

Medtronic Inc.

Viva Quad

Report No. MDTR0124.1

Report Prepared By



www.nwemc.com

1-888-EMI-CERT

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EMC Test Report



22975 NW Evergreen Parkway
 Suite 400
 Hillsboro, Oregon 97124

Certificate of Test
Last Date of Test: November 15, 2011
Medtronic Inc.
Model: Viva Quad

Emissions			
Test Description	Specification	Test Method	Pass/Fail
Emissions Mask	FCC 95I:2011	ANSI/TIA/EIA-603-C-2004	Pass
Emissions Mask	RSS-243:2010	RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009	Pass
Field Strength of Fundamental	FCC 95I:2011	ANSI/TIA/EIA-603-C-2004	Pass
Field Strength of Fundamental	RSS-243:2010	RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009	Pass
Occupied Bandwidth	FCC 95I:2011	ANSI/TIA/EIA-603-C-2004	Pass
Occupied Bandwidth	RSS-243:2010	RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009	Pass
Emission Bandwidth	FCC 95I:2011	ANSI/TIA/EIA-603-C-2004	Pass
Emission Bandwidth	RSS-243:2010	RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009	Pass
Frequency Stability	FCC 95I:2011	ANSI/TIA/EIA-603-C-2004	Pass
Frequency Stability	RSS-243:2010	RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009	Pass
Receiver Spurious Emissions	FCC 15.109:2011	ANSI C63.10:2009	Pass
Receiver Spurious Emissions	RSS-243:2010	RSS-Gen:2010	Pass
Spurious Radiated Emissions	FCC 95I:2011	ANSI/TIA/EIA-603-C-2004	Pass
Spurious Radiated Emissions	RSS-243:2010	RSS-Gen:2010	Pass

*Per Northwest EMC Quality Document, QM205.2 Section 2.0, in situations where testing is performed by an employee "in training" a Lead/Supervisor will oversee testing, review the data for accuracy, and sign off on the data sheets.

Modifications made to the product
 See the Modifications section of this report

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).



Approved By:

A handwritten signature in blue ink, reading "Timothy P. O'Shea", is written over a white background.

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200881-0

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

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 Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.



Accreditations and Authorizations

FCC

Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.

NVLAP

Northwest EMC, Inc. is accredited under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. NVLAP is administered by the National Institute of Standards and Technology (NIST), an agency of the U.S. Commerce Department. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 2004/108/EC, and ANSI C63.4. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.

Industry Canada

Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS-Gen, Issue 2 and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements. (*Site Filing Numbers - Hillsboro: 2834D-1, 2834D-2, Sultan: 2834C-1, Irvine: 2834B-1, 2834B-2, Brooklyn Park: 2834E-1*)

CAB

Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement.

Australia/New Zealand

The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body (NVLAP).



Accreditations and Authorizations

VCCI

Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Numbers. - Hillsboro: C-1071, R-1025, G-84, C-2687, T-1658, and R-2318, Irvine: R-1943, G-85, C-2766, and T-1659, Sultan: R-871, G-83, C-3265, and T-1511, Brooklyn Park: R-3125, G-86, G-141, C-3464, and T-1634.*)

BSMI

Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement (US0017).

GOST

Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification

KCC

Northwest EMC, Inc is a CAB designated by MRA partners and recognized by Korea. (*Assigned Lab Numbers: Hillsboro: US0017, Irvine: US0158, Sultan: US0157, Brooklyn Park: US0175*)

VIETNAM

Vietnam MIC has approved Northwest EMC as an accredited test lab. Per Decision No. 194/QD-QLCL (dated December 15, 2009), Northwest EMC test reports can be used for Vietnam approval submissions.

SCOPE

For details on the Scopes of our Accreditations, please visit:

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



Northwest EMC Locations



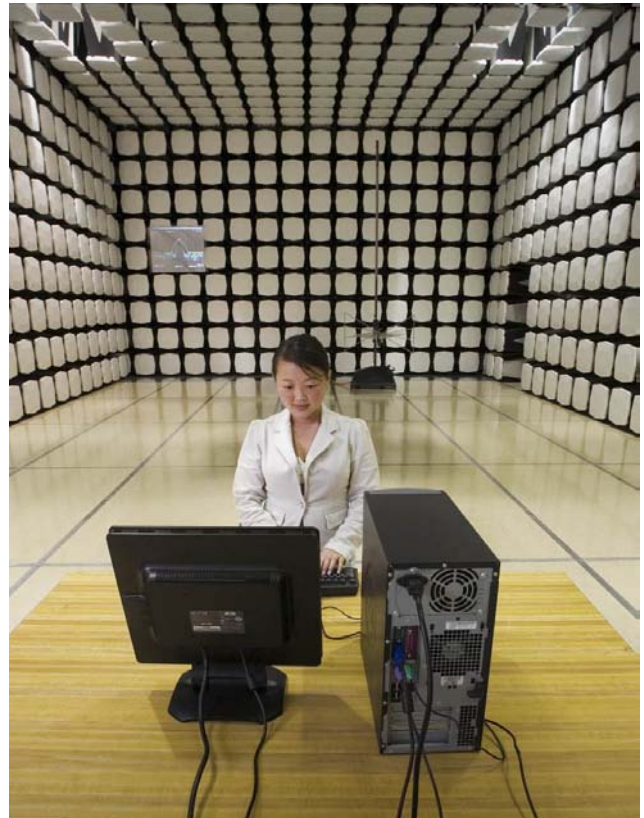
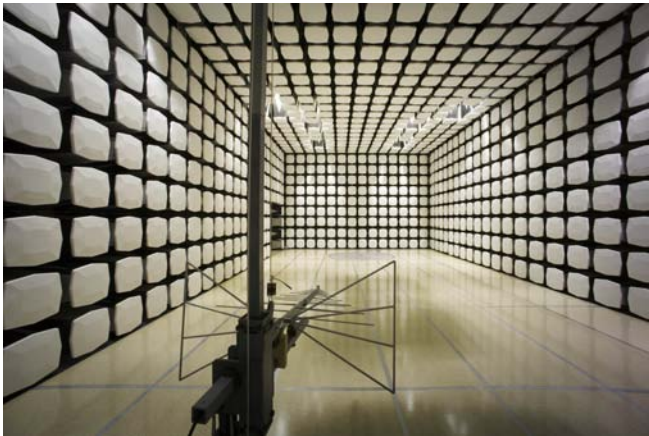
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

California
Labs OC01-OC13
41 Tesla
Irvine, CA 92618
(949) 861-8918

Minnesota
Labs MN01-MN08
9349 W Broadway Ave.
Brooklyn Park,
MN 55445
(763) 425-2281

Washington
Labs SU01-SU07
14128 339th Ave. SE
Sultan, WA 98294
(360) 793-8675

New York
Labs WA01-WA04
4939 Jordan Rd.
Elbridge, NY 13060
(315) 685-0796



Party Requesting the Test

Company Name:	Medtronic Inc.
Address:	8200 Coral Sea St NE
City, State, Zip:	Mounds View, MN 55112
Test Requested By:	Nick Blake
Model:	Viva Quad
First Date of Test:	November 3, 2011
Last Date of Test:	November 15, 2011
Receipt Date of Samples:	November 3, 2011
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test**Functional Description of the EUT (Equipment Under Test):**

Device is an Implantable Cardioverter Defibrillator (ICD) with low-power MICS and inductive telemetry.

Other models for which the test results are applicable: Viva Quad C / Viva Quad XT / Viva Quad S / Brava Quad / Viva XT / Viva S / Brava / Evera XT / Evera S

Note: Our Medical Devices are of identical construction, sharing the same hardware design, with differences in the software and firmware features that allow the appropriate treatment to be delivered to the patient. These implants contain the same RF specifications.

Simulated Biological Solution Measurements

Material/Liquid Type	Date Measured	Permittivity e' @ 403 MHz	Sigma - σ (Calculated Conductivity)
Simulated Biological Solution	11/2/2011	58.90	0.89

Testing Objective:

To demonstrate compliance to FCC and IC requirements for the MICS transmitter.

CONFIGURATION 1 MDTR0124

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Viva Quad	Medtronic Inc	DTBX1QQ	BLA600086S

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
LV - Model: 4298, SN: TEM005482V	No	78cm	No	Viva Quad	Tissue Simulant
Atrium - Model: 5076, SN: PJN1991594	No	65cm	No	Viva Quad	Tissue Simulant
RV+SVC - Model: 6947M, SN: TDK033391V	No	62cm	No	Viva Quad	Tissue Simulant
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 2 MDTR0124

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Viva Quad	Medtronic Inc	DTBX1QQ	BLA600093S

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
LV - Model: 4298, SN: TEM005482V	No	78cm	No	Viva Quad	Tissue Simulant
RV+SVC - Model: 6947M, SN: TDK033391V	No	62cm	No	Viva Quad	Tissue Simulant
Atrium - Model: 5554, SN: LEJ246593V	No	53cm	No	Viva Quad	Tissue Simulant
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 3 MDTR0124

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Viva Quad	Medtronic Inc	DTBX1QQ	BLA600094S

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
LV - Model: 4298, SN: TEM005482V	No	78cm	No	Viva Quad	Tissue Simulant
RV+SVC - Model: 6947M, SN: TDK033391V	No	62cm	No	Viva Quad	Tissue Simulant
Atrium - Model: 4592, SN: LER200629V	No	53cm	No	Viva Quad	Tissue Simulant
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 4 MDTR0124

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Viva Quad	Medtronic Inc	DTBX1QQ	BLA600093S

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Atrium - Model: 5554, SN: LEJ246593V	No	53cm	No	Viva Quad	Tissue Simulant
LV - Model: 4298, SN: TEM005438V	No	78cm	No	Viva Quad	Tissue Simulant
RV+SVC - Model: 6947M, SN: TDK025961V	No	62cm	No	Viva Quad	Tissue Simulant
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 5 MDTR0124**EUT**

Description	Manufacturer	Model/Part Number	Serial Number
Viva Quad	Medtronic Inc	DTBX1QQ	BLA600094S

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Atrium - Model: 4592, SN: LER200629V	No	53cm	No	Viva Quad	Tissue Simulant
LV - Model: 4298, SN: TEM005449V	No	78cm	No	Viva Quad	Tissue Simulant
RV+SVC - Model: 6947M, SN: TDK025962V	No	62cm	No	Viva Quad	Tissue Simulant

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	11/3/2011	Field Strength of Fundamental	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	11/3/2011	Emission Mask	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	11/3/2011	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.
4	11/10/2011	Receiver Spurious 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	11/3/2011	Emission Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
6	11/10/2011	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	11/15/2011	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Pre-Amplifier	Miteq	AM-1616-1000	AVY	7/1/2011	12
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	2/2/2011	12
Antenna, Biconilog	ETS Lindgren	3142D	AXN	12/30/2009	24
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	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 ETSI TR 100 028; 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

Per 47 CFR 95.635(d)(4-5) the emission mask was measured. Emissions more than 150 kHz away from the center frequency must be attenuated below the transmitter output power by at least 20 dB. This was evaluated by the Occupied Bandwidth measurement according to 47 CFR 95.633(e)(1). In addition, emissions 250 kHz or less above and below the MICS band (402-405 MHz) must be attenuated below the maximum permitted output power by at least 20 dB.

A spectrum analyzer was used to measure the emission mask. A spectrum analyzer using a peak detector with no video filtering was used with a resolution bandwidth equal to approximately 1.0 percent of the emission bandwidth of the EUT. However, various plots were made using different frequency spans and resolution bandwidths in an attempt to not only satisfy the measurement criteria, but to also show that all emissions outside of the occupied band are greatly attenuated.

EUT: Viva Quad	Work Order: MDTR0124
Serial Number: BLA600086S, BLA600093S, BLA600094S	Date: 11/03/11
Customer: Medtronic Inc.	Temperature: 23.58 °C
Attendees: Nick Blake	Humidity: 20.86% RH
Project: None	Barometric Pres.: 1027.3 mbar
Tested by: Trevor Buls	Power: Battery
	Job Site: MN05

TEST SPECIFICATIONS		Test Method
FCC 951:2011		ANSI/TIA/EIA-603-C-2004
RSS-243:2010		RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009

COMMENTS
None

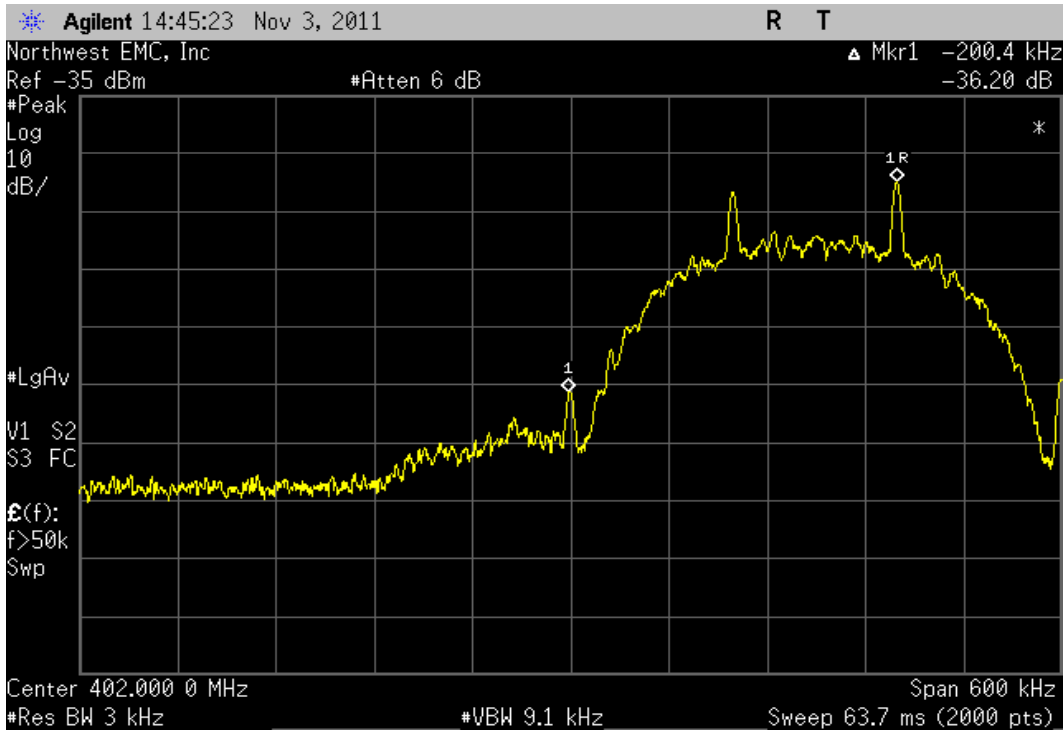
DEVIATIONS FROM TEST STANDARD
None

Configuration #	1,2,3	Signature <i>Trevor Buls</i>
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		Value	Limit	Result
BLA600086S	MICS Standard Data Rate			
	Low Channel, 402.15 MHz	-36.2 dBc	≤ -20 dBc	Pass
	High Channel, 404.85 MHz	-35.72 dBc	≤ -20 dBc	Pass
	MICS High Data Rate			
	Low Channel, 402.15 MHz	-31.58 dBc	≤ -20 dBc	Pass
	High Channel, 404.85 MHz	-33.35 dBc	≤ -20 dBc	Pass
BLA600093S	MICS Standard Data Rate			
	Low Channel, 402.15 MHz	-35.13 dBc	≤ -20 dBc	Pass
	High Channel, 404.85 MHz	-36.62 dBc	≤ -20 dBc	Pass
	MICS High Data Rate			
	Low Channel, 402.15 MHz	-35.32 dBc	≤ -20 dBc	Pass
	High Channel, 404.85 MHz	-33.66 dBc	≤ -20 dBc	Pass
BLA600094S	MICS Standard Data Rate			
	Low Channel, 402.15 MHz	-33.66 dBc	≤ -20 dBc	Pass
	High Channel, 404.85 MHz	-36.31 dBc	≤ -20 dBc	Pass
	MICS High Data Rate			
	Low Channel, 402.15 MHz	-34.78 dBc	≤ -20 dBc	Pass
	High Channel, 404.85 MHz	-32.45 dBc	≤ -20 dBc	Pass

