

NORTHWEST EMC

Medtronic, Inc.

24967 CareLink SmartSync™ Device Manager Patient Connector

FCC 15.207:2016

FCC 15.209:2016

Inductive Radio

Report # MDTR0474.11



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: June 15, 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 15.209:2016	

Results

Method Clause	Test Description	Applied	Results	Comments
6.4	Field Strength of Fundamental	Yes	Pass	
6.4, 6.5	Spurious Radiated Emissions	Yes	Pass	
6.2	Powerline Conducted Emissions	Yes	Pass	

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
00		None		

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:

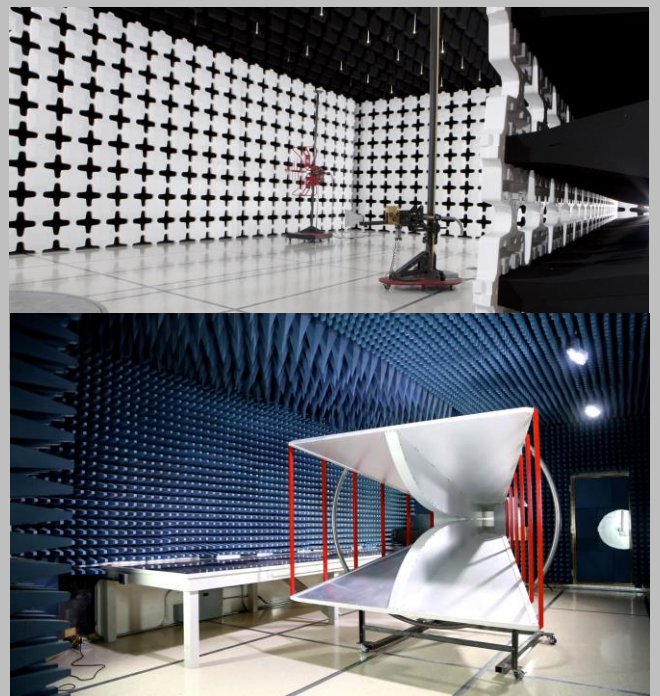
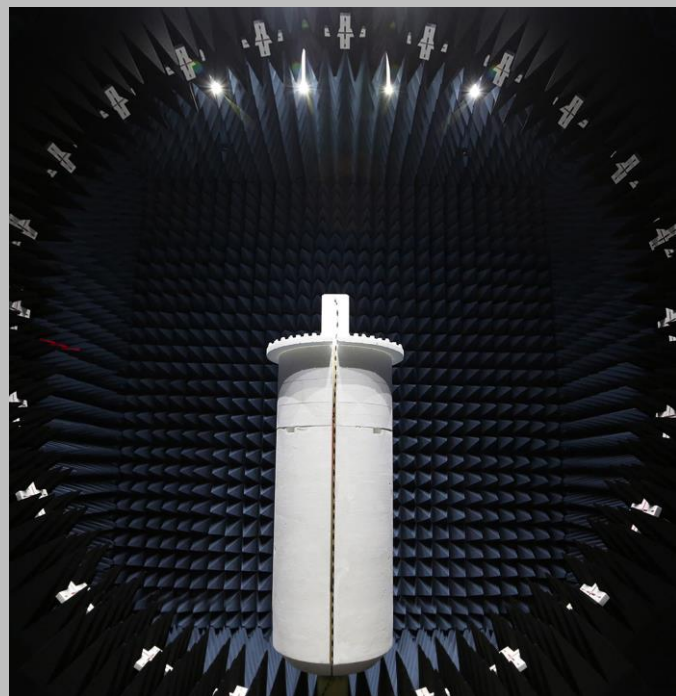
<http://www.nwemc.com/accreditations/>

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

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



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

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 31, 2016
Last Date of Test:	June 15, 2016
Receipt Date of Samples:	May 31, 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 the RF Head in this report. The Sirius system consists of the Handheld RF Head and the Base Station. The Hand held (RF Head) will include 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. 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.

Testing Objective:

To demonstrate compliance of the inductive portion of the device to FCC Part 15.209 and FCC Part 15.207 specifications.

