	30.7	-41.9	EUT on Side
0.898	-25.6	10.3	1.0	55.0	3.0	0.0	Perp to EUT	QP	0.0	-15.3	28.2	-43.5	EUT on Side
1.048	-27.4	10.6	1.0	264.0	3.0	0.0	Perp to EUT	QP	0.0	-16.8	27.3	-44.1	EUT on Side
1.200	-28.7	10.5	1.0	89.0	3.0	0.0	Perp to EUT	QP	0.0	-18.2	26.4	-44.6	EUT on Side
1.350	-29.9	10.5	1.0	161.0	3.0	0.0	Perp to EUT	QP	0.0	-19.4	25.7	-45.1	EUT on Side

CONCLUSION

Pass

Tested By

RADIATED EMISSIONS WPT (GREATER THAN 30 MHz)



TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level was detected. This required the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search was utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT. Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance was 3 meters or 10 meters (from antenna to boundary of EUT). At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna was increased so that the lowest point of the bottom of the antenna cleared the ground surface by at least 25 cm.

The EUT arrangement is configured as equivalent to that occurring in normal use. Tabletop equipment is placed on a 0.8 meter high non-conductive table & for Floor-standing equipment, it is placed on, but insulated from a ground reference plane by the use of its own rollers or stand-off supports. If measurements above 1 GHz were required, the test setup was modified to meet the regulatory requirements for higher frequency measurements. If required, RF absorber was placed on the floor between the measurement antenna and EUT. If required, per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables.

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	Northwest EMC	3kHz - 1GHz RE Cables	OCB	2023-05-26	2024-05-26
Receiver	Rohde & Schwarz	ESCI	ARG	2023-08-31	2024-08-31
Amplifier - Pre-Amplifier	Miteq	AM-1551	AOX	2023-05-26	2024-05-26
Antenna - Biconilog	EMCO	3142B	AXK	2023-09-25	2025-09-25
Filter - Low Pass	Micro-Tronics	LPM50004	LFC	2023-09-07	2024-09-07

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.4 dB	-3.4 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 1000 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MAI0919-1

MODES INVESTIGATED

Inductive Charging at 150 kHz

RADIATED EMISSIONS WPT (GREATER THAN 30 MHz)



EUT:	Masimo Wireless Charger	Work Order:	MASI0919
Serial Number:	ENG0001	Date:	2023-12-08
Customer:	Masimo Corporation	Temperature:	19.9°C
Attendees:	Anami Joshi	Relative Humidity:	55.3%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mb
Tested By:	Mark Baytan	Job Site:	OC08
Power:	110VAC/60Hz	Configuration:	MASI0919-1

TEST SPECIFICATIONS

Specification:	Method:
RSS-216 Issue 2:2016+A1:2020	ANSI C63.10:2013

TEST PARAMETERS

Run #:	6	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

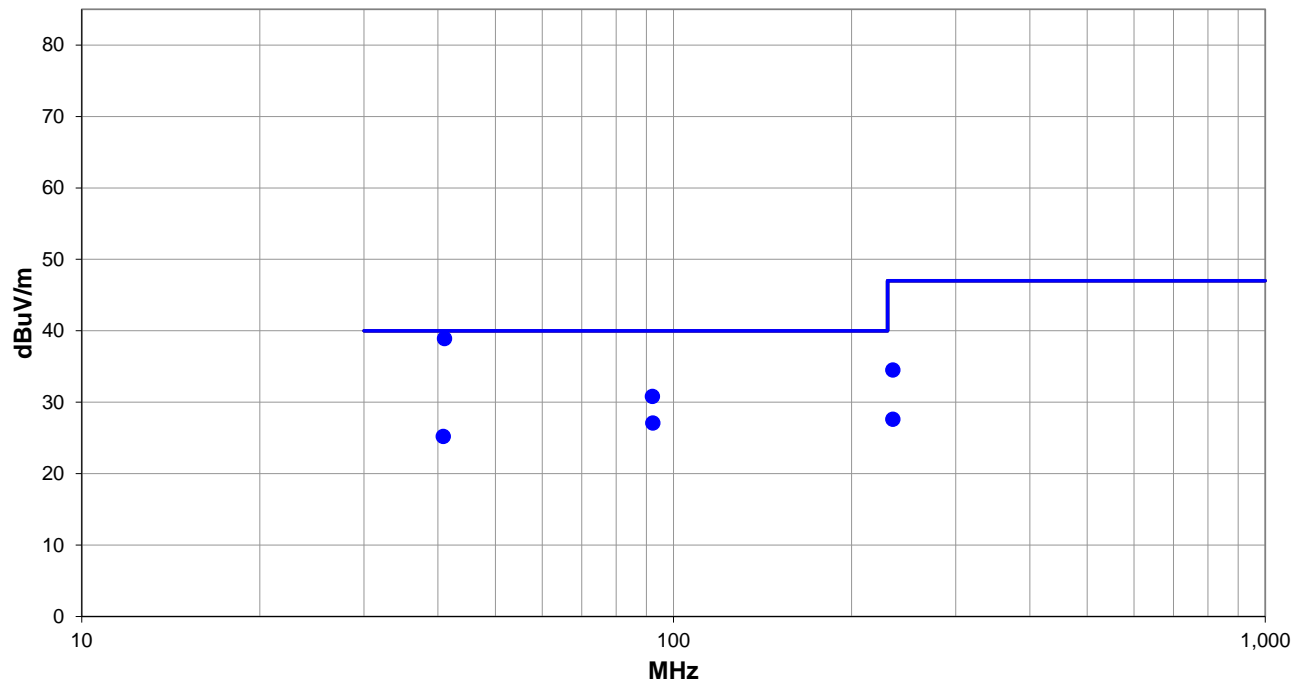
Max duty cycle set at 50%. Spacer added between Watch and Charger to increase charging power. Worst case EUT position: EUT on Side. 3m limit.

