MASIMO CORPORATION TEST REPORT

FOR THE

RAD-87 PULSE CO-OXIMETER

FCC PART C SECTIONS 15.207, 15.209, 15.247 & 15.407
AND RSS-210 ISSUE 7

TESTING

DATE OF ISSUE: OCTOBER 9, 2007

<table>
<tr><td>

PREPARED FOR:

Masimo Corporation
40 Parker
Irvine, CA 92618

P.O. No.:   535944
W.O. No.: 86964

</td><td>

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Date of test: September 13-28, 2007

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</table>

Report No.: FC07-076

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TABLE OF CONTENTS

ADMINISTRATIVE INFORMATION

DATE OF TEST: September 13-28, 2007   **DATE OF RECEIPT:** September 13, 2007

REPRESENTATIVE: George Pierpont

MANUFACTURER: **TEST LOCATION:**
Masimo Corporation   CKC Laboratories, Inc.
40 Parker   110 Olinda Place
Irvine, CA 92618   Brea, CA 92823

TEST METHOD: ANSI C63.4 (2003), RSS-210 Issue 7 and RSS GEN Issue 2

PURPOSE OF TEST: To perform the testing of the RAD-87 Pulse CO-Oximeter with the requirements for FCC Part C Sections 15.207, 15.209, 15.247 & 15.407 and RSS-210 devices.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE: **TEST PERSONNEL:**

Joyce Walker, Quality Assurance Administrative   Septimiu Apahidean, EMC Engineer
Manager

CONDITIONS DURING TESTING

For radiated emissions, the nurse call cable and RS232 cable have a Ferrite # 0444164281.

SUMMARY OF RESULTS

Test	Specification/Method	Results
Voltage Variation	FCC 15.31(e)	Pass
Conducted Emissions	FCC 15.207	Pass
Radiated Emissions	FCC 15.209	Pass
6 dB Bandwidth	FCC 15.247(a)(2)	Pass
RF Power Output	FCC 15.247(b)(3)	Pass
Antenna Conducted Spurious Emissions	FCC 15.247(d)	Pass
Power Spectral Density	FCC 15.247(e) FCC 15.407(a)(5)	Pass
Band Edge	ITU-R 55/1	Pass
Occupied Bandwidth	FCC 15.247 FCC 15.407(a)	Pass
Power Limits	FCC 15.407(a)(1) FCC 15.407(a)(3)	Pass
Peak Excursion	FCC 15.407(a)(6)	Pass
Antenna Conducted Undesirable Emissions	FCC 15.407(b)	Pass
Oats Undesirable Emissions	FCC 15.407(b)	Pass
Frequency Stability	FCC 15.407(g)	Pass

FCC 15.33(a) Frequency Ranges Tested
15.207 Conducted Emissions: 150 kHz – 30 MHz
15.209 Radiated Emissions: 9 kHz – 40 GHz
15.247 Emissions: 9 kHz – 40 GHz
15.407 Emissions: 9 kHz – 40 GHz

FCC 15.203 Antenna Requirements
The antenna is an integral part of the EUT and is non-removable; therefore the EUT complies with Section 15.203 of the FCC rules.

EUT Operating Frequency
The EUT was operating at 2.41-2.46 GHz, 5.18-5.24 GHz and 5.745-5.805 GHz.

Temperature And Humidity During Testing
The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION
The customer declares the EUT tested by CKC Laboratories was representative of a production unit. The EUT is a Pulse Oximeter with SpCO and SpMET.

The following model was tested by CKC Laboratories: **Pulse Rate Monitor, RAD-87**

The term "Pulse Rate Monitor" was an internal term used by CKC but it is not intended to be the actual description of the test. Since the time of testing the manufacturer has chosen to use the following model name in its place. Any differences between the names does not affect their EMC characteristics and therefore meets the level of testing equivalent to the tested model name shown on the data sheets: **RAD-87 Pulse CO-Oximeter**.

EQUIPMENT UNDER TEST

Pulse CO-Oximeter
Manuf: Masimo Corporation
Model: RAD-87
Serial: 804173
FCC ID: VKF-RAD87 (pending)

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):
Laptop
Manuf: IBM
Model: ThinkPAD 2366
Serial: 99-TGPV9

REPORT OF EMISSIONS MEASUREMENTS

TESTING PARAMETERS

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. The following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. When conducted emissions testing was performed, a 10 dB external attenuator was used with internal offset correction in the analyzer.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE

TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the highest readings, this is indicated as a "QP" or an "Ave" on the appropriate rows of the data sheets. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer/receiver readings were recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the measuring device called "peak hold," the measuring device had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the quasi-peak detector.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer/receiver. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.

FCC 15.31(e) VOLTAGE VARIATION

Test Equipment

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/04/2007	01/04/2009	02672
Cable Huber & Suhner	12237/4A	11/28/2005	11/28/2007	P05421
Programmable Power Source	01695/01696	05/15/07	05/15/09	250 / 245

Test Setup Photos
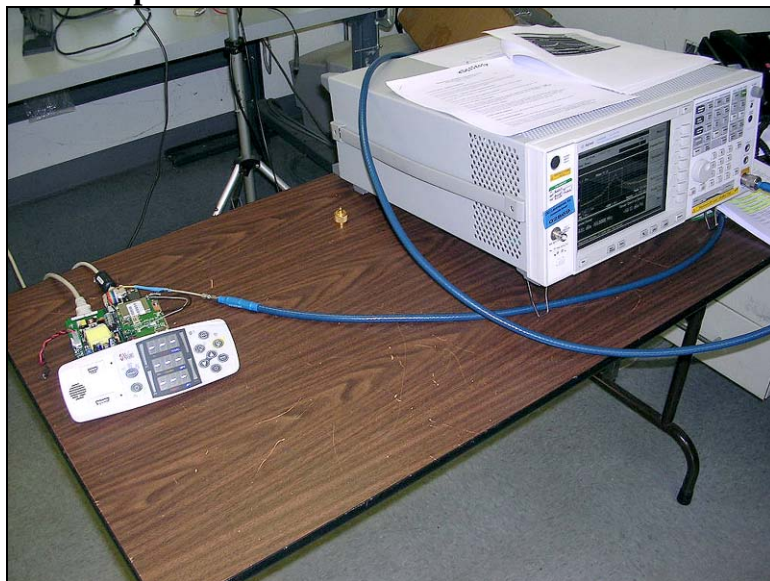
Test Conditions: The EUT is on the table and all the probes and cables are connected to the unit. Measurements are made by direct connect with the Serial cable connected to the laptop computer, which is used to change the TX characteristics. There is a 1.4 dB offset to correct for the cable.