CONFIGURATIONS

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	5/31/2016	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.
2	6/15/2016	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.
3	6/15/2016	Field Strength of Fundamental	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

Inductive, 175kHz

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MDTR0474 - 4

FREQUENCY RANGE INVESTIGATED

Start Frequency 172 kHz

Stop Frequency 176 kHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	12/10/2015	12 mo
Antenna - Biconilog	Teseg	CBL 6141B	AYD	1/6/2016	24 mo
Cable	ESM Cable Corp.	Bilog Cables	MNH	12/7/2015	12 mo
Antenna	ETS Lindgren	6502	AOB	4/28/2015	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 antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

Per ANSI C63.10 sections 6.4.4.1 and 6.4.4.2, the emissions from the EUT were maximized by rotating the EUT on the turntable. Also, the EUT and/or associated antenna was positioned in 3 orthogonal planes. A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity per section 4.5.1. The center of the loop antenna was maintained at 1m above the ground plane during the testing.

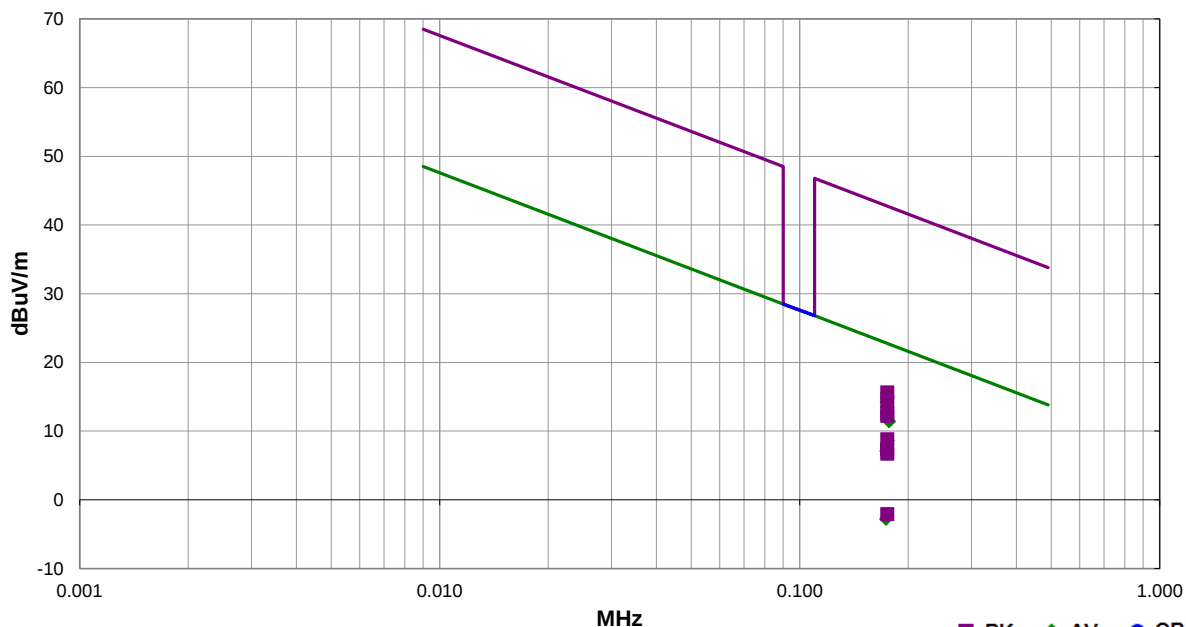
As outlined in 15.209(e) and 15.31(f)(2), measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of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

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

Work Order:	MDTR0474	Date:	06/15/16		
Project:	None	Temperature:	22.2 °C		
Job Site:	MN05	Humidity:	58.8% RH		
Serial Number:	RFA000301A	Barometric Pres.:	1008 mbar	Tested by:	Jared Ison, William Hoffa
EUT:	24967 CareLink SmartSync™ Device Manager Patient Connector				
Configuration:	4				
Customer:	Medtronic, Inc				
Attendees:	Nick Blake				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmit				
Deviations:	None				
Comments:	None				

