Medtronic Inc.

MyCareLink™ Patient Monitor

Models 24950, 24951

FCC 15.247:2012

Report #: MDTR0183.4

Report Prepared By Northwest EMC Inc.

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

California – Minnesota – Oregon – New York – Washington

CERTIFICATE OF TEST

WTD 12.5.23

Last Date of Test: August 8, 2012
Medtronic Inc.
MyCareLink™ Patient Monitor
Models 24950, 24951

Emissions

Test Description	Specification	Test Method	Pass/Fail
Channel Spacing	FCC 15.247:2012	ANSI C63.10:2009	Pass
Dwell Time	FCC 15.247:2012	ANSI C63.10:2009	Pass
Number of Hopping Frequencies	FCC 15.247:2012	ANSI C63.10:2009	Pass
Occupied Bandwidth	FCC 15.247:2012	ANSI C63.10:2009	Pass
Output Power	FCC 15.247:2012	ANSI C63.10:2009	Pass
Band Edge Compliance	FCC 15.247:2012	ANSI C63.10:2009	Pass
Spurious Conducted Emissions	FCC 15.247:2012	ANSI C63.10:2009	Pass
Spurious Radiated Emissions	FCC 15.247:2012	ANSI C63.10:2009	Pass
AC Powerline Conducted Emissions	FCC 15.207:2012	ANSI C63.10:2009	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.

REVISION HISTORY

REV 2012.08.02

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 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 16-4-1 as applicable), and are available upon request.

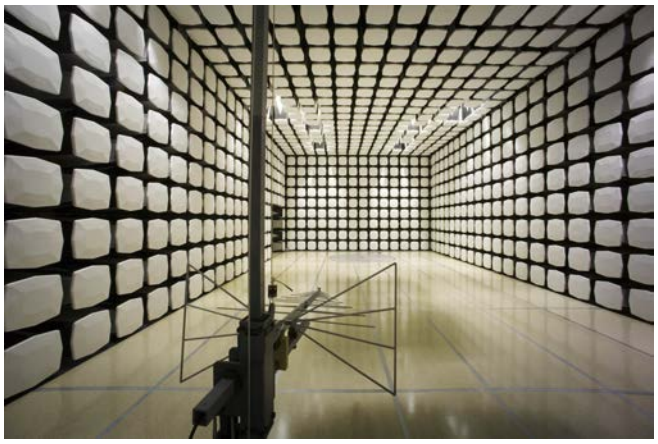
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

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)	4.00	-4.00
AC Powerline Conducted Emissions (dB)	2.70	-2.70

LOCATIONS

REV 2012.08.03

Oregon	California	New York	Minnesota	Washington
Labs EV01-EV12 22975 NW Evergreen Pkwy, #400 Hillsboro, OR 97124 (503) 844-4066	Labs OC01-OC13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs WA01-WA04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	Labs MN01-MN08 9349 W Broadway Ave. Brooklyn Park, MN 55445 (763) 425-2281	Labs SU01-SU07 14128 339th Ave. SE Sultan, WA 98294 (360) 793-8675
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



PRODUCT DESCRIPTION

Client and Equipment Under Test (EUT) Information

Company Name:	Medtronic Inc.
Address:	710 Medtronic Parkway, LS250
City, State, Zip:	Fridley, MN 55432
Test Requested By:	Thomas Kelly
Model:	MyCareLink™ Patient Monitor models 24950, 24951
First Date of Test:	July 11, 2012
Last Date of Test:	August 8, 2012
Receipt Date of Samples:	July 11, 2012
Equipment Design Stage:	Qualification Build
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

The system consists of a home monitor base station and a handheld reader. The base station includes a MICS transmitter and Bluetooth transmitter. The reader has an inductive transmitter and a pre-certified Bluetooth transmitter.

Client Justification:

Model 24951 is identical to Model 24950 except Model 24951 does not contain MICS telemetry components.

Testing Objective:

To demonstrate compliance to FCC requirements for the Bluetooth transmitter.

CONFIGURATIONS

Configuration MDTR0183- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Base Station	Medtronic Inc.	24950	YDM000107A

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC adapter	SL Power	MENB1020A0502C02	SLP #20
Laptop	Dell	Latitude D620	19811181277
Laptop AC Adapter	Dell	DA90PS1-00	CN-0MM545-48661-815-0JIX
Reader	Medtronic Inc.	24955	RFH000105A

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power	No	2.0m	Yes	Base Station	AC adapter
AC Power	No	1.8m	No	Laptop AC Adapter	AC Mains
DC Power	No	1.8m	Yes	Laptop	Laptop AC Adapter
USB	Yes	1.8m	No	Laptop	Base Station
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configuration MDTR0183- 2

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Base Station	Medtronic Inc.	24950	YDM000106A
Reader	Medtronic Inc.	24955	RFH000116A

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
AC adapter	SL Power	MENB1020A0502C02	SLP #20

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
USB to Phone	No	3.1m	No	Base Station	Unterminated
DC Power	No	2.0m	Yes	Base Station	AC adapter
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	7/11/2012	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	7/18/2012	Number of Hoping Frequencies	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	7/18/2012	Channel Spacing	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	7/18/2012	Spurious 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.
5	7/18/2012	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	7/18/2012	Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	8/2/2012	AC Powerline Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
8	8/8/2012	Dwell Time	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.
9	8/8/2012	Band Edge Compliance	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

BLUETOOTH APPROVALS

FCC Procedure Received from Joe Dichoso on 2-15-02

The following exhibit indicates the FCC Spread Spectrum requirements in Section 15.247 for devices meeting the Bluetooth Specifications in the 2.4 GHz band as of February 2001 operating in the USA. The purpose of this exhibit is to help expedite the approval process for Bluetooth devices. This exhibit provides items that vary for each device and also provides a list of items that are common to Bluetooth devices that explains the remaining requirements. The list of common items can be submitted for each application for equipment authorization. This exhibit only specifies requirements in Section 15.247, requirements in other rule Sections for intentional radiators such as in Section 15.203 or 15.207 must be also be addressed. A Bluetooth device is a FHSS transmitter in the data mode and applies as a Hybrid spread spectrum device in the acquisition mode.

For each individual device, the following items, 1-7 will vary from one device to another and must be submitted.

1) The occupied bandwidth in Section 15.247(a)(1)(ii).
2) Conducted output power specified in Section 15.247(b)(1).
3) EIRP limit in Section 15.247(b)(3).
4) RF safety requirement in Section 15.247(b)(4)
5) Spurious emission limits in Section 15.247(c).
6) Processing gain and requirements for Hybrids in Section 15.247(f) in the acquisition mode.
7) Power spectral density requirement in Section 15.247(f) in the acquisition mode.

For all devices, the following items, 1-12, are common to all Bluetooth devices and will not vary from one device to another. This list can be copied into the filing.

1 Output power and channel separation of a Bluetooth device in the different operating modes:

The different operating modes (data-mode, acquisition-mode) of a Bluetooth device don't influence the output power and the channel spacing. There is only one transmitter which is driven by identical input parameters concerning these two parameters.
Only a different hopping sequence will be used. For this reason, the RF parameters in one op-mode is sufficient.

2 Frequency range of a Bluetooth device:

The maximum frequency of the device is: **2402 – 2480 M**Hz.
This is according the Bluetooth Core Specification V 1.0B (+ critical errata) for devices which will be operated in the USA. Other frequency ranges (e.g. for Spain, France, Japan) which are allowed according the Core Specification must **not be** supported by the device.

3 Co-ordination of the hopping sequence in data mode to avoid simultaneous occupancy by multiple transmitters:

Bluetooth units which want to communicate with other units must be organized in a structure called piconet. This piconet consist of max. 8 Bluetooth units. One unit is the master the other seven are the slaves. The master co-ordinates frequency occupation in this piconet for all units. As the master hop sequence is derived from it's BD address which is unique for every Bluetooth device, additional masters intending to establish new piconets will always use different hop sequences.

4 Example of a hopping sequence in data mode:

Example of a 79 hopping sequence in data mode:
40, 21, 44, 23, 42, 53, 46, 55, 48, 33, 52, 35, 50, 65, 54, 67,
56, 37, 60, 39, 58, 69, 62, 71, 64, 25, 68, 27, 66, 57, 70, 59,
72, 29, 76, 31, 74, 61, 78, 63, 01, 41, 05, 43, 03, 73, 07, 75,
09, 45, 13, 47, 11, 77, 15, 00, 64, 49, 66, 53, 68, 02, 70, 06,
01, 51, 03, 55, 05, 04

5 Equally average use of frequencies in data mode and short transmissions:

The generation of the hopping sequence in connection mode depends essentially on two input values:
1. LAP/UAP of the master of the connection
2. Internal master clock

The LAP (lower address part) are the 24 LSB's of the 48 BD_ADDRESS. The BD_ADDRESS is an unambiguous number of every Bluetooth unit. The UAP (upper address part) are the 24 MSB's of the 48 BD_ADDRESS. The internal clock of a Bluetooth unit is derived from a free running clock which is never adjusted and is never turned off. For synchronization with other units, only the offsets are used. It has no relation to the time of the day. Its resolution is at least half the RX/TX slot length of 312.5 µs. The clock has a cycle of about one day (23h30). In most case it is implemented as 28 bit counter. For the deriving of the hopping sequence the entire LAP (24 bits), 4 LSB's (4 bits) (Input 1) and the 27 MSB's of the clock (Input 2) are used. With this input values different mathematical procedures (permutations, additions, XOR-operations) are performed to generate the sequence. This will be done at the beginning of every new transmission.
Regarding short transmissions, the Bluetooth system has the following behavior:
The first connection between the two devices is established, a hopping sequence is generated. For transmitting the wanted data, the complete hopping sequence is not used and the connection ends. The second connection will be established. A new hopping sequence is generated. Due to the fact that the Bluetooth clock has a different value, because the period between the two transmission is longer (and it cannot be shorter) than the minimum resolution of the clock (312.5 µs). The hopping sequence will always differ from the first one.

6 Receiver input bandwidth, synchronization and repeated single or multiple packets:

The input bandwidth of the receiver is 1 MHz.
In every connection, one Bluetooth device is the master and the other one is the slave. The master determines the hopping sequence (see chapter 5). The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection (e.g. single or multi-slot packet) is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing is according to the packet type of the connection. Also, the slave of the connection uses these settings. Repeating of a packet has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means, a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence

7 Dwell time in data mode

The dwell time of 0.3797s within a 30 second period in data mode is independent from the packet type (packet length). The calculation for a 30 second period is a follows:
Dwell time = time slot length * hop rate / number of hopping channels *30s
Example for a DH1 packet (with a maximum length of one time slot)
Dwell time = 625 µs * 1600 1/s / 79 * 30s = 0.3797s (in a 30s period)

For multi-slot packet the hopping is reduced according to the length of the packet.
Example for a DH5 packet (with a maximum length of five time slots)
Dwell time = 5 * 625 µs * 1600 * 1/5 *1/s / 79 * 30s = 0.3797s (in a 30s period)
This is according the Bluetooth Core Specification V 1.0B (+ critical errata) for all Bluetooth devices. Therefore, all Bluetooth devices **comply** with the FCC dwell time requirement in the data mode.
This was checked during the Bluetooth Qualification tests.
The Dwell time in hybrid mode is approximately 2.6 mS (in a 12.8s period)

8 Channel Separation in hybrid mode

The nominal channel spacing of the Bluetooth system is 1Mhz independent of the operating mode.
The maximum “initial carrier frequency tolerance” which is allowed for Bluetooth is fcenter = 75 kHz.
This was checked during the Bluetooth Qualification tests (Test Case: TRM/CA/07-E) for three frequencies (2402, 2441, 2480 MHz).

9 Derivation and examples for a hopping sequence in hybrid mode

For the generation of the inquiry and page hop sequences the same procedures as described for the data mode are used (see item 5), but this time with different input vectors:
**For the inquiry hop sequence, a predefined fixed address is always used. This results in the same 32 frequencies used by all devices doing an inquiry but every time with a different start frequency and phase in this sequence.
**For the page hop sequence, the device address of the paged unit is used as the input vector. This results in the use of a subset of 32 frequencies which is specific for that initial state of the connection establishment between the two units. A page to different devices would result in a different subset of 32 frequencies.
So it is ensured that also in hybrid mode, the frequency is used equally on average.
Example of a hopping sequence in inquiry mode:
48, 50, 09, 13, 52, 54,41, 45, 56, 58, 11, 15, 60, 62, 43, 47, 00, 02, 64, 68, 04, 06, 17, 21, 08, 10, 66, 70, 12, 14, 19, 23
Example of a hopping sequence in paging mode:
08, 57, 68, 70, 51, 02, 42, 40, 04, 61, 44, 46, 63, 14, 50, 48, 16, 65, 52, 54, 67, 18, 58, 56, 20, 53, 60, 62, 55, 06, 66, 64

10 Receiver input bandwidth and synchronization in hybrid mode:

The receiver input bandwidth is the same as in the data mode (1 MHz). When two Bluetooth devices establish contact for the first time, one device sends an inquiry access code and the other device is scanning for this inquiry access code. If two devices have been connected previously and want to start a new transmission, a similar procedure takes place. The only difference is, instead of the inquiry access code, a special access code, derived from the BD_ADDRESS of the paged device will be, will be sent by the master of this connection. Due to the fact that both units have been connected before (in the inquiry procedure) the paging unit has timing and frequency information about the page scan of the paged unit. For this reason the time to establish the connection is reduced.

11 Spread rate / data rate of the direct sequence signal

The Spread rate / Data rate in inquiry and paging mode can be defined via the access code. The access code is the only criterion for the system to check if there is a valid transmission or not. If you regard the presence of a valid access code as one bit of information, and compare it with the length of the access code of 68 bits, the Spread rate / Data rate will be 68/1.

12 Spurious emission in hybrid mode

The Dwell in hybrid mode is shorter than in data mode. For this reason the spurious emissions average level in data mode is worst case. The spurious emissions peak level is the same for both modes.

Channel Spacing

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Signal Generator	Agilent	N5183A	TIA	1/27/2012	24
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/19/2012	12
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	12

TEST DESCRIPTION

The channel carrier frequencies in the 2400-2483.5MHz band must be separated by 25 kHz or the 20dB bandwidth of the hopping channel, whichever is greater. Or, if the output power is less than 125 mW, the channel separation can be 25 kHz or 2/3 of the 20dB bandwidth. The EUT was operated in pseudorandom hopping mode. The spectrum was scanned across two adjacent peaks. The separation between the peaks of these channels was measured.

