

# Masimo Corporation RAD7A/Radical 7 V2 FCC 15.207:2014 FCC 15.407:2014

Report # MASI0233



NVLAP Lab Code: 200676-0

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America. This Report may only be duplicated in its entirety



**CERTIFICATE OF TEST** 

### Last Date of Test: August 25, 2014 Masimo Corporation Model: RAD7A/Radical 7 V2

# **Radio Equipment Testing**

Standards	
Specification	Method
FCC 15.207:2014	ANSI C63.10:2009
FCC 15.407:2014	ANSI C63.10:2009

Results
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Method Clause	Test Description	Applied	Results	Comments
6.2	AC Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
6.7	Band Edge Compliance	No	N/A	Not required, 5GHz band (ch 100-140) not used
6.8	Frequency Stability	Yes	Pass	
6.9.1	Emission Bandwidth	Yes	Pass	
6.10.3	Peak Transmit Power	Yes	Pass	
6.10.4	Peak Excursion of the Modulation Envelope	Yes	Pass	
6.11.1	Peak Power Spectral Density	Yes	Pass	
7.5	Duty Cycle	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.



# **REVISION HISTORY**

Revision Number		Description	Date	Page Number
00	None			

### **Barometric Pressure**

The recorded barometric pressure has been normalized to sea level.



### **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 Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

### Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

### **European Union**

**European Commission** – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

### Australia/New Zealand

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

### Korea

MSIP / 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

OFTA - Recognized by OFTA 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: http://www.nwemc.com/accreditations/



# **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 WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is listed below. 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 16-4-1 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)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	3.80	-3.80
AC Powerline Conducted Emissions (dB)	2.94	-2.94



**FACILITIES** 



Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	<b>California</b> Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Minnesota Labs MN01-08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Washington Labs NC01-05,SU02,SU07 19201 120 <sup>th</sup> Ave. NE Bothell, WA 98011 (425) 984-6600	
		VCCI			
A-0108	A-0029		A-0109	A-0110	
	•	Industry Canada	•		
2834D-1, 2834D-2	2834B-1, 2834B-2, 2834B-3		2834E-1	2834F-1	
NVLAP					
NVLAP Lab Code: 200630-0	NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200629-0	









# **PRODUCT DESCRIPTION**

### **Client and Equipment Under Test (EUT) Information**

Company Name:	Masimo Corporation
Address:	40 Parker
City, State, Zip:	Irvine, CA 92618
Test Requested By:	Michael Clark
Model:	RAD7A/Radical 7 V2
First Date of Test:	January 29, 2014
Last Date of Test:	August 25, 2014
Receipt Date of Samples:	January 19, 2014
Equipment Design Stage:	Production
Equipment Condition:	No Damage

### Information Provided by the Party Requesting the Test

### Functional Description of the EUT:

The device is a Pulse Co-Oximeter incorporating an 802.11a wireless radio assembly. Masimo radio assembly part number = 24514.

### **Testing Objective:**

To demonstrate compliance under FCC 15.407 for operation in the 5.2 GHz band(s).



### **Configuration MASI0151-1**

EUT				
Description	Manufacturer	Model/Part Number	Serial Number	
Pulse Co-Oximeter	Masimo Corporation	RAD7A/Radical 7 V2	100000349	
Wireless Radio	Broadcom	BCM 4334/Azurewave AW-AH634	36235C	

### Configuration MASI0151-2

EUT					
Description	Manufacturer	Model/Part Number	Serial Number		
Pulse Co-Oximeter	Masimo Corporation	RAD7A/Radical 7 V2	100000349		
Wireless Radio	Broadcom	BCM 4334/Azurewave AW-AH634	36235C		

Peripherals in test setup boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
Charging and Docking Station	Masimo Corporation	RDS-1	147484		
Finger Sensor	Masimo Corporation	DCI-DC12	9J042		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Cable	No	1.8m	No	Charging and Docking Station	AC Mains
RS 232	No	1.8m	Yes	Charging and Docking Station	Unterminated
Vue Link Cable	No	1.8m	Yes	Charging and Docking Station	Unterminated
Nursecall Cable	No	1.0m	Yes	Charging and Docking Station	Unterminated
Sp02 Cable	Yes	3.0m	No	Pulse Co-Oximeter	Finger Sensor
Ground Cable	Yes	1.8m	No	Charging and Docking Station	Ground

### Configuration MASI0151-3

EUT					
Description	Manufacturer	Model/Part Number	Serial Number		
Pulse Co-Oximeter	Masimo Corporation	RAD7A/Radical 7 V2	100000349		
Wireless Radio	Broadcom	BCM 4334/Azurewave AW-AH634	24514		



# **MODIFICATIONS**

# **Equipment Modifications**

Item	Date	Test	Modification	Note	Disposition of EUT
1	01/29/2014	Emissions Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	01/29/2014	Peak Excursion of the Modulation Envelope	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
3	01/29/2014	Peak Power Spectral Density	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	01/29/2014	Peak Transmit Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	01/29/2014	Duty Cycle	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	02/07/2014	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	02/07/2014	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
8	08/25/2014	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.



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

### MODES OF OPERATION

Operating 802.11a: Channel 36, 5180MHz, 6Mbps Operating 802.11a: Channel 48, 5240MHz, 6Mbps

### POWER SETTINGS INVESTIGATED

120VAC/60Hz

### **CONFIGURATIONS INVESTIGATED**

MASI0151 - 2

### SAMPLE CALCULATIONS

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

### **TEST EQUIPMENT**

					Interval
Description	Manufacturer	Model	ID	Last Cal.	(mo)
LISN	Solar	9252-50-24-BNC	LIA	6/3/2013	12 mo
Attenuator	Pasternack	6N10W-20	AWC	1/3/2014	12 mo
HP Filter	TTE	H97-100K-50-720B	HFP	3/1/2012	36 mo
OC06 Cables	N/A	Telecom Cables	OCP	10/8/2013	12 mo
Receiver	Rohde & Schwarz	ESCI	ARF	5/21/2013	12 mo

### **MEASUREMENT BANDWIDTHS**

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

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

### TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 500hm measuring port is terminated by a 500hm EMI meter or a 500hm resistive load. All 500hm measuring ports of the LISN are terminated by 500hm.



Work Orde	r: MASI0151	Date:	02/07/14		11	0
Projec	t: None	Temperature:	21.8 °C	-	4-KE	Set
Job Site	e: OC06	Humidity:	39.8% RH			7
Serial Numbe	r: 100000349	Barometric Pres.:	1011 mbar	٦	fested by: Mark Bayta	an
EUT	RAD7A/Radical 7 V2					
Configuration	1: 2					
Custome	r: Masimo Corporation					
Attendees	Michael Clark					
EUT Powe	r: 120VAC/60Hz					
Operating Mode	Operating 802.11a: C	Channel 36, 5180MHz, 6	6Mbps			
Deviation	s: None					
Comments	TX Power = 90					
Test Specifications	6		Test Me	thod		
FCC 15.207:2014	•		ANSI C6	3.10:2009		
Run # 7	Line:	High Line	Ext. Attenuation	<b>1:</b> 20	Results	Pass





	Peak Data - vs - Quasi Peak Limit								
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted ()	Spec. Limit ()	Compared to Spec. (dB)				
1.632	12.2	20.1	32.3	56.0	-23.7				
1.168	12.1	20.1	32.2	56.0	-23.8				
1.312	11.7	20.1	31.8	56.0	-24.2				
3.224	11.6	20.1	31.7	56.0	-24.3				
1.360	11.5	20.1	31.6	56.0	-24.4				
0.883	11.1	20.1	31.2	56.0	-24.8				
3.600	11.1	20.1	31.2	56.0	-24.8				
0.633	11.0	20.1	31.1	56.0	-24.9				
0.804	10.8	20.1	30.9	56.0	-25.1				
0.900	10.8	20.1	30.9	56.0	-25.1				
2.504	10.8	20.1	30.9	56.0	-25.1				
0.269	15.9	20.1	36.0	61.1	-25.1				
0.550	10.6	20.1	30.7	56.0	-25.3				
2.656	10.6	20.1	30.7	56.0	-25.3				
3.760	10.6	20.1	30.7	56.0	-25.3				
3.952	10.6	20.1	30.7	56.0	-25.3				