The power supply voltage was varied between 85% and 115% of the nominal rated supply voltage. The Data plots below show that there was no significant shift in frequency and / or amplitude. Data is shown in the plots below, to support the statement.

The data collected during testing of 15.31(e) test on the 802.11a,b,g frequency ranges did not indicate any measurable change in output power.

Summary Table

Channel	Mode	Voltage	Measured - Reference
1	802.11b	-15%	0.6
1	802.11b	Nominal	0.0
1	802.11b	+15%	0.5
7	802.11b	-15%	-0.5
7	802.11b	Nominal	0.0
7	802.11b	+15%	-0.8
11	802.11b	-15%	0.3
11	802.11b	Nominal	0.0
11	802.11b	+15%	0.1

Test Plots

FCC 15.31(e) LOW VOLTAGE CHANNEL 1

15.31e Voltage at 100VAC , Low voltage 85VAC Channel 1
Ref Level 107.99 dBµV   ATTEN 14 dB   OFFSET: 20dB
RES BW: 30.0kHz VID BW: 50.0MHz SWP: 264.2msec
Marker: 2.413GHz 98.9847dBµV

802.11b

FCC 15.31(e) NORMAL VOLTAGE CHANNEL 1

15.31e Voltage at 100VAC , Normal voltage 100VAC Channel 1
Ref Level 107.99 dBµV   ATTEN 14 dB   OFFSET: 20dB
RES BW: 30.0kHz VID BW: 50.0MHz SWP: 264.2msec
Marker: 2.413GHz 99.5497dBµV
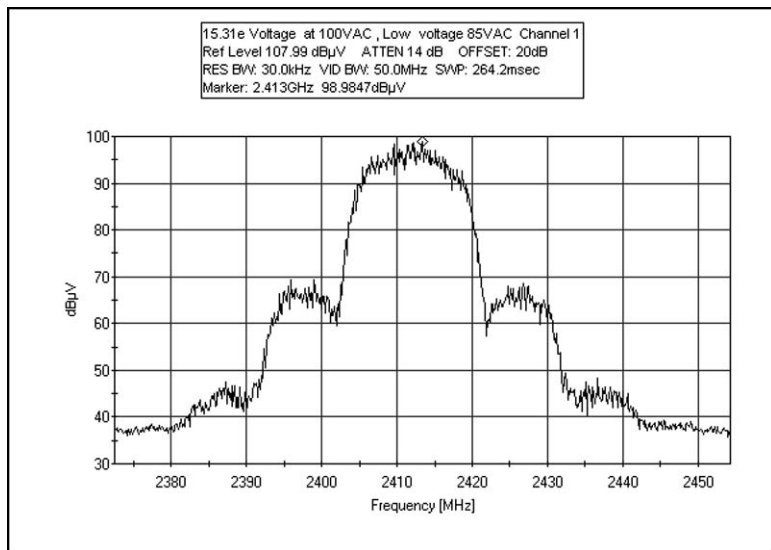
802.11b

FCC 15.31(e) HIGH VOLTAGE CHANNEL 1

802.11b
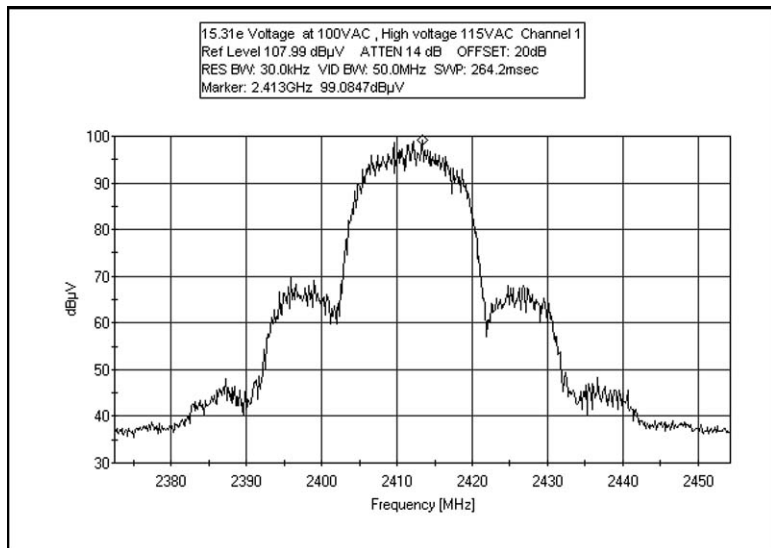
FCC 15.31(e) LOW VOLTAGE CHANNEL 7
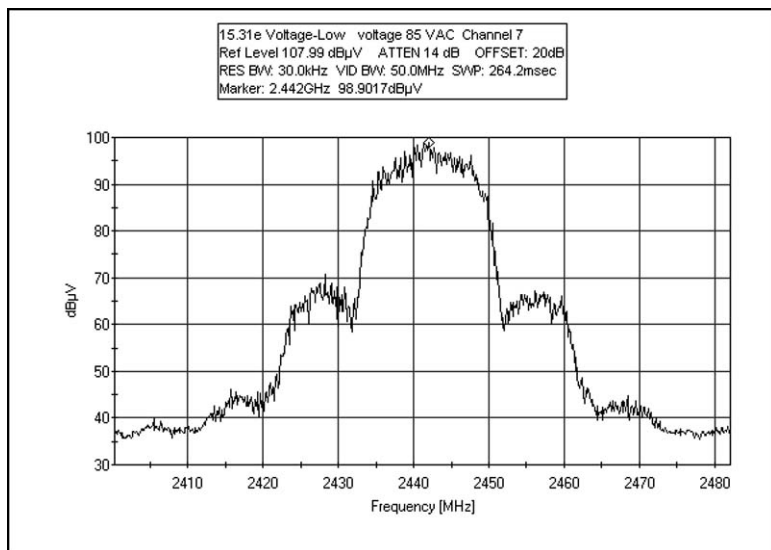
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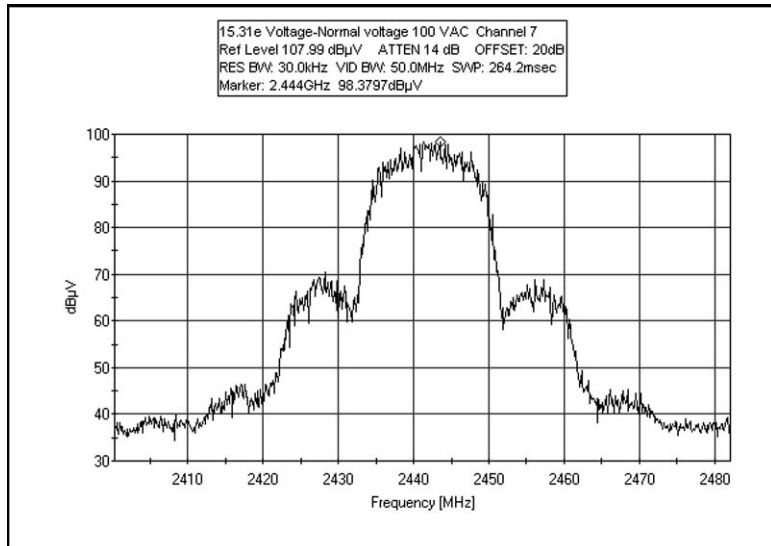
802.11b