EUT OPERATING MODES

Inductive Charging at 150 kHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 6

■ PK ◆ AV ● QP

RADIATED EMISSIONS WPT (GREATER THAN 30 MHz)



RESULTS - Run #6

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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)
41.042	61.5	-22.6	1.0	243.0	3.0	0.0	Vert	QP	0.0	38.9	40.0	-1.1
92.095	56.8	-26.0	3.8	258.0	3.0	0.0	Horz	QP	0.0	30.8	40.0	-9.2
234.828	54.9	-20.4	1.19	89.0	3.0	0.0	Horz	QP	0.0	34.5	47.0	-12.5
92.253	53.1	-26.0	1.12	338.0	3.0	0.0	Vert	QP	0.0	27.1	40.0	-12.9
40.838	47.7	-22.5	3.8	295.0	3.0	0.0	Horz	QP	0.0	25.2	40.0	-14.8
234.833	48.0	-20.4	1.77	175.0	3.0	0.0	Vert	QP	0.0	27.6	47.0	-19.4

CONCLUSION

Pass

Tested By

FIELD STRENGTH OF FUNDAMENTAL



TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

The fundamental carrier of the EUT was 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 polarization (per ANSI C63.10). A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity. The reference point of the loop antenna was maintained at 1m above the ground plane during the testing.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

- QP = Quasi-Peak Detector
- PK = Peak Detector
- AV = CISPR Average Detector

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Loop	EMCO	6502	AZB	2023-09-06	2025-09-06
Cable	Northwest EMC	3kHz - 1GHz RE Cables	OCB	2023-05-26	2024-05-26
Receiver	Rohde & Schwarz	ESCI	ARG	2023-08-31	2024-08-31

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	1.8 dB	-1.8 dB

FREQUENCY RANGE INVESTIGATED

9 kHz TO 490 kHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MASI0919-1

MODES INVESTIGATED

Inductive Charging at 150 kHz

FIELD STRENGTH OF FUNDAMENTAL



EUT:	Masimo Wireless Charger	Work Order:	MASI0919
Serial Number:	ENG0001	Date:	2023-12-06
Customer:	Masimo Corporation	Temperature:	20.3°C
Attendees:	Anami Joshi	Relative Humidity:	47.9%
Customer Project:	None	Bar. Pressure (PMSL):	1018 mb
Tested By:	Mark Baytan	Job Site:	OC08
Power:	110VAC/60Hz	Configuration:	MASI0919-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.209:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	2	Test Distance (m):	3	Ant. Height(s) (m):	1(m)
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COMMENTS

