# Medtronic Inc.

## Intellis - Models 97745 (PTM), 97755 (RTM)

**Report #: MDTR0182.1**

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 25, 2012**
**Medtronic Inc.**
**Model: Intellis - Models 97745 (PTM), 97755 (RTM)**

## 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 |
| Duty Cycle | FCC 15.247:2012 | ANSI C63.10:2009 | Pass |
| Spurious Emissions | FCC 15.247:2012 | 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 |
|---|---|---|---|
| 01 | Corrected Spurious Emissions Peak data | 10-18-2012 | 119 |

## Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

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.

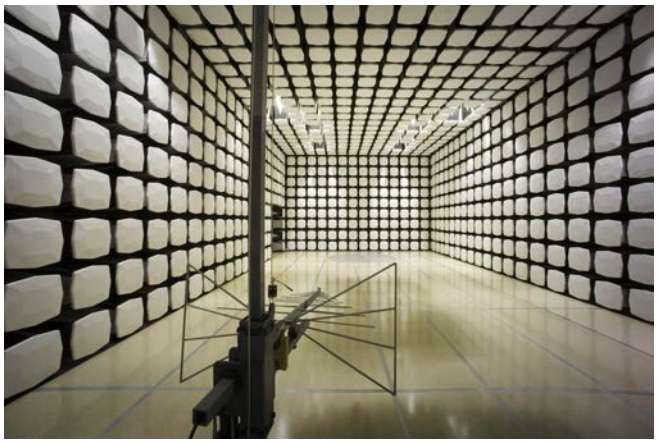
## SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/

# LOCATIONS

REV 2012.05.24

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

WTD 12.5.23

## 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:** | Holli Pheil |
| **Model:** | Intellis - Models 97745 (PTM), 97755 (RTM) |
| **First Date of Test:** | July 17, 2012 |
| **Last Date of Test:** | July 25, 2012 |
| **Receipt Date of Samples:** | July 10, 2012 |
| **Equipment Design Stage:** | Prototype |
| **Equipment Condition:** | No Damage |

## Information Provided by the Party Requesting the Test

**Functional Description of the EUT (Equipment Under Test):**

The Intellis PTM is a handheld, battery operated, microprocessor-based programmer designed for use by clinicians and patients to provide control of medical therapy for pain. Control therapy includes the ability to permit management of stimulation or view and acknowledge medical alarms or alerts.

The RTM is an instrument designed for use by clinicians and patients to charge rechargeable medical devices and stimulators. Operationally, the RTM requires a physical interface with a patient programmer via a cabled system connection. Power is drawn from the patient programmer's battery (PTM) source to drive recharge circuitry. The RTM also assists in the bonding operation of a medical device to a patient programmer and/or places the device in a known state via proximal telemetry, either operation requires patient programmer use and software interaction while the RTM is connected.

**Clocks and Oscillators of the EUT:**

None Provided

**Testing Objective:**

To demonstrate compliance to FCC requirements for the Bluetooth transmitter.

# CONFIGURATIONS

## Configuration MDTR0182- 1

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| PTM | Medtronic inc. | 97745 | NLD001856N |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| DC adapter | Group West | 18UR-05-2000 | None |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| DC Power | No | 1.90m | Yes | DC adapter | PTM |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

## Configuration MDTR0182- 4

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| PTM | Medtronic inc. | 97745 | NLD001856N |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| RTM | Medtronic inc. | 97755 | NLF001345N |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| RTM Cable | Yes | 0.90m | Yes | PTM | RTM |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

## Configuration MDTR0182- 8

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| PTM | Medtronic inc. | 97745 | NLD001856N |
| PTM | Medtronic inc. | 97745 | NLD001683N |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| DC adapter | Group West | 18UR-05-2000 | None |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| DC Power | No | 1.90m | Yes | DC adapter | PTM |
| **PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.** | | | | | |

# CONFIGURATIONS

## Configuration MDTR0182- 10

| EUT | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| PTM | Medtronic inc. | 97745 | NLD001683N |

| Peripherals in test setup boundary | | | |
|---|---|---|---|
| **Description** | **Manufacturer** | **Model/Part Number** | **Serial Number** |
| DC adapter | Group West | 18UR-05-2000 | None |

| Cables | | | | | |
|---|---|---|---|---|---|
| **Cable Type** | **Shield** | **Length (m)** | **Ferrite** | **Connection 1** | **Connection 2** |
| DC Power | No | 1.90m | Yes | DC adapter | PTM |
| **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 | 7/17/2012 | 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. |
| 2 | 7/17/2012 | 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 | 7/17/2012 | 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 | 7/24/2012 | 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 | 7/24/2012 | Band Edge Compliance | 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 | 7/24/2012 | 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 | 7/24/2012 | Duty Cycle | 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 | 7/24/2012 | 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. |
| 9 | 7/25/2012 | Spurious Emissions | 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 |
|---|---|---|---|---|---|
| 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 |

**MEASUREMENT UNCERTAINTY**

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**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:** | Intellis - Models 97745 (PTM), 97755 (RTM) | | | **Work Order:** | MDTR0182 |
| **Serial Number:** | NLD001683N | | | **Date:** | 07/17/12 |
| **Customer:** | Medtronic Inc. | | | **Temperature:** | 24.32°C |
| **Attendees:** | Scott Straka | | | **Humidity:** | 60% |
| **Project:** | None | | | **Barometric Pres.:** | 1008.9 |
| **Tested by:** | Trevor Buls | **Power:** | 5 VDC, Battery | **Job Site:** | MN08 |

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

**COMMENTS**

Per MDTR0043 test plan configuration: 9 and 10. Bluetooth hopping mode.

**DEVIATIONS FROM TEST STANDARD**

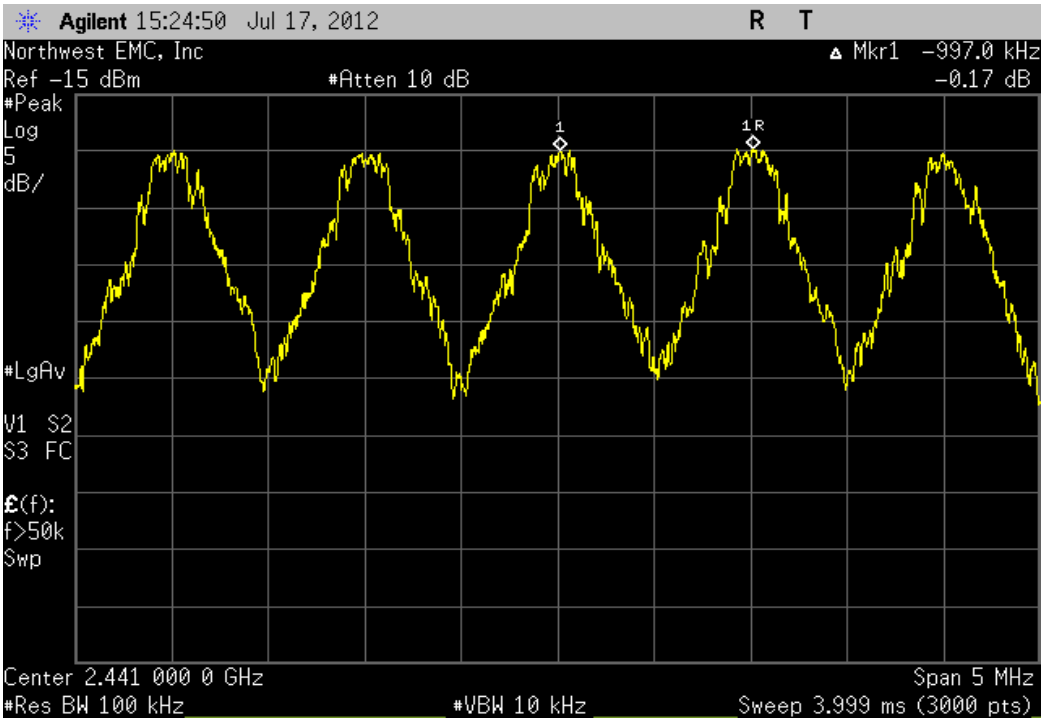
No Deviations

| Configuration # | 8, 10 | Signature Trevor Buls |
|---|---|---|

| | Value | Limit | Result |
|---|---|---|---|
| Per MDTR0043 test plan configuration: 9 (AC Adapter) | | | |
| Hopping Mode | 1.0 MHz | ≥ 1 MHz | Pass |
| Per MDTR0043 test plan configuration: 10 (Battery) | | | |
| Hopping Mode | 1.0 MHz | ≥ 1 MHz | Pass |

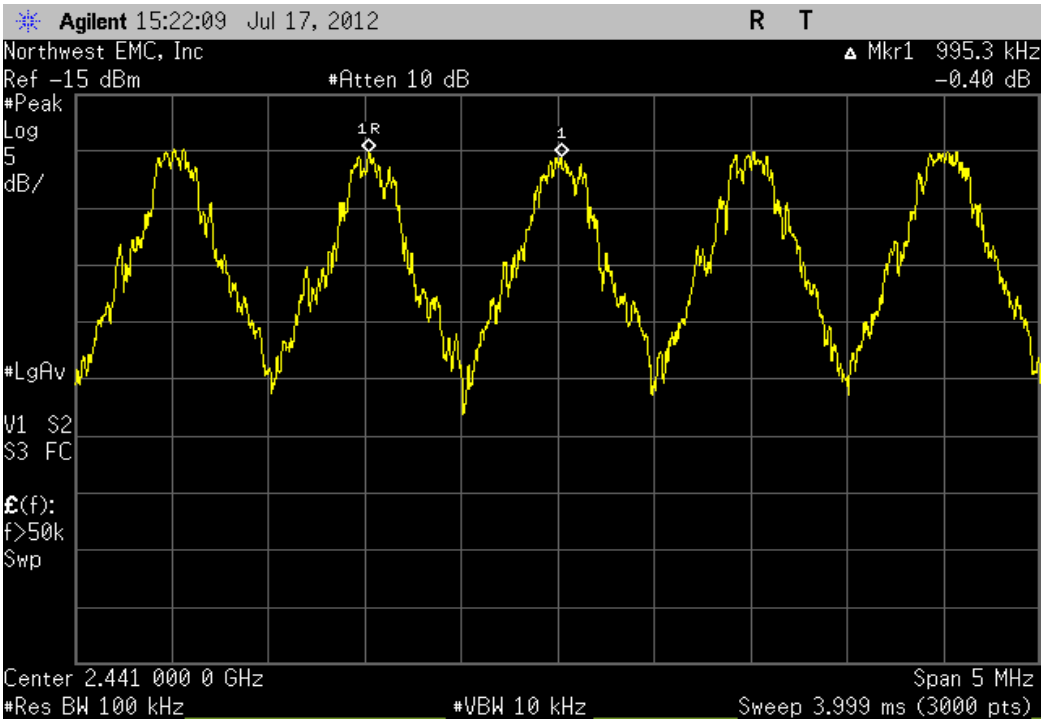
Per MDTR0043 test plan configuration: 9 (AC Adapter), Hopping Mode

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.0 MHz | ≥ 1 MHz | Pass |




Per MDTR0043 test plan configuration: 10 (Battery), 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 |
|---|---|---|---|---|---|
| 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 |

**MEASUREMENT UNCERTAINTY**

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**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:** | Intellis - Models 97745 (PTM), 97755 (RTM) | **Work Order:** | MDTR0182 |
| **Serial Number:** | NLD001683N | **Date:** | 07/17/12 |
| **Customer:** | Medtronic Inc. | **Temperature:** | 24.32°C |
| **Attendees:** | Scott Straka | **Humidity:** | 60% |
| **Project:** | None | **Barometric Pres.:** | 1008.9 |
| **Tested by:** | Trevor Buls | **Power:** 5 VDC, Battery | **Job Site:** MN08 |

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

**COMMENTS**

Per MDTR0043 test plan configuration: 9 and 10. Bluetooth hopping mode.

**DEVIATIONS FROM TEST STANDARD**

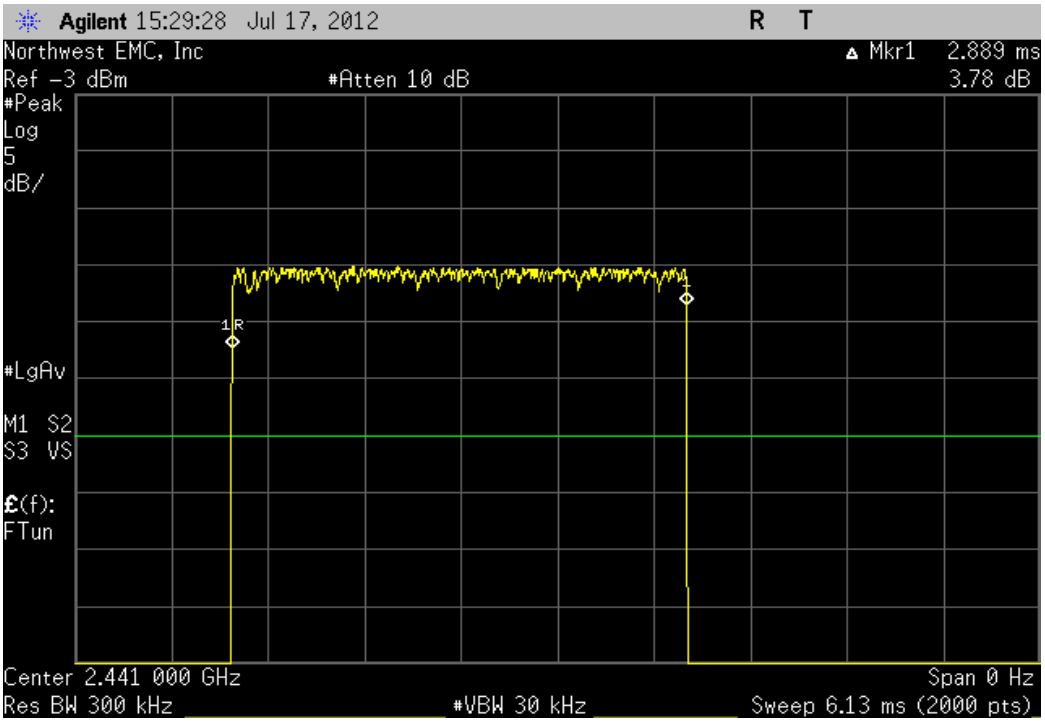
No Deviations

| Configuration # | 8, 10 | *Signature* Trevor Buls |
|---|---|---|

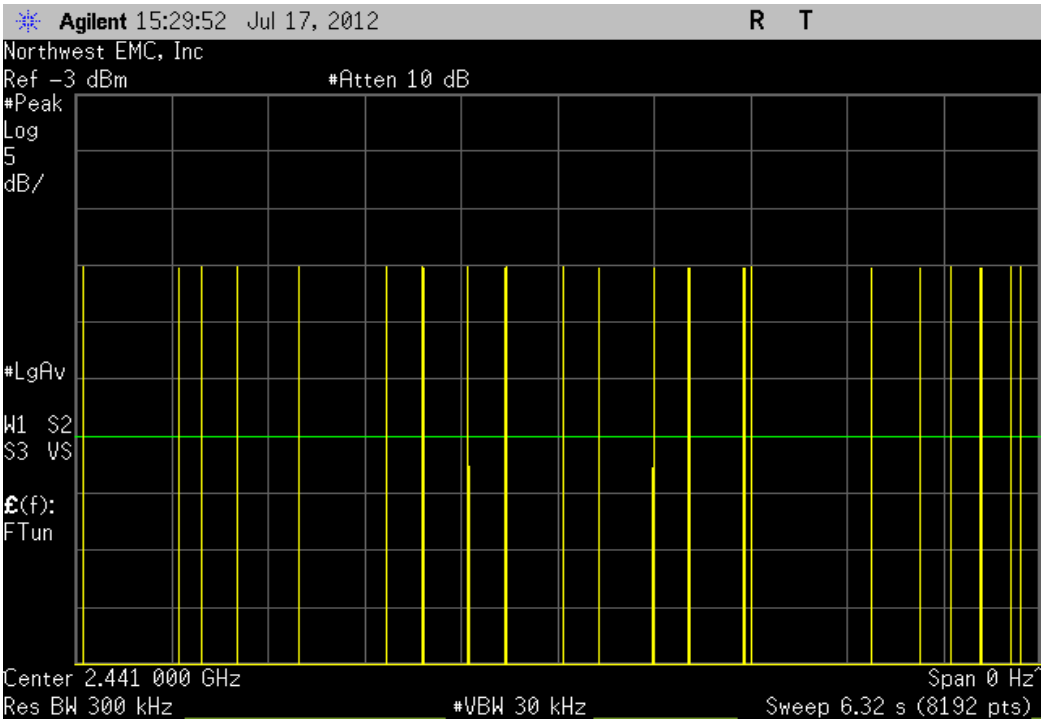
| | Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
|---|---|---|---|---|---|---|---|
| Per MDTR0043 test plan configuration: 9 (AC Adapter) | | | | | | | |
| DH5, GFSK | | | | | | | |
| Mid Channel | 2.889 | N/A | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 21 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 29 | 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 | 16 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | 2.889 | N/A | 22.5 | 5 | 325.0125 | 400 | Pass |
| 2DH5, 4-DQPSK | | | | | | | |
| Mid Channel | 2.288 | N/A | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 28 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 17 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 28 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 25 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | 2.288 | N/A | 24.5 | 5 | 280.28 | 400 | Pass |
| 3DH5, 8-DPSK | | | | | | | |
| Mid Channel | 1.579 | N/A | 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 | 25 | 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 | 1.579 | N/A | 23.5 | 5 | 185.5325 | 400 | Pass |
| Per MDTR0043 test plan configuration: 10 (Battery) | | | | | | | |
| DH5, GFSK | | | | | | | |
| Mid Channel | 2.889 | N/A | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 20 | 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 | 18 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 25 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | 2.889 | N/A | 21.25 | 5 | 306.95625 | 400 | Pass |
| 2DH5, 4-DQPSK | | | | | | | |
| Mid Channel | 2.288 | N/A | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 20 | 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 | 25 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 25 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | 2.288 | N/A | 23 | 5 | 263.12 | 400 | Pass |
| 3DH5, 8-DPSK | | | | | | | |
| Mid Channel | 1.579 | N/A | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 28 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 27 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 28 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | N/A | 19 | N/A | N/A | N/A | N/A | N/A |
| Mid Channel | 1.579 | N/A | 25.5 | 5 | 201.3225 | 400 | Pass |

# Dwell Time

| Per MDTR0043 test plan configuration: 9 (AC Adapter), 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 |
| 2.889 | N/A | N/A | N/A | N/A | N/A | N/A |

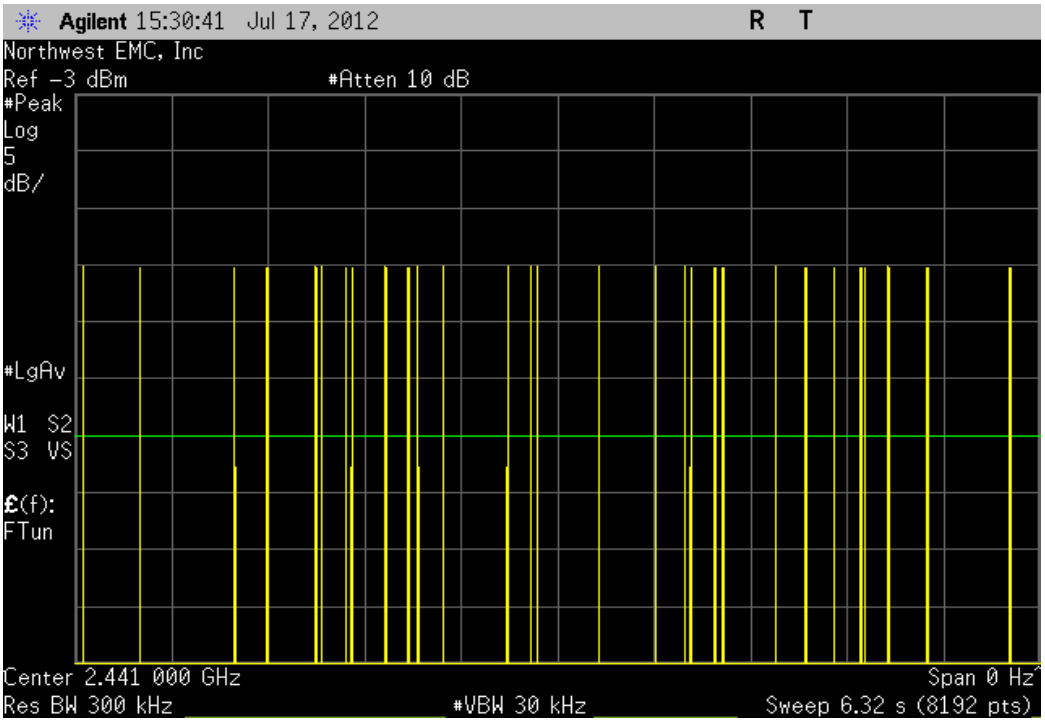



| Per MDTR0043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
| N/A | 21 | N/A | N/A | N/A | N/A | N/A |

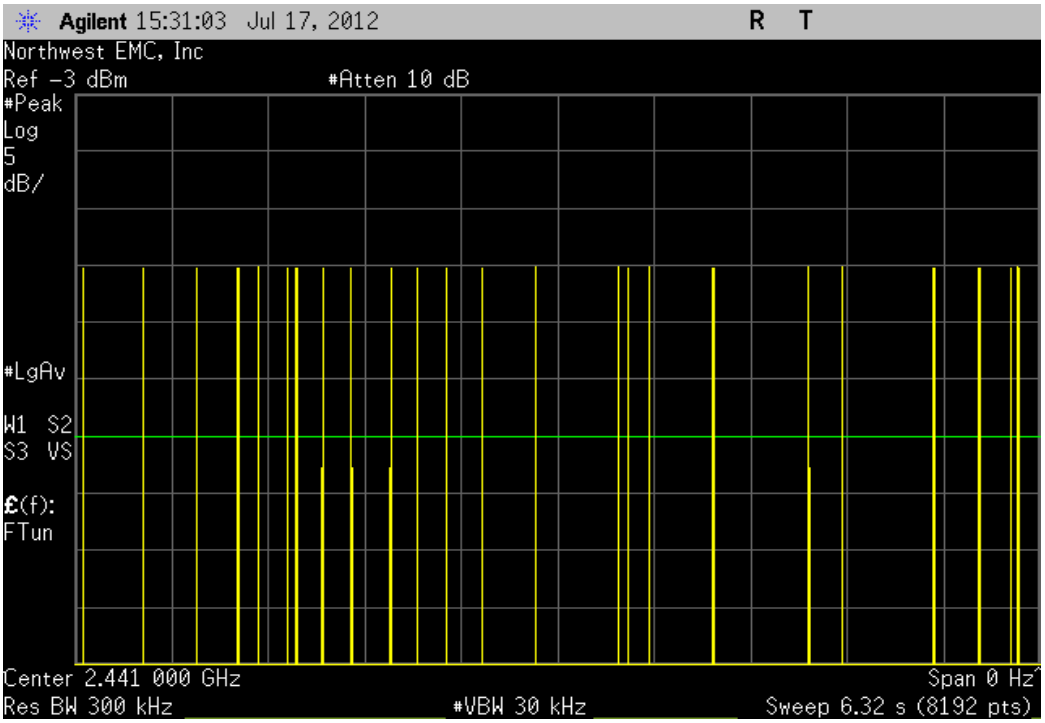


# Dwell Time

| Per MDTR0043 test plan configuration: 9 (AC Adapter), 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 | 29 | N/A | N/A | N/A | N/A | N/A |

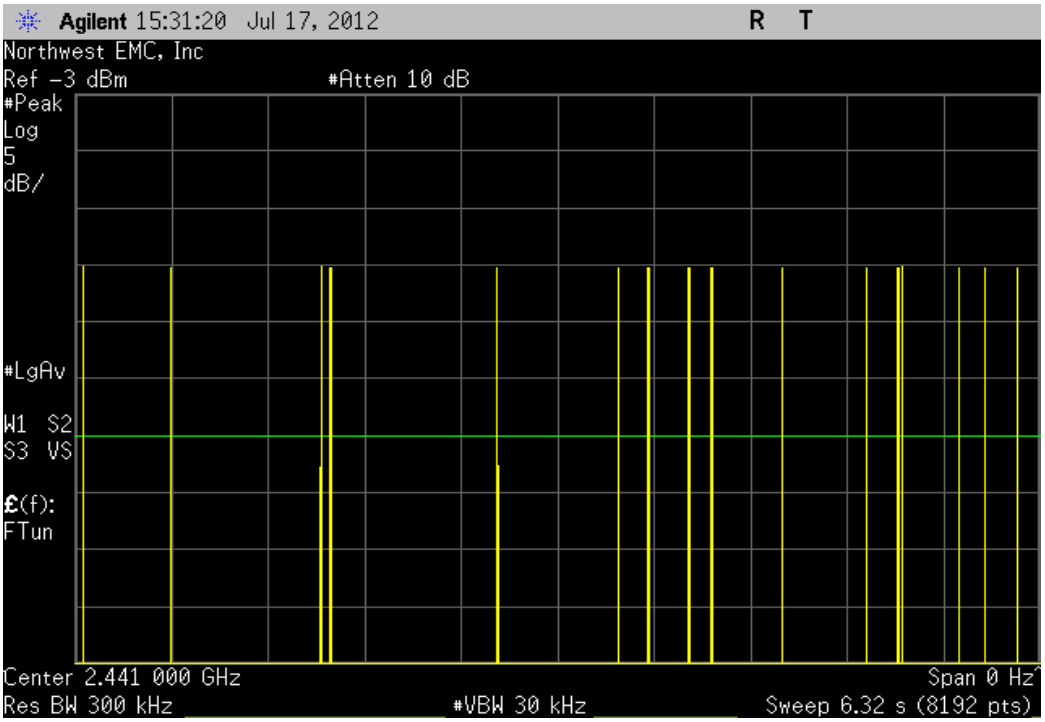



| Per MDTR0043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
| N/A | 24 | N/A | N/A | N/A | N/A | N/A |



# Dwell Time

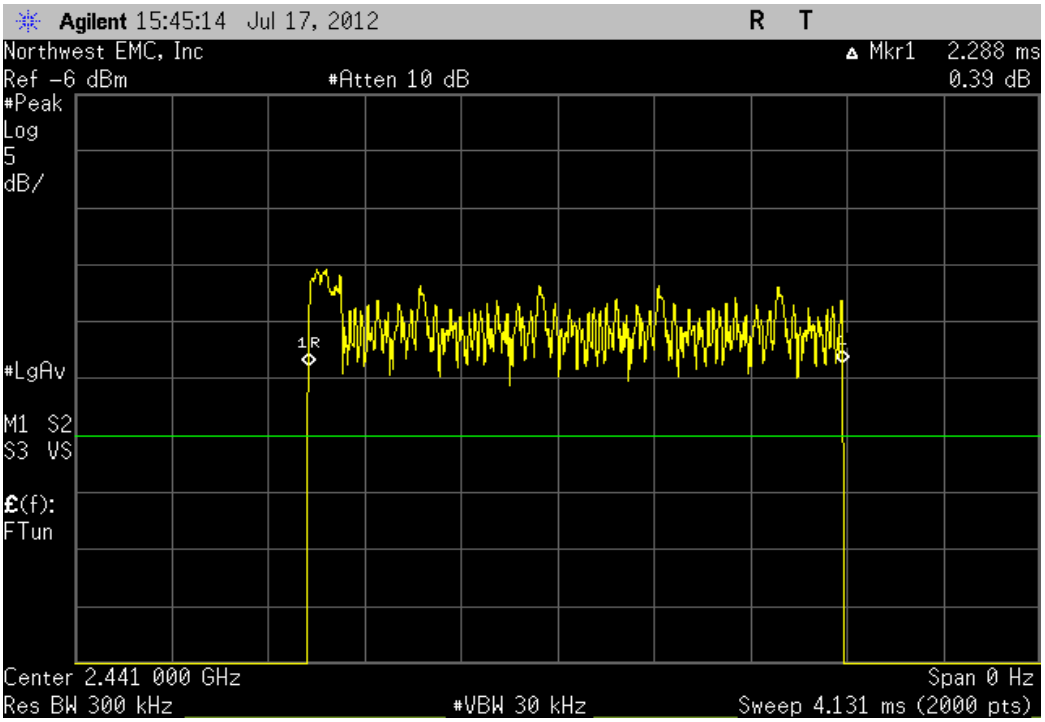
| Per MDTR0043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 16 | N/A | N/A | N/A | N/A | N/A |



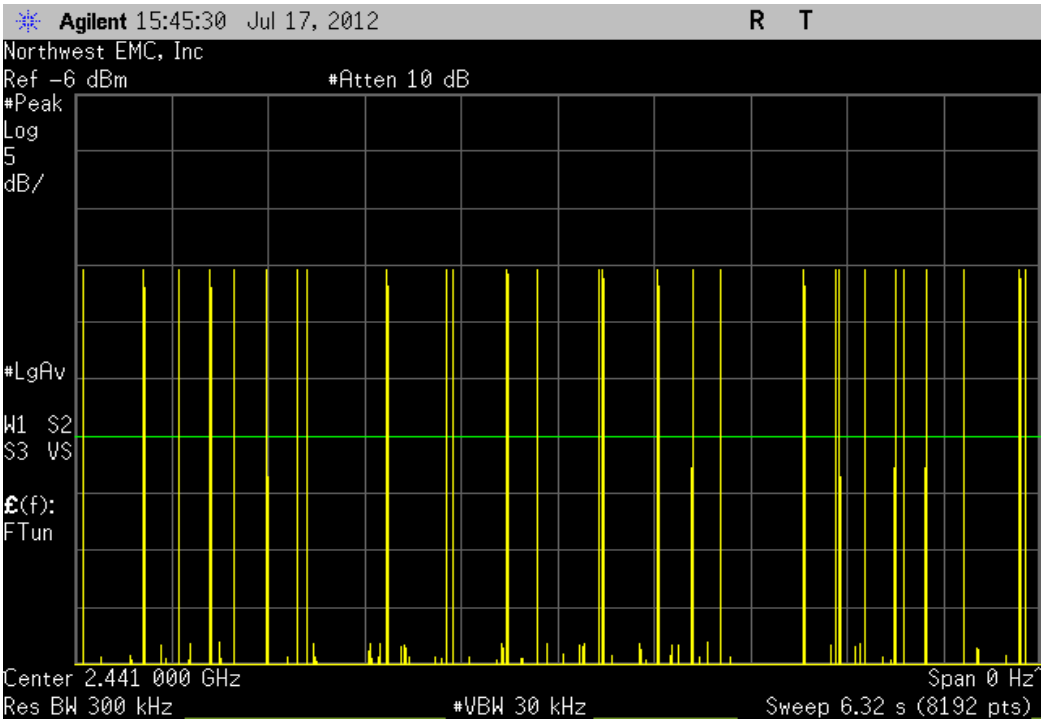

| Per MDTR0043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| 2.889 | N/A | 22.5 | 5 | 325.0125 | 400 | Pass |

# Dwell Time

| Per MDTR0043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| 2.288 | N/A | N/A | N/A | N/A | N/A | N/A |

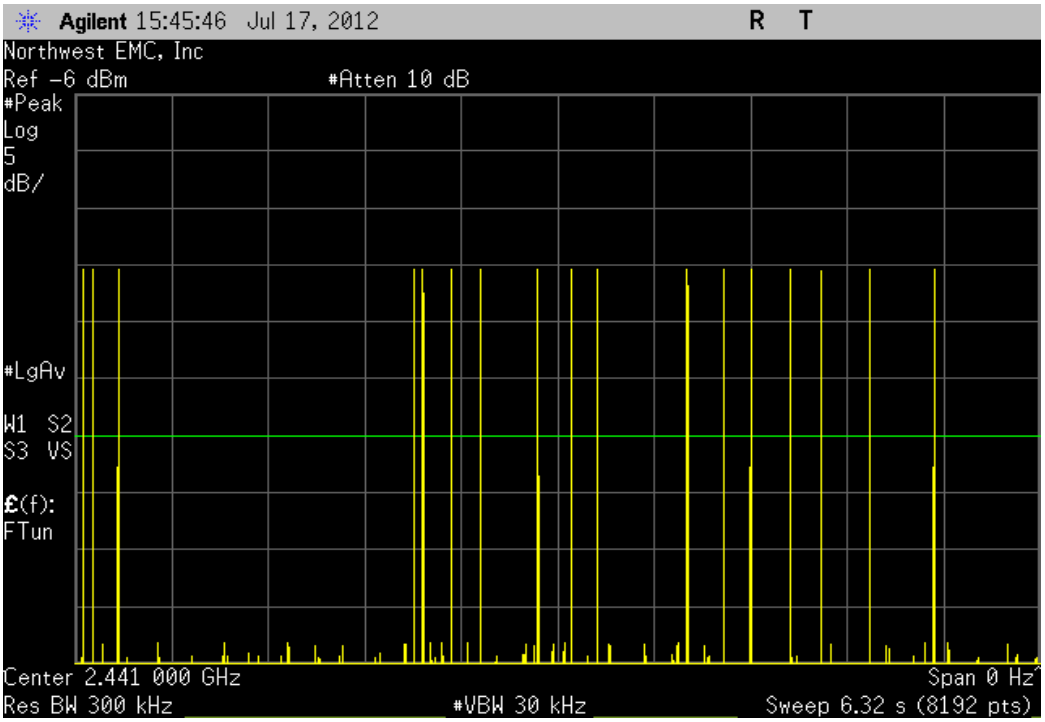



| Per MDTR0043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 28 | N/A | N/A | N/A | N/A | N/A |

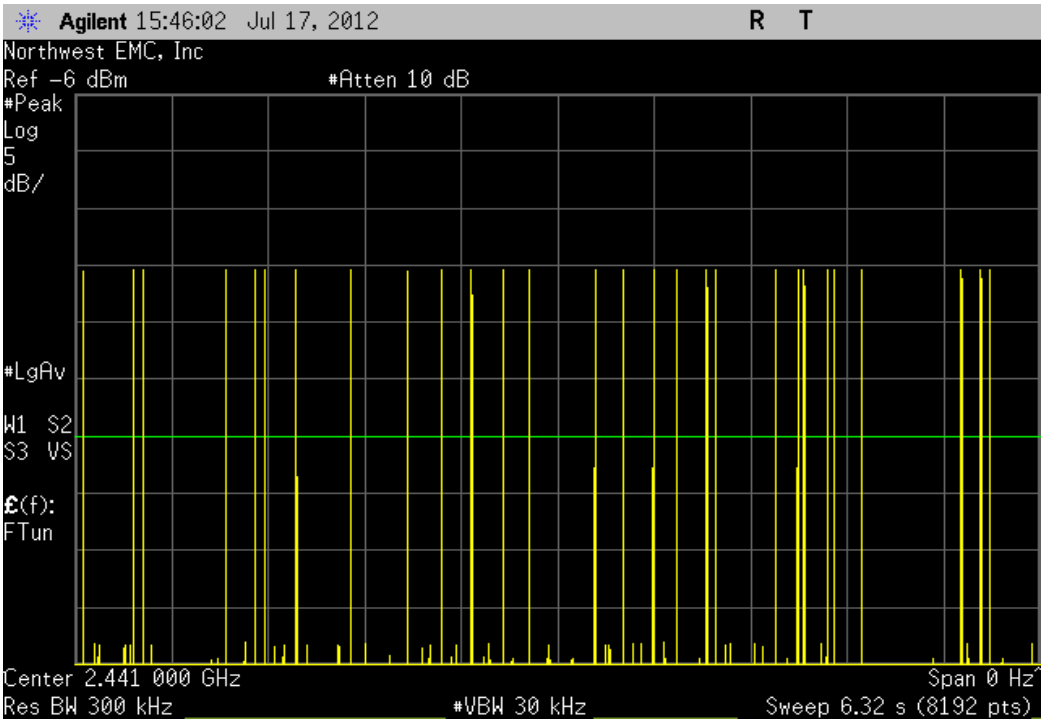


# Dwell Time

| Per MDTR0043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, 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 | 17 | N/A | N/A | N/A | N/A | N/A |

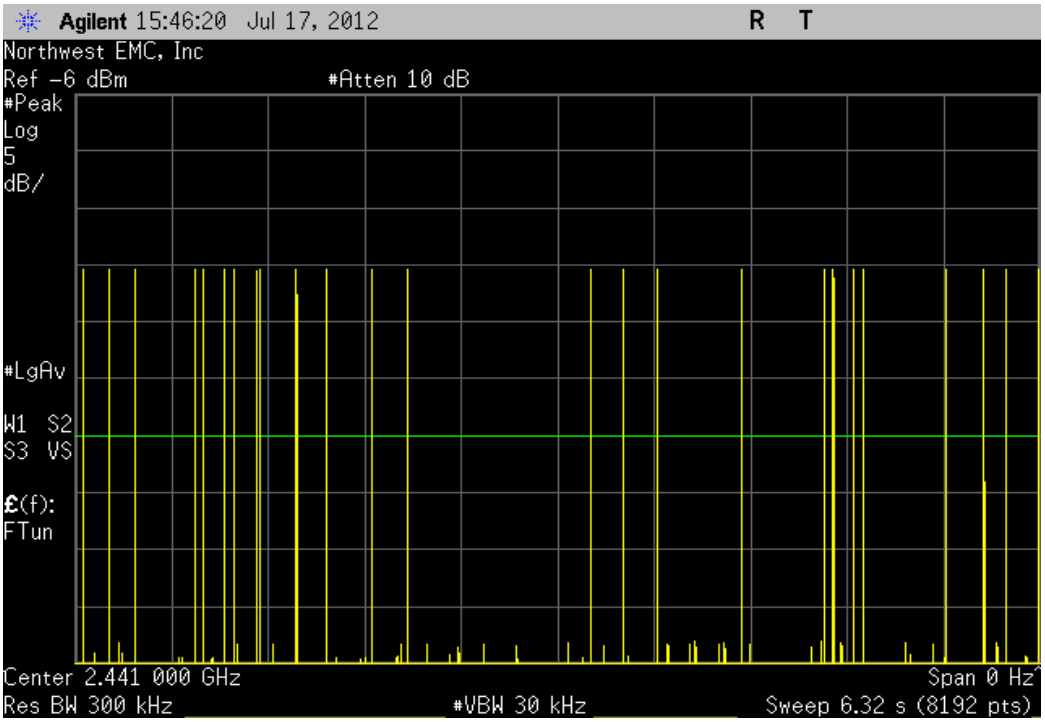



| Per MDTR0043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 28 | N/A | N/A | N/A | N/A | N/A |



# Dwell Time

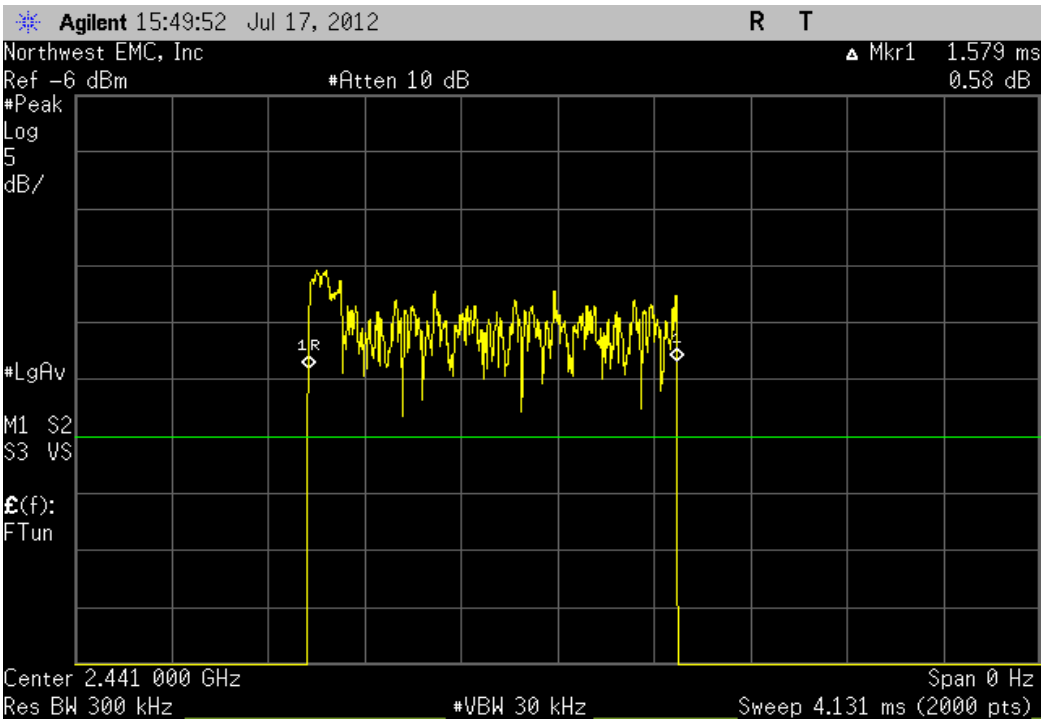
| Per MDTR0043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 25 | N/A | N/A | N/A | N/A | N/A |



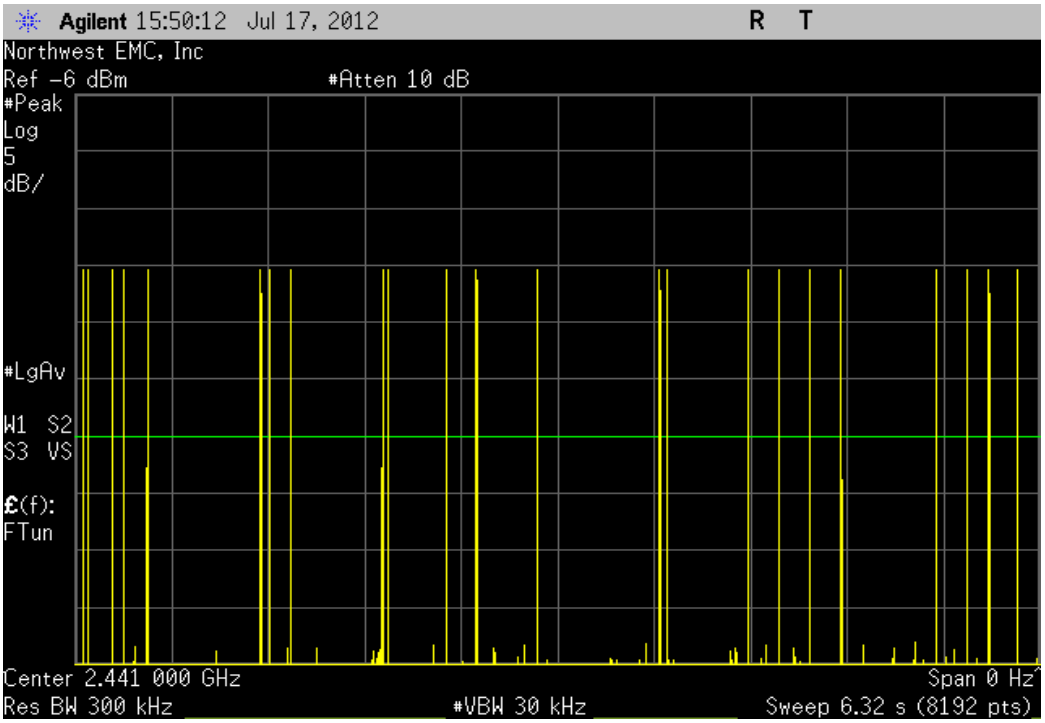

| Per MDTR0043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| 2.288 | N/A | 24.5 | 5 | 280.28 | 400 | Pass |

# Dwell Time

| Per MDTR0043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| 1.579 | N/A | N/A | N/A | N/A | N/A | N/A |

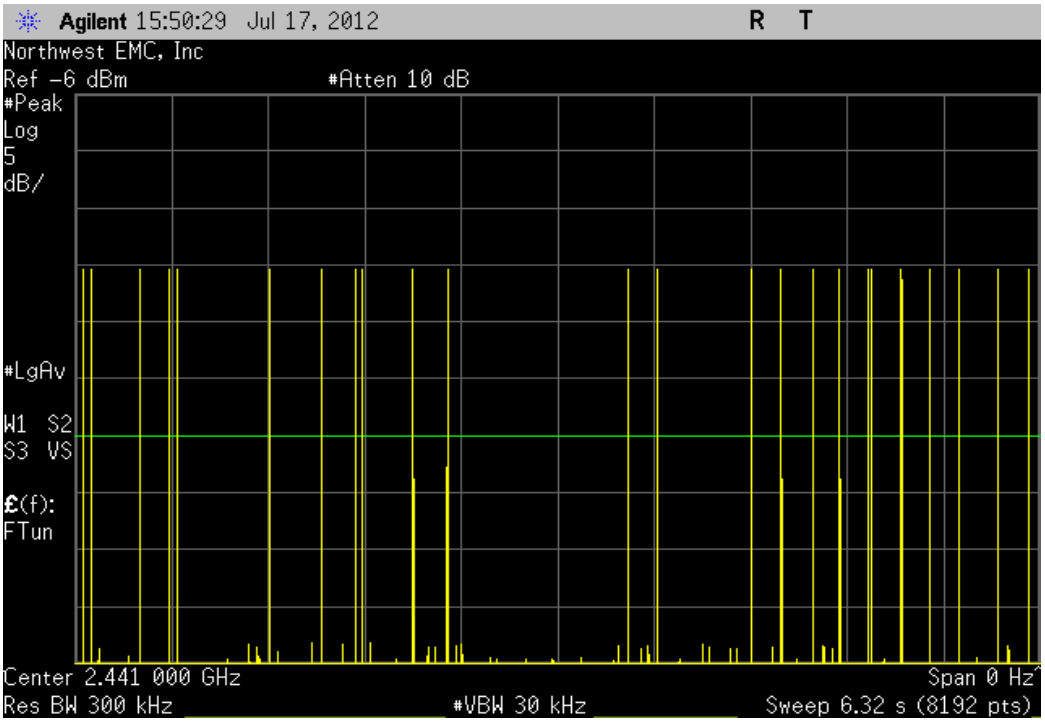



| Per MDTR0043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 23 | N/A | N/A | N/A | N/A | N/A |

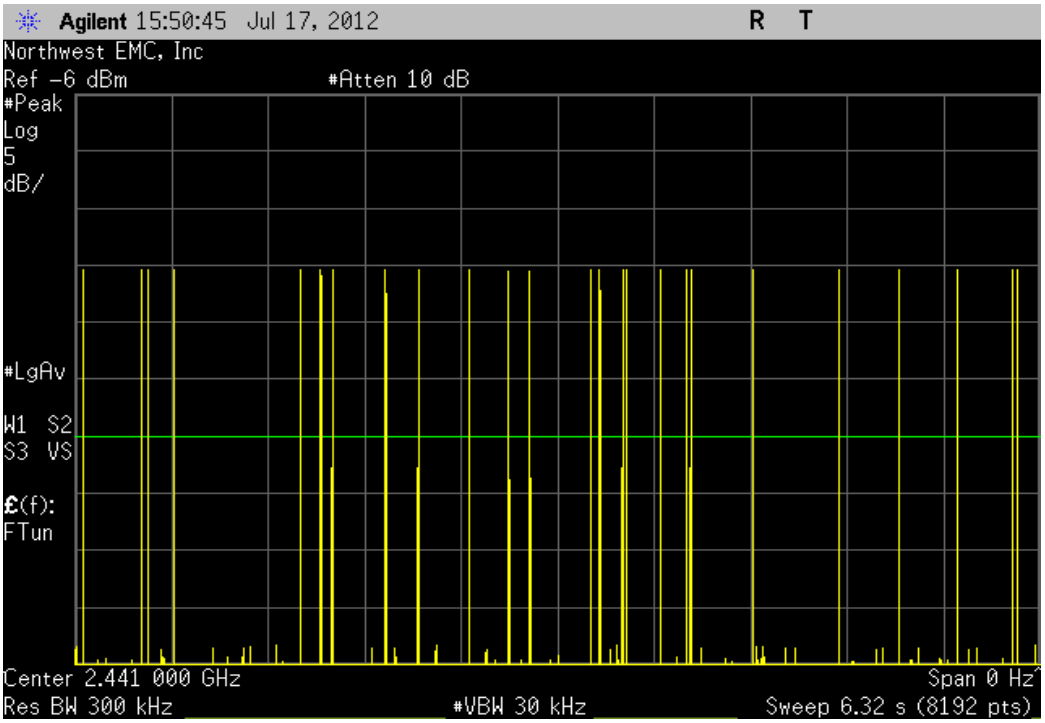


# Dwell Time

| Per MDTR0043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, 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 |

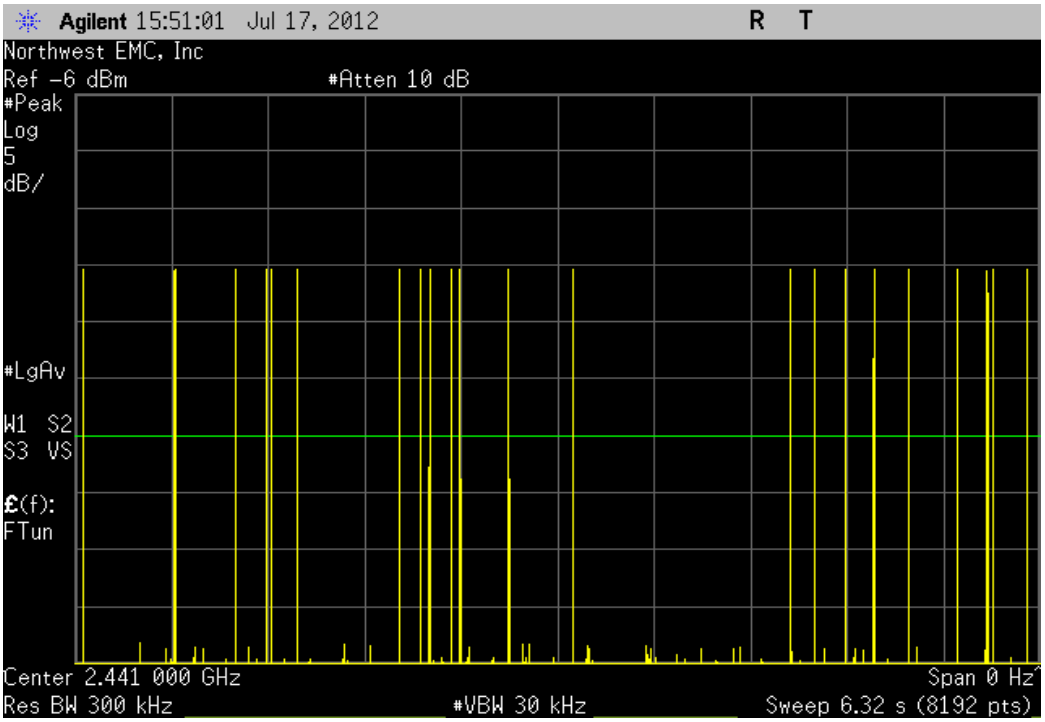



| Per MDTR0043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 25 | N/A | N/A | N/A | N/A | N/A |



# Dwell Time

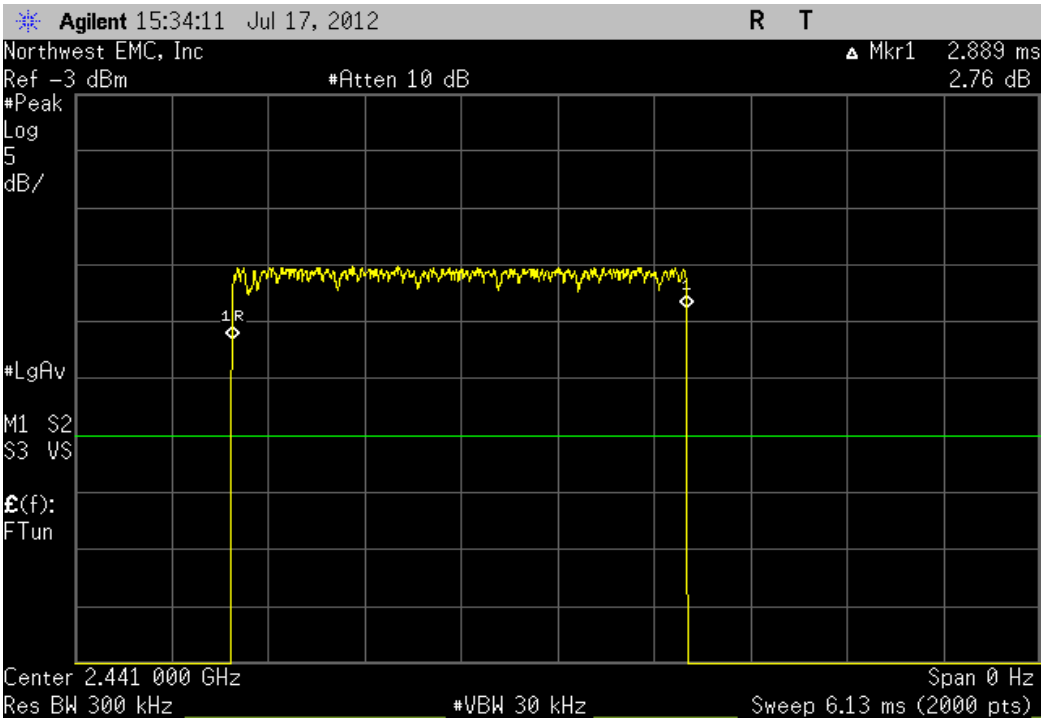
| Per MDTR0043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 22 | N/A | N/A | N/A | N/A | N/A |



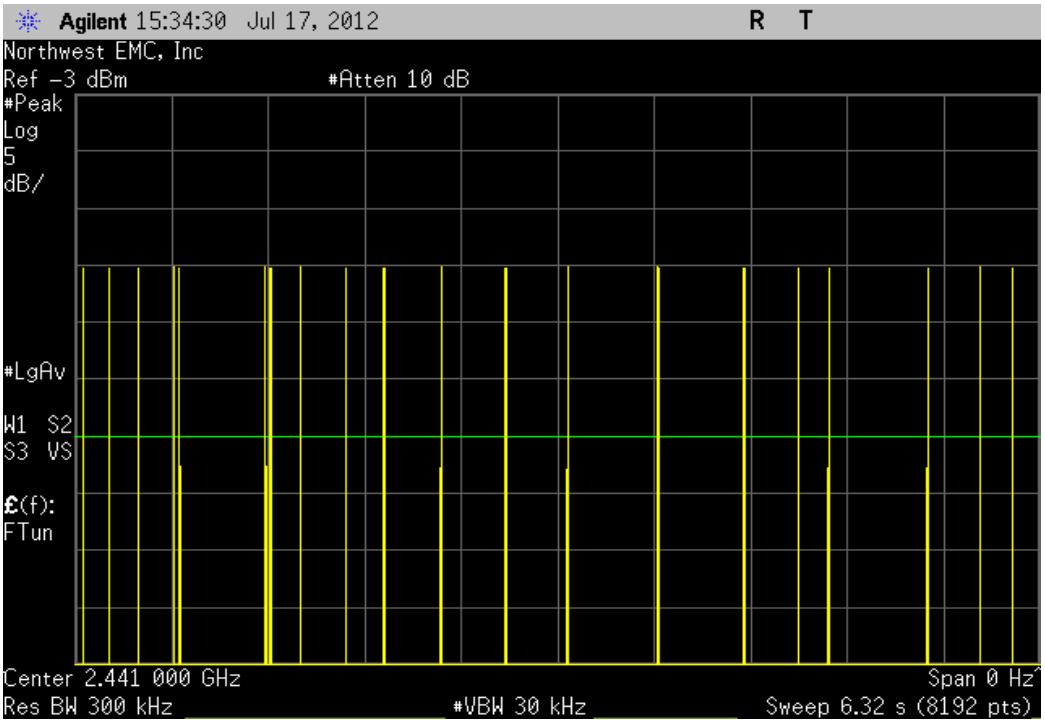

| Per MDTR0043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| 1.579 | N/A | 23.5 | 5 | 185.5325 | 400 | Pass |

# Dwell Time

| Per MDTR0043 test plan configuration: 10 (Battery), 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** |
| 2.889 | N/A | N/A | N/A | N/A | N/A | N/A |

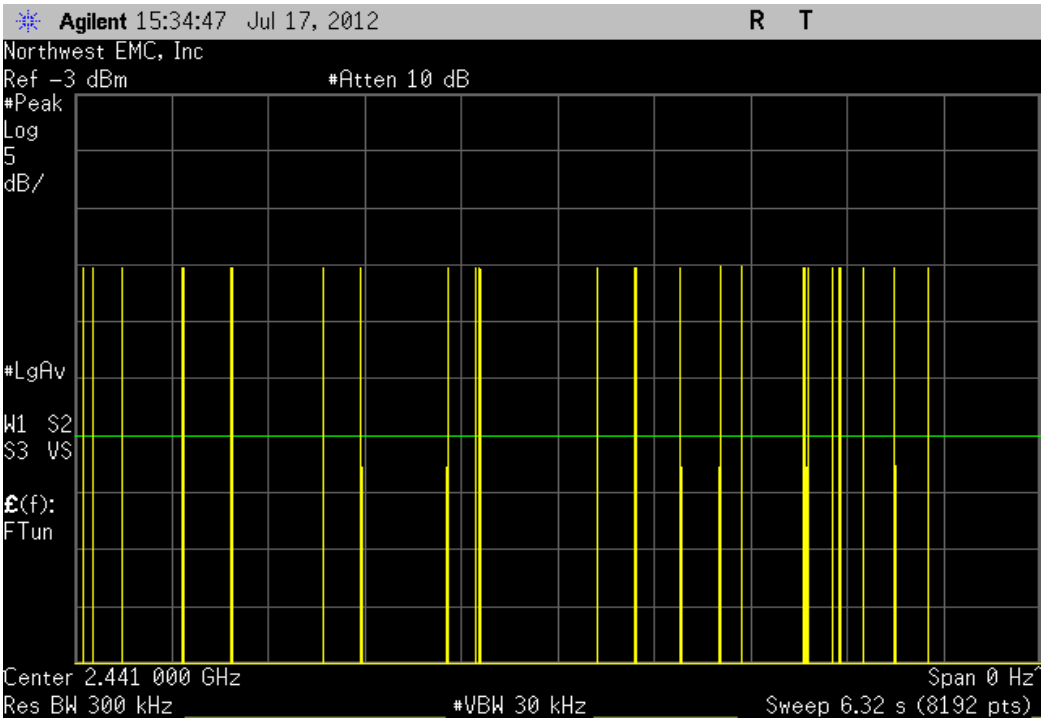



| Per MDTR0043 test plan configuration: 10 (Battery), DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 20 | N/A | N/A | N/A | N/A | N/A |

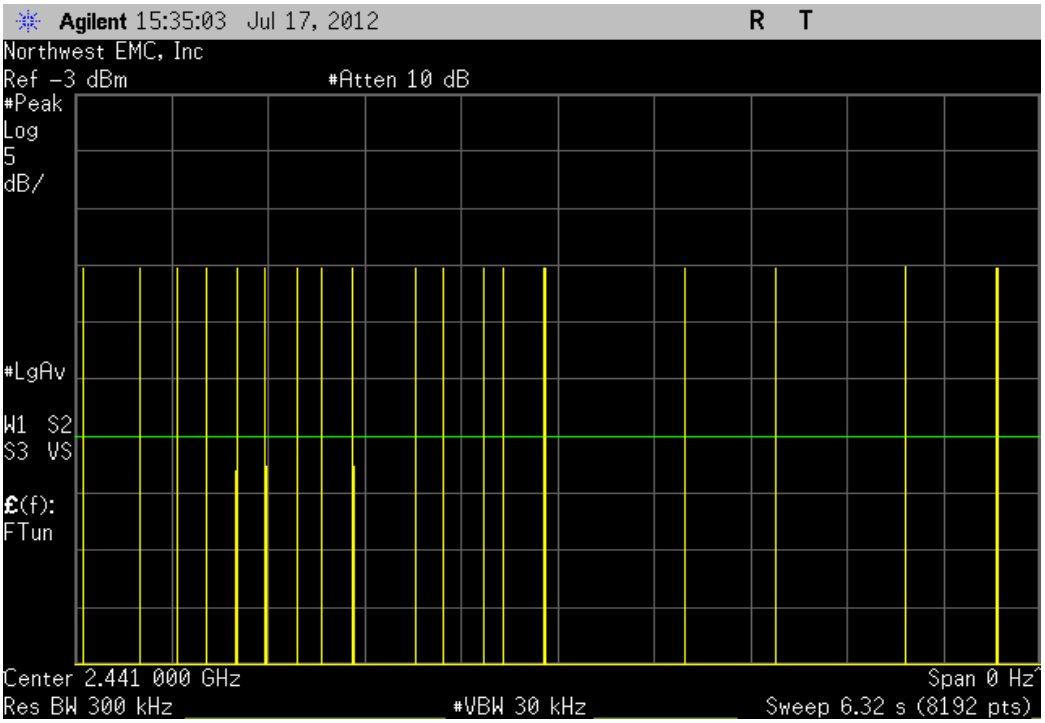


# Dwell Time

| Per MDTR0043 test plan configuration: 10 (Battery), 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 |