Channel Spacing

EUT:	Base			**Work Order:**	MDTR0183
Serial Number:	YDM000107A			**Date:**	07/18/12
Customer:	Medtronic Inc.			**Temperature:**	23.63°C
Attendees:	None			**Humidity:**	57%
Project:	None			**Barometric Pres.:**	1011.0
Tested by:	Trevor Buls	**Power:**	5VDC	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Per Medtronic Test Plan config 7

DEVIATIONS FROM TEST STANDARD

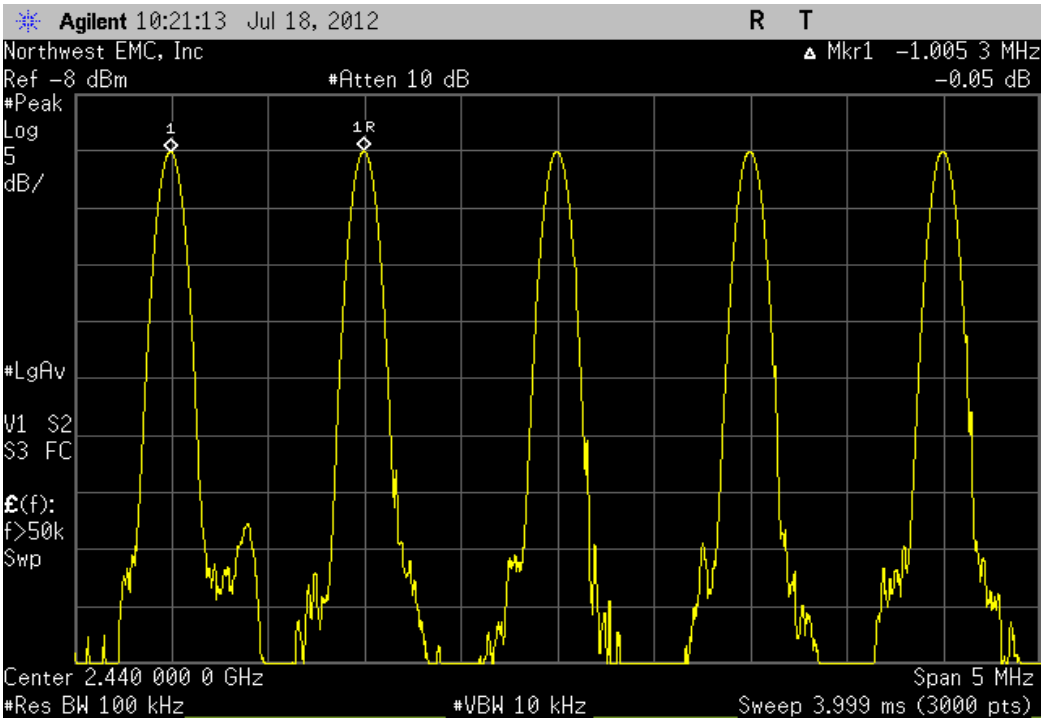
None

Configuration #	1	Signature	Trevor Buls

	Value	Limit	Result
Hopping Mode	1.0 MHz	≥ 1 MHz	Pass

Channel Spacing

Hopping Mode						
				Value	Limit	Result
				1.0 MHz	≥ 1 MHz	Pass



Dwell Time

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Signal Generator	Agilent	N5183A	TIA	1/27/2012	24
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/12/2011	12
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/19/2012	12
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	12

TEST DESCRIPTION

The average dwell time per hopping channel was measured at one hopping channel in the middle of the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

The dwell time limit is based on the Number of Hopping Channels * 400 mS. For Bluetooth this would be 79 Channels * 400mS = 31.6 Sec.

On Time During 31.6 Sec = Pulse Width * Average Number of Pulses * Scale Factor

- Average Number of Pulses is based on 4 samples.

- Scale Factor = 31.6 Sec / Screen Capture Sweep Time = 31.6 Sec / 6.32 Sec = 5

Dwell Time

EUT:	Base			**Work Order:**	MDTR0183
Serial Number:	YDM000107A			**Date:**	08/08/12
Customer:	Medtronic Inc.			**Temperature:**	23.50°C
Attendees:	None			**Humidity:**	51%
Project:	None			**Barometric Pres.:**	1015.9
Tested by:	Trevor Buls	**Power:**	5VDC	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Per MDTR0129 test plan configuration: 7. Maximum Packet size of 506 Bytes. Number of pulses data was taken in normal hopping sequence with unmodulated carriers.

DEVIATIONS FROM TEST STANDARD

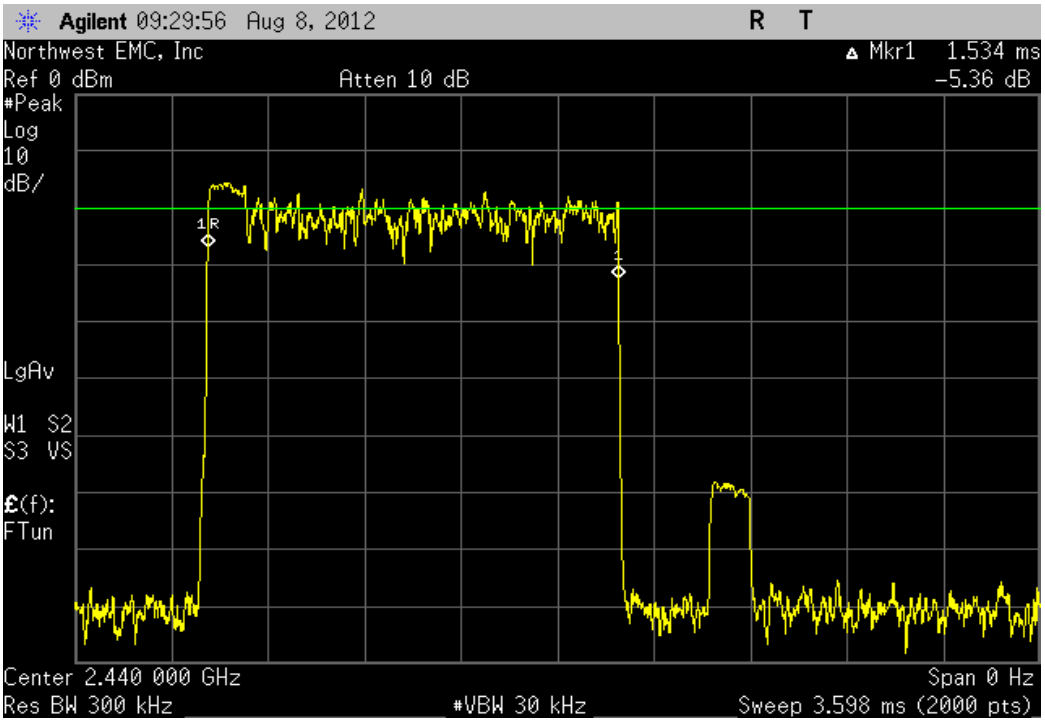
None

Configuration #	1	Signature	Trevor Buls

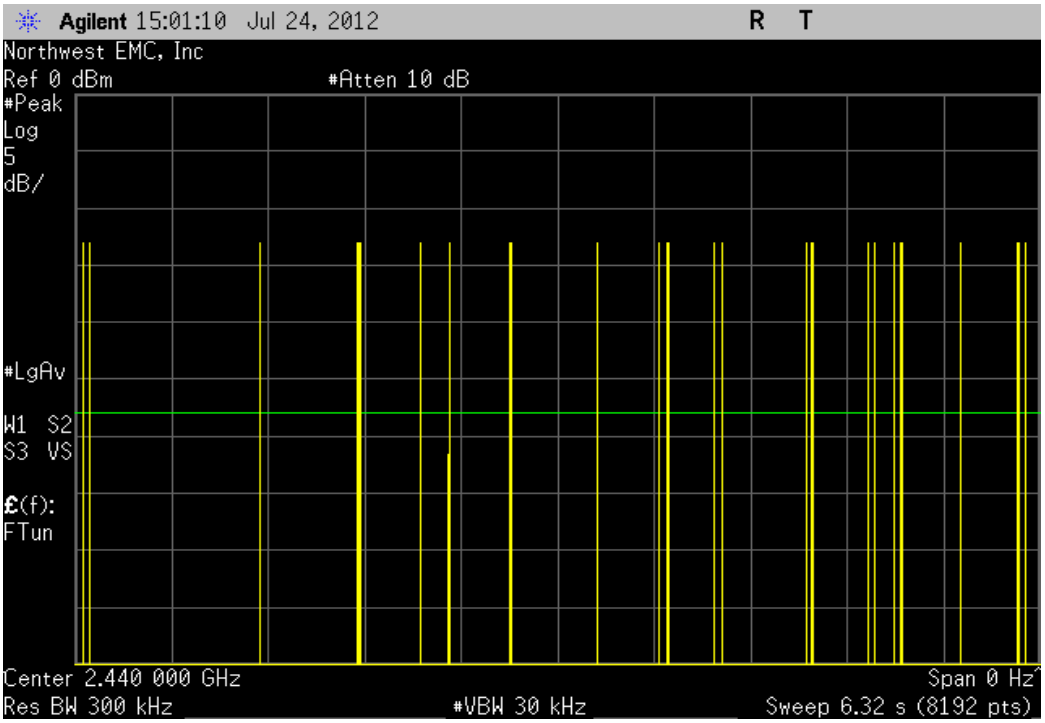
	Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
DH5, GFSK							
Mid Channel	1.534	N/A	N/A	N/A	N/A	N/A	N/A
Mid Channel	N/A	22	N/A	N/A	N/A	N/A	N/A
Mid Channel	N/A	23	N/A	N/A	N/A	N/A	N/A
Mid Channel	N/A	24	N/A	N/A	N/A	N/A	N/A
Mid Channel	N/A	22	N/A	N/A	N/A	N/A	N/A
Mid Channel	1.534	N/A	22.75	5	174.4925	400	Pass

Dwell Time

DH5, GFSK, Mid Channel						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
1.534	N/A	N/A	N/A	N/A	N/A	N/A

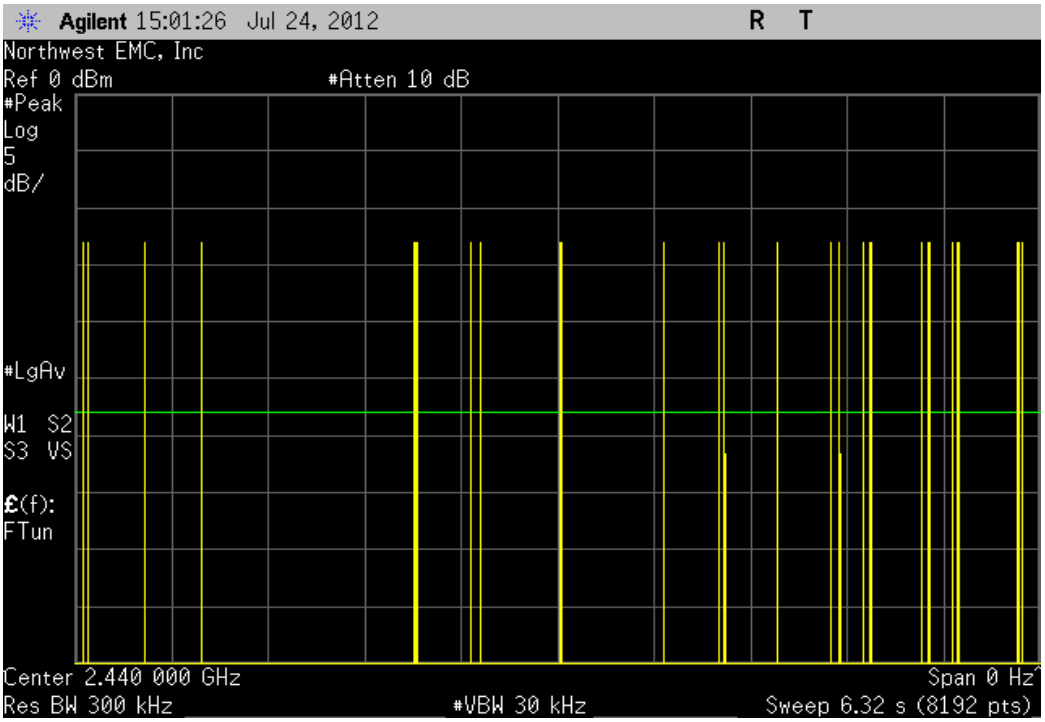


DH5, GFSK, Mid Channel						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	22	N/A	N/A	N/A	N/A	N/A

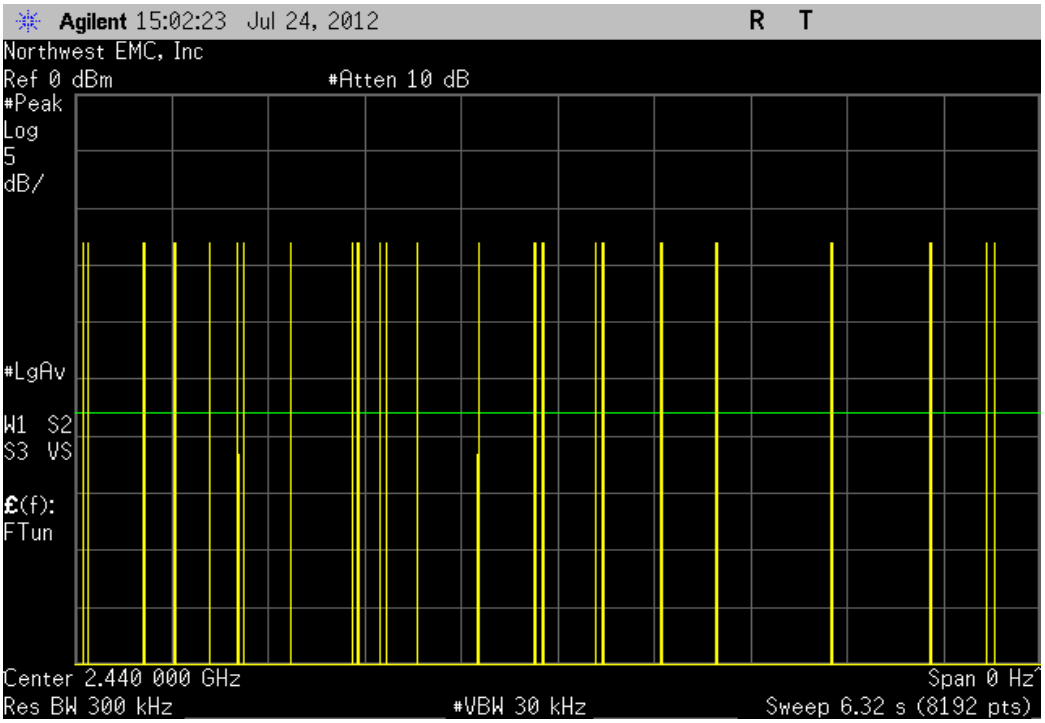


Dwell Time

DH5, GFSK, Mid Channel						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	23	N/A	N/A	N/A	N/A	N/A

