Spacelabs

Telemetry Transmitters

96281-B05N (narrowband),

96281-B05W (wideband)

Report #: SPAC0492

Report Prepared By Northwest EMC Inc.

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

California – Minnesota – Oregon – New York – Washington

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Last Date of Test: January 25, 2012
Spacelabs
Model: Telemetry Transmitters
96281-B05N (narrowband), 96281-B05W (wideband)

Emissions

Test Description	Specification	Test Method	Pass/Fail
Frequency Stability	FCC 95H:2012	ANSI/TIA/EIA-603-C-2004	**Pass**
Occupied Bandwidth	FCC 95H:2012	ANSI/TIA/EIA-603-C-2004	**Pass**
Field Strength of Spurious Emissions	FCC 95H:2012	ANSI/TIA/EIA-603-C-2004	**Pass**
Field Strength of Fundamental	FCC 95H:2012	ANSI/TIA/EIA-603-C-2004	**Pass**

Deviations From Test Standards

None

Approved By:

Tim O'Shea, Operations Manager

NVLAP Lab Code: 200630-0

Test Facility

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

Northwest EMC, Inc.
22975 NW Evergreen Parkway, Suite 400
Hillsboro, OR 97124

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal Communications Commission) and Industry Canada (Site filing #2834D-2).

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

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision History

Revision Number	Description	Date	Page Number
00	None		

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/

Locations

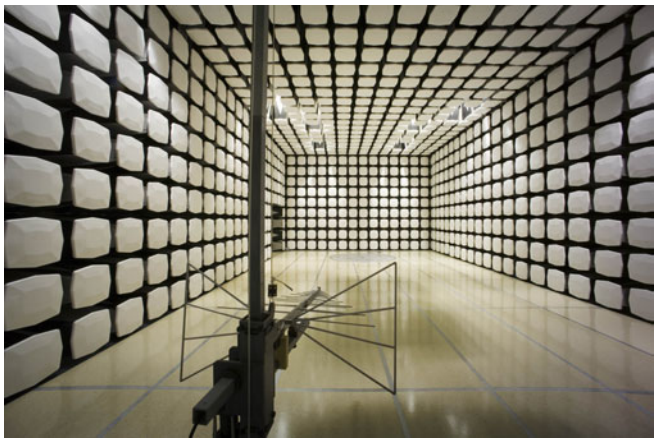
Oregon
Labs EV01-EV12
22975 NW Evergreen Pkwy
Suite 400
Hillsboro, OR 97124
(503) 844-4066

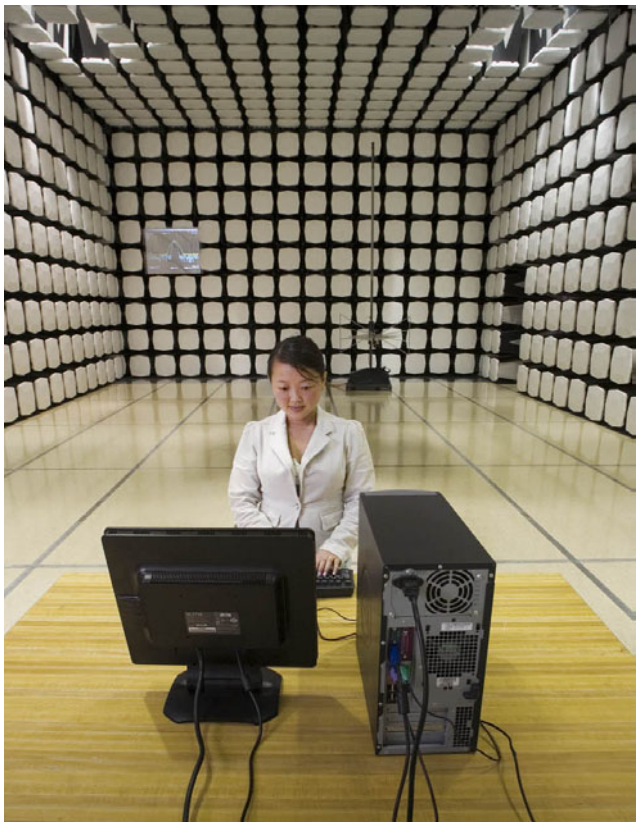
California
Labs OC01-OC13
41 Tesla
Irvine, CA 92618
(949) 861-8918

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





Product Description

Client and Equipment Under Test (EUT) Information

Company Name:	Spacelabs Medical Inc.
Address:	5150 220th Ave SE
City, State, Zip:	Issaquah, WA 98027-7018
Test Requested By:	Steve Cantwell
Model:	Telemetry Transmitters 96281-B05N (narrowband), 96281-B05W (wideband)
First Date of Test:	January 19, 2012
Last Date of Test:	January 25, 2012
Receipt Date of Samples:	January 19, 2012
Equipment Design Stage:	Preproduction
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):

The 96281-B05 is a body-worn telemetry transmitter operating at 600 MHz and also contains a Bluetooth radio. Note that the models 96281-A05N, -A05W, -B05N, -B05W and -C05W use the same radio and antenna. The 96281-B05 models are electrically and mechanically identical to the 96281-A05 models except for the display.

Testing Objective:

To demonstrate compliance with FCC 95H requirements for a medical telemetry device operating in the 600 MHz band.

Configurations

Configuration 1 SPAC0475

Software/Firmware Running during test	
Description	**Version**
STT Driver Interface	1.1.4392.26483

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Telemetry Transmitter (no display)	Spacelabs	96281-A05	6004

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
ECG lead wires shorting bars	Spacelabs	None	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
ECG lead wires	No	0.6m	No	Telemetry Transmitter (no display)	Shorting bar
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Configurations

Configuration 1 SPAC0492

Software/Firmware Running during test	
Description	**Version**
STT Driver Interface	1.1.4392.26483

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Telemetry Transmitter (with display)	Spacelabs	96281-B05	6010

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
ECG lead wires shorting bars	Spacelabs	None	None

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
ECG lead wires	No	0.6m	No	Telemetry Transmitter	Shorting bar
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Modifications

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	1/19/2012	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	1/23/2012	Field Strength of 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.
3	1/24/2012	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	1/25/2012	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

Frequency Stability

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
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
DC Power Supply	Topward	TPS-2000	TPD	NCR	0
Multimeter	Tektronix	DMM912	MMH	1/28/2011	24
Near Field Probe	EMCO	7405	IPD	NCR	0
Chamber Temp. & Humidity Controller	ESZ / Eurotherm	Dimension II	TBC	NCR	0
Chamber, Temp./Humidity Chamber	Cincinnati Sub Zero (CSZ)	ZH-32-2-2-H/AC	TBA	8/20/2010	24

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

Per FCC 95.1115(e) *Frequency stability. "*Manufacturers of wireless medical telemetry devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all of the manufacturer's specified conditions."

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.

Variation of Supply Voltage

The primary supply voltage was varied from 85% to 115% of the nominal voltage. A DC lab supply was used to vary the supply voltage.

Variation of Ambient Temperature

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.

The transmit frequency was recorded at the extremes of the specified temperature range (-30° C to +50° C) and at 10°C intervals.

Frequency Stability

EUT:	Telemetry Transmitter 96281-A05			**Work Order:**	SPAC0475
Serial Number:	6004			**Date:**	01/25/12
Customer:	Spacelabs			**Temperature:**	23°C
Attendees:	None			**Humidity:**	36%
Project:	None			**Barometric Pres.:**	101.69 kPa
Tested by:	Rod Peloquin	**Power:**	Battery	**Job Site:**	EV09

TEST SPECIFICATIONS	**Test Method**
FCC 95H:2012	ANSI/TIA/EIA-603-C-2004

COMMENTS

With ECG lead wires, ECD shorting bar

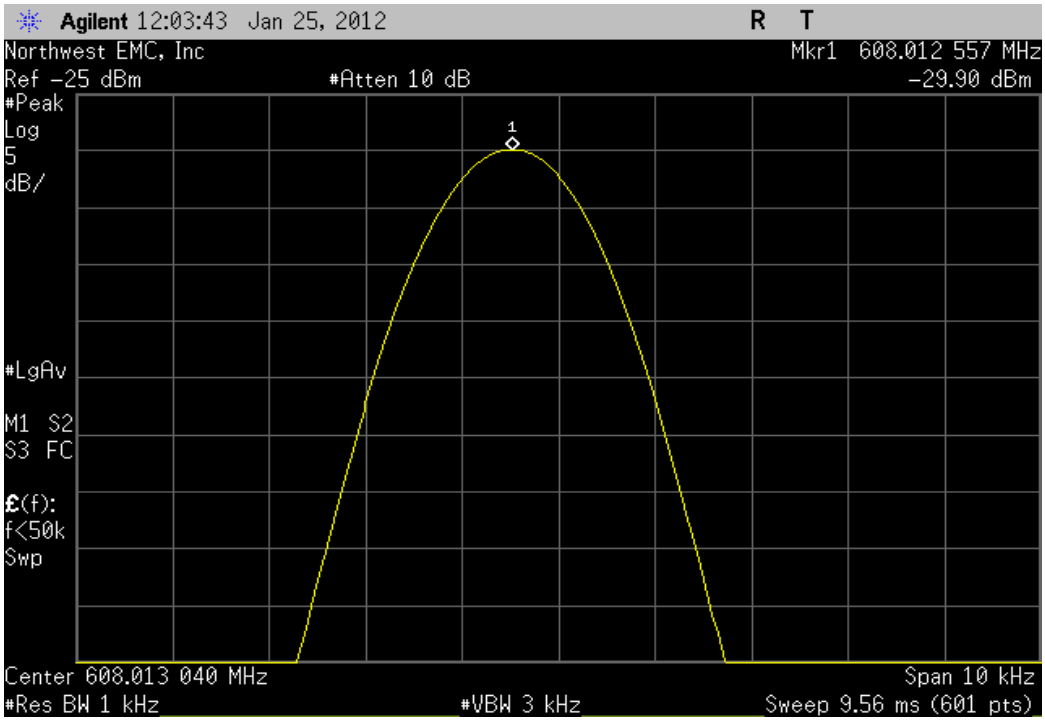
DEVIATIONS FROM TEST STANDARD

Configuration #	**SPAC0475 - 1**	*Signature*

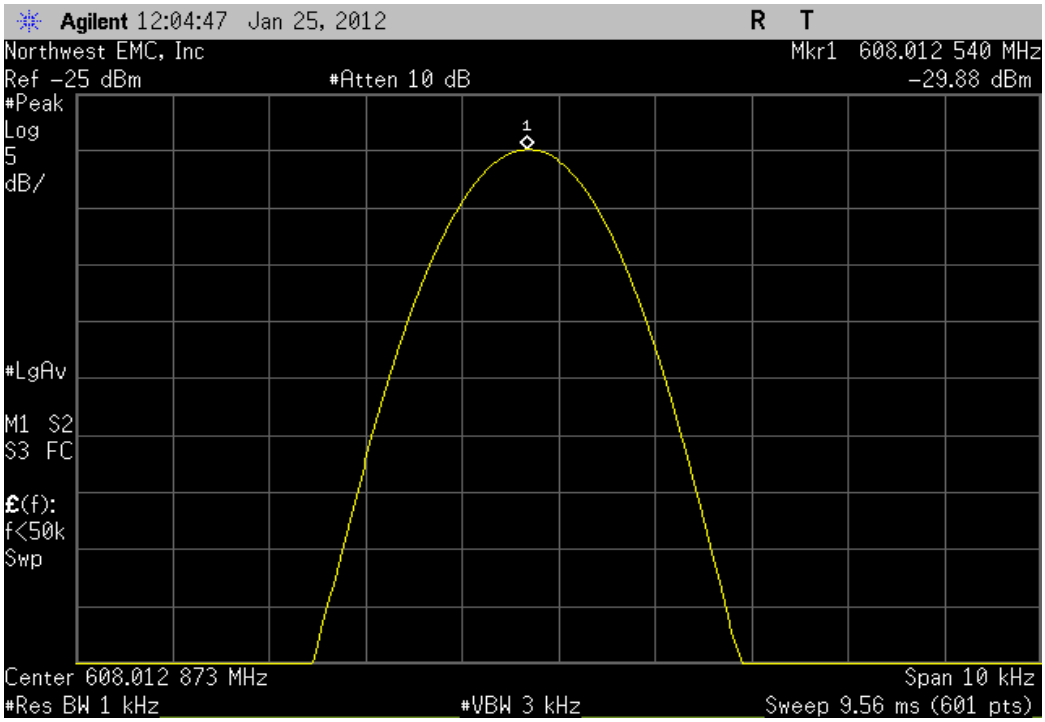
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)	Result
Narrow Band					
	Low, 1241, 608.0125				
	3.45 VDC, 115%	608.012557	608.0125	0.09	Pass
	3.0 VDC, 100%	608.01254	608.0125	0.07	Pass
	2.55 VDC 85%	608.01254	608.0125	0.07	Pass
	+50°	608.012523	608.0125	0.04	Pass
	+40°	608.012506	608.0125	0.01	Pass
	+30°	608.012473	608.0125	0.04	Pass
	+20°	608.012523	608.0125	0.04	Pass
	+10°	608.01249	608.0125	0.02	Pass
	0°	608.01212	608.0125	0.62	Pass
	-10°	608.01212	608.0125	0.62	Pass
	-20°	608.011987	608.0125	0.84	Pass
	-30°	608.012203	608.0125	0.49	Pass
	High, 1480, 613.9875				
	3.45 VDC, 115%	613.987553	613.9875	0.09	Pass
	3.0 VDC, 100%	613.987554	613.9875	0.09	Pass
	2.55 VDC 85%	613.987553	613.9875	0.09	Pass
	+50°	613.98752	613.9875	0.03	Pass
	+40°	613.987503	613.9875	0	Pass
	+30°	613.987485	613.9875	0.02	Pass
	+20°	613.98752	613.9875	0.03	Pass
	+10°	613.987484	613.9875	0.03	Pass
	0°	613.987134	613.9875	0.6	Pass
	-10°	613.987117	613.9875	0.62	Pass
	-20°	613.986968	613.9875	0.87	Pass
	-30°	613.987217	613.9875	0.46	Pass
Wide Band					
	Low, 2242, 608.375				
	3.45 VDC, 115%	608.037554	608.0375	0.09	Pass
	3.0 VDC, 100%	608.03754	608.0375	0.07	Pass
	2.55 VDC 85%	608.03754	608.0375	0.07	Pass
	+50°	608.037506	608.0375	0.01	Pass
	+40°	608.03749	608.0375	0.02	Pass
	+30°	608.037473	608.0375	0.04	Pass
	+20°	608.037523	608.0375	0.04	Pass
	+10°	608.037506	608.0375	0.01	Pass
	0°	608.03712	608.0375	0.62	Pass
	-10°	608.037103	608.0375	0.65	Pass
	-20°	608.03697	608.0375	0.87	Pass
	-30°	608.037187	608.0375	0.51	Pass
	High, 2478, 613.9375				
	3.45 VDC, 115%	613.937554	613.9375	0.09	Pass
	3.0 VDC, 100%	613.937554	613.9375	0.09	Pass
	2.55 VDC 85%	613.937553	613.9375	0.09	Pass
	+50°	613.937503	613.9375	0	Pass
	+40°	613.937485	613.9375	0.02	Pass
	+30°	613.93747	613.9375	0.05	Pass
	+20°	613.937537	613.9375	0.06	Pass
	+10°	613.93752	613.9375	0.03	Pass
	0°	613.937118	613.9375	0.62	Pass
	-10°	613.937085	613.9375	0.68	Pass
	-20°	613.936969	613.9375	0.86	Pass
	-30°	613.937136	613.9375	0.59	Pass

Frequency Stability

Narrow Band, Low, 1241, 608.0125, 3.45 VDC, 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.012557	608.0125	0.09	N/A	N/A

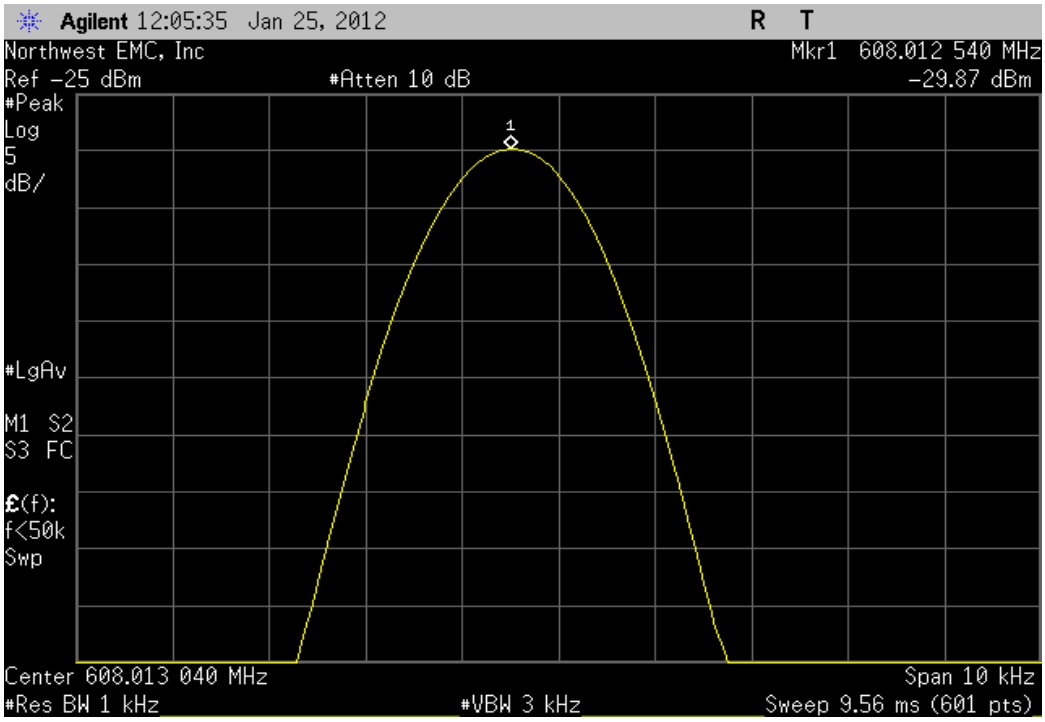


Narrow Band, Low, 1241, 608.0125, 3.0 VDC, 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.01254	608.0125	0.07	N/A	N/A

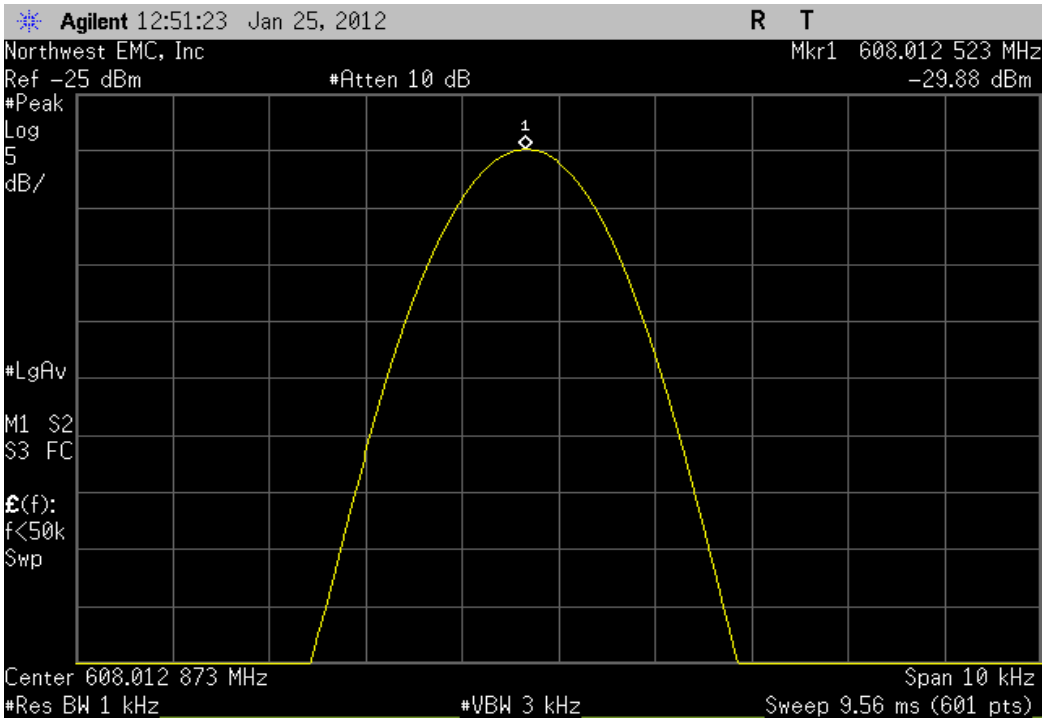


Frequency Stability

Narrow Band, Low, 1241, 608.0125, 2.55 VDC 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.01254	608.0125	0.07	N/A	N/A



