Test Report

Prepared for: Cellphone-Mate, Inc.

Model: Force 5

Description: 5 Band / Inline

FCC ID: RSNFORCE-5INLINE

To

FCC Parts 22, 24, 27

Date of Issue: October 8, 2014

On the behalf of the applicant:	**Cellphone-Mate Inc.** **48346 Milmont Drive** **Fremont, CA 94538**
Attention of:	**Hongtao Zhan, CEO** **Ph: (510) 770-0469** **Email: hzhan@cellphone-mate.com**

Prepared By
Compliance Testing, LLC
1724 S. Nevada Way
Mesa, AZ 85204
(480) 926-3100 phone / (480) 926-3598 fax
www.compliancetesting.com
Project No: p1440012

Mike Graffeo
Project Test Engineer

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	August 20, 2014	Mike Graffeo	Original Document
2.0	September 2, 2014	Amanda Reed & Mike Graffeo	Updated FCC ID & model description, fixed Table of Contents. Retested Frequency plots for the G-Block
3.0	October 7, 2014	Mike Graffeo	Added emission designators

Table of Contents

ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009)

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to http://www.compliancetesting.com/labscope.html for current scope of accreditation.

Testing Certificate Number: **2152.01**

FCC Site Reg. #349717

IC Site Reg. #2044A-2

Non-accredited tests contained in this report:

N/A

The Applicant has been cautioned as to the following:

15.21: **Information to the User**

The user's manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a): **Special Accessories**

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without an additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations Part 90.219, KDB 935210 D03 Booster, and FCC Part 2, Part 20.21, Part 22, Part 24, Part 27 and C63-26 D11 4-3-14v2 where appropriate.

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing.

In accordance with ANSI/TIA 603C, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104°F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Environmental Conditions		
Temp (ºC)	**Humidity (%)**	**Pressure (mbar)**
23.0 – 29.4	23.3 – 38.1	960.8 – 968.5

Measurement results, unless otherwise noted, are worst-case measurements.

EUT Description
Model: Force 5
Description: 5 Band / Inline
Firmware: N/A
Software: N/A

Additional Information: N/A

The signal booster uses the following frequency bands.
The emission designators listed are representative emission designators used by transmitters whose signal is amplified by this booster.

Frequency Band (MHz)					
Uplink	698 - 716	776 - 787	824 - 849	1850 - 1915	1710 - 1755
Downlink	728 - 746	746 - 757	869 - 894	1930 - 1995	2110 - 2155
Modulation Type	LTE		GSM, CDMA, EDGE, HSPA. EVDO, LTE		

Emission Designators					
CDMA	**HSPA**	**LTE**	**EVDO**	**EDGE**	**GSM**
F9W	F9W	G7D	F9W	G7W	GXW

EUT Operation during Tests
The output power was set to the maximum level available for all the tests, when applicable.

AGC Threshold
Several tests reference the AGC Threshold level.
The AGC Threshold was measured as follows:

- Connect a signal generator to the input of the EUT.
- Connect a spectrum analyzer to the output of the EUT using appropriate attenuation.
- Use a CW signal.
- While monitoring the output of the EUT, increase the input level until the output stops increasing or drops a few 10^{th}'s of a dB.
- This is the AGC threshold level of the EUT.
- When the procedure calls out to set the RF Input to just below the AGC Threshold, The AGC Threshold is measured using the procedure listed above, and then the RF Input is backed off 0.2 dB below this threshold level.

Accessories: None
Modifications: None

Cables:

Qty	Description	Length (M)	Shielding Y/N	Shielded Hood Y/N	Termination
1	Power Cord Adapter	2.44	N	N	N/A

Test Result Summary

Specification	Test Name	Pass, Fail, N/A	Comments
KDB 935210-D03	Authorized Frequency Band	Pass	
2.1046	Output Power (Conducted)	Pass	
2.1051 27.53	Spurious Emissions (Transmitter Conducted)	Pass	
2.1053	Radiated Spurious Emissions	Pass	
90.210 2.1049	Occupied Bandwidth	Pass	
KDB 935210-D03	Intermodulation	Pass	
90.219(e)(2)	Noise Figure	Pass	
90.213	Frequency Stability (Temperature Variation)	N/A	The EUT does not perform frequency translation
90.213	Frequency Stability (Voltage Variation)	N/A	The EUT does not perform frequency translation

Authorized Frequency Band

Name of Test:	Authorized Frequency Band	**Engineer:** Mike Graffeo
Test Equipment Utilized:	i00405, i00331	**Test Date:** 8/6/14

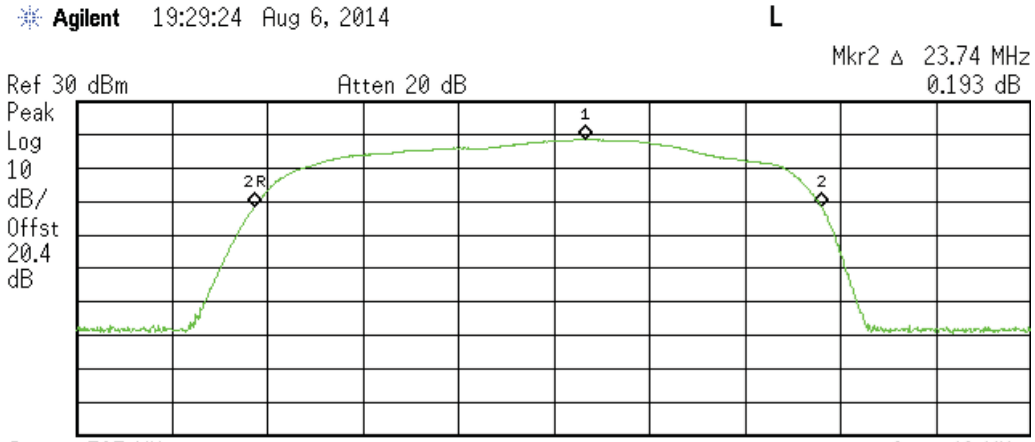
Test Procedure

The EUT was connected to a spectrum analyzer through a power attenuator. A signal generator was utilized to produce a swept CW signal with the RF input level set to 3 dB below the AGC Threshold level. The Uplink and Downlink filter response and the -20 dB bandwidth were measured. The marker table function of the spectrum analyzer was used to show the peak amplitude in the passband and the -20 dB bandwidth of the pass band filter.
RBW = 100 KHz
Video BW = 3x RBW

Test Setup

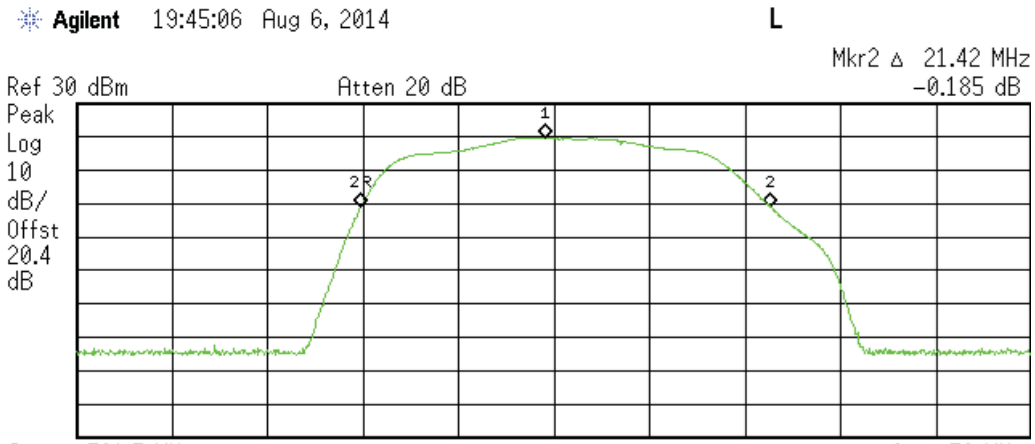
Authorized Frequency Band Test Results

698 - 716 MHz Band



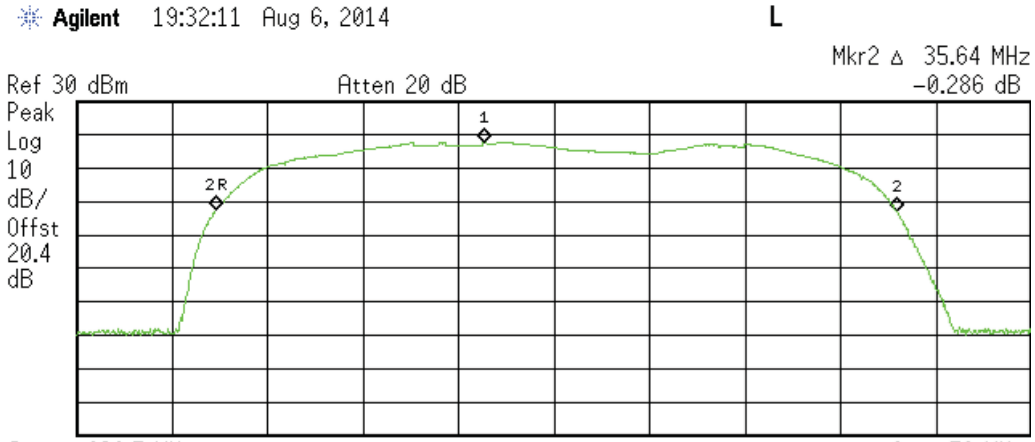
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	708.34 MHz	18.57 dBm
2R	(1)	Freq	694.45 MHz	-1.679 dBm
2Δ	(1)	Freq	23.74 MHz	0.193 dB

776-787 MHz Band



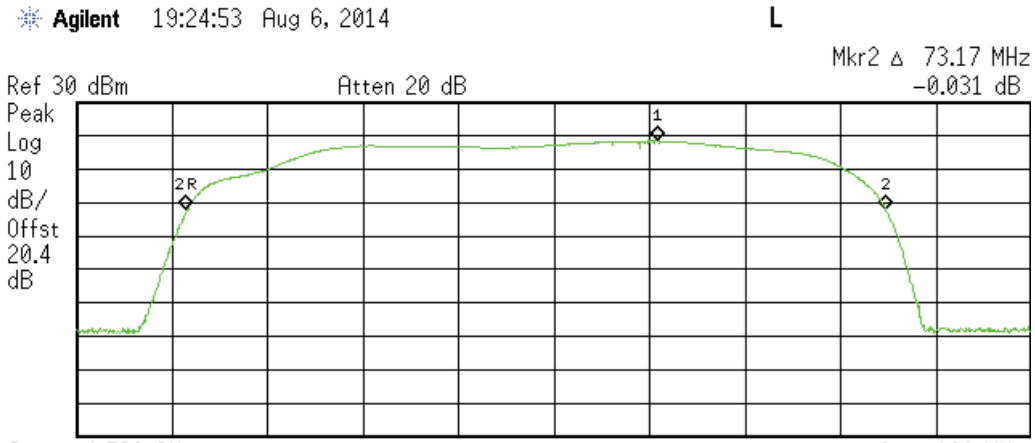
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	781.02 MHz	19.56 dBm
2R	(1)	Freq	771.41 MHz	-0.894 dBm
2Δ	(1)	Freq	21.42 MHz	-0.185 dB

824-849 MHz Band



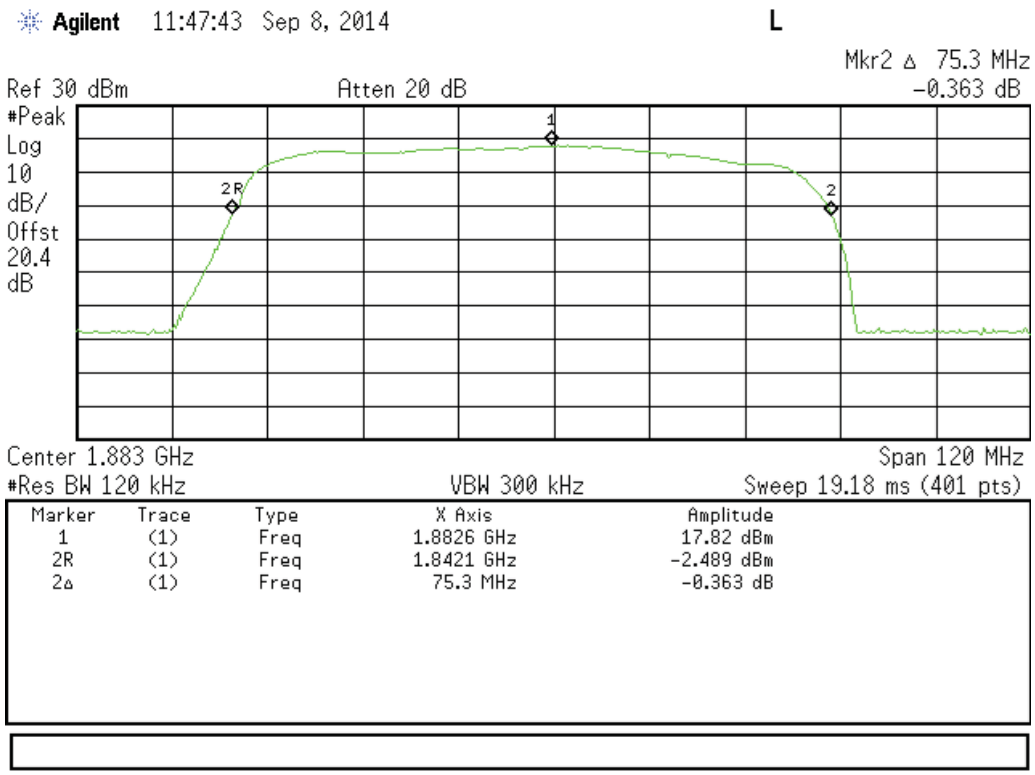
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	832.82 MHz	17.55 dBm
2R	(1)	Freq	818.81 MHz	-2.703 dBm
2Δ	(1)	Freq	35.64 MHz	-0.286 dB

1710-1755 MHz Band

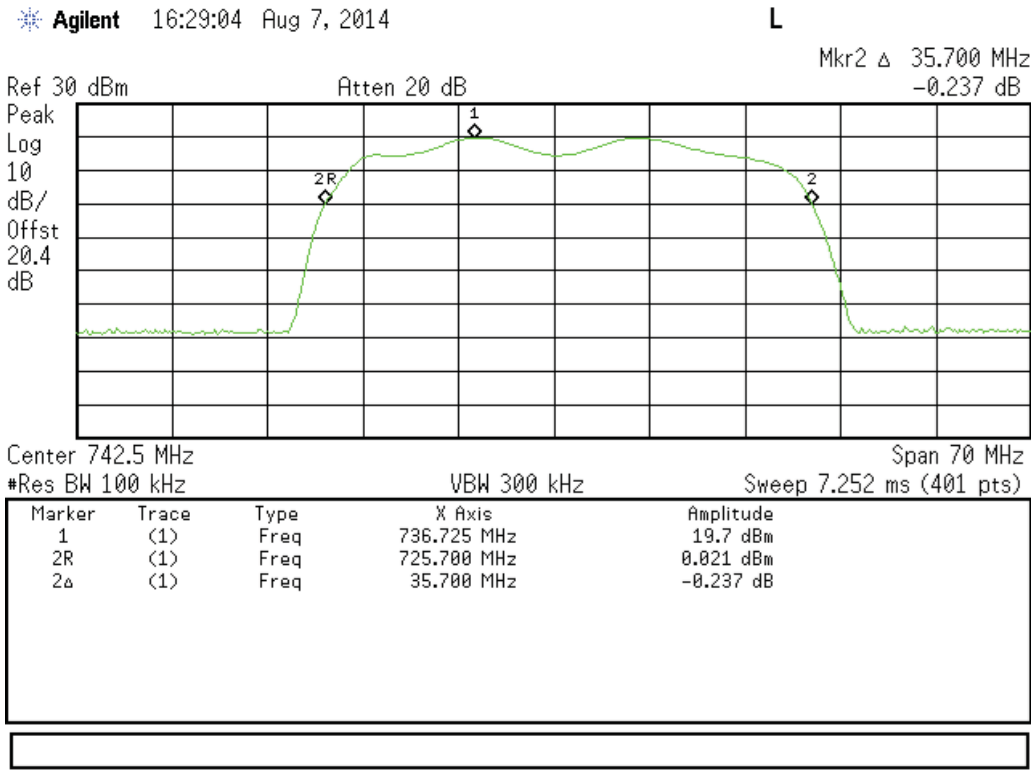


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.74336 GHz	18.34 dBm
2R	(1)	Freq	1.69411 GHz	-2.269 dBm
2Δ	(1)	Freq	73.17 MHz	-0.031 dB

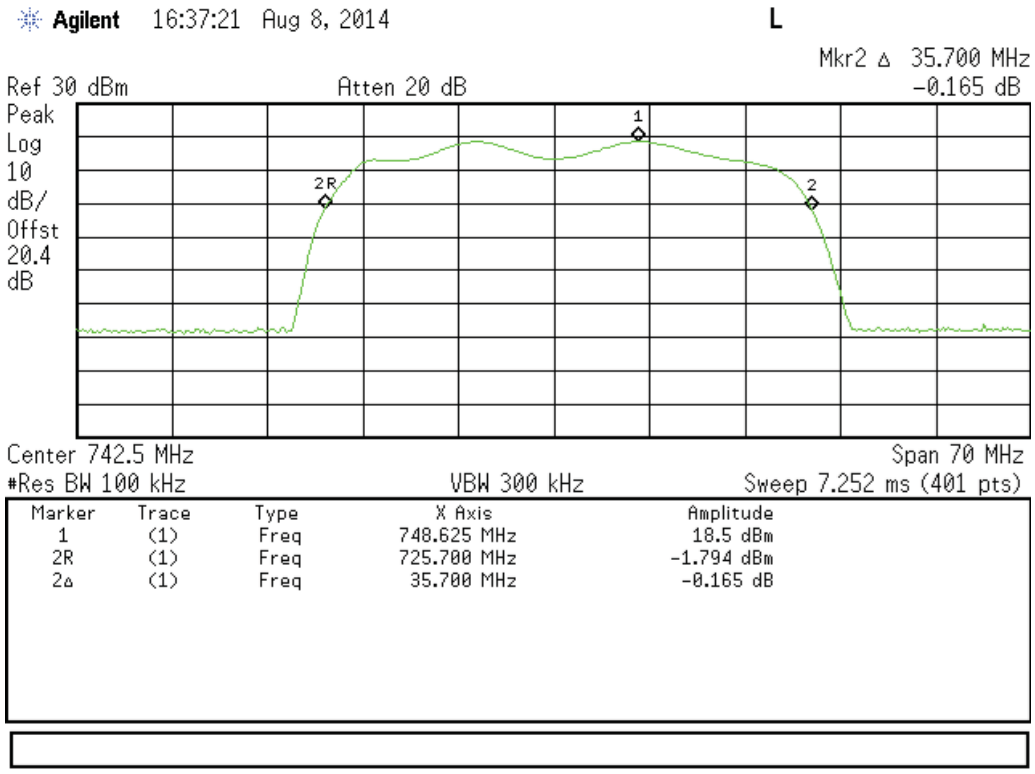
1850-1915 MHz Band



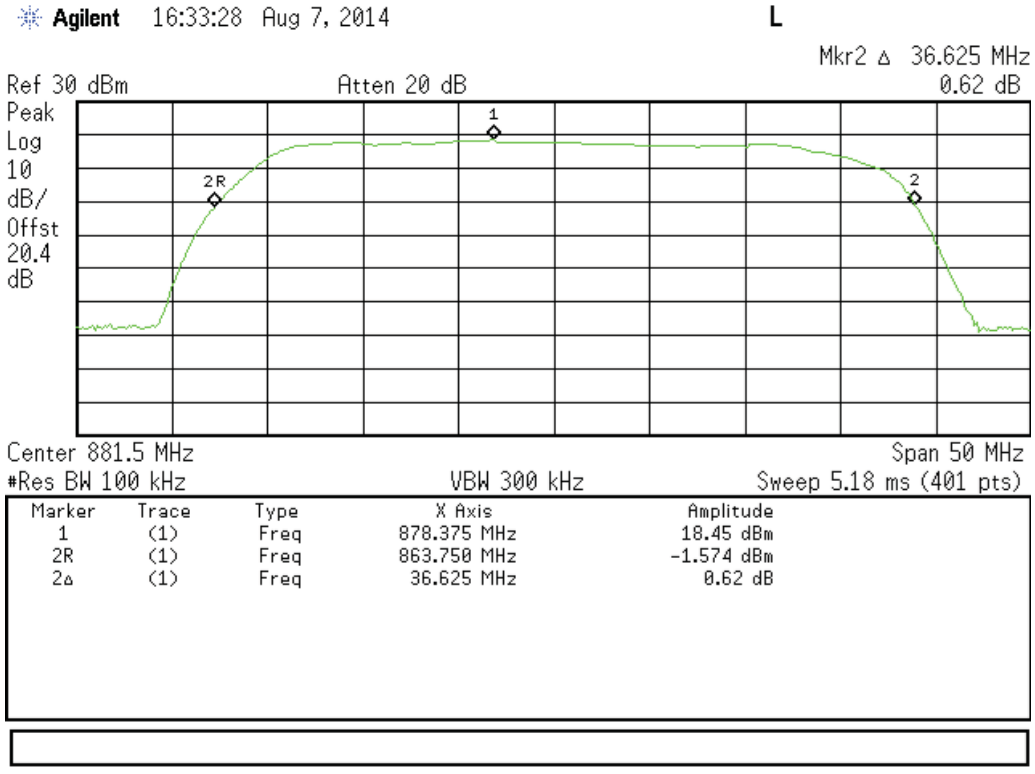
Downlink
728-746 MHz Band



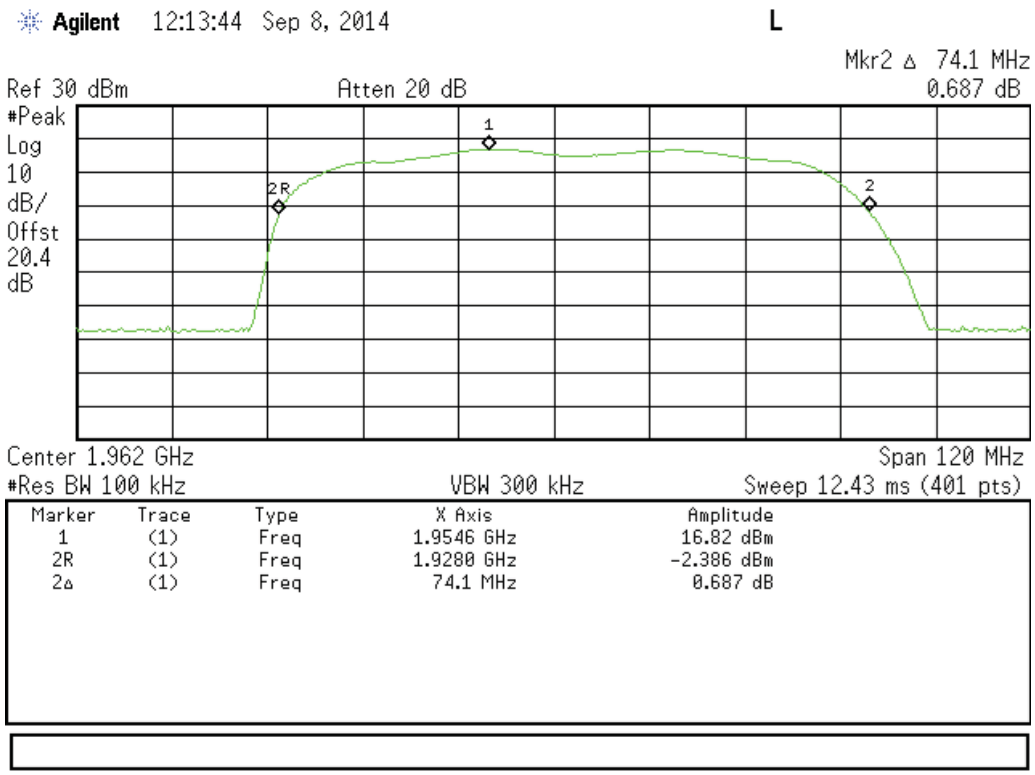
746-757 MHz Band



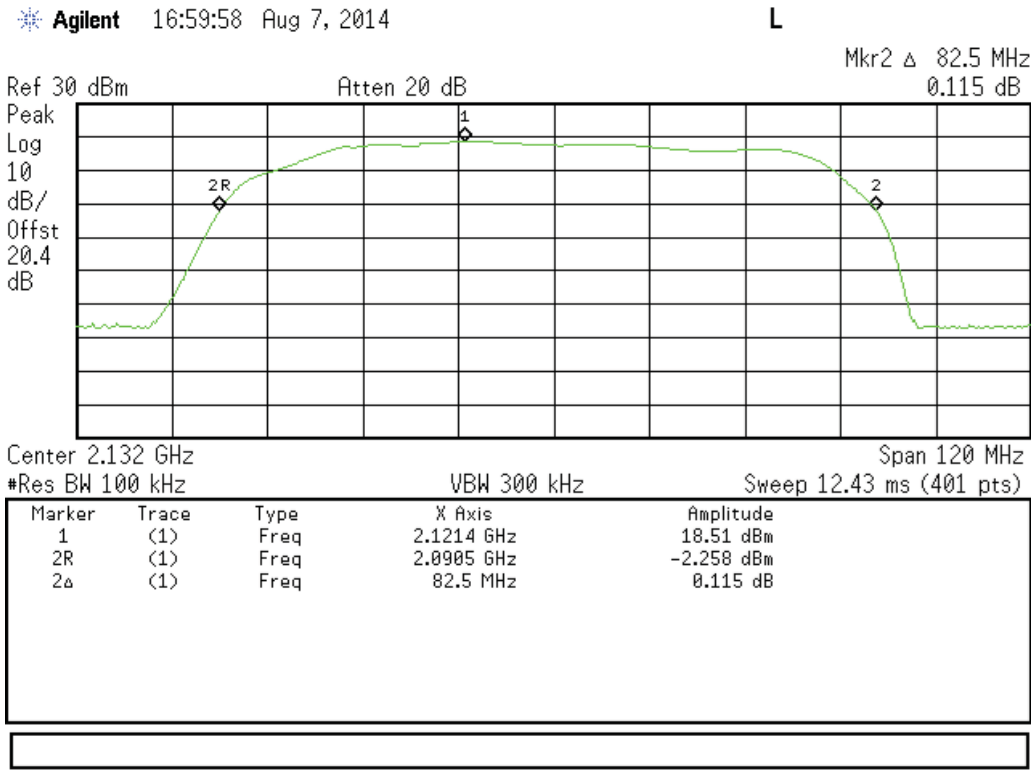
869-894 MHz Band



1930-1995 MHz Band



2110-2155 MHz Band



Conducted Output Power and Amplifier Gain

Name of Test:	Conducted Output Power and Amplifier Gain	**Engineer:** Mike Graffeo
Test Equipment Utilized:	i00405, i00331	**Test Date:** 8/8/14

Test Procedure

The Equipment Under Test (EUT) was connected to a spectrum analyzer through a power attenuator. All cable and attenuator losses were input into the spectrum analyzer as a reference level offset to ensure accurate readings were obtained. A CW signal was utilized, set to the frequency of the peak amplitude measured in the Authorized Frequency Band test. Both narrow band (GSM 250 KHz) and wide band (WCDMA 4.1MHz) signals were utilized. The RF input signal level was set to 0.2 dB below the AGC Threshold, and then repeated for 3dBm above the AGC and then at 3dBm above the AGC

The Input and Output power levels were recorded and the gain was calculated using the following formula:

Gain (dB) = Output Power (dBm) – Input Power (dBm)

Test Setup

Uplink Output Power and Gain

698 - 716 MHz Band
GSM

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	708.34	-29.2	19.47	48.7
3 dBm above the AGC	708.34	-26.2	20.39	46.6
6 dBm above the AGC	708.34	-23.2	20.46	43.7

776-787 MHz Band
GSM

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	781.02	-29.3	18.64	47.9
3 dBm above the AGC	781.02	-26.3	19.24	45.5
6 dBm above the AGC	781.02	-23.3	19.09	42.4

824-849 MHz Band
GSM

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	832.82	-30.6	17.26	47.9
3 dBm above the AGC	832.82	-27.6	17.12	44.7
6 dBm above the AGC	832.82	-24.6	16.76	41.4

1710-1755 MHz Band
GSM

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	1743.40	-29.4	17.61	47.0
3 dBm above the AGC	1743.40	-26.4	18.43	44.8
6 dBm above the AGC	1743.40	-23.4	18.64	42.0

1850-1915 MHz Band
GSM

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	1882.60	-28.9	17.74	46.6
3 dBm above the AGC	1882.60	-25.9	17.62	43.5
6 dBm above the AGC	1882.60	-22.9	17.37	40.3

Uplink Output Power and Gain
698 - 716 MHz Band
WCDMA

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	708.34	-29.5	19.86	49.4
3 dBm above the AGC	708.34	-26.5	19.81	46.3
6 dBm above the AGC	708.34	-23.5	19.77	43.3

776-787 MHz Band
WCDMA

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	781.02	-29.1	19.93	49.0
3 dBm above the AGC	781.02	-26.1	20.00	46.1
6 dBm above the AGC	781.02	-23.1	19.80	42.9

824-849 MHz Band
WCDMA

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	832.82	-31.5	17.51	49.0
3 dBm above the AGC	832.82	-28.5	17.37	45.9
6 dBm above the AGC	832.82	-25.5	17.48	43.0

1710-1755 MHz Band
WCDMA

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	1743.40	-28.5	17.05	45.6
3 dBm above the AGC	1743.40	-25.5	17.06	42.6
6 dBm above the AGC	1743.40	-22.5	17.10	39.6

1850-1915 MHz Band
WCDMA

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	1882.60	-28.6	17.43	46.0
3 dBm above the AGC	1882.60	-25.6	17.59	43.2
6 dBm above the AGC	1882.60	-22.6	17.50	40.1

Downlink Output Power and Gain

728-746 MHz Band
GSM

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	736.73	-29.0	20.32	49.3
3 dBm above the AGC	736.73	-26.0	20.86	46.9
6 dBm above the AGC	736.73	-23.0	20.94	43.9

746-757 MHz Band
GSM

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	748.63	-29.0	20.41	49.4
3 dBm above the AGC	748.63	-26.0	21.47	47.5
6 dBm above the AGC	748.63	-23.0	21.68	44.7

869-894 MHz Band
GSM

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	878.38	-29.5	17.50	47.0
3 dBm above the AGC	878.38	-26.5	17.30	43.8
6 dBm above the AGC	878.38	-23.5	17.12	40.6

1930-1995 MHz Band
GSM

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	1954.60	-29.9	19.49	49.4
3 dBm above the AGC	1954.60	-26.9	19.43	46.3
6 dBm above the AGC	1954.60	-23.9	19.86	43.8

2110-2155 MHz Band
GSM

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	2121.40	-29.0	18.79	47.8
3 dBm above the AGC	2121.40	-26.0	17.96	44.0
6 dBm above the AGC	2121.40	-23.0	17.45	40.5

Downlink Output Power and Gain

728-746 MHz Band
WCDMA

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	736.73	-29.8	19.15	49.0
3 dBm above the AGC	736.73	-26.8	19.96	46.8
6 dBm above the AGC	736.73	-23.8	21.23	45.0

746-757 MHz Band
WCDMA

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	748.63	-28.9	20.01	48.9
3 dBm above the AGC	748.63	-25.9	20.18	46.1
6 dBm above the AGC	748.63	-22.9	20.79	43.7

869-894 MHz Band
WCDMA

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	878.38	-30.2	17.38	47.6
3 dBm above the AGC	878.38	-27.2	18.51	45.7
6 dBm above the AGC	878.38	-24.2	18.48	42.7

1930-1995 MHz Band
WCDMA

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	1954.60	-28.4	19.70	48.1
3 dBm above the AGC	1954.60	-25.4	20.67	46.1
6 dBm above the AGC	1954.60	-22.4	20.52	42.9

2110-2155 MHz Band
WCDMA

Mode	Tuned Frequency (MHz)	Input Power (dBm)	Output Power (dBm)	Gain (dB)
0.2dBm below AGC	2121.40	-28.4	20.36	48.8
3 dBm above the AGC	2121.40	-25.4	19.29	44.7
6 dBm above the AGC	2121.40	-22.4	19.16	41.6

Conducted Spurious Emissions

Name of Test:	Conducted Spurious Emissions	**Engineer:** Mike Graffeo
Test Equipment Utilized:	i00405, i00331	**Test Date:** 8/12/14

Test Procedure

The Equipment Under Test (EUT) was connected to a spectrum analyzer through a power attenuator. All cable and attenuator losses were input into the spectrum analyzer as a combination of reference level offset and correction factor as needed to ensure accurate readings were obtained.
A CW signal was utilized, set to the center frequency of the passband.
The RF input signal level was set to 0.2 dB below the AGC Threshold.
The RBW was set to 100 kHz for measurements below 1 GHz and 1 MHz for measurements above 1 GHz.
The VBW was set to 3 times the RBW.

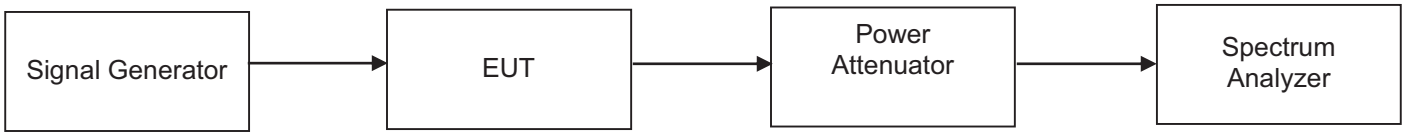
The frequency range from 30 MHz to the 10th harmonic of the passband frequency was observed and plotted.

The following formula was used for calculating the limits.

Conducted Spurious Emissions Limit = P1 – (43+ 10Log(P2)) = -13 dBm
P1 = power in dBm
P2 = power in Watts

Tests were performed at low, mid and high frequencies and with both narrow band (GSM 250 KHz) and wide band (WCDMA 4.1MHz) signals

Test Setup



Uplink Test Results (GSM)
698 - 716 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
698	-37.55	-13	-24.55	Pass
707	-35.03	-13	-22.03	Pass
716	-38.09	-13	-25.09	Pass

776-787 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
776	-37.66	-13	-24.66	Pass
781.5	-32.03	-13	-19.03	Pass
787	-37.88	-13	-24.88	Pass

824-849 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-37.79	-13	-24.79	Pass
836.5	-37.50	-13	-24.50	Pass
849	-38.90	-13	-25.90	Pass

1710-1755 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	-38.57	-13	-25.57	Pass
1732.5	-38.28	-13	-25.28	Pass
1755	-39.14	-13	-26.14	Pass

1850-1915 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-40.47	-13	-27.47	Pass
1880	-40.20	-13	-27.20	Pass
1915	-40.53	-13	-27.53	Pass

Uplink Test Results (WCDMA)
698-716 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
698	-37.66	-13	-24.66	Pass
707	-37.36	-13	-24.36	Pass
716	-37.97	-13	-24.97	Pass

776-787 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
776	-37.55	-13	-24.55	Pass
781.5	-22.22	-13	-9.22	Pass
787	-37.61	-13	-24.61	Pass

824-849 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
824	-38.41	-13	-25.41	Pass
836.5	-38.68	-13	-25.68	Pass
849	-38.62	-13	-25.62	Pass

1710-1755 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
1710	-38.87	-13	-25.87	Pass
1732.5	-39.30	-13	-26.30	Pass
1755	-38.96	-13	-25.96	Pass

1850-1915 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
1850	-39.99	-13	-26.99	Pass
1880	-39.76	-13	-26.76	Pass
1915	-40.26	-13	-27.26	Pass

Downlink Test Results (GSM)
728-746 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
728	-39.04	-13	-26.04	Pass
737	-38.39	-13	-25.39	Pass
746	-38.8	-13	-25.8	Pass

746-757 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
746	-40.24	-13	-27.24	Pass
751.5	-40.16	-13	-27.16	Pass
757	-39.57	-13	-26.57	Pass

869-894 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
869	-38.69	-13	-25.69	Pass
881.5	-39.10	-13	-26.10	Pass
894	-39.49	-13	-26.49	Pass

1930-1995 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
1930	-40.19	-13	-27.19	Pass
1960	-40.19	-13	-27.19	Pass
1995	-40.52	-13	-27.52	Pass

2110-2155 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
2110	-40.11	-13	-27.11	Pass
2132.5	-40.15	-13	-27.15	Pass
2155	-40.07	-13	-27.07	Pass

Downlink Test Results (WCDMA)
728-746 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
728	-39.27	-13	-26.27	Pass
737	-39.45	-13	-26.45	Pass
746	-39.51	-13	-26.51	Pass

746-757 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
746	-39.18	-13	-26.18	Pass
751.5	-38.95	-13	-25.95	Pass
757	-39.95	-13	-26.95	Pass

869-894 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
869	-38.67	-13	-25.67	Pass
881.5	-38.36	-13	-25.36	Pass
894	-37.73	-13	-24.73	Pass

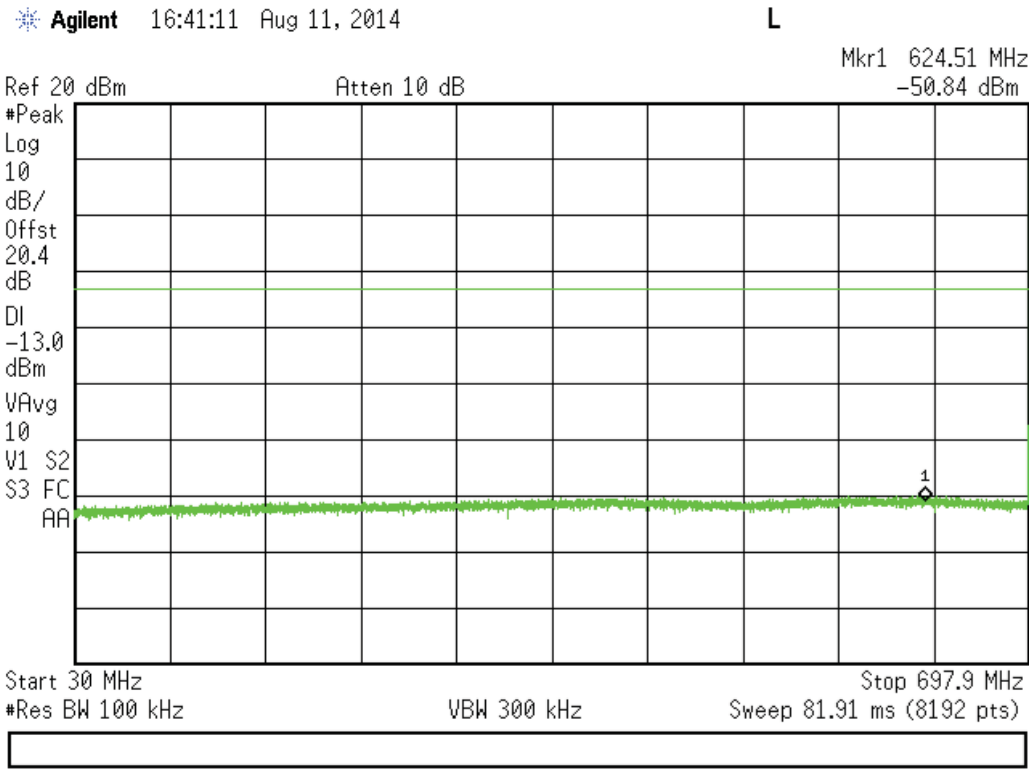
1930-1995 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
1930	-40.85	-13	-27.85	Pass
1960	-40.24	-13	-27.24	Pass
1995	-41.13	-13	-28.13	Pass

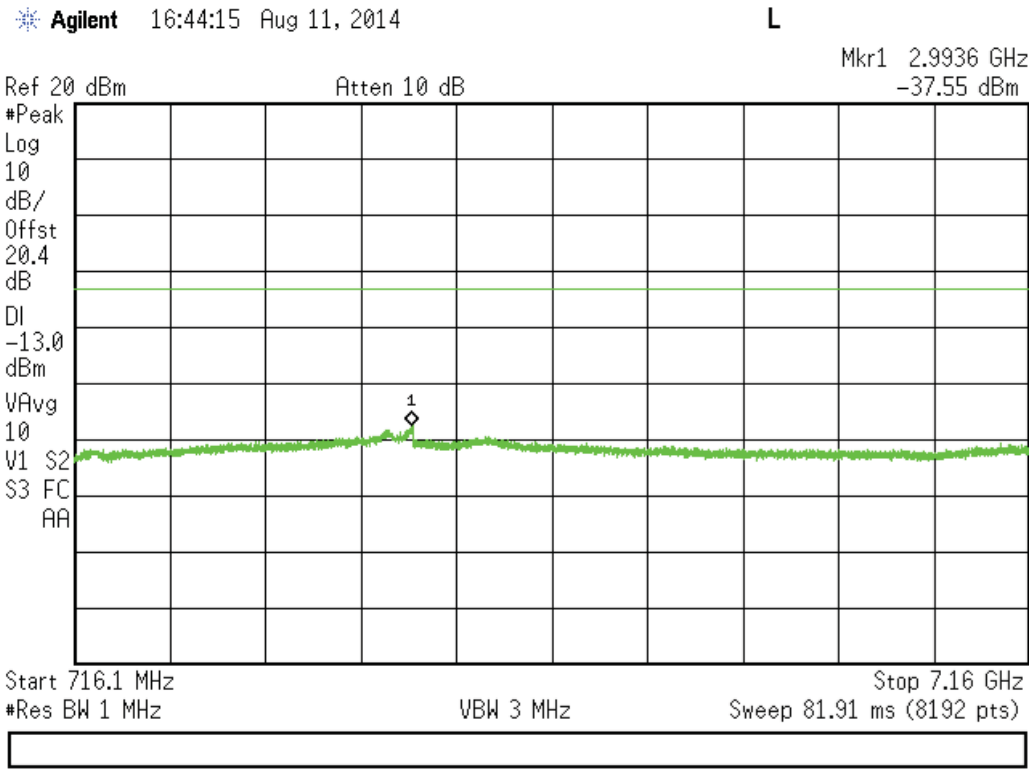
2110-2155 MHz Band

Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Margin (dB)	Result
2110	-39.83	-13	-26.83	Pass
2132.5	-39.97	-13	-26.97	Pass
2155	-39.93	-13	-26.93	Pass

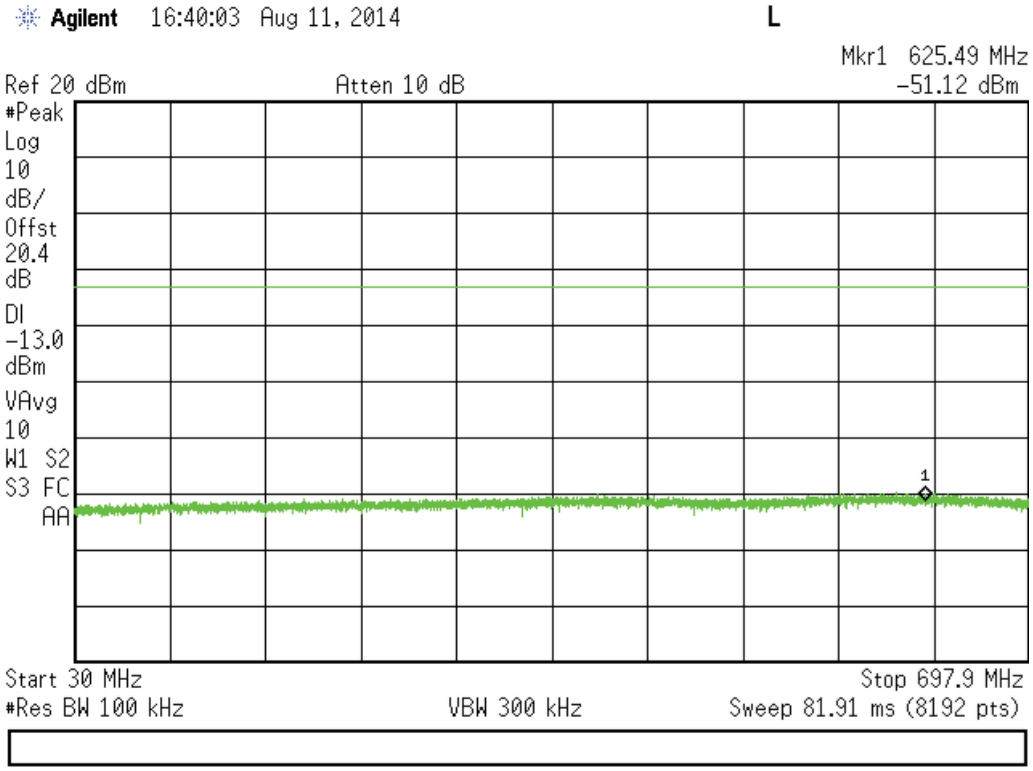
Uplink GSM Signal
698 - 716 MHz Band (Low Frequency)



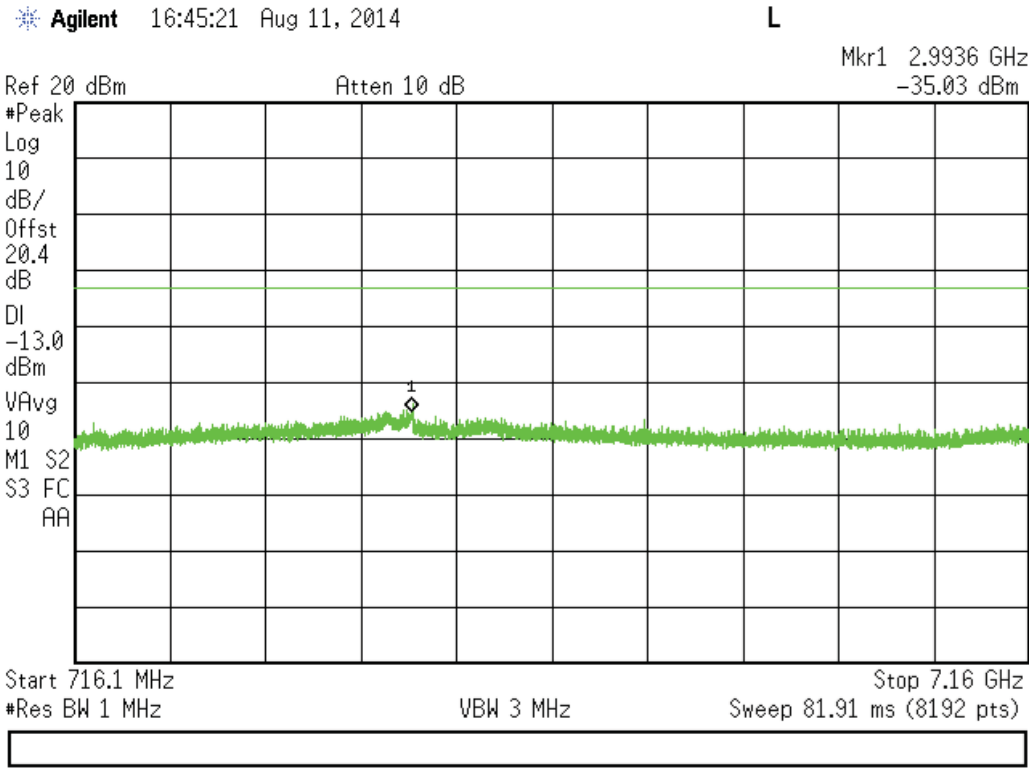
698 - 716 MHz Band (Low Frequency) (Cont)



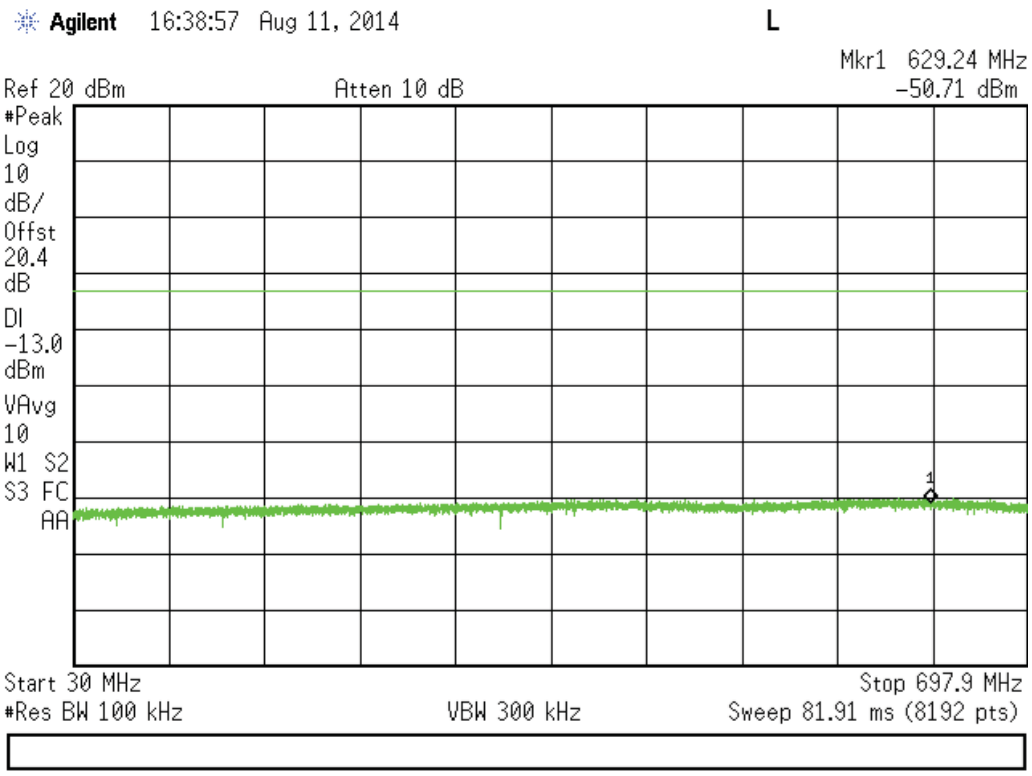
698 - 716 MHz Band (Mid Frequency)



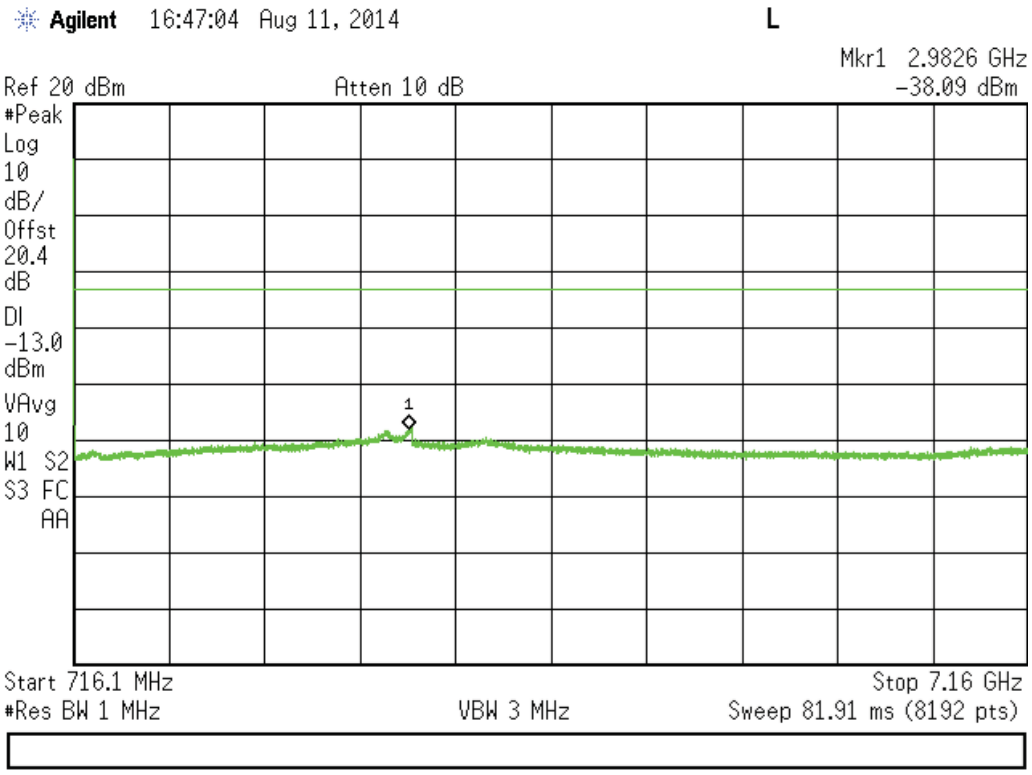
698 - 716 MHz Band (Mid Frequency) (Cont)



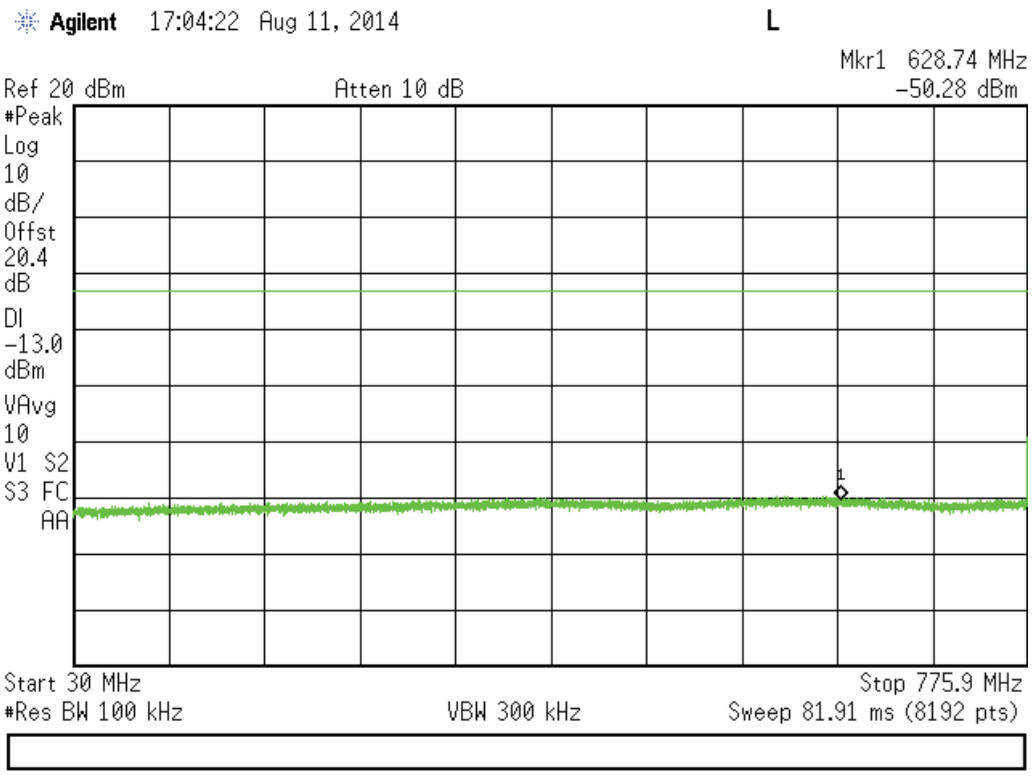
698 - 716 MHz Band (High Frequency)



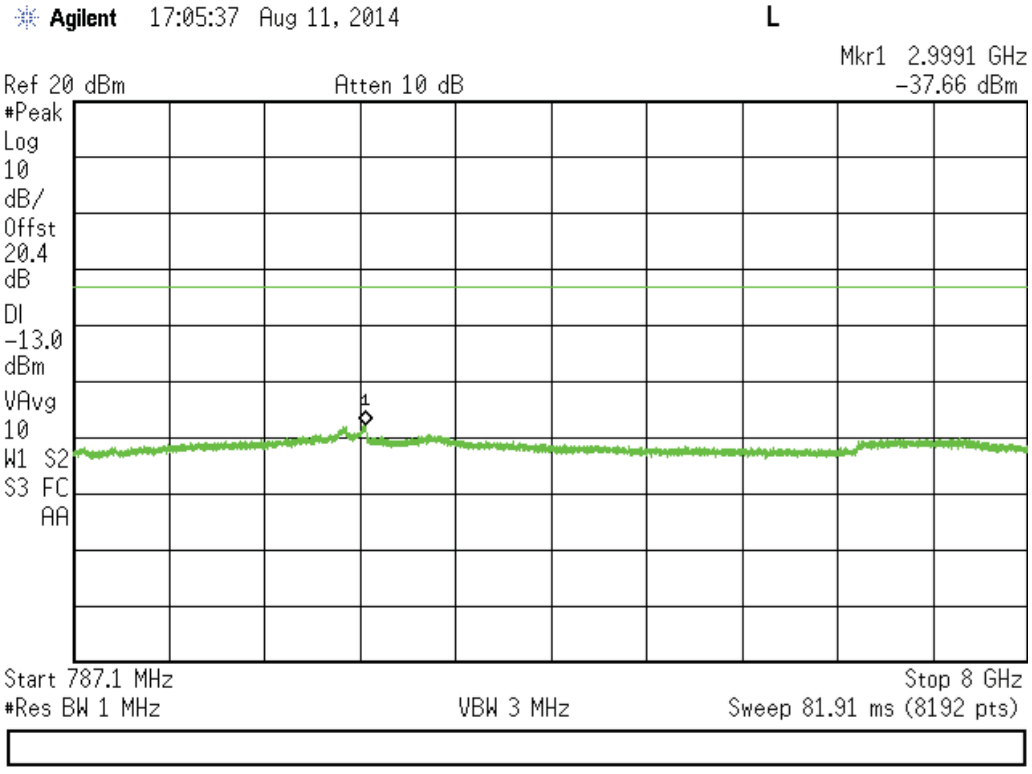
698 - 716 MHz Band (High Frequency) (Cont)



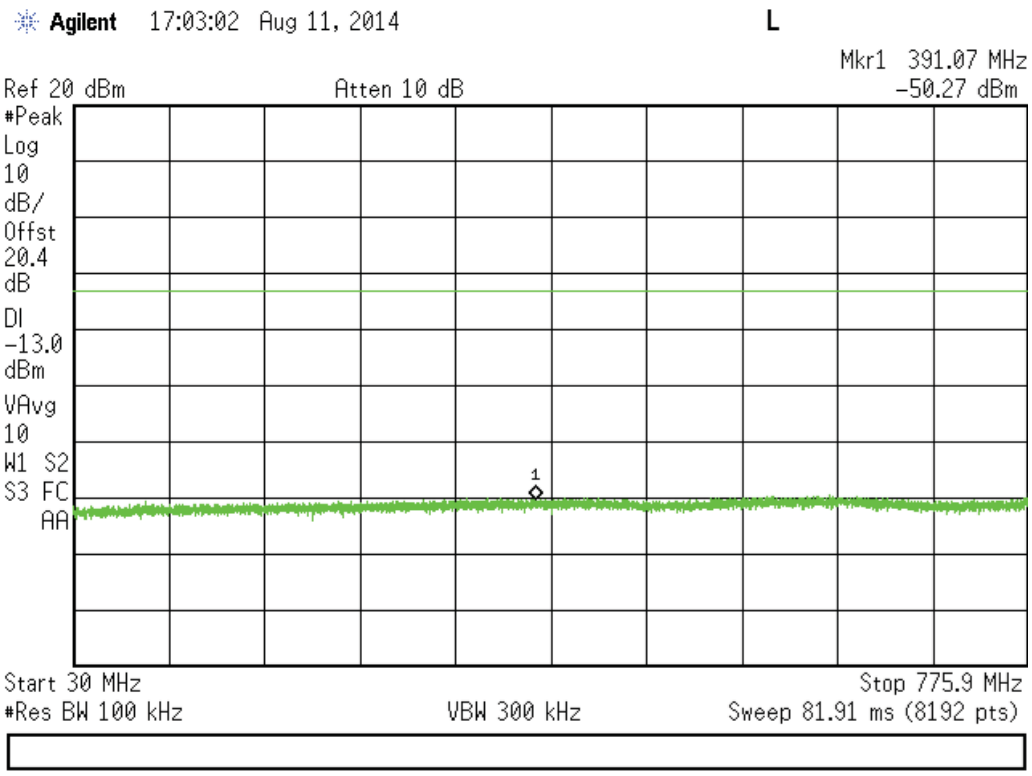
776-787 MHz Band (Low Frequency)



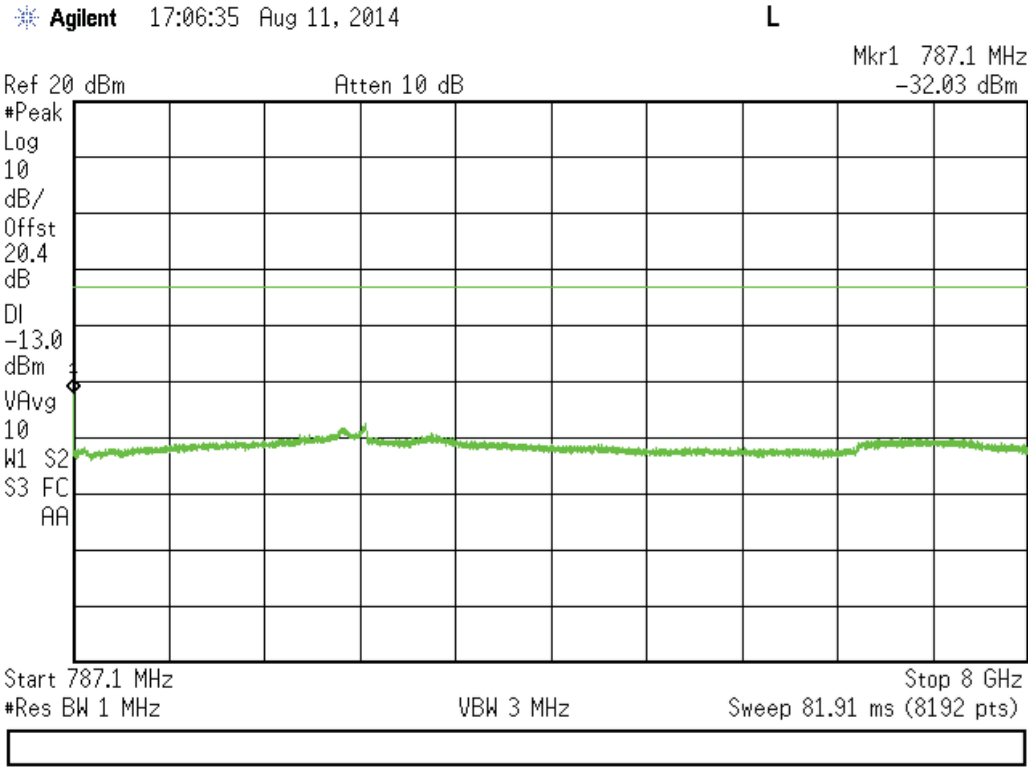
776-787 MHz Band (Low Frequency) (Cont)



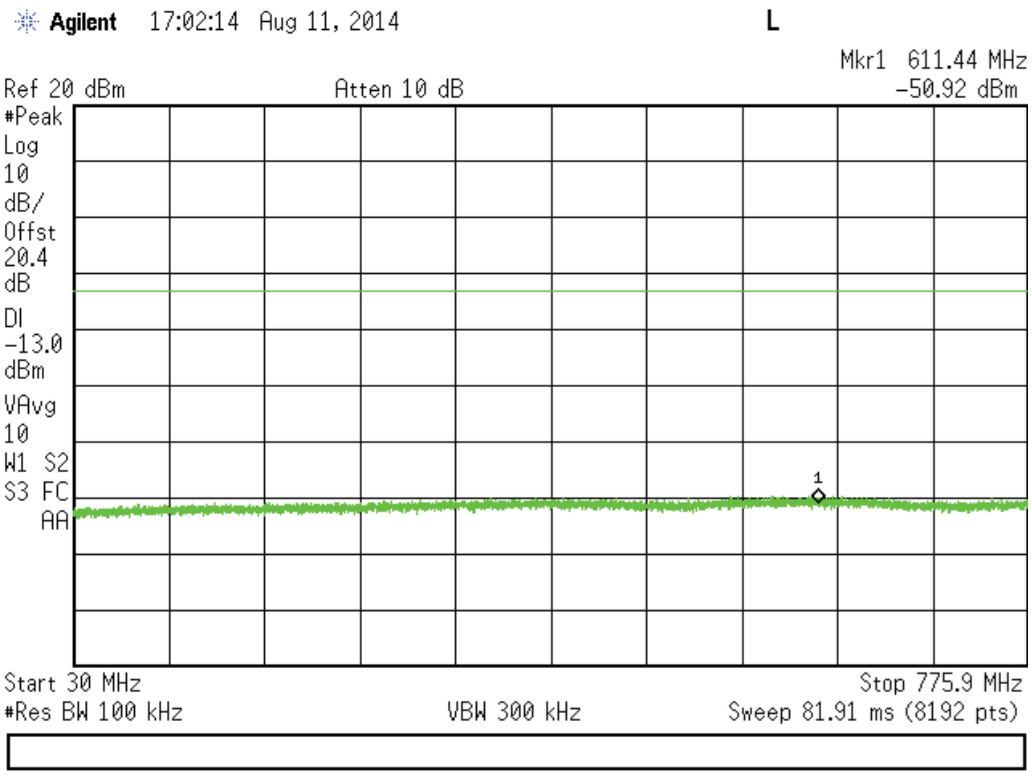
776-787 MHz Band (Mid Frequency)



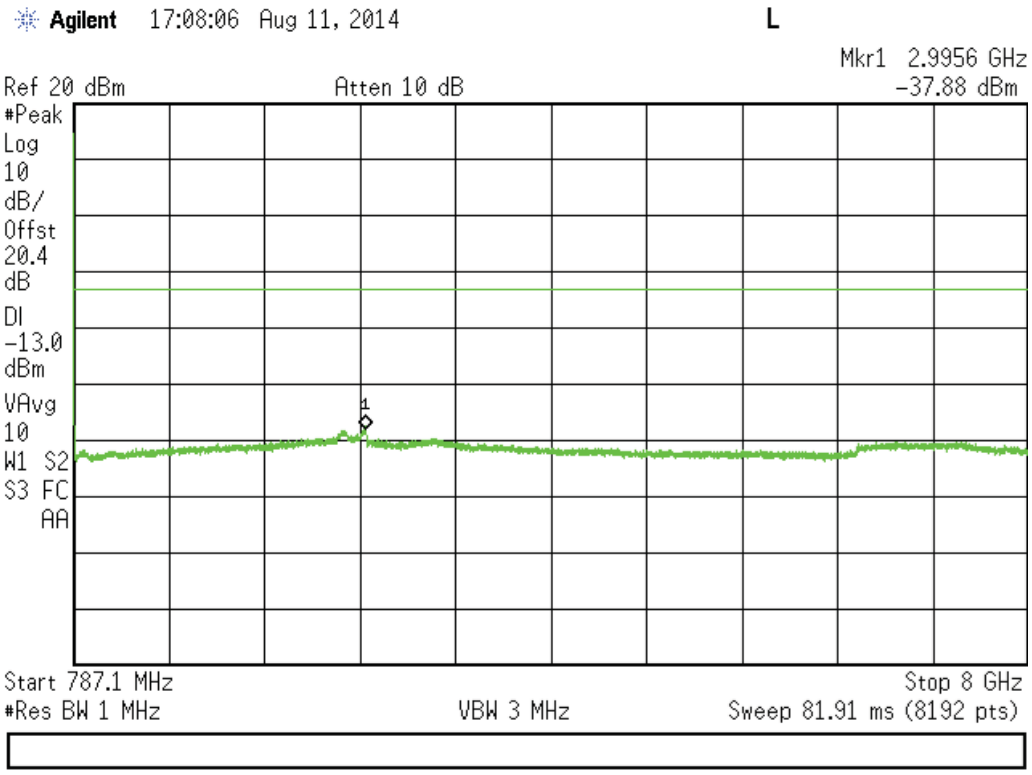
776-787 MHz Band (Mid Frequency) (Cont)



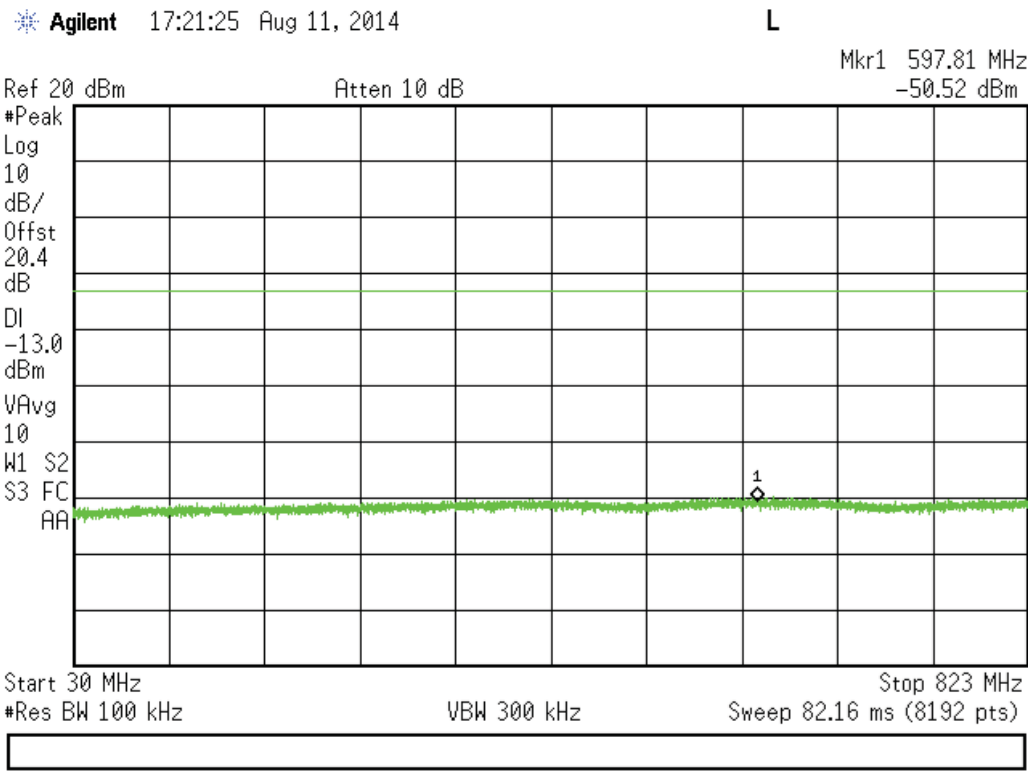
776-787 MHz Band (High Frequency)



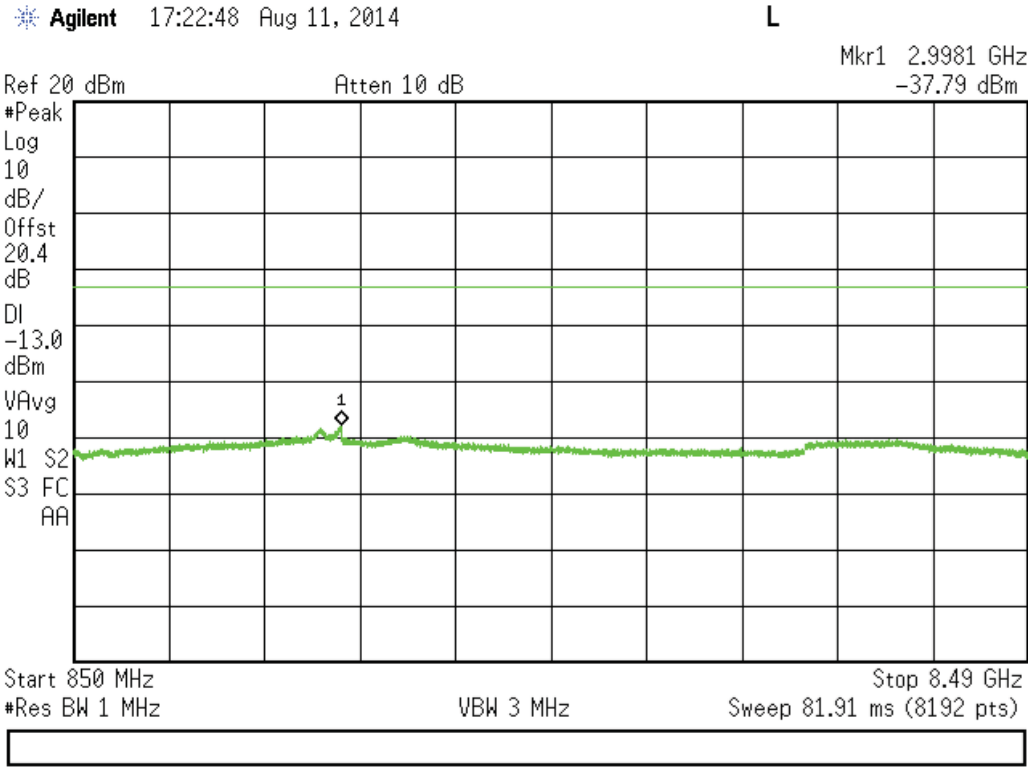
776-787 MHz Band (High Frequency) (Cont)



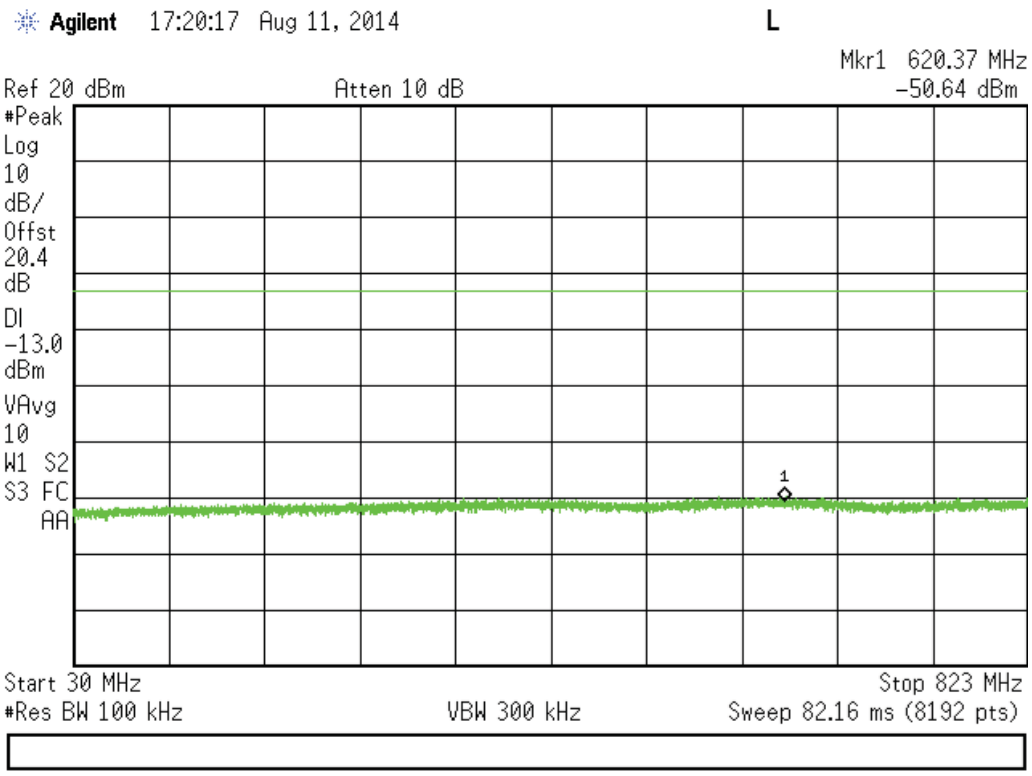
824-849 MHz Band (Low Frequency)



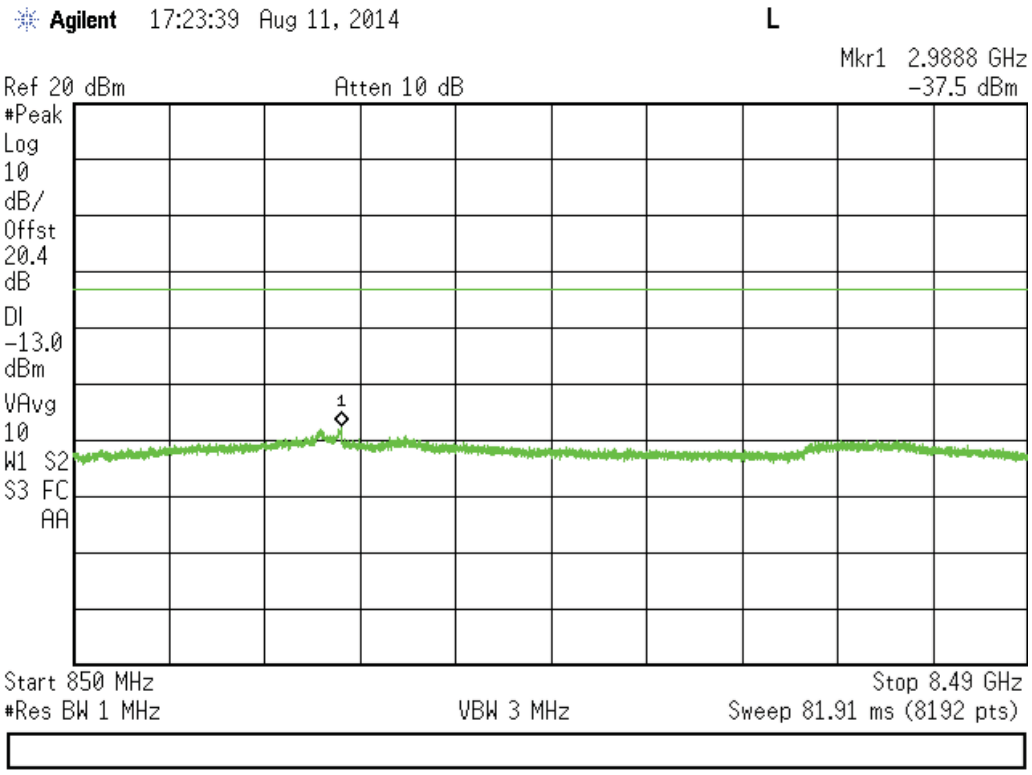
824-849 MHz Band (Low Frequency) (Cont)



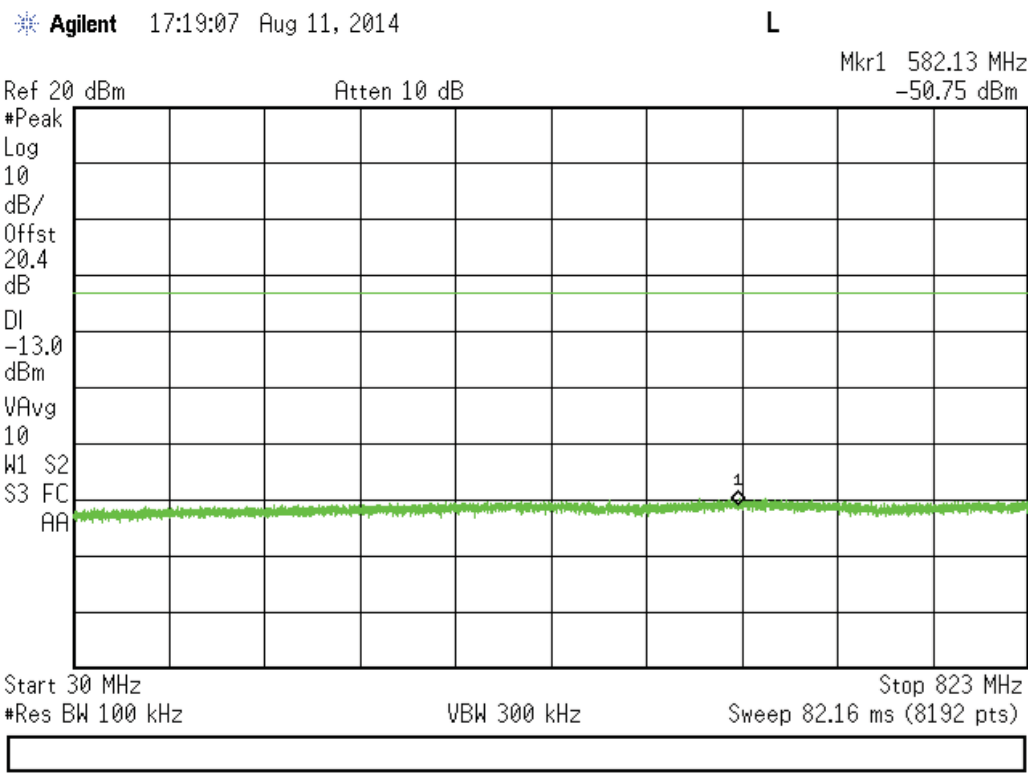
824-849 MHz Band (Mid Frequency)



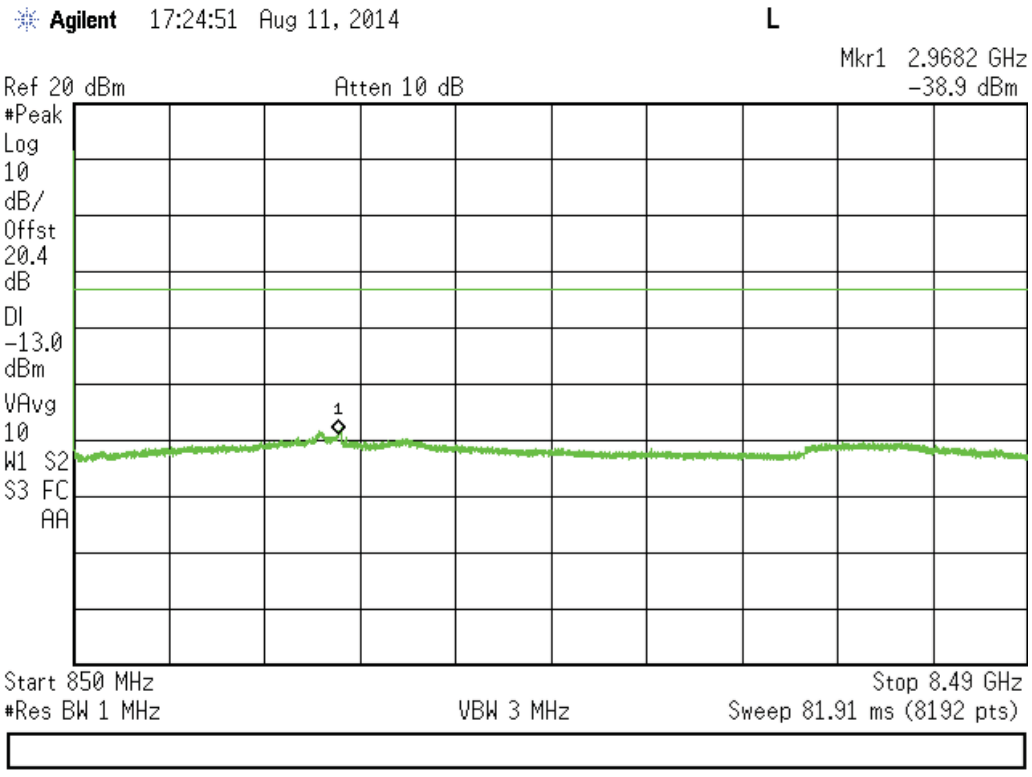
824-849 MHz Band (Mid Frequency) (Cont)



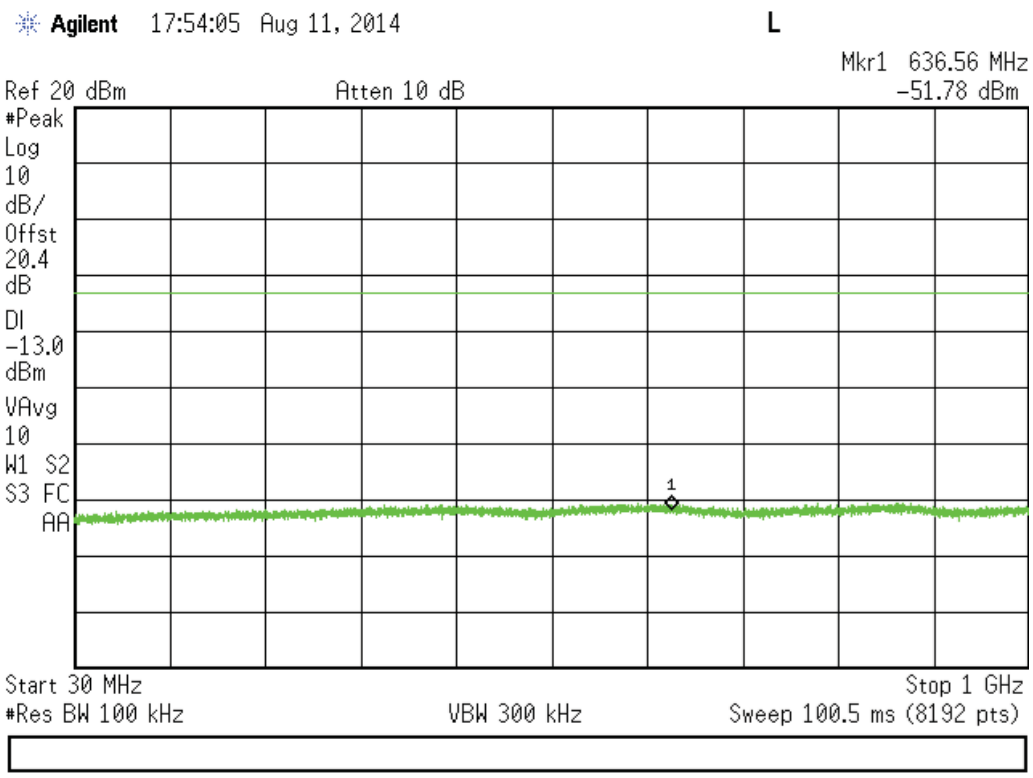
824-849 MHz Band (High Frequency)



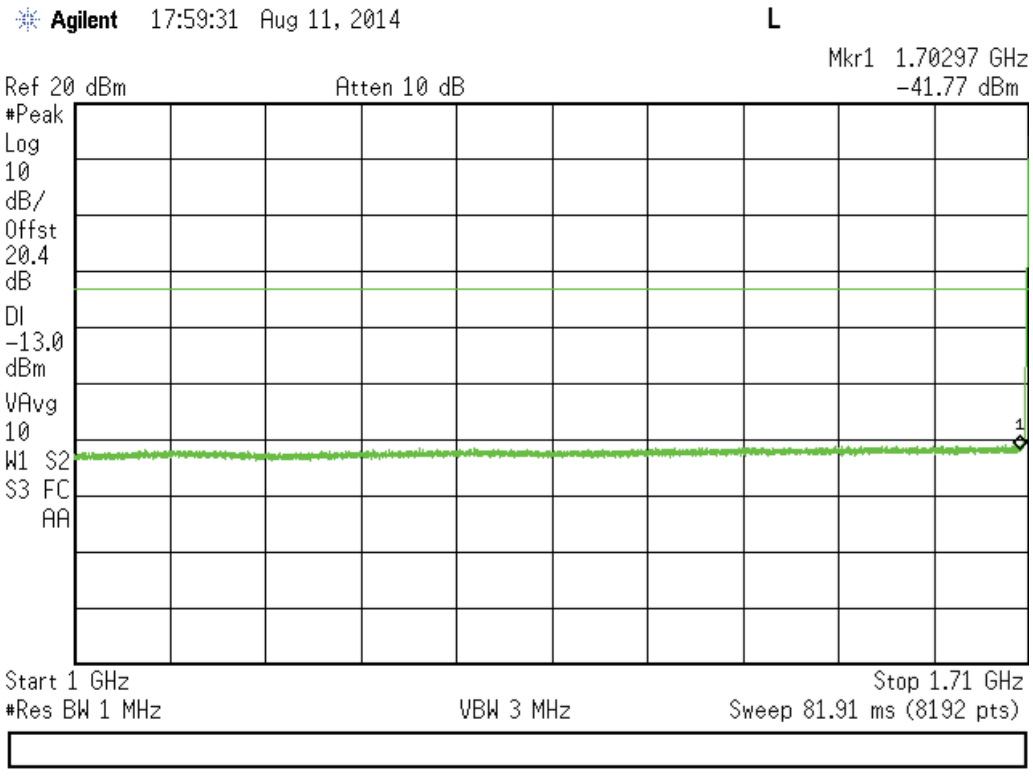
824-849 MHz Band (High Frequency) (Cont)



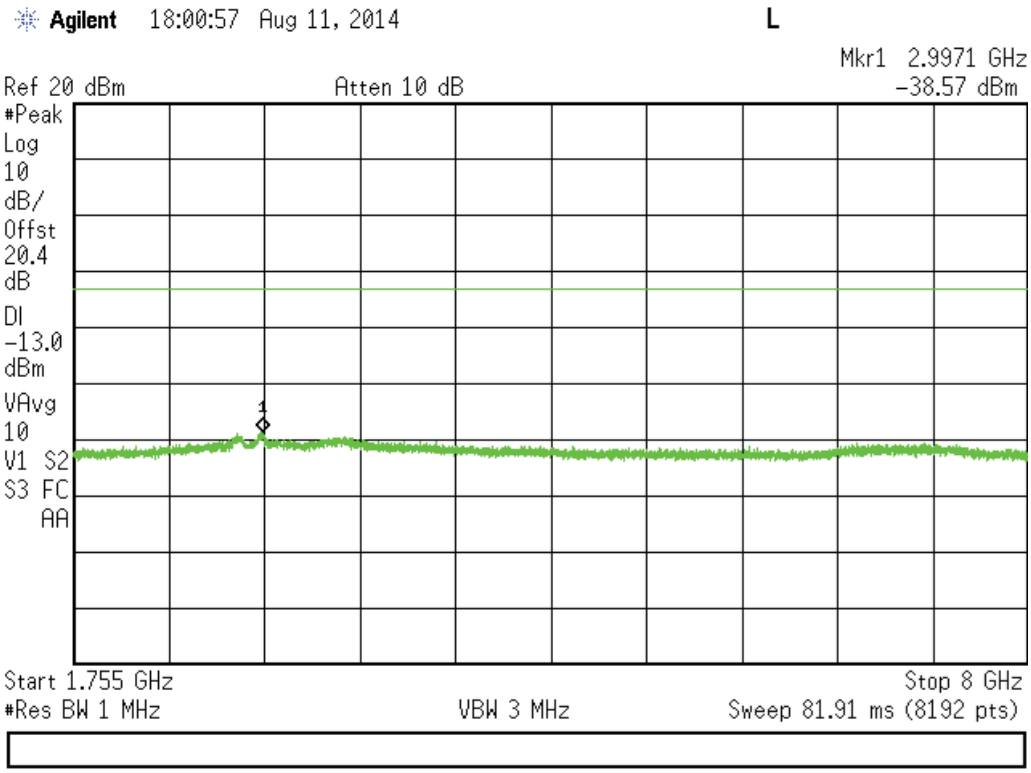
1710-1755 MHz Band (Low Frequency)



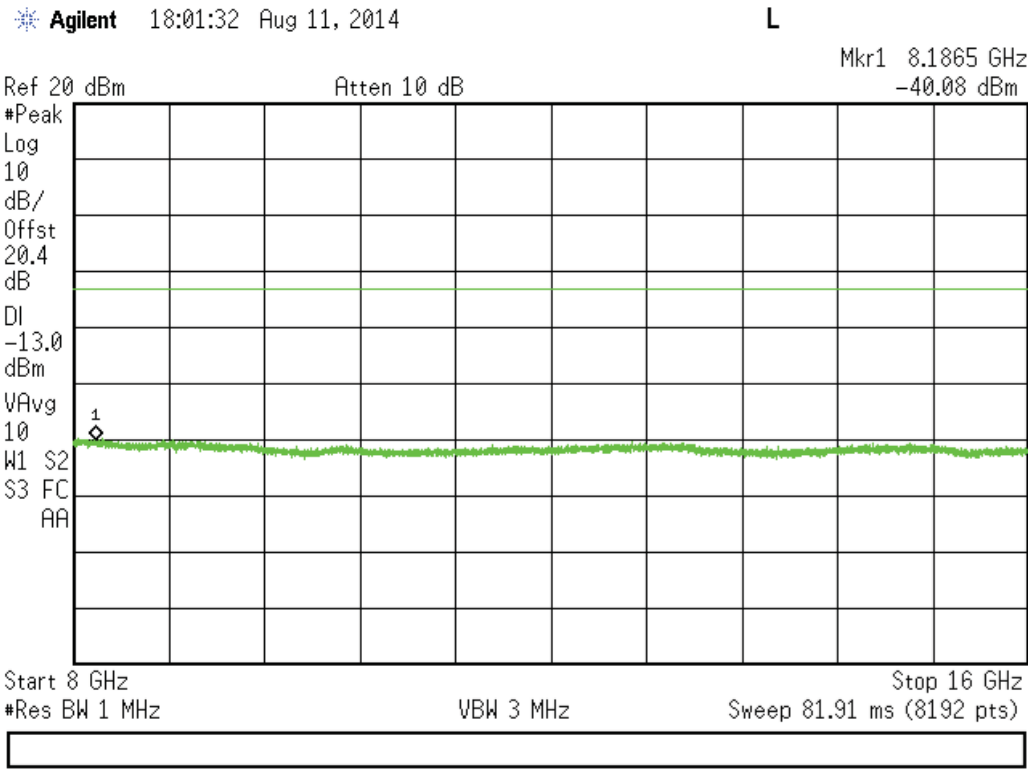
1710-1755 MHz Band (Low Frequency) (Cont)



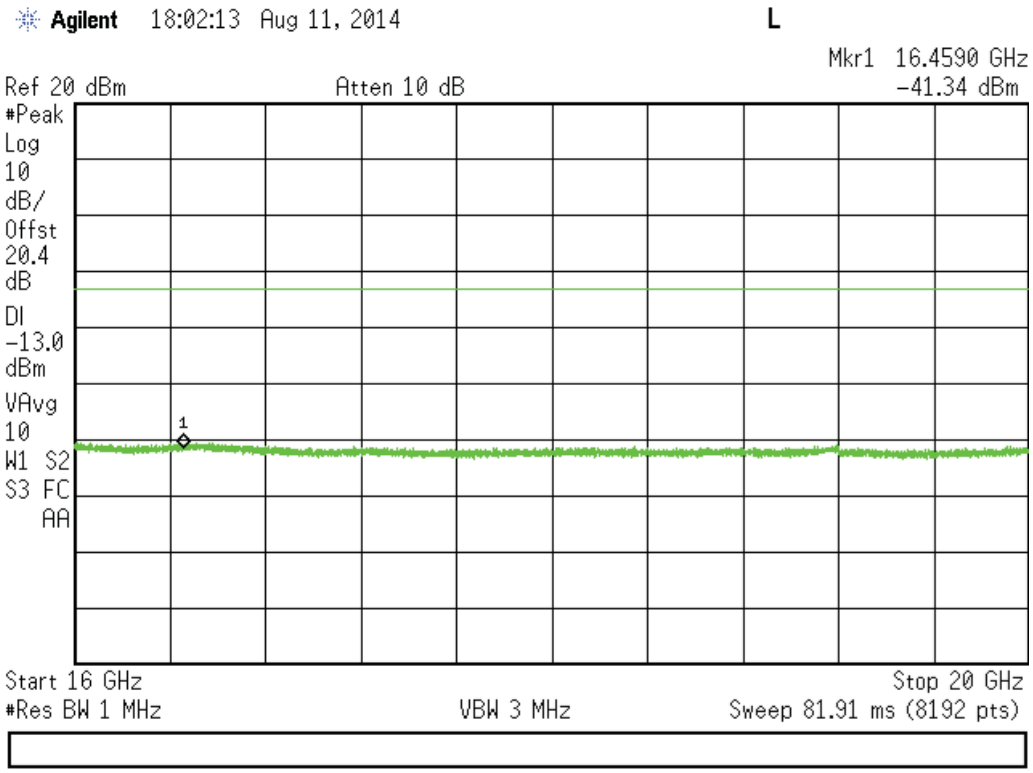
1710-1755 MHz Band (Low Frequency) (Cont)



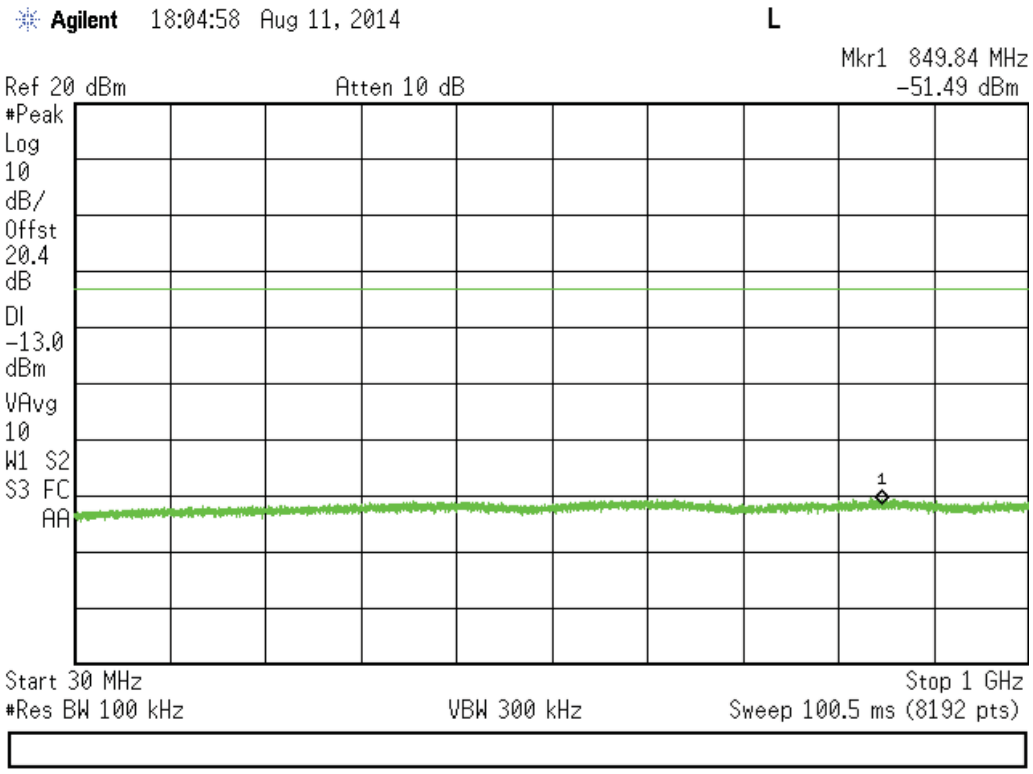
1710-1755 MHz Band (Low Frequency) (Cont)



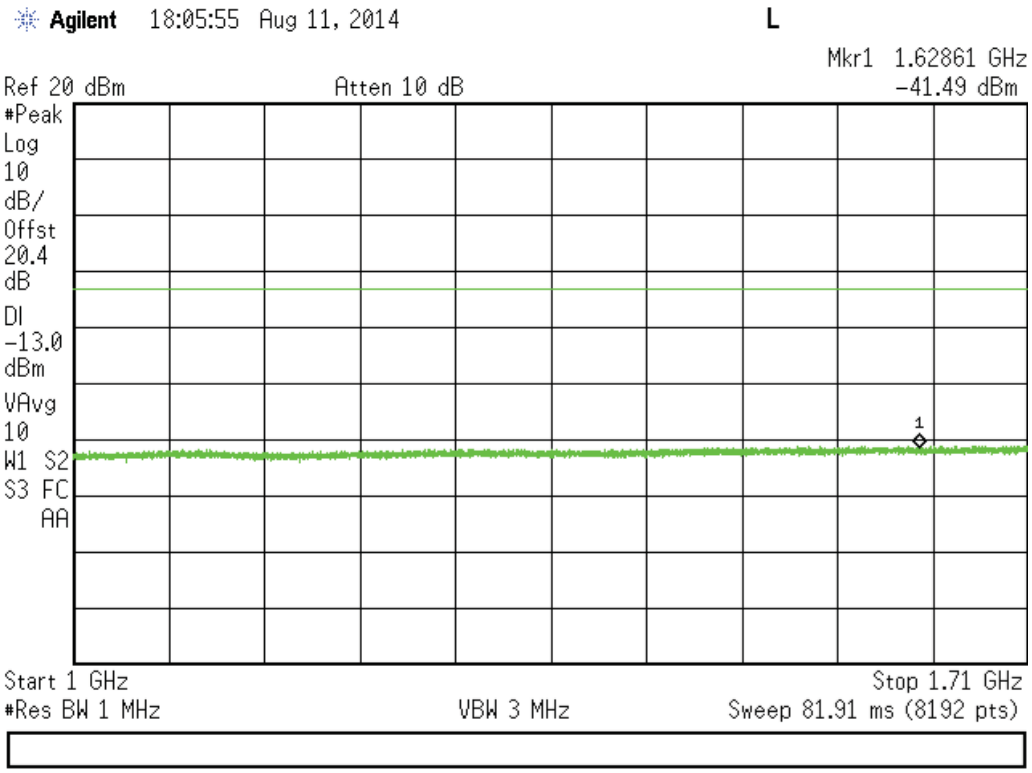
1710-1755 MHz Band (Low Frequency) (Cont)



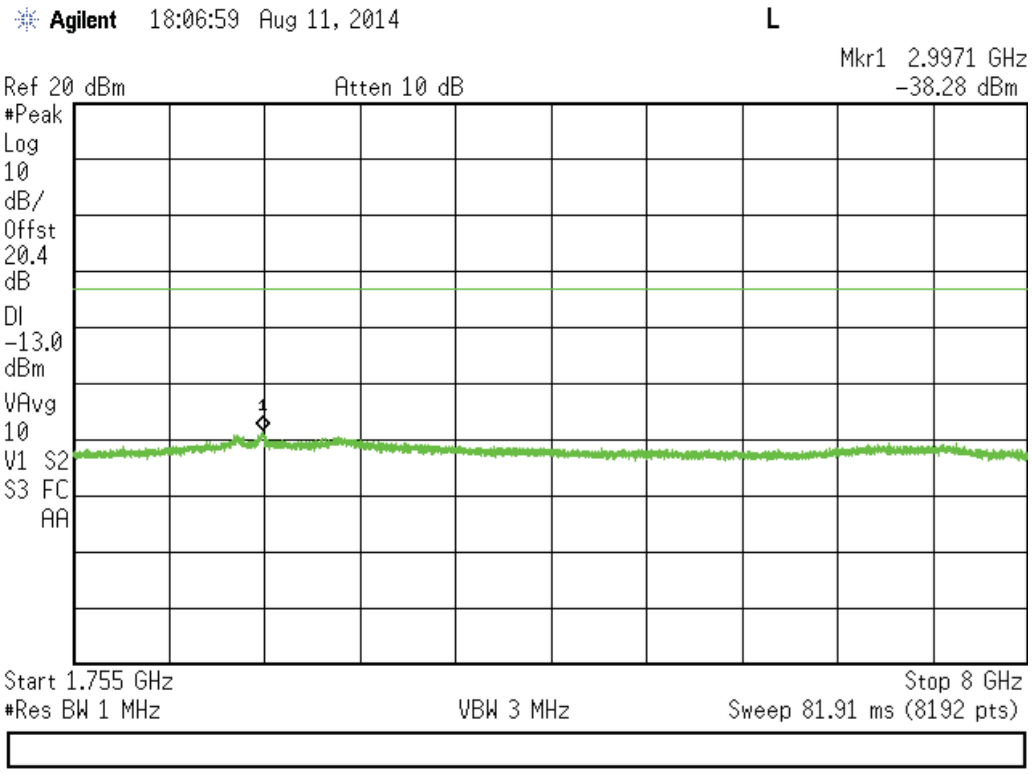
1710-1755 MHz Band (Mid Frequency)



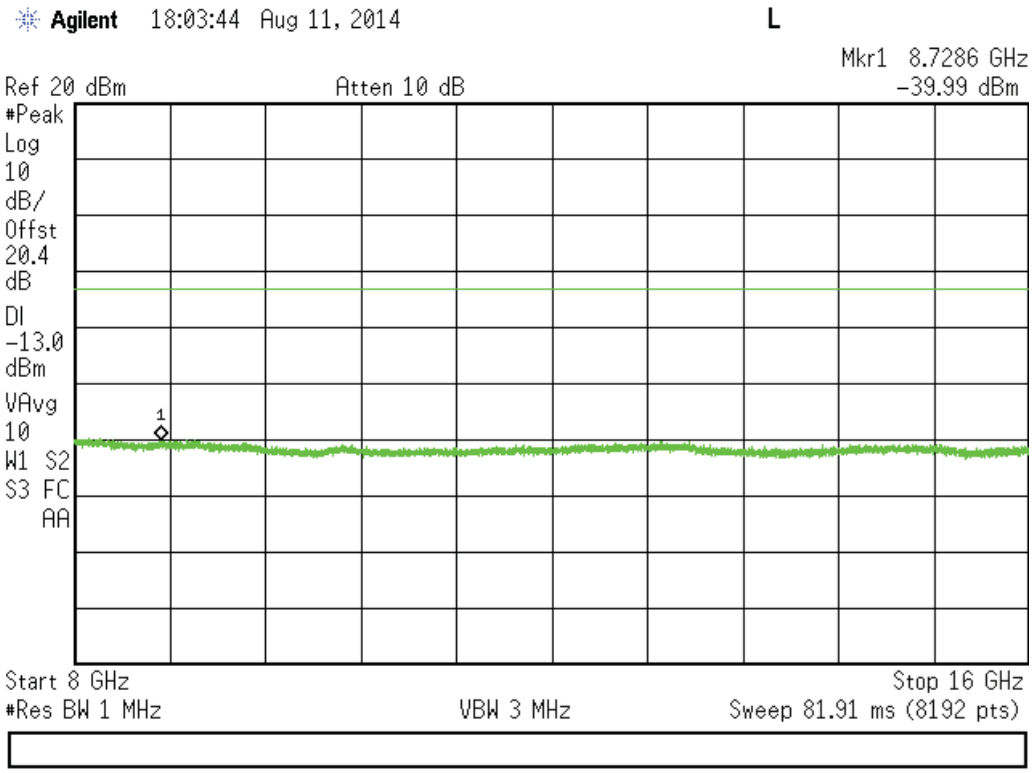
1710-1755 MHz Band (Mid Frequency) (Cont)



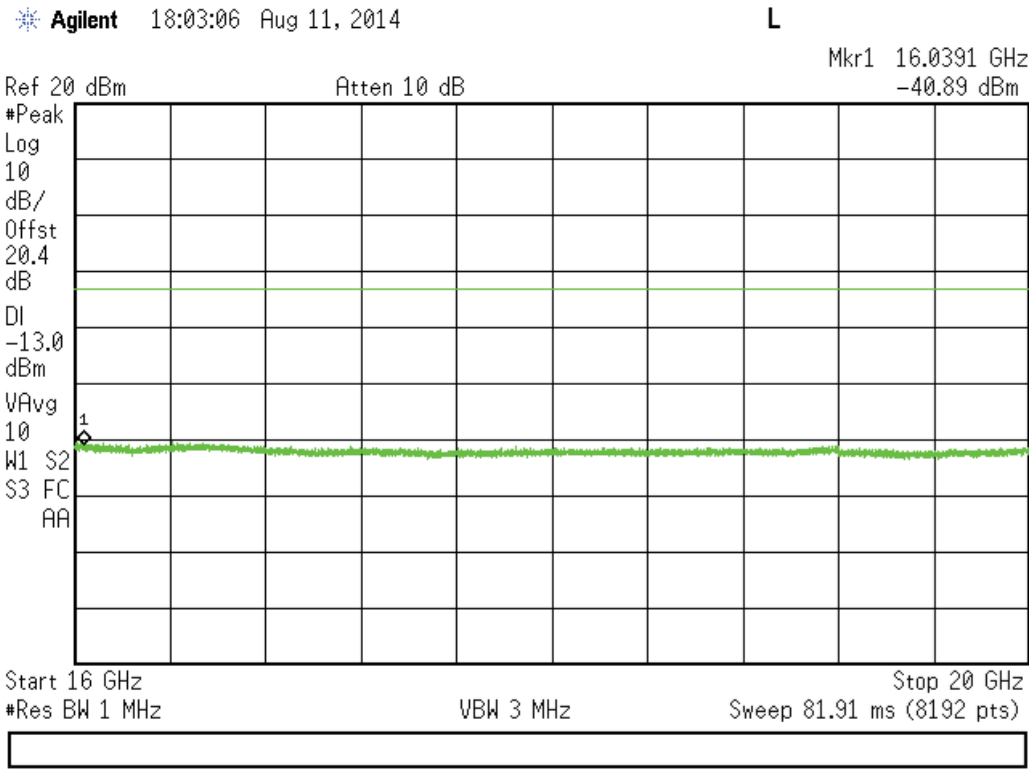
1710-1755 MHz Band (Mid Frequency) (Cont)



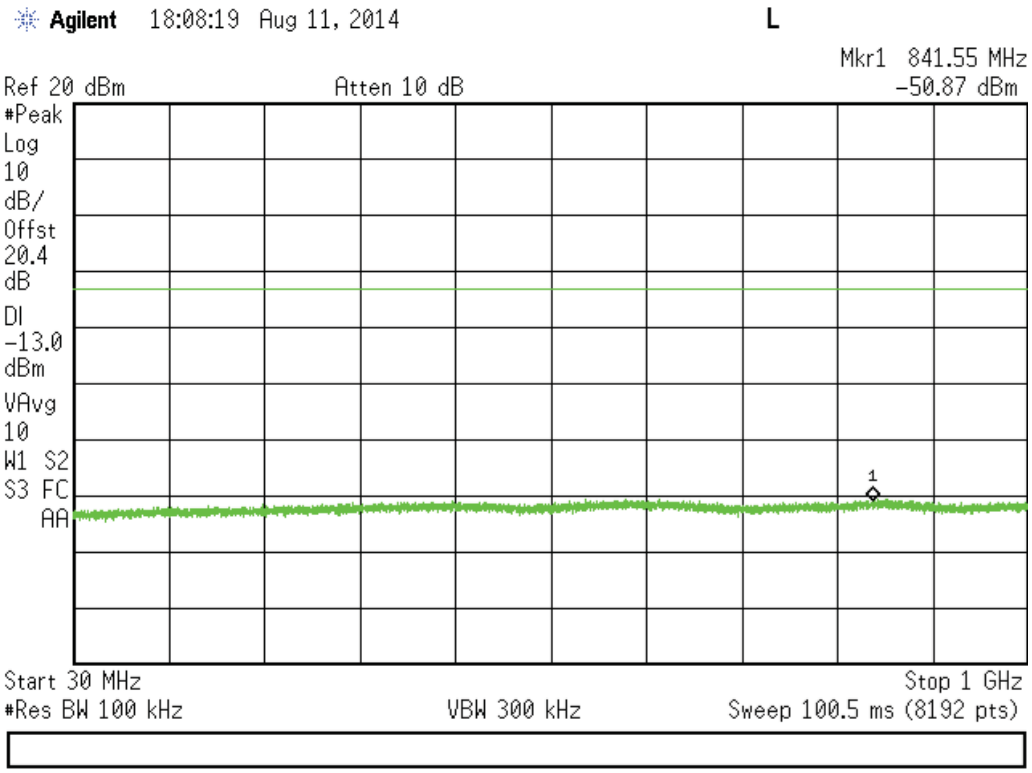
1710-1755 MHz Band (Mid Frequency) (Cont)



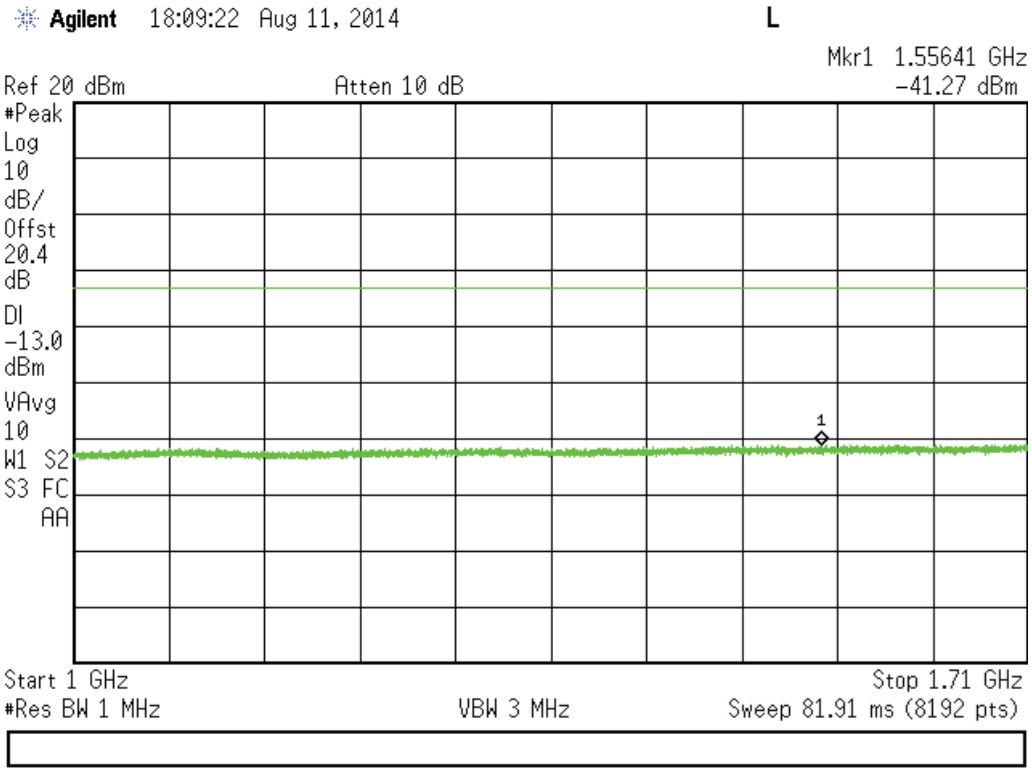
1710-1755 MHz Band (Mid Frequency) (Cont)



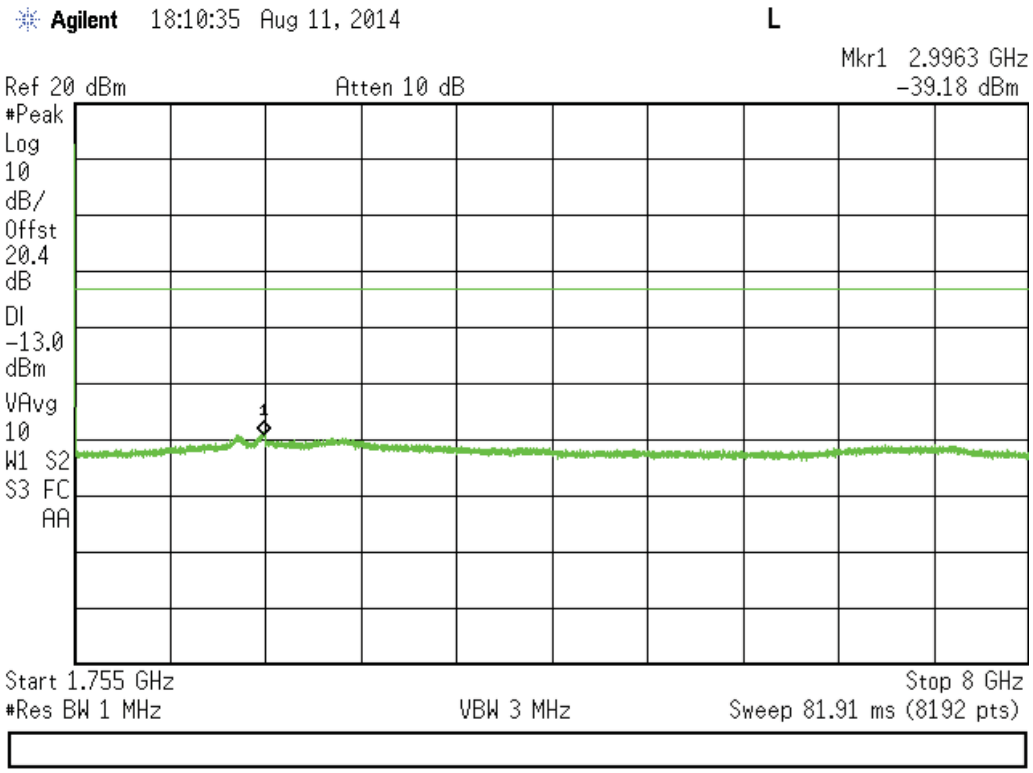
1710-1755 MHz Band (High Frequency)