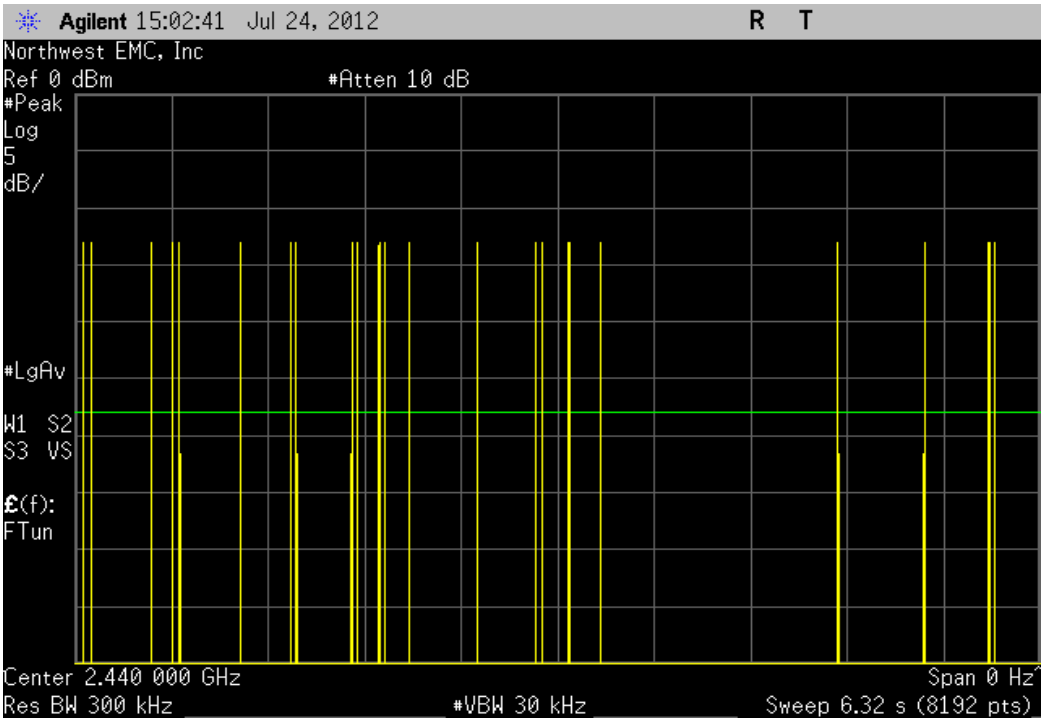


DH5, GFSK, Mid Channel						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	24	N/A	N/A	N/A	N/A	N/A



Dwell Time

DH5, GFSK, Mid Channel						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
N/A	22	N/A	N/A	N/A	N/A	N/A



DH5, GFSK, Mid Channel						
Pulse Width (mS)	Number of Pulses	Average No. of Pulses	Scale Factor	On Time (mS) During 31.6 S	Limit (mS)	Result
1.534	N/A	22.75	5	174.4925	400	Pass

Number of Hopping Frequencies

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/12/2011	12
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/19/2012	12
Signal Generator	Agilent	N5183A	TIA	1/27/2012	24
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	12

TEST DESCRIPTION

The number of hopping frequencies was measured across the authorized band. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The hopping function of the EUT was enabled.

Number of Hopping Frequencies

EUT:	Base			**Work Order:**	MDTR0183
Serial Number:	YDM000107A			**Date:**	07/18/12
Customer:	Medtronic Inc.			**Temperature:**	23.63°C
Attendees:	None			**Humidity:**	57%
Project:	None			**Barometric Pres.:**	1011.0
Tested by:	Trevor Buls	**Power:**	5VDC	**Job Site:**	MN08

TEST SPECIFICATIONS	**Test Method**
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Per Medtronic Test Plan config 7

DEVIATIONS FROM TEST STANDARD

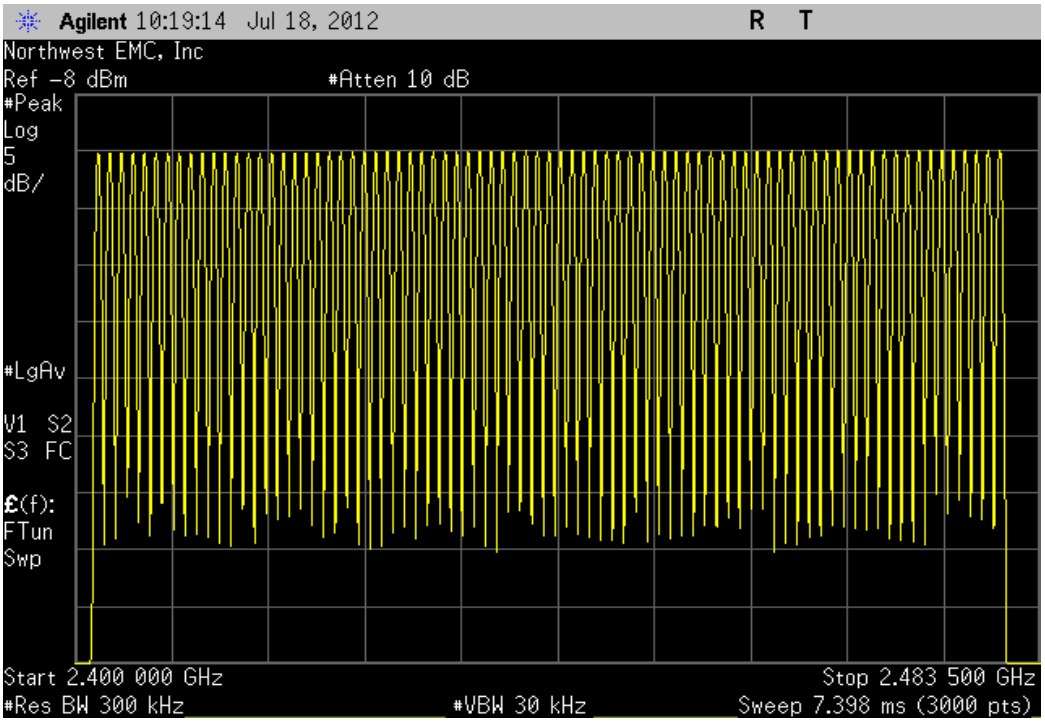
None

Configuration #	**1**	*Signature* Trevor Buls

	Number of Channels	**Limit**	**Result**
Hopping Mode	79	≥ 15	Pass

Number of Hopping Frequencies

Hopping Mode							
					Number of Channels	Limit	Result
					79	≥ 15	Pass



Occupied Bandwidth

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Signal Generator	Agilent	N5183A	TIA	1/27/2012	24
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/19/2012	12
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/12/2011	12
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	12

TEST DESCRIPTION

The occupied bandwidth was measured with the EUT set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode.

Occupied Bandwidth

EUT:	Base			**Work Order:**	MDTR0183
Serial Number:	YDM000107A			**Date:**	07/18/12
Customer:	Medtronic Inc.			**Temperature:**	23.63°C
Attendees:	None			**Humidity:**	57%
Project:	None			**Barometric Pres.:**	1011.0
Tested by:	Trevor Buls	**Power:**	5VDC	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Per Medtronic Test Plan config 7

DEVIATIONS FROM TEST STANDARD

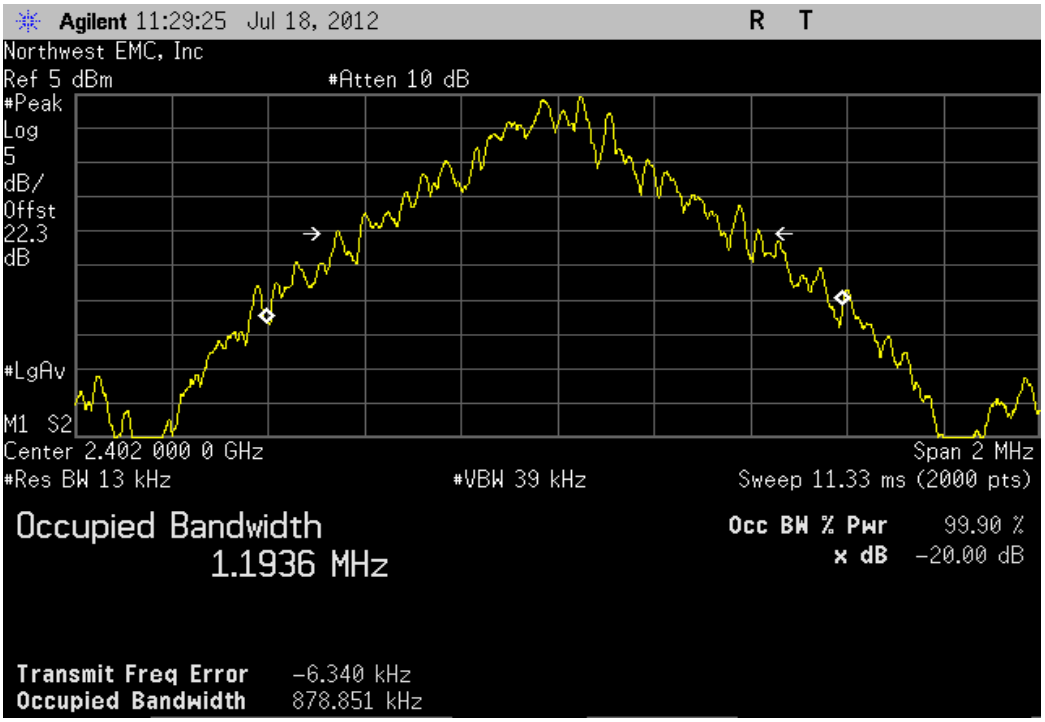
None

Configuration #	1	Signature	Trevor Buls

	Value	Limit	Result
DH5, GFSK			
Low Channel	878.851 kHz	< 1.5 MHz	Pass
Mid Channel	884.081 kHz	< 1.5 MHz	Pass
High Channel	881.294 kHz	< 1.5 MHz	Pass

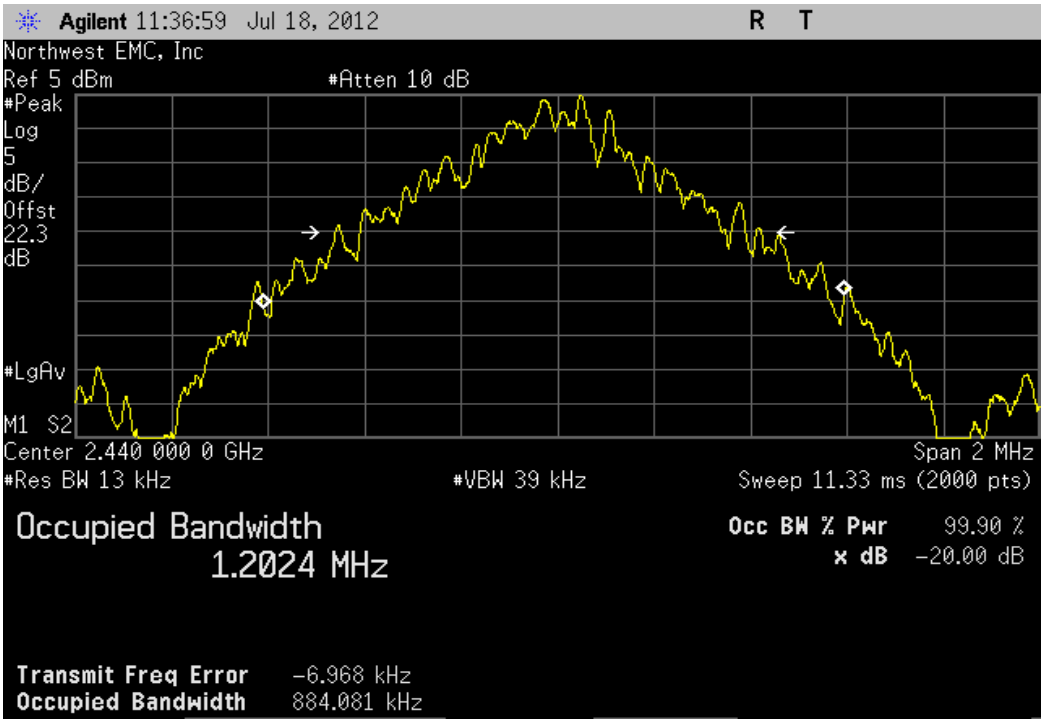
DH5, GFSK, Low Channel

				Value	Limit	Result
				878.851 kHz	< 1.5 MHz	Pass



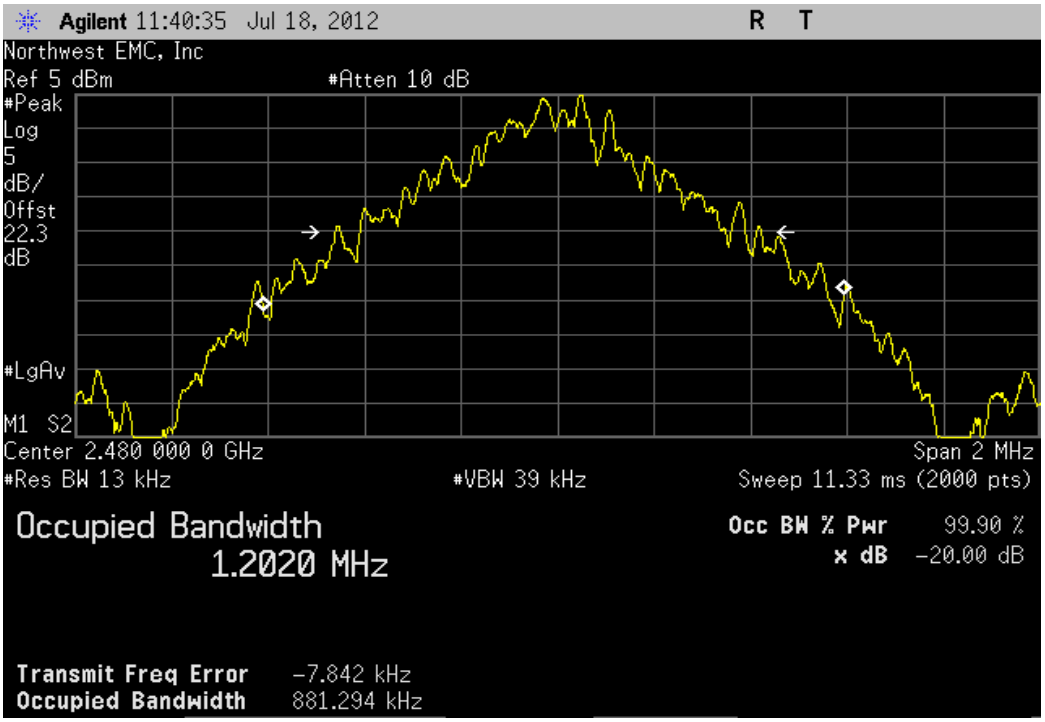
DH5, GFSK, Mid Channel

				Value	Limit	Result
				884.081 kHz	< 1.5 MHz	Pass



DH5, GFSK, High Channel

				Value	Limit	Result
				881.294 kHz	< 1.5 MHz	Pass



Output Power

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/12/2011	12
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/19/2012	12
Signal Generator	Agilent	N5183A	TIA	1/27/2012	24
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	12

TEST DESCRIPTION

The peak output power was measured with the EUT set to low, medium and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting in a no hop mode at the data rate(s) listed in the datasheet.

De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +27dBm.