	Peak Data - vs - Average Limit									
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted ()	Spec. Limit ()	Compared to Spec. (dB)					
1.632	12.2	20.1	32.3	46.0	-13.7					
1.168	12.1	20.1	32.2	46.0	-13.8					
1.312	11.7	20.1	31.8	46.0	-14.2					
3.224	11.6	20.1	31.7	46.0	-14.3					
1.360	11.5	20.1	31.6	46.0	-14.4					
0.883	11.1	20.1	31.2	46.0	-14.8					
3.600	11.1	20.1	31.2	46.0	-14.8					
0.633	11.0	20.1	31.1	46.0	-14.9					
0.804	10.8	20.1	30.9	46.0	-15.1					
0.900	10.8	20.1	30.9	46.0	-15.1					
2.504	10.8	20.1	30.9	46.0	-15.1					
0.269	15.9	20.1	36.0	51.1	-15.1					
0.550	10.6	20.1	30.7	46.0	-15.3					
2.656	10.6	20.1	30.7	46.0	-15.3					
3.760	10.6	20.1	30.7	46.0	-15.3					
3.952	10.6	20.1	30.7	46.0	-15.3					



		HIHUN							
Work	Order:	MASI0151	Date:	02/0	7/14		11		
P	Project:	None	Temperature:	21.8	3 °C	-	4-A	E	1
Jo	b Site:	OC06	Humidity:	39.89	% RH		1	1	
Serial N	umber:	100000349	Barometric Pres.:	1011	mbar		Tested by:	Mark Baytan	
	EUT:	RAD7A/Radical 7 V2							
Configu	ration:	2							
Cus	stomer:	Masimo Corporation							
Atte	ndees:	Michael Clark							
EUT	Power:	120VAC/60Hz							
Operating	Mode:	Operating 802.11a: C	hannel 36, 5180MHz, 6	6Mbps					
Devi	ations:	None							
Com	ments:	TX Power = 90							
<b>Test Specific</b>	ations				Test Meth	od			
FCC 15.207:2	014				ANSI C63.	10:2009			
Run #	8	Line:	Neutral	Fxt At	tenuation.	20		Results	Pass





	Peak Data - vs - Quasi Peak Limit									
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)					
0.267	18.4	20.1	38.5	61.2	-22.7					
2.304	11.8	20.1	31.9	56.0	-24.1					
12.840	15.0	20.6	35.6 60 31.5 56	60.0	-24.4 -24.5					
0.645	11.4	20.1		56.0						
0.815	11.2	20.1	31.3	56.0	-24.7					
3.448	11.2	20.1	31.3	56.0	-24.7					
1.176	11.1	20.1	31.2	56.0	-24.8					
4.192	10.9	20.1	31.0	56.0	-25.0					
0.900	10.9	20.1	31.0	56.0	-25.0					
0.585	10.8	20.1	30.9	56.0	-25.1					
3.320	10.8	20.1	30.9	56.0	-25.1					
3.752	10.8	20.1	30.9	56.0	-25.1					
4.640	10.7	20.2	30.9	56.0	-25.1					
3.536	10.7	20.1	30.8	56.0	-25.2					
0.536	10.6	20.1	30.7	56.0	-25.3					
2.544	10.6	20.1	30.7	56.0	-25.3					

Peak Data - vs - Average Limit									
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)				
0.267	18.4	20.1	38.5	51.2	-12.7				
2.304	11.8	20.1	31.9	46.0	-14.1				
12.840	15.0	20.6	35.6 31.5	50.0 46.0	-14.4 -14.5				
0.645	11.4	20.1							
0.815	11.2	20.1	31.3	46.0	-14.7				
3.448	11.2	20.1	31.3	46.0	-14.7				
1.176	11.1	20.1	31.2	46.0	-14.8				
4.192	10.9	20.1	31.0	46.0	-15.0				
0.900	10.9	20.1	31.0	46.0	-15.0				
0.585	10.8	20.1	30.9	46.0	-15.1				
3.320	10.8	20.1	30.9	46.0	-15.1				
3.752	10.8	20.1	30.9	46.0	-15.1				
4.640	10.7	20.2	30.9	46.0	-15.1				
3.536	10.7	20.1	30.8	46.0	-15.2				
0.536	10.6	20.1	30.7	46.0	-15.3				
2.544	10.6	20.1	30.7	46.0	-15.3				



Work Order:	MASI0151	Date:	02/07/14	11 0			
Project:	None	Temperature:	21.8 °C	The Dit-			
Job Site:	OC06	Humidity:	39.8% RH				
Serial Number:	100000349	Barometric Pres.:	1011 mbar	Tested by: Mark Baytan			
EUT:	RAD7A/Radical 7 V2						
Configuration:	2						
Customer:	Masimo Corporation						
Attendees:	Michael Clark						
EUT Power:	120VAC/60Hz						
Operating Mode:	Operating 802.11a: Cl	hannel 48, 5240MHz, 6N	lbps				
Deviations:	None						
Comments:	TX Power = 90						
Test Specifications			Test Me	ethod			
E00 4E 007.004 4				000 40-0000			

FCC 15.207:2014

ANSI C63.10:2009







	Peak Data - vs - Quasi Peak Limit									
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)					
1.640	12.1	20.1	32.2	56.0	-23.8					
1.344	11.2	20.1	31.3	56.0	-24.7					
1.704	11.2	20.1	31.3	56.0	-24.7					
2.496	11.2	20.1	31.3	56.0	-24.7					
1.464	11.1	20.1	31.2	56.0	-24.8					
4.000	11.1	20.1	31.2	56.0	-24.8					
4.360	11.0	20.2	31.2	56.0	-24.8					
3.400	10.9	20.1	31.0	56.0	-25.0					
0.641	10.8	20.1	30.9	56.0	-25.1					
3.352	10.8	20.1	30.9	56.0	-25.1					
0.697	10.7	20.1	30.8	56.0	-25.2					
4.896	10.6	20.2	30.8	56.0	-25.2					
0.906	10.6	20.1	30.7	56.0	-25.3					
2.624	10.6	20.1	30.7	56.0	-25.3					
0.410	12.2	20.1	32.3	57.6	-25.3					
0.541	10.5	20.1	30.6	56.0	-25.4					
2.088	10.5	20.1	30.6	56.0	-25.4					

	Peak Data - vs - Average Limit								
Freq Amplitude (MHz) (dBuV)		Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)			
	1.640	12.1	20.1	32.2	46.0	-13.8			
	1.344	11.2	20.1	31.3	46.0	-14.7			
	1.704	11.2	20.1	31.3	46.0	-14.7			
	2.496	11.2	20.1	31.3	46.0	-14.7			
	1.464	11.1	20.1	31.2	46.0	-14.8			
	4.000	11.1	20.1	31.2	46.0	-14.8			
	4.360	11.0	20.2	31.2	46.0	-14.8			
	3.400	10.9	20.1	31.0	46.0	-15.0			
	0.641	10.8	20.1	30.9	46.0	-15.1			
	3.352	10.8	20.1	30.9	46.0	-15.1			
	0.697	10.7	20.1	30.8	46.0	-15.2			
	4.896	10.6	20.2	30.8	46.0	-15.2			
	0.906	10.6	20.1	30.7	46.0	-15.3			
	2.624	10.6	20.1	30.7	46.0	-15.3			
	0.410	12.2	20.1	32.3	47.6	-15.3			
	0.541	10.5	20.1	30.6	46.0	-15.4			
	2.088	10.5	20.1	30.6	46.0	-15.4			