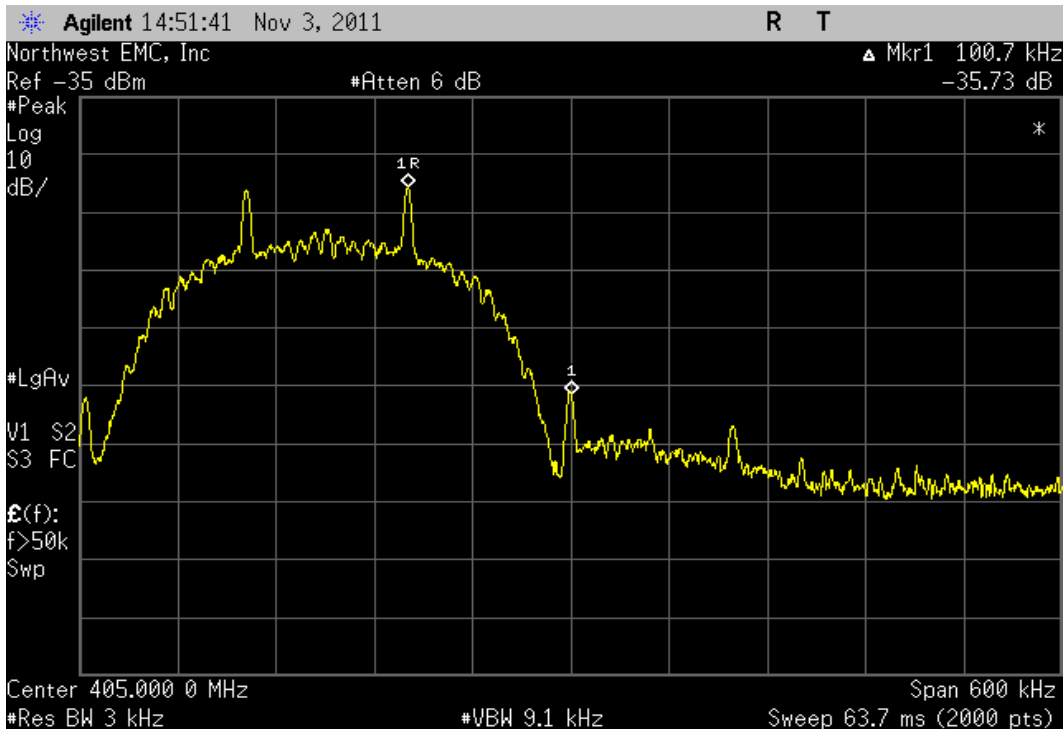
BLA600086S, Low Channel, 402.15 MHz

Value	Limit	Result
-36.2 dBc	≤ -20 dBc	Pass



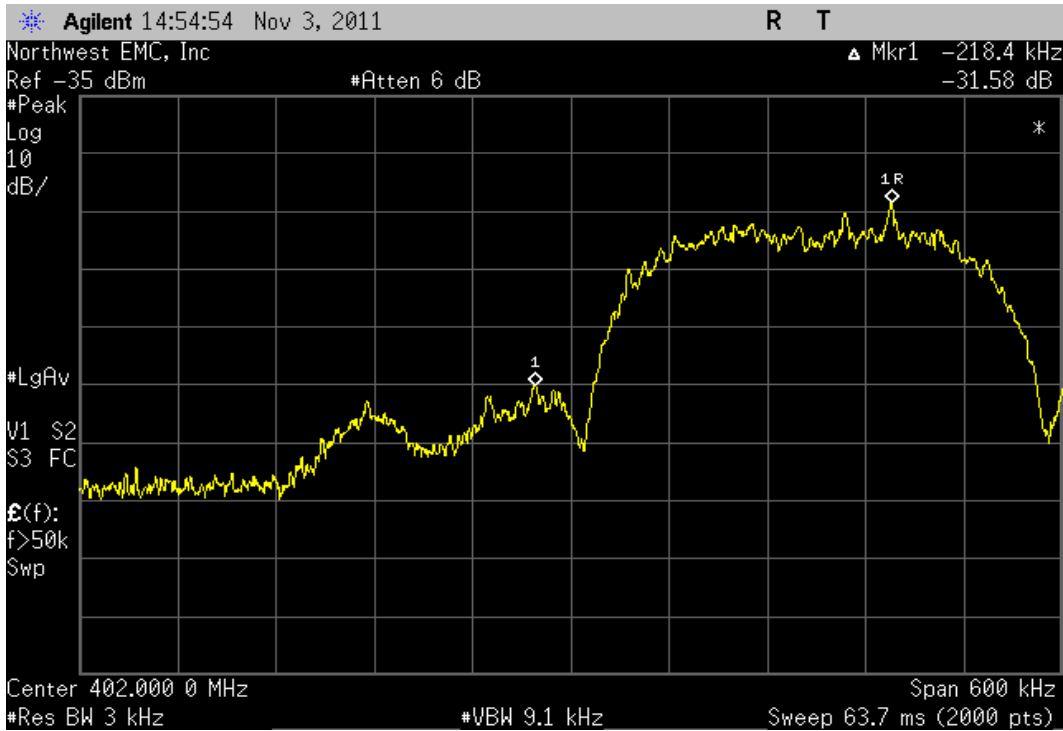
BLA600086S, High Channel, 404.85 MHz

Value	Limit	Result
-35.72 dBc	≤ -20 dBc	Pass



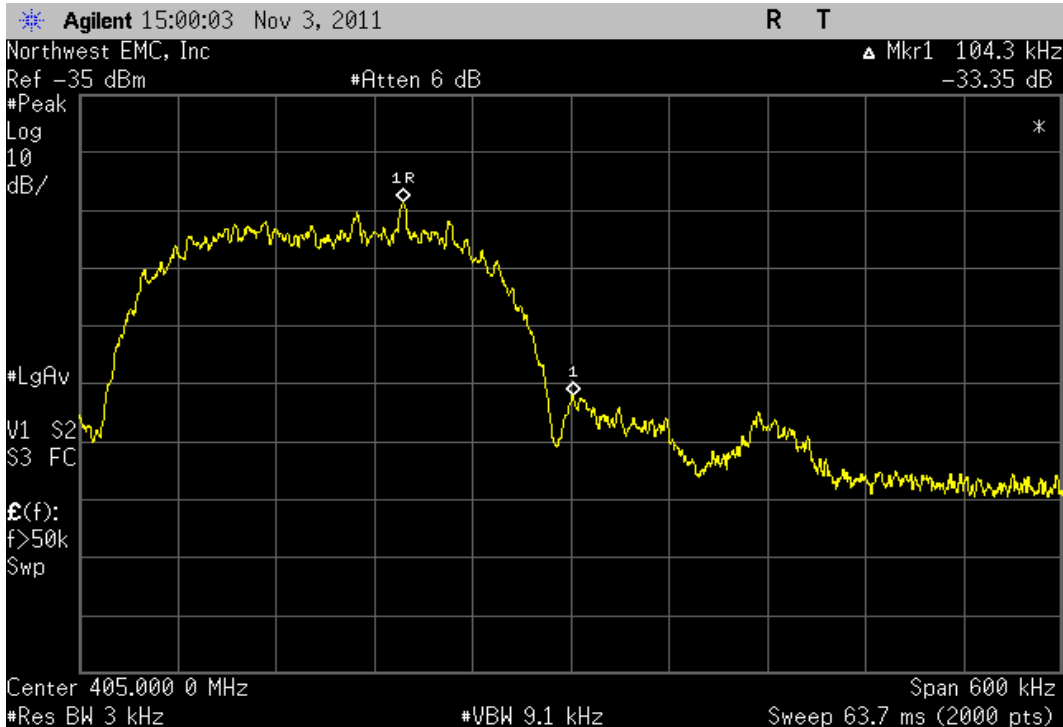
BLA600086S, Low Channel, 402.15 MHz

Value	Limit	Result
-31.58 dBc	≤ -20 dBc	Pass



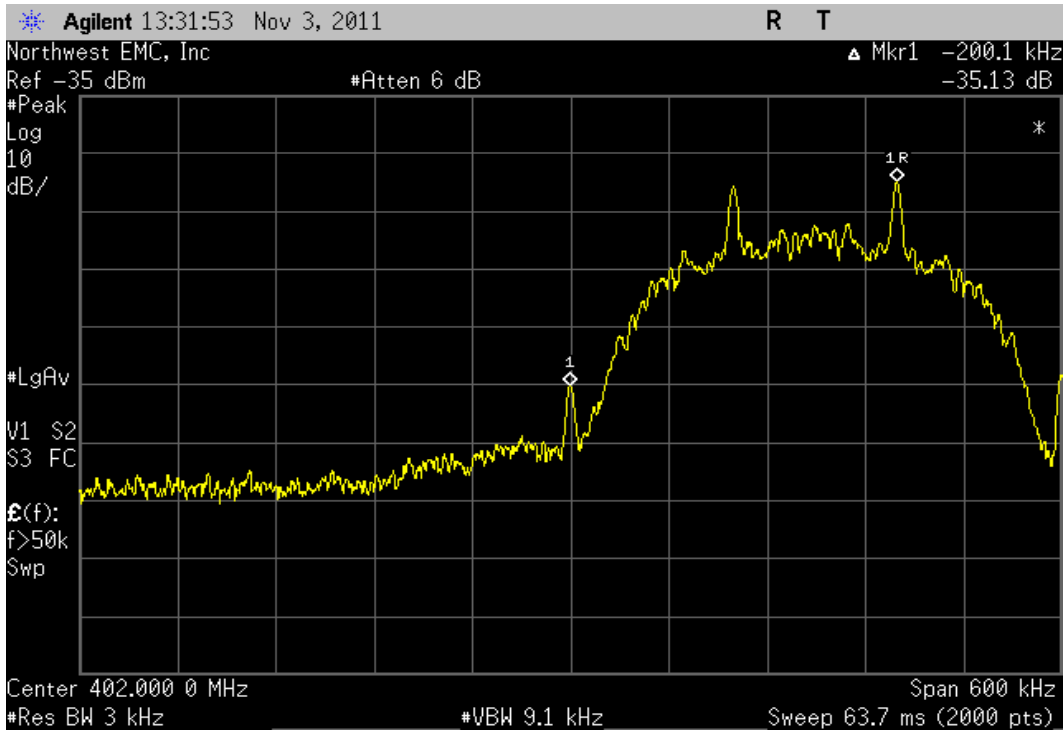
BLA600086S, High Channel, 404.85 MHz

Value	Limit	Result
-33.35 dBc	≤ -20 dBc	Pass



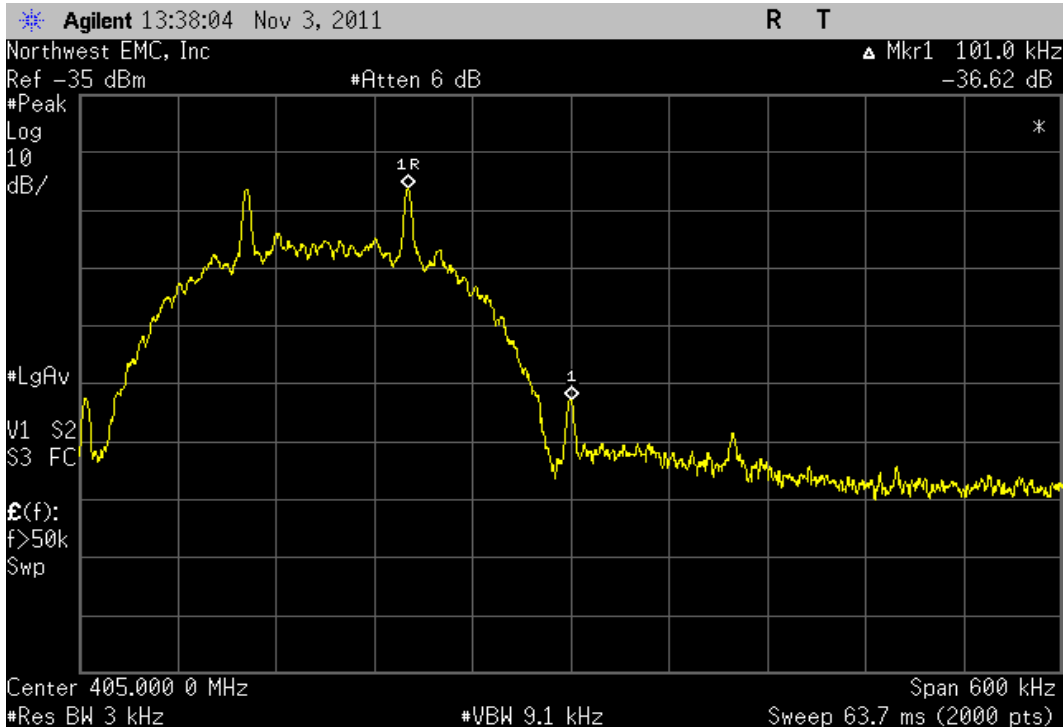
BLA600093S, Low Channel, 402.15 MHz

Value	Limit	Result
-35.13 dBc	≤ -20 dBc	Pass



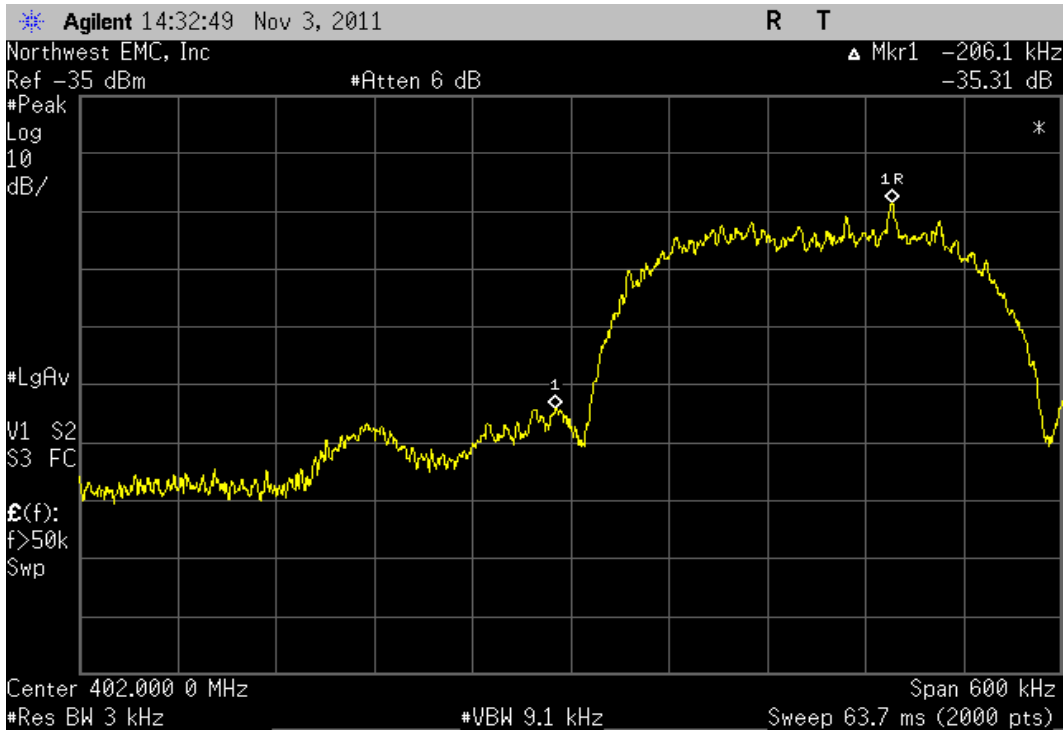
BLA600093S, High Channel, 404.85 MHz

Value	Limit	Result
-36.62 dBc	≤ -20 dBc	Pass



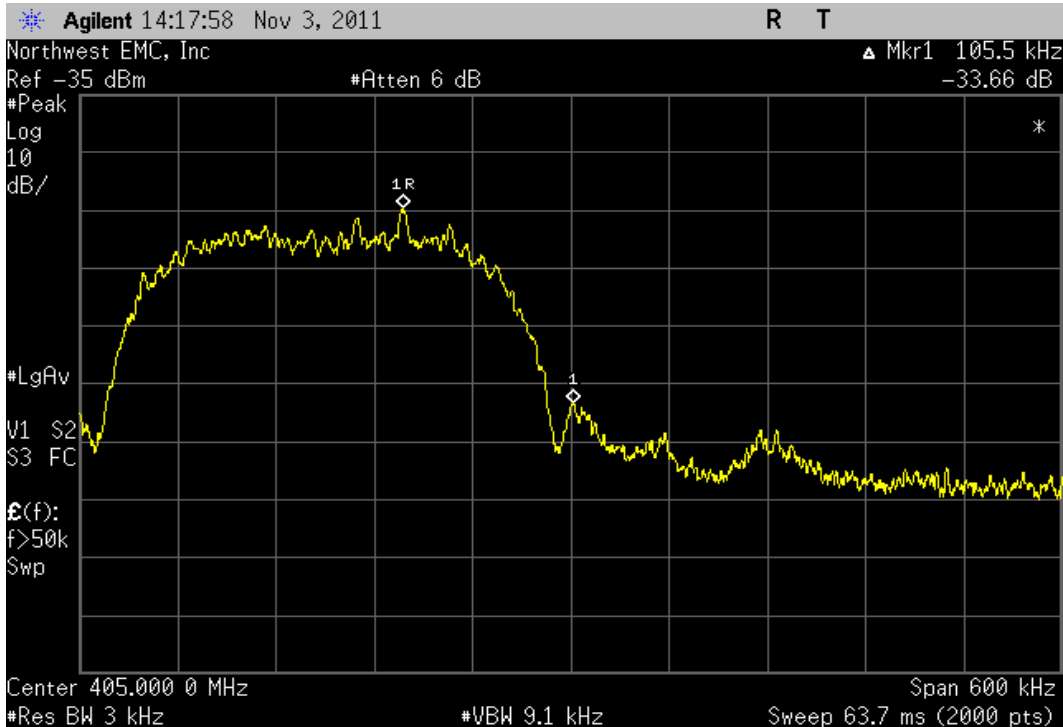
BLA600093S, Low Channel, 402.15 MHz

Value	Limit	Result
-35.32 dBc	≤ -20 dBc	Pass



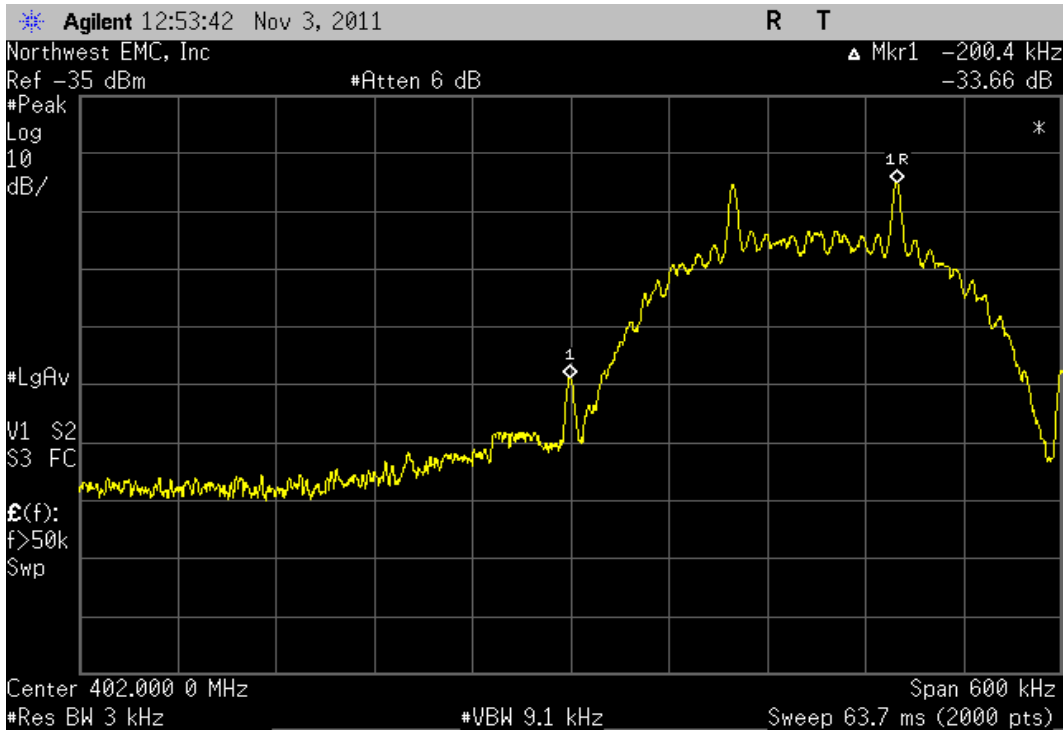
BLA600093S, High Channel, 404.85 MHz

Value	Limit	Result
-33.66 dBc	≤ -20 dBc	Pass



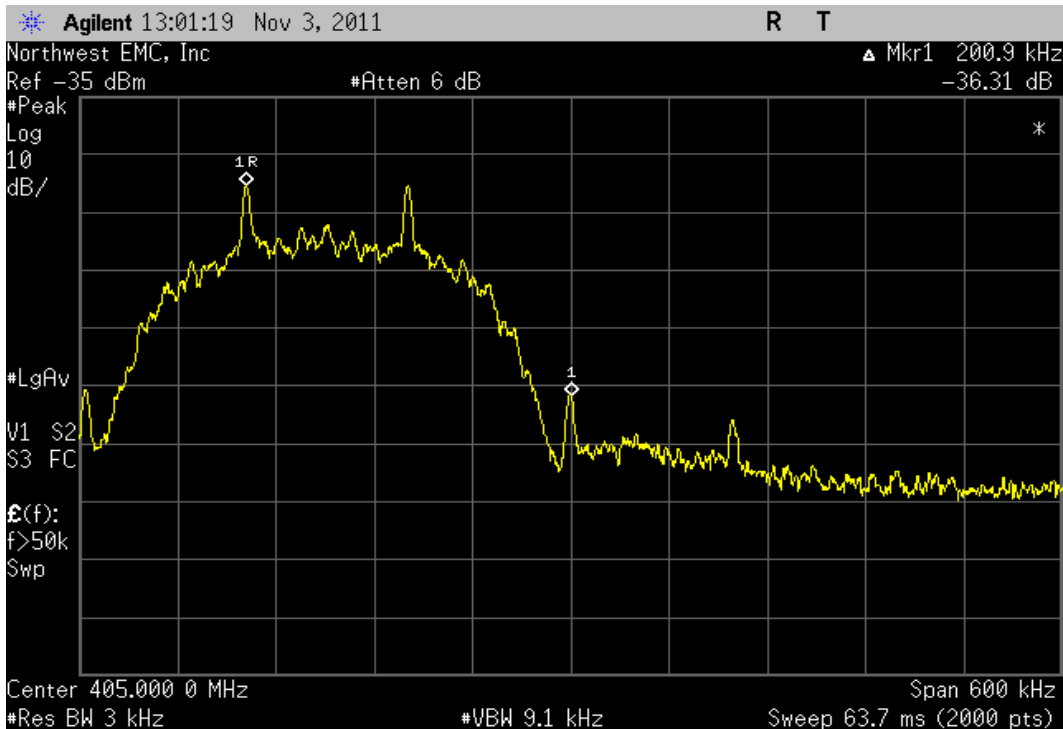
BLA600094S, Low Channel, 402.15 MHz

Value	Limit	Result
-33.66 dBc	≤ -20 dBc	Pass



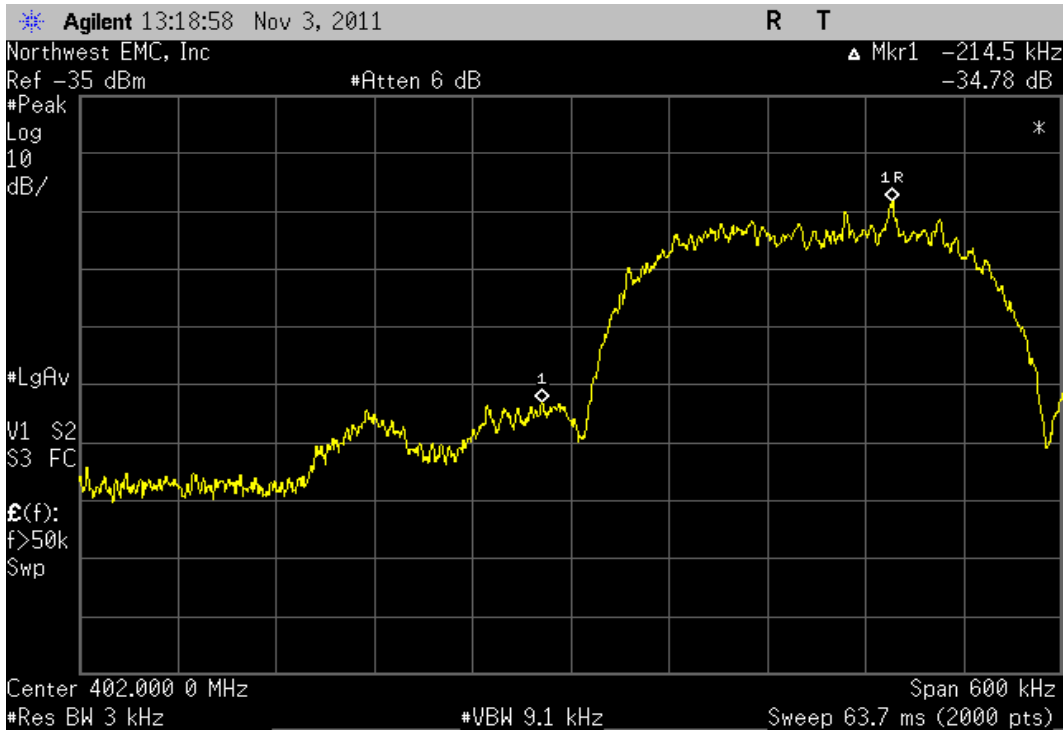
BLA600094S, High Channel, 404.85 MHz

Value	Limit	Result
-36.31 dBc	≤ -20 dBc	Pass



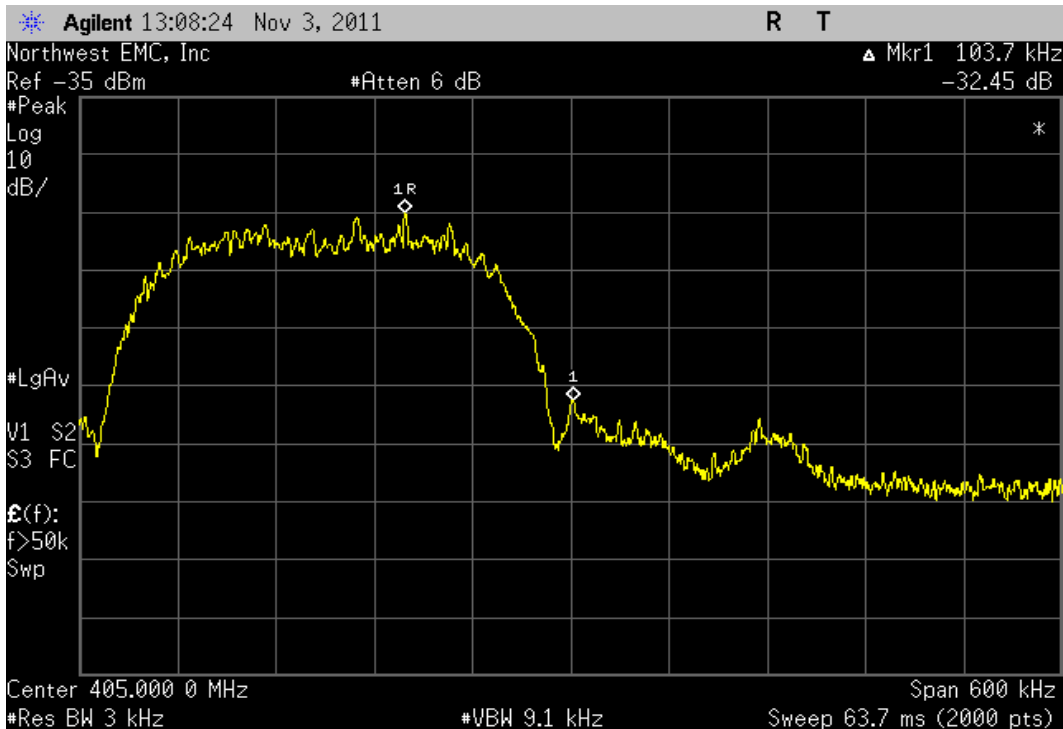
BLA600094S, Low Channel, 402.15 MHz

Value	Limit	Result
-34.78 dBc	≤ -20 dBc	Pass



BLA600094S, High Channel, 404.85 MHz

Value	Limit	Result
-32.45 dBc	≤ -20 dBc	Pass



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

MODES OF OPERATION

Transmitting, MICS Standard Data Rate

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

MDTR0124 - Unit 3

MDTR0124 - Unit 2

MDTR0124 - Unit 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	402 MHz	Stop Frequency	405 MHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna, Biconilog	ETS Lindgren	3142D	AXN	12/30/2009	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	AVY	7/1/2011	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	2/2/2011	12 mo
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	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

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

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 ETSI TR 100 028; 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

Per 95.628(g)(3), the maximum EIRP for a MICS transmitter is 25uW. This is equivalent to a radiated field strength 85.2 dBuV/m at 3 meters when measured over a reference ground plane.

The Field Strength of the Fundamental was measured in the far-field at an FCC Listed Semi-anechoic Chamber. Spectrum analyzer and linearly polarized antennas were used to measure the effective radiated power (EIRP) of the fundamental.

The orientation of the EUT and measurement antenna were manipulated to maximize the level of emissions. . The turntable azimuth was varied to maximize the level of radiated emissions. The height of the measurement antenna was also varied from 1 to 4 meters. The amplitude and frequency of the emissions were noted.

The EUT was configured to transmit in a fixture that simulates the human torso. The dimensions of the test fixture and the characteristics of the tissue substitute material met the requirements 95.628(i) and FCC KDB 617965. The height of the transmitter was 1.5-meter above the reference ground plane.

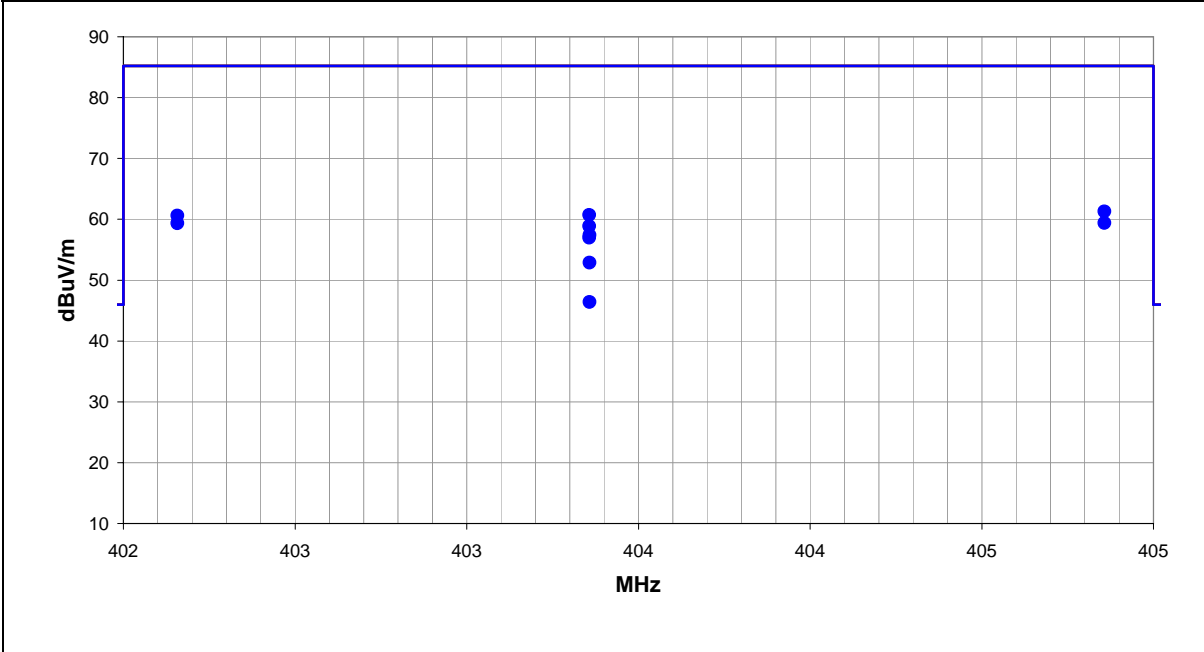
EMC

Field Strength of Fundamental

Work Order:	MDTR0124	Date:	11/03/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	23.58 °C	
Job Site:	MN05	Humidity:	20.86% RH	
Serial Number:	BLA600086S	Barometric Pres.:	1027.3 mbar	
EUT:	Viva Quad			
Configuration:	1			
Customer:	Medtronic Inc.			
Attendees:	Nick Blake			
EUT Power:	Battery			
Operating Mode:	Transmitting, MICS Standard Data Rate			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 951:2011	ANSI/TIA/EIA-603-C:2004
RSS-243:2010	RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009

Run #	0	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
404.858	61.1	0.2	1.7	332.0	3.0	0.0	Vert	QP	0.0	61.3	85.2	-23.9	EUT Vertical
403.357	60.6	0.1	1.6	335.0	3.0	0.0	Vert	QP	0.0	60.7	85.2	-24.5	EUT Vertical
402.158	60.6	0.0	1.6	338.0	3.0	0.0	Vert	QP	0.0	60.6	85.2	-24.6	EUT Vertical
404.858	59.2	0.2	1.0	262.0	3.0	0.0	Horz	QP	0.0	59.4	85.2	-25.8	EUT Vertical
402.158	59.3	0.0	1.1	257.0	3.0	0.0	Horz	QP	0.0	59.3	85.2	-25.9	EUT Vertical
403.357	58.8	0.1	1.1	252.0	3.0	0.0	Horz	QP	0.0	58.9	85.2	-26.3	EUT Vertical
403.358	57.3	0.1	1.7	334.0	3.0	0.0	Vert	QP	0.0	57.4	85.2	-27.8	EUT on Side
403.357	56.9	0.1	1.2	10.0	3.0	0.0	Horz	QP	0.0	57.0	85.2	-28.2	EUT Horizontal
403.358	52.8	0.1	1.2	98.0	3.0	0.0	Horz	QP	0.0	52.9	85.2	-32.3	EUT on Side
403.358	46.3	0.1	1.0	314.0	3.0	0.0	Vert	QP	0.0	46.4	85.2	-38.8	EUT Horizontal

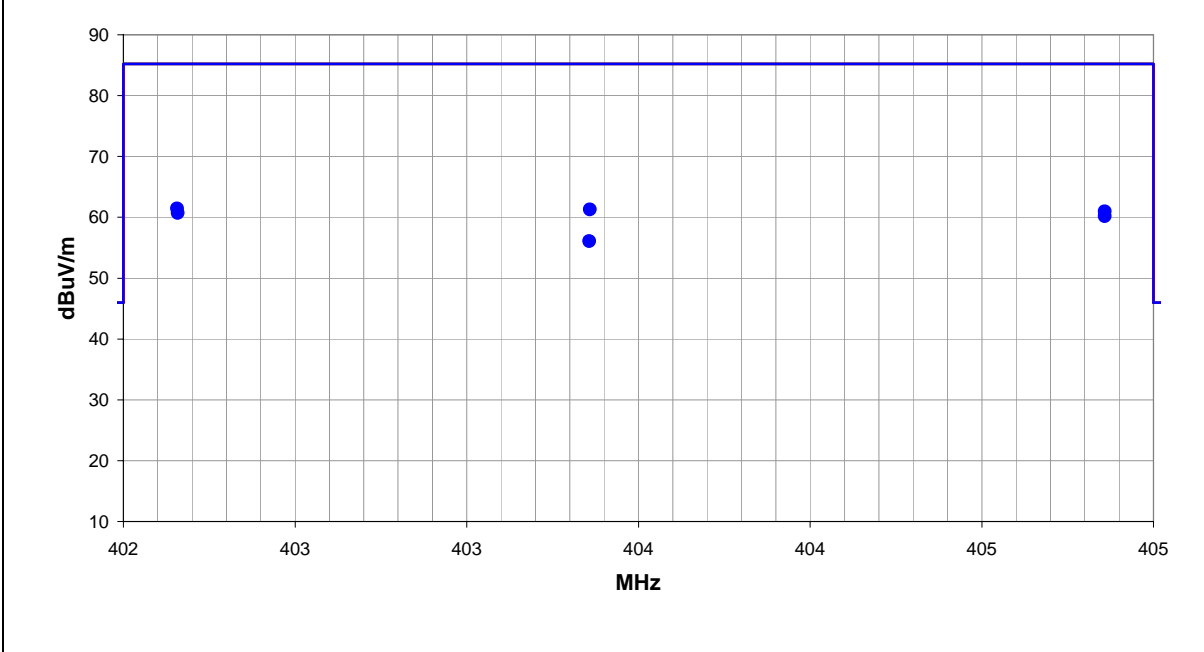
EMC

Field Strength of Fundamental

Work Order:	MDTR0124	Date:	11/03/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	23.58 °C	
Job Site:	MN05	Humidity:	20.86% RH	
Serial Number:	BLA600093S	Barometric Pres.:	1027.3 mbar	
EUT:	Viva Quad			
Configuration:	2			
Customer:	Medtronic Inc.			
Attendees:	Nick Blake			
EUT Power:	Battery			
Operating Mode:	Transmitting, MICS Standard Data Rate			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 951:2011	ANSI/TIA/EIA-603-C:2004
RSS-243:2010	RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009

Run #	1	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
402.157	61.4	0.0	1.1	263.0	3.0	0.0	Horz	QP	0.0	61.4	85.2	-23.8	EUT Vertical
403.358	61.2	0.1	1.1	264.0	3.0	0.0	Horz	QP	0.0	61.3	85.2	-23.9	EUT Vertical
404.858	60.8	0.2	1.1	263.0	3.0	0.0	Horz	QP	0.0	61.0	85.2	-24.2	EUT Vertical
402.158	60.7	0.0	1.7	321.0	3.0	0.0	Vert	QP	0.0	60.7	85.2	-24.5	EUT Vertical
404.858	60.0	0.2	1.6	318.0	3.0	0.0	Vert	QP	0.0	60.2	85.2	-25.0	EUT Vertical
403.357	56.0	0.1	1.0	261.0	3.0	0.0	Vert	QP	0.0	56.1	85.2	-29.1	EUT Vertical

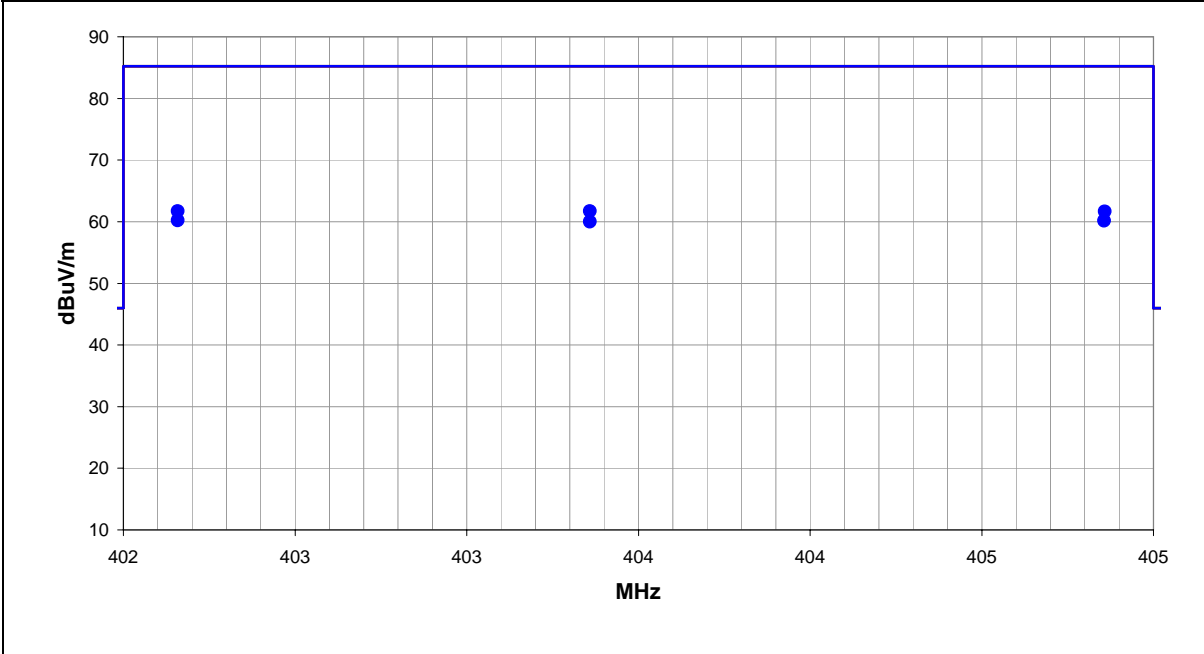
EMC

Field Strength of Fundamental

Work Order:	MDTR0124	Date:	11/03/11	<i>Trevor Buls</i> Tested by: Trevor Buls
Project:	None	Temperature:	23.58 °C	
Job Site:	MN05	Humidity:	20.86% RH	
Serial Number:	BLA600094S	Barometric Pres.:	1027.3 mbar	
EUT:	Viva Quad			
Configuration:	3			
Customer:	Medtronic Inc.			
Attendees:	Nick Blake			
EUT Power:	Battery			
Operating Mode:	Transmitting, MICS Standard Data Rate			
Deviations:	None			
Comments:	None			

Test Specifications FCC 951:2011 RSS-243:2010	Test Method ANSI/TIA/EIA-603-C:2004 RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009
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Run #	2	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
402.158	61.7	0.0	1.7	320.0	3.0	0.0	Vert	QP	0.0	61.7	85.2	-23.5	EUT Vertical
403.358	61.6	0.1	1.7	321.0	3.0	0.0	Vert	QP	0.0	61.7	85.2	-23.5	EUT Vertical
404.858	61.5	0.2	1.6	320.0	3.0	0.0	Vert	QP	0.0	61.7	85.2	-23.5	EUT Vertical
402.158	60.2	0.0	1.0	248.0	3.0	0.0	Horz	QP	0.0	60.2	85.2	-25.0	EUT Vertical
404.857	60.0	0.2	1.0	254.0	3.0	0.0	Horz	QP	0.0	60.2	85.2	-25.0	EUT Vertical
403.358	59.9	0.1	1.1	252.0	3.0	0.0	Horz	QP	0.0	60.0	85.2	-25.2	EUT Vertical

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
Pre-Amplifier	Miteq	AM-1616-1000	AVY	7/1/2011	12
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	2/2/2011	12
Antenna, Biconilog	ETS Lindgren	3142D	AXN	12/30/2009	24
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	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 ETSI TR 100 028; 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 99% occupied bandwidth was measured with the EUT configured for continuous modulated operation at its lowest, middle, and highest transmit frequency in a no-hop mode. The spectrum analyzer's resolution bandwidth was set to between 1% and 3% of the 20dB bandwidth and the video bandwidth was at least 3 times the resolution bandwidth. A sample detector was used

EUT: Viva Quad	Work Order: MDTR0124
Serial Number: BLA600086S, BLA600093S, BLA600094S	Date: 11/03/11
Customer: Medtronic Inc.	Temperature: 23.58 °C
Attendees: Nick Blake	Humidity: 20.86% RH
Project: None	Barometric Pres.: 1027.3 mbar
Tested by: Trevor Buls	Power: Battery
	Job Site: MN05

TEST SPECIFICATIONS		Test Method
FCC 951:2011		ANSI/TIA/EIA-603-C-2004
RSS-243:2010		RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009

COMMENTS
None

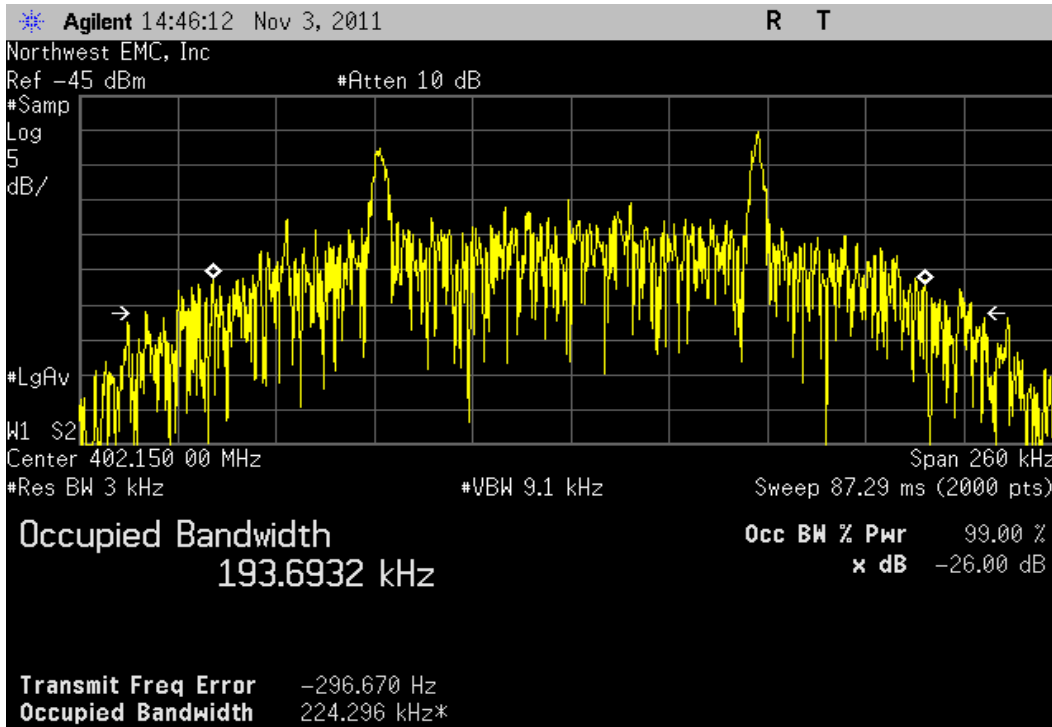
DEVIATIONS FROM TEST STANDARD
None

Configuration #	1,2,3	Signature <i>Trevor Buls</i>
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		Value	Limit	Result
BLA600086S	MICS Standard Data Rate			
	Low Channel, 402.15 MHz	193.693 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	194.772 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	192.179 kHz	≤ 300 kHz	Pass
	MICS High Data Rate			
	Low Channel, 402.15 MHz	225.888 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	225.48 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	225.88 kHz	≤ 300 kHz	Pass
BLA600093S	MICS Standard Data Rate			
	Low Channel, 402.15 MHz	196.298 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	192.71 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	190.949 kHz	≤ 300 kHz	Pass
	MICS High Data Rate			
	Low Channel, 402.15 MHz	225.338 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	225.652 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	226.138 kHz	≤ 300 kHz	Pass
BLA600094S	MICS Standard Data Rate			
	Low Channel, 402.15 MHz	193.561 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	196.218 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	192.582 kHz	≤ 300 kHz	Pass
	MICS High Data Rate			
	Low Channel, 402.15 MHz	225.738 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	225.876 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	225.928 kHz	≤ 300 kHz	Pass