Output Power

EUT:	Base			**Work Order:**	MDTR0183
Serial Number:	YDM000107A			**Date:**	07/18/12
Customer:	Medtronic Inc.			**Temperature:**	23.63°C
Attendees:	None			**Humidity:**	57%
Project:	None			**Barometric Pres.:**	1011.0
Tested by:	Trevor Buls	**Power:**	5VDC	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Per Medtronic Test Plan config 7

DEVIATIONS FROM TEST STANDARD

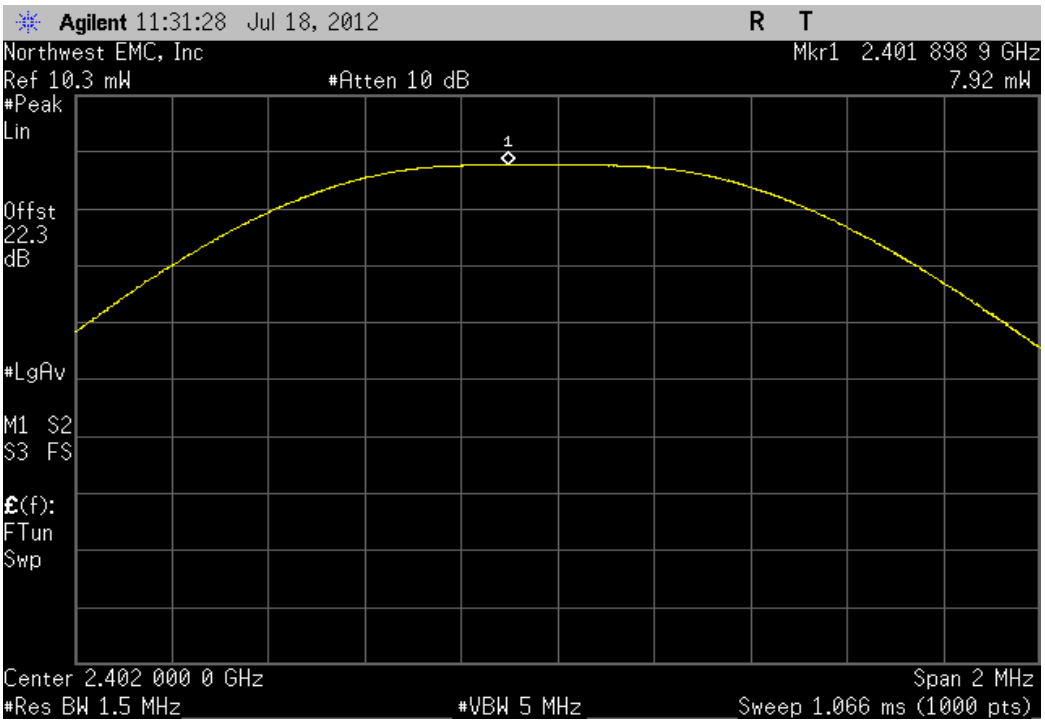
None

Configuration #	1	Signature	Trevor Buls

	Value	Limit	Result
DH5, GFSK			
Low Channel	7.92 mW	< 125 mW	Pass
Mid Channel	8.274 mW	< 125 mW	Pass
High Channel	8.416 mW	< 125 mW	Pass

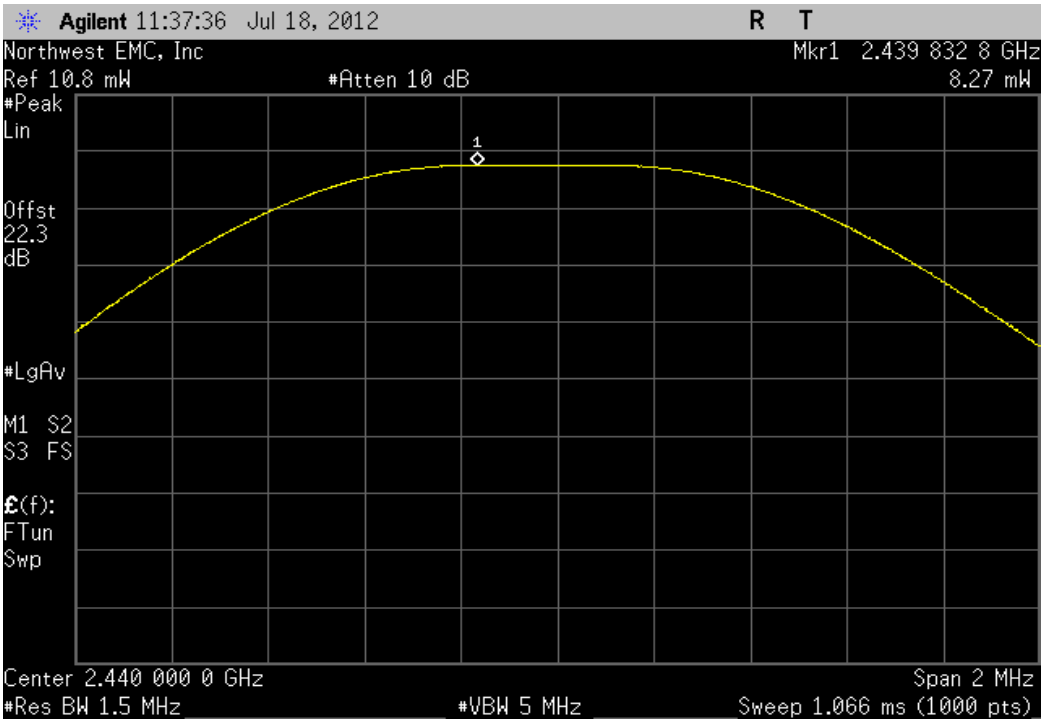
DH5, GFSK, Low Channel

				Value	Limit	Result
				7.92 mW	< 125 mW	Pass



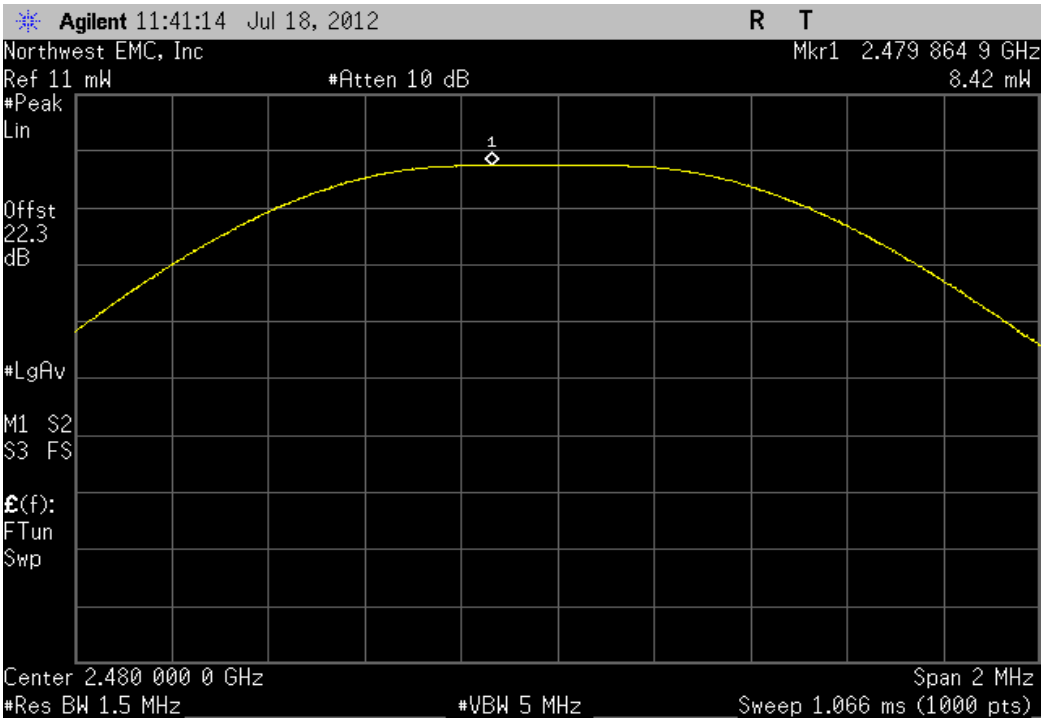
DH5, GFSK, Mid Channel

				Value	Limit	Result
				8.274 mW	< 125 mW	Pass



Output Power

DH5, GFSK, High Channel						
				Value	Limit	Result
				8.416 mW	< 125 mW	Pass



Band Edge Compliance

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/12/2011	12
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/19/2012	12
Signal Generator	Agilent	N5183A	TIA	1/27/2012	24
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	12

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to its normal pseudo-random hopping sequence. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

Band Edge Compliance

EUT:	Base			**Work Order:**	MDTR0183
Serial Number:	YDM000107A			**Date:**	08/08/12
Customer:	Medtronic Inc.			**Temperature:**	23.50°C
Attendees:	None			**Humidity:**	51%
Project:	None			**Barometric Pres.:**	1015.9
Tested by:	Trevor Buls	**Power:**	5VDC	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Per MDTR0129 test plan configuration: 7. Data was taken in normal hopping sequence with unmodulated carriers.

DEVIATIONS FROM TEST STANDARD

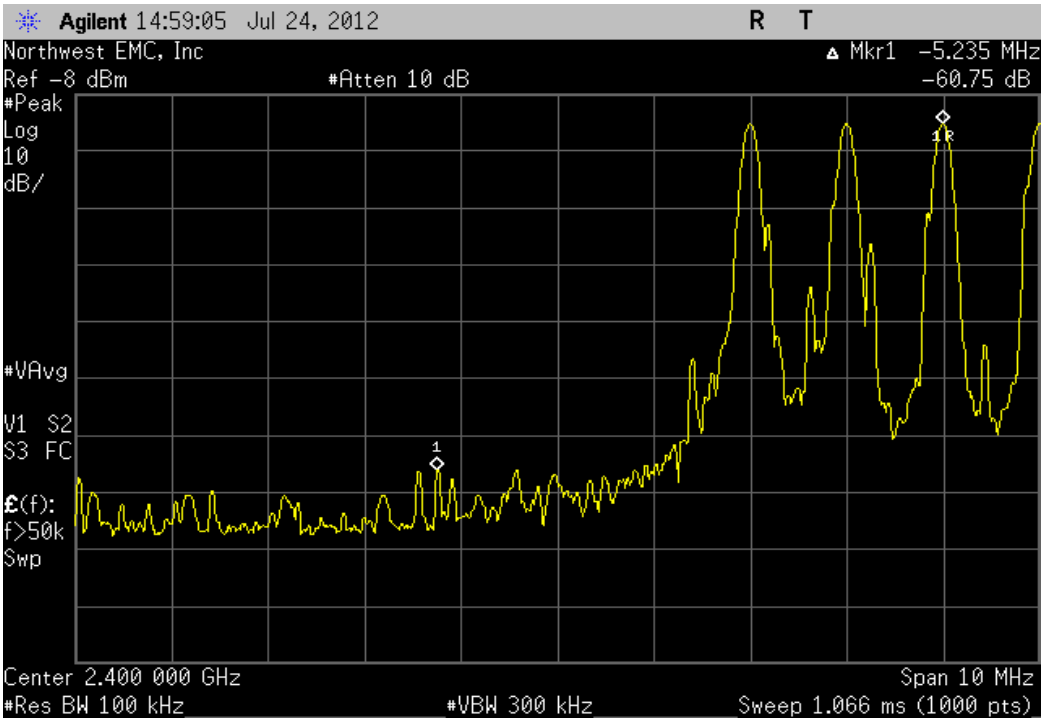
None

Configuration #	1	Signature	Trevor Buls

		Value	Limit	Result
DH5, GFSK				
	Low Channel	-60.75 dBc	≤ -20 dBc	Pass
	High Channel	-61.33 dBc	≤ -20 dBc	Pass

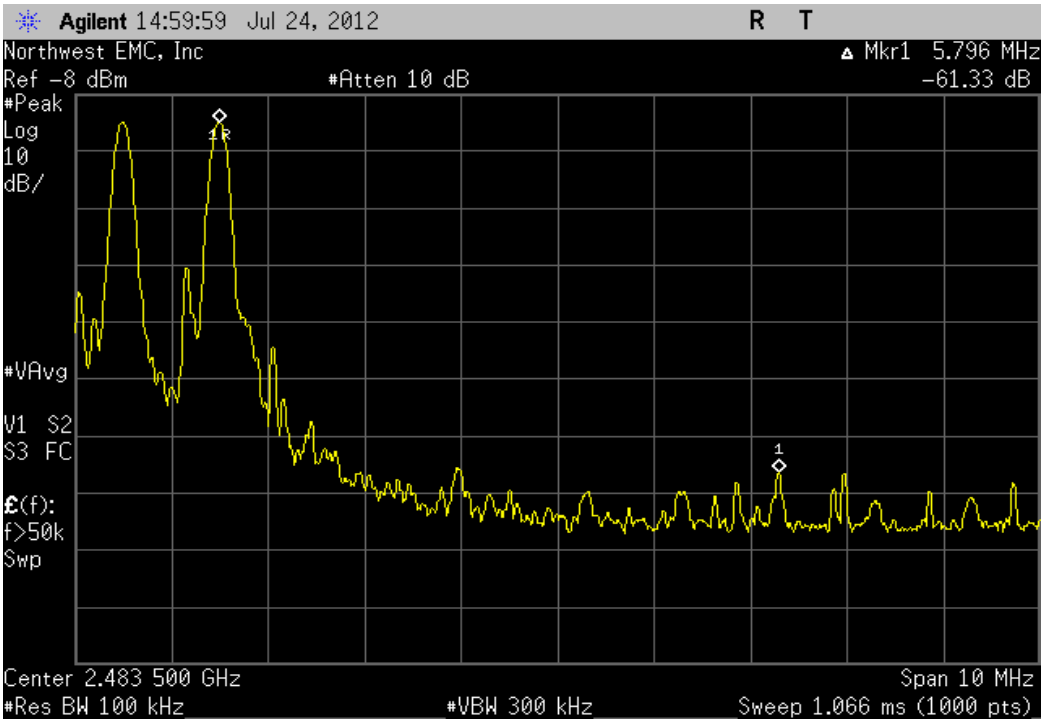
DH5, GFSK, Low Channel

				Value	Limit	Result
				-60.75 dBc	≤ -20 dBc	Pass



DH5, GFSK, High Channel

				Value	Limit	Result
				-61.33 dBc	≤ -20 dBc	Pass



Band Edge Compliance

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/12/2011	12
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/19/2012	12
Signal Generator	Agilent	N5183A	TIA	1/27/2012	24
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	12

TEST DESCRIPTION

The spurious RF conducted emissions at the edges of the authorized band were measured with the EUT set to low and high transmit frequencies. The measurement was made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet in a no hop mode. The channels closest to the band edges were selected.

The spectrum was scanned below the lower band edge and above the higher band edge.