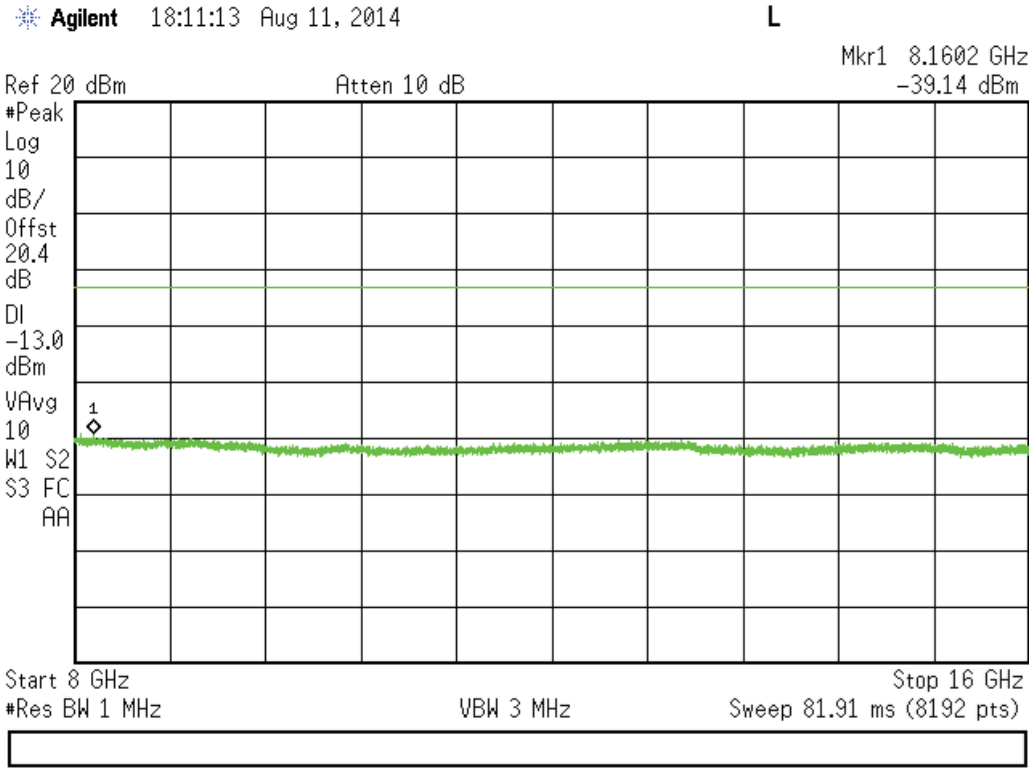
1710-1755 MHz Band (High Frequency) (Cont)



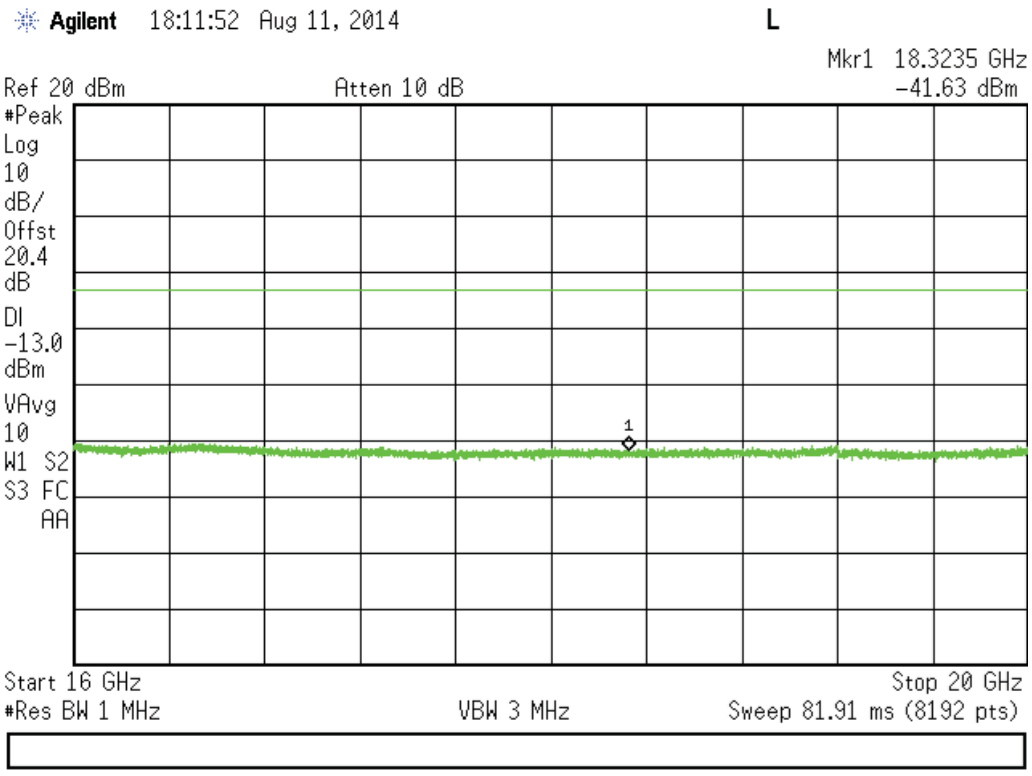
1710-1755 MHz Band (High Frequency) (Cont)



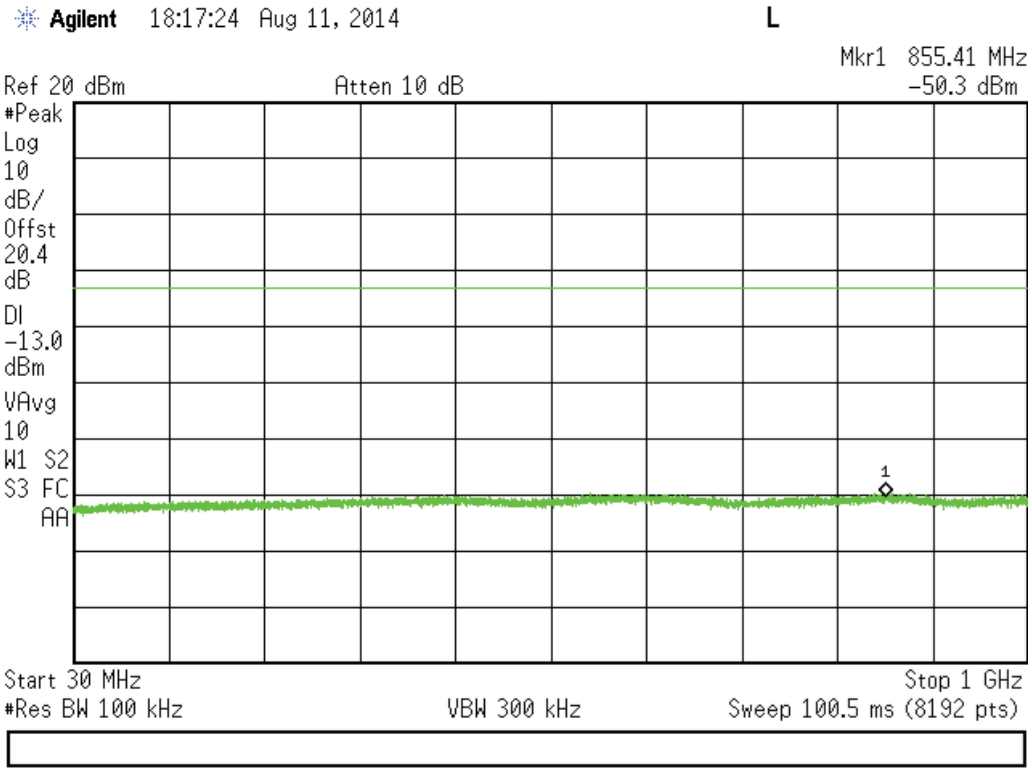
1710-1755 MHz Band (High Frequency) (Cont)



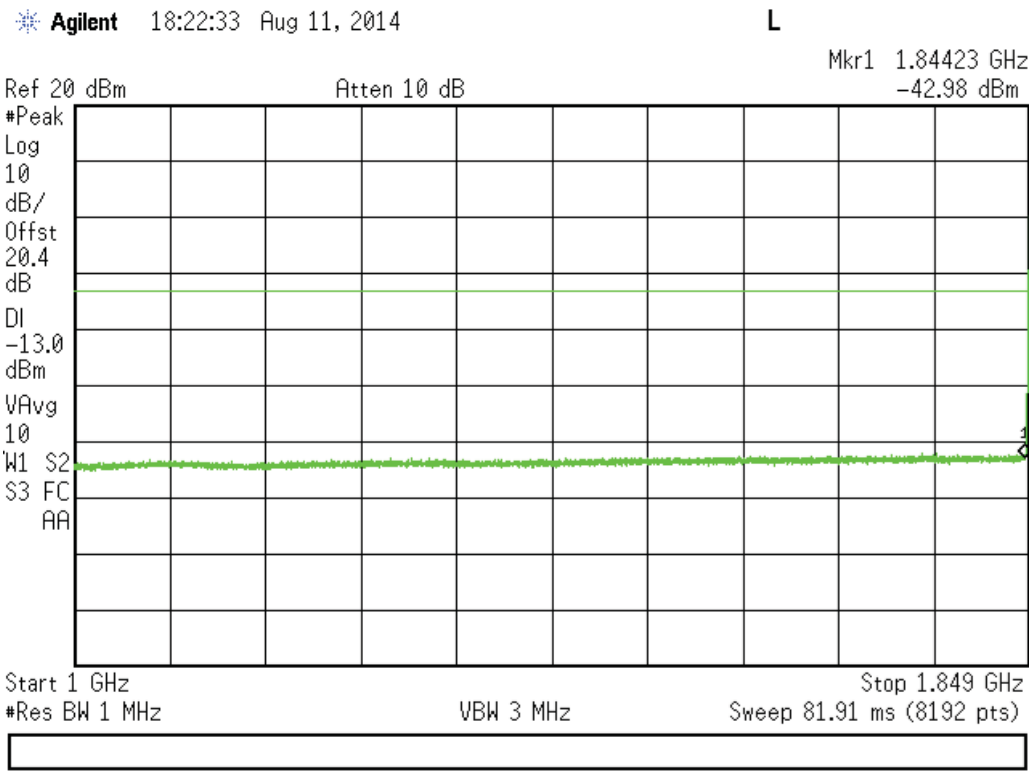
1710-1755 MHz Band (High Frequency) (Cont)



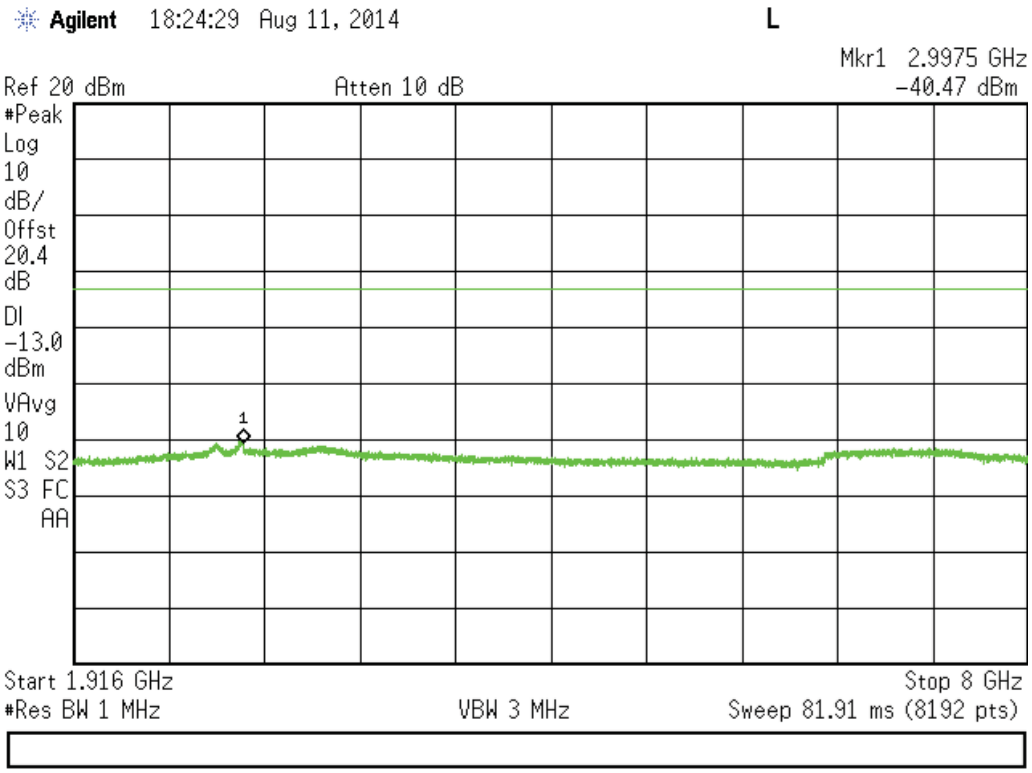
1850-1915 MHz Band (Low Frequency)



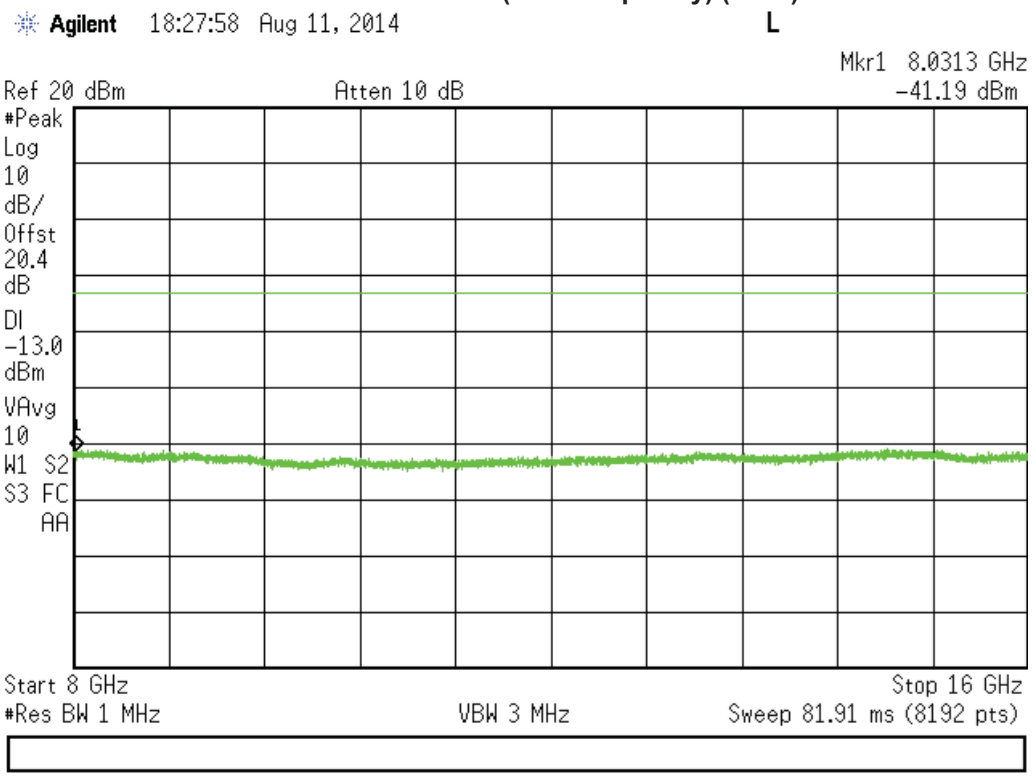
1850-1915 MHz Band (Low Frequency) (Cont)



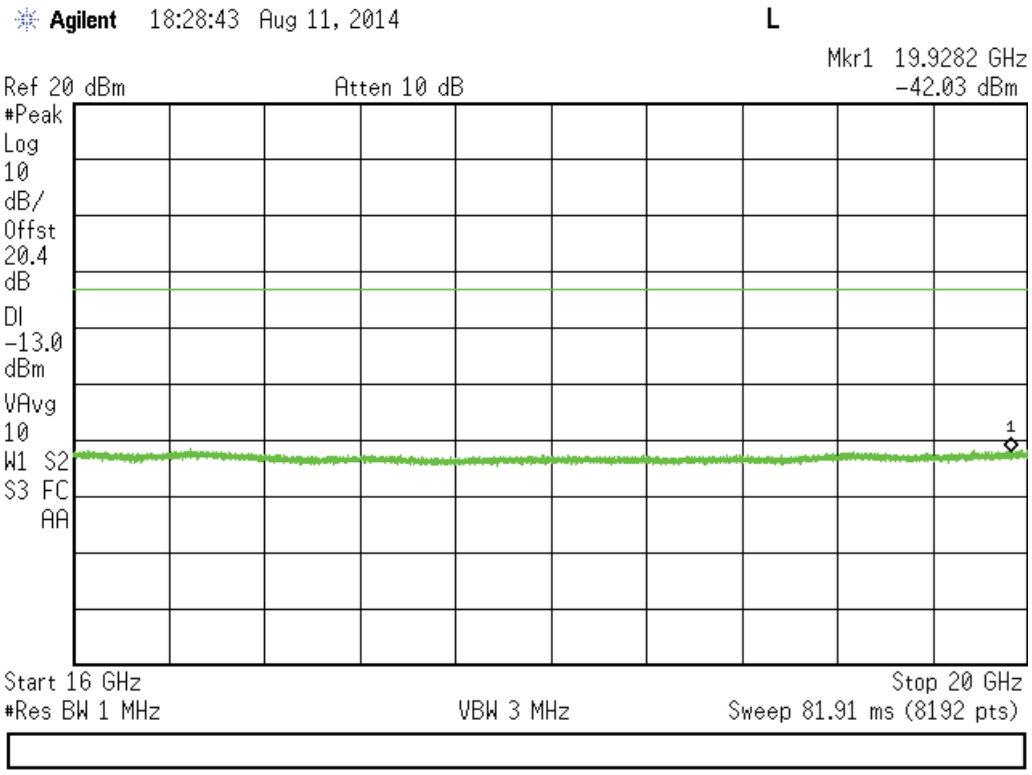
1850-1915 MHz Band (Low Frequency) (Cont)



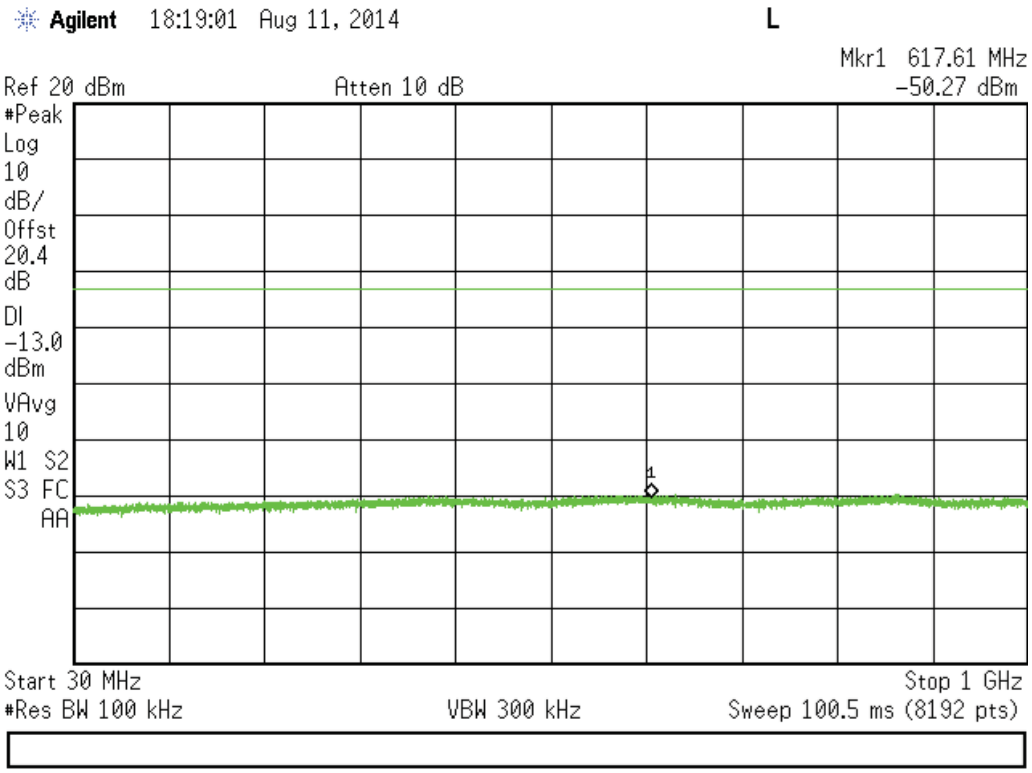
1850-1915 MHz Band (Low Frequency) (Cont)



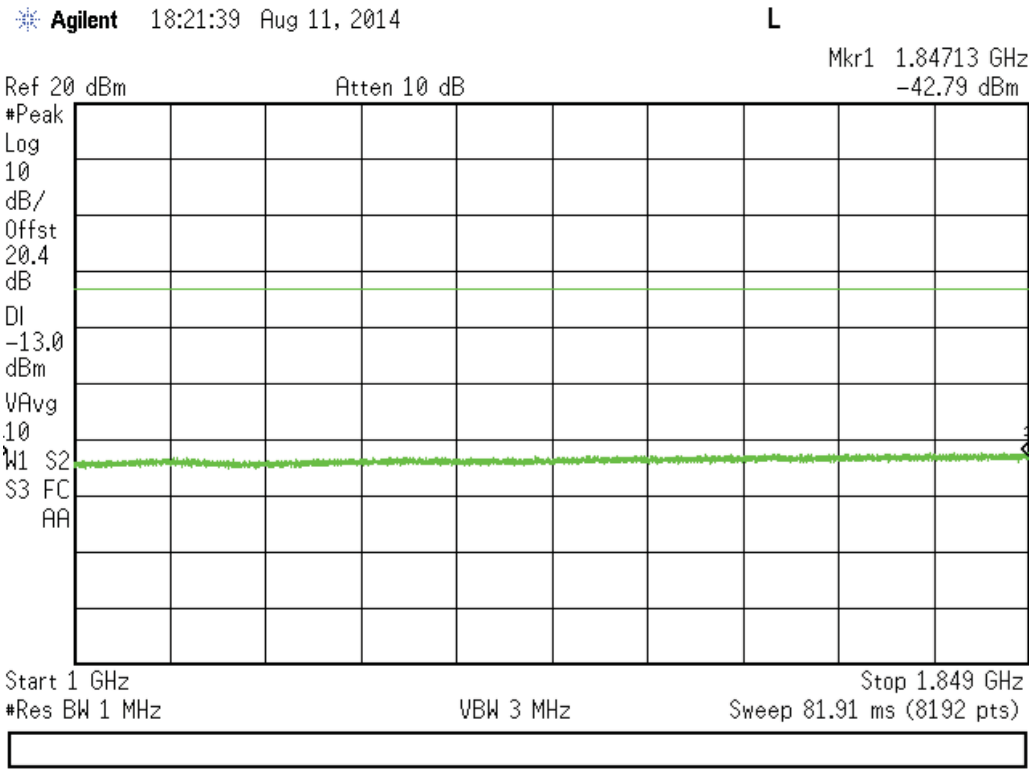
1850-1915 MHz Band (Low Frequency) (Cont)



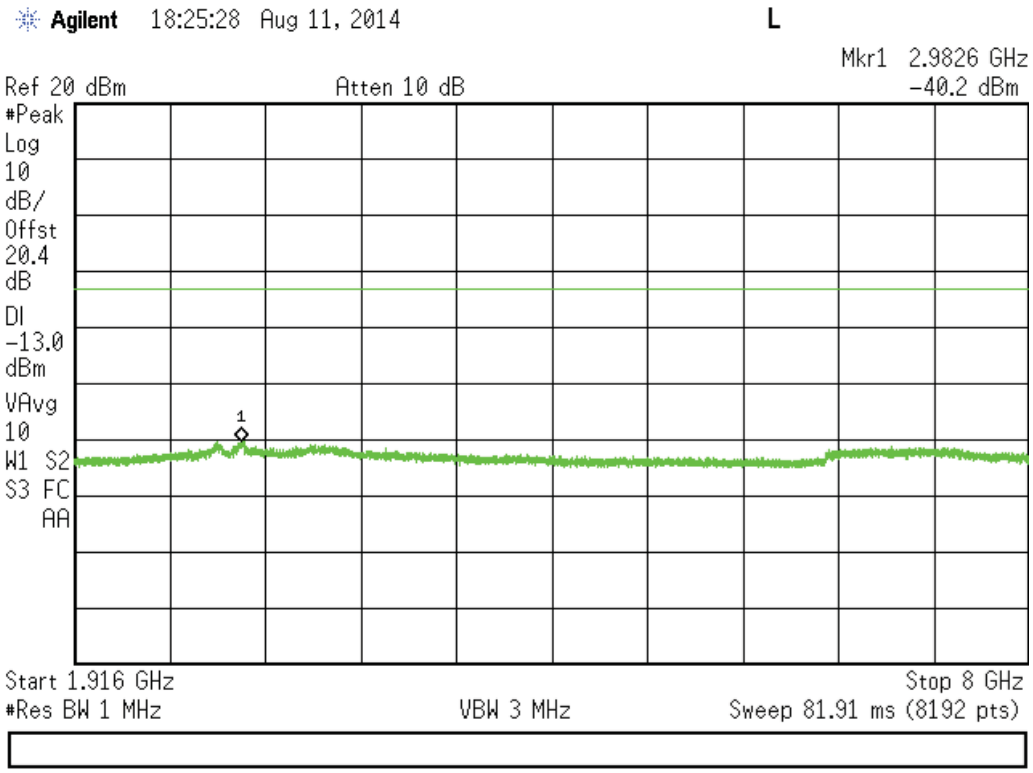
1850-1915 MHz Band (Mid Frequency)



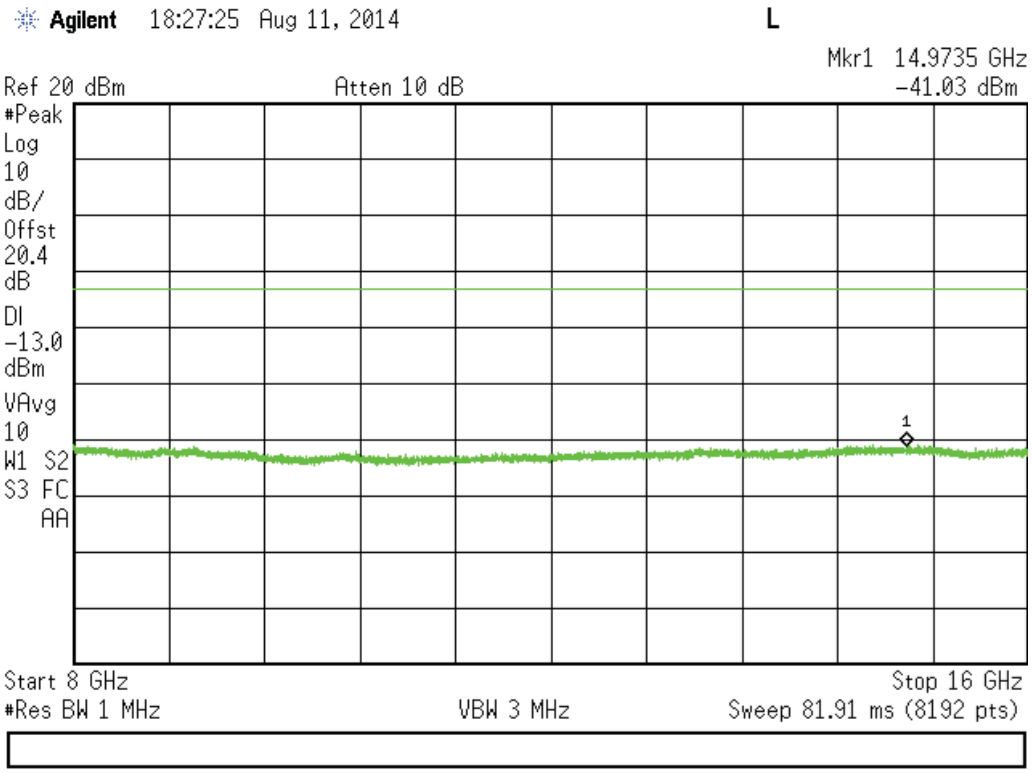
1850-1915 MHz Band (Mid Frequency) (Cont)



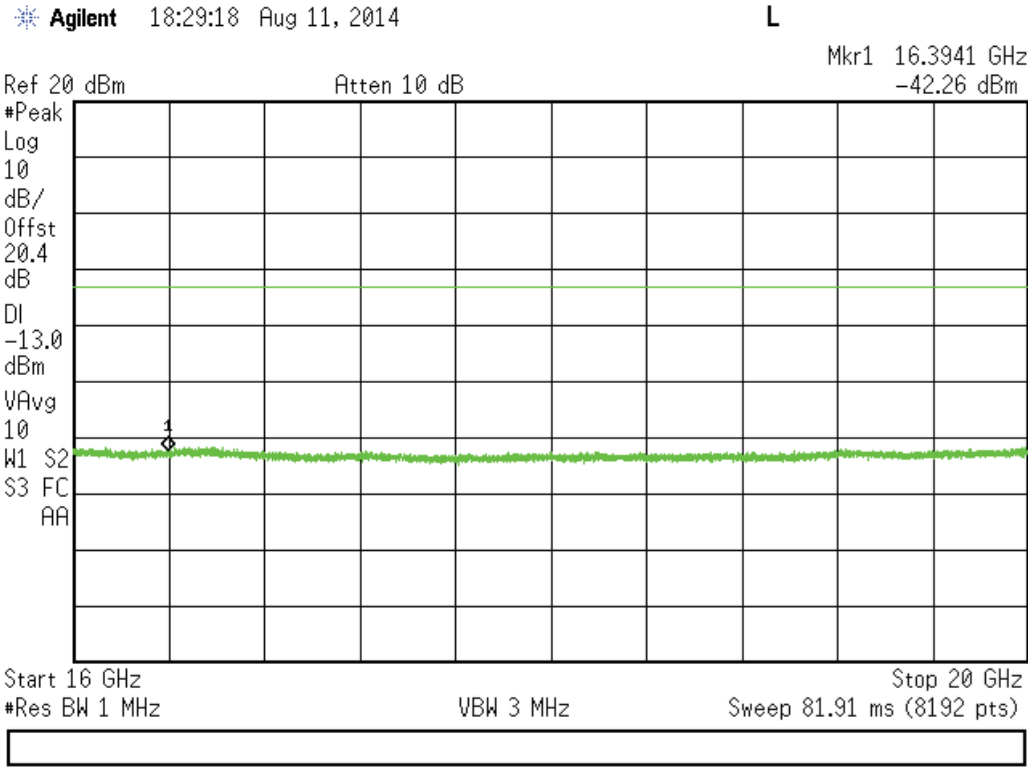
1850-1915 MHz Band (Mid Frequency) (Cont)



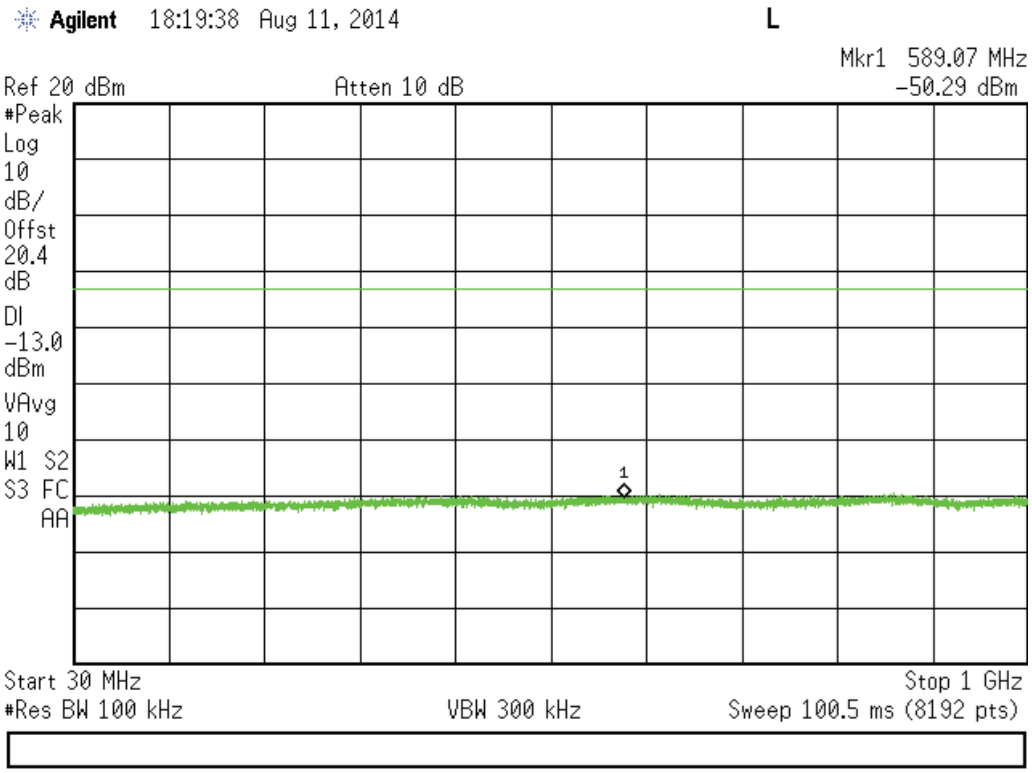
1850-1915 MHz Band (Mid Frequency) (Cont)



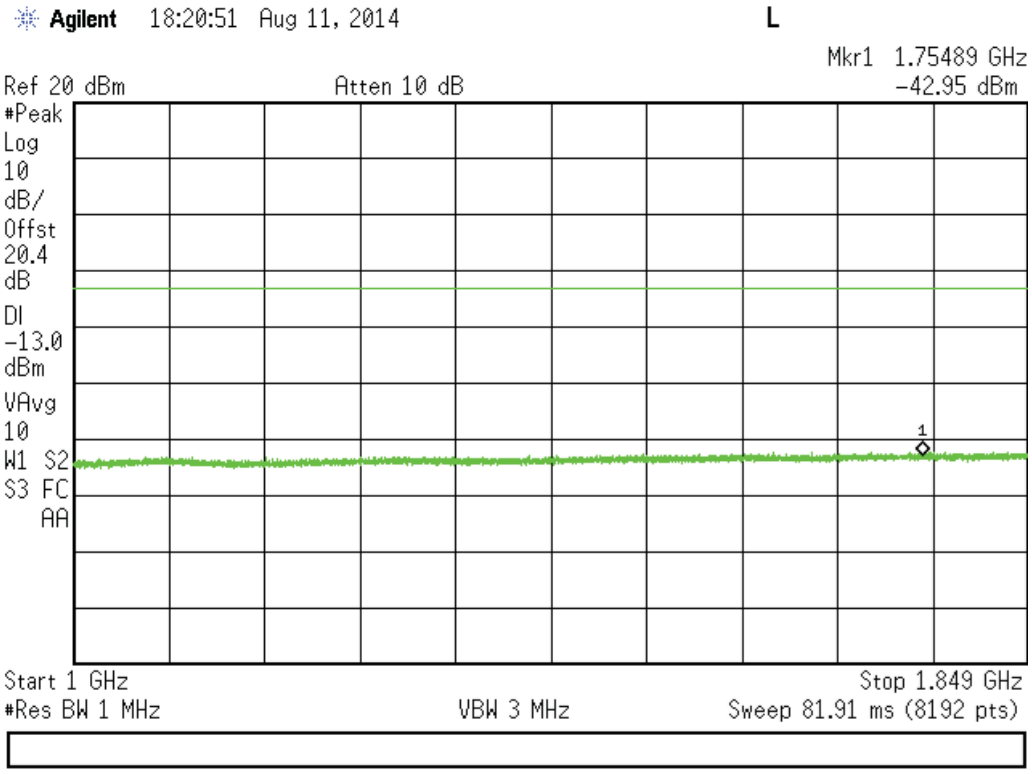
1850-1915 MHz Band (Mid Frequency) (Cont)



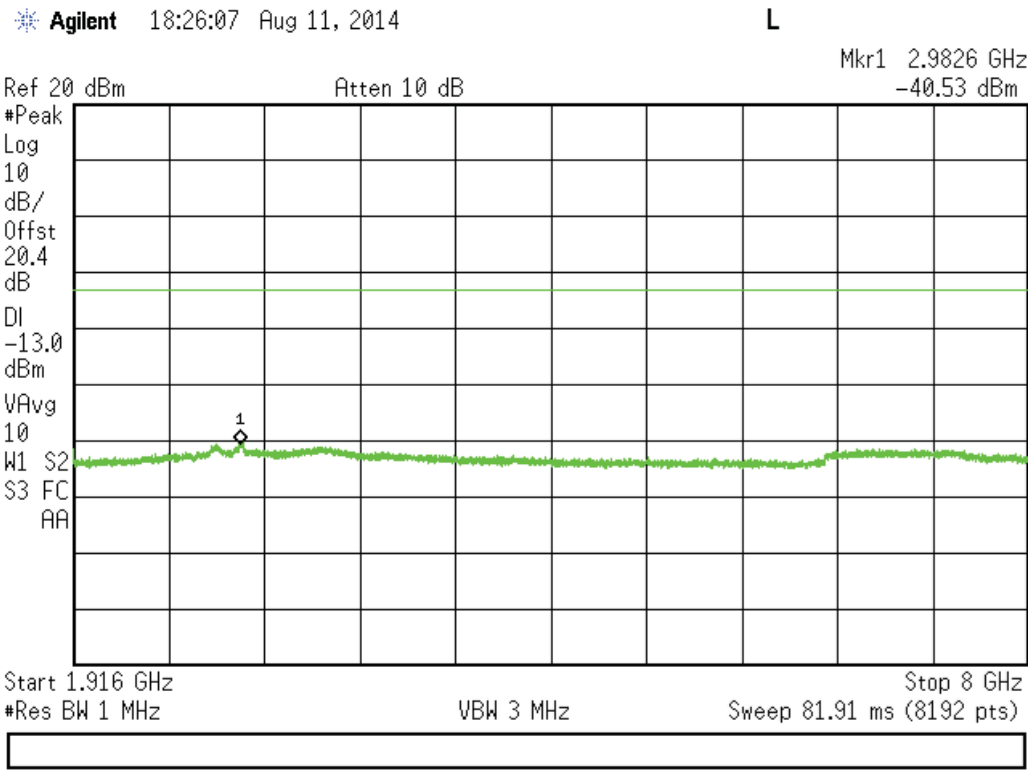
1850-1915 MHz Band (High Frequency)



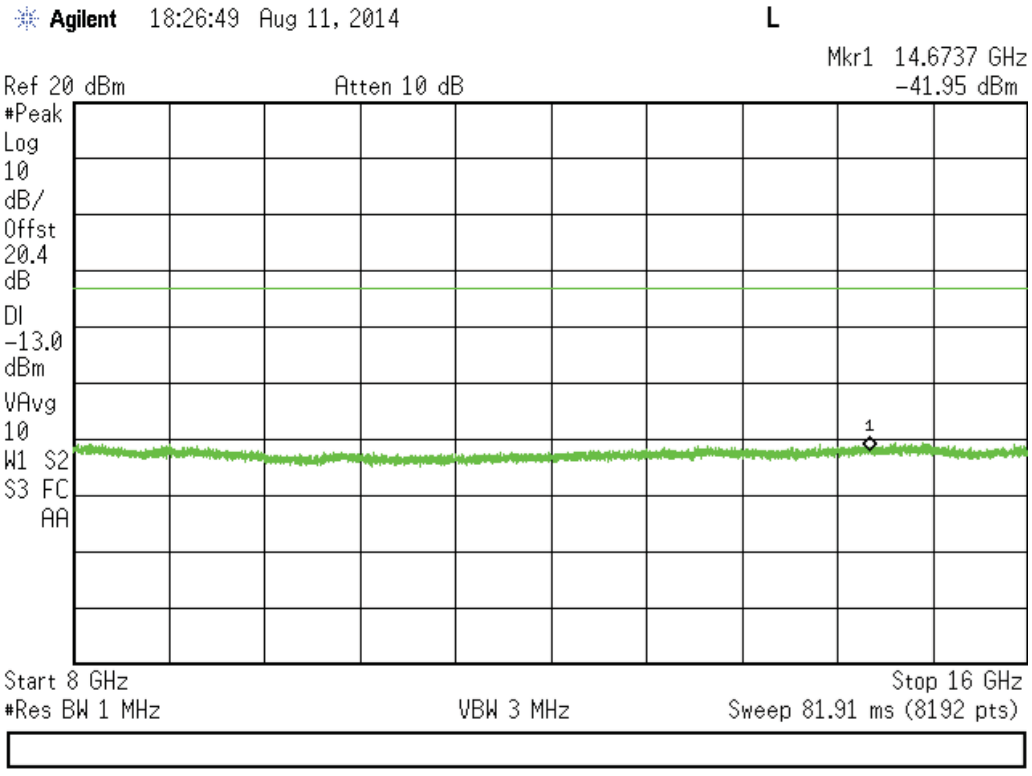
1850-1915 MHz Band (High Frequency) (Cont)



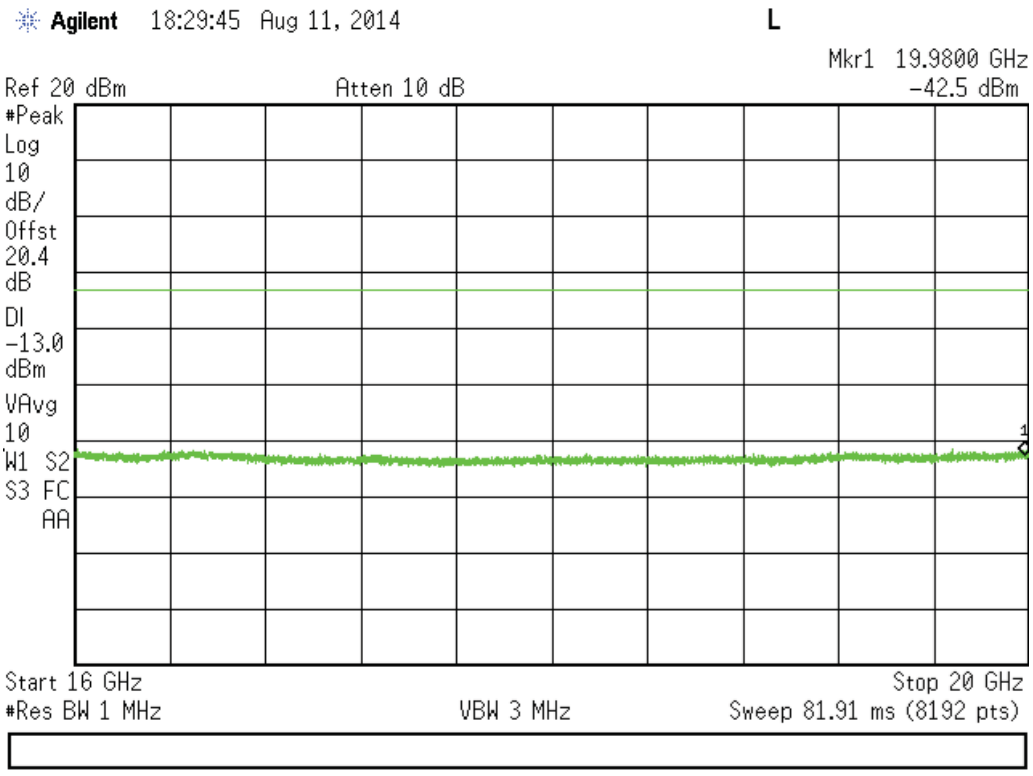
1850-1915 MHz Band (High Frequency) (Cont)



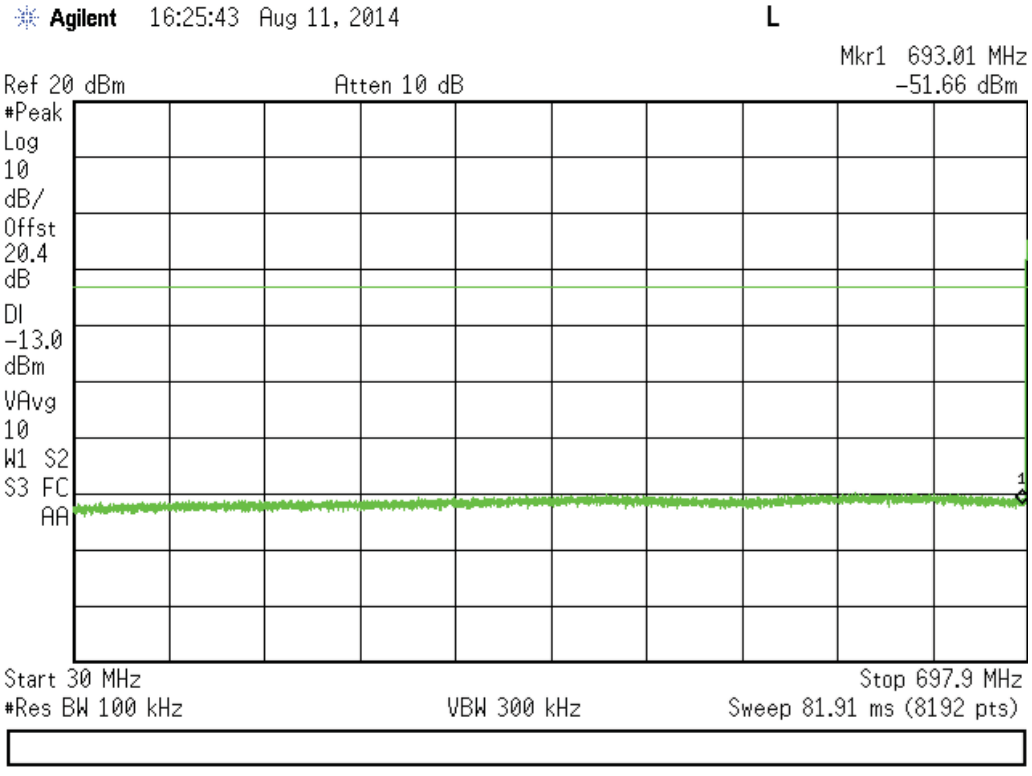
1850-1915 MHz Band (High Frequency) (Cont)



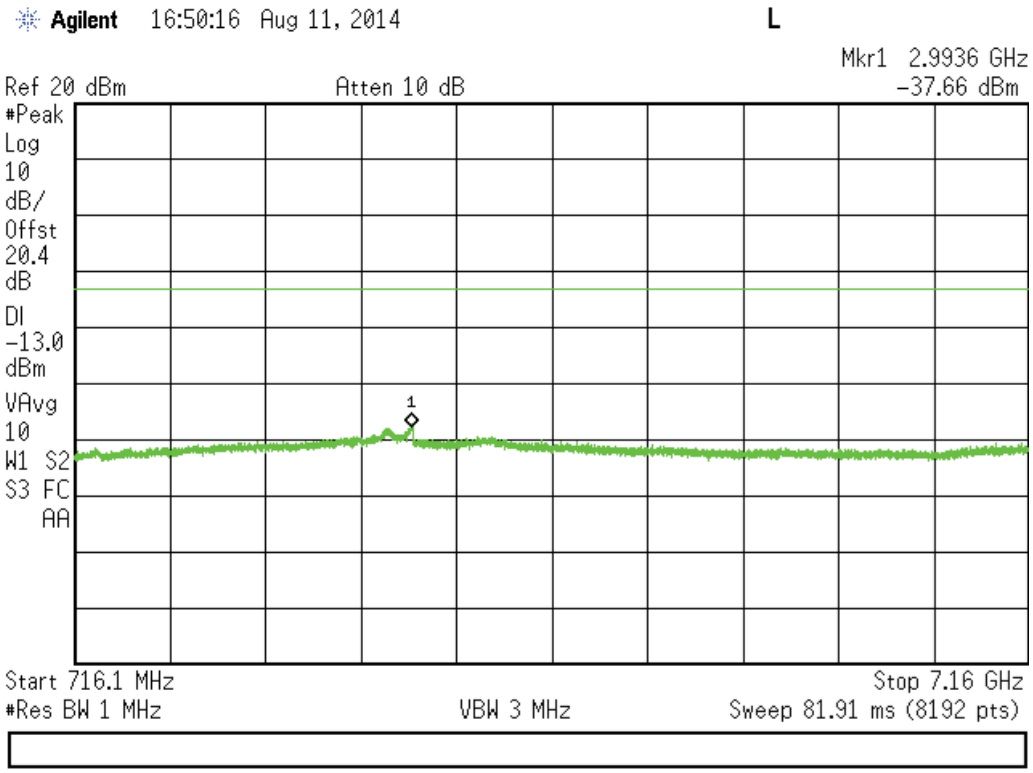
1850-1915 MHz Band (High Frequency) (Cont)



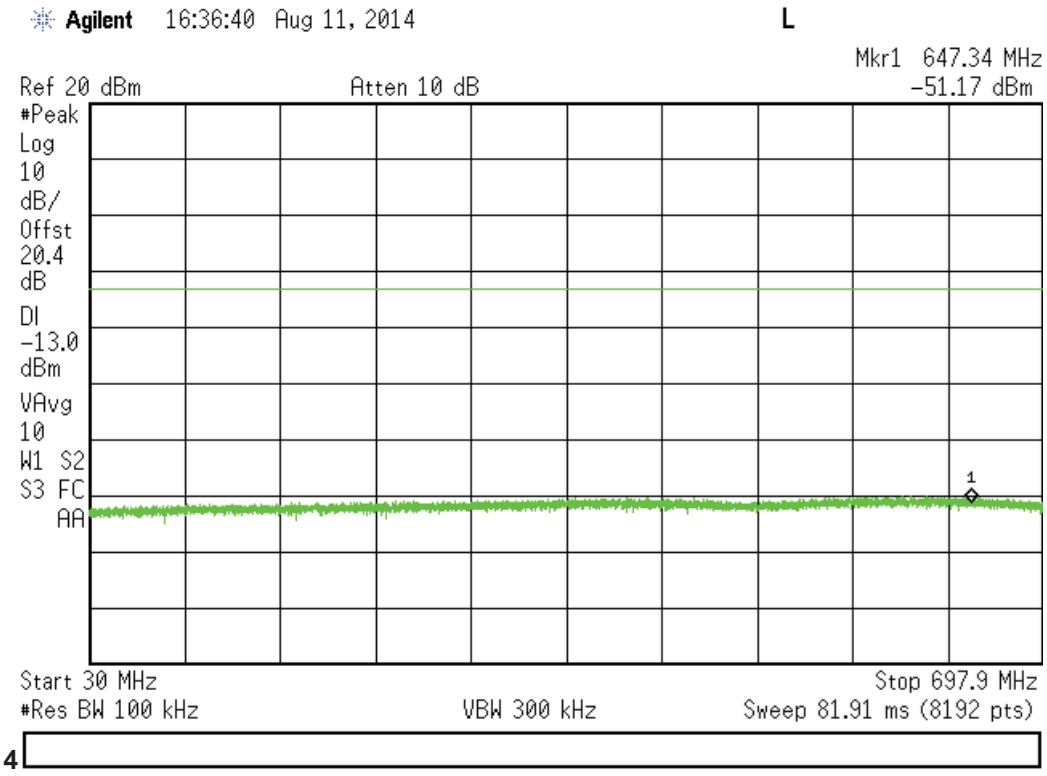
Uplink WCDMA Signal
698 - 716 MHz Band (Low Frequency)



698 - 716 MHz Band (Low Frequency) (Cont)

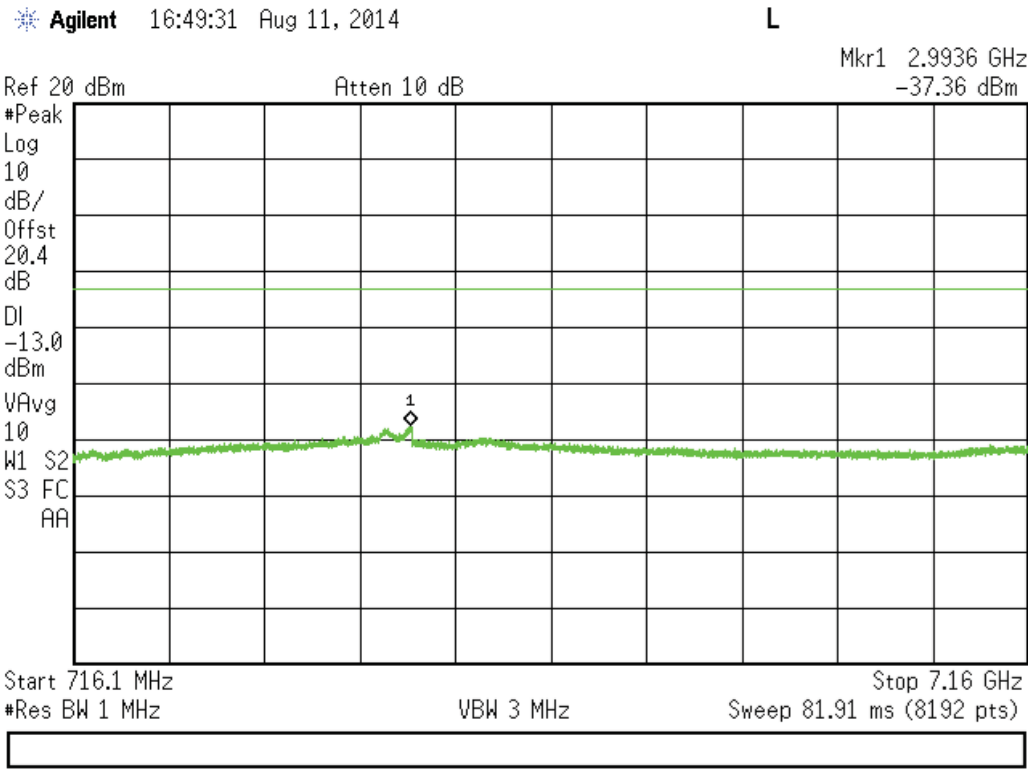


698 - 716 MHz Band (Mid Frequency)

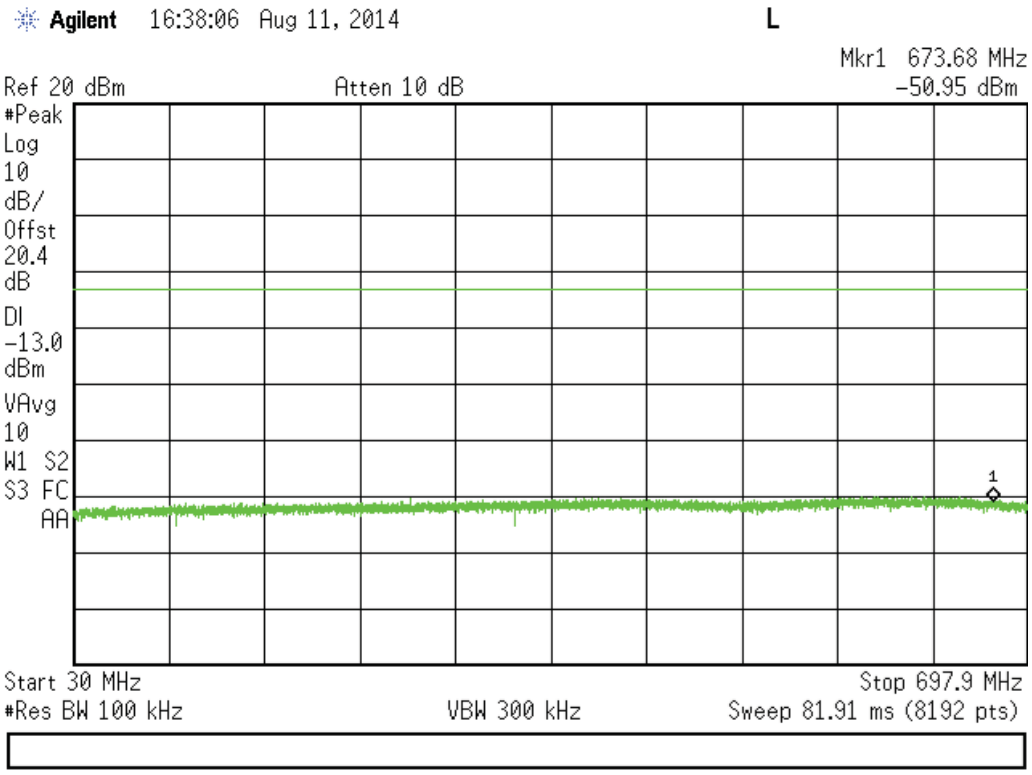


4

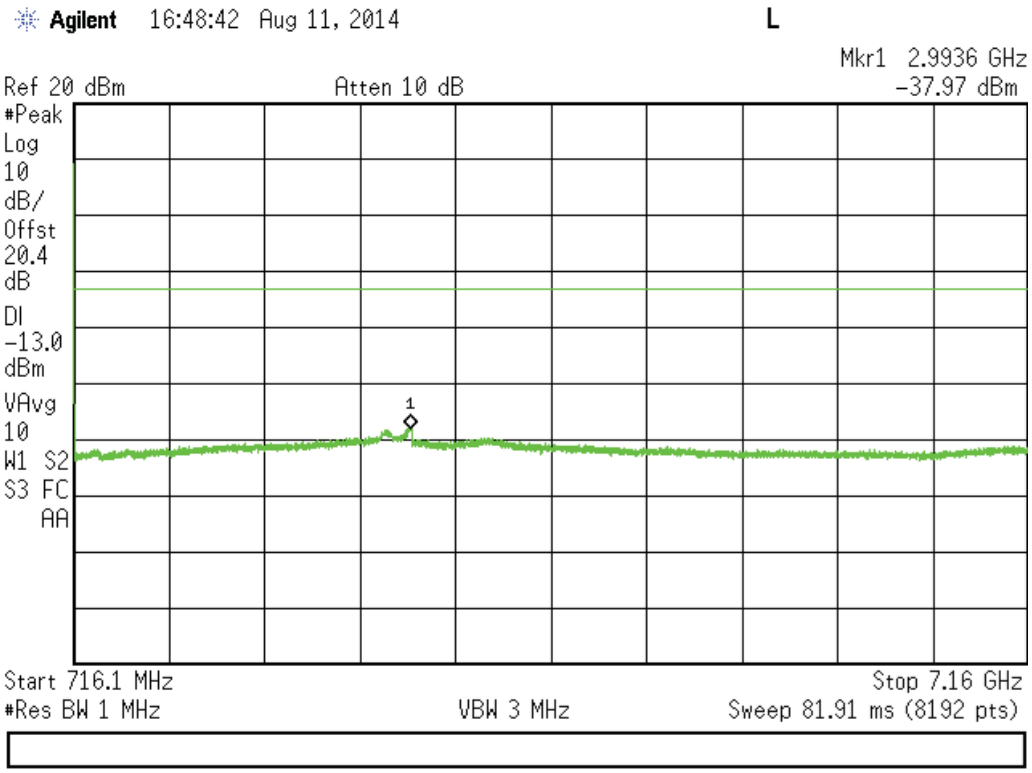
698 - 716 MHz Band (Mid Frequency) (Cont)



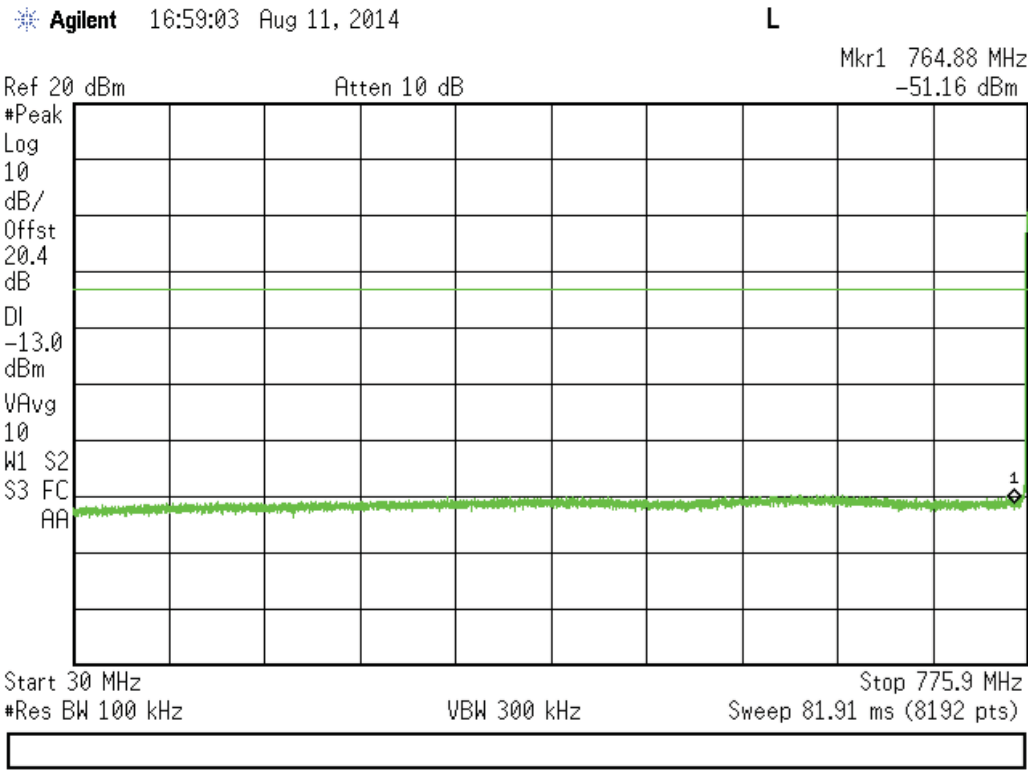
698 - 716 MHz Band (High Frequency)



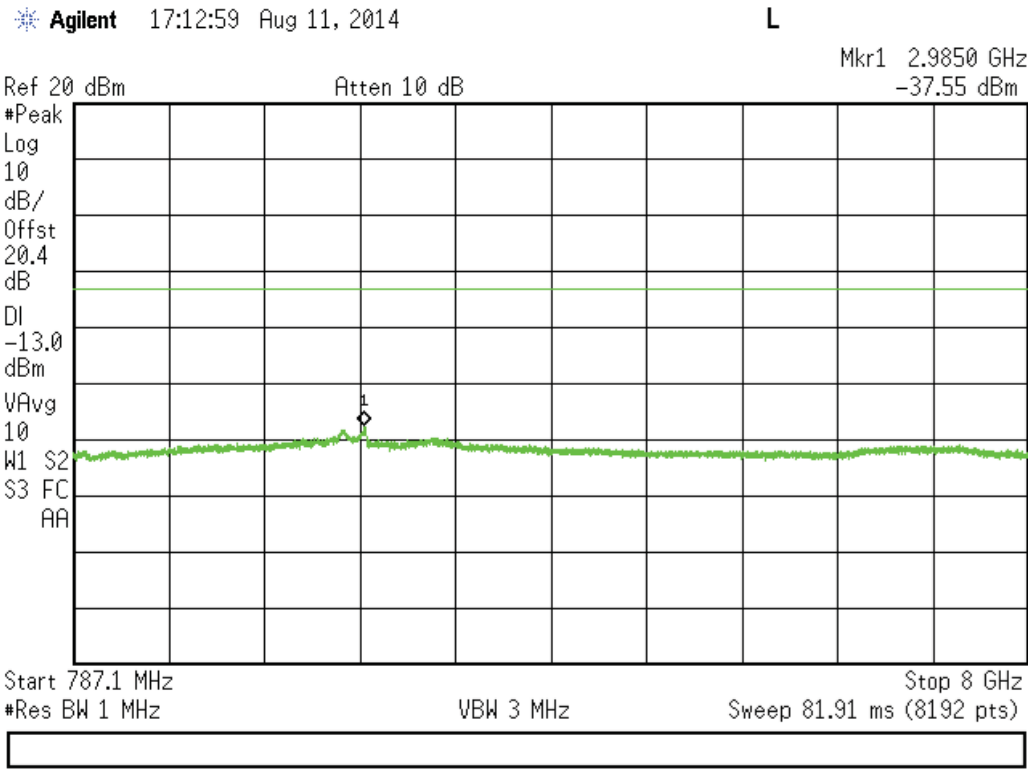
698 - 716 MHz Band (High Frequency) (Cont)



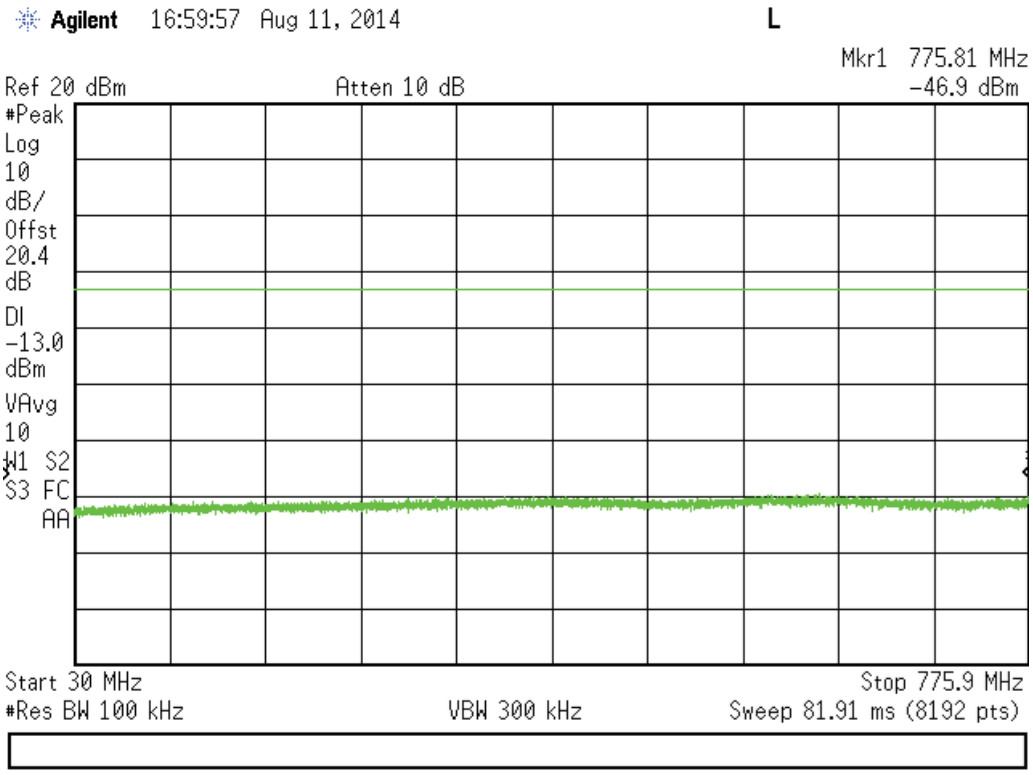
76-787 MHz Band (Low Frequency)



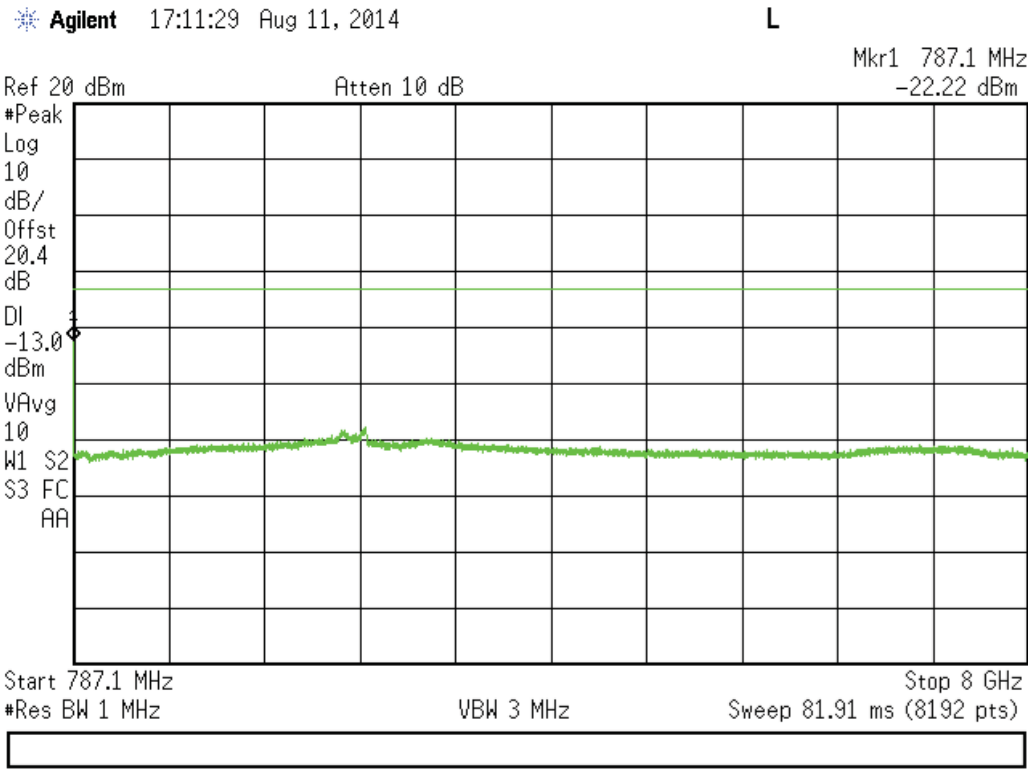
776-787 MHz Band (Low Frequency) (Cont)



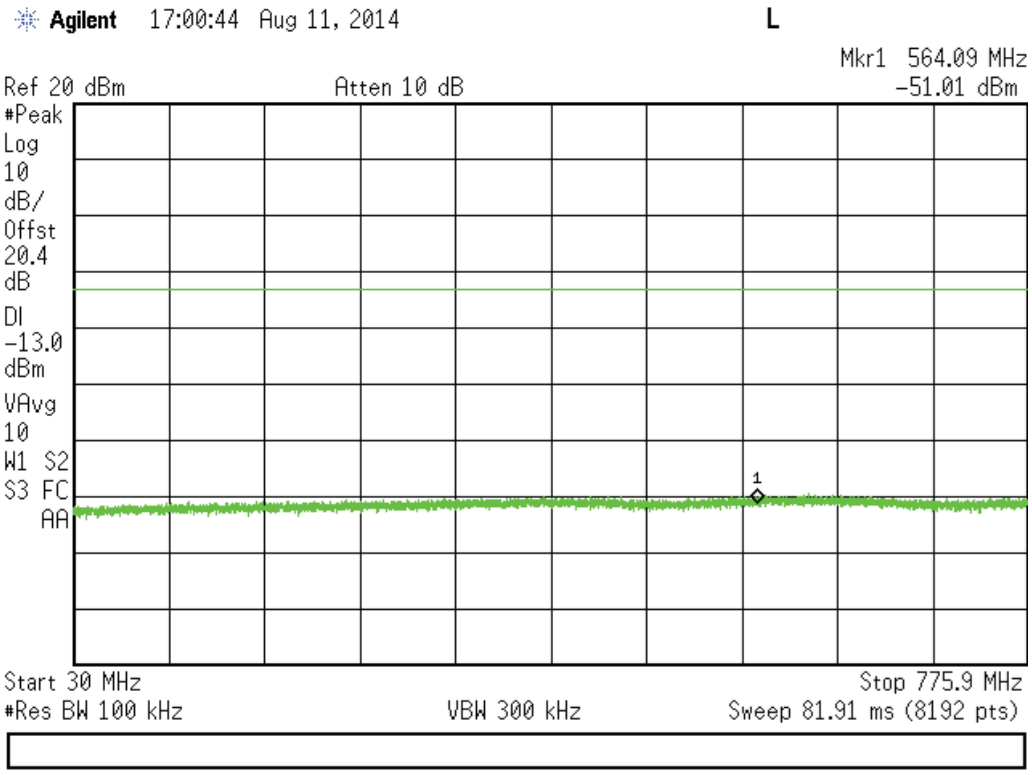
776-787 MHz Band (Mid Frequency)



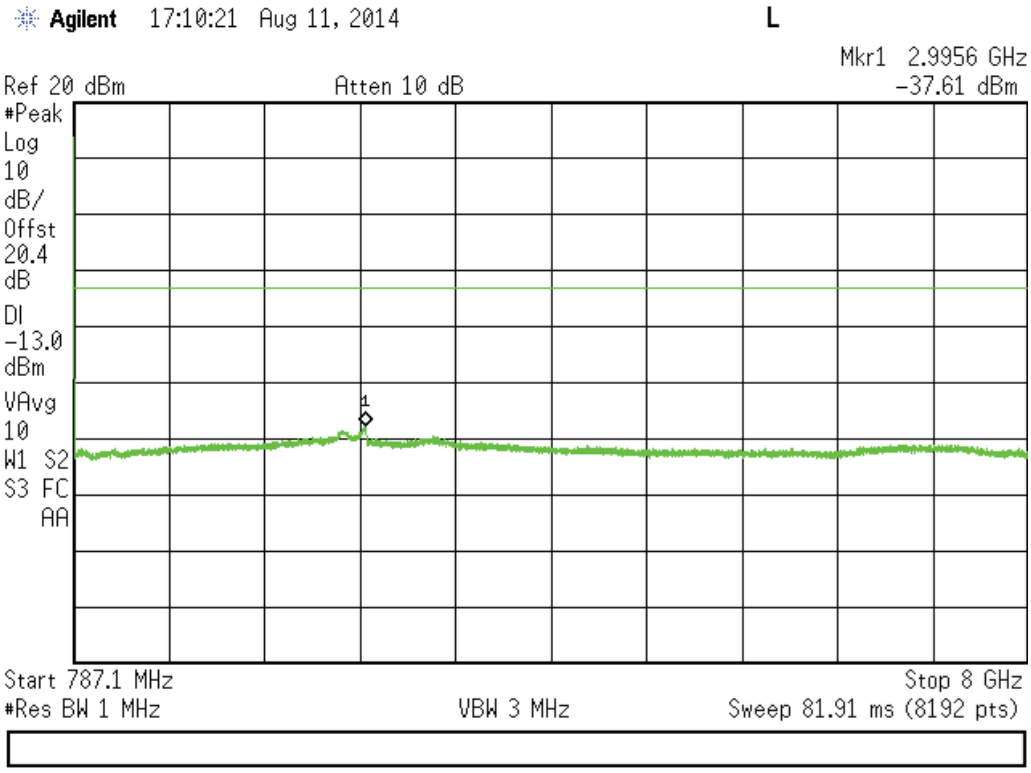
776-787 MHz Band (Mid Frequency) (Cont)



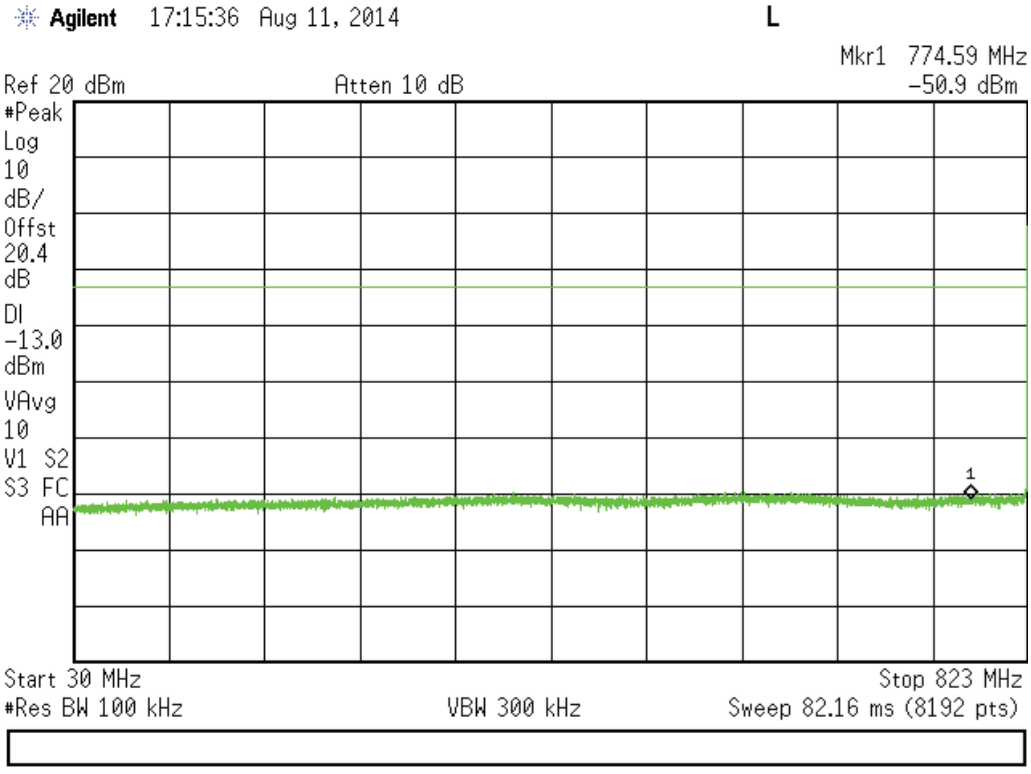
776-787 MHz Band (High Frequency)



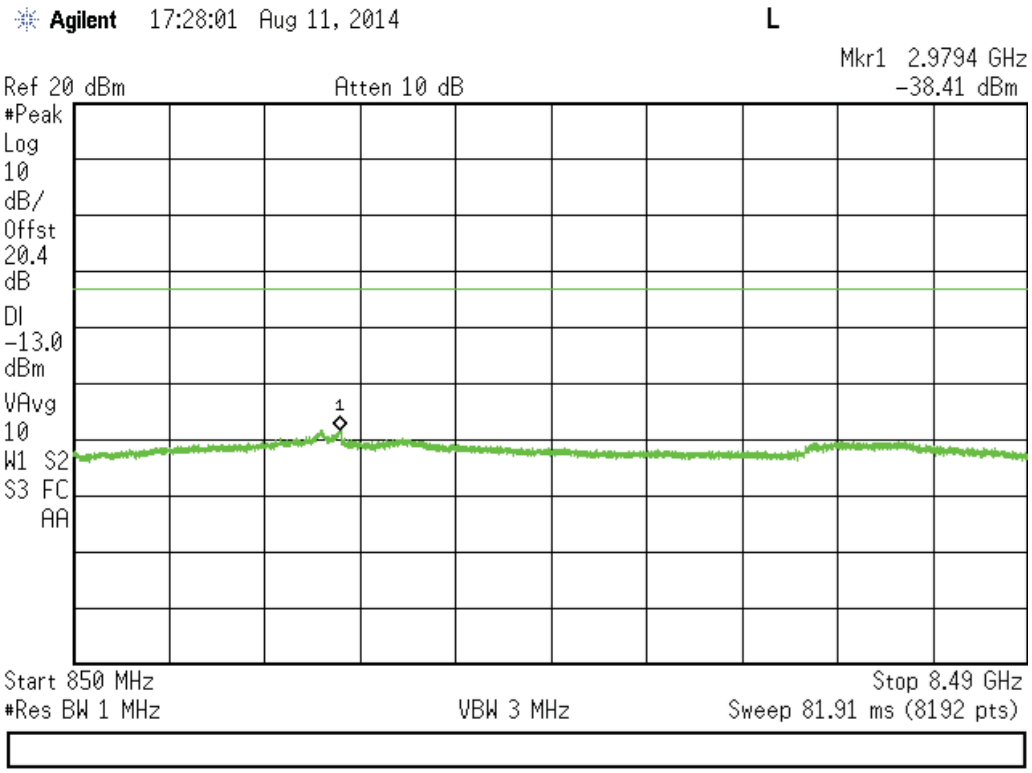
776-787 MHz Band (High Frequency) (Cont)



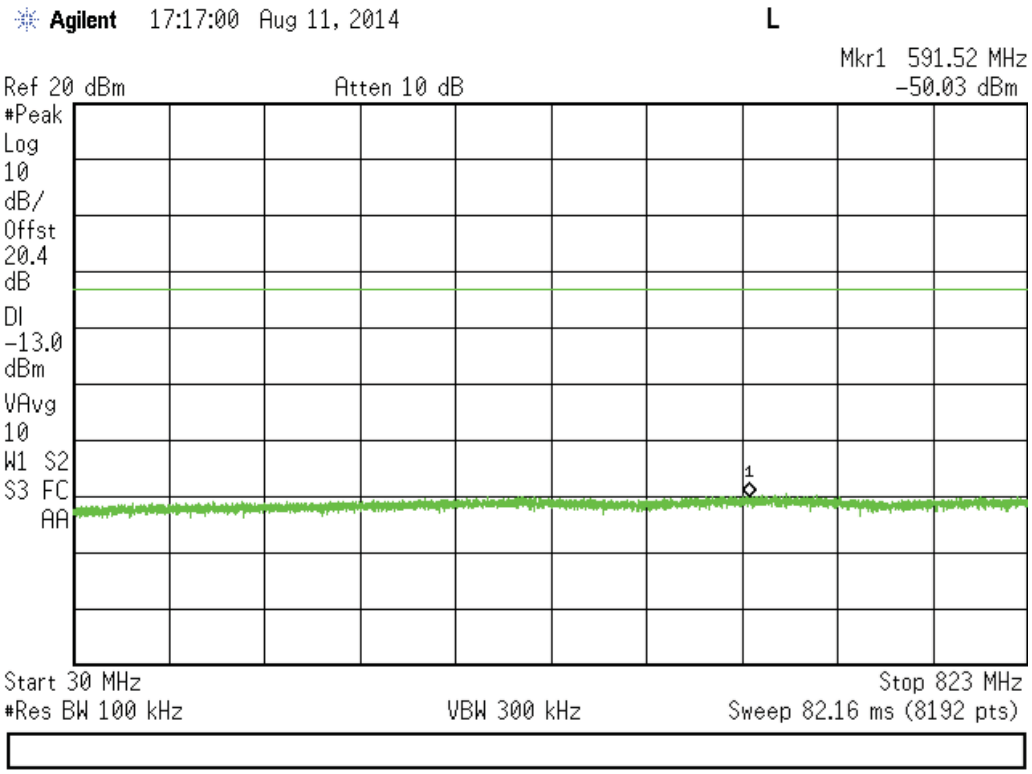
824-849 MHz Band (Low Frequency)



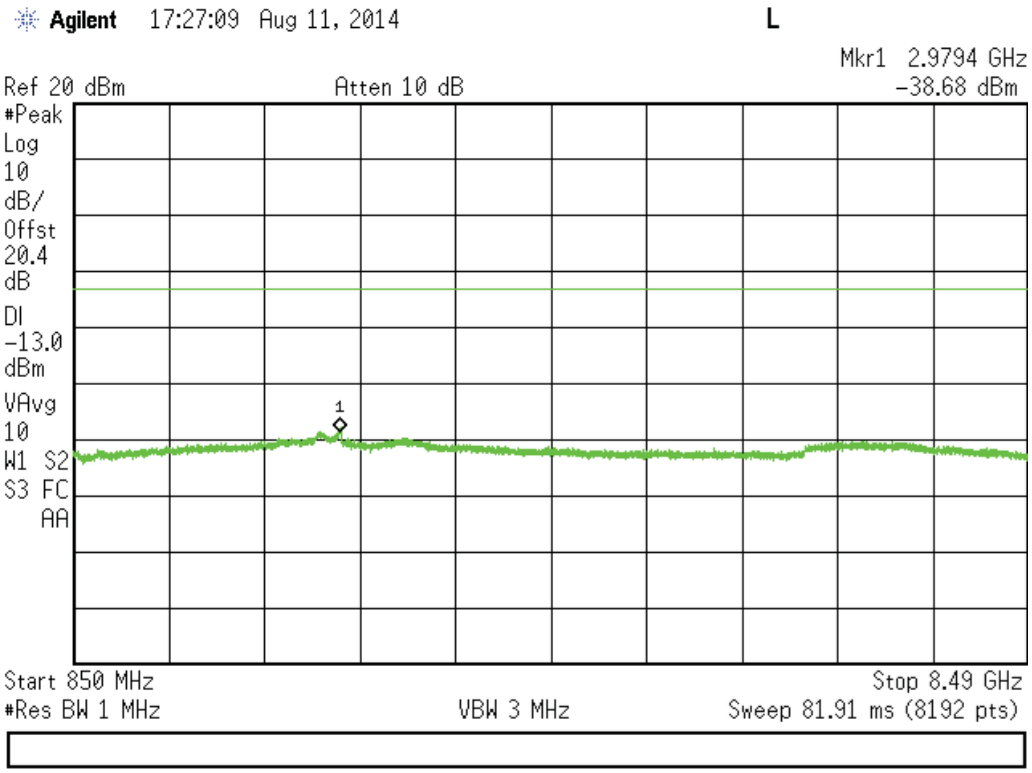
824-849 MHz Band (Low Frequency) (Cont)



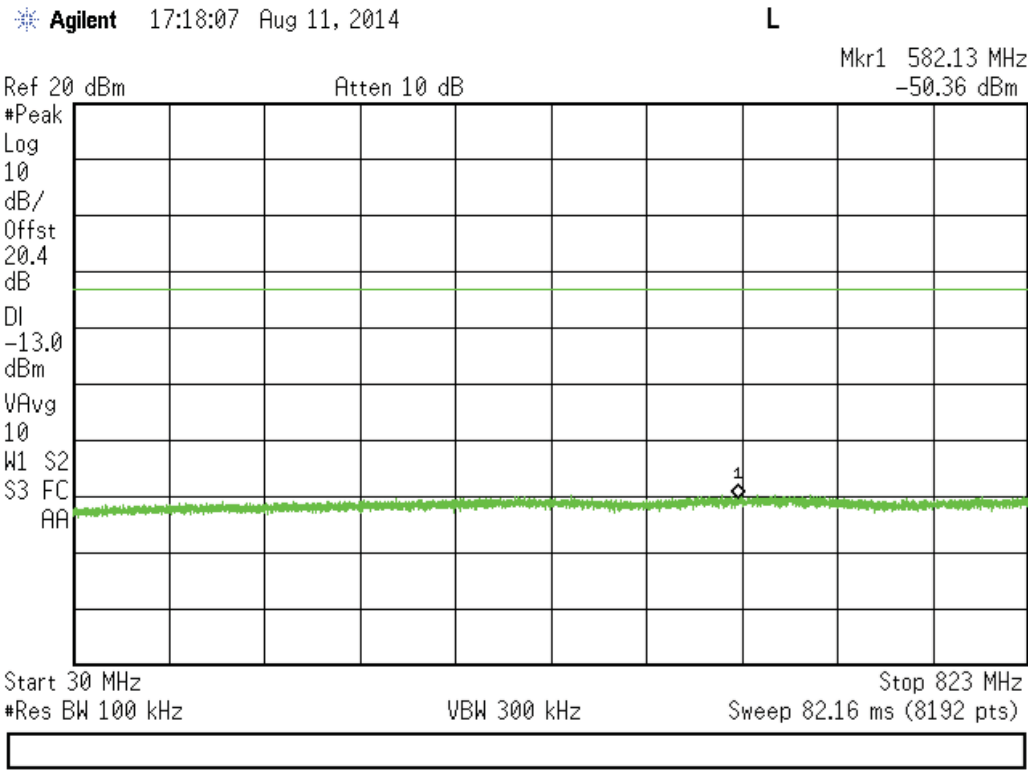
824-849 MHz Band (Mid Frequency)



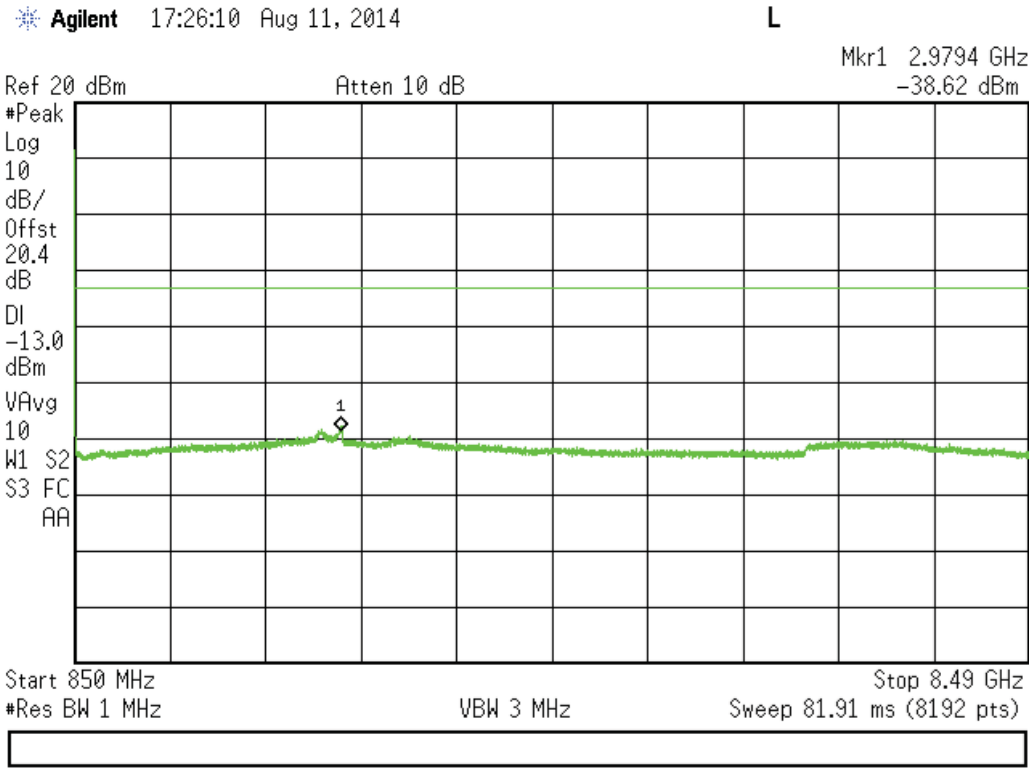
824-849 MHz Band (Mid Frequency) (Cont)



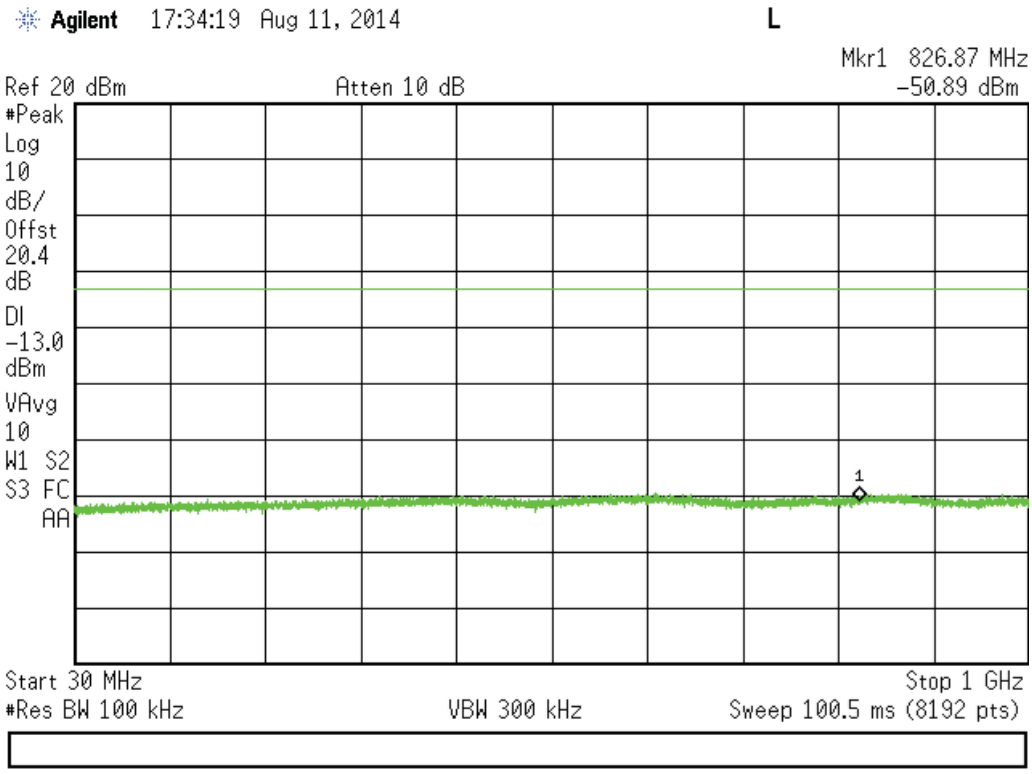
824-849 MHz Band (High Frequency)



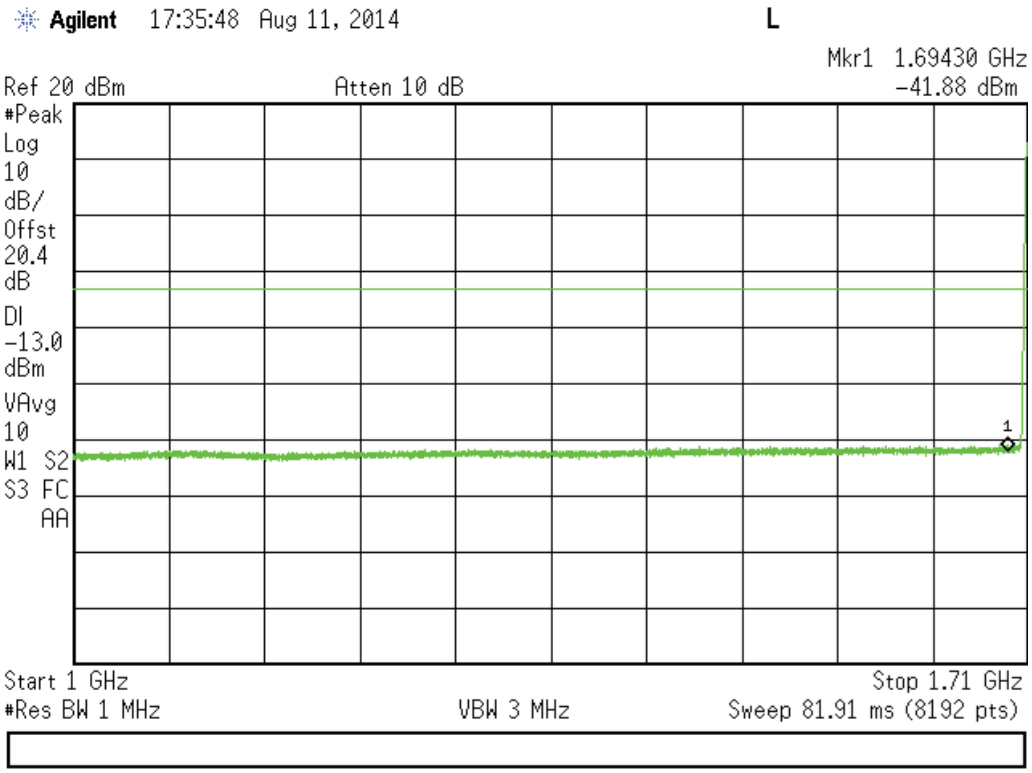
824-849 MHz Band (High Frequency) (Cont)



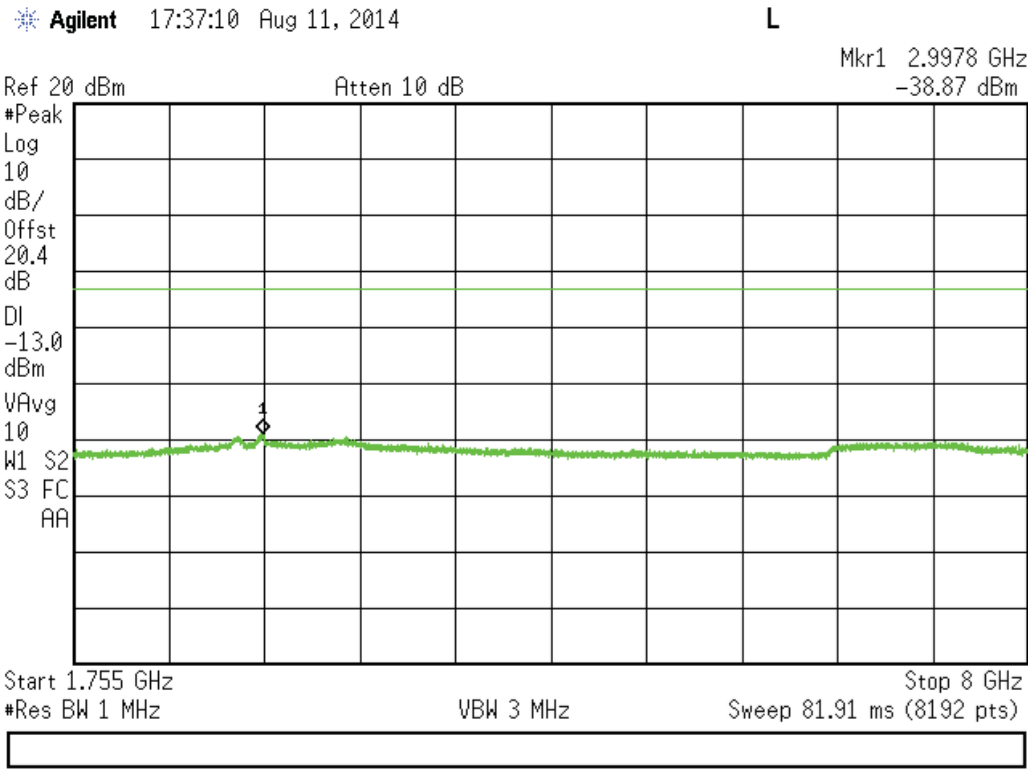
1710-1755 MHz Band (Low Frequency)



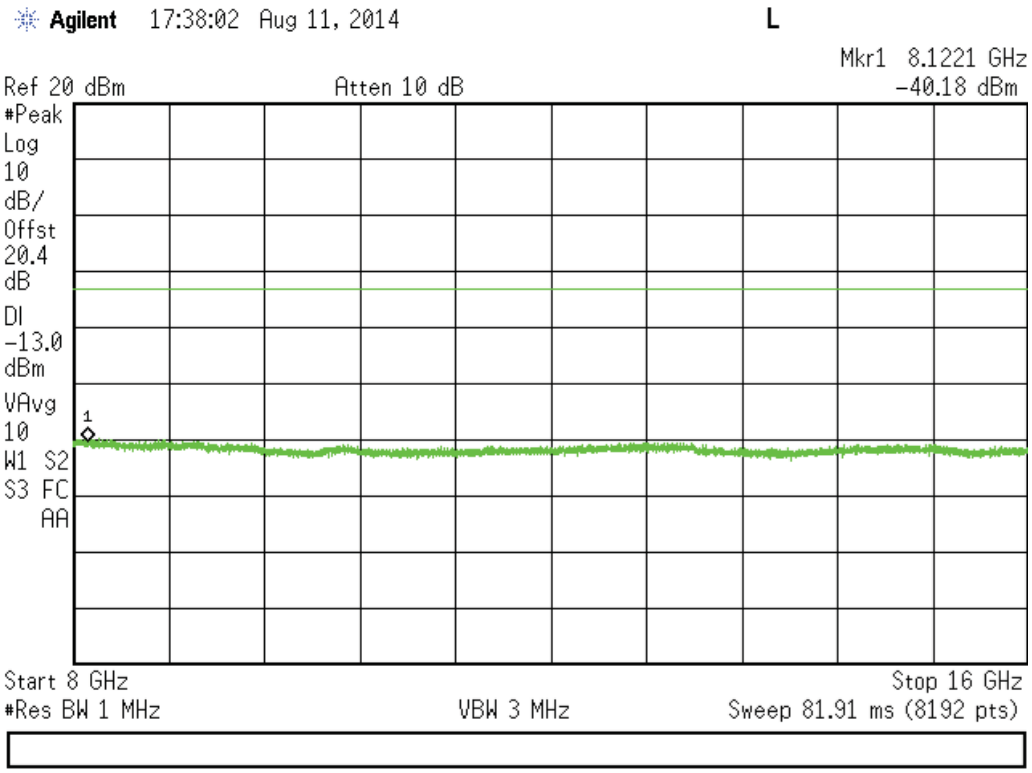
1710-1755 MHz Band (Low Frequency) (Cont)



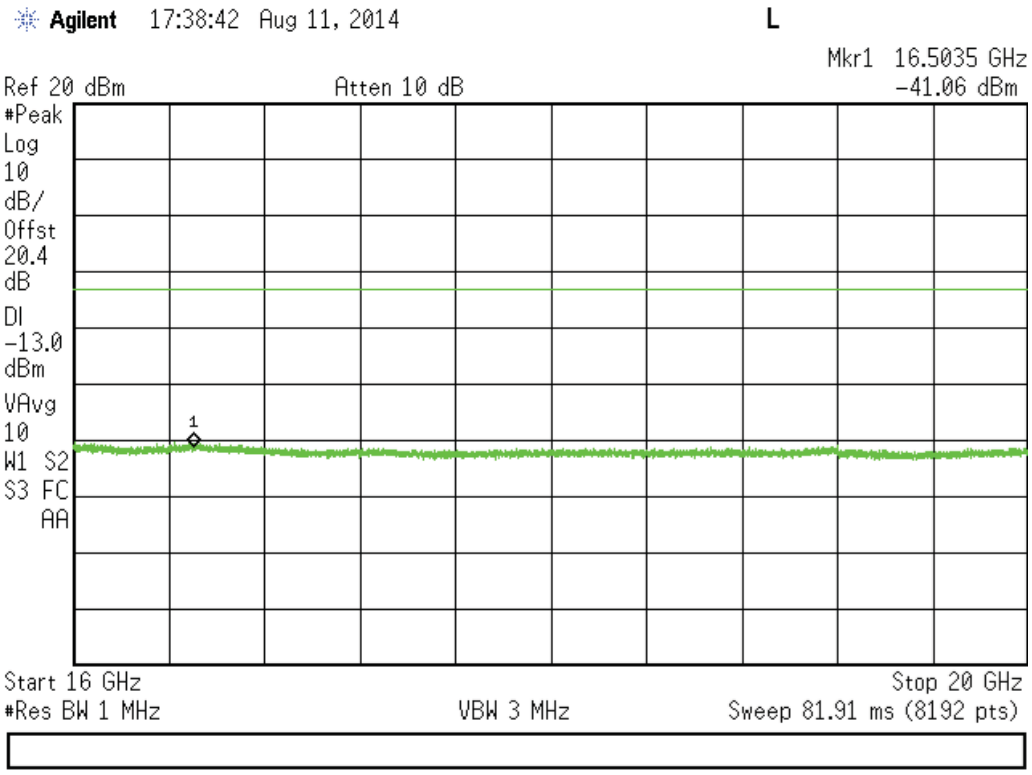
1710-1755 MHz Band (Low Frequency) (Cont)



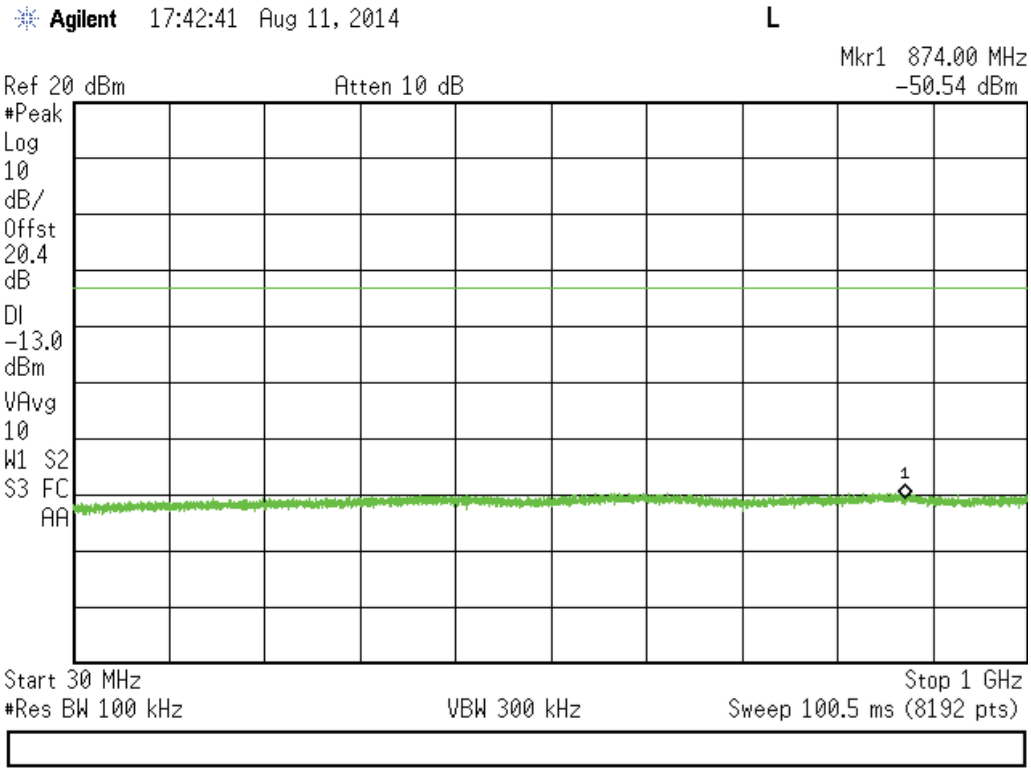
1710-1755 MHz Band (Low Frequency) (Cont)



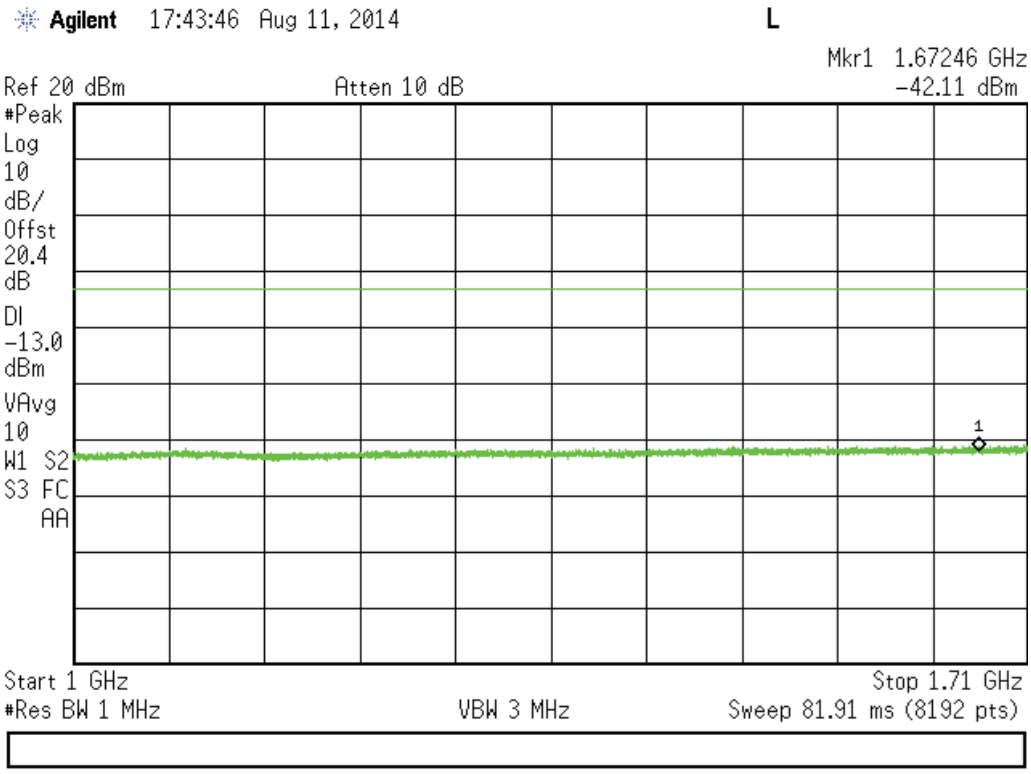
1710-1755 MHz Band (Low Frequency) (Cont)



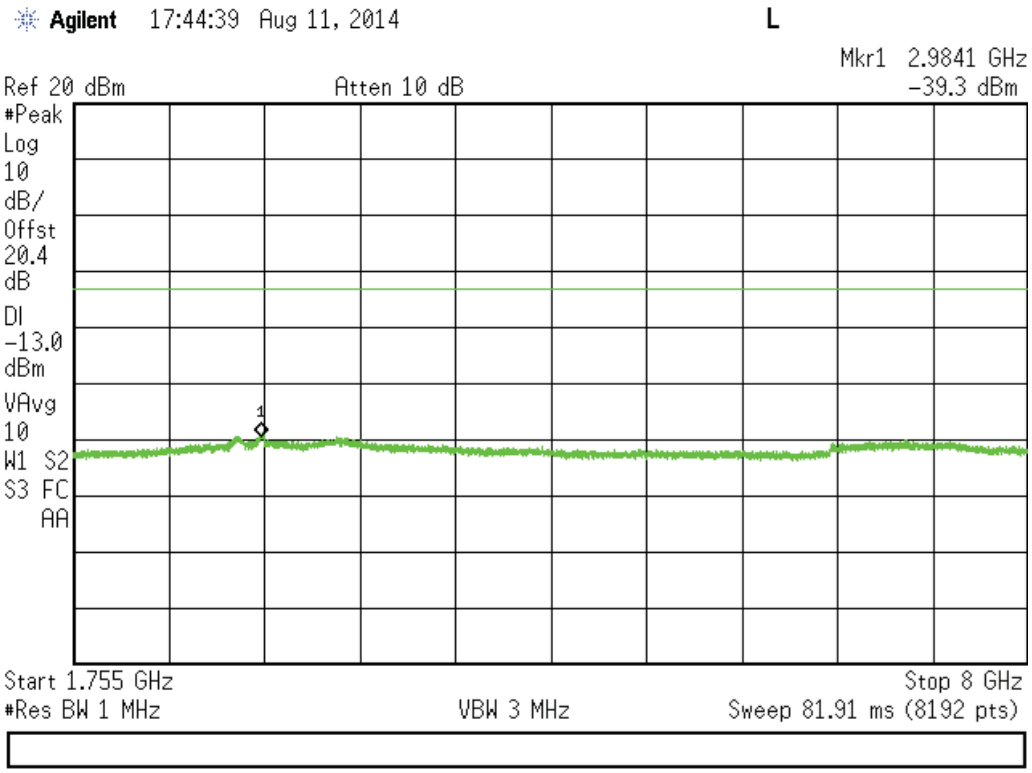
1710-1755 MHz Band (Mid Frequency)



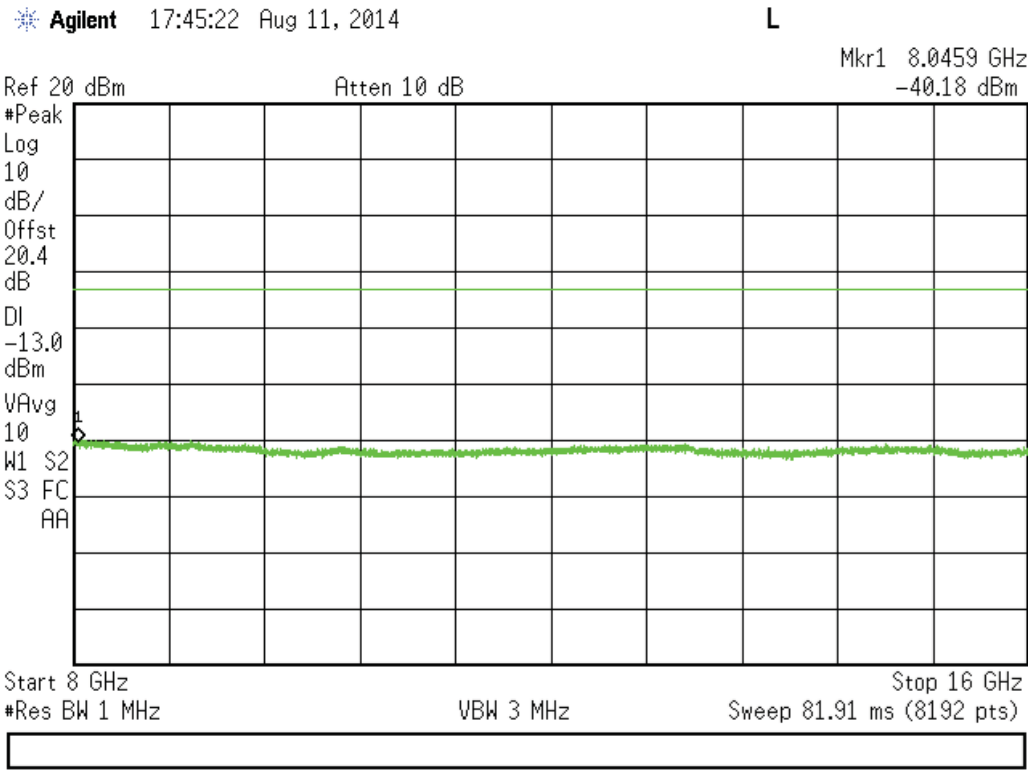
1710-1755 MHz Band (Mid Frequency) (Cont)



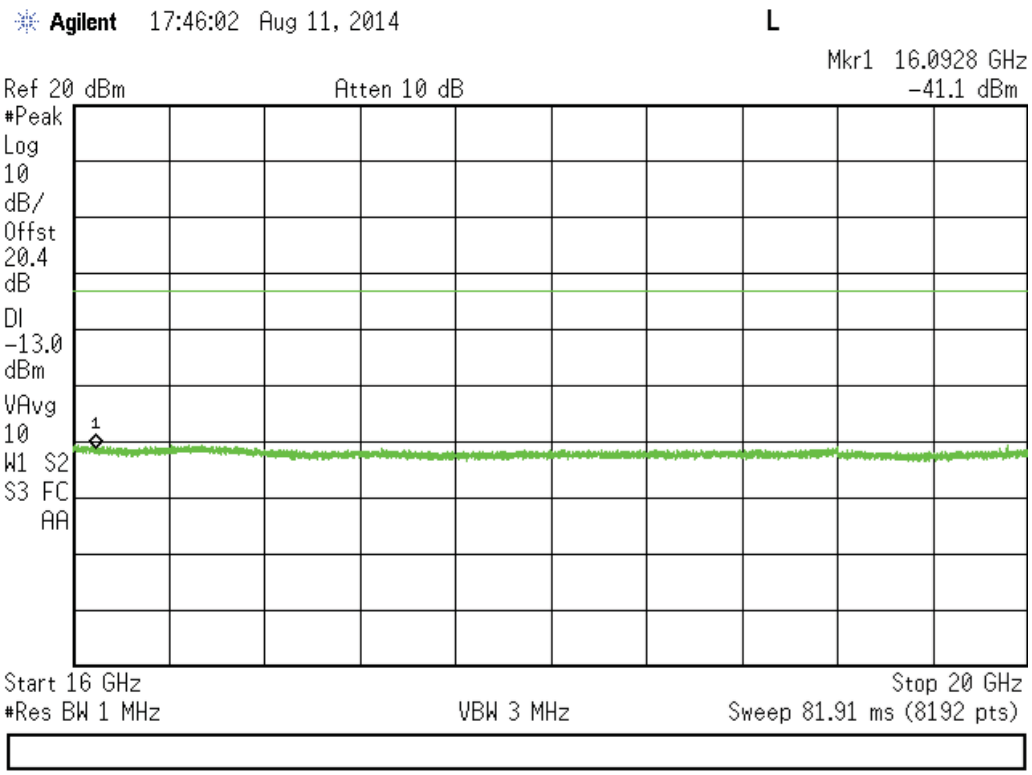
1710-1755 MHz Band (Mid Frequency) (Cont)



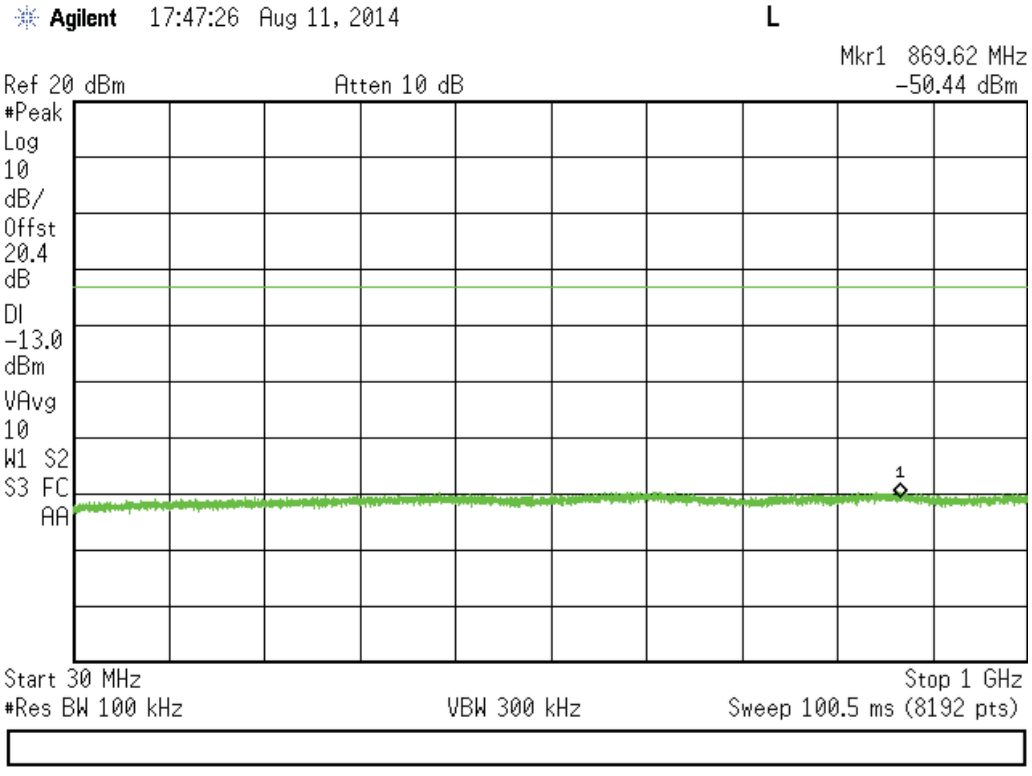
1710-1755 MHz Band (Mid Frequency) (Cont)