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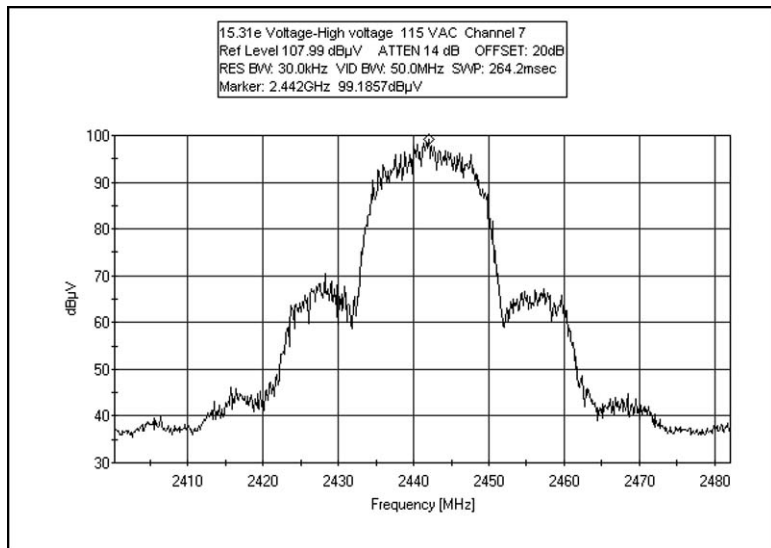
802.11b

FCC 15.31(e) LOW VOLTAGE CHANNEL 11
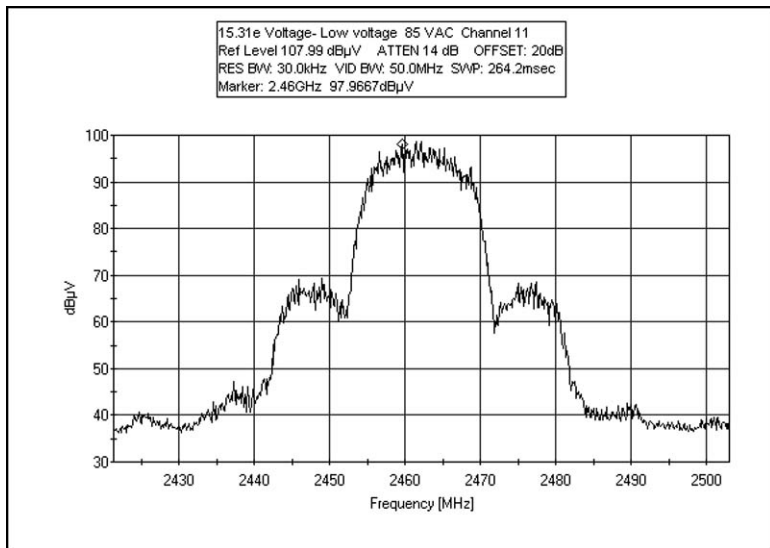
15.31e Voltage- Low voltage 85 VAC Channel 11
Ref Level 107.99 dBµV   ATTEN 14 dB   OFFSET: 20dB
RES BW: 30.0kHz VID BW: 50.0MHz SWP: 264.2msec
Marker: 2.46GHz 97.9667dBµV

802.11b

FCC 15.31(e) NORMAL VOLTAGE CHANNEL 11

15.31e Voltage-Normal voltage 100 VAC Channel 11
Ref Level 107.99 dBµV   ATTEN 14 dB   OFFSET: 20dB
RES BW: 30.0kHz VID BW: 50.0MHz SWP: 264.2msec
Marker: 2.46GHz 98.2327dBµV