Narrow Band, Low, 1241, 608.0125, +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.012523	608.0125	0.04	N/A	N/A



Narrow Band, Low, 1241, 608.0125, +40°						
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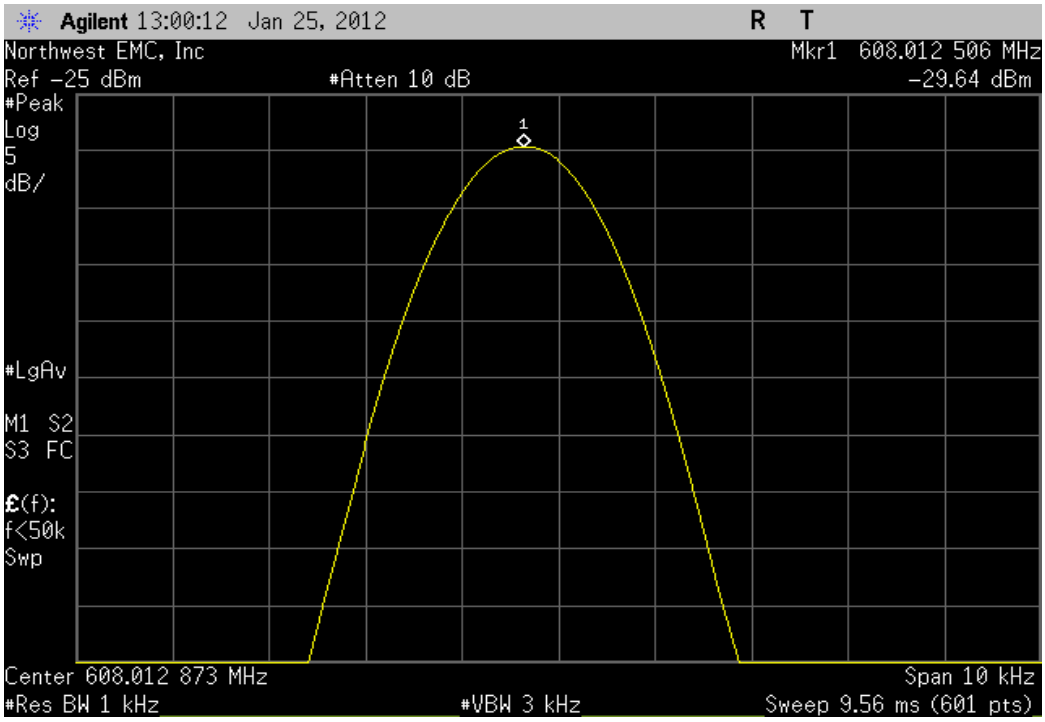
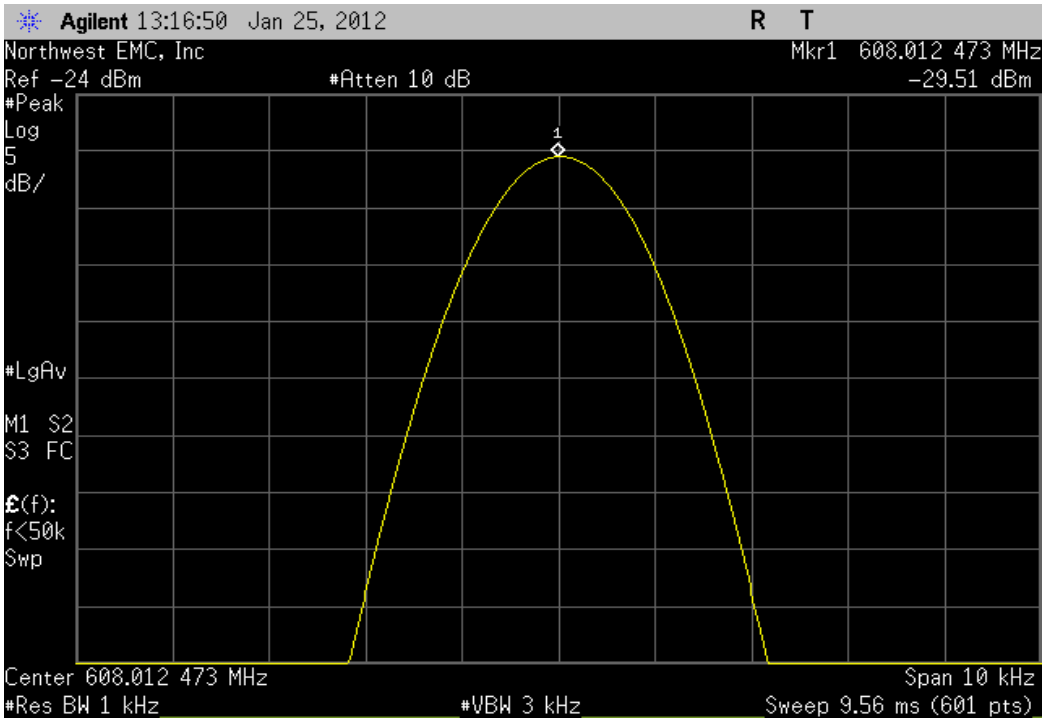
		608.012506	608.0125	0.01	N/A	N/A



Narrow Band, Low, 1241, 608.0125, +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.012473	608.0125	0.04	N/A	N/A



Narrow Band, Low, 1241, 608.0125, +20°						
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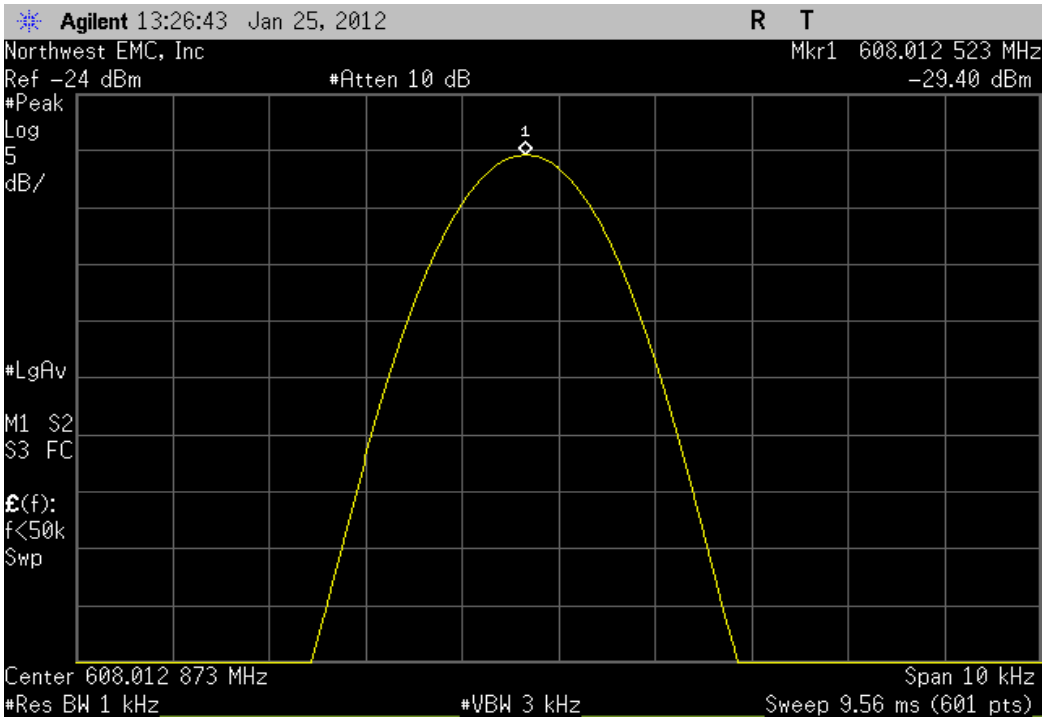
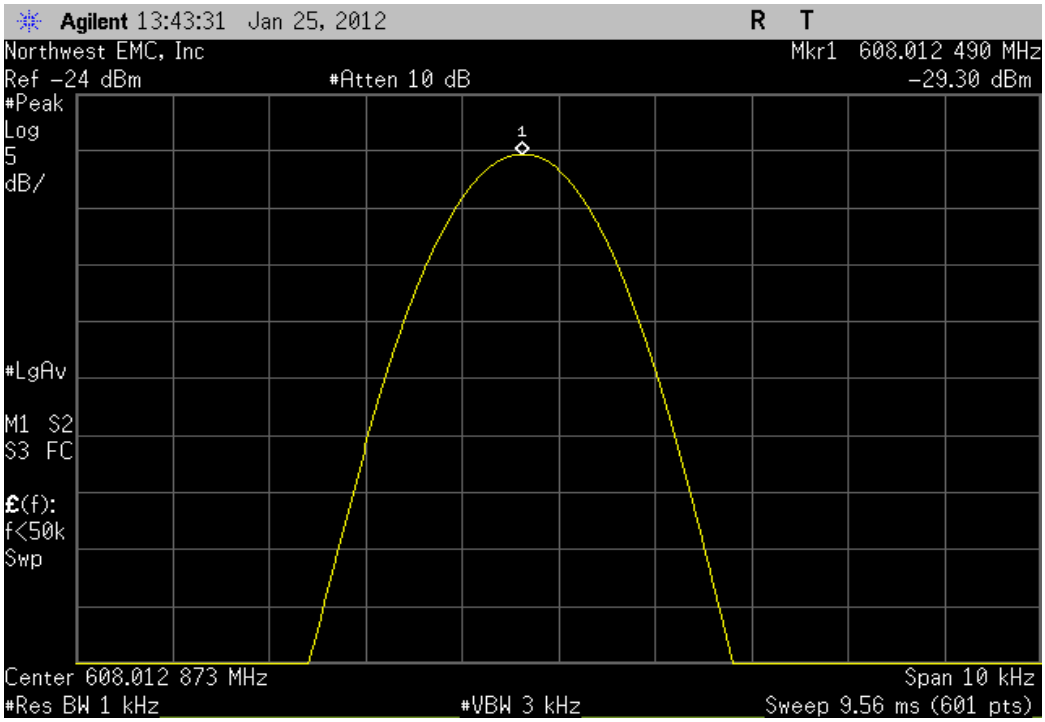
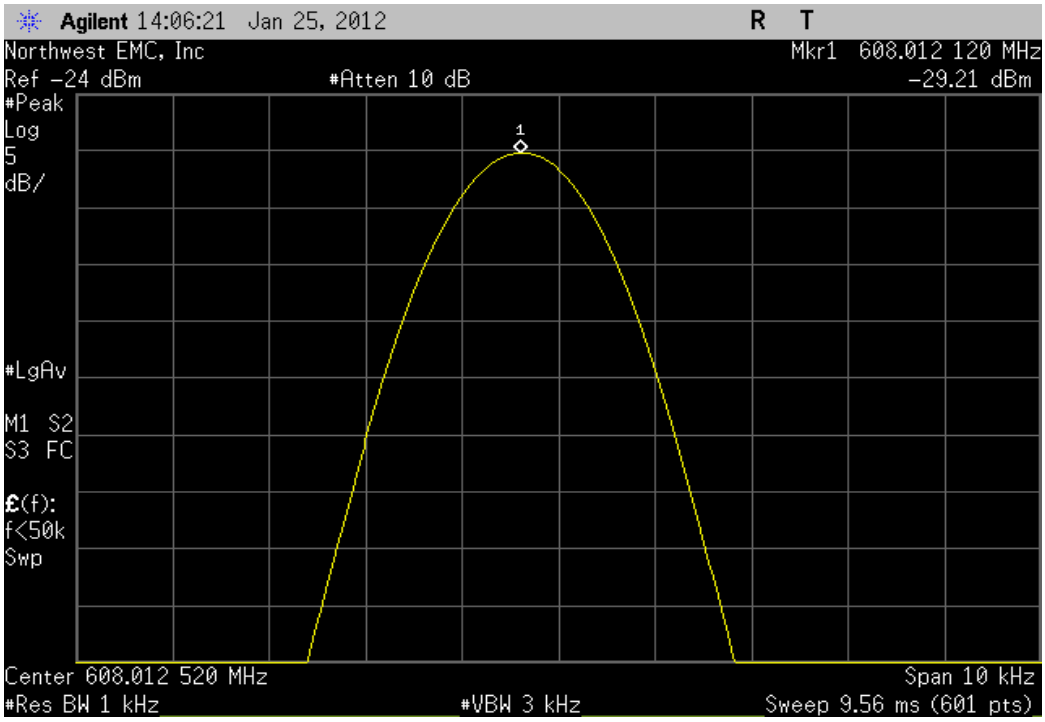
		608.012523	608.0125	0.04	N/A	N/A



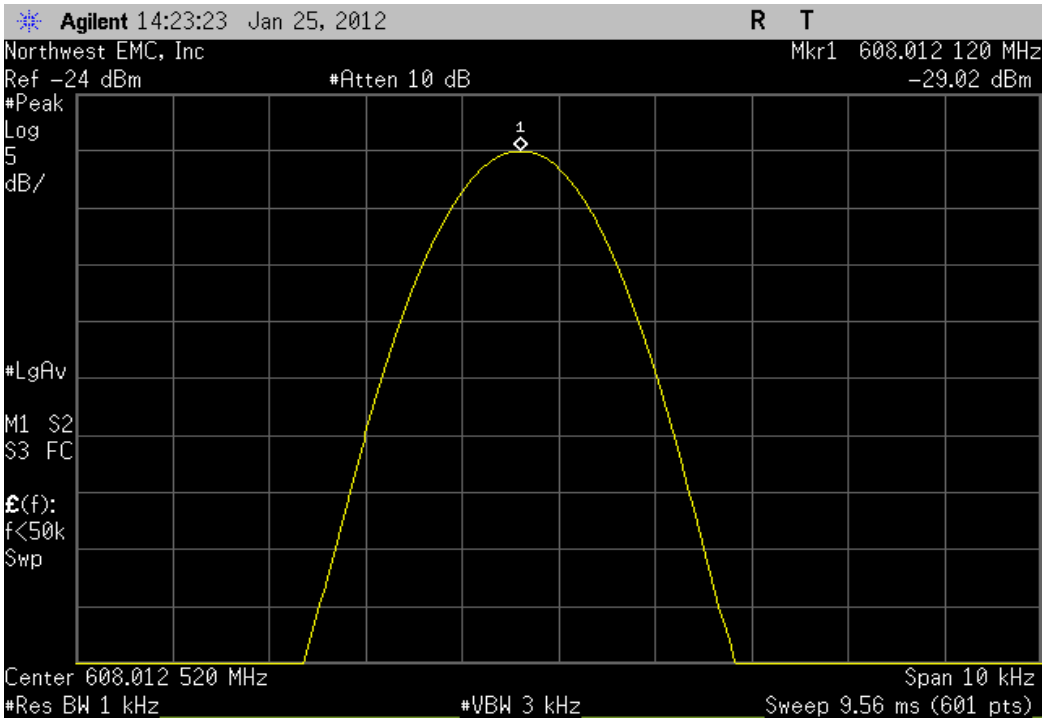
Narrow Band, Low, 1241, 608.0125, +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.01249	608.0125	0.02	N/A	N/A



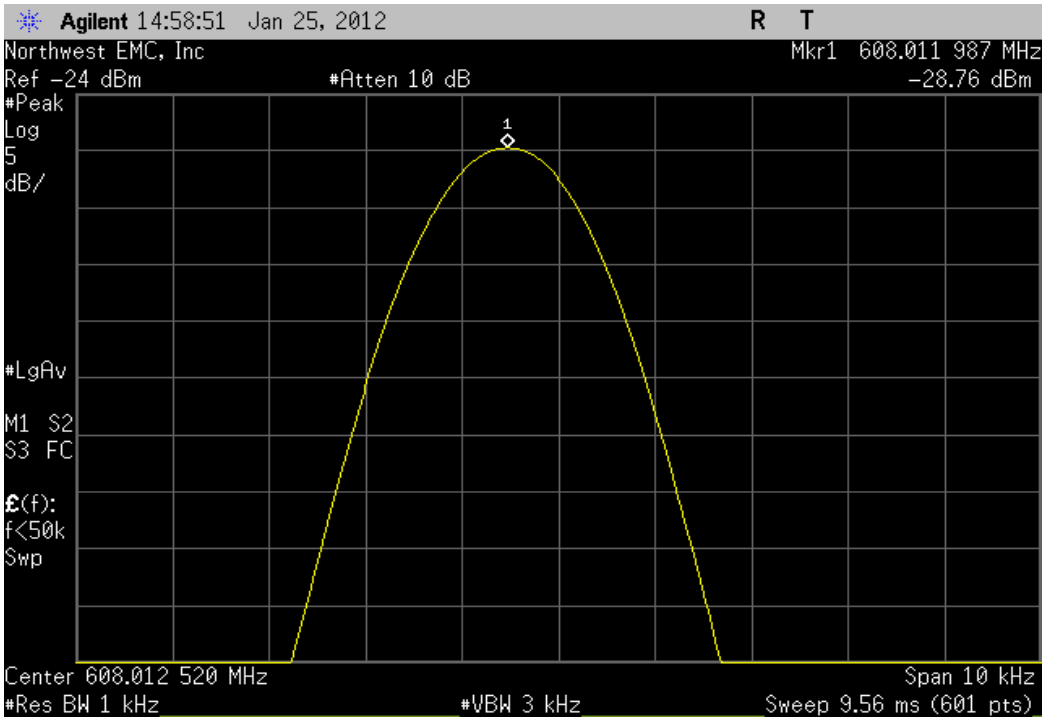
Narrow Band, Low, 1241, 608.0125, 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.01212	608.0125	0.62	N/A	N/A



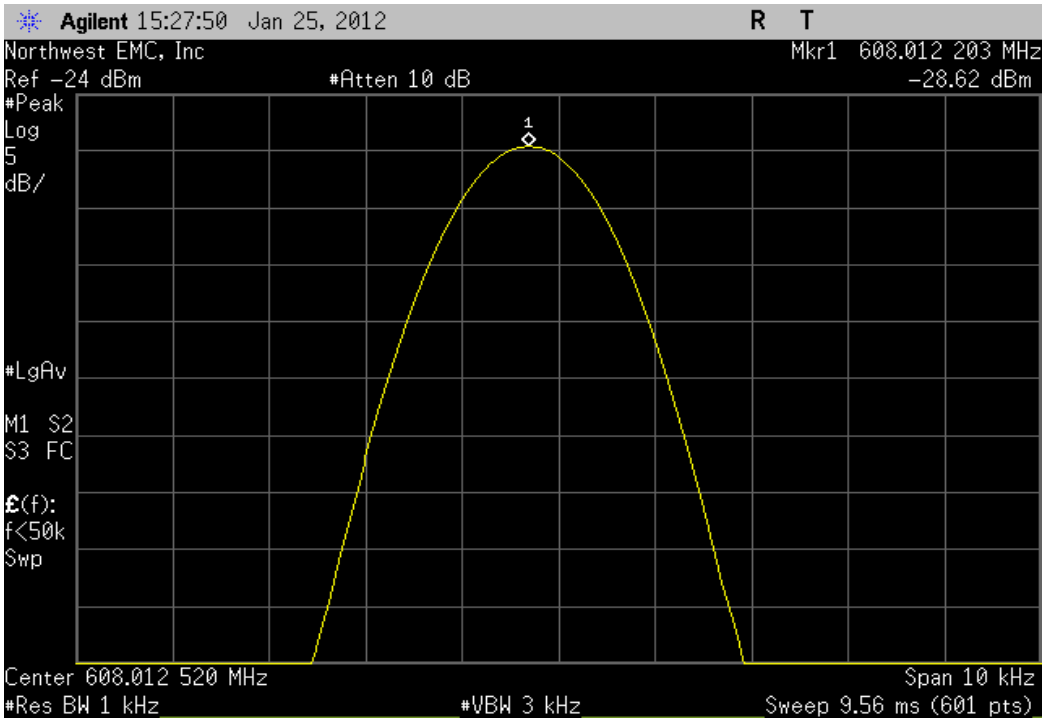
Narrow Band, Low, 1241, 608.0125, -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.01212	608.0125	0.62	N/A	N/A