Run #	9



		HIPMAN	NN.							
Work	k Order:	MASI0151	Date:	02/0	7/14		11	9. sz	~	
	Project:	None	Temperature:	21.	3 °C	/	4-A	26	St	
J	ob Site:	OC06	Humidity:	39.8	% RH		100		1	
Serial N	lumber:	100000349	Barometric Pres.:	1011	mbar		Tested by:	Mark Bayta	an	
	EUT:	RAD7A/Radical 7 V2								
Config	uration:	2								
Cu	stomer:	Masimo Corporation								
Atte	endees:	Michael Clark								
EUT	Power:	120VAC/60Hz								
Operating	g Mode:	Operating 802.11a: C	hannel 48, 5240MHz,	6Mbps						
Dev	viations:	None								
Con	nments:	TX Power = 90								
Test Specific	cations				Test Meth	od				
FCC 15.207:	2014				ANSI C63.	10:2009				
						0	1			
Run #	10	Line:	Neutral	Ext. At	tenuation:	20		Results		Pass





	Peak Data - vs - Quasi Peak Limit											
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)							
0.266	17.6	20.1	37.7	61.3	-23.6							
1.864	12.1	20.1	32.2	56.0	-23.8							
3.248	12.1	20.1	32.2	56.0	-23.8							
0.840	11.7	20.1	31.8	56.0	-24.2							
4.888	11.3	20.2	31.5	56.0	-24.5							
1.992	11.3	20.1	31.4	56.0	-24.6							
0.534	11.2	20.1	31.3	56.0	-24.7							
3.176	11.2	20.1	31.3	56.0	-24.7							
1.200	11.1	20.1	31.2	56.0	-24.8							
2.320	11.1	20.1	31.2	56.0	-24.8							
12.550	14.6	20.6	35.2	60.0	-24.8							
12.800	14.5	20.6	35.1	60.0	-24.9							
1.584	10.9	20.1	31.0	56.0	-25.0							
2.680	10.9	20.1	31.0	56.0	-25.0							
0.929	10.8	20.1	30.9	56.0	-25.1							
2.992	10.8	20.1	30.9	56.0	-25.1							

	Pea	k Data - vs	- Average I	Limit	
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Compared to Spec. (dB)
0.266	17.6	20.1	37.7	51.3	-13.6
1.864	12.1	20.1	32.2	46.0	-13.8
3.248	12.1	20.1	32.2	46.0	-13.8
0.840	11.7	20.1	31.8	46.0	-14.2
4.888	11.3	20.2	31.5	46.0	-14.5
1.992	11.3	20.1	31.4	46.0	-14.6
0.534	11.2	20.1	31.3	46.0	-14.7
3.176	11.2	20.1	31.3	46.0	-14.7
1.200	11.1	20.1	31.2	46.0	-14.8
2.320	11.1	20.1	31.2	46.0	-14.8
12.550	14.6	20.6	35.2	50.0	-14.8
12.800	14.5	20.6	35.1	50.0	-14.9
1.584	10.9	20.1	31.0	46.0	-15.0
2.680	10.9	20.1	31.0	46.0	-15.0
0.929	10.8	20.1	30.9	46.0	-15.1
2,992	10.8	20.1	30.9	46.0	-15.1

# ENC

# SPURIOUS RADIATED EMISSIONS

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

### **CHANNELS TESTED**

Channel 36 (5180MHz)		
Channel 48 (5240 MHz)		

### MODES OF OPERATION

802.11a: 6Mbps 802.11a: 36Mbps 802.11a: 54Mbps

### POWER SETTINGS INVESTIGATED

120VAC/60Hz

### **CONFIGURATIONS INVESTIGATED**

MASI0151 - 1

### FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz

Stop Frequency 40000 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
BP Filter	Micro-Tronics	BRC50705	HFQ	7/26/2012	36 mo
BP Filter	Micro-Tronics	BRC50704	HGB	7/26/2012	36 mo
5.15-5.35 Notch Filter	Micro-Tronics	BRC50703	HGH	6/13/2013	24 mo
Attenuator, 20db, 'SMA'	Weinschel Corp	4H-20	AWB	4/28/2014	12 mo
Pre-Amplifier	Miteq	JSW45-26004000-40-5P	AVQ	1/10/2014	12 mo
Antenna, Horn	ETS	3160-10	AIX	NCR	0 mo
Cable	ESM Cable Corp.	KMKM-72	OC1	1/9/2014	12 mo
Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOI	1/10/2014	12 mo
Antenna, Horn	EMCO	3160-09	AHN	NCR	0 mo
OC floating Cable	N/A	18-26GHz RE Cables	OCK	2/6/2014	12 mo
OC07 Cables	ESM Cable Corp.	8-18GHz cables	OCY	3/27/2014	12 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVP	10/24/2013	12 mo
Antenna, Horn	EMCO	3160-08	AHK	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVL	10/24/2013	12 mo
Antenna, Horn	ETS	3160-07	AHX	NCR	0 mo
OC07 Cables	ESM Cable Corp.	1-8GHz cables	OCX	3/27/2014	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVJ	10/24/2013	12 mo
Antenna, Horn	ETS	3117	AHQ	9/12/2012	36 mo
OC07 Cables	ESM Cable Corp.	30-1GHz cables	OCW	7/15/2014	12 mo
Pre-Amplifier	Miteq	AM-1402	AOZ	7/15/2014	12 mo
Antenna, Biconilog	EMCO	3142	AXA	11/25/2013	24 mo
Spectrum Analyzer	Agilent	N9010A	AFJ	7/10/2013	24 mo

### **MEASUREMENT BANDWIDTHS**

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

### **TEST DESCRIPTION**

The highest gain antenna of each type to be used with the EUT were tested. The EUT was configured for the lowest, a middle, and the highest transmit frequency in each operational band. For each configuration, the spectrum was scanned throughout the specified range. Measurements were made to satisfy the three requirements of 47 CFR 15.407: Field strength under 1GHz, Restricted Bands of 47 CFR 15.205, and EIRP of 47 CFR 15.407.

While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis, and adjusting the measurement antenna height and polarization (per ANSI C63.10:2009). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.



Work Order	MASI0151	Dr	0.0/	02/14										
work order.	IVIASI0151		ile. 09/2	2/14	11, 2									
Project:	None	Temperatu	ire: 22.4	12°C	TRED	yt-								
Job Site:	OC10	Humid	ity: 41.21	% RH										
Serial Number:	100000349	Barometric Pre	es.: 1011	mbar	Tested by: Mark Baytan									
EUT:	RAD7A/Radical 7 V2													
Configuration:	2													
Customer:	Masimo													
Attendees:	Michael Clark													
EUT Power:	120VAC/60Hz													
Operating Mode:	Operating 802.11a: C	erating 802.11a: Channel 36 (5180MHz) and Channel 48 (5240MHz)												
Deviations:	None	one												
Comments:	TX Power = 90													
Test Specifications				Test Method										
FCC 15,407:2014				ANSI C63,10:2009										
Run # 29	Test Distance (m)	3 Ante	nna Height(s)	1 to 4(m)	Results	Pass								
			U (1)											



MHz

■ PK ◆ AV ● QP

Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
10361.410	1.0	3.0	Vert	PK	4.01E-09	-54.0	-27.0	-27.0	Low Ch, 6 Mbps
10359.990	1.0	360.0	Vert	PK	3.57E-09	-54.5	-27.0	-27.5	Low Ch, 36 Mbps
10358.580	1.0	230.0	Horz	PK	3.49E-09	-54.6	-27.0	-27.6	Low Ch, 6 Mbps
10361.180	1.0	360.0	Vert	PK	3.26E-09	-54.9	-27.0	-27.9	Low Ch, 54 Mbps
10359.810	1.0	95.0	Horz	PK	3.11E-09	-55.1	-27.0	-28.1	Low Ch, 54 Mbps
10479.380	1.0	152.0	Horz	PK	3.03E-09	-55.2	-27.0	-28.2	High Ch, 54 Mbps
10360.220	1.0	317.0	Horz	PK	2.97E-09	-55.3	-27.0	-28.3	Low Ch, 36 Mbps
10480.290	1.0	349.0	Vert	PK	2.64E-09	-55.8	-27.0	-28.8	High Ch, 54 Mbps





