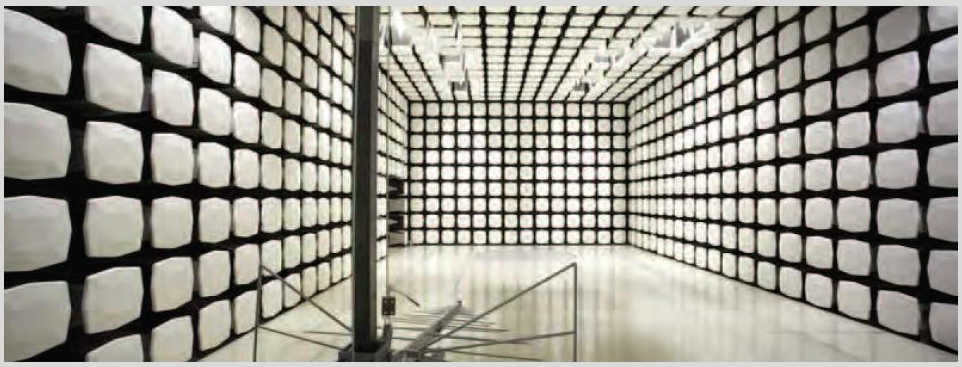
NORTHWEST EMC

Axonics

IPG Model - 1101 (MedRadio/MICS)

FCC 95I:2015

Report # AXON0031.3



NVLAP Lab Code: 200676-0

CERTIFICATE OF TEST

NORTHWEST EMC
2014-12-10

Last Date of Test: November 30, 2015
Axonics
Model: IPG Model - 1101 (MICS)

Radio Equipment Testing

Standards

Specification	Method
FCC 95I:2015	ANSI/TIA-603-D:2010
FCC 95.627(a)	EN 301 839-1 V1.3.1:2009

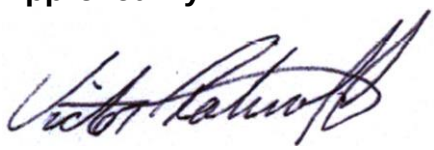
Results

Method Clause	Test Description	Applied	Results	Comments
TIA 603-C 2.2.1	Conducted Output Power	Yes	Pass	
TIA 603-C 2.2.2	Frequency Stability	Yes	Pass	
TIA 603-C 2.2.12	Spurious Radiated Emissions	Yes	Pass	
TIA 603-C 2.2.13	Spurious Conducted Emissions	Yes	Pass	
TIA 603-C 2.2.17	Radiated Power (EIRP)	Yes	Pass	
FCC 95.627(a)	Frequency Monitoring	No	N/A	Device does not initiate communications
FCC 95.633(e)(3)	Emission Bandwidth	Yes	Pass	
FCC 95.635(d)(4-5)	Emission Mask	Yes	Pass	
EN 301 839-1 10.1	LBT Threshold Power Level	No	N/A	Device does not initiate communications
EN 301 839-1 10.2	Monitoring System Bandwidth	No	N/A	Device does not initiate communications
EN 301 839-1 10.3.1	Monitoring System Scan Cycle Time	No	N/A	Device does not initiate communications
EN 301 839-1 10.3.2	Minimum Channel Monitoring Period	No	N/A	Device does not initiate communications
EN 301 839-1 10.4	Channel Access Based on Ambient Levels	No	N/A	Device does not initiate communications
EN 301 839-1 10.5	Discontinuation MICS Session	No	N/A	Device does not initiate communications
EN 301 839-1 10.6	Use of pre-scanned alternative channel	No	N/A	Feature not implemented

Deviations From Test Standards

None

Approved By:



Victor Ratinoff, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information.

REVISION HISTORY

NORTHWEST EMC
REV 2014.10.14

Revision Number	Description	Date	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS

REV 2015.2.19

United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Conformity Assessment Body (CAB) under the EMC directive and as a Notified Body under the R&TTE Directive.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIP / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

SCOPE

For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/
http://gsi.nist.gov/global/docs/cabs/designations.html

MEASUREMENT UNCERTAINTY

TMU.2015.07.10

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) for each test is on each data sheet. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

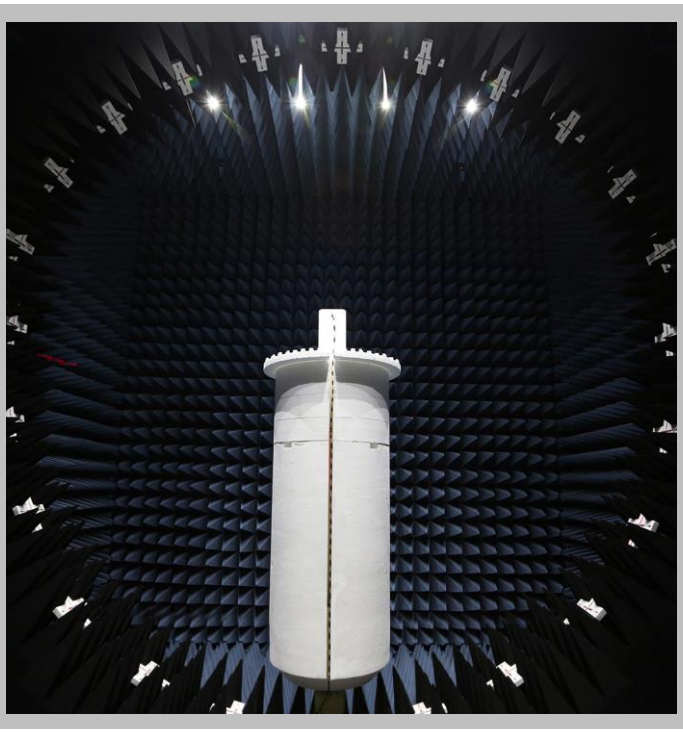
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

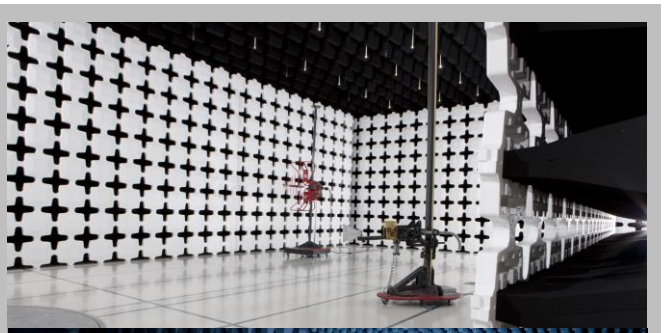
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

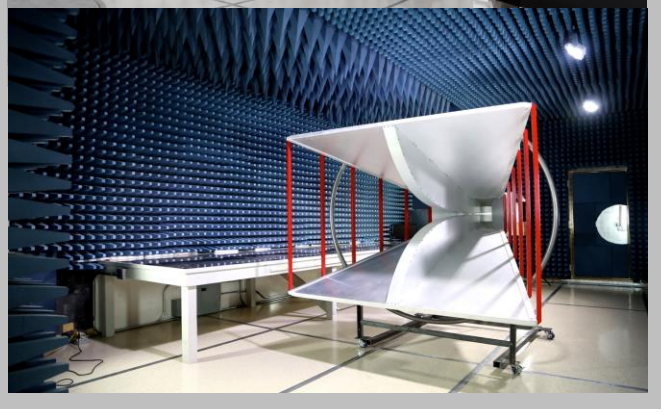
FACILITIES

REV 2015.2.19

California	Minnesota	New York	Oregon	Texas	Washington
Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th Ave NE Bothell, WA 9801 (425)984-6600
NVLAP					
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200761-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Industry Canada					
2834B-1, 2834B-3	2834E-1	N/A	2834D-1, 2834D-*2*	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRA, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	US0017	US0191	US0157







PRODUCT DESCRIPTION

NORTHWEST EMC
2014-12-10

Client and Equipment Under Test (EUT) Information

Company Name:	Axonics
Address:	7575 Irvine Center Drive Suite 200
City, State, Zip:	Irvine, CA 92618
Test Requested By:	Franklin Portillo
Model:	IPG Model - 1101 (MICS)
First Date of Test:	November 23, 2015
Last Date of Test:	November 30, 2015
Receipt Date of Samples:	November 16, 2015
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Rechargeable-battery, implanted device that provides electrical pulses to stimulate the sacral nerve (S3).

Testing Objective:
Seeking FCC authorization for the MedRadio transmitter to FCC Part 95I

CONFIGURATIONS

NORTHWEST EMC 2014-12-10

Configuration AXON0031- 1

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
IPG	Axonics	1101	AX1H150009
Lead	Axonics	1201	AL1FA50002

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Lead	No	30cm	No	IPG	Unterminated

Configuration AXON0031- 3

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Direct Connect IPG	Axonics	1101	4021040161

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Direct Connect Daughter Board	Axonics	120-0441-001 Rev A	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
DC Power Supply	GW INSTEK	GPD-3303S	GEO861981

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Cables	No	2.0m	No	Direct Connect Daughter Board	DC Power Supply
AC Cable	No	1.8m	No	AC Mains	DC Power Supply

MODIFICATIONS

NORTHWEST EMC
2014-12-10

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	11/23/2015	Radiated Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT was taken home by the client before the next scheduled test.
2	11/24/2015	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT was taken home by the client before the next scheduled test.
3	11/30/2015	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.
4	11/30/2015	Conducted Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
5	11/30/2015	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.
6	11/30/2015	Spurious Conducted Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
7	11/30/2015	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

EMISSIONS BANDWIDTH

XMit 2015.01.14

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
Generator - Signal	Agilent	E8257D	TGU	2/5/2015	36
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	0
Attenuator	Fairview Microwave	SA18H-20	TKS	4/8/2015	12
Block - DC	Aeroflex	INMET 8535	AMO	4/8/2015	12
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	7/23/2015	12

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.

EMISSIONS BANDWIDTH

NORTHWEST EMC

XMit 2015.01.14

EUT:	IPG Model - 1101 (MICS)			**Work Order:**	AXON0031
Serial Number:	4021040161			**Date:**	11/30/15
Customer:	Axonics			**Temperature:**	20.9°C
Attendees:	Franklin Portillo			**Humidity:**	39%
Project:	None			**Barometric Pres.:**	1015
Tested by:	Johnny Candelas	**Power:**	3.6VDC	**Job Site:**	OC13

TEST SPECIFICATIONS	Test Method
FCC 95I:2015	ANSI/TIA-603-D:2010

COMMENTS

DC Block + 20dB Attenuator + Coax Cable = 21.35dB Total Offset

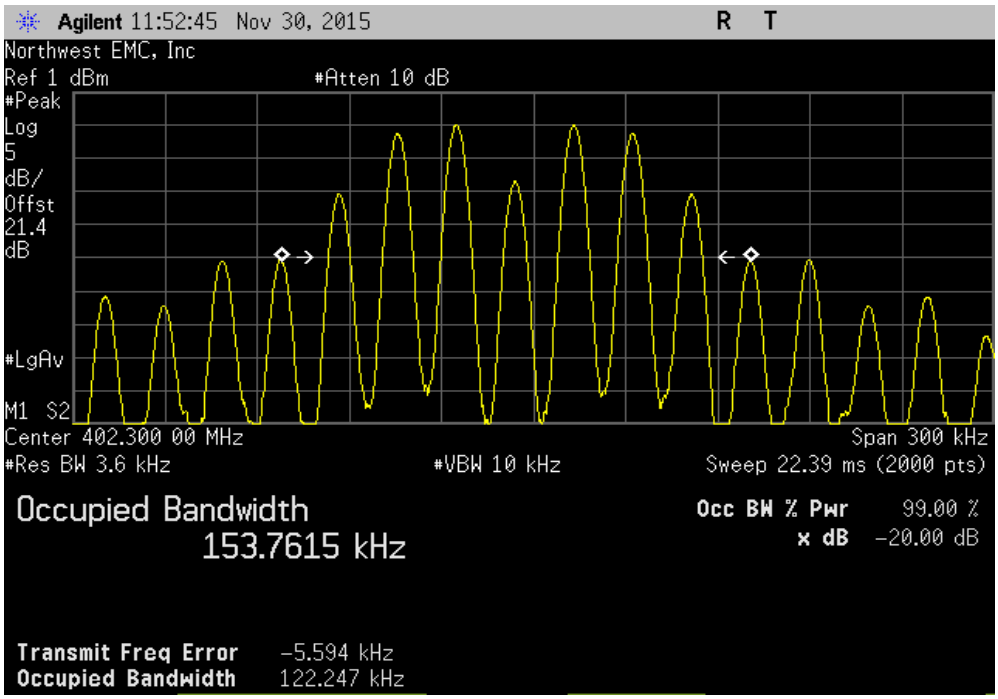
DEVIATIONS FROM TEST STANDARD

None

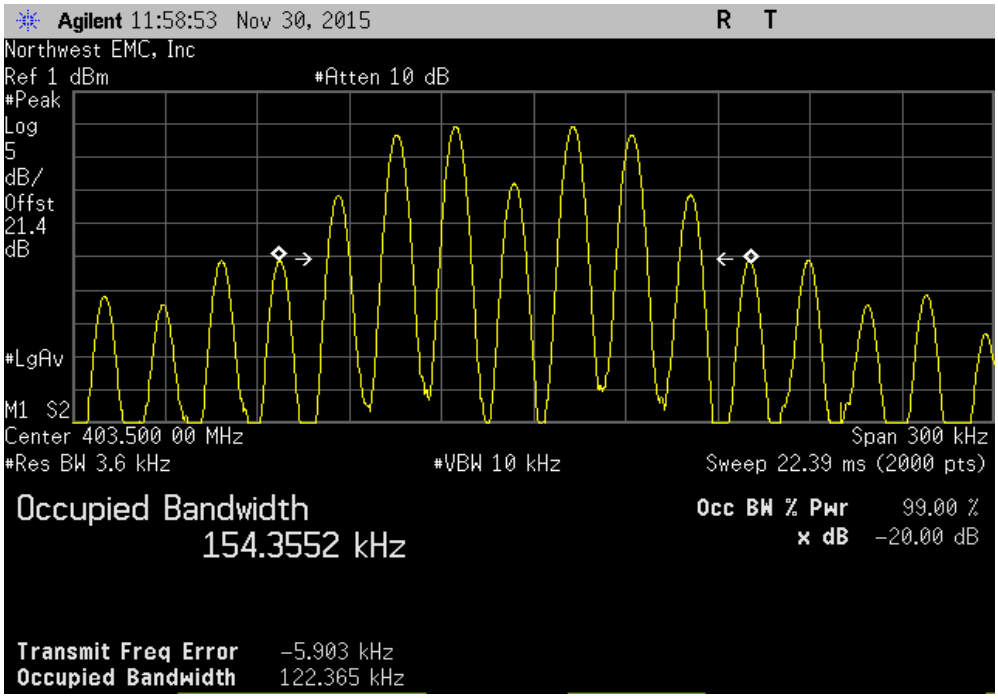
Configuration #	3	Signature

	Value	Limit (≤)	Result
Low Channel, 402.3 MHz	122.247 kHz	300 kHz	Pass
Mid Channel, 403.5 MHz	122.366 kHz	300 kHz	Pass
High Channel, 404.7 MHz	122.381 kHz	300 kHz	Pass

