KMW Communications

800MHz iDEN RRH

EMC Test Report

Report No. KMWC0036.1

Report Prepared By

NORTHWEST EMC

www.nwemc.com
1-888-EMI-CERT

NORTHWEST EMC

22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test

Last Date of Test: February 20, 2013
KMW Communications
Model: 800MHz iDEN RRH

Emissions			
Test Description	**Specification**	**Test Method**	**Pass/Fail**
Field Strength of Spurious Emissions[1]	FCC 90.691:2011	ANSI/TIA/EIA-603-C-2004	**Pass**
Conducted Output Power	FCC 90.635:2011	ANSI/TIA/EIA-603-C-2004	**Pass**
Occupied Bandwidth[1]	FCC 90.691:2011	ANSI/TIA/EIA-603-C-2004	**Pass**
Spurious Emissions at the Antenna Terminals [1]	FCC 90.691:2012	ANSI/TIA/EIA-603-C-2004	**Pass**
Frequency Stability	FCC 90.213:2011	ANSI/TIA/EIA-603-C-2004	**Pass**
Emissions Mask[1]	FCC 90.691:2012	ANSI/TIA/EIA-603-C-2004	**Pass**
Spurious Radiated Emissions	FCC 90.691:2012	ANSI/TIA/EIA-603-C-2004	**Pass**

Note 1: See Report and Order FCC 12-55 that permits broadband CDMA and LTE technology in the 817 - 824 / 862 - 869 MHz band.

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

Test Facility

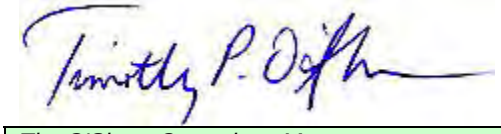
The measurement facility used to collect the data is located at:

Northwest EMC, Inc.
41 Tesla Ave.
Irvine, CA 92618

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 #2834B-1).

Approved By:



Tim O'Shea, Operations Manager

NVLAP Lab Code: 200676-0

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

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

NORTHWEST EMC
REV 2012.08.02

REVISION HISTORY

Revision Number	Description	Date	Page Number
00	None		

Barometric Pressure

The recorded barometric pressure has been normalized to sea level.

NORTHWEST EMC

REV 2012.05.24

ACCREDITATIONS AND AUTHORIZATIONS

United States

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

A2LA - Accredited by A2LA to ISO / IEC Guide 65 as a product certifier. This allows Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

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

European Union

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

Australia/New Zealand

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

Korea

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

Japan

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

Taiwan

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

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

Singapore

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

Hong Kong

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

Vietnam

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

Russia

GOST – Accredited by Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC to perform EMC and Hygienic testing for Information Technology products to GOST standards.

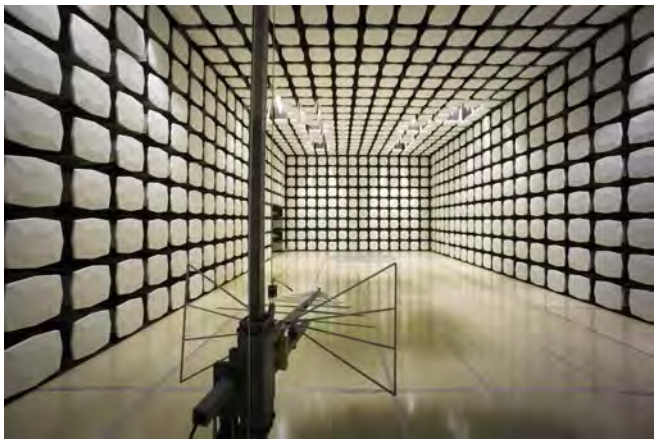
SCOPE

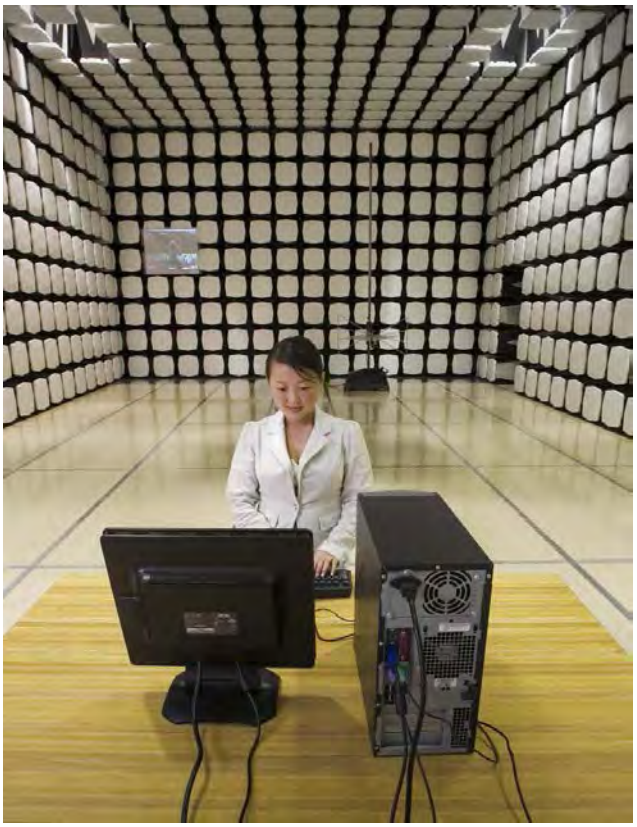
For details on the Scopes of our Accreditations, please visit:
http://www.nwemc.com/accreditations/

LOCATIONS

REV 2012.08.03

Oregon Labs EV01-EV12 22975 NW Evergreen Pkwy, #400 Hillsboro, OR 97124 (503) 844-4066	**California** Labs OC01-OC13 41 Tesla Irvine, CA 92618 (949) 861-8918	**New York** Labs WA01-WA04 4939 Jordan Rd. Elbridge, NY 13060 (315) 685-0796	**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
VCCI				
A-0108	A-0029		A-0109	A-0110
Industry Canada				
2834D-1, 2834D-*2*	2834B-1, 2834B-2, 2834B-3		2834E-1	2834C-1





Party Requesting the Test

Company Name:	KMW Communications
Address:	1521 E Orangethorpe Ave., Suite #A
City, State, Zip:	Fullerton, CA 92831
Test Requested By:	Joshua Jang
Model:	800MHz iDEN RRH
First Date of Test:	July 19, 2011
Last Date of Test:	February 20, 2013
Receipt Date of Samples:	July 18, 2011
Equipment Design Stage:	Production
Equipment Condition:	No Damage

Information Provided by the Party Requesting the Test

Functional Description of the EUT (Equipment Under Test):
CDMA/EVDO Rev A/LTE cellular base station transmitting in the 861 – 868.975 MHz band. This corresponds to 3GPP2 Band Class 10 Blocks C + D (Subclass 2 + 3)

Testing Objective:
To demonstrate compliance to FCC Part 90 requirements. See Report and Order FCC 12-55 that permits broadband CDMA and LTE technology in the 817 - 824 / 862 - 869 MHz band.

CONFIGURATION 1 KMWC0027

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
800MHz iDEN RRH	KMW Communications	iDen 800	U311210059

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
DC Power Supply	Hewlett Packard	6574A	4S36340150

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
MXA Signal Analyzer	Agilent	N9020A	MY49100579
MXA Signal Analzyer	Agilent	N9020A	MY49100570
MXG Vector Signal Generator	Agilent	N5182	MY49180185
Reliability Analzyer	KMW Communications	COBRA	None
Remote Laptop	Fujitsu	A6030	R7908331

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
RF Cable	Yes	3.0m	No	800MHz iDEN RRH	Load
RF Cable #2	Yes	3.0m	No	800MHz iDEN RRH	Load
Ground Cable	Yes	3.0m	No	800MHz iDEN RRH	Ground
Ground Cable	Yes	3.0m	No	800MHz iDEN RRH	Ground Cable
Optic Cable	No	5.0m	No	COBRA	800MHz iDEN RRH
DC Power Cable	Yes	5.0m	No	800MHz iDEN RRH	HP DC Power Supply
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

CONFIGURATION 1 KMWC0036

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
800MHz iDen RRH	KMW Communications	iDen 800	U311070001

Peripherals in test setup boundary			
Description	**Description**	**Description**	**Description**
Reliability Analyzer	Reliability Analyzer	Reliability Analyzer	Reliability Analyzer
Remote Laptop	Remote Laptop	Remote Laptop	Remote Laptop
Power Meter	Power Meter	Power Meter	Power Meter
Power Sensor	Power Sensor	Power Sensor	Power Sensor
Power Seneor	Power Seneor	Power Seneor	Power Seneor
Attenuator	Attenuator	Attenuator	Attenuator
Attenuator	Attenuator	Attenuator	Attenuator
DC Power Supply	DC Power Supply	DC Power Supply	DC Power Supply

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
RF Cable1	Yes	3.0m	No	800MHz iDen RRH	Filter
RF Cable2	Yes	3.0m	No	800MHz iDen RRH	Filter
RF Cable3	Yes	3.0m	No	Filter	Spectrum
Optic Cable	No	5.0m	No	Cobra	800MHz iDen RRH
DC Power Cable	Yes	5.0m	No	800MHz iDen RRH	DC Power Supply
AC Cable	No	1.8m	No	Reliability Analyzer	AC Mains
AC Cable	No	1.8m	No	Power Meter	AC Mains
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Equipment modifications					
Item	Date	Test	Modification	Note	Disposition of EUT
1	7/19/2011	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
2	7/19/2011	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	7/20/2011	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Northwest EMC following the test.
4	7/21/2011	Frequency Stability	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.
5	9/11/2012	Emissions Mask	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.
6	11/14/2012	Emissions 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.
7	11/14/2012	Spurious Emissions at the Antenna Terminals	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.
8	2/20/2013	Conducted Output Power	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

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
LTE 1.4 MHz. Single Carrier 863 MHz, 865.6 MHz, 868.3 MHz
LTE 3 MHz. Single Carrier - 863.8 MHz, 865.6 MHz, 867.5 MHz
LTE 5 MHz. Single Carrier - 864.8 MHz, 865.6 MHz, 866.5 MHz
LTE 1.4 MHz. Multi Carrier (2FA) - (863 MHz, 864 MHz)
LTE 1.4 MHz. Multi Carrier (2FA) - (864.9 MHz, 866.3MHz)
LTE 1.4 MHz. Multi Carrier (2FA) - (866.9 MHz, 868.3 MHz)
LTE 3 MHz. Multi Carrier (2FA) - (863.8 MHz, 866.8 MHz)
LTE 3 MHz. Multi Carrier (2FA) - (864.1 MHz, 867.1 MHz)
LTE 3 MHz. Multi Carrier (2FA) - (864.5 MHz, 867.5 MHz)

POWER SETTINGS INVESTIGATED
48 VDC

AXIS INVESTIGATED
X Axis, Y- Axis, Z-Axis

WORST CASE AXIS
X-Axis

CONFIGURATIONS INVESTIGATED
KMWC0027 - 1

FREQUENCY RANGE INVESTIGATED			
Start Frequency	30 MHz	Stop Frequency	12400 MHz

CLOCKS AND OSCILLATORS
See Modes of Operation.

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOE	11/17/2010	12 mo
Antenna, Horn	ETS	3160-07	AHR	NCR	0 mo
OC 10 Cables	N/A	12-18GHz RE Cables	OCO	6/24/2011	12 mo
.5-1GHz Notch Filter	K&L Microwave	3TNF-500/1000-N/N	HFR	11/30/2010	24 mo
Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	6/24/2011	12 mo
Antenna, Horn	ETS	3117	AHQ	4/19/2011	24 mo
OC10 Cables	N/A	1-8GHz RE Cables	OCJ	6/10/2011	12 mo
Antenna, Biconilog	EMCO	3142	AXB	3/28/2011	12 mo
OC10 Cables	N/A	10kHz-1GHz RE Cables	OCH	6/24/2011	12 mo
Pre-Amplifier	Miteq	AM-1064-9079	AOO	6/28/2011	12 mo
Spectrum Analyzer	Agilent	E4446A	AAY	1/11/2011	12 mo
DC Power Supply	Hewlett Packard	6574A	N/A	NCR	N/A
30 dB Directional Coupler (800-2500 MHz)	Fairview Microwave	SMC4030	N/A	NCR	N/A
50 Ohm Termination	Fairview Microwave	ST6NL-150	N/A	NCR	N/A

CUSTOMER TEST SET

Description	Manufacturer	Model	Last Cal.	Interval
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Vector Signal Generator	Agilent	N5182	6/7/2010	24
KMW Cobra Reliability Analyzer	KMW Commmunications	N/A	NCR	N/A
Power Meter	Agilent	E4419B	4/1/2010	24
Power Head	Agilent	E9300H	NCR	N/A
Power Head	Agilent	E9300H	NCR	N/A
Fujitsu Laptop	Fujitsu	A6030	NCR	N/A
RRH220 Software	KMW Commmunications	N/A	NCRA	N/A

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

MEASUREMENT UNCERTAINTY

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

TEST DESCRIPTION

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

NORTHWEST
EMC

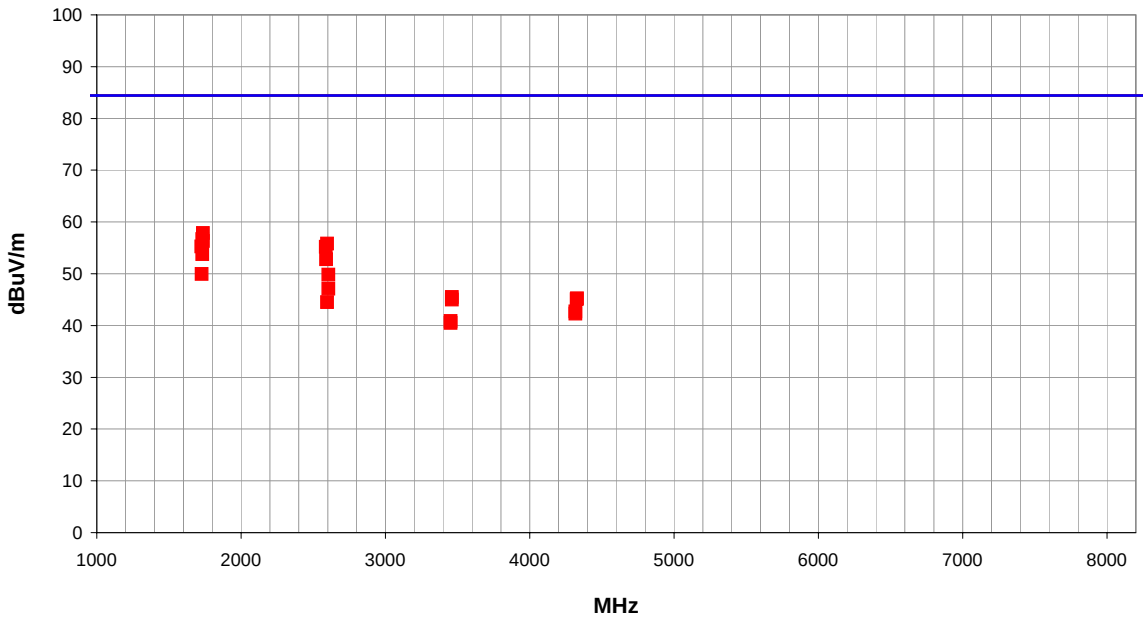
FIELD STRENGTH OF SPURIOUS EMISSIONS

PSA-ESCI 2011.07.07
PSA-ESCI Version 2011.05.10

Work Order:	KMWC0027	**Date:**	07/19/11		
Project:	None	**Temperature:**	22.86 °C		
Job Site:	OC10	**Humidity:**	51.63		
Serial Number:	U311210059	**Barometric Pres.:**	1012.2	**Tested by:**	Jaemi Suh
EUT:	800MHz i-DEN RRH				
Configuration:	1				
Customer:	KMW Communications				
Attendees:	Jaemi Suh				
EUT Power:	48 VDC				
Operating Mode:	Output Power = 50W, LTE 1.4 MHz, Single Carrier, See Comments for channels.				
Deviations:	None				
Comments:	LTE. Single Carrier.				

Test Specifications	**Test Method**
FCC 90.691:2011	ANSI/TIA/EIA-603-C-2004

Run #	73	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**Results**	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
1736.586	55.8	2.1	1.2	22.0	3.0	0.0	Vert	PK	0.0	57.9	84.4	-26.5	High Channel, 868.3 MHz
1731.465	54.7	2.0	1.2	24.0	3.0	0.0	Vert	PK	0.0	56.7	84.4	-27.7	Mid Channel, 865. 6 MHz
1736.840	54.2	2.1	1.2	148.0	3.0	0.0	Horz	PK	0.0	56.3	84.4	-28.1	High Channel, 868.3 MHz
2596.720	49.8	6.0	1.2	24.0	3.0	0.0	Vert	PK	0.0	55.8	84.4	-28.6	Mid Channel, 865. 6 MHz
1725.952	53.4	1.8	1.2	219.0	3.0	0.0	Horz	PK	0.0	55.2	84.4	-29.2	Low Channel, 863 MHz
2588.624	49.2	6.0	1.2	139.0	3.0	0.0	Horz	PK	0.0	55.2	84.4	-29.2	Low Channel, 863 MHz
1731.119	51.8	2.0	1.2	131.0	3.0	0.0	Horz	PK	0.0	53.8	84.4	-30.6	Mid Channel, 865. 6 MHz
2589.184	46.8	6.0	1.2	36.0	3.0	0.0	Vert	PK	0.0	52.8	84.4	-31.6	Low Channel, 863 MHz
1726.272	48.1	1.8	1.3	16.0	3.0	0.0	Vert	PK	0.0	49.9	84.4	-34.5	Low Channel, 863 MHz
2604.791	43.8	6.0	1.2	15.0	3.0	0.0	Vert	PK	0.0	49.8	84.4	-34.6	High Channel, 868.3 MHz
2605.340	41.1	6.0	1.2	112.0	3.0	0.0	Horz	PK	0.0	47.1	84.4	-37.3	High Channel, 868.3 MHz
3461.713	38.5	7.0	1.0	293.0	3.0	0.0	Horz	PK	0.0	45.5	84.4	-38.9	Mid Channel, 865. 6 MHz
4328.600	35.6	9.6	1.2	293.0	3.0	0.0	Horz	PK	0.0	45.2	84.4	-39.2	Mid Channel, 865. 6 MHz
4326.567	35.4	9.6	1.0	293.0	3.0	0.0	Vert	PK	0.0	45.0	84.4	-39.4	Mid Channel, 865. 6 MHz
3462.053	38.0	7.0	2.8	337.0	3.0	0.0	Vert	PK	0.0	45.0	84.4	-39.4	Mid Channel, 865. 6 MHz
2596.956	38.5	6.0	1.2	212.0	3.0	0.0	Horz	PK	0.0	44.5	84.4	-39.9	Mid Channel, 865. 6 MHz
4316.220	33.1	9.6	1.0	171.0	3.0	0.0	Horz	PK	0.0	42.7	84.4	-41.7	Low Channel, 863 MHz
4316.253	32.7	9.6	2.8	301.0	3.0	0.0	Vert	PK	0.0	42.3	84.4	-42.1	Low Channel, 863 MHz
3451.433	33.9	7.0	2.5	103.0	3.0	0.0	Vert	PK	0.0	40.9	84.4	-43.5	Low Channel, 863 MHz
3452.647	33.5	7.0	1.0	1.0	3.0	0.0	Horz	PK	0.0	40.5	84.4	-43.9	Low Channel, 863 MHz

CONDUCTED OUTPUT POWER

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Power Meter	Hewlett Packard	E4418A	SPA	4/11/2012	24
Power Sensor	Agilent	E4412A	SQE	4/11/2012	24
Signal Generator	Agilent	E8257D	TGU	2/1/2012	36
Spectrum Analyzer	Agilent	E4440A	AFG	5/16/2012	24
150W 50 Ohm Terminator	Fairview Microwave	ST6NL-150	RGG	6/4/2012	12
Directional Coupler	Fairview Microwave	SMC4030	RGN	6/17/2011	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

The output power was measured with the EUT set to the parameters called out in the data sheets. The measurement was made using a direct connection between the RF output of the EUT and a spectrum analzyer. Prior to making the measurements the setup and attenuator was calibrated using a signal generator and a power meter. Measurements were taken with RMS average detector. The limit was converted from watts to dBm (250 Watts = 54 dBm)

NORTHWEST EMC

CONDUCTED OUTPUT POWER

XMit 2011.04.20
PsaTx 2011.06.20

EUT:	800MHz i-DEN RRH			Work Order:	KMWC0038
Serial Number:	U311210059			Date:	02/20/13
Customer:	KMW Communications			Temperature:	22.86°C
Attendees:	Edward Lee			Humidity:	52%
Project:	None			Barometric Pres.:	1012.2
Tested by:	Jaemi Suh	Power:	48 VDC	Job Site:	OC10

TEST SPECIFICATIONS	TEST METHOD
FCC 90.691:2012	ANSI/TIA/EIA-603-C-2004

COMMENTS

Port A.

DEVIATIONS FROM TEST STANDARD

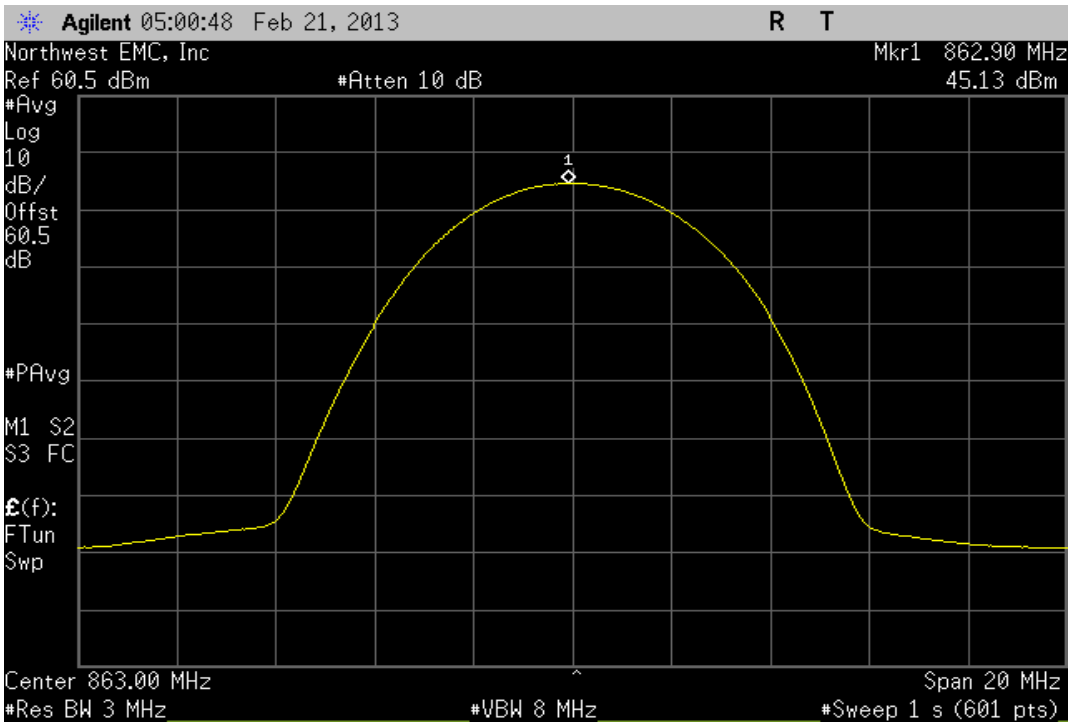
No Deviations

Configuration #	1	Signature

	Value	Limit	Result
LTE 1.4 MHz Single Carrier			
Low Channel	45.13 dBm	54 dBm	Pass
Mid Channel	45.01 dBm	54 dBm	Pass
High Channel	45.06 dBm	54 dBm	Pass
LTE 3 MHz Single Carrier			
Low Channel	44.26 dBm	54 dBm	Pass
Mid Channel	44.29 dBm	54 dBm	Pass
High Channel	44.43 dBm	54 dBm	Pass
LTE 5 MHz Single Carrier			
Low Channel	44.99 dBm	54 dBm	Pass
Mid Channel	45.10 dBm	54 dBm	Pass
High Channel	45.13 dBm	54 dBm	Pass
LTE 1.4 MHz Multi Carrier [2FA]			
Low Channel	44.30 dBm	54 dBm	Pass
Mid Channel	44.26 dBm	54 dBm	Pass
High Channel	44.28 dBm	54 dBm	Pass
LTE 3 MHz Multi Carrier [2FA]			
Low Channel	44.88 dBm	54 dBm	Pass
Mid Channel	44.67 dBm	54 dBm	Pass
High Channel	44.73 dBm	54 dBm	Pass

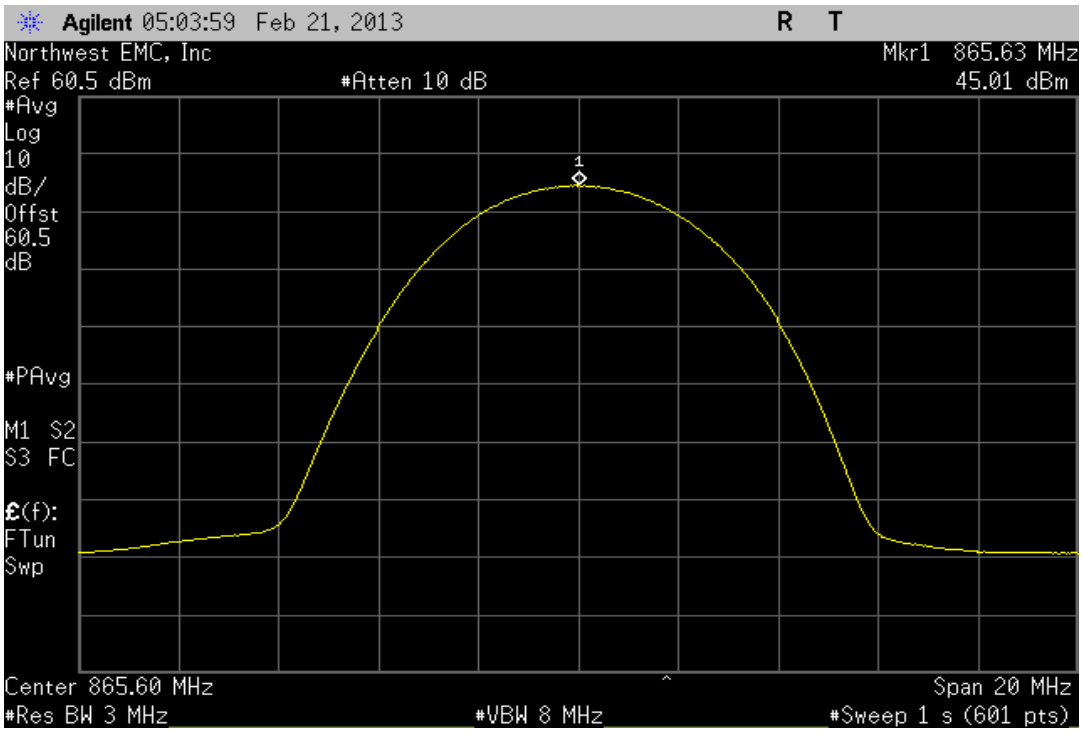
LTE 1.4 MHz Single Carrier, Low Channel

				Value	Limit	Result
				45.13 dBm	54 dBm	Pass



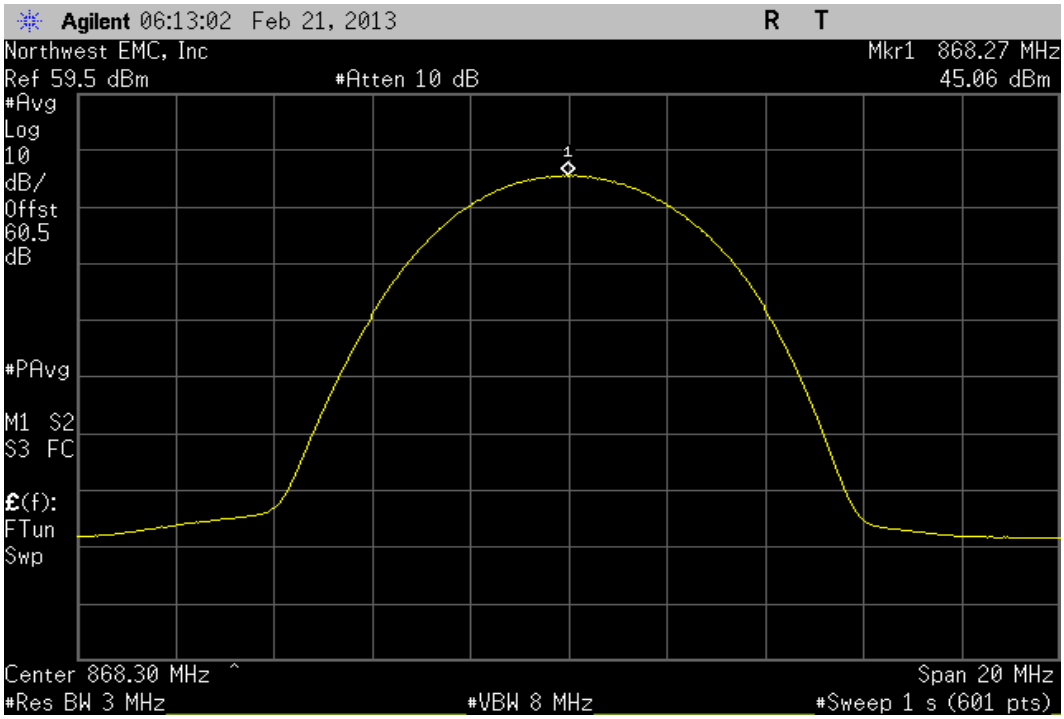
LTE 1.4 MHz Single Carrier, Mid Channel

				Value	Limit	Result
				45.01 dBm	54 dBm	Pass



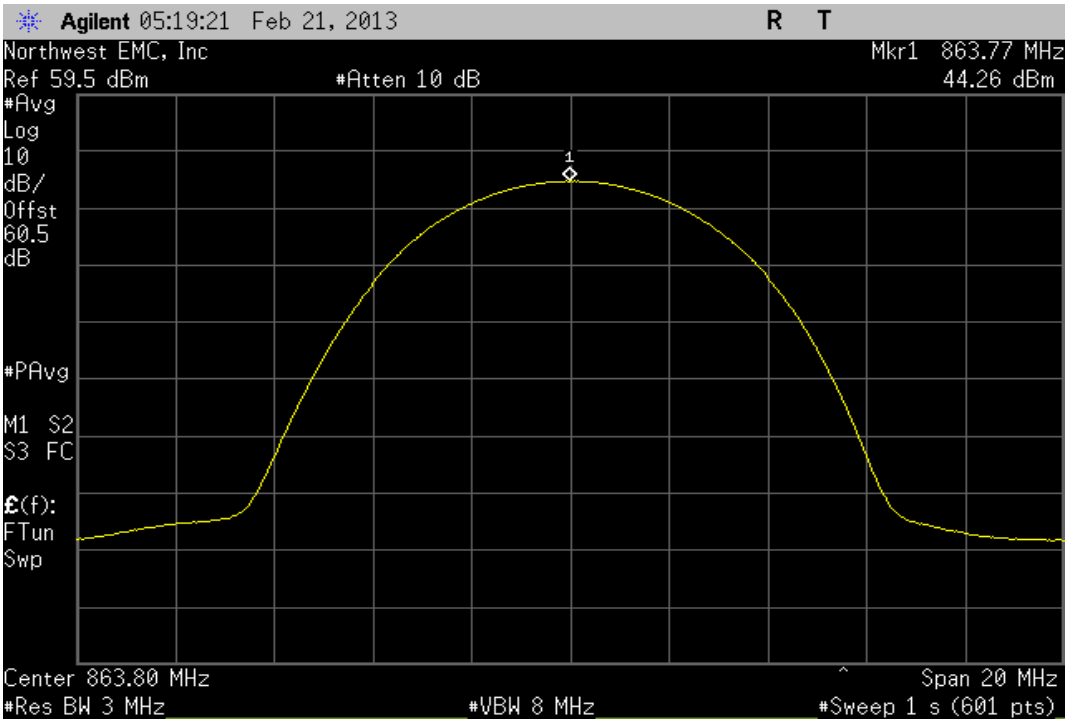
LTE 1.4 MHz Single Carrier, High Channel

				Value	Limit	Result
				45.06 dBm	54 dBm	Pass



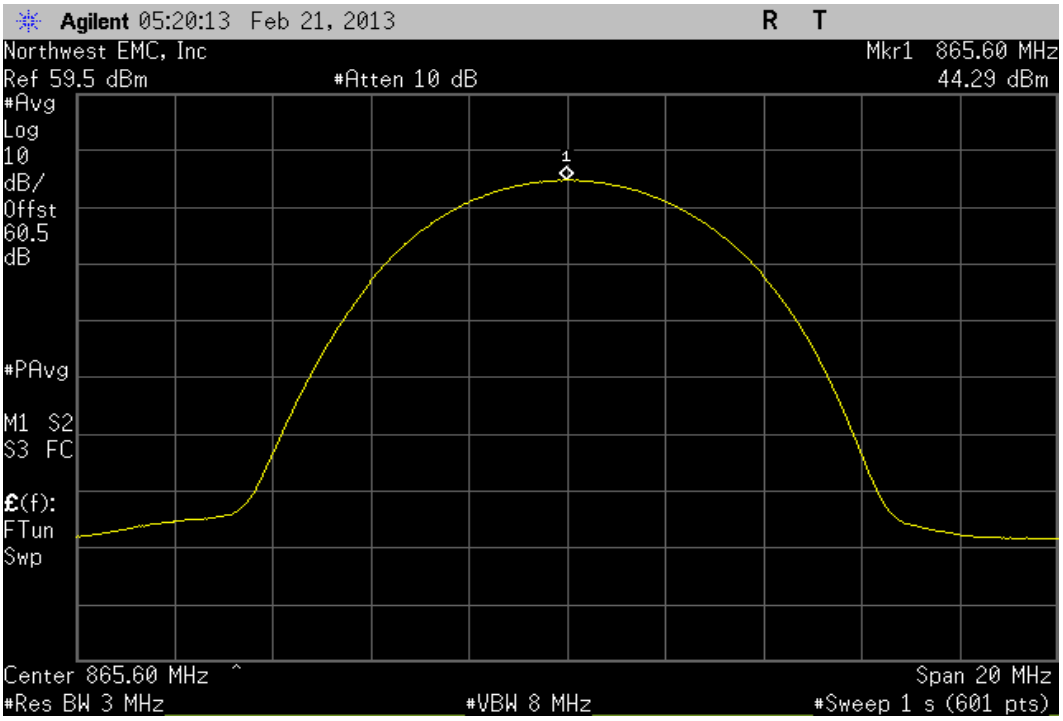
LTE 3 MHz Single Carrier, Low Channel

				Value	Limit	Result
				44.26 dBm	54 dBm	Pass



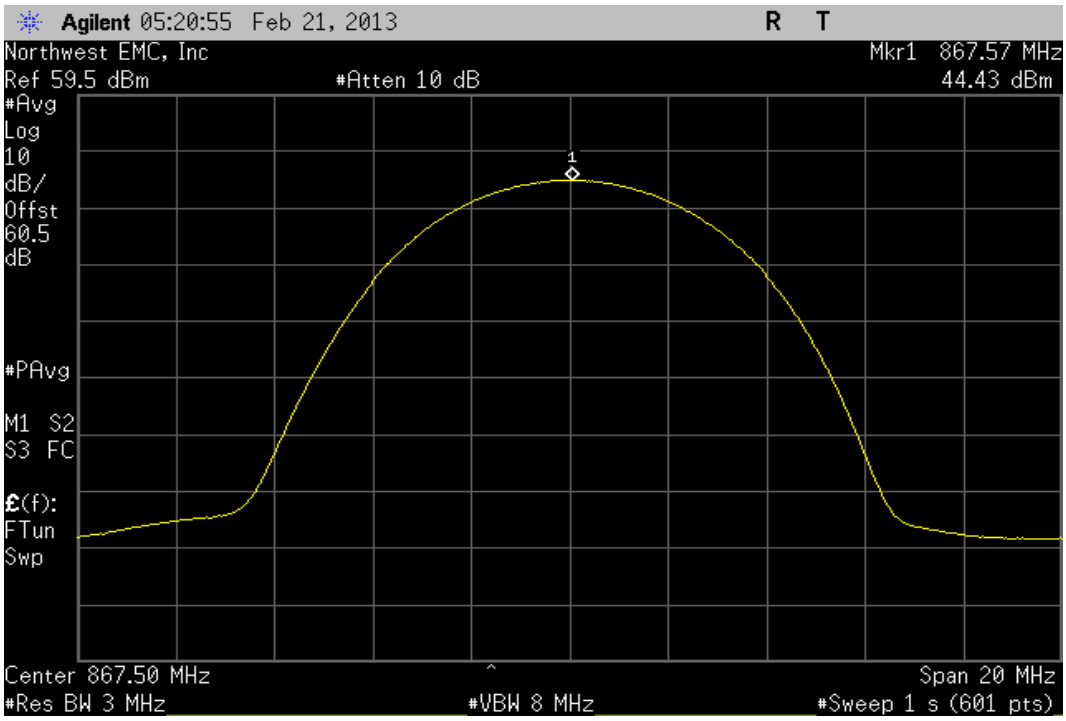
LTE 3 MHz Single Carrier, Mid Channel

				Value	Limit	Result
				44.29 dBm	54 dBm	Pass



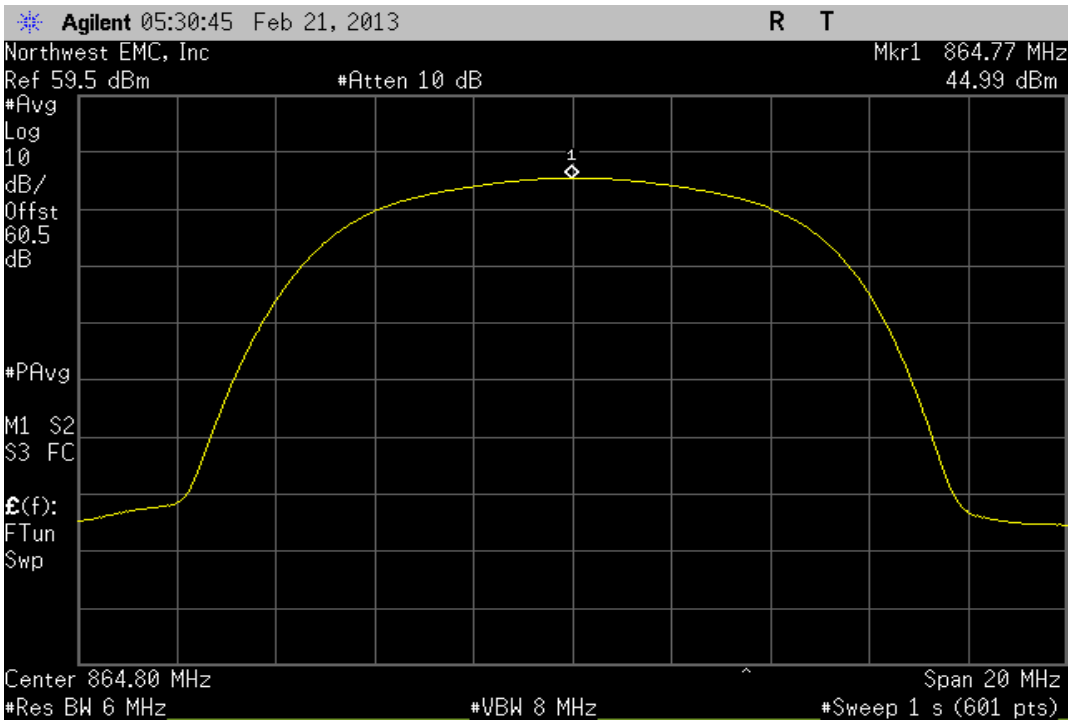
LTE 3 MHz Single Carrier, High Channel

				Value	Limit	Result
				44.43 dBm	54 dBm	Pass



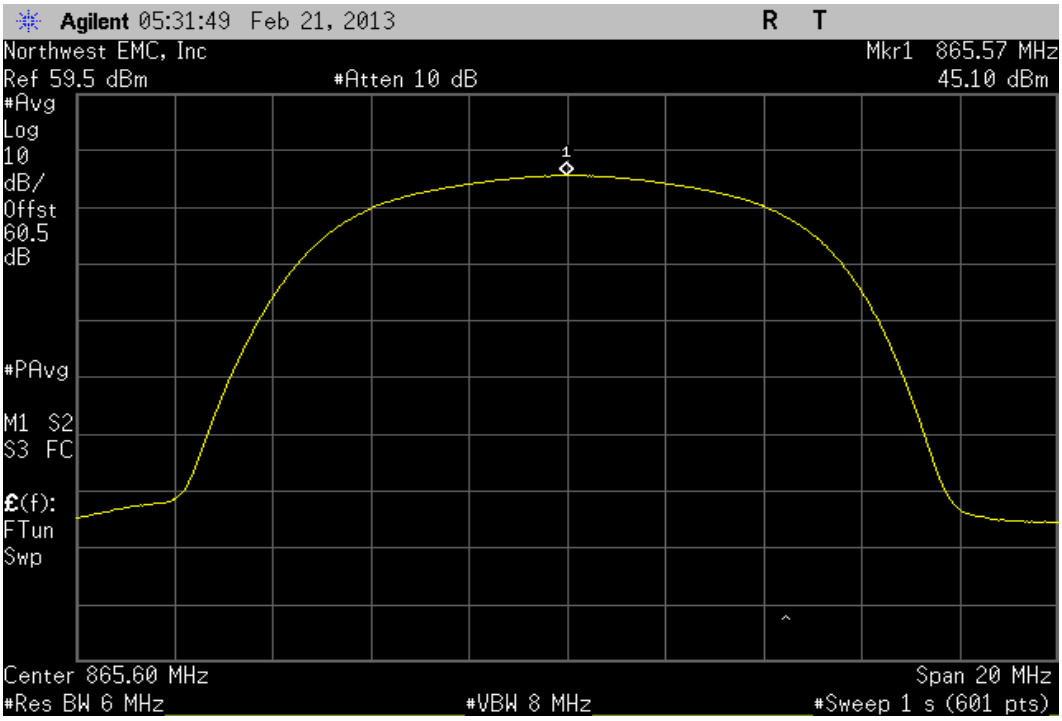
LTE 5 MHz Single Carrier, Low Channel

				Value	Limit	Result
				44.99 dBm	54 dBm	Pass



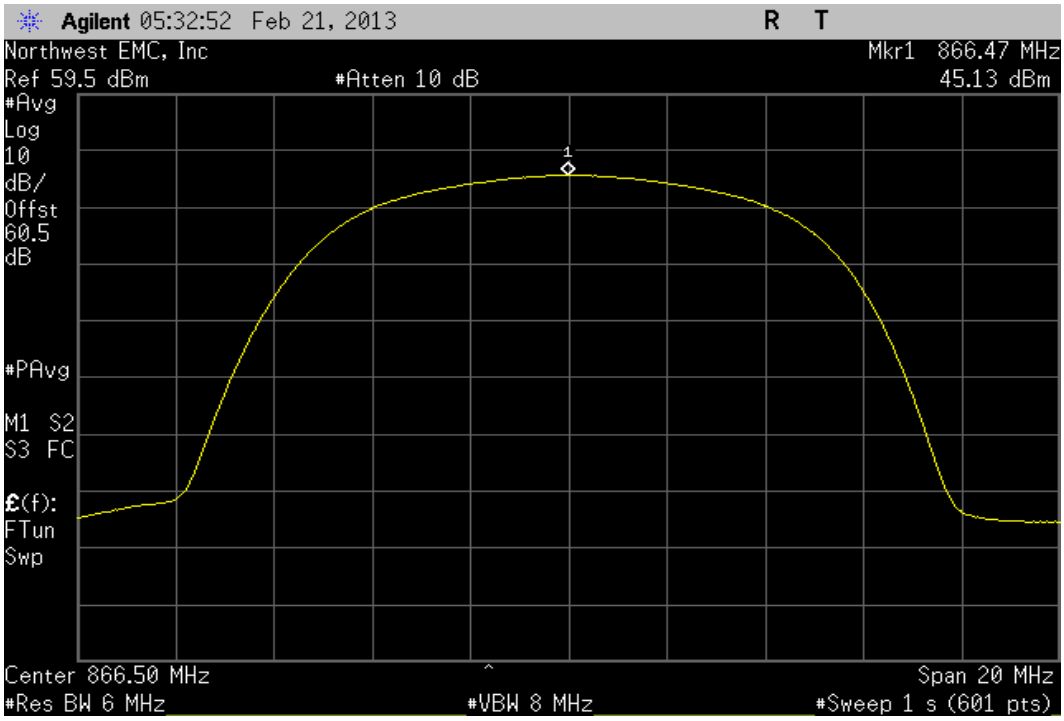
LTE 5 MHz Single Carrier, Mid Channel

				Value	Limit	Result
				45.10 dBm	54 dBm	Pass



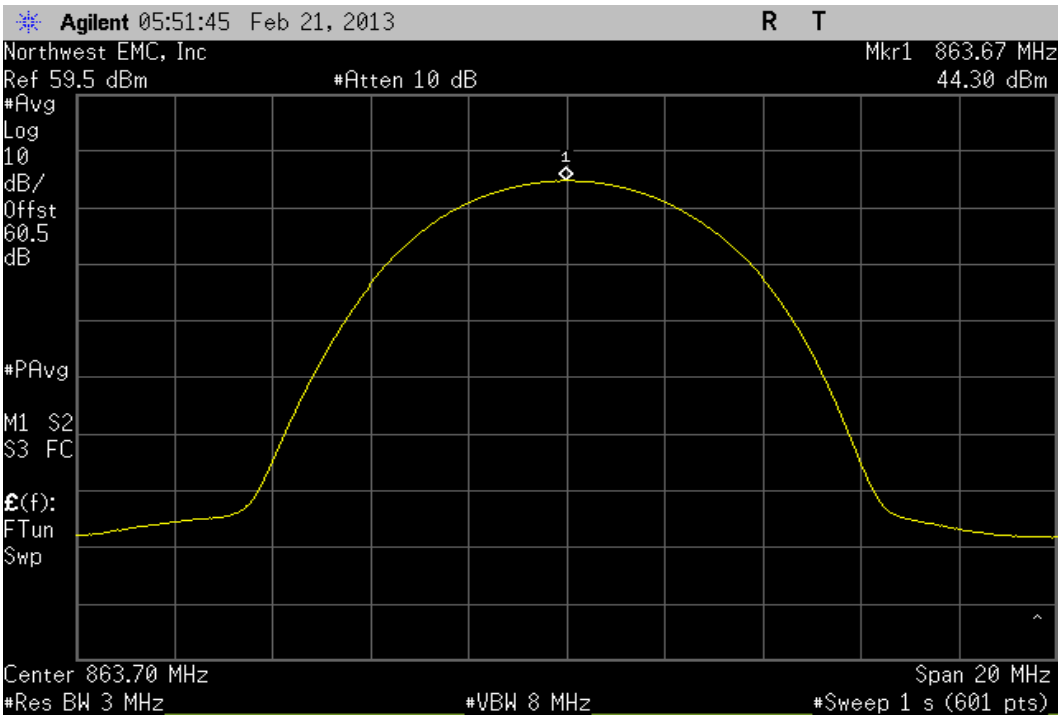
LTE 5 MHz Single Carrier, High Channel

				Value	Limit	Result
				45.13 dBm	54 dBm	Pass



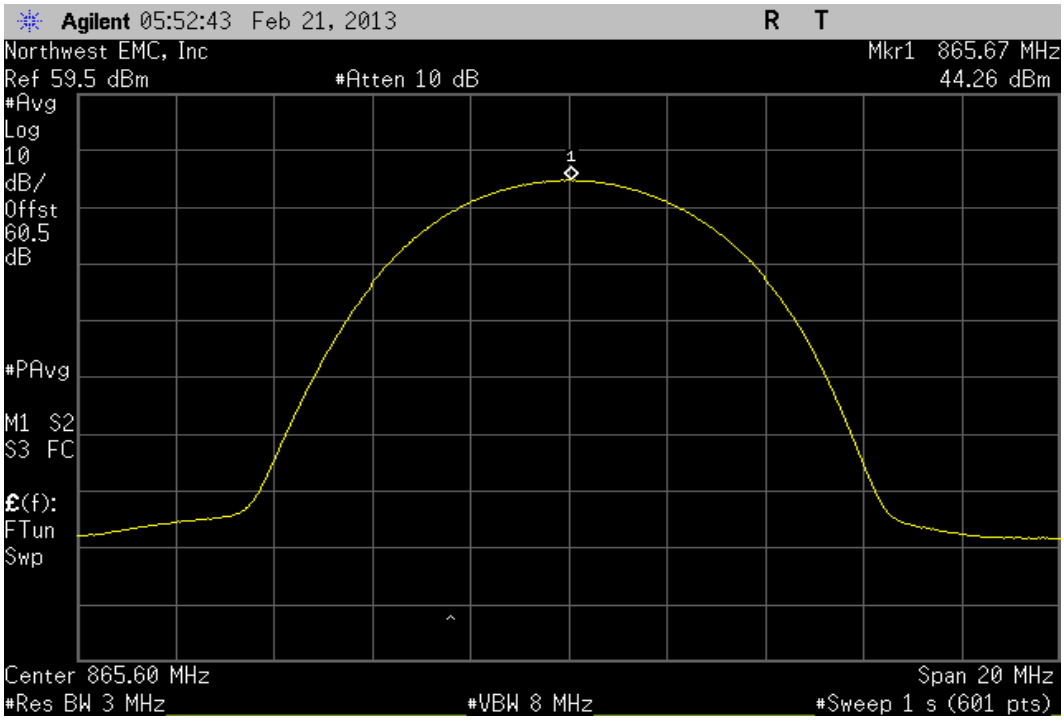
LTE 1.4 MHz Multi Carrier [2FA], Low Channel

				Value	Limit	Result
				44.30 dBm	54 dBm	Pass



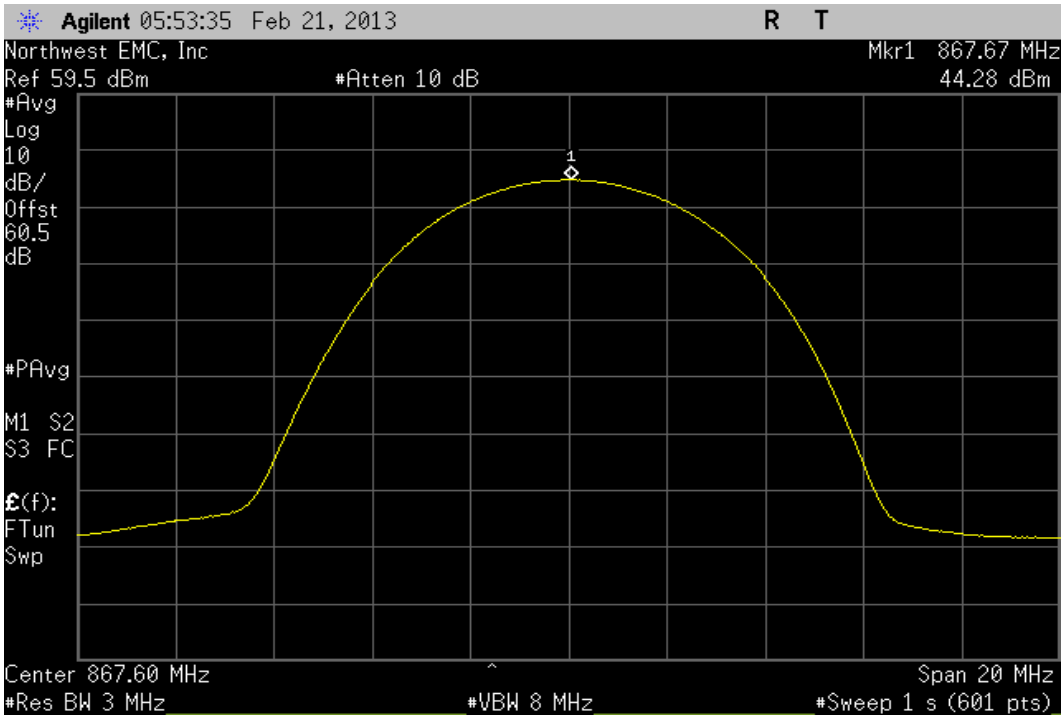
LTE 1.4 MHz Multi Carrier [2FA], Mid Channel

				Value	Limit	Result
				44.26 dBm	54 dBm	Pass



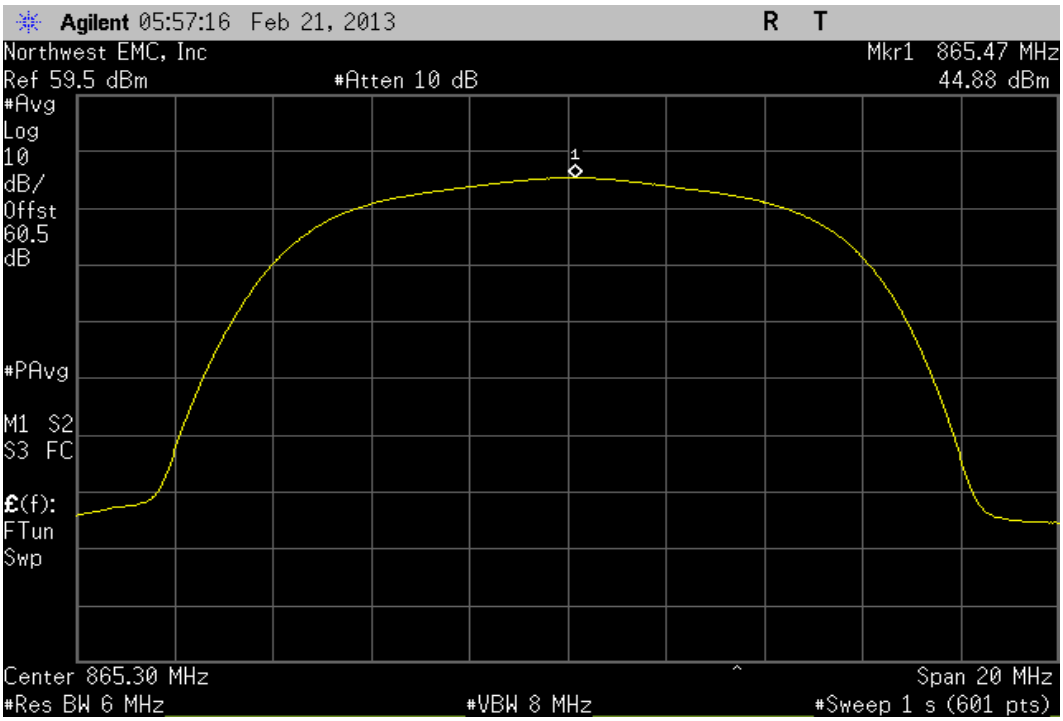
LTE 1.4 MHz Multi Carrier [2FA], High Channel

				Value	Limit	Result
				44.28 dBm	54 dBm	Pass



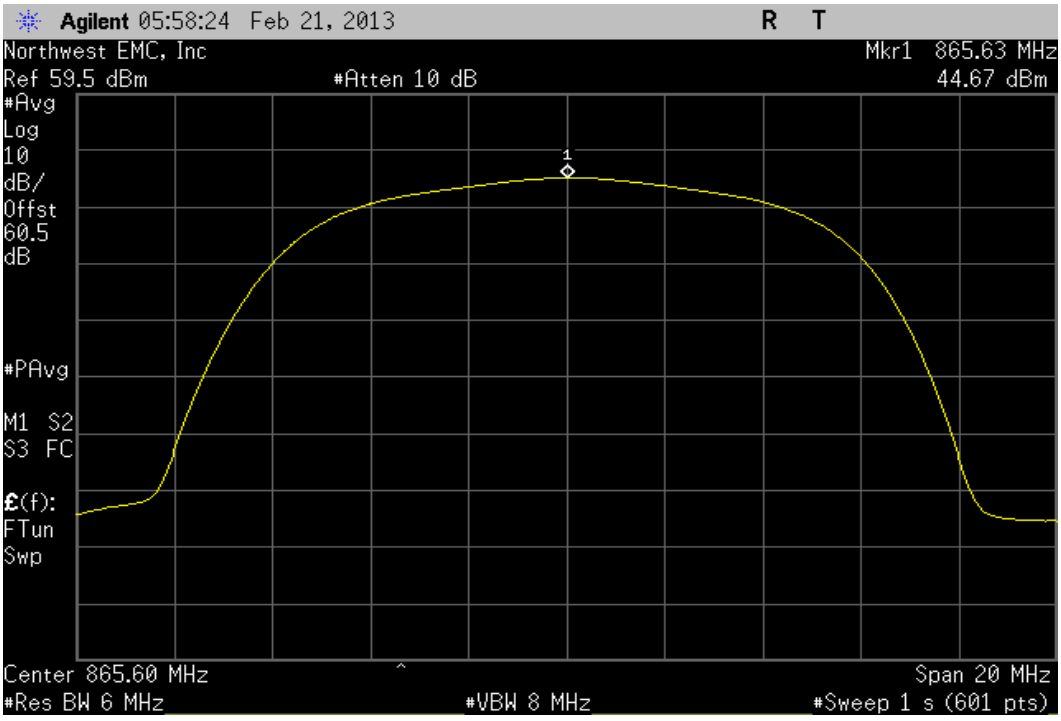
LTE 3 MHz Multi Carrier [2FA], Low Channel

				Value	Limit	Result
				44.88 dBm	54 dBm	Pass



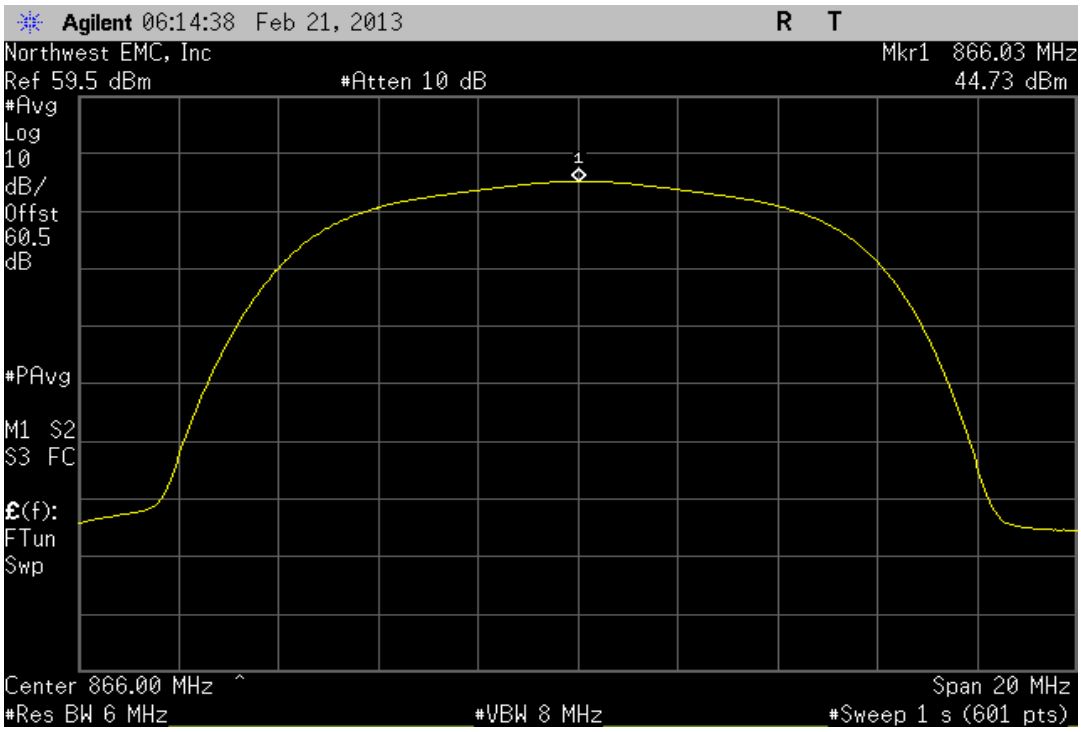
LTE 3 MHz Multi Carrier [2FA], Mid Channel

				Value	Limit	Result
				44.67 dBm	54 dBm	Pass



LTE 3 MHz Multi Carrier [2FA], High Channel

				Value	Limit	Result
				44.73 dBm	54 dBm	Pass



NORTHWEST EMC

CONDUCTED OUTPUT POWER

XMit 2011.04.20
PsaTx 2011.06.20

EUT:	800MHz i-DEN RRH			Work Order:	KMWC0038
Serial Number:	U311210059			Date:	02/20/13
Customer:	KMW Communications			Temperature:	22.86°C
Attendees:	Edward Lee			Humidity:	52%
Project:	None			Barometric Pres.:	1012.2
Tested by:	Jaemi Suh	Power:	48 VDC	Job Site:	OC10

TEST SPECIFICATIONS	TEST METHOD
FCC 90.691:2012	ANSI/TIA/EIA-603-C-2004

COMMENTS

Port B.

DEVIATIONS FROM TEST STANDARD

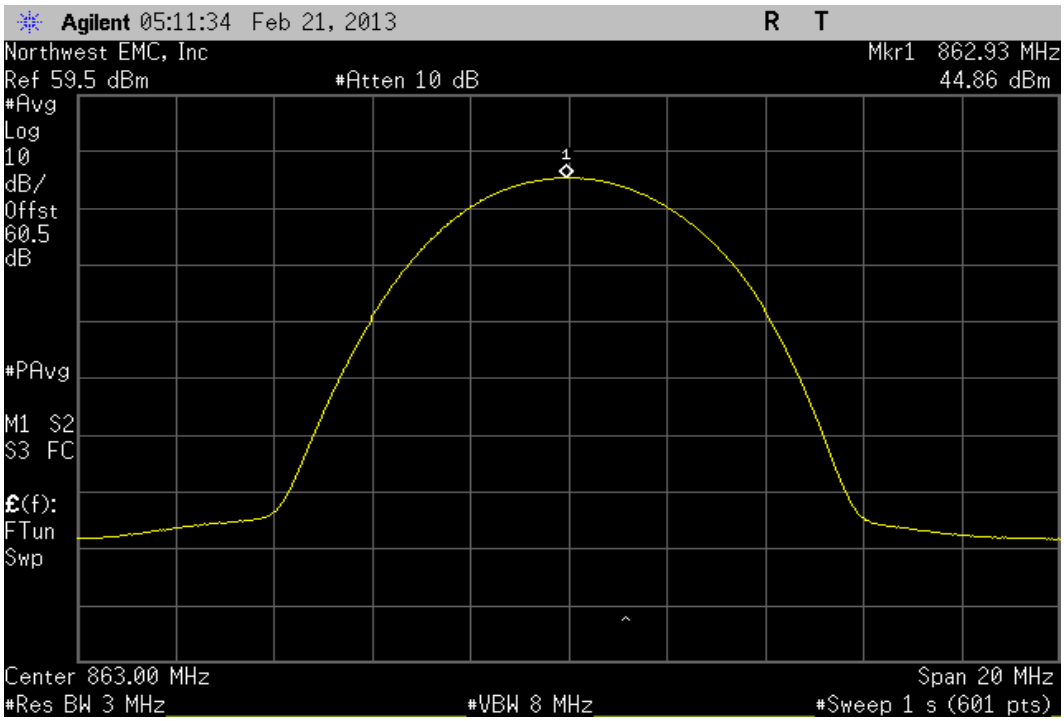
No Deviations

Configuration #	1	Signature

	Value	Limit	Result
LTE 1.4 MHz Single Carrier			
Low Channel	44.86 dBm	54 dBm	Pass
Mid Channel	45 dBm	54 dBm	Pass
High Channel	45.18 dBm	54 dBm	Pass
LTE 3 MHz Single Carrier			
Low Channel	44.25 dBm	54 dBm	Pass
Mid Channel	44.26 dBm	54 dBm	Pass
High Channel	44.25 dBm	54 dBm	Pass
LTE 5 MHz Single Carrier			
Low Channel	44.96 dBm	54 dBm	Pass
Mid Channel	44.89 dBm	54 dBm	Pass
High Channel	44.92 dBm	54 dBm	Pass
LTE 1.4 MHz Multi Carrier [2FA]			
Low Channel	44.16 dBm	54 dBm	Pass
Mid Channel	44.32 dBm	54 dBm	Pass
High Channel	44.27 dBm	54 dBm	Pass
LTE 3 MHz Multi Carrier [2FA]			
Low Channel	44.78 dBm	54 dBm	Pass
Mid Channel	44.68 dBm	54 dBm	Pass
High Channel	44.66 dBm	54 dBm	Pass

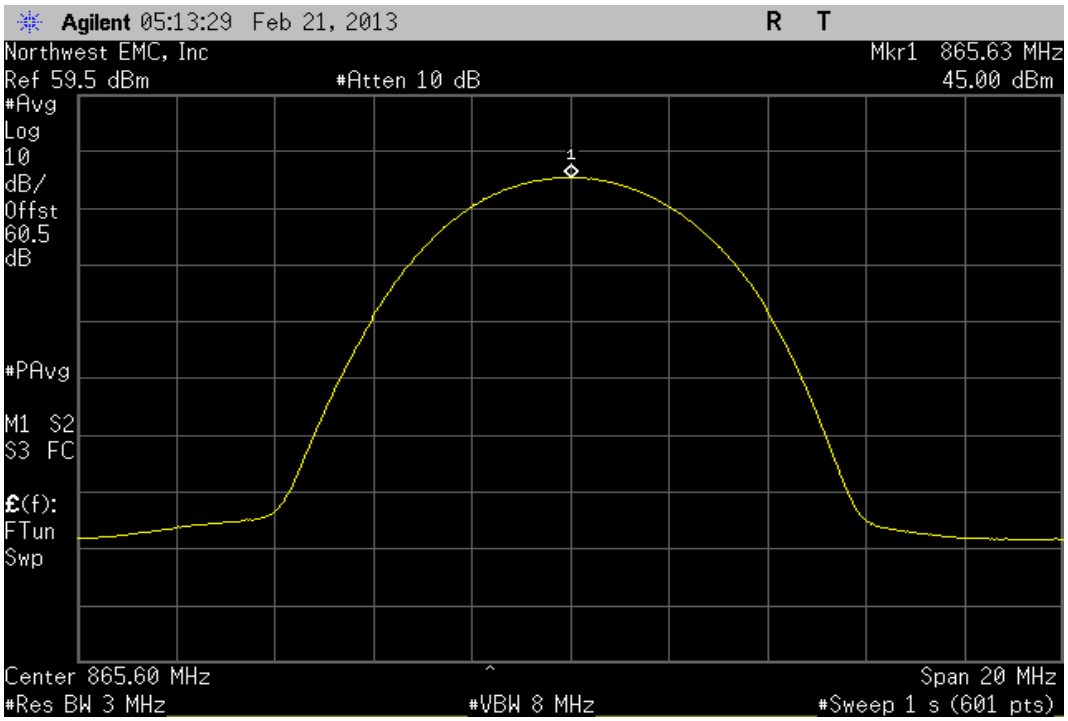
LTE 1.4 MHz Single Carrier, Low Channel

				Value	Limit	Result
				44.86 dBm	54 dBm	Pass



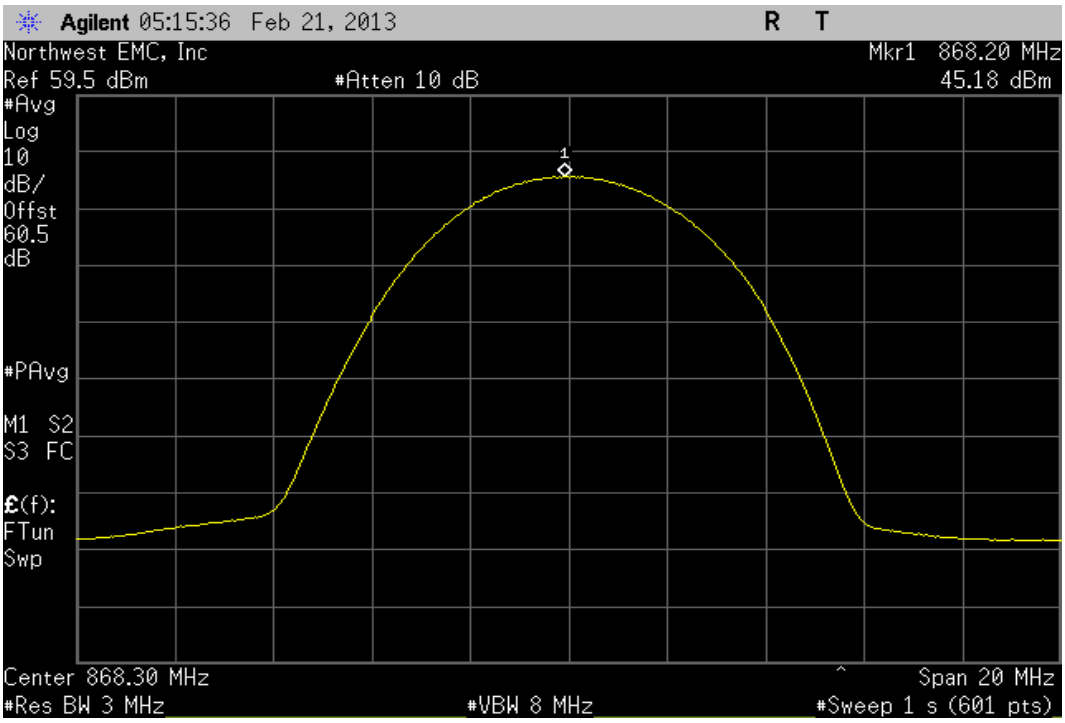
LTE 1.4 MHz Single Carrier, Mid Channel

				Value	Limit	Result
				45.00 dBm	54 dBm	Pass



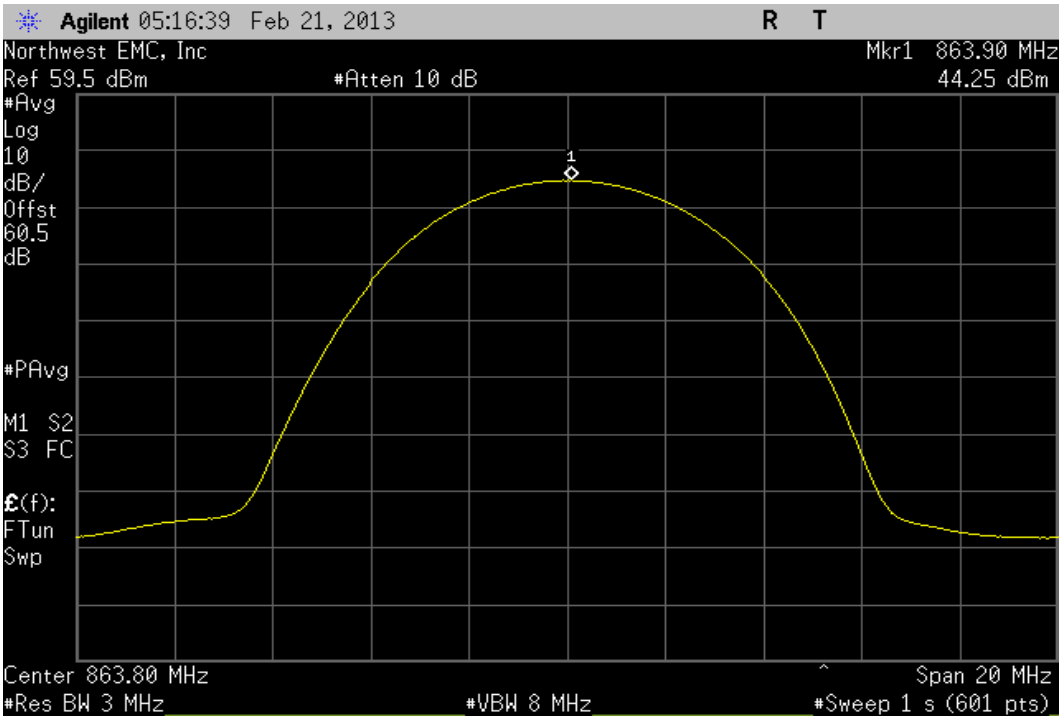
LTE 1.4 MHz Single Carrier, High Channel

				Value	Limit	Result
				45.18 dBm	54 dBm	Pass



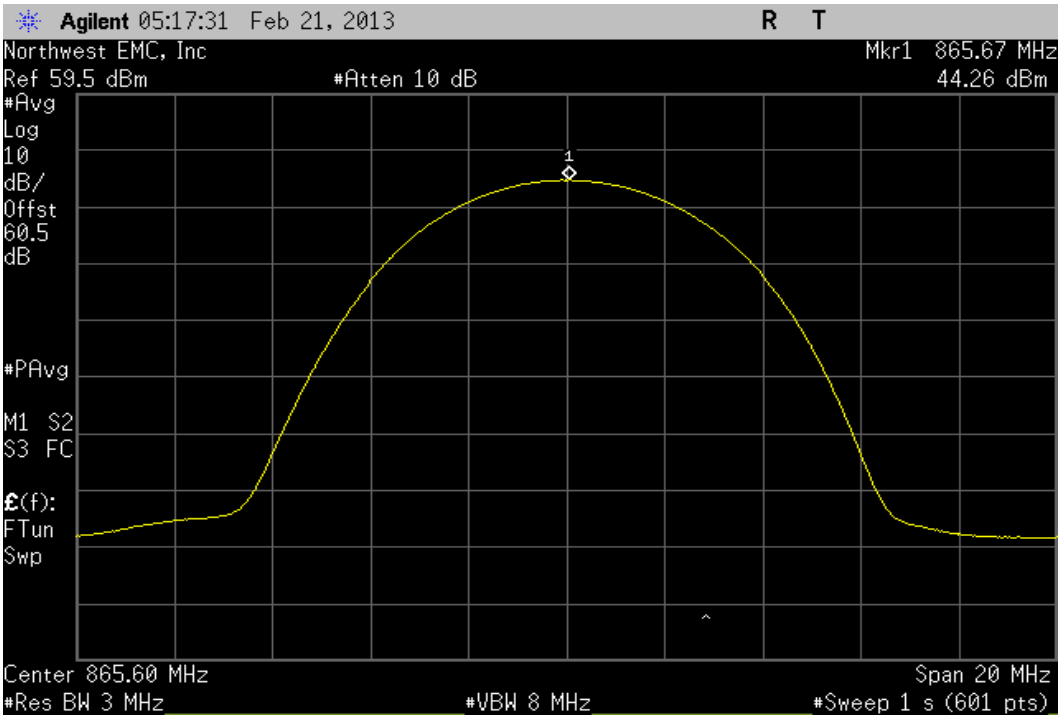
LTE 3 MHz Single Carrier, Low Channel

				Value	Limit	Result
				44.25 dBm	54 dBm	Pass



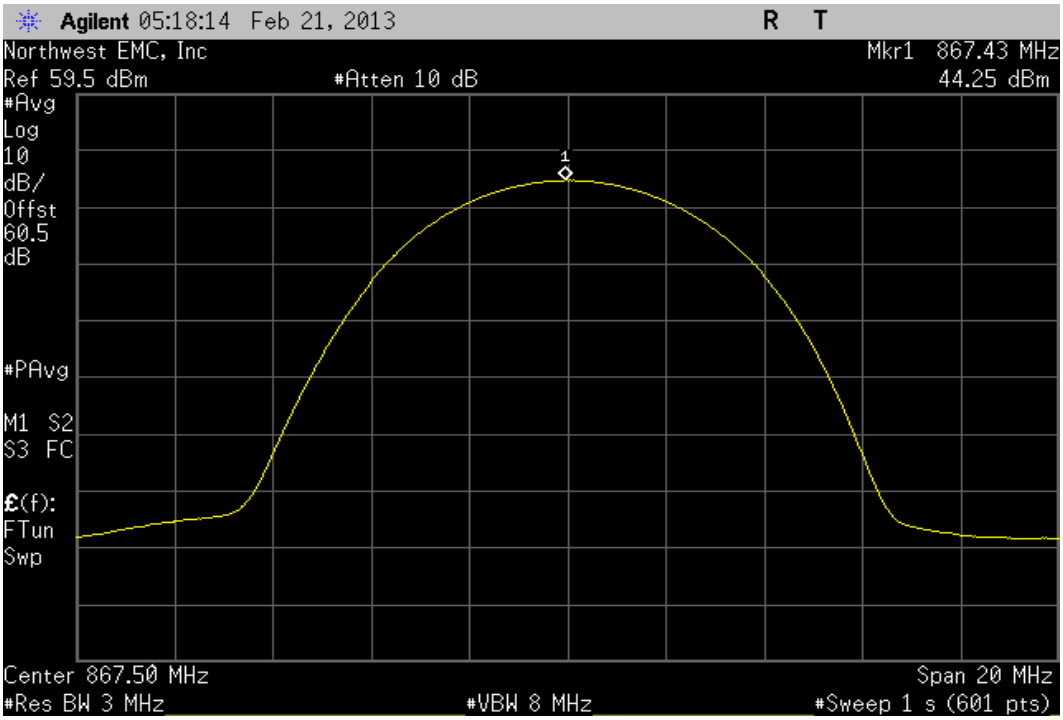
LTE 3 MHz Single Carrier, Mid Channel

				Value	Limit	Result
				44.26 dBm	54 dBm	Pass



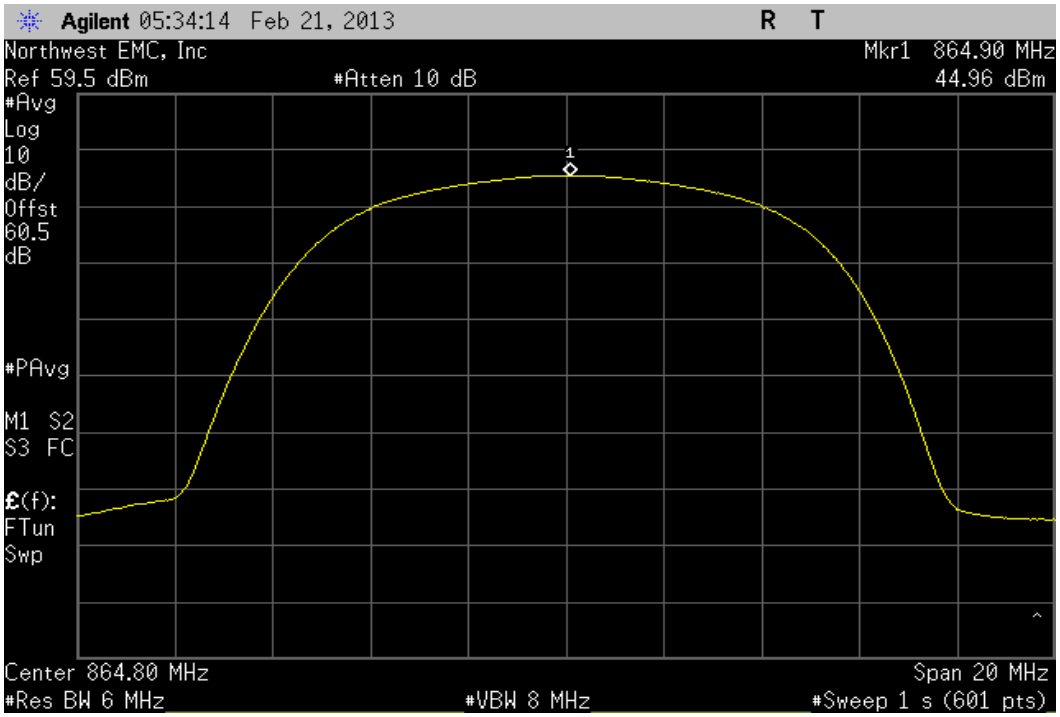
LTE 3 MHz Single Carrier, High Channel

				Value	Limit	Result
				44.25 dBm	54 dBm	Pass



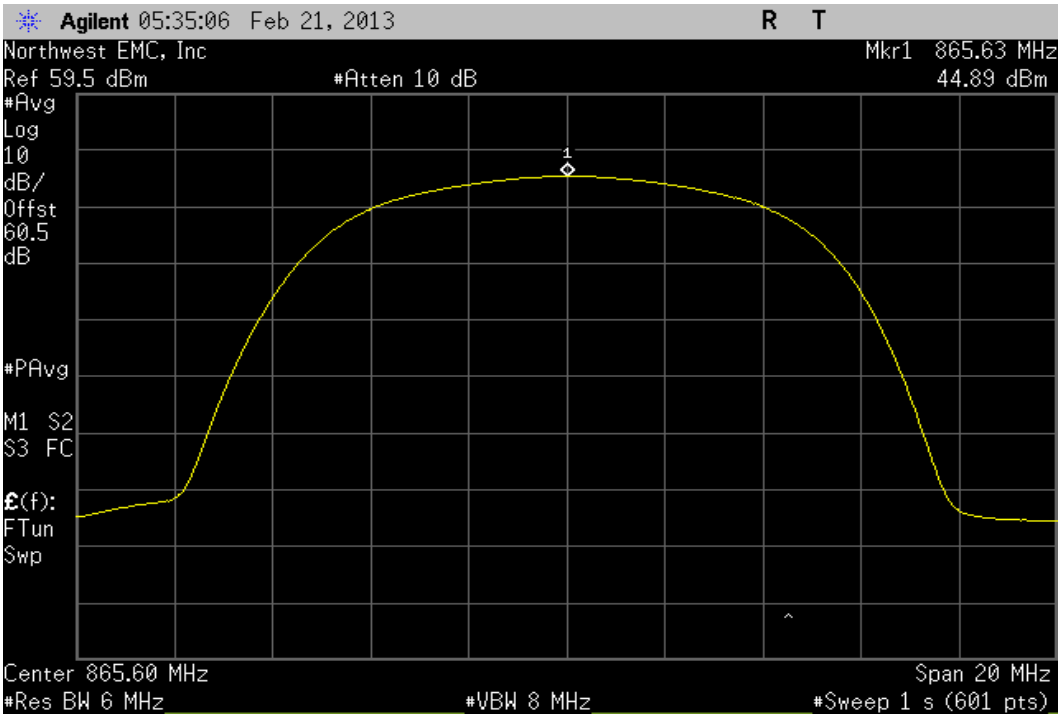
LTE 5 MHz Single Carrier, Low Channel

				Value	Limit	Result
				44.96 dBm	54 dBm	Pass



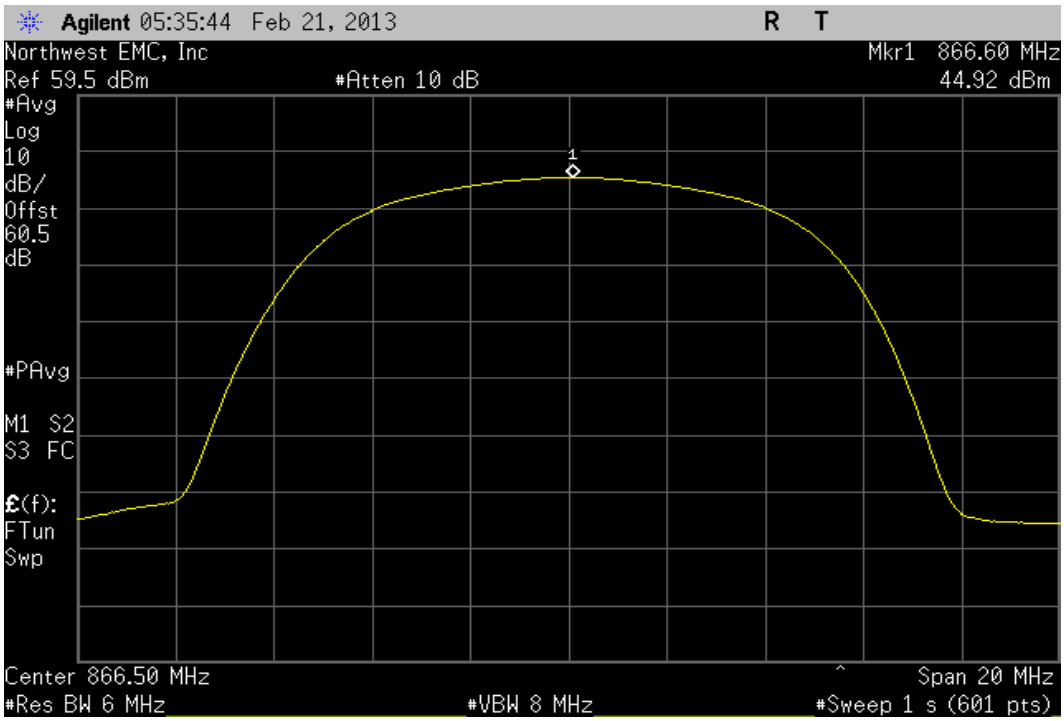
LTE 5 MHz Single Carrier, Mid Channel

				Value	Limit	Result
				44.89 dBm	54 dBm	Pass



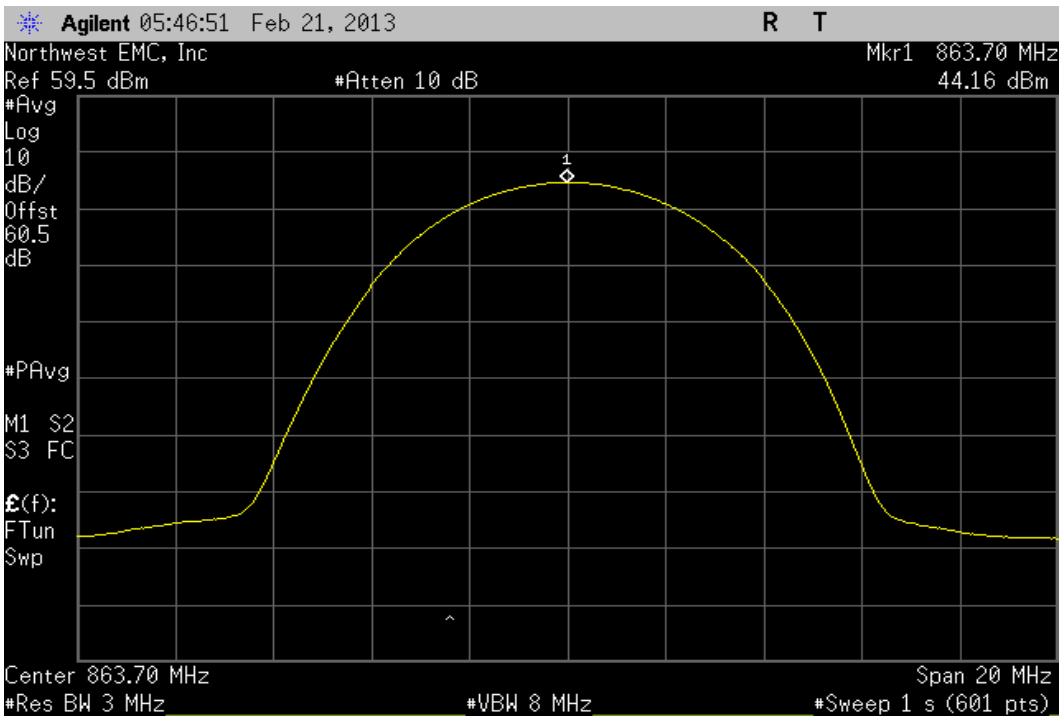
LTE 5 MHz Single Carrier, High Channel

				Value	Limit	Result
				44.92 dBm	54 dBm	Pass



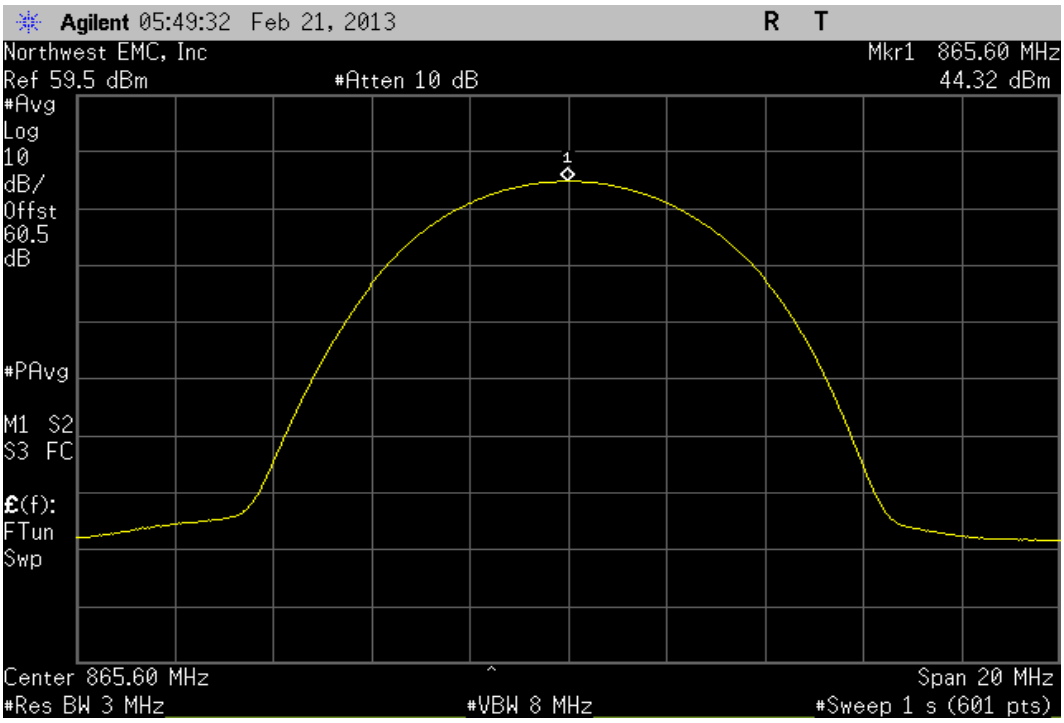
LTE 1.4 MHz Multi Carrier [2FA], Low Channel

				Value	Limit	Result
				44.16 dBm	54 dBm	Pass



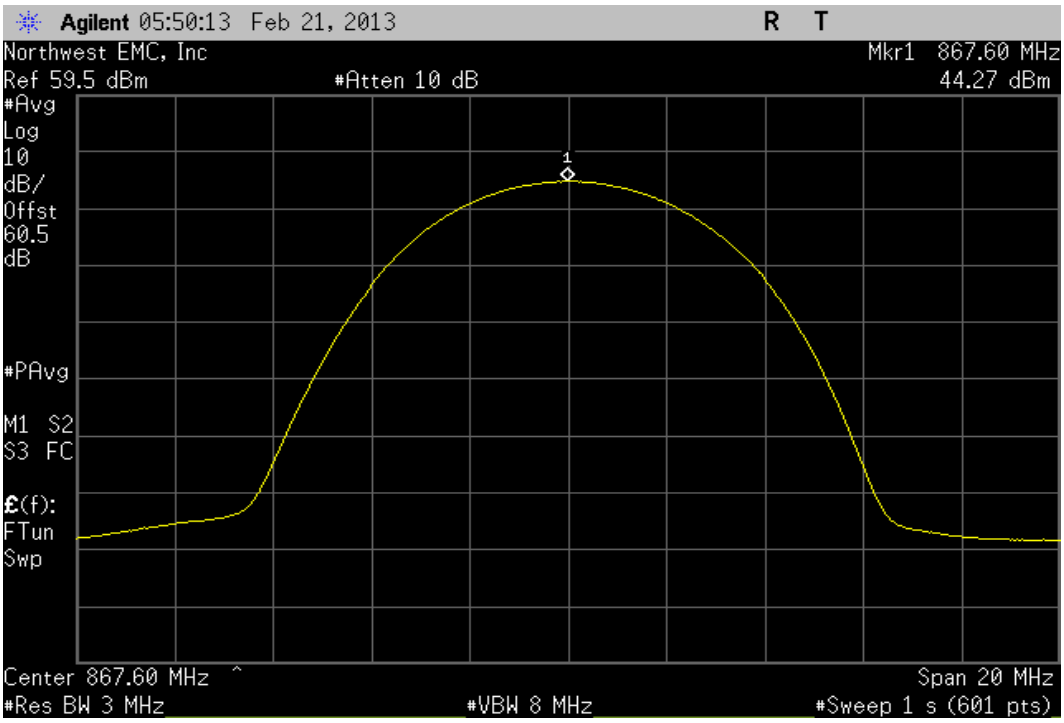
LTE 1.4 MHz Multi Carrier [2FA], Mid Channel

				Value	Limit	Result
				44.32 dBm	54 dBm	Pass



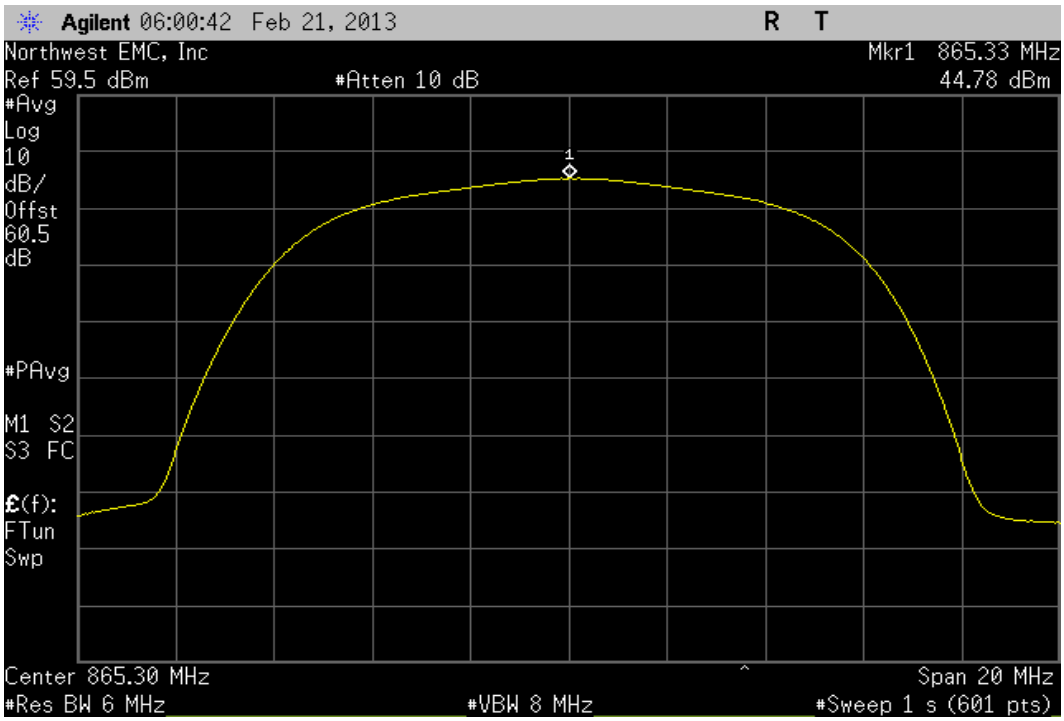
LTE 1.4 MHz Multi Carrier [2FA], High Channel

				Value	Limit	Result
				44.27 dBm	54 dBm	Pass



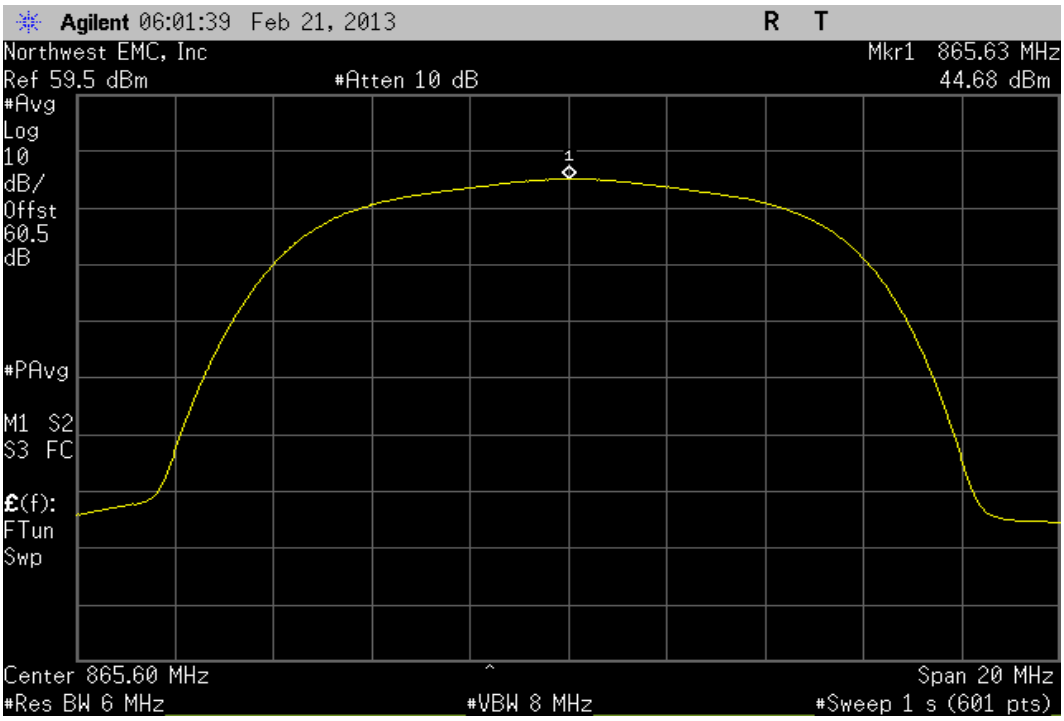
LTE 3 MHz Multi Carrier [2FA], Low Channel

				Value	Limit	Result
				44.78 dBm	54 dBm	Pass



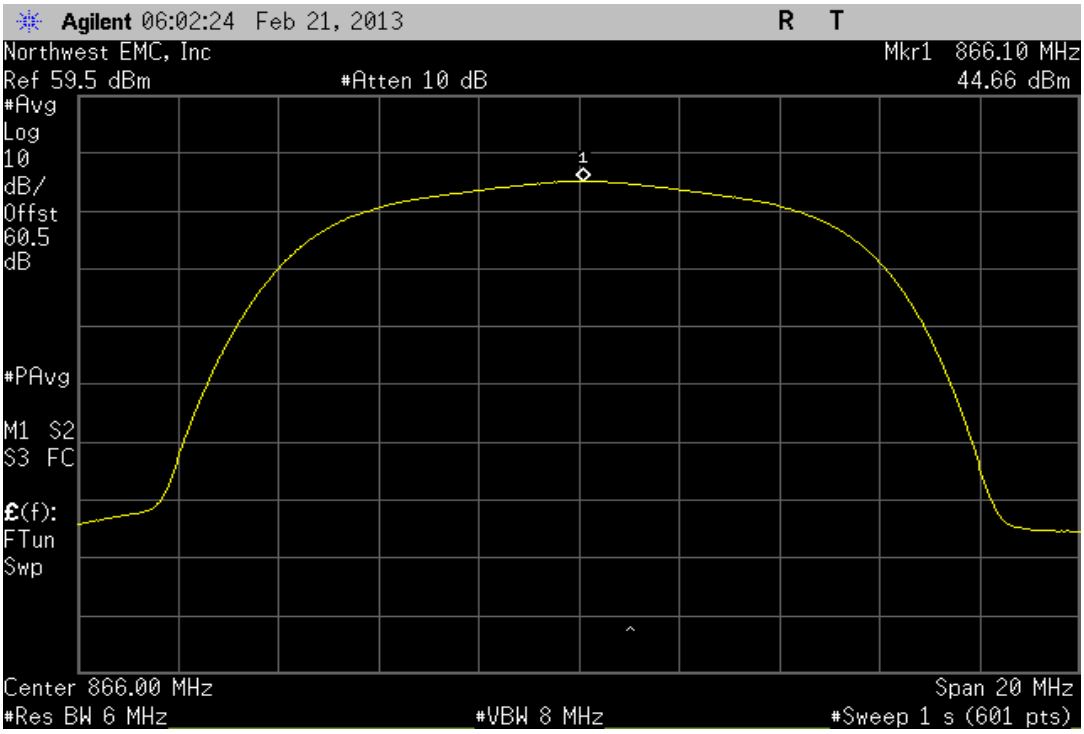
LTE 3 MHz Multi Carrier [2FA], Mid Channel

				Value	Limit	Result
				44.68 dBm	54 dBm	Pass



LTE 3 MHz Multi Carrier [2FA], High Channel

				Value	Limit	Result
				44.66 dBm	54 dBm	Pass



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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Signal Generator	Agilent	E8257D	TGU	1/26/2011	12
Power Sensor	Agilent	E4412A	SQE	4/21/2010	24
Power Meter	Hewlett Packard	E4418A	SPA	4/21/2010	24
Spectrum Analyzer	Agilent	E4440A	AFG	4/28/2011	12
DC Power Supply	Hewlett Packard	6574A	N/A	NCR	N/A
30 dB Directional Coupler (800-2500 MHz)	Fairview Microwave	SMC4030	N/A	NCR	N/A
50 Ohm Termination	Fairview Microwave	ST6NL-150	N/A	NCR	N/A

CUSTOMER TEST SET

Description	Manufacturer	Model	Last Cal.	Interval
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Vector Signal Generator	Agilent	N5182	6/7/2010	24
KMW Cobra Reliability Analyzer	KMW Cormmunications	N/A	NCR	N/A
Power Meter	Agilent	E4419B	4/1/2010	24
Power Head	Agilent	E9300H	NCR	N/A
Power Head	Agilent	E9300H	NCR	N/A
Fujitsu Laptop	Fujitsu	A6030	NCR	N/A
RRH220 Software	KMW Cormmunications	N/A	NCRA	N/A

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 99% bandwidth was measured utilizing the analyzer's peak detector and measuring the carrier's 26 dB occupied bandwidth based on the peak output power level measured. A plot was taken to show the occupied bandwidth is contained within the allowable transmit band.