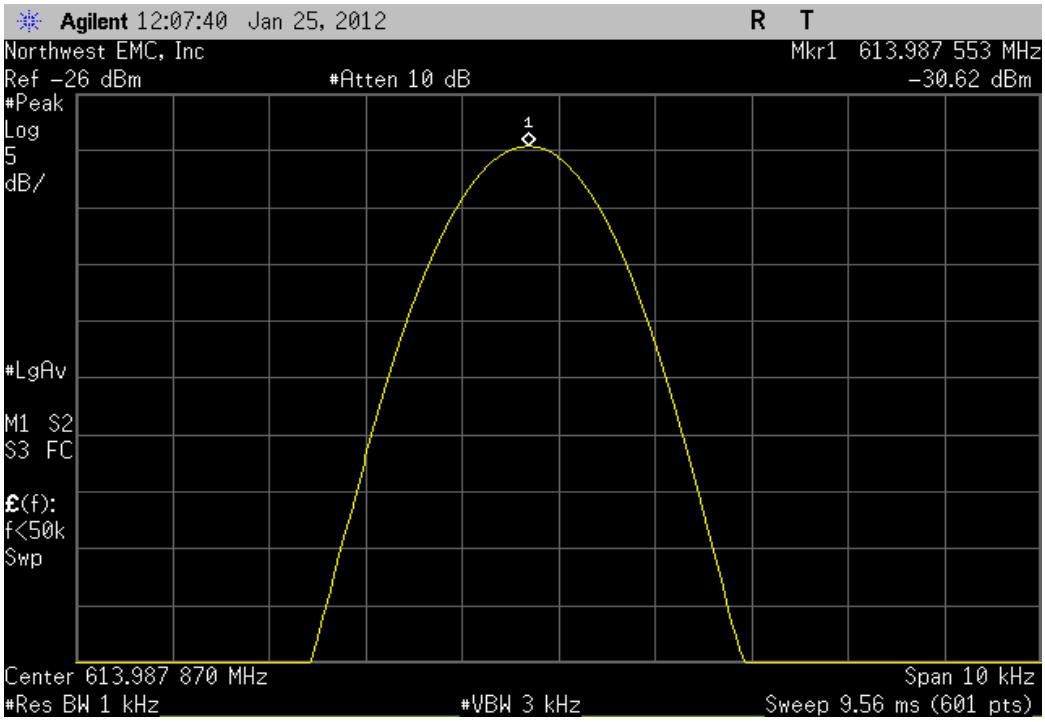
Narrow Band, Low, 1241, 608.0125, -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.011987	608.0125	0.84	N/A	N/A



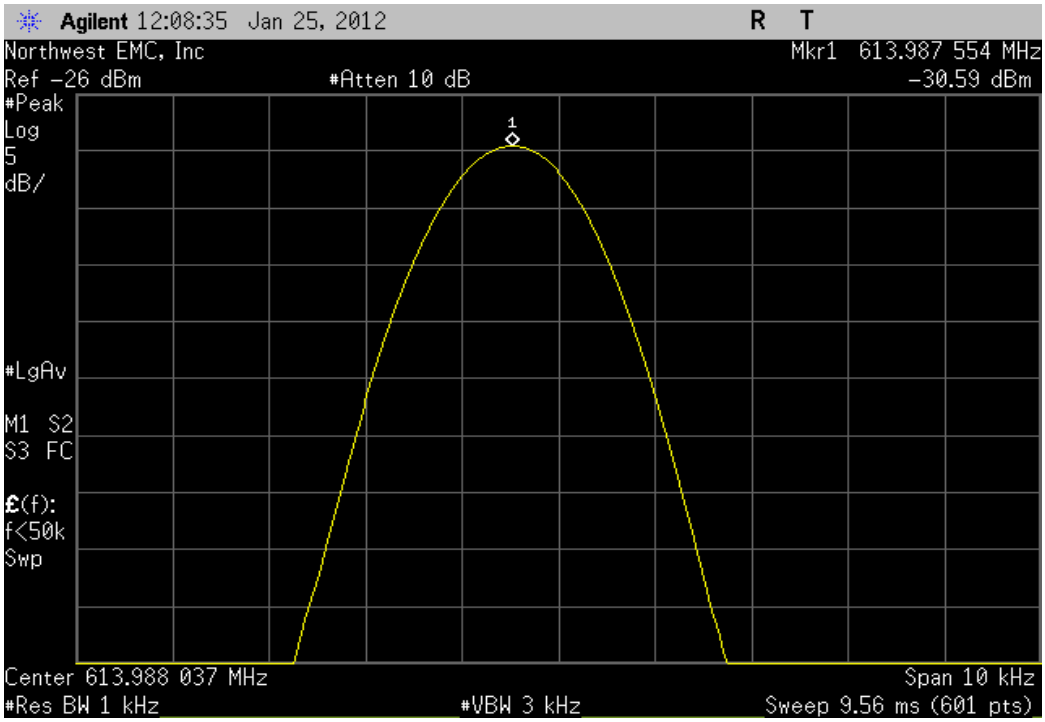
Narrow Band, Low, 1241, 608.0125, -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.012203	608.0125	0.49	N/A	N/A



Narrow Band, High, 1480, 613.9875, 3.45 VDC, 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.987553	613.9875	0.09	N/A	N/A

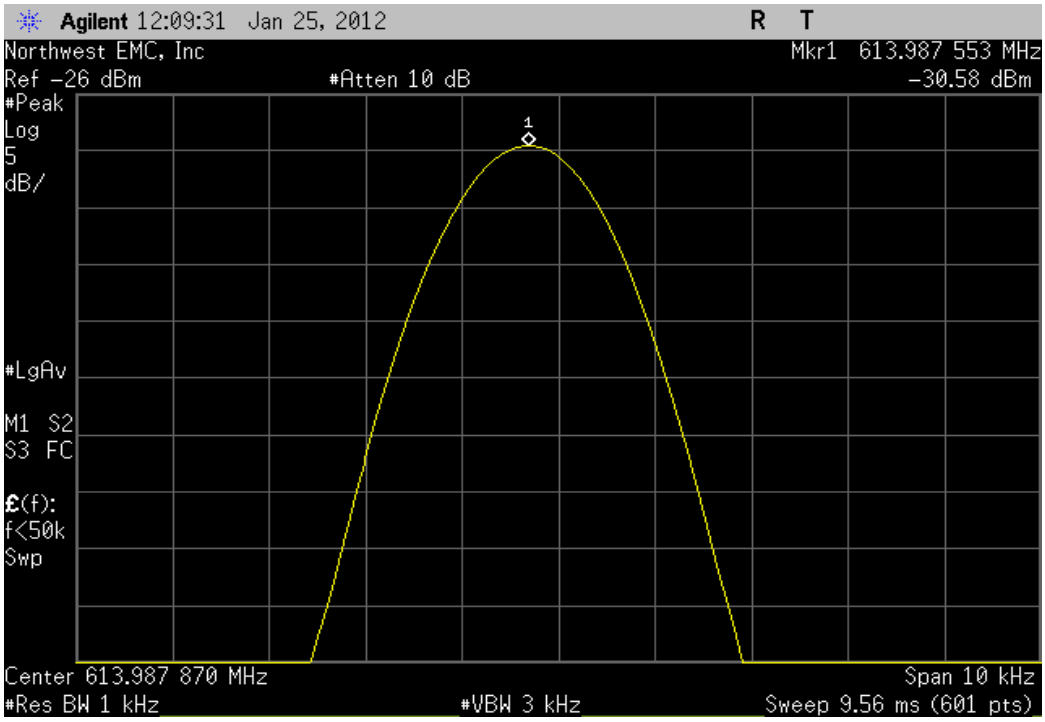


Narrow Band, High, 1480, 613.9875, 3.0 VDC, 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.987554	613.9875	0.09	N/A	N/A

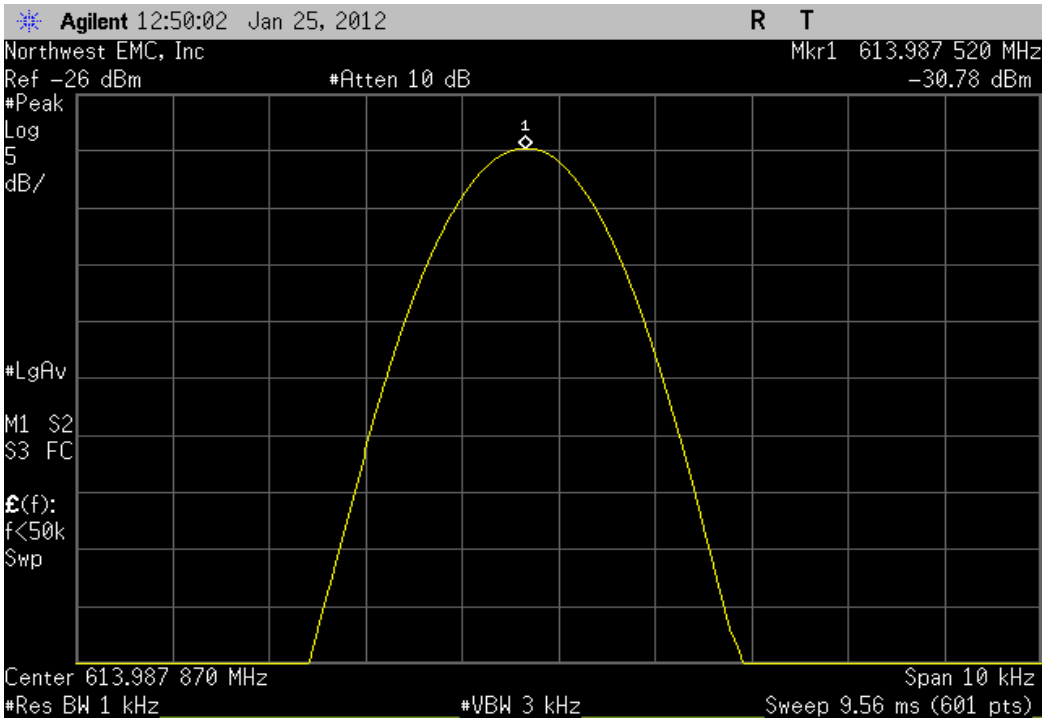


Frequency Stability

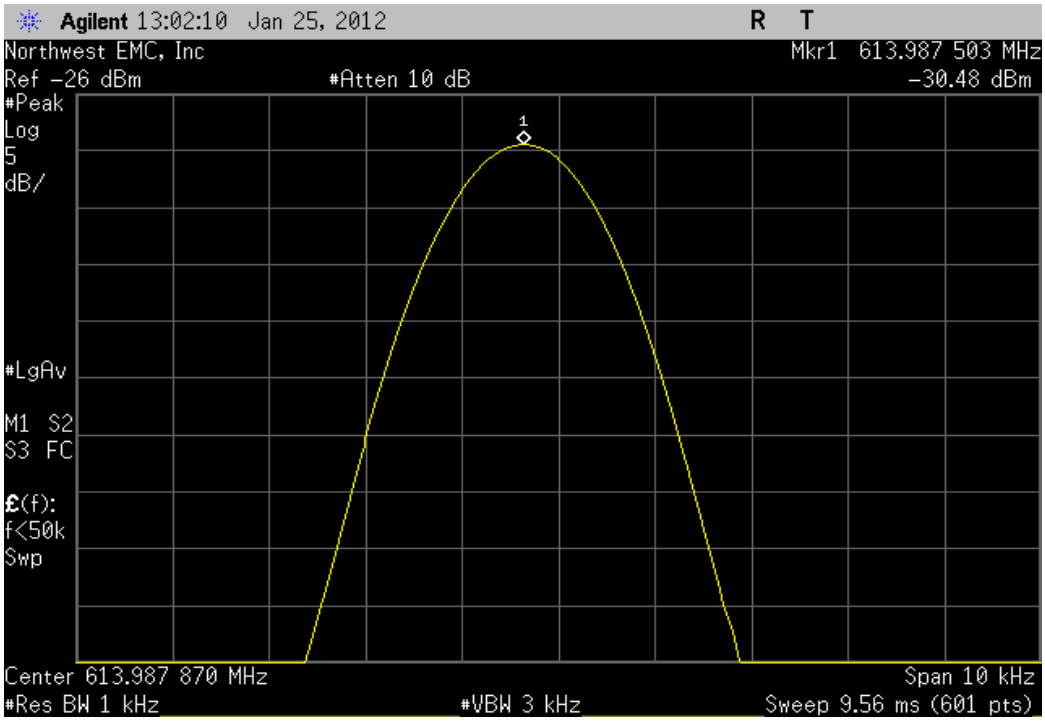
Narrow Band, High, 1480, 613.9875, 2.55 VDC 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.987553	613.9875	0.09	N/A	N/A



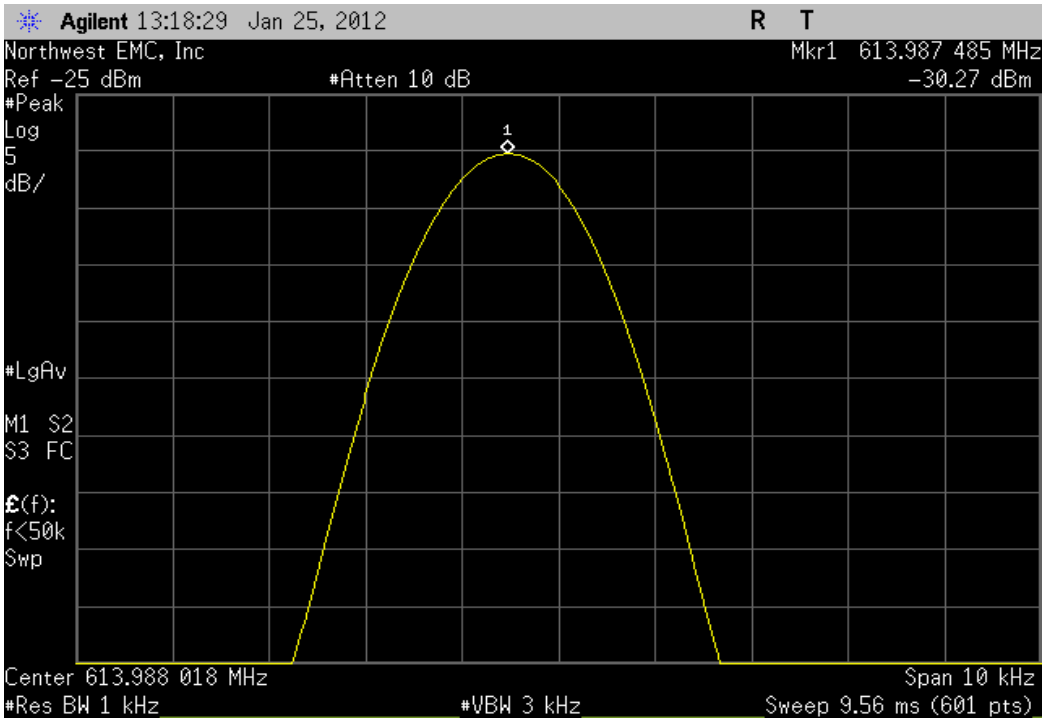
Narrow Band, High, 1480, 613.9875, +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.98752	613.9875	0.03	N/A	N/A



Narrow Band, High, 1480, 613.9875, +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.987503	613.9875	0	N/A	N/A

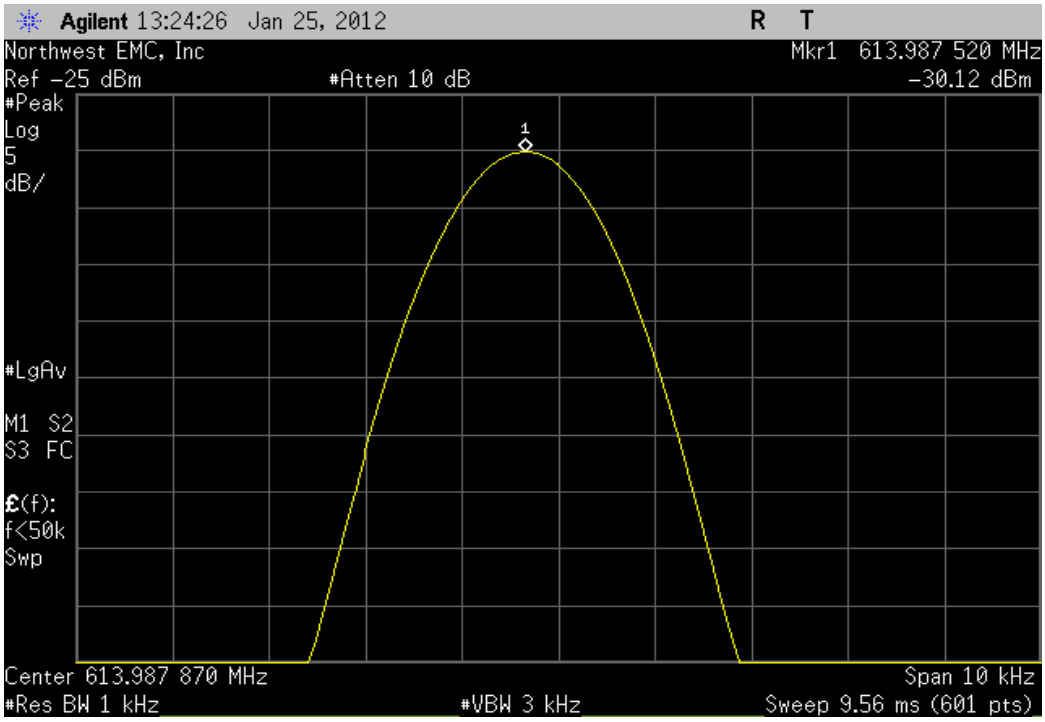


Narrow Band, High, 1480, 613.9875, +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.987485	613.9875	0.02	N/A	N/A

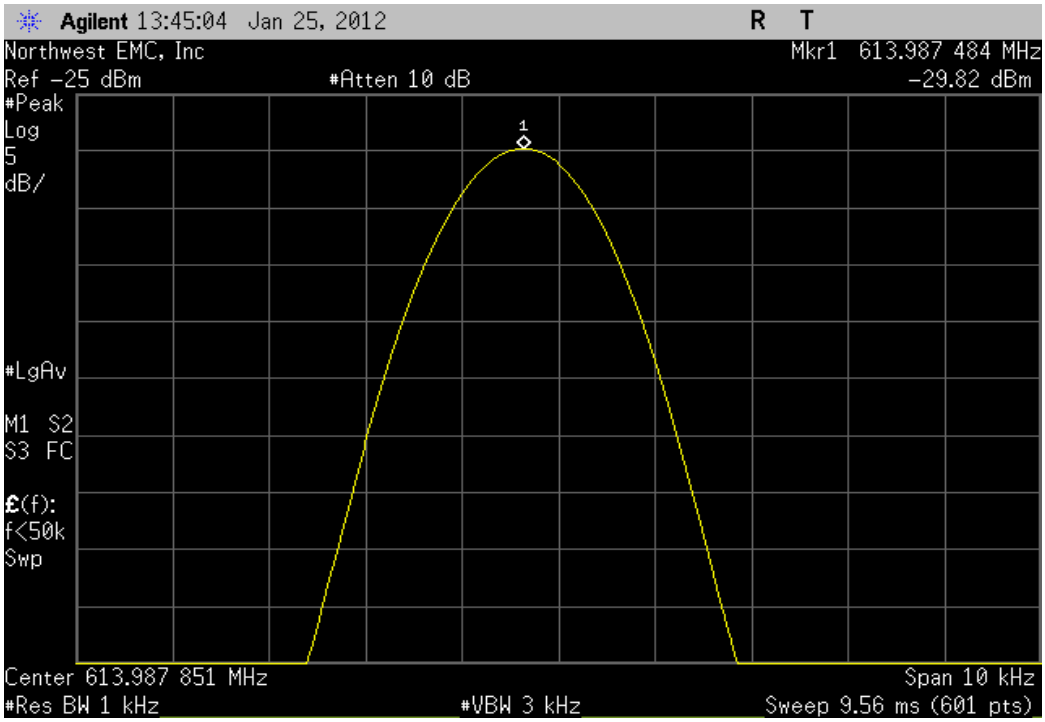


Frequency Stability

Narrow Band, High, 1480, 613.9875, +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.98752	613.9875	0.03	N/A	N/A

