

Masimo Corporation

AIR01 Technology Board

FCC 15.247:2018

Bluetooth Low Energy (DTS) Radio

Report # MASI0520.2 Rev. 1







NVLAP LAB CODE: 200676-0

CERTIFICATE OF TEST



Last Date of Test: November 30, 2018
Masimo Corporation
Model: AIR01 Technology Board

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2018	ANSI C63.10:2013

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not required for a battery powered EUT.
11.6	Duty Cycle	Yes	Pass	
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.1.1	Output Power	Yes	Pass	
11.9.1.1	Equivalent Isotropic Radiated Power	Yes	Pass	
11.10.2	Power Spectral Density	Yes	Pass	
11.11	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	
11.12.1, 11.13.2, 6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:

Victor Ratinoff, 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.

REVISION HISTORY



Revision Number	Description	Date (yyyy-mm-dd)	Page Number
01	Spurious Radiated Emissions: - reformatted so test description is not cut off - duty cycle correction factor needs to be applied to the average measurements that are temporally related to the fundamental. The duty cycle measurement indicates that the EUT operated at a 93% duty cycle.	2019-11-24	23 and 24
	Added output power module based upon the EIRP values. The reported antenna gain for the radio is 1 dBi.	2019-11-24	43-47
	Added output power to certificate of test and modifications pages	2019-11-24	2 and 10

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 - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with ISED.

European Union

European Commission - Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

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: https://www.nwemc.com/emc-testing-accreditations

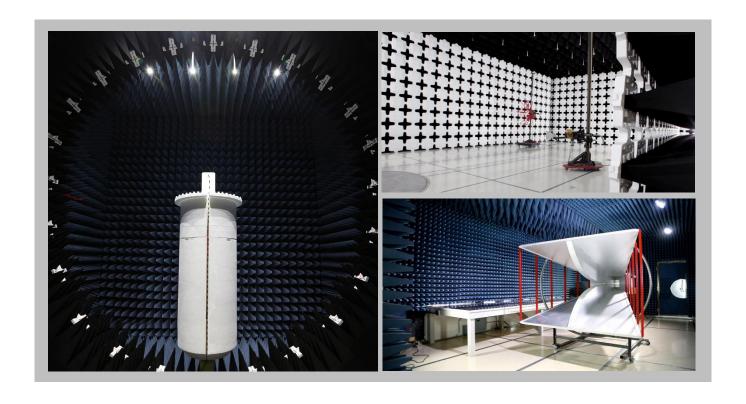
FACILITIES







		_	_	_		
California	Minnesota	New York	Oregon	Texas	Washington	
Labs OC01-17	Labs MN01-10	Labs NY01-04	Labs EV01-12	Labs TX01-09	Labs NC01-05	
41 Tesla	9349 W Broadway Ave.	4939 Jordan Rd.	6775 NE Evergreen Pkwy #400	3801 E Plano Pkwy	19201 120 th Ave NE	
Irvine, CA 92618	Brooklyn Park, MN 55445	Elbridge, NY 13060	Hillsboro, OR 97124	Plano, TX 75074	Bothell, WA 98011	
(949) 861-8918	(612)-638-5136	(315) 554-8214	(503) 844-4066	(469) 304-5255	(425)984-6600	
		NV	LAP			
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0	
	Innovation, Science and Economic Development Canada					
2834B-1, 2834B-3	2834E-1, 2834E-3	N/A	2834D-1, 2834D-2	2834G-1	2834F-1	
		BS	МІ			
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R	
		VC	CI			
A-0029	A-0109	N/A	A-0108	A-0201	A-0110	
	Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157	



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 included as part of the applicable test description page. 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.

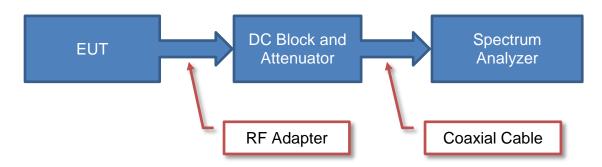
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 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)	2.4 dB	-2.4 dB

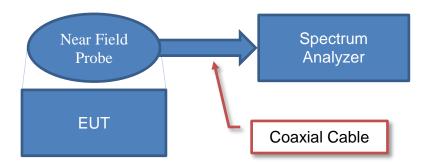
Test Setup Block Diagrams



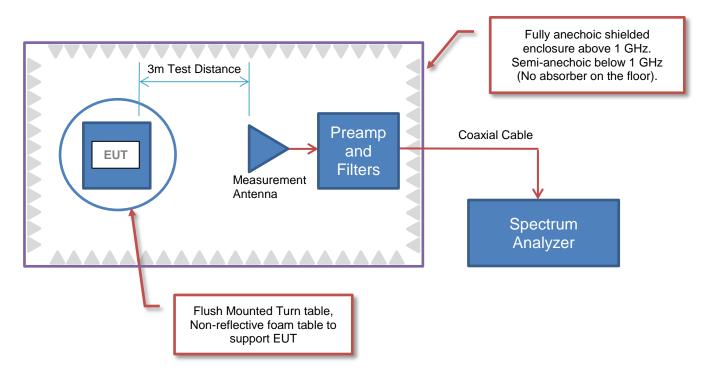
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



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
Model:	AIR01 Technology Board
First Date of Test:	November 29, 2018
Last Date of Test:	November 30, 2018
Receipt Date of Samples:	November 29, 2018
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

AIR01 Technology Board snaps on to sensor (no cable). This assembly of AIR01 Technology Board and sensor is battery powered. This assembly connects to AIR01 Receiver over Bluetooth LE. AIR01 Receiver has a cable (less than 0.3 m) that connects to the patient port of Rad-97.

Testing Objective:

To demonstrate compliance of the Bluetooth low energy (DTS) radio to FCC 15.247 requirements.

Channels	Power Setting	Data Rate	Modulation
Low	+8 dBm	1 Mbps	GFSK
Middle	+8 dBm	1 Mbps	GFSK
High	+8 dBm	1 Mbps	GFSK

CONFIGURATIONS



Configuration MASI0520-1

Software/Firmware Running during test			
Description	Version		
AIR01 Technology Board	V0001		

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
AIR01 Technology Board	Masimo Corporation	P/N 26842 Rev. A	ENG-R-1

Peripherals in test setup boundary				
Description Manufacturer Model/Part Number Serial Number				
Laptop (HP)	HP	X3U21AV	5CG8271JH4	
Power supply	HP	TPN-CA06	None	

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
USB Cable	No	2m	No	AIR01 Technology Board	Laptop (HP)
AC cable	No	.5m	No	AC Mains	Power supply
DC Cable	No	2m	No	Power supply	Laptop (HP)

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
			Tested as	No EMI suppression	EUT remained at
1	1 2018-11-29	Duty Cycle	delivered to	devices were added or	Element following
			Test Station.	modified during this test.	the test.
		Occupied	Tested as	No EMI suppression	EUT remained at
2	2018-11-29	Bandwidth	delivered to	devices were added or	Element following
		Danawidin	Test Station.	modified during this test.	the test.
		Spurious Radiated	Tested as	No EMI suppression	EUT remained at
3	2018-11-29	Emissions	delivered to	devices were added or	Element following
			Test Station.	modified during this test.	the test.
		Equivalent	Tested as	No EMI suppression	EUT remained at
4	2018-11-30	Isotropic Radiated	delivered to	devices were added or	Element following
		Power	Test Station.	modified during this test.	the test.
		Power Spectral Density	Tested as	No EMI suppression	EUT remained at
5	2018-11-30		delivered to	devices were added or	Element following
			Test Station.	modified during this test.	the test.
	Band Edge	Tested as	No EMI suppression	EUT remained at	
6	2018-11-30		delivered to	devices were added or	Element following
		Compliance	Test Station.	modified during this test.	the test.
		Spurious	Tested as	No EMI suppression	EUT remained at
7	2018-11-30	Conducted	delivered to	devices were added or	Element following
		Emissions	Test Station.	modified during this test.	the test.
			Tested as	No EMI suppression	Scheduled testing
8	2018-11-30	018-11-30 Output Power	delivered to	devices were added or	
-			Test Station.	modified during this test.	was completed.



XMit 2017.12.13

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
Attenuator	Fairview Microwave	SA18H-20	TKQ	12-Jul-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	6-Sep-18	6-Sep-19
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	6-Sep-18	6-Sep-19
Antenna - Double Ridge	EMCO	3115	AHB	28-Mar-18	28-Mar-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	13-Jun-18	13-Jun-19

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power. The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

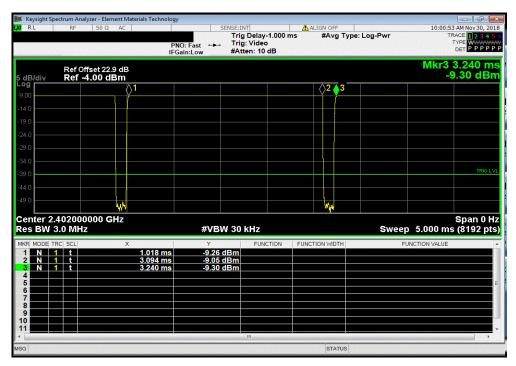
The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, burst gating may have been used during some of the other tests in this report to only take the measurement during the burst duration.

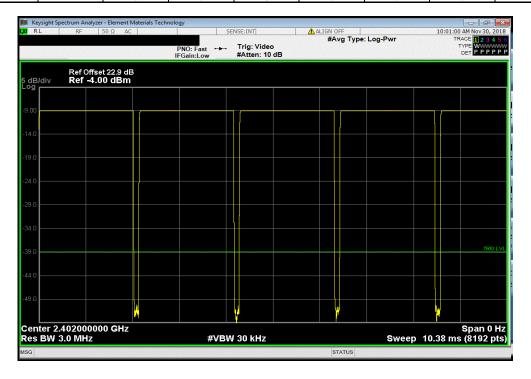


EUT: AIR01 Technology Board
Serial Number: ENG-R-1
Customer: Masimo Corporation
Attendees: Nghi Nguyen
Project: None
Tested by: Salvador Solorzano
TEST SPECIFICATIONS Work Order: MASI0520
Date: 29-Nov-18
Temperature: 20.3 °C Humidity: 56.4% RH
Barometric Pres.: 1017 mbar Power: USB via 110VAC/60Hz Test Method Job Site: OC10 FCC 15.247:2018 COMMENTS Total offset accounts for Antenna Gain, Cable Loss, 20dB Attenuator, and Pre-Amp Gain. Low Ch - 22.9dB, Mid Ch - 22.9dB, & High Ch - 23.1dB EUT Worst Case Orientation = Horizontal DEVIATIONS FROM TEST STANDARD Configuration # Signature (%) 93.4 Number of Pulses Pulse Width Results Period **(%)** N/A BLE/GFSK Low Channel, 2402 MHz N/A N/A N/A BLE/GFSK Low Channel, 2402 MHz BLE/GFSK Mid Channel, 2440 MHz N/A 2.224 ms N/A N/A N/A N/A N/A N/A 2.078 ms 93.4 BLE/GFSK Mid Channel, 2440 MHz N/A N/A 5 N/A BLE/GFSK High Channel, 2480 MHz 2.080 ms 2.234 ms 93.1 N/A BLE/GFSK High Channel, 2480 MHz N/A N/A N/A N/A