A direct connection was made between the EUT and a spectrum analyzer. The resolution bandwidth was approximately equal to 1% of the 20dB bandwidth and the video bandwidth was greater than or equal to the resolution bandwidth.

The occupied bandwidth was measured with the EUT configured in the modes called out in the data sheets.

NORTHWEST EMC

OCCUPIED BANDWIDTH

XMit 2011.04.20
PsaTx 2011.06.20

EUT:	800MHz i-DEN RRH			Work Order:	KMWC0027
Serial Number:	U311210059			Date:	07/20/11
Customer:	KMW Communications			Temperature:	22.86°C
Attendees:	Joshua Jang			Humidity:	52%
Project:	None			Barometric Pres.:	1012.2
Tested by:	Jaemi Suh	Power:	48 VDC	Job Site:	OC11

TEST SPECIFICATIONS	TEST METHOD
FCC 90.691:2011	ANSI/TIA/EIA-603-C-2004

COMMENTS

Port B.

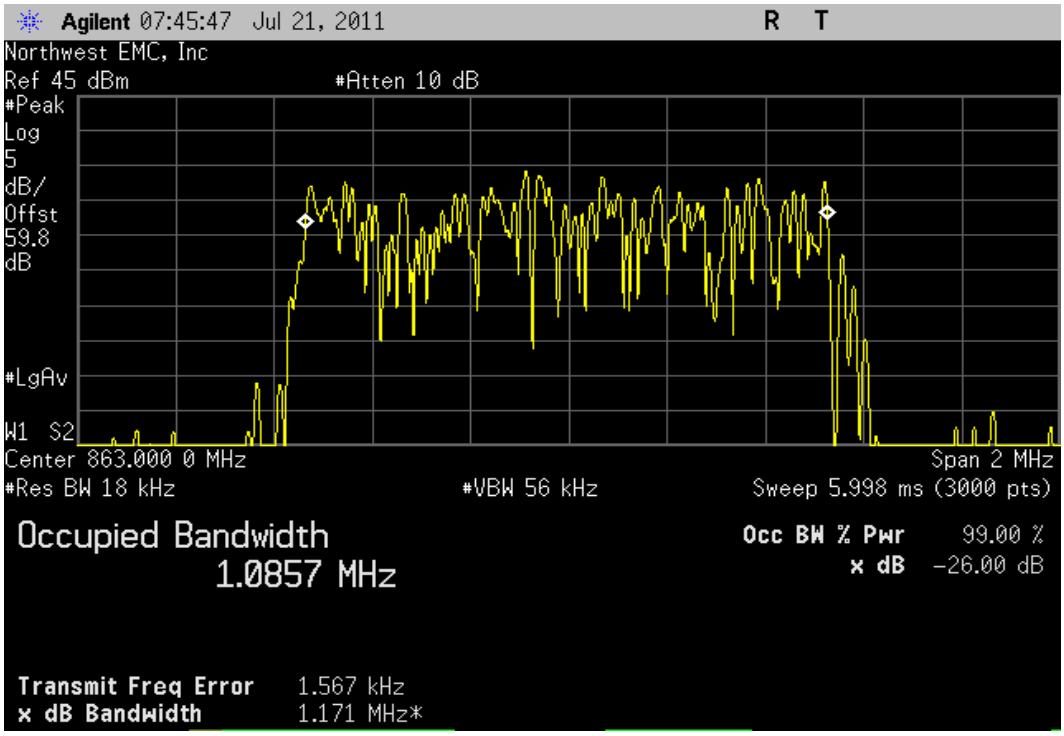
DEVIATIONS FROM TEST STANDARD

Configuration #	1	Signature

	Value	Limit	Result
LTE 1.4 MHz Single Carrier			
Low Channel	1.171 MHz	N/A	N/A
Mid Channel	1.171 MHz	N/A	N/A
High Channel	1.169 MHz	N/A	N/A
LTE 3 MHz Single Carrier			
Low Channel	2.813 MHz	N/A	N/A
Mid Channel	2.804 MHz	N/A	N/A
High Channel	2.811 MHz	N/A	N/A
LTE 5 MHz Single Carrier			
Low Channel	4.671 MHz	N/A	N/A
Mid Channel	4.675 MHz	N/A	N/A
High Channel	4.683 MHz	N/A	N/A

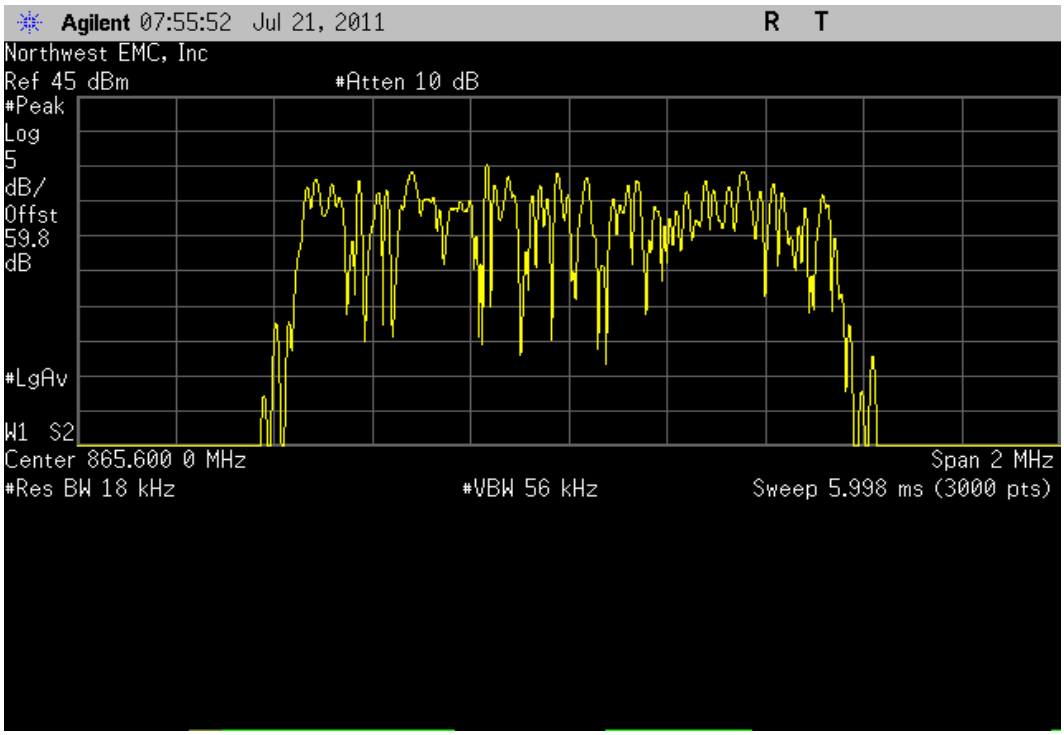
LTE 1.4 MHz Single Carrier, Low Channel

				Value	Limit	Result
				1.171 MHz	N/A	N/A



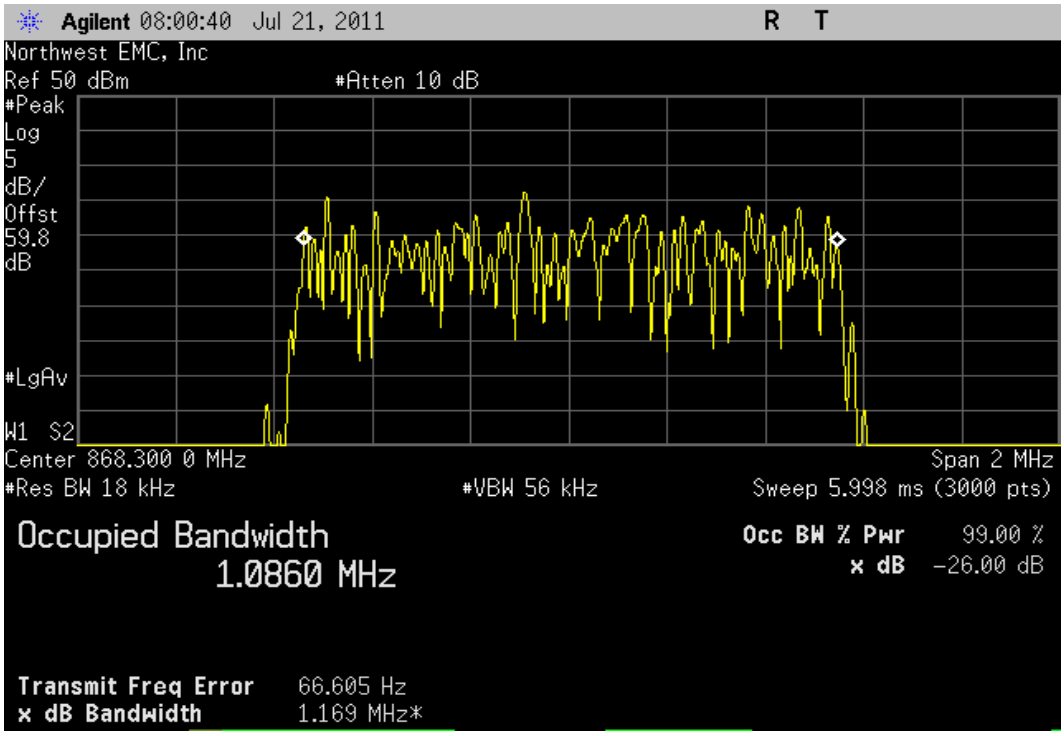
LTE 1.4 MHz Single Carrier, Mid Channel

				Value	Limit	Result
				1.171 MHz	N/A	N/A



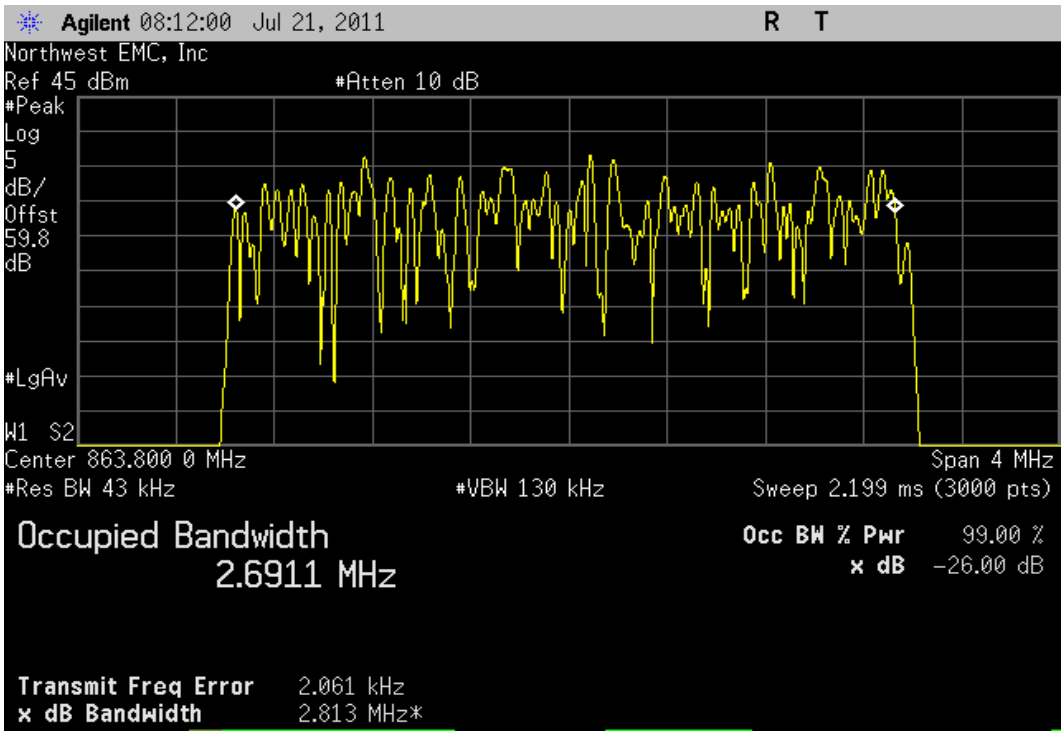
LTE 1.4 MHz Single Carrier, High Channel

				Value	Limit	Result
				1.169 MHz	N/A	N/A



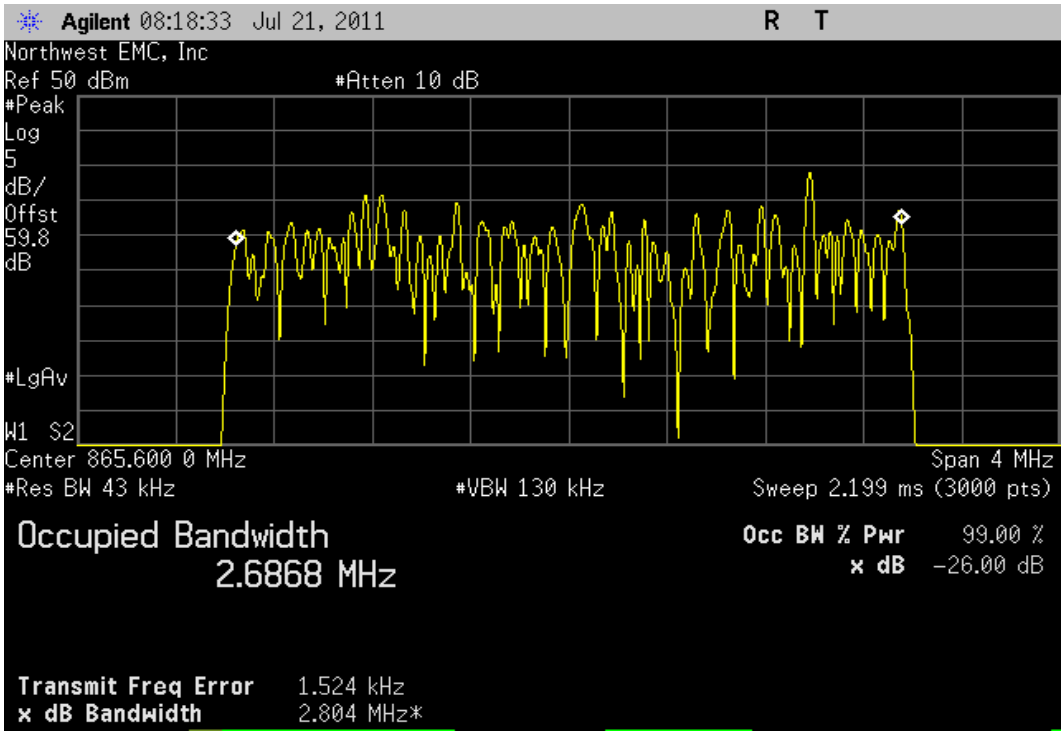
LTE 3 MHz Single Carrier, Low Channel

				Value	Limit	Result
				2.813 MHz	N/A	N/A



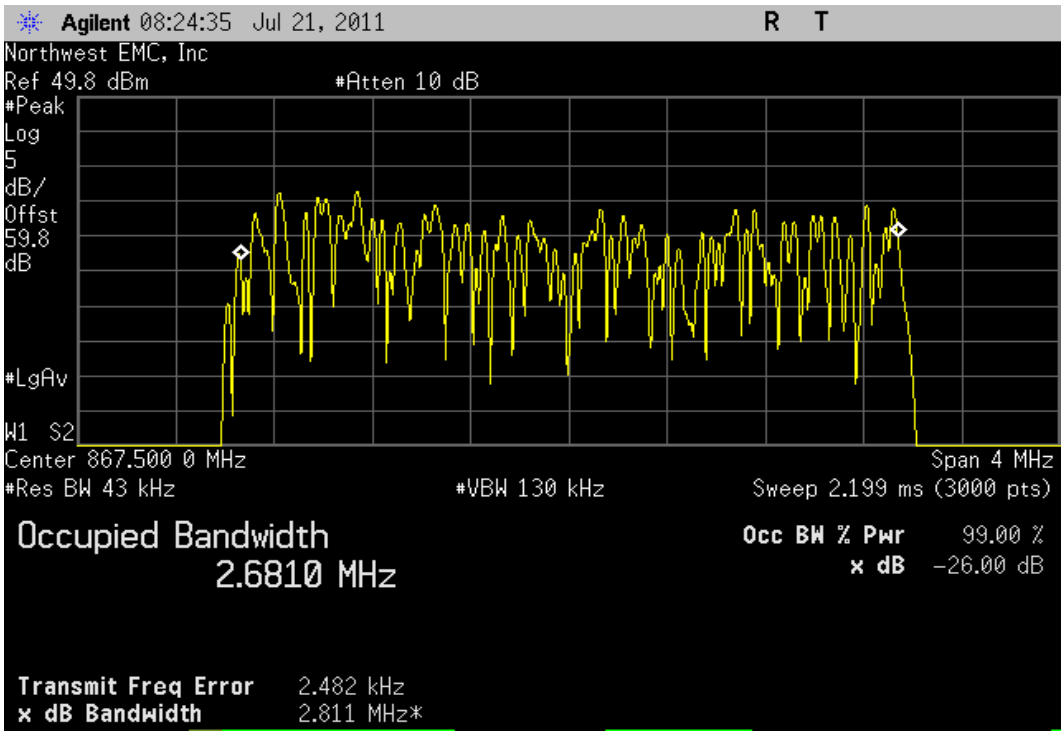
LTE 3 MHz Single Carrier, Mid Channel

				Value	Limit	Result
				2.804 MHz	N/A	N/A



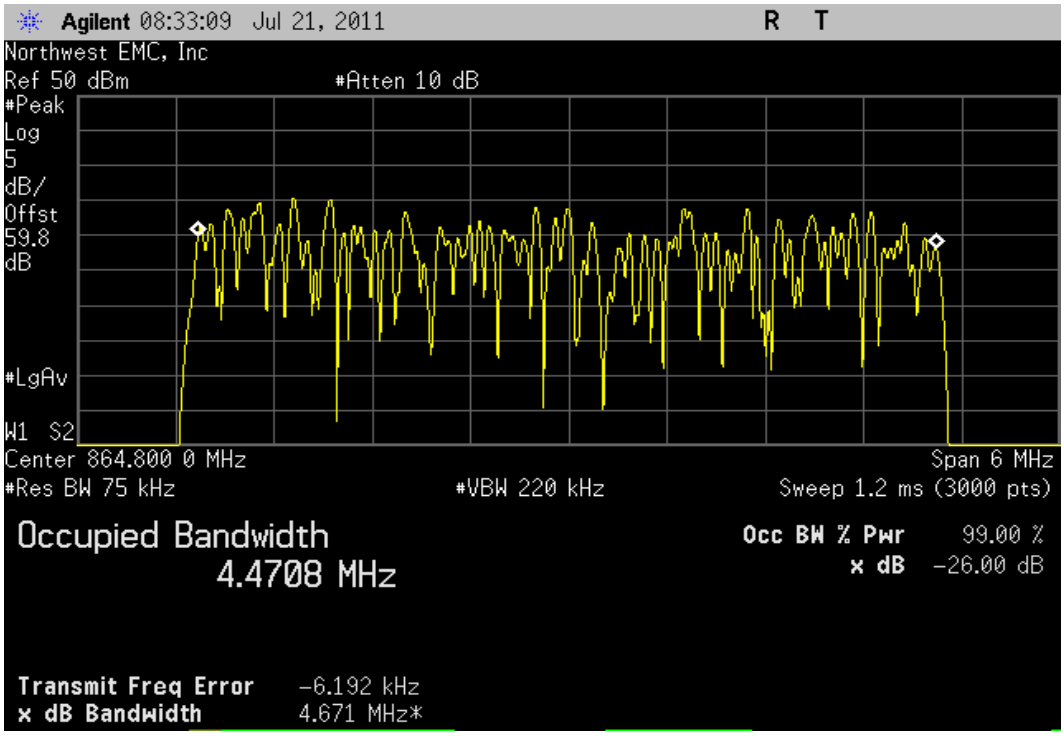
LTE 3 MHz Single Carrier, High Channel

				Value	Limit	Result
				2.811 MHz	N/A	N/A



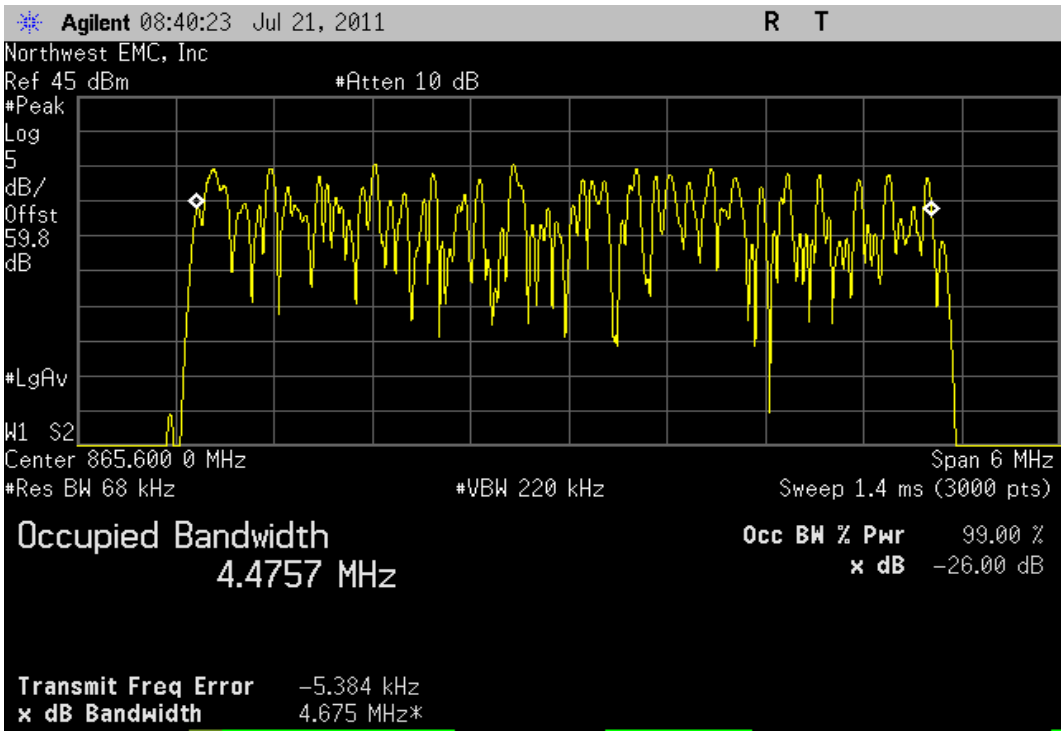
LTE 5 MHz Single Carrier, Low Channel

				Value	Limit	Result
				4.671 MHz	N/A	N/A



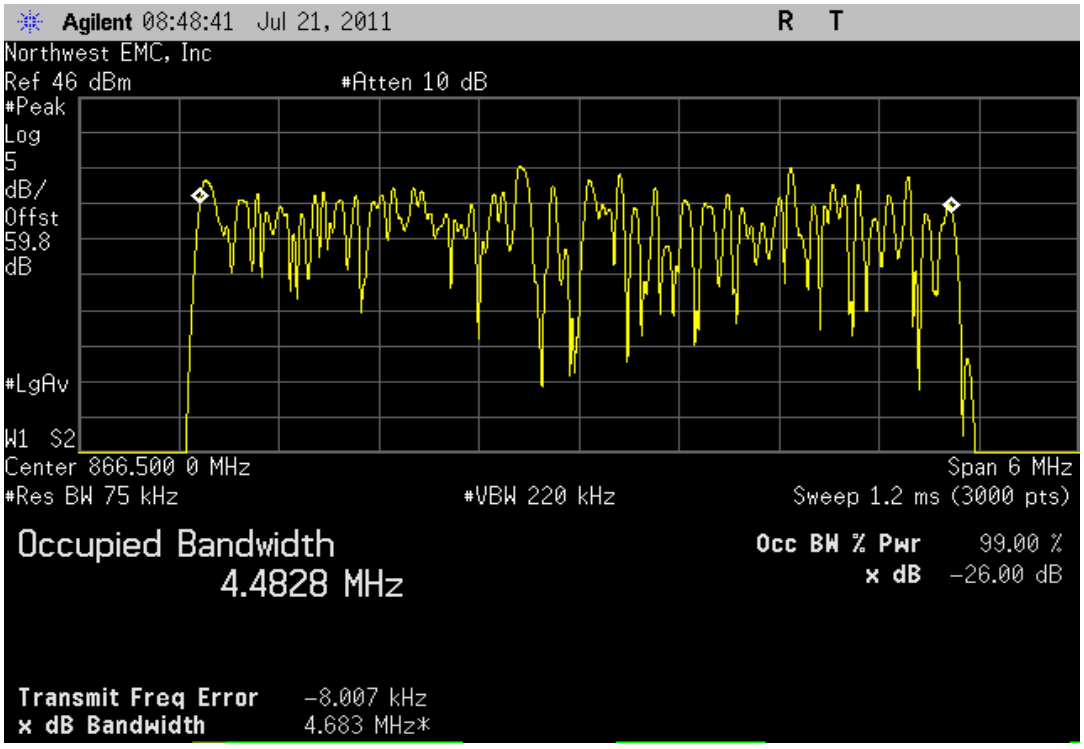
LTE 5 MHz Single Carrier, Mid Channel

				Value	Limit	Result
				4.675 MHz	N/A	N/A



LTE 5 MHz Single Carrier, High Channel

				Value	Limit	Result
				4.683 MHz	N/A	N/A



N/A N/A

SPURIOUS EMISSIONS AT ANTENNA TERMINALS - LTE

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	AFG	5/16/2012	12
DC Power Supply	Hewlett Packard	6574A	N/A	NCR	N/A
30 dB Directional Coupler (800-2500 MHz)	Fairview Microwave	SMC4030	N/A	NCR	N/A
50 Ohm Termination	Fairview Microwave	ST6NL-150	N/A	NCR	N/A

CUSTOMER TEST EQUIPMENT

Description	Manufacturer	Model	Last Cal.	Interval
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Vector Signal Generator	Agilent	N5182	6/7/2010	24
KMW Cobra Reliability Analyzer	KMW Cormmunications	N/A	NCR	N/A
Power Meter	Agilent	E4419B	4/1/2010	24
Power Head	Agilent	E9300H	NCR	N/A
Power Head	Agilent	E9300H	NCR	N/A
Fujitsu Laptop	Fujitsu	A6030	NCR	N/A
RRH220 Software	KMW Cormmunications	N/A	NCRA	N/A

MEASUREMENT UNCERTAINTY

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

TEST DESCRIPTION

The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range 9 kHz to 12.75 GHz.

SPURIOUS EMISSIONS AT ANTENNA TERMINALS - LTE

EUT:	RRH220	**Work Order:**	KMWC0036
Serial Number:	None	**Date:**	11/14/12
Customer:	KMW Communications	**Temperature:**	23.5 C°C
Attendees:	Edward Lee & Ky Kim	**Humidity:**	43%
Project:	None	**Barometric Pres.:**	1018
Tested by:	Johnny Candelas	**Power:** 48VDC	**Job Site:** OC10

TEST SPECIFICATIONS	Test Method
FCC 90.691:2012	ANSI/TIA/EIA-603-C-2004

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

None

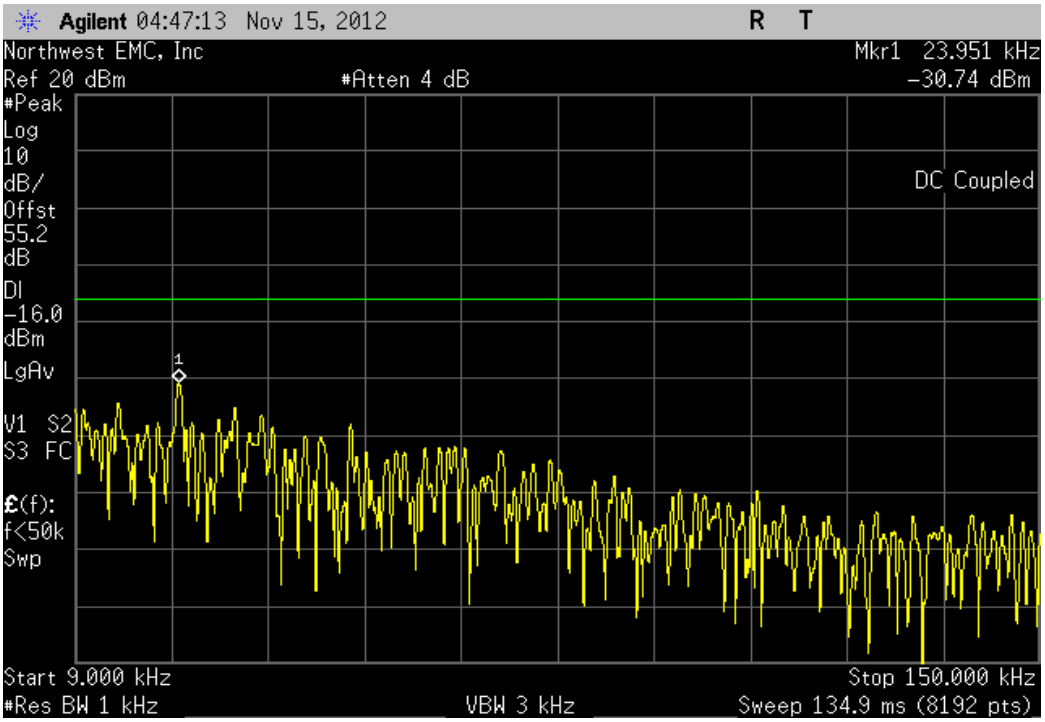
Configuration #	1	Signature

		Value	Limit	Result
Port A				
	LTE 1.4MHz Single Carrier			
	Low			
	9kHz-150kHz	-30.74 dBm	-16 dBm	Pass
	150kHz-30MHz	-43.18 dBm	-16 dBm	Pass
	30MHz-1GHz	-34.43 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-17.71 dBm	-16 dBm	Pass
	Mid			
	9kHz-150kHz	-30.33 dBm	-16 dBm	Pass
	150kHz-30MHz	-42.98 dBm	-16 dBm	Pass
	30MHz-1GHz	-34.06 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-17.92 dBm	-16 dBm	Pass
	High			
	9kHz-150kHz	-30.07 dBm	-16 dBm	Pass
	150kHz-30MHz	-43.91 dBm	-16 dBm	Pass
	30MHz-1GHz	-34.12 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-17.42 dBm	-16 dBm	Pass
	LTE 3MHz Single Carrier			
	Low			
	9kHz-150kHz	-32.12 dBm	-16 dBm	Pass
	150kHz-30MHz	-43.26 dBm	-16 dBm	Pass
	30MHz-1GHz	-33.59 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-17.71 dBm	-16 dBm	Pass
	Mid			
	9kHz-150kHz	-32.08 dBm	-16 dBm	Pass
	150kHz-30MHz	-42.52 dBm	-16 dBm	Pass
	30MHz-1GHz	-33.15 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-18.33 dBm	-16 dBm	Pass
	High			
	9kHz-150kHz	-32.74 dBm	-16 dBm	Pass
	150kHz-30MHz	-42.51 dBm	-16 dBm	Pass
	30MHz-1GHz	-34.09 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-18.03 dBm	-16 dBm	Pass
	LTE 5MHz Single Carrier			
	Low			
	9kHz-150kHz	-33.12 dBm	-16 dBm	Pass
	150kHz-30MHz	-41.48 dBm	-16 dBm	Pass
	30MHz-1GHz	-33.57 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-17.91 dBm	-16 dBm	Pass
	Mid			
	9kHz-150kHz	-32.78 dBm	-16 dBm	Pass
	150kHz-30MHz	-41.85 dBm	-16 dBm	Pass
	30MHz-1GHz	-33.54 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-18.1 dBm	-16 dBm	Pass
	High			
	9kHz-150kHz	-32.65 dBm	-16 dBm	Pass
	150kHz-30MHz	-41.83 dBm	-16 dBm	Pass
	30MHz-1GHz	-34.3 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-17.79 dBm	-16 dBm	Pass
	LTE 1.4MHz Multi Carrier			
	Low			
	9kHz-150kHz	-29.95 dBm	-16 dBm	Pass
	150kHz-30MHz	-42.23 dBm	-16 dBm	Pass
	30MHz-1GHz	-24.62 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-17.96 dBm	-16 dBm	Pass
	Mid			
	9kHz-150kHz	-30.53 dBm	-16 dBm	Pass
	150kHz-30MHz	-42.67 dBm	-16 dBm	Pass
	30MHz-1GHz	-23.44 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-17.96 dBm	-16 dBm	Pass
	High			
	9kHz-150kHz	-30.25 dBm	-16 dBm	Pass
	150kHz-30MHz	-42.01 dBm	-16 dBm	Pass
	30MHz-1GHz	-23.56 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-18.02 dBm	-16 dBm	Pass
	LTE 3MHz Multi Carrier			
	Low			
	9kHz-150kHz	-29.69 dBm	-16 dBm	Pass
	150kHz-30MHz	-42.31 dBm	-16 dBm	Pass
	30MHz-1GHz	-23.03 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-17.83 dBm	-16 dBm	Pass
	Mid			
	9kHz-150kHz	-30.8 dBm	-16 dBm	Pass
	150kHz-30MHz	-41.85 dBm	-16 dBm	Pass
	30MHz-1GHz	-24.59 dBm	-16 dBm	Pass
	1GHz-12.75GHz	-18.28 dBm	-16 dBm	Pass
	High			
	9kHz-150kHz	-30.69 dBm	-16 dBm	Pass
	150kHz-30MHz	-43.01 dBm	-16 dBm	Pass

		30MHz-1GHz	-29 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-17.82 dBm	-16 dBm	Pass
Port B					
	LTE 1.4MHz Single Carrier				
		Low			
		9kHz-150kHz	-32.12 dBm	-16 dBm	Pass
		150kHz-30MHz	-42.19 dBm	-16 dBm	Pass
		30MHz-1GHz	-34.14 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-18.05 dBm	-16 dBm	Pass
		Mid			
		9kHz-150kHz	-31.73 dBm	-16 dBm	Pass
		150kHz-30MHz	-42.82 dBm	-16 dBm	Pass
		30MHz-1GHz	-33.58 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-18.62 dBm	-16 dBm	Pass
		High			
		9kHz-150kHz	-31.22 dBm	-16 dBm	Pass
		150kHz-30MHz	-43.18 dBm	-16 dBm	Pass
		30MHz-1GHz	-33.37 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-18.25 dBm	-16 dBm	Pass
	LTE 3MHz Single Carrier				
		Low			
		9kHz-150kHz	-32.85 dBm	-16 dBm	Pass
		150kHz-30MHz	-43.01 dBm	-16 dBm	Pass
		30MHz-1GHz	-34.34 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-18.55 dBm	-16 dBm	Pass
		Mid			
		9kHz-150kHz	-32.58 dBm	-16 dBm	Pass
		150kHz-30MHz	-43.15 dBm	-16 dBm	Pass
		30MHz-1GHz	-33.91 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-18.19 dBm	-16 dBm	Pass
		High			
		9kHz-150kHz	-32.42 dBm	-16 dBm	Pass
		150kHz-30MHz	-43.26 dBm	-16 dBm	Pass
		30MHz-1GHz	-33.58 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-17.52 dBm	-16 dBm	Pass
	LTE 5MHz Single Carrier				
		Low			
		9kHz-150kHz	-32.31 dBm	-16 dBm	Pass
		150kHz-30MHz	-42.91 dBm	-16 dBm	Pass
		30MHz-1GHz	-33.59 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-18.17 dBm	-16 dBm	Pass
		Mid			
		9kHz-150kHz	-31.19 dBm	-16 dBm	Pass
		150kHz-30MHz	-43.25 dBm	-16 dBm	Pass
		30MHz-1GHz	-32.14 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-18.26 dBm	-16 dBm	Pass
		High			
		9kHz-150kHz	-31.41 dBm	-16 dBm	Pass
		150kHz-30MHz	-43.36 dBm	-16 dBm	Pass
		30MHz-1GHz	-34.05 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-18.13 dBm	-16 dBm	Pass
	LTE 1.4MHz Multi Carrier				
		Low			
		9kHz-150kHz	-29.94 dBm	-16 dBm	Pass
		150kHz-30MHz	-42.32 dBm	-16 dBm	Pass
		30MHz-1GHz	-25.34 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-17.72 dBm	-16 dBm	Pass
		Mid			
		9kHz-150kHz	-29.19 dBm	-16 dBm	Pass
		150kHz-30MHz	-42.67 dBm	-16 dBm	Pass
		30MHz-1GHz	-24.32 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-18.08 dBm	-16 dBm	Pass
		High			
		9kHz-150kHz	-30.24 dBm	-16 dBm	Pass
		150kHz-30MHz	-42.34 dBm	-16 dBm	Pass
		30MHz-1GHz	-24.61 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-18.03 dBm	-16 dBm	Pass
	LTE 3MHz Multi Carrier				
		Low			
		9kHz-150kHz	-30.04 dBm	-16 dBm	Pass
		150kHz-30MHz	-41.25 dBm	-16 dBm	Pass
		30MHz-1GHz	-25.75 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-17.89 dBm	-16 dBm	Pass
		Mid			
		9kHz-150kHz	-30.27 dBm	-16 dBm	Pass
		150kHz-30MHz	-41.78 dBm	-16 dBm	Pass
		30MHz-1GHz	-25.88 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-17.9 dBm	-16 dBm	Pass
		High			
		9kHz-150kHz	-30.96 dBm	-16 dBm	Pass
		150kHz-30MHz	-42.09 dBm	-16 dBm	Pass
		30MHz-1GHz	-24.35 dBm	-16 dBm	Pass
		1GHz-12.75GHz	-18.35 dBm	-16 dBm	Pass

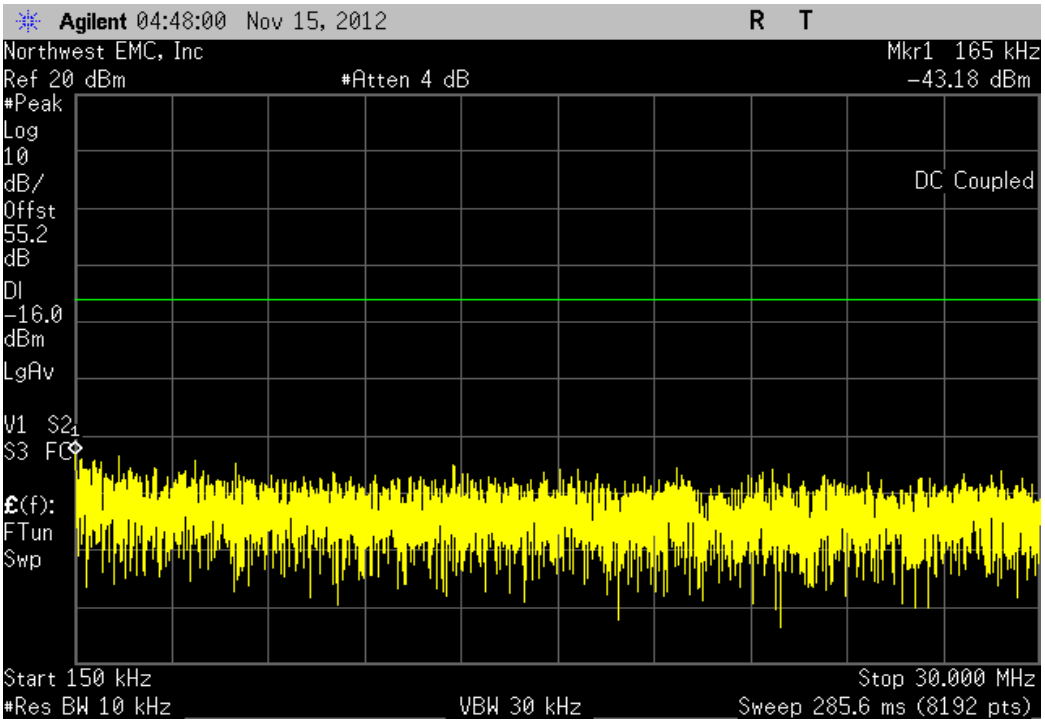
Port A, LTE 1.4MHz Single Carrier, Low, 9kHz-150kHz

				Value	Limit	Result
				-30.74 dBm	-16 dBm	Pass



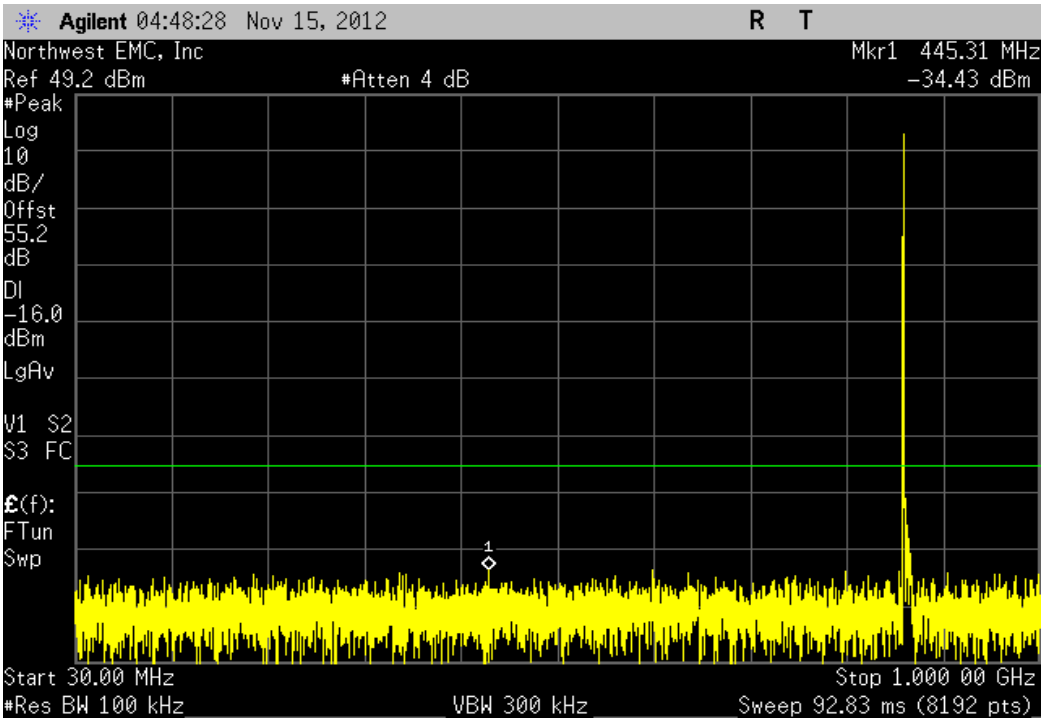
Port A, LTE 1.4MHz Single Carrier, Low, 150kHz-30MHz

				Value	Limit	Result
				-43.18 dBm	-16 dBm	Pass



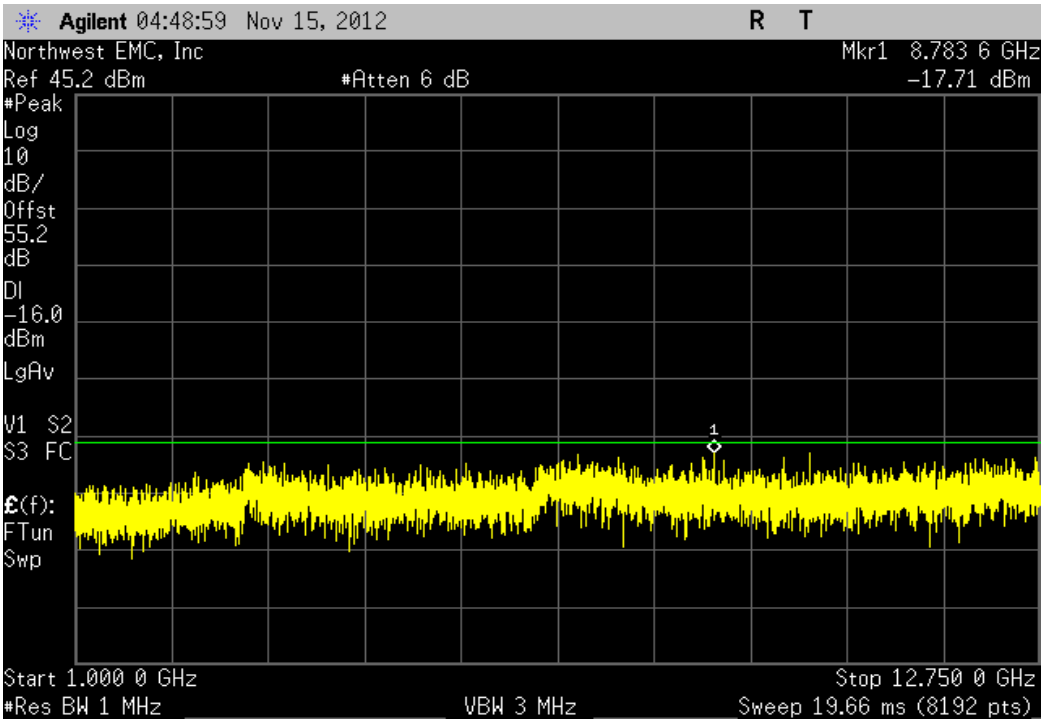
Port A, LTE 1.4MHz Single Carrier, Low, 30MHz-1GHz

				Value	Limit	Result
				-34.43 dBm	-16 dBm	Pass



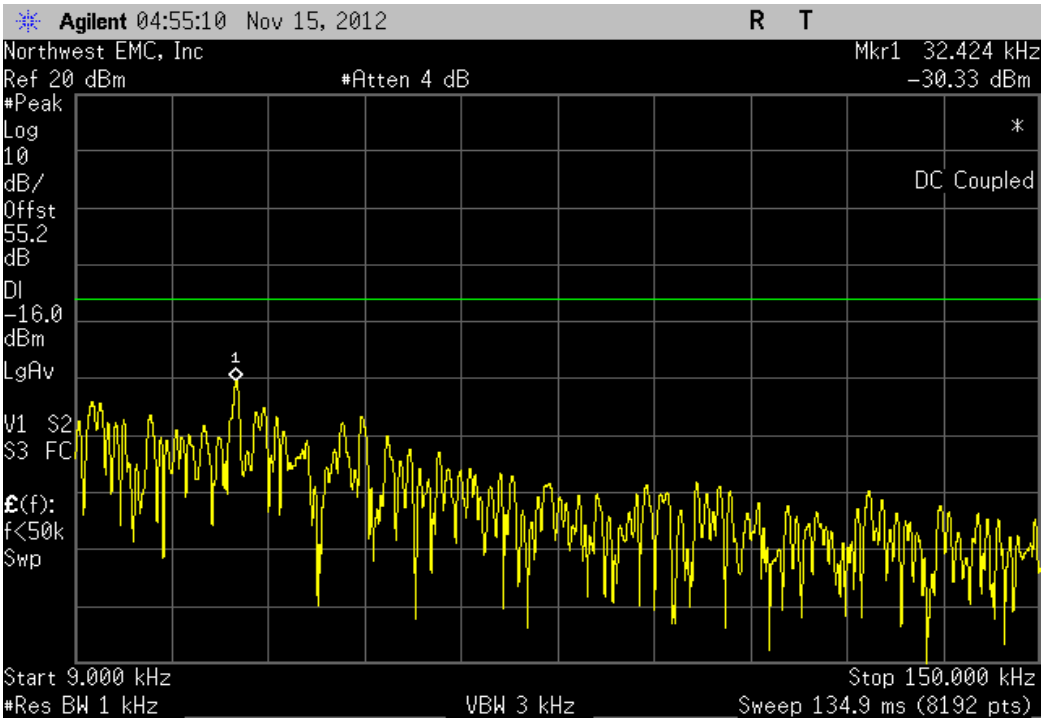
Port A, LTE 1.4MHz Single Carrier, Low, 1GHz-12.75GHz

				Value	Limit	Result
				-17.71 dBm	-16 dBm	Pass



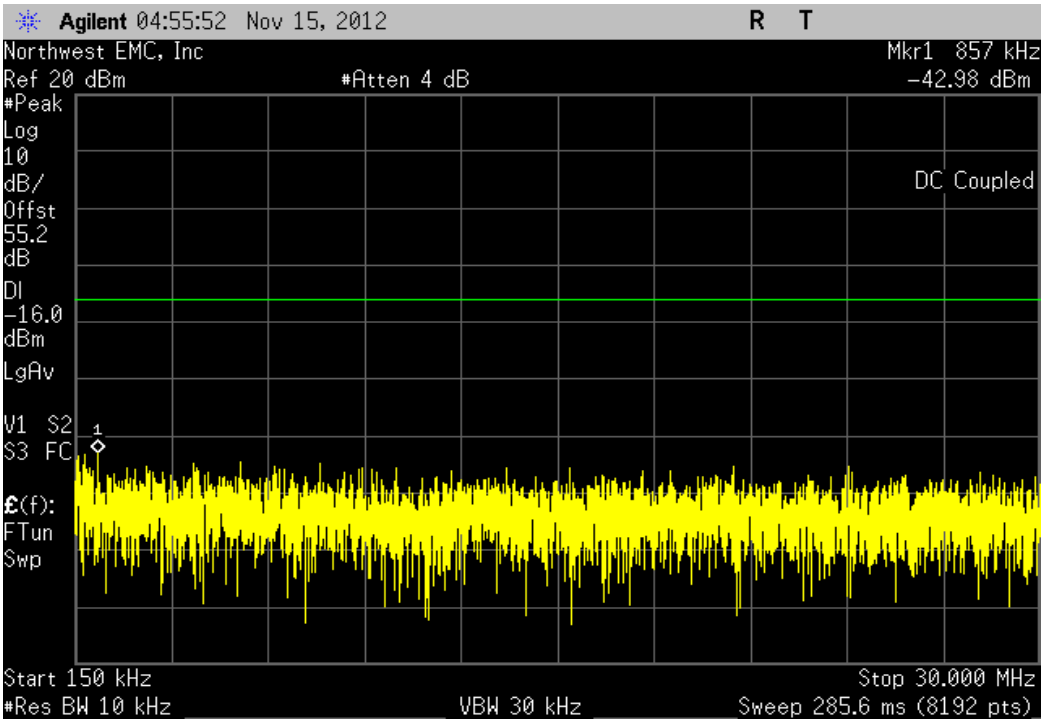
Port A, LTE 1.4MHz Single Carrier, Mid, 9kHz-150kHz

				Value	Limit	Result
				-30.33 dBm	-16 dBm	Pass



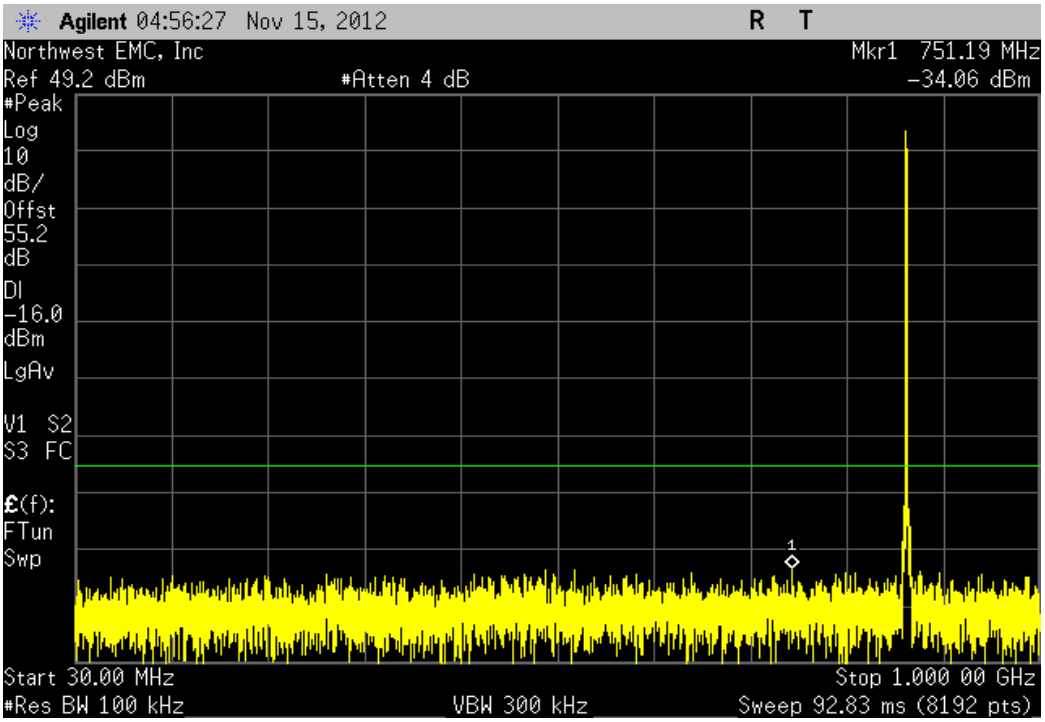
Port A, LTE 1.4MHz Single Carrier, Mid, 150kHz-30MHz

				Value	Limit	Result
				-42.98 dBm	-16 dBm	Pass



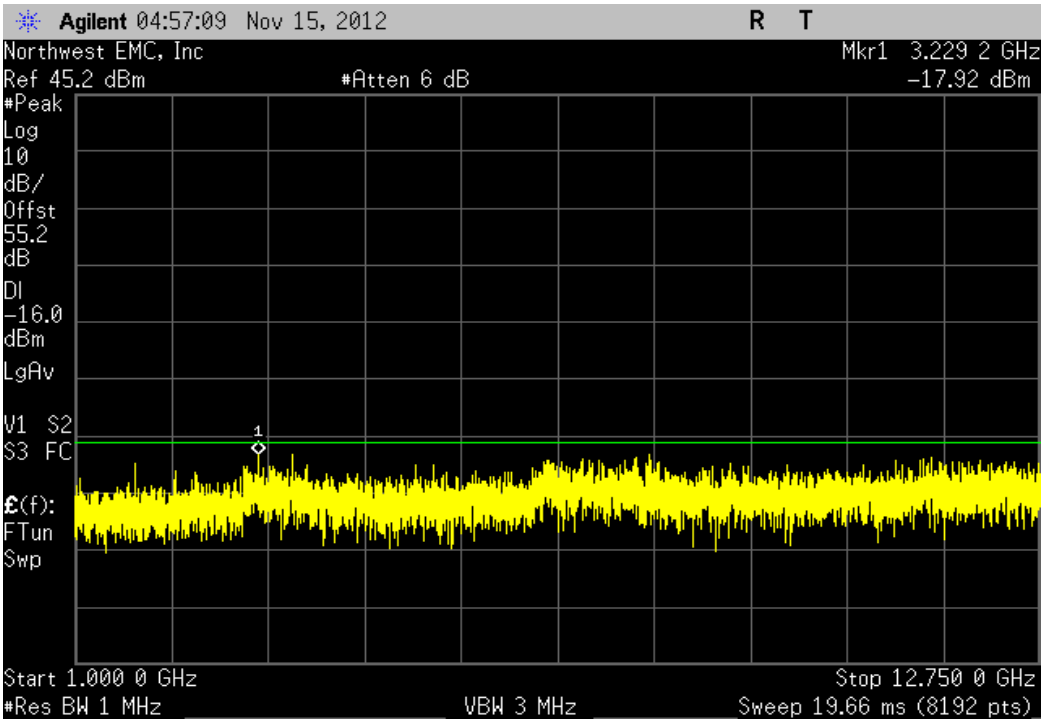
Port A, LTE 1.4MHz Single Carrier, Mid, 30MHz-1GHz

				Value	Limit	Result
				-34.06 dBm	-16 dBm	Pass



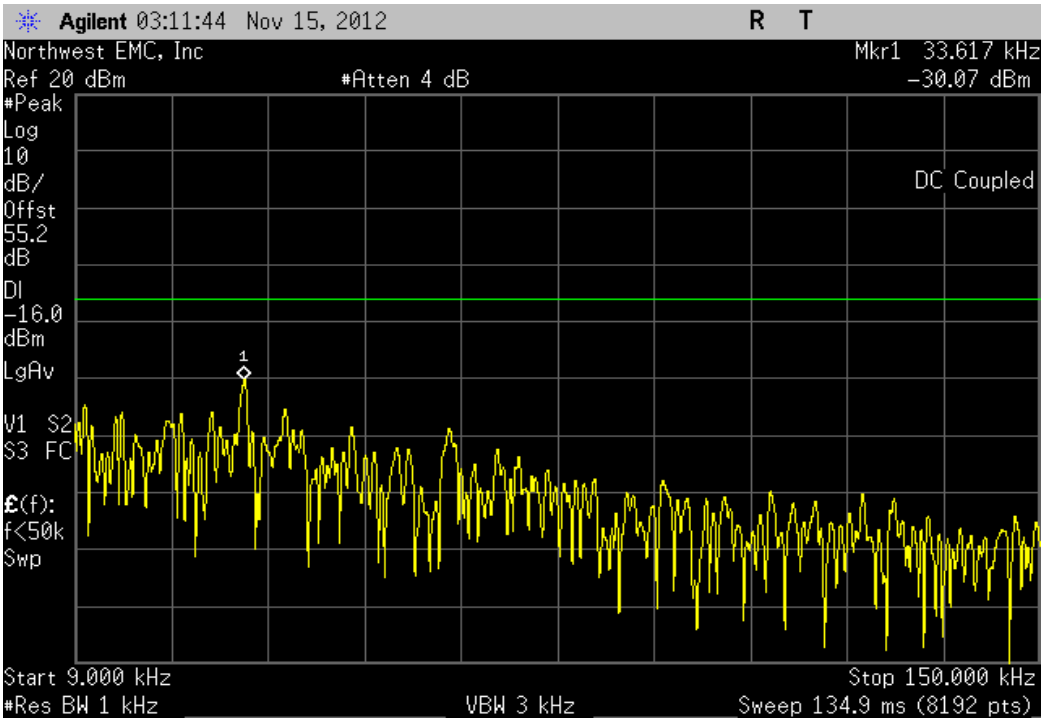
Port A, LTE 1.4MHz Single Carrier, Mid, 1GHz-12.75GHz

				Value	Limit	Result
				-17.92 dBm	-16 dBm	Pass



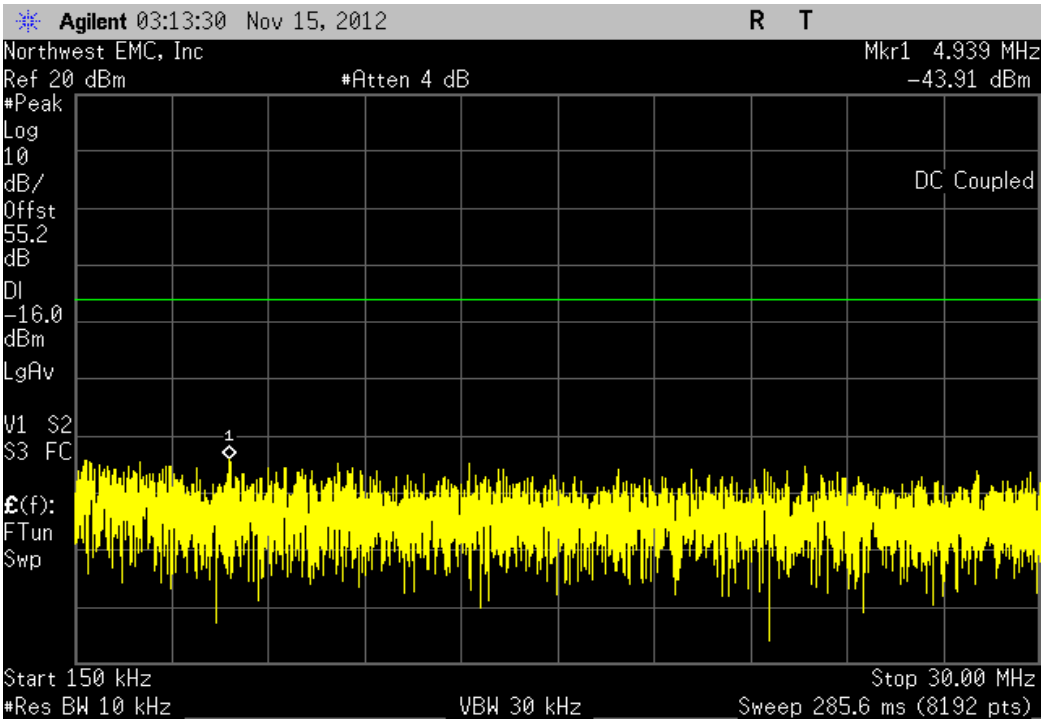
Port A, LTE 1.4MHz Single Carrier, High, 9kHz-150kHz

				Value	Limit	Result
				-30.07 dBm	-16 dBm	Pass



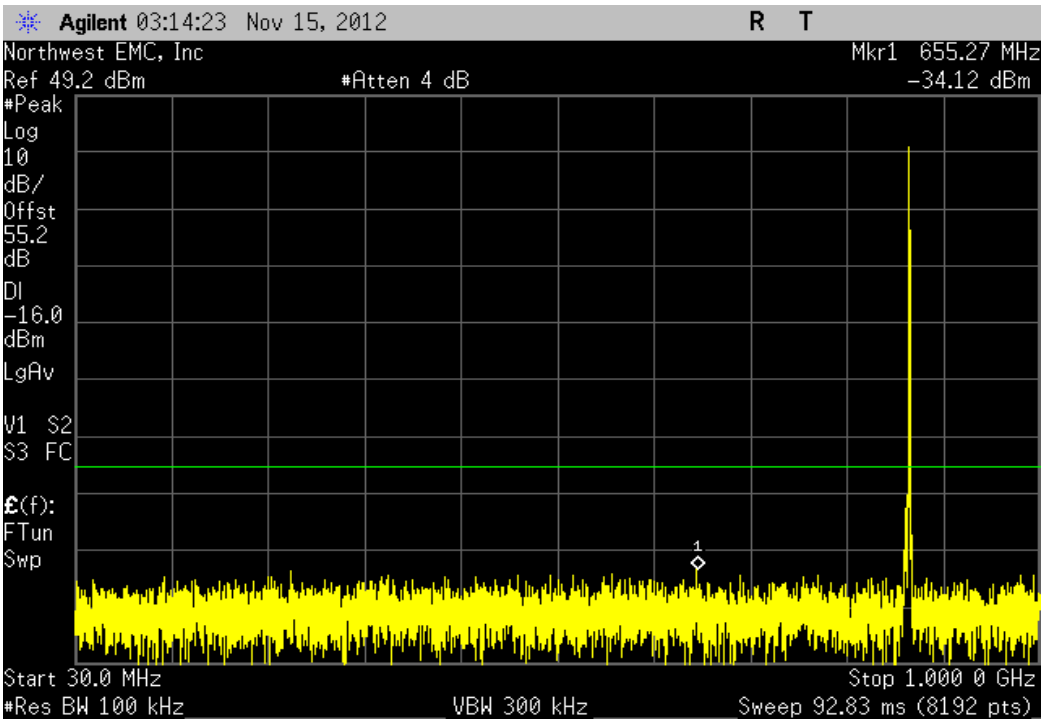
Port A, LTE 1.4MHz Single Carrier, High, 150kHz-30MHz

				Value	Limit	Result
				-43.91 dBm	-16 dBm	Pass



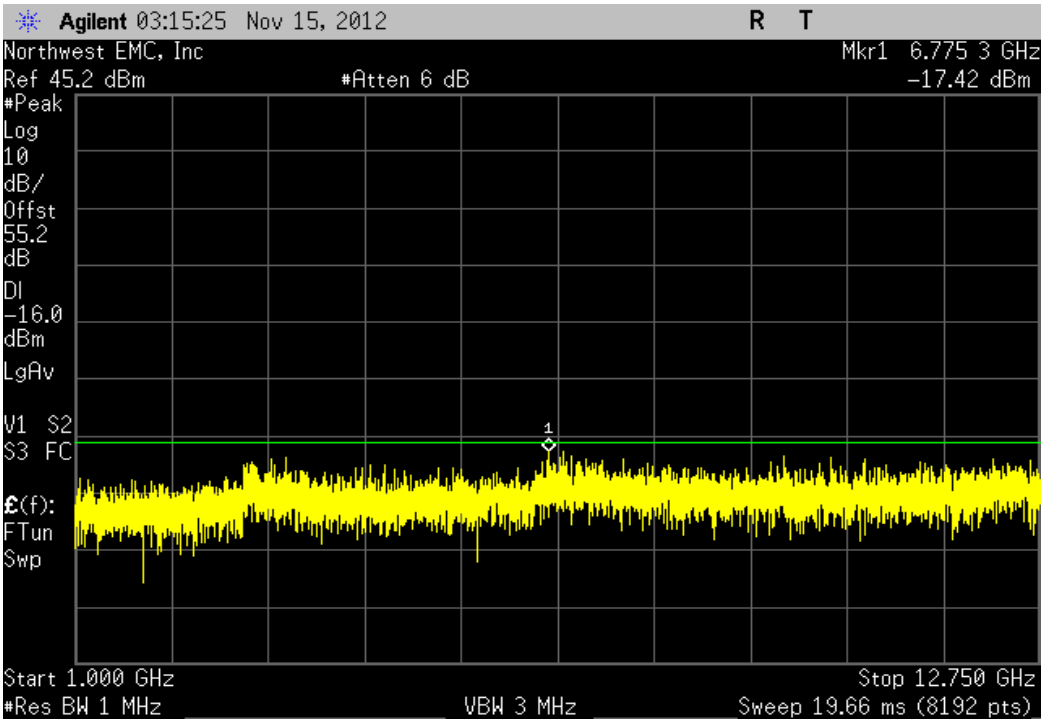
Port A, LTE 1.4MHz Single Carrier, High, 30MHz-1GHz

				Value	Limit	Result
				-34.12 dBm	-16 dBm	Pass



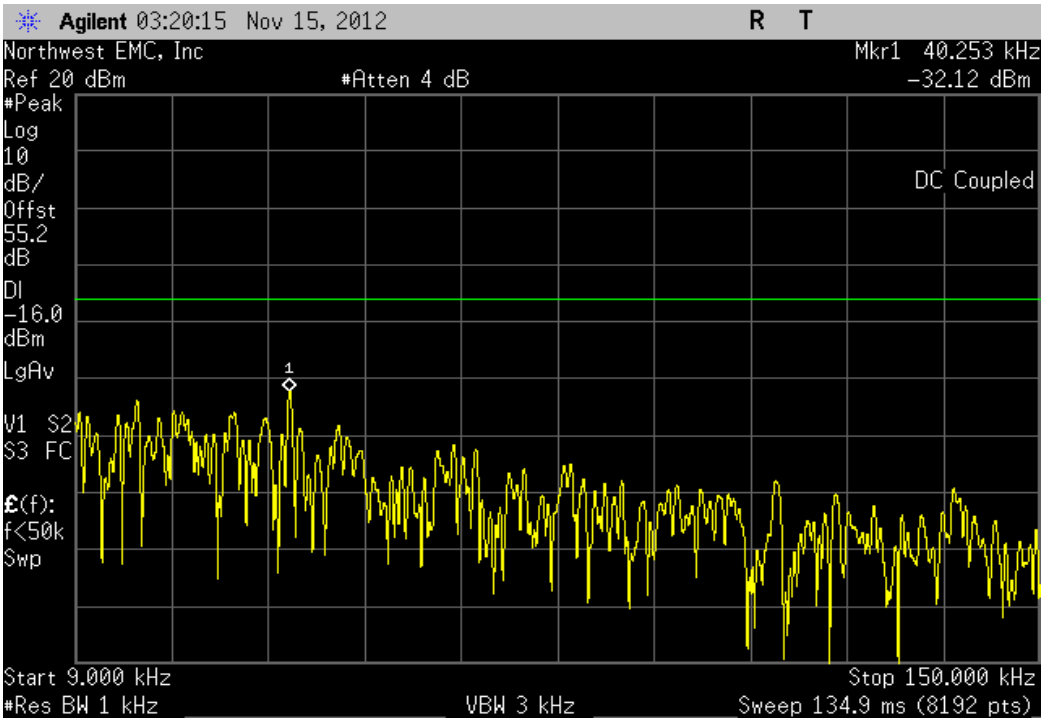
Port A, LTE 1.4MHz Single Carrier, High, 1GHz-12.75GHz

				Value	Limit	Result
				-17.42 dBm	-16 dBm	Pass



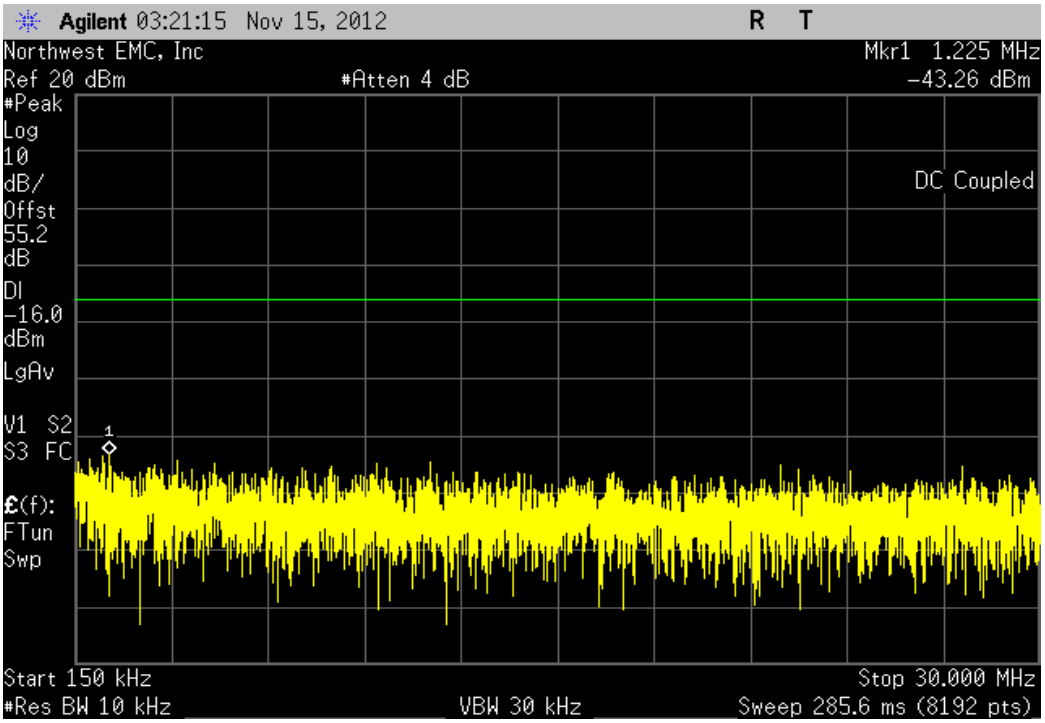
Port A, LTE 3MHz Single Carrier, Low, 9kHz-150kHz

				Value	Limit	Result
				-32.12 dBm	-16 dBm	Pass



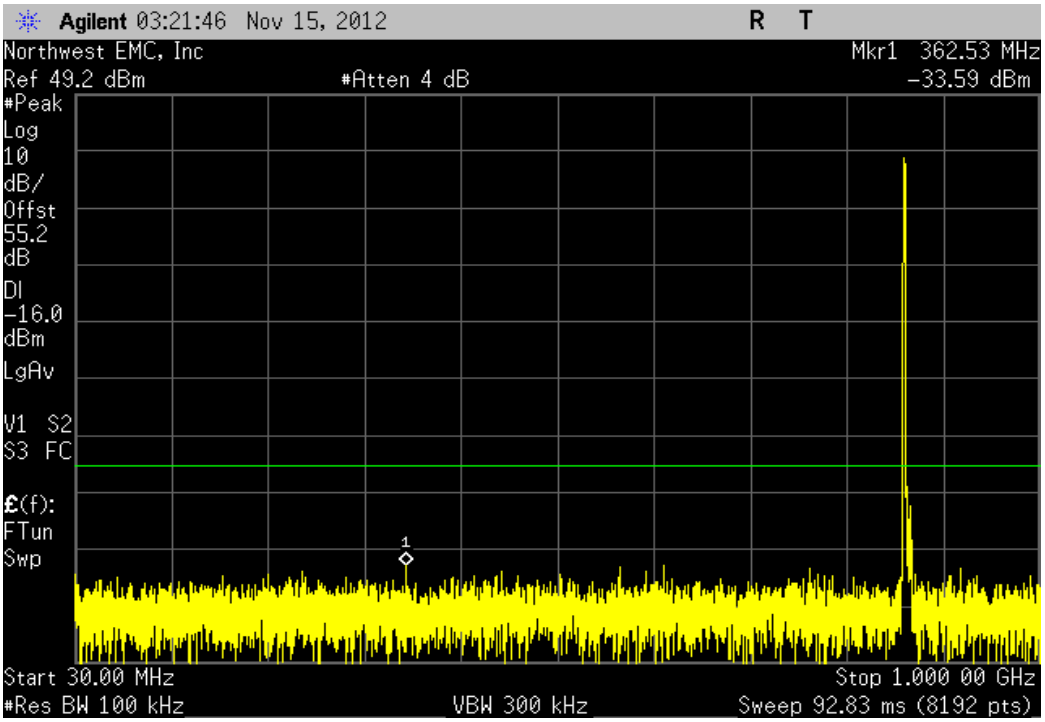
Port A, LTE 3MHz Single Carrier, Low, 150kHz-30MHz

				Value	Limit	Result
				-43.26 dBm	-16 dBm	Pass



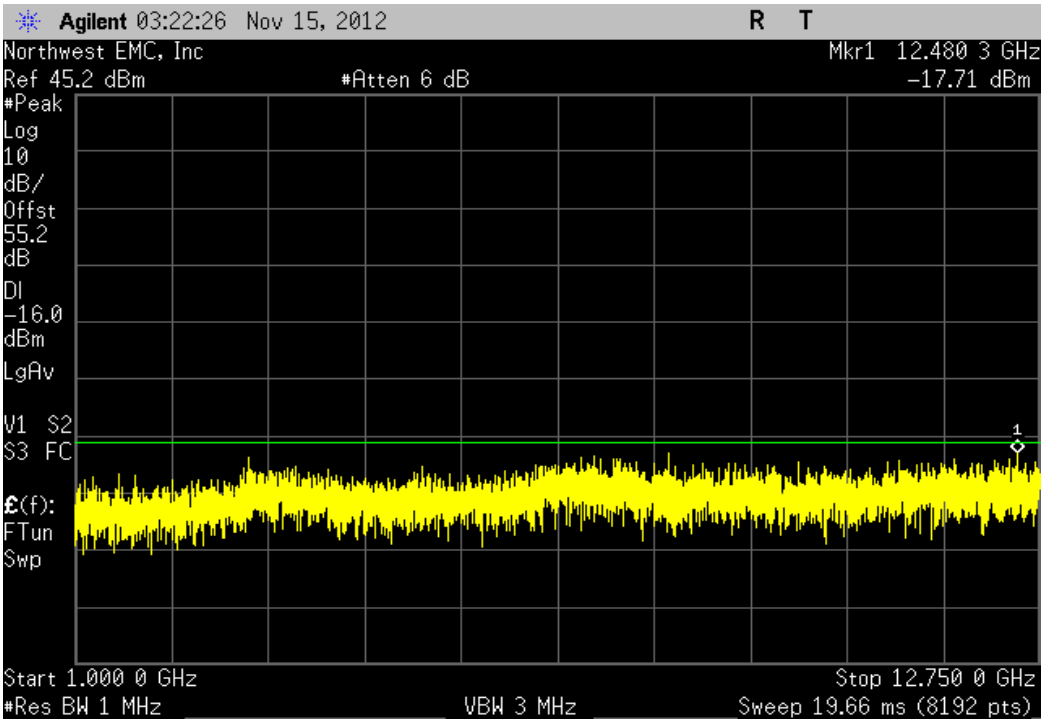
Port A, LTE 3MHz Single Carrier, Low, 30MHz-1GHz

				Value	Limit	Result
				-33.59 dBm	-16 dBm	Pass



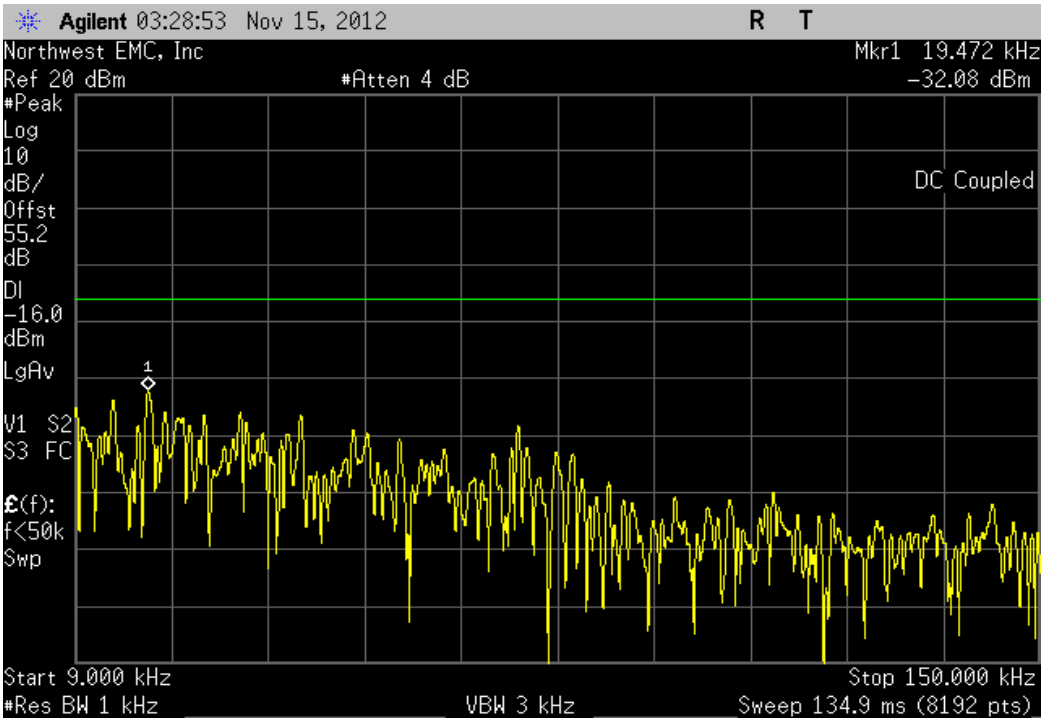
Port A, LTE 3MHz Single Carrier, Low, 1GHz-12.75GHz

				Value	Limit	Result
				-17.71 dBm	-16 dBm	Pass



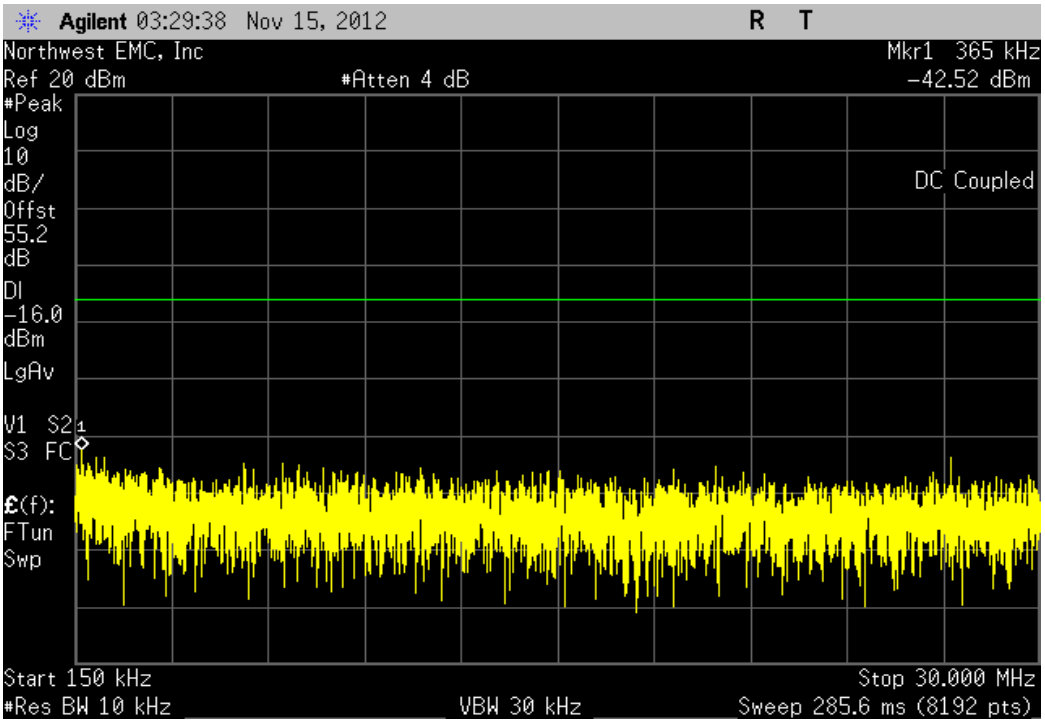
Port A, LTE 3MHz Single Carrier, Mid, 9kHz-150kHz

				Value	Limit	Result
				-32.08 dBm	-16 dBm	Pass



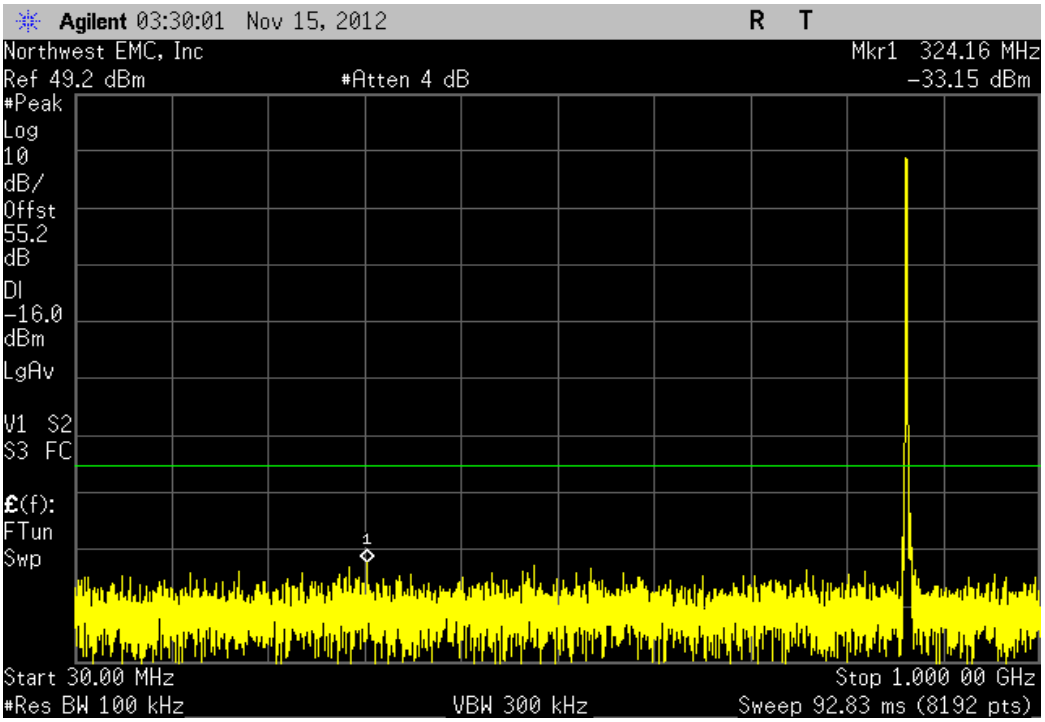
Port A, LTE 3MHz Single Carrier, Mid, 150kHz-30MHz

