Medtronic Inc.

MyCareLink™ Patient Monitor Model 24950

FCC 95I:2013

Report #: MDTR0259.5

Report Prepared By Northwest EMC Inc.

NORTHWEST EMC – (888) 364-2378 – www.nwemc.com

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

Last Date of Test: July 10, 2013
Medtronic Inc.
Model: MyCareLink Patient Monitor Model 24950

Emissions

Test Description	Specification	Test Method	Pass / Fail
Receiver Spurious Emissions	FCC 95I:2013	ANSI/TIA/EIA-603-C:2004	Pass

Deviations From Test Standards

None

Approved By:

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200881-0

Test Facility

The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
9349 W Broadway Ave.
Brooklyn Park, MN 55445
Phone: (763) 425-2281 Fax: (763) 424-3469

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834E-1).

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.

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. This Report may only be duplicated in its entirety. 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.

NORTHWEST EMC
REV 2012.08.02

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

NORTHWEST EMC

REV 2012.05.24

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 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

KCC / 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.

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.

Russia

GOST – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

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.

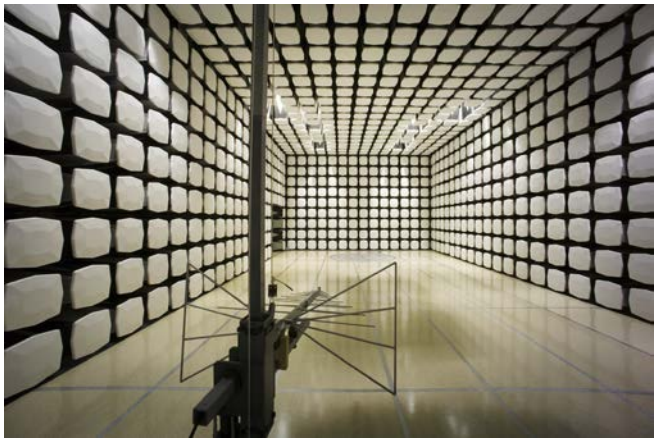
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

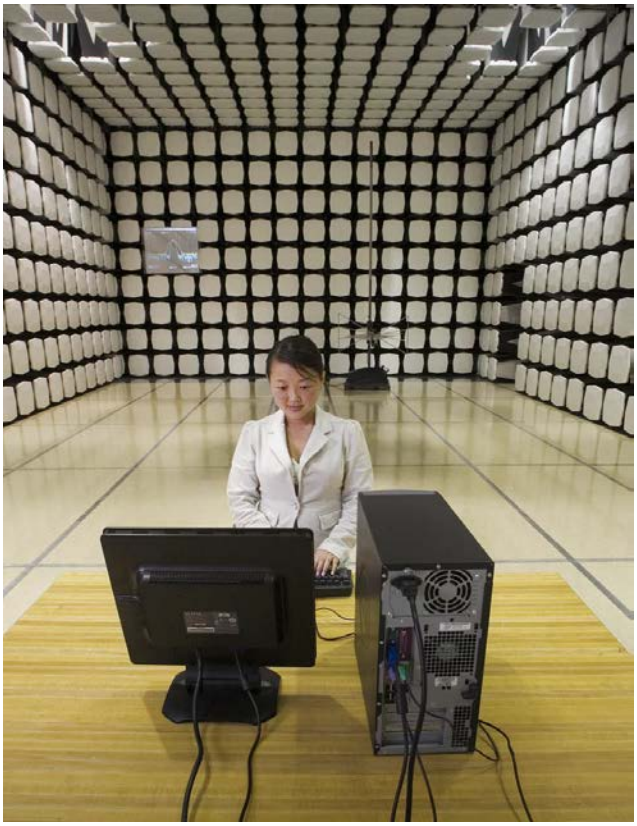
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.12	-0.01
Amplitude Accuracy (dB)	0.49	-0.49
Conducted Power (dB)	0.41	-0.41
Radiated Power via Substitution (dB)	0.69	-0.68
Temperature (degrees C)	0.81	-0.81
Humidity (% RH)	2.89	-2.89
Field Strength (dB)	3.80	-3.80
AC Powerline Conducted Emissions (dB)	2.94	-2.94

FACILITIES

REV 2013.06.28

Oregon Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	**California** 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 120th 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	2834C-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:	Medtronic Inc.
Address:	8200 Coral Sea Street NE
City, State, Zip:	Mounds View, MN 55112
Test Requested By:	Yogi Shah
Model:	MyCareLink Patient Monitor Model 24950
First Date of Test:	July 10, 2013
Last Date of Test:	July 10, 2013
Receipt Date of Samples:	June 20, 2013
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

MEDS radio receiver capability added to existing MyCareLink Patient Monitor. Medtronic MyCareLink Home Monitor Model 24950 – The MyCareLink home monitor is a wireless data receiver used to automatically receive information from the Reveal LINQ device. It also allows the patient to perform full device interrogations using telemetry, and automatically communicates data onto CareLink.