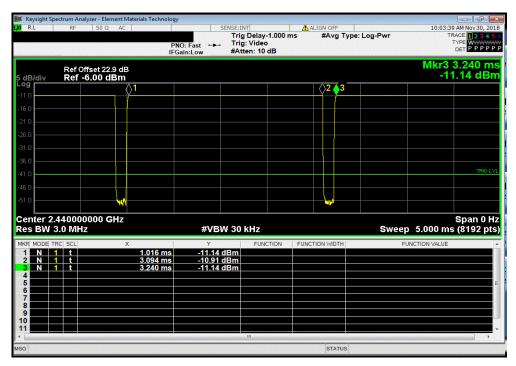




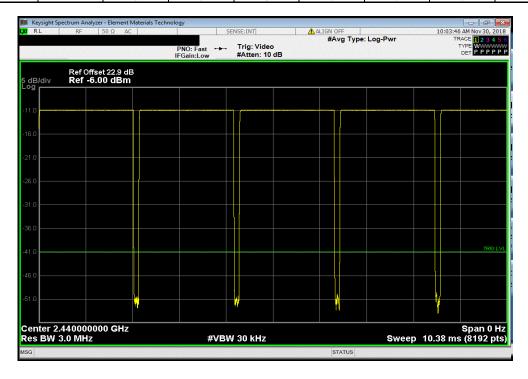
BLE/GFSK Low Channel, 2402 MHz							
			Number of	Value	Limit		
	Pulse Width	Period	Pulses	(%)	(%)	Results	
	N/A	N/A	5	N/A	N/A	N/A	



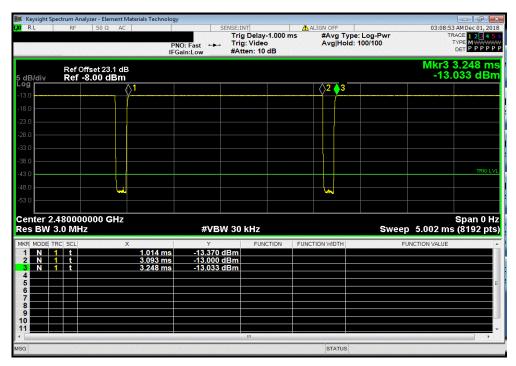




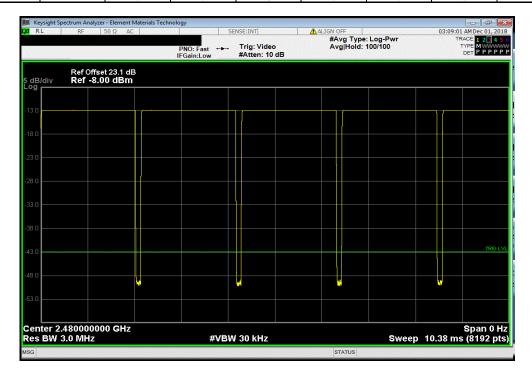
	BLE/GFSK Mid Channel, 2440 MHz							
				Number of	Value	Limit		
_		Pulse Width	Period	Pulses	(%)	(%)	Results	
ĺ		N/A	N/A	5	N/A	N/A	N/A	







	BLE/GFSK High Channel, 2480 MHz							
				Number of	Value	Limit		
		Pulse Width	Period	Pulses	(%)	(%)	Results	
ı		N/A	N/A	5	N/A	N/A	N/A	





XMit 2017.12.13

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	D	Last Cal.	Cal. Due
Attenuator	Fairview Microwave	SA18H-20	TKQ	12-Jul-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	6-Sep-18	6-Sep-19
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	6-Sep-18	6-Sep-19
Antenna - Double Ridge	EMCO	3115	AHB	28-Mar-18	28-Mar-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	13-Jun-18	13-Jun-19

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power. The EUT was set to the channels and modes listed in the datasheet.

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.



						TbtTx 2018.09.13	XMit 2017.12.13			
EUT:	AIR01 Technology Board	d			Work Order:	MASI0520				
Serial Number:	ENG-R-1				Date: 29-Nov-18					
Customer:	Masimo Corporation			Temperature: 20.3 °C						
Attendees:	Nghi Nguyen				Humidity: 56.4% RH					
Project:	None				Barometric Pres.:					
Tested by:	Salvador Solorzano		Power:	USB via 110VAC/60Hz	Job Site:	OC10				
TEST SPECIFICATI	IONS			Test Method						
FCC 15.247:2018				ANSI C63.10:2013						
COMMENTS										
Total offset accour	nts for Antenna Gain, Cab	le Loss, 20dB Attenuator, and Pre-Am	p Gain. Low Ch - 2	2.9dB, Mid Ch - 22.9dB, & High Ch - 2	23.1dB					
EUT Worst Case O	rientation = Horizontal		•	, , ,						
DEVIATIONS FROM	M TEST STANDARD									
None										
Configuration #	1	Signature	ME.	5						
		_		_	<u> </u>	Limit				
					Value	(≥)	Result			
BLE/GFSK Low Cha	annel, 2402 MHz	_		_	703.808 kHz	500 kHz	Pass			
BLE/GFSK Mid Cha	nnel, 2440 MHz				697.815 kHz	500 kHz	Pass			
BLE/GFSK High Cha	annel, 2480 MHz		715.389 kHz	500 kHz	Pass					

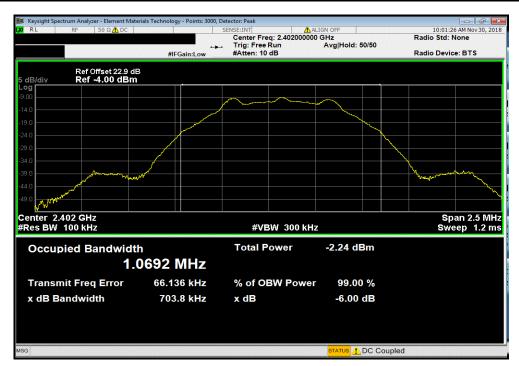


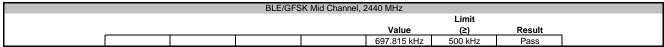
BLE/GFSK Low Channel, 2402 MHz

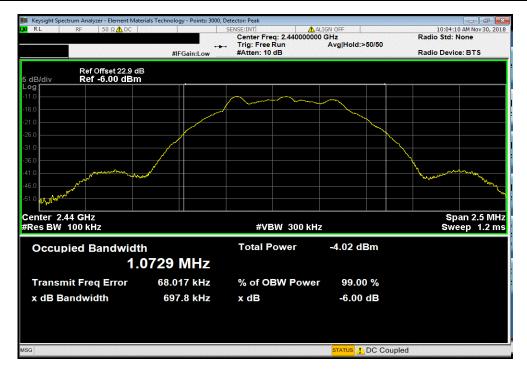
Limit

Value (2) Result

703.808 kHz 500 kHz Pass







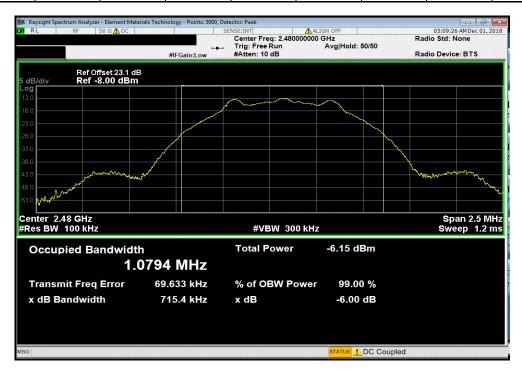


BLE/GFSK High Channel, 2480 MHz

Limit

Value (≥) Result

715.389 kHz 500 kHz Pass



EQUIVALENT ISOTROPIC RADIATED POWER



PSA-ESCI 2018.07.2

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

MODES OF OPERATION

Transmitting at 2402 MHz, 2440 MHz, & 2480 MHz

POWER SETTINGS INVESTIGATED

USB via 110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MASI0520 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 2400 MHz	Stop Frequency	2483.5 MHz
Start i requericy (2400 Miliz	Otop i requeries	2703.3 WI IZ

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
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	20-Nov-2018	12 mo
Attenuator	Fairview Microwave	SA18H-20	TKQ	12-Jul-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	6-Sep-2018	12 mo
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	6-Sep-2018	12 mo
Antenna - Double Ridge	EMCO	3115	AHB	28-Mar-2018	24 mo

TEST DESCRIPTION

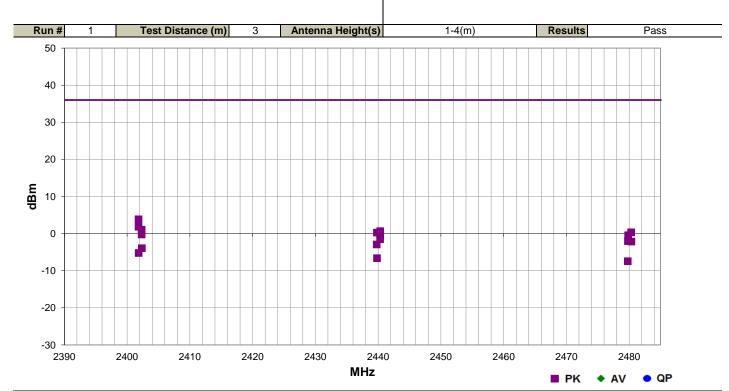
The peak output power was measured with the EUT set to low, medium and high transmit frequencies. A field strength measurement was made of the fundamental with the carrier fully maximized for its highest radiated power.

The final data was converted from field strength to a radiated power value using equations found in ANSI C63.10:2013 Annex G.2

EQUIVALENT ISOTROPIC RADIATED POWER



				EmiR5 2018.09.26 PSA-ESCI 2018.07.27								
Work Order:	MASI0520	Date:	30-Nov-2018	Men								
Project:	None	Temperature:	20.3 °C	All Sin								
Job Site:	OC10	Humidity:	54% RH									
Serial Number:	ENG-R-1	Barometric Pres.:	1013 mbar	Tested by: Salvador Solorzano								
EUT:	AIR01 Technology Board	d										
Configuration:	1											
Customer:	Masimo Corporation											
Attendees:	Nghi Nguyen	jhi Nguyen										
EUT Power:	USB via 110VAC/60Hz	SB via 110VAC/60Hz										
Operating Mode:	ransmitting at 2402 MHz, 2440 MHz, & 2480 MHz											
Deviations:	None											
Comments:	None											
Test Specifications			Test Meth	hod								
FCC 15.247:2018			ANSI C63									
1 00 10.2 17.2010			711101 000	5.10.2010								



Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
2401.817	1.5	255.0	Horz	PK	2.44E-03	3.9	36.0	-32.1	Low Ch, EUT Horz
2401.817	1.5	189.0	Vert	PK	1.54E-03	1.9	36.0	-34.1	Low CH, EUT Vert
2402.317	1.5	174.0	Horz	PK	1.28E-03	1.1	36.0	-34.9	Low Ch, EUT on Side
2440.333	1.5	75.0	Vert	PK	1.17E-03	0.7	36.0	-35.3	Mid Ch, EUT on Side
2480.333	1.5	317.0	Vert	PK	1.09E-03	0.4	36.0	-35.6	High Ch, EUT Vert
2439.808	1.5	267.0	Horz	PK	1.06E-03	0.3	36.0	-35.7	Mid Ch, EUT Horz
2402.317	1.5	288.0	Vert	PK	9.49E-04	-0.2	36.0	-36.2	Low Ch, EUT on Side
2440.333	1.5	104.0	Vert	PK	9.06E-04	-0.4	36.0	-36.4	Mid Ch, EUT Vert
2479.858	1.5	266.0	Horz	PK	9.06E-04	-0.4	36.0	-36.4	High Ch, EUT Horz
2479.842	1.5	116.0	Vert	PK	8.85E-04	-0.5	36.0	-36.5	High CH, EUT on Side
2440.325	1.5	135.0	Horz	PK	7.03E-04	-1.5	36.0	-37.5	Mid Ch, EUT on Side

Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
2479.808	1.5	163.0	Horz	PK	6.27E-04	-2.0	36.0	-38.0	High CH, EUT on Side
2480.350	1.5	164.0	Horz	PK	6.13E-04	-2.1	36.0	-38.1	High Ch, EUT Vert
2439.767	1.5	164.0	Horz	PK	5.09E-04	-2.9	36.0	-38.9	Mid Ch, EUT Vert
2402.350	1.5	162.0	Horz	PK	4.05E-04	-3.9	36.0	-39.9	Low CH, EUT Vert
2401.833	1.5	157.0	Vert	PK	3.00E-04	-5.2	36.0	-41.2	Low Ch, EUT Horz
2439.817	1.5	162.0	Vert	PK	2.17E-04	-6.6	36.0	-42.6	Mid Ch, EUT Horz
2479.775	1.5	270.0	Vert	PK	1.81E-04	-7.4	36.0	-43.4	High Ch, EUT Horz

OUTPUT POWER



PSA-ESCI 2018 07 2

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

MODES OF OPERATION

Transmitting at 2402 MHz, 2440 MHz, & 2480 MHz

POWER SETTINGS INVESTIGATED

USB via 110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MASI0520 - 1

FREQUENCY RANGE INVESTIGATED

3	Start Frequency 2	2400 MHz	Stop Fr	eauenc	/	2483.5 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
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	20-Nov-2018	12 mo
Attenuator	Fairview Microwave	SA18H-20	TKQ	12-Jul-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	6-Sep-2018	12 mo
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	6-Sep-2018	12 mo
Antenna - Double Ridge	EMCO	3115	AHB	28-Mar-2018	24 mo

TEST DESCRIPTION

The peak output power was measured with the EUT set to low, medium and high transmit frequencies. A field strength measurement was made of the fundamental with the carrier fully maximized for its highest radiated power.

The final data was converted from field strength to a radiated power value using equations found in ANSI C63.10:2013 Annex G.2