				Value	Limit	Result
				-42.52 dBm	-16 dBm	Pass



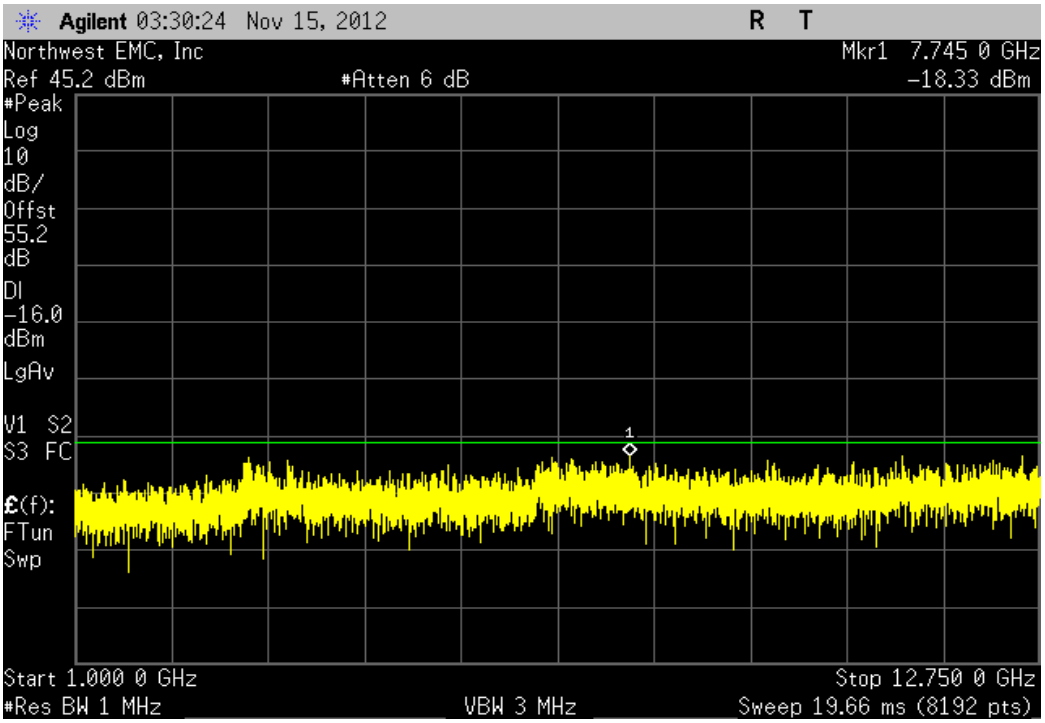
Port A, LTE 3MHz Single Carrier, Mid, 30MHz-1GHz

				Value	Limit	Result
				-33.15 dBm	-16 dBm	Pass



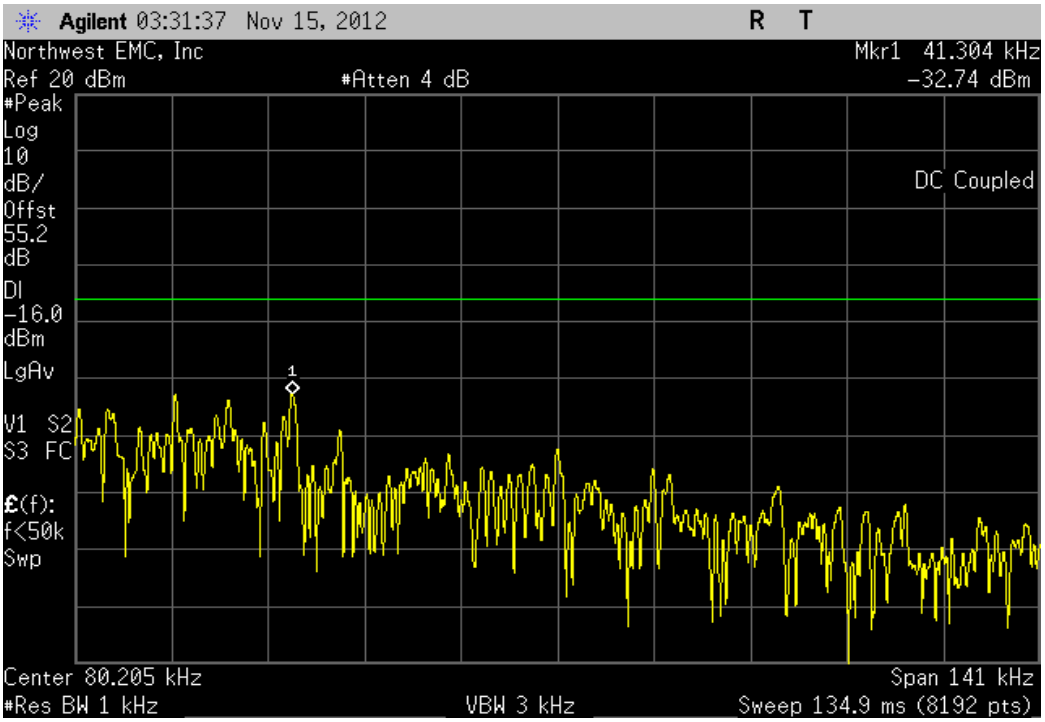
Port A, LTE 3MHz Single Carrier, Mid, 1GHz-12.75GHz

				Value	Limit	Result
				-18.33 dBm	-16 dBm	Pass



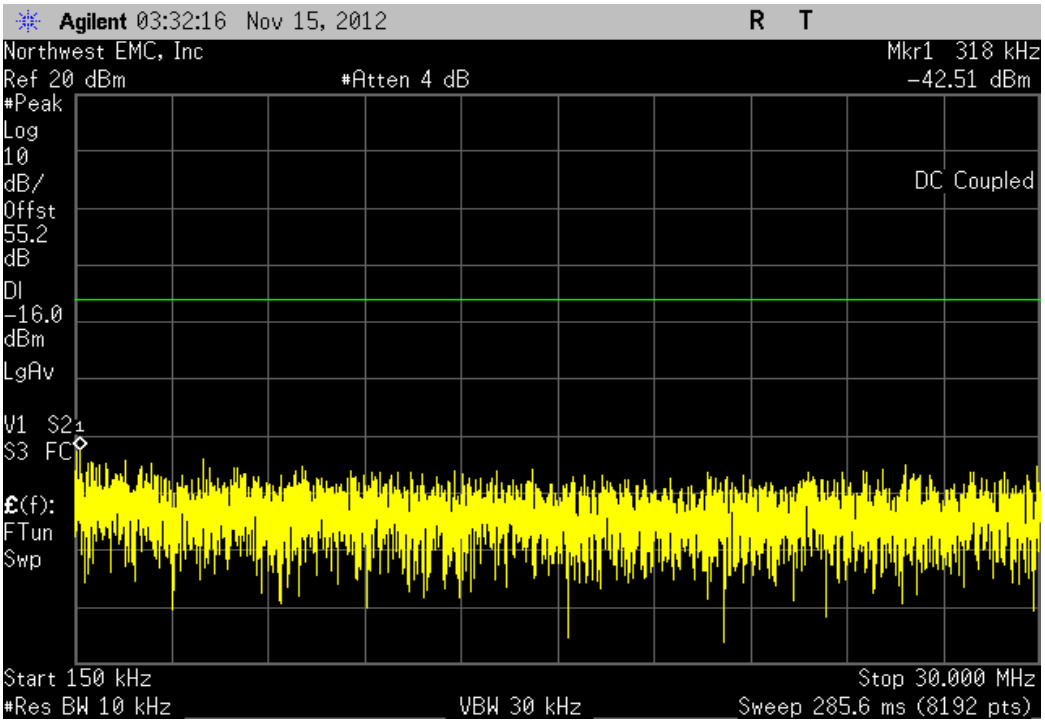
Port A, LTE 3MHz Single Carrier, High, 9kHz-150kHz

				Value	Limit	Result
				-32.74 dBm	-16 dBm	Pass



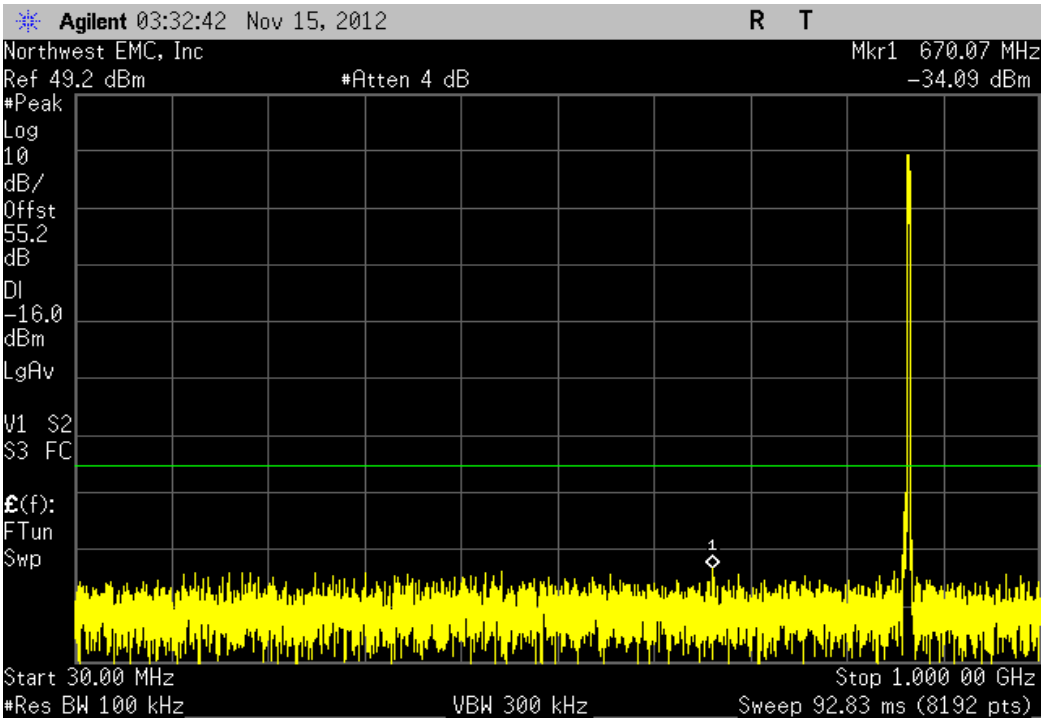
Port A, LTE 3MHz Single Carrier, High, 150kHz-30MHz

				Value	Limit	Result
				-42.51 dBm	-16 dBm	Pass



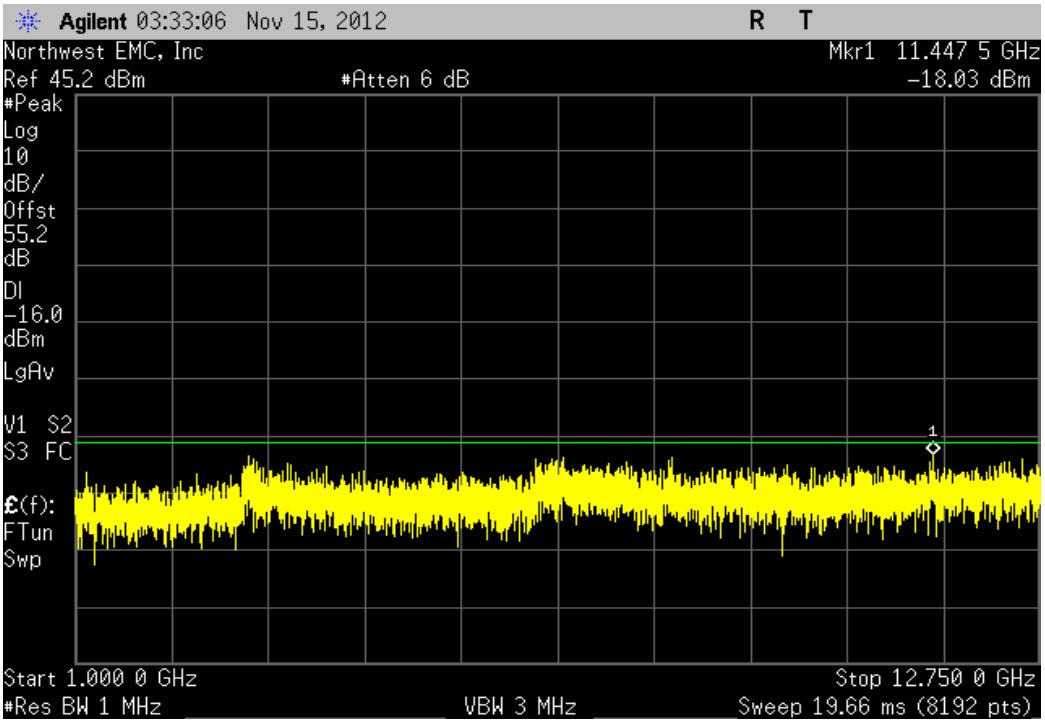
Port A, LTE 3MHz Single Carrier, High, 30MHz-1GHz

				Value	Limit	Result
				-34.09 dBm	-16 dBm	Pass



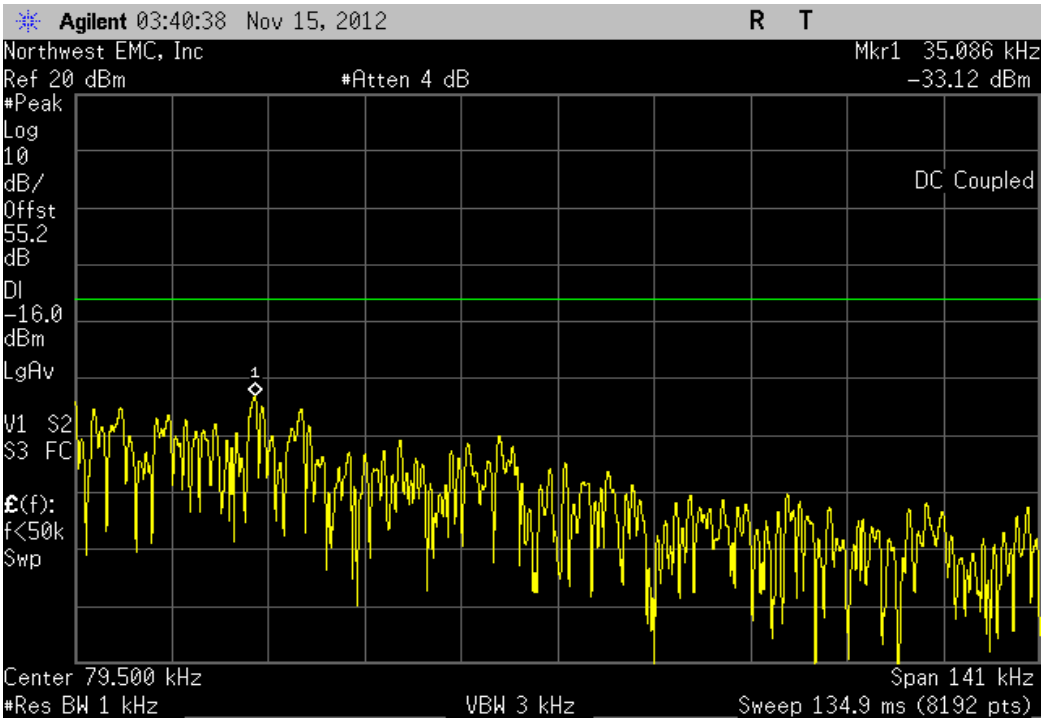
Port A, LTE 3MHz Single Carrier, High, 1GHz-12.75GHz

				Value	Limit	Result
				-18.03 dBm	-16 dBm	Pass



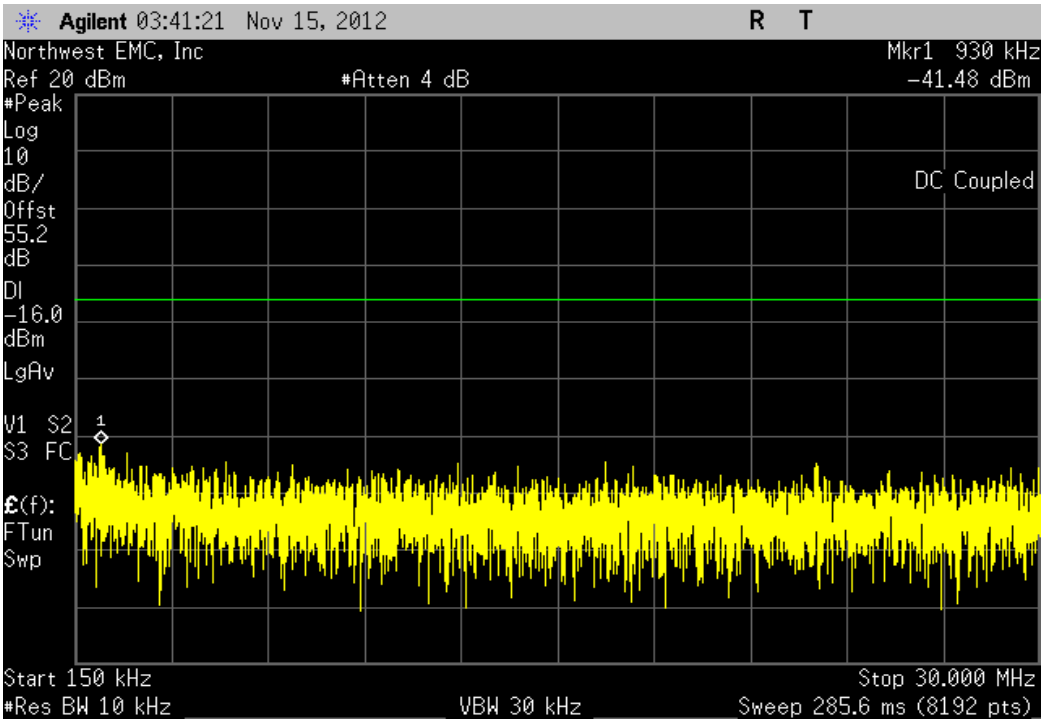
Port A, LTE 5MHz Single Carrier, Low, 9kHz-150kHz

				Value	Limit	Result
				-33.12 dBm	-16 dBm	Pass



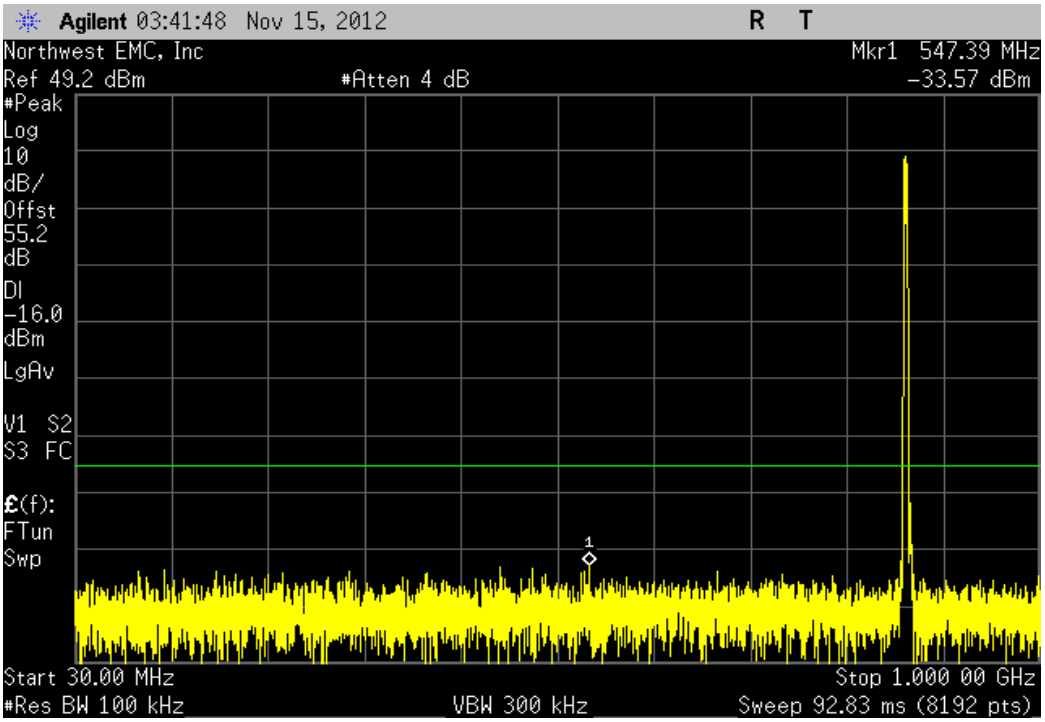
Port A, LTE 5MHz Single Carrier, Low, 150kHz-30MHz

				Value	Limit	Result
				-41.48 dBm	-16 dBm	Pass



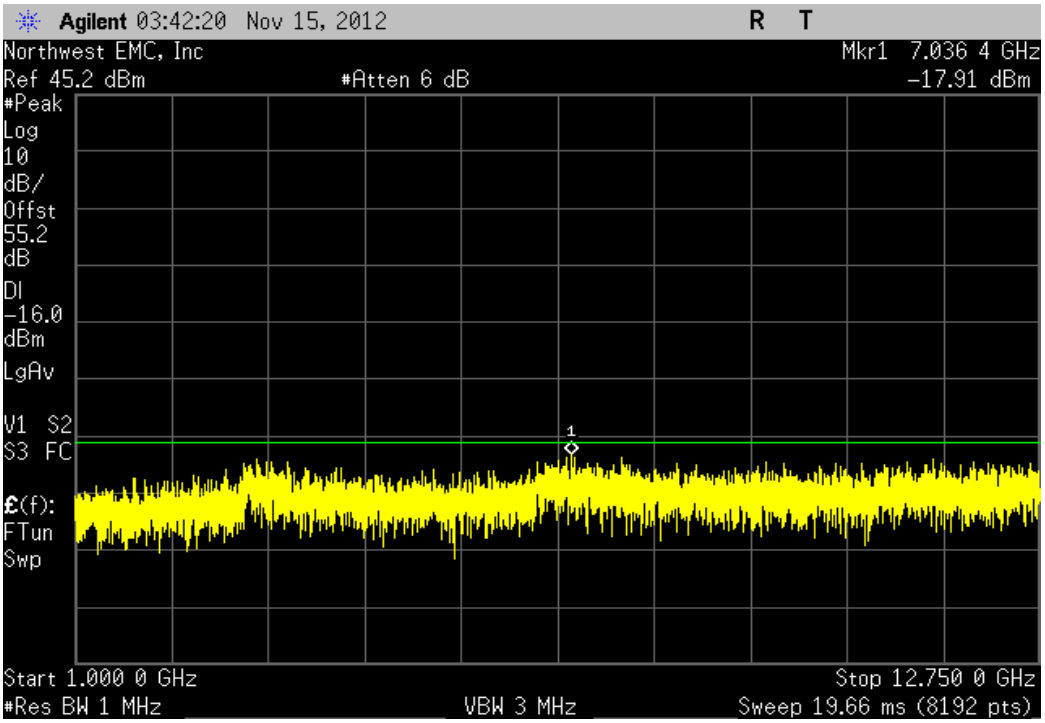
Port A, LTE 5MHz Single Carrier, Low, 30MHz-1GHz

				Value	Limit	Result
				-33.57 dBm	-16 dBm	Pass



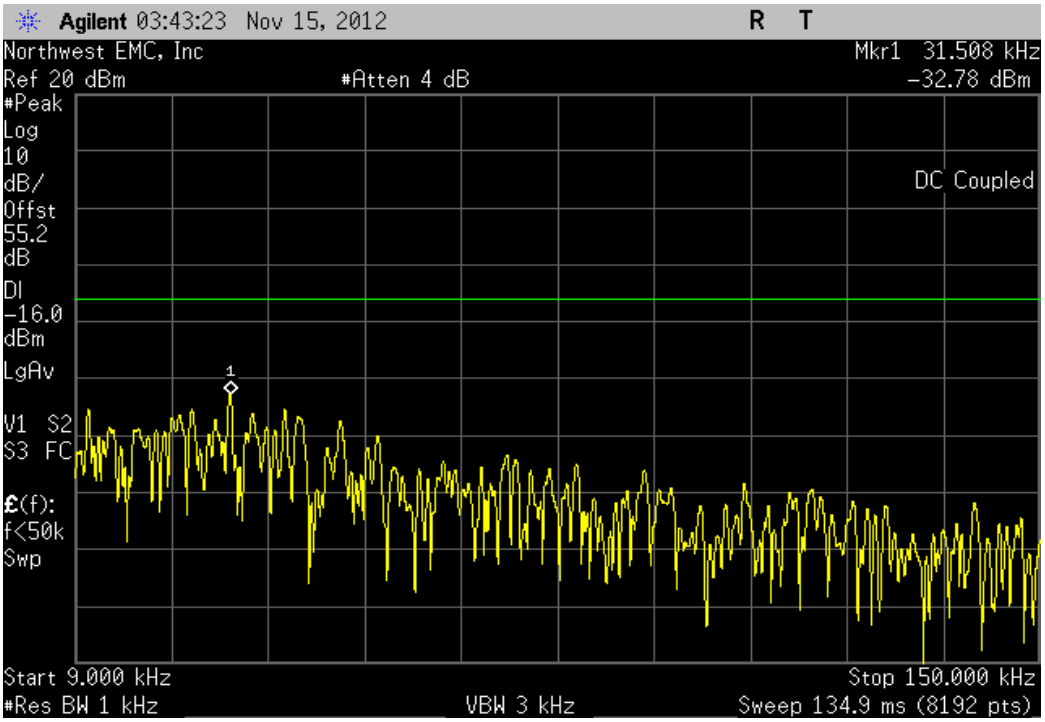
Port A, LTE 5MHz Single Carrier, Low, 1GHz-12.75GHz

				Value	Limit	Result
				-17.91 dBm	-16 dBm	Pass



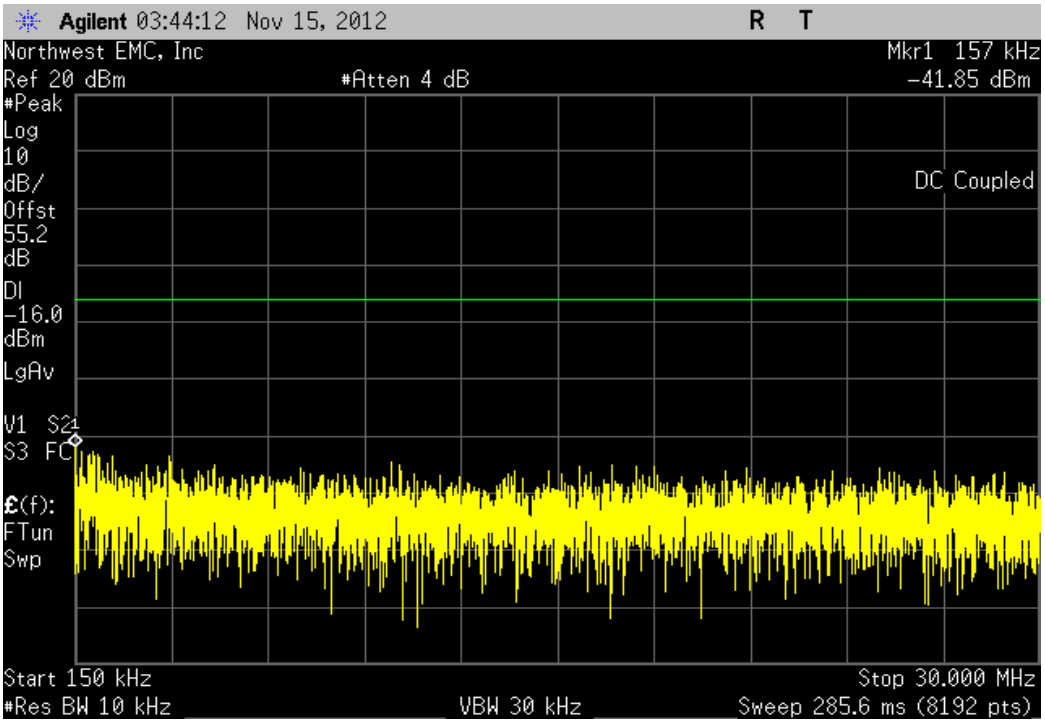
Port A, LTE 5MHz Single Carrier, Mid, 9kHz-150kHz

				Value	Limit	Result
				-32.78 dBm	-16 dBm	Pass



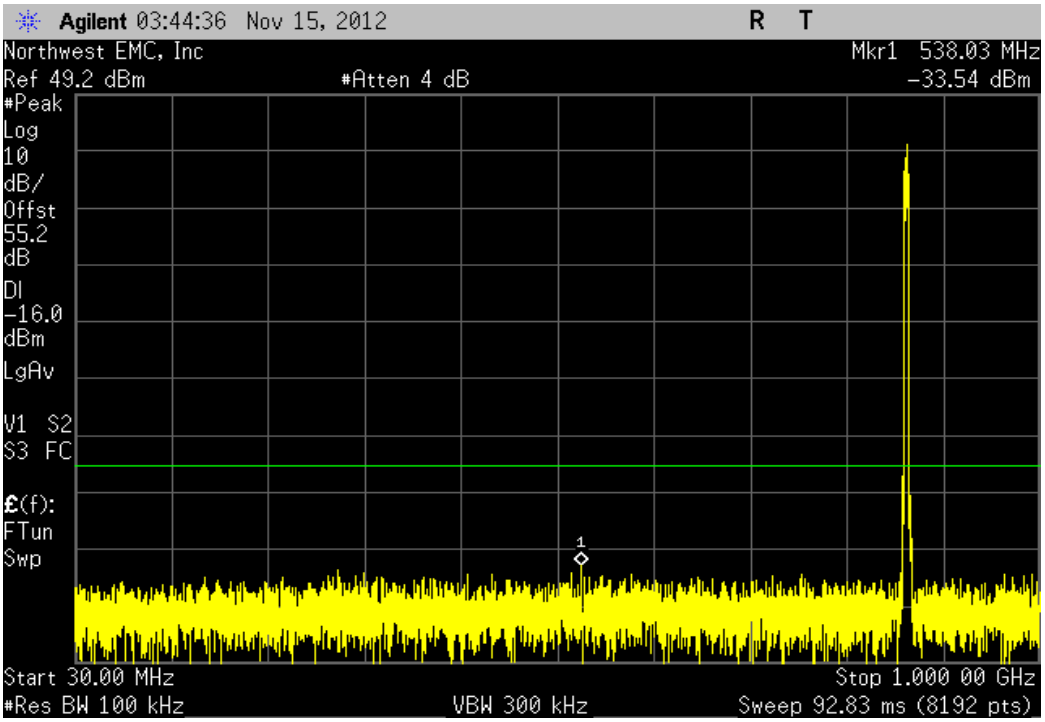
Port A, LTE 5MHz Single Carrier, Mid, 150kHz-30MHz

				Value	Limit	Result
				-41.85 dBm	-16 dBm	Pass



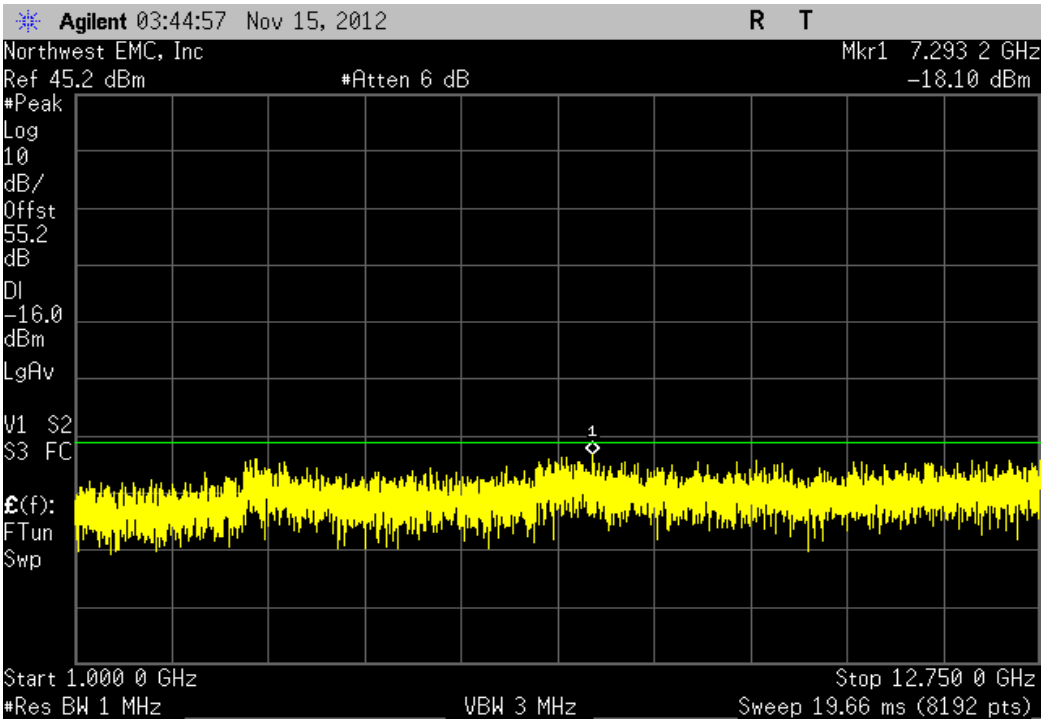
Port A, LTE 5MHz Single Carrier, Mid, 30MHz-1GHz

				Value	Limit	Result
				-33.54 dBm	-16 dBm	Pass



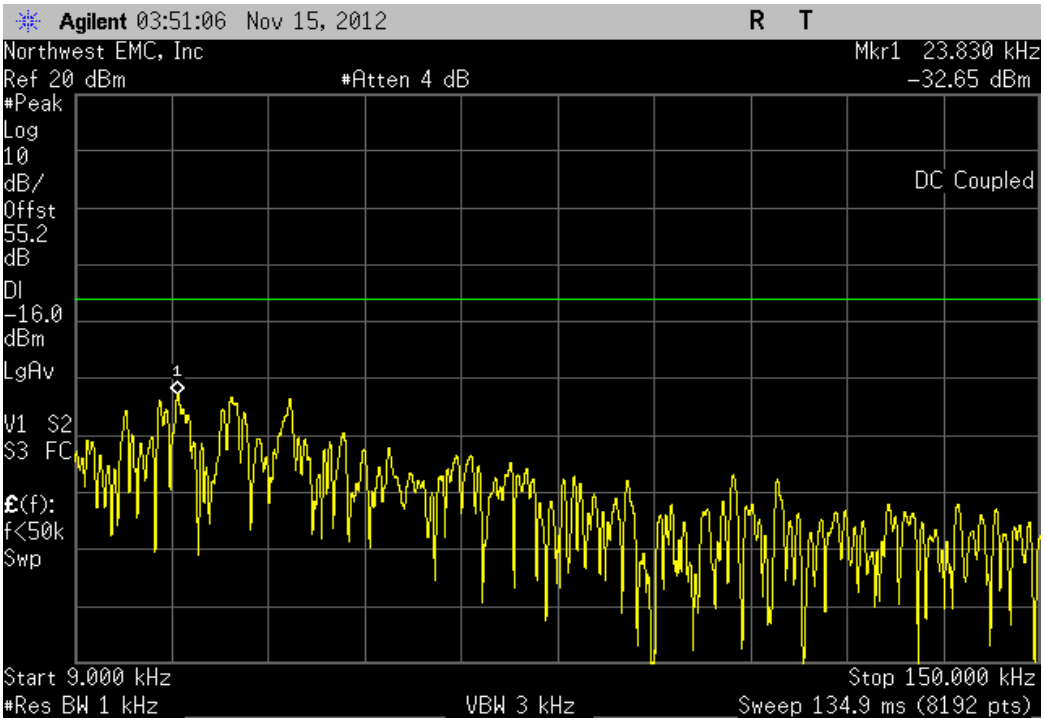
Port A, LTE 5MHz Single Carrier, Mid, 1GHz-12.75GHz

				Value	Limit	Result
				-18.1 dBm	-16 dBm	Pass



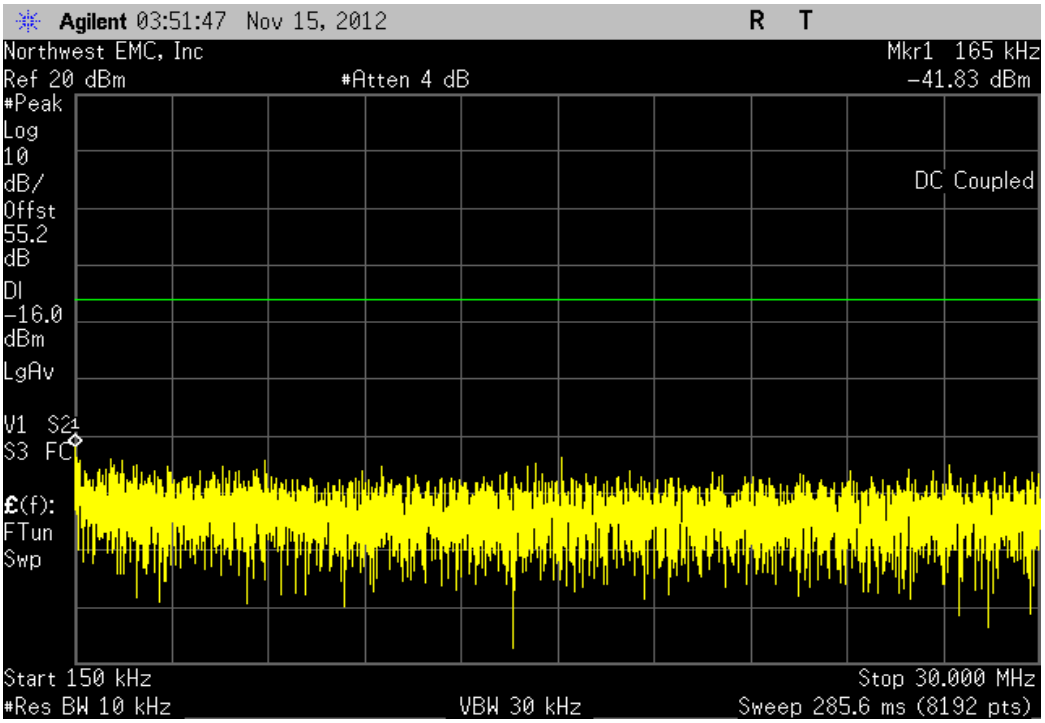
Port A, LTE 5MHz Single Carrier, High, 9kHz-150kHz

				Value	Limit	Result
				-32.65 dBm	-16 dBm	Pass



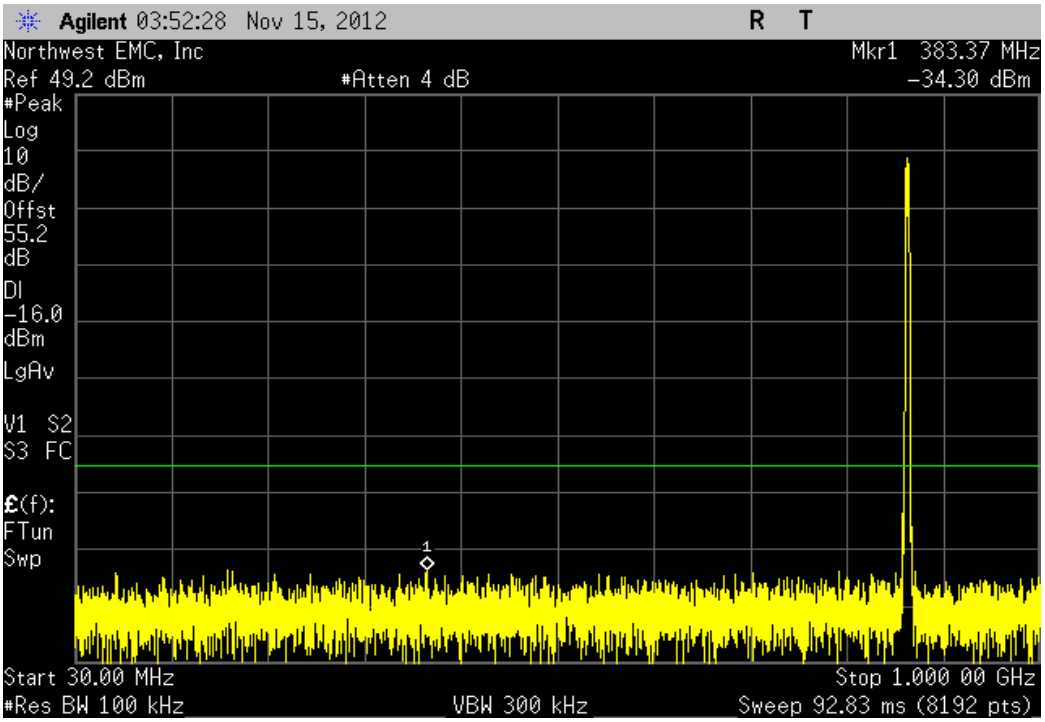
Port A, LTE 5MHz Single Carrier, High, 150kHz-30MHz

				Value	Limit	Result
				-41.83 dBm	-16 dBm	Pass



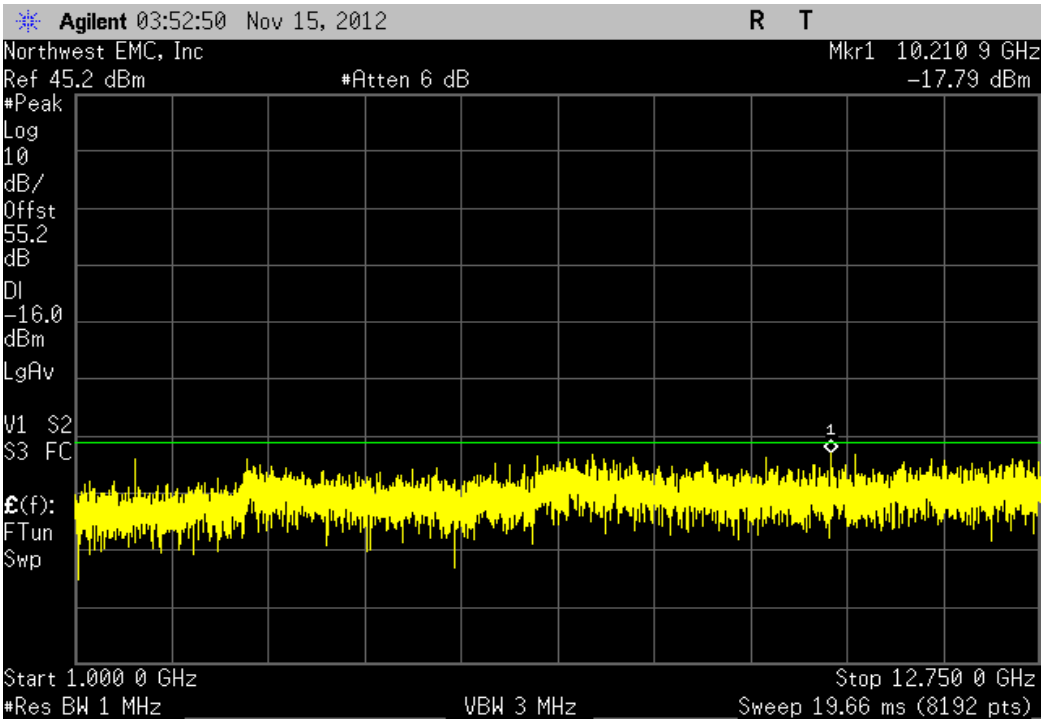
Port A, LTE 5MHz Single Carrier, High, 30MHz-1GHz

				Value	Limit	Result
				-34.3 dBm	-16 dBm	Pass



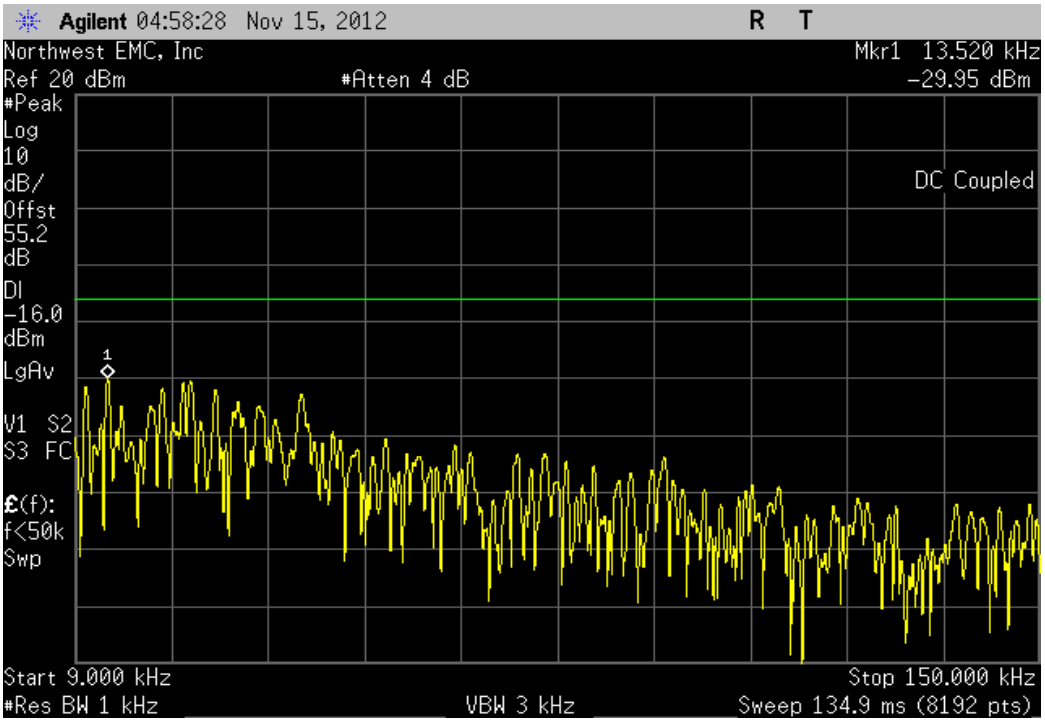
Port A, LTE 5MHz Single Carrier, High, 1GHz-12.75GHz

				Value	Limit	Result
				-17.79 dBm	-16 dBm	Pass



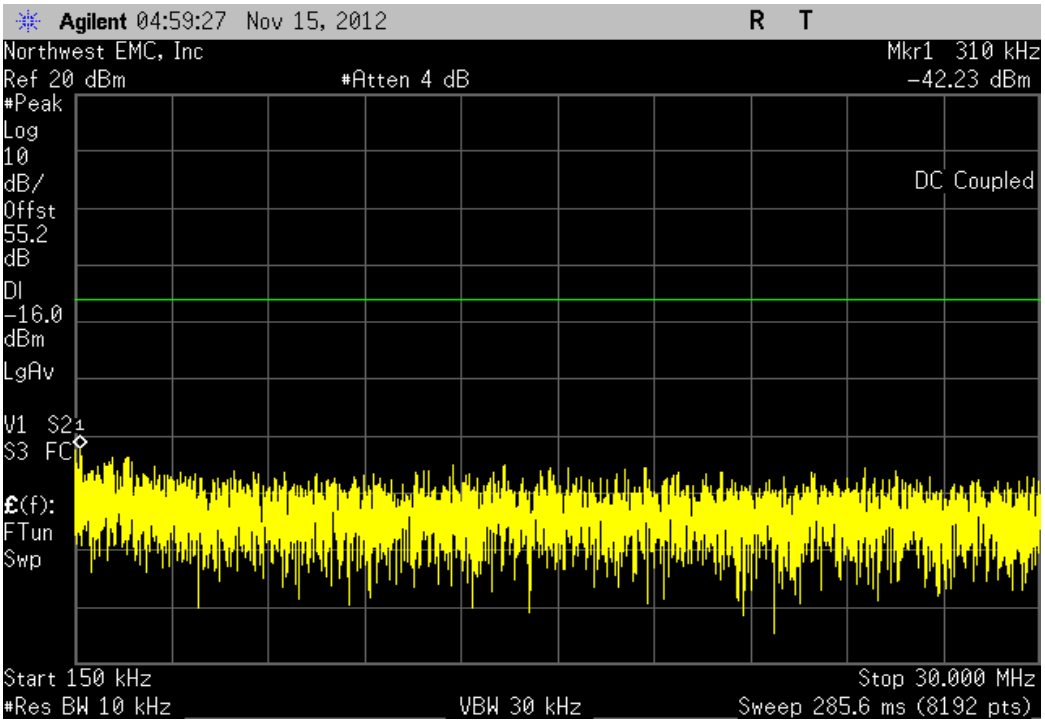
Port A, LTE 1.4MHz Multi Carrier, Low, 9kHz-150kHz

				Value	Limit	Result
				-29.95 dBm	-16 dBm	Pass



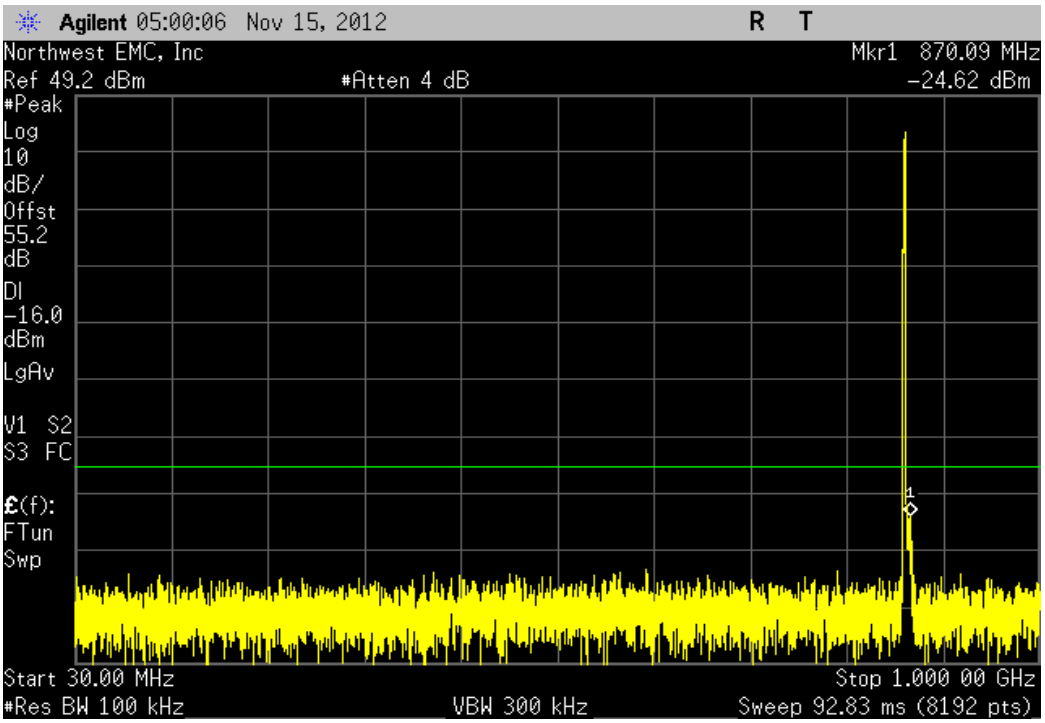
Port A, LTE 1.4MHz Multi Carrier, Low, 150kHz-30MHz

				Value	Limit	Result
				-42.23 dBm	-16 dBm	Pass



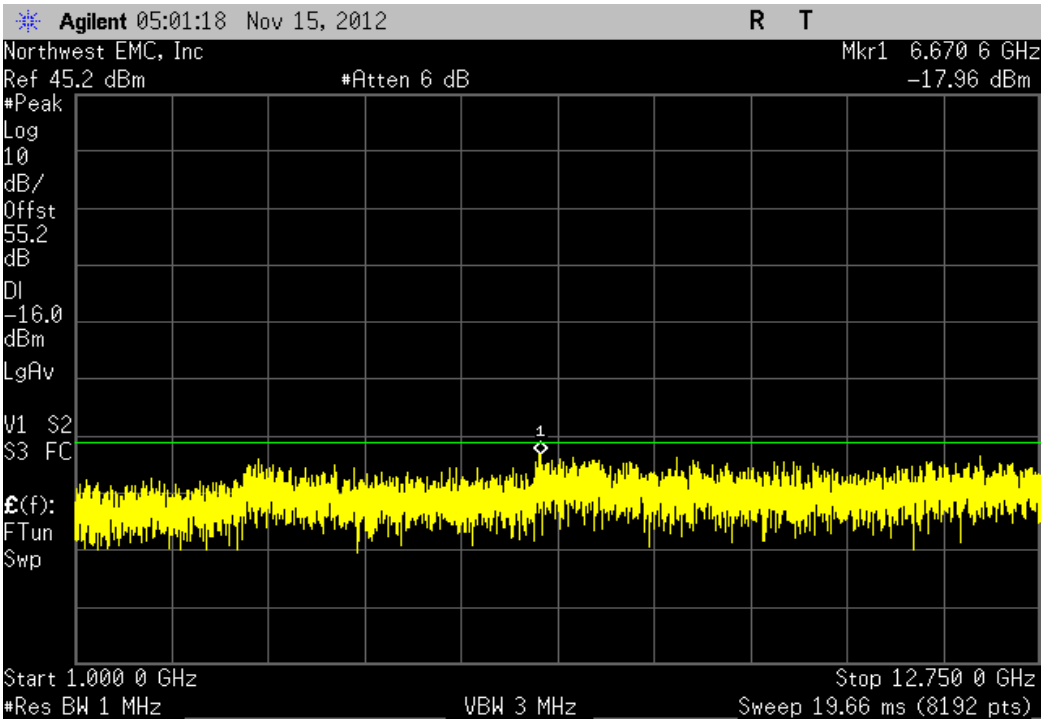
Port A, LTE 1.4MHz Multi Carrier, Low, 30MHz-1GHz

Value	Limit	Result
-24.62 dBm	-16 dBm	Pass



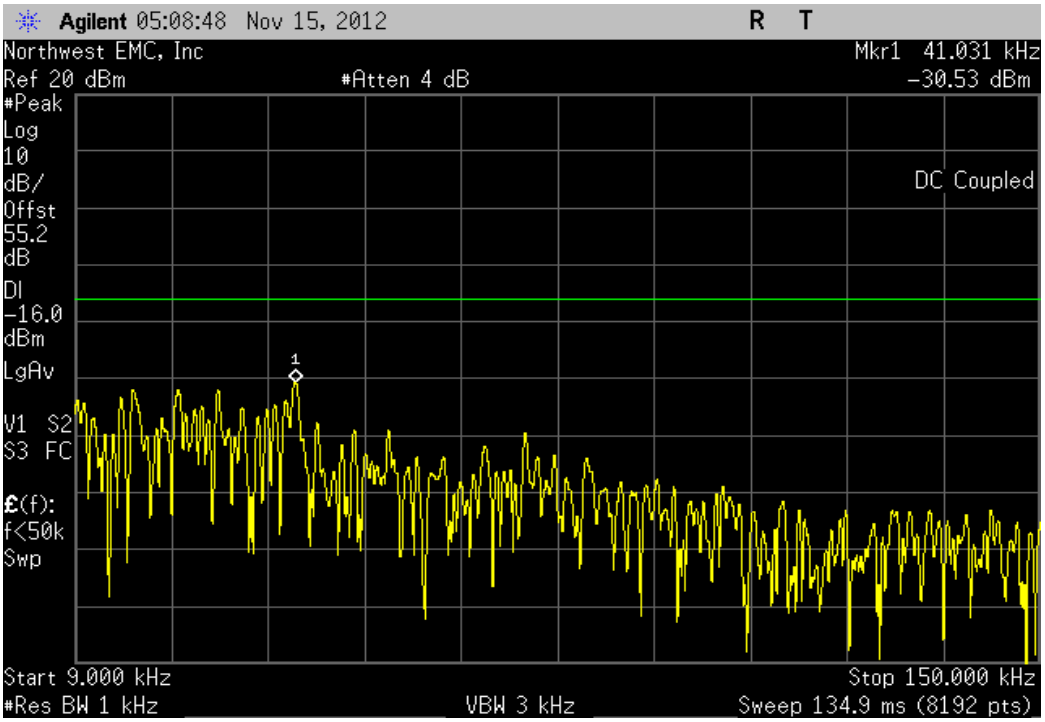
Port A, LTE 1.4MHz Multi Carrier, Low, 1GHz-12.75GHz

Value	Limit	Result
-17.96 dBm	-16 dBm	Pass



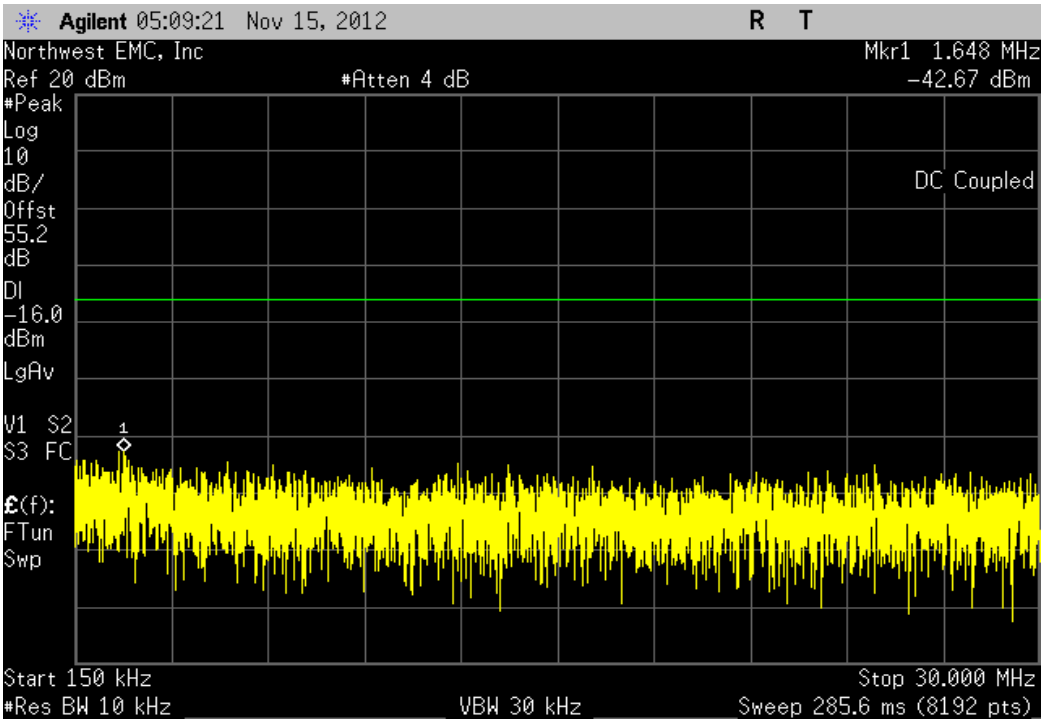
Port A, LTE 1.4MHz Multi Carrier, Mid, 9kHz-150kHz

				Value	Limit	Result
				-30.53 dBm	-16 dBm	Pass



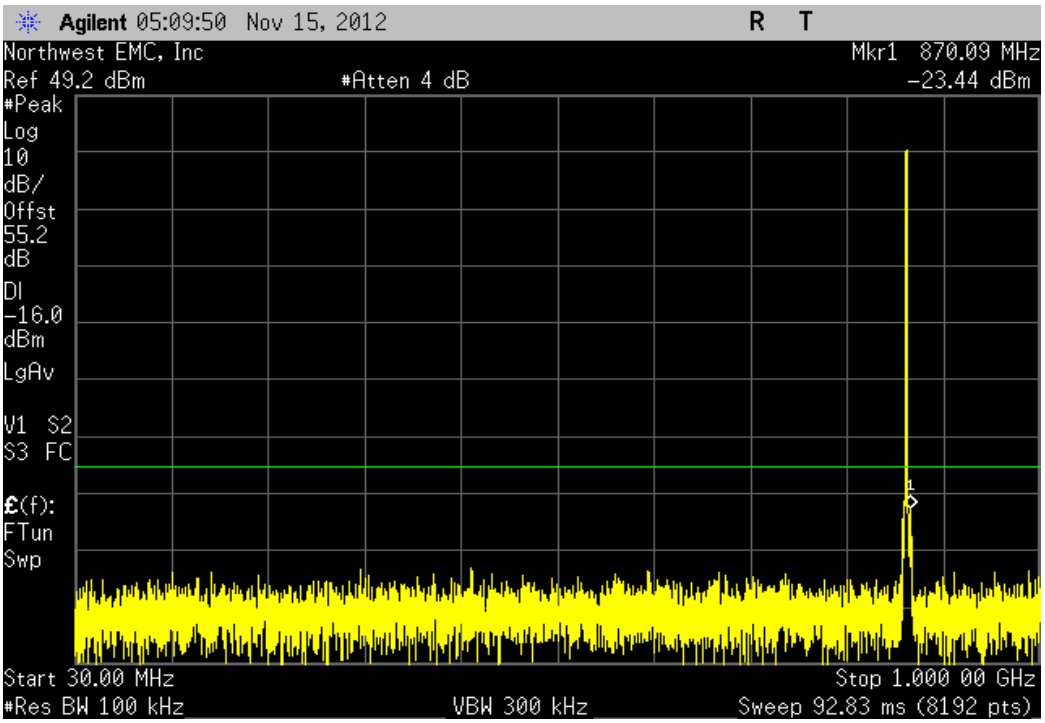
Port A, LTE 1.4MHz Multi Carrier, Mid, 150kHz-30MHz

				Value	Limit	Result
				-42.67 dBm	-16 dBm	Pass



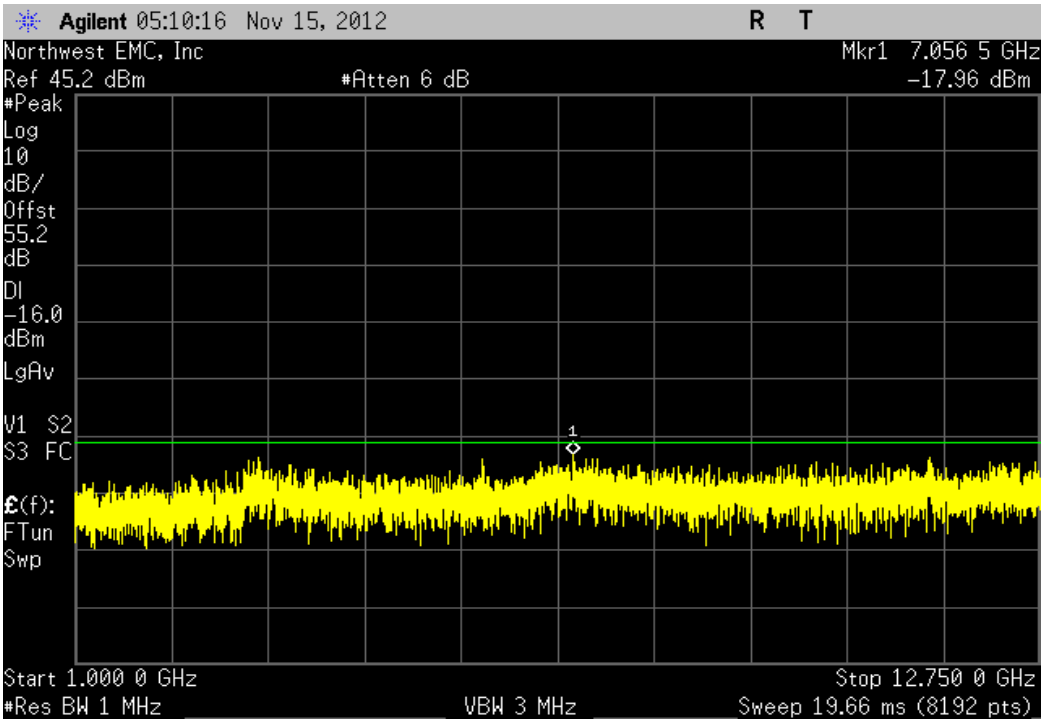
Port A, LTE 1.4MHz Multi Carrier, Mid, 30MHz-1GHz

				Value	Limit	Result
				-23.44 dBm	-16 dBm	Pass

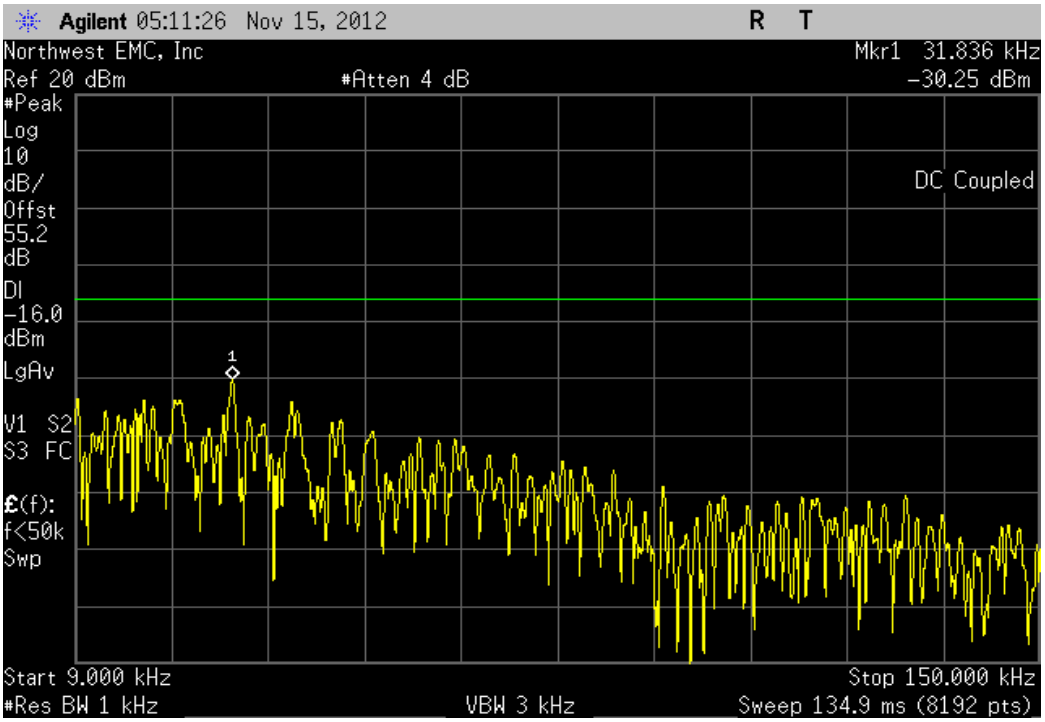


Port A, LTE 1.4MHz Multi Carrier, Mid, 1GHz-12.75GHz

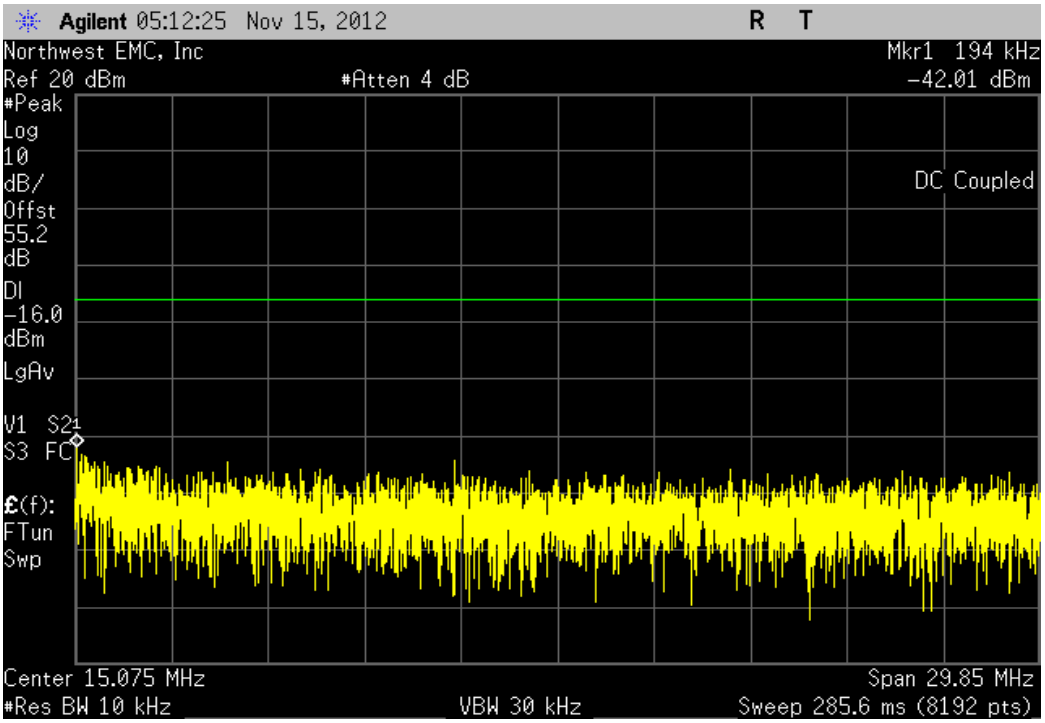
				Value	Limit	Result
				-17.96 dBm	-16 dBm	Pass



Port A, LTE 1.4MHz Multi Carrier, High, 9kHz-150kHz							
					Value	Limit	Result
					-30.25 dBm	-16 dBm	Pass

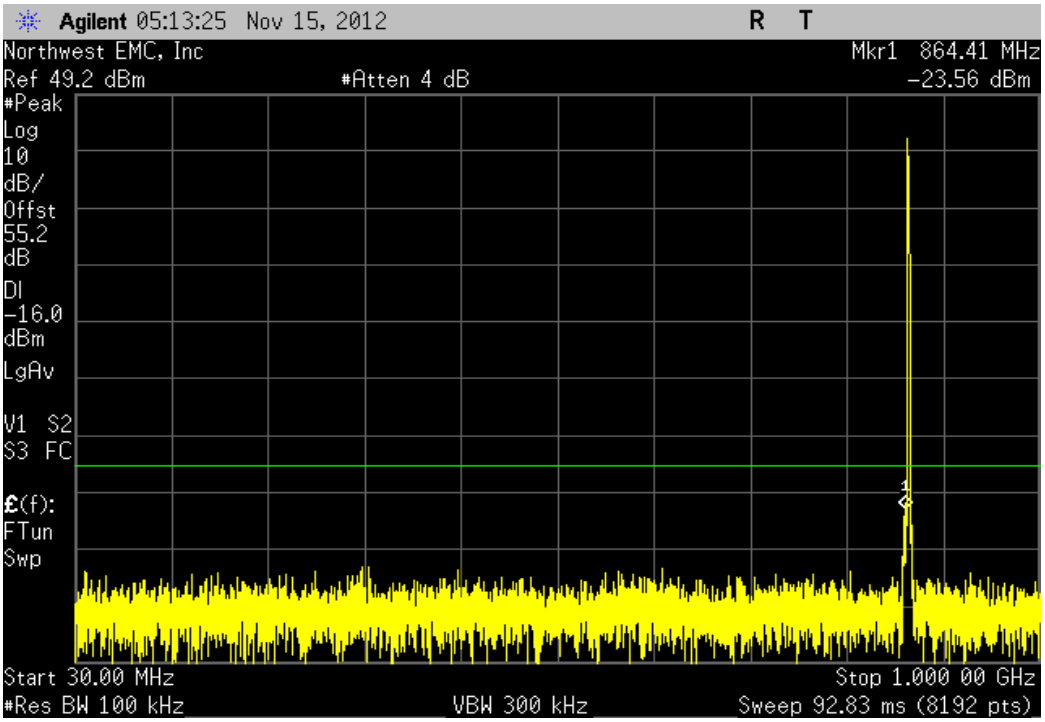


Port A, LTE 1.4MHz Multi Carrier, High, 150kHz-30MHz							
					Value	Limit	Result
					-42.01 dBm	-16 dBm	Pass



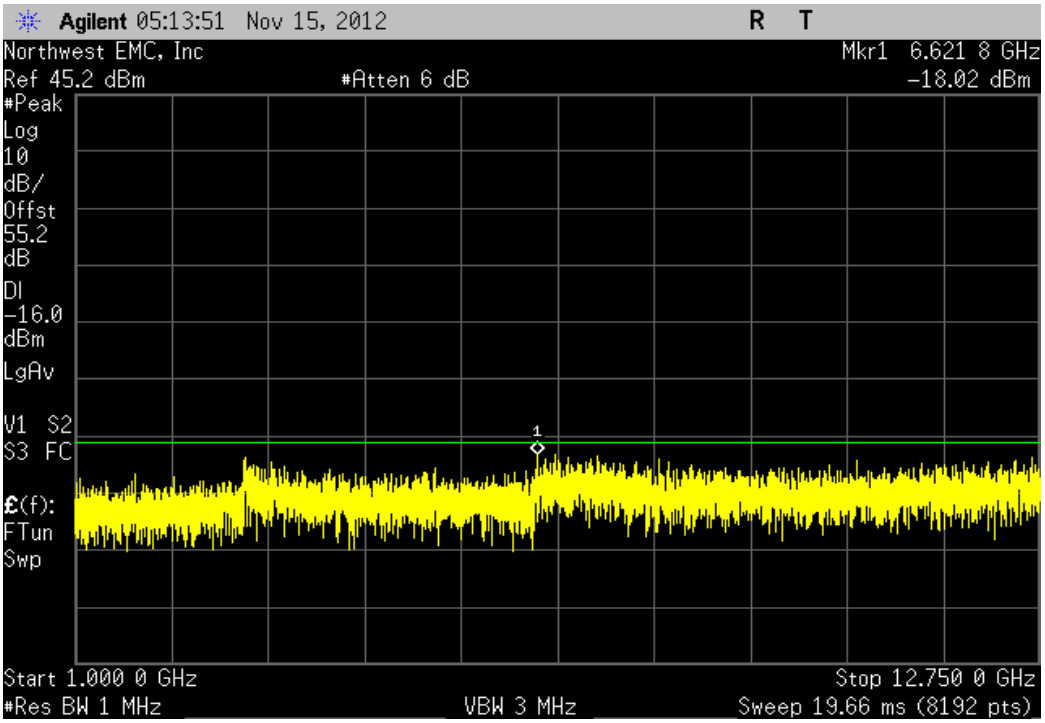
Port A, LTE 1.4MHz Multi Carrier, High, 30MHz-1GHz

				Value	Limit	Result
				-23.56 dBm	-16 dBm	Pass



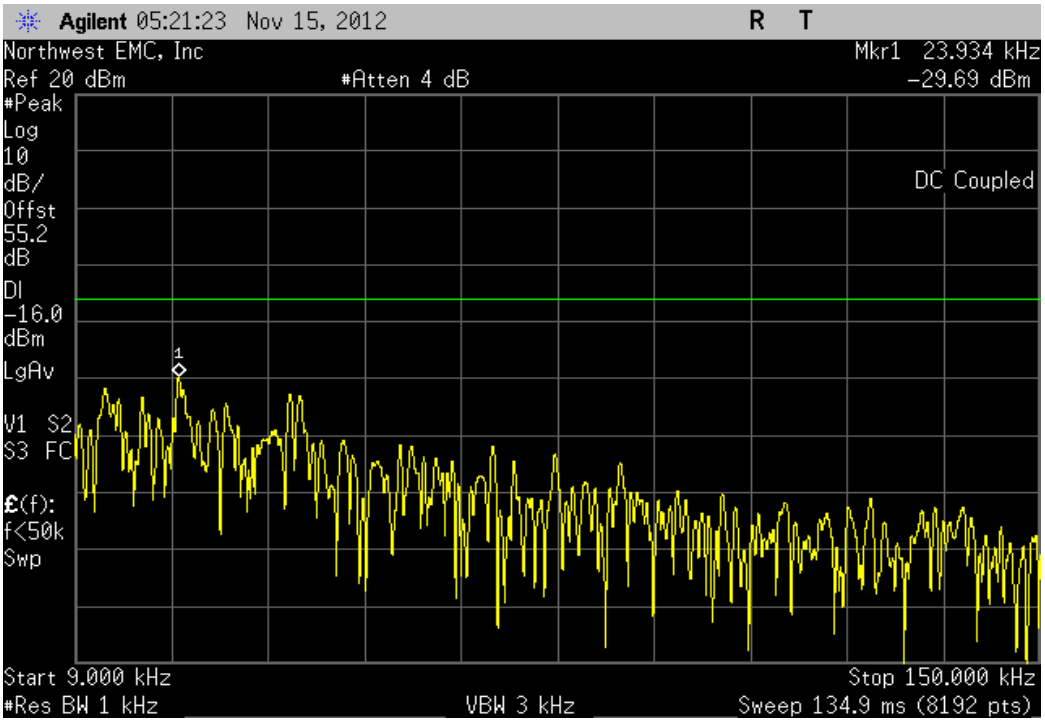
Port A, LTE 1.4MHz Multi Carrier, High, 1GHz-12.75GHz

				Value	Limit	Result
				-18.02 dBm	-16 dBm	Pass



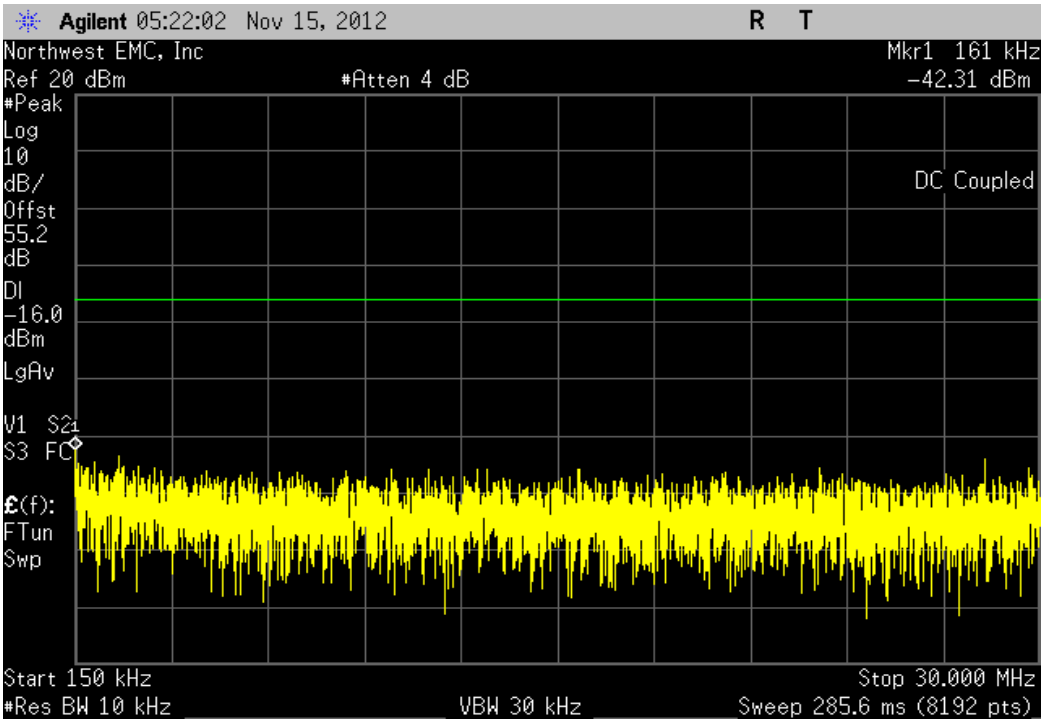
Port A, LTE 3MHz Multi Carrier, Low, 9kHz-150kHz

				Value	Limit	Result
				-29.69 dBm	-16 dBm	Pass



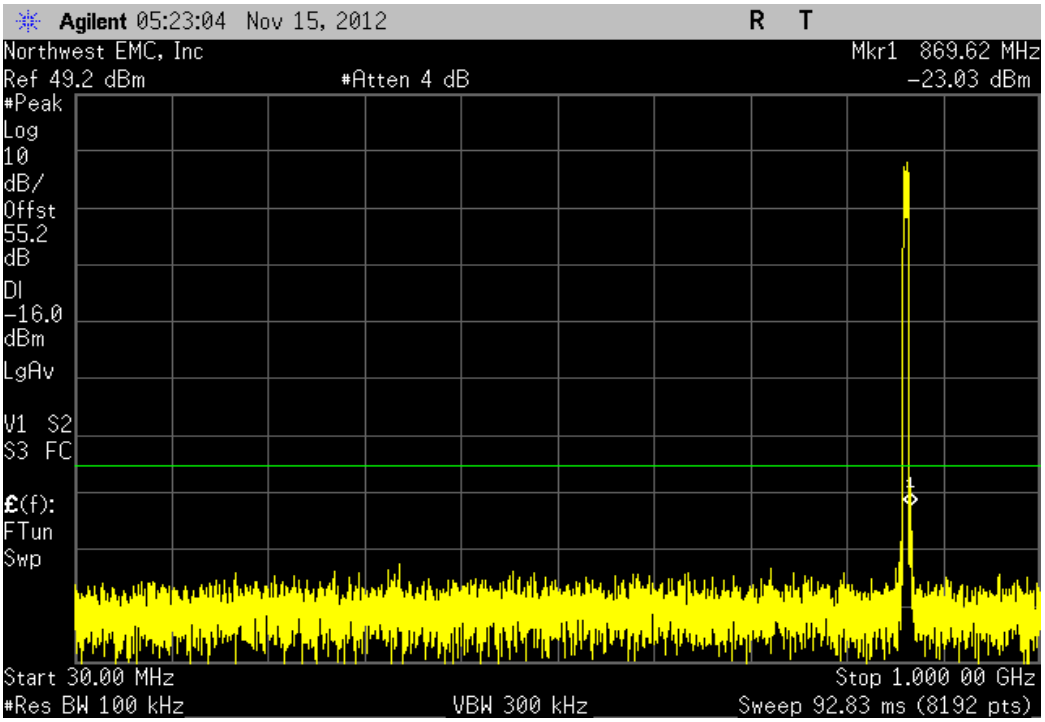
Port A, LTE 3MHz Multi Carrier, Low, 150kHz-30MHz

				Value	Limit	Result
				-42.31 dBm	-16 dBm	Pass



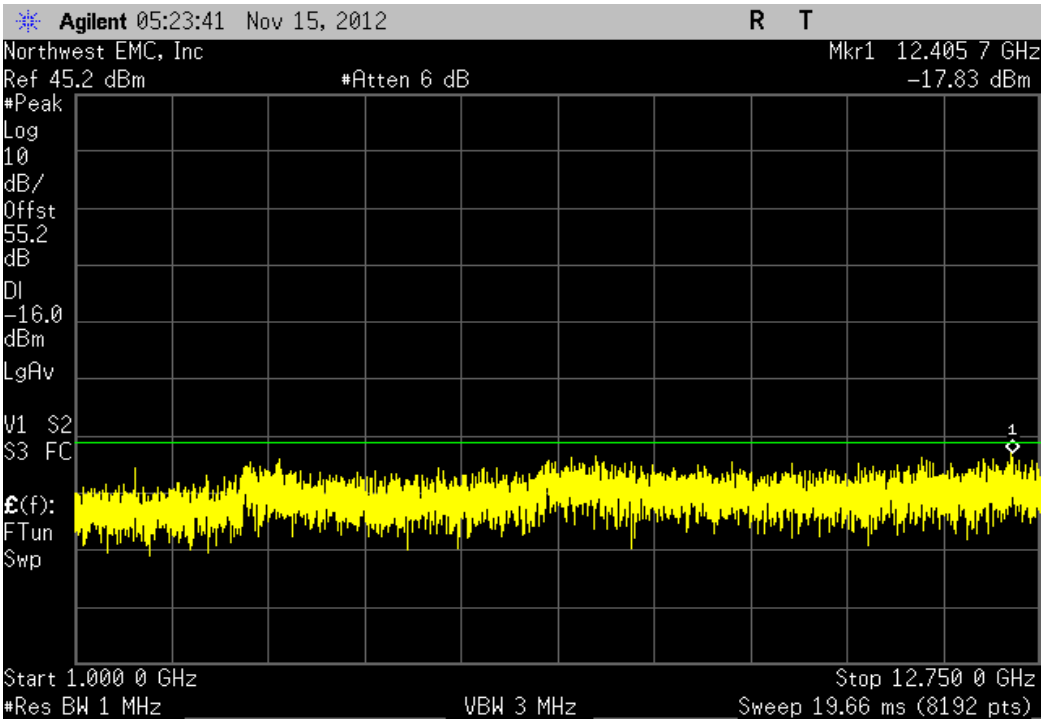
Port A, LTE 3MHz Multi Carrier, Low, 30MHz-1GHz

				Value	Limit	Result
				-23.03 dBm	-16 dBm	Pass



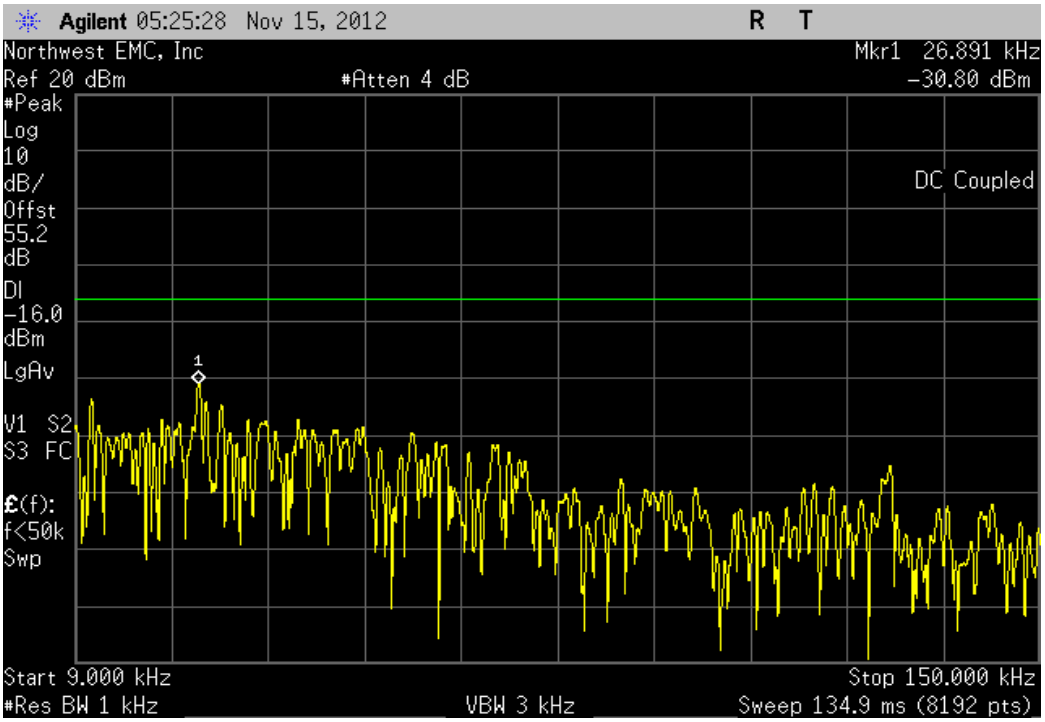
Port A, LTE 3MHz Multi Carrier, Low, 1GHz-12.75GHz

				Value	Limit	Result
				-17.83 dBm	-16 dBm	Pass



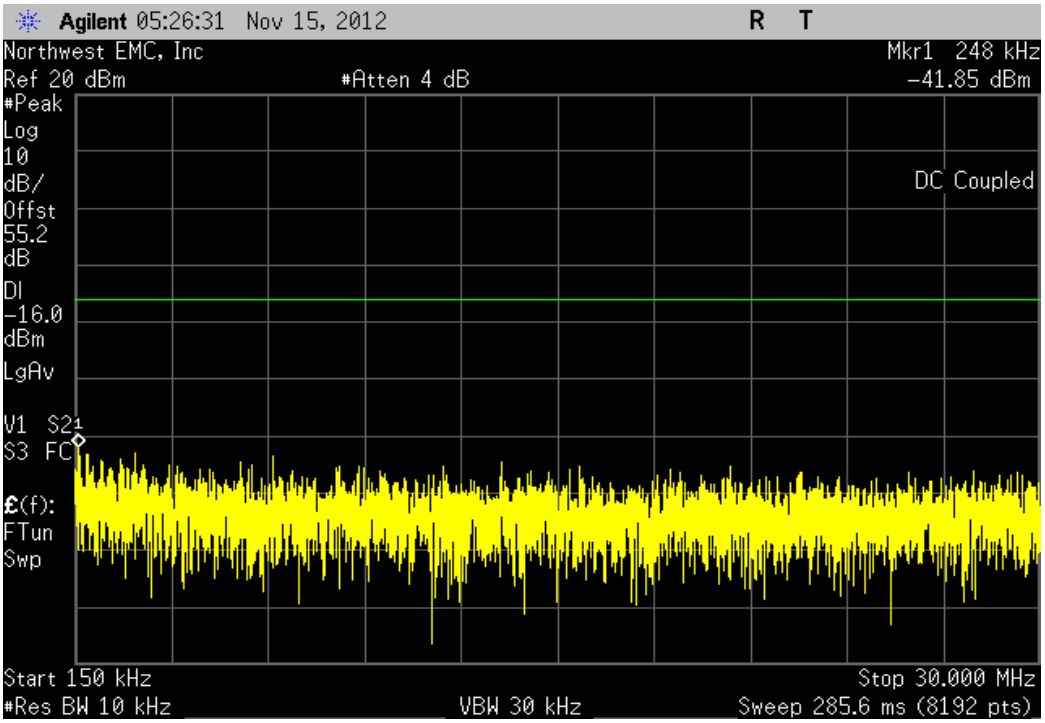
Port A, LTE 3MHz Multi Carrier, Mid, 9kHz-150kHz

Value	Limit	Result
-30.8 dBm	-16 dBm	Pass

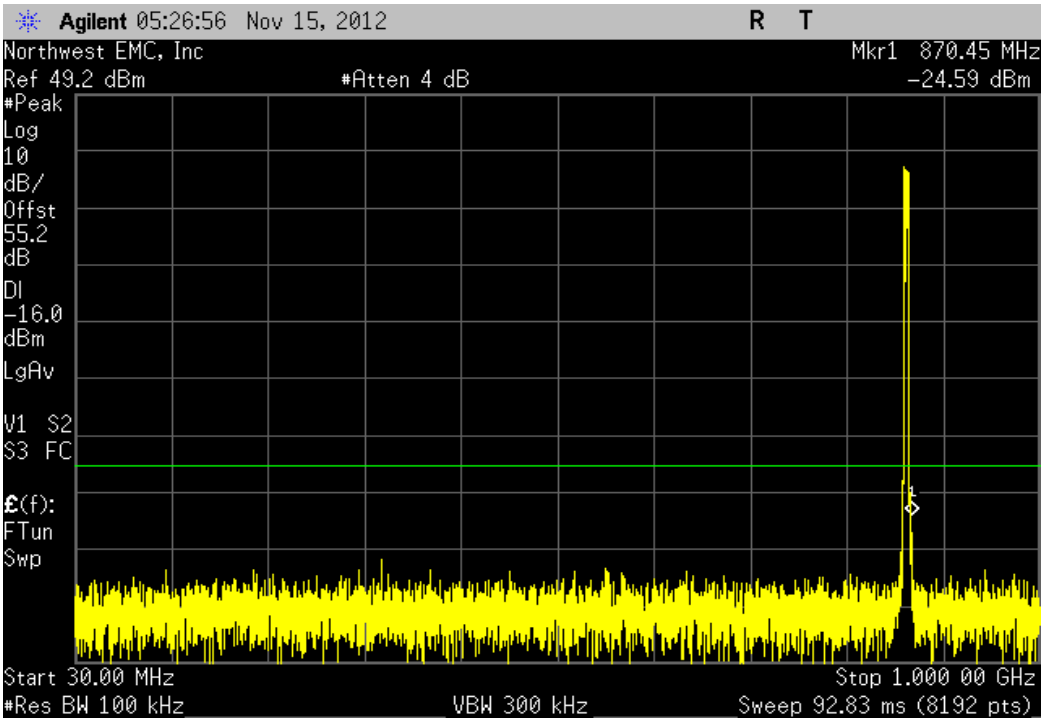


Port A, LTE 3MHz Multi Carrier, Mid, 150kHz-30MHz

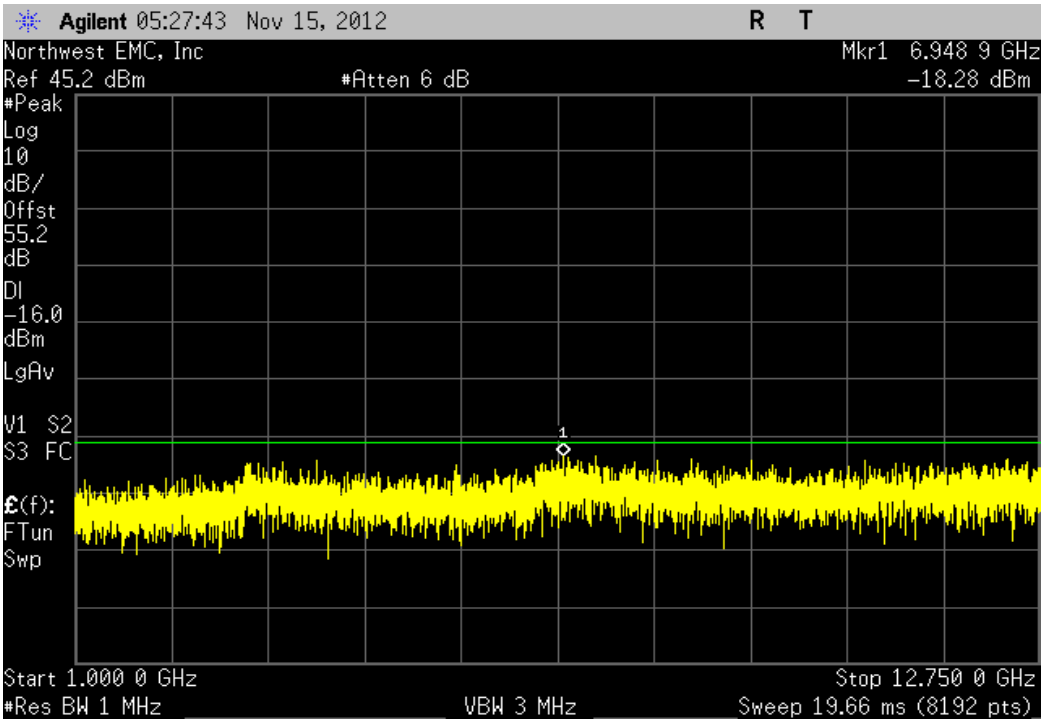
Value	Limit	Result
-41.85 dBm	-16 dBm	Pass