Band Edge Compliance

EUT:	Base			**Work Order:**	MDTR0183
Serial Number:	YDM000107A			**Date:**	07/18/12
Customer:	Medtronic Inc.			**Temperature:**	23.63°C
Attendees:	None			**Humidity:**	57%
Project:	None			**Barometric Pres.:**	1011.0
Tested by:	Trevor Buls	**Power:**	5VDC	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Per Medtronic Test Plan config 7

DEVIATIONS FROM TEST STANDARD

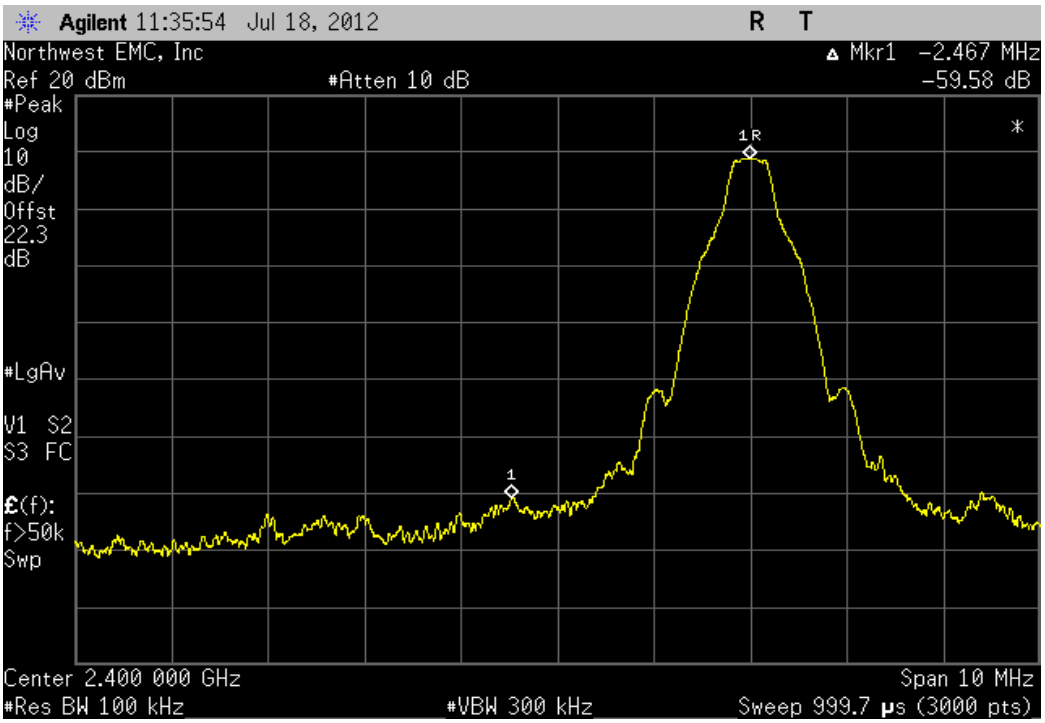
None

Configuration #	1	Signature	Trevor Buls

		Value	Limit	Result
DH5, GFSK				
	Low Channel	-59.58 dBc	≤ -20 dBc	Pass
	High Channel	-60.89 dBc	≤ -20 dBc	Pass

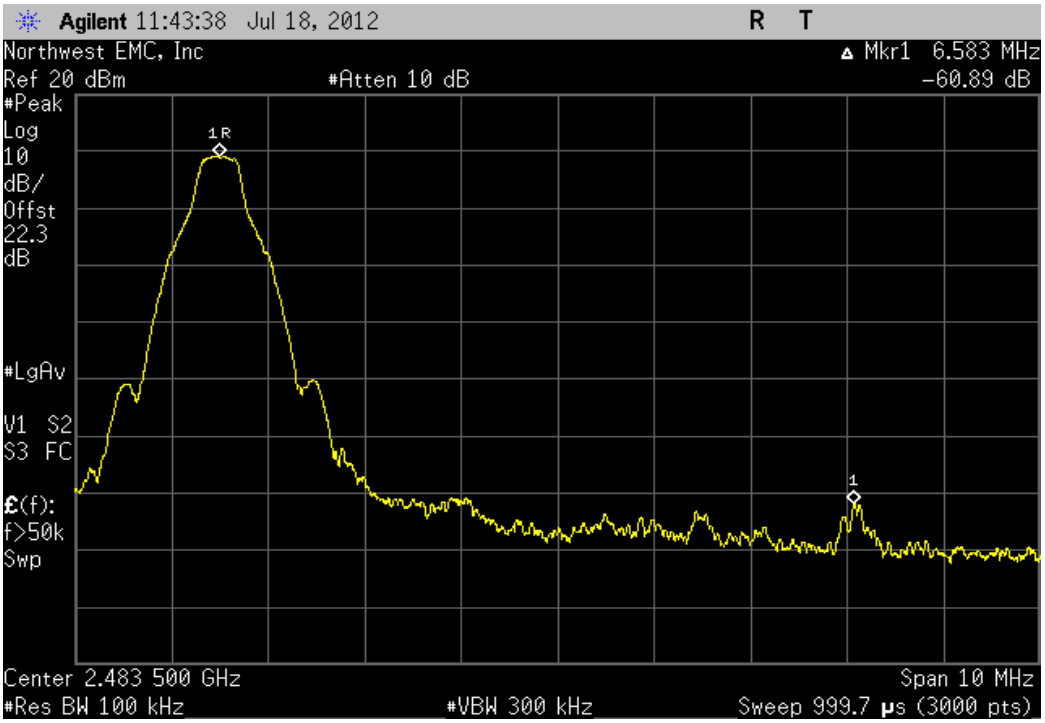
DH5, GFSK, Low Channel

				Value	Limit	Result
				-59.58 dBc	≤ -20 dBc	Pass



DH5, GFSK, High Channel

				Value	Limit	Result
				-60.89 dBc	≤ -20 dBc	Pass



Spurious Conducted 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.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/12/2011	12
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	4/19/2012	12
Signal Generator	Agilent	N5183A	TIA	1/27/2012	24
Spectrum Analyzer	Agilent	E4440A	AAX	5/15/2012	12

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet in a no-hop mode. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

Spurious Conducted Emissions

EUT:	Base			**Work Order:**	MDTR0183
Serial Number:	YDM000107A			**Date:**	07/18/12
Customer:	Medtronic Inc.			**Temperature:**	23.63°C
Attendees:	None			**Humidity:**	57%
Project:	None			**Barometric Pres.:**	1011.0
Tested by:	Trevor Buls	**Power:**	5VDC	**Job Site:**	MN08

TEST SPECIFICATIONS	Test Method
FCC 15.247:2012	ANSI C63.10:2009

COMMENTS

Per Medtronic Test Plan config 7

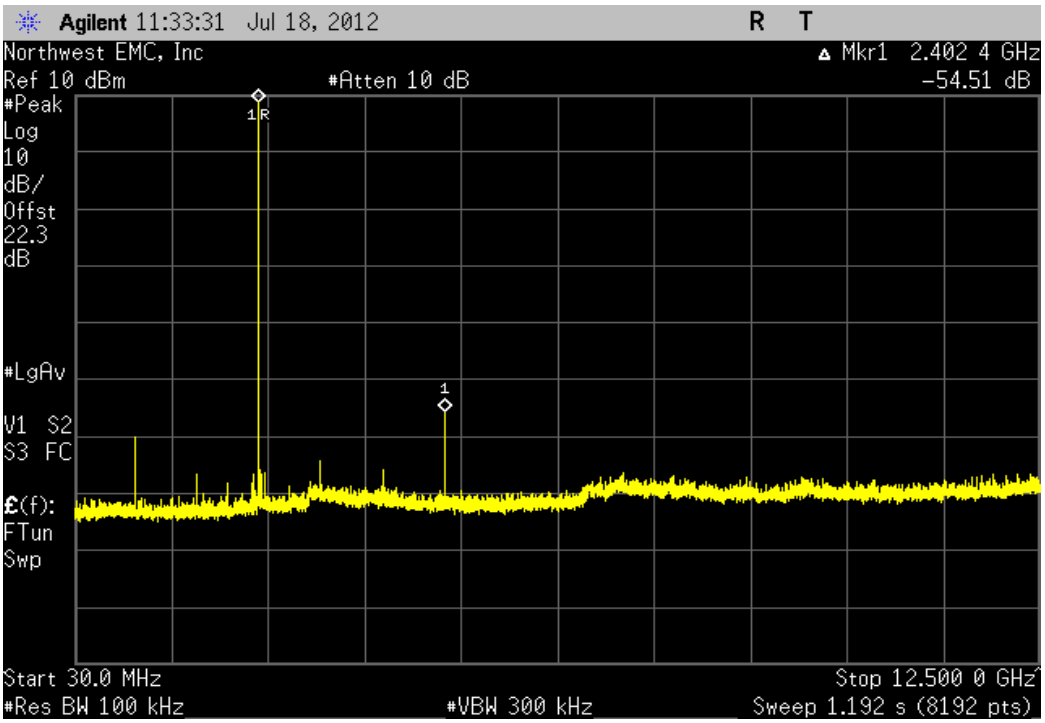
DEVIATIONS FROM TEST STANDARD

None

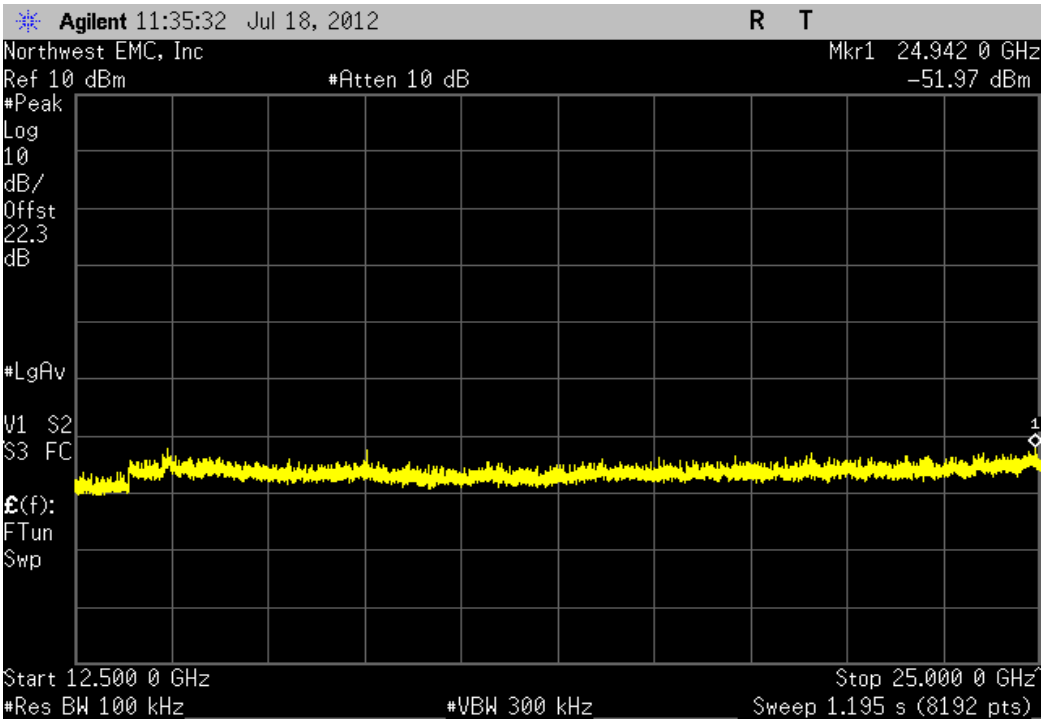
Configuration #	1	Signature	Trevor Buls

		Frequency Range	Value	Limit	Result
DH5, GFSK					
	Low Channel	30 MHz - 12.5 GHz	-54.51 dBc	≤ -20 dBc	Pass
	Low Channel	12.5 GHz - 25 GHz	-60.74 dBc	≤ -20 dBc	Pass
	Mid Channel	30 MHz - 12.5 GHz	-57.01 dBc	≤ -20 dBc	Pass
	Mid Channel	12.5 GHz - 25 GHz	-61.02 dBc	≤ -20 dBc	Pass
	High Channel	30 MHz - 12.5 GHz	-55.03 dBc	≤ -20 dBc	Pass
	High Channel	12.5 GHz - 25 GHz	-60.95 dBc	≤ -20 dBc	Pass

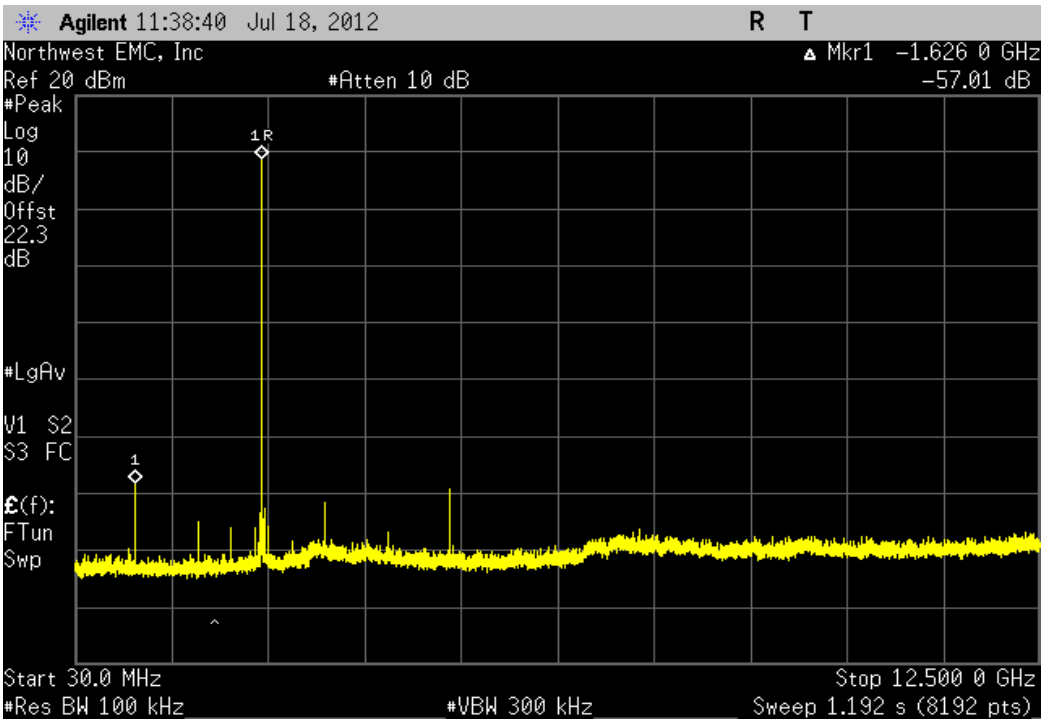
DH5, GFSK, Low Channel				
Frequency Range		**Value**	**Limit**	**Result**
30 MHz - 12.5 GHz		-54.51 dBc	≤ -20 dBc	Pass