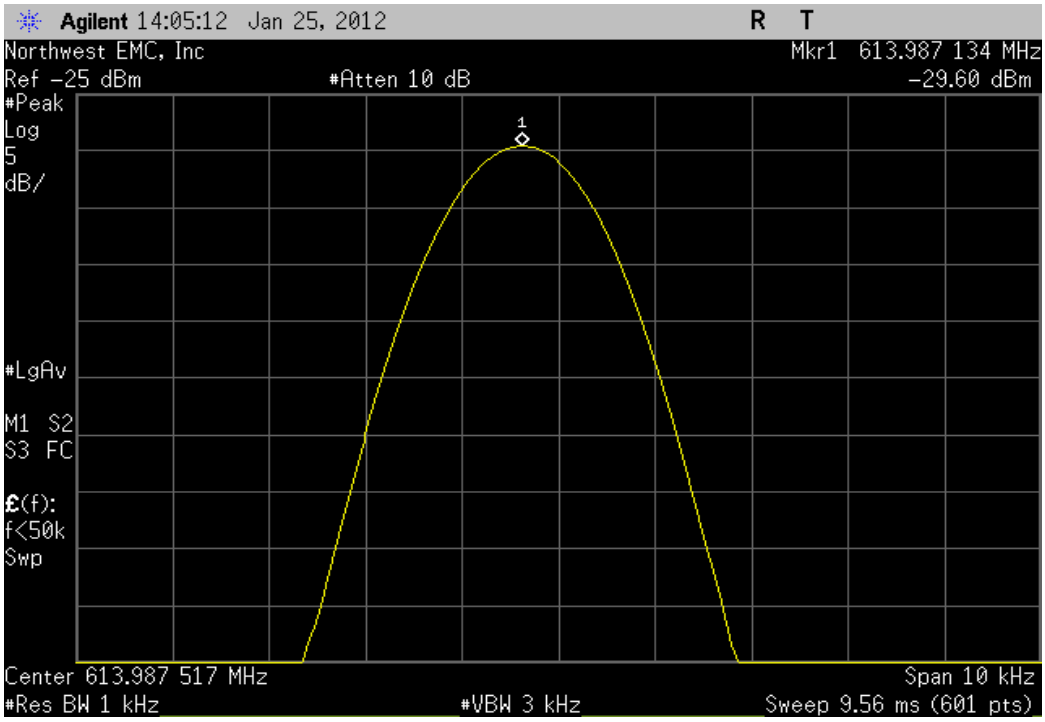


Narrow Band, High, 1480, 613.9875, +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.987484	613.9875	0.03	N/A	N/A

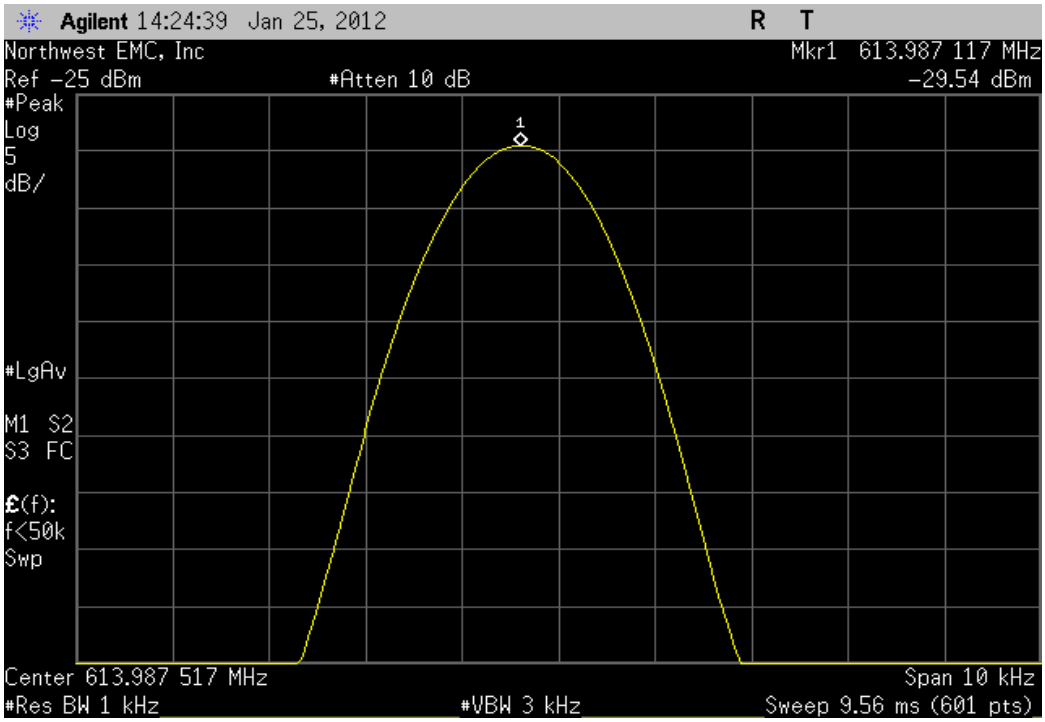


Frequency Stability

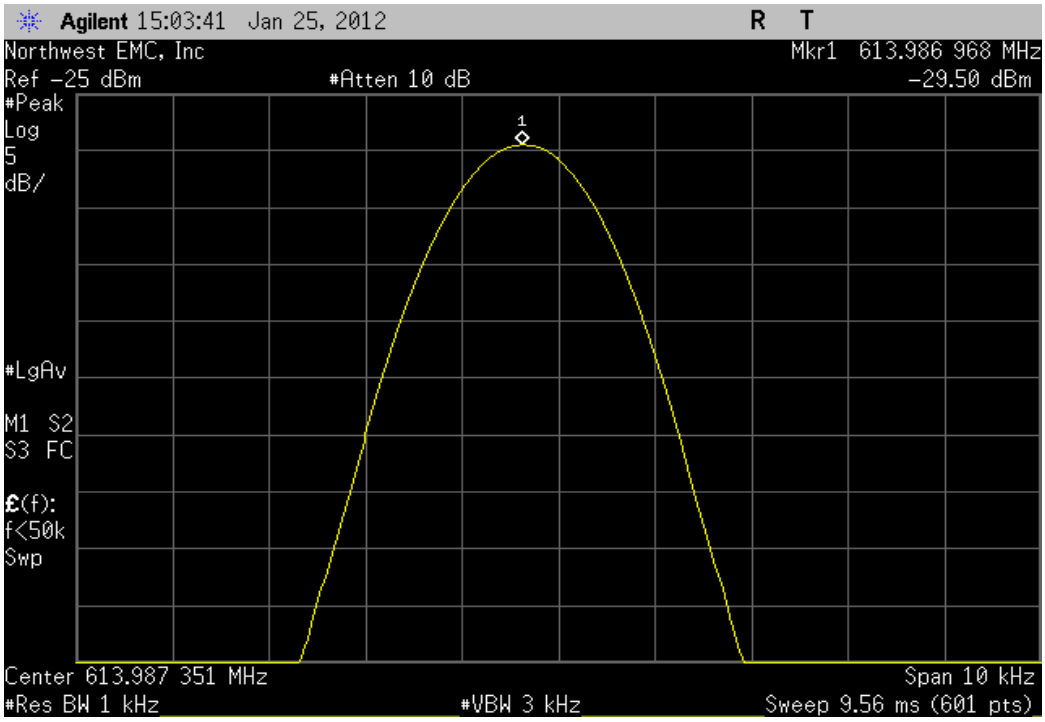
Narrow Band, High, 1480, 613.9875, 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.987134	613.9875	0.6	N/A	N/A



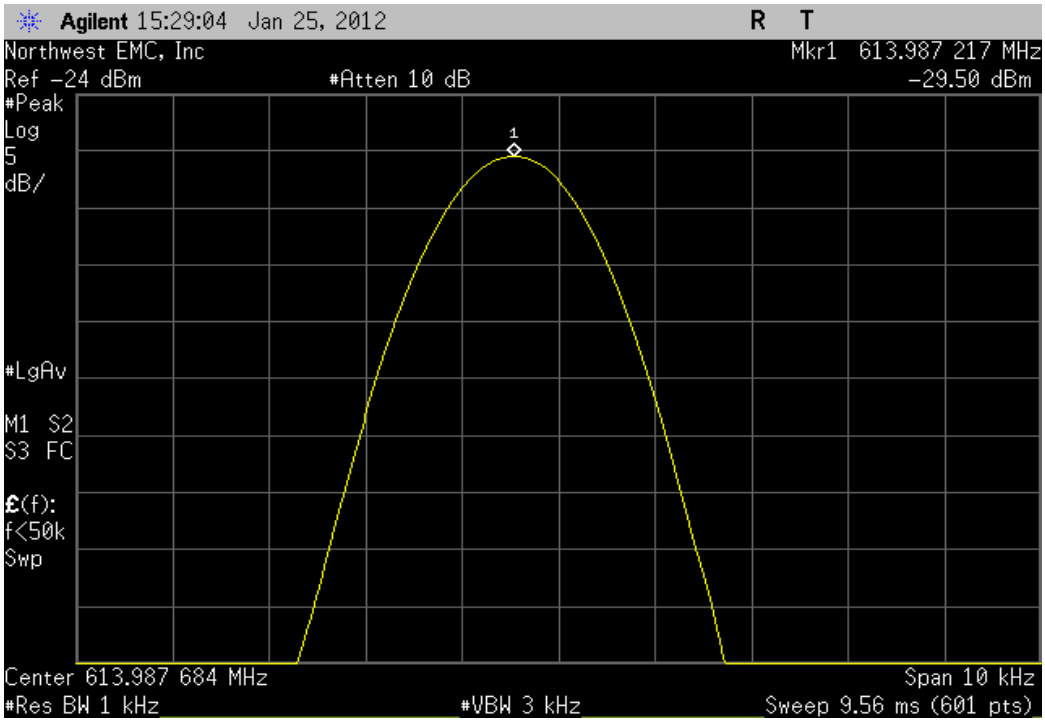
Narrow Band, High, 1480, 613.9875, -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.987117	613.9875	0.62	N/A	N/A



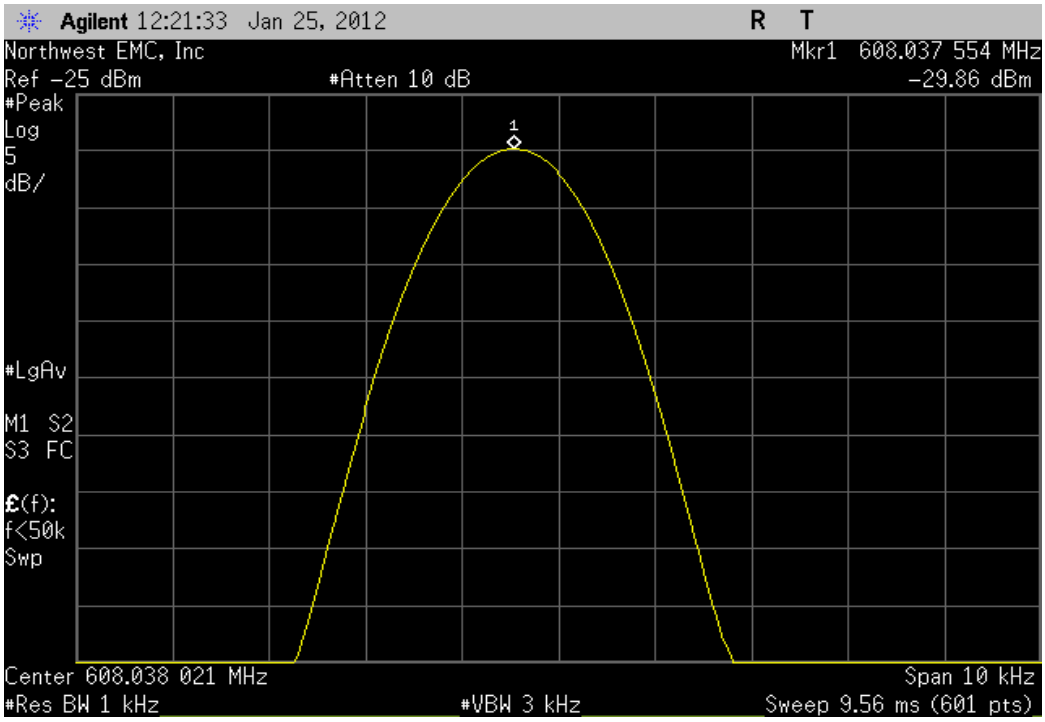
Narrow Band, High, 1480, 613.9875, -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.986968	613.9875	0.87	N/A	N/A



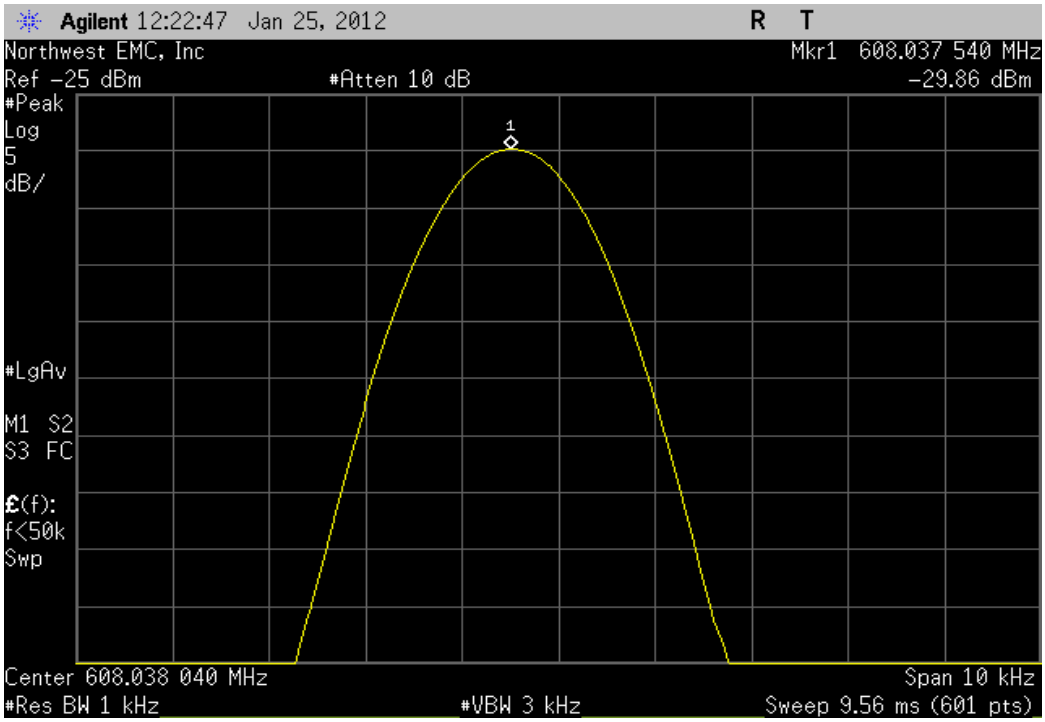
Narrow Band, High, 1480, 613.9875, -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.987217	613.9875	0.46	N/A	N/A



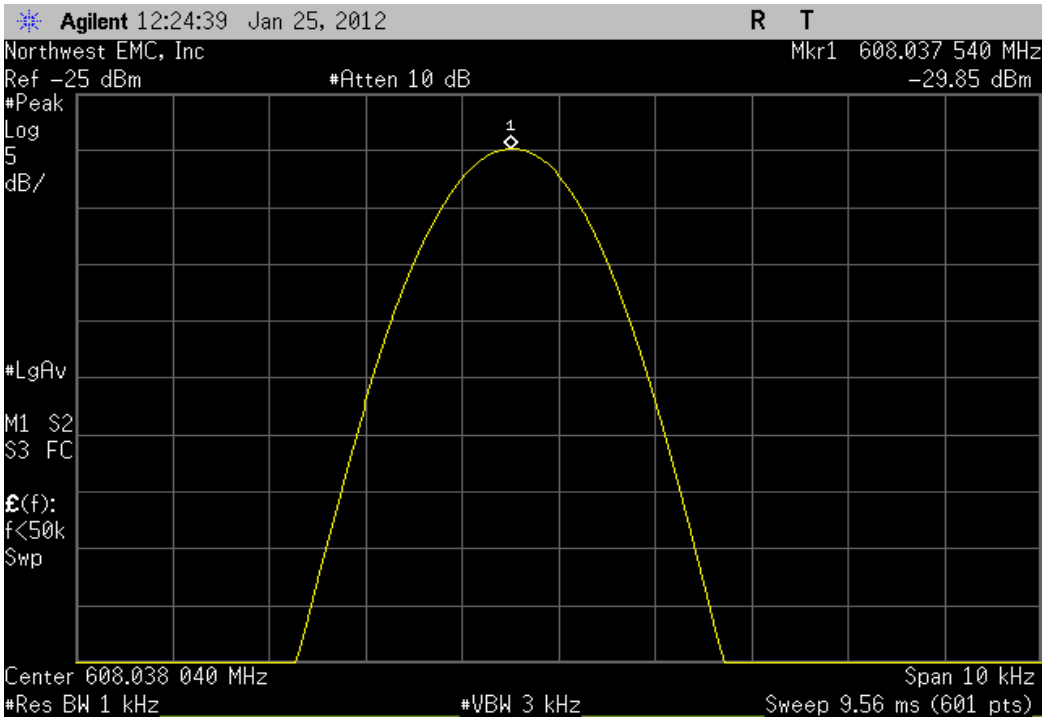
Wide Band, Low, 2242, 608.375, 3.45 VDC, 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.037554	608.0375	0.09	N/A	N/A



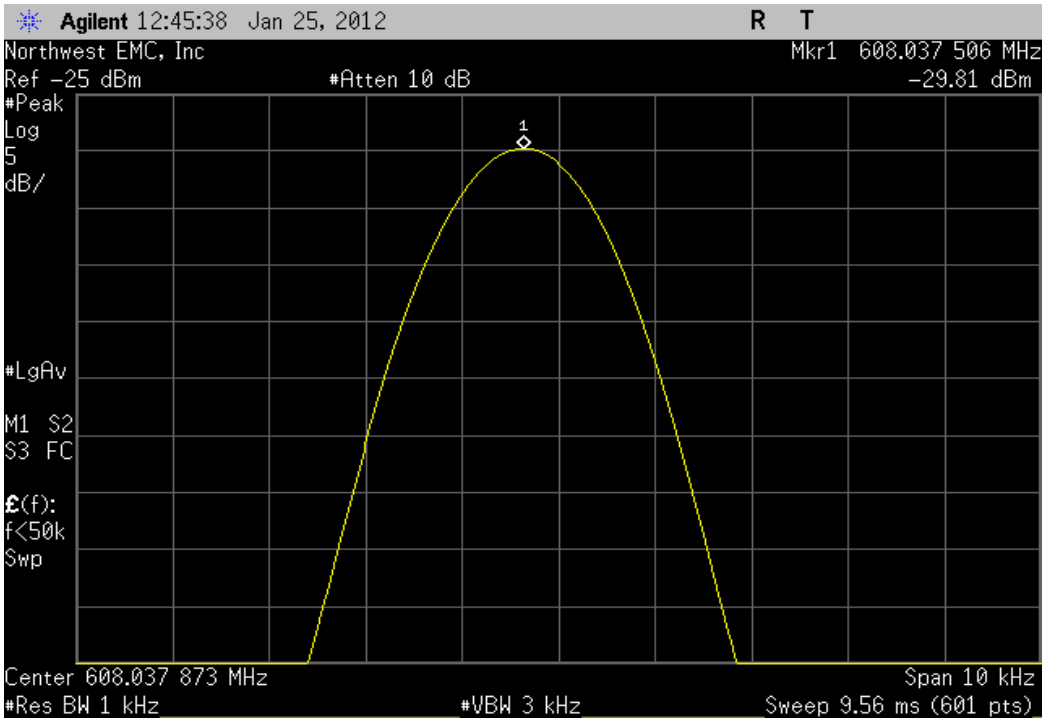
Wide Band, Low, 2242, 608.375, 3.0 VDC, 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.03754	608.0375	0.07	N/A	N/A



Wide Band, Low, 2242, 608.375, 2.55 VDC 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.03754	608.0375	0.07	N/A	N/A