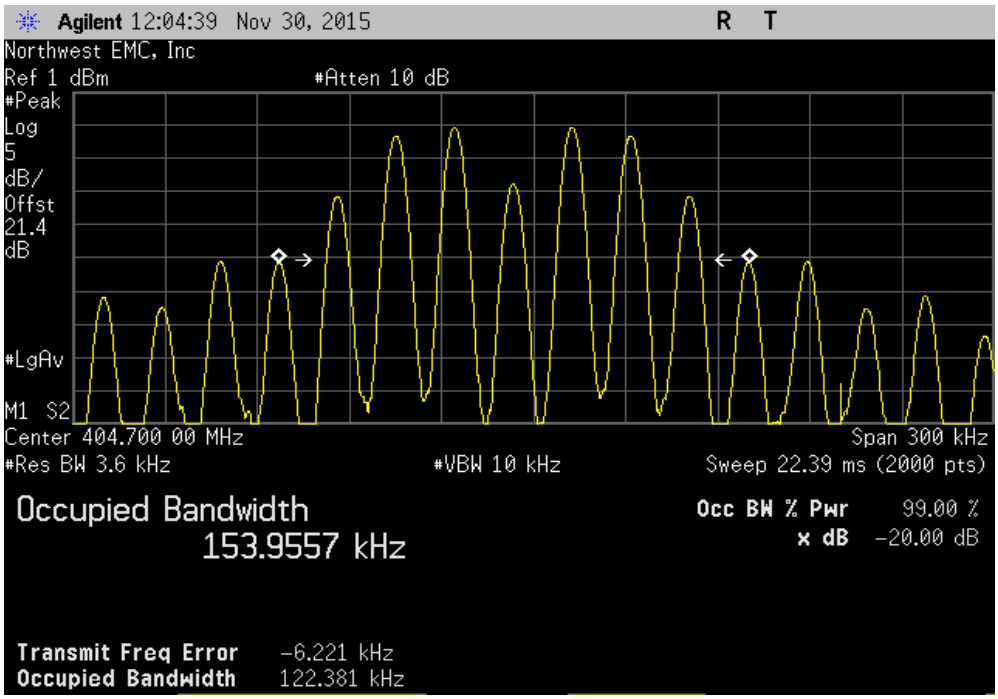
Low Channel, 402.3 MHz						
				Value	Limit (≤)	Result
				122.247 kHz	300 kHz	Pass



Mid Channel, 403.5 MHz						
				Value	Limit (≤)	Result
				122.366 kHz	300 kHz	Pass



High Channel, 404.7 MHz						
				Value	Limit (≤)	Result
				122.381 kHz	300 kHz	Pass



CONDUCTED OUTPUT POWER

XMit 2015.01.14

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
Generator - Signal	Agilent	E8257D	TGU	2/5/2015	36
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	0
Attenuator	Fairview Microwave	SA18H-20	TKS	4/8/2015	12
Block - DC	Aeroflex	INMET 8535	AMO	4/8/2015	12
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	7/23/2015	12

TEST DESCRIPTION

Per FCC Part 2.1046, RSS-GEN, the output power shall be measured at the RF terminal. The peak output power was measured with the EUT configured in the modes listed in the datasheet. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting at its maximum data rate. FCC Part 95 and RSS-243 have no conducted output power limit. It is a requirement to characterize this information and that data is contained within this datasheet.

CONDUCTED OUTPUT POWER

NORTHWEST EMC

XMit 2015.01.14

EUT:	**IPG Model - 1101 (MICS)**			**Work Order:**	**AXON0031**
Serial Number:	**4021040161**			**Date:**	**11/30/15**
Customer:	**Axonics**			**Temperature:**	**20.9°C**
Attendees:	**Franklin Portillo**			**Humidity:**	**39%**
Project:	**None**			**Barometric Pres.:**	**1015**
Tested by:	**Johnny Candelas**	**Power:**	**3.6VDC**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 95I:2015	ANSI/TIA-603-D:2010

COMMENTS

DC Block + 20dB Attenuator + Coax Cable = 21.35dB Total Offset

DEVIATIONS FROM TEST STANDARD

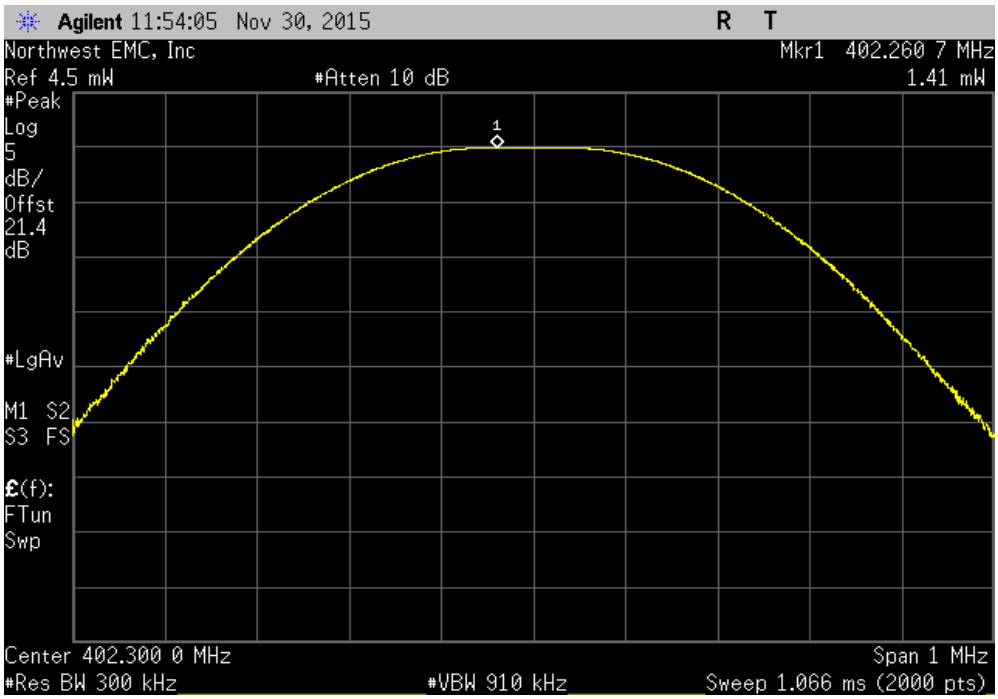
None

Configuration #	**3**	*Signature*

	Value	**Limit**	**Result**
Low Channel, 402.3 MHz	1.406 mW	N/A	N/A
Mid Channel, 403.5 MHz	1.423 mW	N/A	N/A
High Channel, 404.7 MHz	1.410 mW	N/A	N/A

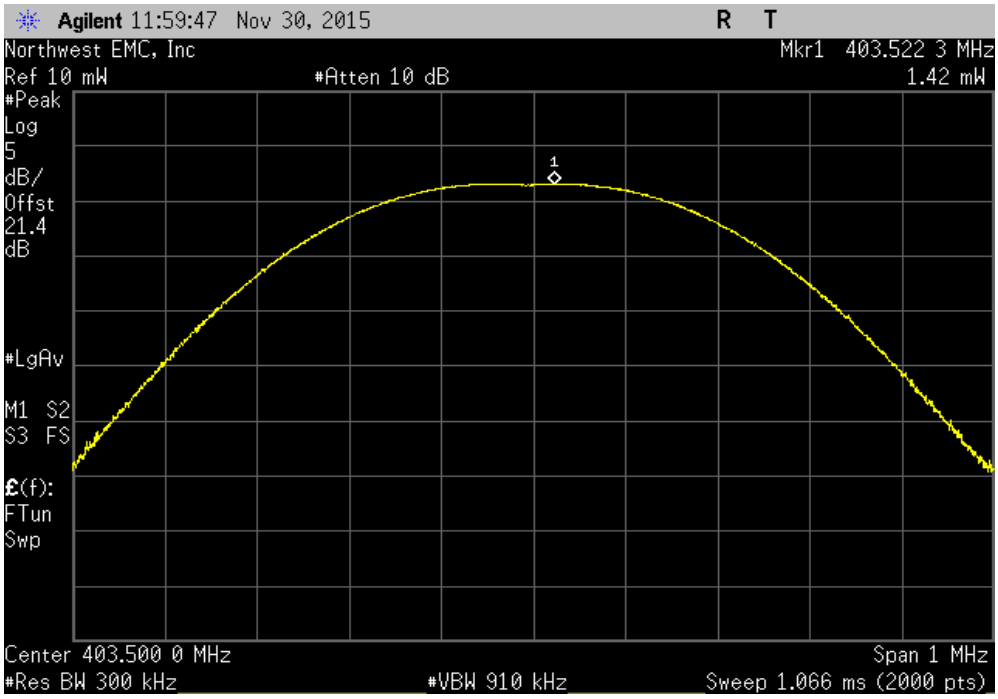
Low Channel, 402.3 MHz

				Value	Limit	Result
				1.406 mW	N/A	N/A

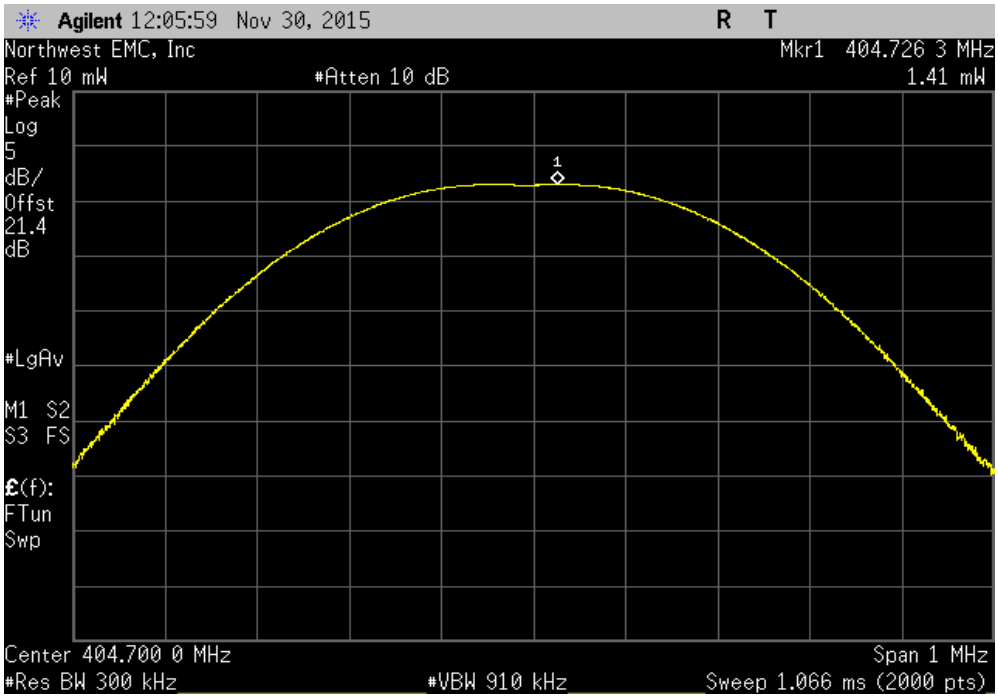


Mid Channel, 403.5 MHz

				Value	Limit	Result
				1.423 mW	N/A	N/A



High Channel, 404.7 MHz						
				Value	Limit	Result
				1.410 mW	N/A	N/A



EMISSIONS MASK

XMit 2015.01.14

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
Generator - Signal	Agilent	E8257D	TGU	2/5/2015	36
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	0
Attenuator	Fairview Microwave	SA18H-20	TKS	4/8/2015	12
Block - DC	Aeroflex	INMET 8535	AMO	4/8/2015	12
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	7/23/2015	12

TEST DESCRIPTION

Per 47 CFR 95.635(d)(4) 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.