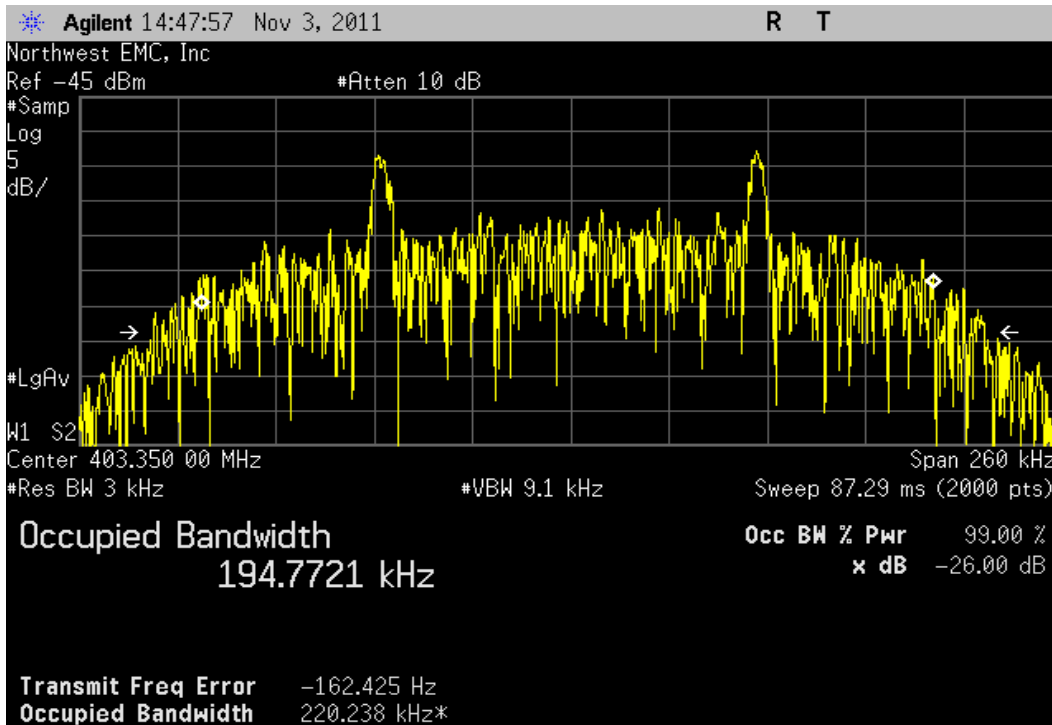
BLA600086S, Low Channel, 402.15 MHz

	Value	Limit	Result
	193.693 kHz	≤ 300 kHz	Pass



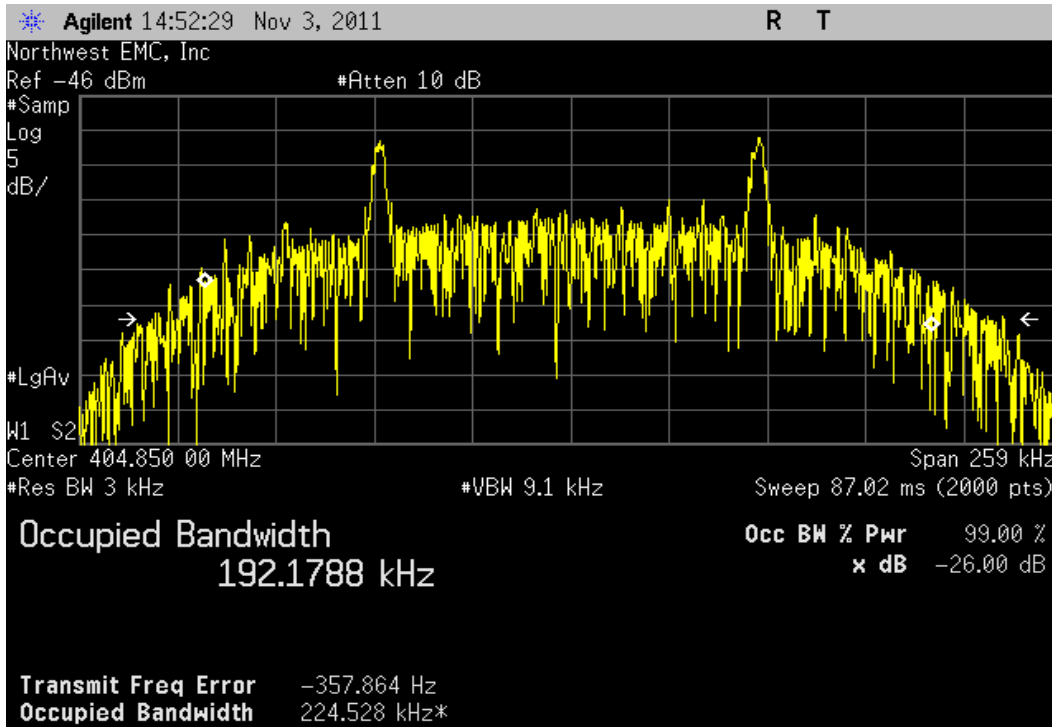
BLA600086S, Mid Channel, 403.35 MHz

	Value	Limit	Result
	194.772 kHz	≤ 300 kHz	Pass



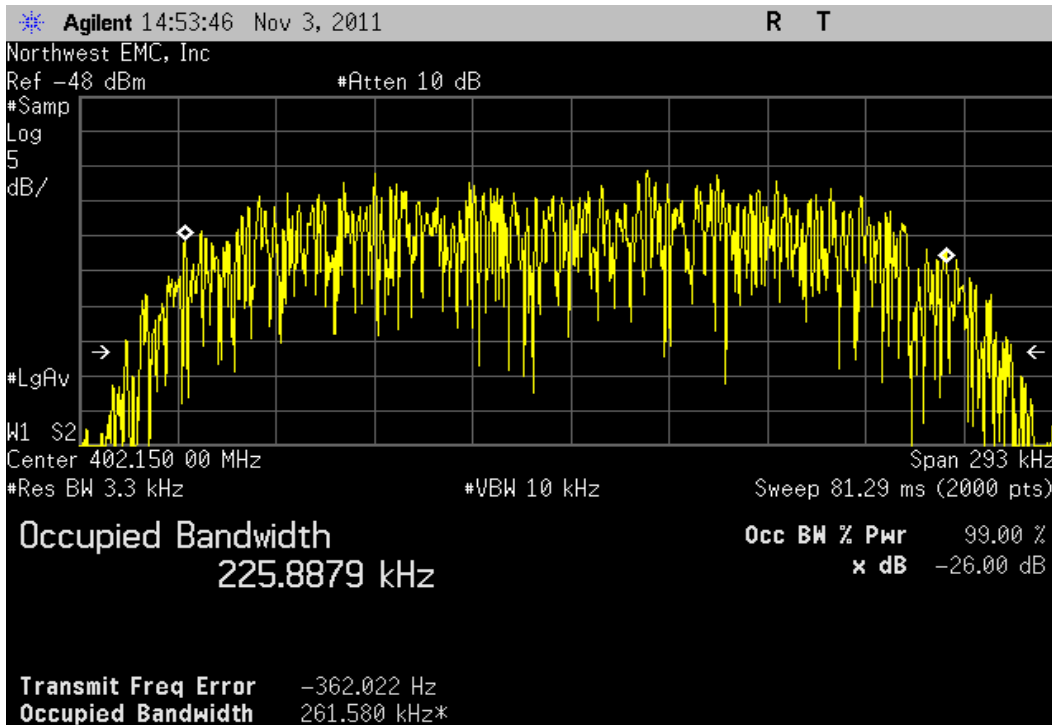
BLA600086S, High Channel, 404.85 MHz

	Value	Limit	Result
	192.179 kHz	≤ 300 kHz	Pass



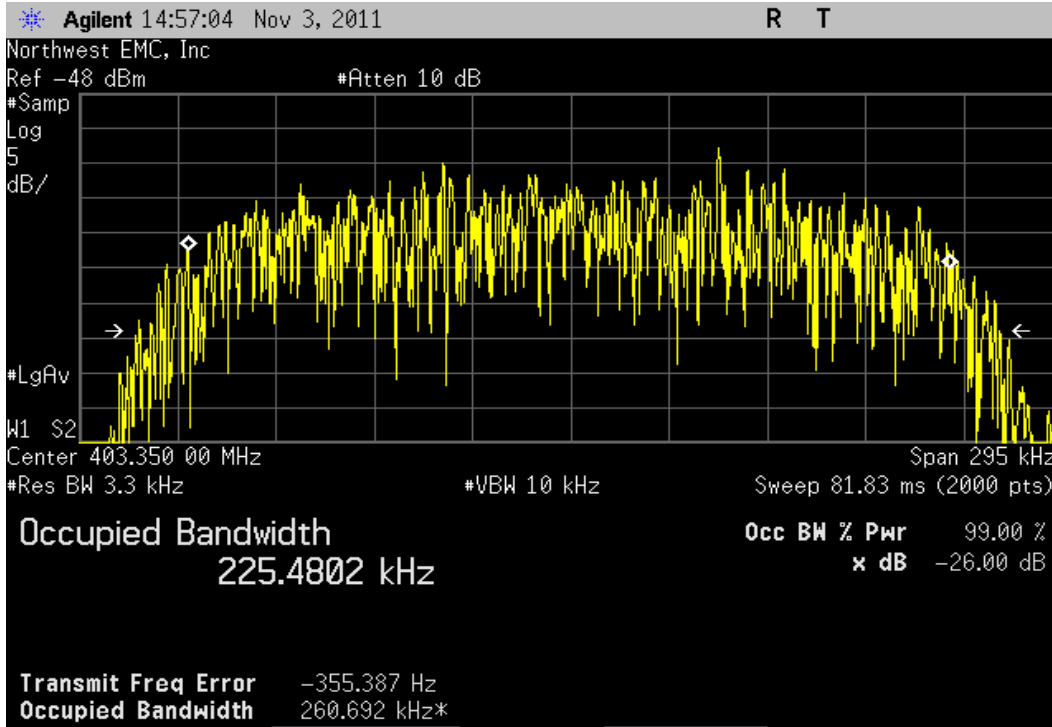
BLA600086S, Low Channel, 402.15 MHz

	Value	Limit	Result
	225.888 kHz	≤ 300 kHz	Pass



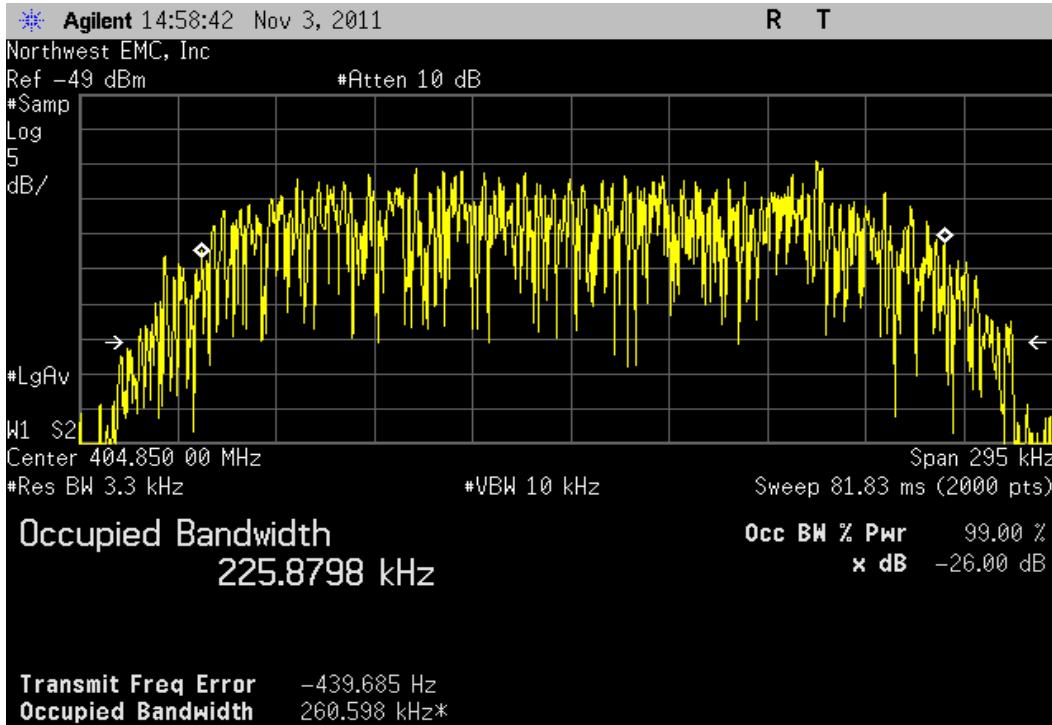
BLA600086S, Mid Channel, 403.35 MHz

	Value	Limit	Result
	225.48 kHz	≤ 300 kHz	Pass



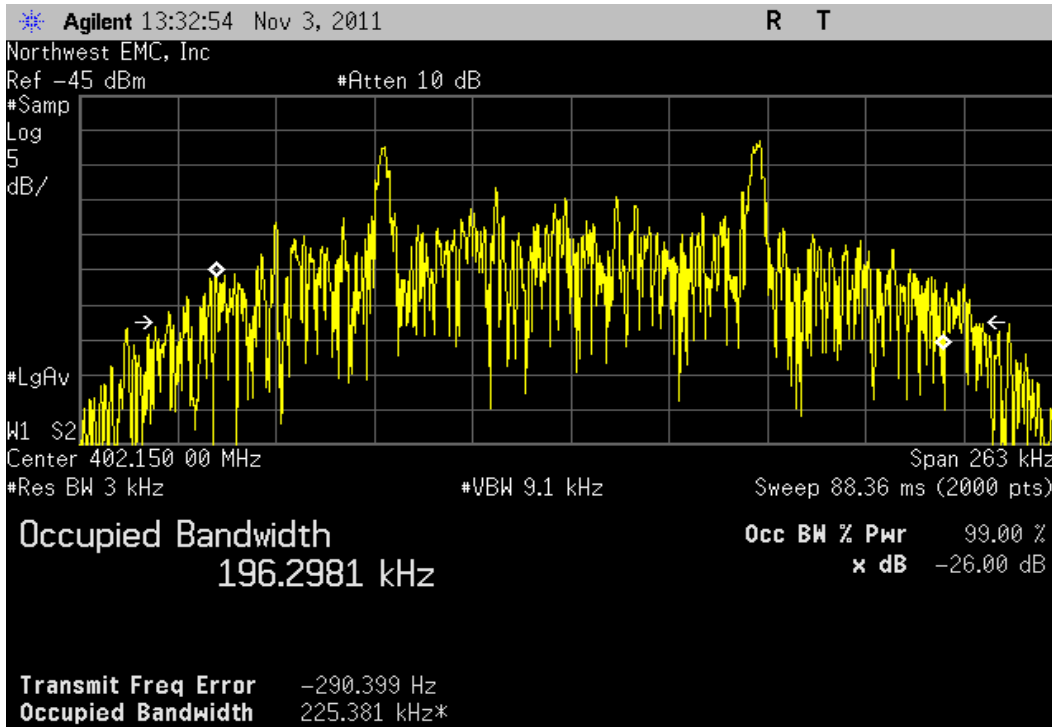
BLA600086S, High Channel, 404.85 MHz

	Value	Limit	Result
	225.88 kHz	≤ 300 kHz	Pass



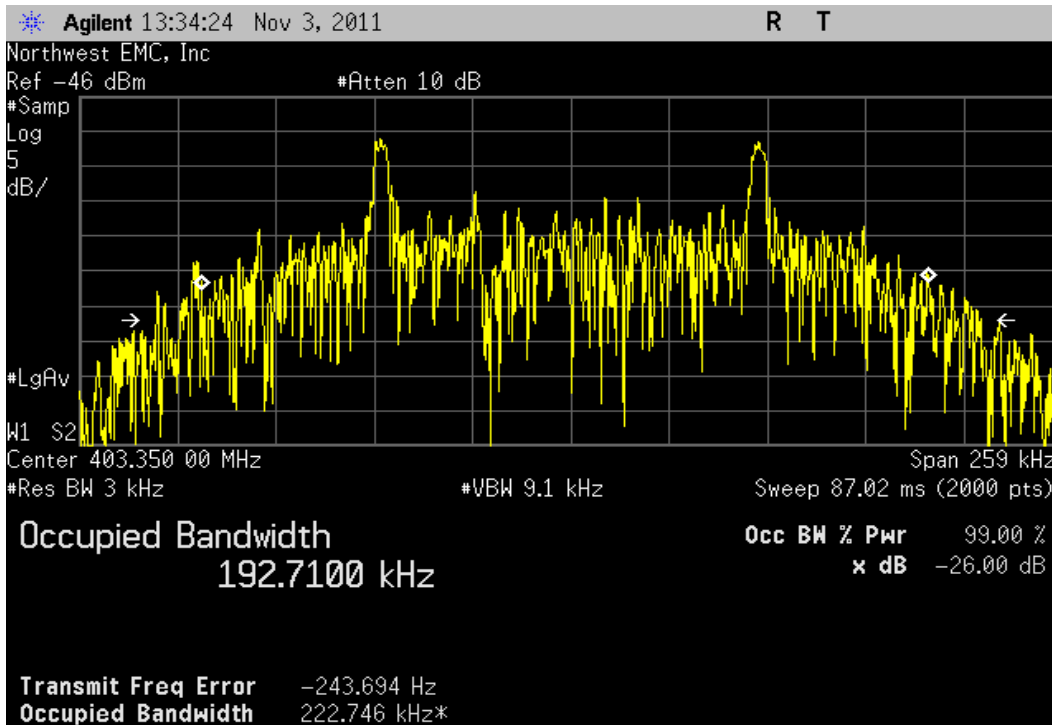
BLA600093S, Low Channel, 402.15 MHz

				Value	Limit	Result
				196.298 kHz	≤ 300 kHz	Pass



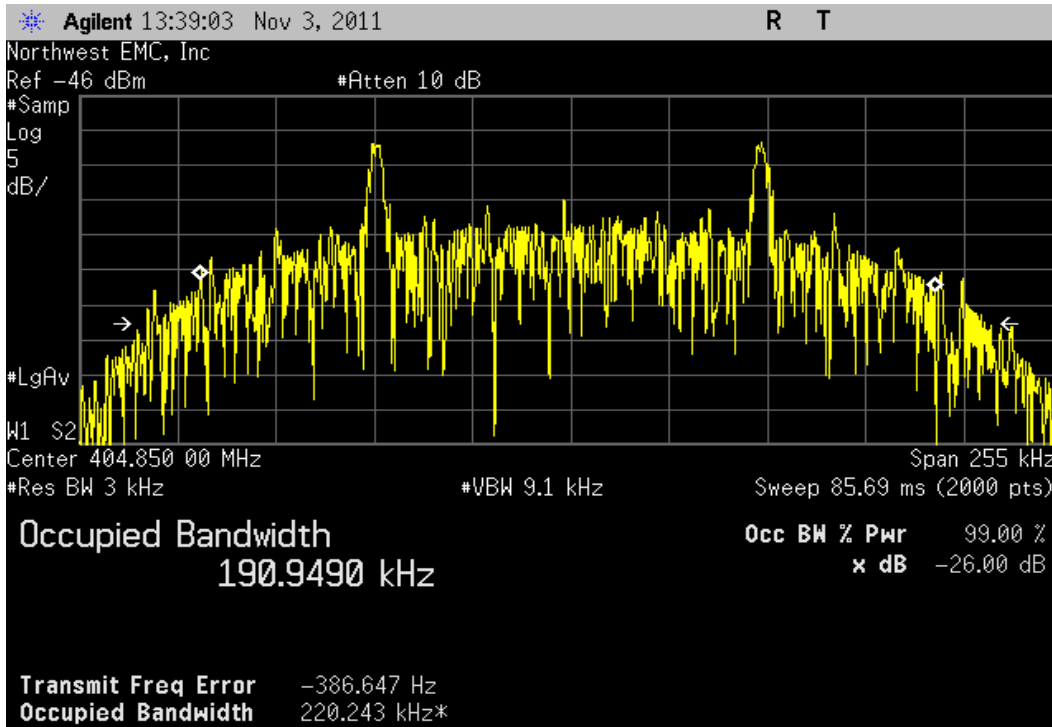
BLA600093S, Mid Channel, 403.35 MHz

				Value	Limit	Result
				192.71 kHz	≤ 300 kHz	Pass



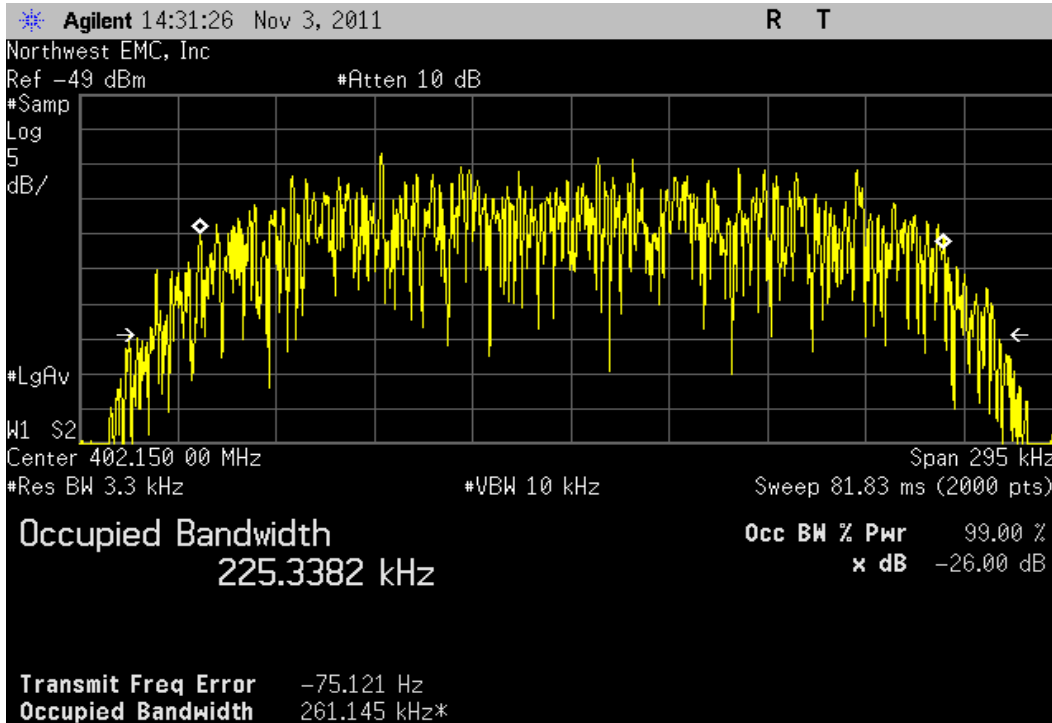
BLA600093S, High Channel, 404.85 MHz

	Value	Limit	Result
	190.949 kHz	≤ 300 kHz	Pass



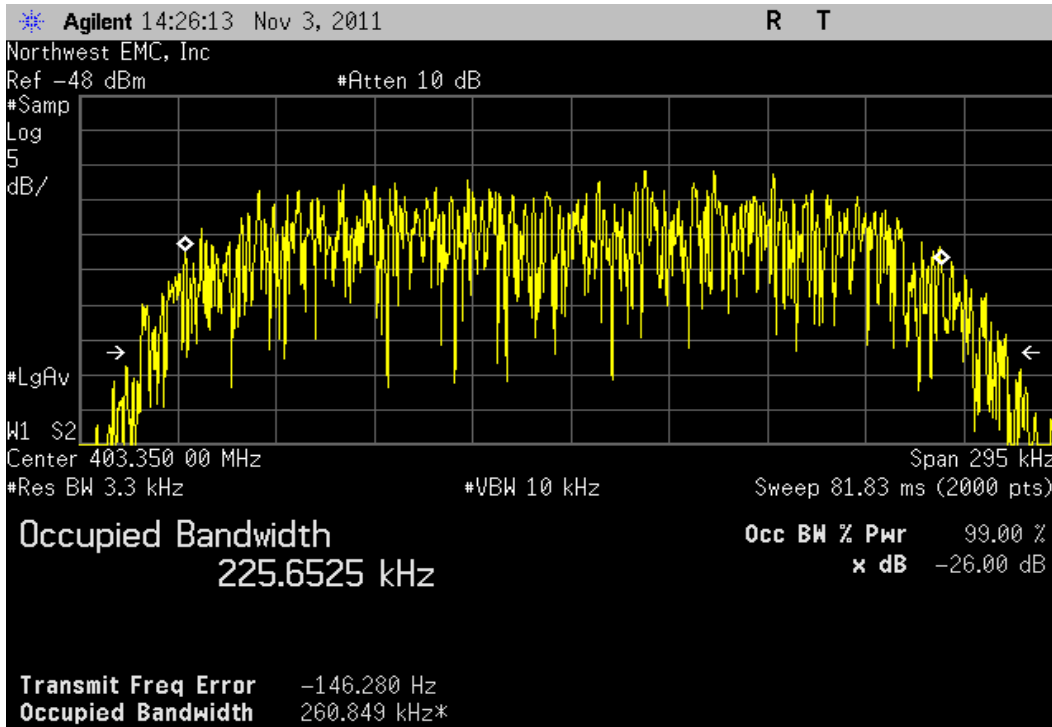
BLA600093S, Low Channel, 402.15 MHz

	Value	Limit	Result
	225.338 kHz	≤ 300 kHz	Pass



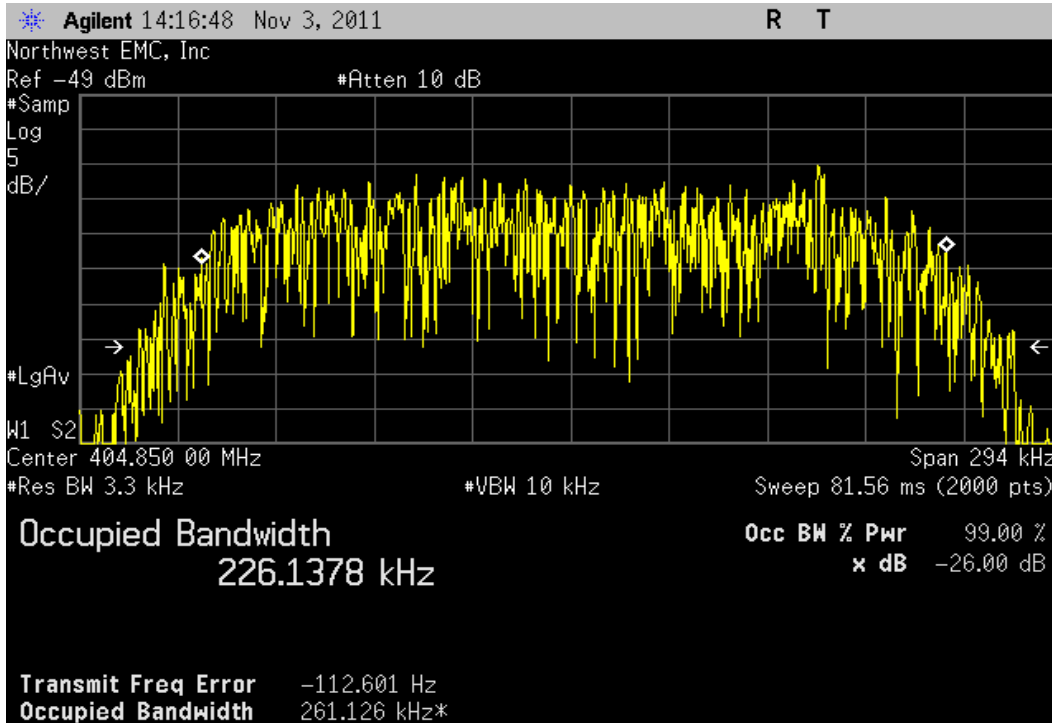
BLA600093S, Mid Channel, 403.35 MHz

Value	Limit	Result
225.652 kHz	≤ 300 kHz	Pass



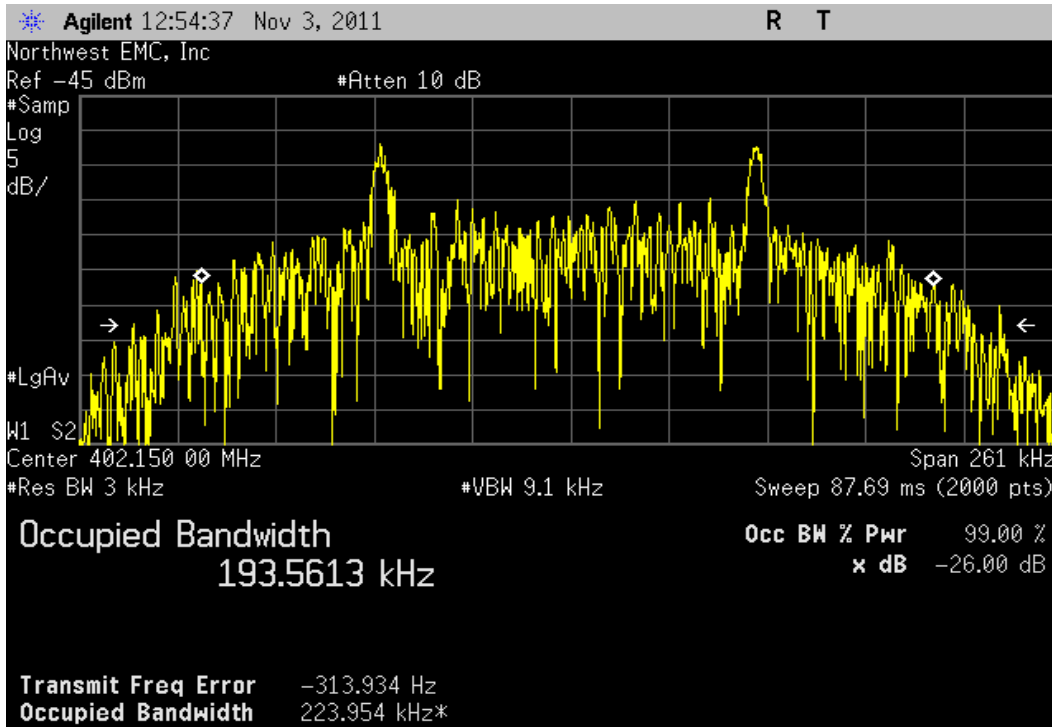
BLA600093S, High Channel, 404.85 MHz

Value	Limit	Result
226.138 kHz	≤ 300 kHz	Pass



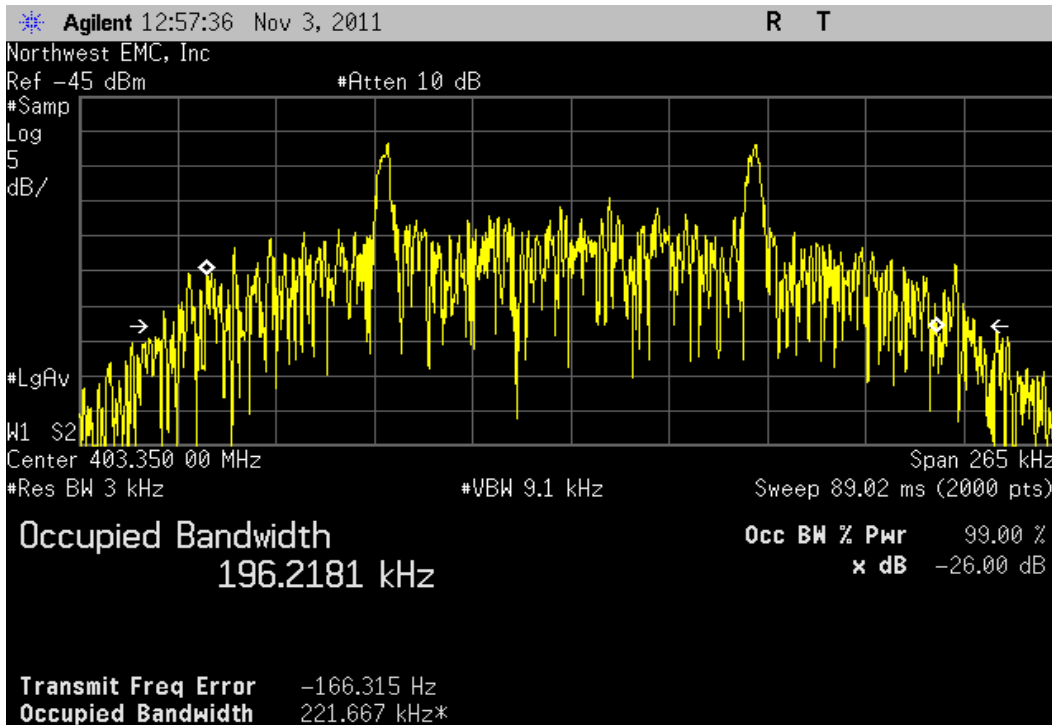
BLA600094S, Low Channel, 402.15 MHz

				Value	Limit	Result
				193.561 kHz	≤ 300 kHz	Pass



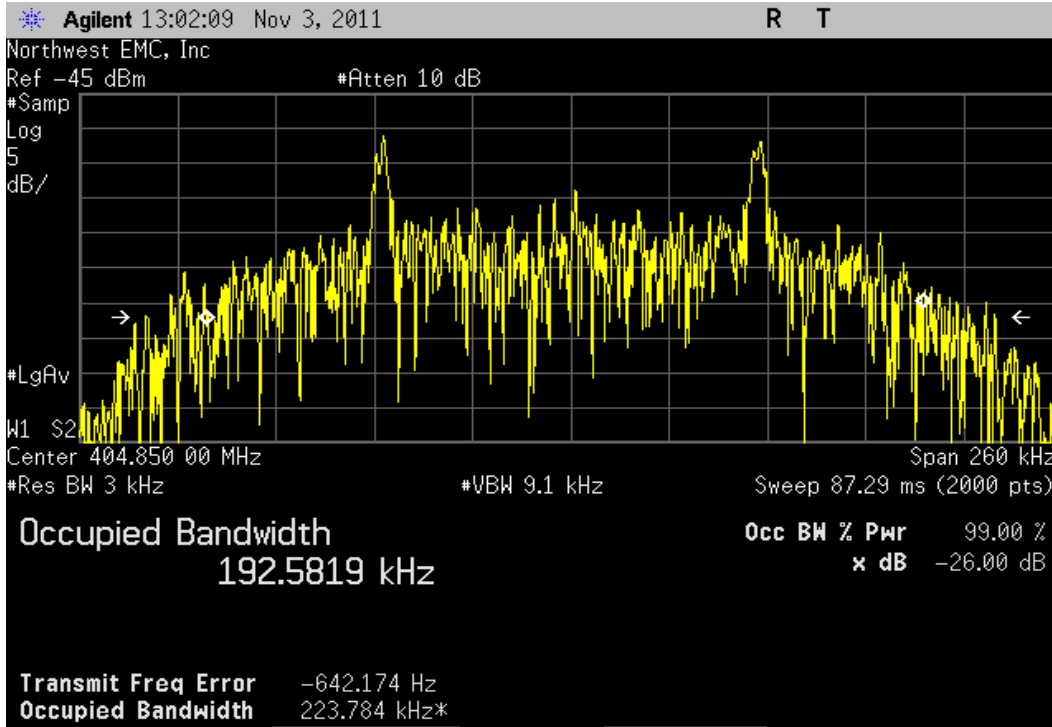
BLA600094S, Mid Channel, 403.35 MHz

				Value	Limit	Result
				196.218 kHz	≤ 300 kHz	Pass



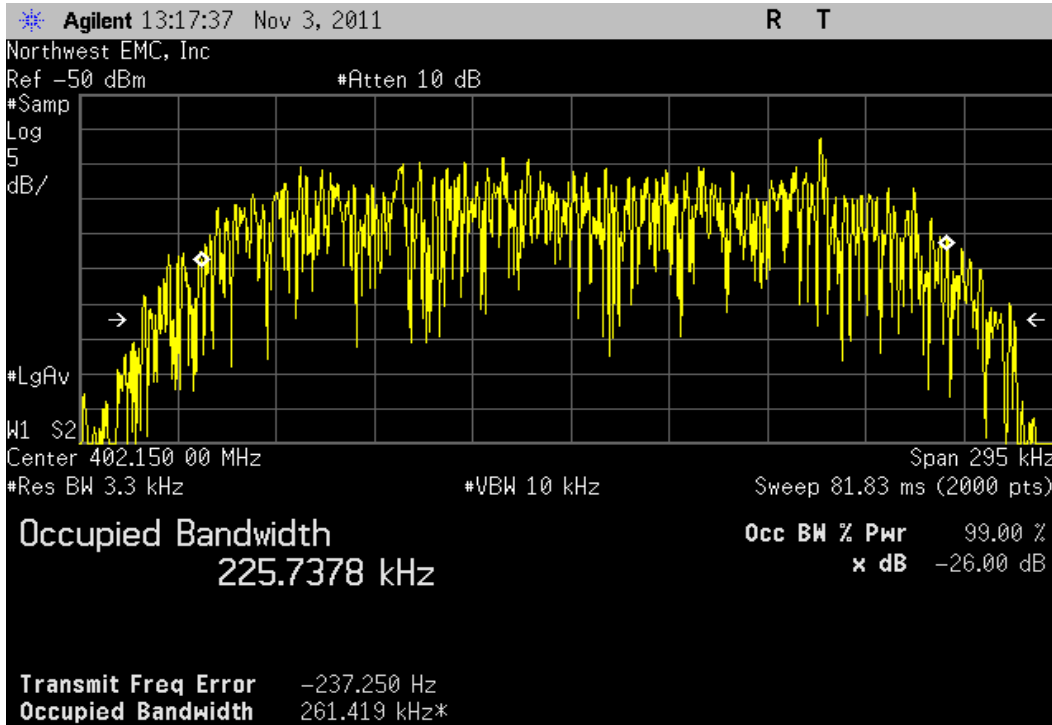
BLA600094S, High Channel, 404.85 MHz

	Value	Limit	Result
	192.582 kHz	≤ 300 kHz	Pass



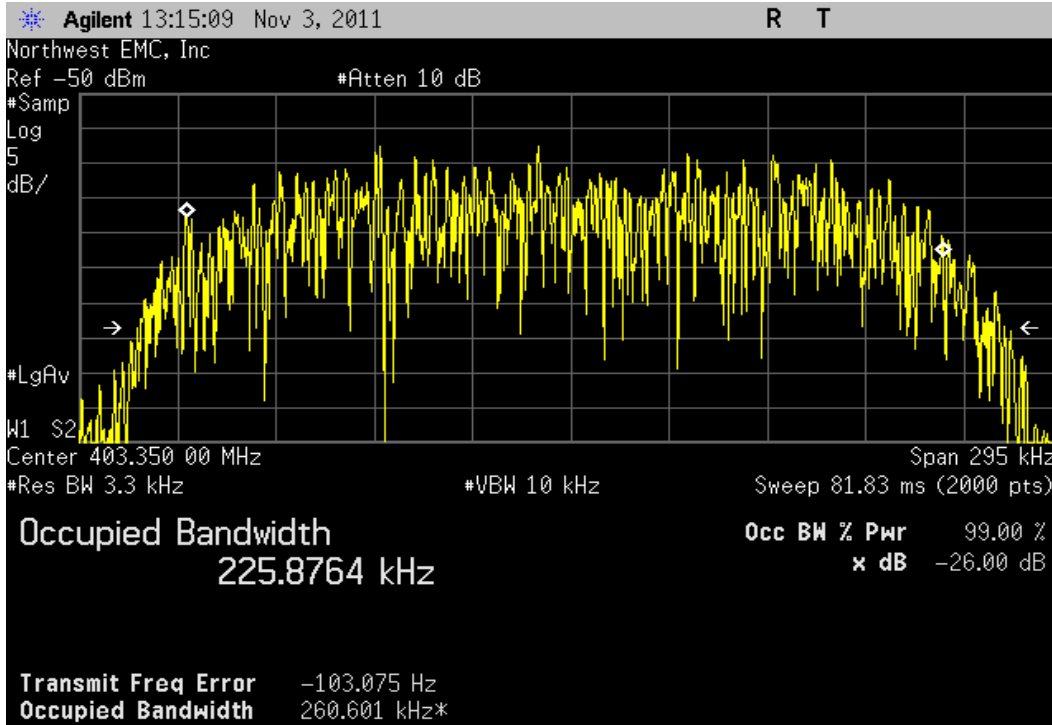
BLA600094S, Low Channel, 402.15 MHz

	Value	Limit	Result
	225.738 kHz	≤ 300 kHz	Pass



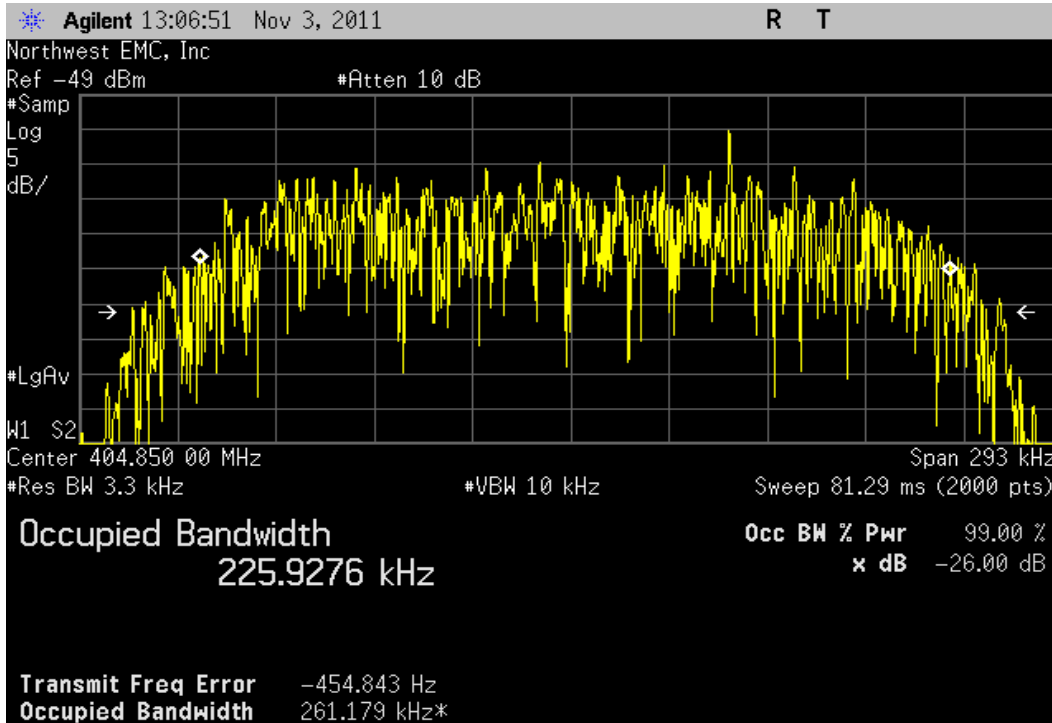
BLA600094S, Mid Channel, 403.35 MHz

				Value	Limit	Result
				225.876 kHz	≤ 300 kHz	Pass



BLA600094S, High Channel, 404.85 MHz

				Value	Limit	Result
				225.928 kHz	≤ 300 kHz	Pass



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
Pre-Amplifier	Miteq	AM-1616-1000	AVY	7/1/2011	12
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	2/2/2011	12
Antenna, Biconilog	ETS Lindgren	3142D	AXN	12/30/2009	24
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	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 ETSI TR 100 028; 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

Per 47 CFR 95.633(e)(3), the emission bandwidth was determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 20 dB down relative to the maximum level of the modulated carrier. A spectrum analyzer using a peak detector with no video filtering was used with a resolution bandwidth equal to approximately 1.0 percent of the emission bandwidth of the EUT.