Test Specifications	Test Method
FCC 15.209:2016	ANSI C63.10:2013

Run #	118	Test Distance (m)	3	Antenna Height(s)	1(m)	Results	Pass
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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
0.175	83.9	11.6	1.0	164.0	3.0	0.0	Para to EUT	AV	-80.0	15.5	22.8	-7.3	EUT On Side
0.175	82.6	11.6	1.0	14.0	3.0	0.0	Para to EUT	AV	-80.0	14.2	22.8	-8.6	EUT Vertical
0.175	81.0	11.6	1.0	268.9	3.0	0.0	Perp to GND	AV	-80.0	12.6	22.8	-10.2	EUT On Side
0.177	79.8	11.6	1.0	73.1	3.0	0.0	Perp to GND	AV	-80.0	11.4	22.7	-11.2	EUT Vertical
0.176	77.0	11.6	1.0	4.1	3.0	0.0	Para to GND	AV	-80.0	8.6	22.7	-14.1	EUT Vertical
0.174	75.5	11.6	1.0	222.0	3.0	0.0	Para to GND	AV	-80.0	7.1	22.8	-15.7	EUT On Side
0.175	75.1	11.6	1.0	240.9	3.0	0.0	Para to GND	AV	-80.0	6.7	22.8	-16.0	EUT Horizontal
0.174	65.6	11.6	1.0	193.0	3.0	0.0	Para to EUT	AV	-80.0	-2.8	22.8	-25.6	EUT Horizontal
0.175	84.0	11.6	1.0	164.0	3.0	0.0	Para to GND	PK	-80.0	15.6	42.8	-27.1	EUT On Side
0.175	82.7	11.6	1.0	14.0	3.0	0.0	Para to EUT	PK	-80.0	14.3	42.8	-28.4	EUT Vertical
0.175	81.0	11.6	1.0	268.9	3.0	0.0	Perp to GND	PK	-80.0	12.6	42.8	-30.1	EUT On Side
0.175	80.6	11.6	1.0	73.1	3.0	0.0	Perp to GND	PK	-80.0	12.2	42.8	-30.5	EUT Vertical
0.175	77.2	11.6	1.0	4.1	3.0	0.0	Para to GND	PK	-80.0	8.8	42.8	-33.9	EUT Vertical
0.175	75.7	11.6	1.0	222.0	3.0	0.0	Para to GND	PK	-80.0	7.3	42.8	-35.4	EUT On Side
0.175	75.1	11.6	1.0	240.9	3.0	0.0	Para to GND	PK	-80.0	6.7	42.8	-36.0	EUT Horizontal
0.175	49.2	11.6	1.0	256.0	3.0	0.0	Perp to GND	AV	-80.0	-19.2	22.8	-42.0	EUT Horizontal
0.175	66.3	11.6	1.0	193.0	3.0	0.0	Para to EUT	PK	-80.0	-2.1	42.8	-44.8	EUT Horizontal
0.172	51.8	11.6	1.0	256.0	3.0	0.0	Perp to GND	PK	-80.0	-16.6	42.9	-59.5	EUT Horizontal

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

Inductive 175kHz

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MDTR0474 - 4

FREQUENCY RANGE INVESTIGATED

Start Frequency 10 kHz

Stop Frequency 1000 MHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AVO	12/10/2015	12 mo
Cable	ESM Cable Corp.	Bilog Cables	MNH	12/7/2015	12 mo
Antenna - Biconilog	Teseg	CBL 6141B	AYD	1/6/2016	24 mo
Antenna	ETS Lindgren	6502	AOB	4/28/2015	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 antennas to be used with the EUT were tested. The EUT was continuously transmitting while set to the channel specified.

Per ANSI C63.10 sections 6.4.4.1 and 6.4.4.2, the emissions from the EUT were maximized by rotating the EUT on the turntable. Also, the EUT and/or associated antenna was positioned in 3 orthogonal planes. A calibrated active loop antenna was used for this test in order to provide sufficient measurement sensitivity per section 4.5.1. The center of the loop antenna was maintained at 1m above the ground plane during the testing.