802.11b

FCC 15.31(e) HIGH VOLTAGE CHANNEL 11

15.31e Voltage-High voltage 115 VAC Channel 11
Ref Level 107.99 dBµV   ATTEN 14 dB   OFFSET: 20dB
RES BW: 30.0kHz VID BW: 50.0MHz SWP: 264.2msec
Marker: 2.46GHz 98.1287dBµV
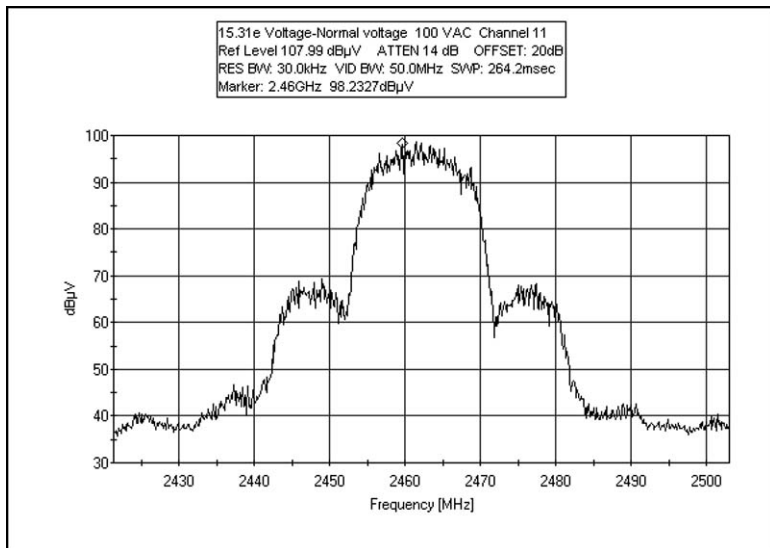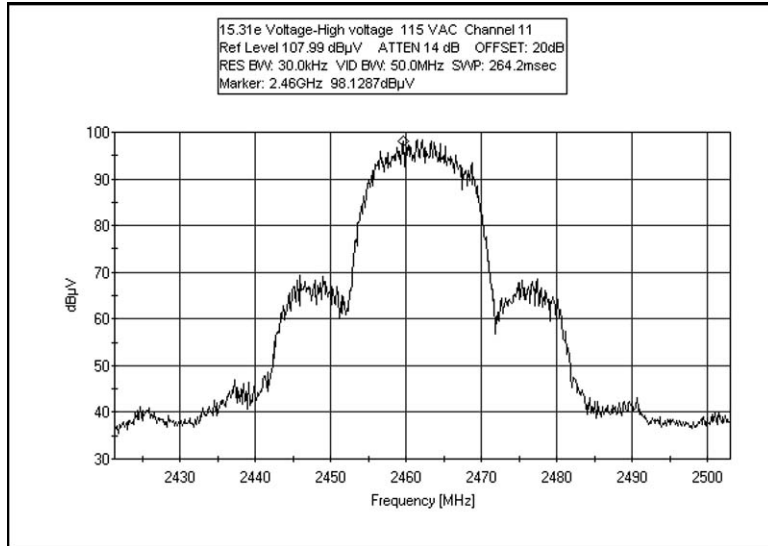
802.11b

FCC 15.207 CONDUCTED EMISSIONS
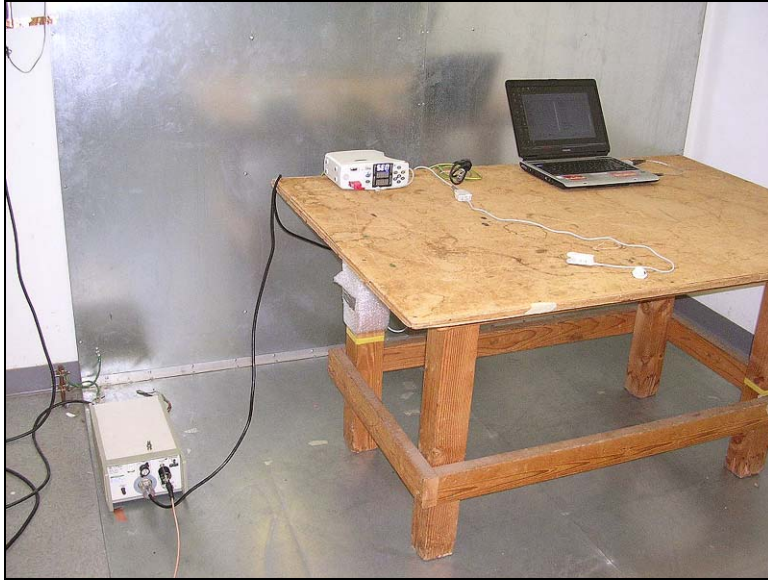
Test Setup Photos

Test Data Sheets

Test Location: CKC Laboratories, Inc. •110 N Olinda Place • Brea, CA 92823 • 714-993-6112

Customer:	**Masimo Corporation**		
Specification:	**FCC 15.207 COND [AVE]**		
Work Order #:	**86964**	Date:	9/24/2007
Test Type:	**Conducted Emissions**	Time:	09:08:25
Equipment:	**Pulse Rate Monitor**	Sequence#:	15
Manufacturer:	Masimo Corp	Tested By:	Sep Apahidean
Model:	RAD-87		120V 60Hz
S/N:	804173		

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
150kHZ HPF	D5201	01/31/2007	01/31/2009	02343
Coaxial Cable	Cable #8	06/06/2006	06/06/2008	01910
LISN	1104	11/10/2006	11/10/2008	00847
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
6dB Attenuator	(none)	11/21/2006	11/21/2008	05613

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Pulse Rate Monitor*	Masimo Corp	RAD-87	804173

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	IBM	ThinkPAD 2366	99-TGPV9

Test Conditions / Notes:

The EUT is on the table and all the probes and cables are connected to the unit. The Serial cable is connected to the laptop computer, which is used to change the TX characteristics. 802.11G, Channel 11, 6Mbits. Frequency range tested: 150 kHz – 30 MHz, 9kHz BW.

Transducer Legend:

T1=HP Filter AN 02343_013108	T2=6dB Attenuator P05613
T3=Cable #8 Conducted Site D	T4=(L1) LISN Insertion Loss 02128

Measurement Data: Reading listed by margin.   Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	205.781k Ave	44.2	+0.3	+6.1	+0.0	+0.2	+0.0	50.8	53.4	-2.6	Black
^	209.631k	47.6	+0.3	+6.1	+0.0	+0.2	+0.0	54.2	53.2	+1.0	Black
3	615.412k	33.0	+0.3	+6.1	+0.1	+0.2	+0.0	39.7	46.0	-6.3	Black
4	512.149k	32.3	+0.3	+6.2	+0.1	+0.2	+0.0	39.1	46.0	-6.9	Black
5	410.340k	33.7	+0.2	+6.2	+0.1	+0.2	+0.0	40.4	47.6	-7.2	Black
6	158.727k	40.9	+0.9	+6.1	+0.0	+0.3	+0.0	48.2	55.5	-7.3	Black