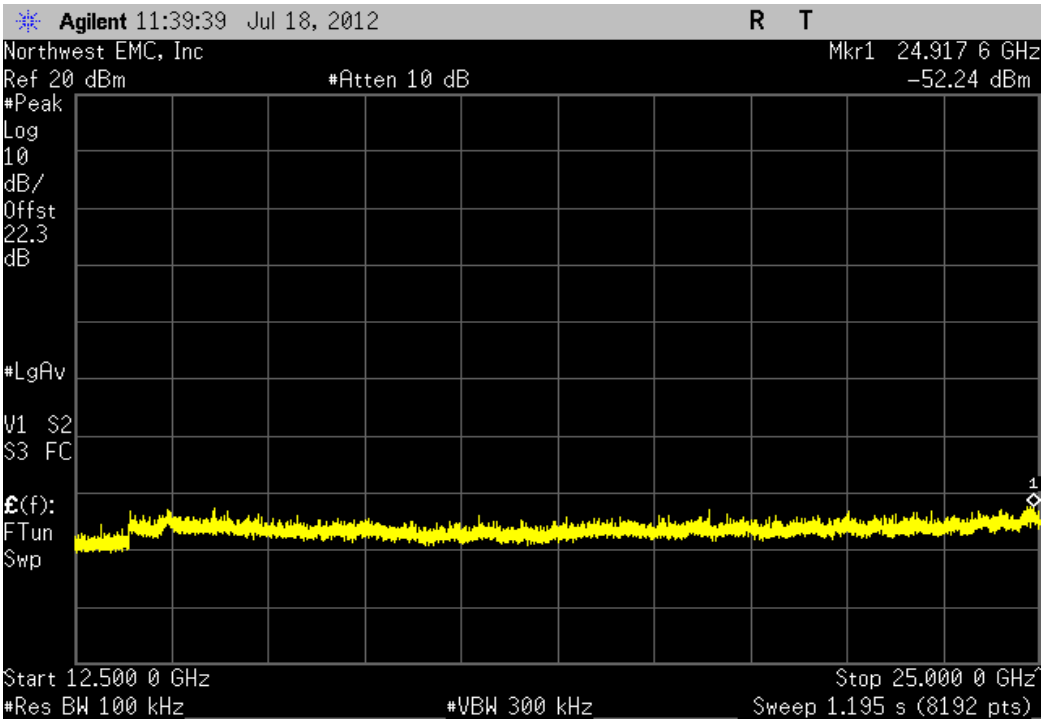
DH5, GFSK, Low Channel				
Frequency Range		**Value**	**Limit**	**Result**
12.5 GHz - 25 GHz		-60.74 dBc	≤ -20 dBc	Pass



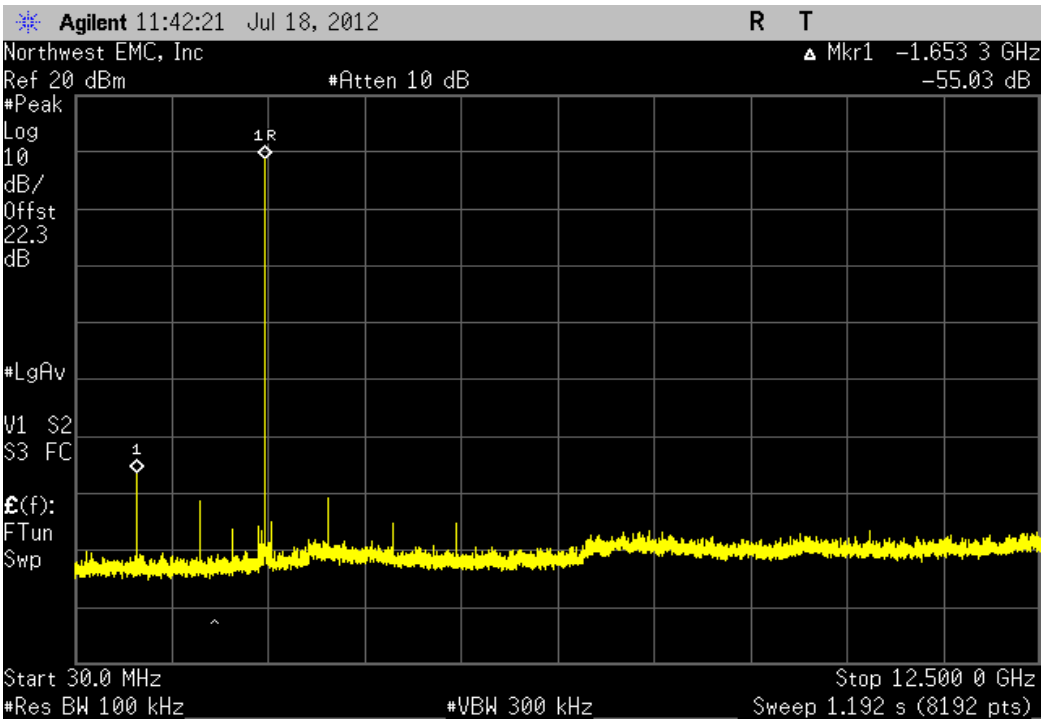
DH5, GFSK, Mid Channel				
Frequency Range		**Value**	**Limit**	**Result**
30 MHz - 12.5 GHz		-57.01 dBc	≤ -20 dBc	Pass



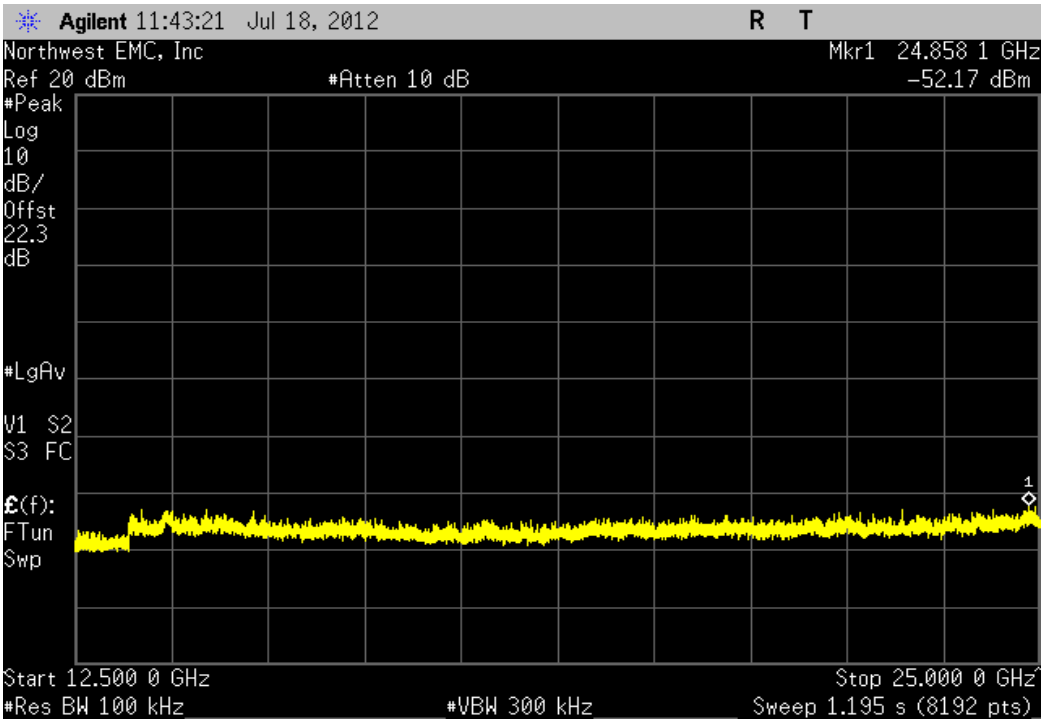
DH5, GFSK, Mid Channel				
Frequency Range		**Value**	**Limit**	**Result**
12.5 GHz - 25 GHz		-61.02 dBc	≤ -20 dBc	Pass



DH5, GFSK, High Channel				
Frequency Range		**Value**	**Limit**	**Result**
30 MHz - 12.5 GHz		-55.03 dBc	≤ -20 dBc	Pass



DH5, GFSK, High Channel				
Frequency Range		**Value**	**Limit**	**Result**
12.5 GHz - 25 GHz		-60.95 dBc	≤ -20 dBc	Pass



DUTY CYCLE

TEST DESCRIPTION

The Duty Cycle (x) were measured for each of the EUT operating modes. The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

The EUT operates at 100% Duty Cycle.

Spurious Radiated Emissions

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

MODES OF OPERATION

Transmitting, Low, Mid, High Channels at 2402, 2440, 2480 MHz with DH5 (See comments)

POWER SETTINGS INVESTIGATED

110VAC/60Hz

CONFIGURATIONS INVESTIGATED

MDTR0183 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	25 GHz

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
High Pass Filter	Micro-Tronics	HPM50111	HGQ	6/1/2012	24 mo
Low Pass Filter	Micro-Tronics	LPM50004	HGK	5/31/2012	24 mo
Attenuator, 20 dB, 'SMA'	SM Electronics	SA6-20	REO	5/31/2012	12 mo
MN05 Cables	N/A	18-26GHz Standard Gain Horn Cable	EVD	2/6/2012	12 mo
Antenna, Horn	ETS	3160-09	AHG	NCR	0 mo
Pre-Amplifier	Miteq	JSD4-18002600-26-8P	APU	2/6/2012	12 mo
Antenna, Horn	ETS	3160-07	AXP	NCR	0 mo
Antenna, Horn	ETS Lindgren	3160-08	AIQ	NCR	0 mo
Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVW	5/30/2012	12 mo
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVV	5/30/2012	12 mo
MN05 Cables	ESM Cable Corp.	Standard Gain Horn Cables	MNJ	5/30/2012	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	5/30/2012	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	24 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	5/30/2012	12 mo
Pre-Amplifier	Miteq	AM-1616-1000	AVY	5/31/2012	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	5/31/2012	12 mo
Antenna, Bilog	Teseq	CBL 6141B	AYD	12/19/2011	12 mo
Spectrum Analyzer	Agilent	E4446A	AAT	6/28/2012	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

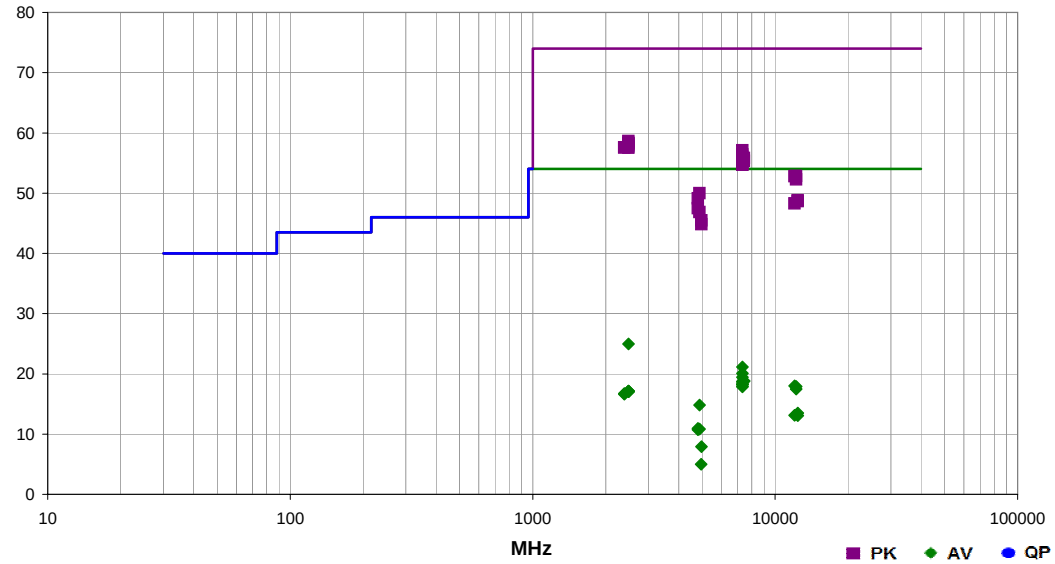
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify 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, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009). A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

Spurious Radiated Emissions

Work Order:	MDTR0183	**Date:**	07/11/12	Trevor Buls	
Project:	None	**Temperature:**	23.93 °C		
Job Site:	MN05	**Humidity:**	45.66% RH		
Serial Number:	YDM000106A	**Barometric Pres.:**	1019.4 mbar	**Tested by:**	Trevor Buls
EUT:	Base				
Configuration:	2				
Customer:	Medtronic Inc.				
Attendees:	Thomas Kelly				
EUT Power:	110VAC/60Hz				
Operating Mode:	Transmitting, Low, Mid, High Channels at 2402, 2440, 2480 MHz with DH5 (See comments)				
Deviations:	None				
Comments:	Medtronic Test Plan Config 7. DCCF = 20*Log(1.534ms pulse width * 2 pulses / 100ms) = -30.26				