EUT: Viva Quad	Work Order: MDTR0124
Serial Number: BLA600086S, BLA600093S, BLA600094S	Date: 11/03/11
Customer: Medtronic Inc.	Temperature: 23.58 °C
Attendees: Nick Blake	Humidity: 20.86% RH
Project: None	Barometric Pres.: 1027.3 mbar
Tested by: Trevor Buls	Power: Battery
	Job Site: MN05

TEST SPECIFICATIONS		Test Method
FCC 951:2011		ANSI/TIA/EIA-603-C-2004
RSS-243:2010		RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009

COMMENTS
None

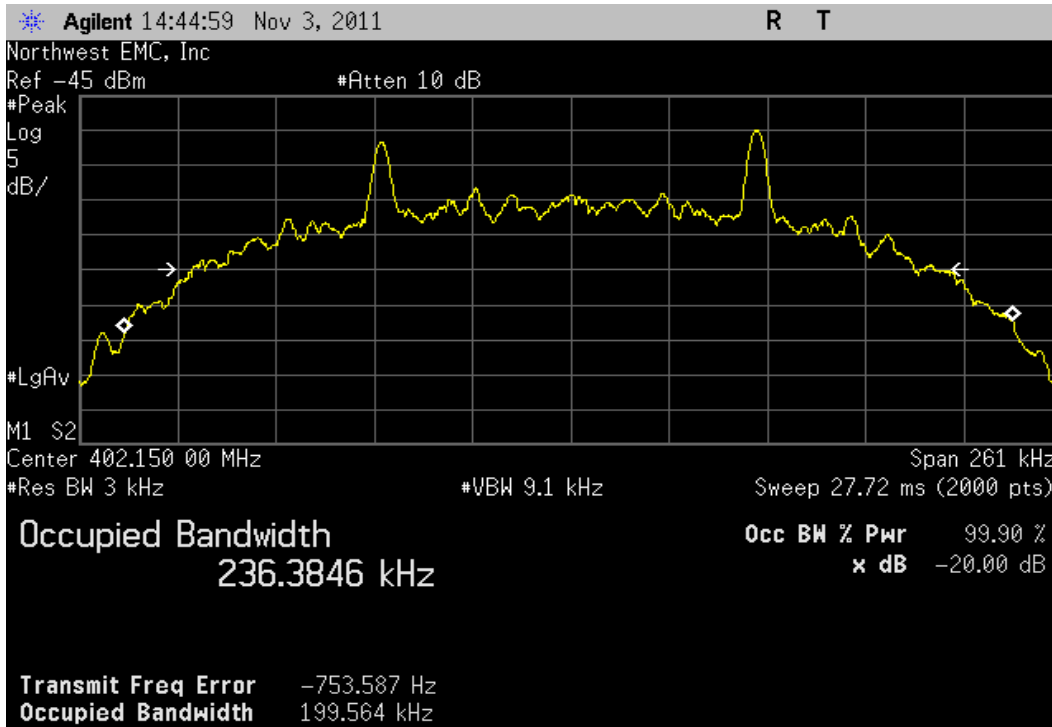
DEVIATIONS FROM TEST STANDARD
None

Configuration #	1,2,3	Signature <i>Trevor Buls</i>
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		Value	Limit	Result
BLA600086S	MICS Standard Data Rate			
	Low Channel, 402.15 MHz	199.564 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	202.498 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	204.3 kHz	≤ 300 kHz	Pass
	MICS High Data Rate			
	Low Channel, 402.15 MHz	247.793 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	249.225 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	248.853 kHz	≤ 300 kHz	Pass
BLA600093S	MICS Standard Data Rate			
	Low Channel, 402.15 MHz	205.13 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	203.503 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	202.31 kHz	≤ 300 kHz	Pass
	MICS High Data Rate			
	Low Channel, 402.15 MHz	247.244 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	248.029 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	248.552 kHz	≤ 300 kHz	Pass
BLA600094S	MICS Standard Data Rate			
	Low Channel, 402.15 MHz	208.782 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	211.063 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	205.155 kHz	≤ 300 kHz	Pass
	MICS High Data Rate			
	Low Channel, 402.15 MHz	248.483 kHz	≤ 300 kHz	Pass
	Mid Channel, 403.35 MHz	250.002 kHz	≤ 300 kHz	Pass
	High Channel, 404.85 MHz	248.853 kHz	≤ 300 kHz	Pass

