

NORTHWEST EMC

Medtronic, Inc.

24967 CareLink SmartSync™ Device Manager Patient Connector

FCC 15.207:2016

FCC 15.247:2016

Bluetooth Radio Module in FHSS Mode

Report # MDTR0474.1 Rev 01



NVLAP Lab Code: 200881-0

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.

CERTIFICATE OF TEST

Last Date of Test: May 31, 2016

Medtronic, Inc.

Model: 24967 CareLink SmartSync™ Device Manager Patient Connector

Radio Equipment Testing

Standards

Specification	Method
FCC 15.207:2016	ANSI C63.10:2013
FCC 15.247:2016	KDB 558074

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	Yes	Pass	
6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
7.5	Duty Cycle	No	N/A	
7.8.2	Carrier Frequency Separation	No	N/A	
7.8.3	Number of Hopping Frequencies	No	N/A	
7.8.4	Dwell Time	No	N/A	
7.8.5	Output Power	No	N/A	
7.8.6	Band Edge Compliance	No	N/A	
7.8.6	Band Edge Compliance - Hopping Mode	No	N/A	
7.8.7	Occupied Bandwidth	No	N/A	
7.8.8	Spurious Conducted Emissions	No	N/A	

See Eurofins test report #G0M-1303-2693-TFC247B-V01

Deviations from Test Standards

None

Approved By:



Tim O'Shea, 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.

REVISION HISTORY

Revision Number	Description	Date	Page Number
01	Revised to reference Eurofins test report for tests not done by Northwest EMC	9/8/16	2
01	Removed reference to C2PC application in the testing objective.	9/8/16	7

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 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 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

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:

<http://www.nwemc.com/accreditations/>

<http://gsi.nist.gov/global/docs/cabs/designations.html>

MEASUREMENT UNCERTAINTY

Measurement Uncertainty

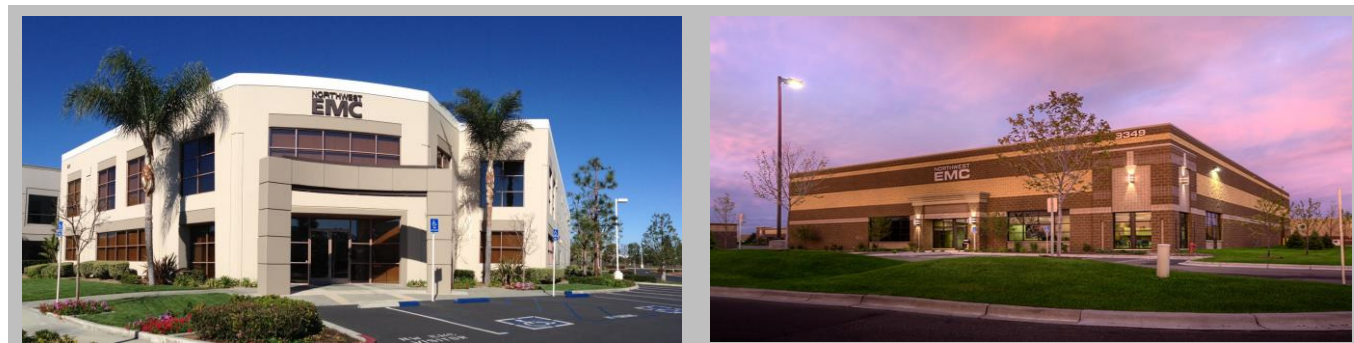
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement 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 on each data sheet. 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.