15541.420

15538.430

15538.340

15540.730

15540.130

15537.830

15540.310

15540 630

15542.370

15542.450

47.0

46.7

46.4

46.0

45.7

44.2

43.9

43.6

43.3

41.7

5.0

5.0

5.0

5.0

5.0

5.0

5.0

5.0

5.0

5.0

1.2

1.2

1.0

1.0

1.0

1.1

1.0

10

1.0

1.0

227.0

227.0

25.0

227.0

321.0

163.0

79.0

221.0

221.0

114.0

3.0

3.0

3.0

3.0

3.0

3.0

3.0

30

3.0

3.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

Horz

Horz

Vert

Horz

Horz

Horz

Vert

Vert

Vert

Vert

PK PK

PK

PK PK

PK

PK PK

ΡK

ΡK

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

0.0

52.0

51.7

51.4

51.0

50.7

49.2

48.9

48.6

48.3

46.7

74.0

74.0

74.0

74.0

74.0

74.0

74.0

74 0

74.0

74.0

-22.0

-22.3

-22.6

-23.0

-23.3

-24.8

-25.1

-25.4

-25.7

-27.3

EUT Vert, Channel 36, 36 Mbps EUT Vert, Channel 36, 54 Mbps

EUT Vert, Channel 36, 6 Mbps

EUT Vert, Channel 36, 6 Mbps

EUT Vert Channel 36 54 Mbps

EUT on its side, Channel 36, 6 Mbps

EUT Vert, Channel 36, 6 Mbps EUT on its side, Channel 36, 6 Mbps

EUT Horizontal, Channel 36, 6 Mbps

EUT Horizontal, Channel 36, 6 Mbps











				HHMM										
	Wo	ork Order:	MAS	SI0151		Date:	09/2	2/14		11	34	-		
		Project:	N	one	Ter	mperature:	22.4	2 °C	-	UT,	46	SI		
		Job Site:	0	C10		Humidity:	41.21	% RH			<	1.		
	Serial	Number:	1000	000349	Barom	etric Pres.:	1011	mbar		Tested by:	Mark Bay	/tan		
		EUT:	RAD7A/R	adical 7 V2										_
	Confi	iguration:	2											_
	C	Sustomer:	Masimo											_
	Α	ttendees:	Michael C	lark										_
	EU	JT Power:	120VAC/6	60Hz										_
0	perati	ing Mode:	Operating	802.11a: Cl	nannel 36	(5180MHz)								
	D	eviations:	None											_
	Co	omments:	TX Power	= 90. Band	Edge.									
Test	Speci	ifications	1					Test Met	hod					
FCC	15 40	7.2014	1					ANSI C61	3 10.2009					_
										X				_
R	Run #	31	Test Di	istance (m)	3	Antenna	Height(s)		1 to 3.9(m	)	Result	S P	Pass	_
	80 T													
	- F													
	70 -													
	60 -													
										•				
	50 +													
٦														
Š	40													
۳,	40 †													
Ъ														
	30													
	20 +													
	10 +													
	0 +				1		1							
	100	00											10000	
							MHz				PK	• AV	• QP	
								Polarity/						
_			_				External	Transducer		Distance			Compared to	)
Fr	eq Hz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	Attenuation (dB)	Туре	Detector	Adjustment (dB)	Adjusted (dBu\//m)	Spec. Limit (dBuV/m)	Spec. (dB)	
(IVI)	112)	(ubuv)	(00)	(meters)	(acgrees)	(meters)	(00)			(00)	(upuv/iii)	(00007/11)	(ub)	Comments
5149	9.790	16.4	36.1	1.0	214.0	3.0	0.0	Vert	AV	0.0	52.5	54.0	-1.5	EUT Vert,
5149	9.917	16.3	36.1	1.0	318.0	3.0	0.0	Horz	AV	0.0	52.4	54.0	-1.6	EUT Vert, 3
5149	1.543	16.3	36.1	1.0	214.0	3.0	0.0	Vert	AV	0.0	52.4	54.0	-1.6	EUI Vert. 6

5149.790	16.4	36.1	1.0	214.0	3.0	0.0	Vert	AV	0.0	52.5	54.0	-1.5	EUT Vert, 54 Mbps
5149.917	16.3	36.1	1.0	318.0	3.0	0.0	Horz	AV	0.0	52.4	54.0	-1.6	EUT Vert, 36 Mbps
5149.543	16.3	36.1	1.0	214.0	3.0	0.0	Vert	AV	0.0	52.4	54.0	-1.6	EUT Vert, 6 Mbps
5148.977	16.3	36.1	1.0	252.0	3.0	0.0	Horz	AV	0.0	52.4	54.0	-1.6	EUT Vert, 6 Mbps
5148.440	16.3	36.1	1.0	314.0	3.0	0.0	Horz	AV	0.0	52.4	54.0	-1.6	EUT Horz, 6 Mbps
5148.407	16.3	36.1	1.0	214.0	3.0	0.0	Vert	AV	0.0	52.4	54.0	-1.6	EUT Vert, 36 Mbps
5148.343	16.3	36.1	1.0	294.0	3.0	0.0	Vert	AV	0.0	52.4	54.0	-1.6	EUT Horz, 6 Mbps
5148.333	16.3	36.1	1.0	138.0	3.0	0.0	Horz	AV	0.0	52.4	54.0	-1.6	EUT on Side, 6 Mbps
5148.123	16.3	36.1	1.0	214.0	3.0	0.0	Vert	AV	0.0	52.4	54.0	-1.6	EUT on Side, 6 Mbps
5148.637	16.2	36.1	1.0	318.0	3.0	0.0	Horz	AV	0.0	52.3	54.0	-1.7	EUT Vert, 54 Mbps
5149.660	33.0	36.1	1.0	314.0	3.0	0.0	Horz	PK	0.0	69.1	74.0	-4.9	EUT Vert, 6 Mbps
5148.240	32.6	36.1	1.0	318.0	3.0	0.0	Horz	PK	0.0	68.7	74.0	-5.3	EUT Vert, 36 Mbps
5148.727	32.5	36.1	1.0	318.0	3.0	0.0	Horz	PK	0.0	68.6	74.0	-5.4	EUT Vert, 54 Mbps
5149.593	32.4	36.1	1.0	214.0	3.0	0.0	Vert	PK	0.0	68.5	74.0	-5.5	EUT Vert, 36 Mbps
5148.833	32.4	36.1	1.0	294.0	3.0	0.0	Vert	PK	0.0	68.5	74.0	-5.5	EUT Horz, 6 Mbps
5148.333	32.4	36.1	1.0	214.0	3.0	0.0	Vert	PK	0.0	68.5	74.0	-5.5	EUT on Side, 6 Mbps
5148.623	32.1	36.1	1.0	214.0	3.0	0.0	Vert	PK	0.0	68.2	74.0	-5.8	EUT Vert, 6 Mbps
5148.013	32.1	36.1	1.0	138.0	3.0	0.0	Horz	PK	0.0	68.2	74.0	-5.8	EUT on Side, 6 Mbps
5149.190	32.0	36.1	1.0	214.0	3.0	0.0	Vert	PK	0.0	68.1	74.0	-5.9	EUT Vert, 54 Mbps
5149.813	31.9	36.1	1.0	252.0	3.0	0.0	Horz	PK	0.0	68.0	74.0	-6.0	EUT Horz, 6 Mbps

# ENC

# FREQUENCY STABILITY

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**

					Interval
Description	Manufacturer	Model	ID	Last Cal.	(mos)
MultiMeter	Fluke	79 III	MMD	2/4/2013	36
Power Meter	Amplifier Research	PM2002	SQA	3/14/2014	12
Power Sensor	Hewlett Packard	8481	SQP	3/3/2014	12
Signal Generator	Agilent	E8257D	TGU	2/1/2012	36
40GHz DC Block	Miteq	DCB4000	AMD	4/28/2014	12
Attenuator 20 dB, SMA M/F 26GHz	S.M. Electronics	SA26B-20	AUY	7/30/2014	12
OC13 Cables	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	0
Spectrum Analyzer	Agilent	E4446A	AAY	2/22/2013	24

### **TEST DESCRIPTION**

A direct connect measurement was made between the EUT's antenna cable and a spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Measurements were made at the edges of the main transmit bands as called out on the data sheets. Testing was done with an absence of modulation in a CW mode of operation.