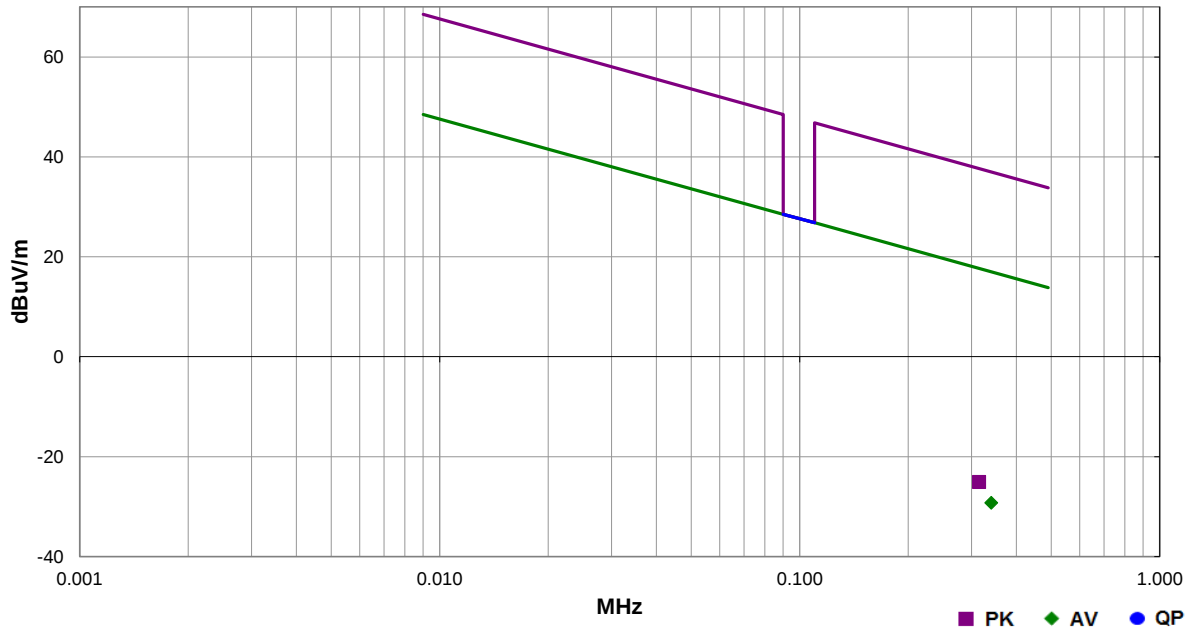
For measurements below 30 MHz, as outlined in 15.209(e) and 15.31(f)(2), measurements may be performed at a distance closer than what is specified with the limit. The limit at the specified distance is shown on the data sheet. Measurements are made at a closer distance and the data is adjusted using a distance correction factor of 40dB/decade for comparison to the limit. Per FCC 15.33(a)(4), measurements were taken up to the highest frequency range of either the 10th harmonic of the fundamental or the applicable digital frequency test range.

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

Work Order:	MDTR0474	Date:	06/15/16	
Project:	None	Temperature:	22.2 °C	
Job Site:	MN05	Humidity:	58.8% RH	
Serial Number:	RFA000301A	Barometric Pres.:	1008 mbar	
		Tested by:		Jared Ison, William Hoffa
EUT:	24967 CareLink SmartSync™ Device Manager Patient Connector			
Configuration:	4			
Customer:	Medtronic, Inc			
Attendees:	Nick Blake			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmit			
Deviations:	None			
Comments:	None			

Test Specifications	FCC 15.209:2016	Test Method	ANSI C63.10:2013
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Run #	119	Test Distance (m)	3	Antenna Height(s)	1(m)	Results	Pass
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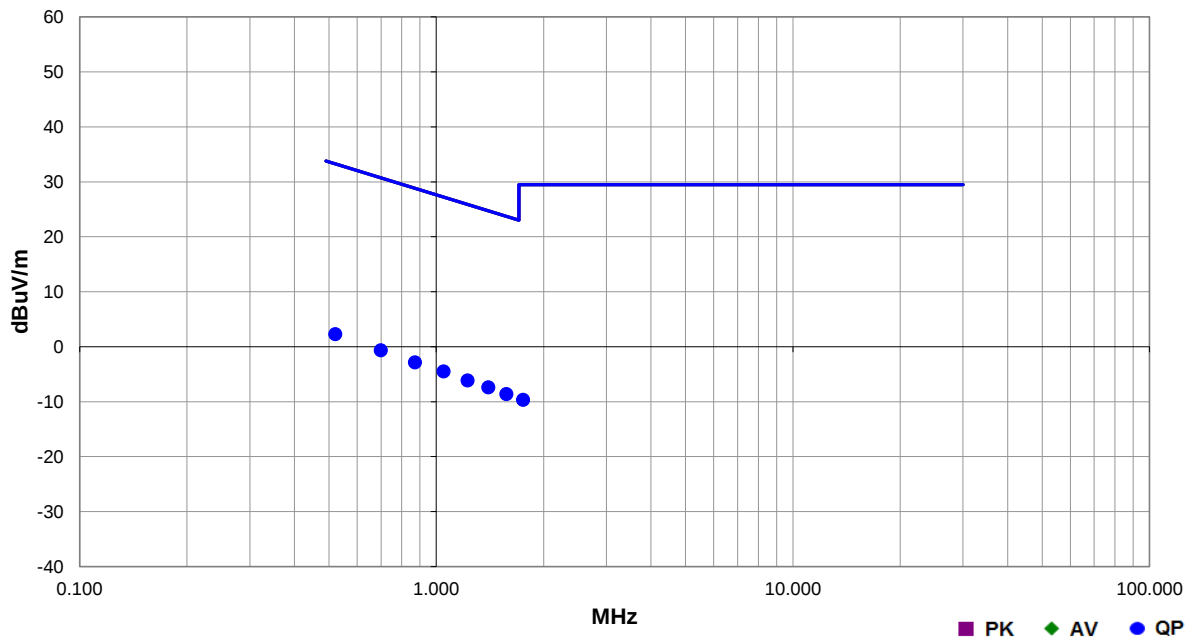