7	310.713k	34.9	+0.2	+6.2	+0.1	+0.2	+0.0	41.6	50.0	-8.4	Black
8	20.517M	29.7	+0.2	+6.1	+0.4	+1.0	+0.0	37.4	50.0	-12.6	Black
9	4.513M	26.2	+0.3	+6.2	+0.2	+0.3	+0.0	33.2	46.0	-12.8	Black
10	20.851M	29.3	+0.2	+6.1	+0.4	+1.1	+0.0	37.1	50.0	-12.9	Black
11	21.022M	29.2	+0.2	+6.1	+0.4	+1.1	+0.0	37.0	50.0	-13.0	Black
12	4.428M	25.9	+0.3	+6.2	+0.2	+0.3	+0.0	32.9	46.0	-13.1	Black
13	4.849M	26.0	+0.2	+6.2	+0.2	+0.3	+0.0	32.9	46.0	-13.1	Black
14	4.126M	25.9	+0.2	+6.2	+0.2	+0.3	+0.0	32.8	46.0	-13.2	Black
15	21.851M	28.8	+0.3	+6.1	+0.4	+1.2	+0.0	36.8	50.0	-13.2	Black
16	22.031M	28.8	+0.3	+6.1	+0.4	+1.2	+0.0	36.8	50.0	-13.2	Black
17	4.620M	25.7	+0.3	+6.2	+0.2	+0.3	+0.0	32.7	46.0	-13.3	Black
18	20.688M	28.9	+0.2	+6.1	+0.4	+1.1	+0.0	36.7	50.0	-13.3	Black
19	24.525M	28.6	+0.3	+6.1	+0.3	+1.4	+0.0	36.7	50.0	-13.3	Black
20	21.526M	28.8	+0.2	+6.1	+0.4	+1.1	+0.0	36.6	50.0	-13.4	Black
21	21.995M	28.6	+0.3	+6.1	+0.4	+1.2	+0.0	36.6	50.0	-13.4	Black

CKC Laboratories, Inc. Date: 9/24/2007 Time: 09:08:25 Masimo Corporation WO#: 86964
FCC 15.207 COND [AVE] Test Lead: Black 120V 60Hz Sequence#: 15
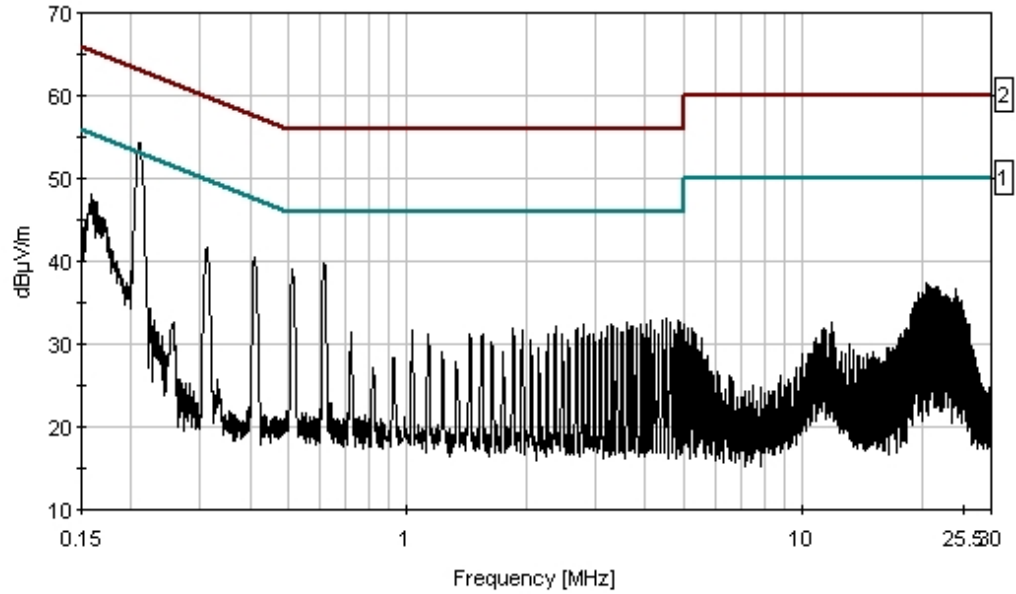
Sweep Data — 1 - FCC 15.207 COND [AVE] — 2 - FCC 15.207 COND [QP]

Test Location: CKC Laboratories, Inc. •110 N Olinda Place • Brea, CA 92823 • 714-993-6112

Customer:	**Masimo Corporation**
Specification:	**FCC 15.207 COND [AVE]**
Work Order #:	**86964**
Test Type:	**Conducted Emissions**
Equipment:	**Pulse Rate Monitor**
Manufacturer:	Masimo Corp
Model:	RAD-87
S/N:	804173

Date: 9/24/2007
Time: 09:12:26
Sequence#: 16
Tested By: Sep Apahidean
120V 60Hz

*Test Equipment***:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
150kHZ HPF	D5201	01/31/2007	01/31/2009	02343
Coaxial Cable	Cable #8	06/06/2006	06/06/2008	01910
LISN	1104	11/10/2006	11/10/2008	00847
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
6dB Attenuator	(none)	11/21/2006	11/21/2008	05613

Equipment Under Test (* = **EUT**):

Function	Manufacturer	Model #	S/N
Pulse Rate Monitor*	Masimo Corp	RAD-87	804173

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	IBM	ThinkPAD 2366	99-TGPV9

Test Conditions / Notes:

The EUT is on the table and all the probes and cables are connected to the unit. The Serial cable is connected to the laptop computer, which is used to change the TX characteristics. 802.11G, Channel 11, 6Mbits. Frequency range tested: 150 kHz – 30 MHz, 9kHz BW.

Transducer Legend:

T1=HP Filter AN 02343_013108	T2=6dB Attenuator P05613
T3=Cable #8 Conducted Site D	T4=(L2) LISN Insertion Loss 02128

Measurement Data: Reading listed by margin.   Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	211.512k Ave	45.2	+0.3	+6.1	+0.0	+0.1	+0.0	51.7	53.3	-1.6	White
^	211.812k	48.4	+0.3	+6.1	+0.0	+0.1	+0.0	54.9	53.1	+1.8	White
3	411.793k	33.3	+0.2	+6.2	+0.1	+0.1	+0.0	39.9	47.6	-7.7	White
4	616.138k	31.7	+0.3	+6.1	+0.1	+0.1	+0.0	38.3	46.0	-7.7	White
5	514.329k	31.1	+0.3	+6.2	+0.1	+0.1	+0.0	37.8	46.0	-8.2	White
6	159.453k	39.5	+0.7	+6.1	+0.0	+0.1	+0.0	46.4	55.5	-9.1	White
7	163.089k	39.3	+0.6	+6.1	+0.0	+0.1	+0.0	46.1	55.3	-9.2	White