OUTPUT POWER



14/-																																EmiR5	2010.0	09.26					PSA-	
VVC	ork	Orde	r:	N	ЛASI	052	0.						D	ate:		30-	No۱	/-20′	18						10	_	_		-			-		2						
		rojec			No						Ter			ure:				O° l							1	-	=			_		>								
		b Site			OC	10								lity:				RH										<	_											
Seria	ıl Nı	umbei			ENG-					Barc	ome	etri	c Pr	es.:		10)13	mba	r				Te	este	d by	:					Sa	vad	lore	Sc	olor	rzar	10			
			: AIF	01	[ech	nolo	ogy E	Boar	d																															
		ration																																						
		tome					atior	1																																
		ndees																																						
El	UT I	Power																																						
Operat	ina	Mode	Tra	nsm	itting	at :	2402	2 MF	Hz, 2	2440) M	lHz,	& 2	480	MH:	Z																								
Operat	9	mode																																						
D	evi	ations	. No	ne																																				
_	•																																							
			No	ne																																				
C	om	ments	5 :																																					
Test Spec	ific	ations	3															Tes	Me	tho	d																			
FCC 15.24	17:2	018																ANS	I Ce	33.10	0:20	13																		
				_				<i>1.</i> `		_			A				<i>(</i> ,)							4 .	()						_	_						_		
Run #		1		Te	st Di	sta	nce	(m)		3		- 4	Ante	enna	Hei	ght	(s)							1-4	(m)							Re	sul	Its				Pa	SS	
50 7				_				1			_		_					1			_			_					_			_	_	_					1	
40 -				+					-	+	+	+	+			-			-	-				-	-	\vdash		-	+			_		+	+	+			-	
30 -				+			_		_	+	+	+	_			+			_	_	+			_	_			_	+			_		+	+	+			+	
20 -				+					_	+	+	+	+						\rightarrow	_				_	_			_	+						+	+			1	
Ε																																								
ш 10 -										+	+	+	+						_					-	-			-							+	+			1	
•																																								
					L															⊥																	L			
0 -				ļ					_			_								-				+	+											\perp	•			
0 -																				7				+													6			
					<u> </u>															5																				
0 - -10 -					-															7																				
					•															3																	•		-	
-10 -					P															7																			_	
																				3																			_	
-10 -					•															7																				
-10 - -20 -					•															-																			-	
-10 - -20 - -30 -	90		2	400			24	110			2	2420	0			2430	0			2440)			245	0			2460)			2470)			24	180			
-10 - -20 - -30 -	90		2	400			24	110			2	22420	0			2430))			245	0			2460)											
-10 - -20 - -30 -	90		2	400			24	110			2	2420	0			2430)		:: tHIM)			245	0			2460)) Pł	K	•	24 AV		•	QP	
-10 - -20 - -30 -	990		2	400			24	1110	P	olaritu		2420	0			2430))			245	0			2460)					K	•			•	QP	
-10 - -20 - -30 -									Tra	olarity	y/ cer)		ИΗ	z									Com	pared				K	•	A	V		QP	
-10 - -20 - -30 -		Freq	Ante	nna He			zimuth	n	Tra		y/ cer		Detec	ttor		EIRP		E	VIH	z	Anten	na Gai	in	Output	Power	r S	pec. L	imit	Com	Spec.				K	•	A			QP	
-10 - -20 - -30 -		Freq (MHz)	Ante					n	Tra	nsdu	y/ cer			ttor				E	ИΗ	z	Anten	na Gain BB - cracted)		Output		, Sp		imit	Com					K	•	A	V		QP	
-10 - -20 - -30 -	(Antei	nna He		(d	zimuth	n s)	Tra	nsdu	y/ cer				(1)	EIRP)	E (d	VIH	z	Anten (c	iB -		Output (dE	Power	r Si	pec. L	.imit n)	Com	Spec.	to	.ow C	PI Ch, E	EUT	Hor	Con	V		QP	
-10 - -20 - -30 -	24	(MHz) 401.817 401.817	Antei (ı	1.5		(d	zimuth egrees 255.0	n s)	Tra	Type Horz Vert	y/ cer		Detection PK	[2.4	EIRP Watts 4E-) 03	E (d	IRP Bm) 3.9	z	Anten (d subt	dB - racted) I.0		Output (dE	Power sm)	r Si	pec. L (dBn 30.	Limit h)	Com	(dB) 27.1 29.1	to	.ow O	Ch, E	EUT EUT	- Ног Г Ve	Con	mme		QP	
-10 - -20 - -30 -	24 24 24	(MHz) 401.817 401.817 402.317	Antei (ı	1.5 1.5 1.5		(d 2 1	zimuth egrees 255.0 189.0	1 (5)	Tra	Type Horz Vert	y/ cer		Detection PK	[[2.4 1.5 1.2	EIRP Watts 4E-) 03 03 03	(d	IRP Bm) 3.9 1.9	z	Anten (c subt	AB - racted) 1.0 1.0		Output (dE	Power 3m)	r S	pec. L (dBn 30. 30.	Limit h) 0 0	Com	27.1 29.1 29.9	to L	.ow (0	Ch, E	EUT EUT	Hor T Ve	Coo	mme		QP	
-10 - -20 - -30 -	24 24 24 24	(MHz) 401.817 401.817 402.317 440.333	Ante:	1.5 1.5 1.5		(d	zimuth egrees 255.0 189.0 174.0 75.0	n s)	Tra	Horz Vert Vert Vert	y/ cer		PK PK PK PK	[[[2.4 1.5 1.2	EIRP Watts 4E- 64E- 7E-) 03 03 03 03	(d	IRP Bm) 3.9 1.9 1.1	z	Anten (c subt	B - racted) 1.0 1.0 1.0		Output (dE 2 0 0	Power 3m) .9 .9 .1 .1 .3	r Si	30. 30. 30. 30.	imit h) 0 0 0	Com	27.1 29.1 29.3 30.3	to L	ow Cow Cow Cow Cow Cow Cow Cow Cow Cow C	Ch, E Ch, E Ch, E	EUT EUT EUT	Hor ΓVe on s	Con rz ert Side	mme		QP	
-10 - -20 - -30 -	24 24 24 24 24	(MHz) 401.817 401.817 402.317	Antei (i	1.5 1.5 1.5		(d 2 1 1	zimuth egrees 255.0 189.0	n (s)	Tra	Type Horz Vert	y/ cer		Detection PK		2.4 1.5 1.2 1.1	EIRP Watts 4E-) 03 03 03 03 03	(d	IRP Bm) 3.9 1.9	z	Anten (c subt	AB - racted) 1.0 1.0		Output (dE 2 0 0 -0	Power 3m)	r Si	pec. L (dBn 30. 30.	imit h) 0 0 0 0	Com	27.1 29.1 29.9	to L	.ow (0	Ch, E Ch, E Ch, E Ch, E	EUT EUT EUT	- Hor ΓVe - on on S	Con rz ert Side Side	mme		QP	
-10 - -20 - -30 -	24 24 24 24 24 24 24	401.817 401.817 402.317 440.333 480.333 439.808 402.317	Anteid (i	1.5 1.5 1.5 1.5 1.5 1.5		(d 1 1 3 2	zimuth egrees 255.0 189.0 174.0 75.0 317.0 267.0 288.0	1 (1)	Tra	Horz Vert Vert Vert Vert Vert Vert	yy/ ccer		PK PK PK PK PK PK PK		2.4 1.5 1.2 1.1 1.0 9.4	EIRP Watts 44E-1 64E-1 7E-1 99E-1 196E-1) 03 03 03 03 03 03 03	(d	IRP Bm) 3.9 1.9 1.1 0.7 0.4 0.3 0.2	z	Anten (d subti	B - racted) 1.0 1.0 1.0 1.0 1.0		2 0 0 -0 -0 -0	Power 3m) .9 .9 .1 .3 .6 .7 .2	r Sp	30. 30. 30. 30. 30. 30. 30.	imit 0 0 0 0 0 0 0 0	Com	27.1 29.1 29.9 30.3 30.6 30.7 31.2	LLLI	ow Cow Cow Cow Cow Cow Cow Cow Cow Cow C	PI Ch, E Ch, E Ch, E	EUT EUT EUT EUT	Horon	Colorization Color	mme		QP	
-10 - -20 - -30 -	24 24 24 24 24 24 24 24	(MHz) 401.817 401.817 402.317 440.333 480.333 439.808 402.317 440.333	Antei (i	1.5 1.5 1.5 1.5 1.5 1.5 1.5		(d	zimuth egrees 255.0 189.0 174.0 75.0 317.0 267.0 288.0 104.0	1	Tra	Horz Vert Horz Vert Vert Vert Vert Vert	y/ ccer		Pk Pk Pk Pk Pk Pk Pk		2.4 1.5 1.2 1.1 1.0 9.4 9.0	EIRP Watts 44E-1 7E-1 99E-1 96E-1) 03 03 03 03 03 03 04 04	(d	IRP Bm) 3.9 1.9 1.1 0.7 0.4 0.3 0.2	z	Anten (d subti	BB - racted) 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0		2 0 0 -0 -0 -1	Power 3m) .9 .9 .1 .3 .6 .7 .2	r S	30. 30. 30. 30. 30. 30. 30. 30.	(imit h) 0 0 0 0 0 0	Com	27.1 29.1 29.9 30.3 30.6 30.7 31.2	I I I I I I I I I I I I I I I I I I I	ow (Cow (Cow (Mid Cow	Ph Ch, E Ch, E Ch, E Ch, E	EUT EUT EUT EUT EUT EUT	Horon S	Cool rz rrt Side Side ert rz Side t	mme		QP	
-10 - -20 - -30 -	24 24 24 24 24 24 24 24 24 24	(MHz) 401.817 401.817 402.317 440.333 480.333 439.808 402.317 440.333 479.858	Antei (i	1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5		(d	255.0 189.0 174.0 75.0 317.0 267.0 288.0 104.0 266.0	1	Tra	Horz Vert Vert Vert Vert Vert Vert Vert	cer		Pk Pk Pk Pk Pk Pk Pk Pk		2.4 1.5 1.2 1.1 1.0 1.0 9.4 9.0	EIRP Watts 44E-1 64E-1 99E-1 96E-1 96E-1))))))))))))))	(d	IRP Bm) 3.9 1.9 1.1 0.7 0.4 0.3 0.2 0.4 0.4	z	Anten ((c subti	BB - racted) 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0		Output (dE 2 0 0 -0 -0 -1 -1	Power 3m) .9 .9 .1 .3 .6 .7 .2 .4	r Si	30. 30. 30. 30. 30. 30. 30. 30. 30.	imit 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Com	27.1 29.1 29.9 30.3 30.6 30.7 31.2 31.4	L L L I I I I I I I I I I I I I I I I I	ow (cow (did Cow (did	Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E	EUT EUT EUT EUT EUT EUT EUT	T Hone on Structure on Structur	Cool rz rz rt Side Side ert z Side t t rz	mme		QP	
-10 - -20 - -30 -	24 24 24 24 24 24 24 24 24 24 24 24	(MHz) 401.817 401.817 402.317 440.333 480.333 439.808 402.317 440.333 479.858 479.842	Anter (I	1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5		(d 1 1 3 2 2 1	255.0 189.0 174.0 775.0 288.0 104.0 266.0 116.0	1	Tra	Horz Vert Horz Vert Vert Vert Vert Vert Vert Vert	ccer		PK PK PK PK PK PK PK PK PK		2.4 1.5 1.2 1.1 1.0 1.0 9.4 9.0 8.8	EIRP Watts 44E-1 44E-1 98E-1 99E-1 96E-1 96E-1))))))))))))))	EE ((d)	IRP Bm) 3.9 1.1 0.7 0.4 0.3 0.2 0.4 0.4 0.5	z	Anten (c subti	BB - racted) 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0		22 2 0 0 -0 -0 -1 -1 -1 -1 -1 -1	Power mm) 9 9 9 1.1 1.3 1.6 1.7 1.2 1.4 1.4 1.5	r Si	30. 30. 30. 30. 30. 30. 30. 30. 30. 30.	00000000000000000000000000000000000000	Com	27.1 29.1 29.9 30.3 30.6 30.7 31.2 31.4 31.5	L L L L L L L L L L L L L L L L L L L	ow (cow (down))	Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E	EUT EUT EUT EUT EUT EUT EUT	T Ve on S T Ve Hor on Ver T Ho	Contraction of the contraction o	mme		QP	
-10 - -20 - -30 -	24 24 24 24 24 24 24 24 24 24 24 24	(MHz) 401.817 401.817 402.317 440.333 480.333 439.808 402.317 440.333 479.858	Antei (i	1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5		(d 1 1 3 2 2 1 1	255.0 189.0 174.0 75.0 317.0 267.0 288.0 104.0 266.0	1 1 1 1 1	Tra	Horz Vert Vert Vert Vert Vert Vert Vert	yy/ ccer		Pk Pk Pk Pk Pk Pk Pk Pk		2.4 1.5 1.2 1.1.1 1.0 9.4 9.0 9.0 8.8 7.0	EIRP Watts 44E-1 64E-1 99E-1 96E-1 96E-1))))))))))))))	E ((d)	IRP Bm) 3.9 1.9 1.1 0.7 0.4 0.3 0.2 0.4 0.4	z	Anten (((BB - racted) 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0		22 0 0 0 -0 -0 -1 -1 -1 -1 -2	Power 3m) .9 .9 .1 .3 .6 .7 .2 .4	r Si	30. 30. 30. 30. 30. 30. 30. 30. 30.	00000000000000000000000000000000000000	Com	27.1 29.1 29.9 30.3 30.6 30.7 31.2 31.4	to	ow (cow (did Cow (did	Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E	EUT EUT EUT EUT EUT EUT EUT	T Veron Structure on Structure	Colorz rz ent Side Side ent z Side t t orz orz Side Side	mmee		QP	
-10 - -20 - -30 -	244 244 244 244 244 244 244 244 244 244	(MHz) 401.817 401.817 402.317 440.333 480.333 439.808 402.317 440.333 479.858 479.842 440.325 479.808 480.350	Ante	1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5		(d (255.0 189.0 174.0 75.0 267.0 288.0 104.0 266.0 116.0 135.0 163.0 164.0	11	Tra	Horz Vert Horz Vert Vert Vert Vert Horz Vert Horz Horz Horz	w/		PK PK PK PK PK PK PK PK PK PK PK PK PK P		2.4.1.5.1.1.1.1.0.1.0.0.0.0.0.0.0.0.0.0.0.0	14E-14E-17E-18E-17E-19E-19E-19E-19E-19E-19E-19E-19E-19E-19))))))))))))))	E E ((a)	IRP Bm) 3.9 1.9 1.1 0.7 0.4 0.3 0.2 0.4 0.5 1.5 2.0 2.1	z	Anten ((c) subtri	BB - racted) 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0		22 0 0 0 -0 -0 -1 -1 -1 -1 -2 -3 -3 -3	Power mm) 9 9 1.3 1.6 1.7 1.2 1.4 1.5 1.5 1.0 1.1	r Si	30. 30. 30. 30. 30. 30. 30. 30. 30. 30.	00000000000000000000000000000000000000	Com	27.1 29.1 29.9 30.3 30.6 30.7 31.2 31.4 31.5 32.5 33.0	L L L L L L L L L L L L L L L L L L L	Low Cow Cow Cow Cow Cow Cow Cow Cow Cow C	Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E	EUT EUT EUT EUT EUT EUT EUT EUT EUT	THor on on o	Con rz ert Side Side ert rz Side t t orz n Side Side t orz n Side	mmee		QP	
-10 - -20 - -30 -	24 24 24 24 24 24 24 24 24 24 24 24 24 2	(MHz) 401.817 401.817 402.317 440.333 480.333 439.808 402.317 440.333 479.842 440.325 479.808 480.350 439.767	Anter (t	1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5		(d (255.0 189.0 174.0 75.0 288.0 104.0 266.0 115.0 163.0 164.0		Tra	Horz Vert Horz Vert Vert Horz Vert Horz Horz Horz Horz	y/ ccer		PK PK PK PK PK PK PK PK PK PK PK PK PK P		2.4 1.5 1.2 1.1.1 1.0 9.4 9.0 9.0 6.2 6.1 5.0	EIRP Watts 44E-1 54E-1 75E-1 96E-1 96E-1 95E-1 93E-1 97E-1 99E-1))))))))))))))	E E (a)	IRP Bm) 3.9 1.9 1.1 0.7 0.4 0.3 0.2 0.4 0.5 1.5 2.0 2.1	z	Anten	HB - racted) 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0		22 0 0 0 -0 -0 -1 -1 -1 -1 -2 -3 -3 -3	Power mm) 9 9 1.1 1.3 1.6 1.7 1.2 1.4 1.5 1.5 1.6 1.7 1.5 1.6 1.7 1.7 1.8 1.9	, Si	30. 30. 30. 30. 30. 30. 30. 30. 30. 30.	00000000000000000000000000000000000000	Com	27.1 29.1 29.9 30.3 30.6 30.7 31.2 31.4 31.5 32.5 33.0 33.1 33.9	L L L L L L L L L L L L L L L L L L L	ow Cow Cow Cow Cow Cow Cow Cow Cow Cow C	Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E	EUT EUT EUT EUT EUT EUT EUT EUT EUT	T Hon on S T Ver on S T On T On T On T Ver	Con rz ert Side Side ert rz Side t rz Side t rz Side s Sid s Side s Sid Side s Sid s Sid s Sid s Sid s Sid s Sid s Sid s Sid s Sid s Sid s Sid s S Sid s Sid s Sid s Sid s Sid s Sid s Sid s Sid s Sid s Sid s Sid s Sid s Sid s Sid s S Sid s Sid s S Sid s S s Sid s S S s Sid s S S S S S s S S S S s S s S s S s S	mmee		QP	
-10 - -20 - -30 -	24 24 24 24 24 24 24 24 24 24 24 24 24 2	(MHz) 401.817 401.817 402.317 440.333 480.333 439.808 402.317 440.333 4479.842 440.325 479.808 480.350 439.767 402.350	Anteier	1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5		(dd	zzimuth egrees 255.0 189.0 174.0 75.0 288.0 104.0 166.0 135.0 164.0 164.0 162.0	1	Tra	Horz Vert Horz Vert Horz Vert Horz Vert Horz Horz Horz Horz Horz	cer		PK PK PK PK PK PK PK PK PK PK PK PK PK		2.4 1.5 1.1.1 1.0 9.4 9.0 9.0 8.8 8.8 6.2 6.1 1.5 6.2 4.0	EIRP Watts 44E-1 98E-1 98E-1 98E-1 98E-1 98E-1 98E-1 99E-1 99E-1))))))))))))))	EE ((d	IRP Bm) 3.9 1.1 1.7 2.4 2.3 0.2 0.4 0.4 0.5 1.5 2.0 2.1 2.9 3.9	z	Anten	BB - racted) 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0		22 00 00 -00 -01 -11 -11 -12 -23 -33 -34	Power Power 1	r S	30. 30. 30. 30. 30. 30. 30. 30. 30. 30.	imit 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Com	27.1 29.1 29.9 30.3 30.6 30.7 31.2 31.4 31.5 33.0 33.1 33.9 34.9	L L L L L L L L L L L L L L L L L L L	ow Cow Cow Cow Cow Cow Cow Cow Cow Cow C	Ch, E	EUT EUT EUT EUT EUT EUT EUT EUT EUT	THOME	Cool TZ Int Side Side Prt Z Side t T Side Side t T Side	mmee		QP	
-10 - -20 - -30 -	24 24 24 24 24 24 24 24 24 24 24 24 24 2	(MHz) 401.817 401.817 402.317 440.333 439.808 402.317 440.333 479.858 479.842 440.325 440.325 440.325 440.350 439.767 402.350 401.833	Anteite	1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5		(dd	255.0 189.0 174.0 75.0 267.0 266.0 1135.0 163.0 164.0 162.0 157.0		Tra	Horz Vert Horz Vert Horz Vert Horz Horz Horz Horz Horz Horz Horz Vert	y/ ccer		PK PK PK PK PK PK PK PK PK PK PK PK PK P		2.4 1.5 1.2 1.1 1.0 9.4 9.0 6.2 6.1 5.0 4.0 3.0	28E-1 28E-1 28E-1 29E-1 26E-1 27E-1 35E-1 27E-1 35E-1 29E-1))))))))))))))	EE ((d)	IRP Bm) 3.9 1.1 1.1 2.0 2.1 2.9 3.9 5.2	z	Anten	BB - 1.0		22 00 00 -00 -01 -11 -11 -12 -33 -33 -44	Power Power 1	r S _i	30. 30. 30. 30. 30. 30. 30. 30. 30. 30.	imit 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Com	27.1 29.1 29.9 30.3 30.6 30.7 31.2 31.4 31.5 33.0 33.1 33.9 34.9 36.2	to	ow (cow (cow (did Cow	Ch, E	EUT EUT EUT EUT EUT EUT EUT EUT EUT	THOME	Cool TZ TZ Int Side Side TZ TZ TZ TZ TZ TZ TZ TZ TZ T	mmee		QP	
-10 - -20 - -30 -	24 24 24 24 24 24 24 24 24 24 24 24 24 2	(MHz) 401.817 401.817 402.317 440.333 480.333 439.808 402.317 440.333 4479.842 440.325 479.808 480.350 439.767 402.350	Antee	1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5 1.5		(dd	zzimuth egrees 255.0 189.0 174.0 75.0 288.0 104.0 166.0 135.0 164.0 164.0 162.0		Tra	Horz Vert Horz Vert Horz Vert Horz Vert Horz Horz Horz Horz Horz	yy/ ccer		PK PK PK PK PK PK PK PK PK PK PK PK PK		2.4.1.5.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	EIRP Watts 44E-1 98E-1 98E-1 98E-1 98E-1 98E-1 98E-1 99E-1 99E-1))))))))))))))	EE (dd	IRP Bm) 3.9 1.1 1.7 2.4 2.3 0.2 0.4 0.4 0.5 1.5 2.0 2.1 2.9 3.9	z	Anten	BB - racted) 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0 1.0		22 00 00 -00 -00 -11 -11 -12 -3 -3 -3 -4 -66 -7	Power Power 1	r Si	30. 30. 30. 30. 30. 30. 30. 30. 30. 30.	imit (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)		27.1 29.1 29.9 30.3 30.6 30.7 31.2 31.4 31.5 33.0 33.1 33.9 34.9	to	ow Cow Cow Cow Cow Cow Cow Cow Cow Cow C	Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E Ch, E	EUT EUT EUT EUT EUT EUT EUT EUT EUT EUT	T Hon on S T Veri T Hon on S T	Con rz rt Side Side ert z Side Side ert z Side ert t orz Side ert t ert ert z z z z z z z z z z z z z z z z z z z	mmee		QP	