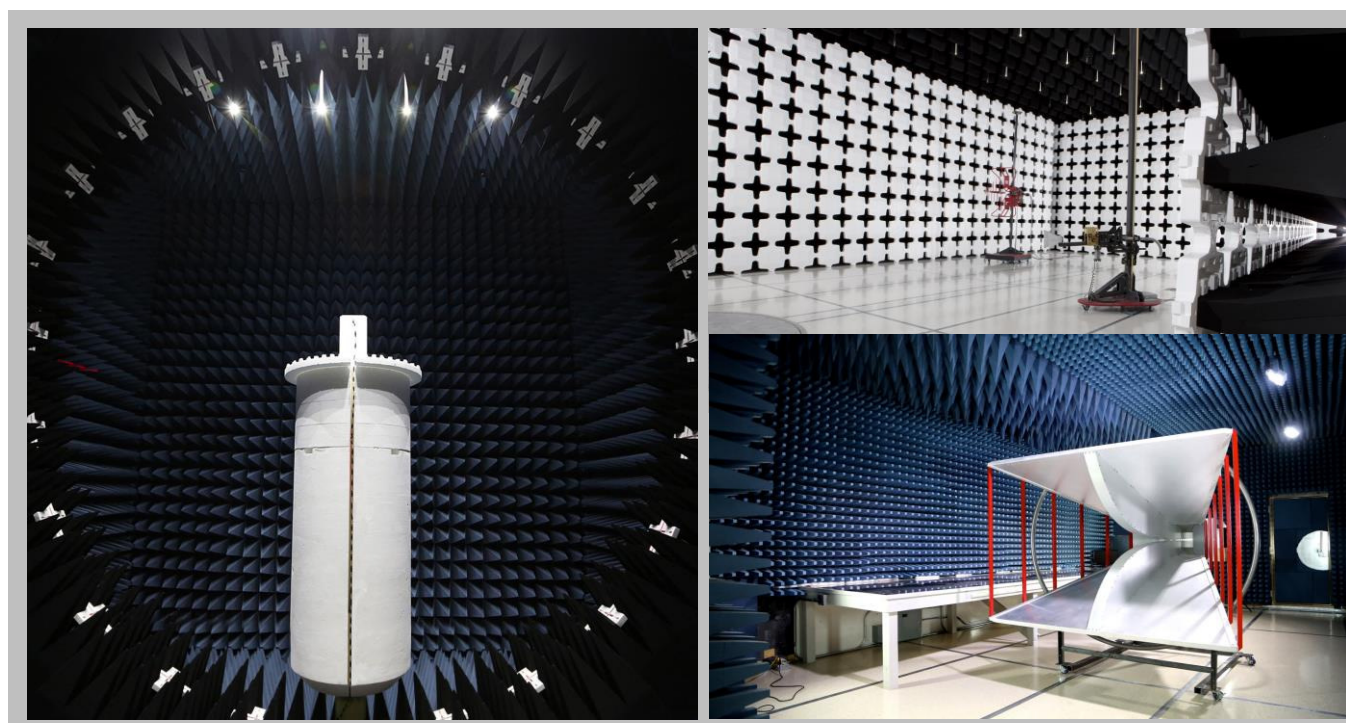
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

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)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

FACILITIES



California Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 98011 (425)984-6600
NVLAP					
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
Industry Canada					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-2	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRR, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Medtronic, Inc
Address:	710 Medtronic Parkway
City, State, Zip:	Fridley, MN 55432
Test Requested By:	Jay Axmann
Model:	24967 CareLink SmartSync™ Device Manager Patient Connector
First Date of Test:	May 26, 2016
Last Date of Test:	May 31, 2016
Receipt Date of Samples:	May 26, 2016
Equipment Design Stage:	Production equivalent
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

The 24967 CareLink SmartSync™ Device Manager Patient Connector is referred to as RF Head throughout this report. The Sirius system consists of the Handheld RF Head and the Base Station. The RF Head will only communicate to the base station via a wired connection. The RF Head will also include a 175 kHz Inductive H Field radio. The Hand held (RF Head) includes a Bluetooth radio that can operate as both a BLE radio when communicating to an implant and a classic Bluetooth radio when communicating to an external tablet.

Testing Objective:

To demonstrate compliance of the Bluetooth Low Energy radio in the RF Head to FCC 15.247 requirements.

CONFIGURATIONS

Configuration MDTR0474- 3

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
24967 CareLink SmartSync™ Device Manager Patient Connector	Medtronic, Inc.	24967	RFA000301A

Configuration MDTR0474- 4

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
24967 CareLink SmartSync™ Device Manager Patient Connector	Medtronic, Inc.	24967	RFA000301A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Power Supply (RF Head)	SL Power	MENB10220A0500C02	Qual PS #1

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop	Dell	Latitude	Unknown

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Cable	No	1m	No	Power Supply (RF Head)	Sirius Programmer (RF Head)

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	5/26/2016	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.
2	5/31/2016	Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. 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 BT EDR - low channel (2402 MHz), mid channel (2440 MHz), and high channel (2480 MHz); DH5, 2DH5, and 3DH5 data rates.