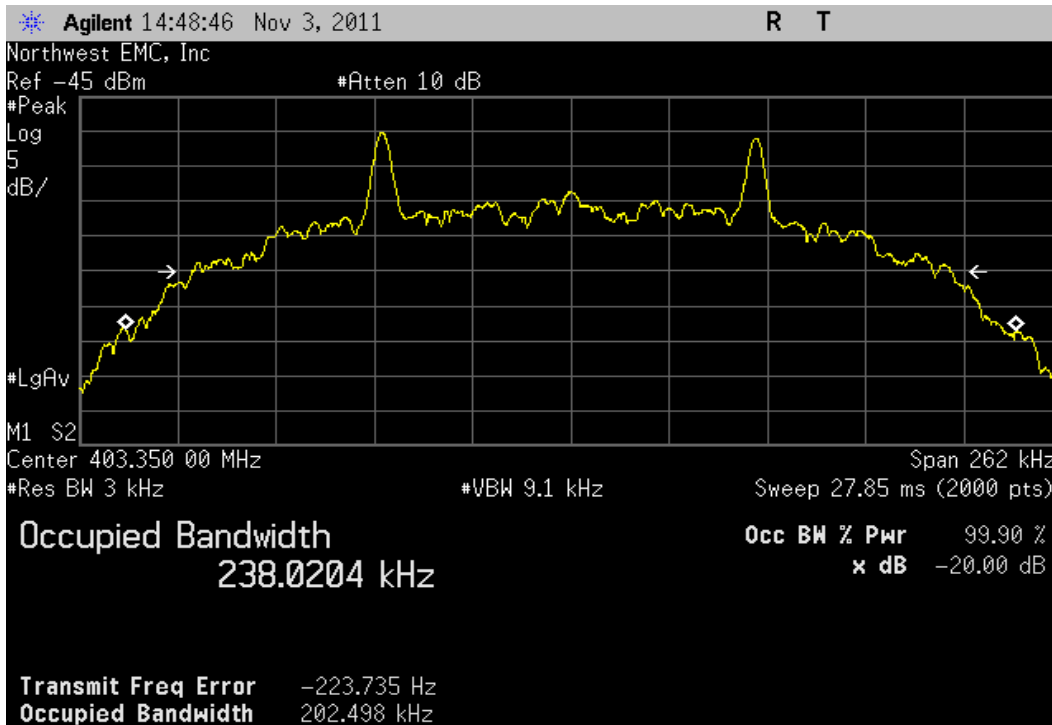
BLA600086S, Low Channel, 402.15 MHz

Value	Limit	Result
199.564 kHz	≤ 300 kHz	Pass



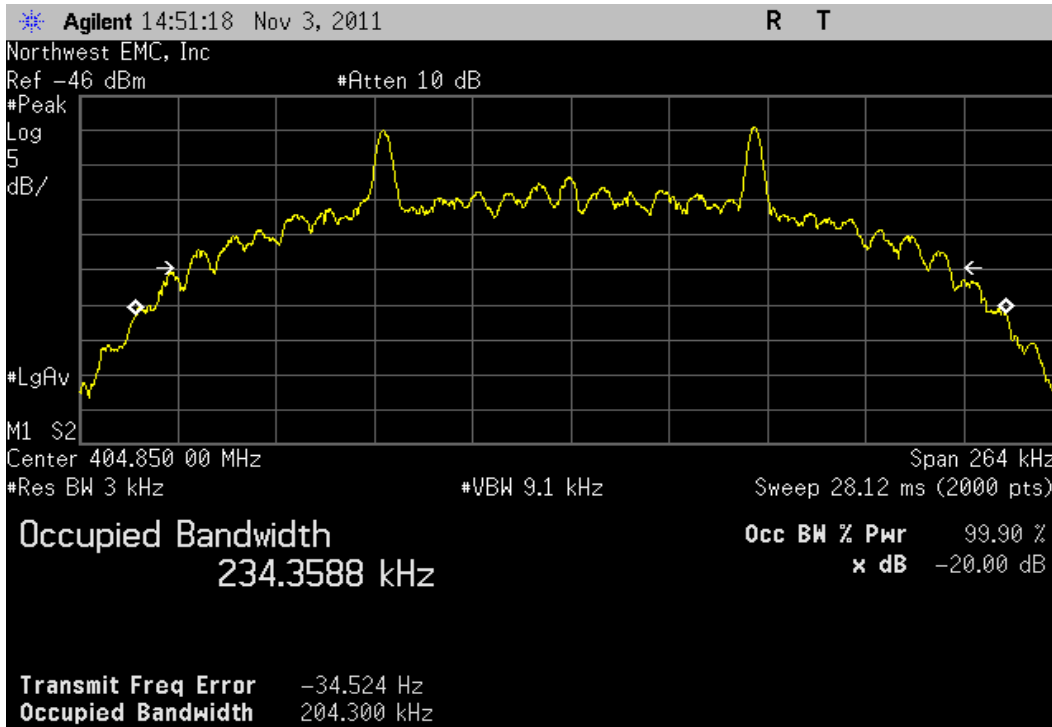
BLA600086S, Mid Channel, 403.35 MHz

Value	Limit	Result
202.498 kHz	≤ 300 kHz	Pass



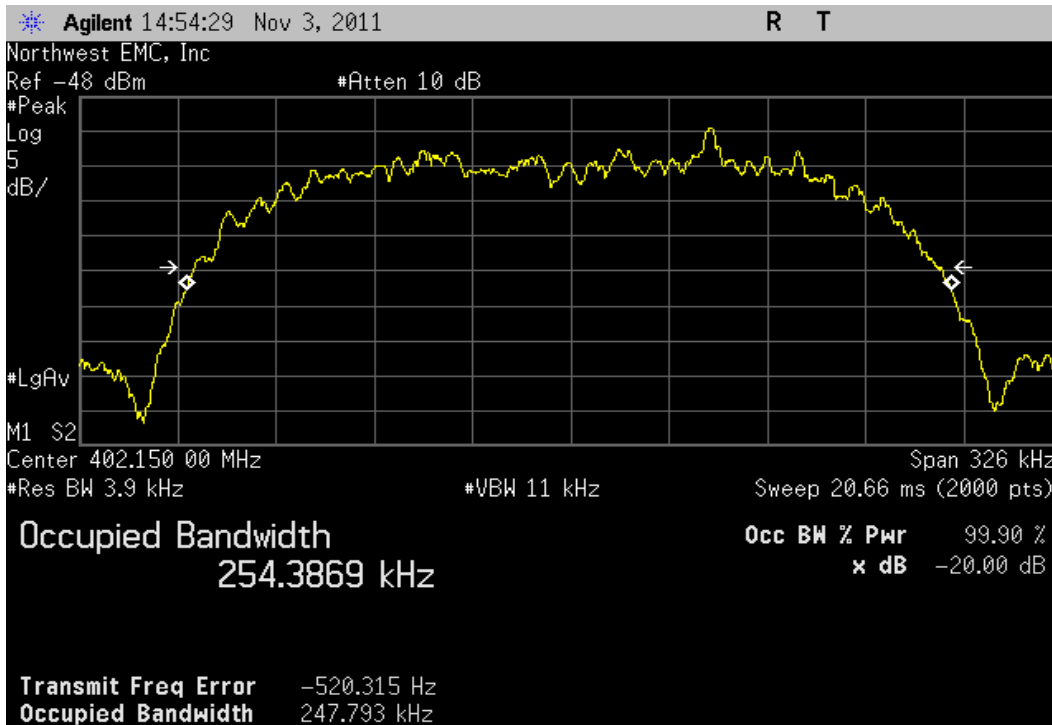
BLA600086S, High Channel, 404.85 MHz

Value	Limit	Result
204.3 kHz	≤ 300 kHz	Pass



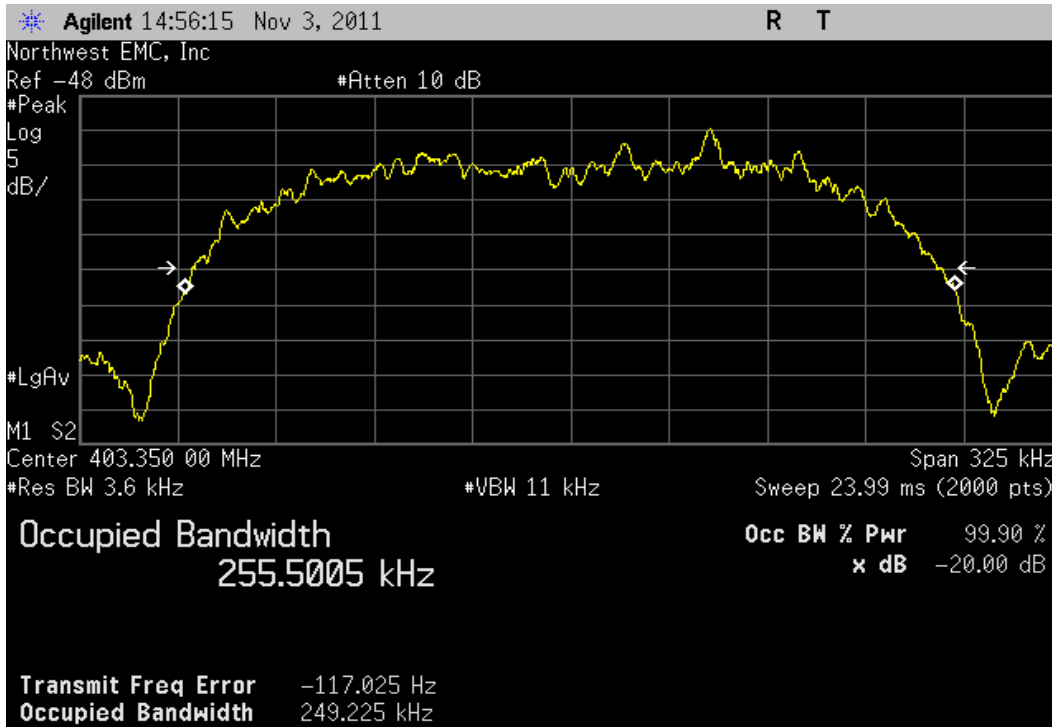
BLA600086S, Low Channel, 402.15 MHz

Value	Limit	Result
247.793 kHz	≤ 300 kHz	Pass



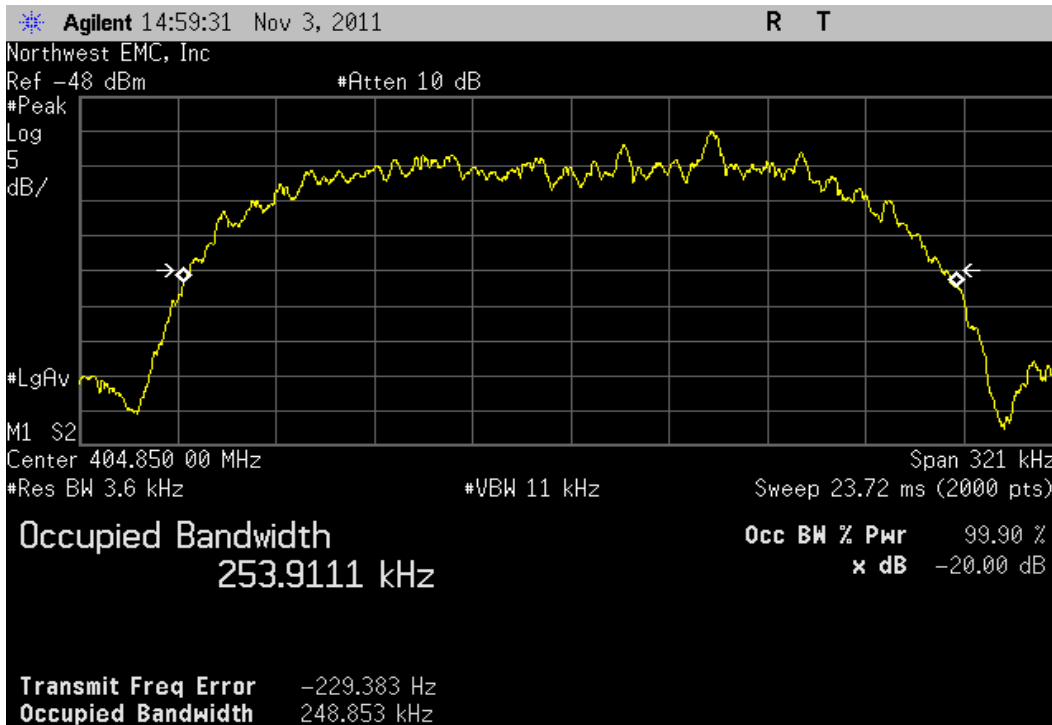
BLA600086S, Mid Channel, 403.35 MHz

Value	Limit	Result
249.225 kHz	≤ 300 kHz	Pass



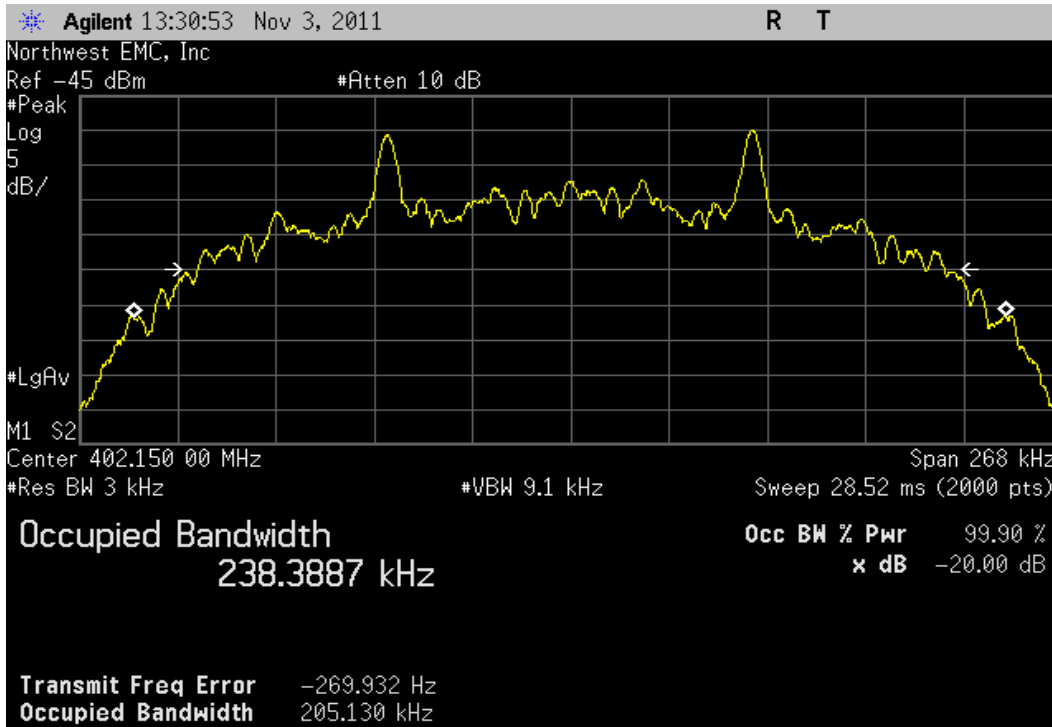
BLA600086S, High Channel, 404.85 MHz

Value	Limit	Result
248.853 kHz	≤ 300 kHz	Pass



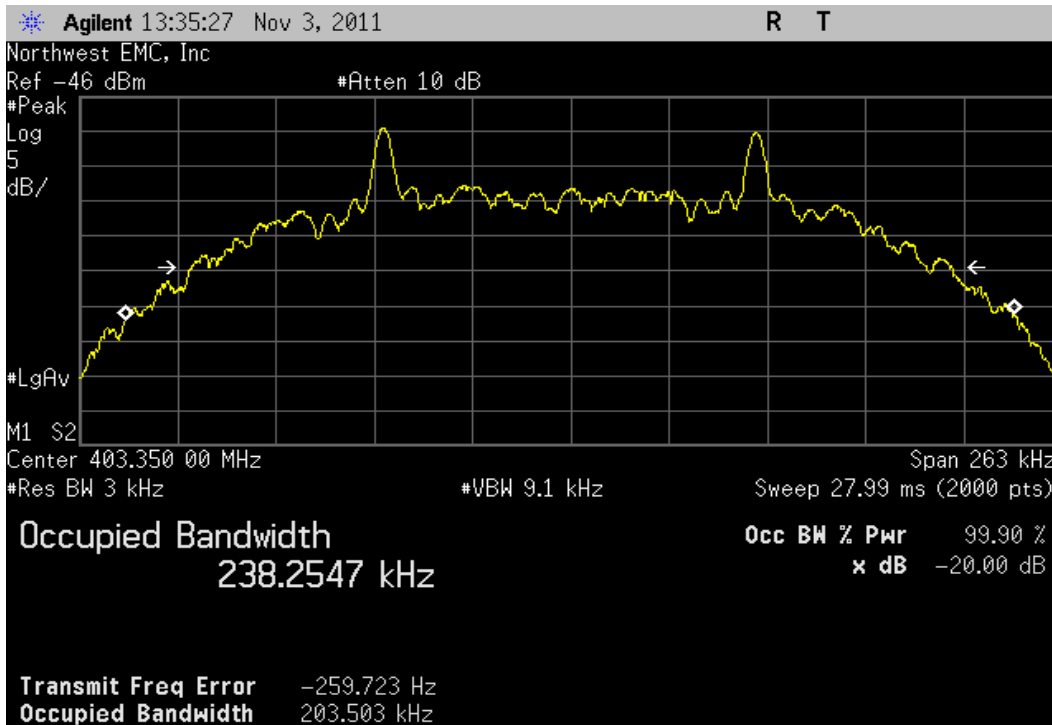
BLA600093S, Low Channel, 402.15 MHz

Value	Limit	Result
205.13 kHz	≤ 300 kHz	Pass



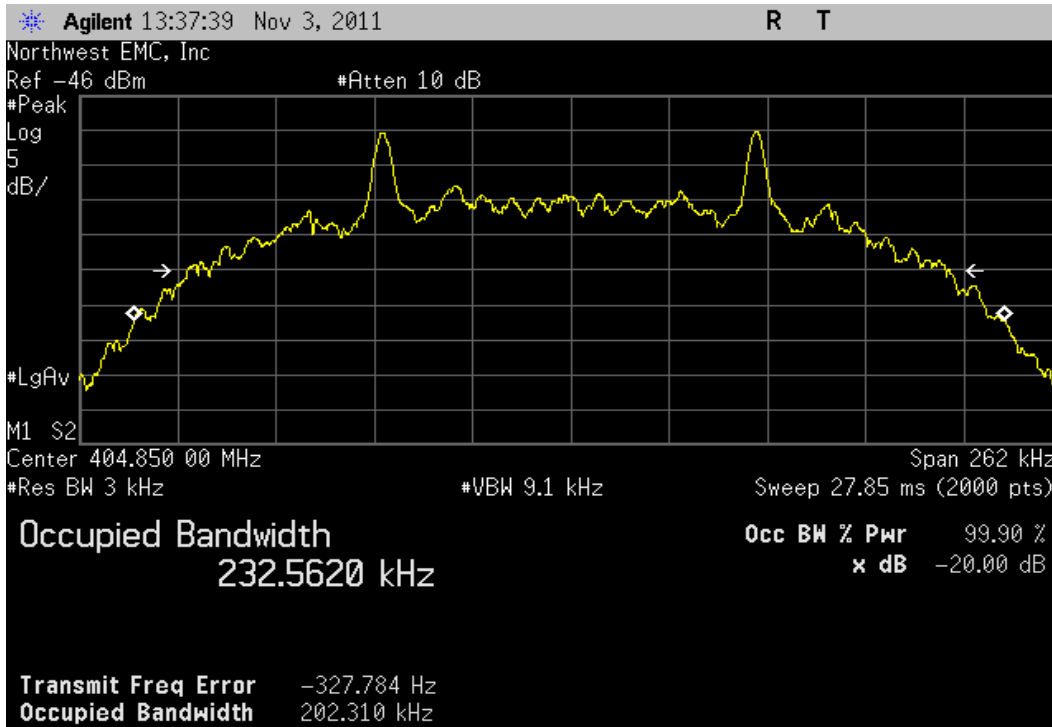
BLA600093S, Mid Channel, 403.35 MHz

Value	Limit	Result
203.503 kHz	≤ 300 kHz	Pass



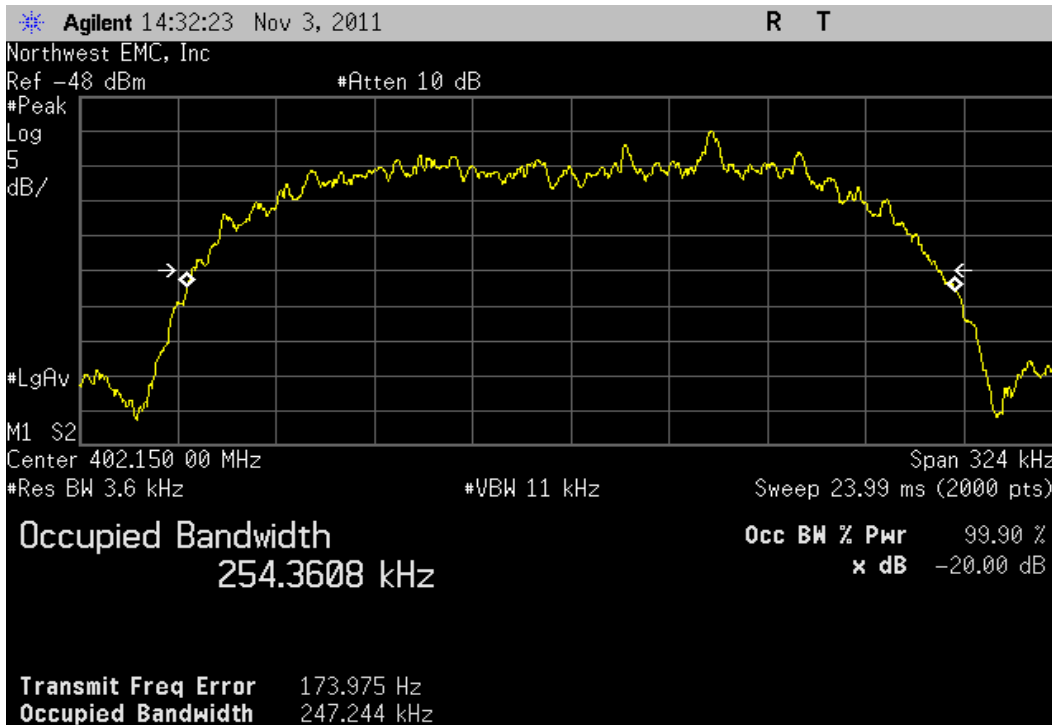
BLA600093S, High Channel, 404.85 MHz

				Value	Limit	Result
				202.31 kHz	≤ 300 kHz	Pass



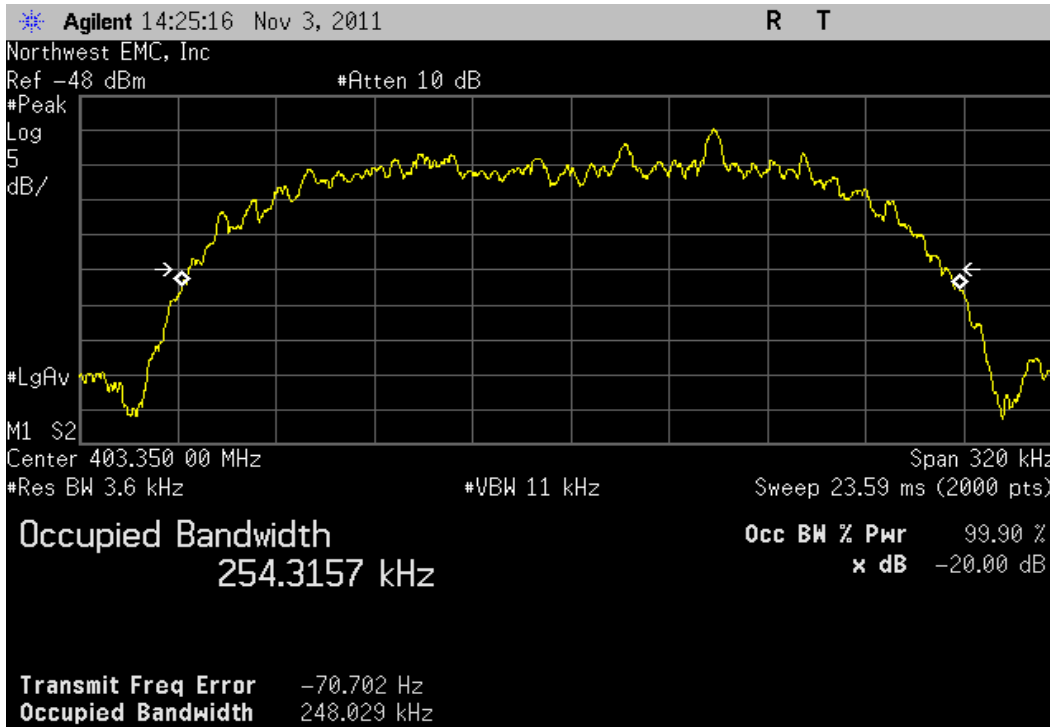
BLA600093S, Low Channel, 402.15 MHz

				Value	Limit	Result
				247.244 kHz	≤ 300 kHz	Pass



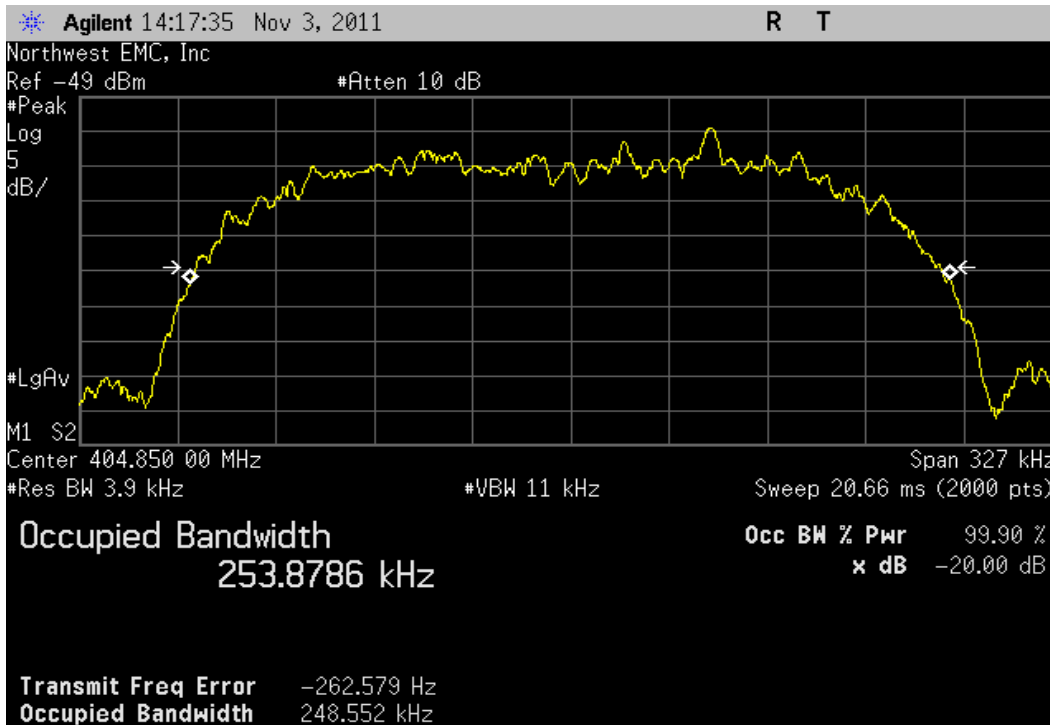
BLA600093S, Mid Channel, 403.35 MHz

	Value	Limit	Result
	248.029 kHz	≤ 300 kHz	Pass



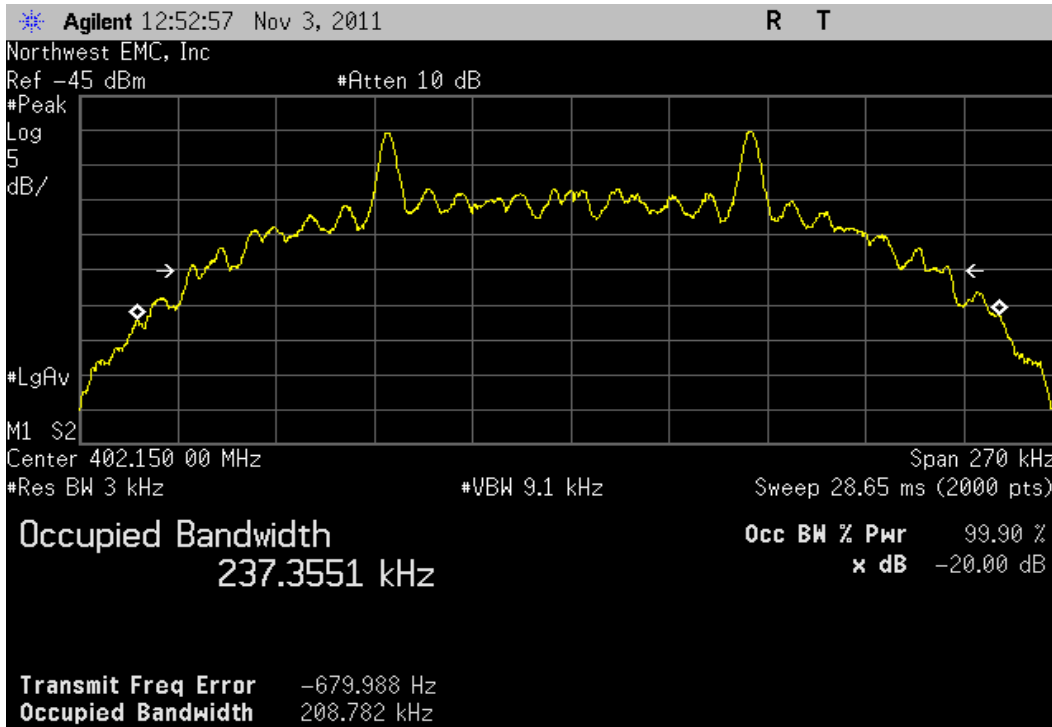
BLA600093S, High Channel, 404.85 MHz

	Value	Limit	Result
	248.552 kHz	≤ 300 kHz	Pass



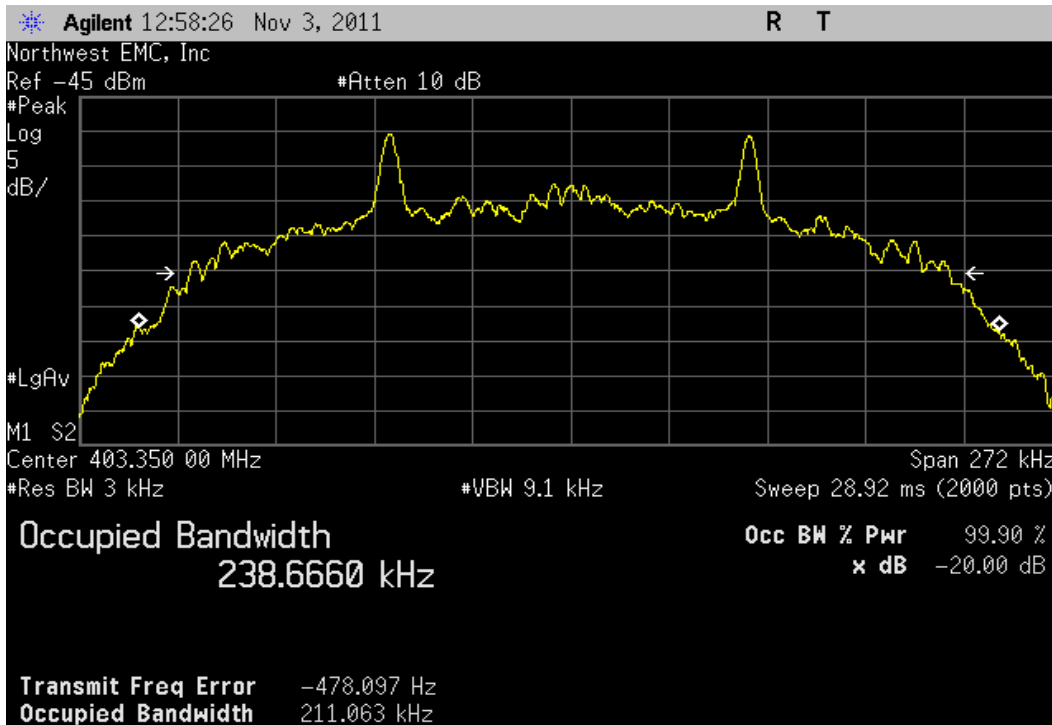
BLA600094S, Low Channel, 402.15 MHz

Value	Limit	Result
208.782 kHz	≤ 300 kHz	Pass



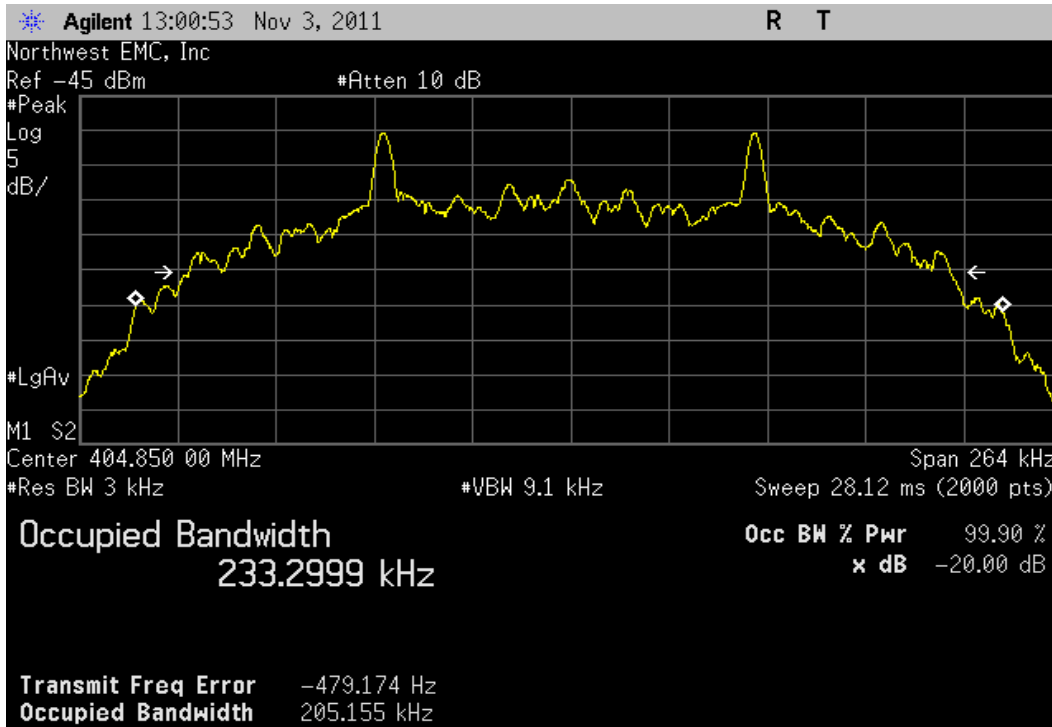
BLA600094S, Mid Channel, 403.35 MHz

Value	Limit	Result
211.063 kHz	≤ 300 kHz	Pass



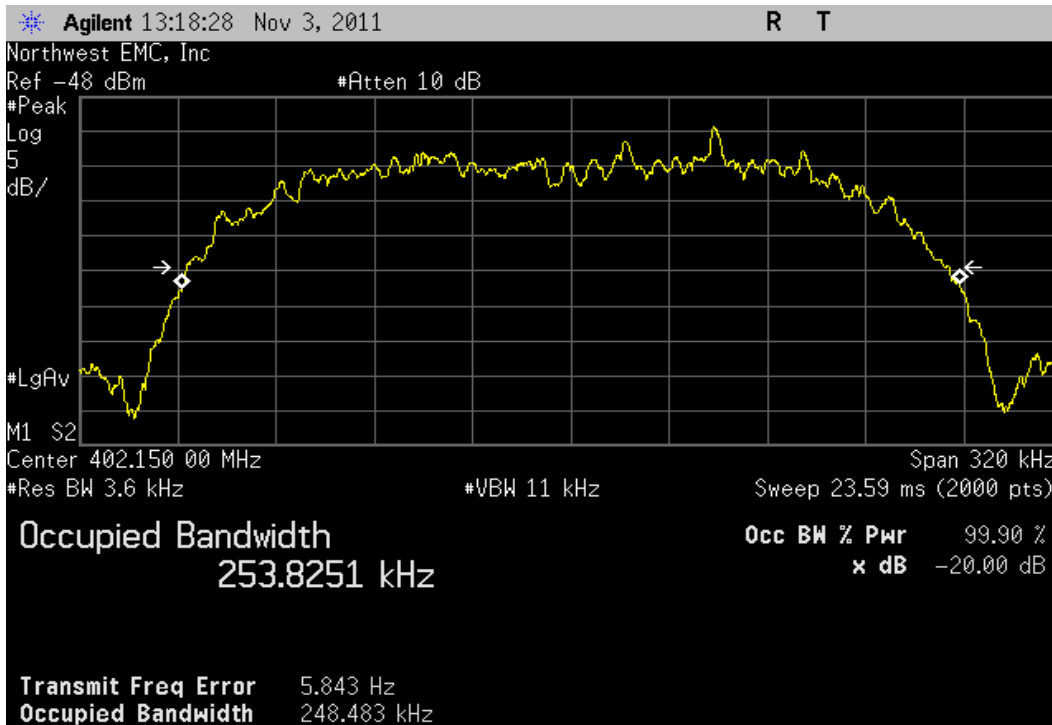
BLA600094S, High Channel, 404.85 MHz

Value	Limit	Result
205.155 kHz	≤ 300 kHz	Pass



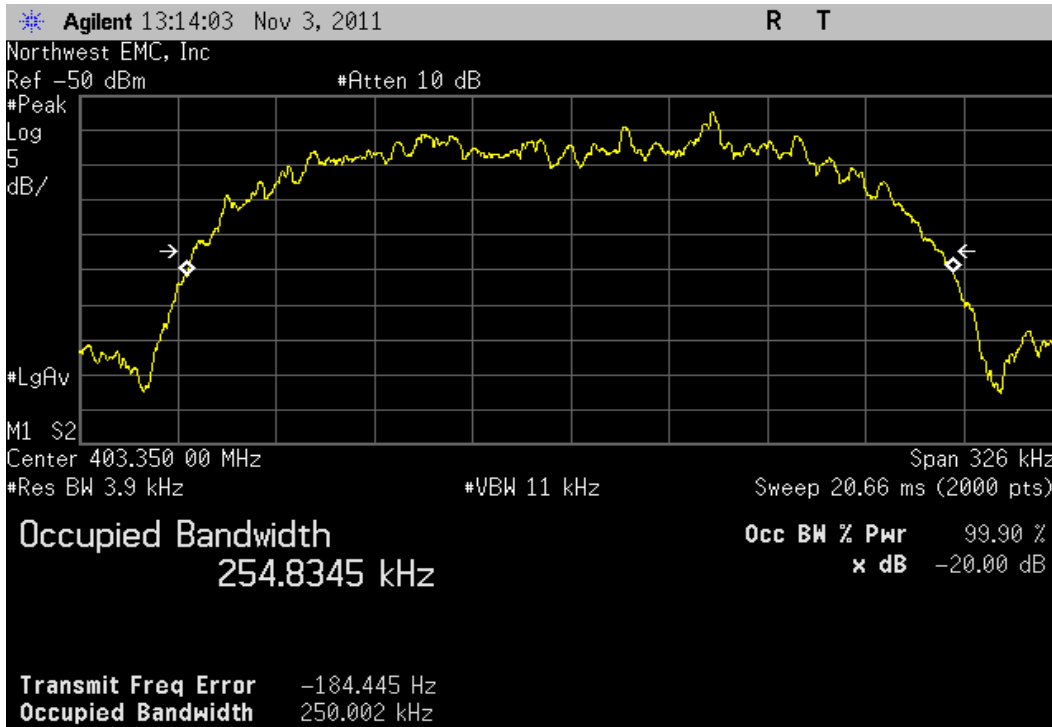
BLA600094S, Low Channel, 402.15 MHz

Value	Limit	Result
248.483 kHz	≤ 300 kHz	Pass



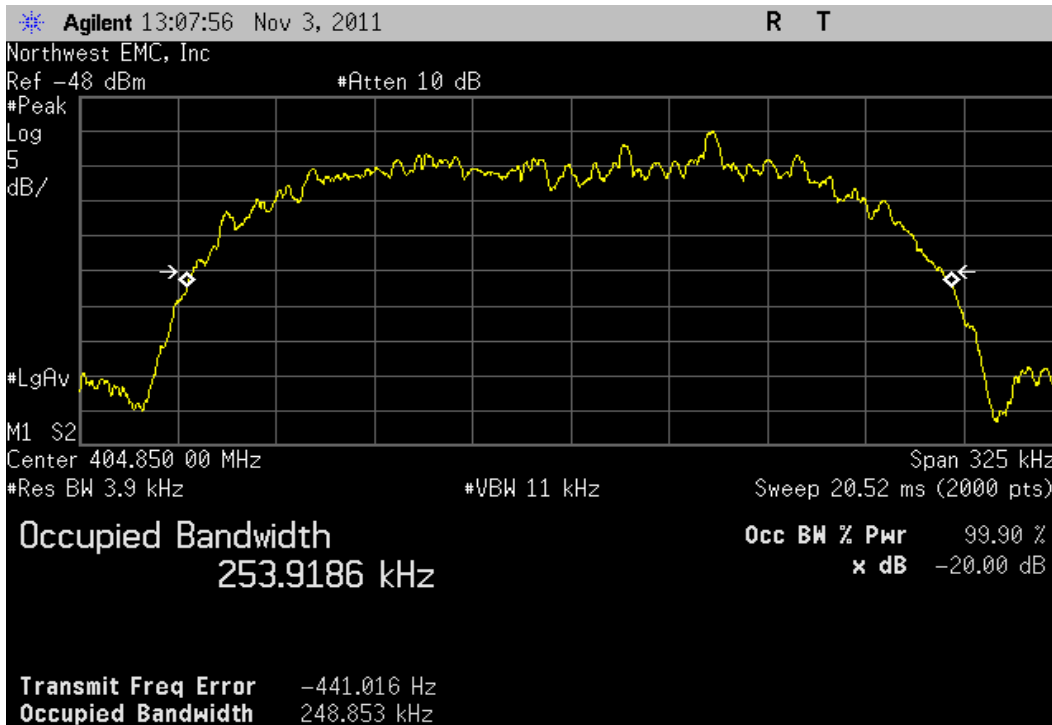
BLA600094S, Mid Channel, 403.35 MHz

Value	Limit	Result
250.002 kHz	≤ 300 kHz	Pass



BLA600094S, High Channel, 404.85 MHz

Value	Limit	Result
248.853 kHz	≤ 300 kHz	Pass



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
Near Field Probe Set	ETS	7405	IPO	NCR	0
40 GHz DC block	Fairview Microwave	SD3379	AMI	10/12/2011	12
Attenuator - 20db, 'SMA'	SM Electronics	SA26B-20	RFW	6/2/2011	12
Chamber, Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZPH-32-3.5-SCT/AC	TBF	12/29/2009	24
Spectrum Analyzer	Agilent	E4440A	AAX	5/23/2011	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 ETSI TR 100 028; 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

Variation of Supply Voltage

Per the client, the device contains a regulated internal battery that can not be removed; it will shut off if the voltage is outside the specified range.

Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (+25°, 37°C and +45° C).

The Frequency Stability was measured using a near-field probe and a spectrum analyzer. The spectrum analyzer is configured with a precision frequency reference that exceeds the stability requirement of the transmitter. The EUT was placed inside a temperature / humidity chamber. The near-field probe was placed near the transmitter. A low-loss coaxial cable connected the near-field probe to the spectrum analyzer outside of the chamber.

Frequency Stability

EUT: Viva Quad	Work Order: MDTR0124
Serial Number: BLA600086S, BLA600093S, BLA600094S	Date: 11/15/11
Customer: Medtronic Inc.	Temperature: 23.28°C
Attendees: Nick Blake	Humidity: 20%
Project: None	Barometric Pres.: 1003.3 mb
Tested by: Elaine Reeves	Power: Battery
	Job Site: MN08

TEST SPECIFICATIONS		Test Method	
FCC 951:2011		ANSI/TIA/EIA-603-C-2004	
RSS-243:2010		RSS-Gen Issue 3:2010 EN 301 839-1 V1.3.1:2009	

COMMENTS

Transmitting

DEVIATIONS FROM TEST STANDARD

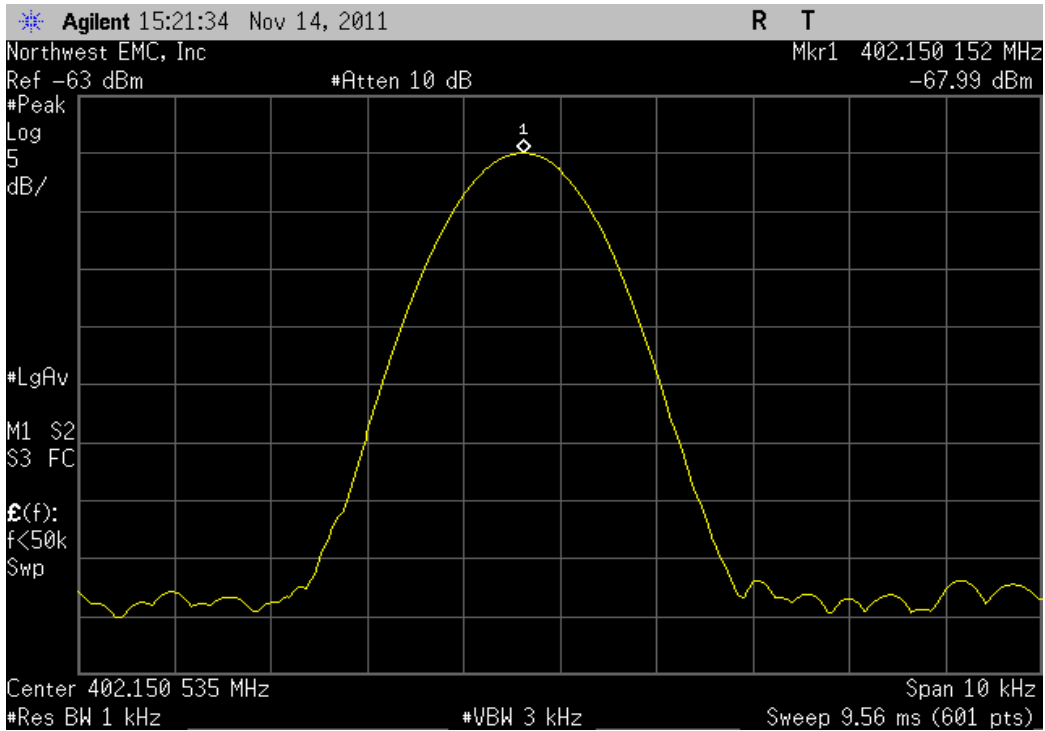
None

Configuration #	1,4,5	Signature	<i>Trevor Bulz</i>
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		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
BLA600086S						
	High Temp +45C					
	Low Channel, 402.15 MHz	402.150152	402.149817	0.8	100	Pass
	Mid Channel, 403.35 MHz	403.350237	403.349903	0.8	100	Pass
	High Channel, 404.85 MHz	404.850187	404.849886	0.7	100	Pass
	Nominal Temp +37C					
	Low Channel, 402.15 MHz	402.149817	N/A	N/A	N/A	N/A
	Mid Channel, 403.35 MHz	403.349903	N/A	N/A	N/A	N/A
	High Channel, 404.85 MHz	404.849886	N/A	N/A	N/A	N/A
	Low Temp +25C					
	Low Channel, 402.15 MHz	402.149502	402.149817	0.8	100	Pass
	Mid Channel, 403.35 MHz	403.349586	403.349903	0.8	100	Pass
	High Channel, 404.85 MHz	404.849555	404.849886	0.8	100	Pass
BLA600093S						
	High Temp +45C					
	Low Channel, 402.15 MHz	402.149984	402.149734	0.6	100	Pass
	Mid Channel, 403.35 MHz	403.350053	403.349820	0.6	100	Pass
	High Channel, 404.85 MHz	404.850023	404.849786	0.6	100	Pass
	Nominal Temp +37C					
	Low Channel, 402.15 MHz	402.149734	N/A	N/A	N/A	N/A
	Mid Channel, 403.35 MHz	403.349820	N/A	N/A	N/A	N/A
	High Channel, 404.85 MHz	404.849786	N/A	N/A	N/A	N/A
	Low Temp +25C					
	Low Channel, 402.15 MHz	402.149484	402.149734	0.6	100	Pass
	Mid Channel, 403.35 MHz	403.349584	403.349820	0.6	100	Pass
	High Channel, 404.85 MHz	404.849569	404.849786	0.5	100	Pass
BLA600094S						
	High Temp +45C					
	Low Channel, 402.15 MHz	402.149901	402.149685	0.5	100	Pass
	Mid Channel, 403.35 MHz	403.349984	403.349769	0.5	100	Pass
	High Channel, 404.85 MHz	404.849954	404.849734	0.5	100	Pass
	Nominal Temp +37C					
	Low Channel, 402.15 MHz	402.149685	N/A	N/A	N/A	N/A
	Mid Channel, 403.35 MHz	403.349769	N/A	N/A	N/A	N/A
	High Channel, 404.85 MHz	404.849734	N/A	N/A	N/A	N/A
	Low Temp +25C					
	Low Channel, 402.15 MHz	402.149416	402.149685	0.7	100	Pass
	Mid Channel, 403.35 MHz	403.349519	403.349769	0.6	100	Pass
	High Channel, 404.85 MHz	404.849489	404.849734	0.6	100	Pass

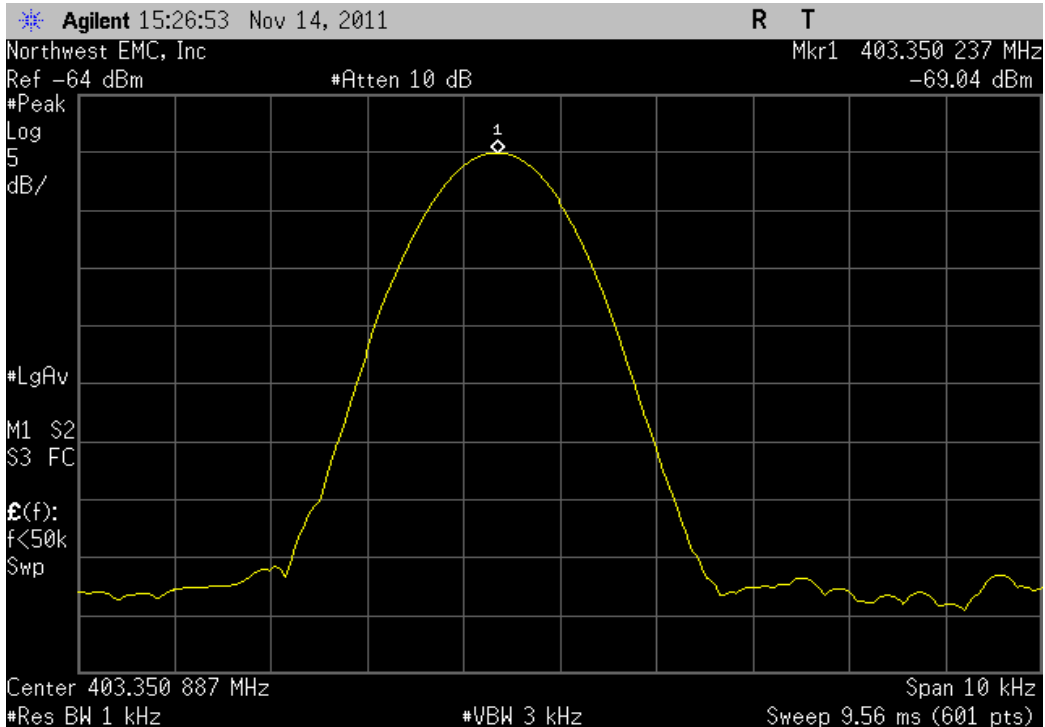
BLA600086S, High Temp +45C, Low Channel, 402.15 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
402.150152	402.149817	0.8	100	Pass



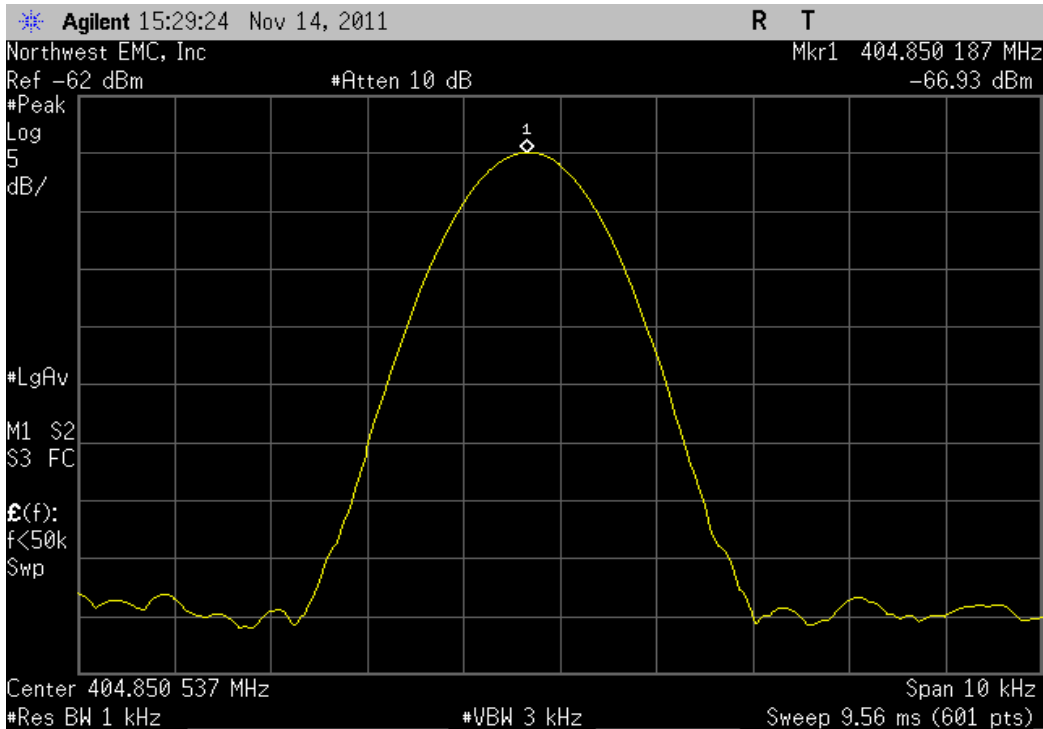
BLA600086S, High Temp +45C, Mid Channel, 403.35 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
403.350237	403.349903	0.8	100	Pass



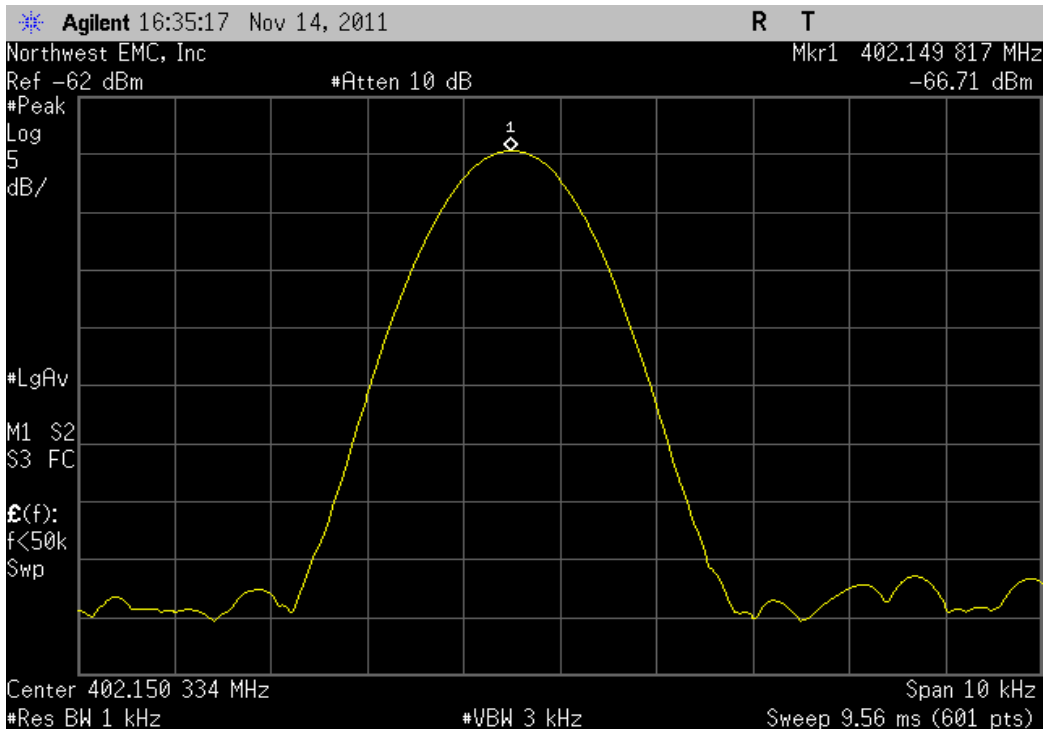
BLA600086S, High Temp +45C, High Channel, 404.85 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
404.850187	404.849886	0.7	100	Pass



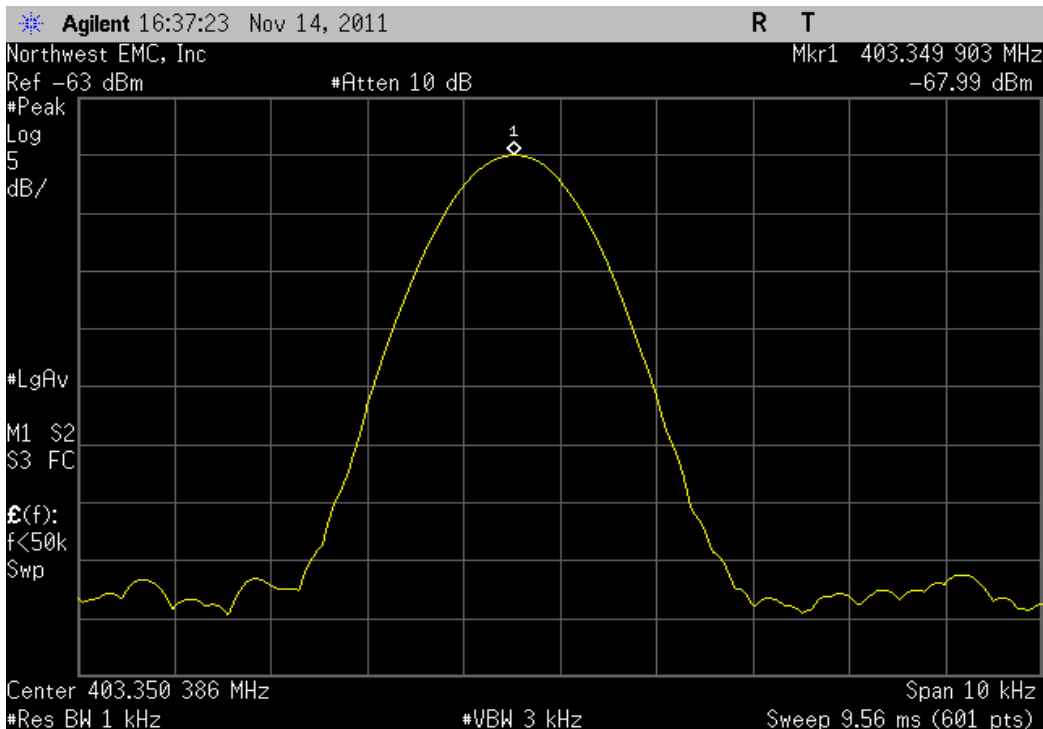
BLA600086S, Nominal Temp +37C, Low Channel, 402.15 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
402.149817	N/A	N/A	N/A	N/A



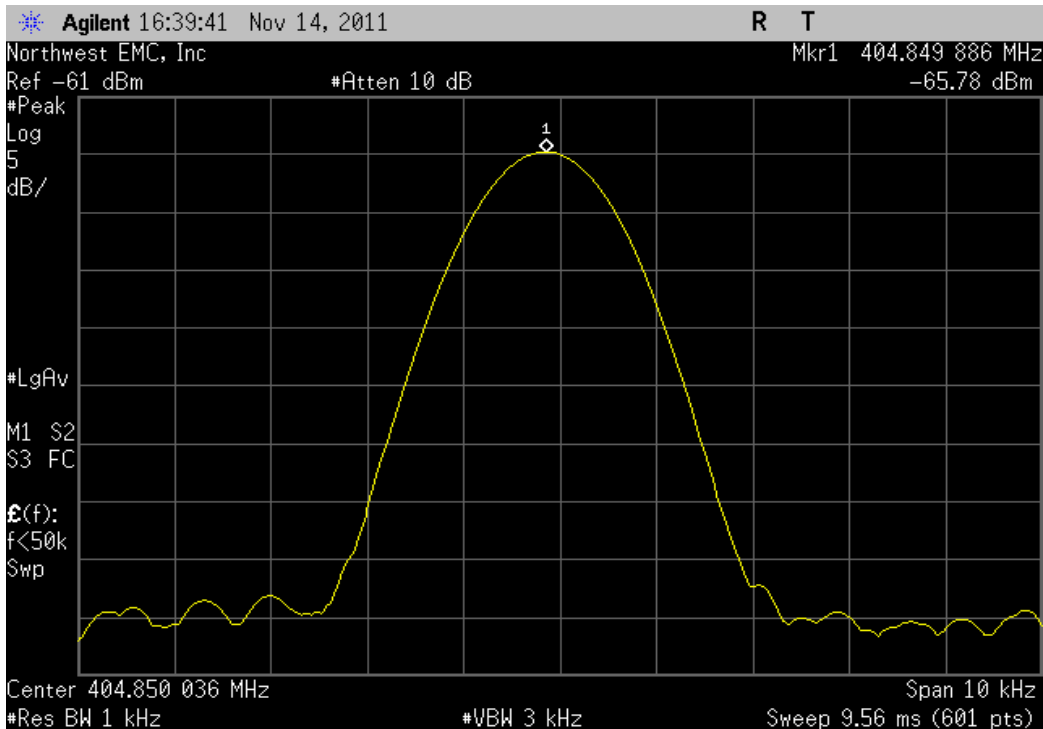
BLA600086S, Nominal Temp +37C, Mid Channel, 403.35 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
403.349903	N/A	N/A	N/A	N/A