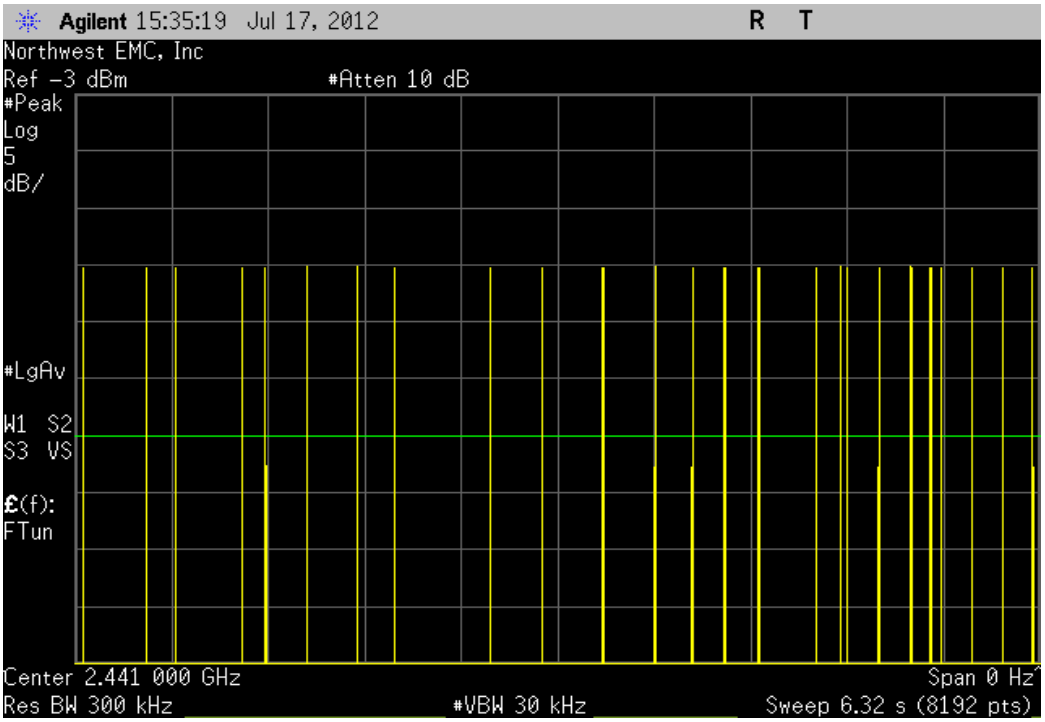



| Per MDTR0043 test plan configuration: 10 (Battery), DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 18 | N/A | N/A | N/A | N/A | N/A |



# Dwell Time

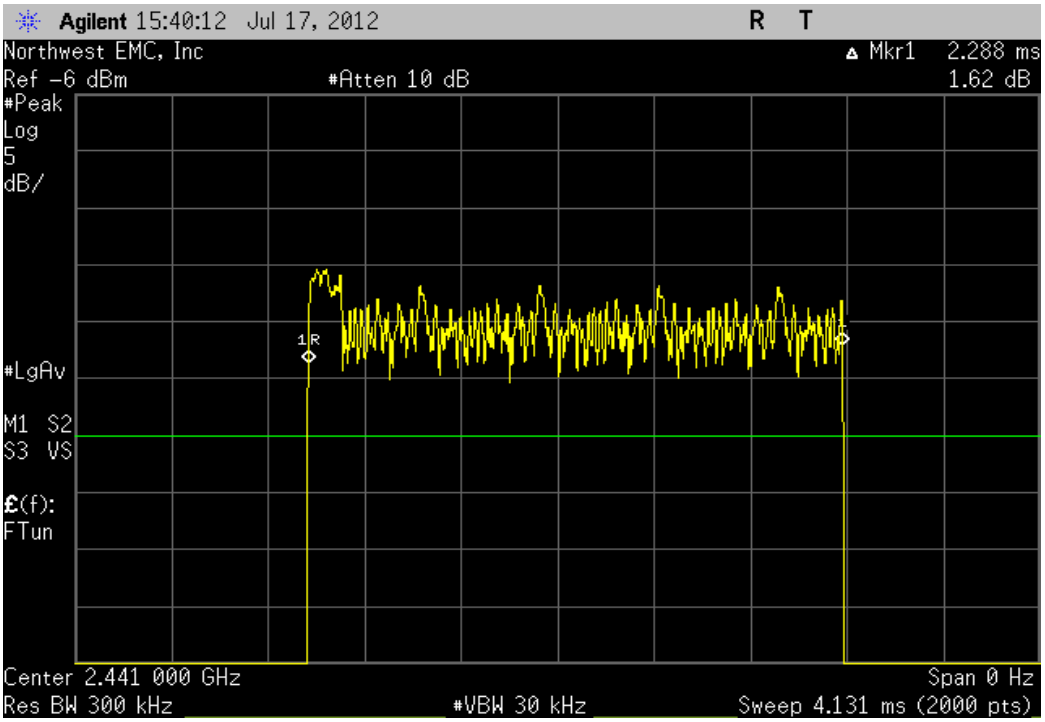
| Per MDTR0043 test plan configuration: 10 (Battery), DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 25 | N/A | N/A | N/A | N/A | N/A |



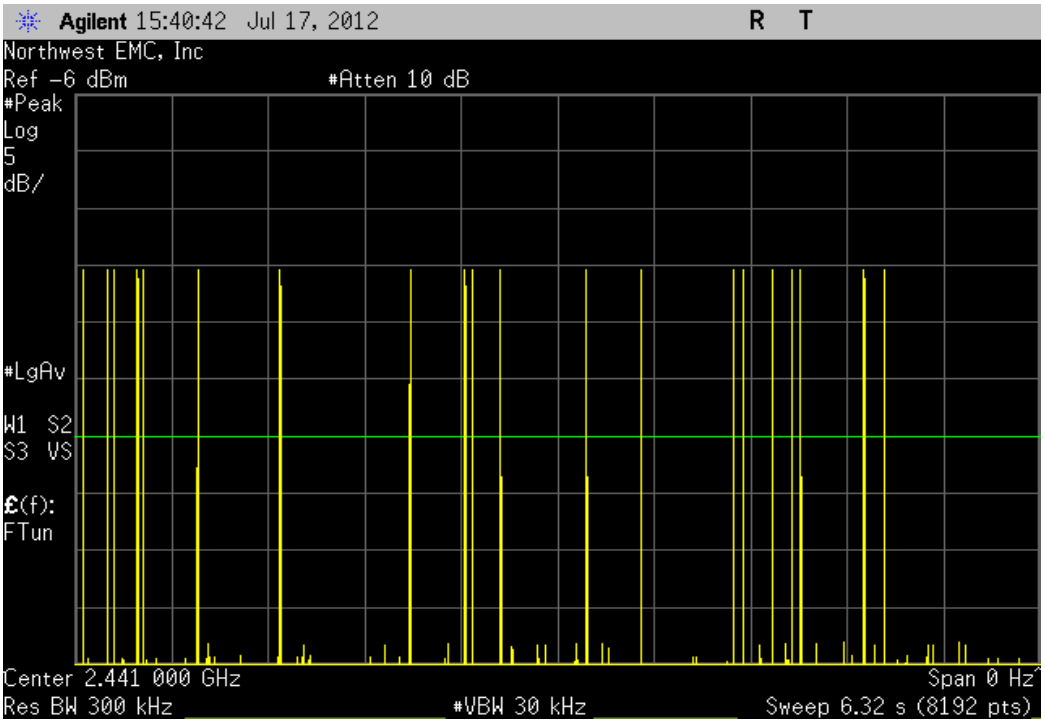

| Per MDTR0043 test plan configuration: 10 (Battery), DH5, GFSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| 2.889 | N/A | 21.25 | 5 | 306.95625 | 400 | Pass |

# Dwell Time

| Per MDTR0043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| 2.288 | N/A | N/A | N/A | N/A | N/A | N/A |

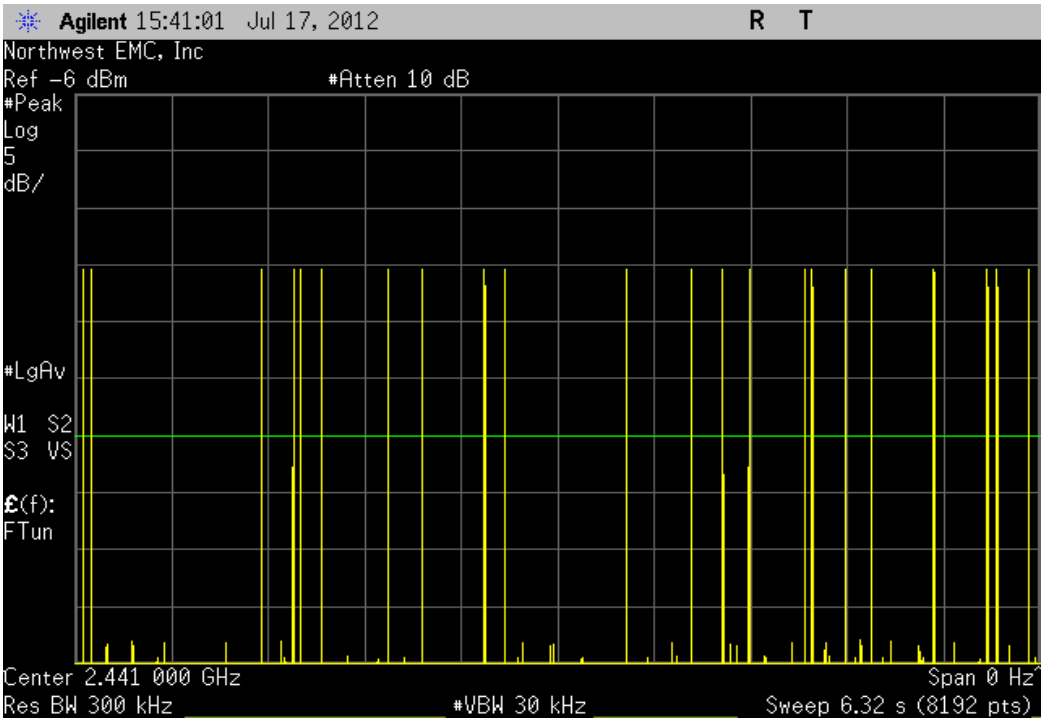



| Per MDTR0043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 20 | N/A | N/A | N/A | N/A | N/A |

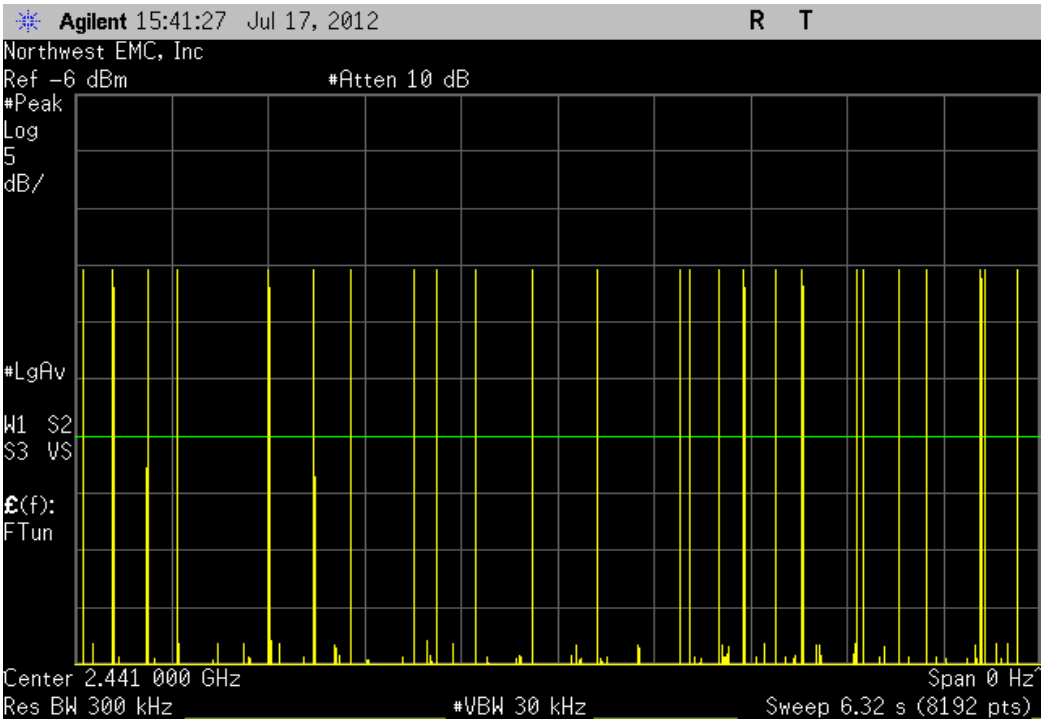


# Dwell Time

| Per MDTR0043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, 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 |

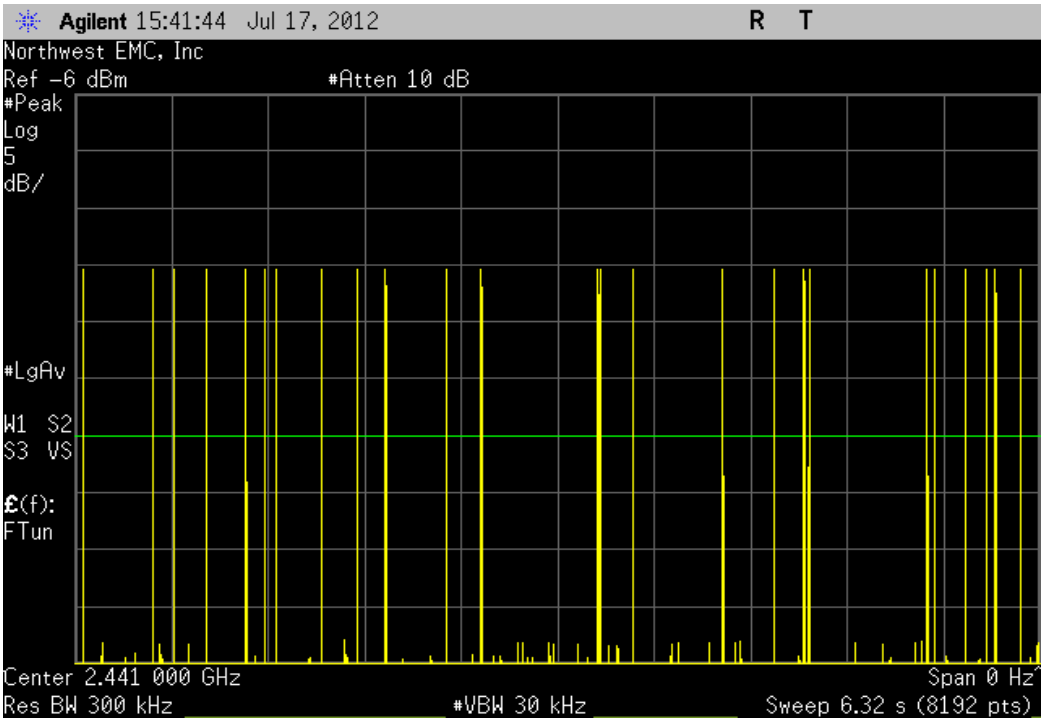



| Per MDTR0043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 25 | N/A | N/A | N/A | N/A | N/A |



# Dwell Time

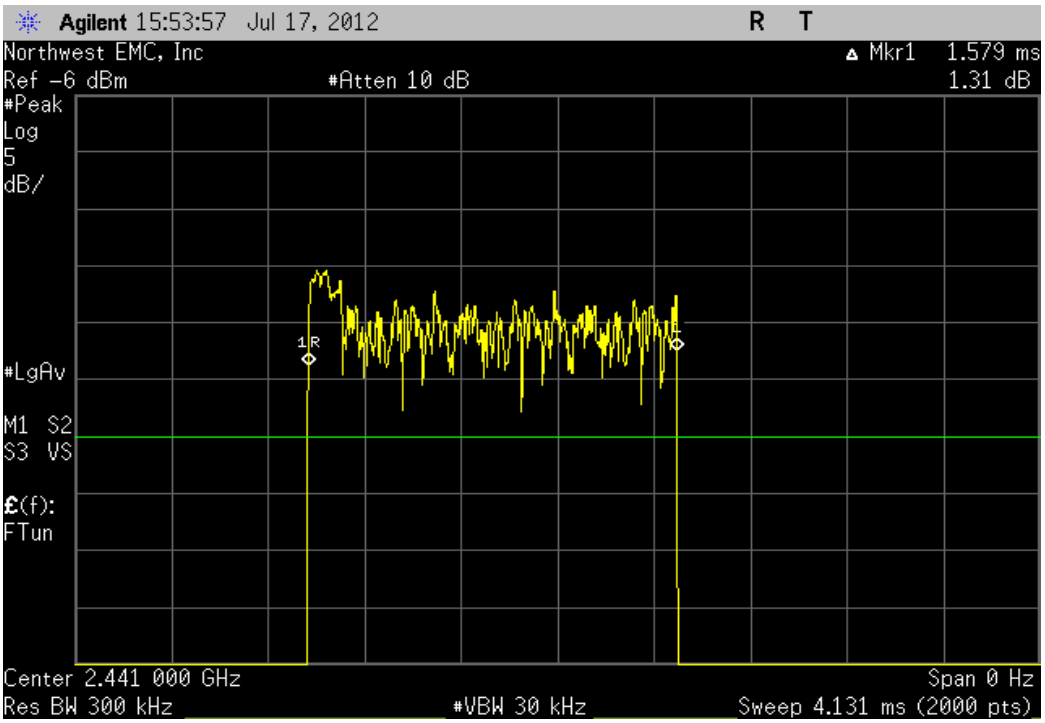
| Per MDTR0043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 25 | N/A | N/A | N/A | N/A | N/A |



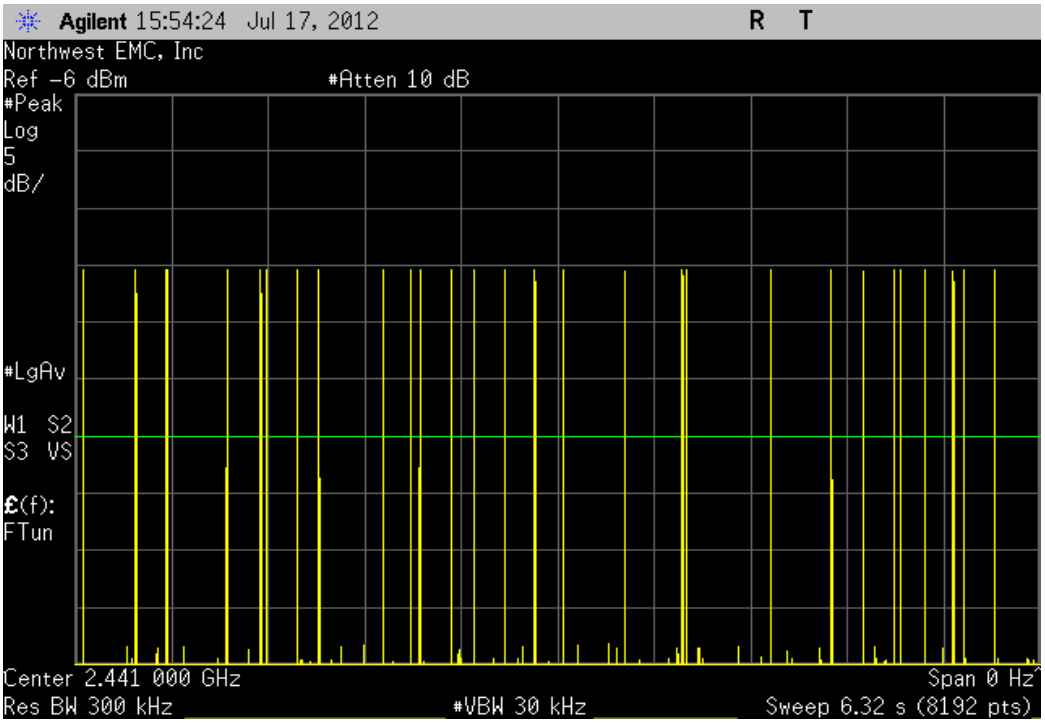

| Per MDTR0043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| 2.288 | N/A | 23 | 5 | 263.12 | 400 | Pass |

# Dwell Time

| Per MDTR0043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
| 1.579 | N/A | N/A | N/A | N/A | N/A | N/A |

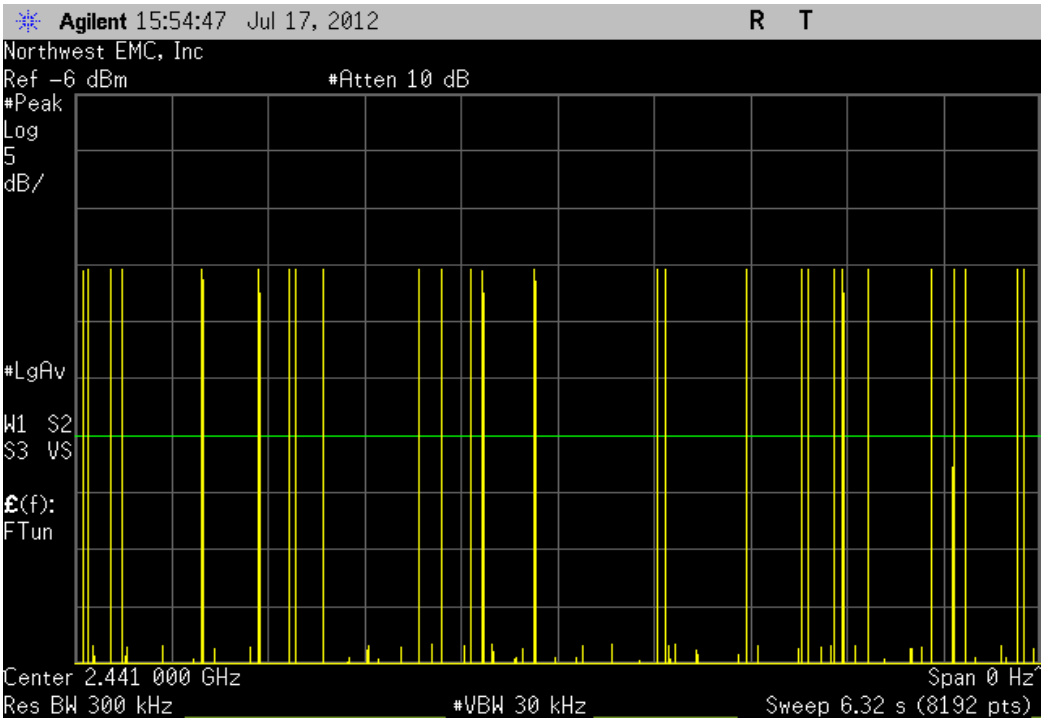



| Per MDTR0043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| Pulse Width (mS) | Number of Pulses | Average No. of Pulses | Scale Factor | On Time (mS) During 31.6 S | Limit (mS) | Result |
| N/A | 28 | N/A | N/A | N/A | N/A | N/A |

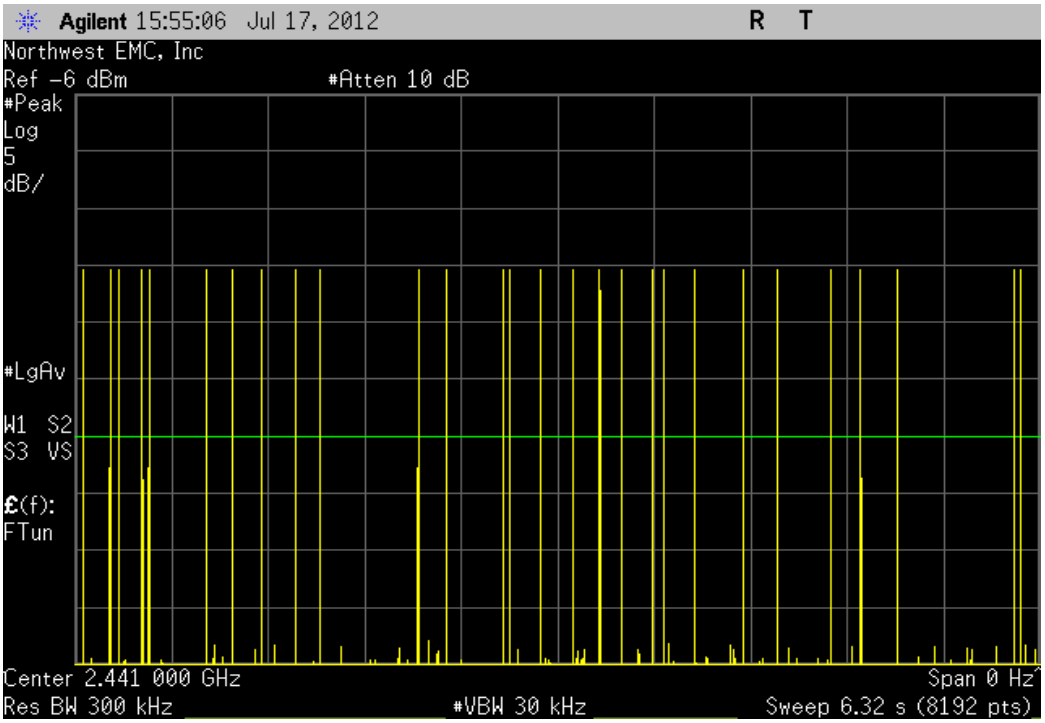


# Dwell Time

| Per MDTR0043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, 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 | 27 | N/A | N/A | N/A | N/A | N/A |

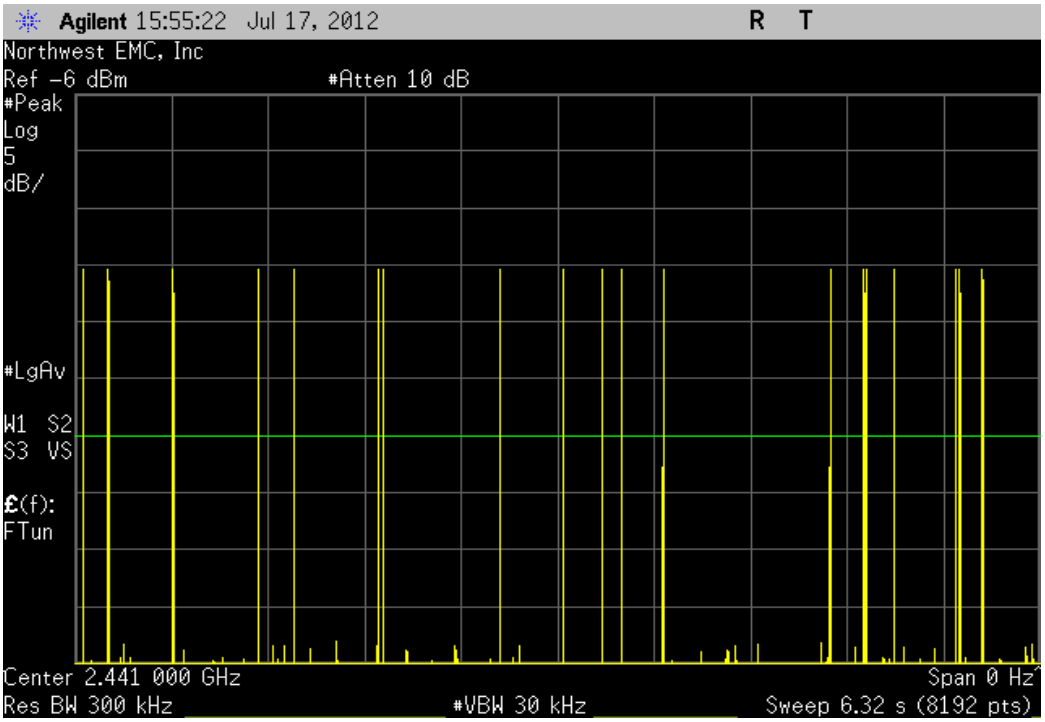



| Per MDTR0043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| N/A | 28 | N/A | N/A | N/A | N/A | N/A |



# Dwell Time

| Per MDTR0043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, 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 | 19 | N/A | N/A | N/A | N/A | N/A |




| Per MDTR0043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Mid Channel | | | | | | |
|---|---|---|---|---|---|---|
| **Pulse Width (mS)** | **Number of Pulses** | **Average No. of Pulses** | **Scale Factor** | **On Time (mS) During 31.6 S** | **Limit (mS)** | **Result** |
| 1.579 | N/A | 25.5 | 5 | 201.3225 | 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 |
| Spectrum Analyzer | Agilent | E4440A | AAX | 5/15/2012 | 12 |

**MEASUREMENT UNCERTAINTY**

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**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:** | Intellis - Models 97745 (PTM), 97755 (RTM) | | | **Work Order:** | MDTR0182 |
| **Serial Number:** | NLD001683N | | | **Date:** | 07/17/12 |
| **Customer:** | Medtronic Inc. | | | **Temperature:** | 24.32°C |
| **Attendees:** | Scott Straka | | | **Humidity:** | 60% |
| **Project:** | None | | | **Barometric Pres.:** | 1008.9 |
| **Tested by:** | Trevor Buls | **Power:** | 5 VDC, Battery | **Job Site:** | MN08 |

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

**COMMENTS**

Per MDTR0043 test plan configuration: 9 and 10. Bluetooth hopping mode.

**DEVIATIONS FROM TEST STANDARD**

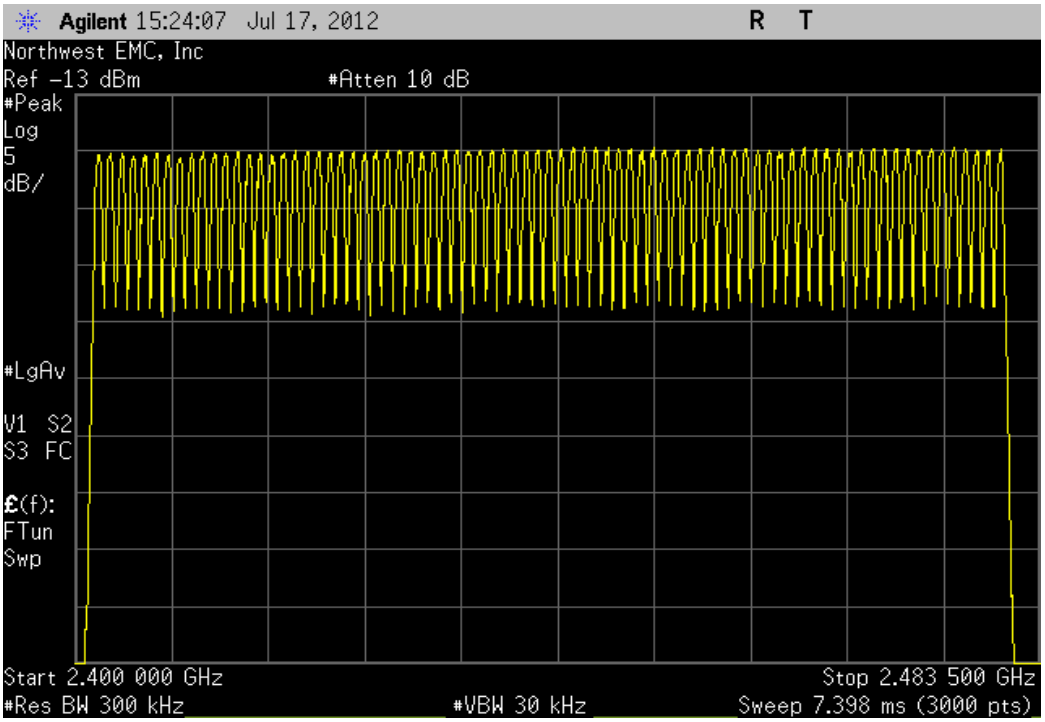
No Deviations

| Configuration # | 8, 10 | Signature Trevor Buls |
|---|---|---|

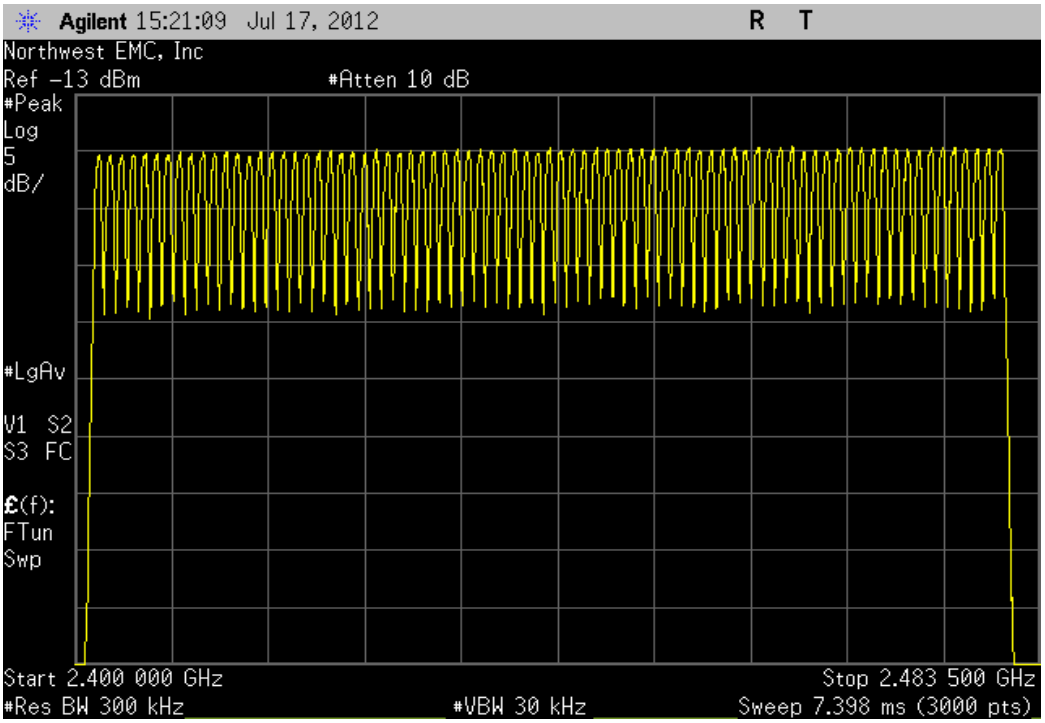
| | Number of Channels | Limit | Result |
|---|---|---|---|
| Per MDTR0043 test plan configuration: 9 (AC Adapter) | | | |
| Hopping Mode | 79 | ≥ 15 | Pass |
| Per MDTR0043 test plan configuration: 10 (Battery) | | | |
| Hopping Mode | 79 | ≥ 15 | Pass |

# Number of Hopping Frequencies

| Per MDTR0043 test plan configuration: 9 (AC Adapter), Hopping Mode | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Number of Channels | Limit | Result |
| | | | | 79 | ≥ 15 | Pass |




| Per MDTR0043 test plan configuration: 10 (Battery), 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 |
|---|---|---|---|---|---|
| Attenuator - 20db, 'SMA' | SM Electronics | SA26B-20 | RFW | 4/19/2012 | 12 |
| 40 GHz DC block | Fairview Microwave | SD3379 | AMI | 10/12/2011 | 12 |
| Signal Generator | Agilent | N5183A | TIA | 1/27/2012 | 24 |
| Spectrum Analyzer | Agilent | E4440A | AAX | 5/15/2012 | 12 |

**MEASUREMENT UNCERTAINTY**

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**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:** | Intellis - Models 97745 (PTM), 97755 (RTM) | **Work Order:** | MDTR0182 |
| **Serial Number:** | NLD001683N | **Date:** | 07/24/12 |
| **Customer:** | Medtronic Inc. | **Temperature:** | 24.36°C |
| **Attendees:** | None | **Humidity:** | 58% |
| **Project:** | None | **Barometric Pres.:** | 1014.4 |
| **Tested by:** | Bryan Weller | **Power:** 5 VDC, Battery | **Job Site:** MN08 |

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

**COMMENTS**

Per MDTR0043 test plan configuration: 9 and 10.

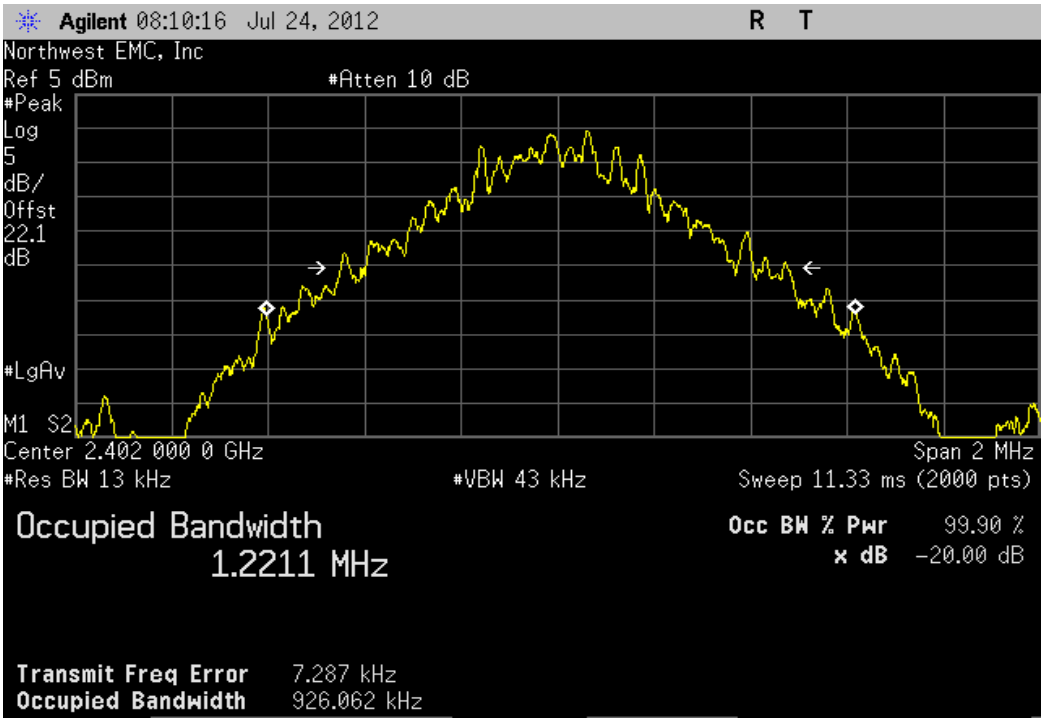
**DEVIATIONS FROM TEST STANDARD**

| Configuration # | 8,10 | Signature Bryan Weller |
|---|---|---|

| | Value | Limit | Result |
|---|---|---|---|
| Per MDTR043 test plan configuration: 9 (AC Adapter) | | | |
| DH5, GFSK | | | |
| Low Channel, 2402 MHz | 926.062 kHz | < 1.5 MHz | Pass |
| Mid Channel, 2441 MHz | 928.701 kHz | < 1.5 MHz | Pass |
| High Channel, 2480 MHz | 924.84 kHz | < 1.5 MHz | Pass |
| 2DH5, 4-DQPSK | | | |
| Low Channel, 2402 MHz | 1.331 MHz | < 1.5 MHz | Pass |
| Mid Channel, 2441 MHz | 1.309 MHz | < 1.5 MHz | Pass |
| High Channel, 2480 MHz | 1.329 MHz | < 1.5 MHz | Pass |
| 3DH5, 8-DPSK | | | |
| Low Channel, 2402 MHz | 1.31 MHz | < 1.5 MHz | Pass |
| Mid Channel, 2441 MHz | 1.307 MHz | < 1.5 MHz | Pass |
| High Channel, 2480 MHz | 1.308 MHz | < 1.5 MHz | Pass |
| Per MDTR043 test plan configuration: 10 (Battery) | | | |
| DH5, GFSK | | | |
| Low Channel, 2402 MHz | 927.545 kHz | < 1.5 MHz | Pass |
| Mid Channel, 2441 MHz | 926.202 kHz | < 1.5 MHz | Pass |
| High Channel, 2480 MHz | 930.287 kHz | < 1.5 MHz | Pass |
| 2DH5, 4-DQPSK | | | |
| Low Channel, 2402 MHz | 1.314 MHz | < 1.5 MHz | Pass |
| Mid Channel, 2441 MHz | 1.32 MHz | < 1.5 MHz | Pass |
| High Channel, 2480 MHz | 1.32 MHz | < 1.5 MHz | Pass |
| 3DH5, 8-DPSK | | | |
| Low Channel, 2402 MHz | 1.335 MHz | < 1.5 MHz | Pass |
| Mid Channel, 2441 MHz | 1.332 MHz | < 1.5 MHz | Pass |
| High Channel, 2480 MHz | 1.305 MHz | < 1.5 MHz | Pass |

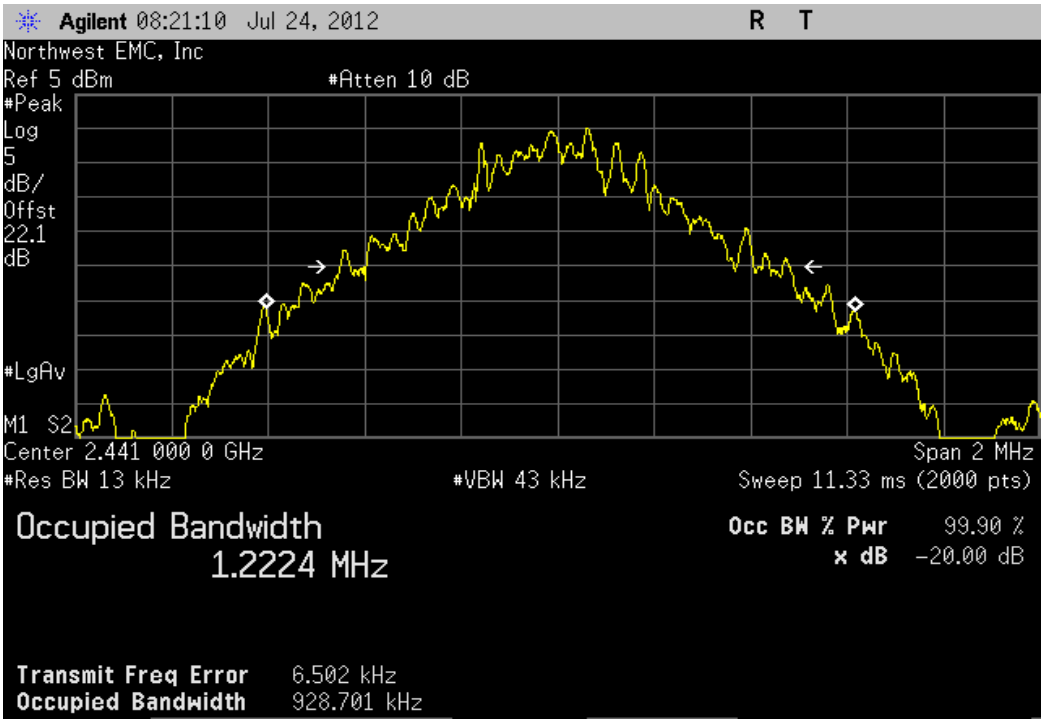
Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 926.062 kHz | < 1.5 MHz | Pass |



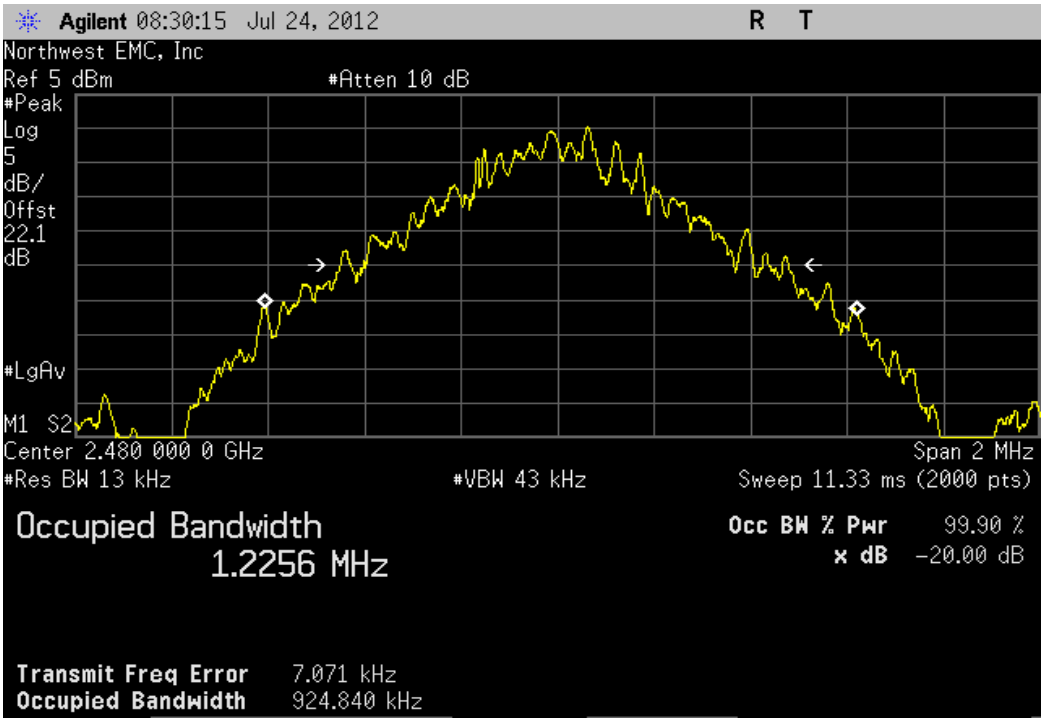

Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Mid Channel, 2441 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 928.701 kHz | < 1.5 MHz | Pass |



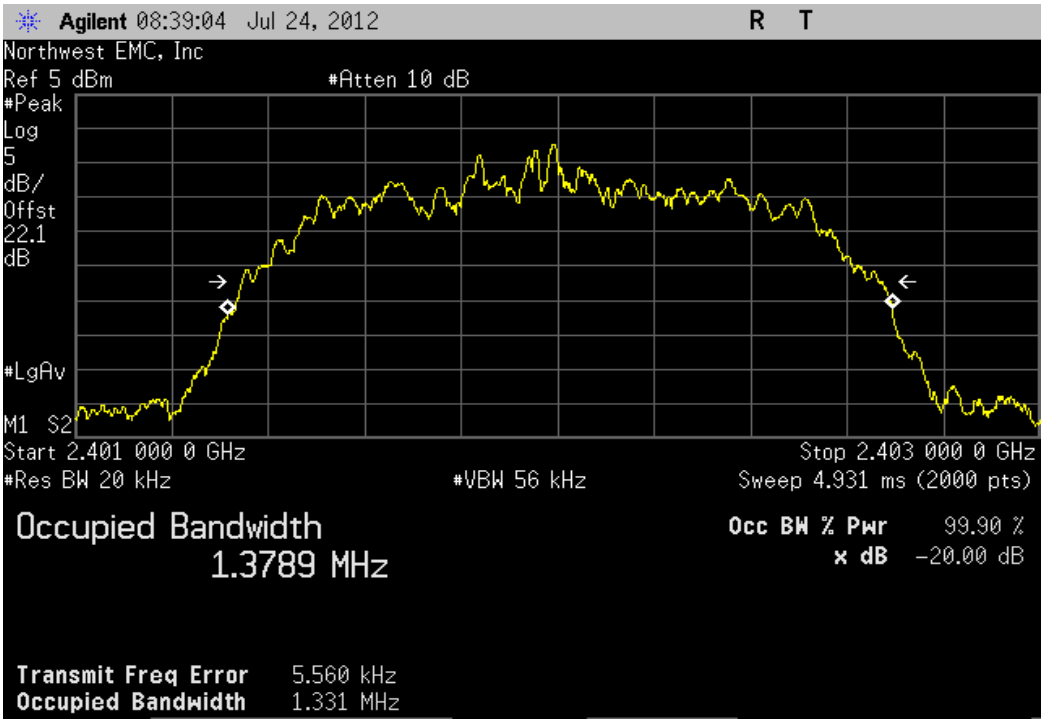
Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 924.84 kHz | < 1.5 MHz | Pass |



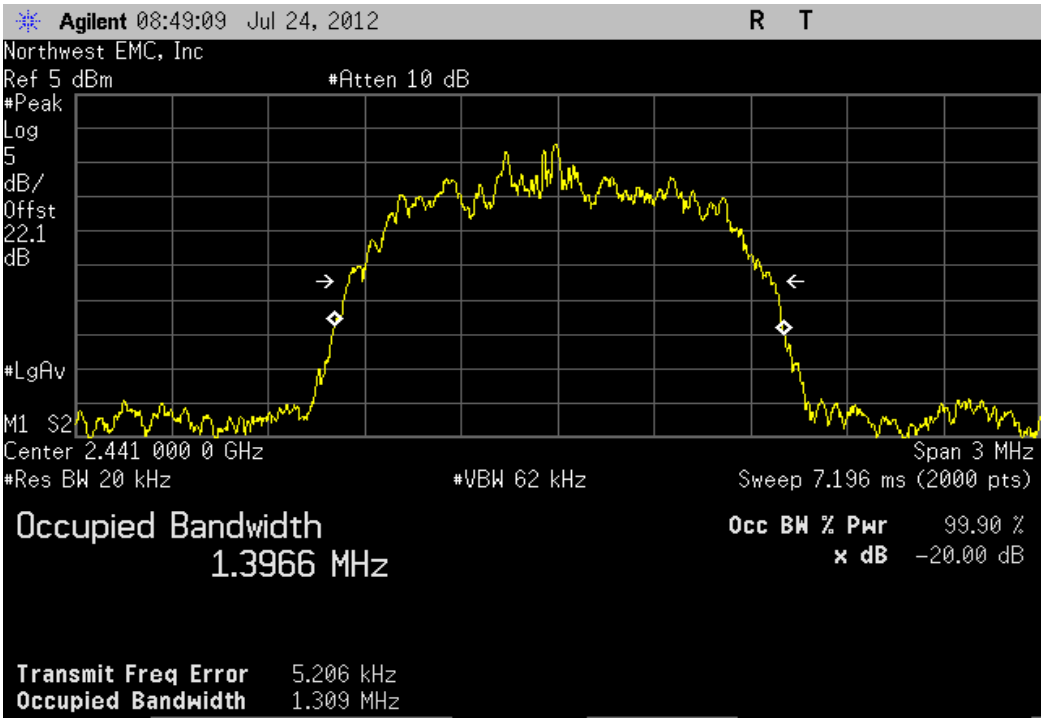

Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.331 MHz | < 1.5 MHz | Pass |



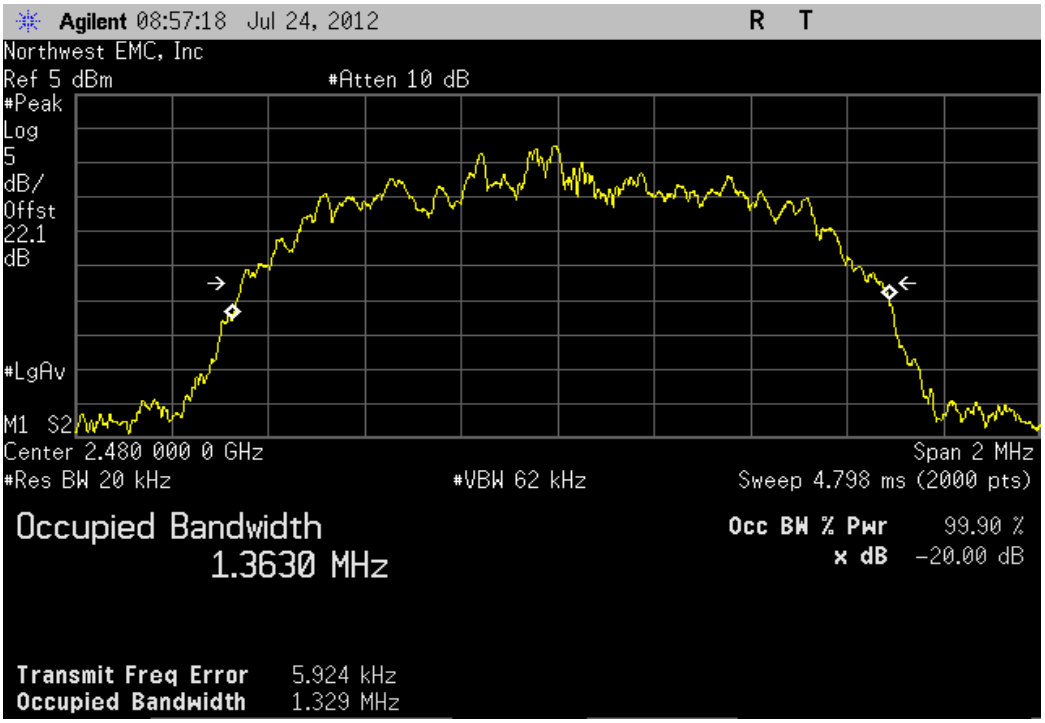
Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.309 MHz | < 1.5 MHz | Pass |



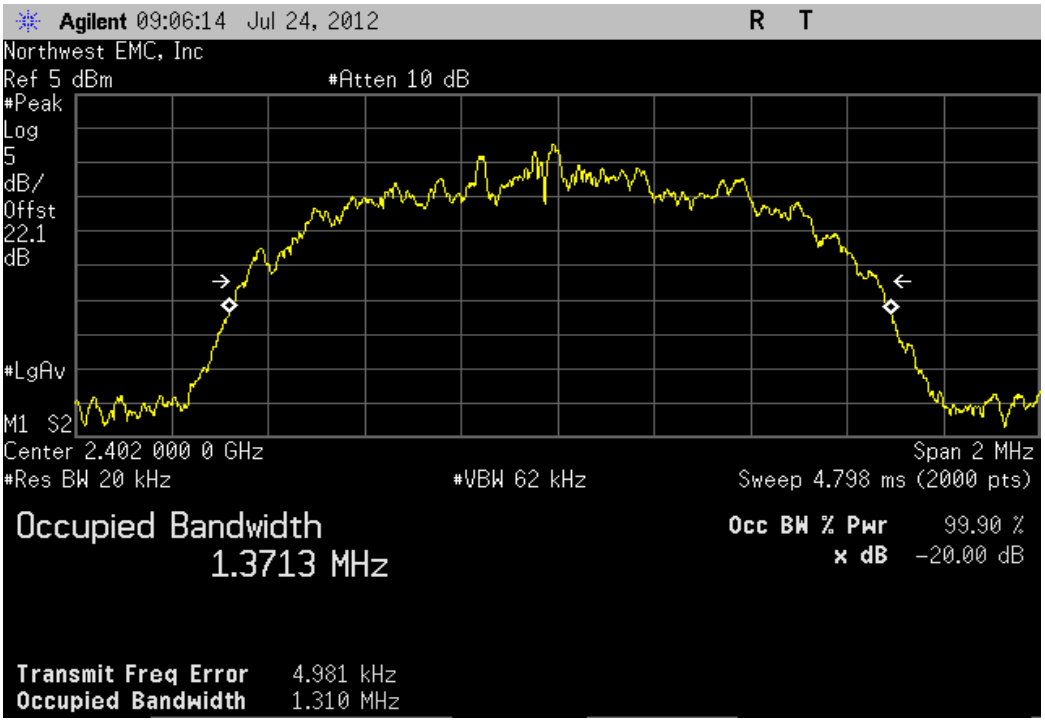

Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.329 MHz | < 1.5 MHz | Pass |

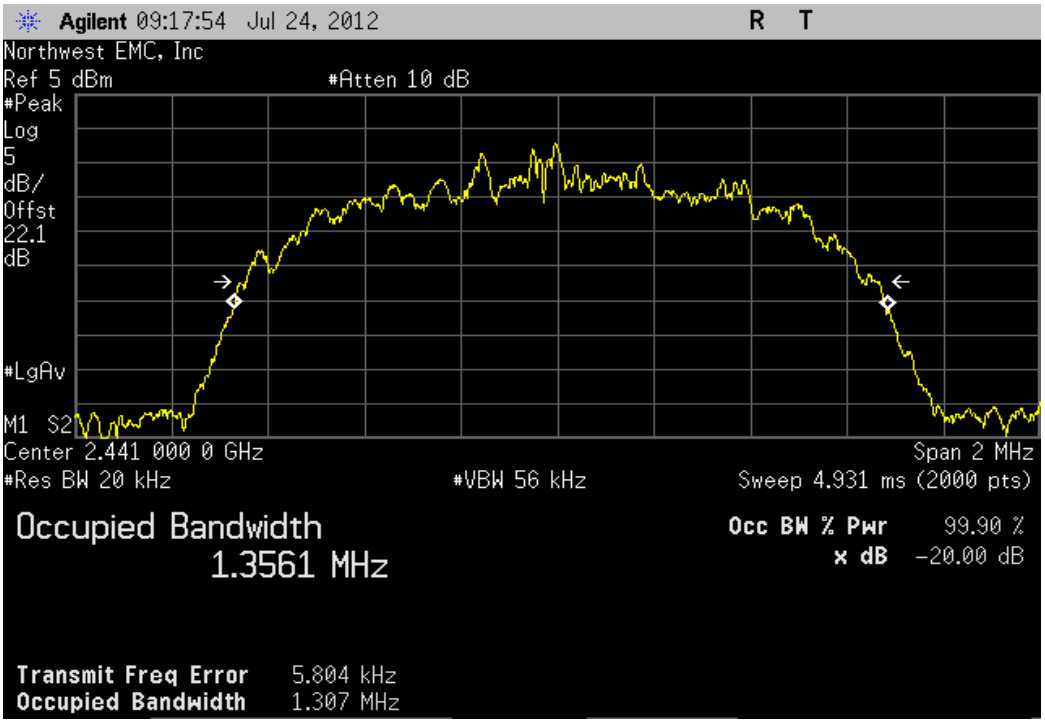


# Occupied Bandwidth

| Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Low Channel, 2402 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Value | Limit | Result |
| | | | | 1.31 MHz | < 1.5 MHz | Pass |

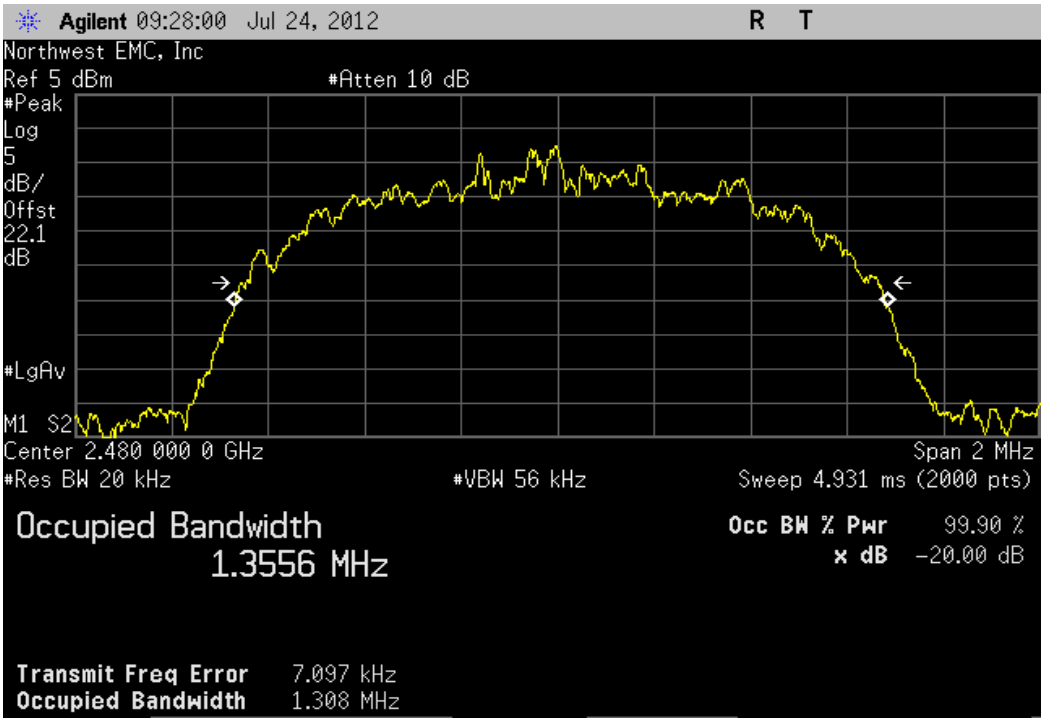



| Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Value | Limit | Result |
| | | | | 1.307 MHz | < 1.5 MHz | Pass |