POWER SETTINGS INVESTIGATED

5 VDC

CONFIGURATIONS INVESTIGATED

MDTR0474 - 3

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26500 MHz
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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
Attenuator	Fairview Microwave	SA18E-20	TWZ	10/21/2015	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFK	10/21/2015	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	LFN	10/21/2015	12 mo
Amplifier - Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	9/18/2015	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AHG	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	12/10/2015	12 mo
Cable	ESM Cable Corp.	Bilog Cables	MNH	12/7/2015	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYD	1/6/2016	24 mo
Cable	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	12/7/2015	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AXP	NCR	0 mo
Cable	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	12/7/2015	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	3/1/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	3/1/2016	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVT	3/1/2016	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AIQ	NCR	0 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIB	8/12/2014	24 mo
Analyzer - Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2016	12 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

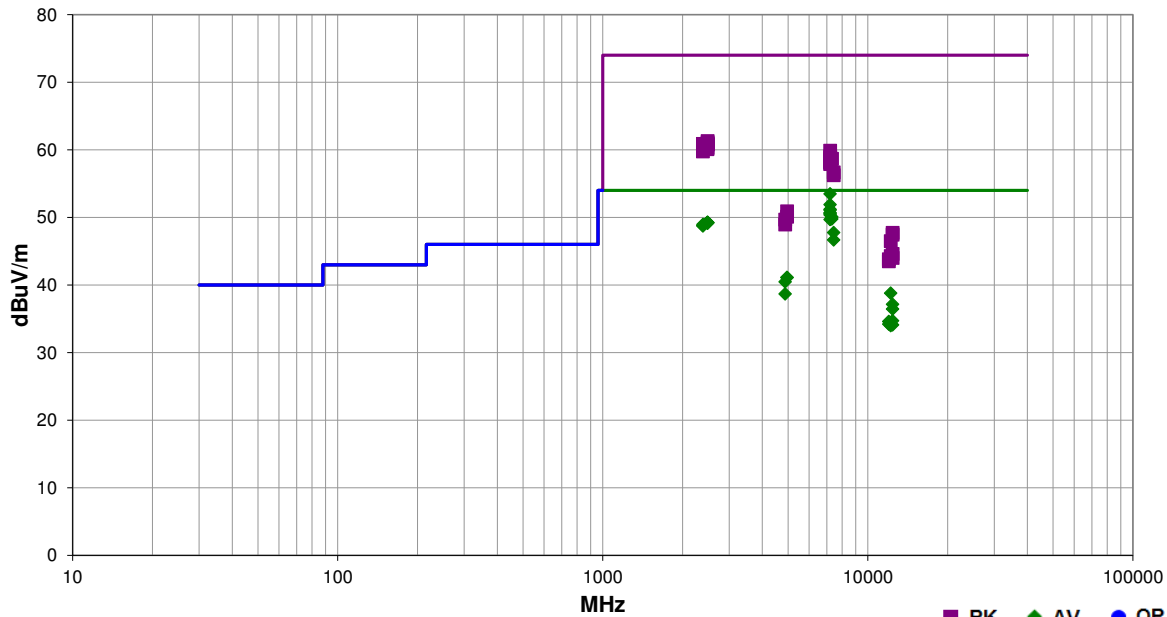
TEST DESCRIPTION

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

Work Order:	MDTR0474	Date:	05/26/16	
Project:	None	Temperature:	22.8 °C	
Job Site:	MN05	Humidity:	53.6% RH	
Serial Number:	RFA000301A	Barometric Pres.:	1012 mbar	
EUT:	24967 CareLink SmartSync™ Device Manager Patient Connector			
Configuration:	3			
Customer:	Medtronic, Inc.			
Attendees:	Nick Blake			
EUT Power:	5 VDC			
Operating Mode:	Transmitting BT EDR - low channel (2402 MHz), mid channel (2440 MHz), and high channel (2480 MHz); DH5, 2DH5, and 3DH5 data rates.			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.247:2016	ANSI C63.10:2013