Test Specifications	**Test Method**
FCC 15.247:2012	ANSI C63.10:2009

Run #	12	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.600	42.4	-3.8	1.0	319.0	0.0	20.0	Horz	PK	0.0	58.6	74.0	-15.4	High Ch, EUT on Side
2486.683	42.1	-3.8	1.0	111.0	0.0	20.0	Horz	PK	0.0	58.3	74.0	-15.7	High Ch, EUT Horizontal
2487.125	42.0	-3.8	1.0	158.0	0.0	20.0	Horz	PK	0.0	58.2	74.0	-15.8	High Ch, EUT Vertical
2484.308	41.8	-3.8	1.7	262.0	0.0	20.0	Vert	PK	0.0	58.0	74.0	-16.0	High Ch, EUT on Side
2485.217	41.5	-3.8	1.0	206.0	0.0	20.0	Vert	PK	0.0	57.7	74.0	-16.3	High Ch, EUT Horizontal
2386.775	41.6	-4.0	1.0	240.0	0.0	20.0	Horz	PK	0.0	57.6	74.0	-16.4	Low Ch, EUT Horizontal
2389.275	41.6	-4.0	1.6	98.0	0.0	20.0	Vert	PK	0.0	57.6	74.0	-16.4	Low Ch, EUT Horizontal
2486.550	41.3	-3.8	1.0	23.0	0.0	20.0	Vert	PK	0.0	57.5	74.0	-16.5	High Ch, EUT Vertical
7319.625	45.1	12.0	1.1	61.0	0.0	0.0	Vert	PK	0.0	57.1	74.0	-16.9	Mid Ch, EUT Horizontal - Added Cable
7319.442	44.4	12.0	1.0	58.0	0.0	0.0	Vert	PK	0.0	56.4	74.0	-17.6	Mid Ch, EUT Horizontal
7319.767	44.0	12.0	1.3	77.0	0.0	0.0	Vert	PK	0.0	56.0	74.0	-18.0	Mid Ch, EUT on Side
7440.333	43.2	12.6	1.0	88.0	0.0	0.0	Horz	PK	0.0	55.8	74.0	-18.2	High Ch, EUT Horizontal
7319.717	43.8	12.0	1.3	158.0	0.0	0.0	Vert	PK	0.0	55.8	74.0	-18.2	Mid Ch, EUT Vertical
7319.742	43.4	12.0	1.0	81.0	0.0	0.0	Horz	PK	0.0	55.4	74.0	-18.6	Mid Ch, EUT Horizontal
7439.258	42.7	12.6	1.0	264.0	0.0	0.0	Vert	PK	0.0	55.3	74.0	-18.7	High Ch, EUT Horizontal
7319.617	43.3	12.0	1.0	62.0	0.0	0.0	Vert	PK	0.0	55.3	74.0	-18.7	Mid Ch, EUT Horizontal - No POTS
7319.567	43.2	12.0	1.0	136.0	0.0	0.0	Horz	PK	0.0	55.2	74.0	-18.8	Mid Ch, EUT Vertical
7320.225	42.9	12.0	1.0	53.0	0.0	0.0	Horz	PK	0.0	54.9	74.0	-19.1	Mid Ch, EUT Horizontal - Added Cable
7320.558	42.7	12.0	1.0	53.0	0.0	0.0	Horz	PK	0.0	54.7	74.0	-19.3	Mid Ch, EUT Horizontal - No POTS
7319.833	42.7	12.0	1.0	140.0	0.0	0.0	Horz	PK	0.0	54.7	74.0	-19.3	Mid Ch, EUT on Side
12199.370	59.0	-6.1	1.2	54.0	0.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	Mid Ch, EUT Horizontal
12009.300	59.4	-6.6	1.3	61.0	0.0	0.0	Horz	PK	0.0	52.8	74.0	-21.2	Low Ch, EUT Horizontal
12199.280	58.4	-6.1	1.3	61.0	0.0	0.0	Horz	PK	0.0	52.3	74.0	-21.7	Mid Ch, EUT Horizontal
4880.350	45.7	4.3	1.1	67.0	0.0	0.0	Vert	PK	0.0	50.0	74.0	-24.0	Mid Ch, EUT Horizontal
4803.833	45.1	4.0	1.1	300.0	0.0	0.0	Horz	PK	0.0	49.1	74.0	-24.9	Low Ch, EUT Horizontal
12399.130	54.5	-5.7	1.1	59.0	0.0	0.0	Horz	PK	0.0	48.8	74.0	-25.2	High Ch, EUT Horizontal
12400.640	54.3	-5.7	1.1	321.0	0.0	0.0	Vert	PK	0.0	48.6	74.0	-25.4	High Ch, EUT Horizontal
12009.190	54.9	-6.6	1.0	56.0	0.0	0.0	Vert	PK	0.0	48.3	74.0	-25.7	Low Ch, EUT Horizontal
4803.942	43.5	4.0	1.1	66.0	0.0	0.0	Vert	PK	0.0	47.5	74.0	-26.5	Low Ch, EUT Horizontal
4879.492	42.6	4.3	1.1	262.0	0.0	0.0	Horz	PK	0.0	46.9	74.0	-27.1	Mid Ch, EUT Horizontal
4960.109	40.9	4.6	1.0	60.0	0.0	0.0	Vert	PK	0.0	45.5	74.0	-28.5	High Ch, EUT Horizontal
2487.150	39.0	-3.8	1.0	111.0	-30.3	20.0	Horz	AV	0.0	25.0	54.0	-29.0	High Ch, EUT Horizontal
4960.142	40.3	4.6	1.0	16.0	0.0	0.0	Horz	PK	0.0	44.9	74.0	-29.1	High Ch, EUT Horizontal
7319.967	39.4	12.0	1.1	61.0	-30.3	0.0	Vert	AV	0.0	21.2	54.0	-32.8	Mid Ch, EUT Horizontal

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7319.933	38.3	12.0	1.0	58.0	-30.3	0.0	Vert	AV	0.0	20.1	54.0	-33.9	Mid Ch, EUT Horizontal - Added Cable
7319.950	37.7	12.0	1.3	158.0	-30.3	0.0	Vert	AV	0.0	19.5	54.0	-34.5	Mid Ch, EUT Vertical
7439.958	36.4	12.6	1.0	264.0	-30.3	0.0	Vert	AV	0.0	18.8	54.0	-35.2	High Ch, EUT Horizontal
7439.942	36.4	12.6	1.0	88.0	-30.3	0.0	Horz	AV	0.0	18.8	54.0	-35.2	High Ch, EUT Horizontal
7319.975	37.0	12.0	1.0	81.0	-30.3	0.0	Horz	AV	0.0	18.8	54.0	-35.2	Mid Ch, EUT Horizontal
7319.975	36.9	12.0	1.0	136.0	-30.3	0.0	Horz	AV	0.0	18.7	54.0	-35.3	Mid Ch, EUT Vertical
7319.992	36.5	12.0	1.0	62.0	-30.3	0.0	Vert	AV	0.0	18.3	54.0	-35.7	Mid Ch, EUT Horizontal - No POTS
7319.983	36.5	12.0	1.3	77.0	-30.3	0.0	Vert	AV	0.0	18.3	54.0	-35.7	Mid Ch, EUT on Side
7319.950	36.5	12.0	1.0	140.0	-30.3	0.0	Horz	AV	0.0	18.3	54.0	-35.7	Mid Ch, EUT on Side
12010.470	54.9	-6.6	1.3	61.0	-30.3	0.0	Horz	AV	0.0	18.0	54.0	-36.0	Low Ch, EUT Horizontal
7319.933	36.2	12.0	1.0	53.0	-30.3	0.0	Horz	AV	0.0	18.0	54.0	-36.0	Mid Ch, EUT Horizontal - Added Cable
12200.450	54.3	-6.1	1.2	54.0	-30.3	0.0	Vert	AV	0.0	17.9	54.0	-36.1	Mid Ch, EUT Horizontal
7320.033	36.1	12.0	1.0	53.0	-30.3	0.0	Horz	AV	0.0	17.9	54.0	-36.1	Mid Ch, EUT Horizontal - No POTS
12199.360	53.9	-6.1	1.3	61.0	-30.3	0.0	Horz	AV	0.0	17.5	54.0	-36.5	Mid Ch, EUT Horizontal
2485.008	31.2	-3.8	1.0	158.0	-30.3	20.0	Horz	AV	0.0	17.2	54.0	-36.8	High Ch, EUT Vertical
2487.108	31.1	-3.8	1.7	262.0	-30.3	20.0	Vert	AV	0.0	17.1	54.0	-36.9	High Ch, EUT on Side
2484.975	31.1	-3.8	1.0	206.0	-30.3	20.0	Vert	AV	0.0	17.1	54.0	-36.9	High Ch, EUT Horizontal
2484.475	31.1	-3.8	1.0	23.0	-30.3	20.0	Vert	AV	0.0	17.1	54.0	-36.9	High Ch, EUT Vertical
2484.208	31.1	-3.8	1.0	319.0	-30.3	20.0	Horz	AV	0.0	17.1	54.0	-36.9	High Ch, EUT on Side
2385.758	31.0	-4.0	1.0	240.0	-30.3	20.0	Horz	AV	0.0	16.7	54.0	-37.3	Low Ch, EUT Horizontal
2388.117	30.9	-4.0	1.6	98.0	-30.3	20.0	Vert	AV	0.0	16.6	54.0	-37.4	Low Ch, EUT Horizontal
4879.958	40.8	4.3	1.1	67.0	-30.3	0.0	Vert	AV	0.0	14.8	54.0	-39.2	Mid Ch, EUT Horizontal
12400.400	49.4	-5.7	1.1	59.0	-30.3	0.0	Horz	AV	0.0	13.5	54.0	-40.5	High Ch, EUT Horizontal
12010.340	50.0	-6.6	1.0	56.0	-30.3	0.0	Vert	AV	0.0	13.1	54.0	-40.9	Low Ch, EUT Horizontal
12399.400	49.0	-5.7	1.1	321.0	-30.3	0.0	Vert	AV	0.0	13.1	54.0	-40.9	High Ch, EUT Horizontal
4803.983	37.2	4.0	1.1	300.0	-30.3	0.0	Horz	AV	0.0	11.0	54.0	-43.0	Low Ch, EUT Horizontal
4880.000	36.8	4.3	1.1	262.0	-30.3	0.0	Horz	AV	0.0	10.8	54.0	-43.2	Mid Ch, EUT Horizontal
4803.992	37.0	4.0	1.1	66.0	-30.3	0.0	Vert	AV	0.0	10.8	54.0	-43.2	Low Ch, EUT Horizontal
4960.000	33.6	4.6	1.0	60.0	-30.3	0.0	Vert	AV	0.0	7.9	54.0	-46.1	High Ch, EUT Horizontal
4959.942	30.7	4.6	1.0	16.0	-30.3	0.0	Horz	AV	0.0	5.0	54.0	-49.0	High Ch, EUT Horizontal

WTD.2012.08.15

AC POWERLINE CONDUCTED EMISSIONS

TEST DESCRIPTION

The EUT will be powered either directly or indirectly from the AC power line. Therefore, conducted emissions measurements were made on the AC input of the EUT, or on the AC input of the device used to power the EUT. The AC power line conducted emissions were measured with the EUT operating at the lowest, the highest, and a middle channel in the operational band. The EUT was transmitting at its maximum data rate. For each mode, the spectrum was scanned from 150 kHz to 30 MHz. The test setup and procedures were in accordance with ANSI C63.10-2009.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Receiver	Rohde & Schwarz	ESCI	ARG	03/22/2012	12 mo
High Pass Filter	TTE	H97-100K-50-720B	HGN	05/31/2012	24 mo
MN03 Cables	ESM Cable Corp.	Conducted Cables	MNC	04/16/2012	12 mo
Attenuator, 20 dB	SM Electronics	SA01B-20	REF	12/21/2011	12 mo
LISN	Solar Electronics	9252-50-R-24-BNC	LIY	05/30/2012	12 mo

CONFIGURATIONS INVESTIGATED

MDTR0183-2

MODES INVESTIGATED

Transmitting Bluetooth channel 1
Transmitting Bluetooth channel 13
Transmitting Bluetooth channel 27

AC POWERLINE CONDUCTED EMISSIONS

EUT:	Base	Work Order:	MDTR0183
Serial Number:	YDM000106A	Date:	08/02/2012
Customer:	Medtronic Inc.	Temperature:	23.48°C
Attendees:	None	Relative Humidity:	56.44%
Customer Project:	None	Bar. Pressure:	1010.4 mb
Tested By:	Johnathan Lee	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	MDTR0183-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2012	ANSI C63.10:2009

TEST PARAMETERS

Run #:	23	Line:	Neutral	Ext. Attenuation (dB):	20

COMMENTS

Per MDTR0129 test plan configuration: 7

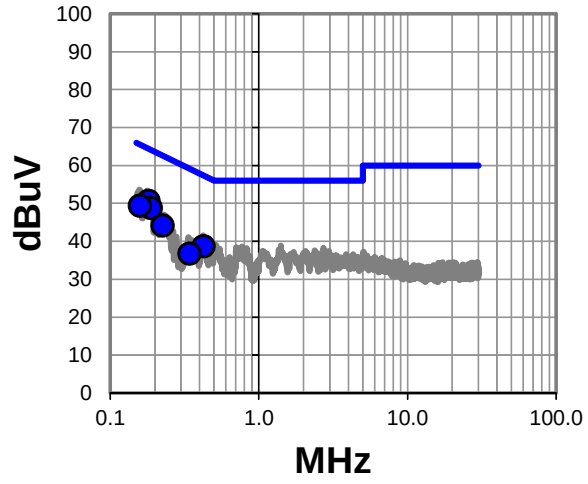
EUT OPERATING MODES

Transmitting Bluetooth channel 1

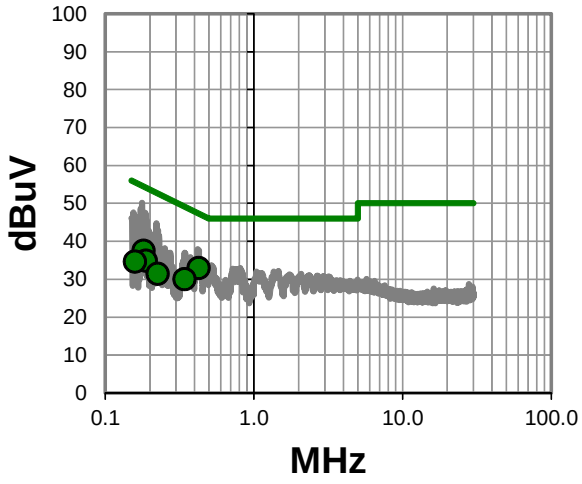
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #23

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.181	30.5	20.2	50.7	64.4	-13.7
0.187	28.6	20.2	48.8	64.2	-15.4
0.158	29.2	20.2	49.4	65.6	-16.2
0.225	24.0	20.2	44.2	62.6	-18.4
0.424	18.5	20.2	38.7	57.4	-18.7
0.342	16.6	20.2	36.8	59.2	-22.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.424	12.8	20.2	33.0	47.4	-14.4
0.181	17.3	20.2	37.5	54.4	-16.9
0.342	9.8	20.2	30.0	49.2	-19.2
0.187	14.7	20.2	34.9	54.2	-19.3
0.158	14.5	20.2	34.7	55.6	-20.9
0.225	11.3	20.2	31.5	52.6	-21.1

CONCLUSION

Pass

Tested By

AC POWERLINE CONDUCTED EMISSIONS

EUT:	Base	Work Order:	MDTR0183
Serial Number:	YDM000106A	Date:	08/02/2012
Customer:	Medtronic Inc.	Temperature:	23.48°C
Attendees:	None	Relative Humidity:	56.44%
Customer Project:	None	Bar. Pressure:	1010.4 mb
Tested By:	Johnathan Lee	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	MDTR0183-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2012	ANSI C63.10:2009

TEST PARAMETERS

Run #:	24	Line:	High Line	Ext. Attenuation (dB):	20

COMMENTS

Per MDTR0129 test plan configuration: 7

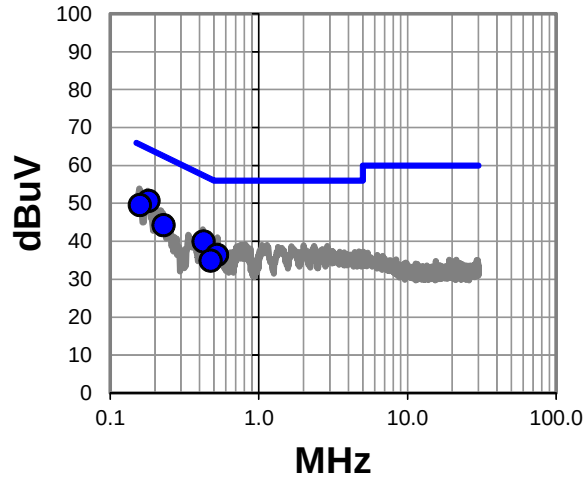
EUT OPERATING MODES

Transmitting Bluetooth channel 1

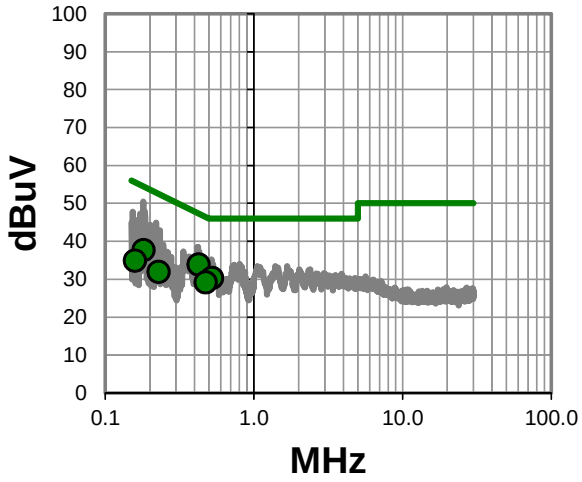
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #24