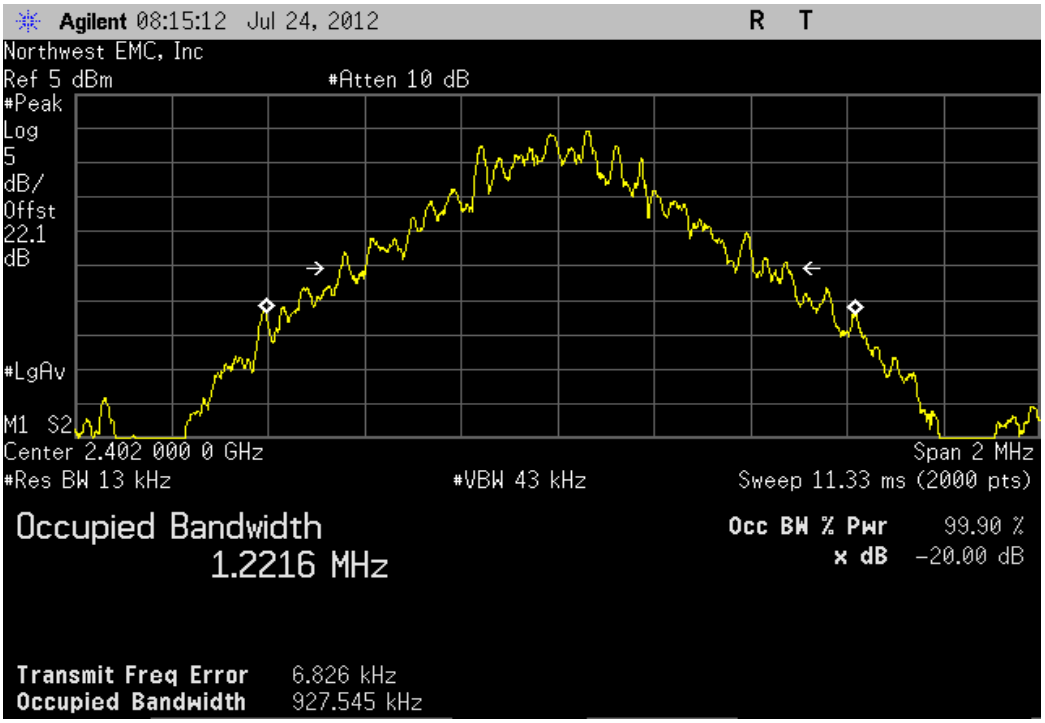
Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.308 MHz | < 1.5 MHz | Pass |



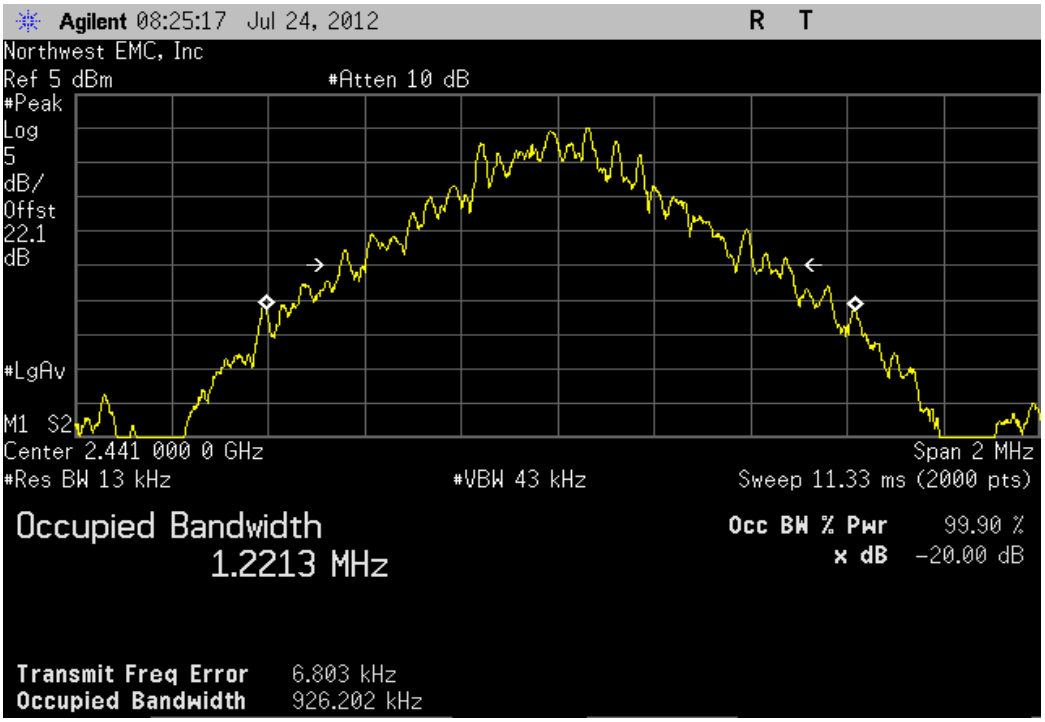

Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 927.545 kHz | < 1.5 MHz | Pass |



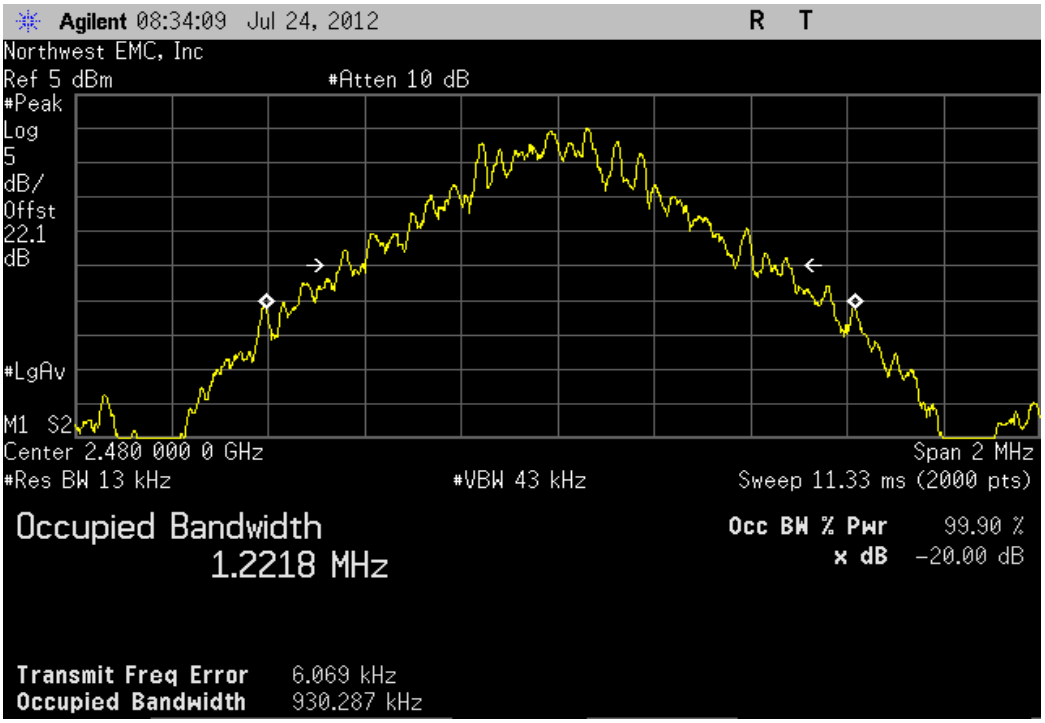
Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Mid Channel, 2441 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 926.202 kHz | < 1.5 MHz | Pass |



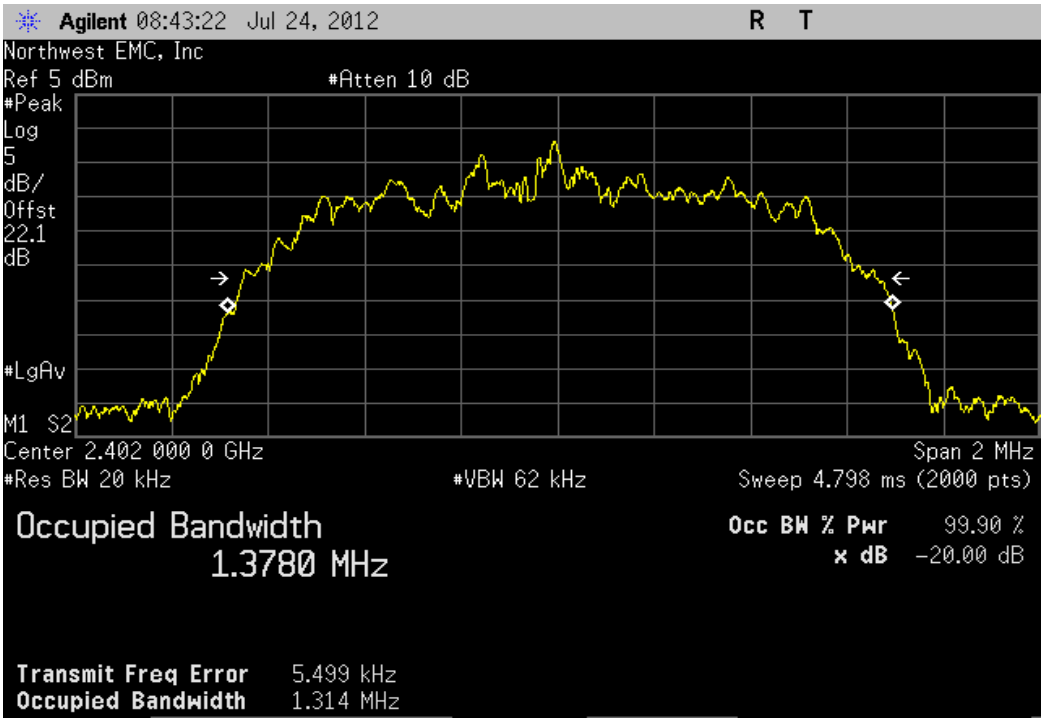

Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 930.287 kHz | < 1.5 MHz | Pass |



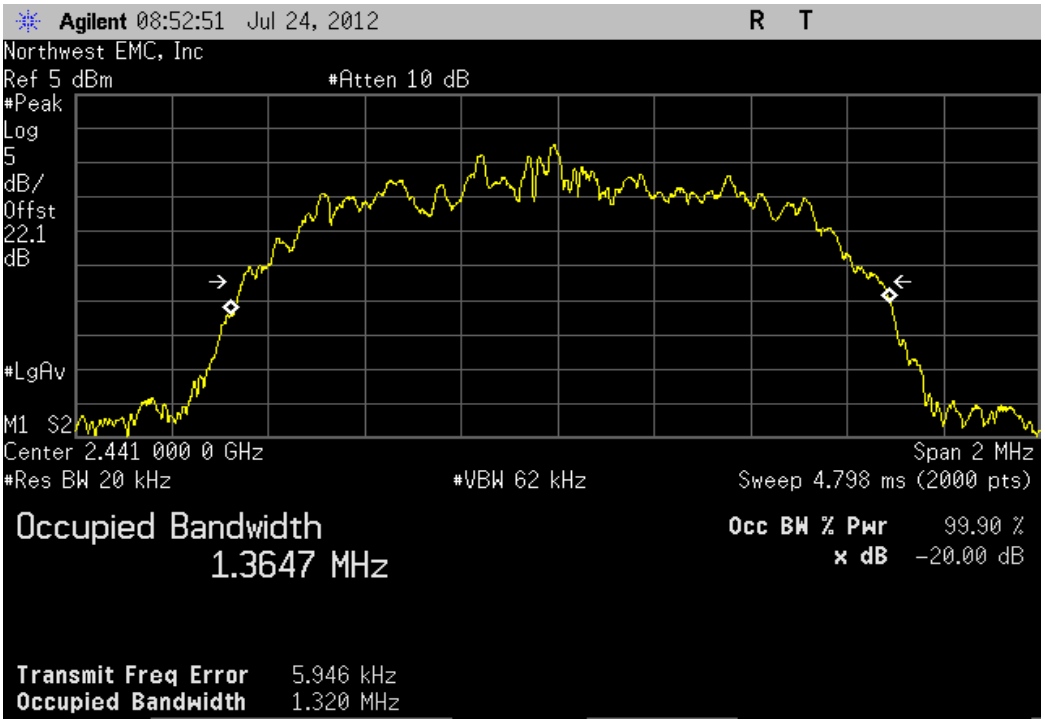
Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.314 MHz | < 1.5 MHz | Pass |



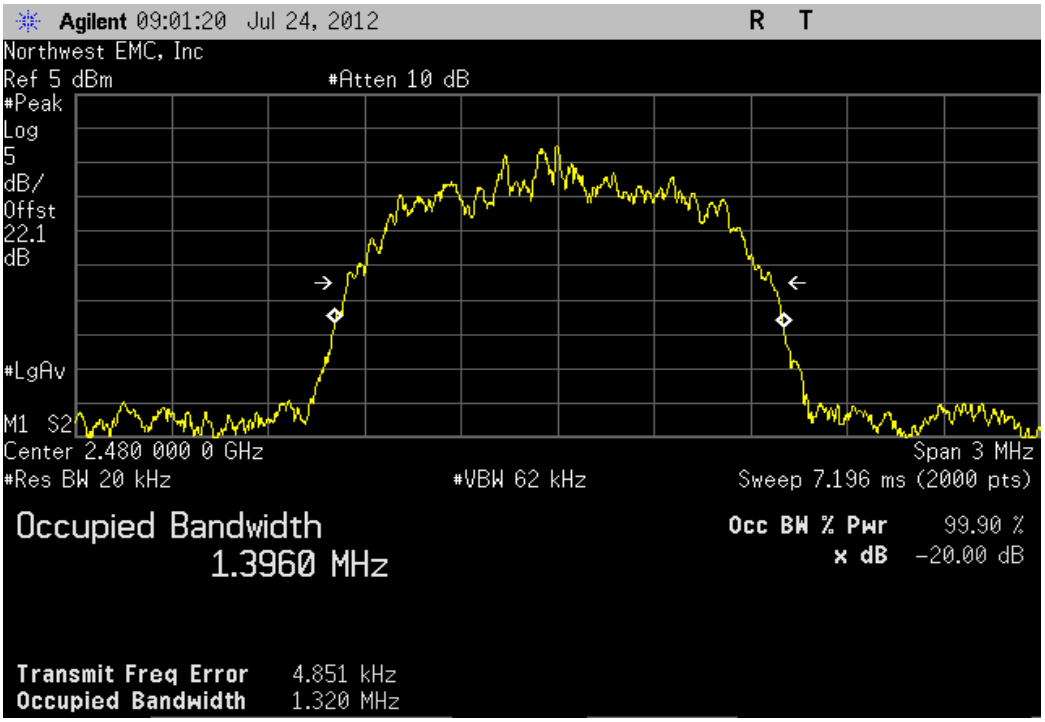

Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.32 MHz | < 1.5 MHz | Pass |



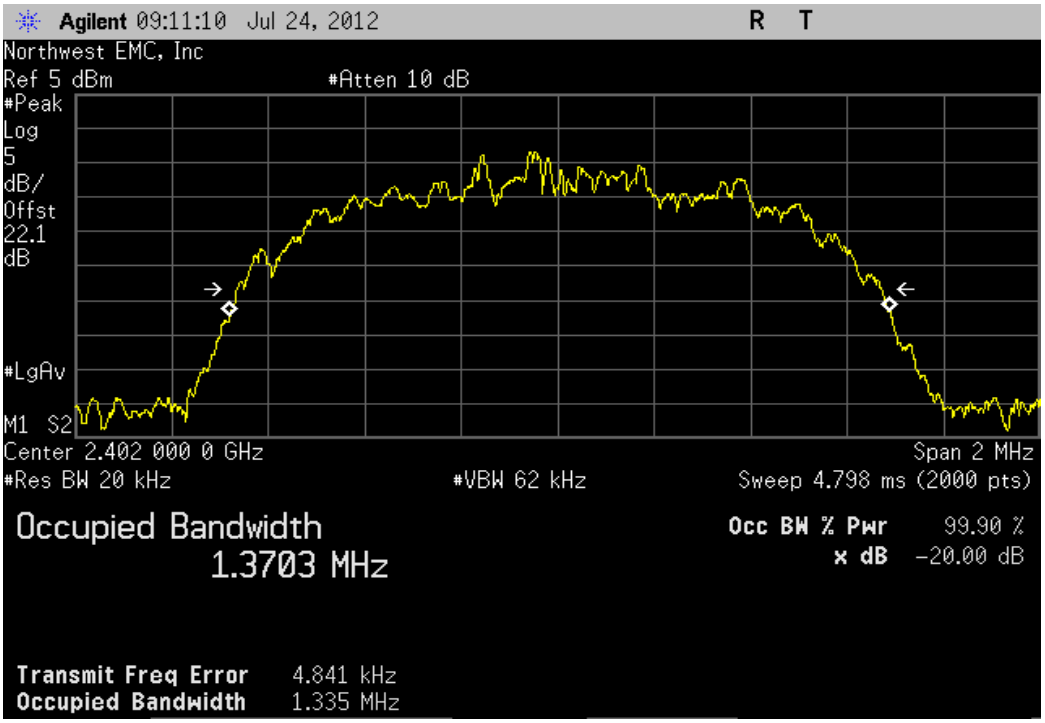
Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.32 MHz | < 1.5 MHz | Pass |




Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Low Channel, 2402 MHz

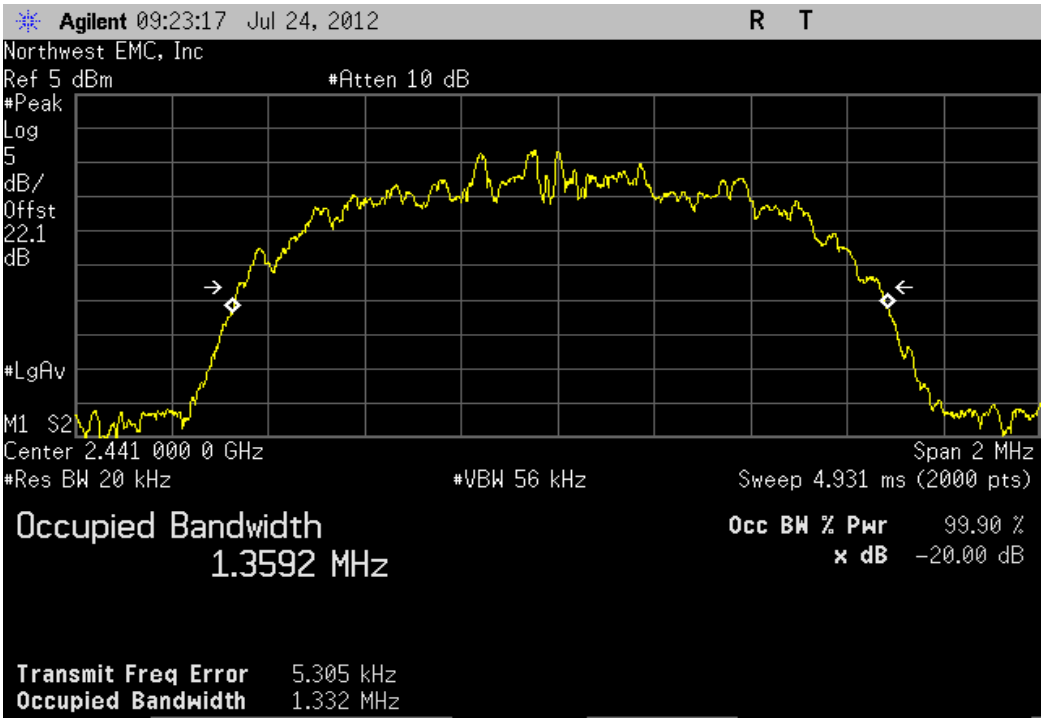
| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.335 MHz | < 1.5 MHz | Pass |



# Occupied Bandwidth

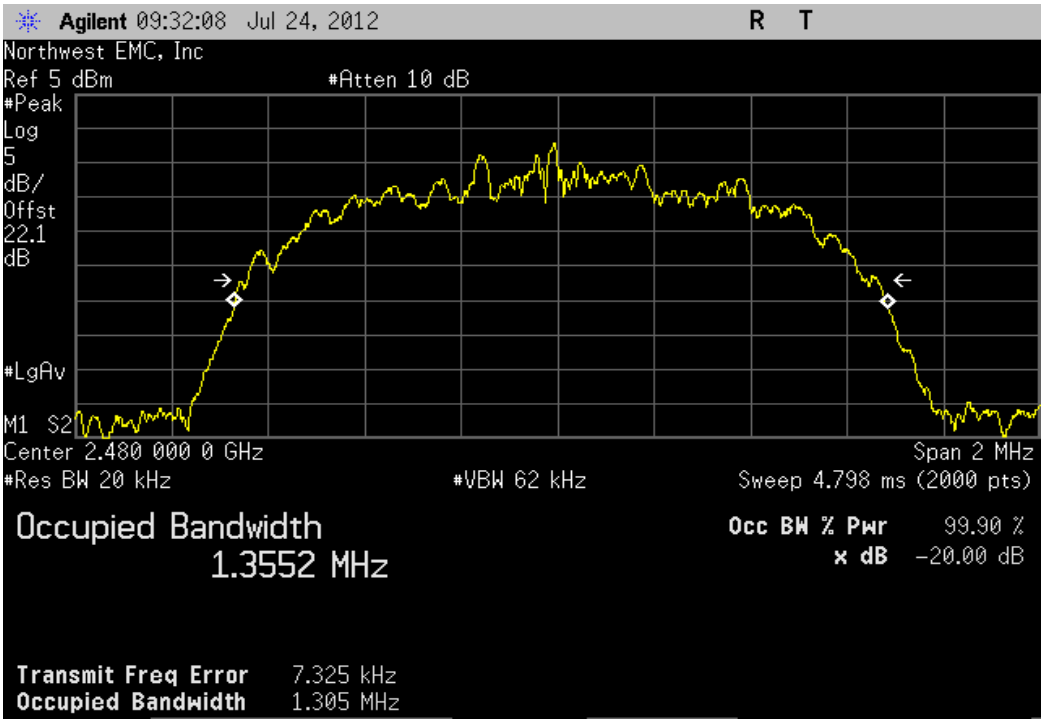
Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Mid Channel, 2441 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.332 MHz | < 1.5 MHz | Pass |




Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.305 MHz | < 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 |

**MEASUREMENT UNCERTAINTY**

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**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:** | Intellis - Models 97745 (PTM), 97755 (RTM) | **Work Order:** | MDTR0182 |
| **Serial Number:** | NLD001683N | **Date:** | 07/24/12 |
| **Customer:** | Medtronic Inc. | **Temperature:** | 24.36°C |
| **Attendees:** | None | **Humidity:** | 58% |
| **Project:** | None | **Barometric Pres.:** | 1014.4 |
| **Tested by:** | Bryan Weller | **Power:** 5 VDC, Battery | **Job Site:** MN08 |

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

**COMMENTS**

Per MDTR0043 test plan configuration: 9 and 10.

**DEVIATIONS FROM TEST STANDARD**

No Deviations

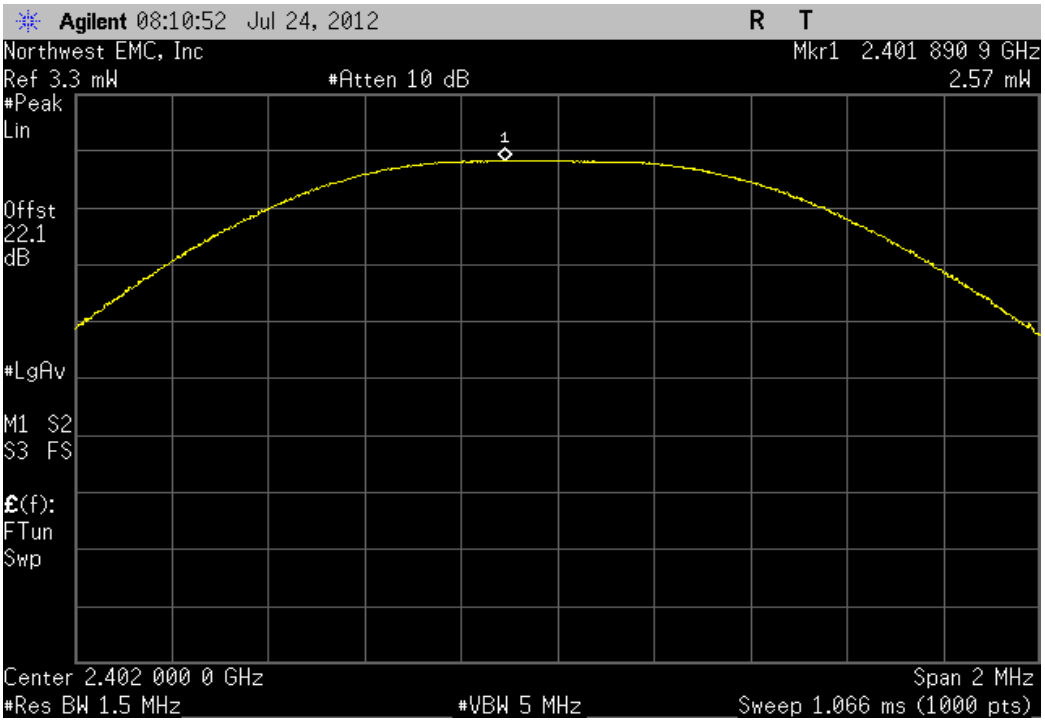
| Configuration # | 8,10 | Signature Bryan Weller |
|---|---|---|

| | Value | Limit | Result |
|---|---|---|---|
| Per MDTR043 test plan configuration: 9 (AC Adapter) | | | |
| DH5, GFSK | | | |
| Low Channel, 2402 MHz | 2.575 mW | < 125 mW | Pass |
| Mid Channel, 2441 MHz | 2.903 mW | < 125 mW | Pass |
| High Channel, 2480 MHz | 2.91 mW | < 125 mW | Pass |
| 2DH5, 4-DQPSK | | | |
| Low Channel, 2402 MHz | 1.915 mW | < 125 mW | Pass |
| Mid Channel, 2441 MHz | 2.042 mW | < 125 mW | Pass |
| High Channel, 2480 MHz | 2.037 mW | < 125 mW | Pass |
| 3DH5, 8-DPSK | | | |
| Low Channel, 2402 MHz | 2.047 mW | < 125 mW | Pass |
| Mid Channel, 2441 MHz | 2.198 mW | < 125 mW | Pass |
| High Channel, 2480 MHz | 2.188 mW | < 125 mW | Pass |
| Per MDTR043 test plan configuration: 10 (Battery) | | | |
| DH5, GFSK | | | |
| Low Channel, 2402 MHz | 2.575 mW | < 125 mW | Pass |
| Mid Channel, 2441 MHz | 2.903 mW | < 125 mW | Pass |
| High Channel, 2480 MHz | 2.913 mW | < 125 mW | Pass |
| 2DH5, 4-DQPSK | | | |
| Low Channel, 2402 MHz | 1.926 mW | < 125 mW | Pass |
| Mid Channel, 2441 MHz | 2.04 mW | < 125 mW | Pass |
| High Channel, 2480 MHz | 2.034 mW | < 125 mW | Pass |
| 3DH5, 8-DPSK | | | |
| Low Channel, 2402 MHz | 2.046 mW | < 125 mW | Pass |
| Mid Channel, 2441 MHz | 2.204 mW | < 125 mW | Pass |
| High Channel, 2480 MHz | 2.184 mW | < 125 mW | Pass |

# Output Power

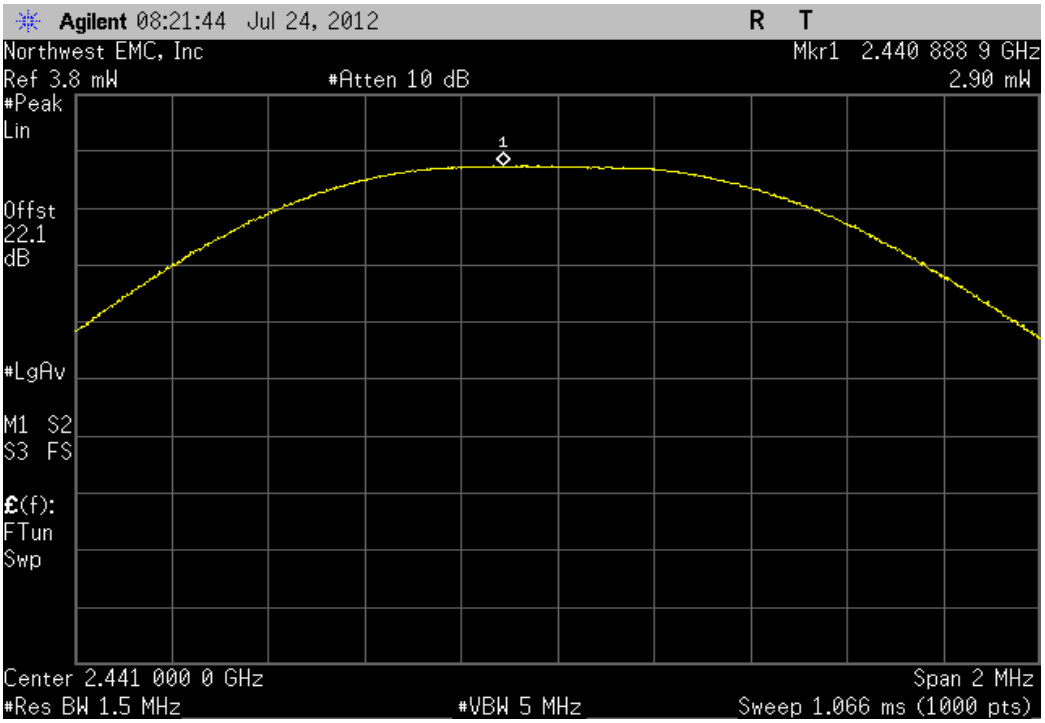
Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.575 mW | < 125 mW | Pass |




Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Mid Channel, 2441 MHz

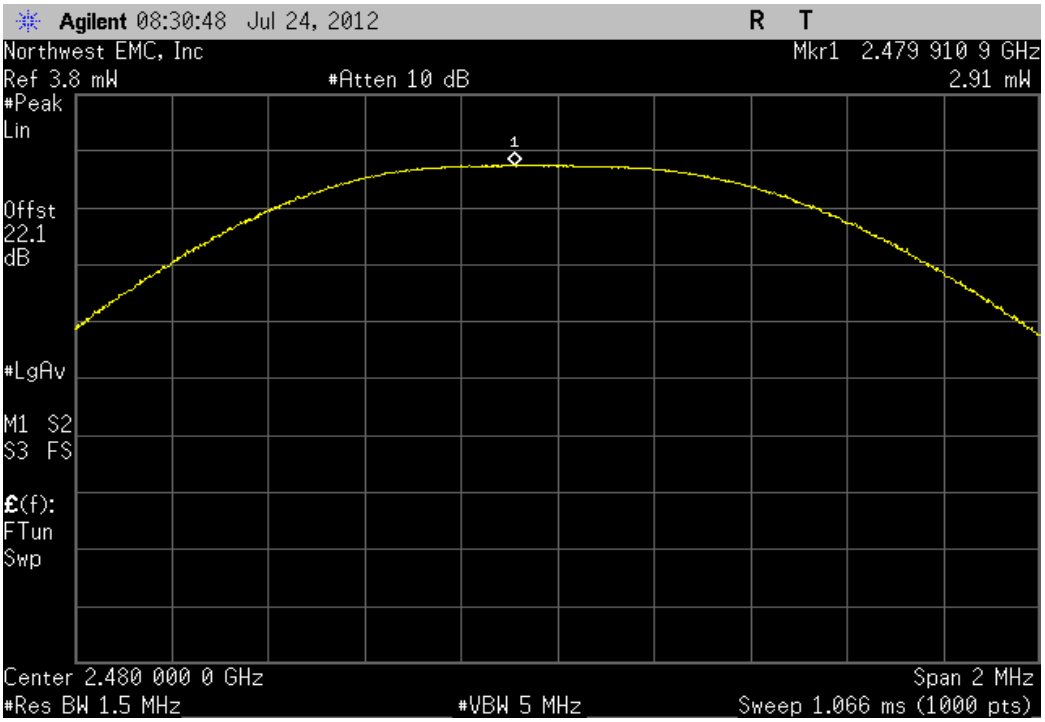
| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.903 mW | < 125 mW | Pass |



# Output Power

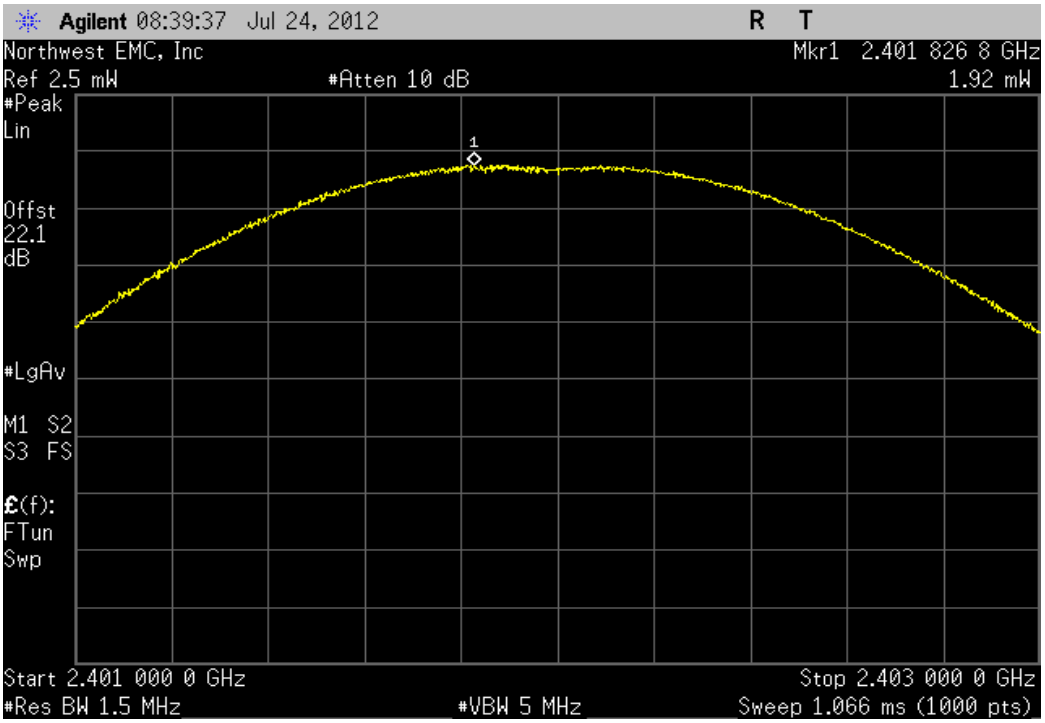
Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.91 mW | < 125 mW | Pass |




Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Low Channel, 2402 MHz

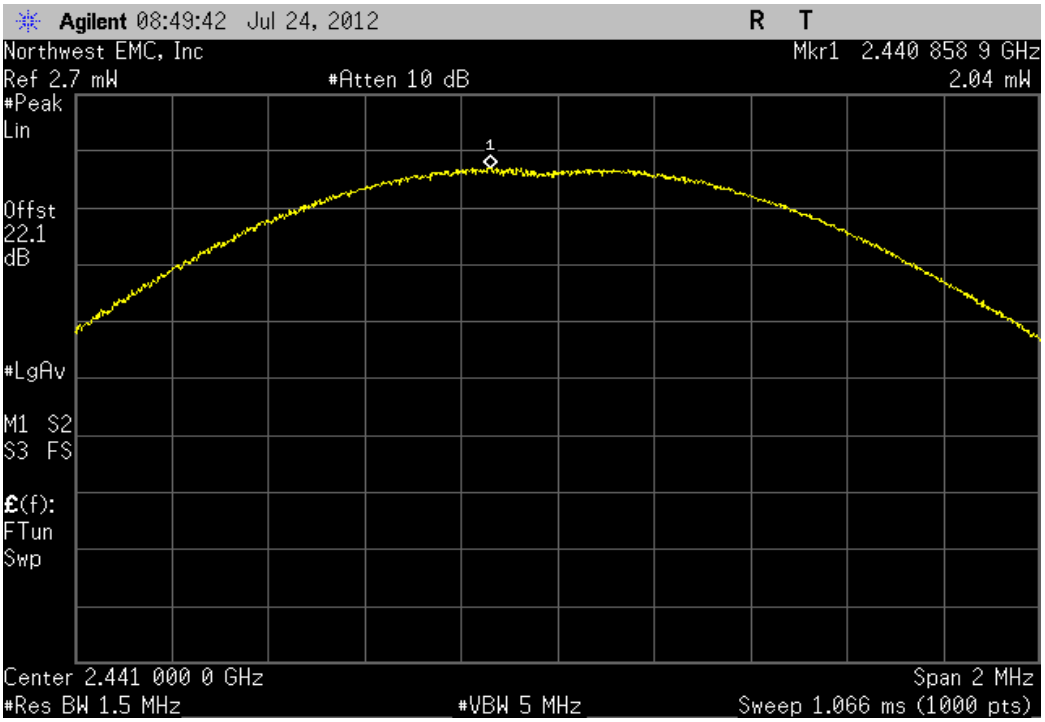
| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.915 mW | < 125 mW | Pass |



# Output Power

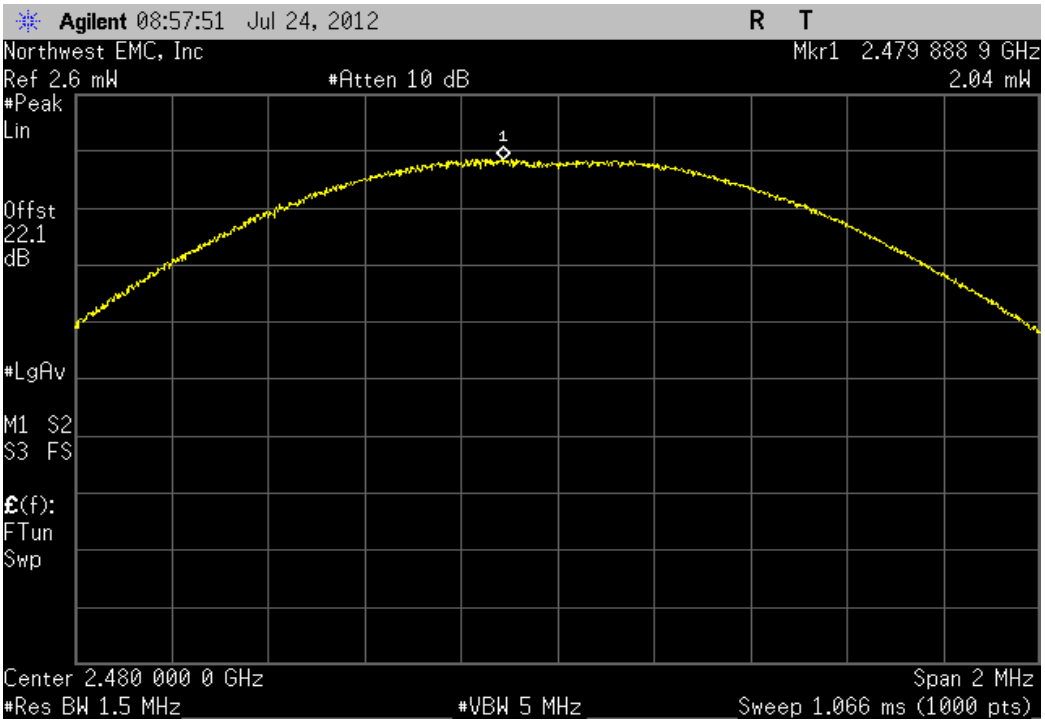
Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.042 mW | < 125 mW | Pass |




Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, High Channel, 2480 MHz

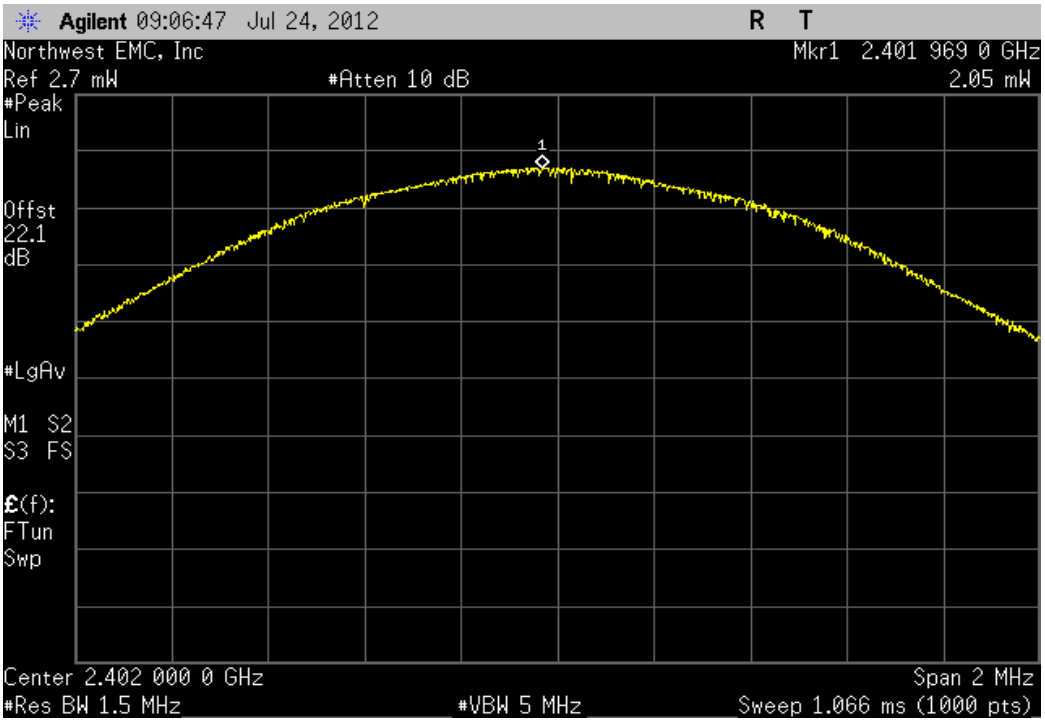
| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.037 mW | < 125 mW | Pass |



# Output Power

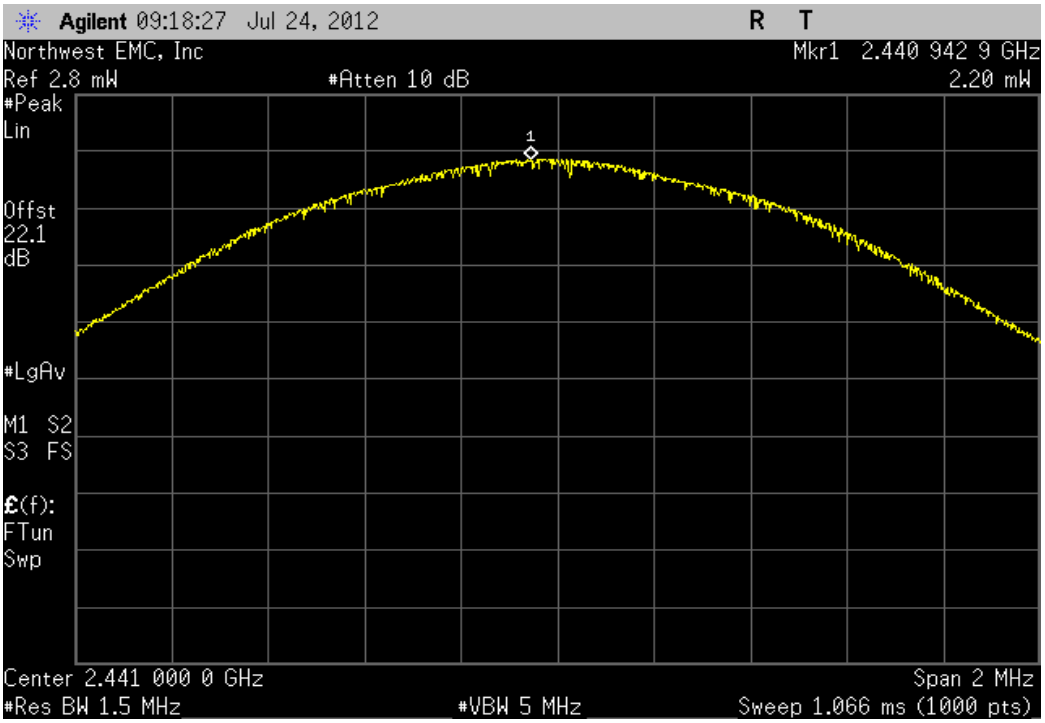
Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.047 mW | < 125 mW | Pass |




Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Mid Channel, 2441 MHz

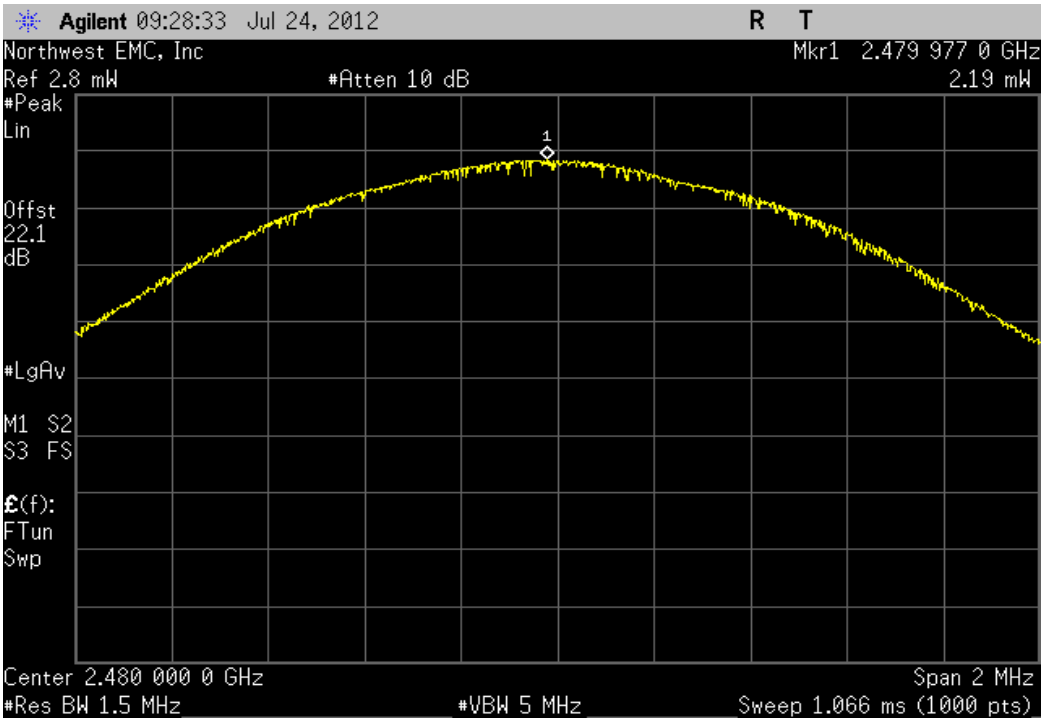
| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.198 mW | < 125 mW | Pass |



# Output Power

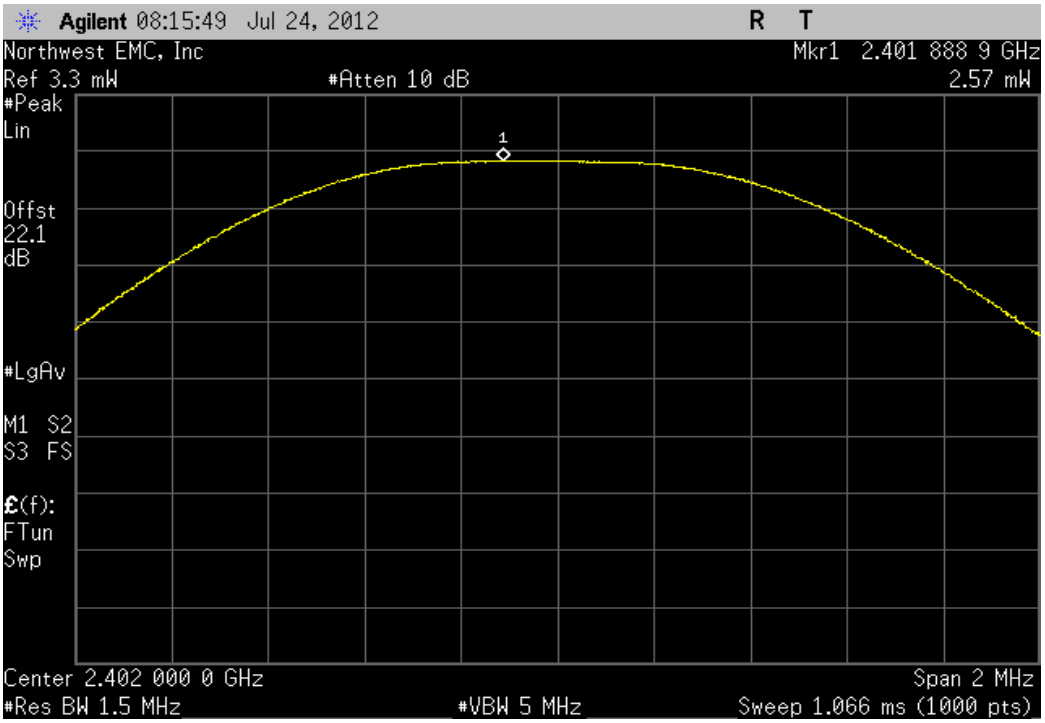
Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.188 mW | < 125 mW | Pass |



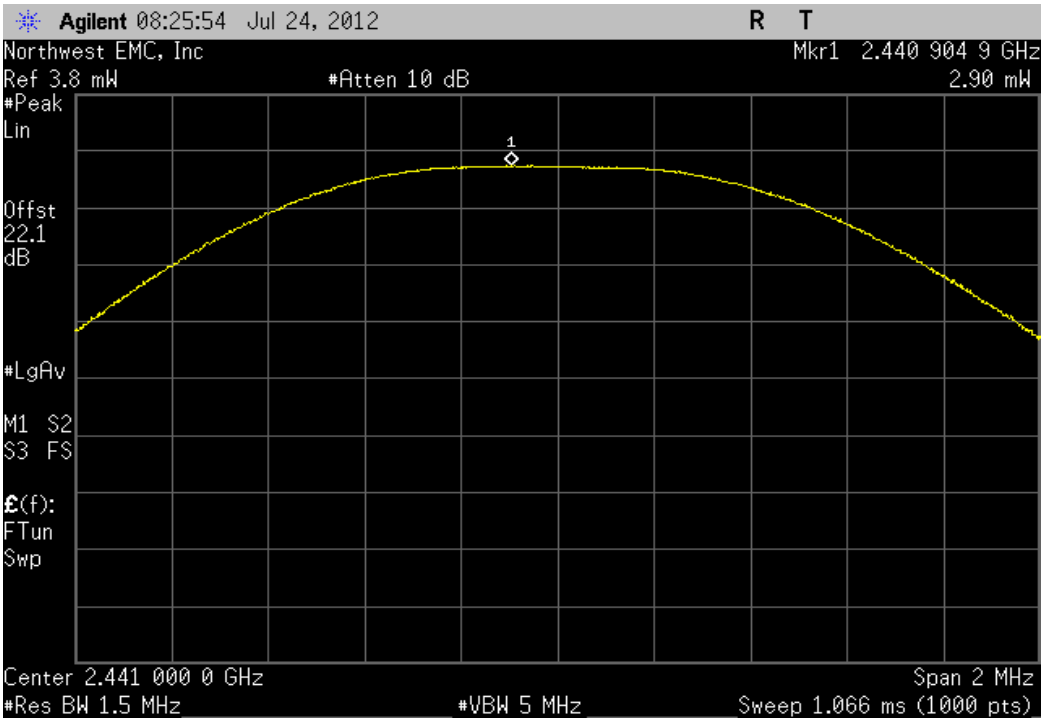

Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.575 mW | < 125 mW | Pass |

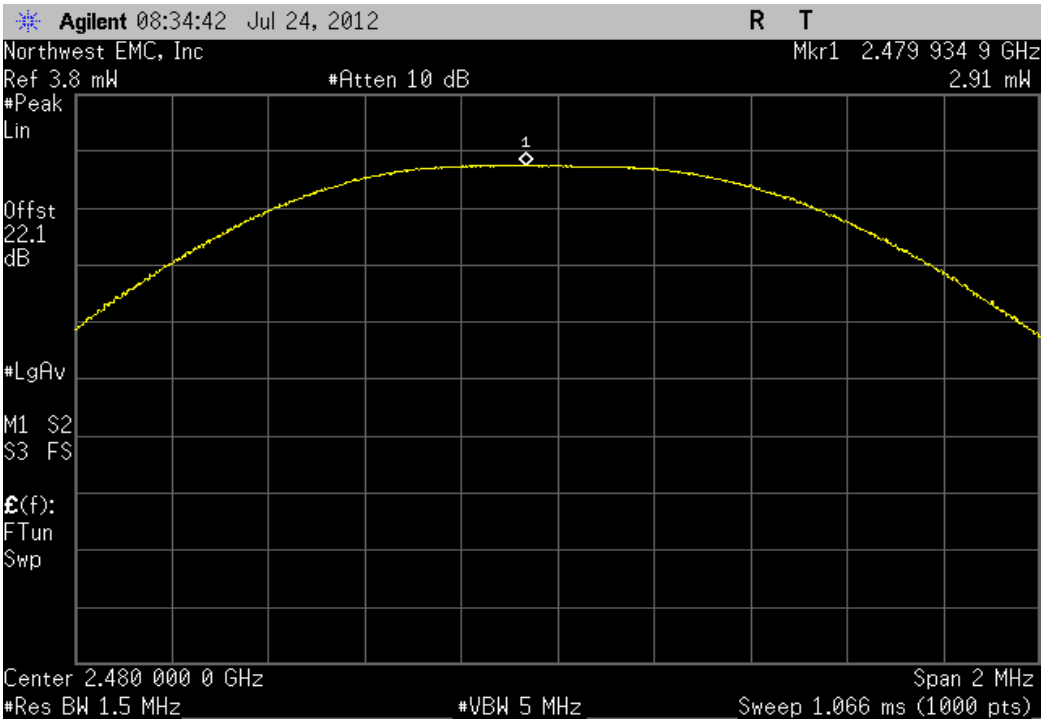


# Output Power

| Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Value | Limit | Result |
| | | | | 2.903 mW | < 125 mW | Pass |



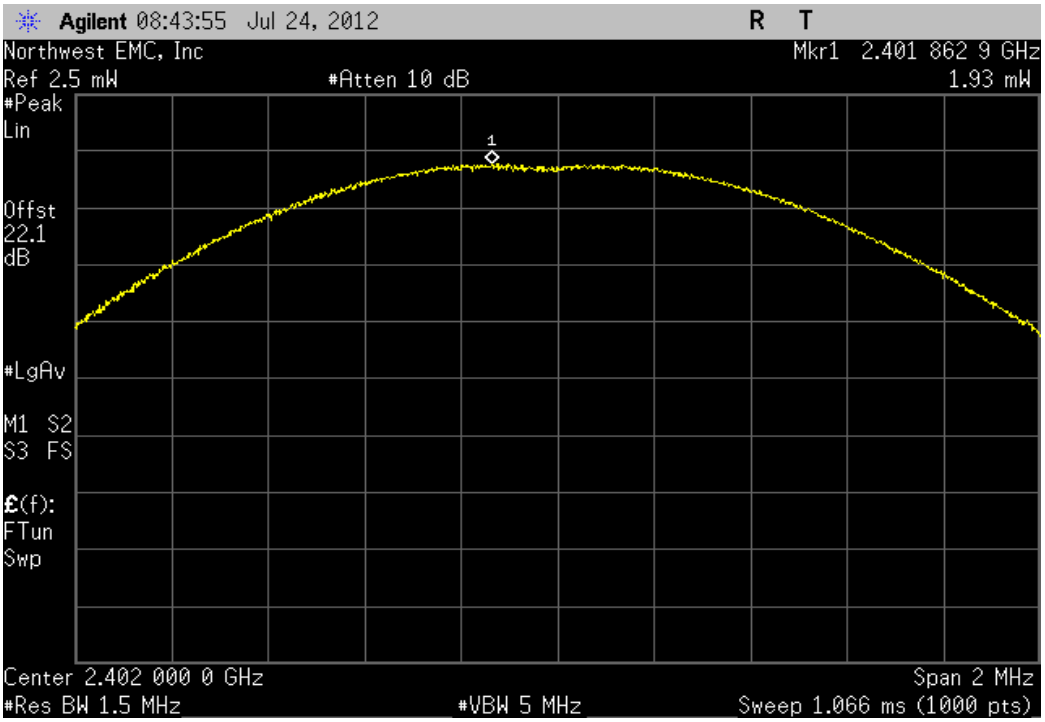

| Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Value | Limit | Result |
| | | | | 2.913 mW | < 125 mW | Pass |



# Output Power

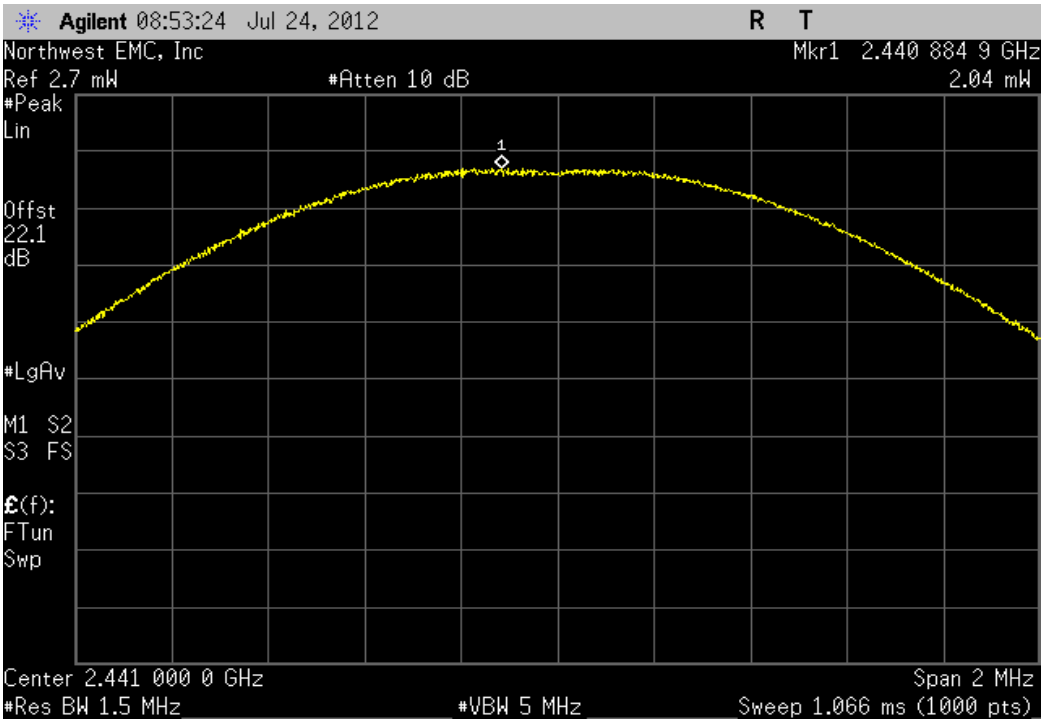
Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 1.926 mW | < 125 mW | Pass |