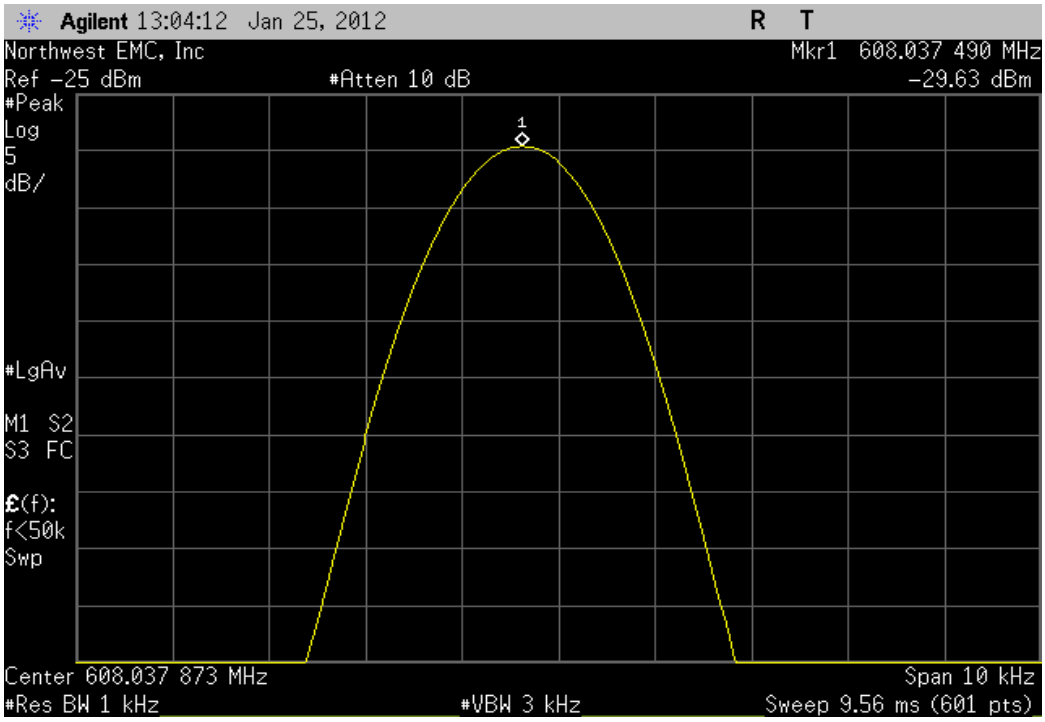


Wide Band, Low, 2242, 608.375, +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.037506	608.0375	0.01	N/A	N/A

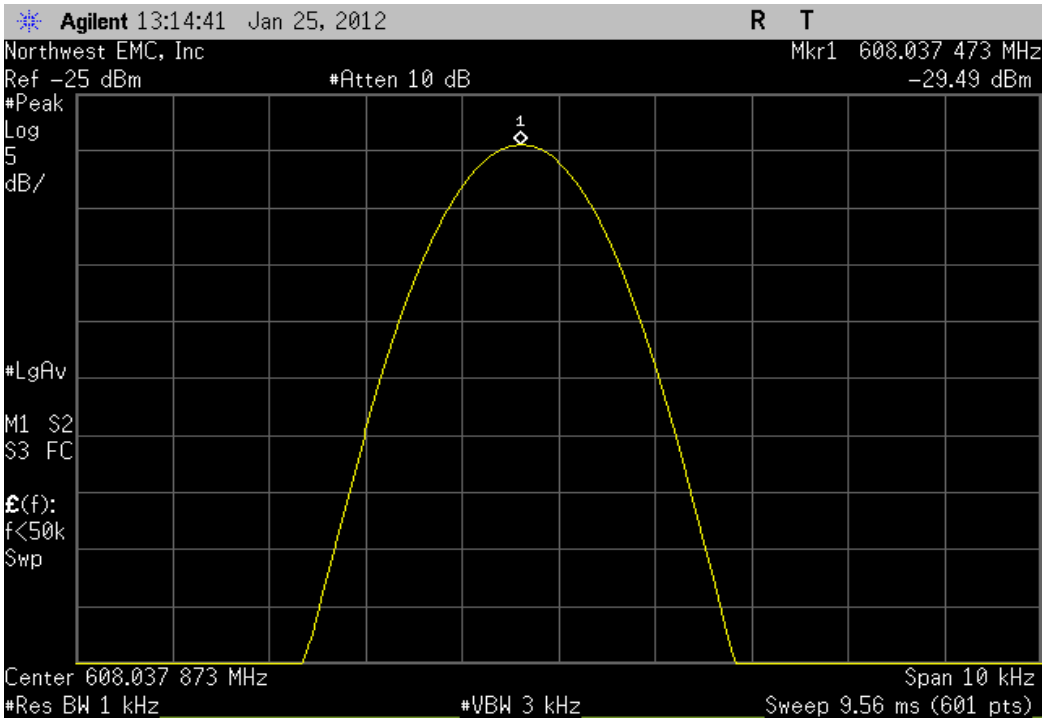


Frequency Stability

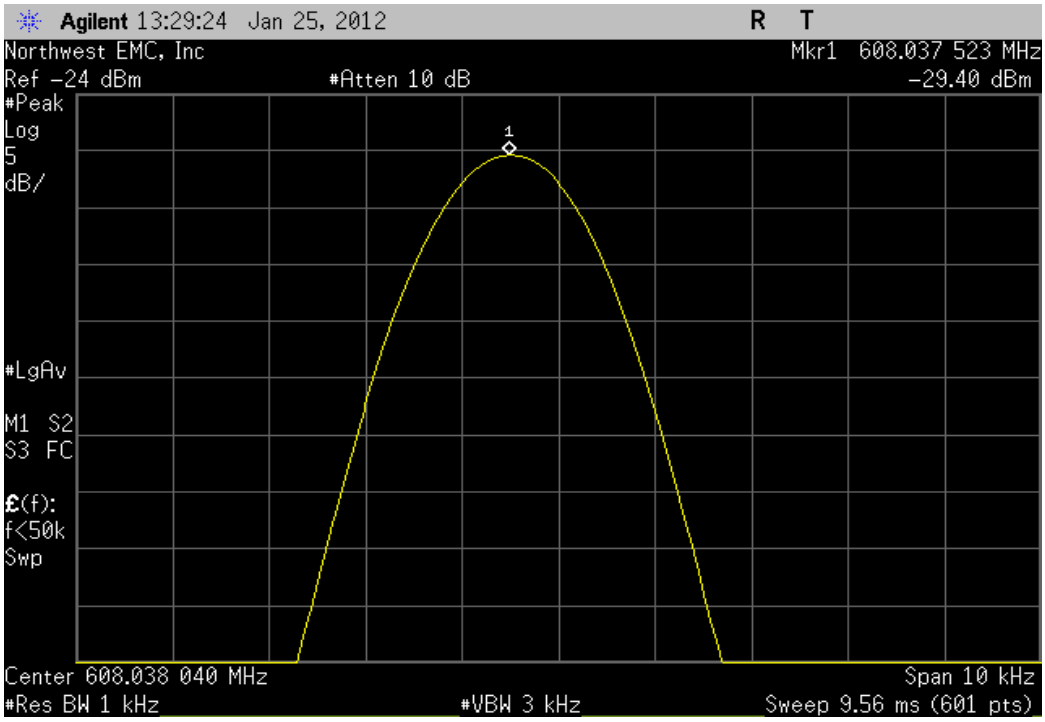
Wide Band, Low, 2242, 608.375, +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.03749	608.0375	0.02	N/A	N/A



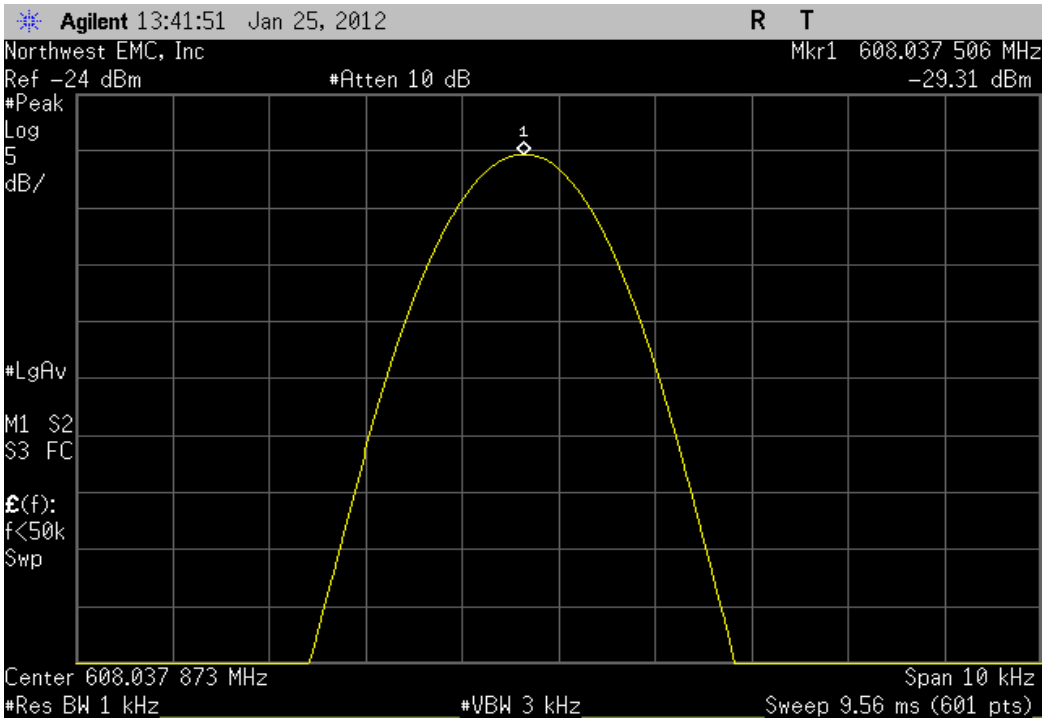
Wide Band, Low, 2242, 608.375, +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.037473	608.0375	0.04	N/A	N/A



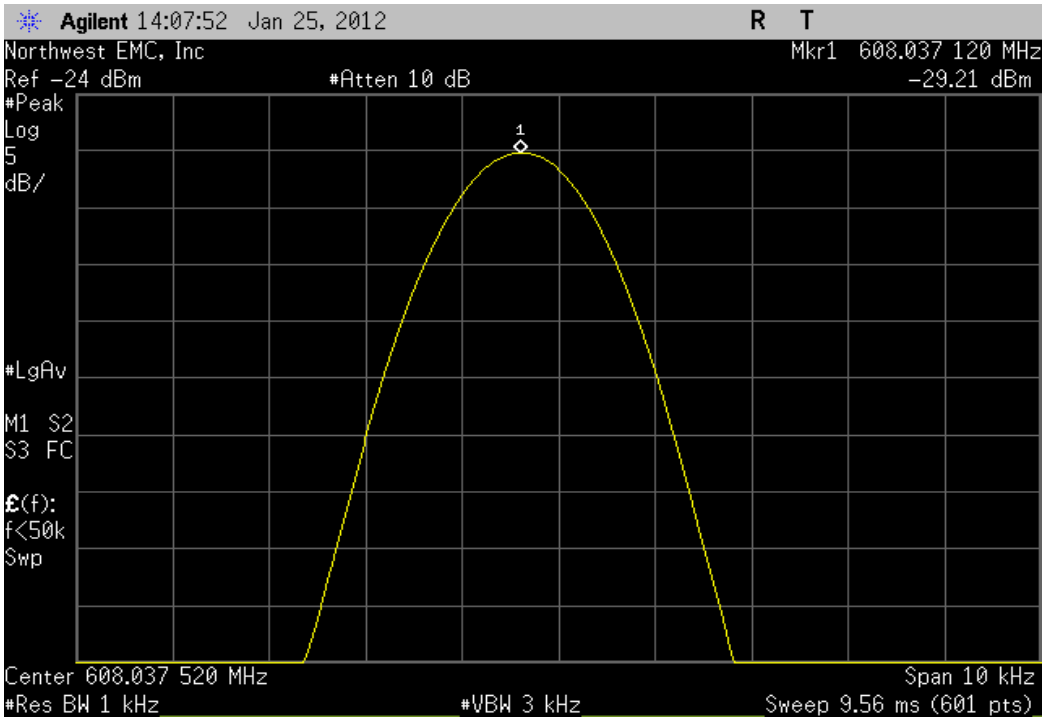
Wide Band, Low, 2242, 608.375, +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.037523	608.0375	0.04	N/A	N/A



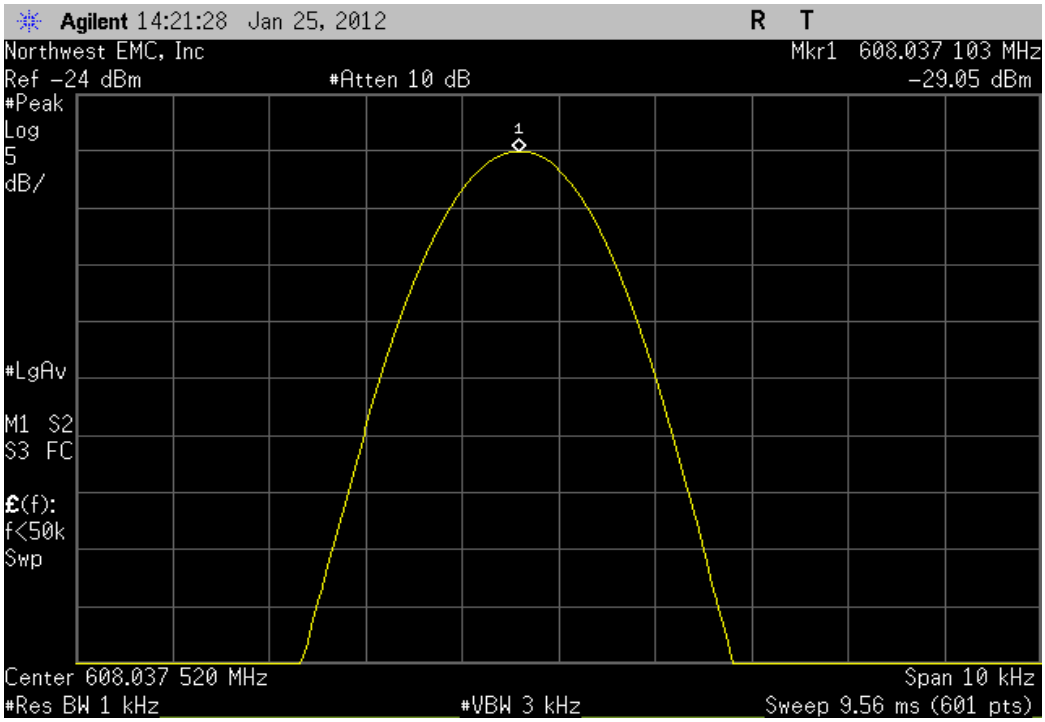
Wide Band, Low, 2242, 608.375, +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.037506	608.0375	0.01	N/A	N/A



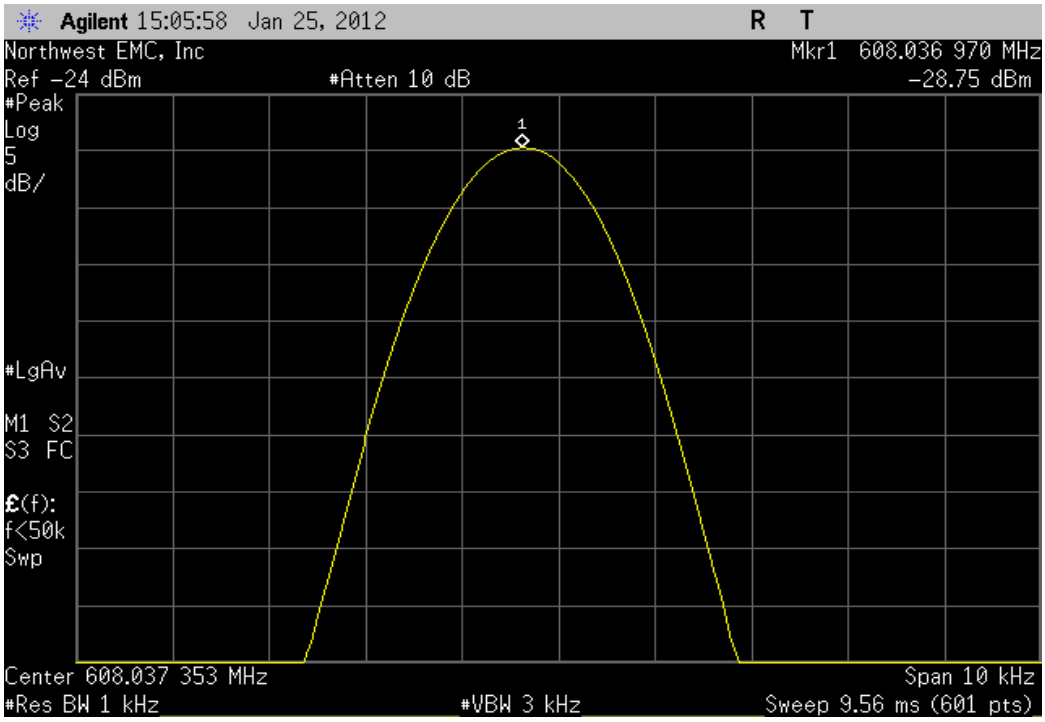
Wide Band, Low, 2242, 608.375, 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.03712	608.0375	0.62	N/A	N/A



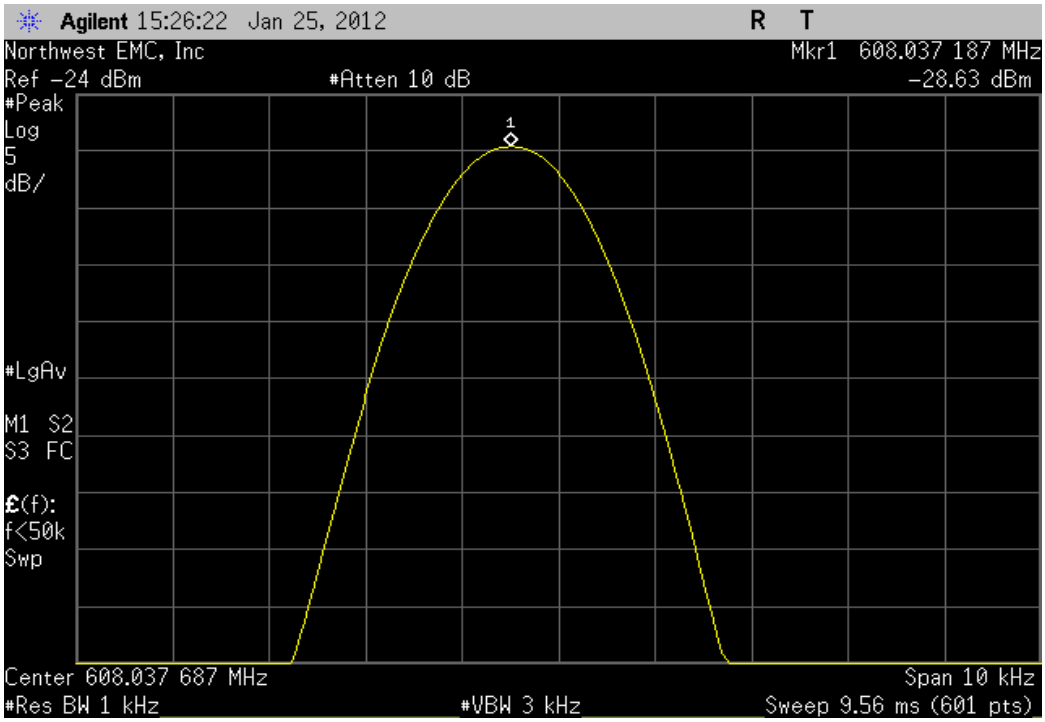
Wide Band, Low, 2242, 608.375, -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.037103	608.0375	0.65	N/A	N/A