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.181	30.5	20.2	50.7	64.4	-13.7
0.158	29.4	20.2	49.6	65.6	-16.0
0.425	19.8	20.2	40.0	57.3	-17.3
0.228	24.1	20.2	44.3	62.5	-18.2
0.523	16.2	20.2	36.4	56.0	-19.6
0.473	14.7	20.2	34.9	56.5	-21.6

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.425	13.7	20.2	33.9	47.3	-13.4
0.523	10.2	20.2	30.4	46.0	-15.6
0.181	17.5	20.2	37.7	54.4	-16.7
0.473	9.0	20.2	29.2	46.5	-17.3
0.228	11.8	20.2	32.0	52.5	-20.5
0.158	14.7	20.2	34.9	55.6	-20.7

CONCLUSION

Pass

Tested By

AC POWERLINE CONDUCTED EMISSIONS

EUT:	Base	Work Order:	MDTR0183
Serial Number:	YDM000106A	Date:	08/02/2012
Customer:	Medtronic Inc.	Temperature:	23.48°C
Attendees:	None	Relative Humidity:	56.44%
Customer Project:	None	Bar. Pressure:	1010.4 mb
Tested By:	Johnathan Lee	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	MDTR0183-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2012	ANSI C63.10:2009

TEST PARAMETERS

Run #:	25	Line:	High Line	Ext. Attenuation (dB):	20

COMMENTS

Per MDTR0129 test plan configuration: 7

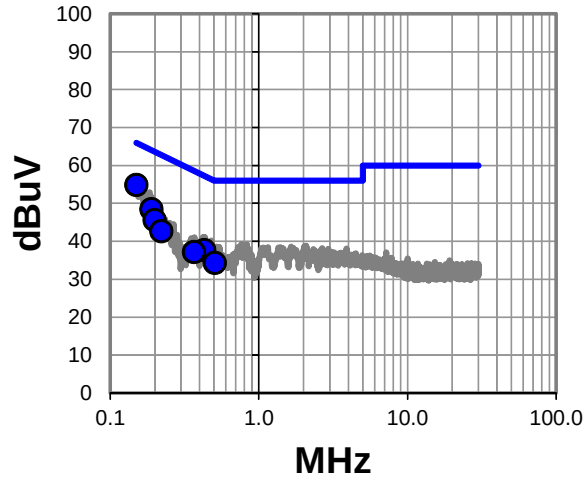
EUT OPERATING MODES

Transmitting Bluetooth channel 13

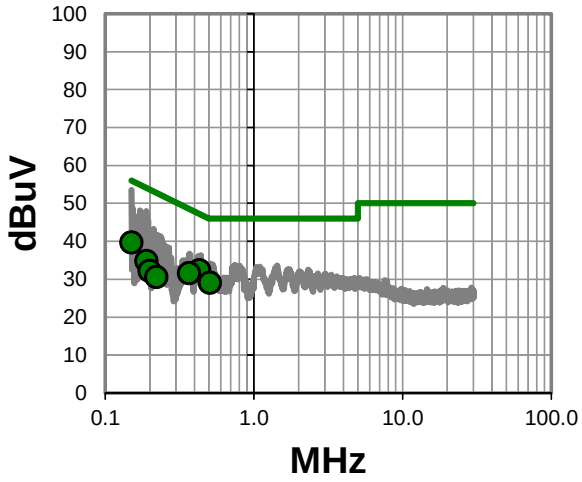
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #25

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.150	34.7	20.2	54.9	66.0	-11.1
0.189	28.3	20.2	48.5	64.1	-15.6
0.199	25.4	20.2	45.6	63.7	-18.1
0.429	17.5	20.2	37.7	57.3	-19.6
0.221	22.5	20.2	42.7	62.8	-20.1
0.365	17.0	20.2	37.2	58.6	-21.4
0.505	14.1	20.2	34.3	56.0	-21.7

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.429	12.2	20.2	32.4	47.3	-14.9
0.150	19.5	20.2	39.7	56.0	-16.3
0.505	8.9	20.2	29.1	46.0	-16.9
0.365	11.4	20.2	31.6	48.6	-17.0
0.189	14.6	20.2	34.8	54.1	-19.3
0.199	12.0	20.2	32.2	53.7	-21.5
0.221	10.4	20.2	30.6	52.8	-22.2

CONCLUSION

Pass

Tested By

AC POWERLINE CONDUCTED EMISSIONS

EUT:	Base	Work Order:	MDTR0183
Serial Number:	YDM000106A	Date:	08/02/2012
Customer:	Medtronic Inc.	Temperature:	23.48°C
Attendees:	None	Relative Humidity:	56.44%
Customer Project:	None	Bar. Pressure:	1010.4 mb
Tested By:	Johnathan Lee	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	MDTR0183-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2012	ANSI C63.10:2009

TEST PARAMETERS

Run #:	26	Line:	Neutral	Ext. Attenuation (dB):	20

COMMENTS

Per MDTR0129 test plan configuration: 7

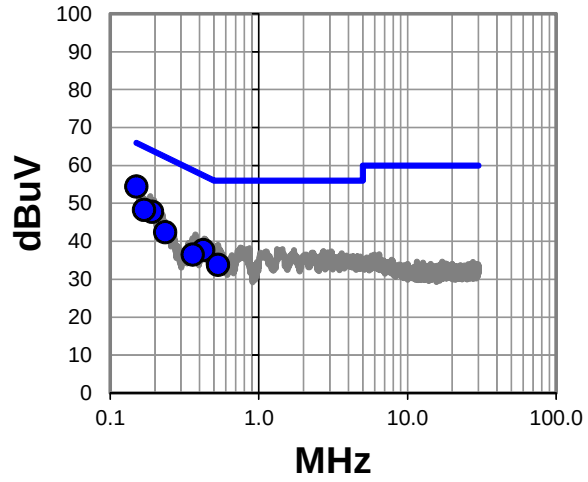
EUT OPERATING MODES

Transmitting Bluetooth channel 13

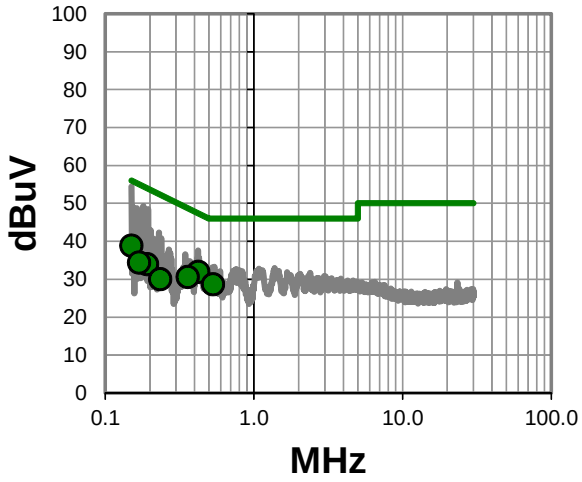
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #26

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.150	34.3	20.2	54.5	66.0	-11.5
0.191	27.6	20.2	47.8	64.0	-16.2
0.169	28.1	20.2	48.3	65.0	-16.7
0.422	17.5	20.2	37.7	57.4	-19.7
0.234	22.2	20.2	42.4	62.3	-19.9
0.531	13.6	20.2	33.8	56.0	-22.2
0.358	16.3	20.2	36.5	58.8	-22.3

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.422	11.8	20.2	32.0	47.4	-15.4
0.150	18.7	20.2	38.9	56.0	-17.1
0.531	8.5	20.2	28.7	46.0	-17.3
0.358	10.4	20.2	30.6	48.8	-18.2
0.191	13.8	20.2	34.0	54.0	-20.0
0.169	14.2	20.2	34.4	55.0	-20.6
0.234	9.8	20.2	30.0	52.3	-22.3

CONCLUSION

Pass

Tested By

AC POWERLINE CONDUCTED EMISSIONS

EUT:	Base	Work Order:	MDTR0183
Serial Number:	YDM000106A	Date:	08/02/2012
Customer:	Medtronic Inc.	Temperature:	23.48°C
Attendees:	None	Relative Humidity:	56.44%
Customer Project:	None	Bar. Pressure:	1010.4 mb
Tested By:	Johnathan Lee	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	MDTR0183-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2012	ANSI C63.10:2009

TEST PARAMETERS

Run #:	27	Line:	Neutral	Ext. Attenuation (dB):	20

COMMENTS

Per MDTR0129 test plan configuration: 7

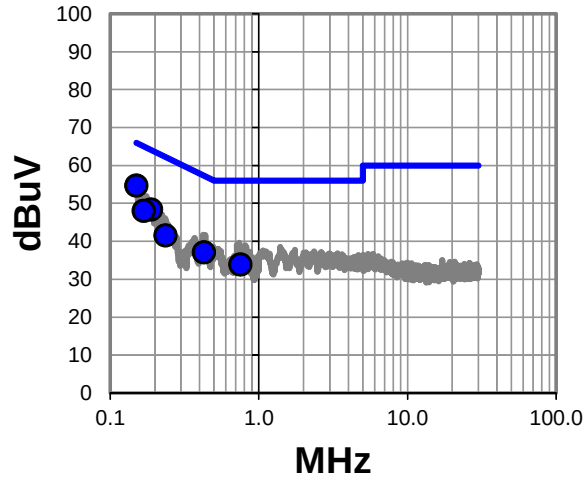
EUT OPERATING MODES

Transmitting Bluetooth channel 27

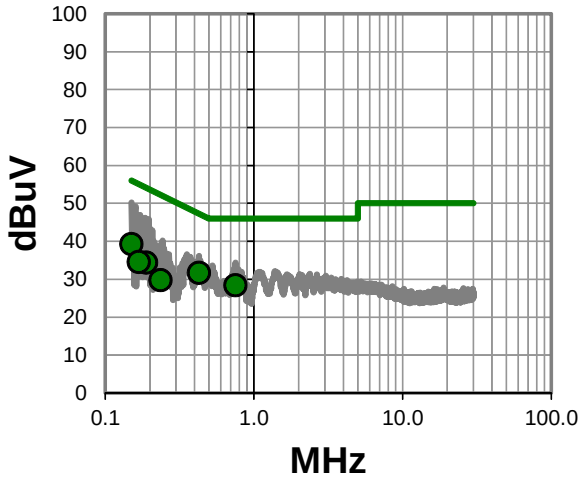
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

RESULTS - Run #27

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.150	34.5	20.2	54.7	66.0	-11.3
0.188	28.2	20.2	48.4	64.1	-15.7
0.168	27.9	20.2	48.1	65.1	-17.0
0.427	16.9	20.2	37.1	57.3	-20.2
0.235	21.4	20.2	41.6	62.3	-20.7
0.752	13.7	20.2	33.9	56.0	-22.1

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.427	11.5	20.2	31.7	47.3	-15.6
0.150	19.1	20.2	39.3	56.0	-16.7
0.752	8.2	20.2	28.4	46.0	-17.6
0.188	14.2	20.2	34.4	54.1	-19.7
0.168	14.4	20.2	34.6	55.1	-20.5
0.235	9.6	20.2	29.8	52.3	-22.5

CONCLUSION

Pass

Tested By

AC POWERLINE CONDUCTED EMISSIONS

EUT:	Base	Work Order:	MDTR0183
Serial Number:	YDM000106A	Date:	08/02/2012
Customer:	Medtronic Inc.	Temperature:	23.48°C
Attendees:	None	Relative Humidity:	56.44%
Customer Project:	None	Bar. Pressure:	1010.4 mb
Tested By:	Johnathan Lee	Job Site:	MN03
Power:	110VAC/60Hz	Configuration:	MDTR0183-2

TEST SPECIFICATIONS

Specification:	Method:
FCC 15.207:2012	ANSI C63.10:2009

TEST PARAMETERS

Run #:	28	Line:	High Line	Ext. Attenuation (dB):	20

COMMENTS

Per MDTR0129 test plan configuration: 7

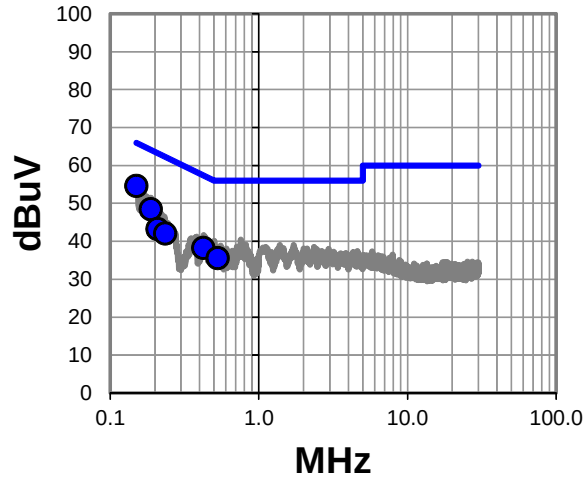
EUT OPERATING MODES

Transmitting Bluetooth channel 27

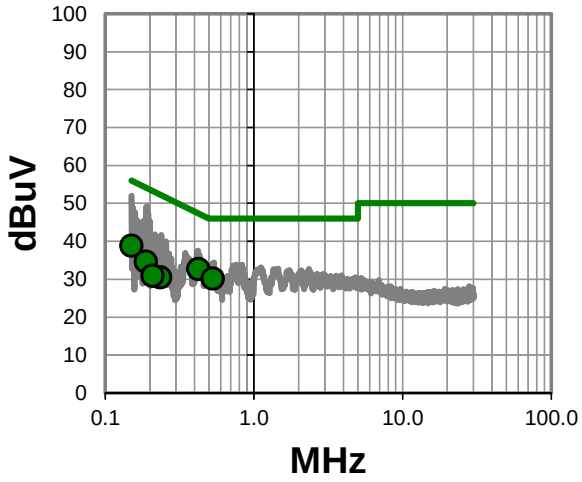
DEVIATIONS FROM TEST STANDARD

None

Quasi Peak Data - vs - Quasi Peak Limit



Average Data - vs - Average Limit



AC POWERLINE CONDUCTED EMISSIONS

WTD.2012.08.15

RESULTS - Run #28

Quasi Peak Data - vs - Quasi Peak Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.150	34.4	20.2	54.6	66.0	-11.4
0.187	28.3	20.2	48.5	64.2	-15.7
0.423	18.1	20.2	38.3	57.4	-19.1
0.208	23.1	20.2	43.3	63.3	-20.0
0.234	21.9	20.2	42.1	62.3	-20.2
0.527	15.4	20.2	35.6	56.0	-20.4

Average Data - vs - Average Limit

Freq (MHz)	Amp. (dBuV)	Factor (dB)	Adjusted (dBuV)	Spec. Limit (dBuV)	Margin (dB)
0.423	12.5	20.2	32.7	47.4	-14.7
0.527	10.0	20.2	30.2	46.0	-15.8
0.150	18.7	20.2	38.9	56.0	-17.1
0.187	14.5	20.2	34.7	54.2	-19.5
0.234	10.3	20.2	30.5	52.3	-21.8
0.208	10.8	20.2	31.0	53.3	-22.3

CONCLUSION

Pass

Tested By