Testing Objective:

To demonstrate compliance of the Reveal LINQ system with MyCareLink Patient Monitor to FCC 95I for the addition of receive only capability for the MEDS lower wing band of operation of 401-402MHz. Reference MDTR0183.7 for previous certification.

CONFIGURATIONS

WTD 12.5.23

Configuration MDTR0259- 1

Software/Firmware Running during test	
Description	**Version**
Firmware	R50

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
MyCareLink Patient Monitor	Medtronic Inc.	24950	YDM000401A
DC Power Supply	SL Power	MENB1020A0502C02	None
RF Head	Medtronic Inc.	24955	RFH000353A

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
POTS Modem	Radicom Research Inc.	V92HU-E2-MD	0003213

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Laptop	Dell	Latitude D630	904DLF1
DC Brick	Dell	NADP-90KB A	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power	No	2.00m	Yes	DC Power Supply	MyCareLink Patient Monitor
RJ11	No	1.80m	No	POTS Modem	Unterminated
USB	Yes	0.13m	No	MyCareLink Patient Monitor	POTS Modem
AC Power	No	1.80m	No	AC Mains	DC Brick
DC Power	No	1.80m	No	DC Brick	Laptop
USB Extension (x2)	Yes	3.00m	No	Laptop	USB Cable
USB Cable	Yes	2.10m	No	USB Extension	MyCareLink Patient Monitor
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

MODIFICATIONS

WTD 12.5.23

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	7/10/2013	Receiver Spurious Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Receiver Spurious 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.

MODES OF OPERATION

Receiving 401.5 ± 0.14 MHz

POWER SETTINGS INVESTIGATED

5VDC

CONFIGURATIONS INVESTIGATED

MDTR0259 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	5000 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
Signal Generator MXG	Agilent	N5183A	TIK	6/7/2012	36 mo
Low Pass Filter	Micro-Tronics	LPM50004	HGK	5/31/2012	24 mo
Attenuator, 10db, 'SMA'	S.M. Electronics	SA18H-10	REN	5/20/2013	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	5/20/2013	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	5/20/2013	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	36 mo
Pre-Amplifier	Miteq	AM-1616-1000	PAD	5/20/2013	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	5/20/2013	12 mo
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/17/2012	12 mo
Spectrum Analyzer	Agilent	N9010A	AFI	1/27/2013	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

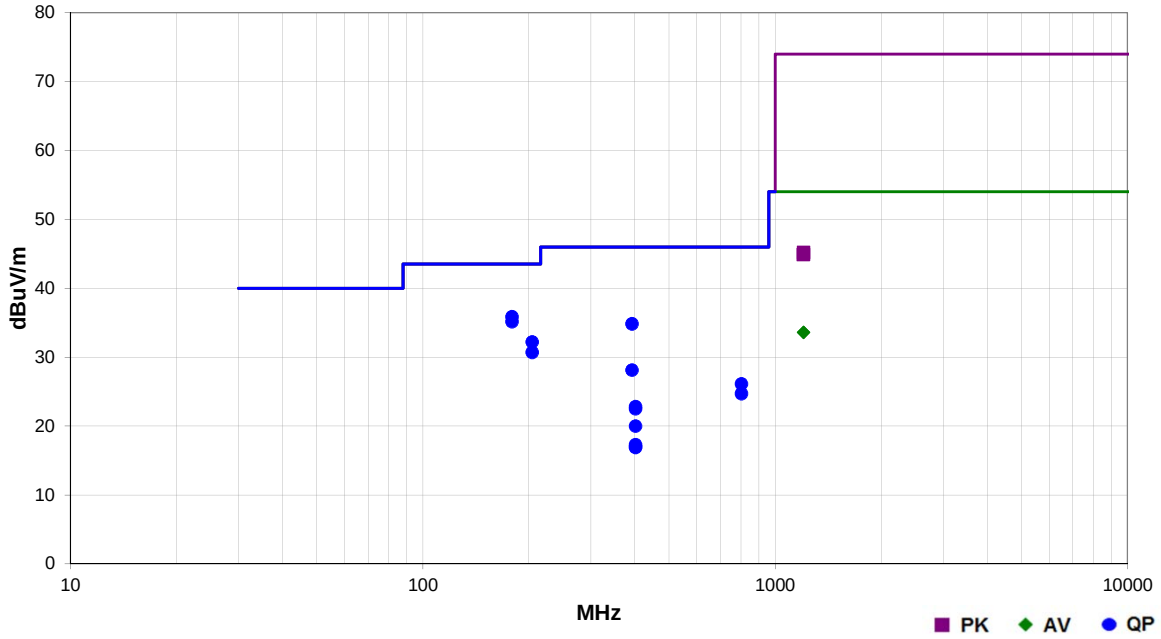
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band receive frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. 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, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10). A preamp was used for this test in order to provide sufficient measurement sensit