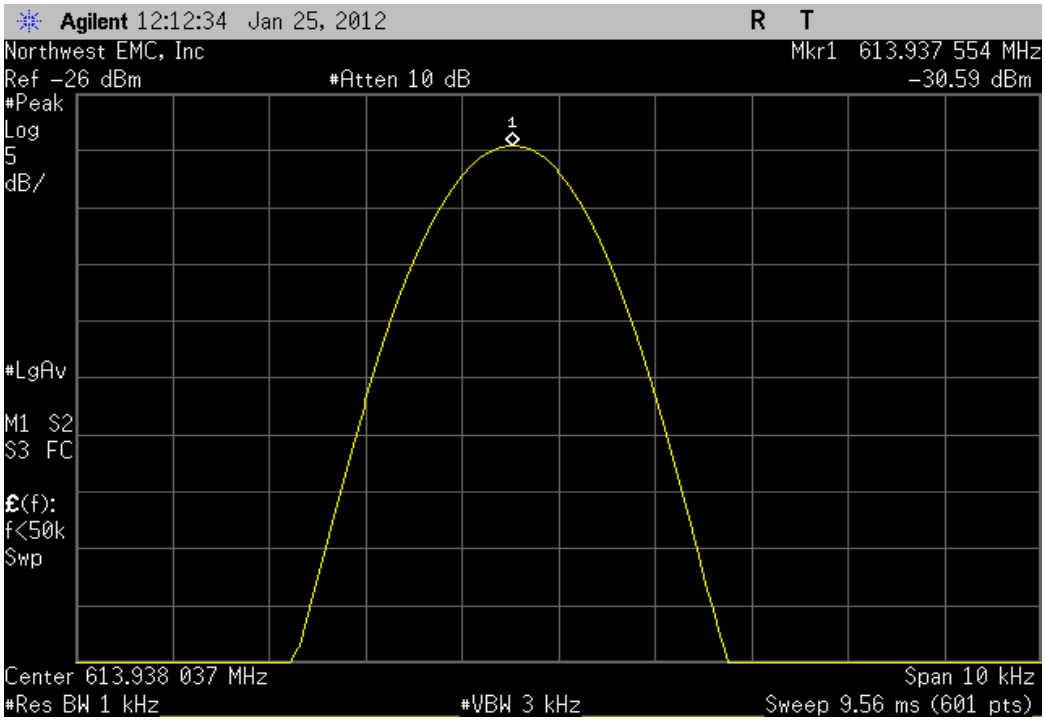
Wide Band, Low, 2242, 608.375, -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.03697	608.0375	0.87	N/A	N/A



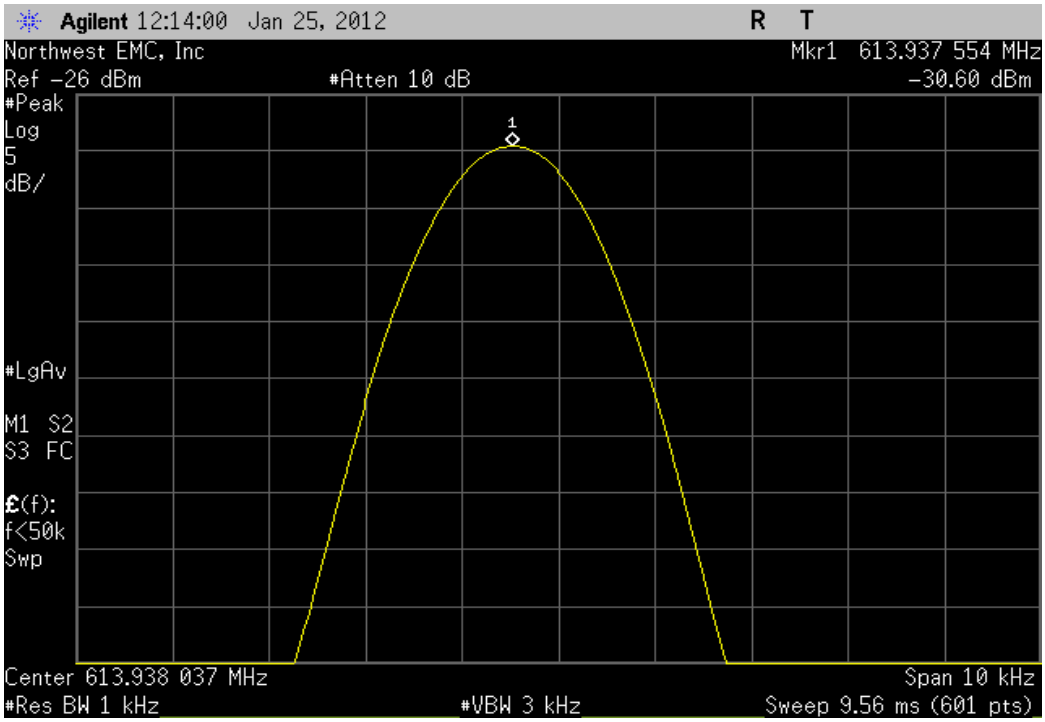
Wide Band, Low, 2242, 608.375, -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		608.037187	608.0375	0.51	N/A	N/A



Wide Band, High, 2478, 613.9375, 3.45 VDC, 115%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.937554	613.9375	0.09	N/A	N/A

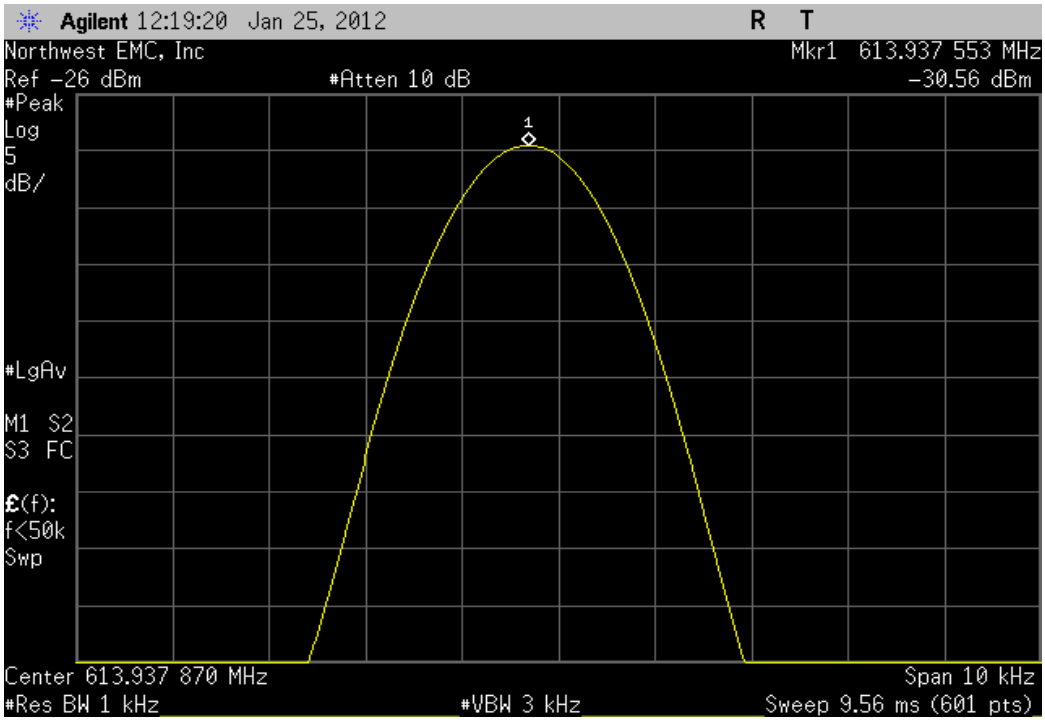


Wide Band, High, 2478, 613.9375, 3.0 VDC, 100%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.937554	613.9375	0.09	N/A	N/A

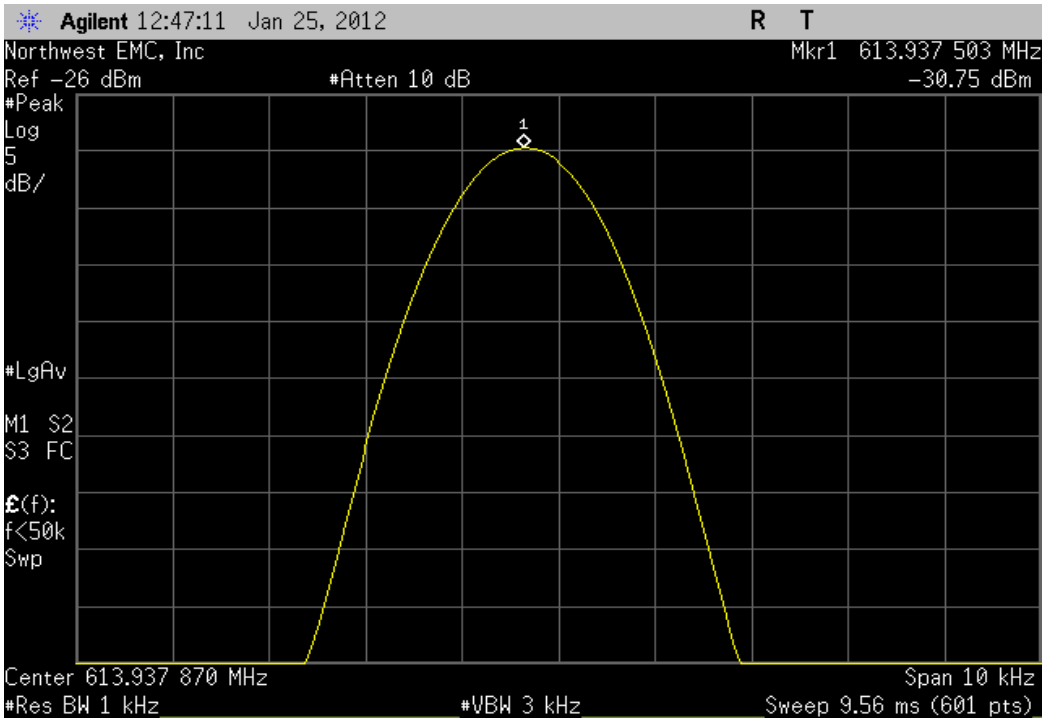


Frequency Stability

Wide Band, High, 2478, 613.9375, 2.55 VDC 85%						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.937553	613.9375	0.09	N/A	N/A

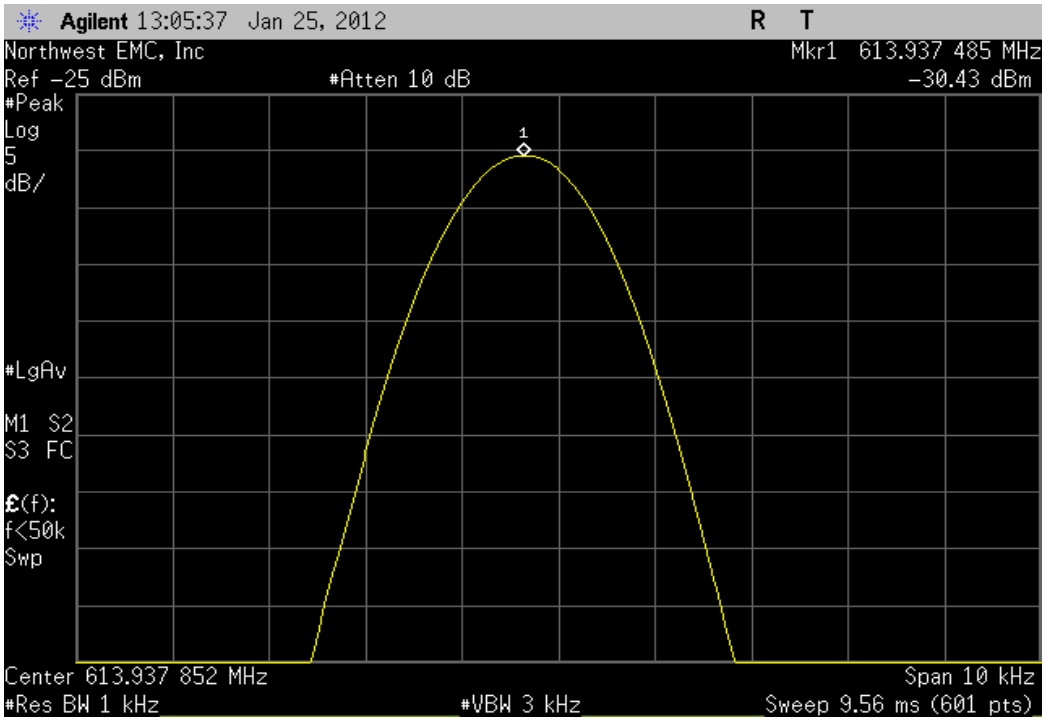


Wide Band, High, 2478, 613.9375, +50°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.937503	613.9375	0	N/A	N/A

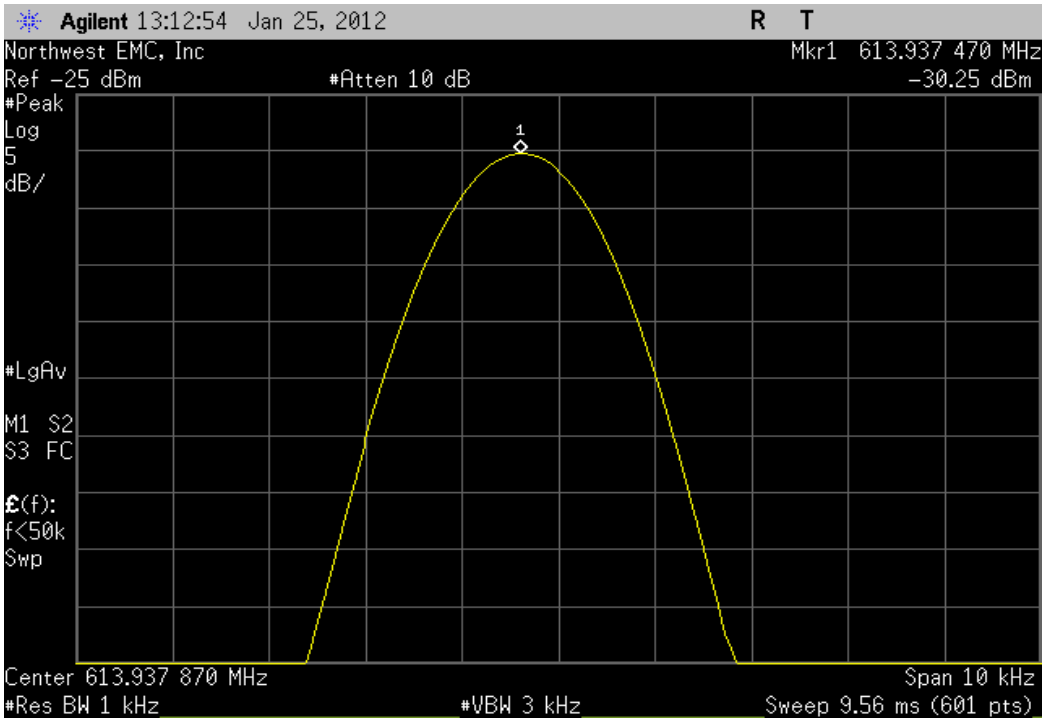


Frequency Stability

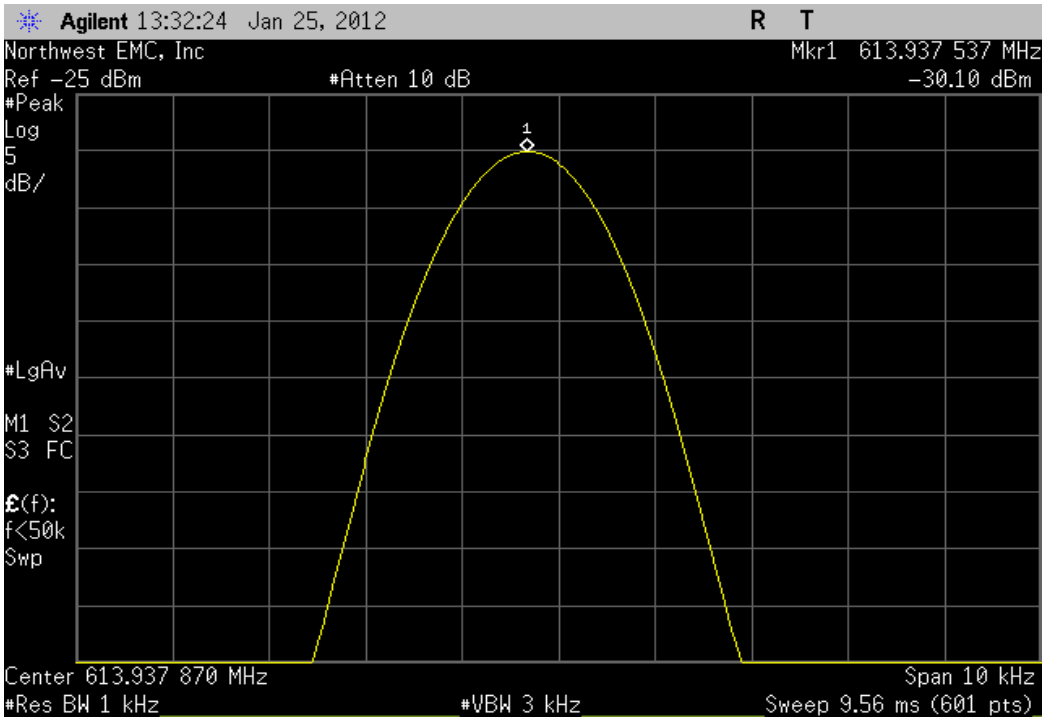
Wide Band, High, 2478, 613.9375, +40°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.937485	613.9375	0.02	N/A	N/A



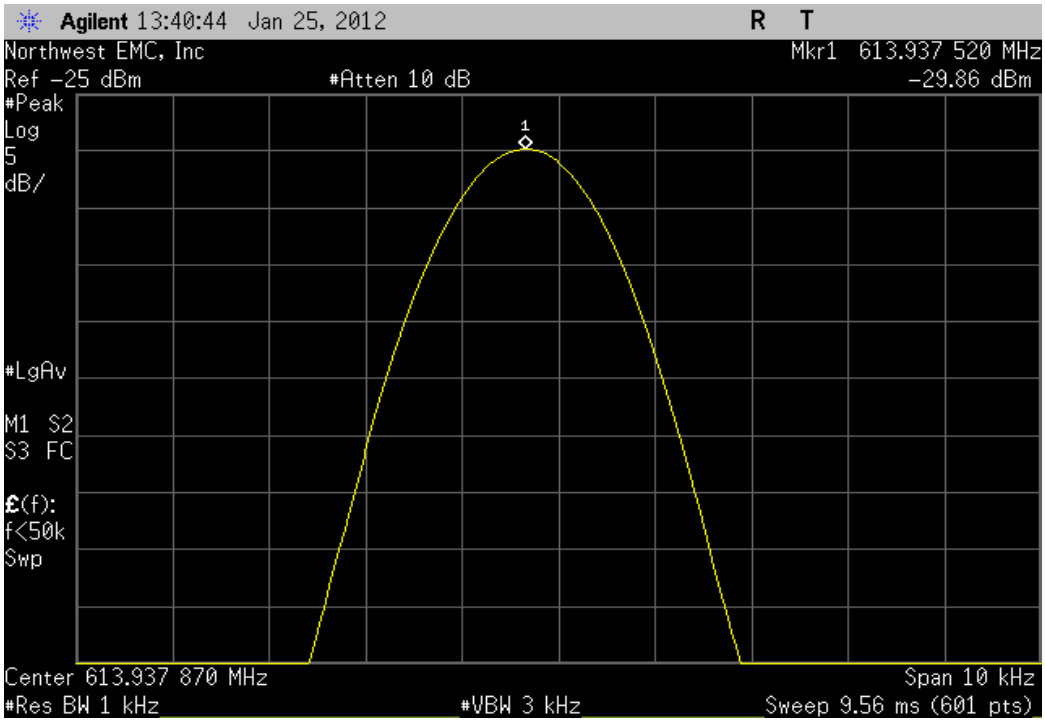
Wide Band, High, 2478, 613.9375, +30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.93747	613.9375	0.05	N/A	N/A