Port A, LTE 3MHz Multi Carrier, Mid, 30MHz-1GHz							
					Value	Limit	Result
					-24.59 dBm	-16 dBm	Pass

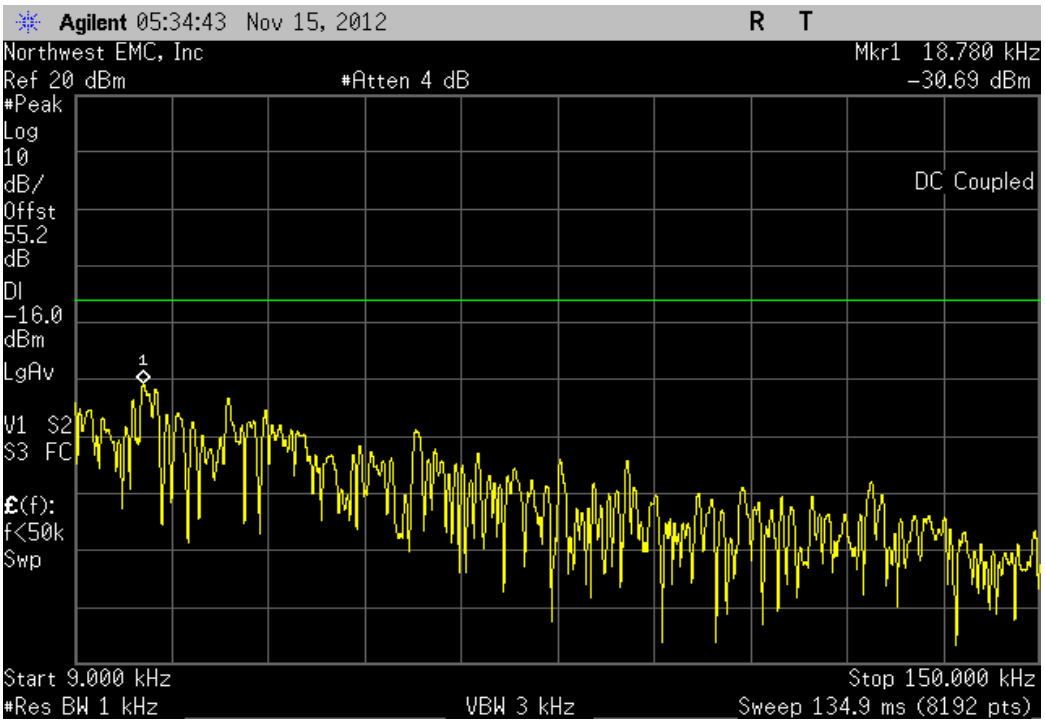


Port A, LTE 3MHz Multi Carrier, Mid, 1GHz-12.75GHz							
					Value	Limit	Result
					-18.28 dBm	-16 dBm	Pass



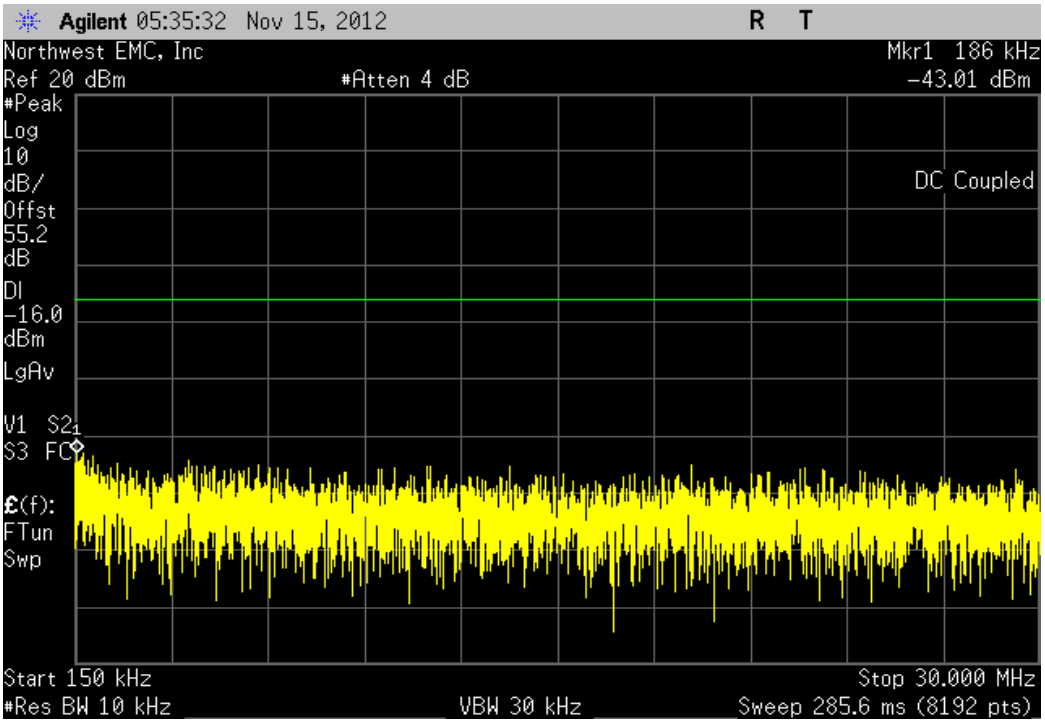
Port A, LTE 3MHz Multi Carrier, High, 9kHz-150kHz

				Value	Limit	Result
				-30.69 dBm	-16 dBm	Pass



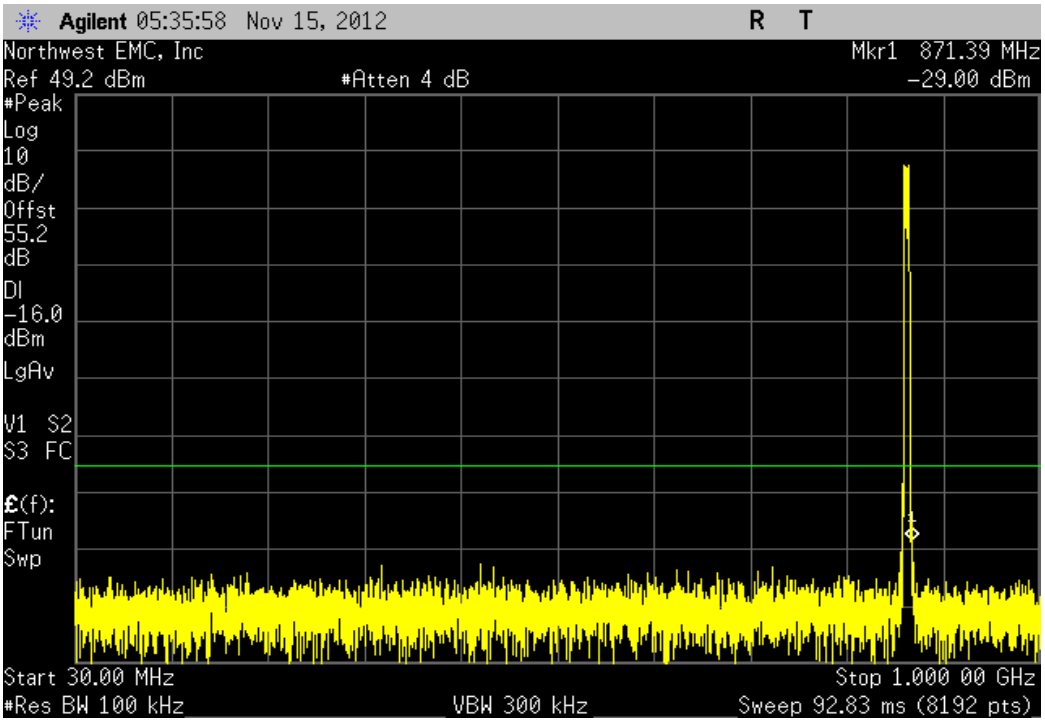
Port A, LTE 3MHz Multi Carrier, High, 150kHz-30MHz

				Value	Limit	Result
				-43.01 dBm	-16 dBm	Pass



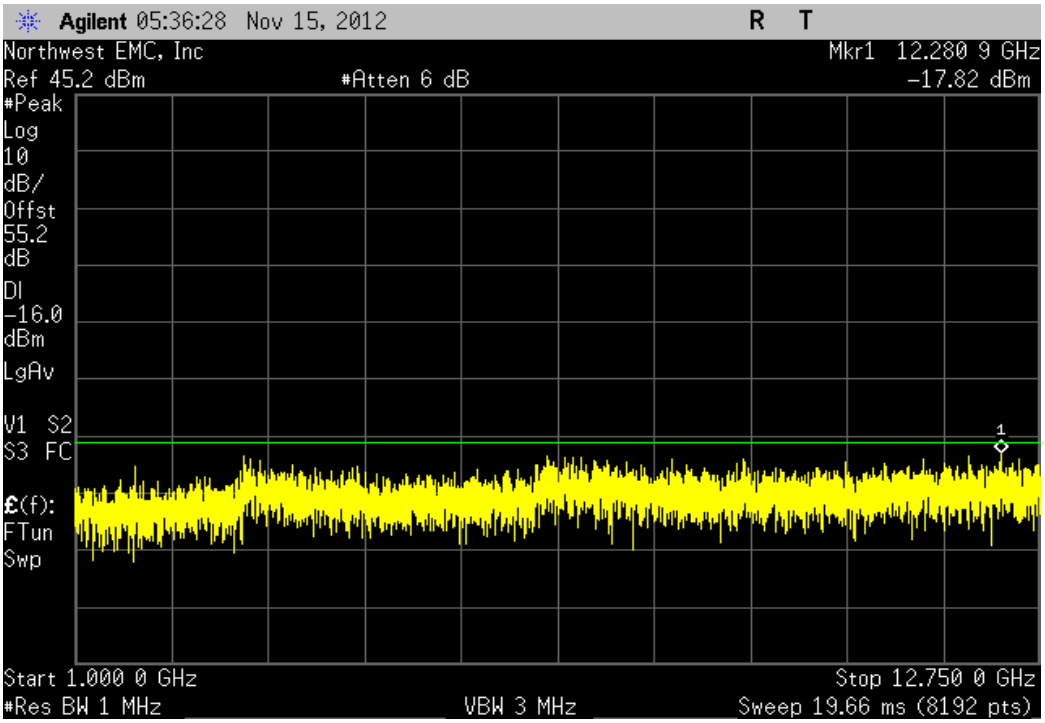
Port A, LTE 3MHz Multi Carrier, High, 30MHz-1GHz

				Value	Limit	Result
				-29 dBm	-16 dBm	Pass



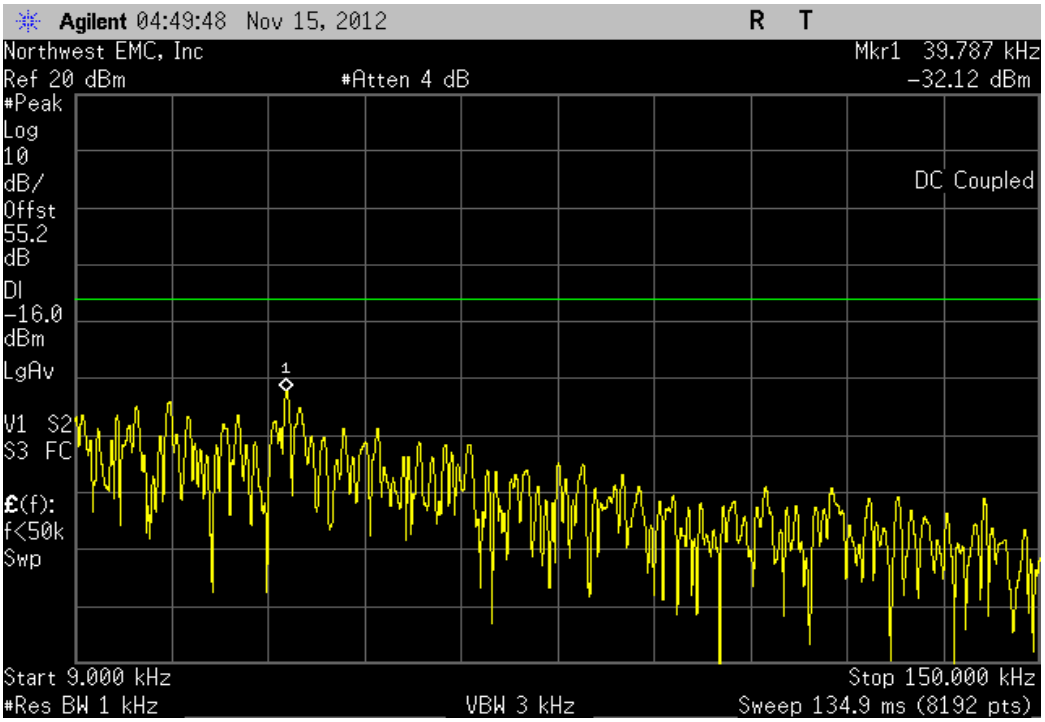
Port A, LTE 3MHz Multi Carrier, High, 1GHz-12.75GHz

				Value	Limit	Result
				-17.82 dBm	-16 dBm	Pass



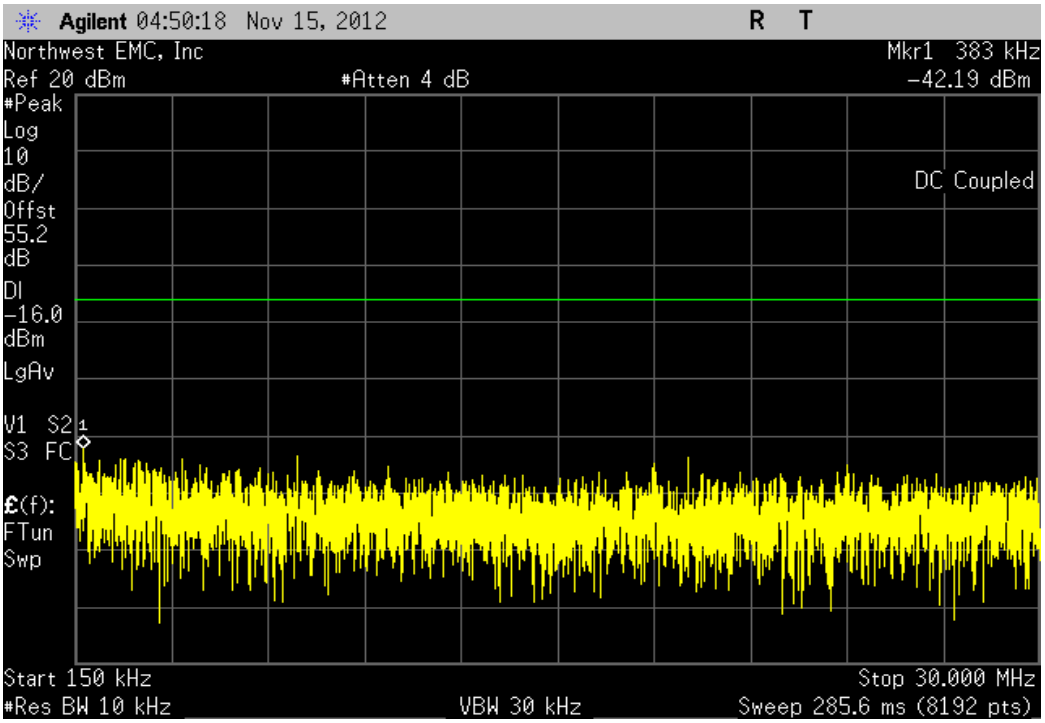
Port B, LTE 1.4MHz Single Carrier, Low, 9kHz-150kHz

				Value	Limit	Result
				-32.12 dBm	-16 dBm	Pass



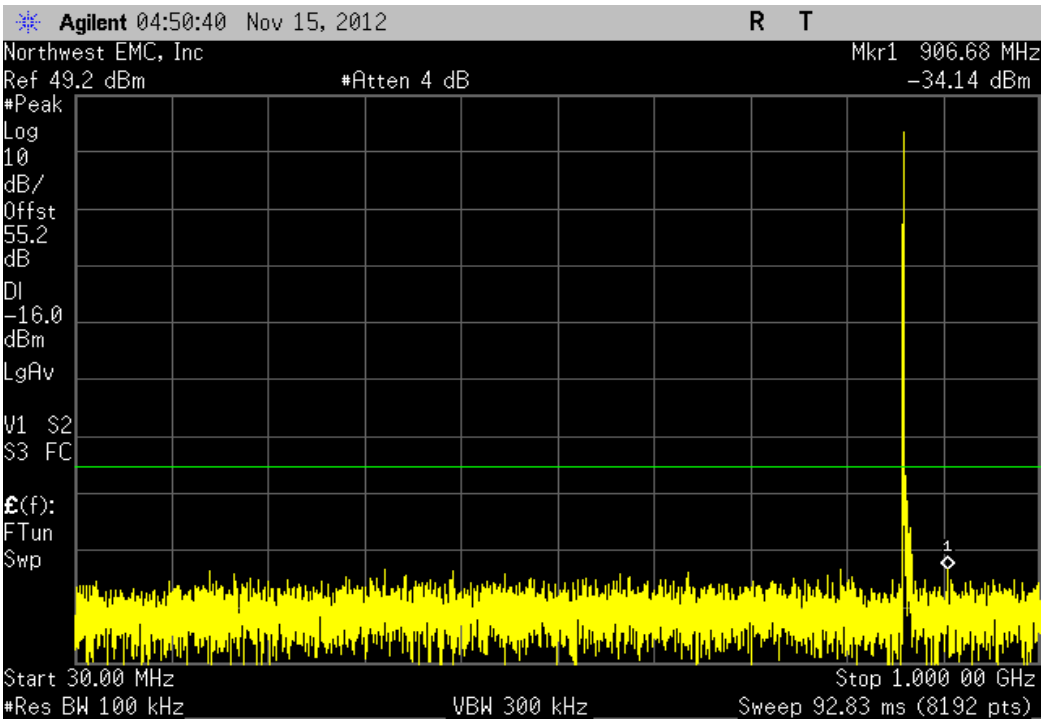
Port B, LTE 1.4MHz Single Carrier, Low, 150kHz-30MHz

				Value	Limit	Result
				-42.19 dBm	-16 dBm	Pass



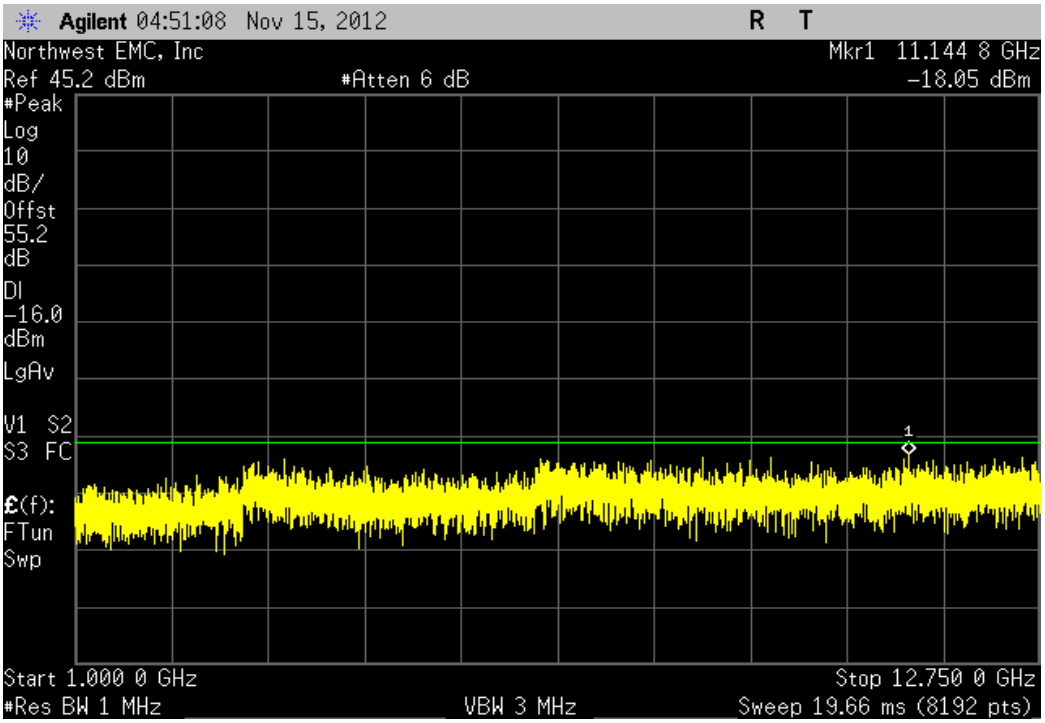
Port B, LTE 1.4MHz Single Carrier, Low, 30MHz-1GHz

				Value	Limit	Result
				-34.14 dBm	-16 dBm	Pass



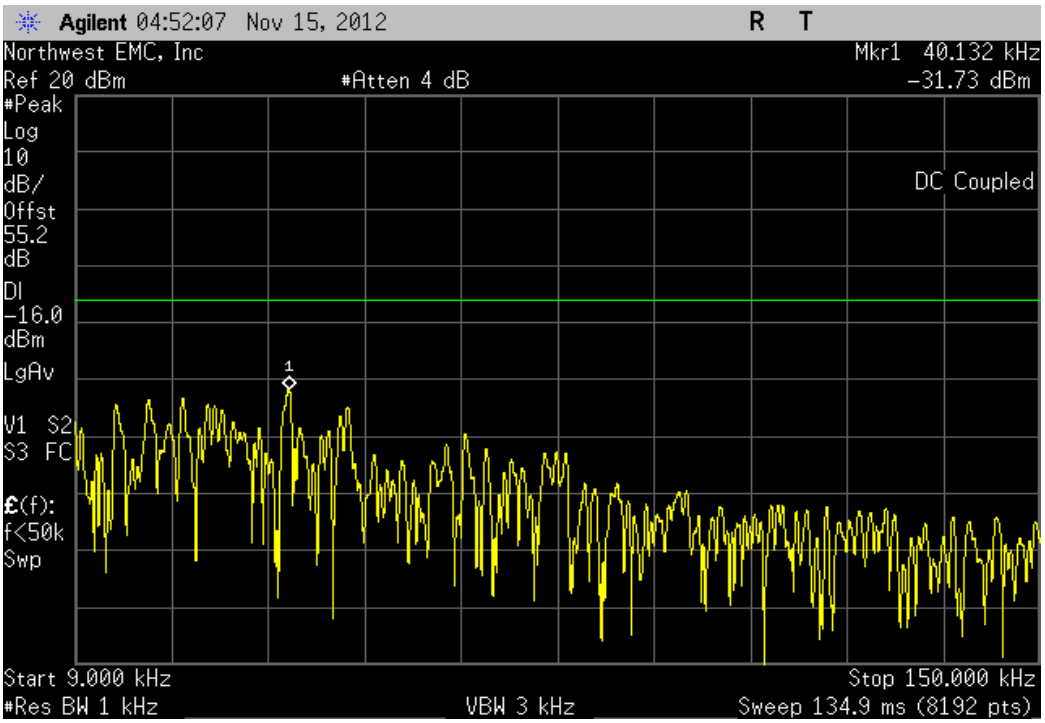
Port B, LTE 1.4MHz Single Carrier, Low, 1GHz-12.75GHz

				Value	Limit	Result
				-18.05 dBm	-16 dBm	Pass



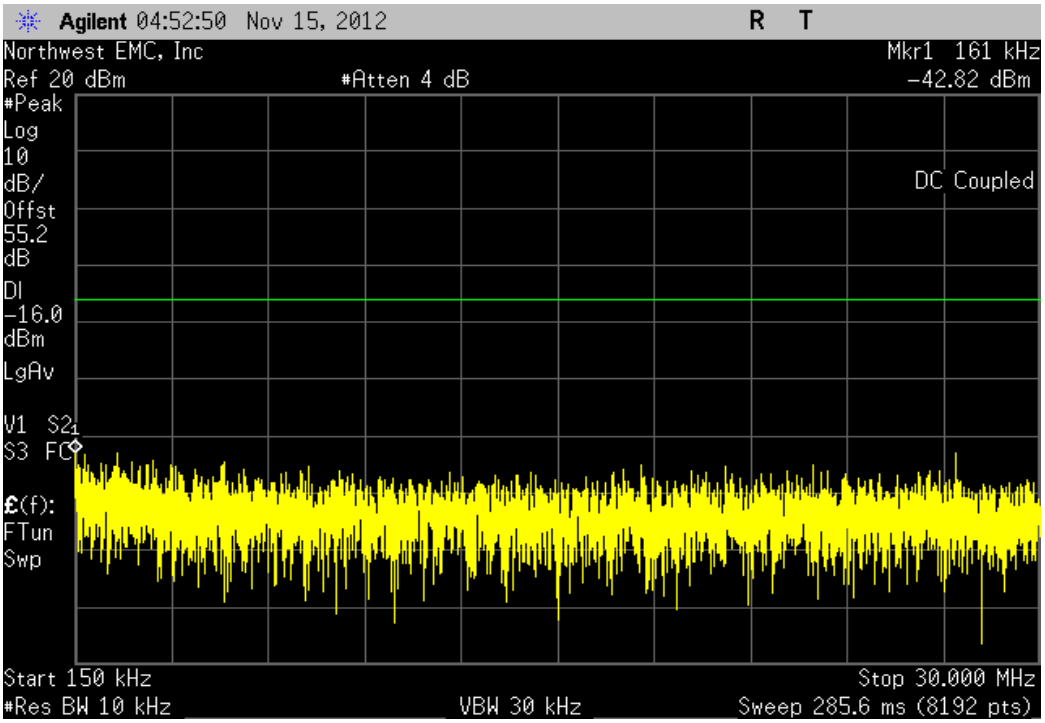
Port B, LTE 1.4MHz Single Carrier, Mid, 9kHz-150kHz

				Value	Limit	Result
				-31.73 dBm	-16 dBm	Pass



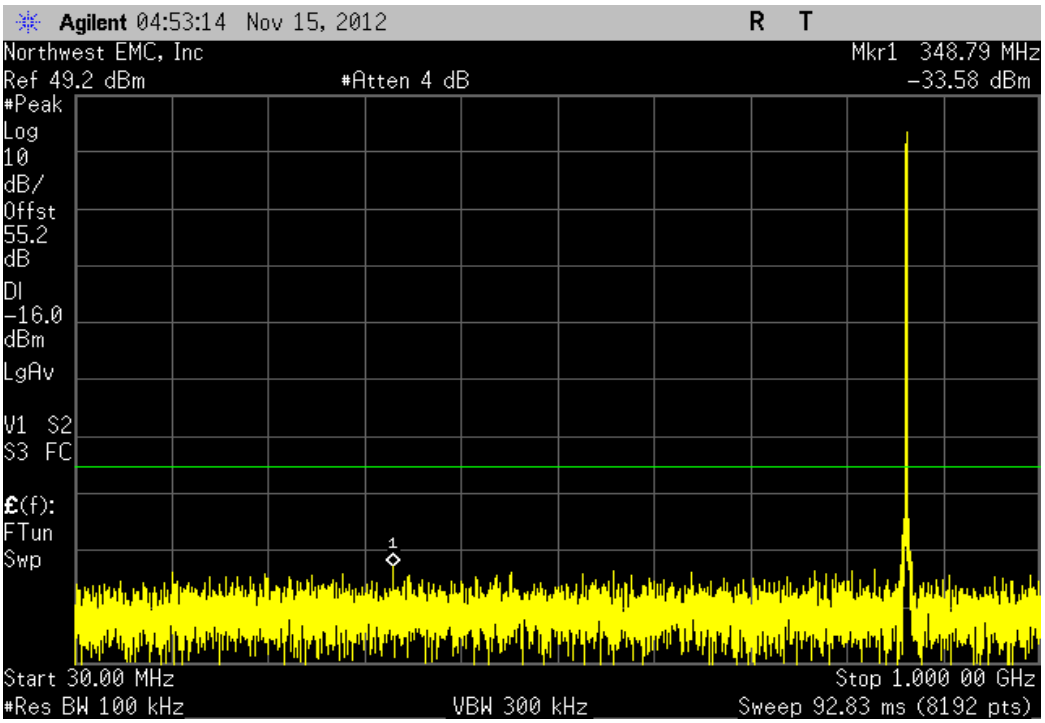
Port B, LTE 1.4MHz Single Carrier, Mid, 150kHz-30MHz

				Value	Limit	Result
				-42.82 dBm	-16 dBm	Pass



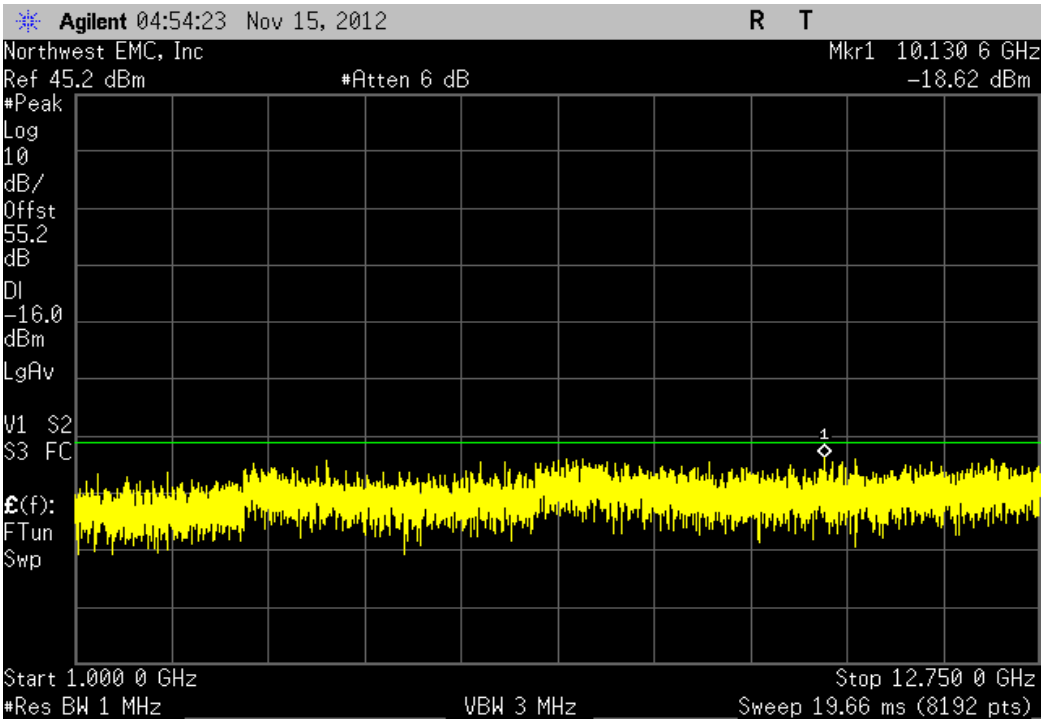
Port B, LTE 1.4MHz Single Carrier, Mid, 30MHz-1GHz

				Value	Limit	Result
				-33.58 dBm	-16 dBm	Pass



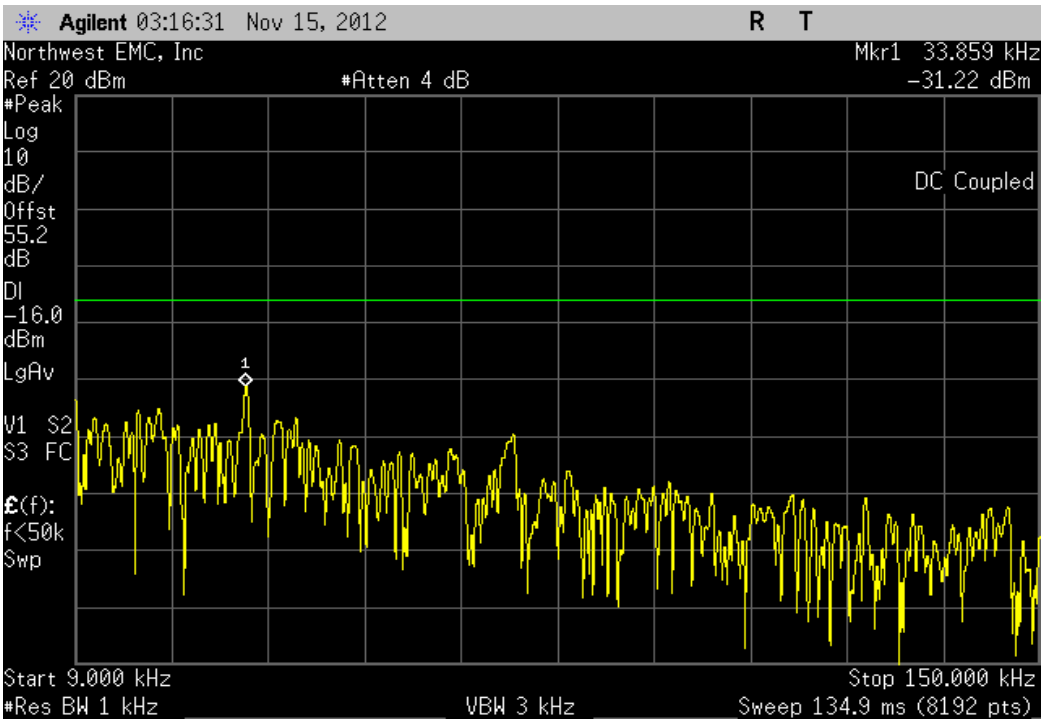
Port B, LTE 1.4MHz Single Carrier, Mid, 1GHz-12.75GHz

				Value	Limit	Result
				-18.62 dBm	-16 dBm	Pass



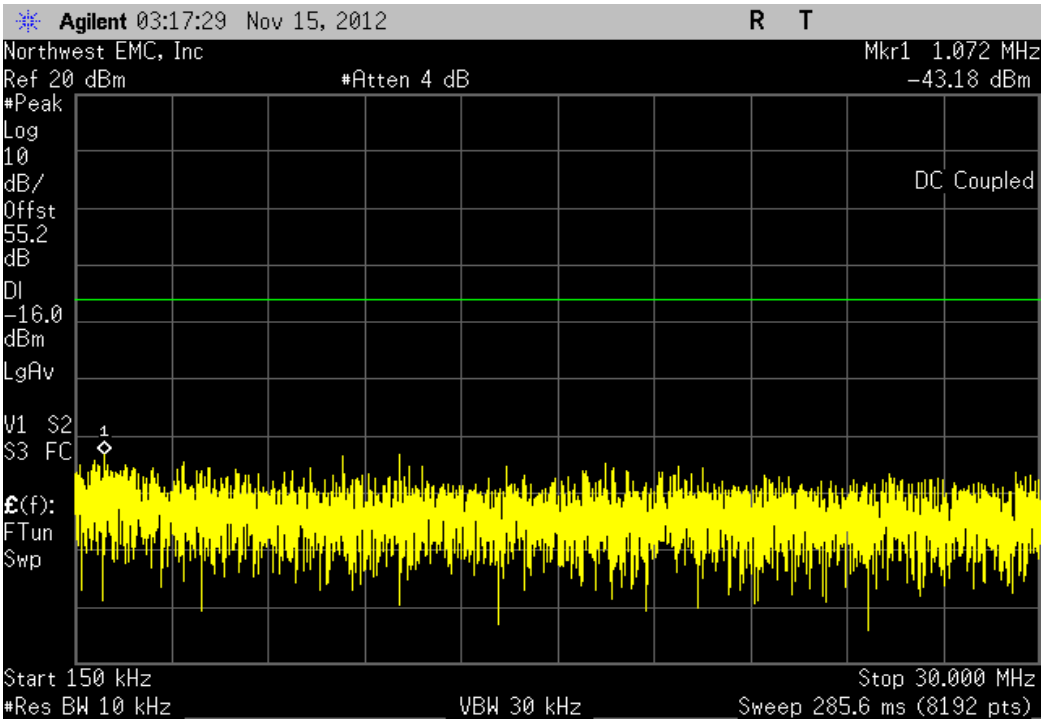
Port B, LTE 1.4MHz Single Carrier, High, 9kHz-150kHz

				Value	Limit	Result
				-31.22 dBm	-16 dBm	Pass



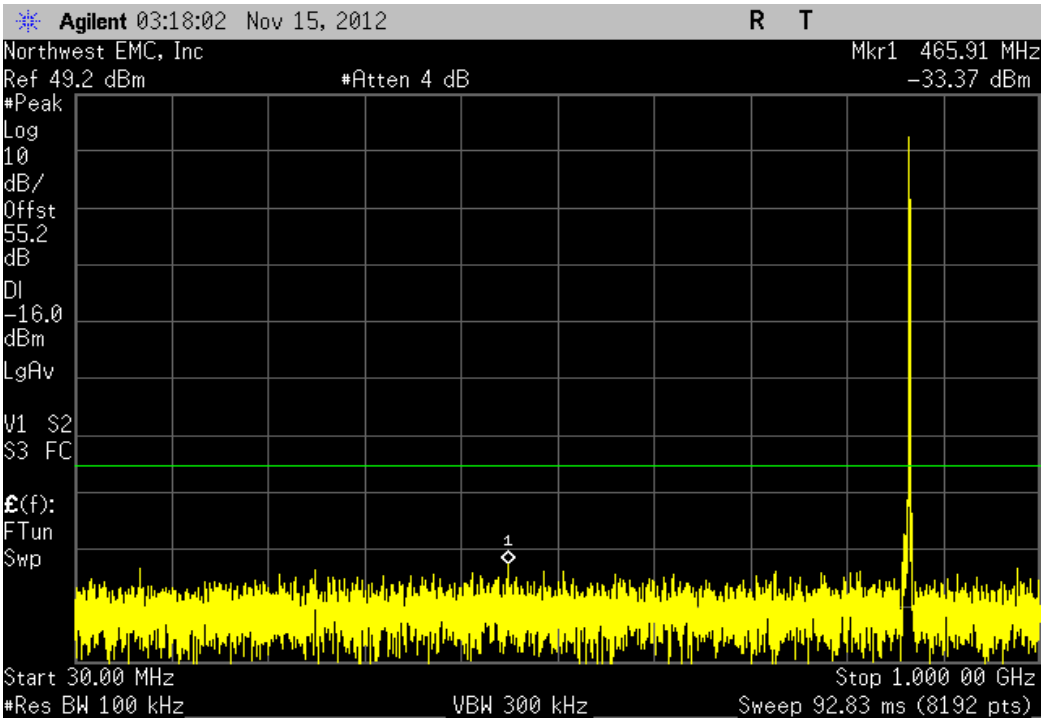
Port B, LTE 1.4MHz Single Carrier, High, 150kHz-30MHz

				Value	Limit	Result
				-43.18 dBm	-16 dBm	Pass



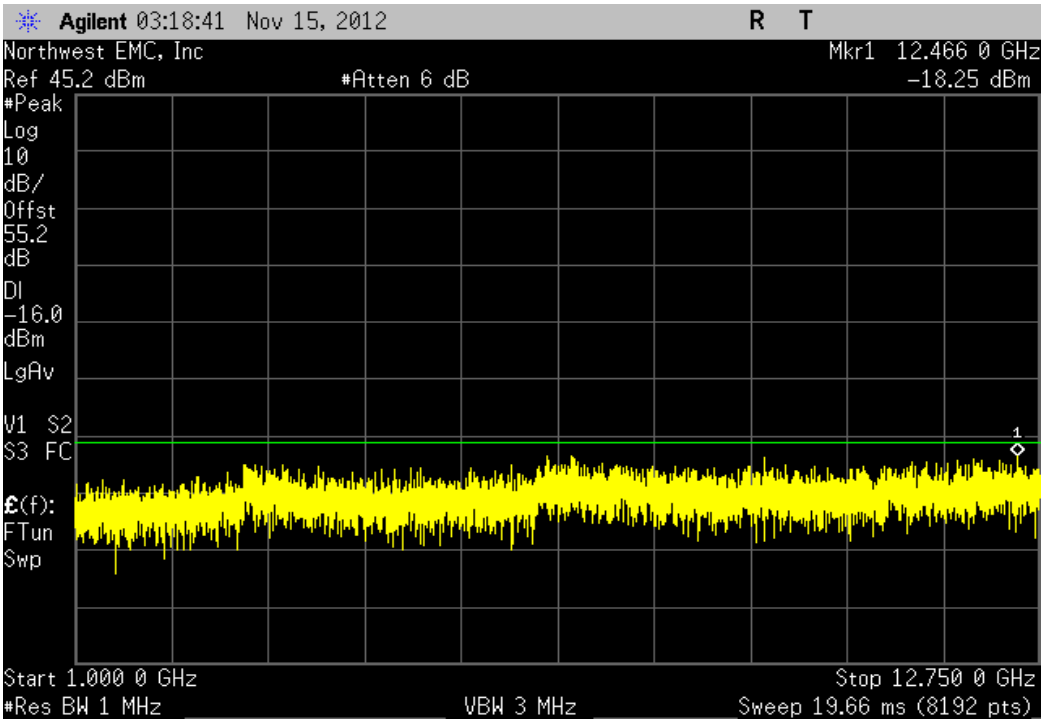
Port B, LTE 1.4MHz Single Carrier, High, 30MHz-1GHz

				Value	Limit	Result
				-33.37 dBm	-16 dBm	Pass



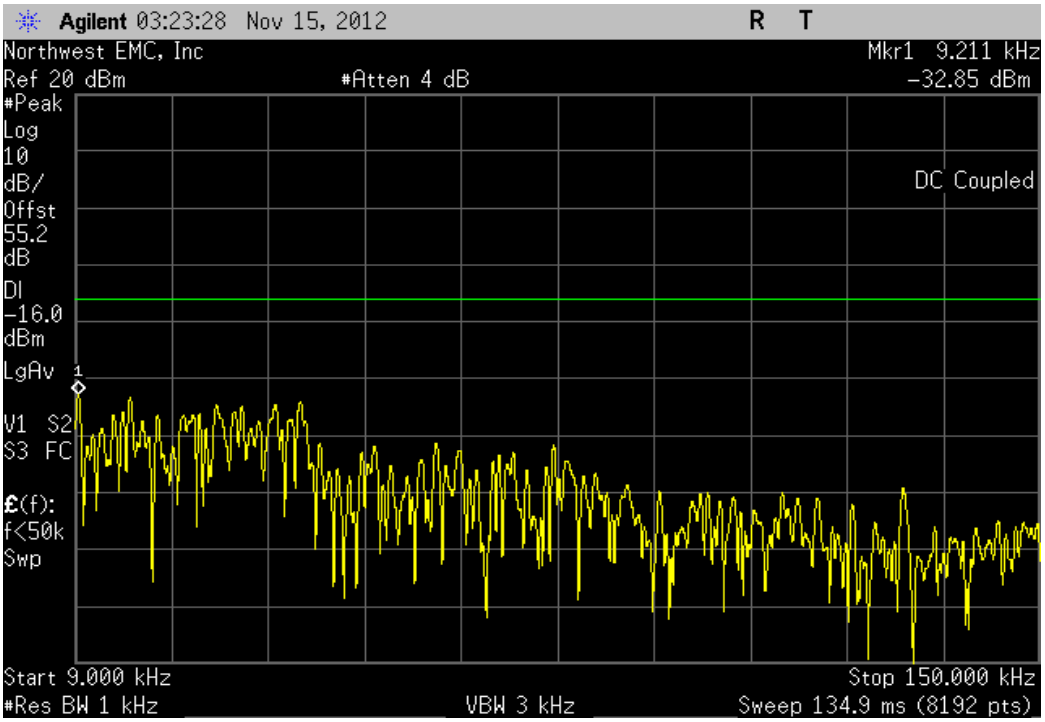
Port B, LTE 1.4MHz Single Carrier, High, 1GHz-12.75GHz

				Value	Limit	Result
				-18.25 dBm	-16 dBm	Pass



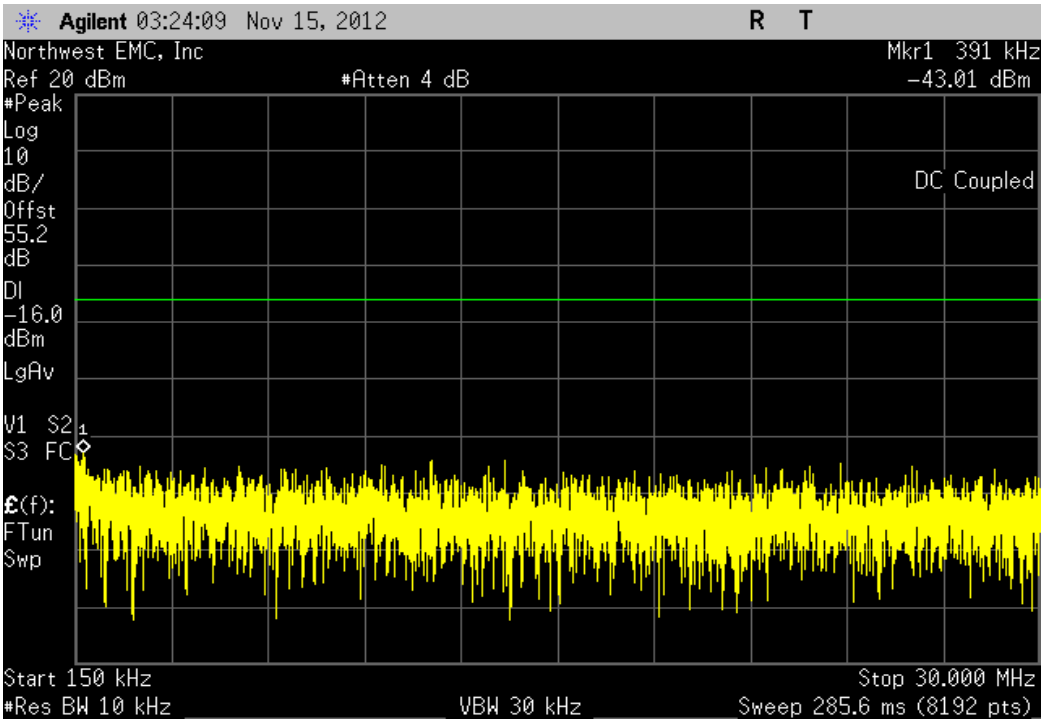
Port B, LTE 3MHz Single Carrier, Low, 9kHz-150kHz

				Value	Limit	Result
				-32.85 dBm	-16 dBm	Pass



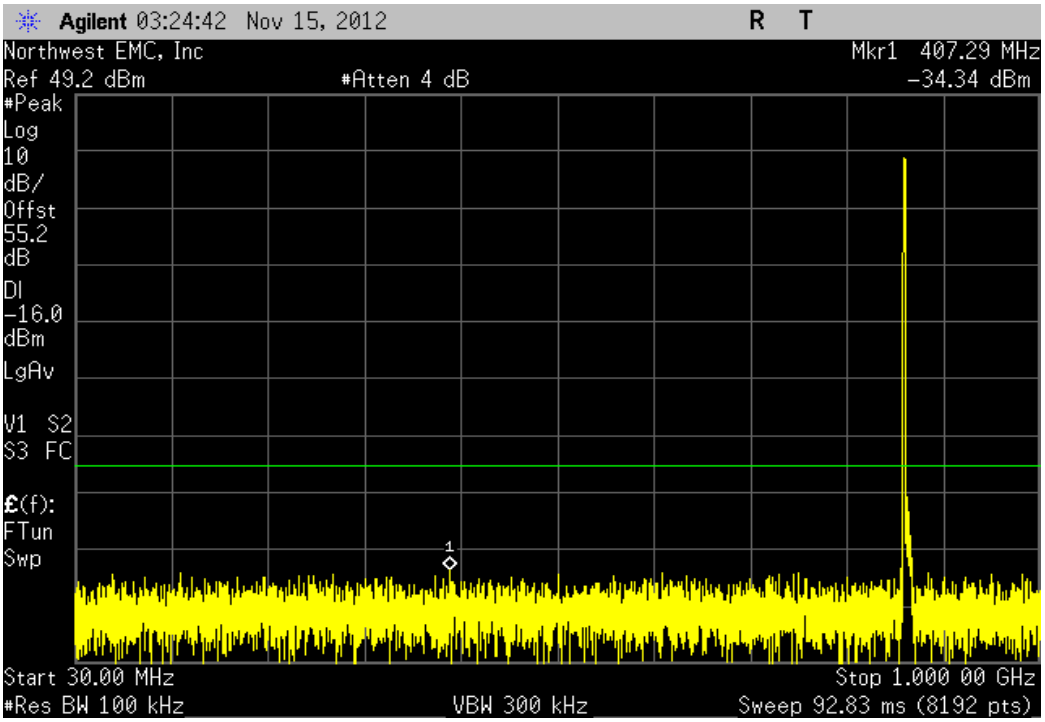
Port B, LTE 3MHz Single Carrier, Low, 150kHz-30MHz

				Value	Limit	Result
				-43.01 dBm	-16 dBm	Pass



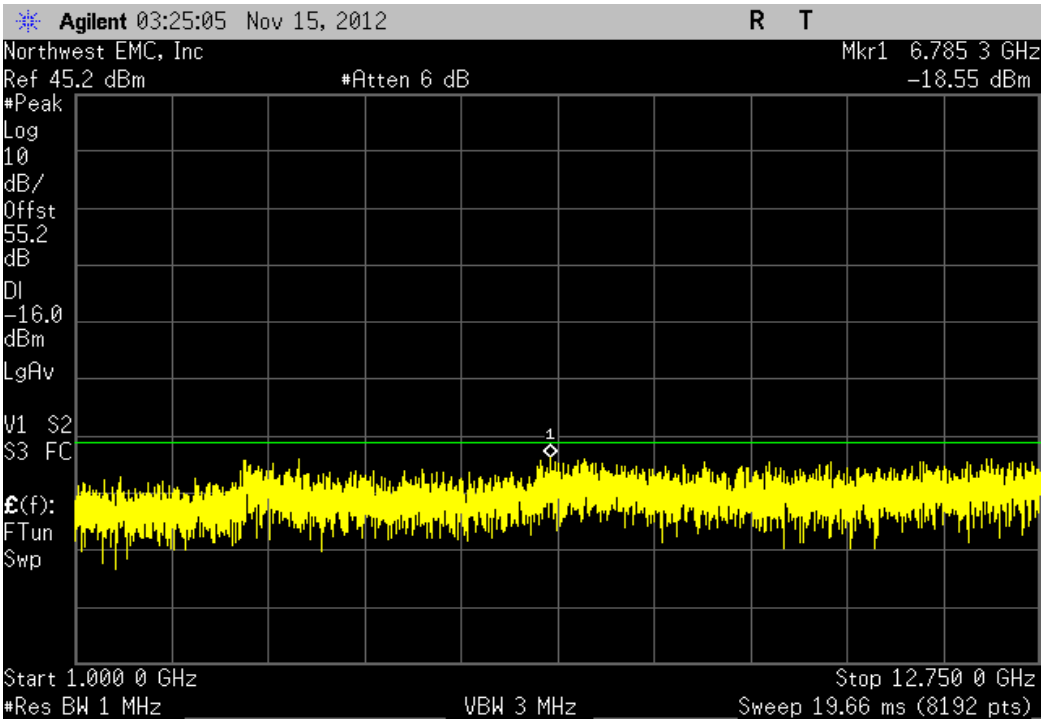
Port B, LTE 3MHz Single Carrier, Low, 30MHz-1GHz

				Value	Limit	Result
				-34.34 dBm	-16 dBm	Pass



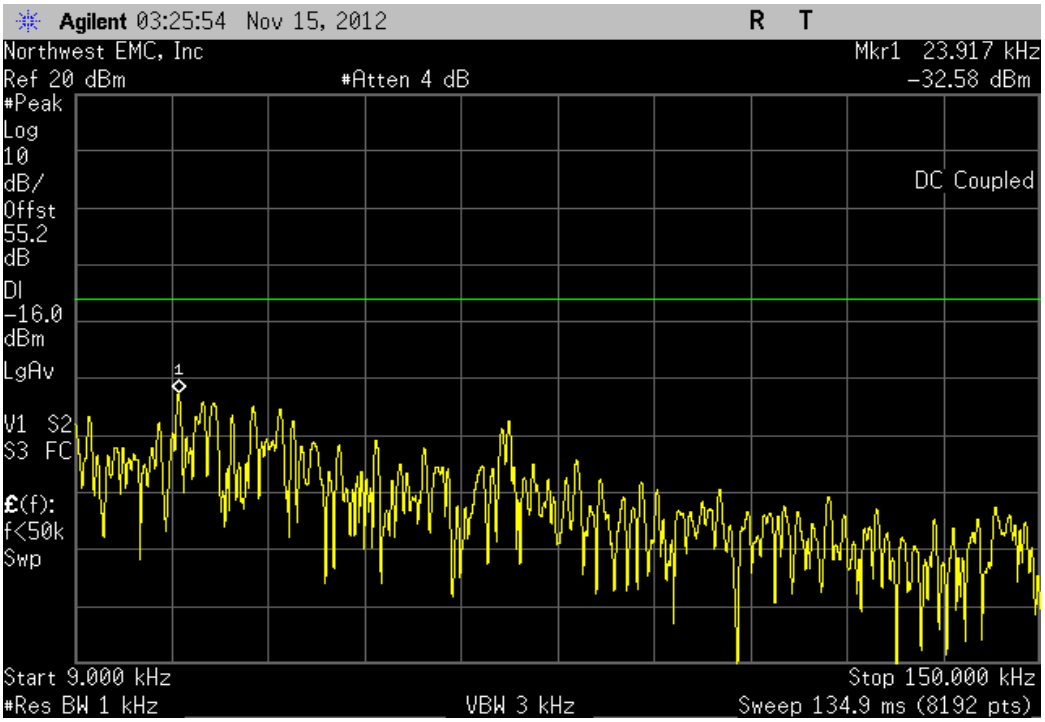
Port B, LTE 3MHz Single Carrier, Low, 1GHz-12.75GHz

				Value	Limit	Result
				-18.55 dBm	-16 dBm	Pass



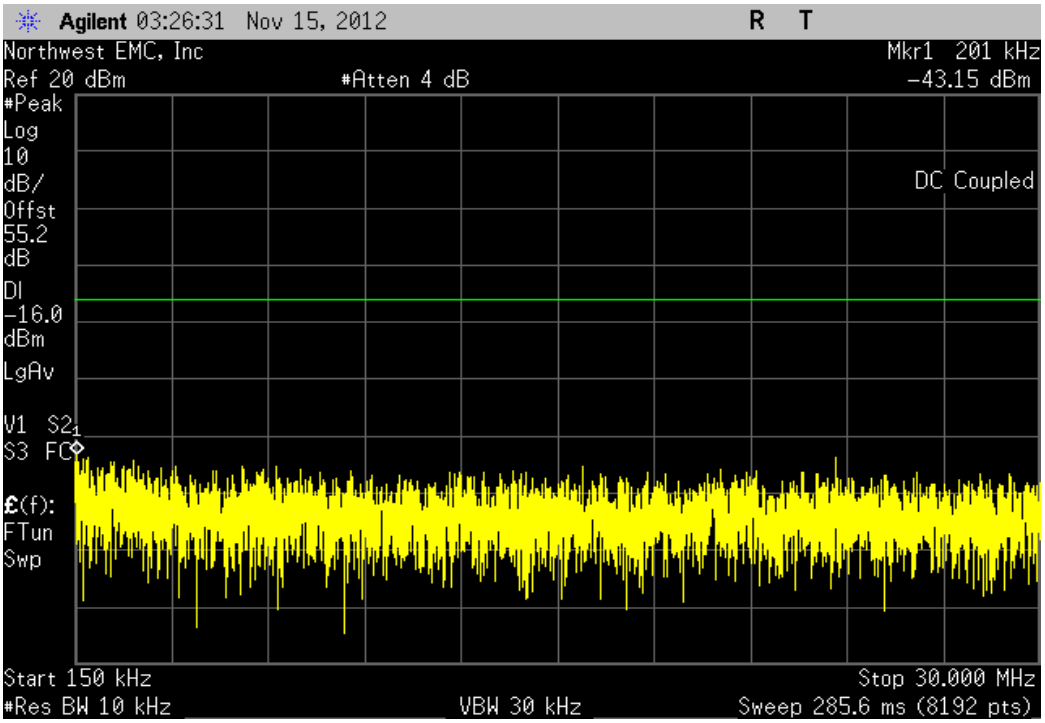
Port B, LTE 3MHz Single Carrier, Mid, 9kHz-150kHz

				Value	Limit	Result
				-32.58 dBm	-16 dBm	Pass



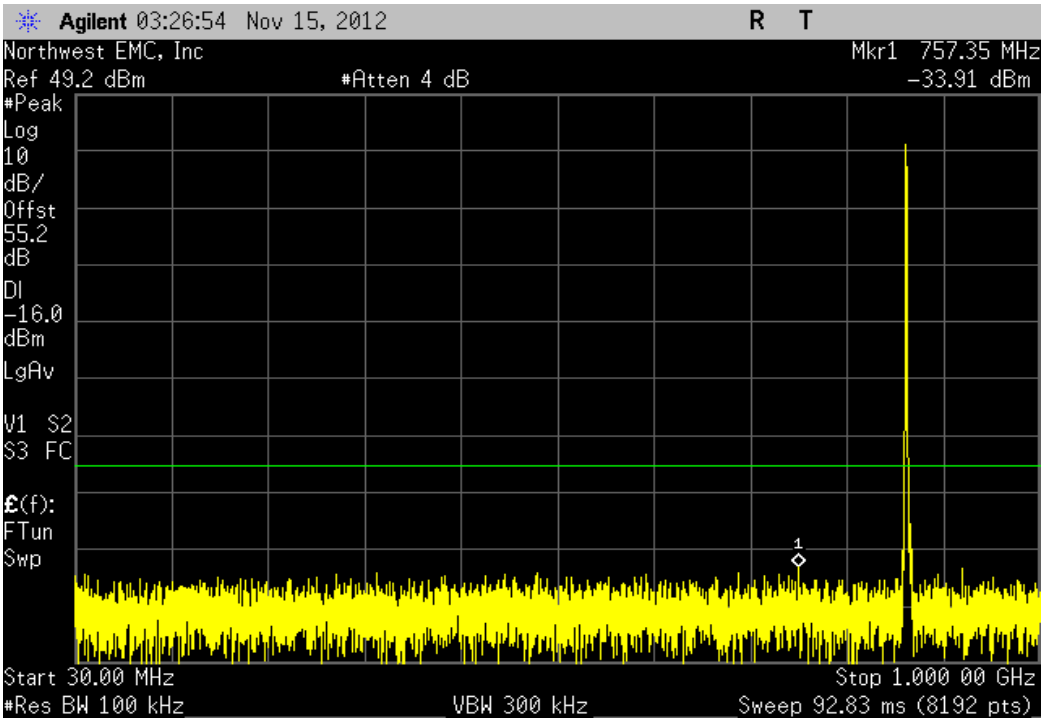
Port B, LTE 3MHz Single Carrier, Mid, 150kHz-30MHz

				Value	Limit	Result
				-43.15 dBm	-16 dBm	Pass



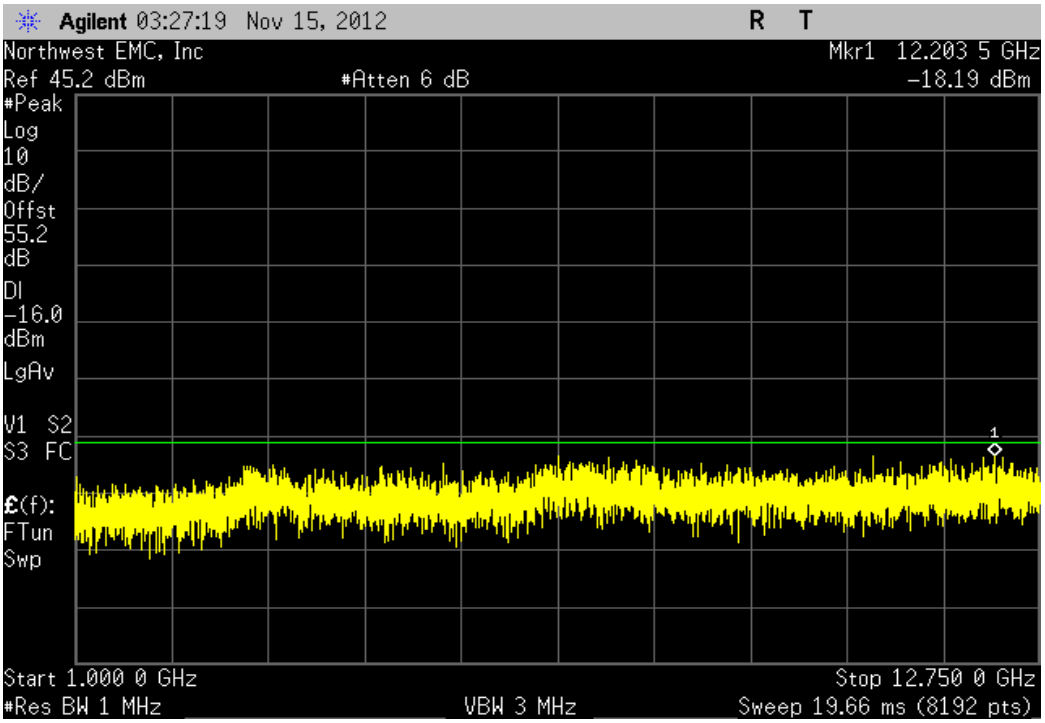
Port B, LTE 3MHz Single Carrier, Mid, 30MHz-1GHz

				Value	Limit	Result
				-33.91 dBm	-16 dBm	Pass



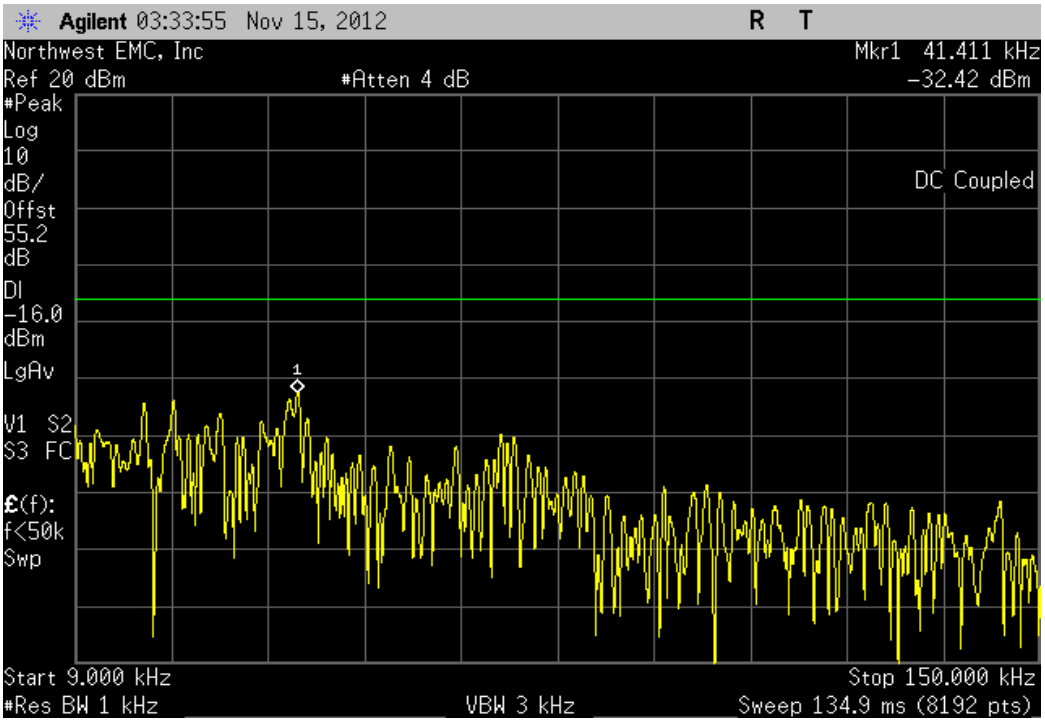
Port B, LTE 3MHz Single Carrier, Mid, 1GHz-12.75GHz

				Value	Limit	Result
				-18.19 dBm	-16 dBm	Pass



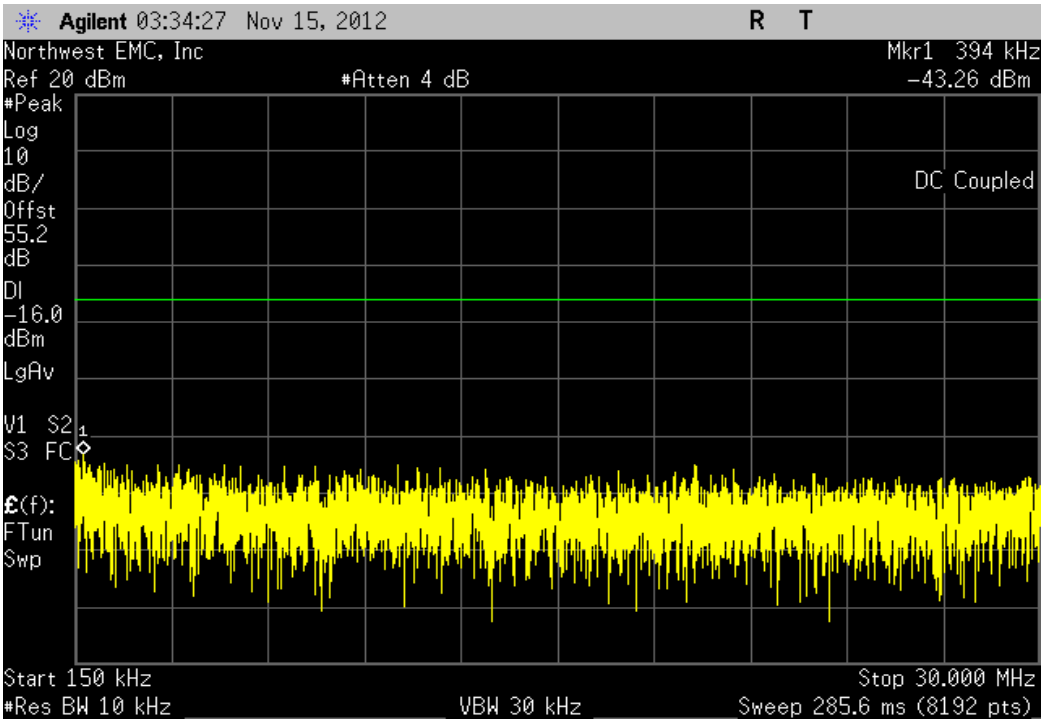
Port B, LTE 3MHz Single Carrier, High, 9kHz-150kHz

				Value	Limit	Result
				-32.42 dBm	-16 dBm	Pass



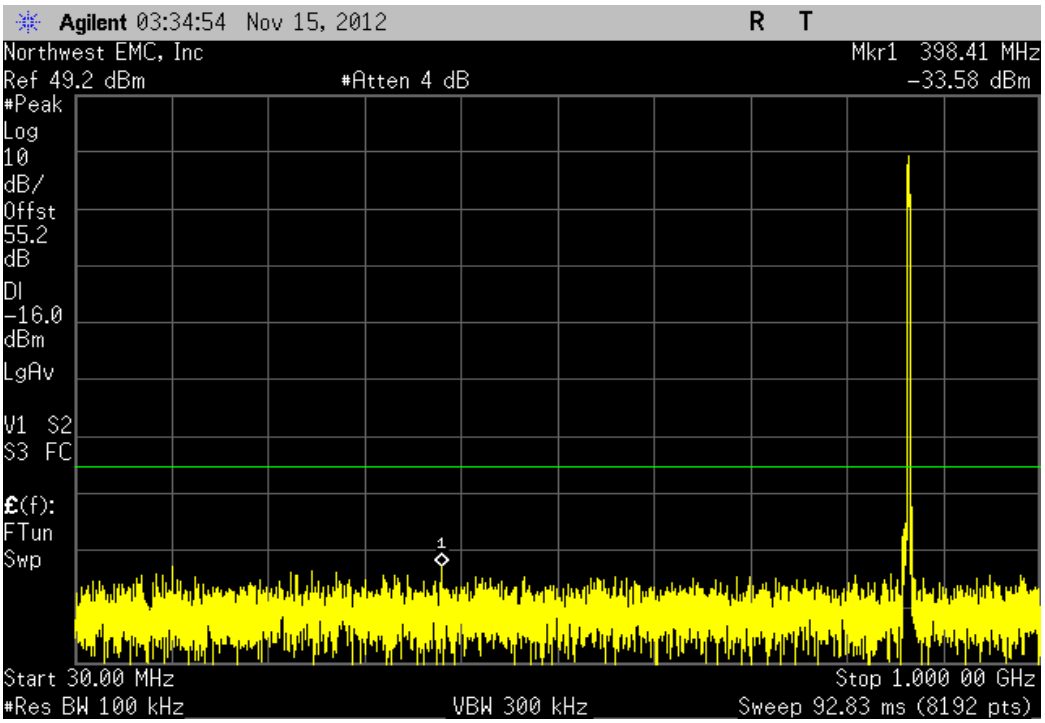
Port B, LTE 3MHz Single Carrier, High, 150kHz-30MHz

				Value	Limit	Result
				-43.26 dBm	-16 dBm	Pass



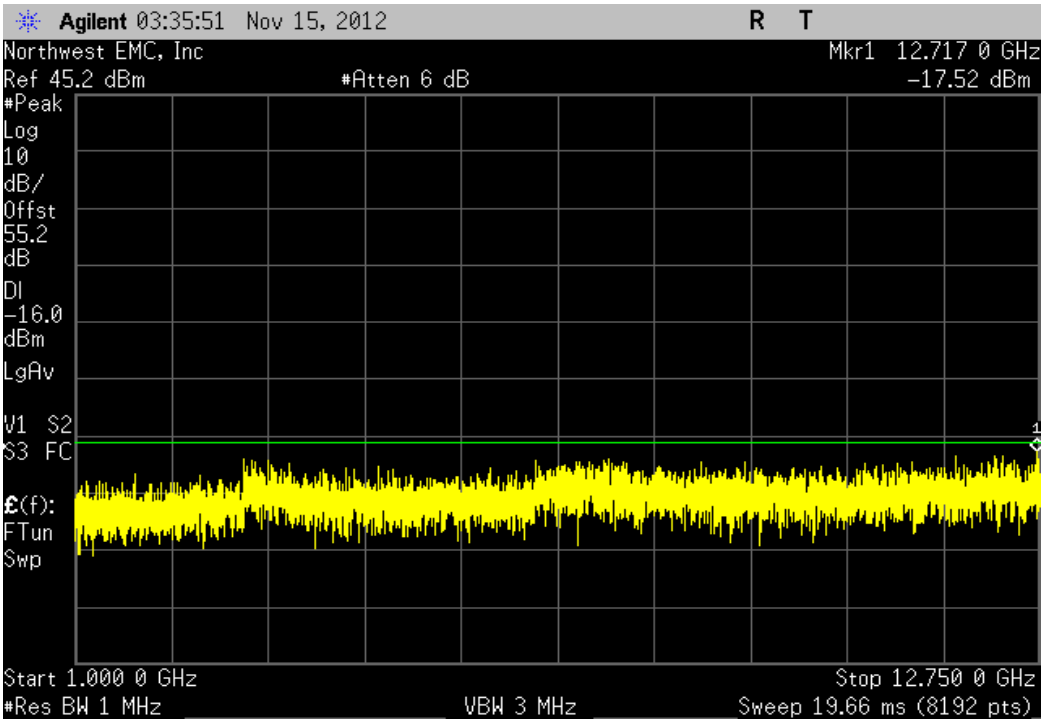
Port B, LTE 3MHz Single Carrier, High, 30MHz-1GHz

				Value	Limit	Result
				-33.58 dBm	-16 dBm	Pass



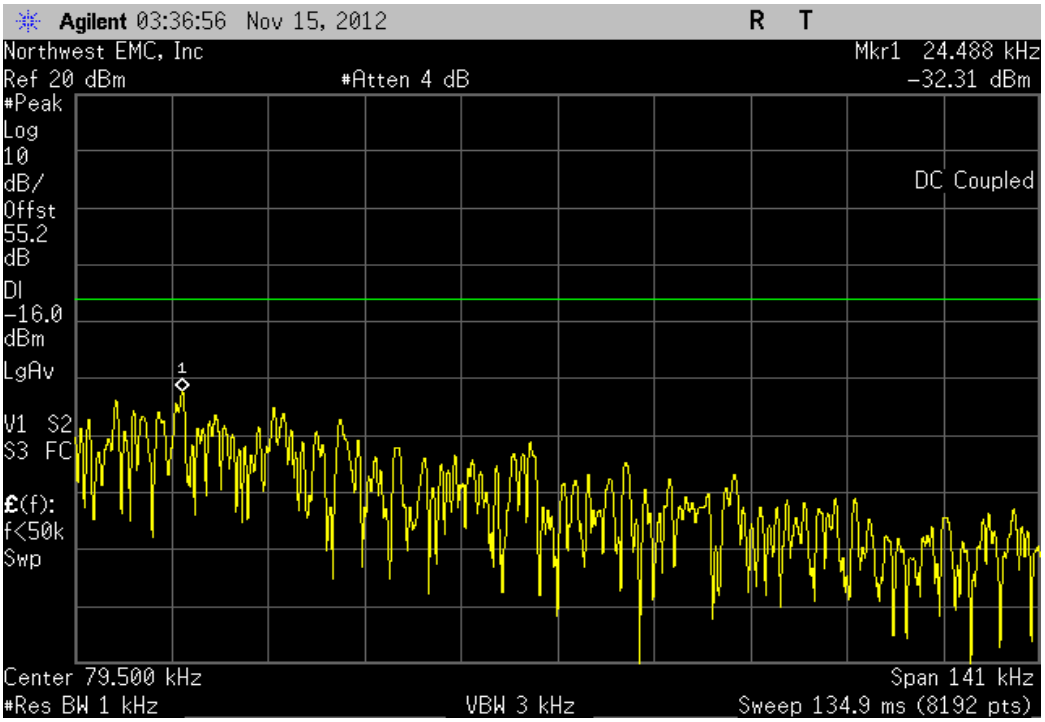
Port B, LTE 3MHz Single Carrier, High, 1GHz-12.75GHz

				Value	Limit	Result
				-17.52 dBm	-16 dBm	Pass



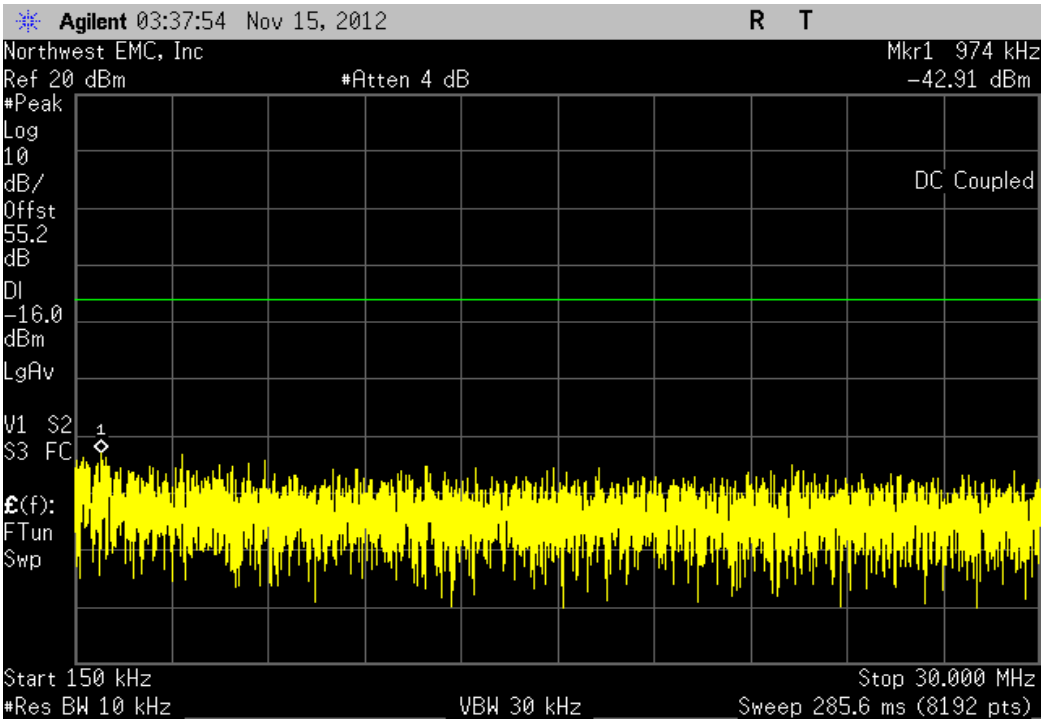
Port B, LTE 5MHz Single Carrier, Low, 9kHz-150kHz

				Value	Limit	Result
				-32.31 dBm	-16 dBm	Pass



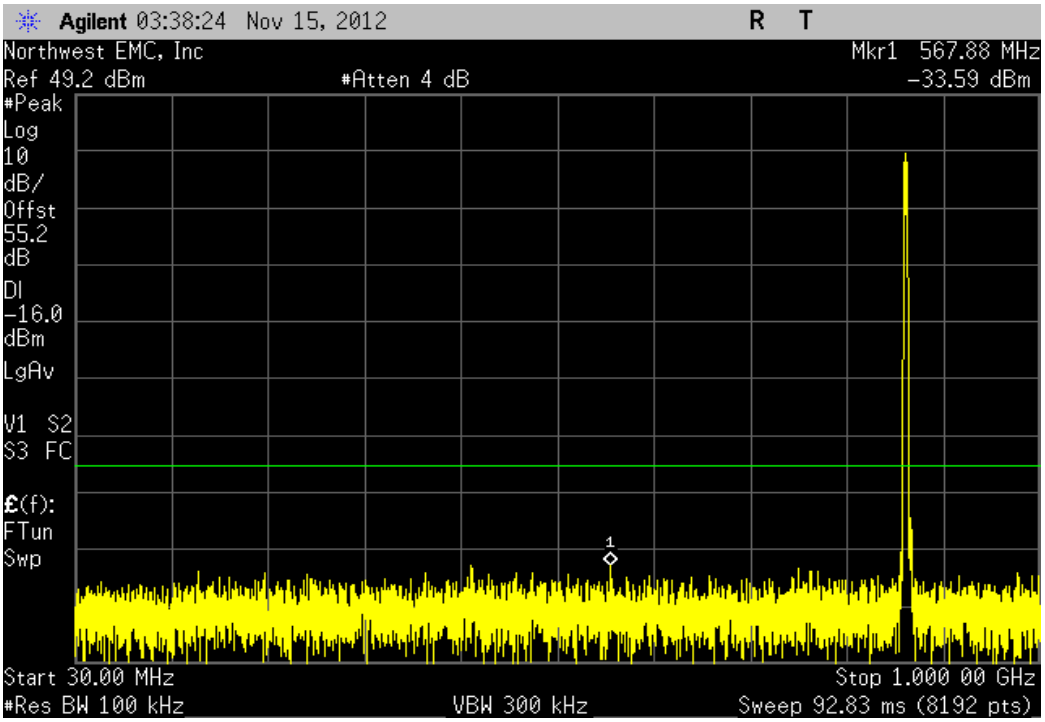
Port B, LTE 5MHz Single Carrier, Low, 150kHz-30MHz

				Value	Limit	Result
				-42.91 dBm	-16 dBm	Pass



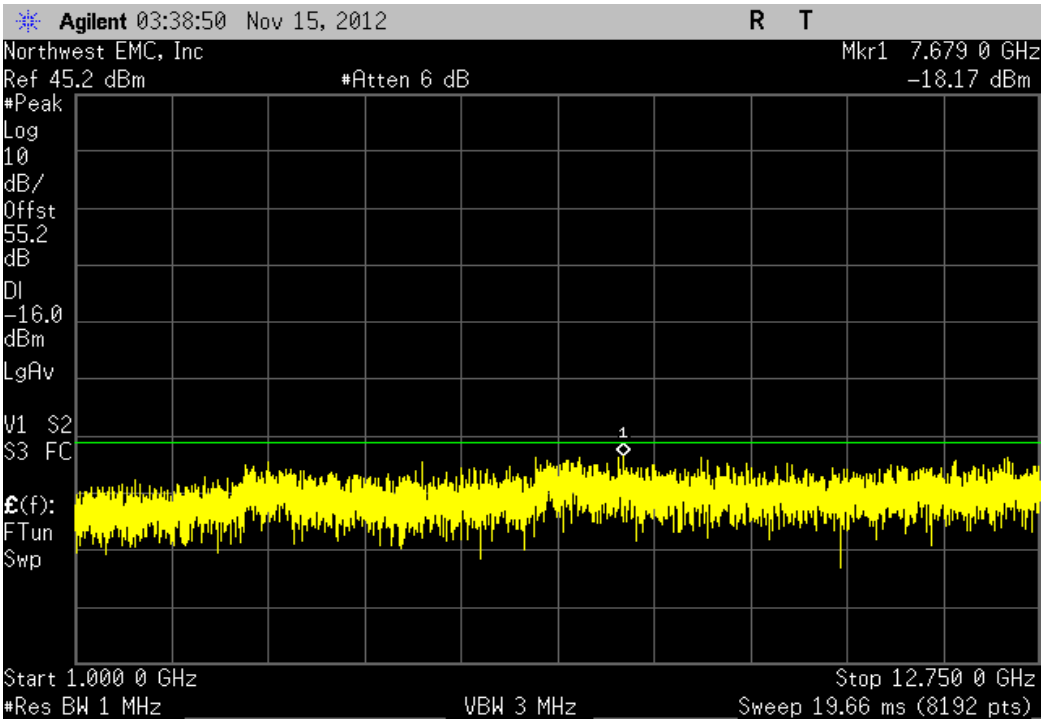
Port B, LTE 5MHz Single Carrier, Low, 30MHz-1GHz

				Value	Limit	Result
				-33.59 dBm	-16 dBm	Pass



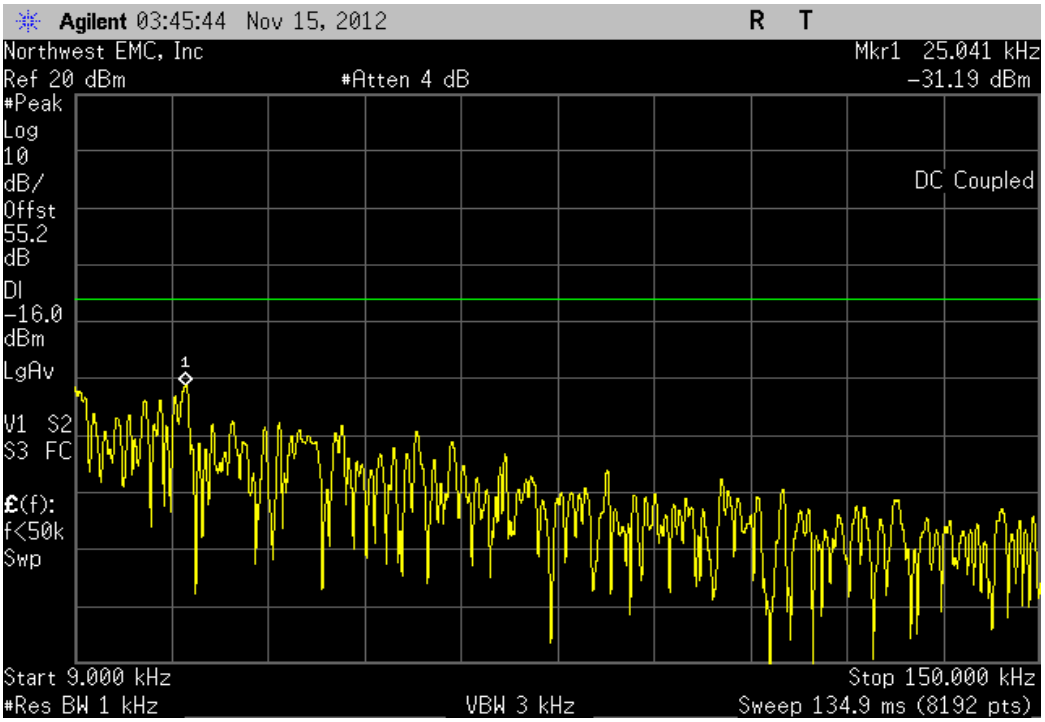
Port B, LTE 5MHz Single Carrier, Low, 1GHz-12.75GHz

				Value	Limit	Result
				-18.17 dBm	-16 dBm	Pass



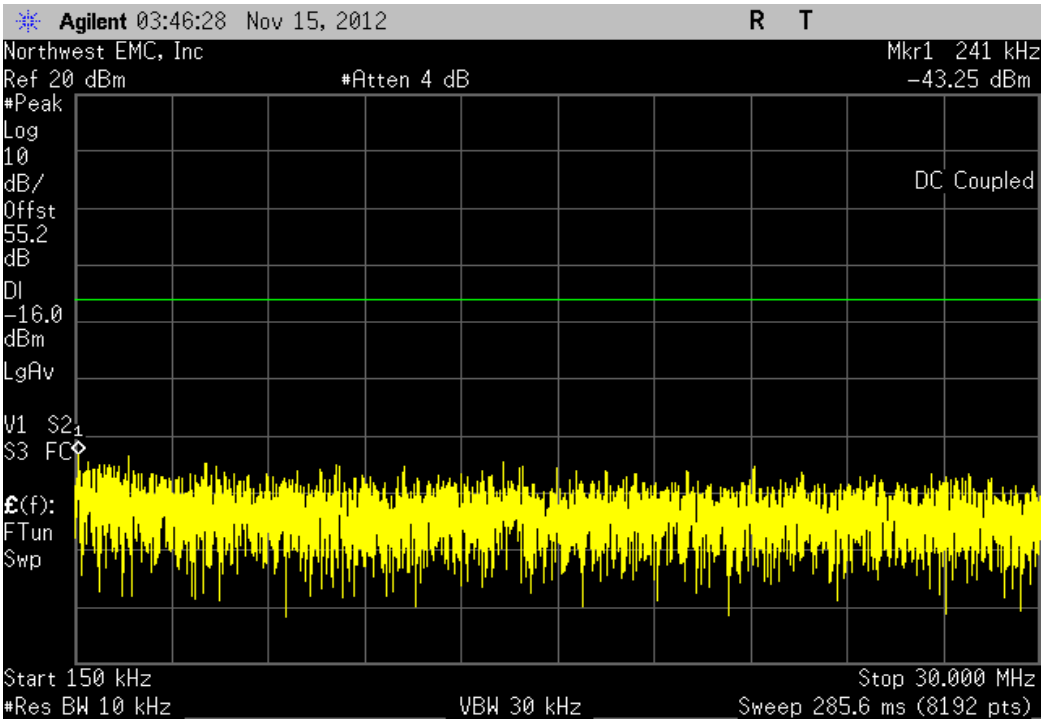
Port B, LTE 5MHz Single Carrier, Mid, 9kHz-150kHz

				Value	Limit	Result
				-31.19 dBm	-16 dBm	Pass



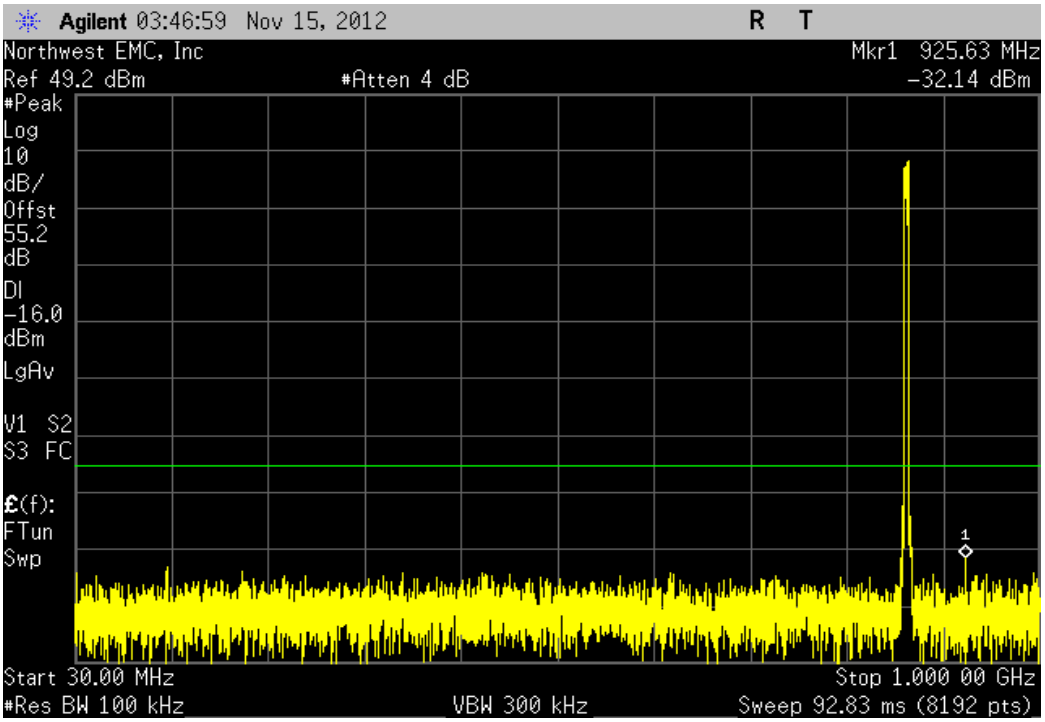
Port B, LTE 5MHz Single Carrier, Mid, 150kHz-30MHz

				Value	Limit	Result
				-43.25 dBm	-16 dBm	Pass



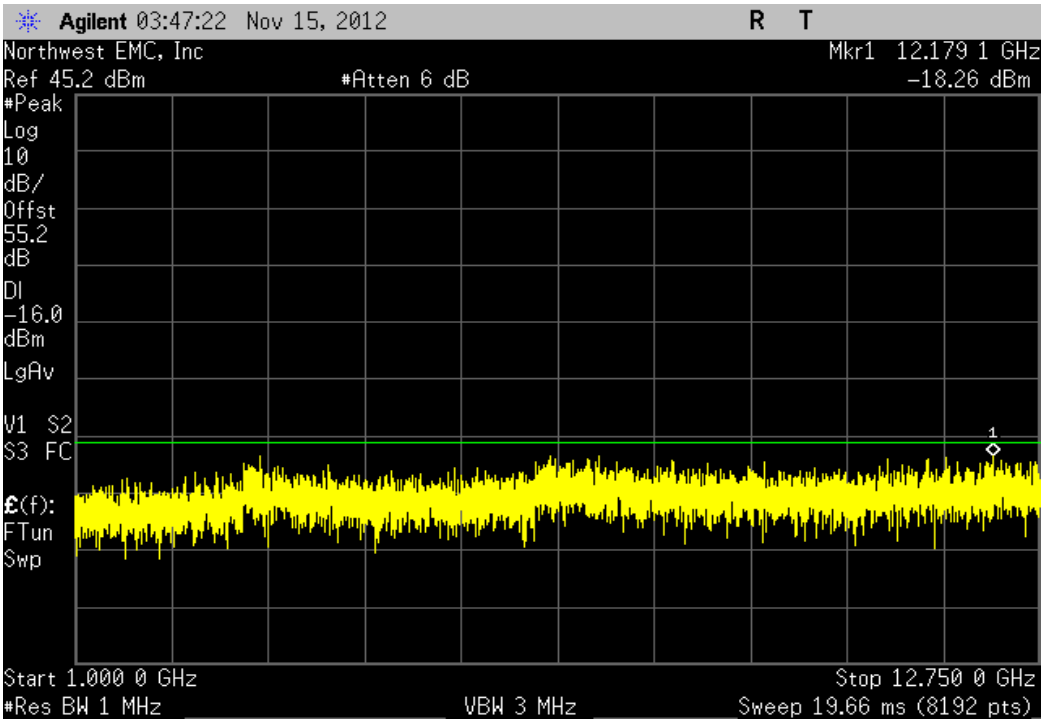
Port B, LTE 5MHz Single Carrier, Mid, 30MHz-1GHz