EMISSIONS MASK

NORTHWEST EMC

XMit 2015.01.14

EUT:	**IPG Model - 1101 (MICS)**			**Work Order:**	**AXON0031**
Serial Number:	**4021040161**			**Date:**	**11/30/15**
Customer:	**Axonics**			**Temperature:**	**20.9°C**
Attendees:	**Franklin Portillo**			**Humidity:**	**39%**
Project:	**None**			**Barometric Pres.:**	**1015**
Tested by:	**Johnny Candelas**	**Power:**	**3.6VDC**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 95I:2015	ANSI/TIA-603-D:2010

COMMENTS

DC Block + 20dB Attenuator + Coax Cable = 21.35dB Total Offset

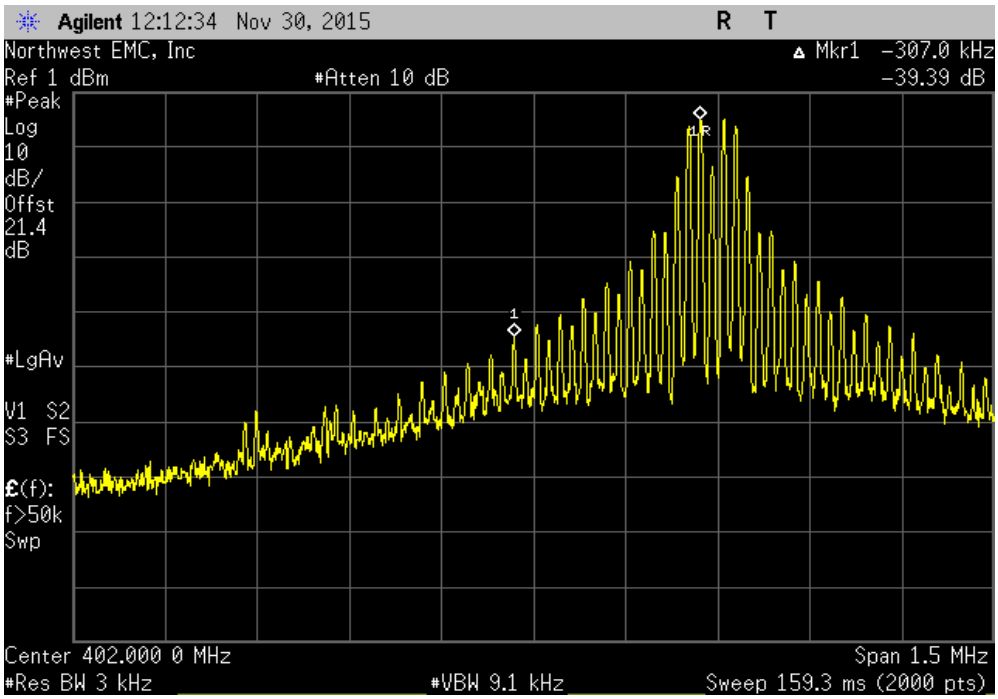
DEVIATIONS FROM TEST STANDARD

None

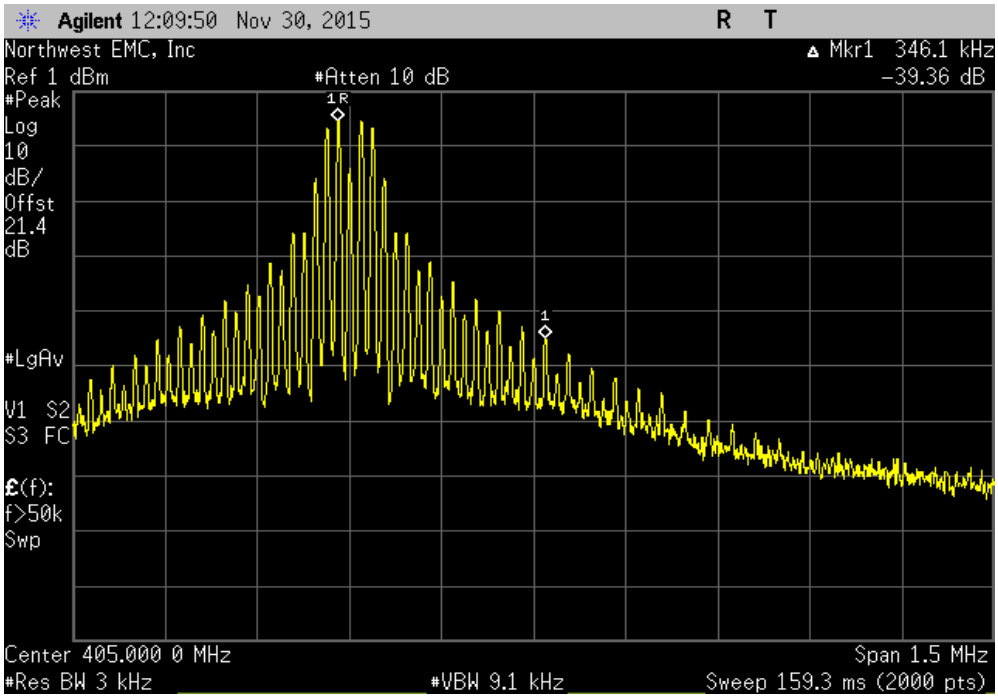
Configuration #	**3**	*Signature*

	Value (dBc)	**Limit ≤ (dBc)**	**Result**
Low Channel, 402.3 MHz	-39.39	-20	Pass
High Channel, 404.7 MHz	-39.36	-20	Pass

Low Channel, 402.3 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-39.39	-20	Pass



High Channel, 404.7 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-39.36	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2015.01.14

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
Generator - Signal	Agilent	E8257D	TGU	2/5/2015	36
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	0
Attenuator	Fairview Microwave	SA18H-20	TKS	4/8/2015	12
Block - DC	Aeroflex	INMET 8535	AMO	4/8/2015	12
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	7/23/2015	12

TEST DESCRIPTION

Per FCC Part 2.1052, RSS-GEN, the spurious emissions shall be measured at the RF terminal. The peak spurious emissions were measured with the EUT configured to the modes listed in the datasheet. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was transmitting at its maximum data rate. FCC Part 95 and RSS-243 have no conducted spurious emissions limit. It is a requirement to characterize this information and that data is contained within this datasheet.

SPURIOUS CONDUCTED EMISSIONS

NORTHWEST EMC

XMit 2015.01.14

EUT:	**IPG Model - 1101 (MICS)**			**Work Order:**	**AXON0031**
Serial Number:	**4021040161**			**Date:**	**11/30/15**
Customer:	**Axonics**			**Temperature:**	**20.9°C**
Attendees:	**Franklin Portillo**			**Humidity:**	**39%**
Project:	**None**			**Barometric Pres.:**	**1015**
Tested by:	**Johnny Candelas**	**Power:**	**3.6VDC**	**Job Site:**	**OC13**

TEST SPECIFICATIONS	**Test Method**
FCC 95I:2015	ANSI/TIA-603-D:2010

COMMENTS

DC Block + 20dB Attenuator + Coax Cable = 21.35dB Total Offset

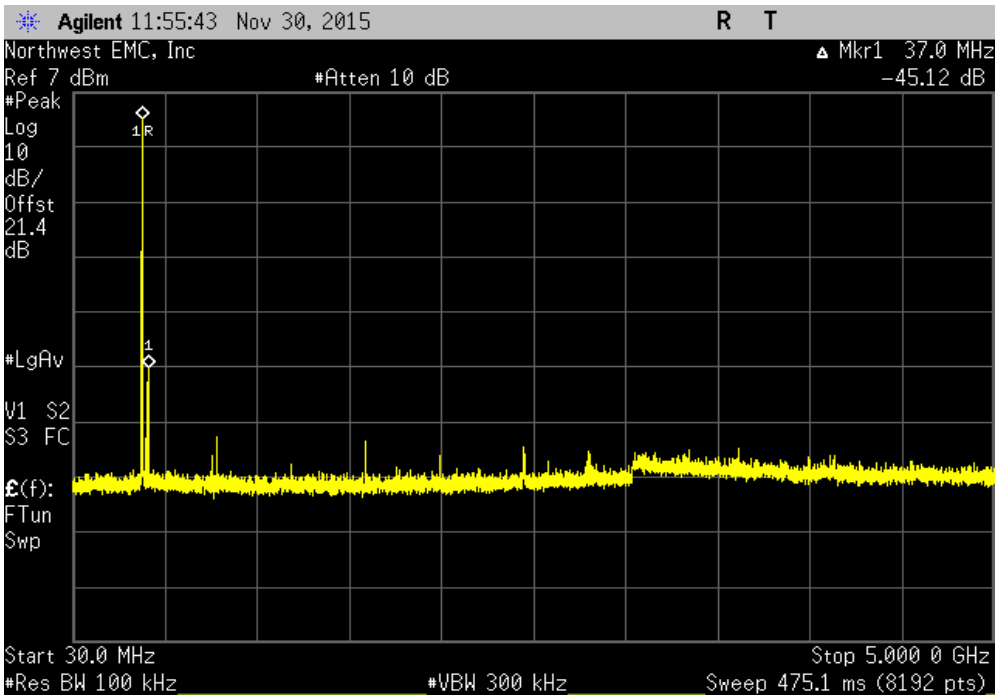
DEVIATIONS FROM TEST STANDARD

None

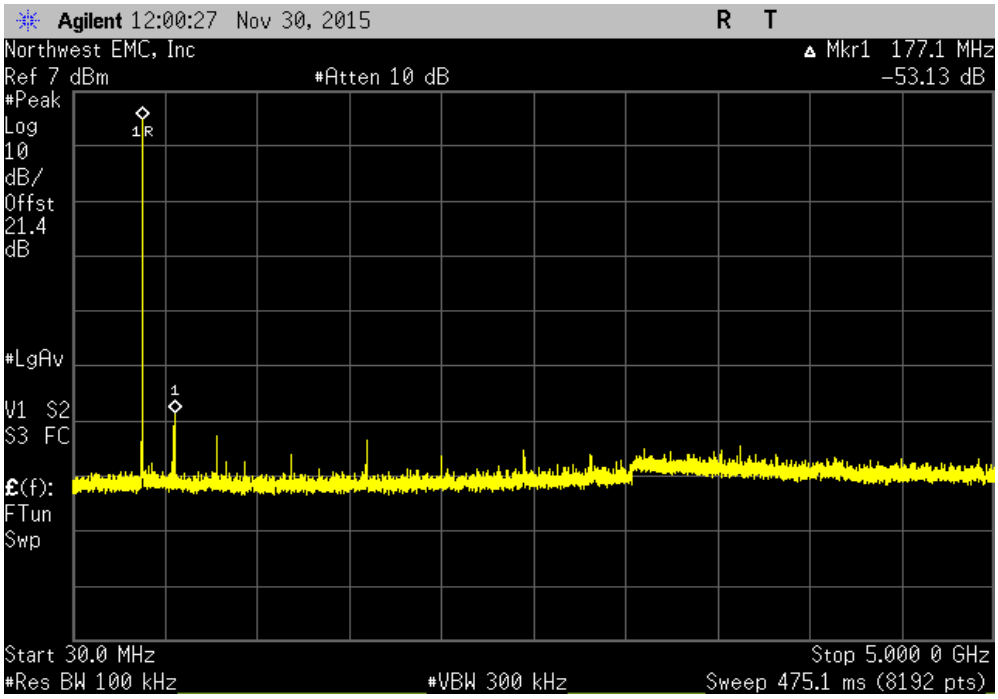
Configuration #	**3**	*Signature*

	Frequency Range	Max Value (dBc)	Limit A (dBc)	Result
Low Channel, 402.3 MHz	30 MHz - 5 GHz	-45.12	N/A	N/A
Mid Channel, 403.5 MHz	30 MHz - 5 GHz	-53.13	N/A	N/A
High Channel, 404.7 MHz	30 MHz - 5 GHz	-46.52	N/A	N/A

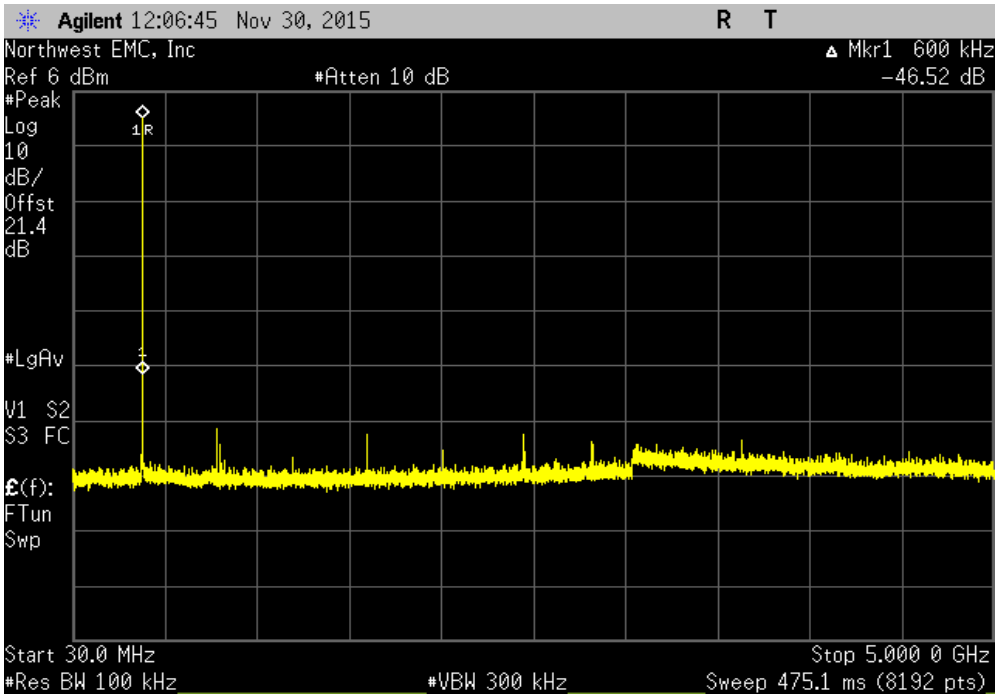
Low Channel, 402.3 MHz						
	Frequency Range			Max Value (dBc)	Limit A (dBc)	Result
	30 MHz - 5 GHz			-45.12	N/A	N/A



Mid Channel, 403.5 MHz						
	Frequency Range			Max Value (dBc)	Limit A (dBc)	Result
	30 MHz - 5 GHz			-53.13	N/A	N/A



High Channel, 404.7 MHz						
	Frequency Range			Max Value (dBc)	Limit A (dBc)	Result
	30 MHz - 5 GHz			-46.52	N/A	N/A



FREQUENCY STABILITY

XMit 2015.01.14

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
Meter - Multimeter	Fluke	79 III	MMD	2/4/2013	36
Thermometer	Omega Engineering, Inc.	HH311	DUC	10/3/2014	36
Chamber - Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPHS-32-3.5-SCT/AC	TBE	NCR	0
Generator - Signal	Agilent	E8257D	TGU	2/5/2015	36
Cable	Fairview Microwave	SCA1814-0101-120	OCZ	NCR	0
Attenuator	Fairview Microwave	SA18E-10	TKS	4/8/2015	12
Block - DC	Aeroflex	INMET 8535	AMO	4/8/2015	12
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	7/23/2015	12

TEST DESCRIPTION

Variation of Supply Voltage
The primary supply voltage was varied over the range specified by the client. Per the client, the device only works over this voltage range; 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 (+20°, +25°, +35°C and +45° C).