Receiver Spurious Emissions

Work Order:	MDTR0259	**Date:**	07/10/13		
Project:	None	**Temperature:**	23.5 °C		
Job Site:	MN05	**Humidity:**	53.7% RH		
Serial Number:	YDM000401A	**Barometric Pres.:**	1016.7 mbar	**Tested by:**	Johnathan Lee
EUT:	MyCareLink Patient Monitor Model 24950				
Configuration:	1				
Customer:	Medtronic Inc.				
Attendees:	Cody Satterlee, Nick Blake				
EUT Power:	5VDC				
Operating Mode:	Receiving 401.5 ±0.14 MHz				
Deviations:	None				
Comments:	R50 software				

Test Specifications	**Test Method**
FCC 95I:2013	ANSI/TIA/EIA-603-C:2004

Run #	18	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



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)
179.313	42.3	-6.4	1.6	43.0	3.0	0.0	Horz	QP	0.0	35.9	43.5	-7.6
179.313	41.6	-6.4	1.1	70.0	3.0	0.0	Horz	QP	0.0	35.2	43.5	-8.3
392.684	35.0	-0.2	2.0	9.0	3.0	0.0	Horz	QP	0.0	34.8	46.0	-11.2
204.415	37.9	-5.7	1.5	201.0	3.0	0.0	Horz	QP	0.0	32.2	43.5	-11.3
204.415	36.4	-5.7	1.5	201.0	3.0	0.0	Horz	QP	0.0	30.7	43.5	-12.8
392.684	28.3	-0.2	2.0	253.0	3.0	0.0	Horz	QP	0.0	28.1	46.0	-17.9
803.100	17.9	8.2	1.0	84.0	3.0	0.0	Vert	QP	0.0	26.1	46.0	-19.9
1204.783	28.5	5.1	1.9	240.0	3.0	0.0	Horz	AV	0.0	33.6	54.0	-20.4
1203.092	28.5	5.1	1.0	165.0	3.0	0.0	Vert	AV	0.0	33.6	54.0	-20.4
803.100	16.5	8.2	1.0	187.0	3.0	0.0	Horz	QP	0.0	24.7	46.0	-21.3
401.550	22.3	0.5	1.0	241.0	3.0	0.0	Vert	QP	0.0	22.8	46.0	-23.2
401.550	22.0	0.5	1.9	199.0	3.0	0.0	Horz	QP	0.0	22.5	46.0	-23.5
401.550	19.5	0.5	1.0	264.0	3.0	0.0	Vert	QP	0.0	20.0	46.0	-26.0
401.550	16.8	0.5	1.0	293.0	3.0	0.0	Horz	QP	0.0	17.3	46.0	-28.7
1203.375	40.1	5.1	1.9	240.0	3.0	0.0	Horz	PK	0.0	45.2	74.0	-28.8
401.550	16.5	0.5	1.0	44.0	3.0	0.0	Horz	QP	0.0	17.0	46.0	-29.0
401.550	16.4	0.5	1.0	320.0	3.0	0.0	Vert	QP	0.0	16.9	46.0	-29.1
1203.217	39.8	5.1	1.0	165.0	3.0	0.0	Vert	PK	0.0	44.9	74.0	-29.1