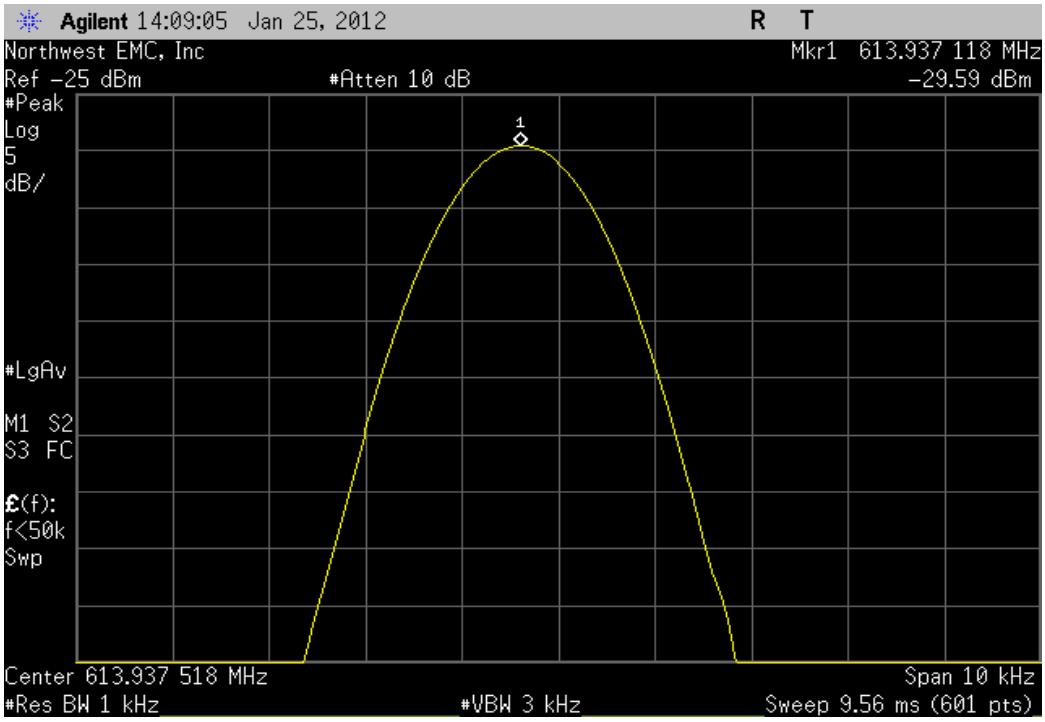
Wide Band, High, 2478, 613.9375, +20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.937537	613.9375	0.06	N/A	N/A



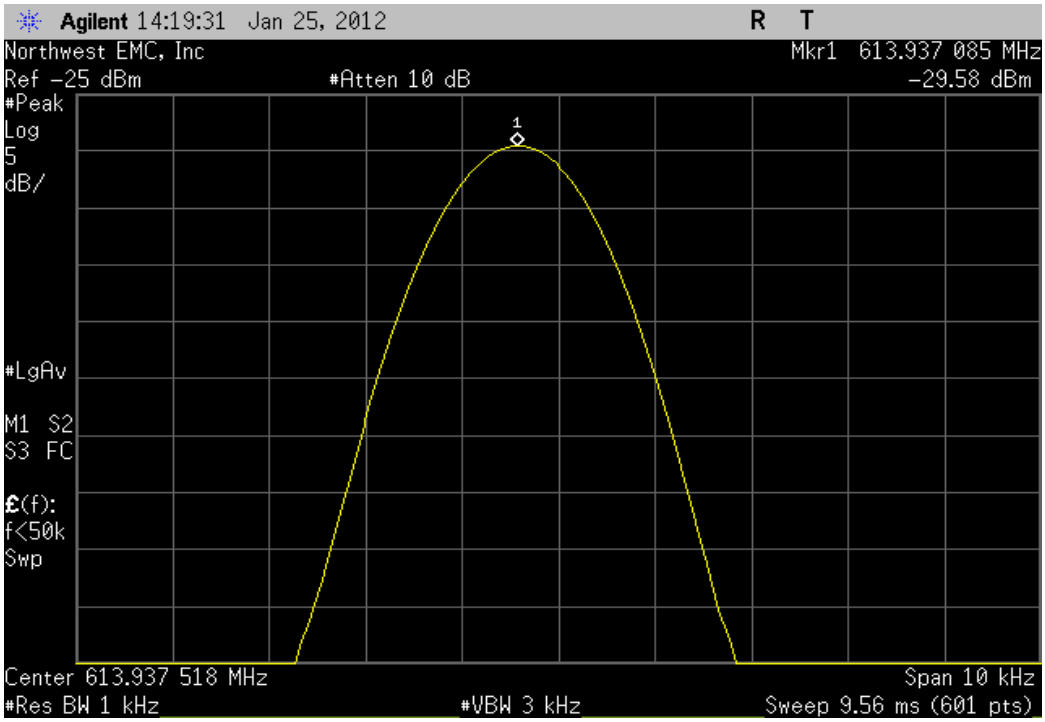
Wide Band, High, 2478, 613.9375, +10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.93752	613.9375	0.03	N/A	N/A



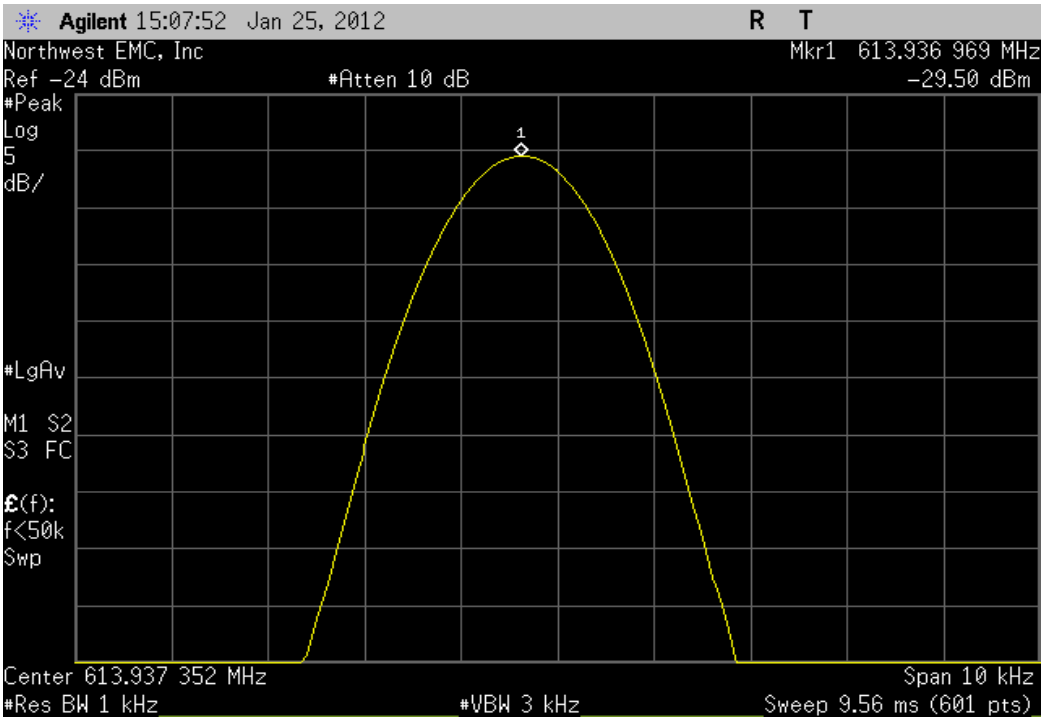
Wide Band, High, 2478, 613.9375, 0°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.937118	613.9375	0.62	N/A	N/A



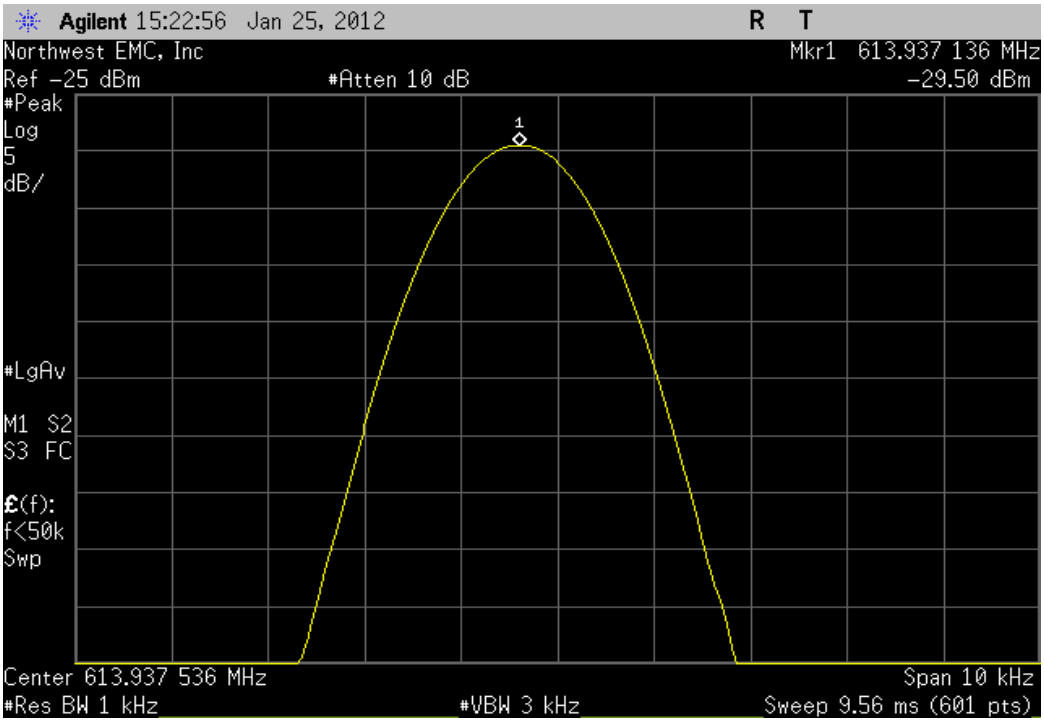
Wide Band, High, 2478, 613.9375, -10°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.937085	613.9375	0.68	N/A	N/A



Wide Band, High, 2478, 613.9375, -20°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.936969	613.9375	0.86	N/A	N/A



Wide Band, High, 2478, 613.9375, -30°						
		Measured Value (MHz)	Assigned Value (MHz)	Error (ppm)		Result
		613.937136	613.9375	0.59	N/A	N/A



OCCUPIED BANDWIDTH

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
Near Field Probe	EMCO	7405	IPD	NCR	0

MEASUREMENT UNCERTAINTY

A measurement uncertainty estimation has been performed for each test per our internal quality document WP 342. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty for radiated emissions measurements is less than +/- 4 dB, and for conducted emissions measurements is less than +/- 2.7 dB. Our measurement data meets or exceeds the measurement uncertainty requirements of CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

Per 47 CFR 2.1049, the 99% bandwidth was measured utilizing the analyzer's Occupied BW measurement function. The antenna is integral to the EUT, so a radiated measurement was made using a spectrum analyzer and a near field probe. The analyzer's resolution bandwidth was sufficiently narrow to plot the actual bandwidth of the signal and not the filter response curve of the spectrum analyzer. The resolution bandwidth was >1% of the 99% bandwidth and the video bandwidth was greater than or equal to the resolution bandwidth.

The occupied bandwidth was measured with the EUT configured for continuous modulated operation at the low, mid, and high channel of the operational band.

OCCUPIED BANDWIDTH

EUT:	Telemetry Transmitter 96281-A05			**Work Order:**	SPAC0475
Serial Number:	6004			**Date:**	01/24/12
Customer:	Spacelabs			**Temperature:**	23°C
Attendees:	None			**Humidity:**	38%
Project:	None			**Barometric Pres.:**	101.42 kPa
Tested by:	Rod Peloquin	**Power:**	3.0 VDC	**Job Site:**	EV06

TEST SPECIFICATIONS	Test Method
FCC 95H:2012	ANSI/TIA/EIA-603-C-2004

COMMENTS

With ECG lead wires, ECD shorting bar

DEVIATIONS FROM TEST STANDARD

Configuration #	SPAC0475 - 1	Signature

		Value	Limit	Result
Narrow Band				
	Low, 1241, 608.0125	8.7316	N/A	N/A
	Mid, 1360, 610.9875	8.7532	N/A	N/A
	High, 1480, 613.9875	8.7853	N/A	N/A
Wide Band				
	Low, 2242, 608.375	18.1122	N/A	N/A
	Mid, 2360, 610.9875	18.1968	N/A	N/A
	High, 2478, 613.9375	18.4483	N/A	N/A

Narrow Band, Low, 1241, 608.0125

				Value	Limit	Result
				8.73 kHz	N/A	N/A

Narrow Band, Mid, 1360, 610.9875

				Value	Limit	Result
				8.75 kHz	N/A	N/A

Narrow Band, High, 1480, 613.9875

				Value	Limit	Result
				8.79 kHz	N/A	N/A

Wide Band, Low, 2242, 608.375

				Value	Limit	Result
				18.11 kHz	N/A	N/A

Wide Band, Mid, 2360, 610.9875

				Value	Limit	Result
				18.20 kHz	N/A	N/A

Wide Band, High, 2478, 613.9375

				Value	Limit	Result
				18.45 kHz	N/A	N/A

FIELD STRENGTH OF SPURIOUS EMISSIONS

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

MODES OF OPERATION

Transmitting WBT (Wideband), Low = Ch.2242, 608.0375 MHz
Transmitting WBT (Wideband), Mid = Ch. 2360, 610.9875 MHz
Transmitting WBT (Wideband), High = Ch. 2478, 613.9375 MHz
Transmitting NBT (Narrowband), Low = Ch.1241, 608.0125 MHz
Transmitting NBT (Narrowband), Mid = Ch. 1360, 610.9875 MHz
Transmitting NBT (Narrowband), High = Ch. 1480, 613.9875 MHz

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

SPAC0492 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	7 GHz

SAMPLE CALCULATIONS

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
High Pass Filter	Micro-Tronics	50108	HGF	1/9/2012	24
Attenuator	Pasternack	PE7005-20	AUN	7/5/2011	12
Attenuator	INMET	64671 6A-10dB	AUI	10/6/2011	12
Low Pass Filter 0-425 MHz	Micro-Tronics	LPM50003	HGL	7/14/2010	24
.5-1 GHz Notch Filter	K&L Microwave	3TNF-500/1000-N/N	HFT	1/11/2011	24
Pre-Amplifier	Miteq	AM-1616-1000	AVM	6/20/2011	12
Antenna, Biconilog	EMCO	3141	AXG	3/15/2010	24
EV12 Cables	N/A	Bilog Cables	EVS	6/20/2011	12
Antenna, Horn	ETS	3115	AIB	9/8/2010	24
Pre-Amplifier	Miteq	AMF-3D00100800-32-13P	AVF	6/20/2011	12
EV12 Cables	N/A	Double Ridge Horn Cables	EVT	10/6/2011	12

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 CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization, and manipulating the EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009). A preamp was used for this test in order to provide sufficient measurement sensitivity.

FIELD STRENGTH OF SPURIOUS EMISSIONS

EUT:	Telemetry Transmitter 96281-B05			Work Order:	SPAC0492
Serial Number:	6010			Date:	01/23/12
Customer:	Spacelabs			Temperature:	23
Attendees:	None			Humidity:	38%
Project:	None			Barometric Pres.:	101.76 kPa
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV12

TEST SPECIFICATIONS	Test Method
FCC 95H:2012	ANSI/TIA/EIA-603-C-2004

TEST PARAMETERS

Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

With ECG lead wires, ECD shorting bar

EUT OPERATING MODES

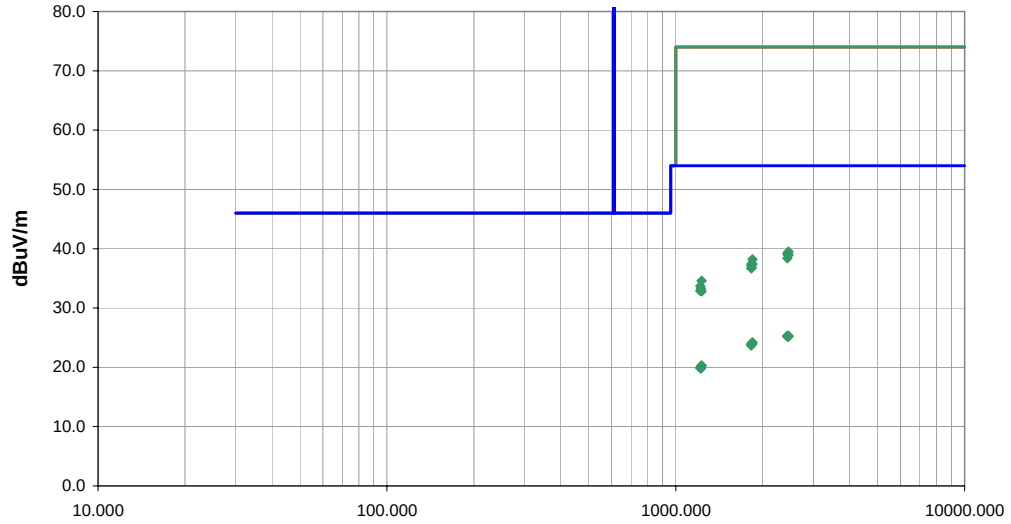
Transmitting NBT

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	6
Configuration #	SPAC0492 - 1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
2430.667	26.6	-1.3	108.0	1.0	3.0	0.0	V-Horn	AV	0.0	25.3	54.0	-28.7	Low Channel, Narrowband
2455.737	26.5	-1.2	176.0	1.0	3.0	0.0	H-Horn	AV	0.0	25.3	54.0	-28.7	High Channel, Narrowband
2430.510	26.5	-1.3	160.0	1.3	3.0	0.0	H-Horn	AV	0.0	25.2	54.0	-28.8	Low Channel, Narrowband
2443.033	26.5	-1.3	197.0	1.9	3.0	0.0	V-Horn	AV	0.0	25.2	54.0	-28.8	Mid Channel, Narrowband
2444.780	26.5	-1.3	351.0	1.0	3.0	0.0	H-Horn	AV	0.0	25.2	54.0	-28.8	Mid Channel, Narrowband
2456.243	26.4	-1.2	234.0	1.0	3.0	0.0	V-Horn	AV	0.0	25.2	54.0	-28.8	High Channel, Narrowband
1841.837	27.9	-3.7	180.0	1.3	3.0	0.0	V-Horn	AV	0.0	24.2	54.0	-29.8	High Channel, Narrowband
1832.953	27.9	-3.8	287.0	1.0	3.0	0.0	H-Horn	AV	0.0	24.1	54.0	-29.9	Mid Channel, Narrowband
1841.833	27.7	-3.7	142.0	1.0	3.0	0.0	H-Horn	AV	0.0	24.0	54.0	-30.0	High Channel, Narrowband
1832.940	27.7	-3.8	99.0	1.0	3.0	0.0	V-Horn	AV	0.0	23.9	54.0	-30.1	Mid Channel, Narrowband
1823.950	27.8	-3.9	162.0	1.0	3.0	0.0	V-Horn	AV	0.0	23.9	54.0	-30.1	Low Channel, Narrowband
1824.210	27.6	-3.9	353.0	1.5	3.0	0.0	H-Horn	AV	0.0	23.7	54.0	-30.3	Low Channel, Narrowband
1227.987	28.8	-8.5	103.0	1.0	3.0	0.0	H-Horn	AV	0.0	20.3	54.0	-33.7	High Channel, Narrowband
1228.137	28.8	-8.5	55.0	1.0	3.0	0.0	V-Horn	AV	0.0	20.3	54.0	-33.7	High Channel, Narrowband
1221.960	28.7	-8.7	91.0	1.0	3.0	0.0	H-Horn	AV	0.0	20.0	54.0	-34.0	Mid Channel, Narrowband
1215.983	28.6	-8.7	33.0	1.0	3.0	0.0	H-Horn	AV	0.0	19.9	54.0	-34.1	Low Channel, Narrowband
1216.077	28.6	-8.7	356.0	1.0	3.0	0.0	V-Horn	AV	0.0	19.9	54.0	-34.1	Low Channel, Narrowband
1222.577	28.5	-8.7	181.0	1.0	3.0	0.0	V-Horn	AV	0.0	19.8	54.0	-34.2	Mid Channel, Narrowband
2456.800	40.7	-1.2	234.0	1.0	3.0	0.0	V-Horn	PK	0.0	39.5	74.0	-34.5	High Channel, Narrowband
2432.787	40.5	-1.3	160.0	1.3	3.0	0.0	H-Horn	PK	0.0	39.2	74.0	-34.8	Low Channel, Narrowband
2443.003	40.4	-1.3	351.0	1.0	3.0	0.0	H-Horn	PK	0.0	39.1	74.0	-34.9	Mid Channel, Narrowband
2444.417	40.3	-1.3	197.0	1.9	3.0	0.0	V-Horn	PK	0.0	39.0	74.0	-35.0	Mid Channel, Narrowband
2455.590	40.1	-1.2	176.0	1.0	3.0	0.0	H-Horn	PK	0.0	38.9	74.0	-35.1	High Channel, Narrowband
2432.393	39.7	-1.3	108.0	1.0	3.0	0.0	V-Horn	PK	0.0	38.4	74.0	-35.6	Low Channel, Narrowband
1842.313	41.9	-3.7	142.0	1.0	3.0	0.0	H-Horn	PK	0.0	38.2	74.0	-35.8	High Channel, Narrowband
1833.573	41.3	-3.8	99.0	1.0	3.0	0.0	V-Horn	PK	0.0	37.5	74.0	-36.5	Mid Channel, Narrowband
1842.323	41.1	-3.7	180.0	1.3	3.0	0.0	V-Horn	PK	0.0	37.4	74.0	-36.6	High Channel, Narrowband