Run #	16	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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■ PK ◆ AV ● QP

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7205.875	41.1	12.4	2.0	238.0	3.0	0.0	Horz	AV	0.0	53.5	54.0	-0.5	Low ch, DH5, EUT vert
7205.883	39.5	12.4	2.2	358.0	3.0	0.0	Horz	AV	0.0	51.9	54.0	-2.1	Low ch, DH5, EUT on side
7205.867	38.8	12.4	1.0	104.0	3.0	0.0	Vert	AV	0.0	51.2	54.0	-2.8	Low ch, DH5, EUT vert
7205.883	38.7	12.4	2.9	318.9	3.0	0.0	Horz	AV	0.0	51.1	54.0	-2.9	Low ch, DH5, EUT horz
7206.000	38.3	12.4	2.2	183.0	3.0	0.0	Vert	AV	0.0	50.7	54.0	-3.3	Low ch, DH5, EUT horz
7205.950	38.2	12.4	2.9	258.9	3.0	0.0	Horz	AV	0.0	50.6	54.0	-3.4	Low ch, 3DH5, EUT vert
7205.917	38.0	12.4	1.0	78.0	3.0	0.0	Vert	AV	0.0	50.4	54.0	-3.6	Low ch, DH5, EUT on side
7319.967	36.9	13.2	1.0	122.0	3.0	0.0	Vert	AV	0.0	50.1	54.0	-3.9	Mid ch, DH5, EUT vert
7319.825	36.6	13.2	1.0	267.0	3.0	0.0	Horz	AV	0.0	49.8	54.0	-4.2	Mid ch, DH5, EUT vert
7205.983	37.3	12.4	1.0	88.1	3.0	0.0	Horz	AV	0.0	49.7	54.0	-4.3	Low ch, 2DH5, EUT vert
2485.233	32.9	-3.6	1.0	3.0	3.0	20.0	Horz	AV	0.0	49.3	54.0	-4.7	High ch, DH5, EUT on side
2488.367	32.8	-3.6	1.0	307.9	3.0	20.0	Vert	AV	0.0	49.2	54.0	-4.8	High ch, DH5, EUT vert
2488.058	32.8	-3.6	1.0	116.1	3.0	20.0	Horz	AV	0.0	49.2	54.0	-4.8	High ch, DH5, EUT vert
2487.708	32.8	-3.6	1.7	176.0	3.0	20.0	Horz	AV	0.0	49.2	54.0	-4.8	High ch, DH5, EUT horz
2487.675	32.8	-3.6	1.0	238.0	3.0	20.0	Vert	AV	0.0	49.2	54.0	-4.8	High ch, DH5, EUT horz
2487.683	32.8	-3.6	1.0	171.0	3.0	20.0	Vert	AV	0.0	49.2	54.0	-4.8	High ch, DH5, EUT on side
2484.050	32.8	-3.6	3.1	279.0	3.0	20.0	Horz	AV	0.0	49.2	54.0	-4.8	High ch, 2DH5, EUT on side
2483.558	32.8	-3.6	1.0	299.0	3.0	20.0	Horz	AV	0.0	49.2	54.0	-4.8	High ch, 3DH5, EUT on side
2388.667	32.8	-3.8	1.0	353.0	3.0	20.0	Horz	AV	0.0	49.0	54.0	-5.0	Low ch, 3DH5, EUT on side
2386.833	32.6	-3.8	1.0	62.1	3.0	20.0	Horz	AV	0.0	48.8	54.0	-5.2	Low ch, DH5, EUT on side
2389.325	32.6	-3.9	1.0	360.0	3.0	20.0	Horz	AV	0.0	48.7	54.0	-5.3	Low ch, 2DH5, EUT on side
7440.017	34.5	13.3	1.0	123.1	3.0	0.0	Vert	AV	0.0	47.8	54.0	-6.2	High ch, DH5, EUT vert