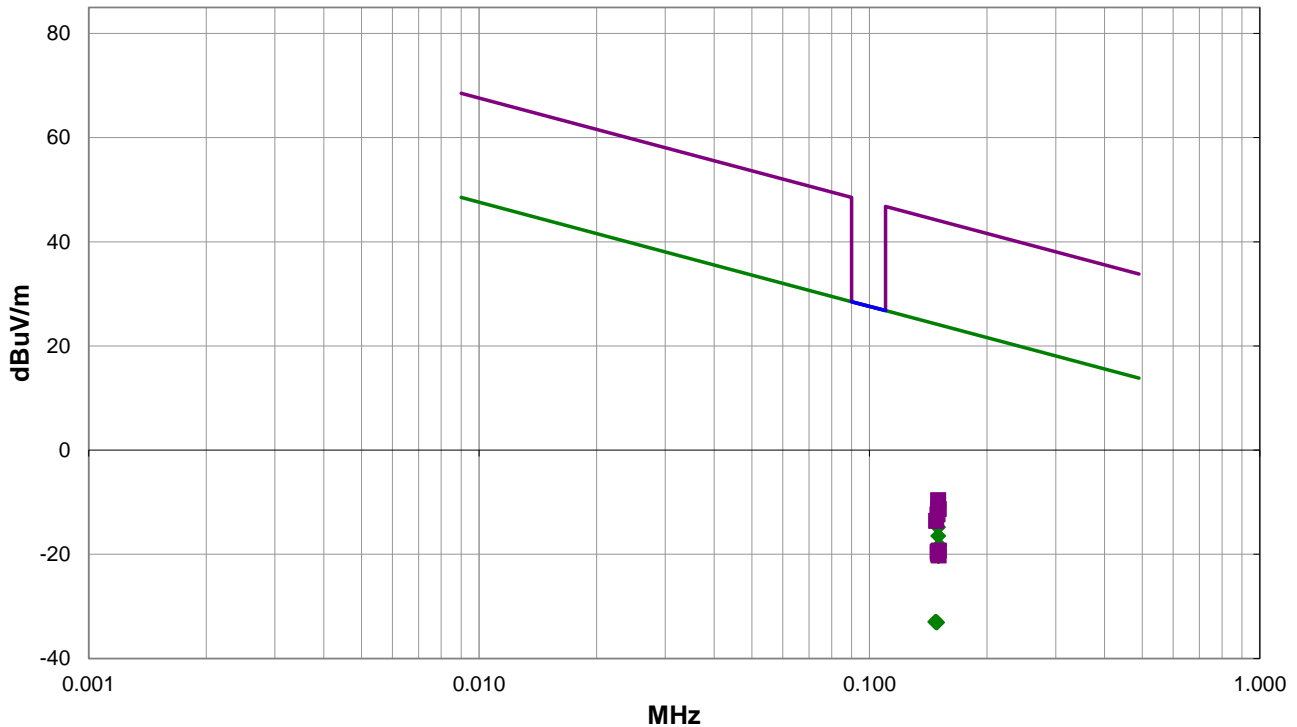
Max duty cycle set at 50%. Spacer added between Watch and Charger to increase charging power. Final values account for 40dB/decade distance adjustment factor due to measurements taken at a closer distance. 300m limit.

EUT OPERATING MODES

Inductive Charging at 150 kHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 2

■ PK ◆ AV ● QP

FIELD STRENGTH OF FUNDAMENTAL

RESULTS - Run #2

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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
0.150	55.0	10.2	1.0	334.0	3.0	0.0	Perp to EUT	AV	-80.0	-14.8	24.1	-38.9	EUT Vert
0.150	53.3	10.2	1.0	166.0	3.0	0.0	Par to EUT	AV	-80.0	-16.5	24.1	-40.6	EUT Horz
0.151	51.5	10.2	1.0	282.0	3.0	0.0	Par to GND	AV	-80.0	-18.3	24.0	-42.3	EUT Vert
0.150	51.0	10.2	1.0	202.0	3.0	0.0	Par to GND	AV	-80.0	-18.8	24.1	-42.9	EUT Horz
0.150	49.4	10.2	1.0	260.0	3.0	0.0	Perp to EUT	AV	-80.0	-20.4	24.1	-44.5	EUT Horz
0.150	60.2	10.2	1.0	166.0	3.0	0.0	Par to EUT	PK	-80.0	-9.6	44.1	-53.7	EUT Horz
0.150	58.5	10.2	1.0	202.0	3.0	0.0	Par to GND	PK	-80.0	-11.3	44.1	-55.4	EUT Horz
0.150	58.5	10.2	1.0	334.0	3.0	0.0	Perp to EUT	PK	-80.0	-11.3	44.1	-55.4	EUT Vert
0.149	57.5	10.2	1.0	260.0	3.0	0.0	Perp to EUT	PK	-80.0	-12.3	44.1	-56.4	EUT Horz
0.148	36.8	10.2	1.0	268.0	3.0	0.0	Perp to EUT	AV	-80.0	-33.0	24.2	-57.2	EUT on Side
0.148	36.8	10.2	1.0	38.0	3.0	0.0	Par to EUT	AV	-80.0	-33.0	24.2	-57.2	EUT on Side
0.148	36.7	10.2	1.0	119.0	3.0	0.0	Par to GND	AV	-80.0	-33.1	24.2	-57.3	EUT on Side
0.149	36.7	10.2	1.0	108.0	3.0	0.0	Par to EUT	AV	-80.0	-33.1	24.2	-57.3	EUT Vert
0.148	56.2	10.2	1.0	282.0	3.0	0.0	Par to GND	PK	-80.0	-13.6	44.2	-57.8	EUT Vert
0.150	50.5	10.2	1.0	119.0	3.0	0.0	Par to GND	PK	-80.0	-19.3	44.1	-63.4	EUT on Side
0.150	50.3	10.2	1.0	38.0	3.0	0.0	Par to EUT	PK	-80.0	-19.5	44.1	-63.6	EUT on Side
0.150	49.9	10.2	1.0	268.0	3.0	0.0	Perp to EUT	PK	-80.0	-19.9	44.1	-64.0	EUT on Side
0.150	49.6	10.2	1.0	108.0	3.0	0.0	Par to EUT	PK	-80.0	-20.2	44.1	-64.3	EUT Vert

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS (LESS THAN 30 MHz)



TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual 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 (where applicable) and polarization (per ANSI C63.10). A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity. The reference point of the loop antenna was maintained at 1m above the ground plane during the testing.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

- QP = Quasi-Peak Detector
- PK = Peak Detector
- AV = CISPR Average Detector

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

As outlined in 15.209(e), 15.31(f)(2), and RSS-GEN, 6.5, measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Antenna - Loop	EMCO	6502	AZB	2023-09-06	2025-09-06
Cable	Northwest EMC	3kHz - 1GHz RE Cables	OCB	2023-05-26	2024-05-26
Receiver	Rohde & Schwarz	ESCI	ARG	2023-08-31	2024-08-31

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.4 dB	-3.4 dB

FREQUENCY RANGE INVESTIGATED

9 kHz TO 30 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MASI0919-1

MODES INVESTIGATED

Inductive Charging at 150 kHz

SPURIOUS RADIATED EMISSIONS (LESS THAN 30 MHz)



EUT:	Masimo Wireless Charger	Work Order:	MASI0919
Serial Number:	ENG0001	Date:	2023-12-08
Customer:	Masimo Corporation	Temperature:	19.9°C
Attendees:	Anami Joshi	Relative Humidity:	55.3%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mb
Tested By:	Mark Baytan	Job Site:	OC08
Power:	110VAC/60Hz	Configuration:	MASI0919-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.209:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	3	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

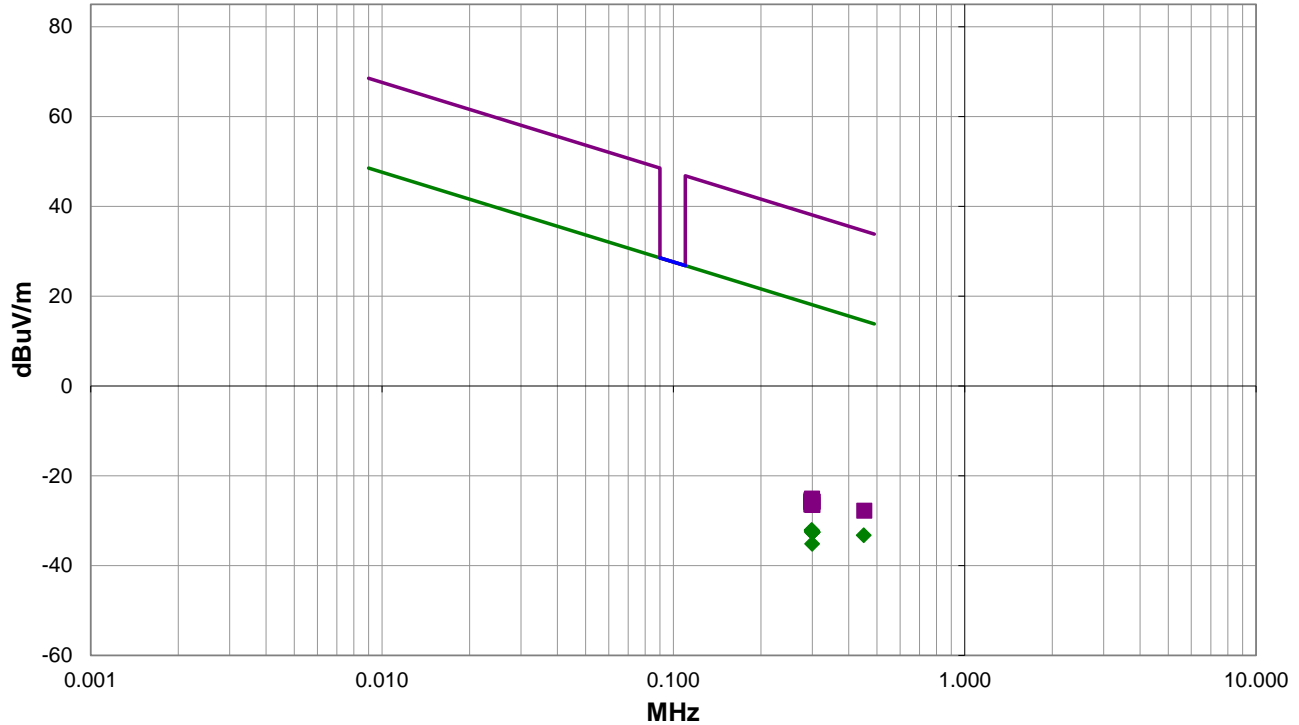
Max duty cycle set at 50%. Spacer added between Watch and Charger to increase charging power. Final values account for 40dB/decade distance adjustment factor due to measurements taken at a closer distance. 300m limit.