The primary supply voltage was varied from 85 % to 115% of the nominal voltage Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30  $^{\circ}$  to +50 $^{\circ}$  C) and at 10 $^{\circ}$ C intervals.

Per the requirements of FCC 15.407:

"Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual."

No specific limits are provided in either FCC 15.407, the product specific rule part, or FCC 2.1055, the equipment authorization procedure for testing frequency stability. While there are no limits called out, any results less than 100ppm will still allow the radio to be operating within the band.



EUT:										
	RAD7A/Radical 7 V2							Work Order:	MASI0151	
Serial Number:	1000000349							Date:	08/25/14	
Customer:	Masimo Corporation							Temperature:	25.1°C	
Attendees:	Michael Clark							Humidity:	42%	
Project:	None							Barometric Pres.:	1011	
Tested by:	Mark Baytan			Power:	110VAC/60Hz			Job Site:	OC13	
TEST SPECIFICATION	ONS				Test Method					
FCC 15.407:2014					ANSI C63.10:2009					
COMMENTS										
TX Power = 30										
DEVIATIONS FROM	I TEST STANDARD									
None										
				11	0					
Configuration #	3			-011/						
				1 7 6	->++					
			Signature	TAE	37-					
			Signature	TAE	21-	Measured	Assigned	Error	Limit	
			Signature	TAE	71-	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
5150 MHz - 5250 MH	Hz - Low Channel, Ch. 36,	5180 MHz	Signature	176	21	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
5150 MHz - 5250 MH	Hz - Low Channel, Ch. 36, Voltage: 115%	5180 MHz	Signature	T~E	21	Measured Value (MHz) 5180.013258	Assigned Value (MHz) 5180	Error (ppm) 2.6	Limit (ppm) 100	<b>Results</b> Pass
5150 MHz - 5250 MH	Hz - Low Channel, Ch. 36, Voltage: 115% Voltage: 100%	, 5180 MHz	Signature	The state	At-	Measured Value (MHz) 5180.013258 5180.013141	Assigned Value (MHz) 5180 5180	Error (ppm) 2.6 2.5	Limit (ppm) 100 100	Results Pass Pass
5150 MHz - 5250 MH	Hz - Low Channel, Ch. 36, Voltage: 115% Voltage: 100% Voltage: 85%	5180 MHz	Signature	TAE	At-	Measured Value (MHz) 5180.013258 5180.013141 5180.012506	Assigned Value (MHz) 5180 5180 5180	Error (ppm) 2.6 2.5 2.4	Limit (ppm) 100 100 100	Results Pass Pass Pass
5150 MHz - 5250 MH	Hz - Low Channel, Ch. 36, Voltage: 115% Voltage: 100% Voltage: 85% Temperature: +50°	5180 MHz	Signature	175	21	Measured Value (MHz) 5180.013258 5180.013141 5180.012506 5180.010461	Assigned Value (MHz) 5180 5180 5180 5180	Error (ppm) 2.6 2.5 2.4 2	Limit (ppm) 100 100 100 100	Results Pass Pass Pass Pass
5150 MHz - 5250 MH	Hz - Low Channel, Ch. 36, Voltage: 115% Voltage: 100% Voltage: 85% Temperature: +50° Temperature: +40°	5180 MHz	Signature	122		Measured Value (MHz) 5180.013258 5180.013141 5180.012506 5180.010461 5180.008757	Assigned Value (MHz) 5180 5180 5180 5180 5180	Error (ppm) 2.6 2.5 2.4 2 1.7	Limit (ppm) 100 100 100 100 100	Results Pass Pass Pass Pass Pass
5150 MHz - 5250 MH	Hz - Low Channel, Ch. 36, Voltage: 115% Voltage: 00% Voltage: 85% Temperature: +50° Temperature: +30°	5180 MHz	Signature			Measured Value (MHz) 5180.013258 5180.013141 5180.012506 5180.010461 5180.008757 5180.008724	Assigned Value (MHz) 5180 5180 5180 5180 5180 5180	Error (ppm) 2.6 2.5 2.4 2 1.7 1.7	Limit (ppm) 100 100 100 100 100 100	Results Pass Pass Pass Pass Pass Pass
5150 MHz - 5250 MH	tz - Low Channel, Ch. 36, Voltage: 115% Voltage: 85% Temperature: +50° Temperature: +30° Temperature: +30°	5180 MHz	Signature			Measured Value (MHz) 5180.013258 5180.013141 5180.012506 5180.010461 5180.008757 5180.008724 5180.01606	Assigned Value (MHz) 5180 5180 5180 5180 5180 5180 5180 5180	Error (ppm) 2.6 2.5 2.4 2 1.7 1.7 3.1	Limit (ppm) 100 100 100 100 100 100 100	Results Pass Pass Pass Pass Pass Pass Pass
5150 MHz - 5250 MH	Hz - Low Channel, Ch. 36, Voltage: 115% Voltage: 100% Voltage: 85% Temperature: +40° Temperature: +40° Temperature: +20° Temperature: +10°	,5180 MHz	Signature			Measured Value (MHz) 5180.013258 5180.013250 5180.012506 5180.010461 5180.008757 5180.008724 5180.008724 5180.02165	Assigned Value (MHz) 5180 5180 5180 5180 5180 5180 5180 5180	Error (ppm) 2.6 2.5 2.4 2 1.7 1.7 1.7 3.1 4.2	Limit (ppm) 100 100 100 100 100 100 100 100	Results Pass Pass Pass Pass Pass Pass Pass Pa
5150 MHz - 5250 MF	Hz - Low Channel, Ch. 36, Voltage: 115% Voltage: 85% Temperature: +50° Temperature: +30° Temperature: +20° Temperature: +10° Temperature: 0°	5180 MHz	Signature			Measured Value (MHz) 5180.013258 5180.013141 5180.012506 5180.012506 5180.02165 5180.02165 5180.021231	Assigned Value (MHz) 5180 5180 5180 5180 5180 5180 5180 5180	Error (ppm) 2.6 2.5 2.4 2 1.7 1.7 3.1 4.2 4.1	Limit (ppm) 100 100 100 100 100 100 100 100 100	Results Pass Pass Pass Pass Pass Pass Pass Pa
5150 MHz - 5250 MH	rz - Low Channel, Ch. 36, Voltage: 115% Voltage: 100% Voltage: 85% Temperature: +40° Temperature: +40° Temperature: +20° Temperature: +10° Temperature: -10°	5180 MHz	Signature			Measured Value (MHz) 5180.013258 5180.013141 5180.012506 5180.010461 5180.008757 5180.008724 5180.02165 5180.02165 5180.02165 5180.020549	Assigned Value (MHz) 5180 5180 5180 5180 5180 5180 5180 5180	Error (ppm) 2.6 2.5 2.4 2 1.7 3.1 4.2 4.1 4	Limit (ppm) 100 100 100 100 100 100 100 100 100 10	Results Pass Pass Pass Pass Pass Pass Pass Pa
5150 MHz - 5250 MH	Hz - Low Channel, Ch. 36, Voltage: 115% Voltage: 100% Voltage: 85% Temperature: +40° Temperature: +40° Temperature: +20° Temperature: +10° Temperature: 0° Temperature: -10° Temperature: -20°	5180 MHz	Signature			Measured Value (MHz) 5180.013258 5180.012506 5180.012506 5180.008757 5180.008757 5180.008754 5180.02165 5180.02165 5180.02165 5180.02549 5180.020549	Assigned Value (MHz) 5180 5180 5180 5180 5180 5180 5180 5180	Error (ppm) 2.6 2.5 2.4 2 1.7 1.7 1.7 3.1 4.2 4.1 4 4	Limit (ppm) 100 100 100 100 100 100 100 100 100 10	Results Pass Pass Pass Pass Pass Pass Pass Pa































![](_page_28_Picture_0.jpeg)

![](_page_28_Figure_3.jpeg)

![](_page_28_Figure_4.jpeg)

# ENC

# **EMISSION BANDWIDTH**

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**

						Interval
Des	cription	Manufacturer	Model	ID	Last Cal.	(mos)
Spectru	m Analyzer	Agilent	E4446A	AAY	2/22/2013	24
OC13	3 Cables	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	0
Attenuator	, 20db, 'SMA'	Weinschel Corp	4H-20	AWB	6/7/2013	12
40GHz	DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Signal	Generator	Agilent	E8257D	TGU	2/1/2012	36
Powe	er Meter	Hewlett Packard	E4418A	SPA	4/11/2012	24
Powe	r Sensor	Agilent	E4412A	SQE	4/11/2012	24
Powe	r Sensor	Agilent	E4412A	SQE	4/11/2012	24

### **TEST DESCRIPTION**

FCC KDB 789033 D01 General UNII Test Procedures were followed.