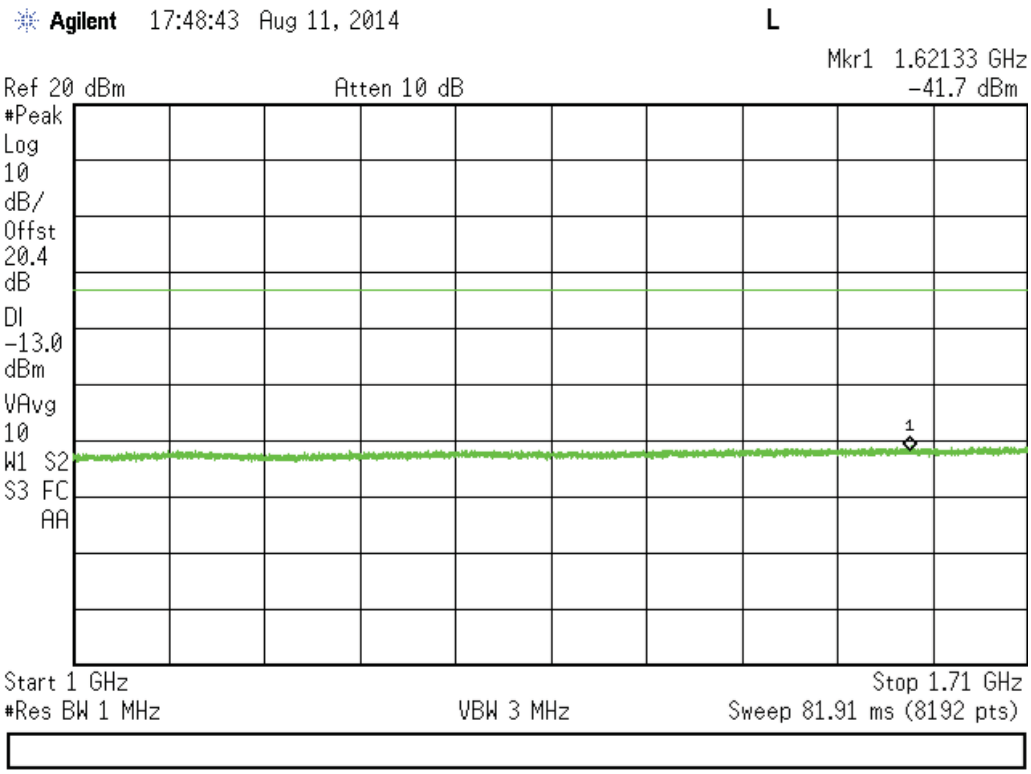
1710-1755 MHz Band (Mid Frequency) (Cont)



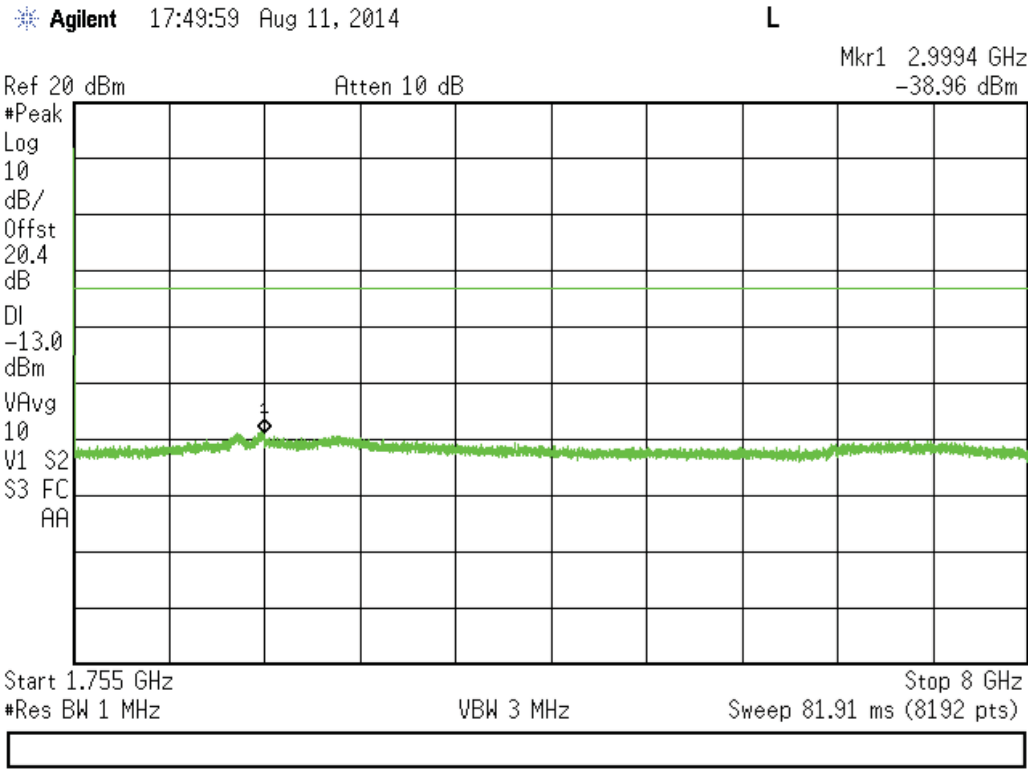
1710-1755 MHz Band (High Frequency)



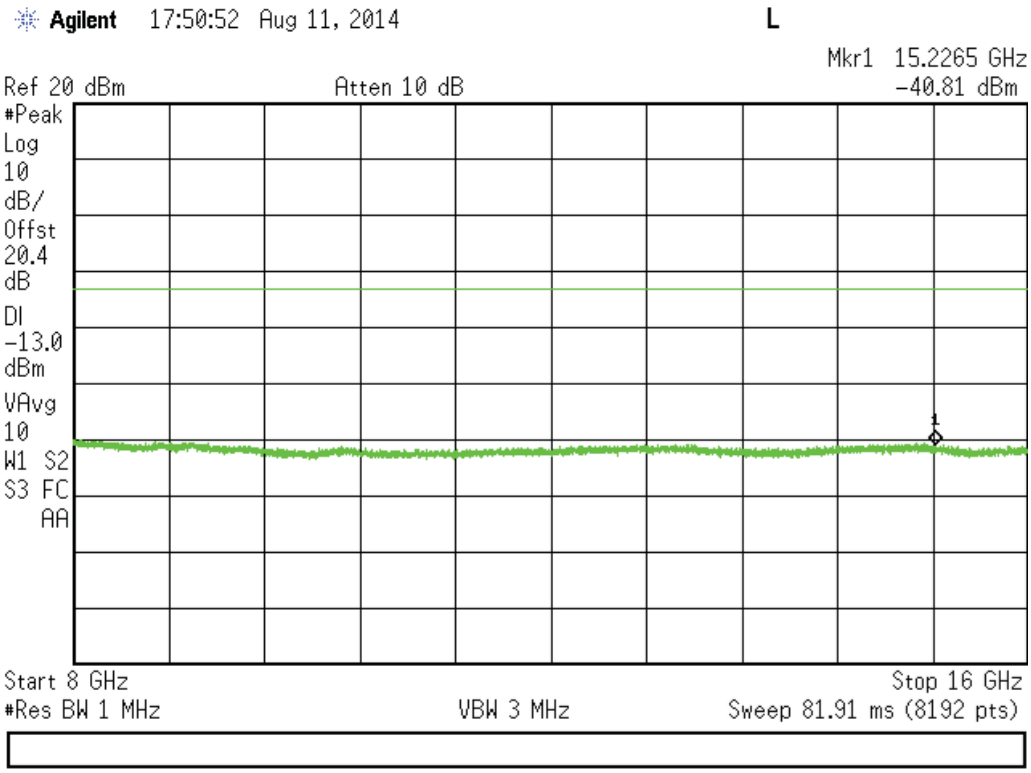
1710-1755 MHz Band (High Frequency) (Cont)



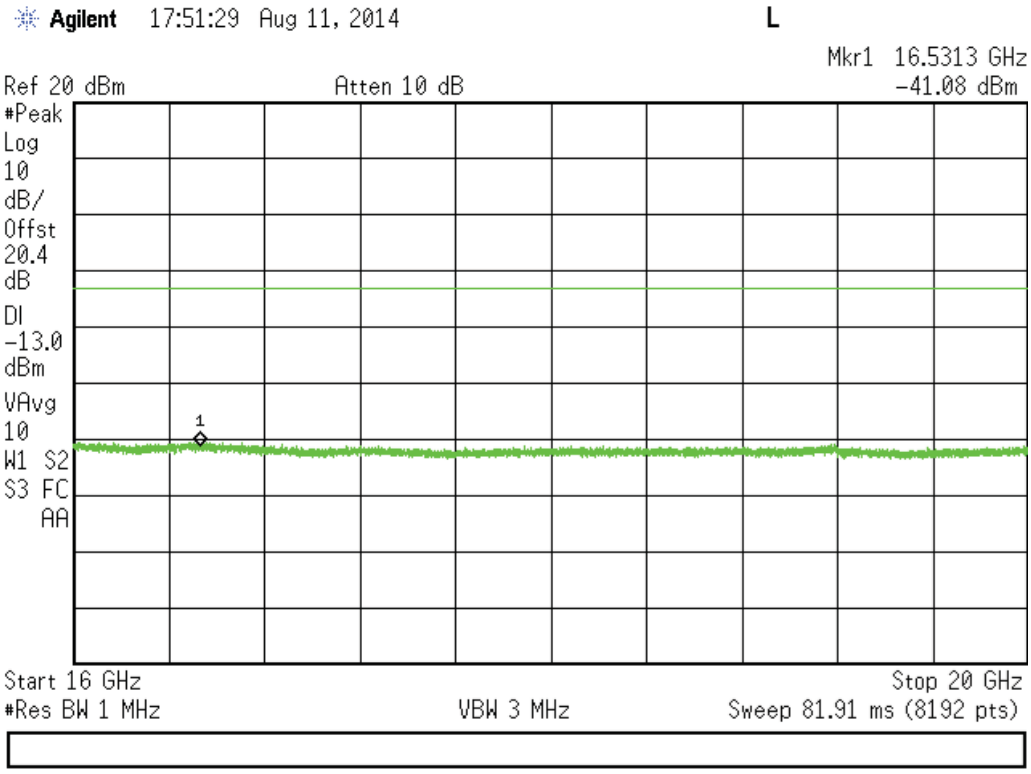
1710-1755 MHz Band (High Frequency) (Cont)



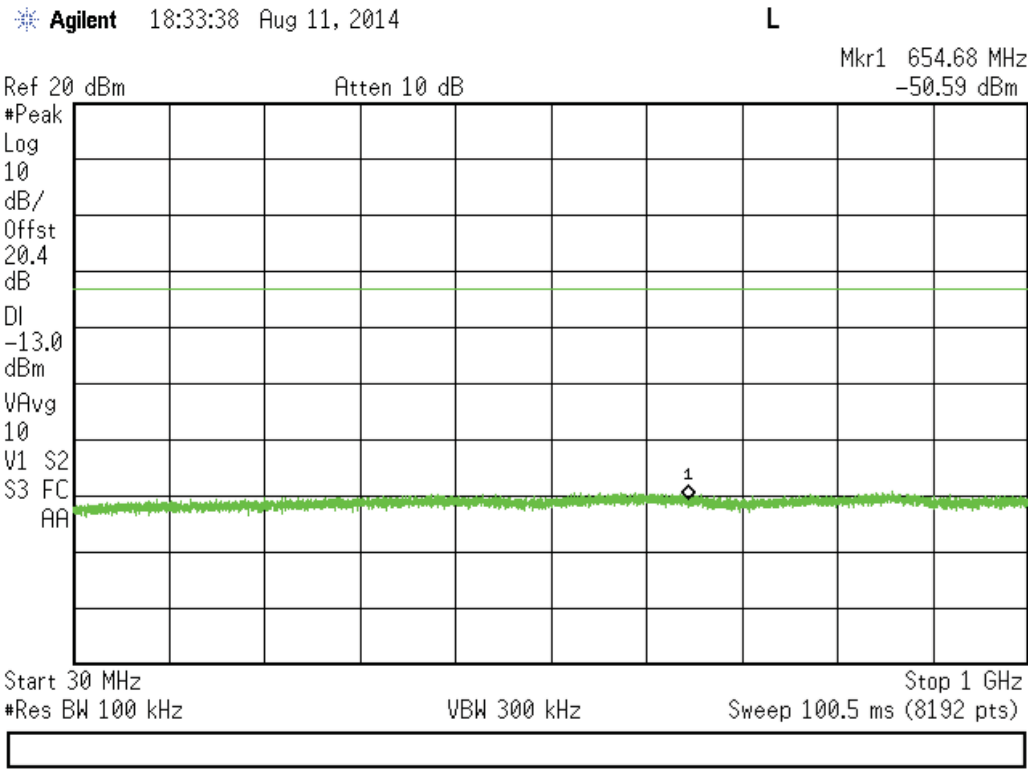
1710-1755 MHz Band (High Frequency) (Cont)



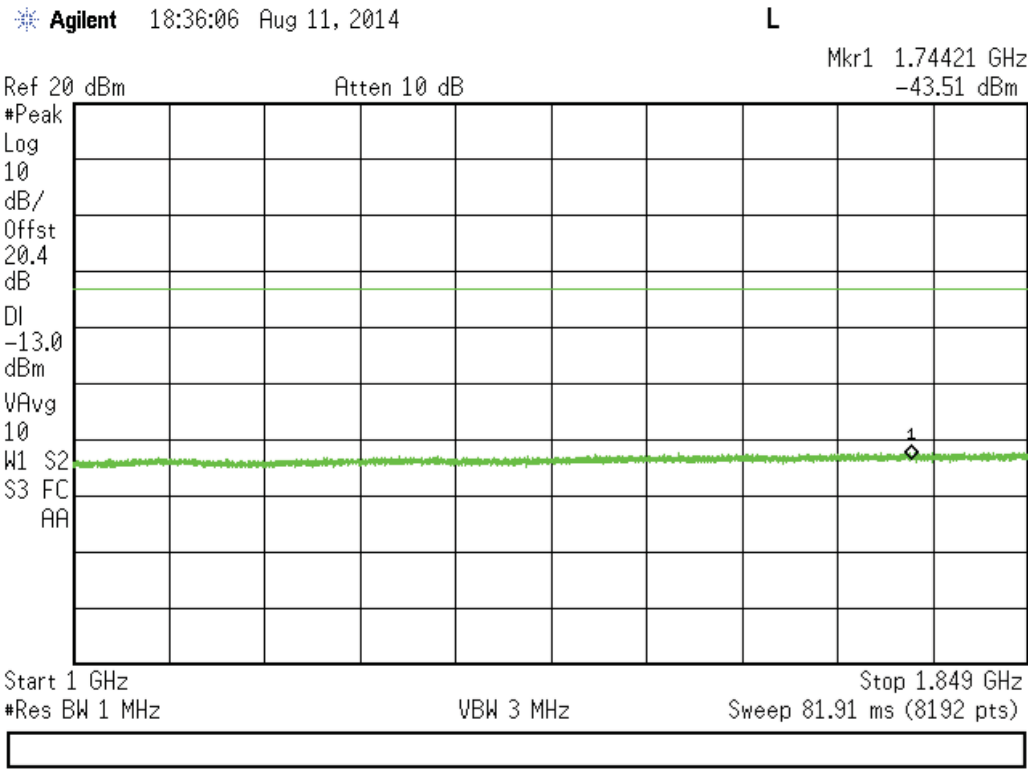
1710-1755 MHz Band (High Frequency) (Cont)



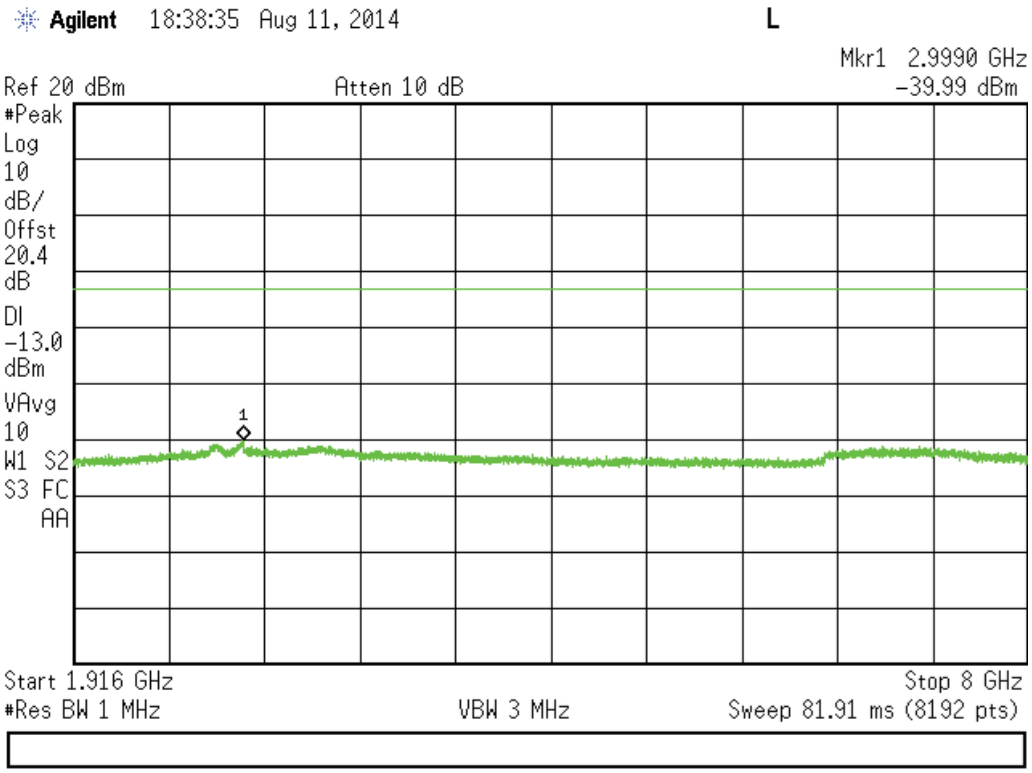
1850-1915 MHz Band (Low Frequency)



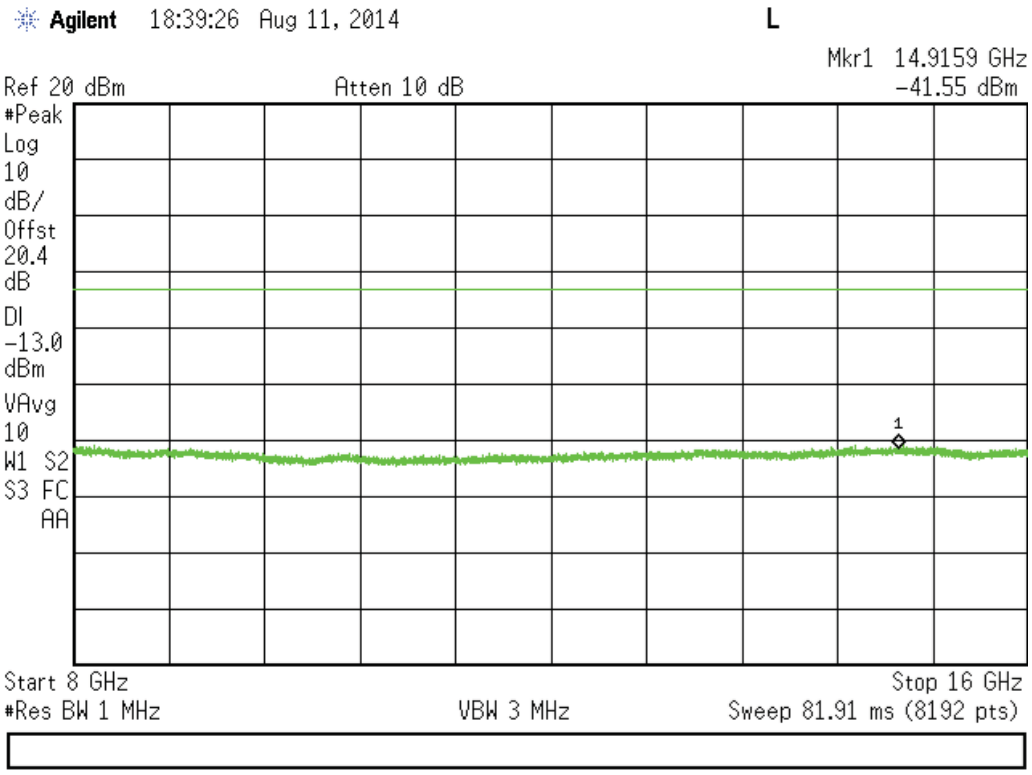
1850-1915 MHz Band (Low Frequency) (Cont)



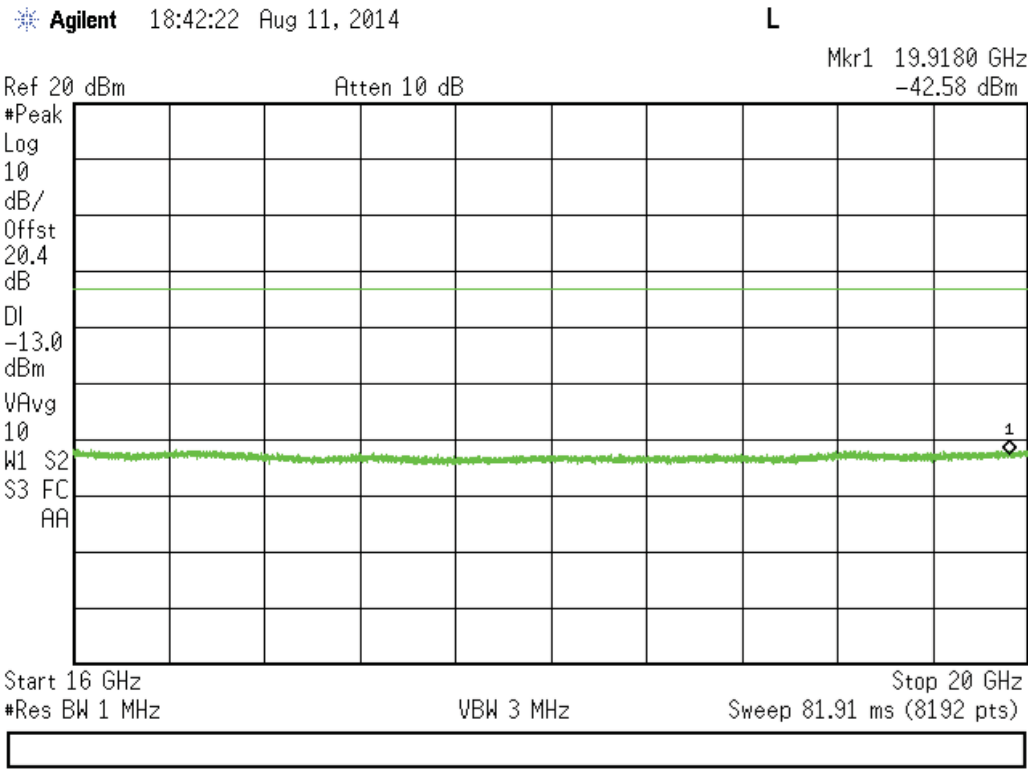
1850-1915 MHz Band (Low Frequency) (Cont)



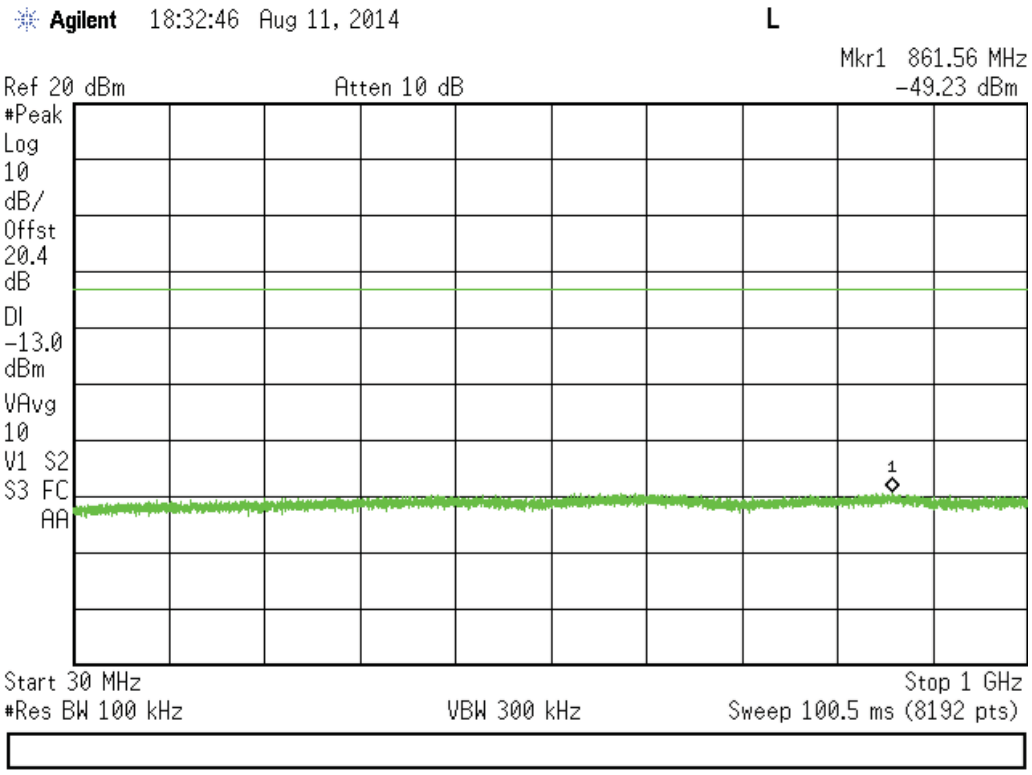
1850-1915 MHz Band (Low Frequency) (Cont)



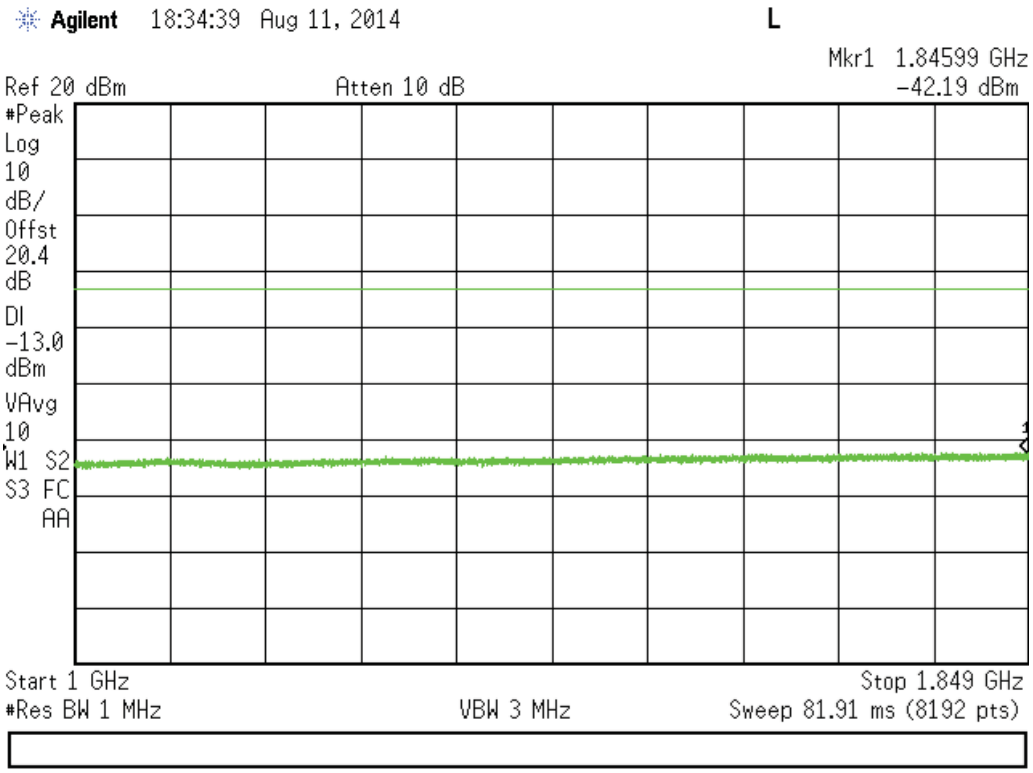
1850-1915 MHz Band (Low Frequency) (Cont)



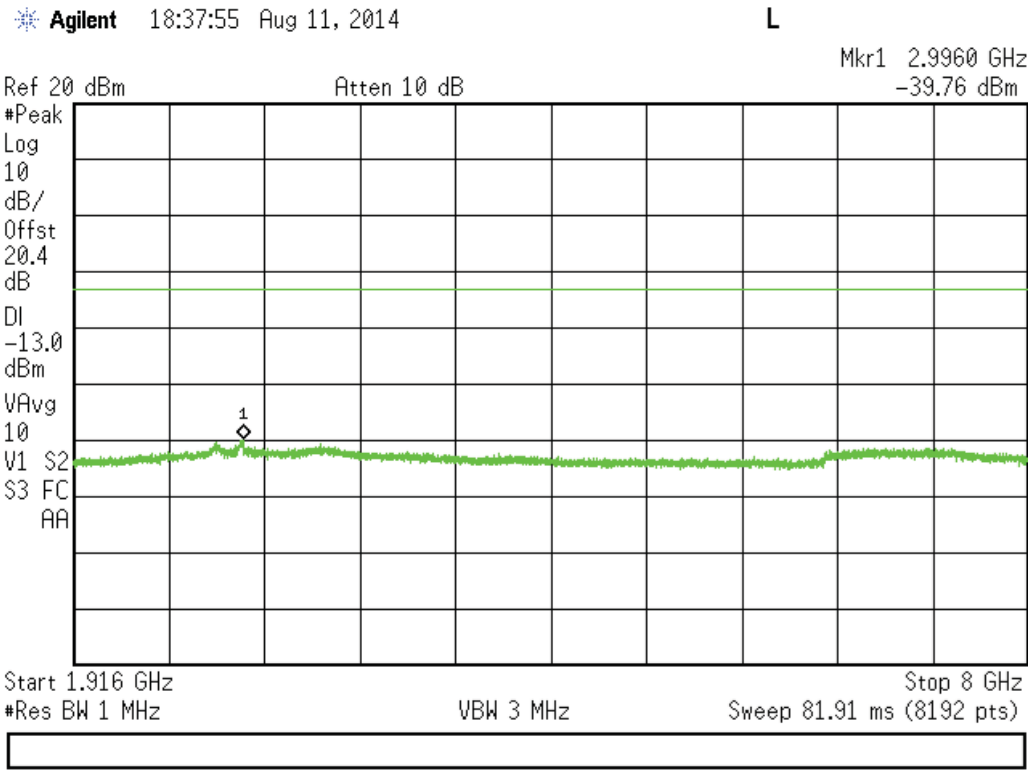
1850-1915 MHz Band (Mid Frequency)



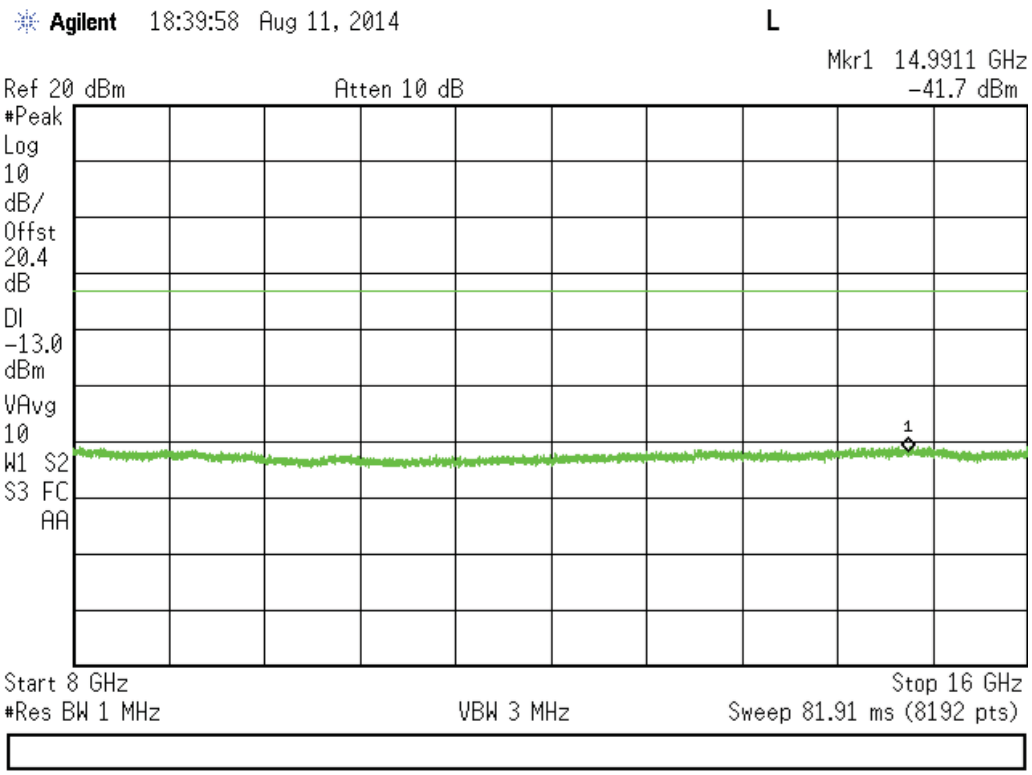
1850-1915 MHz Band (Mid Frequency) (Cont)



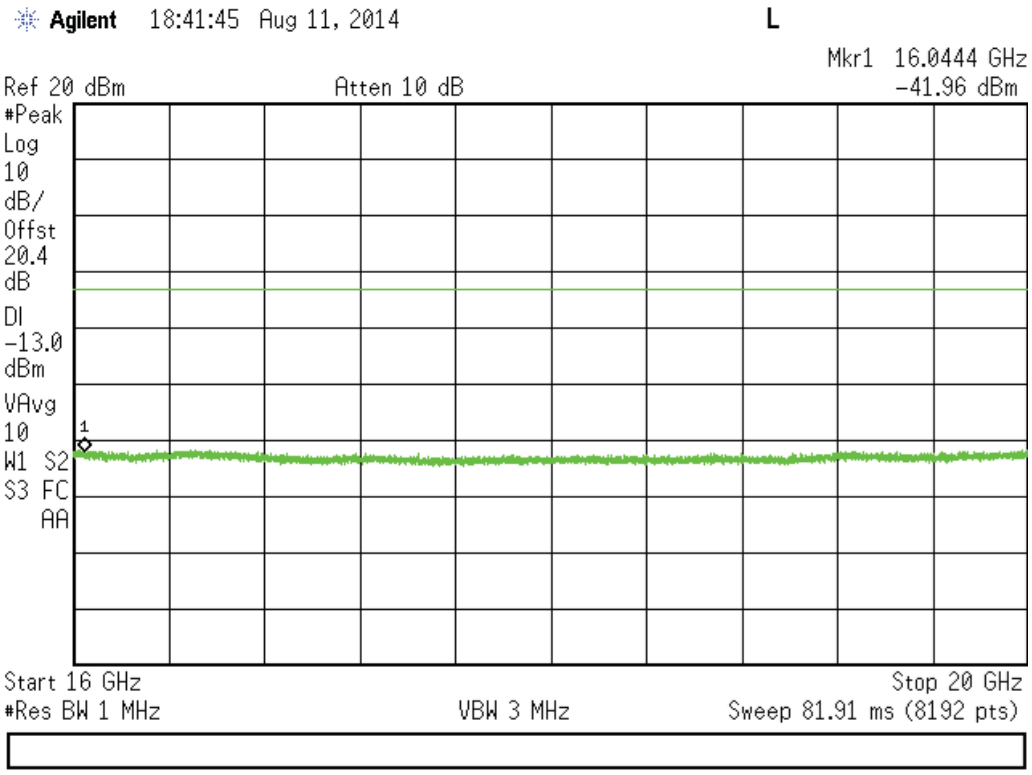
1850-1915 MHz Band (Mid Frequency) (Cont)



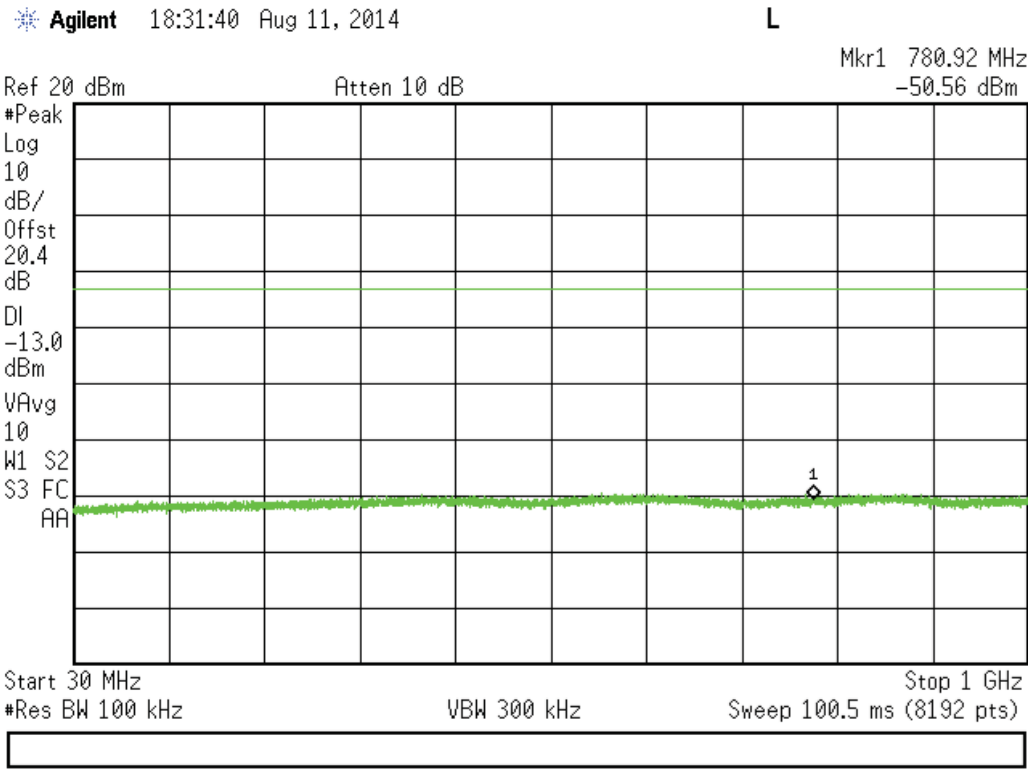
1850-1915 MHz Band (Mid Frequency) (Cont)



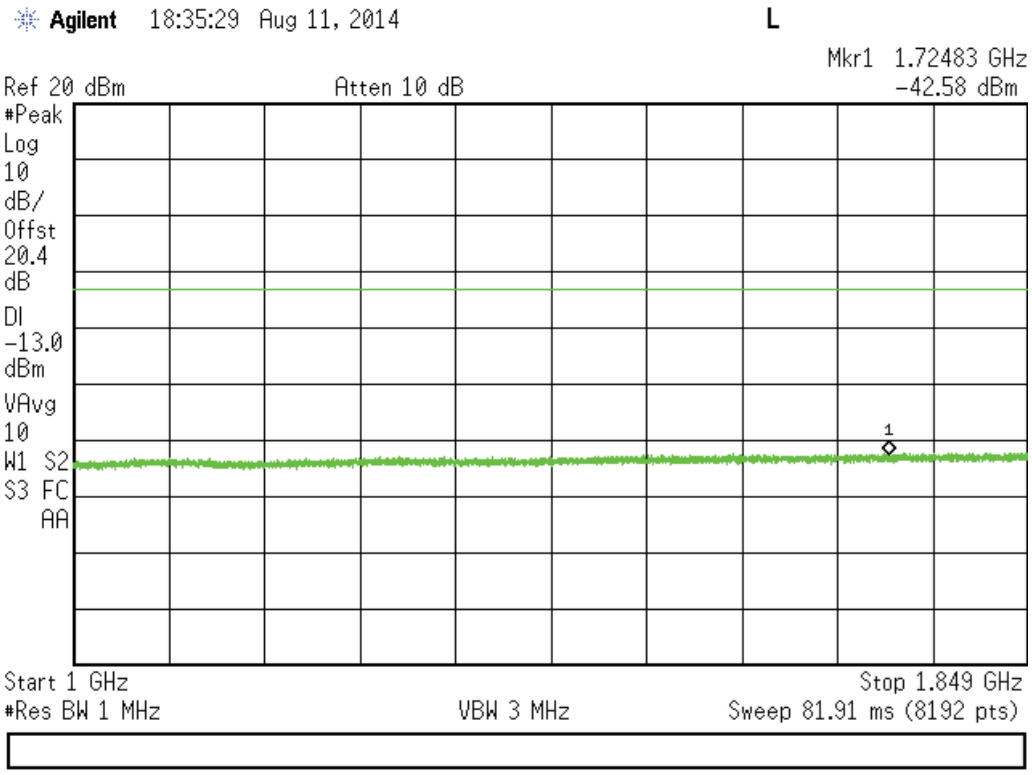
1850-1915 MHz Band (Mid Frequency) (Cont)



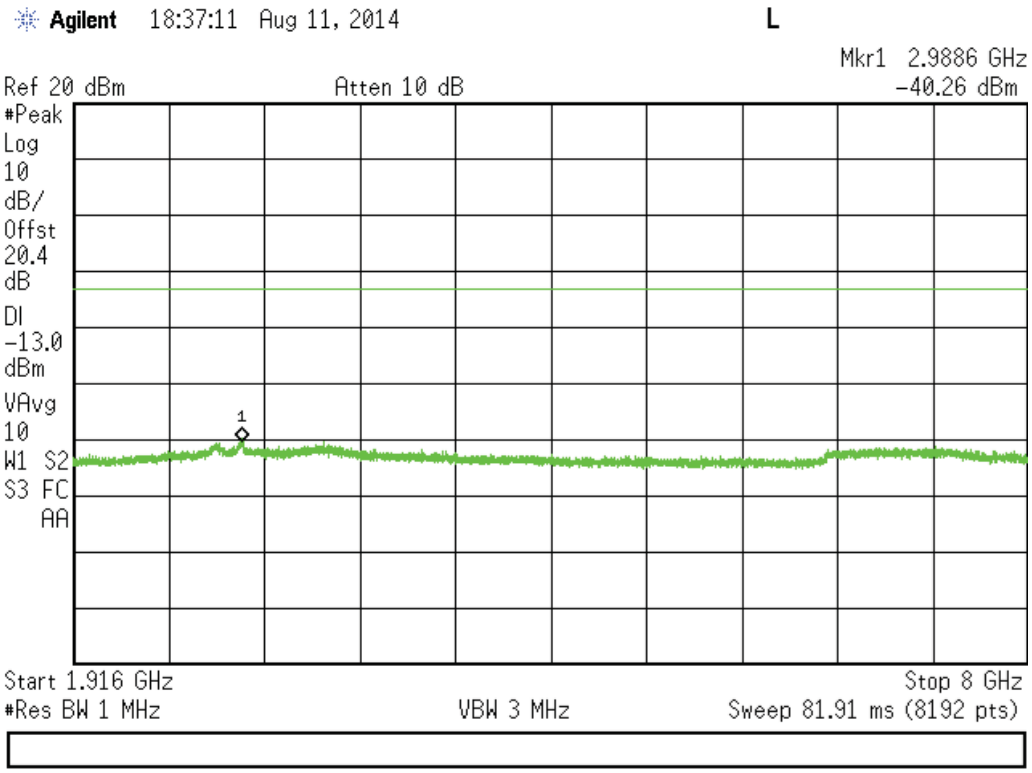
1850-1915 MHz Band (High Frequency)



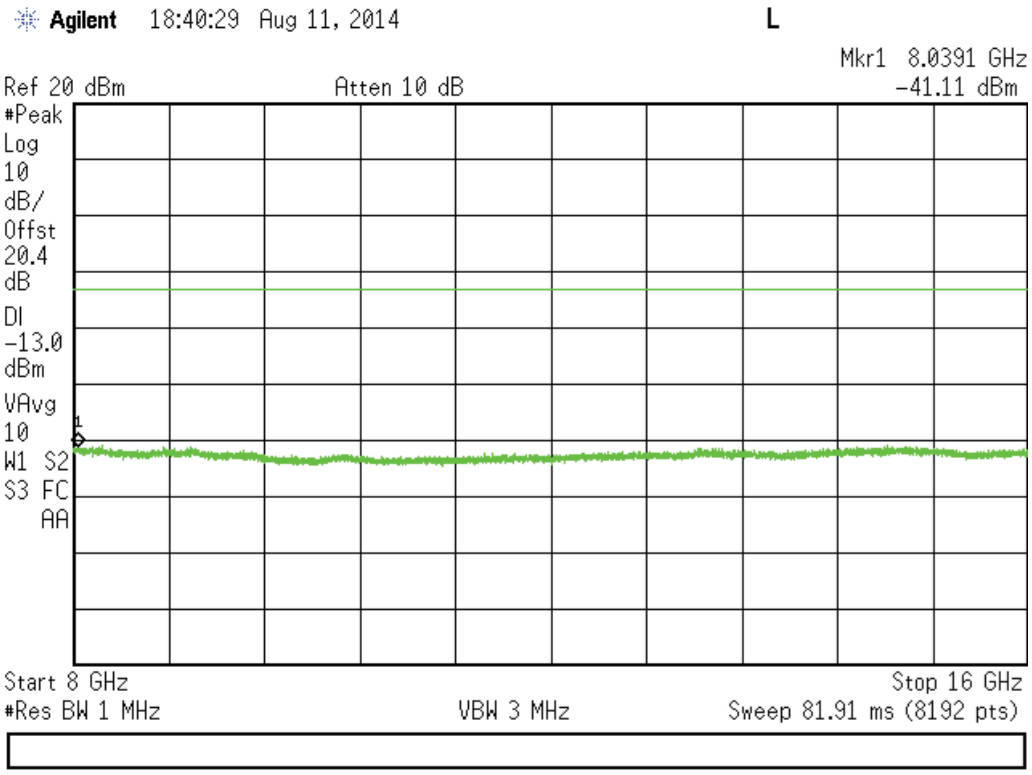
1850-1915 MHz Band (High Frequency) (Cont)



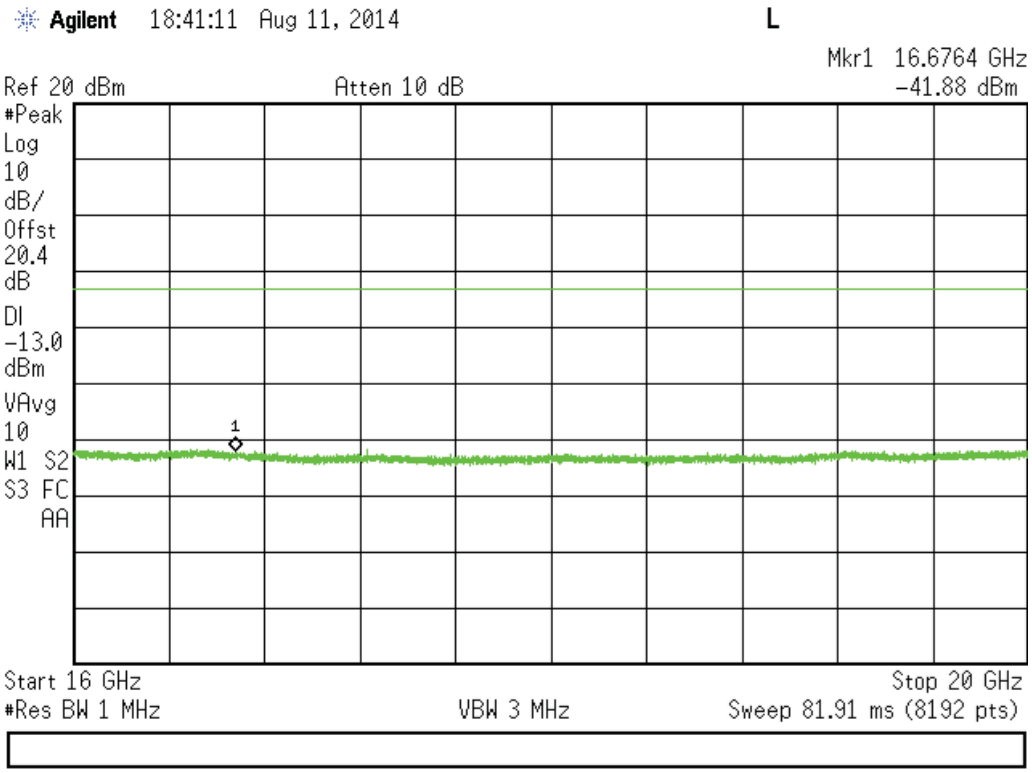
1850-1915 MHz Band (High Frequency) (Cont)



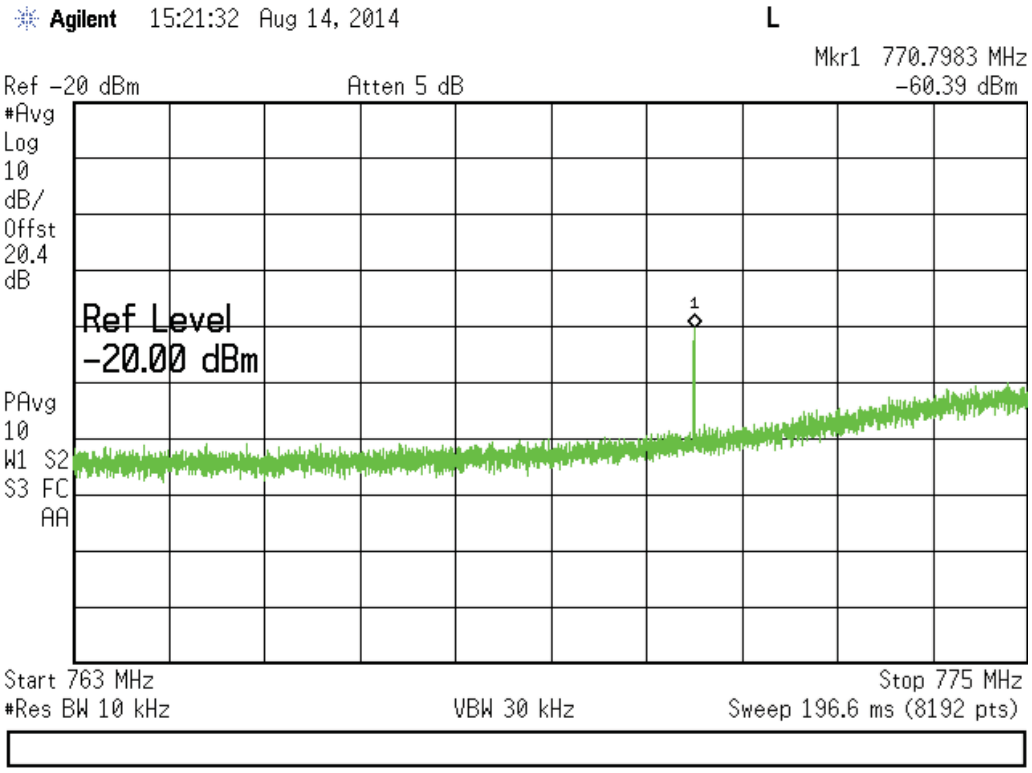
1850-1915 MHz Band (High Frequency) (Cont)



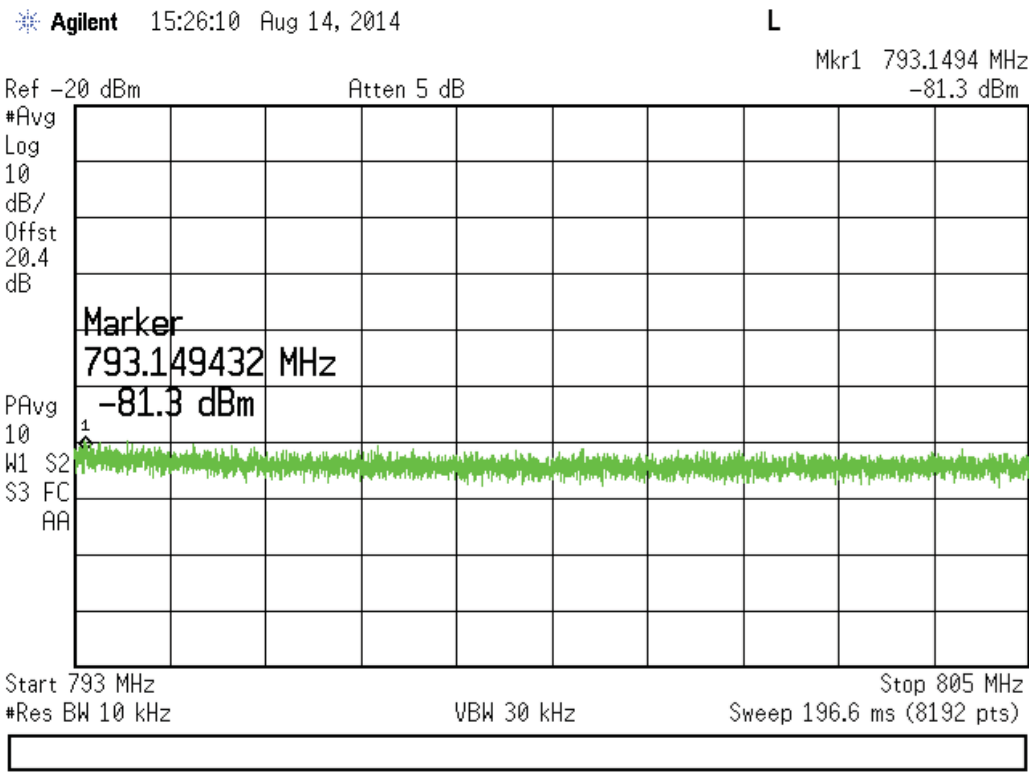
1850-1915 MHz Band (High Frequency) (Cont)



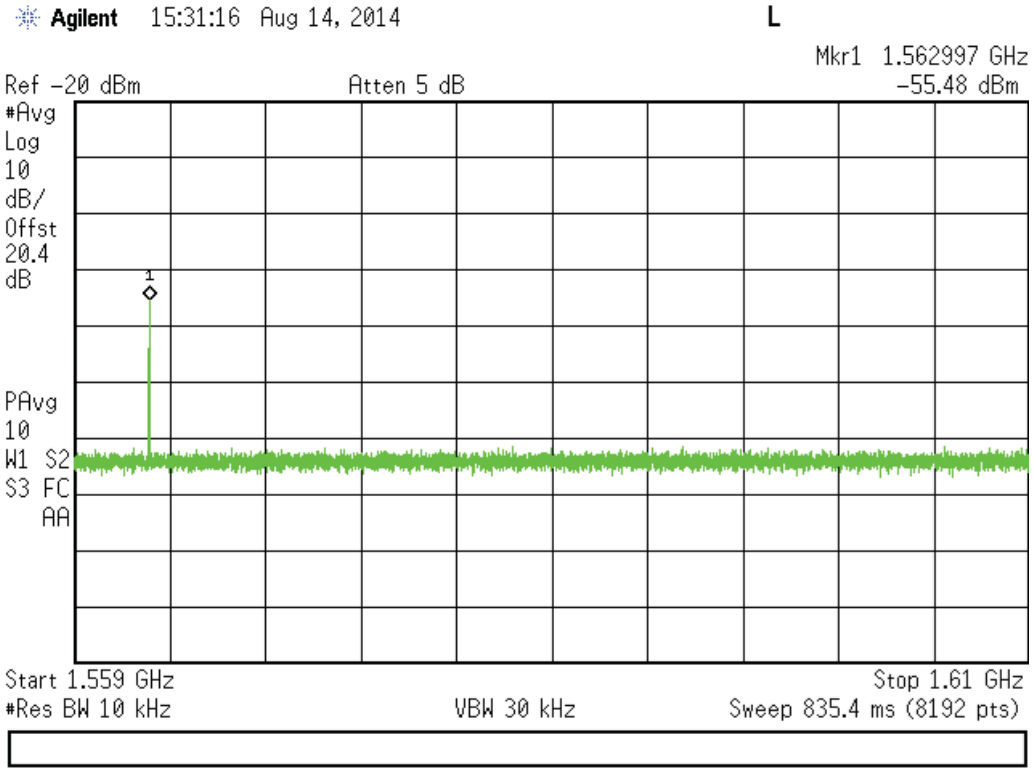
Additional testing 763 - 775 MHz (Narrowband)



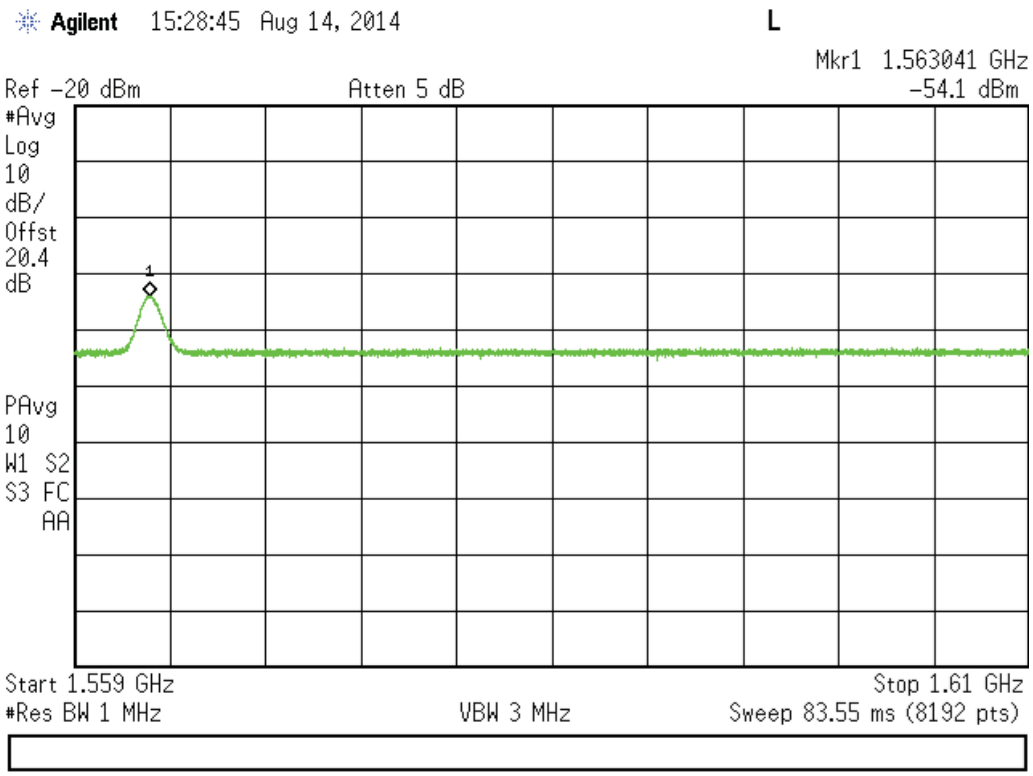
Additional testing 793 - 805 MHz (Narrowband)



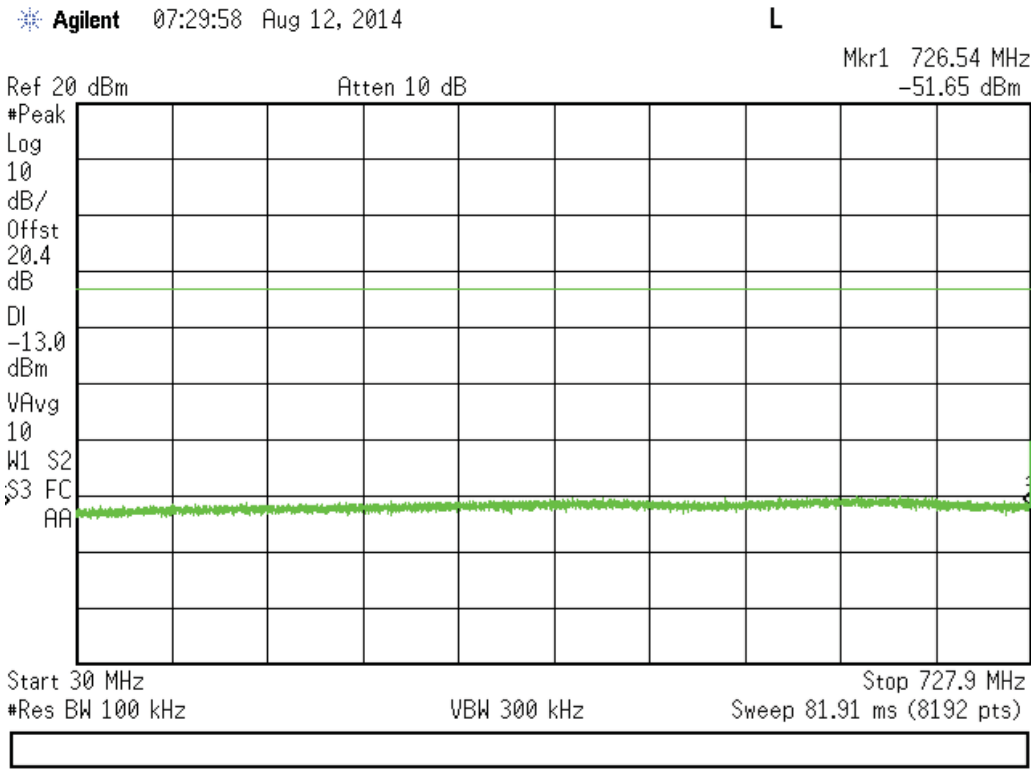
Additional testing 1559 - 1610 MHz (Narrowband)



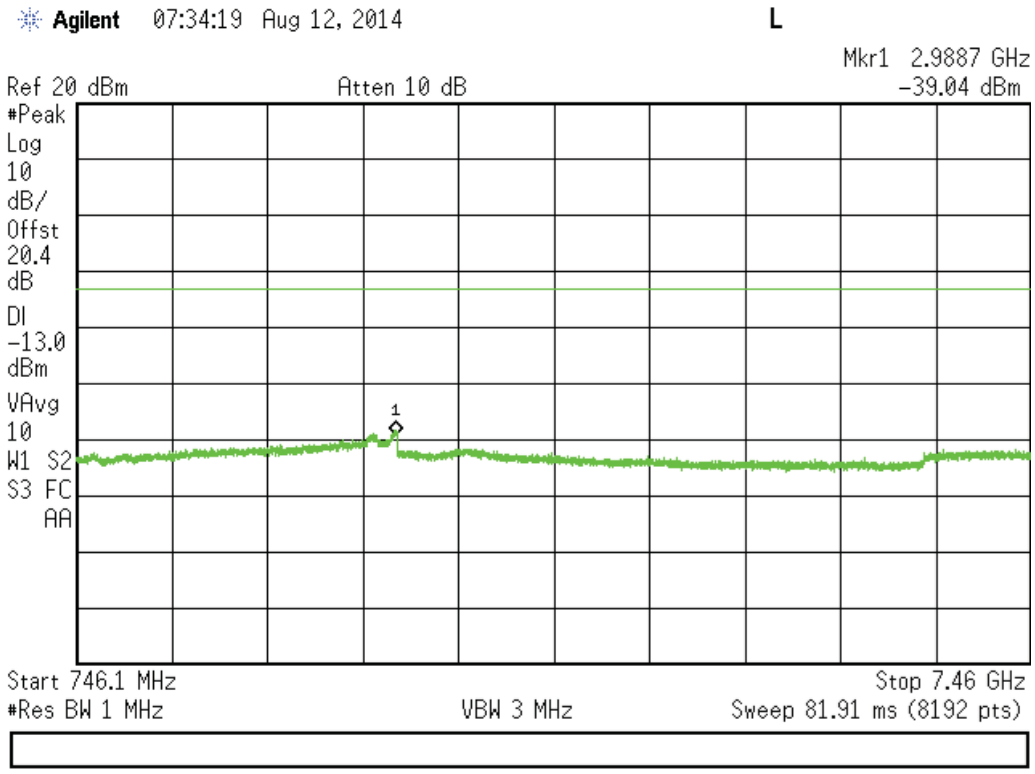
Additional testing 1559 - 1610 MHz (Wideband)



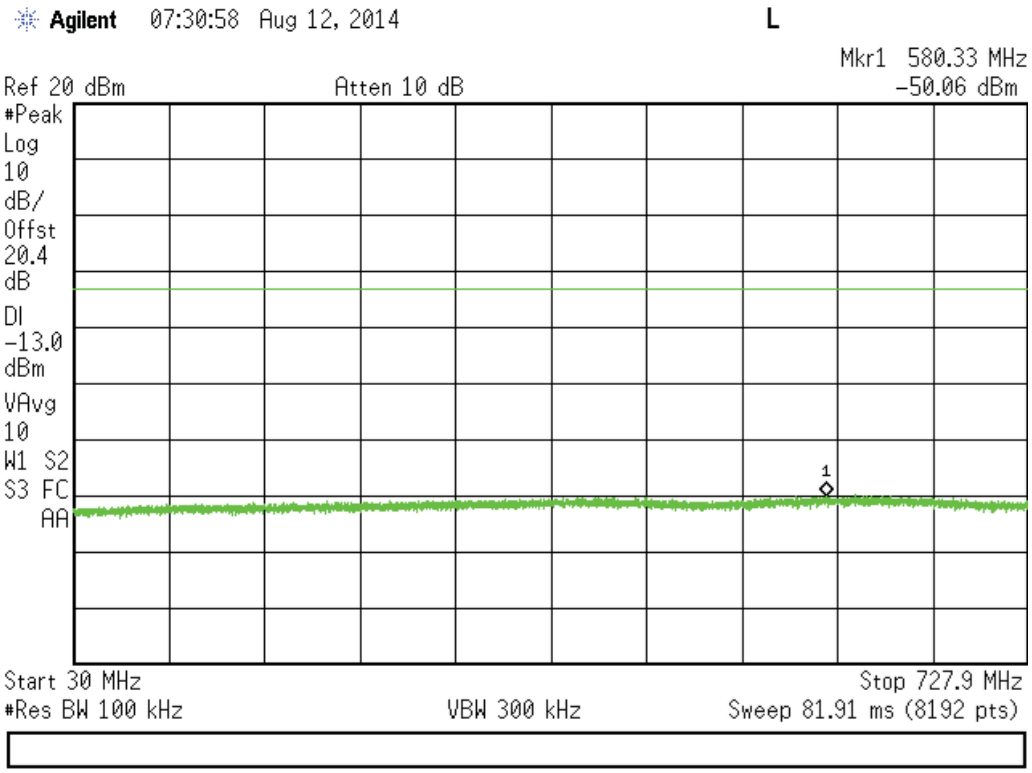
Downlink GSM Signal
728-746 MHz Band (Low Frequency)



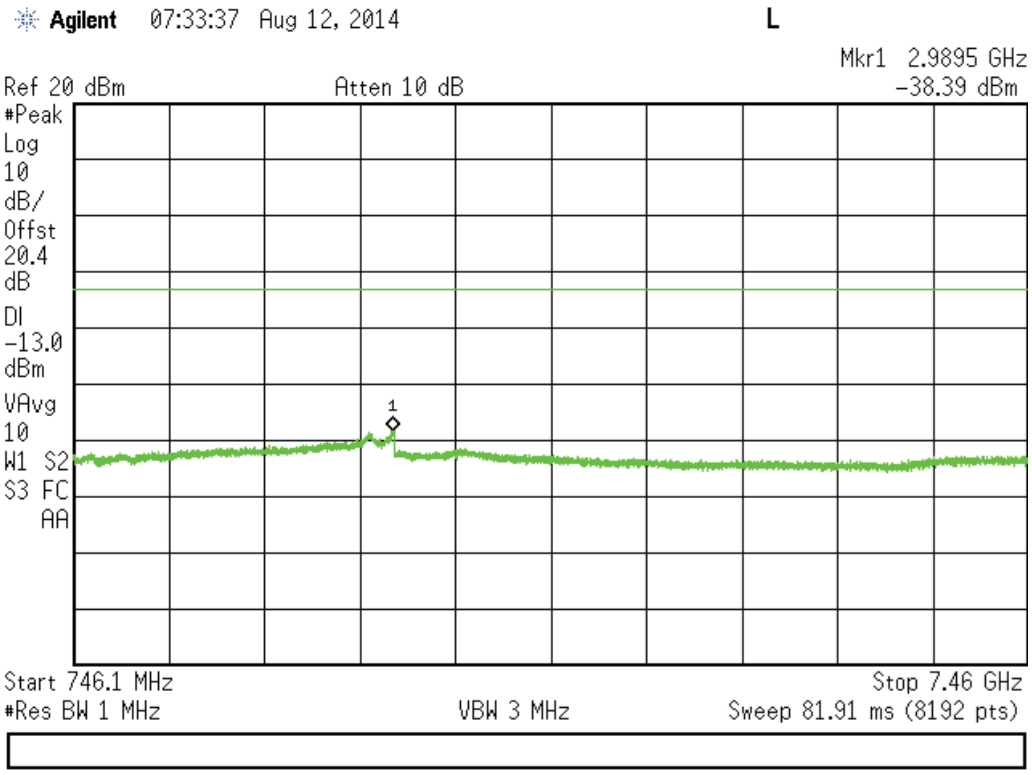
728-746 MHz Band (Low Frequency) (Cont)



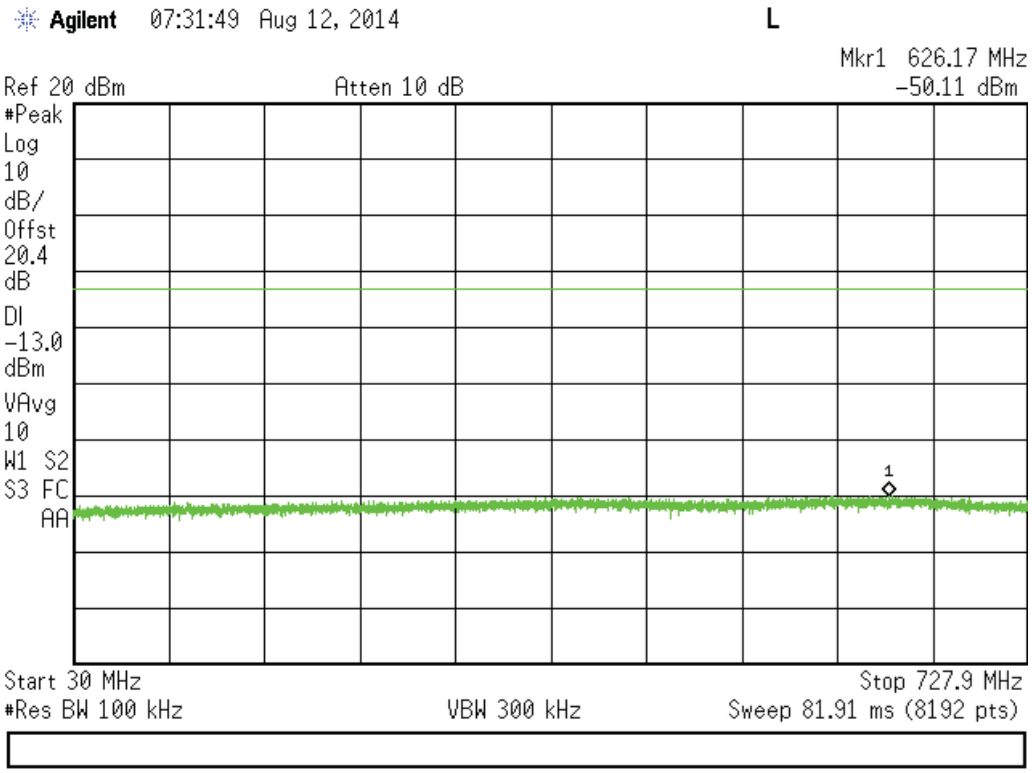
728-746 MHz Band (Mid Frequency)



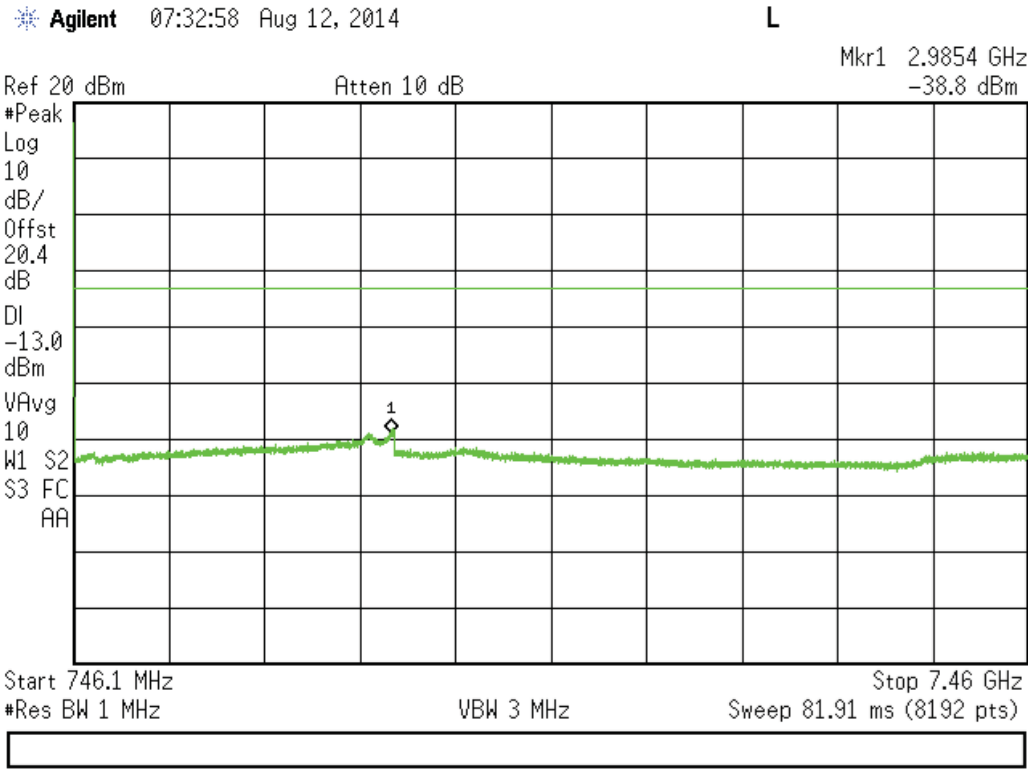
728-746 MHz Band (Mid Frequency) (Cont)



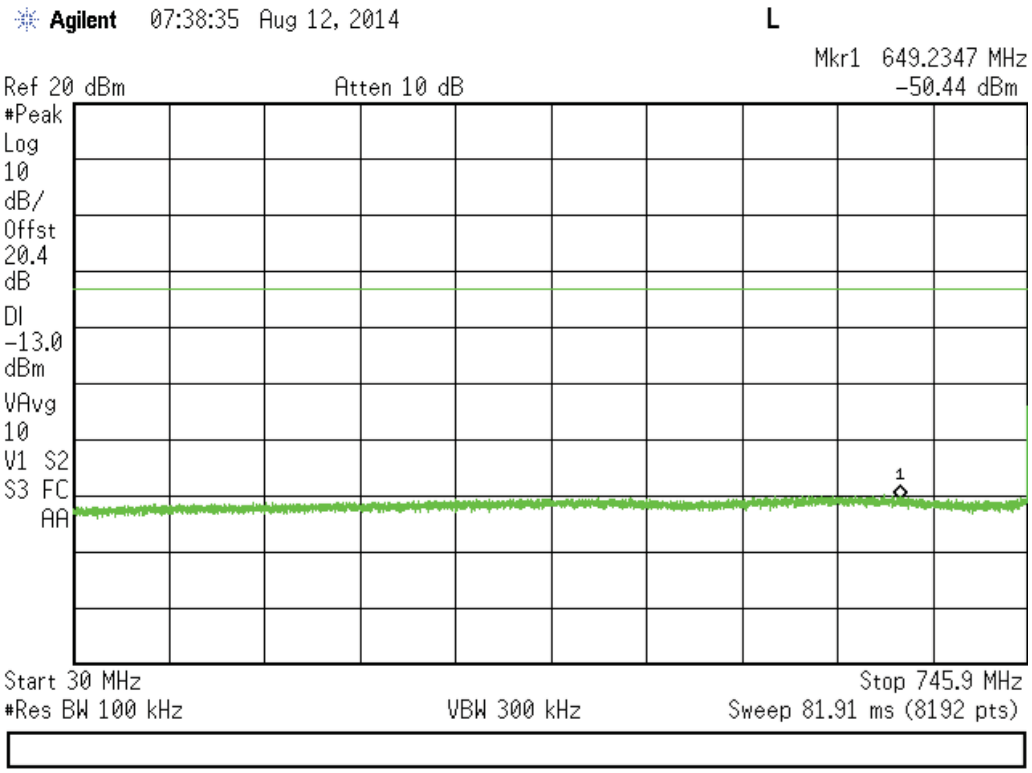
728-746 MHz Band (High Frequency)



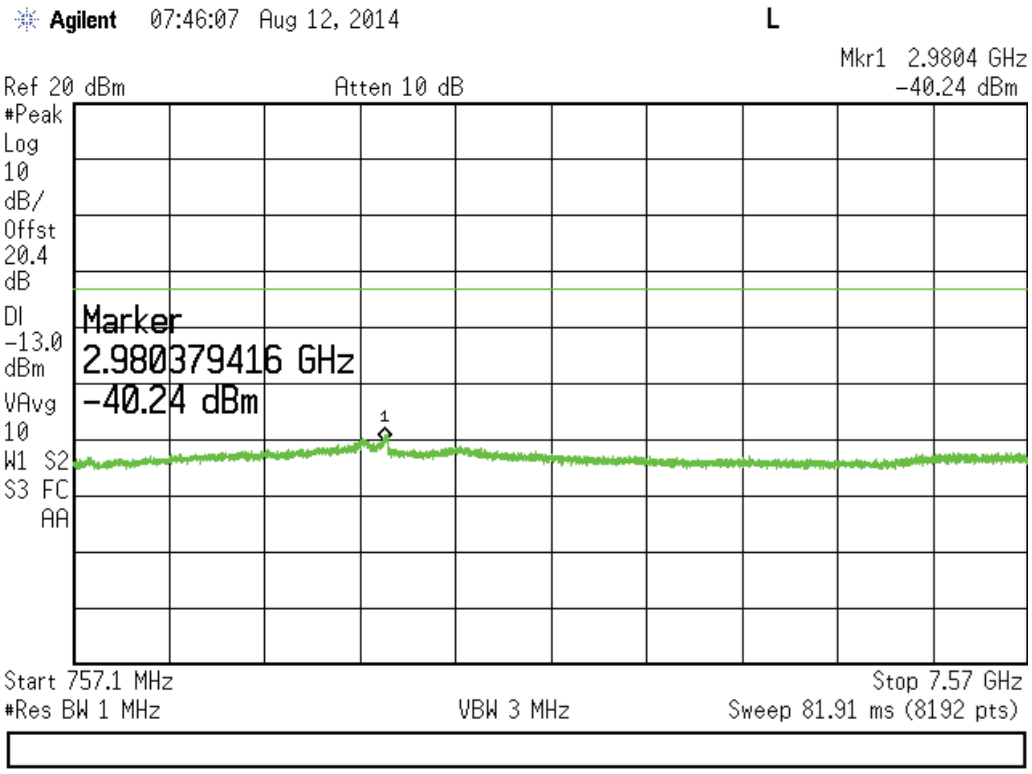
728-746 MHz Band (High Frequency) (Cont)



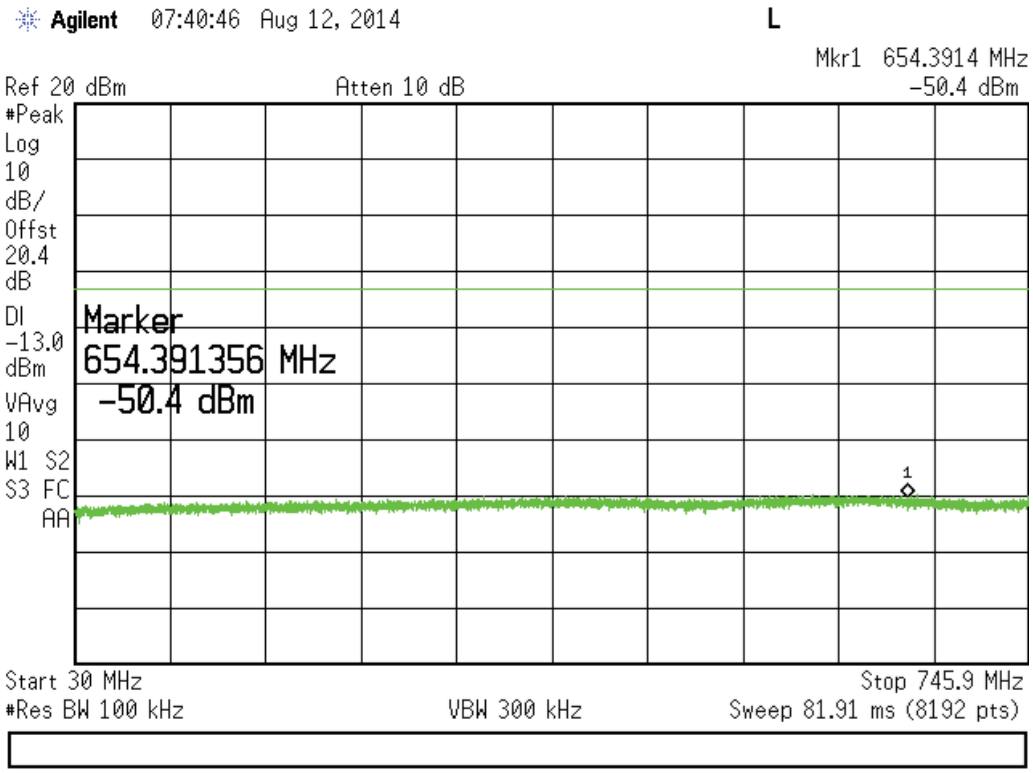
746-757 MHz Band (Low Frequency)



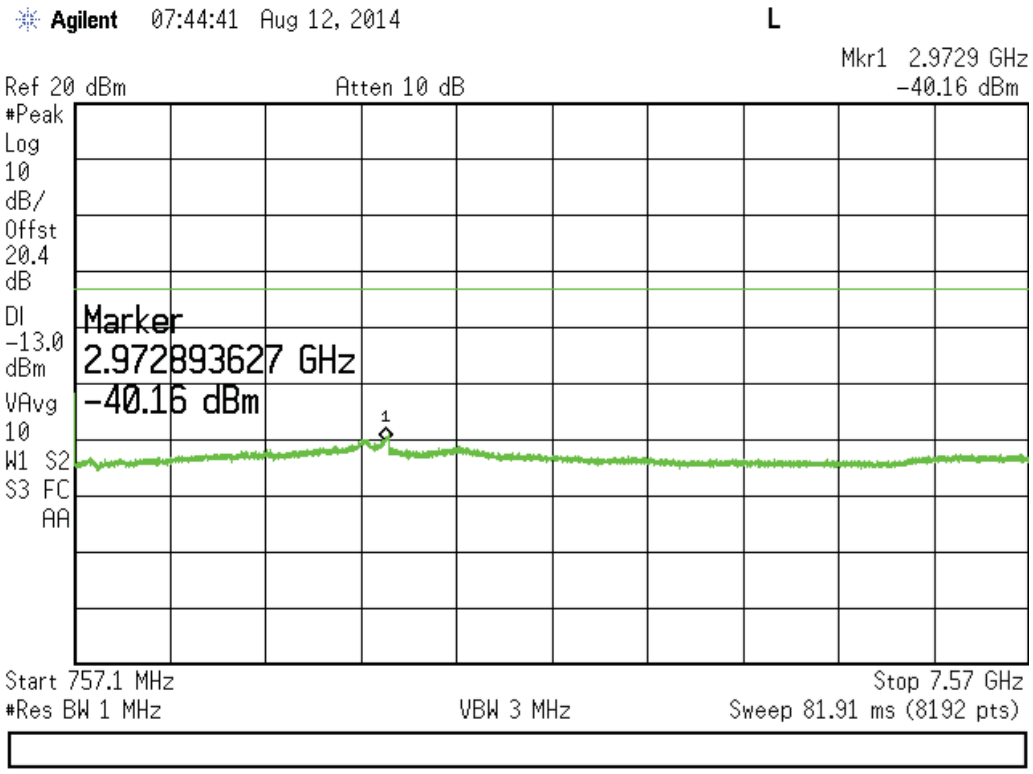
728-746 MHz Band (Low Frequency) (Cont)



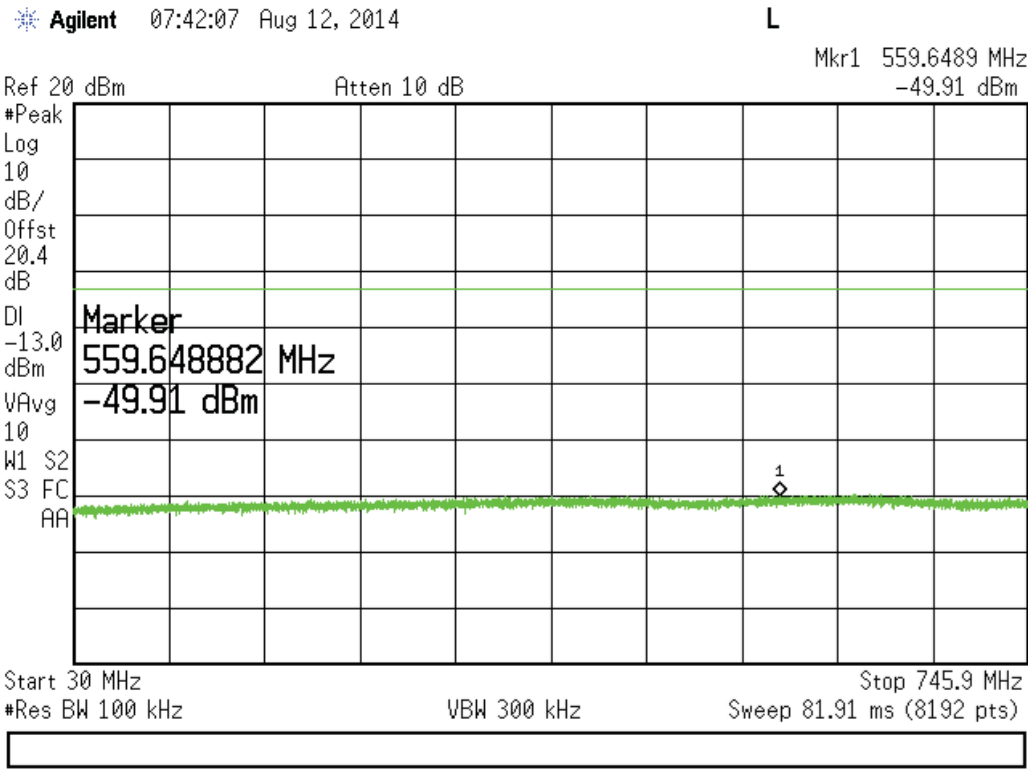
746-757 MHz Band (Mid Frequency)



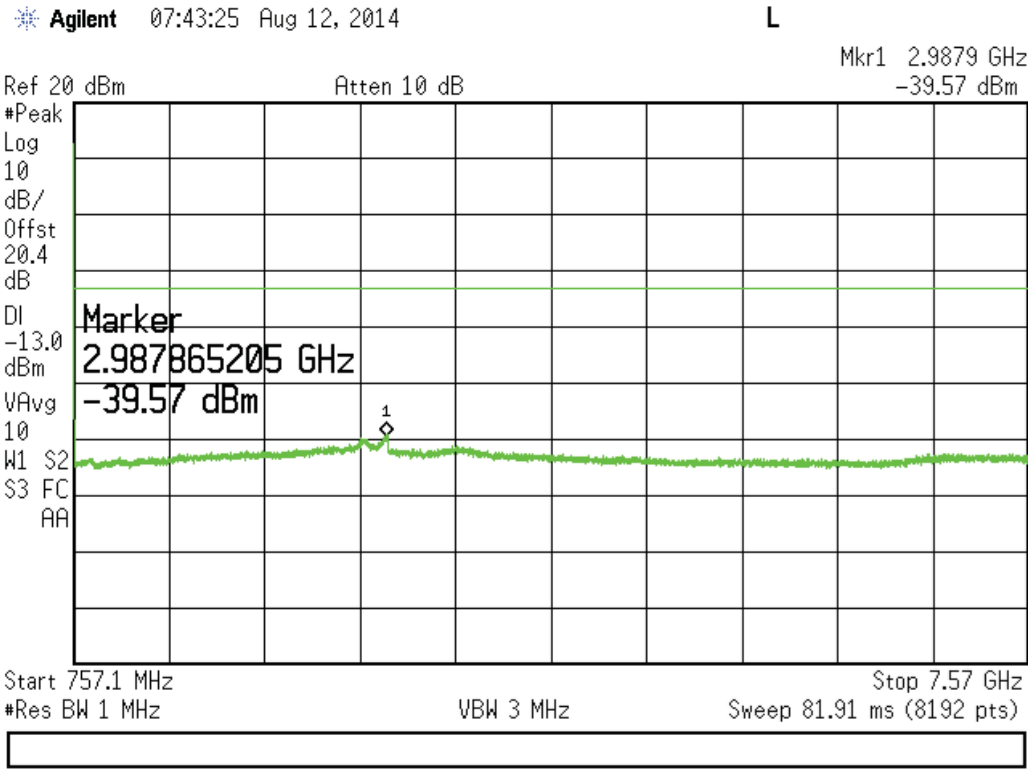
746-757 MHz Band (Mid Frequency) (Cont)



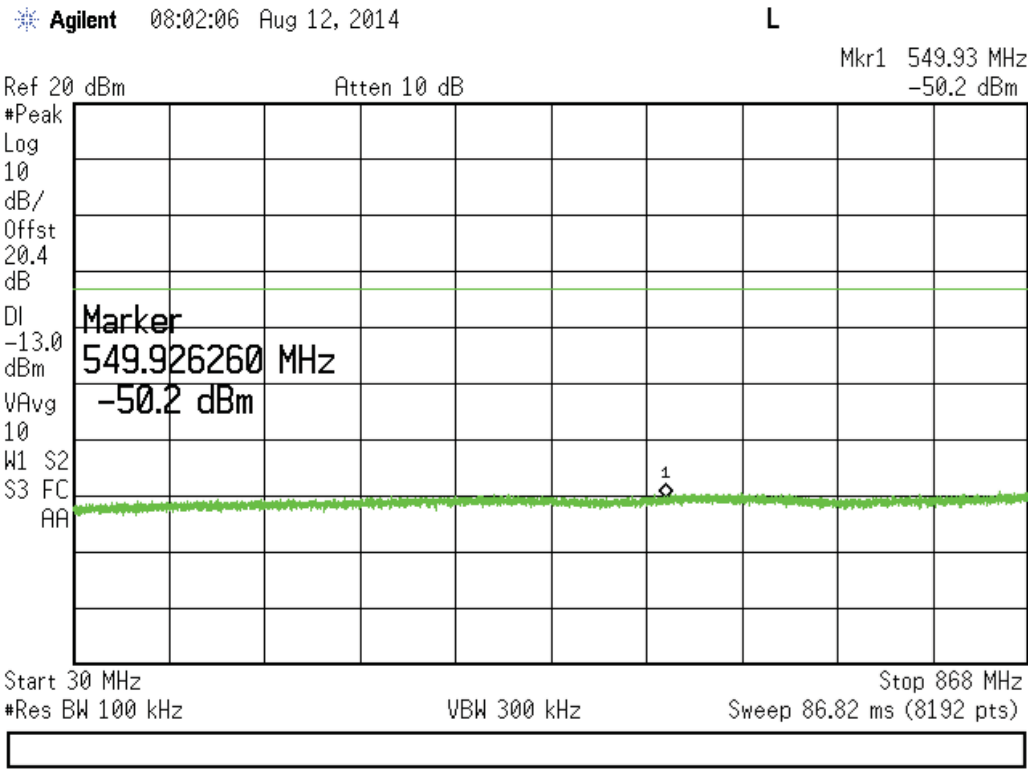
746-757 MHz Band (High Frequency)



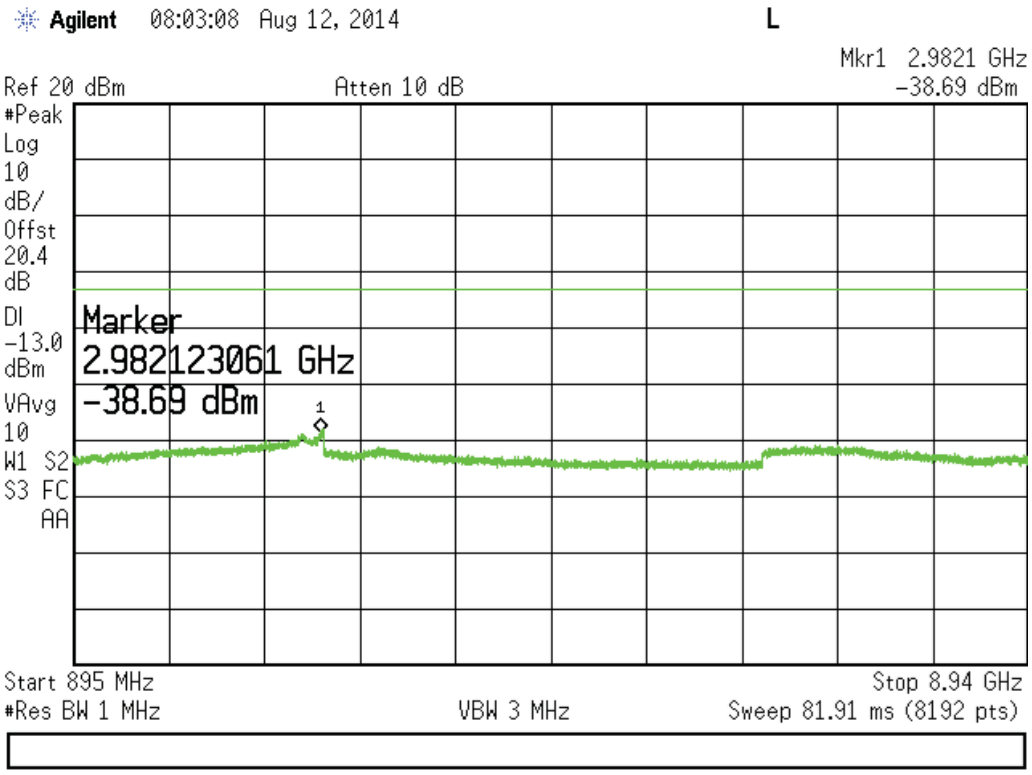
746-757 MHz Band (High Frequency) (Cont)



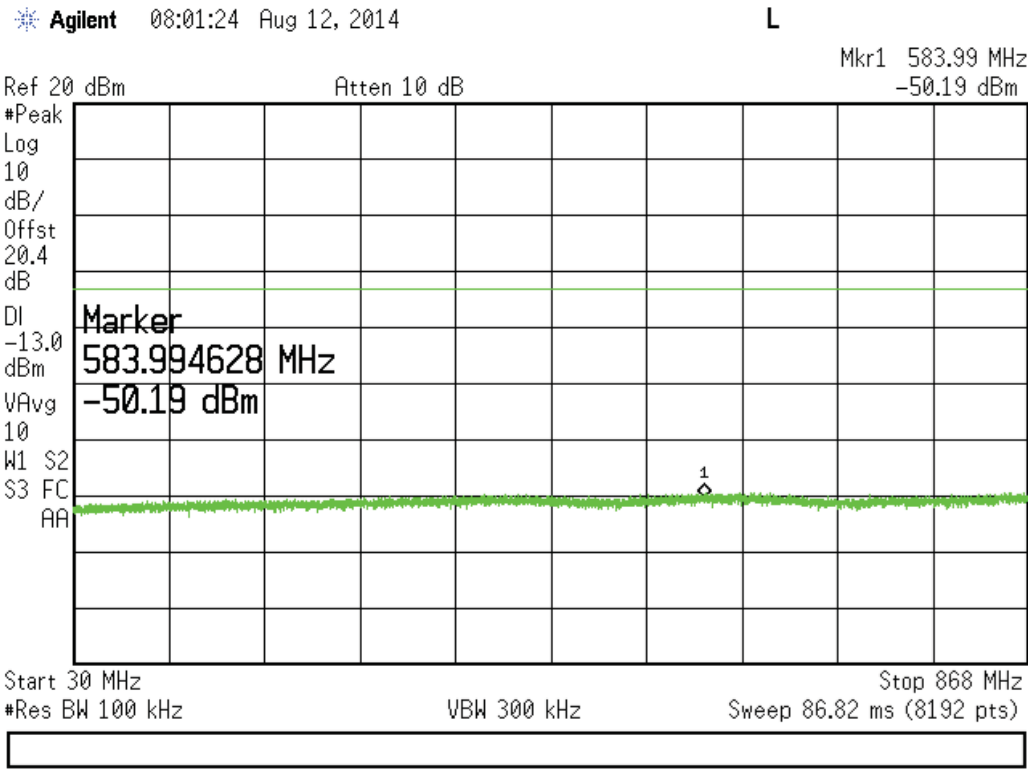
869-894 MHz Band (Low Frequency)



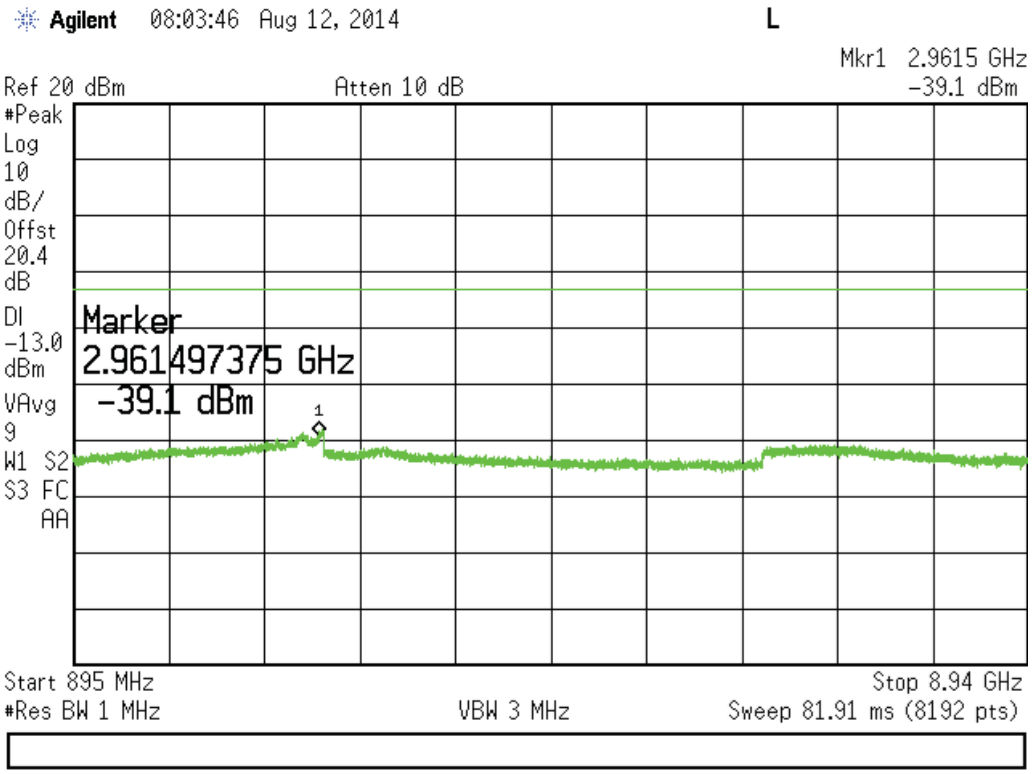
869-894 MHz Band (Low Frequency) (Cont)



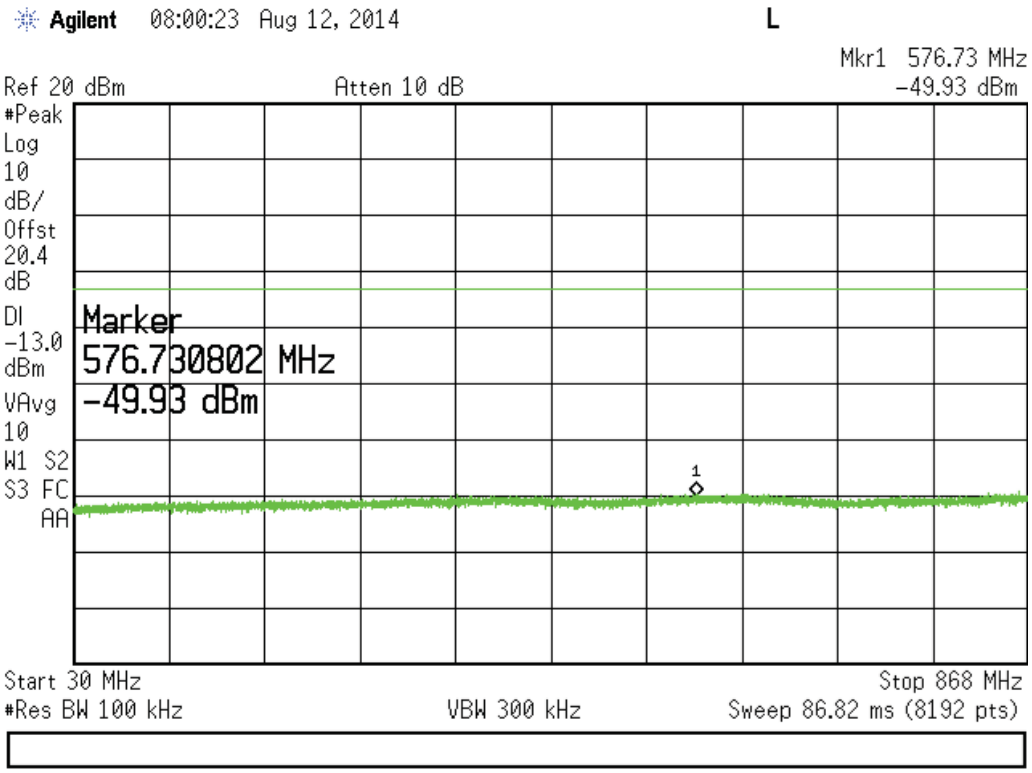
869-894 MHz Band (Mid Frequency)



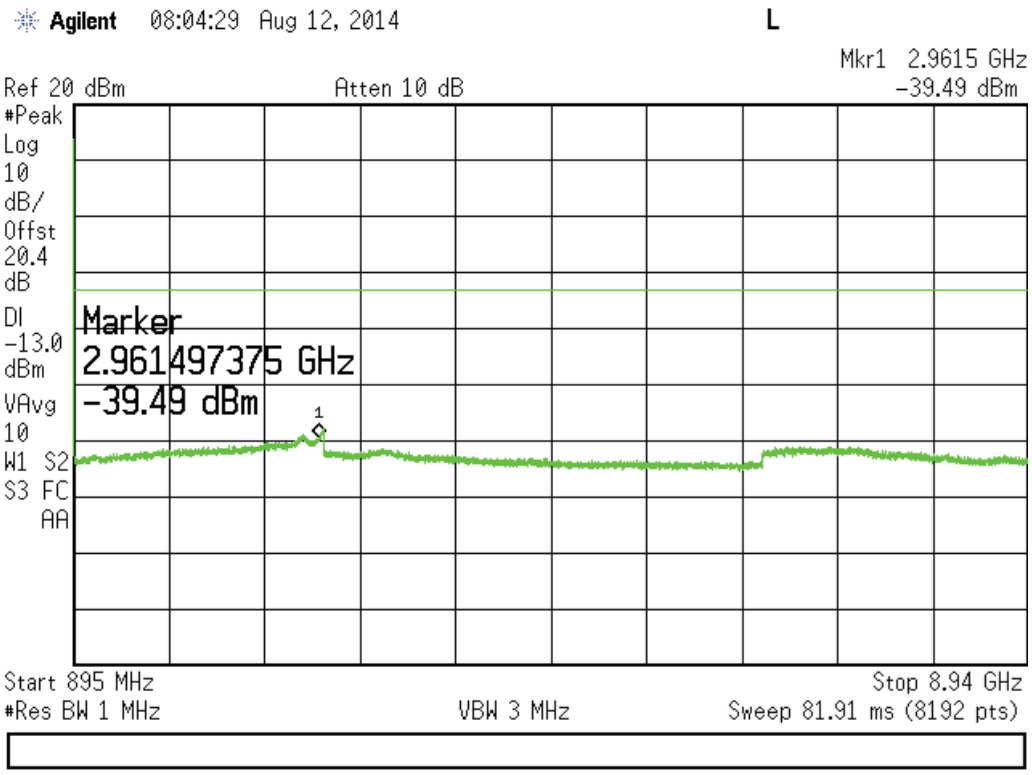
869-894 MHz Band (Mid Frequency) (Cont)



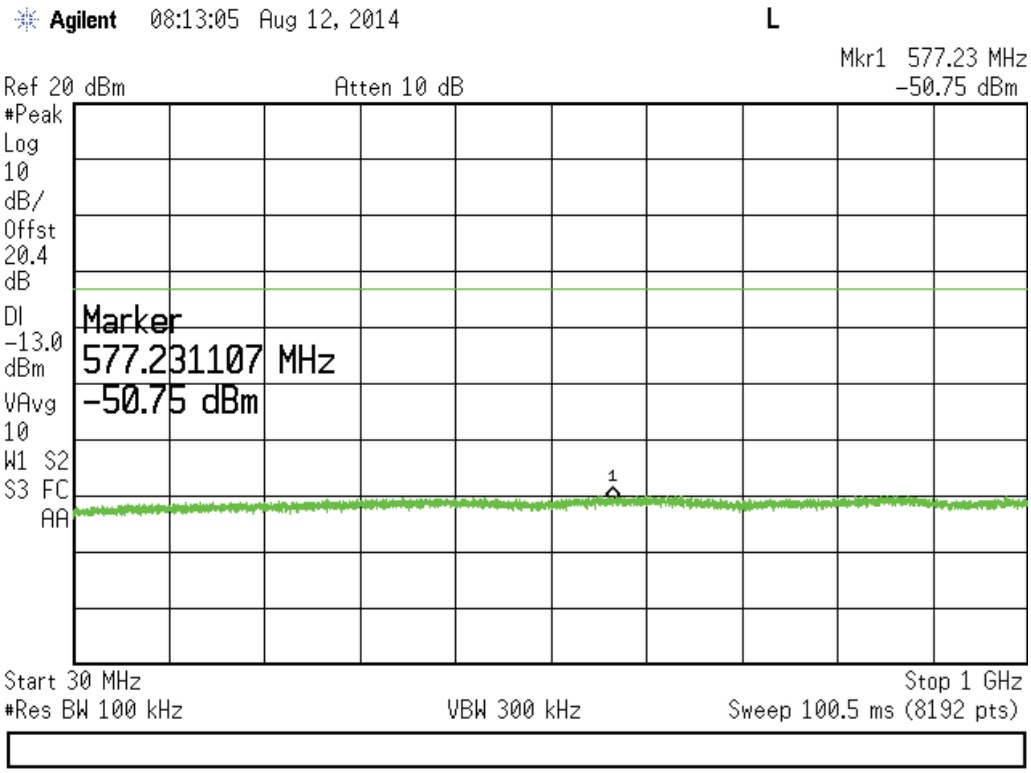
869-894 MHz Band (High Frequency)



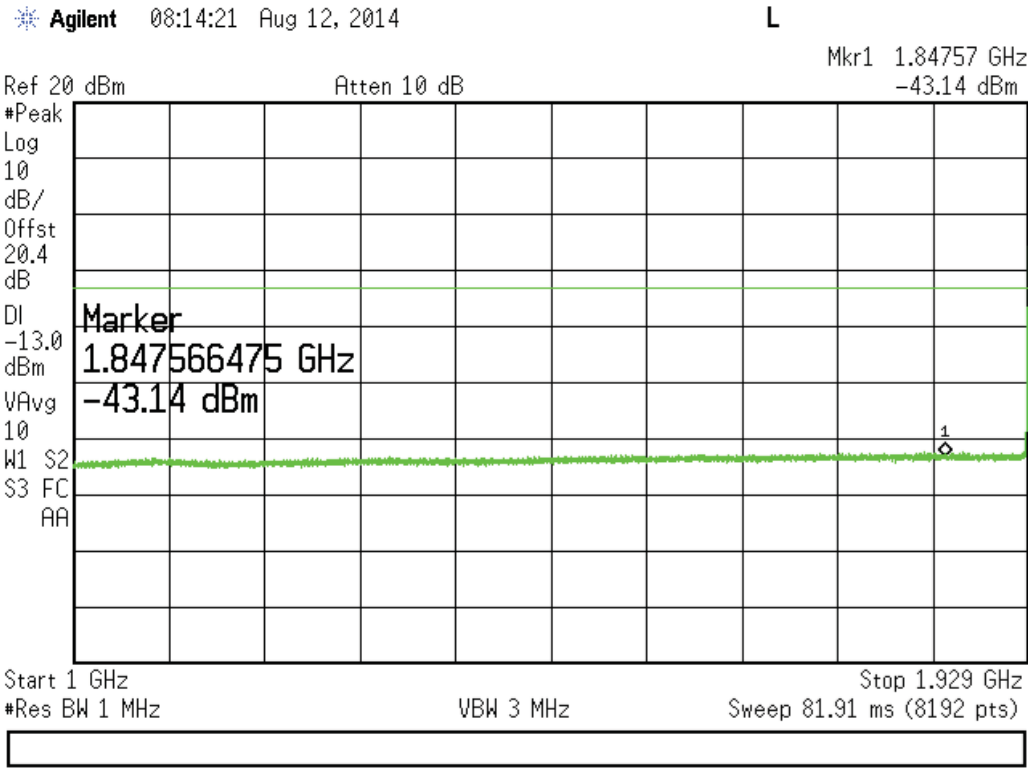
869-894 MHz Band (High Frequency) (Cont)



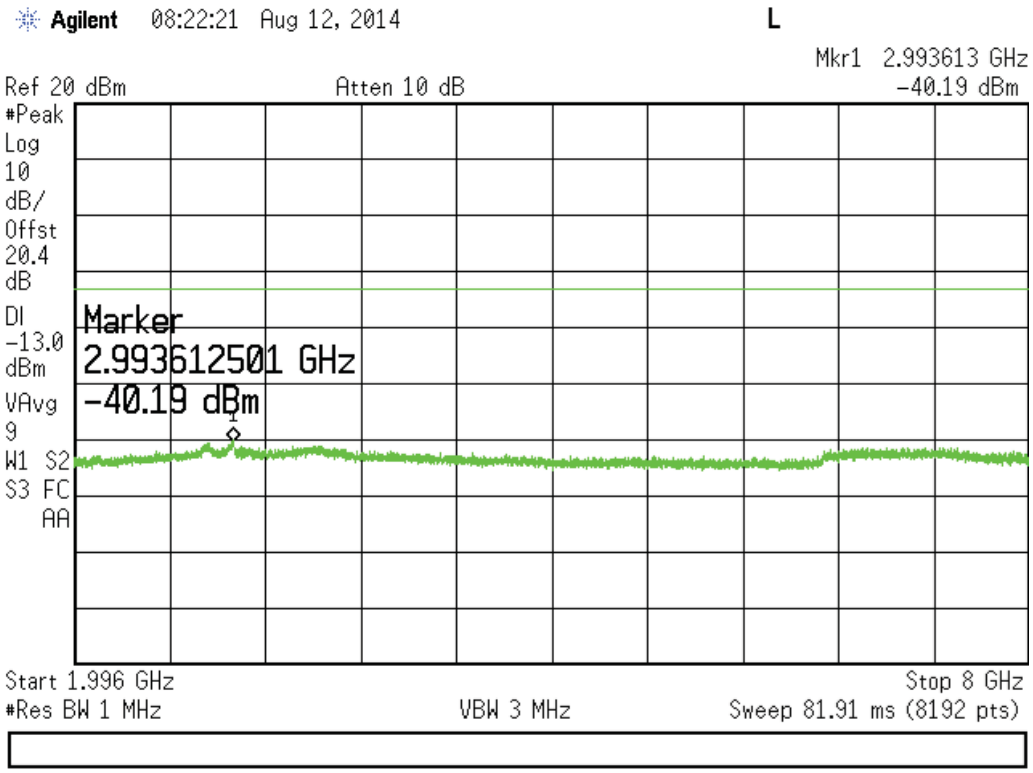
1930-1995 MHz Band (Low Frequency)



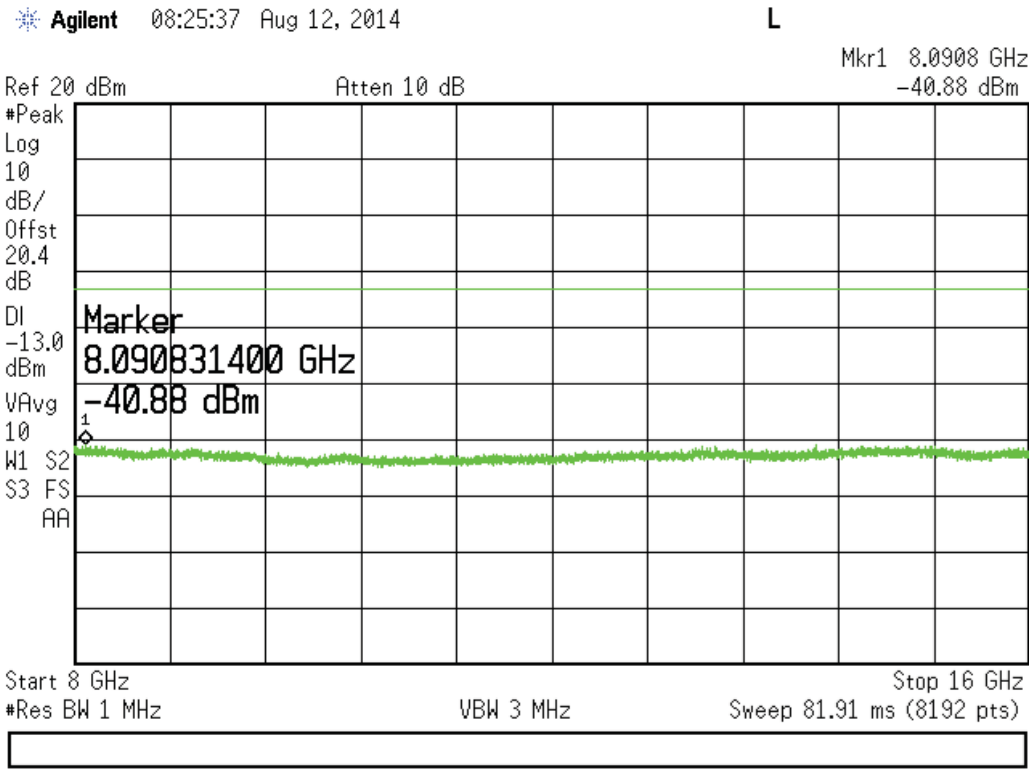
1930-1995 MHz Band (Low Frequency) (Cont)