The Frequency Stability was measured using a direct connection between the EUT 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.

FREQUENCY STABILITY

NORTHWEST EMC

XMit 2015.01.14

EUT:	IPG Model - 1101 (MICS)			**Work Order:**	AXON0031
Serial Number:	4021040161			**Date:**	11/30/15
Customer:	Axonics			**Temperature:**	20.9°C
Attendees:	Franklin Portillo			**Humidity:**	39%
Project:	None			**Barometric Pres.:**	1015
Tested by:	Johnny Candelas	**Power:**	3.6VDC	**Job Site:**	OC13

TEST SPECIFICATIONS	Test Method
FCC 95I:2015	ANSI/TIA-603-D:2010

COMMENTS

DC Block + 20dB Attenuator + Coax Cable = 21.35dB Total Offset

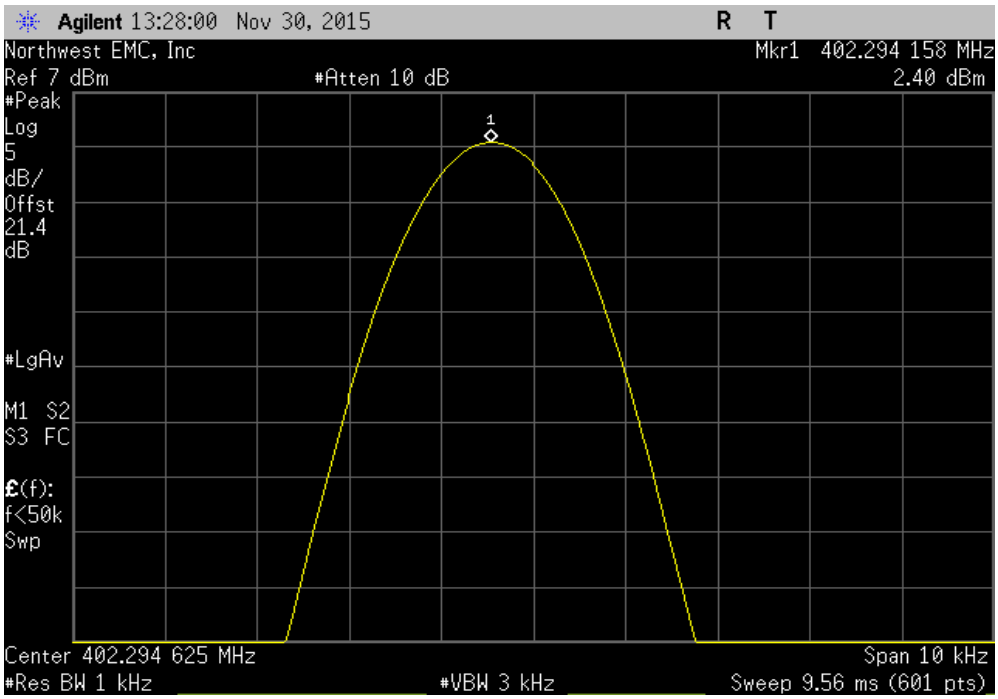
DEVIATIONS FROM TEST STANDARD

None

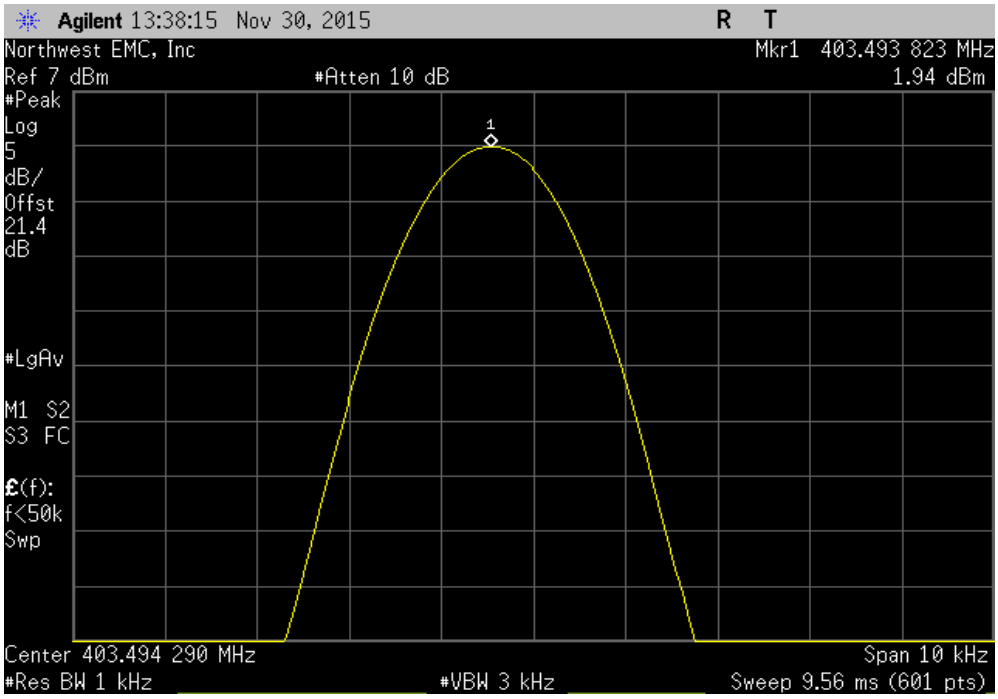
Configuration #	3	Signature

	Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
Nominal Voltage 3.6VDC					
Low Channel, 402.3 MHz	402.294158	402.3	14.5	100	Pass
Mid Channel, 403.5 MHz	403.493823	403.5	15.3	100	Pass
High Channel, 404.7 MHz	404.693506	404.7	16.1	100	Pass
Extreme Max Voltage 4.1VDC					
Low Channel, 402.3 MHz	402.294125	402.3	14.6	100	Pass
Mid Channel, 403.5 MHz	403.493806	403.5	15.4	100	Pass
High Channel, 404.7 MHz	404.693489	404.7	16.1	100	Pass
Extreme Min Voltage 3.0VDC					
Low Channel, 402.3 MHz	402.294125	402.3	14.6	100	Pass
Mid Channel, 403.5 MHz	403.49379	403.5	15.4	100	Pass
High Channel, 404.7 MHz	404.693472	404.7	16.1	100	Pass
Extreme Temperature +45°C					
Low Channel, 402.3 MHz	402.29329	402.3	16.7	100	Pass
Mid Channel, 403.5 MHz	403.492987	403.5	17.4	100	Pass
High Channel, 404.7 MHz	404.692652	404.7	18.2	100	Pass
Extreme Temperature +35°C					
Low Channel, 402.3 MHz	402.293423	402.3	16.4	100	Pass
Mid Channel, 403.5 MHz	403.493122	403.5	17.1	100	Pass
High Channel, 404.7 MHz	404.692819	404.7	17.7	100	Pass
Extreme Temperature +25°C					
Low Channel, 402.3 MHz	402.293891	402.3	15.2	100	Pass
Mid Channel, 403.5 MHz	403.493573	403.5	15.9	100	Pass
High Channel, 404.7 MHz	404.693272	404.7	16.6	100	Pass
Extreme Temperature +20°C					
Low Channel, 402.3 MHz	402.294043	402.3	14.8	100	Pass
Mid Channel, 403.5 MHz	403.493723	403.5	15.6	100	Pass
High Channel, 404.7 MHz	404.693422	404.7	16.3	100	Pass

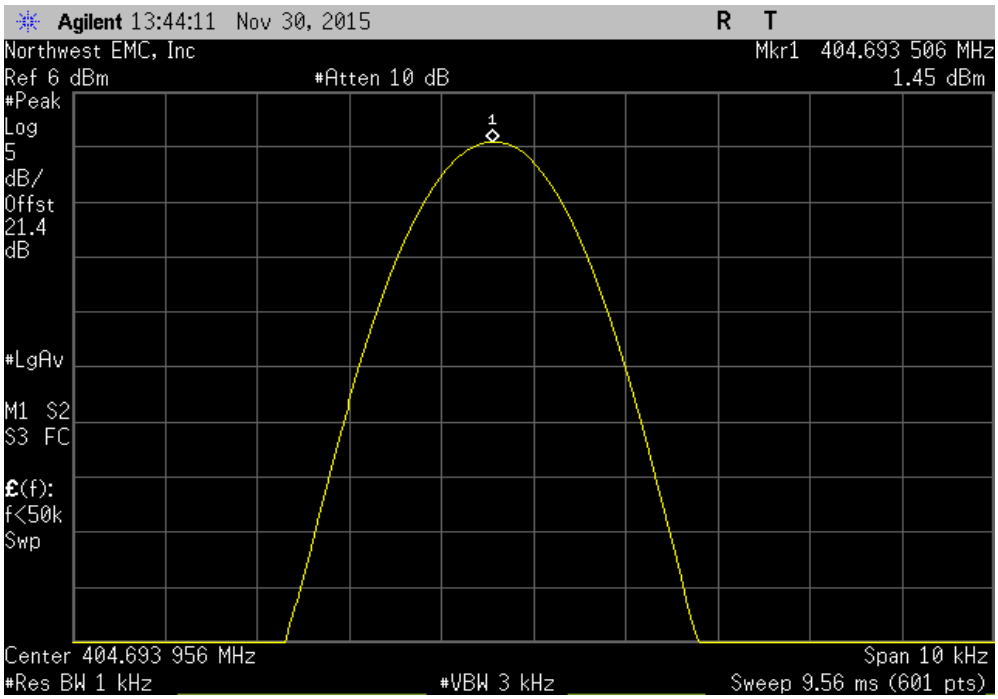
Nominal Voltage 3.6VDC, Low Channel, 402.3 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		402.294158	402.3	14.5	100	Pass



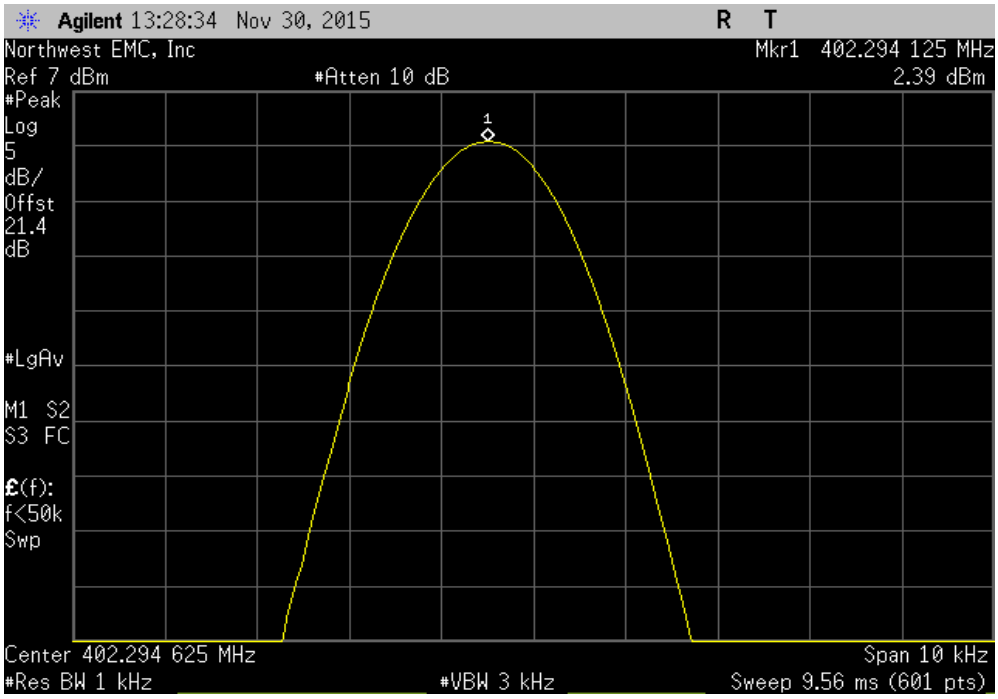
Nominal Voltage 3.6VDC, Mid Channel, 403.5 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		403.493823	403.5	15.3	100	Pass



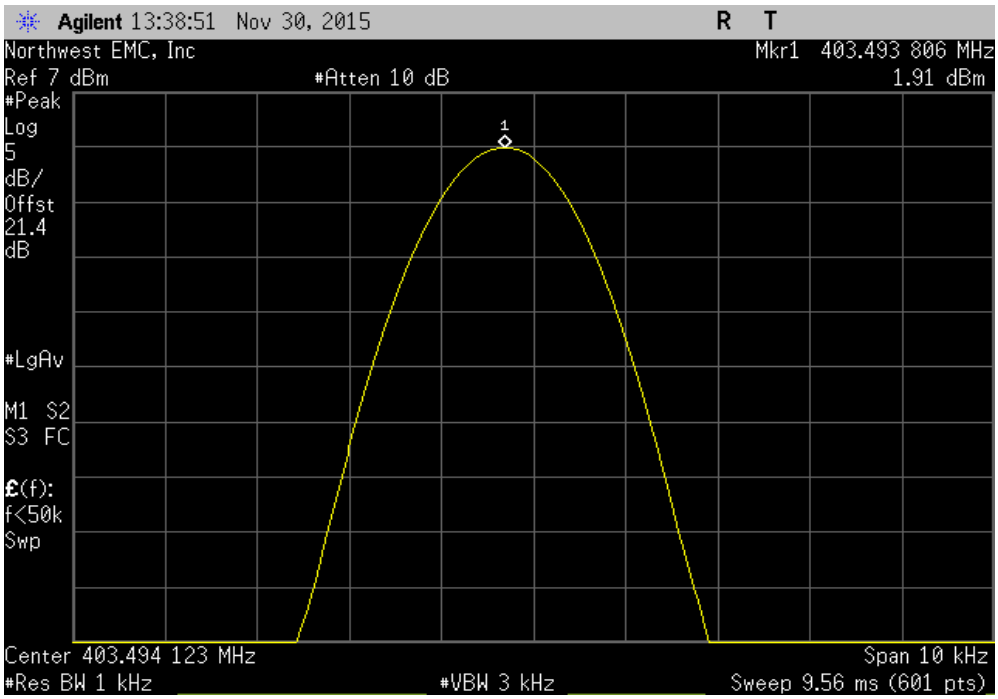
Nominal Voltage 3.6VDC, High Channel, 404.7 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		404.693506	404.7	16.1	100	Pass