XMit 2017.12.13

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
Attenuator	Fairview Microwave	SA18H-20	TKQ	12-Jul-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	6-Sep-18	6-Sep-19
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	6-Sep-18	6-Sep-19
Antenna - Double Ridge	EMCO	3115	AHB	28-Mar-18	28-Mar-20
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	20-Nov-18	20-Nov-19

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power. The maximum power spectral density measurements were measured with the EUT set to the required transmit frequencies in each band. The EUT was transmitting at the lowest, middle, and maximum data rate for each modulation type available.

The final data was converted from a field strength to a radiated power value. The equations in section 9.5 of ANSI C63.10:2013, were used to derive this conversion formula:

dBm/m (field strength) + 11.77 = dBm EIRP

Per the procedure outlined in ANSI C63.10:2013 Section 11.10.2, the peak power spectral density was measured.

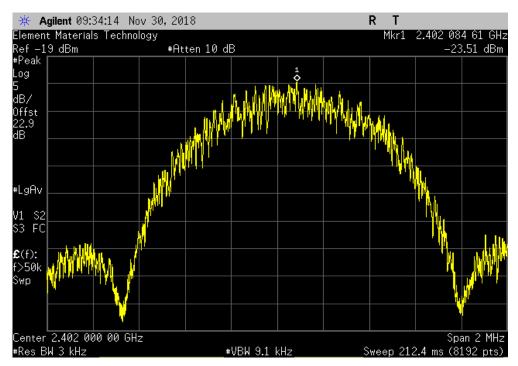


EUT: AIR01 Technology Board
Serial Number: ENG-R-1
Customer: Masimo Corporation
Attendees: Nghi Nguyen
Project: None
Tested by: Salvador Solorzano
TEST SPECIFICATIONS Work Order: MASI0520
Date: 30-Nov-18
Temperature: 20.3 °C Humidity: 56.4% RH
Barometric Pres.: 1017 mbar Power: USB via 110VAC/60Hz Test Method Job Site: OC10 FCC 15.247:2018 COMMENTS Total offset accounts for Antenna Gain, Cable Loss, 20dB Attenuator, and Pre-Amp Gain. Low Ch - 22.9dB, Mid Ch - 22.9dB, & High Ch - 23.1dB EUT Worst Case Orientation = Horizontal DEVIATIONS FROM TEST STANDARD Configuration # Signature leasured Value (dBm/3kHz) Total EIRP Results Factor (dB) 11.77 < dBm/3kHz (dBm/3kHz) BLE/GFSK Low Channel, 2402 MHz Pass BLE/GFSK Mid Channel, 2440 MHz BLE/GFSK High Channel, 2480 MHz 11.77 11.77 Pass Pass -23.488 -11.718 -26.247 -14.477

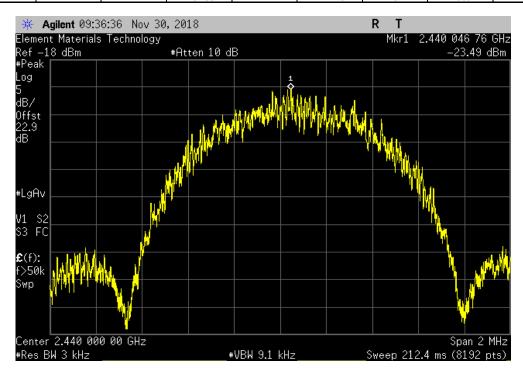


BLE/GFSK Low Channel, 2402 MHz

Measured Value	Conversion	Total EIRP	Limit	
(dBm/3kHz)	Factor (dB)	(dBm/3kHz)	< dBm/3kHz	Results
-23.507	11.77	-11.737	8	Pass



	BLE/GFSK Mid Channel, 2440 MHz								
			Measured Value	Conversion	Total EIRP	Limit			
_			(dBm/3kHz)	Factor (dB)	(dBm/3kHz)	< dBm/3kHz	Results		
ĺ			-23.488	11.77	-11.718	8	Pass		



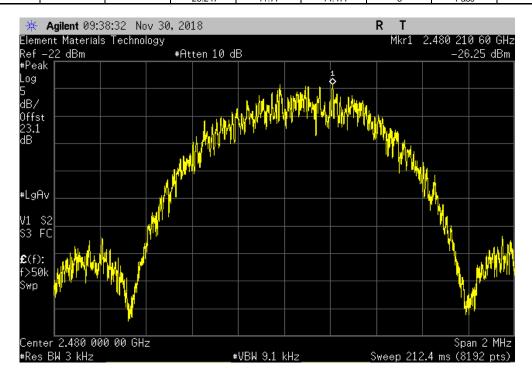


BLE/GFSK High Channel, 2480 MHz

Measured Value Conversion Total EIRP Limit

(dBm/3kHz) Factor (dB) (dBm/3kHz) < dBm/3kHz Results

-26.247 11.77 -14.477 8 Pass



BAND EDGE COMPLIANCE



XMit 2017.12.13

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
Attenuator	Fairview Microwave	SA18H-20	TKQ	12-Jul-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	6-Sep-18	6-Sep-19
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	6-Sep-18	6-Sep-19
Antenna - Double Ridge	EMCO	3115	AHB	28-Mar-18	28-Mar-20
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	13-Jun-18	13-Jun-19

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power. The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE



EUT: AIR01 Technology Board
Serial Number: ENG-R-1
Customer: Masimo Corporation
Attendees: Nghi Nguyen
Project: None
Tested by: Salvador Solorzano
TEST SPECIFICATIONS Work Order: MASI0520
Date: 30-Nov-18
Temperature: 20.3 °C Humidity: 56.4% RH
Barometric Pres.: 1017 mbar Power: USB via 110VAC/60Hz Test Method Job Site: OC10 FCC 15.247:2018 COMMENTS Total offset accounts for Antenna Gain, Cable Loss, 20dB Attenuator, and Pre-Amp Gain. Low Ch - 22.9dB, Mid Ch - 22.9dB, & High Ch - 23.1dB EUT Worst Case Orientation = Horizontal DEVIATIONS FROM TEST STANDARD Configuration # Signature Value (dBc) Result ≤ (dBc) BLE/GFSK Low Channel, 2402 MHz BLE/GFSK High Channel, 2480 MHz -39.62 Pass -20

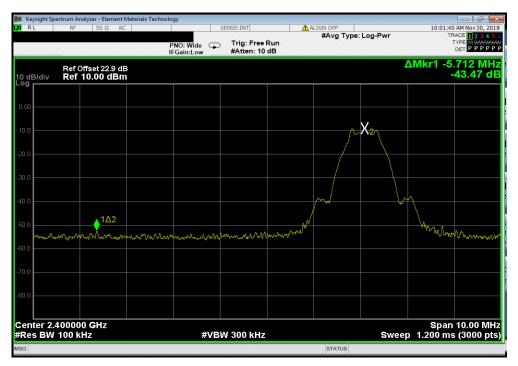
BAND EDGE COMPLIANCE



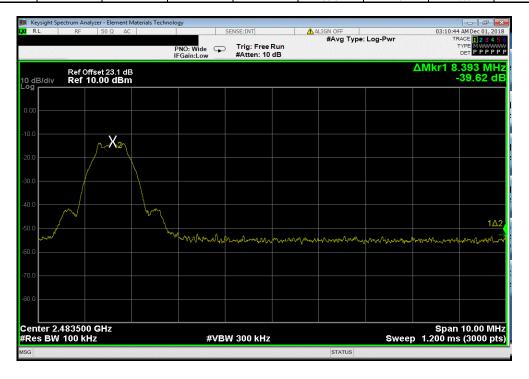
BLE/GFSK Low Channel, 2402 MHz

Value Limit
(dBc) ≤ (dBc) Result

-43.47 -20 Pass



	BLE/GFS	K High Channel,	2480 MHz		
			Value	Limit	
			(dBc)	≤ (dBc)	Result
			-39.62	-20	Pass





XMit 2017.12.13

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
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOI	27-Dec-17	27-Dec-18
Cable	Northwest EMC	18-26GHz RE Cables	OCK	27-Dec-17	27-Dec-18
Antenna - Standard Gain	ETS Lindgren	3160-09	AHN	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOF	7-Sep-18	7-Sep-19
Antenna - Standard Gain	ETS Lindgren	3160-08	AHT	NCR	NCR
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOE	7-Sep-18	7-Sep-19
Cable	Northwest EMC	8-18GHz RE Cables	OCO	6-Sep-18	6-Sep-19
Antenna - Standard Gain	ETS Lindgren	3160-07	AHR	NCR	NCR
Attenuator	Fairview Microwave	SA18H-20	TKQ	12-Jul-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	6-Sep-18	6-Sep-19
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	6-Sep-18	6-Sep-19
Antenna - Double Ridge	EMCO	3115	AHB	28-Mar-18	28-Mar-20
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFA	20-Nov-18	20-Nov-19

TEST DESCRIPTION

The measurement was made in a radiated configuration of the fundamental with the carrier fully maximized for its highest radiated power. The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.