EUT OPERATING MODES

Inductive Charging at 150 kHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 3

■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS (LESS THAN 30 MHz)

RESULTS - Run #3

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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
0.450	36.6	10.1	1.0	126.0	3.0	0.0	Perp to EUT	AV	-80.0	-33.3	14.5	-47.8	EUT on Side
0.299	37.8	10.1	1.0	160.0	3.0	0.0	Perp to EUT	AV	-80.0	-32.1	18.1	-50.2	EUT on Side
0.299	37.6	10.1	1.0	219.0	3.0	0.0	Par to GND	AV	-80.0	-32.3	18.1	-50.4	EUT Horz
0.299	37.6	10.1	1.0	114.0	3.0	0.0	Par to GND	AV	-80.0	-32.3	18.1	-50.4	EUT Vert
0.300	37.5	10.1	1.0	71.0	3.0	0.0	Par to EUT	AV	-80.0	-32.4	18.1	-50.5	EUT on Side
0.299	37.4	10.1	1.0	210.0	3.0	0.0	Perp to EUT	AV	-80.0	-32.5	18.1	-50.6	EUT Horz
0.301	37.3	10.1	1.0	11.0	3.0	0.0	Par to EUT	AV	-80.0	-32.6	18.0	-50.6	EUT Vert
0.302	37.3	10.1	1.0	159.0	3.0	0.0	Par to GND	AV	-80.0	-32.6	18.0	-50.6	EUT on Side
0.300	37.2	10.1	1.0	155.0	3.0	0.0	Perp to EUT	AV	-80.0	-32.7	18.1	-50.8	EUT Vert
0.300	34.7	10.1	1.0	153.0	3.0	0.0	Par to EUT	AV	-80.0	-35.2	18.1	-53.3	EUT Horz
0.452	42.1	10.1	1.0	126.0	3.0	0.0	Perp to EUT	PK	-80.0	-27.8	34.5	-62.3	EUT on Side
0.299	44.8	10.1	1.0	219.0	3.0	0.0	Par to GND	PK	-80.0	-25.1	38.1	-63.2	EUT Horz
0.298	44.5	10.1	1.0	155.0	3.0	0.0	Perp to EUT	PK	-80.0	-25.4	38.1	-63.5	EUT Vert
0.298	44.2	10.1	1.0	210.0	3.0	0.0	Perp to EUT	PK	-80.0	-25.7	38.1	-63.8	EUT Horz
0.300	44.1	10.1	1.0	114.0	3.0	0.0	Par to GND	PK	-80.0	-25.8	38.1	-63.9	EUT Vert
0.301	44.1	10.1	1.0	160.0	3.0	0.0	Perp to EUT	PK	-80.0	-25.8	38.1	-63.9	EUT on Side
0.298	44.0	10.1	1.0	11.0	3.0	0.0	Par to EUT	PK	-80.0	-25.9	38.1	-64.0	EUT Vert
0.299	43.9	10.1	1.0	71.0	3.0	0.0	Par to EUT	PK	-80.0	-26.0	38.1	-64.1	EUT on Side
0.298	43.5	10.1	1.0	159.0	3.0	0.0	Par to GND	PK	-80.0	-26.4	38.1	-64.5	EUT on Side
0.300	43.4	10.1	1.0	153.0	3.0	0.0	Par to EUT	PK	-80.0	-26.5	38.1	-64.6	EUT Horz

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS (LESS THAN 30 MHz)



EUT:	Masimo Wireless Charger	Work Order:	MASI0919
Serial Number:	ENG0001	Date:	2023-12-08
Customer:	Masimo Corporation	Temperature:	19.9°C
Attendees:	Anami Joshi	Relative Humidity:	55.3%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mb
Tested By:	Mark Baytan	Job Site:	OC08
Power:	110VAC/60Hz	Configuration:	MASI0919-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.209:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	5	Test Distance (m):	3	Ant. Height(s) (m):	1(m)
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COMMENTS