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
0.341	39.2	11.5	1.0	120.1	3.0	0.0	Para to EUT	AV	-80.0	-29.3	17.0	-46.2	EUT on Side
0.315	43.4	11.5	1.0	120.1	3.0	0.0	Para to EUT	PK	-80.0	-25.1	37.6	-62.7	EUT on Side

Work Order:	MDTR0474	Date:	06/15/16	
Project:	None	Temperature:	22.2 °C	
Job Site:	MN05	Humidity:	58.8% RH	
Serial Number:	RFA000301A	Barometric Pres.:	1008 mbar	
EUT:	24967 CareLink SmartSync™ Device Manager Patient Connector			
Configuration:	4			
Customer:	Medtronic, Inc			
Attendees:	Nick Blake			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmit			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.209:2016	ANSI C63.10:2013

Run #	120	Test Distance (m)	3	Antenna Height(s)	1(m)	Results	Pass
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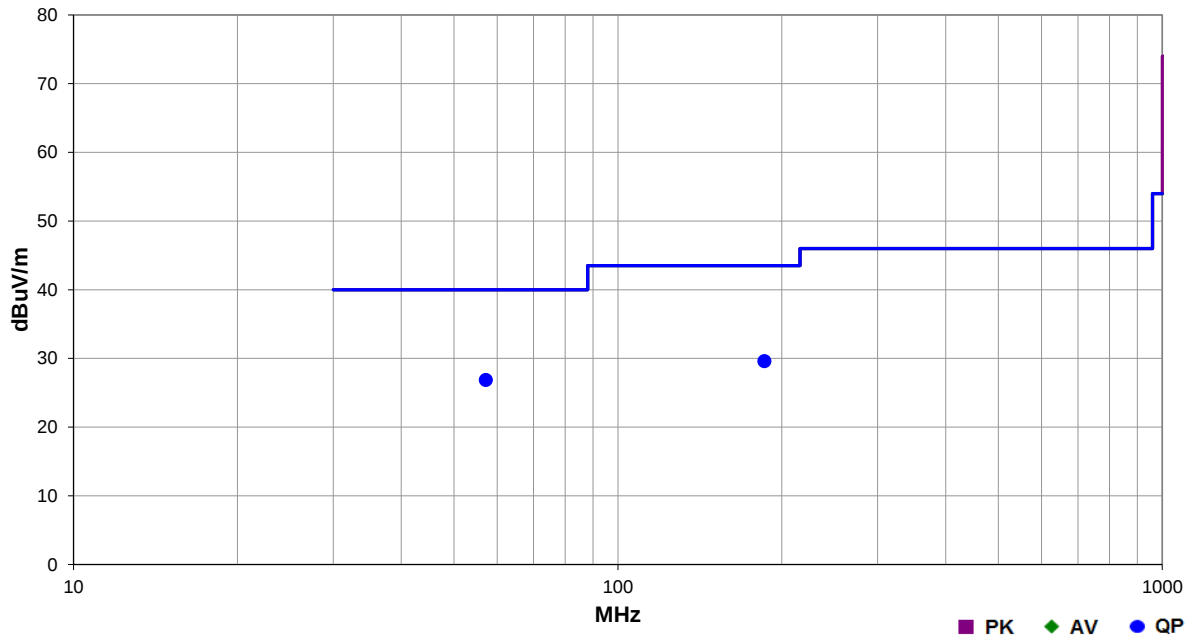


Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
0.521	30.5	11.8	1.0	1.1	3.0	0.0	Para to EUT	QP	-40.0	2.3	33.3	-31.0	EUT On Side
0.699	27.6	11.7	1.0	219.0	3.0	0.0	Para to EUT	QP	-40.0	-0.7	30.7	-31.4	EUT On Side
0.872	25.3	11.8	1.0	306.0	3.0	0.0	Para to EUT	QP	-40.0	-2.9	28.8	-31.7	EUT On Side
1.048	23.3	12.2	1.0	343.0	3.0	0.0	Para to EUT	QP	-40.0	-4.5	27.2	-31.7	EUT On Side
1.224	21.7	12.2	1.0	42.0	3.0	0.0	Para to EUT	QP	-40.0	-6.1	25.9	-32.0	EUT On Side
1.399	20.5	12.1	1.0	43.0	3.0	0.0	Para to EUT	QP	-40.0	-7.4	24.7	-32.1	EUT On Side
1.572	19.3	12.1	1.0	11.1	3.0	0.0	Para to EUT	QP	-40.0	-8.6	23.7	-32.3	EUT On Side
1.751	18.3	12.0	1.0	348.9	3.0	0.0	Para to EUT	QP	-40.0	-9.7	29.5	-39.2	EUT On Side

Work Order:	MDTR0474	Date:	06/15/16	
Project:	None	Temperature:	22.2 °C	
Job Site:	MN05	Humidity:	58.8% RH	
Serial Number:	RFA000301A	Barometric Pres.:	1008 mbar	
EUT:	24967 CareLink SmartSync™ Device Manager Patient Connector			
Configuration:	4			
Customer:	Medtronic, Inc			
Attendees:	Nick Blake			
EUT Power:	110VAC/60Hz			
Operating Mode:	Transmit			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.209:2016	ANSI C63.10:2013

Run #	122	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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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
57.179	33.5	-6.6	1.0	82.0	3.0	0.0	Vert	QP	0.0	26.9	40.0	-13.1	EUT On Side
185.787	35.7	-6.1	2.3	311.9	3.0	0.0	Vert	QP	0.0	29.6	43.5	-13.9	EUT On Side

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

Inductive 175 kHz.

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

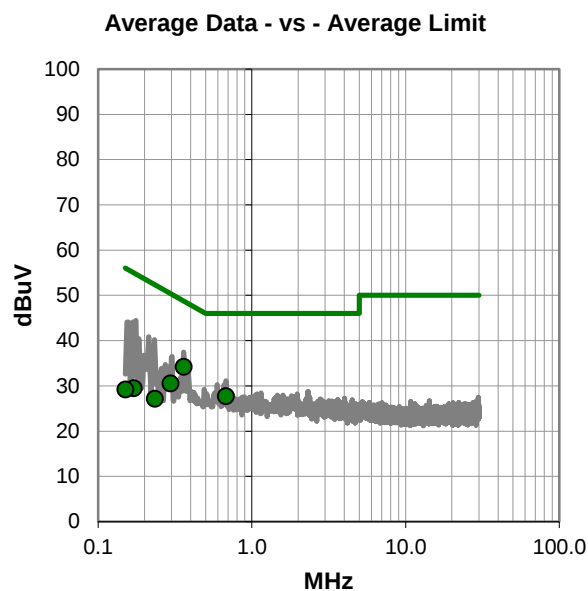
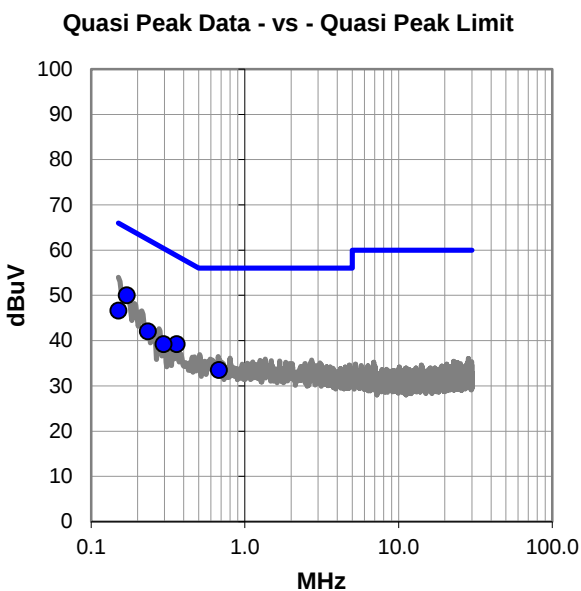
None