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
1824.380	41.1	-3.9	162.0	1.0	3.0	0.0	V-Horn	PK	0.0	37.2	74.0	-36.8	Low Channel, Narrowband
1832.653	40.6	-3.8	287.0	1.0	3.0	0.0	H-Horn	PK	0.0	36.8	74.0	-37.2	Mid Channel, Narrowband
1825.003	40.6	-3.9	353.0	1.5	3.0	0.0	H-Horn	PK	0.0	36.7	74.0	-37.3	Low Channel, Narrowband
1227.757	43.1	-8.5	55.0	1.0	3.0	0.0	V-Horn	PK	0.0	34.6	74.0	-39.4	High Channel, Narrowband
1216.187	42.4	-8.7	33.0	1.0	3.0	0.0	H-Horn	PK	0.0	33.7	74.0	-40.3	Low Channel, Narrowband
1221.943	42.0	-8.7	91.0	1.0	3.0	0.0	H-Horn	PK	0.0	33.3	74.0	-40.7	Mid Channel, Narrowband
1216.457	41.6	-8.7	356.0	1.0	3.0	0.0	V-Horn	PK	0.0	32.9	74.0	-41.1	Low Channel, Narrowband
1221.790	41.6	-8.7	181.0	1.0	3.0	0.0	V-Horn	PK	0.0	32.9	74.0	-41.1	Mid Channel, Narrowband
1228.280	41.3	-8.5	103.0	1.0	3.0	0.0	H-Horn	PK	0.0	32.8	74.0	-41.2	High Channel, Narrowband

FIELD STRENGTH OF SPURIOUS EMISSIONS

EUT:	Telemetry Transmitter 96281-B05			Work Order:	SPAC0492
Serial Number:	6010			Date:	01/23/12
Customer:	Spacelabs			Temperature:	23
Attendees:	None			Humidity:	38%
Project:	None			Barometric Pres.:	101.76 kPa
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV12

TEST SPECIFICATIONS	Test Method
FCC 95H:2012	ANSI/TIA/EIA-603-C-2004

TEST PARAMETERS

Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

With ECG lead wires, ECD shorting bar

EUT OPERATING MODES

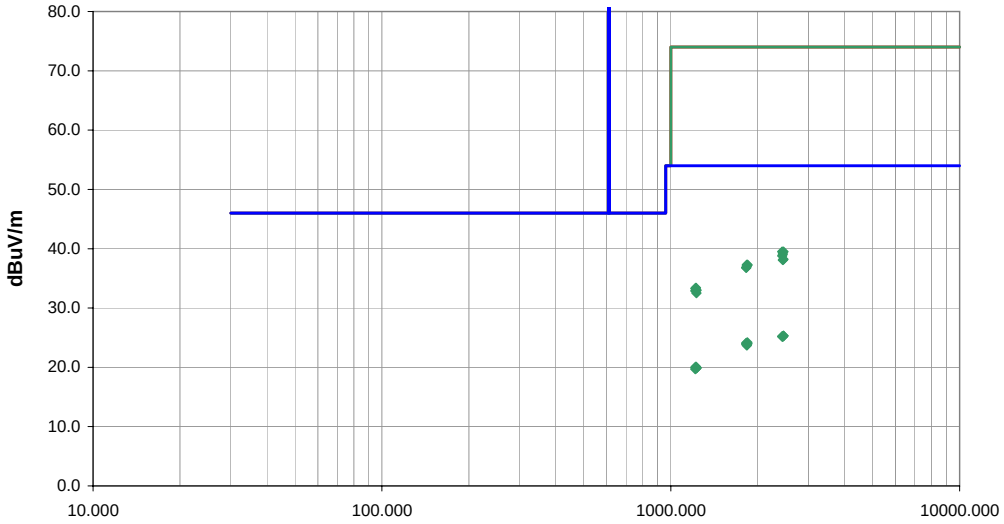
Transmitting WBT

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	7
Configuration #	SPAC0492 - 1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
2454.917	26.5	-1.2	150.0	1.0	3.0	0.0	H-Horn	AV	0.0	25.3	54.0	-28.7	High Channel, Wideband
2455.310	26.5	-1.2	103.0	1.0	3.0	0.0	V-Horn	AV	0.0	25.3	54.0	-28.7	High Channel, Wideband
2431.047	26.5	-1.3	45.0	1.0	3.0	0.0	V-Horn	AV	0.0	25.2	54.0	-28.8	Low Channel, Wideband
2432.397	26.5	-1.3	1.0	2.2	3.0	0.0	H-Horn	AV	0.0	25.2	54.0	-28.8	Low Channel, Wideband
2443.020	26.5	-1.3	173.0	1.0	3.0	0.0	V-Horn	AV	0.0	25.2	54.0	-28.8	Mid Channel, Wideband
2443.243	26.5	-1.3	246.0	1.0	3.0	0.0	H-Horn	AV	0.0	25.2	54.0	-28.8	Mid Channel, Wideband
1841.677	27.9	-3.7	342.0	1.0	3.0	0.0	H-Horn	AV	0.0	24.2	54.0	-29.8	High Channel, Wideband
1824.077	28.0	-3.9	103.0	1.0	3.0	0.0	H-Horn	AV	0.0	24.1	54.0	-29.9	Low Channel, Wideband
1832.843	27.8	-3.8	236.0	1.0	3.0	0.0	H-Horn	AV	0.0	24.0	54.0	-30.0	Mid Channel, Wideband
1841.917	27.7	-3.7	135.0	1.0	3.0	0.0	V-Horn	AV	0.0	24.0	54.0	-30.0	High Channel, Wideband
1824.080	27.8	-3.9	28.0	1.5	3.0	0.0	V-Horn	AV	0.0	23.9	54.0	-30.1	Low Channel, Wideband
1833.240	27.5	-3.8	35.0	1.0	3.0	0.0	V-Horn	AV	0.0	23.7	54.0	-30.3	Mid Channel, Wideband
1221.990	28.8	-8.7	93.0	1.0	3.0	0.0	V-Horn	AV	0.0	20.1	54.0	-33.9	Mid Channel, Wideband
1216.033	28.7	-8.7	101.0	1.0	3.0	0.0	H-Horn	AV	0.0	20.0	54.0	-34.0	Low Channel, Wideband
1227.773	28.4	-8.5	304.0	1.0	3.0	0.0	V-Horn	AV	0.0	19.9	54.0	-34.1	High Channel, Wideband
1228.187	28.4	-8.5	354.0	2.4	3.0	0.0	H-Horn	AV	0.0	19.9	54.0	-34.1	High Channel, Wideband
1222.073	28.5	-8.7	32.0	2.2	3.0	0.0	H-Horn	AV	0.0	19.8	54.0	-34.2	Mid Channel, Wideband
1216.120	28.4	-8.7	156.0	1.0	3.0	0.0	V-Horn	AV	0.0	19.7	54.0	-34.3	Low Channel, Wideband
2432.027	40.8	-1.3	1.0	2.2	3.0	0.0	H-Horn	PK	0.0	39.5	74.0	-34.5	Low Channel, Wideband
2455.790	40.7	-1.2	103.0	1.0	3.0	0.0	V-Horn	PK	0.0	39.5	74.0	-34.5	High Channel, Wideband
2444.287	40.4	-1.3	173.0	1.0	3.0	0.0	V-Horn	PK	0.0	39.1	74.0	-34.9	Mid Channel, Wideband
2431.650	40.1	-1.3	45.0	1.0	3.0	0.0	V-Horn	PK	0.0	38.8	74.0	-35.2	Low Channel, Wideband
2455.073	39.4	-1.2	150.0	1.0	3.0	0.0	H-Horn	PK	0.0	38.2	74.0	-35.8	High Channel, Wideband
2443.163	39.4	-1.3	246.0	1.0	3.0	0.0	H-Horn	PK	0.0	38.1	74.0	-35.9	Mid Channel, Wideband
1833.227	41.1	-3.8	35.0	1.0	3.0	0.0	V-Horn	PK	0.0	37.3	74.0	-36.7	Mid Channel, Wideband
1842.657	41.0	-3.7	135.0	1.0	3.0	0.0	V-Horn	PK	0.0	37.3	74.0	-36.7	High Channel, Wideband
1841.497	40.9	-3.7	342.0	1.0	3.0	0.0	H-Horn	PK	0.0	37.2	74.0	-36.8	High Channel, Wideband

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
1833.440	40.9	-3.8	236.0	1.0	3.0	0.0	H-Horn	PK	0.0	37.1	74.0	-36.9	Mid Channel, Wideband
1824.110	40.7	-3.9	103.0	1.0	3.0	0.0	H-Horn	PK	0.0	36.8	74.0	-37.2	Low Channel, Wideband
1824.587	40.7	-3.9	28.0	1.5	3.0	0.0	V-Horn	PK	0.0	36.8	74.0	-37.2	Low Channel, Wideband
1222.537	42.1	-8.7	32.0	2.2	3.0	0.0	H-Horn	PK	0.0	33.4	74.0	-40.6	Mid Channel, Wideband
1215.937	42.0	-8.7	101.0	1.0	3.0	0.0	H-Horn	PK	0.0	33.3	74.0	-40.7	Low Channel, Wideband
1221.613	41.7	-8.7	93.0	1.0	3.0	0.0	V-Horn	PK	0.0	33.0	74.0	-41.0	Mid Channel, Wideband
1227.800	41.5	-8.5	304.0	1.0	3.0	0.0	V-Horn	PK	0.0	33.0	74.0	-41.0	High Channel, Wideband
1216.347	41.6	-8.7	156.0	1.0	3.0	0.0	V-Horn	PK	0.0	32.9	74.0	-41.1	Low Channel, Wideband
1227.650	41.0	-8.5	354.0	2.4	3.0	0.0	H-Horn	PK	0.0	32.5	74.0	-41.5	High Channel, Wideband

FIELD STRENGTH OF FUNDAMENTAL

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 WBT (Wideband), Low = Ch.2242, 608.0375 MHz
Transmitting WBT (Wideband), Mid = Ch. 2360, 610.9875 MHz
Transmitting WBT (Wideband), High = Ch. 2478, 613.9375 MHz
Transmitting NBT (Narrowband), Low = Ch.1241, 608.0125 MHz
Transmitting NBT (Narrowband), Mid = Ch. 1360, 610.9875 MHz
Transmitting NBT (Narrowband), High = Ch. 1480, 613.9875 MHz

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

SPAC0492 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	608 MHz	Stop Frequency	616 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
Spectrum Analyzer	Agilent	E4440A	AFD	7/5/2011	12
Antenna, Biconilog	EMCO	3141	AXG	3/15/2010	24
EV12 Cables	N/A	Bilog Cables	EVS	6/20/2011	12

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 CISPR 16-4; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for measurement uncertainty are available upon request.

TEST DESCRIPTION

The antennas to be used with the EUT were tested. The EUT was transmitting and while set at the lowest channel, a middle channel, and the highest channel available. While scanning, emissions from the EUT were maximized by rotating the EUT, adjusting the measurement antenna height and polarization, and manipulating the EUT and EUT antenna in 3 orthogonal planes (per ANSI C63.10:2009).

FIELD STRENGTH OF FUNDAMENTAL

EUT:	Telemetry Transmitter 96281-B05			Work Order:	SPAC0492
Serial Number:	6010			Date:	01/19/12
Customer:	Spacelabs			Temperature:	23
Attendees:	Hugh Carter			Humidity:	41%
Project:	None			Barometric Pres.:	99.66 kPa
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV12

TEST SPECIFICATIONS	Test Method
FCC 95H:2012	ANSI/TIA/EIA-603-C-2004

TEST PARAMETERS

Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

With ECG lead wires, ECD shorting bar

EUT OPERATING MODES

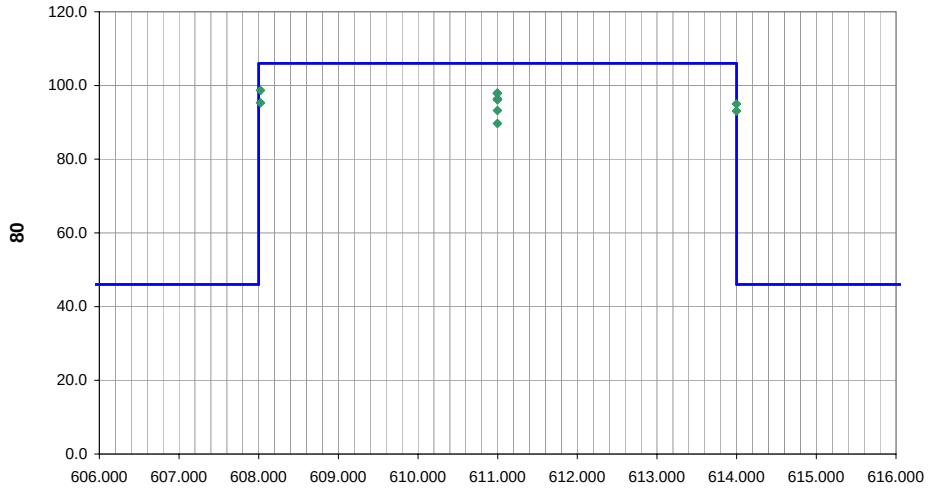
Transmitting NBT

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	1
Configuration #	SPAC0492 - 1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted 80.00	Spec. Limit 80.00	Compared to Spec. (dB)	Comments
608.023	68.9	29.8	108.0	1.3	3.0	0.0	H-Bilog	QP	0.0	98.7	106.0	-7.3	Low Channel, Narrowband, EUT horizontal
610.995	68.1	29.8	227.0	1.3	3.0	0.0	H-Bilog	QP	0.0	97.9	106.0	-8.1	Mid Channel, Narrowband, EUT horizontal
610.996	68.1	29.8	291.0	1.3	3.0	0.0	H-Bilog	QP	0.0	97.9	106.0	-8.1	Mid Channel, Narrowband, EUT on side
610.997	66.6	29.8	268.0	1.5	3.0	0.0	V-Bilog	QP	0.0	96.4	106.0	-9.6	Mid Channel, Narrowband, EUT horizontal
610.996	66.3	29.8	264.0	1.5	3.0	0.0	V-Bilog	QP	0.0	96.1	106.0	-9.9	Mid Channel, Narrowband, EUT on side
608.022	65.5	29.8	81.0	1.3	3.0	0.0	V-Bilog	QP	0.0	95.3	106.0	-10.7	Low Channel, Narrowband, EUT horizontal
613.998	65.1	29.9	108.0	1.3	3.0	0.0	H-Bilog	QP	0.0	95.0	106.0	-11.0	High Channel, Narrowband, EUT horizontal
610.997	63.4	29.8	55.0	1.6	3.0	0.0	V-Bilog	QP	0.0	93.2	106.0	-12.8	Mid Channel, Narrowband, EUT vertical
613.997	63.2	29.9	88.0	1.3	3.0	0.0	V-Bilog	QP	0.0	93.1	106.0	-12.9	High Channel, Narrowband, EUT horizontal
610.997	59.9	29.8	327.0	1.3	3.0	0.0	H-Bilog	QP	0.0	89.7	106.0	-16.3	Mid Channel, Narrowband, EUT vertical

FIELD STRENGTH OF FUNDAMENTAL

EUT:	Telemetry Transmitter 96281-B05			Work Order:	SPAC0492
Serial Number:	6010			Date:	01/23/12
Customer:	Spacelabs			Temperature:	23
Attendees:	None			Humidity:	38%
Project:	None			Barometric Pres.:	101.76 kPa
Tested by:	Rod Peloquin	Power:	Battery	Job Site:	EV12

TEST SPECIFICATIONS	Test Method
FCC 95H:2012	ANSI/TIA/EIA-603-C-2004

TEST PARAMETERS

Antenna Height(s) (m)	1 - 4	Test Distance (m)	3

COMMENTS

With ECG lead wires, ECD shorting bar

EUT OPERATING MODES

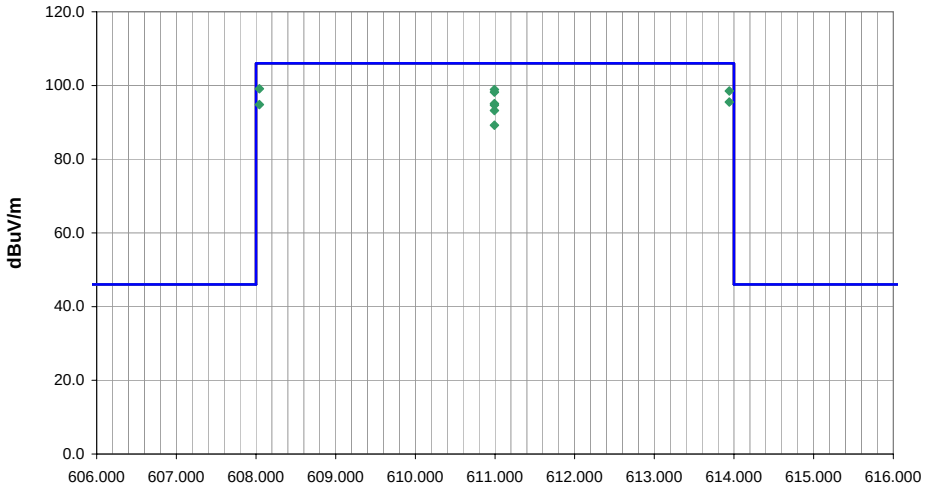
Transmitting WBT

DEVIATIONS FROM TEST STANDARD

No deviations.

Run #	8
Configuration #	SPAC0492 - 1
Results	Pass

Signature



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)	Comments
608.042	69.3	29.8	117.0	1.2	3.0	0.0	H-Bilog	QP	0.0	99.1	106.0	-6.9	Low Channel, Wideband, EUT horizontal
610.992	69.1	29.8	299.0	1.3	3.0	0.0	H-Bilog	QP	0.0	98.9	106.0	-7.1	Mid Channel, Wideband, EUT horizontal
613.942	68.6	29.9	303.0	1.3	3.0	0.0	H-Bilog	QP	0.0	98.5	106.0	-7.5	High Channel, Wideband, EUT horizontal
610.992	68.4	29.8	113.0	1.3	3.0	0.0	H-Bilog	QP	0.0	98.2	106.0	-7.8	Mid Channel, Wideband, EUT on side
613.942	65.6	29.9	233.0	1.0	3.0	0.0	V-Bilog	QP	0.0	95.5	106.0	-10.5	High Channel, Wideband, EUT on side
610.992	65.3	29.8	228.0	1.0	3.0	0.0	V-Bilog	QP	0.0	95.1	106.0	-10.9	Mid Channel, Wideband, EUT on side
608.042	65.0	29.8	227.0	1.0	3.0	0.0	V-Bilog	QP	0.0	94.8	106.0	-11.2	Low Channel, Wideband, EUT on side
610.992	64.9	29.8	93.0	1.3	3.0	0.0	V-Bilog	QP	0.0	94.7	106.0	-11.3	Mid Channel, Wideband, EUT horizontal
610.992	63.4	29.8	85.0	1.0	3.0	0.0	V-Bilog	QP	0.0	93.2	106.0	-12.8	Mid Channel, Wideband, EUT vertical
610.992	59.4	29.8	175.0	1.3	3.0	0.0	H-Bilog	QP	0.0	89.2	106.0	-16.8	Mid Channel, Wideband, EUT vertical