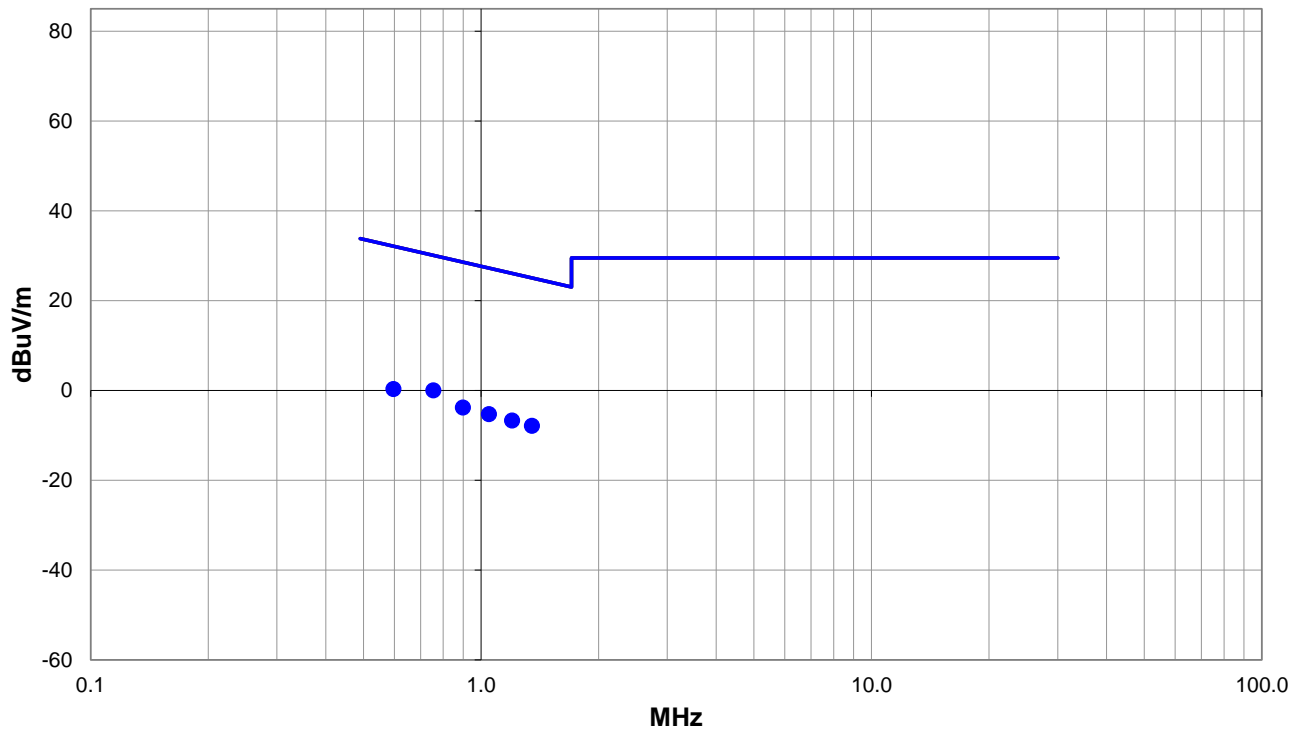
Max duty cycle set at 50%. Spacer added between Watch and Charger to increase charging power. Worst case condition: Loop antenna perpendicular to EUT, EUT on Side. Final values account for 40dB/decade distance adjustment factor due to measurements taken at a closer distance. 30m limit.

EUT OPERATING MODES

Inductive Charging at 150 kHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 5

■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS (LESS THAN 30 MHz)

RESULTS - Run #5

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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
0.755	29.7	10.3	1.0	67.0	3.0	0.0	Perp to EUT	QP	-40.0	0.0	30.1	-30.1	EUT on Side
0.596	30.1	10.2	1.0	149.0	3.0	0.0	Perp to EUT	QP	-40.0	0.3	32.1	-31.8	EUT on Side
0.898	25.9	10.3	1.0	55.0	3.0	0.0	Perp to EUT	QP	-40.0	-3.8	28.6	-32.4	EUT on Side
1.048	24.1	10.6	1.0	264.0	3.0	0.0	Perp to EUT	QP	-40.0	-5.3	27.2	-32.5	EUT on Side
1.200	22.8	10.5	1.0	89.0	3.0	0.0	Perp to EUT	QP	-40.0	-6.7	26.0	-32.7	EUT on Side
1.350	21.6	10.5	1.0	161.0	3.0	0.0	Perp to EUT	QP	-40.0	-7.9	25.0	-32.9	EUT on Side

CONCLUSION

Pass



Tested By

SPURIOUS RADIATED EMISSIONS (GREATER THAN 30 MHz)



TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level was detected. This required the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search was utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT. Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance was 3 meters or 10 meters (from antenna to boundary of EUT). At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna was increased so that the lowest point of the bottom of the antenna cleared the ground surface by at least 25 cm.

The EUT arrangement is configured as equivalent to that occurring in normal use. Tabletop equipment is placed on a 0.8 meter high non-conductive table & for Floor-standing equipment, it is placed on, but insulated from a ground reference plane by the use of its own rollers or stand-off supports. If measurements above 1 GHz were required, the test setup was modified to meet the regulatory requirements for higher frequency measurements. If required, RF absorber was placed on the floor between the measurement antenna and EUT. If required, per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables.

The diameter of the illumination area is the dimension of the line tangent to the EUT formed by 3 dB beamwidth of the measurement antenna at the measurement distance. At a 3 meter test distance, the diameter of the illumination area was 3.8 meters at 1 GHz and greater than 2.1 meters up to 6 GHz. Above 1 GHz, when required by the measurement standard, the antenna is pointed for both azimuth and elevation to maintain the receive antenna within the cone of radiation from the EUT. The specified measurement detectors were used for comparison of the emissions to the peak and average specification limits.