				Value	Limit	Result
				-32.14 dBm	-16 dBm	Pass



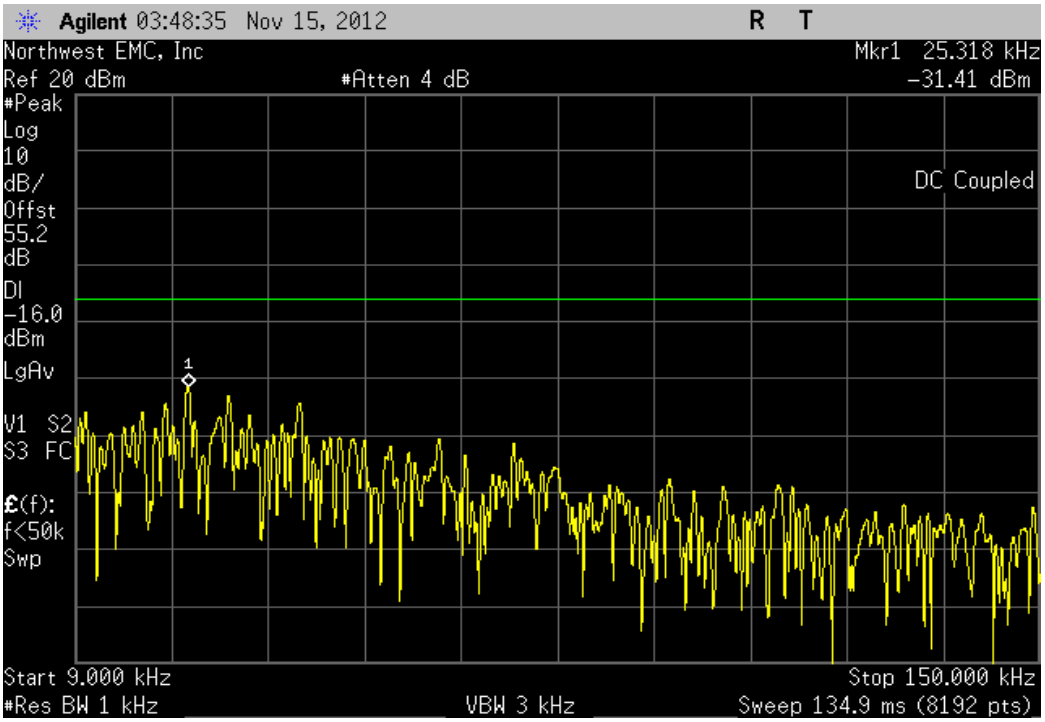
Port B, LTE 5MHz Single Carrier, Mid, 1GHz-12.75GHz

				Value	Limit	Result
				-18.26 dBm	-16 dBm	Pass



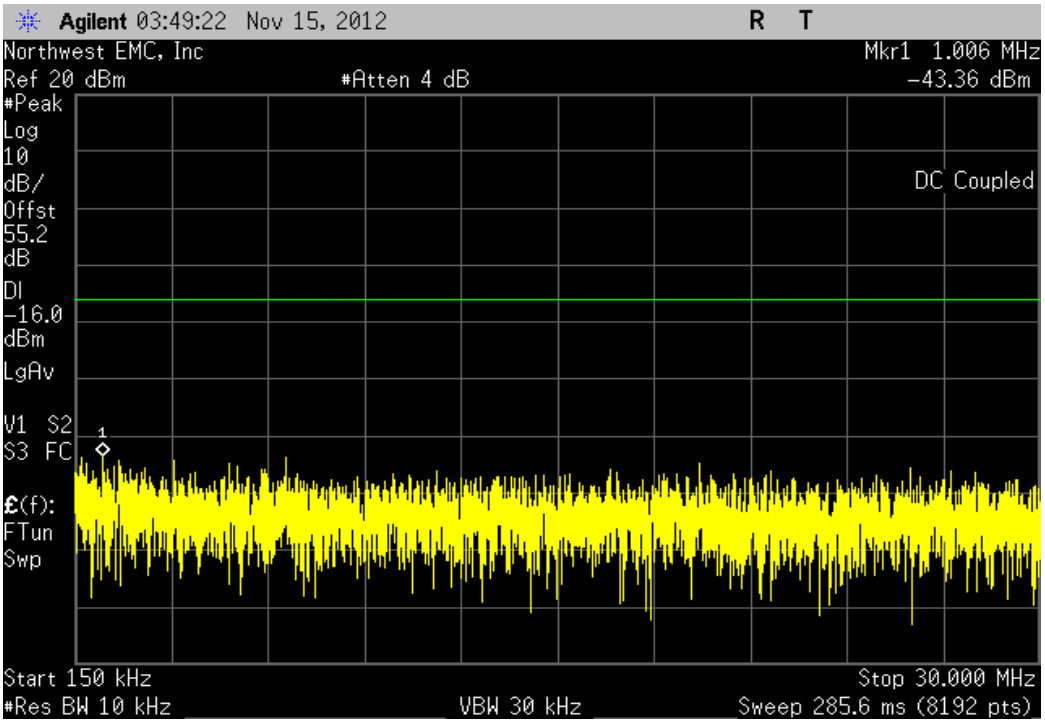
Port B, LTE 5MHz Single Carrier, High, 9kHz-150kHz

				Value	Limit	Result
				-31.41 dBm	-16 dBm	Pass



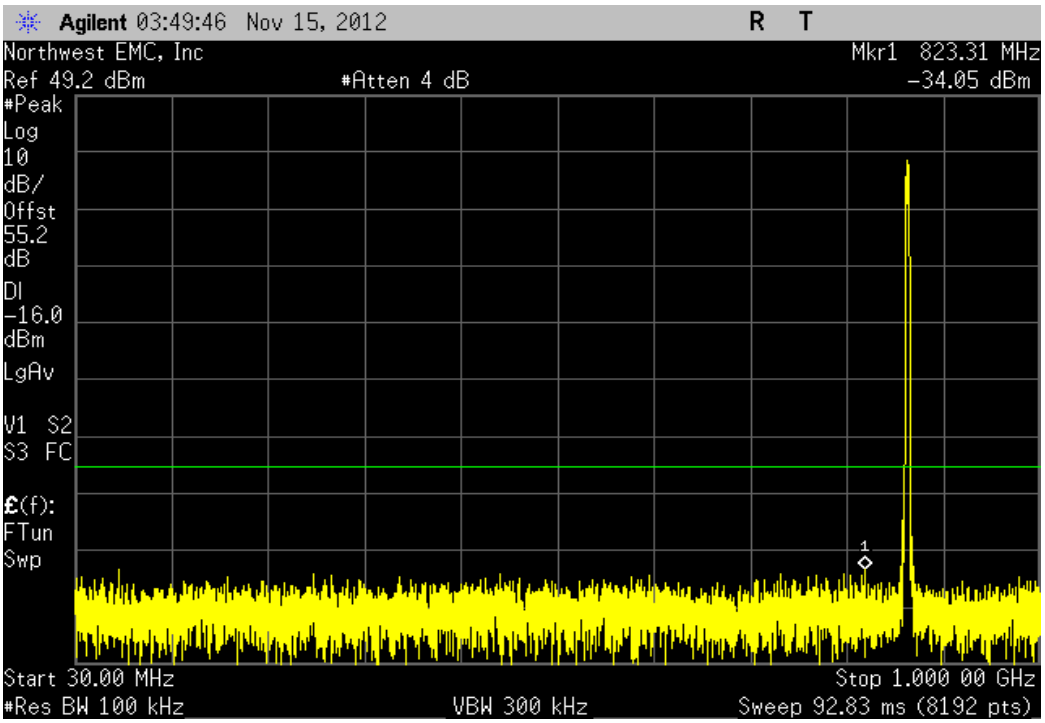
Port B, LTE 5MHz Single Carrier, High, 150kHz-30MHz

				Value	Limit	Result
				-43.36 dBm	-16 dBm	Pass



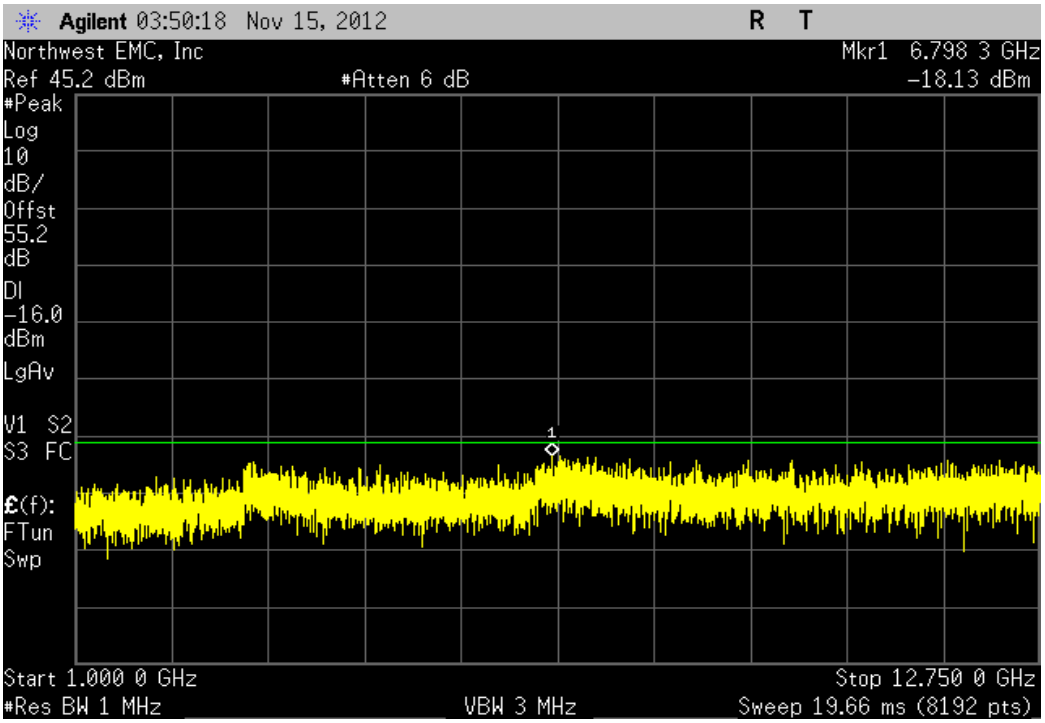
Port B, LTE 5MHz Single Carrier, High, 30MHz-1GHz

				Value	Limit	Result
				-34.05 dBm	-16 dBm	Pass



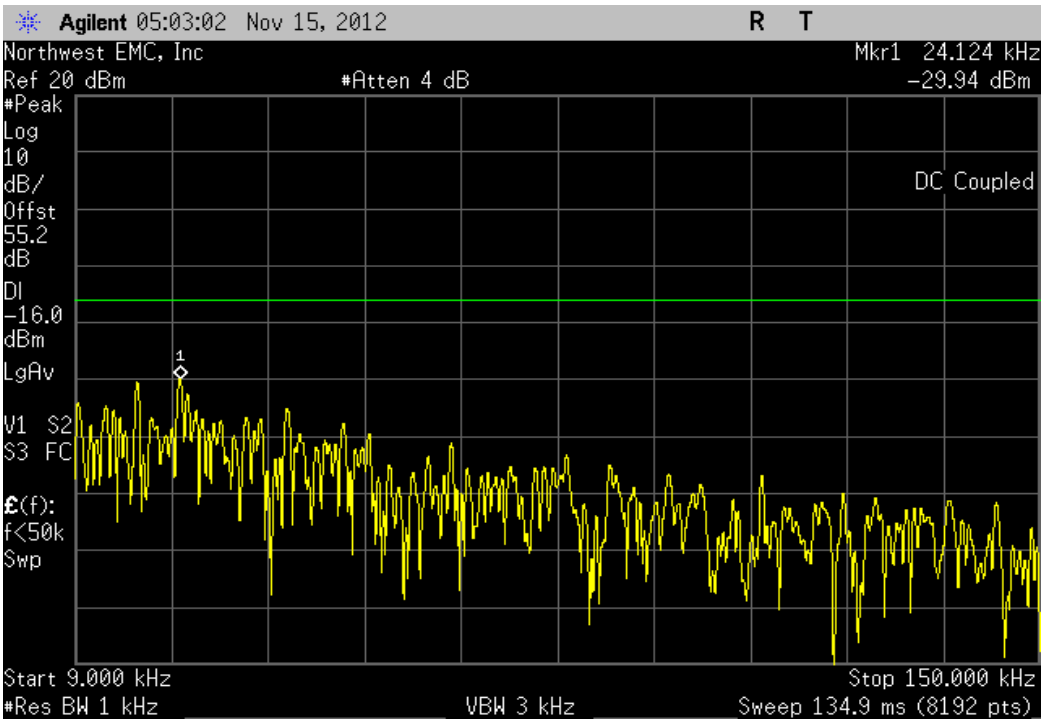
Port B, LTE 5MHz Single Carrier, High, 1GHz-12.75GHz

				Value	Limit	Result
				-18.13 dBm	-16 dBm	Pass



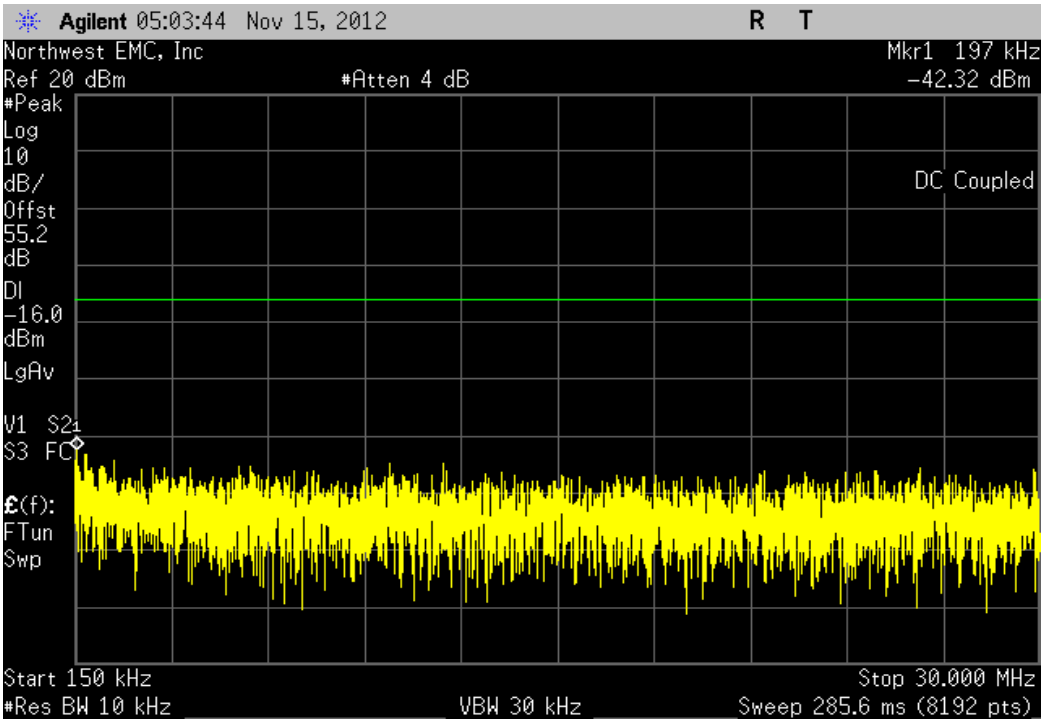
Port B, LTE 1.4MHz Multi Carrier, Low, 9kHz-150kHz

				Value	Limit	Result
				-29.94 dBm	-16 dBm	Pass



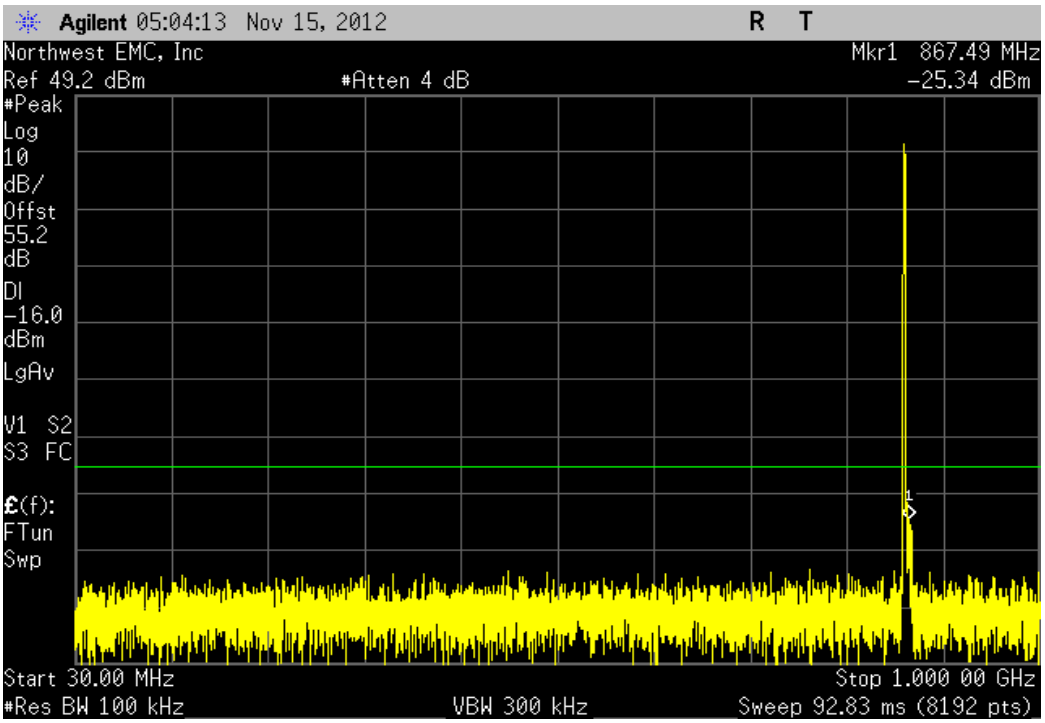
Port B, LTE 1.4MHz Multi Carrier, Low, 150kHz-30MHz

				Value	Limit	Result
				-42.32 dBm	-16 dBm	Pass



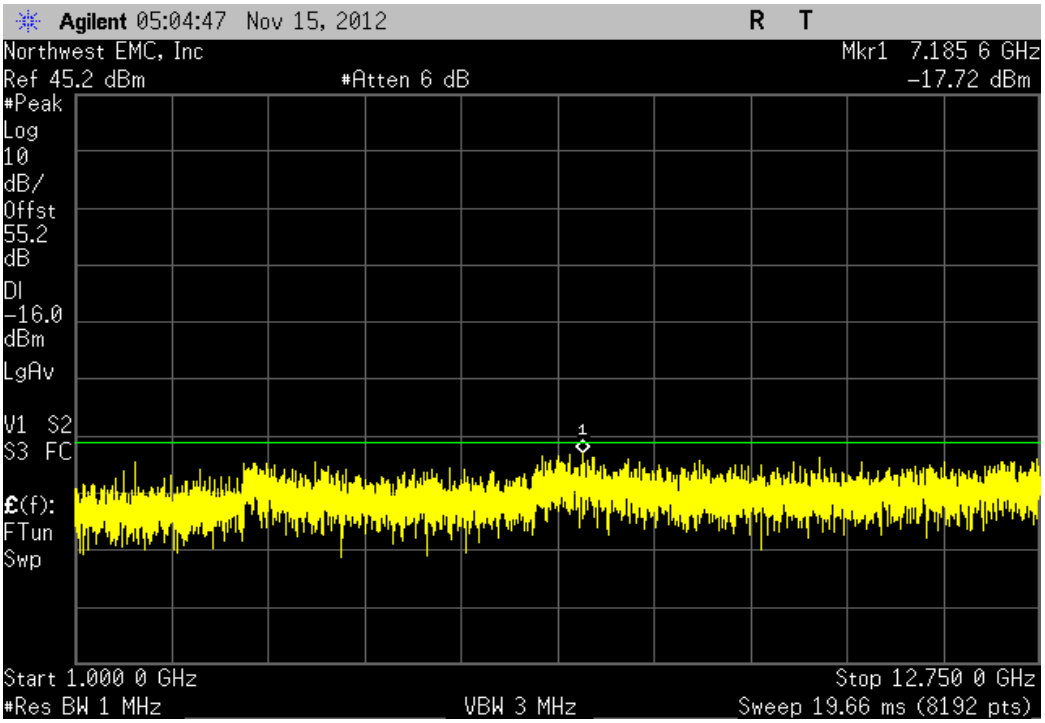
Port B, LTE 1.4MHz Multi Carrier, Low, 30MHz-1GHz

				Value	Limit	Result
				-25.34 dBm	-16 dBm	Pass



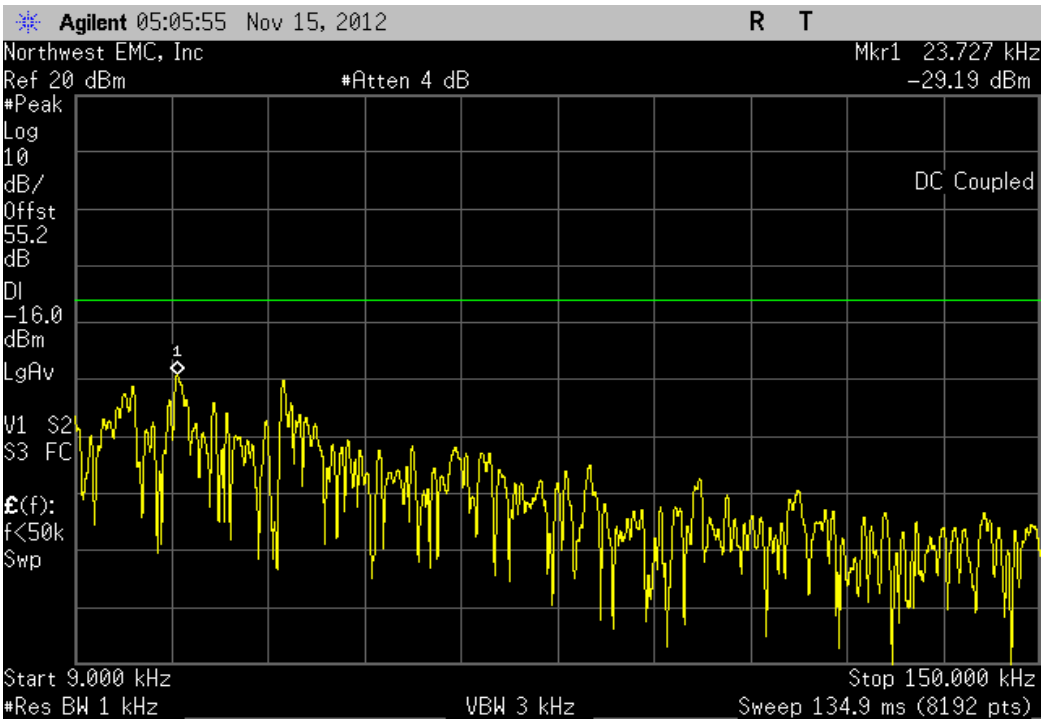
Port B, LTE 1.4MHz Multi Carrier, Low, 1GHz-12.75GHz

				Value	Limit	Result
				-17.72 dBm	-16 dBm	Pass



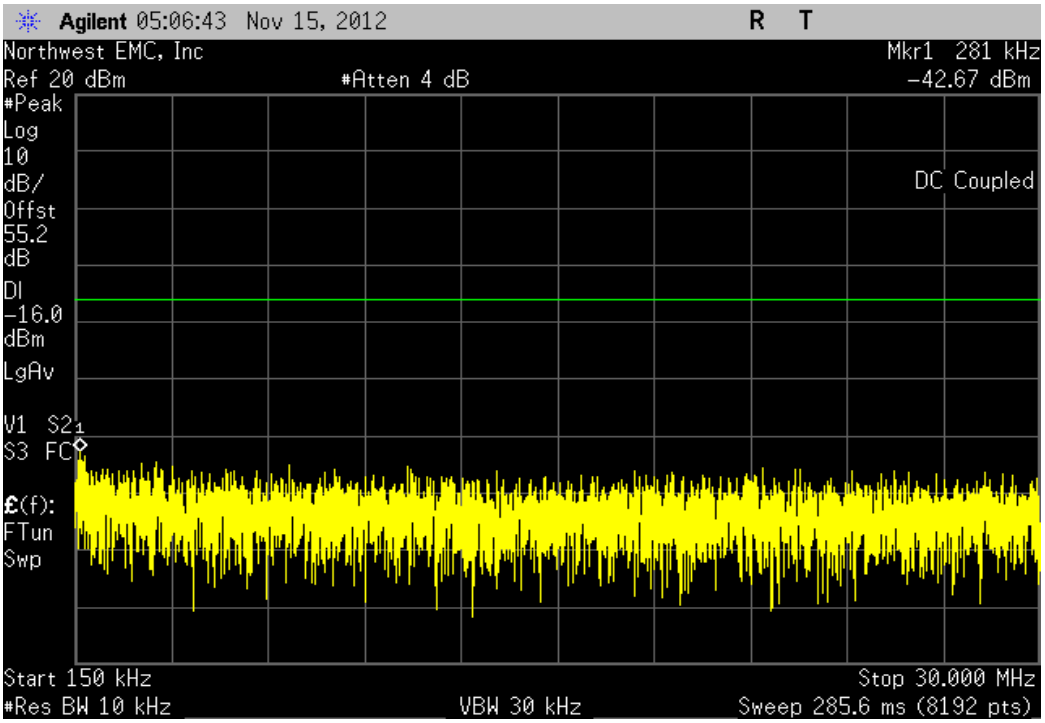
Port B, LTE 1.4MHz Multi Carrier, Mid, 9kHz-150kHz

				Value	Limit	Result
				-29.19 dBm	-16 dBm	Pass



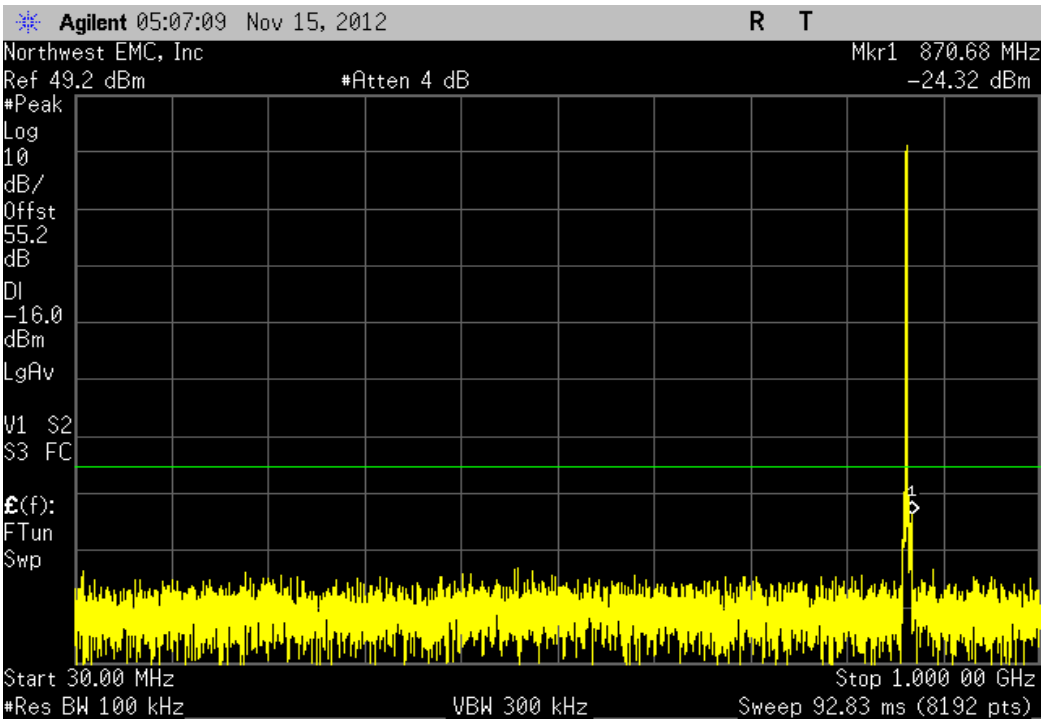
Port B, LTE 1.4MHz Multi Carrier, Mid, 150kHz-30MHz

				Value	Limit	Result
				-42.67 dBm	-16 dBm	Pass



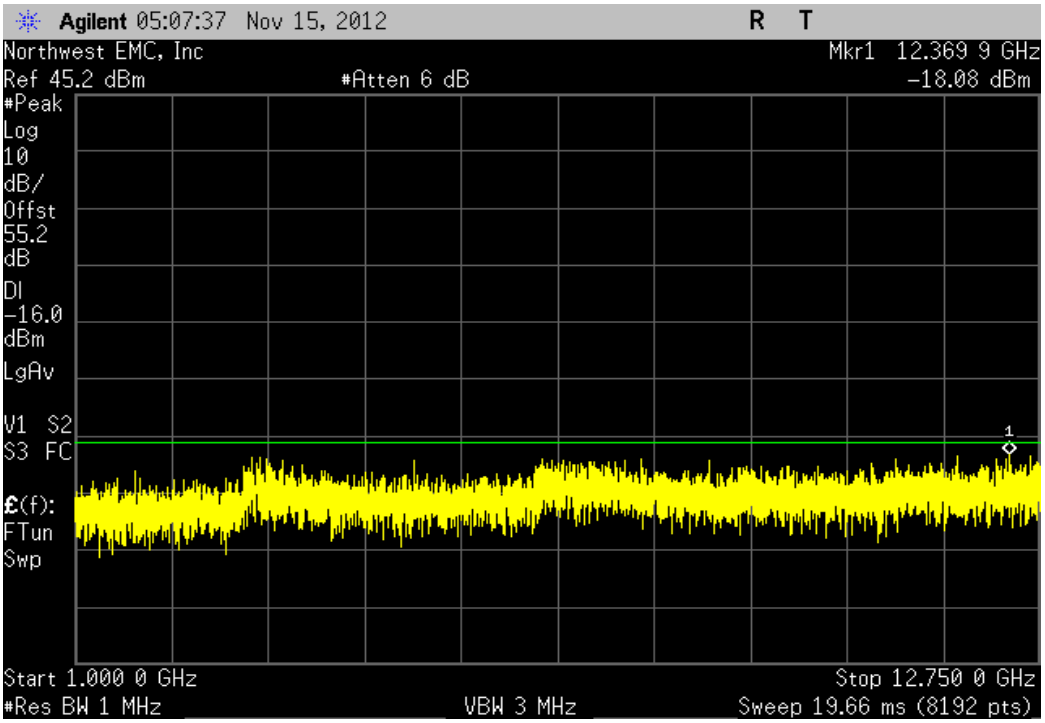
Port B, LTE 1.4MHz Multi Carrier, Mid, 30MHz-1GHz

				Value	Limit	Result
				-24.32 dBm	-16 dBm	Pass



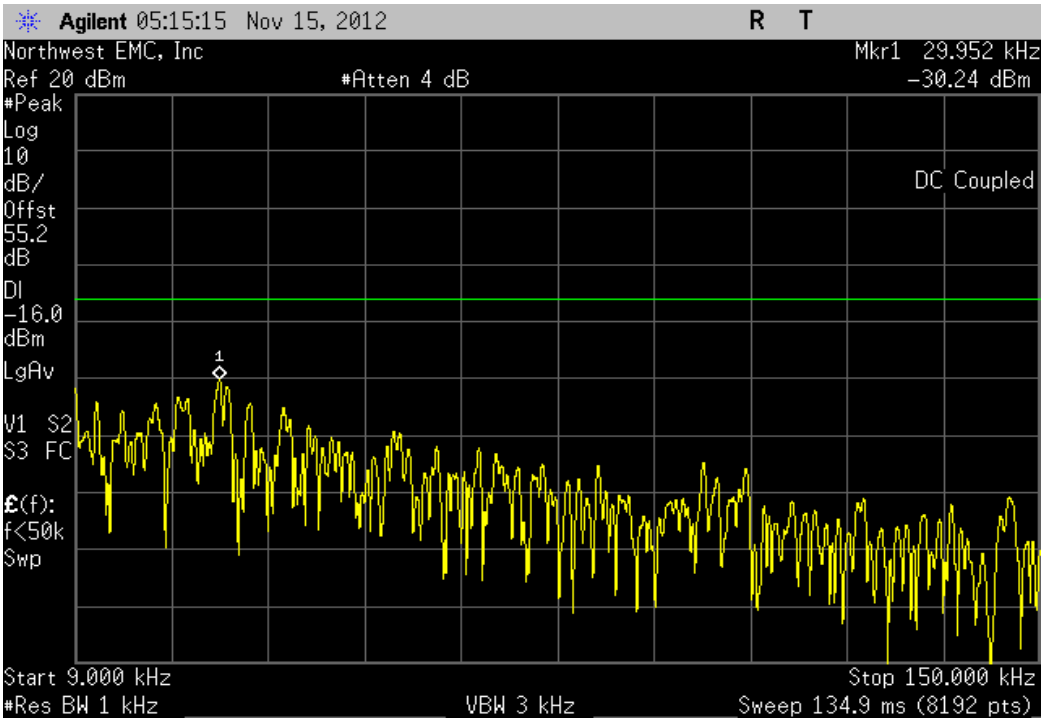
Port B, LTE 1.4MHz Multi Carrier, Mid, 1GHz-12.75GHz

				Value	Limit	Result
				-18.08 dBm	-16 dBm	Pass



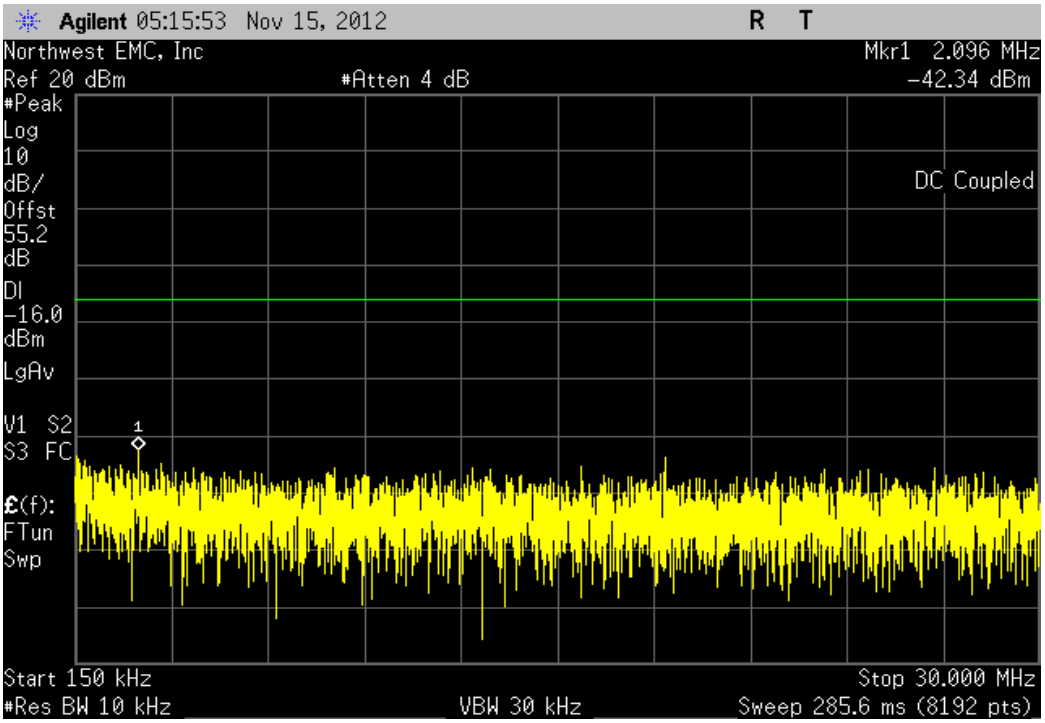
Port B, LTE 1.4MHz Multi Carrier, High, 9kHz-150kHz

				Value	Limit	Result
				-30.24 dBm	-16 dBm	Pass



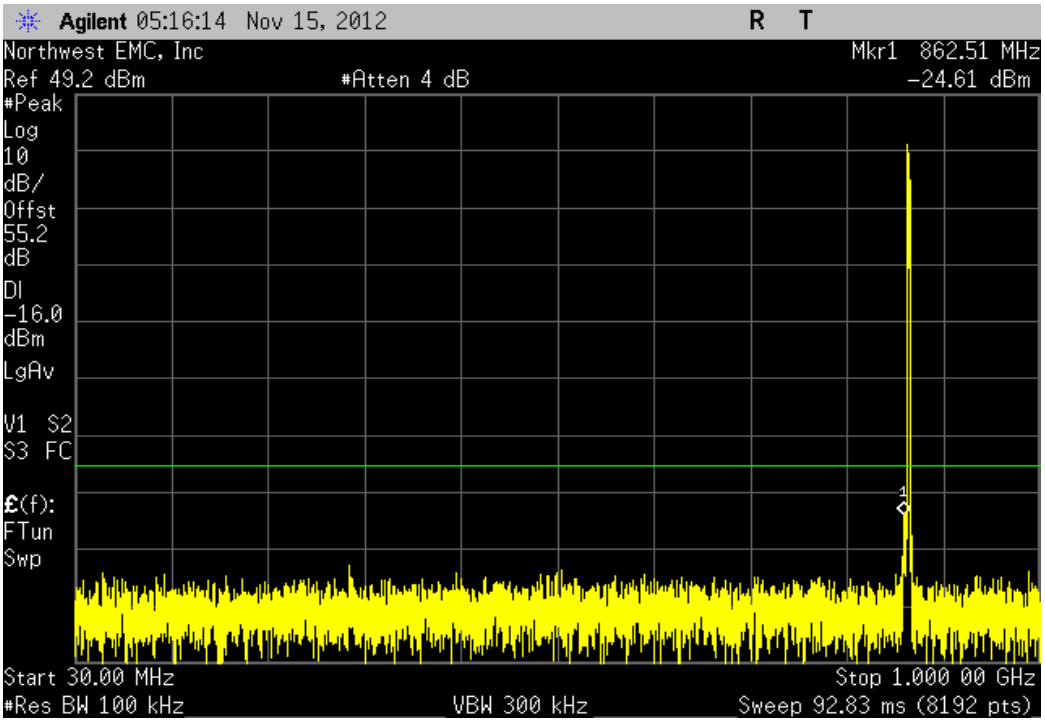
Port B, LTE 1.4MHz Multi Carrier, High, 150kHz-30MHz

				Value	Limit	Result
				-42.34 dBm	-16 dBm	Pass



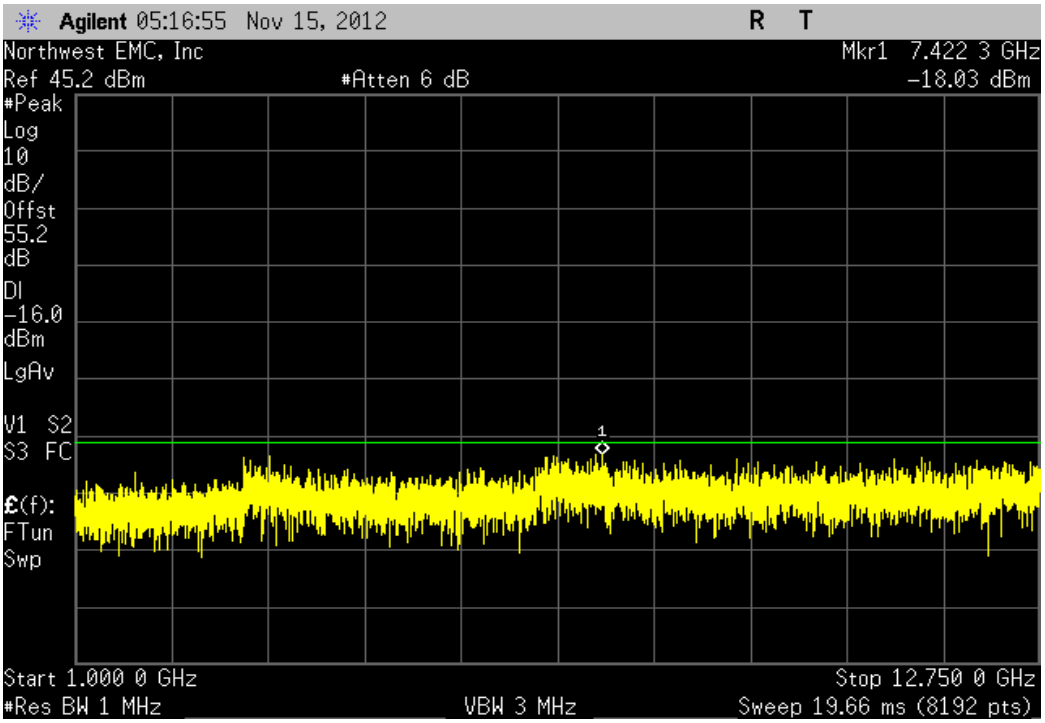
Port B, LTE 1.4MHz Multi Carrier, High, 30MHz-1GHz

				Value	Limit	Result
				-24.61 dBm	-16 dBm	Pass



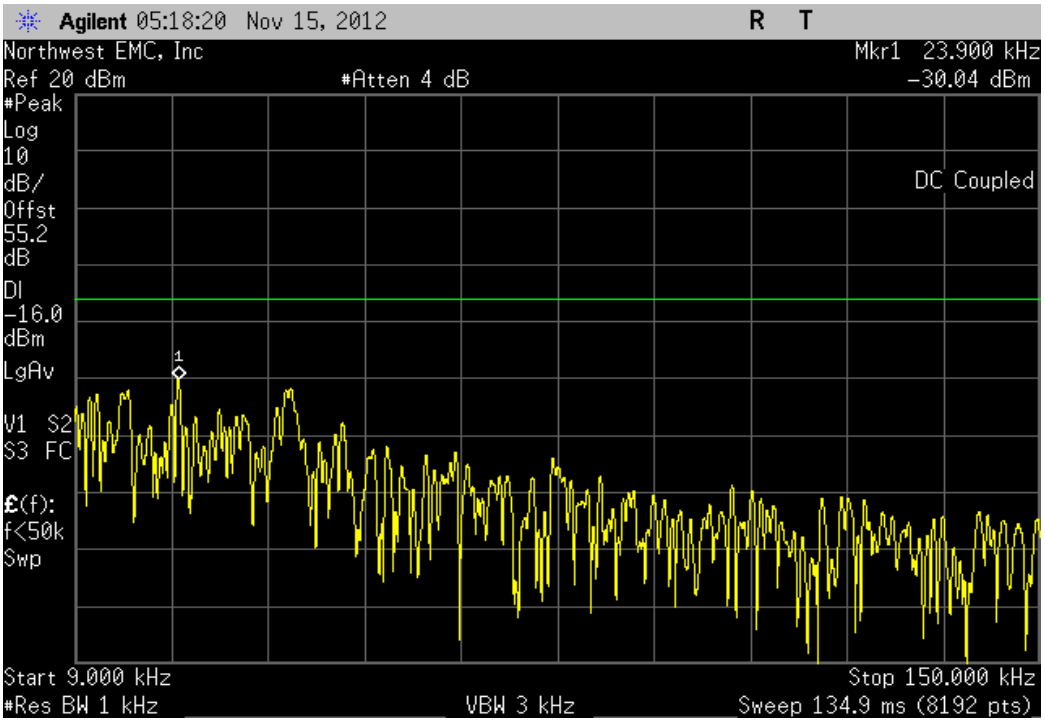
Port B, LTE 1.4MHz Multi Carrier, High, 1GHz-12.75GHz

				Value	Limit	Result
				-18.03 dBm	-16 dBm	Pass



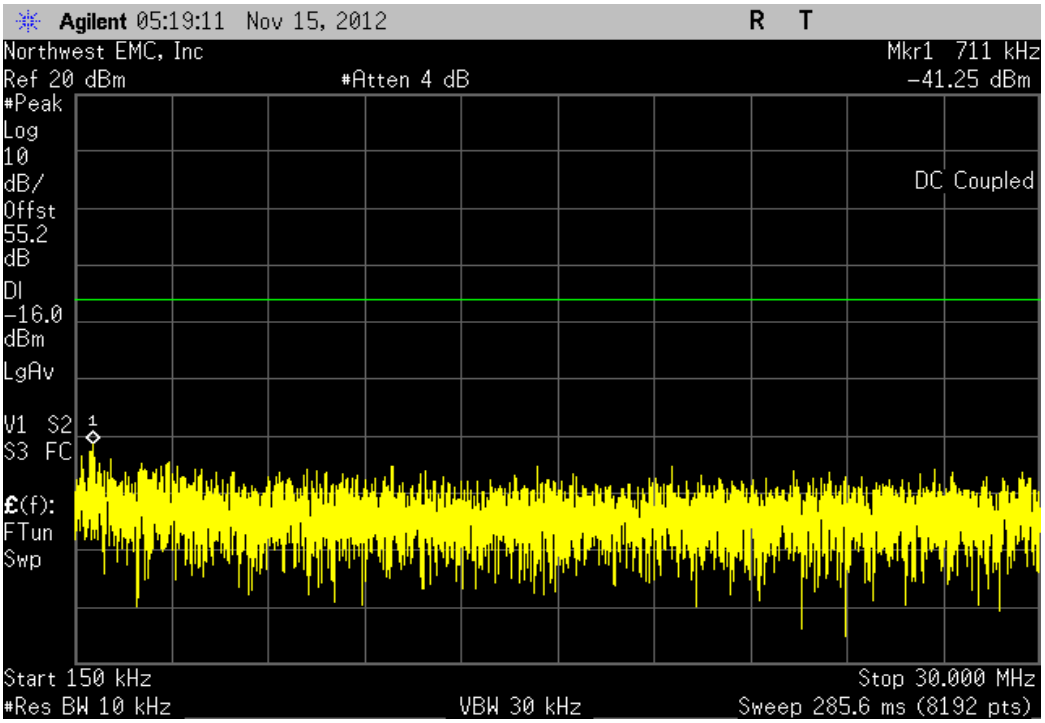
Port B, LTE 3MHz Multi Carrier, Low, 9kHz-150kHz

				Value	Limit	Result
				-30.04 dBm	-16 dBm	Pass



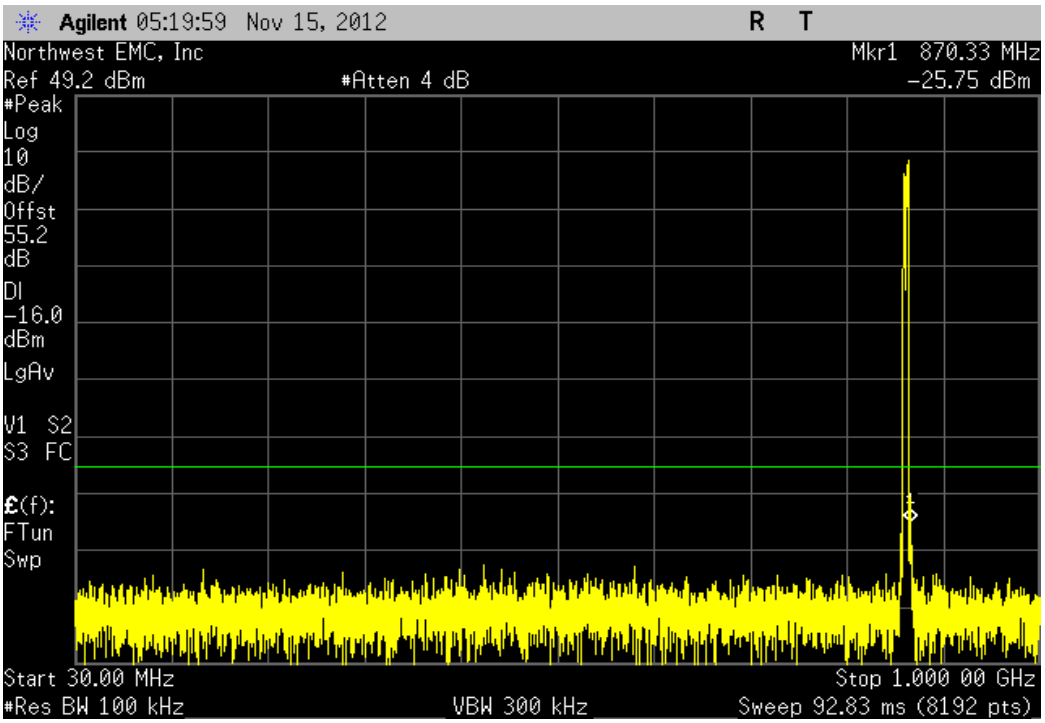
Port B, LTE 3MHz Multi Carrier, Low, 150kHz-30MHz

				Value	Limit	Result
				-41.25 dBm	-16 dBm	Pass



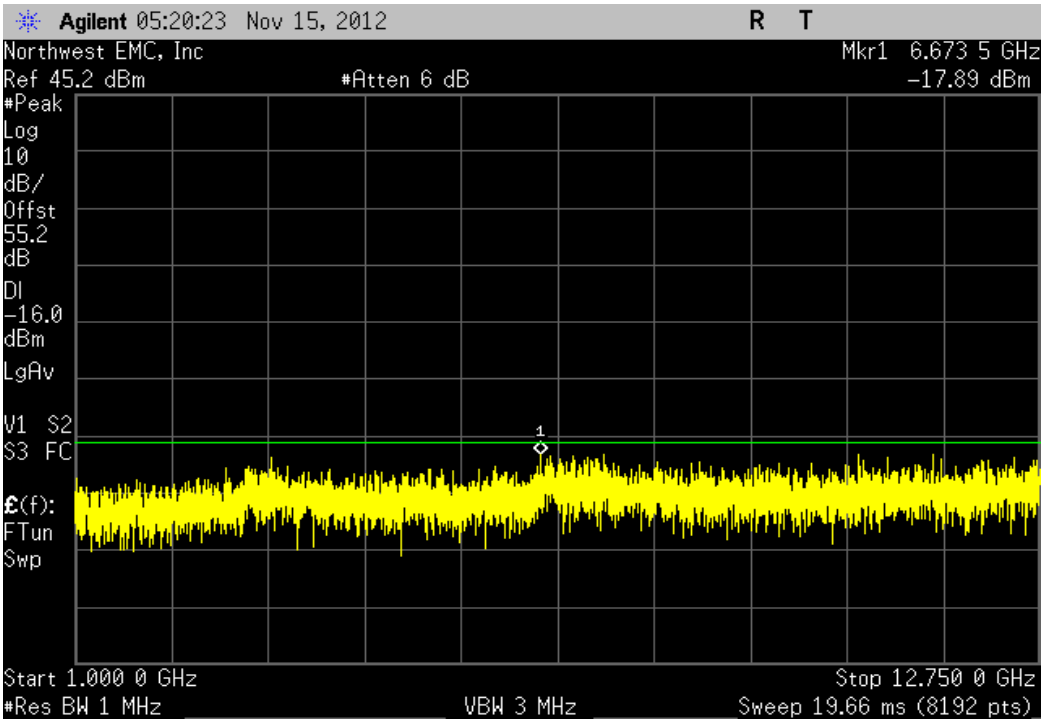
Port B, LTE 3MHz Multi Carrier, Low, 30MHz-1GHz

				Value	Limit	Result
				-25.75 dBm	-16 dBm	Pass



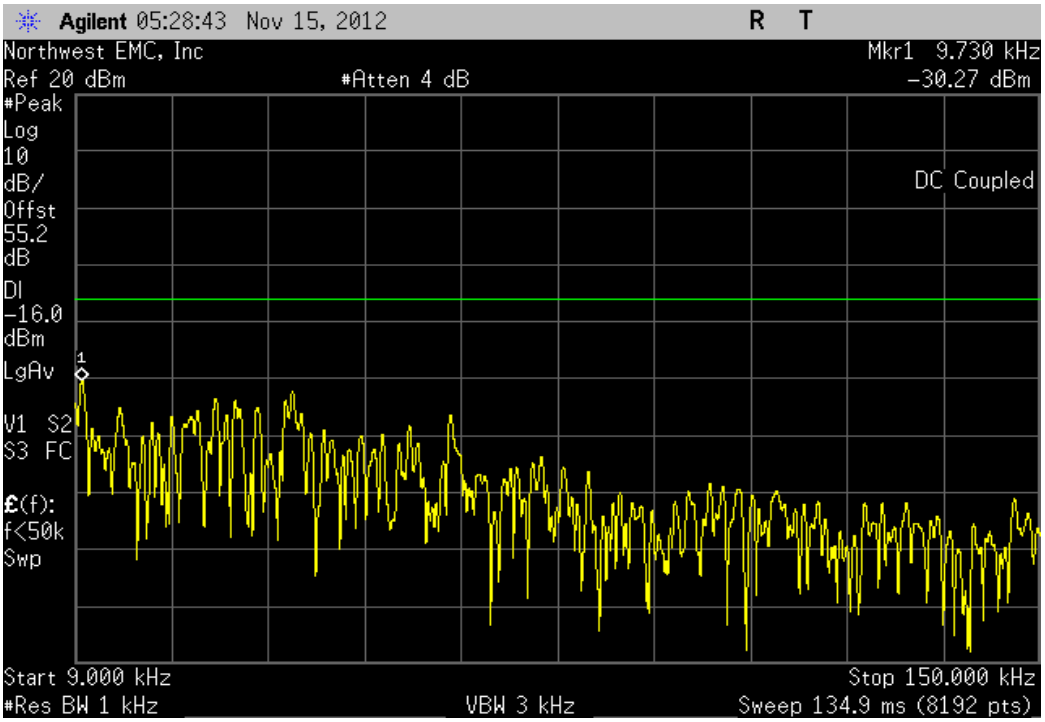
Port B, LTE 3MHz Multi Carrier, Low, 1GHz-12.75GHz

				Value	Limit	Result
				-17.89 dBm	-16 dBm	Pass



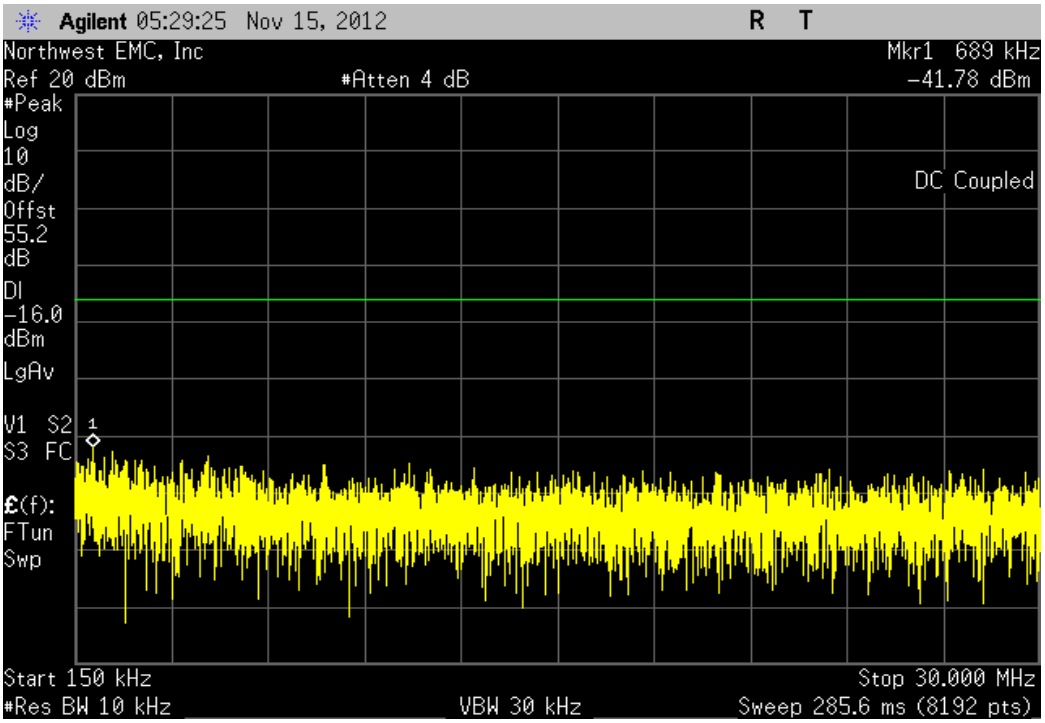
Port B, LTE 3MHz Multi Carrier, Mid, 9kHz-150kHz

				Value	Limit	Result
				-30.27 dBm	-16 dBm	Pass



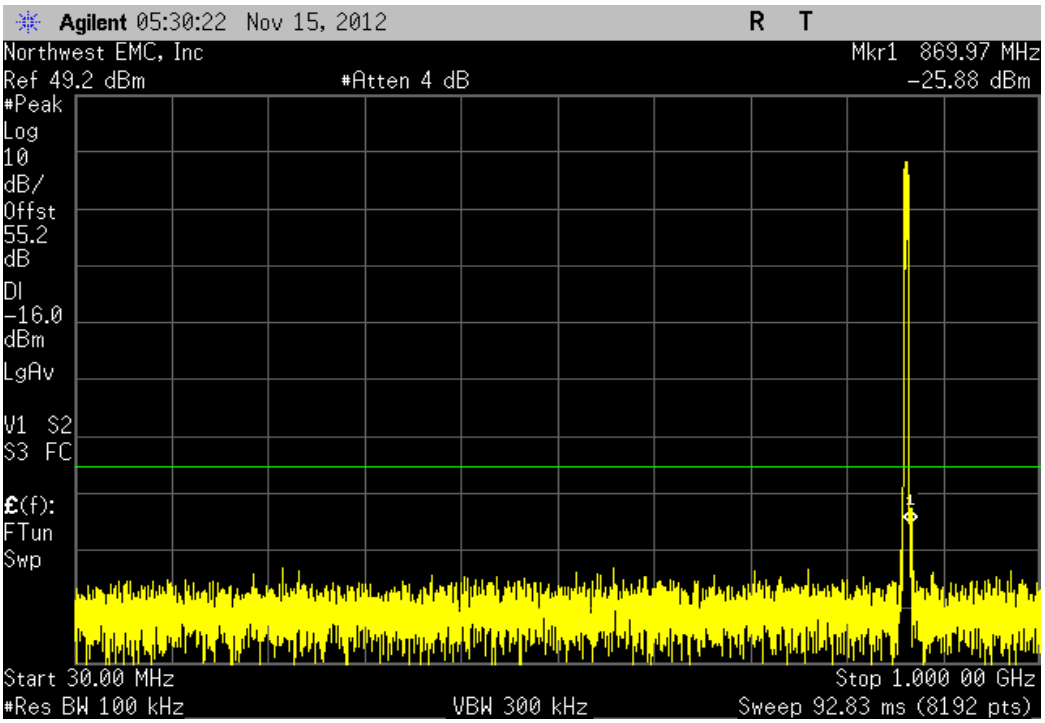
Port B, LTE 3MHz Multi Carrier, Mid, 150kHz-30MHz

				Value	Limit	Result
				-41.78 dBm	-16 dBm	Pass



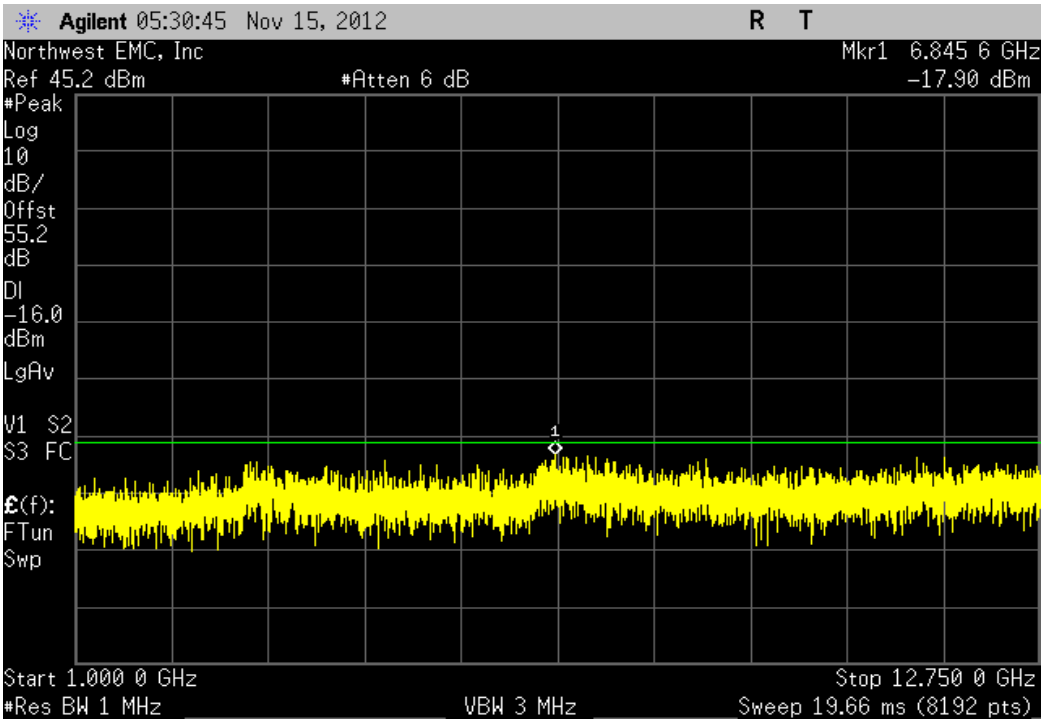
Port B, LTE 3MHz Multi Carrier, Mid, 30MHz-1GHz

				Value	Limit	Result
				-25.88 dBm	-16 dBm	Pass



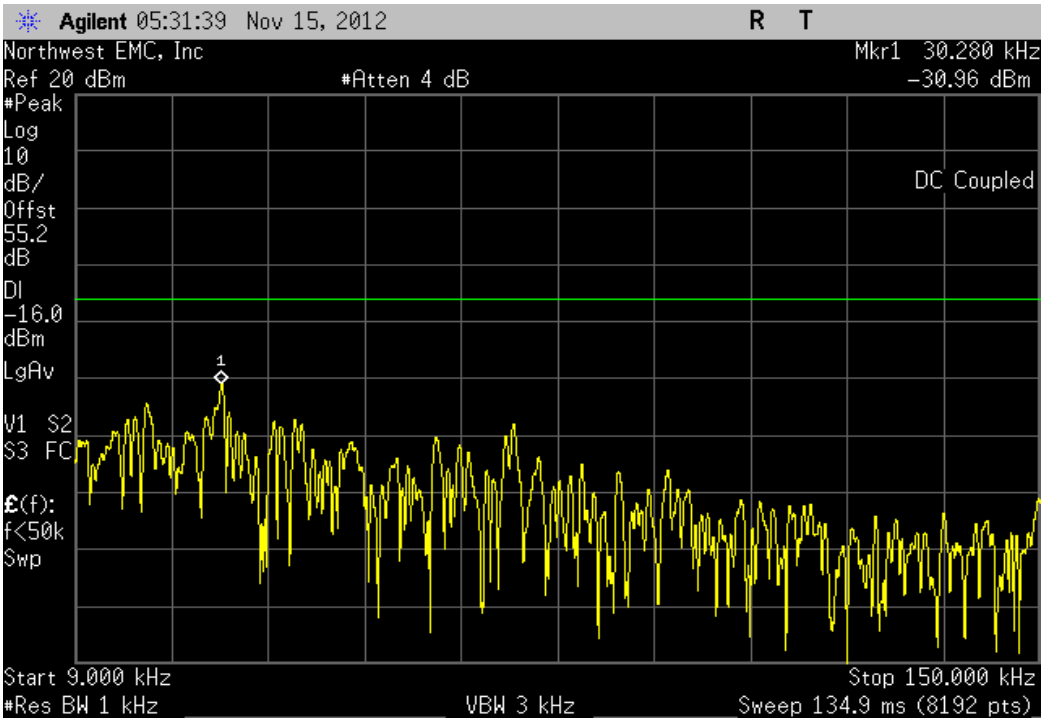
Port B, LTE 3MHz Multi Carrier, Mid, 1GHz-12.75GHz

				Value	Limit	Result
				-17.9 dBm	-16 dBm	Pass



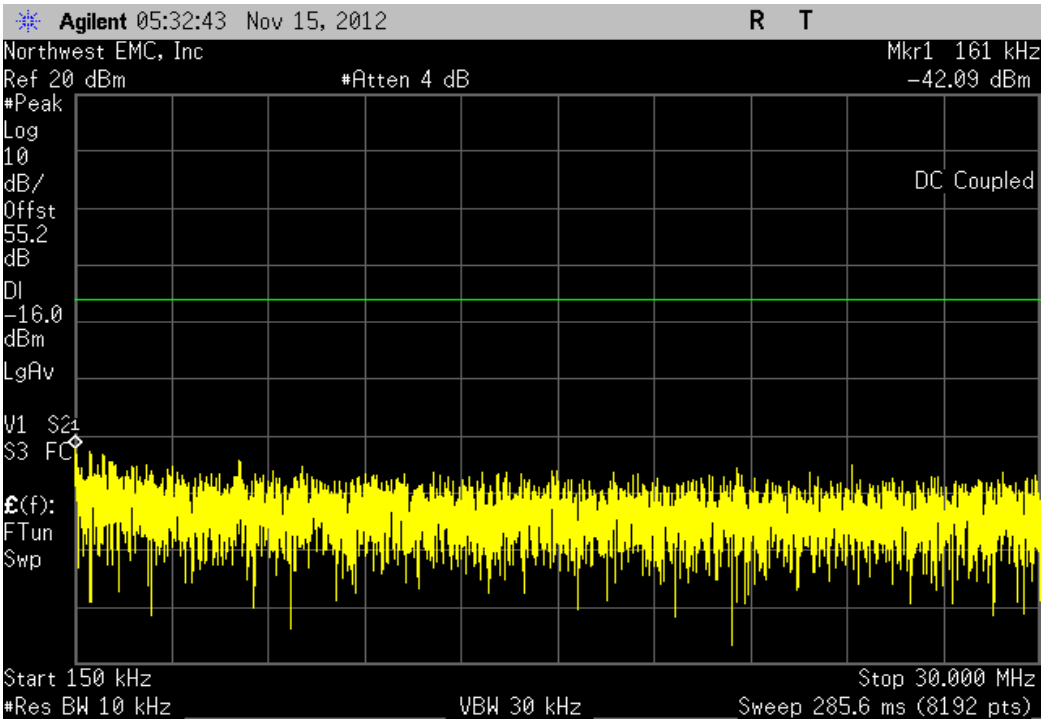
Port B, LTE 3MHz Multi Carrier, High, 9kHz-150kHz

				Value	Limit	Result
				-30.96 dBm	-16 dBm	Pass



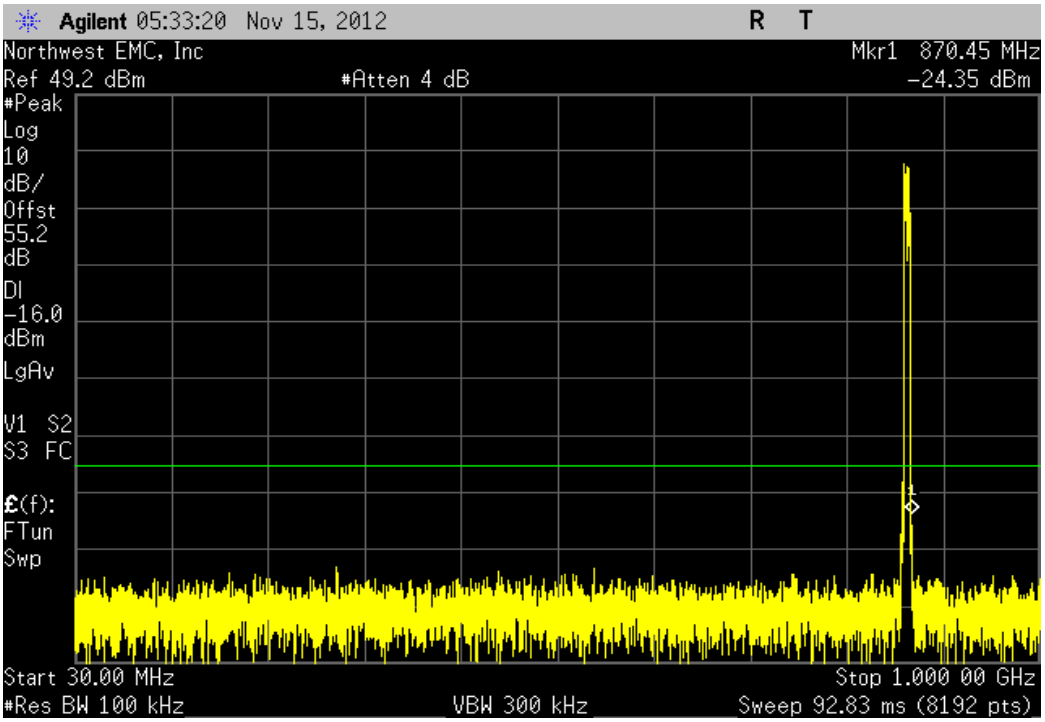
Port B, LTE 3MHz Multi Carrier, High, 150kHz-30MHz

				Value	Limit	Result
				-42.09 dBm	-16 dBm	Pass



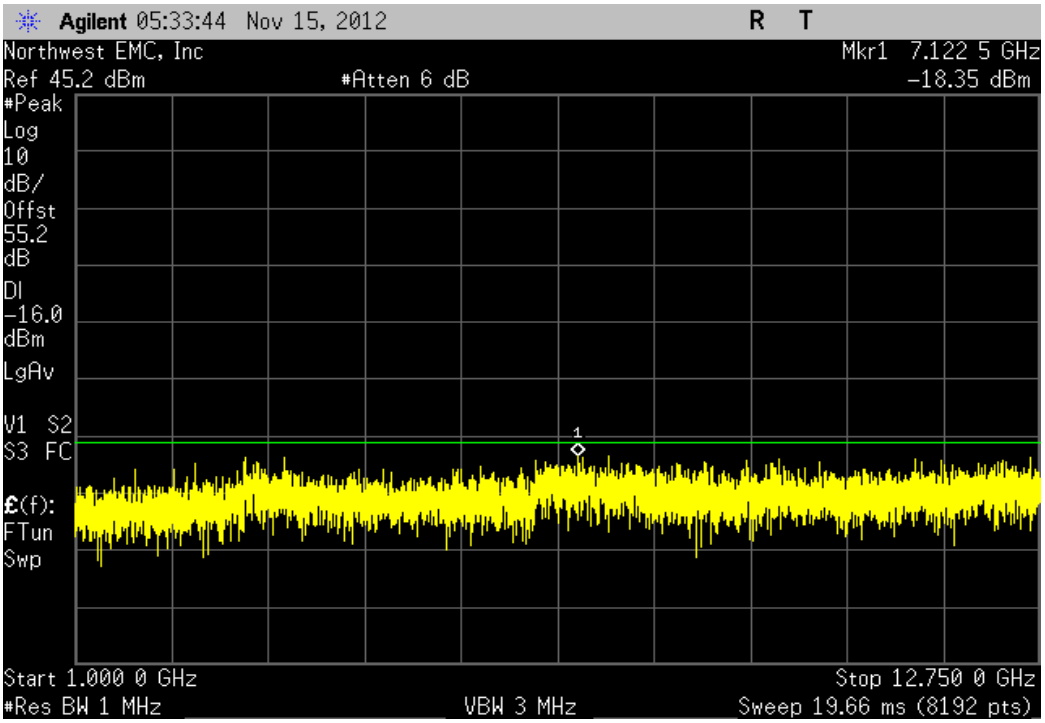
Port B, LTE 3MHz Multi Carrier, High, 30MHz-1GHz

				Value	Limit	Result
				-24.35 dBm	-16 dBm	Pass



Port B, LTE 3MHz Multi Carrier, High, 1GHz-12.75GHz

				Value	Limit	Result
				-18.35 dBm	-16 dBm	Pass



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
MultiMeter	Fluke	79 III	MMD	1/26/2011	24
Power Sensor	Agilent	E4412A	SQE	4/21/2010	24
Power Sensor	Hewlett Packard	8481	SQP	6/7/2010	24
Power Meter	Hewlett Packard	E4418A	SPA	4/21/2010	24
Chamber, Temperature/Humidity	Cincinnati Sub Zero (CSZ)	ZPHS-32-3.5-SCT/AC	TBE	6/8/2010	24
Spectrum Analyzer	Agilent	E4446A	AAY	1/11/2011	12
DC Power Supply	Hewlett Packard	6574A	N/A	NCR	N/A
30 dB Directional Coupler (800-2500 MHz)	Fairview Microwave	SMC4030	N/A	NCR	N/A
50 Ohm Termination	Fairview Microwave	ST6NL-150	N/A	NCR	N/A

CUSTOMER TEST SET

Description	Manufacturer	Model	Last Cal.	Interval
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Vector Signal Generator	Agilent	N5182	6/7/2010	24
KMW Cobra Reliability Analyzer	KMW Corrmunications	N/A	NCR	N/A
Power Meter	Agilent	E4419B	4/1/2010	24
Power Head	Agilent	E9300H	NCR	N/A
Power Head	Agilent	E9300H	NCR	N/A
DC Power Supply	Hewlett Packard	6574A	NCR	N/A
30 dB Directional Coupler (800-2500 MHz)	Fairview Microwave	SMC4030	NCR	N/A
50 Ohm Termination	Fairview Microwave	ST6NL-150	NCR	N/A
Fujitsu Laptop	Fujitsu	A6030	NCR	N/A
RRH220 Software	KMW Corrmunications	N/A	NCRA	N/A

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

Variation of Supply Voltage

The primary supply voltage was varied from 85% to 115% of nominal

Variation of Ambient Temperature

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

A direct connect measurement was made between the EUT's antenna cable and a spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT. Measurements were made at the mid channel of each band to determine frequency stability. If the frequency variation is less than 100 ppm, the EUT will meet the requirement of 15.407(g), that the emissions are maintained within the band of operation.

NORTHWEST EMC

FREQUENCY STABILITY

XMit 2010.07.29

EUT:	800MHz i-DEN RRH			Work Order:	KMWC0027
Serial Number:	U311210059			Date:	07/21/11
Customer:	KMW Communications			Temperature:	22.86°C
Attendees:	Joshua Jang			Humidity:	52%
Project:	None			Barometric Pres.:	1012.2
Tested by:	Jaemi Suh	Power:	48 VDC	Job Site:	OC13

TEST SPECIFICATIONS	TEST METHOD
FCC 90.213:2011	ANSI/TIA/EIA-603-C-2004

COMMENTS

Transmitting CW signal at 865.4 MHz.

DEVIATIONS FROM TEST STANDARD

No Deviations

Configuration #	1	Signature

Low Channel, 5150 MHz - 5250 MHz Band

Frequency Stability with Variation of DC Voltage (Ambient Temperature = 20° C)

Voltage (VDC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
55.2 (115%)	865.400000	865.400228	0.26	1.5
52.8 (110%)	865.400000	865.400222	0.26	1.5
50.4 (105%)	865.400000	865.400222	0.26	1.5
48 (100%)	865.400000	865.400222	0.26	1.5
45.6 (95%)	865.400000	865.400218	0.25	1.5
43.2 (90%)	865.400000	865.400233	0.27	1.5
40.8 (85%)	865.400000	865.400222	0.26	1.5

Frequency Stability with Variation of Ambient Temperature (Primary Supply = 48 VDC)

Temp (°C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Tolerance (ppm)	Specification (ppm)
50	865.400000	865.400228	0.26	1.5
40	865.400000	865.400232	0.27	1.5
30	865.400000	865.400223	0.26	1.5
20	865.400000	865.400222	0.26	1.5
10	865.400000	865.400222	0.26	1.5
0	865.400000	865.400227	0.26	1.5
-10	865.400000	865.400232	0.27	1.5
-20	865.400000	865.400222	0.26	1.5
-30	865.400000	865.400228	0.26	1.5

EMISSION MASK - LTE

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	AFG	5/16/2012	12
Signal Generator	Agilent	E8257D	TGU	1/26/2011	12
Directional Coupler 800MHz-2500MHz	Fairview Microwave	SMC4030	RGN	6/17/2011	24

CUSTOMER TEST SET

Description	Manufacturer	Model	Last Cal.	Interval
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Vector Signal Generator	Agilent	N5182	6/7/2010	24
KMW Cobra Reliability Analyzer	KMW Cormmunications	N/A	NCR	N/A
Power Meter	Agilent	E4419B	4/1/2010	24
Power Head	Agilent	E9300H	NCR	N/A
Power Head	Agilent	E9300H	NCR	N/A
DC Power Supply	Hewlett Packard	6574A	NCR	N/A
dB Directional Coupler (800-2500 M	Fairview Microwave	SMC4030	NCR	N/A
50 Ohm Termination	Fairview Microwave	ST6NL-150	NCR	N/A
Fujitsu Laptop	Fujitsu	A6030	NCR	N/A
RRH220 Software	KMW Cormmunications	N/A	NCR	N/A

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 emission mask defined by 90.691 was only measured with the EUT set to low and high transmit frequencies. At each channel, measurements were made at the highest output settings

A directional coupler and coaxial cable loss were compensated in the spectrum analyzer. Measureing 100kHz of spectrum with 10kHz resolution bandwidth and an average detector were used.

Emissions Mask - LTE

EUT:	RRH220	**Work Order:**	KMWC0035
Serial Number:	None	**Date:**	09/11/12
Customer:	KMW Communications	**Temperature:**	25 C°C
Attendees:	Edward Lee & Andy Ku	**Humidity:**	48%
Project:	None	**Barometric Pres.:**	1016
Tested by:	Johnny Candelas	**Power:**	**Job Site:** OC07

TEST SPECIFICATIONS	Test Method
FCC 90.691:2012	ANSI/TIA/EIA-603-C-2004

COMMENTS

Client had specific limits that were provided to them by Lucentd. It called for a 30kHz resolution bandwidth and a limit of -69dBm at 861.35 MHz and -20dBm at 862 and 869 MHz.

DEVIATIONS FROM TEST STANDARD

None

Configuration #	1	Signature

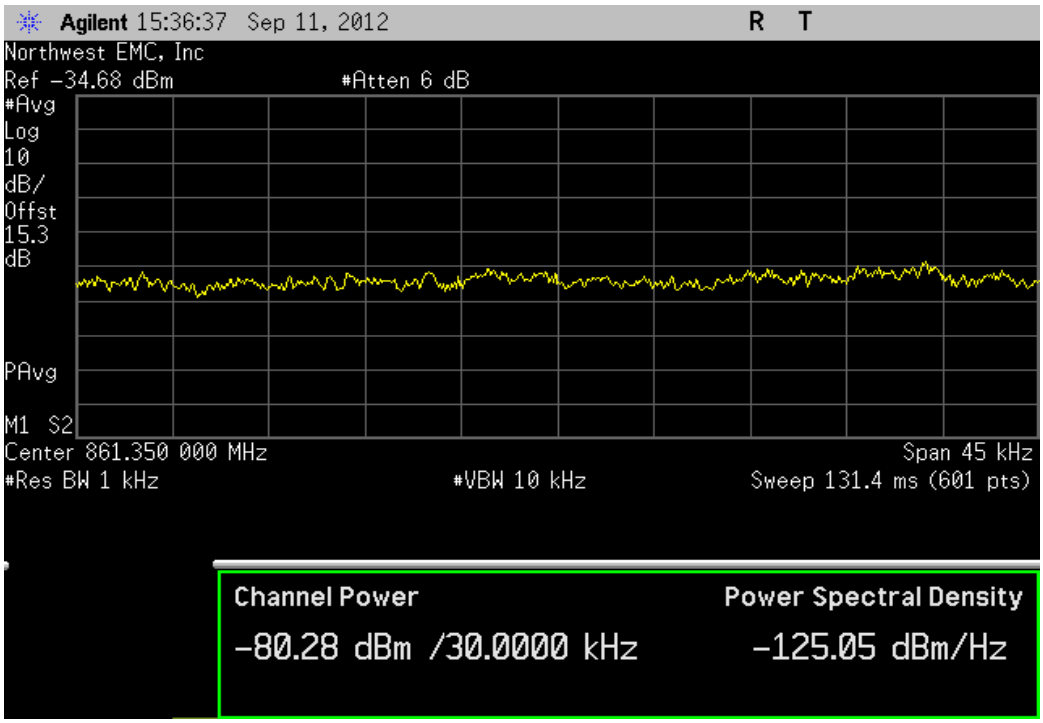
			Value	Limit	Result
Port A					
	LTE 1.4M				
		Low			
		Low	-80.28	-69	Pass
		Center	-39.41	-20	Pass
		High	-36.92	-20	Pass
		Mid			
		Low	-85.98	-69	Pass
		Center	-41.33	-20	Pass
		High	-36.07	-20	Pass
		High			
		Low	-87.7	-69	Pass
		Center	-41.17	-20	Pass
		High	-27.63	-20	Pass
	LTE 3M				
		Low			
		Low	-77.87	-69	Pass
		Center	-40.41	-20	Pass
		High	-36.24	-20	Pass
		Mid			
		Low	-83.58	-69	Pass
		Center	-41.61	-20	Pass
		High	-34.3	-20	Pass
		High			
		Low	-85.51	-69	Pass
		Center	-40.25	-20	Pass
		High	-28.89	-20	Pass
	LTE 5M				
		Low			
		Low	-77.69	-69	Pass
		Center	-40.07	-20	Pass
		High	-35.06	-20	Pass
		Mid			
		Low	-79.59	-69	Pass
		Center	-40.67	-20	Pass
		High	-33.89	-20	Pass
		High			
		Low	-80.51	-69	Pass
		Center	-41.35	-20	Pass
		High	-30.8	-20	Pass
Port B					
	LTE 1.4M				
		Low			
		Low	-80.12	-69	Pass
		Center	-40.02	-20	Pass
		High	-37.08	-20	Pass
		Mid			
		Low	-85.4	-69	Pass
		Center	-40.88	-20	Pass
		High	-36.35	-20	Pass
		High			
		Low	-87.29	-69	Pass
		Center	-40.49	-20	Pass
		High	-27.22	-20	Pass
	LTE 3M				
		Low			
		Low	-78.86	-69	Pass
		Center	-39.55	-20	Pass
		High	-35.25	-20	Pass
		Mid			
		Low	-84.97	-69	Pass
		Center	-40.05	-20	Pass
		High	-32.9	-20	Pass
		High			
		Low	-84.73	-69	Pass
		Center	-41.44	-20	Pass
		High	-29.25	-20	Pass
	LTE 5M				
		Low			
		Low	-79.15	-69	Pass
		Center	-40.39	-20	Pass
		High	-33.99	-20	Pass
		Mid			
		Low	-80.75	-69	Pass
		Center	-40.06	-20	Pass
		High	-31.74	-20	Pass
		High			
		Low	-80.36	-69	Pass
		Center	-41.38	-20	Pass

			High	-32.21	-20	Pass
Multi-Carrier Port A						
	LTE 1.4M					
		Low				
			Low	-75.02	-69	Pass
			Center	-40.38	-20	Pass
			High	-36.14	-20	Pass
		Mid				
			Low	-83.85	-69	Pass
			Center	-40.77	-20	Pass
			High	-34.72	-20	Pass
		High				
			Low	-84.9	-69	Pass
			Center	-40.62	-20	Pass
			High	-28.05	-20	Pass
	LTE 3M					
		Low				
			Low	-76.45	-69	Pass
			Center	-39.79	-20	Pass
			High	-33.64	-20	Pass
		Mid				
			Low	-76.29	-69	Pass
			Center	-39.78	-20	Pass
			High	-32.89	-20	Pass
		High				
			Low	-77.46	-69	Pass
			Center	-40.04	-20	Pass
			High	-30.25	-20	Pass
Multi-Carrier Port B						
	LTE 1.4M					
		Low				
			Low	-77.01	-69	Pass
			Center	-39.37	-20	Pass
			High	-35.44	-20	Pass
		Mid				
			Low	-84.17	-69	Pass
			Center	-41.36	-20	Pass
			High	-34.25	-20	Pass
		High				
			Low	-84.24	-69	Pass
			Center	-41.37	-20	Pass
			High	-29.32	-20	Pass
	LTE 3M					
		Low				
			Low	-78.1	-69	Pass
			Center	-39.59	-20	Pass
			High	-33.6	-20	Pass
		Mid				
			Low	-78.64	-69	Pass
			Center	-39.33	-20	Pass
			High	-30.62	-20	Pass
		High				
			Low	-78.99	-69	Pass
			Center	-39.6	-20	Pass
			High	-31.54	-20	Pass

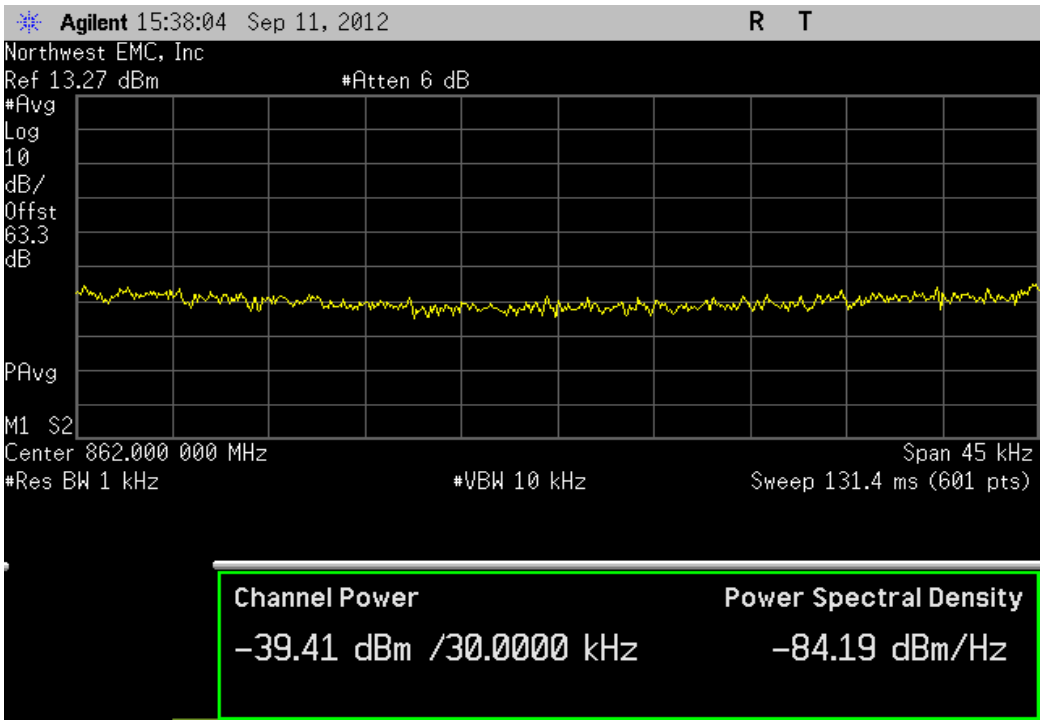
PORT	PORT A			PORT B		
Measure point	LOW	CENTER	HIGH	LOW	CENTER	HIGH
Frequency	861.35	862	869	861.35	862	869
Spec	-72	-23	-23	-72	-23	-23
FILTER offset	5.3	53.3	56.4	5.3	53.3	56.4
ATTEN offset	10	10	10	10	10	10
TOTAL OFFSET	15.3	63.3	66.4	15.3	63.3	66.4

Modulation	Carrier FREQ 1 (MHz)	Carrier FREQ 2 (MHz)	POWER (dBm)	PORT A			PORT B		
				861.35	862	869	861.35	862	869
LTE 1.4MHz Single carrier	863		46	-80.28	-39.41	-36.92	-80.12	-40.02	-37.08
	865.6		46	-85.98	-41.33	-36.07	-85.4	-40.88	-36.35
	868.3		46	-87.7	-41.17	-27.63	-87.29	-40.49	-27.22
LTE 3MHz Single carrier	863.8		47	-77.87	-40.41	-36.24	-78.86	-39.55	-35.26
	865.6		47	-83.58	-41.61	-34.3	-84.97	-40.05	-32.9
	867.5		47	-85.51	-40.25	-28.89	-84.73	-41.44	-29.25
LTE 5MHz Single carrier	864.8		47	-77.69	-40.07	-35.06	-79.15	-40.39	-33.99
	865.6		47	-79.59	-40.67	-33.89	-80.75	-40.06	-31.74
	866.5		47	-80.51	-41.35	-30.8	-80.36	-41.38	-32.21
LTE 1.4MHz Multi carrier	863	864.4	47	-75.02	-40.38	-36.14	-77.01	-39.37	-35.44
	864.9	866.3	47	-83.85	-40.77	-34.72	-84.17	-41.36	-34.25
	868.3	866.9	47	-84.9	-40.62	-28.05	-84.24	-41.37	-29.32
LTE 3MHz Multi carrier	863.8	866.8	47	-76.45	-39.79	-33.64	-78.1	-39.59	-33.6
	864.1	867.1	47	-76.29	-39.78	-32.89	-78.64	-39.33	-30.62
	864.5	867.5	47	-77.46	-40.04	-30.25	-78.99	-39.6	-31.54

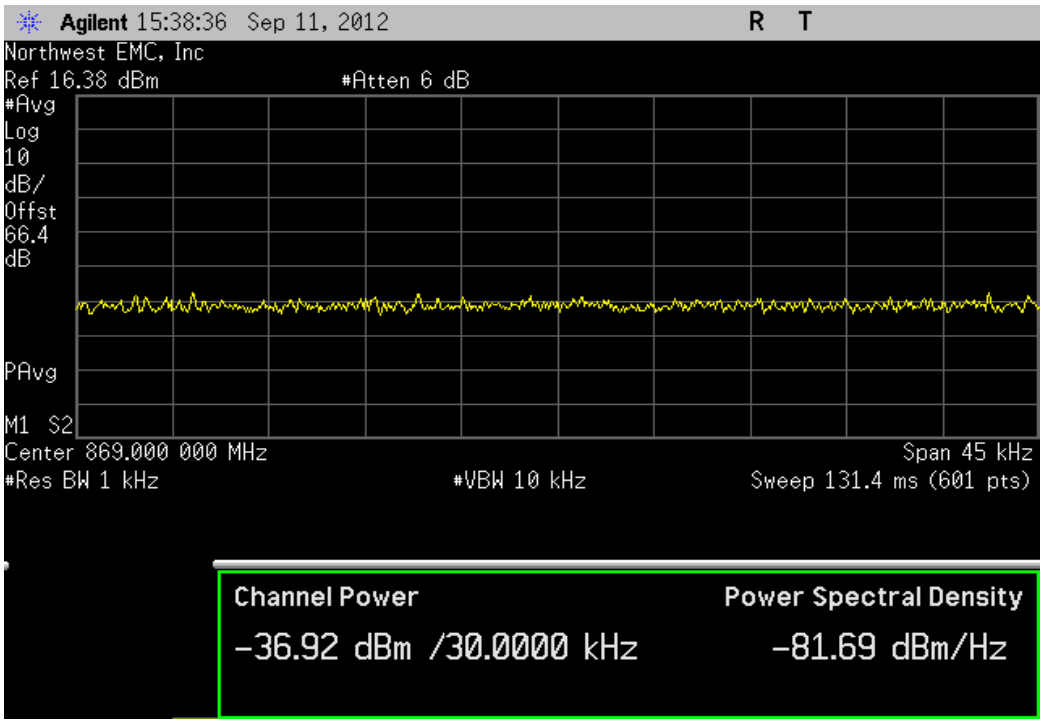
Port A, LTE 1.4M, Low, Low							
					Value	Limit	Result
					-80.28	-69	Pass



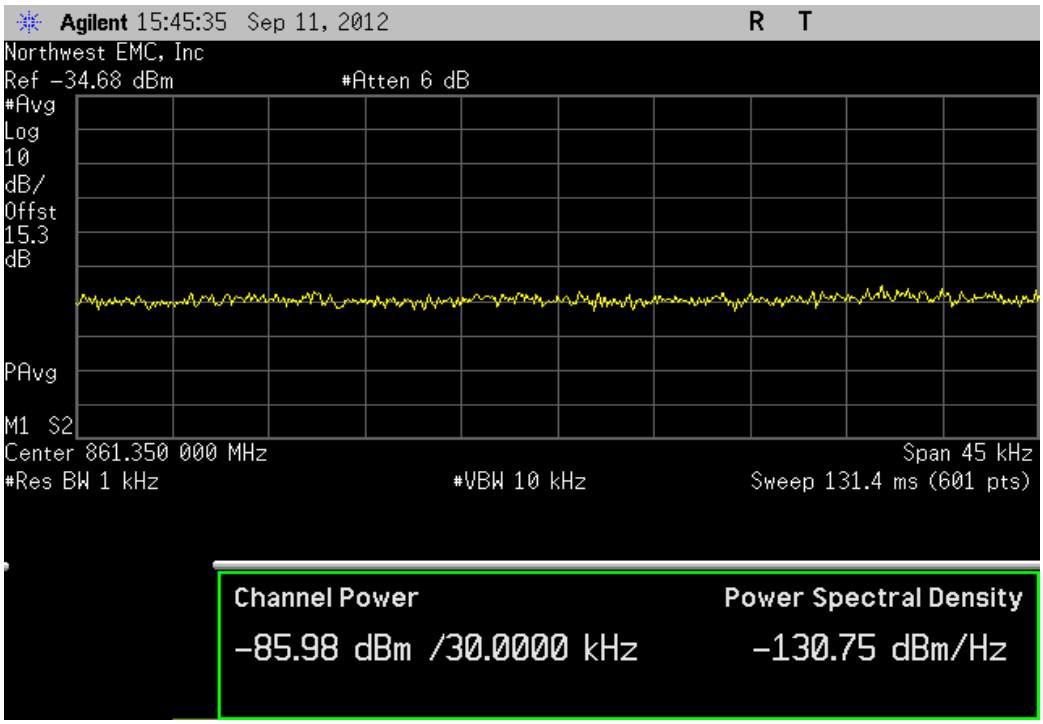
Port A, LTE 1.4M, Low, Center							
					Value	Limit	Result
					-39.41	-20	Pass