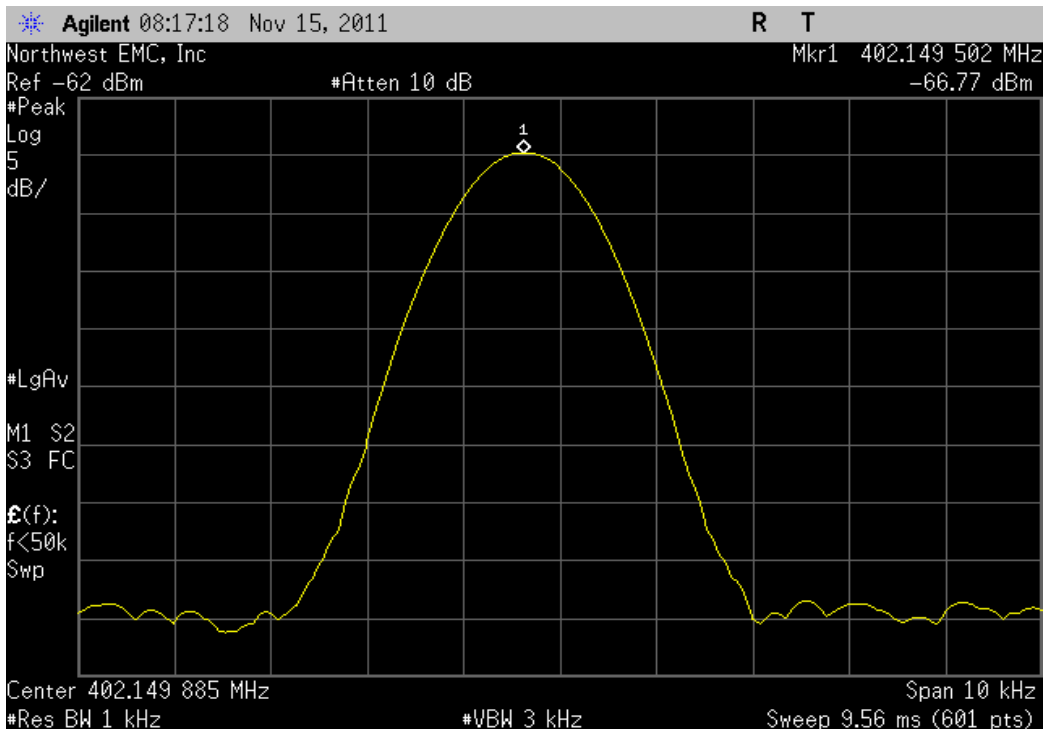
BLA600086S, Nominal Temp +37C, High Channel, 404.85 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
404.849886	N/A	N/A	N/A	N/A



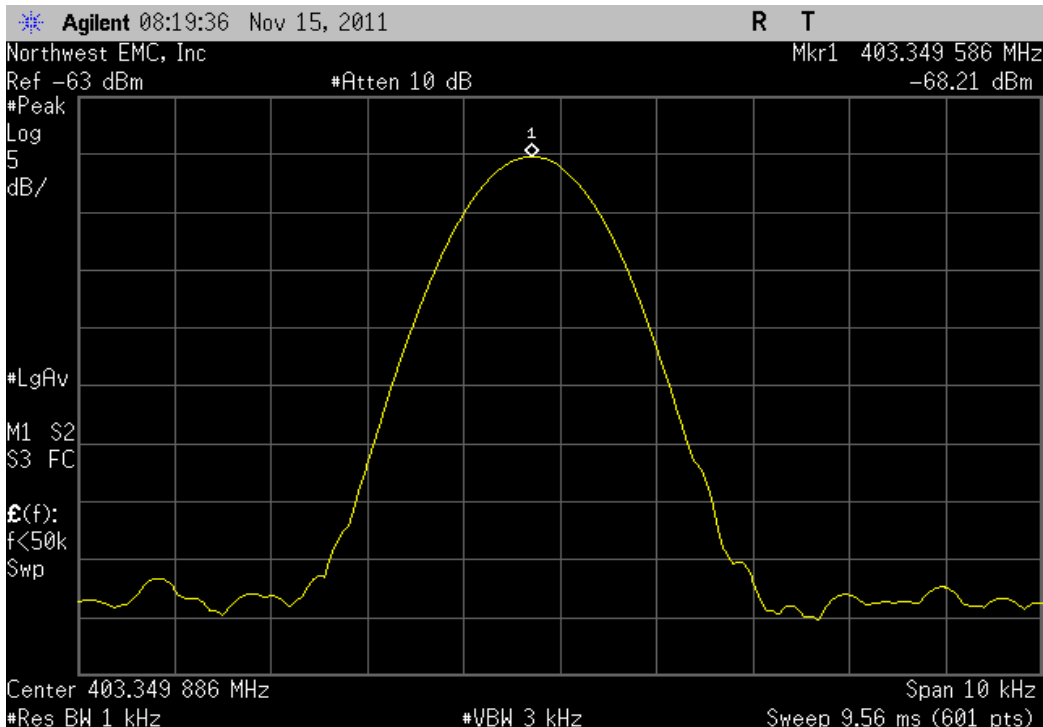
BLA600086S, Low Temp +25C, Low Channel, 402.15 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
402.149502	402.149817	0.8	100	Pass



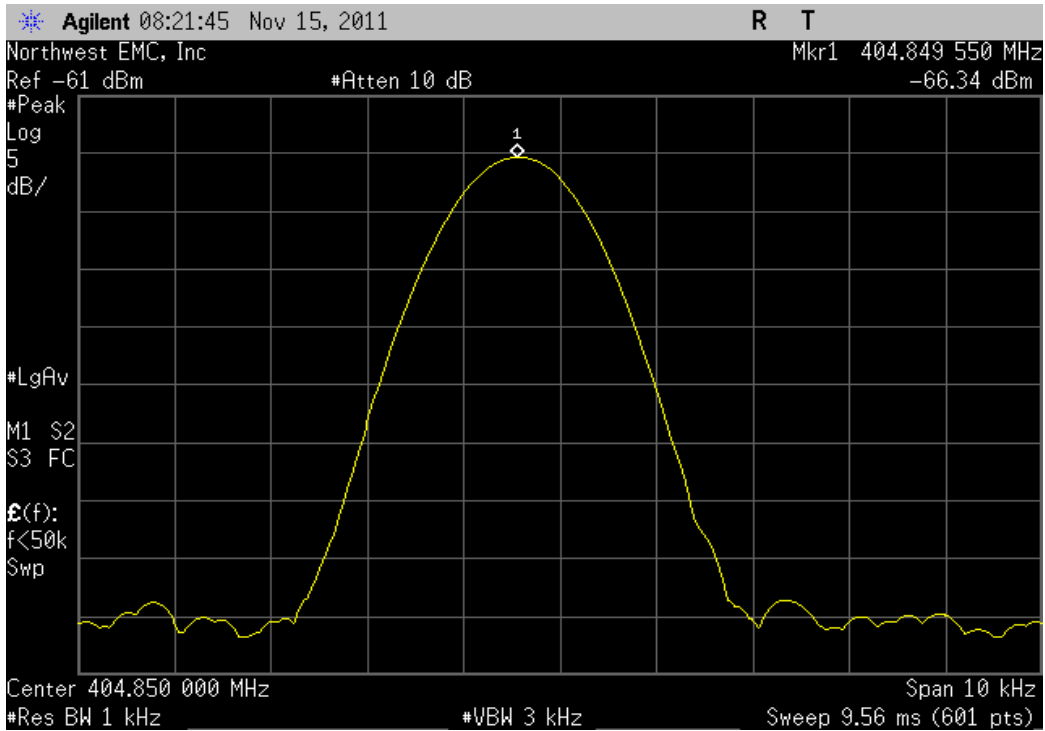
BLA600086S, Low Temp +25C, Mid Channel, 403.35 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
403.349586	403.349903	0.8	100	Pass



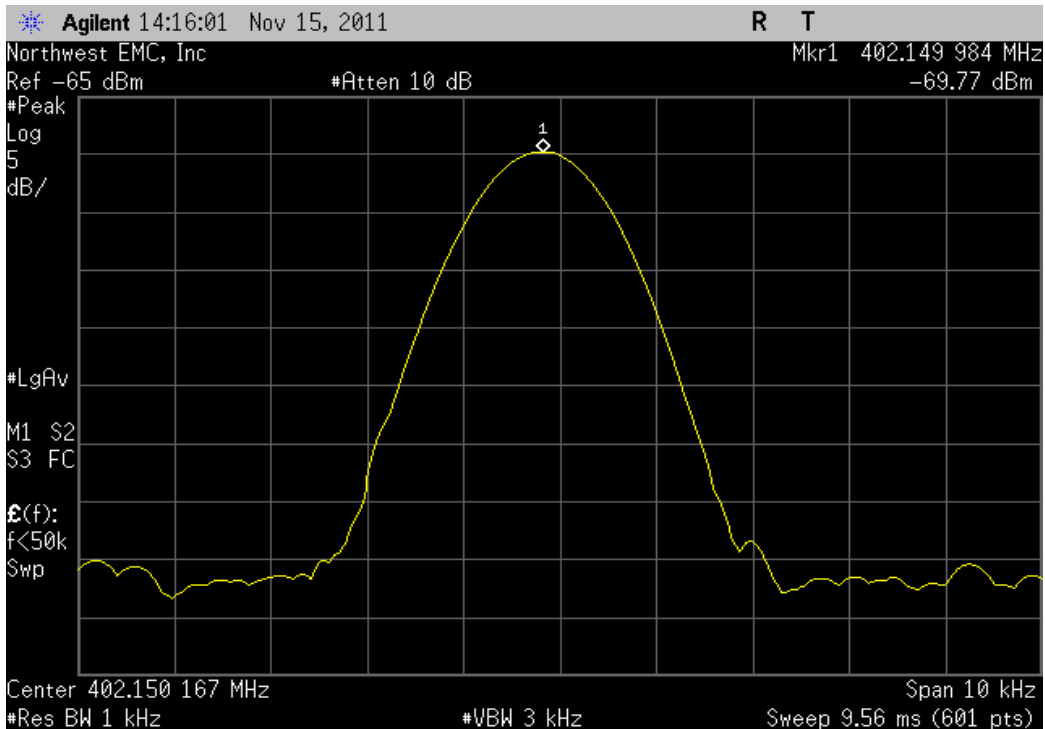
BLA600086S, Low Temp +25C, High Channel, 404.85 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
404.84955	404.849886	0.8	100	Pass



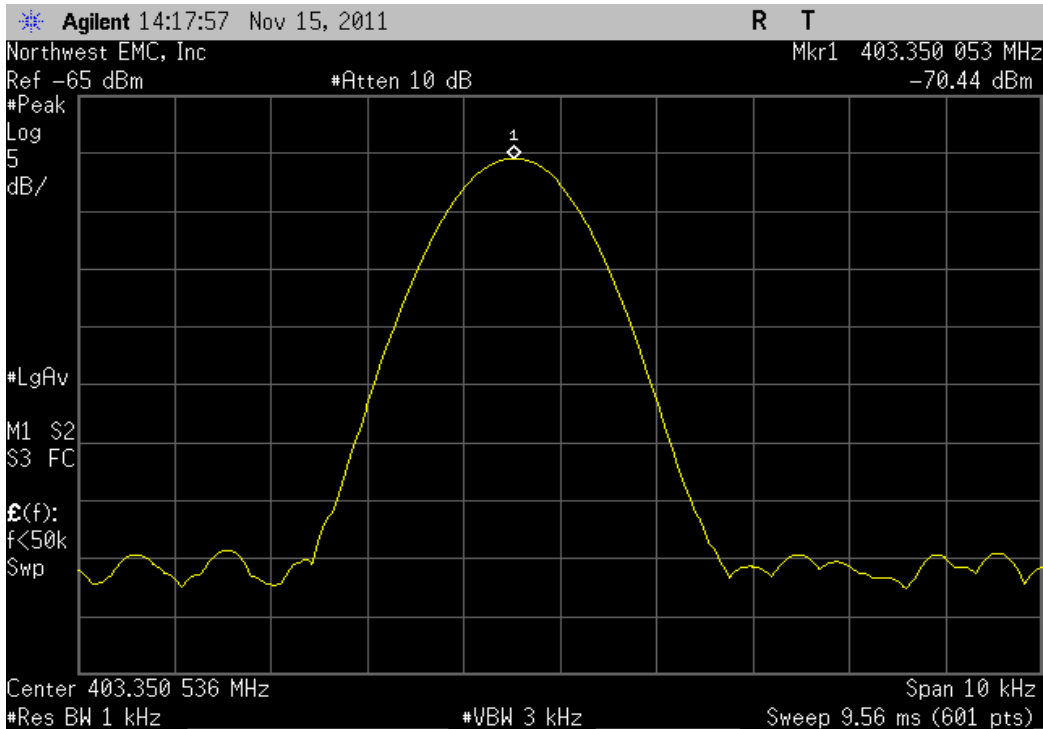
BLA600093S, High Temp +45C, Low Channel, 402.15 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
402.149984	402.149734	0.6	100	Pass



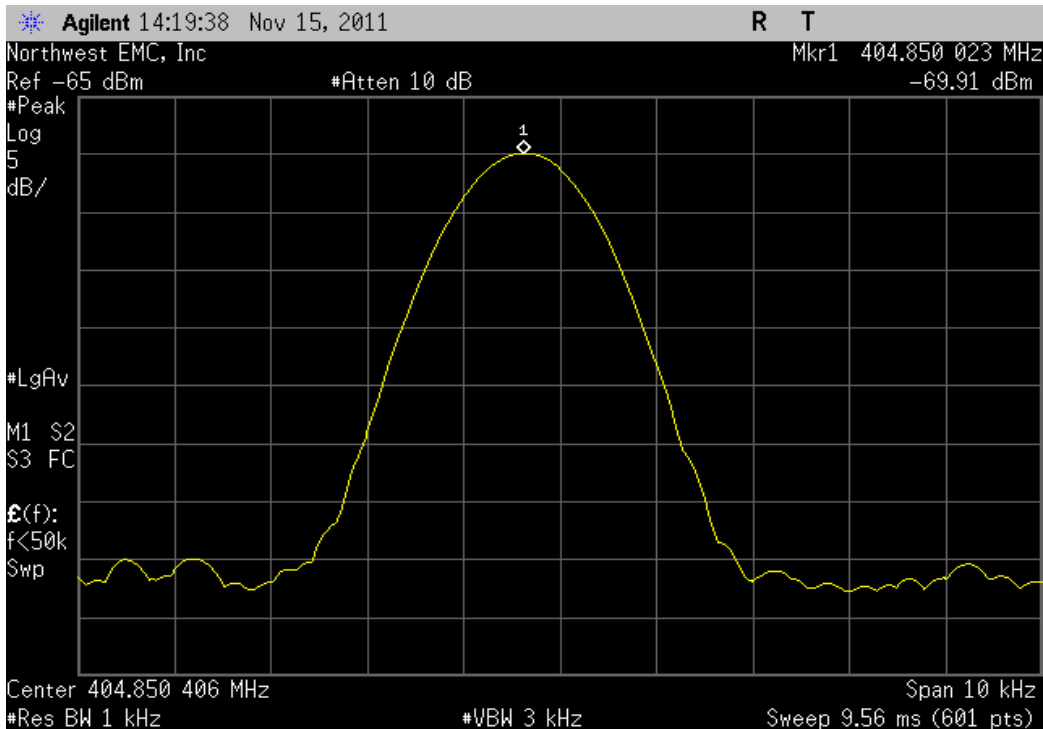
BLA600093S, High Temp +45C, Mid Channel, 403.35 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
403.350053	403.349820	0.6	100	Pass



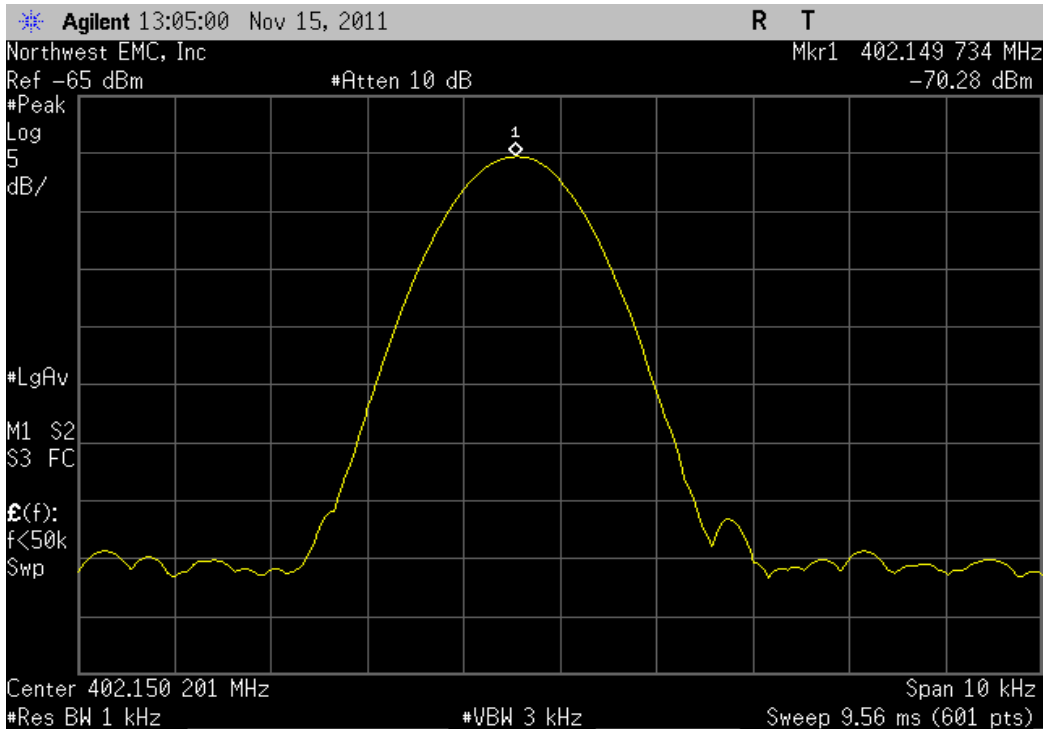
BLA600093S, High Temp +45C, High Channel, 404.85 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
404.850023	404.849786	0.6	100	Pass



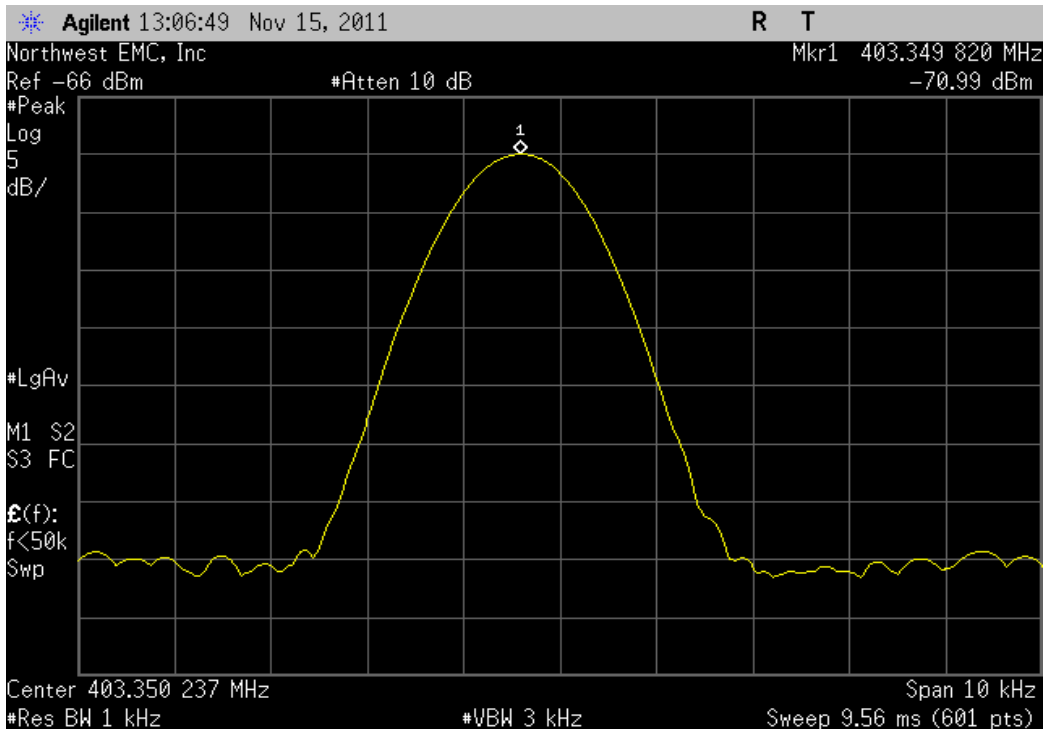
BLA600093S, Nominal Temp +37C, Low Channel, 402.15 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
402.149734	N/A	N/A	N/A	N/A



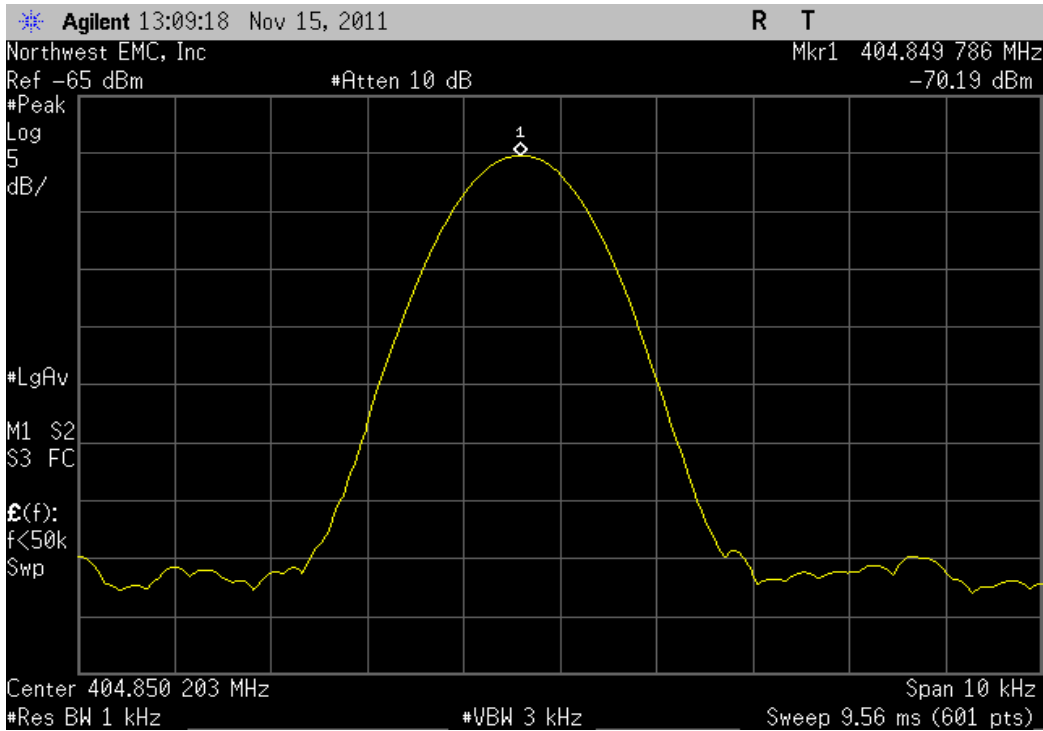
BLA600093S, Nominal Temp +37C, Mid Channel, 403.35 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
403.34982	N/A	N/A	N/A	N/A



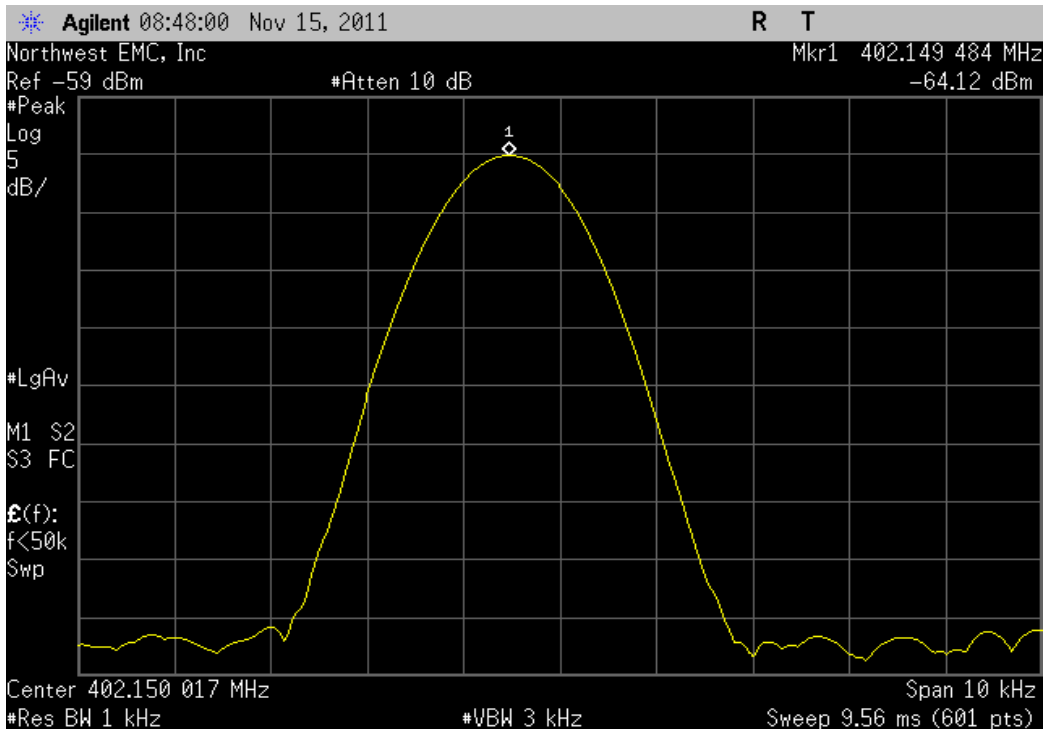
BLA600093S, Nominal Temp +37C, High Channel, 404.85 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
404.849786	N/A	N/A	N/A	N/A



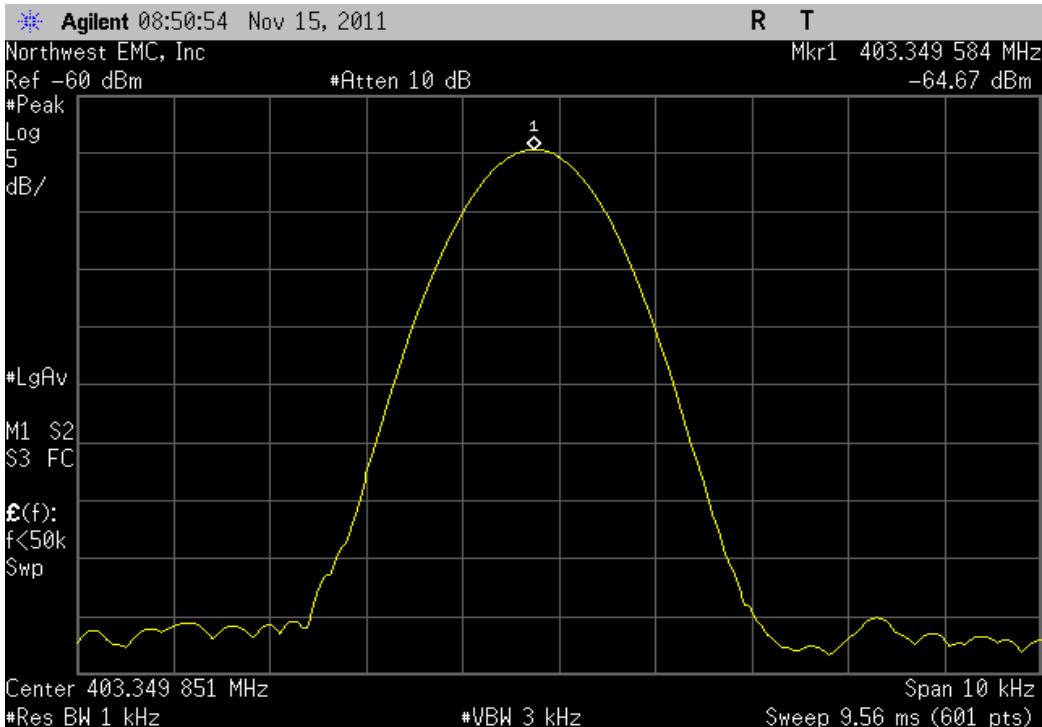
BLA600093S, Low Temp +25C, Low Channel, 402.15 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
402.149484	402.149734	0.6	100	Pass



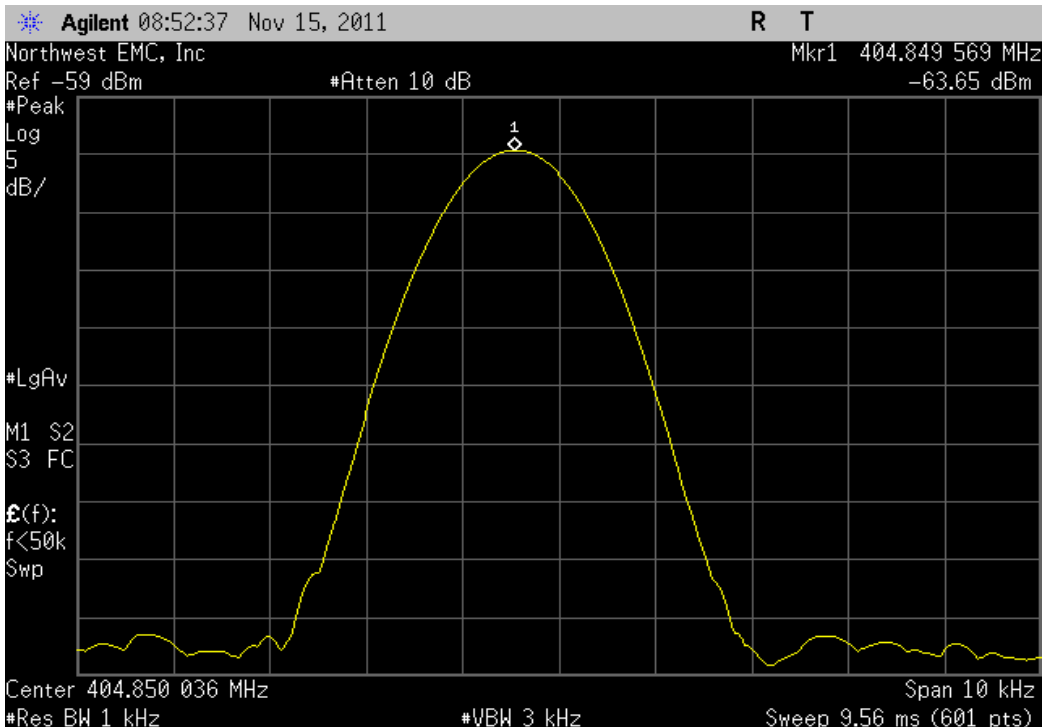
BLA600093S, Low Temp +25C, Mid Channel, 403.35 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
403.349584	403.349820	0.6	100	Pass



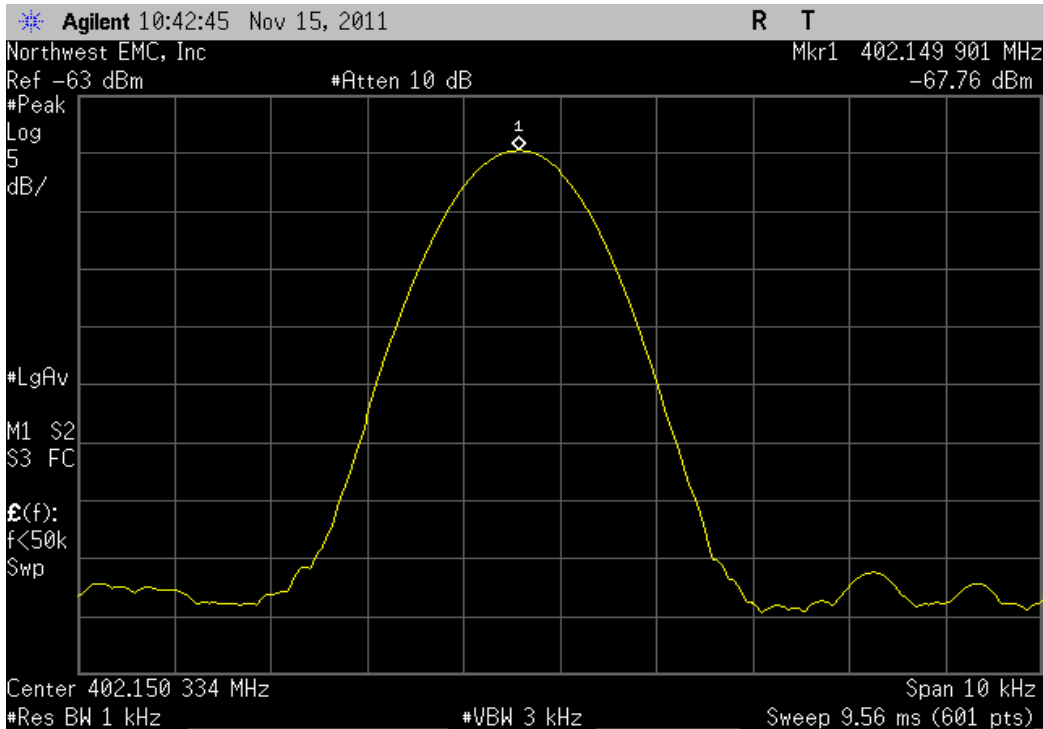
BLA600093S, Low Temp +25C, High Channel, 404.85 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
404.849569	404.849786	0.5	100	Pass



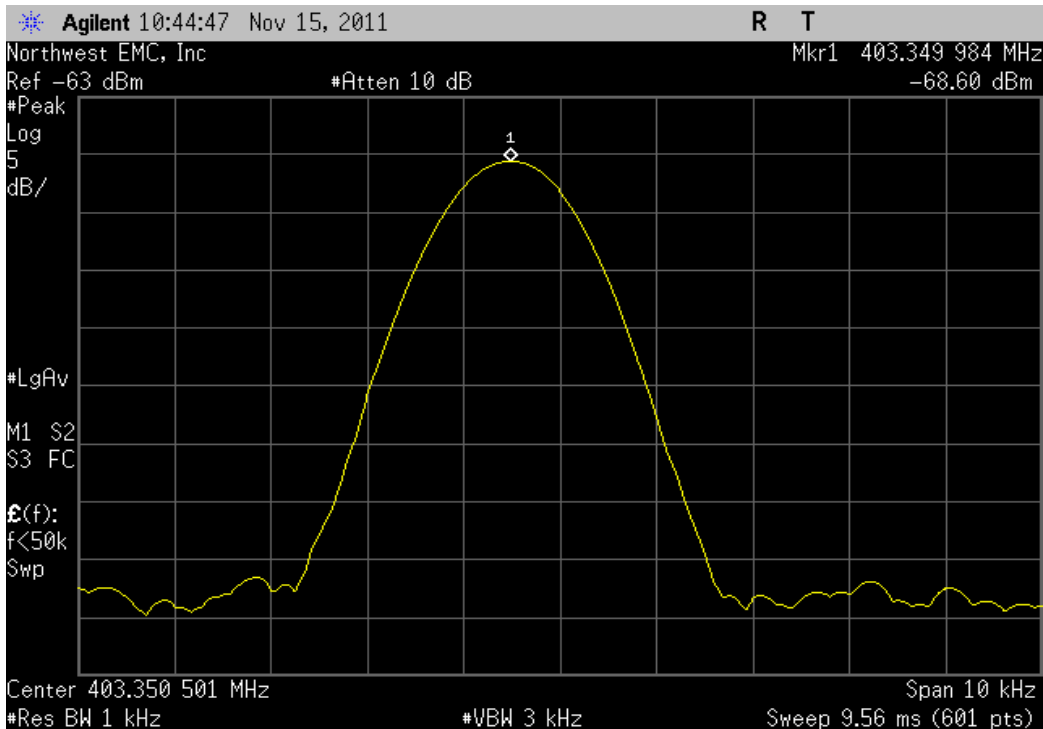
BLA600094S, High Temp +45C, Low Channel, 402.15 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
402.149901	402.149685	0.5	100	Pass