7440.025	33.4	13.3	1.0	239.9	3.0	0.0	Horz	AV	0.0	46.7	54.0	-7.3	High ch, DH5, EUT vert
2485.458	44.9	-3.6	1.0	171.0	3.0	20.0	Vert	PK	0.0	61.3	74.0	-12.7	High ch, DH5, EUT on side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4959.992	35.7	5.4	1.0	211.0	3.0	0.0	Vert	AV	0.0	41.1	54.0	-12.9	High ch, DH5, EUT vert
4959.908	35.7	5.4	2.2	183.0	3.0	0.0	Horz	AV	0.0	41.1	54.0	-12.9	High ch, DH5, EUT vert
2487.925	44.7	-3.6	1.0	3.0	3.0	20.0	Horz	PK	0.0	61.1	74.0	-12.9	High ch, DH5, EUT on side
2487.975	44.5	-3.6	1.0	307.9	3.0	20.0	Vert	PK	0.0	60.9	74.0	-13.1	High ch, DH5, EUT vert
2385.133	44.7	-3.8	1.0	353.0	3.0	20.0	Horz	PK	0.0	60.9	74.0	-13.1	High ch, 3DH5, EUT on side
2487.600	44.4	-3.6	1.0	116.1	3.0	20.0	Horz	PK	0.0	60.8	74.0	-13.2	High ch, DH5, EUT vert
2487.492	44.4	-3.6	1.0	299.0	3.0	20.0	Horz	PK	0.0	60.8	74.0	-13.2	High ch, 3DH5, EUT on side
2485.258	44.4	-3.6	1.0	238.0	3.0	20.0	Vert	PK	0.0	60.8	74.0	-13.2	High ch, DH5, EUT horz
4879.933	35.3	5.2	1.0	159.1	3.0	0.0	Horz	AV	0.0	40.5	54.0	-13.5	Mid ch, DH5, EUT vert
2484.858	43.9	-3.6	3.1	279.0	3.0	20.0	Horz	PK	0.0	60.3	74.0	-13.7	High ch, 3DH5, EUT on side
2483.642	43.7	-3.6	1.7	176.0	3.0	20.0	Horz	PK	0.0	60.1	74.0	-13.9	High ch, DH5, EUT horz
2385.475	43.9	-3.8	1.0	360.0	3.0	20.0	Horz	PK	0.0	60.1	74.0	-13.9	Low ch, 2DH5, EUT on side
7205.592	47.5	12.4	2.0	238.0	3.0	0.0	Horz	PK	0.0	59.9	74.0	-14.1	Low ch, DH5, EUT vert
2385.800	43.6	-3.8	1.0	62.1	3.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	Low ch, DH5, EUT on side
7205.308	46.7	12.4	2.9	258.9	3.0	0.0	Horz	PK	0.0	59.1	74.0	-14.9	Low ch, 3DH5, EUT vert
12199.280	39.5	-0.7	2.2	321.0	3.0	0.0	Horz	AV	0.0	38.8	54.0	-15.2	Mid ch, DH5, EUT vert
7206.500	46.4	12.4	2.2	358.0	3.0	0.0	Horz	PK	0.0	58.8	74.0	-15.2	Low ch, DH5, EUT on side
7319.642	45.5	13.2	1.0	267.0	3.0	0.0	Horz	PK	0.0	58.7	74.0	-15.3	Mid ch, DH5, EUT vert
7320.058	45.5	13.2	1.0	122.0	3.0	0.0	Vert	PK	0.0	58.7	74.0	-15.3	Mid ch, DH5, EUT vert
4879.833	33.5	5.2	1.0	110.0	3.0	0.0	Vert	AV	0.0	38.7	54.0	-15.3	Mid ch, DH5, EUT vert
7206.358	46.1	12.4	2.9	318.9	3.0	0.0	Horz	PK	0.0	58.5	74.0	-15.5	Low ch, DH5, EUT horz
7206.292	46.0	12.4	1.0	88.1	3.0	0.0	Horz	PK	0.0	58.4	74.0	-15.6	Low ch, 2DH5, EUT vert