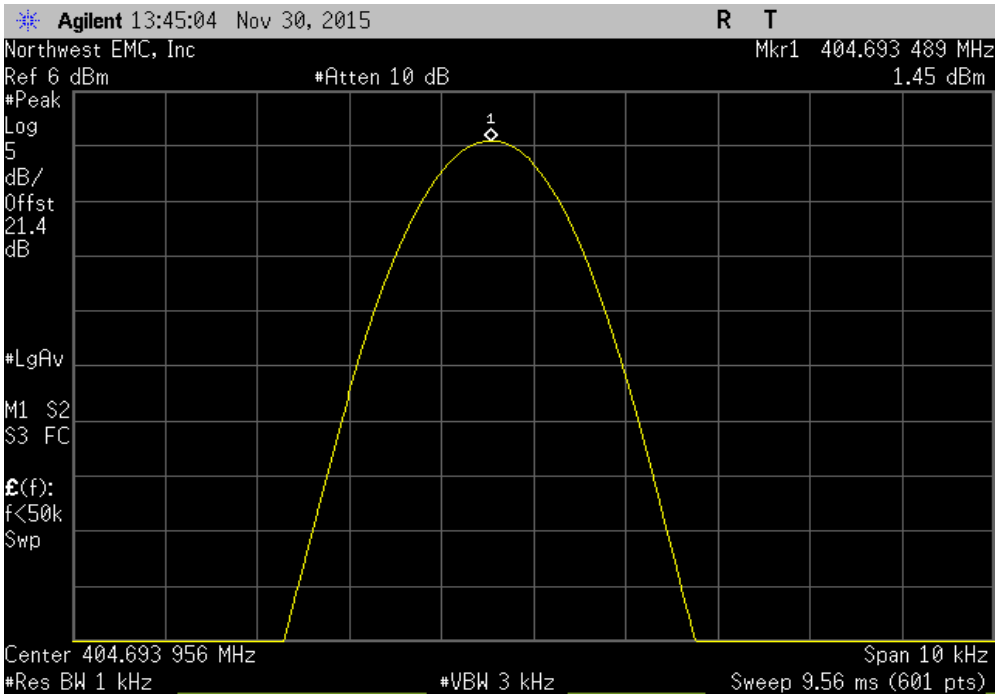
Extreme Max Voltage 4.1VDC, Low Channel, 402.3 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		402.294125	402.3	14.6	100	Pass



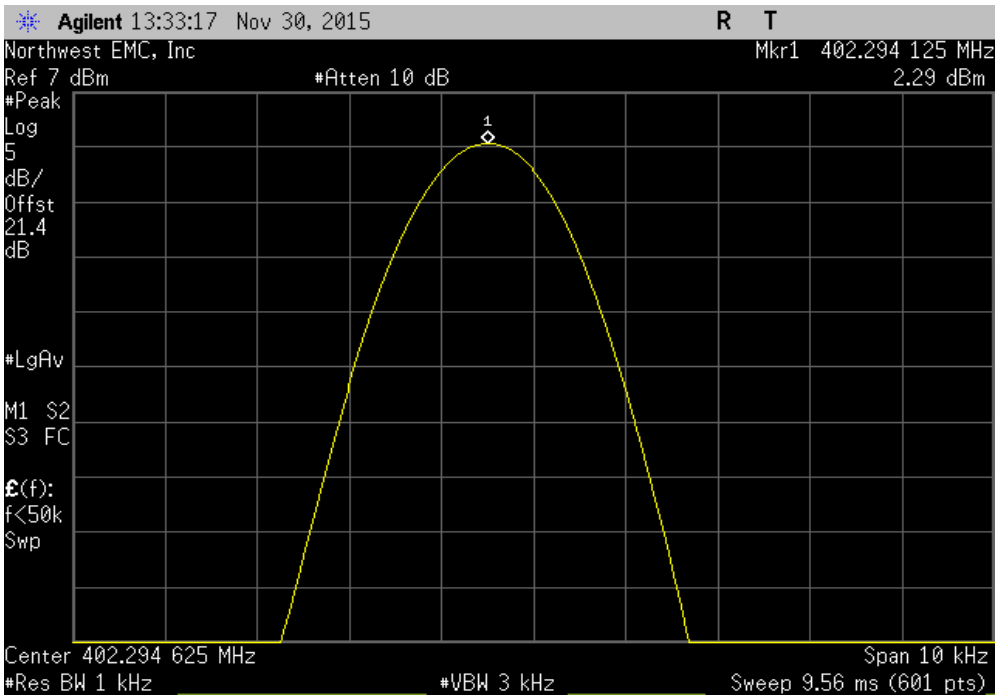
Extreme Max Voltage 4.1VDC, Mid Channel, 403.5 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		403.493806	403.5	15.4	100	Pass



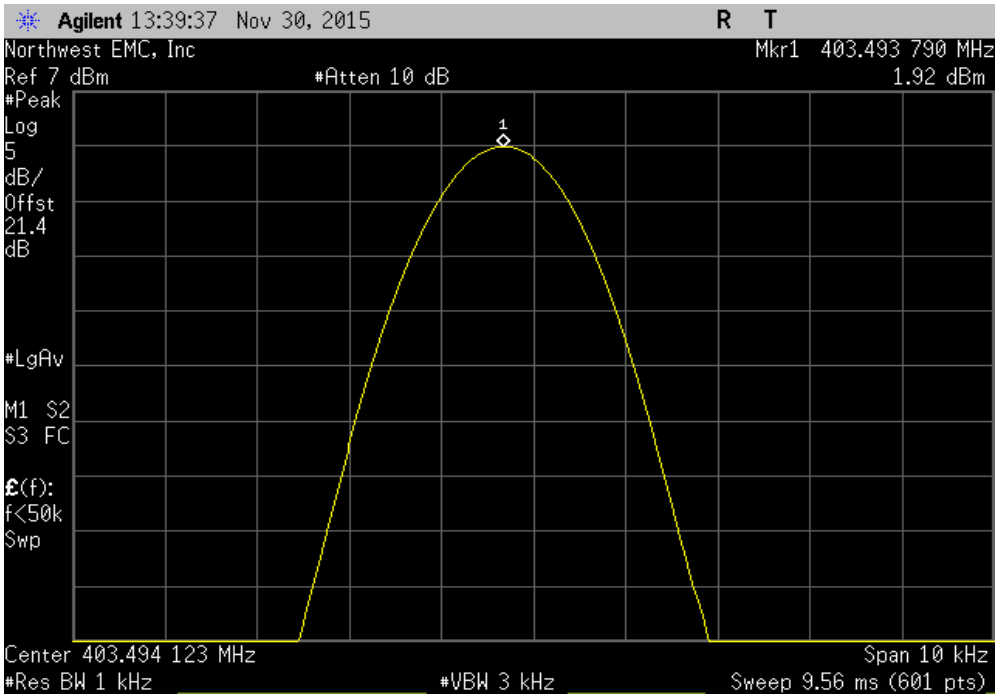
Extreme Max Voltage 4.1VDC, High Channel, 404.7 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		404.693489	404.7	16.1	100	Pass



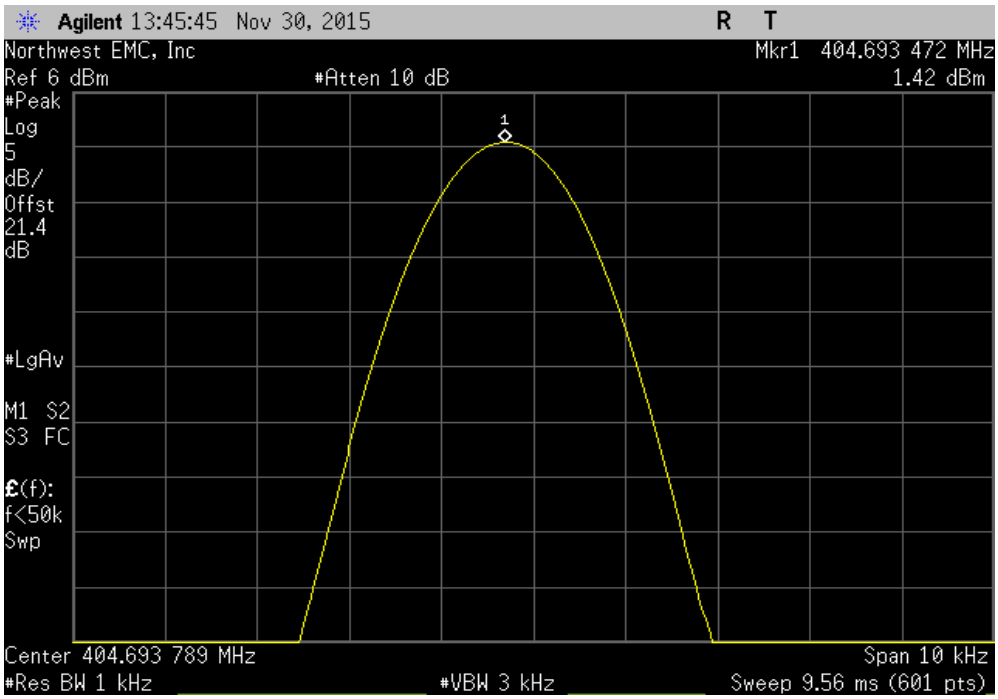
Extreme Min Voltage 3.0VDC, Low Channel, 402.3 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		402.294125	402.3	14.6	100	Pass



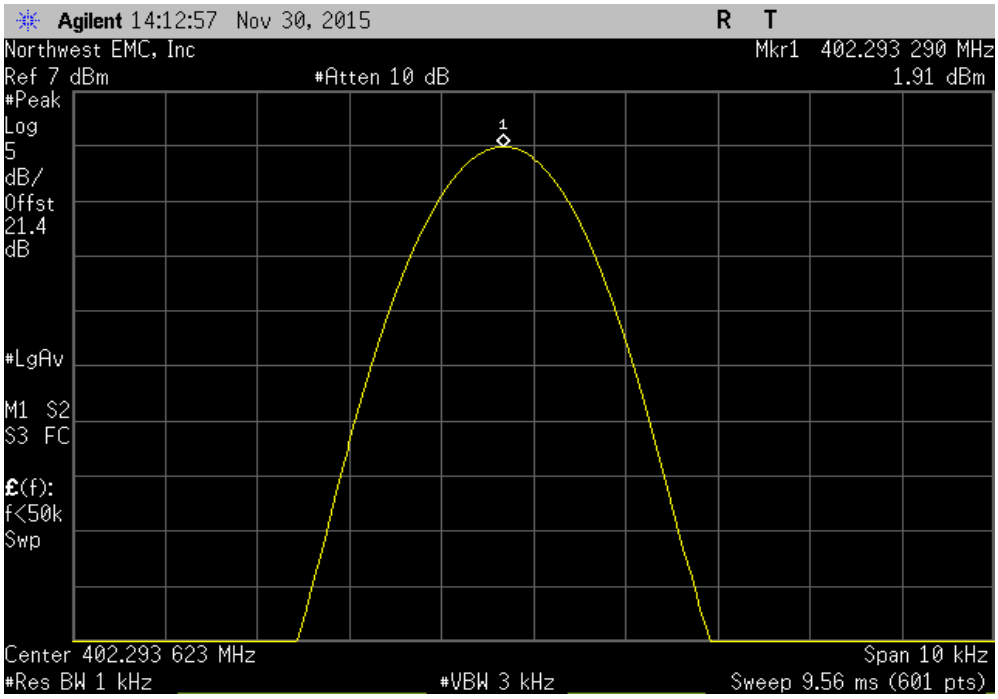
Extreme Min Voltage 3.0VDC, Mid Channel, 403.5 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		403.49379	403.5	15.4	100	Pass



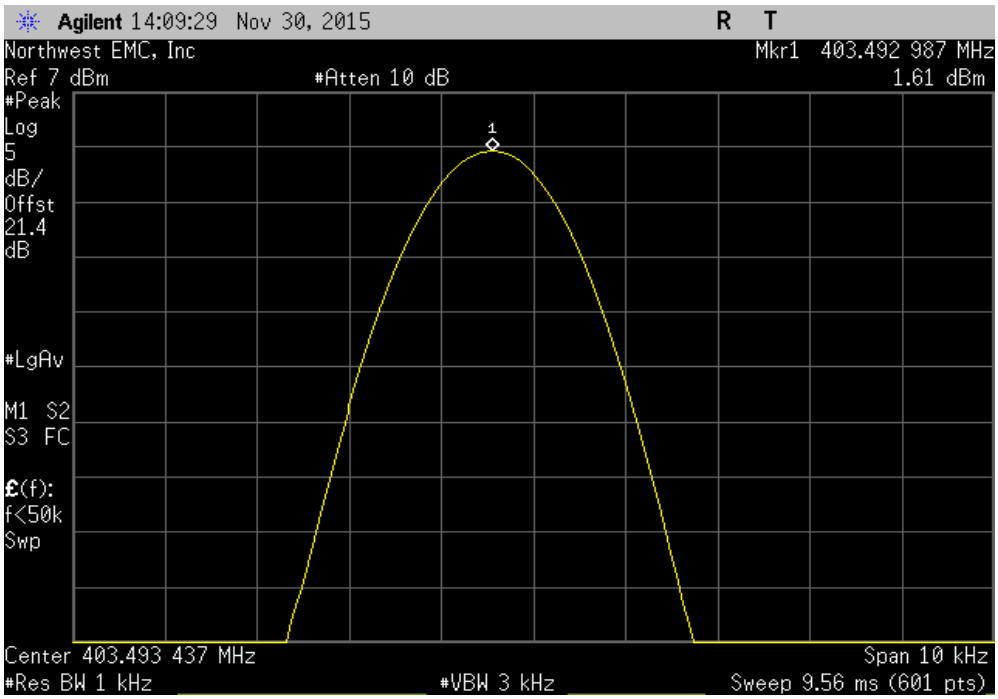
Extreme Min Voltage 3.0VDC, High Channel, 404.7 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		404.693472	404.7	16.1	100	Pass