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Cable	Northwest EMC	3kHz - 1GHz RE Cables	OCB	2023-05-26	2024-05-26
Receiver	Rohde & Schwarz	ESCI	ARG	2023-08-31	2024-08-31
Amplifier - Pre-Amplifier	Miteq	AM-1551	AOX	2023-05-26	2024-05-26
Antenna - Biconilog	EMCO	3142B	AXK	2023-09-25	2025-09-25
Filter - Low Pass	Micro-Tronics	LPM50004	LFC	2023-09-07	2024-09-07

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	3.4 dB	-3.4 dB

FREQUENCY RANGE INVESTIGATED

30 MHz TO 1000 MHz

POWER INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MASI0919-1

MODES INVESTIGATED

Inductive Charging at 150 kHz

SPURIOUS RADIATED EMISSIONS (GREATER THAN 30 MHz)



EUT:	Masimo Wireless Charger	Work Order:	MASI0919
Serial Number:	ENG0001	Date:	2023-12-08
Customer:	Masimo Corporation	Temperature:	19.9°C
Attendees:	Anami Joshi	Relative Humidity:	55.3%
Customer Project:	None	Bar. Pressure (PMSL):	1016 mb
Tested By:	Mark Baytan	Job Site:	OC08
Power:	110VAC/60Hz	Configuration:	MASI0919-1

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.209:2023	ANSI C63.10:2013

TEST PARAMETERS

Run #:	6	Test Distance (m):	3	Ant. Height(s) (m):	1 to 4(m)
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COMMENTS

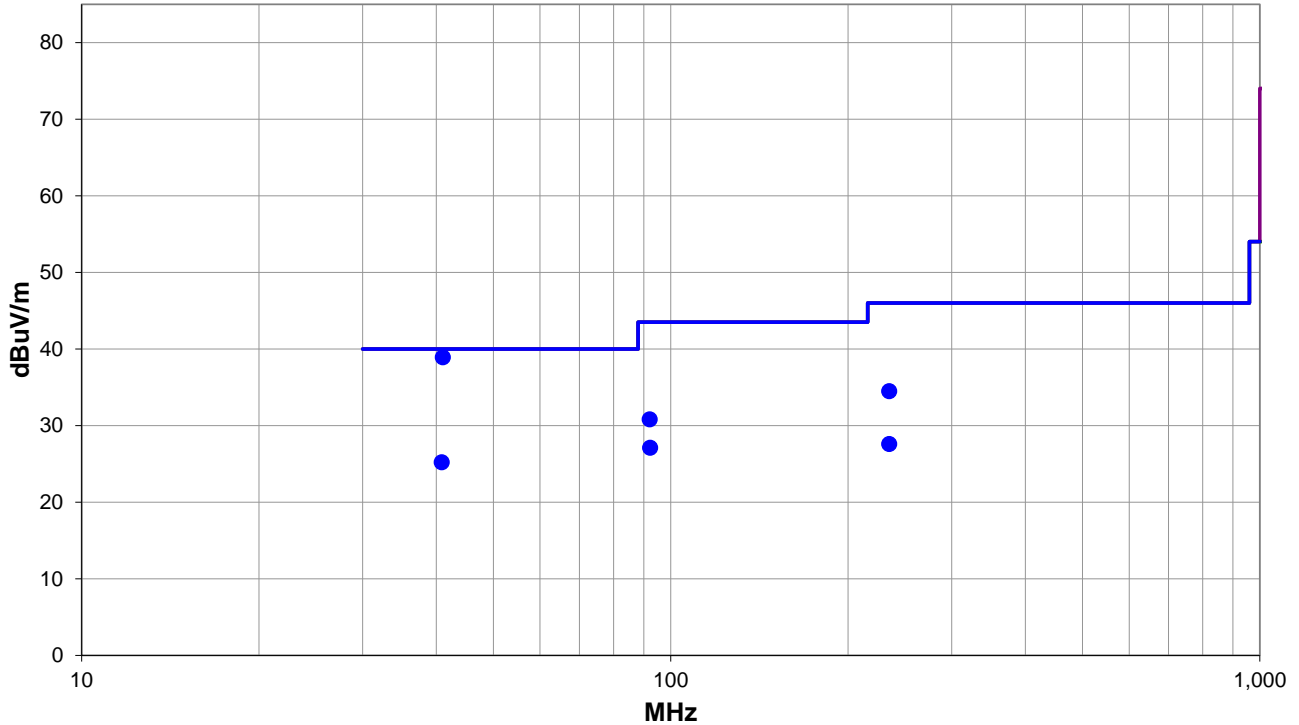
Max duty cycle set at 50%. Spacer added between Watch and Charger to increase charging power. Worst case EUT position: EUT on Side. 3m limit.