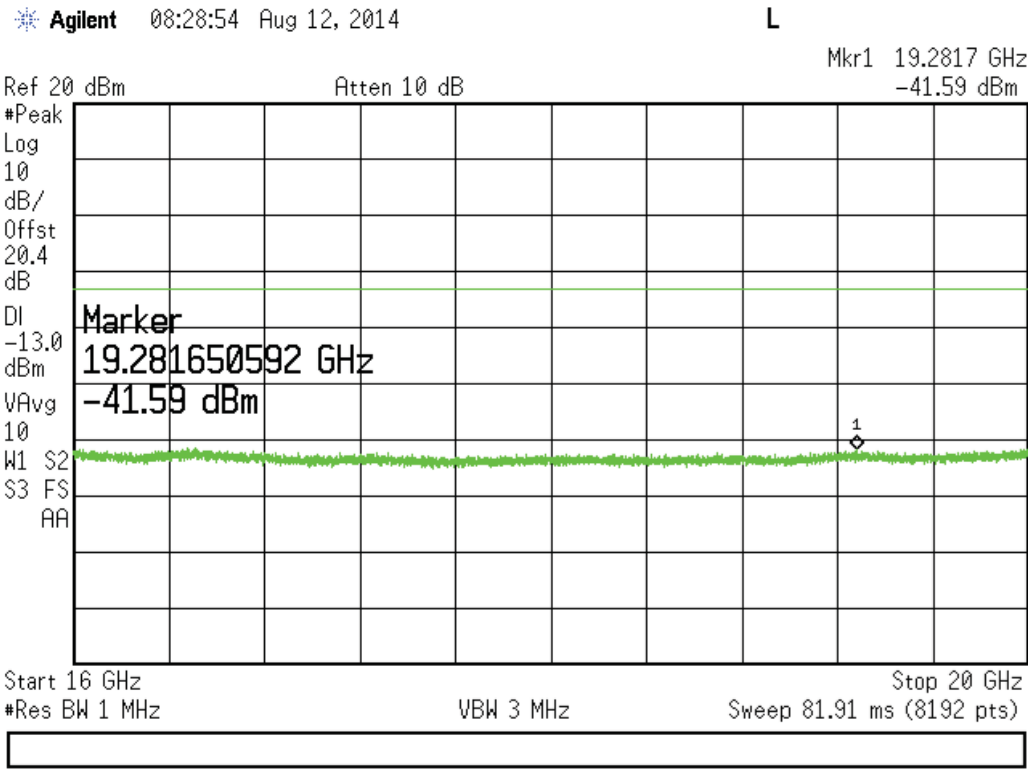
1930-1995 MHz Band (Low Frequency) (Cont)



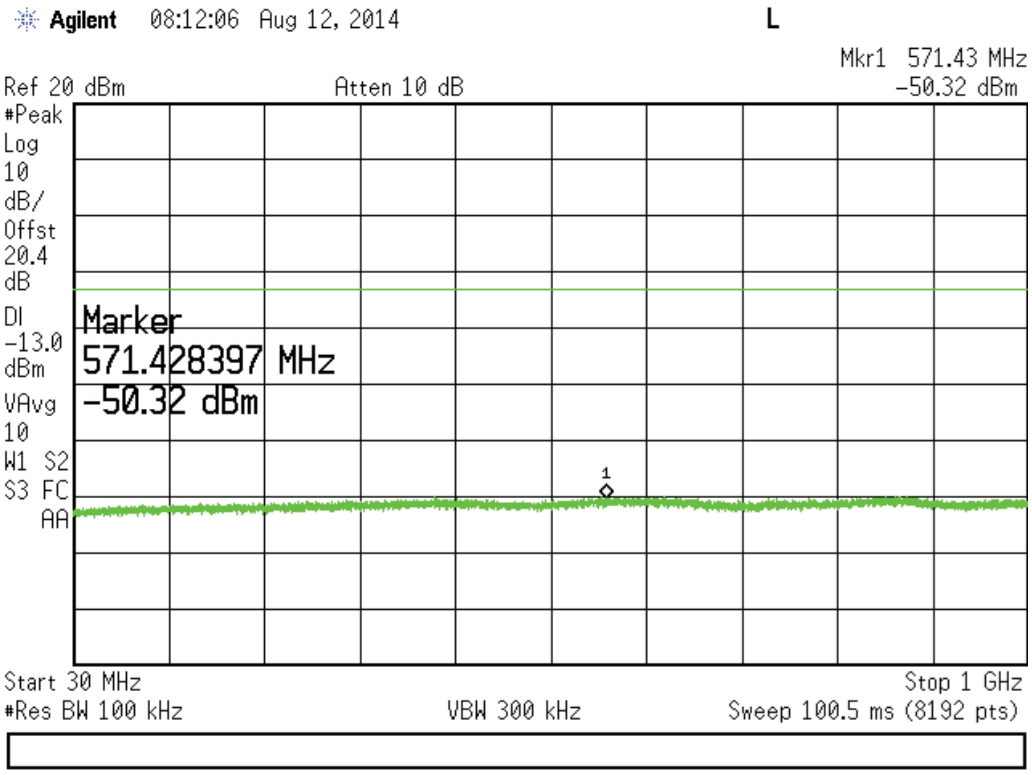
1930-1995 MHz Band (Low Frequency) (Cont)



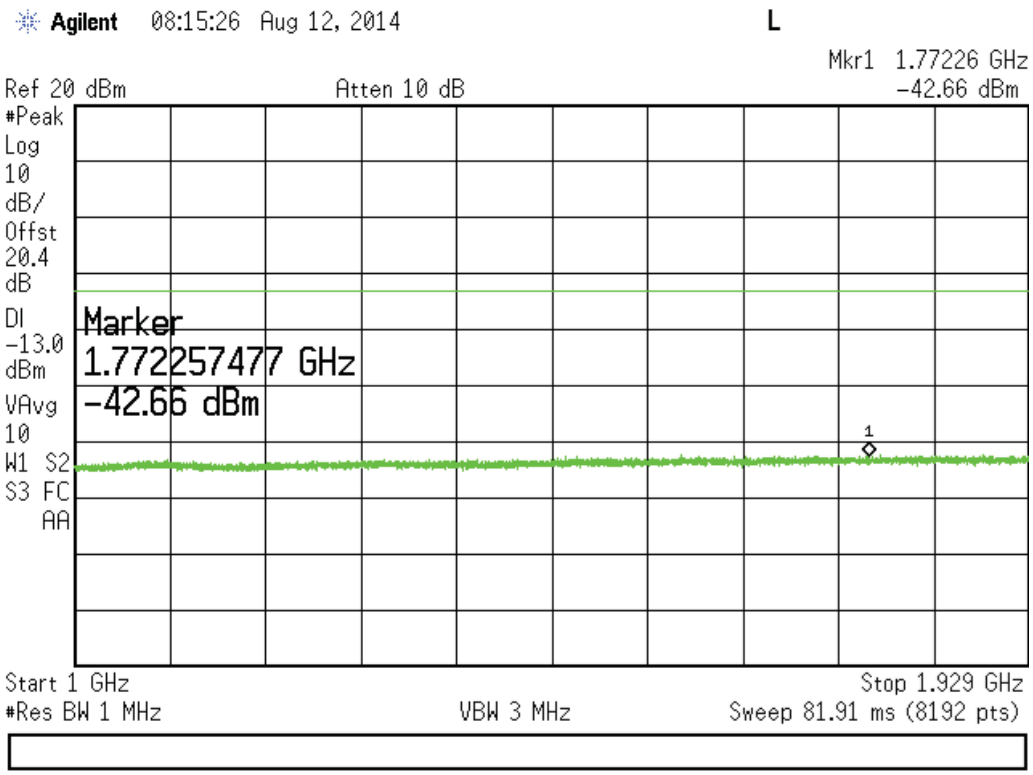
1930-1995 MHz Band (Low Frequency) (Cont)



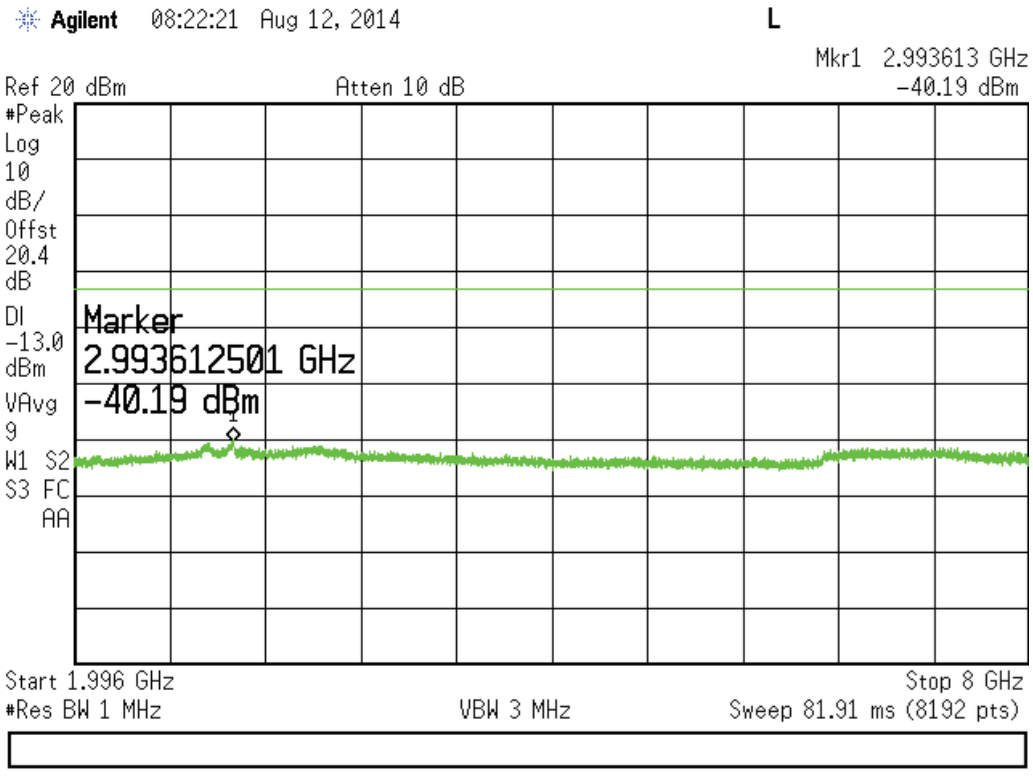
1930-1995 MHz Band (Mid Frequency)



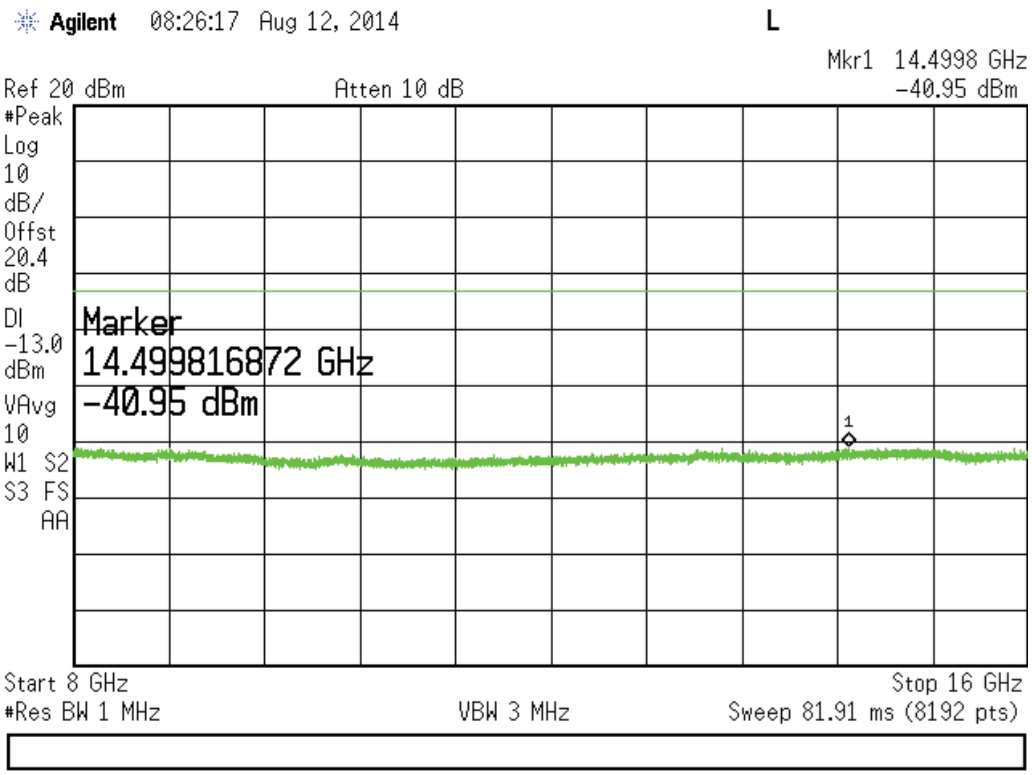
1930-1995 MHz Band (Mid Frequency) (Cont)



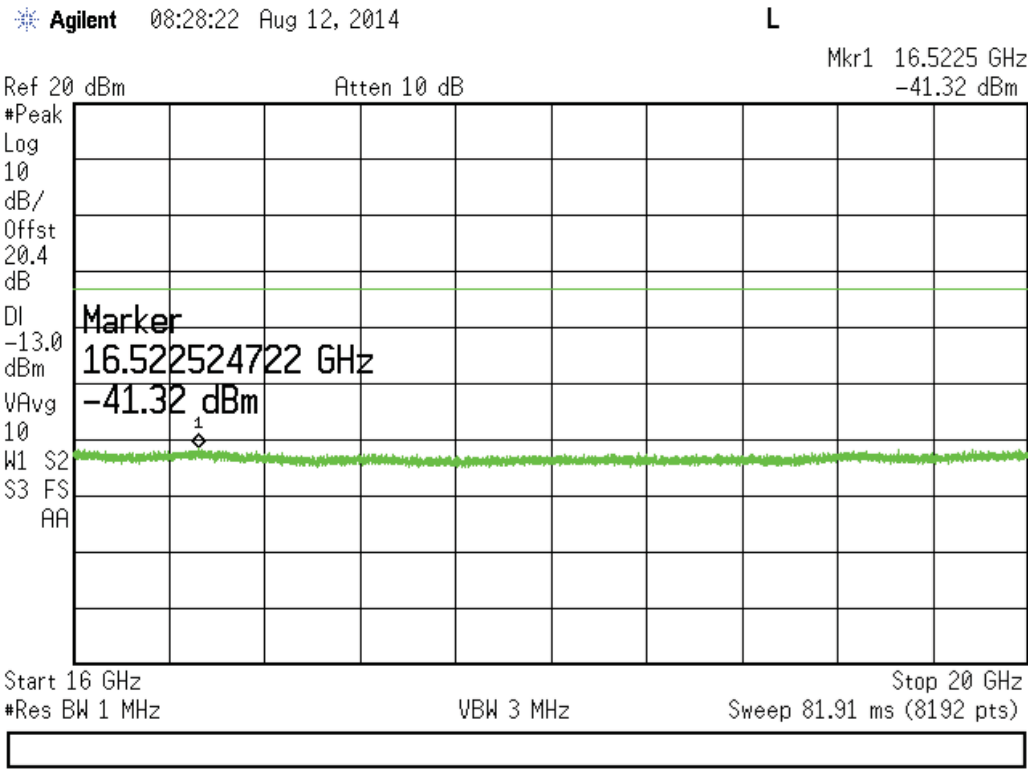
1930-1995 MHz Band (Mid Frequency) (Cont)



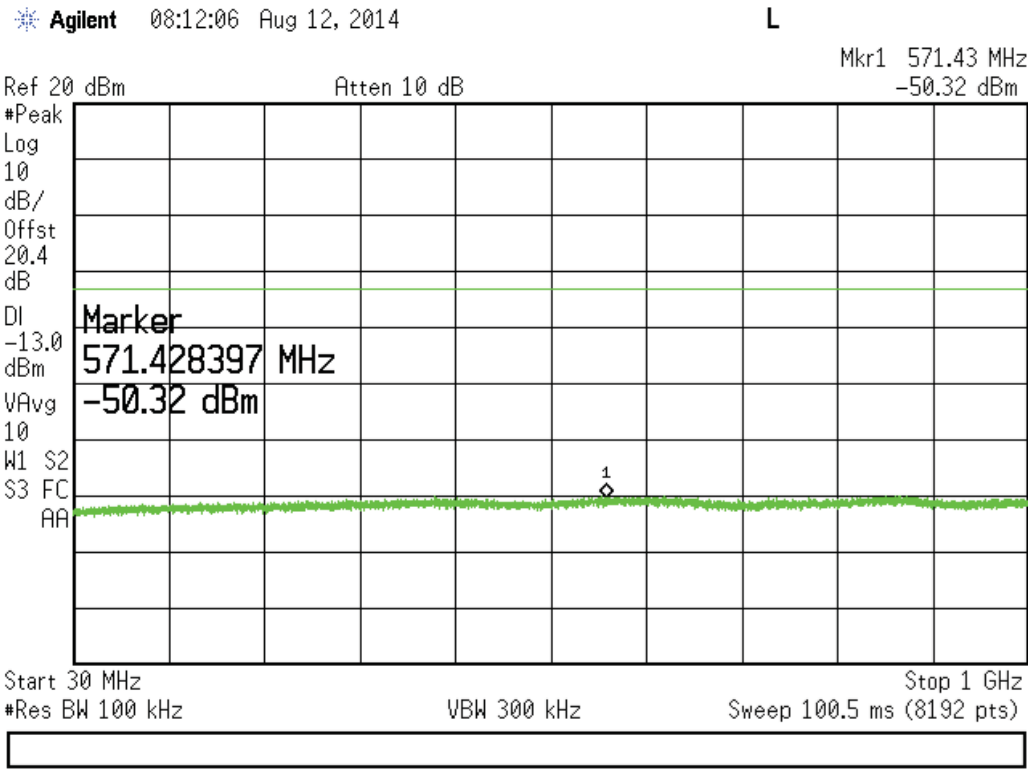
1930-1995 MHz Band (Mid Frequency) (Cont)



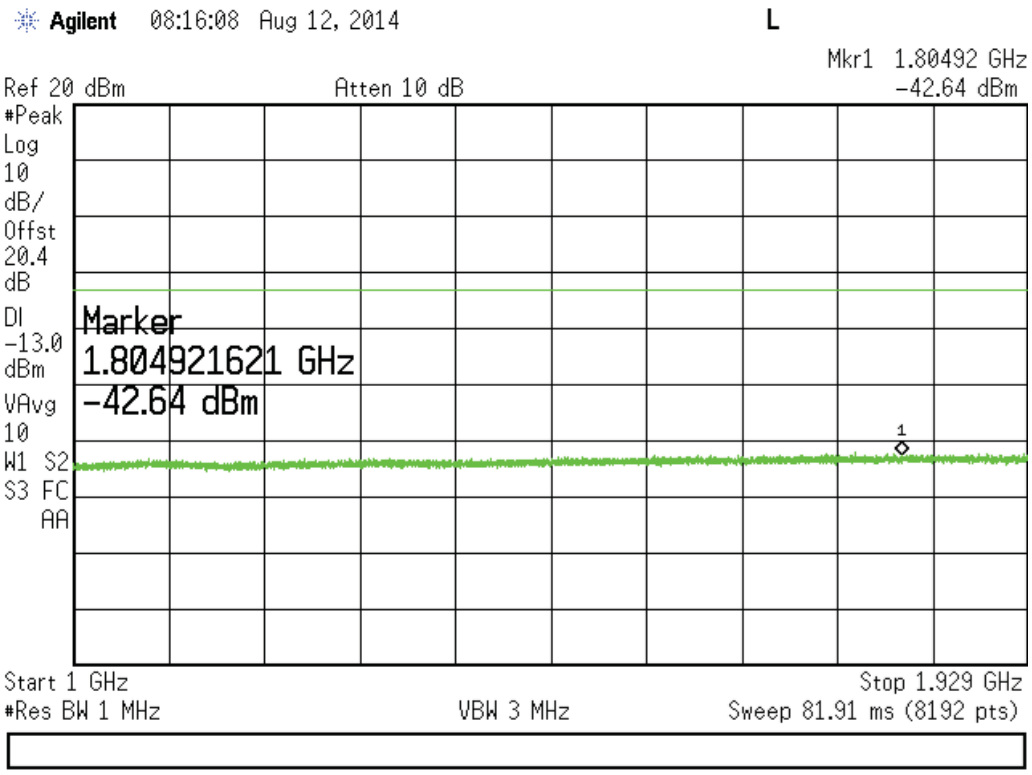
1930-1995 MHz Band (Mid Frequency) (Cont)



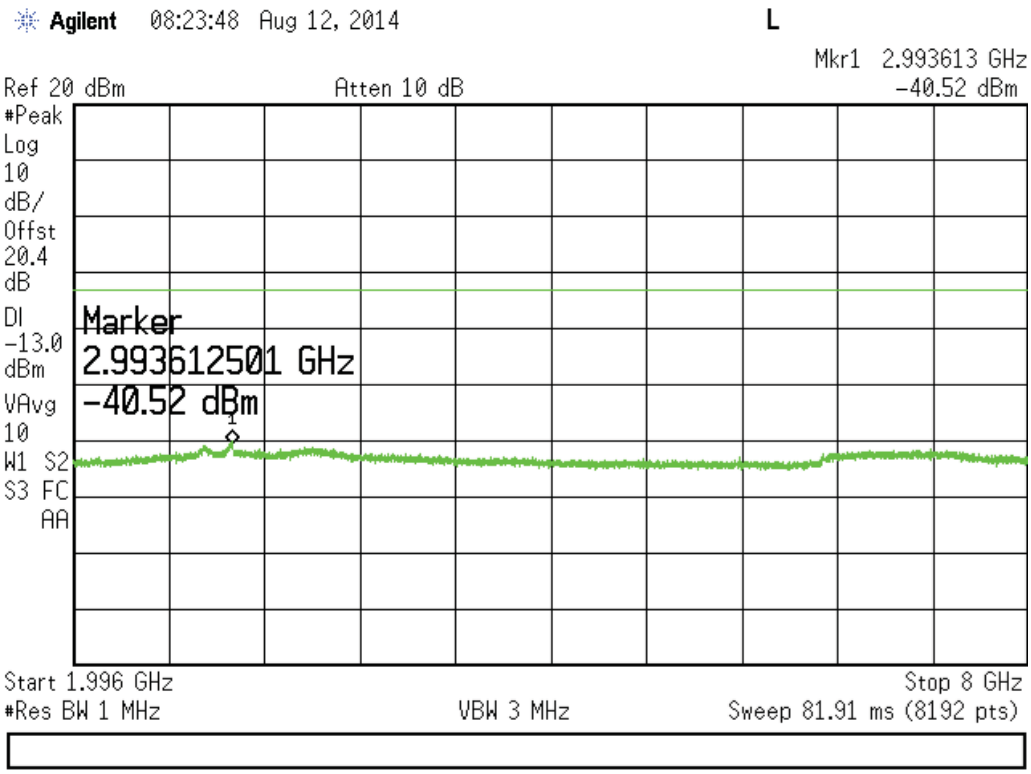
1930-1995 MHz Band (High Frequency)



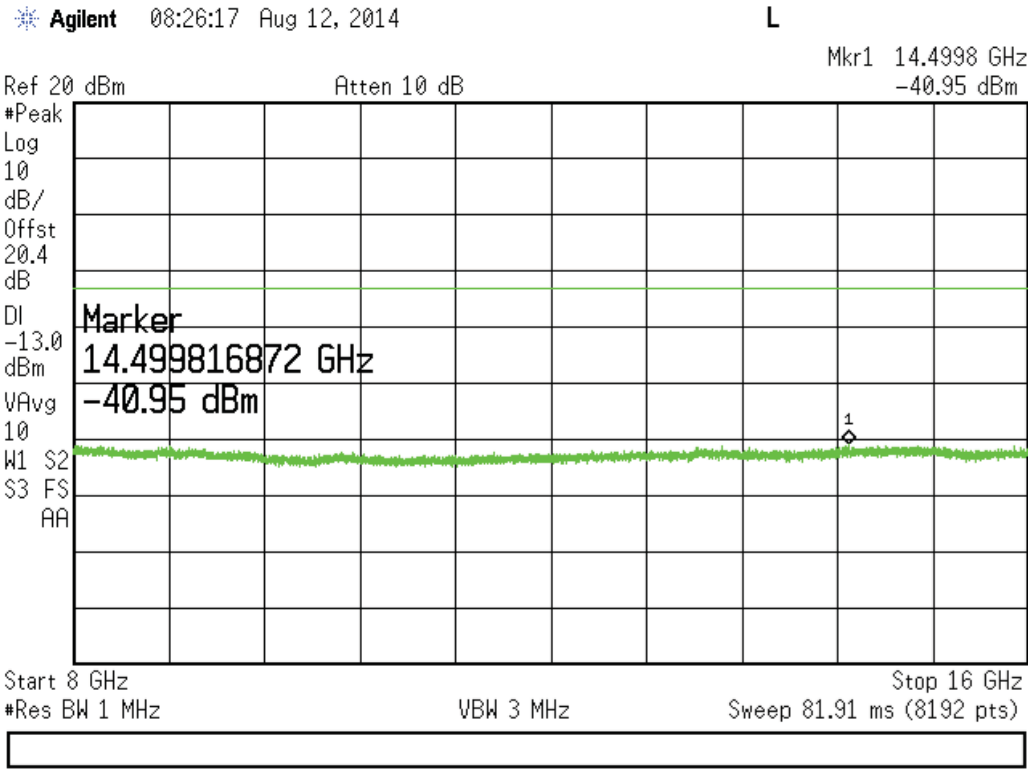
1930-1995 MHz Band (High Frequency) (Cont)



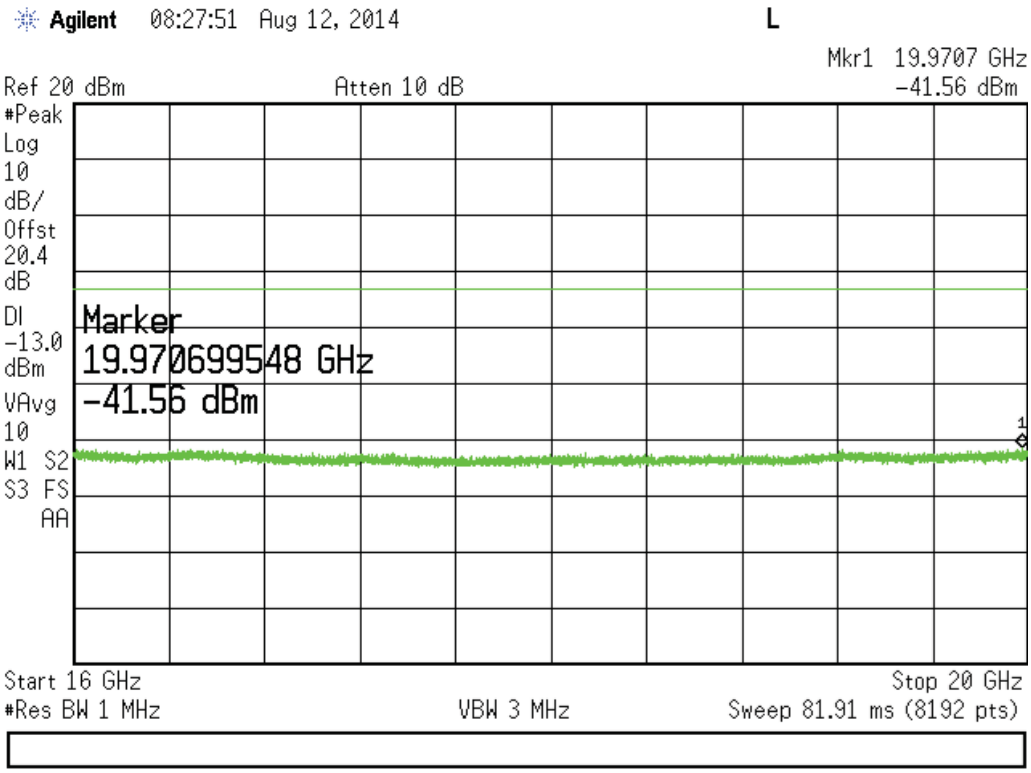
1930-1995 MHz Band (High Frequency) (Cont)



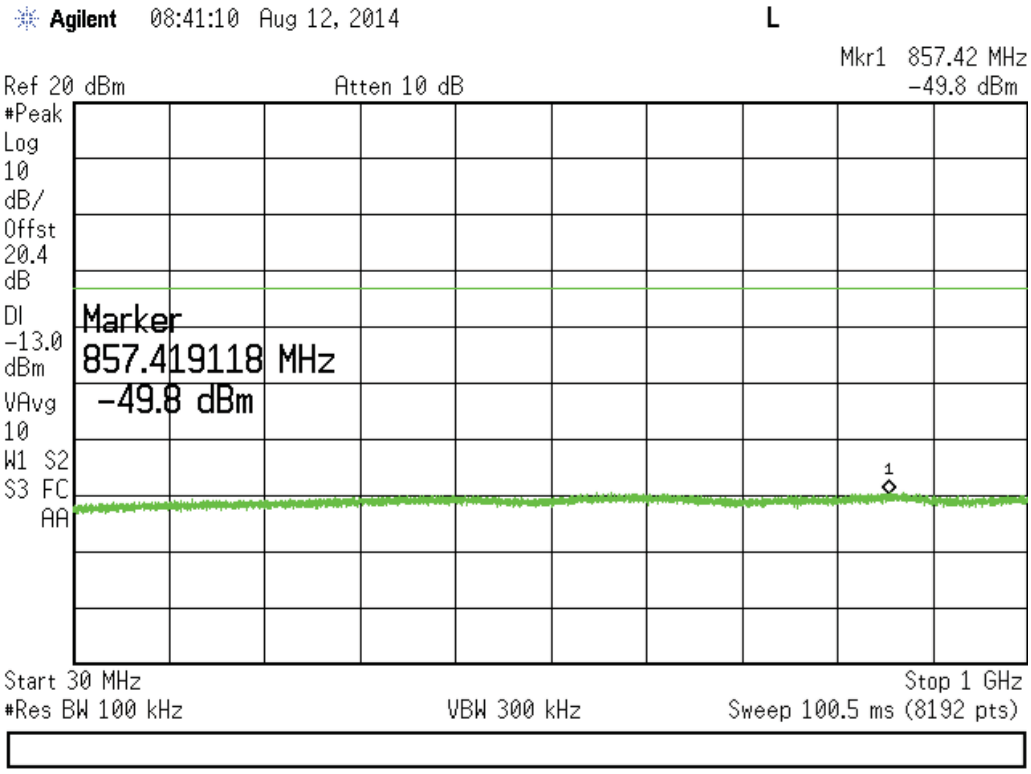
1930-1995 MHz Band (High Frequency) (Cont)



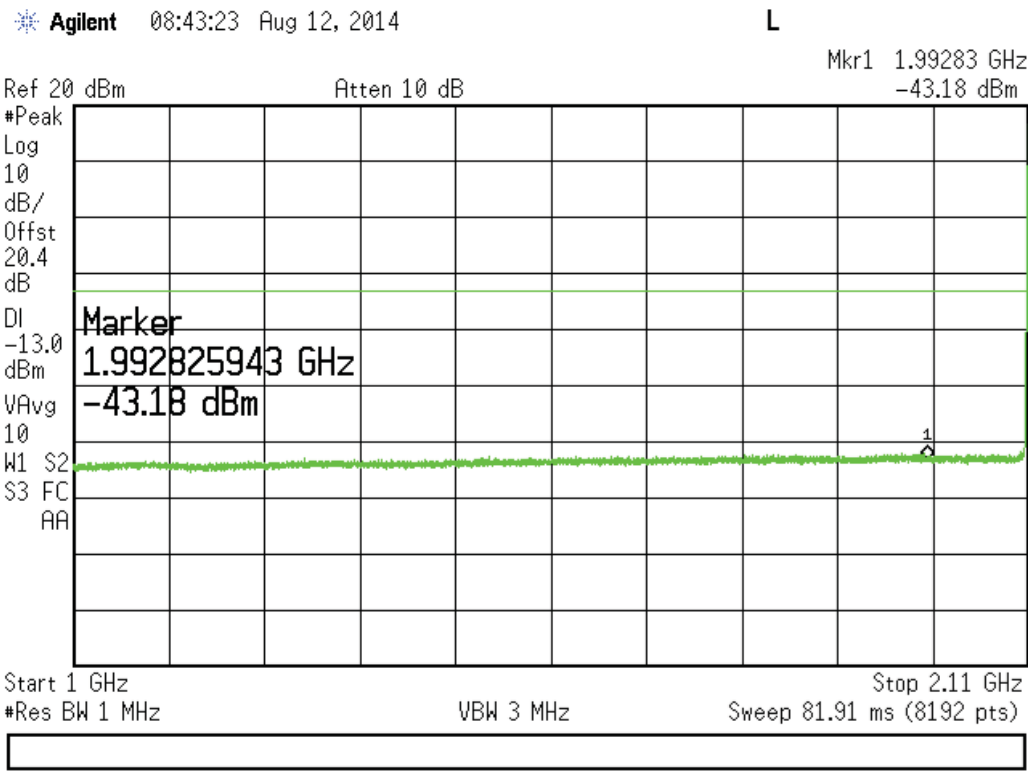
1930-1995 MHz Band (High Frequency) (Cont)



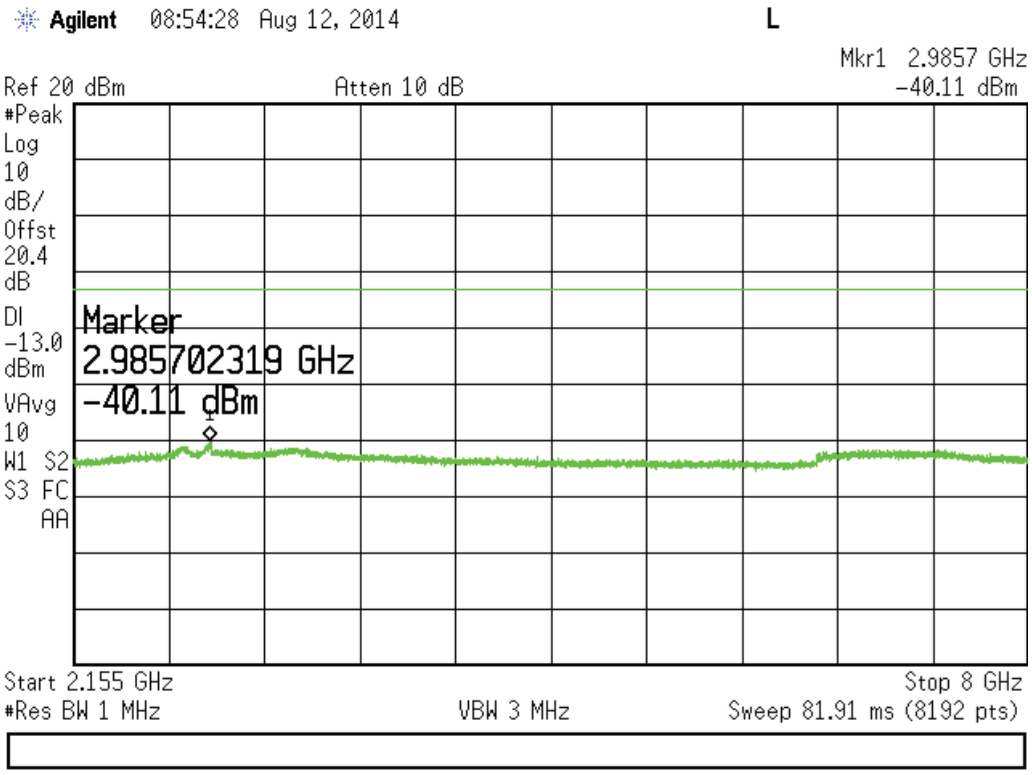
2110-2155 MHz Band (Low Frequency)



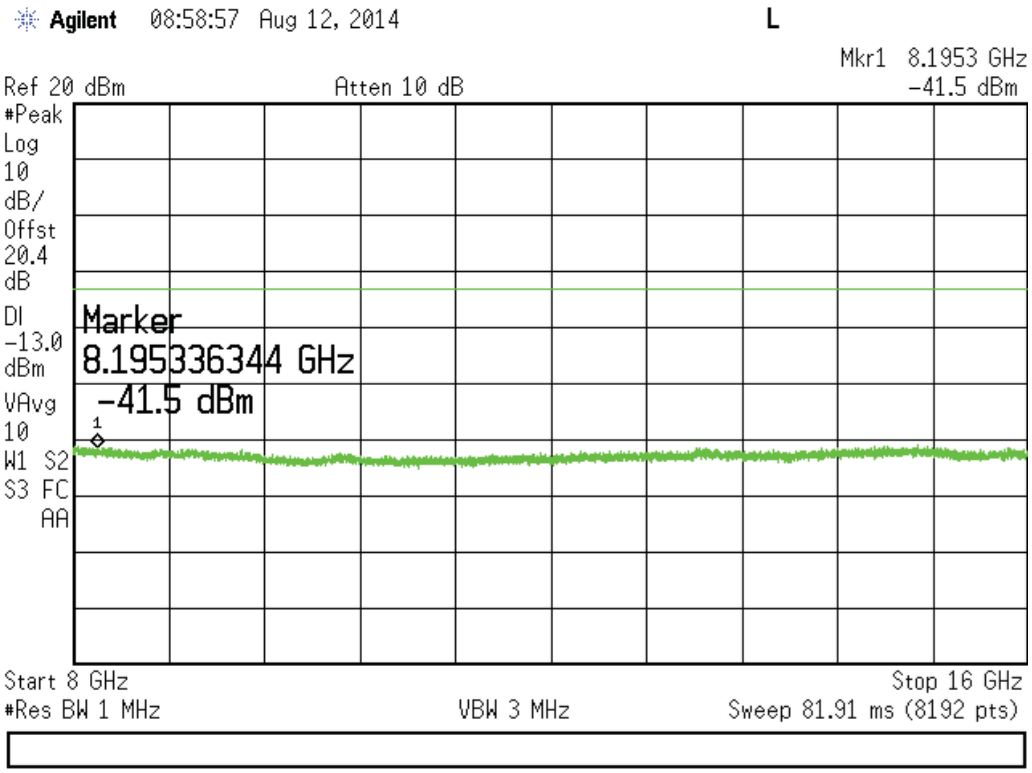
2110-2155 MHz Band (Low Frequency) (Cont)



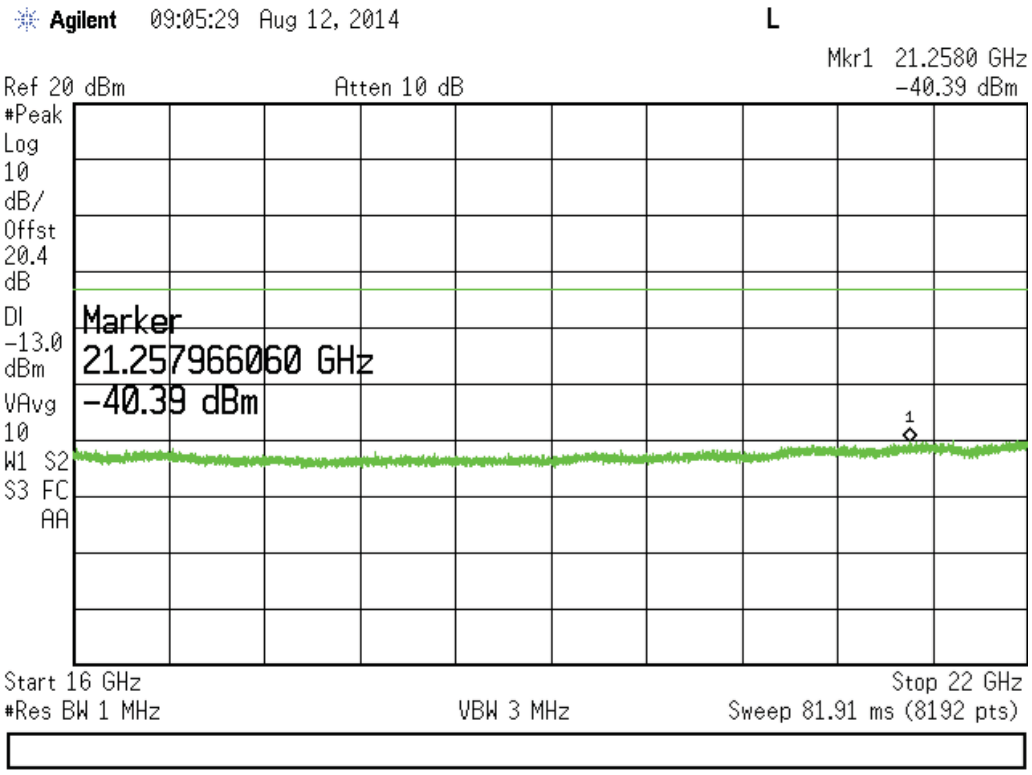
2110-2155 MHz Band (Low Frequency) (Cont)



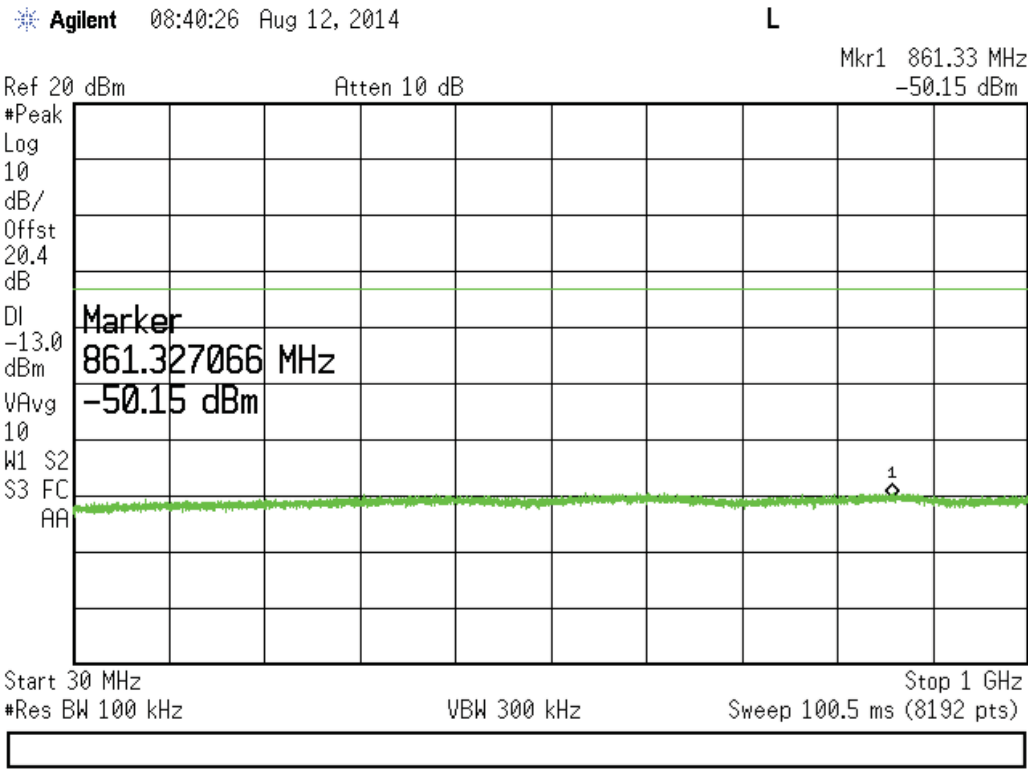
2110-2155 MHz Band (Low Frequency) (Cont)



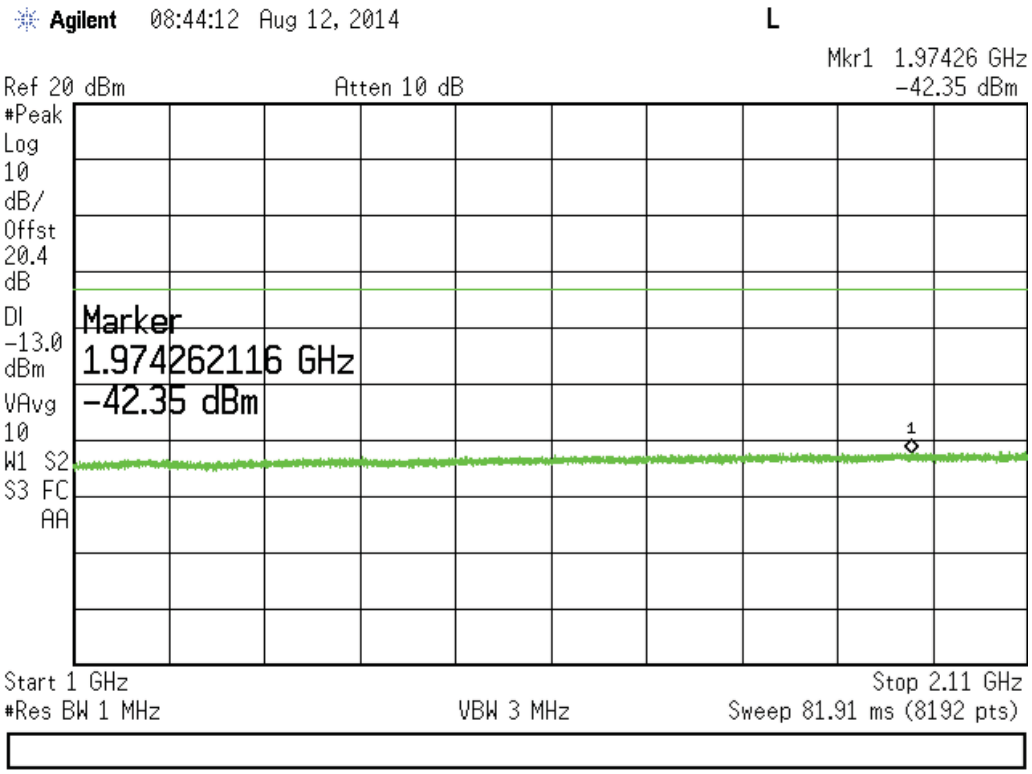
2110-2155 MHz Band (Low Frequency) (Cont)



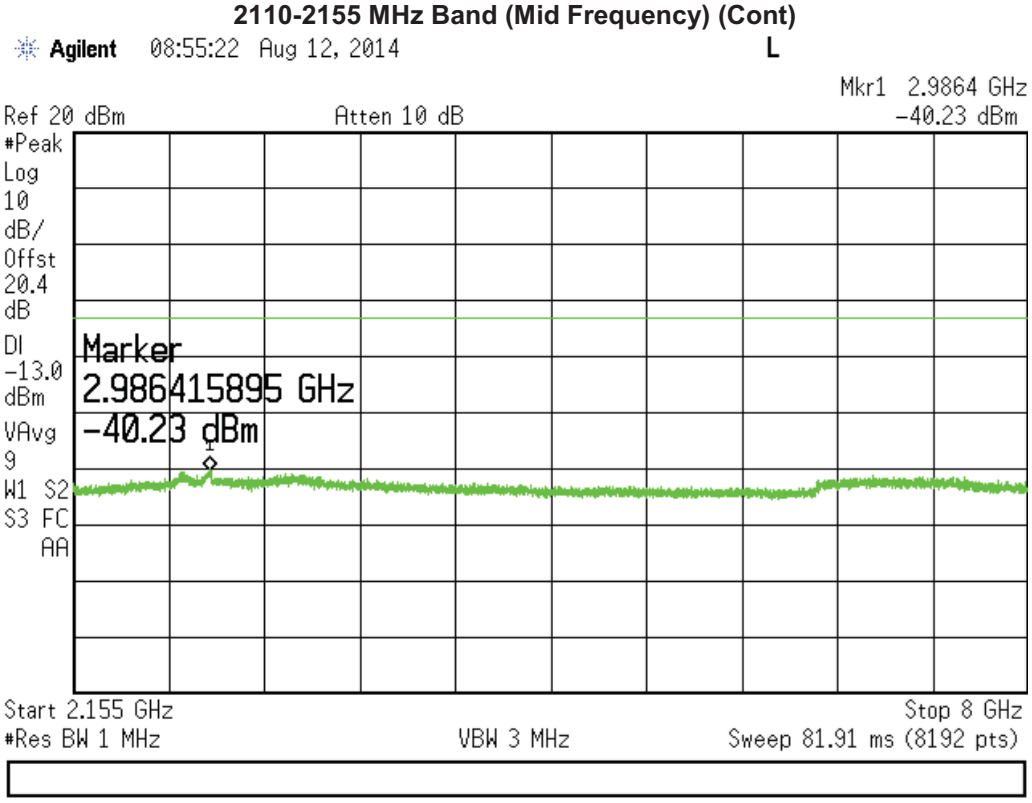
2110-2155 MHz Band (Mid Frequency)



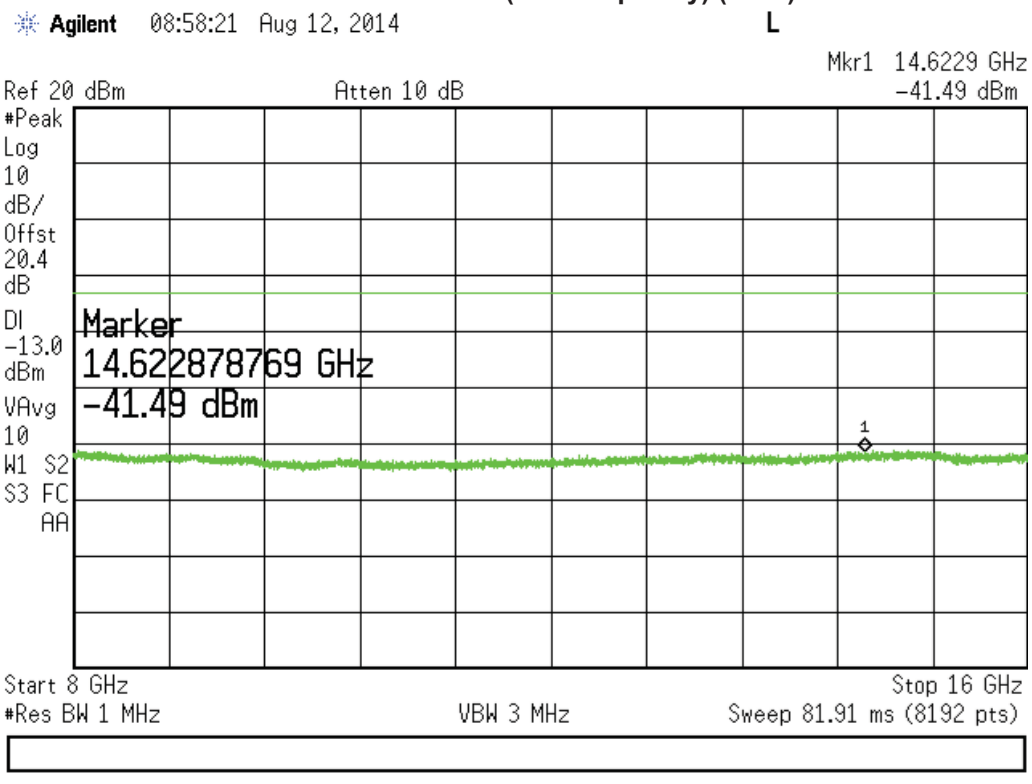
2110-2155 MHz Band (Mid Frequency) (Cont)



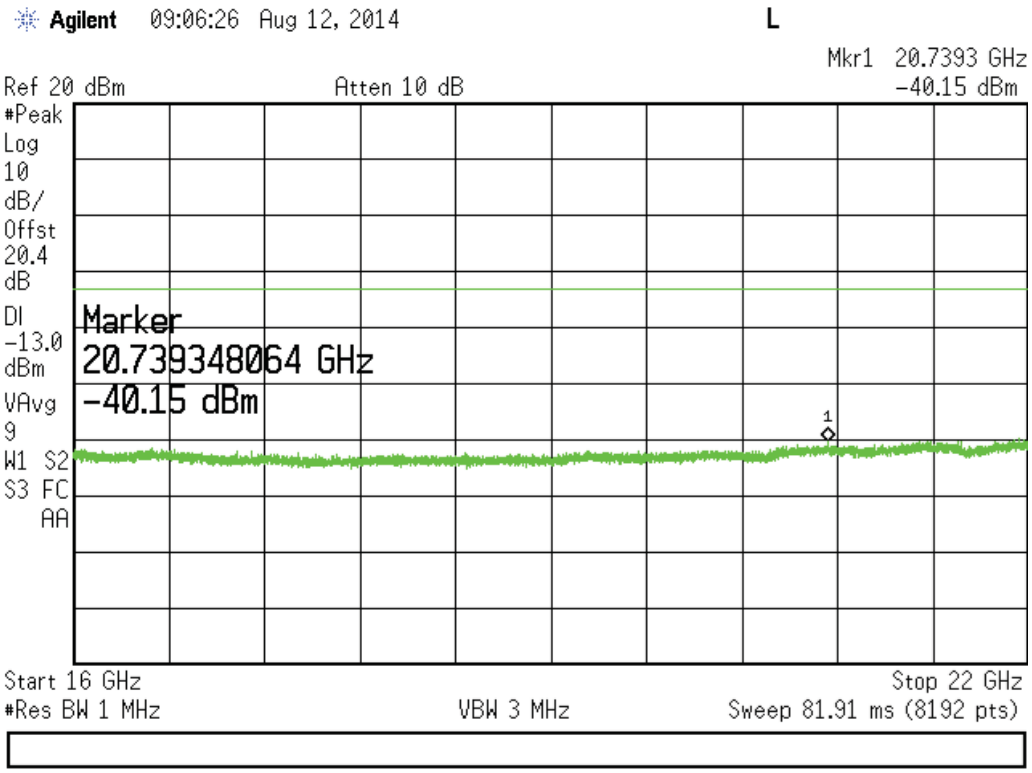
2110-2155 MHz Band (Mid Frequency) (Cont)



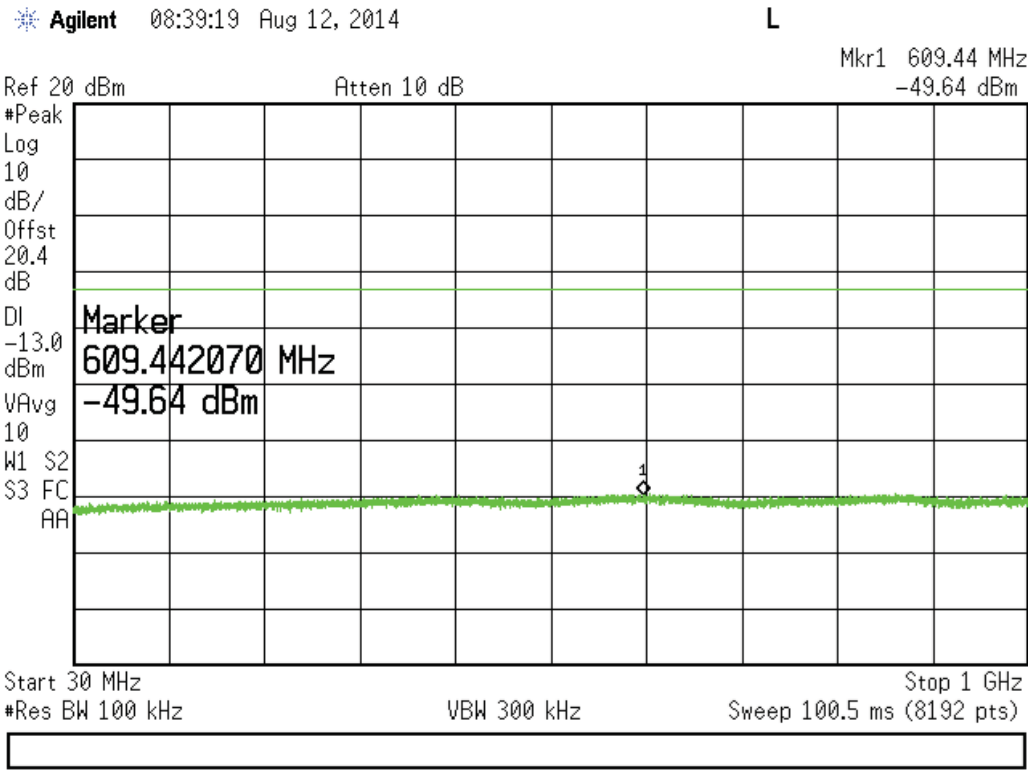
2110-2155 MHz Band (Mid Frequency) (Cont)



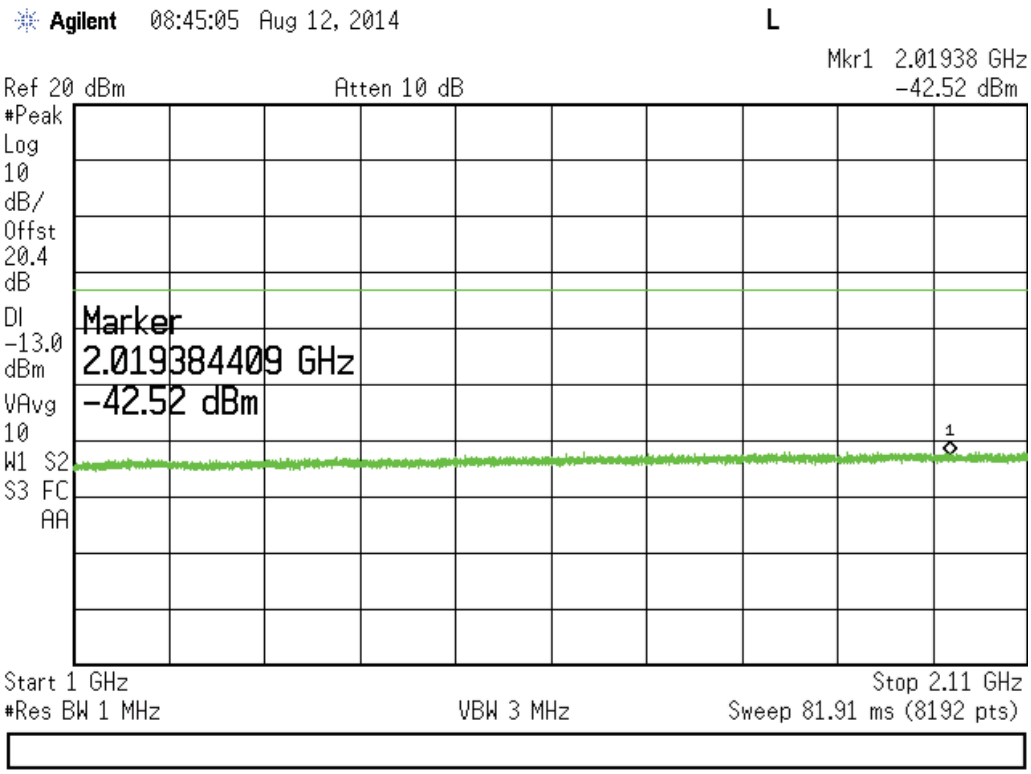
2110-2155 MHz Band (Mid Frequency) (Cont)



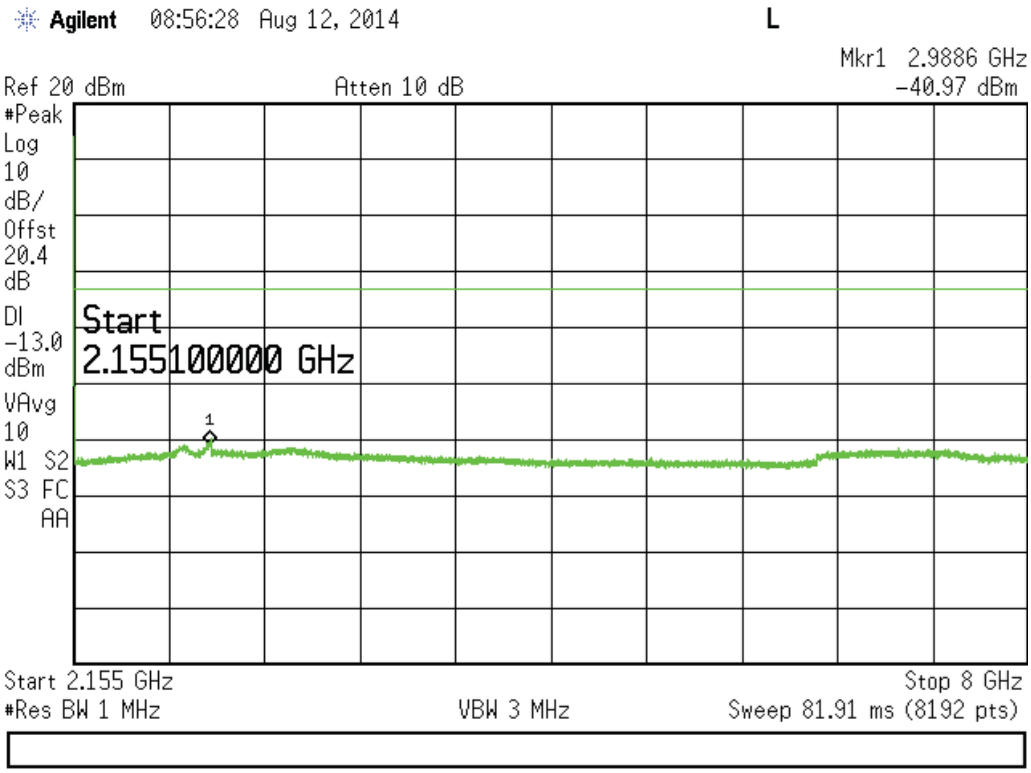
2110-2155 MHz Band (High Frequency)



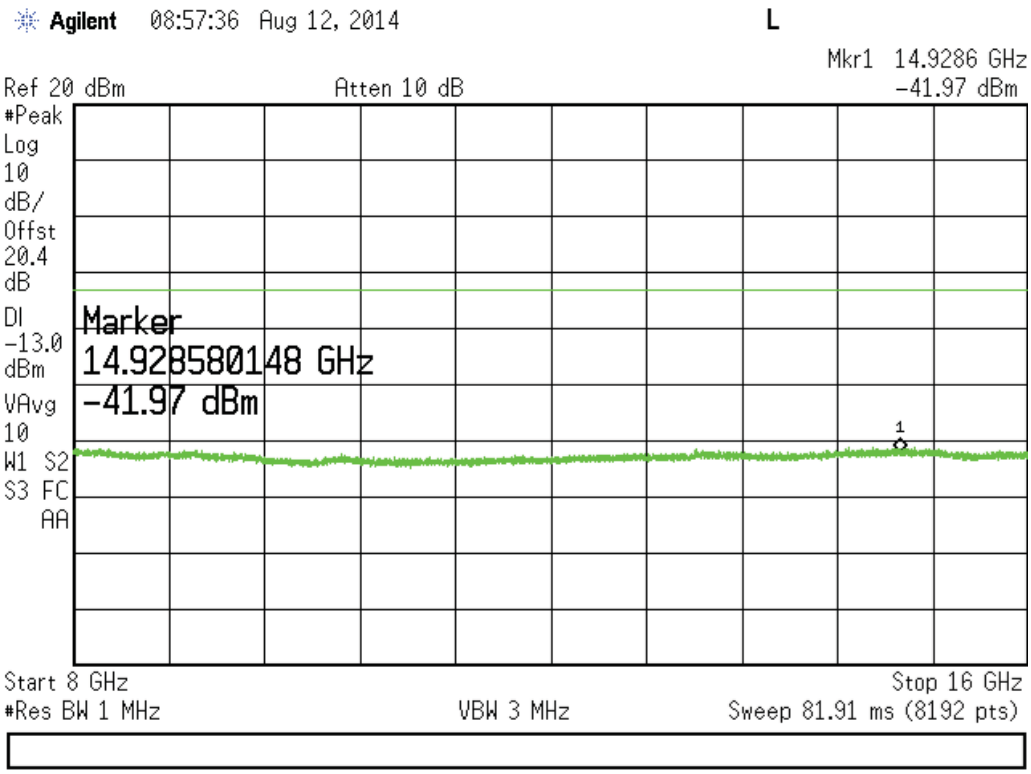
2110-2155 MHz Band (High Frequency) (Cont)



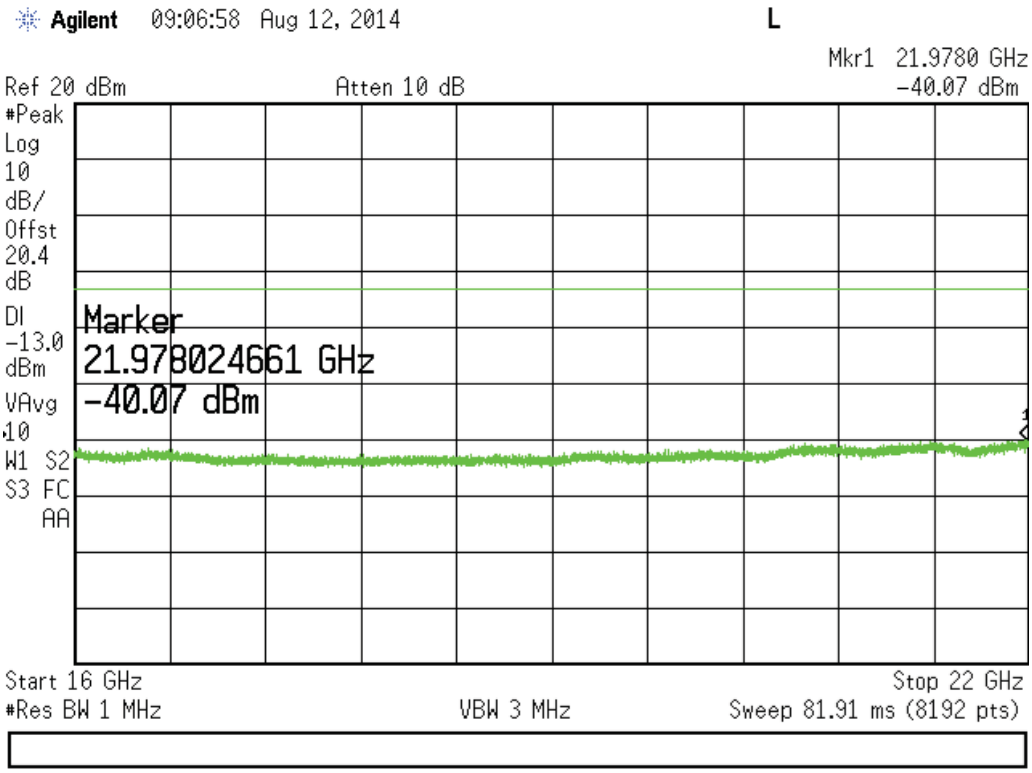
2110-2155 MHz Band (High Frequency) (Cont)



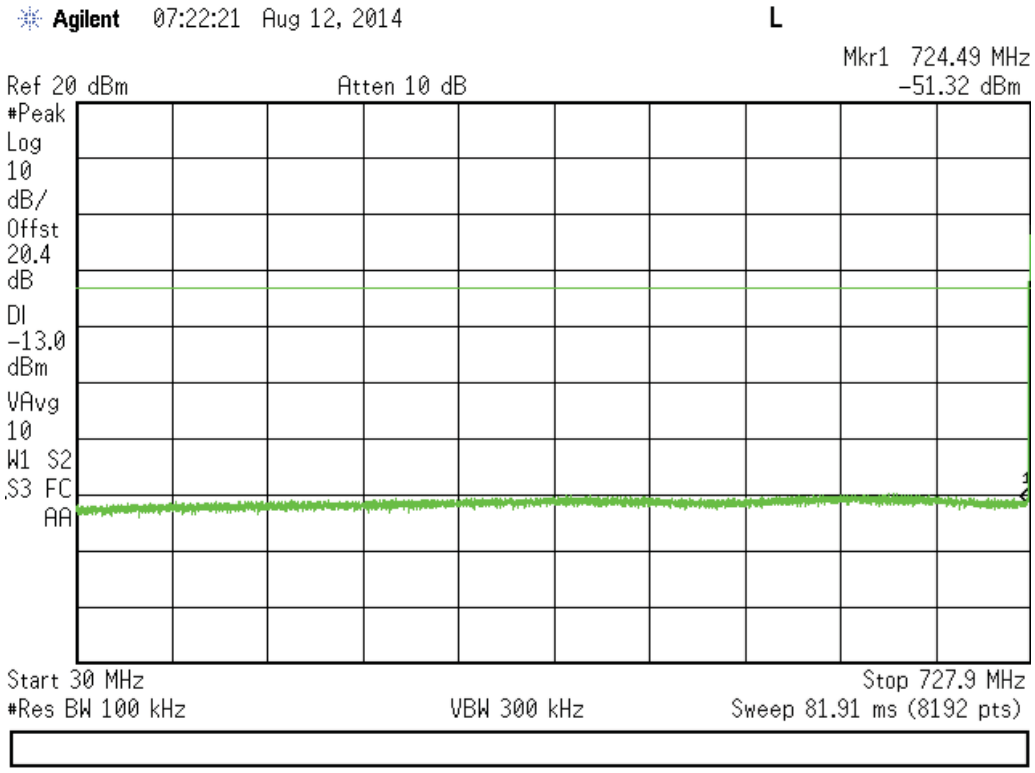
2110-2155 MHz Band (High Frequency) (Cont)



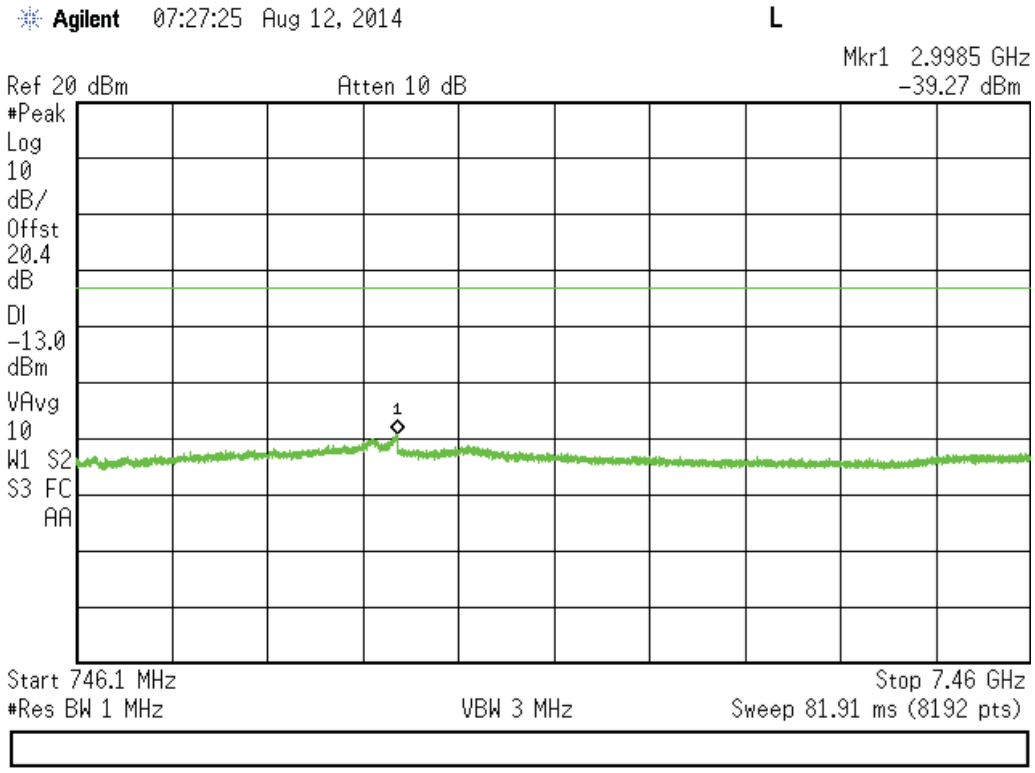
2110-2155 MHz Band (High Frequency) (Cont)



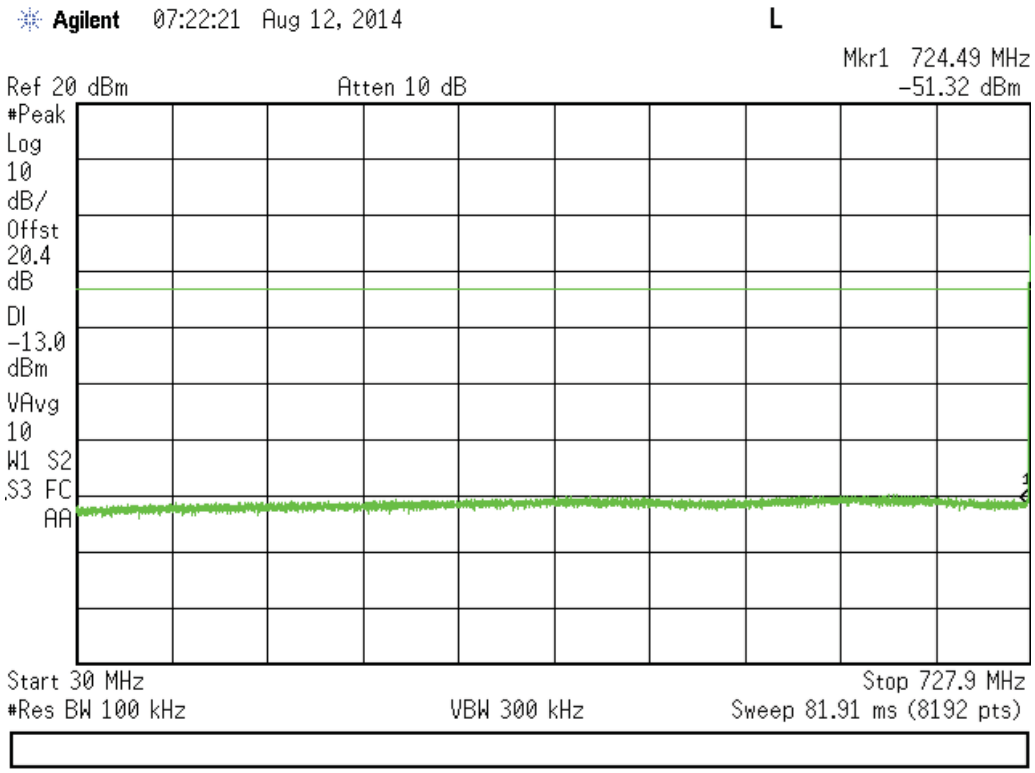
Downlink WCDMA Signal
728-746 MHz Band (Low Frequency)



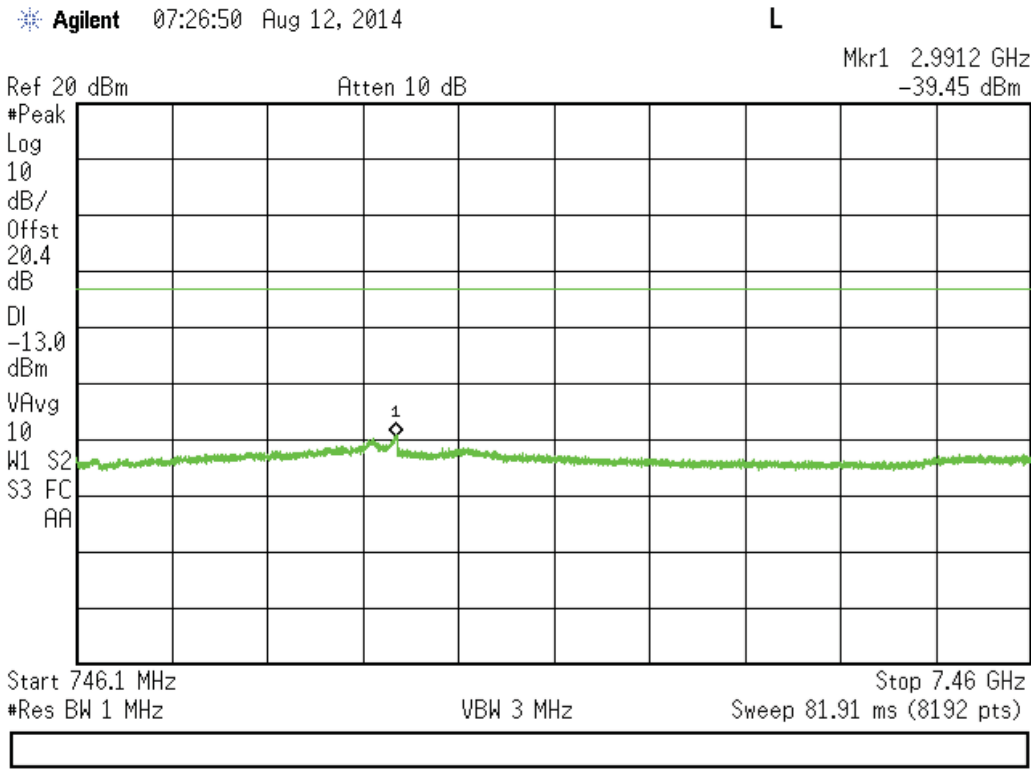
728-746 MHz Band (Low Frequency) (Cont)



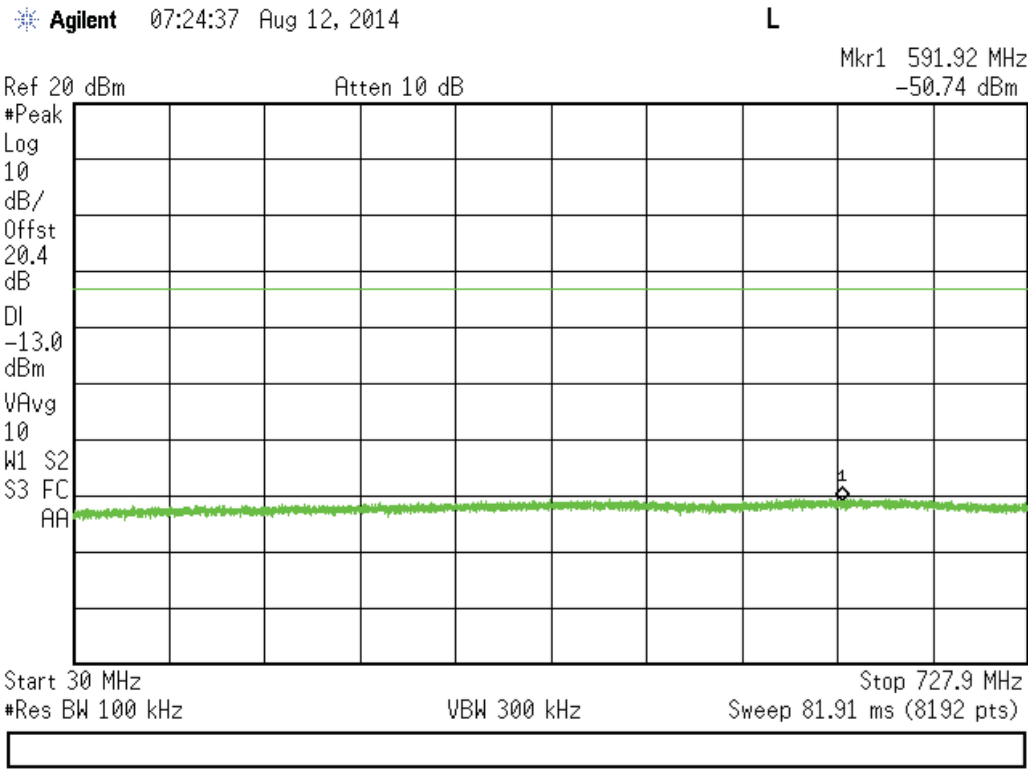
728-746 MHz Band (Mid Frequency)



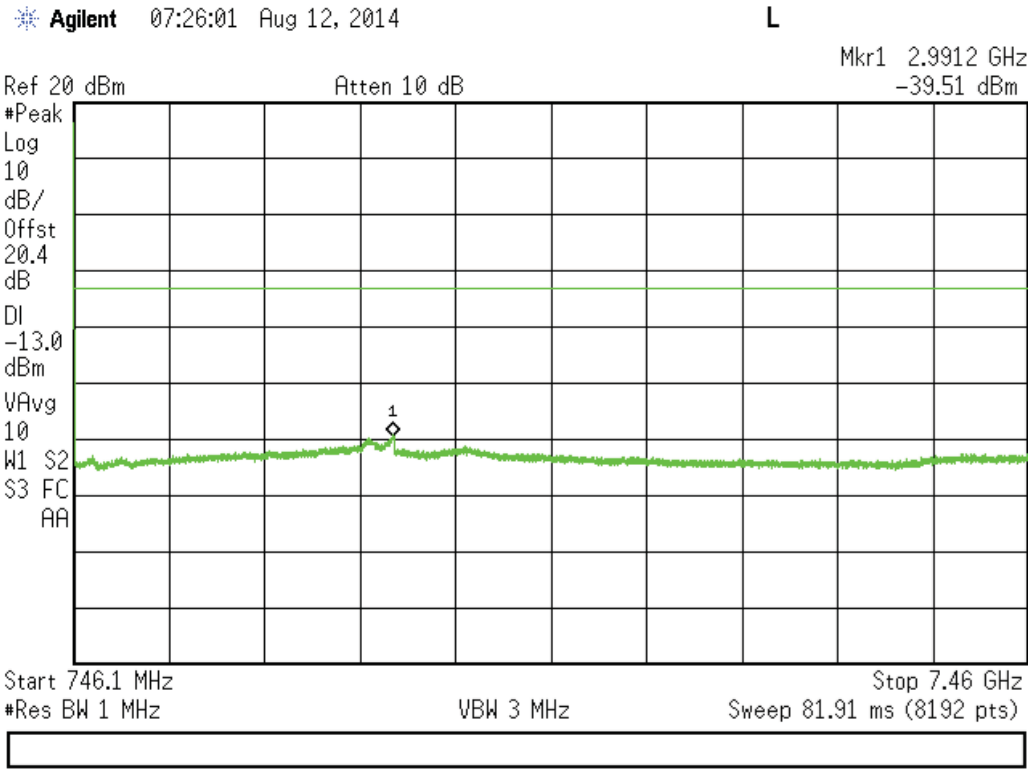
728-746 MHz Band (Mid Frequency) (Cont)



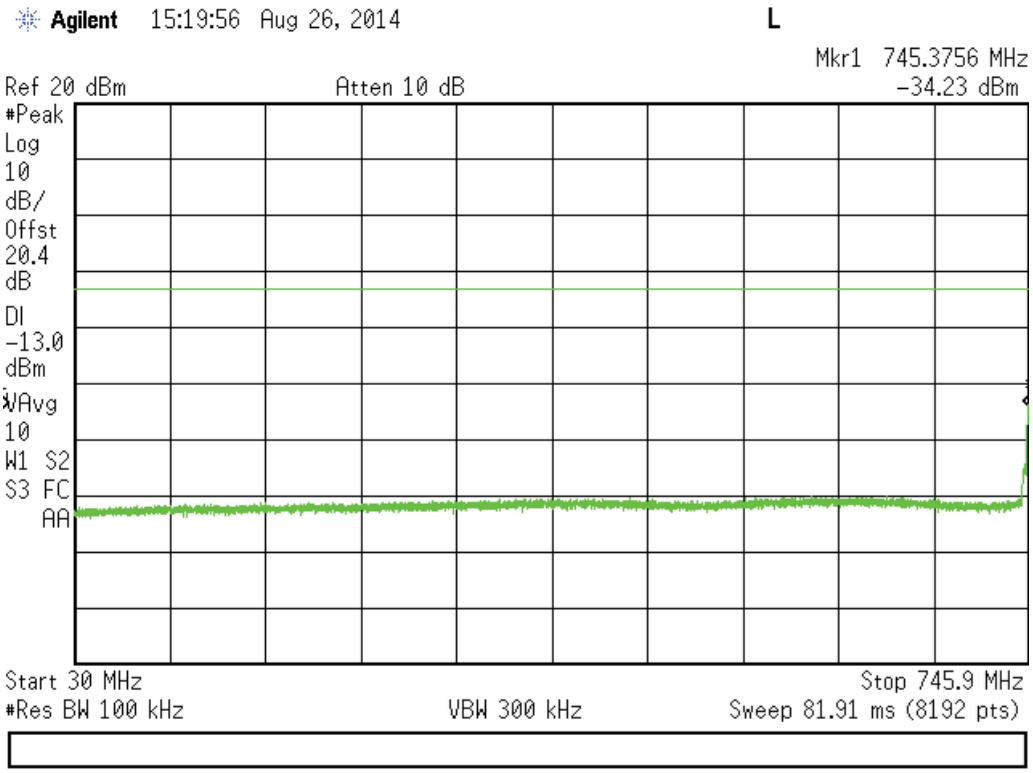
728-746 MHz Band (High Frequency)



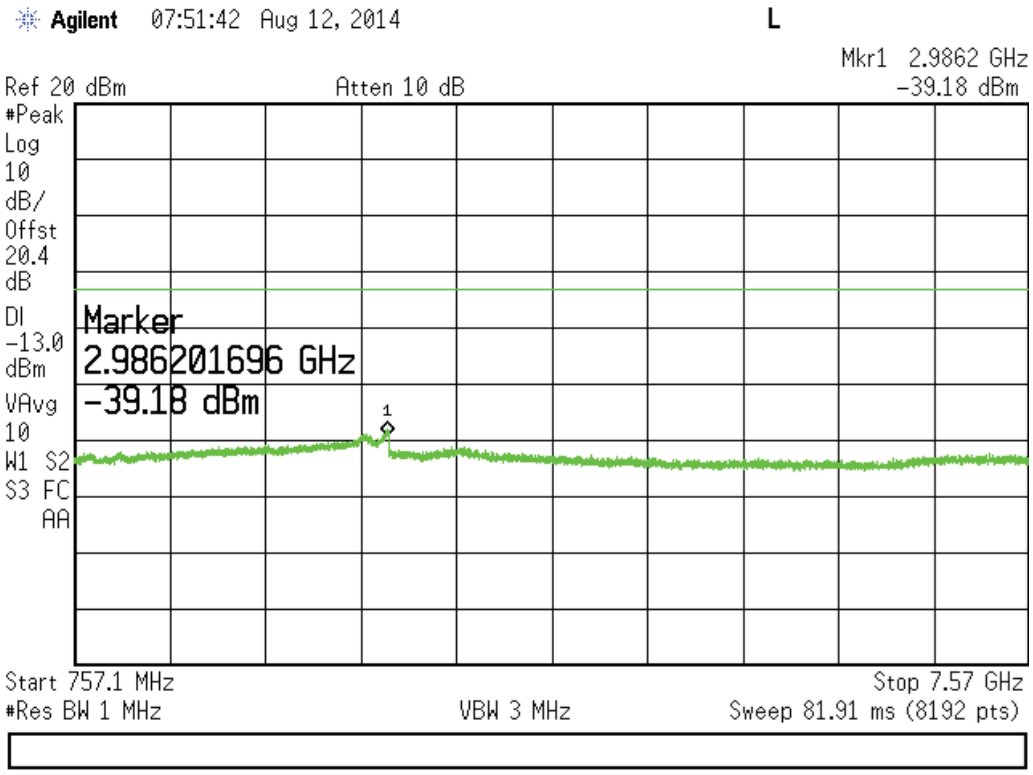
728-746 MHz Band (High Frequency) (Cont)



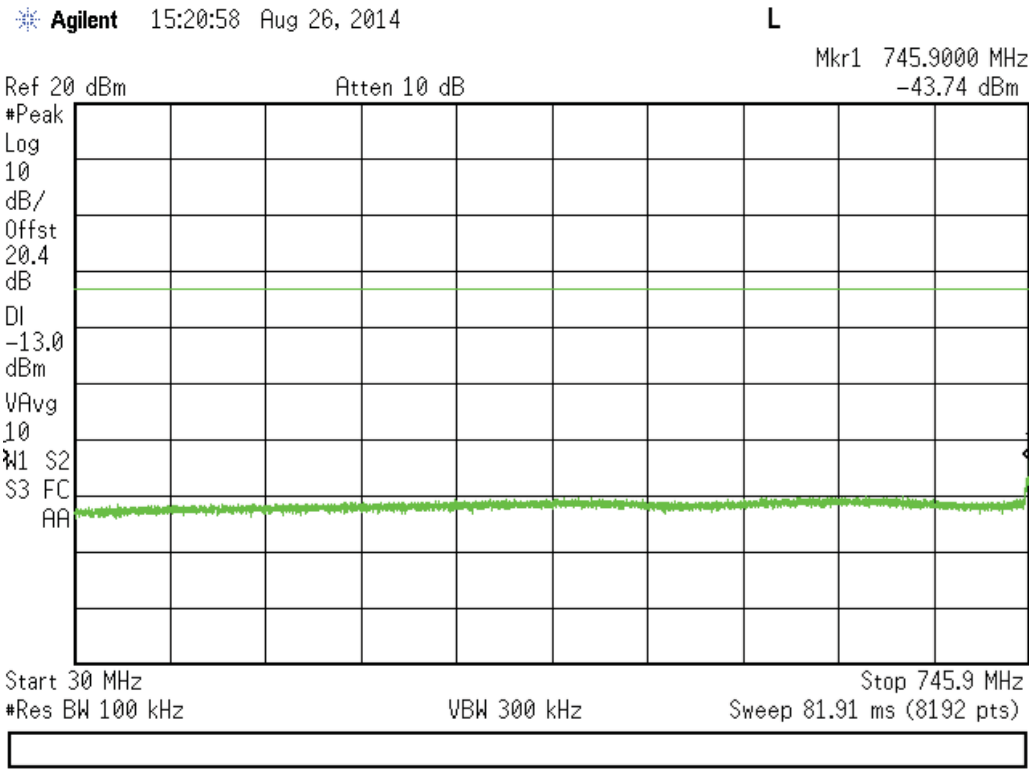
746-757 MHz Band (Low Frequency)



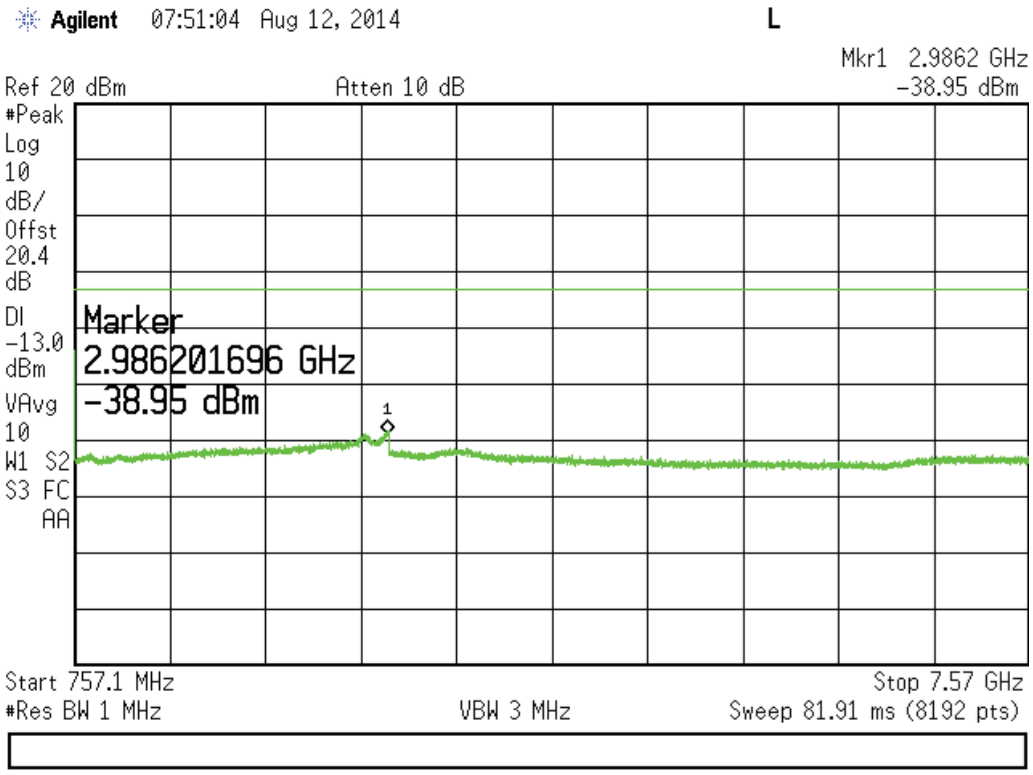
728-746 MHz Band (Low Frequency) (Cont)



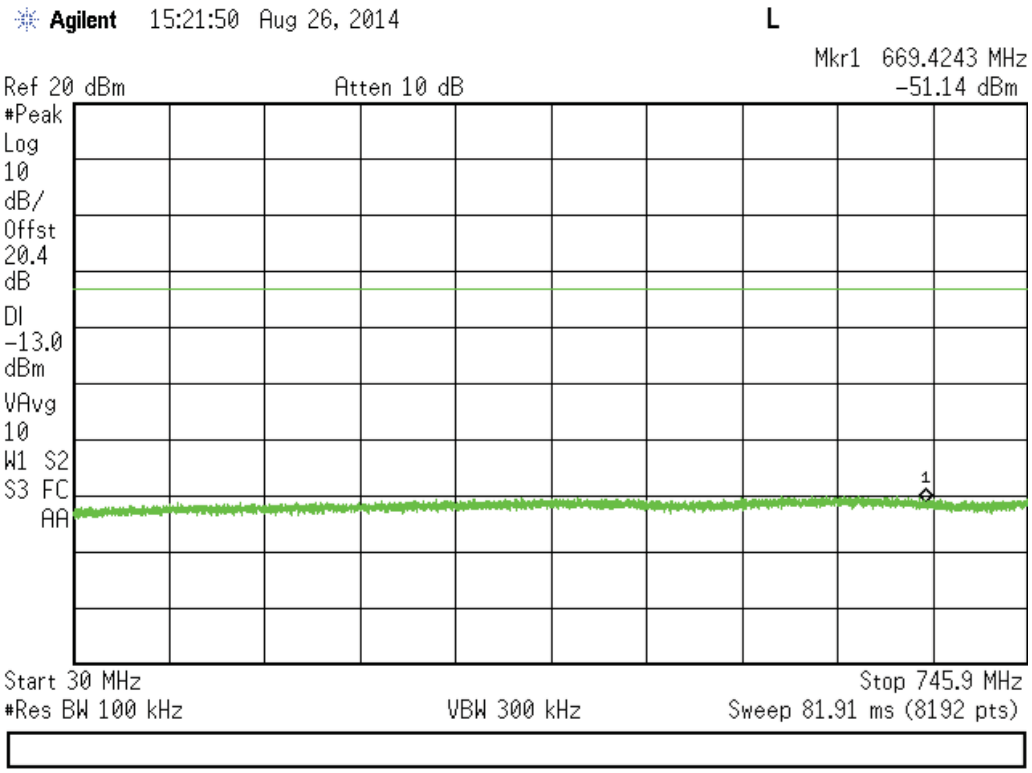
746-757 MHz Band (Mid Frequency)



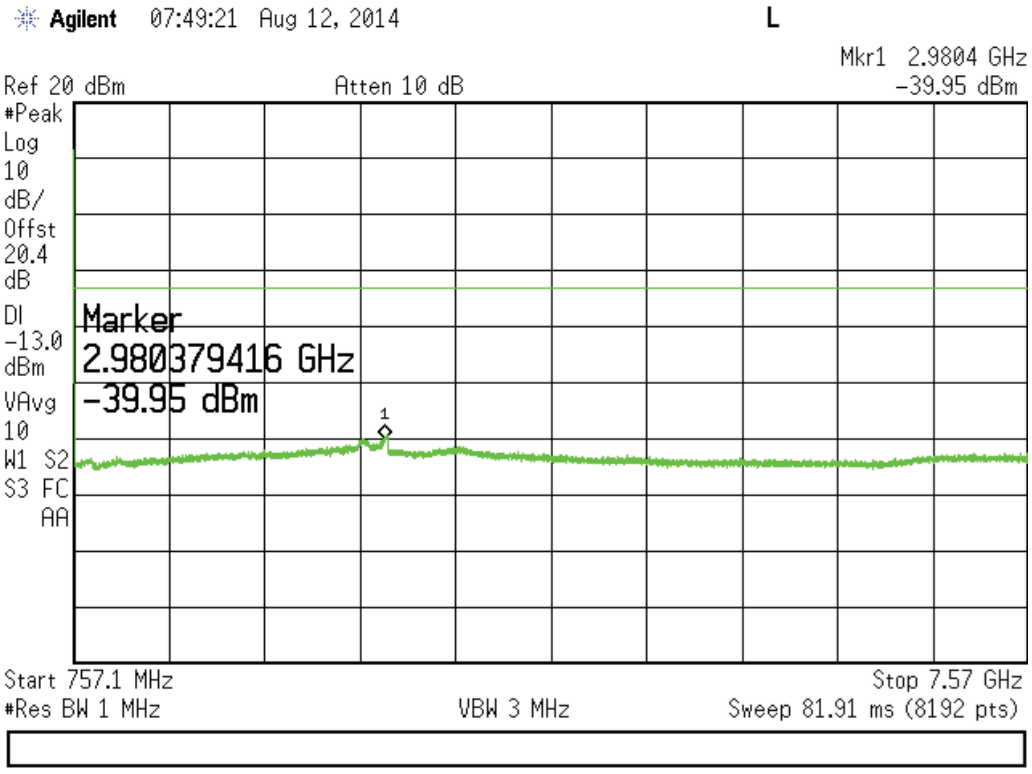
746-757 MHz Band (Mid Frequency) (Cont)



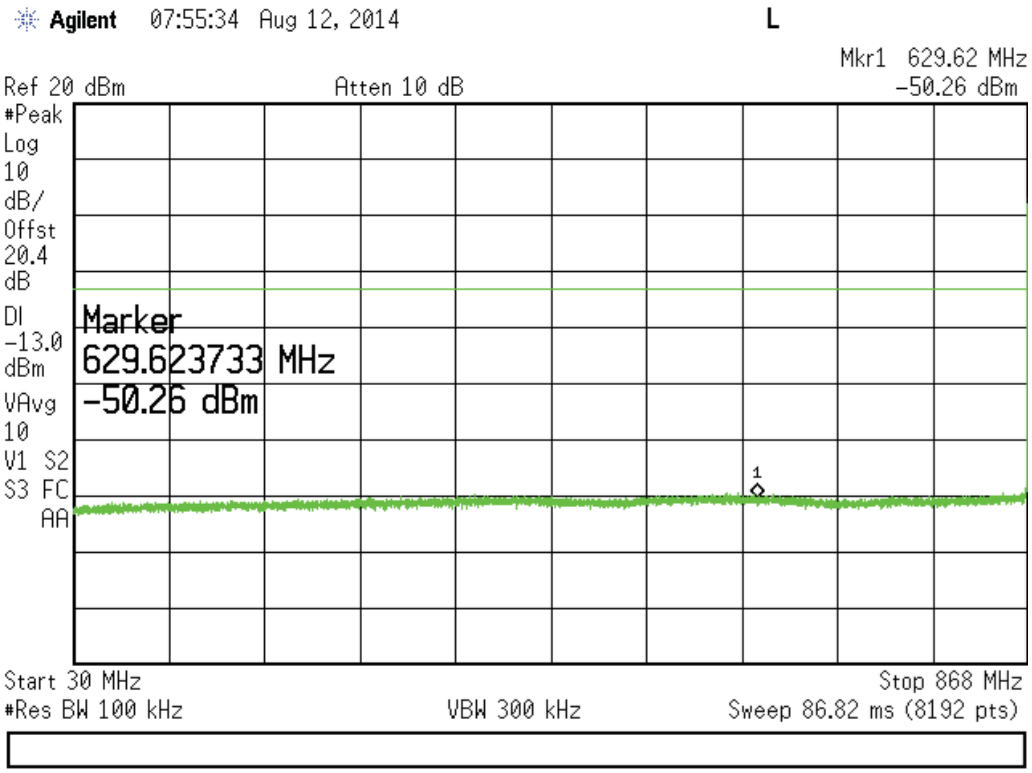
746-757 MHz Band (High Frequency)



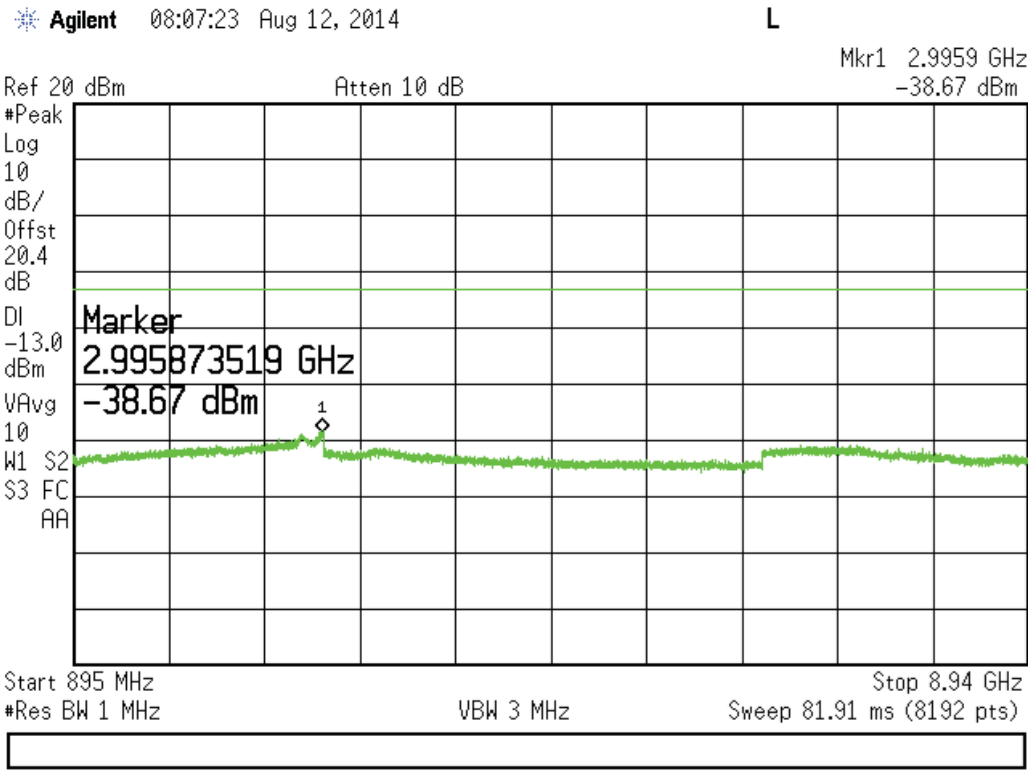
746-757 MHz Band (High Frequency) (Cont)



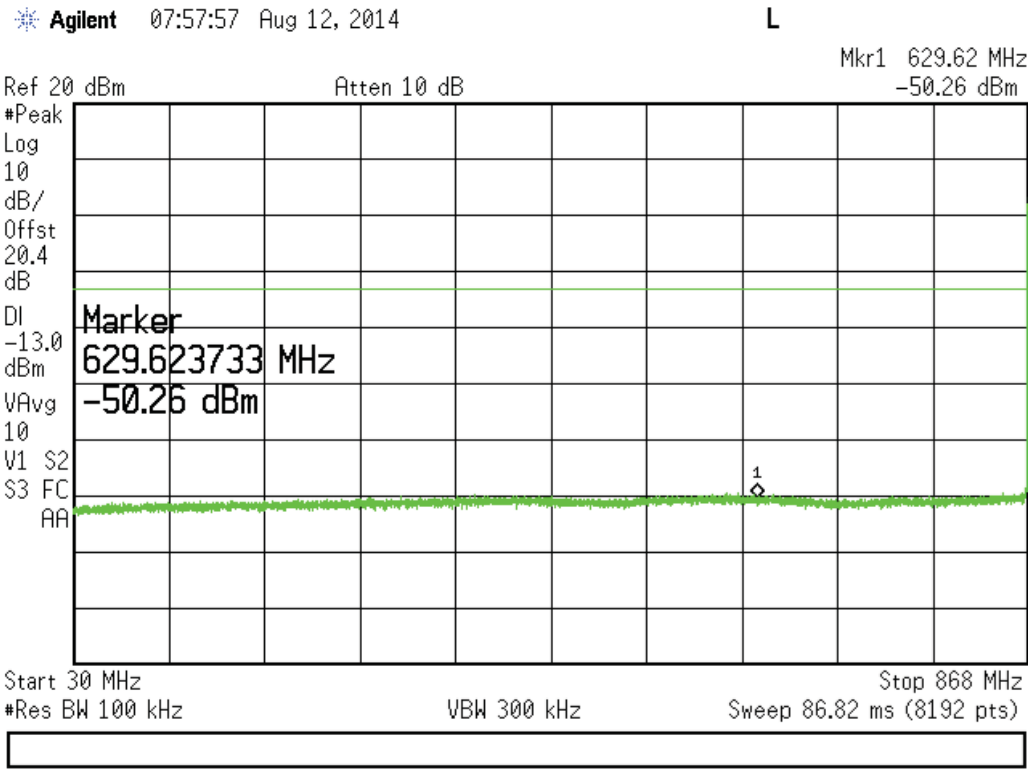
869-894 MHz Band (Low Frequency)



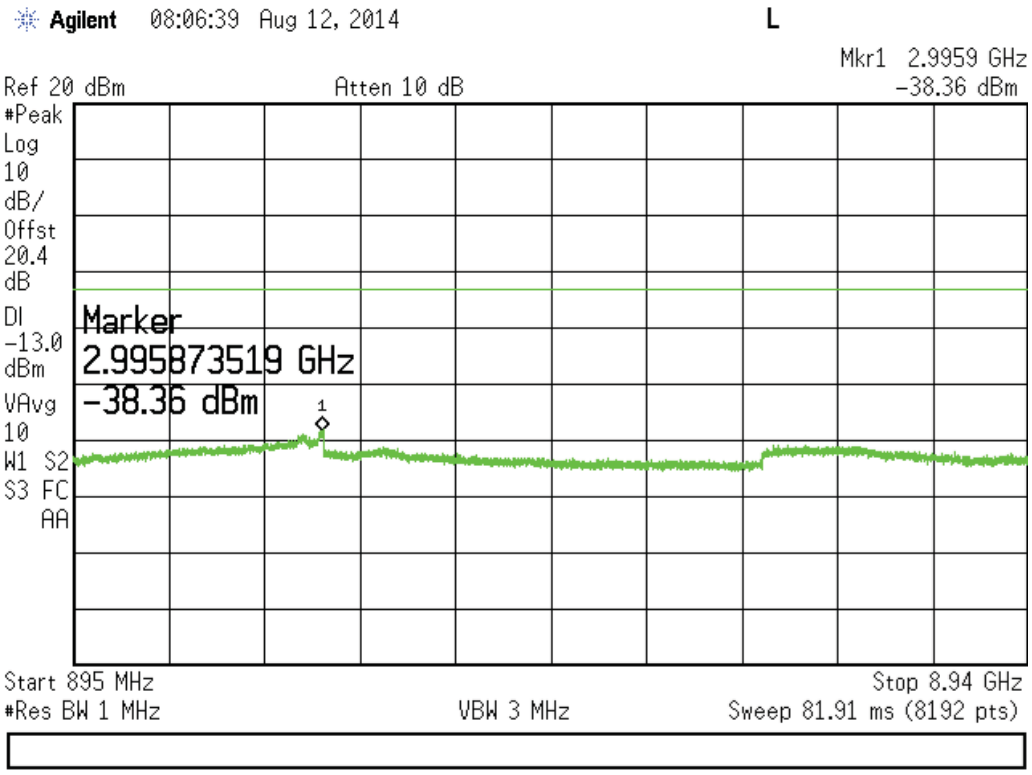
869-894 MHz Band (Low Frequency) (Cont)



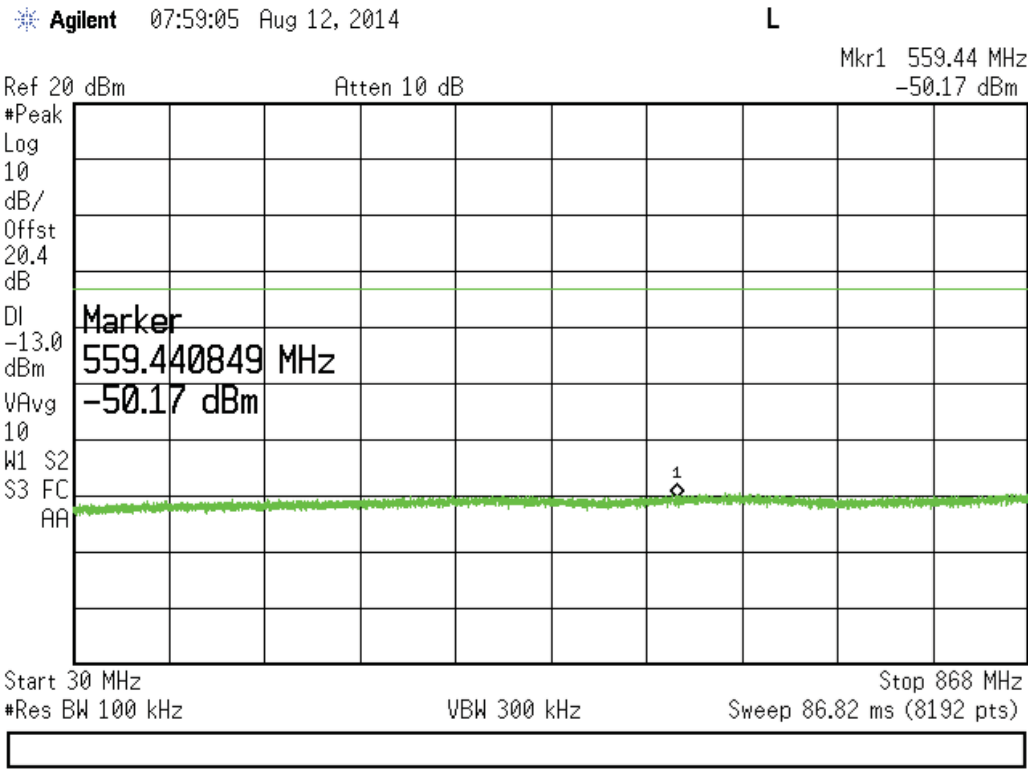
869-894 MHz Band (Mid Frequency)



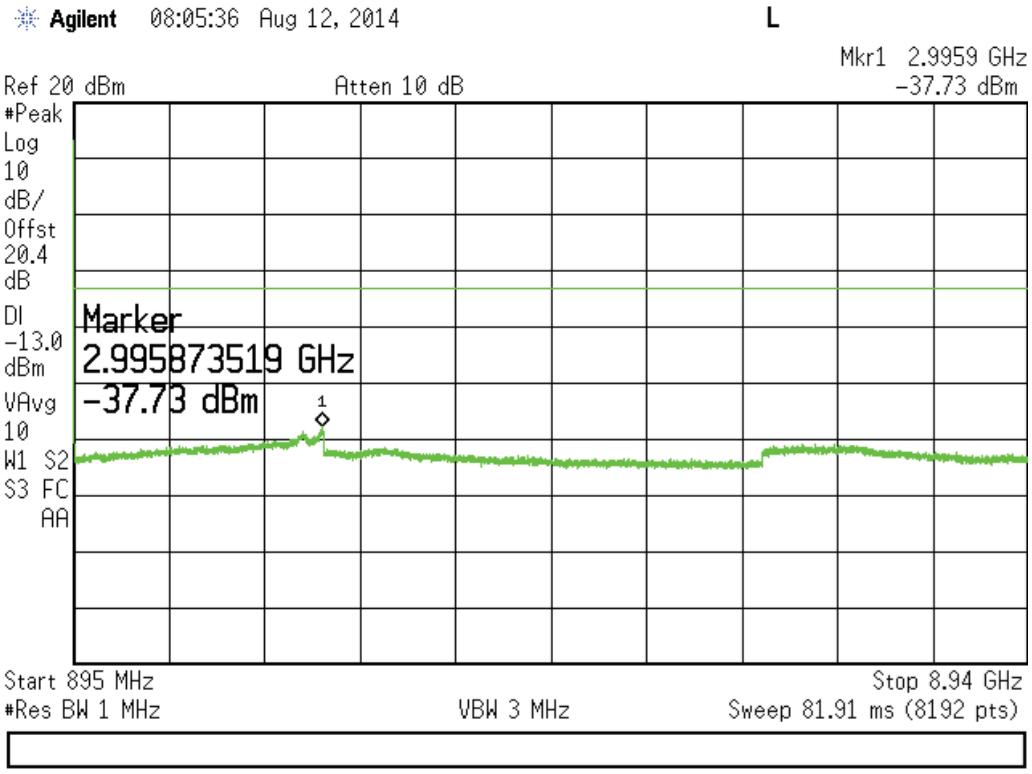
869-894 MHz Band (Mid Frequency) (Cont)



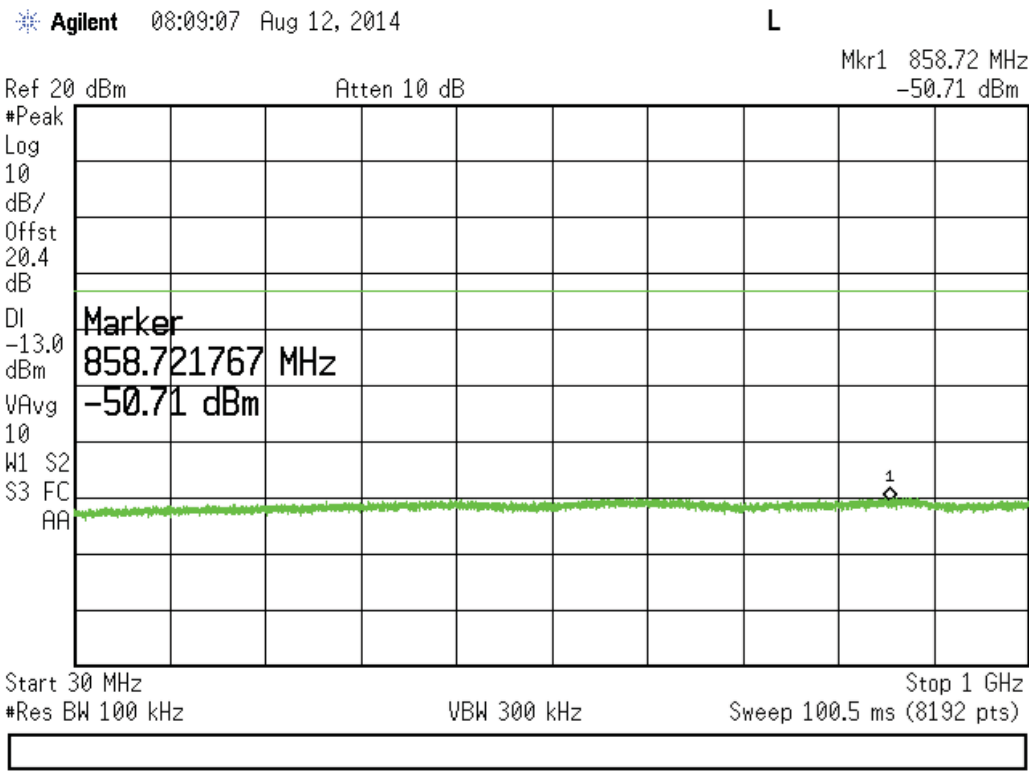
869-894 MHz Band (High Frequency)



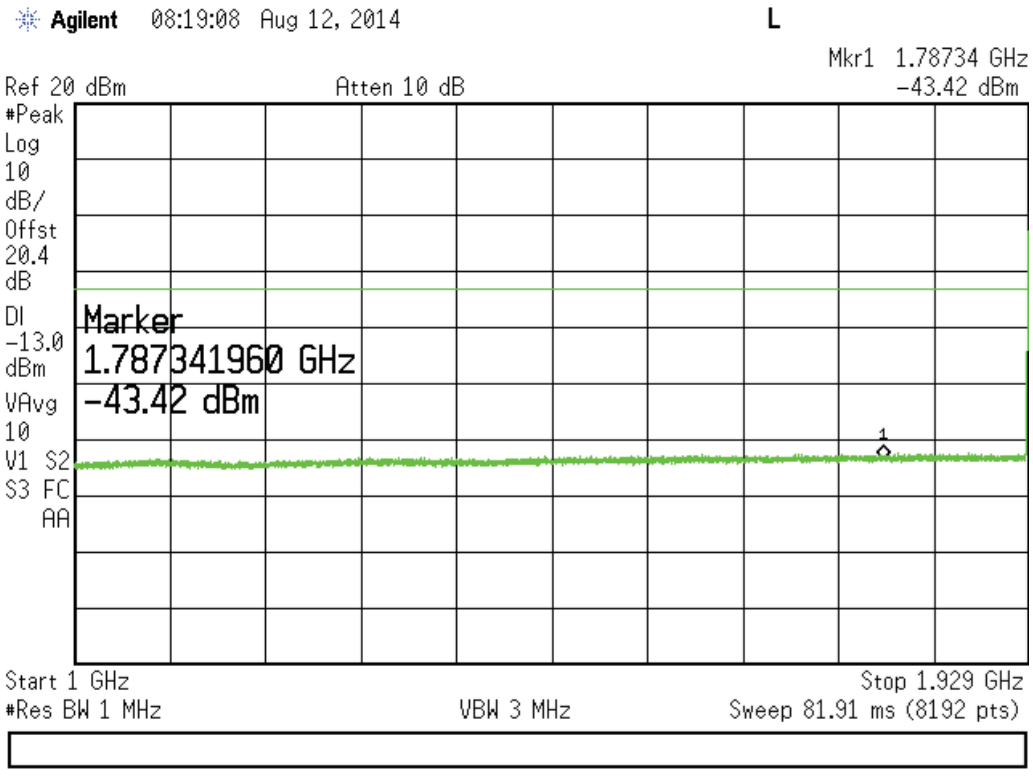
869-894 MHz Band (High Frequency) (Cont)