8	161.634k	39.3	+0.6	+6.1	+0.0	+0.1	+0.0	46.1	55.4	-9.3	White
9	312.166k	33.8	+0.2	+6.2	+0.1	+0.2	+0.0	40.5	49.9	-9.4	White
10	168.906k	38.7	+0.5	+6.1	+0.0	+0.1	+0.0	45.4	55.0	-9.6	White
11	171.815k	35.3	+0.5	+6.1	+0.0	+0.1	+0.0	42.0	54.9	-12.9	White
12	20.427M	29.4	+0.2	+6.1	+0.4	+0.9	+0.0	37.0	50.0	-13.0	White
13	21.797M	29.0	+0.3	+6.1	+0.4	+1.1	+0.0	36.9	50.0	-13.1	White
14	4.535M	25.8	+0.3	+6.2	+0.2	+0.3	+0.0	32.8	46.0	-13.2	White
15	20.625M	29.1	+0.2	+6.1	+0.4	+1.0	+0.0	36.8	50.0	-13.2	White
16	20.950M	29.1	+0.2	+6.1	+0.4	+1.0	+0.0	36.8	50.0	-13.2	White
17	20.283M	29.1	+0.2	+6.1	+0.4	+0.9	+0.0	36.7	50.0	-13.3	White
18	4.449M	25.6	+0.3	+6.2	+0.2	+0.3	+0.0	32.6	46.0	-13.4	White
19	21.103M	28.9	+0.2	+6.1	+0.4	+1.0	+0.0	36.6	50.0	-13.4	White
20	21.265M	28.9	+0.2	+6.1	+0.4	+1.0	+0.0	36.6	50.0	-13.4	White
21	21.454M	28.7	+0.2	+6.1	+0.4	+1.1	+0.0	36.5	50.0	-13.5	White

CKC Laboratories, Inc. Date: 9/24/2007 Time: 09:12:26 Masimo Corporation WO#: 86964
FCC 15.207 COND [AVE] Test Lead: White 120V 60Hz Sequence#: 16

Sweep Data — 1 - FCC 15.207 COND [AVE] — 2 - FCC 15.207 COND [QP]

![CKC Testing the Future LABORATORIES, INC.]
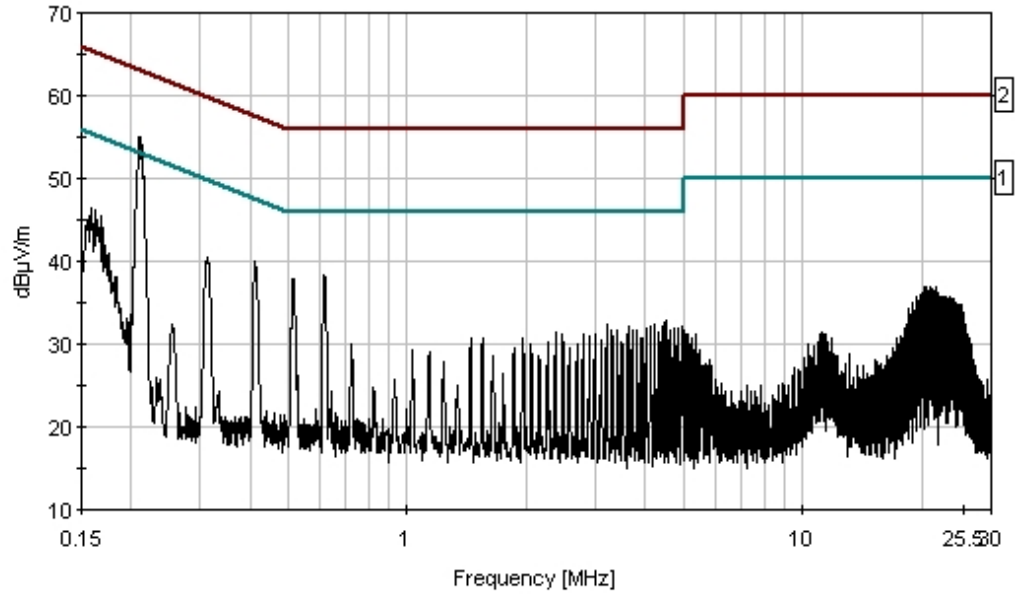
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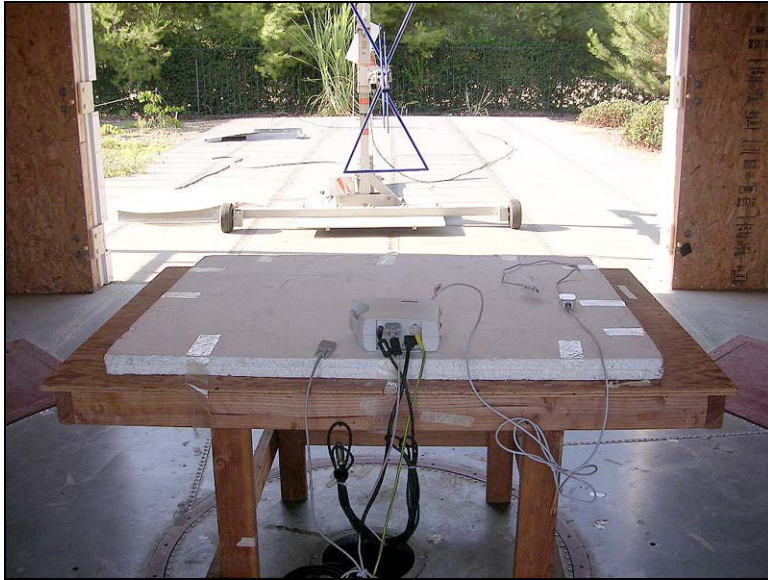
Test Setup Photos

Low Frequency

Mid

Mid

Mid Horizontal

Mid Horizontal

Hi Frequency

Test Data Sheets

Test Location: CKC Laboratories, Inc. •110 N Olinda Place • Brea, CA 92823 • 714-993-6112

Customer:	**Masimo Corporation**		
Specification:	**FCC 15.209**		
Work Order #:	**86964**	Date:	9/18/2007
Test Type:	**Radiated Scan**	Time:	16:12:47
Equipment:	**Pulse Rate Monitor**	Sequence#:	21
Manufacturer:	Masimo Corp	Tested By:	Sep Apahidean
Model:	RAD-87		
S/N:	804173		