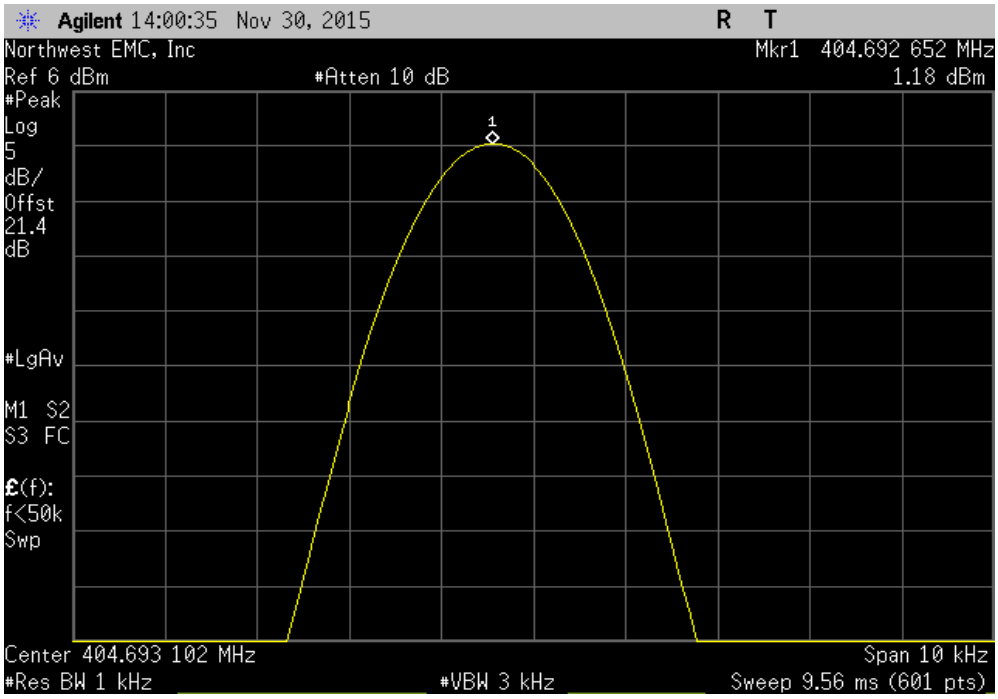
Extreme Temperature +45°C, Low Channel, 402.3 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		402.29329	402.3	16.7	100	Pass



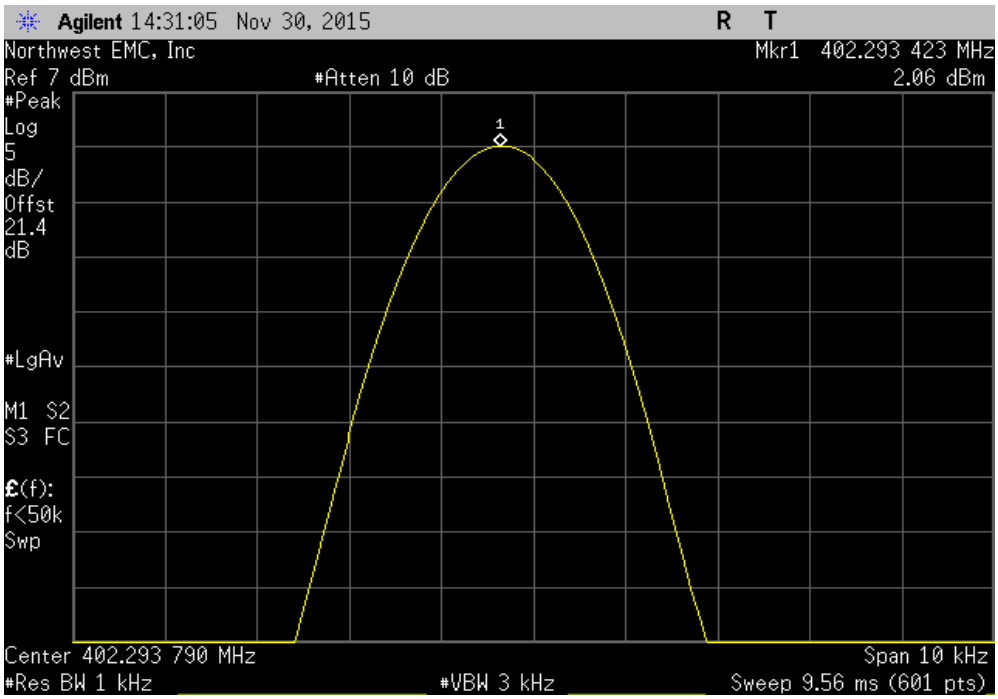
Extreme Temperature +45°C, Mid Channel, 403.5 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		403.492987	403.5	17.4	100	Pass



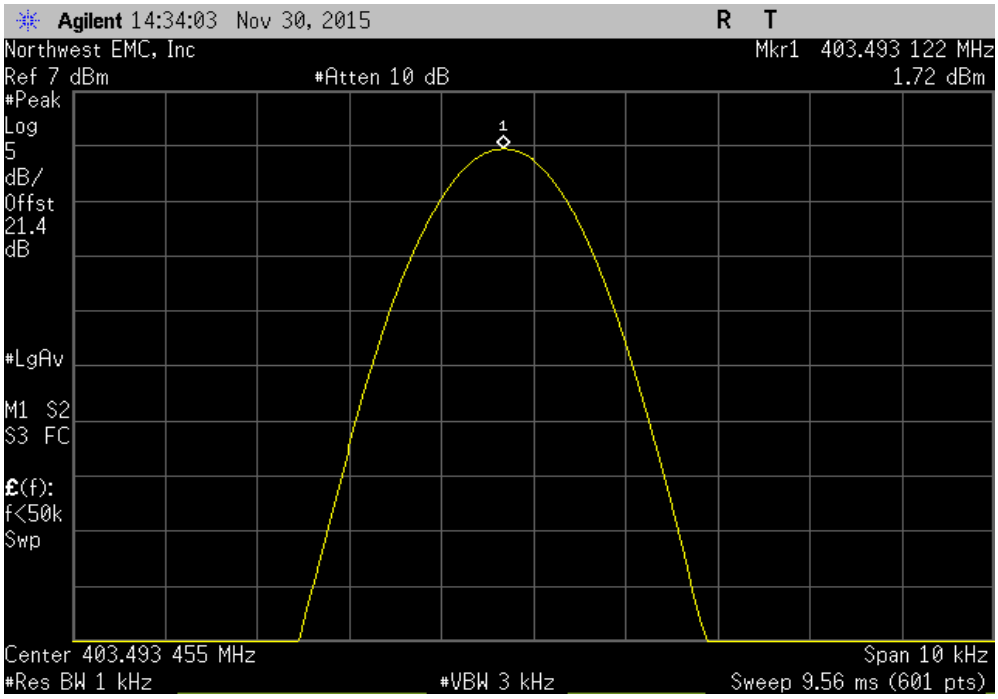
Extreme Temperature +45°C, High Channel, 404.7 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		404.692652	404.7	18.2	100	Pass



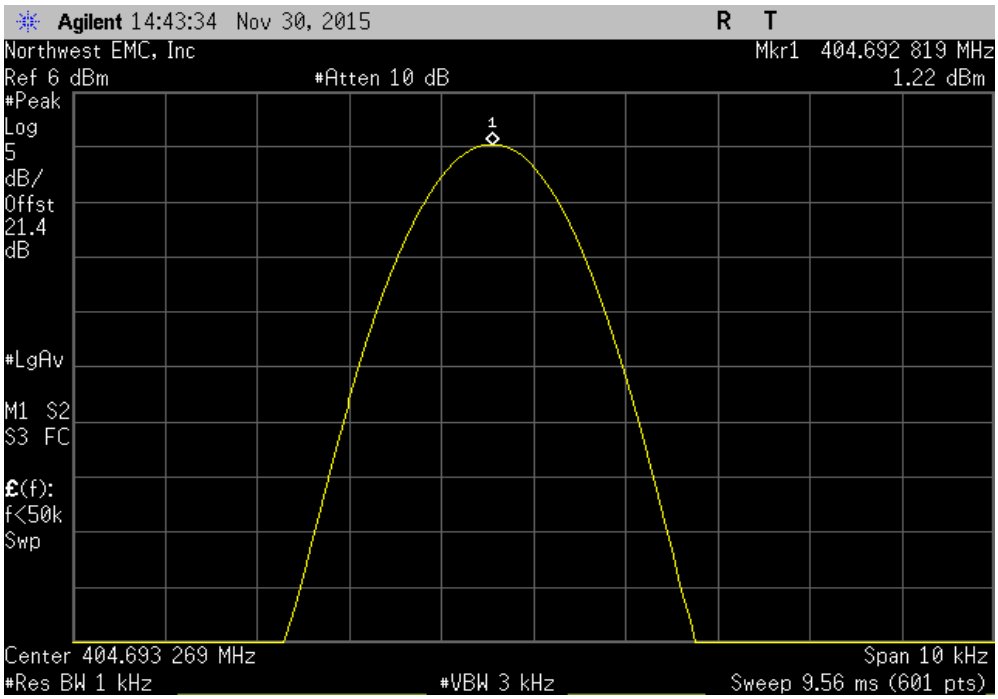
Extreme Temperature +35°C, Low Channel, 402.3 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		402.293423	402.3	16.4	100	Pass



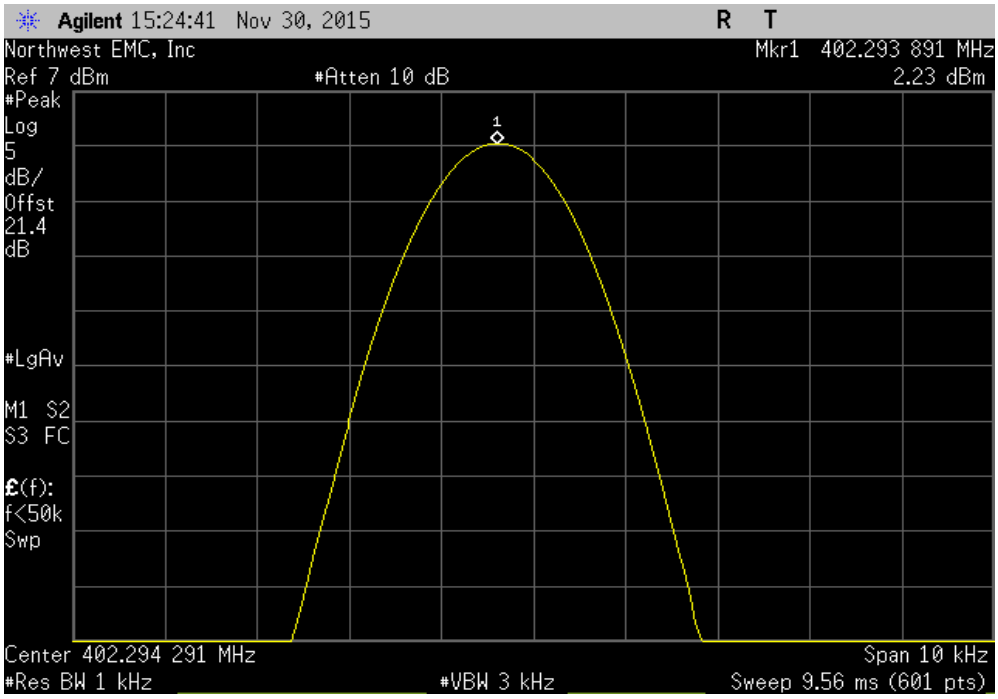
Extreme Temperature +35°C, Mid Channel, 403.5 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		403.493122	403.5	17.1	100	Pass



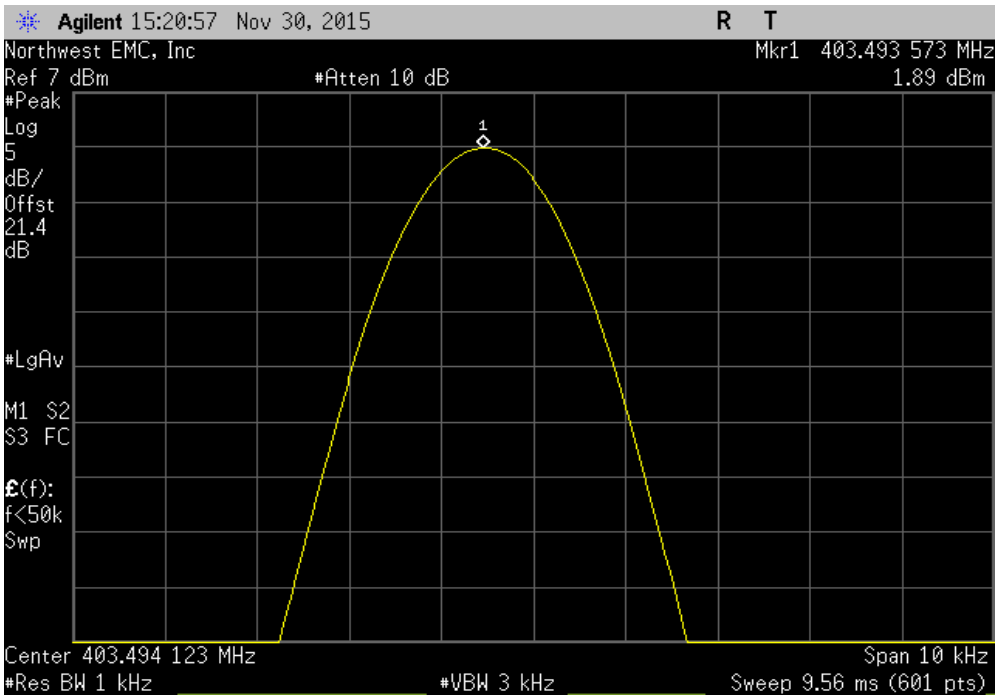
Extreme Temperature +35°C, High Channel, 404.7 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		404.692819	404.7	17.7	100	Pass