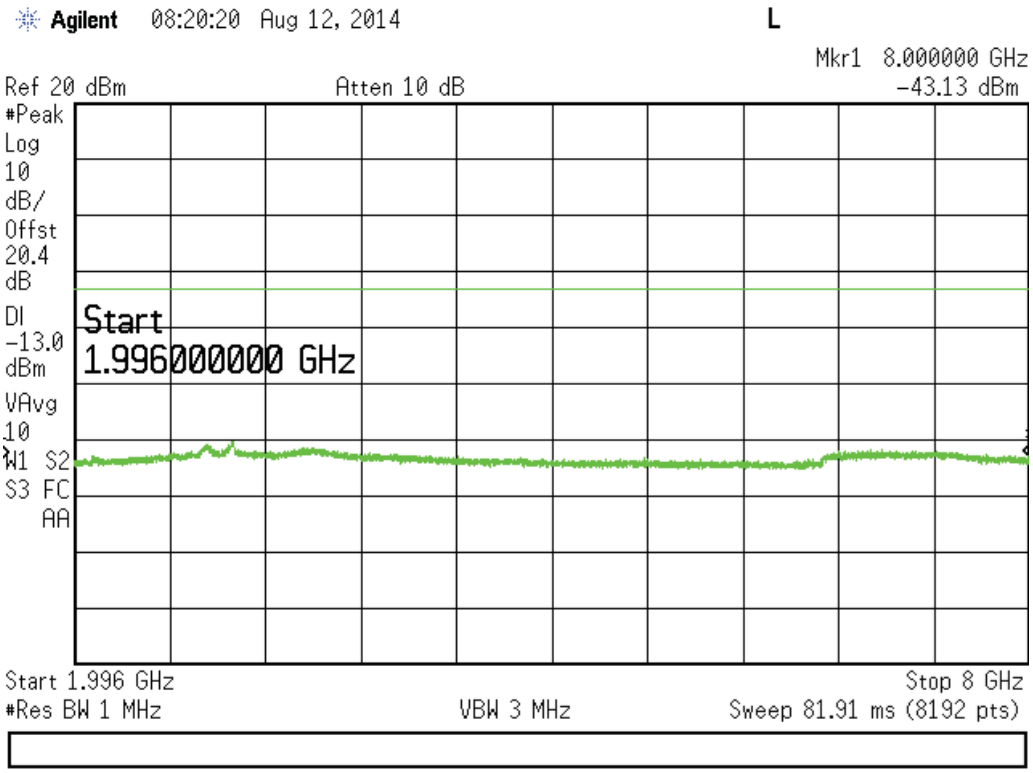
1930-1995 MHz Band (Low Frequency)



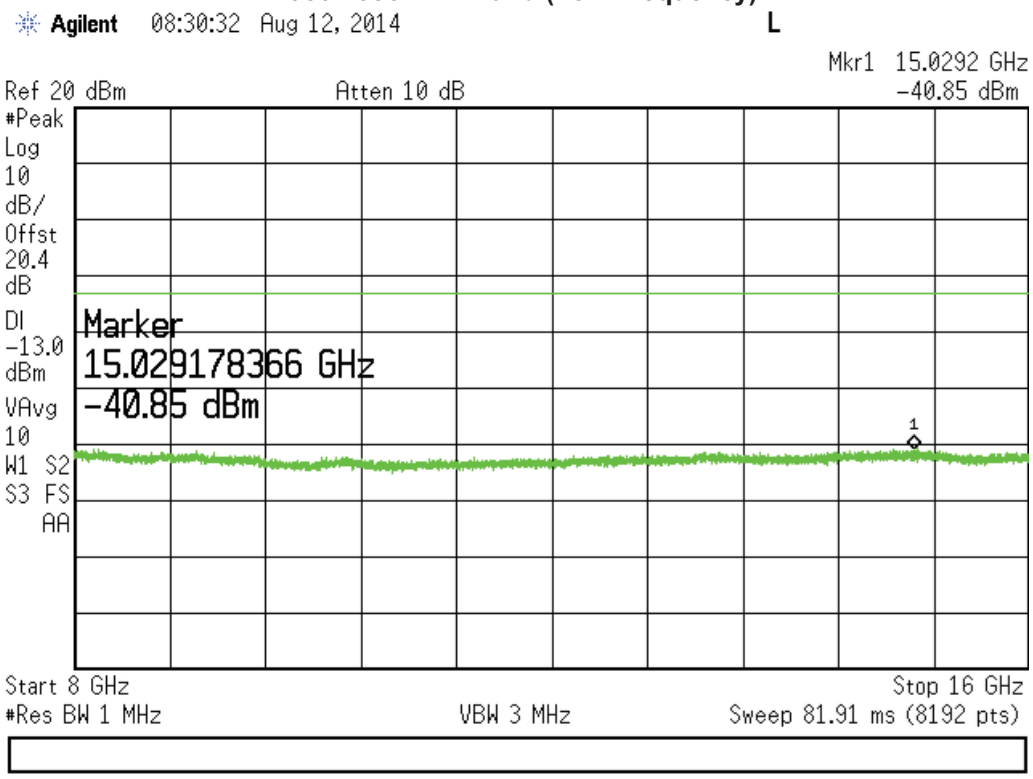
1930-1995 MHz Band (Low Frequency)



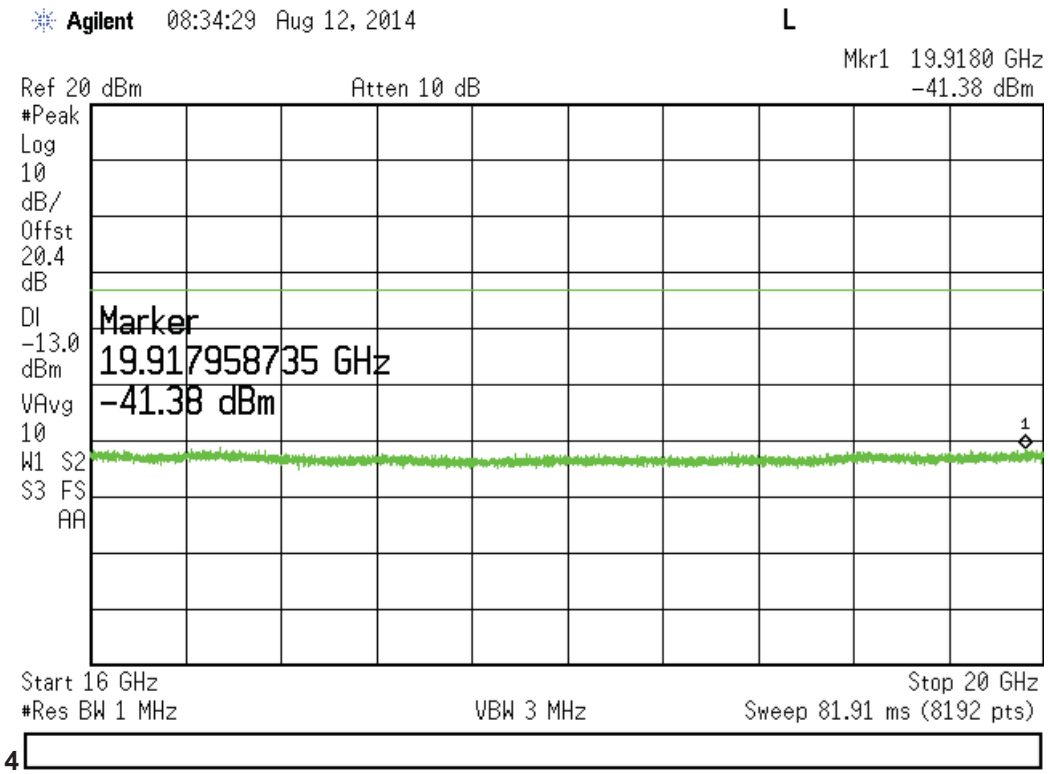
1930-1995 MHz Band (Low Frequency) (Cont)



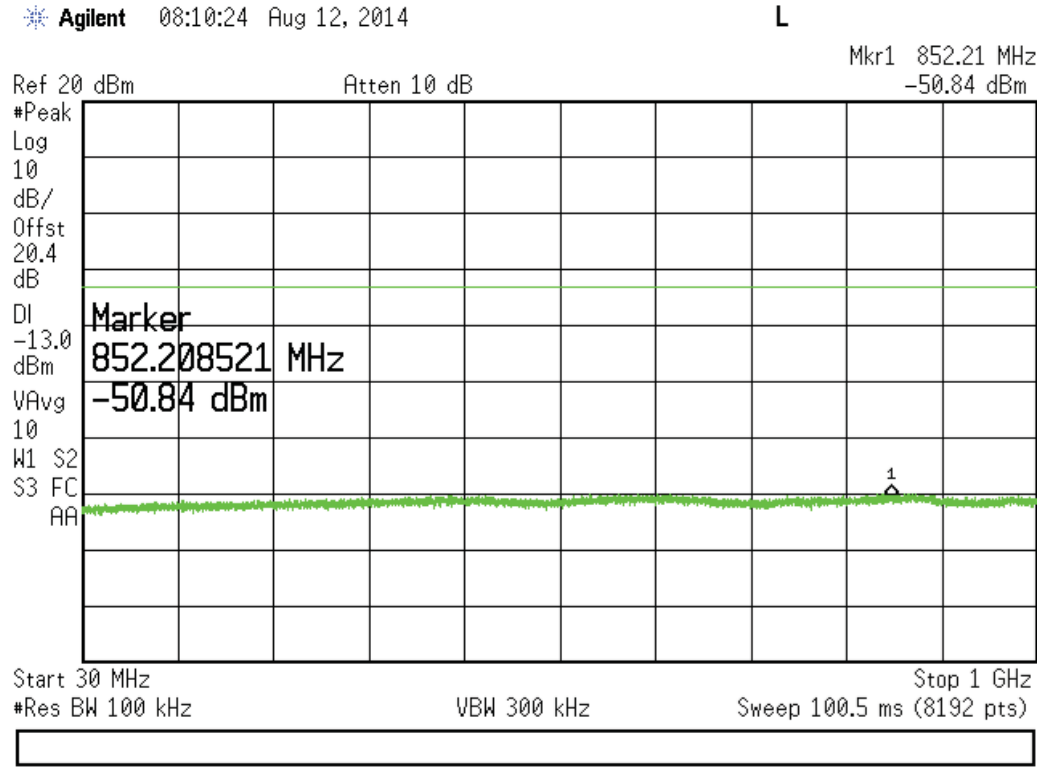
1930-1995 MHz Band (Low Frequency)



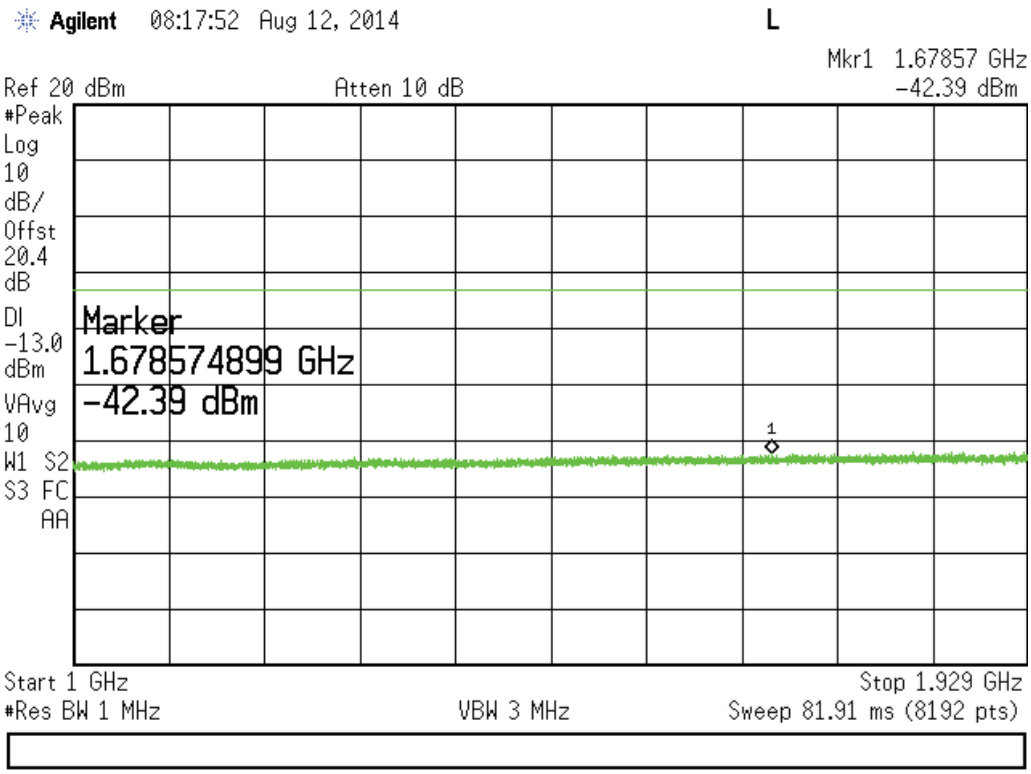
1930-1995 MHz Band (Low Frequency) (Cont)



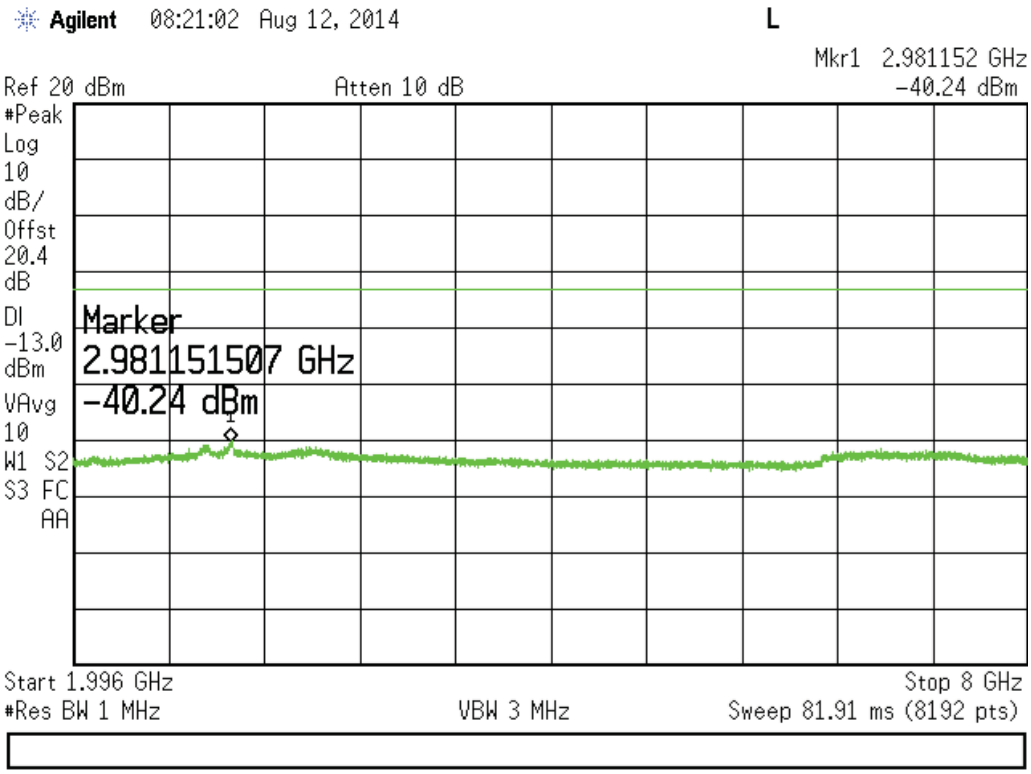
1930-1995 MHz Band (Mid Frequency)



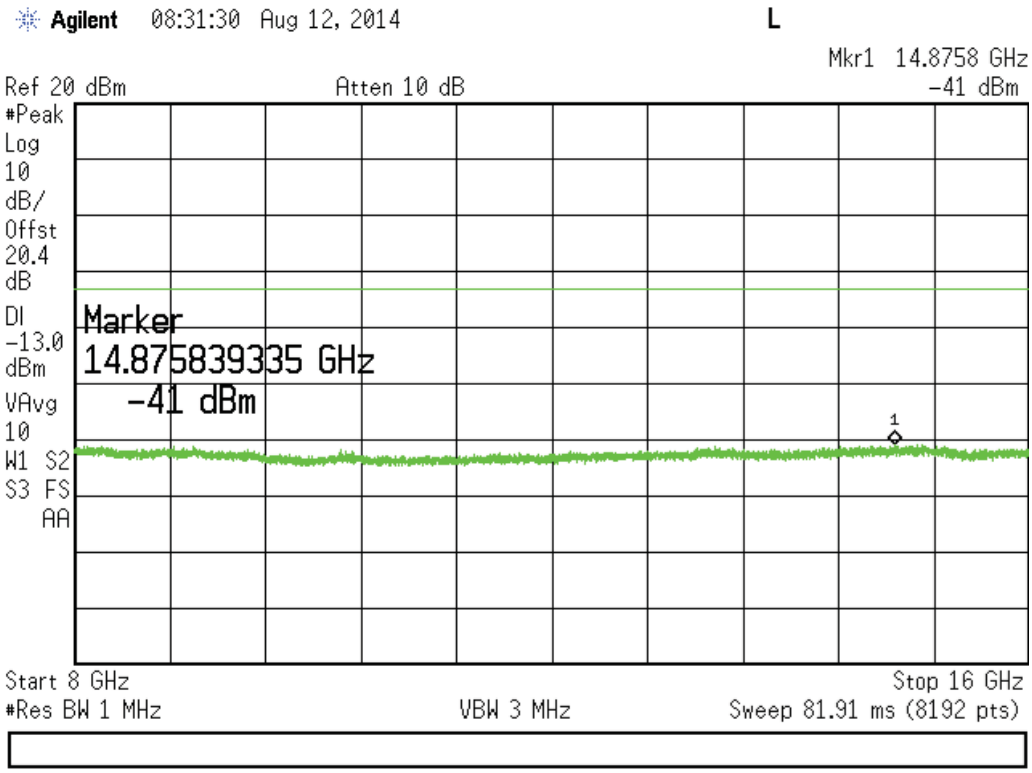
1930-1995 MHz Band (Mid Frequency) (Cont)



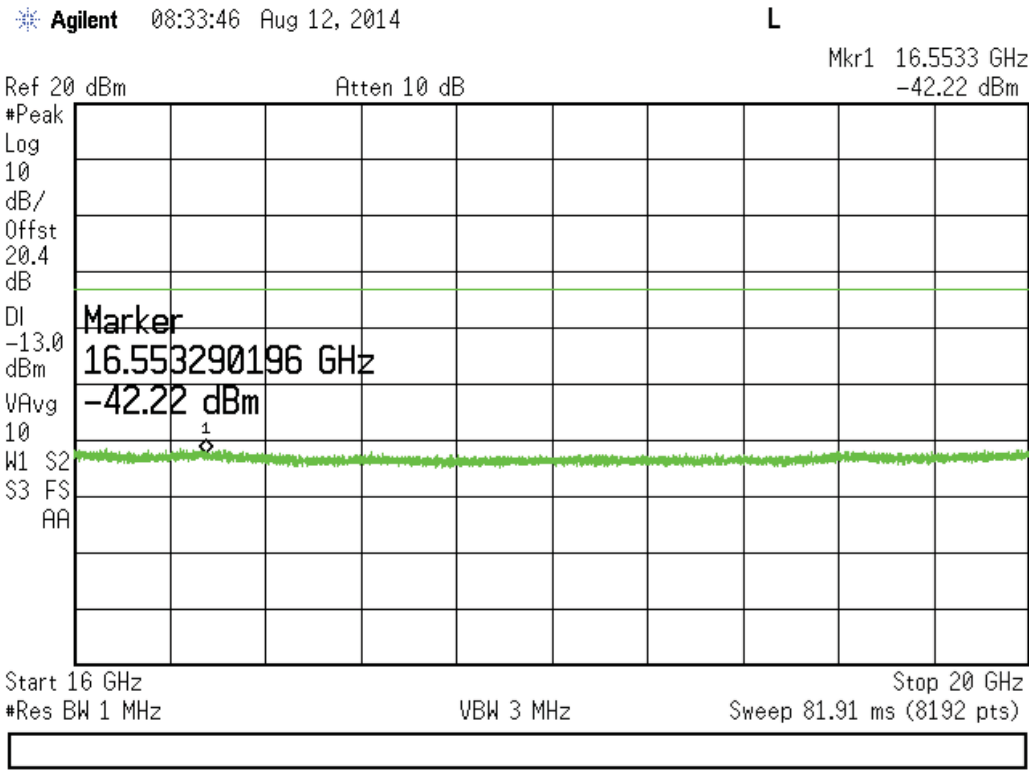
1930-1995 MHz Band (Mid Frequency) (Cont)



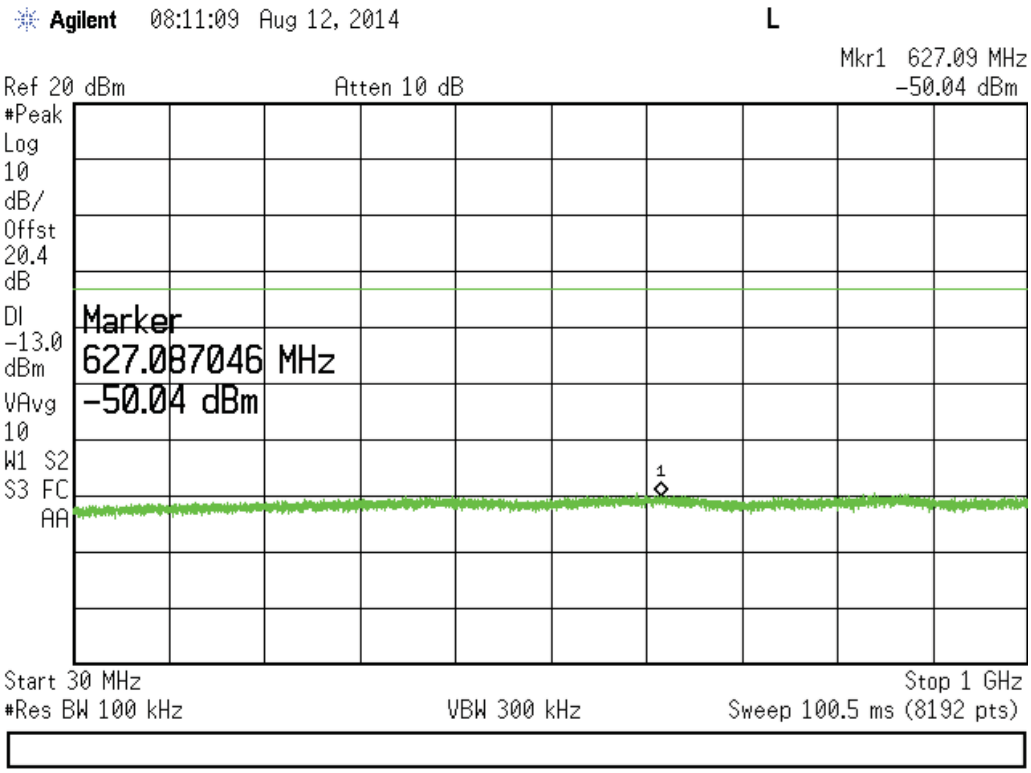
1930-1995 MHz Band (Mid Frequency) (Cont)



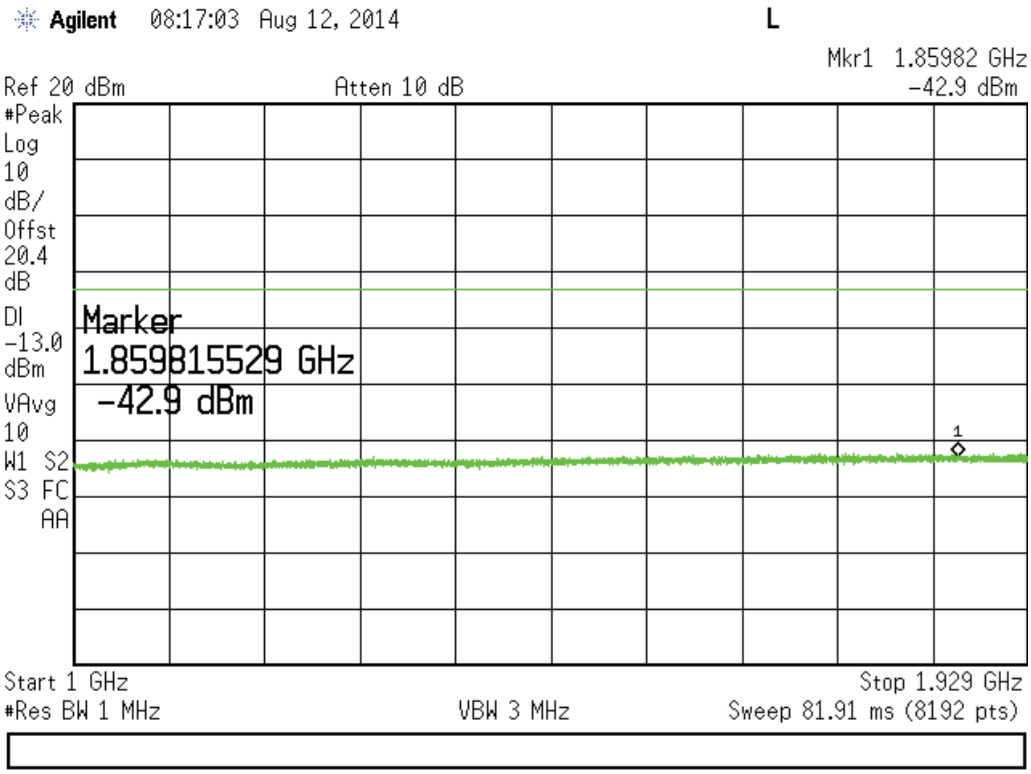
1930-1995 MHz Band (Mid Frequency) (Cont)



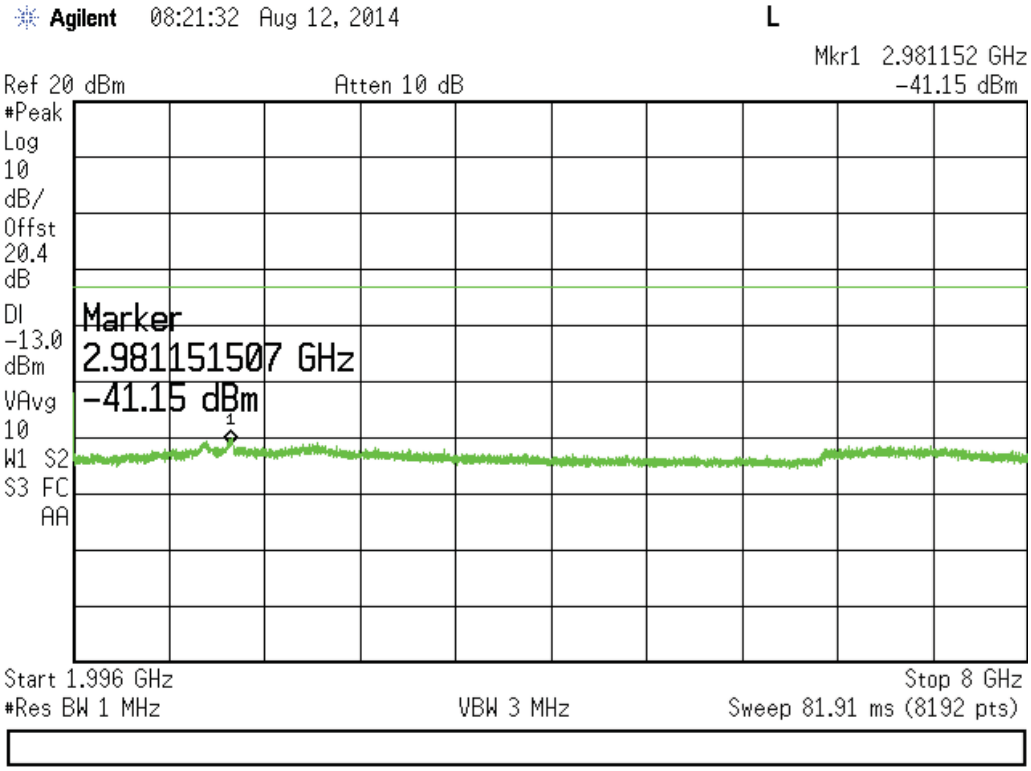
1930-1995 MHz Band (High Frequency)



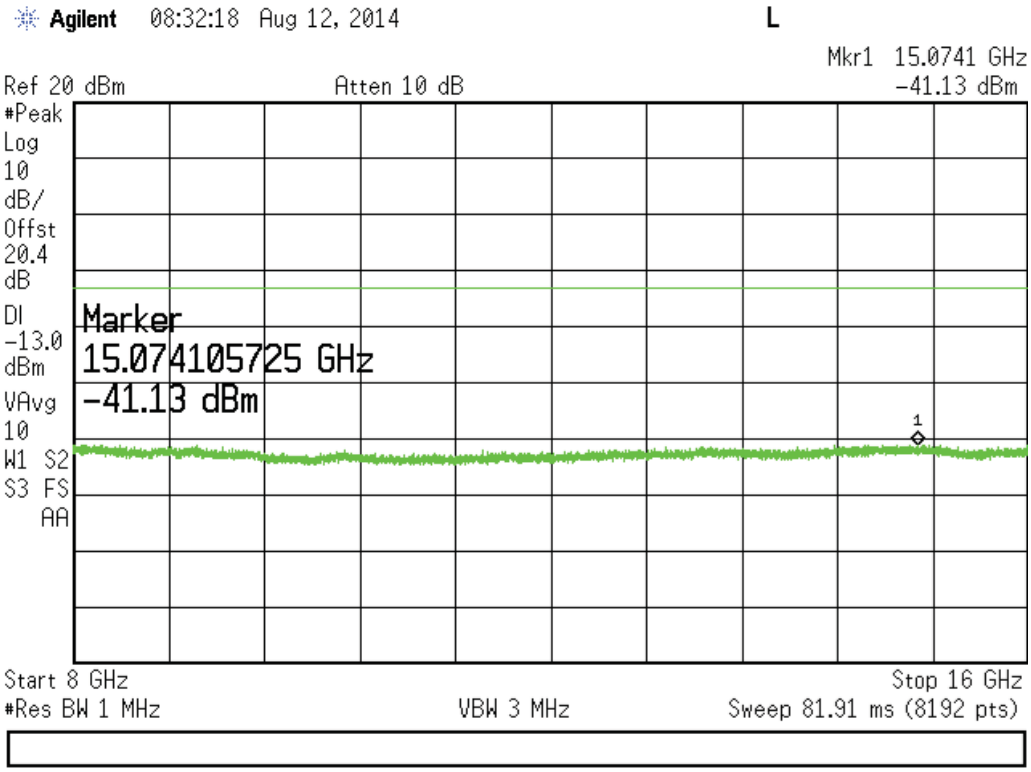
1930-1995 MHz Band (High Frequency) (Cont)



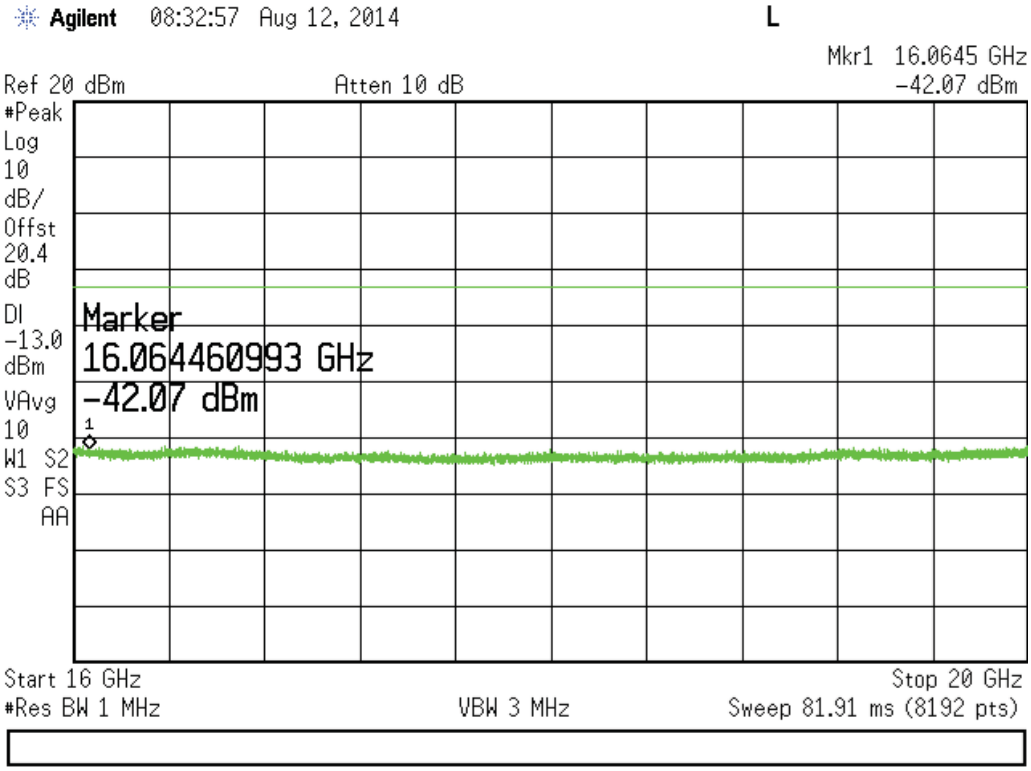
1930-1995 MHz Band (High Frequency) (Cont)



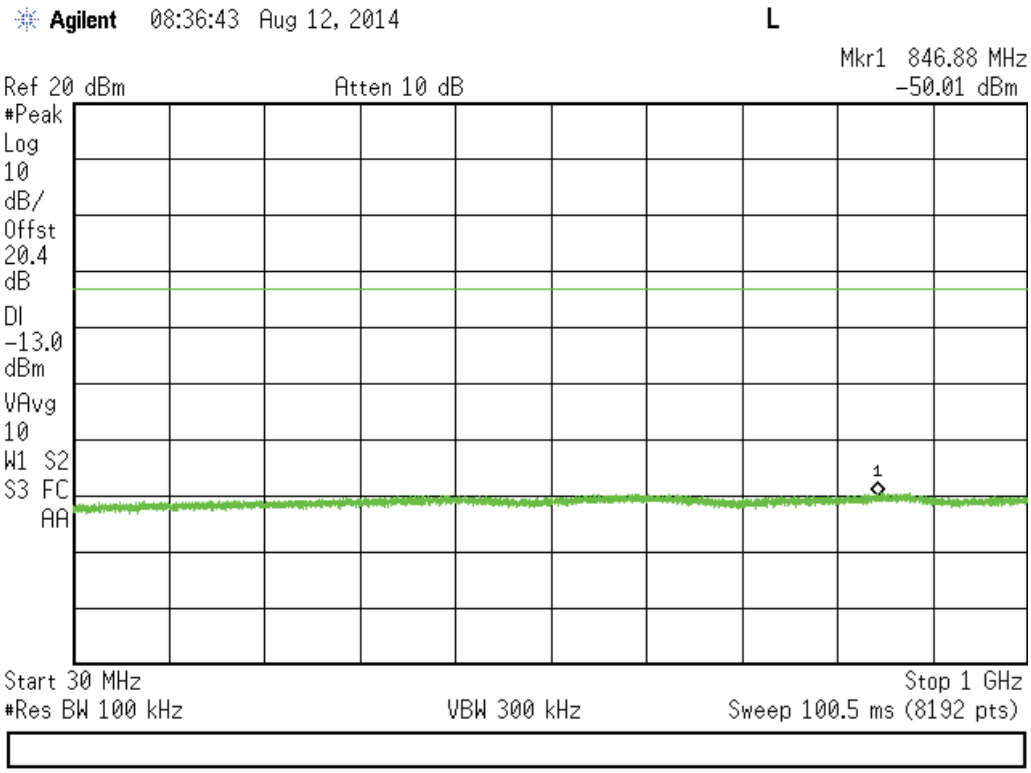
1930-1995 MHz Band (High Frequency) (Cont)



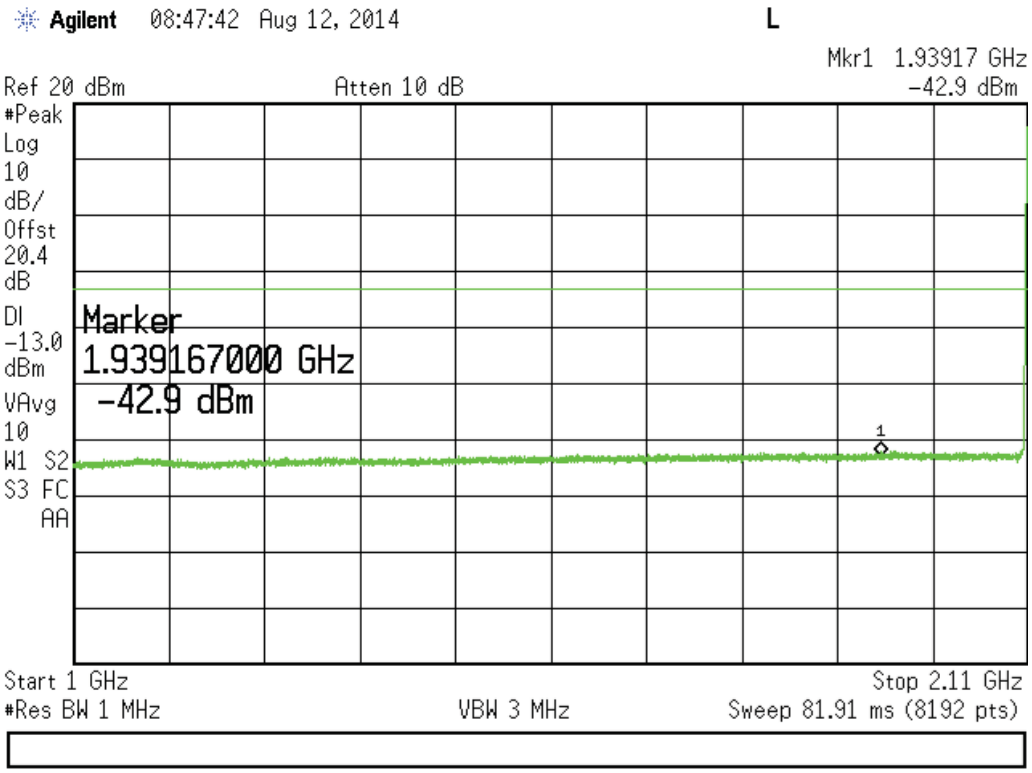
1930-1995 MHz Band (High Frequency) (Cont)



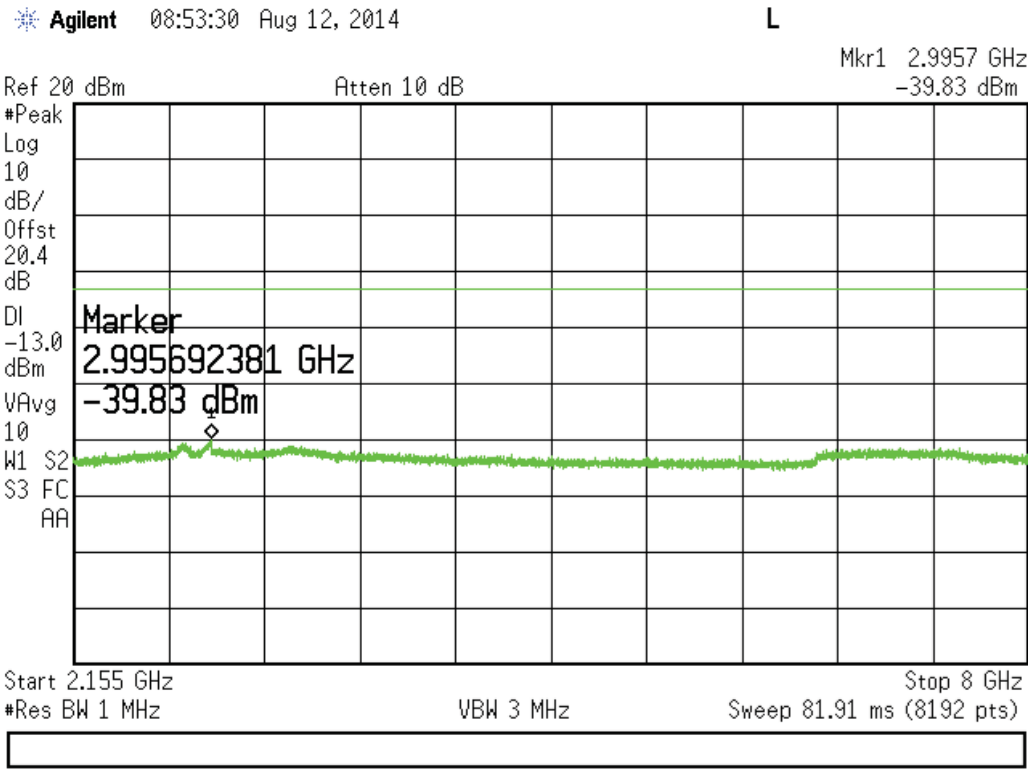
2110-2155 MHz Band (Low Frequency)



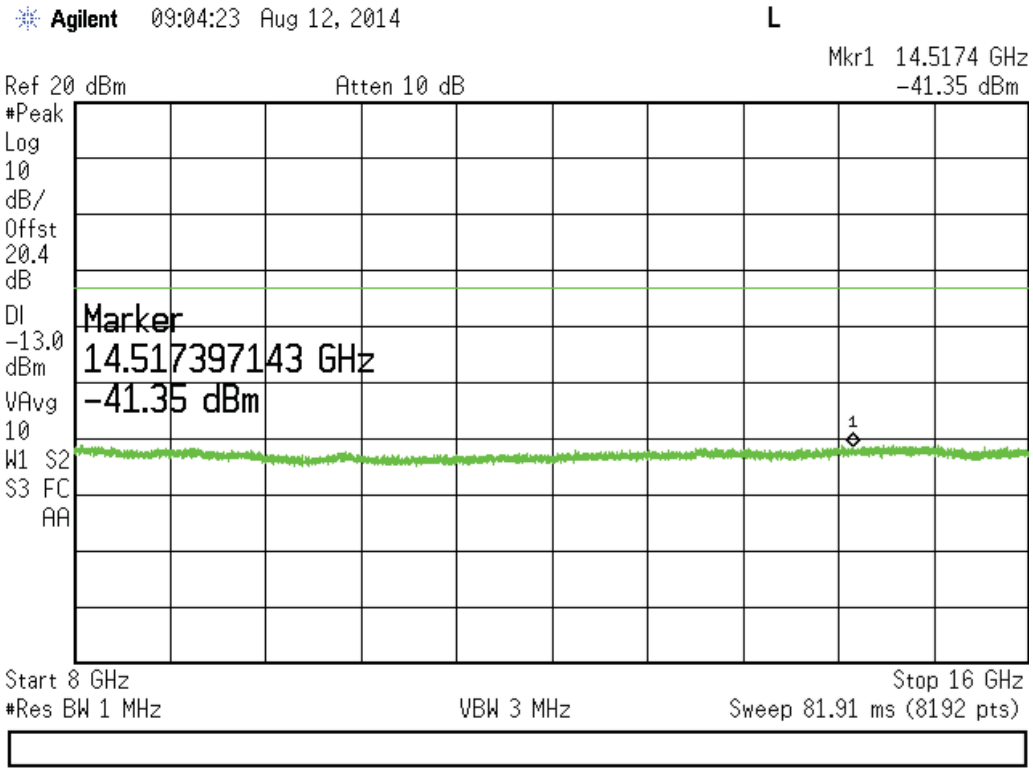
2110-2155 MHz Band (Low Frequency) (Cont)



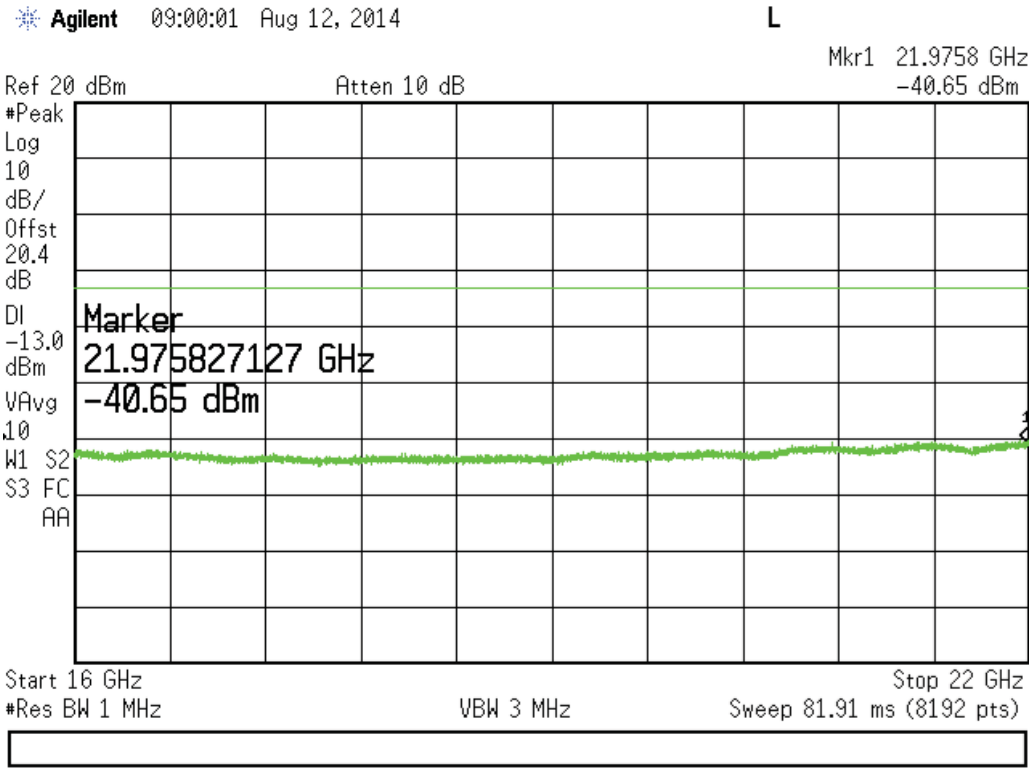
2110-2155 MHz Band (Low Frequency) (Cont)



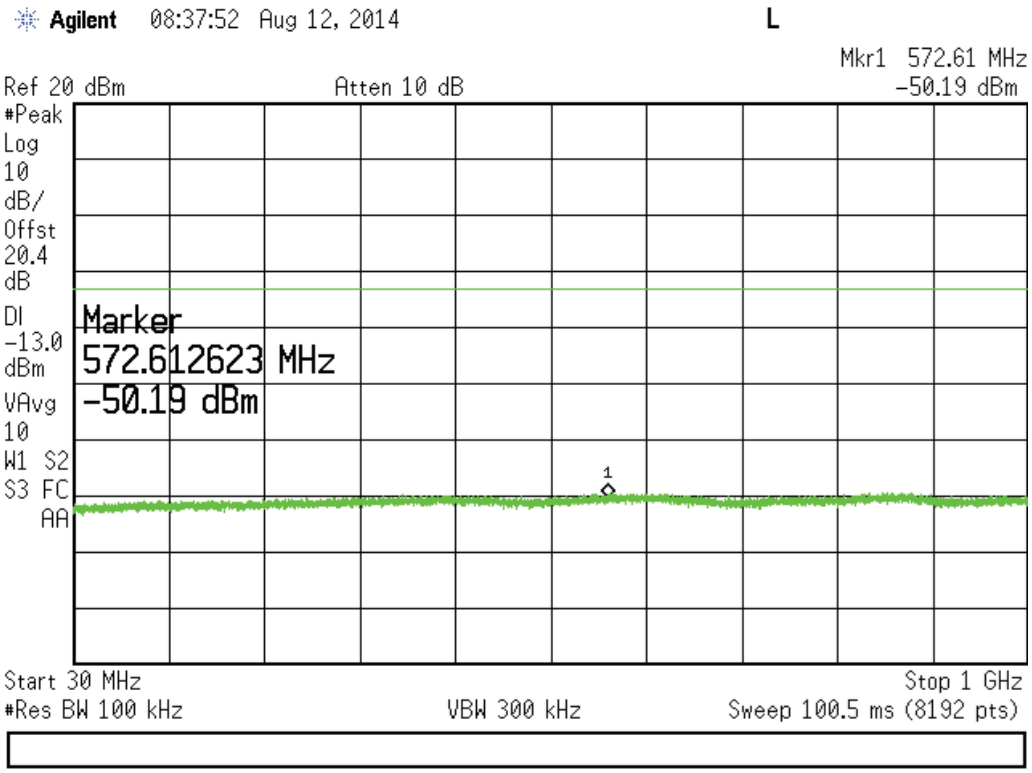
2110-2155 MHz Band (Low Frequency) (Cont)



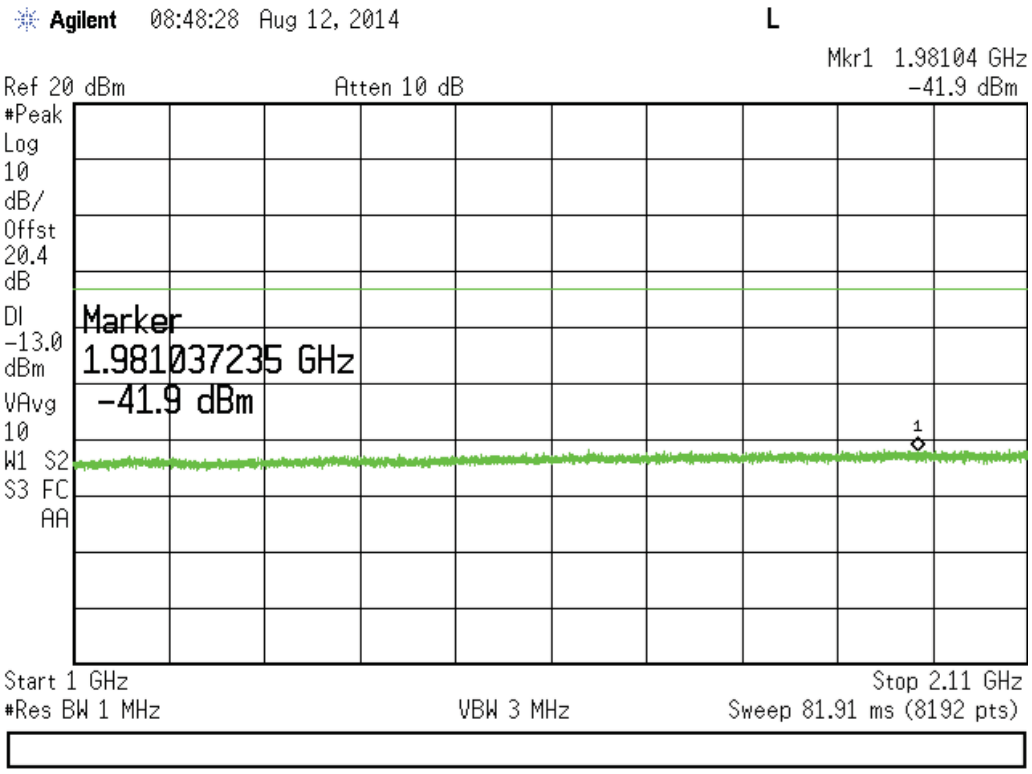
2110-2155 MHz Band (Low Frequency) (Cont)



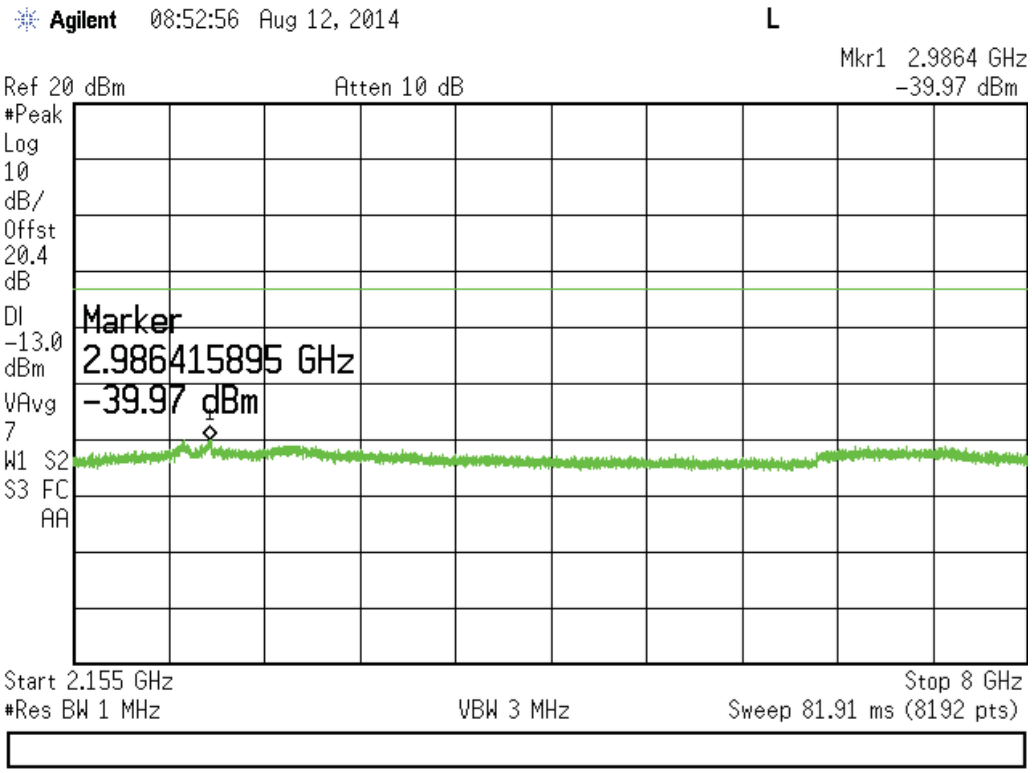
2110-2155 MHz Band (Mid Frequency)



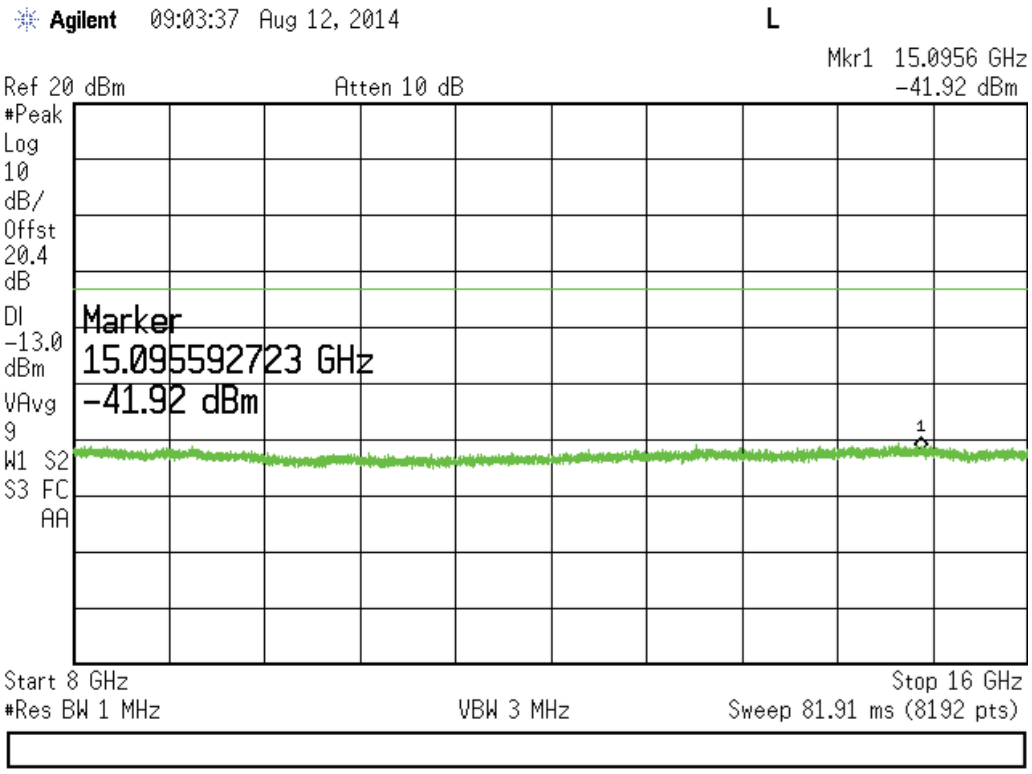
2110-2155 MHz Band (Mid Frequency) (Cont)



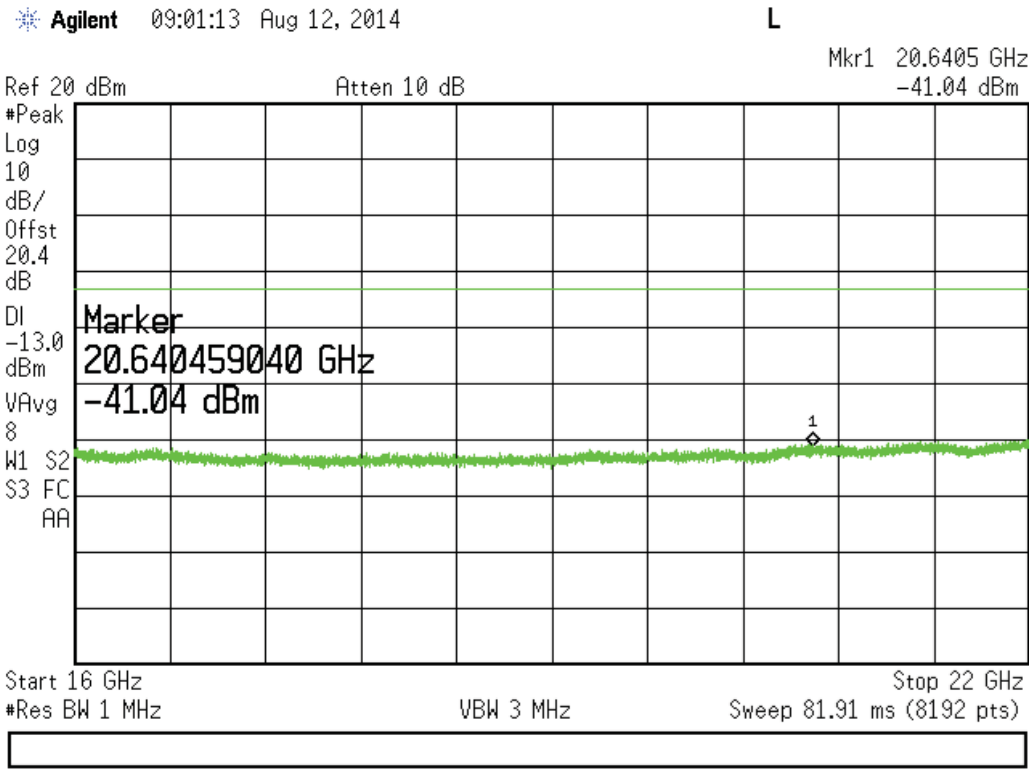
2110-2155 MHz Band (Mid Frequency) (Cont)



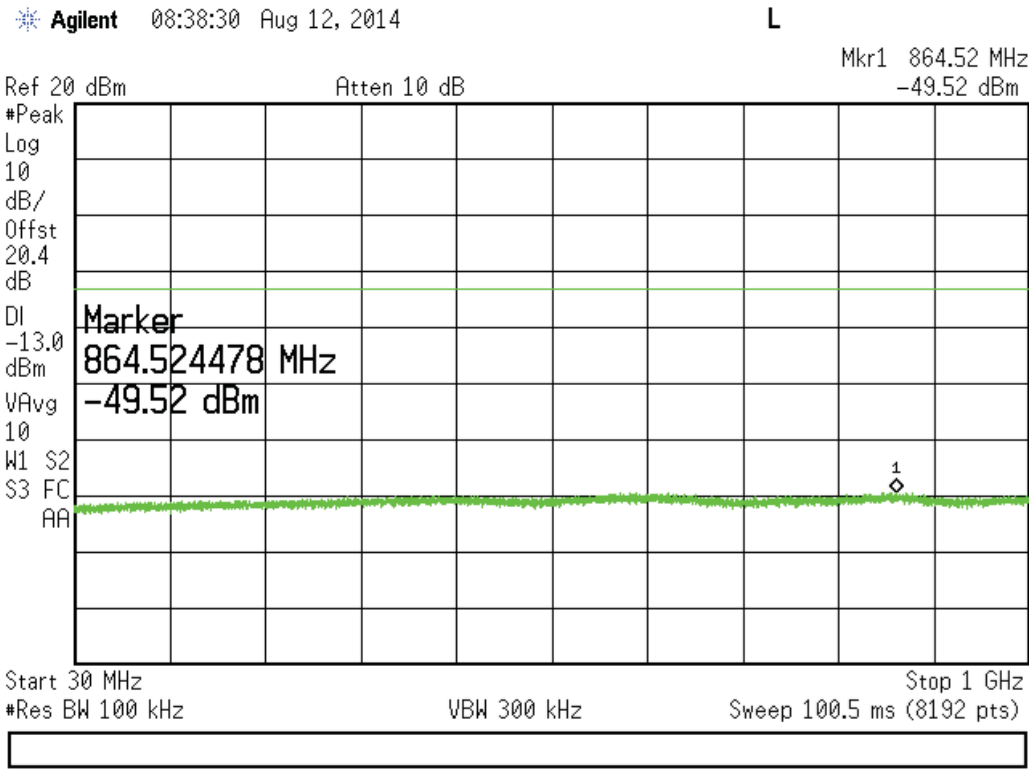
2110-2155 MHz Band (Mid Frequency) (Cont)



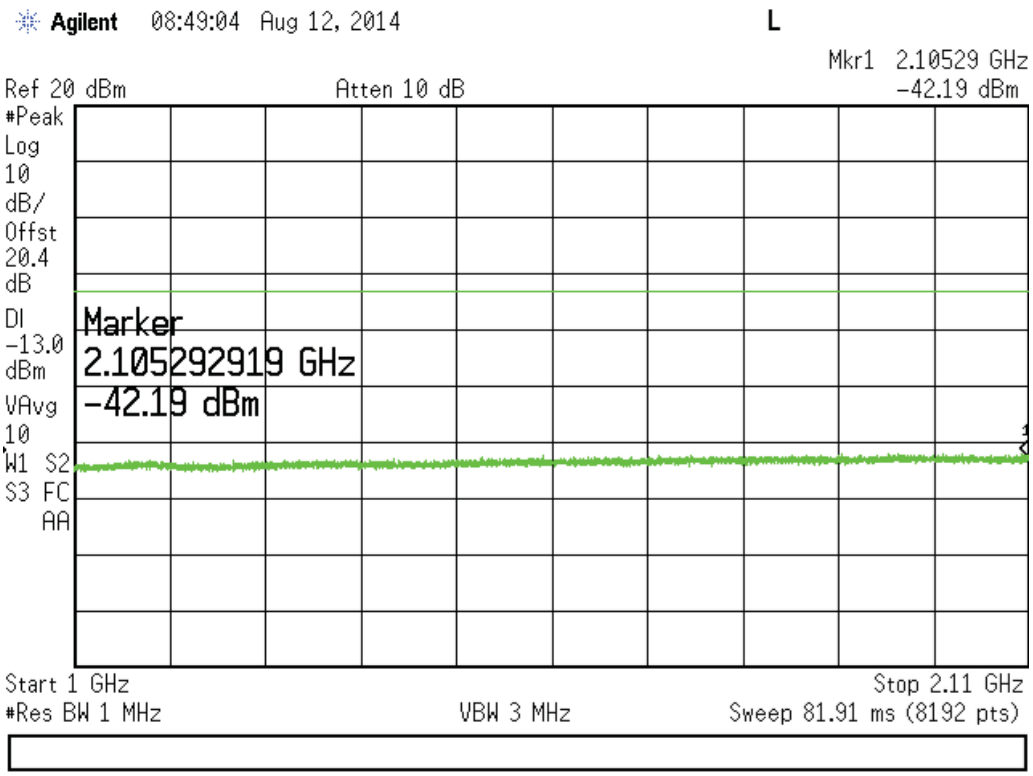
2110-2155 MHz Band (Mid Frequency) (Cont)



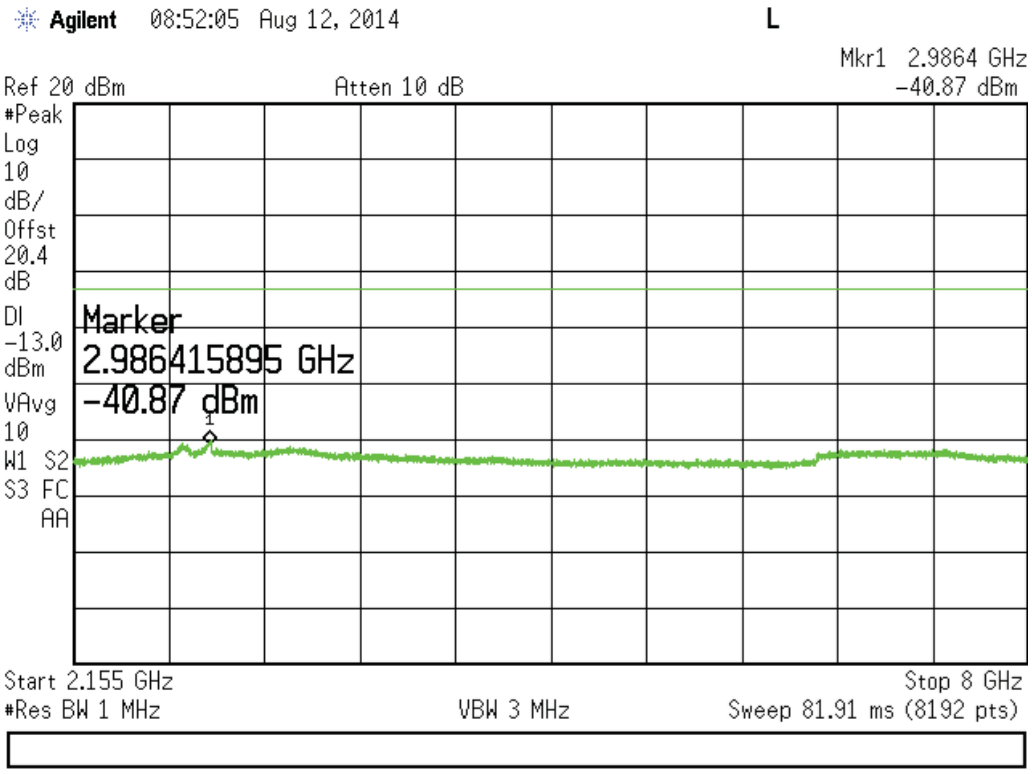
2110-2155 MHz Band (High Frequency)



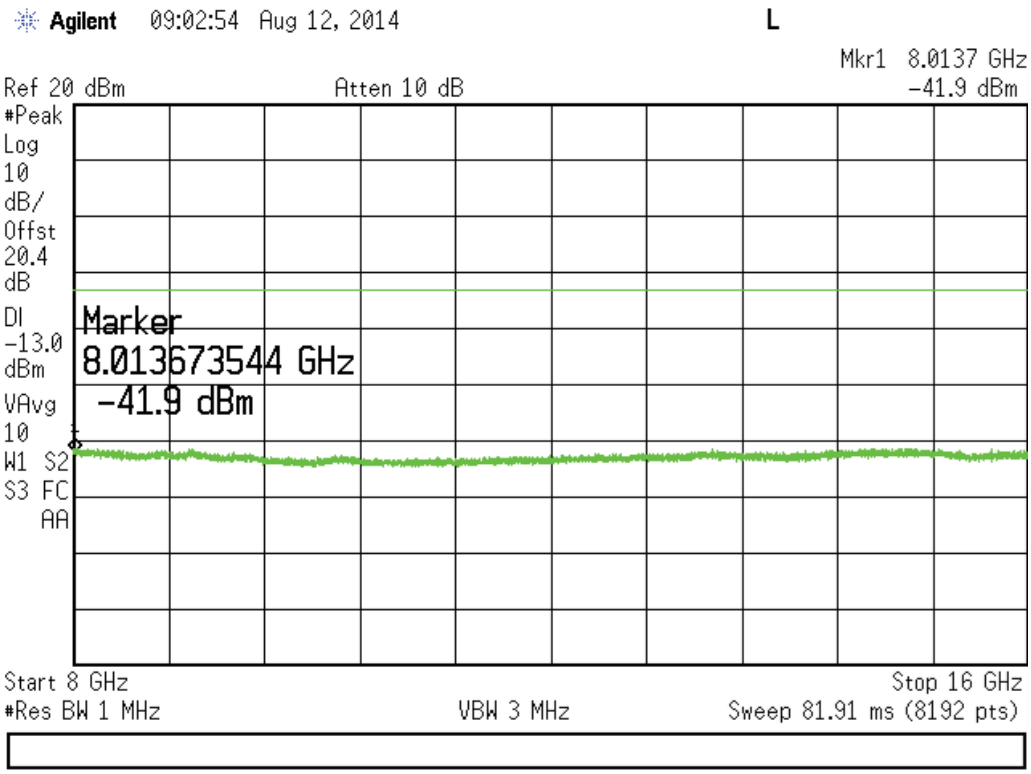
2110-2155 MHz Band (High Frequency) (Cont)



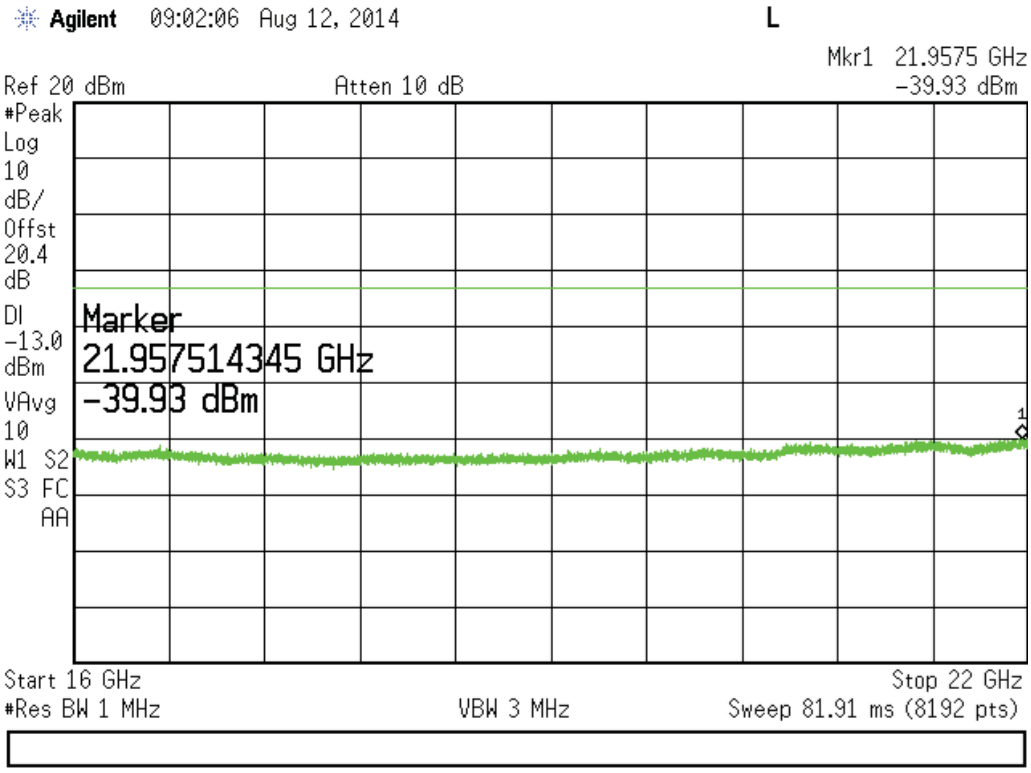
2110-2155 MHz Band (High Frequency) (Cont)



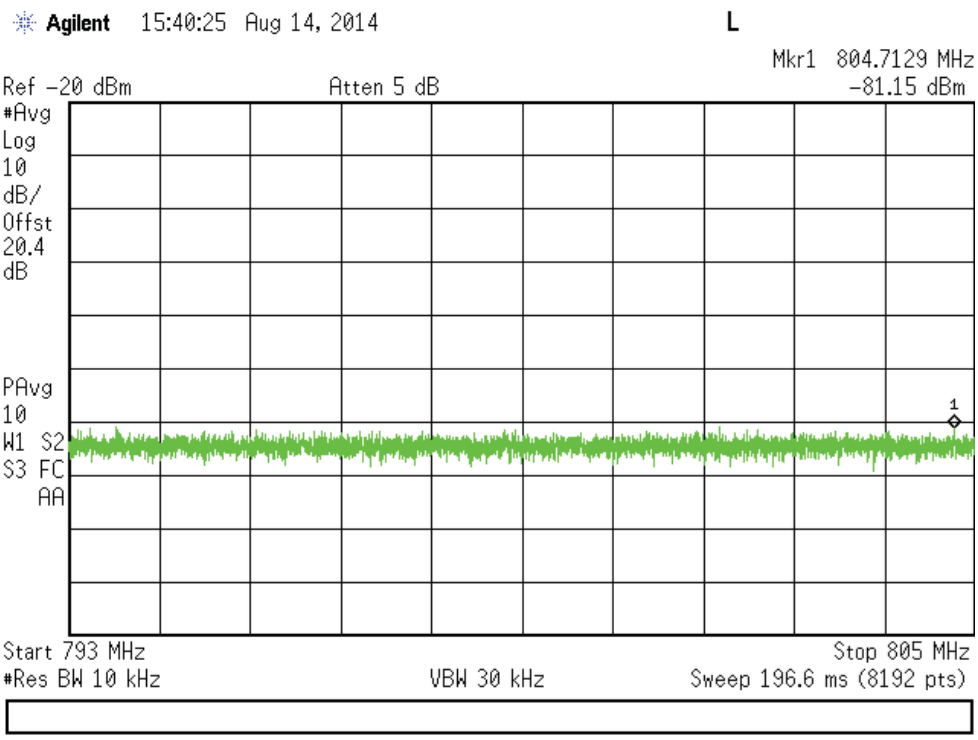
2110-2155 MHz Band (High Frequency) (Cont)



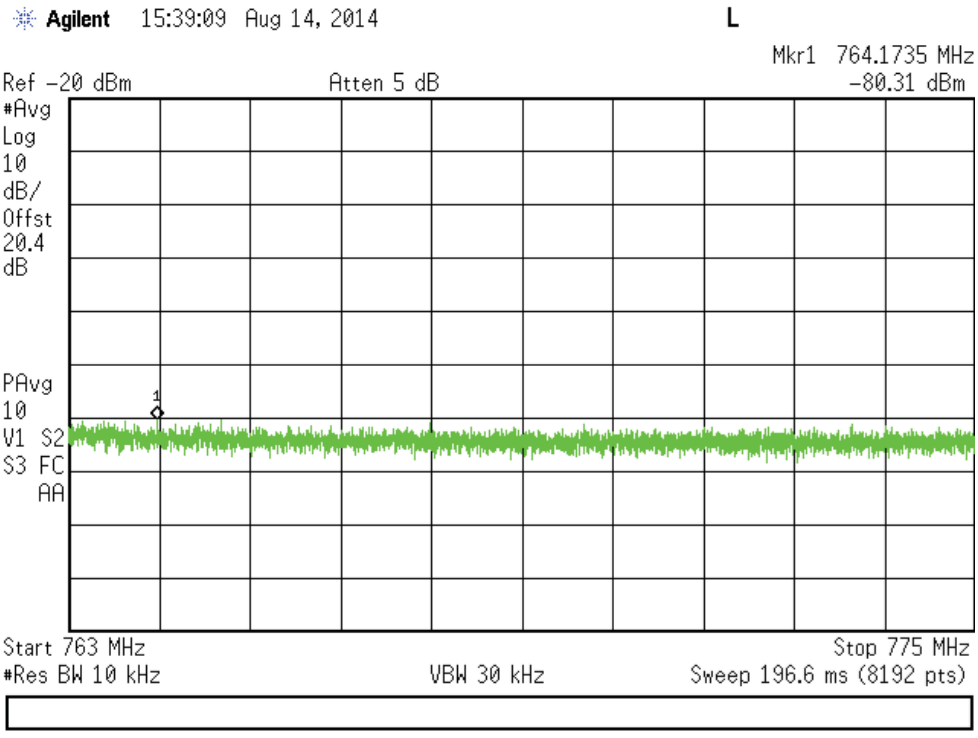
2110-2155 MHz Band (High Frequency) (Cont)



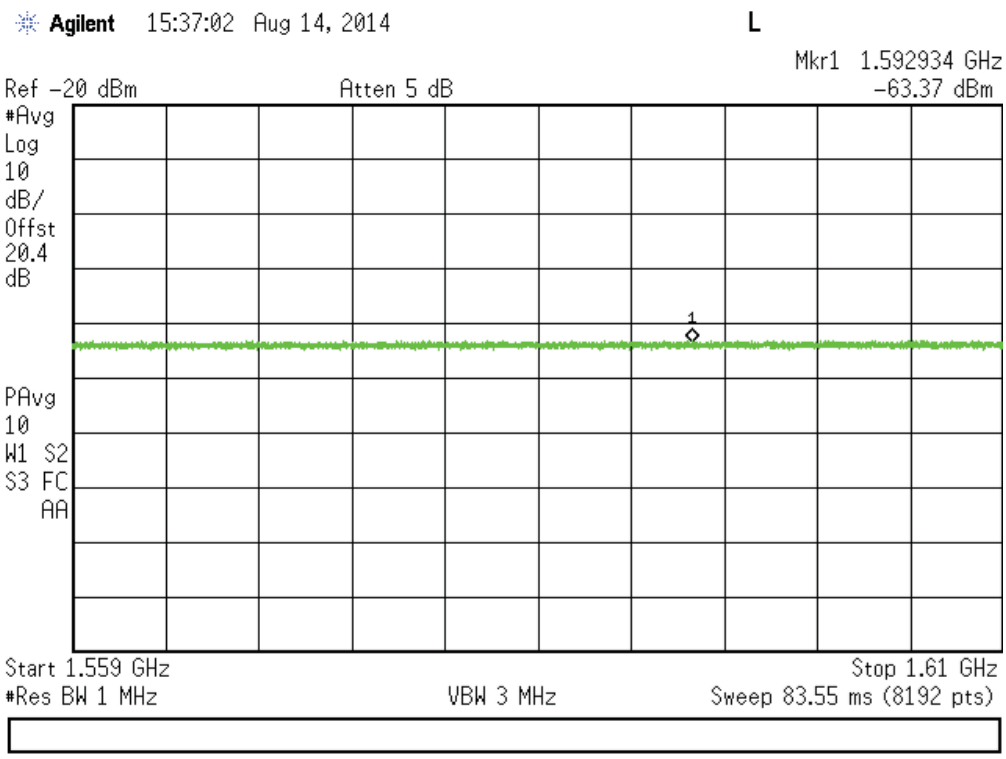
Additional testing 793 - 805 MHz (Narrowband)



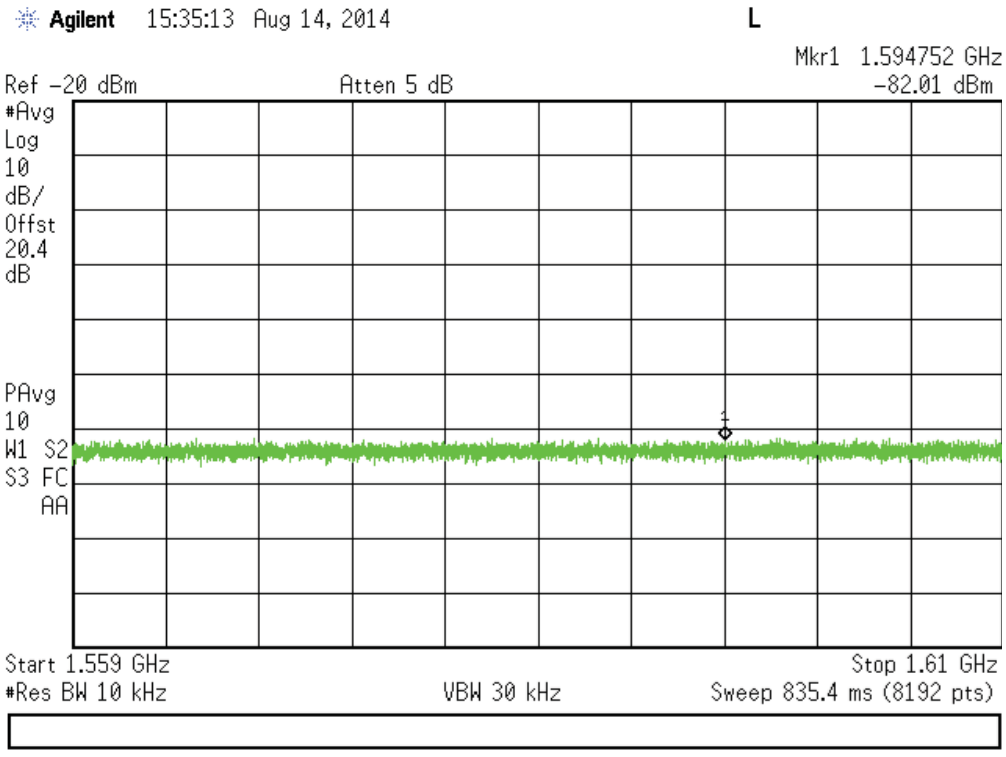
Additional testing 763 - 775 MHz (Narrowband)



Additional testing 1559 - 1610 MHz (Wideband)



Additional testing 1559 - 1610 MHz (Narrowband)



Radiated Spurious Emissions

Name of Test:	Radiated Spurious Emissions	**Engineer:** Mike Graffeo
Test Equipment Utilized:	i00103, i00349, i00405, i00428, i00331	**Test Date:** 8/14/14

Test Procedure

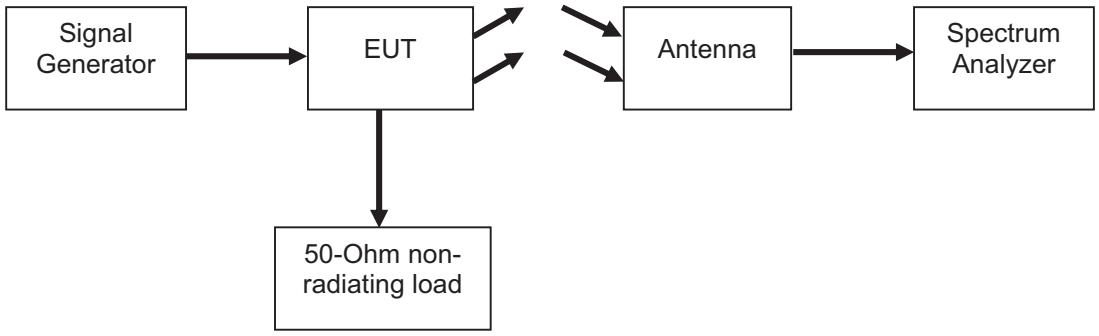
The EUT was tested in a semi-anechoic chamber with the turntable set 3m from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Radiated Emissions. The EUT was tested by rotating it 360 degrees with the antenna in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure that the signal levels were maximized. All cable and antenna correction factors were input into the spectrum analyzer ensuring an accurate measurement in ERP/EIRP with the resultant power in dBm. A signal generator was used to provide a CW signal. The EUT output was terminated into a 50 Ohm non-radiating load.

The RBW was set to 100 kHz for measurements below 1 GHz and 1 MHz for measurements above 1 GHz.
The VBW was set to 3 times the RBW.

The following formula was used for calculating the limits:

Radiated Spurious Emissions Limit = P1 – (43+ 10Log(P2)) = -13dBm
P1 = power in dBm
P2 = power in Watts

Test Setup



UPLINK BANDS

698 - 716 MHz Band 707 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
1414	-71.73	-13	Pass
2121	-65.55	-13	Pass
2828	-56.69	-13	Pass
3535	-56.31	-13	Pass

777 - 787 MHz Band 781.5 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
1563	-57.28	-13	Pass
2444.5	-47.24	-13	Pass
3126	-44.3	-13	Pass
3907.5	-44.51	-13	Pass

824 - 849 MHz Band 836.5 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
1673	-52.98	-13	Pass
2509.5	-46.74	-13	Pass
3346	-46.36	-13	Pass
4182.5	-43.91	-13	Pass

1710 - 1755 MHz Band 1732.5 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
3465	-44.26	-13	Pass
5197.5	-42.13	-13	Pass
6930	-38.61	-13	Pass
8662.5	-33.5	-13	Pass

1850 - 1915 MHz Band 1880 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
3760	-45.28	-13	Pass
5640	-43.6	-13	Pass
7520	-34.1	-13	Pass
9400	-30.25	-13	Pass

DOWNLINK BANDS

728 - 746 MHz Band 737 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
1474	-58.38	-13	Pass
2211	-51.08	-13	Pass
2948	-44.78	-13	Pass
3685	-46.49	-13	Pass

746 - 757 MHz Band 751.5 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
1503	-56.18	-13	Pass
2254.5	-52.5	-13	Pass
3006	-46.46	-13	Pass
3757.5	-43.99	-13	Pass

869 - 894 MHz Band 881.5 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
1763	-52.62	-13	Pass
2644.5	-49.57	-13	Pass
3526	-48.19	-13	Pass
4407.5	-48.19	-13	Pass

1930 - 1995 MHz Band 1960 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
3920	-44.56	-13	Pass
5880	-38.42	-13	Pass
7840	-39.68	-13	Pass
9800	44.94	-13	Pass

2110 - 2155 MHz Band 2132.5 MHz Tuned Frequency

Measured Frequency (MHz)	Measured Level (dBm)	Limit (dBm)	Result
4265	-44.47	-13	Pass
6397.5	-44.81	-13	Pass
8530	-32.6	-13	Pass
10662.5	-29.7	-13	Pass

No other emissions were detected. All emissions were 20 below the limit of –13 dBm.

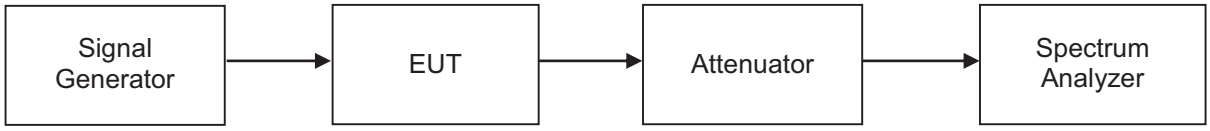
Occupied Bandwidth

Name of Test:	Occupied Bandwidth	**Engineer:** Mike Graffeo
Test Equipment Utilized	i00405, i00331	**Test Date:** 8/7/14

Test Procedure

The Occupied Bandwidth was measured at 26dB down across the midpoint of the band, with the input to the EUT at 3dBm above AGC level and again at 6dBm above AGC level. Only the worst case of the two results is shown.

Test Setup



Uplink (GSM Signal)

Band (MHz)	Worst case 99% Emission Bandwidth at Input (KHz)	Worst case 99% Emission Bandwidth at EUT Output (KHz)
698 - 716	245.19	246.22
776-787	244.05	244.73
824-849	242.52	247.29
1710-1755	243.17	244.02
1850-1915	244.53	245.03

Uplink (CDMA Signal)

Band (MHz)	Worst case 99% Emission Bandwidth at Input (MHz)	Worst case 99% Emission Bandwidth at EUT Output (MHz)
698 - 716	1.277	1.273
776-787	1.270	1.273
824-849	1.273	1.270
1710-1755	1.271	1.276
1850-1915	1.271	1.276

Downlink (GSM Signal)

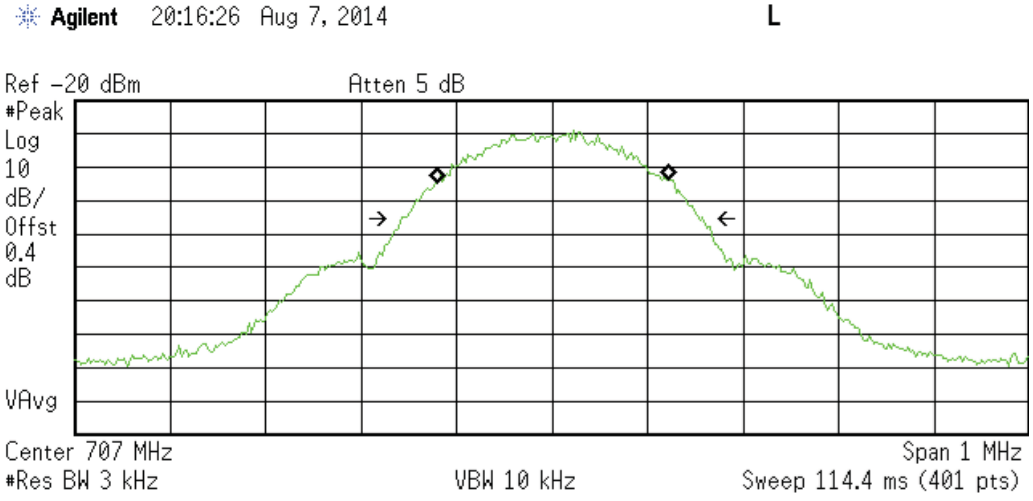
Band (MHz)	Worst case 99% Emission Bandwidth at Input (KHz)	Worst case 99% Emission Bandwidth at EUT Output (KHz)
728-746	243.79	243.82
746-757	245.10	246.06
869-894	244.42	245.55
1930-1995	245.04	246.18
2110-2155	245.95	245.98

Downlink (CDMA Signal)

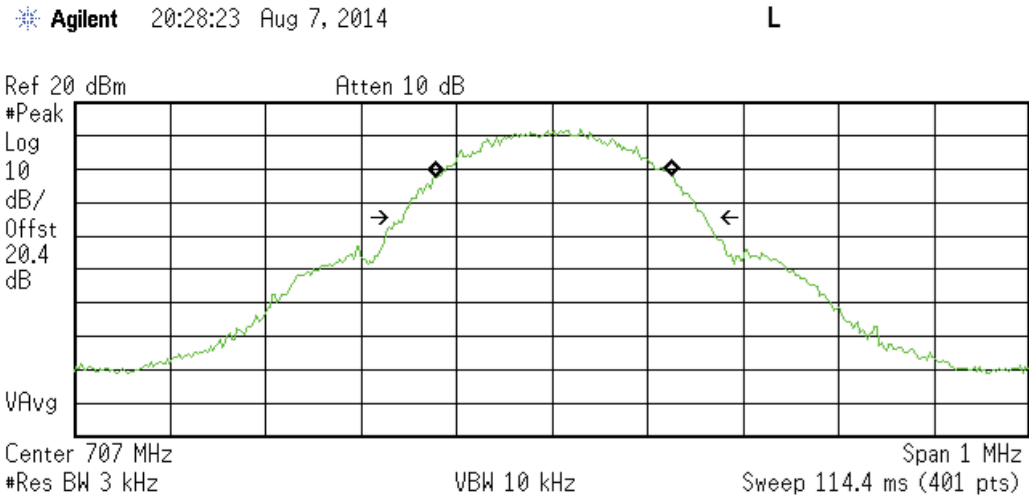
Band (MHz)	Worst case 99% Emission Bandwidth at Input (MHz)	Worst case 99% Emission Bandwidth at EUT Output (MHz)
728-746	1.272	1.269
746-757	1.273	1.274
869-894	1.270	1.273
1930-1995	1.273	1.269
2110-2155	1.272	1.274

Uplink (GSM Signal)

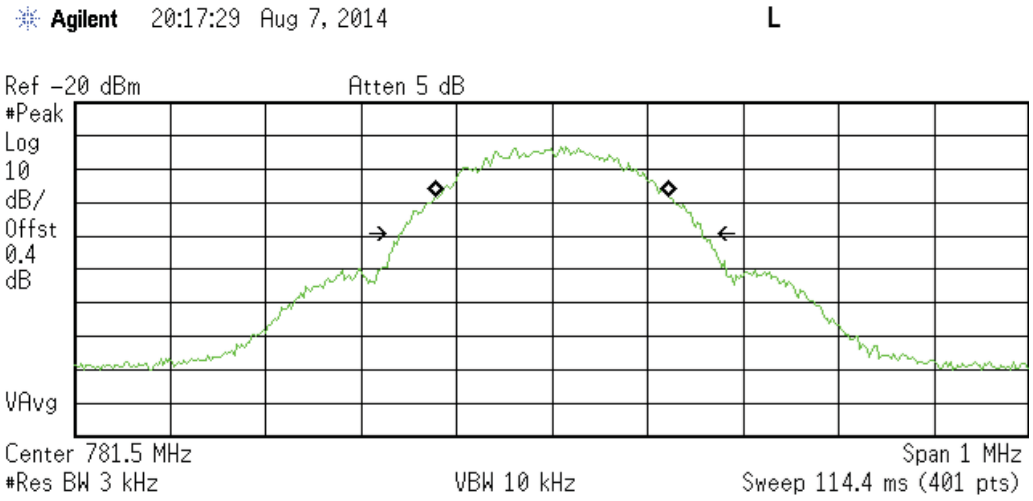
698 - 716 MHz Band
Input



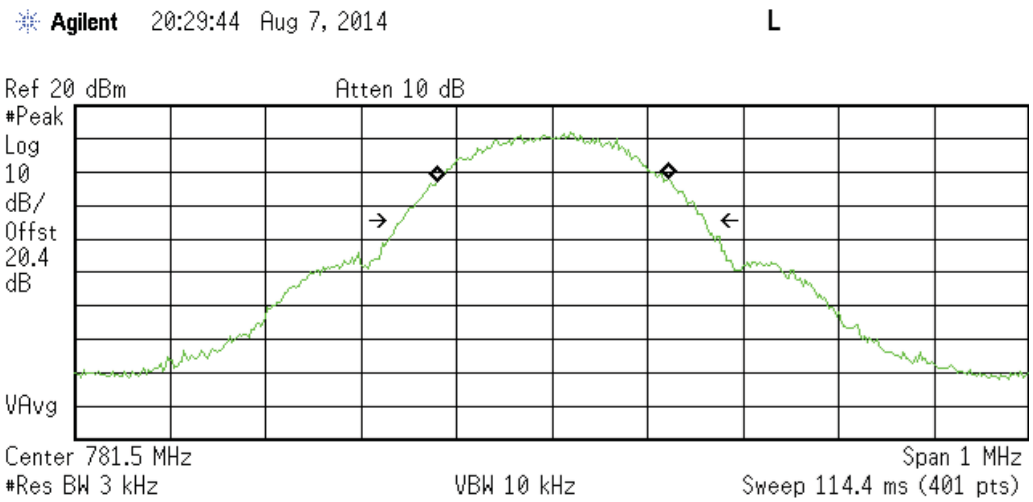
Output



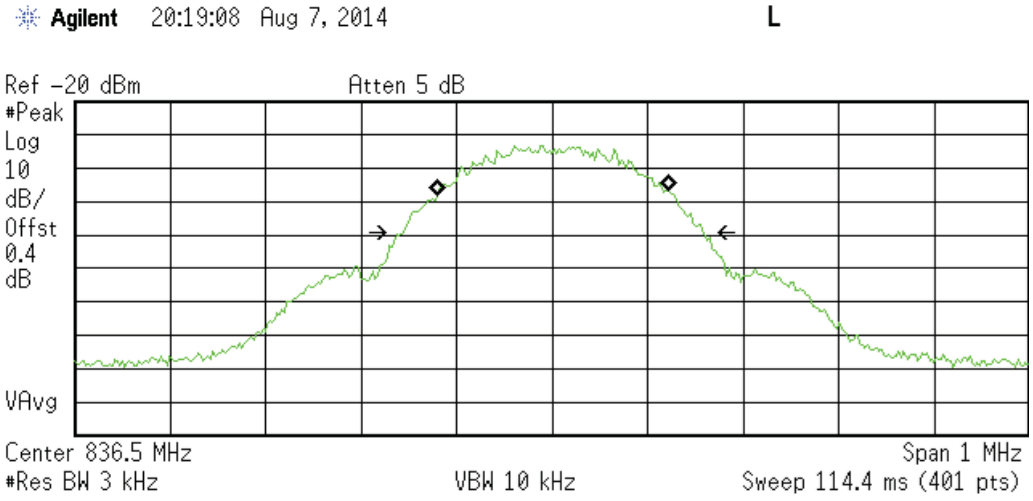
776-787 MHz Band
Input



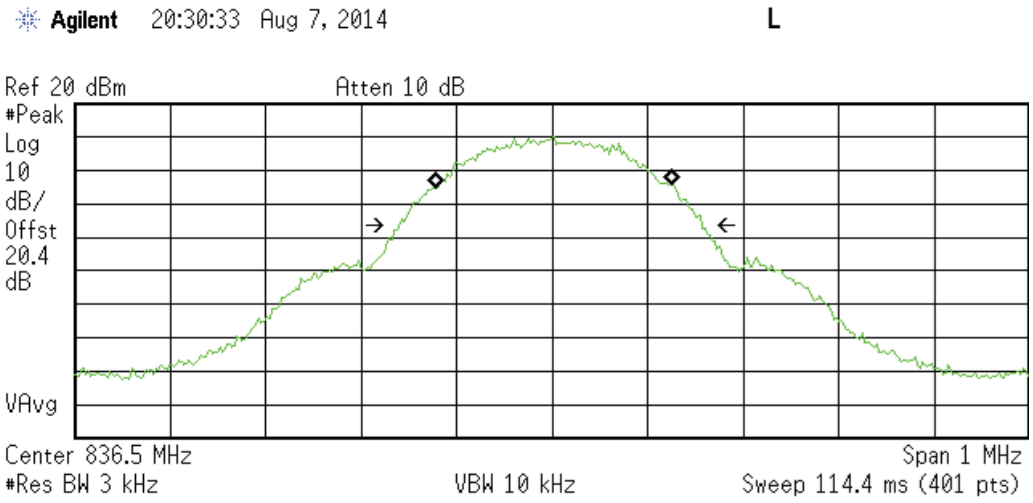
Output



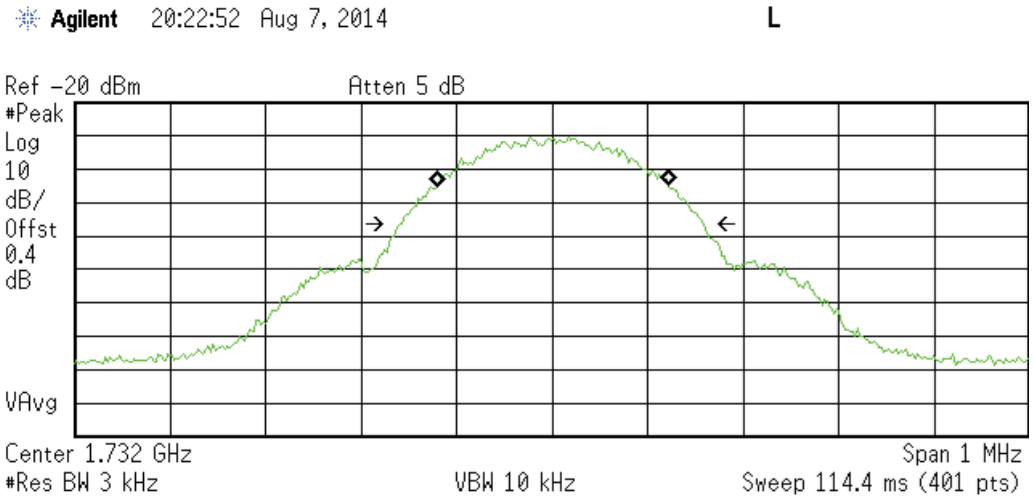
824-849 MHz Band
Input



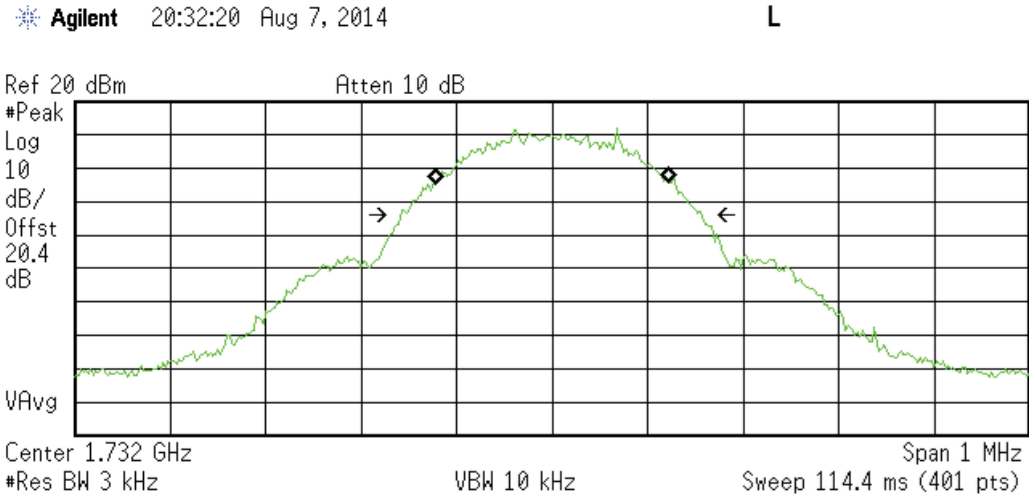
Output



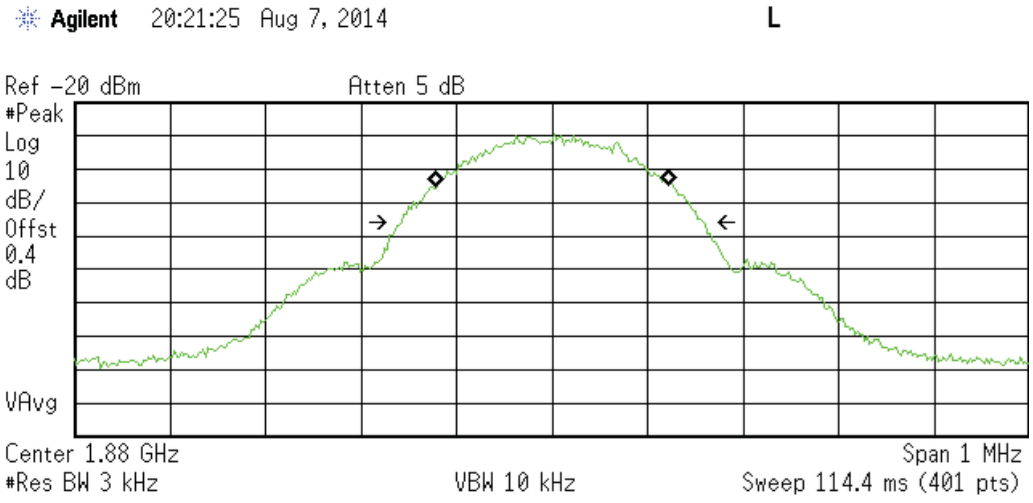
1710-1755 MHz Band
Input



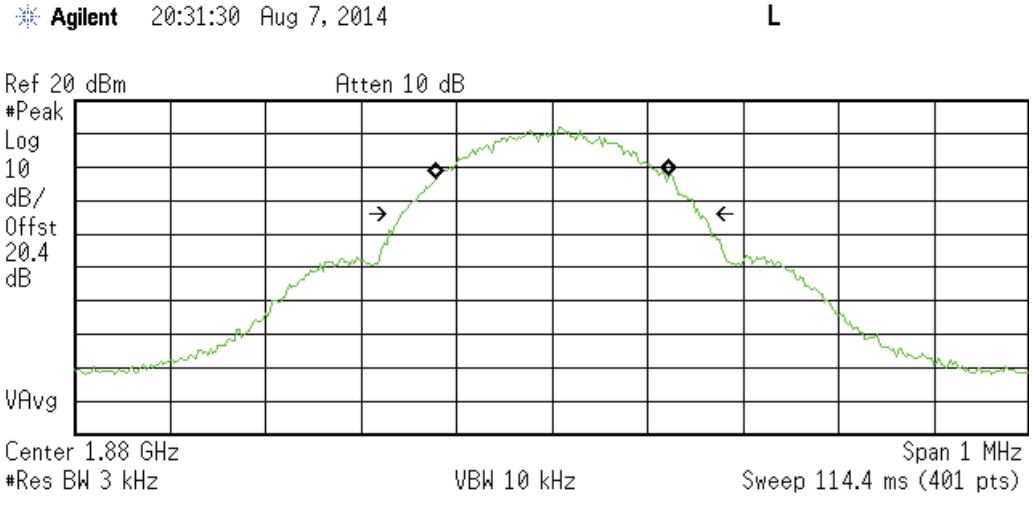
Output



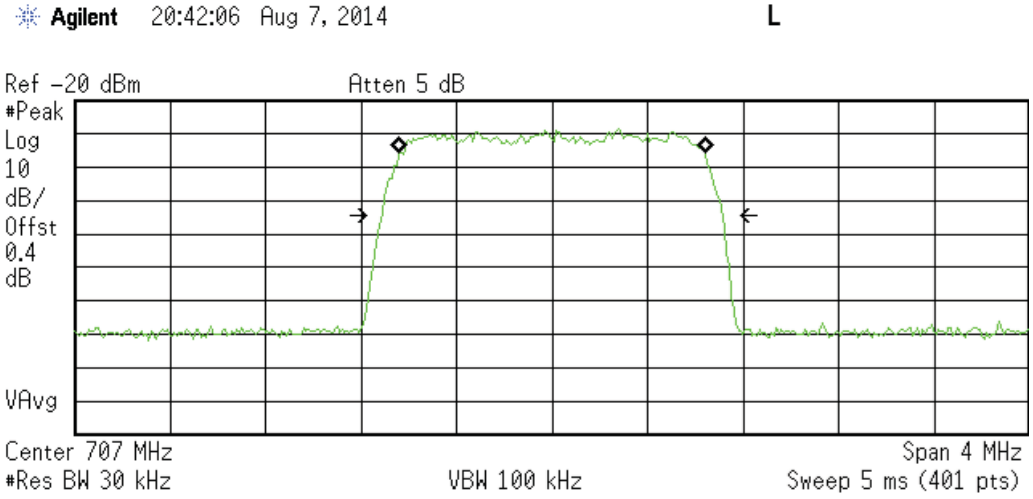
1850-1915 MHz Band
Input



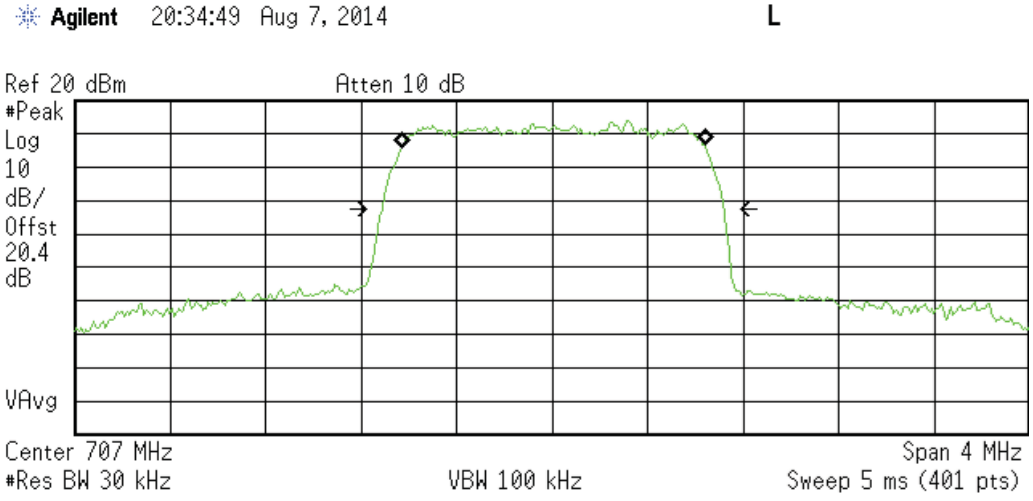
Output



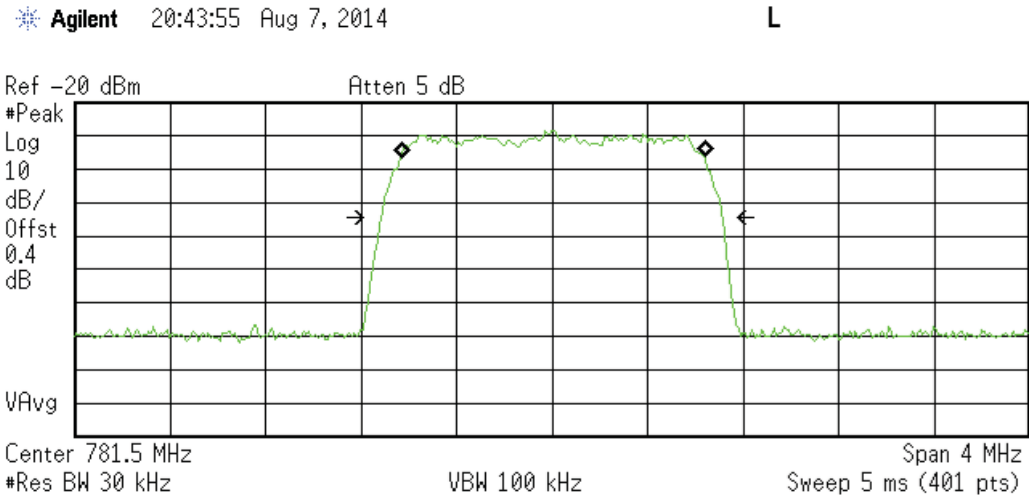
Uplink (CDMA Signal)
698 - 716 MHz Band
Input