The transmit frequencies and data rates listed in the datasheet were measured in each band utilized by the radio. The transmit power was set to its default maximum.

A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

>RBW = Approx. 1% of the emission bandwidth (B). This was an iterative process to determine the RBW based on the emissions bandwidth (B).

- ≻VBW= > RBW
- >A peak detector was used
- ≻Trace max hold.

The spectrum analyzer occupied bandwidth measurement function was then used to measure 26 dB emission bandwidth.

There is no required limit to be met in the rule part for this test. The purpose of the test is to both report the results as required by the KDB, and to utilize the emission bandwidth for setting the channel power integration bandwidth during conducted output

![](_page_30_Picture_0.jpeg)

EUT	RAD7A/Radical 7 V2				Work Order:	MASI0151	
Serial Number	: 1000000349				Date:	01/29/14	
Customer	: Masimo Corporation				Temperature:	24.3°C	
Attendees	: Mike Clark				Humidity:	41%	
Project	: None				Barometric Pres.:	1011	
Tested by	: Jaemi Suh		Power: Battery		Job Site:	OC13	
TEST SPECIFICAT	IONS		Test Method				
FCC 15.407:2014			ANSI C63.10	2009			
COMMENTS							
Channel 36/48 pov	ver level is set to 30.						
DEVIATIONS FROM	M TEST STANDARD						
None							
			1 6	-			
Configuration #	1						
		Signature	0				
					Value	Limit	Result
802.11(a) 6 Mbps							
	5150 - 5250 MHz Band						
	Channel 36, L	ow Channel			24.13 MHz	> 500 kHz	Pass
	Channel 48, H	ligh Channel			23.448 MHz	> 500 kHz	Pass
802.11(a) 36 Mbps							
	5150 - 5250 MHz Band						
	Channel 36, L	ow Channel			22.193 MHz	> 500 kHz	Pass
	Channel 48, H	ligh Channel			22.33 MHz	> 500 kHz	Pass
802.11(a) 54 Mbps							
	5150 - 5250 MHz Band						
	Channel 36, L	ow Channel			22.423 MHz	> 500 kHz	Pass
	Channel 48. H	ligh Channel			22.359 MHz	> 500 kHz	Pass

![](_page_31_Picture_0.jpeg)

![](_page_31_Figure_3.jpeg)

![](_page_31_Figure_4.jpeg)

![](_page_32_Picture_0.jpeg)

![](_page_32_Figure_3.jpeg)

![](_page_33_Picture_0.jpeg)

![](_page_33_Figure_3.jpeg)

![](_page_34_Picture_0.jpeg)

![](_page_34_Figure_3.jpeg)

![](_page_34_Figure_4.jpeg)

# ENC

# PEAK TRANSMIT POWER

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**

					Interval
Description	Manufacturer	Model	ID	Last Cal.	(mos)
Spectrum Analyzer	Agilent	E4446A	AAY	2/22/2013	24
OC13 Cables	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	0
Attenuator, 20db, 'SMA'	Weinschel Corp	4H-20	AWB	6/7/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Power Meter	Hewlett Packard	E4418A	SPA	4/11/2012	24
Power Sensor	Agilent	E4412A	SQE	4/11/2012	24
Signal Generator	Agilent	E8257D	TGU	2/1/2012	36

### **TEST DESCRIPTION**

FCC KDB 789033 D01 General UNII Test Procedures Section C was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak transmit power; the emission bandwidth (B) and the transmission pulse duration (T) were measured. The method of measuring the emission bandwidth and the associated data are found elsewhere in this test report. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep) was used for this test.

The spectrum analyzer settings were set per the guidance as well as the following specifics:

≻RBW = 1 MHz, VBW = 3 MHz

Sample Detector

>The number of points was set to 601. This satisfied the requirement of being > 2 \* span / RBW

>Trace average 100 traces in power averaging mode.

≻Power was integrated across "B", by using the channel power function of the analyzer.

![](_page_36_Picture_0.jpeg)

EUT:	RAD7A/Radical 7 V2					Work Order:	MASI0151	
Serial Number:	1000000349					Date:	01/29/14	
Customer:	Masimo Corporation					Temperature:	24.3°C	
Attendees:	Mike Clark					Humidity:	41%	
Project:	None					Barometric Pres.: 1011		
Tested by:	Jaemi Suh		Power:	120 VAC		Job Site:	OC13	
TEST SPECIFICATI	ONS			Test Method				
FCC 15.407:2014				ANSI C63.10:2009				
COMMENTS								
Channel 36/48 pow	er level is set to 30.							
DEVIATIONS FROM	I TEST STANDARD							
None								
	Choi de							
Configuration #	1		Chon .	5-				
Configuration #	1	Signature	fron .	52				
Configuration #	1	Signature	from .	5-				
Configuration #	1	Signature	fron .	S		Value	Limit	Result
Configuration # 802.11(a) 6 Mbps	1	Signature	from	52		Value	Limit	Result
Configuration # 802.11(a) 6 Mbps	1 5150 - 5250 MHz Band	Signature	fee	52		Value	Limit	Result
Configuration # 802.11(a) 6 Mbps	1 5150 - 5250 MHz Band Channel 36, I	Signature	- feer	52	_	Value 14.086 dBm	Limit < 17 dBm	Result Pass
Configuration # 802.11(a) 6 Mbps	1 5150 - 5250 MHz Band Channel 36, I Channel 48, t	Signature Low Channel High Channel	le l	5	_	Value 14.086 dBm 14.286 dBm	Limit < 17 dBm < 17 dBm	Result Pass Pass
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps	1 5150 - 5250 MHz Band Channel 36, I Channel 48, H	Signature Low Channel High Channel	leon	5-2-		Value 14.086 dBm 14.286 dBm	Limit < 17 dBm < 17 dBm	Result Pass Pass
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps	1 5150 - 5250 MHz Band Channel 36, I Channel 48, F 5150 - 5250 MHz Band	Signature Low Channel High Channel	the	5-2-		Value 14.086 dBm 14.286 dBm	Limit < 17 dBm < 17 dBm	Result Pass Pass
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps	1 5150 - 5250 MHz Band Channel 36, I Channel 48, F 5150 - 5250 MHz Band Channel 36, I	Signature Low Channel High Channel Low Channel	- deci-	5-2-		Value 14.086 dBm 14.286 dBm 13.322 dBm	Limit < 17 dBm < 17 dBm < 17 dBm	Result Pass Pass Pass
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps	1 5150 - 5250 MHz Band Channel 36, I Channel 48, F 5150 - 5250 MHz Band Channel 36, I Channel 36, I	Signature	Lo	<i>S <sup>2</sup></i>		Value 14.086 dBm 14.286 dBm 13.322 dBm 10.663 dBm	Limit < 17 dBm < 17 dBm < 17 dBm < 17 dBm	Result Pass Pass Pass Pass
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps 802.11(a) 54 Mbps	1 5150 - 5250 MHz Band Channel 36, I Channel 48, H 5150 - 5250 MHz Band Channel 48, H Channel 48, H	Signature Low Channel High Channel Low Channel High Channel	- the second sec	<u>}</u>		Value 14.086 dBm 14.286 dBm 13.322 dBm 10.663 dBm	Limit < 17 dBm < 17 dBm < 17 dBm < 17 dBm	Result Pass Pass Pass Pass
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps 802.11(a) 54 Mbps	1 5150 - 5250 MHz Band Channel 36, I Channel 48, F 5150 - 5250 MHz Band Channel 48, F 5150 - 5250 MHz Band	Signature Low Channel High Channel Low Channel High Channel	Lo	5-2-		Value 14.086 dBm 14.286 dBm 13.322 dBm 10.663 dBm	Limit < 17 dBm < 17 dBm < 17 dBm < 17 dBm	Result Pass Pass Pass Pass
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps 802.11(a) 54 Mbps	1 5150 - 5250 MHz Band Channel 36, I Channel 48, F 5150 - 5250 MHz Band Channel 36, I 5150 - 5250 MHz Band Channel 36, I	Signature	Loo	<i>S * *</i>		Value 14.086 dBm 14.286 dBm 13.322 dBm 10.663 dBm 12.846 dBm	Limit < 17 dBm < 17 dBm < 17 dBm < 17 dBm < 17 dBm	Result Pass Pass Pass Pass Pass