7206.475	45.8	12.4	1.0	78.0	3.0	0.0	Vert	PK	0.0	58.2	74.0	-15.8	Low ch, DH5, EUT on side
7205.775	45.7	12.4	1.0	104.0	3.0	0.0	Vert	PK	0.0	58.1	74.0	-15.9	Low ch, DH5, EUT vert
7205.442	45.5	12.4	2.2	183.0	3.0	0.0	Vert	PK	0.0	57.9	74.0	-16.1	Low ch, DH5, EUT vert
12400.450	31.6	5.5	1.0	228.1	3.0	0.0	Horz	AV	0.0	37.1	54.0	-16.9	High ch, DH5, EUT vert
7439.358	43.4	13.3	1.0	123.1	3.0	0.0	Vert	PK	0.0	56.7	74.0	-17.3	High ch, DH5, EUT vert
12400.510	30.9	5.5	1.0	347.0	3.0	0.0	Vert	AV	0.0	36.4	54.0	-17.6	High ch, DH5, EUT vert
7439.675	43.0	13.3	1.0	239.9	3.0	0.0	Horz	PK	0.0	56.3	74.0	-17.7	High ch, DH5, EUT vert
12399.290	34.7	0.0	1.0	149.1	3.0	0.0	Horz	AV	0.0	34.7	54.0	-19.3	High ch, DH5, EUT vert
12009.310	36.0	-1.4	1.0	106.1	3.0	0.0	Horz	AV	0.0	34.6	54.0	-19.4	Low ch, DH5, EUT vert
12009.340	35.6	-1.4	1.0	172.0	3.0	0.0	Vert	AV	0.0	34.2	54.0	-19.8	Low ch, DH5, EUT vert
12399.310	34.1	0.0	1.0	31.0	3.0	0.0	Vert	AV	0.0	34.1	54.0	-19.9	High ch, DH5, EUT vert
12199.300	34.7	-0.7	1.0	351.0	3.0	0.0	Vert	AV	0.0	34.0	54.0	-20.0	Mid ch, DH5, EUT vert
4960.233	45.5	5.4	2.2	183.0	3.0	0.0	Horz	PK	0.0	50.9	74.0	-23.1	High ch, DH5, EUT vert
4960.392	44.7	5.4	1.0	211.0	3.0	0.0	Vert	PK	0.0	50.1	74.0	-23.9	High ch, DH5, EUT vert
4880.592	44.5	5.2	1.0	159.1	3.0	0.0	Horz	PK	0.0	49.7	74.0	-24.3	Mid ch, DH5, EUT vert
4879.600	43.8	5.2	1.0	110.0	3.0	0.0	Vert	PK	0.0	49.0	74.0	-25.0	Mid ch, DH5, EUT vert
12400.580	42.2	5.5	1.0	228.1	3.0	0.0	Horz	PK	0.0	47.7	74.0	-26.3	High ch, DH5, EUT vert
12400.460	41.9	5.5	1.0	347.0	3.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	High ch, DH5, EUT vert
12200.720	47.2	-0.7	2.2	321.0	3.0	0.0	Horz	PK	0.0	46.5	74.0	-27.5	Mid ch, DH5, EUT vert
12399.330	44.6	0.0	1.0	31.0	3.0	0.0	Vert	PK	0.0	44.6	74.0	-29.4	High ch, DH5, EUT vert
12200.730	45.0	-0.7	1.0	351.0	3.0	0.0	Vert	PK	0.0	44.3	74.0	-29.7	Mid ch, DH5, EUT vert
12399.160	44.0	0.0	1.0	149.1	3.0	0.0	Horz	PK	0.0	44.0	74.0	-30.0	High ch, DH5, EUT vert
12009.150	45.2	-1.4	1.0	172.0	3.0	0.0	Vert	PK	0.0	43.8	74.0	-30.2	Low ch, DH5, EUT vert
12010.720	44.9	-1.4	1.0	106.1	3.0	0.0	Horz	PK	0.0	43.5	74.0	-30.5	Low ch, DH5, EUT vert