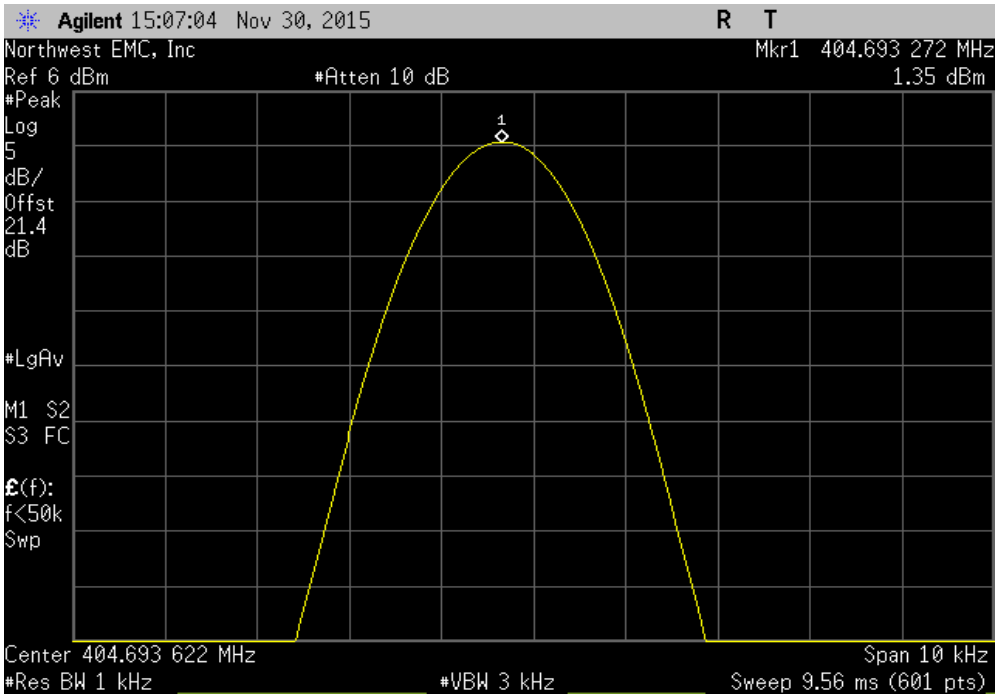
Extreme Temperature +25°C, Low Channel, 402.3 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		402.293891	402.3	15.2	100	Pass



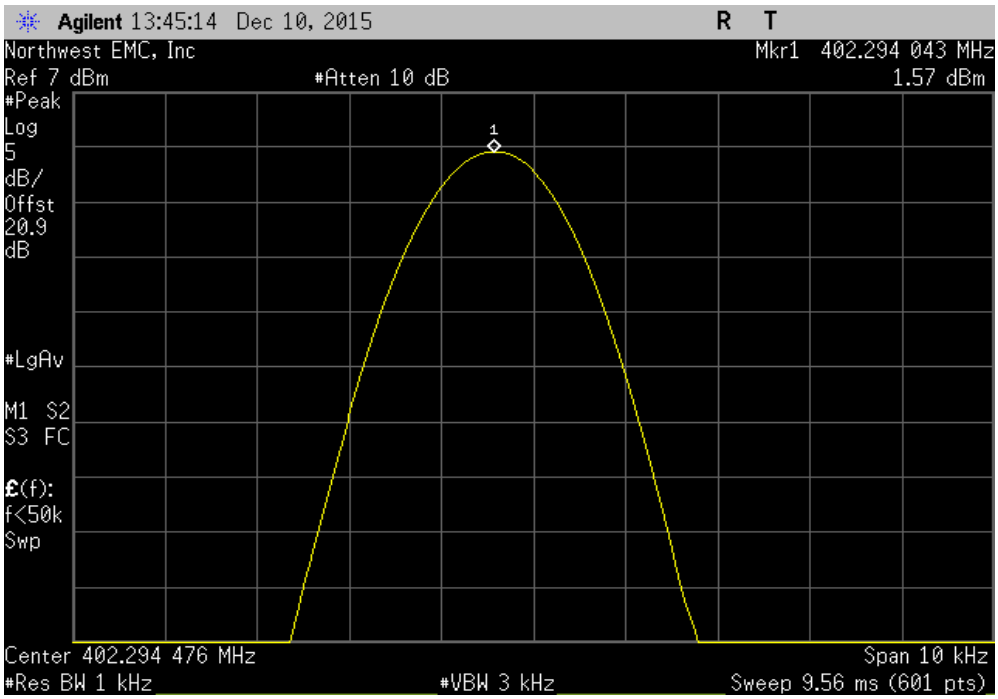
Extreme Temperature +25°C, Mid Channel, 403.5 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		403.493573	403.5	15.9	100	Pass



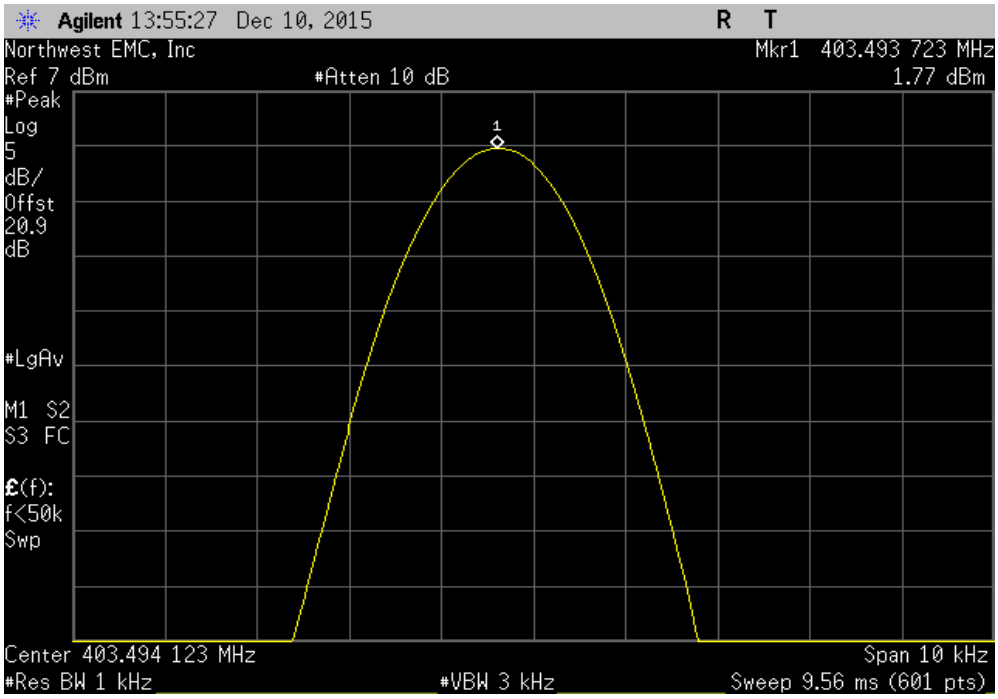
Extreme Temperature +25°C, High Channel, 404.7 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		404.693272	404.7	16.6	100	Pass



Extreme Temperature +20°C, Low Channel, 402.3 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		402.294043	402.3	14.8	100	Pass



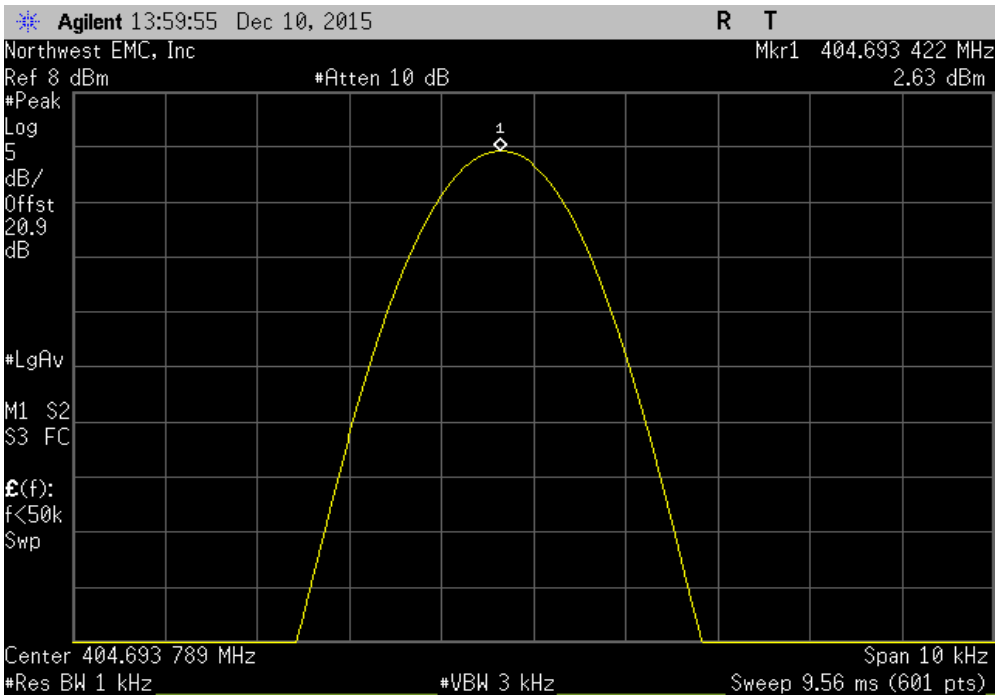
Extreme Temperature +20°C, Mid Channel, 403.5 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		403.493723	403.5	15.6	100	Pass



FREQUENCY STABILITY

XMit 2015.01.14

Extreme Temperature +20°C, High Channel, 404.7 MHz						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Limit (ppm)	Results
		404.693422	404.7	16.3	100	Pass



RADIATED POWER (EIRP)

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 at Low, Mid, and High Ch (402.3MHz, 403.5MHz, 404.7MHz)

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

AXON0031 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	402 MHz	Stop Frequency	405 MHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Generator - Signal	Agilent	E8257D	TGU	2/5/2015	36 mo
Power Sensor	Agilent	E4412A	SQE	2/6/2015	12 mo
Meter - Power	Hewlett Packard	E4418A	SPA	2/6/2015	12 mo
Antenna - Dipole	EMCO	3121C-DB1,DB2,DB3,DB4	ADC	5/17/2013	36 mo
Cable	Northwest EMC	10kHz-1GHz RE Cables	OCH	3/4/2015	12 mo
Antenna - Biconilog	EMCO	3142B	AXK	10/6/2014	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1064-9079	AOO	3/5/2015	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAY	11/5/2015	12 mo

TEST DESCRIPTION

Per 95.627(g)(3), the maximum radiated field strength for a MICS transmitter is 25uW EIRP. The Field Strength of the Fundamental data was converted to EIRP with the formula based upon the Friis transmission equation with 6 dB removed due to reflections from the ground plane: EIRP = ((E/2)*d)^2/30 where E is V/m and d = distance = 3m, and EIRP = W.

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 radiated field strength 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.

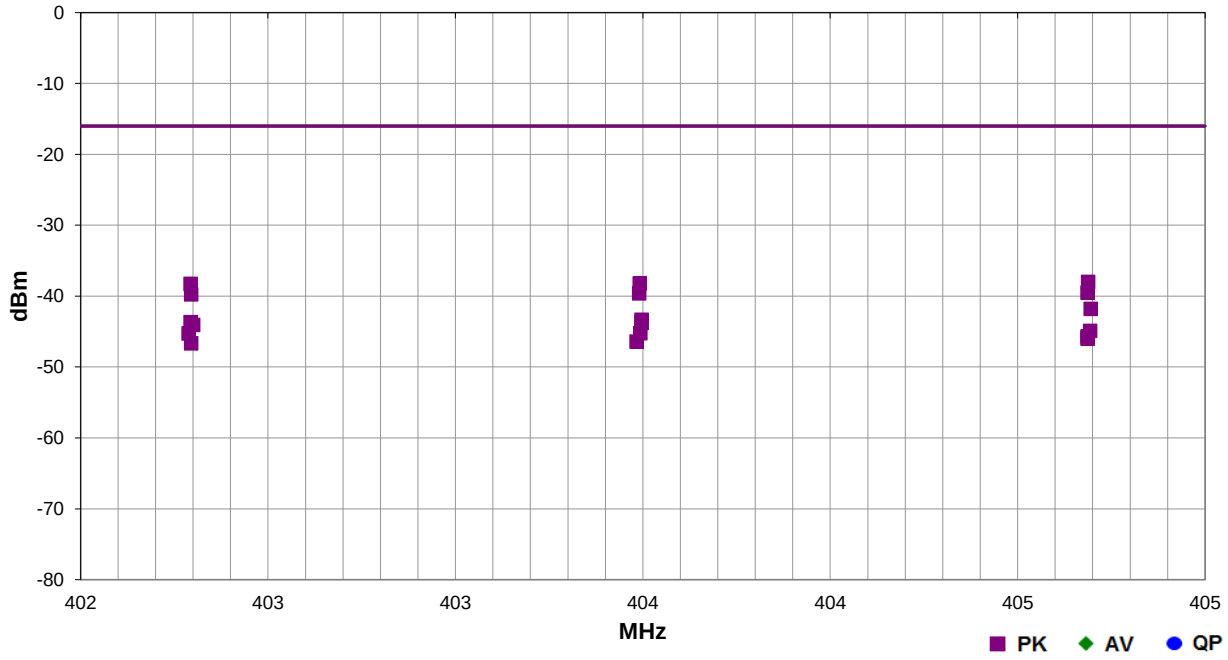
The EUT was configured to transmit in a fixture that simulates the human torso. The dimensions of the test fixture and the characteristics of the tissue substitute material met the requirements 95.627(i) and FCC KDB 617965. The height of the transmitter was 1.5-meter above the reference ground plane.