EUT: AIR01 Technology Board
Serial Number: ENG-R-1
Customer: Masimo Corporation Work Order: MASI0520
Date: 30-Nov-18
Temperature: 20.3 °C Humidity: 56.4% RH Barometric Pres.: 1017 mbar Attendees: Nghi Nguyen Project: None
Tested by: Salvador Solorzano
TEST SPECIFICATIONS Power: USB via 110VAC/60Hz Test Method Job Site: OC10 FCC 15.247:2018 COMMENTS Total offset accounts for Antenna Gain, Cable Loss, 20dB Attenuator, and Pre-Amp Gain. Low Ch - 22.9dB, Mid Ch - 22.9dB, & High Ch - 23.1dB EUT Worst Case Orientation = Horizontal DEVIATIONS FROM TEST STANDARD Configuration # Signature Freq (MHz) Result (dBc) Range ≤ (dBc) BLE/GFSK Low Channel, 2402 MHz Fundamental BLE/GFSK Low Channel, 2402 MHz BLE/GFSK Low Channel, 2402 MHz 30 MHz - 1 GHz 1 GHz - 8.2 GHz 167.96 -41.13 -20 Pass 1750.7 -43.06 -20 Pass BLE/GFSK Low Channel, 2402 MHz 8.2 GHz - 12.4 GHz 9607 -35.12 -20 Pass BLE/GFSK Low Channel, 2402 MHz 12.4 GHz - 18 GHz 13630.6 -41.68 -20 Pass BLE/GFSK Low Channel, 2402 MHz BLE/GFSK Mid Channel, 2440 MHz 18 GHz - 25 GHz Fundamental -20 N/A 24598.3 -42.02 Pass 2440.07 N/A N/A BLE/GFSK Mid Channel, 2440 MHz BLE/GFSK Mid Channel, 2440 MHz 30 MHz - 1 GHz 1 GHz - 8.2 GHz 167.96 1086.1 -20 -20 Pass Pass -41.78 BLE/GFSK Mid Channel, 2440 MHz BLE/GFSK Mid Channel, 2440 MHz 8.2 GHz - 12.4 GHz 12.4 GHz - 18 GHz -20 -20 9759.3 -33.91 Pass 13874.7 -42.16 Pass 18 GHz - 25 GHz Fundamental BLE/GFSK Mid Channel, 2440 MHz 24599.2 -42.31 -20 Pass BLE/GFSK High Channel, 2480 MHz 2480.08 N/A N/A N/A BLE/GFSK High Channel, 2480 MHz BLE/GFSK High Channel, 2480 MHz 30 MHz - 1 GHz 1 GHz - 8.2 GHz -38 67 Pass Pass 167 96 -20 1008.8 -40.50 -20 BLE/GFSK High Channel, 2480 MHz BLE/GFSK High Channel, 2480 MHz 8.2 GHz - 12.4 GHz 9919.3 -29.47 -20 Pass 12.4 GHz - 18 GHz 13802.9 -20 -38.61 Pass BLE/GFSK High Channel, 2480 MHz 18 GHz - 25 GHz 24201 -38.00 Pass

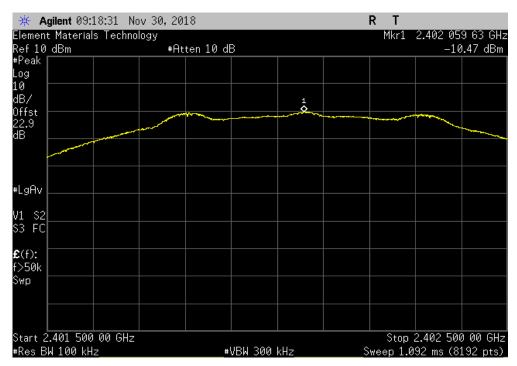


 BLE/GFSK Low Channel, 2402 MHz

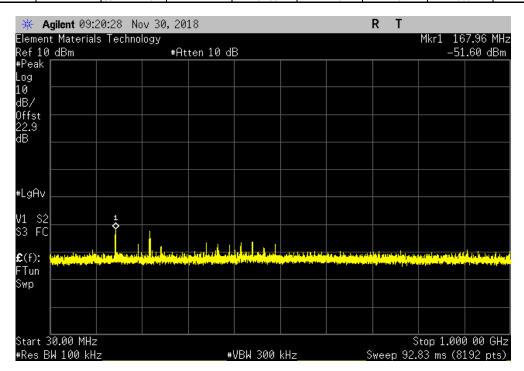
 Frequency
 Measured
 Max Value
 Limit

 Range
 Freq (MHz)
 (dBc)
 ≤ (dBc)
 Result

 Fundamental
 2402.06
 N/A
 N/A
 N/A



BLE	GFSK Low Channel, 2	2402 MHz		
Frequency	Measured	Max Value	Limit	
Range	Freq (MHz)	(dBc)	≤ (dBc)	Result
30 MHz - 1 GHz	167.96	-41.13	-20	Pass



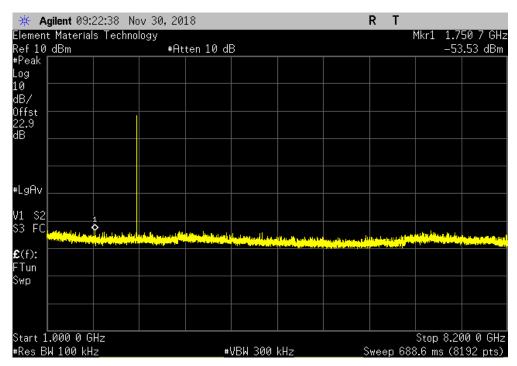


 BLE/GFSK Low Channel, 2402 MHz

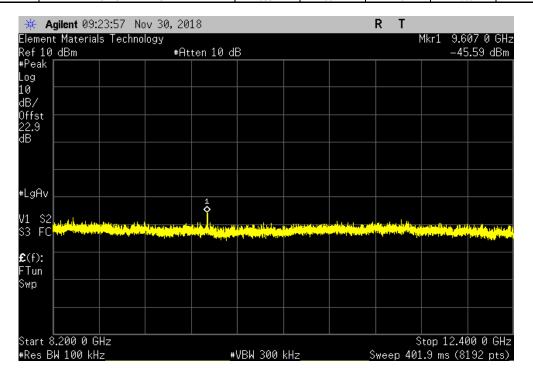
 Frequency
 Measured Max Value Limit

 Range
 Freq (MHz)
 (dBc)
 ≤ (dBc)
 Result

 1 GHz - 8.2 GHz
 1750.7
 -43.06
 -20
 Pass



	BLE/GFSK Low Channel, 2402 MHz									
	Frequency	Measured	Max Value	Limit						
	Range	Freq (MHz)	(dBc)	≤ (dBc)	Result					
Г	8.2 GHz - 12.4 GHz	9607	-35.12	-20	Pass					



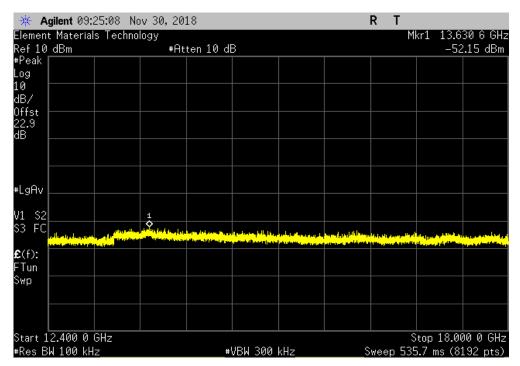


 BLE/GFSK Low Channel, 2402 MHz

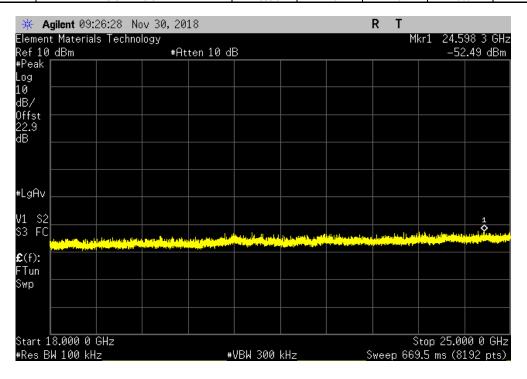
 Frequency
 Measured
 Max Value
 Limit

 Range
 Freq (MHz)
 (dBc)
 ≤ (dBc)
 Result

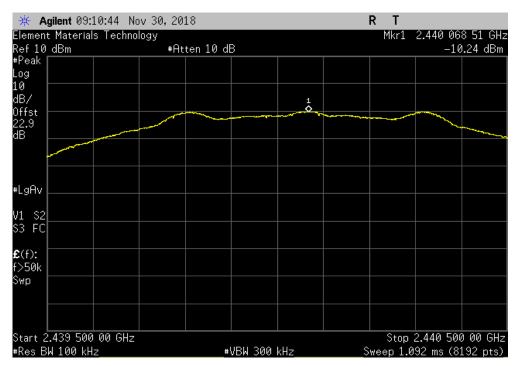
 12.4 GHz - 18 GHz
 13630.6
 -41.68
 -20
 Pass



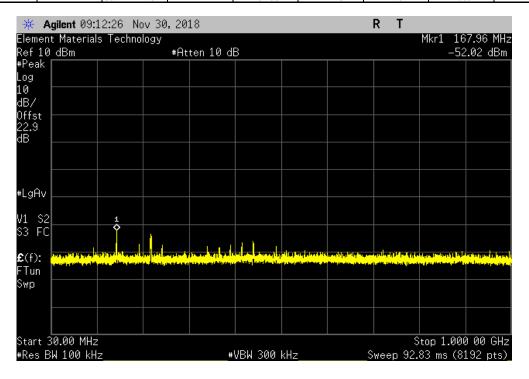
	BLE/G	FSK Low Channel, 2	2402 MHz		
	Frequency	Measured	Max Value	Limit	
	Range	Freq (MHz)	(dBc)	≤ (dBc)	Result
i	18 GHz - 25 GHz	24598.3	-42.02	-20	Pass







	BLE	/GFSK Mid Channel, 2	2440 MHz		
	Frequency	Measured	Max Value	Limit	
_	Range	Freq (MHz)	(dBc)	≤ (dBc)	Result
	30 MHz - 1 GHz	167.96	-41.78	-20	Pass