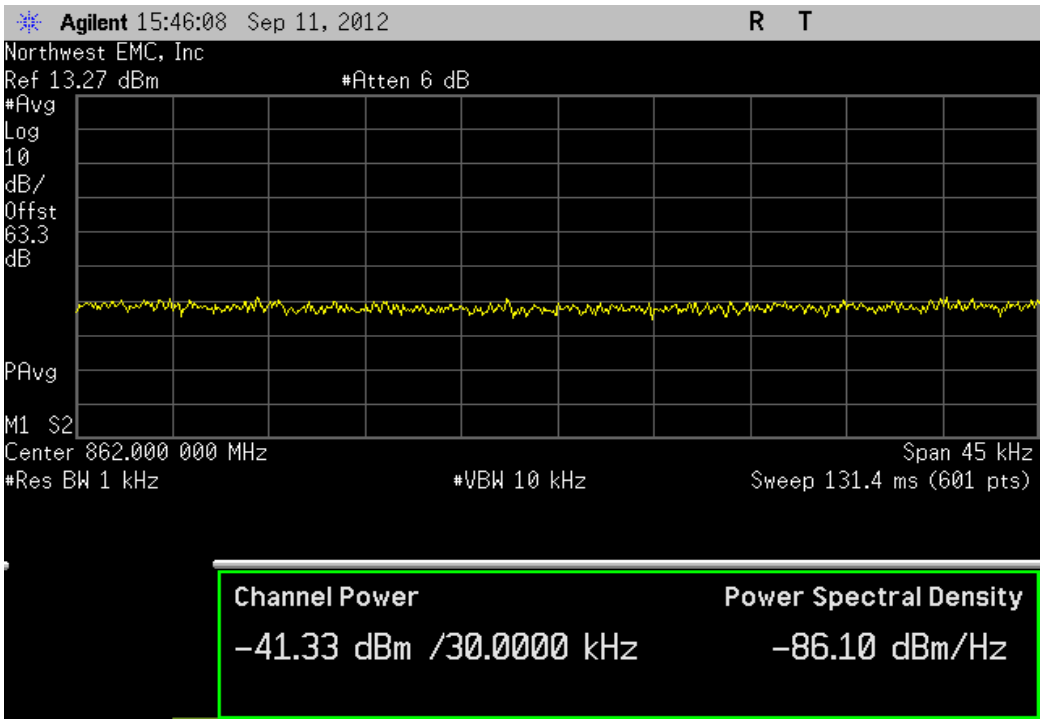
Port A, LTE 1.4M, Low, High							
					Value	Limit	Result
					-36.92	-20	Pass



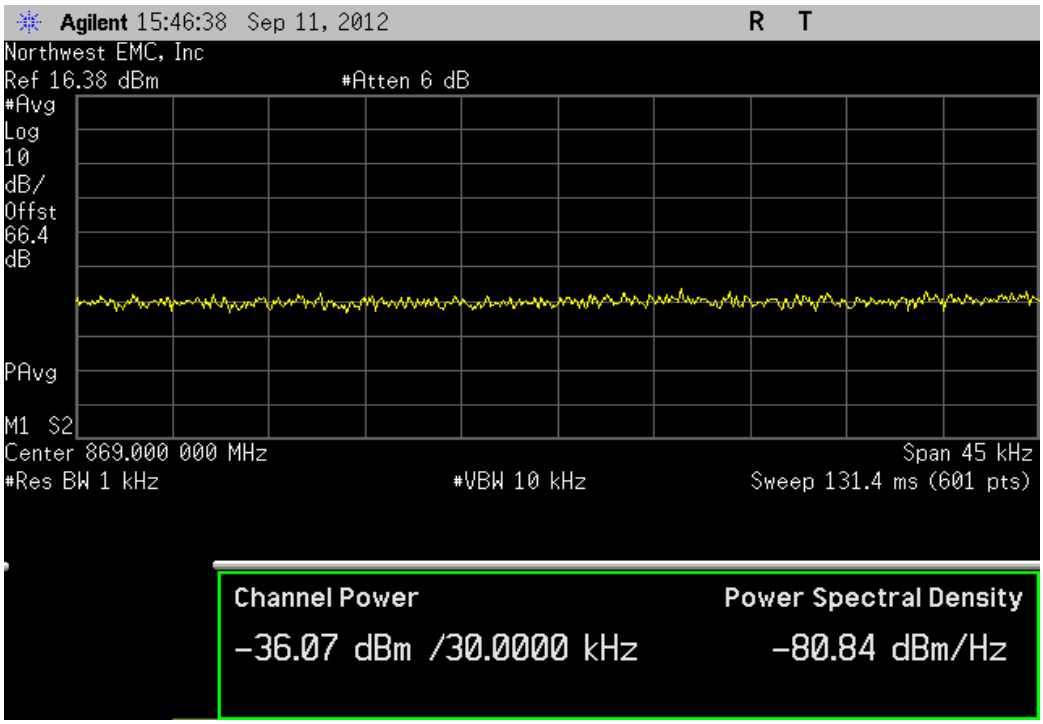
Port A, LTE 1.4M, Mid, Low							
					Value	Limit	Result
					-85.98	-69	Pass



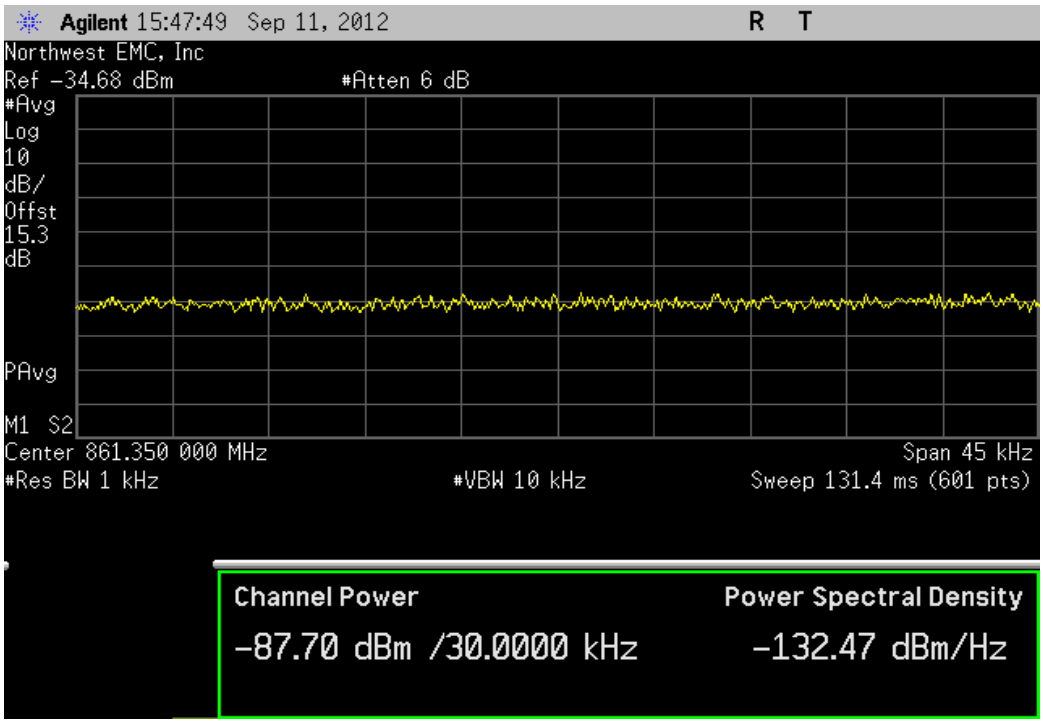
Port A, LTE 1.4M, Mid, Center							
					Value	Limit	Result
					-41.33	-20	Pass



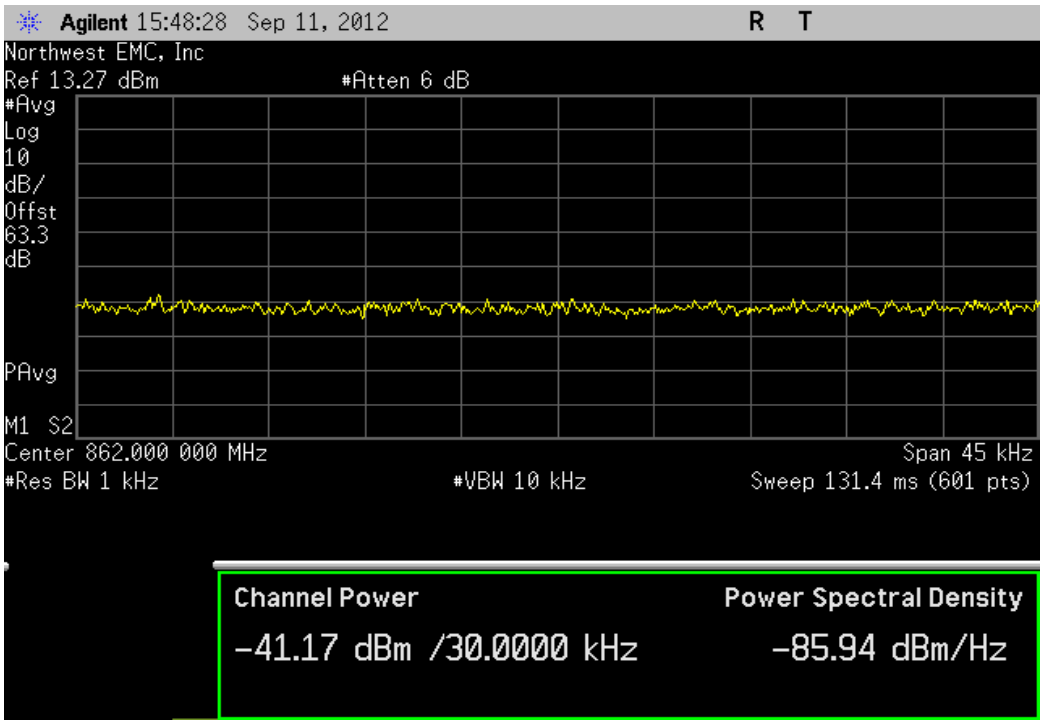
Port A, LTE 1.4M, Mid, High							
					Value	Limit	Result
					-36.07	-20	Pass



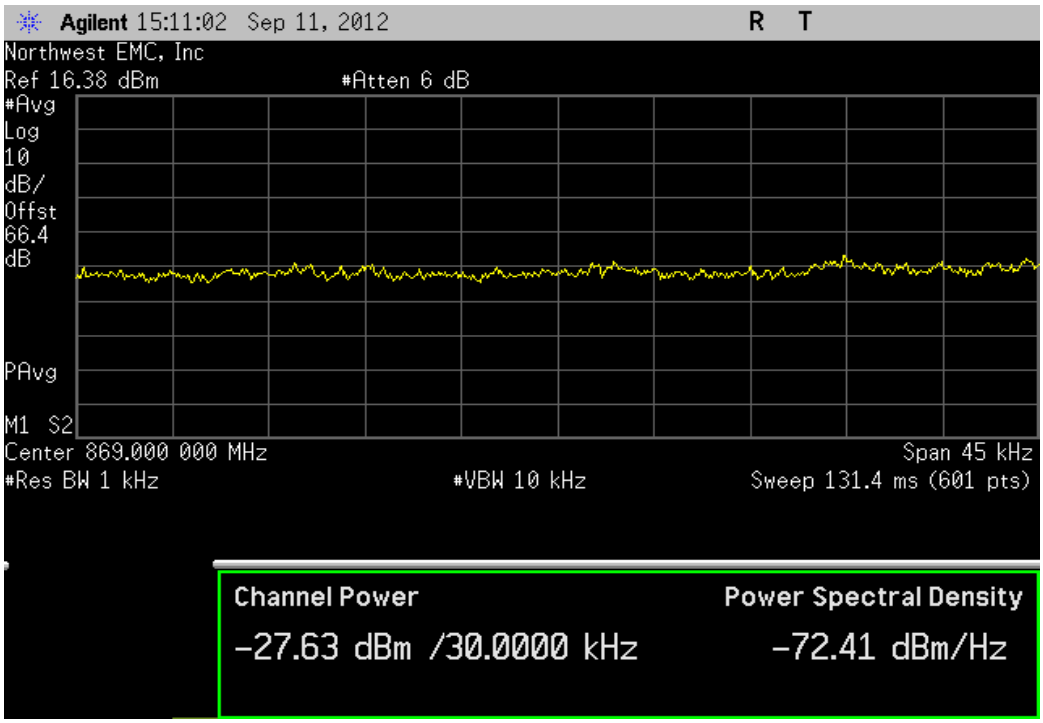
Port A, LTE 1.4M, High, Low							
					Value	Limit	Result
					-87.7	-69	Pass



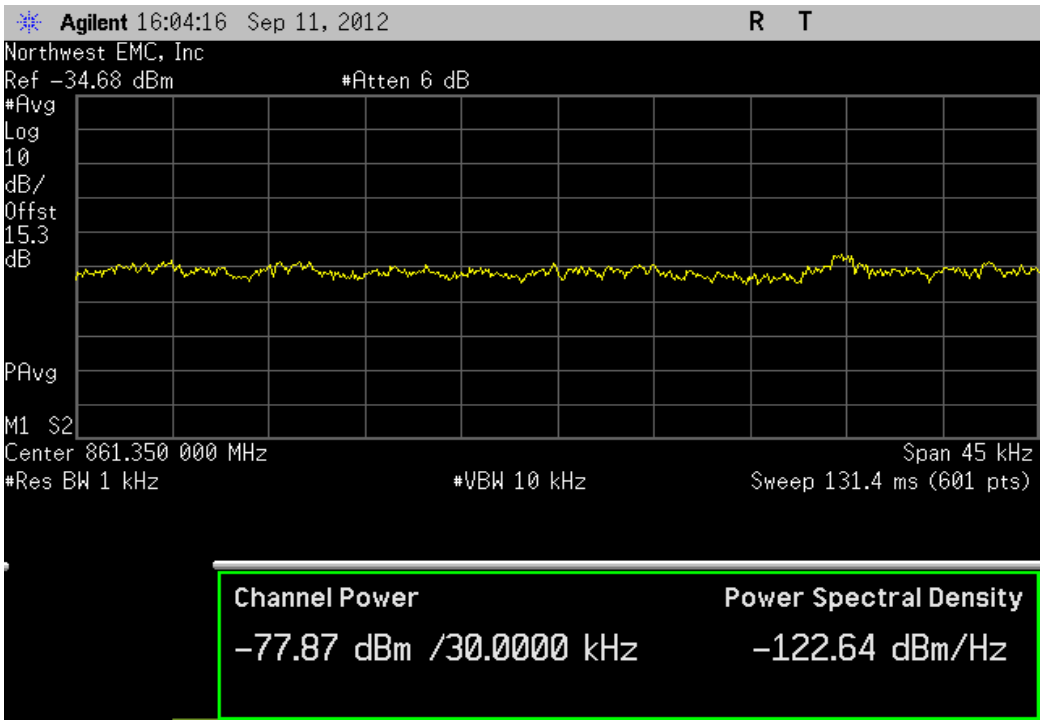
Port A, LTE 1.4M, High, Center							
					Value	Limit	Result
					-41.17	-20	Pass



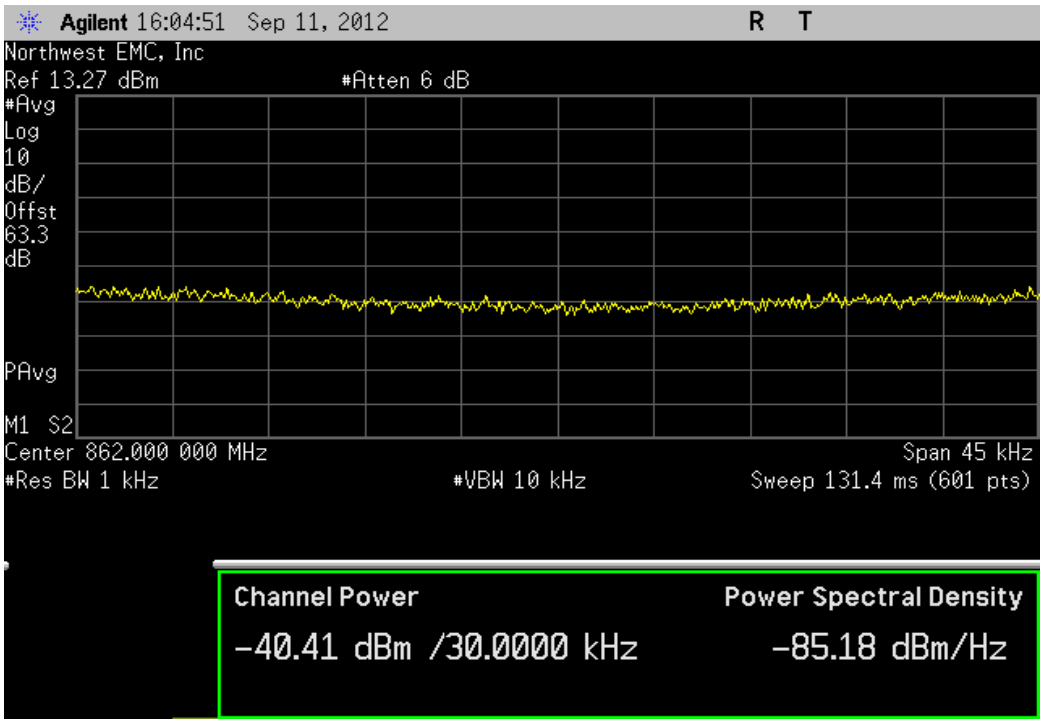
Port A, LTE 1.4M, High, High							
					Value	Limit	Result
					-27.63	-20	Pass



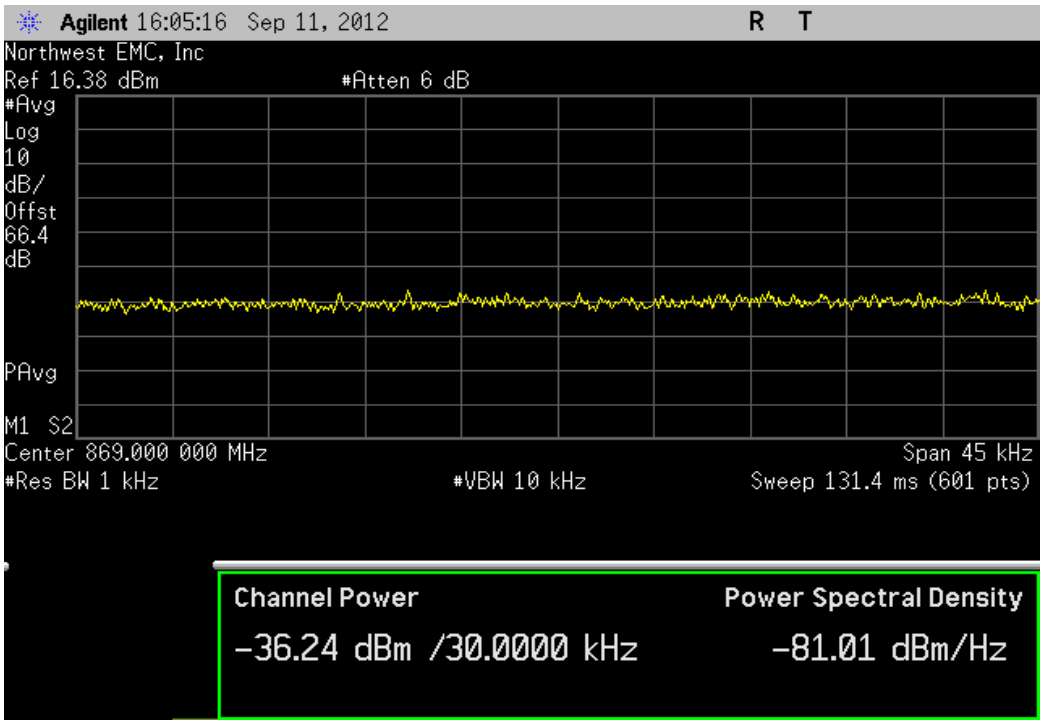
Port A, LTE 3M, Low, Low							
					Value	Limit	Result
					-77.87	-69	Pass



Port A, LTE 3M, Low, Center							
					Value	Limit	Result
					-40.41	-20	Pass

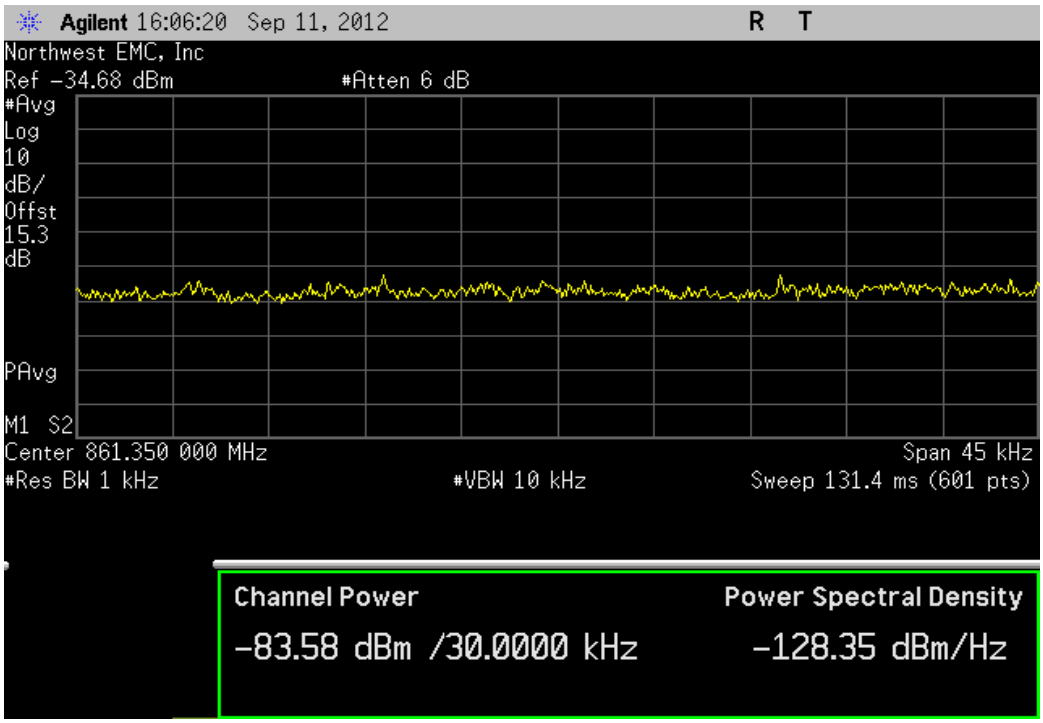


Port A, LTE 3M, Low, High							
					Value	Limit	Result
					-36.24	-20	Pass

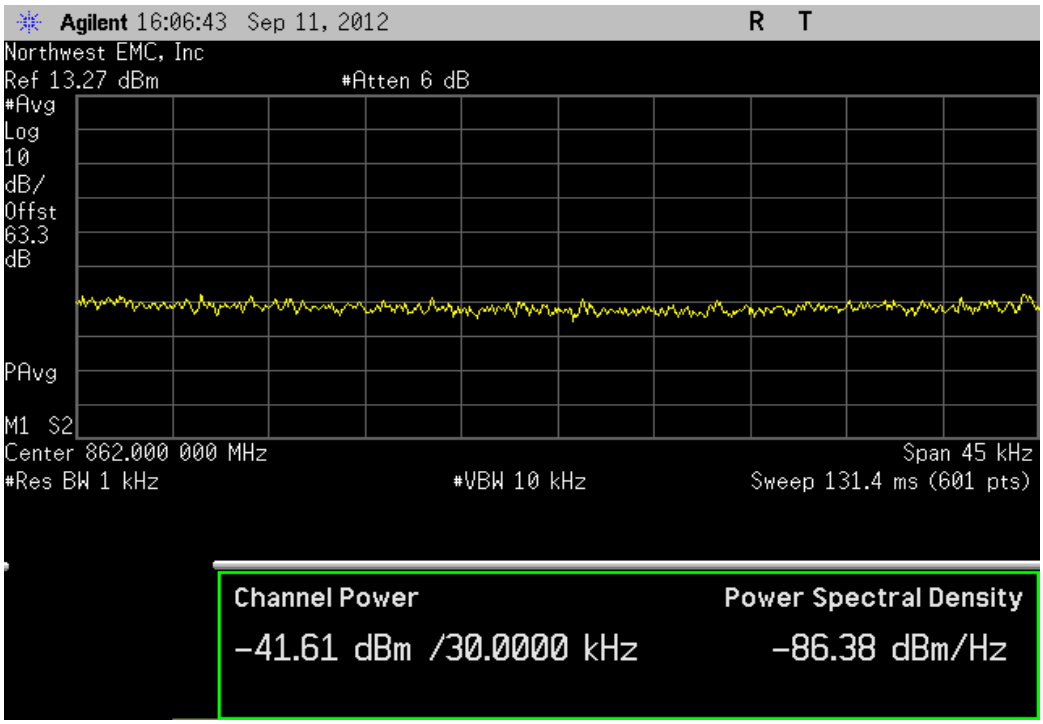


Emissions Mask - LTE

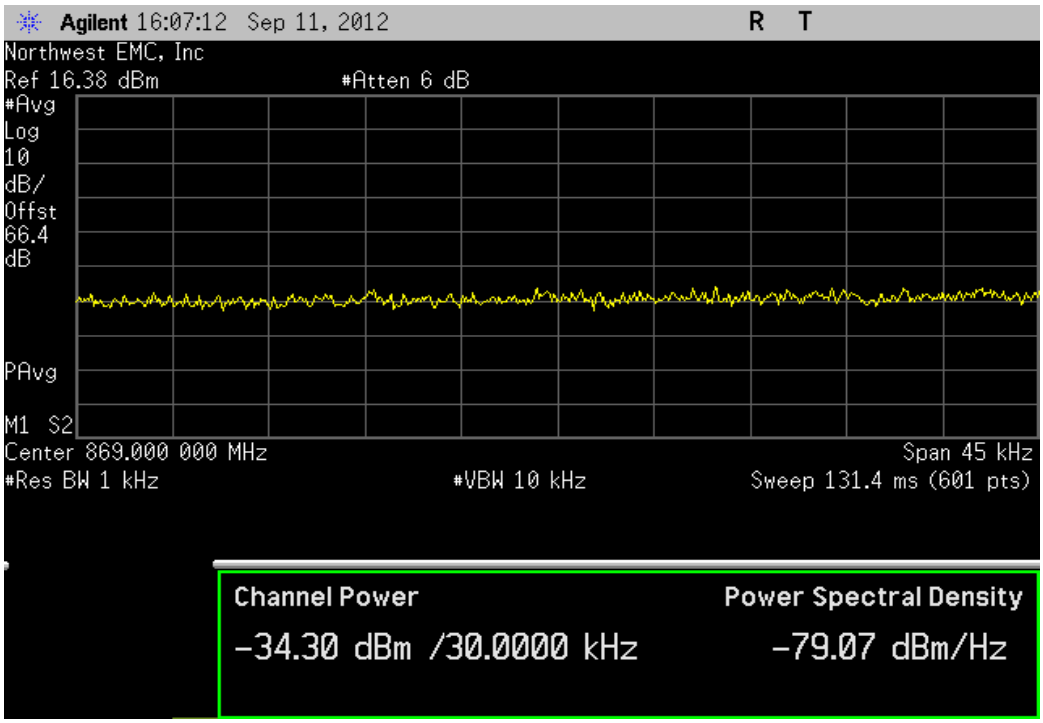
Port A, LTE 3M, Mid, Low							
					Value	Limit	Result
					-83.58	-69	Pass



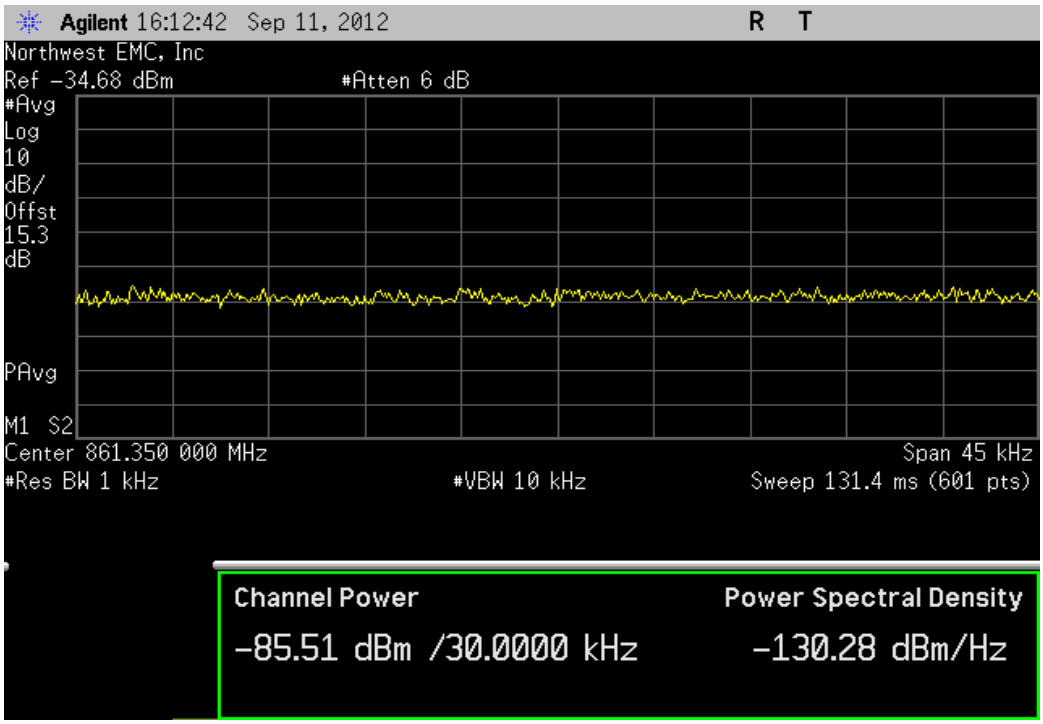
Port A, LTE 3M, Mid, Center							
					Value	Limit	Result
					-41.61	-20	Pass



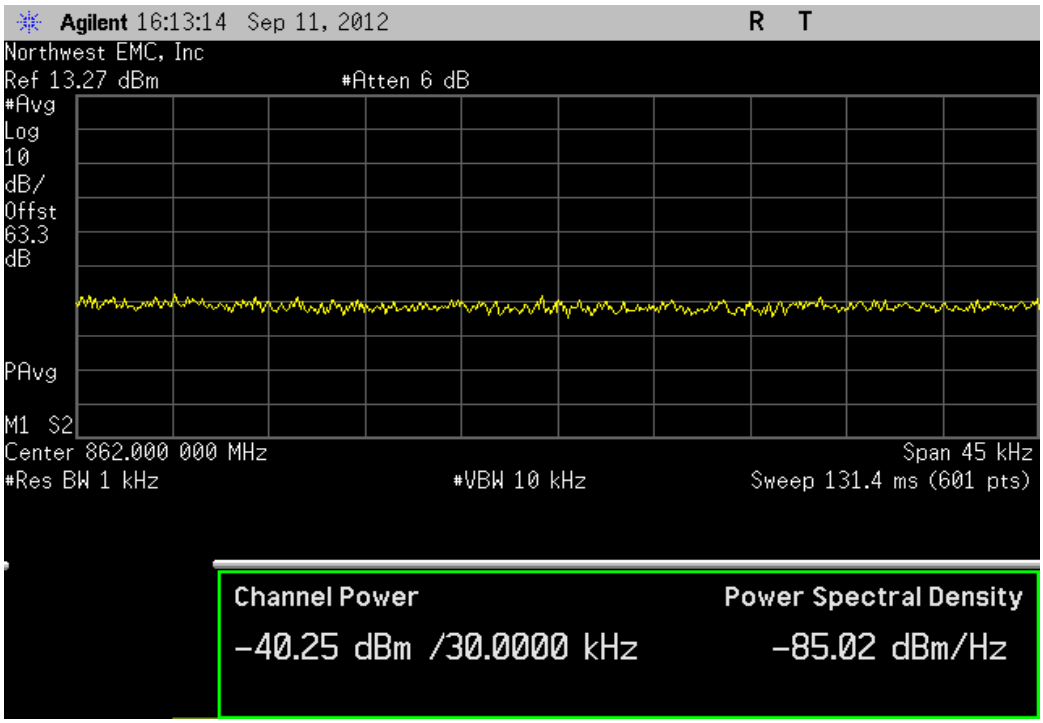
Port A, LTE 3M, Mid, High							
					Value	Limit	Result
					-34.3	-20	Pass



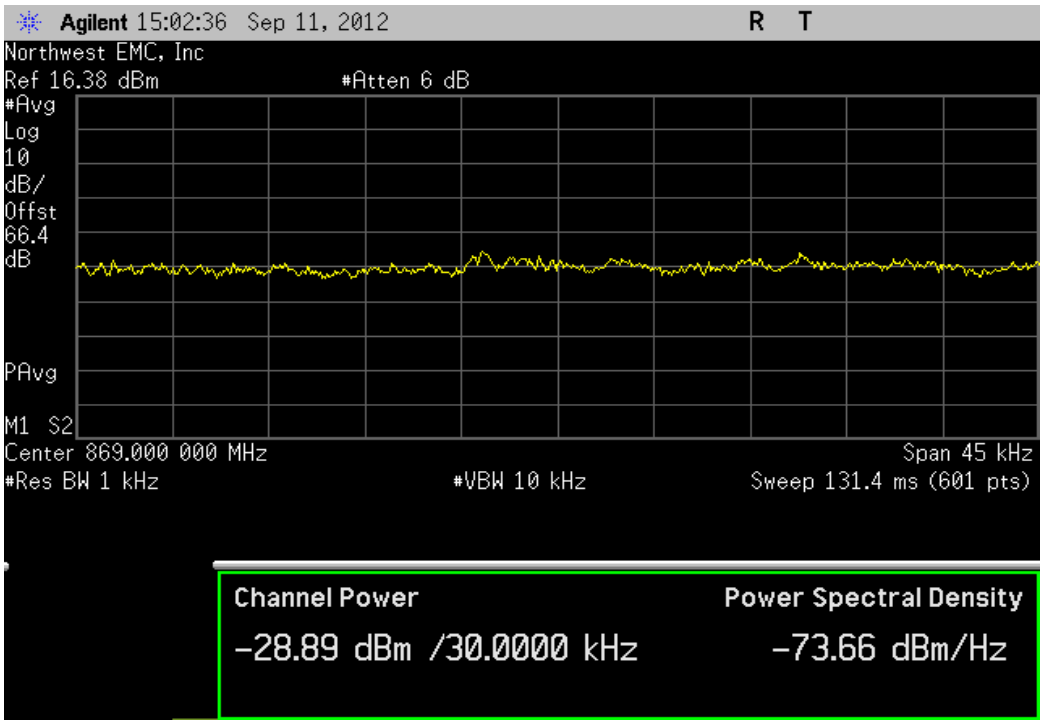
Port A, LTE 3M, High, Low							
					Value	Limit	Result
					-85.51	-69	Pass



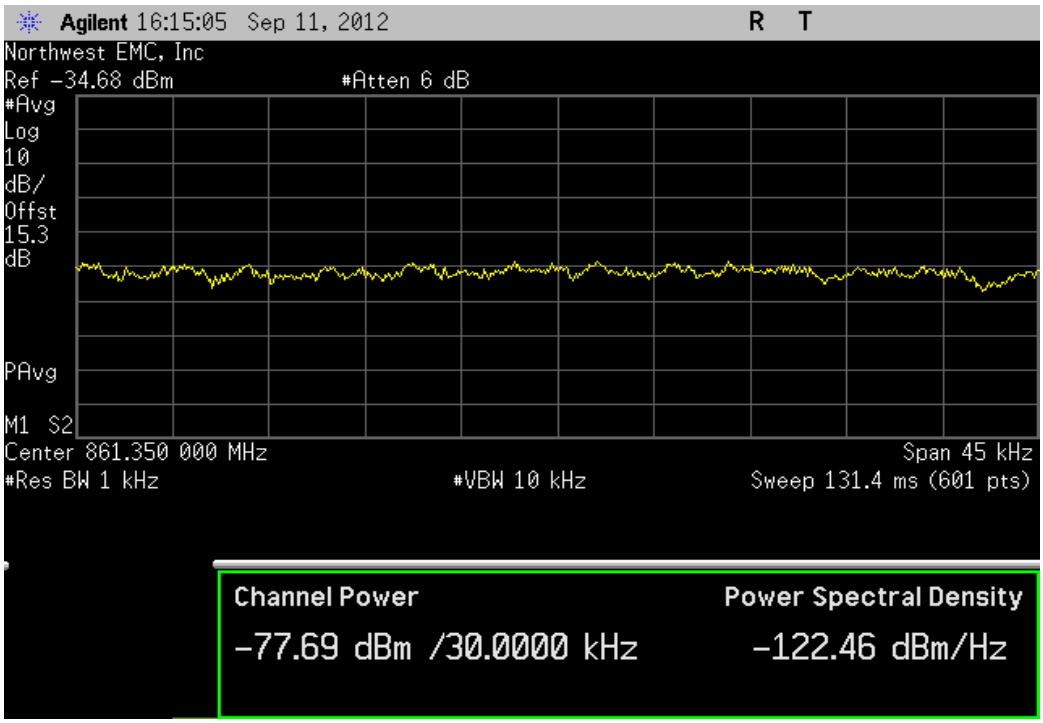
Port A, LTE 3M, High, Center							
					Value	Limit	Result
					-40.25	-20	Pass



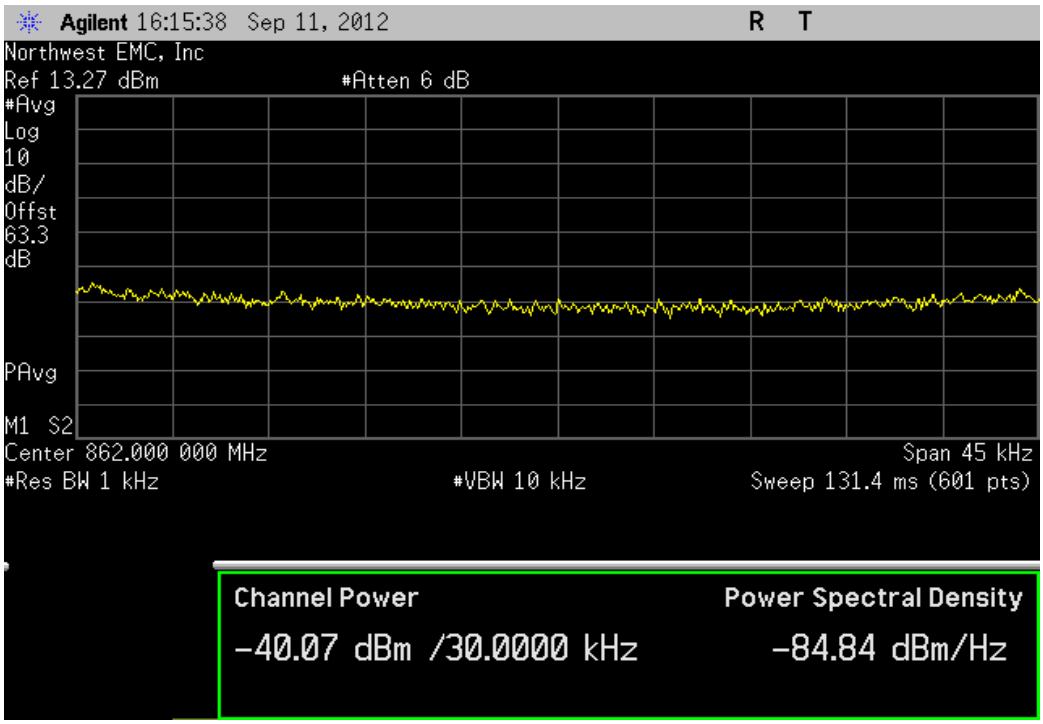
Port A, LTE 3M, High, High							
					Value	Limit	Result
					-28.89	-20	Pass



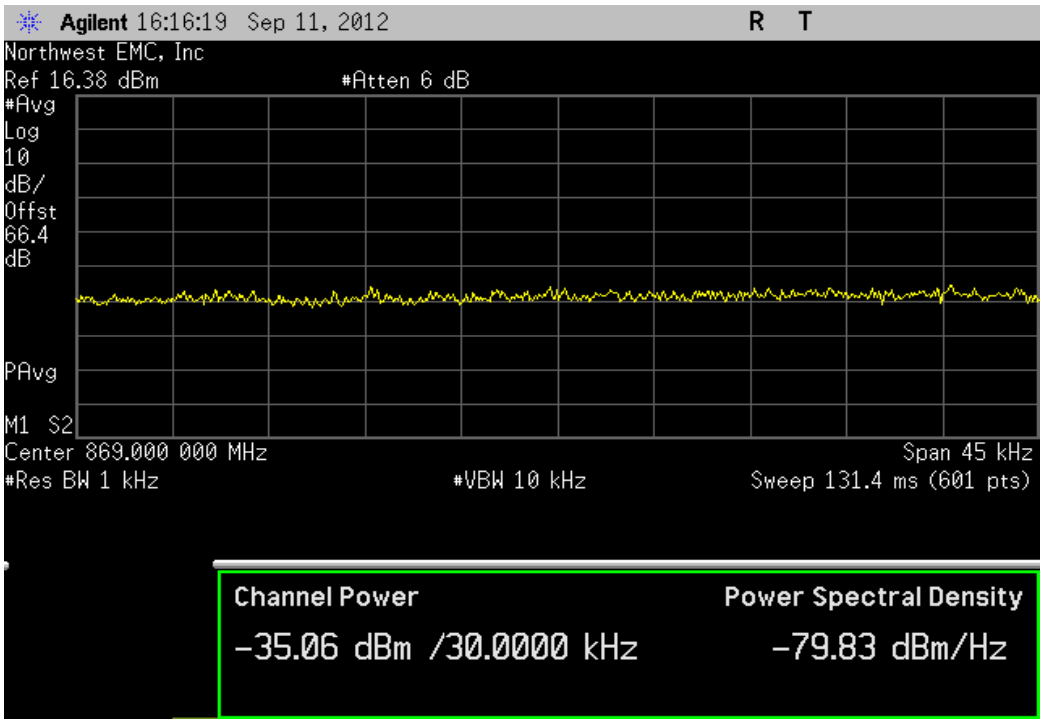
Port A, LTE 5M, Low, Low							
					Value	Limit	Result
					-77.69	-69	Pass



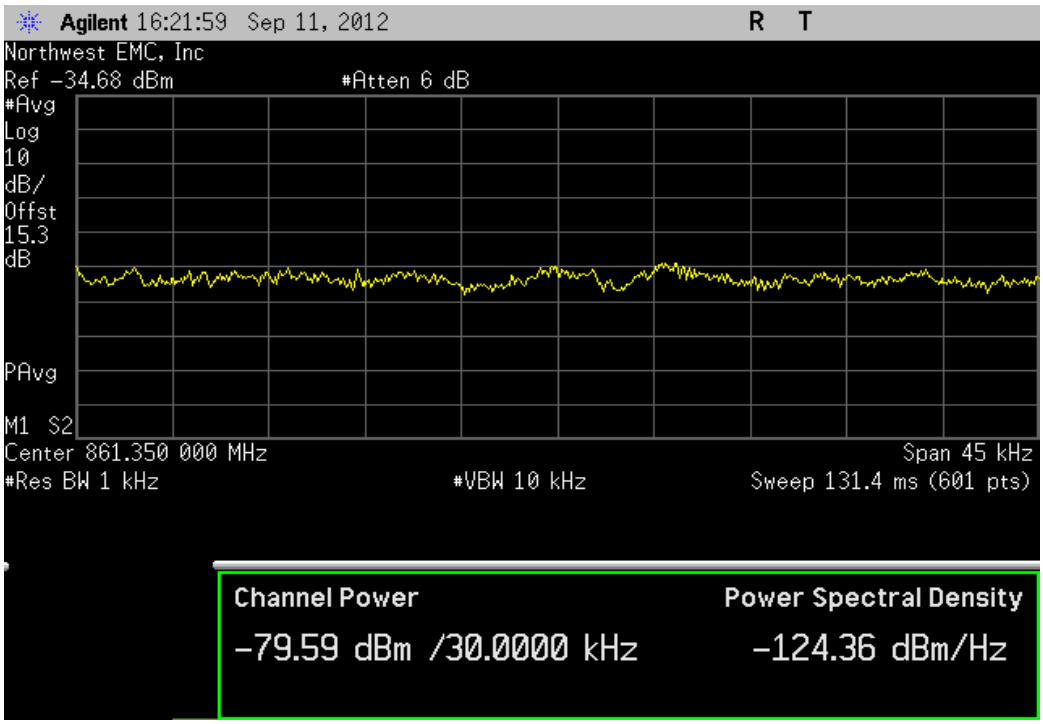
Port A, LTE 5M, Low, Center							
					Value	Limit	Result
					-40.07	-20	Pass



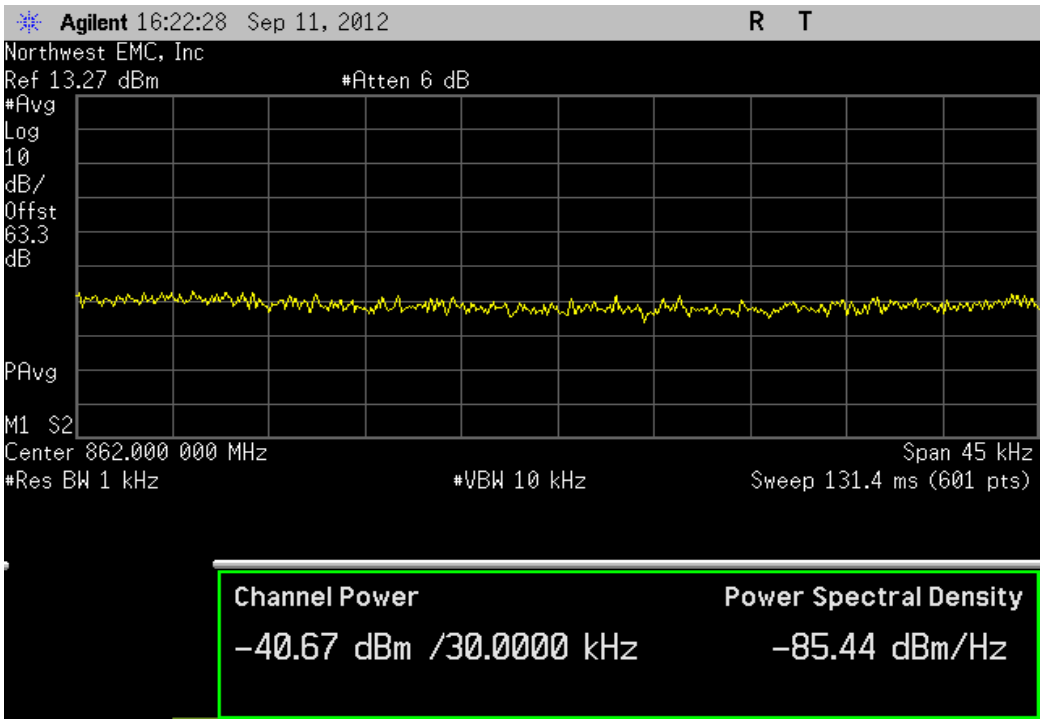
Port A, LTE 5M, Low, High							
					Value	Limit	Result
					-35.06	-20	Pass



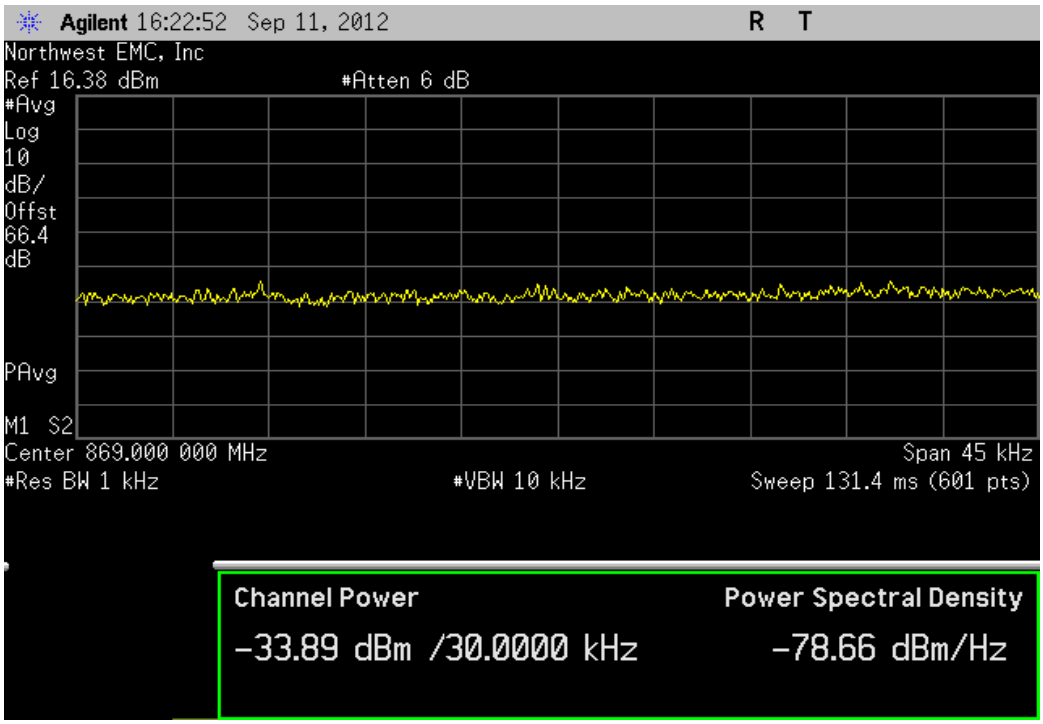
Port A, LTE 5M, Mid, Low							
					Value	Limit	Result
					-79.59	-69	Pass



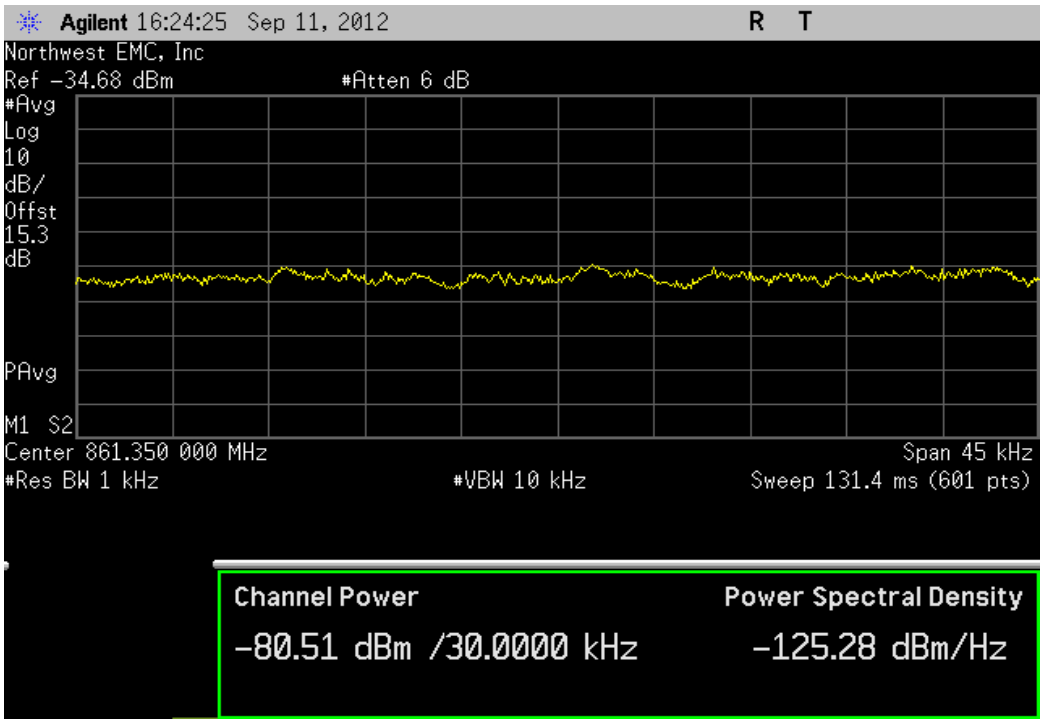
Port A, LTE 5M, Mid, Center							
					Value	Limit	Result
					-40.67	-20	Pass



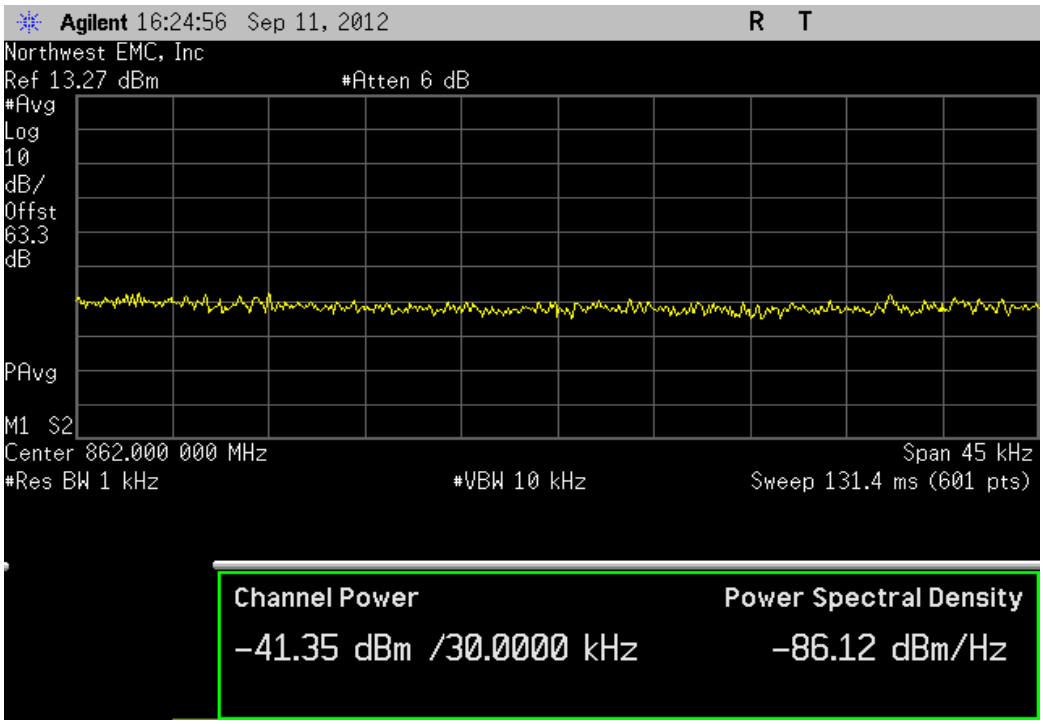
Port A, LTE 5M, Mid, High							
					Value	Limit	Result
					-33.89	-20	Pass



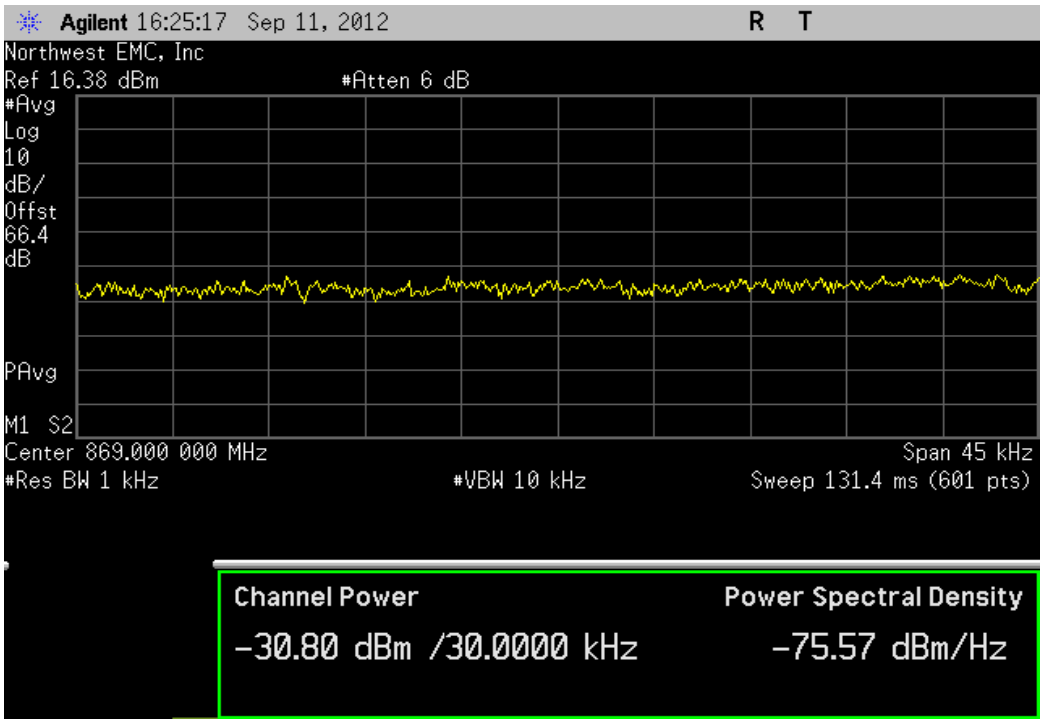
Port A, LTE 5M, High, Low							
					Value	Limit	Result
					-80.51	-69	Pass



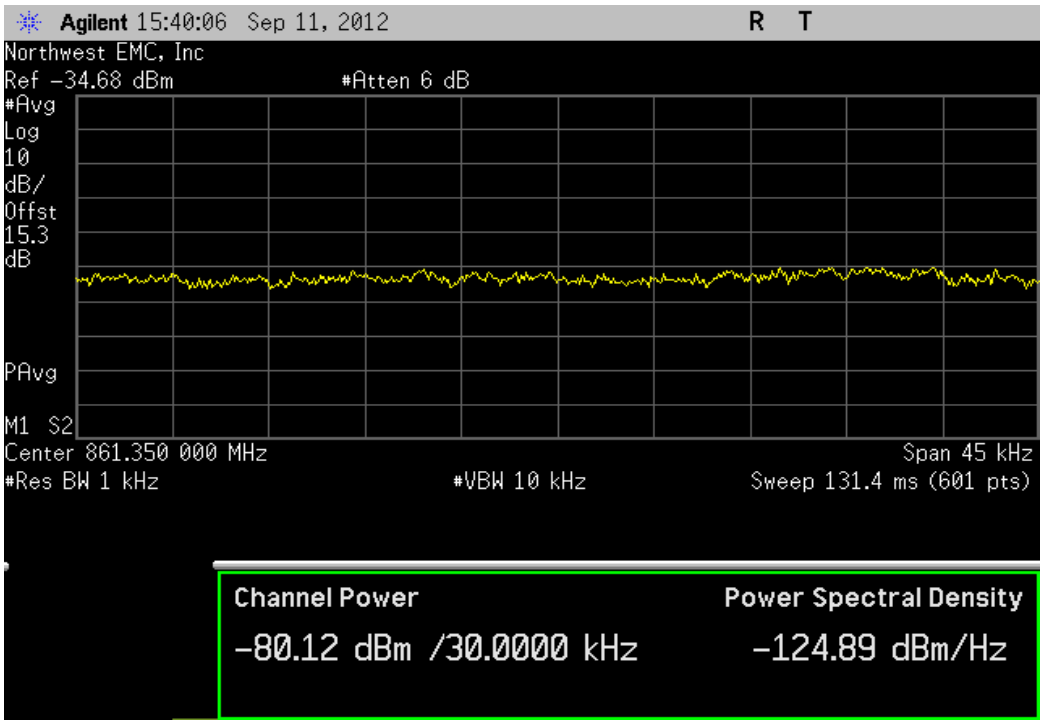
Port A, LTE 5M, High, Center							
					Value	Limit	Result
					-41.35	-20	Pass



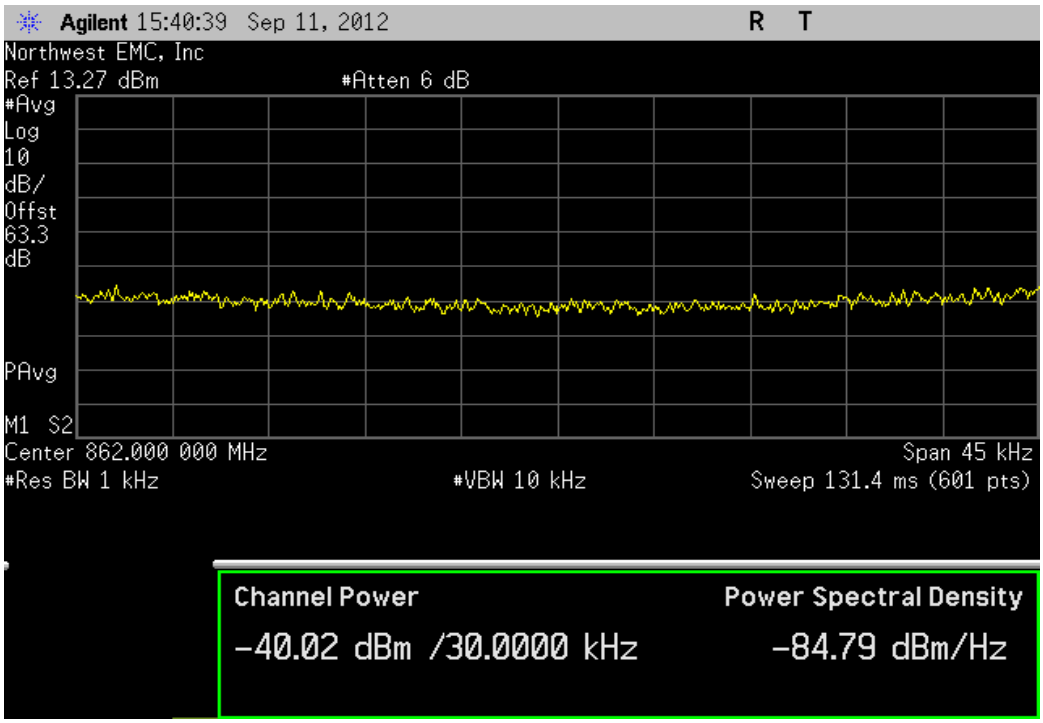
Port A, LTE 5M, High, High							
					Value	Limit	Result
					-30.8	-20	Pass



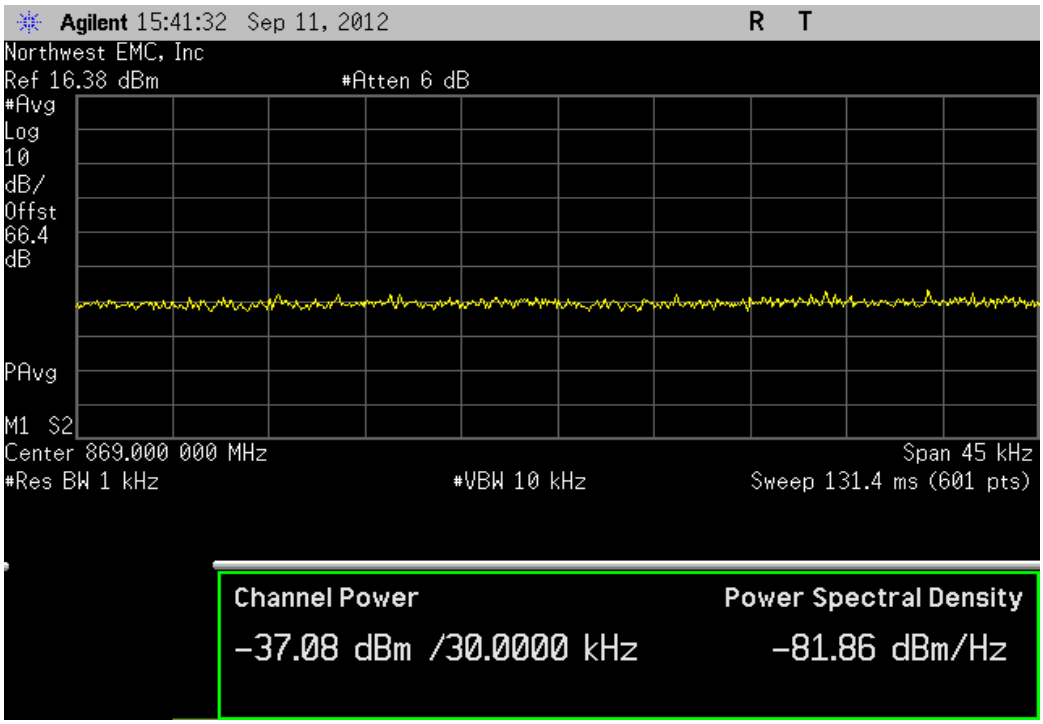
Port B, LTE 1.4M, Low, Low							
					Value	Limit	Result
					-80.12	-69	Pass



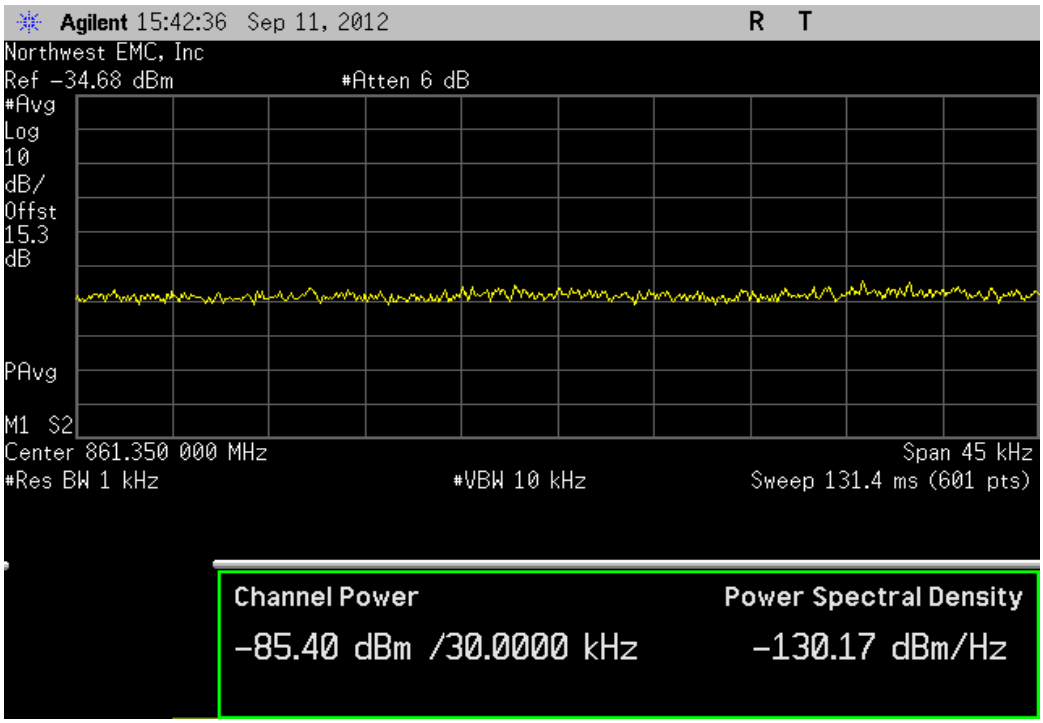
Port B, LTE 1.4M, Low, Center							
					Value	Limit	Result
					-40.02	-20	Pass



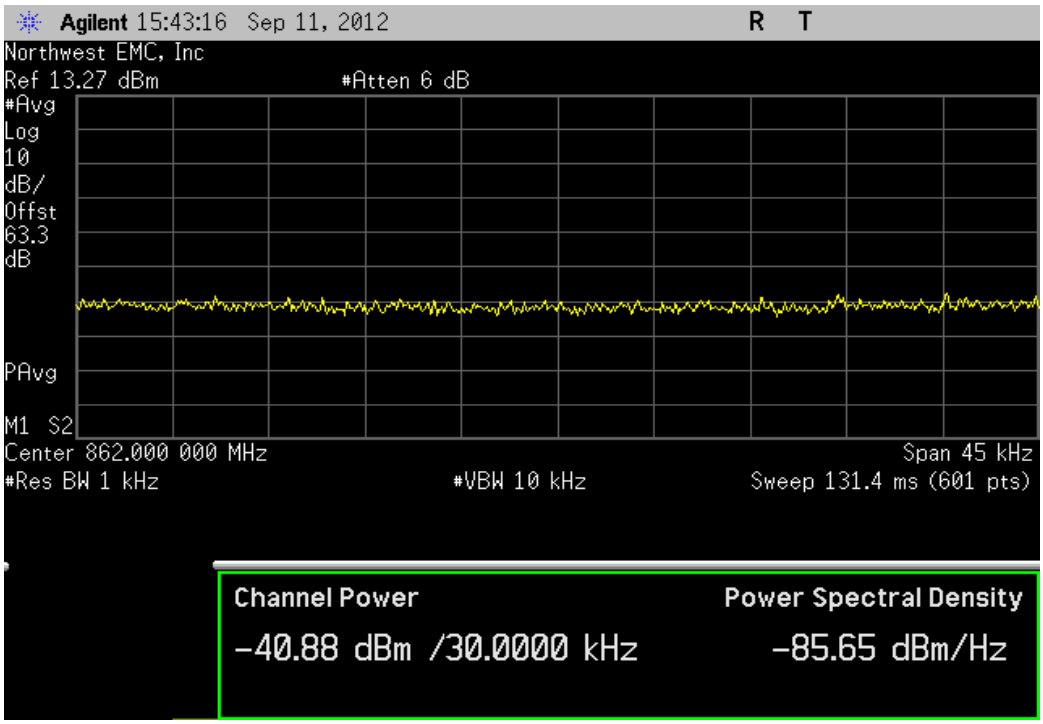
Port B, LTE 1.4M, Low, High							
					Value	Limit	Result
					-37.08	-20	Pass



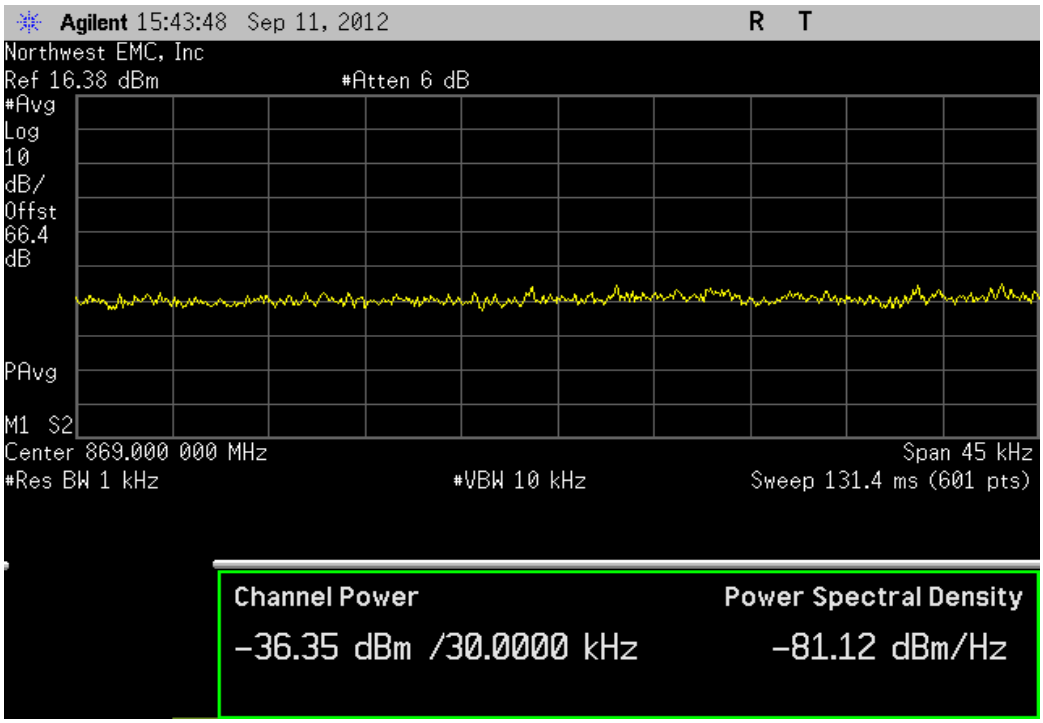
Port B, LTE 1.4M, Mid, Low							
					Value	Limit	Result
					-85.4	-69	Pass



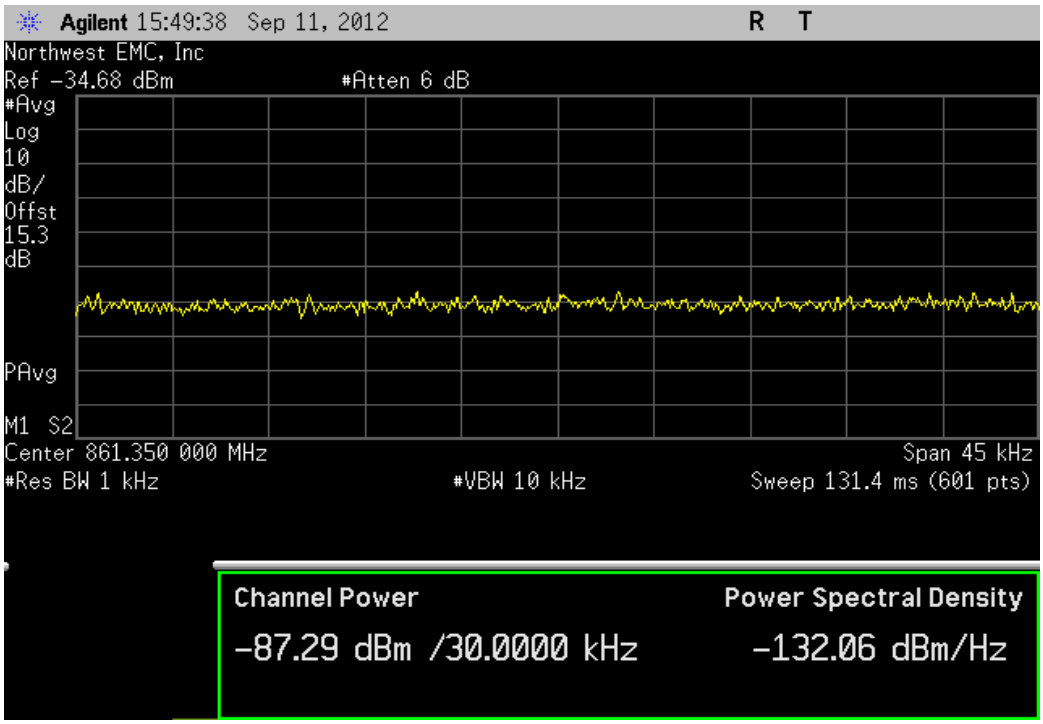
Port B, LTE 1.4M, Mid, Center							
					Value	Limit	Result
					-40.88	-20	Pass



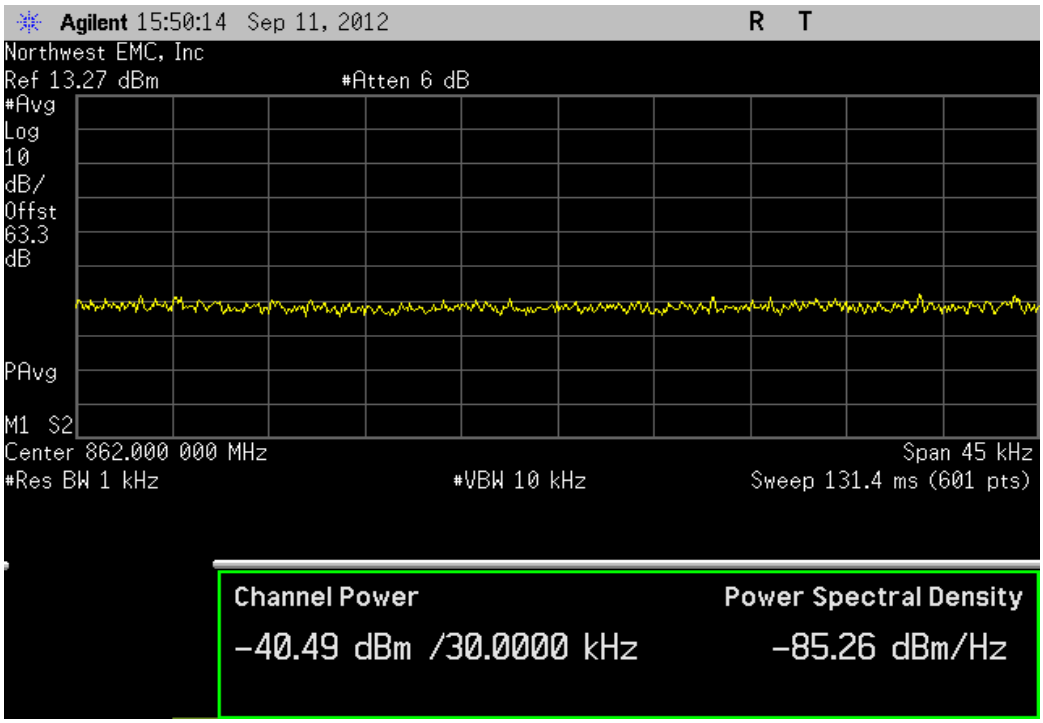
Port B, LTE 1.4M, Mid, High							
					Value	Limit	Result
					-36.35	-20	Pass



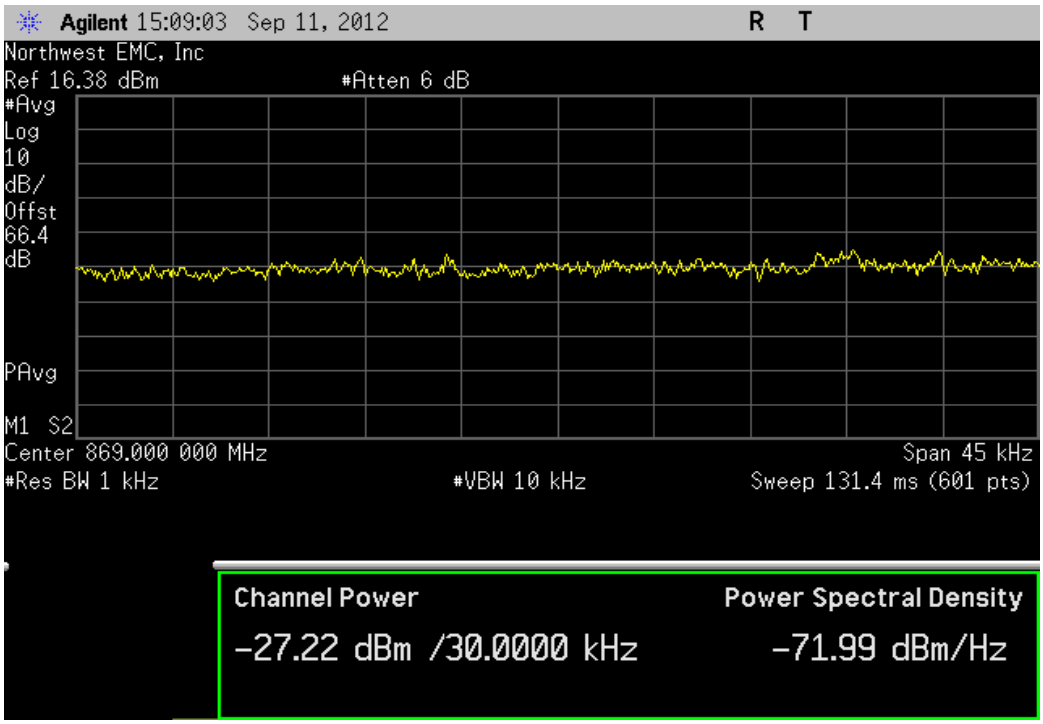
Port B, LTE 1.4M, High, Low							
					Value	Limit	Result
					-87.29	-69	Pass



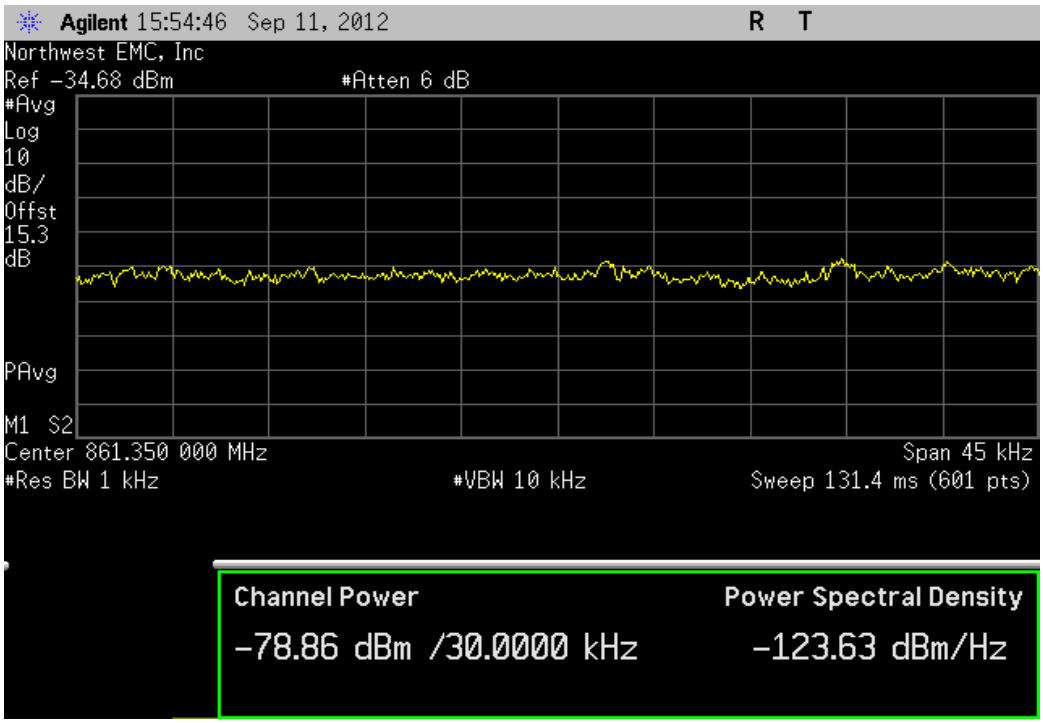
Port B, LTE 1.4M, High, Center							
					Value	Limit	Result
					-40.49	-20	Pass



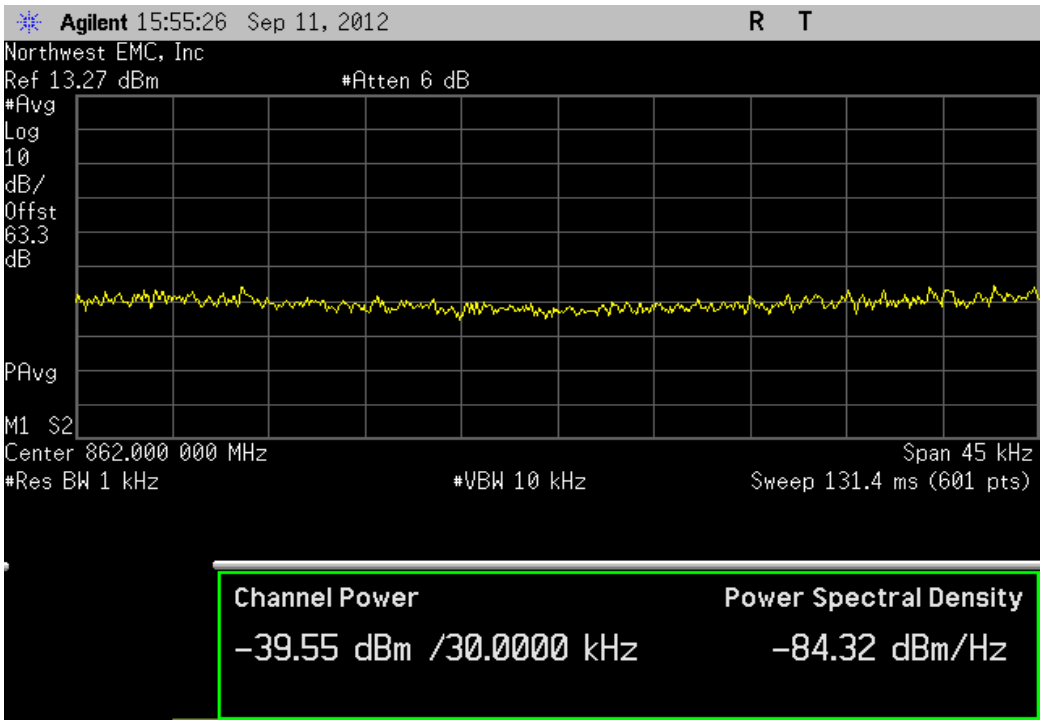
Port B, LTE 1.4M, High, High							
					Value	Limit	Result
					-27.22	-20	Pass



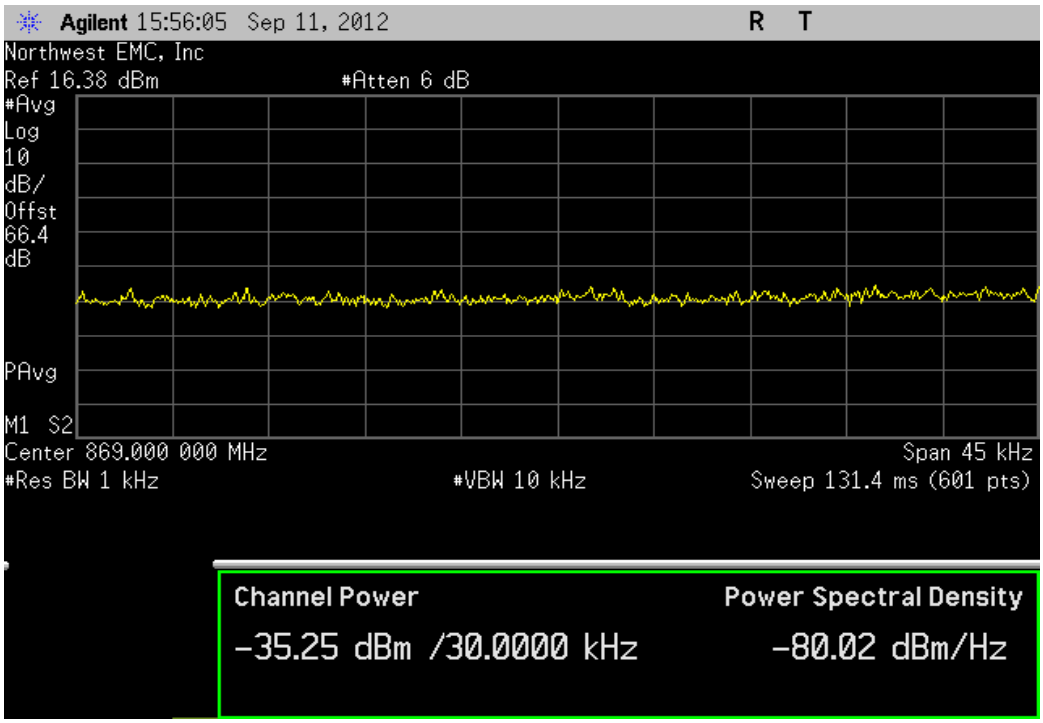
Port B, LTE 3M, Low, Low							
					Value	Limit	Result
					-78.86	-69	Pass



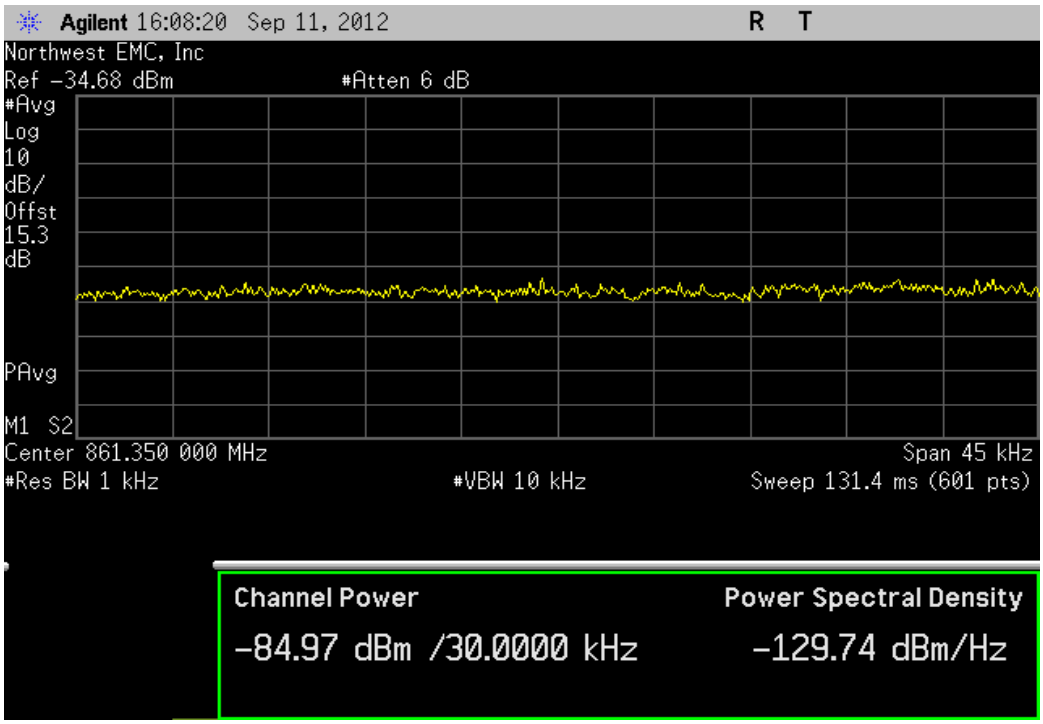
Port B, LTE 3M, Low, Center							
					Value	Limit	Result
					-39.55	-20	Pass



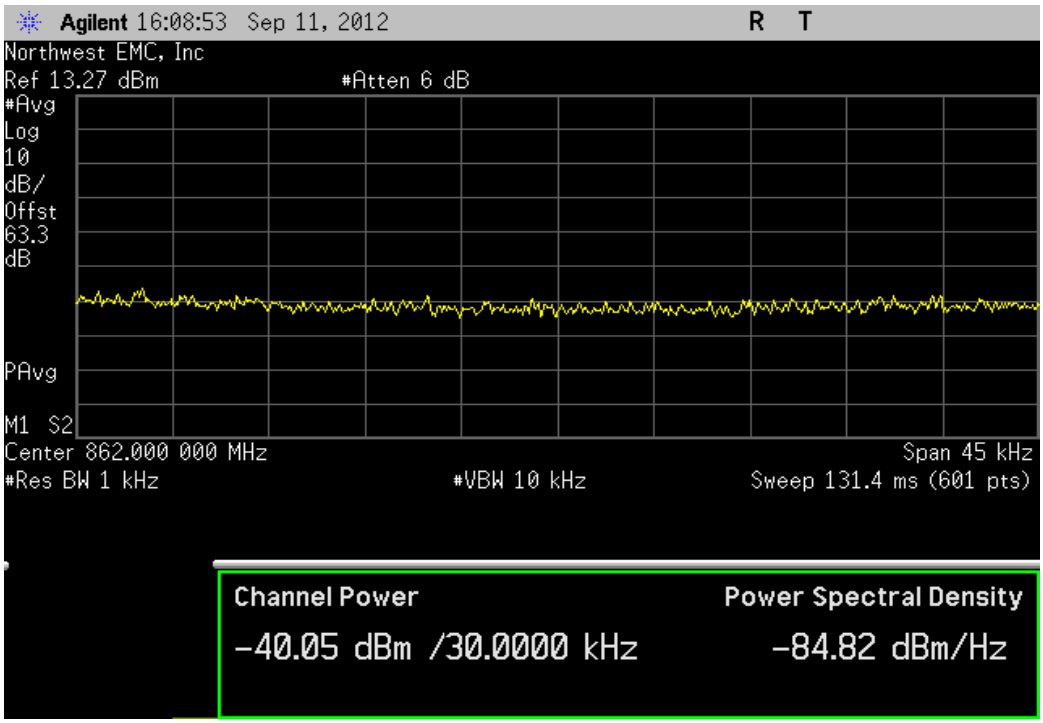
Port B, LTE 3M, Low, High							
					Value	Limit	Result
					-35.25	-20	Pass



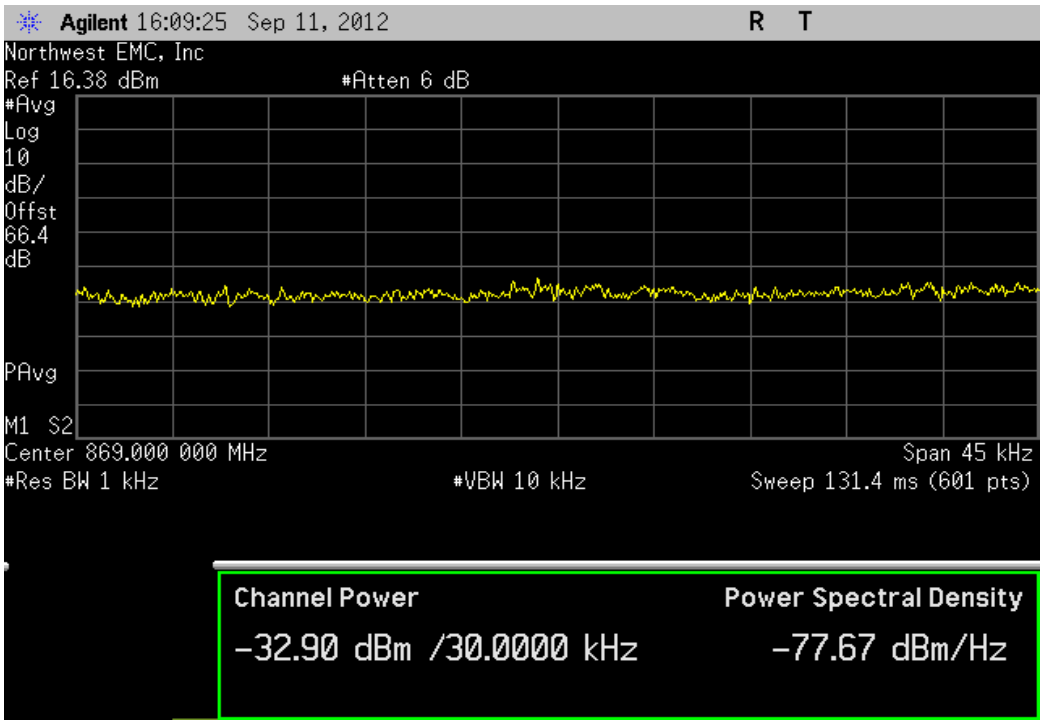
Port B, LTE 3M, Mid, Low							
					Value	Limit	Result
					-84.97	-69	Pass