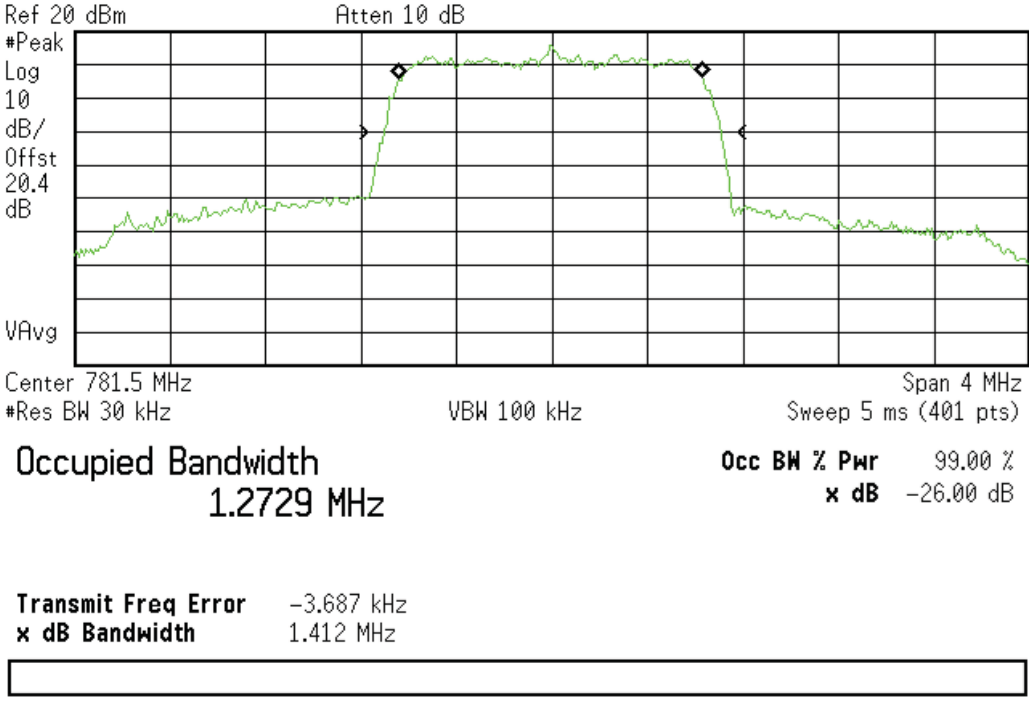
Output



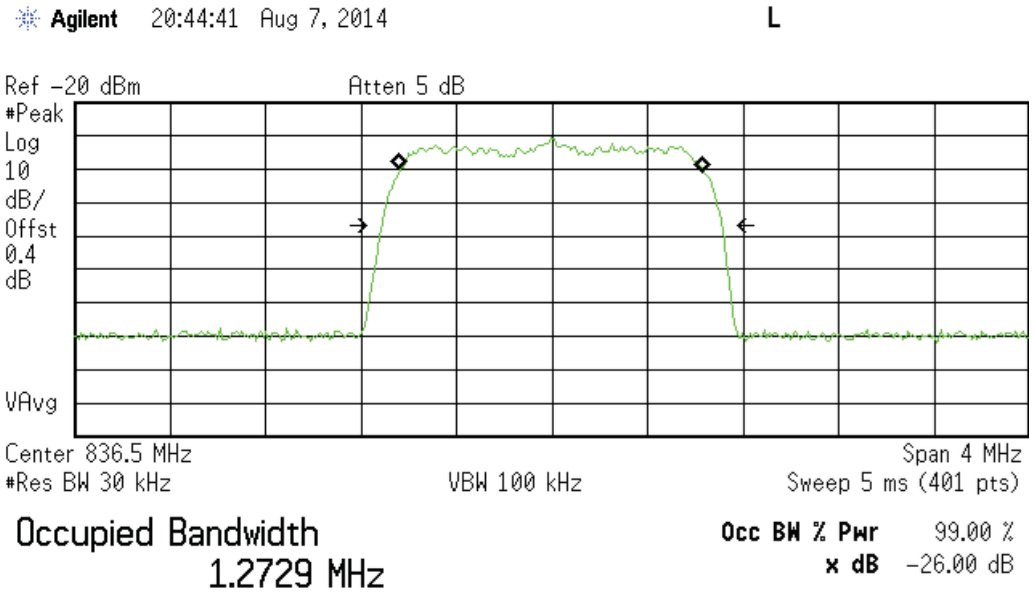
776-787 MHz Band
Input



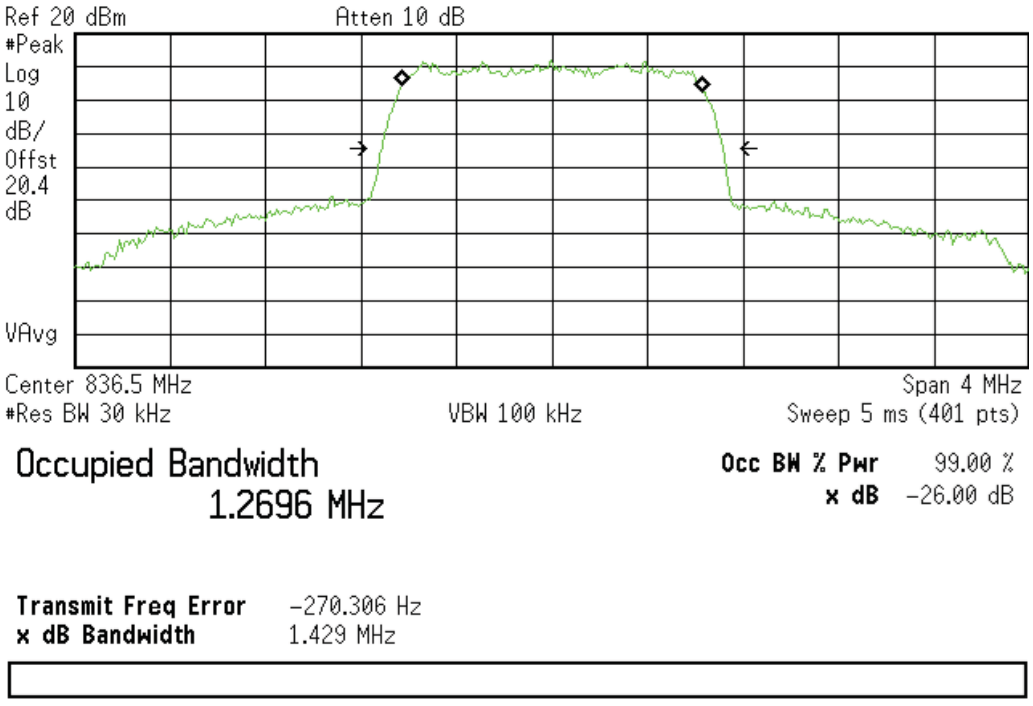
Output



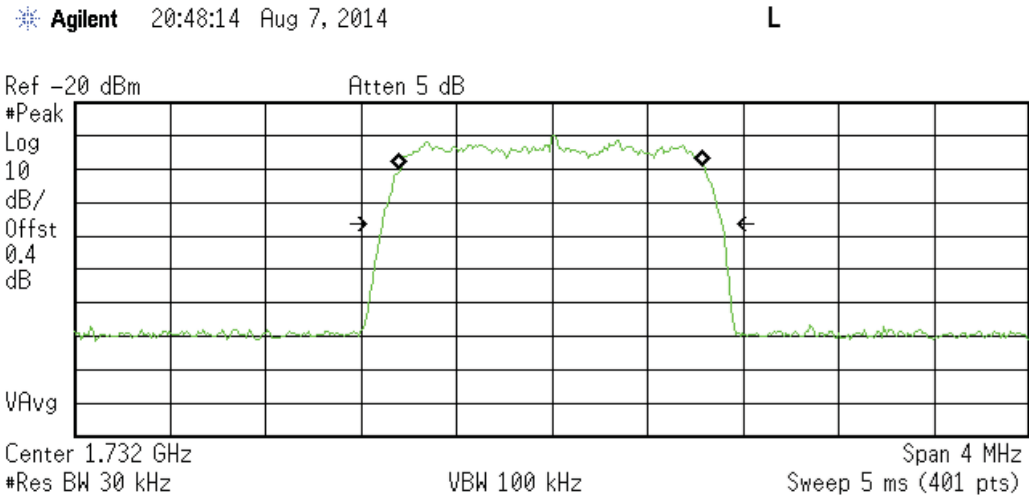
824-849 MHz Band
Input



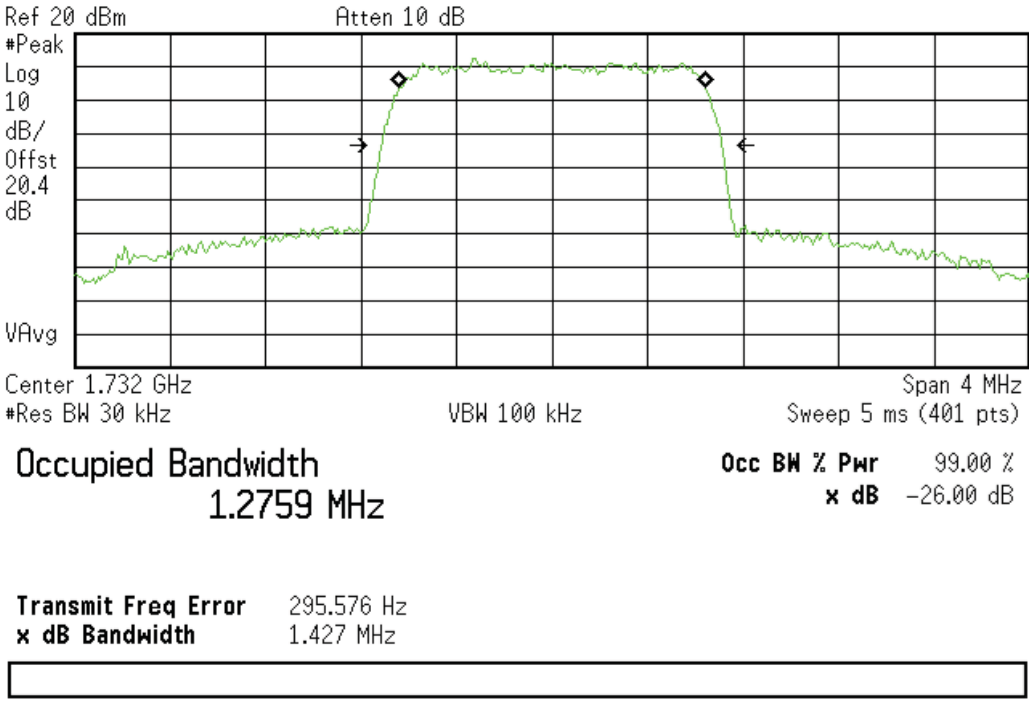
Output



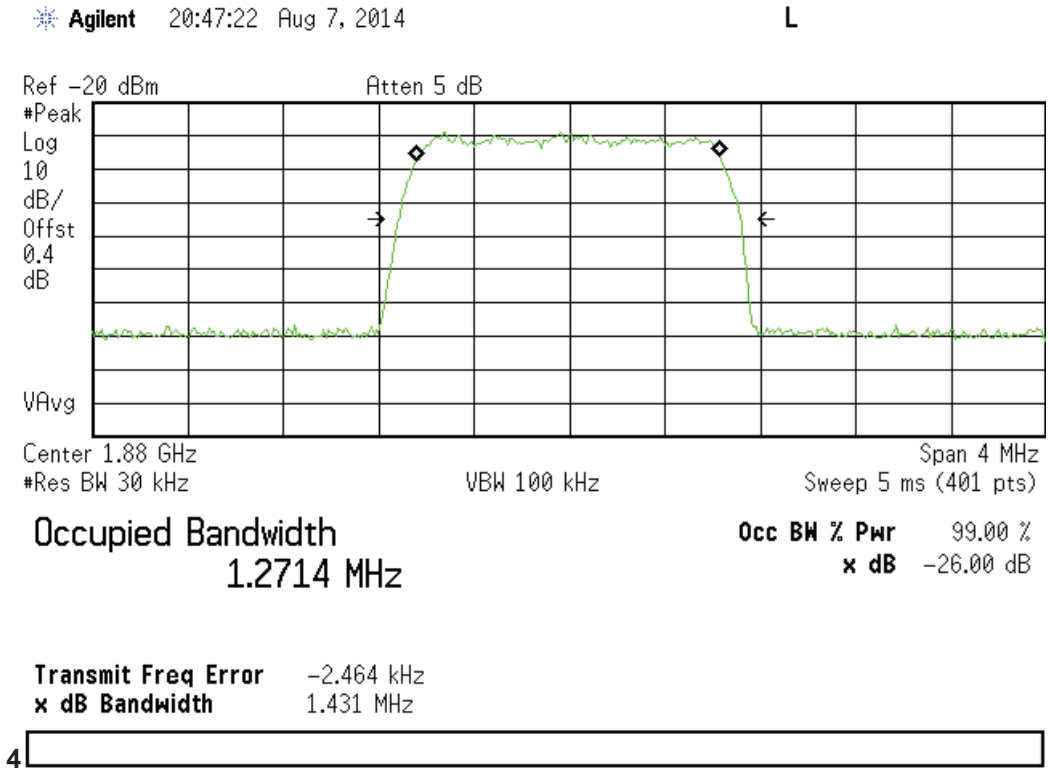
1710-1755 MHz Band
Input



Output

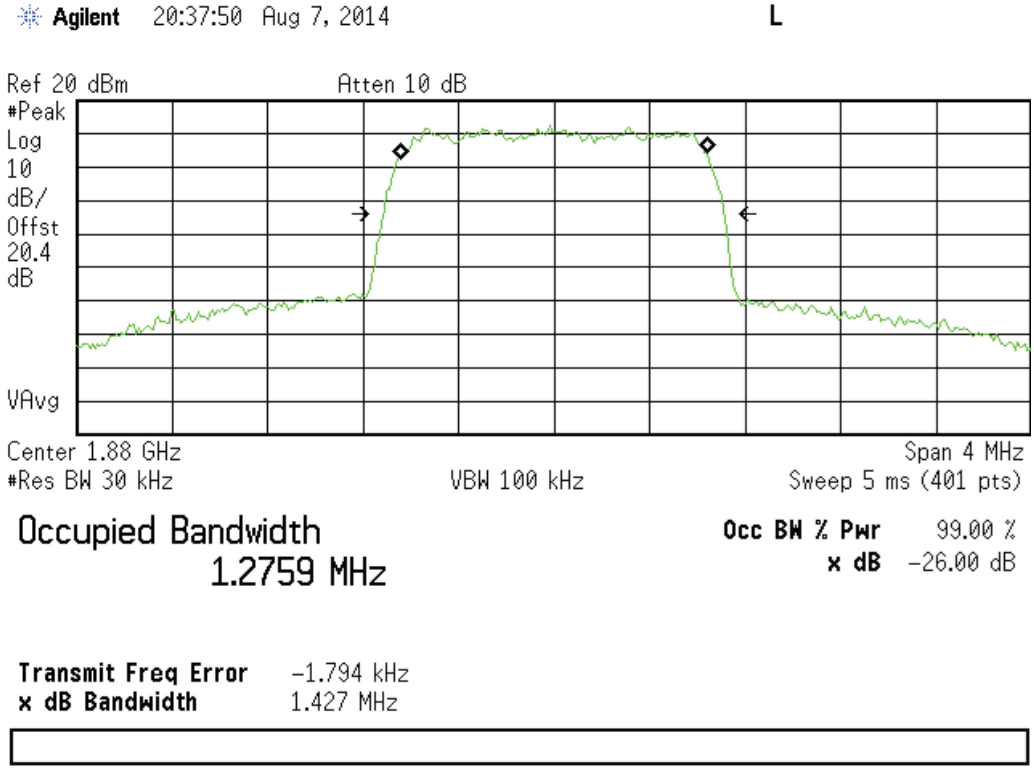


1850-1915 MHz Band
Input

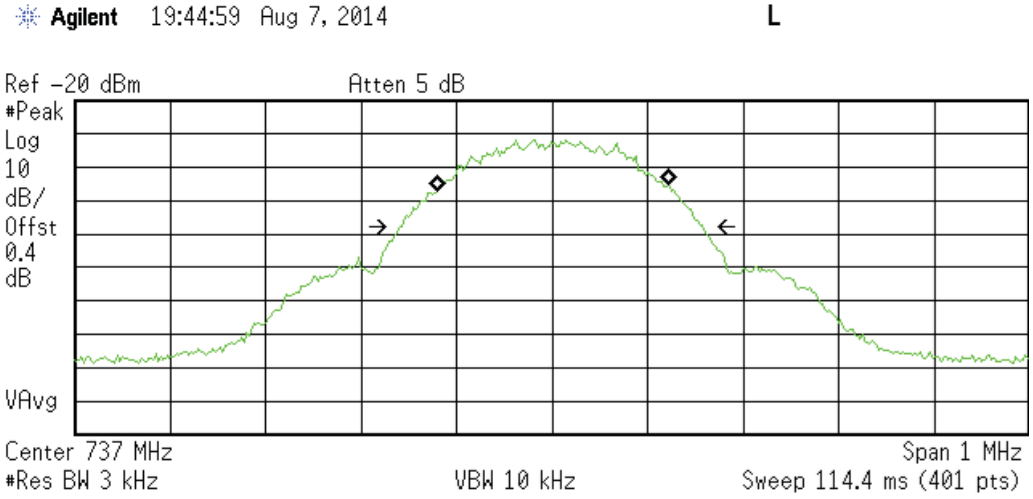


4

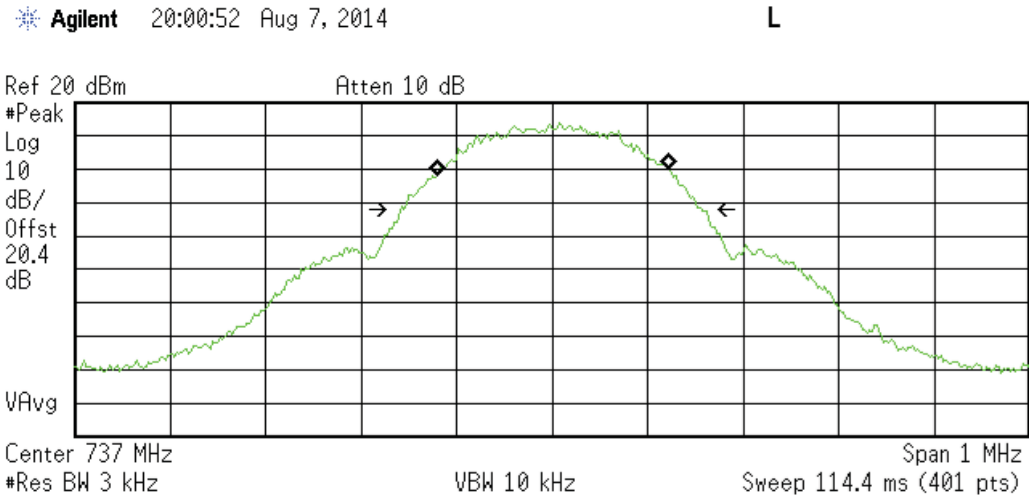
Output



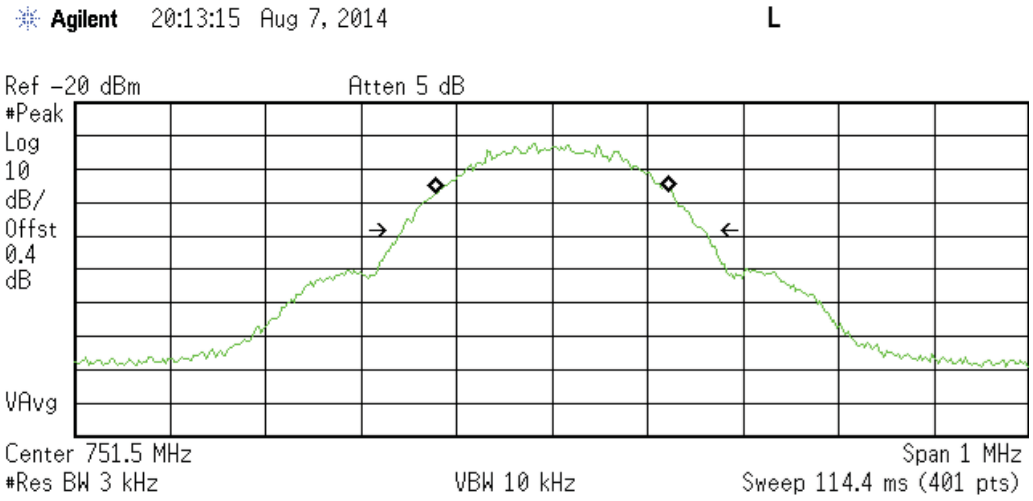
Downlink (GSM Signal)
728-746 MHz Band
Input



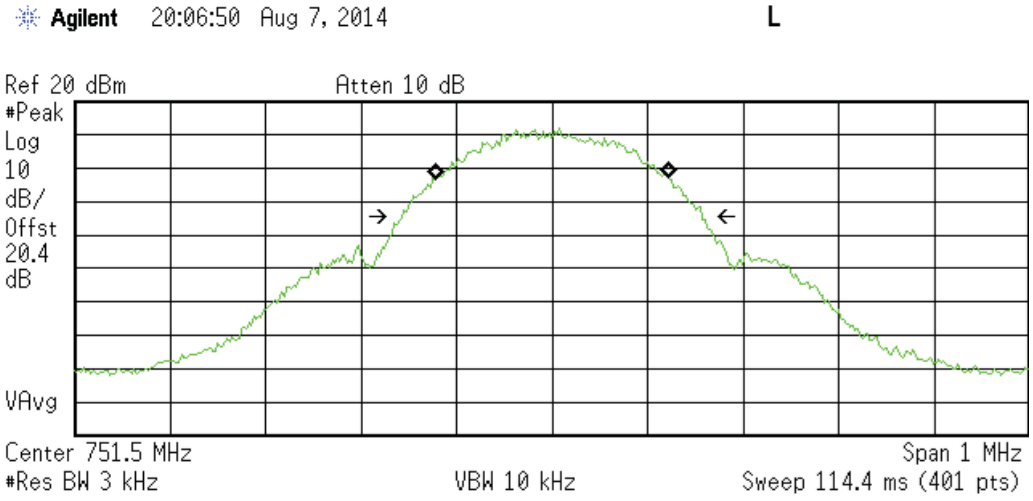
Output



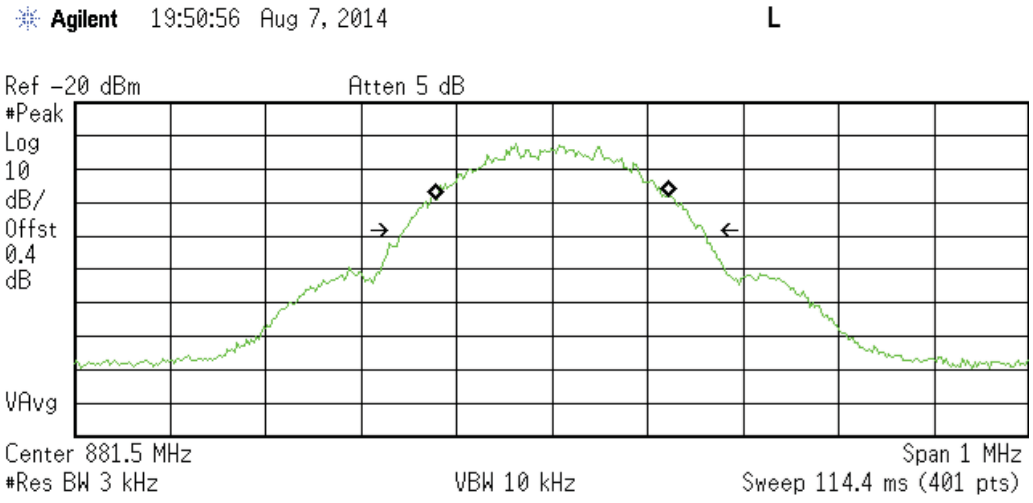
746-757 MHz Band
Input



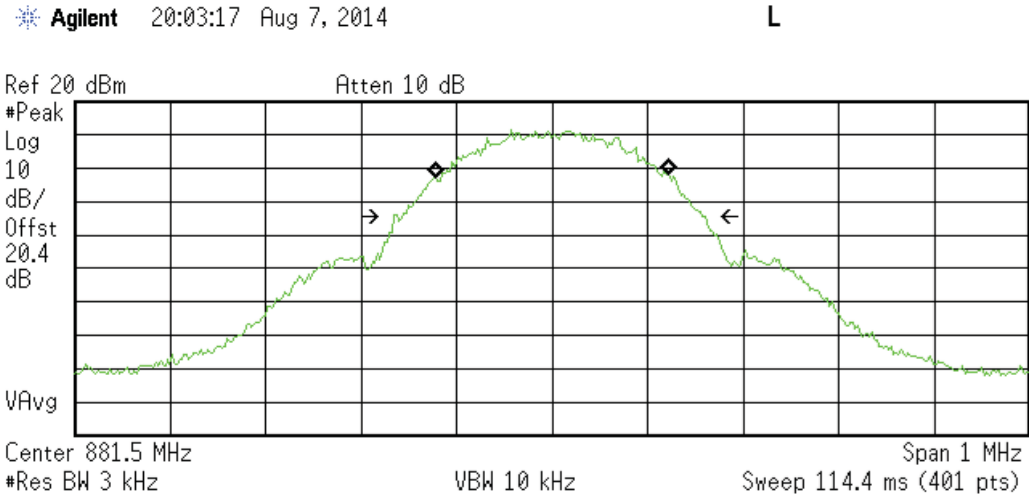
Output



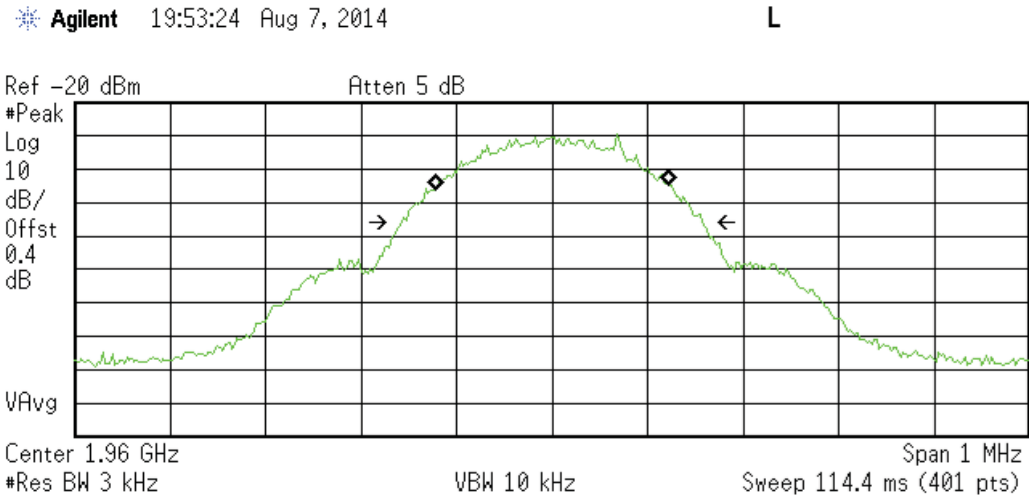
869-894 MHz Band
Input



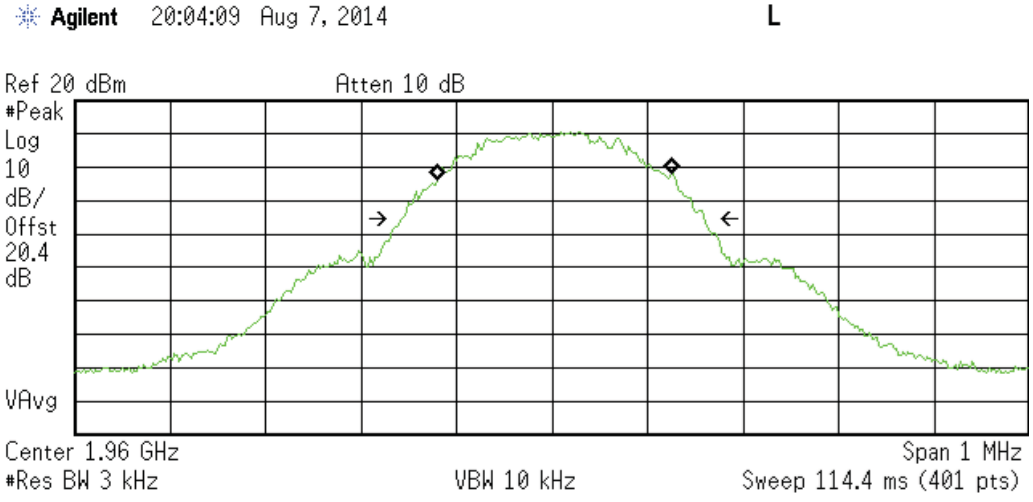
Output



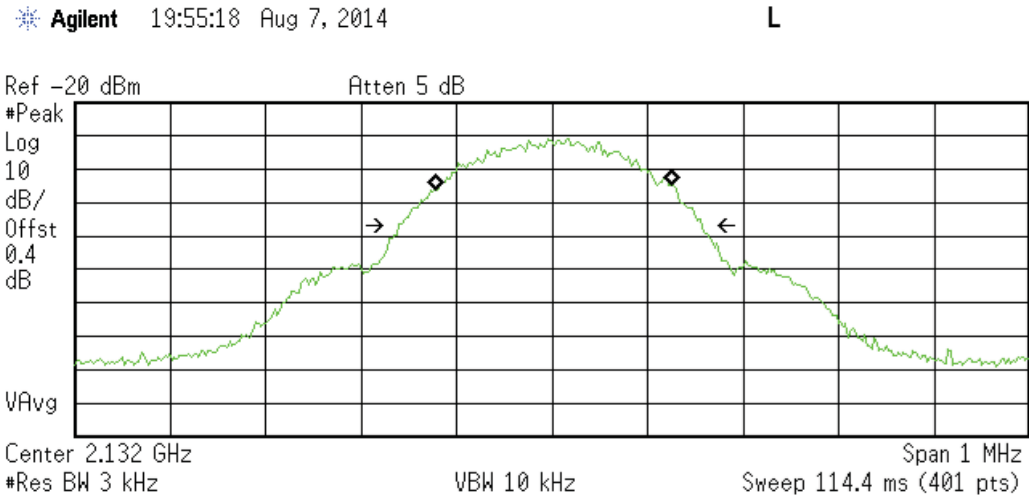
1930-1995 MHz Band
Input



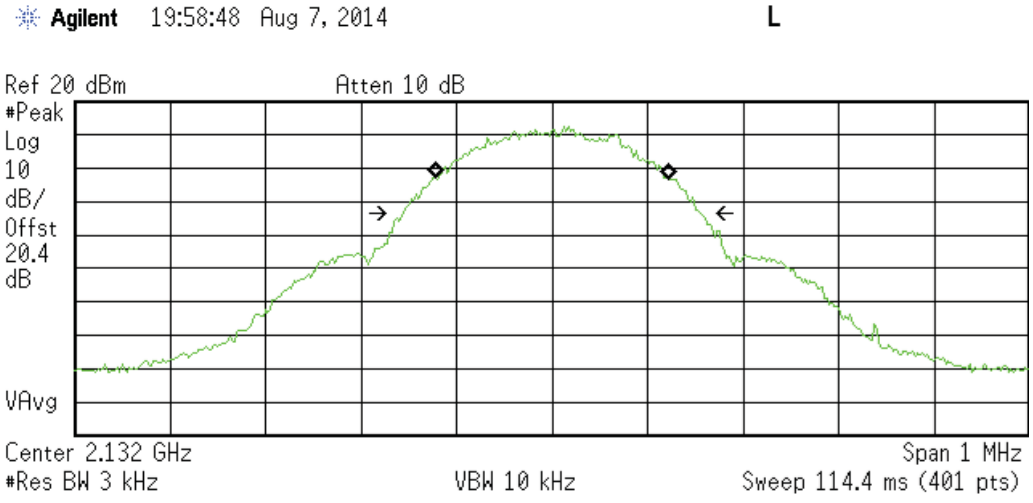
Output



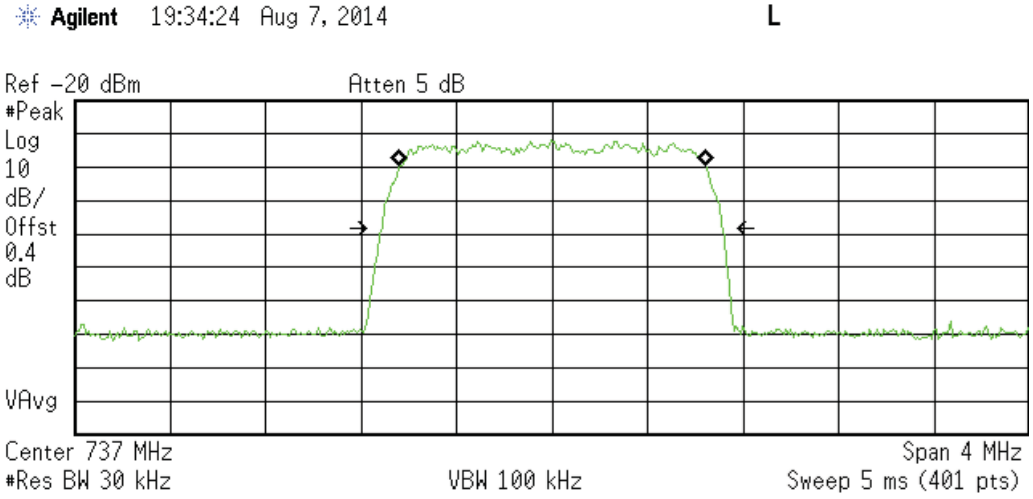
2110-2155 MHz Band
Input



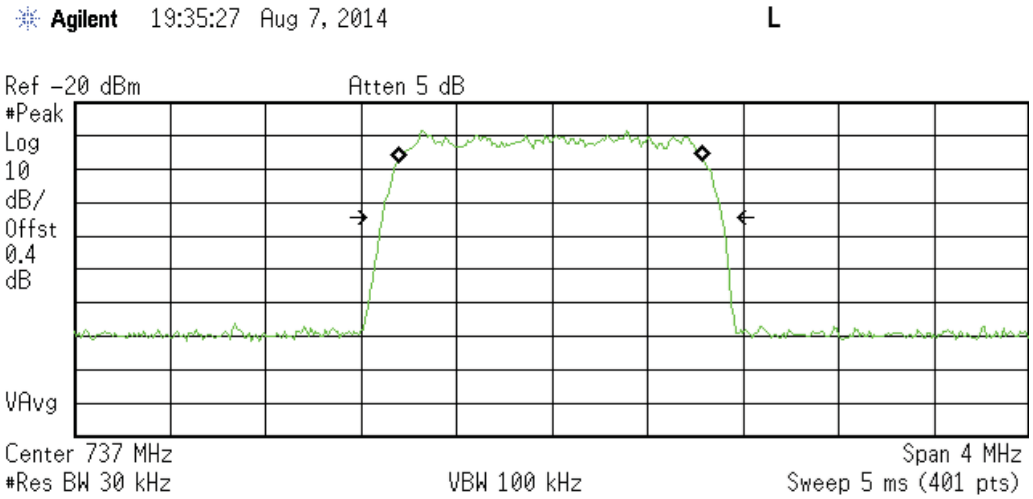
Output



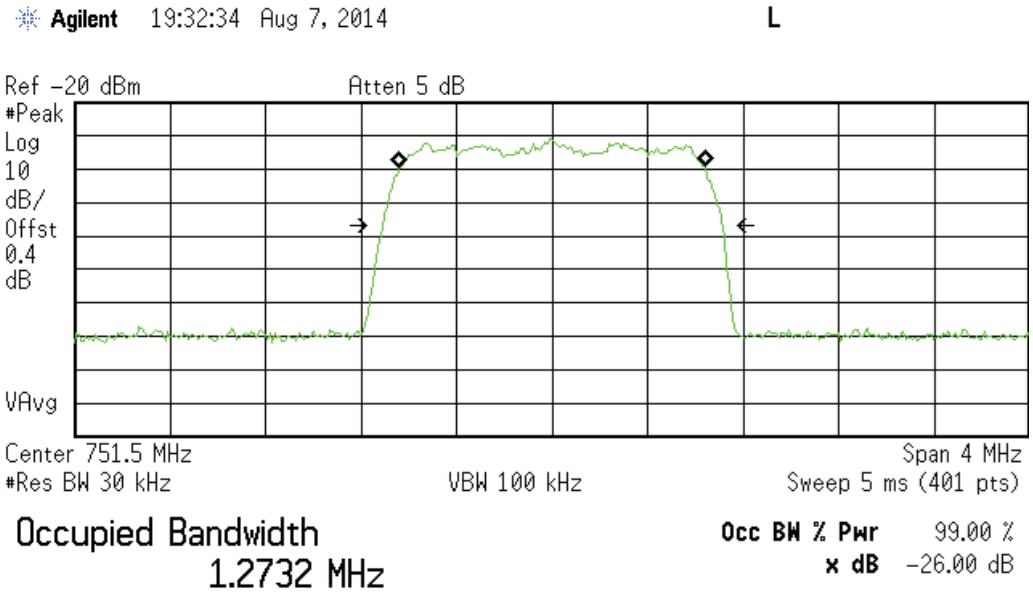
Downlink (CDMA Signal)
728-746 MHz Band
Input



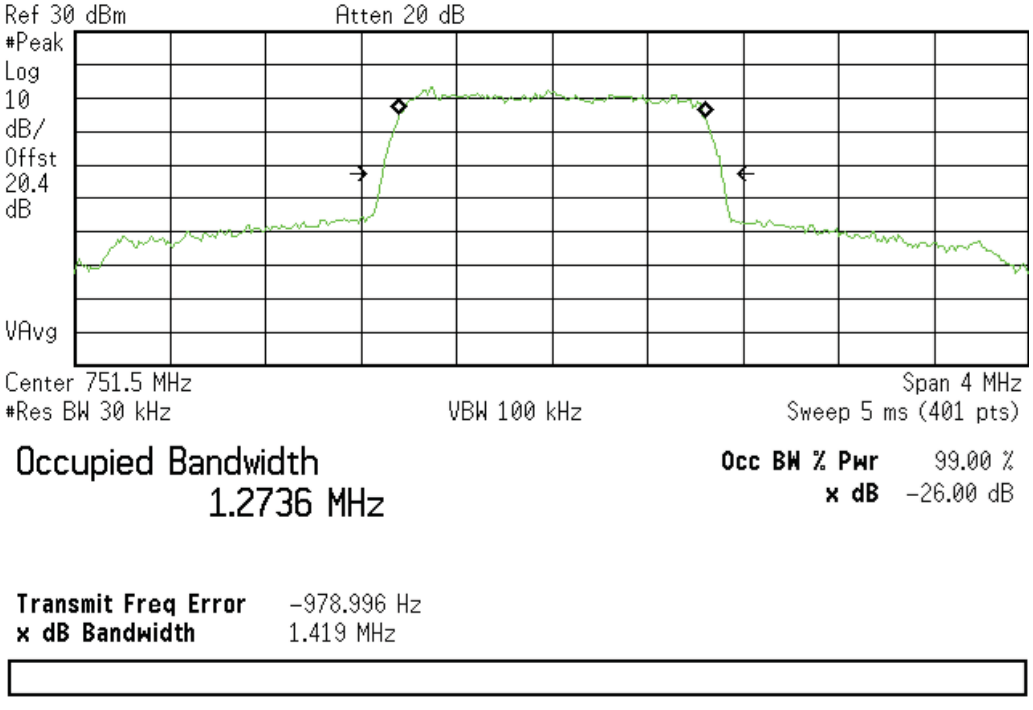
Output



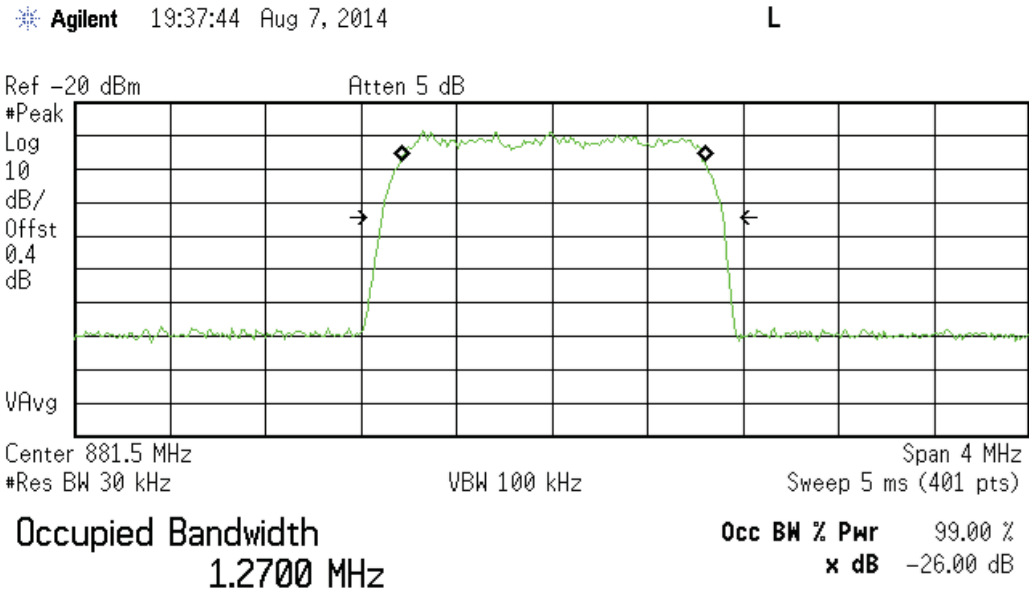
746-757 MHz Band
Input



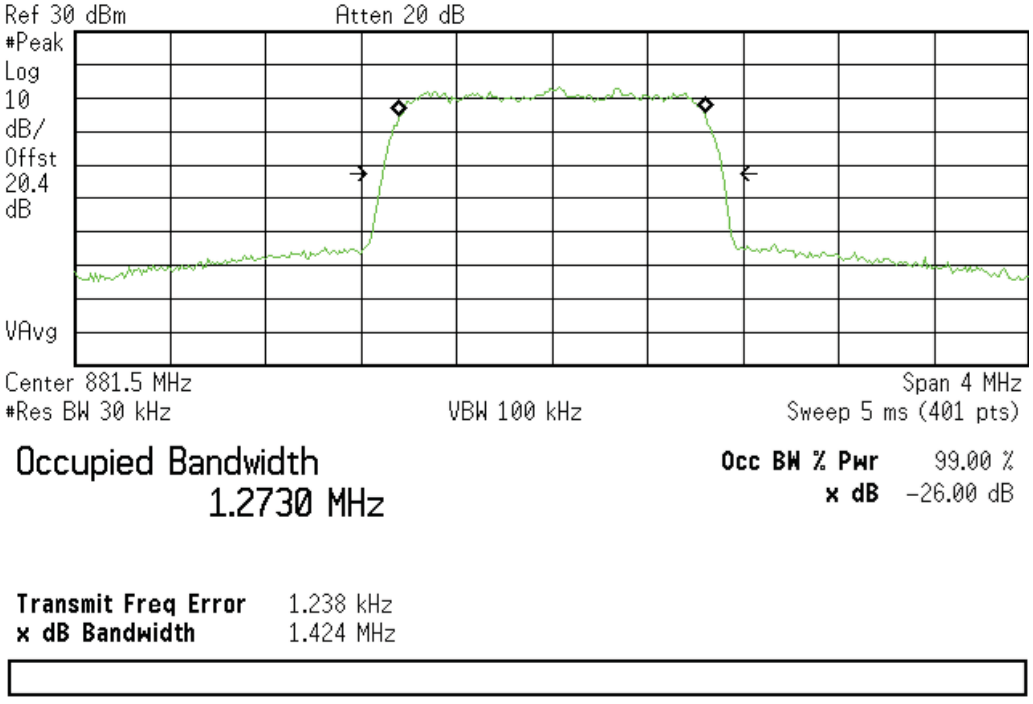
Output



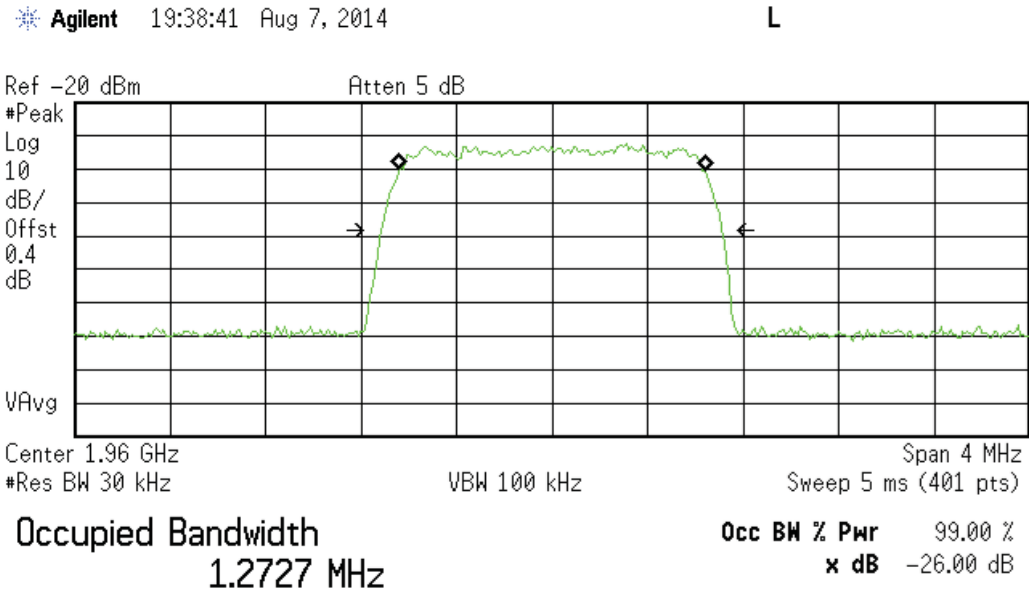
869-894 MHz Band
Input



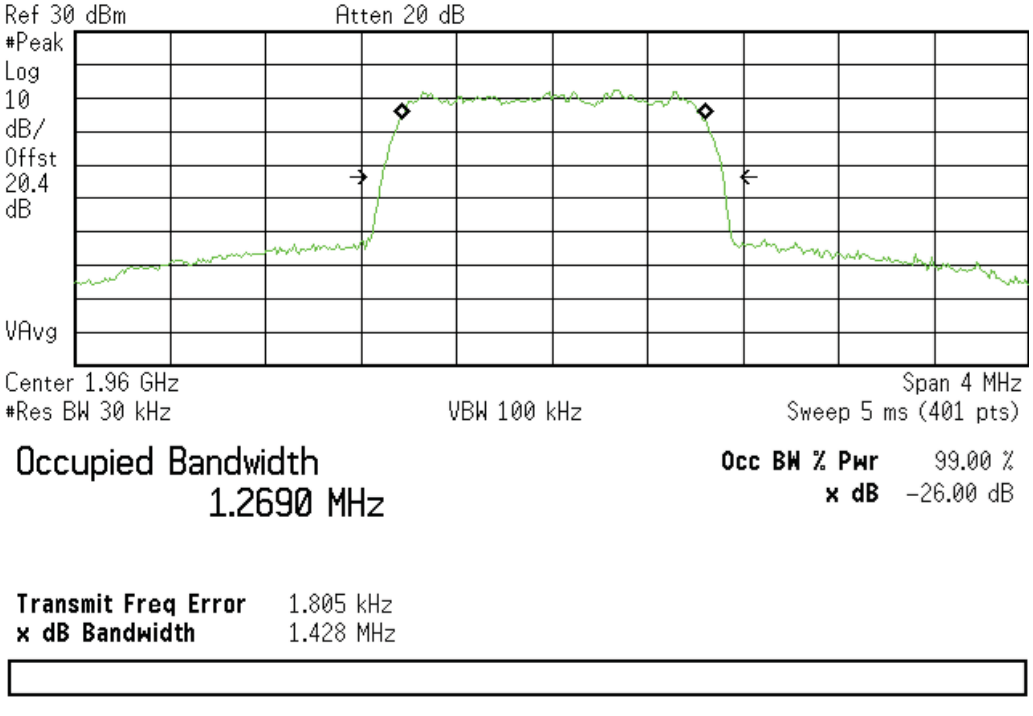
Output



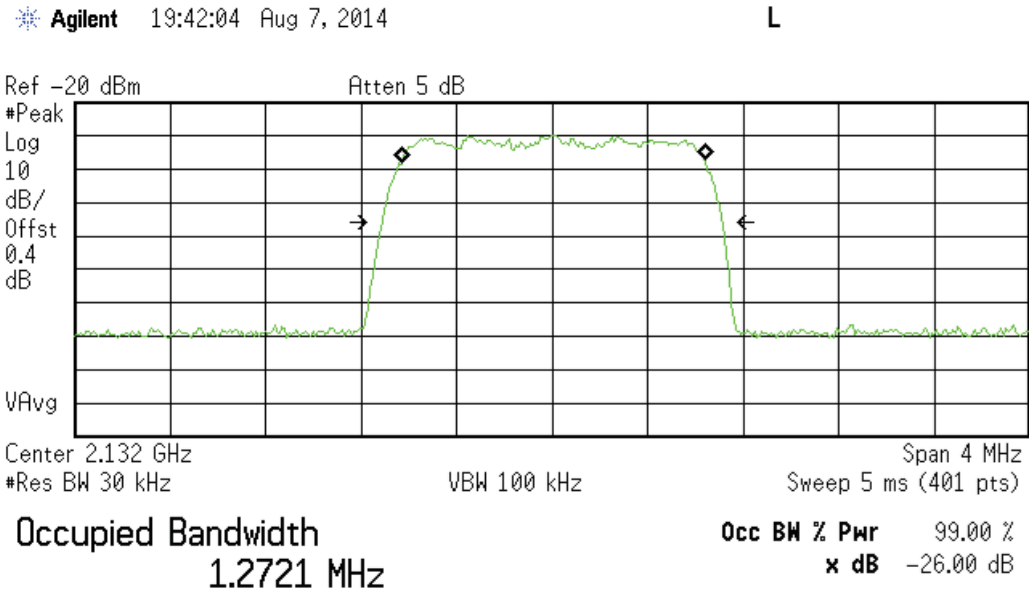
1930-1995 MHz Band
Input



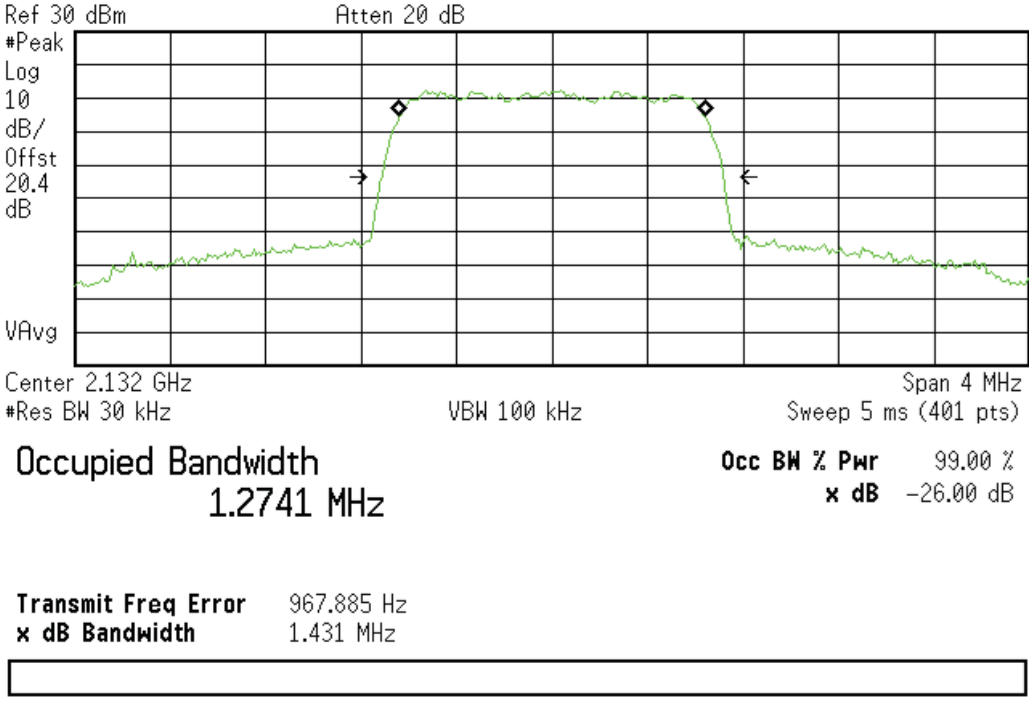
Output



2110-2155 MHz Band
Input



Output



Intermodulation

Name of Test:	Intermodulation	**Engineer:** Mike Graffeo
Test Equipment Utilized:	i00405, i00331	**Test Date:** 8/14/14

Test Procedure

The EUT was connected to a spectrum analyzer through a power attenuator. Two signal generators were utilized to produce a two tone signal set so the intermodulation products fell within the operational band. Frequency at the maximum power from out of band rejection was utilized.

The RF input signal level was set to 0.2 dB below the AGC Threshold for this test and then repeated at 3dBm and 6dBm above AGC level.

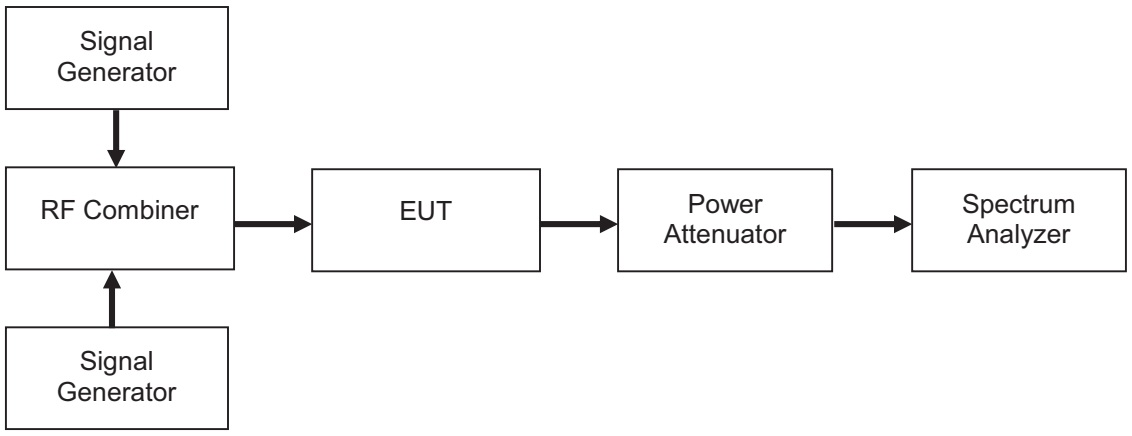
All losses for the combiner and cables were accounted for.

Plots show lower and upper frequencies pairs across band.

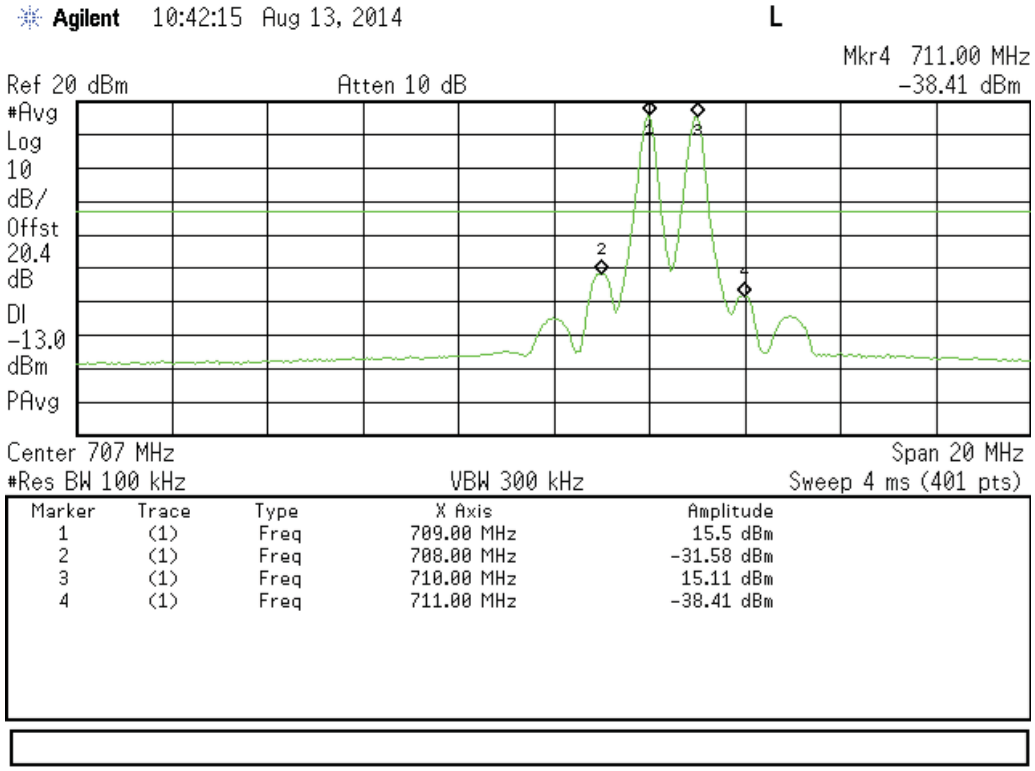
Note1: The RBW was increased to better view the intermodulation products, and significant time was allowed to pass before plotting.

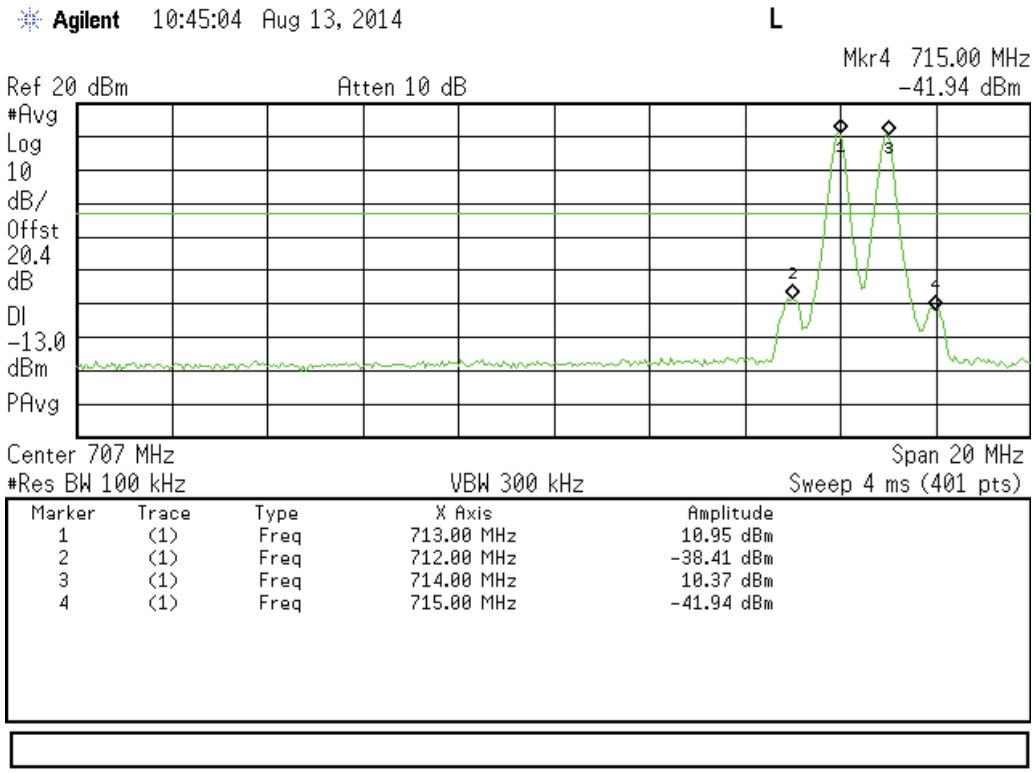
Note2: When the band was narrower compared to fitting two wide band signals, the plots were still left in the report for reference.

Test Setup

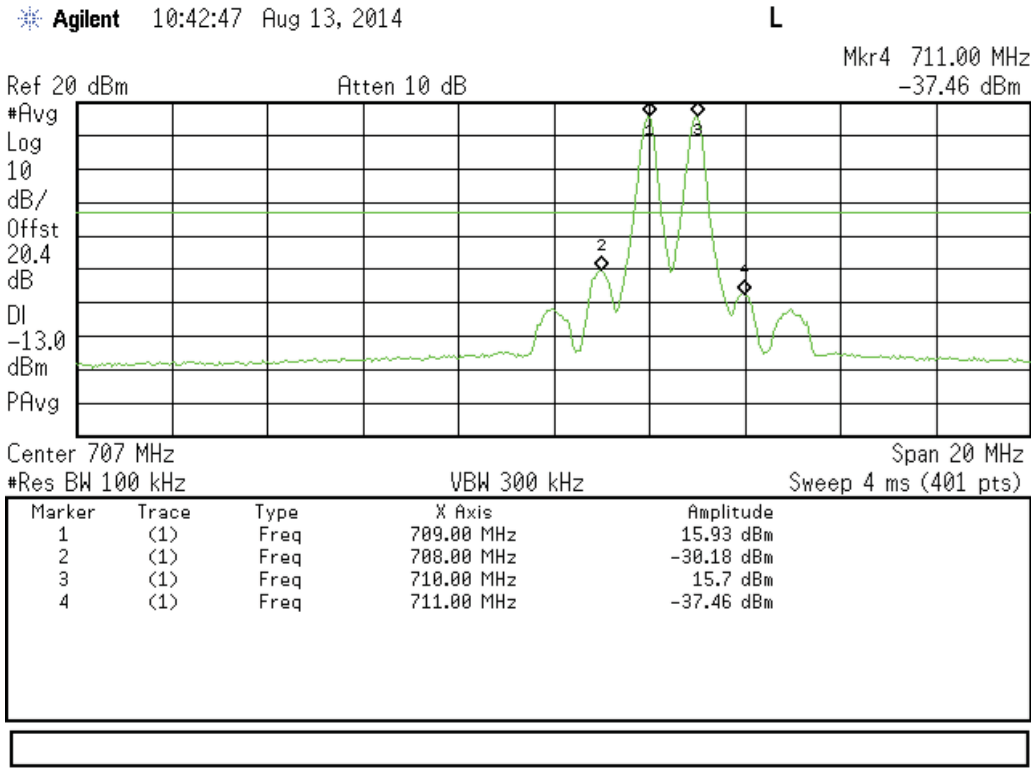


Intermodulation Uplink Test Results at AGC (GSM Signal)
698 - 716 MHz Band

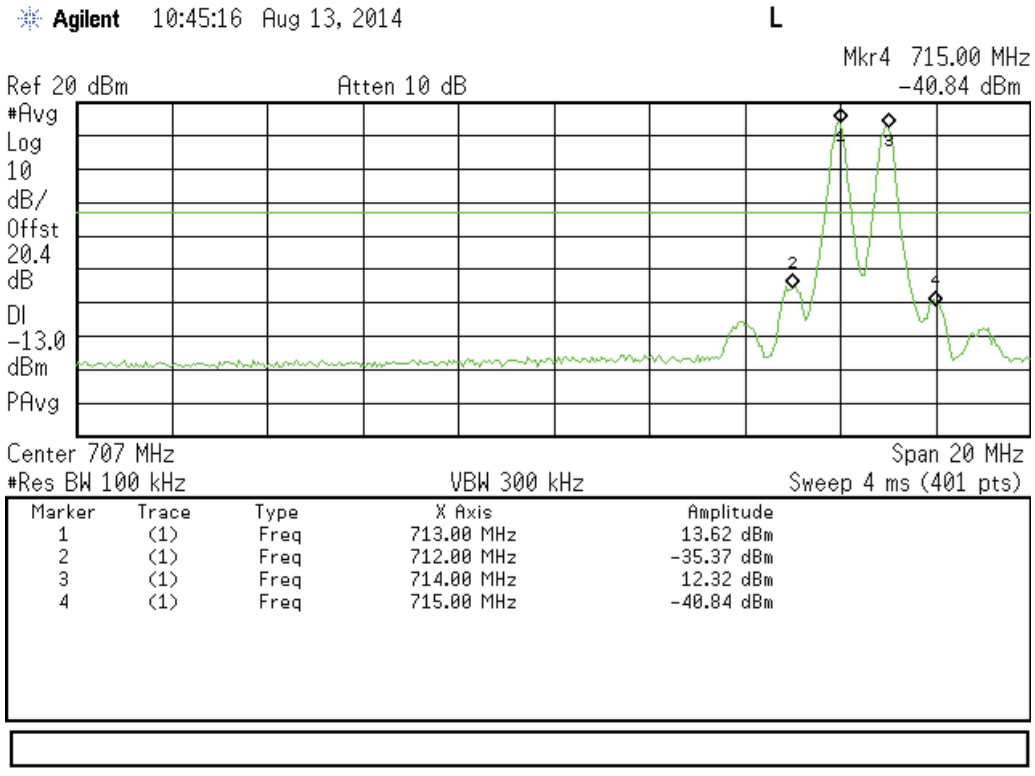




Intermodulation Uplink Test Results at 3db above AGC (GSM Signal)
698 - 716 MHz Band

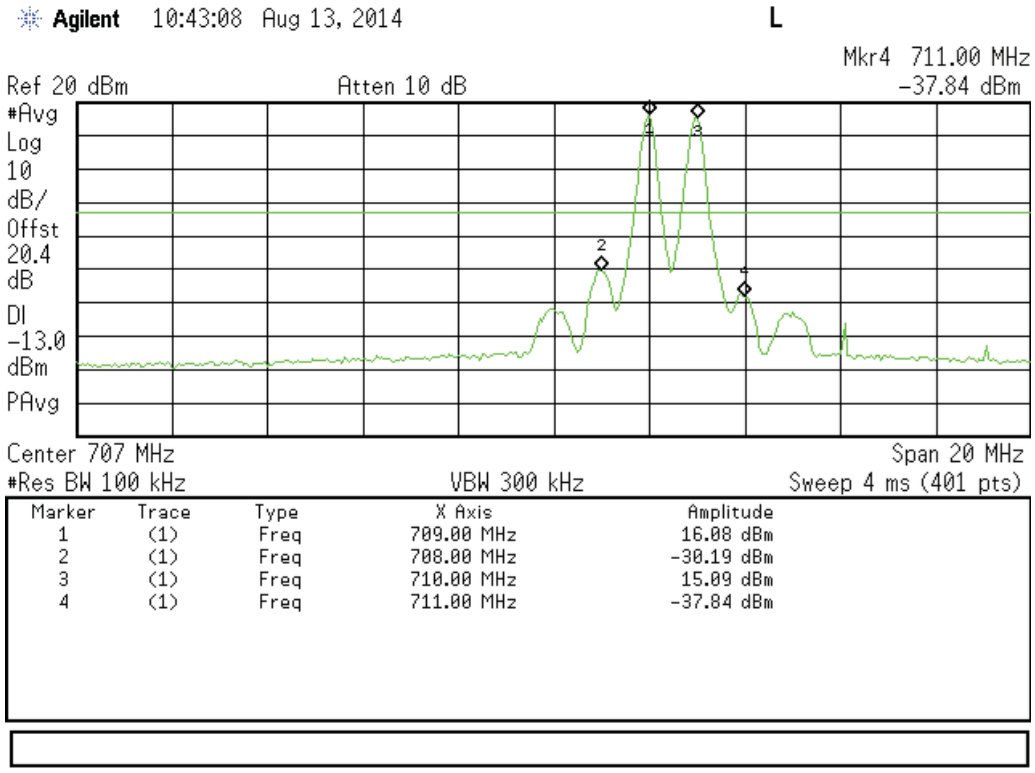


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	709.00 MHz	15.93 dBm
2	(1)	Freq	708.00 MHz	-30.18 dBm
3	(1)	Freq	710.00 MHz	15.7 dBm
4	(1)	Freq	711.00 MHz	-37.46 dBm

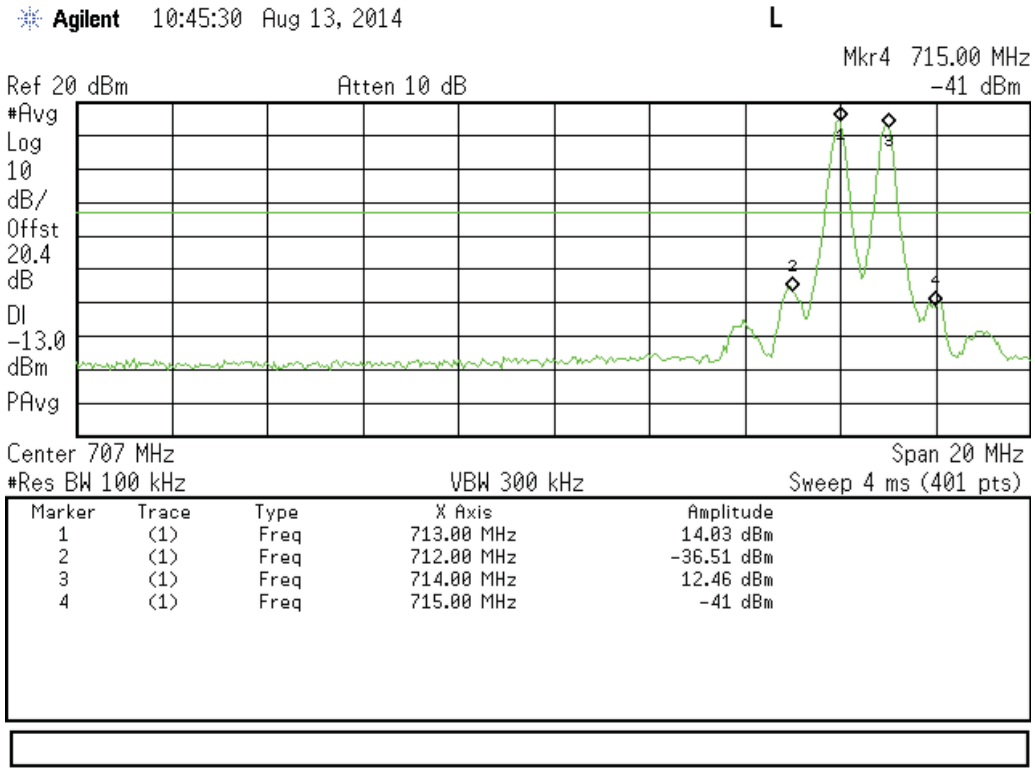


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	713.00 MHz	13.62 dBm
2	(1)	Freq	712.00 MHz	-35.37 dBm
3	(1)	Freq	714.00 MHz	12.32 dBm
4	(1)	Freq	715.00 MHz	-40.84 dBm

Intermodulation Uplink Test Results at 6db above AGC (GSM Signal)
698 - 716 MHz Band

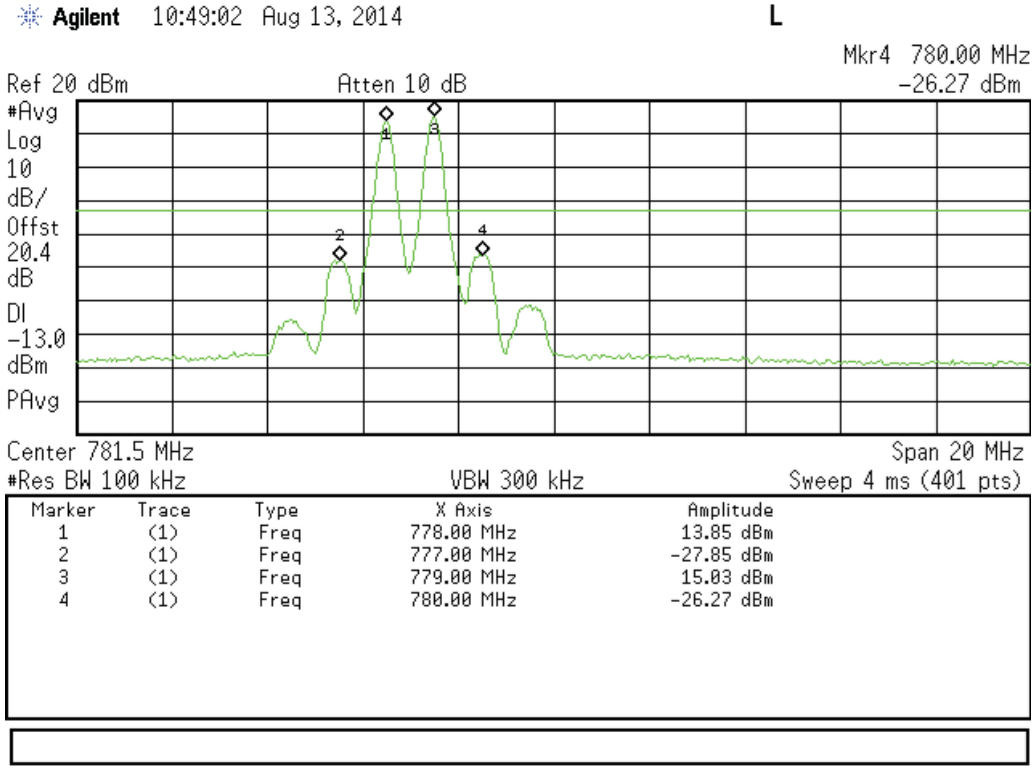


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	709.00 MHz	16.08 dBm
2	(1)	Freq	708.00 MHz	-30.19 dBm
3	(1)	Freq	710.00 MHz	15.09 dBm
4	(1)	Freq	711.00 MHz	-37.84 dBm

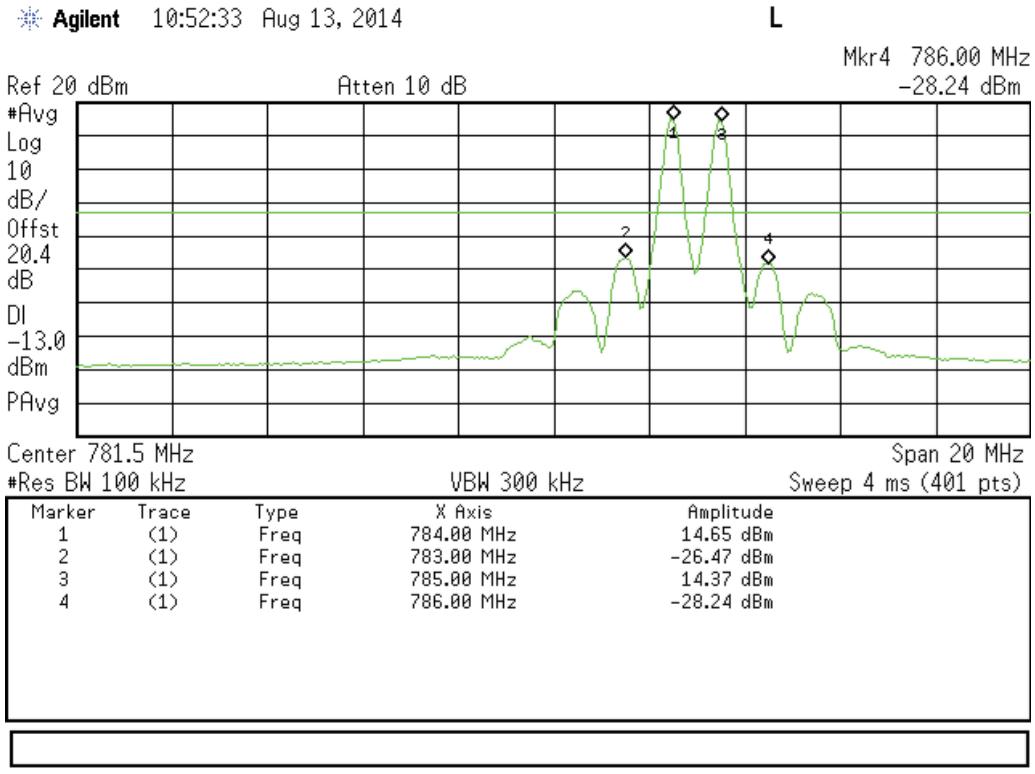


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	713.00 MHz	14.03 dBm
2	(1)	Freq	712.00 MHz	-36.51 dBm
3	(1)	Freq	714.00 MHz	12.46 dBm
4	(1)	Freq	715.00 MHz	-41 dBm

Intermodulation Uplink Test Results at AGC (GSM Signal)
776-787 MHz Band

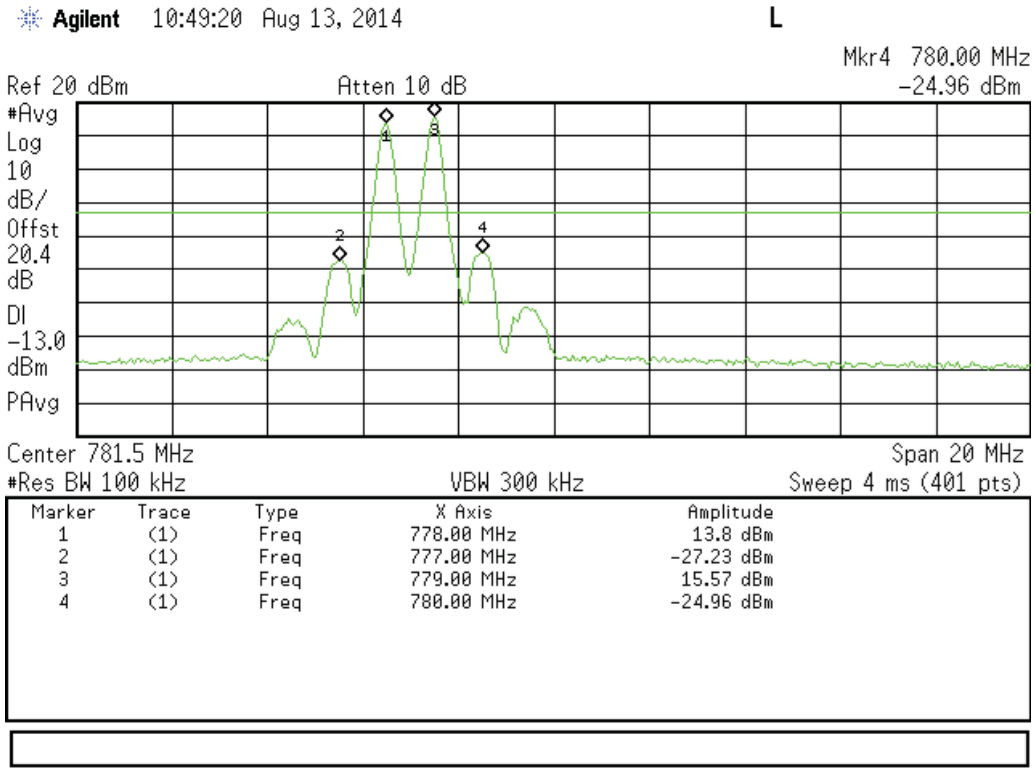


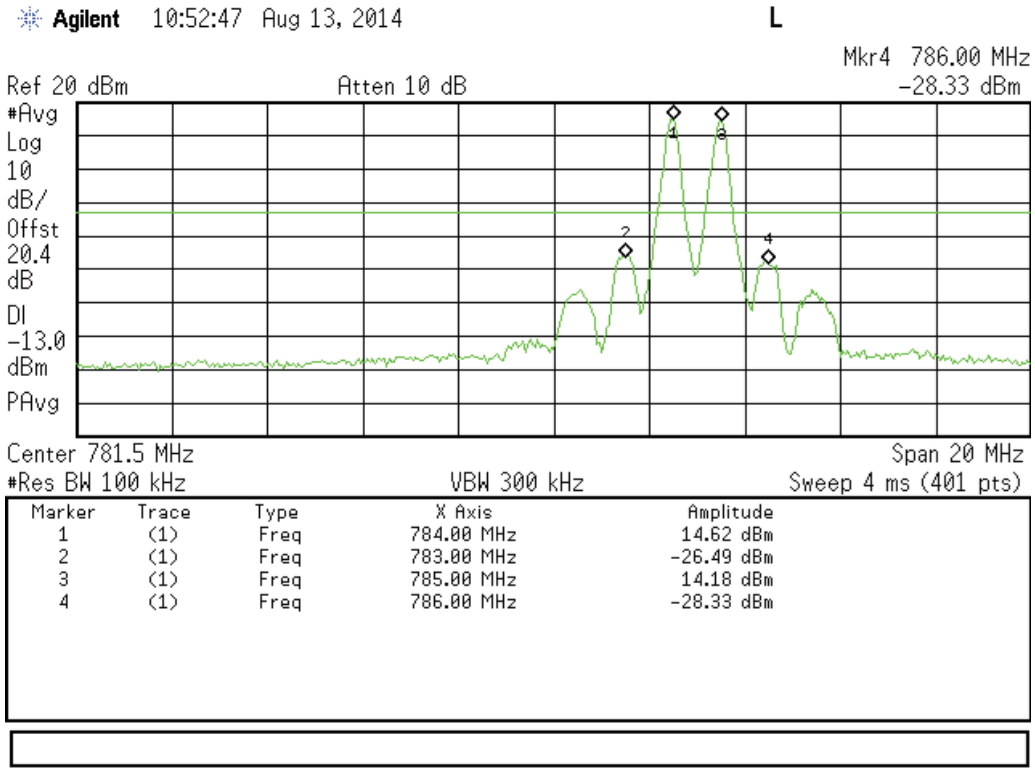
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	778.00 MHz	13.85 dBm
2	(1)	Freq	777.00 MHz	-27.85 dBm
3	(1)	Freq	779.00 MHz	15.03 dBm
4	(1)	Freq	780.00 MHz	-26.27 dBm



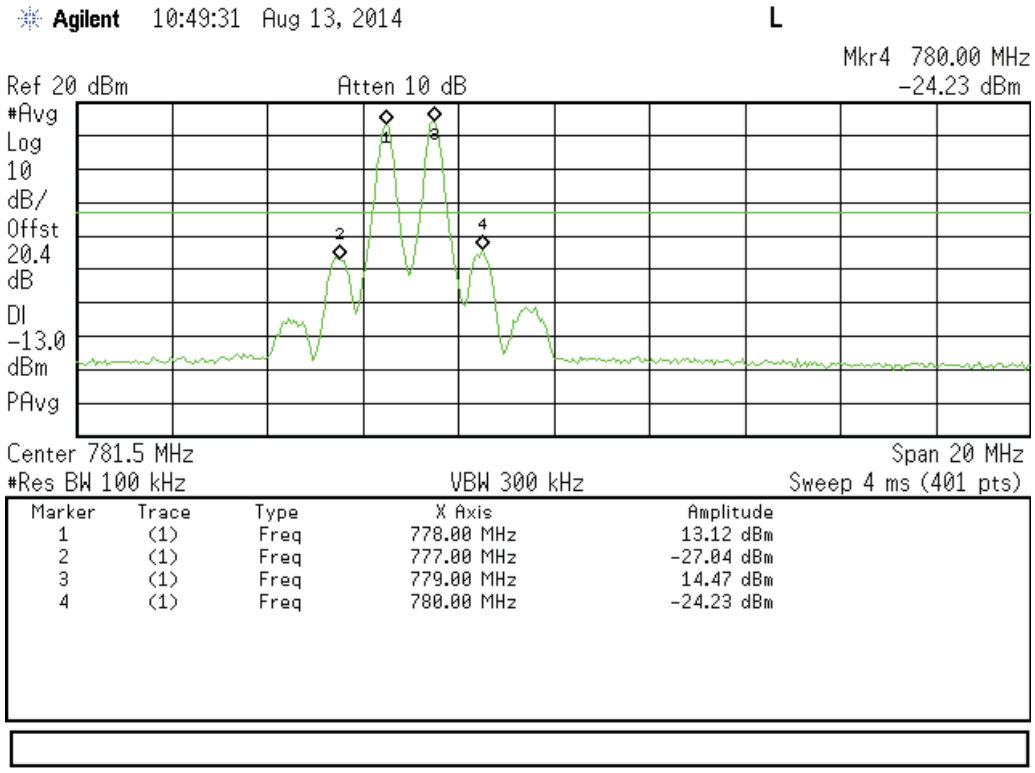
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	784.00 MHz	14.65 dBm
2	(1)	Freq	783.00 MHz	-26.47 dBm
3	(1)	Freq	785.00 MHz	14.37 dBm
4	(1)	Freq	786.00 MHz	-28.24 dBm

Intermodulation Uplink Test Results at 3db above AGC (GSM Signal)
776-787 MHz Band

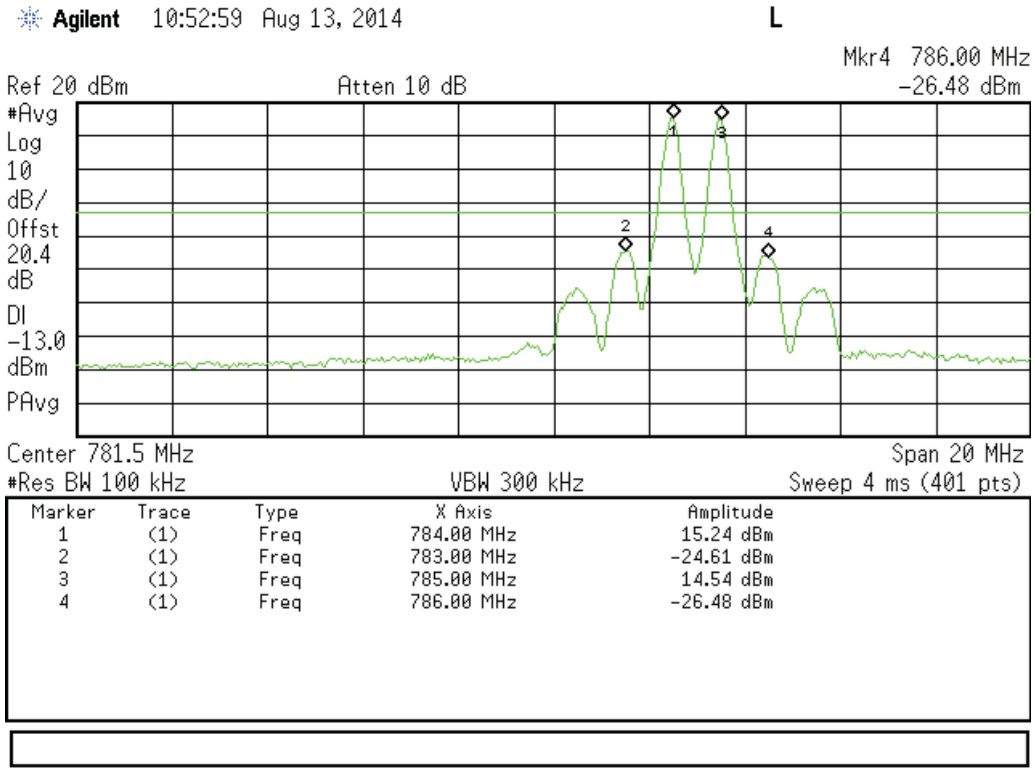




Intermodulation Uplink Test Results at 6db above AGC (GSM Signal)
776-787 MHz Band

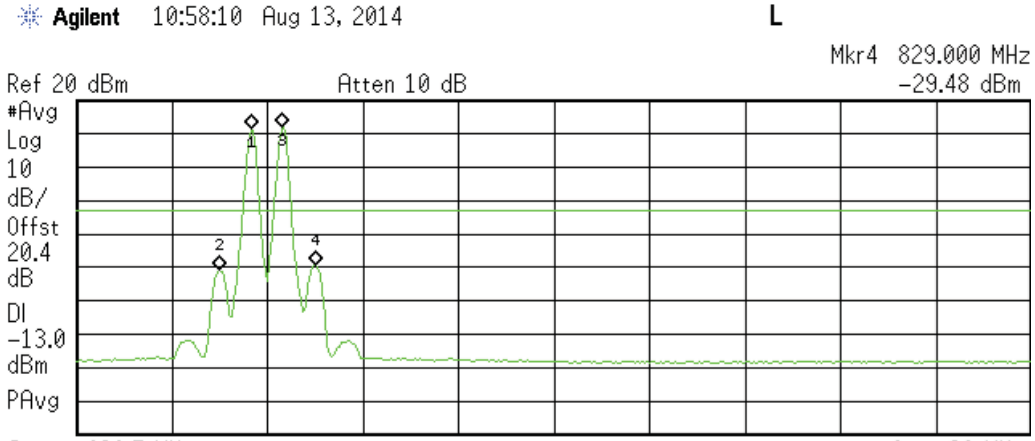


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	778.00 MHz	13.12 dBm
2	(1)	Freq	777.00 MHz	-27.04 dBm
3	(1)	Freq	779.00 MHz	14.47 dBm
4	(1)	Freq	780.00 MHz	-24.23 dBm

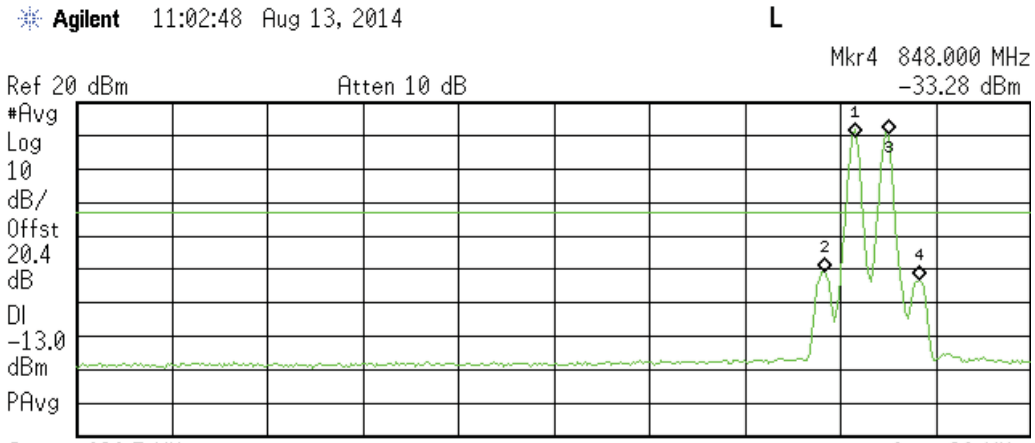


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	784.00 MHz	15.24 dBm
2	(1)	Freq	783.00 MHz	-24.61 dBm
3	(1)	Freq	785.00 MHz	14.54 dBm
4	(1)	Freq	786.00 MHz	-26.48 dBm

Intermodulation Uplink Test Results at AGC (GSM Signal)
824-849 MHz Band

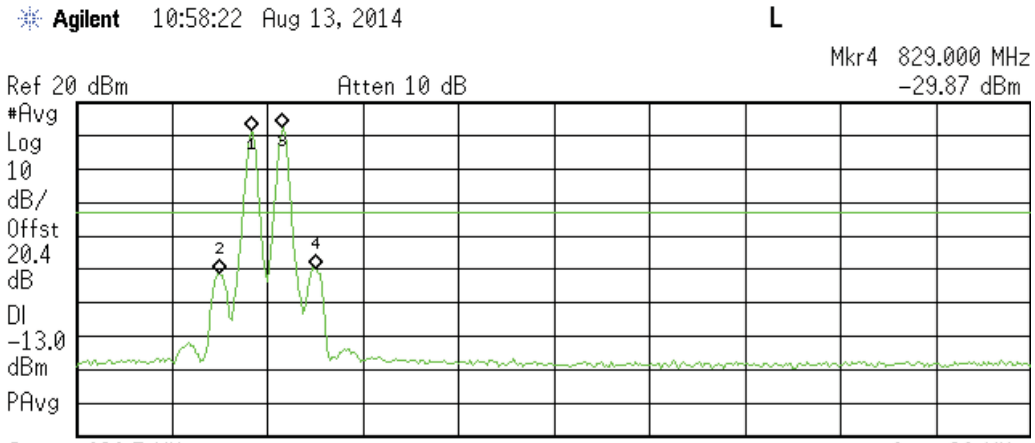


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	827.000 MHz	11.2 dBm
2	(1)	Freq	826.000 MHz	-30.89 dBm
3	(1)	Freq	828.000 MHz	11.82 dBm
4	(1)	Freq	829.000 MHz	-29.48 dBm

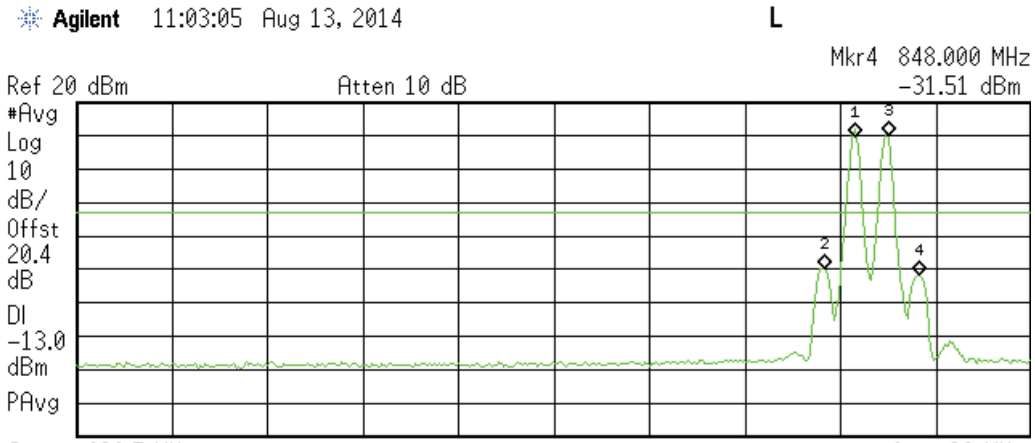


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	846.000 MHz	9.363 dBm
2	(1)	Freq	845.000 MHz	-30.91 dBm
3	(1)	Freq	847.000 MHz	10.41 dBm
4	(1)	Freq	848.000 MHz	-33.28 dBm

Intermodulation Uplink Test Results at 3db above AGC (GSM Signal)
824-849 MHz Band

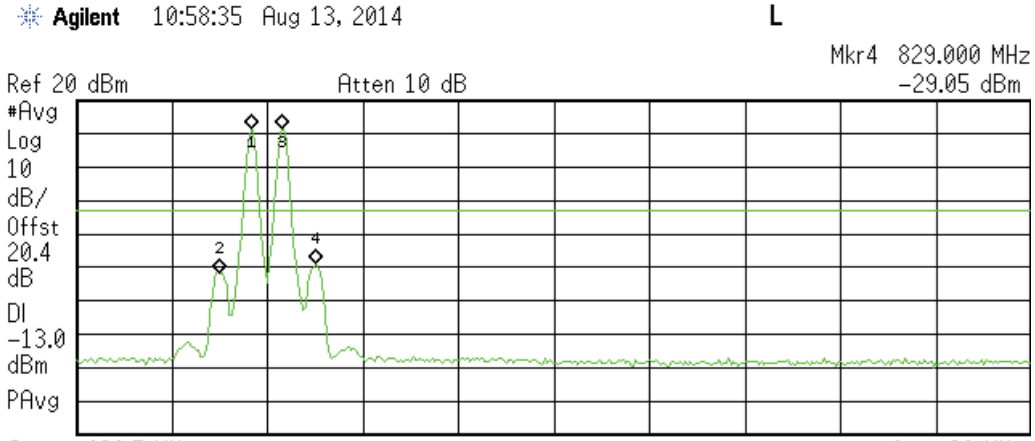


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	827.000 MHz	11.33 dBm
2	(1)	Freq	826.000 MHz	-31 dBm
3	(1)	Freq	828.000 MHz	12.14 dBm
4	(1)	Freq	829.000 MHz	-29.87 dBm

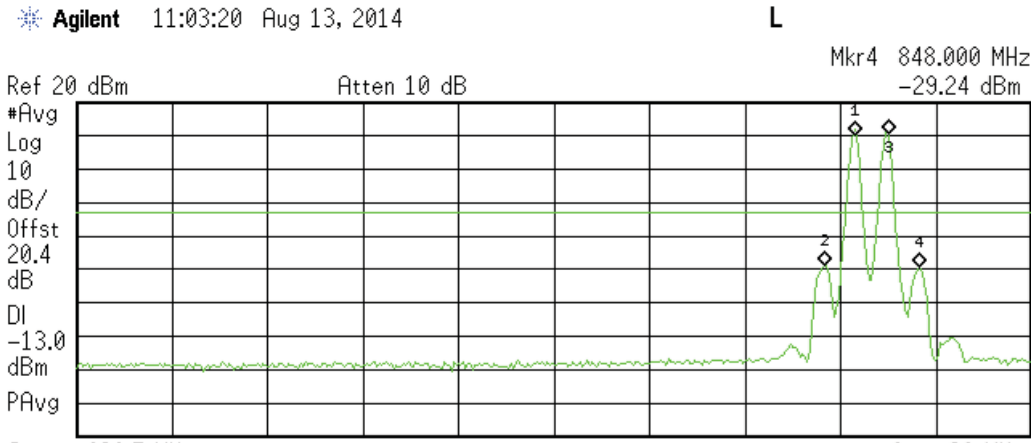


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	846.000 MHz	9.666 dBm
2	(1)	Freq	845.000 MHz	-29.92 dBm
3	(1)	Freq	847.000 MHz	9.927 dBm
4	(1)	Freq	848.000 MHz	-31.51 dBm

Intermodulation Uplink Test Results at 6db above AGC (GSM Signal)
824-849 MHz Band

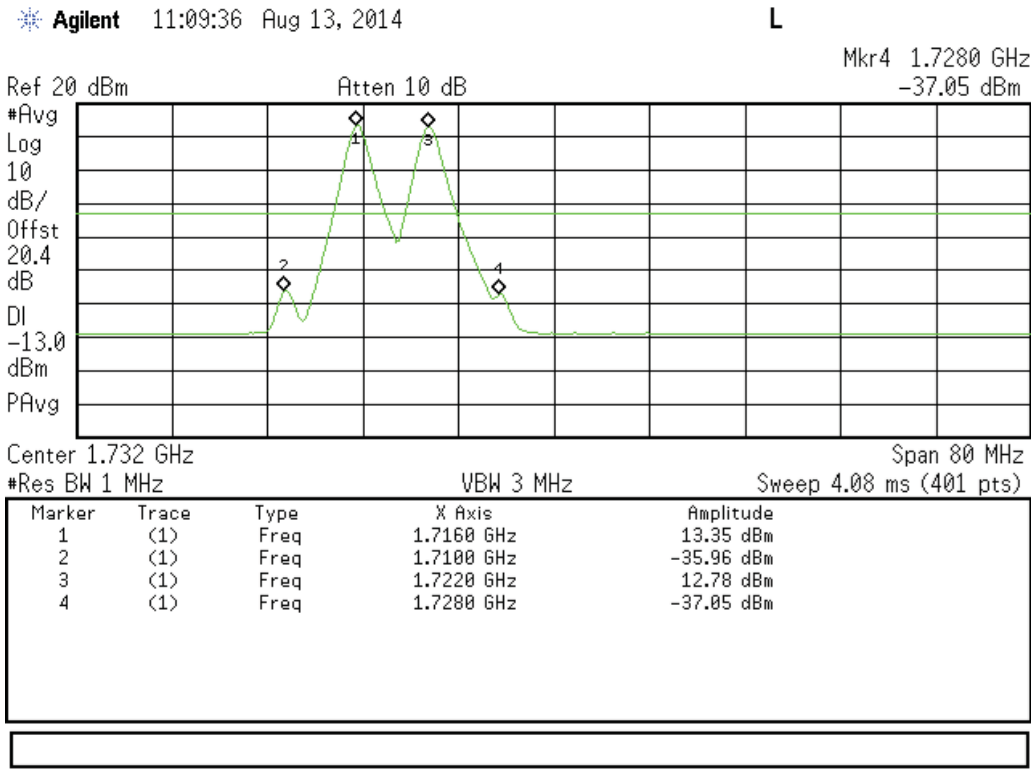


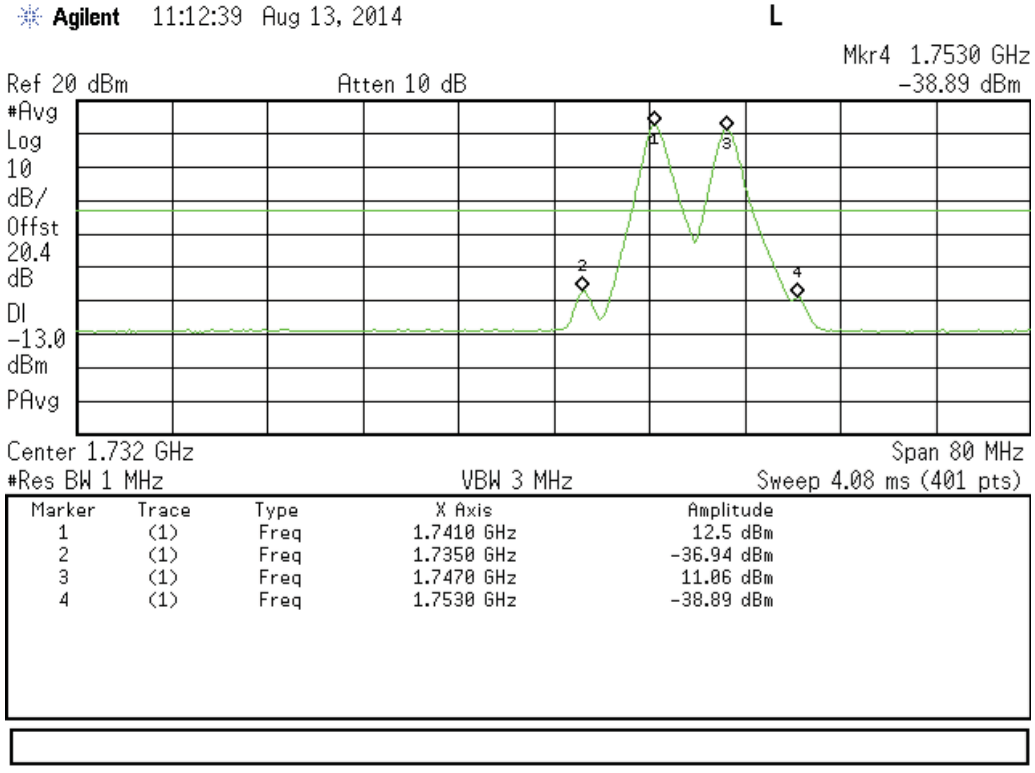
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	827.000 MHz	11.26 dBm
2	(1)	Freq	826.000 MHz	-31.83 dBm
3	(1)	Freq	828.000 MHz	11.34 dBm
4	(1)	Freq	829.000 MHz	-29.05 dBm



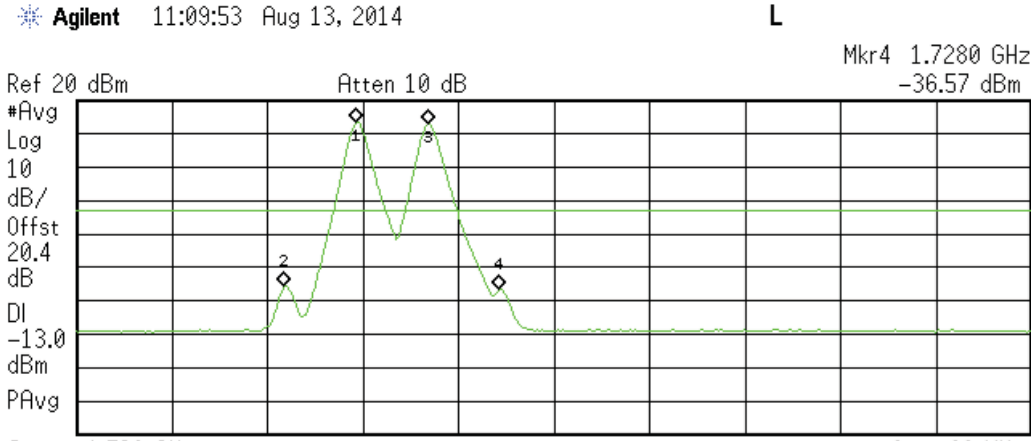
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	846.000 MHz	9.897 dBm
2	(1)	Freq	845.000 MHz	-28.65 dBm
3	(1)	Freq	847.000 MHz	10.49 dBm
4	(1)	Freq	848.000 MHz	-29.24 dBm

Intermodulation Uplink Test Results at AGC (GSM Signal)
1710-1755 MHz Band

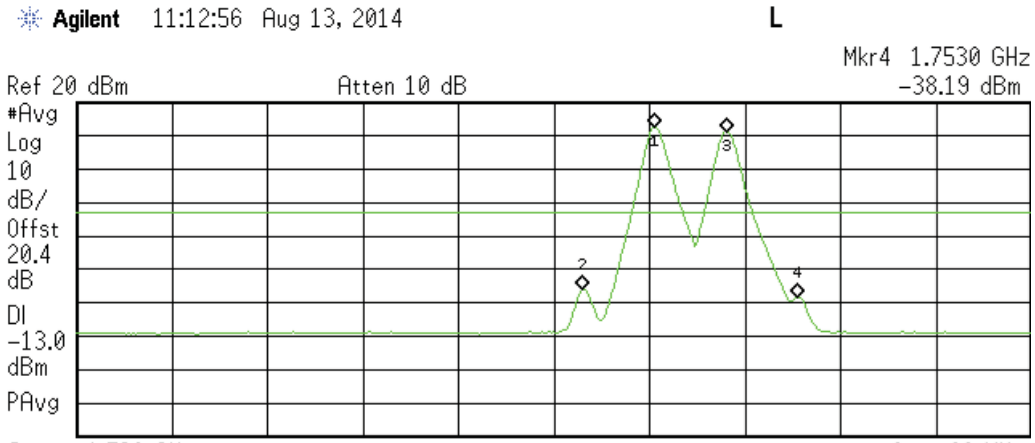




Intermodulation Uplink Test Results at 3db above AGC (GSM Signal)
1710-1755 MHz Band

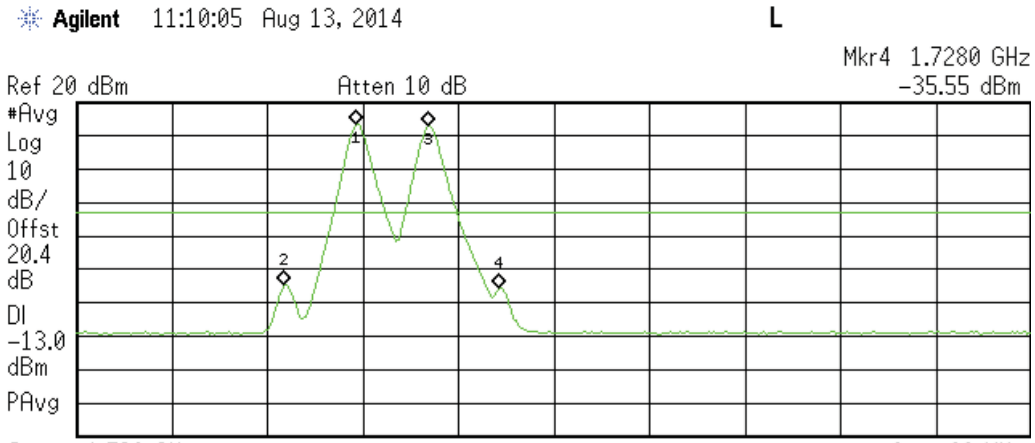


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.7160 GHz	13.28 dBm
2	(1)	Freq	1.7100 GHz	-35.55 dBm
3	(1)	Freq	1.7220 GHz	12.65 dBm
4	(1)	Freq	1.7280 GHz	-36.57 dBm

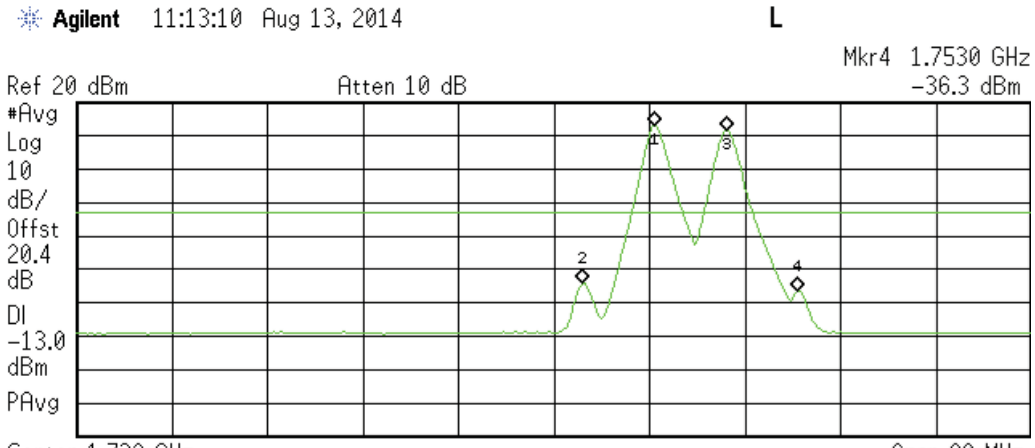


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.7410 GHz	12.54 dBm
2	(1)	Freq	1.7350 GHz	-36.17 dBm
3	(1)	Freq	1.7470 GHz	11.11 dBm
4	(1)	Freq	1.7530 GHz	-38.19 dBm

Intermodulation Uplink Test Results at 6db above AGC (GSM Signal)
1710-1755 MHz Band

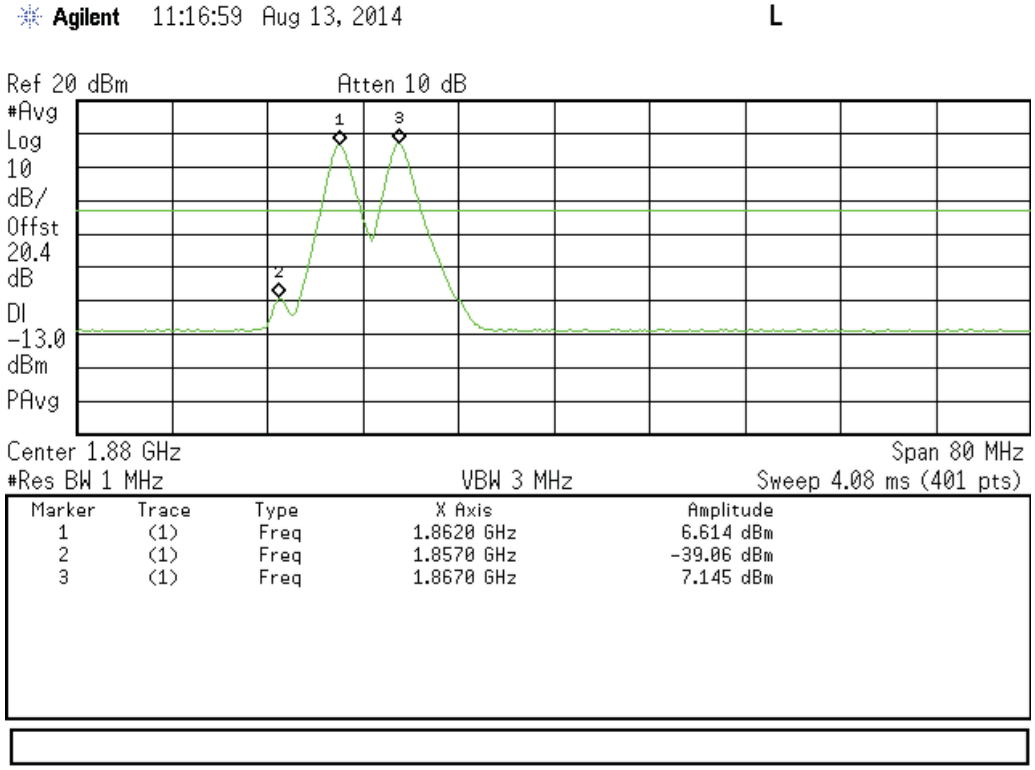


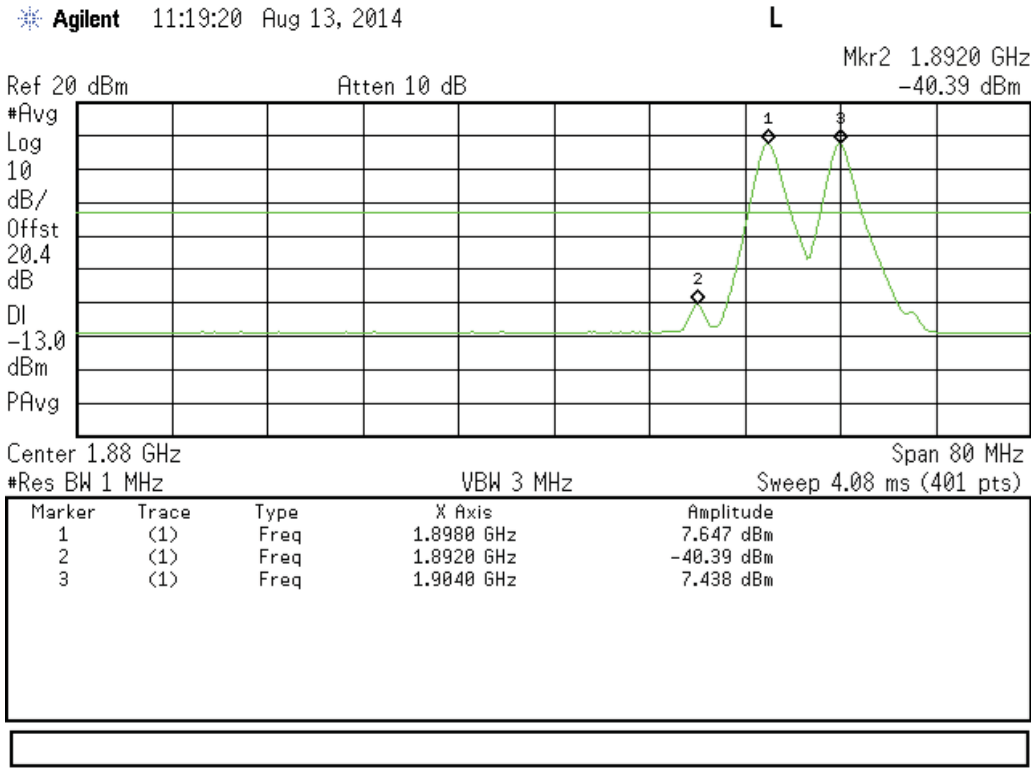
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.7160 GHz	13.25 dBm
2	(1)	Freq	1.7100 GHz	-34.56 dBm
3	(1)	Freq	1.7220 GHz	12.68 dBm
4	(1)	Freq	1.7280 GHz	-35.55 dBm



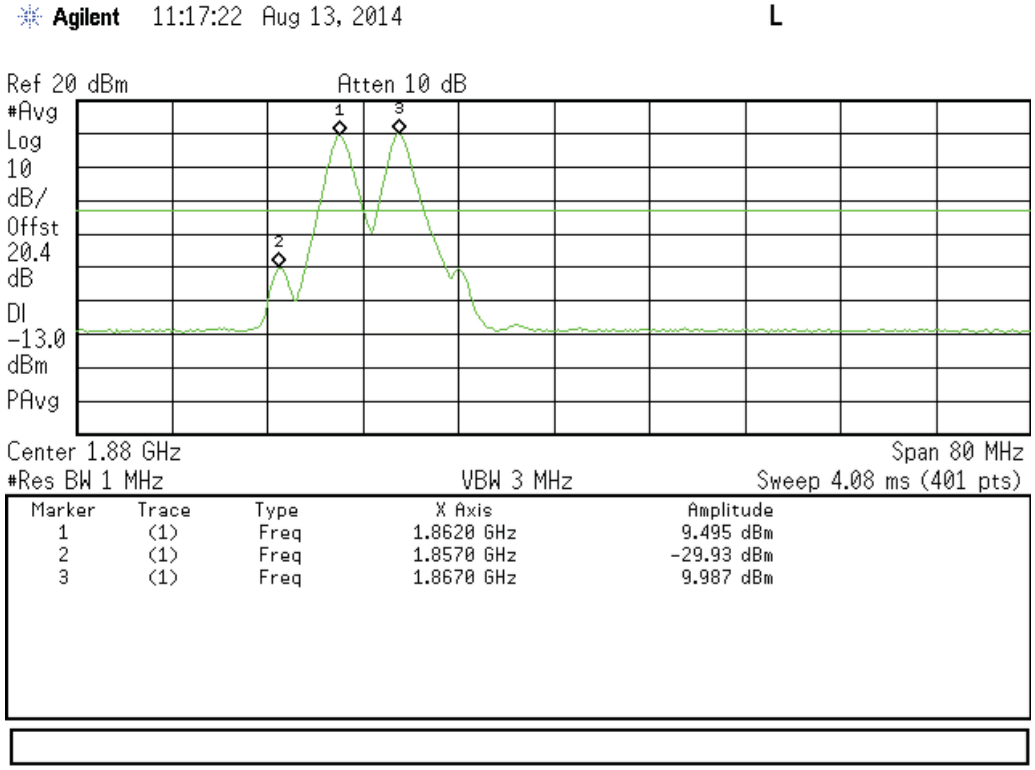
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.7410 GHz	12.66 dBm
2	(1)	Freq	1.7350 GHz	-34.26 dBm
3	(1)	Freq	1.7470 GHz	11.21 dBm
4	(1)	Freq	1.7530 GHz	-36.3 dBm

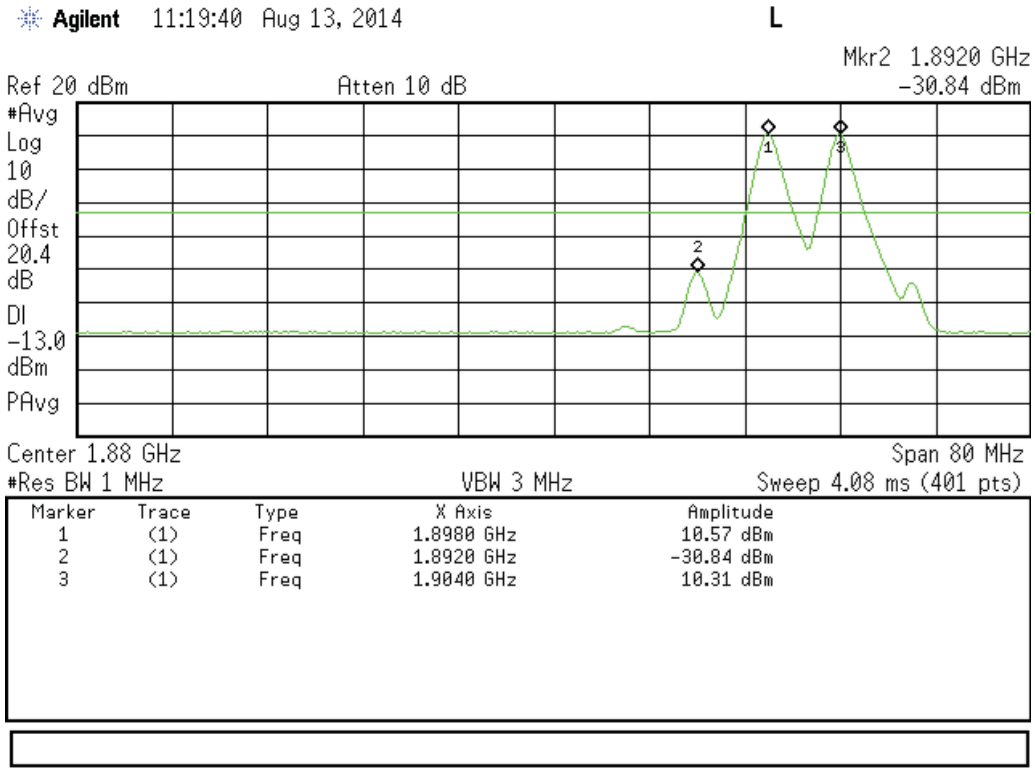
Intermodulation Uplink Test Results at AGC (GSM Signal)
1850-1915 MHz Band



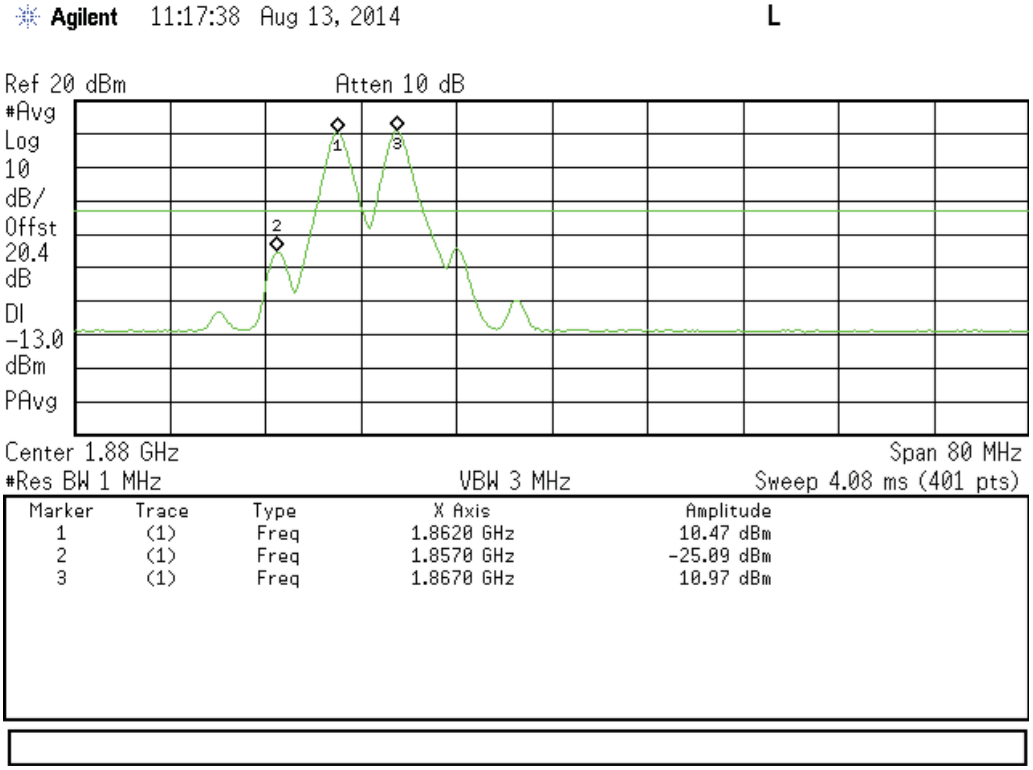


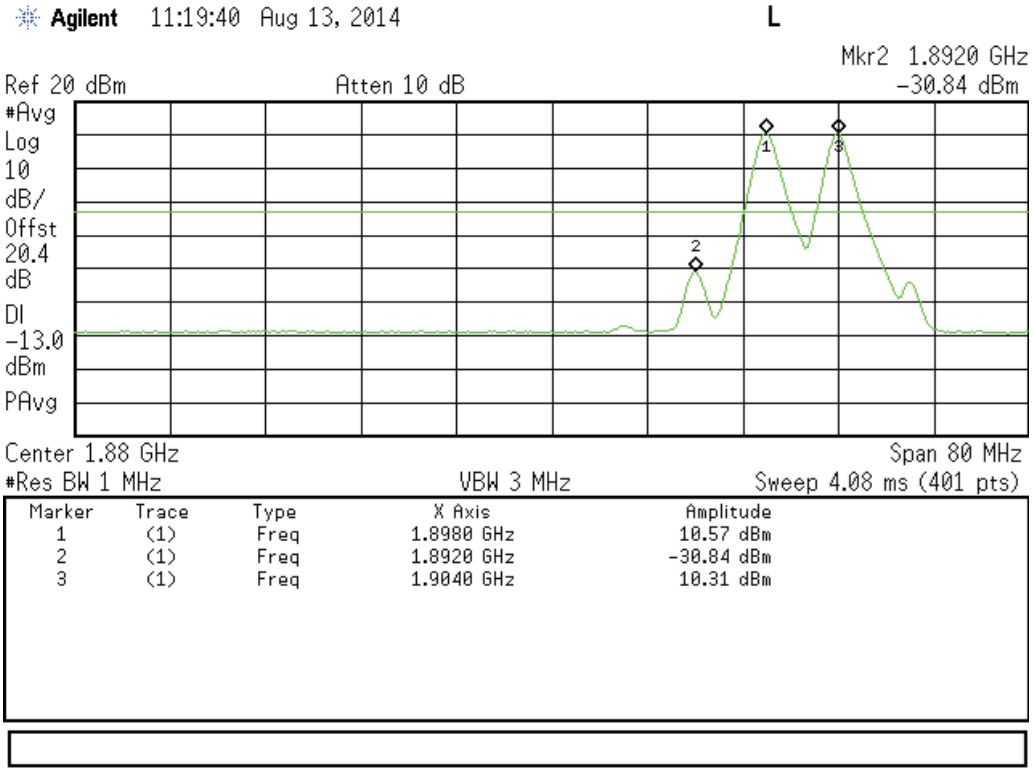
Intermodulation Uplink Test Results at 3db above AGC (GSM Signal)
1850-1915 MHz Band