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
Spectrum Analyzer	US44300438	01/04/2007	01/04/2009	02672
Bilog Antenna	2629	02/02/2006	02/02/2008	00851
Antenna cable	Cable#17	09/19/2006	09/19/2008	P04382
Antenna cable from bulkhead to antenna	Cable #33	02/22/2007	02/22/2009	P05569
Preamp to SA Cable (3 feet)	Cable #22	08/09/2006	08/09/2008	P05555
Pre-amp	2727A05392	06/06/2006	06/06/2008	00010
Spectrum Analyzer	2928A04874	09/14/2006	09/14/2008	02462
Spectrum Analyzer	3001A18430	09/14/2006	09/14/2008	02472
QP Adapter	3303A01884	09/14/2006	09/14/2008	01437
Loop Antenna	2014	06/14/2006	06/14/2008	00314
Cable Big Blue	12237/4A	11/28/2005	11/28/2007	P05421
Antenna cable (Heliax)	P05348	09/28/2005	09/28/2007	NA
Horn Antenna	9603-4683	06/29/2006	06/29/2008	01646
Microwave Pre-amp	3123A00282	06/05/2007	06/05/2009	00787

Equipment Under Test (* = **EUT**):

Function	Manufacturer	Model #	S/N
Pulse Rate Monitor*	Masimo Corp	RAD-87	804173

Support Devices:

Function	Manufacturer	Model #	S/N
Laptop	IBM	ThinkPAD 2366	99-TGPV9

Test Conditions / Notes:

The EUT is on the table, connected to the spectrum analyzer. The Serial cable is connected to the laptop computer, which is used to change the TX characteristics. Unit is horizontally placed on the table. The nurse call cable and RS232 cable have a Ferrite # 0444164281. Worst case frequency and data rate tested from 802.11b, 802.11g and 802.11a. Frequency range of tests is 9 kHz to 40 GHz. 9 kHz – 150 kHz 200 Hz, 150 kHz – 30 MHz 9 kHz, 30 MHz – 1000 MHz 120 kHz, 1 GHz – 40 GHz 1 MHz.

Transducer Legend:

T1=Bilog AN00851 020208 Chase	T2=84' Heliax Cable P04382
T3=Cable #22 Preamp to SA 081008	T4=Cable #33_Ant_bulkhead_P05569_022209
T5=Preamp 8447D Asset 00010	

Measurement Data: Reading listed by margin.   Test Distance: 3 Meters

#	Freq	Rdng	T1 T5	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	157.940M QP	54.8	+10.3 -26.9	+1.1	+0.2	+1.4	+0.0	40.9	43.5	-2.6	Horiz
^	157.984M	59.2	+10.3 -26.9	+1.1	+0.2	+1.4	+0.0	45.3	43.5	+1.8	Horiz
3	663.606M	43.0	+20.5 -28.0	+2.8	+0.5	+3.0	+0.0	41.8	46.0	-4.2	Vert
4	359.540M	49.4	+14.7 -26.9	+2.0	+0.3	+2.1	+0.0	41.6	46.0	-4.4	Vert
5	341.131M	49.7	+14.3 -26.8	+2.0	+0.3	+2.1	+0.0	41.6	46.0	-4.4	Vert
6	70.038M	54.7	+6.1 -27.1	+0.9	+0.1	+0.8	+0.0	35.5	40.0	-4.5	Vert
7	208.957M QP	53.2	+9.4 -26.7	+1.4	+0.2	+1.5	+0.0	39.0	43.5	-4.5	Vert
^	208.962M	55.3	+9.4 -26.7	+1.4	+0.2	+1.5	+0.0	41.1	43.5	-2.4	Vert
9	347.212M QP	49.5	+14.4 -26.8	+2.0	+0.3	+2.1	+0.0	41.5	46.0	-4.5	Vert
^	347.211M	50.9	+14.4 -26.8	+2.0	+0.3	+2.1	+0.0	42.9	46.0	-3.1	Vert
11	589.927M QP	43.4	+19.9 -27.9	+2.7	+0.5	+2.8	+0.0	41.4	46.0	-4.6	Vert
^	589.930M	44.4	+19.9 -27.9	+2.7	+0.5	+2.8	+0.0	42.4	46.0	-3.6	Vert
13	336.420M	49.6	+14.2 -26.7	+1.9	+0.3	+2.0	+0.0	41.3	46.0	-4.7	Horiz

14	353.362M QP	49.0	+14.6 -26.8	+2.0	+0.3	+2.1	+0.0	41.2	46.0	-4.8	Vert
^	353.353M	51.1	+14.6 -26.8	+2.0	+0.3	+2.1	+0.0	43.3	46.0	-2.7	Vert
16	68.702M	54.2	+6.1 -27.1	+0.9	+0.1	+0.8	+0.0	35.0	40.0	-5.0	Vert
17	61.442M	54.2	+6.2 -27.2	+0.8	+0.1	+0.8	+0.0	34.9	40.0	-5.1	Vert
18	242.760M	52.1	+11.9 -26.7	+1.6	+0.3	+1.7	+0.0	40.9	46.0	-5.1	Vert
19	417.832M	46.2	+16.2 -27.1	+2.2	+0.4	+2.3	+0.0	40.2	46.0	-5.8	Vert
20	67.747M QP	53.3	+6.1 -27.1	+0.9	+0.1	+0.8	+0.0	34.1	40.0	-5.9	Vert
^	67.797M	55.9	+6.1 -27.1	+0.9	+0.1	+0.8	+0.0	36.7	40.0	-3.3	Vert
22	194.744M	52.3	+8.8 -26.7	+1.4	+0.2	+1.5	+0.0	37.5	43.5	-6.0	Horiz
23	328.844M	48.5	+14.0 -26.7	+1.9	+0.3	+2.0	+0.0	40.0	46.0	-6.0	Vert
24	212.890M	50.8	+9.7 -26.6	+1.5	+0.2	+1.6	+0.0	37.2	43.5	-6.3	Horiz
25	316.521M	48.5	+13.7 -26.6	+1.8	+0.3	+2.0	+0.0	39.7	46.0	-6.3	Vert
26	322.686M	48.4	+13.8 -26.6	+1.8	+0.3	+2.0	+0.0	39.7	46.0	-6.3	Vert
27	402.587M	46.1	+15.8 -27.1	+2.1	+0.4	+2.3	+0.0	39.6	46.0	-6.4	Vert
28	87.013M QP	50.5	+8.0 -27.1	+1.0	+0.1	+0.9	+0.0	33.4	40.0	-6.6	Vert
^	87.013M	52.6	+7.9 -27.1	+1.0	+0.1	+0.9	+0.0	35.4	40.0	-4.6	Vert
30	334.902M	47.7	+14.1 -26.7	+1.9	+0.3	+2.0	+0.0	39.3	46.0	-6.7	Vert
31	663.576M	40.4	+20.5 -28.0	+2.8	+0.5	+3.0	+0.0	39.2	46.0	-6.8	Horiz
32	69.413M	52.4	+6.1 -27.1	+0.9	+0.1	+0.8	+0.0	33.2	40.0	-6.8	Horiz
33	384.110M	46.2	+15.3 -27.0	+2.1	+0.4	+2.2	+0.0	39.2	46.0	-6.8	Vert
34	310.370M	48.3	+13.5 -26.6	+1.8	+0.3	+1.9	+0.0	39.2	46.0	-6.8	Vert
35	365.669M	46.6	+14.9 -26.9	+2.0	+0.3	+2.2	+0.0	39.1	46.0	-6.9	Vert
36	86.072M	50.2	+7.9 -27.1	+1.0	+0.1	+0.9	+0.0	33.0	40.0	-7.0	Vert
37	663.602M	40.2	+20.5 -28.0	+2.8	+0.5	+3.0	+0.0	39.0	46.0	-7.0	Horiz
38	371.858M	46.3	+15.0 -26.9	+2.0	+0.3	+2.2	+0.0	38.9	46.0	-7.1	Vert