EUT OPERATING MODES

Inductive 175 kHz.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #9

Quasi Peak Data - vs - Quasi Peak Limit

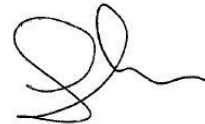
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.171	29.6	20.4	50.0	64.9	-14.9
0.151	26.2	20.4	46.6	66.0	-19.4
0.361	19.0	20.2	39.2	58.7	-19.5
0.234	21.8	20.3	42.1	62.3	-20.3
0.297	19.0	20.2	39.2	60.3	-21.1
0.679	13.4	20.1	33.5	56.0	-22.5

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	7.6	20.1	27.7	46.0	-18.3
0.297	10.3	20.2	30.5	50.3	-19.8
0.234	6.9	20.3	27.2	52.3	-25.2
0.171	9.1	20.4	29.5	54.9	-25.4
0.151	8.8	20.4	29.2	56.0	-26.8

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

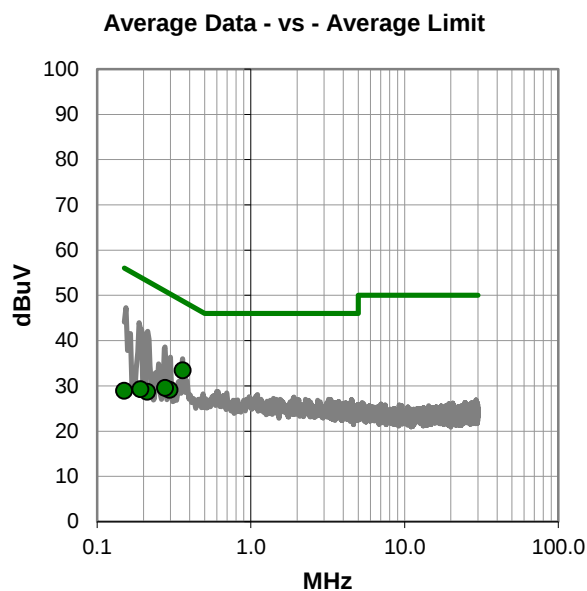
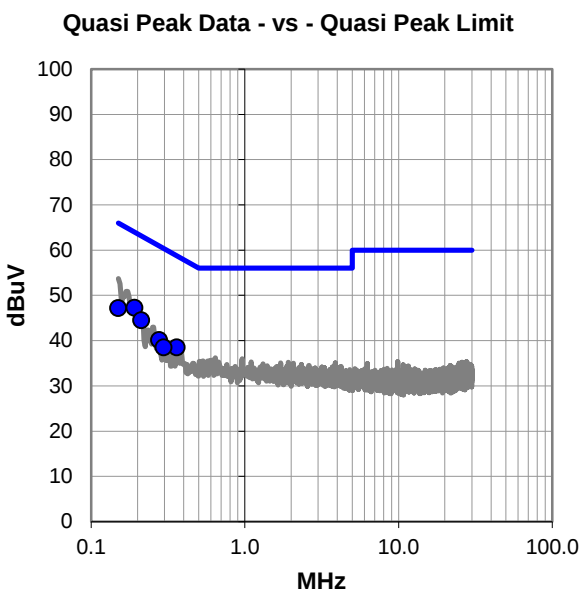
None

EUT OPERATING MODES

Inductive 175 kHz.

DEVIATIONS FROM TEST STANDARD

None



POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #10

Quasi Peak Data - vs - Quasi Peak Limit

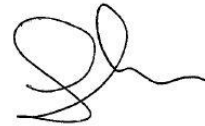
Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.192	26.9	20.3	47.2	64.0	-16.7
0.212	24.2	20.3	44.5	63.1	-18.7
0.150	26.8	20.4	47.2	66.0	-18.8
0.361	18.3	20.2	38.5	58.7	-20.2
0.277	19.9	20.2	40.1	60.9	-20.8
0.297	18.3	20.2	38.5	60.3	-21.8

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.361	13.2	20.2	33.4	48.7	-15.3
0.297	8.9	20.2	29.1	50.3	-21.2
0.277	9.3	20.2	29.5	50.9	-21.4
0.212	8.4	20.3	28.7	53.1	-24.5
0.192	8.9	20.3	29.2	54.0	-24.7
0.150	8.5	20.4	28.9	56.0	-27.1

CONCLUSION

Pass



Tested By