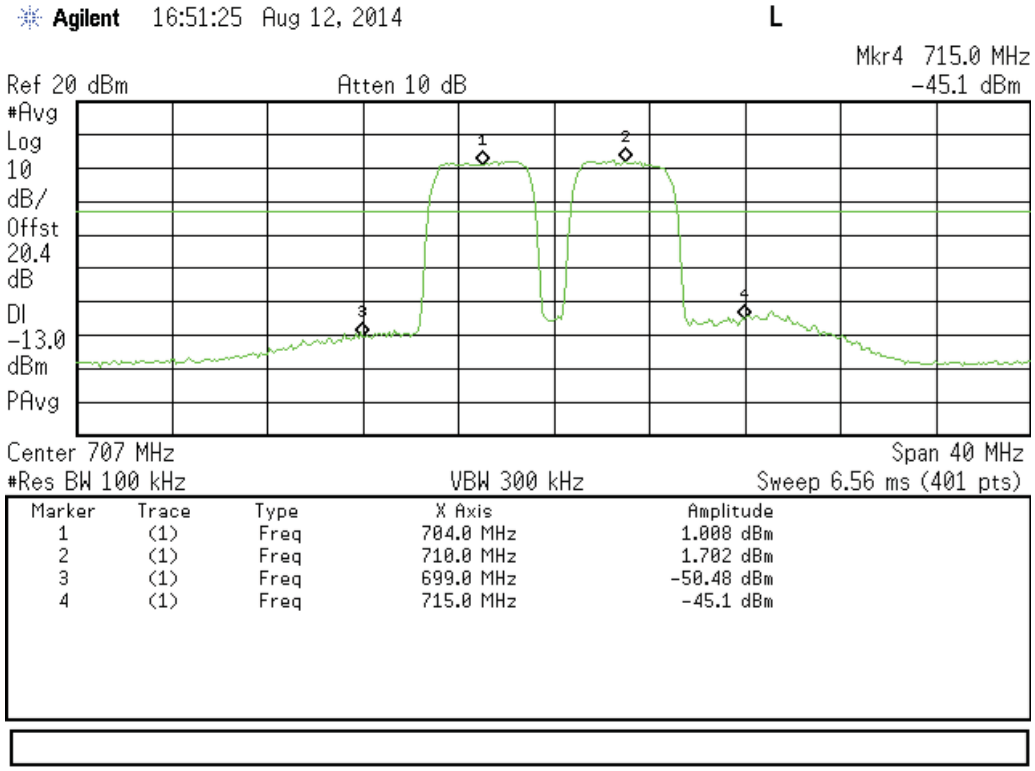


Intermodulation Uplink Test Results at 6db above AGC (GSM Signal)
1850-1915 MHz Band

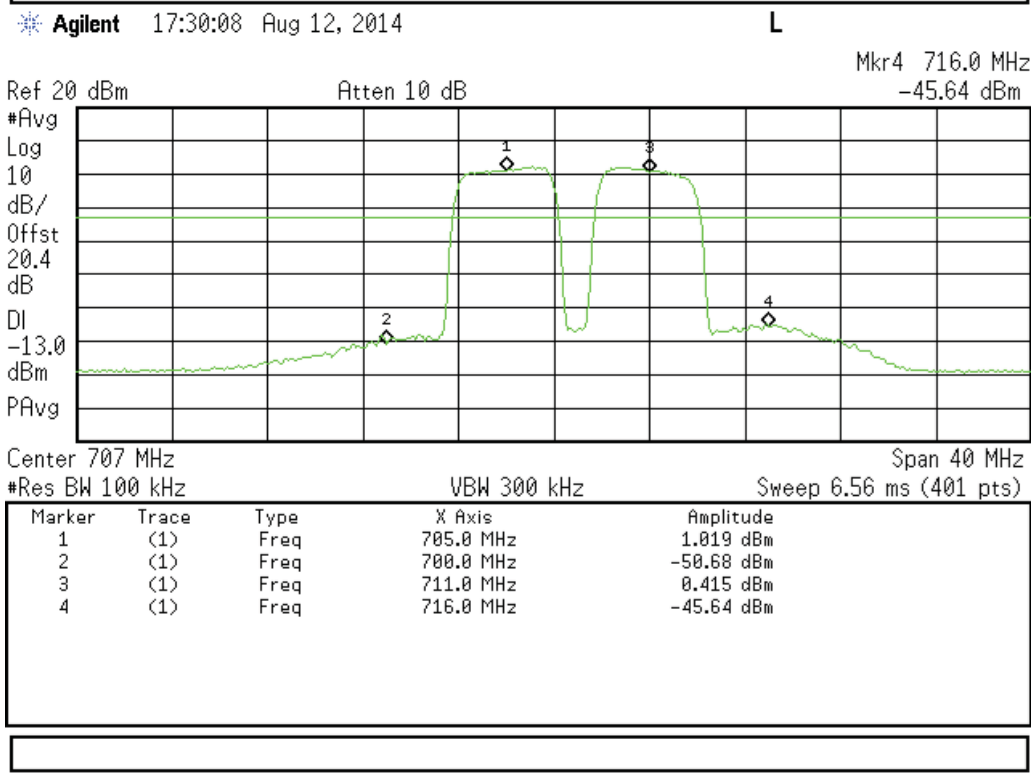




Intermodulation Uplink Test Results at AGC (CDMA Signal)
698 - 716 MHz Band

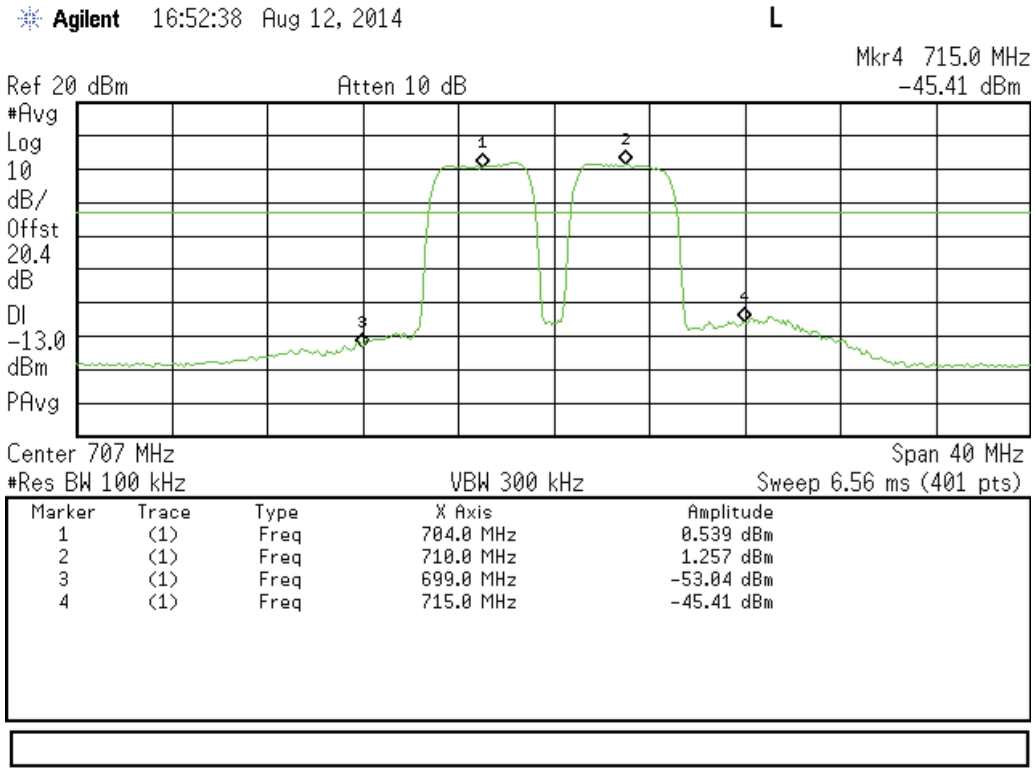


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	704.0 MHz	1.008 dBm
2	(1)	Freq	710.0 MHz	1.702 dBm
3	(1)	Freq	699.0 MHz	-50.48 dBm
4	(1)	Freq	715.0 MHz	-45.1 dBm

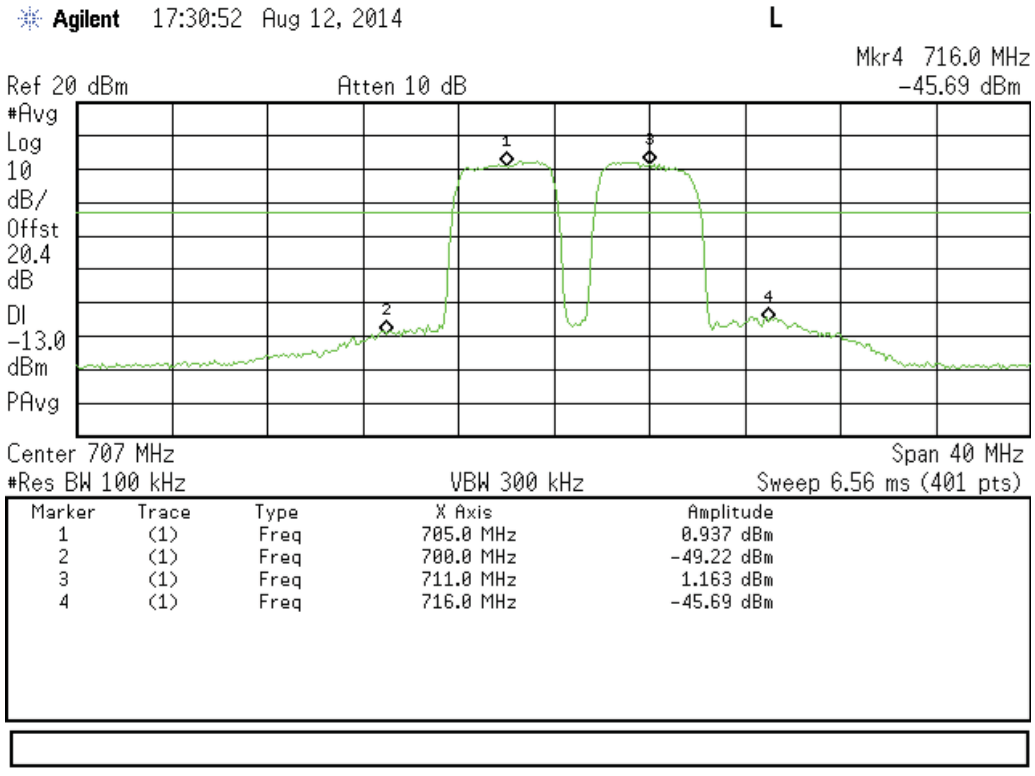


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	705.0 MHz	1.019 dBm
2	(1)	Freq	700.0 MHz	-50.68 dBm
3	(1)	Freq	711.0 MHz	0.415 dBm
4	(1)	Freq	716.0 MHz	-45.64 dBm

Intermodulation Uplink Test Results at 3db above AGC (CDMA Signal)
698 - 716 MHz Band

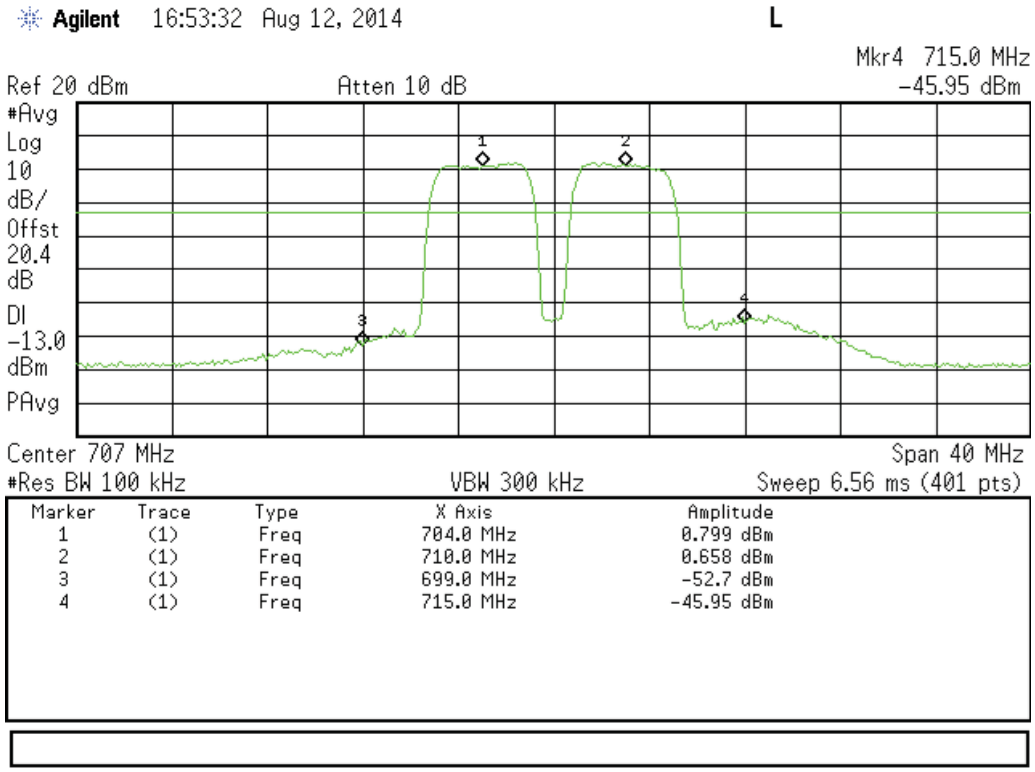


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	704.0 MHz	0.539 dBm
2	(1)	Freq	710.0 MHz	1.257 dBm
3	(1)	Freq	699.0 MHz	-53.04 dBm
4	(1)	Freq	715.0 MHz	-45.41 dBm

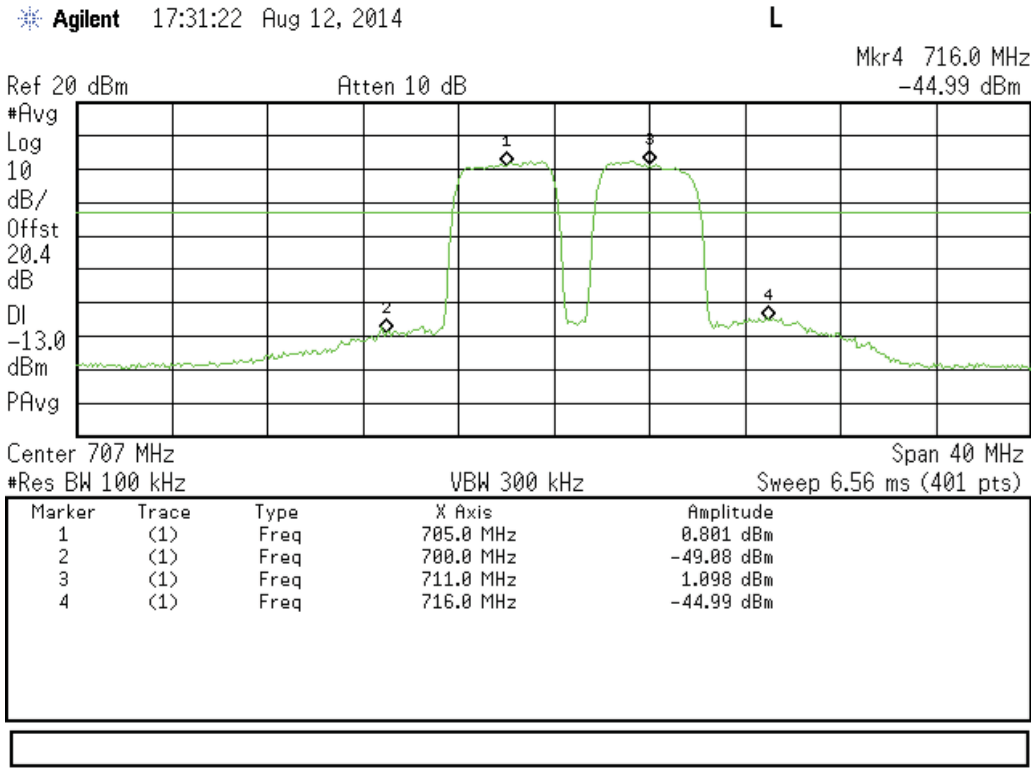


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	705.0 MHz	0.937 dBm
2	(1)	Freq	700.0 MHz	-49.22 dBm
3	(1)	Freq	711.0 MHz	1.163 dBm
4	(1)	Freq	716.0 MHz	-45.69 dBm

Intermodulation Uplink Test Results at 6db above AGC (CDMA Signal)
698 - 716 MHz Band

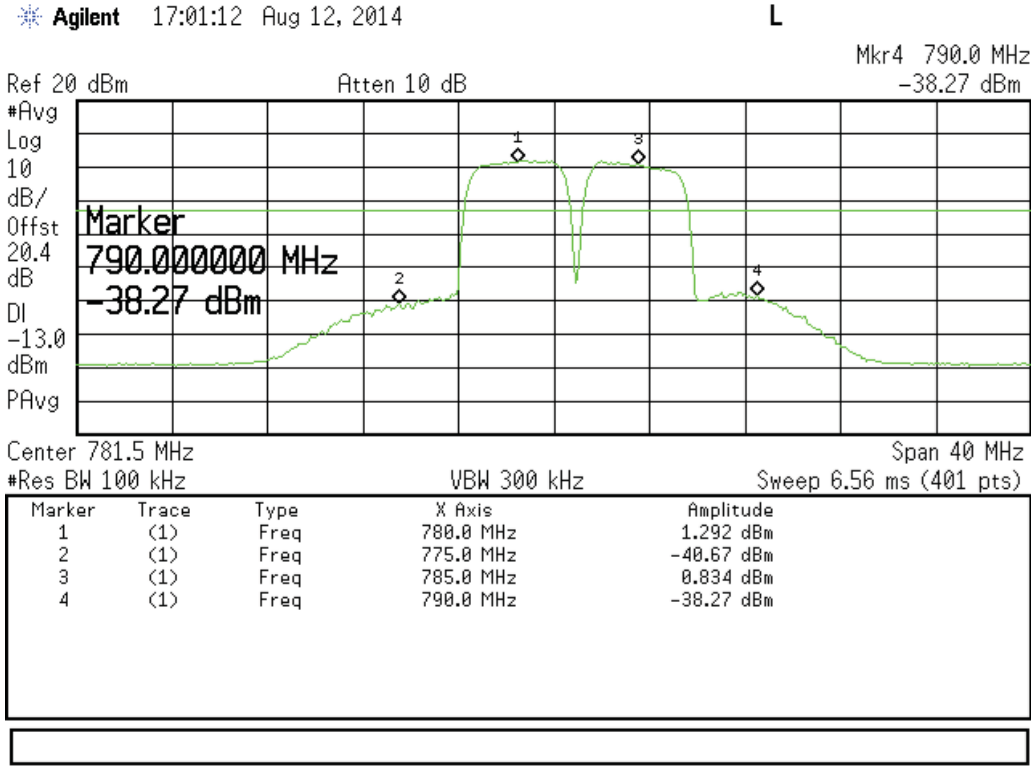


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	704.0 MHz	0.799 dBm
2	(1)	Freq	710.0 MHz	0.658 dBm
3	(1)	Freq	699.0 MHz	-52.7 dBm
4	(1)	Freq	715.0 MHz	-45.95 dBm

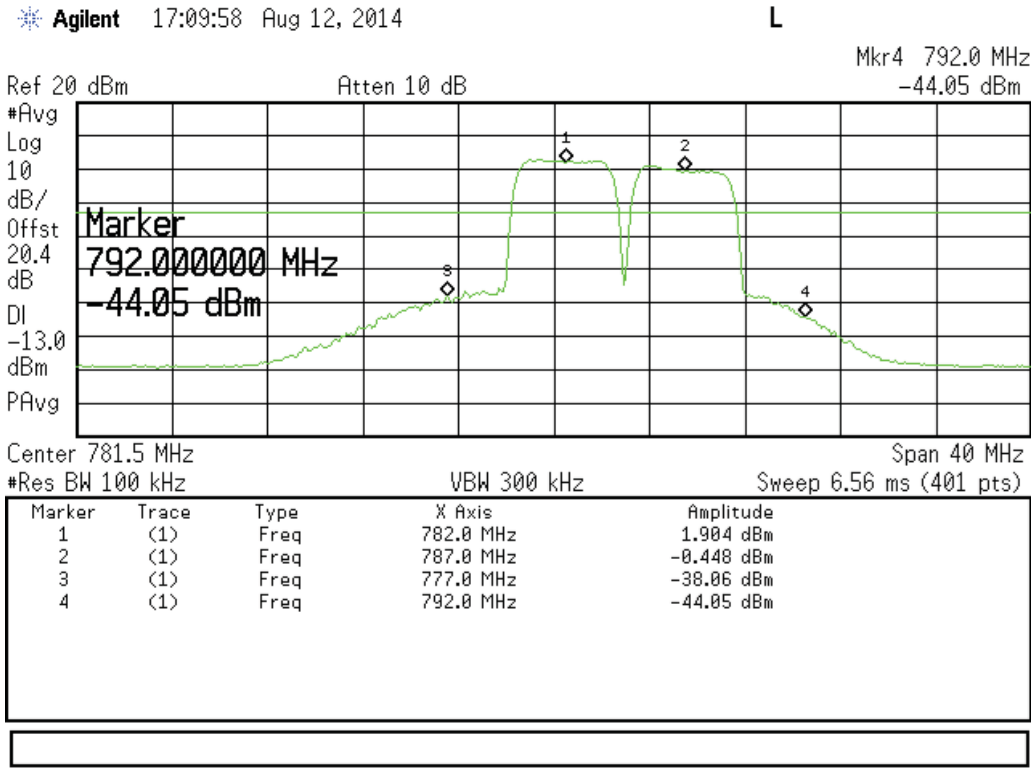


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	705.0 MHz	0.801 dBm
2	(1)	Freq	700.0 MHz	-49.08 dBm
3	(1)	Freq	711.0 MHz	1.098 dBm
4	(1)	Freq	716.0 MHz	-44.99 dBm

Intermodulation Uplink Test Results at AGC (CDMA Signal)
776-787 MHz Band

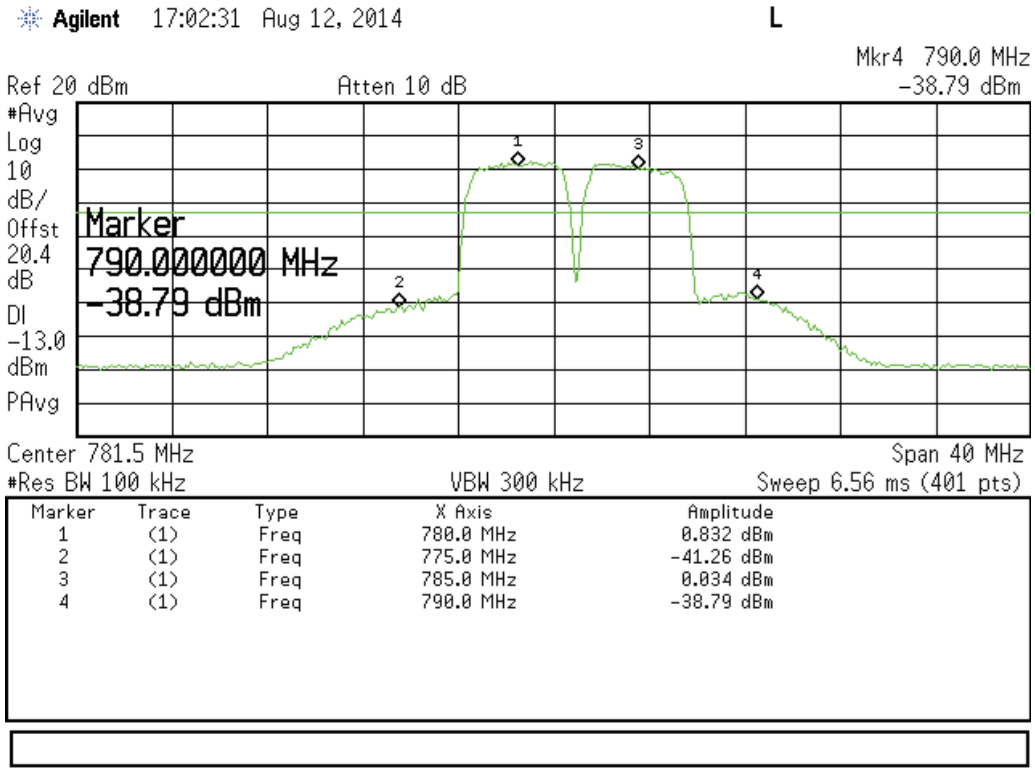


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	780.0 MHz	1.292 dBm
2	(1)	Freq	775.0 MHz	-40.67 dBm
3	(1)	Freq	785.0 MHz	0.834 dBm
4	(1)	Freq	790.0 MHz	-38.27 dBm

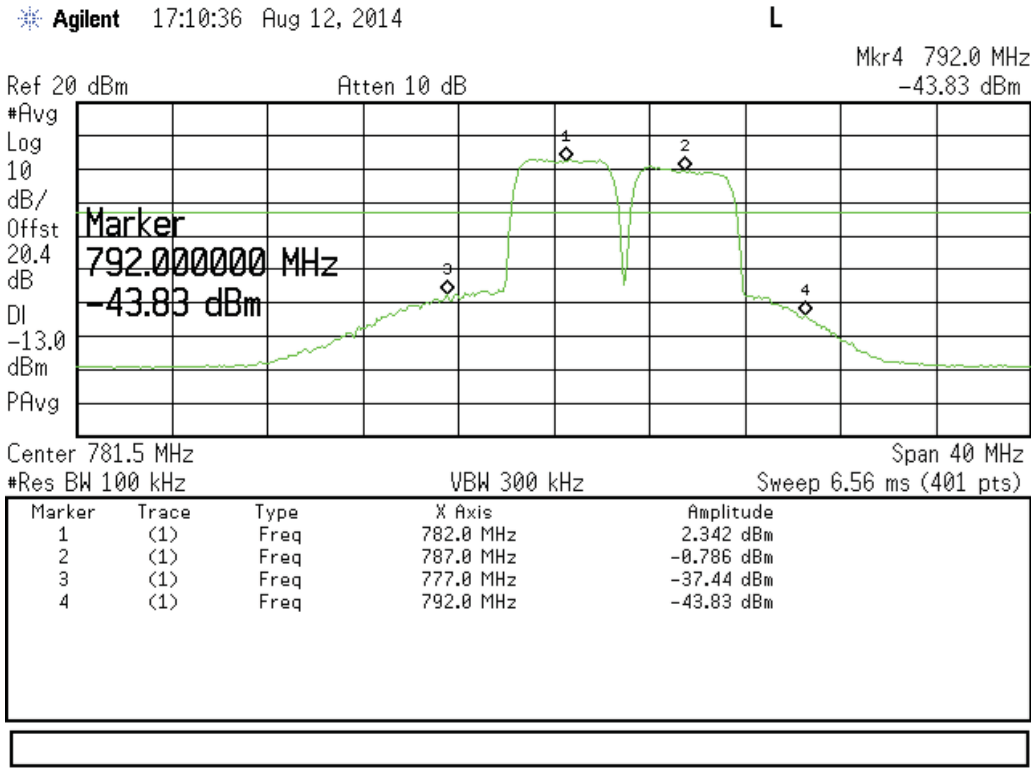


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	782.0 MHz	1.904 dBm
2	(1)	Freq	787.0 MHz	-0.448 dBm
3	(1)	Freq	777.0 MHz	-38.06 dBm
4	(1)	Freq	792.0 MHz	-44.05 dBm

Intermodulation Uplink Test Results at 3db above AGC (CDMA Signal)
776-787 MHz Band

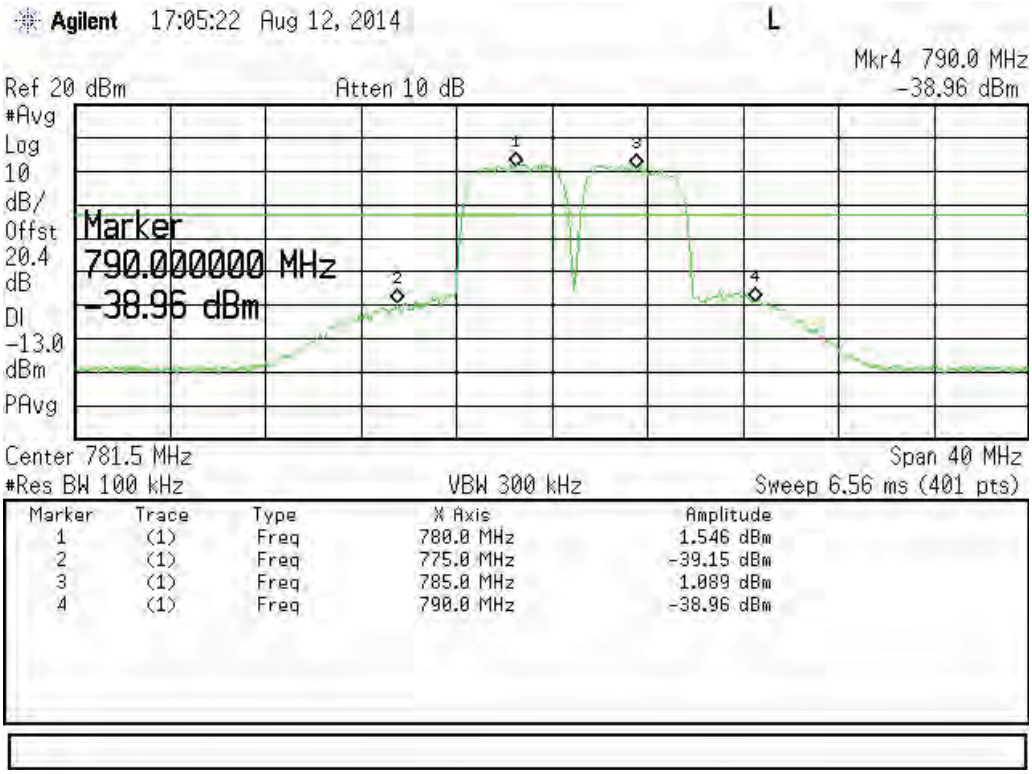


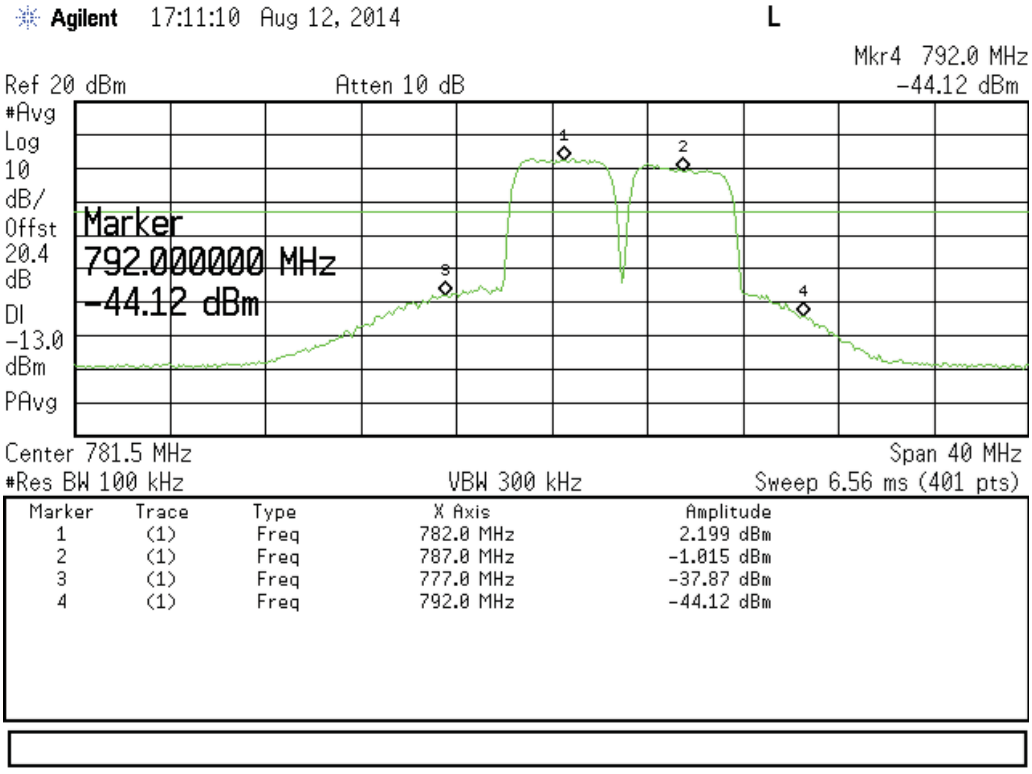
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	780.0 MHz	0.832 dBm
2	(1)	Freq	775.0 MHz	-41.26 dBm
3	(1)	Freq	785.0 MHz	0.034 dBm
4	(1)	Freq	790.0 MHz	-38.79 dBm



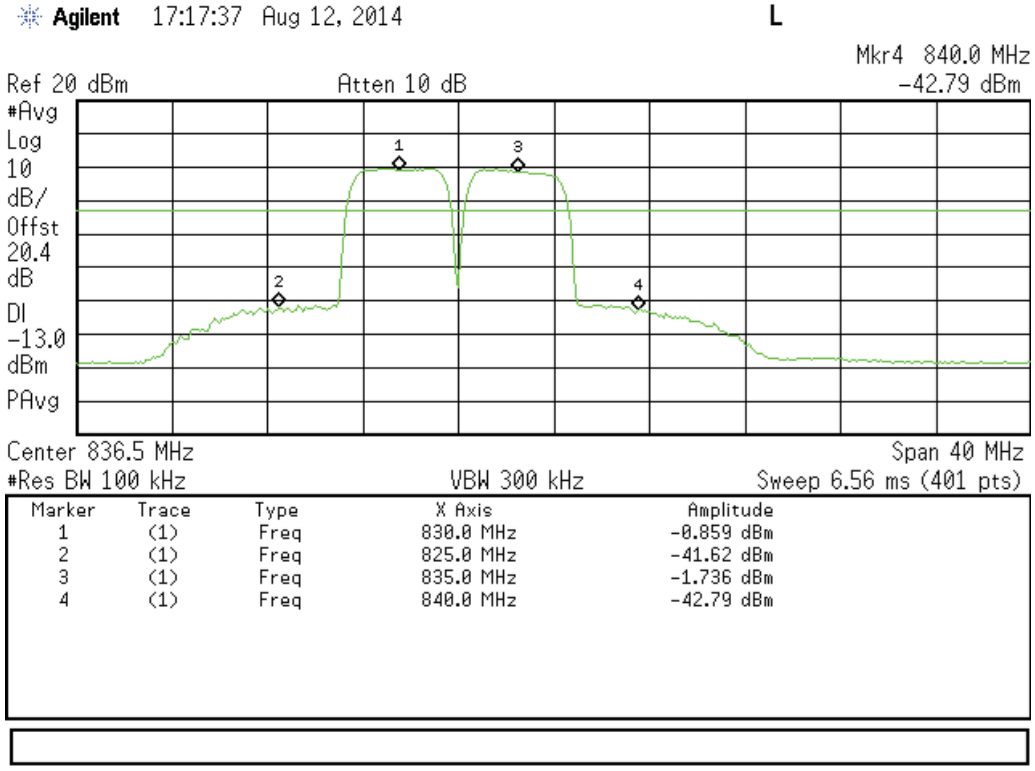
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	782.0 MHz	2.342 dBm
2	(1)	Freq	787.0 MHz	-0.786 dBm
3	(1)	Freq	777.0 MHz	-37.44 dBm
4	(1)	Freq	792.0 MHz	-43.83 dBm

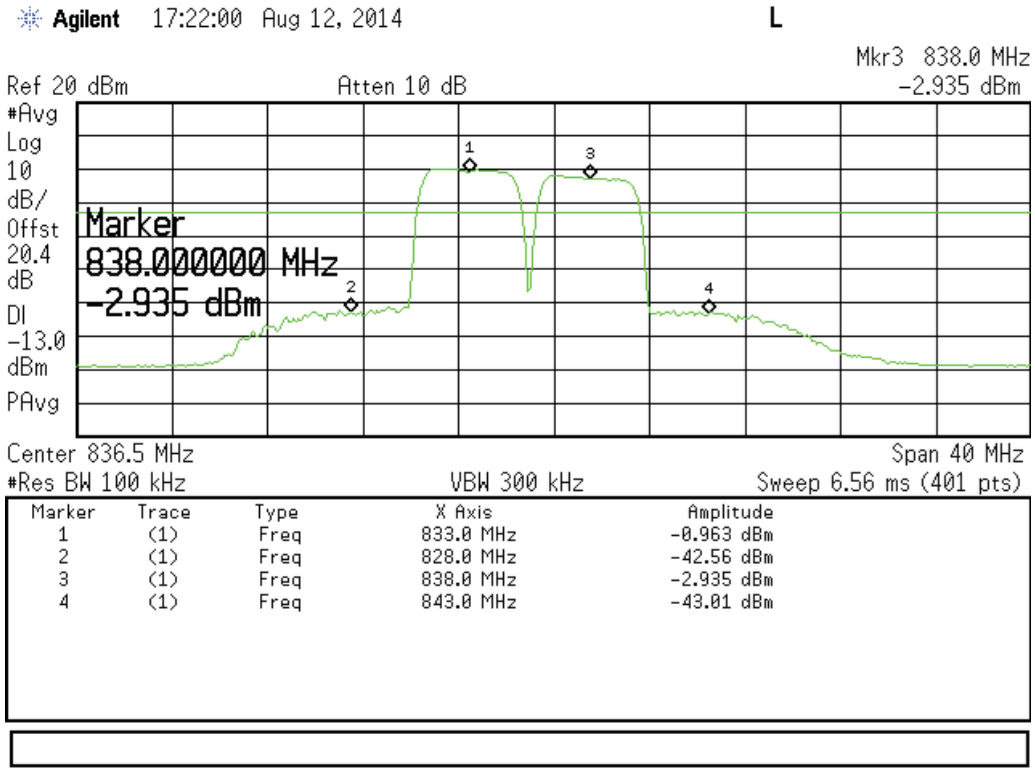
Intermodulation Uplink Test Results at 6db above AGC (CDMA Signal)
776-787 MHz Band



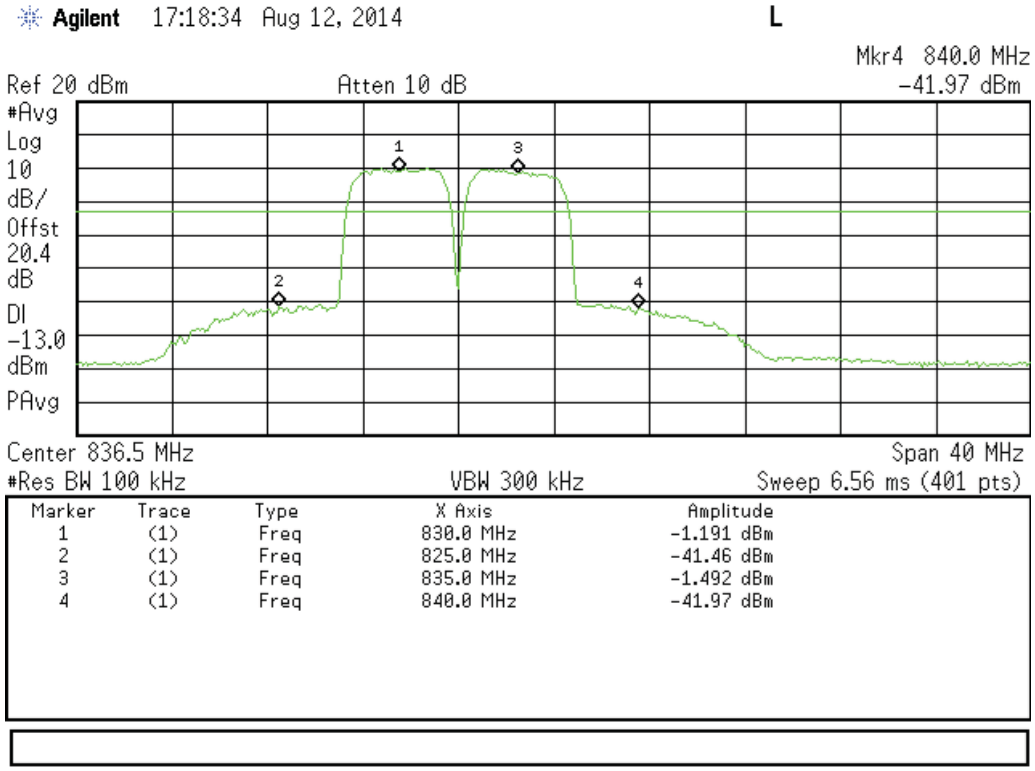


Intermodulation Uplink Test Results at AGC (CDMA Signal)
824-849 MHz Band

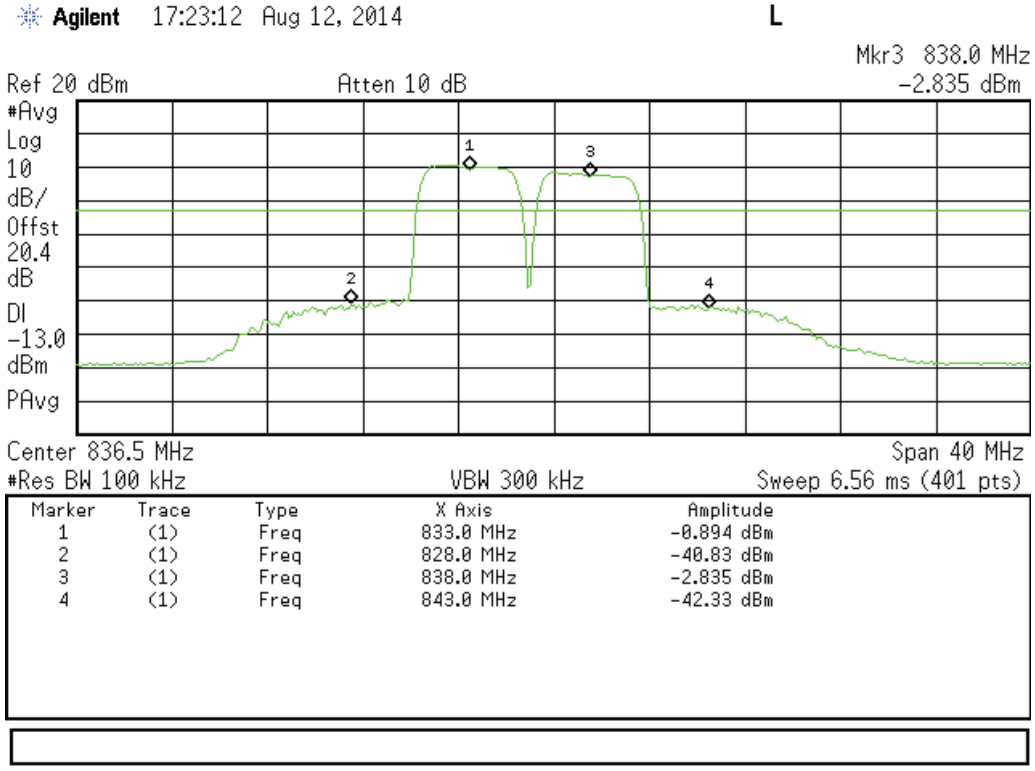




Intermodulation Uplink Test Results at 3db above AGC (CDMA Signal)
824-849 MHz Band

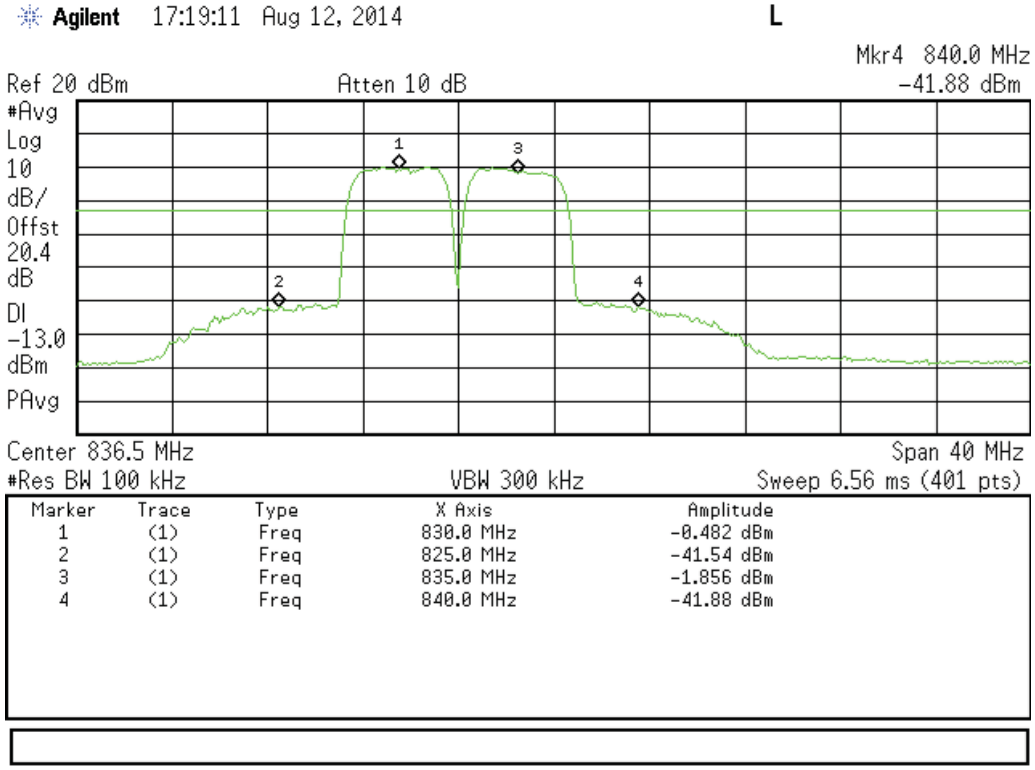


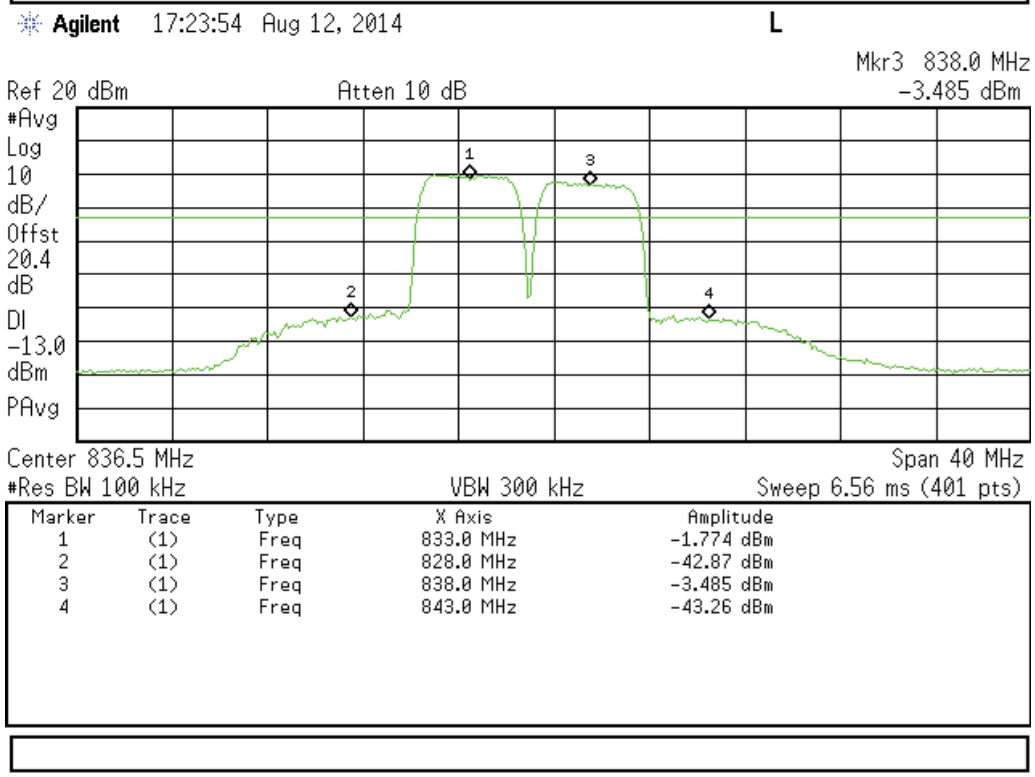
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	830.0 MHz	-1.191 dBm
2	(1)	Freq	825.0 MHz	-41.46 dBm
3	(1)	Freq	835.0 MHz	-1.492 dBm
4	(1)	Freq	840.0 MHz	-41.97 dBm



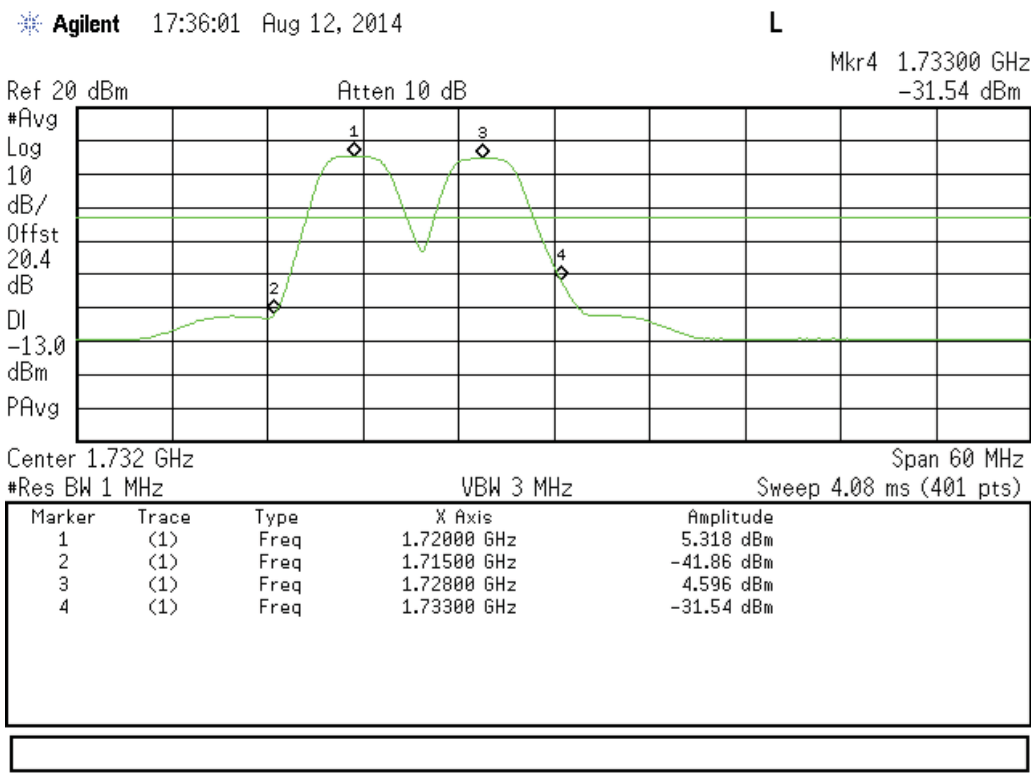
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	833.0 MHz	-0.894 dBm
2	(1)	Freq	828.0 MHz	-40.83 dBm
3	(1)	Freq	838.0 MHz	-2.835 dBm
4	(1)	Freq	843.0 MHz	-42.33 dBm

Intermodulation Uplink Test Results at 6db above AGC (CDMA Signal)
824-849 MHz Band

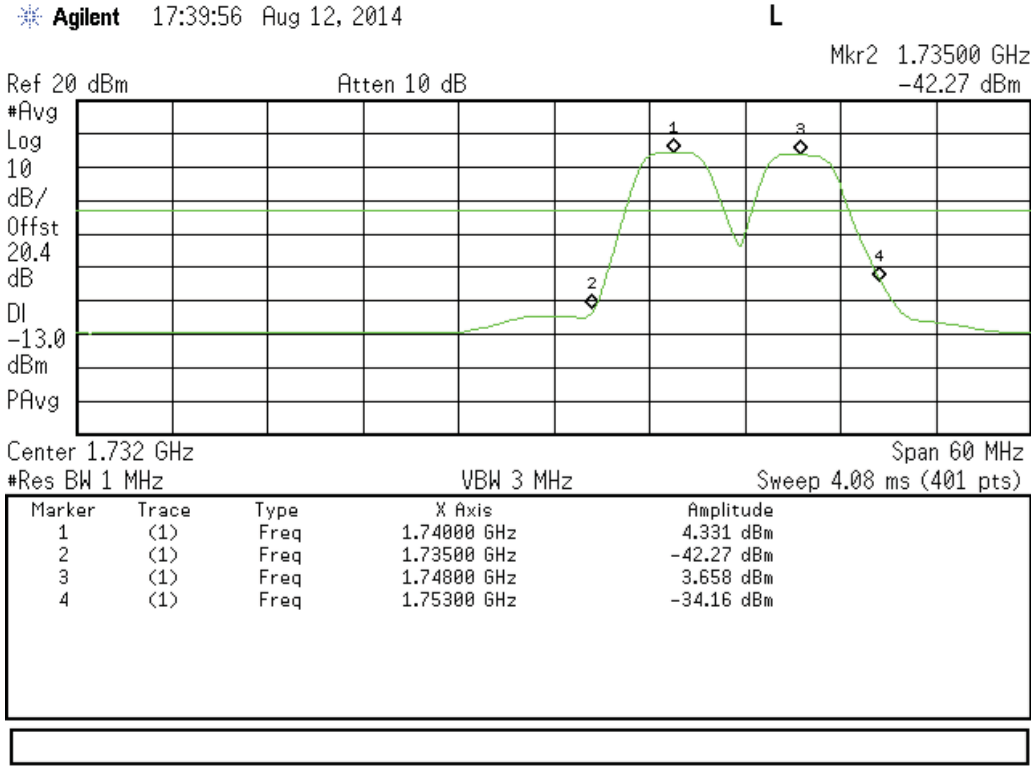




Intermodulation Uplink Test Results at AGC (CDMA Signal)
1710-1755 MHz Band

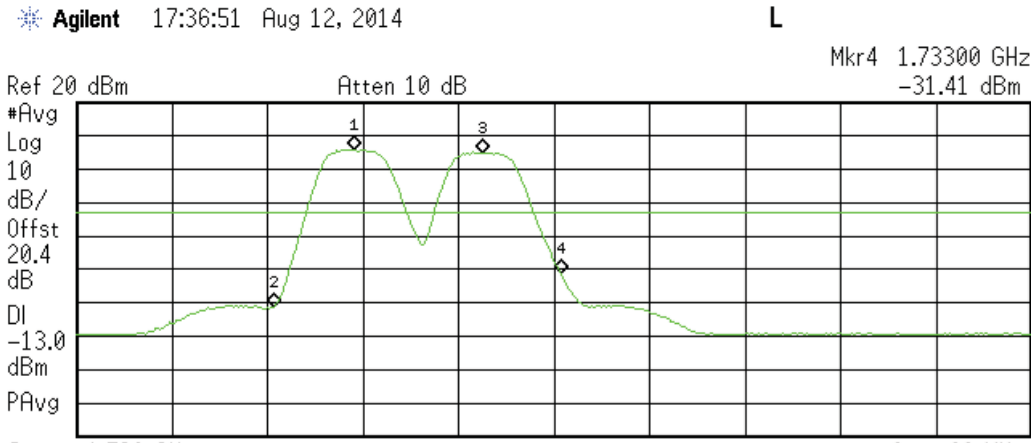


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.72000 GHz	5.318 dBm
2	(1)	Freq	1.71500 GHz	-41.86 dBm
3	(1)	Freq	1.72800 GHz	4.596 dBm
4	(1)	Freq	1.73300 GHz	-31.54 dBm

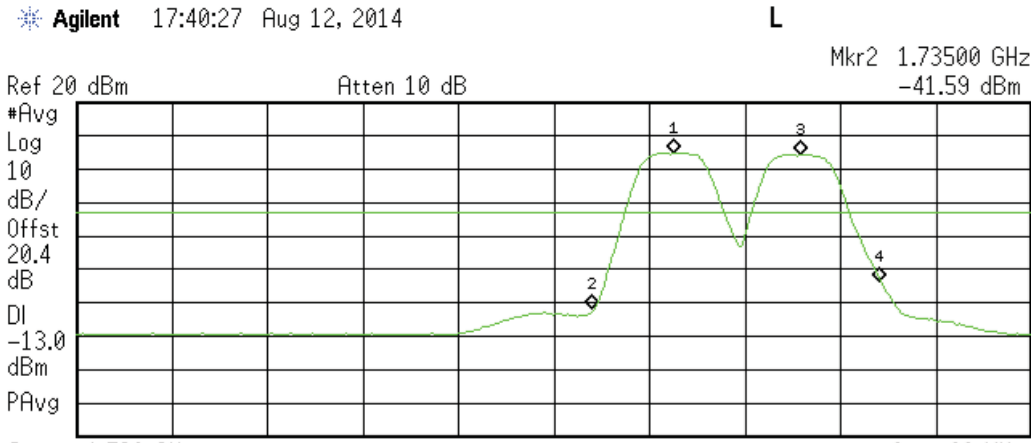


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.74000 GHz	4.331 dBm
2	(1)	Freq	1.73500 GHz	-42.27 dBm
3	(1)	Freq	1.74800 GHz	3.658 dBm
4	(1)	Freq	1.75300 GHz	-34.16 dBm

Intermodulation Uplink Test Results at 3db above AGC (CDMA Signal)
1710-1755 MHz Band

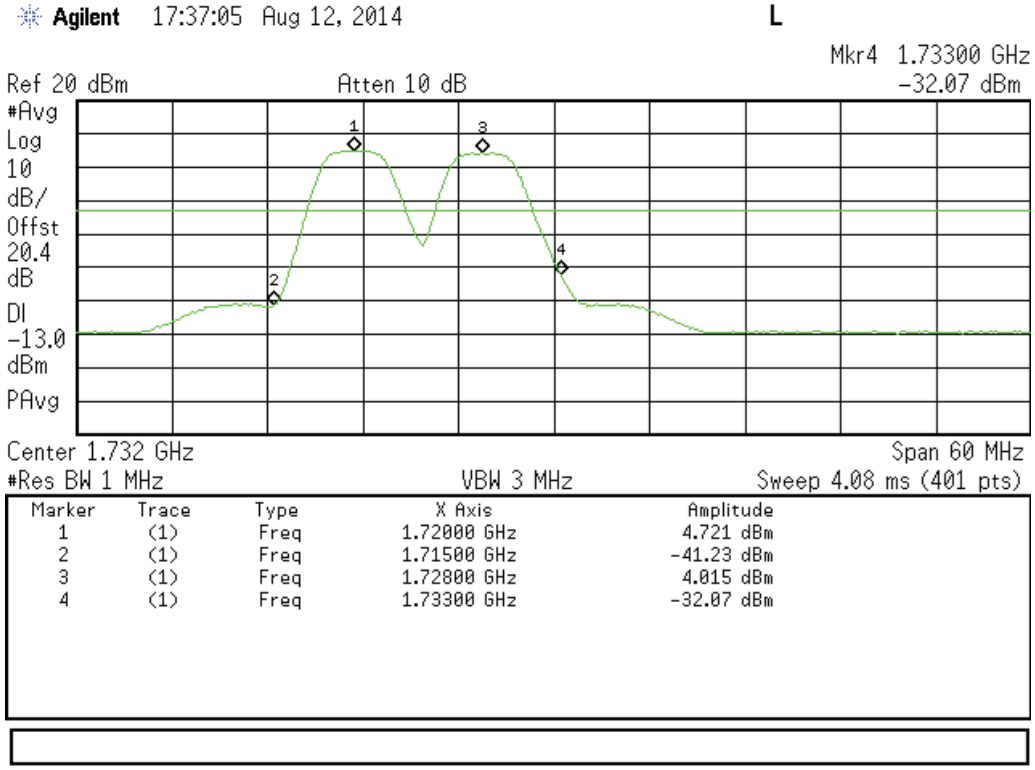


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.72000 GHz	5.429 dBm
2	(1)	Freq	1.71500 GHz	-41.14 dBm
3	(1)	Freq	1.72800 GHz	4.586 dBm
4	(1)	Freq	1.73300 GHz	-31.41 dBm

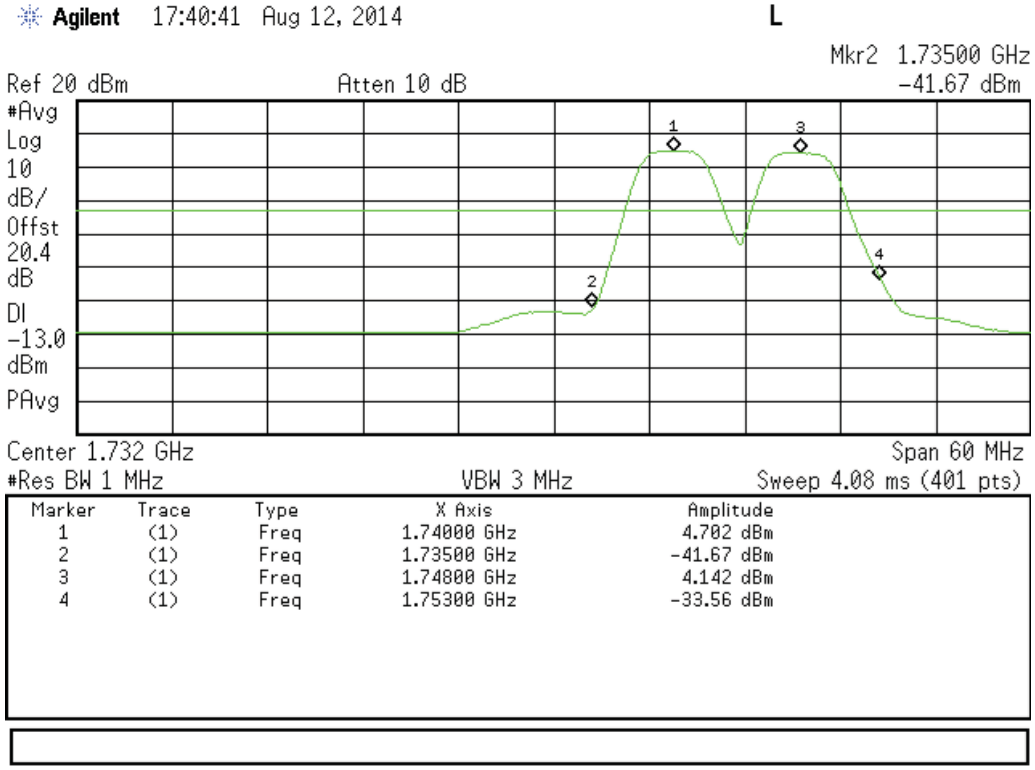


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.74000 GHz	4.772 dBm
2	(1)	Freq	1.73500 GHz	-41.59 dBm
3	(1)	Freq	1.74800 GHz	4.132 dBm
4	(1)	Freq	1.75300 GHz	-33.61 dBm

Intermodulation Uplink Test Results at 6db above AGC (CDMA Signal)
1710-1755 MHz Band

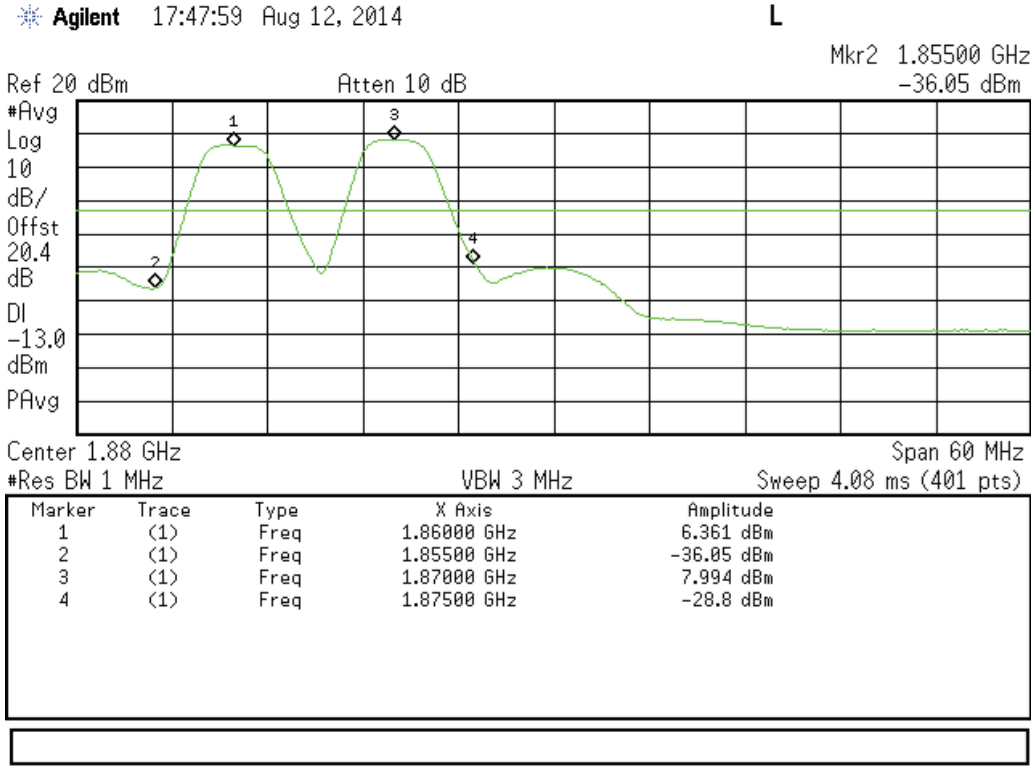


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.72000 GHz	4.721 dBm
2	(1)	Freq	1.71500 GHz	-41.23 dBm
3	(1)	Freq	1.72800 GHz	4.015 dBm
4	(1)	Freq	1.73300 GHz	-32.07 dBm

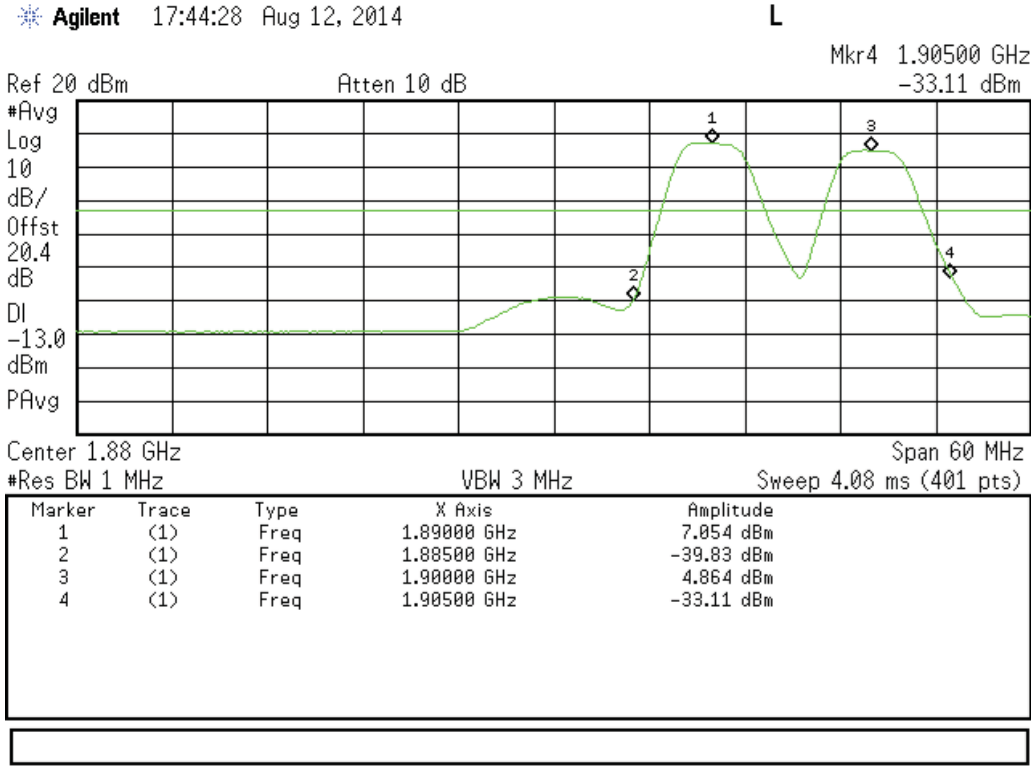


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.74000 GHz	4.702 dBm
2	(1)	Freq	1.73500 GHz	-41.67 dBm
3	(1)	Freq	1.74800 GHz	4.142 dBm
4	(1)	Freq	1.75300 GHz	-33.56 dBm

Intermodulation Uplink Test Results at AGC (CDMA Signal)
1850-1915 MHz Band

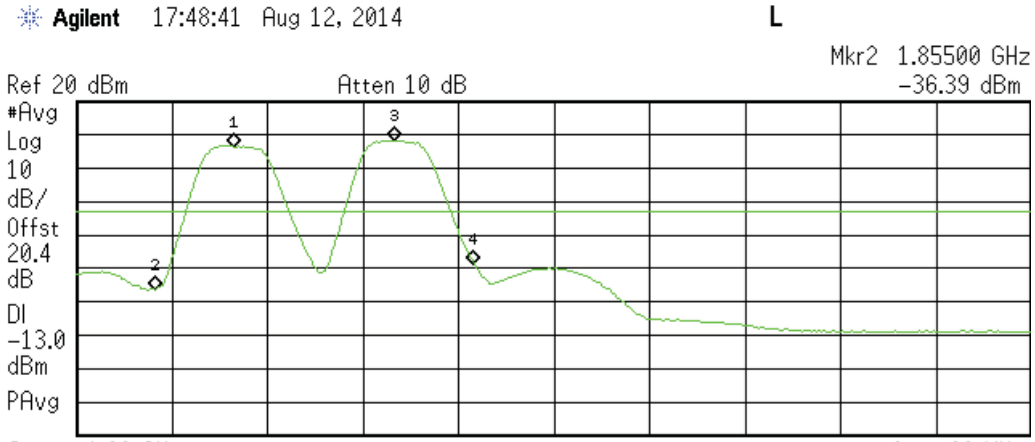


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.86000 GHz	6.361 dBm
2	(1)	Freq	1.85500 GHz	-36.05 dBm
3	(1)	Freq	1.87000 GHz	7.994 dBm
4	(1)	Freq	1.87500 GHz	-28.8 dBm

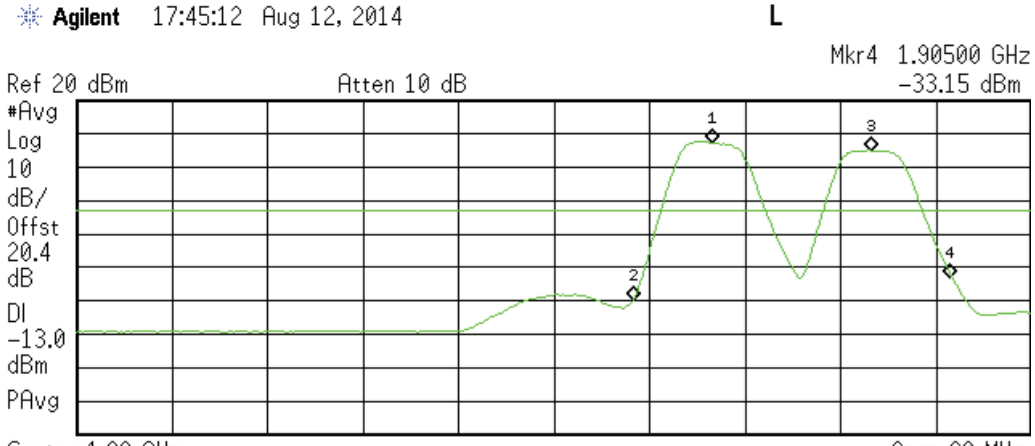


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.89000 GHz	7.054 dBm
2	(1)	Freq	1.88500 GHz	-39.83 dBm
3	(1)	Freq	1.90000 GHz	4.864 dBm
4	(1)	Freq	1.90500 GHz	-33.11 dBm

Intermodulation Uplink Test Results at 3db above AGC (CDMA Signal)
1850-1915 MHz Band

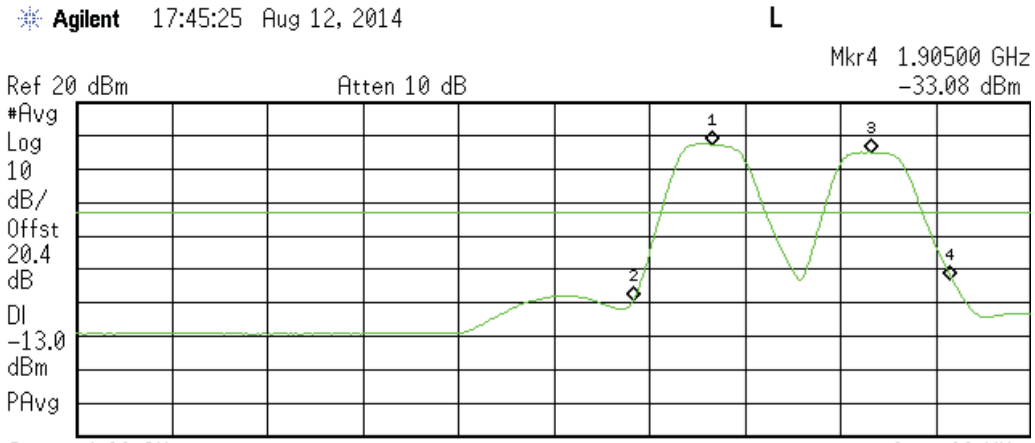


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.86000 GHz	6.336 dBm
2	(1)	Freq	1.85500 GHz	-36.39 dBm
3	(1)	Freq	1.87000 GHz	7.882 dBm
4	(1)	Freq	1.87500 GHz	-28.77 dBm

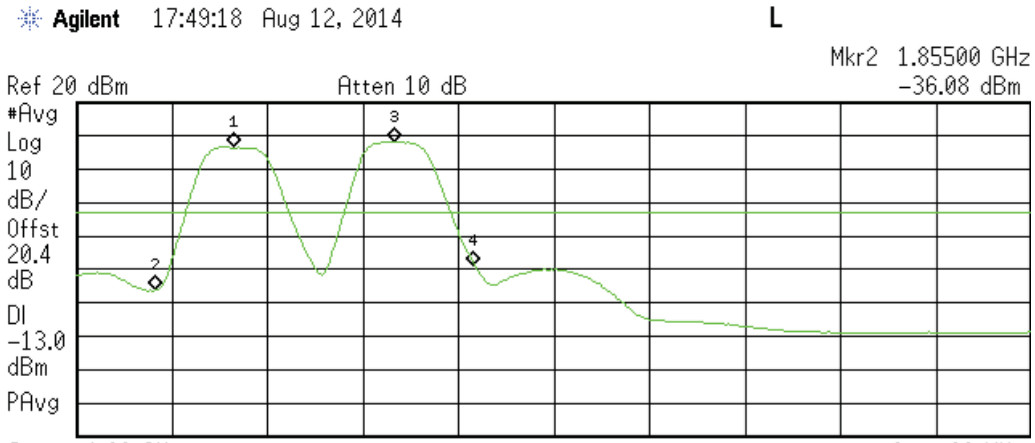


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.89000 GHz	7.192 dBm
2	(1)	Freq	1.88500 GHz	-39.58 dBm
3	(1)	Freq	1.90000 GHz	4.838 dBm
4	(1)	Freq	1.90500 GHz	-33.15 dBm

Intermodulation Uplink Test Results at 6db above AGC (CDMA Signal)
1850-1915 MHz Band

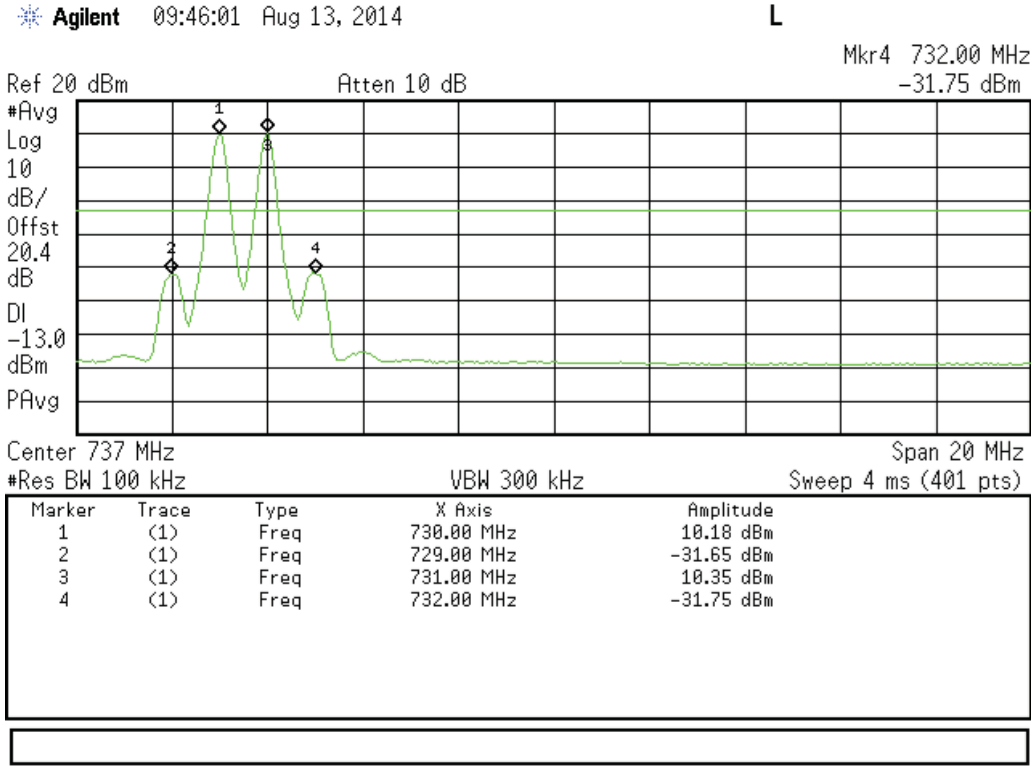


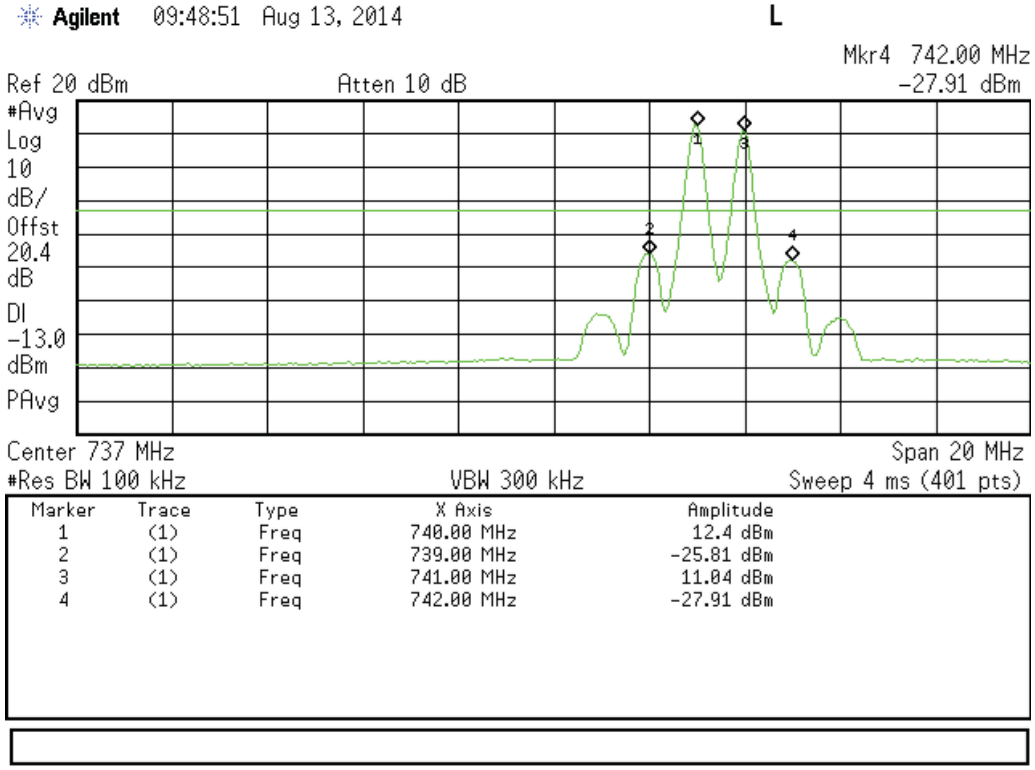
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.89000 GHz	7.18 dBm
2	(1)	Freq	1.88500 GHz	-39.53 dBm
3	(1)	Freq	1.90000 GHz	4.918 dBm
4	(1)	Freq	1.90500 GHz	-33.08 dBm



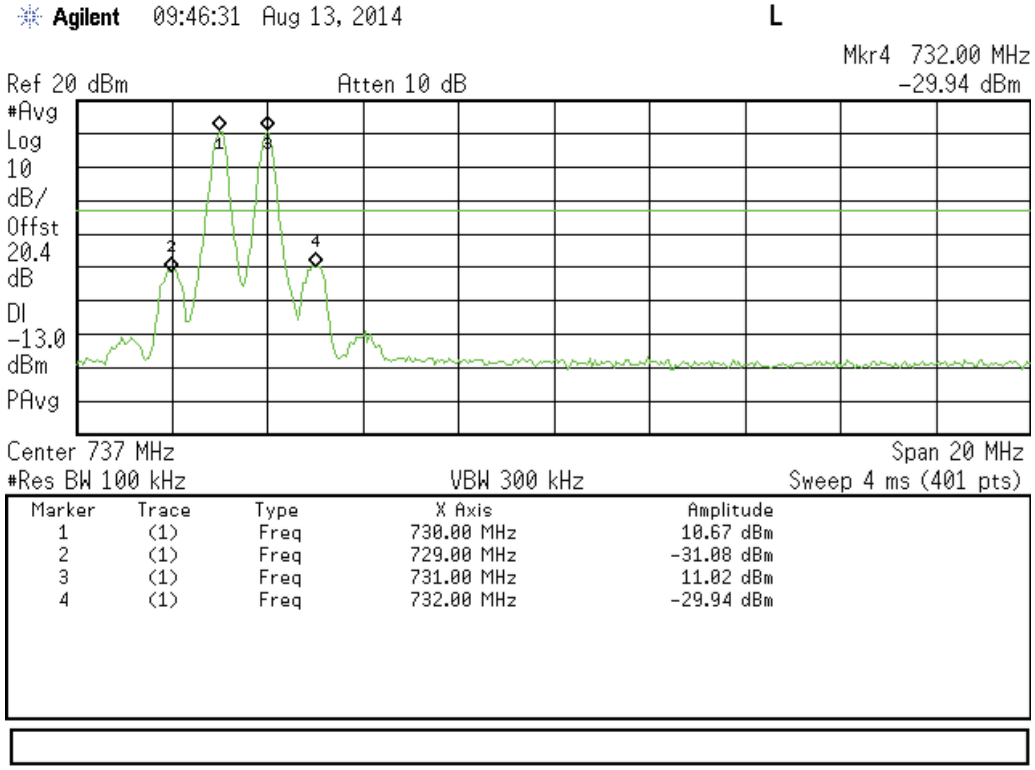
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.86000 GHz	6.376 dBm
2	(1)	Freq	1.85500 GHz	-36.08 dBm
3	(1)	Freq	1.87000 GHz	7.94 dBm
4	(1)	Freq	1.87500 GHz	-28.77 dBm

Intermodulation Downlink Test Results at AGC (GSM Signal)
728-746 MHz Band

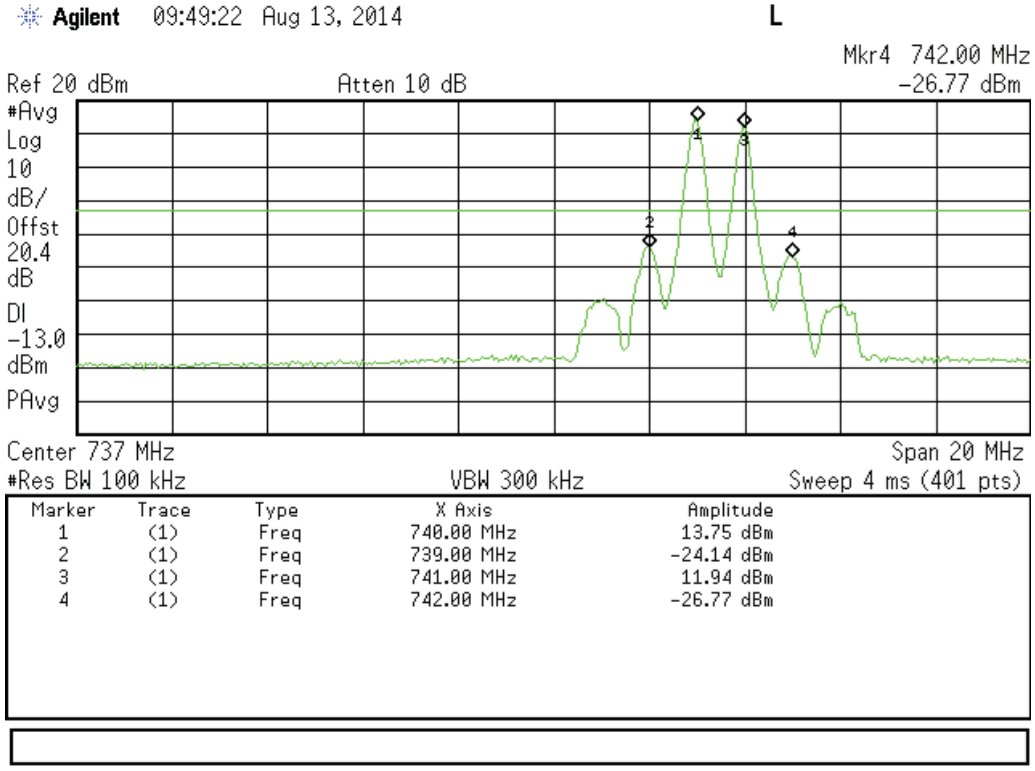




Intermodulation Downlink Test Results at 3db above AGC (GSM Signal)
728-746 MHz Band

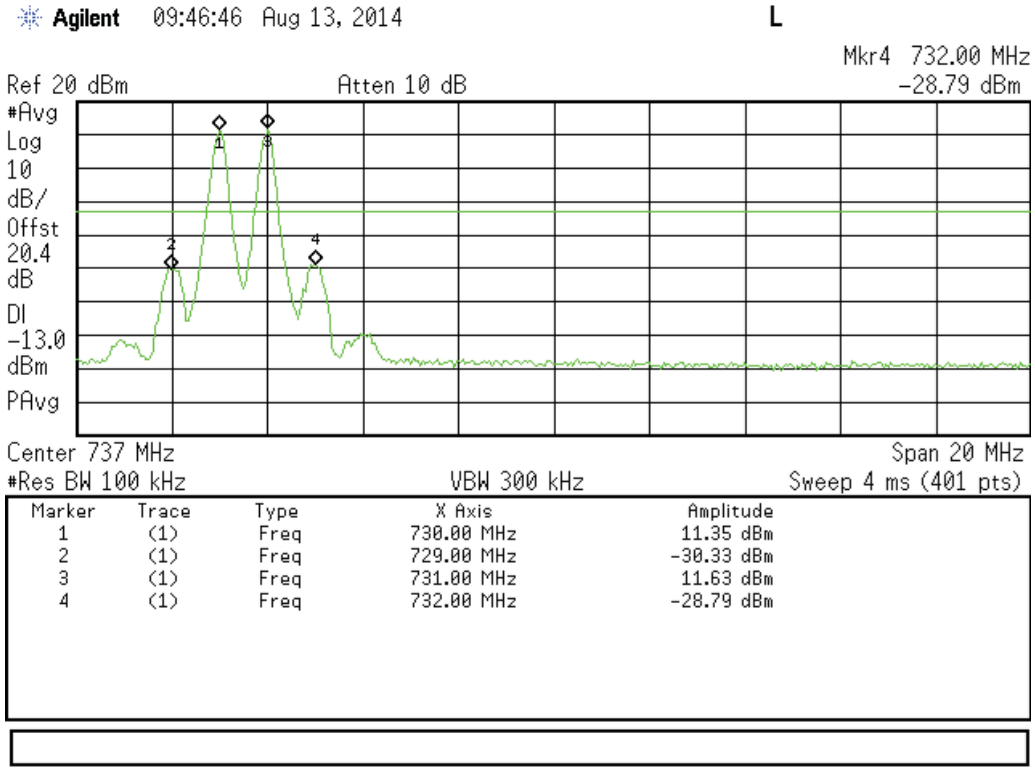


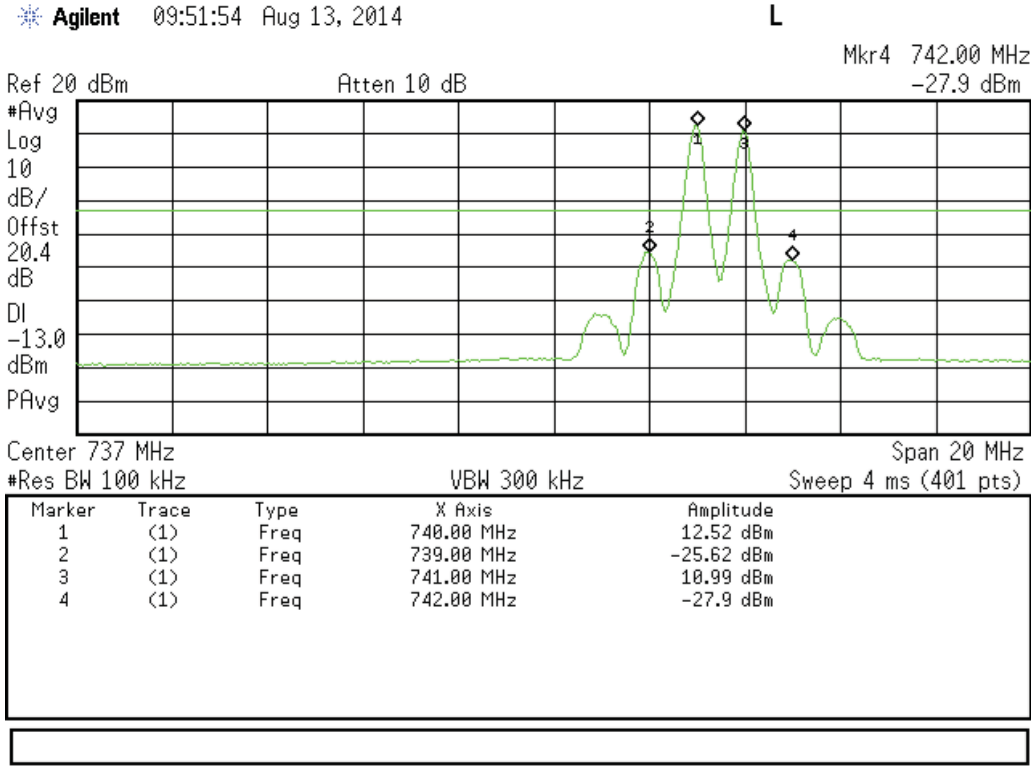
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	730.00 MHz	10.67 dBm
2	(1)	Freq	729.00 MHz	-31.08 dBm
3	(1)	Freq	731.00 MHz	11.02 dBm
4	(1)	Freq	732.00 MHz	-29.94 dBm



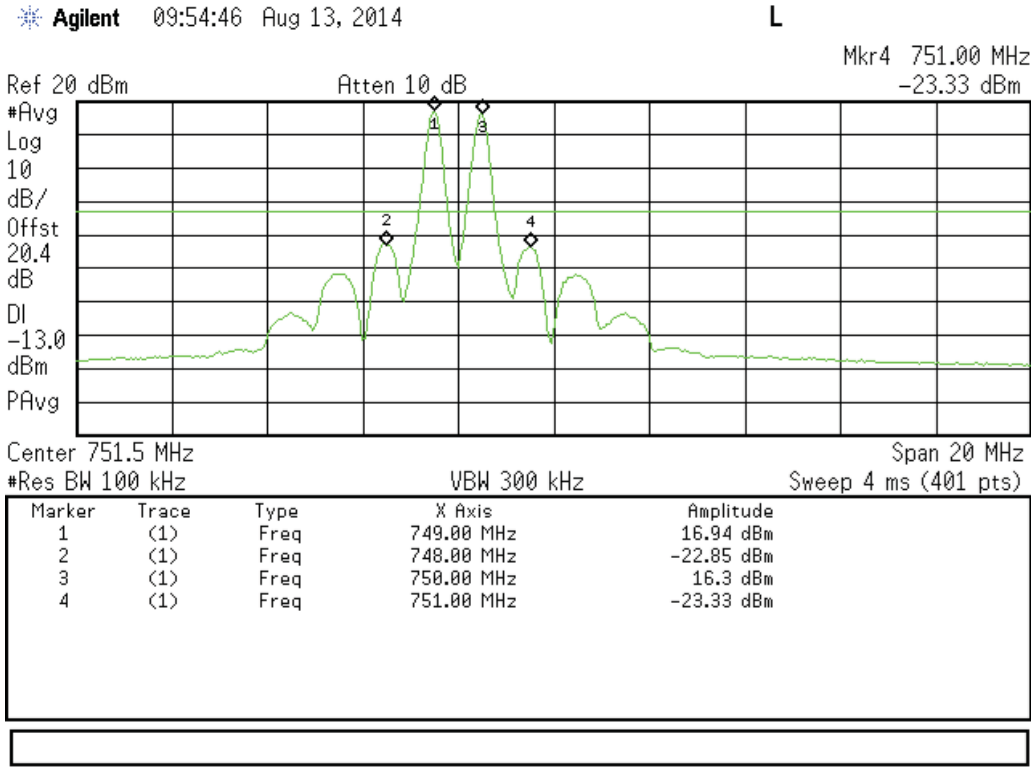
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	740.00 MHz	13.75 dBm
2	(1)	Freq	739.00 MHz	-24.14 dBm
3	(1)	Freq	741.00 MHz	11.94 dBm
4	(1)	Freq	742.00 MHz	-26.77 dBm

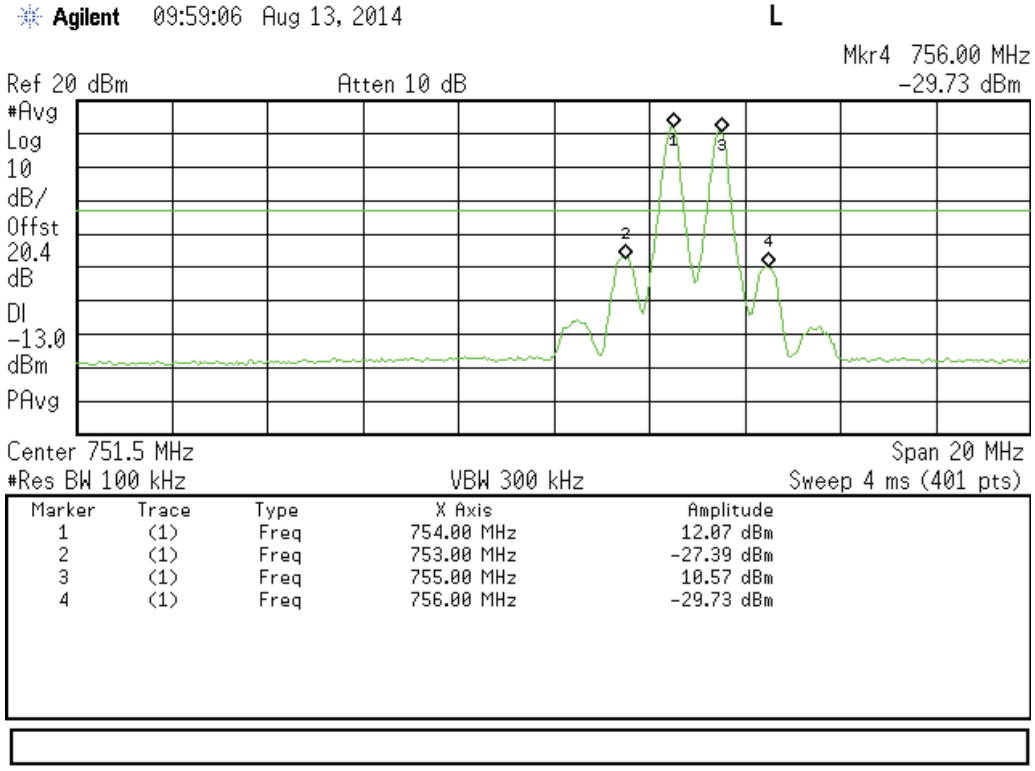
Intermodulation Downlink Test Results at 6db above AGC (GSM Signal)
728-746 MHz Band



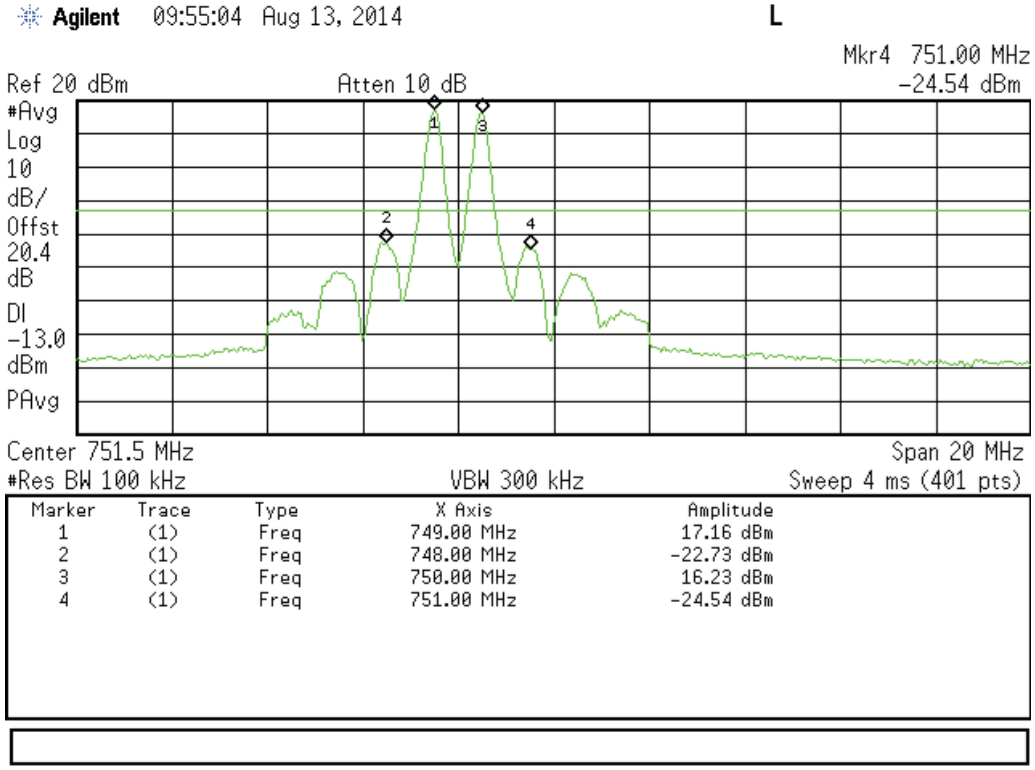


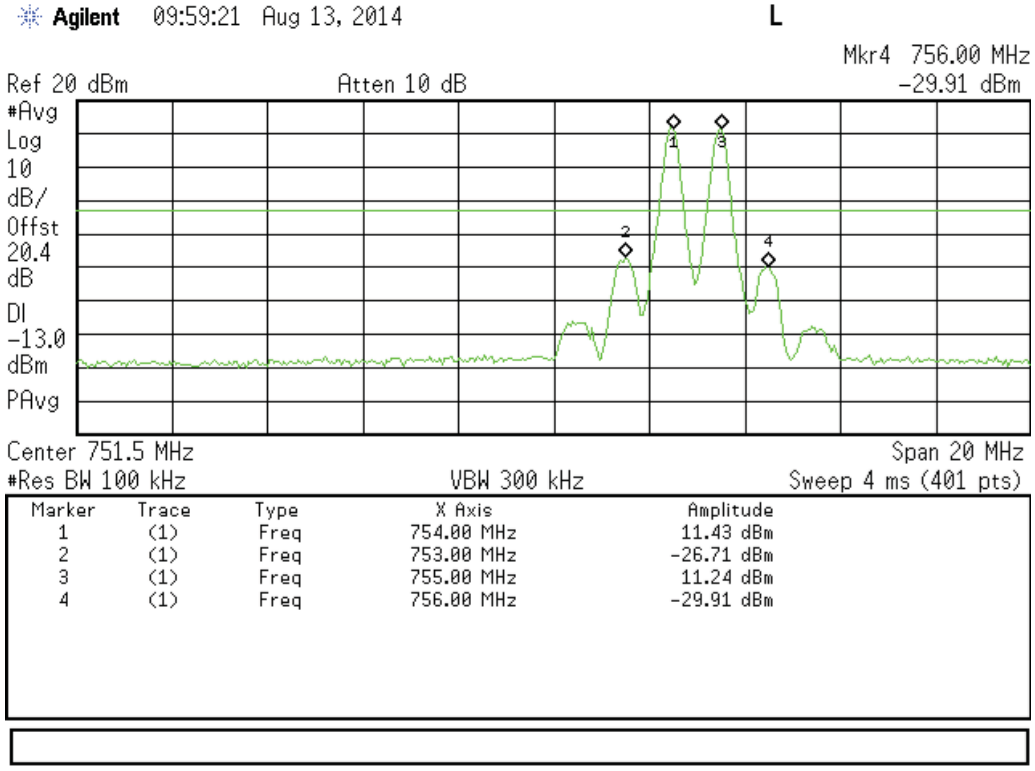
Intermodulation Downlink Test Results at AGC (GSM Signal)
746-757 MHz Band



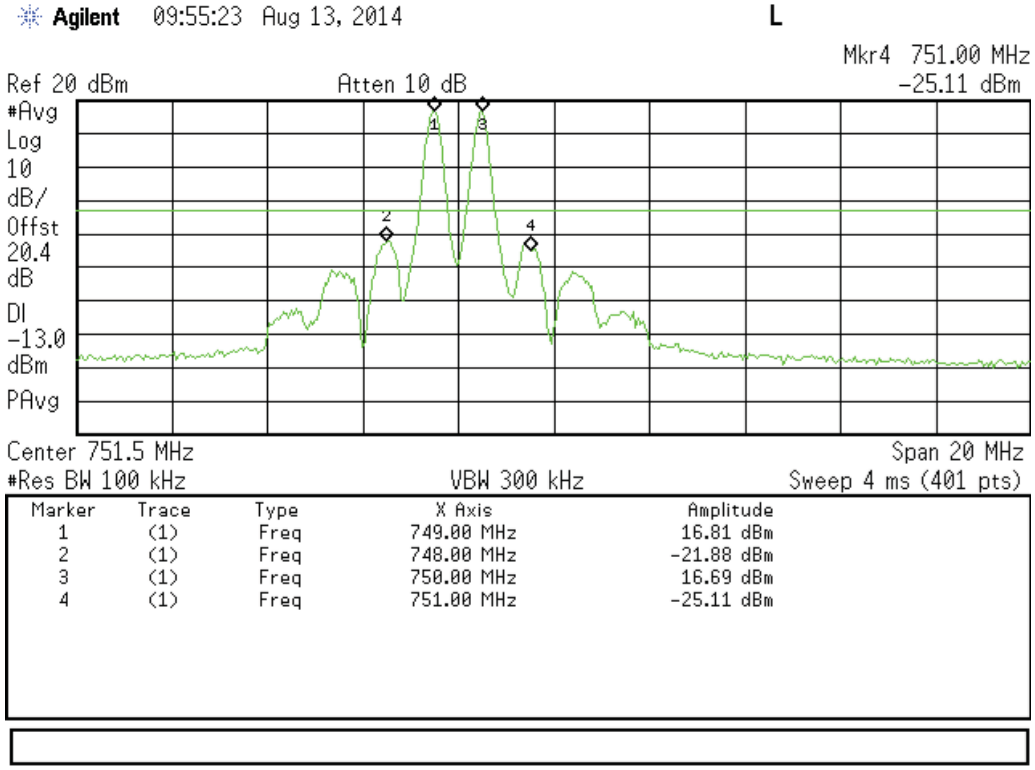


Intermodulation Downlink Test Results at 3db above AGC (GSM Signal)
746-757 MHz Band

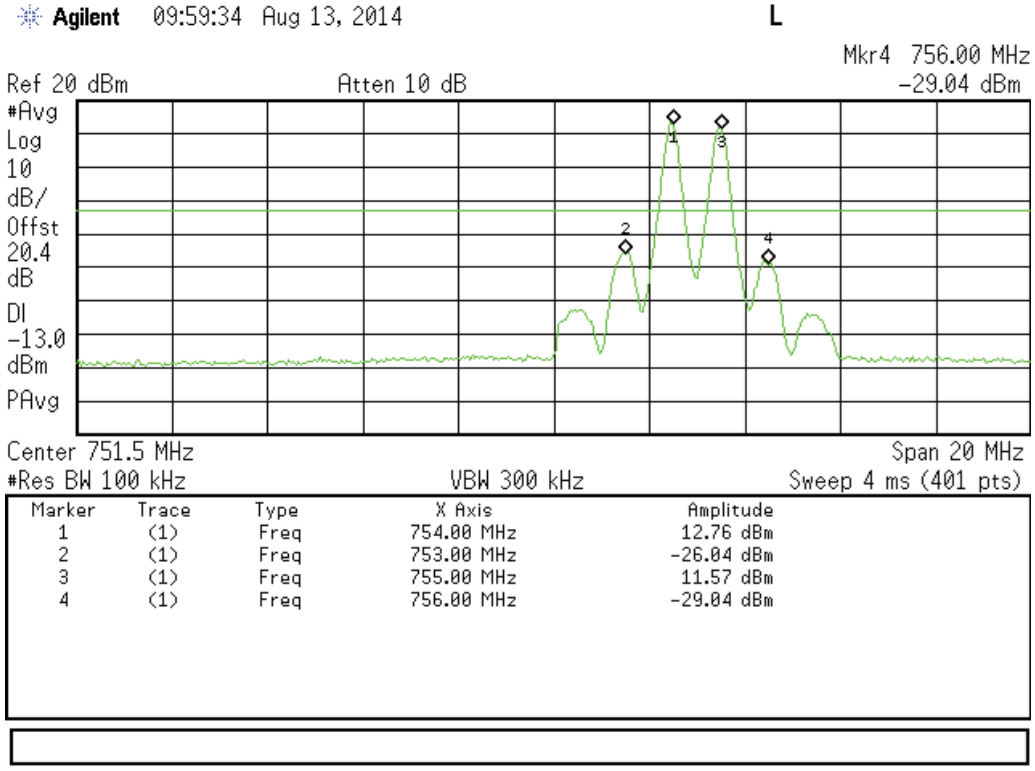




Intermodulation Downlink Test Results at 6db above AGC (GSM Signal)
746-757 MHz Band

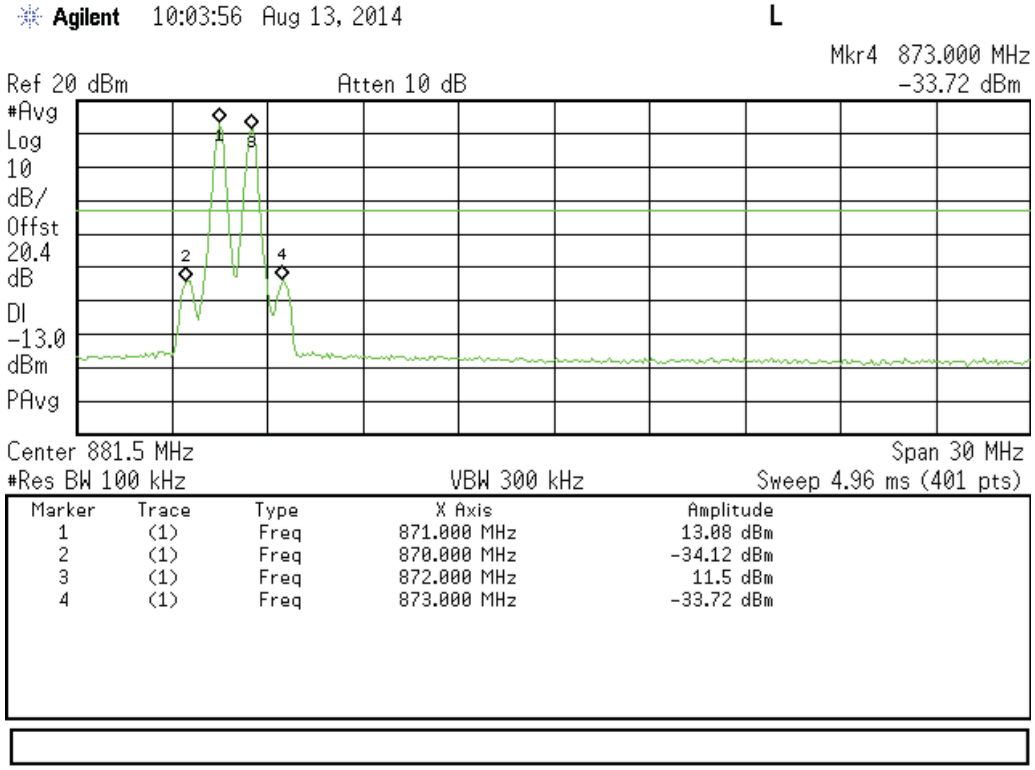


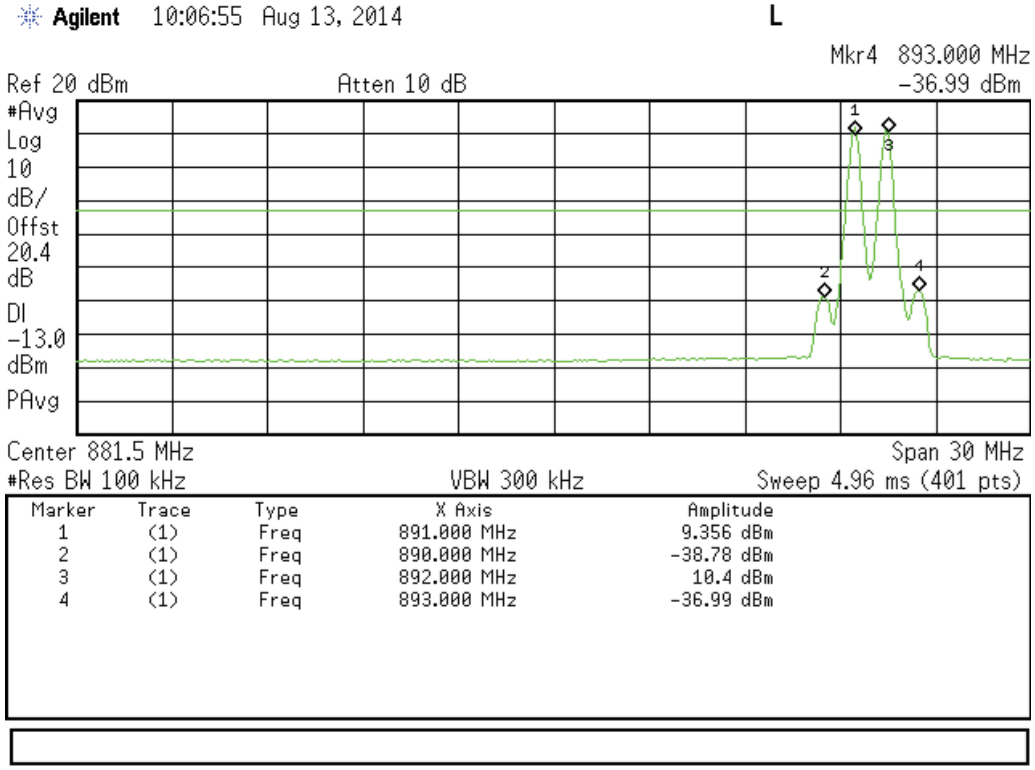
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	749.00 MHz	16.81 dBm
2	(1)	Freq	748.00 MHz	-21.88 dBm
3	(1)	Freq	750.00 MHz	16.69 dBm
4	(1)	Freq	751.00 MHz	-25.11 dBm



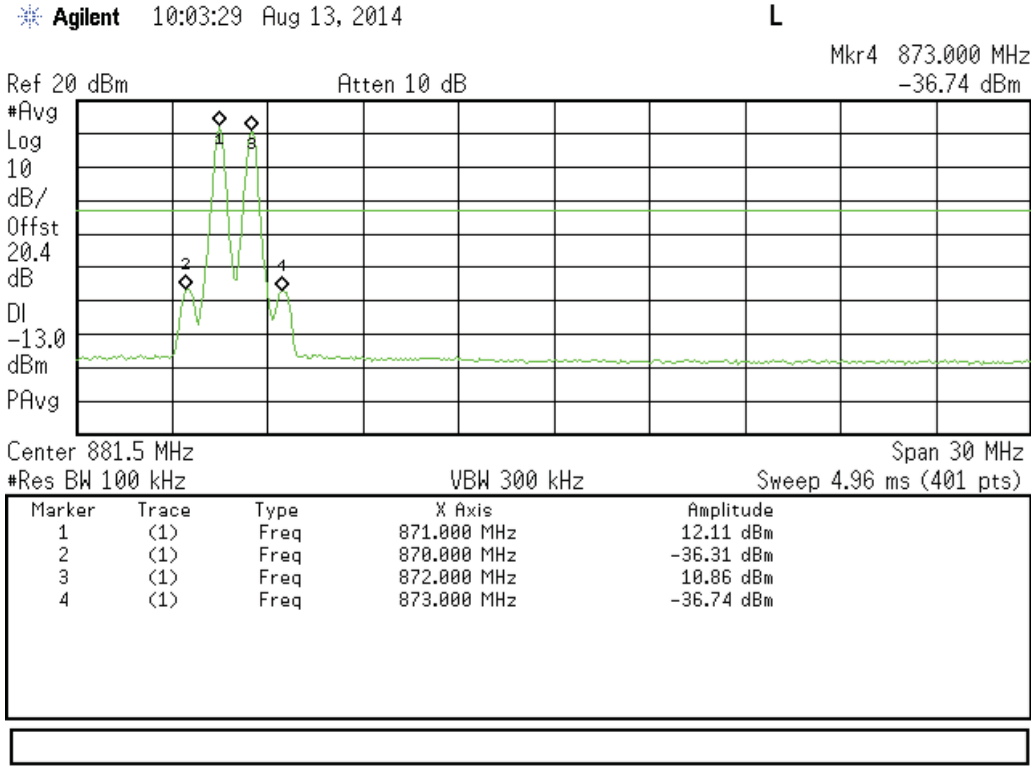
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	754.00 MHz	12.76 dBm
2	(1)	Freq	753.00 MHz	-26.04 dBm
3	(1)	Freq	755.00 MHz	11.57 dBm
4	(1)	Freq	756.00 MHz	-29.04 dBm