Port B, LTE 3M, Mid, Center							
					Value	Limit	Result
					-40.05	-20	Pass

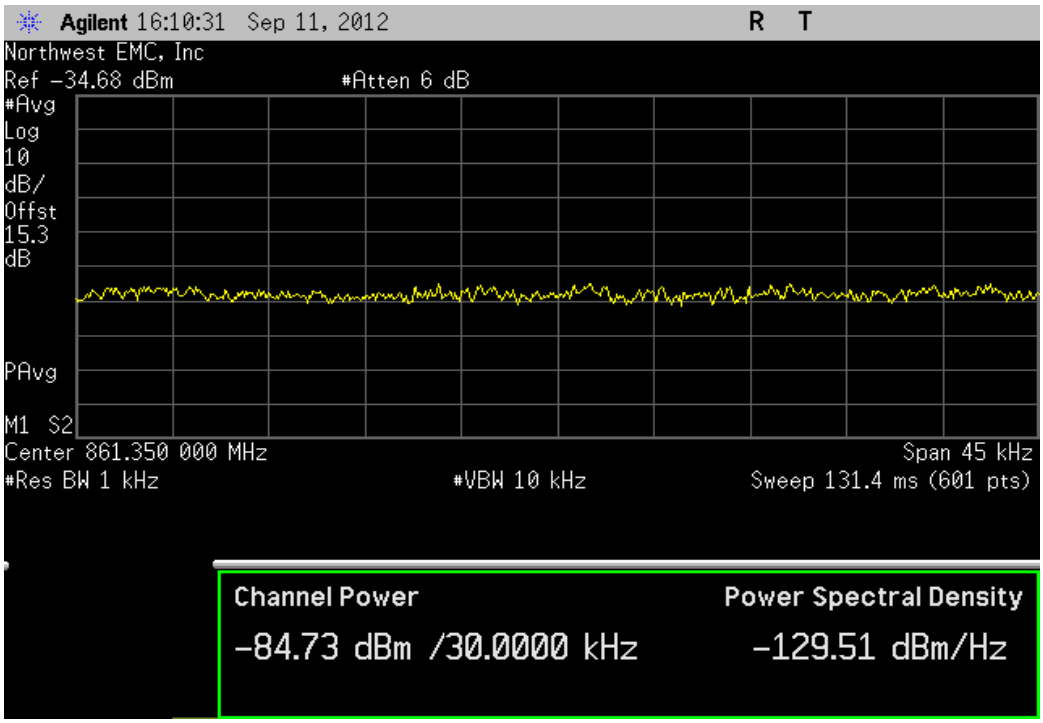


Port B, LTE 3M, Mid, High							
					Value	Limit	Result
					-32.9	-20	Pass

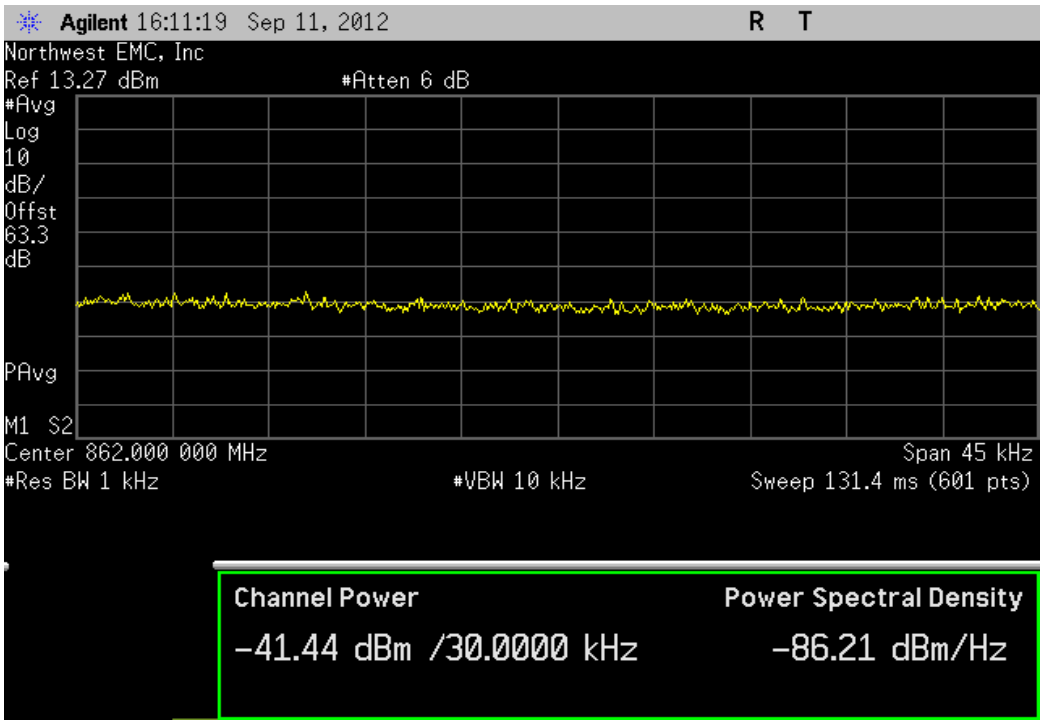


Emissions Mask - LTE

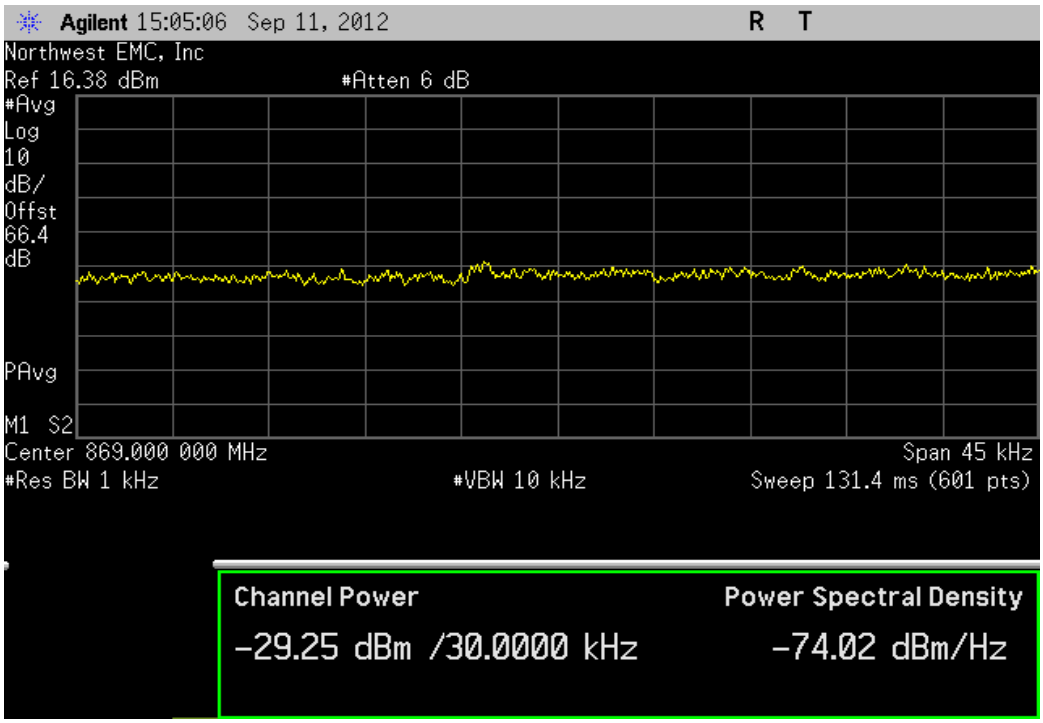
Port B, LTE 3M, High, Low							
					Value	Limit	Result
					-84.73	-69	Pass



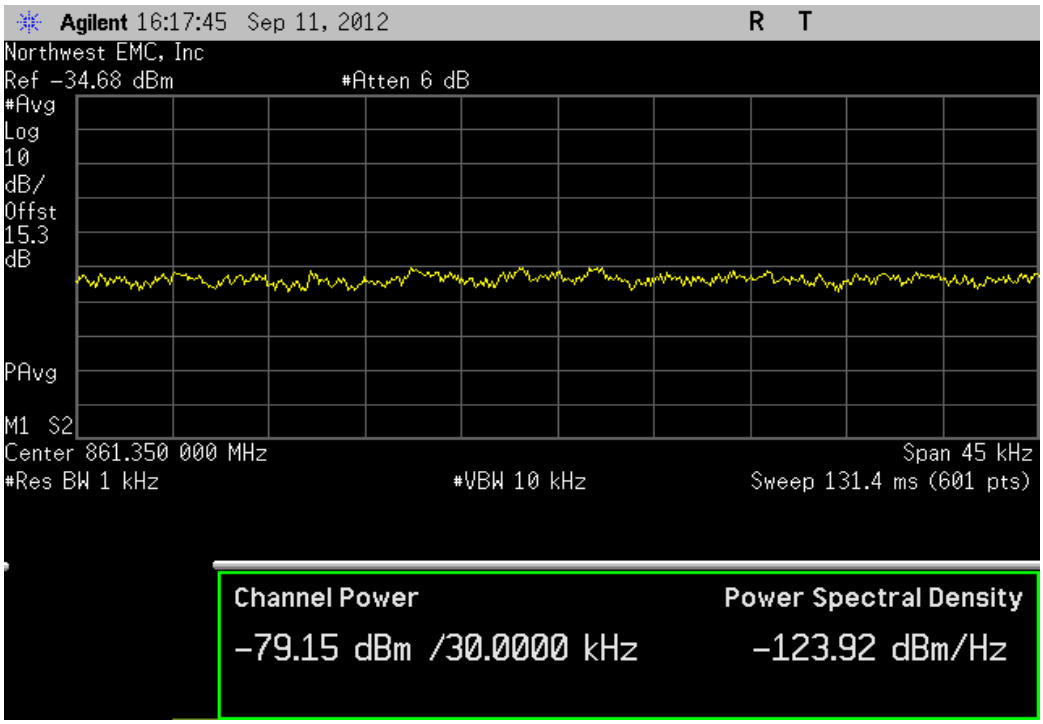
Port B, LTE 3M, High, Center							
					Value	Limit	Result
					-41.44	-20	Pass



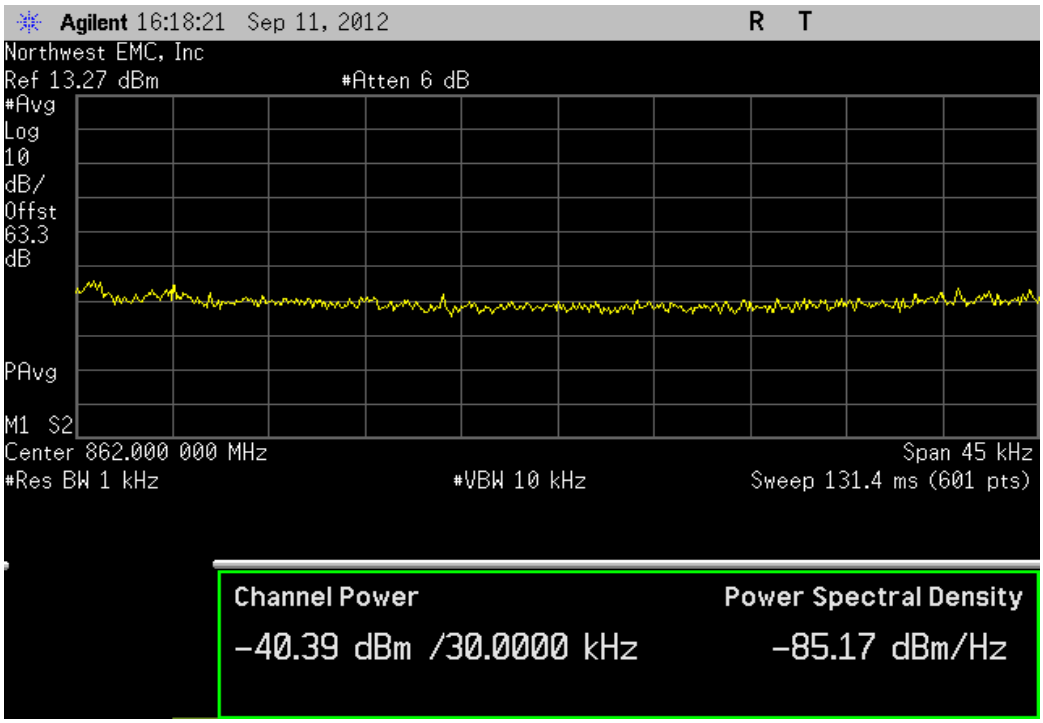
Port B, LTE 3M, High, High							
					Value	Limit	Result
					-29.25	-20	Pass



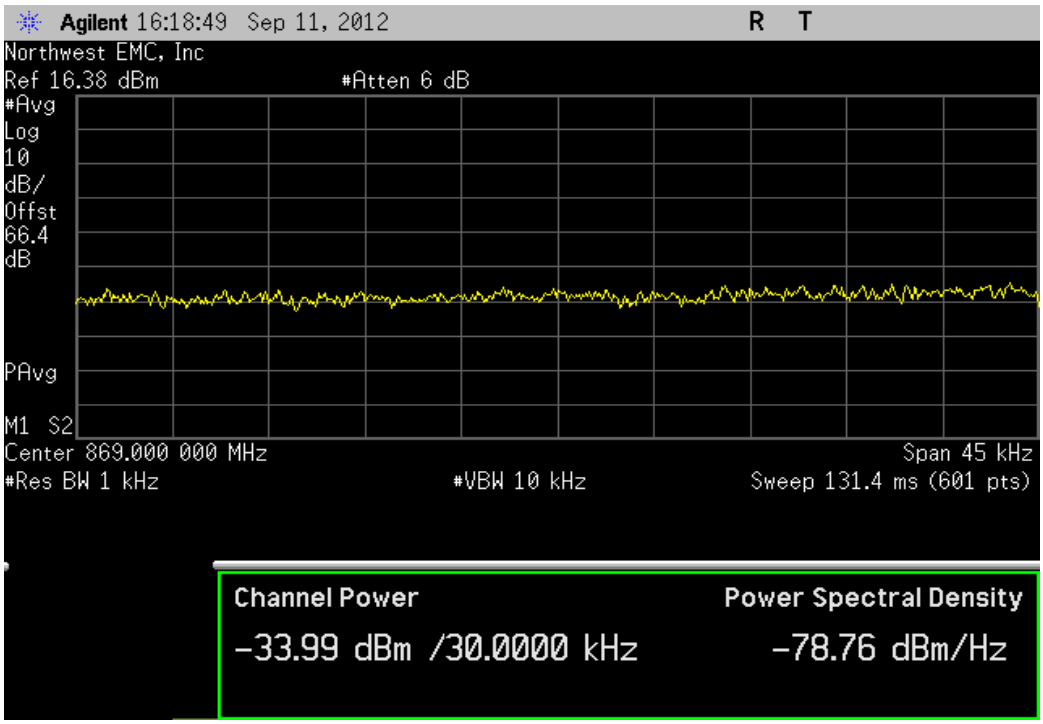
Port B, LTE 5M, Low, Low							
					Value	Limit	Result
					-79.15	-69	Pass



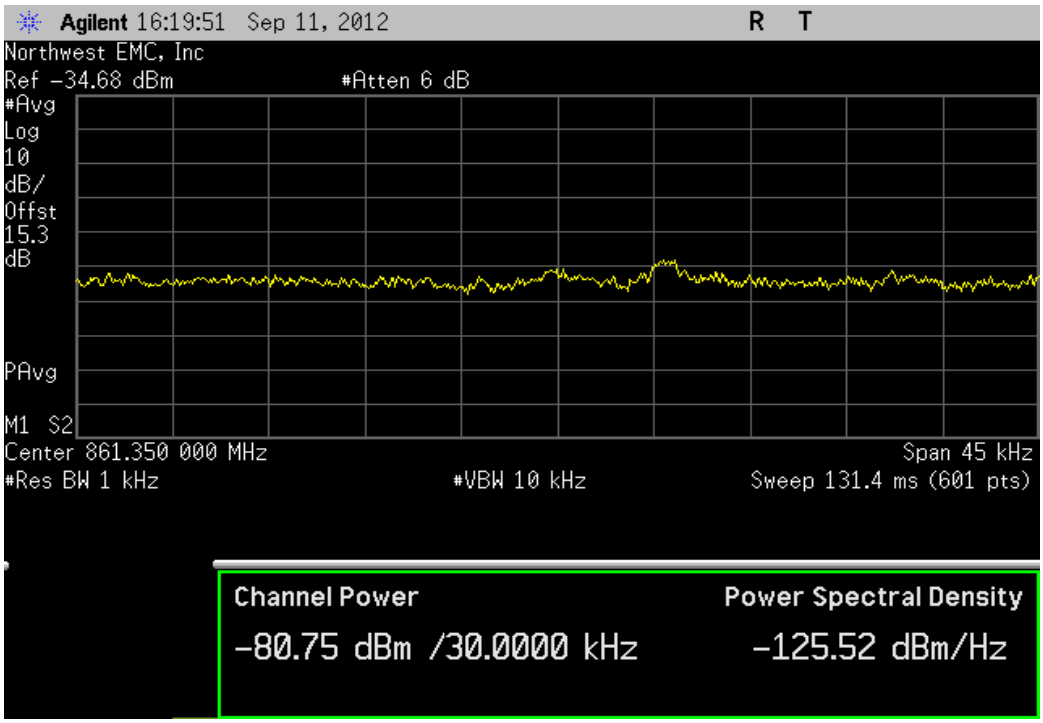
Port B, LTE 5M, Low, Center							
					Value	Limit	Result
					-40.39	-20	Pass



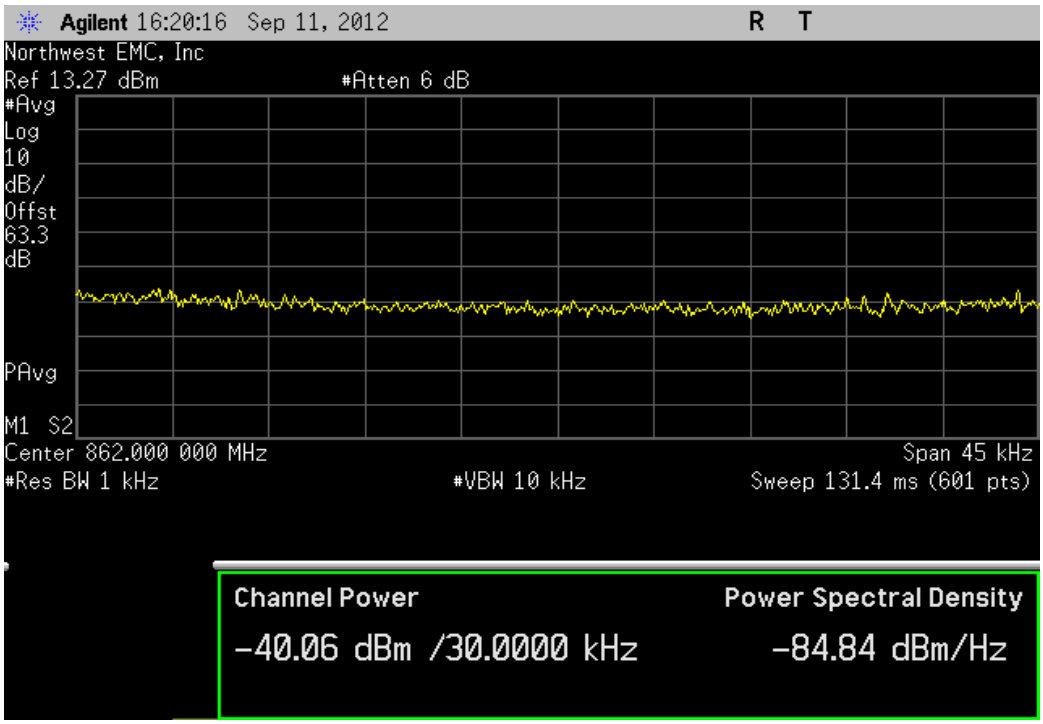
Port B, LTE 5M, Low, High							
					Value	Limit	Result
					-33.99	-20	Pass



Port B, LTE 5M, Mid, Low							
					Value	Limit	Result
					-80.75	-69	Pass



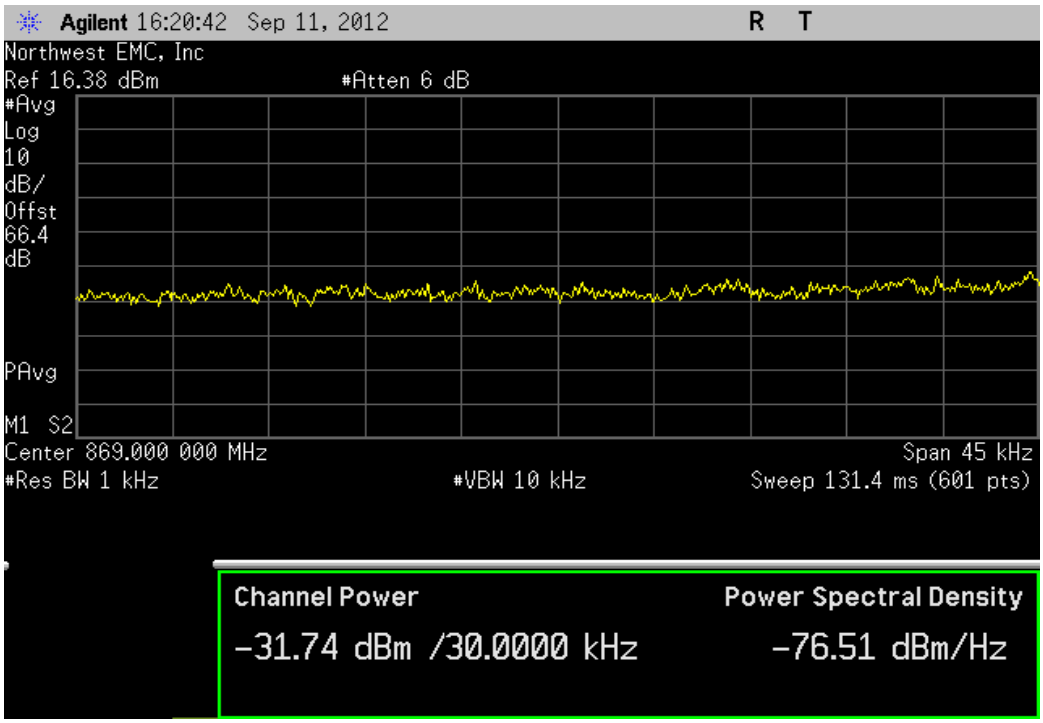
Port B, LTE 5M, Mid, Center							
					Value	Limit	Result
					-40.06	-20	Pass



Emissions Mask - LTE

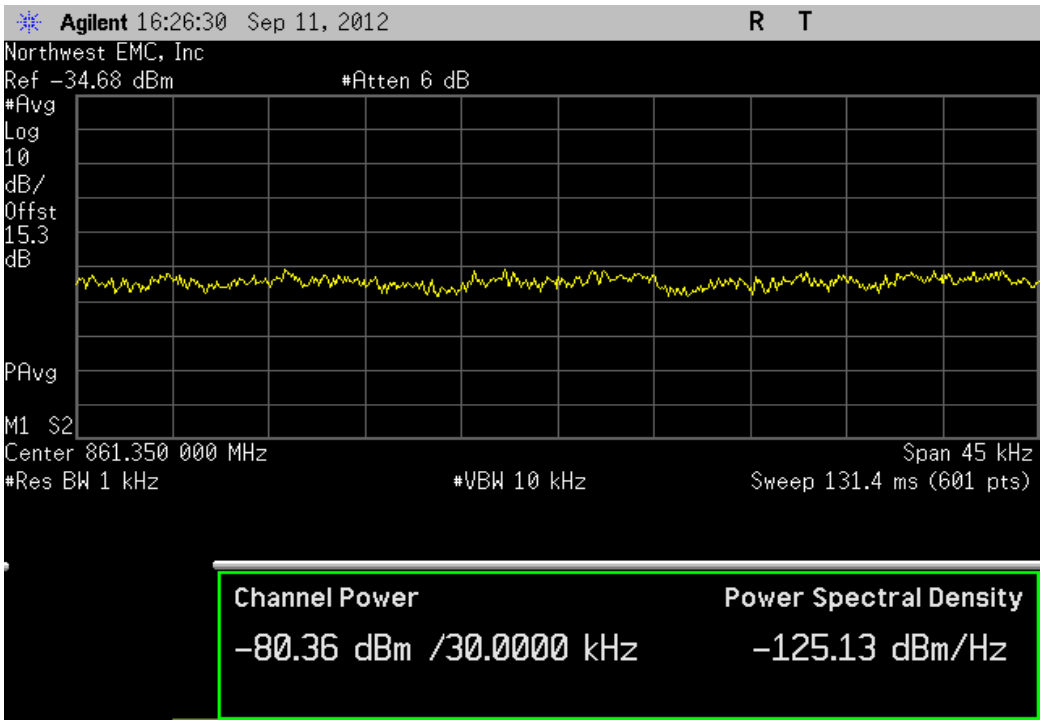
Port B, LTE 5M, Mid, High

				Value	Limit	Result
				-31.74	-20	Pass

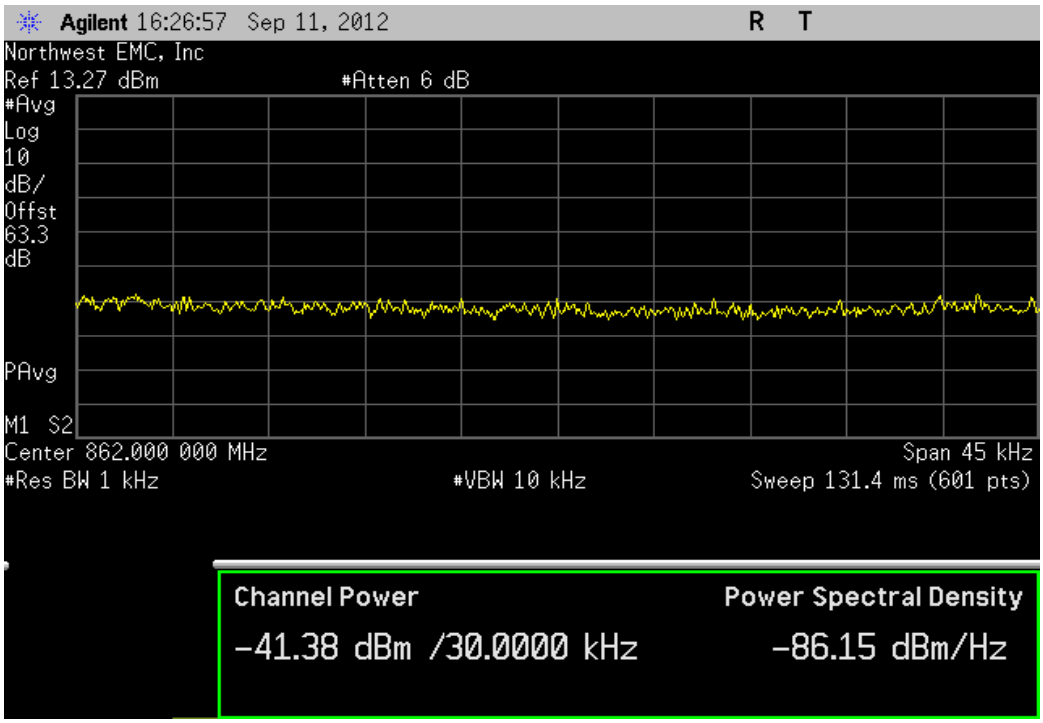


Port B, LTE 5M, High, Low

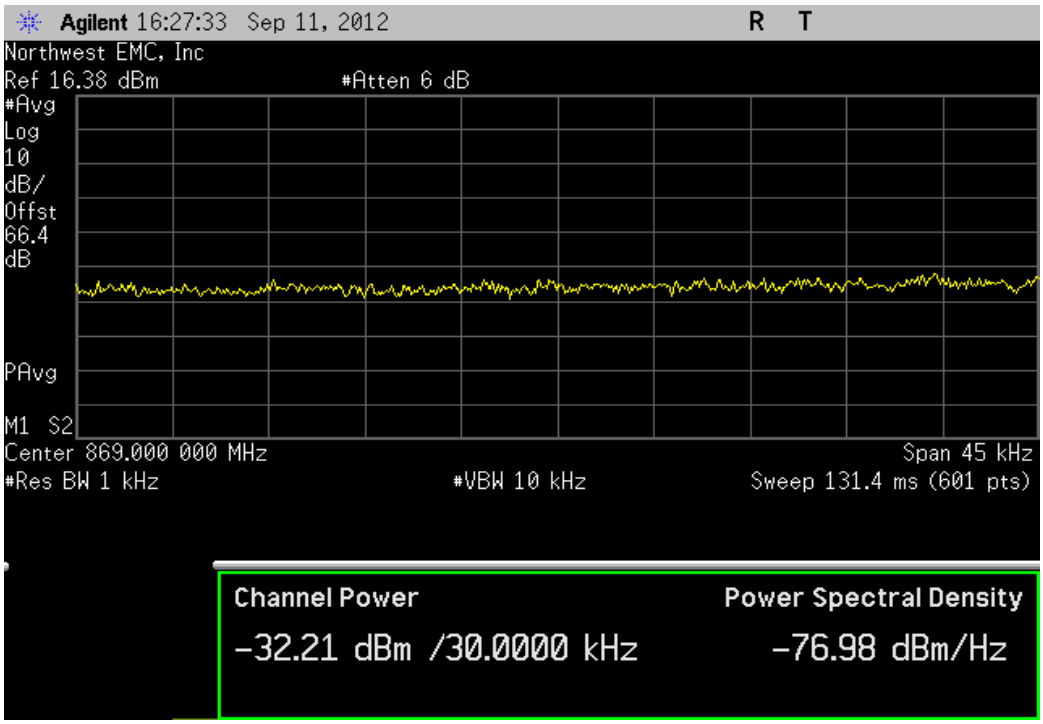
				Value	Limit	Result
				-80.36	-69	Pass



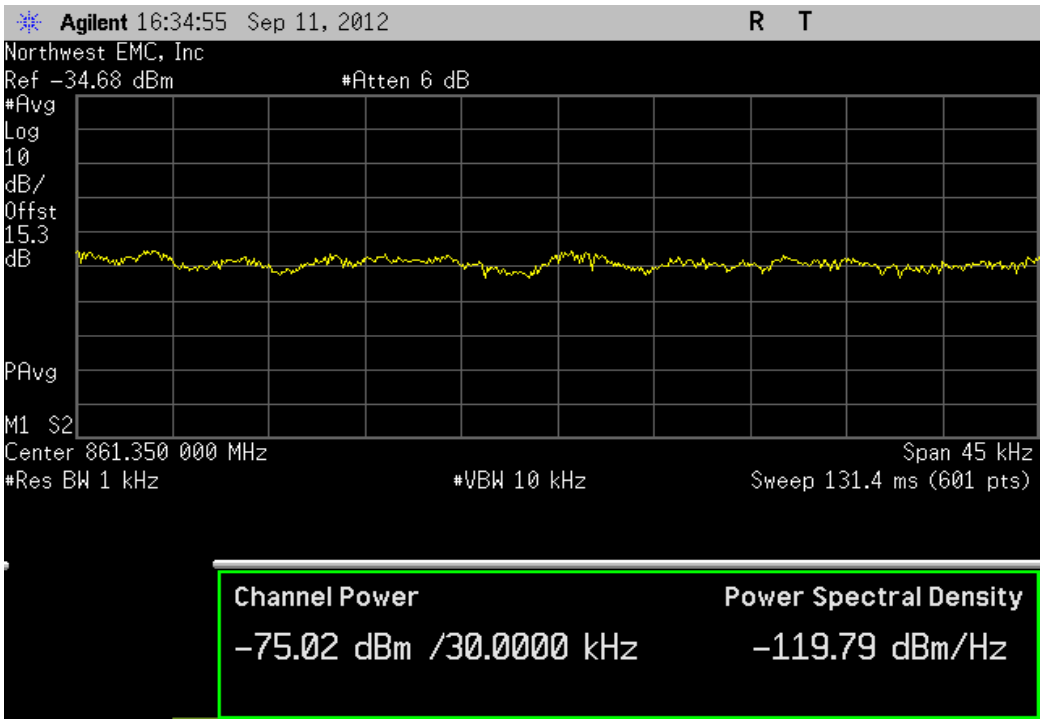
Port B, LTE 5M, High, Center						
				Value	Limit	Result
				-41.38	-20	Pass



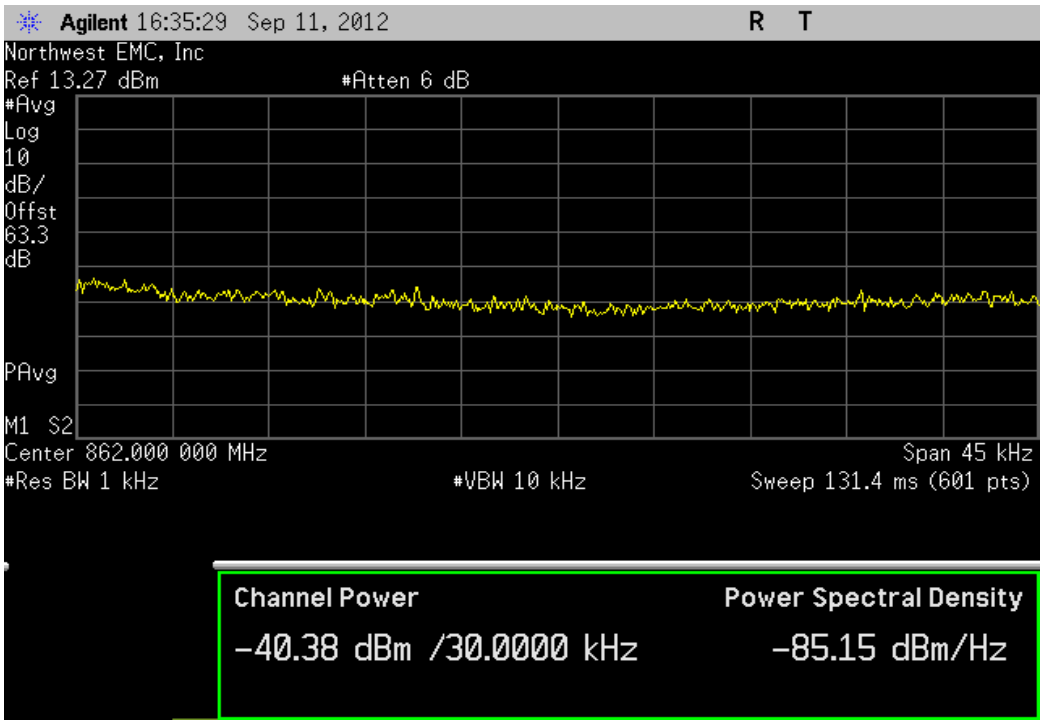
Port B, LTE 5M, High, High						
				Value	Limit	Result
				-32.21	-20	Pass



Multi-Carrier Port A, LTE 1.4M, Low, Low							
					Value	Limit	Result
					-75.02	-69	Pass

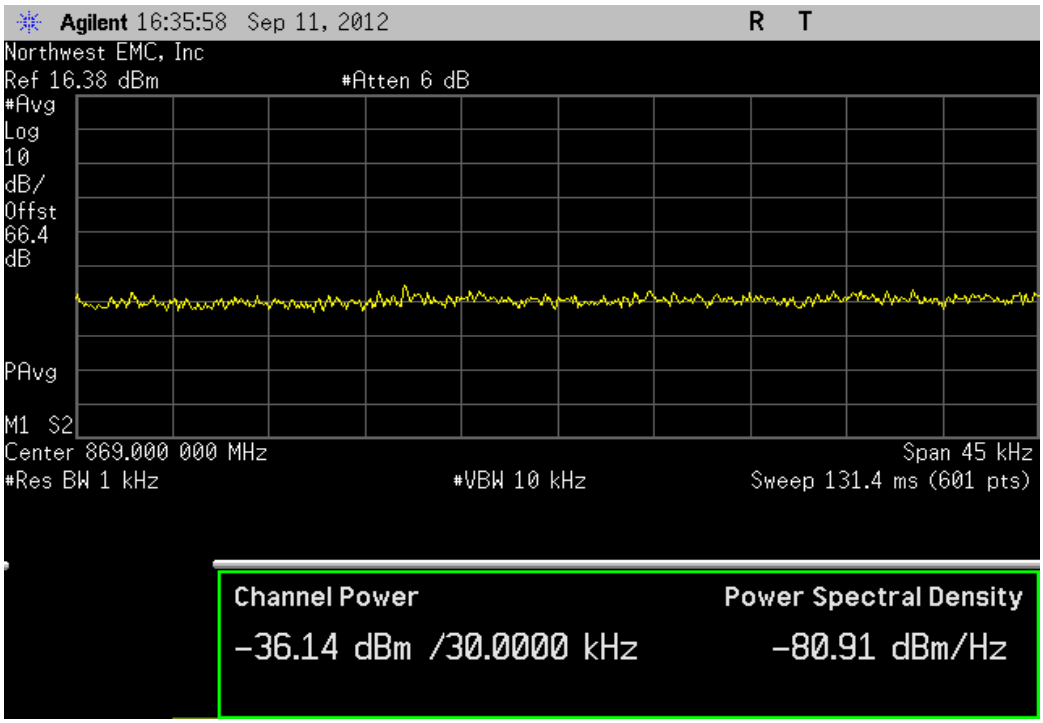


Multi-Carrier Port A, LTE 1.4M, Low, Center							
					Value	Limit	Result
					-40.38	-20	Pass

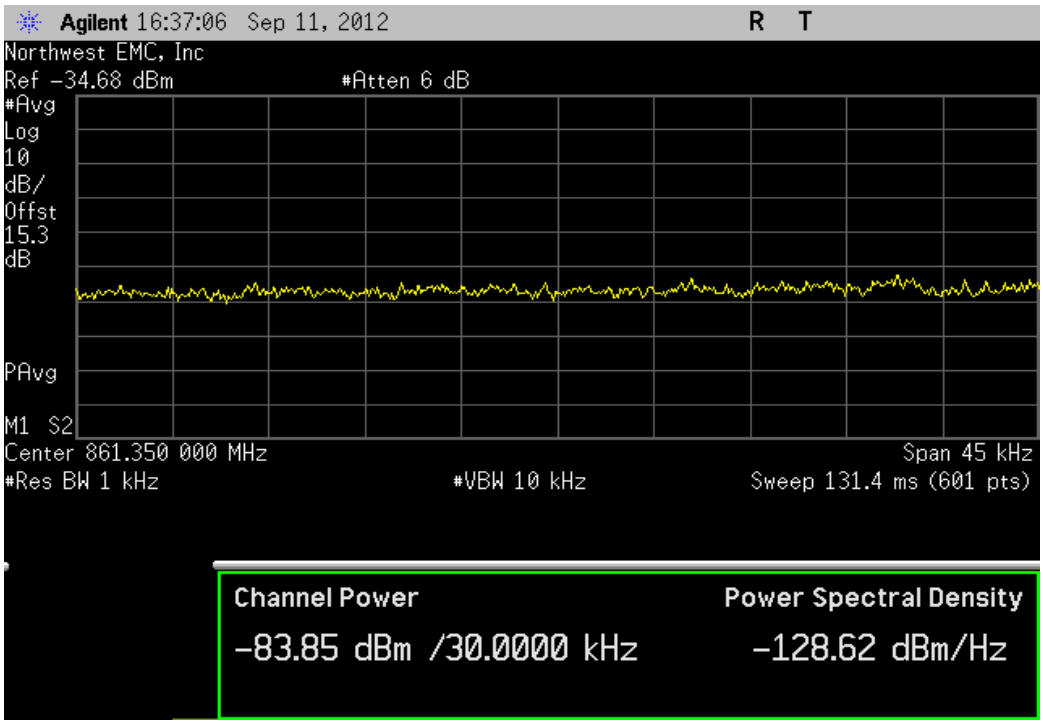


Emissions Mask - LTE

Multi-Carrier Port A, LTE 1.4M, Low, High							
					Value	Limit	Result
					-36.14	-20	Pass

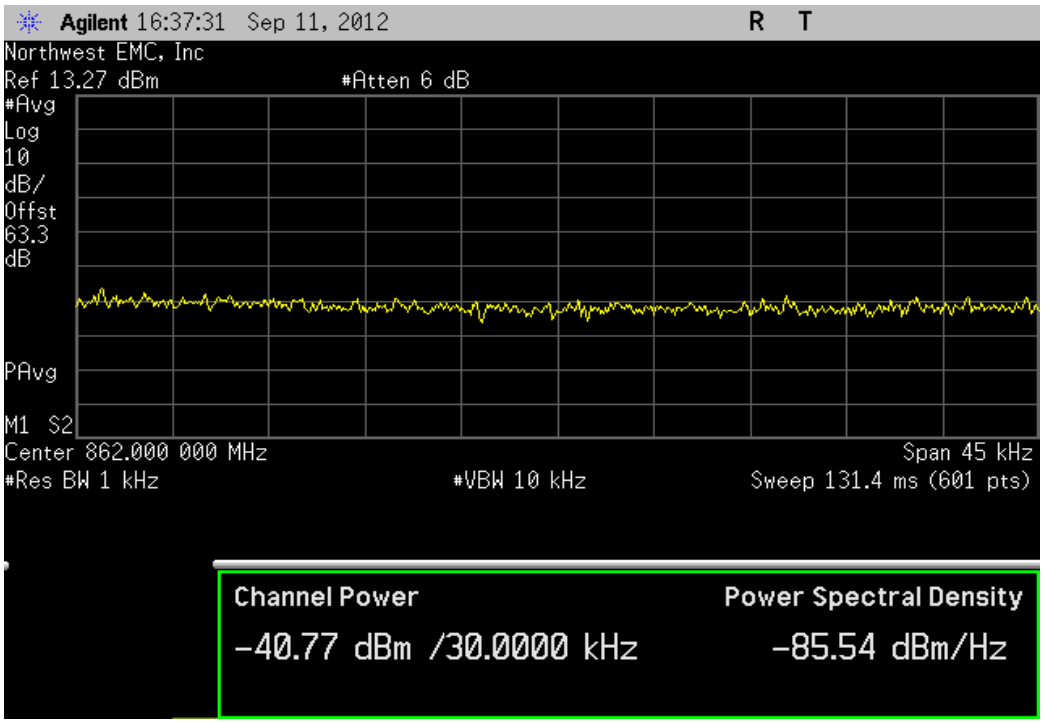


Multi-Carrier Port A, LTE 1.4M, Mid, Low							
					Value	Limit	Result
					-83.85	-69	Pass

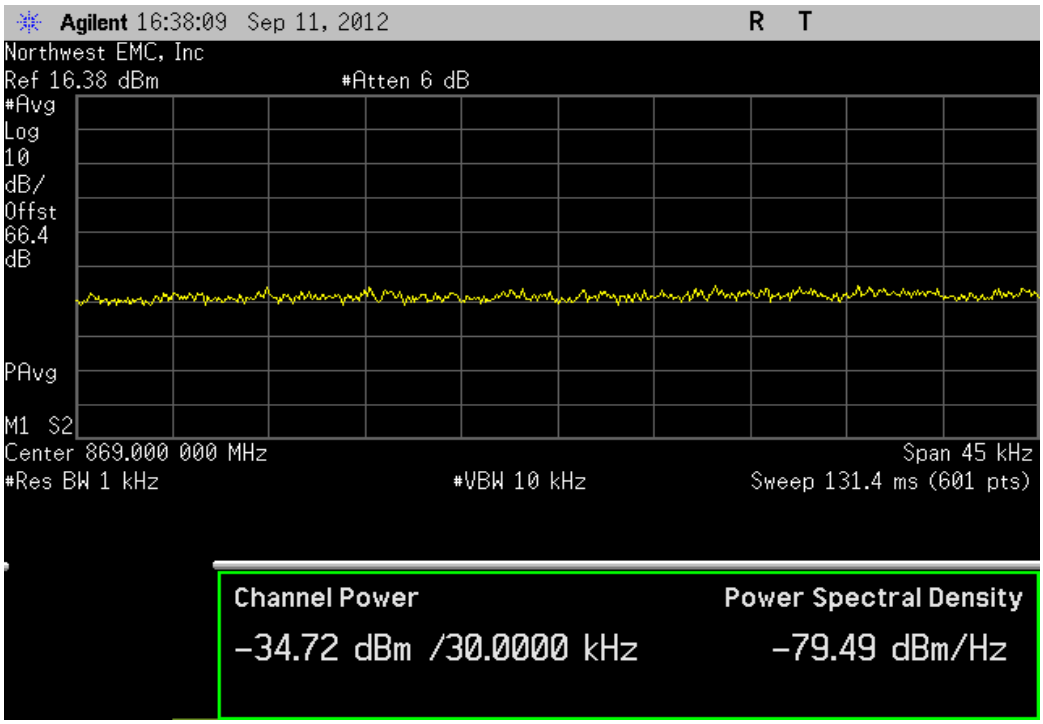


Emissions Mask - LTE

Multi-Carrier Port A, LTE 1.4M, Mid, Center						
				Value	Limit	Result
				-40.77	-20	Pass

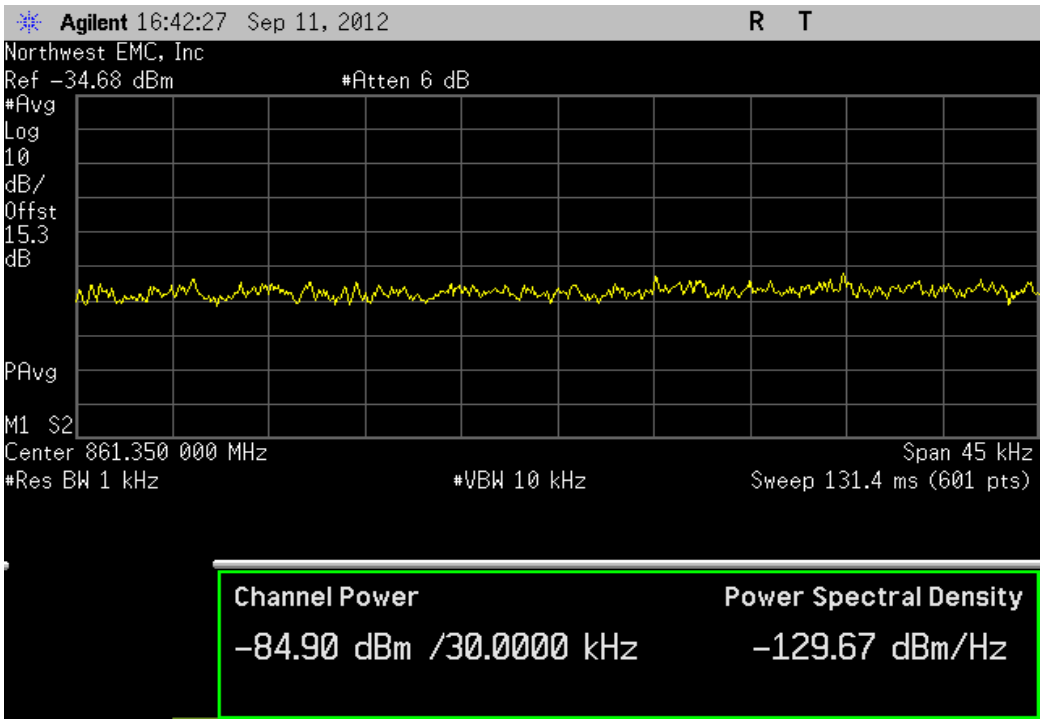


Multi-Carrier Port A, LTE 1.4M, Mid, High						
				Value	Limit	Result
				-34.72	-20	Pass

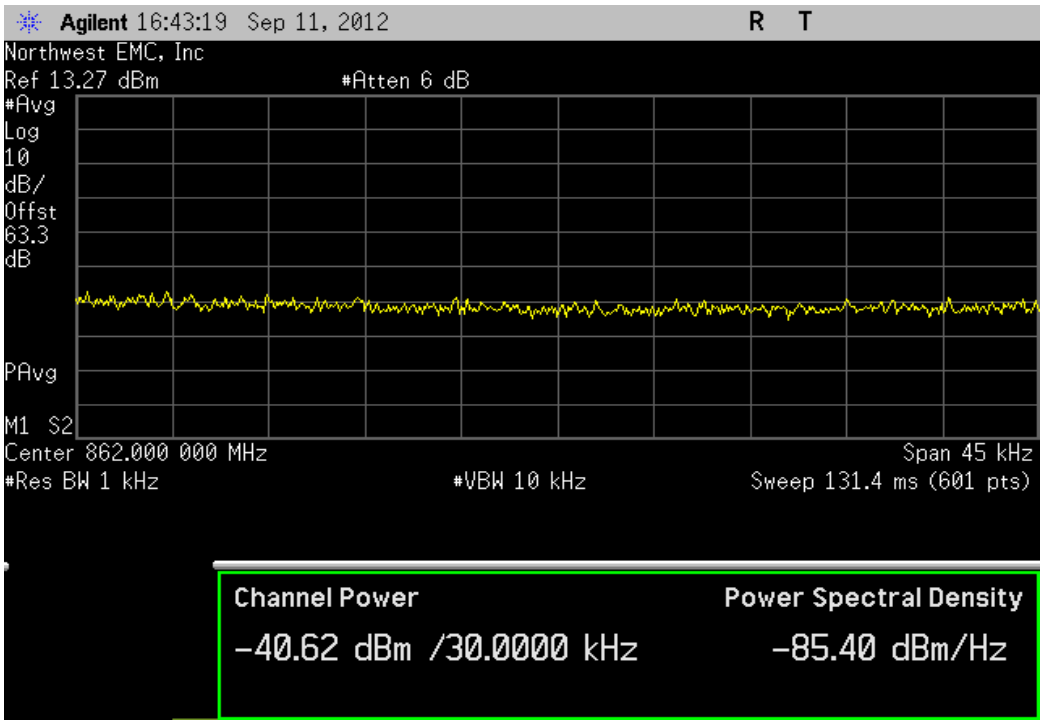


Emissions Mask - LTE

Multi-Carrier Port A, LTE 1.4M, High, Low							
					Value	Limit	Result
					-84.9	-69	Pass

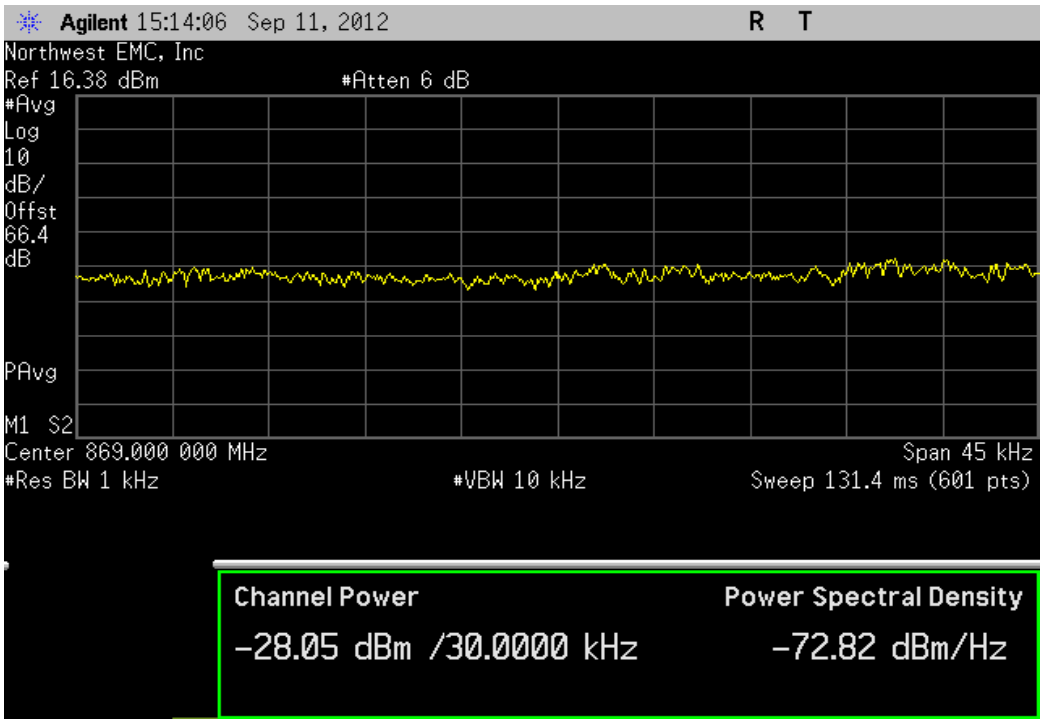


Multi-Carrier Port A, LTE 1.4M, High, Center							
					Value	Limit	Result
					-40.62	-20	Pass

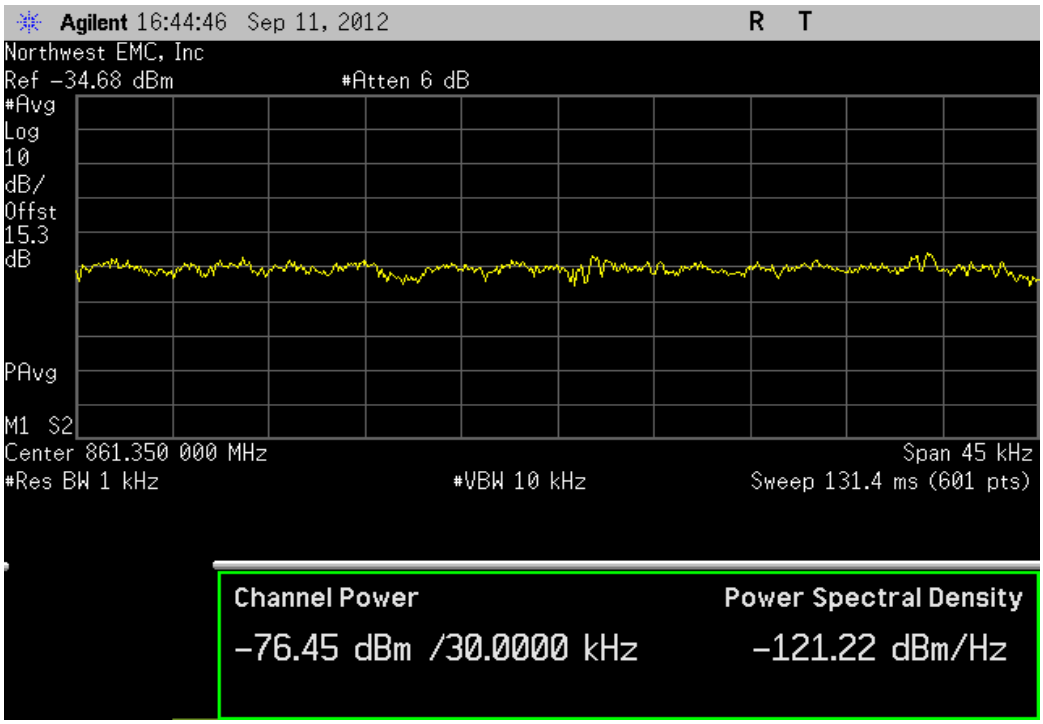


Emissions Mask - LTE

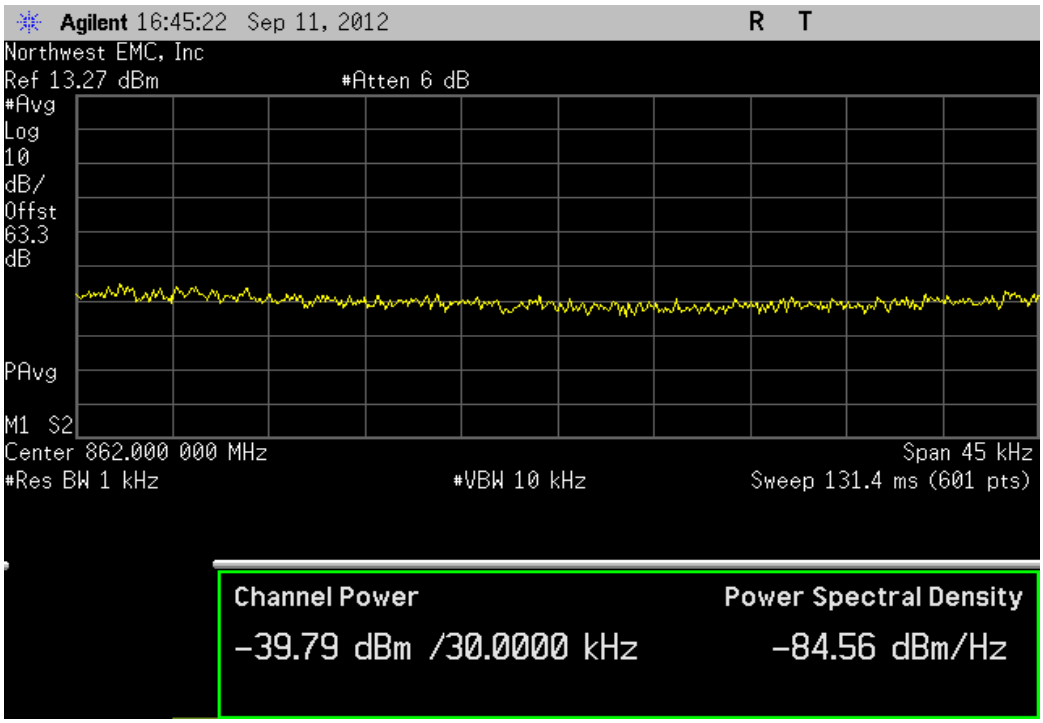
Multi-Carrier Port A, LTE 1.4M, High, High							
					Value	Limit	Result
					-28.05	-20	Pass



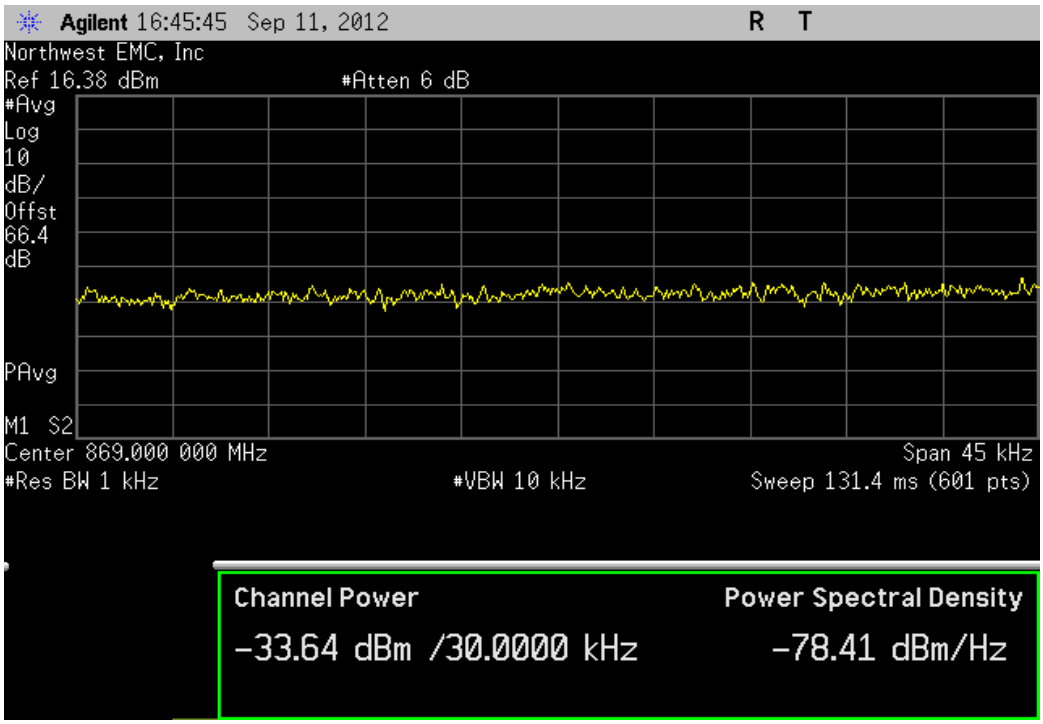
Multi-Carrier Port A, LTE 3M, Low, Low							
					Value	Limit	Result
					-76.45	-69	Pass



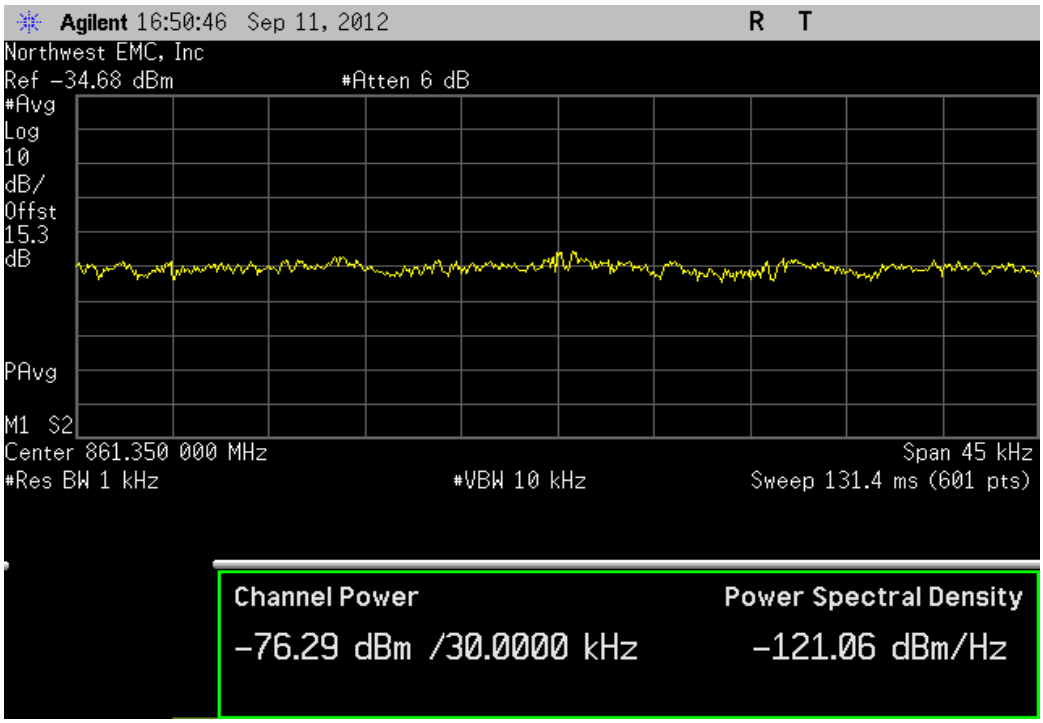
Multi-Carrier Port A, LTE 3M, Low, Center						
				Value	Limit	Result
				-39.79	-20	Pass



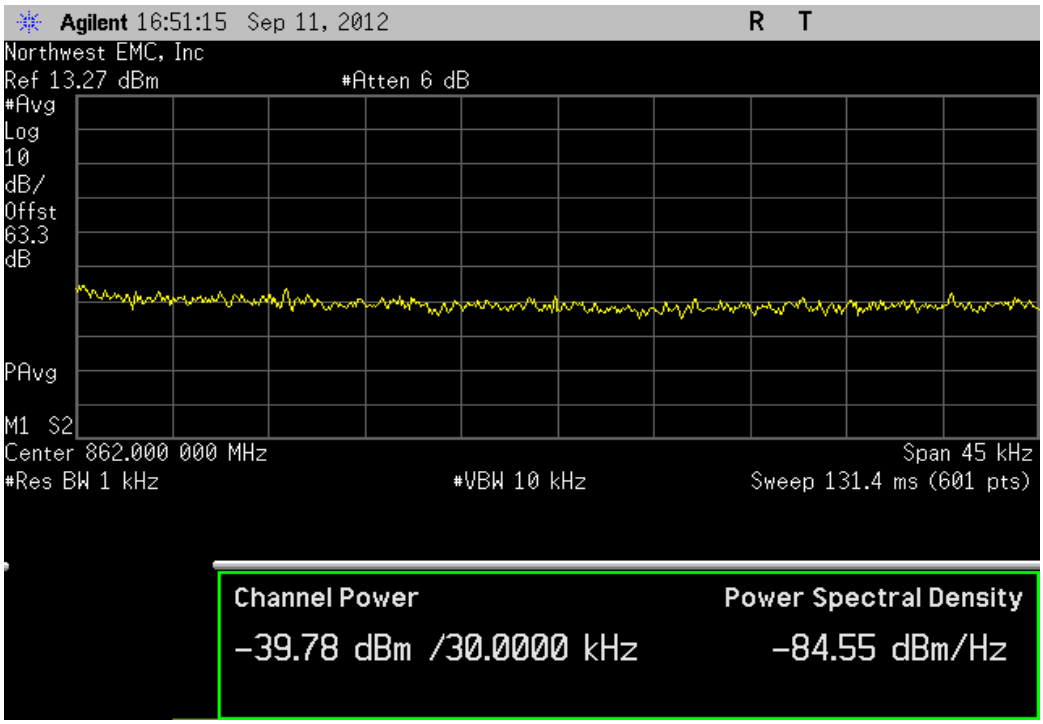
Multi-Carrier Port A, LTE 3M, Low, High						
				Value	Limit	Result
				-33.64	-20	Pass



Multi-Carrier Port A, LTE 3M, Mid, Low							
					Value	Limit	Result
					-76.29	-69	Pass

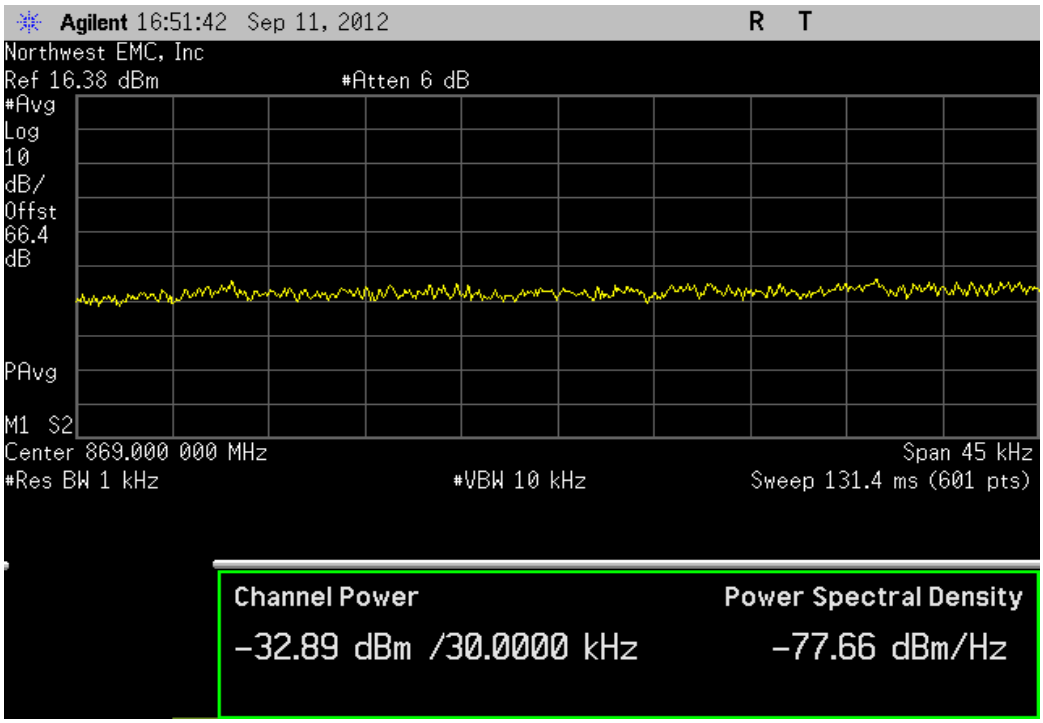


Multi-Carrier Port A, LTE 3M, Mid, Center							
					Value	Limit	Result
					-39.78	-20	Pass

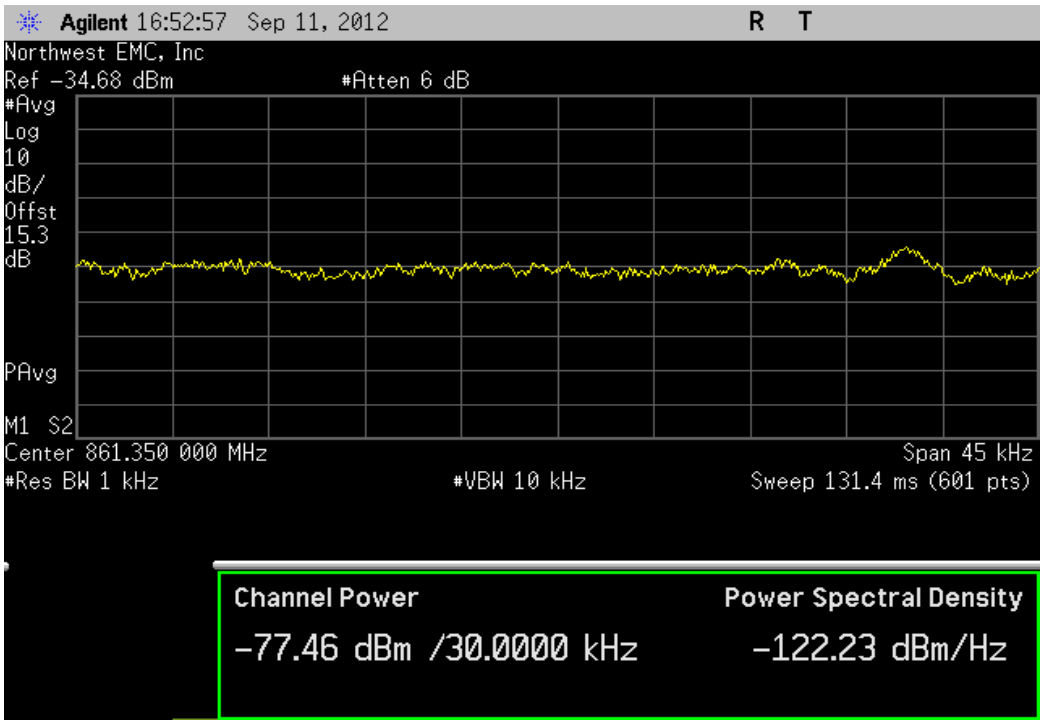


Emissions Mask - LTE

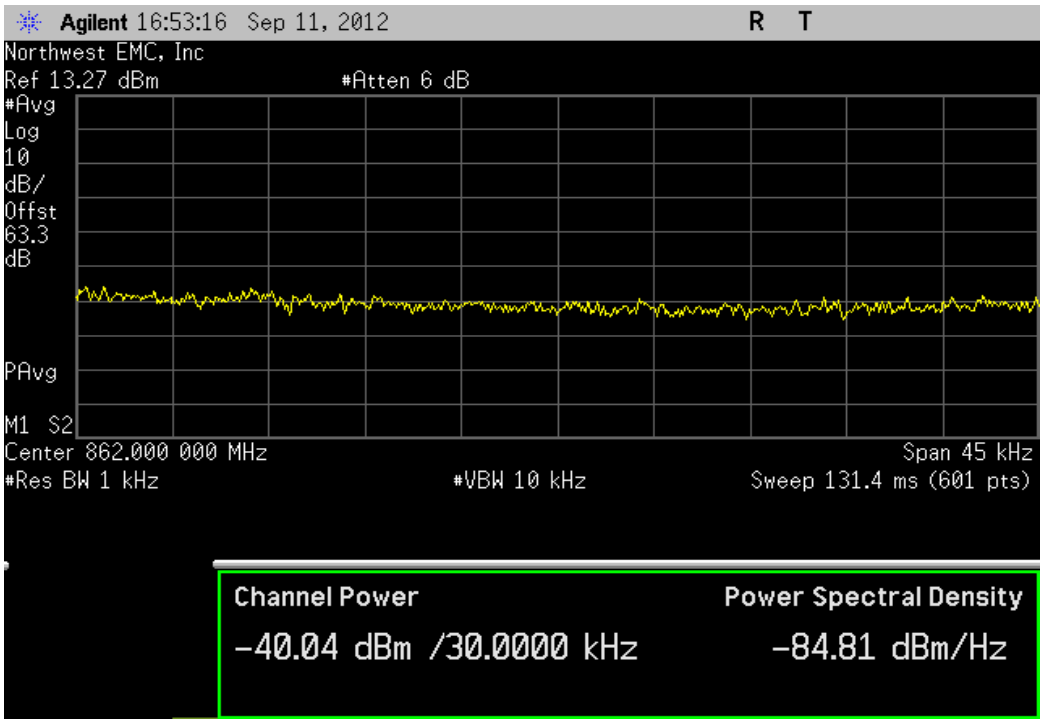
Multi-Carrier Port A, LTE 3M, Mid, High							
					Value	Limit	Result
					-32.89	-20	Pass



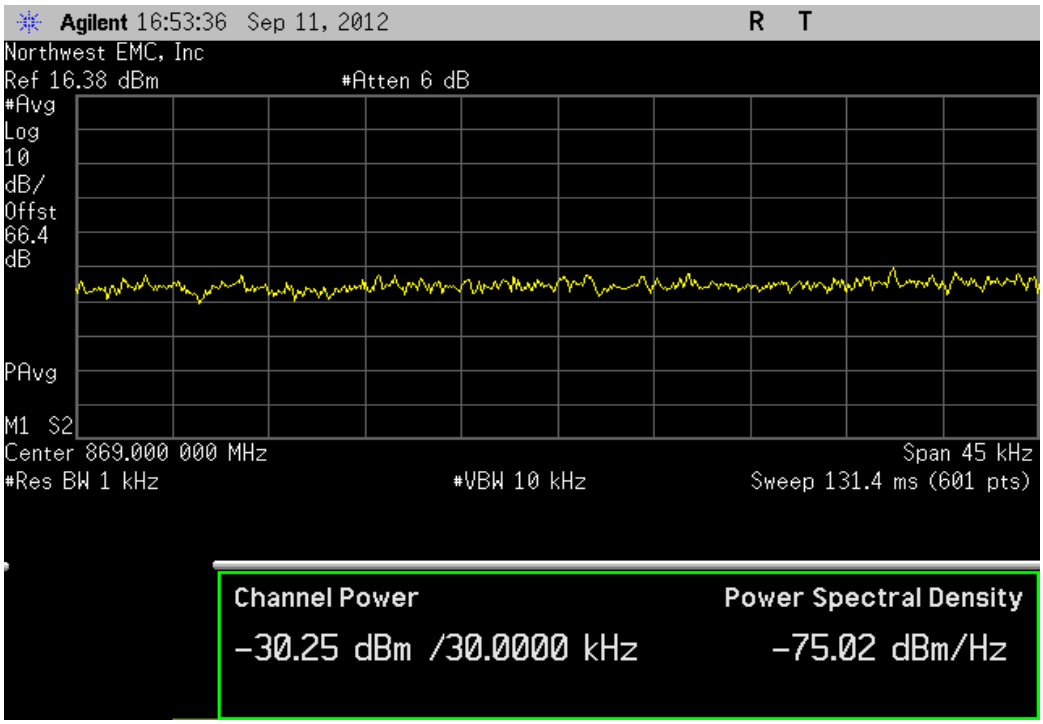
Multi-Carrier Port A, LTE 3M, High, Low							
					Value	Limit	Result
					-77.46	-69	Pass



Multi-Carrier Port A, LTE 3M, High, Center						
				Value	Limit	Result
				-40.04	-20	Pass

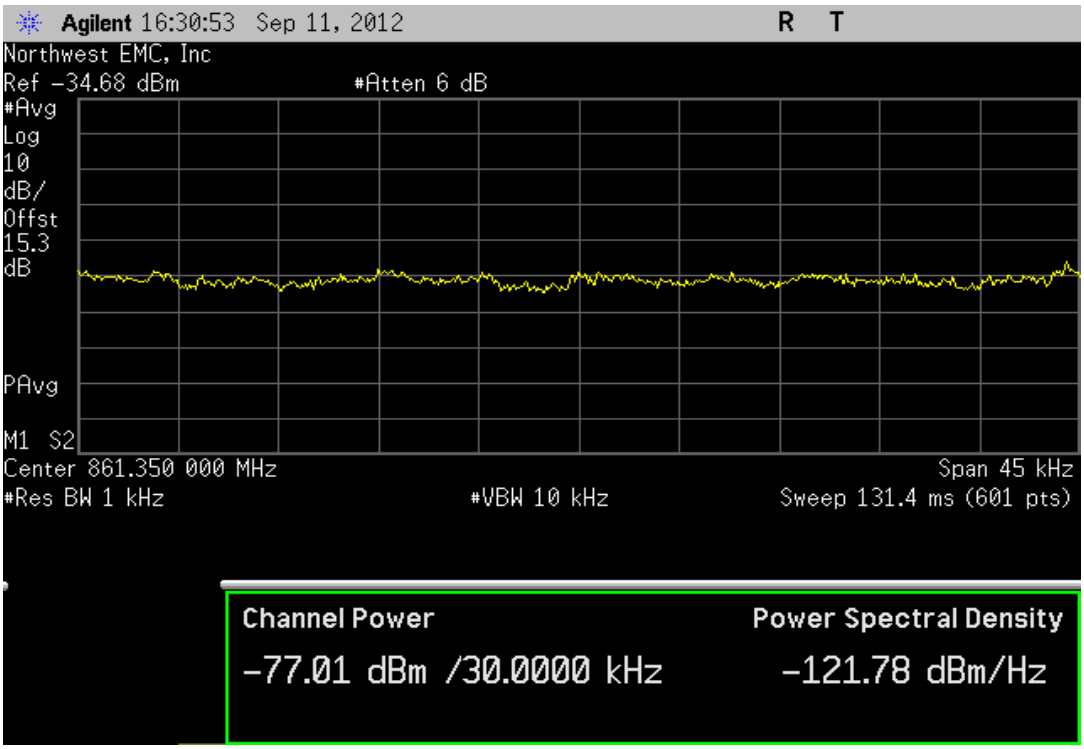


Multi-Carrier Port A, LTE 3M, High, High						
				Value	Limit	Result
				-30.25	-20	Pass

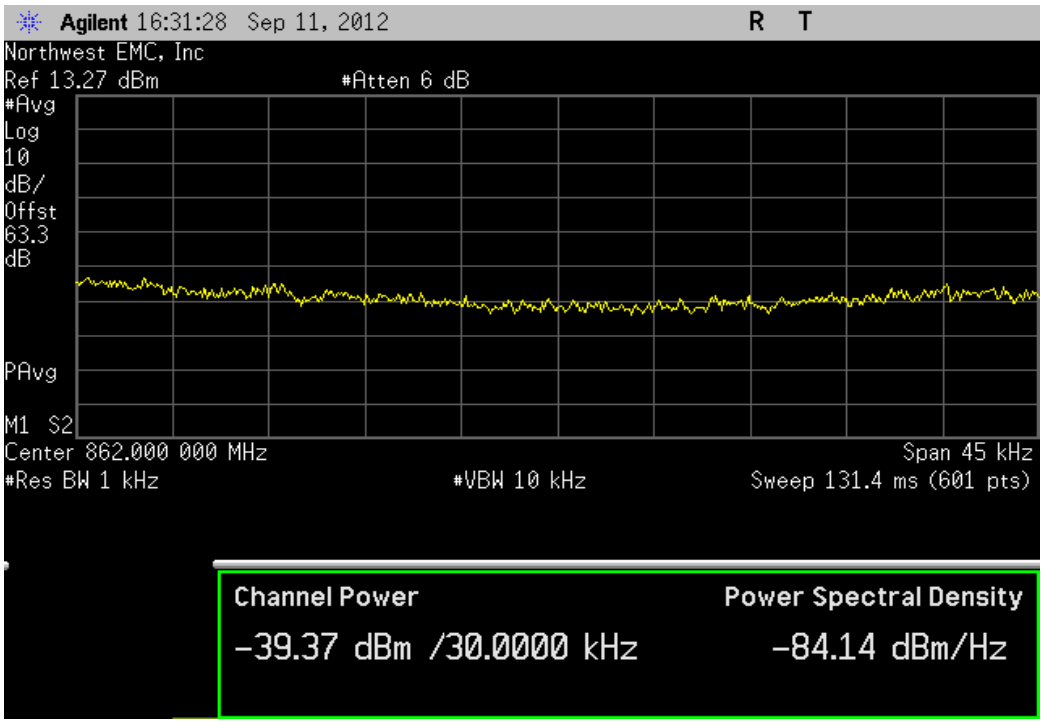


Emissions Mask - LTE

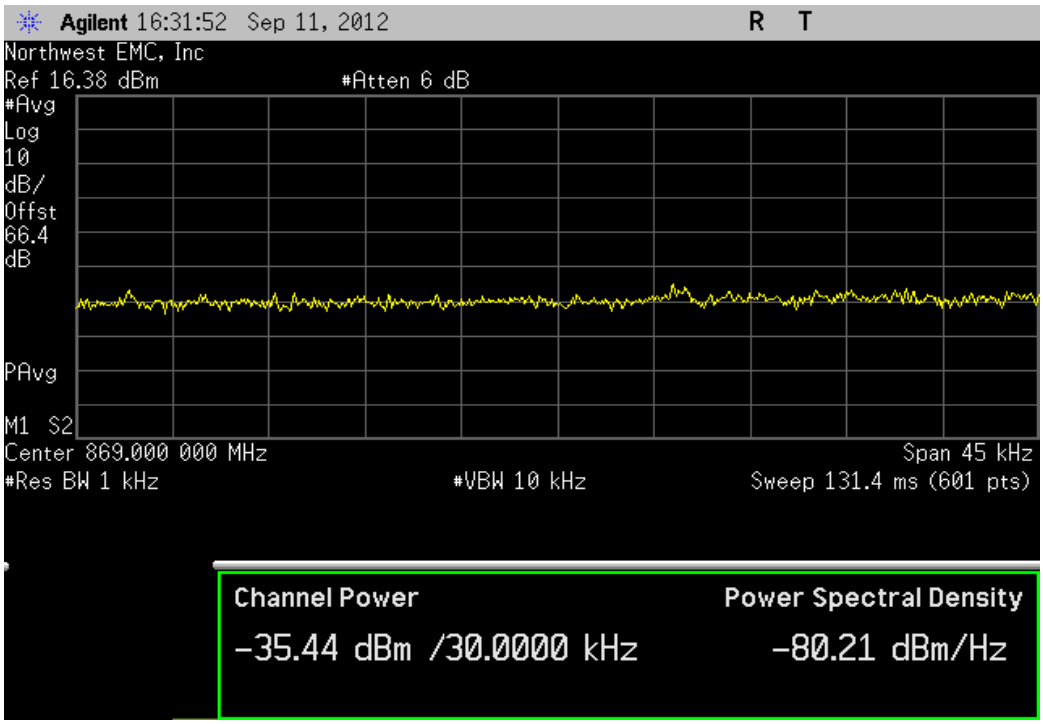
Multi-Carrier Port B, LTE 1.4M, Low, Low						
				Value	Limit	Result
				-77.01	-69	Pass



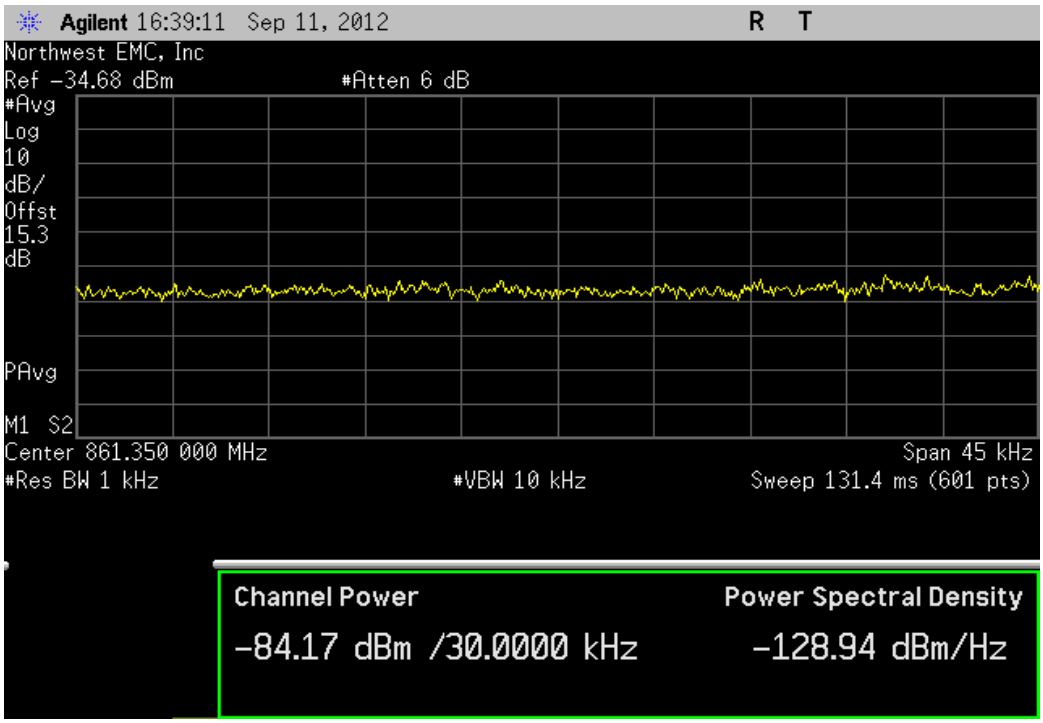
Multi-Carrier Port B, LTE 1.4M, Low, Center							
					Value	Limit	Result
					-39.37	-20	Pass



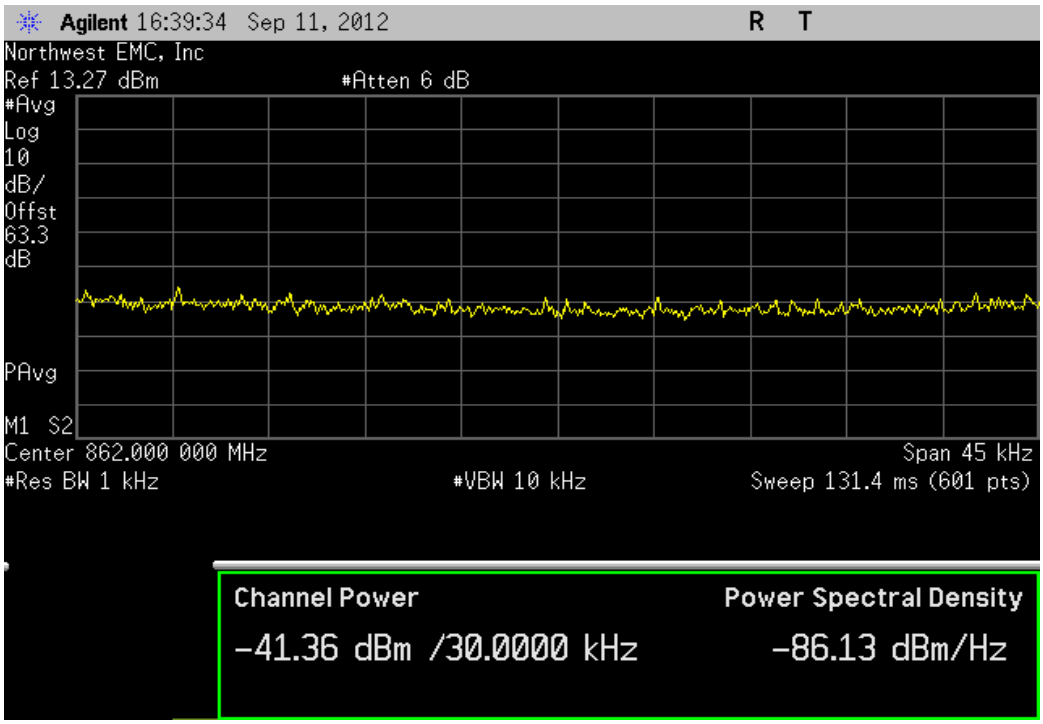
Multi-Carrier Port B, LTE 1.4M, Low, High							
					Value	Limit	Result
					-35.44	-20	Pass



Multi-Carrier Port B, LTE 1.4M, Mid, Low							
					Value	Limit	Result
					-84.17	-69	Pass

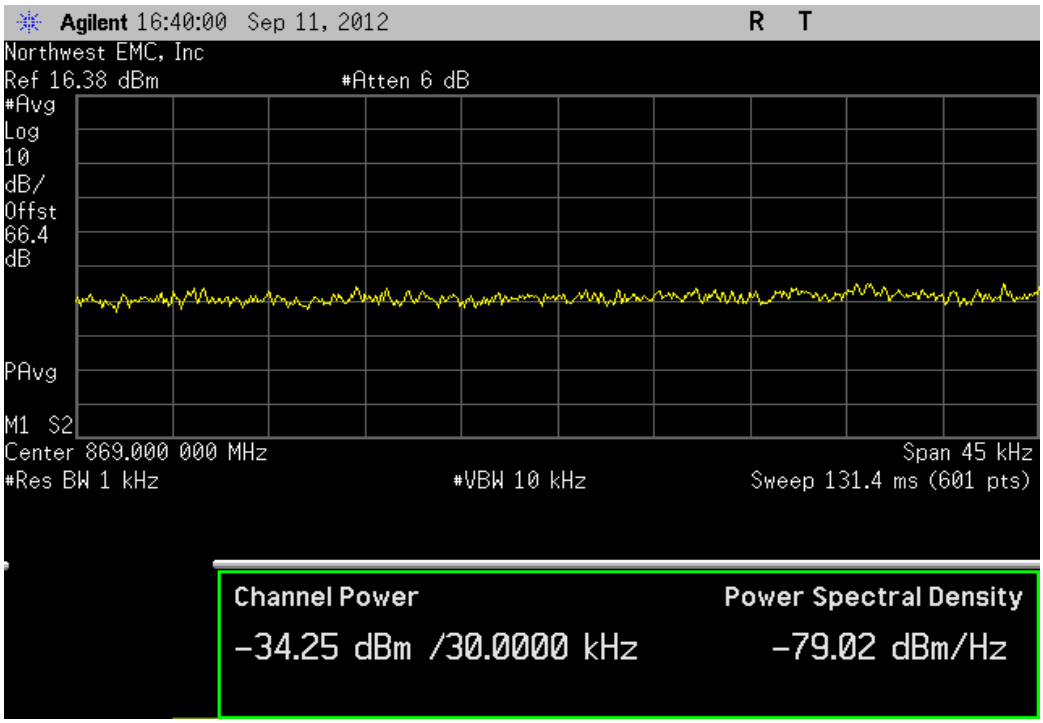


Multi-Carrier Port B, LTE 1.4M, Mid, Center							
					Value	Limit	Result
					-41.36	-20	Pass



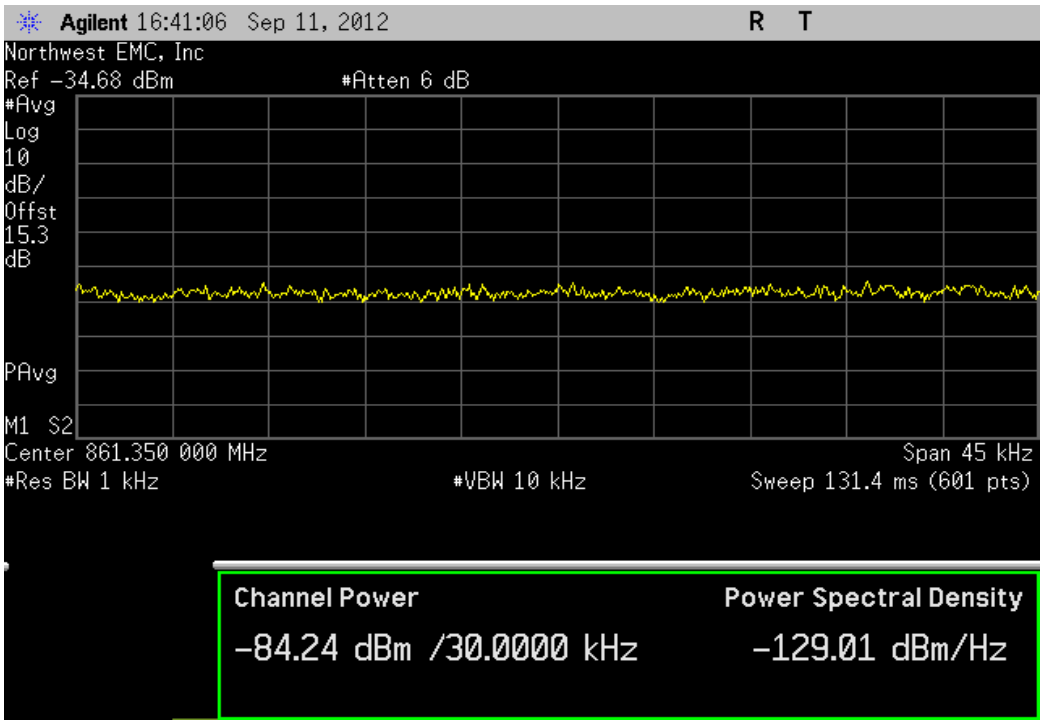
Multi-Carrier Port B, LTE 1.4M, Mid, High