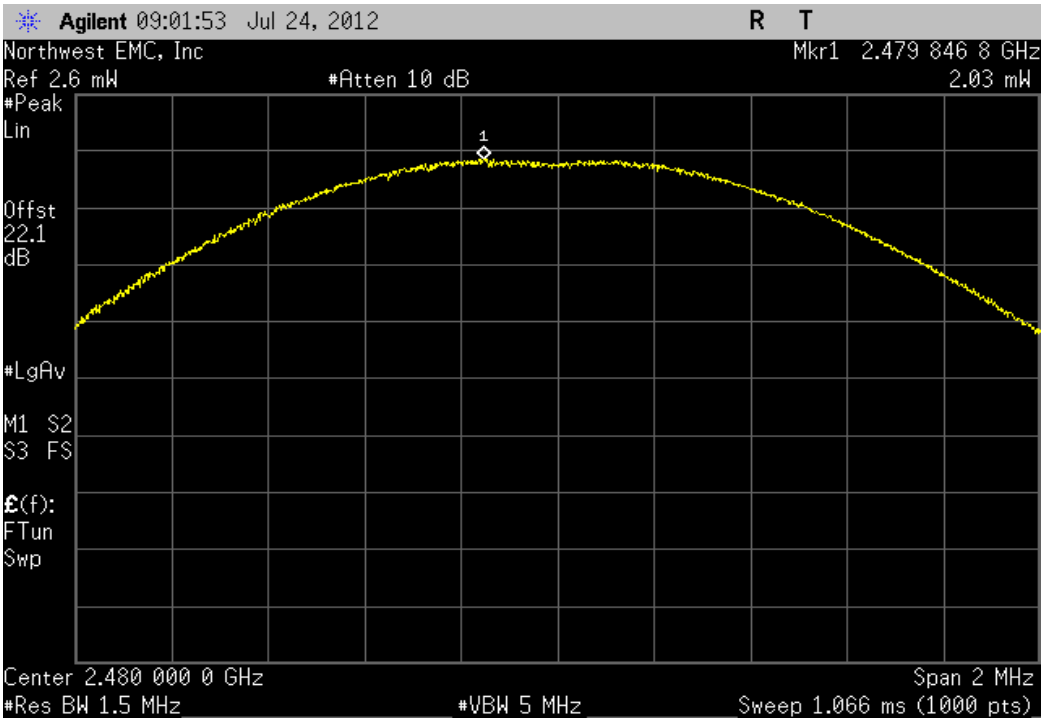



Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz

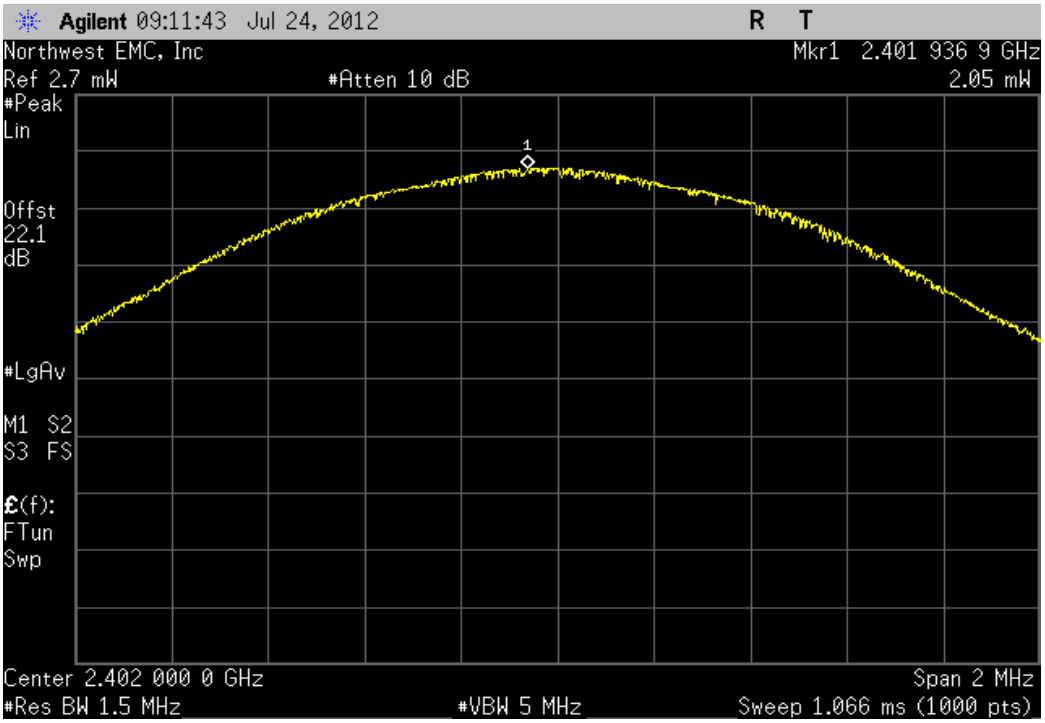
| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.04 mW | < 125 mW | Pass |



| Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Value | Limit | Result |
| | | | | 2.034 mW | < 125 mW | Pass |



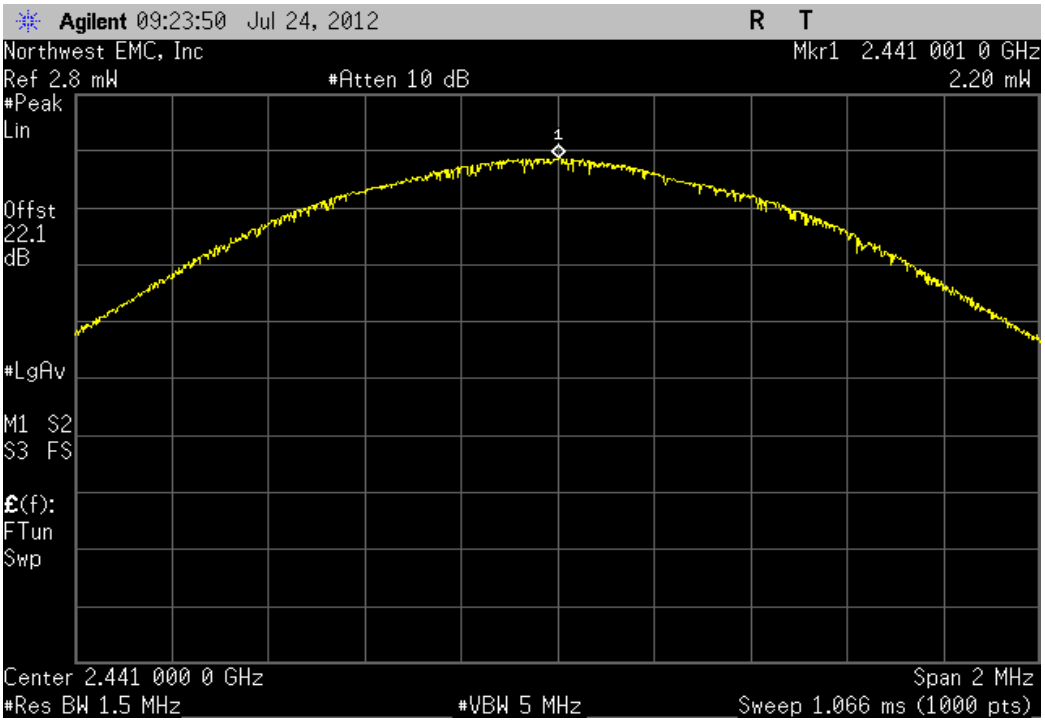

| Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Low Channel, 2402 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Value | Limit | Result |
| | | | | 2.046 mW | < 125 mW | Pass |



# Output Power

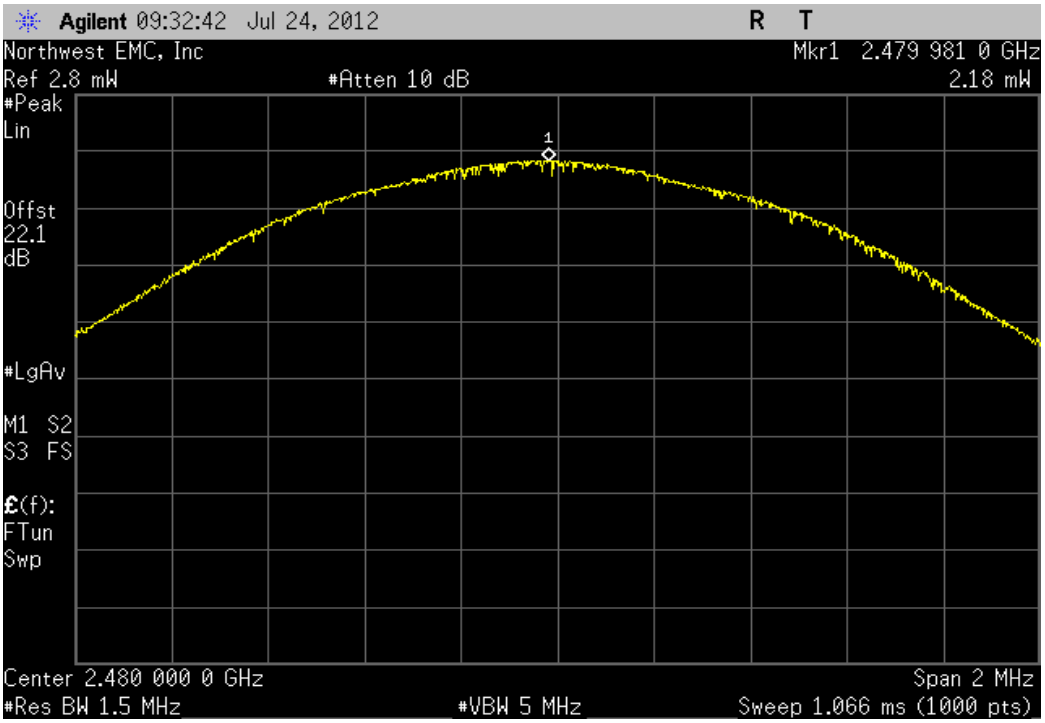
Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Mid Channel, 2441 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.204 mW | < 125 mW | Pass |




Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | 2.184 mW | < 125 mW | Pass |



# Band Edge Compliance - Hopping Mode

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 |
| Spectrum Analyzer | Agilent | E4440A | AAX | 5/15/2012 | 12 |

**MEASUREMENT UNCERTAINTY**

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**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 - Hopping Mode

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | Intellis - Models 97745 (PTM), 97755 (RTM) | | | **Work Order:** | MDTR0182 |
| **Serial Number:** | NLD001683N | | | **Date:** | 07/17/12 |
| **Customer:** | Medtronic Inc. | | | **Temperature:** | 24.32°C |
| **Attendees:** | Scott Straka | | | **Humidity:** | 60% |
| **Project:** | None | | | **Barometric Pres.:** | 1008.9 |
| **Tested by:** | Trevor Buls | **Power:** | 5 VDC, Battery | **Job Site:** | MN08 |

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

**COMMENTS**

Per MDTR0043 test plan configuration: 9 and 10. Bluetooth hopping mode.

**DEVIATIONS FROM TEST STANDARD**

No Deviations

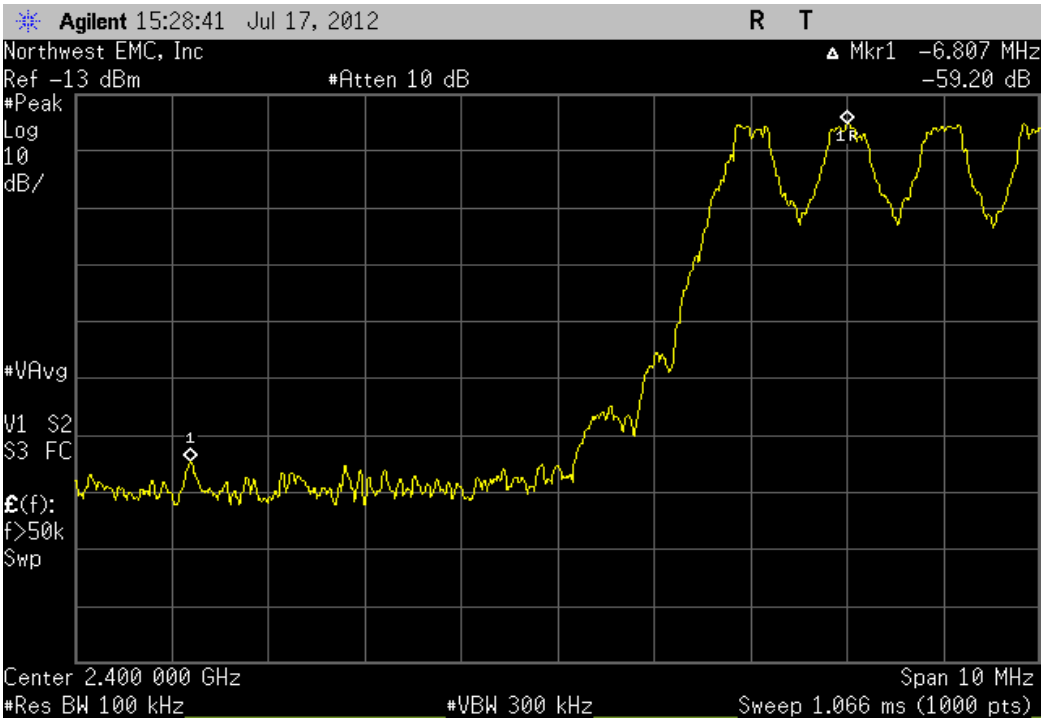
| Configuration # | 8, 10 | Signature Trevor Buls |
|---|---|---|

| | | Value | Limit | Result |
|---|---|---|---|---|
| Per MDTR0043 test plan configuration: 9 (AC Adapter) | | | | |
| | DH5, GFSK | | | |
| | Low Channel | -59.2 dBc | ≤ -20 dBc | Pass |
| | High Channel | -58.57 dBc | ≤ -20 dBc | Pass |
| | 2DH5, 4-DQPSK | | | |
| | Low Channel | -53.67 dBc | ≤ -20 dBc | Pass |
| | High Channel | -54.28 dBc | ≤ -20 dBc | Pass |
| | 3DH5, 8-DPSK | | | |
| | Low Channel | -52.24 dBc | ≤ -20 dBc | Pass |
| | High Channel | -54.05 dBc | ≤ -20 dBc | Pass |
| Per MDTR0043 test plan configuration: 10 (Battery) | | | | |
| | DH5, GFSK | | | |
| | Low Channel | -59.14 dBc | ≤ -20 dBc | Pass |
| | High Channel | -59.61 dBc | ≤ -20 dBc | Pass |
| | 2DH5, 4-DQPSK | | | |
| | Low Channel | -52.7 dBc | ≤ -20 dBc | Pass |
| | High Channel | -52.77 dBc | ≤ -20 dBc | Pass |
| | 3DH5, 8-DPSK | | | |
| | Low Channel | -54.84 dBc | ≤ -20 dBc | Pass |
| | High Channel | -53.48 dBc | ≤ -20 dBc | Pass |

# Band Edge Compliance - Hopping Mode

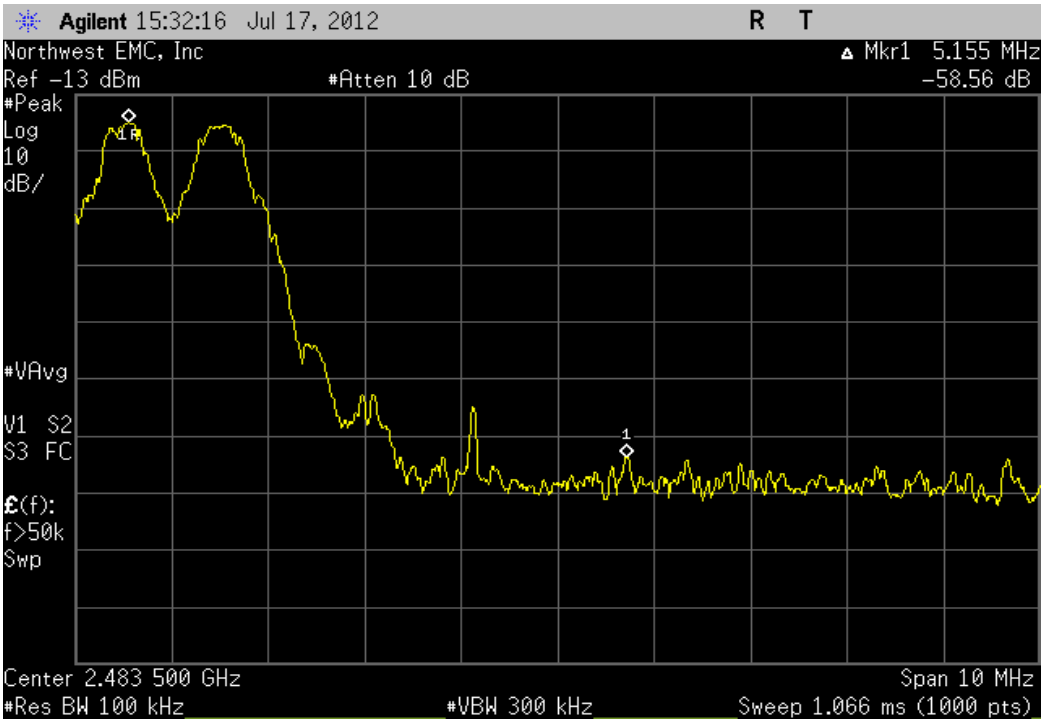
Per MDTR0043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Low Channel

| Value | Limit | Result |
|---|---|---|
| -59.2 dBc | ≤ -20 dBc | Pass |




Per MDTR0043 test plan configuration: 9 (AC Adapter), DH5, GFSK, High Channel

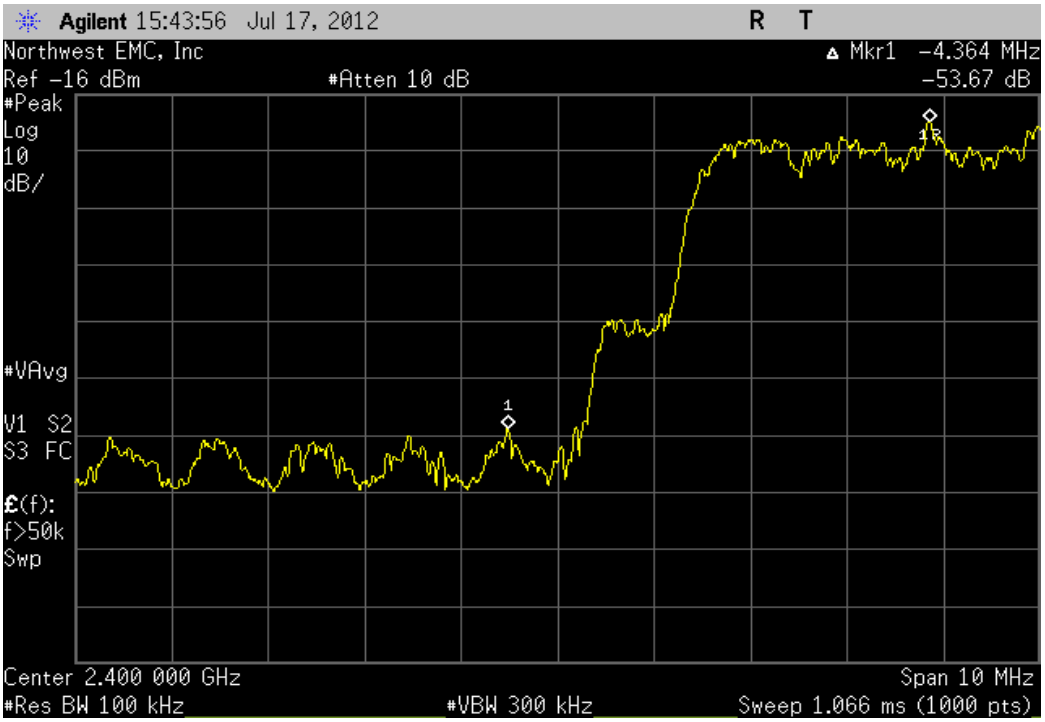
| Value | Limit | Result |
|---|---|---|
| -58.57 dBc | ≤ -20 dBc | Pass |



# Band Edge Compliance - Hopping Mode

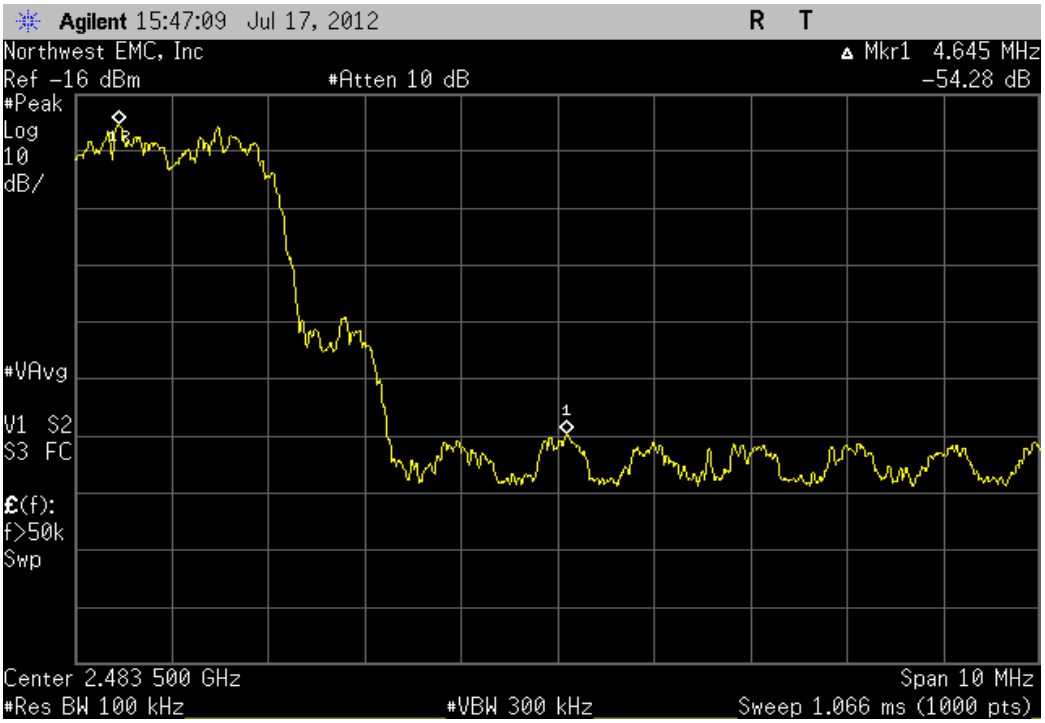
Per MDTR0043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Low Channel

| Value | Limit | Result |
|---|---|---|
| -53.67 dBc | ≤ -20 dBc | Pass |




Per MDTR0043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, High Channel

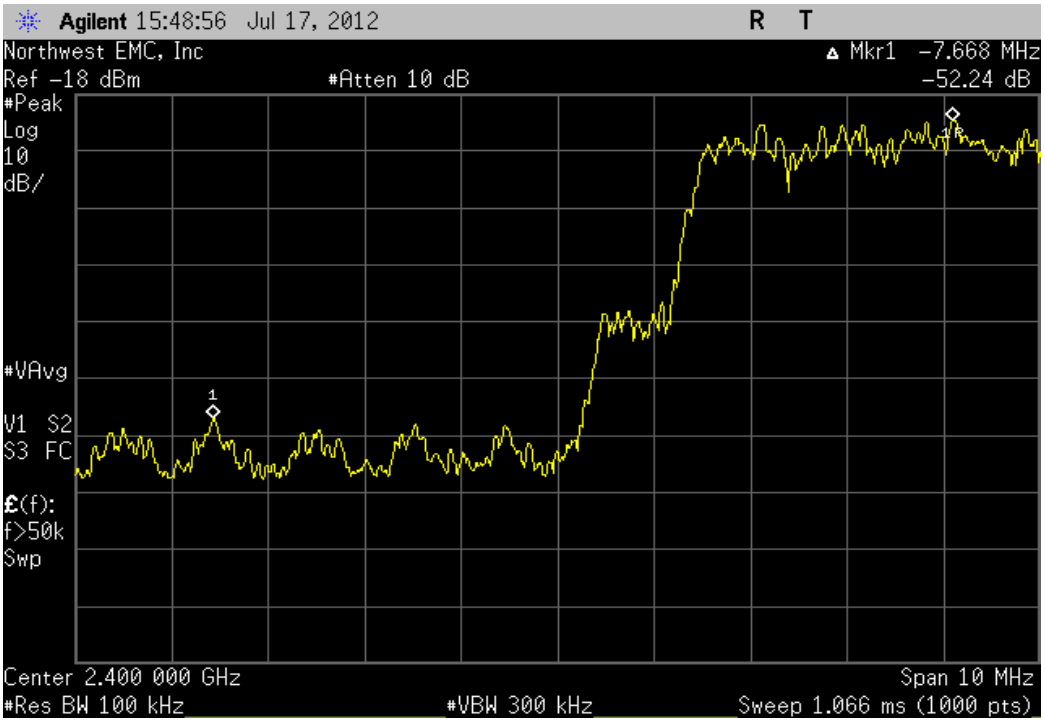
| Value | Limit | Result |
|---|---|---|
| -54.28 dBc | ≤ -20 dBc | Pass |



# Band Edge Compliance - Hopping Mode

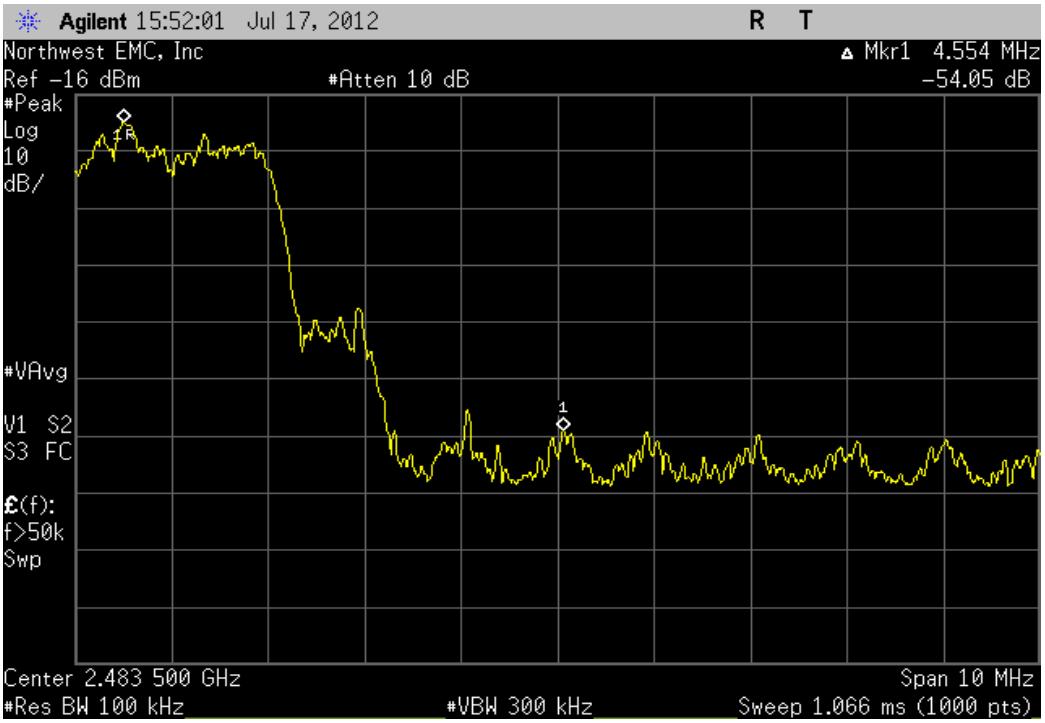
Per MDTR0043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Low Channel

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -52.24 dBc | ≤ -20 dBc | Pass |




Per MDTR0043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, High Channel

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -54.05 dBc | ≤ -20 dBc | Pass |



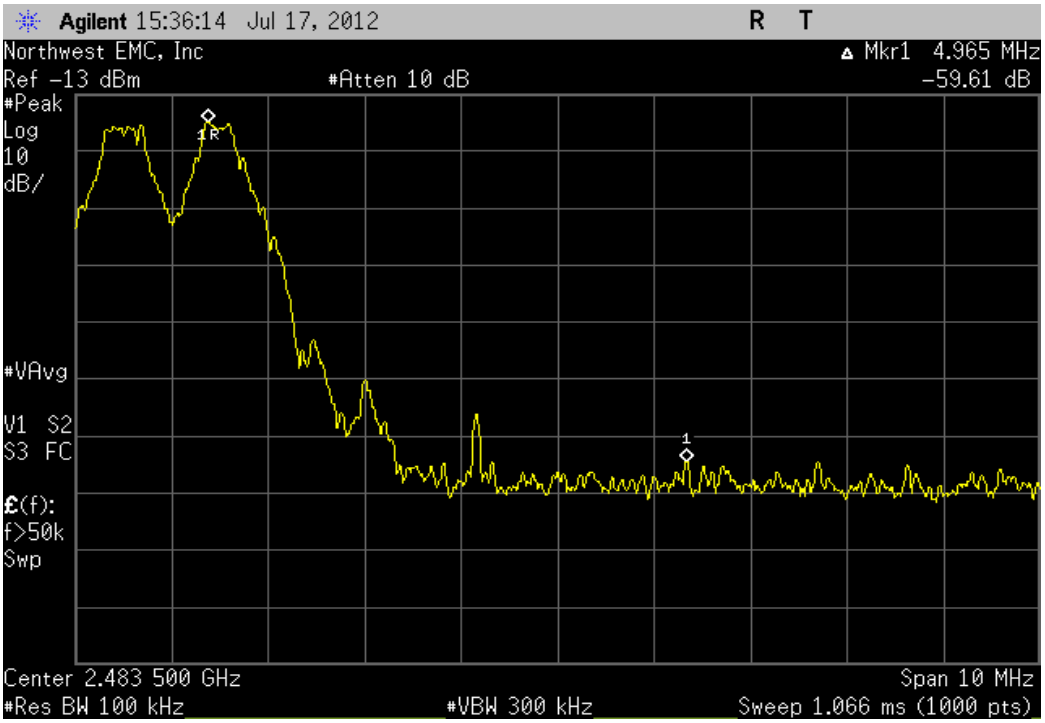
# Band Edge Compliance - Hopping Mode

Per MDTR0043 test plan configuration: 10 (Battery), DH5, GFSK, Low Channel

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -59.14 dBc | ≤ -20 dBc | Pass |


Per MDTR0043 test plan configuration: 10 (Battery), DH5, GFSK, High Channel

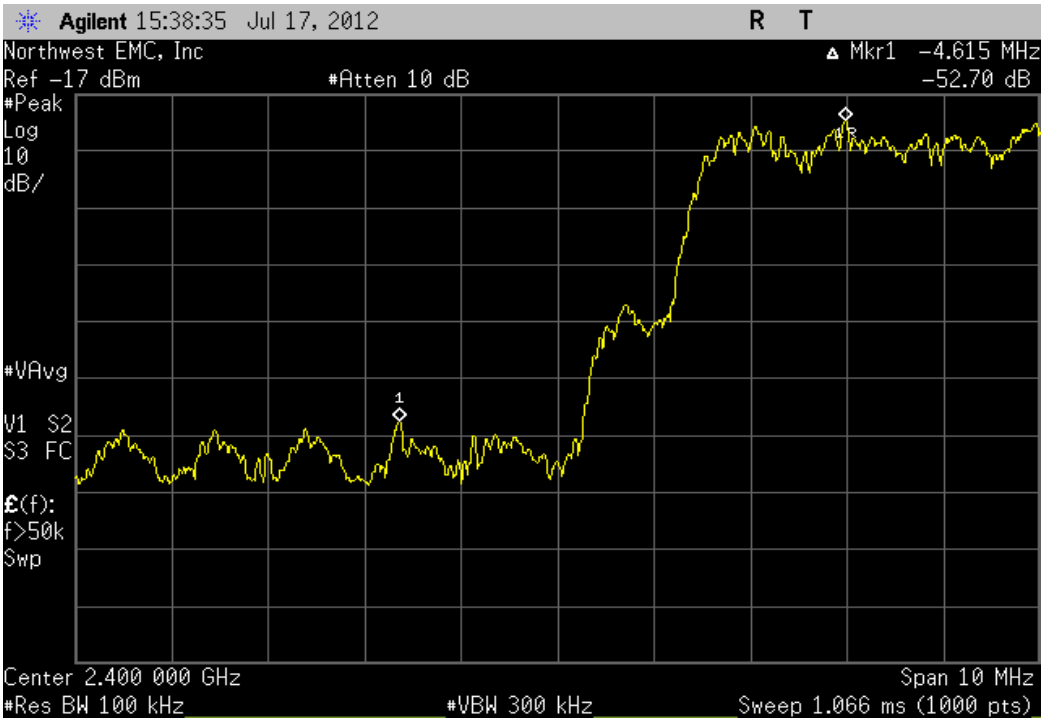
| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -59.61 dBc | ≤ -20 dBc | Pass |



# Band Edge Compliance - Hopping Mode

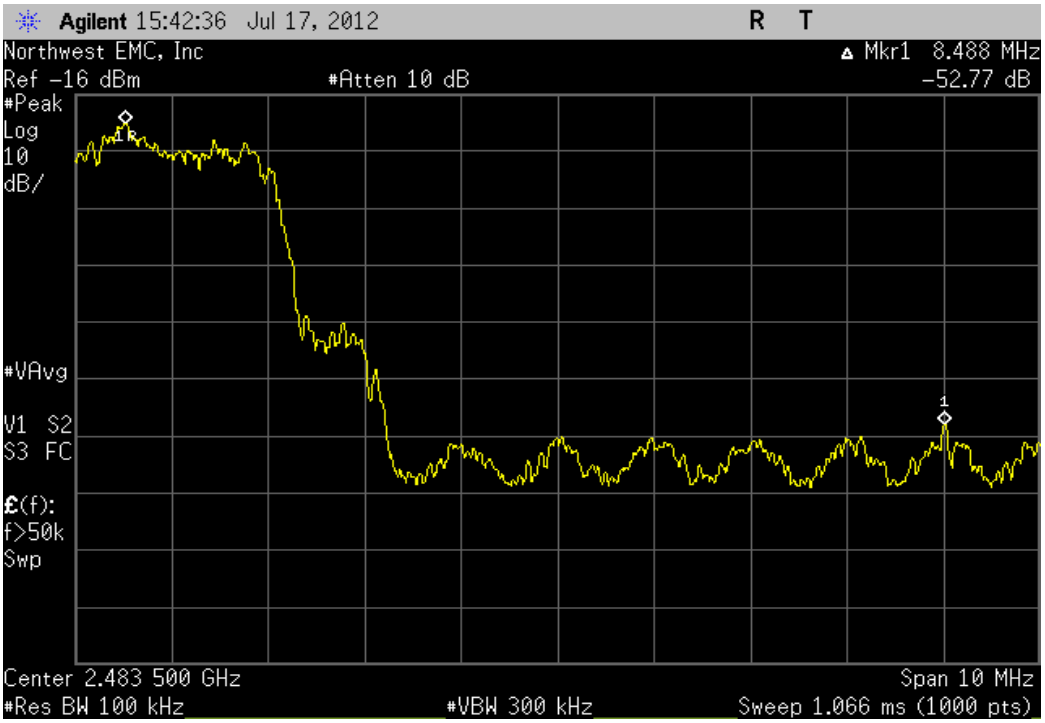
Per MDTR0043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Low Channel

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -52.7 dBc | ≤ -20 dBc | Pass |




Per MDTR0043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, High Channel

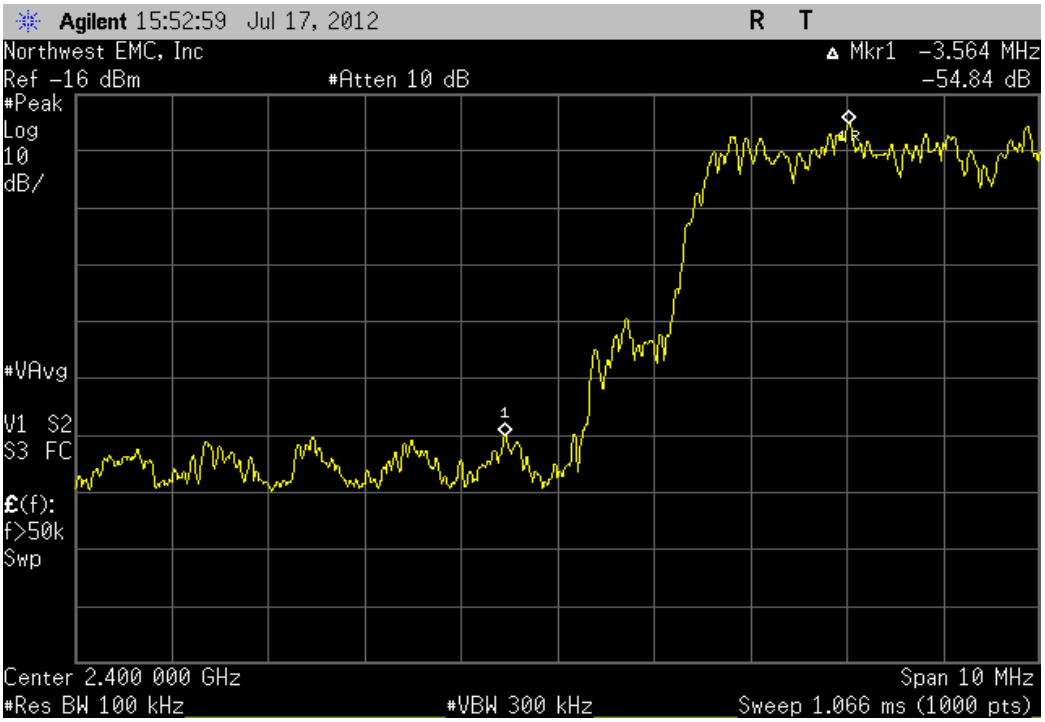
| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -52.77 dBc | ≤ -20 dBc | Pass |



# Band Edge Compliance - Hopping Mode

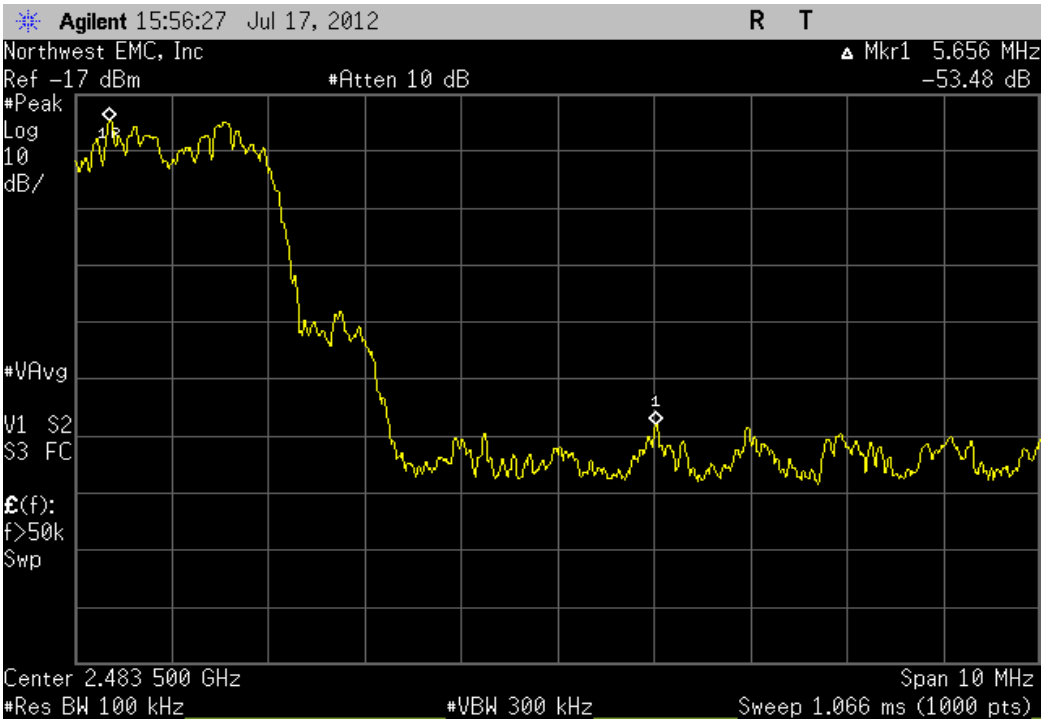
Per MDTR0043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Low Channel

| Value | Limit | Result |
|---|---|---|
| -54.84 dBc | ≤ -20 dBc | Pass |




Per MDTR0043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, High Channel

| Value | Limit | Result |
|---|---|---|
| -53.48 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 |

**MEASUREMENT UNCERTAINTY**

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**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:** | Intellis - Models 97745 (PTM), 97755 (RTM) | | | **Work Order:** | MDTR0182 |
| **Serial Number:** | NLD001683N | | | **Date:** | 07/24/12 |
| **Customer:** | Medtronic Inc. | | | **Temperature:** | 24.36°C |
| **Attendees:** | None | | | **Humidity:** | 58% |
| **Project:** | None | | | **Barometric Pres.:** | 1014.4 |
| **Tested by:** | Bryan Weller | **Power:** | 5 VDC, Battery | **Job Site:** | MN08 |

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

**COMMENTS**

Per MDTR0043 test plan configuration: 9 and 10.

**DEVIATIONS FROM TEST STANDARD**

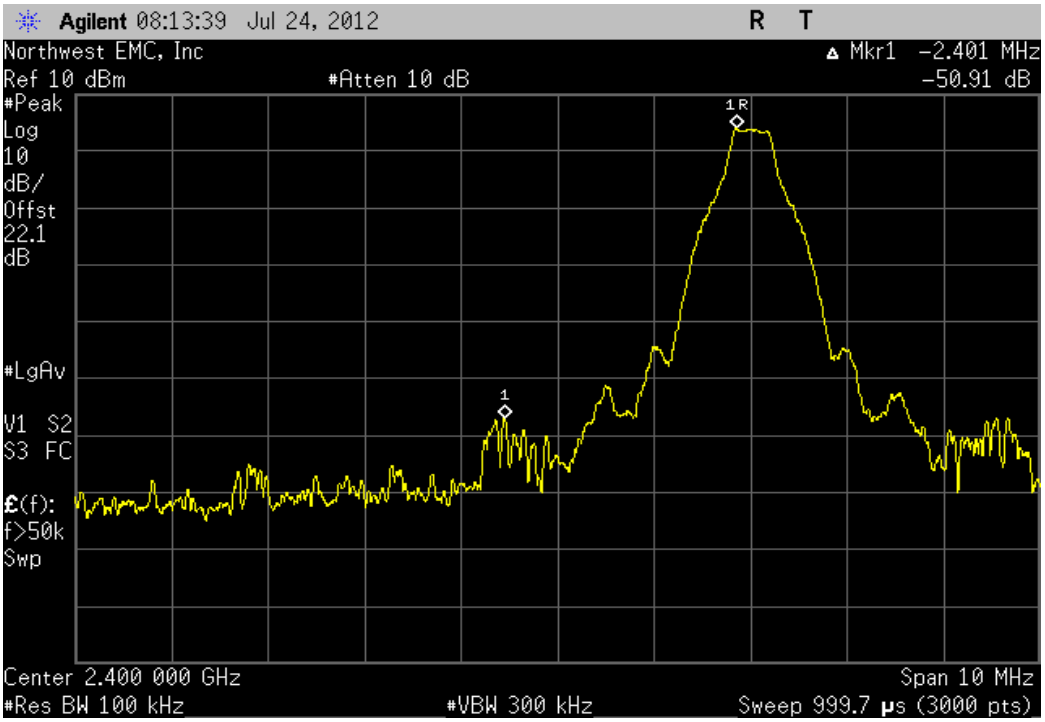
No Deviations

| Configuration # | 8,10 | Signature Bryan Weller |
|---|---|---|

| | | Value | Limit | Result |
|---|---|---|---|---|
| Per MDTR043 test plan configuration: 9 (AC Adapter) | | | | |
| | DH5, GFSK | | | |
| | Low Channel, 2402 MHz | -50.9 dBc | ≤ -20 dBc | Pass |
| | High Channel, 2480 MHz | -57.95 dBc | ≤ -20 dBc | Pass |
| | 2DH5, 4-DQPSK | | | |
| | Low Channel, 2402 MHz | -51.11 dBc | ≤ -20 dBc | Pass |
| | High Channel, 2480 MHz | -58.59 dBc | ≤ -20 dBc | Pass |
| | 3DH5, 8-DPSK | | | |
| | Low Channel, 2402 MHz | -50.3 dBc | ≤ -20 dBc | Pass |
| | High Channel, 2480 MHz | -57.92 dBc | ≤ -20 dBc | Pass |
| Per MDTR043 test plan configuration: 10 (Battery) | | | | |
| | DH5, GFSK | | | |
| | Low Channel, 2402 MHz | -50.61 dBc | ≤ -20 dBc | Pass |
| | High Channel, 2480 MHz | -59.09 dBc | ≤ -20 dBc | Pass |
| | 2DH5, 4-DQPSK | | | |
| | Low Channel, 2402 MHz | -49.91 dBc | ≤ -20 dBc | Pass |
| | High Channel, 2480 MHz | -57.47 dBc | ≤ -20 dBc | Pass |
| | 3DH5, 8-DPSK | | | |
| | Low Channel, 2402 MHz | -50.99 dBc | ≤ -20 dBc | Pass |
| | High Channel, 2480 MHz | -58.7 dBc | ≤ -20 dBc | Pass |

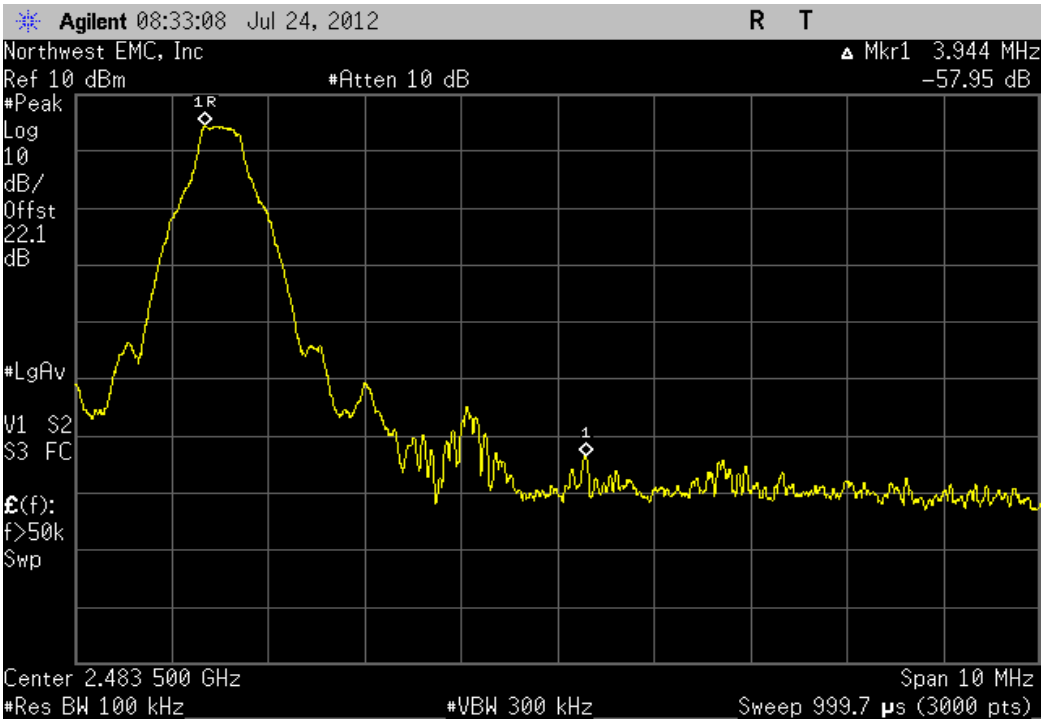
Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -50.9 dBc | ≤ -20 dBc | Pass |




Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, High Channel, 2480 MHz

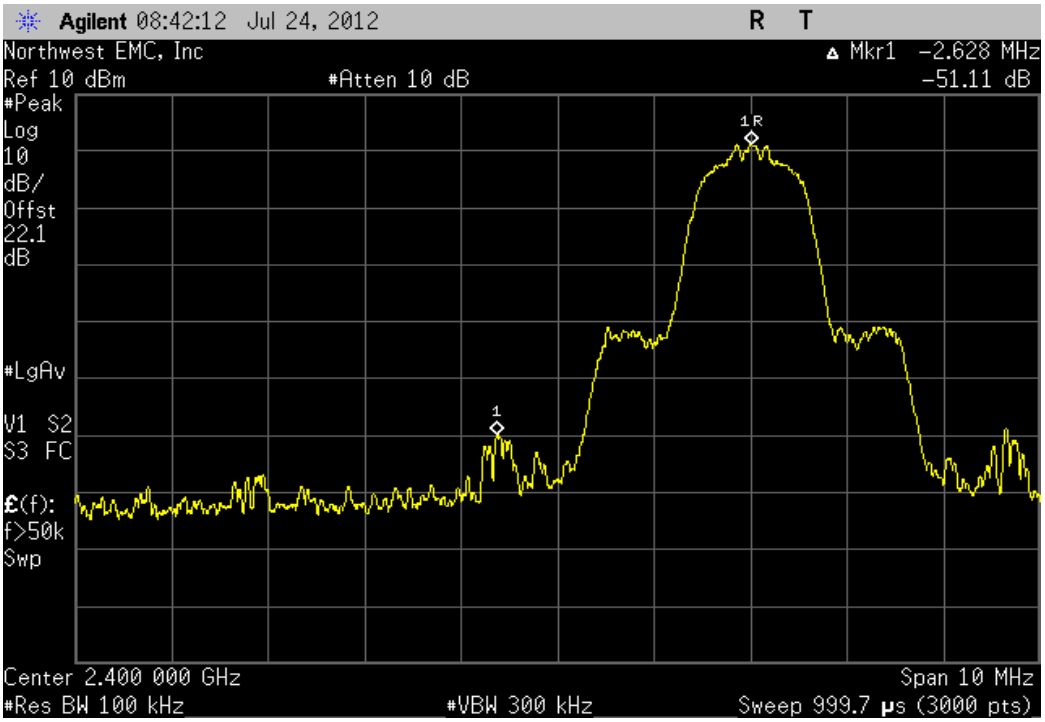
| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -57.95 dBc | ≤ -20 dBc | Pass |



# Band Edge Compliance

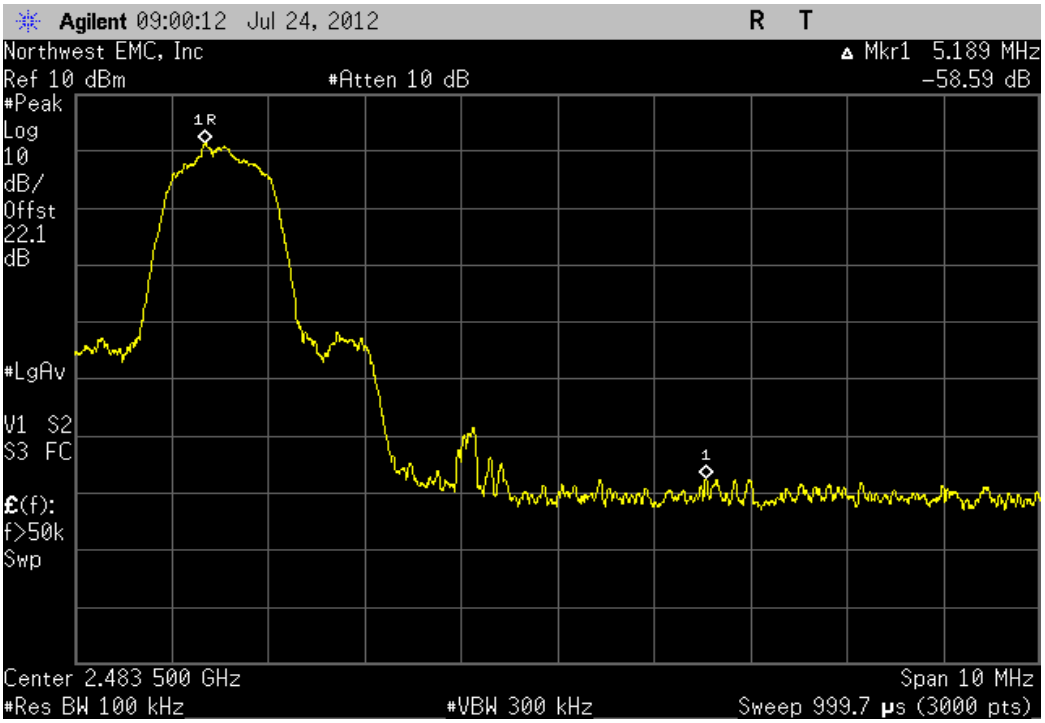
Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Low Channel, 2402 MHz

| Value | Limit | Result |
|---|---|---|
| -51.11 dBc | ≤ -20 dBc | Pass |




Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, High Channel, 2480 MHz

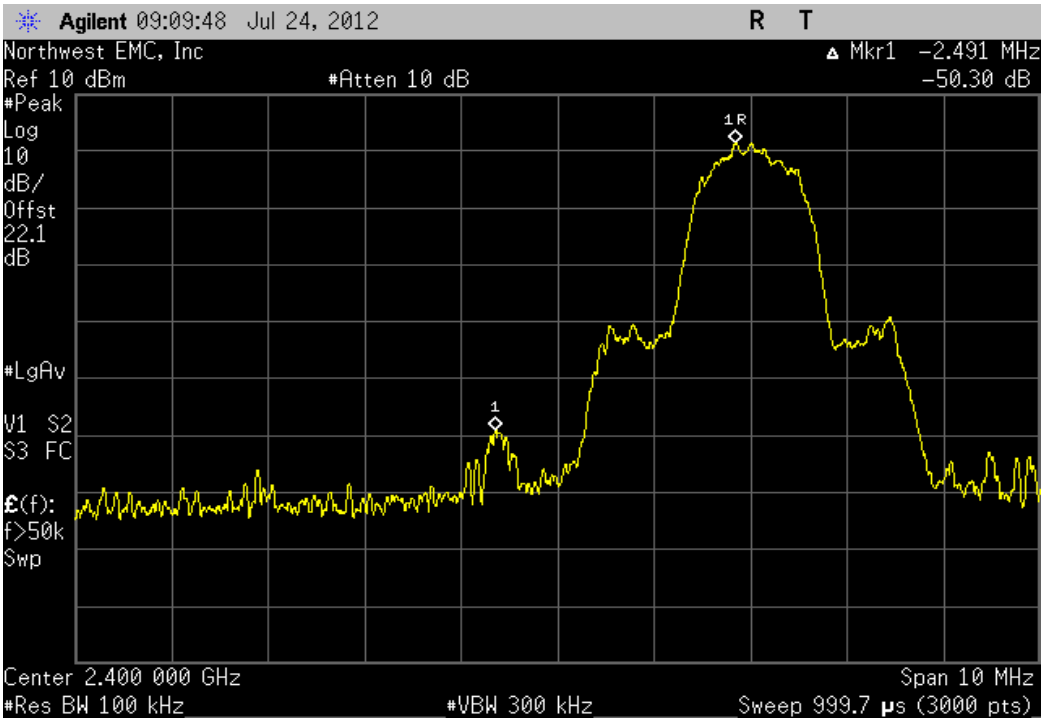
| Value | Limit | Result |
|---|---|---|
| -58.59 dBc | ≤ -20 dBc | Pass |



# Band Edge Compliance

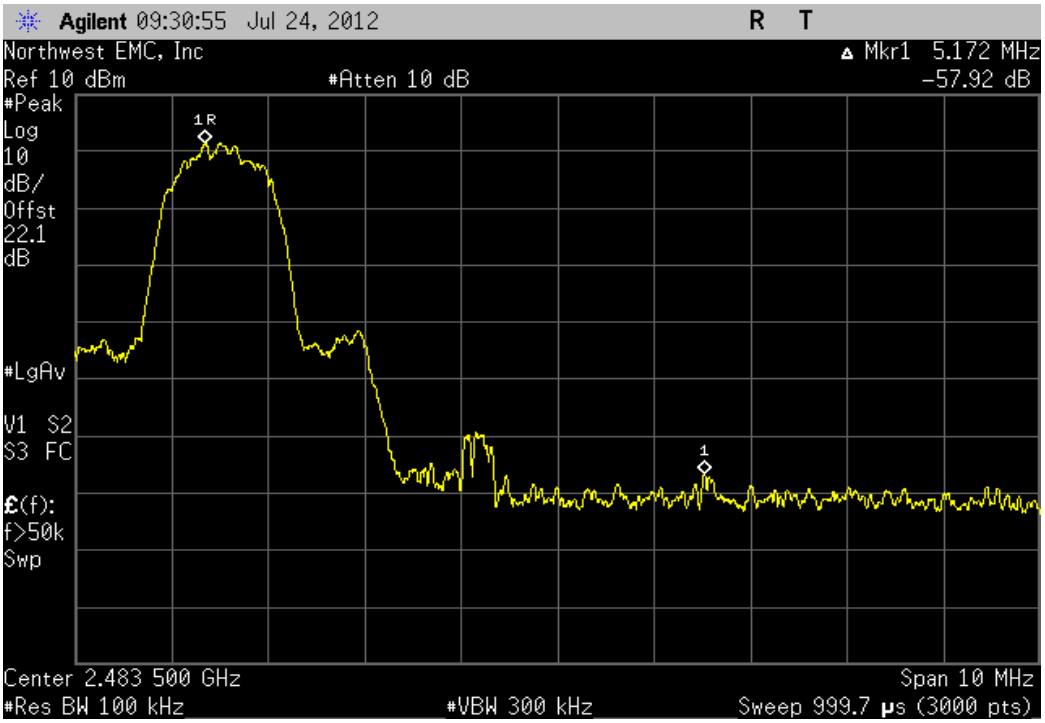
Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -50.3 dBc | ≤ -20 dBc | Pass |



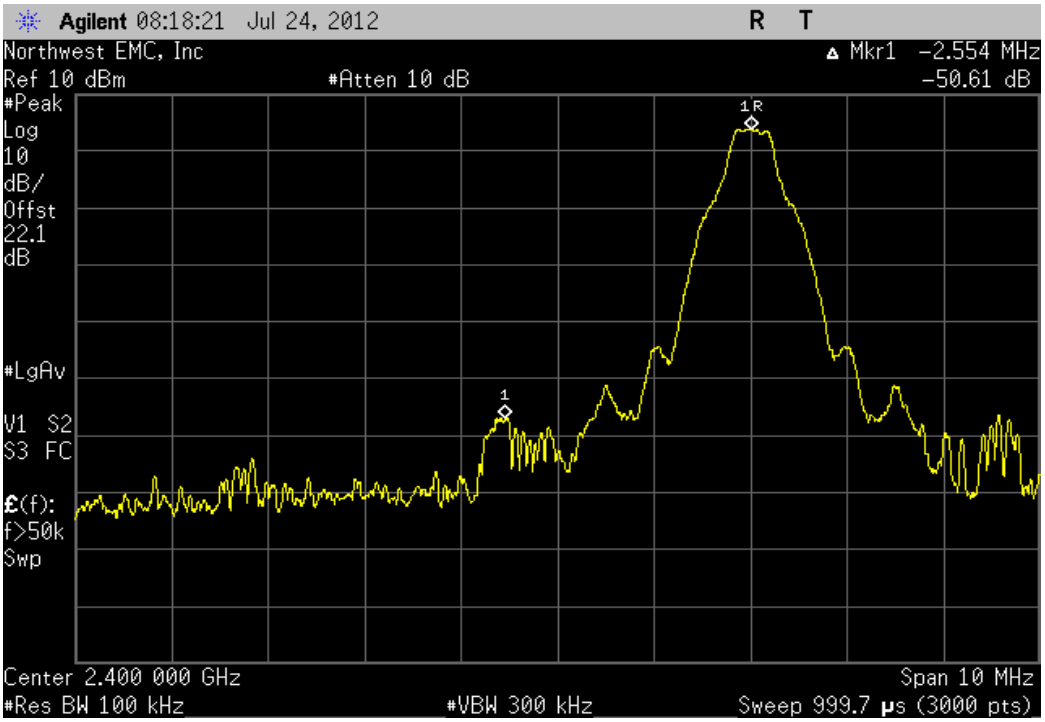

Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -57.92 dBc | ≤ -20 dBc | Pass |



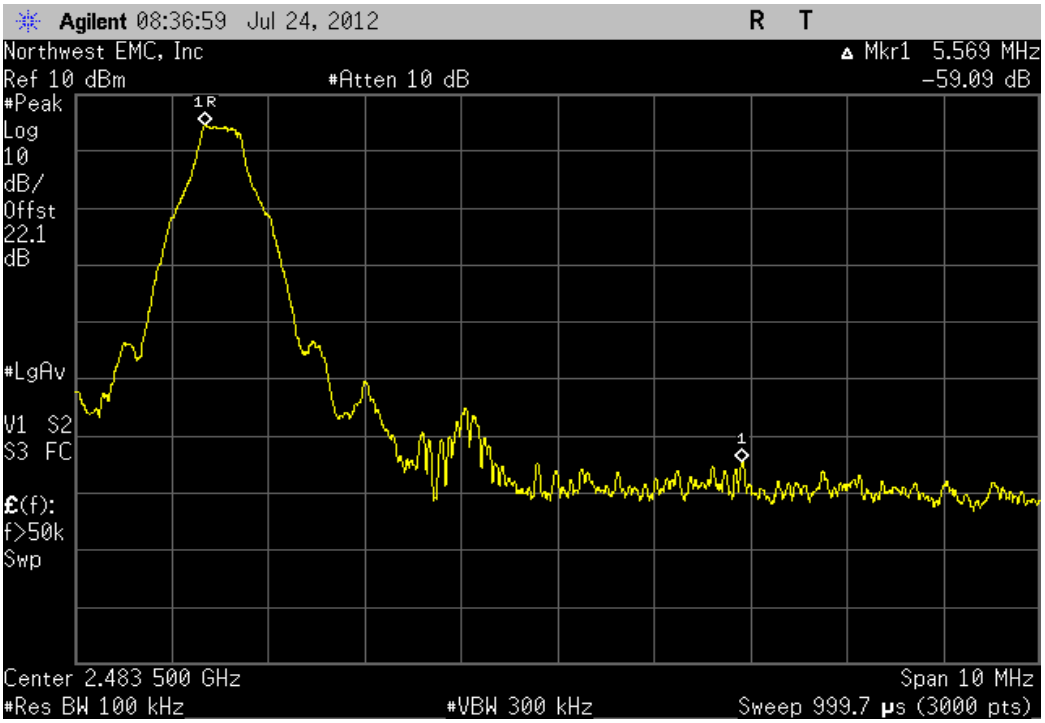
Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -50.61 dBc | ≤ -20 dBc | Pass |




Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, High Channel, 2480 MHz

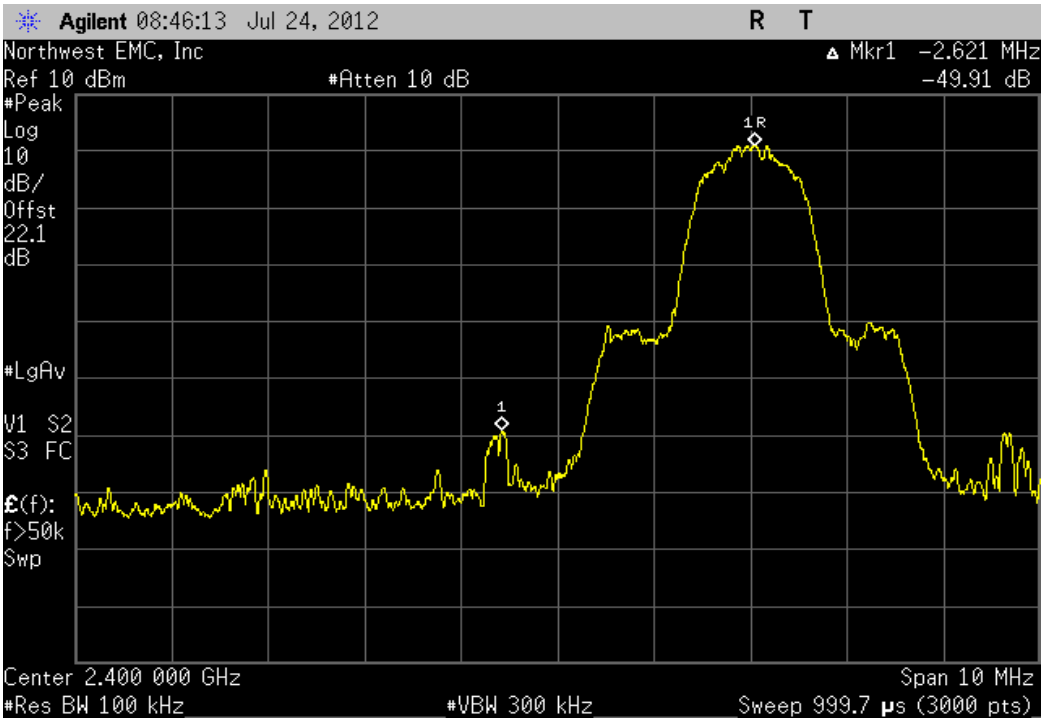
| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -59.09 dBc | ≤ -20 dBc | Pass |



# Band Edge Compliance

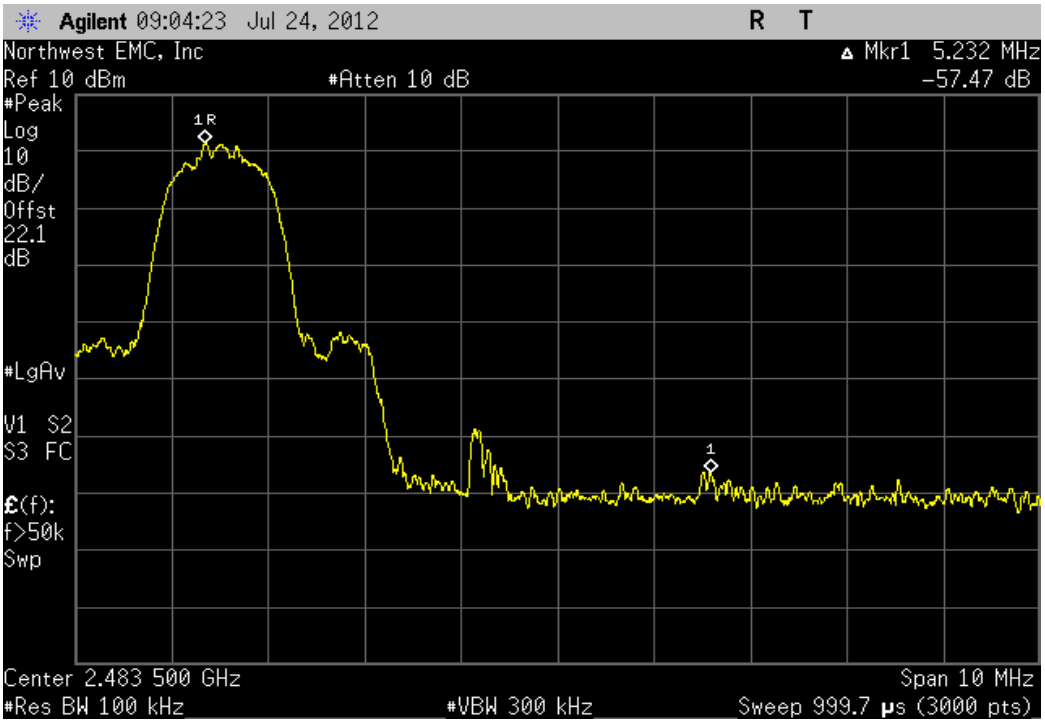
Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -49.91 dBc | ≤ -20 dBc | Pass |



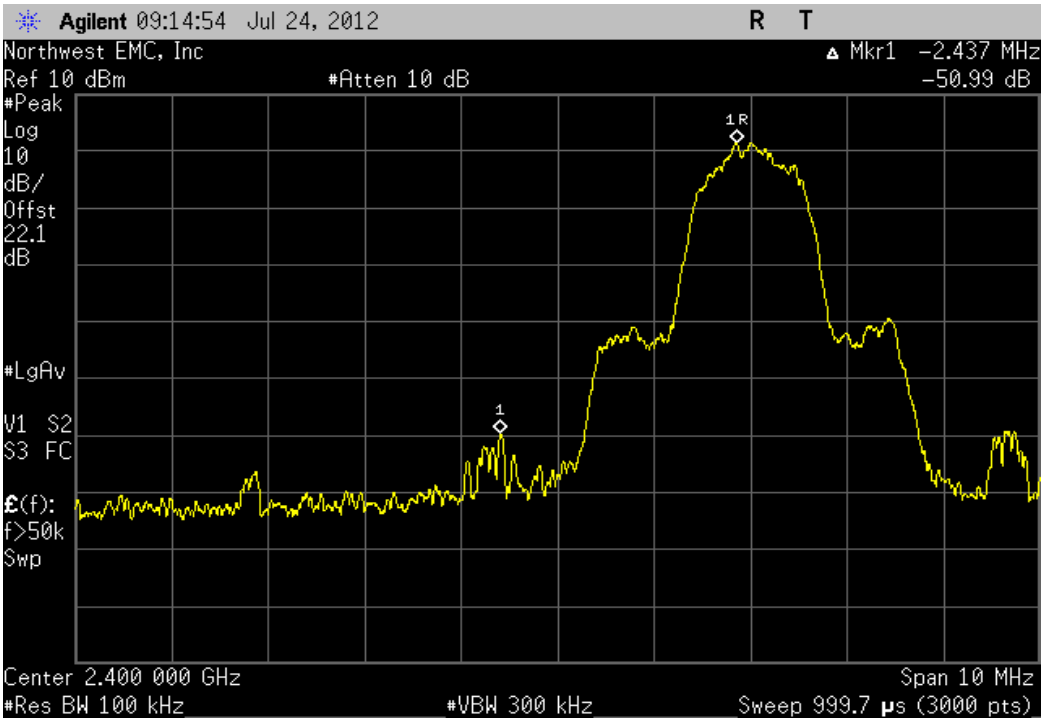

Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -57.47 dBc | ≤ -20 dBc | Pass |



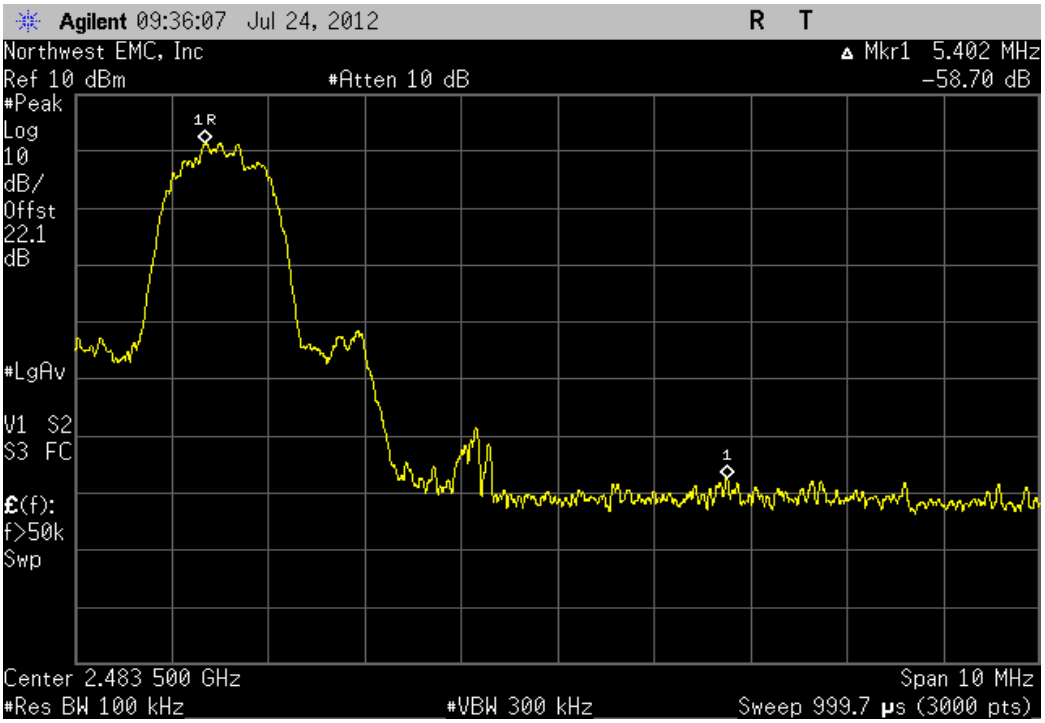
Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Low Channel, 2402 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -50.99 dBc | ≤ -20 dBc | Pass |




Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, High Channel, 2480 MHz

| | | | | Value | Limit | Result |
|---|---|---|---|---|---|---|
| | | | | -58.7 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 |

**MEASUREMENT UNCERTAINTY**

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**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:** | Intellis - Models 97745 (PTM), 97755 (RTM) | | | **Work Order:** | MDTR0182 |
| **Serial Number:** | NLD001683N | | | **Date:** | 07/24/12 |
| **Customer:** | Medtronic Inc. | | | **Temperature:** | 24.36°C |
| **Attendees:** | None | | | **Humidity:** | 58% |
| **Project:** | None | | | **Barometric Pres.:** | 1014.4 |
| **Tested by:** | Bryan Weller | **Power:** | 5 VDC, Battery | **Job Site:** | MN08 |

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

**COMMENTS**

Per MDTR0043 test plan configuration: 9 and 10.

**DEVIATIONS FROM TEST STANDARD**

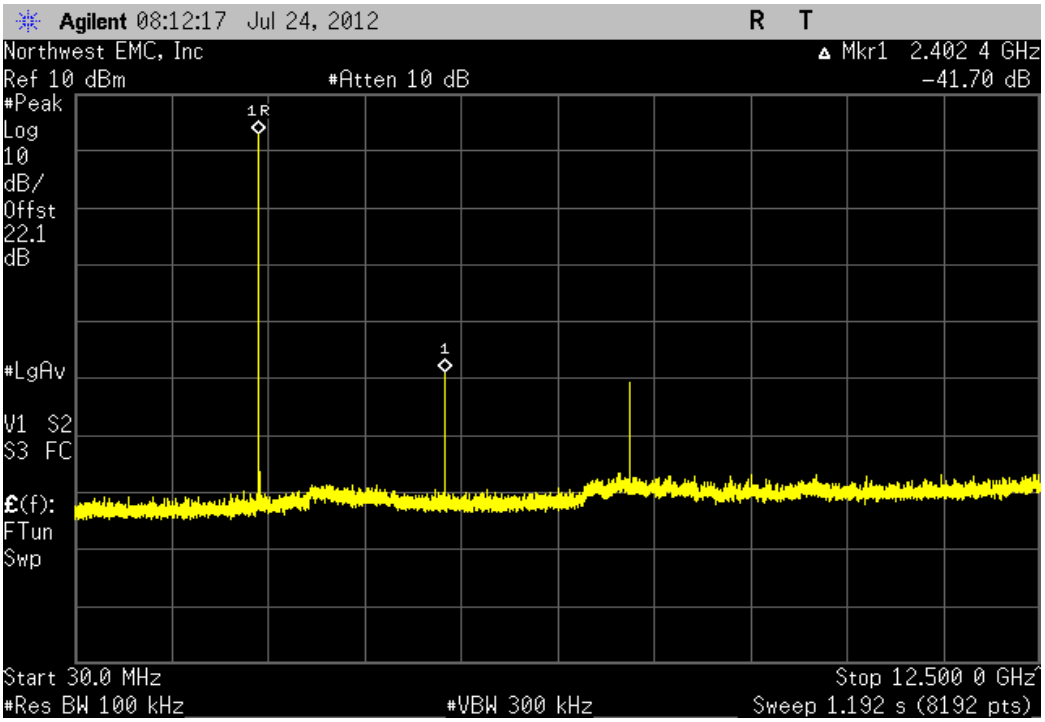
No Deviations

| Configuration # | 8,10 | Signature: Bryan Weller |
|---|---|---|

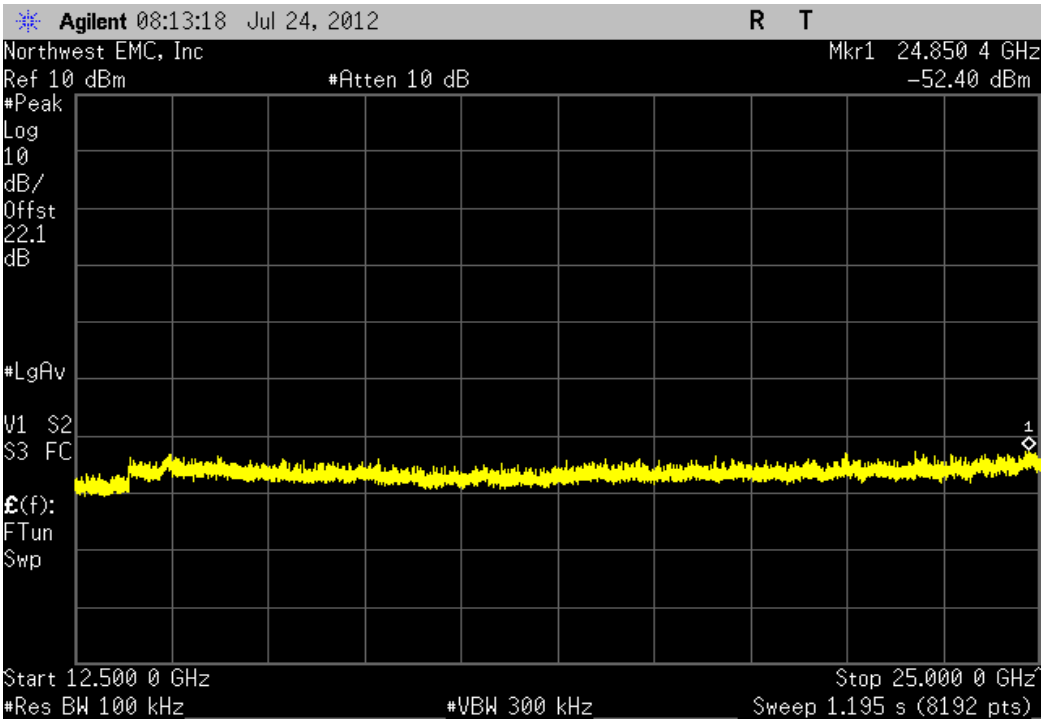
| | Frequency Range | Value | Limit | Result |
|---|---|---|---|---|
| Per MDTR043 test plan configuration: 9 (AC Adapter) | | | | |
| DH5, GFSK | | | | |
| Low Channel, 2402 MHz | 30 MHz - 12.5 GHz | -41.7 dBc | ≤ -20 dBc | Pass |
| Low Channel, 2402 MHz | 12.5 GHz - 25 GHz | -55.37 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 30 MHz - 12.5 GHz | -43.58 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 12.5 GHz - 25 GHz | -56.58 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 30 MHz - 12.5 GHz | -42.91 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 12.5 GHz - 25 GHz | -56.53 dBc | ≤ -20 dBc | Pass |
| 2DH5, 4-DQPSK | | | | |
| Low Channel, 2402 MHz | 30 MHz - 12.5 GHz | -41.97 dBc | ≤ -20 dBc | Pass |
| Low Channel, 2402 MHz | 12.5 GHz - 25 GHz | -51.34 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 30 MHz - 12.5 GHz | -41.76 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 12.5 GHz - 25 GHz | -51.35 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 30 MHz - 12.5 GHz | -44.8 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 12.5 GHz - 25 GHz | -52.8 dBc | ≤ -20 dBc | Pass |
| 3DH5, 8-DPSK | | | | |
| Low Channel, 2402 MHz | 30 MHz - 12.5 GHz | -40.35 dBc | ≤ -20 dBc | Pass |
| Low Channel, 2402 MHz | 12.5 GHz - 25 GHz | -51.74 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 30 MHz - 12.5 GHz | -44.61 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 12.5 GHz - 25 GHz | -52.02 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 30 MHz - 12.5 GHz | -44.89 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 12.5 GHz - 25 GHz | -53.1 dBc | ≤ -20 dBc | Pass |
| Per MDTR043 test plan configuration: 10 (Battery) | | | | |
| DH5, GFSK | | | | |
| Low Channel, 2402 MHz | 30 MHz - 12.5 GHz | -41.92 dBc | ≤ -20 dBc | Pass |
| Low Channel, 2402 MHz | 12.5 GHz - 25 GHz | -55.62 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 30 MHz - 12.5 GHz | -42.69 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 12.5 GHz - 25 GHz | -56.41 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 30 MHz - 12.5 GHz | -43.1 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 12.5 GHz - 25 GHz | -55.45 dBc | ≤ -20 dBc | Pass |
| 2DH5, 4-DQPSK | | | | |
| Low Channel, 2402 MHz | 30 MHz - 12.5 GHz | -41.94 dBc | ≤ -20 dBc | Pass |
| Low Channel, 2402 MHz | 12.5 GHz - 25 GHz | -51.54 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 30 MHz - 12.5 GHz | -45.59 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 12.5 GHz - 25 GHz | -53.84 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 30 MHz - 12.5 GHz | -46.16 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 12.5 GHz - 25 GHz | -53.02 dBc | ≤ -20 dBc | Pass |
| 3DH5, 8-DPSK | | | | |
| Low Channel, 2402 MHz | 30 MHz - 12.5 GHz | -41.33 dBc | ≤ -20 dBc | Pass |
| Low Channel, 2402 MHz | 12.5 GHz - 25 GHz | -52.12 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 30 MHz - 12.5 GHz | -44.66 dBc | ≤ -20 dBc | Pass |
| Mid Channel, 2441 MHz | 12.5 GHz - 25 GHz | -53.15 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 30 MHz - 12.5 GHz | -46.32 dBc | ≤ -20 dBc | Pass |
| High Channel, 2480 MHz | 12.5 GHz - 25 GHz | -51.16 dBc | ≤ -20 dBc | Pass |

# Spurious Conducted Emissions

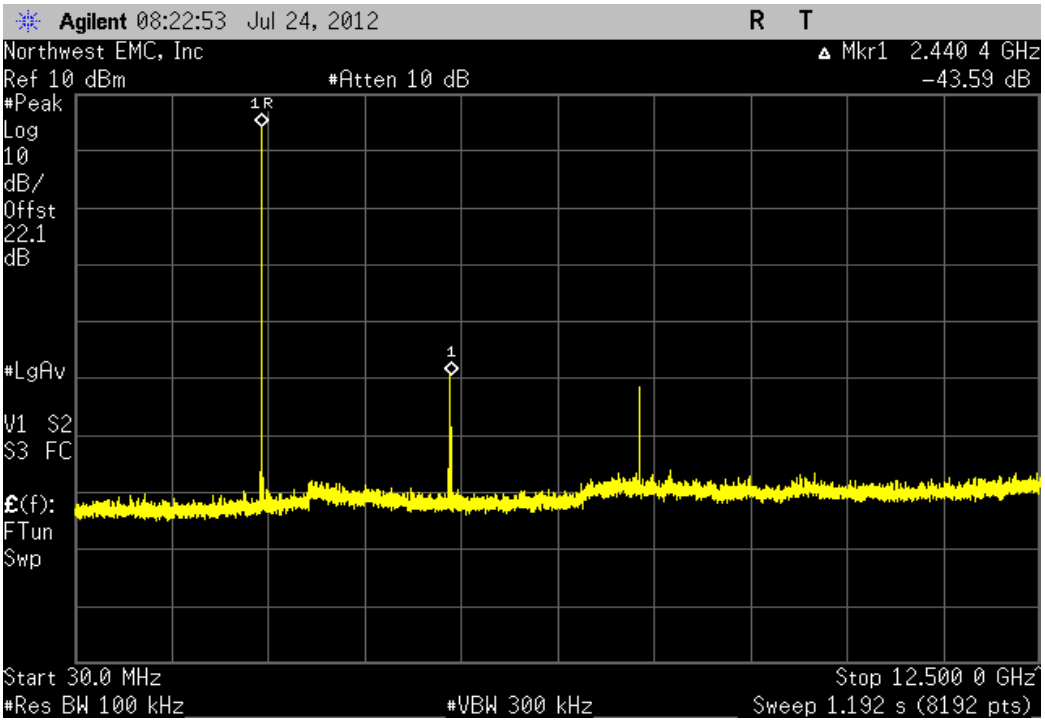
| Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Low Channel, 2402 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -41.7 dBc | ≤ -20 dBc | Pass |



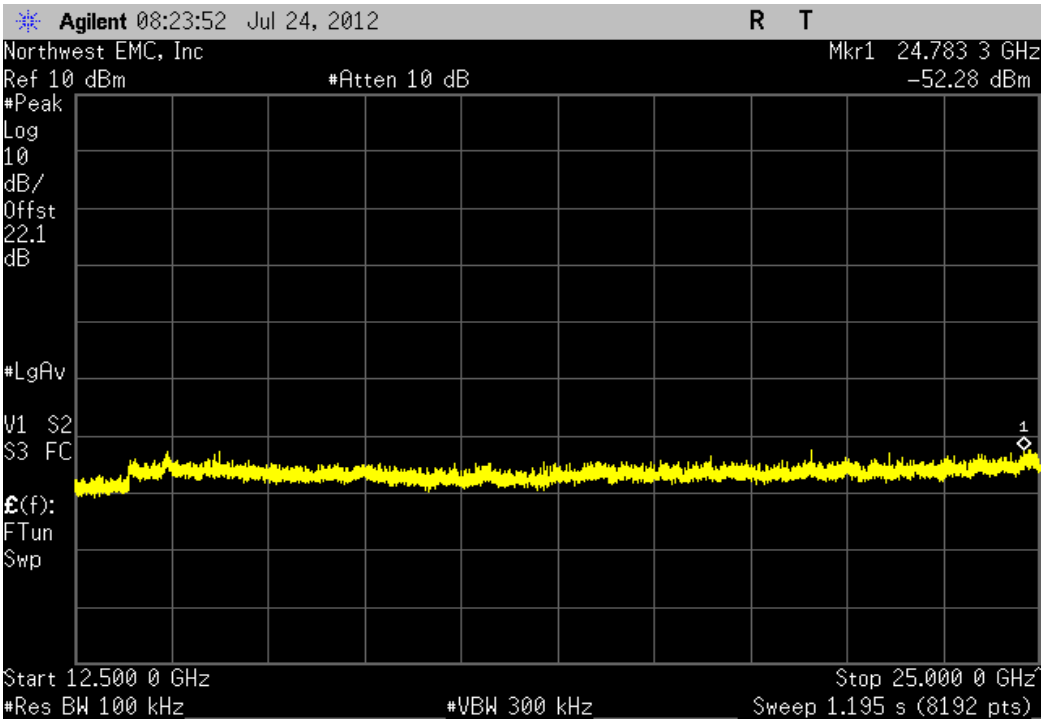

| Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Low Channel, 2402 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -55.37 dBc | ≤ -20 dBc | Pass |



| Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -43.58 dBc | ≤ -20 dBc | Pass |

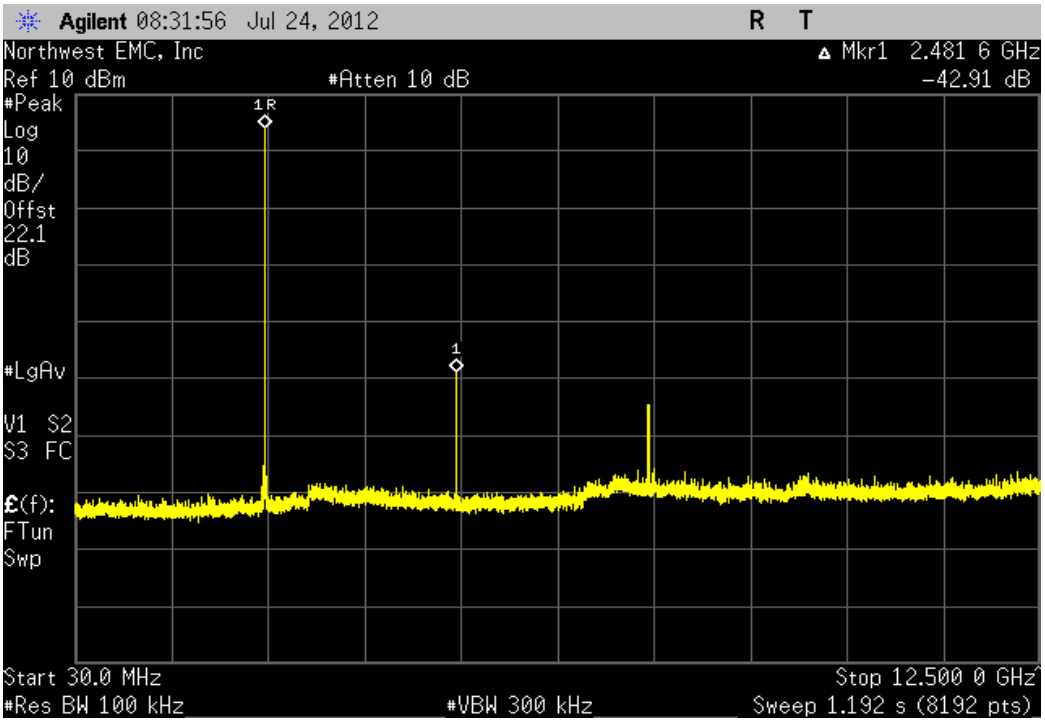



| Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -56.58 dBc | ≤ -20 dBc | Pass |

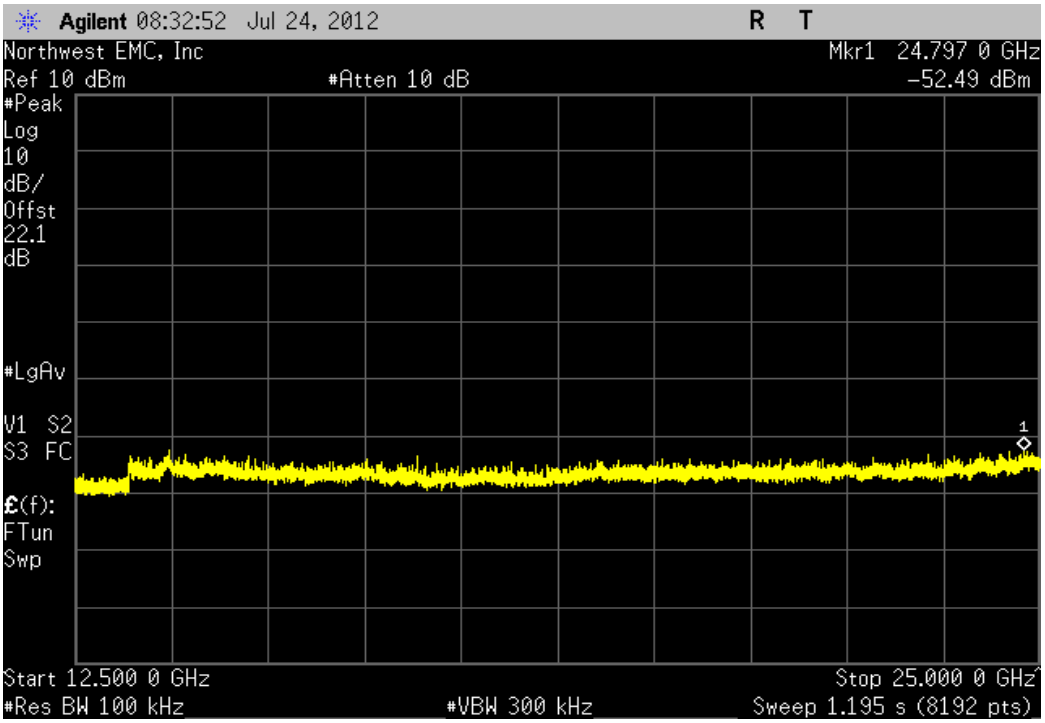


# Spurious Conducted Emissions

| Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -42.91 dBc | ≤ -20 dBc | Pass |

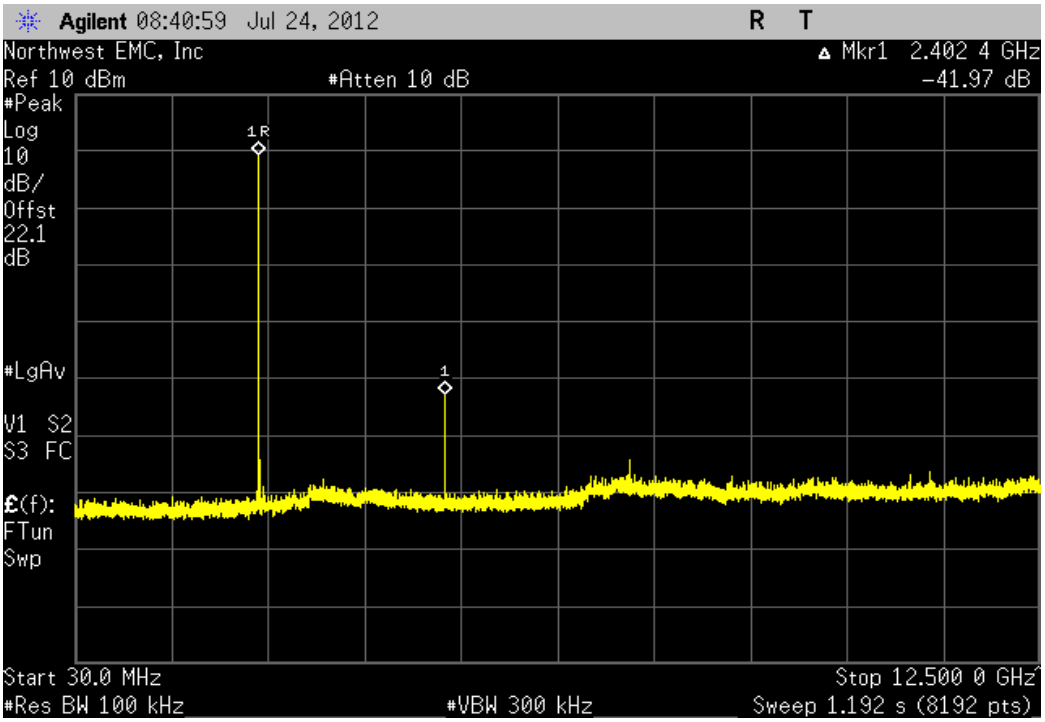



| Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -56.53 dBc | ≤ -20 dBc | Pass |

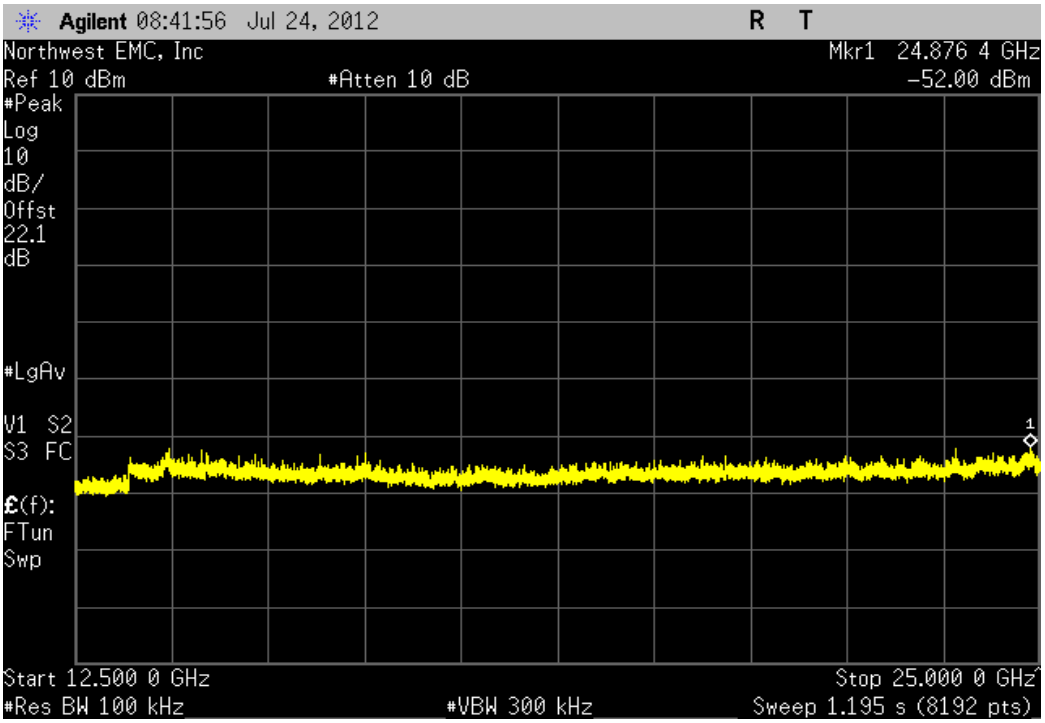


# Spurious Conducted Emissions

| Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Low Channel, 2402 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -41.97 dBc | ≤ -20 dBc | Pass |

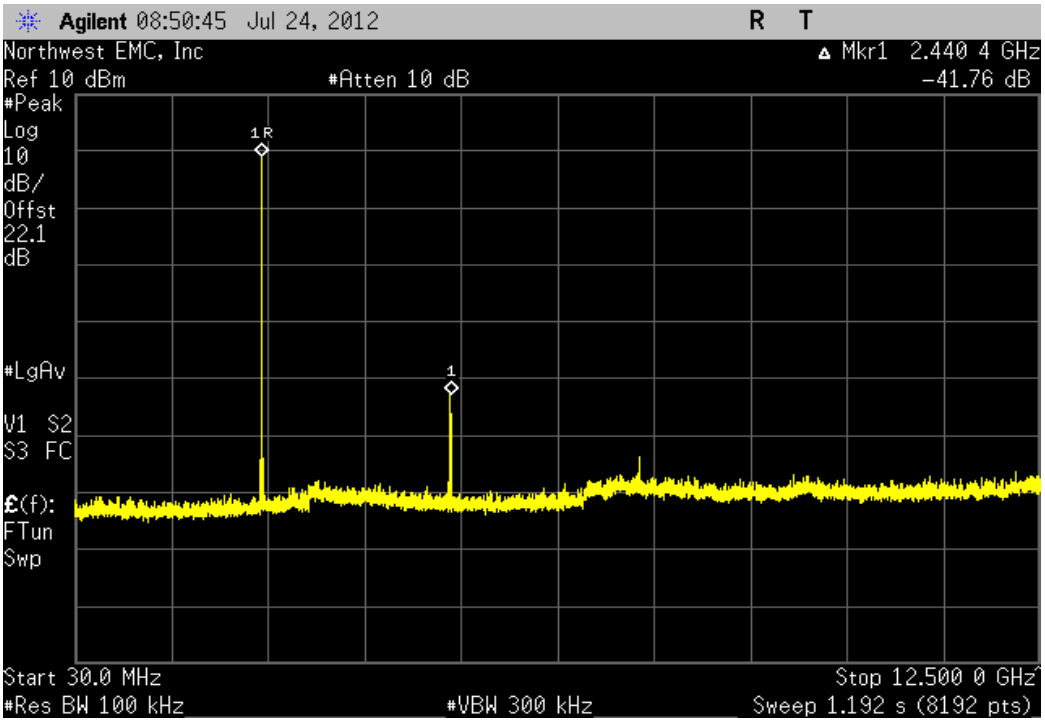



| Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Low Channel, 2402 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -51.34 dBc | ≤ -20 dBc | Pass |

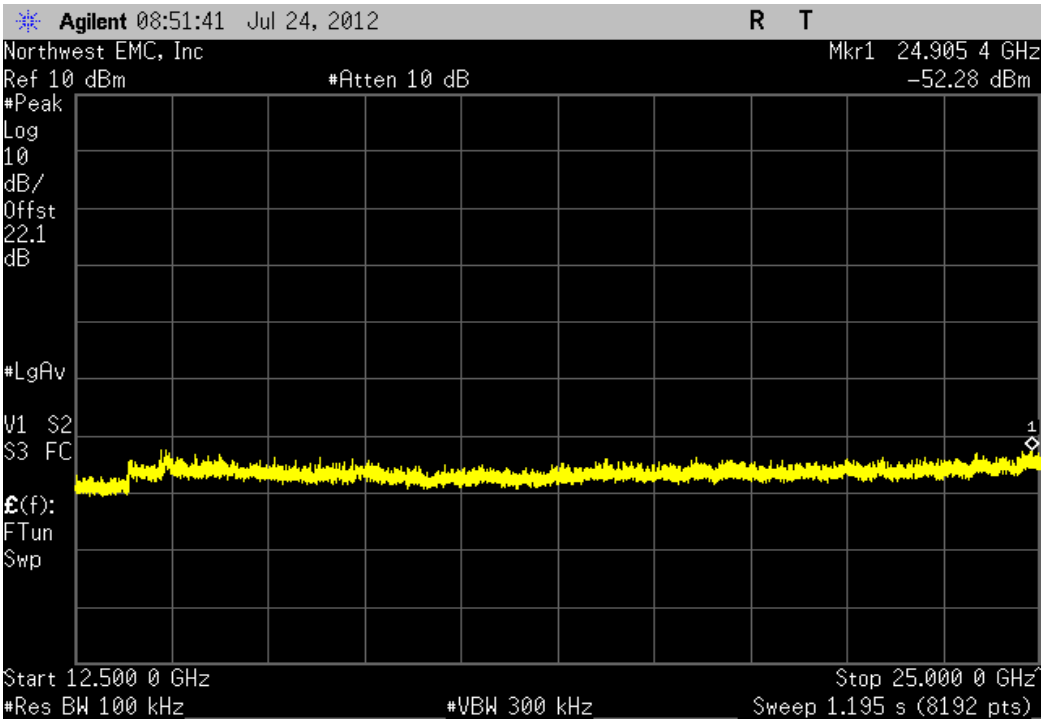


# Spurious Conducted Emissions

| Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -41.76 dBc | ≤ -20 dBc | Pass |

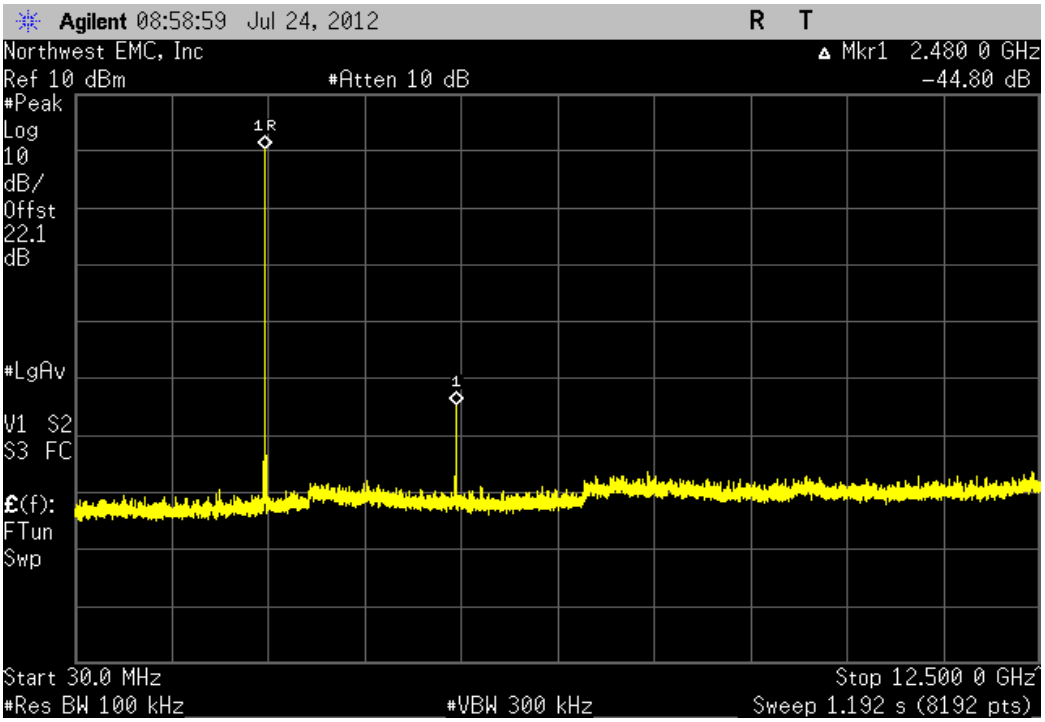



| Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -51.35 dBc | ≤ -20 dBc | Pass |

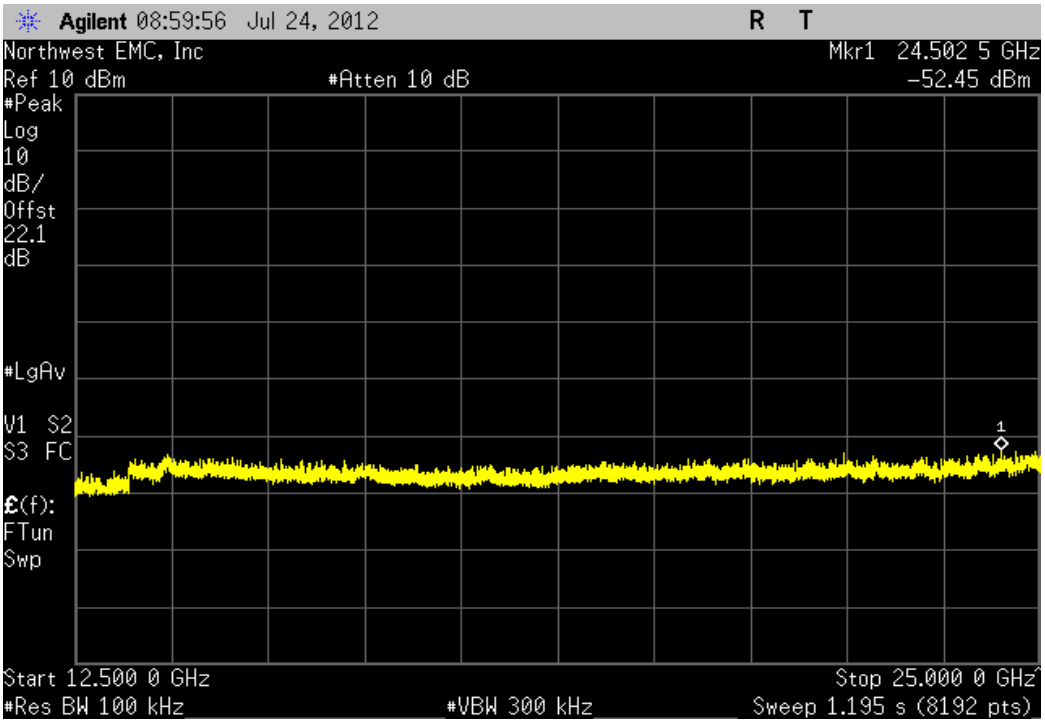


# Spurious Conducted Emissions

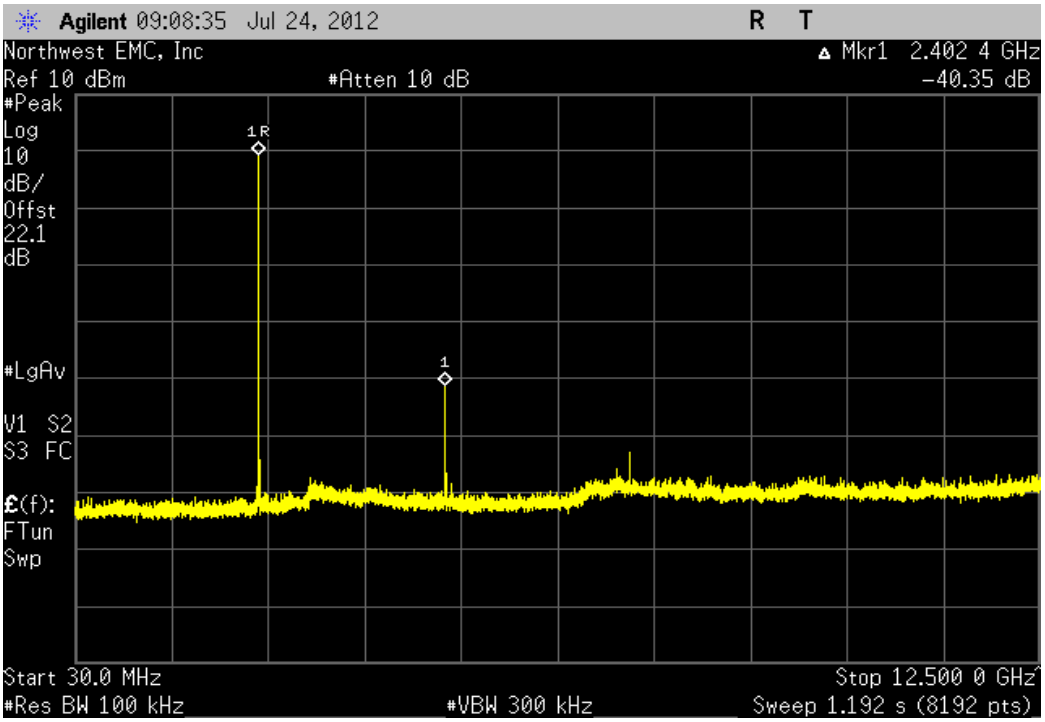
| Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -44.8 dBc | ≤ -20 dBc | Pass |



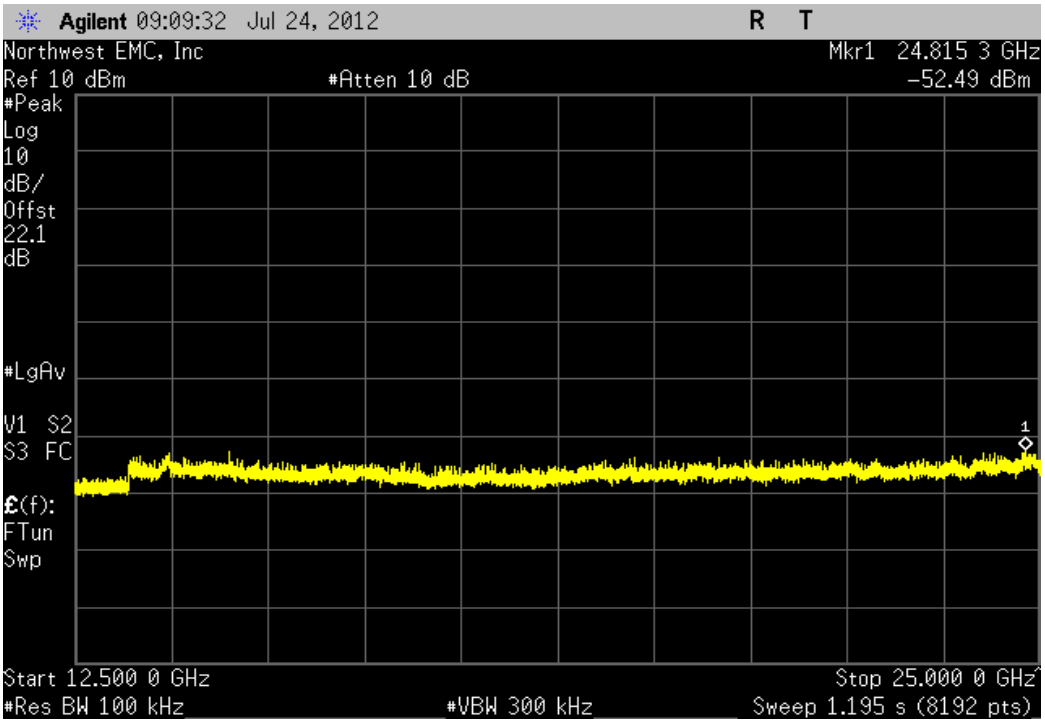

| Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -52.8 dBc | ≤ -20 dBc | Pass |



| Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Low Channel, 2402 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -40.35 dBc | ≤ -20 dBc | Pass |

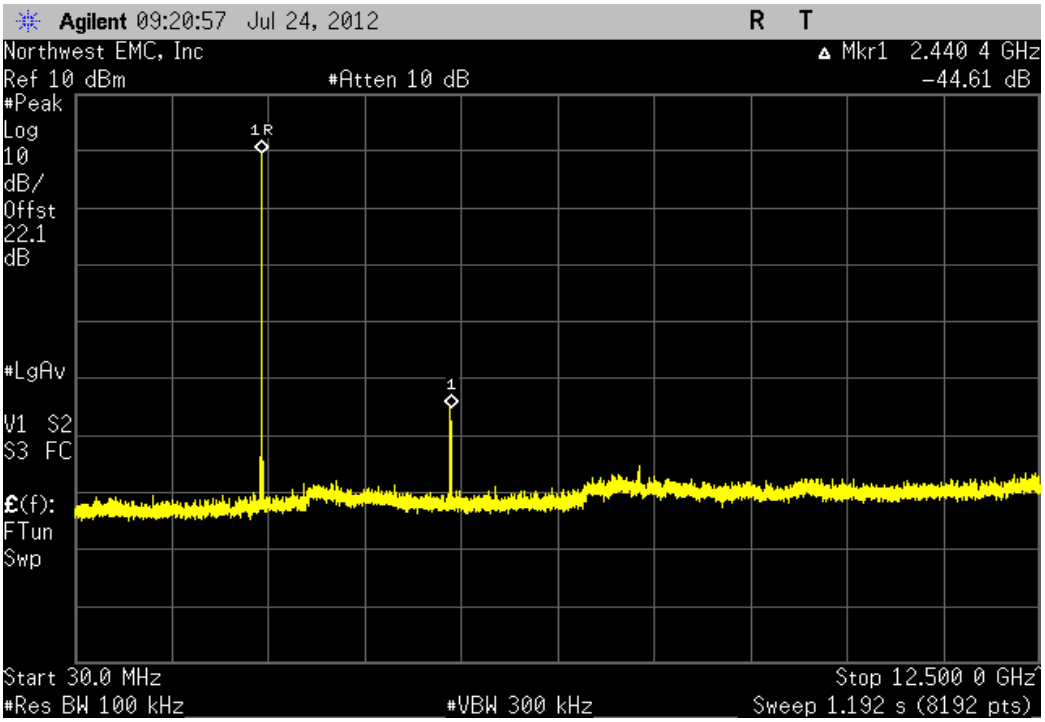



| Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Low Channel, 2402 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -51.74 dBc | ≤ -20 dBc | Pass |

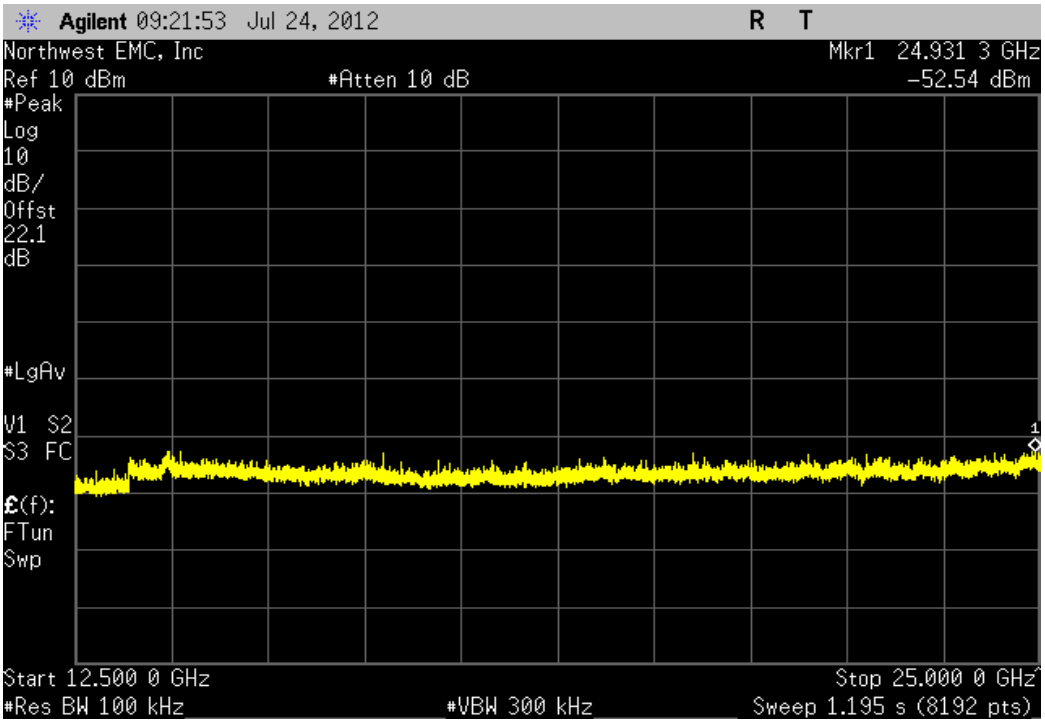


# Spurious Conducted Emissions

| Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -44.61 dBc | ≤ -20 dBc | Pass |

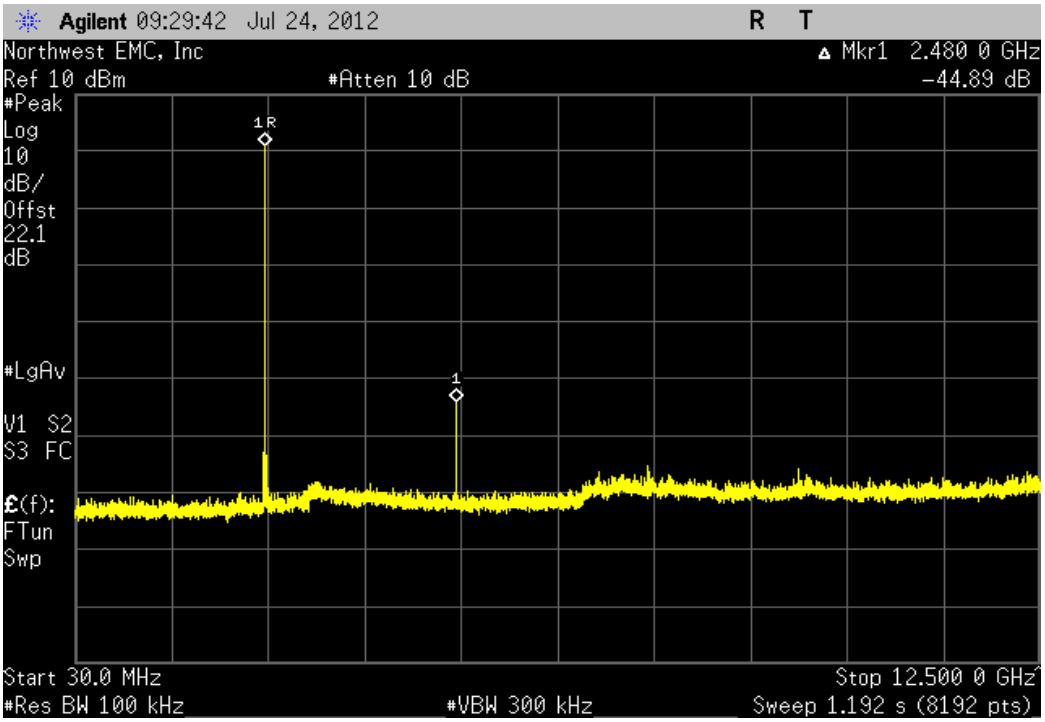



| Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -52.02 dBc | ≤ -20 dBc | Pass |

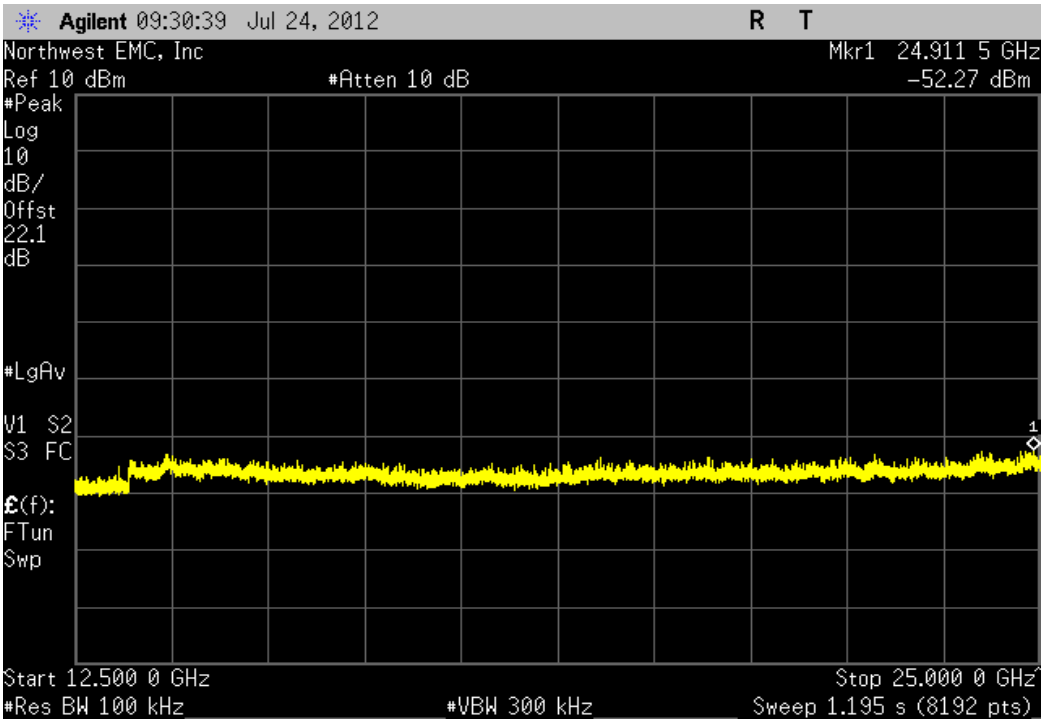


# Spurious Conducted Emissions

| Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -44.89 dBc | ≤ -20 dBc | Pass |