POWERLINE CONDUCTED EMISSIONS

TEST DESCRIPTION

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Per the standard, an insulating material was also added to ground plane between the EUT's power and remote I/O cables. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50ohm measuring port is terminated by a 50ohm EMI meter or a 50ohm resistive load. All 50ohm measuring ports of the LISN are terminated by 50ohm. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Analyzer - Spectrum Analyzer	Agilent	E4443A	AAS	3/8/2016	3/8/2017
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	3/21/2016	3/21/2017
Cable - Conducted Cable Assembly	Northwest EMC	MNC, HGN, TYK	MNCA	1/29/2016	1/29/2017

MEASUREMENT UNCERTAINTY

Description		
Expanded k=2	2.4 dB	-2.4 dB

CONFIGURATIONS INVESTIGATED

MDTR0474-4

MODES INVESTIGATED

Middle Channel 2440 MHz, DH5.

POWERLINE CONDUCTED EMISSIONS

EUT:	24967 CareLink SmartSync™ Device Manager Patient Connector	Work Order:	MDTR0474
Serial Number:	RFA000301A	Date:	05/31/2016
Customer:	Medtronic, Inc.	Temperature:	22.2°C
Attendees:	Nick Blake	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure:	1014 mb
Tested By:	Jared Ison	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	MDTR0474-4

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2016	ANSI C63.10:2013

TEST PARAMETERS

Run #:	5	Line:	Neutral	Add. Ext. Attenuation (dB):	0
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COMMENTS

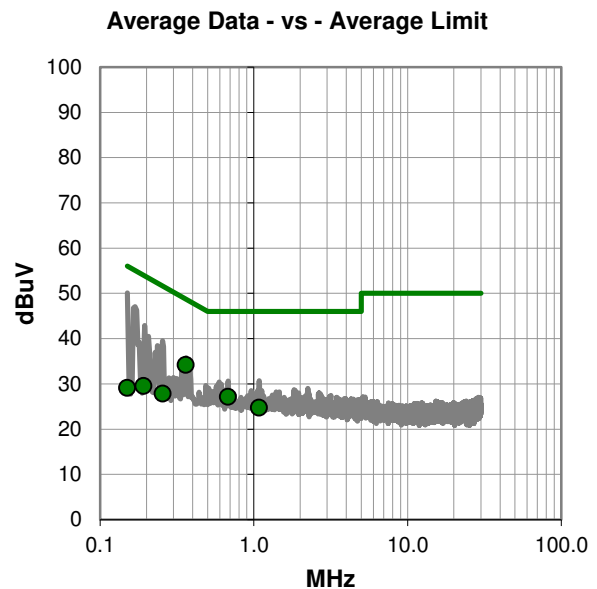
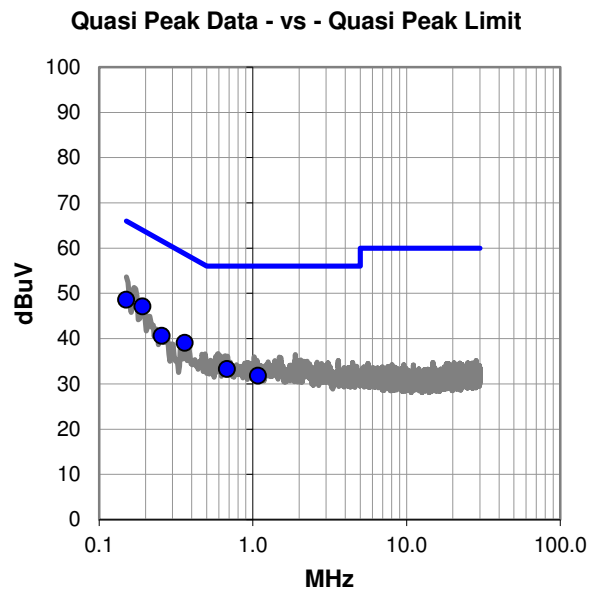
None

EUT OPERATING MODES

Middle Channel 2440 MHz, DH5.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #5

Quasi Peak Data - vs - Quasi Peak Limit

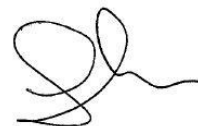
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.192	26.8	20.3	47.1	64.0	-16.9
0.150	28.2	20.4	48.6	66.0	-17.4
0.361	18.9	20.2	39.1	58.7	-19.6
0.256	20.4	20.2	40.6	61.6	-20.9
0.679	13.2	20.1	33.3	56.0	-22.7
1.083	11.7	20.1	31.8	56.0	-24.2

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.361	14.0	20.2	34.2	48.7	-14.5
0.679	7.0	20.1	27.1	46.0	-18.9
1.083	4.6	20.1	24.7	46.0	-21.3
0.256	7.6	20.2	27.8	51.6	-23.7
0.192	9.2	20.3	29.5	54.0	-24.5
0.150	8.7	20.4	29.1	56.0	-26.9