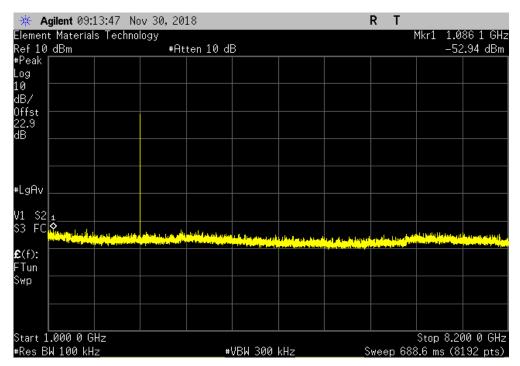


 BLE/GFSK Mid Channel, 2440 MHz

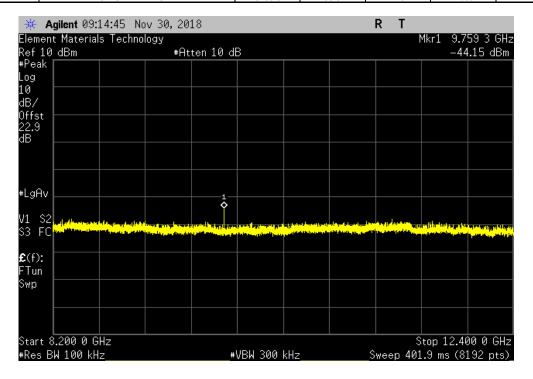
 Frequency
 Measured Max Value Limit

 Range
 Freq (MHz)
 (dBc)
 ≤ (dBc)
 Result

 1 GHz - 8.2 GHz
 1086.1
 -42.7
 -20
 Pass



BLE	GFSK Mid Channel, 2	2440 MHz		
Frequency	Measured	Max Value	Limit	
 Range	Freq (MHz)	(dBc)	≤ (dBc)	Result
8.2 GHz - 12.4 GHz	9759.3	-33.91	-20	Pass



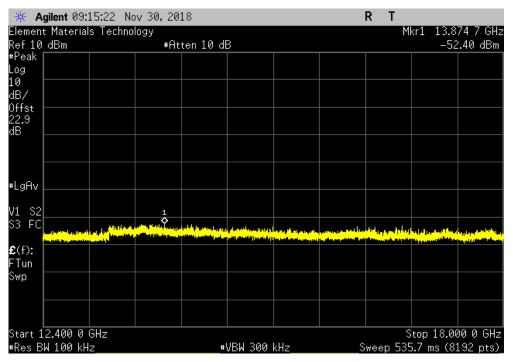


 BLE/GFSK Mid Channel, 2440 MHz

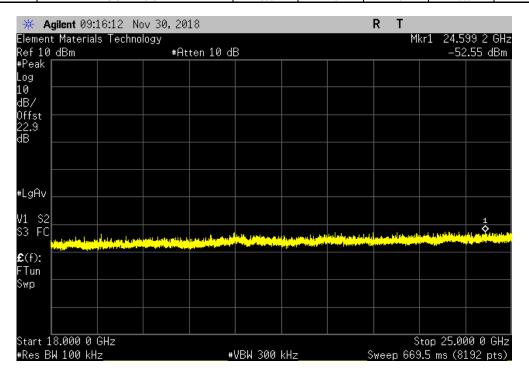
 Frequency
 Measured
 Max Value
 Limit

 Range
 Freq (MHz)
 (dBc)
 ≤ (dBc)
 Result

 12.4 GHz - 18 GHz
 13874.7
 -42.16
 -20
 Pass



	BLE/GFSK Mid Channel, 2440 MHz									
	Frequency	Measured	Max Value	Limit						
_	Range	Freq (MHz)	(dBc)	≤ (dBc)	Result					
ı	18 GHz - 25 GHz	24599.2	-42.31	-20	Pass					



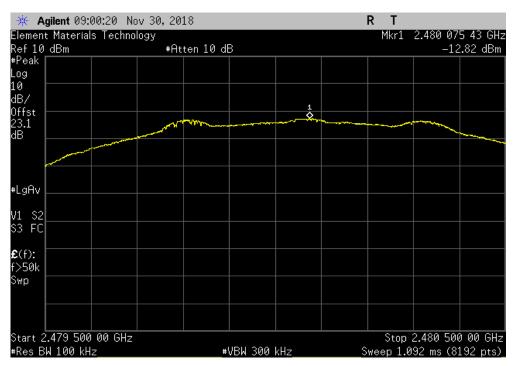


 BLE/GFSK High Channel, 2480 MHz

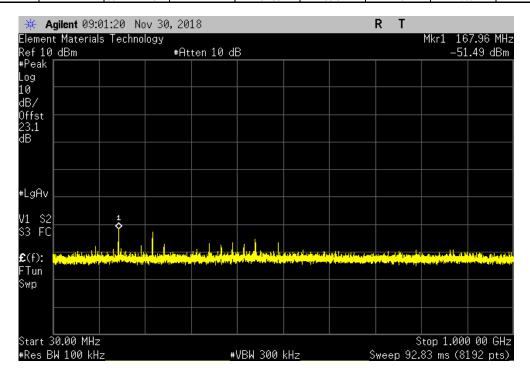
 Frequency
 Measured
 Max Value
 Limit

 Range
 Freq (MHz)
 (dBc)
 ≤ (dBc)
 Result

 Fundamental
 2480.08
 N/A
 N/A
 N/A



	BLE/GFSK High Channel, 2480 MHz									
	Frequency	Measured	Max Value	Limit						
	Range	Freq (MHz)	(dBc)	≤ (dBc)	Result					
ı İ	30 MHz - 1 GHz	167.96	-38.67	-20	Pass					



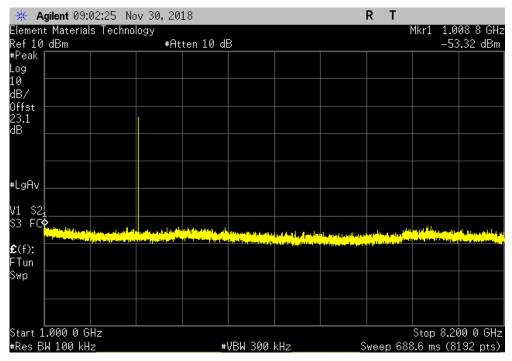


 BLE/GFSK High Channel, 2480 MHz

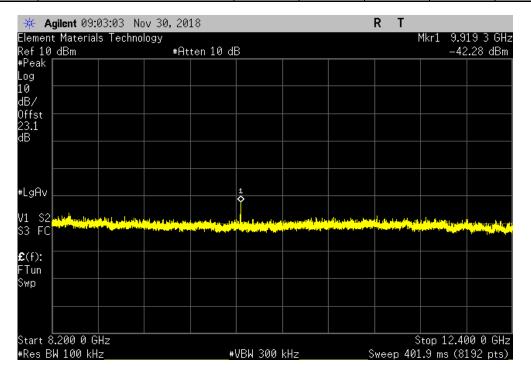
 Frequency
 Measured
 Max Value
 Limit

 Range
 Freq (MHz)
 (dBc)
 ≤ (dBc)
 Result

 1 GHz - 8.2 GHz
 1008.8
 -40.5
 -20
 Pass



	BLE/GFSK High Channel, 2480 MHz									
	Frequency	Measured	Max Value	Limit						
	Range	Freq (MHz)	(dBc)	≤ (dBc)	Result					
1	8.2 GHz - 12.4 GHz	9919.3	-29.47	-20	Pass					



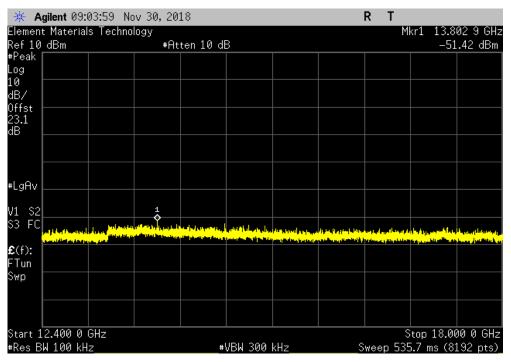


 BLE/GFSK High Channel, 2480 MHz

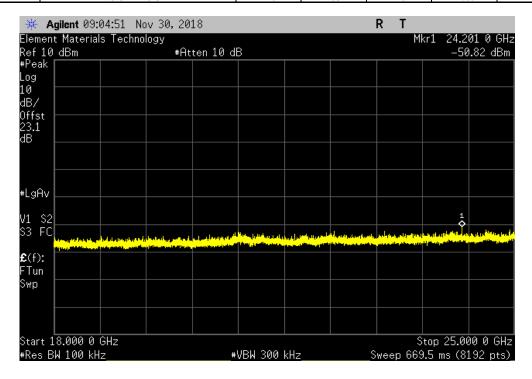
 Frequency
 Measured
 Max Value
 Limit

 Range
 Freq (MHz)
 (dBc)
 ≤ (dBc)
 Result

 12.4 GHz - 18 GHz
 13802.9
 -38.61
 -20
 Pass



	BLE/GFSK High Channel, 2480 MHz									
	Frequency	Measured	Max Value	Limit						
_	Range	Freq (MHz)	(dBc)	≤ (dBc)	Result					
. [18 GHz - 25 GHz	24201	-38	-20	Pass					





PSA-ESCI 2018.07.27

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

MODES OF OPERATION

Transmitting at 2402 MHz, 2440 MHz, & 2480 MHz

POWER SETTINGS INVESTIGATED

USB via 110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MASI0520 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz Stop Frequency 26000 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
Amplifier - Pre-Amplifier	Miteq	AM-1402	AOZ	10-Jul-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOF	7-Sep-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOE	7-Sep-2018	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHT	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHR	NCR	0 mo
Antenna - Biconilog	Teseq	CBL 6141A	AYE	7-Nov-2017	24 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOI	27-Dec-2017	12 mo
Cable	Northwest EMC	18-26GHz RE Cables	OCK	27-Dec-2017	12 mo
Attenuator	Fairview Microwave	SA18H-20	TKQ	12-Jul-2018	12 mo
Attenuator	S.M. Electronics	SA18H-10	REN	25-Jan-2018	12 mo
Cable	Northwest EMC	8-18GHz RE Cables	OCO	6-Sep-2018	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHX	16-Jul-2018	12 mo
Filter - High Pass	Micro-Tronics	HPM50108	HGP	25-Jan-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	6-Sep-2018	12 mo
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFP	13-Jun-2018	12 mo
Antenna - Double Ridge	EMCO	3115	AHB	28-Mar-2018	24 mo

MEASUREMENT BANDWIDTHS

INEXCORLEMENT BY MAD THE				
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	

Report No. MASI0520.2 Rev 1



PSA-ESCI 2018.07.27

TEST DESCRIPTION

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 if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

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 = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

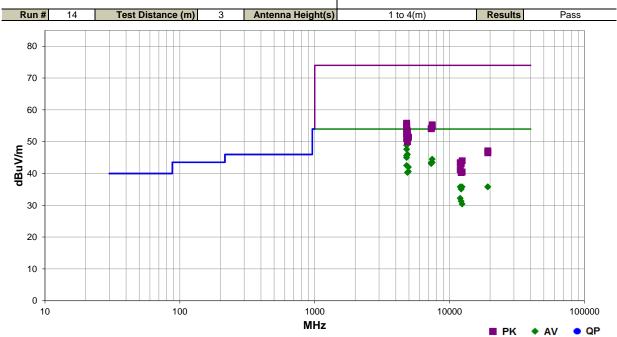
If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.