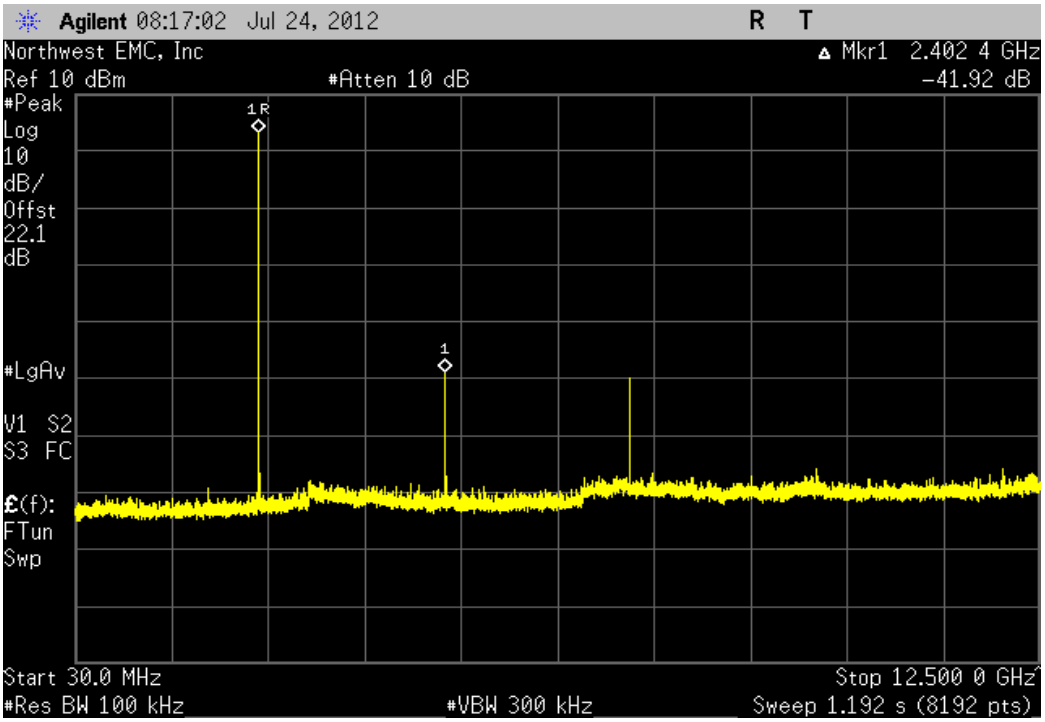



| Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -53.1 dBc | ≤ -20 dBc | Pass |

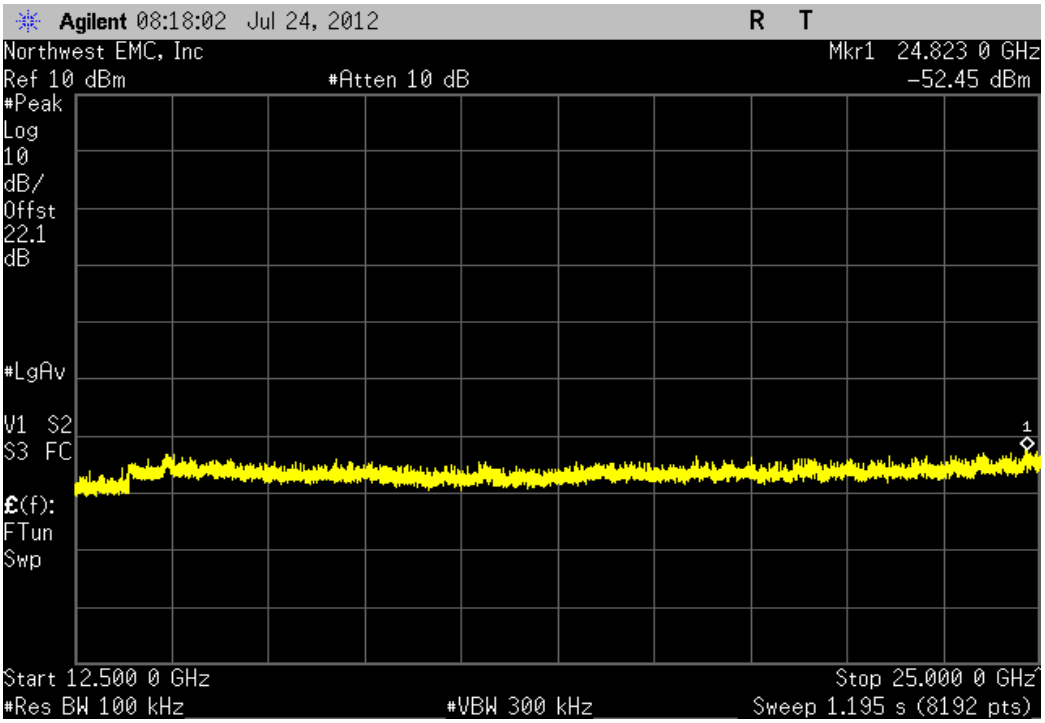


# Spurious Conducted Emissions

| Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Low Channel, 2402 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -41.92 dBc | ≤ -20 dBc | Pass |

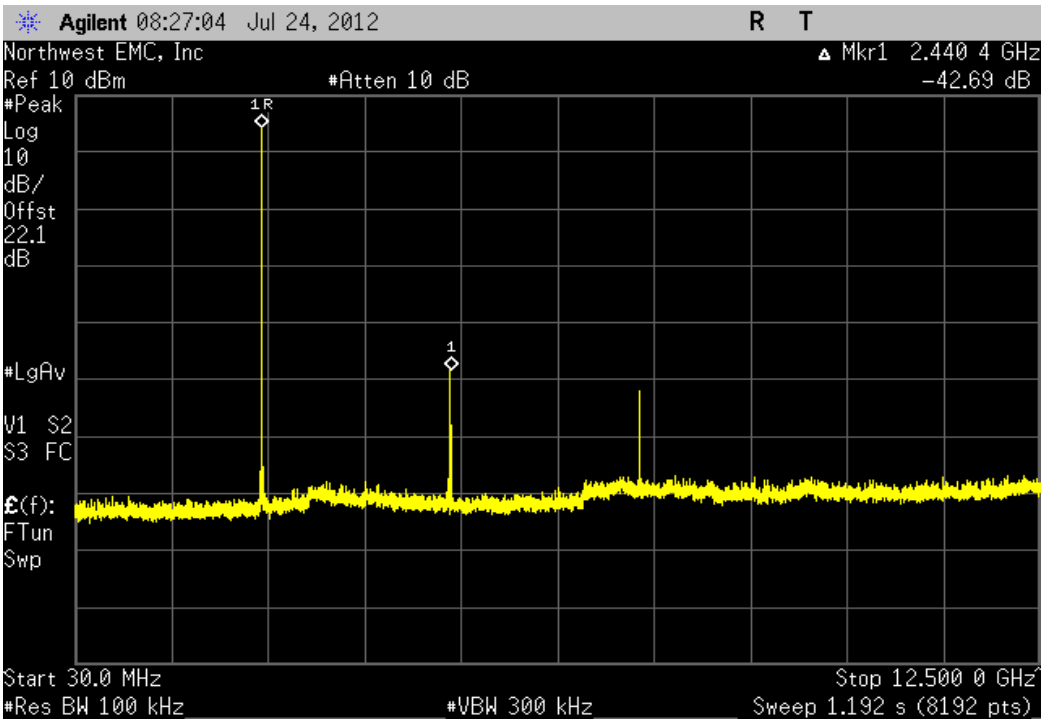



| Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Low Channel, 2402 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -55.62 dBc | ≤ -20 dBc | Pass |

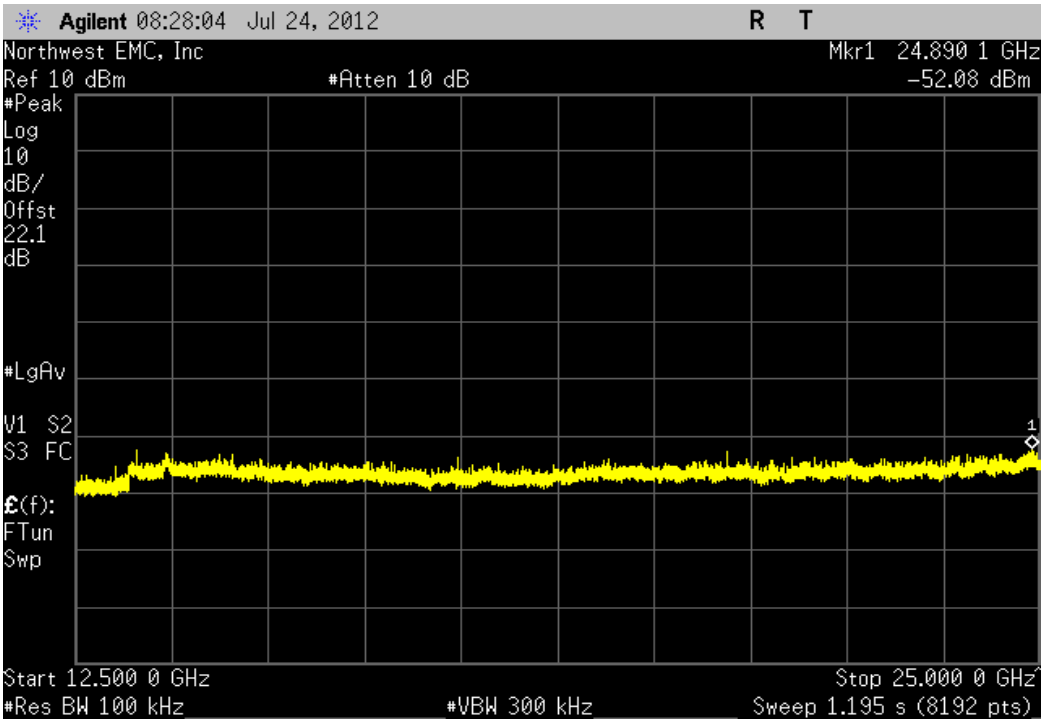


# Spurious Conducted Emissions

| Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -42.69 dBc | ≤ -20 dBc | Pass |

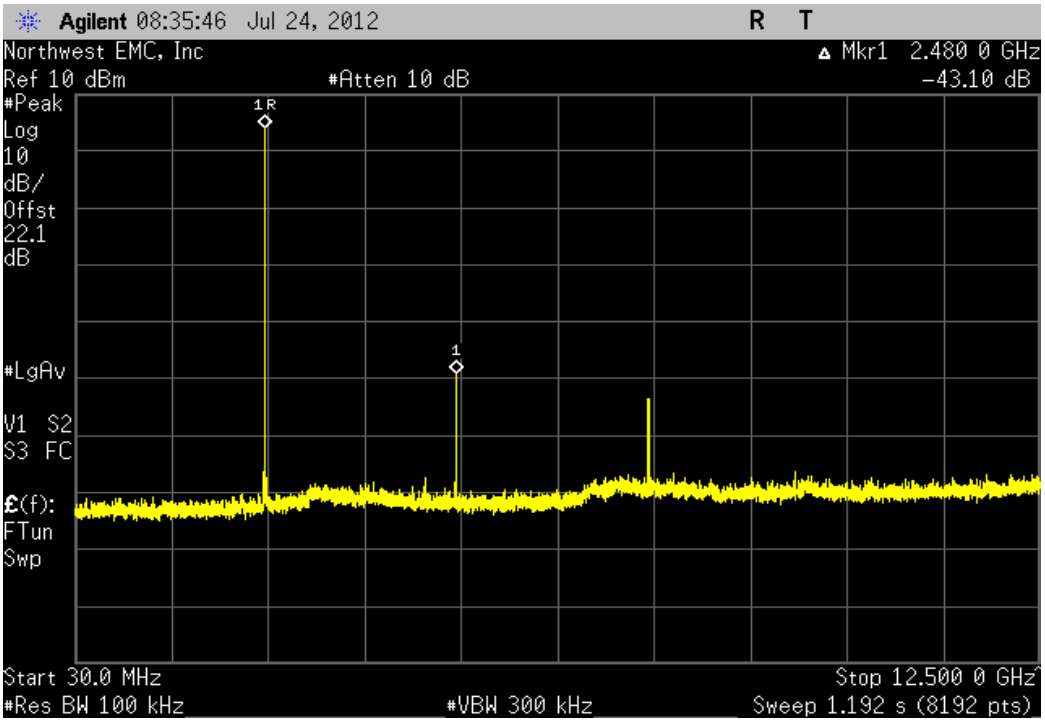



| Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -56.41 dBc | ≤ -20 dBc | Pass |

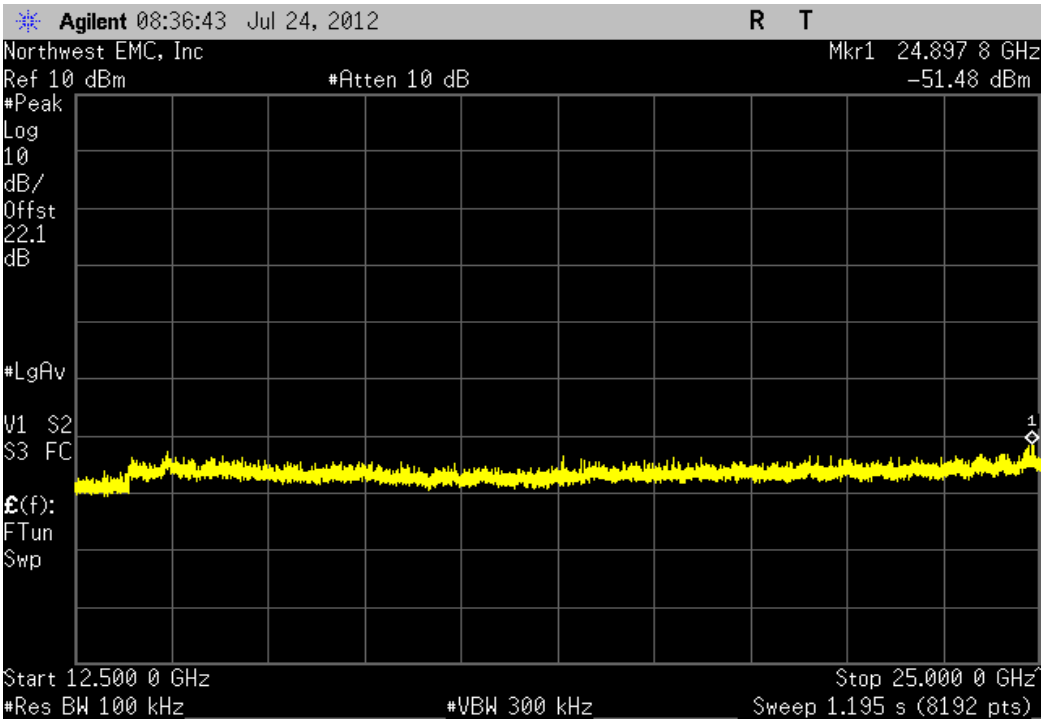


# Spurious Conducted Emissions

| Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -43.1 dBc | ≤ -20 dBc | Pass |



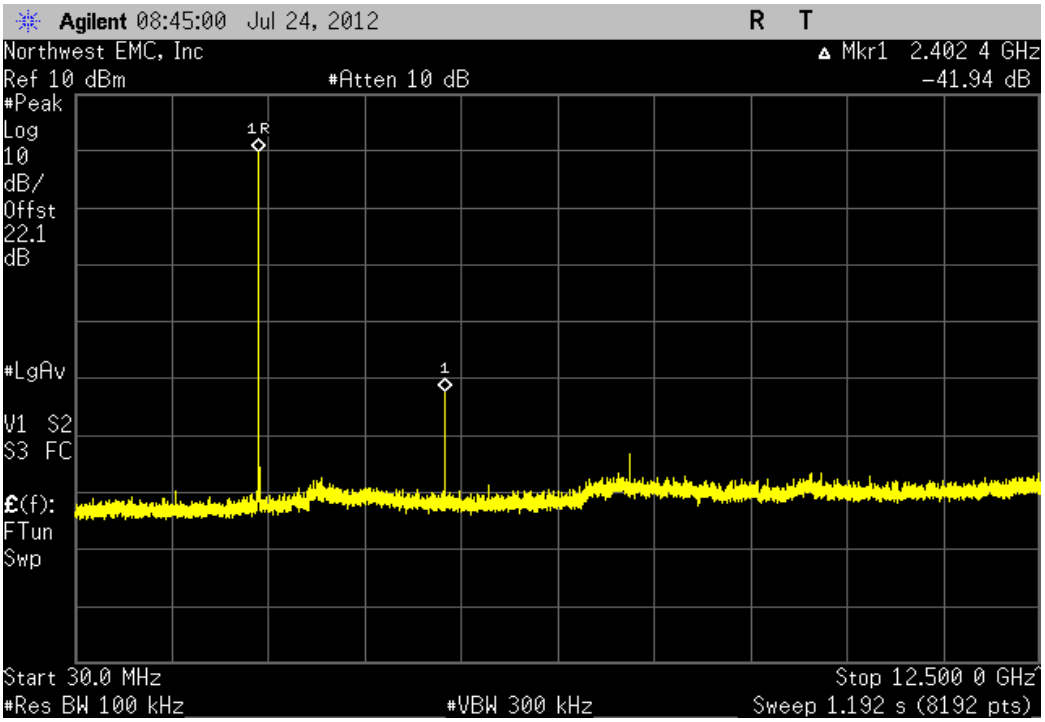

| Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -55.45 dBc | ≤ -20 dBc | Pass |



# Spurious Conducted Emissions

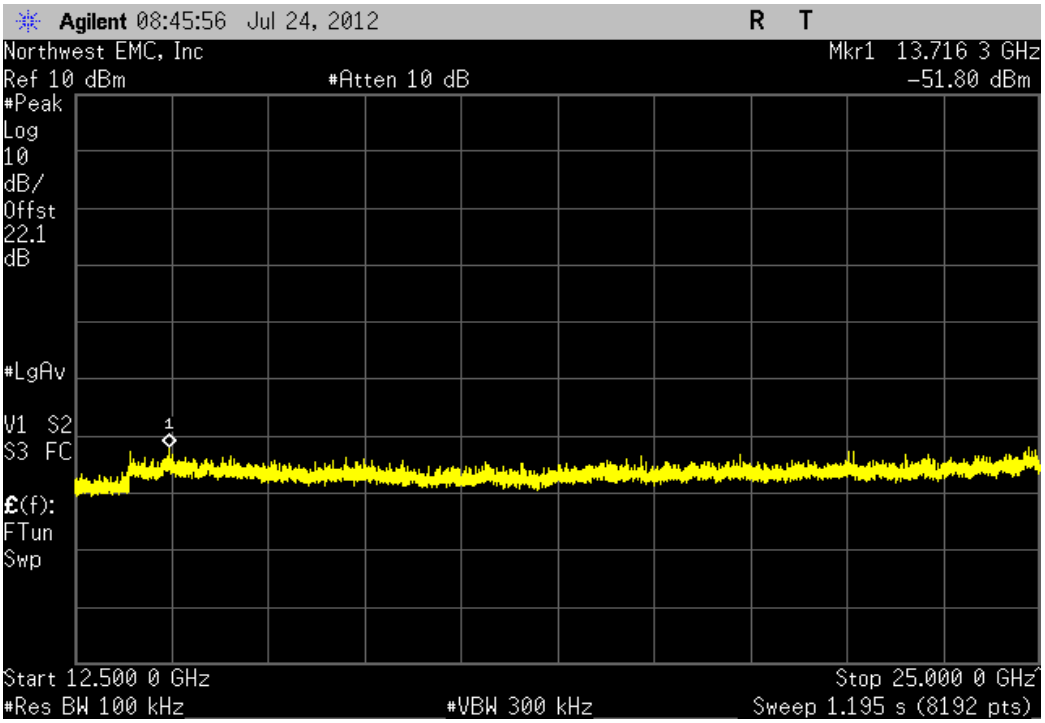
Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Low Channel, 2402 MHz

| Frequency Range | | Value | Limit | Result |
|---|---|---|---|---|
| 30 MHz - 12.5 GHz | | -41.94 dBc | ≤ -20 dBc | Pass |

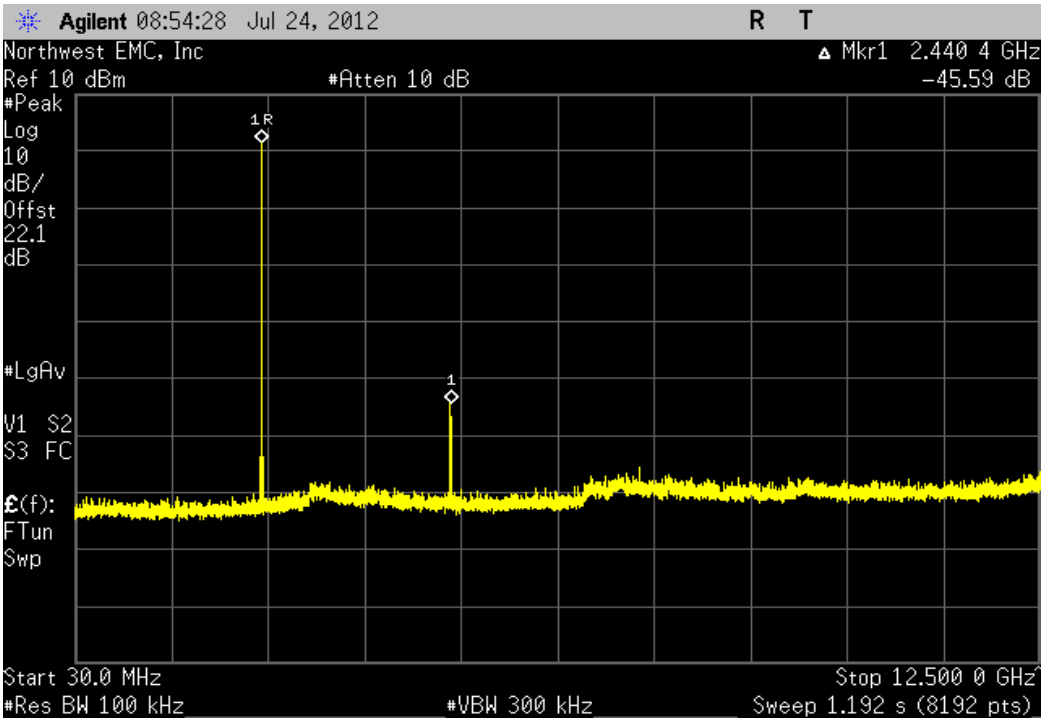



Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Low Channel, 2402 MHz

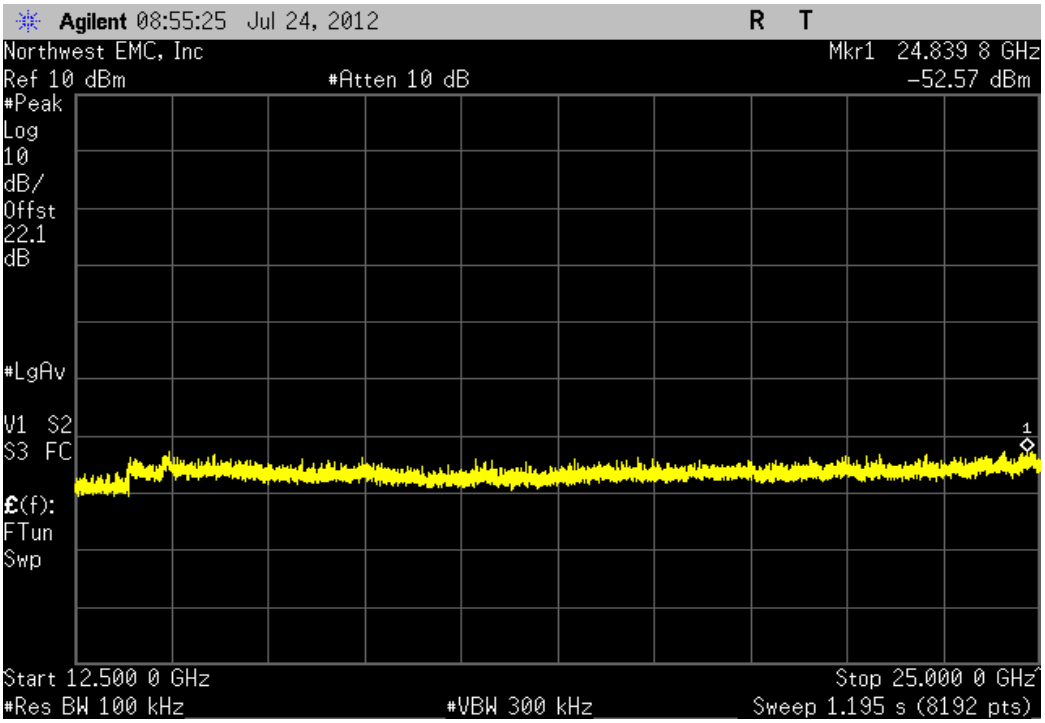
| Frequency Range | | Value | Limit | Result |
|---|---|---|---|---|
| 12.5 GHz - 25 GHz | | -51.54 dBc | ≤ -20 dBc | Pass |



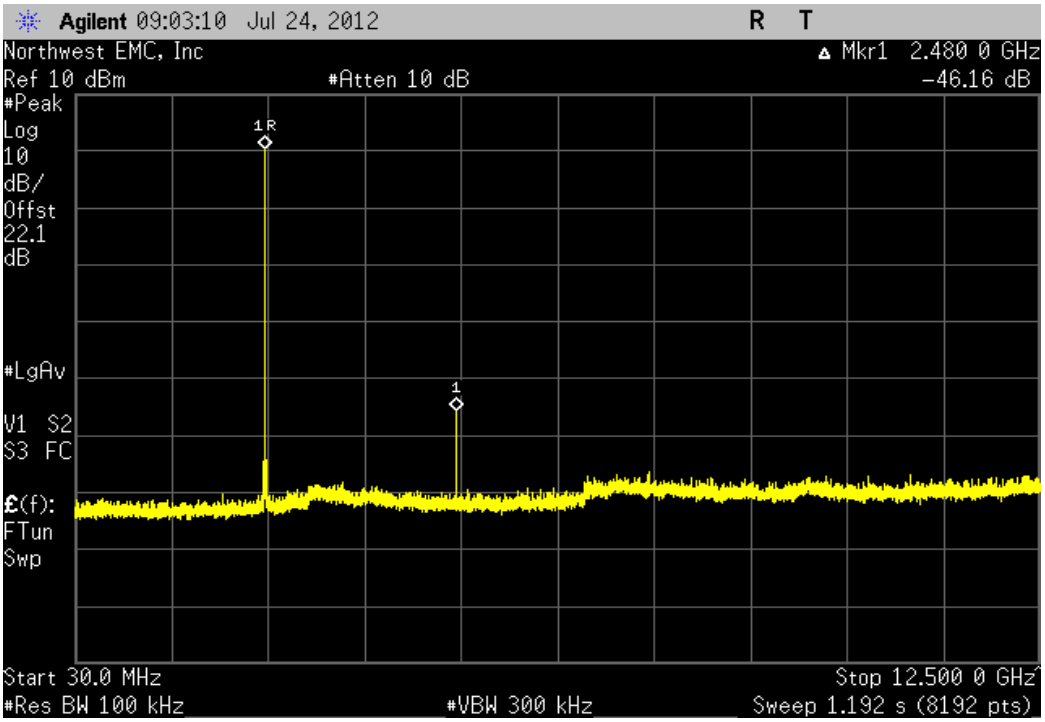
| Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -45.59 dBc | ≤ -20 dBc | Pass |



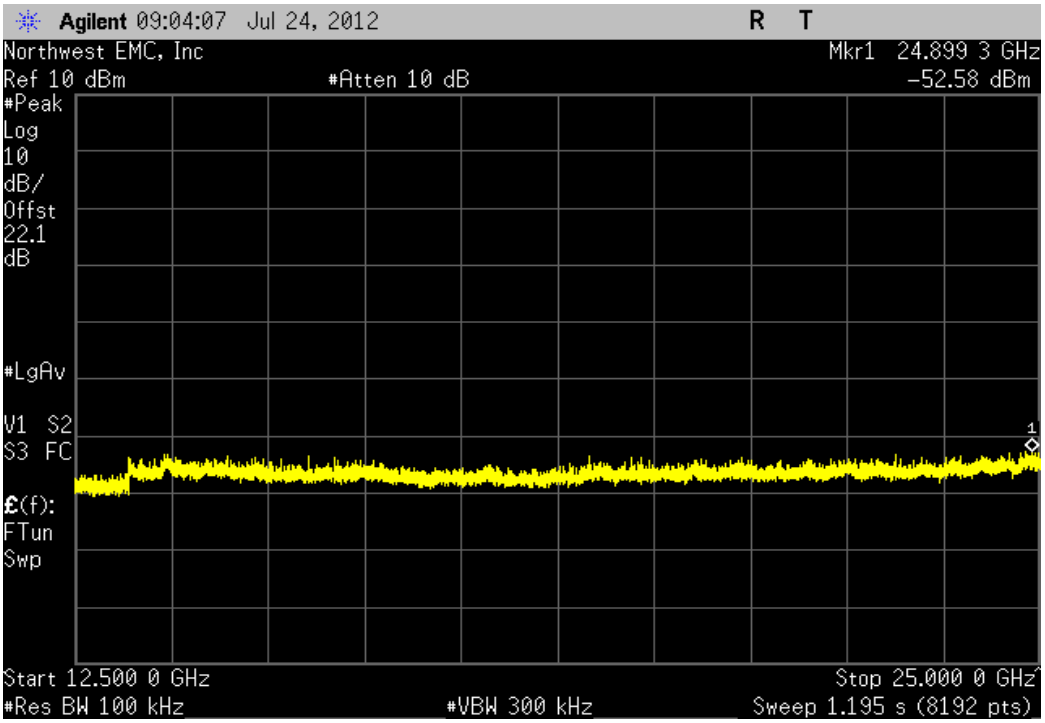

| Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -53.84 dBc | ≤ -20 dBc | Pass |



| Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -46.16 dBc | ≤ -20 dBc | Pass |

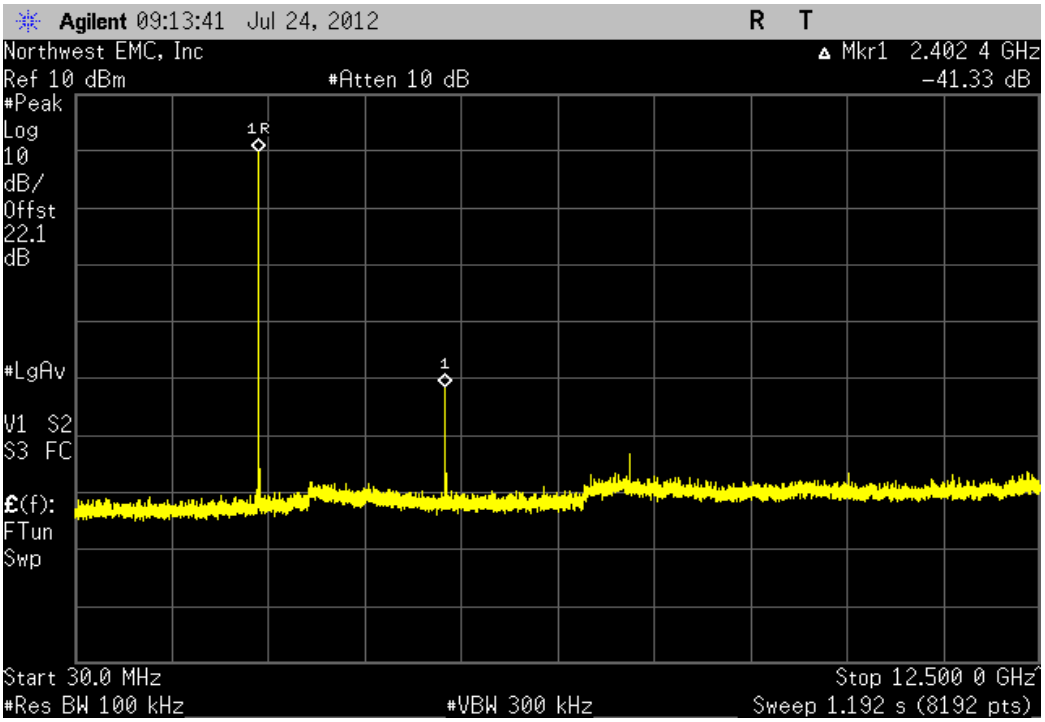



| Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -53.02 dBc | ≤ -20 dBc | Pass |

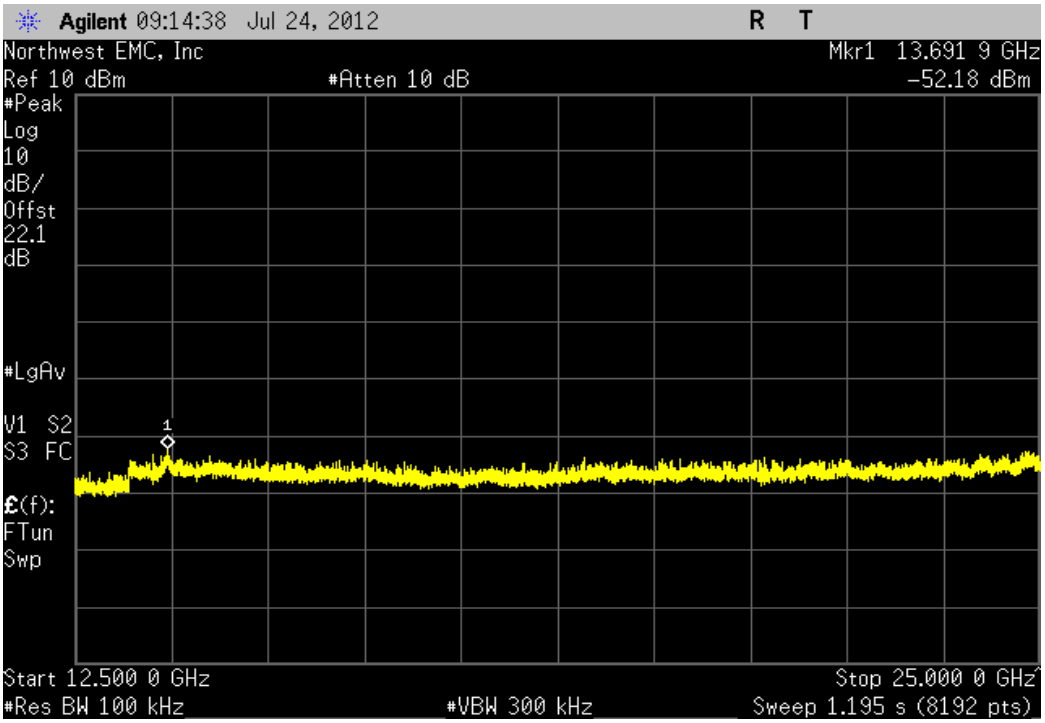


# Spurious Conducted Emissions

| Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Low Channel, 2402 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -41.33 dBc | ≤ -20 dBc | Pass |

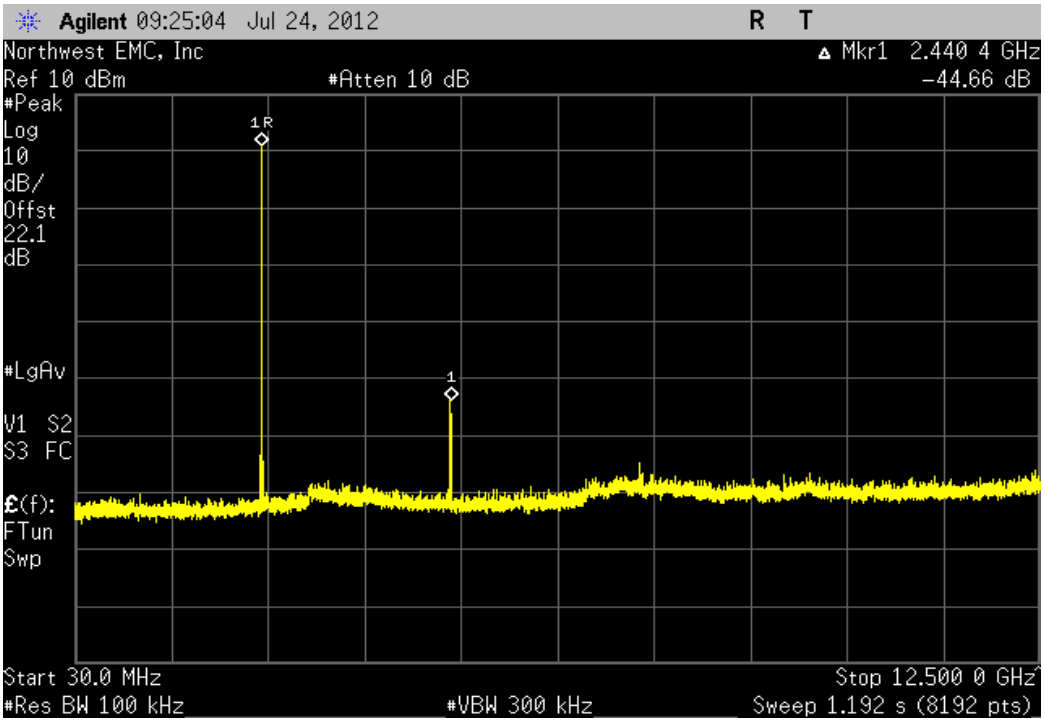



| Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Low Channel, 2402 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -52.12 dBc | ≤ -20 dBc | Pass |

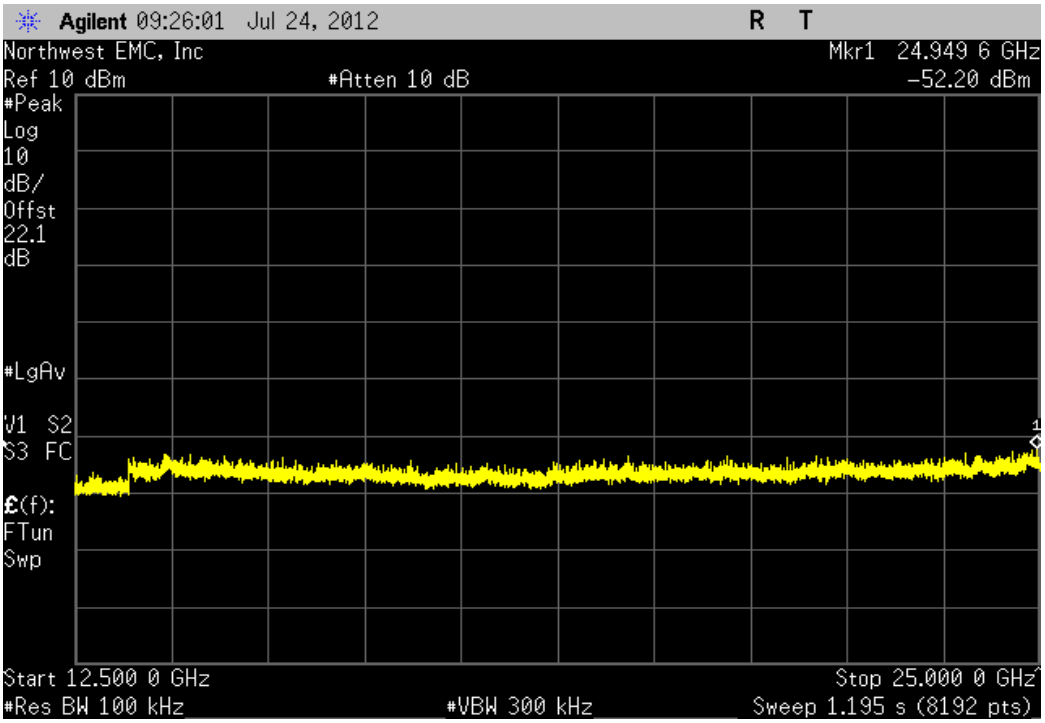


# Spurious Conducted Emissions

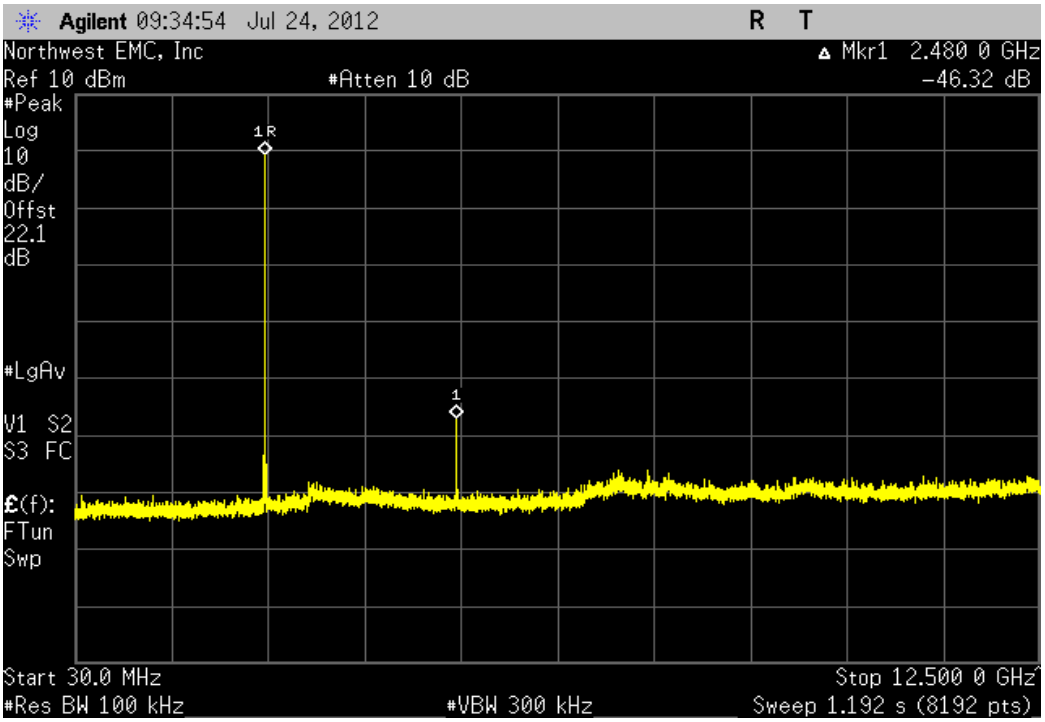
| Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -44.66 dBc | ≤ -20 dBc | Pass |



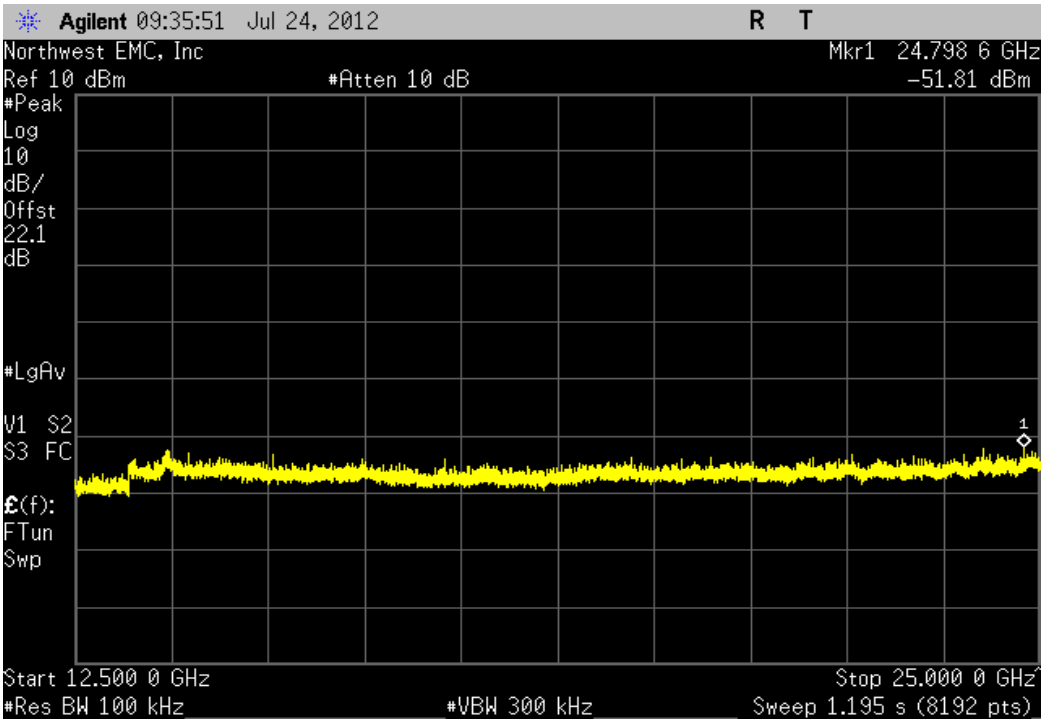

| Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Mid Channel, 2441 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -53.15 dBc | ≤ -20 dBc | Pass |



| Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 30 MHz - 12.5 GHz | | -46.32 dBc | ≤ -20 dBc | Pass |




| Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, High Channel, 2480 MHz | | | | |
|---|---|---|---|---|
| **Frequency Range** | | **Value** | **Limit** | **Result** |
| 12.5 GHz - 25 GHz | | -51.16 dBc | ≤ -20 dBc | Pass |



# Duty Cycle

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 |

**MEASUREMENT UNCERTAINTY**

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**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.

If the transmit duty cycle < 98 percent, burst gating was used during some of the other tests in this report to only measure during the burst duration.

# Duty Cycle

| | | | | | |
|---|---|---|---|---|---|
| **EUT:** | Intellis - Models 97745 (PTM), 97755 (RTM) | | | **Work Order:** | MDTR0182 |
| **Serial Number:** | NLD001683N | | | **Date:** | 07/24/12 |
| **Customer:** | Medtronic Inc. | | | **Temperature:** | 24.36°C |
| **Attendees:** | None | | | **Humidity:** | 58% |
| **Project:** | None | | | **Barometric Pres.:** | 1014.4 |
| **Tested by:** | Bryan Weller | **Power:** | 5 VDC, Battery | **Job Site:** | MN08 |

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

**COMMENTS**

Per MDTR0043 test plan configuration: 9 and 10.

**DEVIATIONS FROM TEST STANDARD**

No Deviations

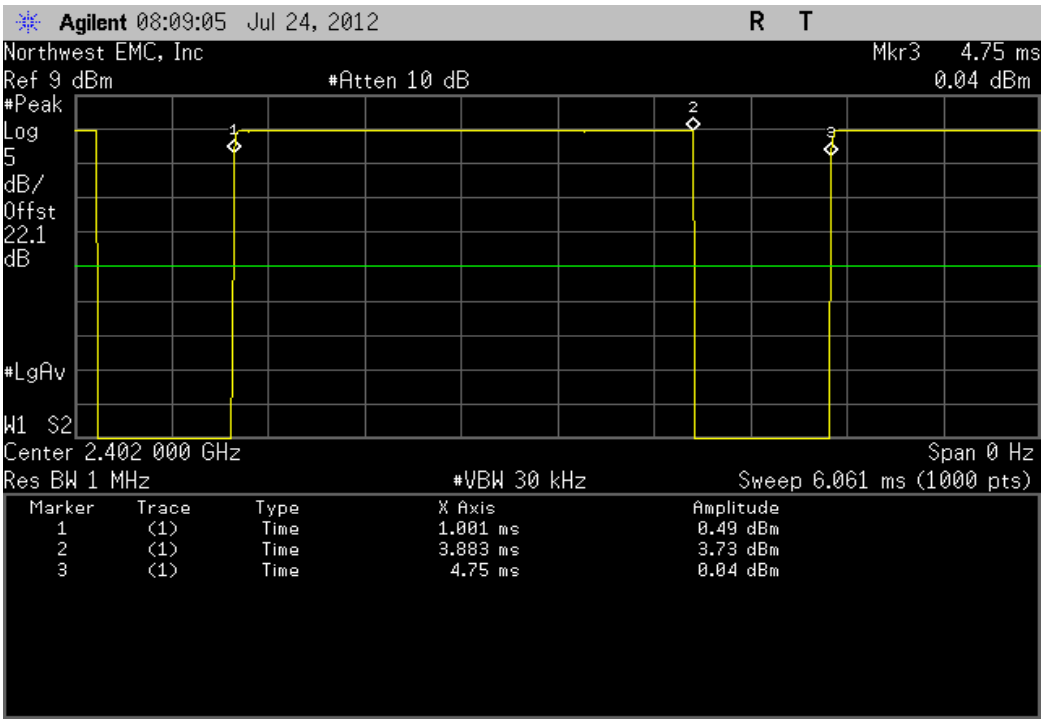
| Configuration # | 8,10 | Signature Bryan Weller |
|---|---|---|

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| Per MDTR043 test plan configuration: 9 (AC Adapter) | | | | | | |
| DH5, GFSK | | | | | | |
| Low Channel, 2402 MHz | 2.882 mS | 3.749 mS | 1 | 76.9 | N/A | N/A |
| Low Channel, 2402 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid Channel, 2441 MHz | 2.882 mS | 3.749 mS | 1 | 76.9 | N/A | N/A |
| Mid Channel, 2441 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| High Channel, 2480 MHz | 2.888 mS | 3.755 mS | 1 | 76.9 | N/A | N/A |
| High Channel, 2480 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| 2DH5, 4-DQPSK | | | | | | |
| Low Channel, 2402 MHz | 2.287 mS | 3.749 mS | 1 | 61 | N/A | N/A |
| Low Channel, 2402 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid Channel, 2441 MHz | 2.287 mS | 3.749 mS | 1 | 61 | N/A | N/A |
| Mid Channel, 2441 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| High Channel, 2480 MHz | 2.281 mS | 3.749 mS | 1 | 60.8 | N/A | N/A |
| High Channel, 2480 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| 3DH5, 8-DPSK | | | | | | |
| Low Channel, 2402 MHz | 1.577 mS | 3.755 mS | 1 | 42 | N/A | N/A |
| Low Channel, 2402 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid Channel, 2441 MHz | 1.577 mS | 3.749 mS | 1 | 42.1 | N/A | N/A |
| Mid Channel, 2441 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| High Channel, 2480 MHz | 1.571 mS | 3.749 mS | 1 | 41.9 | N/A | N/A |
| High Channel, 2480 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Per MDTR043 test plan configuration: 10 (Battery) | | | | | | |
| DH5, GFSK | | | | | | |
| Low Channel, 2402 MHz | 2.888 mS | 3.755 mS | 1 | 76.9 | N/A | N/A |
| Low Channel, 2402 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid Channel, 2441 MHz | 2.882 mS | 3.749 mS | 1 | 76.9 | N/A | N/A |
| Mid Channel, 2441 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| High Channel, 2480 MHz | 2.882 mS | 3.749 mS | 1 | 76.9 | N/A | N/A |
| High Channel, 2480 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| 2DH5, 4-DQPSK | | | | | | |
| Low Channel, 2402 MHz | 2.287 mS | 3.755 mS | 1 | 60.9 | N/A | N/A |
| Low Channel, 2402 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid Channel, 2441 MHz | 2.287 mS | 3.749 mS | 1 | 61 | N/A | N/A |
| Mid Channel, 2441 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| High Channel, 2480 MHz | 2.281 mS | 3.749 mS | 1 | 60.8 | N/A | N/A |
| High Channel, 2480 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| 3DH5, 8-DPSK | | | | | | |
| Low Channel, 2402 MHz | 1.577 mS | 3.749 mS | 1 | 42.1 | N/A | N/A |
| Low Channel, 2402 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| Mid Channel, 2441 MHz | 1.577 mS | 3.749 mS | 1 | 42.1 | N/A | N/A |
| Mid Channel, 2441 MHz | N/A | N/A | 5 | N/A | N/A | N/A |
| High Channel, 2480 MHz | 1.577 mS | 3.755 mS | 1 | 42 | N/A | N/A |
| High Channel, 2480 MHz | N/A | N/A | 5 | N/A | N/A | N/A |

# Duty Cycle

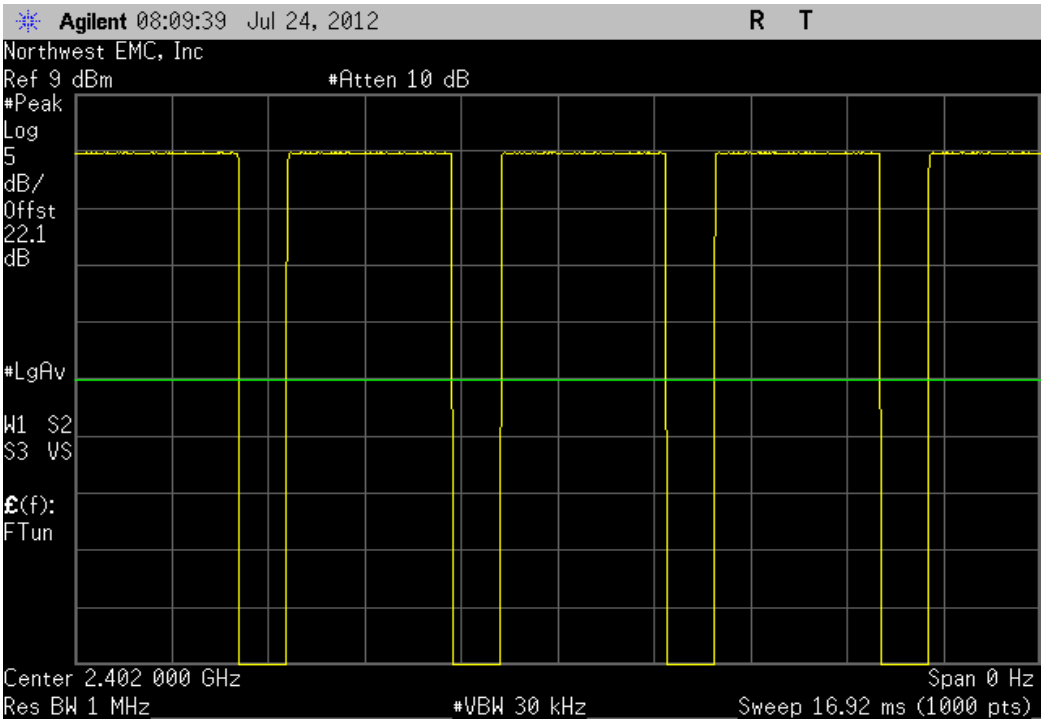
Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Low Channel, 2402 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 2.882 mS | 3.749 mS | 1 | 76.9 | N/A | N/A |



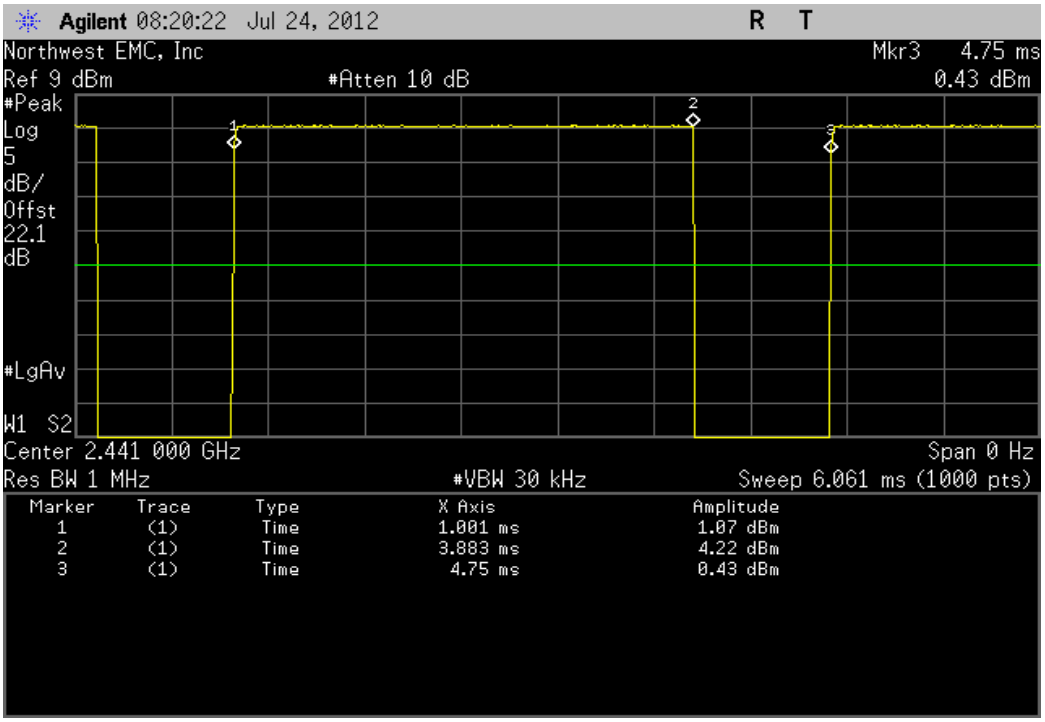

Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Low Channel, 2402 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |

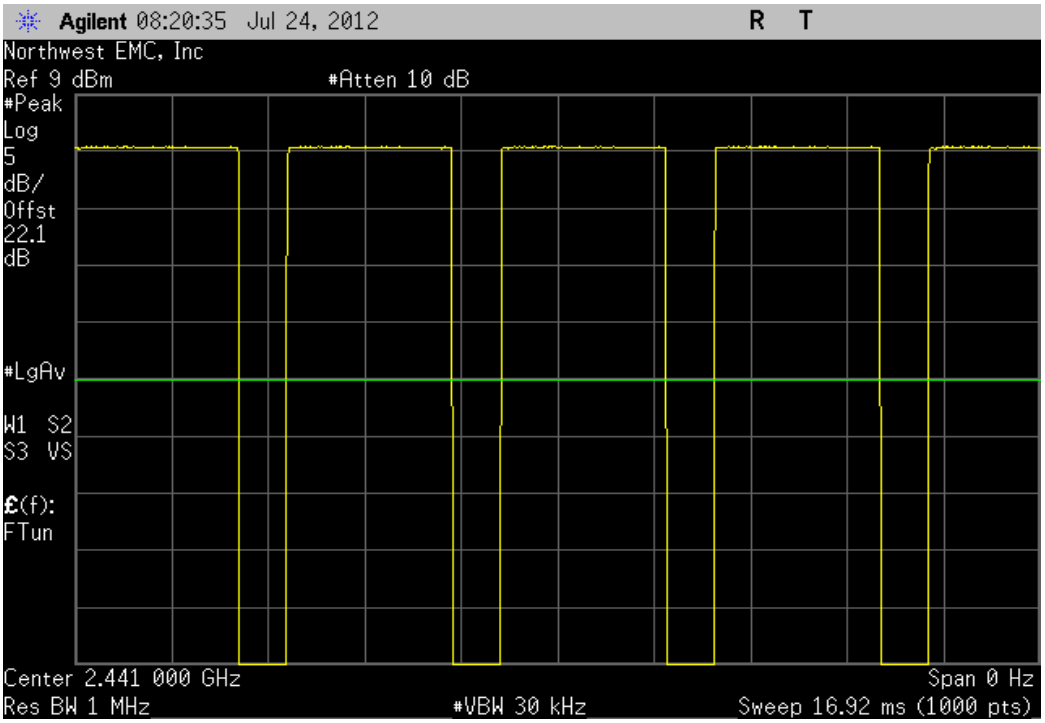


# Duty Cycle

| Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | 2.882 mS | 3.749 mS | 1 | 76.9 | N/A | N/A |



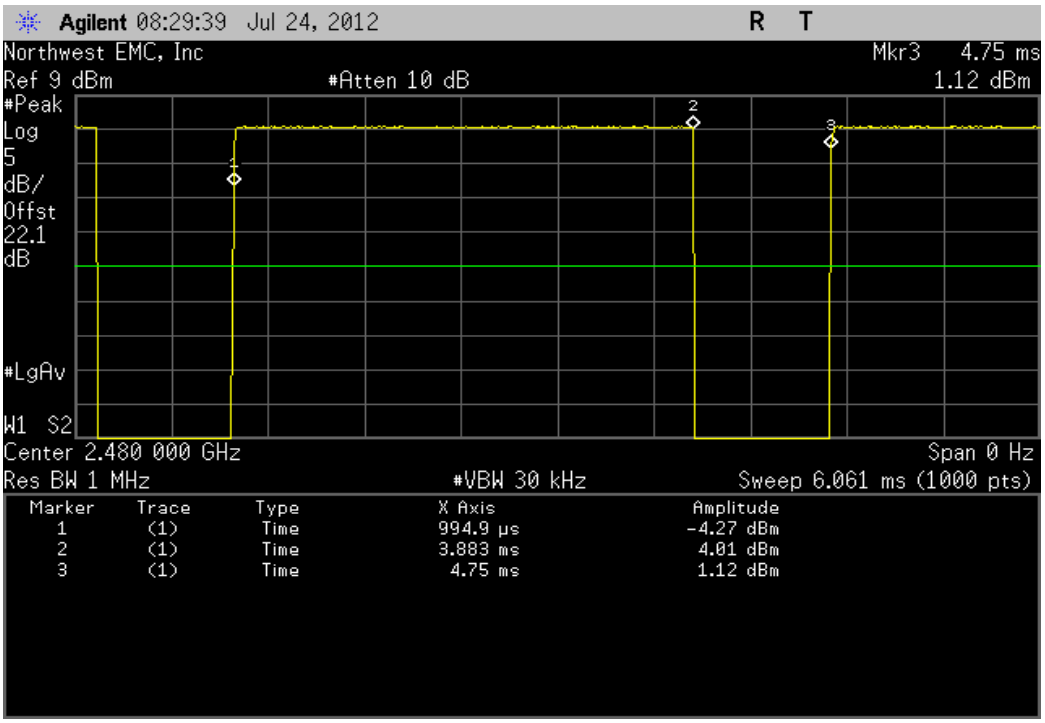

| Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle

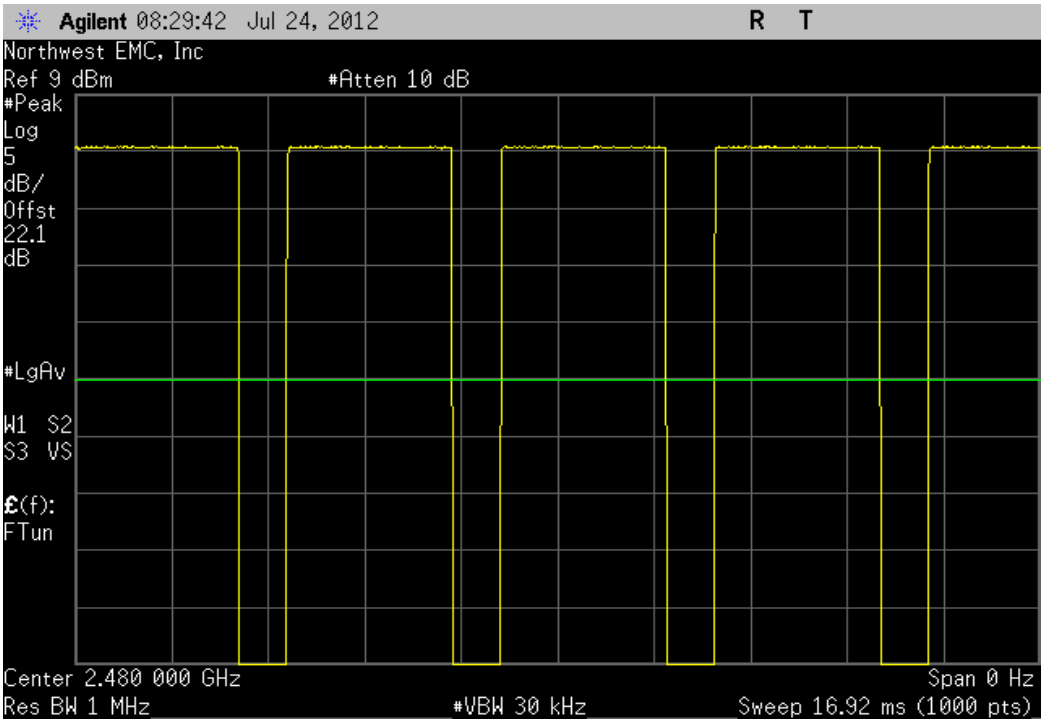
Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, High Channel, 2480 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 2.888 mS | 3.755 mS | 1 | 76.9 | N/A | N/A |



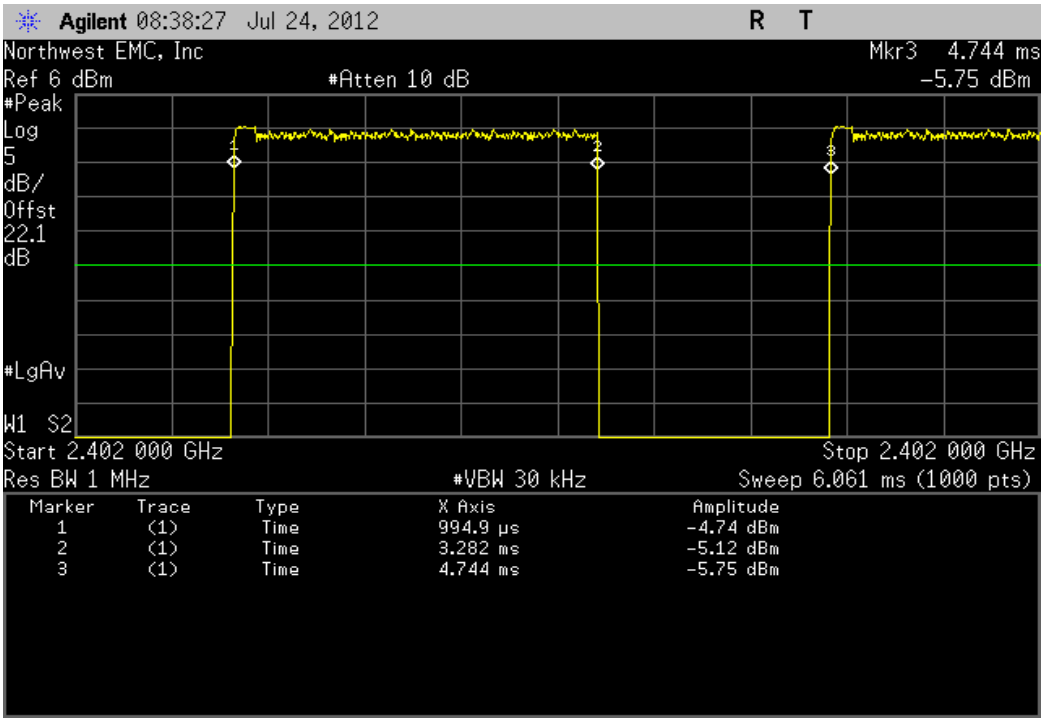

Per MDTR043 test plan configuration: 9 (AC Adapter), DH5, GFSK, High Channel, 2480 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |

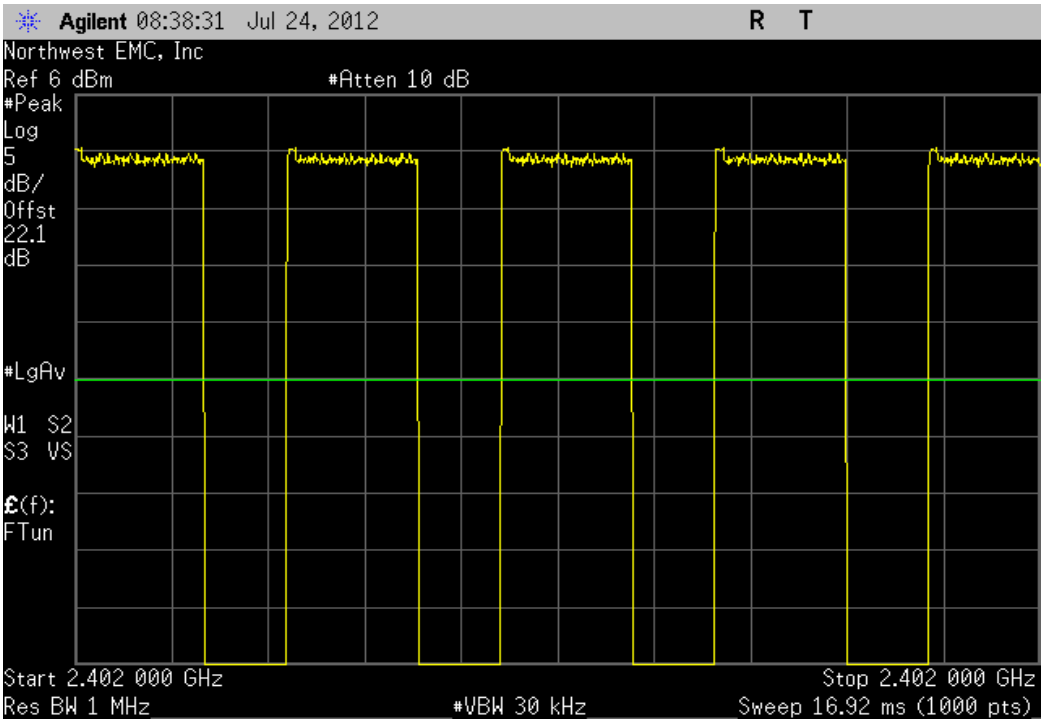


# Duty Cycle

| Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Low Channel, 2402 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | 2.287 mS | 3.749 mS | 1 | 61 | N/A | N/A |



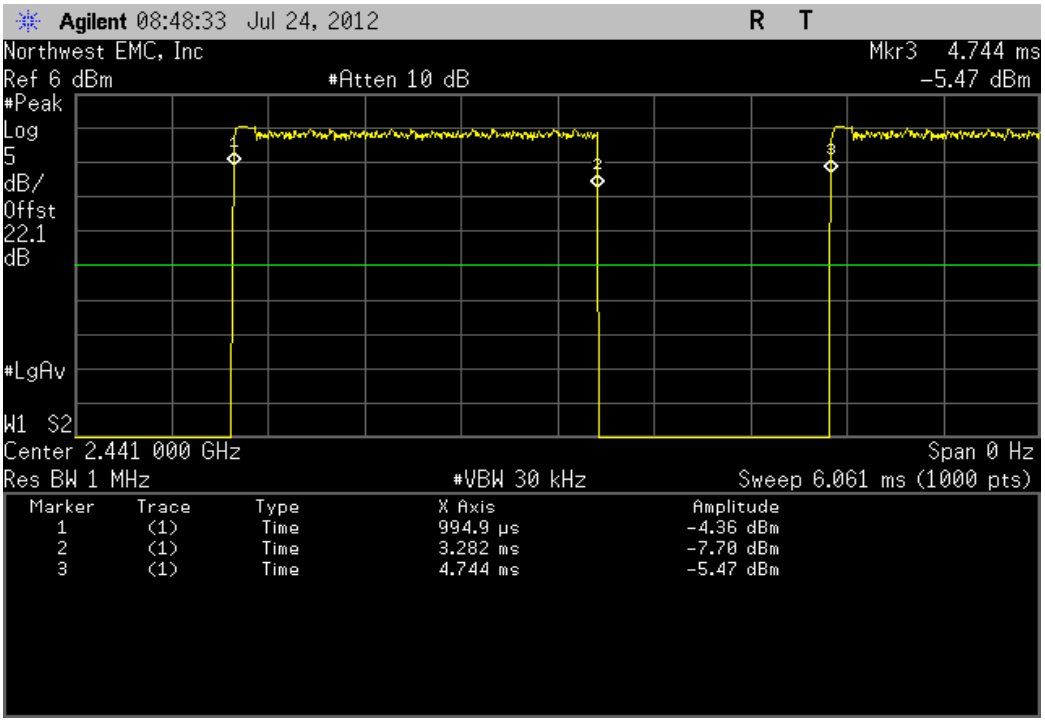

| Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Low Channel, 2402 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle

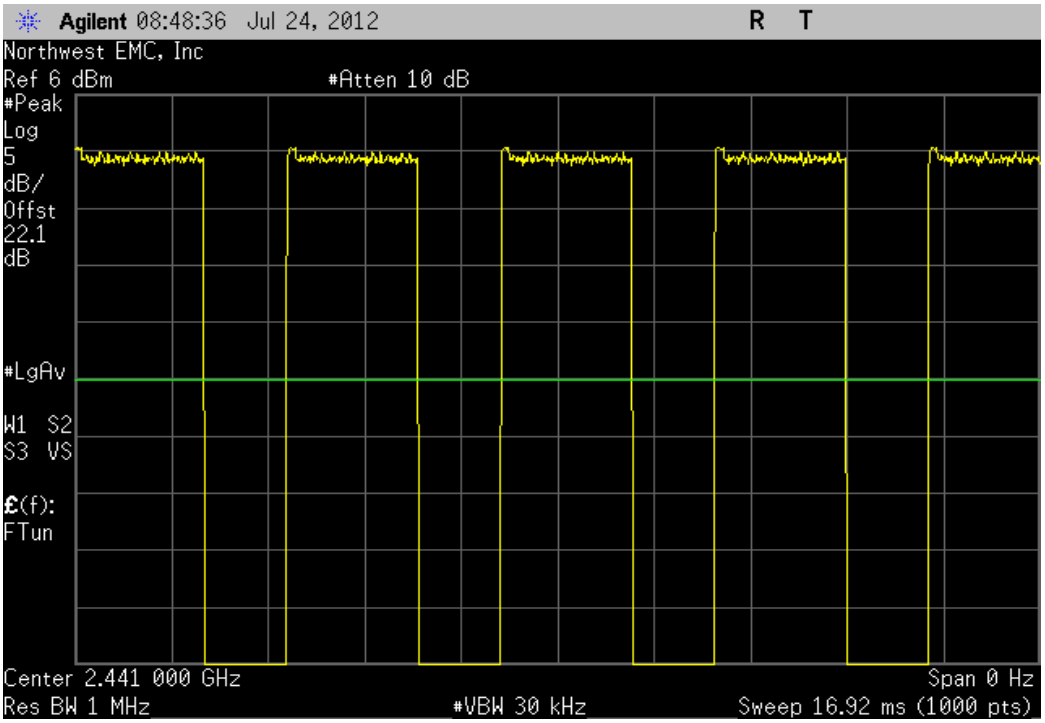
Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 2.287 mS | 3.749 mS | 1 | 61 | N/A | N/A |




Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz

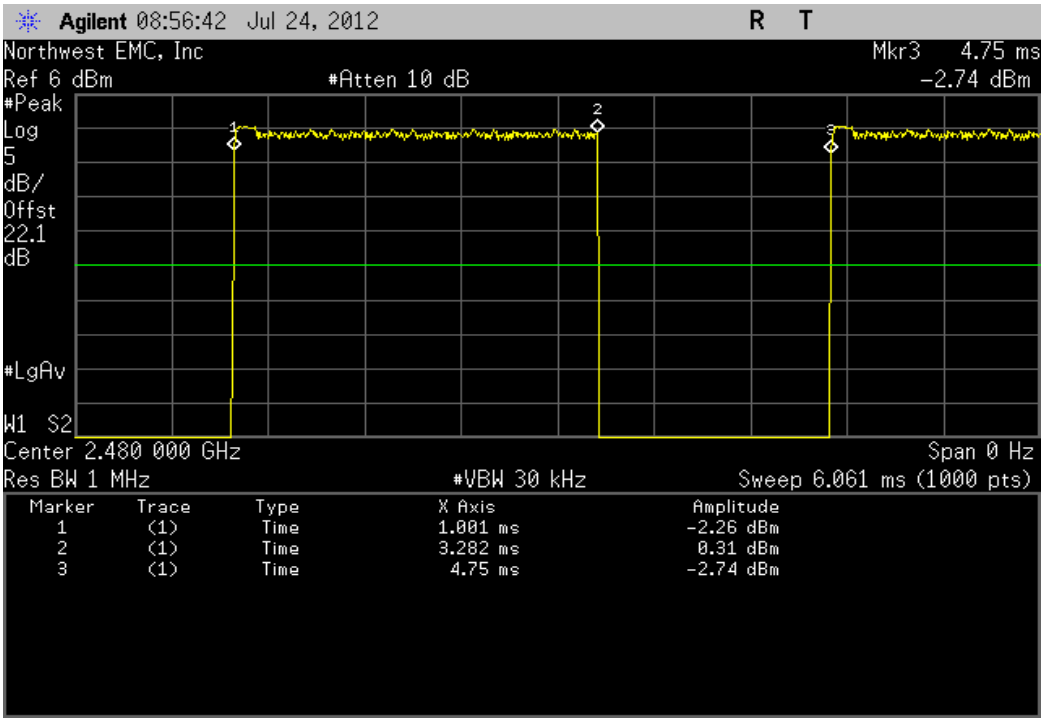
| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle

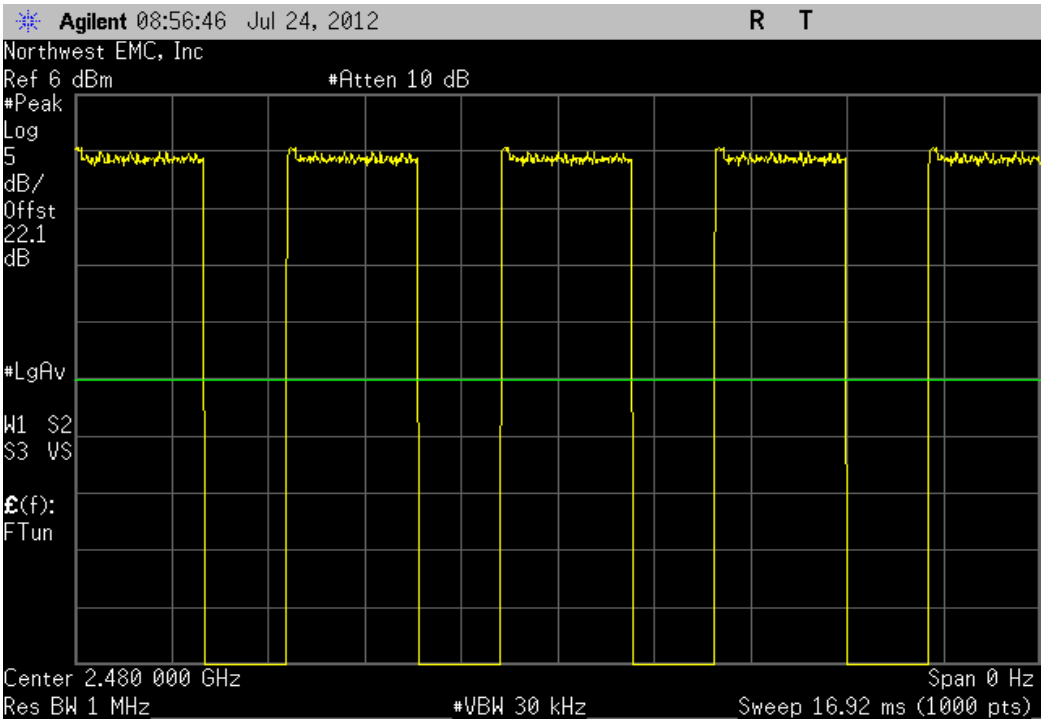
Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, High Channel, 2480 MHz

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | 2.281 mS | 3.749 mS | 1 | 60.8 | N/A | N/A |




Per MDTR043 test plan configuration: 9 (AC Adapter), 2DH5, 4-DQPSK, High Channel, 2480 MHz

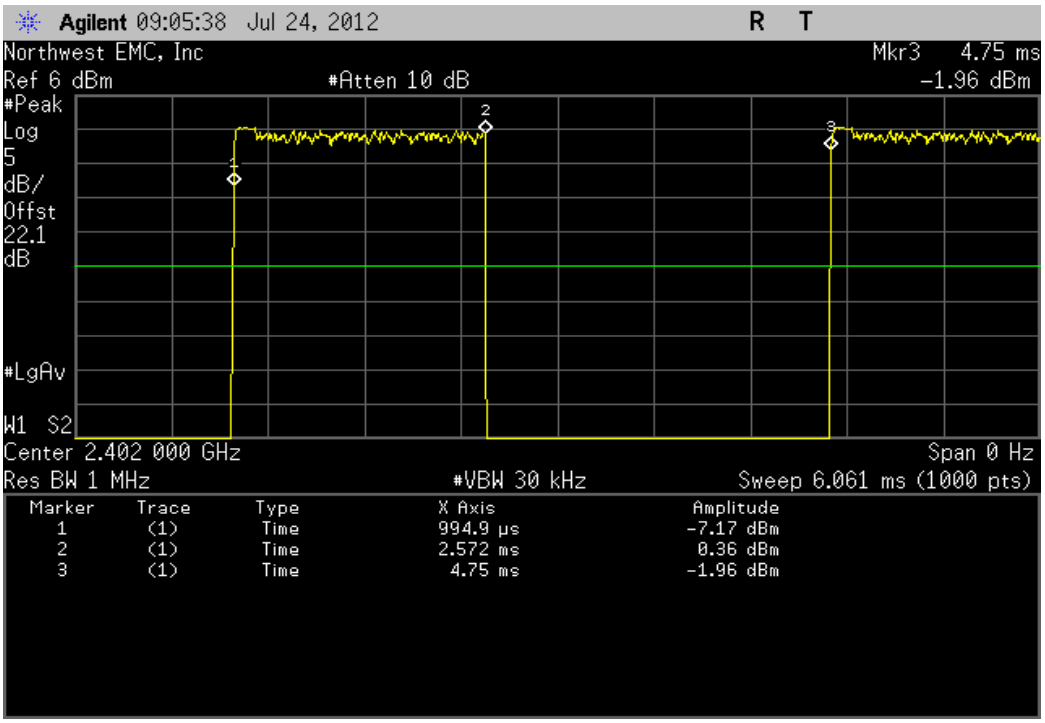
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle

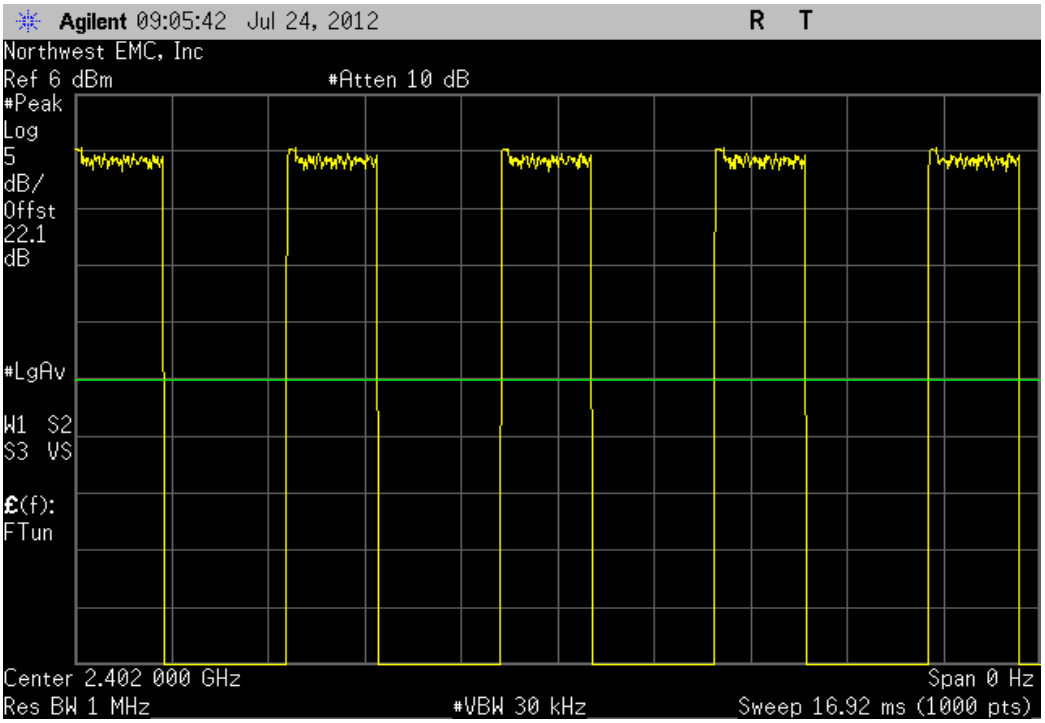
Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Low Channel, 2402 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 1.577 mS | 3.755 mS | 1 | 42 | N/A | N/A |




Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Low Channel, 2402 MHz

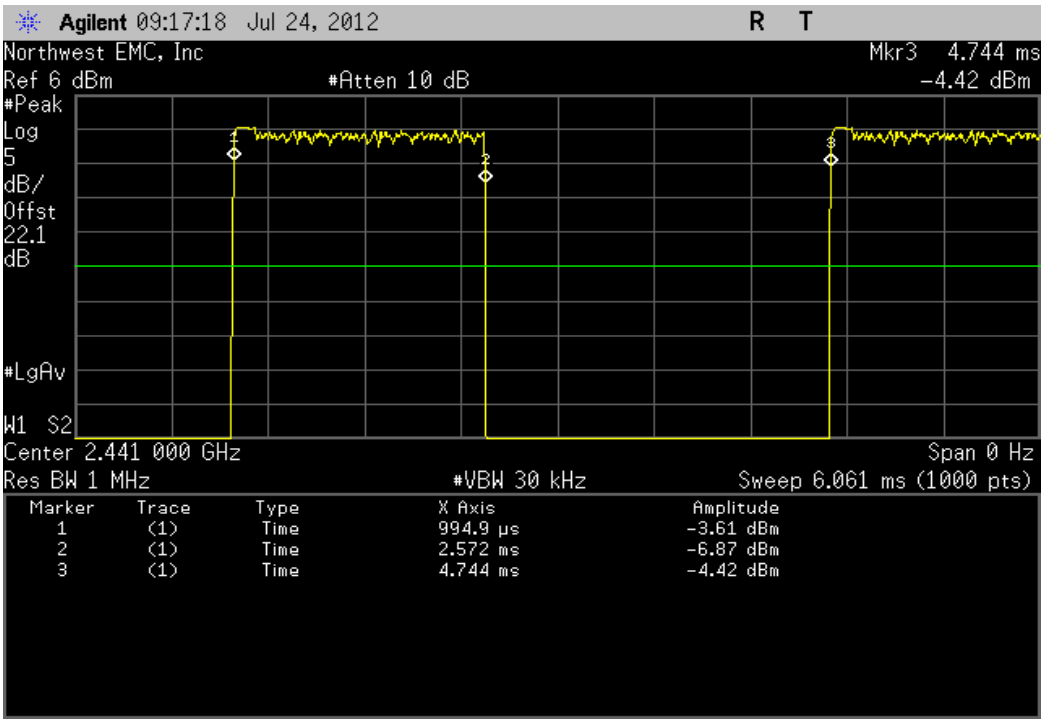
| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle

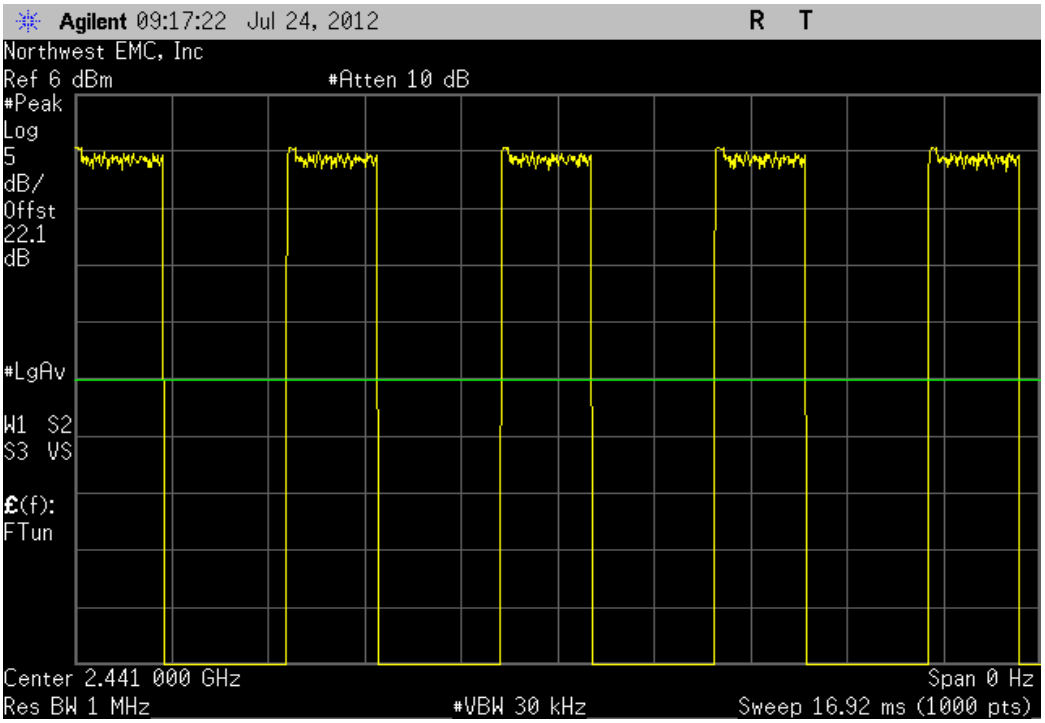
Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Mid Channel, 2441 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 1.577 mS | 3.749 mS | 1 | 42.1 | N/A | N/A |




Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, Mid Channel, 2441 MHz

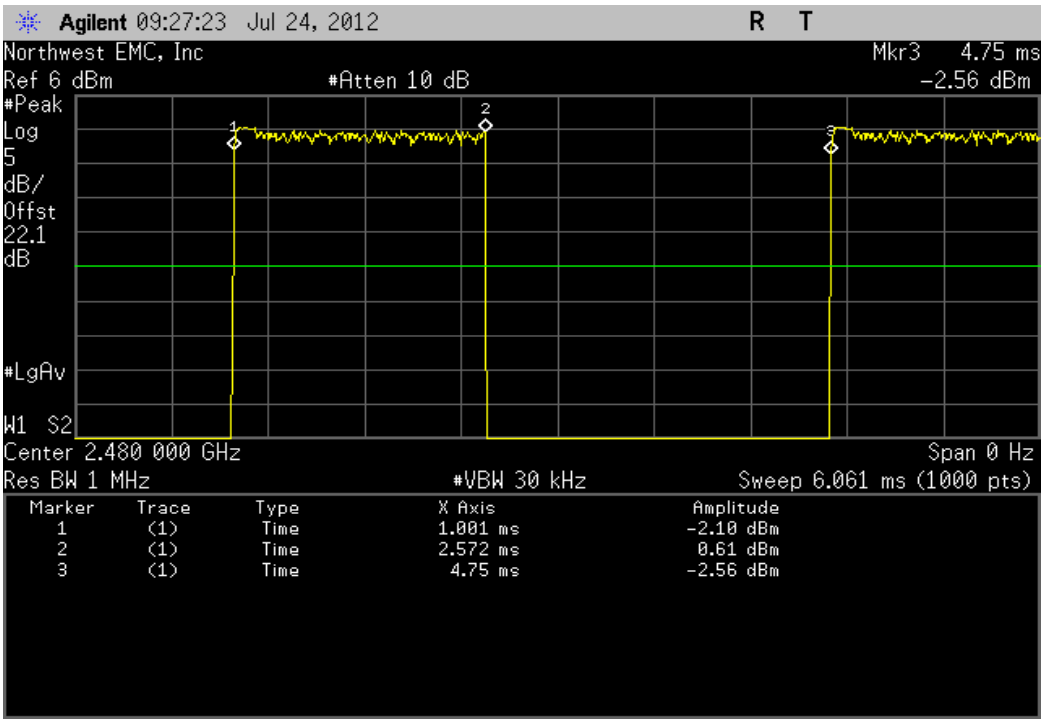
| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle

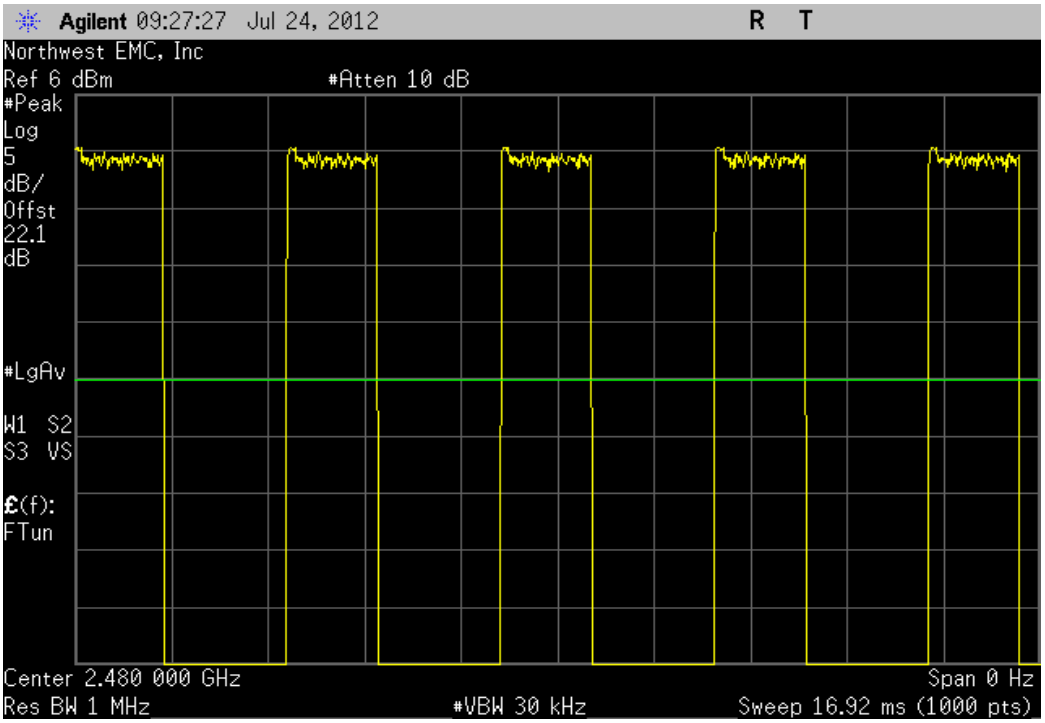
Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, High Channel, 2480 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 1.571 mS | 3.749 mS | 1 | 41.9 | N/A | N/A |




Per MDTR043 test plan configuration: 9 (AC Adapter), 3DH5, 8-DPSK, High Channel, 2480 MHz

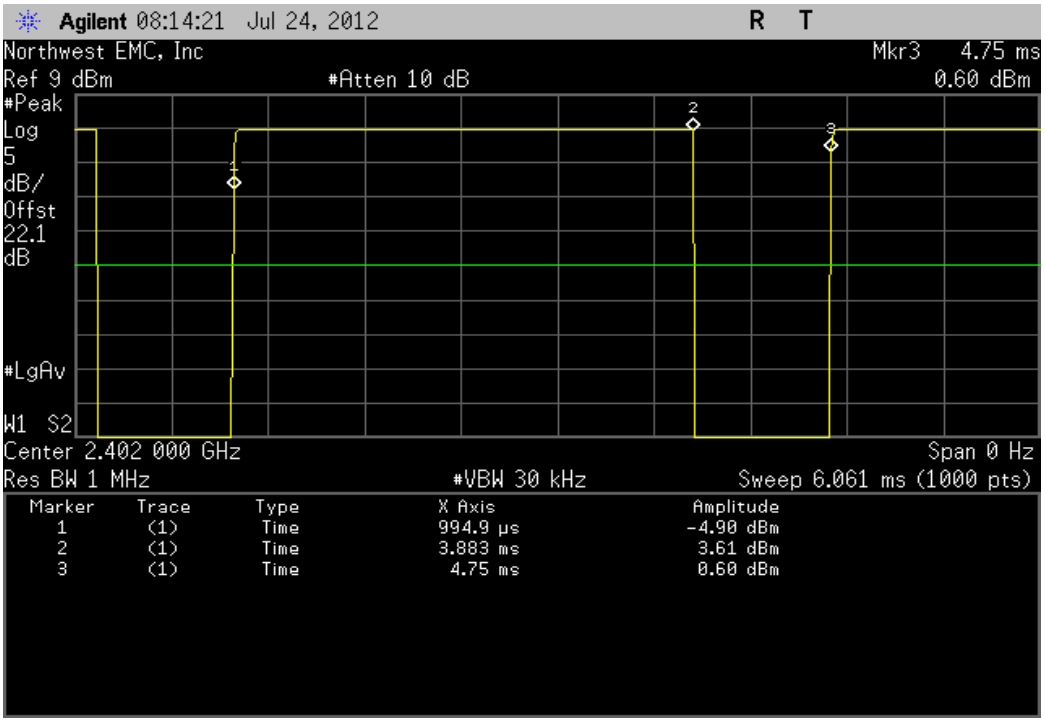
| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle

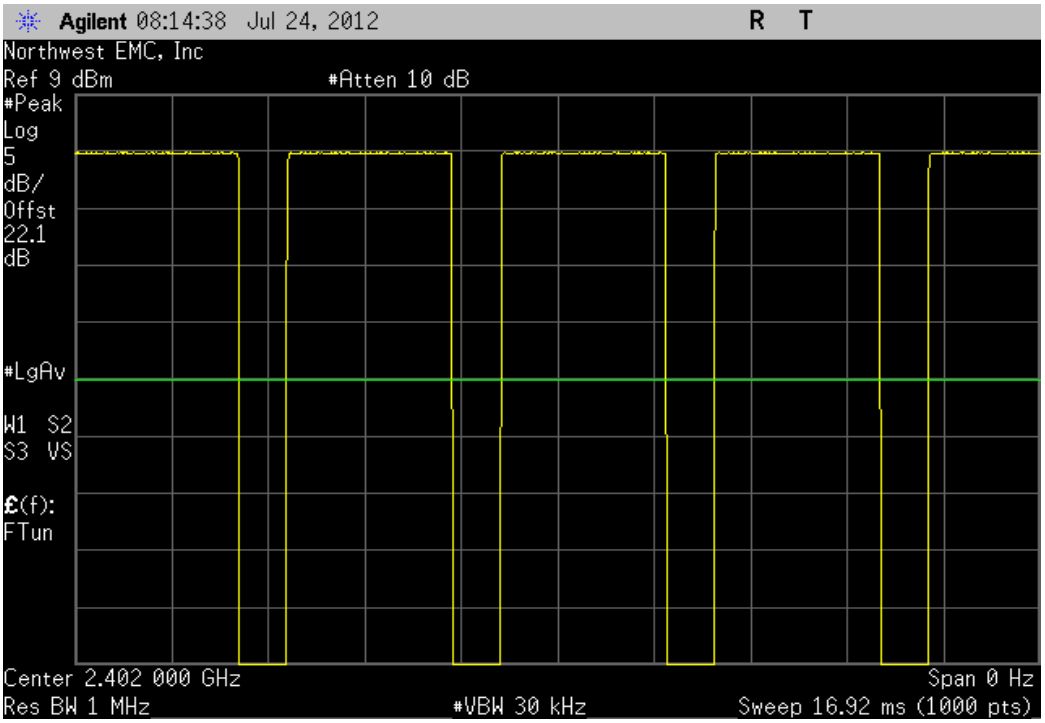
Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Low Channel, 2402 MHz

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | 2.888 mS | 3.755 mS | 1 | 76.9 | N/A | N/A |




Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Low Channel, 2402 MHz

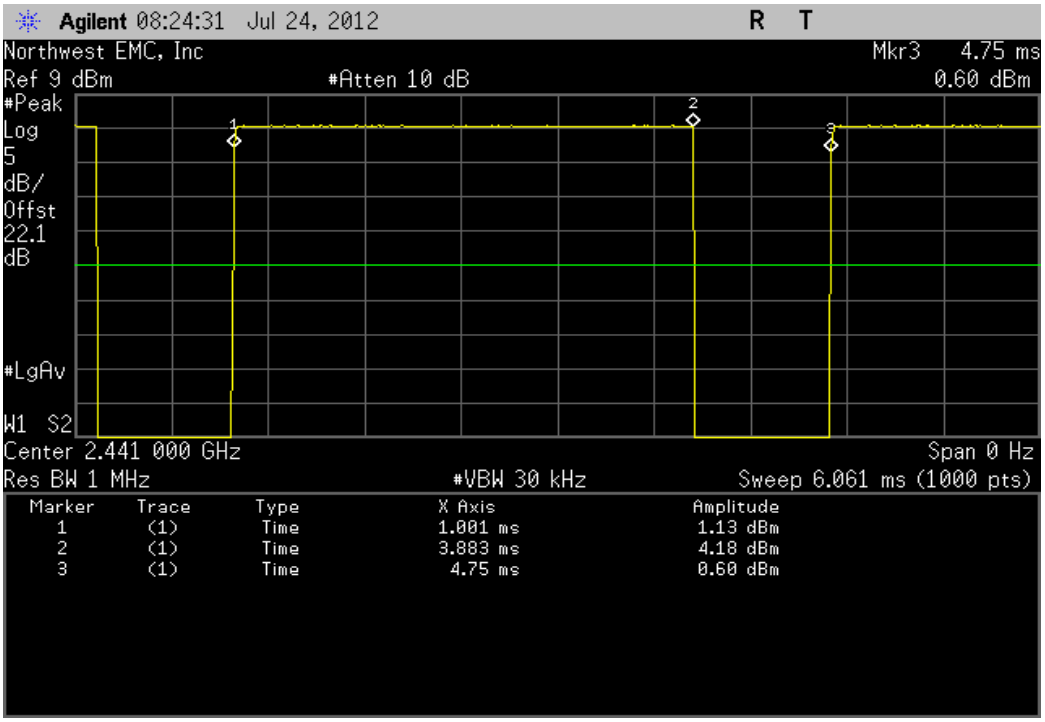
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle

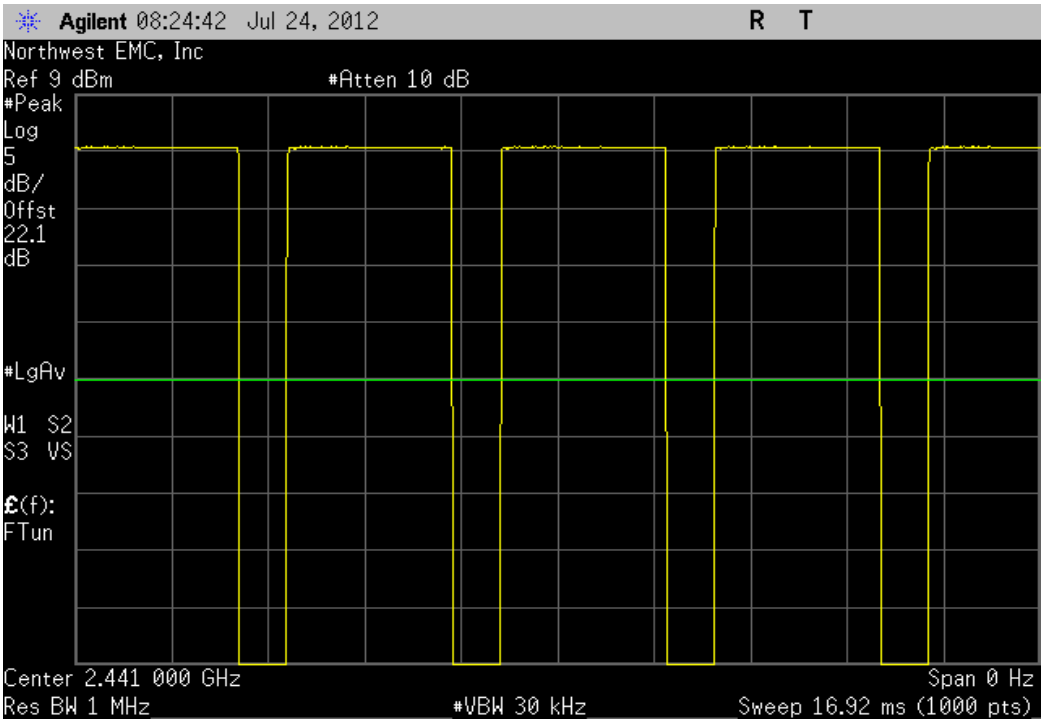
Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Mid Channel, 2441 MHz

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | 2.882 mS | 3.749 mS | 1 | 76.9 | N/A | N/A |



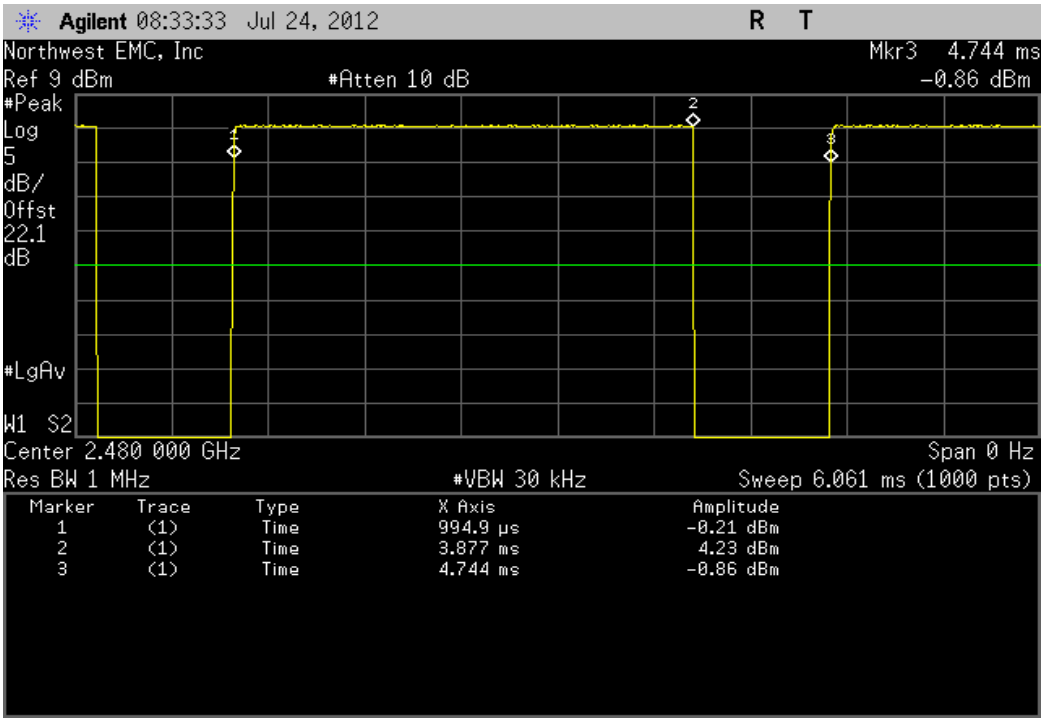

Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, Mid Channel, 2441 MHz

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | N/A | N/A | 5 | N/A | N/A | N/A |

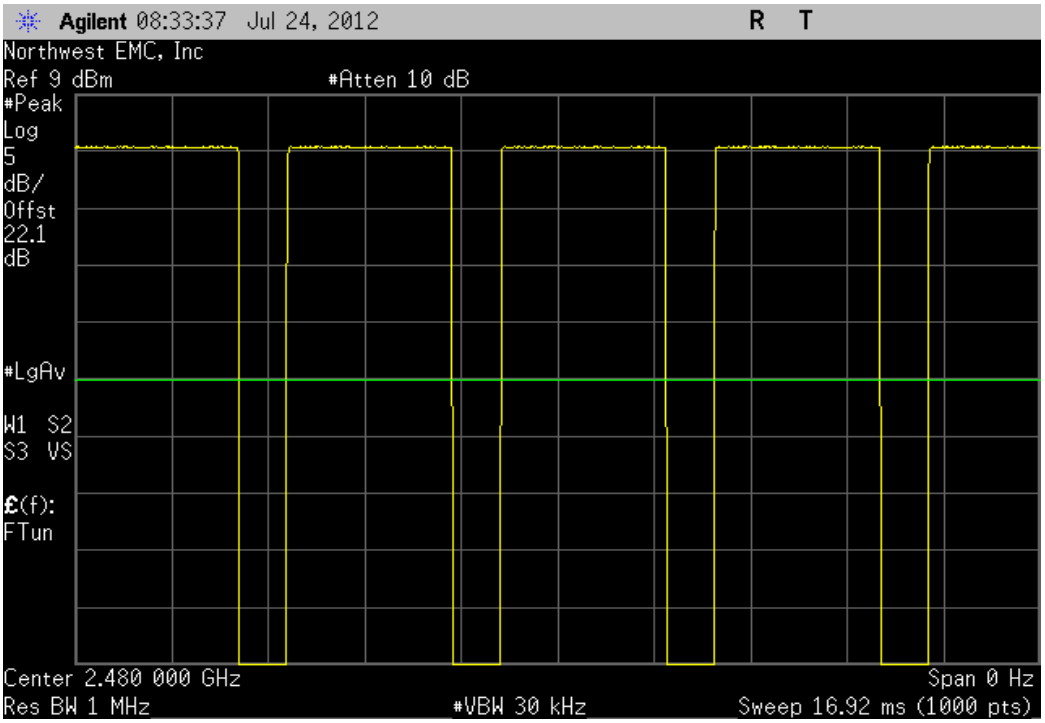


# Duty Cycle

| Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | 2.882 mS | 3.749 mS | 1 | 76.9 | N/A | N/A |



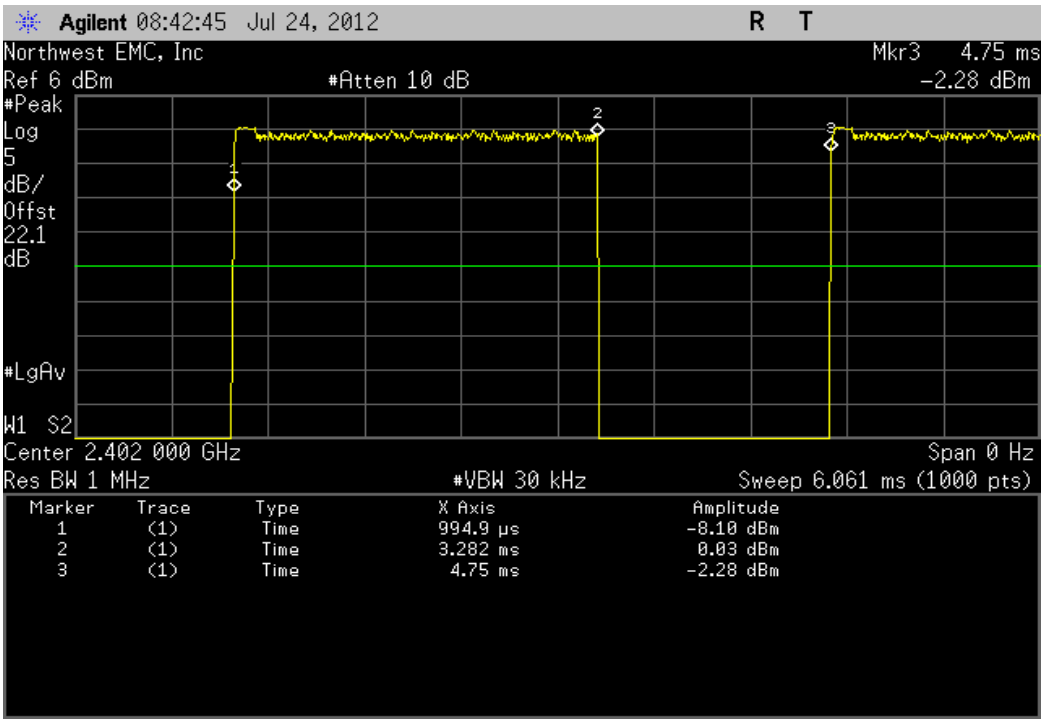

| Per MDTR043 test plan configuration: 10 (Battery), DH5, GFSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle

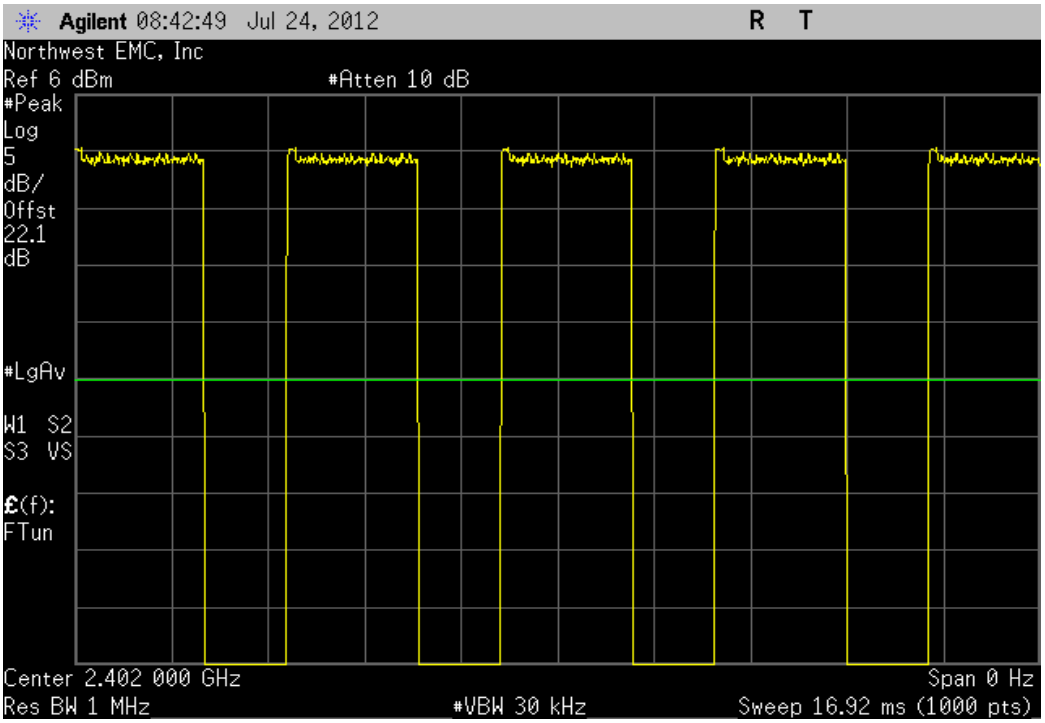
Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Low Channel, 2402 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 2.287 mS | 3.755 mS | 1 | 60.9 | N/A | N/A |



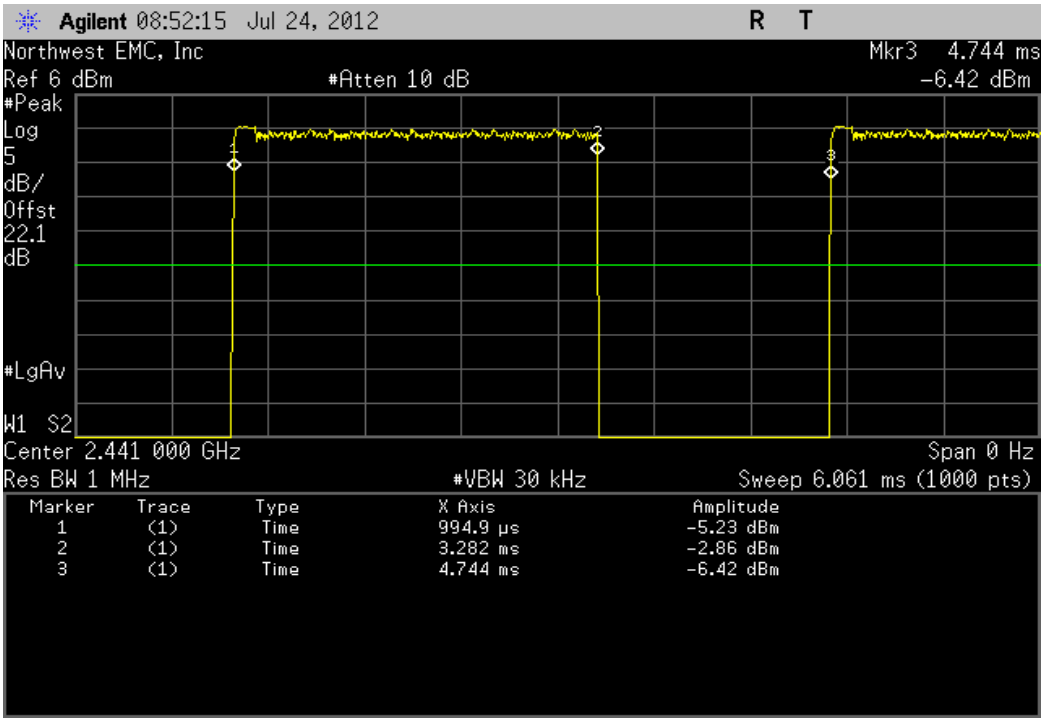

Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Low Channel, 2402 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |

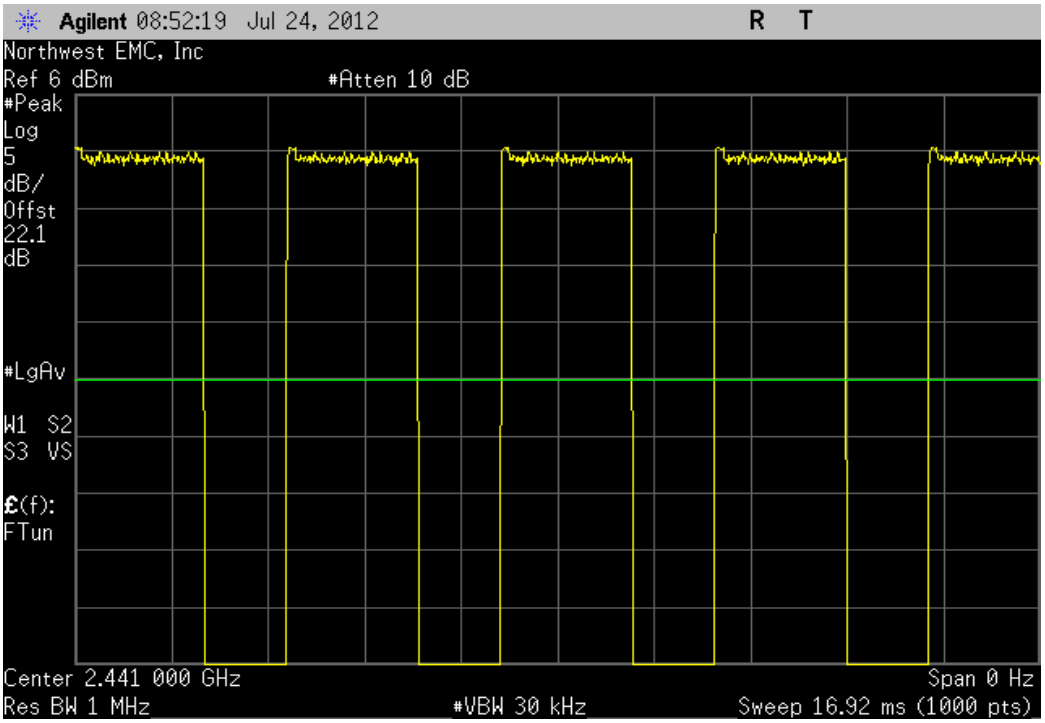


# Duty Cycle

| Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | 2.287 mS | 3.749 mS | 1 | 61 | N/A | N/A |

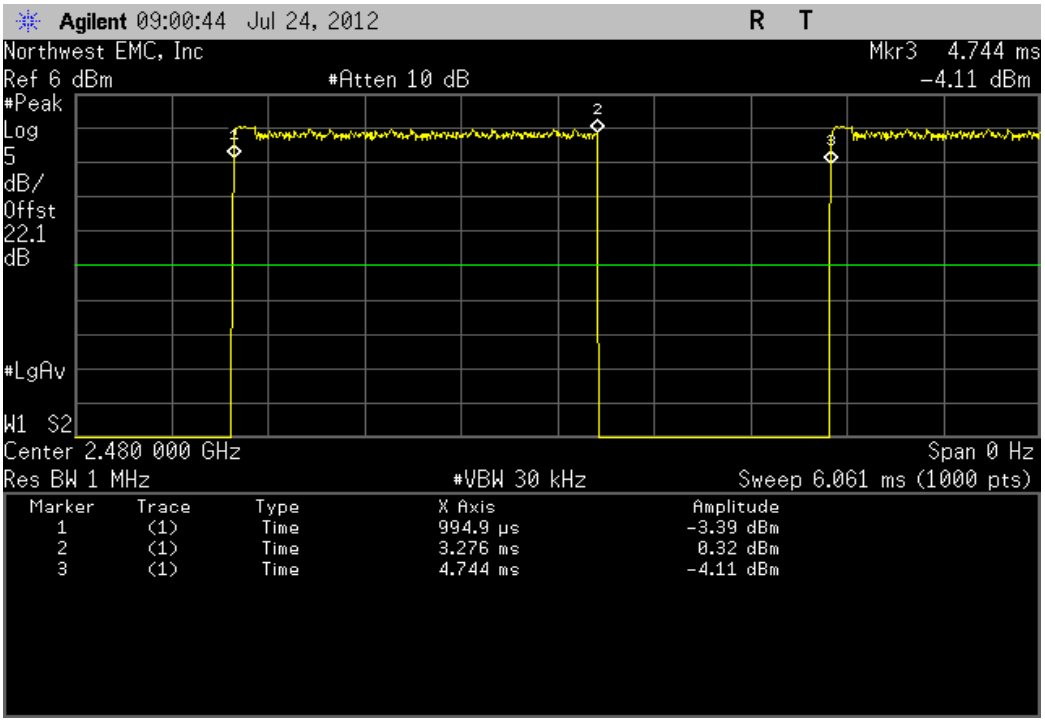



| Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, Mid Channel, 2441 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | N/A | N/A | 5 | N/A | N/A | N/A |