CONCLUSION

Pass



Tested By

POWERLINE CONDUCTED EMISSIONS

EUT:	24967 CareLink SmartSync™ Device Manager Patient Connector	Work Order:	MDTR0474
Serial Number:	RFA000301A	Date:	05/31/2016
Customer:	Medtronic, Inc.	Temperature:	22.2°C
Attendees:	Nick Blake	Relative Humidity:	57%
Customer Project:	None	Bar. Pressure:	1014 mb
Tested By:	Jared Ison	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	MDTR0474-4

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2016	ANSI C63.10:2013

TEST PARAMETERS

Run #:	6	Line:	High Line	Add. Ext. Attenuation (dB):	0
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COMMENTS

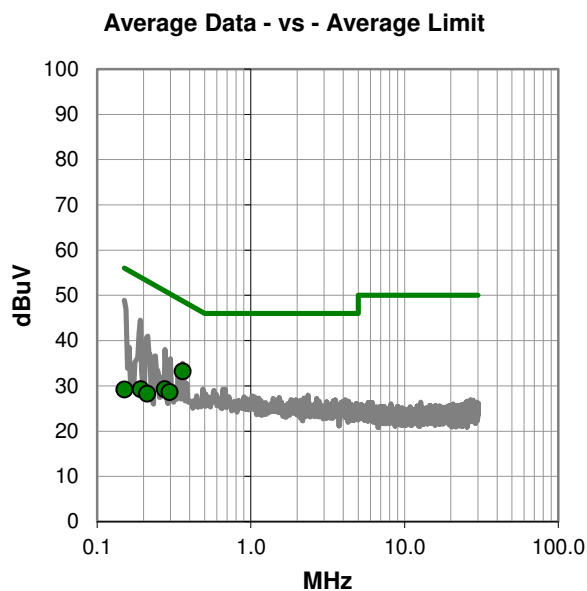
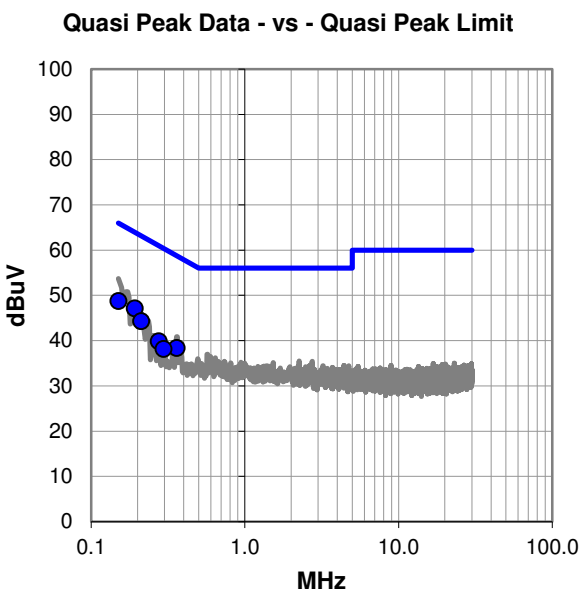
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EUT OPERATING MODES

Middle Channel 2440 MHz, DH5.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #6

Quasi Peak Data - vs - Quasi Peak Limit

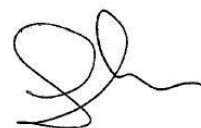
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.192	26.8	20.3	47.1	63.9	-16.8
0.151	28.3	20.4	48.7	66.0	-17.3
0.212	24.0	20.3	44.3	63.1	-18.9
0.360	18.2	20.2	38.4	58.7	-20.3
0.276	19.6	20.2	39.8	60.9	-21.1
0.297	17.9	20.2	38.1	60.3	-22.2

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.360	13.0	20.2	33.2	48.7	-15.5
0.276	9.0	20.2	29.2	50.9	-21.7
0.297	8.4	20.2	28.6	50.3	-21.7
0.192	8.9	20.3	29.2	53.9	-24.7
0.212	8.0	20.3	28.3	53.1	-24.9
0.151	8.8	20.4	29.2	56.0	-26.8

CONCLUSION

Pass



Tested By