EUT OPERATING MODES

Inductive Charging at 150 kHz

DEVIATIONS FROM TEST STANDARD

None



Run #: 6

■ PK ◆ AV ● QP

SPURIOUS RADIATED EMISSIONS (GREATER THAN 30 MHz)



RESULTS - Run #6

Freq (MHz)	Amplitude (dBuV)	Factor (dB/m)	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)
41.042	61.5	-22.6	1.0	243.0	3.0	0.0	Vert	QP	0.0	38.9	40.0	-1.1
234.828	54.9	-20.4	1.19	89.0	3.0	0.0	Horz	QP	0.0	34.5	46.0	-11.5
92.095	56.8	-26.0	3.8	258.0	3.0	0.0	Horz	QP	0.0	30.8	43.5	-12.7
40.838	47.7	-22.5	3.8	295.0	3.0	0.0	Horz	QP	0.0	25.2	40.0	-14.8
92.253	53.1	-26.0	1.12	338.0	3.0	0.0	Vert	QP	0.0	27.1	43.5	-16.4
234.833	48.0	-20.4	1.77	175.0	3.0	0.0	Vert	QP	0.0	27.6	46.0	-18.4

CONCLUSION

Pass

Tested By

OCCUPIED BANDWIDTH (99%)



XMR 2023.02.14.0

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.	Cal. Due
Probe	Fischer Custom Communications	F-120-9	IIP	NCR	NCR
Cable	Micro-Coax	UFD150A-1-0720-200200	OCA	2023-12-29	2024-12-29
Analyzer - Spectrum Analyzer	Agilent	E4443A	AAR	2023-10-10	2024-10-10

TEST DESCRIPTION

When the occupied bandwidth limit is not stated in the applicable RSS or reference measurement method, the transmitted signal bandwidth shall be reported as the 99% emission bandwidth as defined in RSS-Gen.

The 99% occupied bandwidth was measured with the EUT configured for continuous modulated operation.


The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts.

The resolution bandwidth (RBW) of the spectrum analyzer was set to the range of 1% to 5% of the occupied bandwidth (OBW) and video bandwidth (VBW) bandwidth was set to at least 3 times the resolution bandwidth. The analyzer sweep time was set to auto to prevent video filtering or averaging. A sample detector was used unless the device was not able to be operated in a continuous transmit mode, in which case a peak detector was used.

OCCUPIED BANDWIDTH (99%)



XMI: 2023.02.14.0

EUT: Masimo Wireless Charger		Work Order: MASI0919	
Serial Number: ENG0001		Date: 01/09/2024	
Customer: Masimo Corporation		Temperature: 20.8°C	
Attendees: Anami Joshi		Humidity: 30%	
Project: None		Barometric Pres.: 1024 mbar	
Tested by: Mark Baytan		Power: 110VAC/60Hz	
		Job Site: OC13	
TEST SPECIFICATIONS			
RSS-Gen Issue 5:2018+A1:2019+A2:2021		Test Method	
		ANSI C63.10:2013	
COMMENTS			
Max duty cycle set at 50%.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	MASI0919-1	Signature 	
		Value (kHz)	Limit
		92.2513	N/A
			Result
			N/A

Inductive Charging 150 kHz

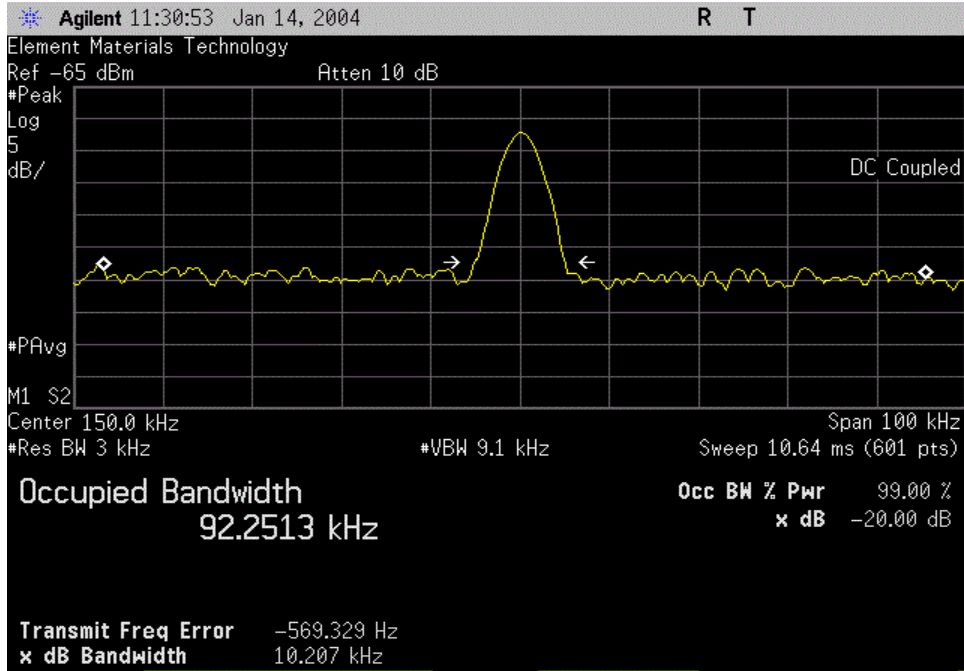
Value (kHz) Limit Result
92.2513 N/A N/A

OCCUPIED BANDWIDTH (99%)



XMI 2023.02.14.0

Inductive Charging 150 kHz				Value	Limit	Result
				(kHz)		
				92.2513	N/A	N/A



End of Test Report