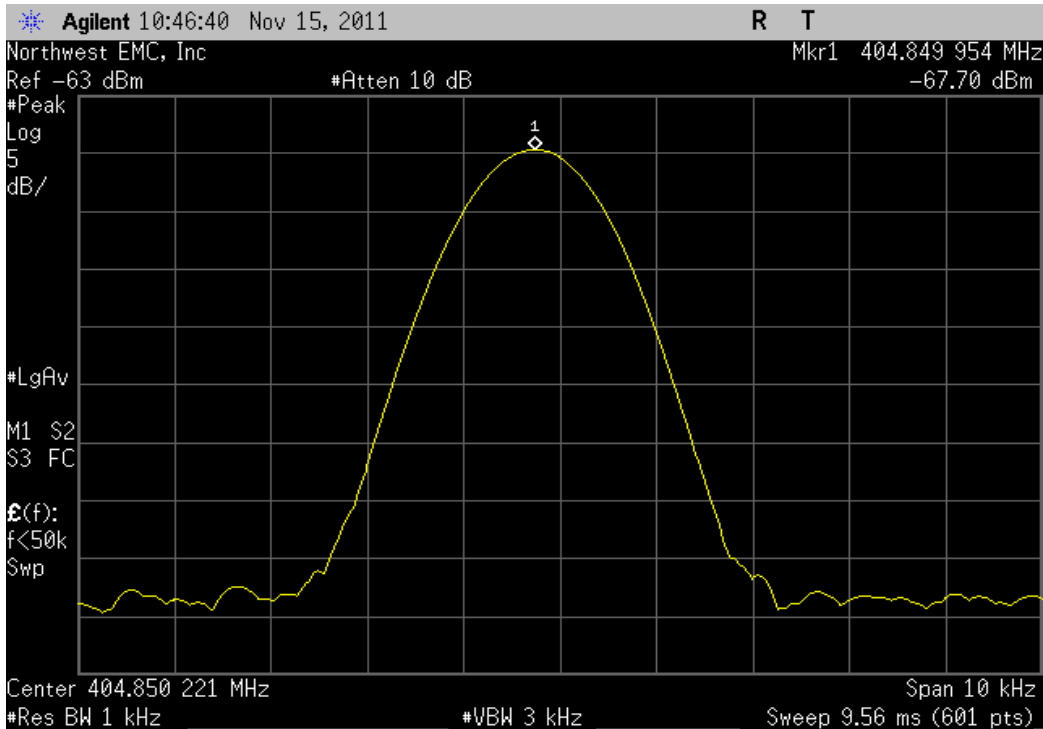
BLA600094S, High Temp +45C, Mid Channel, 403.35 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
403.349984	403.349769	0.5	100	Pass



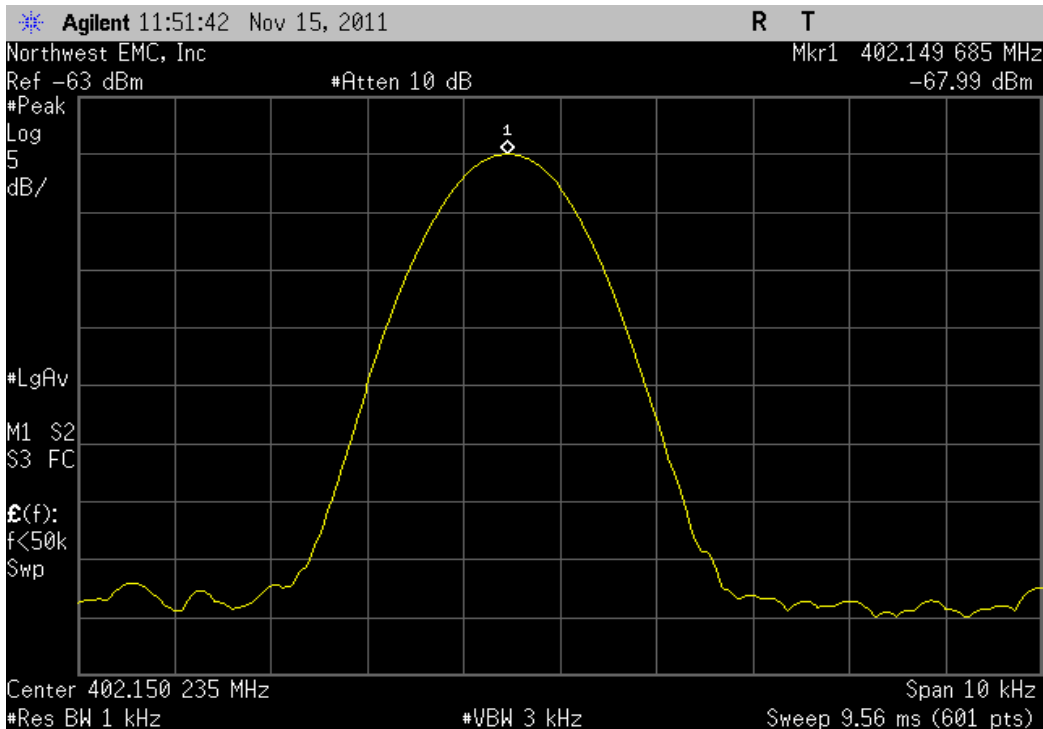
BLA600094S, High Temp +45C, High Channel, 404.85 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
404.849954	404.849734	0.5	100	Pass



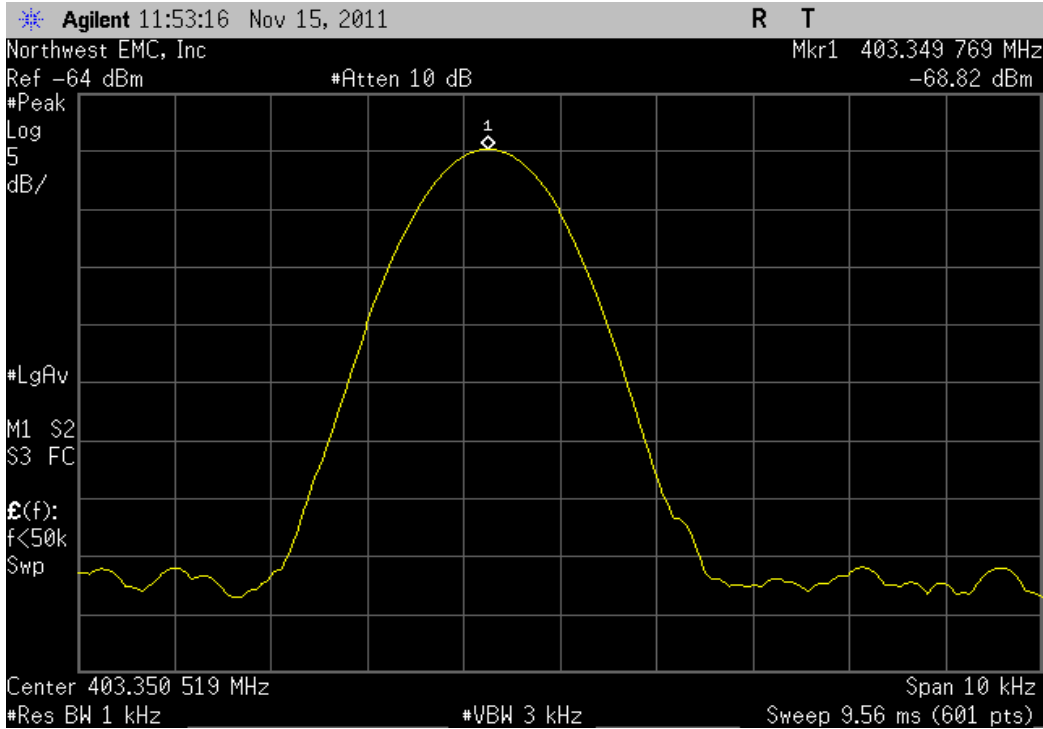
BLA600094S, Nominal Temp +37C, Low Channel, 402.15 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
402.149685	N/A	N/A	N/A	N/A



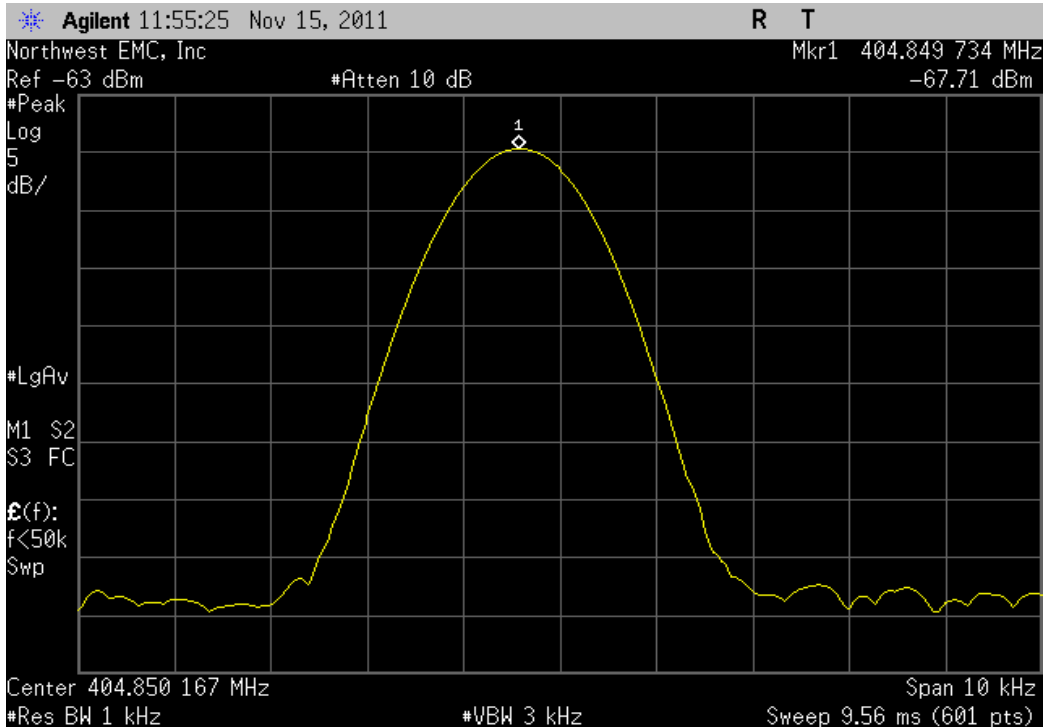
BLA600094S, Nominal Temp +37C, Mid Channel, 403.35 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
403.349769	N/A	N/A	N/A	N/A



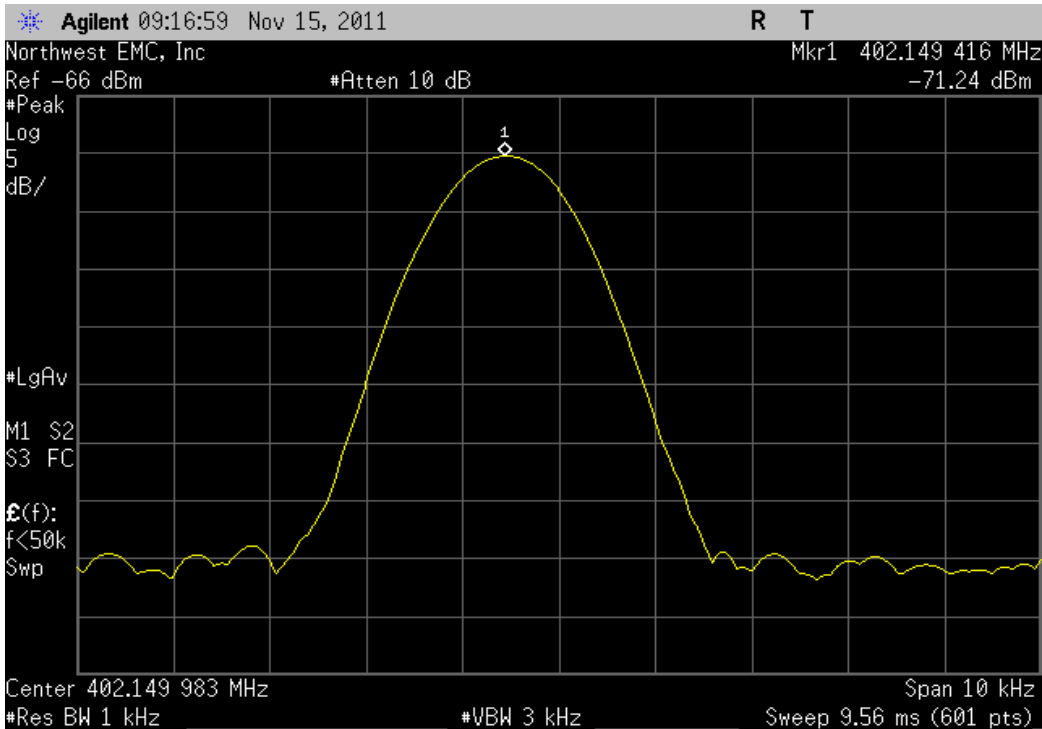
BLA600094S, Nominal Temp +37C, High Channel, 404.85 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
404.849734	N/A	N/A	N/A	N/A



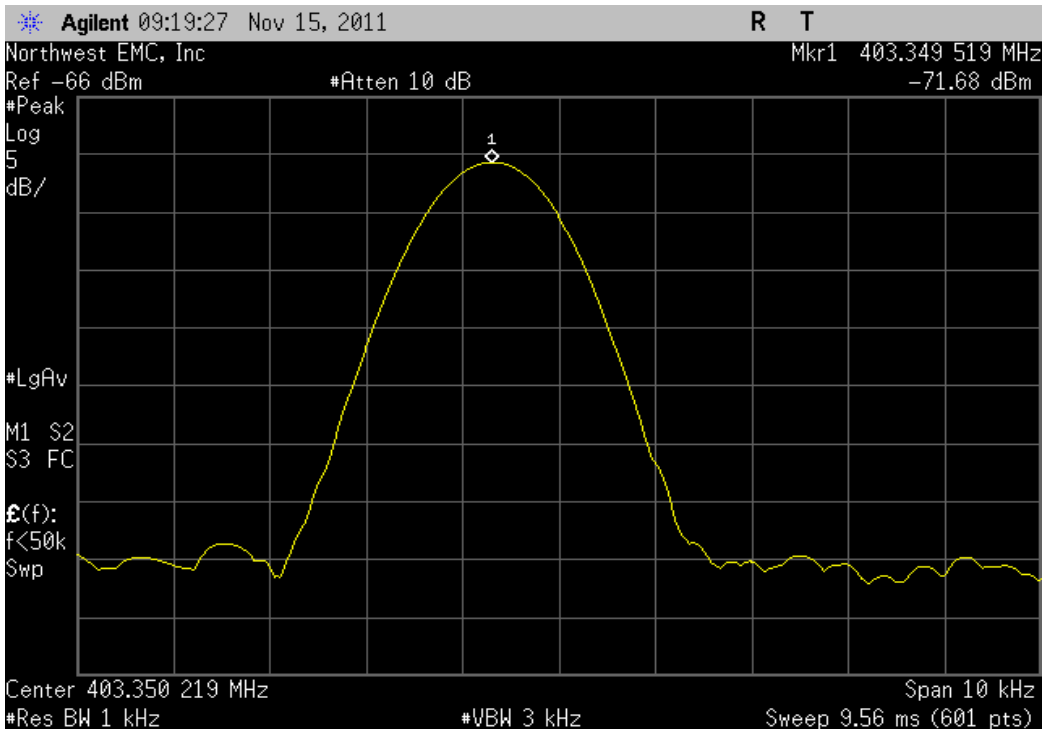
BLA600094S, Low Temp +25C, Low Channel, 402.15 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
402.149416	402.149685	0.7	100	Pass



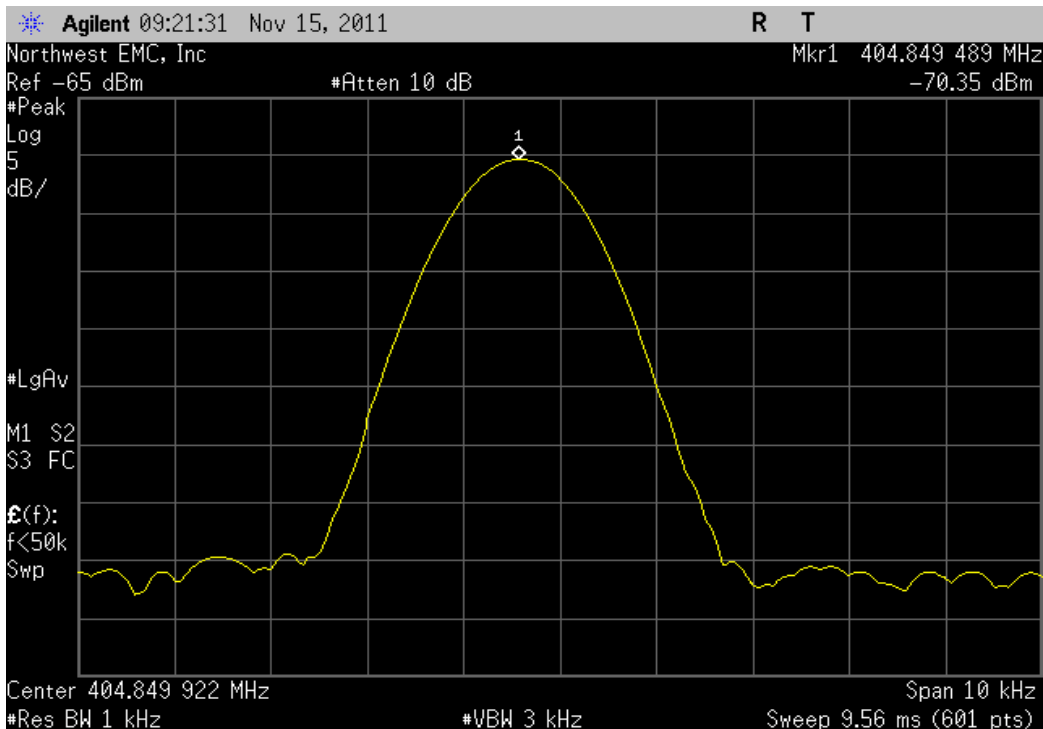
BLA600094S, Low Temp +25C, Mid Channel, 403.35 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
403.349519	403.349769	0.6	100	Pass



BLA600094S, Low Temp +25C, High Channel, 404.85 MHz

Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit	Result
404.849489	404.849734	0.6	100	Pass



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

Receive Mode, MICS Standard Data rate, Ch 1, 5, 10 (see comments)

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

MDTR0124 - 1

MDTR0124 - 4

MDTR0124 - 5

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	5 GHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	10/18/2011	12 mo
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	7/1/2011	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	AVY	7/1/2011	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	2/2/2011	12 mo
Antenna, Biconilog	ETS Lindgren	3142D	AXN	12/30/2009	24 mo
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	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

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

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 ETSI TR 100 028; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

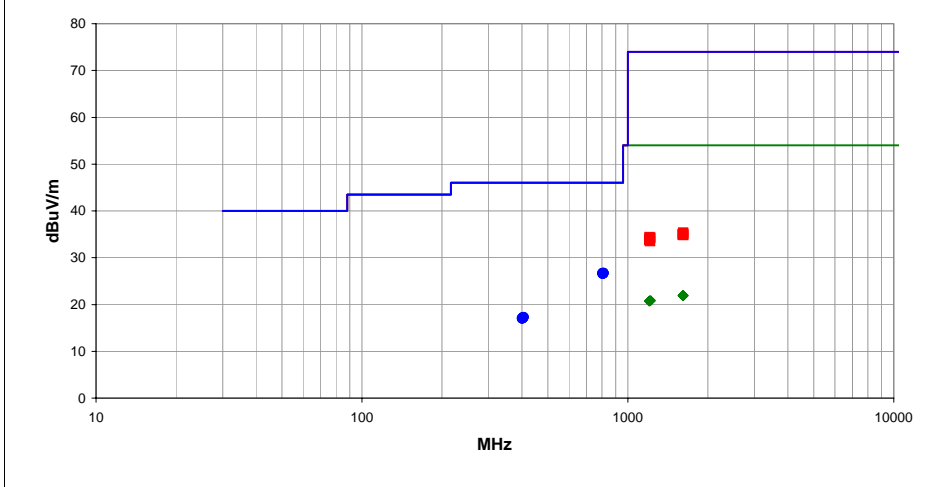
TEST DESCRIPTION

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 receive frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSIC63.10:2009). A preamp was used for this test in order to provide sufficient measurement

Work Order:	MDTR0124	Date:	11/07/11	<i>Trevor Buls</i>
Project:	None	Temperature:	23.55 °C	
Job Site:	MN05	Humidity:	20.56% RH	
Serial Number:	BLA600086S	Barometric Pres.:	1021.1 mbar	
EUT:	Viva Quad			
Configuration:	1			
Customer:	Medtronic Inc.			
Attendees:	Nick Blake			
EUT Power:	Battery			
Operating Mode:	Receive Mode, MICS Standard Data Rate, Ch 1, 5, 10 (see comments)			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 15.109:2011	ANSI C63.4:2003

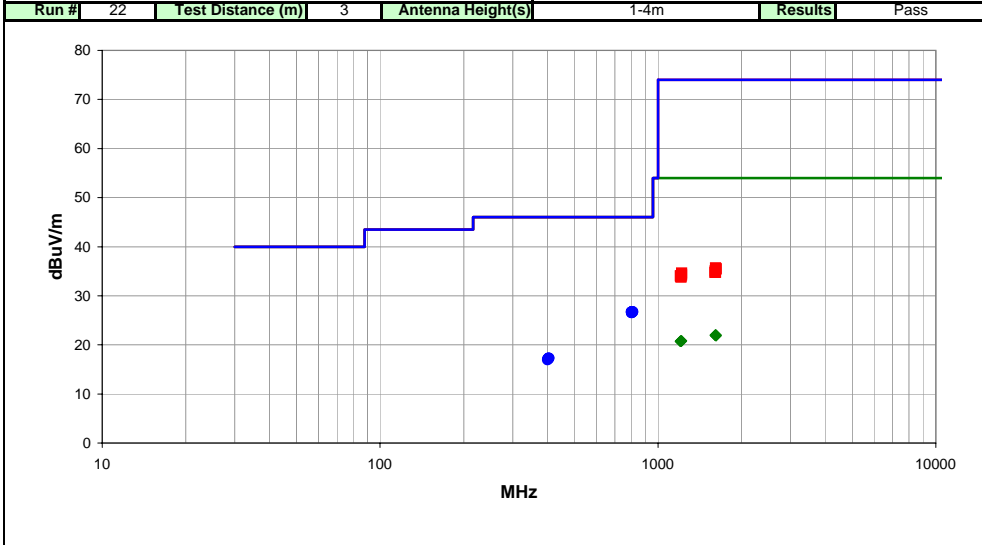
Run #	6	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
811.105	17.0	9.8	1.0	268.0	3.0	0.0	Vert	QP	0.0	26.8	46.0	-19.2	Ch 10, Native, EUT Vertical
810.878	17.0	9.8	2.1	324.0	3.0	0.0	Horz	QP	0.0	26.8	46.0	-19.2	Ch 10, Native, EUT Vertical
806.426	17.0	9.7	1.0	108.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 5, Native, EUT Vertical
805.986	17.0	9.7	1.0	40.0	3.0	0.0	Horz	QP	0.0	26.7	46.0	-19.3	Ch 1, Native, EUT Vertical
803.806	17.0	9.7	2.6	340.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 1, Native, EUT Vertical
810.760	16.9	9.8	1.6	292.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 10, Native, EUT Vertical
803.525	17.0	9.6	3.8	302.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 1, Native, EUT Vertical
810.003	16.9	9.7	2.6	55.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 10, Native, EUT Vertical
809.005	16.9	9.7	3.4	37.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Wake-Up, EUT Vertical
808.388	16.9	9.7	1.9	132.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Wake-Up, EUT Vertical
806.750	16.9	9.7	3.4	294.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 5, Native, EUT Vertical
806.378	16.9	9.7	3.1	131.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 5, Native, EUT Vertical
806.328	16.9	9.7	3.4	170.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 5, Native, EUT Vertical
803.293	16.9	9.6	3.0	134.0	3.0	0.0	Horz	QP	0.0	26.5	46.0	-19.5	Ch 1, Native, EUT Vertical
405.867	17.1	0.2	1.0	314.0	3.0	0.0	Vert	QP	0.0	17.3	46.0	-28.7	Ch 10, Native, EUT Vertical
404.160	17.1	0.1	1.0	303.0	3.0	0.0	Horz	QP	0.0	17.2	46.0	-28.8	Ch 10, Native, EUT Vertical
403.637	17.1	0.1	3.5	148.0	3.0	0.0	Vert	QP	0.0	17.2	46.0	-28.8	Ch 10, Native, EUT Vertical
405.310	17.0	0.2	2.2	167.0	3.0	0.0	Vert	QP	0.0	17.2	46.0	-28.8	Ch 5, Native, EUT Vertical
403.229	17.1	0.1	3.6	349.0	3.0	0.0	Horz	QP	0.0	17.2	46.0	-28.8	Ch 5, Native, EUT Vertical
403.061	17.1	0.1	1.3	196.0	3.0	0.0	Vert	QP	0.0	17.2	46.0	-28.8	Ch 1, Native, EUT Vertical
404.186	17.0	0.1	1.0	284.0	3.0	0.0	Vert	QP	0.0	17.1	46.0	-28.9	Wake-Up, EUT Vertical
403.987	17.0	0.1	1.0	16.0	3.0	0.0	Horz	QP	0.0	17.1	46.0	-28.9	Wake-Up, EUT Vertical
403.549	17.0	0.1	1.5	250.0	3.0	0.0	Horz	QP	0.0	17.1	46.0	-28.9	Ch 1, Native, EUT Vertical
403.458	17.0	0.1	1.0	316.0	3.0	0.0	Horz	QP	0.0	17.1	46.0	-28.9	Wake-Up, EUT Vertical
402.359	17.0	0.0	1.0	282.0	3.0	0.0	Vert	QP	0.0	17.0	46.0	-29.0	Ch 5, Native, EUT Vertical
402.139	17.0	0.0	2.8	240.0	3.0	0.0	Horz	QP	0.0	17.0	46.0	-29.0	Ch 5, Native, EUT Vertical
399.978	17.1	-0.1	1.0	124.0	3.0	0.0	Vert	QP	0.0	17.0	46.0	-29.0	Ch 1, Native, EUT Vertical
401.226	17.0	0.0	1.0	73.0	3.0	0.0	Horz	QP	0.0	17.0	46.0	-29.0	Ch 1, Native, EUT Vertical
1613.325	27.7	-5.7	1.8	230.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 5, Native, EUT Vertical
1612.200	27.7	-5.7	2.1	280.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 5, Native, EUT Vertical
1610.892	27.7	-5.7	3.8	218.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 1, Native, EUT Vertical
1617.175	27.6	-5.7	1.6	164.0	3.0	0.0	Vert	AV	0.0	21.9	54.0	-32.1	Ch 10, Native, EUT Vertical
1616.967	27.6	-5.7	2.3	140.0	3.0	0.0	Horz	AV	0.0	21.9	54.0	-32.1	Ch 10, Native, EUT Vertical
1610.525	27.6	-5.7	1.0	20.0	3.0	0.0	Horz	AV	0.0	21.9	54.0	-32.1	Ch 1, Native, EUT Vertical
1216.675	28.0	-7.2	2.5	218.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 10, Native, EUT Vertical
1215.550	28.0	-7.2	3.0	41.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 10, Native, EUT Vertical
1207.742	28.0	-7.2	1.9	223.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 5, Native, EUT Vertical
1207.683	28.0	-7.2	3.7	84.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 5, Native, EUT Vertical
1204.942	28.0	-7.3	1.0	154.0	3.0	0.0	Horz	AV	0.0	20.7	54.0	-33.3	Ch 1, Native, EUT Vertical
1204.908	28.0	-7.3	1.1	226.0	3.0	0.0	Vert	AV	0.0	20.7	54.0	-33.3	Ch 1, Native, EUT Vertical
1612.933	41.1	-5.7	1.8	230.0	3.0	0.0	Horz	PK	0.0	35.4	74.0	-38.6	Ch 5, Native, EUT Vertical
1620.475	40.9	-5.7	1.6	164.0	3.0	0.0	Vert	PK	0.0	35.2	74.0	-38.8	Ch 10, Native, EUT Vertical
1611.733	40.8	-5.7	2.1	280.0	3.0	0.0	Vert	PK	0.0	35.1	74.0	-38.9	Ch 5, Native, EUT Vertical
1608.692	40.7	-5.7	1.0	20.0	3.0	0.0	Horz	PK	0.0	35.0	74.0	-39.0	Ch 1, Native, EUT Vertical
1610.775	40.6	-5.7	3.7	218.0	3.0	0.0	Vert	PK	0.0	34.9	74.0	-39.1	Ch 1, Native, EUT Vertical
1621.150	40.5	-5.7	2.3	140.0	3.0	0.0	Horz	PK	0.0	34.8	74.0	-39.2	Ch 10, Native, EUT Vertical
1208.917	41.6	-7.2	1.9	223.0	3.0	0.0	Vert	PK	0.0	34.4	74.0	-39.6	Ch 5, Native, EUT Vertical
1216.917	41.4	-7.2	3.0	41.0	3.0	0.0	Vert	PK	0.0	34.2	74.0	-39.8	Ch 10, Native, EUT Vertical
1211.633	41.4	-7.2	3.6	84.0	3.0	0.0	Horz	PK	0.0	34.2	74.0	-39.8	Ch 5, Native, EUT Vertical
1204.025	41.2	-7.3	1.1	226.0	3.0	0.0	Vert	PK	0.0	33.9	74.0	-40.1	Ch 1, Native, EUT Vertical
1205.258	41.0	-7.3	1.0	154.0	3.0	0.0	Horz	PK	0.0	33.7	74.0	-40.3	Ch 1, Native, EUT Vertical
1213.983	40.7	-7.2	2.5	218.0	3.0	0.0	Horz	PK	0.0	33.5	74.0	-40.5	Ch 10, Native, EUT Vertical

Work Order:	MDTR0124	Date:	11/09/11	<i>Trevor Buls</i>
Project:	None	Temperature:	23.47 °C	
Job Site:	MN05	Humidity:	20.34% RH	
Serial Number:	BLA600093S	Barometric Pres.:	1017.8 mbar	Tested by: Trevor Buls
EUT:	Viva Quad			
Configuration:	4			
Customer:	Medtronic Inc.			
Attendees:	Nick Blake			
EUT Power:	Battery			
Operating Mode:	Receive Mode, MICS Standard Data Rate, Ch 1, 5, 10 (see comments)			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method						
FCC 15.109:2011	ANSI C63.4:2003						
Run #	22	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass



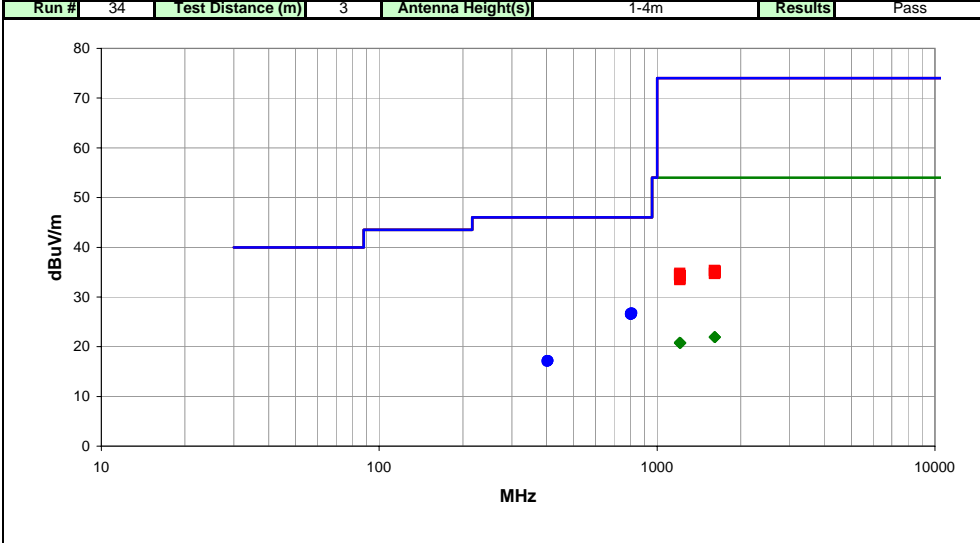
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
810.973	17.0	9.8	3.9	300.0	3.0	0.0	Vert	QP	0.0	26.8	46.0	-19.2	Ch 10, Native, EUT Vertical
810.315	17.0	9.7	1.0	75.0	3.0	0.0	Horz	QP	0.0	26.7	46.0	-19.3	Ch 10, Native, EUT Vertical
809.731	17.0	9.7	3.4	170.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 10, Native, EUT Vertical
805.252	17.0	9.7	1.0	351.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 1, Native, EUT Vertical
805.240	17.0	9.7	1.0	161.0	3.0	0.0	Horz	QP	0.0	26.7	46.0	-19.3	Ch 5, Native, EUT Vertical
804.708	17.0	9.7	1.0	355.0	3.0	0.0	Horz	QP	0.0	26.7	46.0	-19.3	Ch 1, Native, EUT Vertical
803.955	17.0	9.7	1.0	108.0	3.0	0.0	Horz	QP	0.0	26.7	46.0	-19.3	Ch 1, Native, EUT Vertical
811.029	16.9	9.8	3.0	59.0	3.0	0.0	Horz	QP	0.0	26.7	46.0	-19.3	Ch 10, Native, EUT Vertical
803.318	17.0	9.6	3.4	344.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 1, Native, EUT Vertical
806.202	16.9	9.7	1.0	96.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 5, Native, EUT Vertical
805.831	16.9	9.7	1.0	190.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Wake-Up, EUT Vertical
805.750	16.9	9.7	1.0	335.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 5, Native, EUT Vertical
805.394	16.9	9.7	4.0	43.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 5, Native, EUT Vertical
804.613	16.9	9.7	1.0	180.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Wake-Up, EUT Vertical
405.129	17.1	0.2	1.0	297.0	3.0	0.0	Vert	QP	0.0	17.3	46.0	-28.7	Ch 10, Native, EUT Vertical
405.110	17.1	0.2	2.4	215.0	3.0	0.0	Horz	QP	0.0	17.3	46.0	-28.7	Ch 10, Native, EUT Vertical
403.404	17.1	0.1	1.0	266.0	3.0	0.0	Horz	QP	0.0	17.2	46.0	-28.8	Ch 5, Native, EUT Vertical
403.164	17.1	0.1	3.5	353.0	3.0	0.0	Horz	QP	0.0	17.2	46.0	-28.8	Ch 1, Native, EUT Vertical
401.891	17.1	0.0	3.6	221.0	3.0	0.0	Vert	QP	0.0	17.1	46.0	-28.9	Ch 5, Native, EUT Vertical
401.071	17.0	0.0	1.0	318.0	3.0	0.0	Vert	QP	0.0	17.0	46.0	-29.0	Ch 1, Native, EUT Vertical
1617.300	27.7	-5.7	1.5	42.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 10, Native, EUT Vertical
1613.400	27.7	-5.7	1.0	208.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 5, Native, EUT Vertical
1611.850	27.7	-5.7	1.0	52.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 5, Native, EUT Vertical
1610.908	27.7	-5.7	1.4	157.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 1, Native, EUT Vertical
1610.417	27.7	-5.7	1.0	42.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 1, Native, EUT Vertical
1617.200	27.6	-5.7	1.0	274.0	3.0	0.0	Horz	AV	0.0	21.9	54.0	-32.1	Ch 10, Native, EUT Vertical
1215.833	28.0	-7.2	2.8	168.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 10, Native, EUT Vertical
1215.225	28.0	-7.2	2.7	200.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 10, Native, EUT Vertical
1208.100	28.0	-7.2	1.0	83.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 5, Native, EUT Vertical
1207.683	28.0	-7.2	2.7	256.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 5, Native, EUT Vertical
1206.317	28.0	-7.3	1.0	23.0	3.0	0.0	Vert	AV	0.0	20.7	54.0	-33.3	Ch 1, Native, EUT Vertical
1204.025	28.0	-7.3	1.0	65.0	3.0	0.0	Horz	AV	0.0	20.7	54.0	-33.3	Ch 1, Native, EUT Vertical
1613.892	41.4	-5.7	1.0	208.0	3.0	0.0	Horz	PK	0.0	35.7	74.0	-38.3	Ch 5, Native, EUT Vertical
1619.642	41.2	-5.7	1.5	42.0	3.0	0.0	Vert	PK	0.0	35.5	74.0	-38.5	Ch 10, Native, EUT Vertical
1616.950	41.2	-5.7	1.0	274.0	3.0	0.0	Horz	PK	0.0	35.5	74.0	-38.5	Ch 10, Native, EUT Vertical
1607.183	40.8	-5.7	1.4	157.0	3.0	0.0	Vert	PK	0.0	35.1	74.0	-38.9	Ch 1, Native, EUT Vertical
1613.400	40.5	-5.7	1.0	52.0	3.0	0.0	Vert	PK	0.0	34.8	74.0	-39.2	Ch 5, Native, EUT Vertical
1606.500	40.5	-5.7	1.0	42.0	3.0	0.0	Horz	PK	0.0	34.8	74.0	-39.2	Ch 1, Native, EUT Vertical
1217.008	41.8	-7.2	2.7	200.0	3.0	0.0	Horz	PK	0.0	34.6	74.0	-39.4	Ch 10, Native, EUT Vertical
1216.575	41.4	-7.2	2.8	168.0	3.0	0.0	Vert	PK	0.0	34.2	74.0	-39.8	Ch 10, Native, EUT Vertical
1205.800	41.3	-7.3	1.0	23.0	3.0	0.0	Vert	PK	0.0	34.0	74.0	-40.0	Ch 1, Native, EUT Vertical
1211.667	41.2	-7.2	2.7	256.0	3.0	0.0	Vert	PK	0.0	34.0	74.0	-40.0	Ch 5, Native, EUT Vertical
1207.725	41.2	-7.2	1.0	65.0	3.0	0.0	Horz	PK	0.0	34.0	74.0	-40.0	Ch 1, Native, EUT Vertical
1210.483	41.0	-7.2	1.0	83.0	3.0	0.0	Horz	PK	0.0	33.8	74.0	-40.2	Ch 5, Native, EUT Vertical

EMC

Receiver Spurious Emissions

Work Order:	MDTR0124	Date:	11/10/11	<i>Trevor Buls</i>
Project:	None	Temperature:	23.36 °C	
Job Site:	MN05	Humidity:	20.04% RH	
Serial Number:	BLA600094S	Barometric Pres.:	1017.3 mbar	Tested by: Trevor Buls
EUT:	Viva Quad			
Configuration:	5			
Customer:	Medtronic Inc.			
Attendees:	Nick Blake			
EUT Power:	Battery			
Operating Mode:	Receive Mode, MICS Standard Data Rate, Ch 1, 5, 10 (see comments)			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method						
FCC 15.109:2011	ANSI C63.4:2003						
Run #	34	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
811.304	17.0	9.8	1.0	256.0	3.0	0.0	Vert	QP	0.0	26.8	46.0	-19.2	Ch 10, Native, EUT Vertical
810.010	17.0	9.7	3.0	9.0	3.0	0.0	Horz	QP	0.0	26.7	46.0	-19.3	Ch 10, Native, EUT Vertical
806.083	17.0	9.7	1.0	83.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 5, Native, EUT Vertical
810.070	16.9	9.7	1.0	55.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 10, Native, EUT Vertical
808.857	16.9	9.7	1.0	206.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 5, Native, EUT Vertical
808.738	16.9	9.7	1.8	245.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 10, Native, EUT Vertical
805.977	16.9	9.7	1.0	91.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Wake-Up, EUT Vertical
805.484	16.9	9.7	1.0	277.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 1, Native, EUT Vertical
804.739	16.9	9.7	4.0	207.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 5, Native, EUT Vertical
804.725	16.9	9.7	1.3	306.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Wake-Up, EUT Vertical
804.351	16.9	9.7	2.1	144.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 1, Native, EUT Vertical
803.739	16.9	9.7	1.0	250.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 1, Native, EUT Vertical
802.403	16.9	9.6	1.0	351.0	3.0	0.0	Horz	QP	0.0	26.5	46.0	-19.5	Ch 5, Native, EUT Vertical
806.953	16.8	9.7	1.0	10.0	3.0	0.0	Horz	QP	0.0	26.5	46.0	-19.5	Ch 5, Native, EUT Vertical
403.612	17.1	0.1	3.9	246.0	3.0	0.0	Horz	QP	0.0	17.2	46.0	-28.8	Ch 1, Native, EUT Vertical
405.027	17.0	0.2	1.0	300.0	3.0	0.0	Horz	QP	0.0	17.2	46.0	-28.8	Ch 10, Native, EUT Vertical
403.030	17.1	0.1	1.0	155.0	3.0	0.0	Horz	QP	0.0	17.2	46.0	-28.8	Ch 5, Native, EUT Vertical
404.376	17.0	0.1	2.8	352.0	3.0	0.0	Vert	QP	0.0	17.1	46.0	-28.9	Ch 10, Native, EUT Vertical
404.113	17.0	0.1	1.0	323.0	3.0	0.0	Vert	QP	0.0	17.1	46.0	-28.9	Ch 5, Native, EUT Vertical
402.377	17.0	0.0	1.0	324.0	3.0	0.0	Vert	QP	0.0	17.0	46.0	-29.0	Ch 1, Native, EUT Vertical
1617.208	27.7	-5.7	1.0	32.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 10, Native, EUT Vertical
1612.925	27.7	-5.7	1.0	342.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 5, Native, EUT Vertical
1610.950	27.7	-5.7	1.0	249.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 5, Native, EUT Vertical
1608.750	27.7	-5.7	2.7	144.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 1, Native, EUT Vertical
1607.383	27.7	-5.7	1.0	90.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 1, Native, EUT Vertical
1617.733	27.6	-5.7	2.1	64.0	3.0	0.0	Horz	AV	0.0	21.9	54.0	-32.1	Ch 10, Native, EUT Vertical
1205.033	28.1	-7.3	1.0	150.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 1, Native, EUT Vertical
1215.325	28.0	-7.2	1.2	203.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 10, Native, EUT Vertical
1208.533	28.0	-7.2	1.0	18.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 5, Native, EUT Vertical
1207.675	28.0	-7.2	1.0	192.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 5, Native, EUT Vertical
1205.958	28.0	-7.3	1.0	144.0	3.0	0.0	Horz	AV	0.0	20.7	54.0	-33.3	Ch 1, Native, EUT Vertical
1215.400	27.9	-7.2	1.0	300.0	3.0	0.0	Vert	AV	0.0	20.7	54.0	-33.3	Ch 10, Native, EUT Vertical
1609.817	41.1	-5.7	1.0	90.0	3.0	0.0	Vert	PK	0.0	35.4	74.0	-38.6	Ch 1, Native, EUT Vertical
1620.292	40.9	-5.7	2.1	64.0	3.0	0.0	Horz	PK	0.0	35.2	74.0	-38.8	Ch 10, Native, EUT Vertical
1615.067	40.9	-5.7	1.0	342.0	3.0	0.0	Vert	PK	0.0	35.2	74.0	-38.8	Ch 5, Native, EUT Vertical
1621.583	40.6	-5.7	1.0	32.0	3.0	0.0	Vert	PK	0.0	34.9	74.0	-39.1	Ch 10, Native, EUT Vertical
1208.408	42.0	-7.2	1.0	18.0	3.0	0.0	Horz	PK	0.0	34.8	74.0	-39.2	Ch 5, Native, EUT Vertical
1608.642	40.5	-5.7	2.7	144.0	3.0	0.0	Horz	PK	0.0	34.8	74.0	-39.2	Ch 1, Native, EUT Vertical
1611.542	40.4	-5.7	1.0	249.0	3.0	0.0	Horz	PK	0.0	34.7	74.0	-39.3	Ch 5, Native, EUT Vertical
1205.742	41.7	-7.3	1.0	144.0	3.0	0.0	Horz	PK	0.0	34.4	74.0	-39.6	Ch 1, Native, EUT Vertical
1213.075	41.5	-7.2	1.0	300.0	3.0	0.0	Vert	PK	0.0	34.3	74.0	-39.7	Ch 10, Native, EUT Vertical
1212.275	40.9	-7.2	1.2	203.0	3.0	0.0	Horz	PK	0.0	33.7	74.0	-40.3	Ch 10, Native, EUT Vertical
1207.350	40.9	-7.2	1.0	150.0	3.0	0.0	Vert	PK	0.0	33.7	74.0	-40.3	Ch 1, Native, EUT Vertical
1207.800	40.7	-7.2	1.0	192.0	3.0	0.0	Vert	PK	0.0	33.5	74.0	-40.5	Ch 5, Native, EUT Vertical

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

MODES OF OPERATION

Transmitting, MICS Standard Data Rate and MICS High Data Rate, Channels 1 - 402.15 MHz, 5 - 403.35 MHz, 10 - 404.85 MHz (See comments)

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

MDTR0124 - 1

MDTR0124 - 4

MDTR0124 - 5

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	5 GHz
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SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVX	7/1/2011	12 mo
MN05 Cables	ESM Cable Corp.	Double Ridge Guide Horn Cables	MNI	10/18/2011	12 mo
Antenna, Horn (DRG)	ETS Lindgren	3115	AIP	6/29/2011	24 mo
Pre-Amplifier	Miteq	AM-1616-1000	AVY	7/1/2011	12 mo
MN05 Cables	ESM Cable Corp.	Bilog Cables	MNH	2/2/2011	12 mo
Antenna, Biconilog	ETS Lindgren	3142D	AXN	12/30/2009	24 mo
Spectrum Analyzer	Agilent	E4446A	AAT	2/15/2011	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

Measurements were made using the IF bandwidths and detectors specified. No video filter was used, except in the case of the FCC Average Measurements above 1GHz. In that case, a peak detector with a 10Hz video bandwidth was used.

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 ETSI TR 100 028; 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

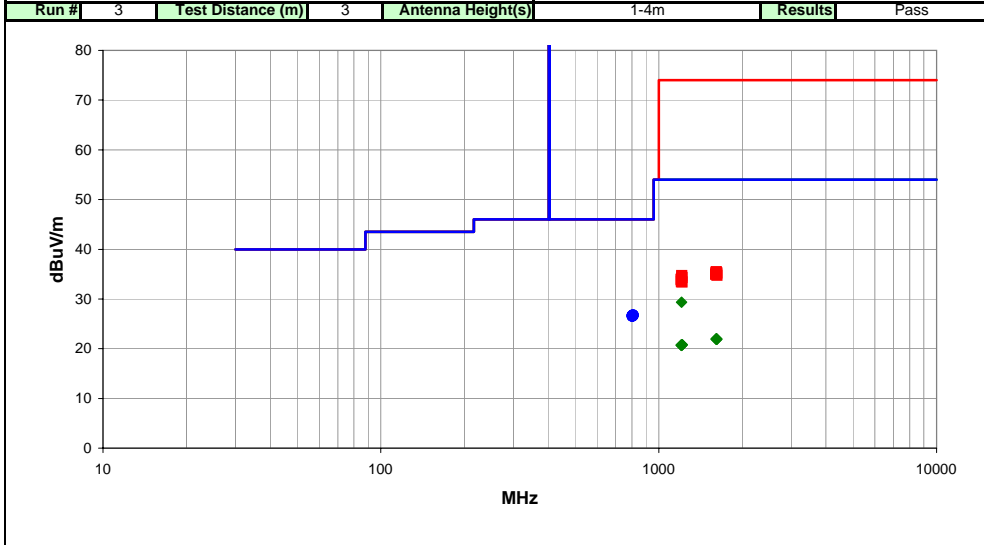
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. While scanning, emissions from the EUT were maximized by rotating the 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 ANSIC63.10:2009). A preamp was used for this test in order to provide sufficient measurement sensitivity.

EMC

Spurious Radiated Emissions

Work Order:	MDTR0124	Date:	11/07/11	<i>Trevor Buis</i>
Project:	None	Temperature:	23.55 °C	
Job Site:	MN05	Humidity:	20.56% RH	
Serial Number:	BLA600086S	Barometric Pres.:	1021.1 mbar	Tested by: Trevor Buis
EUT:	Viva Quad			
Configuration:	1			
Customer:	Medtronic Inc.			
Attendees:	Nick Blake			
EUT Power:	Battery			
Operating Mode:	Transmitting, MICS Standard Data Rate and MICS High Data Rate, Channels 1 - 402.15 MHz, 5 - 403.35 MHz, 10 - 404.85 MHz (See comments)			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method						
FCC 951.2011 RSS-243.2010	ANSI/TIA/EIA-603-C:2004 RSS-Gen:2010						
Run #	3	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
810.542	17.0	9.7	1.5	216.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 10, EUT Vertical
810.521	17.0	9.7	3.6	59.0	3.0	0.0	Horz	QP	0.0	26.7	46.0	-19.3	Ch 10, EUT Vertical
810.062	17.0	9.7	2.4	116.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 10, EUT Vertical
805.024	17.0	9.7	1.0	119.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 5, EUT Vertical
803.971	17.0	9.7	1.0	144.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 1, EUT Vertical
809.990	16.9	9.7	3.5	15.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 10, EUT Vertical
807.253	16.9	9.7	1.2	280.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT Vertical
806.582	16.9	9.7	3.8	41.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT on Side
806.301	16.9	9.7	2.7	215.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT Horizontal
805.908	16.9	9.7	3.4	297.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT Vertical
805.487	16.9	9.7	1.9	31.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 1, EUT Vertical
805.323	16.9	9.7	1.1	254.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT Horizontal
805.218	16.9	9.7	2.3	28.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT Vertical
805.202	16.9	9.7	1.6	321.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT on Side
804.112	16.9	9.7	2.6	241.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 1, EUT Vertical
803.153	16.9	9.6	1.0	97.0	3.0	0.0	Horz	QP	0.0	26.5	46.0	-19.5	Ch 1, EUT Vertical
1207.600	36.6	-7.2	3.2	272.0	3.0	0.0	Vert	AV	0.0	29.4	54.0	-24.6	Ch 5, EUT Vertical
1618.075	27.7	-5.7	1.0	158.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 10, EUT Vertical
1613.300	27.7	-5.7	3.4	307.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 5, EUT Vertical
1611.367	27.7	-5.7	1.9	126.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 5, EUT Vertical
1611.058	27.7	-5.7	2.0	164.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 1, EUT Vertical
1610.942	27.7	-5.7	1.4	310.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 1, EUT Vertical
1617.317	27.6	-5.7	1.0	212.0	3.0	0.0	Horz	AV	0.0	21.9	54.0	-32.1	Ch 10, EUT Vertical
1215.850	28.0	-7.2	2.3	296.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 10, EUT Vertical
1213.475	28.0	-7.2	1.0	196.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 10, EUT Vertical
1204.450	28.0	-7.3	1.0	4.0	3.0	0.0	Vert	AV	0.0	20.7	54.0	-33.3	Ch 1, EUT Vertical
1204.267	28.0	-7.3	1.0	123.0	3.0	0.0	Horz	AV	0.0	20.7	54.0	-33.3	Ch 1, EUT Vertical
1207.650	27.9	-7.2	1.0	44.0	3.0	0.0	Horz	AV	0.0	20.7	54.0	-33.3	Ch 5, EUT Vertical
1613.675	41.2	-5.7	3.4	307.0	3.0	0.0	Horz	PK	0.0	35.5	74.0	-38.5	Ch 5, EUT Vertical
1610.483	41.0	-5.7	1.4	310.0	3.0	0.0	Horz	PK	0.0	35.3	74.0	-38.7	Ch 1, EUT Vertical
1620.350	40.9	-5.7	1.0	158.0	3.0	0.0	Vert	PK	0.0	35.2	74.0	-38.8	Ch 10, EUT Vertical
1614.708	40.8	-5.7	1.9	126.0	3.0	0.0	Vert	PK	0.0	35.1	74.0	-38.9	Ch 5, EUT Vertical
1606.417	40.7	-5.7	2.0	164.0	3.0	0.0	Vert	PK	0.0	35.0	74.0	-39.0	Ch 1, EUT Vertical
1621.233	40.5	-5.7	1.0	212.0	3.0	0.0	Horz	PK	0.0	34.8	74.0	-39.2	Ch 10, EUT Vertical
1211.642	41.9	-7.2	1.0	44.0	3.0	0.0	Horz	PK	0.0	34.7	74.0	-39.3	Ch 5, EUT Vertical
1215.367	41.5	-7.2	1.0	196.0	3.0	0.0	Vert	PK	0.0	34.3	74.0	-39.7	Ch 10, EUT Vertical
1208.758	41.3	-7.2	1.0	123.0	3.0	0.0	Horz	PK	0.0	34.1	74.0	-39.9	Ch 1, EUT Vertical
1205.600	41.1	-7.3	1.0	4.0	3.0	0.0	Vert	PK	0.0	33.8	74.0	-40.2	Ch 1, EUT Vertical
1209.408	40.7	-7.2	3.2	272.0	3.0	0.0	Vert	PK	0.0	33.5	74.0	-40.5	Ch 5, EUT Vertical
1214.650	40.6	-7.2	2.3	296.0	3.0	0.0	Horz	PK	0.0	33.4	74.0	-40.6	Ch 10, EUT Vertical

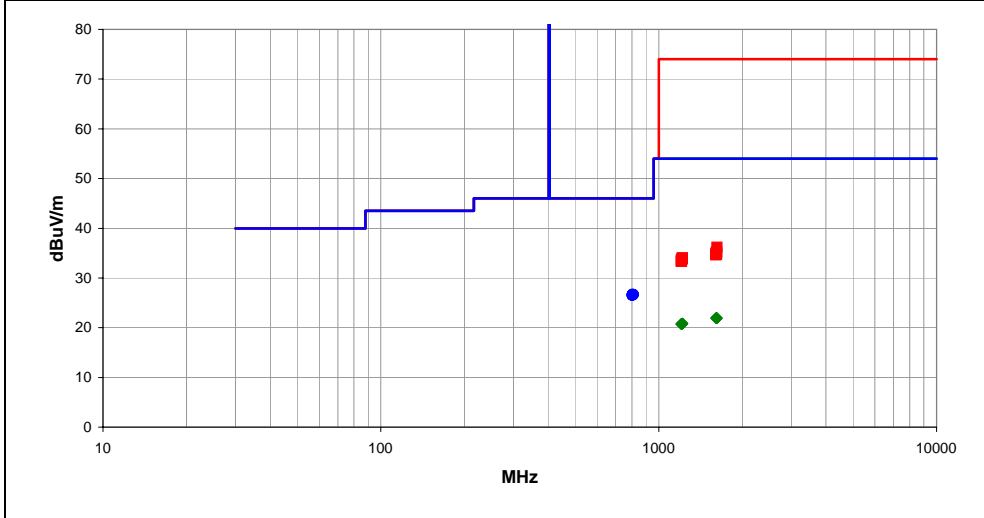
EMC

Spurious Radiated Emissions

Work Order:	MDTR0124	Date:	11/09/11	<i>Trevor Buis</i>
Project:	None	Temperature:	23.47 °C	
Job Site:	MN05	Humidity:	20.34% RH	
Serial Number:	BLA600093S	Barometric Pres.:	1017.8 mbar	Tested by: Trevor Buis
EUT:	Viva Quad			
Configuration:	4			
Customer:	Medtronic Inc.			
Attendees:	Nick Blake			
EUT Power:	Battery			
Operating Mode:	Transmitting, MICS Standard Data Rate and MICS High Data Rate, Channels 1 - 402.15 MHz, 5 - 403.35 MHz, 10 - 404.85 MHz (See comments)			
Deviations:	None			
Comments:	None			

Test Specifications	Test Method
FCC 951.2011 RSS-243.2010	ANSI/TIA/EIA-603-C:2004 RSS-Gen:2010

Run #	21	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
805.833	17.0	9.7	1.0	155.0	3.0	0.0	Horz	QP	0.0	26.7	46.0	-19.3	Ch 5, EUT Vertical
811.177	16.9	9.8	1.0	235.0	3.0	0.0	Horz	QP	0.0	26.7	46.0	-19.3	Ch 10, EUT Vertical
810.251	16.9	9.7	1.0	94.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 10, EUT Vertical
810.065	16.9	9.7	1.0	94.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 10, EUT Vertical
809.215	16.9	9.7	1.0	93.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 10, EUT Vertical
806.257	16.9	9.7	1.8	106.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT Vertical
805.729	16.9	9.7	1.8	92.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT Vertical
805.235	16.9	9.7	3.1	79.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT Vertical
804.457	16.9	9.7	1.3	178.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 1, EUT Vertical
803.743	16.9	9.7	3.6	0.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 1, EUT Vertical
803.446	16.9	9.6	3.2	302.0	3.0	0.0	Horz	QP	0.0	26.5	46.0	-19.5	Ch 1, EUT Vertical
802.662	16.9	9.6	3.4	25.0	3.0	0.0	Vert	QP	0.0	26.5	46.0	-19.5	Ch 1, EUT Vertical
1618.408	27.7	-5.7	1.0	359.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 10, EUT Vertical
1617.817	27.7	-5.7	1.0	190.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 10, EUT Vertical
1612.683	27.7	-5.7	1.0	230.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 5, EUT Vertical
1611.333	27.7	-5.7	1.0	277.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 5, EUT Vertical
1610.883	27.7	-5.7	1.4	113.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 1, EUT Vertical
1610.000	27.7	-5.7	2.4	159.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 1, EUT Vertical
1617.300	27.6	-5.7	3.8	232.0	3.0	0.0	Horz	AV	0.0	21.9	54.0	-32.1	Ch 10, EUT Vertical
1616.917	27.6	-5.7	1.0	14.0	3.0	0.0	Horz	AV	0.0	21.9	54.0	-32.1	Ch 10, EUT Vertical
1216.633	28.0	-7.2	2.4	288.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 10, EUT Vertical
1216.458	28.0	-7.2	2.4	116.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 10, EUT Vertical
1215.367	28.0	-7.2	1.0	181.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 10, EUT Vertical
1207.783	28.0	-7.2	3.8	303.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 5, EUT Vertical
1207.742	28.0	-7.2	3.3	35.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 5, EUT Vertical
1206.117	28.0	-7.3	1.0	267.0	3.0	0.0	Vert	AV	0.0	20.7	54.0	-33.3	Ch 1, EUT Vertical
1205.825	28.0	-7.3	1.0	87.0	3.0	0.0	Horz	AV	0.0	20.7	54.0	-33.3	Ch 1, EUT Vertical
1214.625	27.9	-7.2	1.0	327.0	3.0	0.0	Vert	AV	0.0	20.7	54.0	-33.3	Ch 10, EUT Vertical
1620.600	41.9	-5.7	1.0	190.0	3.0	0.0	Vert	PK	0.0	36.2	74.0	-37.8	Ch 10, EUT Vertical
1619.325	41.0	-5.7	1.0	14.0	3.0	0.0	Horz	PK	0.0	35.3	74.0	-38.7	Ch 10, EUT Vertical
1617.775	40.9	-5.7	3.8	232.0	3.0	0.0	Horz	PK	0.0	35.2	74.0	-38.8	Ch 10, EUT Vertical
1615.283	40.7	-5.7	1.0	230.0	3.0	0.0	Horz	PK	0.0	35.0	74.0	-39.0	Ch 5, EUT Vertical
1610.708	40.7	-5.7	2.4	159.0	3.0	0.0	Horz	PK	0.0	35.0	74.0	-39.0	Ch 1, EUT Vertical
1618.958	40.5	-5.7	1.0	359.0	3.0	0.0	Vert	PK	0.0	34.8	74.0	-39.2	Ch 10, EUT Vertical
1612.533	40.5	-5.7	1.0	277.0	3.0	0.0	Vert	PK	0.0	34.8	74.0	-39.2	Ch 5, EUT Vertical
1606.108	40.4	-5.7	1.4	113.0	3.0	0.0	Vert	PK	0.0	34.7	74.0	-39.3	Ch 1, EUT Vertical
1216.542	41.2	-7.2	2.4	288.0	3.0	0.0	Horz	PK	0.0	34.0	74.0	-40.0	Ch 10, EUT Vertical
1214.533	41.1	-7.2	1.0	327.0	3.0	0.0	Vert	PK	0.0	33.9	74.0	-40.1	Ch 10, EUT Vertical
1214.933	41.0	-7.2	1.0	181.0	3.0	0.0	Vert	PK	0.0	33.8	74.0	-40.2	Ch 10, EUT Vertical
1212.750	40.8	-7.2	2.4	116.0	3.0	0.0	Horz	PK	0.0	33.6	74.0	-40.4	Ch 10, EUT Vertical
1207.550	40.8	-7.2	1.0	87.0	3.0	0.0	Horz	PK	0.0	33.6	74.0	-40.4	Ch 1, EUT Vertical
1207.483	40.7	-7.2	1.0	267.0	3.0	0.0	Vert	PK	0.0	33.5	74.0	-40.5	Ch 1, EUT Vertical
1209.092	40.6	-7.2	3.7	303.0	3.0	0.0	Vert	PK	0.0	33.4	74.0	-40.6	Ch 5, EUT Vertical
1207.658	40.6	-7.2	3.3	35.0	3.0	0.0	Horz	PK	0.0	33.4	74.0	-40.6	Ch 5, EUT Vertical

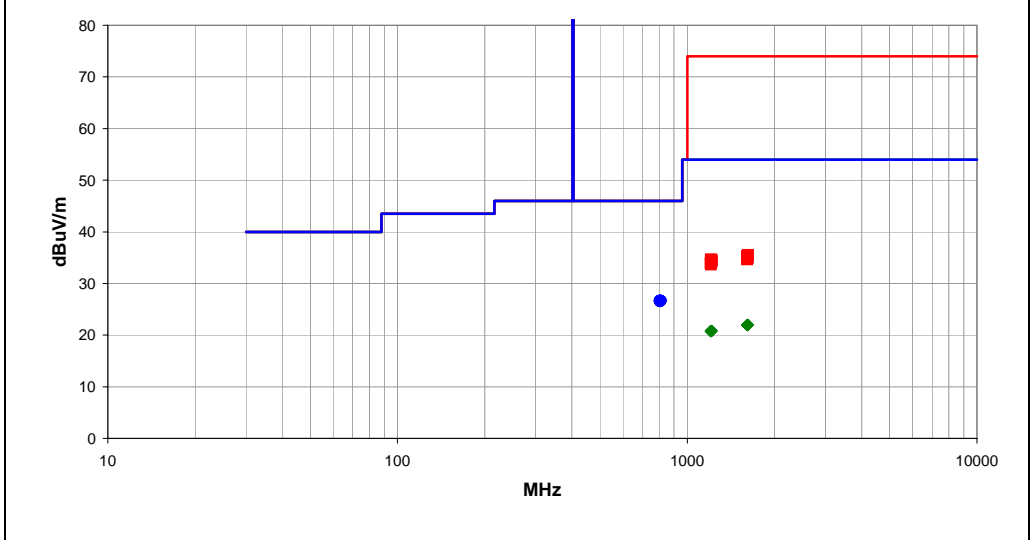
EMC

Spurious Radiated Emissions

Work Order:	MDTR0124	Date:	11/10/11	<i>Trevor Buls</i>
Project:	None	Temperature:	23.36 °C	
Job Site:	MN05	Humidity:	20.04% RH	
Serial Number:	BLA600094S	Barometric Pres.:	1017.3 mbar	
EUT:	Viva Quad			
Configuration:	5			
Customer:	Medtronic Inc.			
Attendees:	Nick Blake			
EUT Power:	Battery			
Operating Mode:	Transmitting, MICS Standard Data Rate and MICS High Data Rate, Channels 1 - 402.15 MHz, 5 - 403.35 MHz, 10 - 404.85 MHz (See comments)			
Deviations:	None			
Comments:	None			

Test Specifications FCC 95:2011 RSS-243:2010	Test Method ANSI/TIA/EIA-603-C:2004 RSS-Gen:2010
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Run #	31	Test Distance (m)	3	Antenna Height(s)	1-4m	Results	Pass
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Freq (MHz)	Amplitude (dBUV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBUV/m)	Spec. Limit (dBUV/m)	Compared to Spec. (dB)	Comments
804.734	17.0	9.7	1.0	98.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 1, EUT Vertical
803.654	17.0	9.7	1.0	302.0	3.0	0.0	Vert	QP	0.0	26.7	46.0	-19.3	Ch 1, EUT Vertical
810.208	16.9	9.7	1.0	248.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 10, EUT Vertical
810.162	16.9	9.7	1.0	245.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 10, EUT Vertical
809.815	16.9	9.7	2.6	282.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 10, EUT Vertical
809.726	16.9	9.7	1.0	11.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 10, EUT Vertical
808.991	16.9	9.7	1.0	260.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT Vertical
806.959	16.9	9.7	1.0	190.0	3.0	0.0	Vert	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT Vertical
806.700	16.9	9.7	3.4	266.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 5, EUT Vertical
805.219	16.9	9.7	2.9	277.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 1, EUT Vertical
804.761	16.9	9.7	1.0	223.0	3.0	0.0	Horz	QP	0.0	26.6	46.0	-19.4	Ch 1, EUT Vertical
806.734	16.8	9.7	1.0	301.0	3.0	0.0	Vert	QP	0.0	26.5	46.0	-19.5	Ch 5, EUT Vertical
1617.158	27.7	-5.7	1.3	103.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 10, EUT Vertical
1617.025	27.7	-5.7	3.3	216.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 10, EUT Vertical
1613.608	27.7	-5.7	3.5	85.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 5, EUT Vertical
1611.083	27.7	-5.7	1.0	100.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 5, EUT Vertical
1610.692	27.7	-5.7	3.3	52.0	3.0	0.0	Horz	AV	0.0	22.0	54.0	-32.0	Ch 1, EUT Vertical
1609.900	27.7	-5.7	1.0	289.0	3.0	0.0	Vert	AV	0.0	22.0	54.0	-32.0	Ch 1, EUT Vertical
1204.225	28.1	-7.3	1.0	173.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 1, EUT Vertical
1215.300	28.0	-7.2	3.1	338.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 10, EUT Vertical
1213.900	28.0	-7.2	3.9	358.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 10, EUT Vertical
1208.183	28.0	-7.2	1.0	62.0	3.0	0.0	Vert	AV	0.0	20.8	54.0	-33.2	Ch 5, EUT Vertical
1207.850	28.0	-7.2	1.0	123.0	3.0	0.0	Horz	AV	0.0	20.8	54.0	-33.2	Ch 5, EUT Vertical
1204.758	28.0	-7.3	1.0	141.0	3.0	0.0	Horz	AV	0.0	20.7	54.0	-33.3	Ch 1, EUT Vertical
1621.342	41.2	-5.7	3.3	216.0	3.0	0.0	Vert	PK	0.0	35.5	74.0	-38.5	Ch 10, EUT Vertical
1612.750	41.0	-5.7	1.0	100.0	3.0	0.0	Vert	PK	0.0	35.3	74.0	-38.7	Ch 5, EUT Vertical
1610.250	41.0	-5.7	3.3	52.0	3.0	0.0	Horz	PK	0.0	35.3	74.0	-38.7	Ch 1, EUT Vertical
1613.883	40.8	-5.7	3.5	85.0	3.0	0.0	Horz	PK	0.0	35.1	74.0	-38.9	Ch 5, EUT Vertical
1620.433	40.6	-5.7	1.3	103.0	3.0	0.0	Horz	PK	0.0	34.9	74.0	-39.1	Ch 10, EUT Vertical
1208.675	41.9	-7.2	1.0	173.0	3.0	0.0	Vert	PK	0.0	34.7	74.0	-39.3	Ch 1, EUT Vertical
1610.592	40.4	-5.7	1.0	289.0	3.0	0.0	Vert	PK	0.0	34.7	74.0	-39.3	Ch 1, EUT Vertical
1207.933	41.8	-7.2	1.0	62.0	3.0	0.0	Vert	PK	0.0	34.6	74.0	-39.4	Ch 5, EUT Vertical
1217.083	41.6	-7.2	3.1	338.0	3.0	0.0	Vert	PK	0.0	34.4	74.0	-39.6	Ch 10, EUT Vertical
1214.100	41.4	-7.2	3.9	358.0	3.0	0.0	Horz	PK	0.0	34.2	74.0	-39.8	Ch 10, EUT Vertical
1204.842	41.2	-7.3	1.0	141.0	3.0	0.0	Horz	PK	0.0	33.9	74.0	-40.1	Ch 1, EUT Vertical
1208.800	40.9	-7.2	1.0	123.0	3.0	0.0	Horz	PK	0.0	33.7	74.0	-40.3	Ch 5, EUT Vertical