39	331.838M	47.0	+14.1 -26.7	+1.9	+0.3	+2.0	+0.0	38.6	46.0	-7.4	Vert
40	304.232M	47.8	+13.3 -26.5	+1.7	+0.3	+1.9	+0.0	38.5	46.0	-7.5	Vert
41	184.651M	50.6	+8.9 -26.8	+1.3	+0.2	+1.5	+0.0	35.7	43.5	-7.8	Horiz
42	239.662M	49.6	+11.7 -26.7	+1.6	+0.3	+1.7	+0.0	38.2	46.0	-7.8	Vert
43	390.269M	44.8	+15.5 -27.0	+2.1	+0.4	+2.3	+0.0	38.1	46.0	-7.9	Vert
44	387.173M	44.4	+15.4 -27.0	+2.1	+0.4	+2.3	+0.0	37.6	46.0	-8.4	Vert
45	356.445M	45.2	+14.7 -26.8	+2.0	+0.3	+2.1	+0.0	37.5	46.0	-8.5	Vert
46	114.599M	48.7	+10.9 -27.0	+1.1	+0.2	+1.1	+0.0	35.0	43.5	-8.5	Vert
47	66.500M	50.1	+6.1 -27.1	+0.9	+0.1	+0.8	+0.0	30.9	40.0	-9.1	Vert
48	835.741M	34.1	+23.0 -27.5	+3.2	+0.5	+3.4	+0.0	36.7	46.0	-9.3	Vert
49	126.394M	47.3	+11.5 -27.0	+1.1	+0.2	+1.1	+0.0	34.2	43.5	-9.3	Vert
50	491.627M	40.9	+17.9 -27.6	+2.4	+0.4	+2.6	+0.0	36.6	46.0	-9.4	Vert
51	245.686M	47.3	+12.1 -26.7	+1.7	+0.3	+1.7	+0.0	36.4	46.0	-9.6	Horiz
52	934.055M	32.3	+24.1 -27.5	+3.4	+0.5	+3.6	+0.0	36.4	46.0	-9.6	Vert
53	80.094M	47.9	+7.5 -27.1	+1.0	+0.1	+0.9	+0.0	30.3	40.0	-9.7	Vert
54	811.072M	34.5	+22.4 -27.6	+3.1	+0.5	+3.3	+0.0	36.2	46.0	-9.8	Vert
55	377.988M	43.2	+15.2 -27.0	+2.1	+0.4	+2.2	+0.0	36.1	46.0	-9.9	Vert
56	298.135M	45.2	+13.2 -26.5	+1.7	+0.3	+1.9	+0.0	35.8	46.0	-10.2	Vert
57	67.796M	48.9	+6.1 -27.1	+0.9	+0.1	+0.8	+0.0	29.7	40.0	-10.3	Horiz
58	285.810M	45.4	+13.0 -26.5	+1.7	+0.3	+1.8	+0.0	35.7	46.0	-10.3	Vert
59	909.474M	31.8	+23.4 -27.6	+3.3	+0.5	+3.5	+0.0	34.9	46.0	-11.1	Vert
60	308.130M	43.8	+13.4 -26.6	+1.8	+0.3	+1.9	+0.0	34.6	46.0	-11.4	Horiz
61	86.772M	45.5	+8.0 -27.1	+1.0	+0.1	+0.9	+0.0	28.4	40.0	-11.6	Horiz
62	343.600M	41.4	+14.3 -26.8	+2.0	+0.3	+2.1	+0.0	33.3	46.0	-12.7	Vert
63	315.670M	41.8	+13.6 -26.6	+1.8	+0.3	+2.0	+0.0	32.9	46.0	-13.1	Horiz

64	345.190M	40.9	+14.4 -26.8	+2.0	+0.3	+2.1	+0.0	32.9	46.0	-13.1	Horiz
65	897.186M	30.2	+23.1 -27.7	+3.3	+0.5	+3.5	+0.0	32.9	46.0	-13.1	Vert
66	73.722M	45.3	+6.6 -27.1	+0.9	+0.1	+0.8	+0.0	26.6	40.0	-13.4	Horiz
67	284.255M	42.1	+13.0 -26.5	+1.7	+0.3	+1.8	+0.0	32.4	46.0	-13.6	Vert
68	287.330M	41.5	+13.0 -26.5	+1.7	+0.3	+1.9	+0.0	31.9	46.0	-14.1	Vert
69	245.688M	41.9	+12.1 -26.7	+1.7	+0.3	+1.7	+0.0	31.0	46.0	-15.0	Vert
70	258.081M	40.8	+12.5 -26.6	+1.7	+0.3	+1.7	+0.0	30.4	46.0	-15.6	Horiz
71	233.422M	41.8	+11.3 -26.6	+1.6	+0.2	+1.6	+0.0	29.9	46.0	-16.1	Horiz
72	970.879M	31.2	+24.6 -27.6	+3.4	+0.5	+3.7	+0.0	35.8	54.0	-18.2	Vert
73	258.063M	37.7	+12.5 -26.6	+1.7	+0.3	+1.7	+0.0	27.3	46.0	-18.7	Vert