				EmiR5 2018.09.26 PSA-ESCI 2018.07.27								
Work Order:	MASI0520	Date:	29-Nov-2018	Men								
Project:	None	Temperature:	20.3 °C	feld S								
Job Site:	OC10	Humidity:	55.9% RH									
Serial Number:	ENG-R-1	Barometric Pres.:	1013 mbar	Tested by: Salvador Solorzano								
	AIR01 Technology Boar	d										
Configuration:	1											
Customer:	Masimo Corporation											
	Nghi Nguyen											
EUT Power:	USB via 110VAC/60Hz	JSB via 110VAC/60Hz										
Operating Mode:	Transmitting at 2402 MF	lz, 2440 MHz, & 2480 N	ИHz									
Deviations:	None											
Comments:	None											
Test Specifications			Test Metl	hod								
FCC 15.247:2018			ANSI C63	3.10:2013								

real openionionio	reet metrica	
FCC 15.247:2018	ANSI C63.10:2013	



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4803.890	38.6	11.3	1.1	192.0	0.3	0.0	Vert	AV	0.0	50.2	54.0	-3.8	Low Ch, EUT Horz
4803.775	37.3	11.3	1.2	183.0	0.3	0.0	Horz	AV	0.0	48.9	54.0	-5.1	Low Ch, EUT Horz
4803.785	36.0	11.3	3.5	342.0	0.3	0.0	Vert	AV	0.0	47.6	54.0	-6.4	Low Ch, EUT on Side
4880.500	33.6	12.1	2.8	221.0	0.3	0.0	Horz	AV	0.0	46.0	54.0	-8.0	Mid Ch, EUT Horz
4803.775	34.0	11.3	2.8	221.0	0.3	0.0	Horz	AV	0.0	45.6	54.0	-8.4	Low Ch, EUT on Side
4803.805	33.4	11.3	1.3	7.0	0.3	0.0	Horz	AV	0.0	45.0	54.0	-9.0	Low Ch, EUT Vert
7440.955	26.4	17.8	1.5	202.0	0.3	0.0	Horz	AV	0.0	44.5	54.0	-9.5	High Ch, EUT Horz
7440.695	25.4	17.8	1.5	153.0	0.3	0.0	Vert	AV	0.0	43.5	54.0	-10.5	High Ch, EUT Horz
7319.590	25.8	17.3	1.5	110.0	0.3	0.0	Horz	AV	0.0	43.4	54.0	-10.6	High Ch, EUT Horz
7320.210	25.5	17.3	1.5	229.0	0.3	0.0	Vert	AV	0.0	43.1	54.0	-10.9	Mid Ch, EUT Horz
4803.765	30.9	11.3	1.6	136.0	0.3	0.0	Vert	AV	0.0	42.5	54.0	-11.5	Low Ch, EUT Vert
4959.780	29.2	12.5	1.5	174.0	0.3	0.0	Horz	AV	0.0	42.0	54.0	-12.0	High Ch, EUT Horz
4959.830	27.8	12.5	2.9	132.0	0.3	0.0	Vert	AV	0.0	40.6	54.0	-13.4	High Ch, EUT Horz
4879.755	27.9	12.1	1.2	214.0	0.3	0.0	Vert	AV	0.0	40.3	54.0	-13.7	Mid Ch, EUT Horz
4804.655	44.5	11.3	1.1	192.0	0.0	0.0	Vert	PK	0.0	55.8	74.0	-18.2	Low Ch, EUT Horz
12009.090	40.9	-5.4	1.0	7.0	0.3	0.0	Vert	AV	0.0	35.8	54.0	-18.2	Low Ch, EUT Horz
12399.100	38.9	-3.4	1.0	14.0	0.3	0.0	Vert	AV	0.0	35.8	54.0	-18.2	High Ch, EUT Horz
19216.290	39.4	-3.9	1.5	284.0	0.3	0.0	Horz	AV	0.0	35.8	54.0	-18.2	Low Ch, EUT Horz
19217.280	39.4	-3.9	1.5	165.0	0.3	0.0	Vert	AV	0.0	35.8	54.0	-18.2	Low Ch, EUT Horz
4804.665	44.0	11.3	1.2	183.0	0.0	0.0	Horz	PK	0.0	55.3	74.0	-18.7	Low Ch, EUT Horz

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7440.950	37.5	17.8	1.5	202.0	0.0	0.0	Horz	PK	0.0	55.3	74.0	-18.7	High Ch, EUT Horz
12199.110	38.6	-3.8	1.0	16.0	0.3	0.0	Vert	AV	0.0	35.1	54.0	-18.9	Mid Ch, EUT Horz
7440.870	36.9	17.8	1.5	153.0	0.0	0.0	Vert	PK	0.0	54.7	74.0	-19.3	High Ch, EUT Horz
4803.790	43.1	11.3	3.5	342.0	0.0	0.0	Vert	PK	0.0	54.4	74.0	-19.6	Low Ch, EUT on Side
7320.690	36.8	17.3	1.5	110.0	0.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	Mid Ch, EUT Horz
7318.585	36.8	17.3	1.5	229.0	0.0	0.0	Vert	PK	0.0	54.1	74.0	-19.9	Mid Ch, EUT Horz
4879.930	41.3	12.1	2.8	221.0	0.0	0.0	Horz	PK	0.0	53.4	74.0	-20.6	Mid Ch, EUT Horz
4803.665	41.8	11.3	2.8	221.0	0.0	0.0	Horz	PK	0.0	53.1	74.0	-20.9	Low Ch, EUT on Side
4804.630	41.3	11.3	1.3	7.0	0.0	0.0	Horz	PK	0.0	52.6	74.0	-21.4	Low Ch, EUT Vert
12009.180	37.3	-5.4	2.6	175.0	0.3	0.0	Horz	AV	0.0	32.2	54.0	-21.8	Low Ch, EUT Horz
4960.550	38.9	12.5	1.5	174.0	0.0	0.0	Horz	PK	0.0	51.4	74.0	-22.6	High Ch, EUT Horz
4959.450	38.9	12.5	2.9	132.0	0.0	0.0	Vert	PK	0.0	51.4	74.0	-22.6	High Ch, EUT Horz
4804.215	39.7	11.3	1.6	136.0	0.0	0.0	Vert	PK	0.0	51.0	74.0	-23.0	Low Ch, EUT Vert
12199.120	34.8	-3.8	1.0	168.0	0.3	0.0	Horz	AV	0.0	31.3	54.0	-22.7	Mid Ch, EUT Horz
12399.140	33.5	-3.4	1.5	307.0	0.3	0.0	Horz	AV	0.0	30.4	54.0	-23.6	High Ch, EUT Horz
4880.775	37.9	12.1	1.2	214.0	0.0	0.0	Vert	PK	0.0	50.0	74.0	-24.0	Mid Ch, EUT Horz
19217.380	51.0	-3.9	1.5	165.0	0.0	0.0	Vert	PK	0.0	47.1	74.0	-26.9	Low Ch, EUT Horz
19214.880	50.4	-3.9	1.5	284.0	0.0	0.0	Horz	PK	0.0	46.5	74.0	-27.5	Low Ch, EUT Horz
12399.140	47.4	-3.4	1.0	14.0	0.0	0.0	Vert	PK	0.0	44.0	74.0	-30.0	High Ch, EUT Horz
12008.960	48.8	-5.4	1.0	7.0	0.0	0.0	Vert	PK	0.0	43.4	74.0	-30.6	Low Ch, EUT Horz
12199.040	46.8	-3.8	1.0	16.0	0.0	0.0	Vert	PK	0.0	43.0	74.0	-31.0	Mid Ch, EUT Horz
12008.740	46.6	-5.4	2.6	175.0	0.0	0.0	Horz	PK	0.0	41.2	74.0	-32.8	Low Ch, EUT Horz
12399.390	43.9	-3.4	1.5	307.0	0.0	0.0	Horz	PK	0.0	40.5	74.0	-33.5	High Ch, EUT Horz
12199.230	44.1	-3.8	1.0	168.0	0.0	0.0	Horz	PK	0.0	40.3	74.0	-33.7	Mid Ch, EUT Horz



										EmiR5 2018.09.26		PSA-ESCI 2018.07.27
Wo	ork Order:	MAS	SI0520		Date:		v-2018		///			
	Project:		lone		nperature:		6 °C		letel		,	
	Job Site:		C10		Humidity:		% RH		(
Seria	I Number:		G-R-1		tric Pres.:	1017	mbar	1	Tested by:	Salvador S	olorzano	
Conf		AIR01 Tec	hnology Board	d								
	iguration:	Masimo Co	ornoration									
	Attendees:		Diporation									
EU	UT Power:	USB via 11	I0VAC/60Hz									
	ing Mode:		ng at 2402 MH	z & 2480 N	1Hz							_
Operati	ing woue.											
D	eviations:	None										
		Band Edge										
C	omments:	Danu Luge	,									
Test Speci	ifications						Test Meth	od				
FCC 15.24							ANSI C63.					
1 00 10.24	7.2010						711101 000.	10.2010				
Run #	21	Test I	Distance (m)	3	Antenna	Height(s)		1 to 4(m)		Results	P	ass
Г												
80												-
70												
70												
60												
											-	
50												
≥ ⁵⁰ †												
w//ngp												
⋥ 40 ∔												
ਰ												
30												
30												
20 +												
10												
_												
0 + 237	70	2390		2410	2.	430	245	50	2470		2490	
	-				_	MHz	_10	-				
										■ PK	◆ AV	QP
					Duty Cycle		Polarity/					
Freq	Amplitude	Factor	Antenna Height	Azimuth	Correction Factor	External Attenuation	Transducer Type	Detector	Distance Adjustment	Adjusted	Spec. Limit	Compared to Spec.
(MHz)	(dBuV)	(dB)	(meters)	(degrees)	(dB)	(dB)	.,,,-	Dotooloi	(dB)	(dBuV/m)	(dBuV/m)	(dB)
2494 257	27 5	2.0	1.5	271.0	0.3	20.0	Hora	AV	0.0	50.9	54.0	2.2
2484.257 2485.443	27.5 27.5	3.0 3.0	1.5 1.5	271.0 160.0	0.3 0.3	20.0 20.0	Horz Vert	AV	0.0 0.0	50.8 50.8	54.0 54.0	-3.2 -3.2
2484.837	27.4	3.0	1.5	243.0	0.3	20.0	Horz	AV	0.0	50.7	54.0	-3.3
2484.390 2484.810	27.4 27.4	3.0 3.0	1.5 1.5	8.0 323.0	0.3 0.3	20.0 20.0	Vert Horz	AV AV	0.0 0.0	50.7 50.7	54.0 54.0	-3.3 -3.3
2484.810	27.4 27.4	3.0	2.8	200.0	0.3	20.0	Vert	AV	0.0	50.7	54.0 54.0	-3.3 -3.3
2389.117	27.4	2.6	2.1	229.0	0.3	20.0	Horz	AV	0.0	50.3	54.0	-3.7
2388.233 2485.440	27.3 36.9	2.6 3.0	1.5 1.5	145.0 271.0	0.3	20.0 20.0	Vert	AV PK	0.0 0.0	50.2 59.9	54.0	-3.8 -14.1
2388.560	36.9 36.6	3.0 2.6	1.5 2.1	271.0		20.0	Horz Horz	PK PK	0.0	59.9 59.2	74.0 74.0	-14.1 -14.8
2485.030	36.0	3.0	1.5	160.0		20.0	Vert	PK	0.0	59.0	74.0	-15.0
2483.813	35.8	3.0	1.5	8.0		20.0	Vert	PK	0.0	58.8 58.6	74.0	-15.2
2388.680 2484.350	36.0 35.5	2.6 3.0	1.5 2.8	145.0 200.0		20.0 20.0	Vert Vert	PK PK	0.0 0.0	58.6 58.5	74.0 74.0	-15.4 -15.5
2484.330	29.7	3.0	1.5	243.0		20.0	Horz	PK	0.0	52.7	74.0	-21.3
2484.910	25.1	3.0	1.5	323.0		20.0	Horz	PK	0.0	48.1	74.0	-25.9