				Value	Limit	Result
				-34.25	-20	Pass



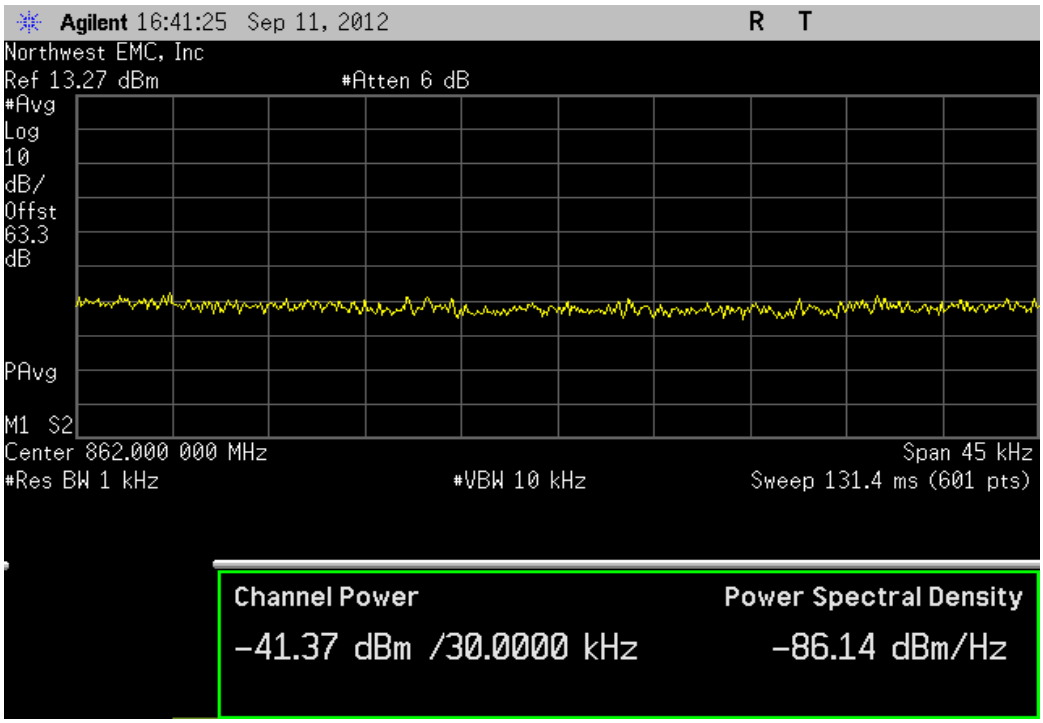
Multi-Carrier Port B, LTE 1.4M, High, Low

				Value	Limit	Result
				-84.24	-69	Pass

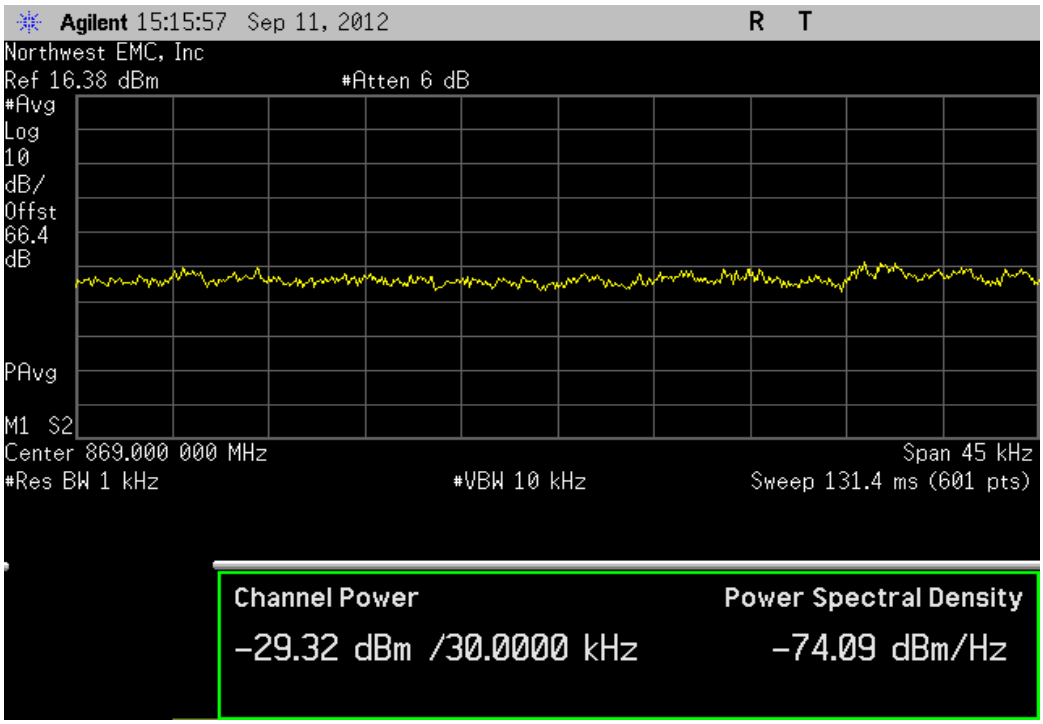


Emissions Mask - LTE

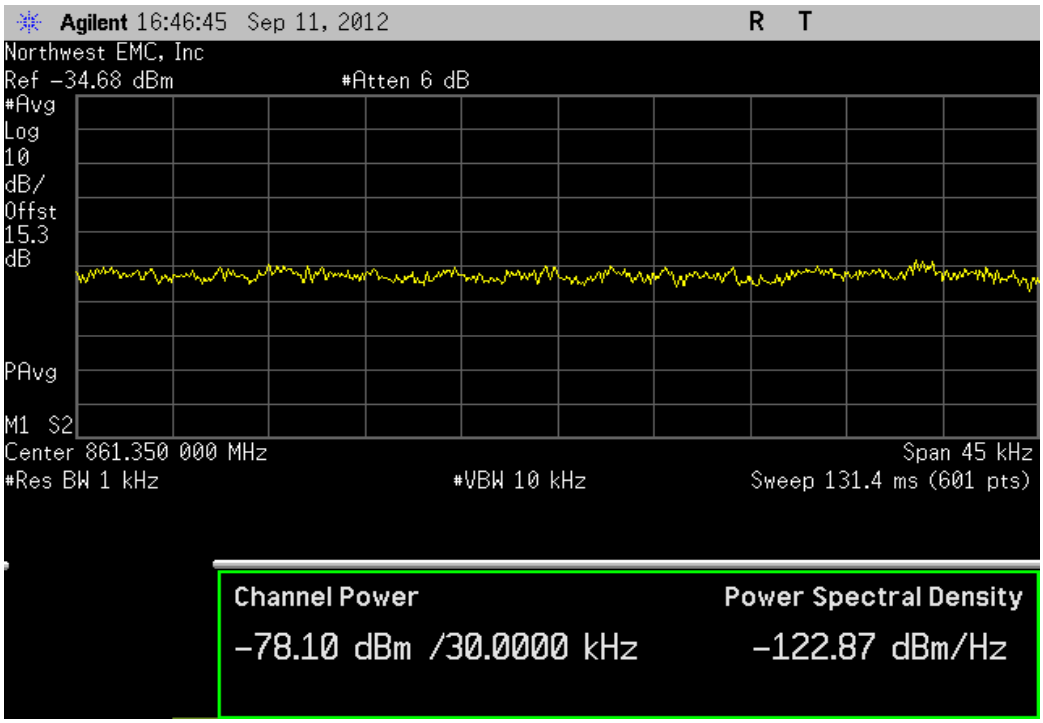
Multi-Carrier Port B, LTE 1.4M, High, Center							
					Value	Limit	Result
					-41.37	-20	Pass



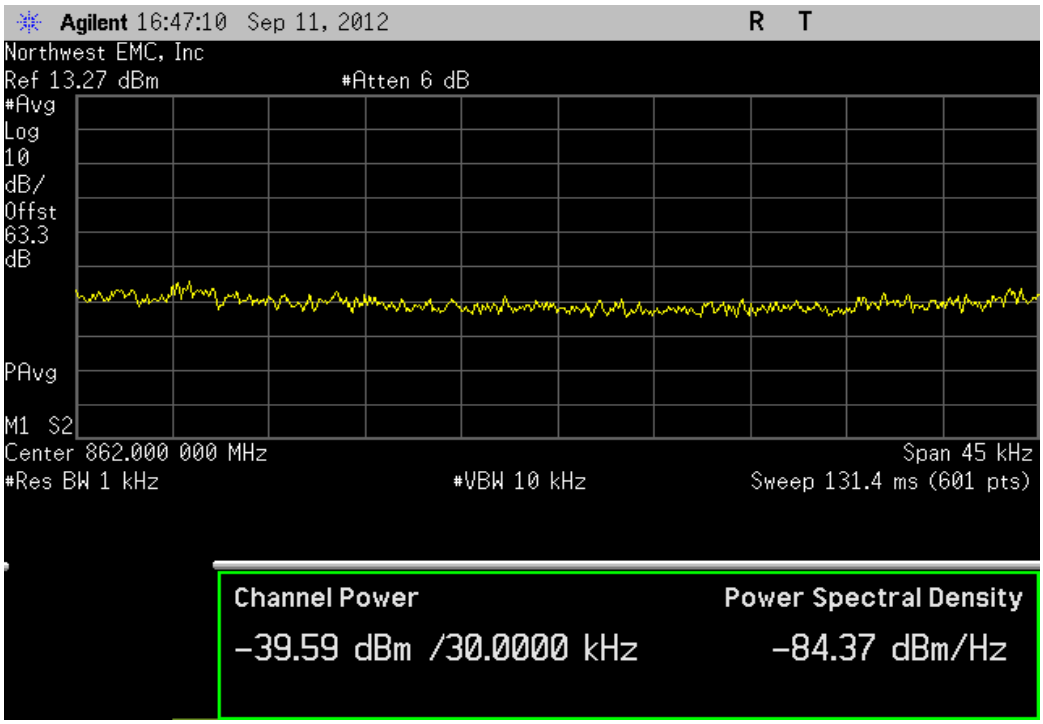
Multi-Carrier Port B, LTE 1.4M, High, High							
					Value	Limit	Result
					-29.32	-20	Pass



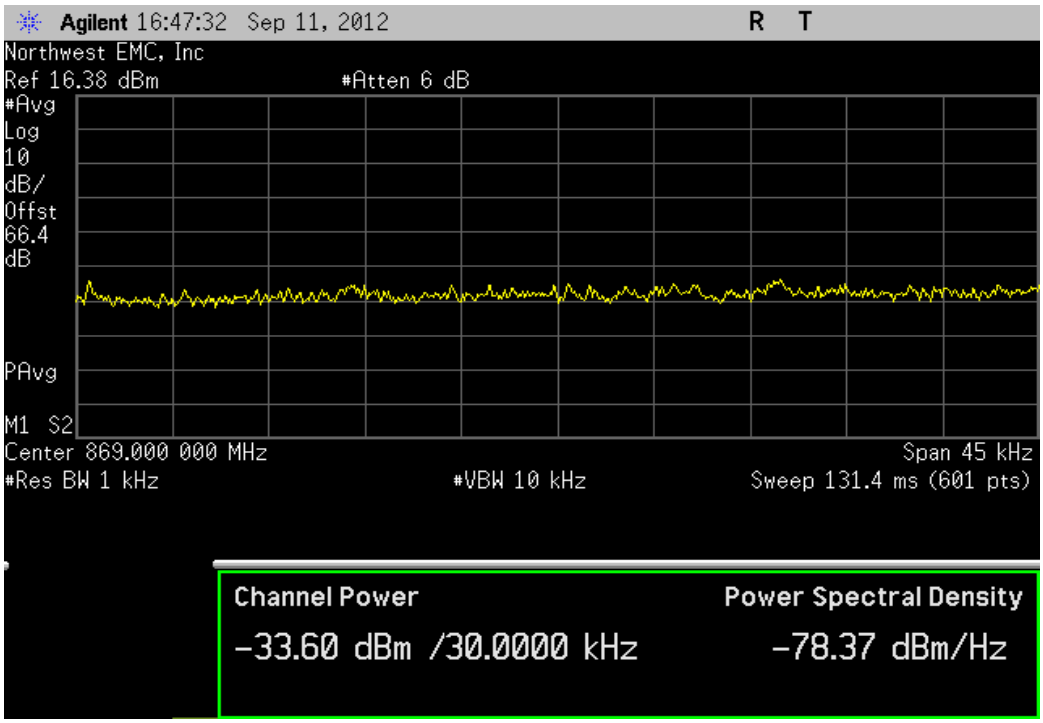
Multi-Carrier Port B, LTE 3M, Low, Low							
					Value	Limit	Result
					-78.1	-69	Pass



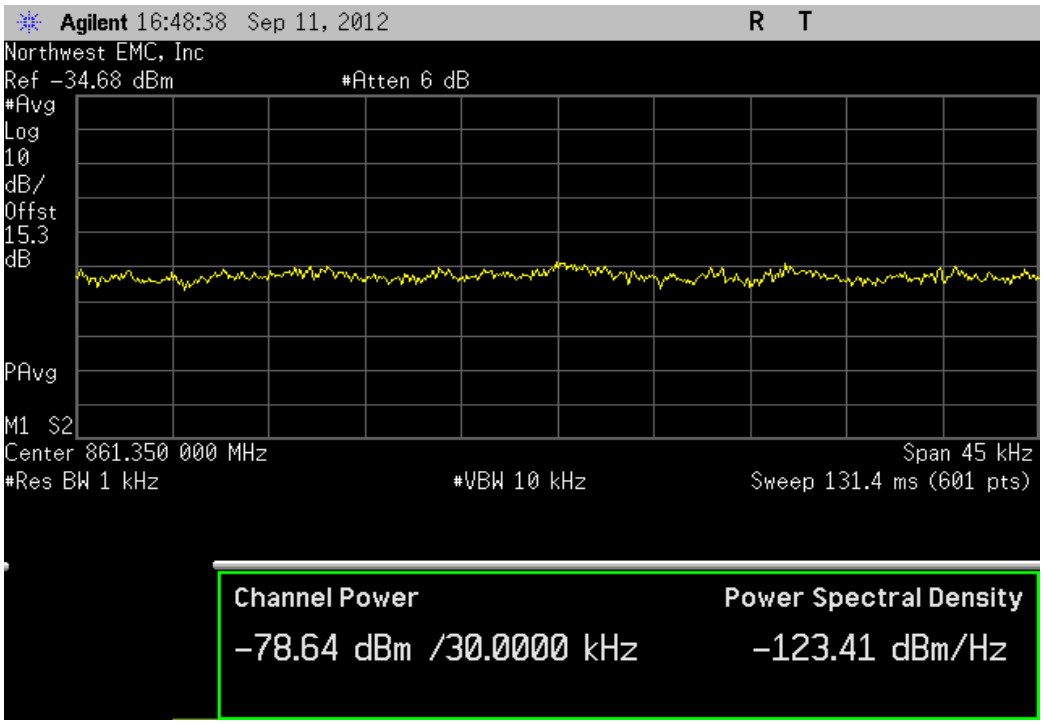
Multi-Carrier Port B, LTE 3M, Low, Center							
					Value	Limit	Result
					-39.59	-20	Pass



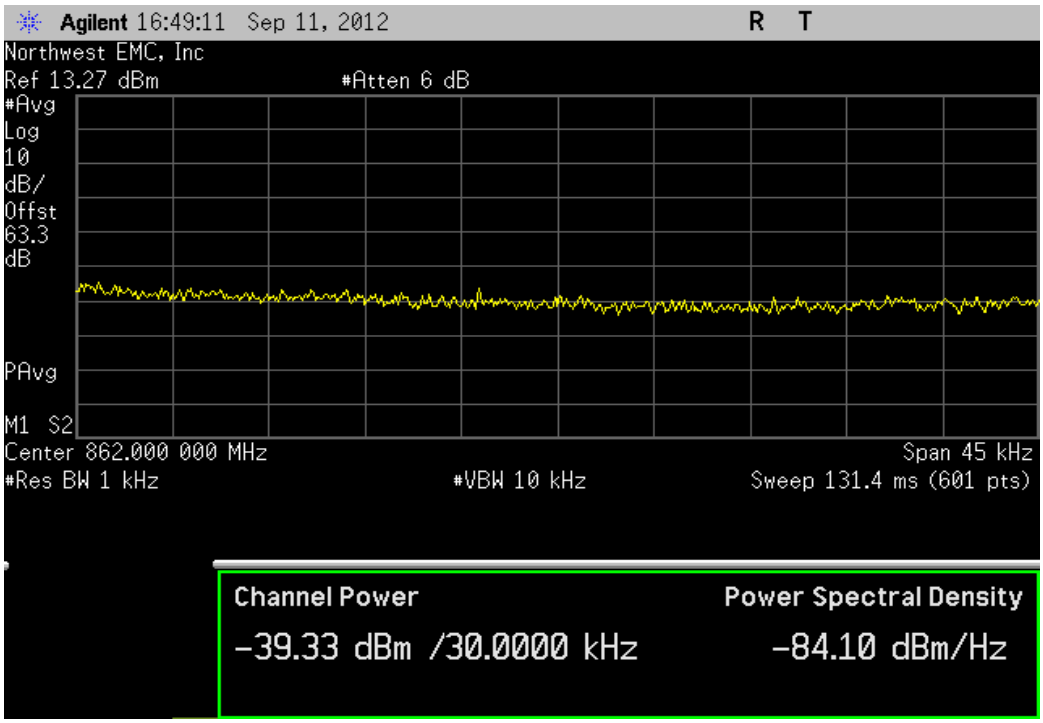
Multi-Carrier Port B, LTE 3M, Low, High							
					Value	Limit	Result
					-33.6	-20	Pass



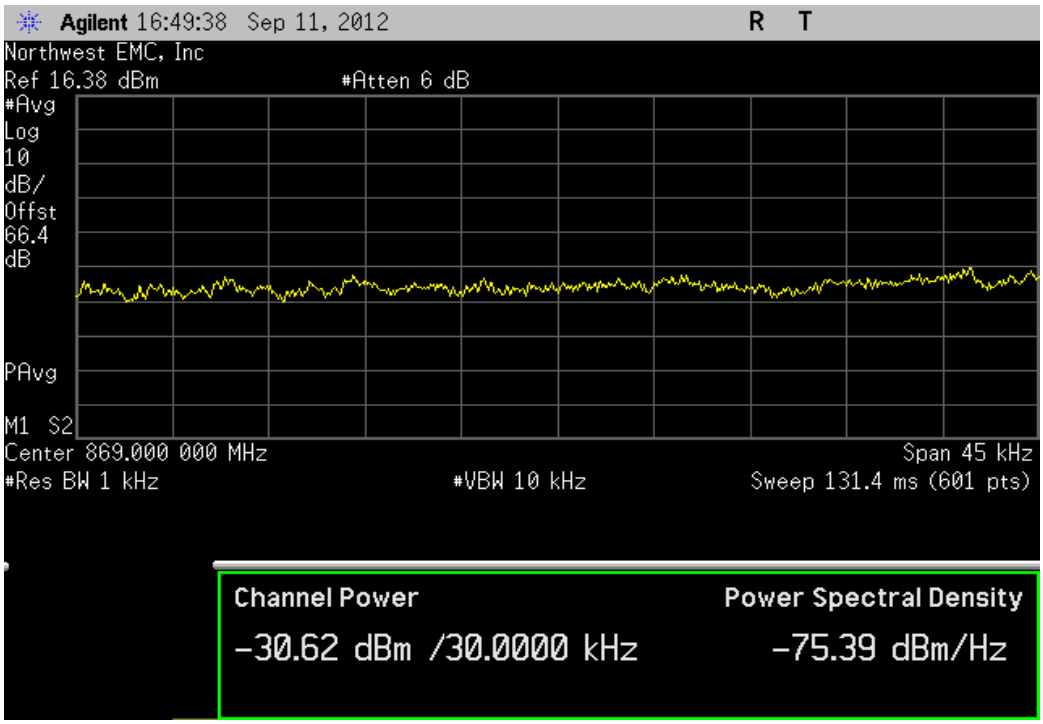
Multi-Carrier Port B, LTE 3M, Mid, Low							
					Value	Limit	Result
					-78.64	-69	Pass



Multi-Carrier Port B, LTE 3M, Mid, Center							
					Value	Limit	Result
					-39.33	-20	Pass

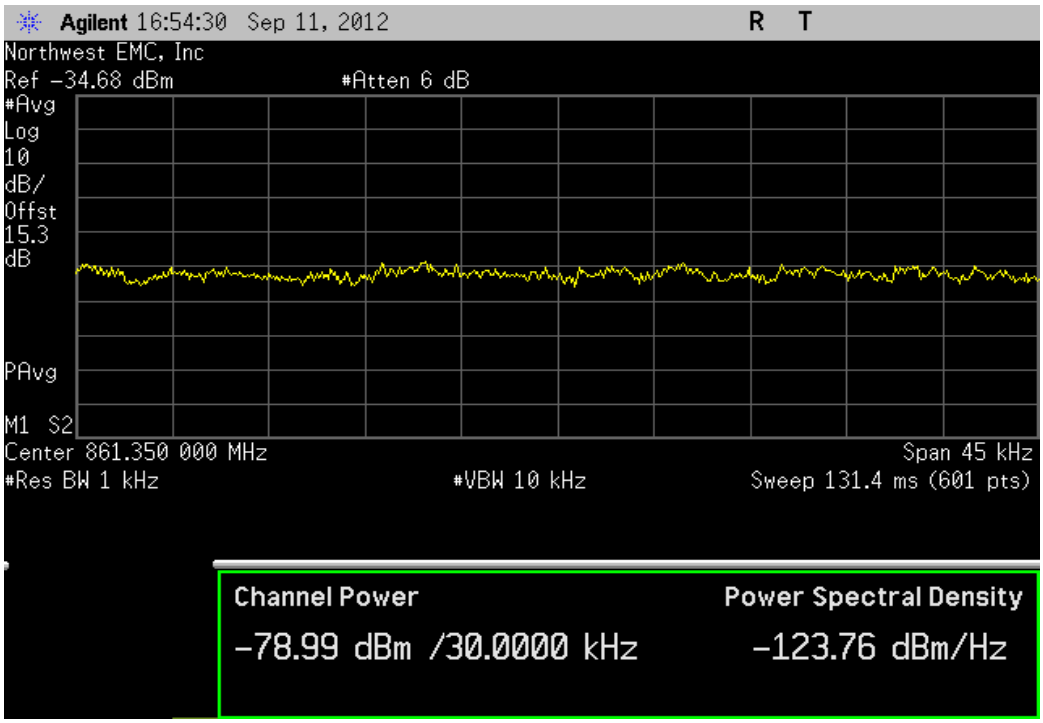


Multi-Carrier Port B, LTE 3M, Mid, High							
					Value	Limit	Result
					-30.62	-20	Pass

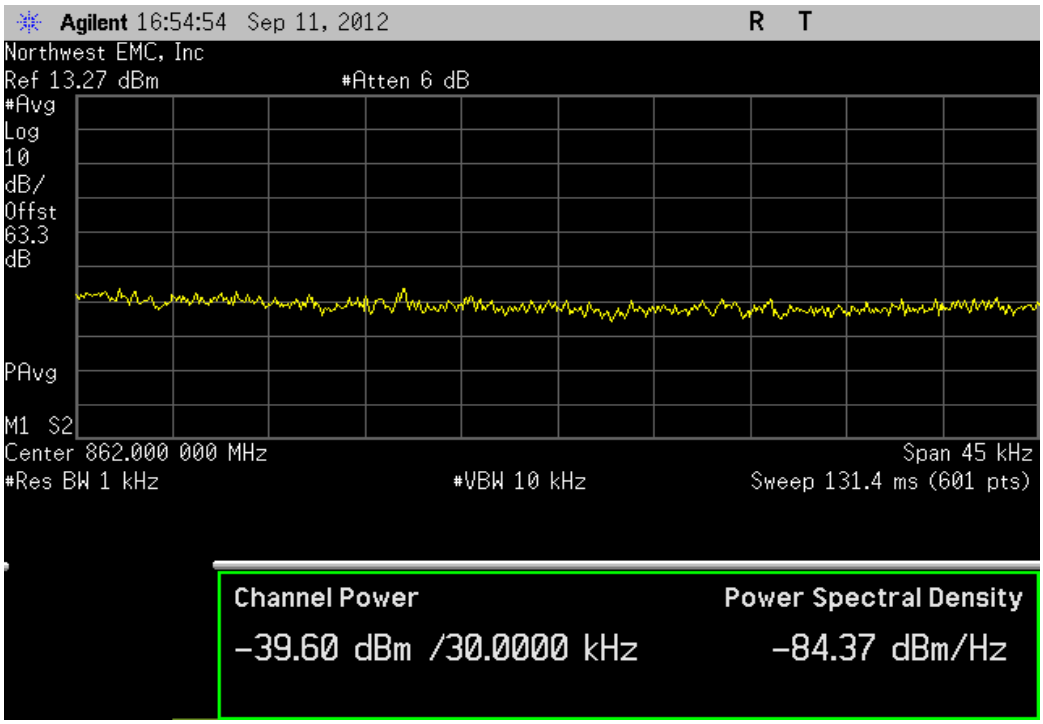


Emissions Mask - LTE

Multi-Carrier Port B, LTE 3M, High, Low							
					Value	Limit	Result
					-78.99	-69	Pass

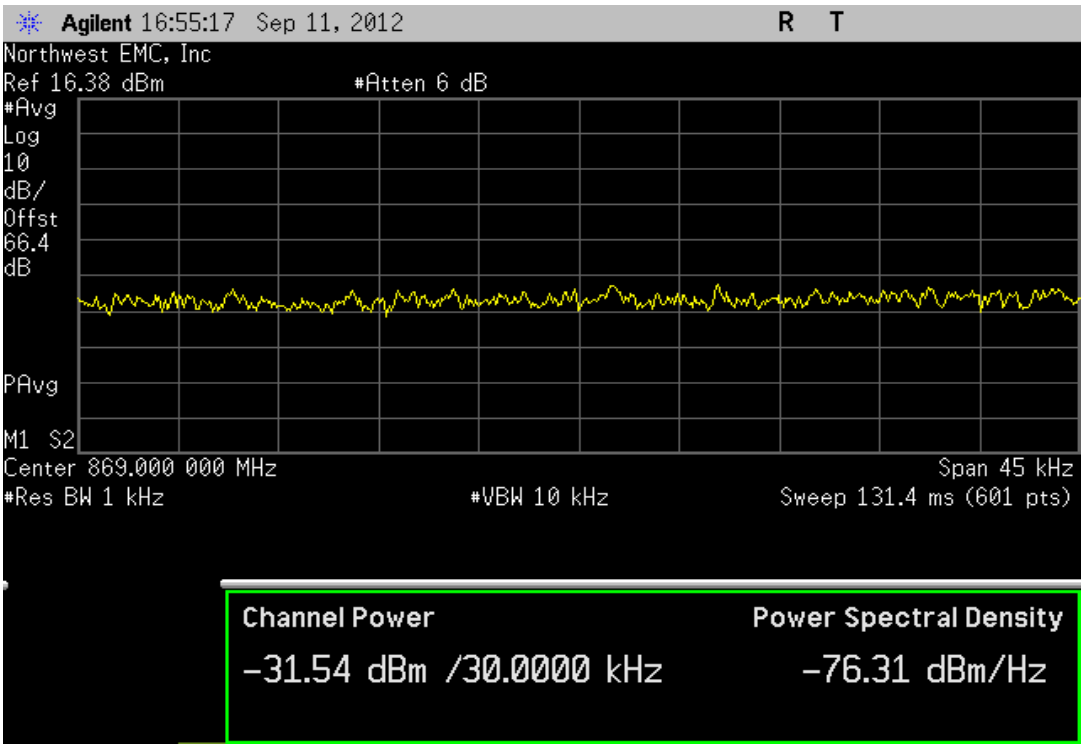


Multi-Carrier Port B, LTE 3M, High, Center							
					Value	Limit	Result
					-39.6	-20	Pass



Emissions Mask - LTE

Multi-Carrier Port B, LTE 3M, High, High						
				Value	Limit	Result
				-31.54	-20	Pass



EMISSION MASK - LTE

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	AFG	5/16/2012	12
Signal Generator	Agilent	E8257D	TGU	1/26/2011	12
Directional Coupler 800MHz-2500MHz	Fairview Microwave	SMC4030	RGN	6/17/2011	24
Spectrum Analyzer	Agilent	E4440A	AFG	4/28/2011	12

CUSTOMER TEST SET

Description	Manufacturer	Model	Last Cal.	Interval
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Vector Signal Generator	Agilent	N5182	6/7/2010	24
KMW Cobra Reliability Analyzer	KMW Cormmunications	N/A	NCR	N/A
Power Meter	Agilent	E4419B	4/1/2010	24
Power Head	Agilent	E9300H	NCR	N/A
Power Head	Agilent	E9300H	NCR	N/A
DC Power Supply	Hewlett Packard	6574A	NCR	N/A
dB Directional Coupler (800-2500 M	Fairview Microwave	SMC4030	NCR	N/A
50 Ohm Termination	Fairview Microwave	ST6NL-150	NCR	N/A
Fujitsu Laptop	Fujitsu	A6030	NCR	N/A
RRH220 Software	KMW Cormmunications	N/A	NCRA	N/A

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 emission mask defined by 90.691 was only measured with the EUT set to low and high transmit frequencies. At each channel, measurements were made at the highest output settings

A directional coupler and coaxial cable loss were compensated in the spectrum analyzer. Measureing 100kHz of spectrum with 10kHz resolution bandwidth and an average detector were used.

EMISSION MASK - LTE

EUT:	RRH220	**Work Order:**	KMWC0036
Serial Number:	None	**Date:**	11/14/12
Customer:	KMW Communications	**Temperature:**	23.5 C°C
Attendees:	Edward Lee & Ky Kim	**Humidity:**	43%
Project:	None	**Barometric Pres.:**	1018
Tested by:	Johnny Candelas	**Power:** 48VDC	**Job Site:** OC10

TEST SPECIFICATIONS	Test Method
FCC 90.691:2012	ANSI/TIA/EIA-603-C-2004

COMMENTS

None

DEVIATIONS FROM TEST STANDARD

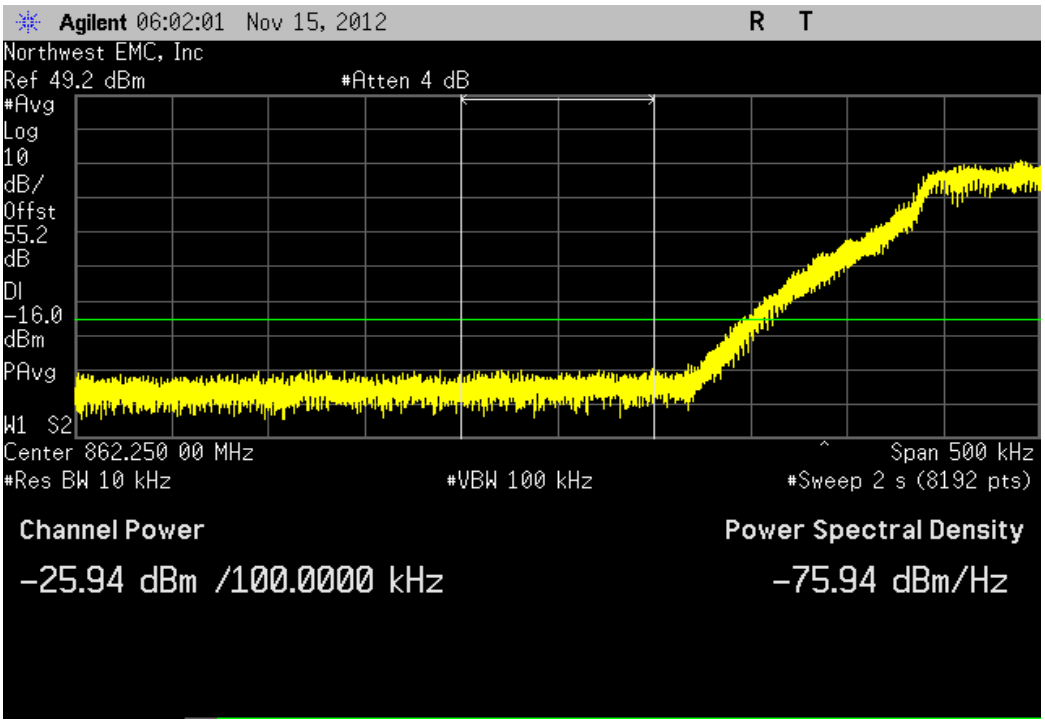
None

Configuration #	1	Signature

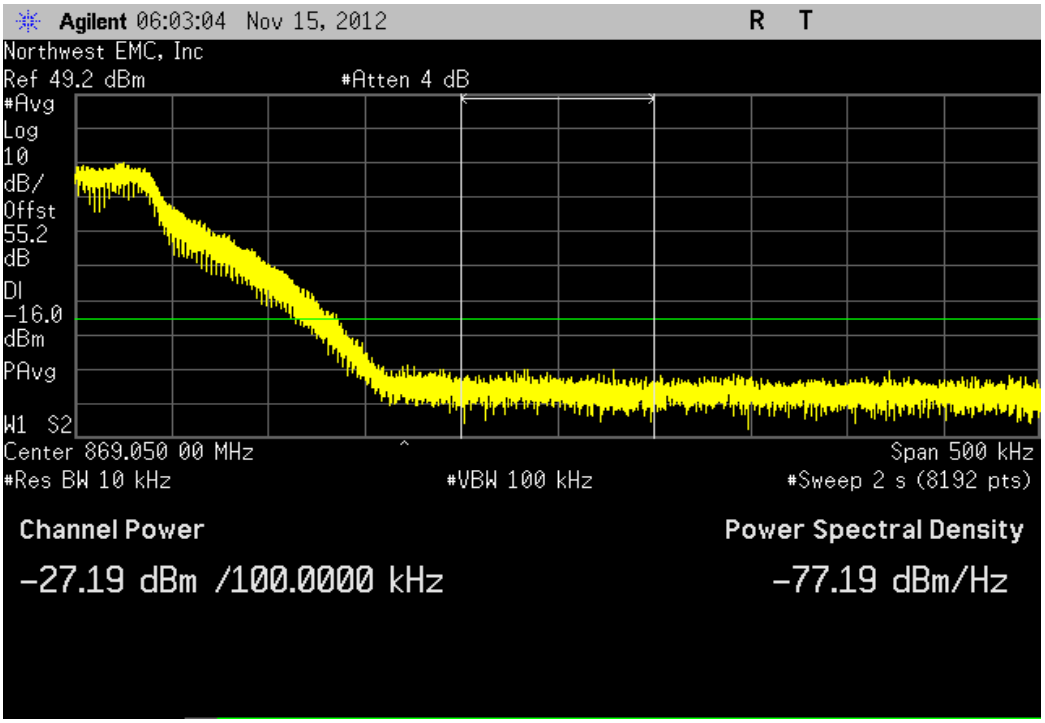
		Value	Limit	Result
Port A				
	LTE 1.4MHz Single Carrier			
	Low	-25.94 dBm	-16 dBm	Pass
	High	-27.19 dBm	-16 dBm	Pass
	LTE 3MHz Single Carrier			
	Low	-25.15 dBm	-16 dBm	Pass
	High	-27.17 dBm	-16 dBm	Pass
	LTE 5MHz Single Carrier			
	Low	-29.06 dBm	-16 dBm	Pass
	High	-28.11 dBm	-16 dBm	Pass
	LTE 1.4MHz Multi Carrier			
	Low	-25.51 dBm	-16 dBm	Pass
	High	-27.14 dBm	-16 dBm	Pass
	LTE 3MHz Multi Carrier			
	Low	-25.38 dBm	-16 dBm	Pass
	High	-27.37 dBm	-16 dBm	Pass
Port B				
	LTE 1.4MHz Single Carrier			
	Low	-27.05 dBm	-16 dBm	Pass
	High	-26.35 dBm	-16 dBm	Pass
	LTE 3MHz Single Carrier			
	Low	-26.91 dBm	-16 dBm	Pass
	High	-27.31 dBm	-16 dBm	Pass
	LTE 5MHz Single Carrier			
	Low	-27.68 dBm	-16 dBm	Pass
	High	-28.48 dBm	-16 dBm	Pass
	LTE 1.4MHz Multi Carrier			
	Low	-26.85 dBm	-16 dBm	Pass
	High	-27.43 dBm	-16 dBm	Pass
	LTE 3MHz Multi Carrier			
	Low	-28.3 dBm	-16 dBm	Pass
	High	-27.95 dBm	-16 dBm	Pass

EMISSION MASK - LTE

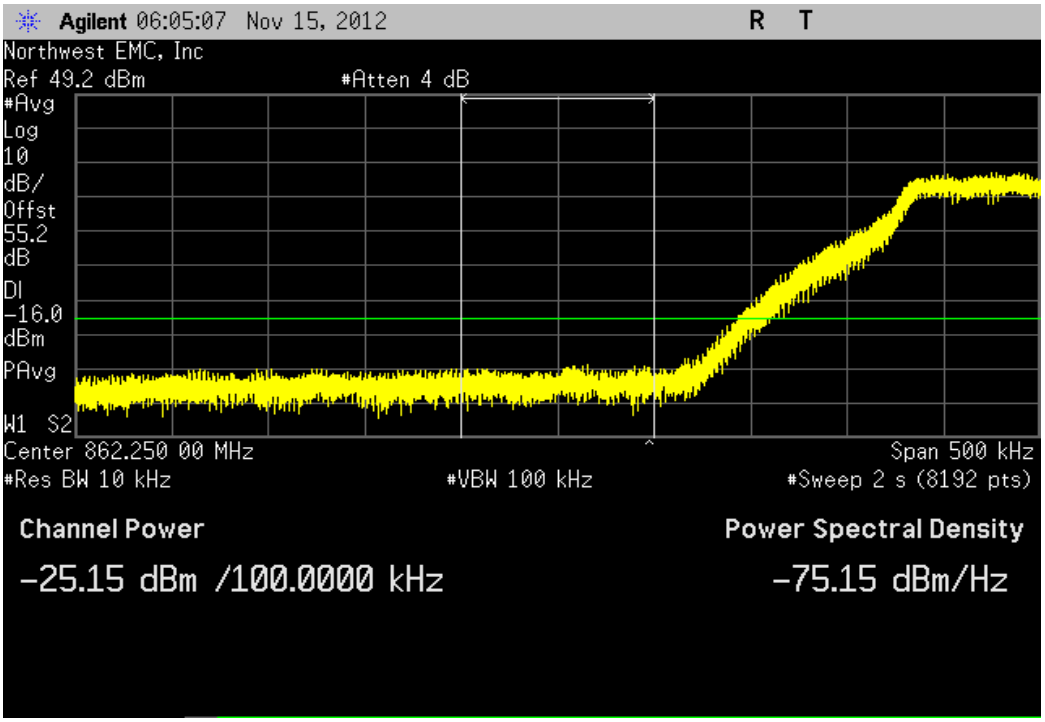
Port A, LTE 1.4MHz Single Carrier, Low							
					Value	Limit	Result
					-25.94 dBm	-16 dBm	Pass



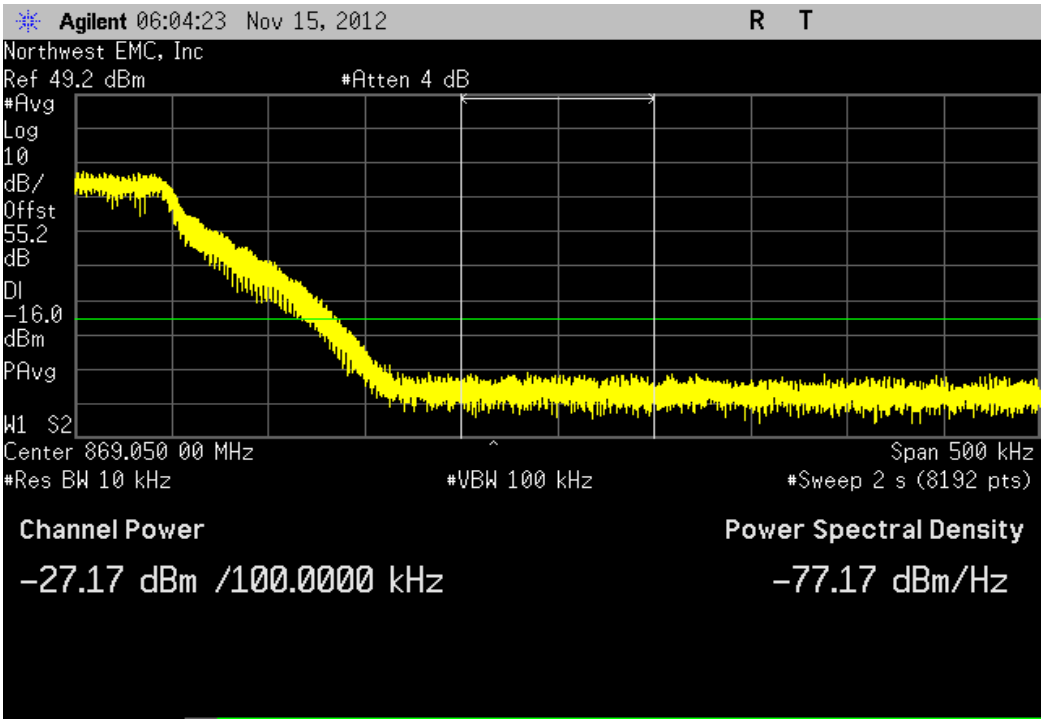
Port A, LTE 1.4MHz Single Carrier, High							
					Value	Limit	Result
					-27.19 dBm	-16 dBm	Pass



Port A, LTE 3MHz Single Carrier, Low							
					Value	Limit	Result
					-25.15 dBm	-16 dBm	Pass

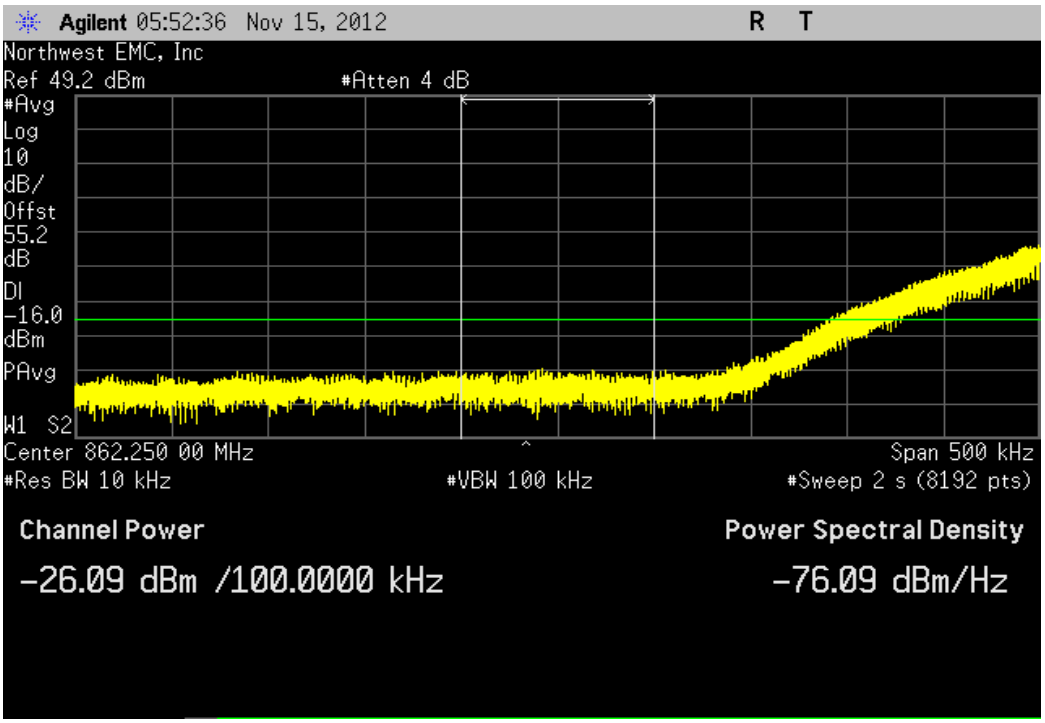


Port A, LTE 3MHz Single Carrier, High							
					Value	Limit	Result
					-27.17 dBm	-16 dBm	Pass

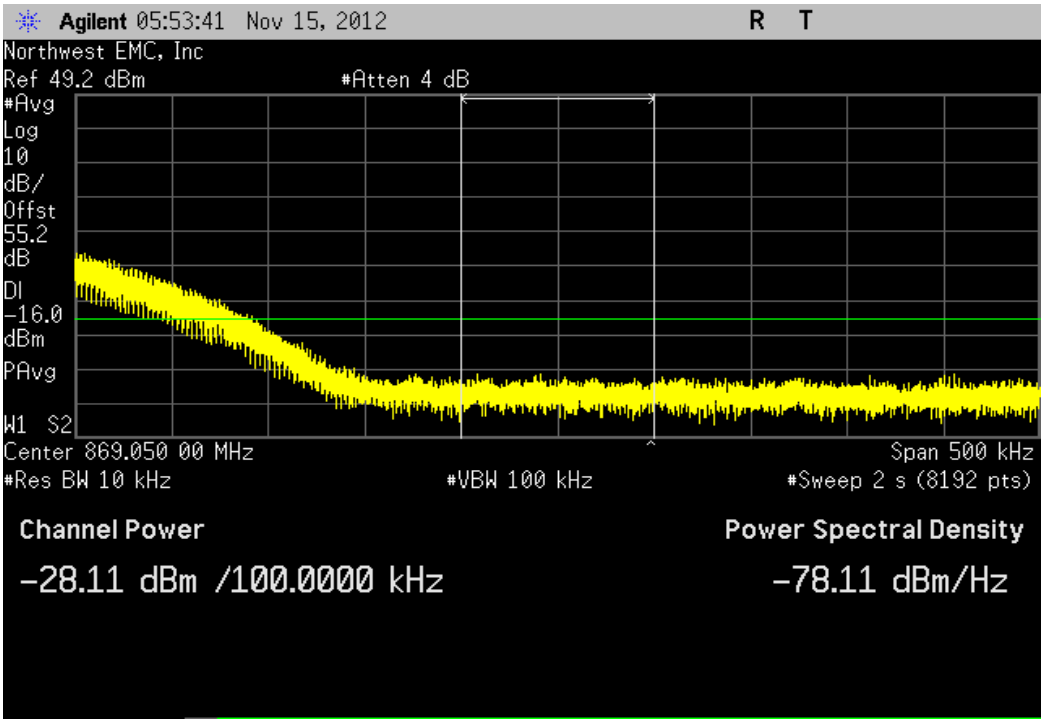


EMISSION MASK - LTE

Port A, LTE 5MHz Single Carrier, Low							
					Value	Limit	Result
					-29.06 dBm	-16 dBm	Pass

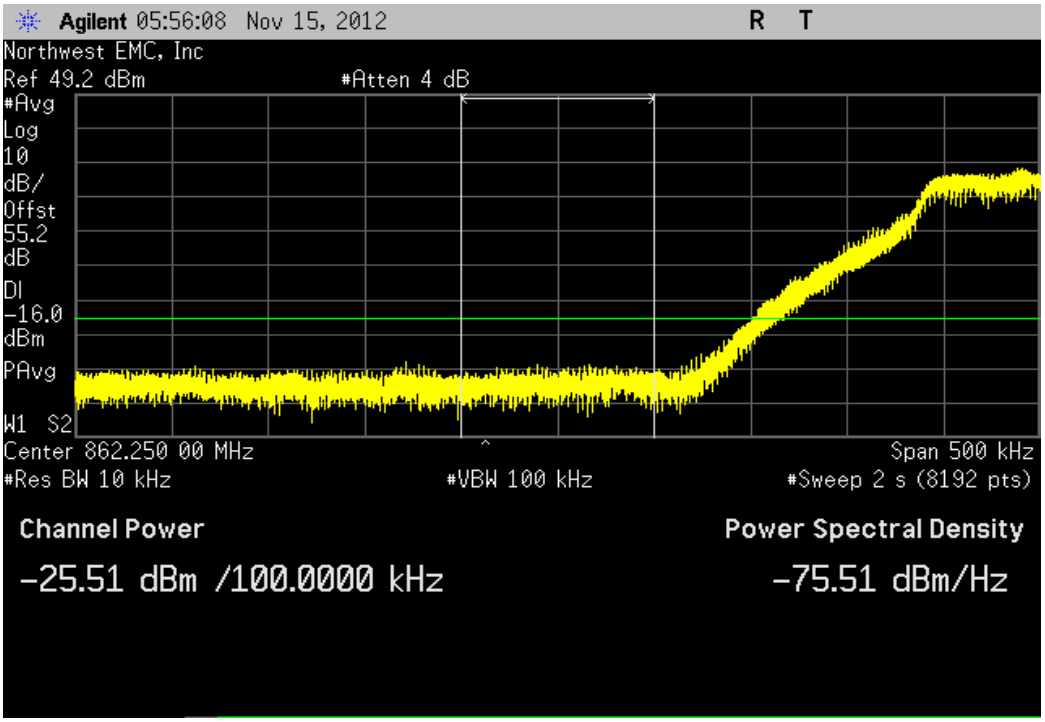


Port A, LTE 5MHz Single Carrier, High							
					Value	Limit	Result
					-28.11 dBm	-16 dBm	Pass

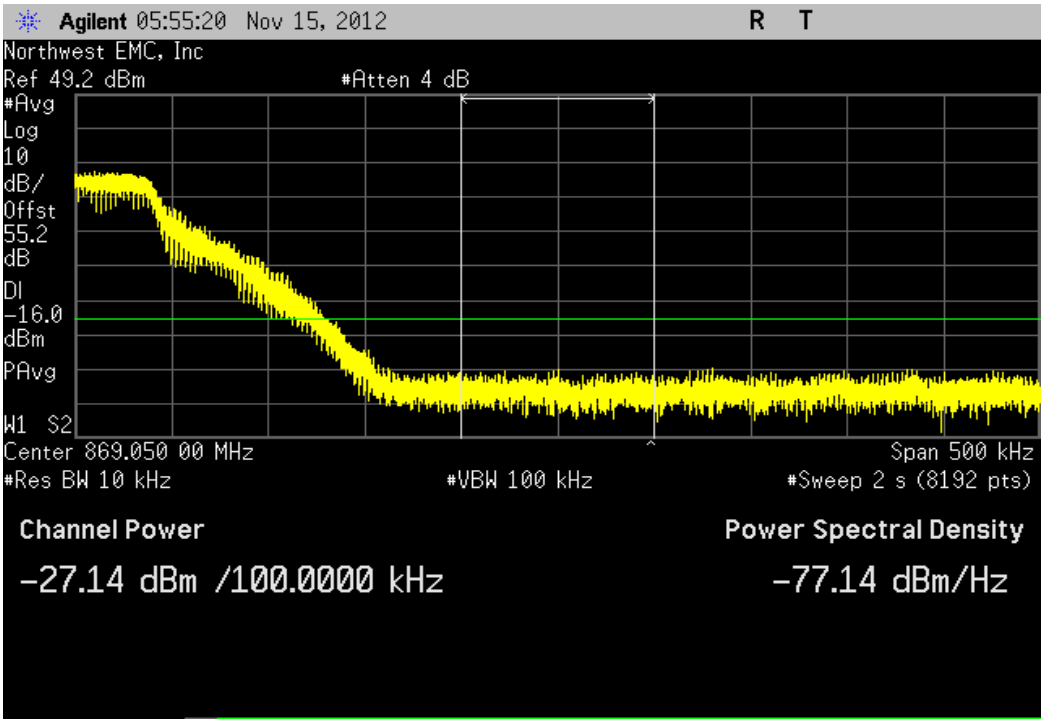


EMISSION MASK - LTE

Port A, LTE 1.4MHz Multi Carrier, Low							
					Value	Limit	Result
					-25.51 dBm	-16 dBm	Pass

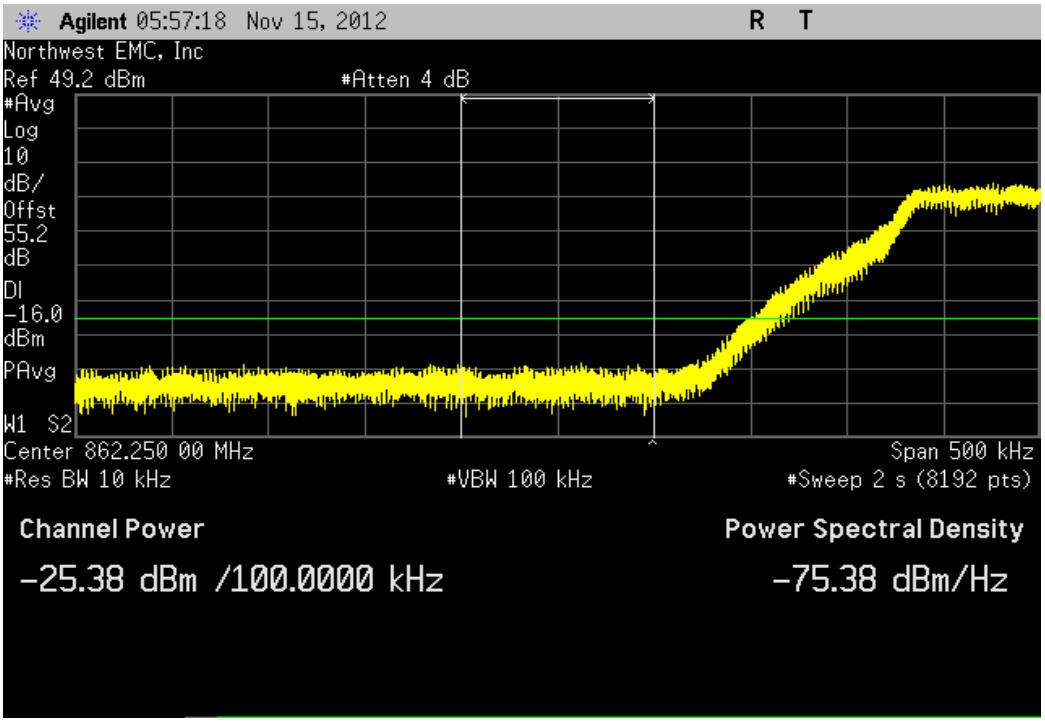


Port A, LTE 1.4MHz Multi Carrier, High							
					Value	Limit	Result
					-27.14 dBm	-16 dBm	Pass

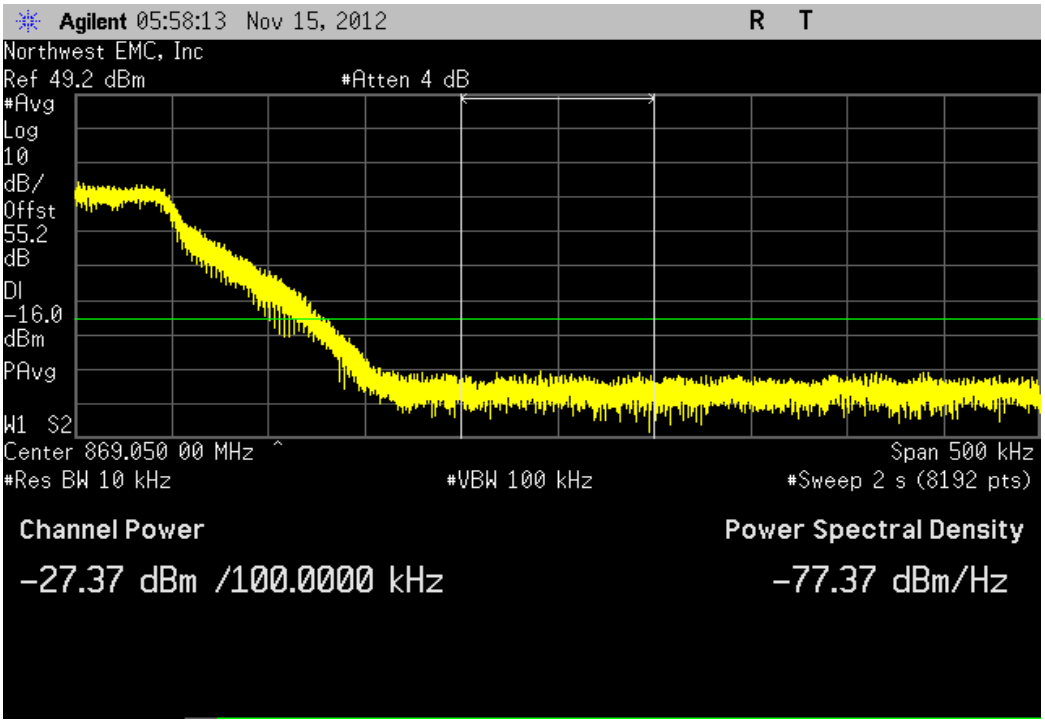


EMISSION MASK - LTE

Port A, LTE 3MHz Multi Carrier, Low							
					Value	Limit	Result
					-25.38 dBm	-16 dBm	Pass

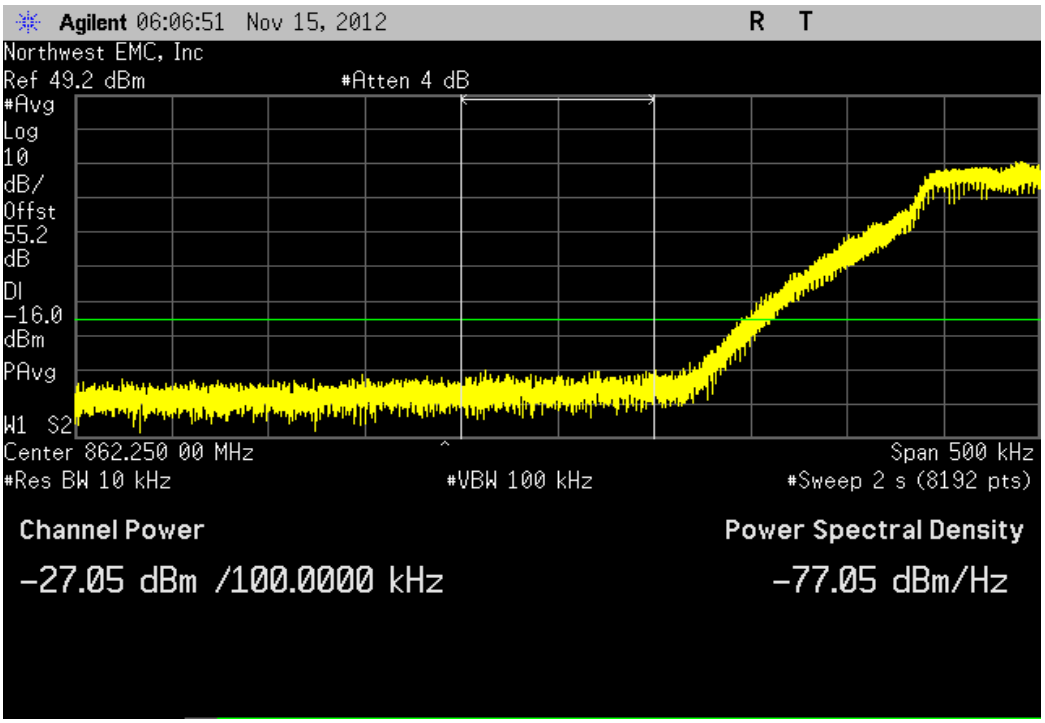


Port A, LTE 3MHz Multi Carrier, High							
					Value	Limit	Result
					-27.37 dBm	-16 dBm	Pass

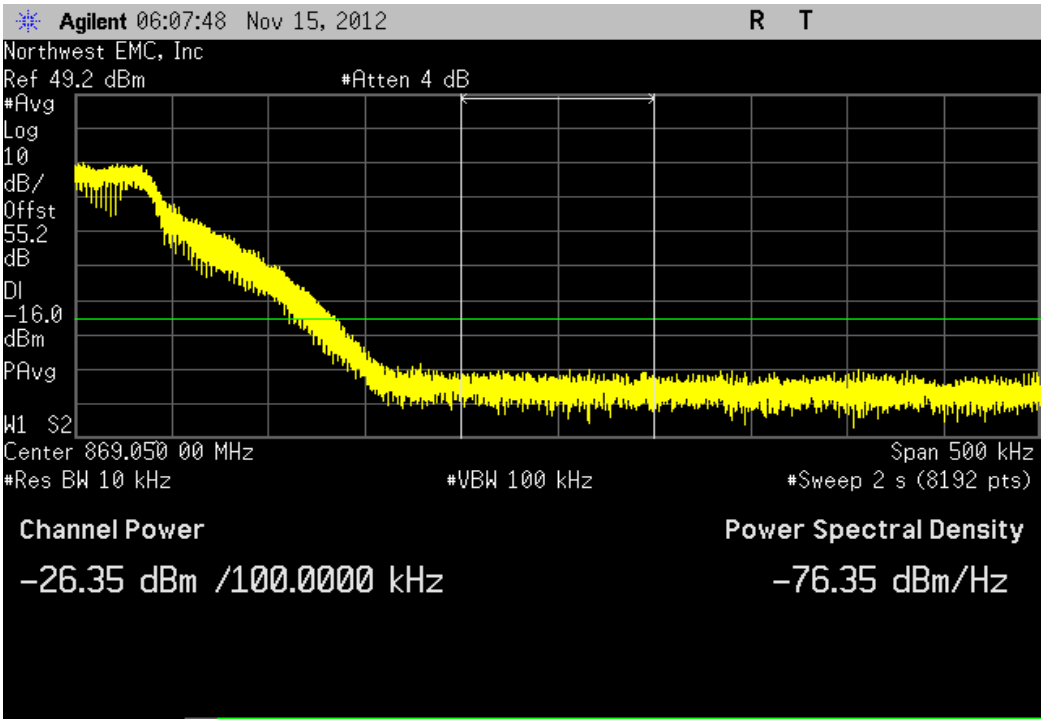


EMISSION MASK - LTE

Port B, LTE 1.4MHz Single Carrier, Low						
				Value	Limit	Result
				-27.05 dBm	-16 dBm	Pass

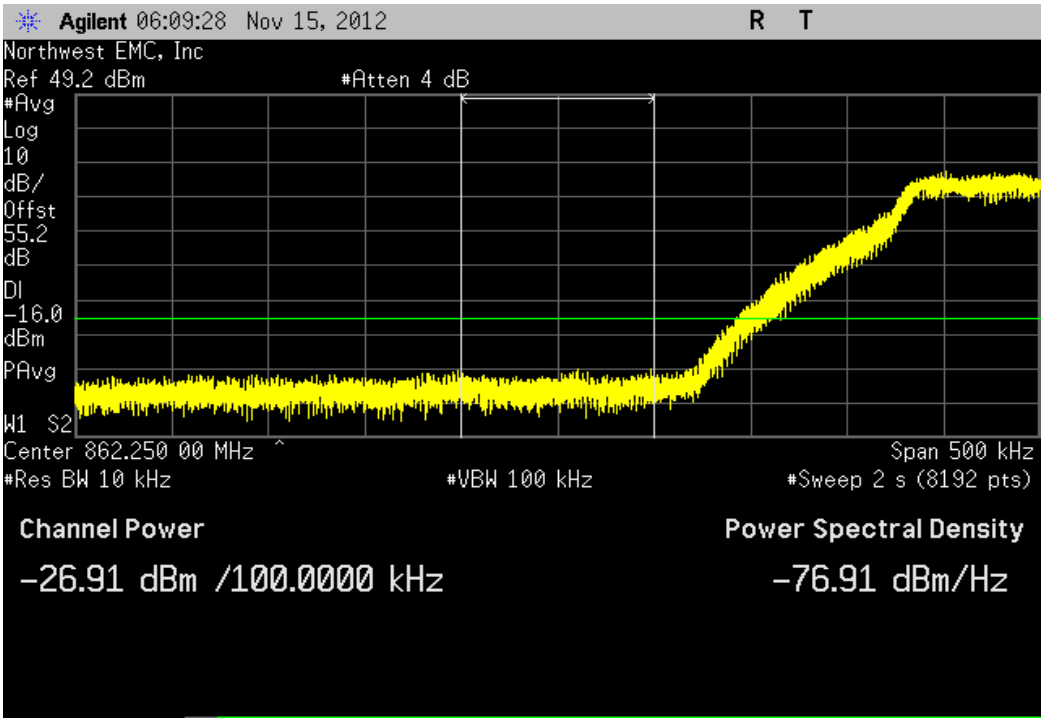


Port B, LTE 1.4MHz Single Carrier, High						
				Value	Limit	Result
				-26.35 dBm	-16 dBm	Pass

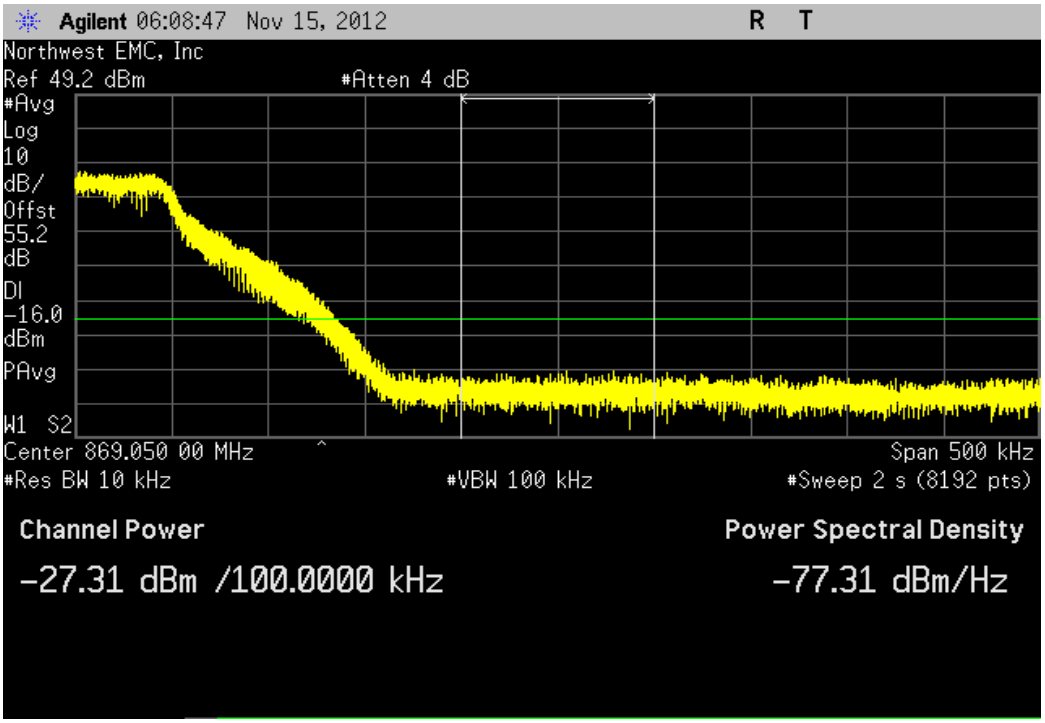


EMISSION MASK - LTE

Port B, LTE 3MHz Single Carrier, Low						
				Value	Limit	Result
				-26.91 dBm	-16 dBm	Pass

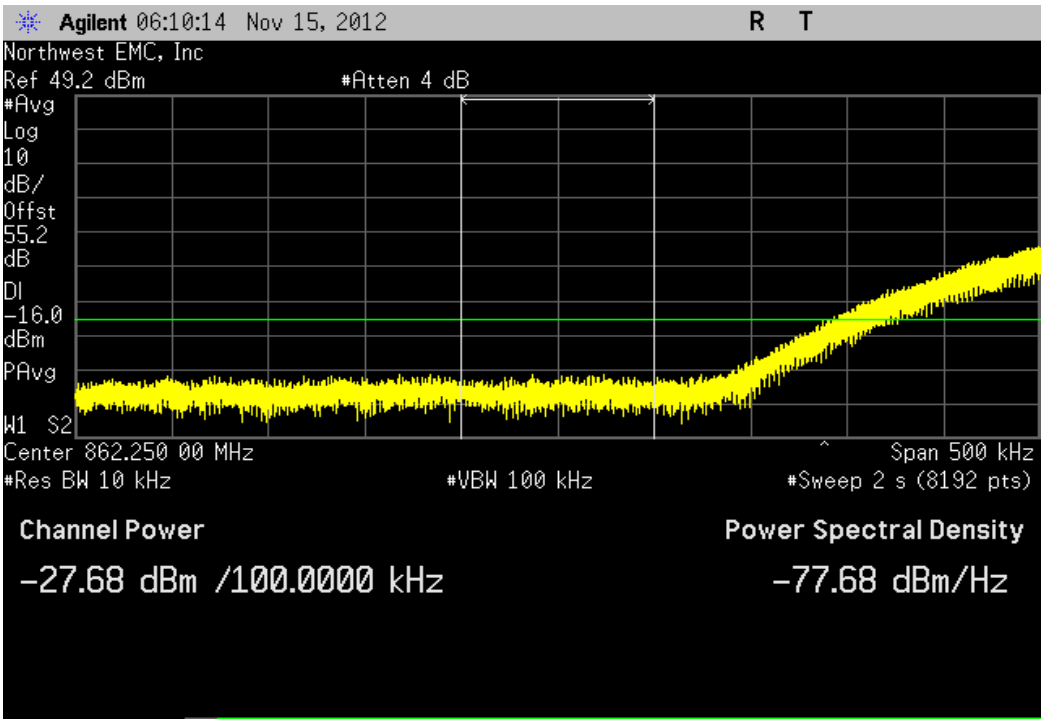


Port B, LTE 3MHz Single Carrier, High						
				Value	Limit	Result
				-27.31 dBm	-16 dBm	Pass

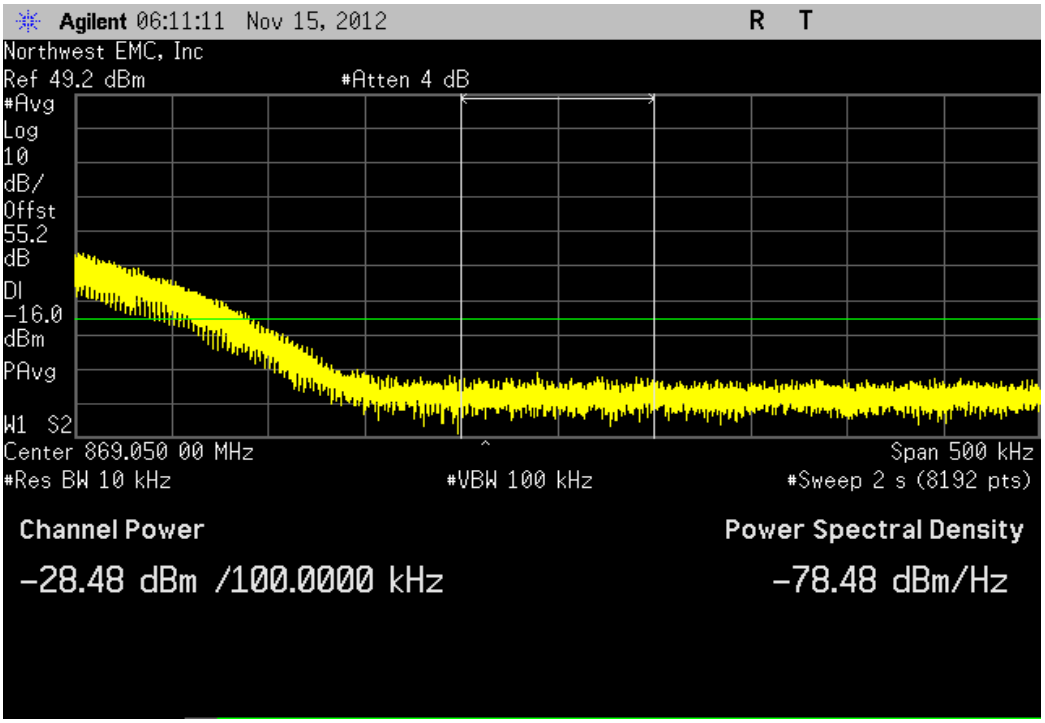


EMISSION MASK - LTE

Port B, LTE 5MHz Single Carrier, Low							
					Value	Limit	Result
					-27.68 dBm	-16 dBm	Pass

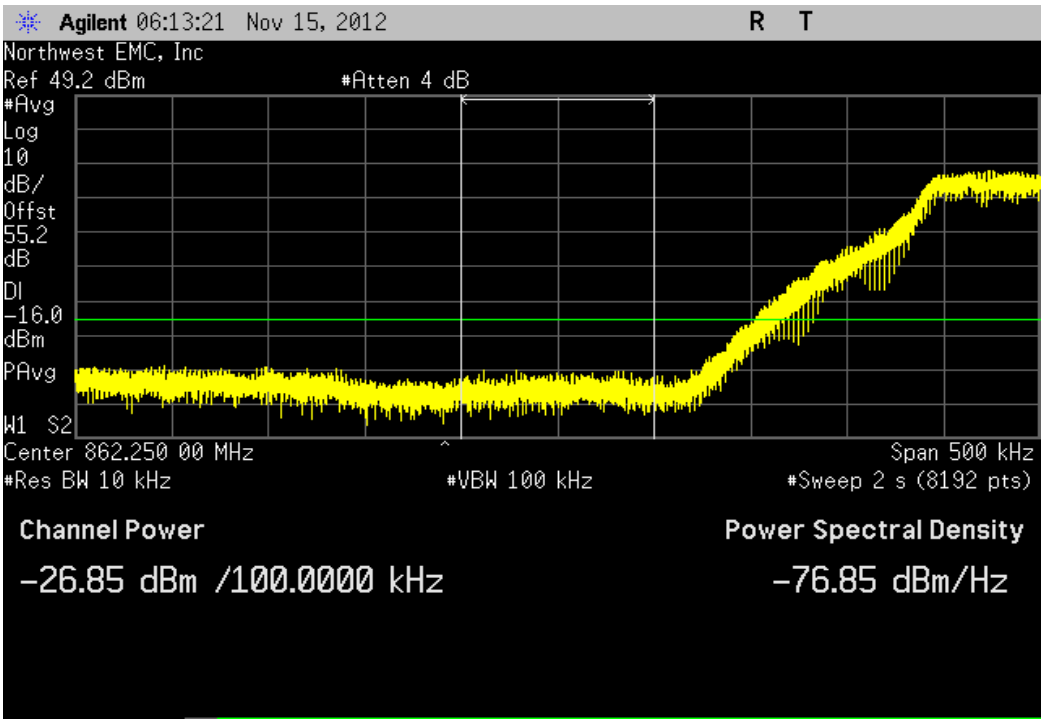


Port B, LTE 5MHz Single Carrier, High							
					Value	Limit	Result
					-28.48 dBm	-16 dBm	Pass



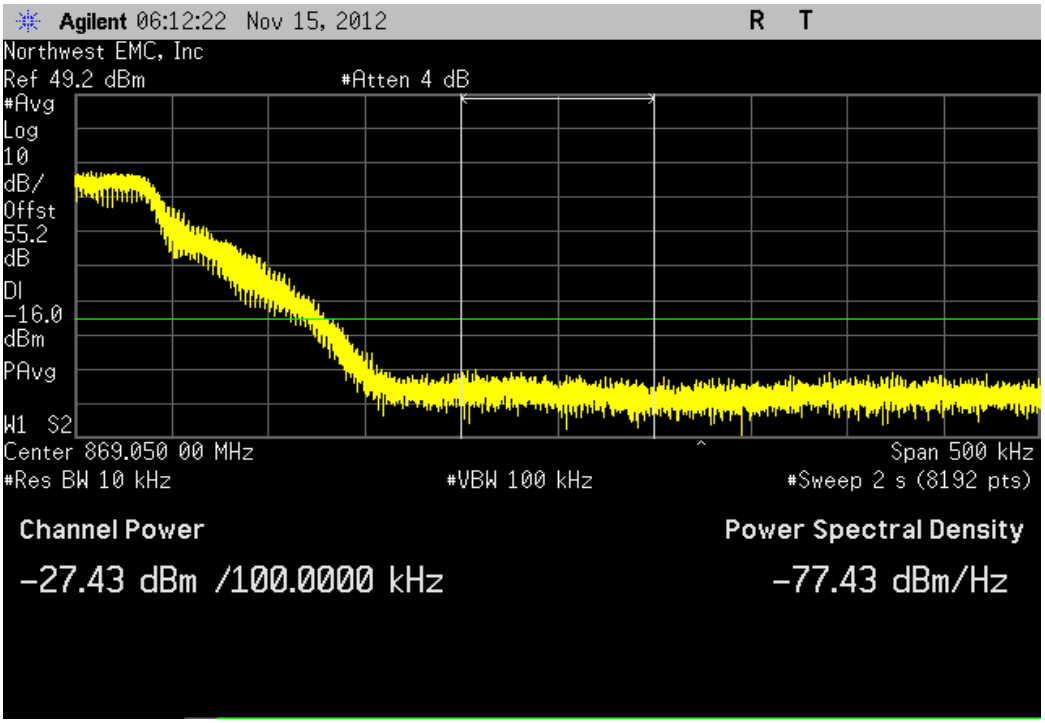
Port B, LTE 1.4MHz Multi Carrier, Low

				Value	Limit	Result
				-26.85 dBm	-16 dBm	Pass



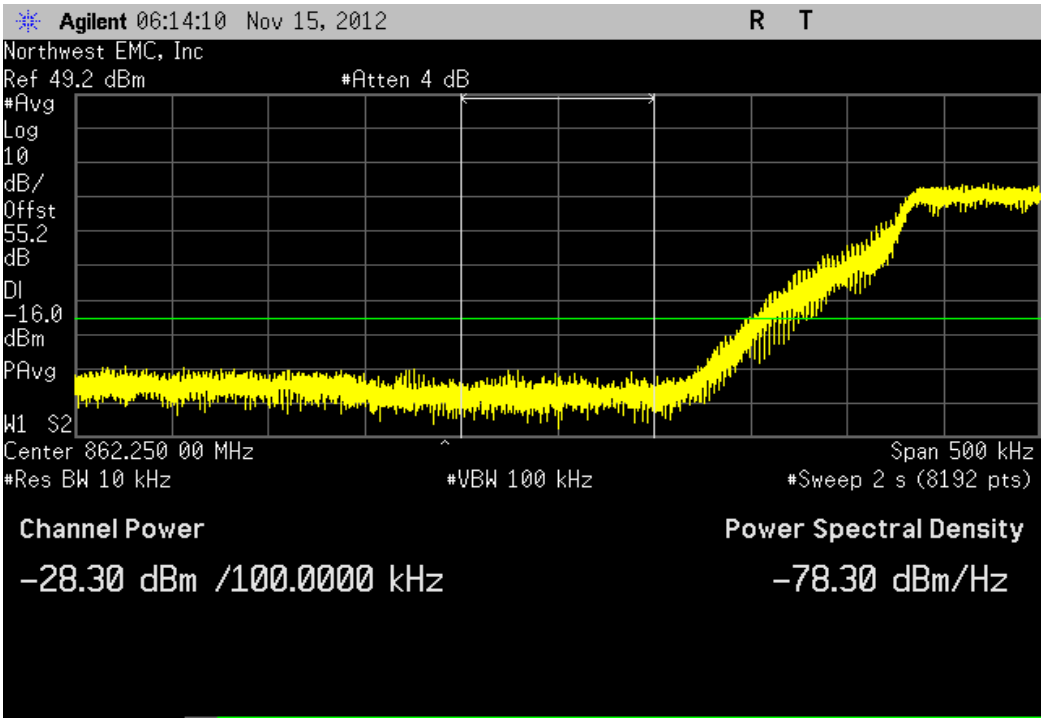
Port B, LTE 1.4MHz Multi Carrier, High

				Value	Limit	Result
				-27.43 dBm	-16 dBm	Pass

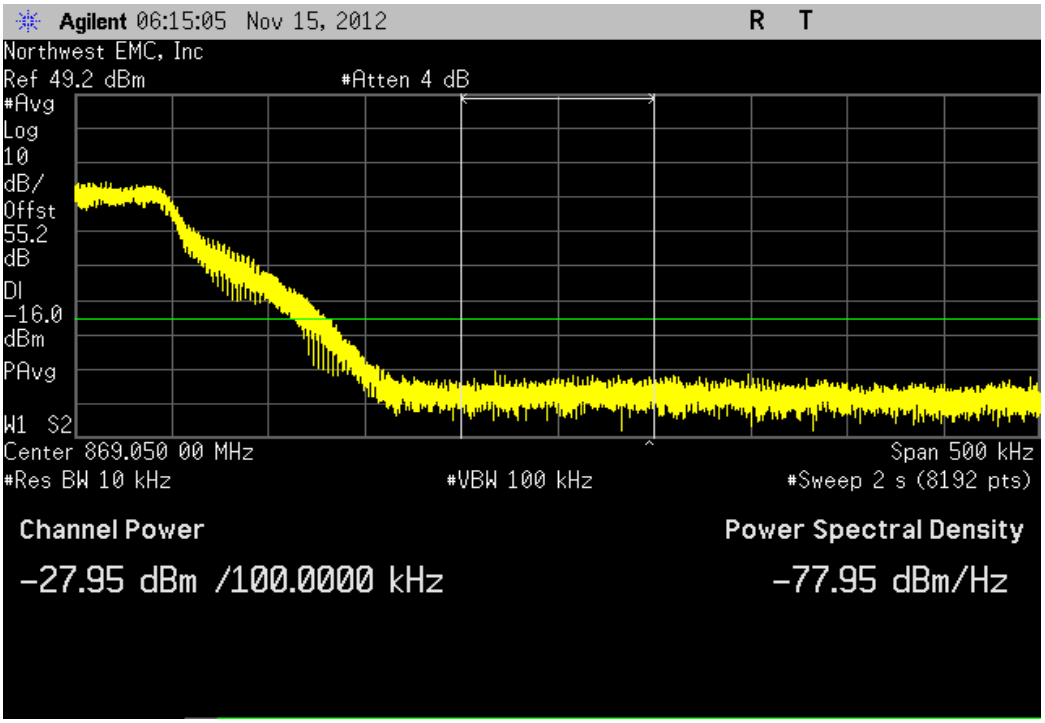


EMISSION MASK - LTE

Port B, LTE 3MHz Multi Carrier, Low							
					Value	Limit	Result
					-28.3 dBm	-16 dBm	Pass



Port B, LTE 3MHz Multi Carrier, High							
					Value	Limit	Result
					-27.95 dBm	-16 dBm	Pass



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
LTE 1.4 MHz. Single Carrier 863 MHz, 865.6 MHz, 868.3 MHz
LTE 3 MHz. Single Carrier - 863.8 MHz, 865.6 MHz, 867.5 MHz
LTE 5 MHz. Single Carrier - 864.8 MHz, 865.6 MHz, 866.5 MHz
LTE 1.4 MHz. Multi Carrier (2FA) - (863 MHz, 864 MHz)
LTE 1.4 MHz. Multi Carrier (2FA) - (864.9 MHz, 866.3MHz)
LTE 1.4 MHz. Multi Carrier (2FA) - (866.9 MHz, 868.3 MHz)
LTE 3 MHz. Multi Carrier (2FA) - (863.8 MHz, 866.8 MHz)
LTE 3 MHz. Multi Carrier (2FA) - (864.1 MHz, 867.1 MHz)
LTE 3 MHz. Multi Carrier (2FA) - (864.5 MHz, 867.5 MHz)

POWER SETTINGS INVESTIGATED
48 VDC

AXIS INVESTIGATED
X Axis, Y- Axis, Z-Axis

WORST CASE AXIS
X-Axis

CONFIGURATIONS INVESTIGATED
KMWC0027 - 1

FREQUENCY RANGE INVESTIGATED			
Start Frequency	30 MHz	Stop Frequency	12400 MHz

CLOCKS AND OSCILLATORS
See Modes of Operation.

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

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOE	11/17/2010	12 mo
Antenna, Horn	ETS	3160-07	AHR	NCR	0 mo
OC 10 Cables	N/A	12-18GHz RE Cables	OCO	6/24/2011	12 mo
.5-1GHz Notch Filter	K&L Microwave	3TNF-500/1000-N/N	HFR	11/30/2010	24 mo
Pre-Amplifier	Miteq	AMF-4D-010120-30-10P-1	AOP	6/24/2011	12 mo
Antenna, Horn	ETS	3117	AHQ	4/19/2011	24 mo
OC10 Cables	N/A	1-8GHz RE Cables	OCJ	6/10/2011	12 mo
Antenna, Biconilog	EMCO	3142	AXB	3/28/2011	12 mo
OC10 Cables	N/A	10kHz-1GHz RE Cables	OCH	6/24/2011	12 mo
Pre-Amplifier	Miteq	AM-1064-9079	AOO	6/28/2011	12 mo
Spectrum Analyzer	Agilent	E4446A	AAY	1/11/2011	12 mo
DC Power Supply	Hewlett Packard	6574A	N/A	NCR	N/A
30 dB Directional Coupler (800-2500 MHz)	Fairview Microwave	SMC4030	N/A	NCR	N/A
50 Ohm Termination	Fairview Microwave	ST6NL-150	N/A	NCR	N/A

CUSTOMER TEST SET

Description	Manufacturer	Model	Last Cal.	Interval
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Signal Analyzer	Agilent	N9020a	6/20/2011	24
MXA Vector Signal Generator	Agilent	N5182	6/7/2010	24
KMW Cobra Reliability Analyzer	KMW Cormmunications	N/A	NCR	N/A
Power Meter	Agilent	E4419B	4/1/2010	24
Power Head	Agilent	E9300H	NCR	N/A
Power Head	Agilent	E9300H	NCR	N/A
Fujitsu Laptop	Fujitsu	A6030	NCR	N/A
RRH220 Software	KMW Cormmunications	N/A	NCRA	N/A

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

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 antenna ports were terminated in 50 ohms. 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, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions for emissions below 1 GHz, and a horn antenna for emissions above 1 GHz. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

NORTHWEST
EMC

Spurious Radiated Emissions

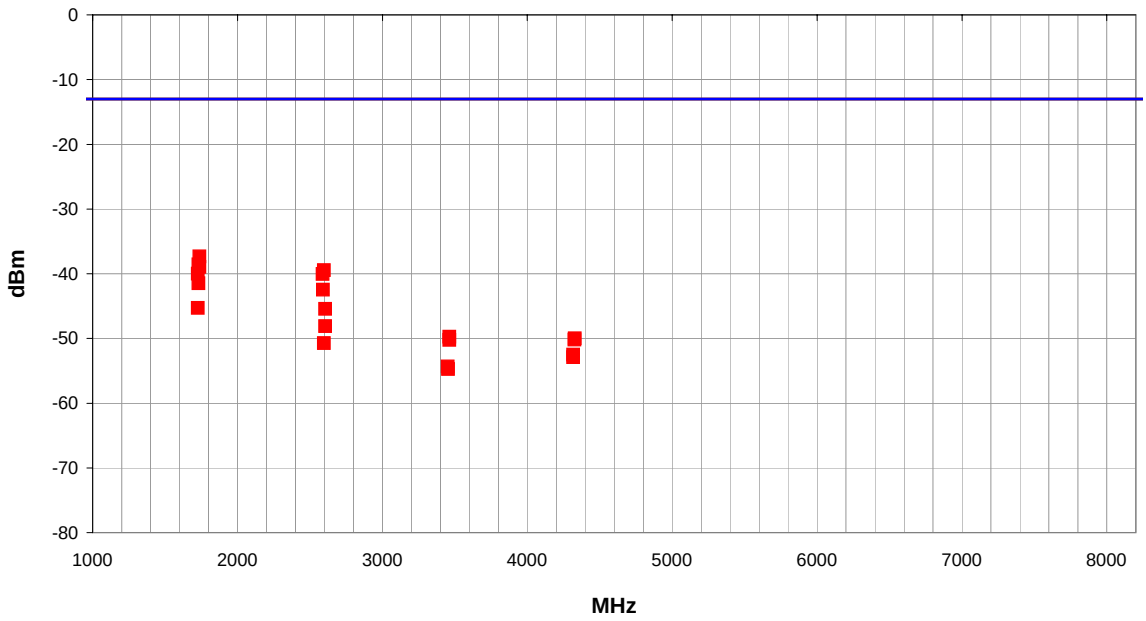
PSA-ESCI 2011.07.07
PSA-ESCI Version 2011.05.10

Work Order:	KMWC00027	**Date:**	07/19/11		
Project:	None	**Temperature:**	22.86 °C		
Job Site:	OC10	**Humidity:**	51.63		
Serial Number:	U311210059	**Barometric Pres.:**	1012.2	**Tested by:**	Jaemi Suh

EUT:	800MHz i-DEN RRH
Configuration:	1
Customer:	KMW Communications
Attendees:	Jaemi Suh
EUT Power:	48 VDC
Operating Mode:	Output Power = 50W, LTE 1.4 MHz, Single Carrier, See Comments for channels.
Deviations:	None
Comments:	LTE. Single Carrier.

Test Specifications	**Test Method**
FCC 90.691:2011	ANSI C63.10:2009

Run #	73	**Test Distance (m)**	3	**Antenna Height(s)**	1-4m	**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
1736.586			1.2	22.0			Vert	PK	1.84E-07	-37.3	-13.0	-24.3	High Channel, 868.3 MHz
1731.465			1.2	24.0			Vert	PK	1.39E-07	-38.6	-13.0	-25.6	Mid Channel, 865. 6 MHz
1736.840			1.2	148.0			Horz	PK	1.28E-07	-38.9	-13.0	-25.9	High Channel, 868.3 MHz
2596.720			1.2	24.0			Vert	PK	1.14E-07	-39.4	-13.0	-26.4	Mid Channel, 865. 6 MHz
1725.952			1.2	219.0			Horz	PK	1.00E-07	-40.0	-13.0	-27.0	Low Channel, 863 MHz
2588.624			1.2	139.0			Horz	PK	9.87E-08	-40.1	-13.0	-27.1	Low Channel, 863 MHz
1731.119			1.2	131.0			Horz	PK	7.13E-08	-41.5	-13.0	-28.5	Mid Channel, 865. 6 MHz
2589.184			1.2	36.0			Vert	PK	5.68E-08	-42.5	-13.0	-29.5	Low Channel, 863 MHz
1726.272			1.3	16.0			Vert	PK	2.96E-08	-45.3	-13.0	-32.3	Low Channel, 863 MHz
2604.791			1.2	15.0			Vert	PK	2.86E-08	-45.4	-13.0	-32.4	High Channel, 868.3 MHz
2605.340			1.2	112.0			Horz	PK	1.54E-08	-48.1	-13.0	-35.1	High Channel, 868.3 MHz
3461.713			1.0	293.0			Horz	PK	1.07E-08	-49.7	-13.0	-36.7	Mid Channel, 865. 6 MHz
4328.600			1.2	293.0			Horz	PK	1.00E-08	-50.0	-13.0	-37.0	Mid Channel, 865. 6 MHz
4326.567			1.0	293.0			Vert	PK	9.54E-09	-50.2	-13.0	-37.2	Mid Channel, 865. 6 MHz
3462.053			2.8	337.0			Vert	PK	9.51E-09	-50.2	-13.0	-37.2	Mid Channel, 865. 6 MHz
2596.956			1.2	212.0			Horz	PK	8.45E-09	-50.7	-13.0	-37.7	Mid Channel, 865. 6 MHz
4316.220			1.0	171.0			Horz	PK	5.59E-09	-52.5	-13.0	-39.5	Low Channel, 863 MHz
4316.253			2.8	301.0			Vert	PK	5.10E-09	-52.9	-13.0	-39.9	Low Channel, 863 MHz
3451.433			2.5	103.0			Vert	PK	3.66E-09	-54.4	-13.0	-41.4	Low Channel, 863 MHz
3452.647			1.0	1.0			Horz	PK	3.34E-09	-54.8	-13.0	-41.8	Low Channel, 863 MHz