![](_page_37_Picture_0.jpeg)

![](_page_37_Figure_3.jpeg)

![](_page_37_Figure_4.jpeg)

![](_page_38_Picture_0.jpeg)

![](_page_38_Figure_3.jpeg)

![](_page_39_Picture_0.jpeg)

![](_page_39_Figure_2.jpeg)

![](_page_39_Figure_3.jpeg)

![](_page_40_Picture_0.jpeg)

![](_page_40_Figure_3.jpeg)

![](_page_40_Figure_4.jpeg)

# ENC

# PEAK EXCURSION OF THE MODULATION ENVELOPE

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**

					Interval
Description	Manufacturer	Model	ID	Last Cal.	(mos)
Spectrum Analyzer	Agilent	E4446A	AAY	2/22/2013	24
OC13 Cables	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	0
Attenuator, 20db, 'SMA'	Weinschel Corp	4H-20	AWB	6/7/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Power Meter	Hewlett Packard	E4418A	SPA	4/11/2012	24
Power Sensor	Agilent	E4412A	SQE	4/11/2012	24
Signal Generator	Agilent	E8257D	TGU	2/1/2012	36

### **TEST DESCRIPTION**

FCC KDB 789033 D01 General UNII Test Procedures Section F was followed to show that the radio of the maximum peak-maxhold spectrum to the maximum of the average spectrum does not exceed 13 dBm.

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

The spectrum analyzer settings were as follows:

Span set to encompass the entire emission bandwidth (B), centered on the transmit channel.

Using the marker delta function, the largest difference between the following two traces was measured:

>1st Trace: RBW = 1 MHz, VBW >= 3 MHz with peak detector and trace max-hold...

>2nd Trace: The same procedure and settings as was used for peak power spectral density

![](_page_42_Picture_0.jpeg)

					14/ - ula	0-1	
EUI	I: RAD/A/Radical / V2				WORK	Order: MASI0151	
Serial Numbe	r: 100000349					Date: 01/29/14	
Custome	r: Masimo Corporation				Tempe	rature: 24.3°C	
Attendees	s: Mike Clark				Hu	nidity: 41%	
Projec	t: None			-	Barometric	Pres.: 1011	
Tested by	y: Jaemi Suh		Power:	Battery	Jo	b Site: OC13	
TEST SPECIFICA	TIONS			Test Method			
FCC 15.407:2014				ANSI C63.10:2009			
COMMENTS				•			
Channel 36/48 po	wer level is set to 30						
DEVIATIONS FRC	OM TEST STANDARD						
None							
			1	62			
Configuration #	1		Gao.				
g		Signature	6				
					Value	e Limit	Result
802.11(a) 6 Mbps							
	5150 - 5250 MHz Band						
	Channel 36, I	Low Channel			9.058	lB ≤ 13 dB	Pass
	Channel 48, I	High Channel			10.08	lB ≤ 13 dB	Pass
802.11(a) 36 Mbps	8						
	5150 - 5250 MHz Band						
	Channel 36, I	Low Channel			9.959 (	lB ≤ 13 dB	Pass
	Channel 48. I	High Channel			7,919 (	lB ≤ 13 dB	Pass
802.11(a) 54 Mbps	3	<b>.</b>					
.,	5150 - 5250 MHz Band						
	Channel 36, I	Low Channel			9.255 (	IB ≤ 13 dB	Pass
	Channel 48.	High Channel			7.377	IB ≤13 dB	Pass
	enamer re, i				110111	= 10 00	1 400

![](_page_43_Picture_0.jpeg)

### PEAK EXCURSION OF THE MODULATION ENVELOPE

![](_page_43_Figure_3.jpeg)

![](_page_43_Figure_4.jpeg)

![](_page_44_Picture_0.jpeg)

# PEAK EXCURSION OF THE MODULATION ENVELOPE

![](_page_44_Figure_3.jpeg)

![](_page_45_Picture_0.jpeg)

# PEAK EXCURSION OF THE MODULATION ENVELOPE

![](_page_45_Figure_3.jpeg)

![](_page_46_Picture_0.jpeg)

# PEAK EXCURSION OF THE MODULATION ENVELOPE

![](_page_46_Figure_3.jpeg)

#VBW 3 MHz

V1 V2 S3 BS

£(f): FTun Swp

Center 5.240 00 GHz

#Res BW 1 MHz

Span 34 MHz

Sweep 1 ms (601 pts)

![](_page_47_Picture_1.jpeg)

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**

					Interval
Description	Manufacturer	Model	ID	Last Cal.	(mos)
Spectrum Analyzer	Agilent	E4446A	AAY	2/22/2013	24
OC13 Cables	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	0
Attenuator, 20db, 'SMA'	Weinschel Corp	4H-20	AWB	6/7/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Power Meter	Hewlett Packard	E4418A	SPA	4/11/2012	24
Power Sensor	Agilent	E4412A	SQE	4/11/2012	24
Signal Generator	Agilent	E8257D	TGU	2/1/2012	36

### **TEST DESCRIPTION**

FCC KDB 789033 D01 General UNII Test Procedures Section E was followed. The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. The data rate(s) listed in the datasheet were tested. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak power spectral density, the transmission pulse duration (T) was measured. The transmission pulse duration and the associated data are found elsewhere in this test report.

The spectrum analyzer settings were as follows:

>The span was set to encompass entire emission bandwidth (B), centered on the transmit channel.

≻RBW = 1 MHz, VBW ≥ 3 MHz

>Sample detector was used because Method SA-1 Alternate was used to measure the Maximum Conducted Output Power.

≻Trace average 100 traces in power averaging mode (not video averaging).

The peak power spectral density (PPSD) was determined to be the highest level found across the emission in any 1 MHz band after 100 sweeps of power averaging (not video averaging).

![](_page_48_Picture_0.jpeg)