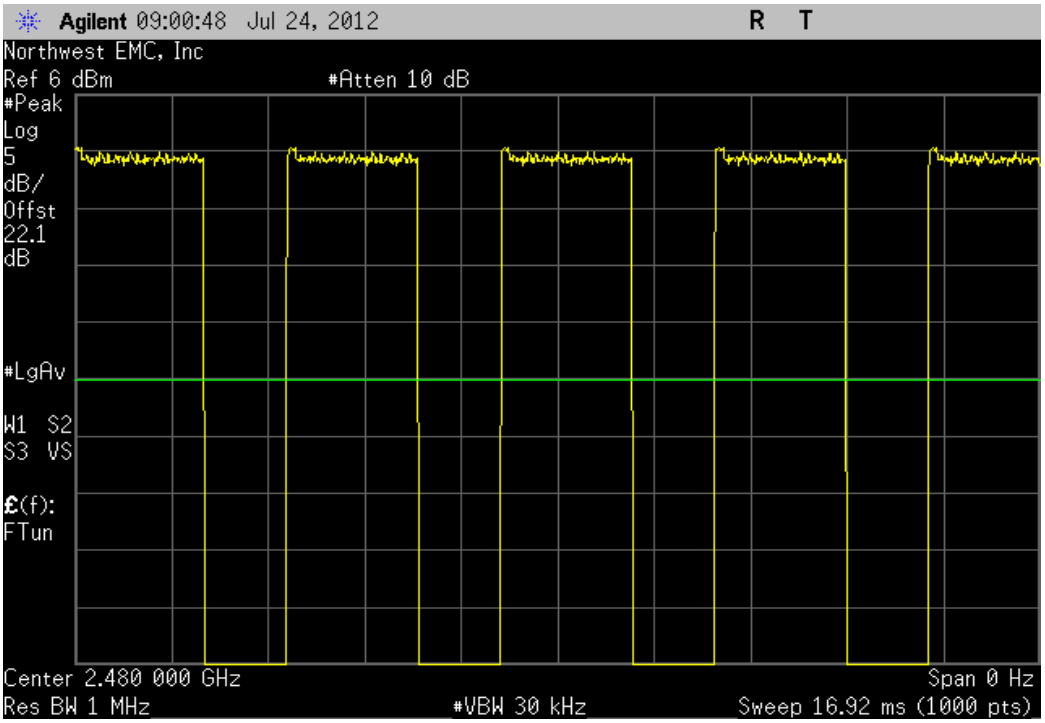


# Duty Cycle

| Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | 2.281 mS | 3.749 mS | 1 | 60.8 | N/A | N/A |



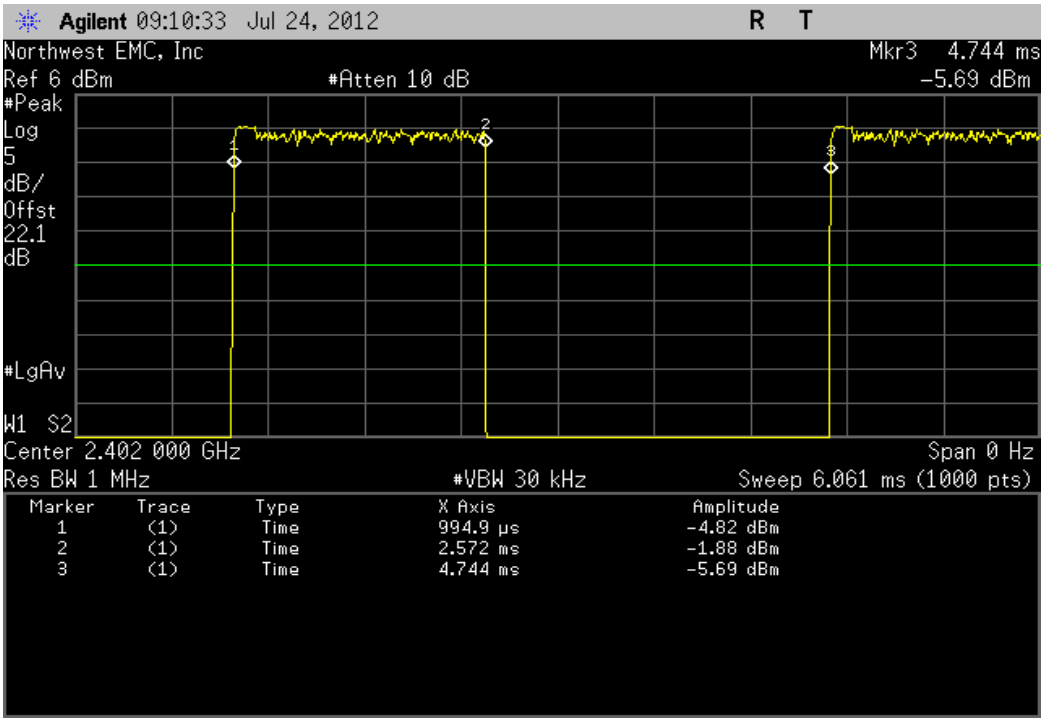

| Per MDTR043 test plan configuration: 10 (Battery), 2DH5, 4-DQPSK, High Channel, 2480 MHz | | | | | | |
|---|---|---|---|---|---|---|
| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
| | N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle

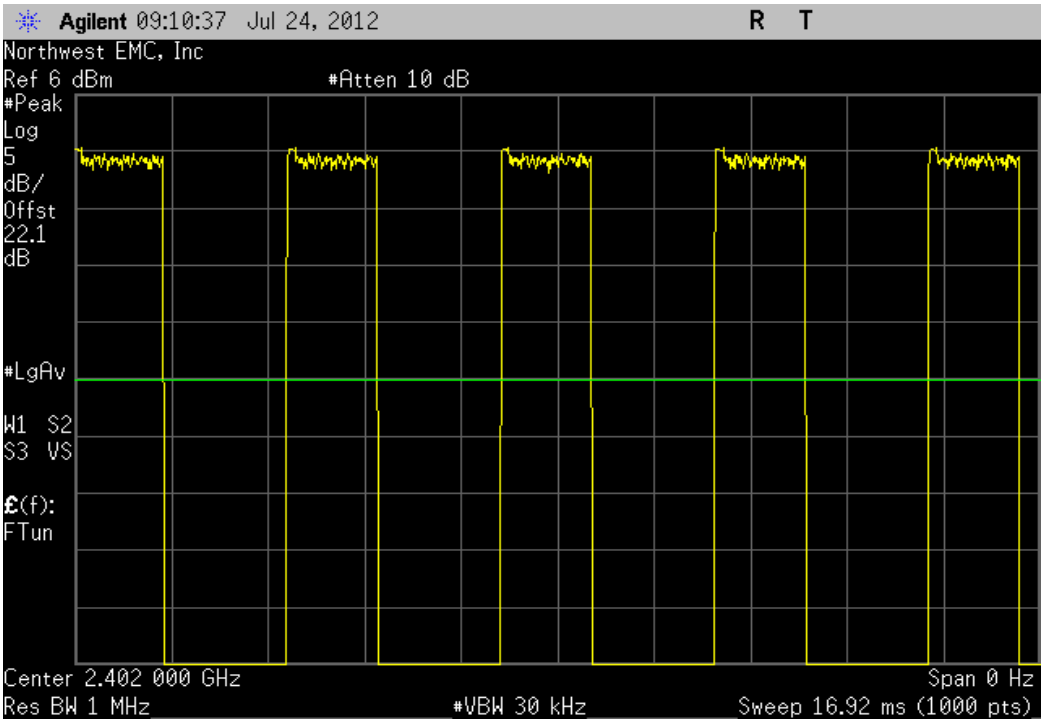
Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Low Channel, 2402 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 1.577 mS | 3.749 mS | 1 | 42.1 | N/A | N/A |



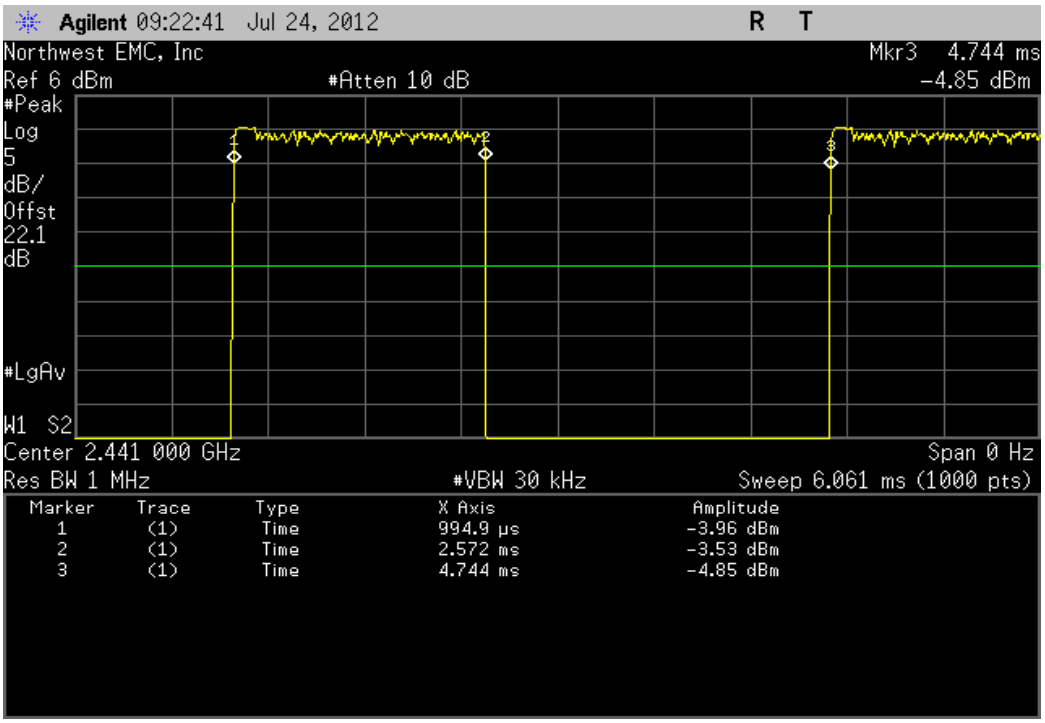

Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Low Channel, 2402 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |



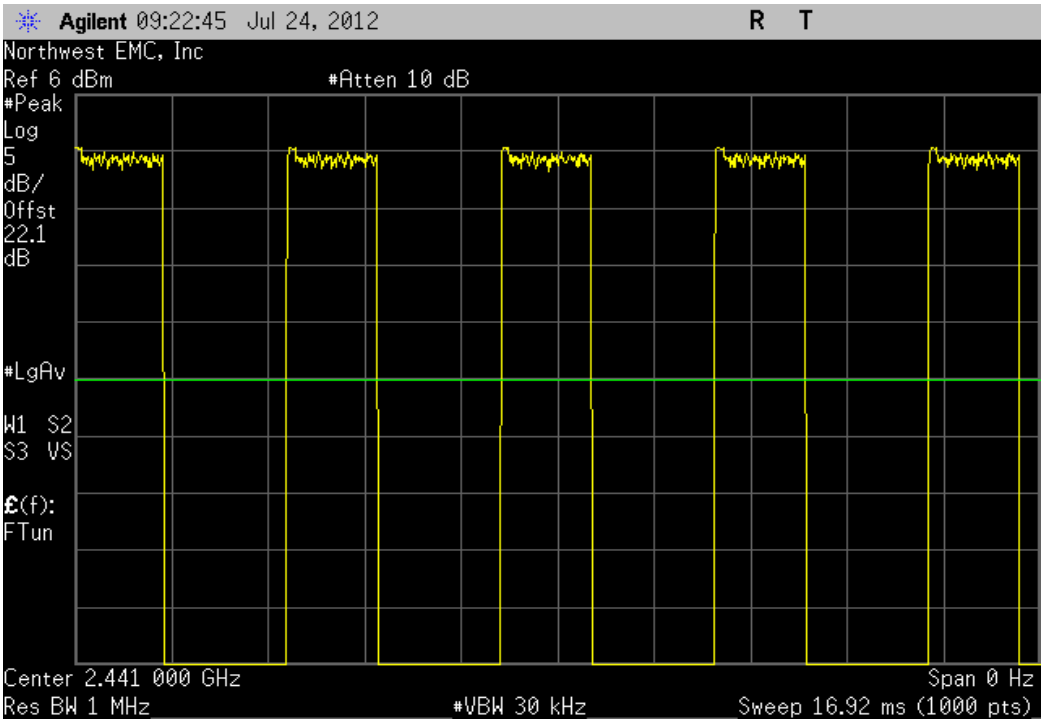
Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Mid Channel, 2441 MHz

| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| 1.577 mS | 3.749 mS | 1 | 42.1 | N/A | N/A |




Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, Mid Channel, 2441 MHz

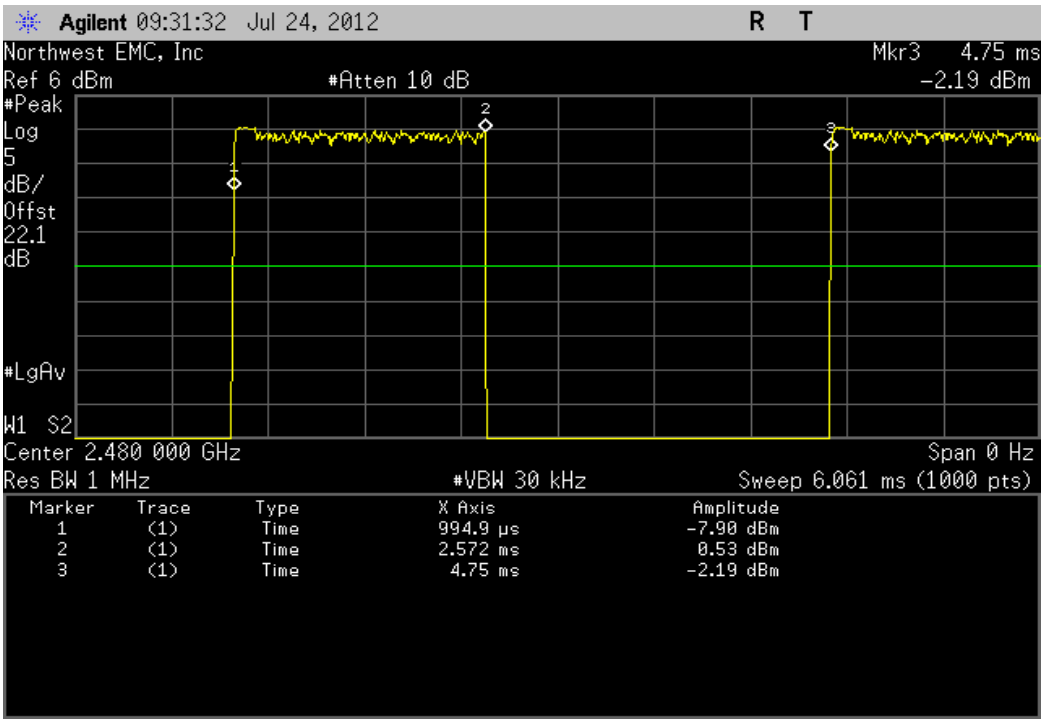
| Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|
| N/A | N/A | 5 | N/A | N/A | N/A |



# Duty Cycle

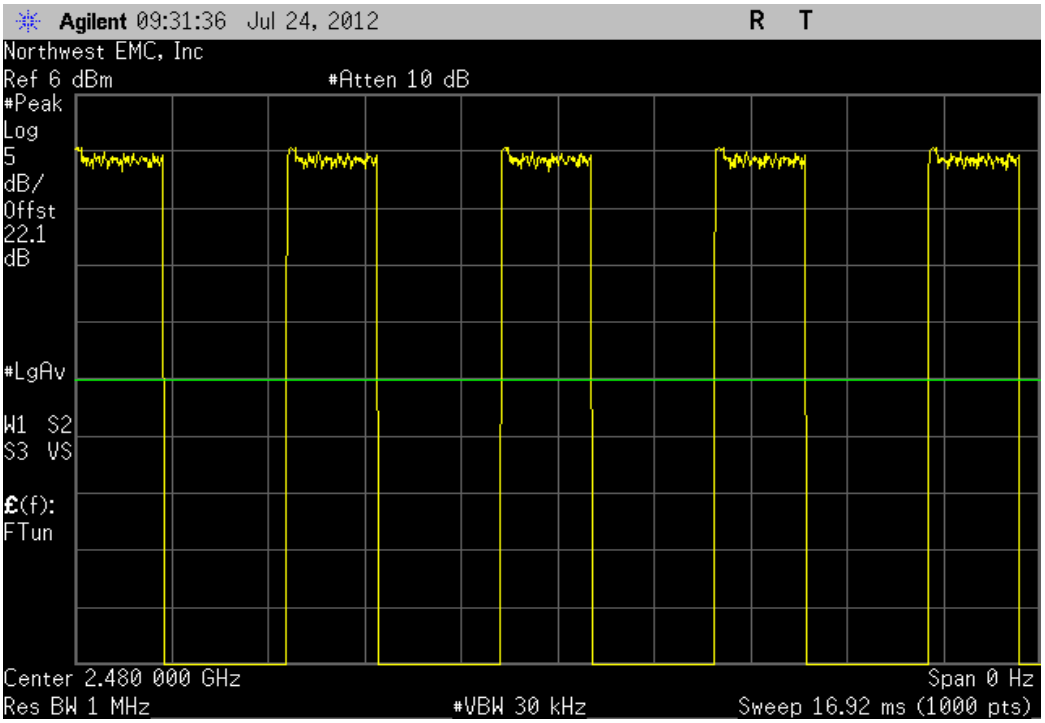
Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, High Channel, 2480 MHz

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | 1.577 mS | 3.755 mS | 1 | 42 | N/A | N/A |




Per MDTR043 test plan configuration: 10 (Battery), 3DH5, 8-DPSK, High Channel, 2480 MHz

| | Pulse Width | Period | Number of Pulses | Value (%) | Limit | Result |
|---|---|---|---|---|---|---|
| | N/A | N/A | 5 | N/A | N/A | N/A |



# 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**

PTM connected to AC Power. Bluetooth communication Low, High Channel, DH5, 2DH5, 3DH5 mode.

RTM connected to PTM. PTM on Li-ion battery. Bluetooth communication Low, High Channel, DH5, 2DH5, 3DH5 mode.

**POWER SETTINGS INVESTIGATED**

120VAC/60Hz

Battery

**CONFIGURATIONS INVESTIGATED**

MDTR0182 - 1

MDTR0182 - 4

**FREQUENCY RANGE INVESTIGATED**

| | | | |
|---|---|---|---|
| Start Frequency | 30 MHz | Stop Frequency | 26000 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 |
|---|---|---|---|---|---|
| Low Pass Filter | Micro-Tronics | LPM50004 | HGK | 5/31/2012 | 24 mo |
| High Pass Filter | Micro-Tronics | HPM50111 | HGQ | 6/1/2012 | 24 mo |
| Attenuator, 20 dB, 'SMA' | SM Electronics | SA6-20 | REO | 5/31/2012 | 12 mo |
| Pre-Amplifier | Miteq | JSD4-18002600-26-8P | APU | 2/6/2012 | 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 | AMF-6F-12001800-30-10P | AVW | 5/30/2012 | 12 mo |
| Antenna, Horn | ETS Lindgren | 3160-08 | AIQ | NCR | 0 mo |
| MN05 Cables | ESM Cable Corp. | Standard Gain Horn Cables | MNJ | 5/30/2012 | 12 mo |
| Pre-Amplifier | Miteq | AMF-6F-08001200-30-10P | AVV | 5/30/2012 | 12 mo |
| Antenna, Horn | ETS | 3160-07 | AXP | NCR | 0 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 | AM-1616-1000 | AVY | 5/31/2012 | 12 mo |
| MN05 Cables | ESM Cable Corp. | Bilog Cables | MNH | 5/31/2012 | 12 mo |
| Spectrum Analyzer | Agilent | E4446A | AAT | 6/28/2012 | 12 mo |
| Antenna, Bilog | Teseq | CBL 6141B | AYD | 12/19/2011 | 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 |

**MEASUREMENT UNCERTAINTY**

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 for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

**TEST DESCRIPTION**

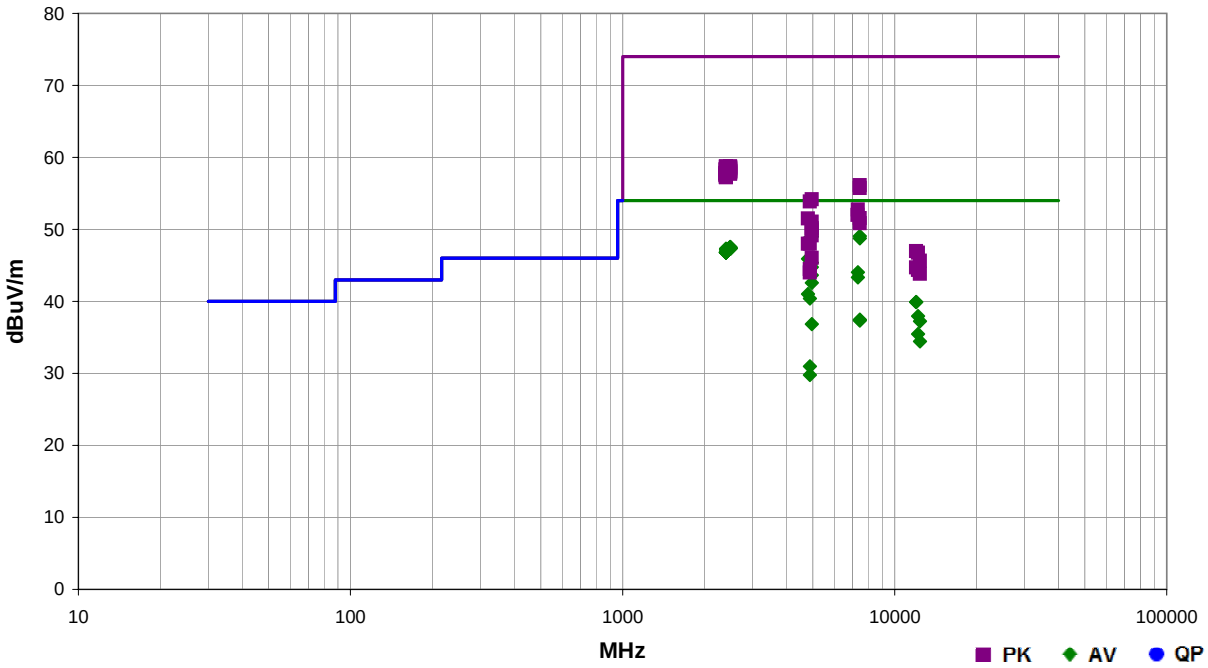
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify 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 EMISSIONS

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | MDTR0182 | **Date:** | 07/25/12 | Bryan Weller | |
| **Project:** | None | **Temperature:** | 23.59 °C | | |
| **Job Site:** | MN05 | **Humidity:** | 61.44% RH | | |
| **Serial Number:** | NLD001856N | **Barometric Pres.:** | 1003.7 mbar | **Tested by:** | Bryan Weller |
| **EUT:** | Intellis - Models 97745 (PTM), 97755 (RTM) | | | | |
| **Configuration:** | 4 | | | | |
| **Customer:** | Medtronic Inc. | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | Battery | | | | |
| **Operating Mode:** | RTM connected to PTM. PTM on Li-ion battery. Bluetooth communication Low, High Channel, DH5, 2DH5, 3DH5 mode. | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | Per MDTR0043 test plan configuration: 10. | | | | |

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

| **Run #** | 49 | **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) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7439.953 | 36.4 | 12.6 | 1.0 | 27.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 49.0 | 54.0 | -5.0 | EUT Horizontal |
| 4959.963 | 44.4 | 4.6 | 1.0 | 10.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 49.0 | 54.0 | -5.0 | EUT Horizontal |
| 4881.987 | 44.5 | 4.3 | 1.0 | 263.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 48.8 | 54.0 | -5.2 | EUT on side |
| 7439.973 | 36.1 | 12.6 | 1.4 | 320.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 48.7 | 54.0 | -5.3 | EUT on side |
| 2484.825 | 31.3 | -3.8 | 4.0 | 103.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.5 | 54.0 | -6.5 | DH5 EUT Vertical |
| 2484.275 | 31.3 | -3.8 | 1.3 | 189.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.5 | 54.0 | -6.5 | DH5 EUT Vertical |
| 2485.313 | 31.2 | -3.8 | 2.2 | 185.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.4 | 54.0 | -6.6 | DH5 EUT On Side |
| 2485.313 | 31.2 | -3.8 | 2.2 | 185.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.4 | 54.0 | -6.6 | DH5 EUT On Side |
| 2484.992 | 31.2 | -3.8 | 2.1 | 103.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.4 | 54.0 | -6.6 | DH5 EUT Horizontal |
| 2484.953 | 31.2 | -3.8 | 1.0 | 153.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.4 | 54.0 | -6.6 | DH5 EUT Horizontal |
| 2484.953 | 31.2 | -3.8 | 1.0 | 153.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.4 | 54.0 | -6.6 | 3DH5 EUT Vertical |
| 2484.283 | 31.2 | -3.8 | 1.8 | 189.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.4 | 54.0 | -6.6 | 3DH5 EUT Vertical |
| 2483.658 | 31.2 | -3.8 | 1.8 | 82.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.4 | 54.0 | -6.6 | 3DH5 EUT Horizontal |
| 2487.883 | 31.1 | -3.7 | 1.4 | 146.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.4 | 54.0 | -6.6 | 3DH5 EUT Horizontal |
| 2486.825 | 31.1 | -3.8 | 1.1 | 105.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.3 | 54.0 | -6.7 | 2DH5 EUT Vertical |
| 2486.750 | 31.1 | -3.8 | 1.0 | 124.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.3 | 54.0 | -6.7 | 2DH5 EUT Vertical |
| 2486.400 | 31.1 | -3.8 | 1.5 | 40.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.3 | 54.0 | -6.7 | 2DH5 EUT Vertical |
| 2486.050 | 31.1 | -3.8 | 1.2 | 0.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.3 | 54.0 | -6.7 | 2DH5 EUT On Side |

| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2486.042 | 31.1 | -3.8 | 1.0 | 124.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.3 | 54.0 | -6.7 | 2DH5 EUT On Side |
| 2485.925 | 31.1 | -3.8 | 1.5 | 40.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.3 | 54.0 | -6.7 | 2DH5 EUT Horizontal |
| 2483.842 | 31.1 | -3.8 | 1.8 | 136.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.3 | 54.0 | -6.7 | 3DH5 EUT on Side |
| 2483.717 | 31.1 | -3.8 | 1.8 | 82.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.3 | 54.0 | -6.7 | 3DH5 EUT on Side |
| 4804.020 | 41.9 | 4.0 | 1.0 | 321.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 45.9 | 54.0 | -8.1 | EUT on Side |
| 4960.016 | 40.8 | 4.6 | 1.1 | 345.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 45.4 | 54.0 | -8.6 | EUT on side |
| 4960.096 | 40.2 | 4.6 | 1.0 | 314.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 44.8 | 54.0 | -9.2 | EUT Vertical |
| 7322.000 | 32.0 | 12.0 | 1.0 | 322.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 44.0 | 54.0 | -10.0 | EUT on side |
| 4960.036 | 39.1 | 4.6 | 1.0 | 172.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 43.7 | 54.0 | -10.3 | EUT on side |
| 7322.000 | 31.3 | 12.0 | 1.2 | 351.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 43.3 | 54.0 | -10.7 | EUT Horizontal |
| 4960.023 | 38.0 | 4.6 | 1.0 | 224.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 42.6 | 54.0 | -11.4 | EUT Vertical |
| 4803.949 | 37.0 | 4.0 | 1.0 | 77.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 41.0 | 54.0 | -13.0 | EUT Horizontal |
| 4881.993 | 36.1 | 4.3 | 1.0 | 220.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 40.4 | 54.0 | -13.6 | EUT Horizontal |
| 12010.500 | 46.5 | -6.6 | 1.2 | 13.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 39.9 | 54.0 | -14.1 | EUT Horizontal |
| 12009.510 | 46.5 | -6.6 | 1.2 | 321.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 39.9 | 54.0 | -14.1 | EUT On side |
| 2487.573 | 42.5 | -3.7 | 1.8 | 82.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.8 | 74.0 | -15.2 | DH5 EUT Vertical |
| 2399.420 | 42.8 | -4.1 | 1.0 | 183.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.7 | 74.0 | -15.3 | 3DH5 EUT Vertical |
| 2398.420 | 42.8 | -4.1 | 1.0 | 183.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.7 | 74.0 | -15.3 | 3DH5 EUT Horizontal |
| 2399.180 | 42.8 | -4.1 | 1.0 | 183.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.7 | 74.0 | -15.3 | 2DH5 EUT On Side |
| 2486.758 | 42.4 | -3.8 | 1.3 | 189.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.6 | 74.0 | -15.4 | DH5 EUT Vertical |
| 2484.200 | 42.4 | -3.8 | 4.0 | 103.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.6 | 74.0 | -15.4 | DH5 EUT On Side |
| 2486.360 | 42.3 | -3.8 | 2.2 | 185.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.5 | 74.0 | -15.5 | DH5 EUT On Side |
| 2486.360 | 42.3 | -3.8 | 2.2 | 185.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.5 | 74.0 | -15.5 | DH5 EUT Horizontal |
| 2485.760 | 42.3 | -3.8 | 1.8 | 136.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.5 | 74.0 | -15.5 | DH5 EUT Horizontal |
| 2487.083 | 42.1 | -3.8 | 1.4 | 146.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.3 | 74.0 | -15.7 | 3DH5 EUT on Side |
| 2486.373 | 42.1 | -3.8 | 1.0 | 124.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.3 | 74.0 | -15.7 | 3DH5 EUT Vertical |
| 2398.325 | 42.4 | -4.1 | 3.0 | 305.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.3 | 74.0 | -15.7 | DH5 EUT Vertical |
| 2397.473 | 42.4 | -4.1 | 3.0 | 305.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.3 | 74.0 | -15.7 | 2DH5 EUT Vertical |
| 2397.158 | 42.4 | -4.1 | 3.0 | 305.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.3 | 74.0 | -15.7 | 3DH5 EUT on Side |
| 2485.067 | 42.0 | -3.8 | 1.2 | 25.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.2 | 74.0 | -15.8 | 3DH5 EUT Vertical |
| 2487.113 | 41.9 | -3.8 | 1.1 | 105.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.1 | 74.0 | -15.9 | 3DH5 EUT Horizontal |
| 2487.133 | 41.8 | -3.8 | 1.5 | 40.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.0 | 74.0 | -16.0 | 3DH5 EUT Horizontal |
| 2486.307 | 41.8 | -3.8 | 1.5 | 40.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.0 | 74.0 | -16.0 | 2DH5 EUT Vertical |
| 2485.960 | 41.8 | -3.8 | 1.0 | 124.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.0 | 74.0 | -16.0 | 2DH5 EUT On Side |
| 2484.687 | 41.8 | -3.8 | 2.4 | 151.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.0 | 74.0 | -16.0 | 2DH5 EUT On Side |
| 12205.070 | 44.1 | -6.1 | 1.2 | 340.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 38.0 | 54.0 | -16.0 | EUT Horiztonal |
| 2487.013 | 41.7 | -3.8 | 1.5 | 103.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.9 | 74.0 | -16.1 | 2DH5 EUT Horizontal |
| 2487.142 | 41.6 | -3.8 | 1.8 | 82.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.8 | 74.0 | -16.2 | 2DH5 EUT Horizontal |
| 2398.420 | 41.9 | -4.1 | 1.0 | 249.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.8 | 74.0 | -16.2 | 3DH5 EUT Vertical |
| 2398.527 | 41.9 | -4.1 | 1.0 | 249.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.8 | 74.0 | -16.2 | 3DH5 EUT Horizontal |
| 2396.767 | 41.9 | -4.1 | 1.0 | 249.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.8 | 74.0 | -16.2 | 2DH5 EUT Vertical |
| 2484.240 | 41.5 | -3.8 | 1.0 | 153.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.7 | 74.0 | -16.3 | 2DH5 EUT Horizontal |
| 2484.240 | 41.5 | -3.8 | 1.0 | 153.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.7 | 74.0 | -16.3 | 3DH5 EUT on Side |
| 2396.980 | 41.8 | -4.1 | 2.1 | 7.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.7 | 74.0 | -16.3 | DH5 EUT Horizontal |
| 2397.553 | 41.8 | -4.1 | 2.1 | 7.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.7 | 74.0 | -16.3 | 2DH5 EUT Vertical |
| 2398.127 | 41.8 | -4.1 | 2.1 | 7.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.7 | 74.0 | -16.3 | 3DH5 EUT on Side |
| 2397.861 | 41.6 | -4.1 | 1.0 | 198.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.5 | 74.0 | -16.5 | DH5 EUT Vertical |
| 2399.420 | 41.6 | -4.1 | 1.0 | 198.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.5 | 74.0 | -16.5 | DH5 EUT On Side |
| 2395.385 | 41.6 | -4.1 | 1.0 | 198.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.5 | 74.0 | -16.5 | 2DH5 EUT On Side |
| 7439.653 | 24.8 | 12.6 | 1.0 | 27.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 37.4 | 54.0 | -16.6 | 3DHFS EUT Horiztonal |
| 7439.813 | 24.7 | 12.6 | 1.0 | 27.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 37.3 | 54.0 | -16.7 | 2DHFS EUT Horiztonal |
| 12399.490 | 42.9 | -5.7 | 1.2 | 346.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 37.2 | 54.0 | -16.8 | EUT Horizontal |
| 2398.325 | 41.3 | -4.1 | 1.8 | 10.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.2 | 74.0 | -16.8 | DH5 EUT On Side |
| 2399.180 | 41.3 | -4.1 | 1.8 | 10.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.2 | 74.0 | -16.8 | DH5 EUT Horizontal |
| 2398.420 | 41.3 | -4.1 | 1.8 | 10.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.2 | 74.0 | -16.8 | 2DH5 EUT Horizontal |
| 4960.036 | 32.3 | 4.6 | 1.3 | 250.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 36.9 | 54.0 | -17.1 | EUT Horizontal |
| 7439.707 | 43.5 | 12.6 | 1.0 | 27.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 56.1 | 74.0 | -17.9 | EUT Horizontal |
| 7439.713 | 43.1 | 12.6 | 1.4 | 320.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 55.7 | 74.0 | -18.3 | EUT on side |
| 12204.990 | 41.6 | -6.1 | 1.3 | 196.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 35.5 | 54.0 | -18.5 | EUT On Side |
| 12399.530 | 40.1 | -5.7 | 1.2 | 319.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 34.4 | 54.0 | -19.6 | EUT on Side |
| 4959.923 | 49.6 | 4.6 | 1.0 | 10.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 54.2 | 74.0 | -19.8 | EUT Horizontal |
| 4881.747 | 49.6 | 4.3 | 1.0 | 263.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 53.9 | 74.0 | -20.1 | EUT on side |
| 7322.000 | 40.7 | 12.0 | 1.0 | 322.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 52.7 | 74.0 | -21.3 | EUT on side |
| 7318.247 | 40.0 | 12.0 | 1.2 | 351.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 52.0 | 74.0 | -22.0 | EUT Horizontal |
| 7440.406 | 38.9 | 12.6 | 1.0 | 27.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 51.5 | 74.0 | -22.5 | 2DHFS EUT Horiztonal |
| 4804.280 | 47.5 | 4.0 | 1.0 | 321.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 51.5 | 74.0 | -22.5 | EUT on Side |
| 4959.969 | 46.5 | 4.6 | 1.1 | 345.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 51.1 | 74.0 | -22.9 | EUT on side |
| 4881.961 | 26.7 | 4.3 | 1.0 | 264.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 31.0 | 54.0 | -23.0 | 2DHFS EUT Vertical |
| 7439.086 | 38.2 | 12.6 | 1.0 | 27.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 50.8 | 74.0 | -23.2 | 2DHFS EUT Horiztonal |
| 4959.989 | 45.6 | 4.6 | 1.0 | 314.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 50.2 | 74.0 | -23.8 | EUT Vertical |
| 4959.896 | 45.4 | 4.6 | 1.0 | 172.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 50.0 | 74.0 | -24.0 | EUT on side |
| 4880.127 | 25.5 | 4.3 | 1.0 | 264.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 29.8 | 54.0 | -24.2 | 3DHFS EUT Vertical |
| 4960.083 | 44.6 | 4.6 | 1.0 | 224.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 49.2 | 74.0 | -24.8 | EUT Vertical |
| 4804.069 | 44.0 | 4.0 | 1.0 | 77.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.0 | 74.0 | -26.0 | EUT Horizontal |
| 4881.933 | 43.7 | 4.3 | 1.0 | 220.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.0 | 74.0 | -26.0 | EUT Horizontal |
| 2399.420 | 31.4 | -4.1 | 1.0 | 183.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.3 | 74.0 | -26.7 | DH5 EUT Vertical |
| 2399.180 | 31.4 | -4.1 | 1.0 | 183.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.3 | 74.0 | -26.7 | 2DH5 EUT On Side |
| 2398.420 | 31.4 | -4.1 | 1.0 | 183.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.3 | 74.0 | -26.7 | 3DH5 EUT on Side |
| 12010.490 | 53.6 | -6.6 | 1.2 | 321.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 47.0 | 74.0 | -27.0 | EUT On side |
| 2398.420 | 31.0 | -4.1 | 2.1 | 7.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.9 | 74.0 | -27.1 | DH5 EUT On Side |
| 2399.420 | 31.0 | -4.1 | 2.1 | 7.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.9 | 74.0 | -27.1 | 3DH5 EUT Vertical |
| 2399.180 | 31.0 | -4.1 | 2.1 | 7.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.9 | 74.0 | -27.1 | 2DH5 EUT On Side |
| 2399.420 | 30.9 | -4.1 | 3.0 | 305.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 74.0 | -27.2 | DH5 EUT Vertical |
| 2398.325 | 30.9 | -4.1 | 3.0 | 305.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 74.0 | -27.2 | 3DH5 EUT Vertical |
| 2397.473 | 30.9 | -4.1 | 3.0 | 305.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 74.0 | -27.2 | 2DH5 EUT Vertical |

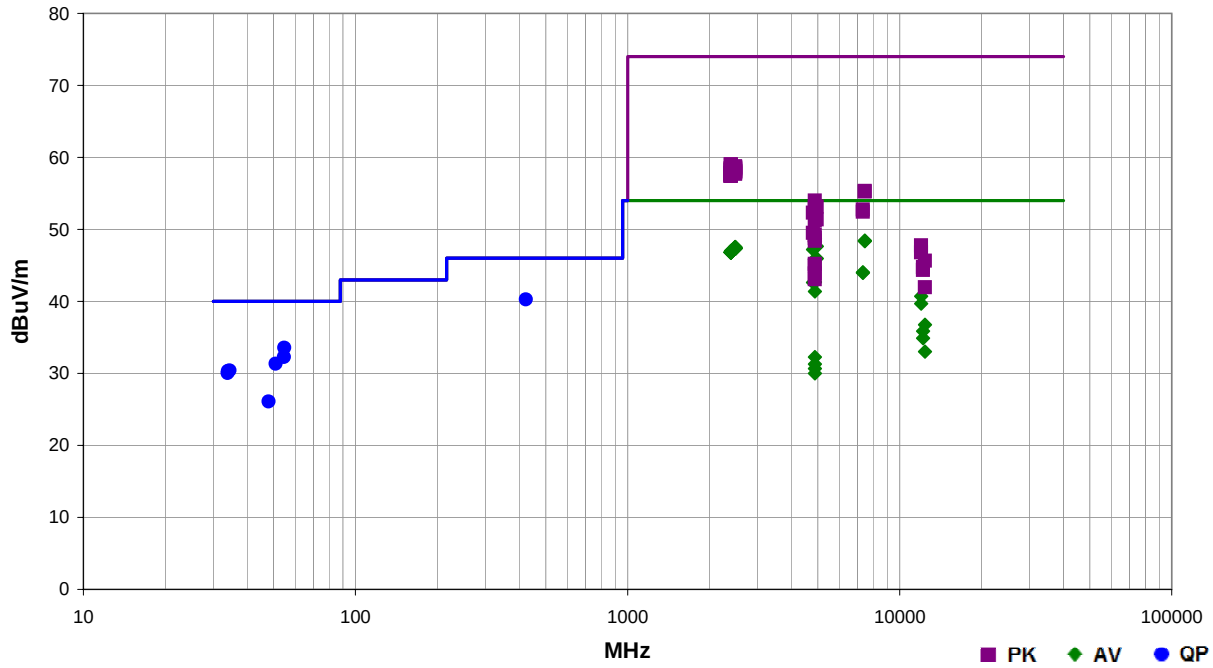
| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | External Attenuation (dB) | Polarity/ Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2399.180 | 30.9 | -4.1 | 1.0 | 249.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 74.0 | -27.2 | DH5 EUT Horizontal |
| 2398.325 | 30.9 | -4.1 | 1.0 | 249.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 74.0 | -27.2 | 3DH5 EUT Horizontal |
| 2398.420 | 30.9 | -4.1 | 1.0 | 249.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 74.0 | -27.2 | 2DH5 EUT Horizontal |
| 2399.420 | 30.9 | -4.1 | 1.8 | 10.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 74.0 | -27.2 | DH5 EUT On Side |
| 2398.420 | 30.9 | -4.1 | 1.8 | 10.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 74.0 | -27.2 | 3DH5 EUT Horizontal |
| 2399.180 | 30.9 | -4.1 | 1.8 | 10.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 74.0 | -27.2 | 2DH5 EUT Horizontal |
| 2399.420 | 30.9 | -4.1 | 1.0 | 198.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 74.0 | -27.2 | DH5 EUT Horizontal |
| 2398.420 | 30.9 | -4.1 | 1.0 | 198.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 74.0 | -27.2 | 3DH5 EUT on Side |
| 2399.180 | 30.9 | -4.1 | 1.0 | 198.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 74.0 | -27.2 | 2DH5 EUT Horizontal |
| 12205.160 | 52.9 | -6.1 | 1.2 | 340.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 46.8 | 74.0 | -27.2 | EUT Horiztonal |
| 4959.923 | 41.5 | 4.6 | 1.3 | 250.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 46.1 | 74.0 | -27.9 | EUT Horizontal |
| 12399.160 | 51.3 | -5.7 | 1.2 | 346.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 45.6 | 74.0 | -28.4 | EUT Horizontal |
| 12010.700 | 51.3 | -6.6 | 1.2 | 13.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 44.7 | 74.0 | -29.3 | EUT Horizontal |
| 4880.394 | 40.2 | 4.3 | 1.0 | 264.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 44.5 | 74.0 | -29.5 | 3DHFS EUT Vertical |
| 12205.130 | 50.5 | -6.1 | 1.3 | 196.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 44.4 | 74.0 | -29.6 | EUT On Side |
| 4882.341 | 39.7 | 4.3 | 1.0 | 264.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 44.0 | 74.0 | -30.0 | 2DHFS EUT Vertical |
| 12399.400 | 49.5 | -5.7 | 1.2 | 319.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 43.8 | 74.0 | -30.2 | EUT on Side |

# SPURIOUS EMISSIONS

| | | | | | |
|---|---|---|---|---|---|
| **Work Order:** | MDTR0182 | **Date:** | 07/25/12 | | |
| **Project:** | None | **Temperature:** | 23.59 °C | | |
| **Job Site:** | MN05 | **Humidity:** | 61.44% RH | | |
| **Serial Number:** | NLD001856N | **Barometric Pres.:** | 1003.7 mbar | **Tested by:** | Bryan Weller |
| **EUT:** | Intellis - Models 97745 (PTM), 97755 (RTM) | | | | |
| **Configuration:** | 1 | | | | |
| **Customer:** | Medtronic Inc. | | | | |
| **Attendees:** | None | | | | |
| **EUT Power:** | 120VAC/60Hz | | | | |
| **Operating Mode:** | PTM connected to AC Power. Bluetooth communication Low, High Channel, DH5, 2DH5, 3DH5 mode. | | | | |
| **Deviations:** | None | | | | |
| **Comments:** | Per MDTR0043 test plan configuration: 9. | | | | |

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

| **Run #** | 50 | **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) | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4881.973 | 44.4 | 4.3 | 1.1 | 321.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 48.7 | 54.0 | -5.3 | EUT on side |
| 7439.887 | 35.8 | 12.6 | 1.0 | 350.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 48.4 | 54.0 | -5.6 | EUT Horizontal |
| 7440.027 | 35.7 | 12.6 | 1.0 | 319.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 48.3 | 54.0 | -5.7 | EUT Vertical |
| 4881.973 | 44.0 | 4.3 | 1.2 | 3.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 48.3 | 54.0 | -5.7 | EUT Horizontal |
| 4960.007 | 43.1 | 4.6 | 1.0 | 264.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 47.7 | 54.0 | -6.3 | EUT Vertical |
| 2484.825 | 31.3 | -3.8 | 4.0 | 103.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.5 | 54.0 | -6.5 | 3DH5 EUT Horizontal |
| 2484.275 | 31.3 | -3.8 | 1.3 | 189.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.5 | 54.0 | -6.5 | 3DH5 EUT on Side |
| 2485.313 | 31.2 | -3.8 | 2.2 | 185.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.4 | 54.0 | -6.6 | DH5 EUT Vertical |
| 2485.313 | 31.2 | -3.8 | 2.2 | 185.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.4 | 54.0 | -6.6 | DH5 EUT Horizontal |
| 2484.992 | 31.2 | -3.8 | 2.1 | 103.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.4 | 54.0 | -6.6 | 3DH5 EUT Horizontal |
| 2484.953 | 31.2 | -3.8 | 1.0 | 153.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.4 | 54.0 | -6.6 | DH5 EUT Vertical |
| 2484.953 | 31.2 | -3.8 | 1.0 | 153.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.4 | 54.0 | -6.6 | DH5 EUT Horizontal |
| 2484.283 | 31.2 | -3.8 | 1.8 | 189.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.4 | 54.0 | -6.6 | 3DH5 EUT on Side |
| 2483.658 | 31.2 | -3.8 | 1.8 | 82.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.4 | 54.0 | -6.6 | 2DH5 EUT On Side |
| 2487.883 | 31.1 | -3.7 | 1.4 | 146.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.4 | 54.0 | -6.6 | DH5 EUT On Side |
| 2486.825 | 31.1 | -3.8 | 1.1 | 105.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.3 | 54.0 | -6.7 | 2DH5 EUT Vertical |
| 2486.750 | 31.1 | -3.8 | 1.0 | 124.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.3 | 54.0 | -6.7 | 3DH5 EUT Vertical |
| 2486.400 | 31.1 | -3.8 | 1.5 | 40.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.3 | 54.0 | -6.7 | 2DH5 EUT Horiztonal |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2486.050 | 31.1 | -3.8 | 1.2 | 0.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.3 | 54.0 | -6.7 | 2DH5 EUT Vertical |
| 2486.042 | 31.1 | -3.8 | 1.0 | 124.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.3 | 54.0 | -6.7 | 3DH5 EUT Vertical |
| 2485.925 | 31.1 | -3.8 | 1.5 | 40.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.3 | 54.0 | -6.7 | 2DH5 EUT Horiztonal |
| 2483.842 | 31.1 | -3.8 | 1.8 | 136.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 47.3 | 54.0 | -6.7 | DH5 EUT On Side |
| 2483.717 | 31.1 | -3.8 | 1.8 | 82.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.3 | 54.0 | -6.7 | 2DH5 EUT On Side |
| 4803.973 | 43.2 | 4.0 | 1.1 | 309.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 47.2 | 54.0 | -6.8 | EUT on side |
| 2399.453 | 31.1 | -4.1 | 1.2 | 173.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 47.0 | 54.0 | -7.0 | DH5 EUT Vertical |
| 2397.667 | 31.0 | -4.1 | 1.4 | 168.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.9 | 54.0 | -7.1 | DH5 EUT on Side |
| 2396.093 | 30.9 | -4.1 | 1.1 | 97.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 54.0 | -7.2 | DH5 EUT on Side |
| 2396.760 | 30.9 | -4.1 | 1.3 | 80.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 54.0 | -7.2 | 2DH5 EUT Horizontal |
| 2398.320 | 30.9 | -4.1 | 1.3 | 80.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 54.0 | -7.2 | 3DH5 EUT Horizontal |
| 2397.840 | 30.9 | -4.1 | 1.0 | 152.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 54.0 | -7.2 | 3DH5 EUT Horizontal |
| 2397.067 | 30.9 | -4.1 | 1.0 | 152.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 54.0 | -7.2 | DH5 EUT Horizontal |
| 2397.620 | 30.9 | -4.1 | 1.8 | 136.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 54.0 | -7.2 | 2DH5 EUT on side |
| 2398.240 | 30.9 | -4.1 | 1.8 | 136.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 54.0 | -7.2 | 3DH5 EUT on Side |
| 2397.840 | 30.9 | -4.1 | 1.4 | 75.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 54.0 | -7.2 | 2DH5 EUT Vertical |
| 2397.860 | 30.9 | -4.1 | 1.4 | 75.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 54.0 | -7.2 | 2DH5 EUT Vertical |
| 2399.213 | 30.9 | -4.1 | 1.4 | 75.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 54.0 | -7.2 | 3DH5 EUT on Side |
| 2399.220 | 30.9 | -4.1 | 1.4 | 75.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 54.0 | -7.2 | 3DH5 EUT Vertical |
| 2398.240 | 30.9 | -4.1 | 1.4 | 80.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 54.0 | -7.2 | 2DH5 EUT Horizontal |
| 2395.753 | 30.9 | -4.1 | 1.4 | 80.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 54.0 | -7.2 | 3DH5 EUT Horizontal |
| 2398.460 | 30.9 | -4.1 | 1.0 | 183.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 54.0 | -7.2 | DH5 EUT Vertical |
| 2398.760 | 30.9 | -4.1 | 1.0 | 66.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.8 | 54.0 | -7.2 | DH5 EUT Horizontal |
| 2398.747 | 30.9 | -4.1 | 1.8 | 136.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.8 | 54.0 | -7.2 | 2DH5 EUT on side |
| 4959.960 | 41.4 | 4.6 | 1.0 | 32.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 46.0 | 54.0 | -8.0 | EUT Horizontal |
| 4881.967 | 41.6 | 4.3 | 1.1 | 10.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 45.9 | 54.0 | -8.1 | EUT Vertical |
| 7322.000 | 32.0 | 12.0 | 1.0 | 353.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 44.0 | 54.0 | -10.0 | EUT Horizontal |
| 7321.993 | 31.9 | 12.0 | 1.0 | 323.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 43.9 | 54.0 | -10.1 | EUT on side |
| 4882.000 | 38.4 | 4.3 | 1.0 | 157.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 42.7 | 54.0 | -11.3 | EUT Horizontal |
| 4881.973 | 38.4 | 4.3 | 1.1 | 78.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 42.7 | 54.0 | -11.3 | EUT on side |
| 4803.956 | 38.6 | 4.0 | 1.0 | 188.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 42.6 | 54.0 | -11.4 | EUT Horizontal |
| 4881.993 | 37.1 | 4.3 | 1.0 | 179.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 41.4 | 54.0 | -12.6 | EUT Vertical |
| 12009.350 | 47.3 | -6.6 | 1.2 | 256.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 40.7 | 54.0 | -13.3 | EUT on Side |
| 12009.460 | 46.3 | -6.6 | 1.1 | 345.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 39.7 | 54.0 | -14.3 | EUT Horizontal |
| 2399.220 | 43.1 | -4.1 | 1.4 | 75.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 59.0 | 74.0 | -15.0 | 2DH5 EUT Vertical |
| 2397.520 | 43.1 | -4.1 | 1.4 | 75.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 59.0 | 74.0 | -15.0 | 3DH5 EUT Vertical |
| 2487.573 | 42.5 | -3.7 | 1.8 | 82.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.8 | 74.0 | -15.2 | 2DH5 EUT On Side |
| 2486.758 | 42.4 | -3.8 | 1.3 | 189.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.6 | 74.0 | -15.4 | 3DH5 EUT on Side |
| 2484.200 | 42.4 | -3.8 | 4.0 | 103.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.6 | 74.0 | -15.4 | 3DH5 EUT Horizontal |
| 2486.360 | 42.3 | -3.8 | 2.2 | 185.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.5 | 74.0 | -15.5 | DH5 EUT Vertical |
| 2486.360 | 42.3 | -3.8 | 2.2 | 185.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.5 | 74.0 | -15.5 | DH5 EUT Horizontal |
| 2485.760 | 42.3 | -3.8 | 1.8 | 136.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.5 | 74.0 | -15.5 | DH5 EUT On Side |
| 2397.810 | 42.5 | -4.1 | 1.0 | 183.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.4 | 74.0 | -15.6 | 3DH5 EUT Vertical |
| 2395.753 | 42.5 | -4.1 | 1.0 | 183.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.4 | 74.0 | -15.6 | DH5 EUT Vertical |
| 2487.083 | 42.1 | -3.8 | 1.4 | 146.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.3 | 74.0 | -15.7 | DH5 EUT On Side |
| 2486.373 | 42.1 | -3.8 | 1.0 | 124.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.3 | 74.0 | -15.7 | 3DH5 EUT Vertical |
| 2485.067 | 42.0 | -3.8 | 1.2 | 25.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.2 | 74.0 | -15.8 | 2DH5 EUT Vertical |
| 2396.533 | 42.3 | -4.1 | 1.1 | 97.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.2 | 74.0 | -15.8 | 3DH5 EUT on Side |
| 2399.213 | 42.3 | -4.1 | 1.1 | 97.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.2 | 74.0 | -15.8 | DH5 EUT on Side |
| 2487.113 | 41.9 | -3.8 | 1.1 | 105.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.1 | 74.0 | -15.9 | 2DH5 EUT Vertical |
| 2487.133 | 41.8 | -3.8 | 1.5 | 40.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.0 | 74.0 | -16.0 | 2DH5 EUT Horiztonal |
| 2486.307 | 41.8 | -3.8 | 1.5 | 40.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.0 | 74.0 | -16.0 | 2DH5 EUT Horiztonal |
| 2485.960 | 41.8 | -3.8 | 1.0 | 124.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.0 | 74.0 | -16.0 | 3DH5 EUT Vertical |
| 2484.687 | 41.8 | -3.8 | 2.4 | 151.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.0 | 74.0 | -16.0 | 3DH5 EUT on Side |
| 2398.320 | 42.1 | -4.1 | 1.4 | 75.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.0 | 74.0 | -16.0 | 2DH5 EUT Vertical |
| 2487.013 | 41.7 | -3.8 | 1.5 | 103.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.9 | 74.0 | -16.1 | 3DH5 EUT Horizontal |
| 2487.142 | 41.6 | -3.8 | 1.8 | 82.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.8 | 74.0 | -16.2 | 2DH5 EUT On Side |
| 2398.007 | 41.9 | -4.1 | 1.8 | 136.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.8 | 74.0 | -16.2 | 2DH5 EUT on side |
| 2397.287 | 41.9 | -4.1 | 1.8 | 136.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.8 | 74.0 | -16.2 | 3DH5 EUT Vertical |
| 2484.240 | 41.5 | -3.8 | 1.0 | 153.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.7 | 74.0 | -16.3 | DH5 EUT Vertical |
| 2484.240 | 41.5 | -3.8 | 1.0 | 153.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.7 | 74.0 | -16.3 | DH5 EUT Horizontal |
| 2397.900 | 41.8 | -4.1 | 1.2 | 173.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.7 | 74.0 | -16.3 | 3DH5 EUT Horizontal |
| 2398.947 | 41.8 | -4.1 | 1.2 | 173.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.7 | 74.0 | -16.3 | DH5 EUT Vertical |
| 2396.440 | 41.7 | -4.1 | 1.8 | 136.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.6 | 74.0 | -16.4 | 2DH5 EUT on side |
| 2395.740 | 41.7 | -4.1 | 1.8 | 136.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.6 | 74.0 | -16.4 | 3DH5 EUT on Side |
| 2397.287 | 41.7 | -4.1 | 1.4 | 168.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.6 | 74.0 | -16.4 | DH5 EUT on Side |
| 2397.900 | 41.6 | -4.1 | 1.3 | 80.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.5 | 74.0 | -16.5 | 2DH5 EUT Horizontal |
| 2395.740 | 41.5 | -4.1 | 1.0 | 66.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 57.4 | 74.0 | -16.6 | DH5 EUT Horizontal |
| 2396.533 | 41.5 | -4.1 | 1.0 | 152.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.4 | 74.0 | -16.6 | DH5 EUT Horizontal |
| 2397.520 | 41.5 | -4.1 | 1.4 | 80.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 57.4 | 74.0 | -16.6 | 2DH5 EUT Horizontal |
| 12399.460 | 42.4 | -5.7 | 1.3 | 10.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 36.7 | 54.0 | -17.3 | EUT Horizontal |
| 12204.760 | 42.0 | -6.1 | 1.4 | 353.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 35.9 | 54.0 | -18.1 | EUT Horiztonal |
| 7439.593 | 42.7 | 12.6 | 1.0 | 319.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 55.3 | 74.0 | -18.7 | EUT Vertical |
| 7440.153 | 42.6 | 12.6 | 1.0 | 350.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 55.2 | 74.0 | -18.8 | EUT Horizontal |
| 12204.950 | 41.0 | -6.1 | 1.1 | 266.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 34.9 | 54.0 | -19.1 | EUT Vertical |
| 4881.833 | 49.7 | 4.3 | 1.1 | 321.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 54.0 | 74.0 | -20.0 | EUT on side |
| 4959.840 | 48.6 | 4.6 | 1.0 | 264.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 53.2 | 74.0 | -20.8 | EUT Vertical |
| 4881.833 | 48.8 | 4.3 | 1.2 | 3.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 53.1 | 74.0 | -20.9 | EUT Horizontal |
| 12399.620 | 38.7 | -5.7 | 1.2 | 222.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 33.0 | 54.0 | -21.0 | EUT On Side |
| 7321.873 | 40.7 | 12.0 | 1.0 | 323.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 52.7 | 74.0 | -21.3 | EUT on side |
| 7321.960 | 40.4 | 12.0 | 1.0 | 353.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 52.4 | 74.0 | -21.6 | EUT Horizontal |
| 4803.853 | 48.3 | 4.0 | 1.1 | 309.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 52.3 | 74.0 | -21.7 | EUT on side |
| 4882.001 | 28.0 | 4.3 | 1.0 | 263.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 32.3 | 54.0 | -21.7 | 2DHFS EUT Horiztonal |
| 4960.040 | 46.8 | 4.6 | 1.0 | 32.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 51.4 | 74.0 | -22.6 | EUT Horizontal |
| 4881.907 | 27.0 | 4.3 | 1.0 | 264.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 31.3 | 54.0 | -22.7 | 3DHFS EUT Horiztonal |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4881.720 | 46.9 | 4.3 | 1.1 | 10.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 51.2 | 74.0 | -22.8 | EUT Vertical |
| 4881.914 | 26.4 | 4.3 | 1.0 | 264.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 30.7 | 54.0 | -23.3 | 2DHFS EUT Vertical |
| 4882.027 | 25.7 | 4.3 | 1.0 | 264.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 30.0 | 54.0 | -24.0 | 3DHFS EUT Vertical |
| 4803.789 | 45.5 | 4.0 | 1.0 | 188.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 49.5 | 74.0 | -24.5 | EUT Horizontal |
| 4881.887 | 44.9 | 4.3 | 1.0 | 157.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 49.2 | 74.0 | -24.8 | EUT Horizontal |
| 4881.853 | 44.5 | 4.3 | 1.1 | 78.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 48.8 | 74.0 | -25.2 | EUT on side |
| 4881.593 | 44.1 | 4.3 | 1.0 | 179.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 48.4 | 74.0 | -25.6 | EUT Vertical |
| 12009.890 | 54.4 | -6.6 | 1.2 | 256.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 47.8 | 74.0 | -26.2 | EUT on Side |
| 12010.390 | 53.4 | -6.6 | 1.1 | 345.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 46.8 | 74.0 | -27.2 | EUT Horizontal |
| 12399.840 | 51.3 | -5.7 | 1.3 | 10.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 45.6 | 74.0 | -28.4 | EUT Horizontal |
| 4881.907 | 40.9 | 4.3 | 1.0 | 264.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 45.2 | 74.0 | -28.8 | 3DHFS EUT Horiztonal |
| 4881.367 | 40.7 | 4.3 | 1.0 | 263.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 45.0 | 74.0 | -29.0 | 2DHFS EUT Horiztonal |
| 12204.580 | 50.9 | -6.1 | 1.4 | 353.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 44.8 | 74.0 | -29.2 | EUT Horiztonal |
| 12204.600 | 50.5 | -6.1 | 1.1 | 266.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 44.4 | 74.0 | -29.6 | EUT Vertical |
| 4881.327 | 39.6 | 4.3 | 1.0 | 264.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 43.9 | 74.0 | -30.1 | 2DHFS EUT Vertical |
| 4881.707 | 38.8 | 4.3 | 1.0 | 264.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 43.1 | 74.0 | -30.9 | 3DHFS EUT Vertical |
| 12400.900 | 47.6 | -5.7 | 1.2 | 222.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 41.9 | 74.0 | -32.1 | EUT On Side |