RADIATED POWER (EIRP)

Work Order:	AXON0031	**Date:**	11/23/15		
Project:	None	**Temperature:**	19.9 °C		
Job Site:	OC10	**Humidity:**	34.1% RH		
Serial Number:	AX1H150009	**Barometric Pres.:**	1013 mbar	**Tested by:**	Johnny Candelas
EUT:	IPG 1101				
Configuration:	1				
Customer:	Axonics				
Attendees:	Franklin Portillo				
EUT Power:	Battery				
Operating Mode:	Transmitting at Low, Mid, and High Ch (402.3MHz, 403.5MHz, 404.7MHz)				
Deviations:	None				
Comments:	IPG Transmit Power Index 2				

Test Specifications	**Test Method**
FCC 95I:2015	ANSI/TIA-603-D:2010

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



	Freq (MHz)	Antenna Height (meters)	Azimuth (degrees)	Polarity/ Transducer Type	Detector	EIRP (Watts)	EIRP (dBm)	Spec. Limit (dBm)	Compared to Spec. (dB)	Comments
	404.688	1.7	10.0	Vert	PK	1.59E-07	-38.0	-16.0	-22.0	EUT Vert, High Ch
	403.492	1.7	10.0	Vert	PK	1.50E-07	-38.2	-16.0	-22.2	EUT Vert, Mid Ch
	402.293	1.7	14.0	Vert	PK	1.49E-07	-38.3	-16.0	-22.3	EUT Vert, Low Ch
	404.687	1.7	40.0	Vert	PK	1.12E-07	-39.5	-16.0	-23.5	EUT Horiz, High Ch
	403.490	1.7	28.0	Vert	PK	1.09E-07	-39.6	-16.0	-23.6	EUT Horiz, Mid Ch
	402.295	1.7	33.0	Vert	PK	1.06E-07	-39.8	-16.0	-23.8	EUT Horiz, Low Ch
	404.695	1.3	40.0	Horz	PK	6.61E-08	-41.8	-16.0	-25.8	EUT Vert, High Ch
	403.497	1.4	108.0	Horz	PK	4.65E-08	-43.3	-16.0	-27.3	EUT Vert, Mid Ch
	402.293	1.4	116.0	Horz	PK	4.31E-08	-43.7	-16.0	-27.7	EUT Vert, Low Ch
	403.497	1.4	111.0	Horz	PK	4.24E-08	-43.7	-16.0	-27.7	EUT Horiz, Mid Ch
	402.300	1.4	106.0	Horz	PK	3.93E-08	-44.1	-16.0	-28.1	EUT Horiz, Low Ch
	404.693	1.7	316.0	Vert	PK	3.24E-08	-44.9	-16.0	-28.9	EUT on Side, High Ch
	403.493	1.7	316.0	Vert	PK	3.00E-08	-45.2	-16.0	-29.2	EUT on Side, Mid Ch
	402.288	1.7	313.0	Vert	PK	2.98E-08	-45.3	-16.0	-29.3	EUT on Side, Low Ch
	404.687	1.5	28.0	Horz	PK	2.69E-08	-45.7	-16.0	-29.7	EUT Horiz, High Ch
	404.687	1.2	104.0	Horz	PK	2.51E-08	-46.0	-16.0	-30.0	EUT on Side, High Ch
	403.483	1.3	109.0	Horz	PK	2.28E-08	-46.4	-16.0	-30.4	EUT on Side, Mid Ch
	402.295	1.2	103.0	Horz	PK	2.16E-08	-46.7	-16.0	-30.7	EUT on Side, Low Ch

SPURIOUS RADIATED EMISSIONS

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

MODES OF OPERATION

Transmitting at Low, Mid, and High Ch (402.3MHz, 403.5MHz, 404.7MHz)

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

AXON0031 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	5000 MHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	Northwest EMC	1-8GHz RE Cables	OCJ	8/26/2015	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	8/26/2015	12 mo
Antenna - Double Ridge	EMCO	3115	AHB	3/10/2014	24 mo
Cable	Northwest EMC	10kHz-1GHz RE Cables	OCH	3/4/2015	12 mo
Antenna - Biconilog	EMCO	3142B	AXK	10/6/2014	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1064-9079	AOO	3/5/2015	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAY	11/5/2015	12 mo

TEST DESCRIPTION

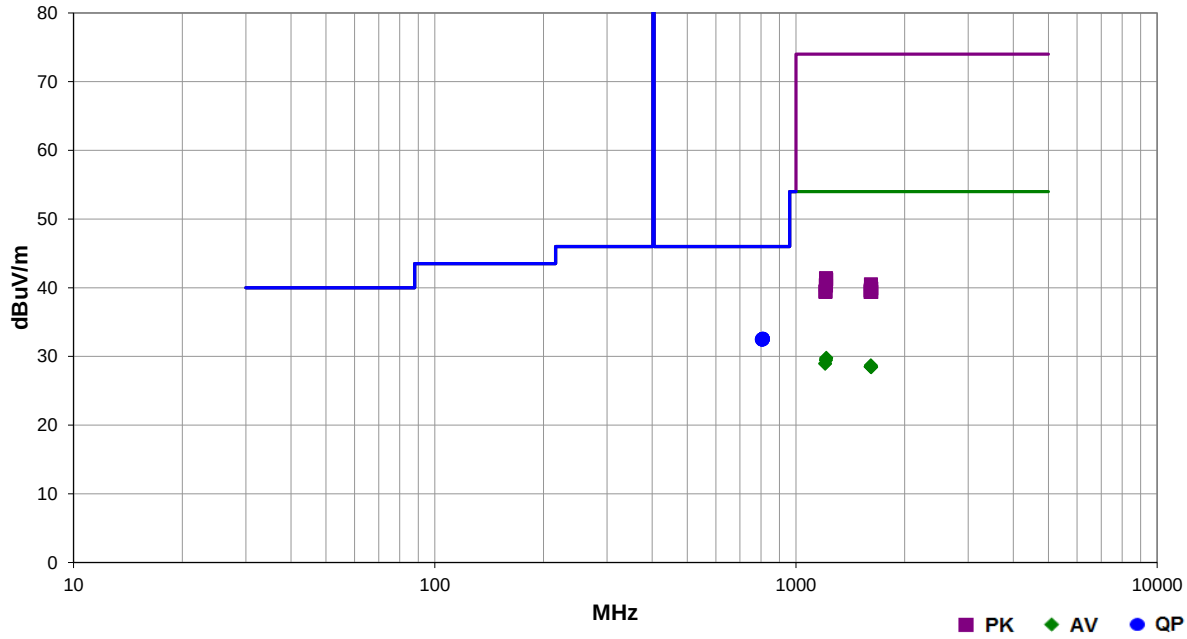
The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured in the modes listed in the datasheet. For each configuration, the spectrum was scanned throughout the specified range. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, 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 plane. A preamp was used for this test in order to provide sufficient measurement sensitivity. The EUT was tested inside human torso similant.

SPURIOUS RADIATED EMISSIONS

Work Order:	AXON0031	**Date:**	11/24/15		
Project:	None	**Temperature:**	19.2 °C		
Job Site:	OC10	**Humidity:**	38.9% RH		
Serial Number:	AX1H150009	**Barometric Pres.:**	1014 mbar	**Tested by:**	Johnny Candelas
EUT:	IPG 1101				
Configuration:	1				
Customer:	Axonics				
Attendees:	Franklin Portillo				
EUT Power:	Battery				
Operating Mode:	Transmitting at Low, Mid, and High Ch (402.3MHz, 403.5MHz, 404.7MHz)				
Deviations:	None				
Comments:	IPG Transmit Power Index 2				

Test Specifications	**Test Method**
FCC 95I:2015	ANSI/TIA-603-D:2010

Run #	7	**Test Distance (m)**	3	**Antenna Height(s)**	1 to 4(m)	**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
809.897	20.6	12.0	1.2	216.0	3.0	0.0	Horz	QP	0.0	32.6	46.0	-13.4	EUT Horiz, High Ch
809.633	20.6	12.0	1.5	211.0	3.0	0.0	Vert	QP	0.0	32.6	46.0	-13.4	EUT on Side, High Ch
809.387	20.6	12.0	1.5	9.0	3.0	0.0	Horz	QP	0.0	32.6	46.0	-13.4	EUT Vert, High Ch
809.181	20.6	12.0	1.2	21.0	3.0	0.0	Horz	QP	0.0	32.6	46.0	-13.4	EUT on Side, High Ch
809.019	20.6	12.0	1.5	46.0	3.0	0.0	Vert	QP	0.0	32.6	46.0	-13.4	EUT Vert, High Ch
808.905	20.6	12.0	1.5	264.0	3.0	0.0	Vert	QP	0.0	32.6	46.0	-13.5	EUT Horiz, High Ch
806.509	20.6	11.9	1.5	103.0	3.0	0.0	Horz	QP	0.0	32.5	46.0	-13.5	EUT Vert, Mid Ch
804.483	20.6	11.9	1.5	138.0	3.0	0.0	Vert	QP	0.0	32.5	46.0	-13.5	EUT Horiz, Low Ch
804.456	20.6	11.9	3.2	87.0	3.0	0.0	Horz	QP	0.0	32.5	46.0	-13.5	EUT Vert, Low Ch
806.998	20.5	11.9	1.5	185.0	3.0	0.0	Vert	QP	0.0	32.4	46.0	-13.6	EUT Horiz, Mid Ch
1213.658	29.8	0.0	1.5	209.0	3.0	0.0	Horz	AV	0.0	29.8	54.0	-24.2	EUT Vert, High Ch
1212.858	29.7	0.0	1.5	162.0	3.0	0.0	Vert	AV	0.0	29.7	54.0	-24.3	EUT Horiz, High Ch
1211.865	29.5	0.0	1.6	61.0	3.0	0.0	Vert	AV	0.0	29.5	54.0	-24.5	EUT Horiz, Mid Ch
1211.520	29.4	0.0	2.8	179.0	3.0	0.0	Horz	AV	0.0	29.4	54.0	-24.6	EUT Vert, Mid Ch
1205.735	29.0	0.0	1.5	65.0	3.0	0.0	Vert	AV	0.0	29.0	54.0	-25.0	EUT Horiz, Low Ch
1205.420	28.9	0.0	1.6	126.0	3.0	0.0	Horz	AV	0.0	28.9	54.0	-25.1	EUT Vert, Low Ch
1613.490	28.7	0.0	1.5	318.0	3.0	0.0	Horz	AV	0.0	28.7	54.0	-25.3	EUT Vert, Mid Ch
1613.180	28.6	0.0	1.5	215.0	3.0	0.0	Vert	AV	0.0	28.6	54.0	-25.4	EUT Horiz, Mid Ch
1616.450	28.5	0.0	1.5	282.0	3.0	0.0	Horz	AV	0.0	28.5	54.0	-25.5	EUT Vert, High Ch
1610.585	28.5	0.0	1.5	105.0	3.0	0.0	Horz	AV	0.0	28.5	54.0	-25.5	EUT Vert, Low Ch
1609.335	28.5	0.0	1.5	138.0	3.0	0.0	Vert	AV	0.0	28.5	54.0	-25.5	EUT Horiz, Low Ch
1616.825	28.4	0.0	1.5	164.0	3.0	0.0	Vert	AV	0.0	28.4	54.0	-25.6	EUT Horiz, High Ch

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
1211.675	41.4	0.0	1.5	162.0	3.0	0.0	Vert	PK	0.0	41.4	74.0	-32.6	EUT Horiz, High Ch
1212.858	41.2	0.0	1.5	209.0	3.0	0.0	Horz	PK	0.0	41.2	74.0	-32.8	EUT Vert, High Ch
1612.655	40.5	0.0	1.5	215.0	3.0	0.0	Vert	PK	0.0	40.5	74.0	-33.5	EUT Horiz, Mid Ch
1210.560	40.4	0.0	2.8	179.0	3.0	0.0	Horz	PK	0.0	40.4	74.0	-33.6	EUT Vert, Mid Ch
1211.870	40.3	0.0	1.6	61.0	3.0	0.0	Vert	PK	0.0	40.3	74.0	-33.7	EUT Horiz, Mid Ch
1616.300	39.9	0.0	1.5	282.0	3.0	0.0	Horz	PK	0.0	39.9	74.0	-34.1	EUT Vert, High Ch
1613.105	39.8	0.0	1.5	318.0	3.0	0.0	Horz	PK	0.0	39.8	74.0	-34.2	EUT Vert, Mid Ch
1608.290	39.6	0.0	1.5	138.0	3.0	0.0	Vert	PK	0.0	39.6	74.0	-34.4	EUT Horiz, Low Ch
1206.585	39.5	0.0	1.5	65.0	3.0	0.0	Vert	PK	0.0	39.5	74.0	-34.5	EUT Horiz, Low Ch
1616.725	39.4	0.0	1.5	164.0	3.0	0.0	Vert	PK	0.0	39.4	74.0	-34.6	EUT Horiz, High Ch
1608.845	39.4	0.0	1.5	105.0	3.0	0.0	Horz	PK	0.0	39.4	74.0	-34.6	EUT Vert, Low Ch
1206.580	39.4	0.0	1.6	126.0	3.0	0.0	Horz	PK	0.0	39.4	74.0	-34.6	EUT Vert, Low Ch