EUT: Serial Number:									
Serial Number:	RAD/A/Radical / V2					Work Order:	MASI0151		
	100000349					Date:	01/29/14		
Customer:	Masimo Corporation					Temperature:	24.3°C		
Attendees:	Mike Clark					Humidity: 41%			
Project:	None		-			Barometric Pres.: 1011			
Tested by:	Jaemi Suh		Power:	3.7 VDC		Job Site:	OC13		
TEST SPECIFICATI	IONS			Test Method					
FCC 15.407:2014				ANSI C63.10:2009					
COMMENTS									
Channel 36/48 pow	er level is set to 30.								
DEVIATIONS FROM	I TEST STANDARD								
None									
				C					
			1 hours						
Configuration #	1		Gao.	)					
Configuration #	1	Signature	Chan .	) -					
Configuration #	1	Signature	Cheer !	) ~		Value	Limit		
Configuration #	1	Signature	Chan .			Value (dBm / MHz)	Limit (dBm / MHz)	Result	
Configuration # 802.11(a) 6 Mbps	1	Signature			_	Value (dBm / MHz)	Limit (dBm / MHz)	Result	
Configuration # 802.11(a) 6 Mbps	1 5150 - 5250 MHz Band	Signature	Que.			Value (dBm / MHz)	Limit (dBm / MHz)	Result	
Configuration # 802.11(a) 6 Mbps	1 5150 - 5250 MHz Band Channel 36, L	Signature				Value (dBm / MHz) 3.497	Limit (dBm / MHz) 4	<b>Result</b> Pass	
Configuration #	1 5150 - 5250 MHz Band Channel 36, L Channel 48, H	Signature ow Channel ligh Channel				Value (dBm / MHz) 3.497 3.299	Limit (dBm / MHz) 4 4	Result Pass Pass	
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps	1 5150 - 5250 MHz Band Channel 36, L Channel 48, H	Signature ow Channel ligh Channel	Chan-	)	_	Value (dBm / MHz) 3.497 3.299	Limit (dBm / MHz) 4 4	Result Pass Pass	
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps	1 5150 - 5250 MHz Band Channel 36, L Channel 48, H 5150 - 5250 MHz Band	Signature ow Channel ligh Channel	Cherry Contraction of the second			Value (dBm / MHz) 3.497 3.299	Limit (dBm / MHz) 4 4	<b>Result</b> Pass Pass	
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps	1 5150 - 5250 MHz Band Channel 36, L Channel 48, H 5150 - 5250 MHz Band Channel 36, L	Signature .ow Channel ligh Channel .ow Channel	- Jan			Value (dBm / MHz) 3.497 3.299 3.394	Limit (dBm / MHz) 4 4 4	Result Pass Pass Pass	
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps	1 5150 - 5250 MHz Band Channel 36, L Channel 48, H 5150 - 5250 MHz Band Channel 36, L Channel 48, H	Signature ow Channel ligh Channel ow Channel ligh Channel	- fair			Value (dBm / MHz) 3.497 3.299 3.394 3.106	Limit (dBm / MHz) 4 4 4 4 4 4	Result Pass Pass Pass Pass	
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps 802.11(a) 54 Mbps	1 5150 - 5250 MHz Band Channel 36, L Channel 48, H 5150 - 5250 MHz Band Channel 36, L Channel 48, H	Signature ow Channel ligh Channel ww Channel ligh Channel	- fair			Value (dBm / MHz) 3.497 3.299 3.394 3.106	Limit (dBm / MHz) 4 4 4 4 4 4	Result Pass Pass Pass Pass Pass	
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps 802.11(a) 54 Mbps	1 5150 - 5250 MHz Band Channel 36, L Channel 48, H 5150 - 5250 MHz Band Channel 48, H 5150 - 5250 MHz Band	Signature ow Channel tigh Channel tigh Channel tigh Channel	- Jan			Value (dBm / MHz) 3.497 3.299 3.394 3.106	Limit (dBm / MHz) 4 4 4 4 4 4	Result Pass Pass Pass Pass Pass	
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps 802.11(a) 54 Mbps	1 5150 - 5250 MHz Band Channel 36, L Channel 48, H 5150 - 5250 MHz Band Channel 48, H 5150 - 5250 MHz Band Channel 36, L	Signature ow Channel iigh Channel iigh Channel iigh Channel ow Channel	- fair			Value (dBm / MHz) 3.497 3.299 3.394 3.106 3.503	Limit (dBm / MHz) 4 4 4 4 4 4 4	Result Pass Pass Pass Pass Pass	
Configuration # 802.11(a) 6 Mbps 802.11(a) 36 Mbps 802.11(a) 54 Mbps	1 5150 - 5250 MHz Band Channel 36, L Channel 48, H 5150 - 5250 MHz Band Channel 36, L Channel 36, L Channel 36, L	Signature ow Channel ligh Channel ligh Channel ow Channel	- fair			Value (dBm / MHz) 3.497 3.299 3.394 3.106 3.503	Limit (dBm / MHz) 4 4 4 4 4 4 4	Result Pass Pass Pass Pass Pass	

![](_page_49_Picture_0.jpeg)

![](_page_49_Figure_3.jpeg)

![](_page_49_Figure_4.jpeg)

![](_page_50_Picture_0.jpeg)

![](_page_50_Figure_3.jpeg)

![](_page_51_Picture_0.jpeg)

![](_page_51_Figure_3.jpeg)

![](_page_52_Picture_0.jpeg)

![](_page_52_Figure_3.jpeg)

![](_page_53_Picture_0.jpeg)

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**

					Interval
Description	Manufacturer	Model	ID	Last Cal.	(mos)
Spectrum Analyzer	Agilent	E4446A	AAY	2/22/2013	24
OC13 Cables	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	0
Attenuator, 20db, 'SMA'	Weinschel Corp	4H-20	AWB	6/7/2013	12
40GHz DC Block	Miteq	DCB4000	AMD	5/16/2013	12
Signal Generator	Agilent	E8257D	TGU	2/1/2012	36
Power Meter	Hewlett Packard	E4418A	SPA	4/11/2012	24
Power Sensor	Agilent	E4412A	SQE	4/11/2012	24

### **TEST DESCRIPTION**

The transmission pulse duration (T) and Duty Cycle (x) were measured for each of the EUT operating modes per the FCC KDB 789033 D01 General UNII Test Procedures.

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. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used

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 was used during some of the other tests in this report only measure during the burst duration.

![](_page_54_Picture_1.jpeg)

				1	Wester Onders	MA 010454	
EUI					work Order:	MASI0151	
Serial Number	r: 1000000349				Date:	01/29/14	
Custome	r: Masimo Corporation				Temperature:	24.3°C	
Attendees	s: Mike Clark				Humidity:	41%	
Projec	t: None			Barometric Pres.: 1011			
Tested by	y: Jaemi Suh	Power: Battery			Job Site:	OC13	
TEST SPECIFICA	TIONS	Test Method					
FCC 15.407:2014		ANSI C63.10:2009					
COMMENTS							
Channel 36/48 po	wer level is set to 30.						
DEVIATIONS FRO	DM TEST STANDARD						
None	_						
		Chair St					
Configuration #	1						
	Signature						
				Number of	Value		_
		Pulse Width	Period	Pulses	(%)	Limit	Result
802.11(a) 6 Mbps							
	5150 - 5250 MHz Band						
	Channel 36, Low Channel	1.39 mS	1.496 mS	1	92.9	N/A	N/A
	Channel 36, Low Channel	N/A	N/A	6	N/A	N/A	N/A
	Channel 48, High Channel	1.388 mS	1.494 mS	1	92.9	N/A	N/A
000 444 3 00 14	Channel 48, High Channel	N/A	N/A	5	N/A	N/A	N/A
802.11(a) 36 Mbps							
	5150 - 5250 MHz Band	045.00	0500		70	N1/A	N1/A
	Channel 36, Low Channel	245 05	350 05	5	70	N/A	IN/A
	Channel 36, Low Channel	N/A	N/A	5	N/A	N/A	N/A
	Channel 48, High Channel	245 US	350 05	1	70	N/A	N/A
000 44/-> 54 Mb	Channel 48, High Channel	N/A	N/A	5	N/A	N/A	N/A
802.11(a) 54 Mbps	5150 - 5250 MHz Band						
	Channel 36, Low Channel	168 uS	274 uS	1	61.3	N/A	N/A
	Channel 36, Low Channel	N/A	N/A	5	N/A	N/A	N/A
	Channel 48, High Channel	167 uS	274 uS	1	60.9	N/A	N/A
	Channel 48. High Channel	N/A	N/A	5	N/A	N/A	N/A

![](_page_55_Picture_0.jpeg)

![](_page_55_Figure_3.jpeg)

![](_page_55_Figure_4.jpeg)

![](_page_56_Picture_0.jpeg)

![](_page_56_Figure_3.jpeg)

![](_page_56_Figure_4.jpeg)

![](_page_57_Picture_0.jpeg)

![](_page_57_Figure_3.jpeg)

![](_page_57_Figure_4.jpeg)

![](_page_58_Picture_0.jpeg)

![](_page_58_Figure_3.jpeg)

![](_page_58_Figure_4.jpeg)

![](_page_59_Picture_0.jpeg)

![](_page_59_Figure_3.jpeg)

![](_page_59_Figure_4.jpeg)

![](_page_60_Picture_0.jpeg)

![](_page_60_Figure_3.jpeg)

![](_page_60_Figure_4.jpeg)