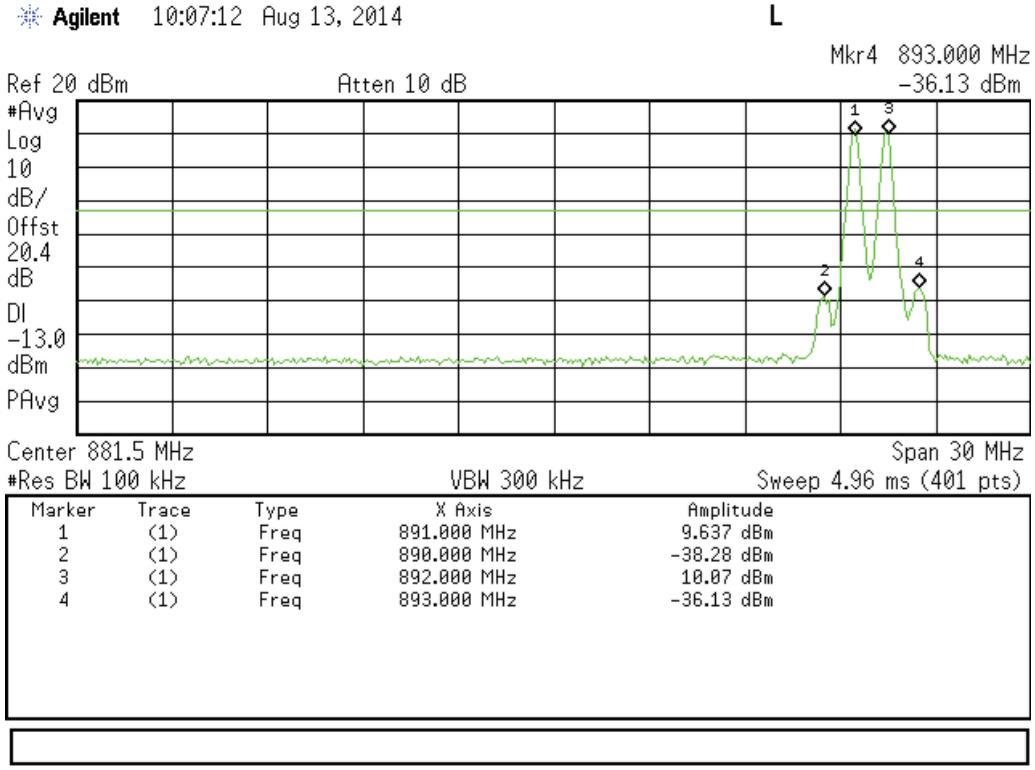
Intermodulation Downlink Test Results at AGC (GSM Signal)
869-894 MHz Band



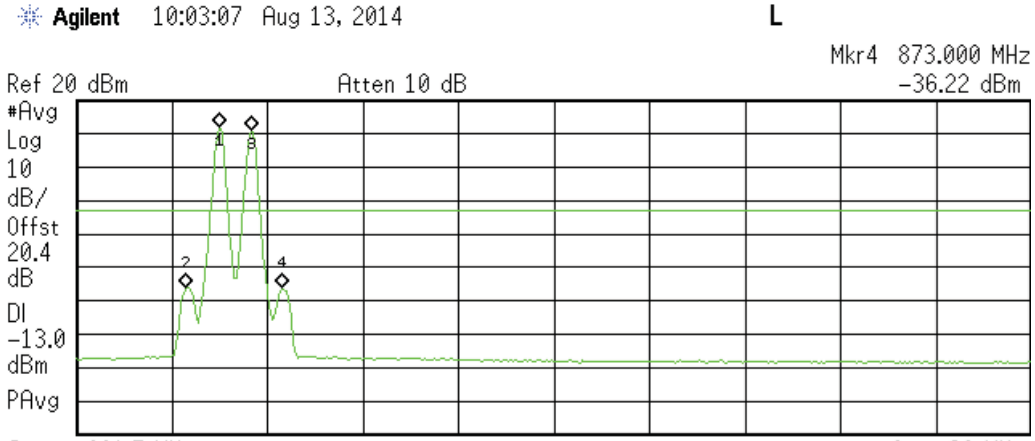


Intermodulation Downlink Test Results at 3db above AGC (GSM Signal)
869-894 MHz Band

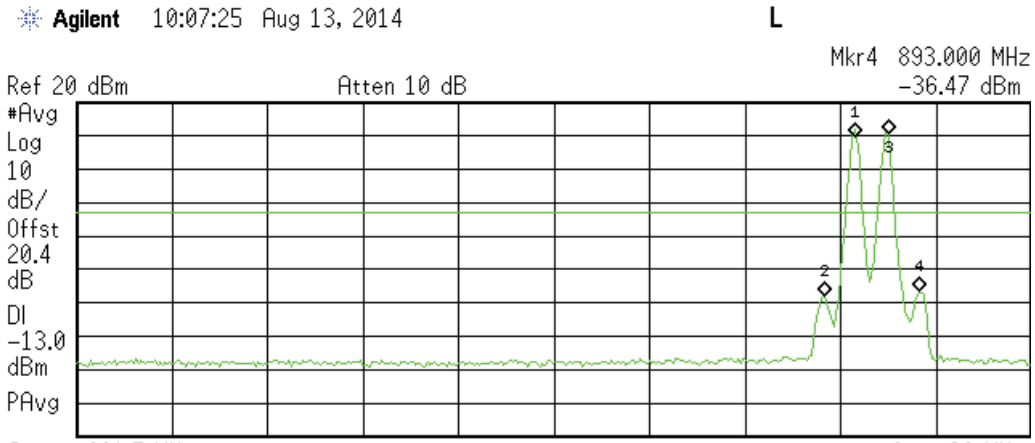




Intermodulation Downlink Test Results at 6db above AGC (GSM Signal)
869-894 MHz Band

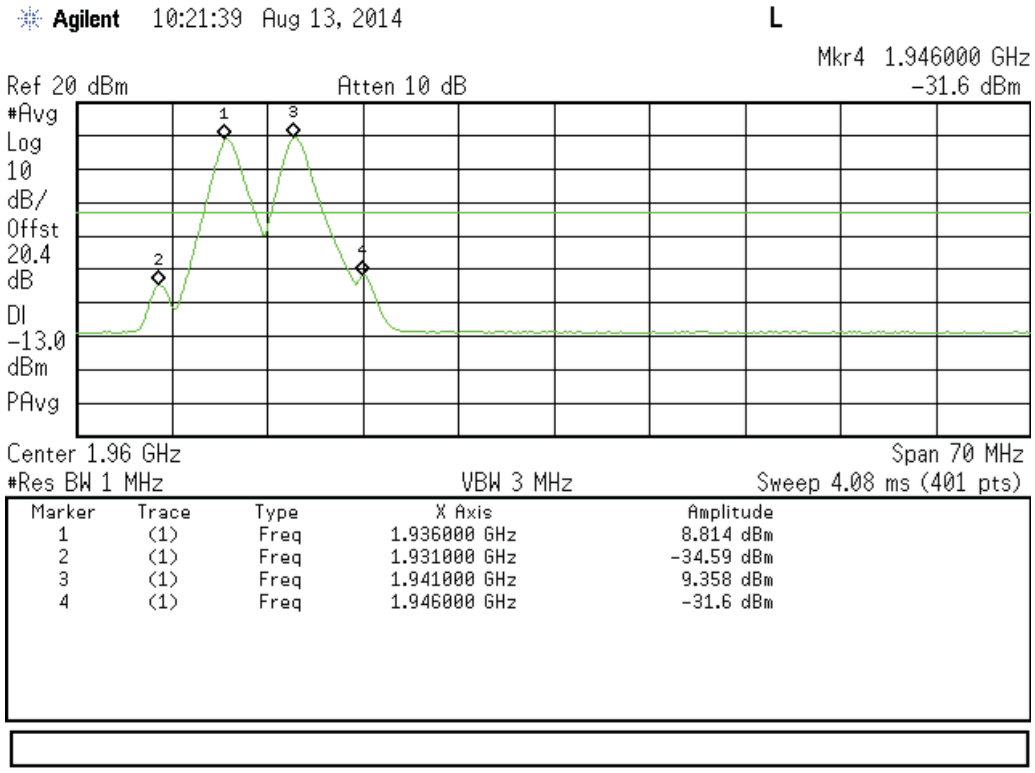


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	871.000 MHz	11.9 dBm
2	(1)	Freq	870.000 MHz	-36.09 dBm
3	(1)	Freq	872.000 MHz	11.11 dBm
4	(1)	Freq	873.000 MHz	-36.22 dBm

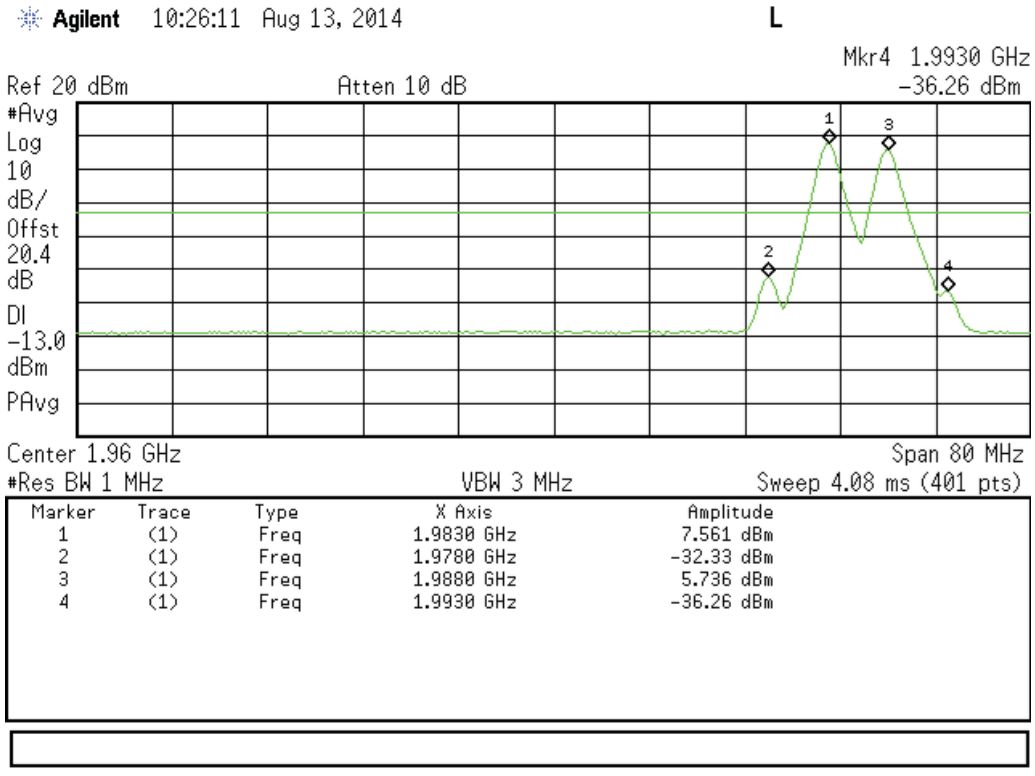


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	891.000 MHz	9.652 dBm
2	(1)	Freq	890.000 MHz	-37.77 dBm
3	(1)	Freq	892.000 MHz	10.36 dBm
4	(1)	Freq	893.000 MHz	-36.47 dBm

Intermodulation Downlink Test Results at AGC (GSM Signal)
1930-1995 MHz Band

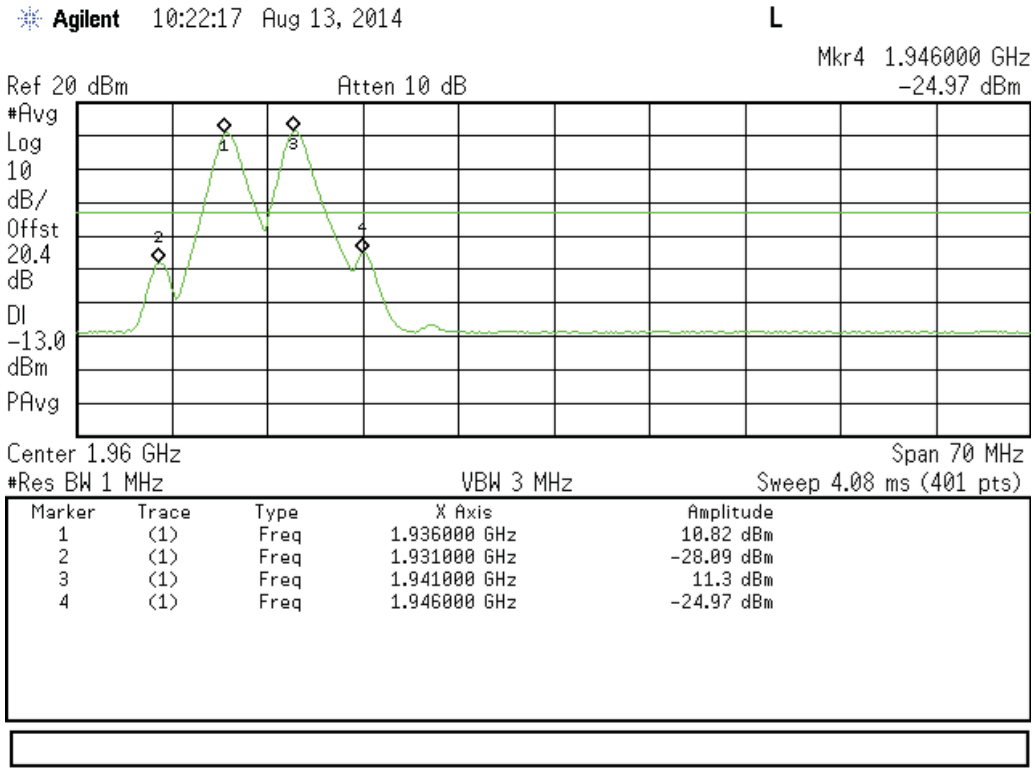


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.936000 GHz	8.814 dBm
2	(1)	Freq	1.931000 GHz	-34.59 dBm
3	(1)	Freq	1.941000 GHz	9.358 dBm
4	(1)	Freq	1.946000 GHz	-31.6 dBm

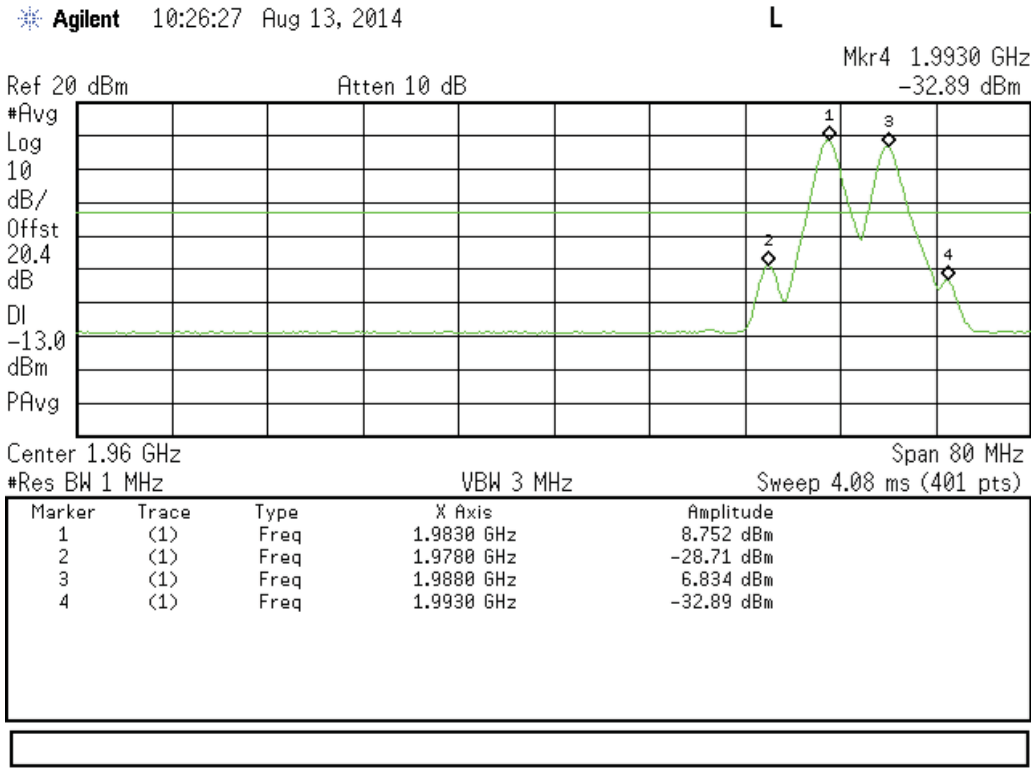


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.9830 GHz	7.561 dBm
2	(1)	Freq	1.9780 GHz	-32.33 dBm
3	(1)	Freq	1.9880 GHz	5.736 dBm
4	(1)	Freq	1.9930 GHz	-36.26 dBm

Intermodulation Downlink Test Results at 3db above AGC (GSM Signal)
1930-1995 MHz Band

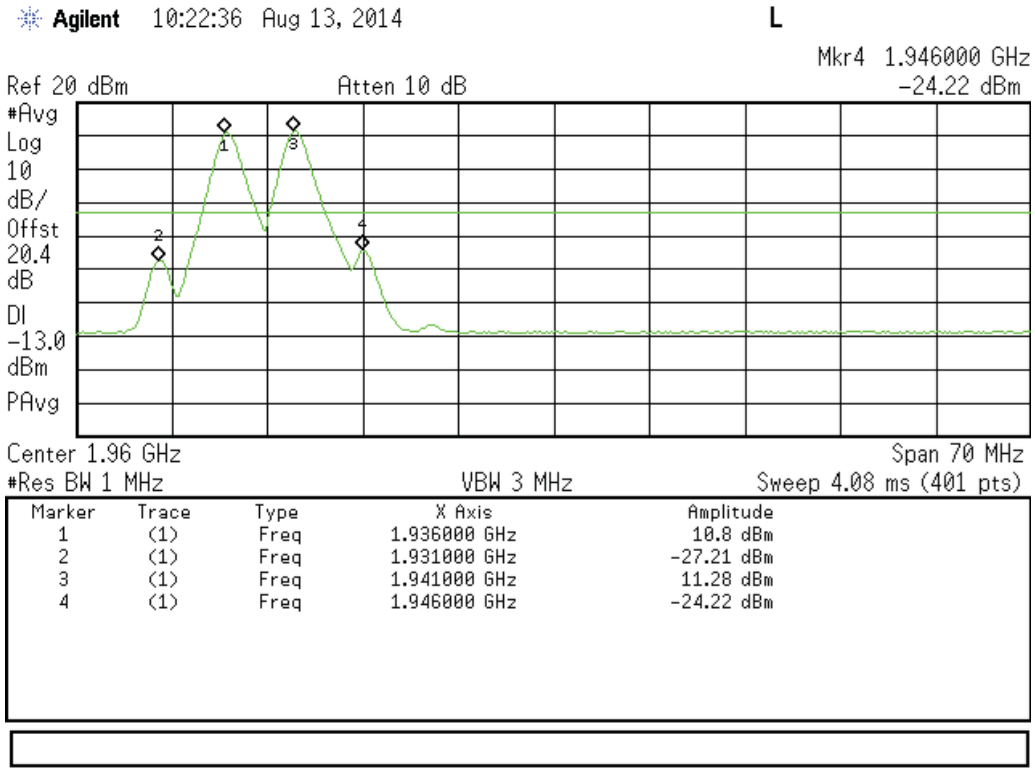


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.936000 GHz	10.82 dBm
2	(1)	Freq	1.931000 GHz	-28.09 dBm
3	(1)	Freq	1.941000 GHz	11.3 dBm
4	(1)	Freq	1.946000 GHz	-24.97 dBm

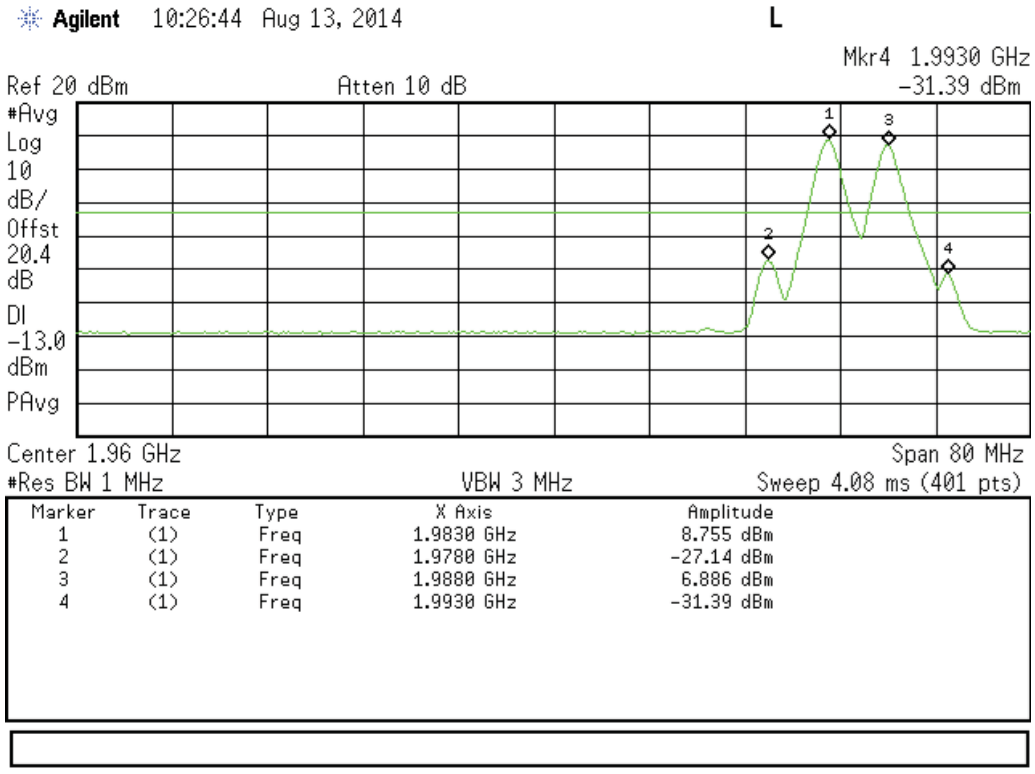


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.9830 GHz	8.752 dBm
2	(1)	Freq	1.9780 GHz	-28.71 dBm
3	(1)	Freq	1.9880 GHz	6.834 dBm
4	(1)	Freq	1.9930 GHz	-32.89 dBm

Intermodulation Downlink Test Results at 6db above AGC (GSM Signal)
1930-1995 MHz Band

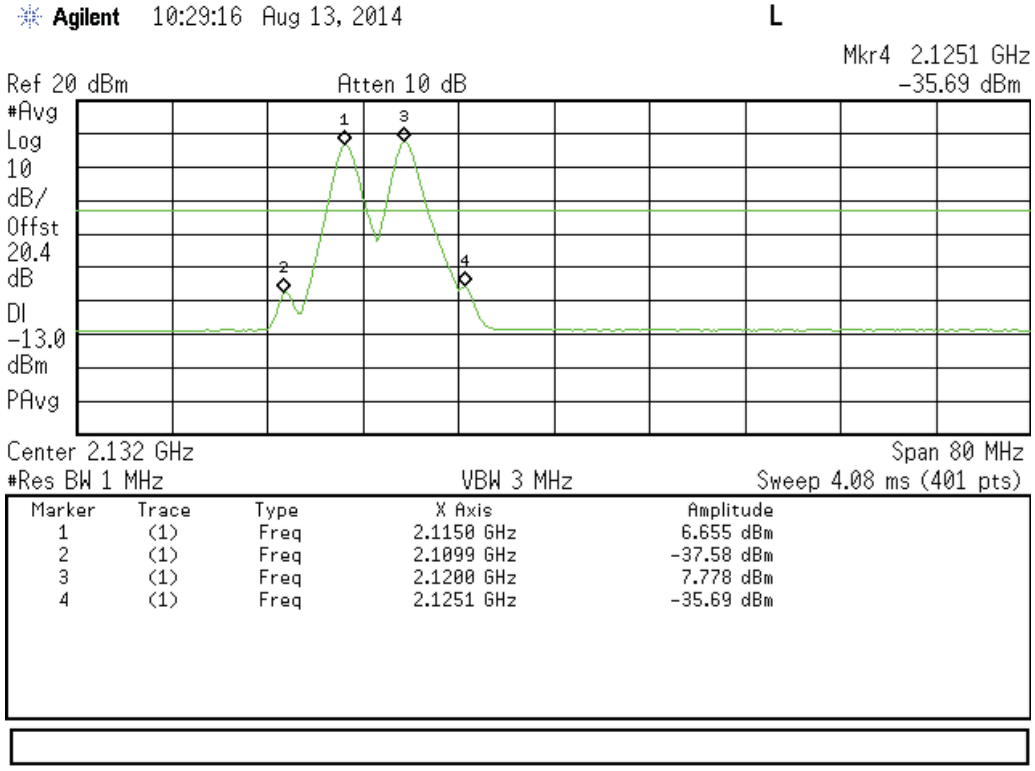


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.936000 GHz	10.8 dBm
2	(1)	Freq	1.931000 GHz	-27.21 dBm
3	(1)	Freq	1.941000 GHz	11.28 dBm
4	(1)	Freq	1.946000 GHz	-24.22 dBm

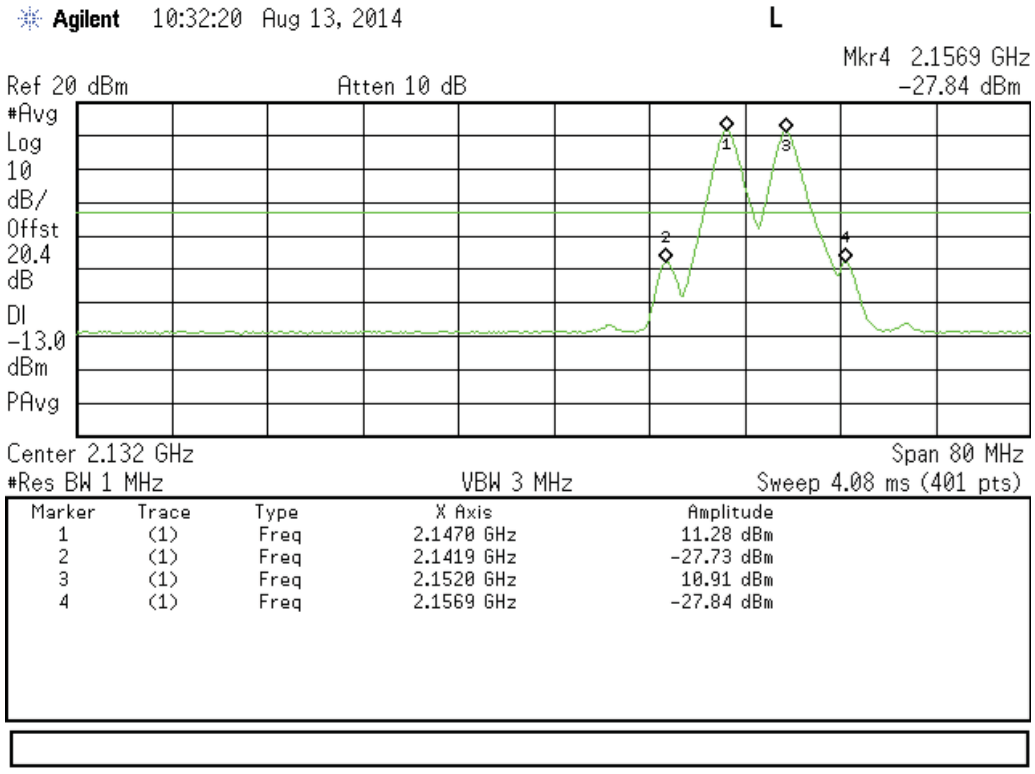


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.9830 GHz	8.755 dBm
2	(1)	Freq	1.9780 GHz	-27.14 dBm
3	(1)	Freq	1.9880 GHz	6.886 dBm
4	(1)	Freq	1.9930 GHz	-31.39 dBm

Intermodulation Downlink Test Results at AGC (GSM Signal)
2110-2155 MHz Band

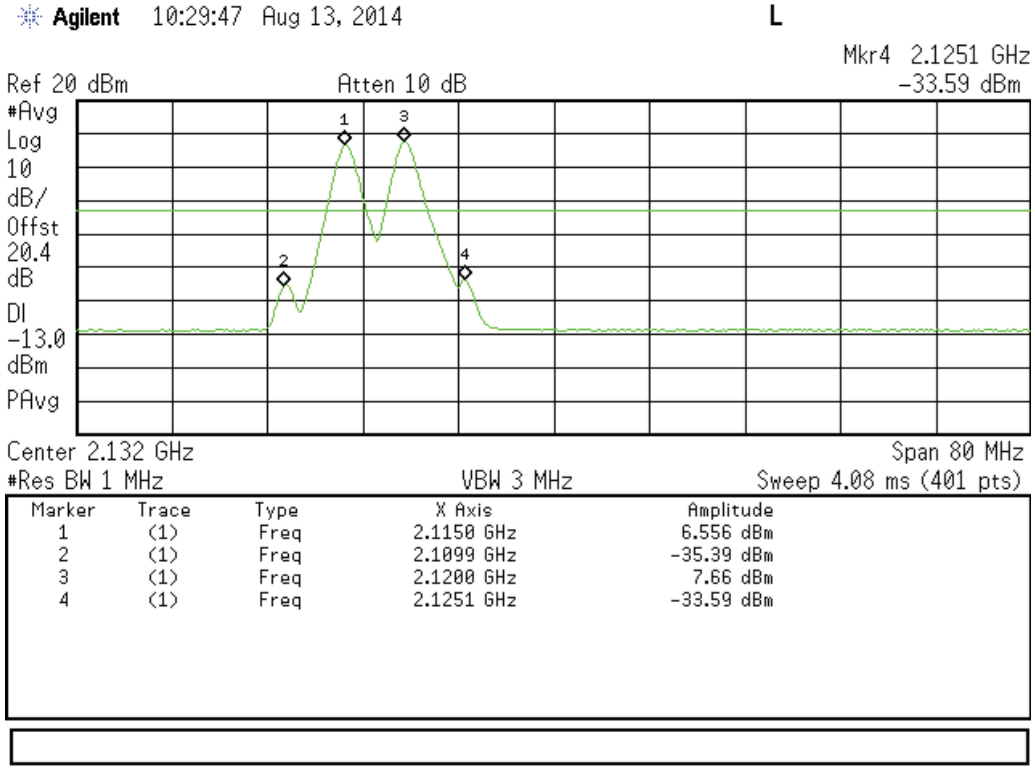


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1150 GHz	6.655 dBm
2	(1)	Freq	2.1099 GHz	-37.58 dBm
3	(1)	Freq	2.1200 GHz	7.778 dBm
4	(1)	Freq	2.1251 GHz	-35.69 dBm

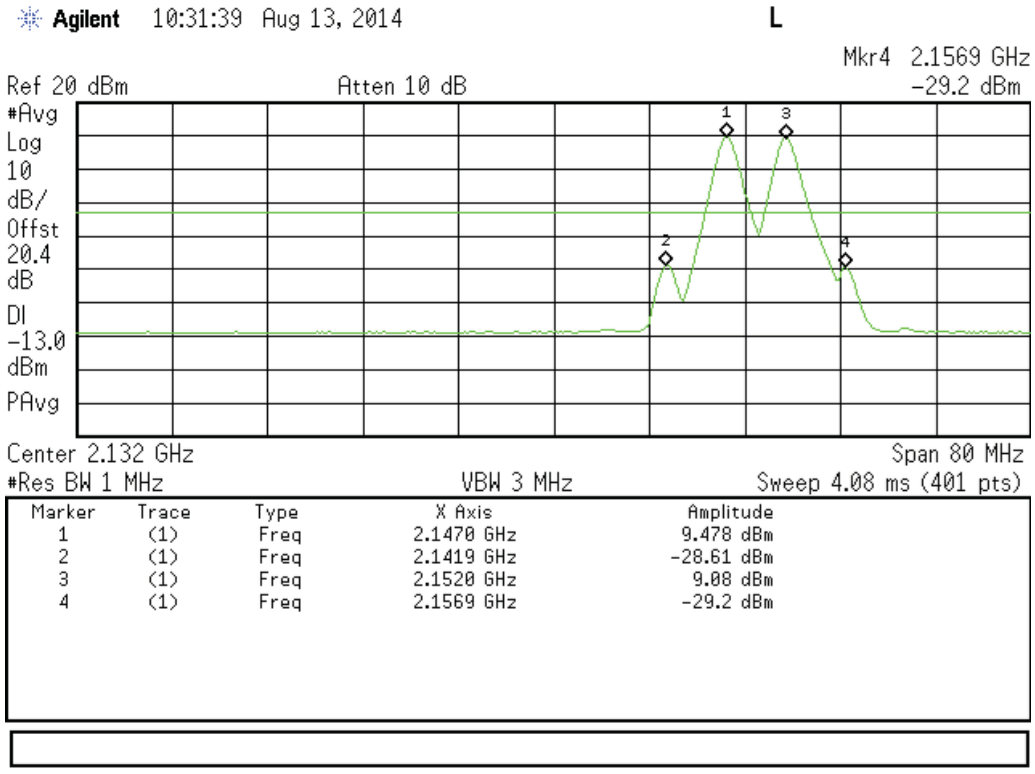


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1470 GHz	11.28 dBm
2	(1)	Freq	2.1419 GHz	-27.73 dBm
3	(1)	Freq	2.1520 GHz	10.91 dBm
4	(1)	Freq	2.1569 GHz	-27.84 dBm

Intermodulation Downlink Test Results at 3db above AGC (GSM Signal)
2110-2155 MHz Band

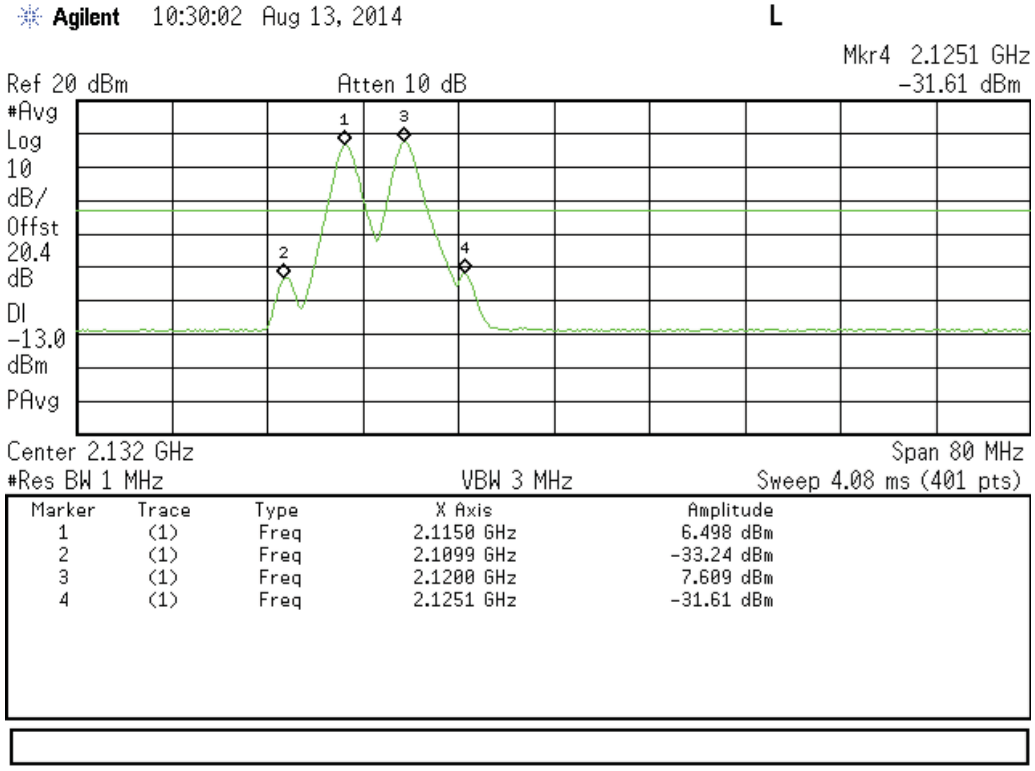


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1150 GHz	6.556 dBm
2	(1)	Freq	2.1099 GHz	-35.39 dBm
3	(1)	Freq	2.1200 GHz	7.66 dBm
4	(1)	Freq	2.1251 GHz	-33.59 dBm

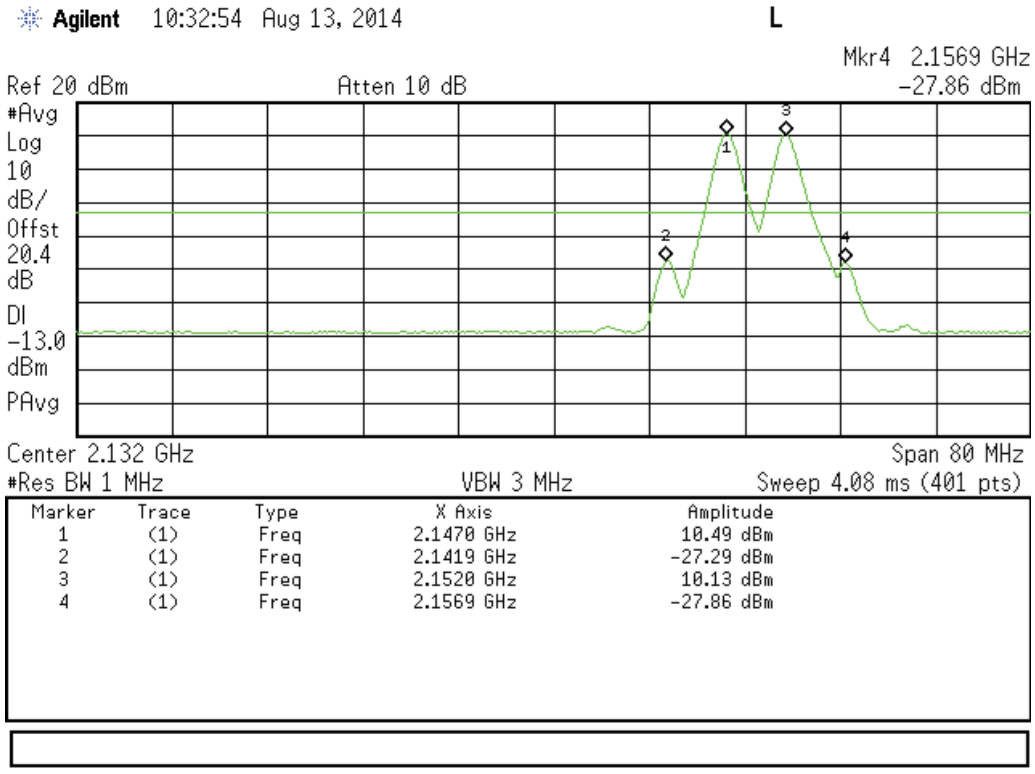


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1470 GHz	9.478 dBm
2	(1)	Freq	2.1419 GHz	-28.61 dBm
3	(1)	Freq	2.1520 GHz	9.08 dBm
4	(1)	Freq	2.1569 GHz	-29.2 dBm

Intermodulation Downlink Test Results at 6db above AGC (GSM Signal)
2110-2155 MHz Band

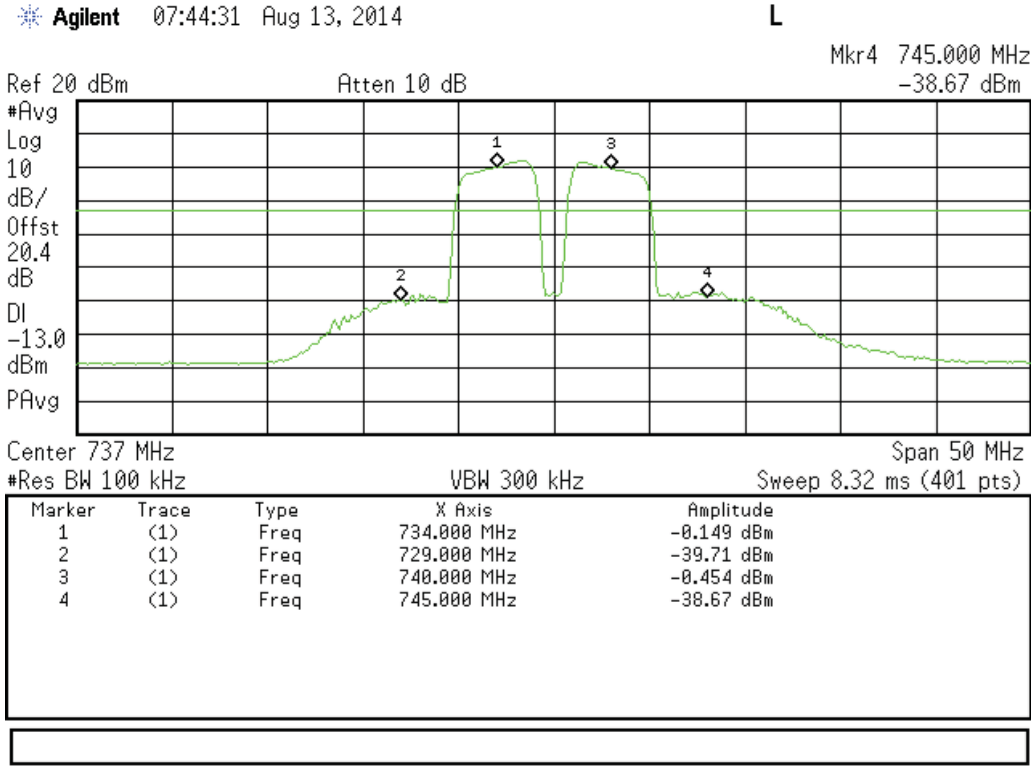


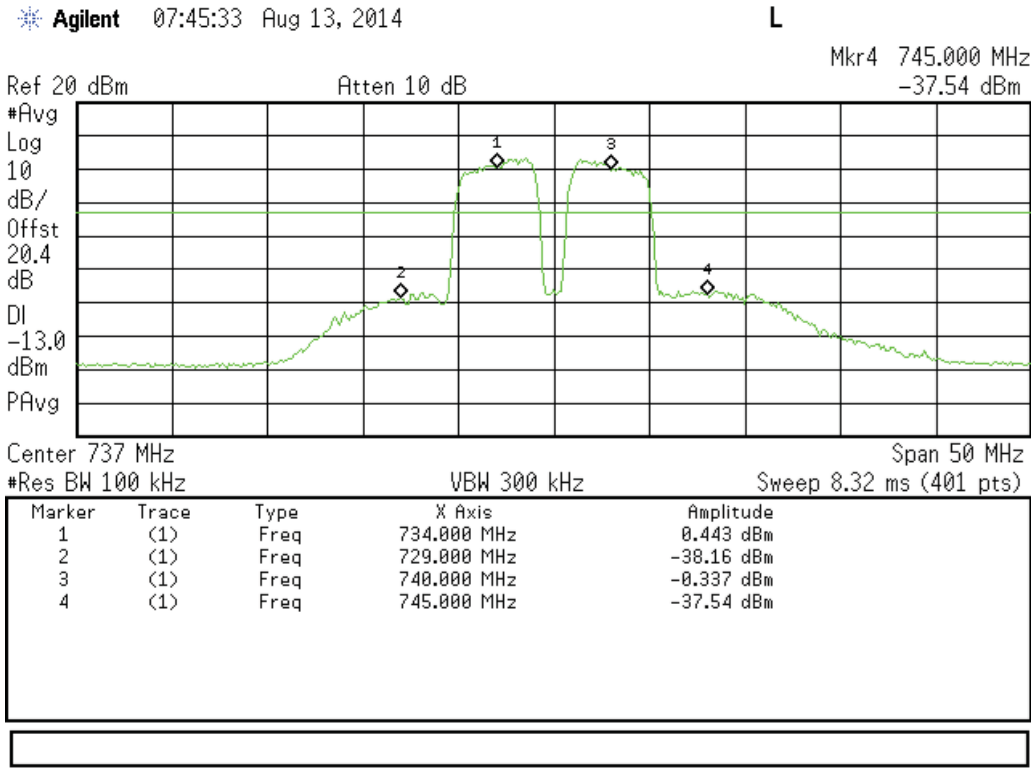
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1150 GHz	6.498 dBm
2	(1)	Freq	2.1099 GHz	-33.24 dBm
3	(1)	Freq	2.1200 GHz	7.609 dBm
4	(1)	Freq	2.1251 GHz	-31.61 dBm



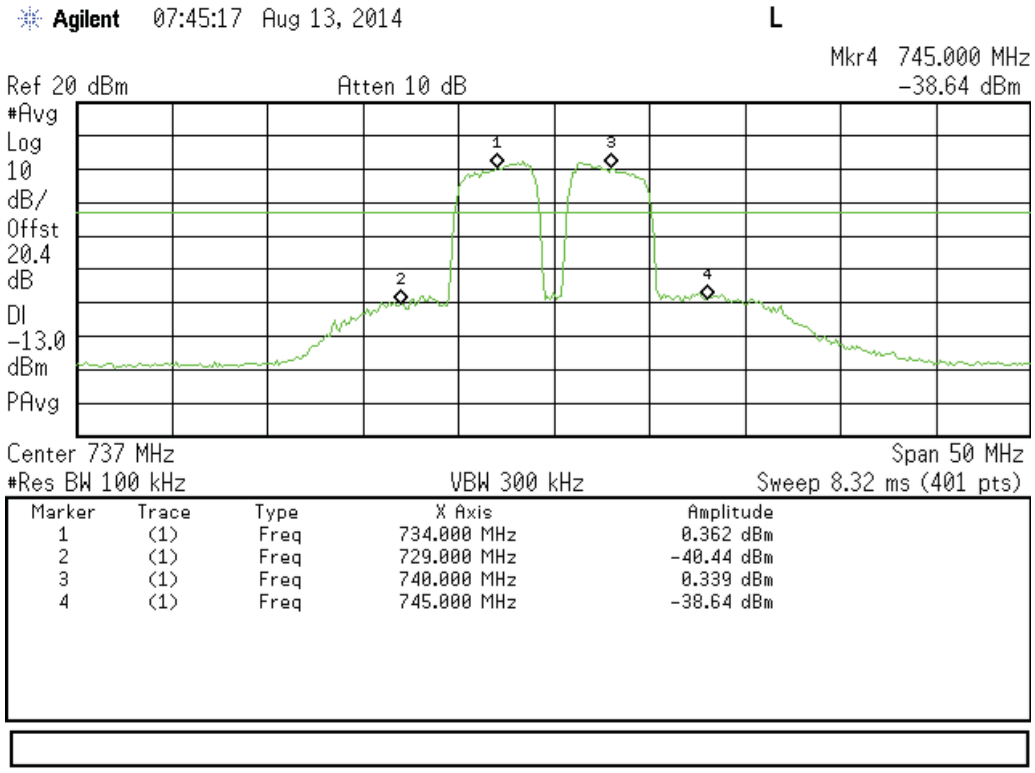
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1470 GHz	10.49 dBm
2	(1)	Freq	2.1419 GHz	-27.29 dBm
3	(1)	Freq	2.1520 GHz	10.13 dBm
4	(1)	Freq	2.1569 GHz	-27.86 dBm

Intermodulation Downlink Test Results at AGC (CDMA Signal)
728-746 MHz Band

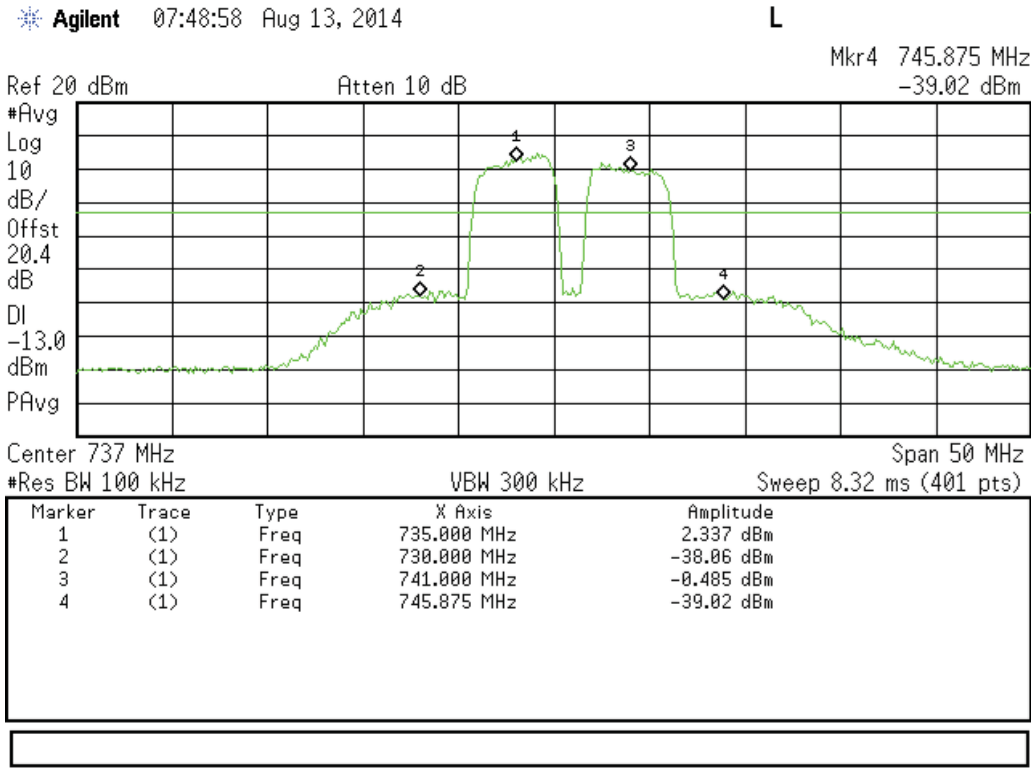




Intermodulation Downlink Test Results at 3db above AGC (CDMA Signal)
728-746 MHz Band

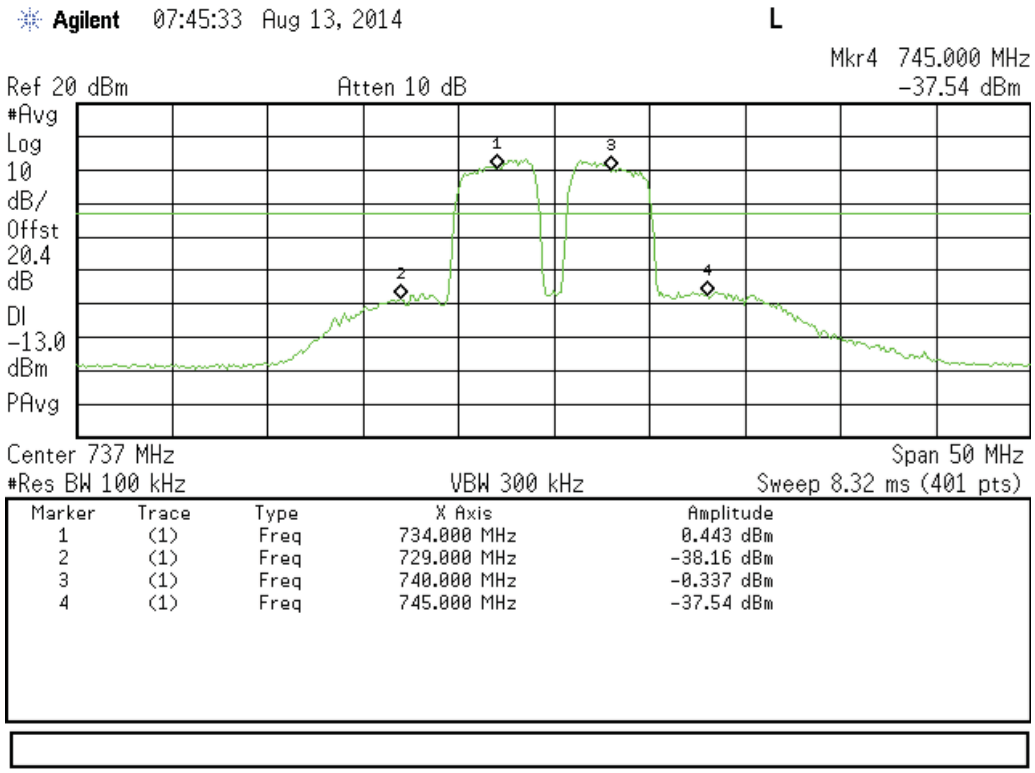


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	734.000 MHz	0.362 dBm
2	(1)	Freq	729.000 MHz	-40.44 dBm
3	(1)	Freq	740.000 MHz	0.339 dBm
4	(1)	Freq	745.000 MHz	-38.64 dBm

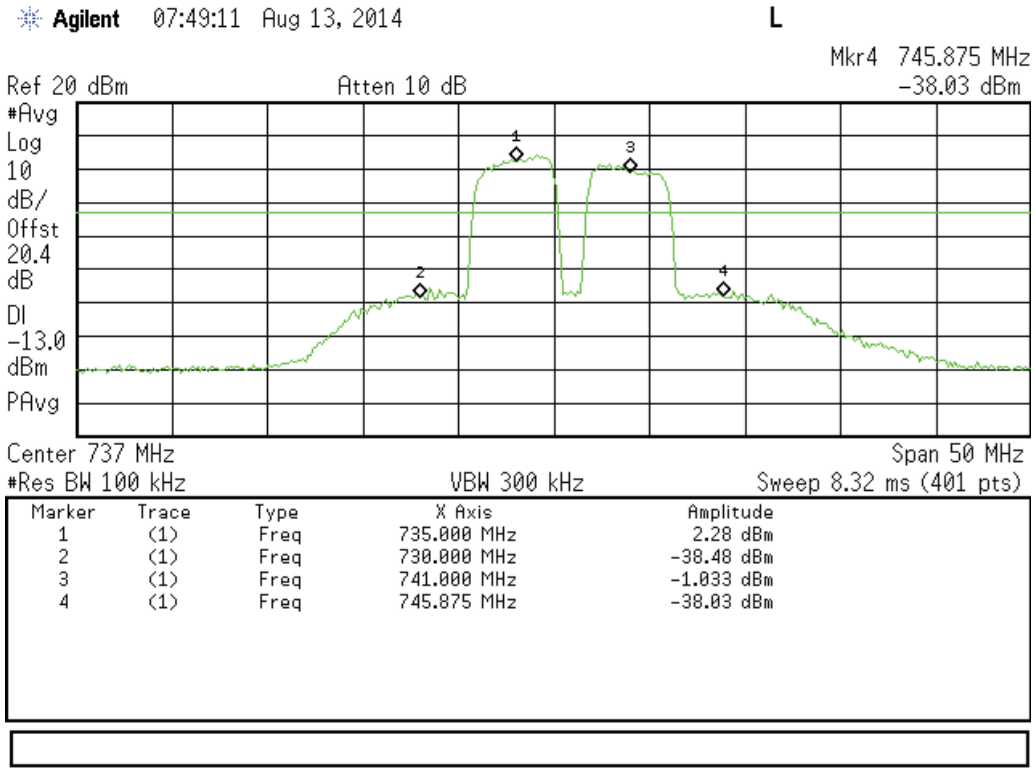


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	735.000 MHz	2.337 dBm
2	(1)	Freq	730.000 MHz	-38.06 dBm
3	(1)	Freq	741.000 MHz	-0.485 dBm
4	(1)	Freq	745.875 MHz	-39.02 dBm

Intermodulation Downlink Test Results at 6db above AGC (CDMA Signal)
728-746 MHz Band

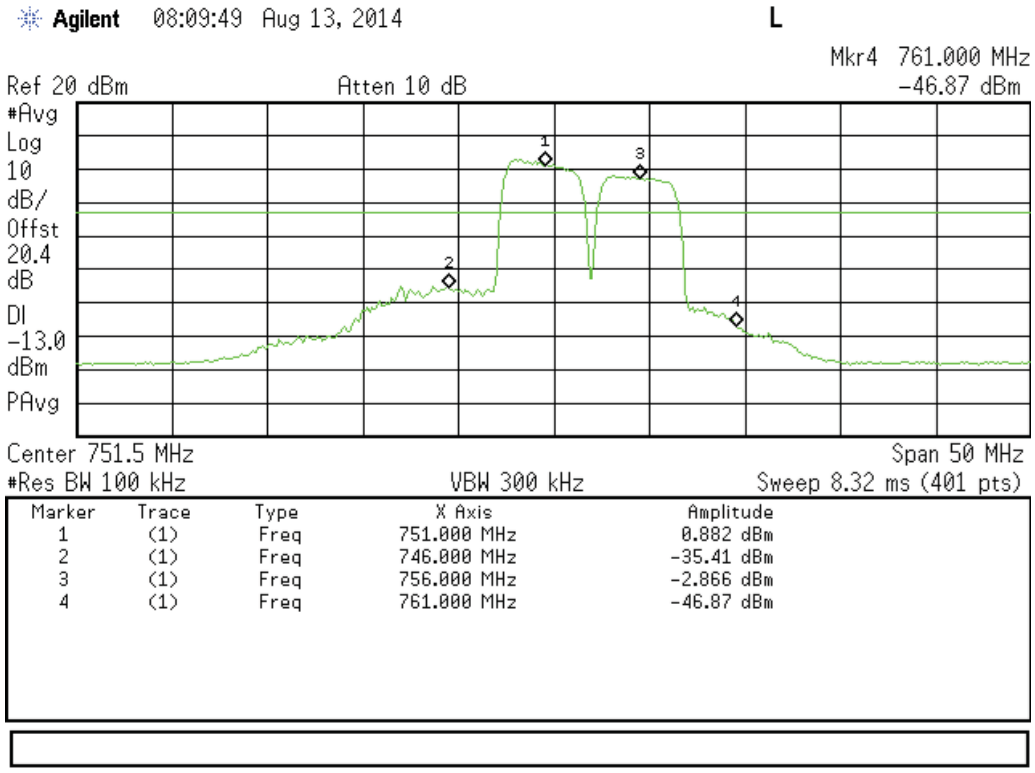


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	734.000 MHz	0.443 dBm
2	(1)	Freq	729.000 MHz	-38.16 dBm
3	(1)	Freq	740.000 MHz	-0.337 dBm
4	(1)	Freq	745.000 MHz	-37.54 dBm

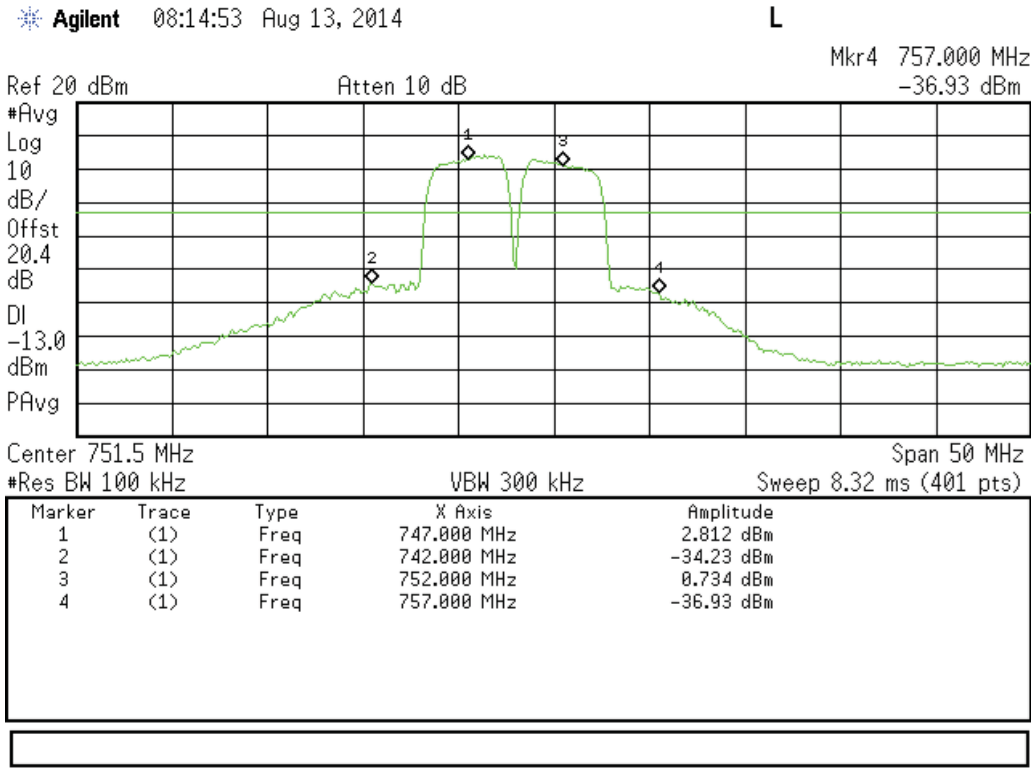


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	735.000 MHz	2.28 dBm
2	(1)	Freq	730.000 MHz	-38.48 dBm
3	(1)	Freq	741.000 MHz	-1.033 dBm
4	(1)	Freq	745.875 MHz	-38.03 dBm

Intermodulation Downlink Test Results at AGC (CDMA Signal)
746-757 MHz Band

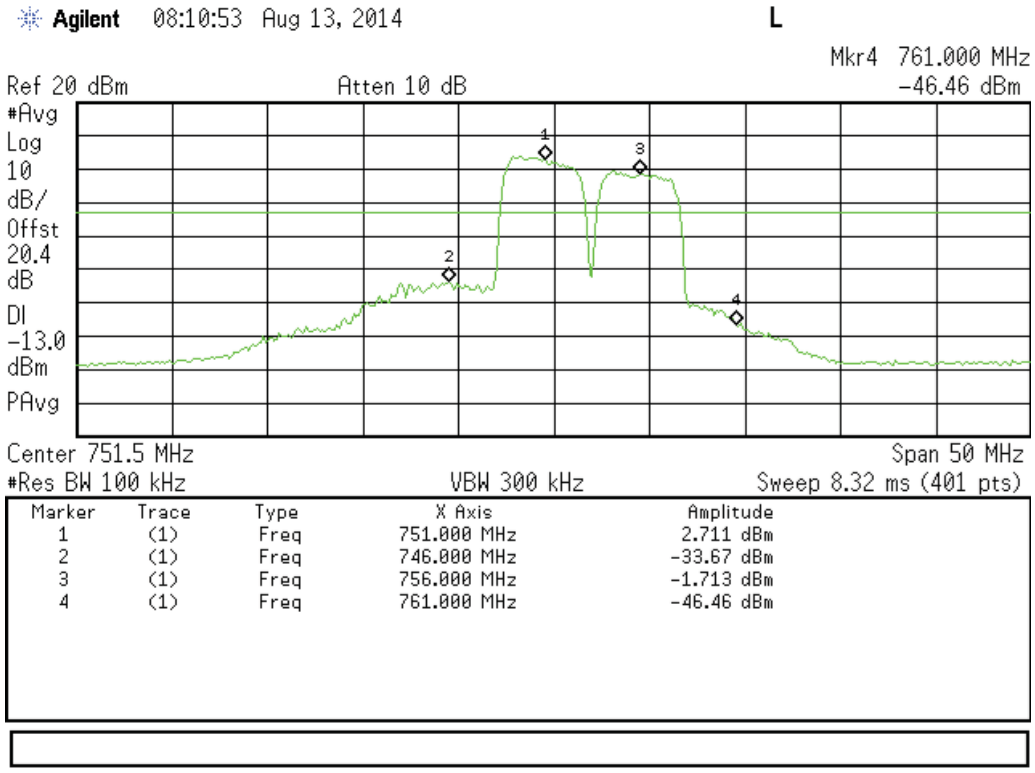


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	751.000 MHz	0.882 dBm
2	(1)	Freq	746.000 MHz	-35.41 dBm
3	(1)	Freq	756.000 MHz	-2.866 dBm
4	(1)	Freq	761.000 MHz	-46.87 dBm

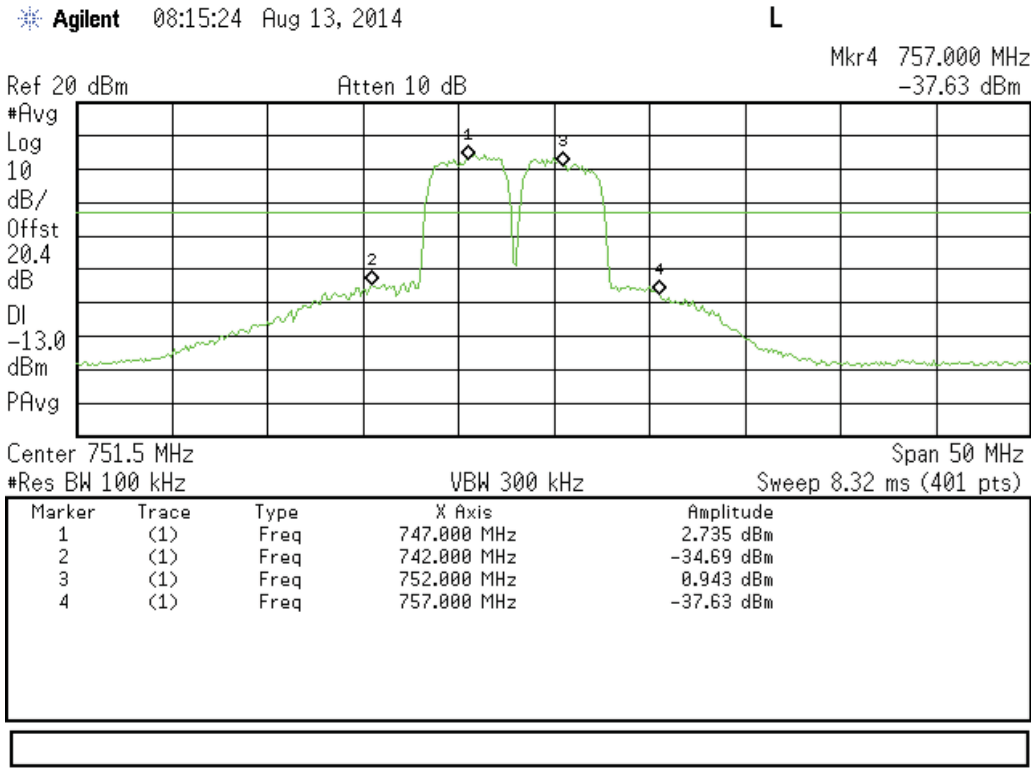


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	747.000 MHz	2.812 dBm
2	(1)	Freq	742.000 MHz	-34.23 dBm
3	(1)	Freq	752.000 MHz	0.734 dBm
4	(1)	Freq	757.000 MHz	-36.93 dBm

Intermodulation Downlink Test Results at 3db above AGC (CDMA Signal)
746-757 MHz Band

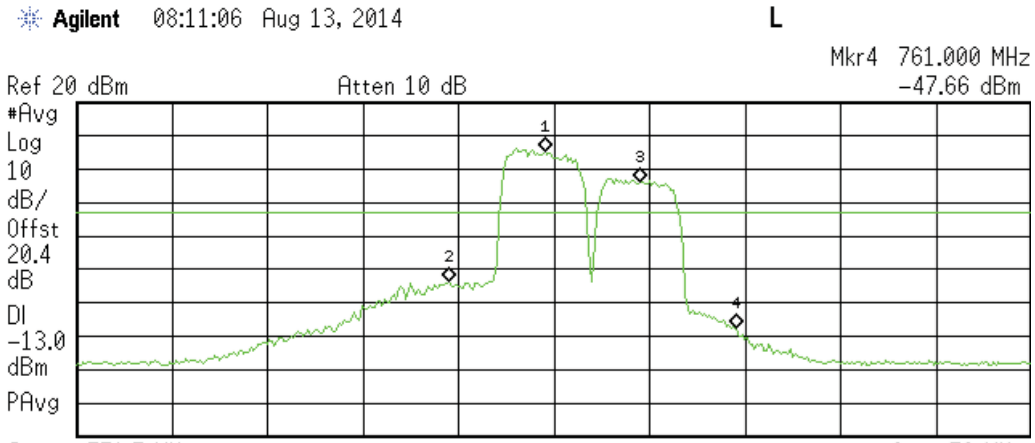


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	751.000 MHz	2.711 dBm
2	(1)	Freq	746.000 MHz	-33.67 dBm
3	(1)	Freq	756.000 MHz	-1.713 dBm
4	(1)	Freq	761.000 MHz	-46.46 dBm

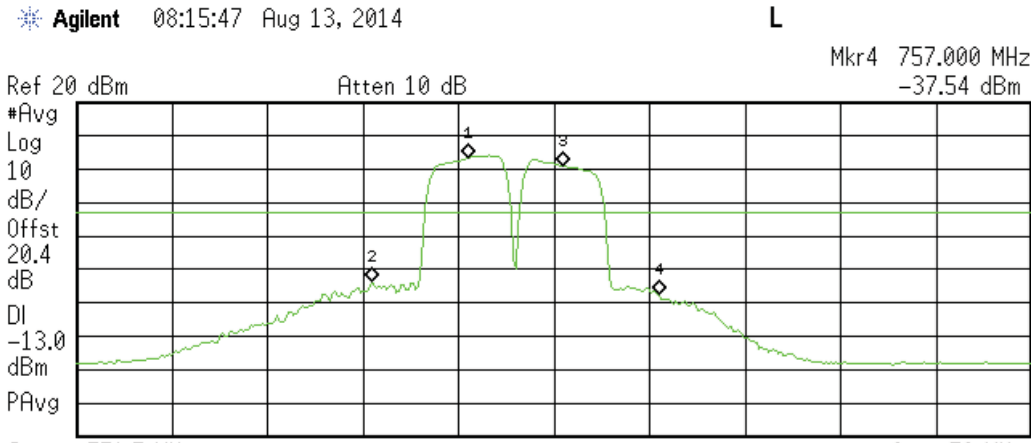


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	747.000 MHz	2.735 dBm
2	(1)	Freq	742.000 MHz	-34.69 dBm
3	(1)	Freq	752.000 MHz	0.943 dBm
4	(1)	Freq	757.000 MHz	-37.63 dBm

Intermodulation Downlink Test Results at 6db above AGC (CDMA Signal)
746-757 MHz Band

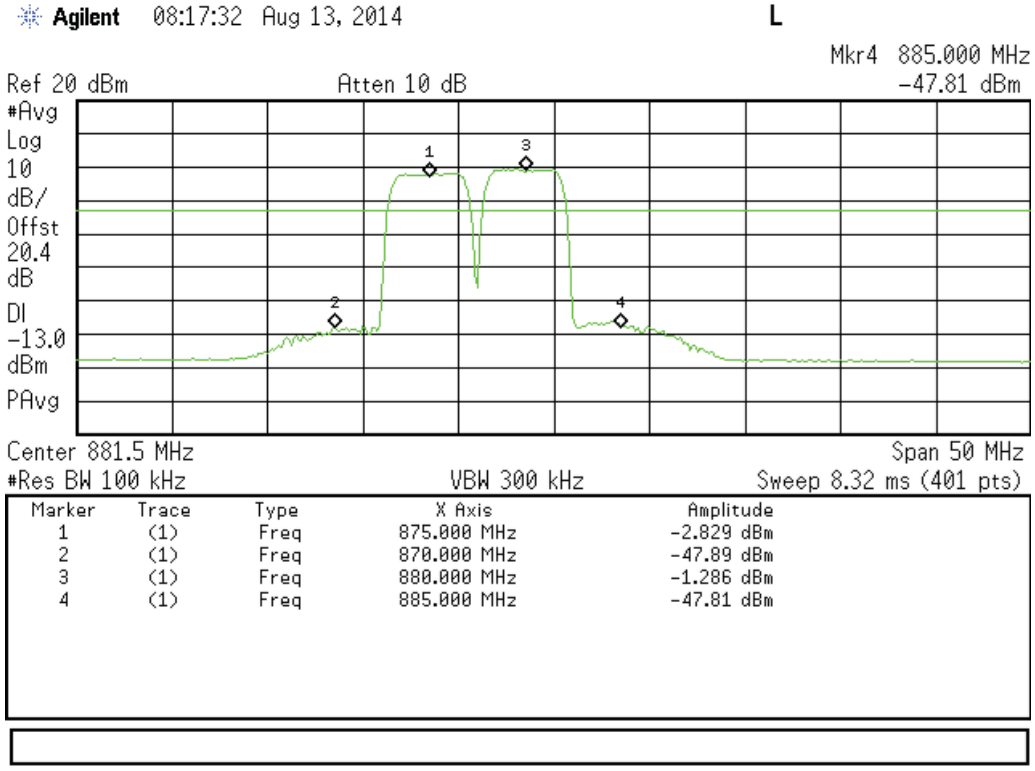


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	751.000 MHz	5.167 dBm
2	(1)	Freq	746.000 MHz	-33.44 dBm
3	(1)	Freq	756.000 MHz	-4.001 dBm
4	(1)	Freq	761.000 MHz	-47.66 dBm

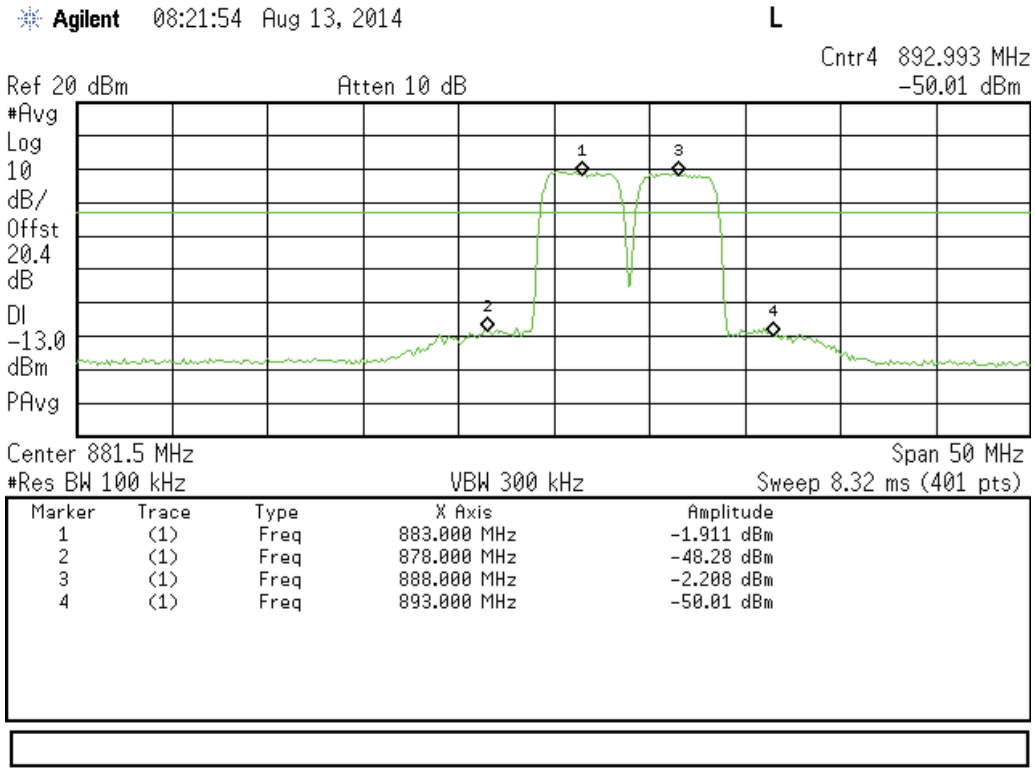


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	747.000 MHz	3.234 dBm
2	(1)	Freq	742.000 MHz	-33.79 dBm
3	(1)	Freq	752.000 MHz	0.851 dBm
4	(1)	Freq	757.000 MHz	-37.54 dBm

Intermodulation Downlink Test Results at AGC (CDMA Signal)
869-894 MHz Band

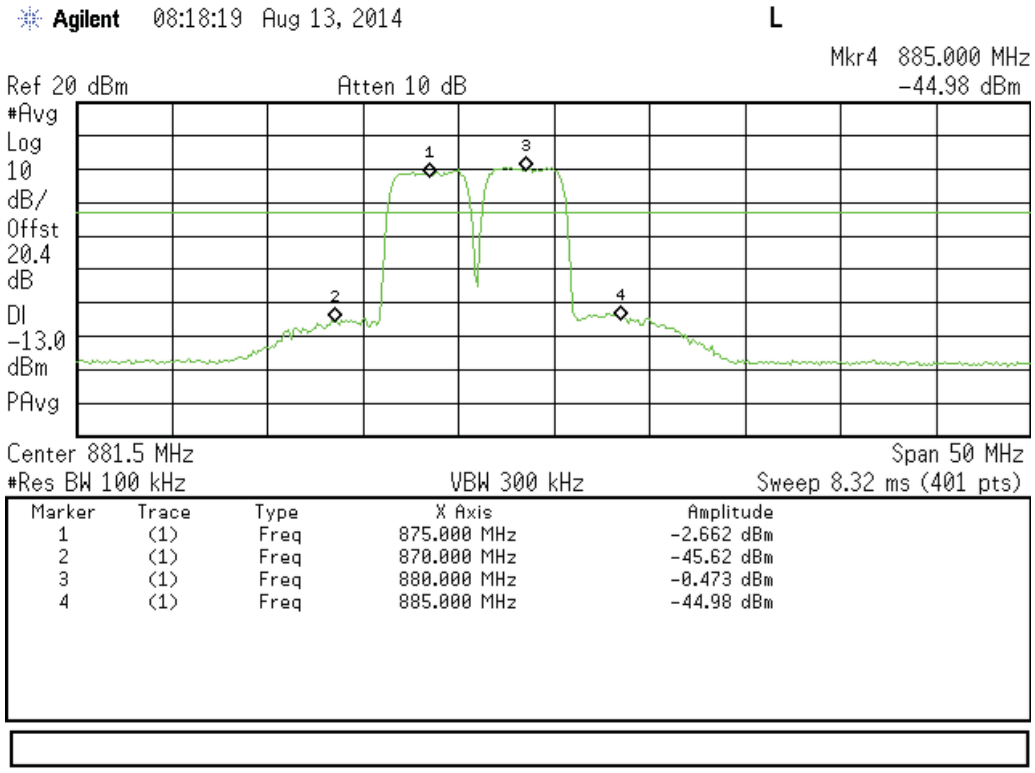


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	875.000 MHz	-2.829 dBm
2	(1)	Freq	870.000 MHz	-47.89 dBm
3	(1)	Freq	880.000 MHz	-1.286 dBm
4	(1)	Freq	885.000 MHz	-47.81 dBm

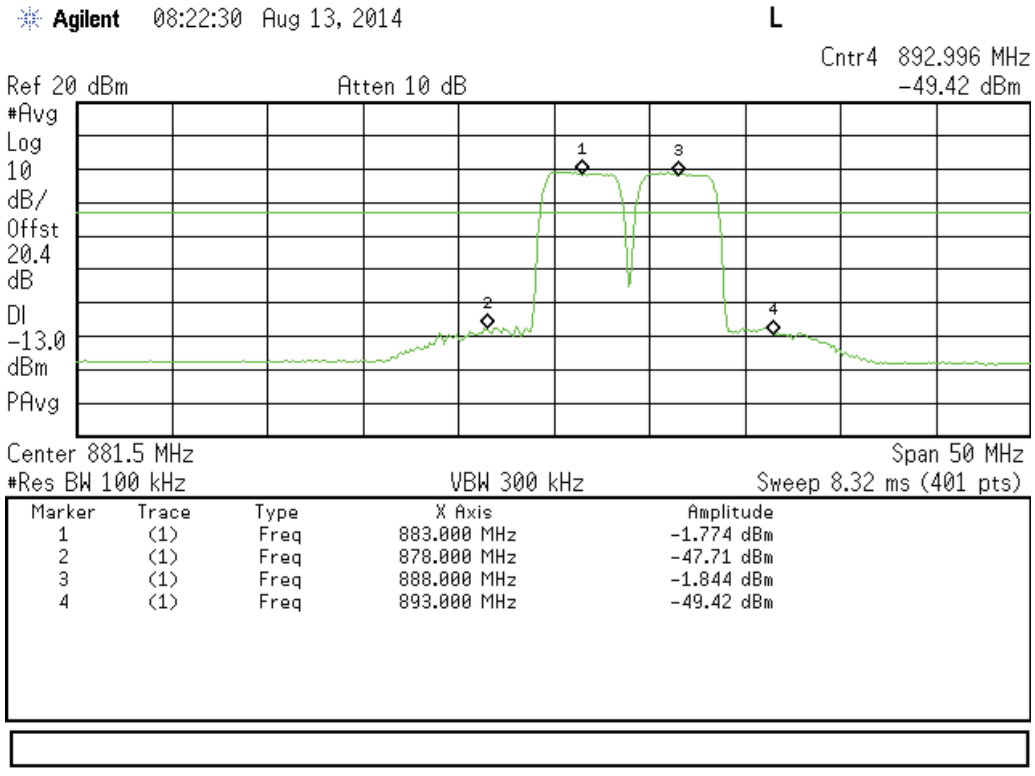


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	883.000 MHz	-1.911 dBm
2	(1)	Freq	878.000 MHz	-48.28 dBm
3	(1)	Freq	888.000 MHz	-2.208 dBm
4	(1)	Freq	893.000 MHz	-50.01 dBm

Intermodulation Downlink Test Results at 3db above AGC (CDMA Signal)
869-894 MHz Band

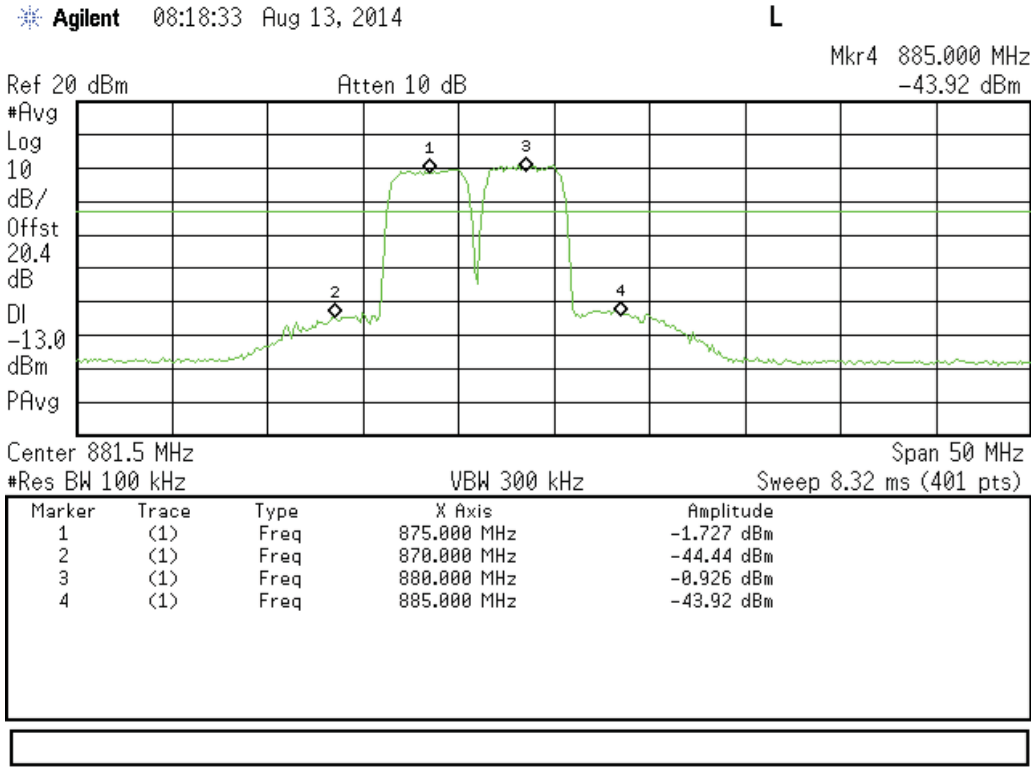


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	875.000 MHz	-2.662 dBm
2	(1)	Freq	870.000 MHz	-45.62 dBm
3	(1)	Freq	880.000 MHz	-0.473 dBm
4	(1)	Freq	885.000 MHz	-44.98 dBm

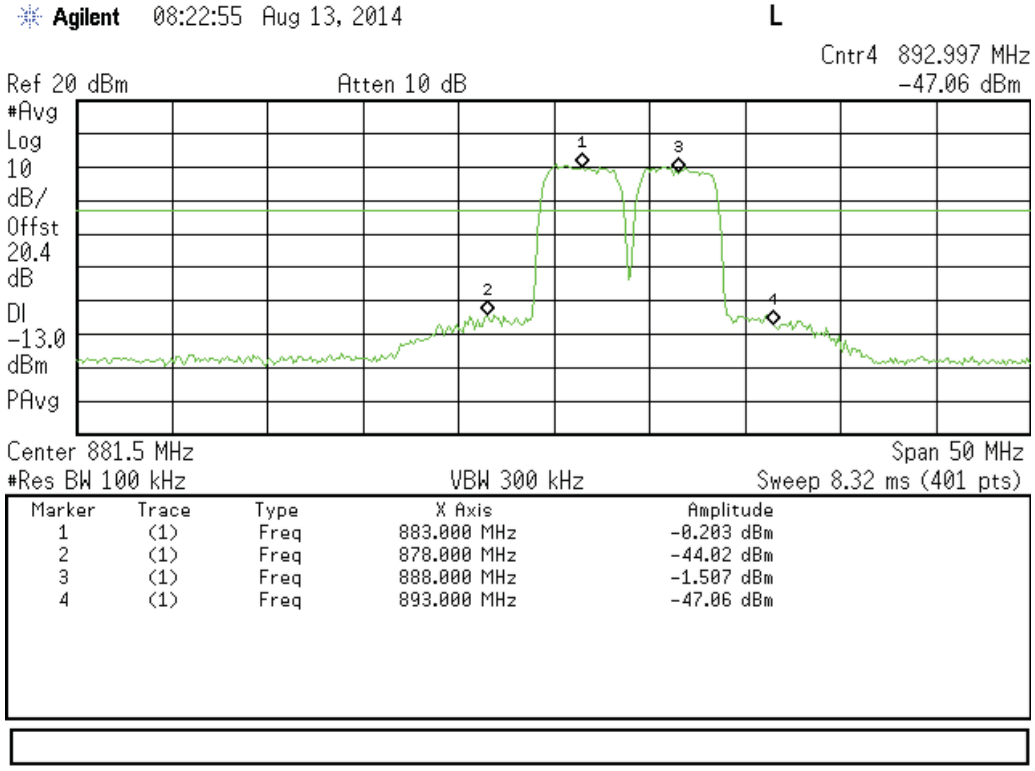


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	883.000 MHz	-1.774 dBm
2	(1)	Freq	878.000 MHz	-47.71 dBm
3	(1)	Freq	888.000 MHz	-1.844 dBm
4	(1)	Freq	893.000 MHz	-49.42 dBm

Intermodulation Downlink Test Results at 6db above AGC (CDMA Signal)
869-894 MHz Band

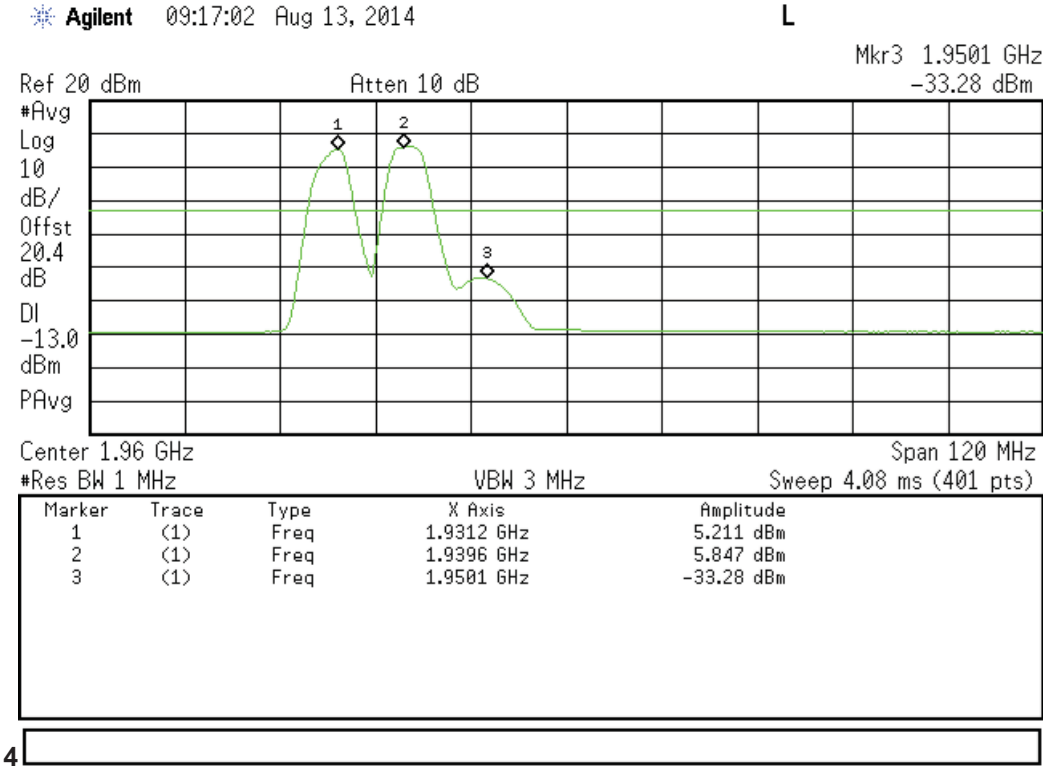


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	875.000 MHz	-1.727 dBm
2	(1)	Freq	870.000 MHz	-44.44 dBm
3	(1)	Freq	880.000 MHz	-0.926 dBm
4	(1)	Freq	885.000 MHz	-43.92 dBm

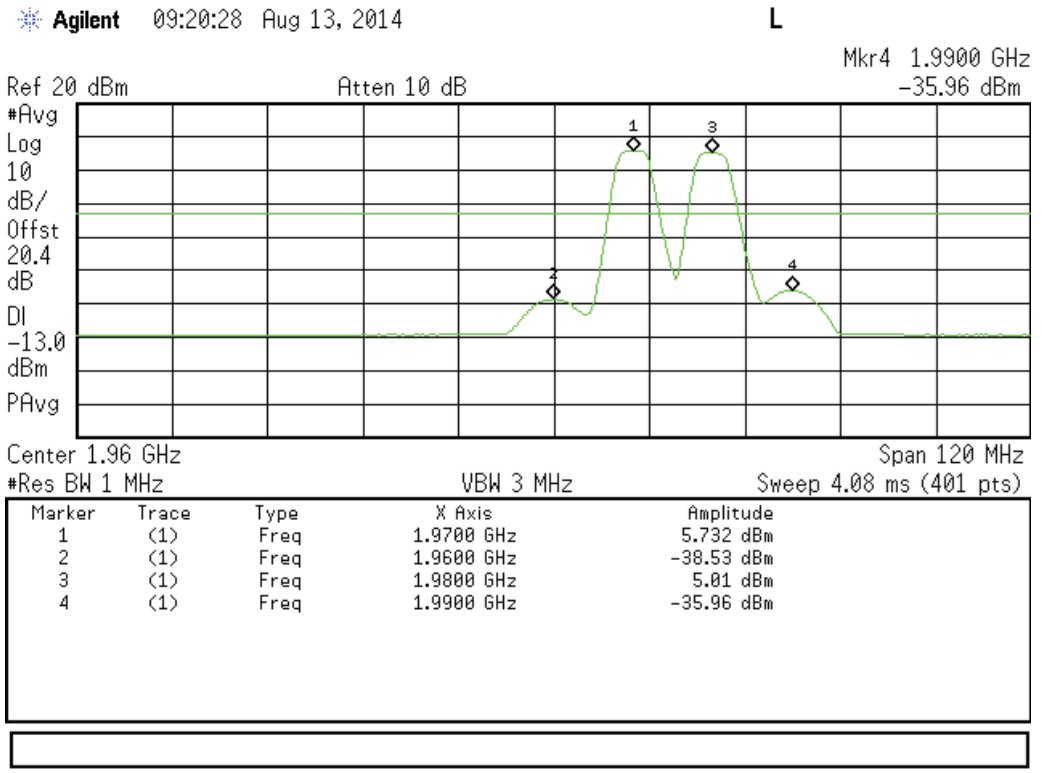


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	883.000 MHz	-0.203 dBm
2	(1)	Freq	878.000 MHz	-44.02 dBm
3	(1)	Freq	888.000 MHz	-1.507 dBm
4	(1)	Freq	893.000 MHz	-47.06 dBm

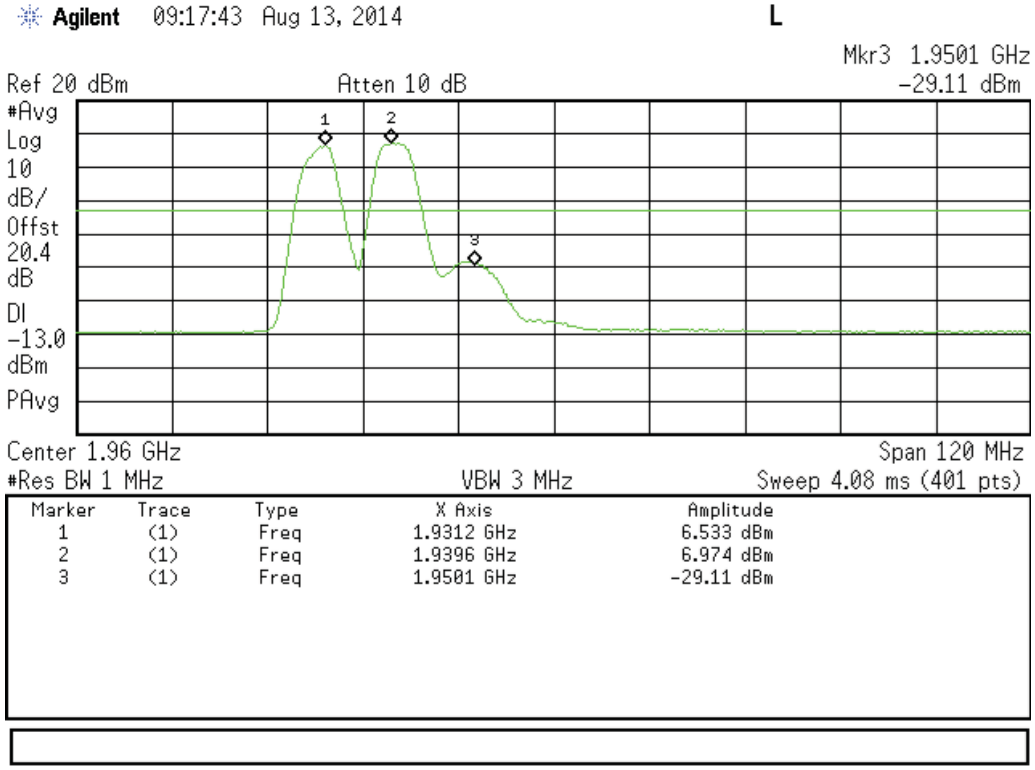
Intermodulation Downlink Test Results at AGC (CDMA Signal)
1930-1995 MHz Band

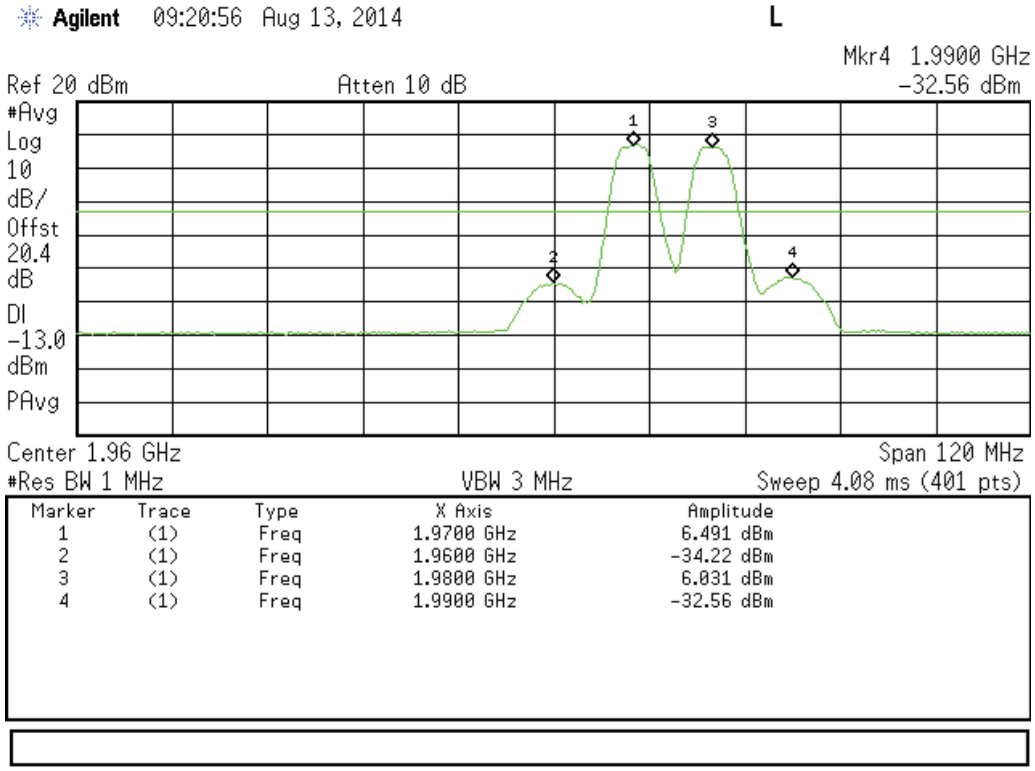


4

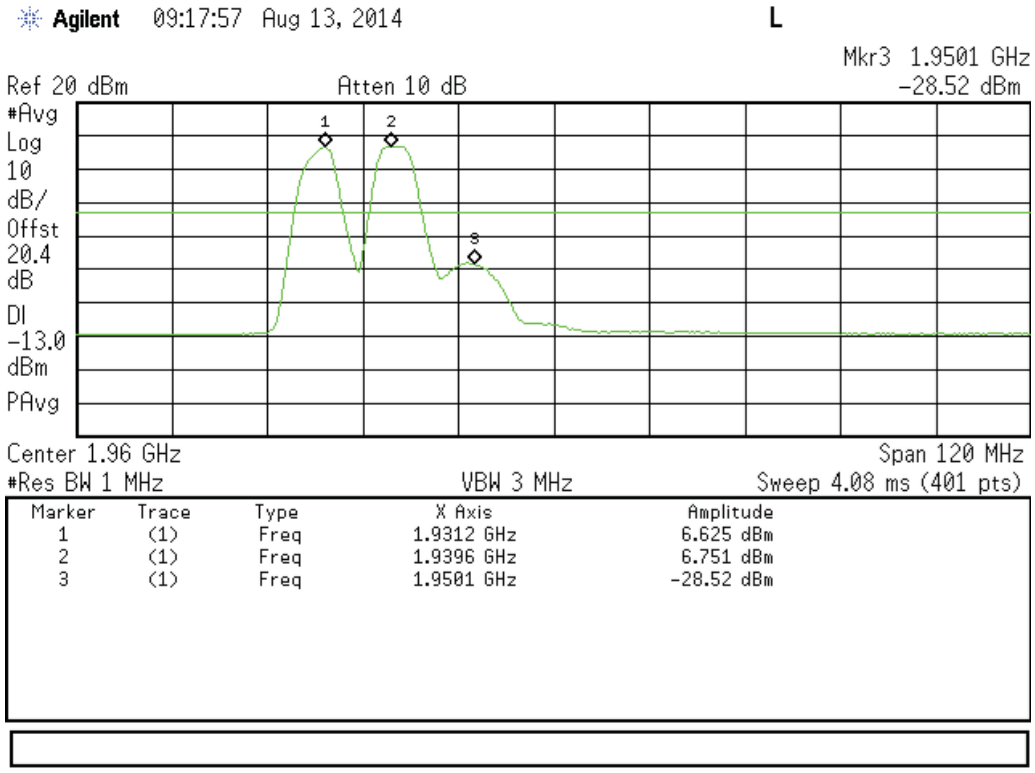


Intermodulation Downlink Test Results at 3db above AGC (CDMA Signal)
1930-1995 MHz Band

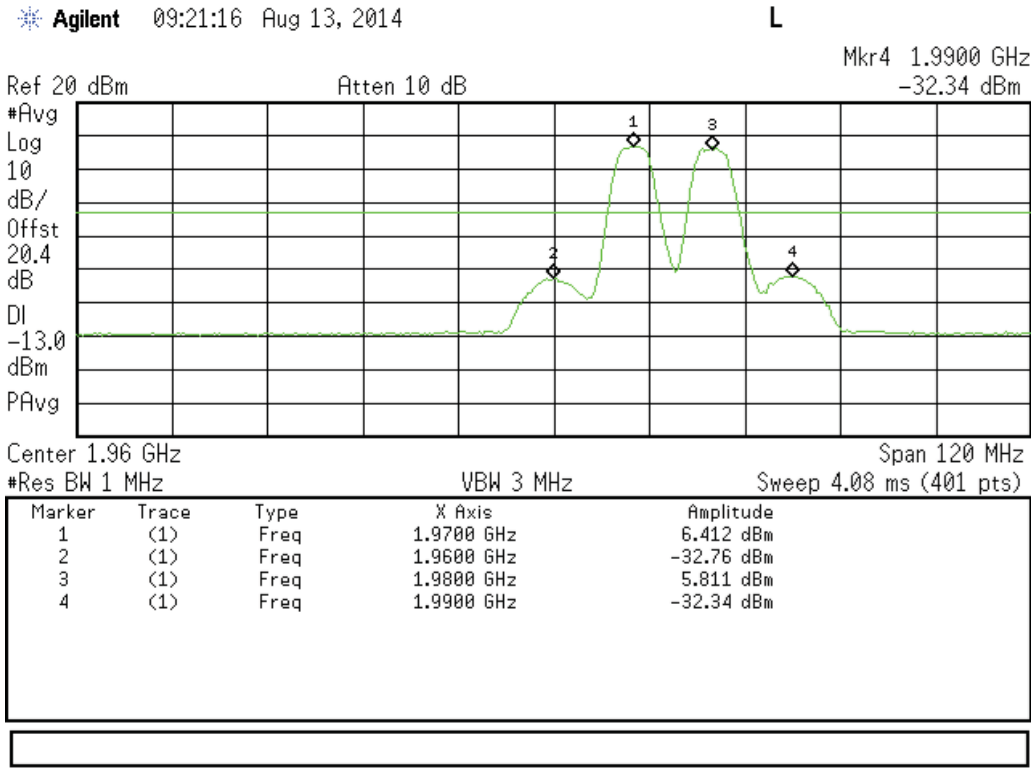




Intermodulation Downlink Test Results at 6db above AGC (CDMA Signal)
1930-1995 MHz Band

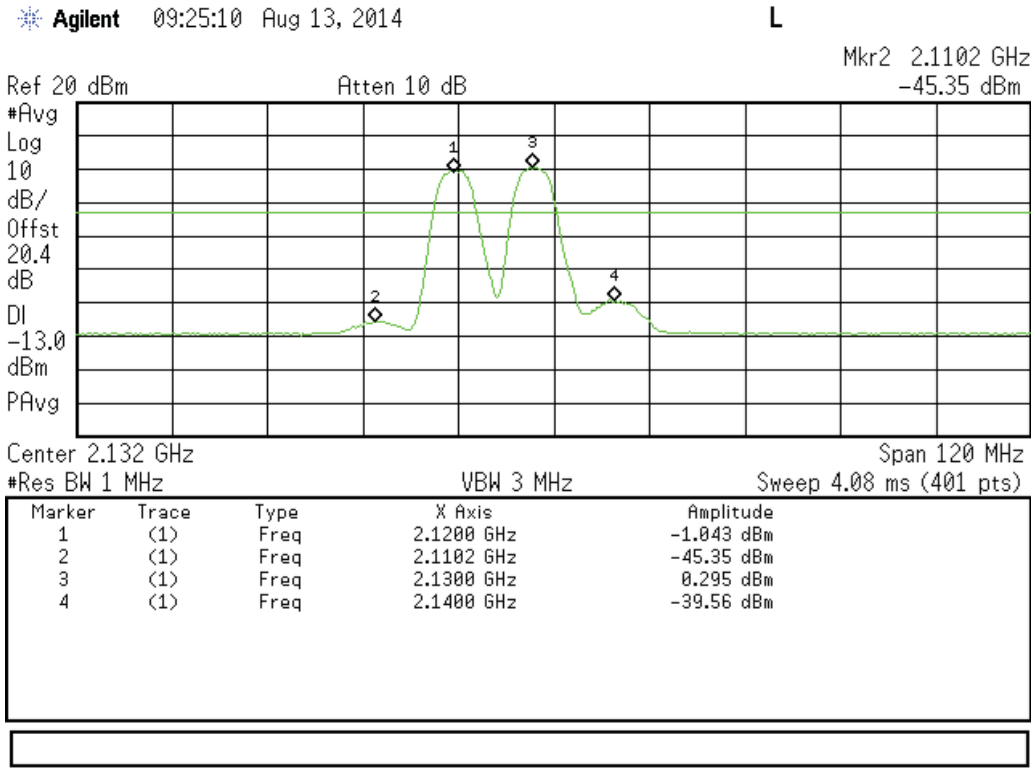


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.9312 GHz	6.625 dBm
2	(1)	Freq	1.9396 GHz	6.751 dBm
3	(1)	Freq	1.9501 GHz	-28.52 dBm

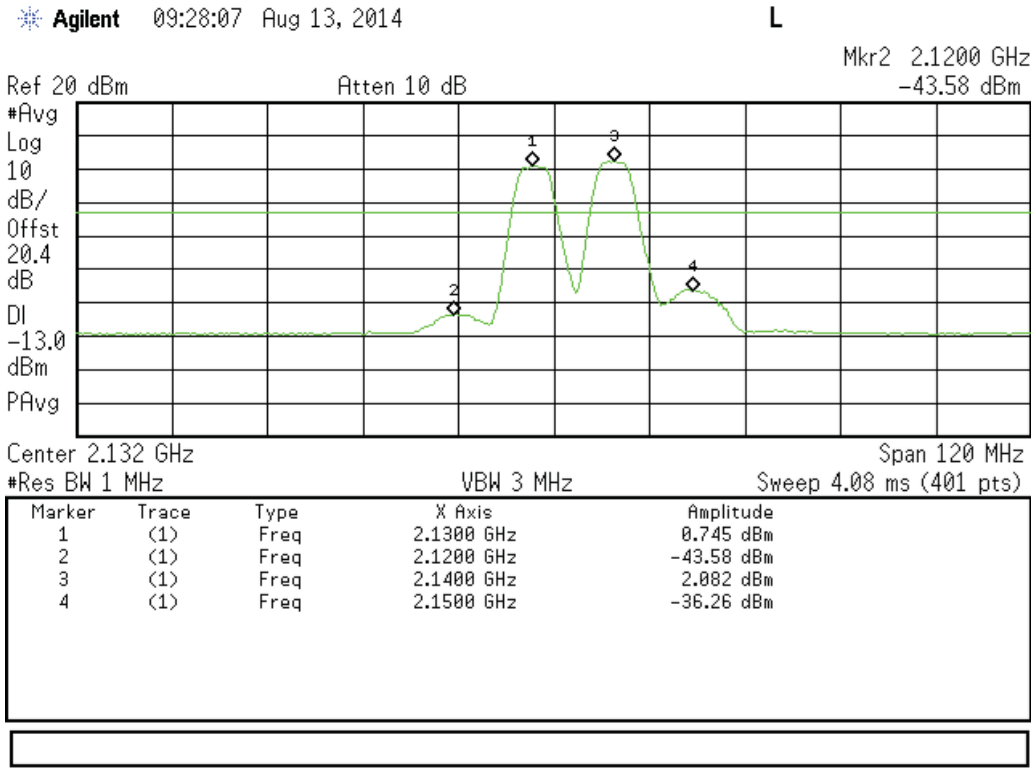


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	1.9700 GHz	6.412 dBm
2	(1)	Freq	1.9600 GHz	-32.76 dBm
3	(1)	Freq	1.9800 GHz	5.811 dBm
4	(1)	Freq	1.9900 GHz	-32.34 dBm

Intermodulation Downlink Test Results at AGC (CDMA Signal)
2110-2155 MHz Band

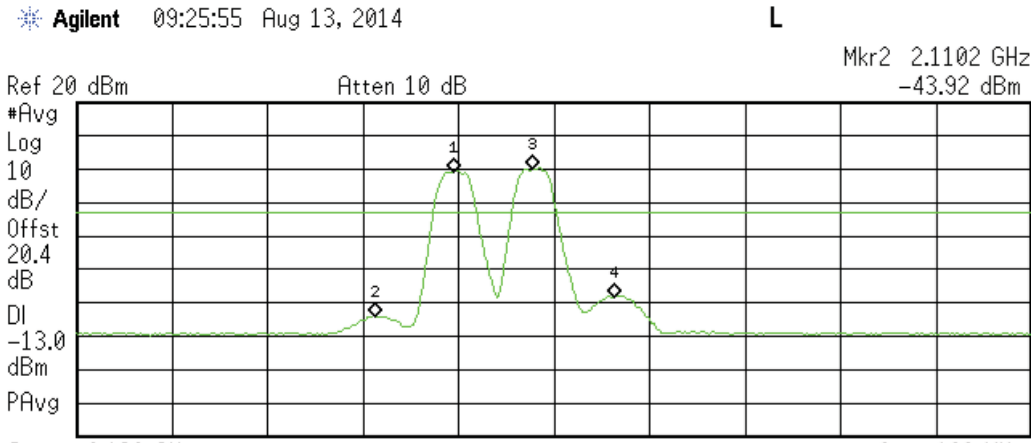


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1200 GHz	-1.043 dBm
2	(1)	Freq	2.1102 GHz	-45.35 dBm
3	(1)	Freq	2.1300 GHz	0.295 dBm
4	(1)	Freq	2.1400 GHz	-39.56 dBm

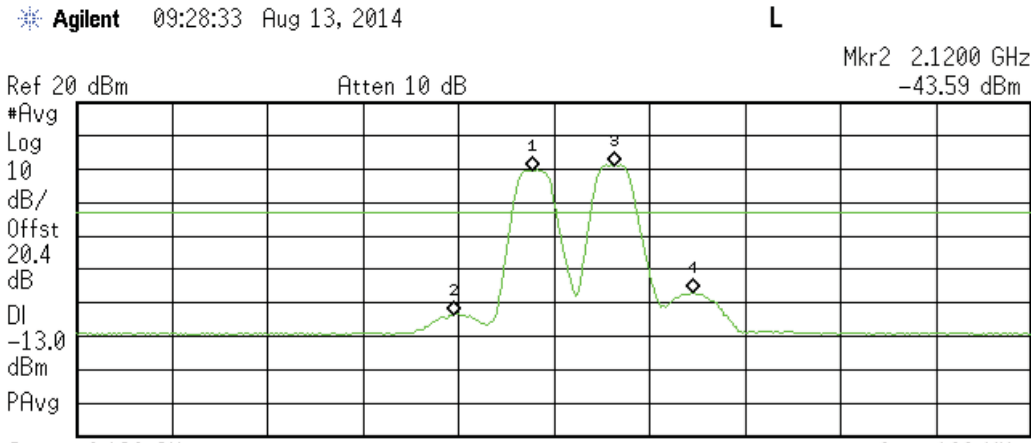


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1300 GHz	0.745 dBm
2	(1)	Freq	2.1200 GHz	-43.58 dBm
3	(1)	Freq	2.1400 GHz	2.082 dBm
4	(1)	Freq	2.1500 GHz	-36.26 dBm

Intermodulation Downlink Test Results at 3db above AGC (CDMA Signal)
2110-2155 MHz Band

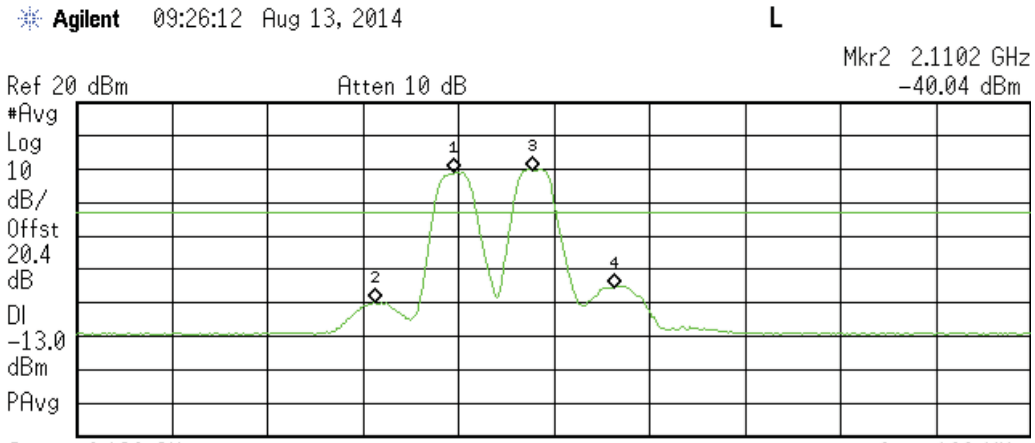


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1200 GHz	-1.027 dBm
2	(1)	Freq	2.1102 GHz	-43.92 dBm
3	(1)	Freq	2.1300 GHz	0 dBm
4	(1)	Freq	2.1400 GHz	-38.4 dBm

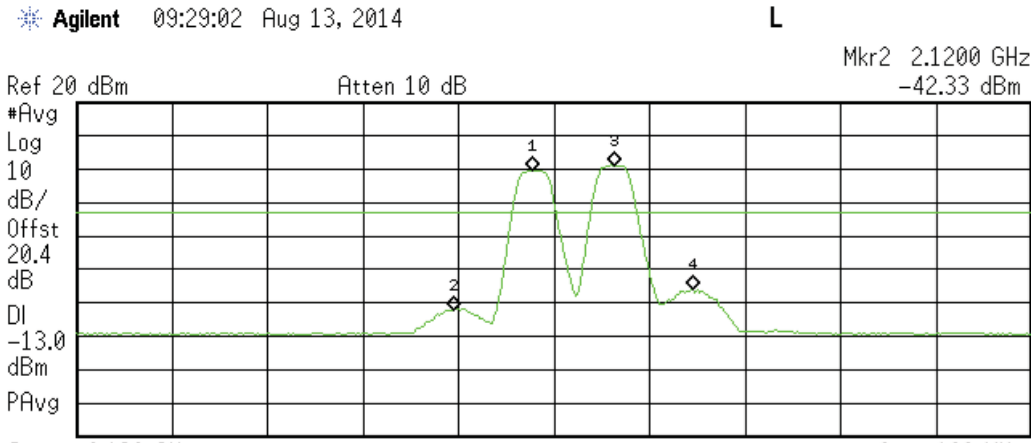


Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1300 GHz	-0.59 dBm
2	(1)	Freq	2.1200 GHz	-43.59 dBm
3	(1)	Freq	2.1400 GHz	0.96 dBm
4	(1)	Freq	2.1500 GHz	-36.98 dBm

Intermodulation Downlink Test Results at 6db above AGC (CDMA Signal)
2110-2155 MHz Band



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1200 GHz	-1.282 dBm
2	(1)	Freq	2.1102 GHz	-40.04 dBm
3	(1)	Freq	2.1300 GHz	-0.446 dBm
4	(1)	Freq	2.1400 GHz	-35.34 dBm



Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	2.1300 GHz	-0.495 dBm
2	(1)	Freq	2.1200 GHz	-42.33 dBm
3	(1)	Freq	2.1400 GHz	0.811 dBm
4	(1)	Freq	2.1500 GHz	-36.13 dBm

Noise Figure Test

Name of Test:	Noise Figure	**Engineer:** Mike Graffeo
Test Equipment Utilized:	i00444, i00445 i00450	**Test Date:** 8/21/14

Test Procedure

The test equipment was connected as shown in the test set-up.

The noise figure was measured at the passband center frequency.
Noise figure was measured at EUT AGC level
Industrial booster limit = 9dB

Uplink Noise Figure

Operational Band (MHz)	Noise Figure (dB)	Limit (dB)	Margin (dB)
698-716	6.1	9	-2.9
776-787	6.3	9	-2.7
824-849	5.6	9	-3.4
1710-1755	5.1	9	-3.9
1850-1915	7.2	9	-1.8

Downlink Noise Figure

Operational Band (MHz)	Noise Figure (dB)	Limit (dB)	Margin (dB)
728-746	6.5	9	-2.5
746-757	5.8	9	-3.2
869-894	6.3	9	-2.7
1930-1995	6.2	9	-2.8
2110-2155	5	9	-4.0

Test Equipment Utilized

Description	Manufacturer	Model #	CT Asset #	Last Cal Date	Cal Due Date
Horn Antenna	EMCO	3115	i00103	12/11/12	12/11/14
Humidity / Temp Meter	Newport	IBTHX-W-5	i00282	3/24/14	3/24/15
Bi-Log Antenna	Schaffner	CBL 6111D	i00349	10/8/13	10/8/15
EMI Analyzer	Agilent	E4407B	i00331	6/13/14	6/13/15
Signal Generator	Rohde & Schwarz	SMU200A	i00405	12/11/13	12/11/14
3 Meter Semi-Anechoic Chamber	Panashield	3 Meter Semi-Anechoic Chamber	i00428	11/26/13	11/26/15
Noise Figure Meter	HP	8970B	i00444	8/14/2014	8/14/2015
Noise Figure Test Set	HP	8971C	i00450	N/A	N/A
Noise Source	HP	346A	i00445	8/11/2014	8/11/2015

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT