



**Compliance Testing, LLC**  
Previously Flom Test Lab  
EMI, EMC, RF Testing Experts Since 1963

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## 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.  
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Attention of:

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Project No: p1440012

**Mike Graffeo**  
Project Test Engineer

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All results contained herein relate only to the sample tested

### 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  |
|          |                   |                            |   |

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## 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 (°C)                | 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)   |           |           |                                  |             |             |
|------------------------|-----------|-----------|----------------------------------|-------------|-------------|
| <b>Uplink</b>          | 698 - 716 | 776 - 787 | 824 - 849                        | 1850 - 1915 | 1710 - 1755 |
| <b>Downlink</b>        | 728 - 746 | 746 - 757 | 869 - 894                        | 1930 - 1995 | 2110 - 2155 |
| <b>Modulation Type</b> | LTE       |           | GSM, CDMA, EDGE, HSPA, EVDO, LTE |             |             |

| Emission Designators |             |            |             |             |            |
|----------------------|-------------|------------|-------------|-------------|------------|
| <b>CDMA</b>          | <b>HSPA</b> | <b>LTE</b> | <b>EVDO</b> | <b>EDGE</b> | <b>GSM</b> |
| 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<sup>th</sup>'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:**

| <b>Qty</b> | <b>Description</b> | <b>Length<br/>(M)</b> | <b>Shielding<br/>Y/N</b> | <b>Shielded Hood<br/>Y/N</b> | <b>Termination</b> |
|------------|--------------------|-----------------------|--------------------------|------------------------------|--------------------|
| 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<br>27.53  | Spurious Emissions (Transmitter Conducted)  | Pass            |  |
| 2.1053           | Radiated Spurious Emissions                 | Pass            |  |
| 90.210<br>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  
**Test Equipment Utilized:** i00405, i00331

**Engineer:** Mike Graffeo  
**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**



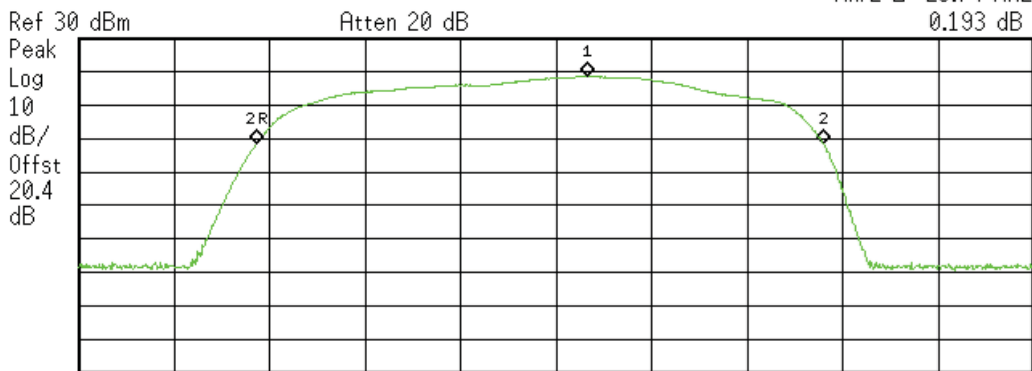
**Authorized Frequency Band Test Results**

**698 - 716 MHz Band**

Agilent 19:29:24 Aug 6, 2014

L

Mkr2 Δ 23.74 MHz  
0.193 dB



Center 707 MHz Span 40 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 9.99 ms (1000 pts)

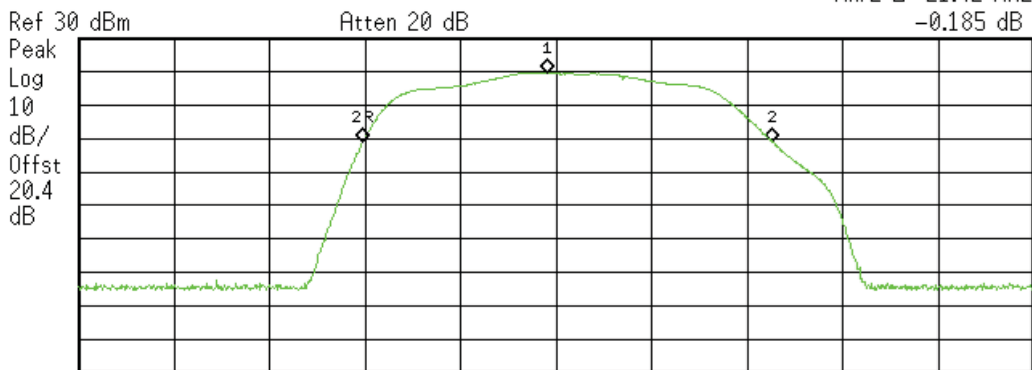
| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 708.34 MHz | 18.57 dBm  |
| 2R     | (1)   | Freq | 694.45 MHz | -1.679 dBm |
| 2Δ     | (1)   | Freq | 23.74 MHz  | 0.193 dB   |

**776-787 MHz Band**

Agilent 19:45:06 Aug 6, 2014

L

Mkr2 Δ 21.42 MHz  
-0.185 dB



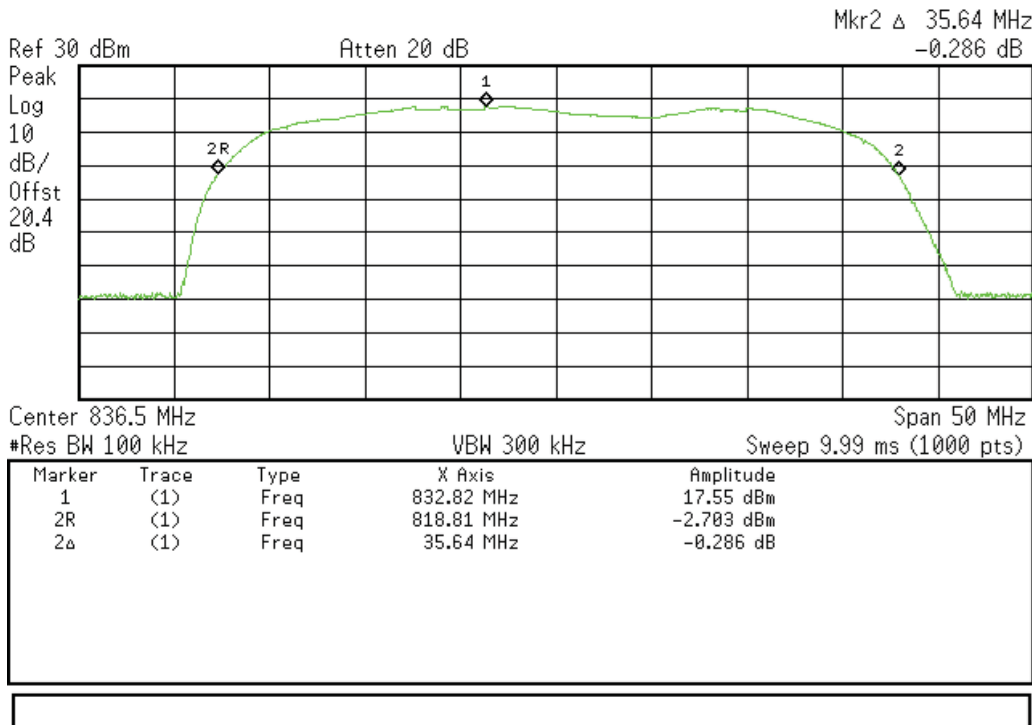
Center 781.5 MHz Span 50 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 57.18 ms (1000 pts)

| 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**

Agilent 19:32:11 Aug 6, 2014

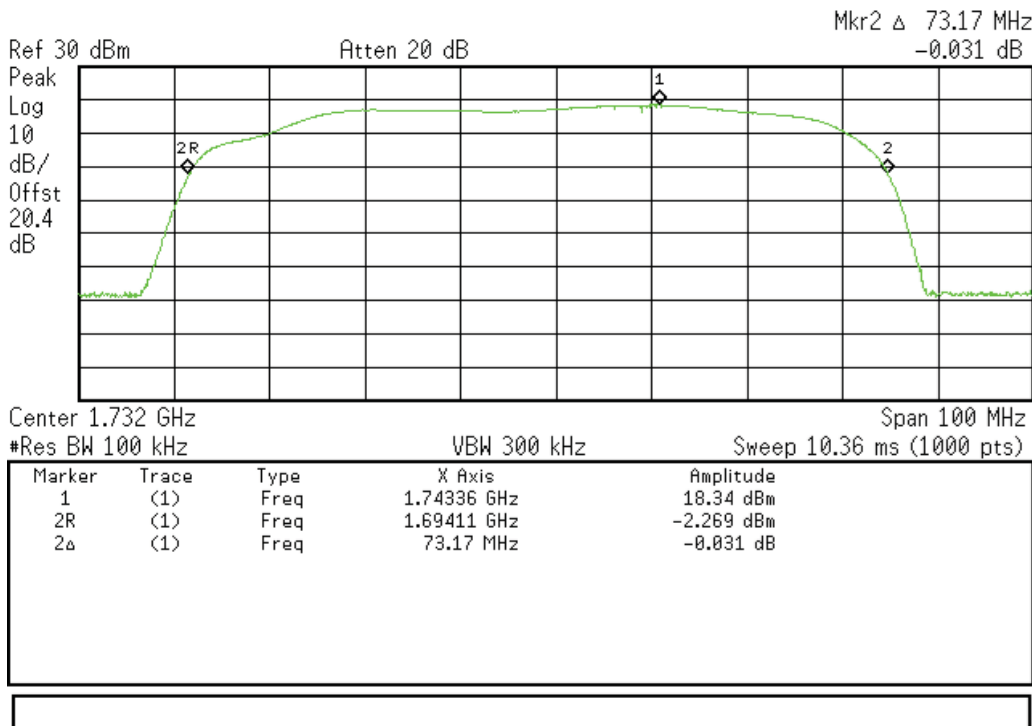
L



**1710-1755 MHz Band**

Agilent 19:24:53 Aug 6, 2014

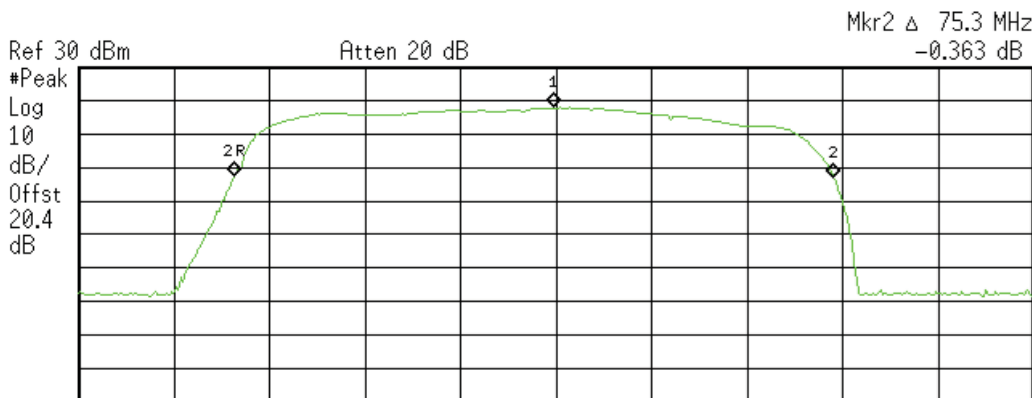
L



**1850-1915 MHz Band**

Agilent 11:47:43 Sep 8, 2014

L



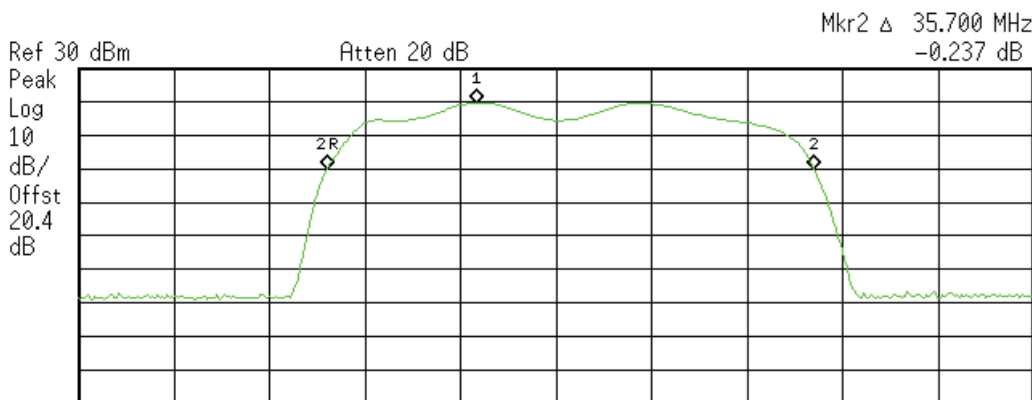
Center 1.883 GHz Span 120 MHz  
#Res BW 120 kHz VBW 300 kHz Sweep 19.18 ms (401 pts)

| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 1.8826 GHz | 17.82 dBm  |
| 2R     | (1)   | Freq | 1.8421 GHz | -2.489 dBm |
| 2Δ     | (1)   | Freq | 75.3 MHz   | -0.363 dB  |

**Downlink  
728-746 MHz Band**

Agilent 16:29:04 Aug 7, 2014

L



Center 742.5 MHz Span 70 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 7.252 ms (401 pts)

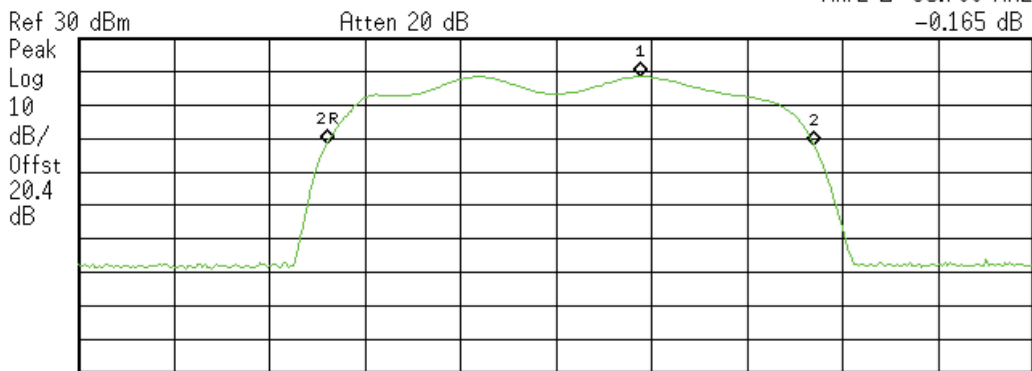
| Marker | Trace | Type | X Axis      | Amplitude |
|--------|-------|------|-------------|-----------|
| 1      | (1)   | Freq | 736.725 MHz | 19.7 dBm  |
| 2R     | (1)   | Freq | 725.700 MHz | 0.021 dBm |
| 2Δ     | (1)   | Freq | 35.700 MHz  | -0.237 dB |

### 746-757 MHz Band

Agilent 16:37:21 Aug 8, 2014

L

Mkr2 Δ 35.700 MHz  
-0.165 dB



Center 742.5 MHz Span 70 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 7.252 ms (401 pts)

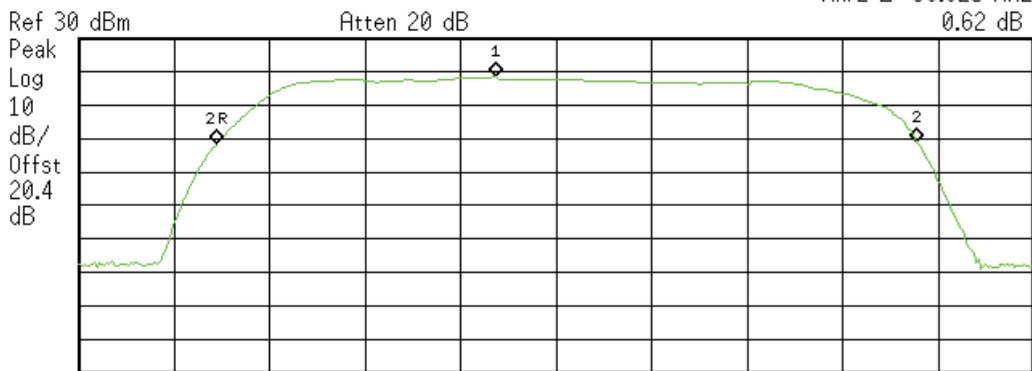
| Marker | Trace | Type | X Axis      | Amplitude  |
|--------|-------|------|-------------|------------|
| 1      | (1)   | Freq | 748.625 MHz | 18.5 dBm   |
| 2R     | (1)   | Freq | 725.700 MHz | -1.794 dBm |
| 2Δ     | (1)   | Freq | 35.700 MHz  | -0.165 dB  |

### 869-894 MHz Band

Agilent 16:33:28 Aug 7, 2014

L

Mkr2 Δ 36.625 MHz  
0.62 dB



Center 881.5 MHz Span 50 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 5.18 ms (401 pts)

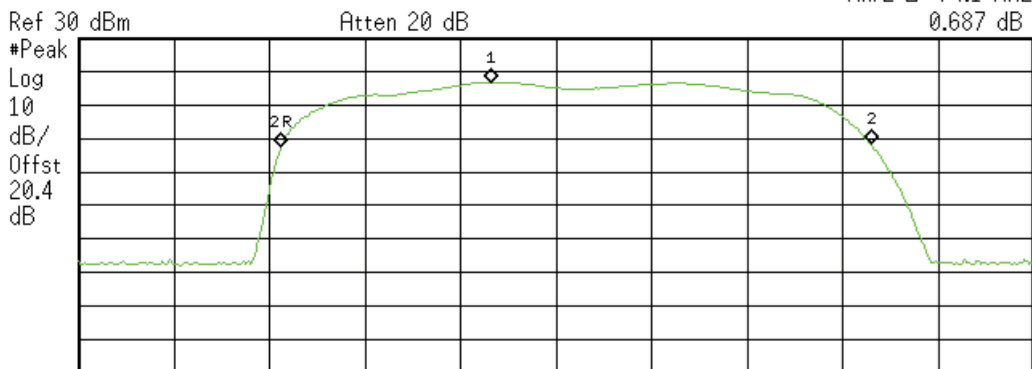
| Marker | Trace | Type | X Axis      | Amplitude  |
|--------|-------|------|-------------|------------|
| 1      | (1)   | Freq | 878.375 MHz | 18.45 dBm  |
| 2R     | (1)   | Freq | 863.750 MHz | -1.574 dBm |
| 2Δ     | (1)   | Freq | 36.625 MHz  | 0.62 dB    |

**1930-1995 MHz Band**

Agilent 12:13:44 Sep 8, 2014

L

Mkr2  $\Delta$  74.1 MHz  
0.687 dB



Ref 30 dBm Atten 20 dB  
Center 1.962 GHz Span 120 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 12.43 ms (401 pts)

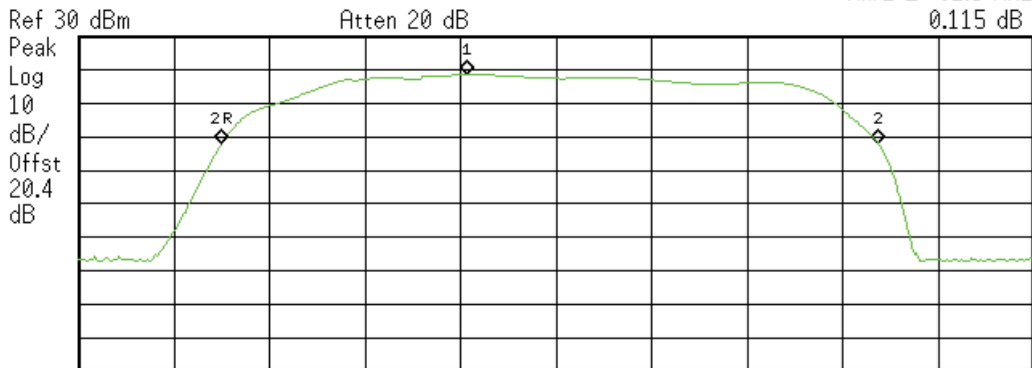
| Marker     | Trace | Type | X Axis     | Amplitude  |
|------------|-------|------|------------|------------|
| 1          | (1)   | Freq | 1.9546 GHz | 16.82 dBm  |
| 2R         | (1)   | Freq | 1.9280 GHz | -2.386 dBm |
| 2 $\Delta$ | (1)   | Freq | 74.1 MHz   | 0.687 dB   |

**2110-2155 MHz Band**

Agilent 16:59:58 Aug 7, 2014

L

Mkr2  $\Delta$  82.5 MHz  
0.115 dB



Ref 30 dBm Atten 20 dB  
Center 2.132 GHz Span 120 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 12.43 ms (401 pts)

| Marker     | Trace | Type | X Axis     | Amplitude  |
|------------|-------|------|------------|------------|
| 1          | (1)   | Freq | 2.1214 GHz | 18.51 dBm  |
| 2R         | (1)   | Freq | 2.0905 GHz | -2.258 dBm |
| 2 $\Delta$ | (1)   | Freq | 82.5 MHz   | 0.115 dB   |

### Conducted Output Power and Amplifier Gain

**Name of Test:** Conducted Output Power and Amplifier Gain  
**Test Equipment Utilized:** i00405, i00331

**Engineer:** Mike Graffeo  
**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:

$$\text{Gain (dB)} = \text{Output Power (dBm)} - \text{Input Power (dBm)}$$

### 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 10<sup>th</sup> harmonic of the passband frequency was observed and plotted.

The following formula was used for calculating the limits.

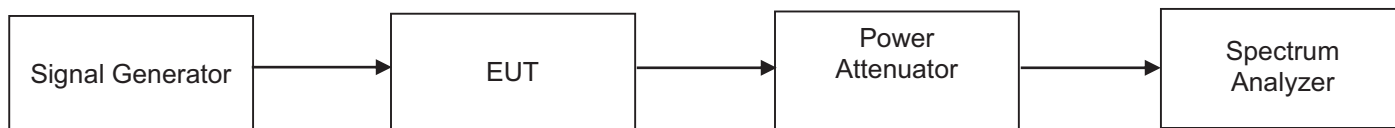
Conducted Spurious Emissions Limit =  $P1 - (43 + 10\text{Log}(P2)) = -13 \text{ dBm}$

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**

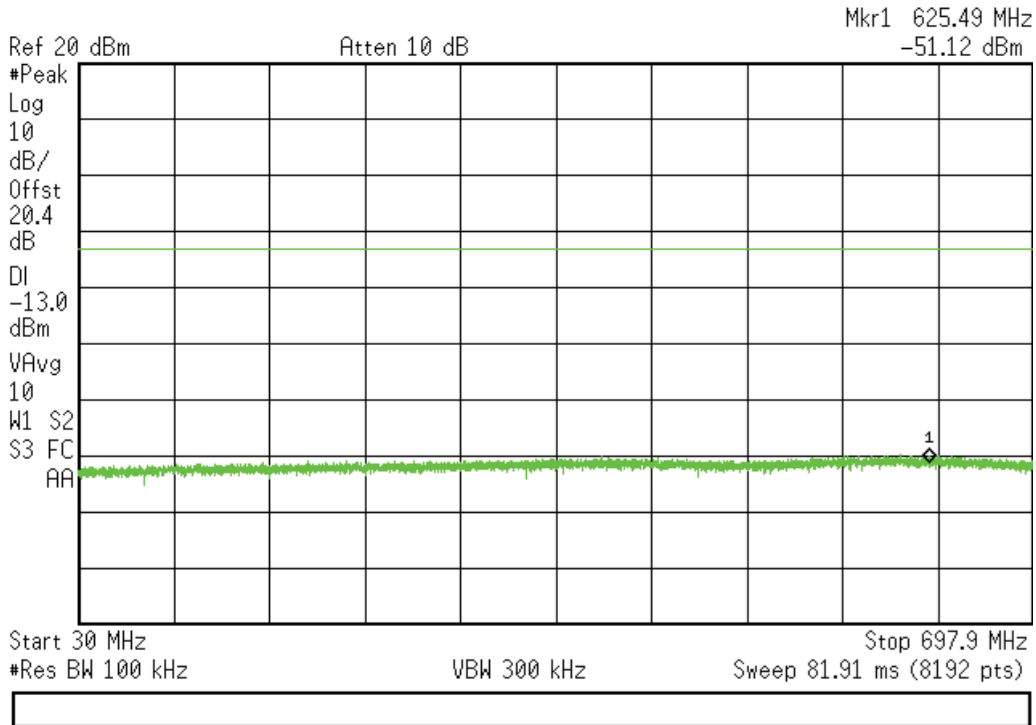
| Frequency (MHz) | Measured Level (dBm) | Limit (dBm) | Margin (dB) | Result |
|-----------------|----------------------|-------------|-------------|--------|
| 2110            | -39.83               | -13         | -26.83      | Pass   |
| 2132.5          | -39.97               | -13         | -26.97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



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

Agilent 16:40:03 Aug 11, 2014

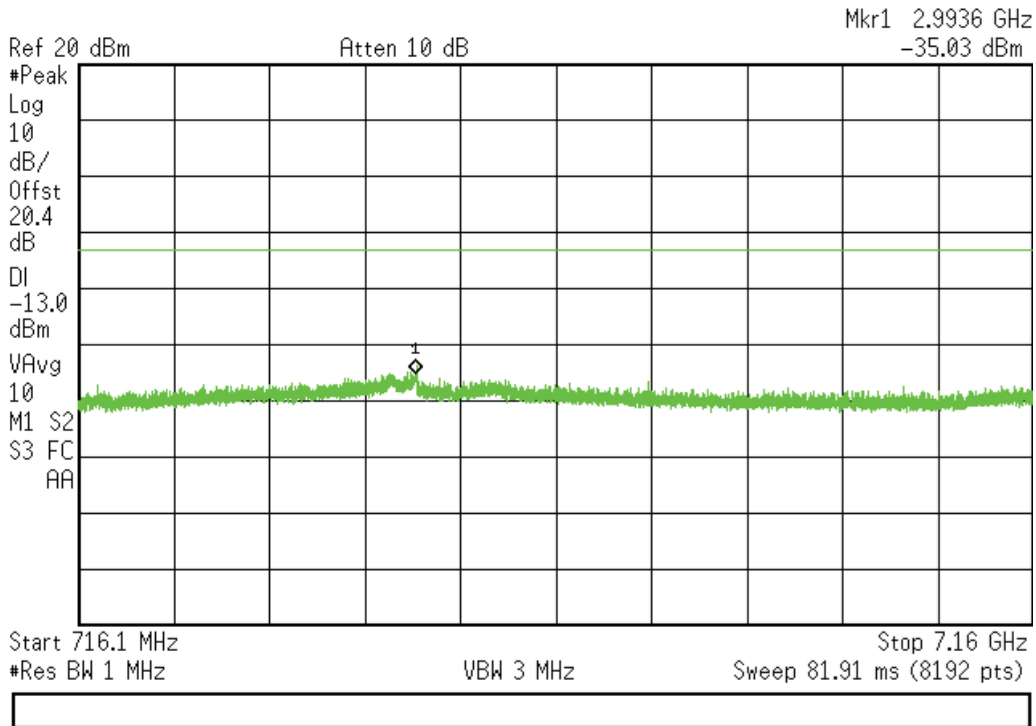
L



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

Agilent 16:45:21 Aug 11, 2014

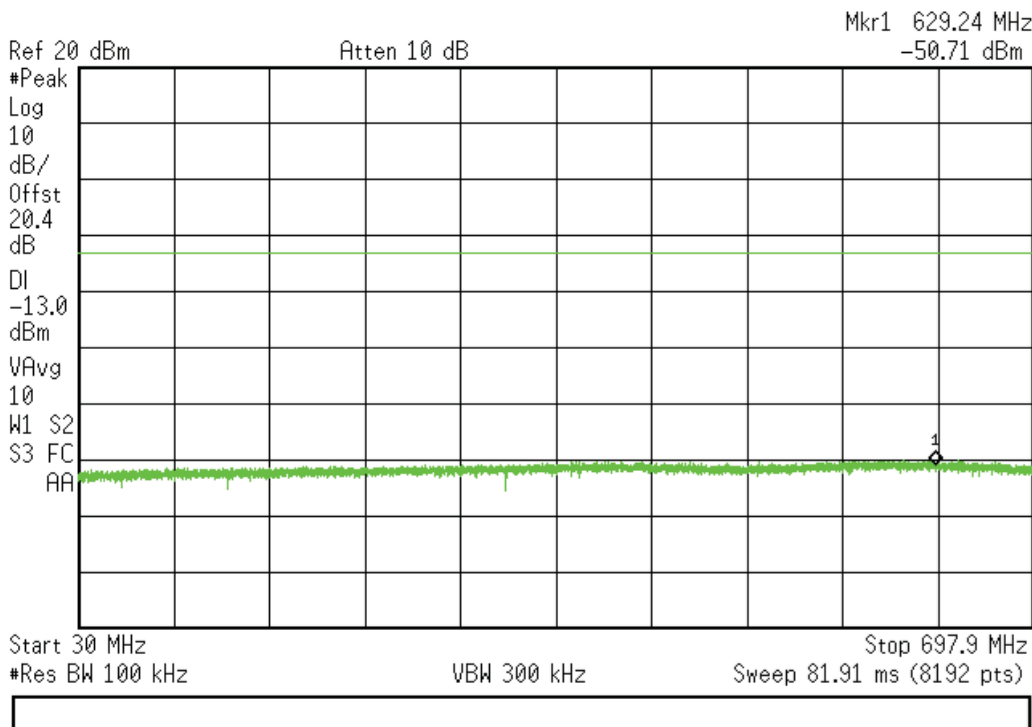
L



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

Agilent 16:38:57 Aug 11, 2014

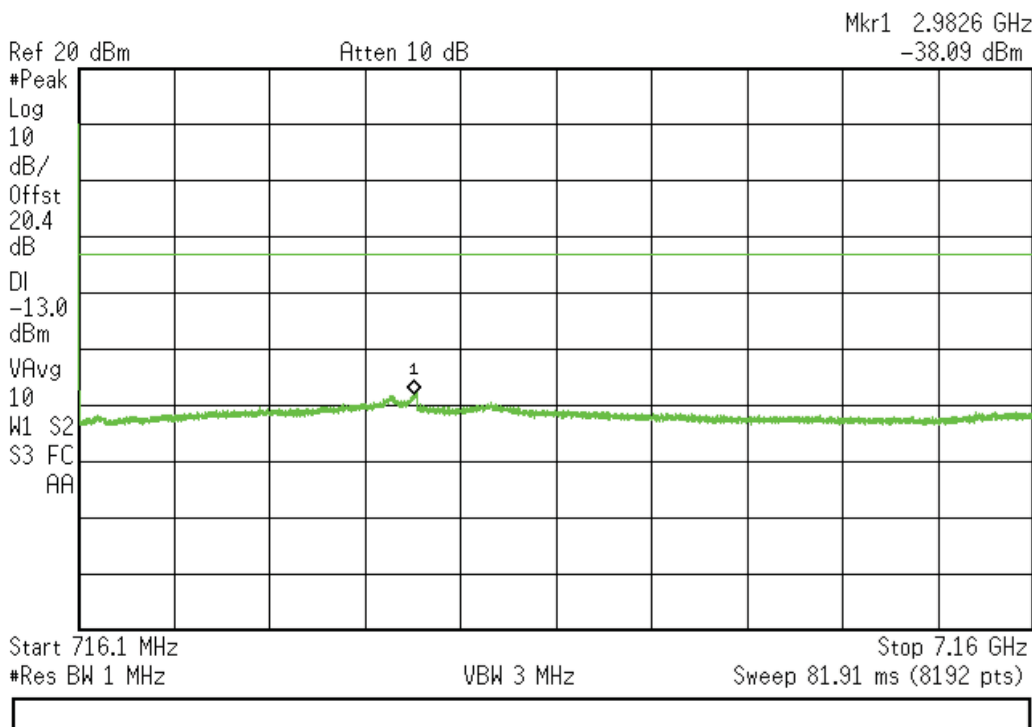
L



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

Agilent 16:47:04 Aug 11, 2014

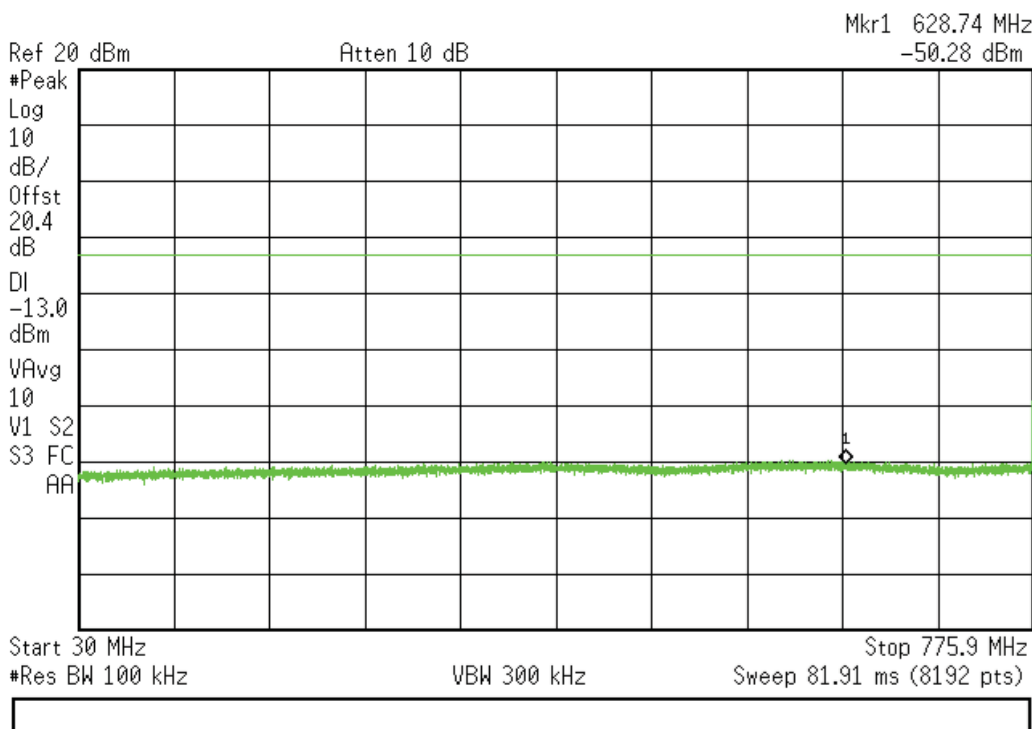
L



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

Agilent 17:04:22 Aug 11, 2014

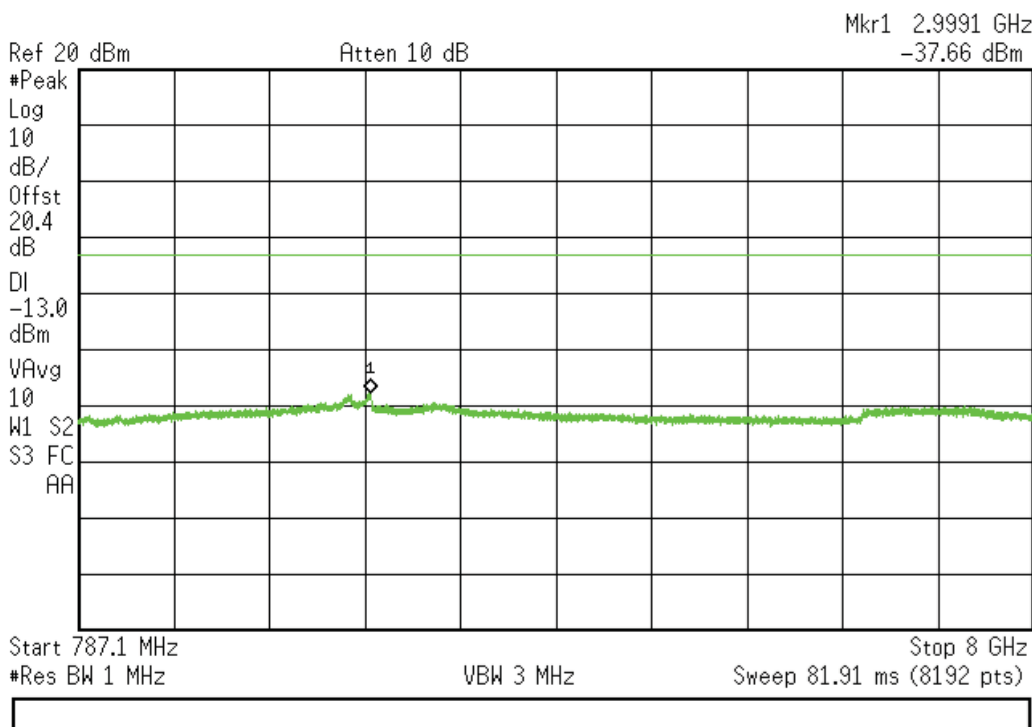
L



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

Agilent 17:05:37 Aug 11, 2014

L

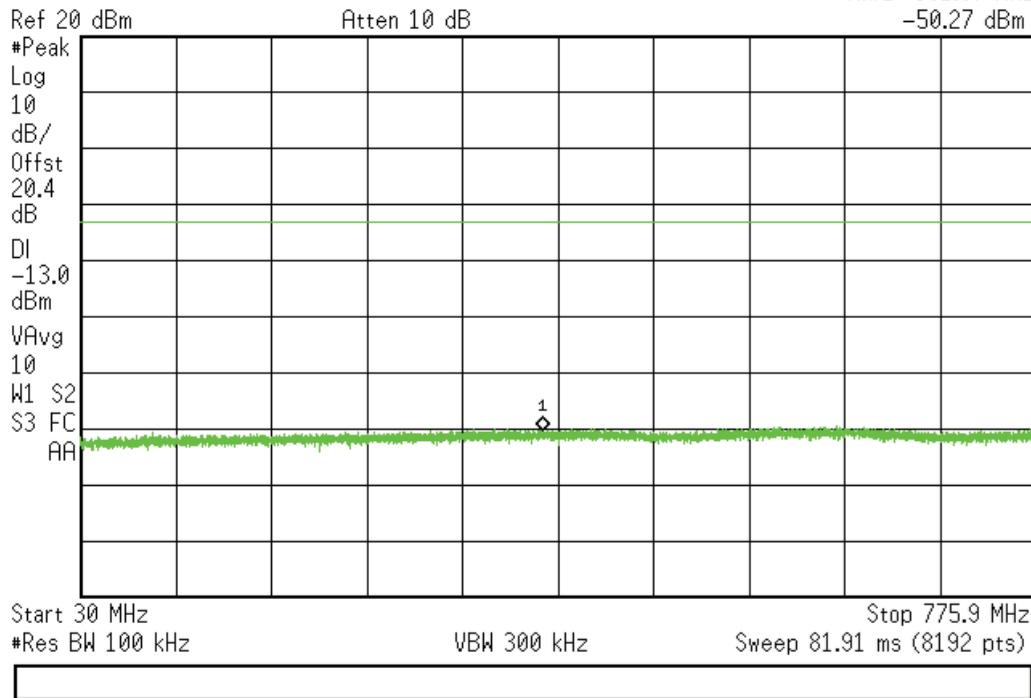


**776-787 MHz Band (Mid Frequency)**

Agilent 17:03:02 Aug 11, 2014

L

Mkr1 391.07 MHz  
-50.27 dBm

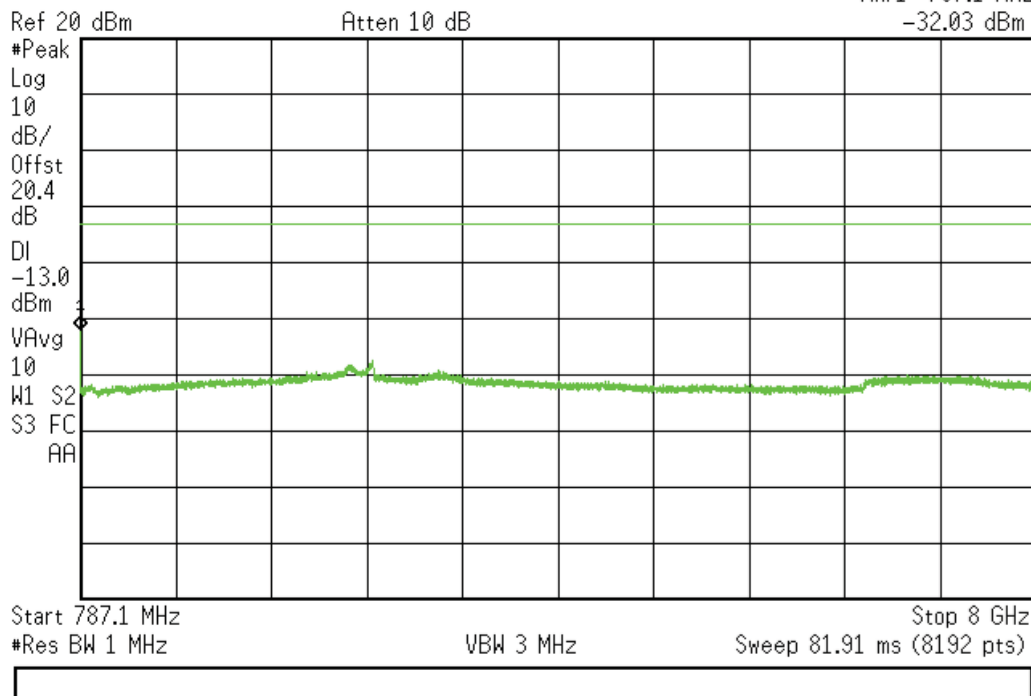


**776-787 MHz Band (Mid Frequency) (Cont)**

Agilent 17:06:35 Aug 11, 2014

L

Mkr1 787.1 MHz  
-32.03 dBm



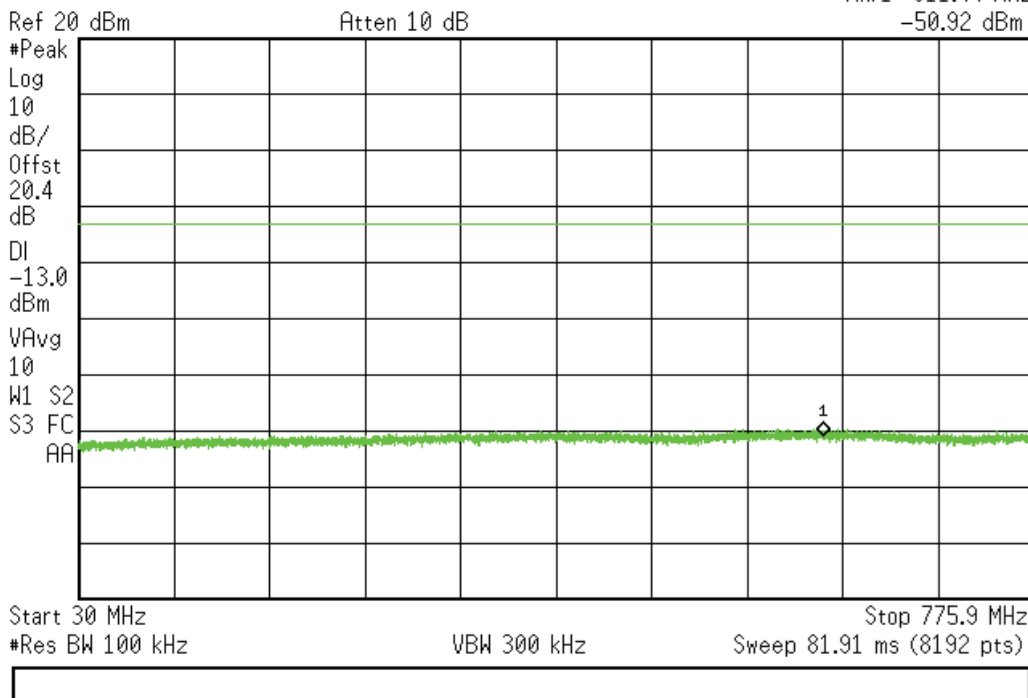


### 776-787 MHz Band (High Frequency)

Agilent 17:02:14 Aug 11, 2014

L

Mkr1 611.44 MHz  
-50.92 dBm

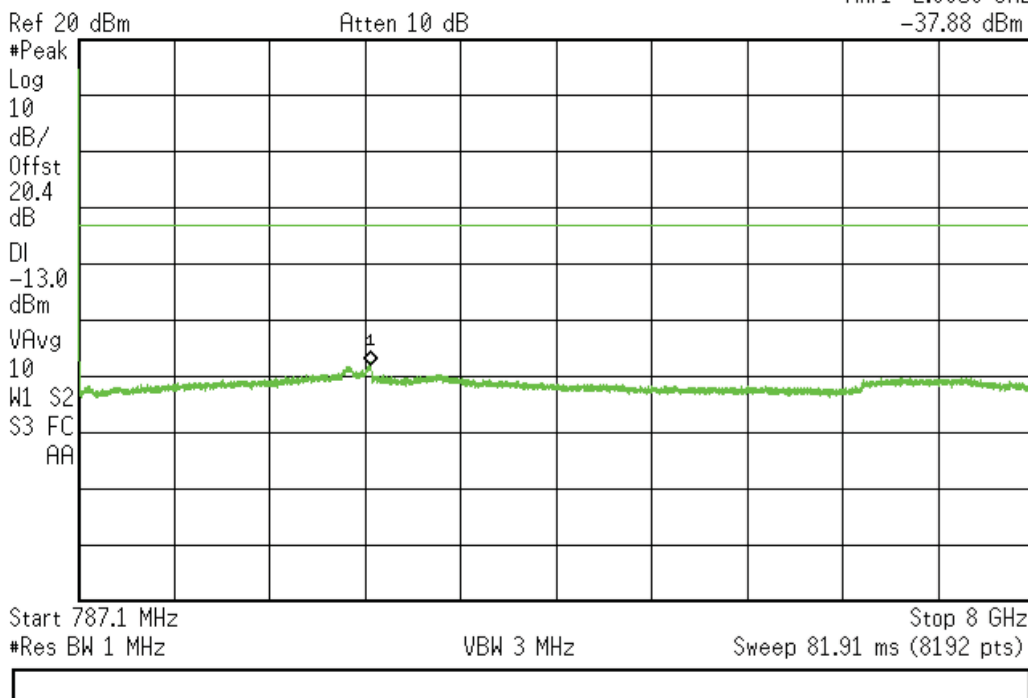


### 776-787 MHz Band (High Frequency) (Cont)

Agilent 17:08:06 Aug 11, 2014

L

Mkr1 2.9956 GHz  
-37.88 dBm

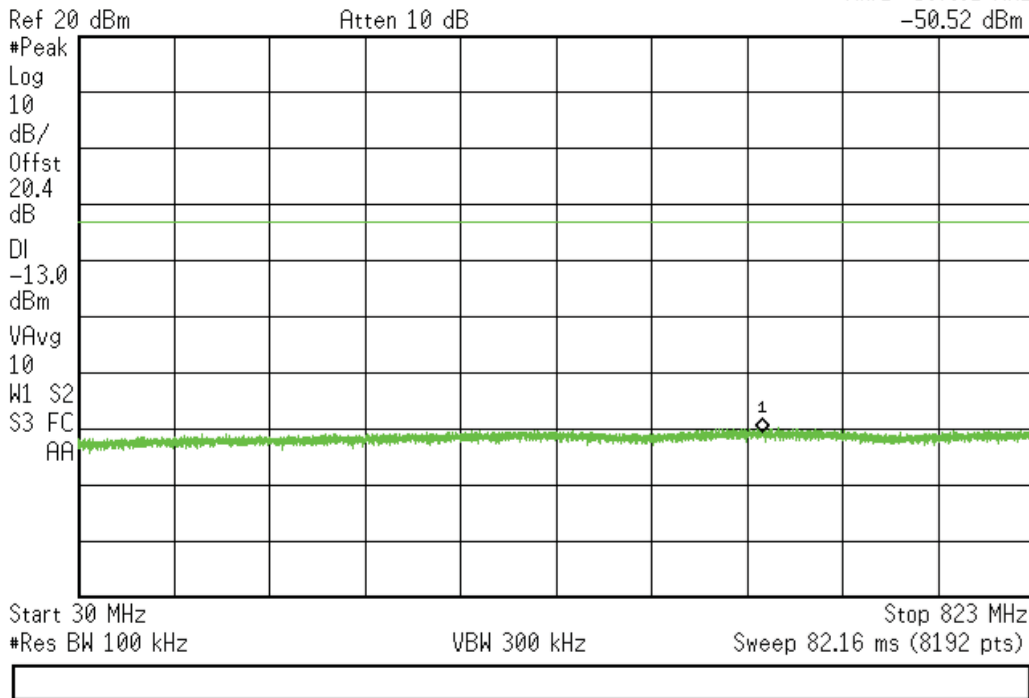


**824-849 MHz Band (Low Frequency)**

Agilent 17:21:25 Aug 11, 2014

L

Mkr1 597.81 MHz  
-50.52 dBm

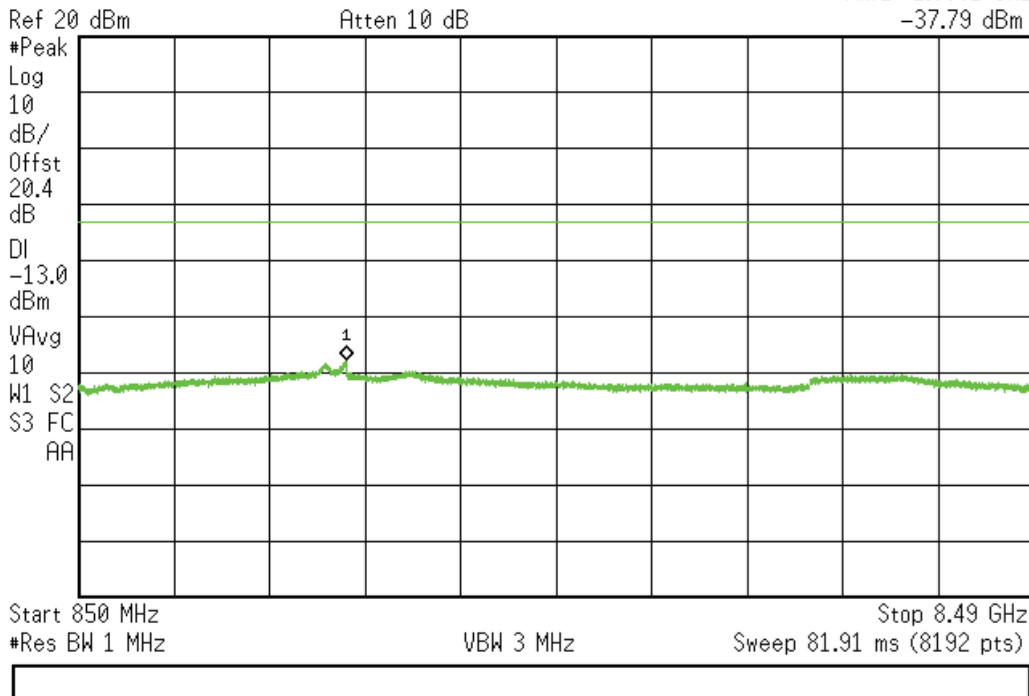


**824-849 MHz Band (Low Frequency) (Cont)**

Agilent 17:22:48 Aug 11, 2014

L

Mkr1 2.9981 GHz  
-37.79 dBm





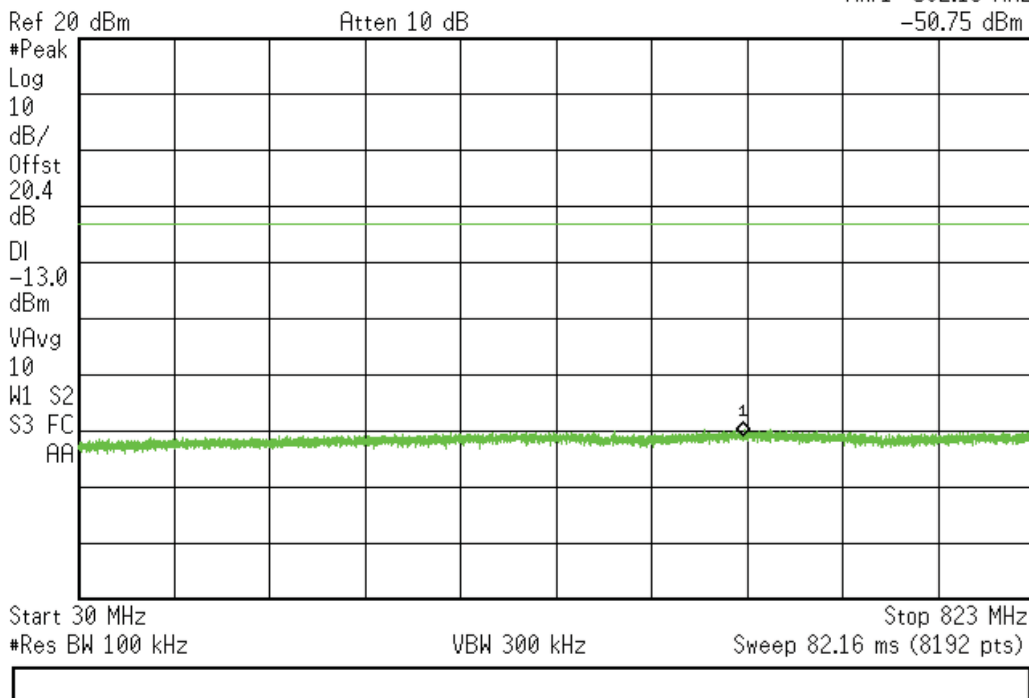


### 824-849 MHz Band (High Frequency)

Agilent 17:19:07 Aug 11, 2014

L

Mkr1 582.13 MHz  
-50.75 dBm

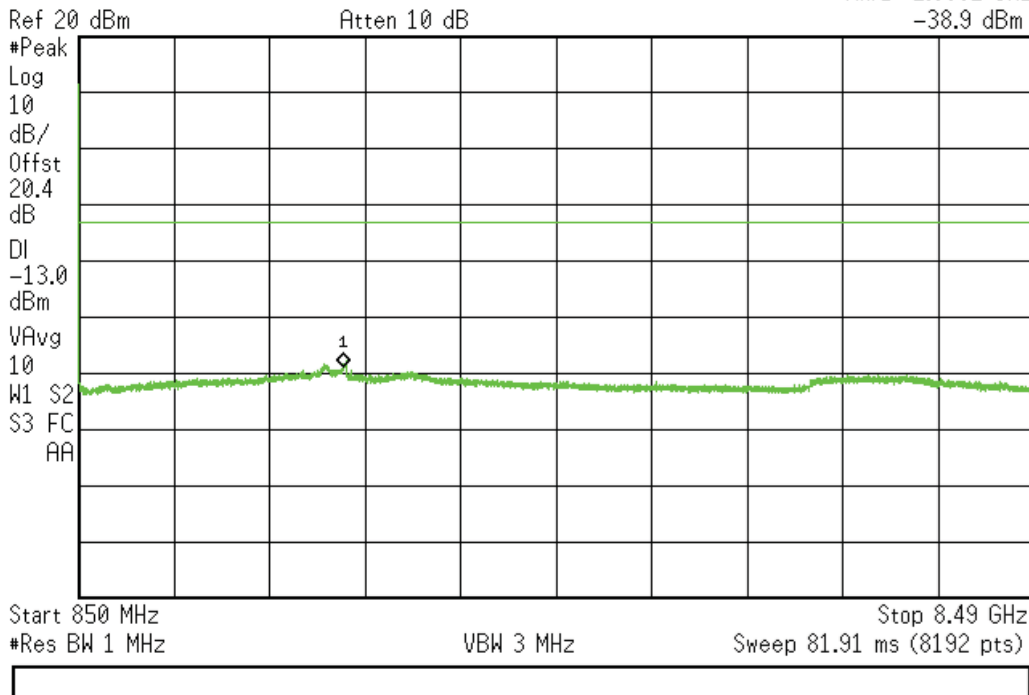


### 824-849 MHz Band (High Frequency) (Cont)

Agilent 17:24:51 Aug 11, 2014

L

Mkr1 2.9682 GHz  
-38.9 dBm



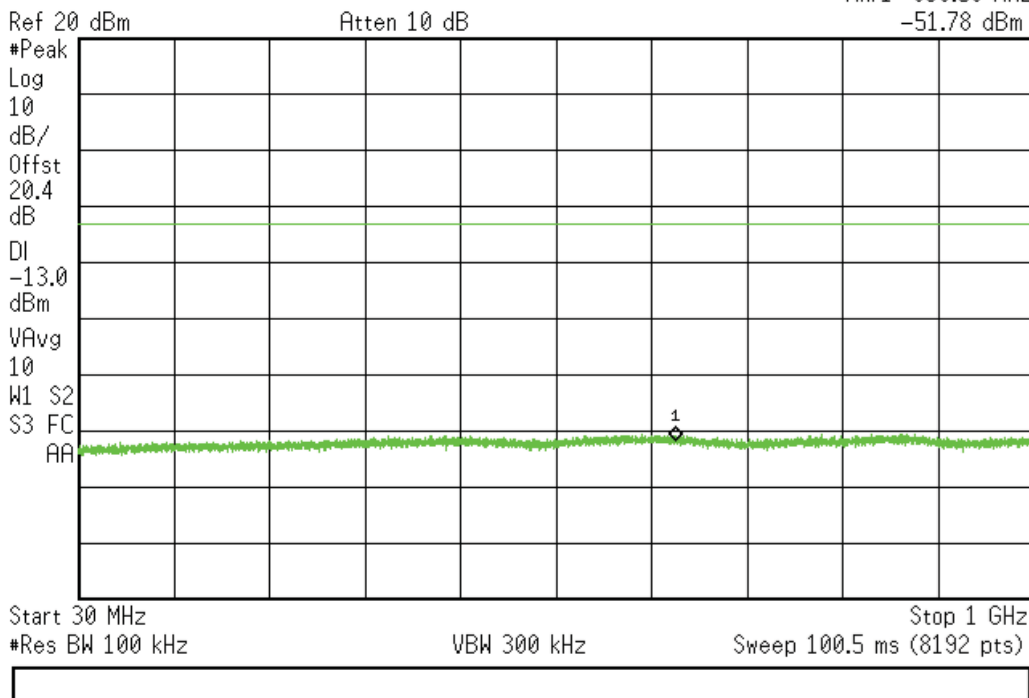


### 1710-1755 MHz Band (Low Frequency)

Agilent 17:54:05 Aug 11, 2014

L

Mkr1 636.56 MHz  
-51.78 dBm



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

Agilent 17:59:31 Aug 11, 2014

L

Mkr1 1.70297 GHz  
-41.77 dBm

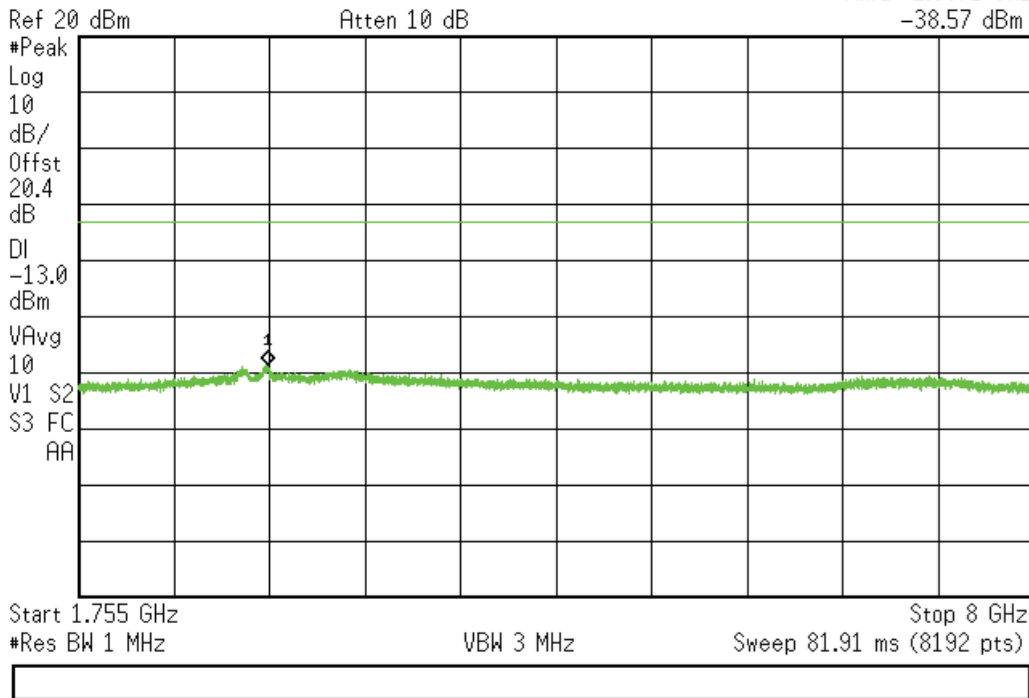


### 1710-1755 MHz Band (Low Frequency) (Cont)

Agilent 18:00:57 Aug 11, 2014

L

Mkr1 2.9971 GHz  
-38.57 dBm

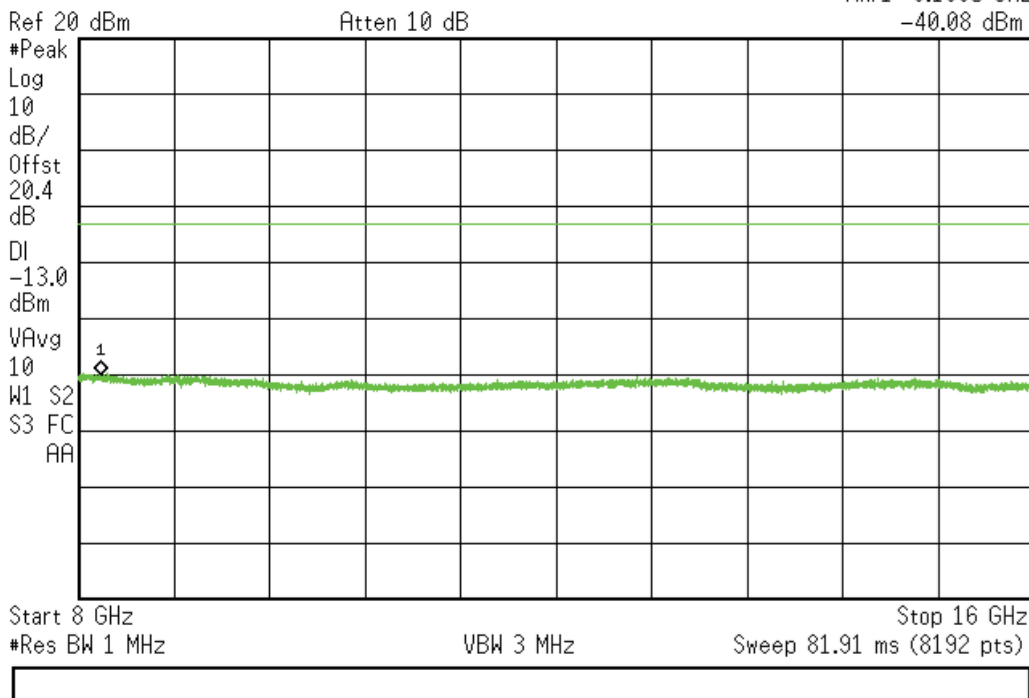


### 1710-1755 MHz Band (Low Frequency) (Cont)

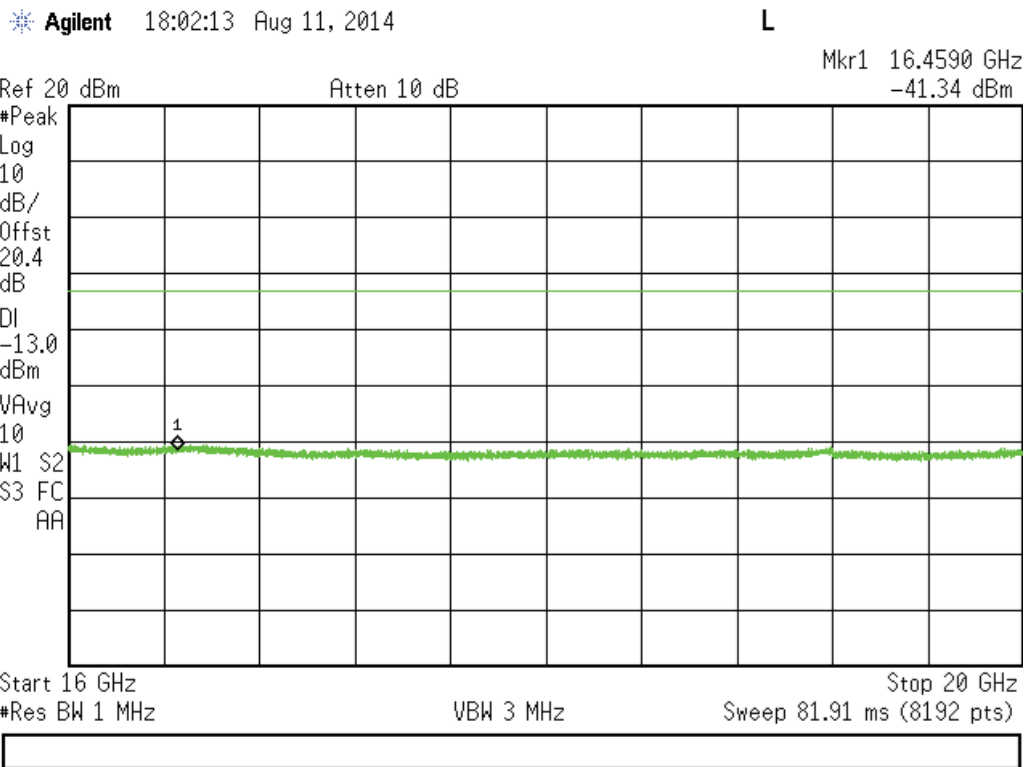
Agilent 18:01:32 Aug 11, 2014

L

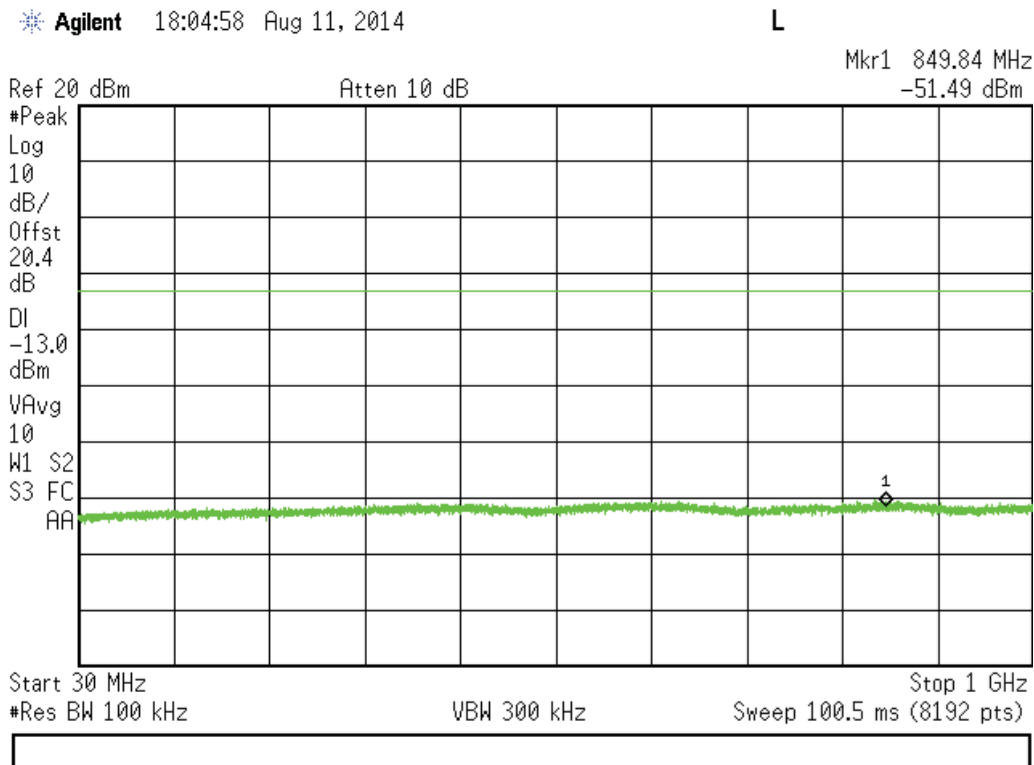
Mkr1 8.1865 GHz  
-40.08 dBm



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



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



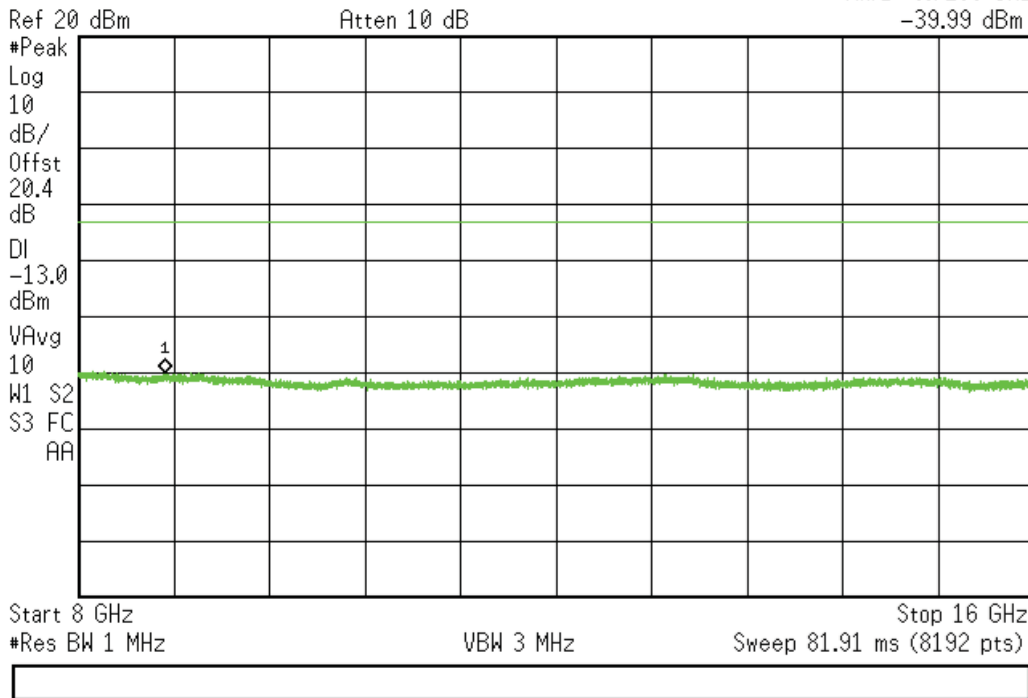


1710-1755 MHz Band (Mid Frequency) (Cont)

Agilent 18:03:44 Aug 11, 2014

L

Mkr1 8.7286 GHz  
-39.99 dBm

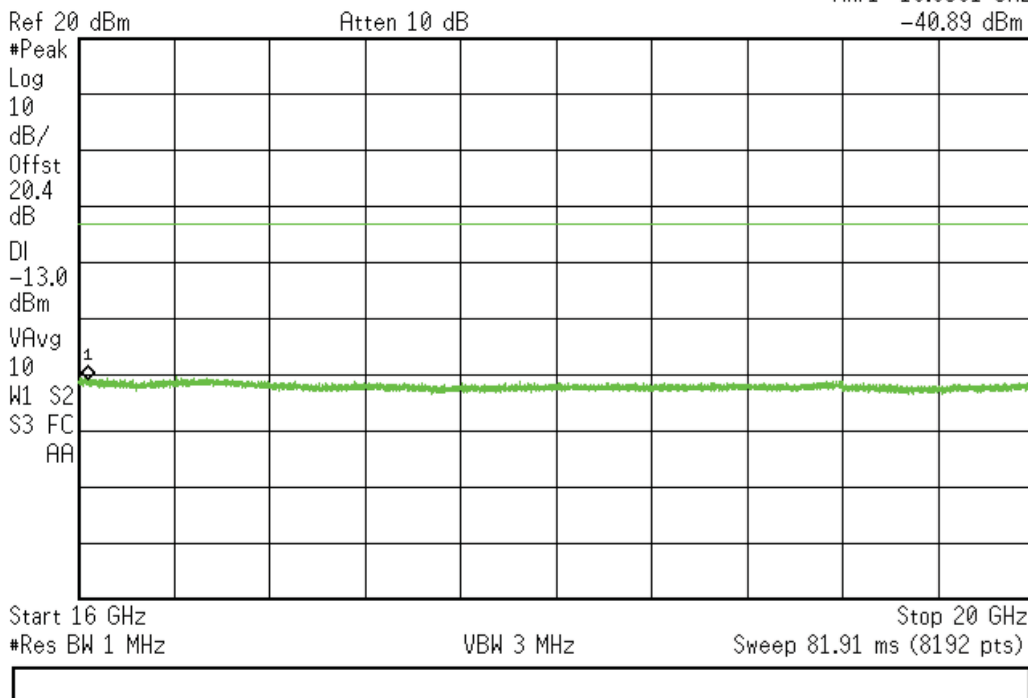


1710-1755 MHz Band (Mid Frequency) (Cont)

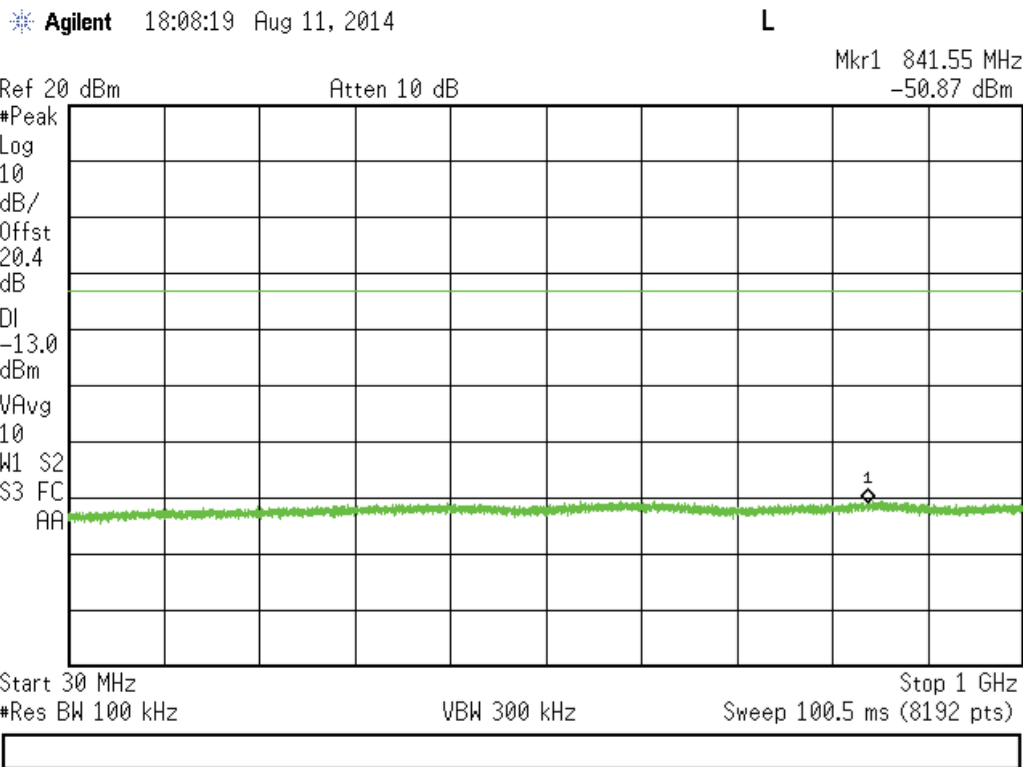
Agilent 18:03:06 Aug 11, 2014

L

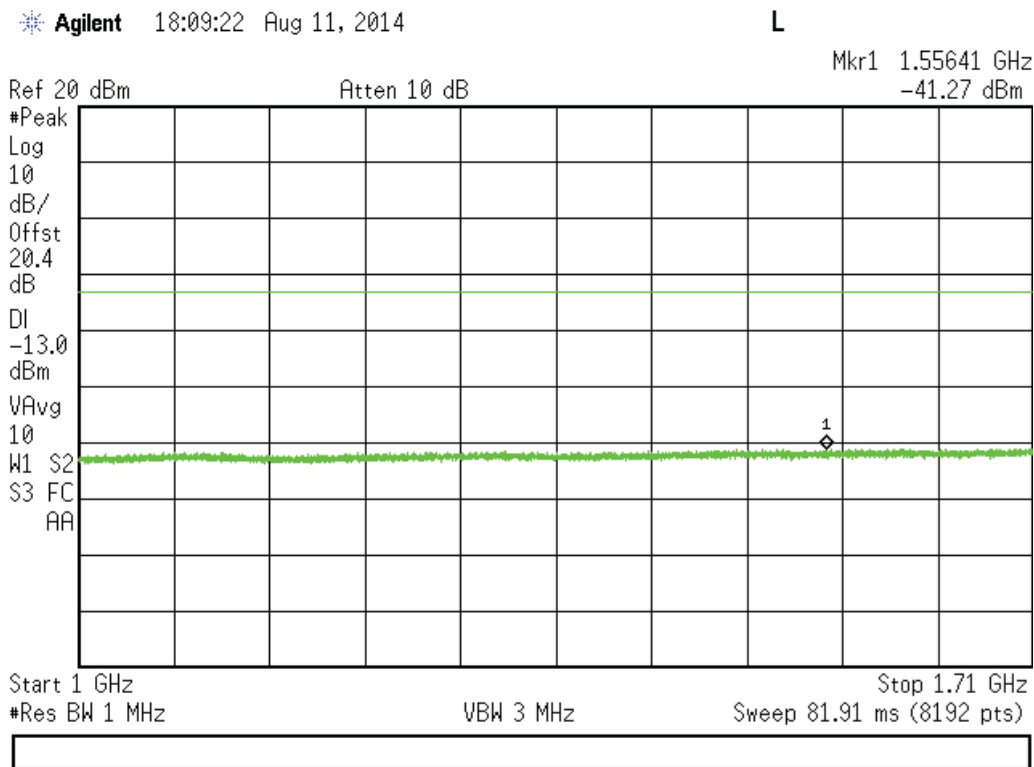
Mkr1 16.0391 GHz  
-40.89 dBm



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



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



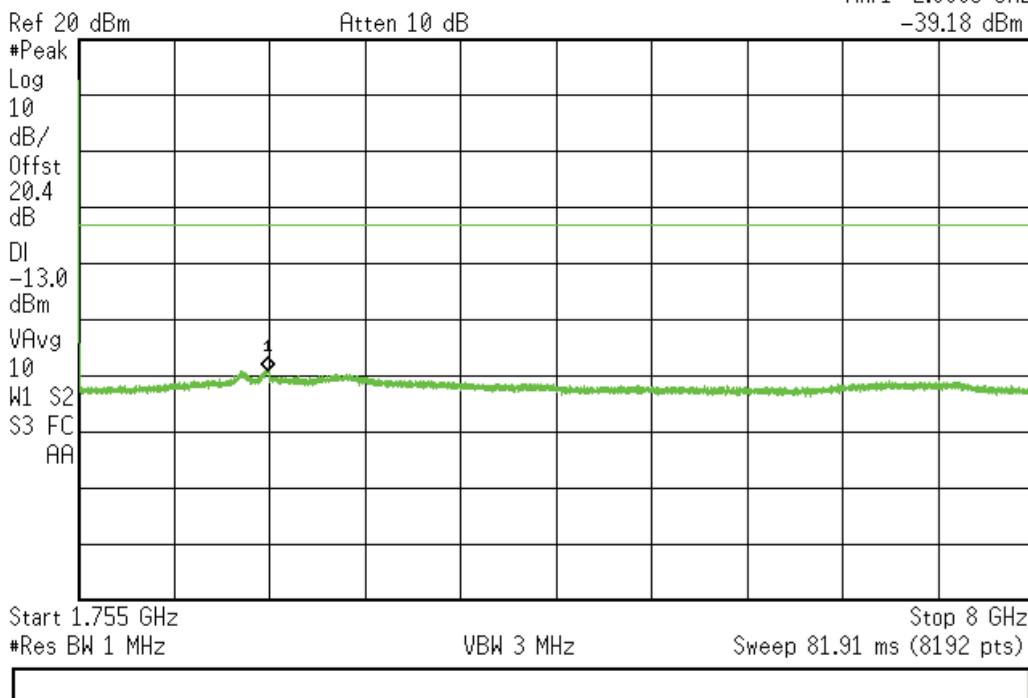


### 1710-1755 MHz Band (High Frequency) (Cont)

Agilent 18:10:35 Aug 11, 2014

L

Mkr1 2.9963 GHz  
-39.18 dBm

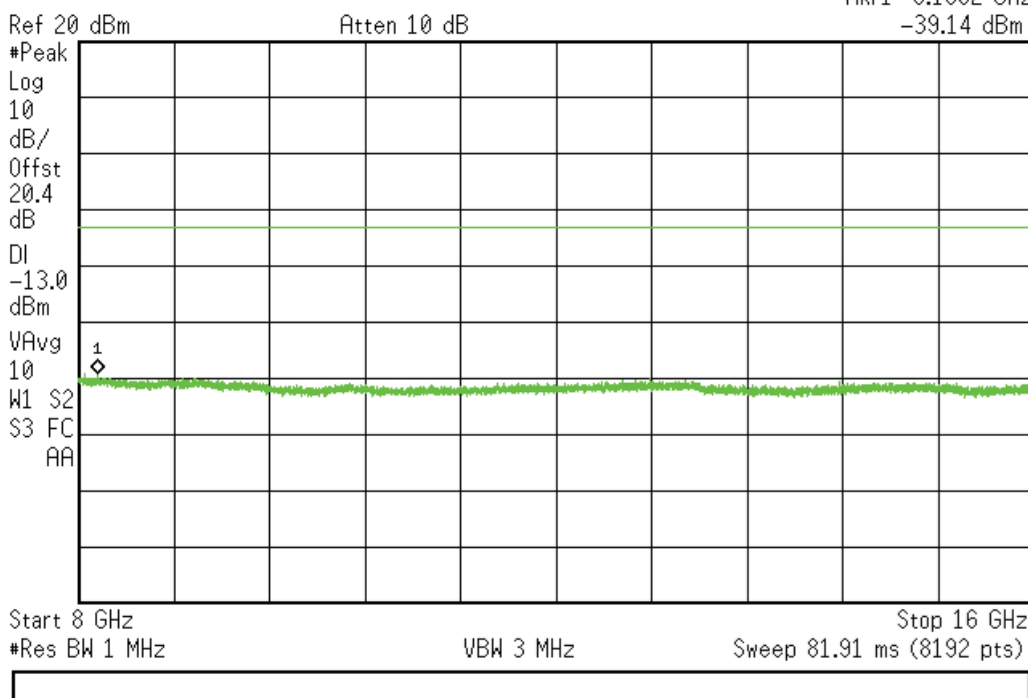


### 1710-1755 MHz Band (High Frequency) (Cont)

Agilent 18:11:13 Aug 11, 2014

L

Mkr1 8.1602 GHz  
-39.14 dBm

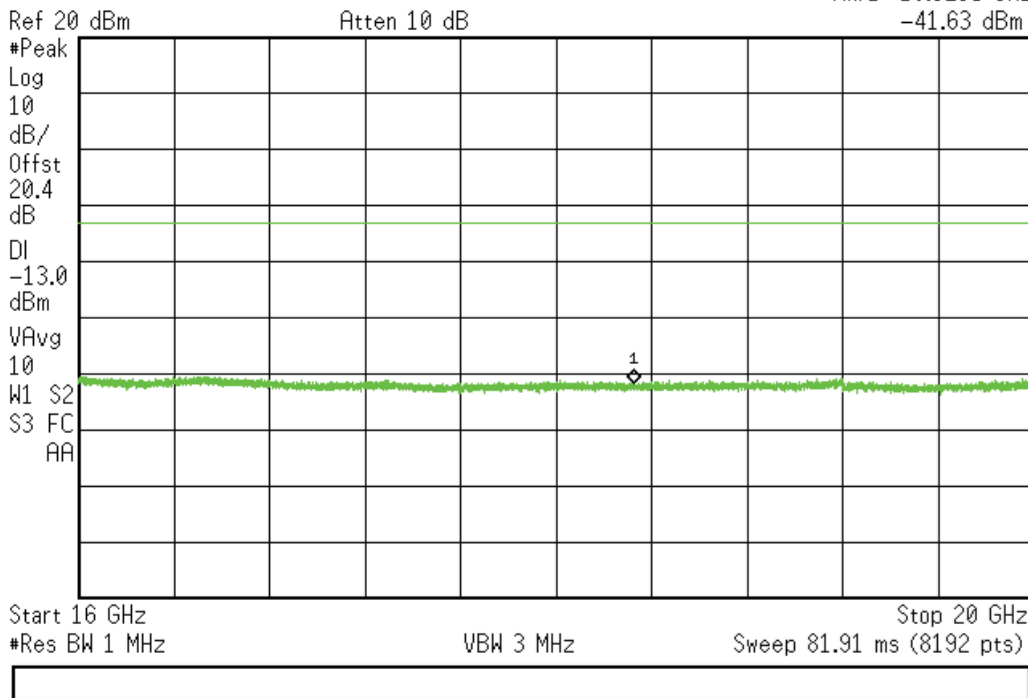


**1710-1755 MHz Band (High Frequency) (Cont)**

Agilent 18:11:52 Aug 11, 2014

L

Mkr1 18.3235 GHz  
-41.63 dBm

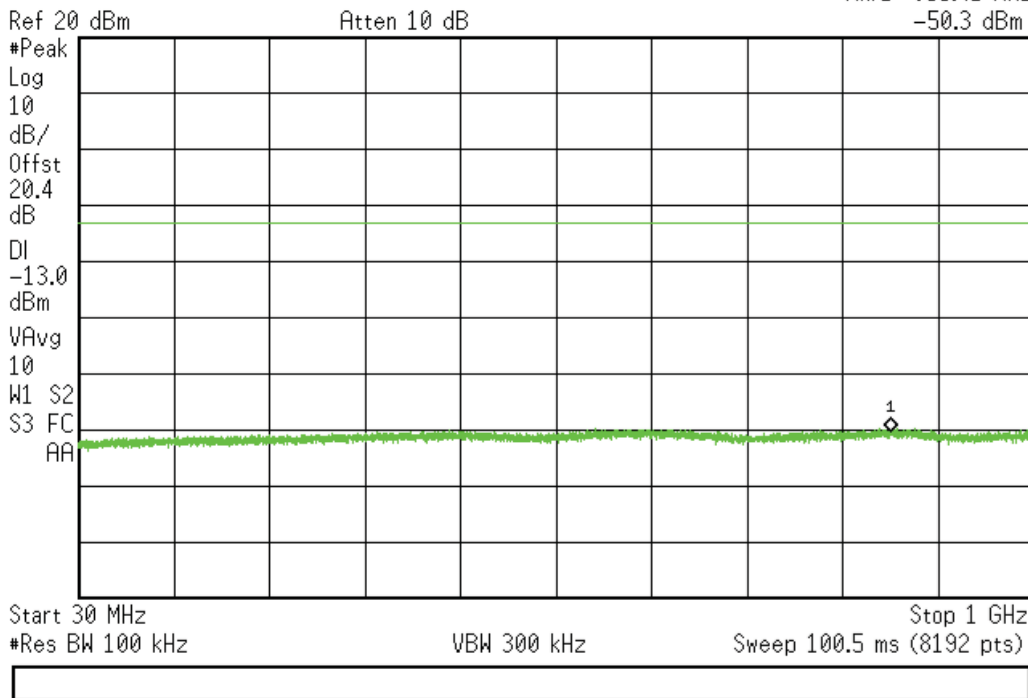


**1850-1915 MHz Band (Low Frequency)**

Agilent 18:17:24 Aug 11, 2014

L

Mkr1 855.41 MHz  
-50.3 dBm

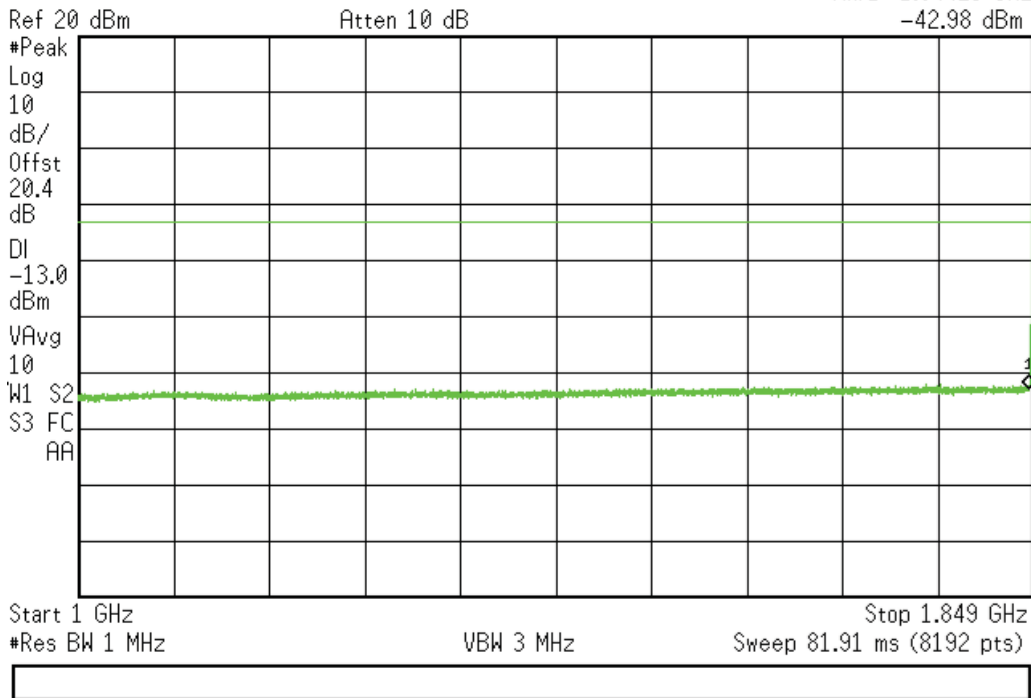


**1850-1915 MHz Band (Low Frequency) (Cont)**

Agilent 18:22:33 Aug 11, 2014

L

Mkr1 1.84423 GHz  
-42.98 dBm

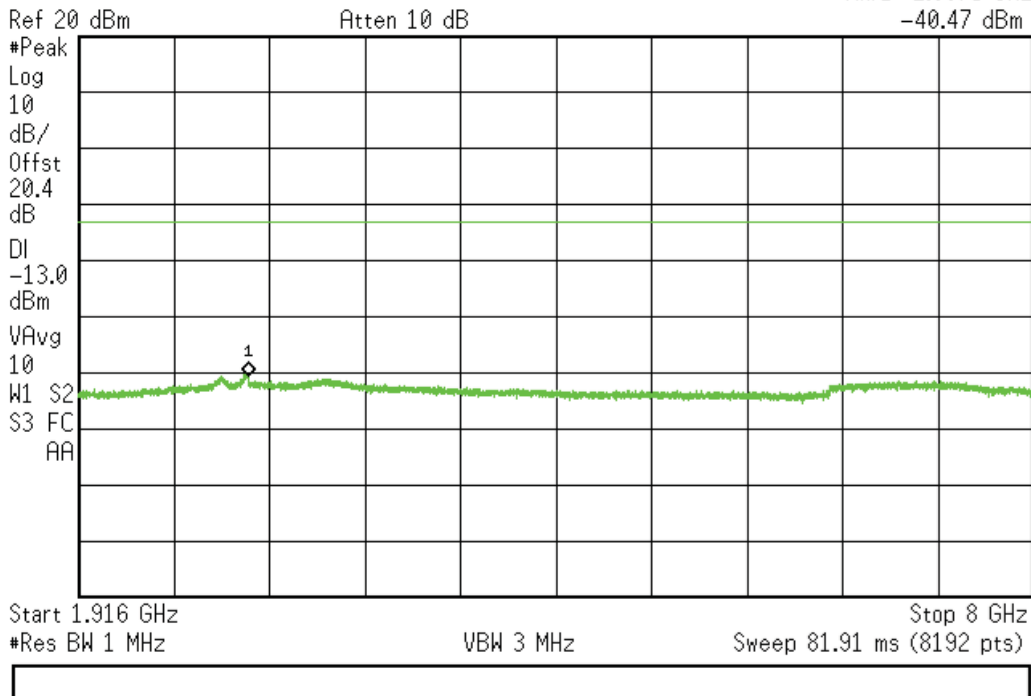


**1850-1915 MHz Band (Low Frequency) (Cont)**

Agilent 18:24:29 Aug 11, 2014

L

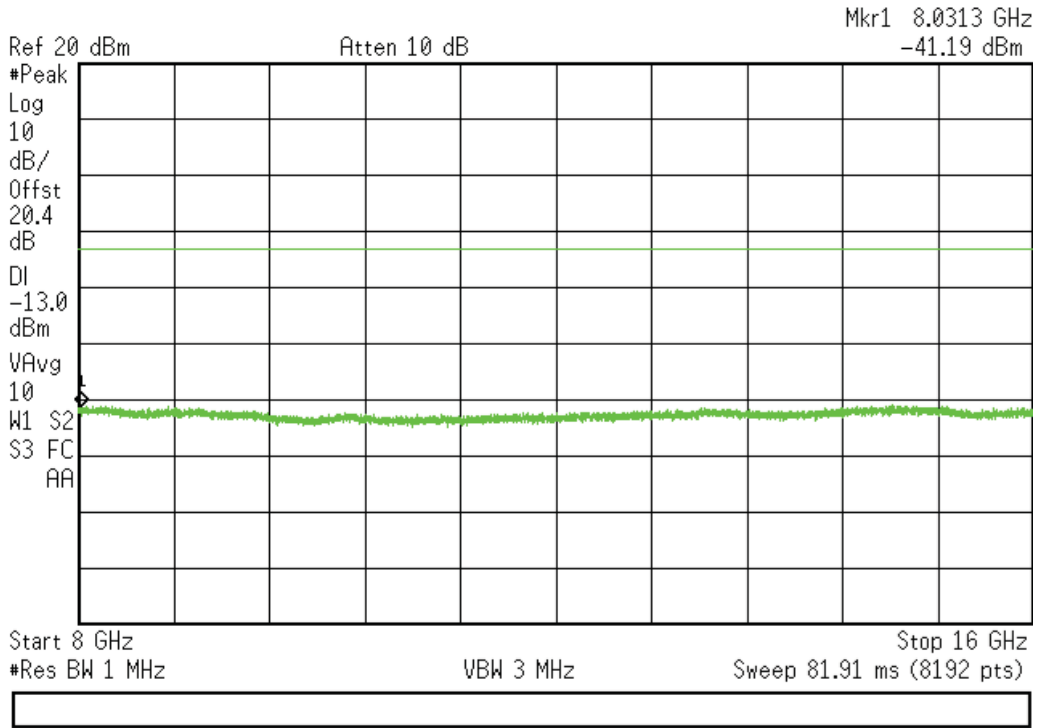
Mkr1 2.9975 GHz  
-40.47 dBm



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

Agilent 18:27:58 Aug 11, 2014

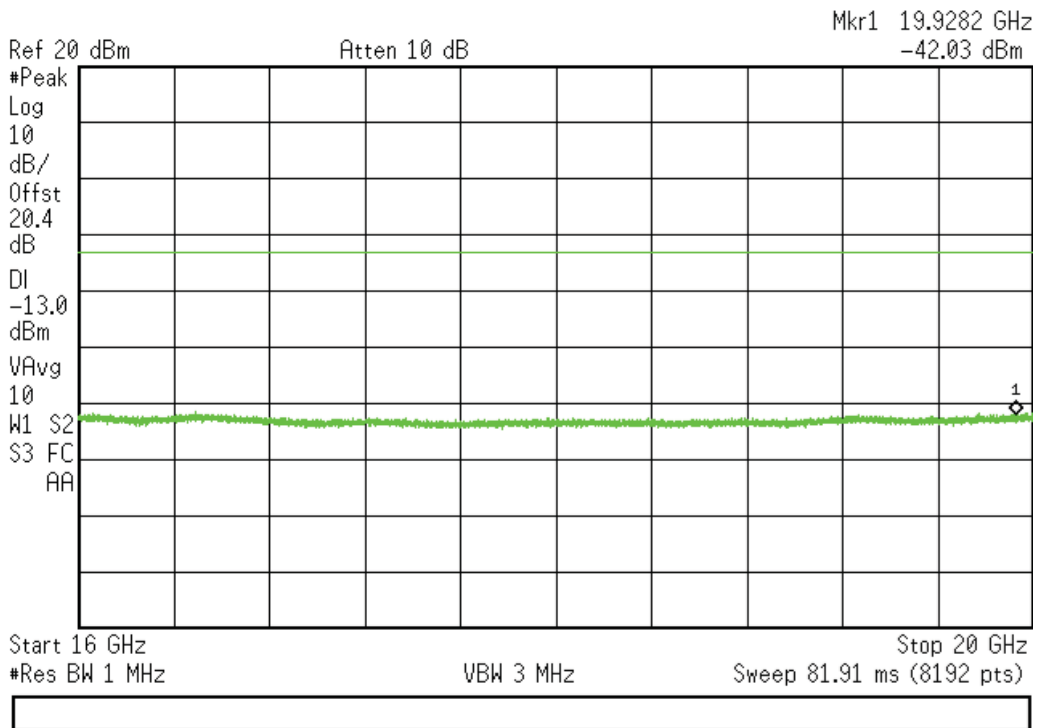
L



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

Agilent 18:28:43 Aug 11, 2014

L

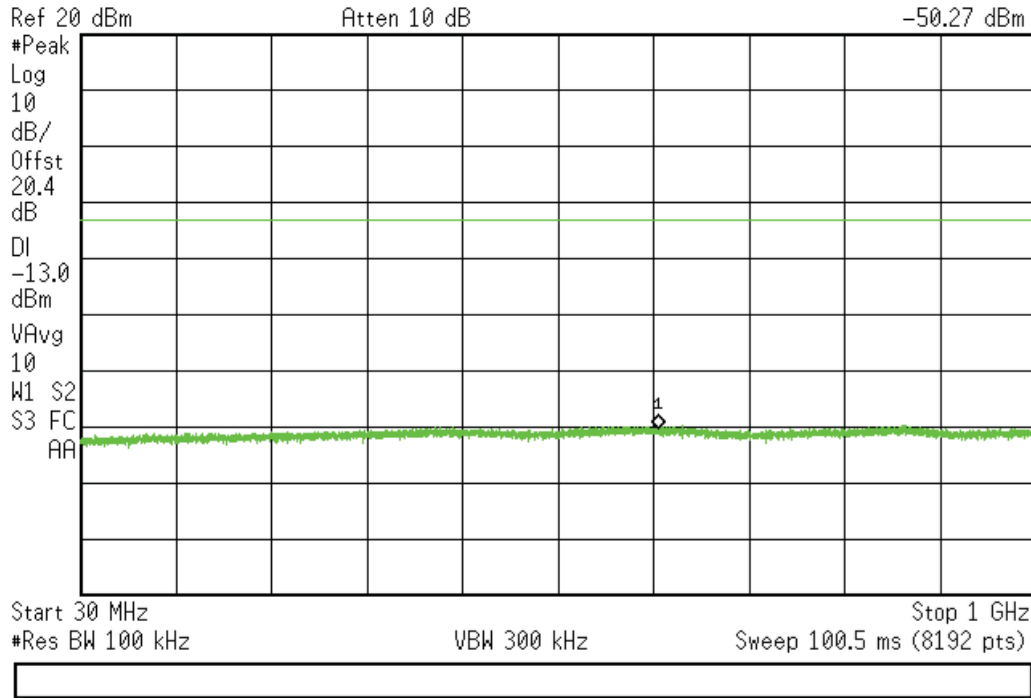


**1850-1915 MHz Band (Mid Frequency)**

Agilent 18:19:01 Aug 11, 2014

L

Mkr1 617.61 MHz  
-50.27 dBm

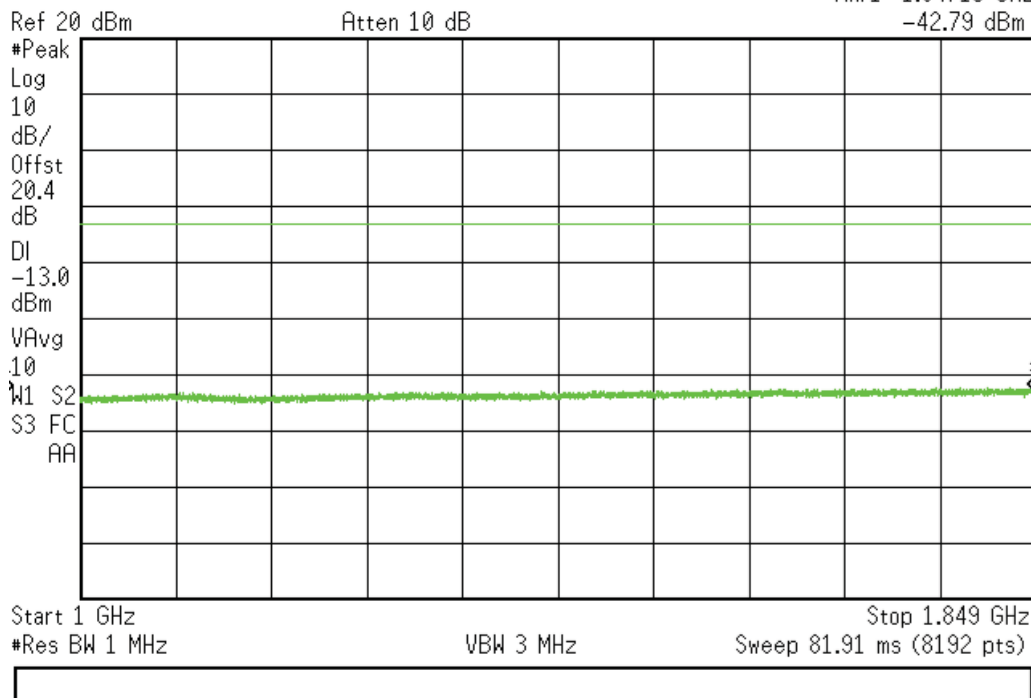


**1850-1915 MHz Band (Mid Frequency) (Cont)**


Agilent 18:21:39 Aug 11, 2014

L

Mkr1 1.84713 GHz  
-42.79 dBm

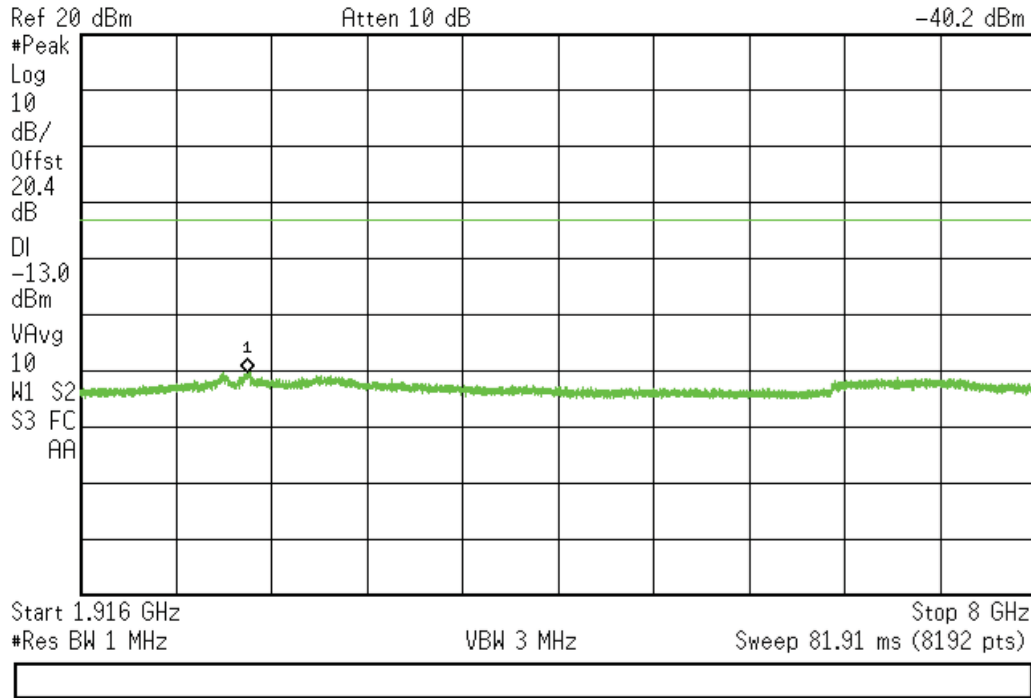


**1850-1915 MHz Band (Mid Frequency) (Cont)**


**Agilent** 18:25:28 Aug 11, 2014

L

Mkr1 2.9826 GHz  
 -40.2 dBm



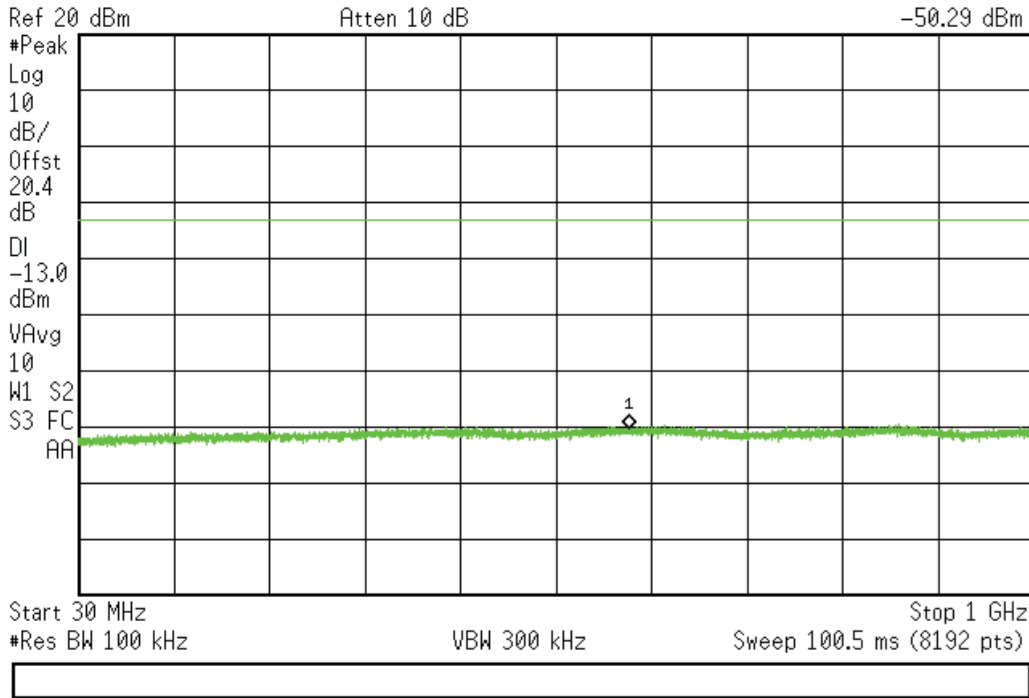


### 1850-1915 MHz Band (High Frequency)

Agilent 18:19:38 Aug 11, 2014

L

Mkr1 589.07 MHz  
-50.29 dBm

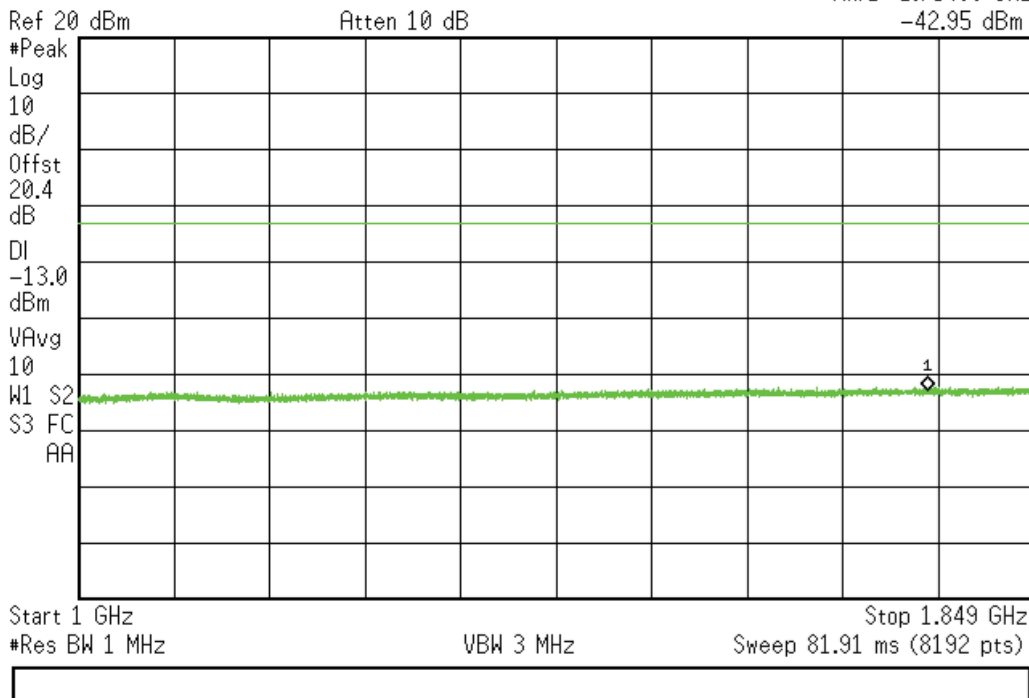


### 1850-1915 MHz Band (High Frequency) (Cont)

Agilent 18:20:51 Aug 11, 2014

L

Mkr1 1.75489 GHz  
-42.95 dBm



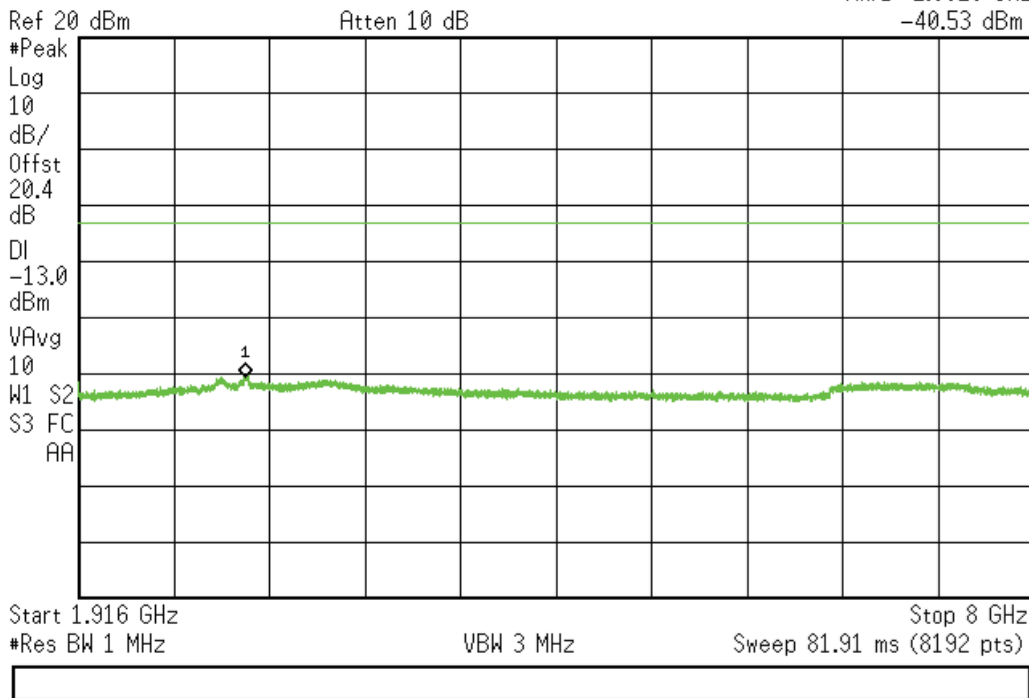


### 1850-1915 MHz Band (High Frequency) (Cont)

Agilent 18:26:07 Aug 11, 2014

L

Mkr1 2.9826 GHz  
-40.53 dBm

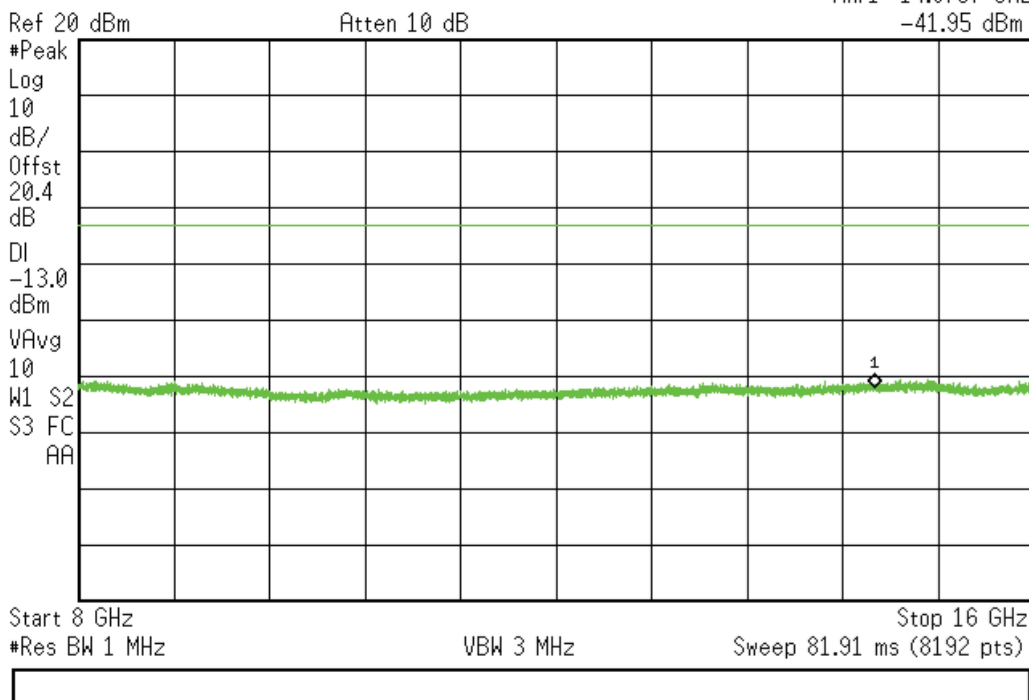


### 1850-1915 MHz Band (High Frequency) (Cont)

Agilent 18:26:49 Aug 11, 2014

L

Mkr1 14.6737 GHz  
-41.95 dBm



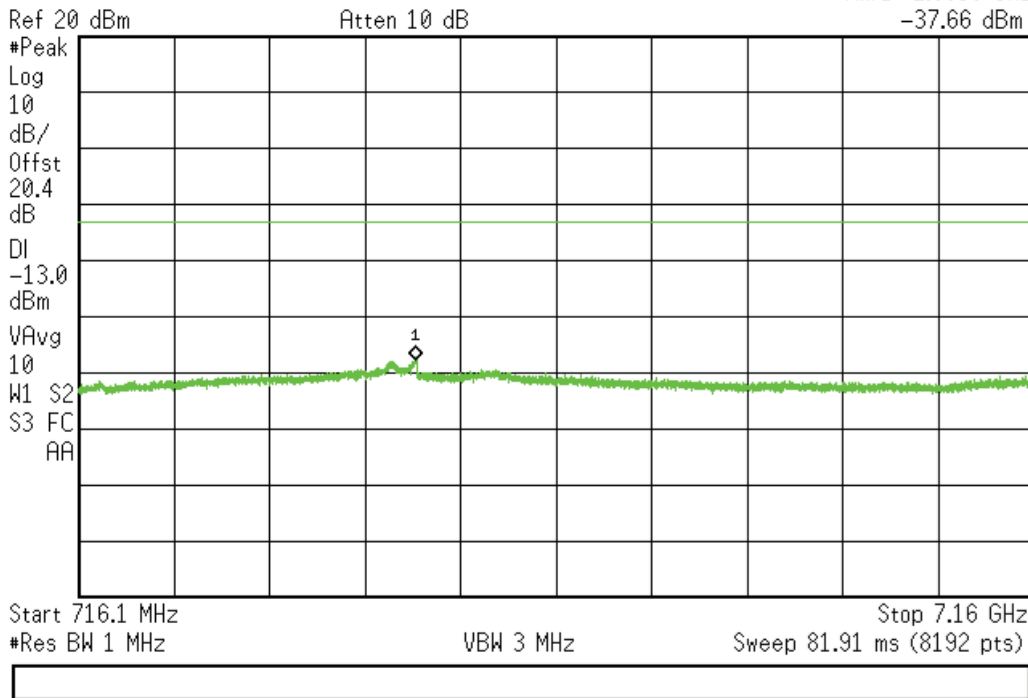


### 698 - 716 MHz Band (Low Frequency) (Cont)

Agilent 16:50:16 Aug 11, 2014

L

Mkr1 2.9936 GHz  
-37.66 dBm

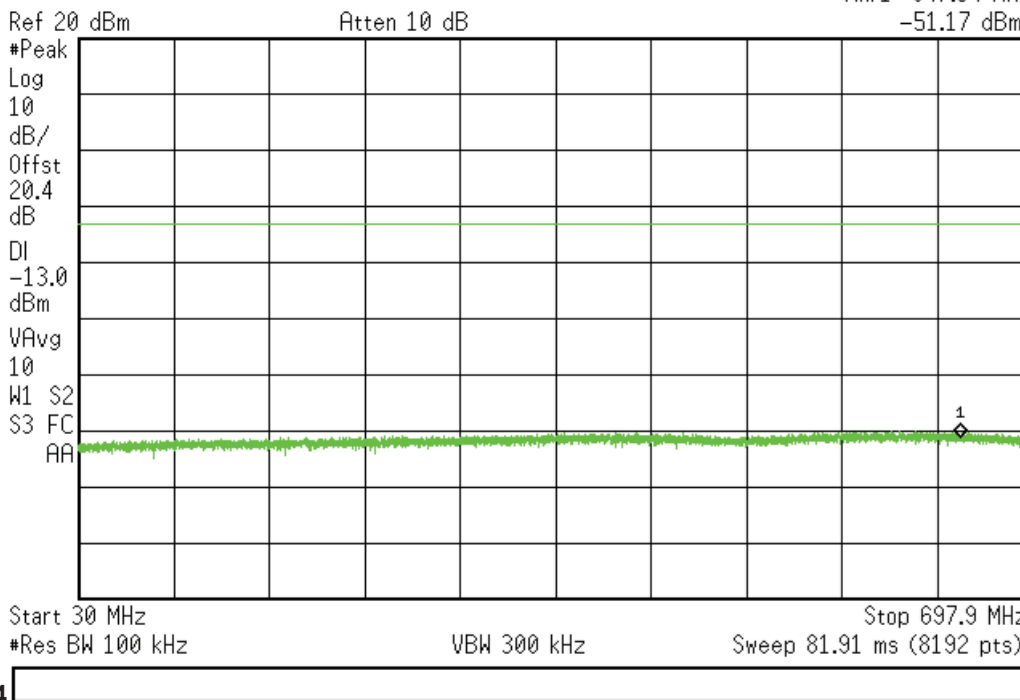


### 698 - 716 MHz Band (Mid Frequency)

Agilent 16:36:40 Aug 11, 2014

L

Mkr1 647.34 MHz  
-51.17 dBm



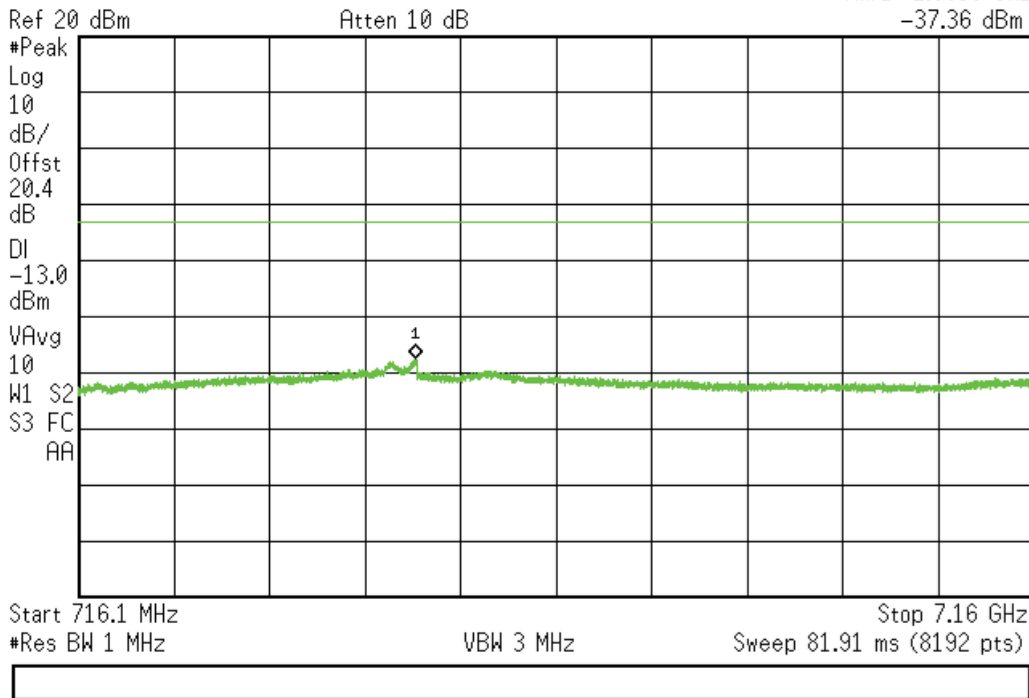
4

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

Agilent 16:49:31 Aug 11, 2014

L

Mkr1 2.9936 GHz  
-37.36 dBm

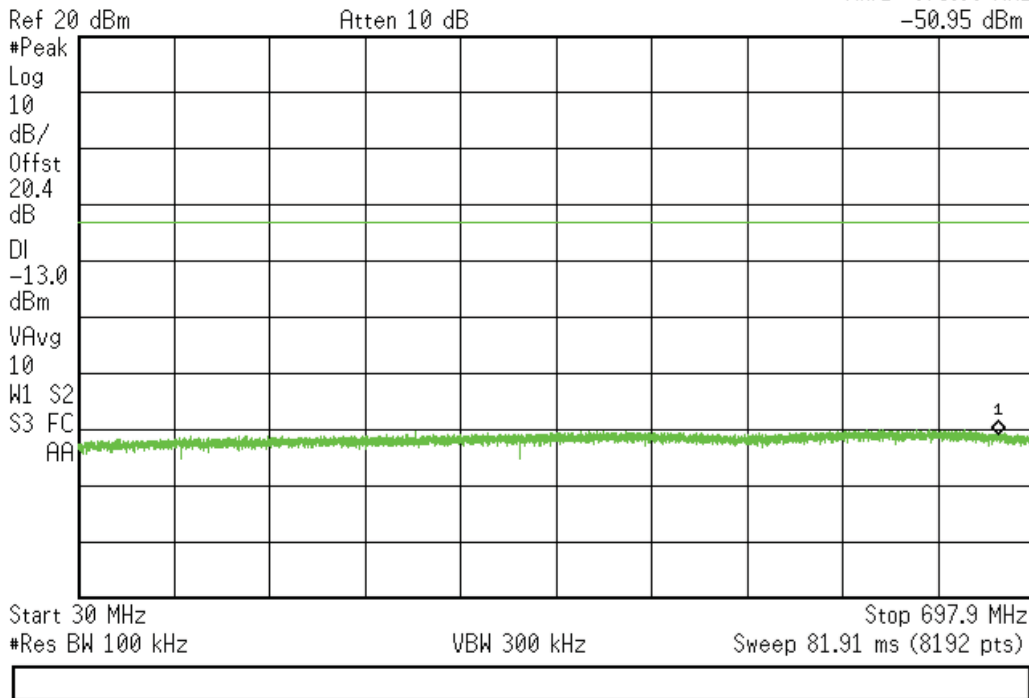


### 698 - 716 MHz Band (High Frequency)

Agilent 16:38:06 Aug 11, 2014

L

Mkr1 673.68 MHz  
-50.95 dBm

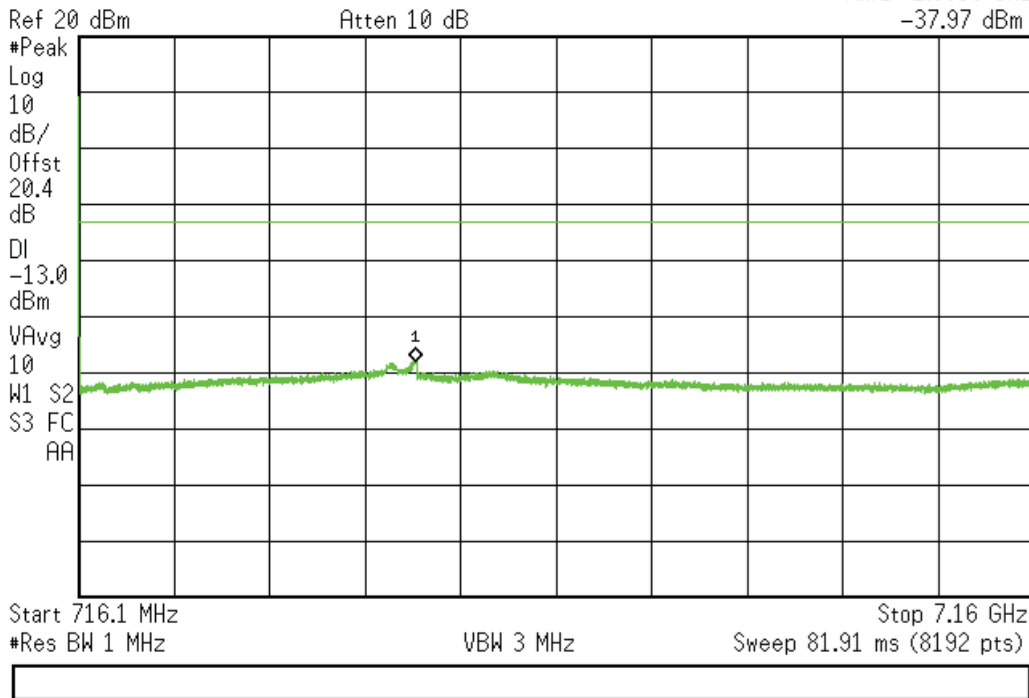


### 698 - 716 MHz Band (High Frequency) (Cont)

Agilent 16:48:42 Aug 11, 2014

L

Mkr1 2.9936 GHz  
-37.97 dBm

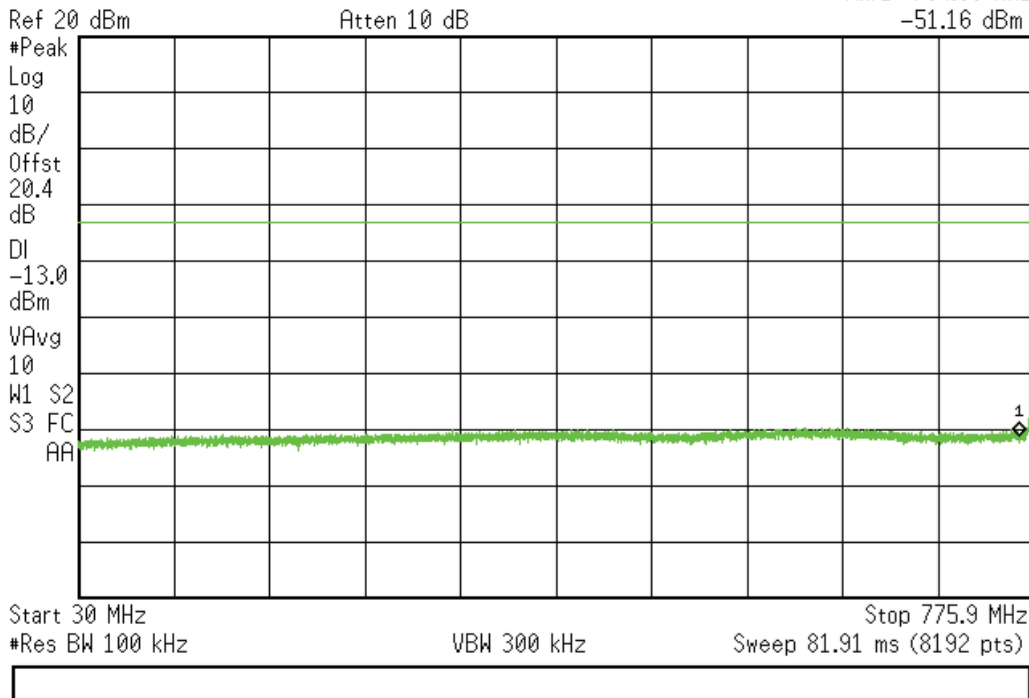


### 76-787 MHz Band (Low Frequency)

Agilent 16:59:03 Aug 11, 2014

L

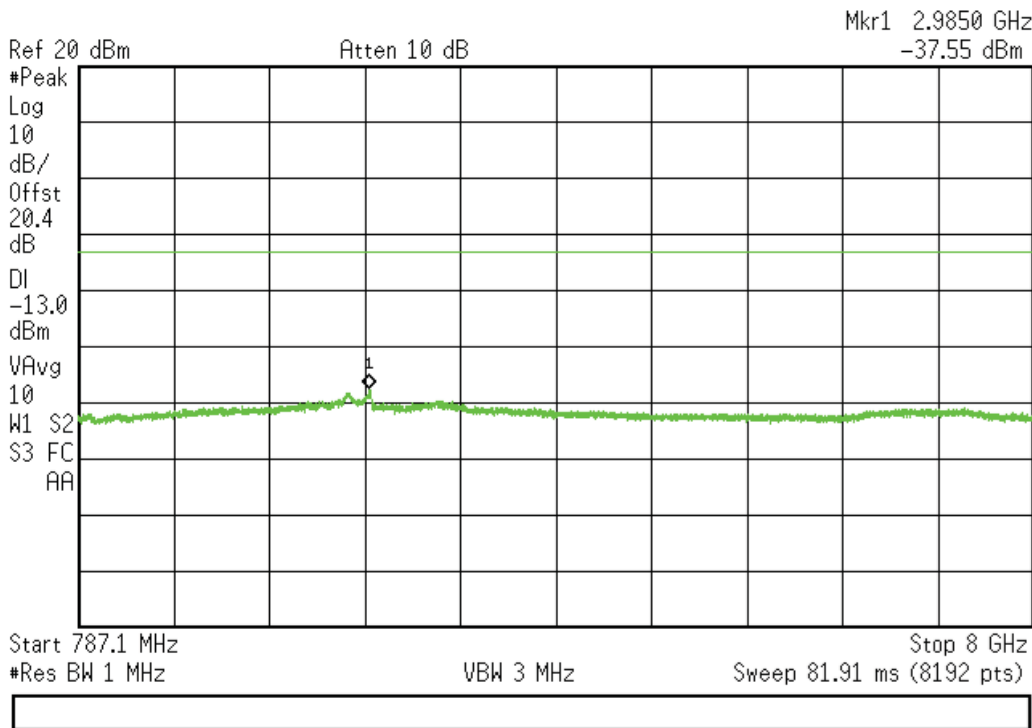
Mkr1 764.88 MHz  
-51.16 dBm



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

Agilent 17:12:59 Aug 11, 2014

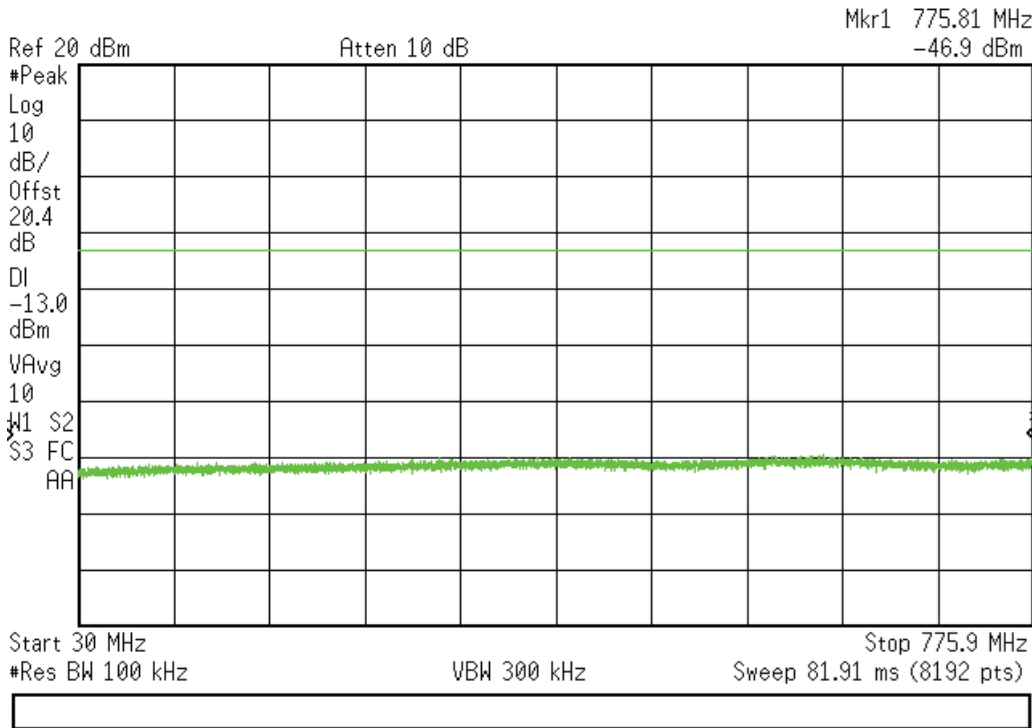
L



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

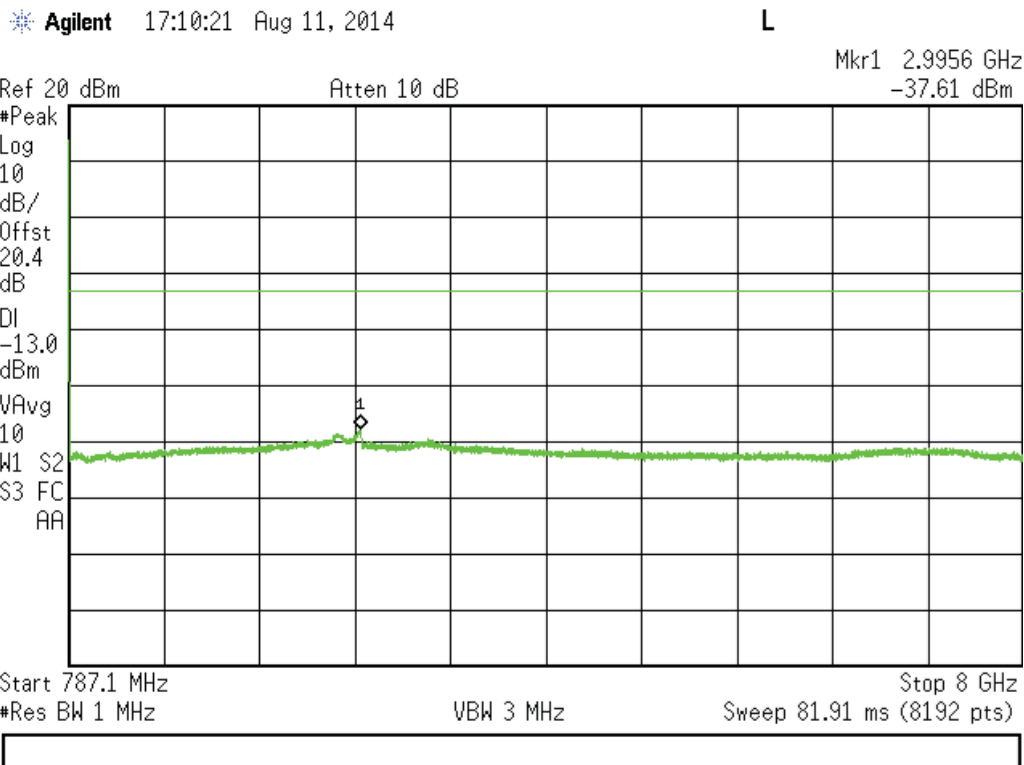
Agilent 16:59:57 Aug 11, 2014

L

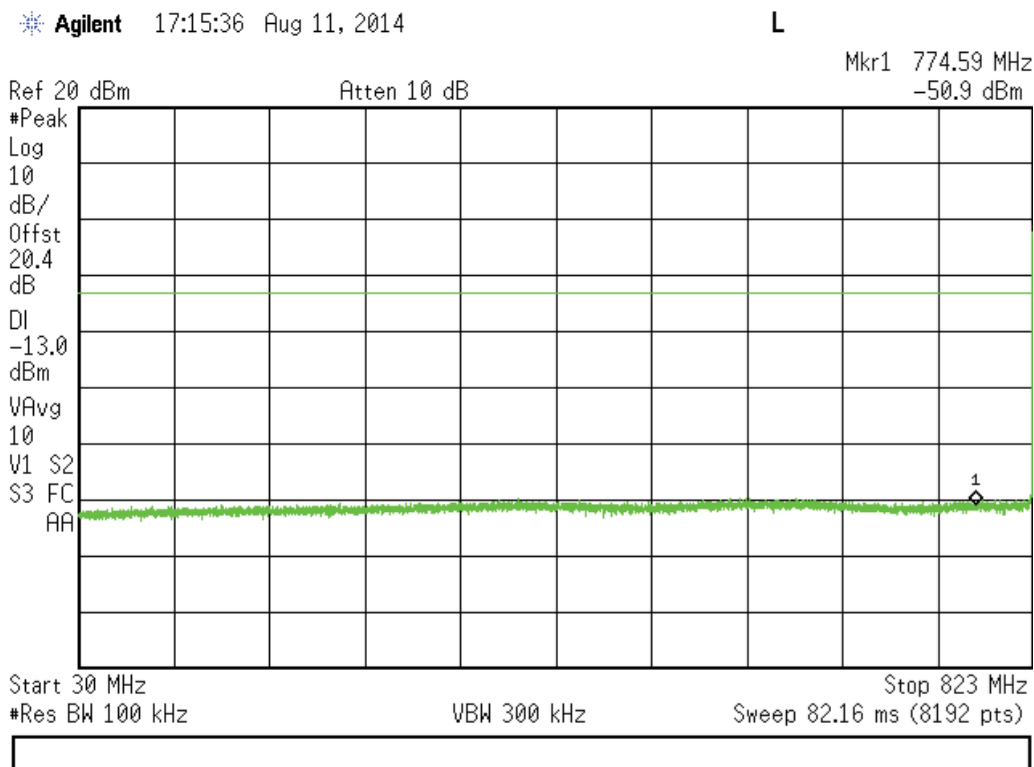




### 776-787 MHz Band (High Frequency) (Cont)



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

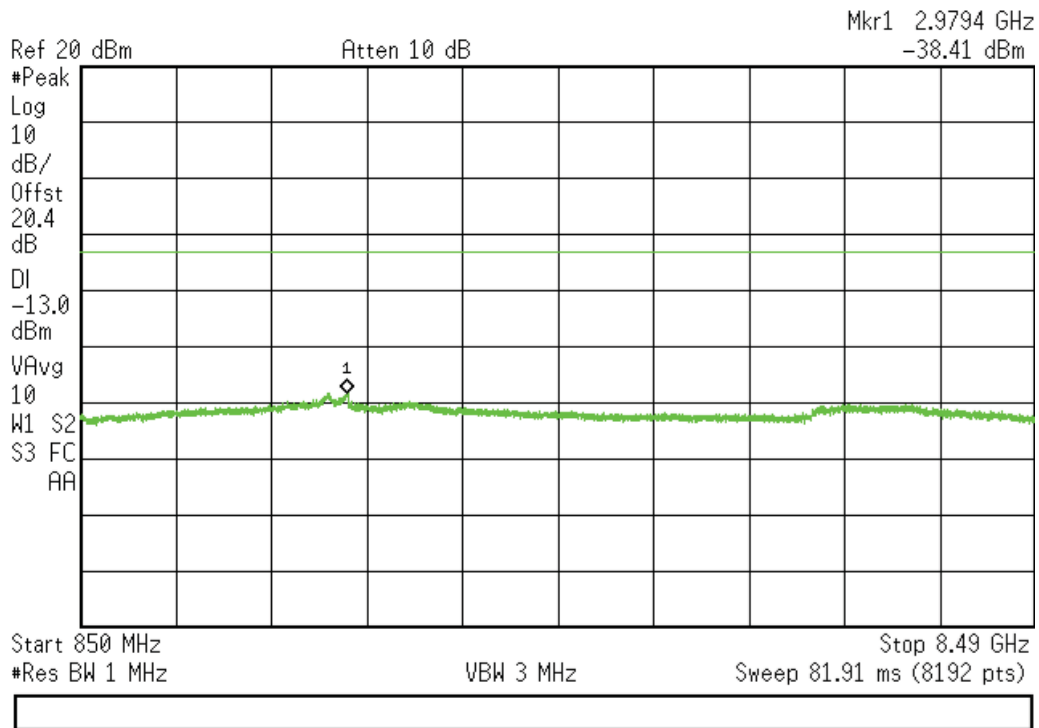




### 824-849 MHz Band (Low Frequency) (Cont)

Agilent 17:28:01 Aug 11, 2014

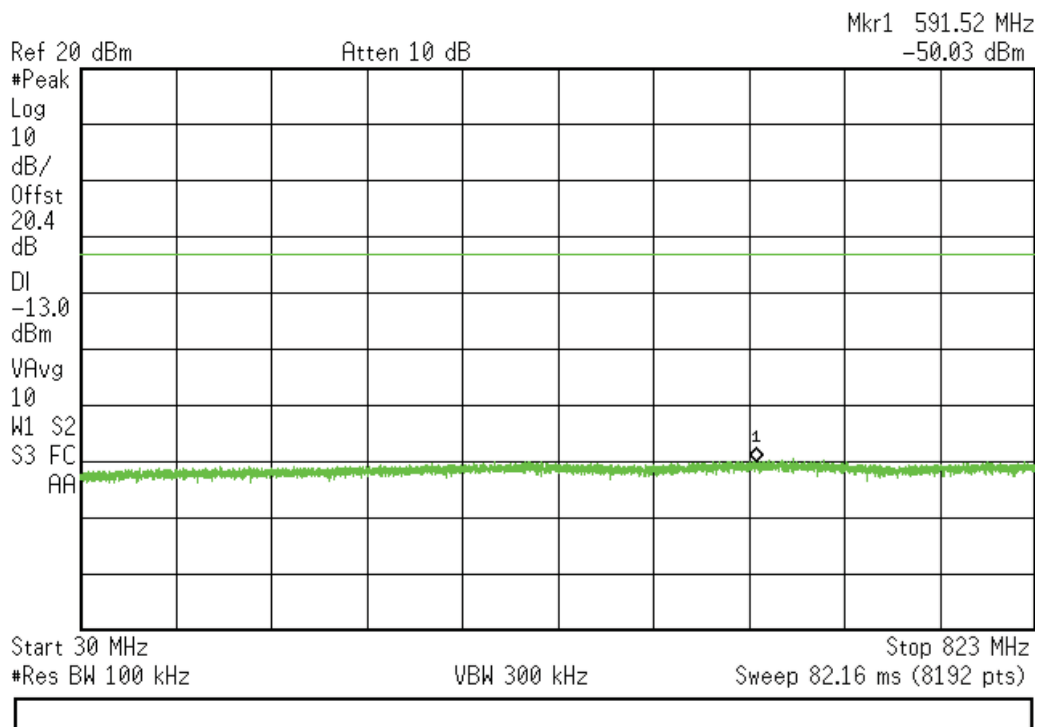
L



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

Agilent 17:17:00 Aug 11, 2014

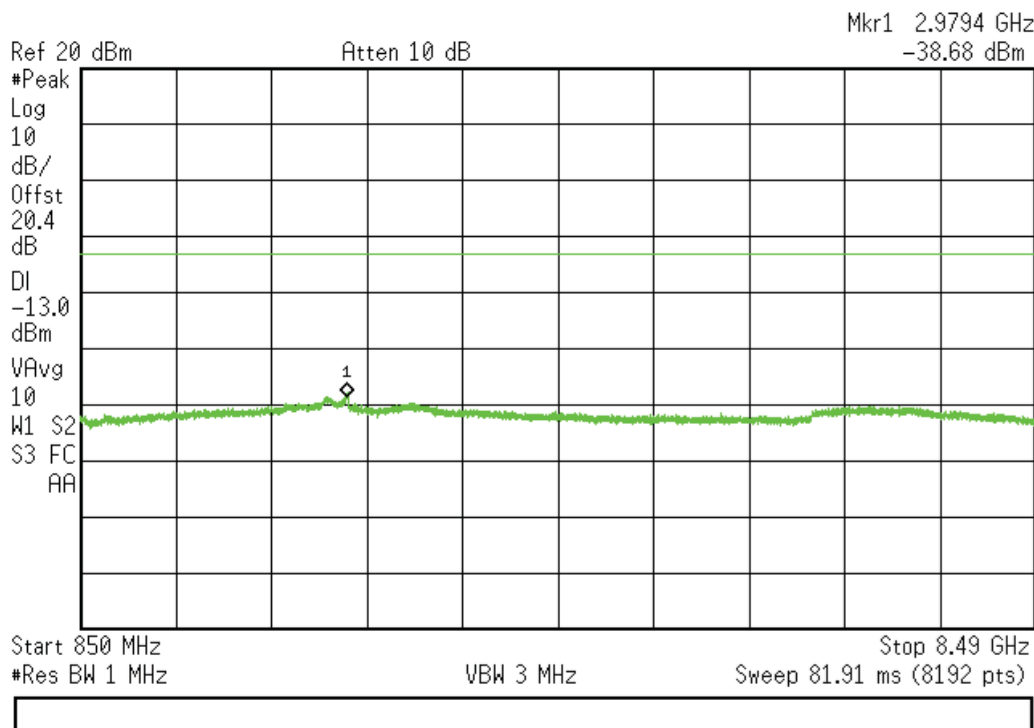
L



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

Agilent 17:27:09 Aug 11, 2014

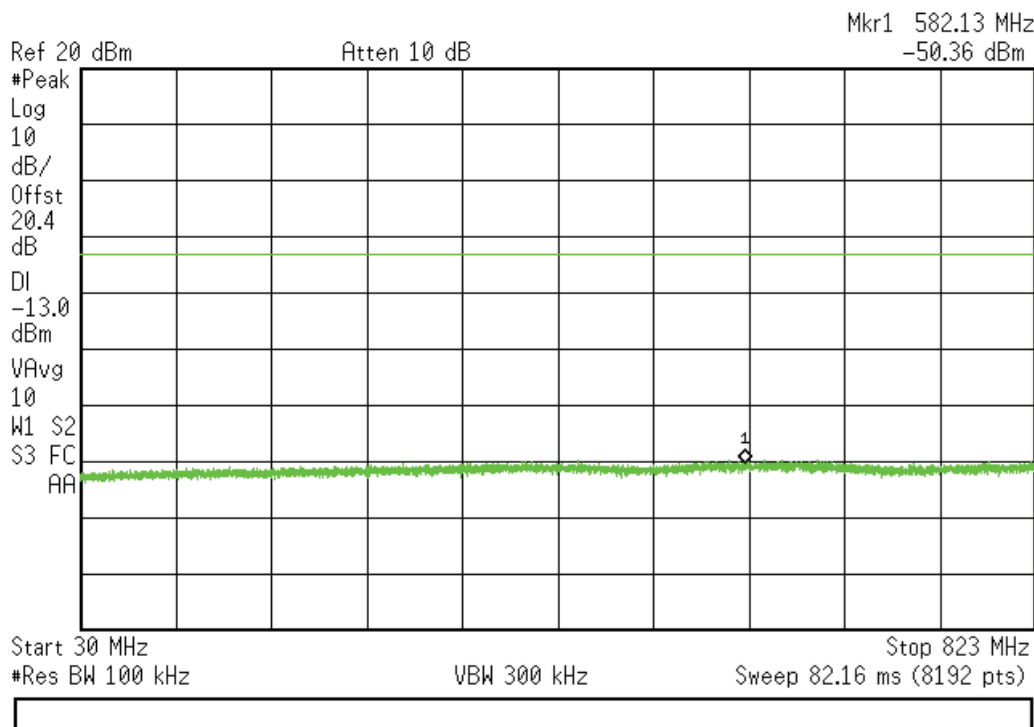
L



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

Agilent 17:18:07 Aug 11, 2014

L

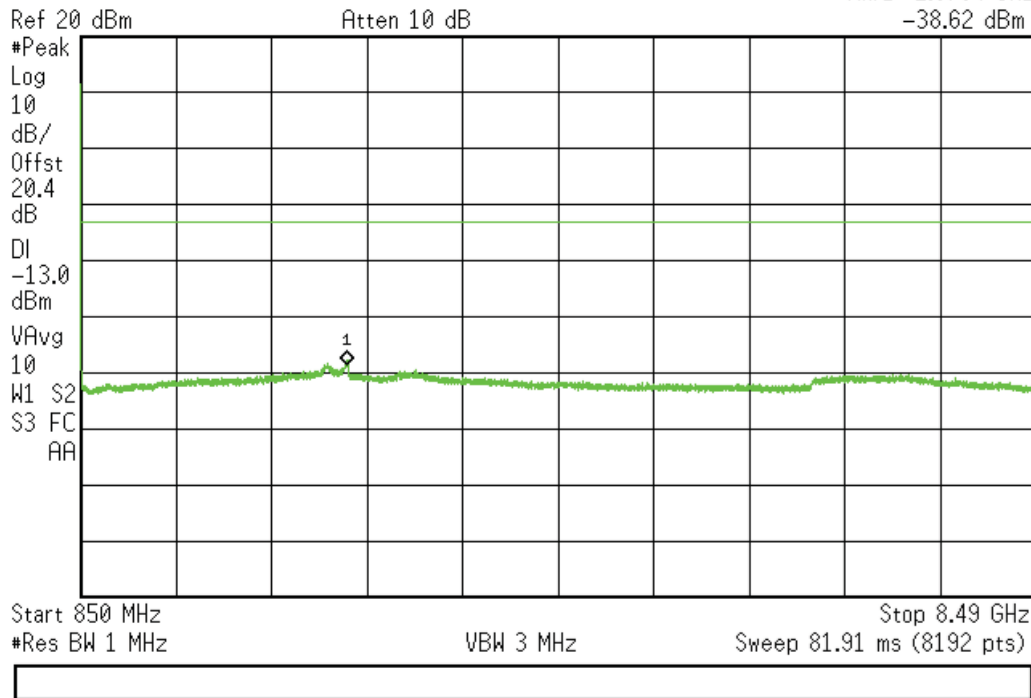


### 824-849 MHz Band (High Frequency) (Cont)

Agilent 17:26:10 Aug 11, 2014

L

Mkr1 2.9794 GHz  
-38.62 dBm

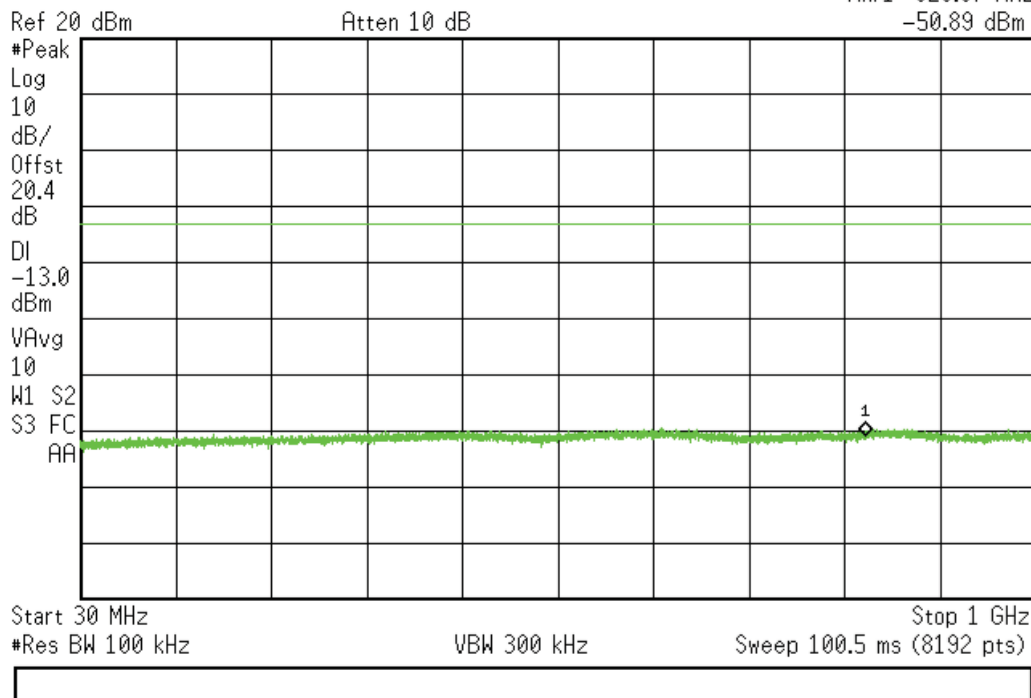


### 1710-1755 MHz Band (Low Frequency)

Agilent 17:34:19 Aug 11, 2014

L

Mkr1 826.87 MHz  
-50.89 dBm

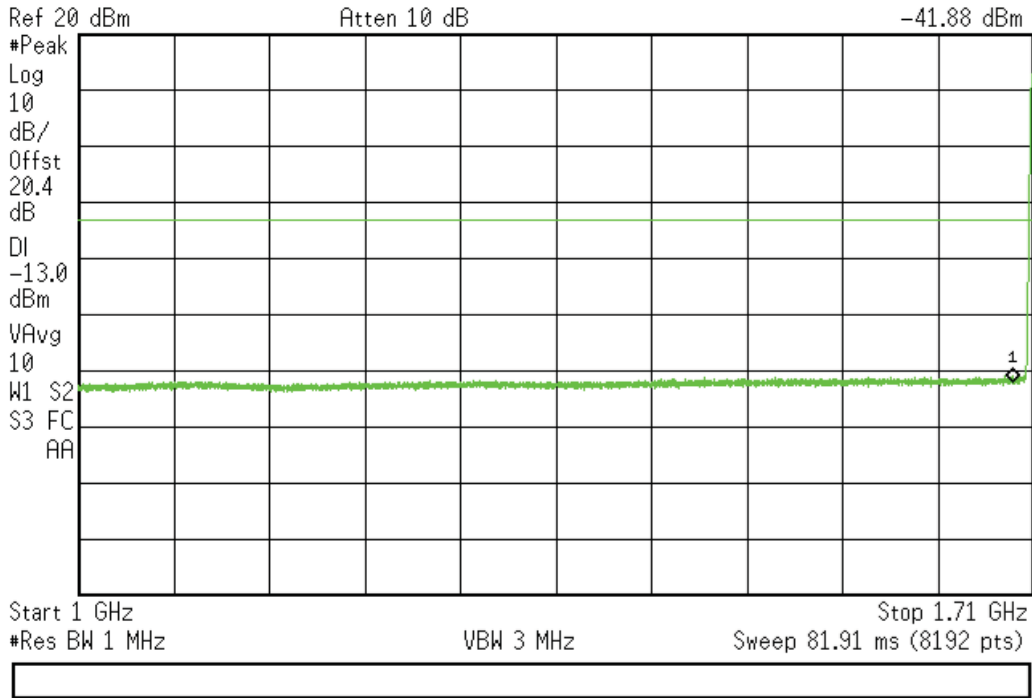


1710-1755 MHz Band (Low Frequency) (Cont)

Agilent 17:35:48 Aug 11, 2014

L

Mkr1 1.69430 GHz  
-41.88 dBm

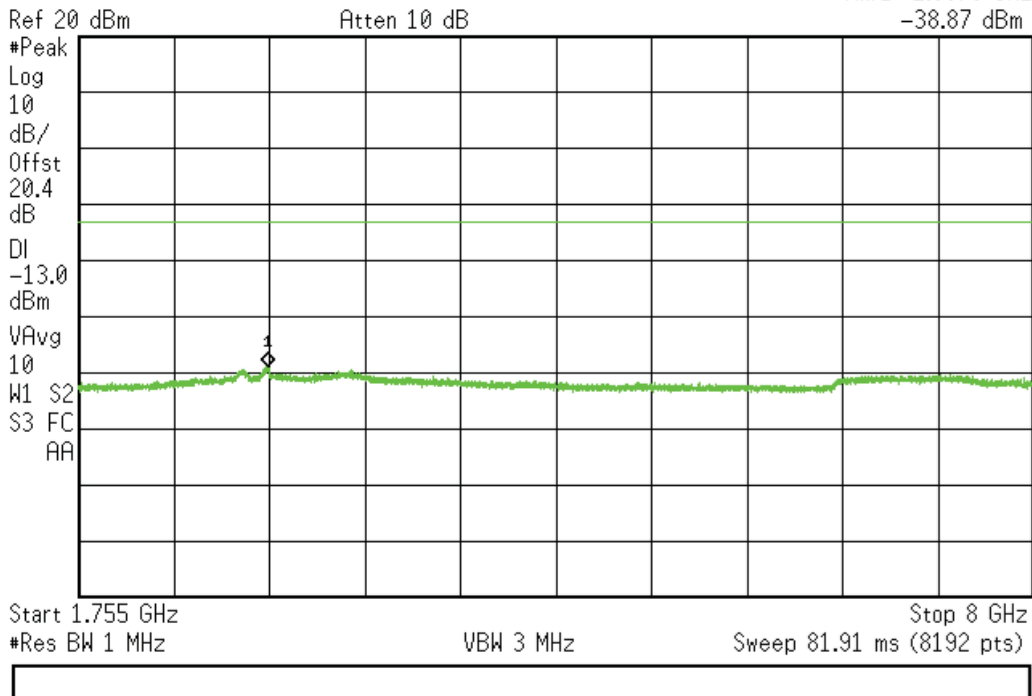


1710-1755 MHz Band (Low Frequency) (Cont)

Agilent 17:37:10 Aug 11, 2014

L

Mkr1 2.9978 GHz  
-38.87 dBm

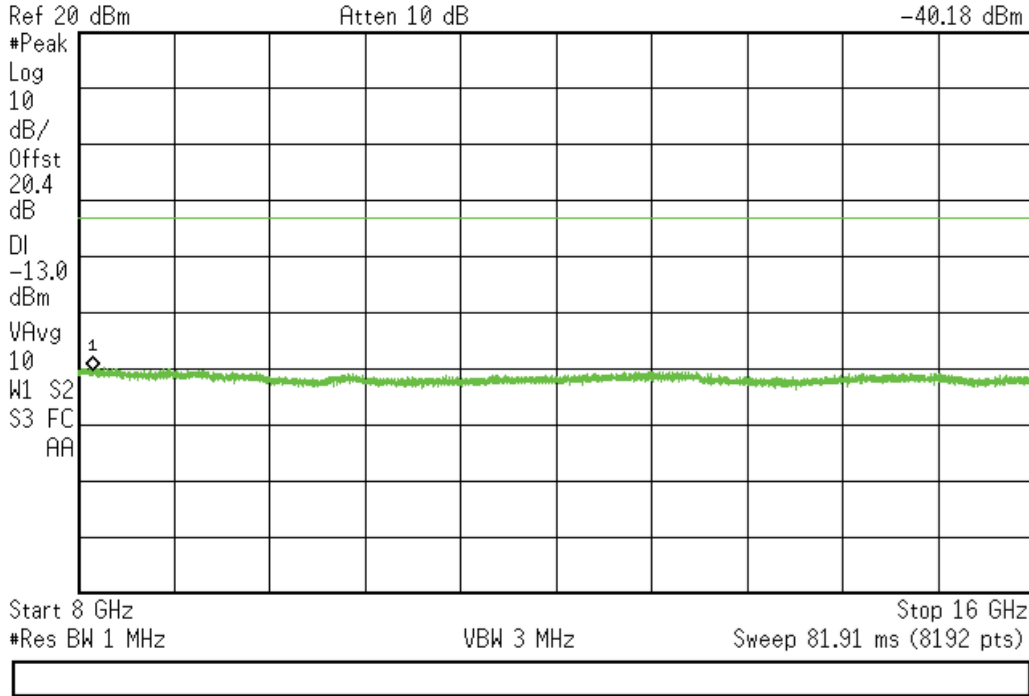


1710-1755 MHz Band (Low Frequency) (Cont)

Agilent 17:38:02 Aug 11, 2014

L

Mkr1 8.1221 GHz  
-40.18 dBm

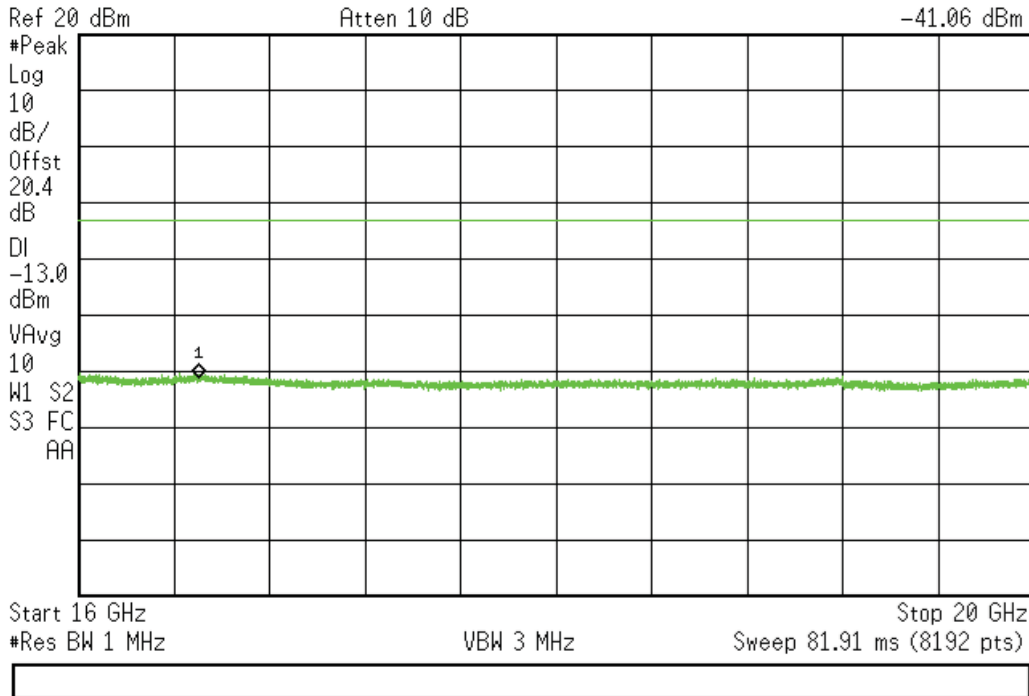


1710-1755 MHz Band (Low Frequency) (Cont)

Agilent 17:38:42 Aug 11, 2014

L

Mkr1 16.5035 GHz  
-41.06 dBm

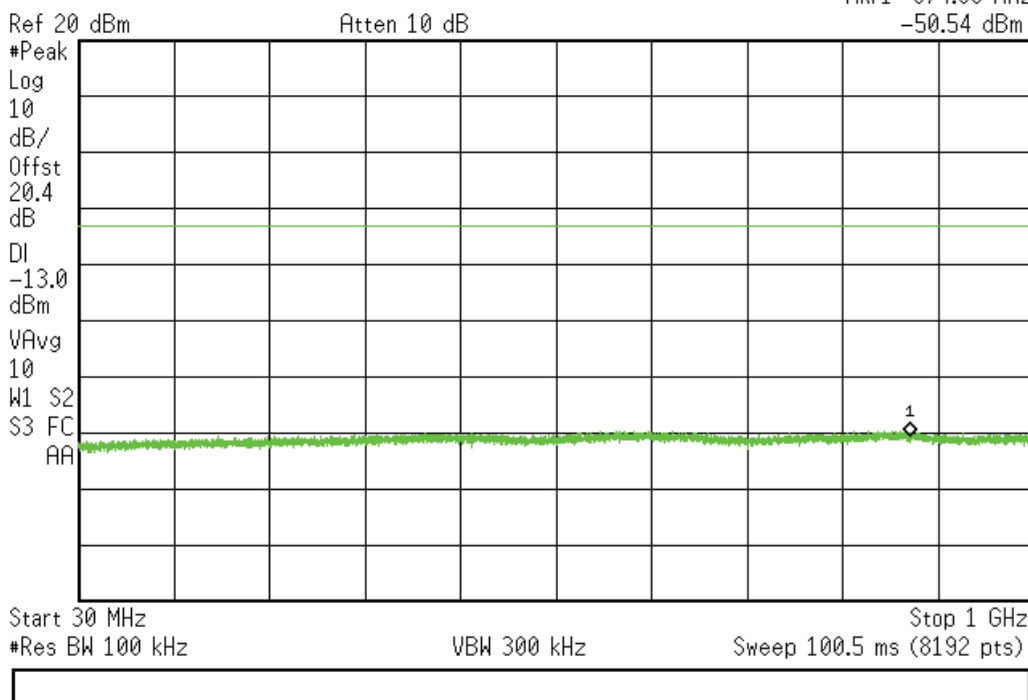


### 1710-1755 MHz Band (Mid Frequency)

Agilent 17:42:41 Aug 11, 2014

L

Mkr1 874.00 MHz  
-50.54 dBm



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

Agilent 17:43:46 Aug 11, 2014

L

Mkr1 1.67246 GHz  
-42.11 dBm

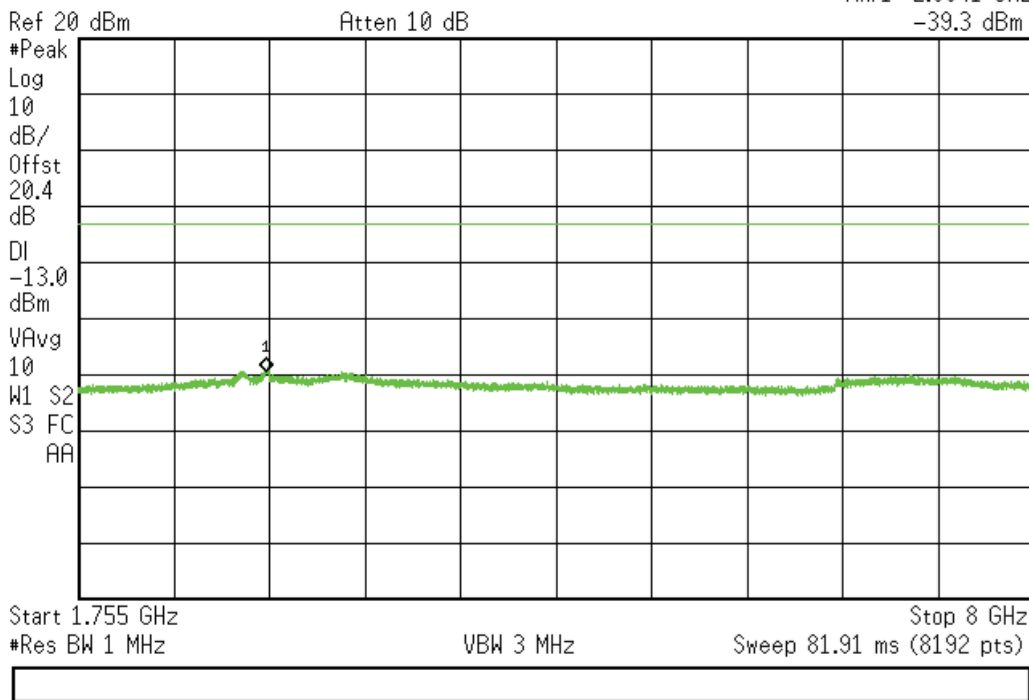


1710-1755 MHz Band (Mid Frequency) (Cont)

Agilent 17:44:39 Aug 11, 2014

L

Mkr1 2.9841 GHz  
-39.3 dBm

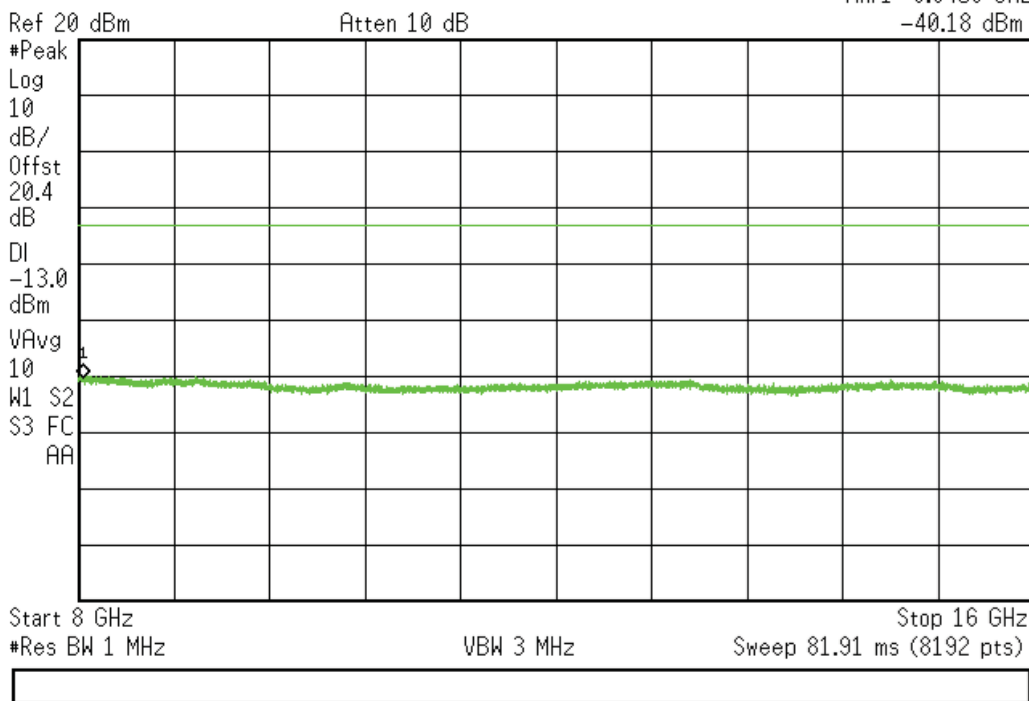


1710-1755 MHz Band (Mid Frequency) (Cont)

Agilent 17:45:22 Aug 11, 2014

L

Mkr1 8.0459 GHz  
-40.18 dBm

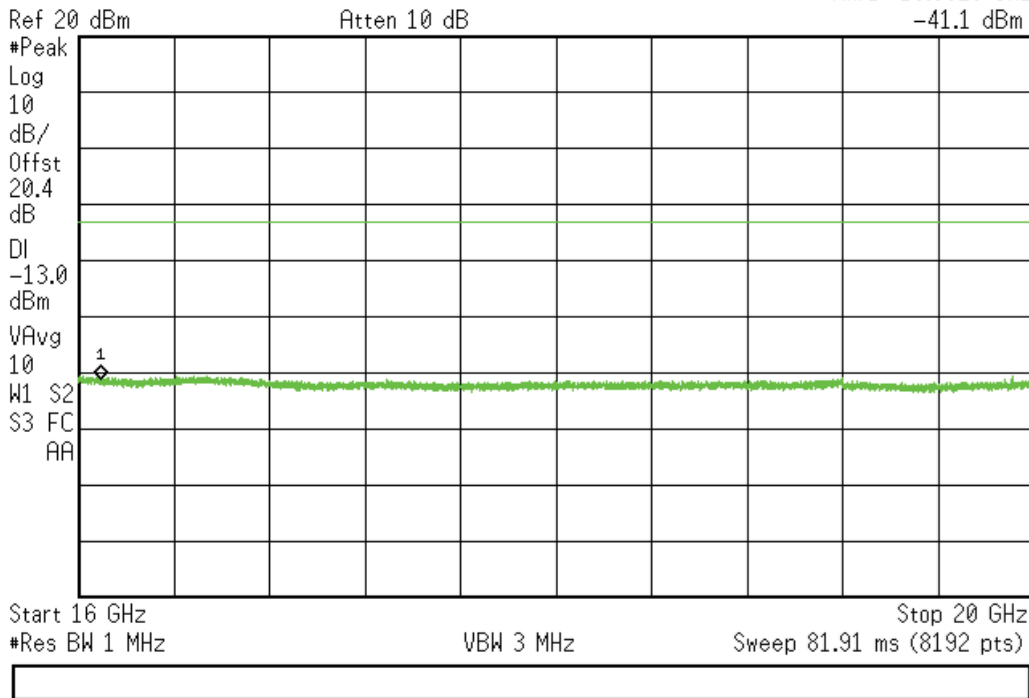


### 1710-1755 MHz Band (Mid Frequency) (Cont)

Agilent 17:46:02 Aug 11, 2014

L

Mkr1 16.0928 GHz  
-41.1 dBm

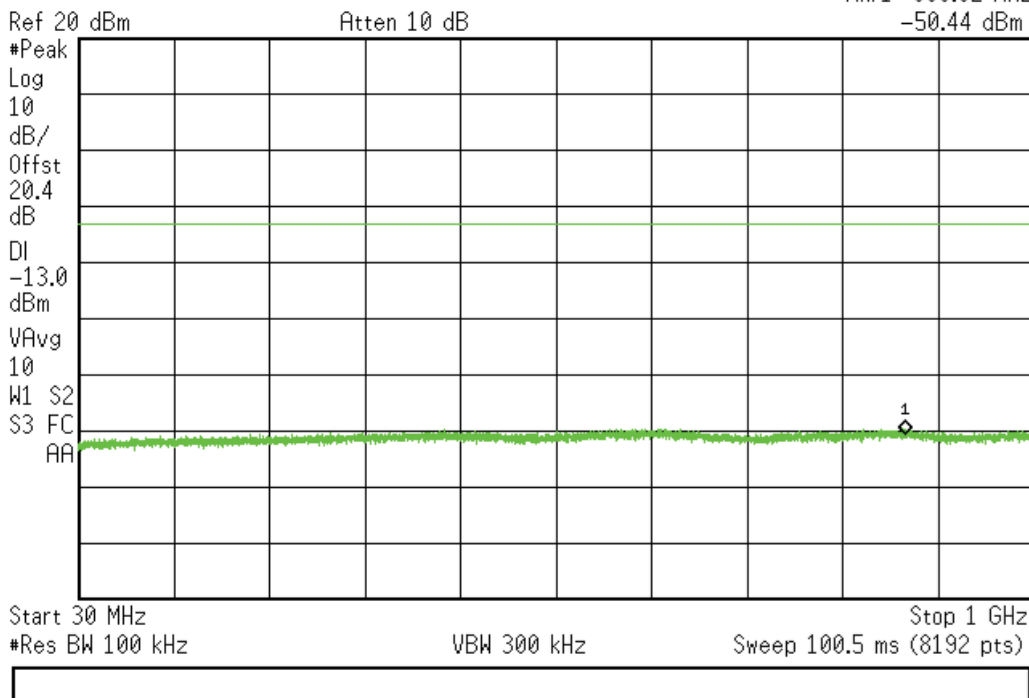


### 1710-1755 MHz Band (High Frequency)

Agilent 17:47:26 Aug 11, 2014

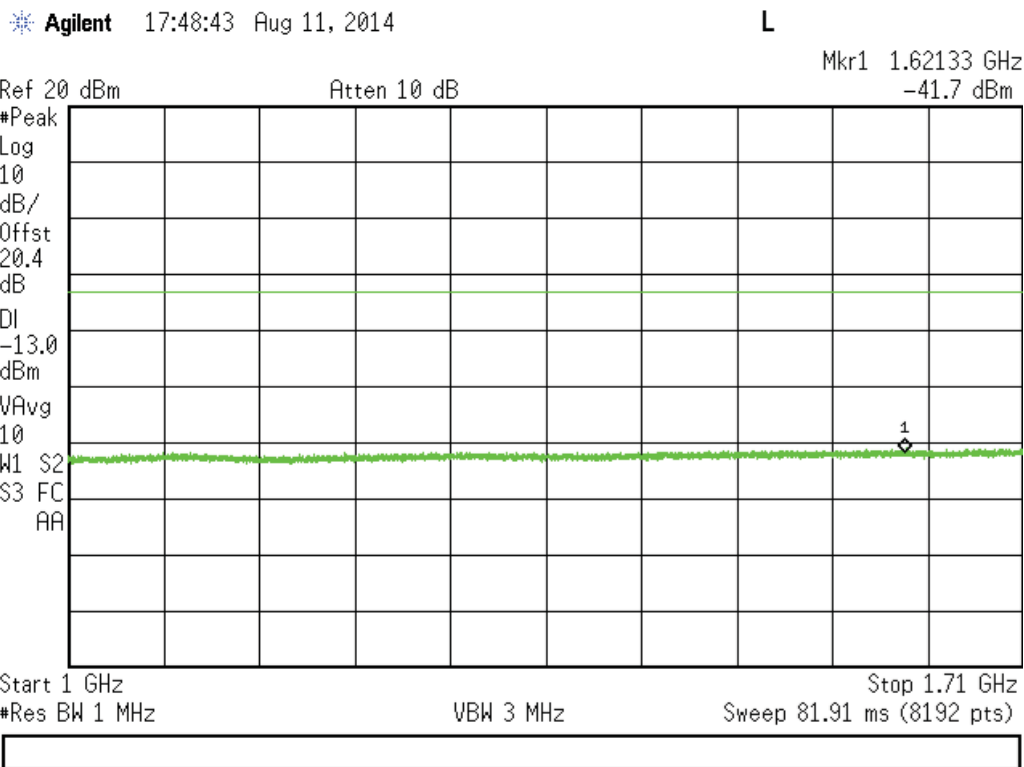
L

Mkr1 869.62 MHz  
-50.44 dBm

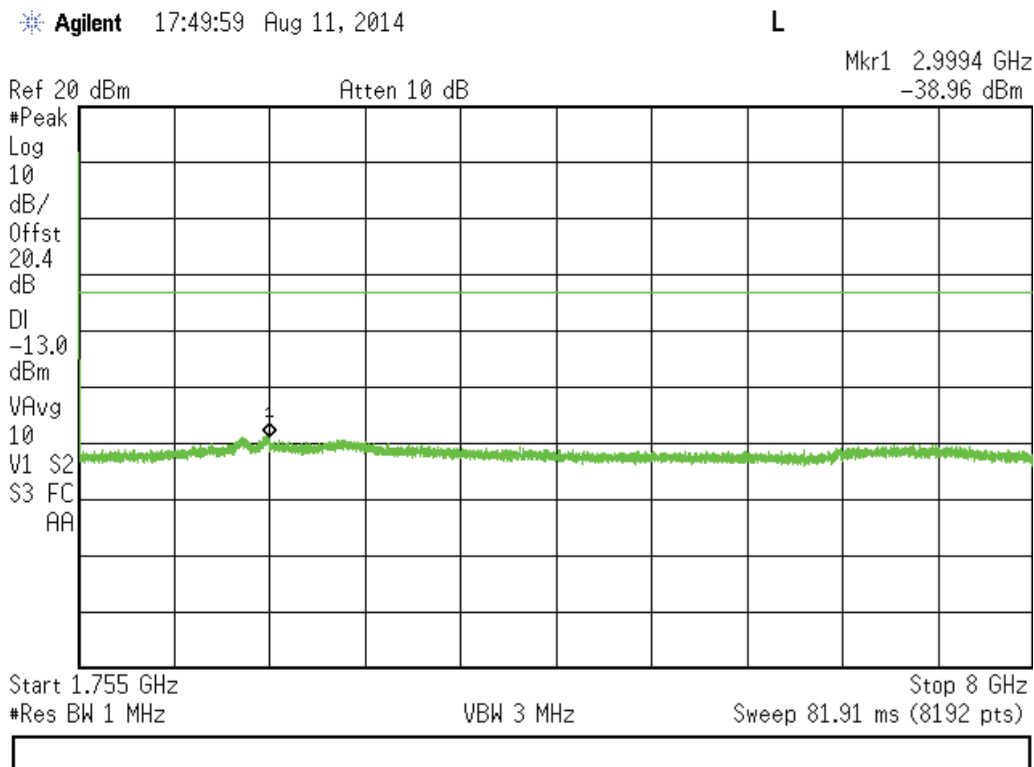




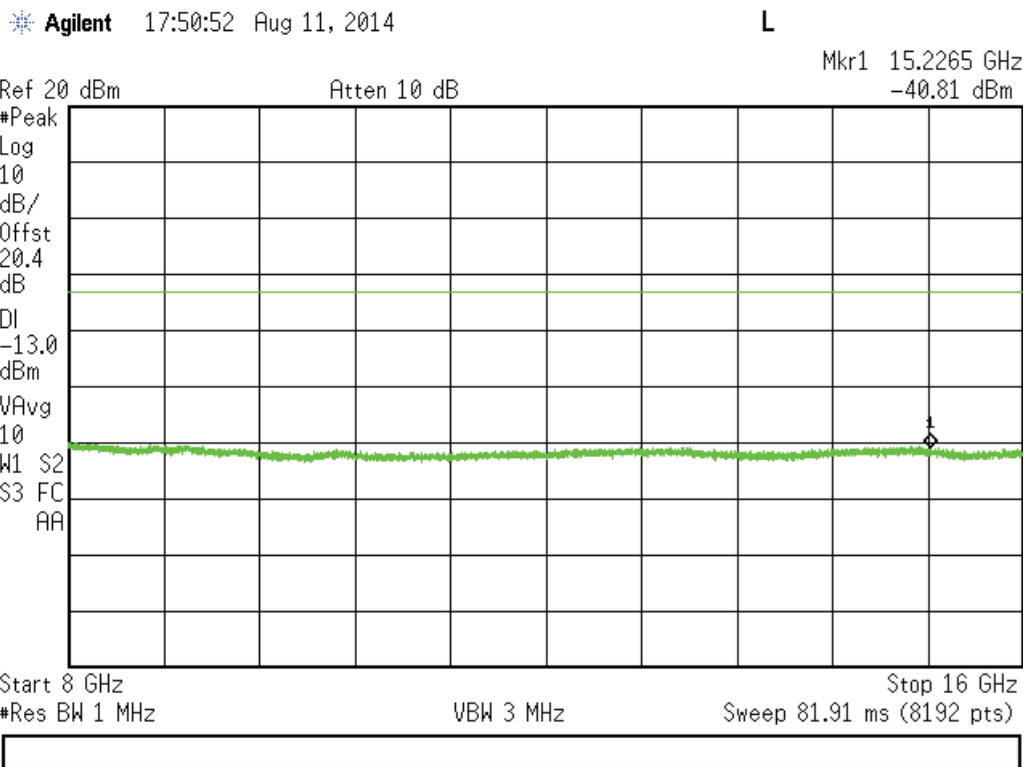
1710-1755 MHz Band (High Frequency) (Cont)



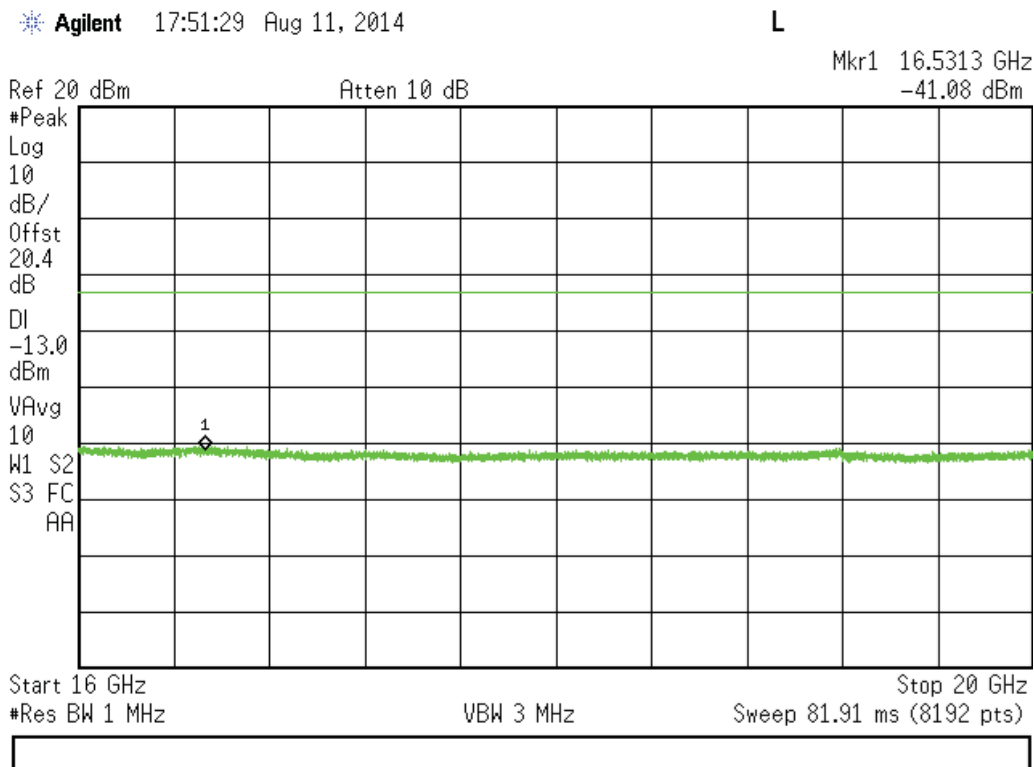
1710-1755 MHz Band (High Frequency) (Cont)



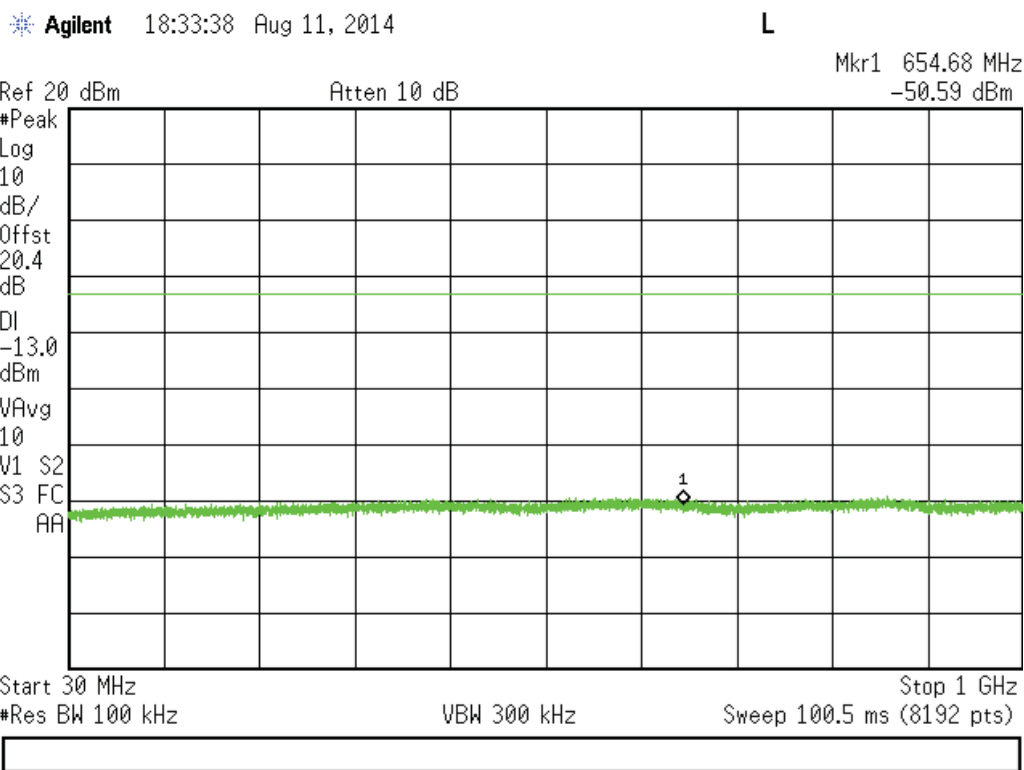
**1710-1755 MHz Band (High Frequency) (Cont)**



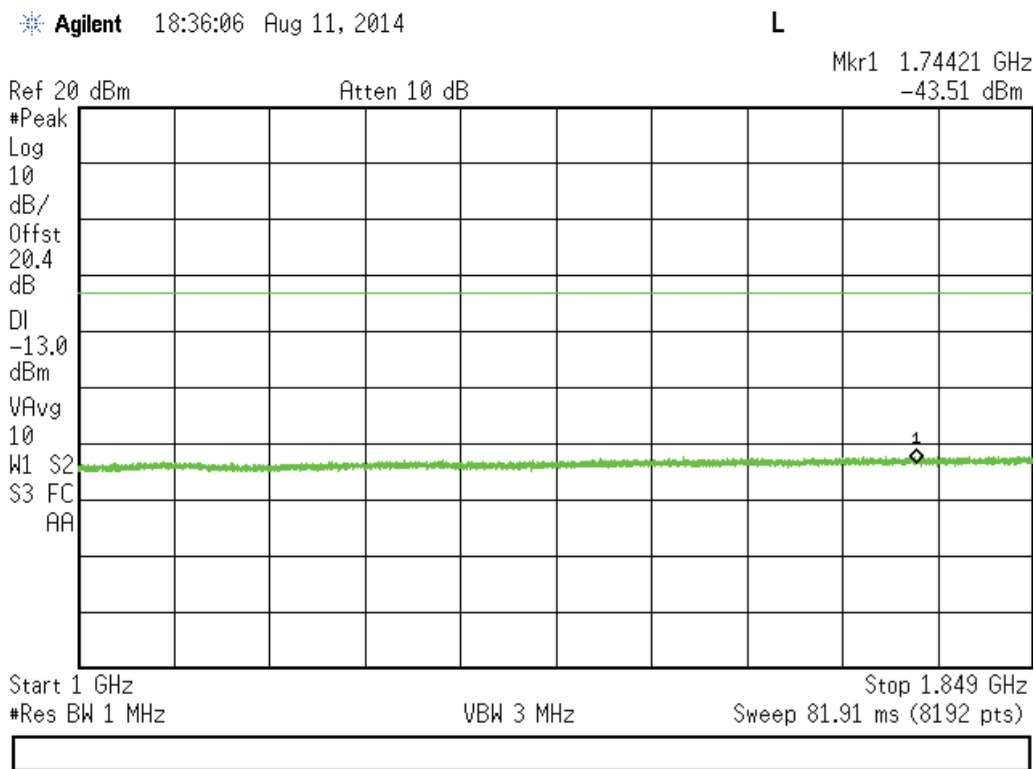
**1710-1755 MHz Band (High Frequency) (Cont)**



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



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

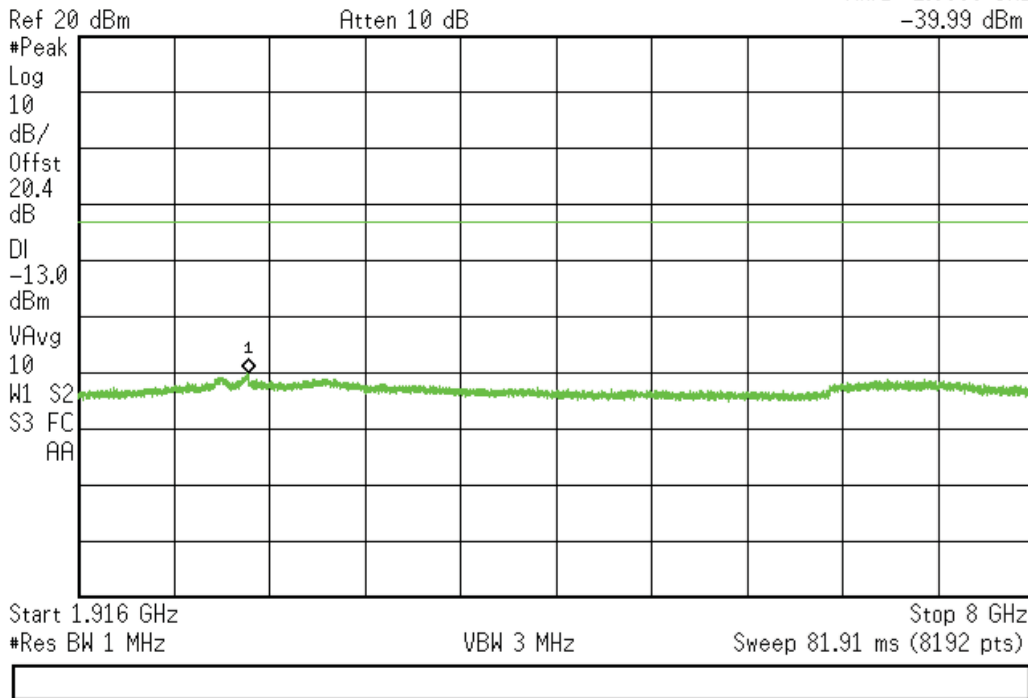


1850-1915 MHz Band (Low Frequency) (Cont)

Agilent 18:38:35 Aug 11, 2014

L

Mkr1 2.9990 GHz  
-39.99 dBm

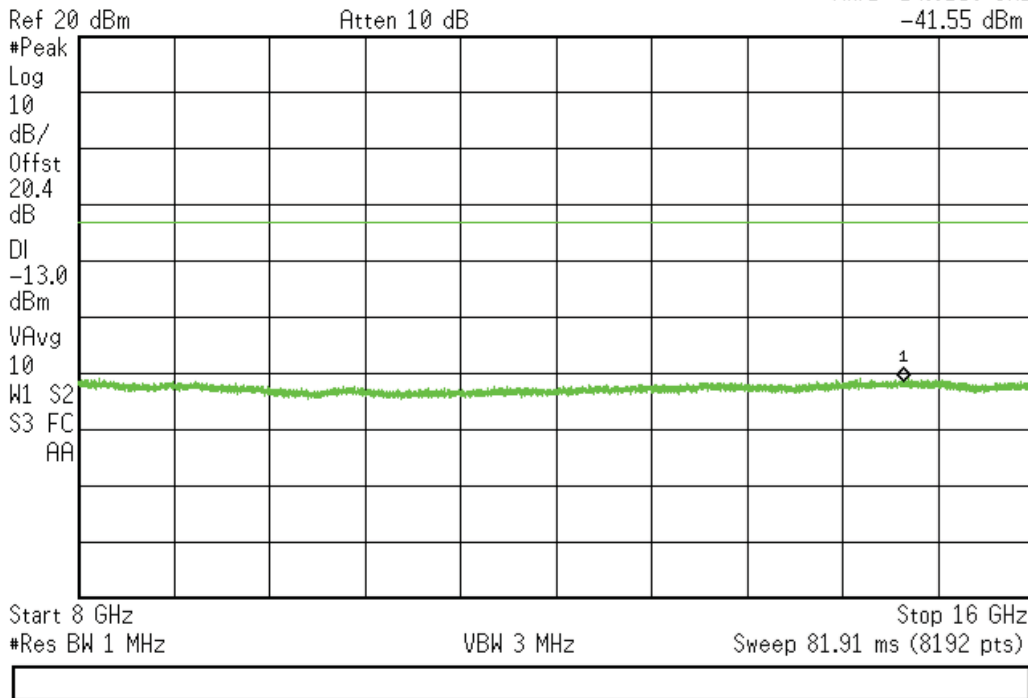


1850-1915 MHz Band (Low Frequency) (Cont)

Agilent 18:39:26 Aug 11, 2014

L

Mkr1 14.9159 GHz  
-41.55 dBm



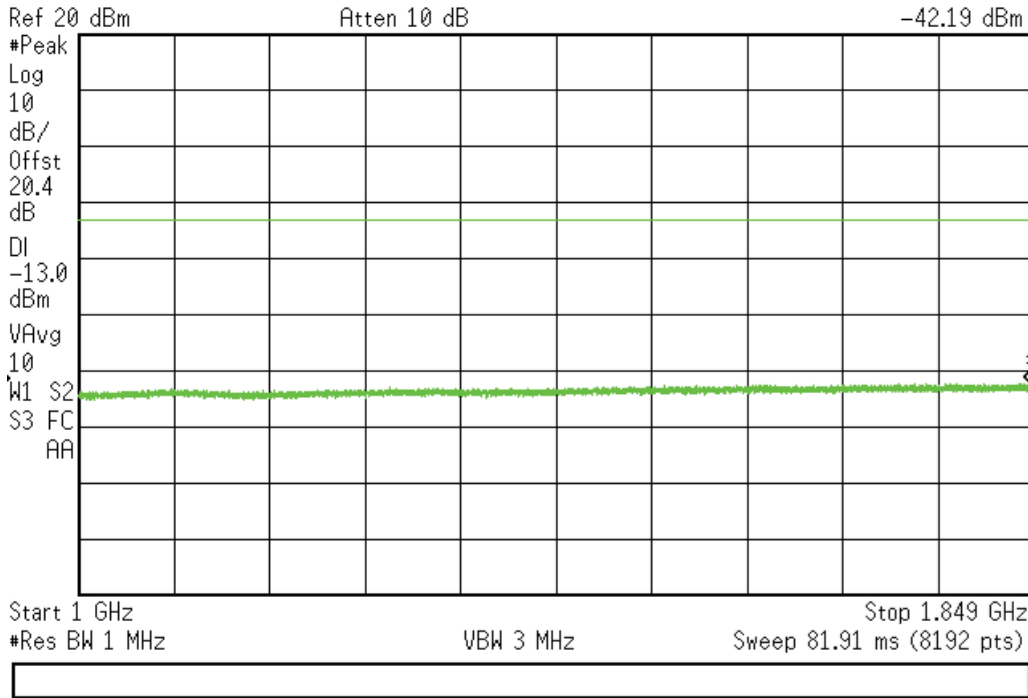


1850-1915 MHz Band (Mid Frequency) (Cont)

Agilent 18:34:39 Aug 11, 2014

L

Mkr1 1.84599 GHz  
-42.19 dBm

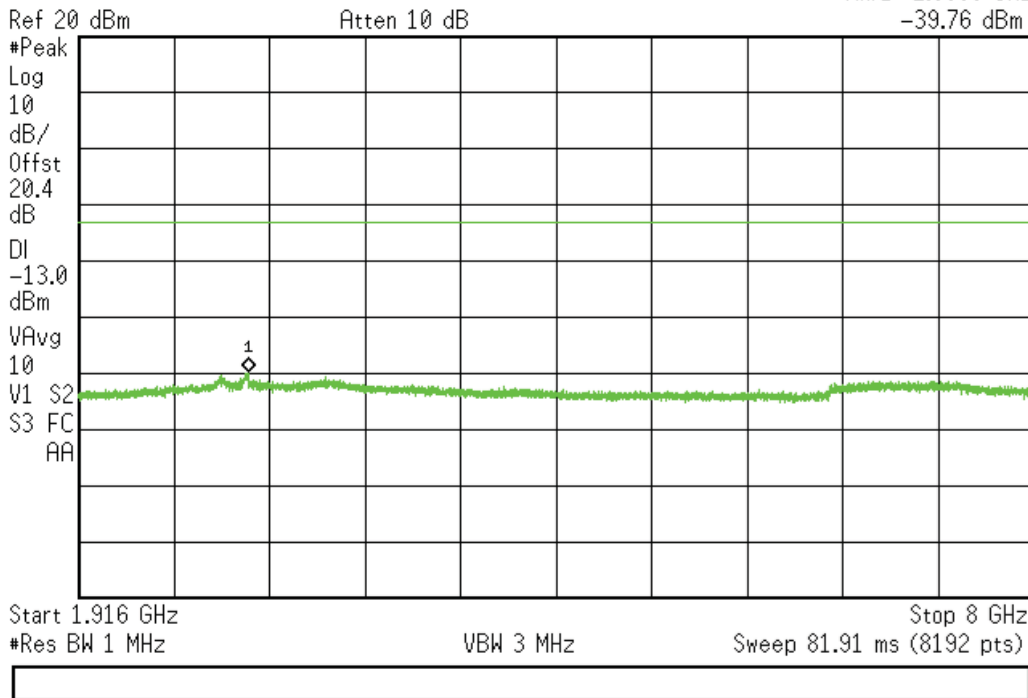


1850-1915 MHz Band (Mid Frequency) (Cont)

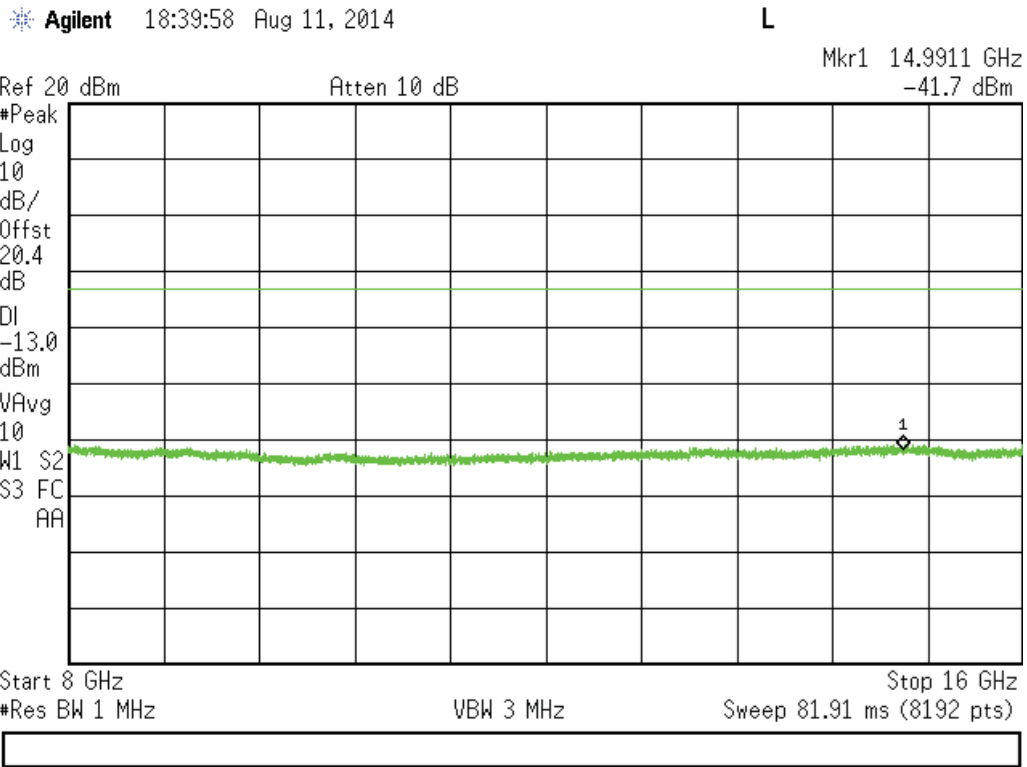
Agilent 18:37:55 Aug 11, 2014

L

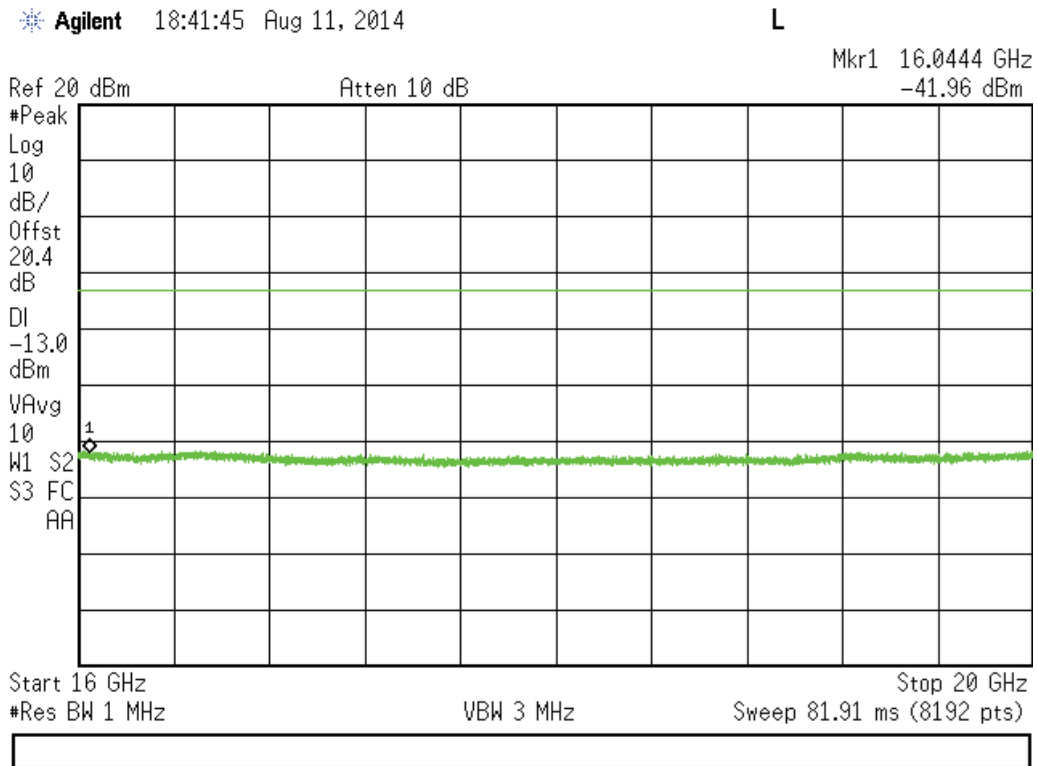
Mkr1 2.9960 GHz  
-39.76 dBm



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



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

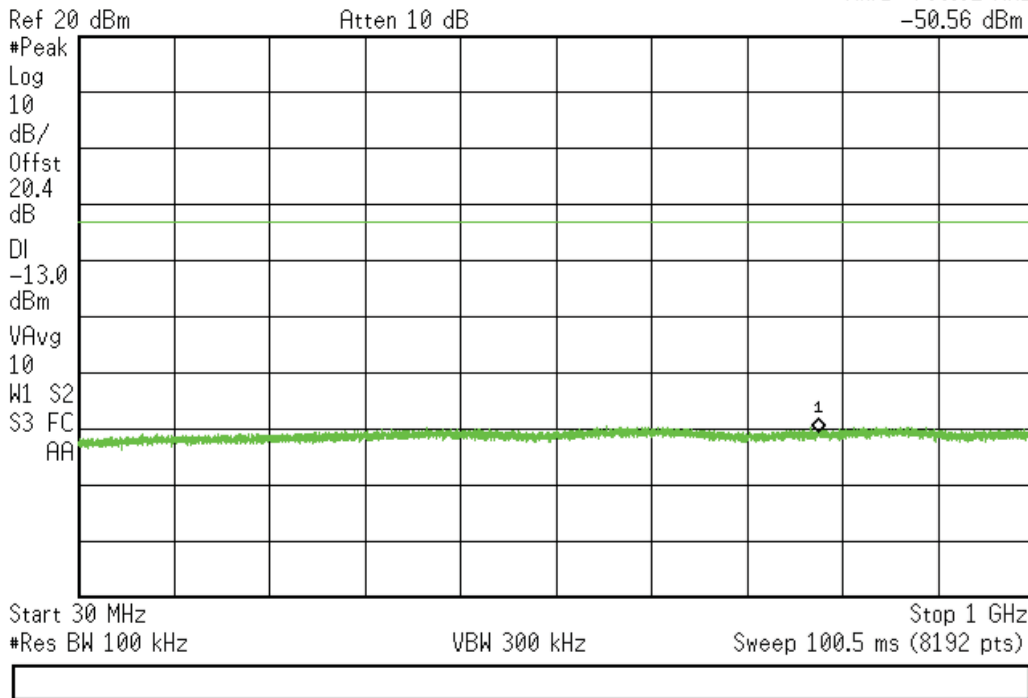


### 1850-1915 MHz Band (High Frequency)

Agilent 18:31:40 Aug 11, 2014

L

Mkr1 780.92 MHz  
-50.56 dBm

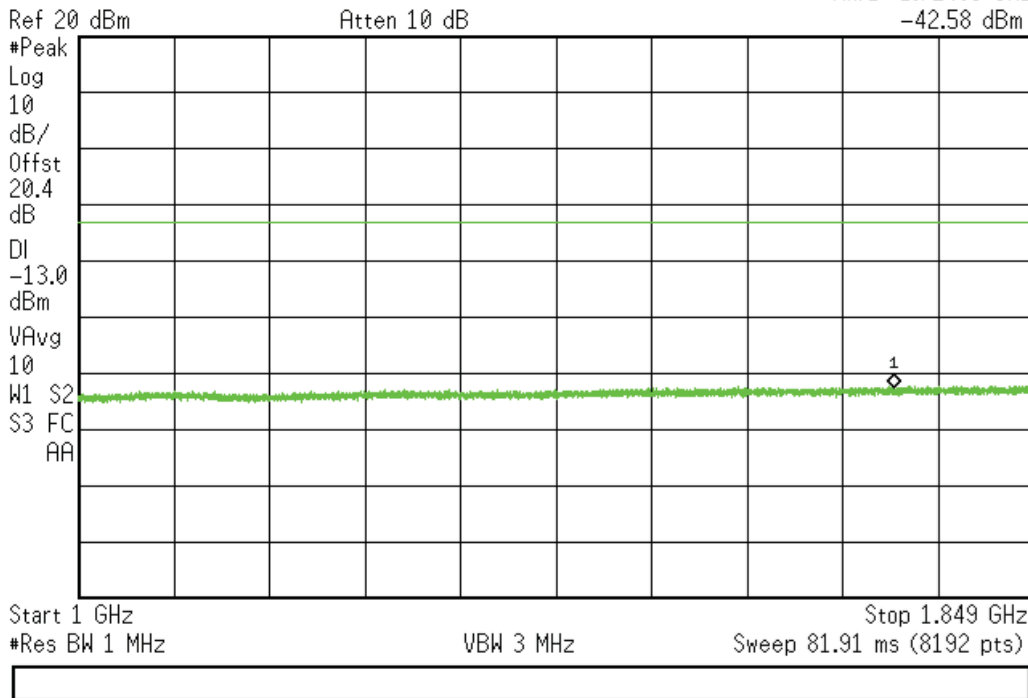


### 1850-1915 MHz Band (High Frequency) (Cont)

Agilent 18:35:29 Aug 11, 2014

L

Mkr1 1.72483 GHz  
-42.58 dBm



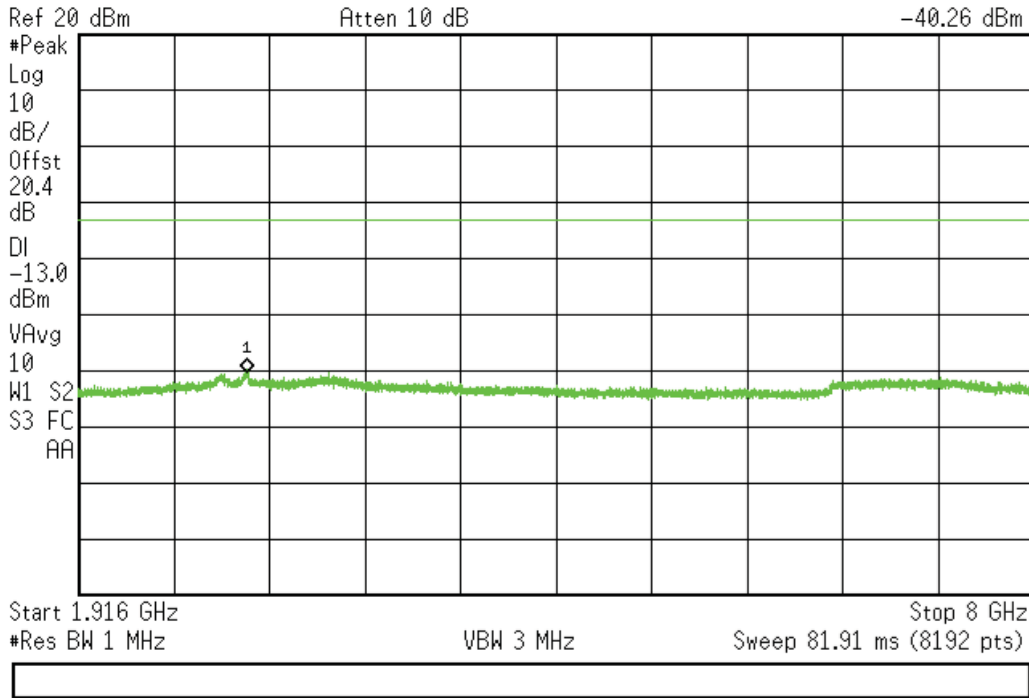


1850-1915 MHz Band (High Frequency) (Cont)

Agilent 18:37:11 Aug 11, 2014

L

Mkr1 2.9886 GHz  
-40.26 dBm

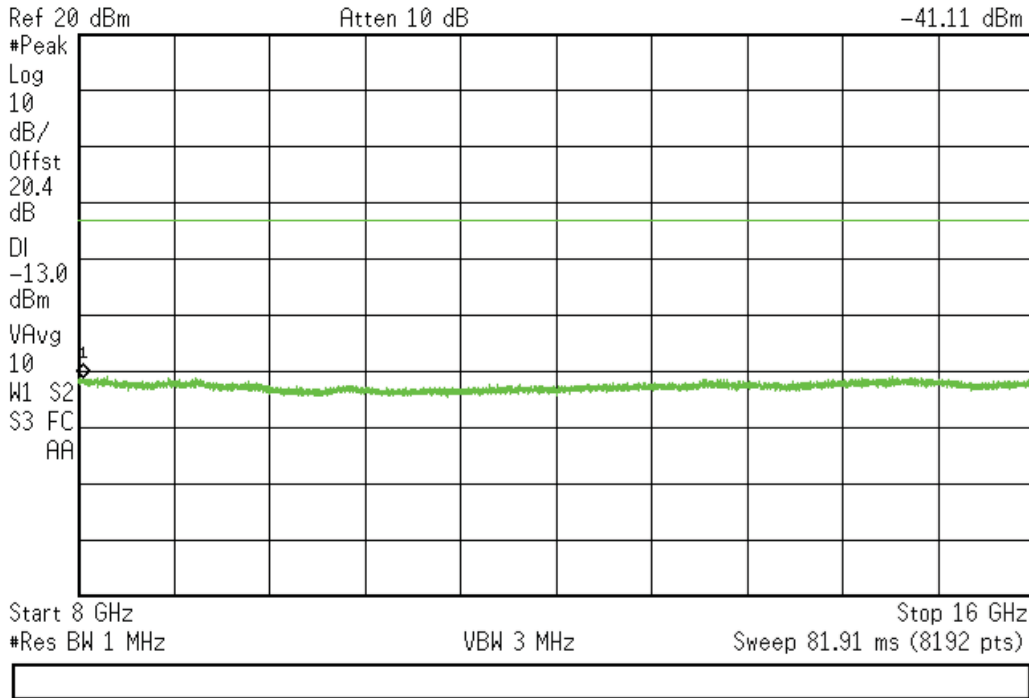


1850-1915 MHz Band (High Frequency) (Cont)

Agilent 18:40:29 Aug 11, 2014

L

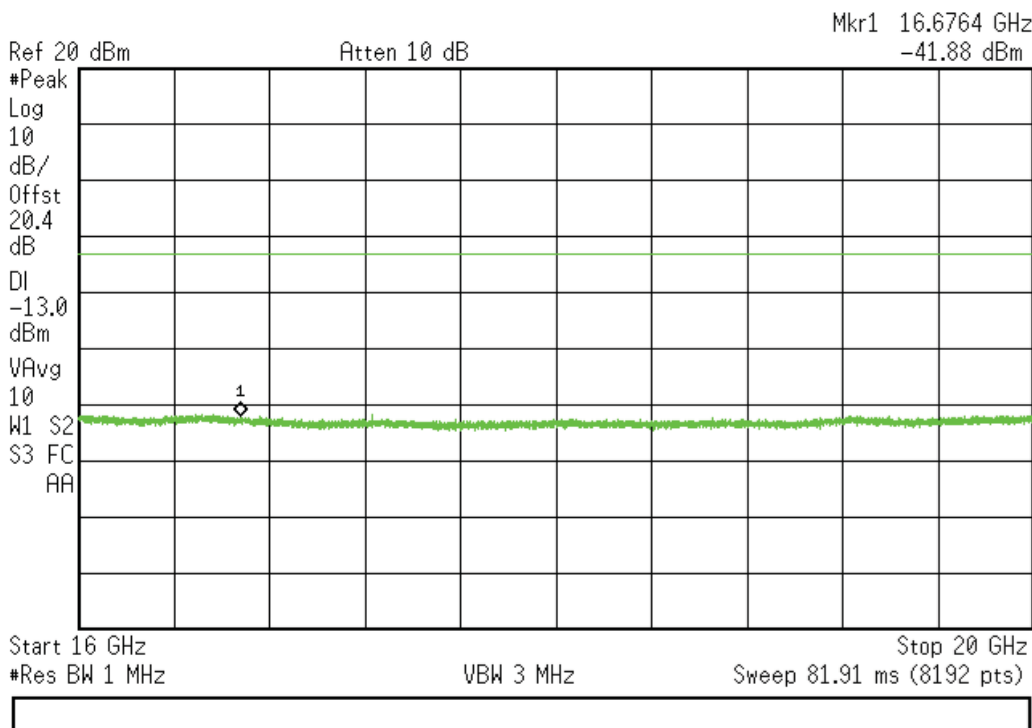
Mkr1 8.0391 GHz  
-41.11 dBm



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

Agilent 18:41:11 Aug 11, 2014

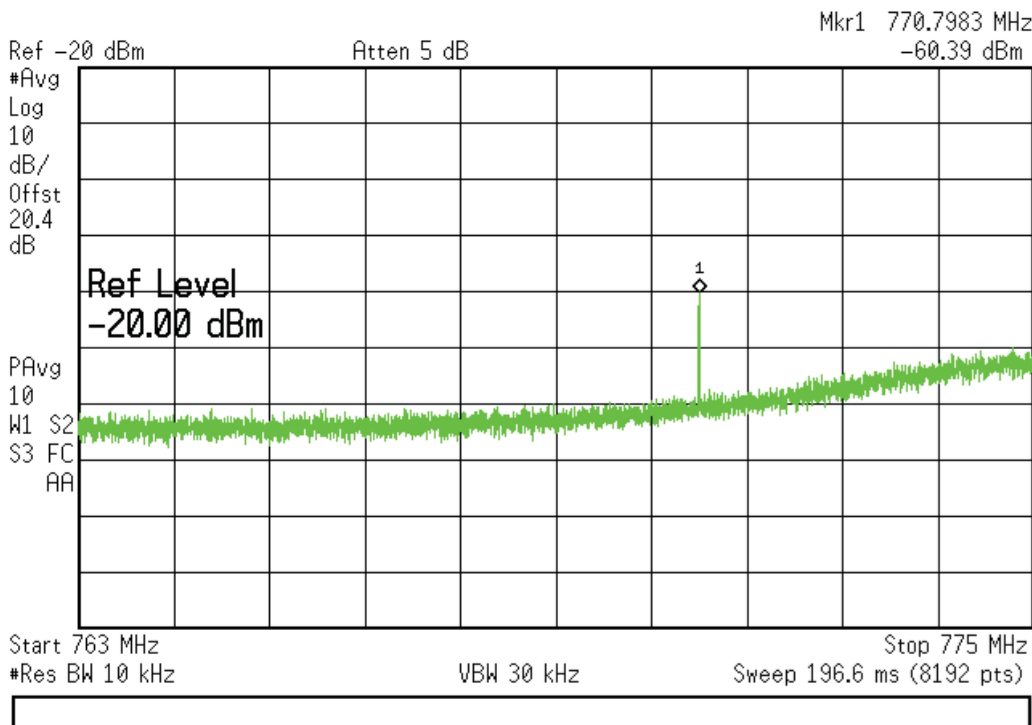
L



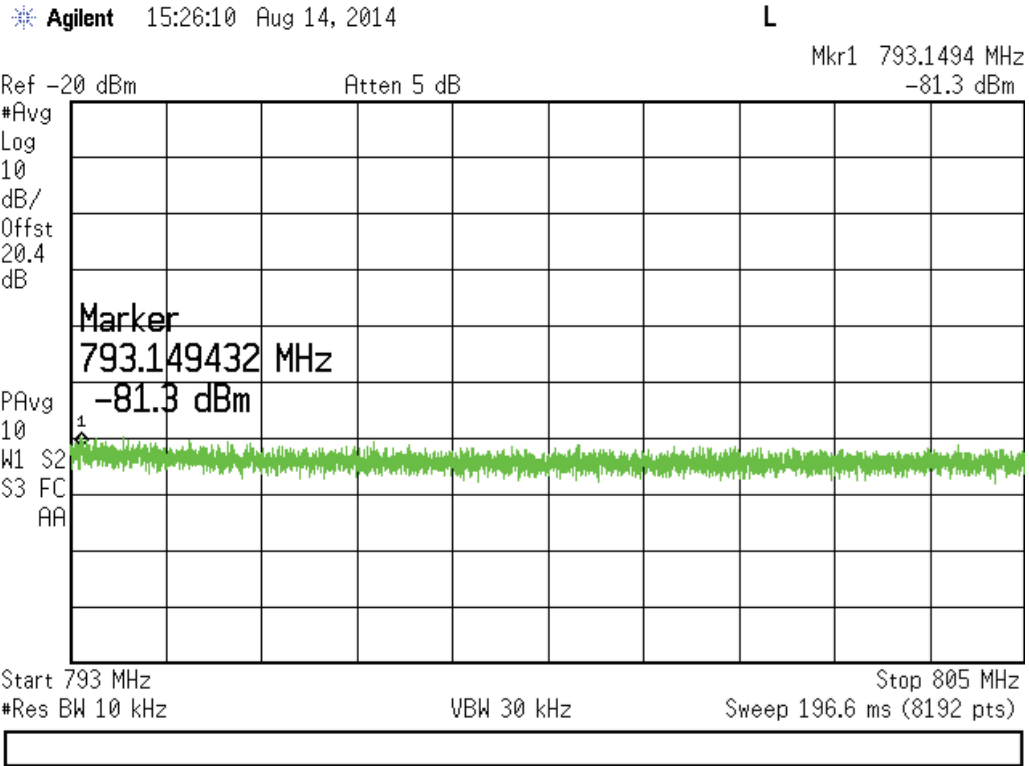
### Additional testing 763 - 775 MHz (Narrowband)

Agilent 15:21:32 Aug 14, 2014

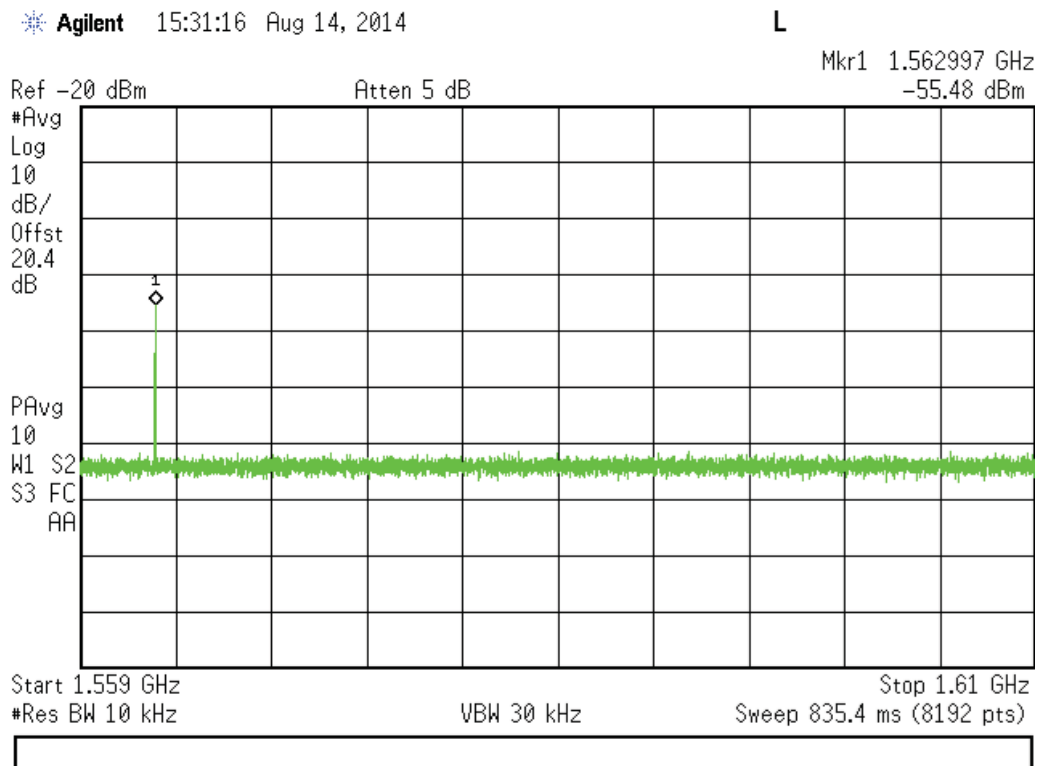
L



**Additional testing 793 - 805 MHz (Narrowband)**



**Additional testing 1559 - 1610 MHz (Narrowband)**



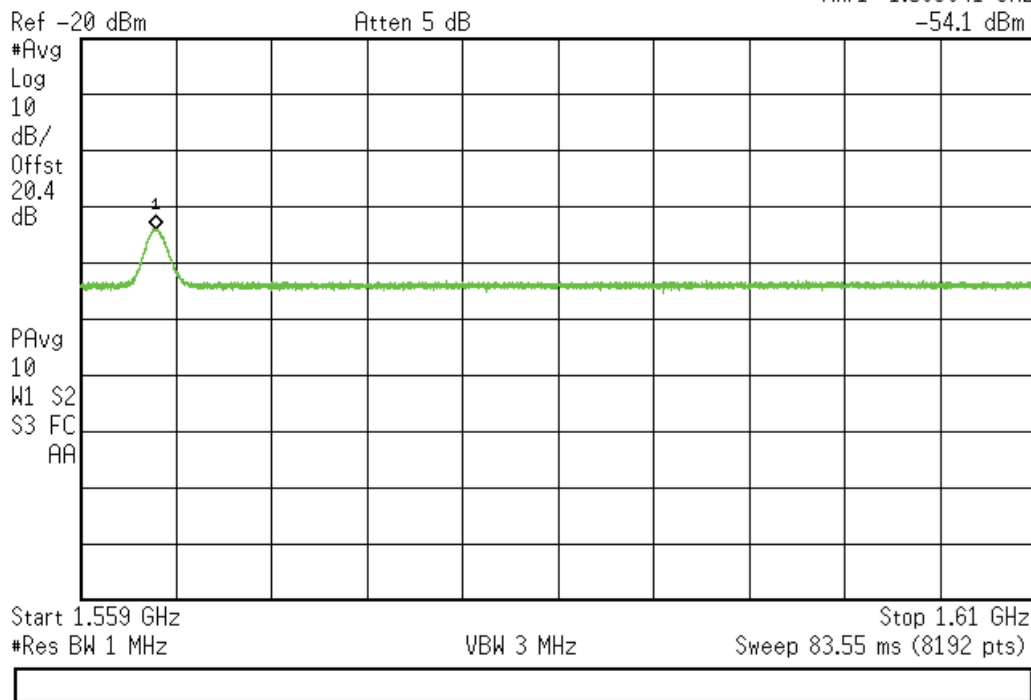


### Additional testing 1559 - 1610 MHz (Wideband)

Agilent 15:28:45 Aug 14, 2014

L

Mkr1 1.563041 GHz  
-54.1 dBm

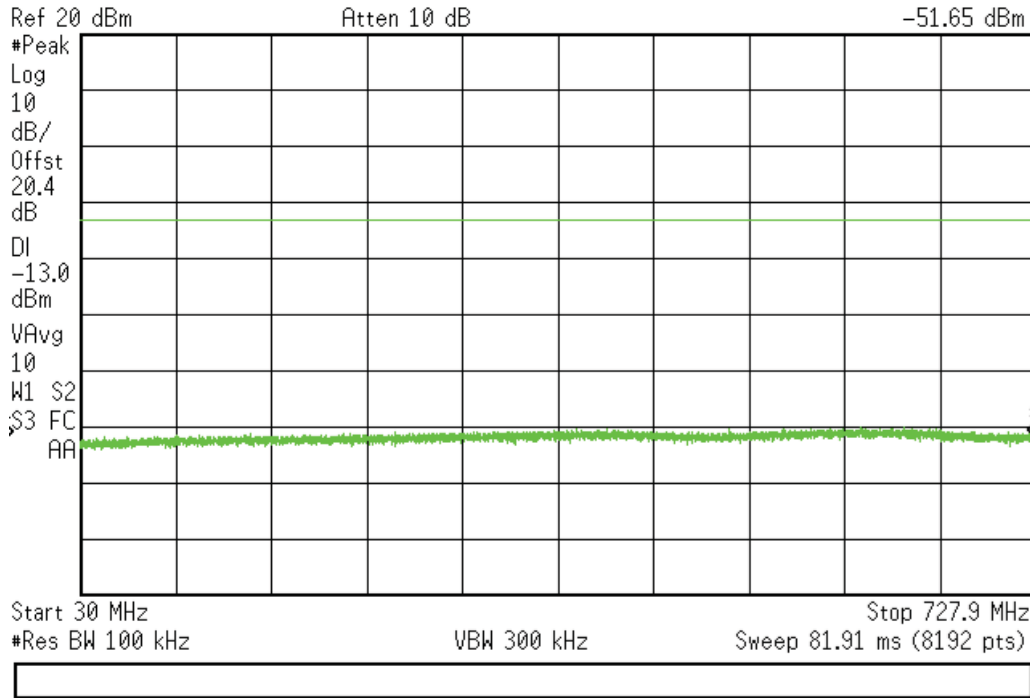


**Downlink GSM Signal  
728-746 MHz Band (Low Frequency)**

Agilent 07:29:58 Aug 12, 2014

L

Mkr1 726.54 MHz  
-51.65 dBm

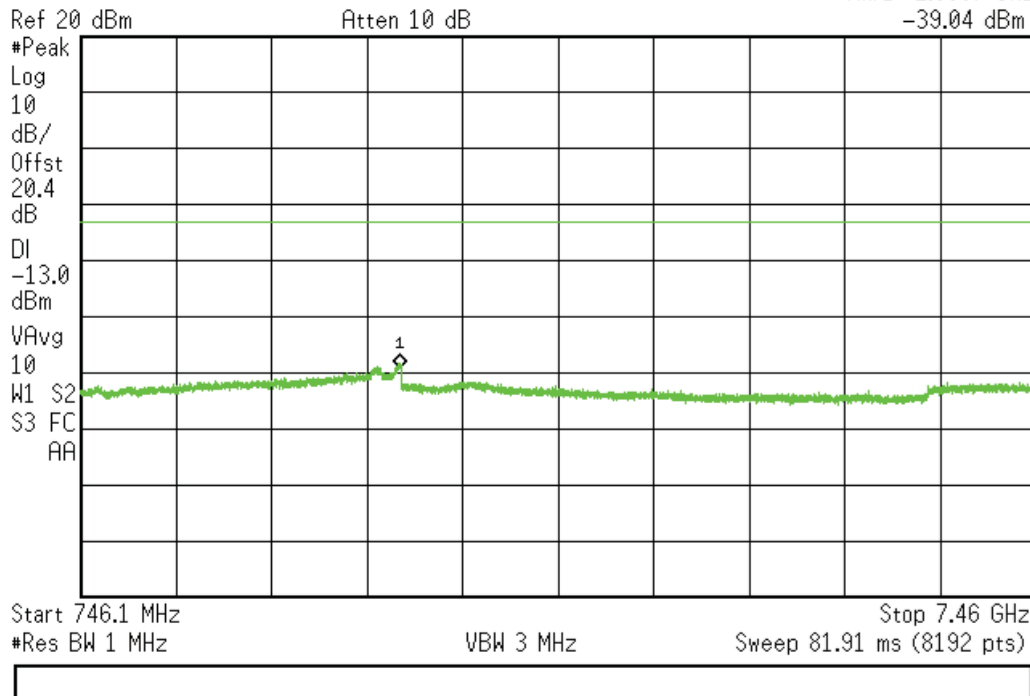


**728-746 MHz Band (Low Frequency) (Cont)**

Agilent 07:34:19 Aug 12, 2014

L

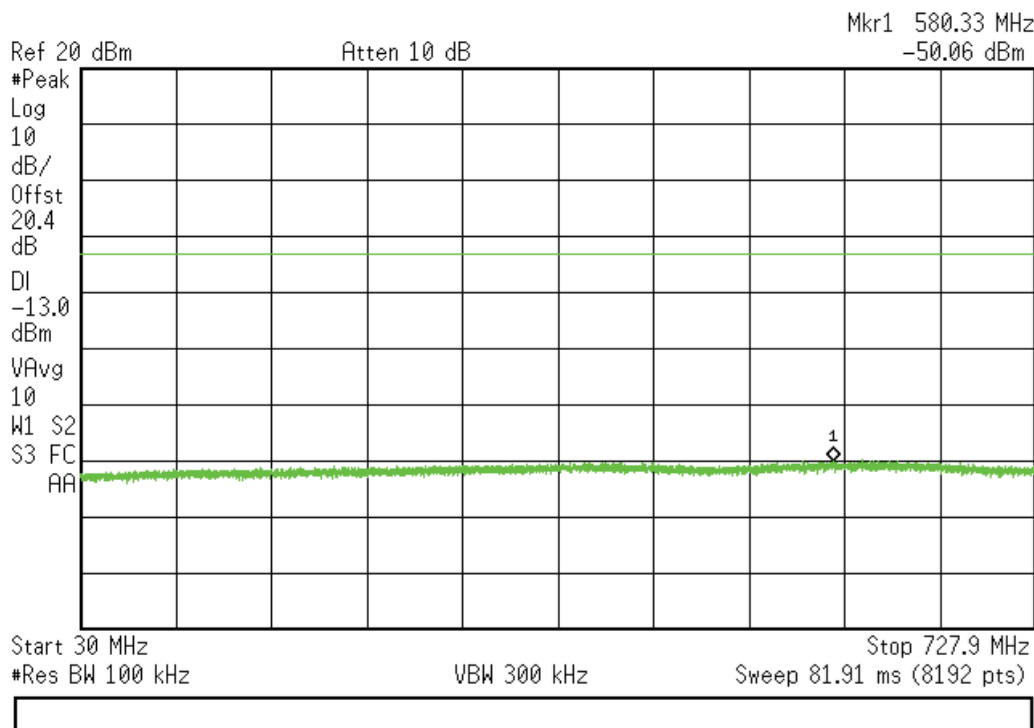
Mkr1 2.9887 GHz  
-39.04 dBm



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

Agilent 07:30:58 Aug 12, 2014

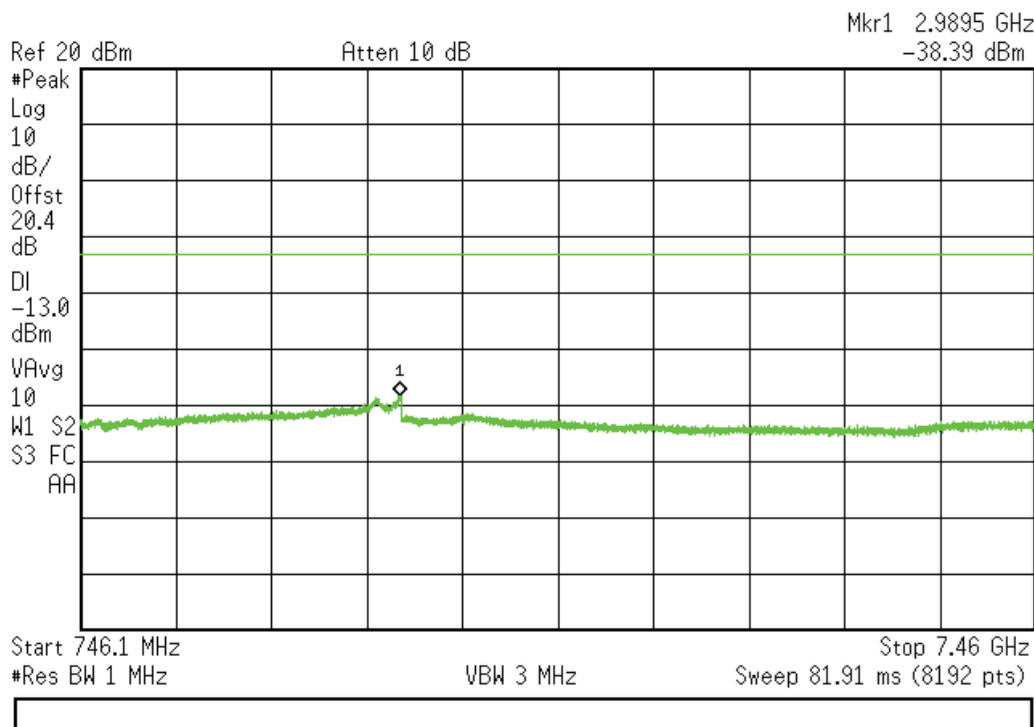
L



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

Agilent 07:33:37 Aug 12, 2014

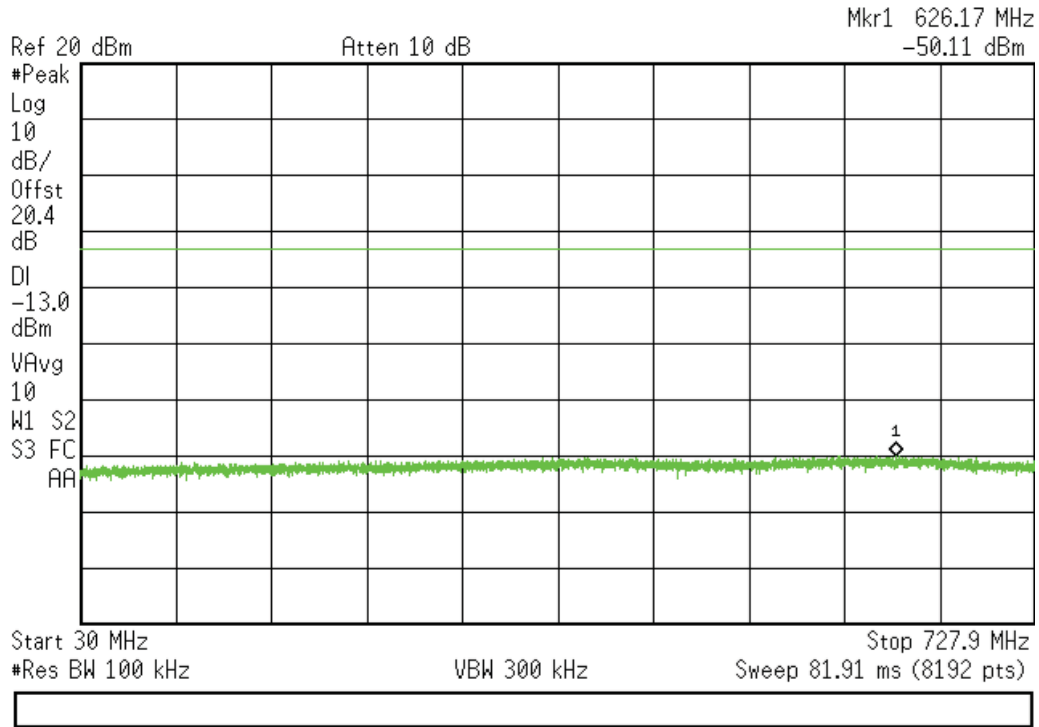
L



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

Agilent 07:31:49 Aug 12, 2014

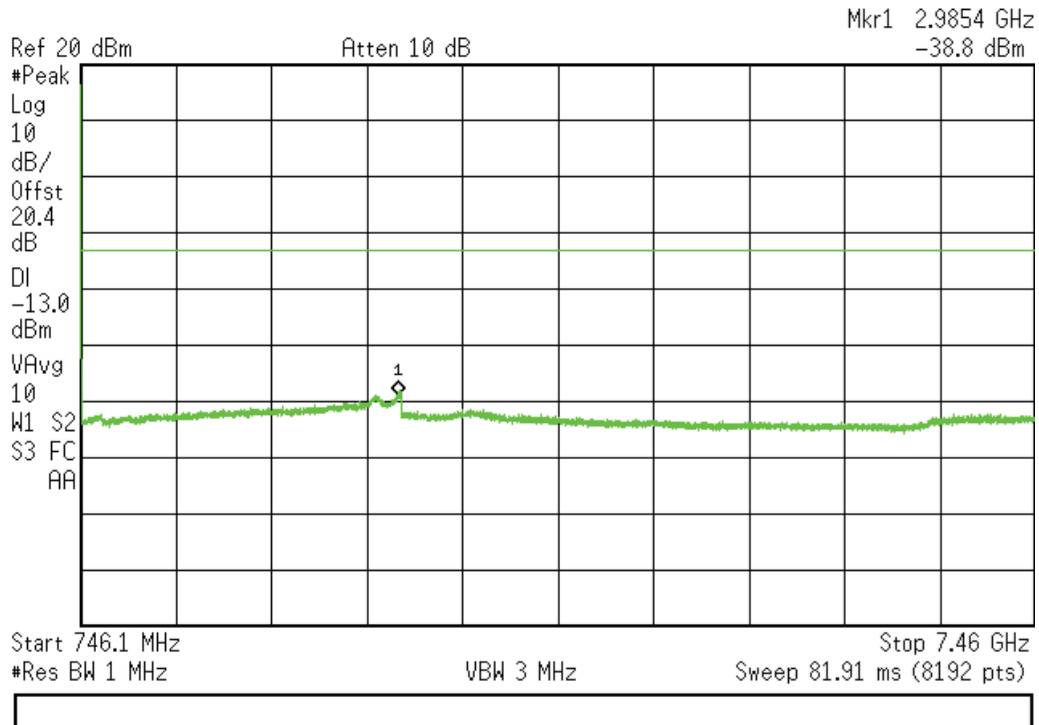
L



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

Agilent 07:32:58 Aug 12, 2014

L

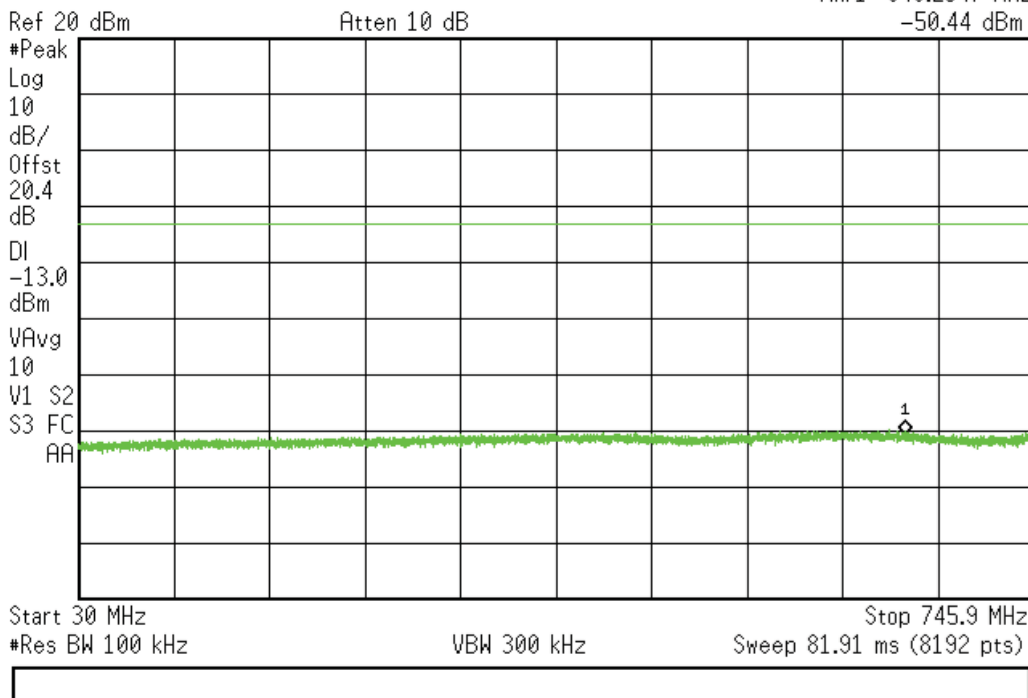


### 746-757 MHz Band (Low Frequency)

Agilent 07:38:35 Aug 12, 2014

L

Mkr1 649.2347 MHz  
-50.44 dBm

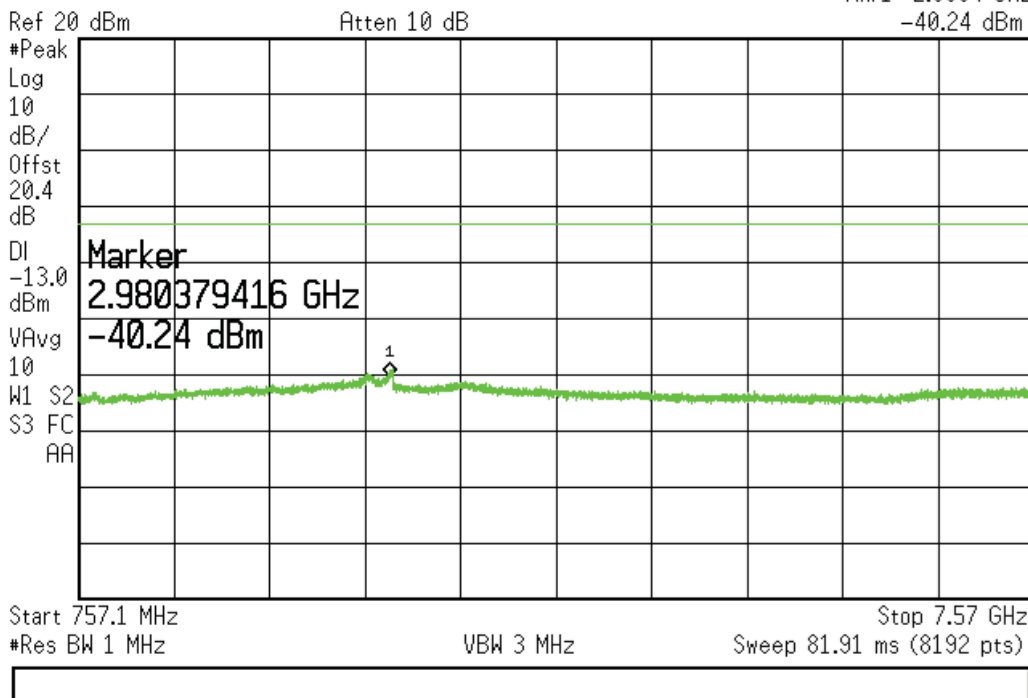


### 728-746 MHz Band (Low Frequency) (Cont)

Agilent 07:46:07 Aug 12, 2014

L

Mkr1 2.9804 GHz  
-40.24 dBm



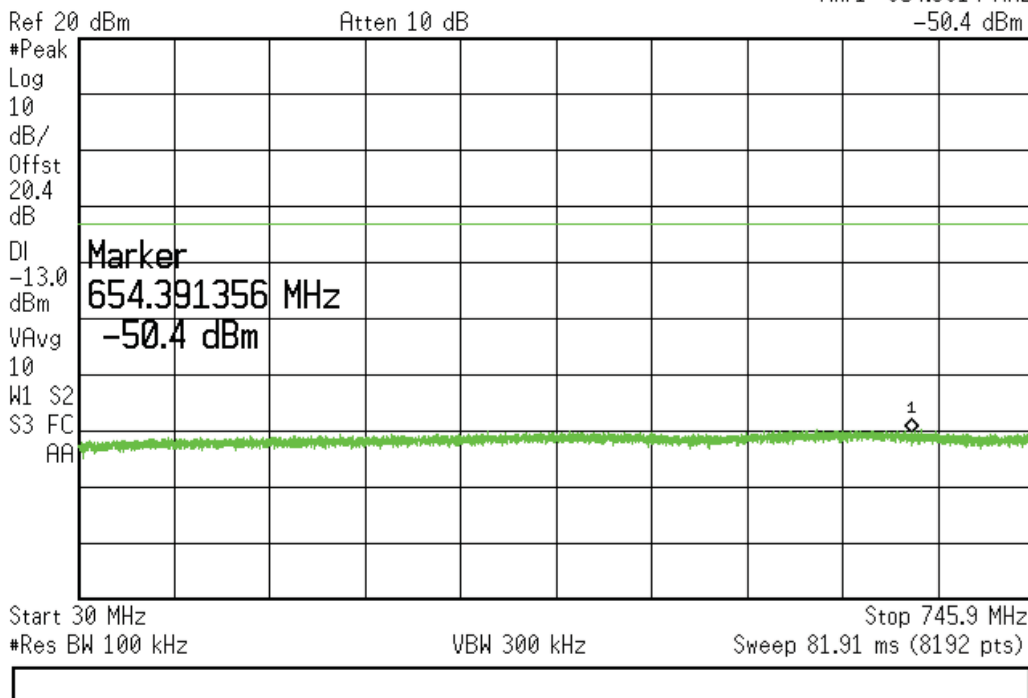


**746-757 MHz Band (Mid Frequency)**

Agilent 07:40:46 Aug 12, 2014

L

Mkr1 654.3914 MHz  
-50.4 dBm

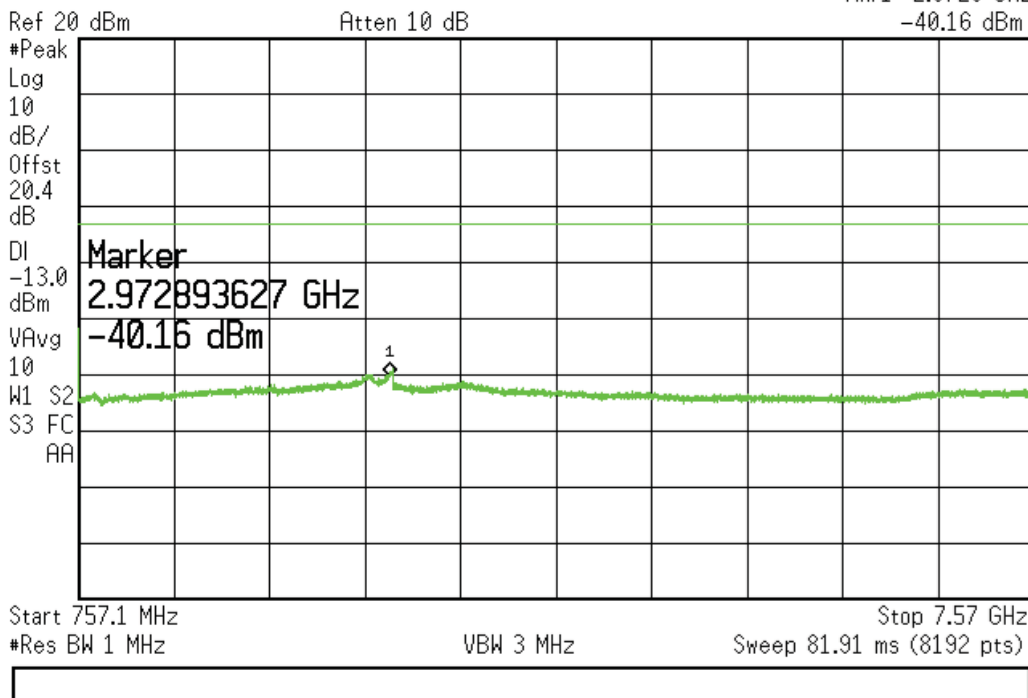


**746-757 MHz Band (Mid Frequency) (Cont)**

Agilent 07:44:41 Aug 12, 2014

L

Mkr1 2.9729 GHz  
-40.16 dBm

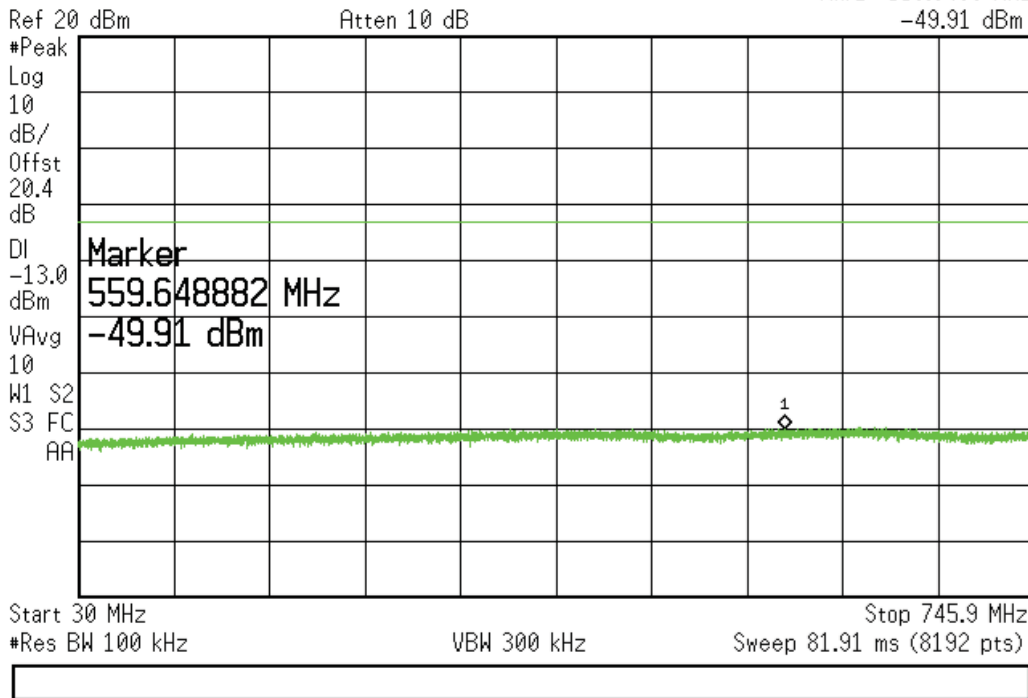


### 746-757 MHz Band (High Frequency)

Agilent 07:42:07 Aug 12, 2014

L

Mkr1 559.6489 MHz  
-49.91 dBm

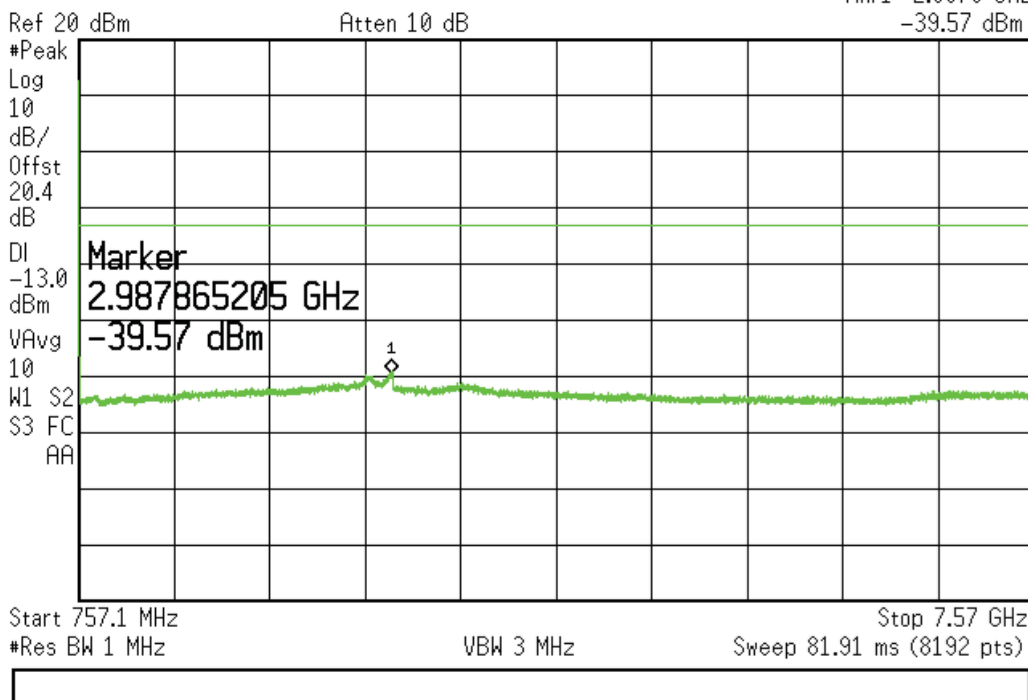


### 746-757 MHz Band (High Frequency) (Cont)

Agilent 07:43:25 Aug 12, 2014

L

Mkr1 2.9879 GHz  
-39.57 dBm

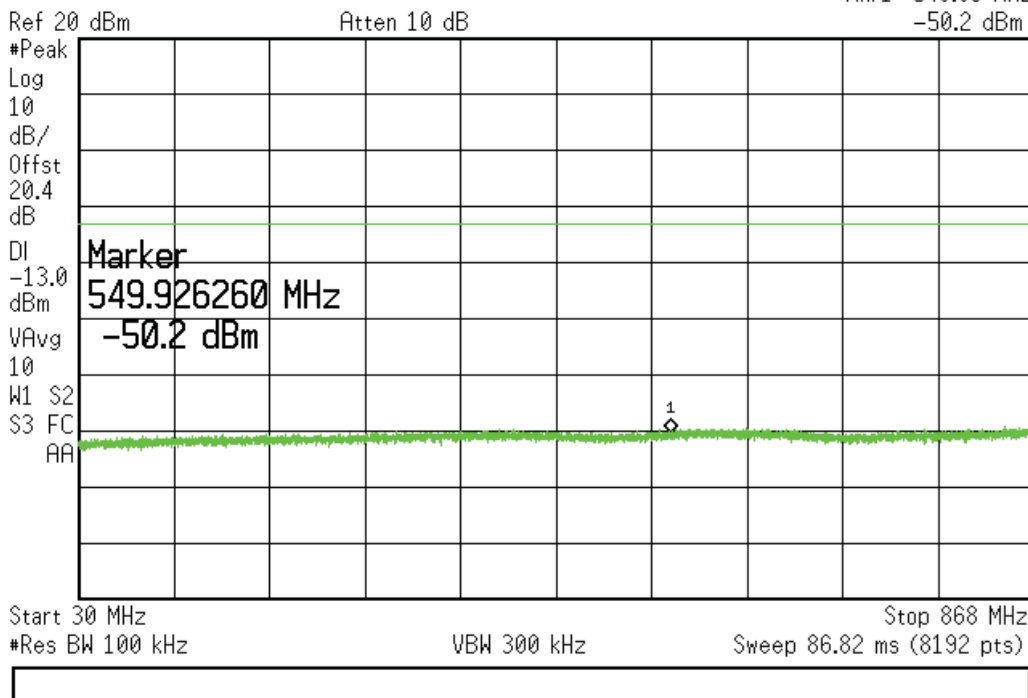


### 869-894 MHz Band (Low Frequency)

Agilent 08:02:06 Aug 12, 2014

L

Mkr1 549.93 MHz  
-50.2 dBm

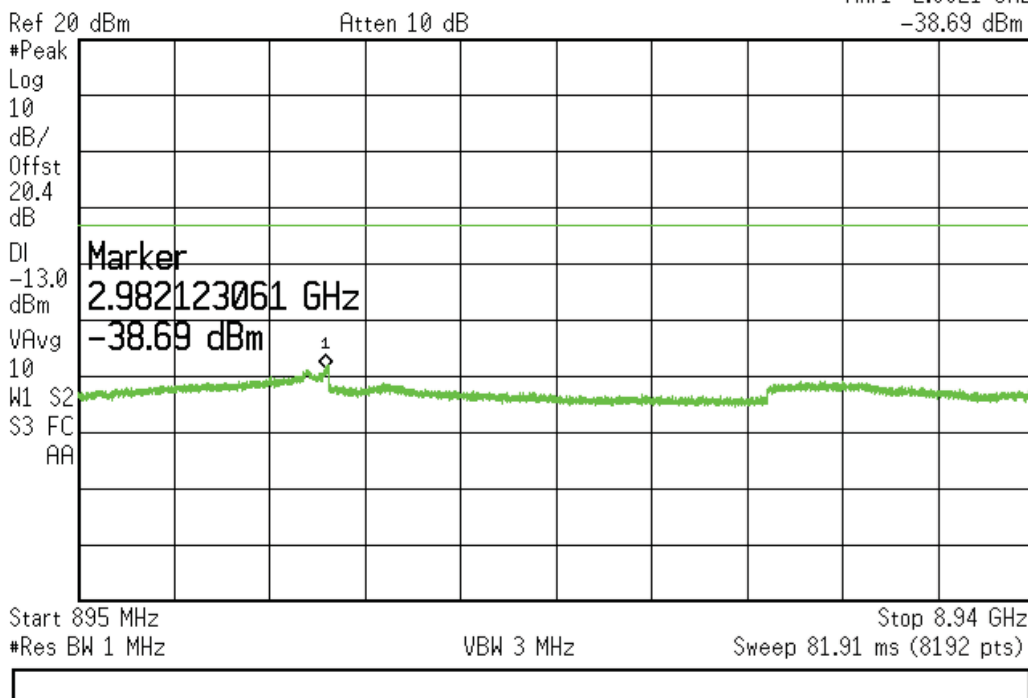


### 869-894 MHz Band (Low Frequency) (Cont)

Agilent 08:03:08 Aug 12, 2014

L

Mkr1 2.9821 GHz  
-38.69 dBm

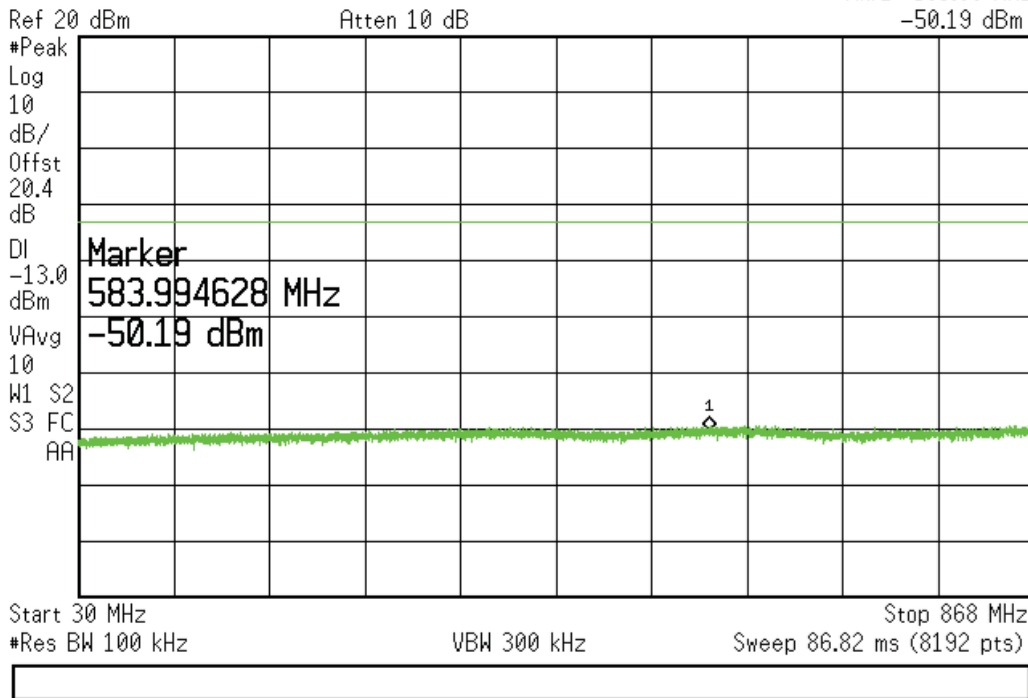


### 869-894 MHz Band (Mid Frequency)

Agilent 08:01:24 Aug 12, 2014

L

Mkr1 583.99 MHz  
-50.19 dBm

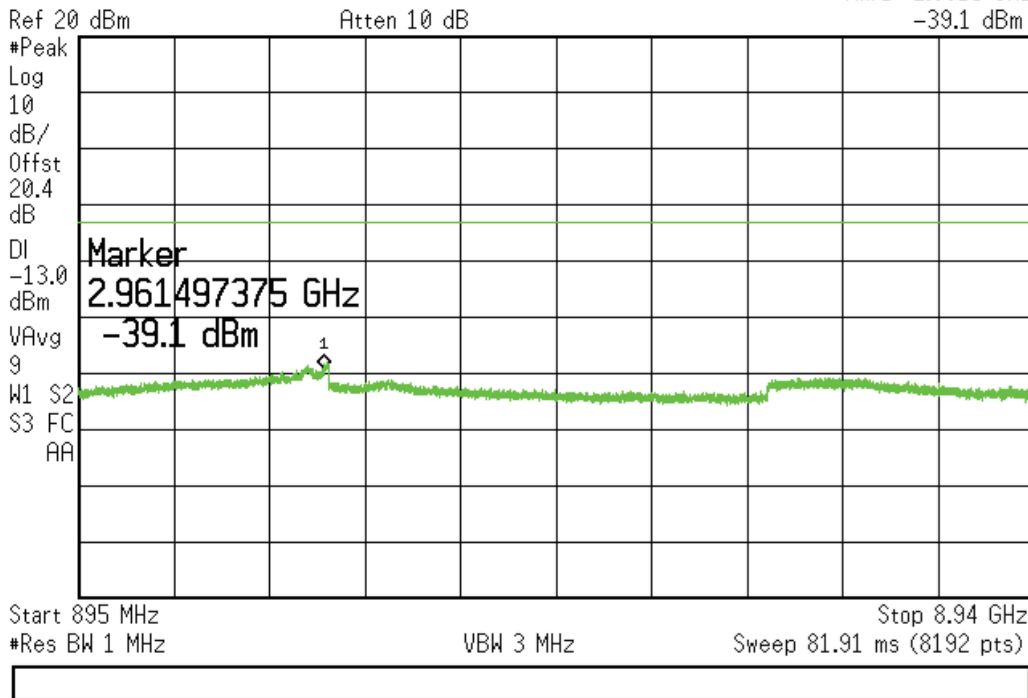


### 869-894 MHz Band (Mid Frequency) (Cont)

Agilent 08:03:46 Aug 12, 2014

L

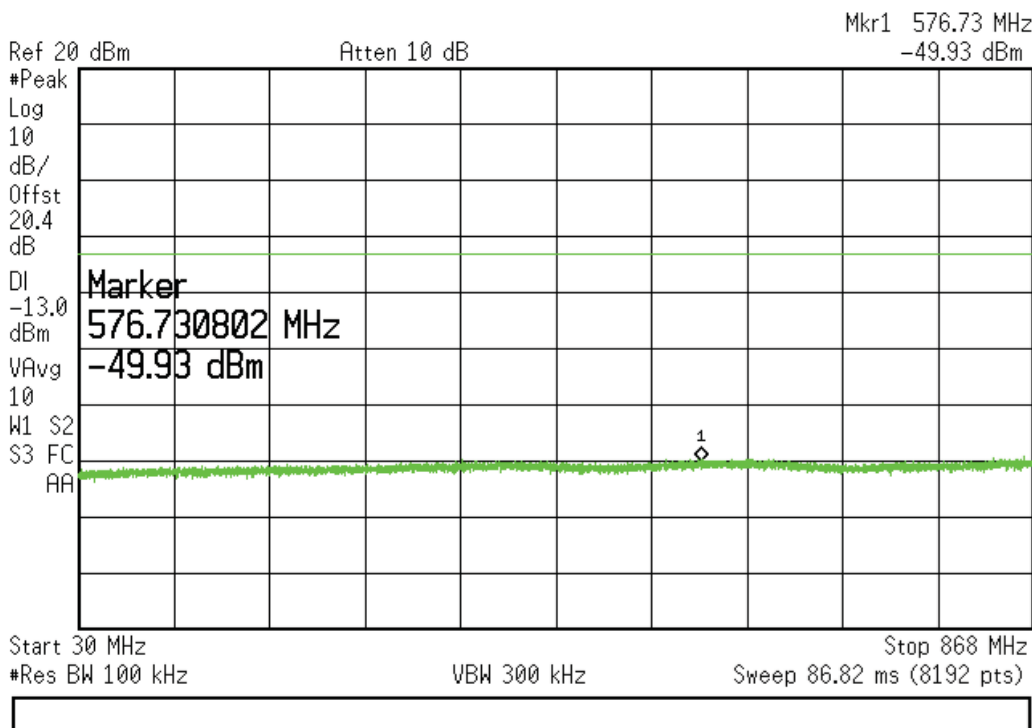
Mkr1 2.9615 GHz  
-39.1 dBm



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

Agilent 08:00:23 Aug 12, 2014

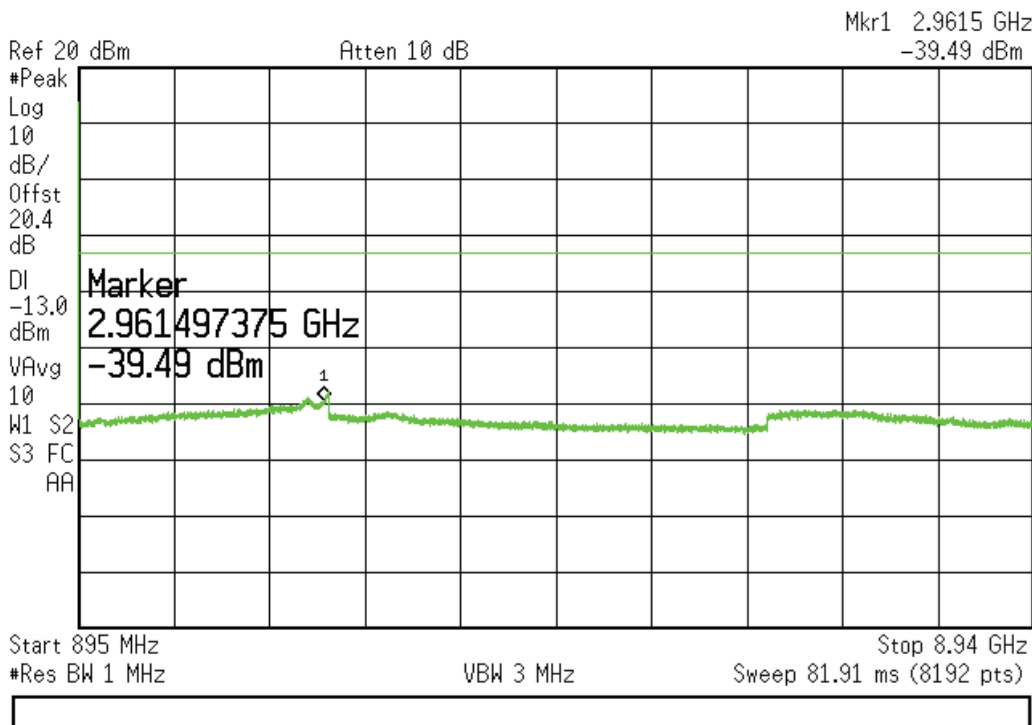
L



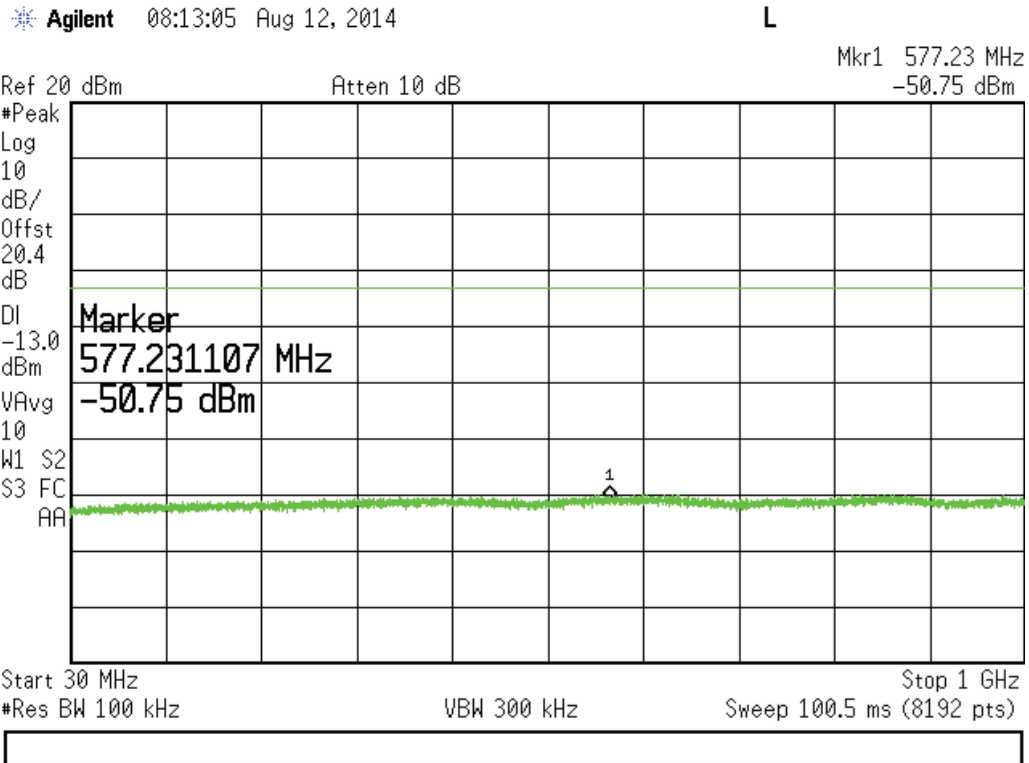
### 869-894 MHz Band (High Frequency) (Cont)

Agilent 08:04:29 Aug 12, 2014

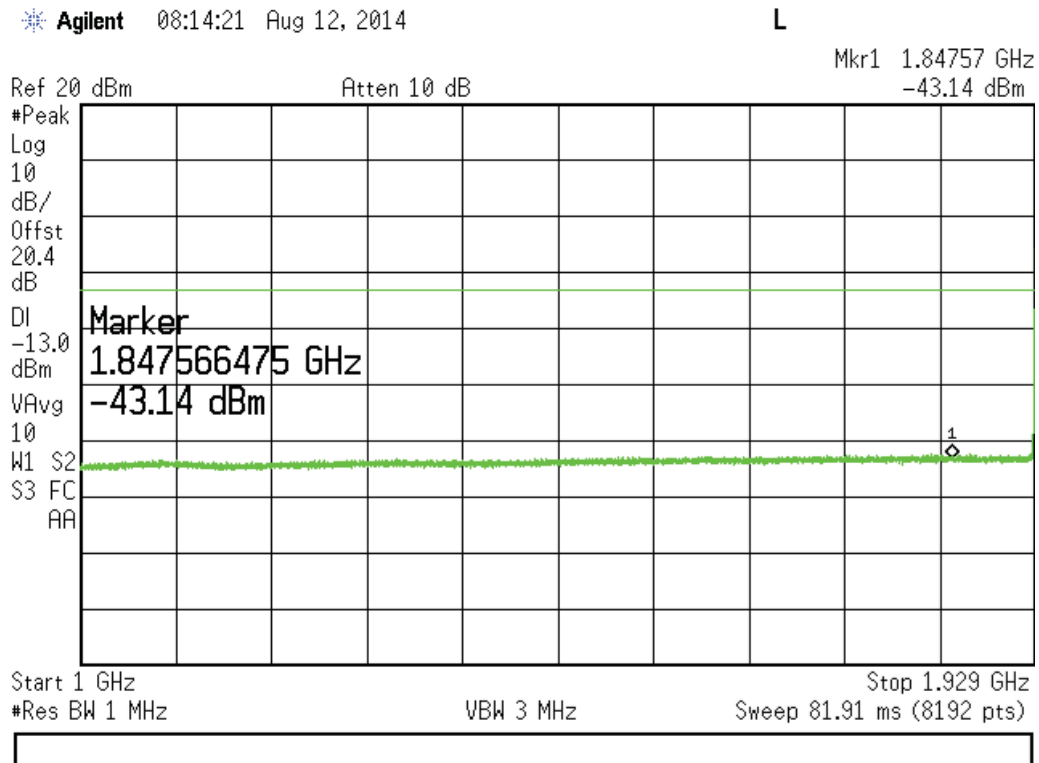
L



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



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

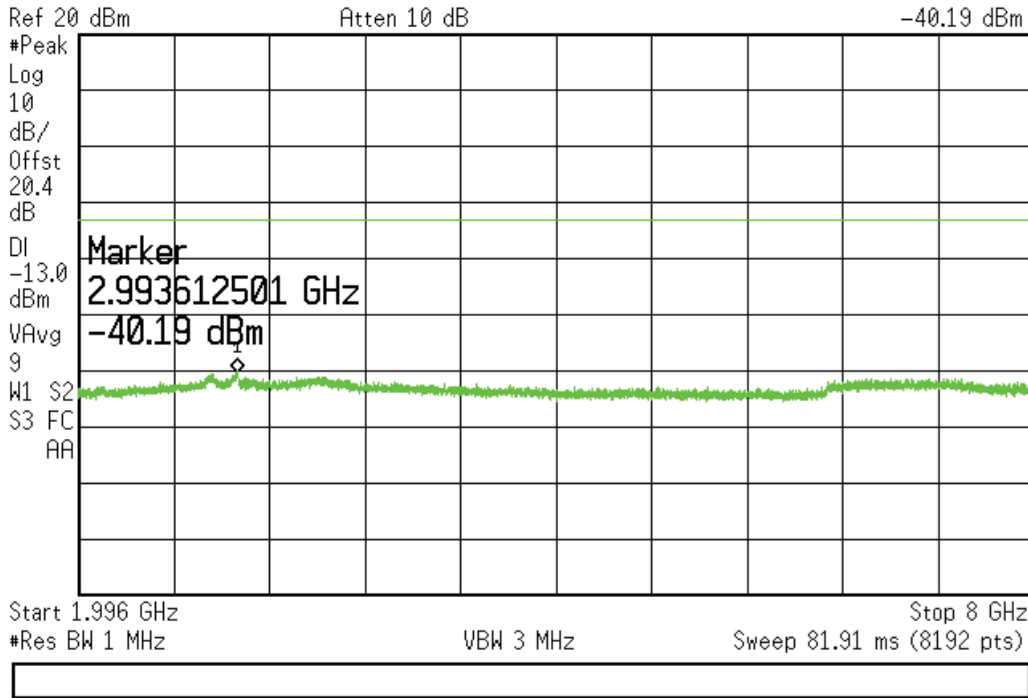


1930-1995 MHz Band (Low Frequency) (Cont)

Agilent 08:22:21 Aug 12, 2014

L

Mkr1 2.993613 GHz  
-40.19 dBm

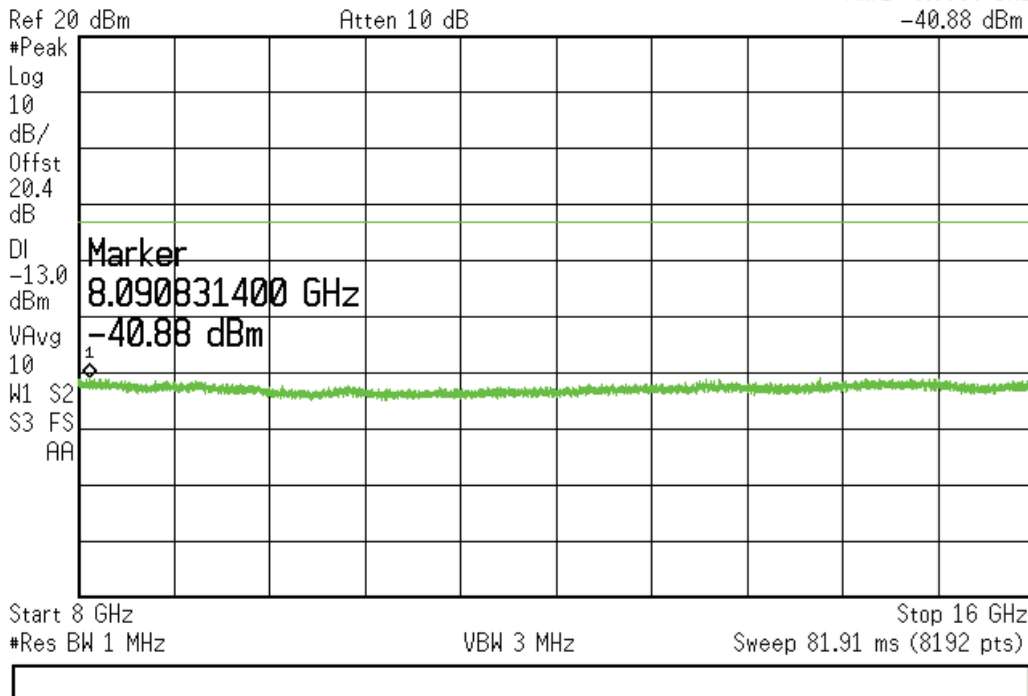


1930-1995 MHz Band (Low Frequency) (Cont)

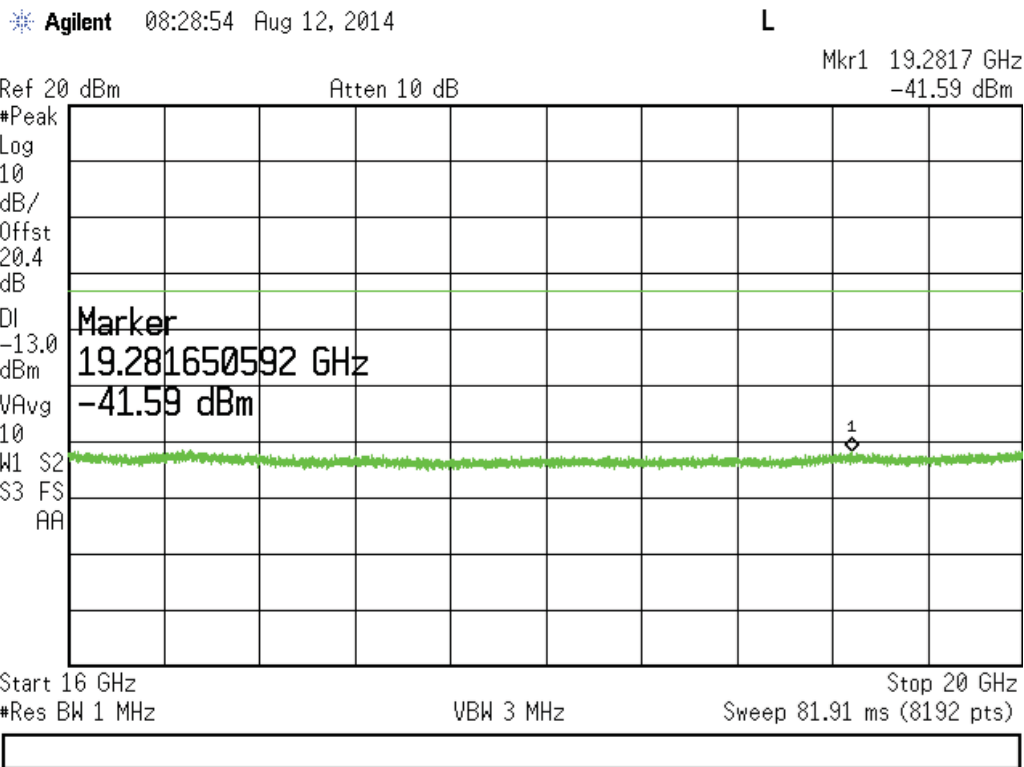
Agilent 08:25:37 Aug 12, 2014

L

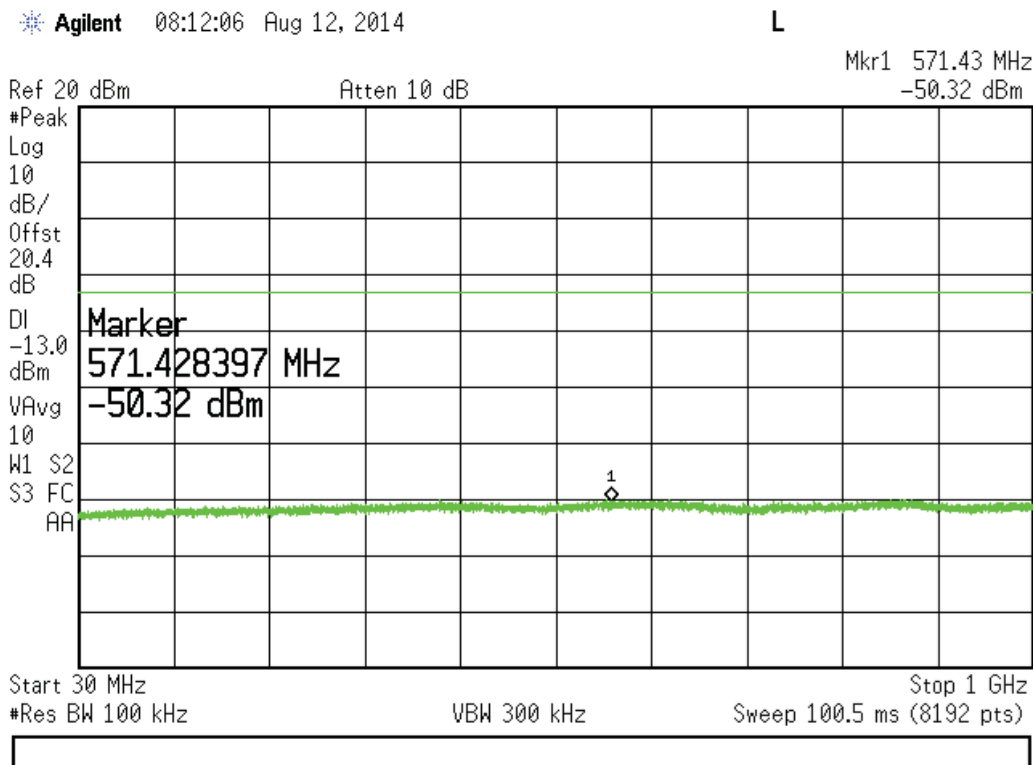
Mkr1 8.0908 GHz  
-40.88 dBm



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

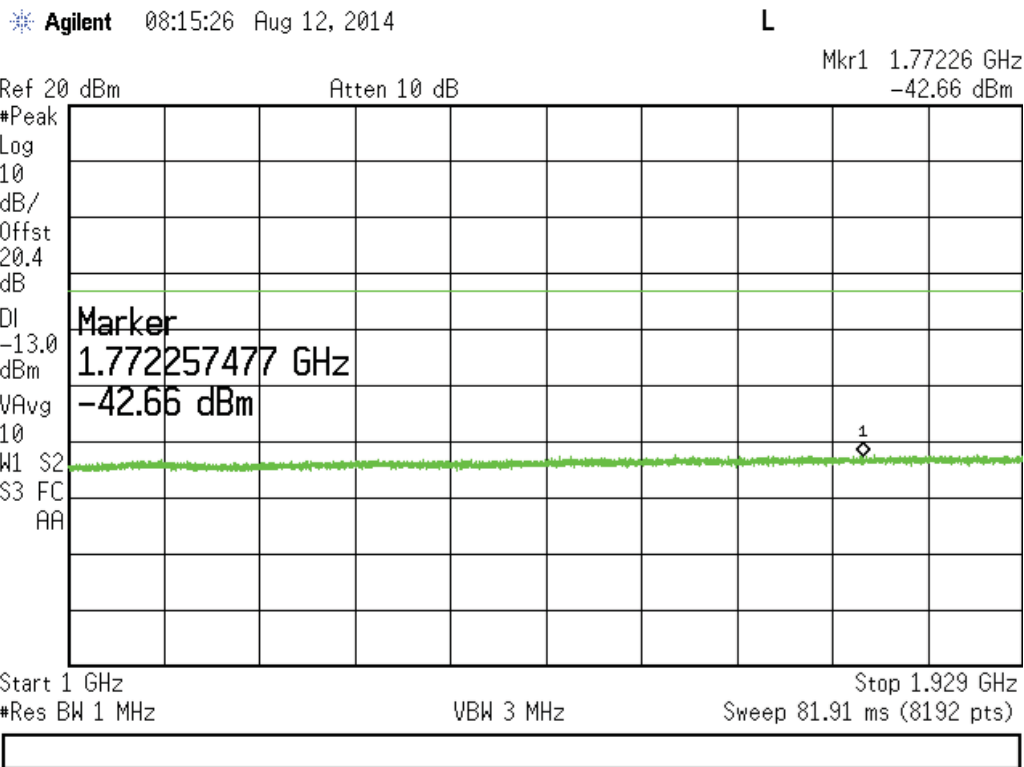


### 1930-1995 MHz Band (Mid Frequency)

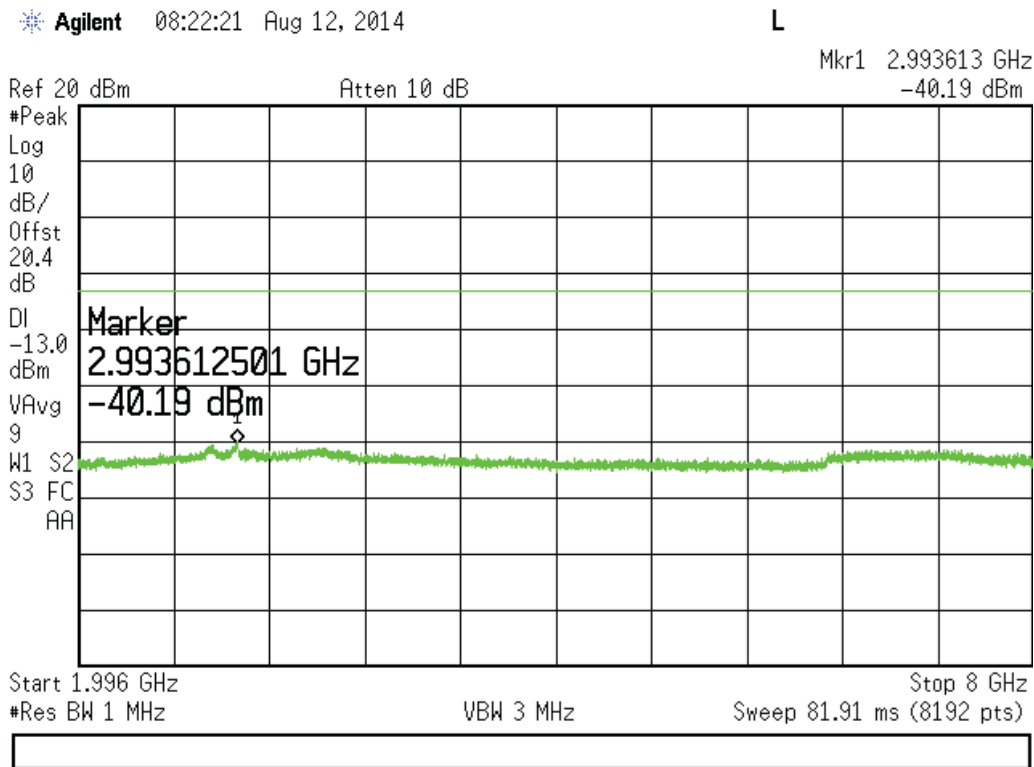




1930-1995 MHz Band (Mid Frequency) (Cont)



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

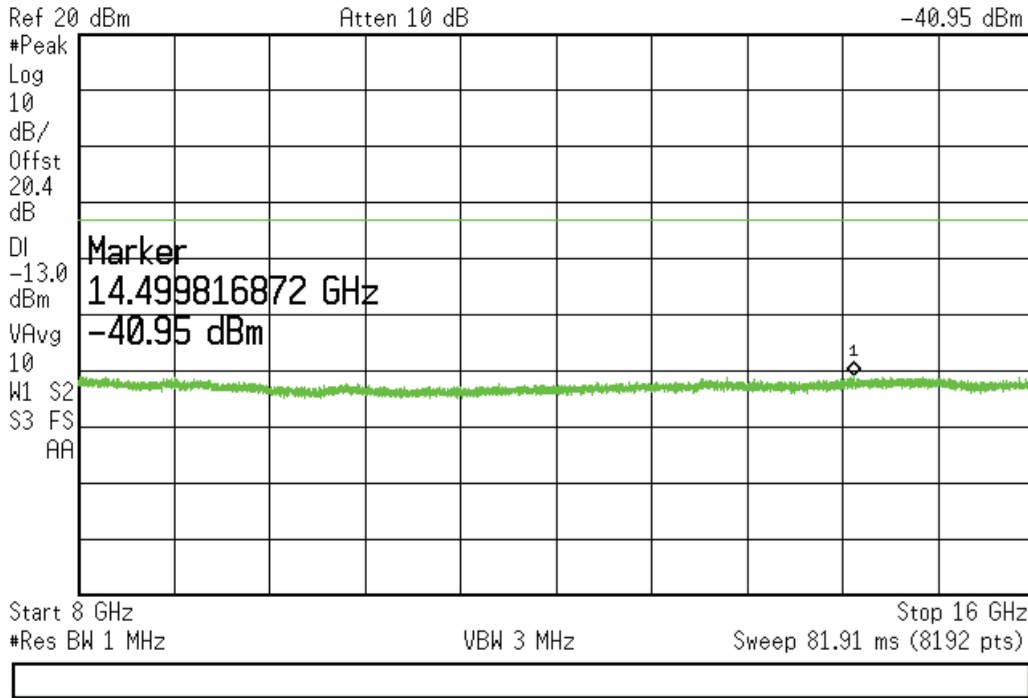


1930-1995 MHz Band (Mid Frequency) (Cont)

Agilent 08:26:17 Aug 12, 2014

L

Mkr1 14.4998 GHz  
-40.95 dBm

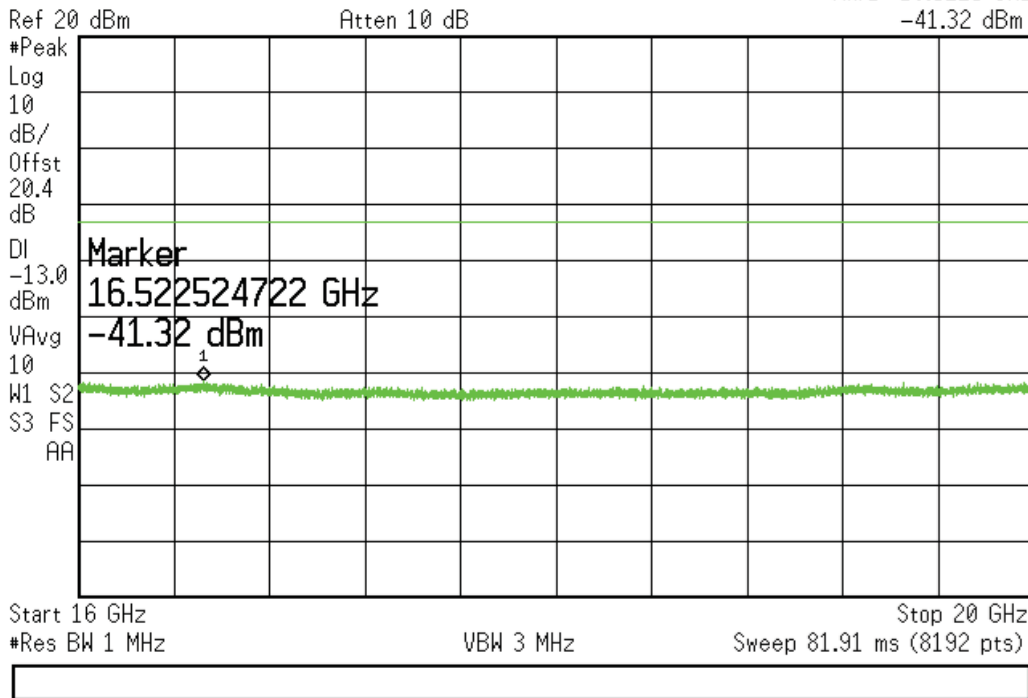


1930-1995 MHz Band (Mid Frequency) (Cont)

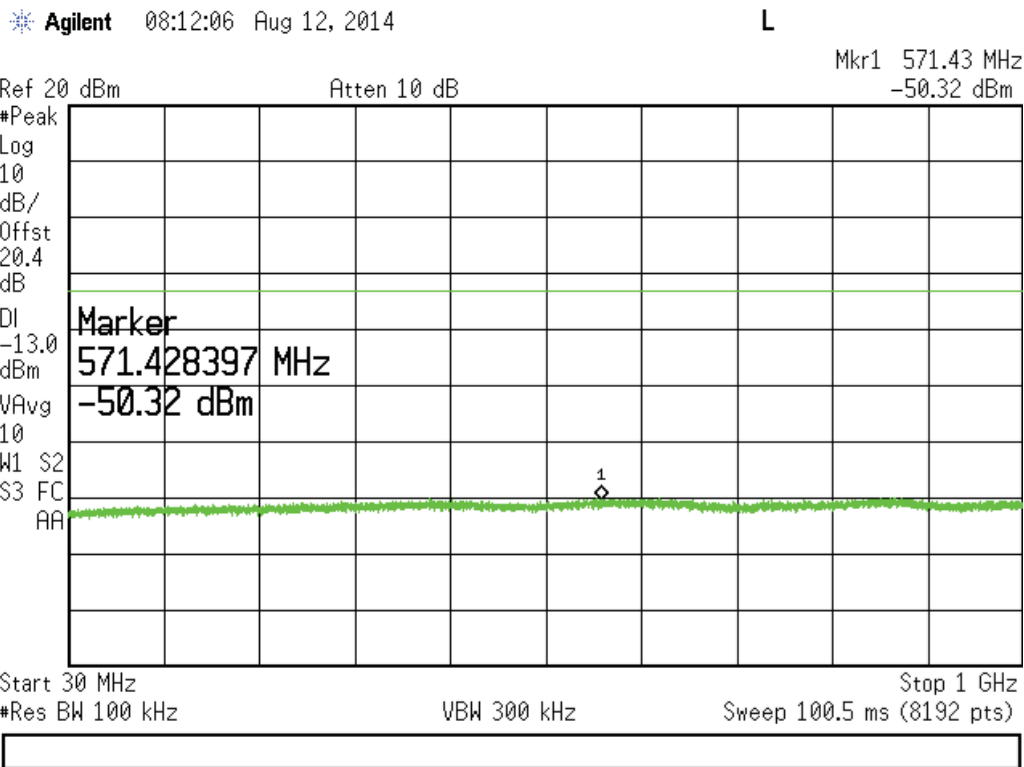
Agilent 08:28:22 Aug 12, 2014

L

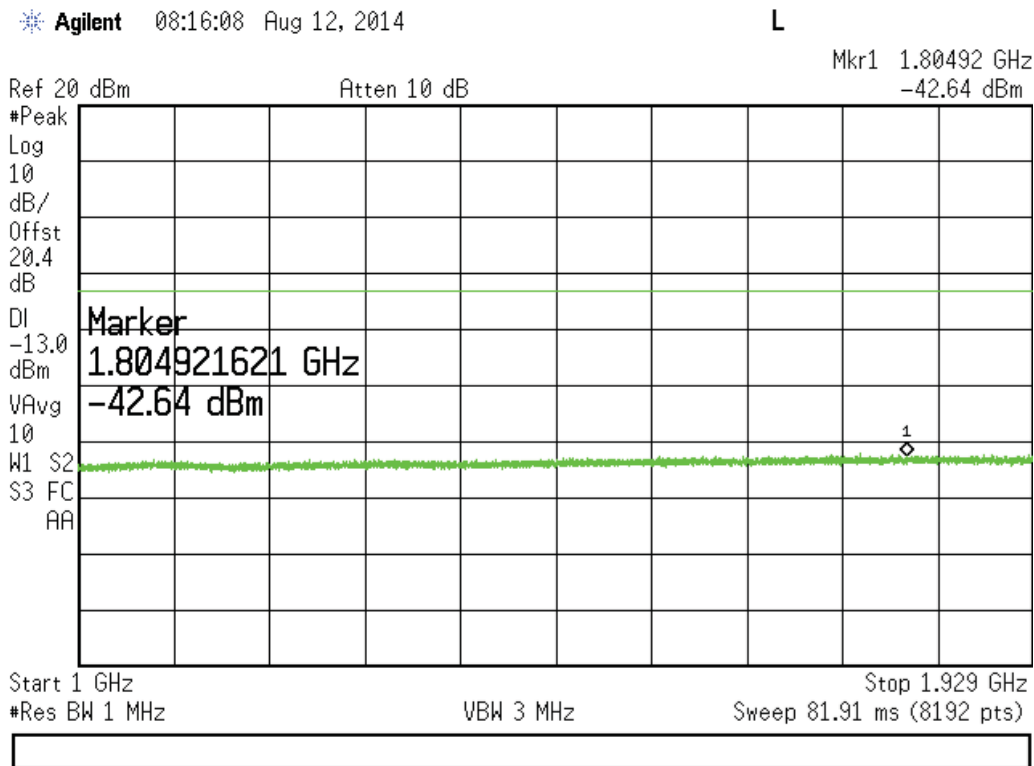
Mkr1 16.5225 GHz  
-41.32 dBm



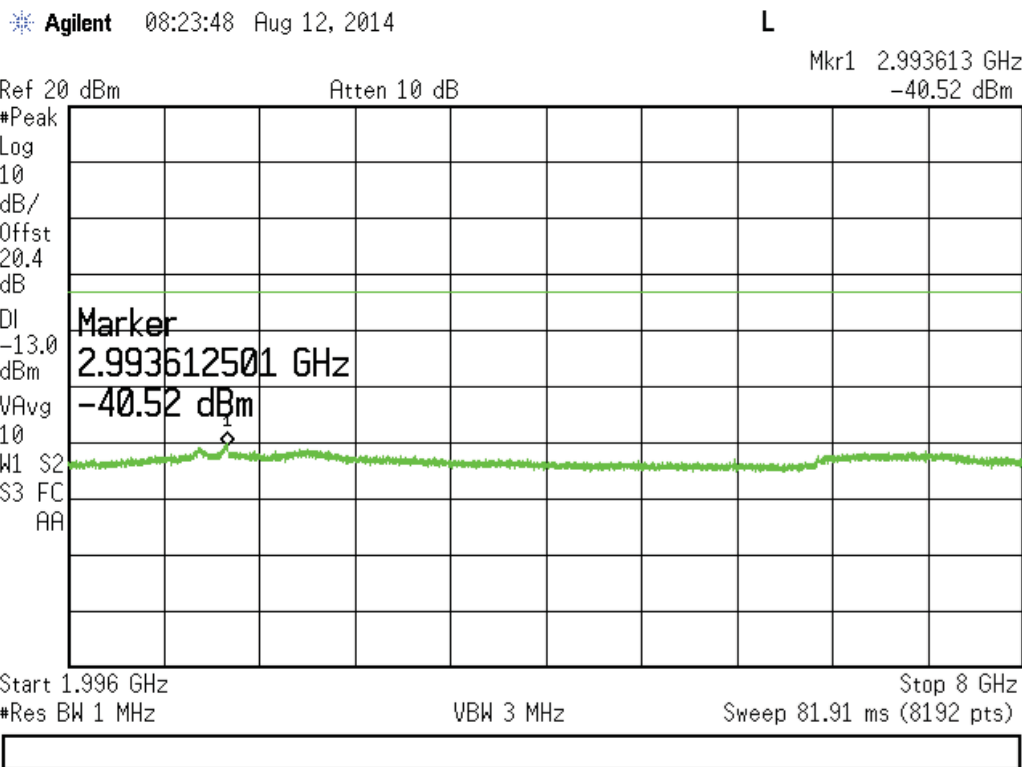
### 1930-1995 MHz Band (High Frequency)



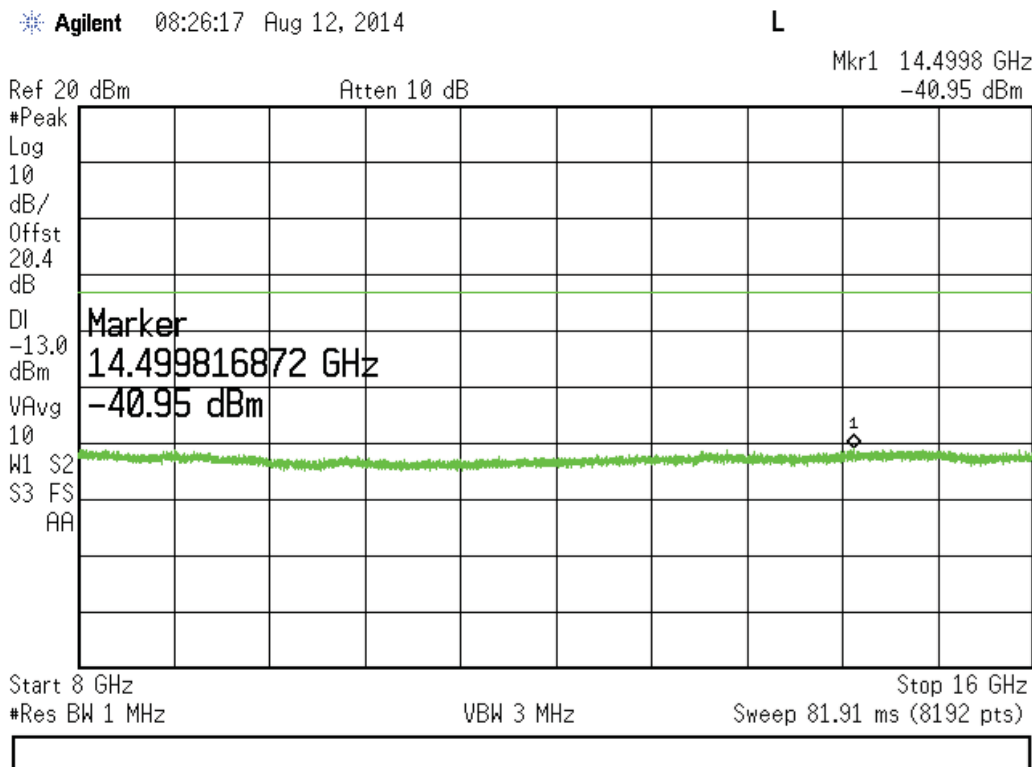
### 1930-1995 MHz Band (High Frequency) (Cont)



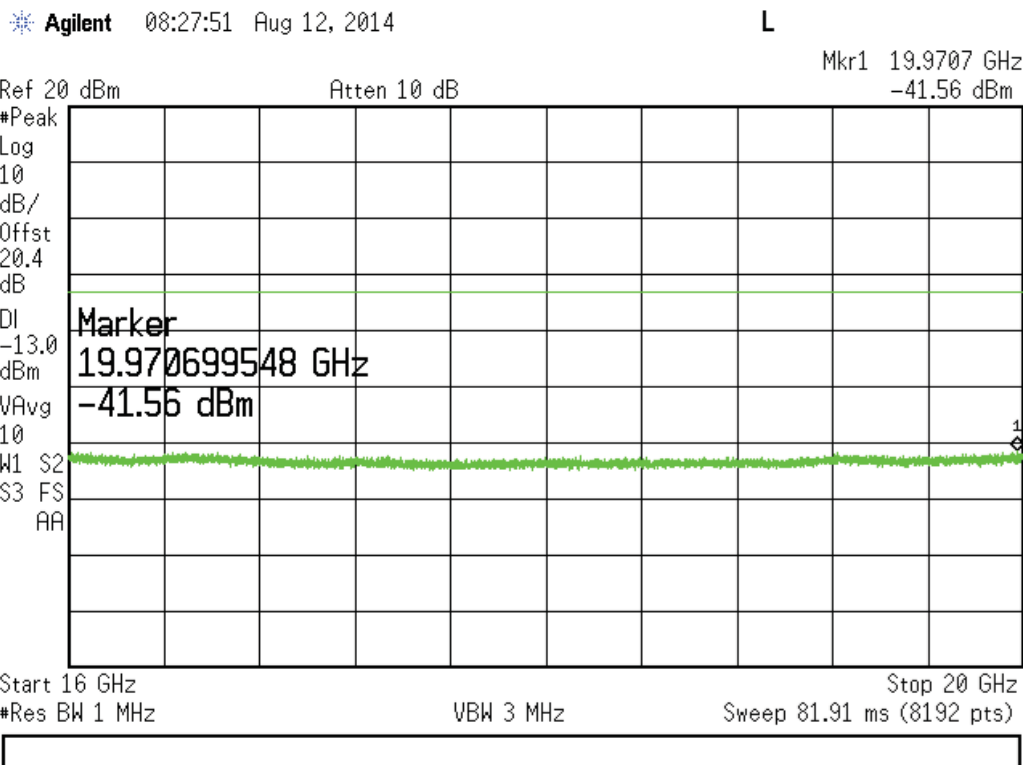
1930-1995 MHz Band (High Frequency) (Cont)



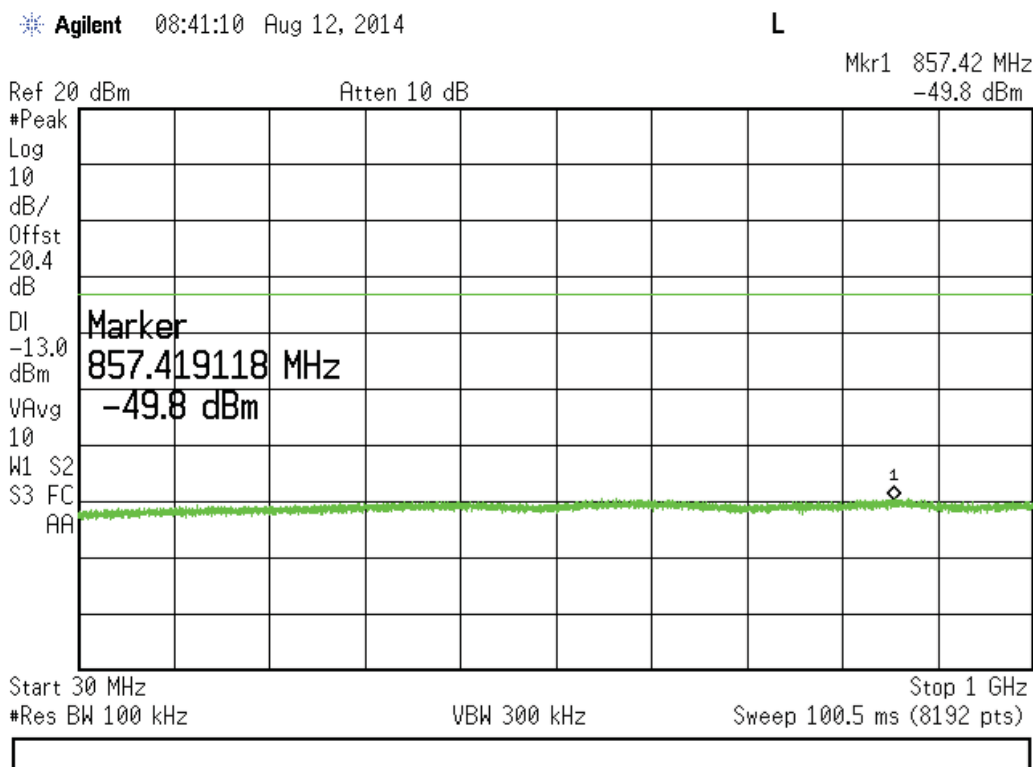
1930-1995 MHz Band (High Frequency) (Cont)



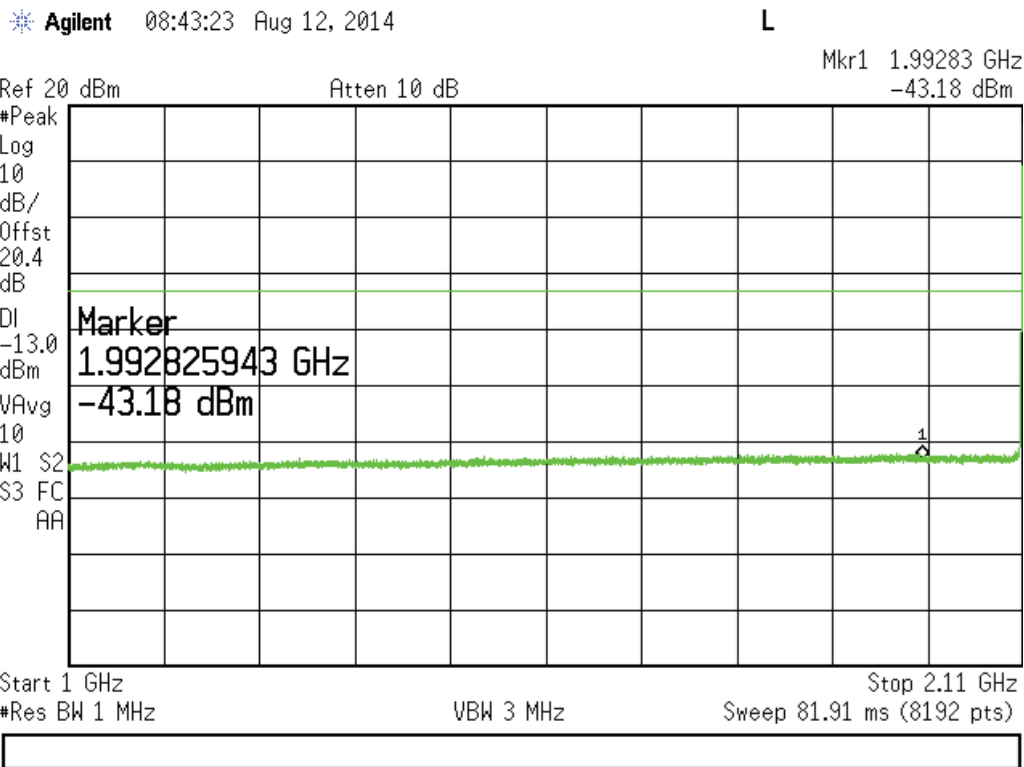
### 1930-1995 MHz Band (High Frequency) (Cont)



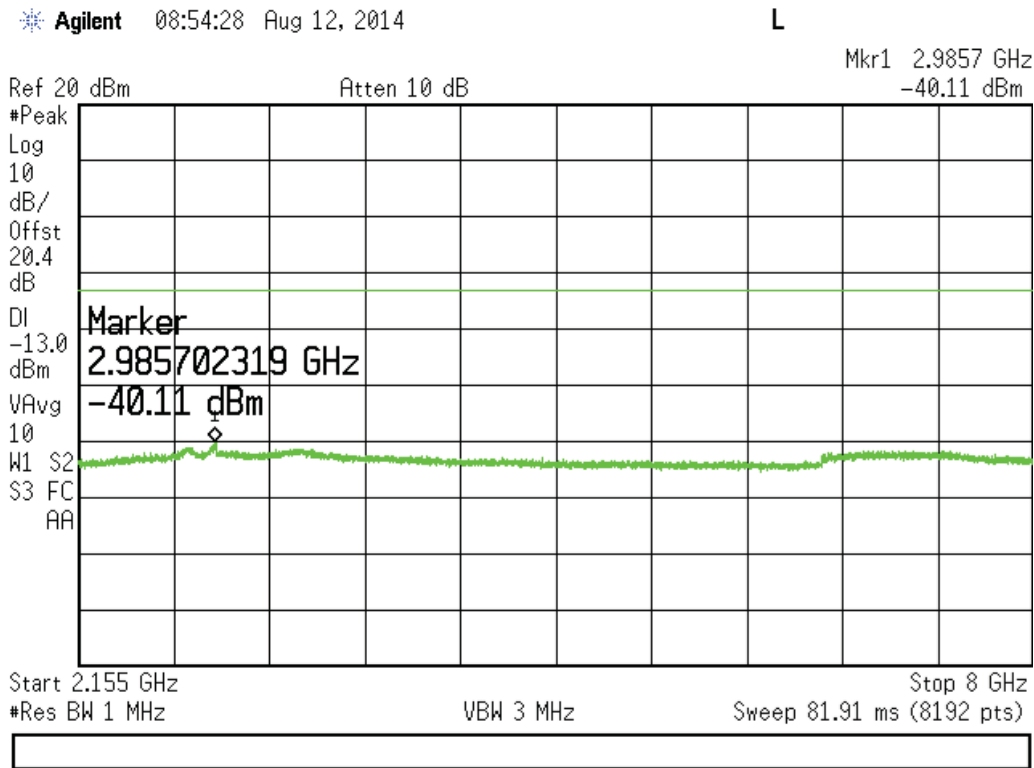
### 2110-2155 MHz Band (Low Frequency)



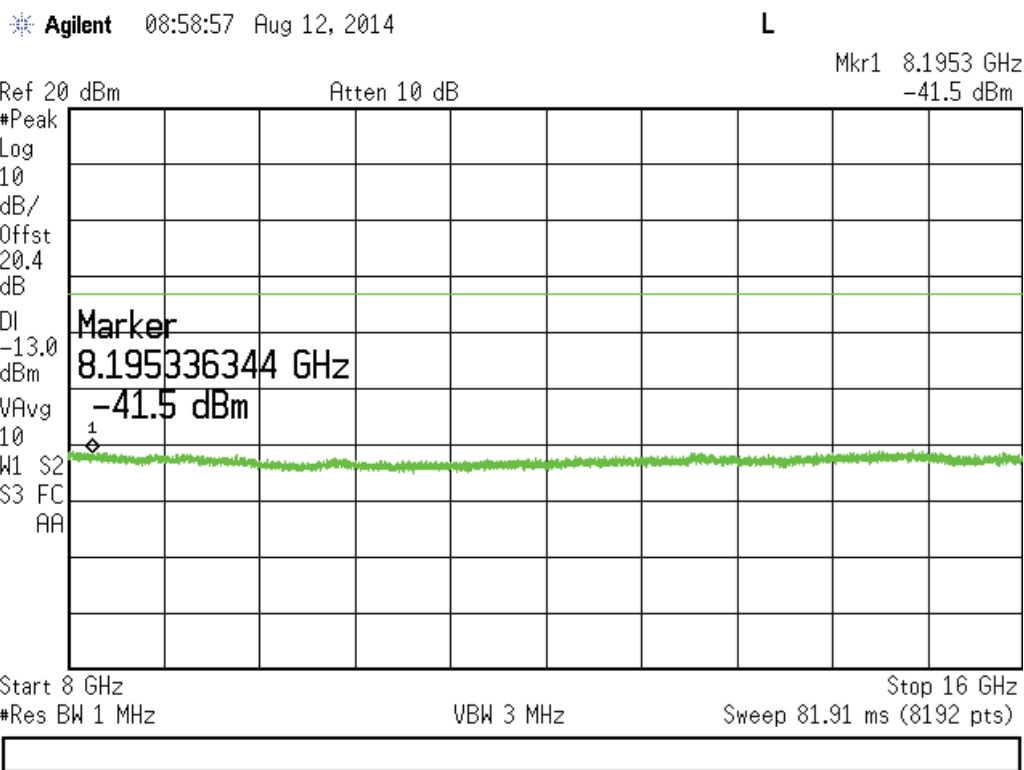
2110-2155 MHz Band (Low Frequency) (Cont)



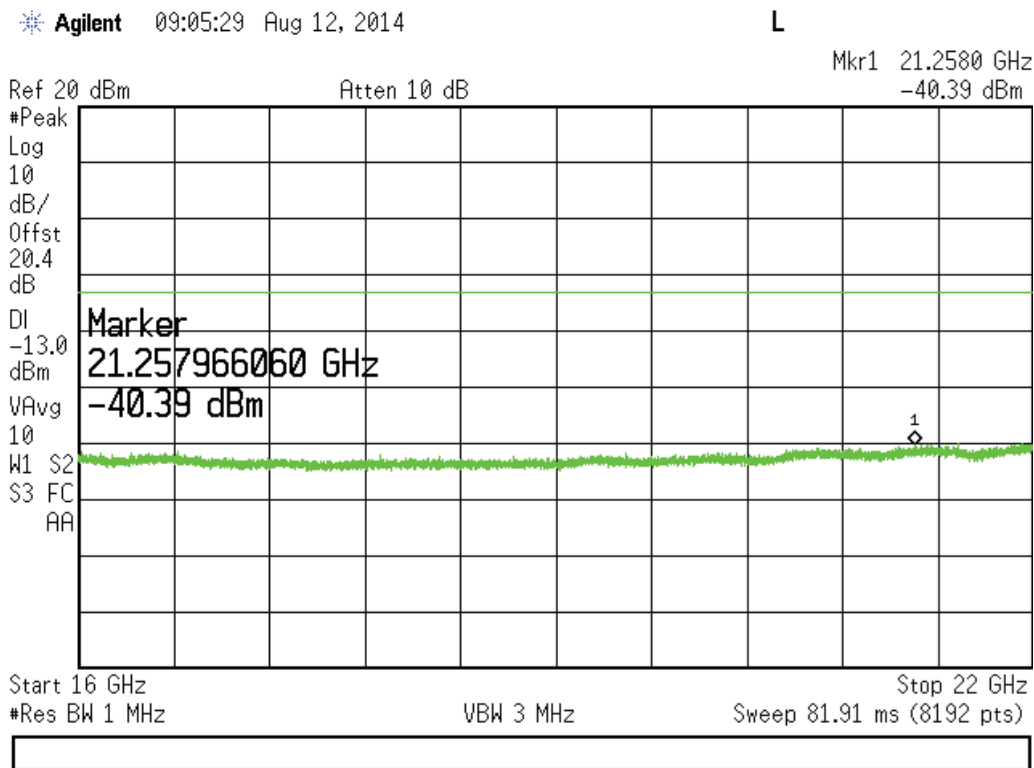
2110-2155 MHz Band (Low Frequency) (Cont)



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



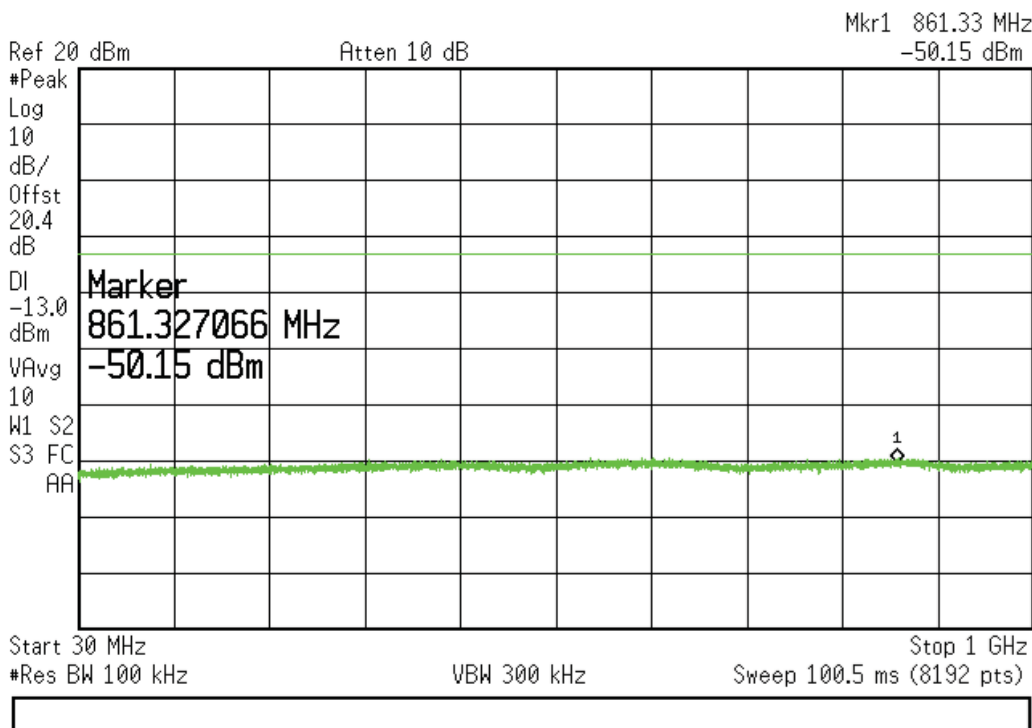
2110-2155 MHz Band (Low Frequency) (Cont)



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

Agilent 08:40:26 Aug 12, 2014

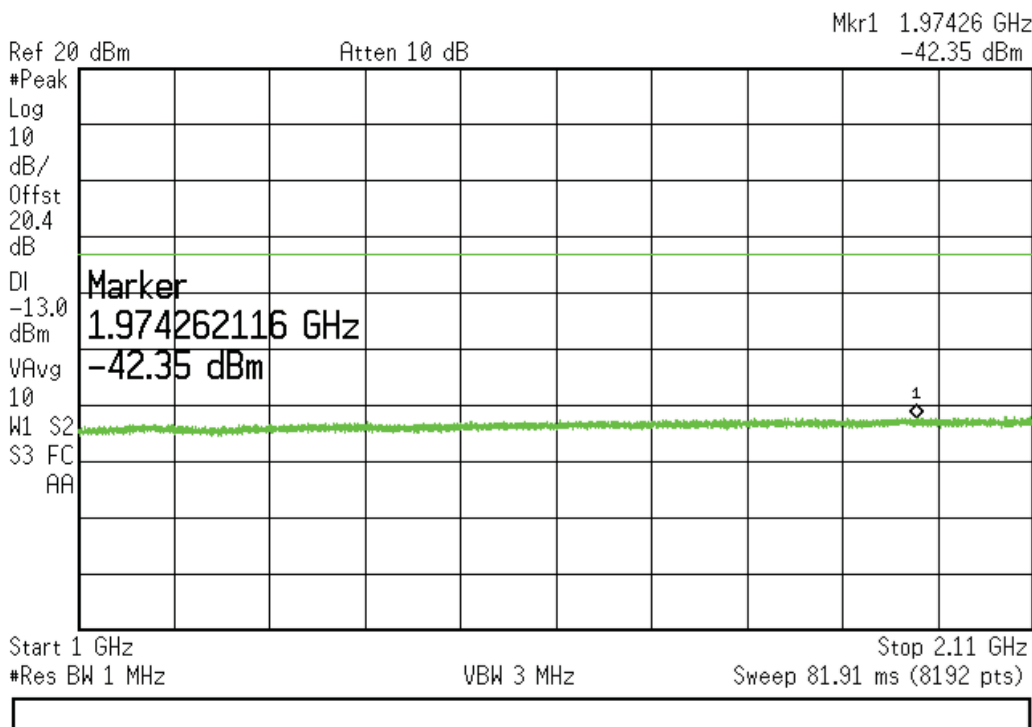
L



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

Agilent 08:44:12 Aug 12, 2014

L





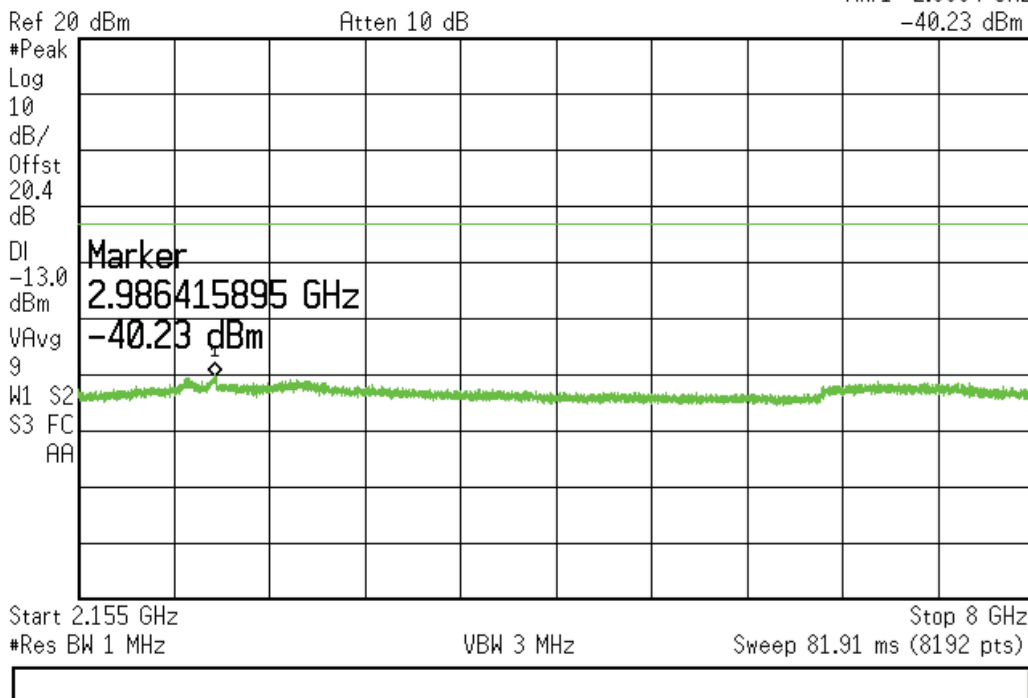


### 2110-2155 MHz Band (Mid Frequency) (Cont)

Agilent 08:55:22 Aug 12, 2014

L

Mkr1 2.9864 GHz  
-40.23 dBm

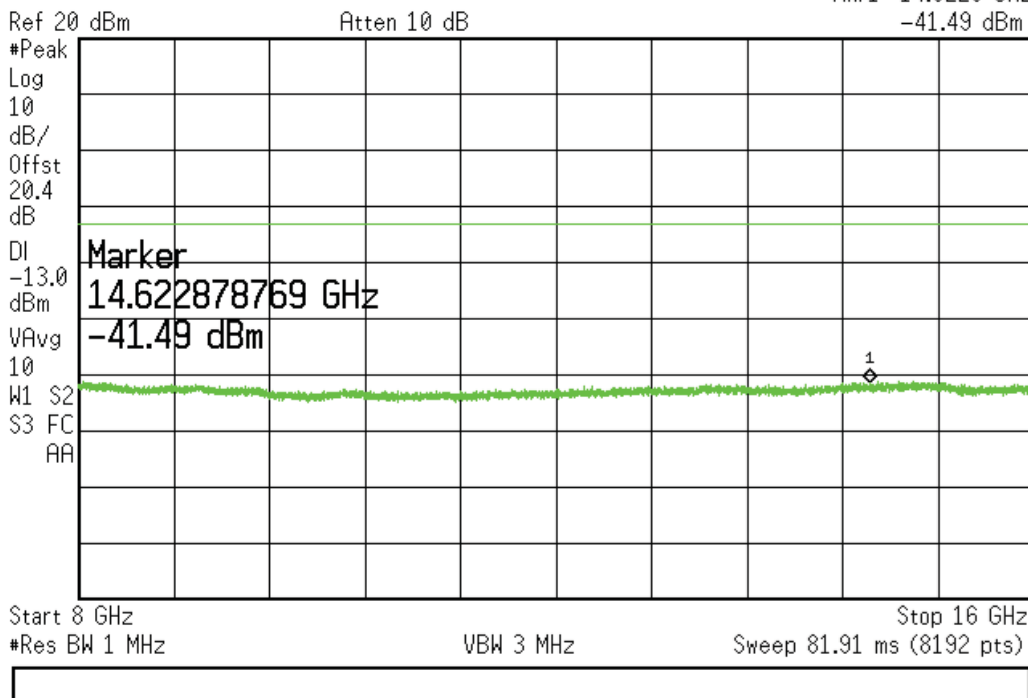


### 2110-2155 MHz Band (Mid Frequency) (Cont)

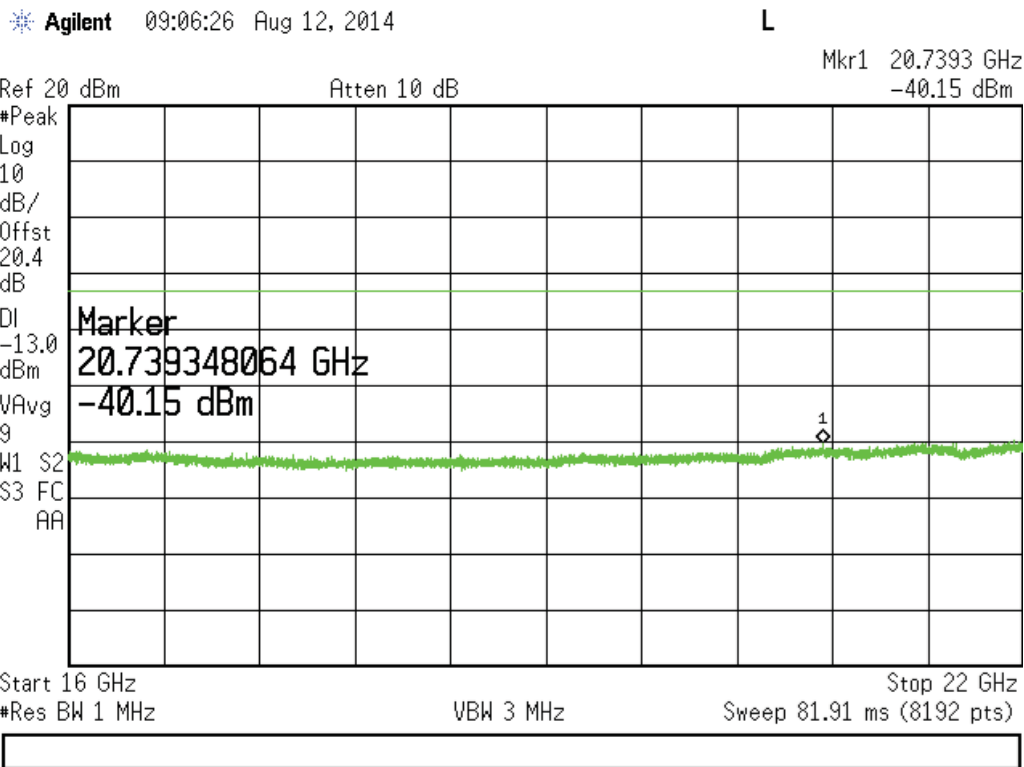
Agilent 08:58:21 Aug 12, 2014

L

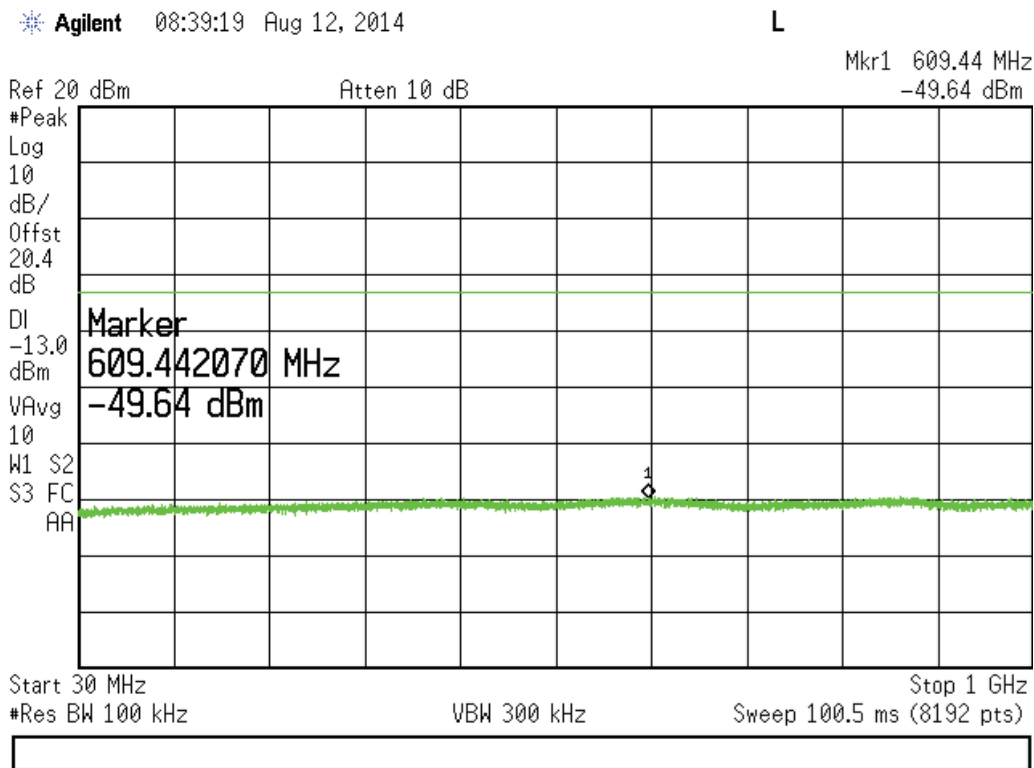
Mkr1 14.6229 GHz  
-41.49 dBm



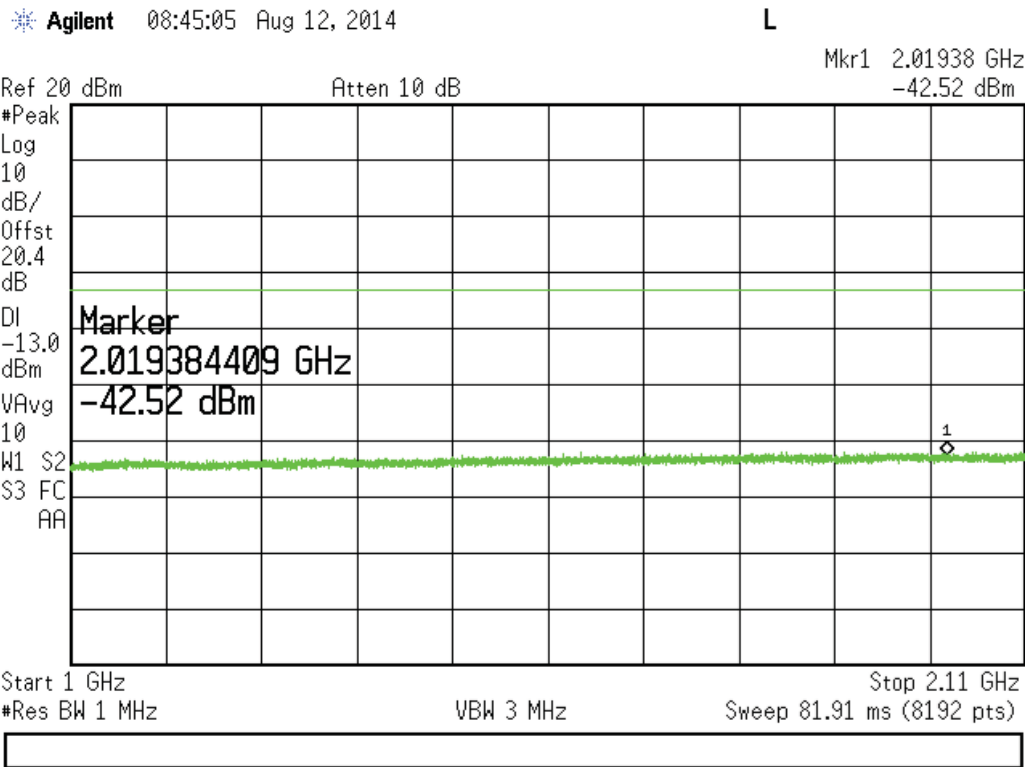
### 2110-2155 MHz Band (Mid Frequency) (Cont)



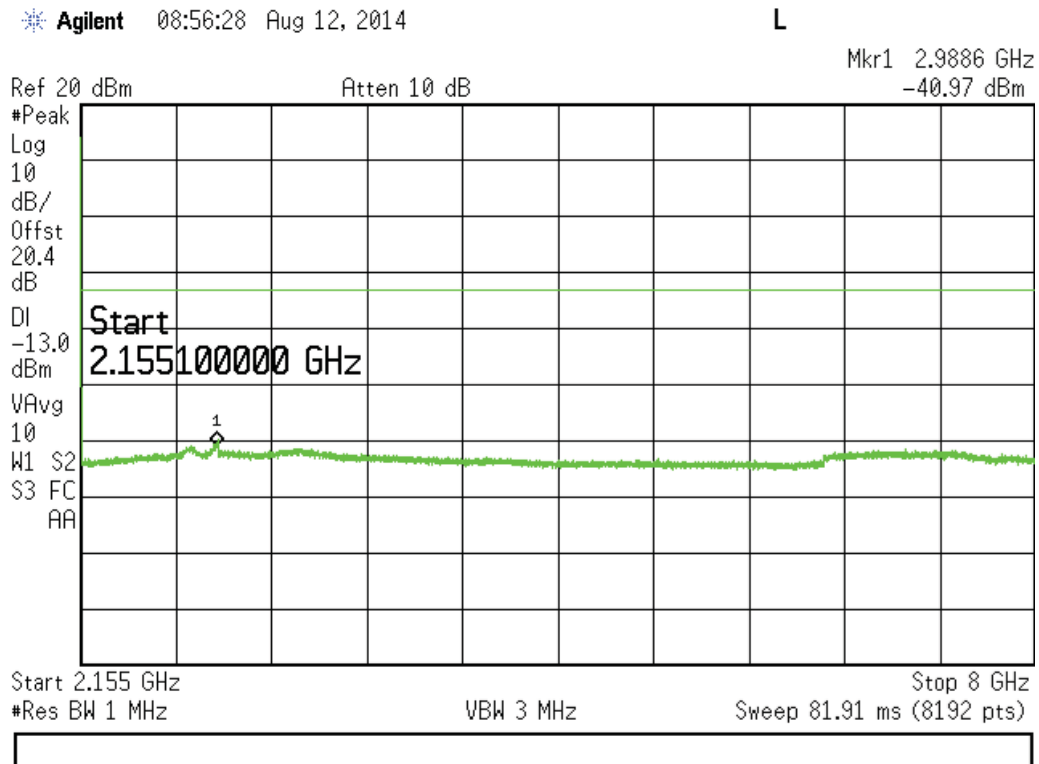
### 2110-2155 MHz Band (High Frequency)



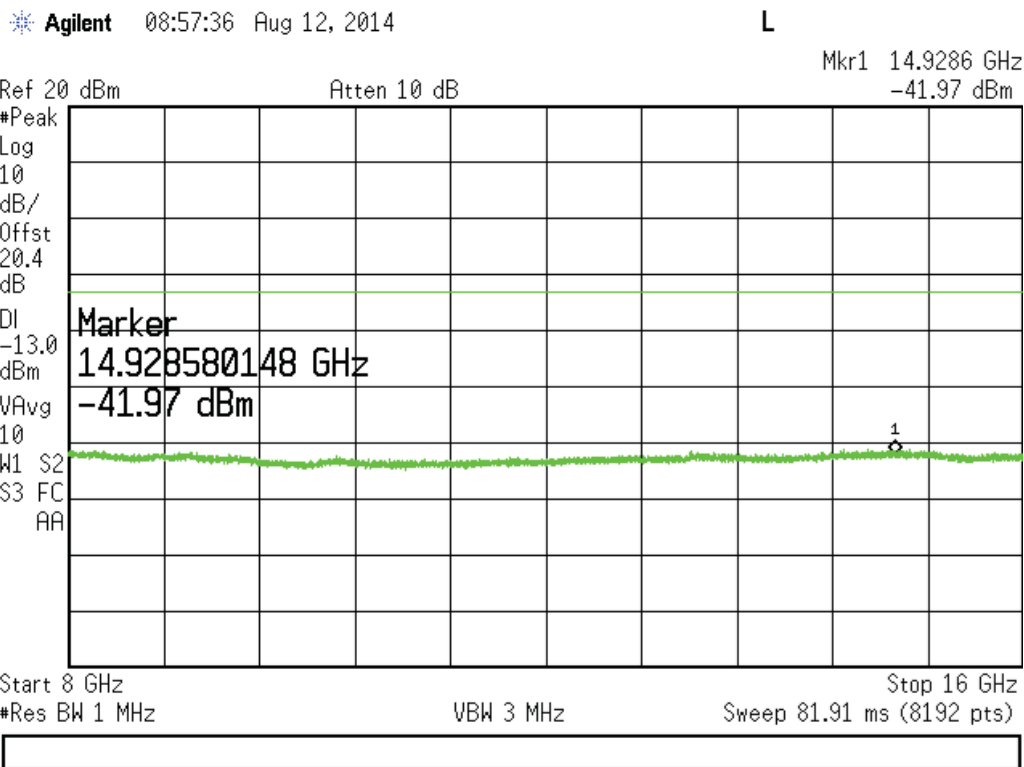
### 2110-2155 MHz Band (High Frequency) (Cont)



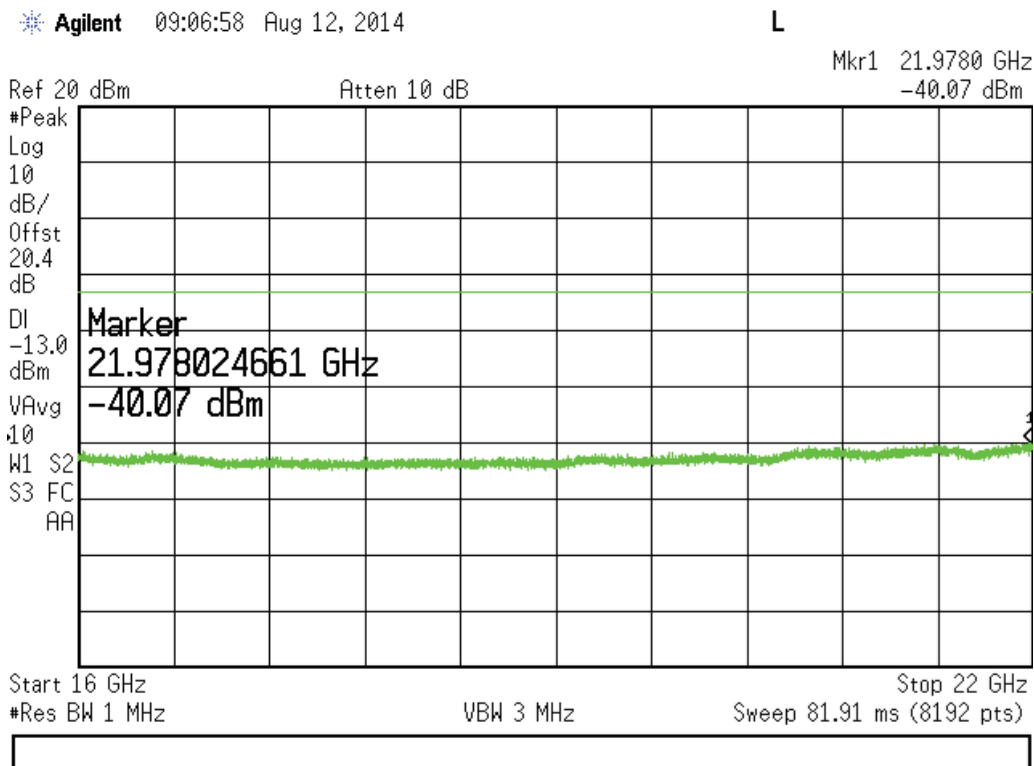
### 2110-2155 MHz Band (High Frequency) (Cont)



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



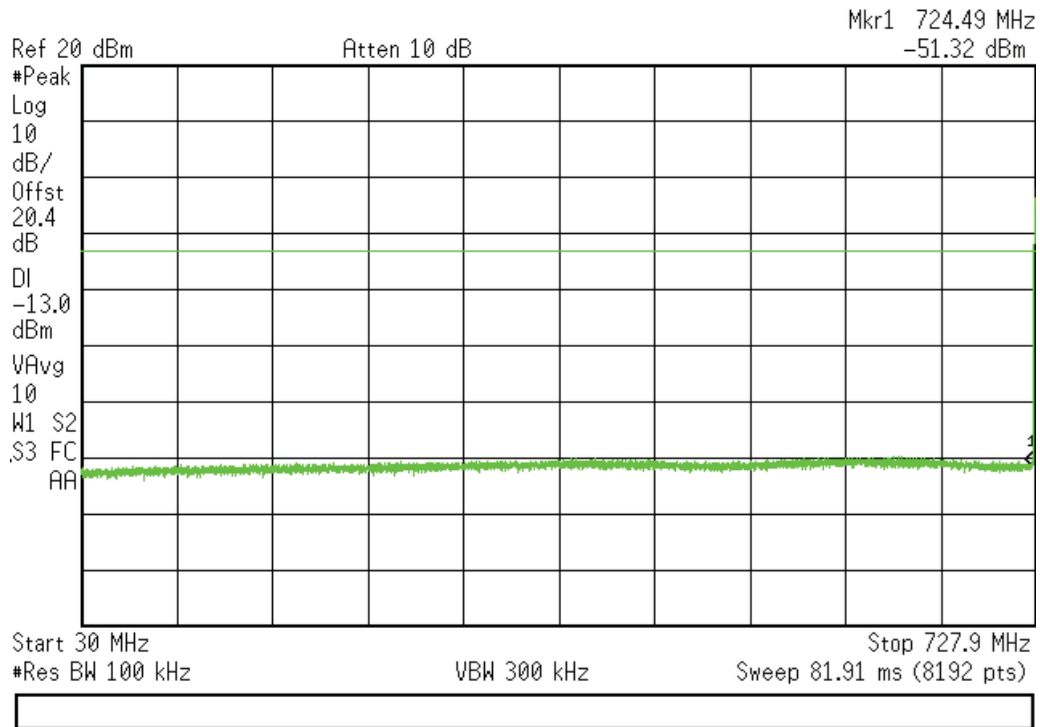
2110-2155 MHz Band (High Frequency) (Cont)



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

Agilent 07:22:21 Aug 12, 2014

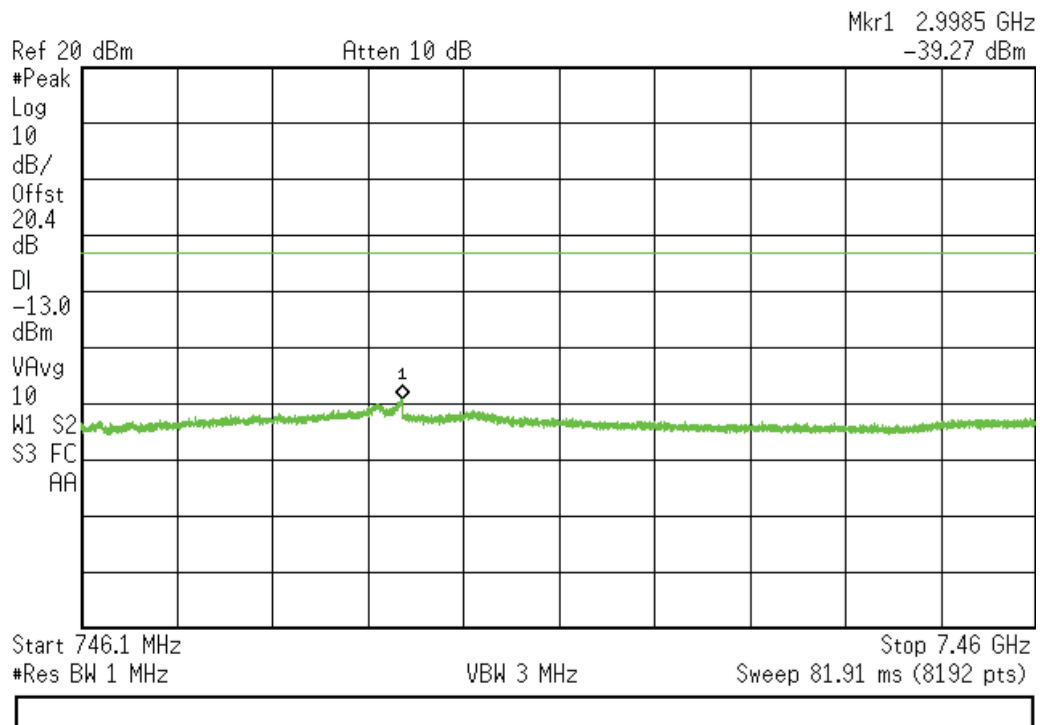
L



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

Agilent 07:27:25 Aug 12, 2014

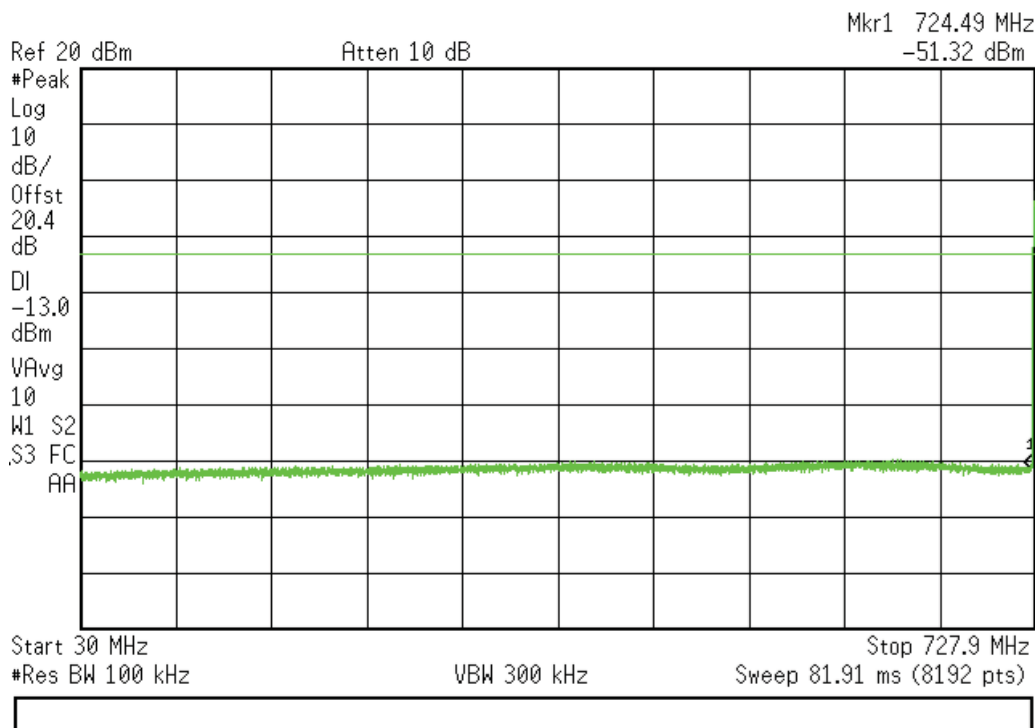
L



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

Agilent 07:22:21 Aug 12, 2014

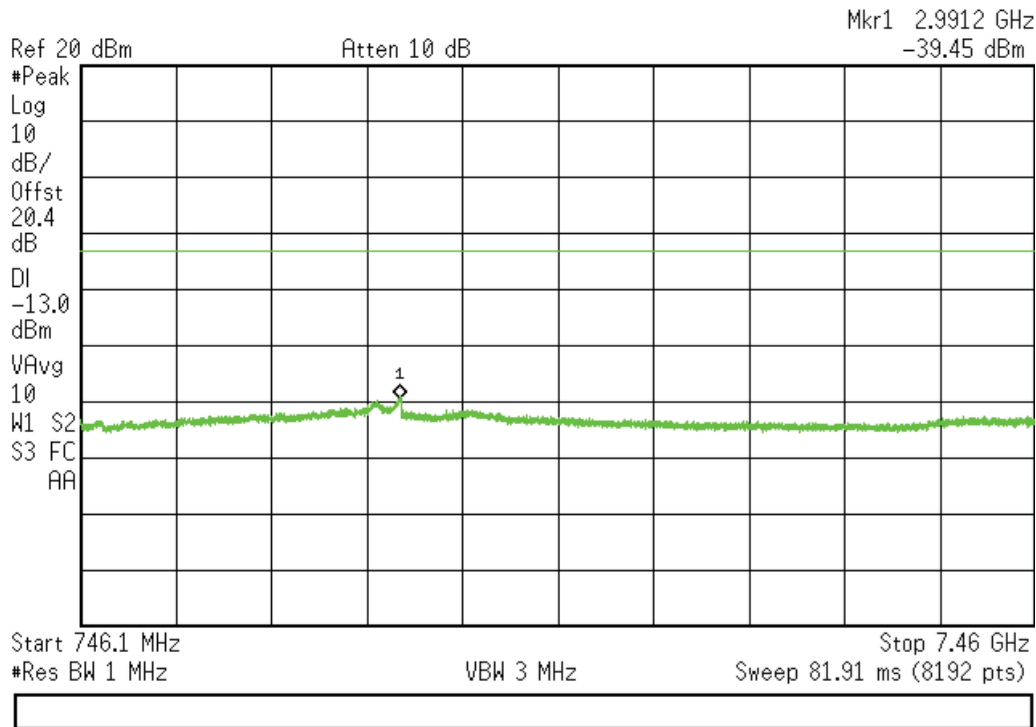
L



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

Agilent 07:26:50 Aug 12, 2014

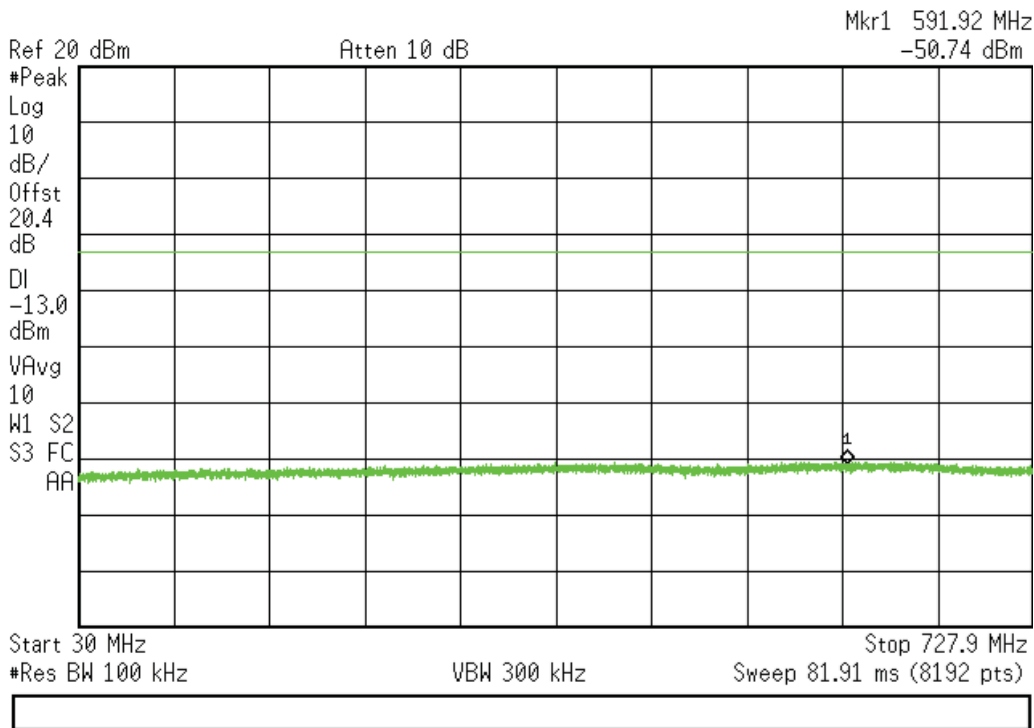
L



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

Agilent 07:24:37 Aug 12, 2014

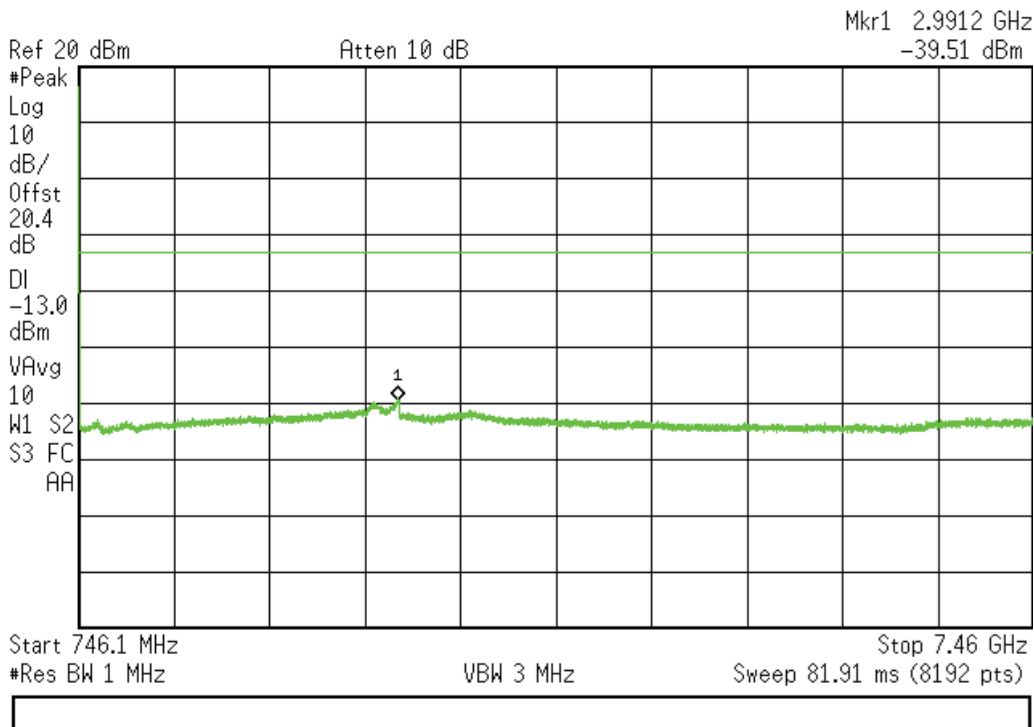
L



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

Agilent 07:26:01 Aug 12, 2014

L

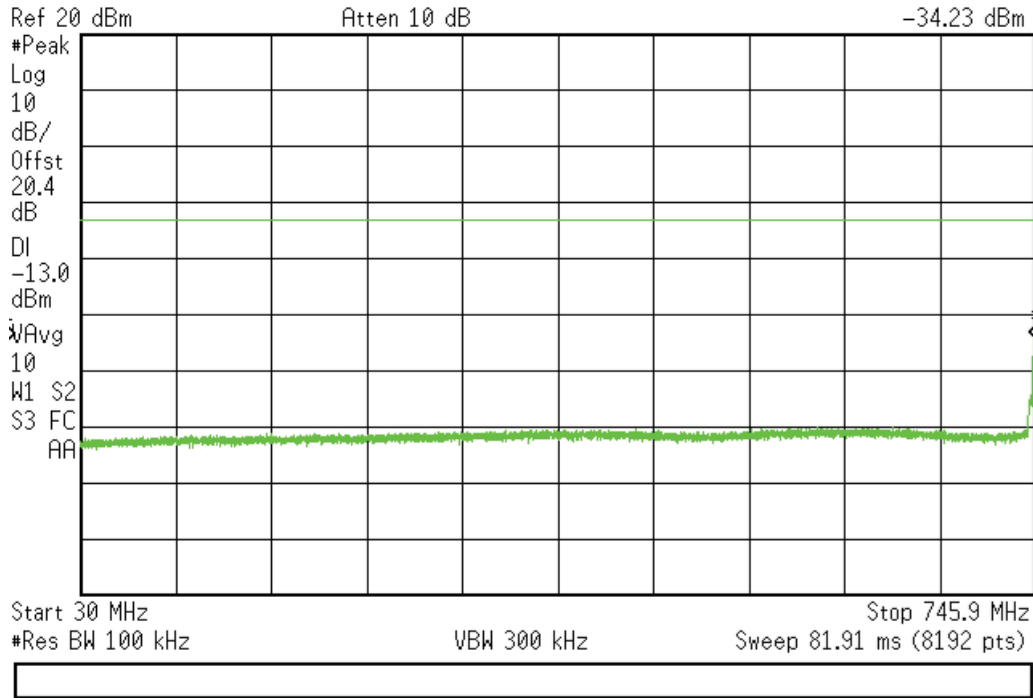


### 746-757 MHz Band (Low Frequency)

Agilent 15:19:56 Aug 26, 2014

L

Mkr1 745.3756 MHz  
-34.23 dBm

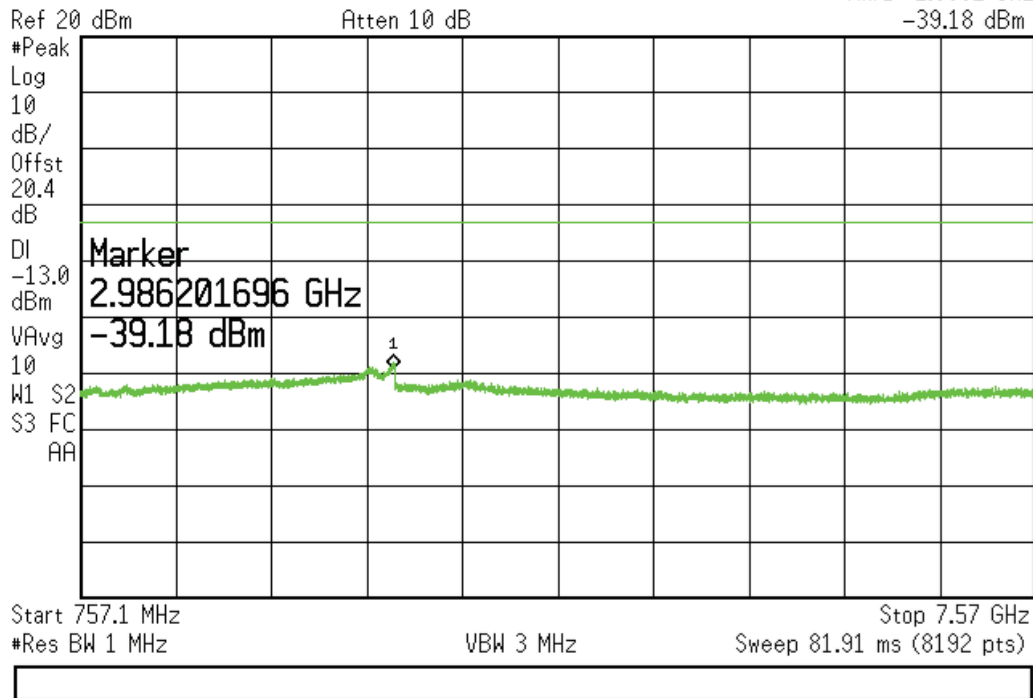


### 728-746 MHz Band (Low Frequency) (Cont)

Agilent 07:51:42 Aug 12, 2014

L

Mkr1 2.986201696 GHz  
-39.18 dBm



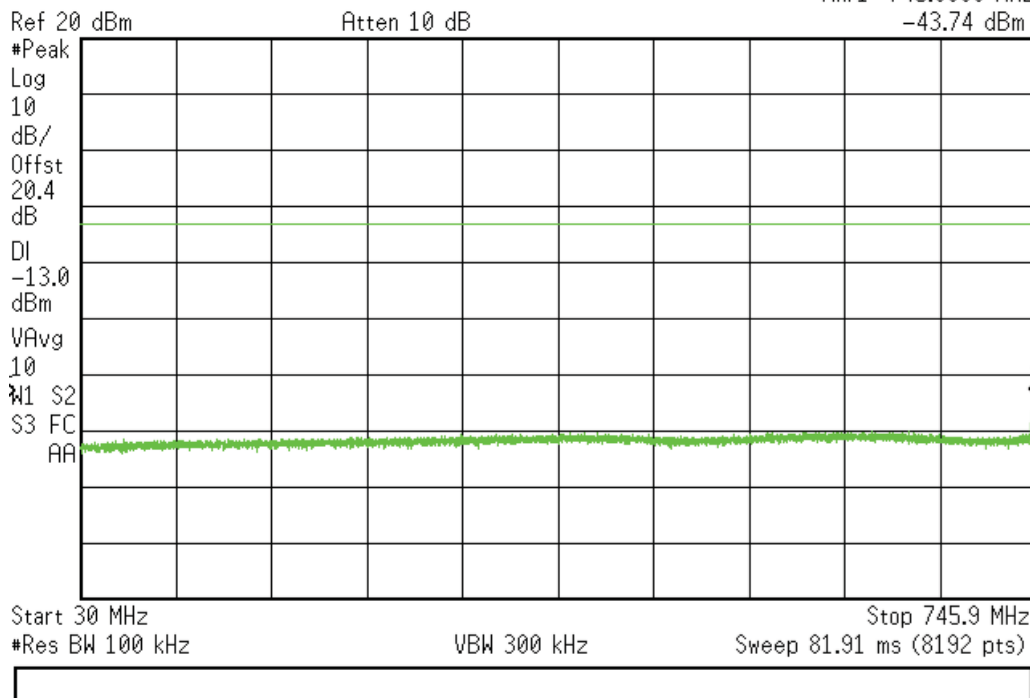


### 746-757 MHz Band (Mid Frequency)

Agilent 15:20:58 Aug 26, 2014

L

Mkr1 745.9000 MHz  
-43.74 dBm

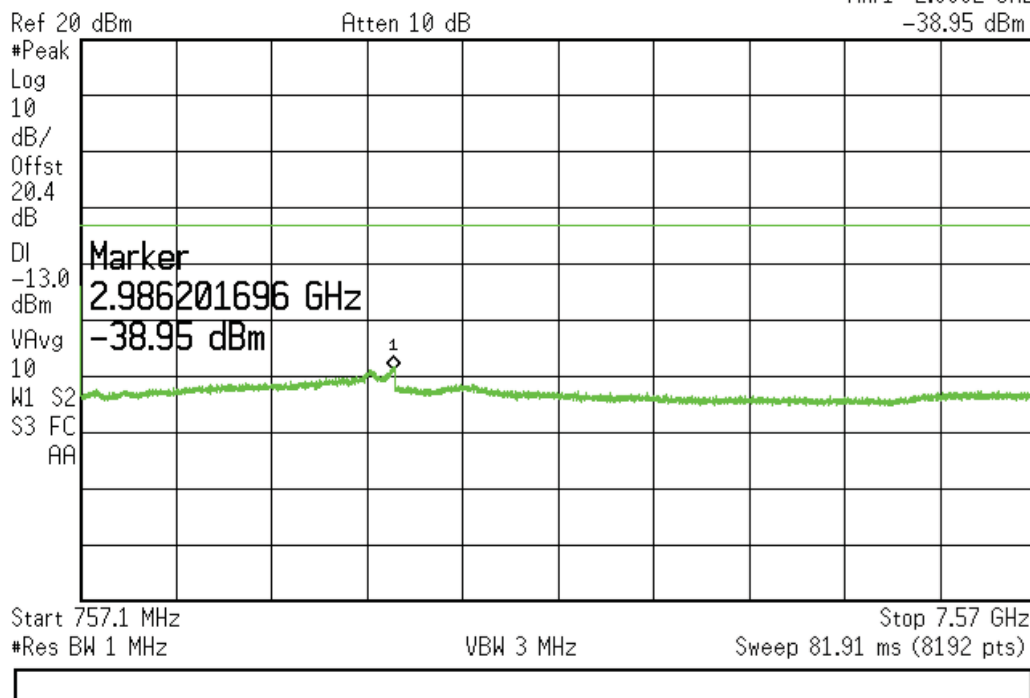


### 746-757 MHz Band (Mid Frequency) (Cont)

Agilent 07:51:04 Aug 12, 2014

L

Mkr1 2.9862 GHz  
-38.95 dBm

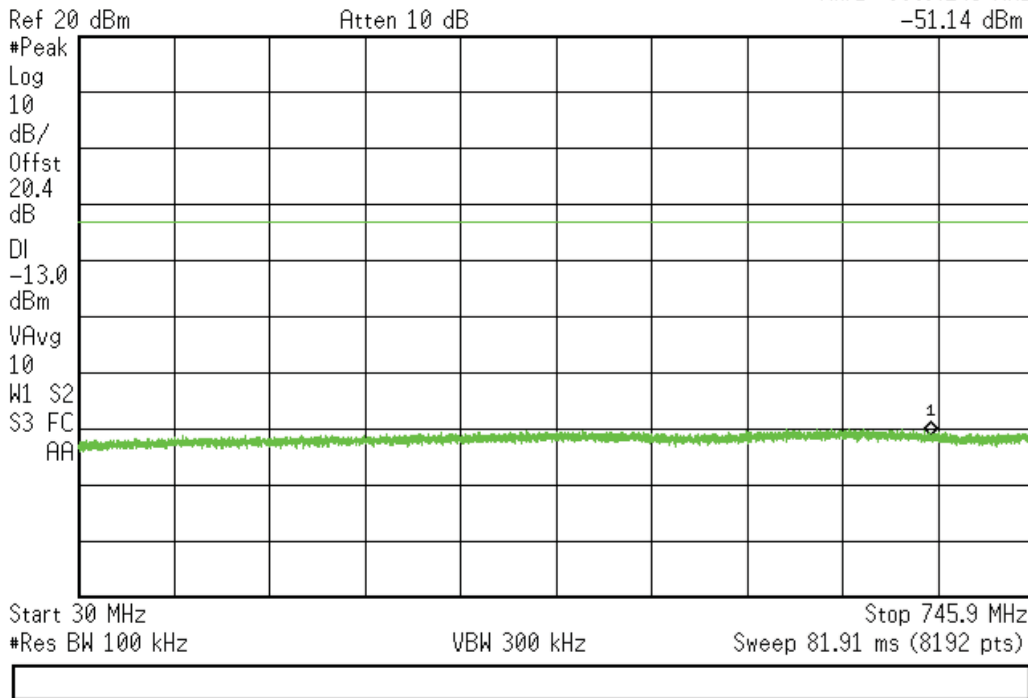


### 746-757 MHz Band (High Frequency)

Agilent 15:21:50 Aug 26, 2014

L

Mkr1 669.4243 MHz  
-51.14 dBm

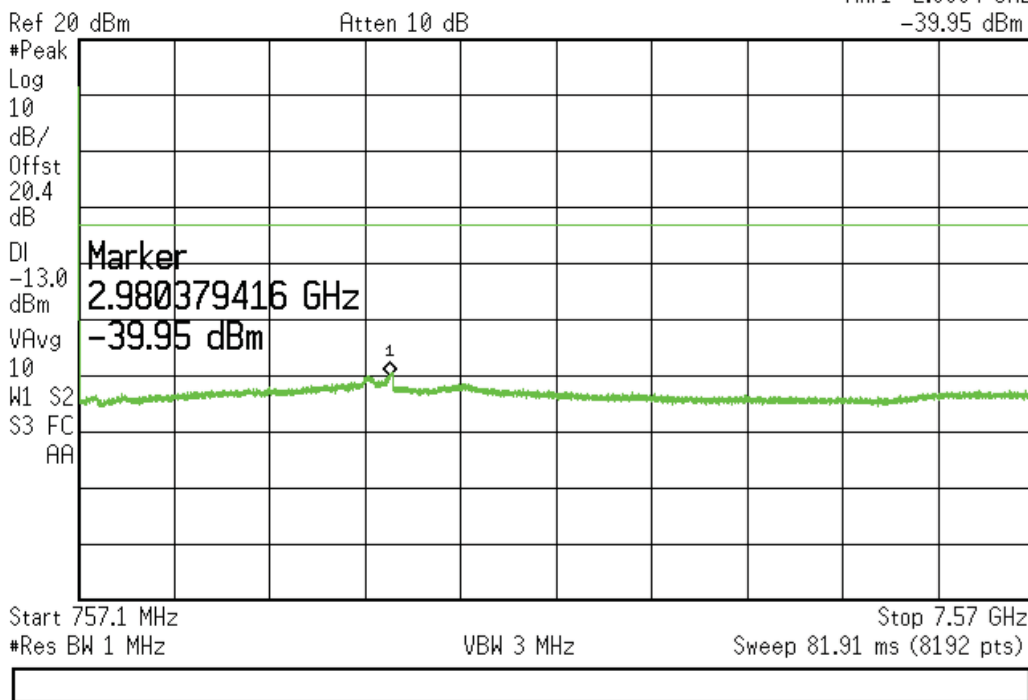


### 746-757 MHz Band (High Frequency) (Cont)

Agilent 07:49:21 Aug 12, 2014

L

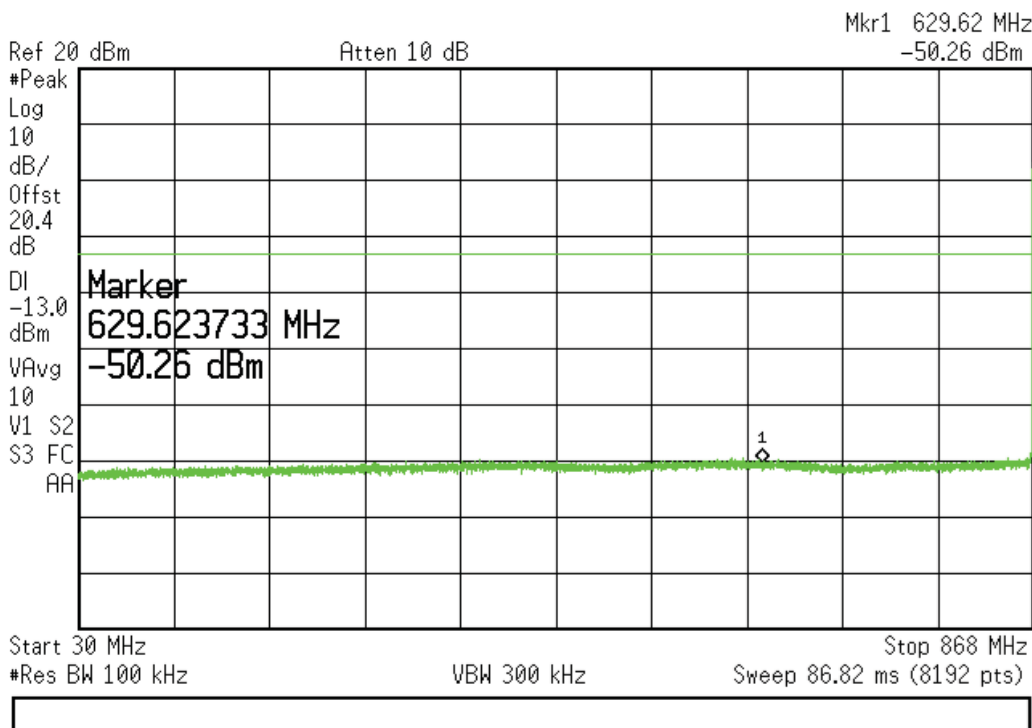
Mkr1 2.9804 GHz  
-39.95 dBm



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

Agilent 07:55:34 Aug 12, 2014

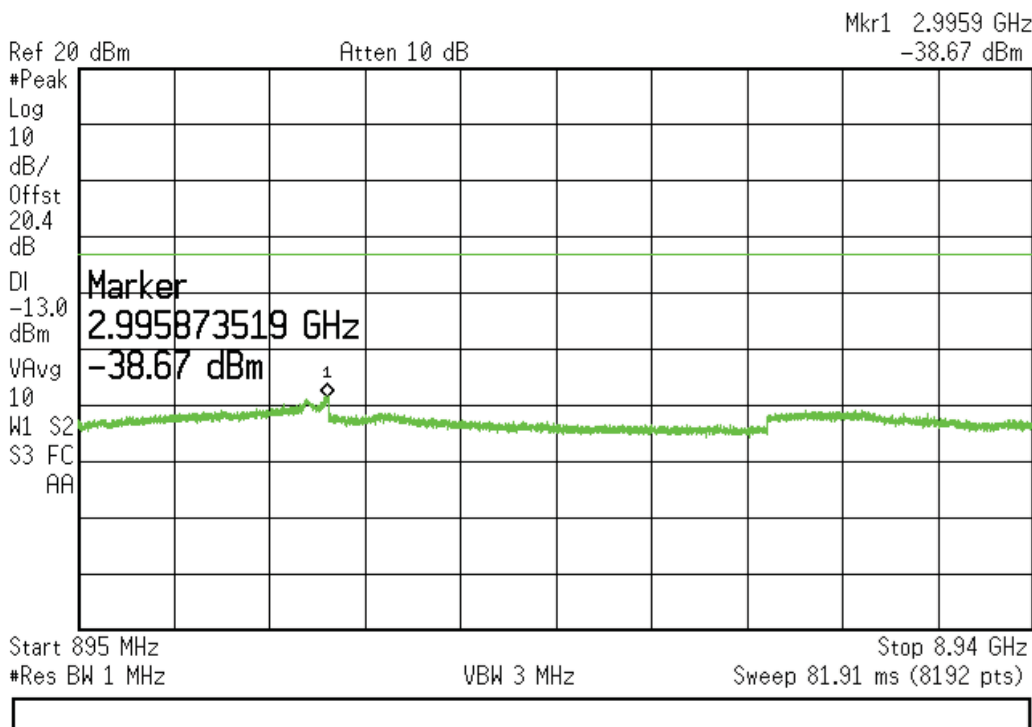
L



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

Agilent 08:07:23 Aug 12, 2014

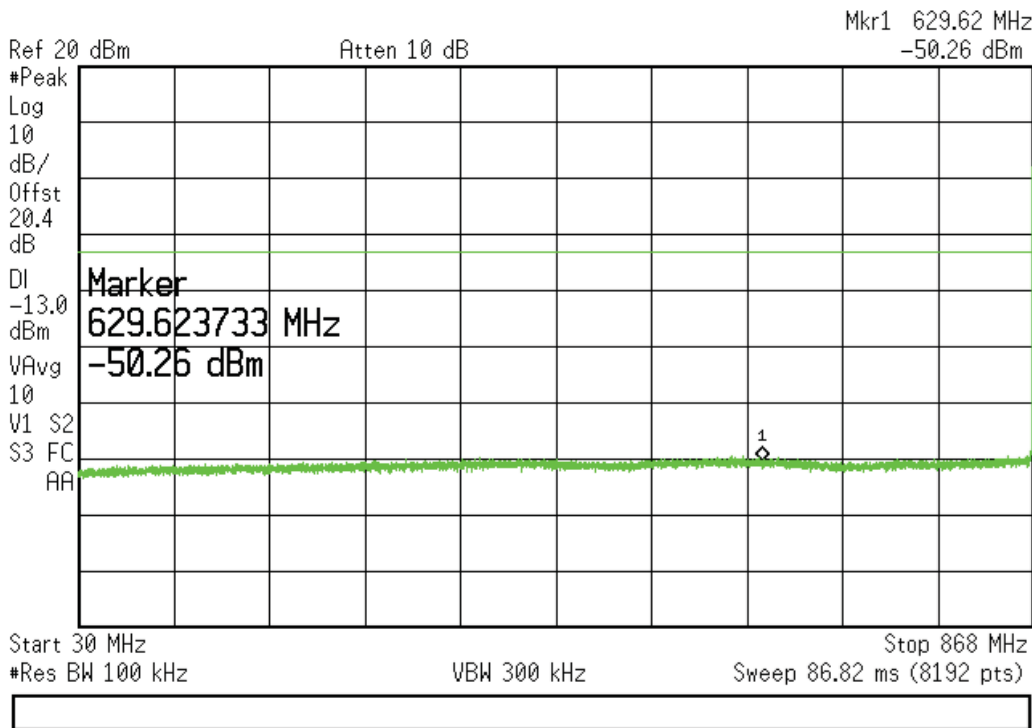
L



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

Agilent 07:57:57 Aug 12, 2014

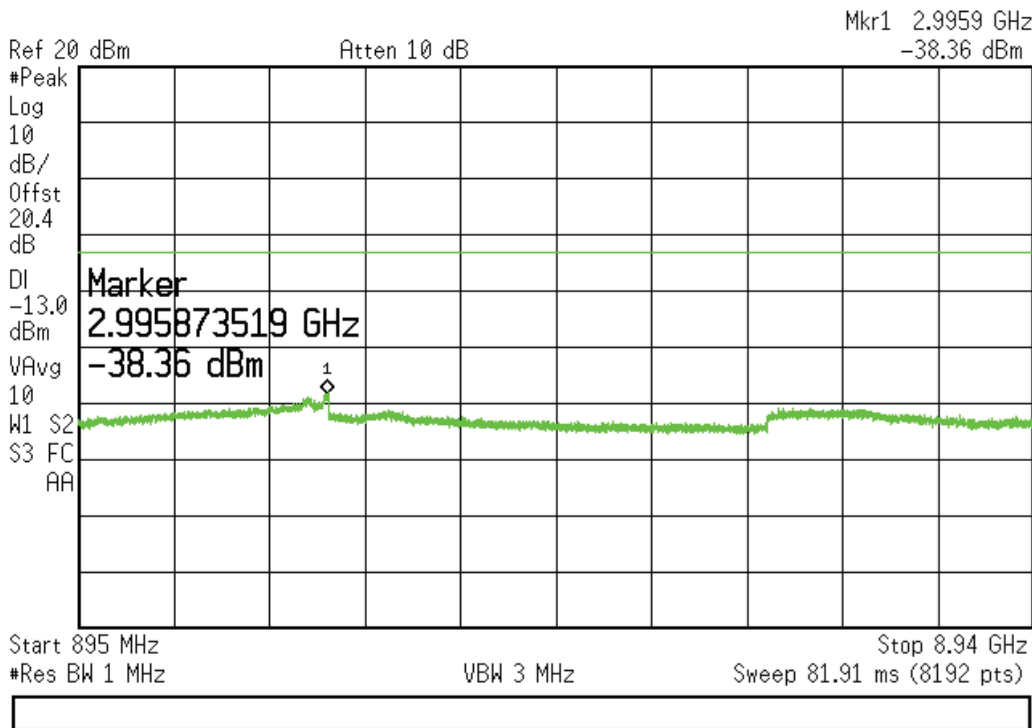
L



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

Agilent 08:06:39 Aug 12, 2014

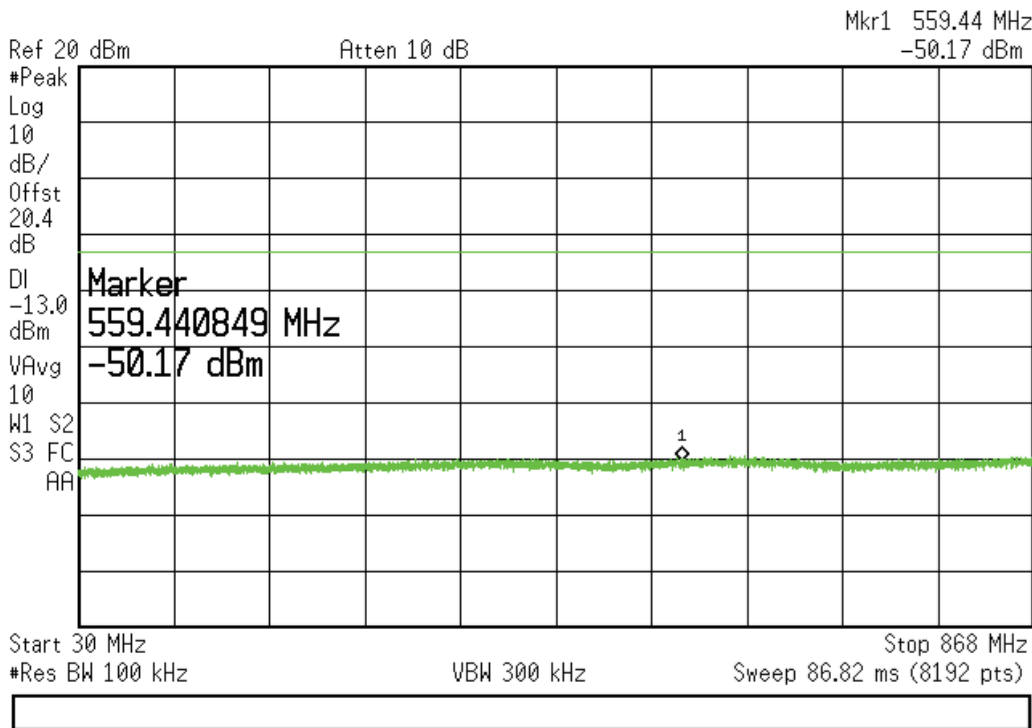
L



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

Agilent 07:59:05 Aug 12, 2014

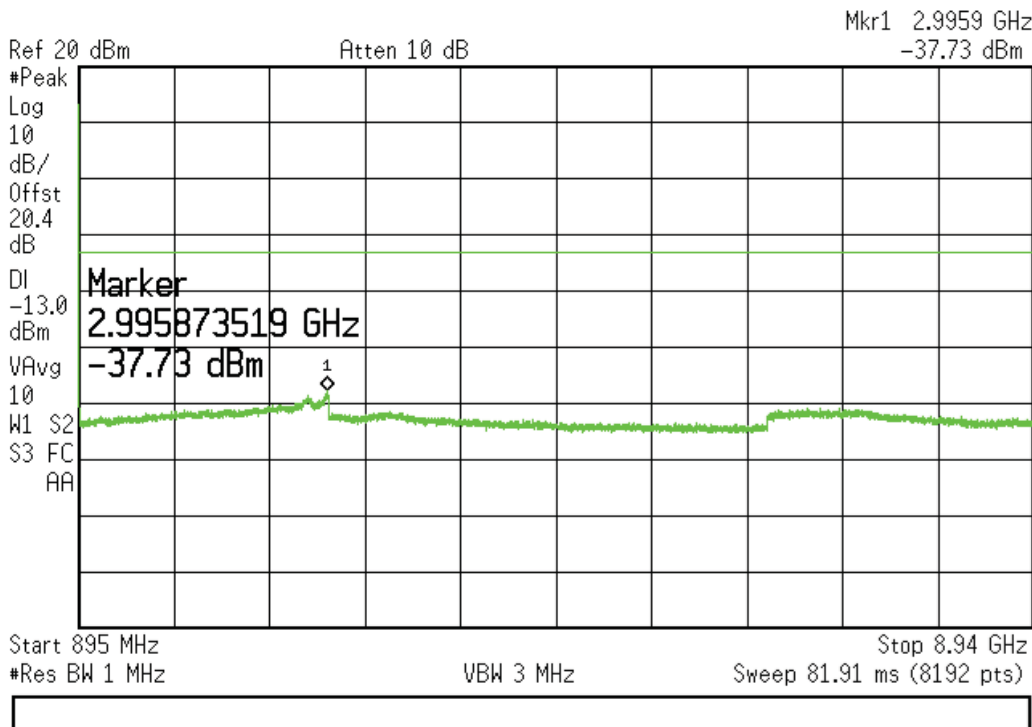
L



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

Agilent 08:05:36 Aug 12, 2014

L



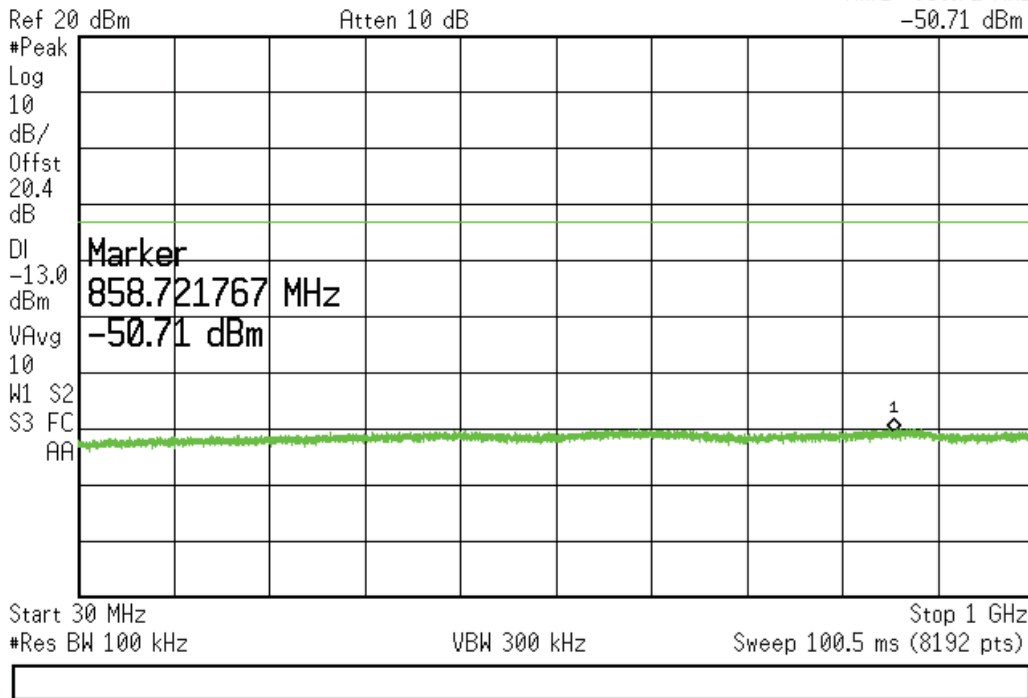


### 1930-1995 MHz Band (Low Frequency)

Agilent 08:09:07 Aug 12, 2014

L

Mkr1 858.72 MHz  
-50.71 dBm

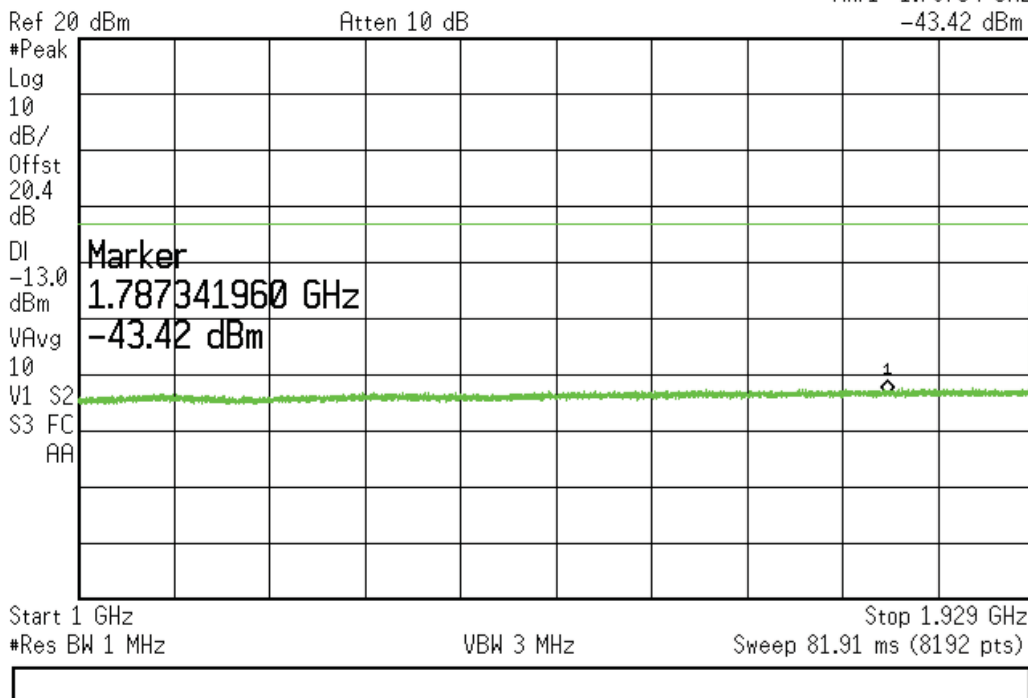


### 1930-1995 MHz Band (Low Frequency)

Agilent 08:19:08 Aug 12, 2014

L

Mkr1 1.78734 GHz  
-43.42 dBm

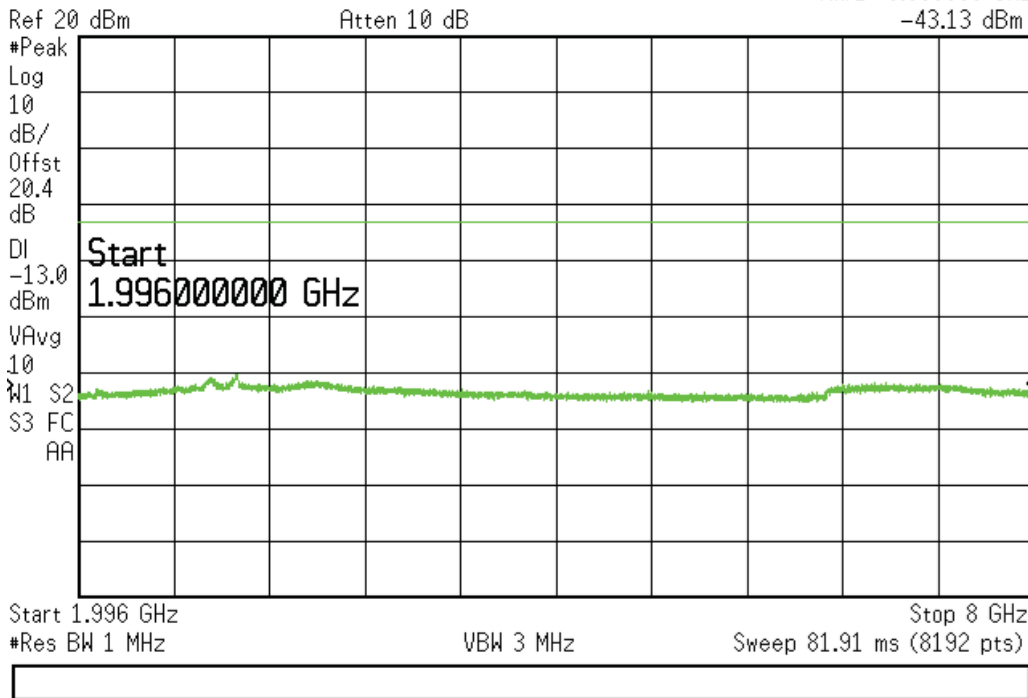


1930-1995 MHz Band (Low Frequency) (Cont)

Agilent 08:20:20 Aug 12, 2014

L

Mkr1 8.000000 GHz  
-43.13 dBm

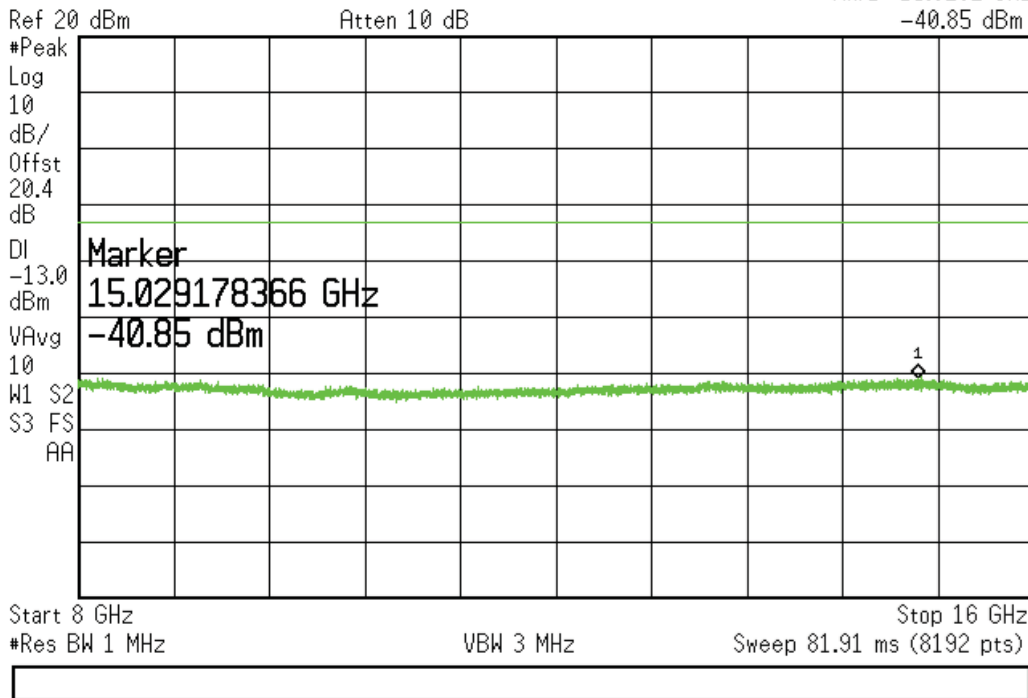


1930-1995 MHz Band (Low Frequency)

Agilent 08:30:32 Aug 12, 2014

L

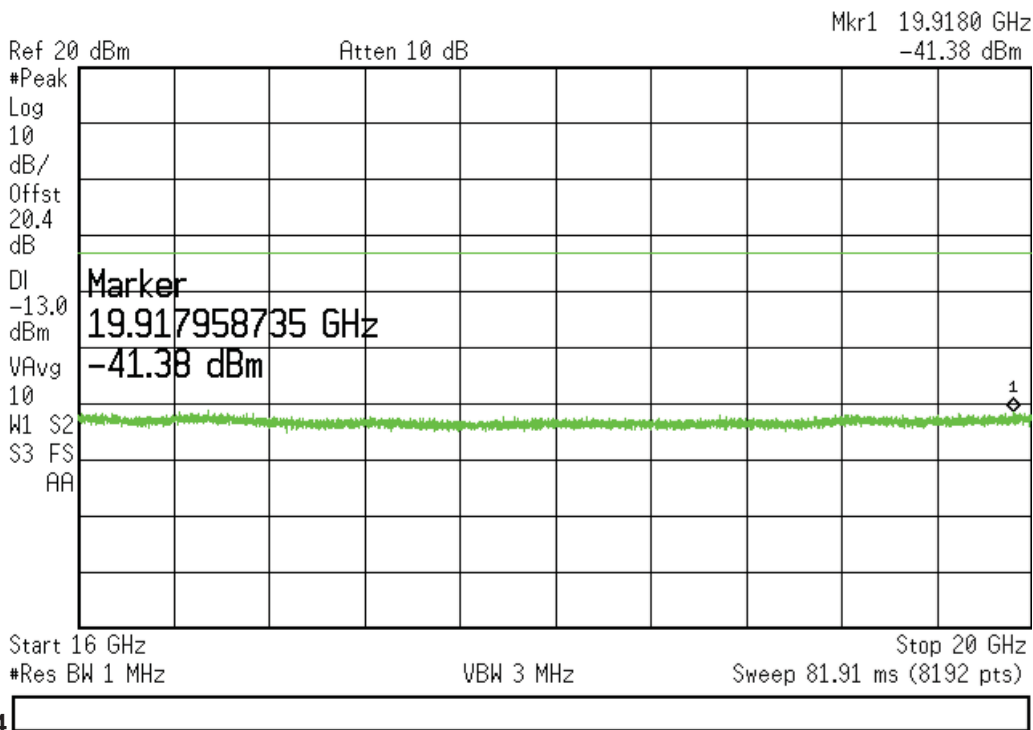
Mkr1 15.0292 GHz  
-40.85 dBm



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

Agilent 08:34:29 Aug 12, 2014

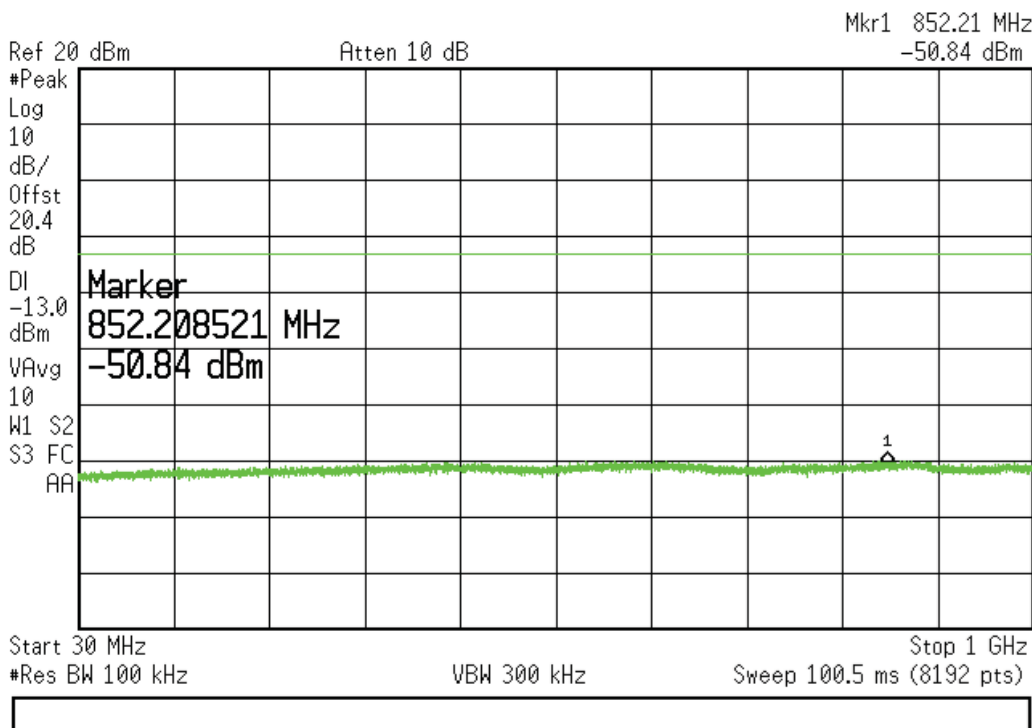
L



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

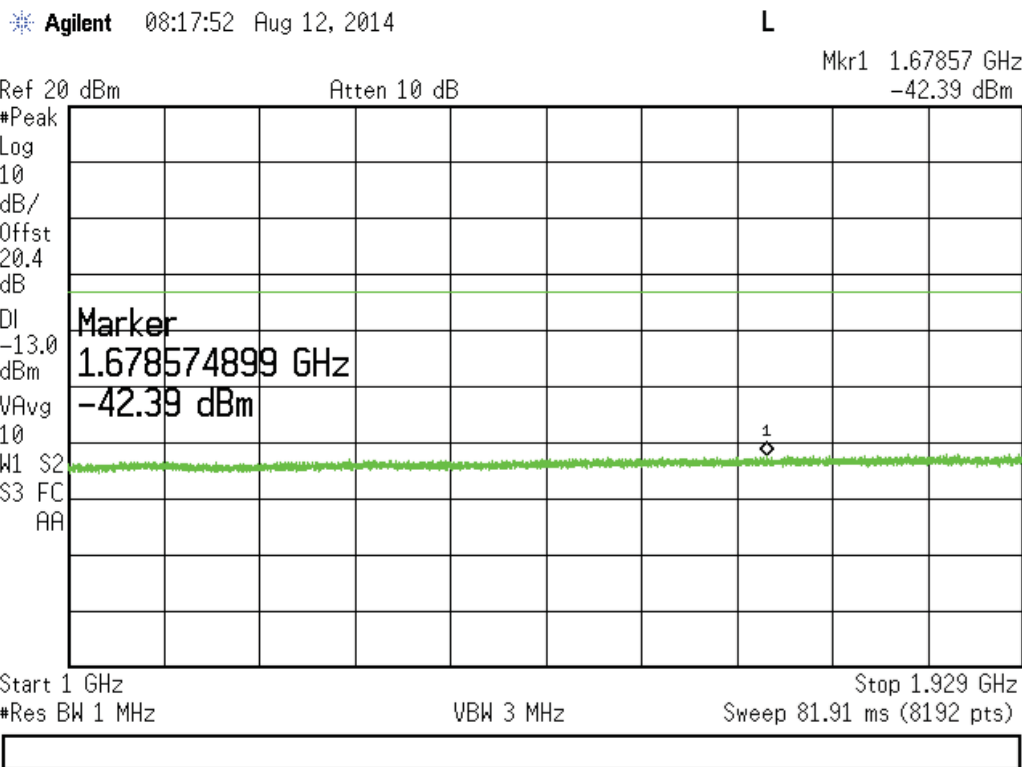
Agilent 08:10:24 Aug 12, 2014

L

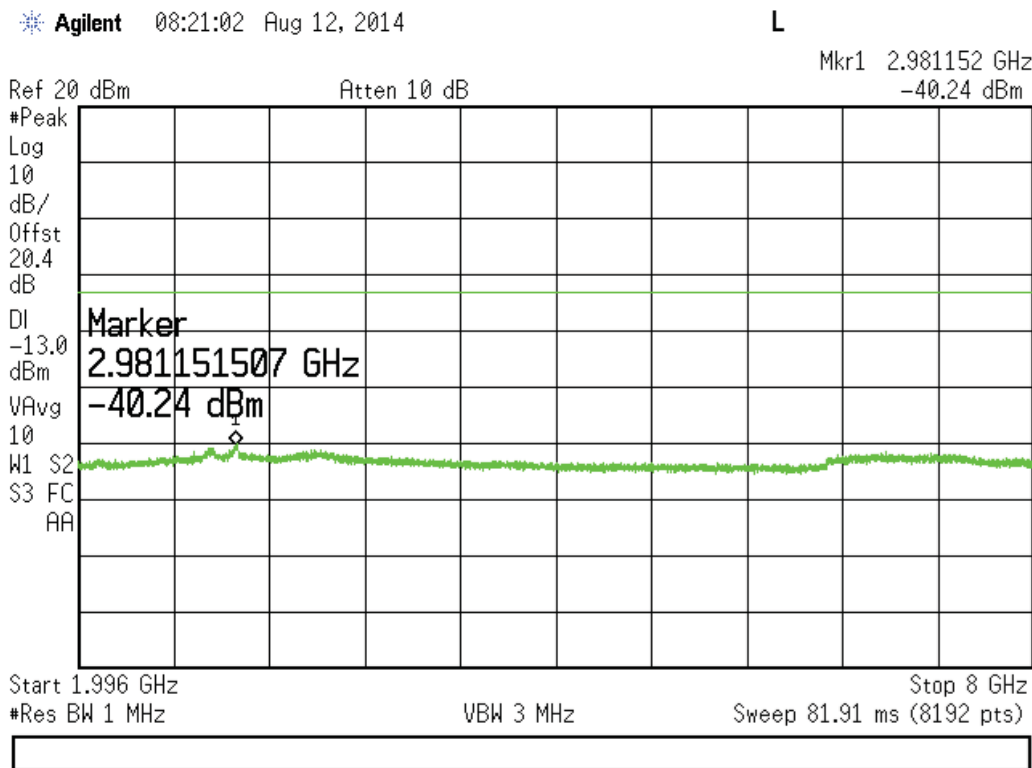




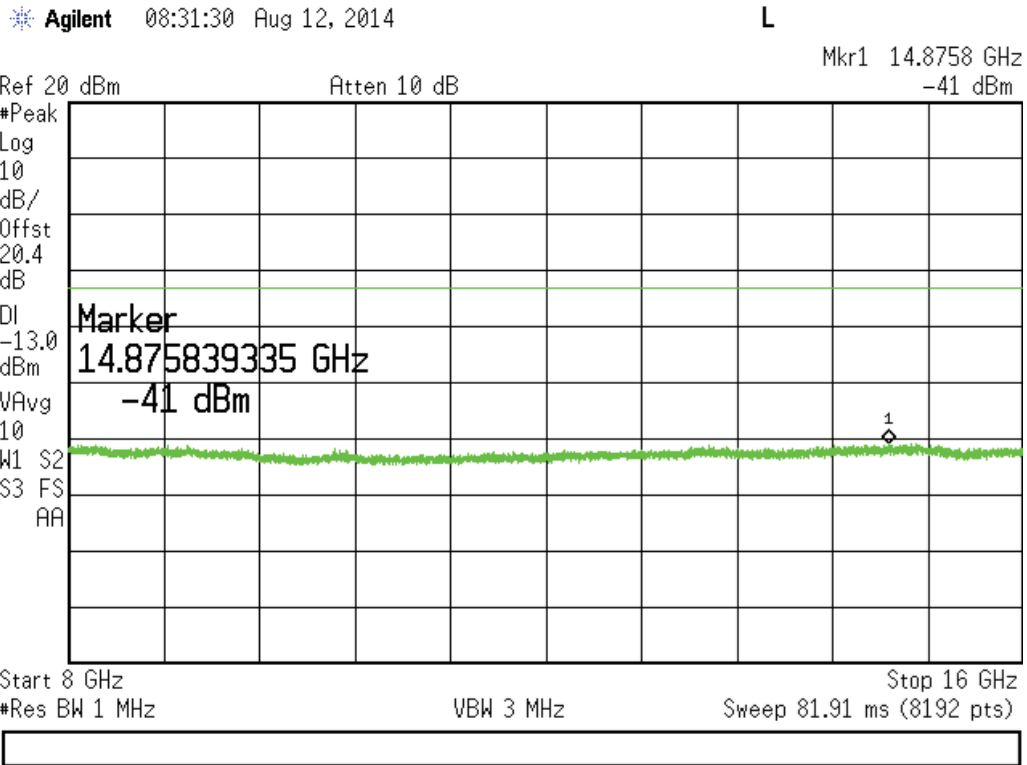
1930-1995 MHz Band (Mid Frequency) (Cont)



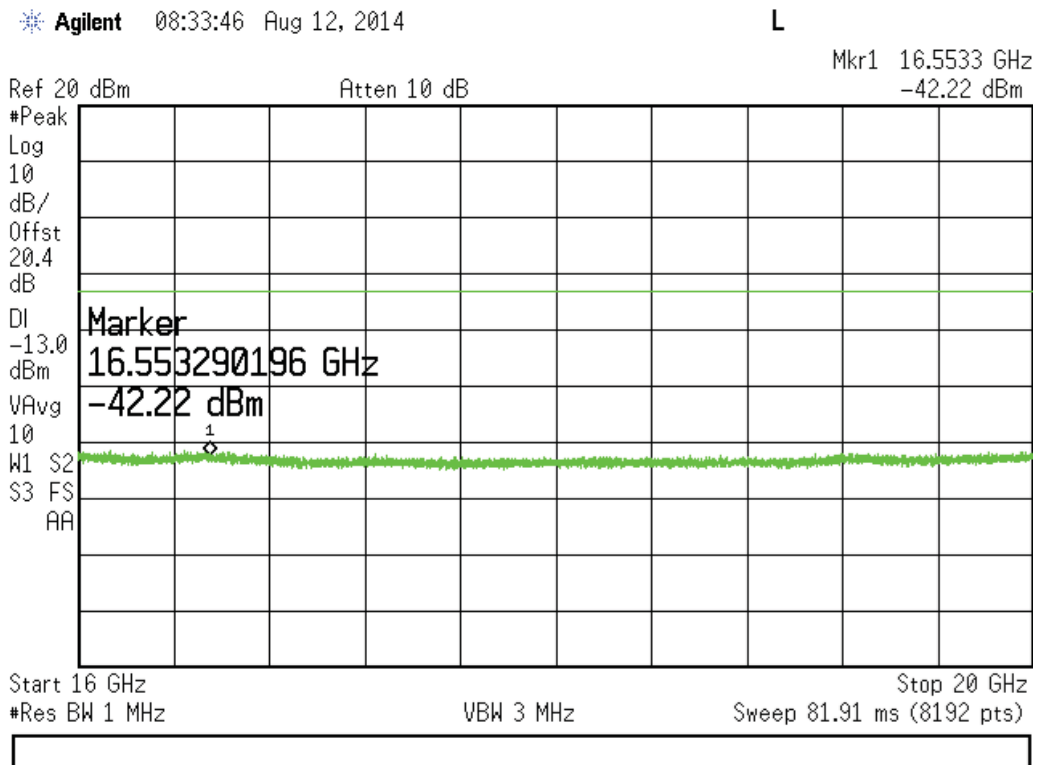
1930-1995 MHz Band (Mid Frequency) (Cont)



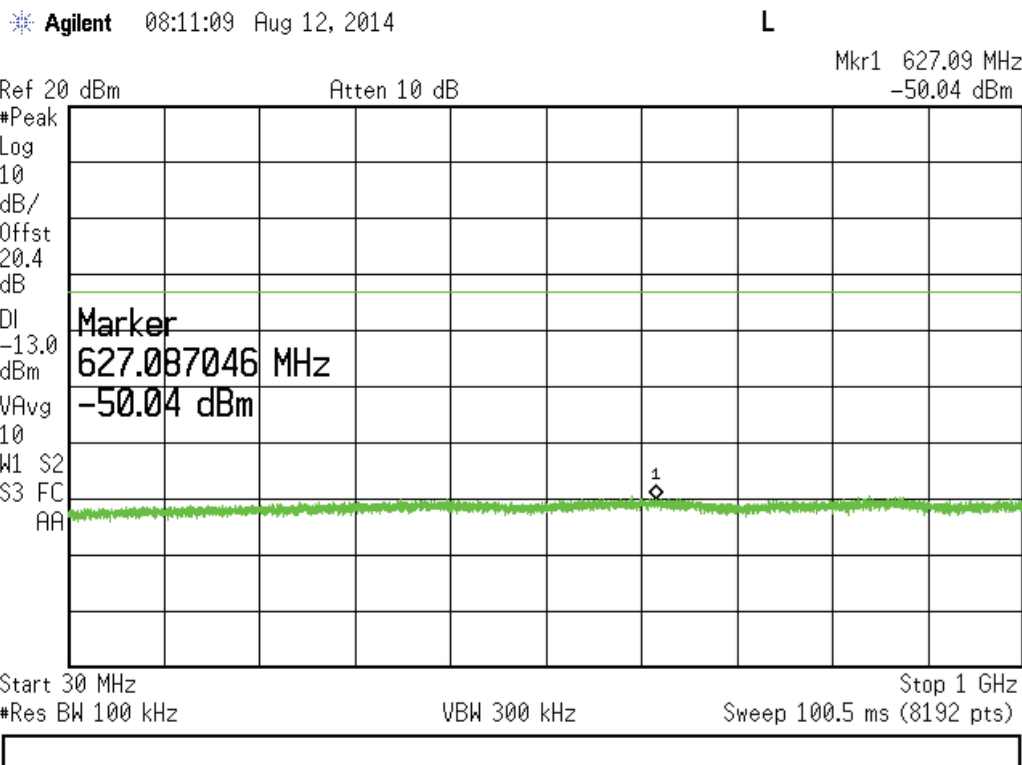
1930-1995 MHz Band (Mid Frequency) (Cont)



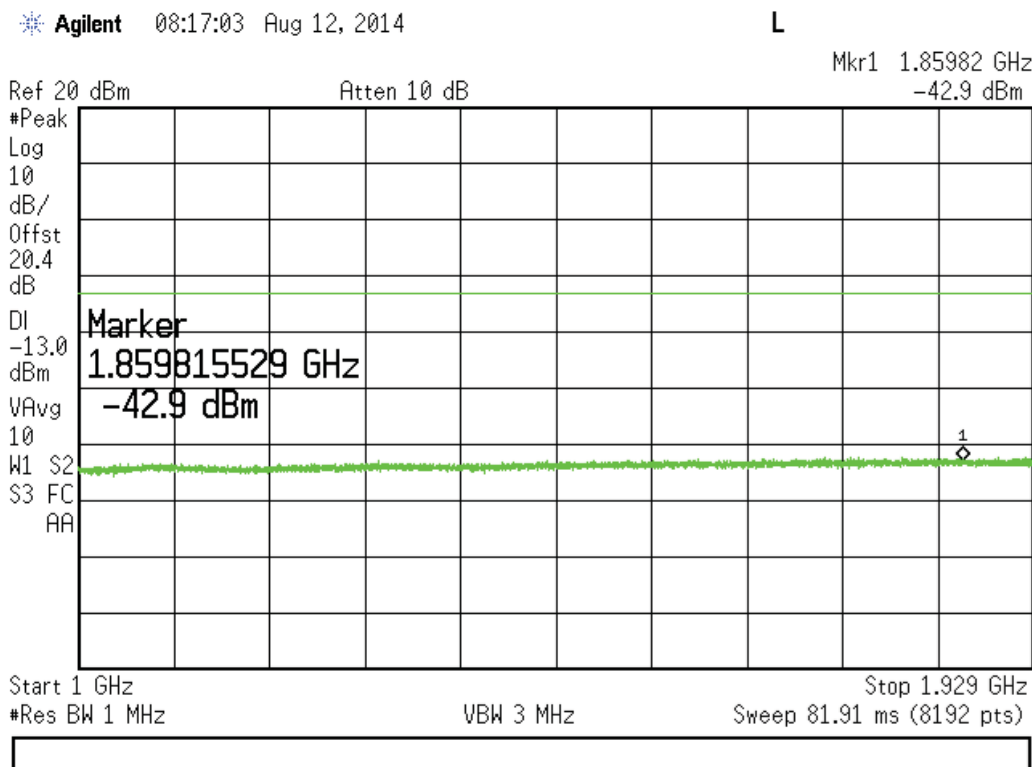
1930-1995 MHz Band (Mid Frequency) (Cont)



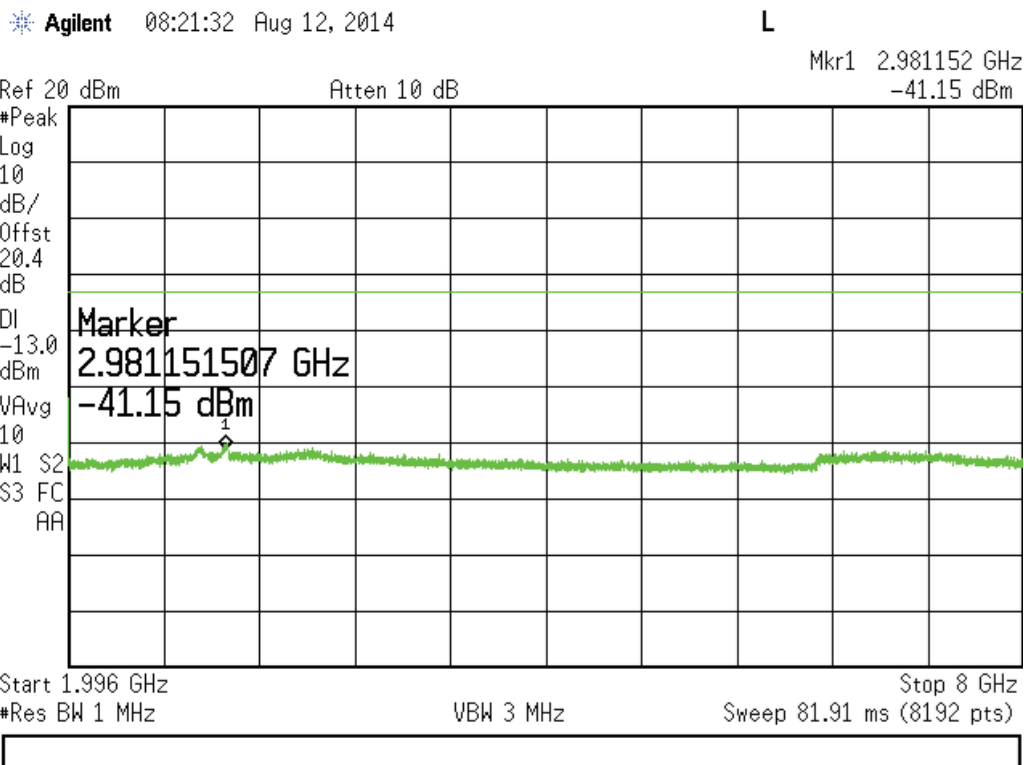
### 1930-1995 MHz Band (High Frequency)



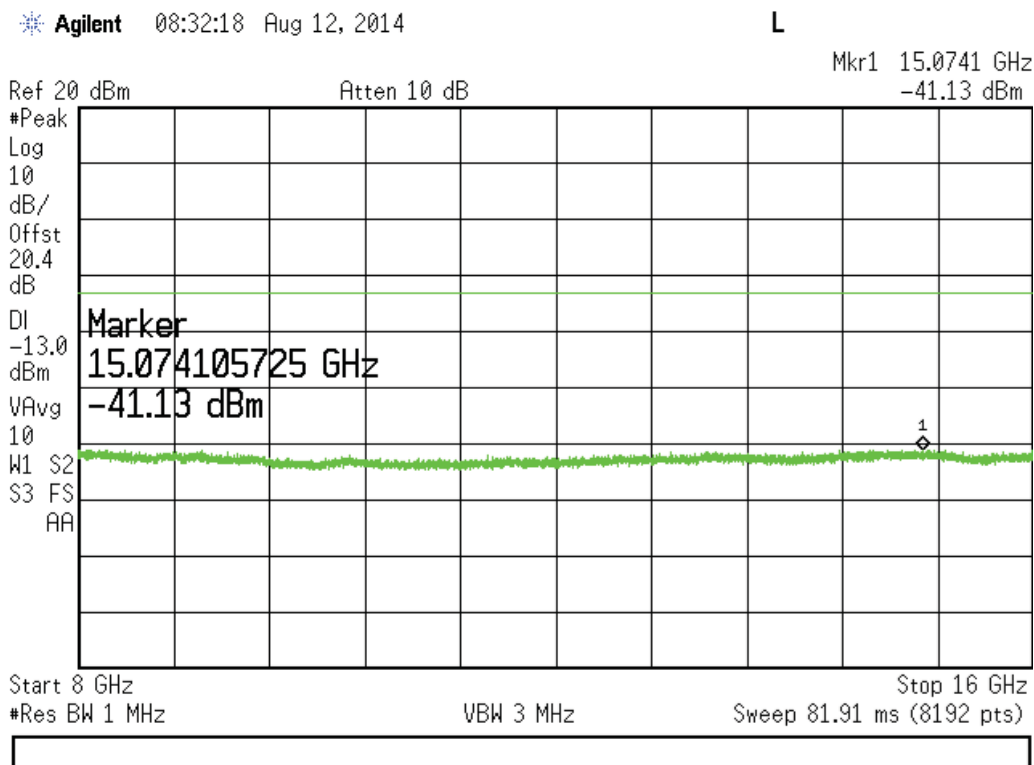
### 1930-1995 MHz Band (High Frequency) (Cont)



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



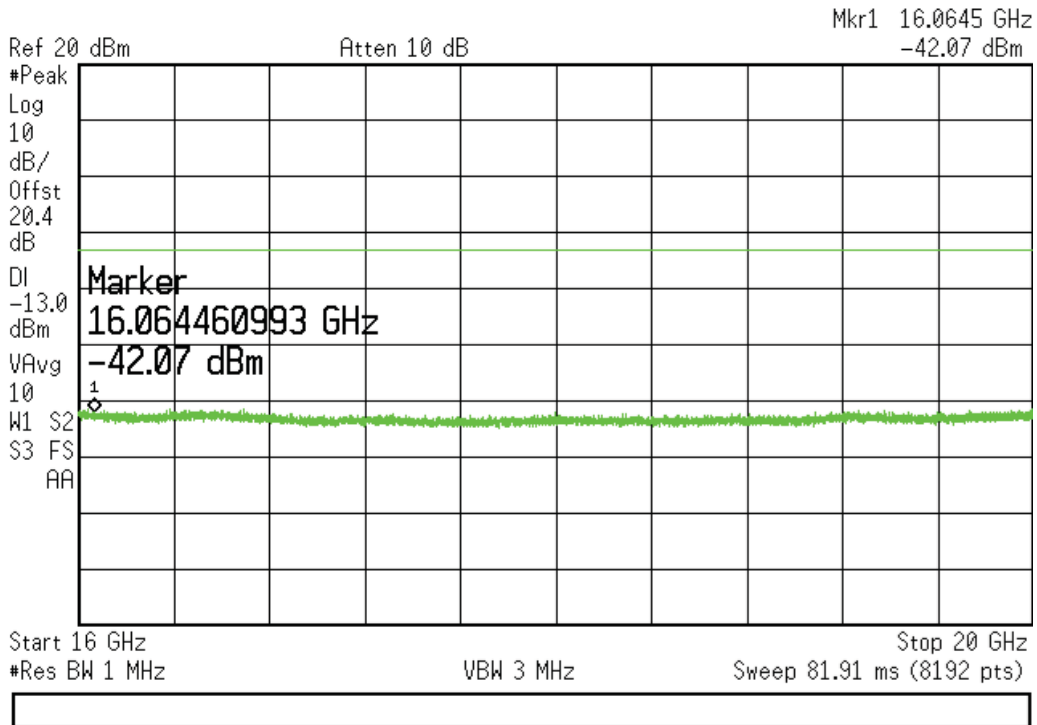
1930-1995 MHz Band (High Frequency) (Cont)



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

Agilent 08:32:57 Aug 12, 2014

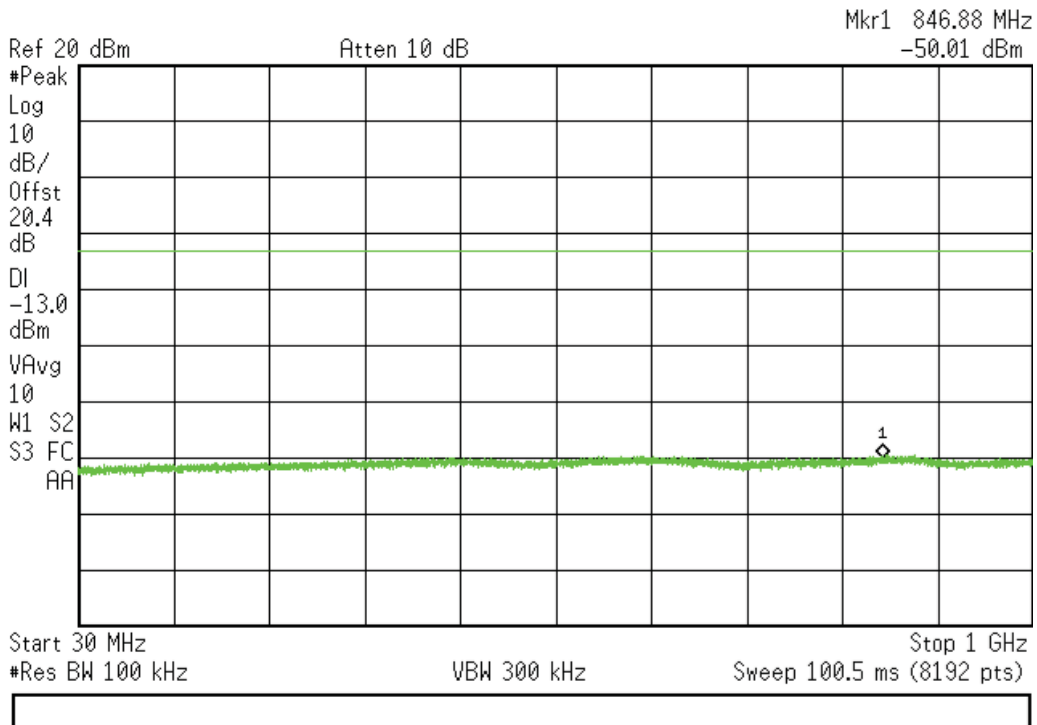
L



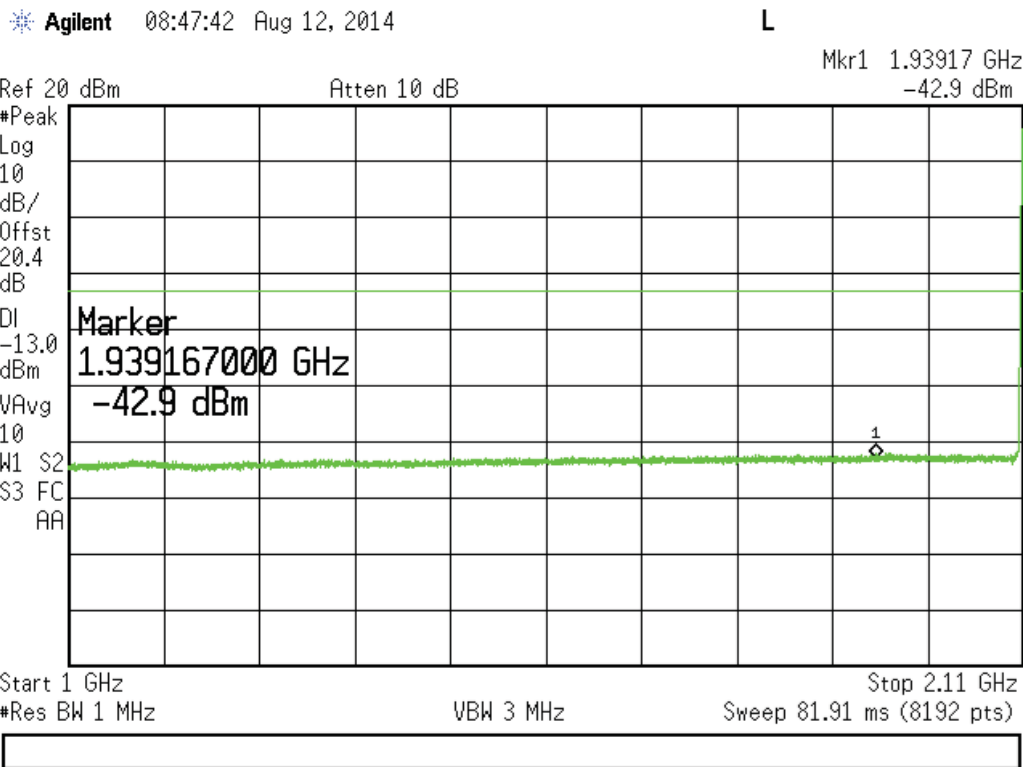
### 2110-2155 MHz Band (Low Frequency)

Agilent 08:36:43 Aug 12, 2014

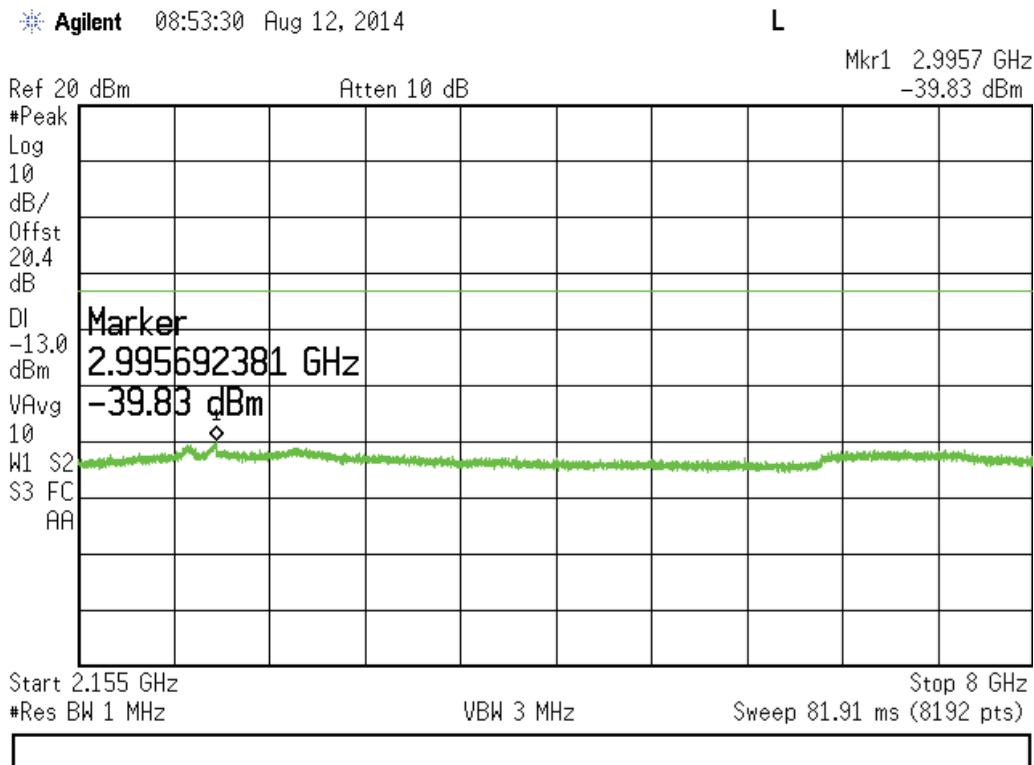
L



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



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



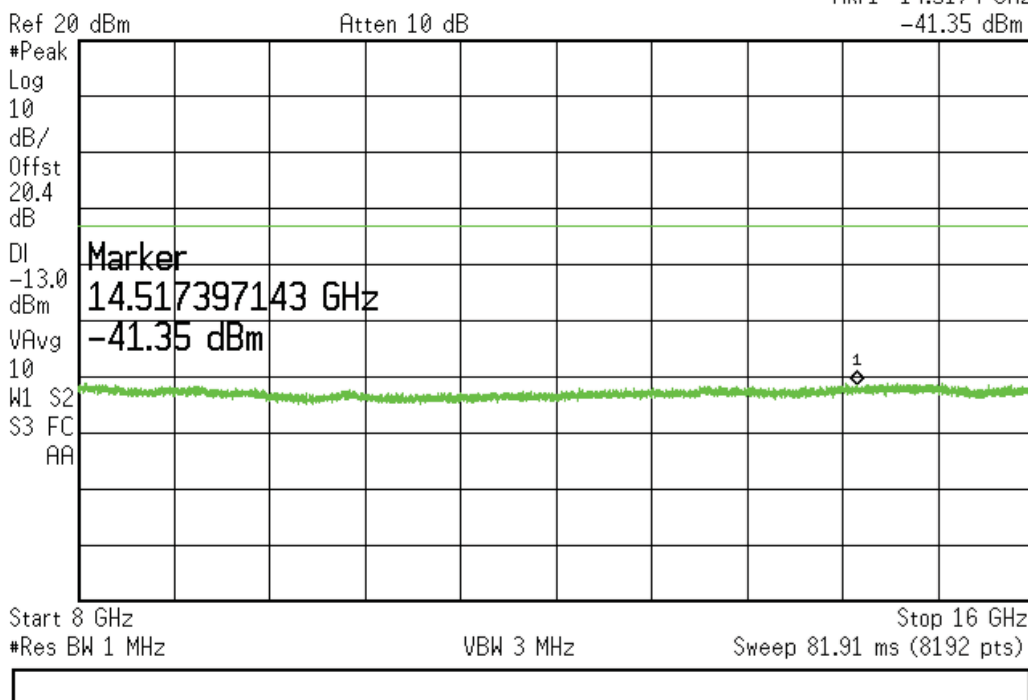


### 2110-2155 MHz Band (Low Frequency) (Cont)

Agilent 09:04:23 Aug 12, 2014

L

Mkr1 14.5174 GHz  
-41.35 dBm

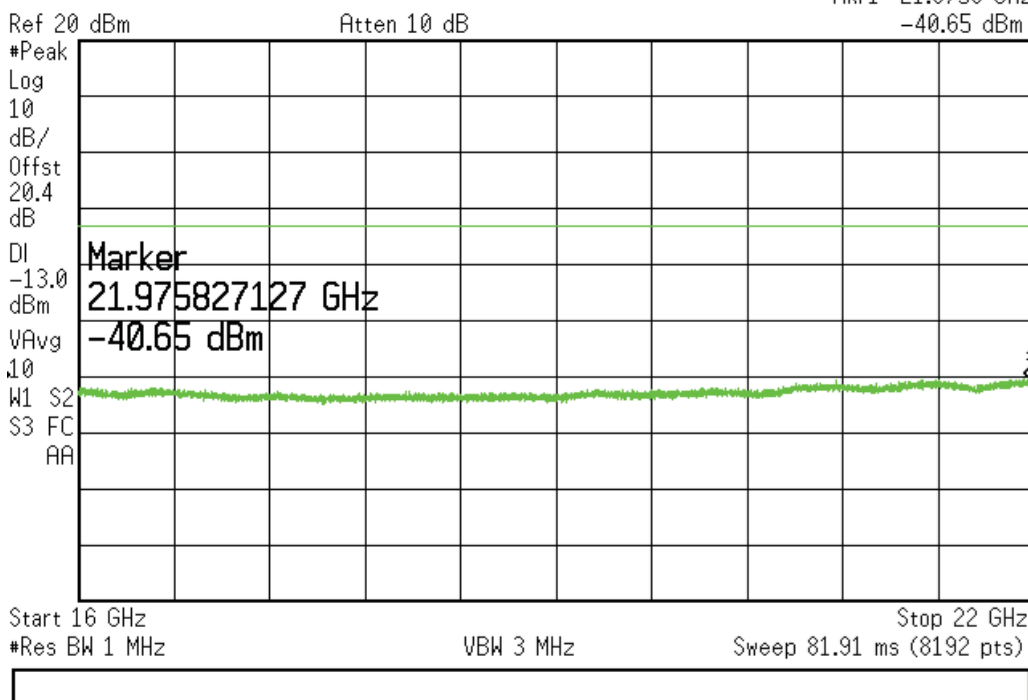


### 2110-2155 MHz Band (Low Frequency) (Cont)

Agilent 09:00:01 Aug 12, 2014

L

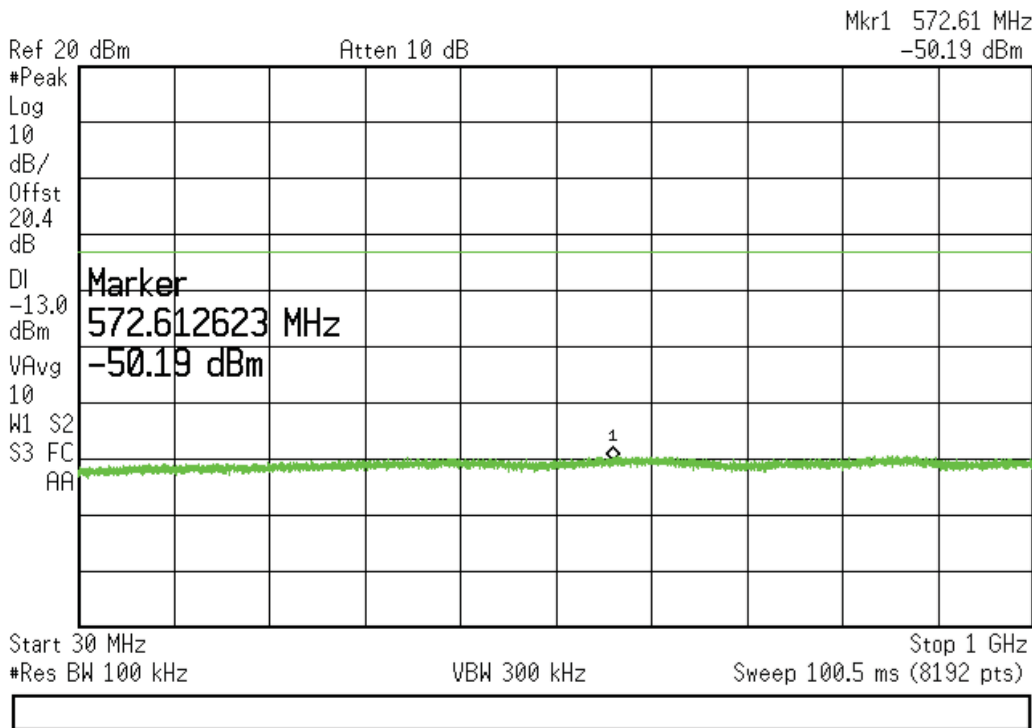
Mkr1 21.9758 GHz  
-40.65 dBm



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

Agilent 08:37:52 Aug 12, 2014

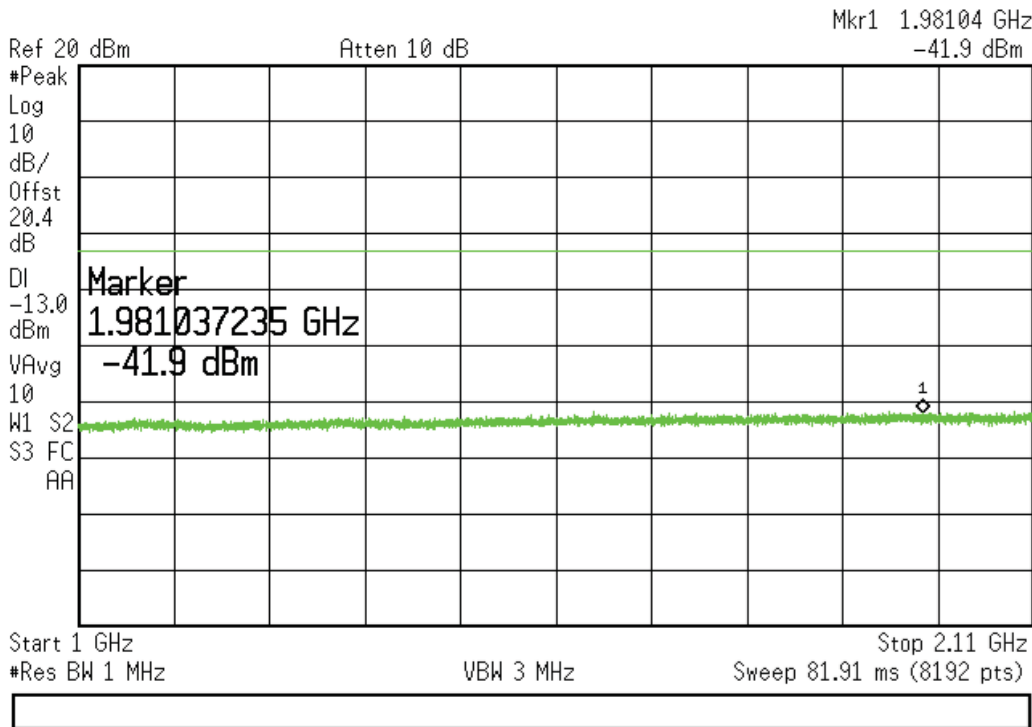
L



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

Agilent 08:48:28 Aug 12, 2014

L

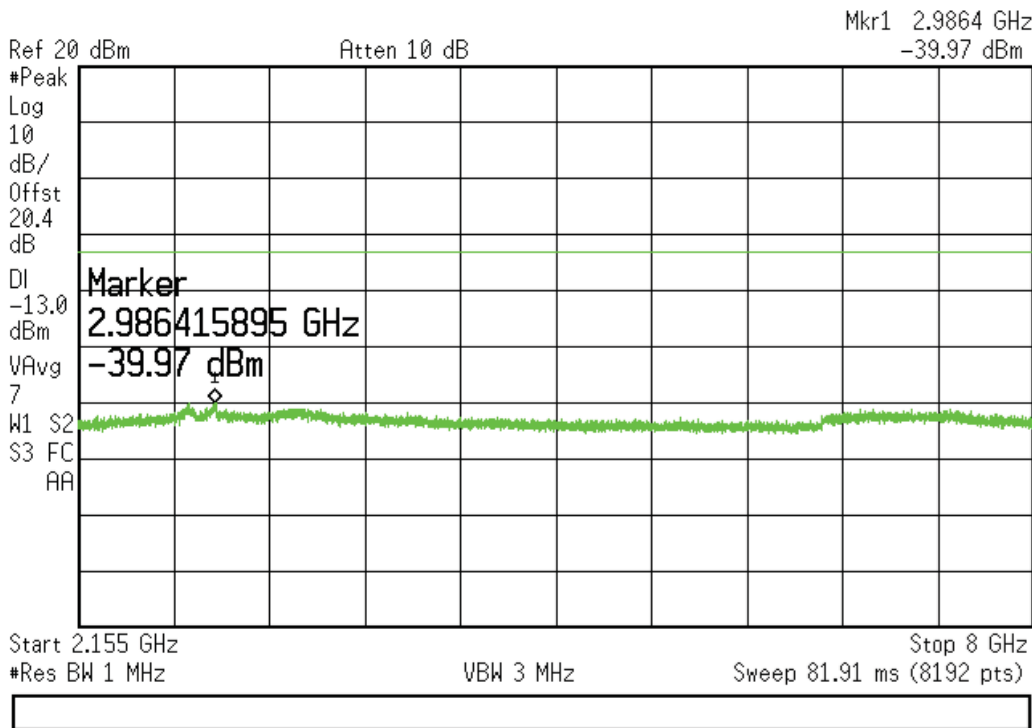




2110-2155 MHz Band (Mid Frequency) (Cont)

Agilent 08:52:56 Aug 12, 2014

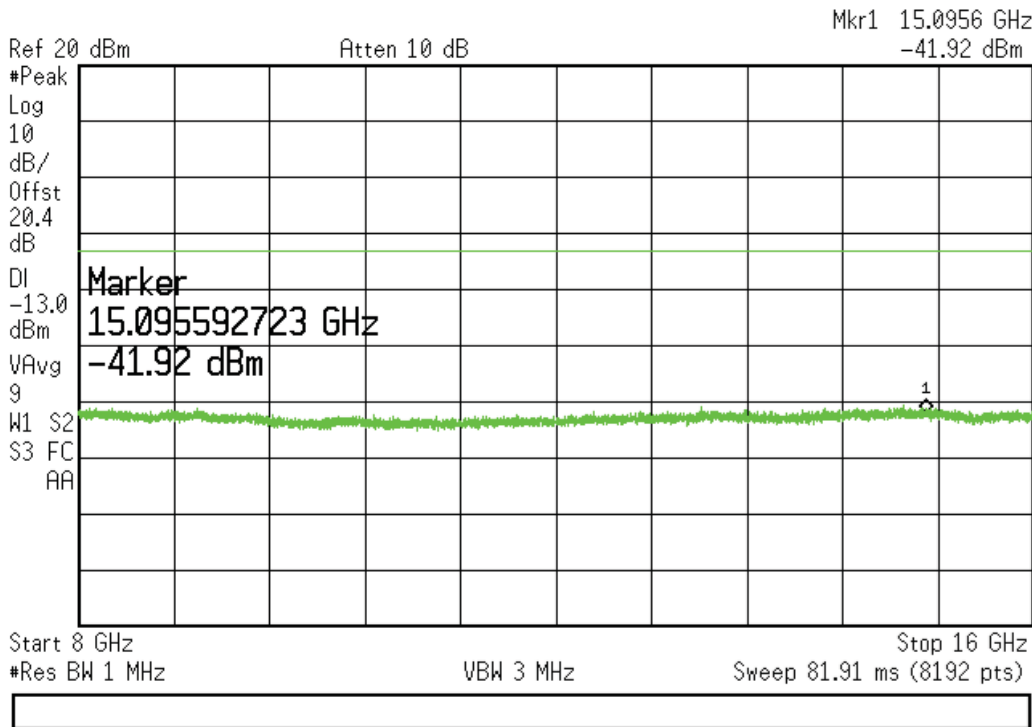
L



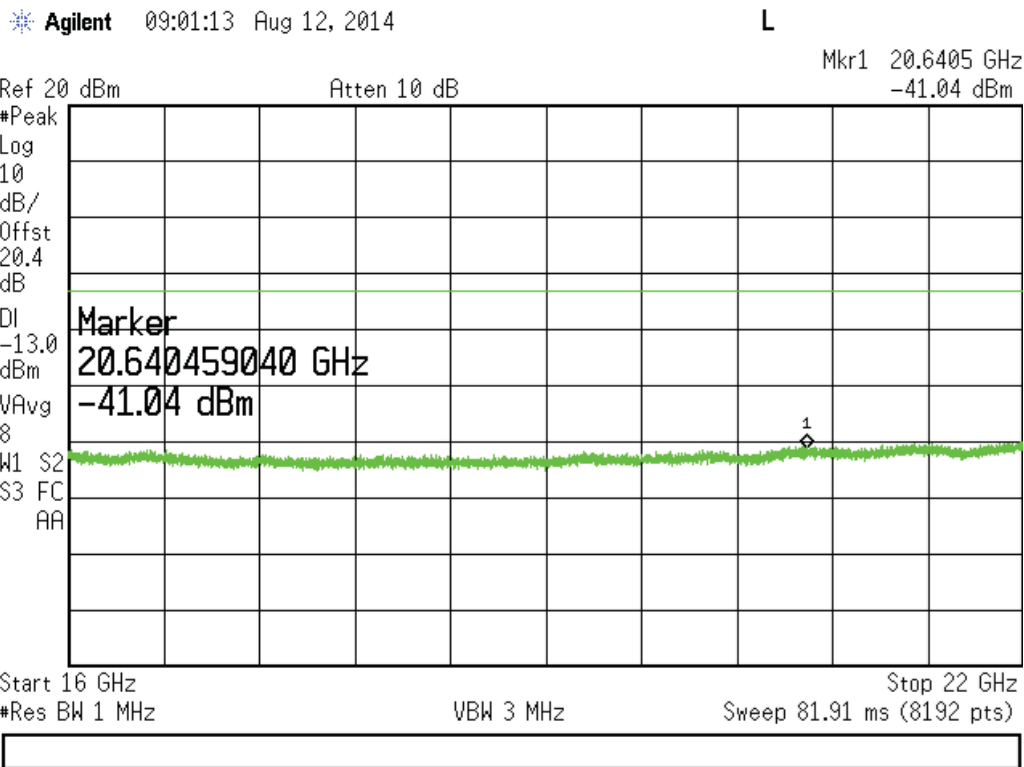
2110-2155 MHz Band (Mid Frequency) (Cont)

Agilent 09:03:37 Aug 12, 2014

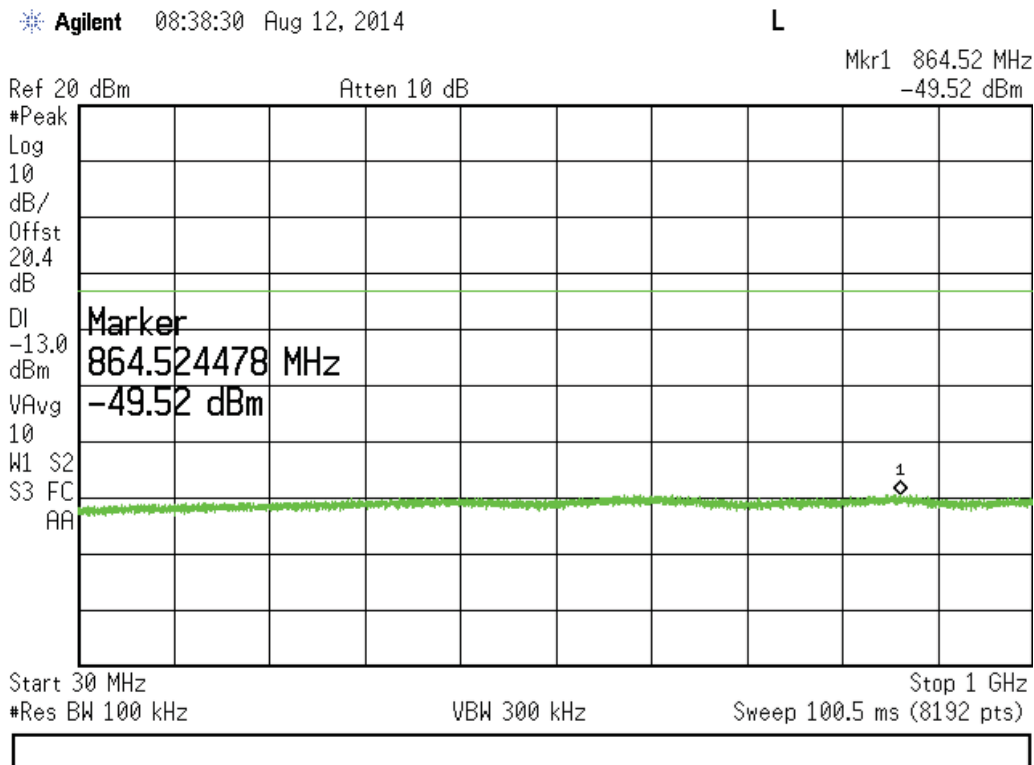
L



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



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



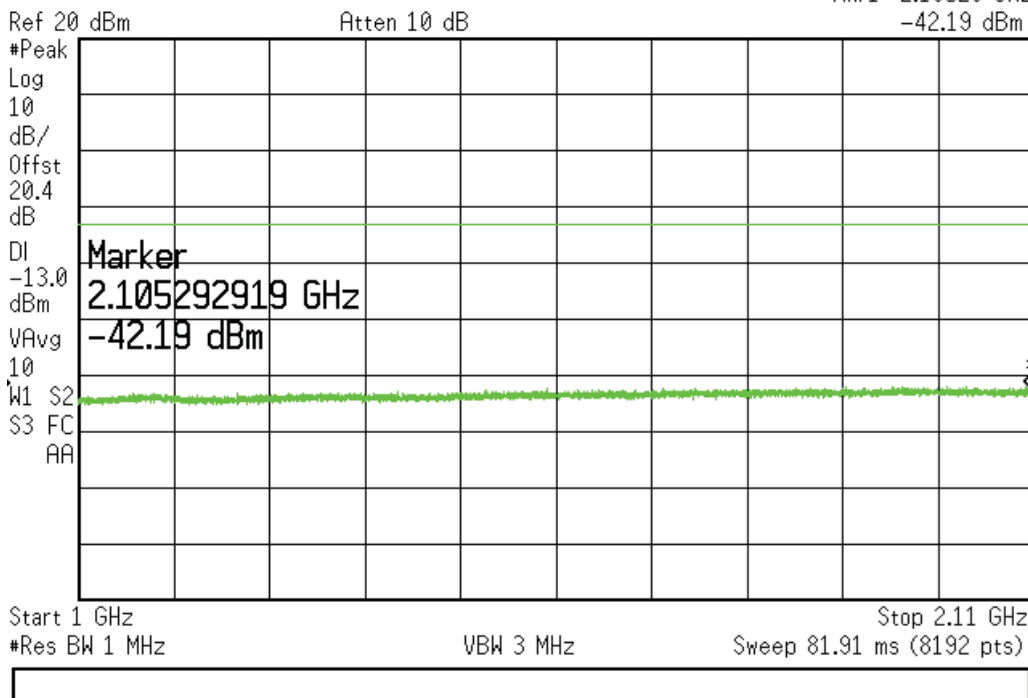


### 2110-2155 MHz Band (High Frequency) (Cont)

Agilent 08:49:04 Aug 12, 2014

L

Mkr1 2.10529 GHz  
-42.19 dBm

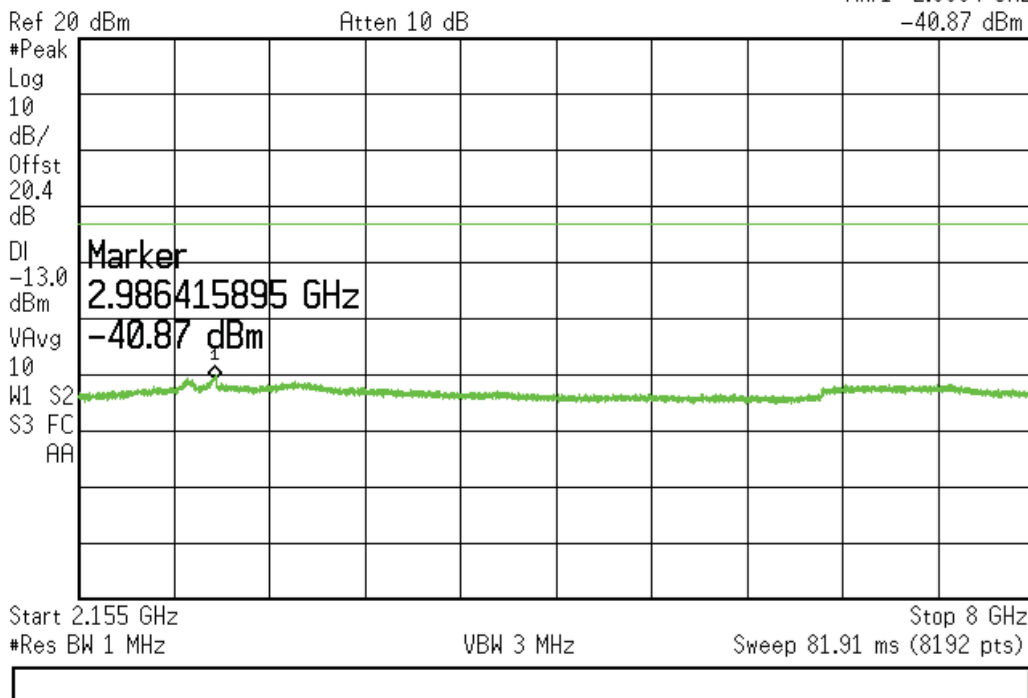


### 2110-2155 MHz Band (High Frequency) (Cont)

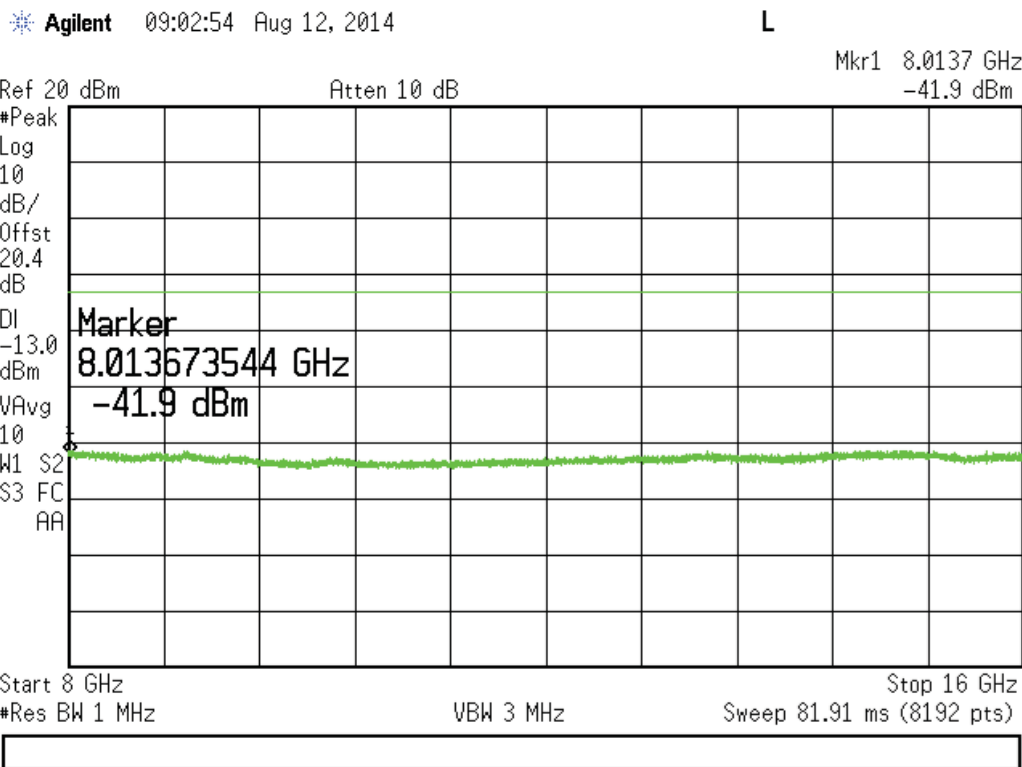
Agilent 08:52:05 Aug 12, 2014

L

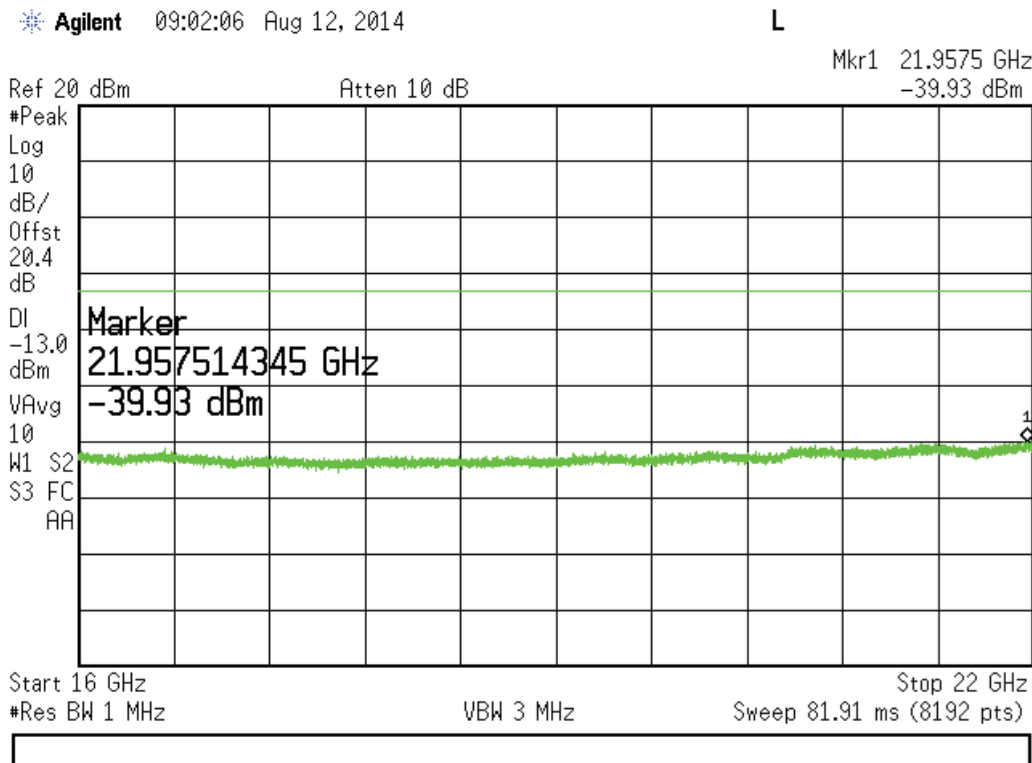
Mkr1 2.9864 GHz  
-40.87 dBm



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



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



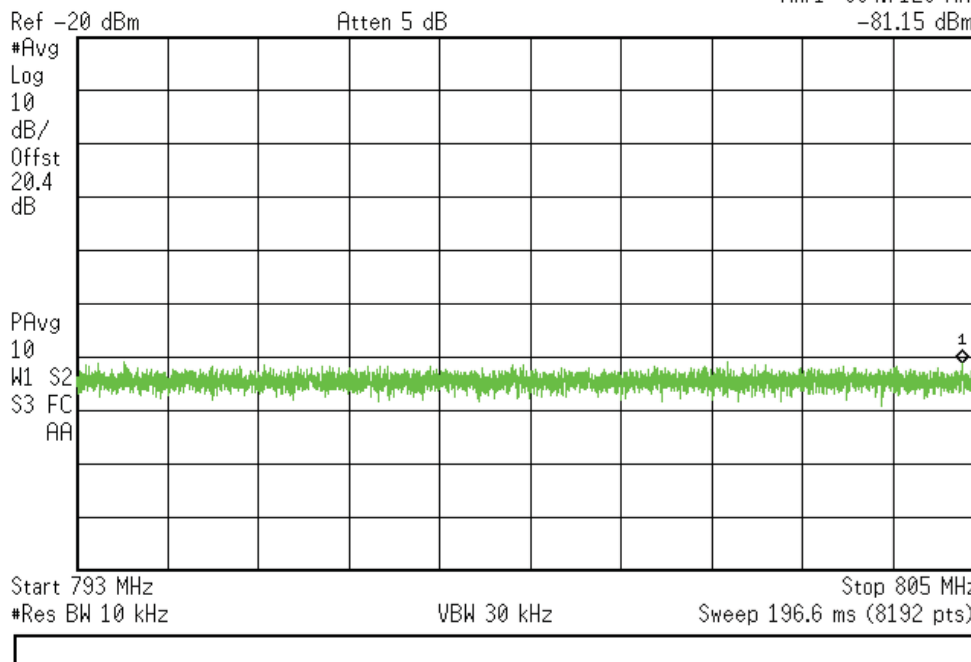


### Additional testing 793 - 805 MHz (Narrowband)

Agilent 15:40:25 Aug 14, 2014

L

Mkr1 804.7129 MHz  
-81.15 dBm

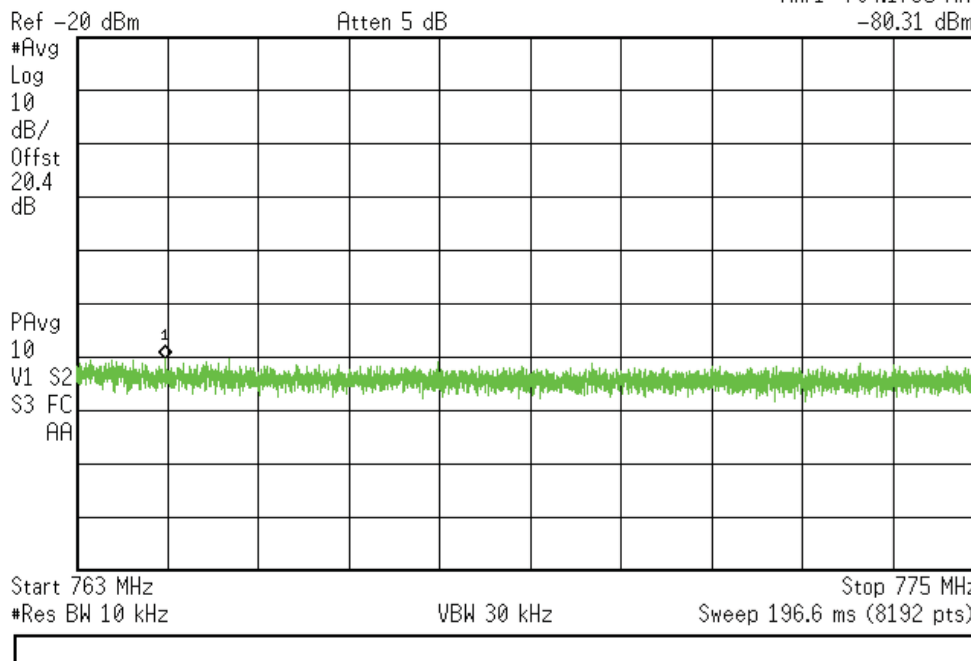


### Additional testing 763 - 775 MHz (Narrowband)

Agilent 15:39:09 Aug 14, 2014

L

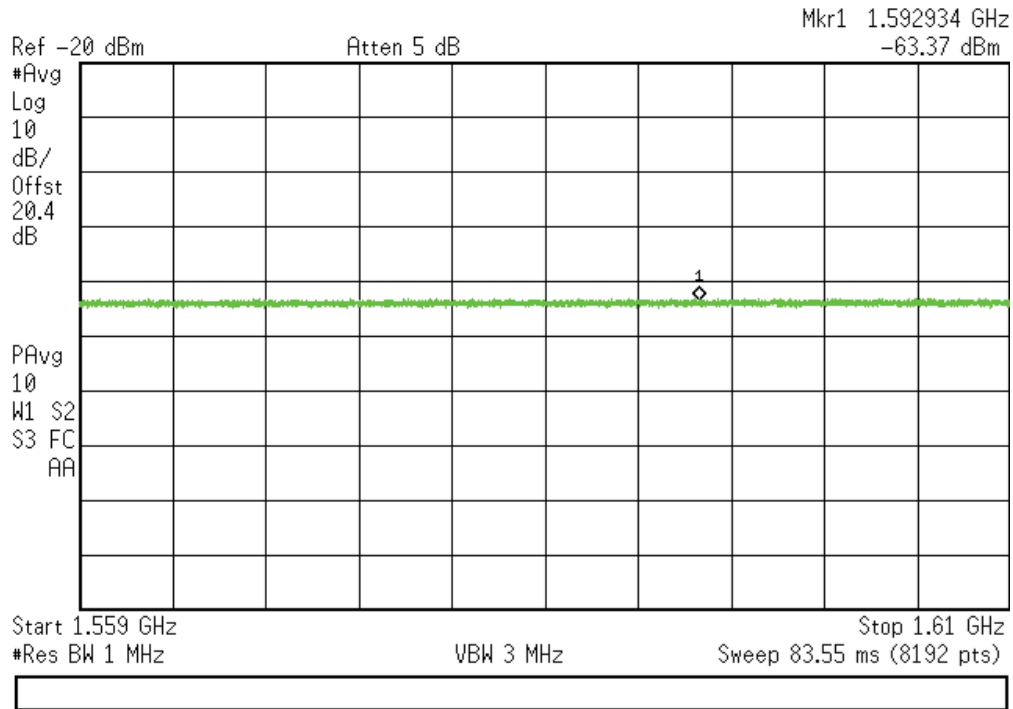
Mkr1 764.1735 MHz  
-80.31 dBm



**Additional testing 1559 - 1610 MHz (Wideband)**

Agilent 15:37:02 Aug 14, 2014

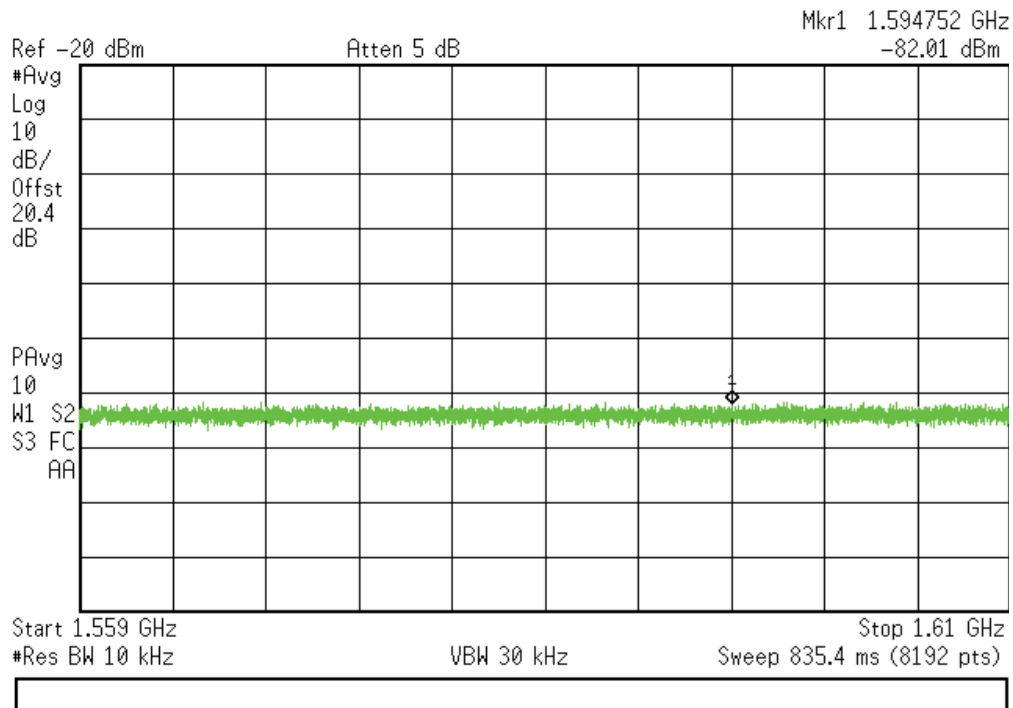
L



**Additional testing 1559 - 1610 MHz (Narrowband)**

Agilent 15:35:13 Aug 14, 2014

L



## Radiated Spurious Emissions

**Name of Test:** Radiated Spurious Emissions  
**Test Equipment Utilized:** i00103, i00349, i00405, i00428, i00331

**Engineer:** Mike Graffeo  
**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.

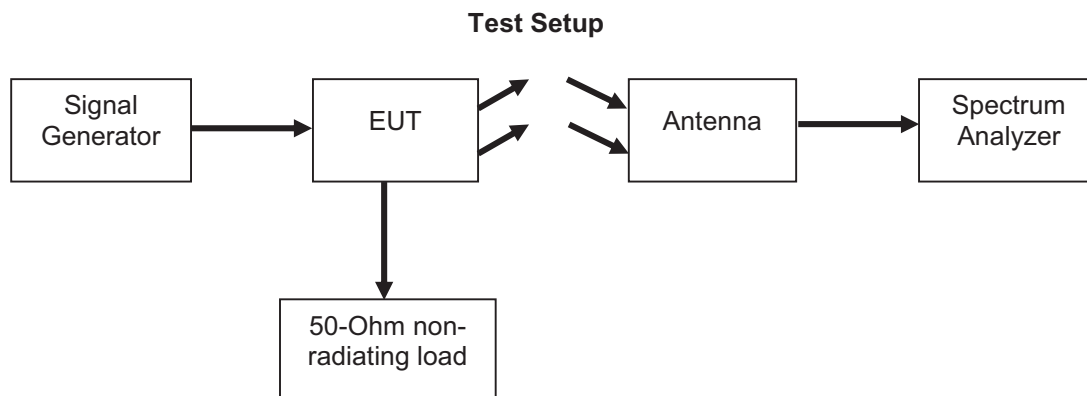
The RBW was set to 100 kHz for measurements below 1 GHz and 1 MHz for measurements above 1 GHz. The VBW was set to 3 times the RBW.

The following formula was used for calculating the limits:

$$\text{Radiated Spurious Emissions Limit} = P1 - (43 + 10\text{Log}(P2)) = -13\text{dBm}$$

P1 = power in dBm

P2 = power in Watts





**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**

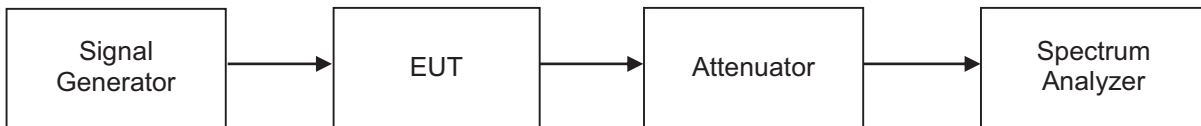
i00405, i00331

**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)

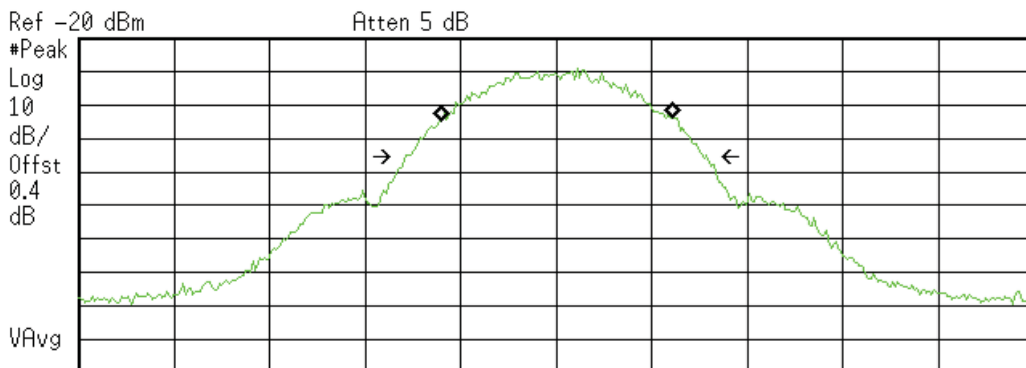
| Band (MHz) | Worst case 99% Emission Bandwidth at Input (MHz) | Worst case 99% Emission Bandwidth at EUT Output (MHz) |
|------------|--|---|
| 728-746    | 1.272  | 1.269   |
| 746-757    | 1.273  | 1.274   |
| 869-894    | 1.270  | 1.273   |
| 1930-1995  | 1.273  | 1.269   |
| 2110-2155  | 1.272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

**Uplink (GSM Signal)**

**698 - 716 MHz Band  
Input**

Agilent 20:16:26 Aug 7, 2014

L



Ref -20 dBm Atten 5 dB  
Center 707 MHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
**245.1982 kHz**

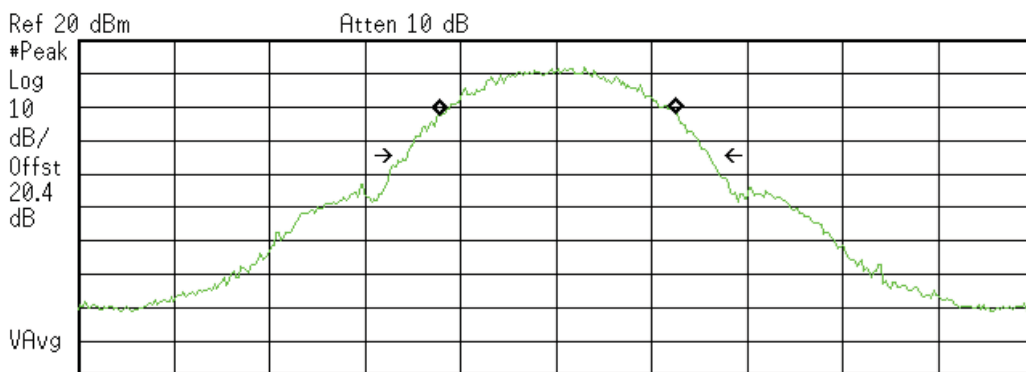
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 915.283 Hz  
**x dB Bandwidth** 314.209 kHz

**Output**

Agilent 20:28:23 Aug 7, 2014

L



Ref 20 dBm Atten 10 dB  
Center 707 MHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
**246.2156 kHz**

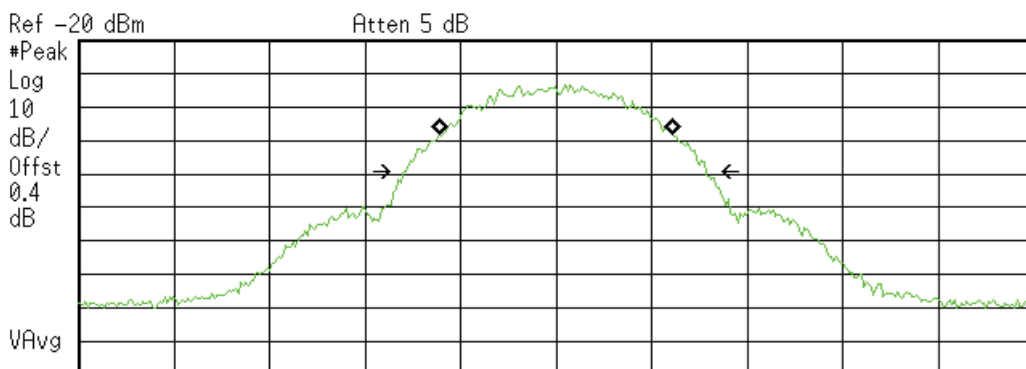
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 837.597 Hz  
**x dB Bandwidth** 315.708 kHz

### 776-787 MHz Band Input

Agilent 20:17:29 Aug 7, 2014

L



Ref -20 dBm Atten 5 dB  
Center 781.5 MHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
244.0540 kHz

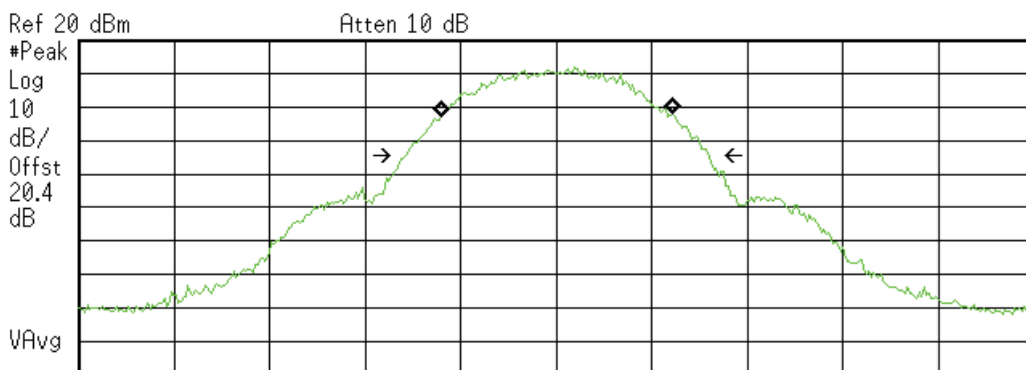
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 427.362 Hz  
**x dB Bandwidth** 314.012 kHz

### Output

Agilent 20:29:44 Aug 7, 2014

L



Ref 20 dBm Atten 10 dB  
Center 781.5 MHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
244.7347 kHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

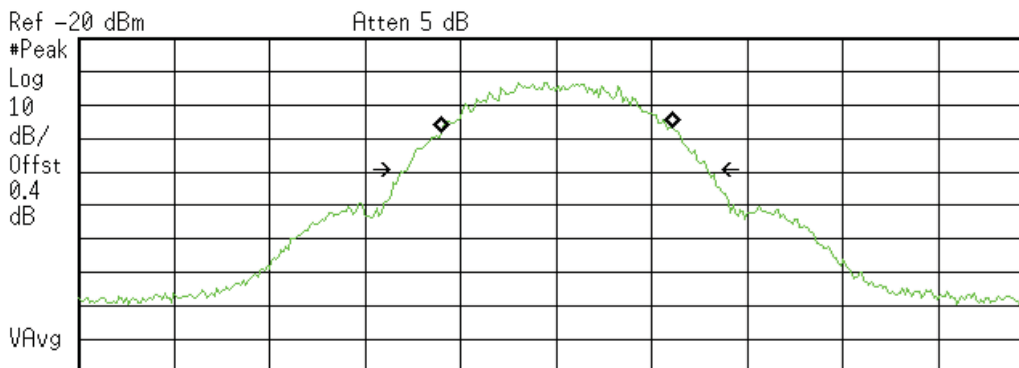
**Transmit Freq Error** -126.059 Hz  
**x dB Bandwidth** 313.048 kHz



### 824-849 MHz Band Input

Agilent 20:19:08 Aug 7, 2014

L



Center 836.5 MHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
242.5151 kHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

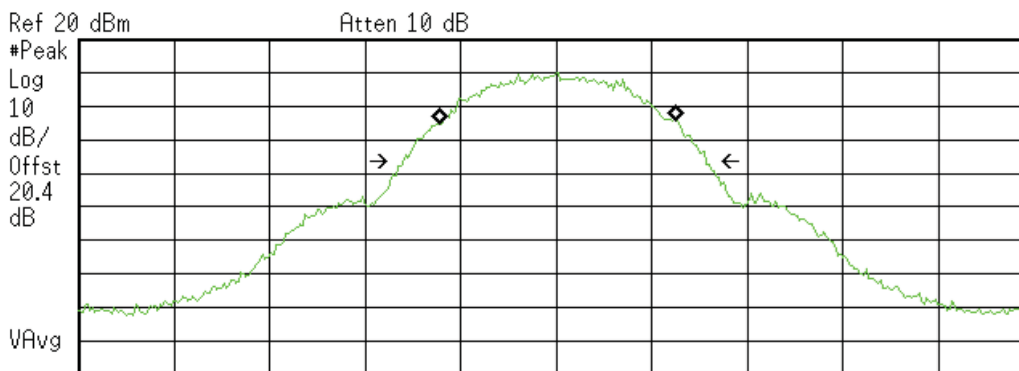
**Transmit Freq Error** 739.096 Hz  
**x dB Bandwidth** 314.334 kHz



### Output

Agilent 20:30:33 Aug 7, 2014

L



Center 836.5 MHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
247.2910 kHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

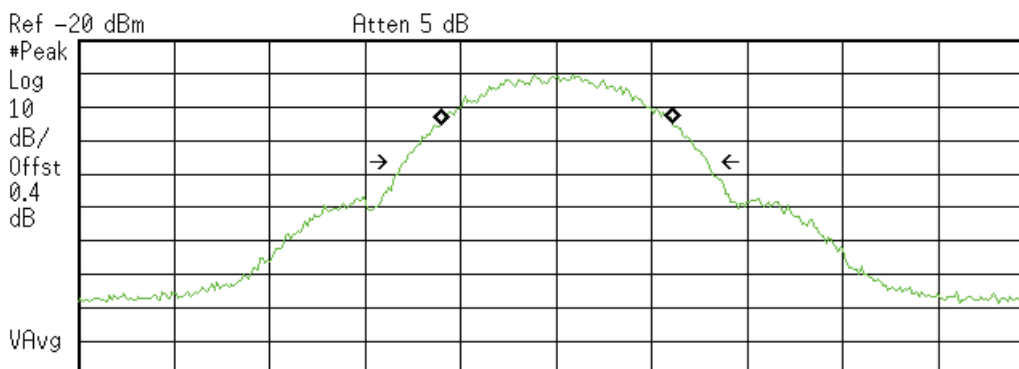
**Transmit Freq Error** 386.019 Hz  
**x dB Bandwidth** 316.051 kHz



### 1710-1755 MHz Band Input

Agilent 20:22:52 Aug 7, 2014

L



Ref -20 dBm Atten 5 dB  
Center 1.732 GHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
243.1724 kHz

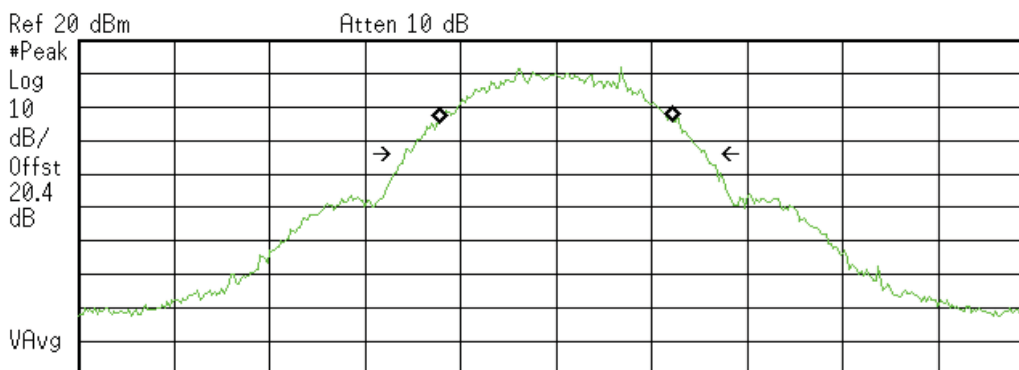
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 364.918 Hz  
**x dB Bandwidth** 316.337 kHz

### Output

Agilent 20:32:20 Aug 7, 2014

L



Ref 20 dBm Atten 10 dB  
Center 1.732 GHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
244.0159 kHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

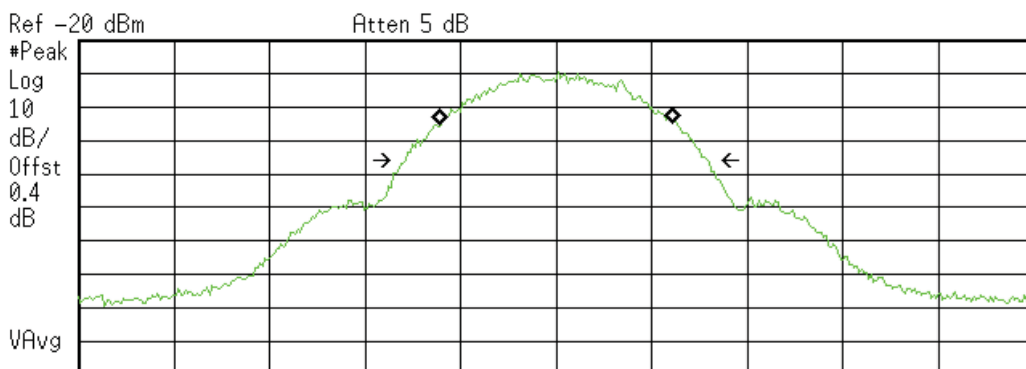
**Transmit Freq Error** 775.204 Hz  
**x dB Bandwidth** 309.698 kHz



### 1850-1915 MHz Band Input

Agilent 20:21:25 Aug 7, 2014

L



Ref -20 dBm Atten 5 dB  
Center 1.88 GHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
244.5390 kHz

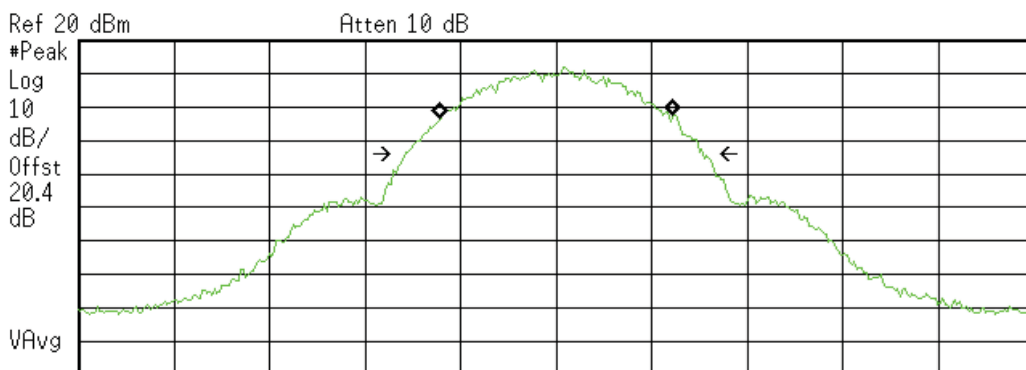
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 813.702 Hz  
**x dB Bandwidth** 315.664 kHz

### Output

Agilent 20:31:30 Aug 7, 2014

L



Ref 20 dBm Atten 10 dB  
Center 1.88 GHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
245.0323 kHz

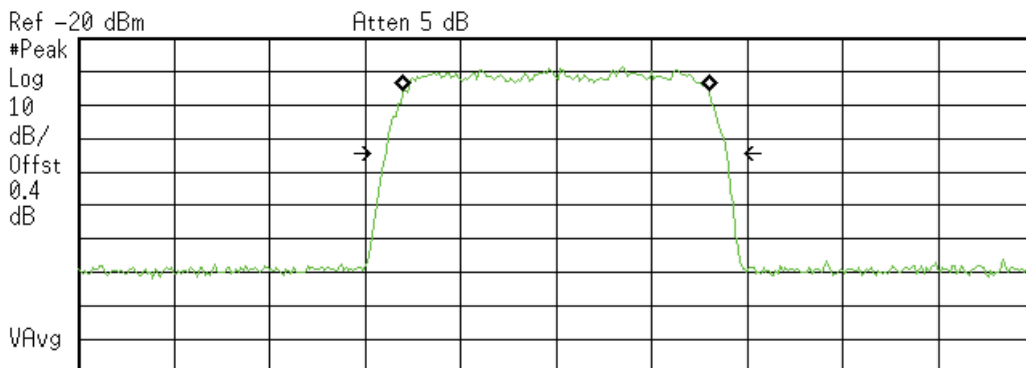
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 799.049 Hz  
**x dB Bandwidth** 311.576 kHz

**Uplink (CDMA Signal)  
698 - 716 MHz Band  
Input**

Agilent 20:42:06 Aug 7, 2014

L



Center 707 MHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2769 MHz

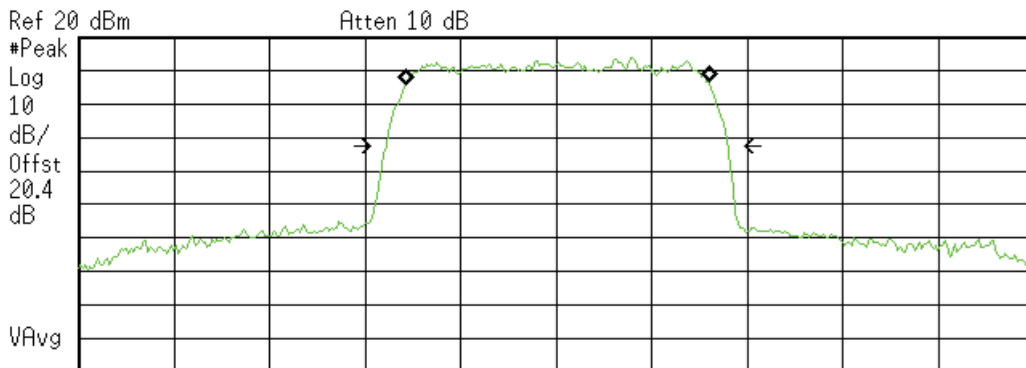
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** -1.871 kHz  
**x dB Bandwidth** 1.425 MHz

**Output**

Agilent 20:34:49 Aug 7, 2014

L



Center 707 MHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2734 MHz

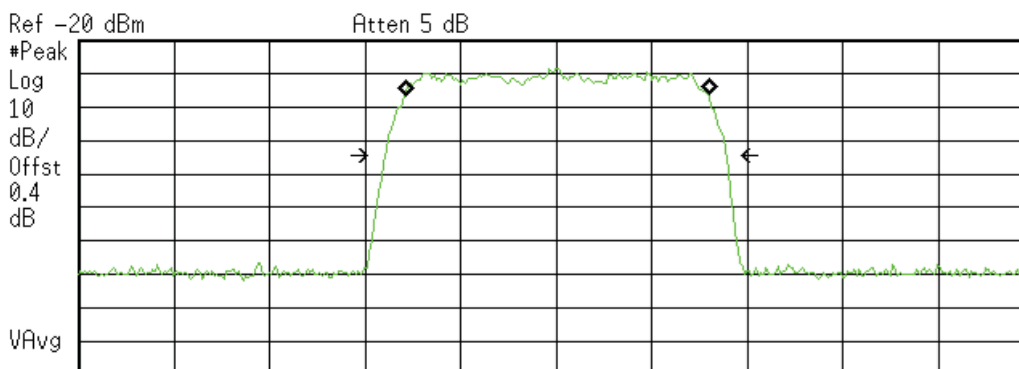
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 4.201 kHz  
**x dB Bandwidth** 1.426 MHz

### 776-787 MHz Band Input

Agilent 20:43:55 Aug 7, 2014

L



Center 781.5 MHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2700 MHz

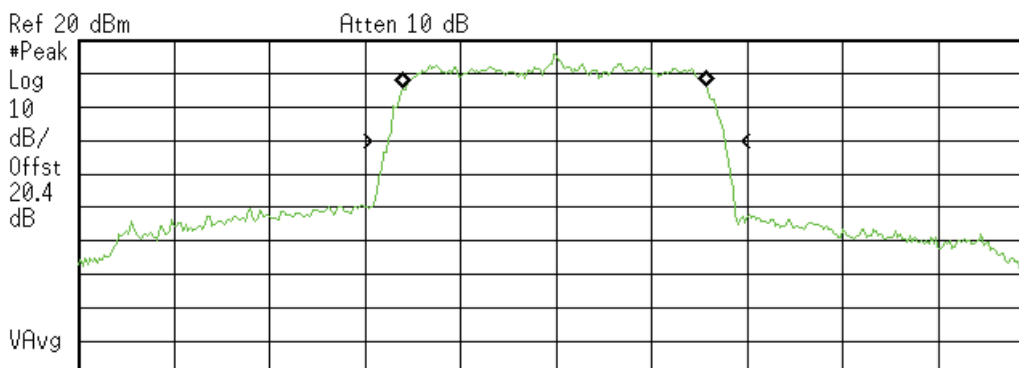
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 398.930 Hz  
**x dB Bandwidth** 1.430 MHz

### Output

Agilent 20:36:17 Aug 7, 2014

L



Center 781.5 MHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2729 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

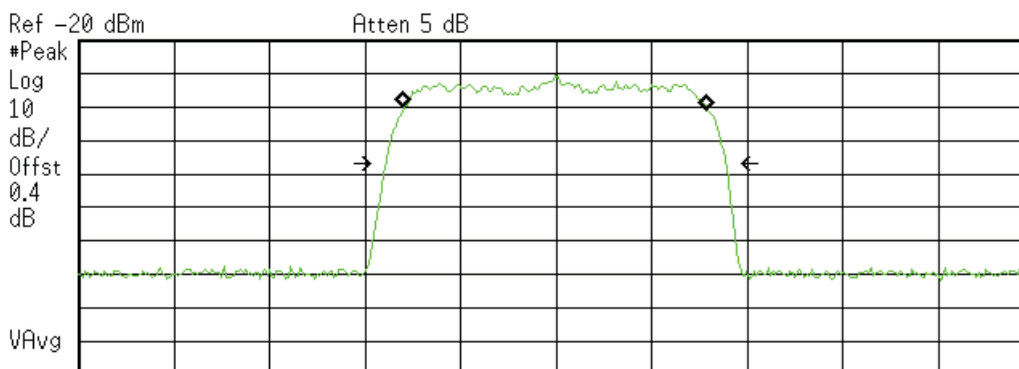
**Transmit Freq Error** -3.687 kHz  
**x dB Bandwidth** 1.412 MHz



### 824-849 MHz Band Input

Agilent 20:44:41 Aug 7, 2014

L



Center 836.5 MHz Span 4 MHz  
 #Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
**1.2729 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

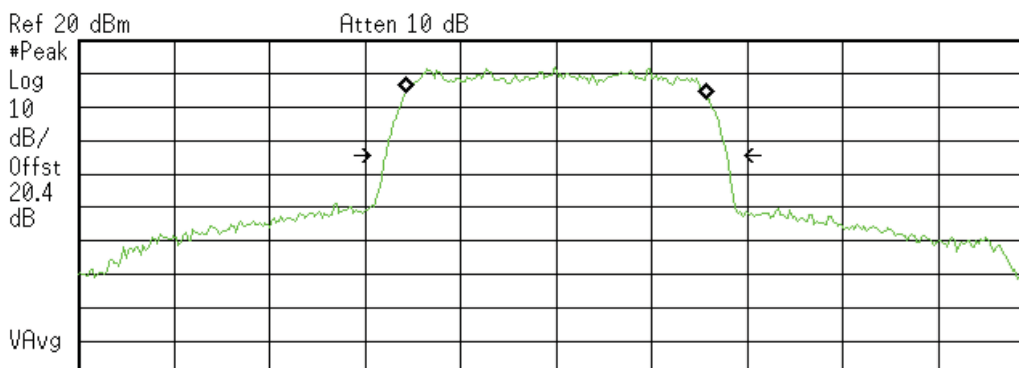
**Transmit Freq Error** -163.172 Hz  
**x dB Bandwidth** 1.427 MHz



### Output

Agilent 20:37:03 Aug 7, 2014

L



Center 836.5 MHz Span 4 MHz  
 #Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
**1.2696 MHz**

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

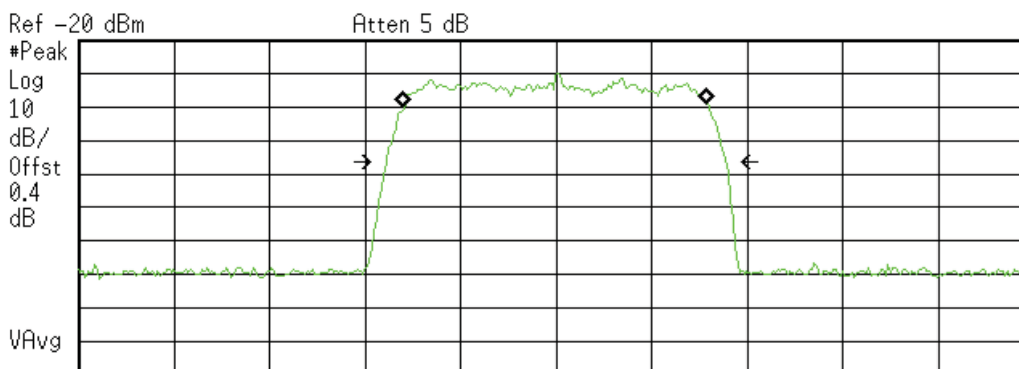
**Transmit Freq Error** -270.306 Hz  
**x dB Bandwidth** 1.429 MHz



### 1710-1755 MHz Band Input

Agilent 20:48:14 Aug 7, 2014

L



Center 1.732 GHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2712 MHz

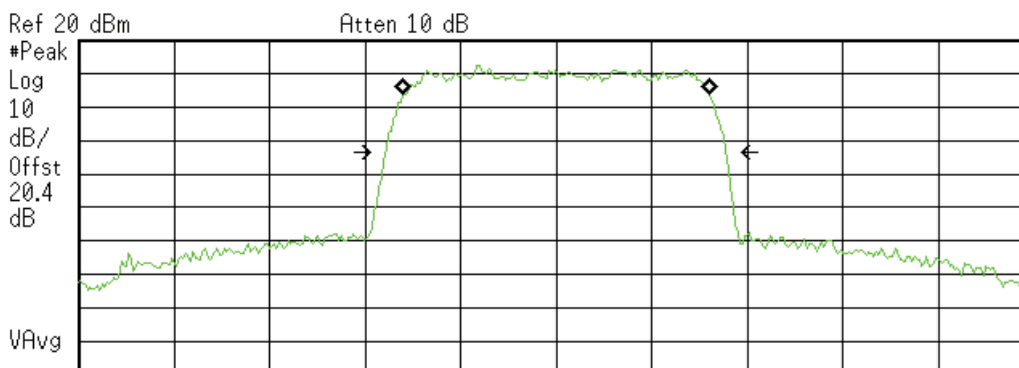
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** -757.863 Hz  
**x dB Bandwidth** 1.426 MHz

### Output

Agilent 20:38:37 Aug 7, 2014

L



Center 1.732 GHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2759 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

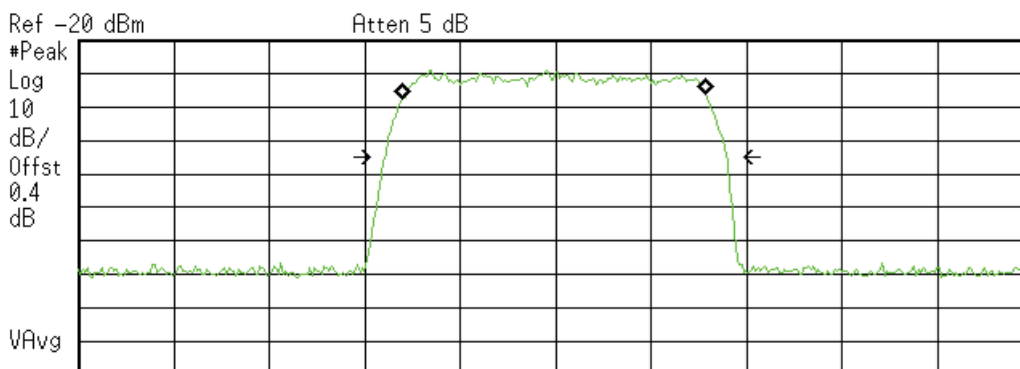
**Transmit Freq Error** 295.576 Hz  
**x dB Bandwidth** 1.427 MHz



### 1850-1915 MHz Band Input

Agilent 20:47:22 Aug 7, 2014

L



Center 1.88 GHz Span 4 MHz  
 #Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
 1.2714 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

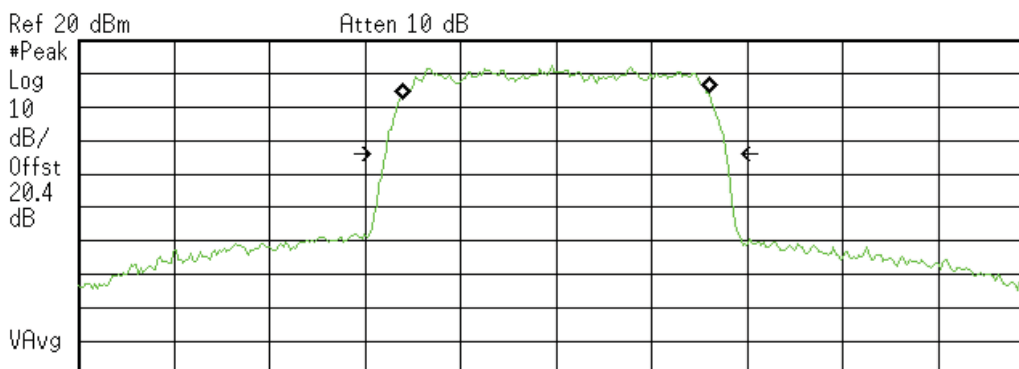
**Transmit Freq Error** -2.464 kHz  
**x dB Bandwidth** 1.431 MHz



### Output

Agilent 20:37:50 Aug 7, 2014

L



Center 1.88 GHz Span 4 MHz  
 #Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
 1.2759 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** -1.794 kHz  
**x dB Bandwidth** 1.427 MHz

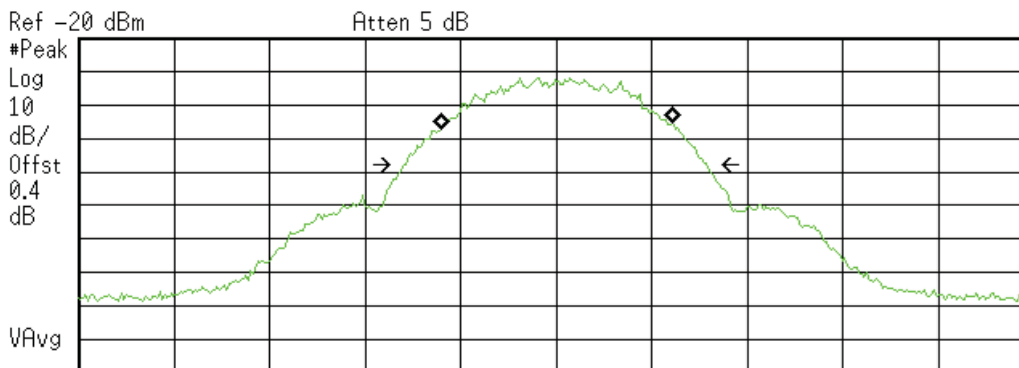




### Downlink (GSM Signal) 728-746 MHz Band Input

Agilent 19:44:59 Aug 7, 2014

L



Center 737 MHz Span 1 MHz  
 #Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
 243.7998 kHz

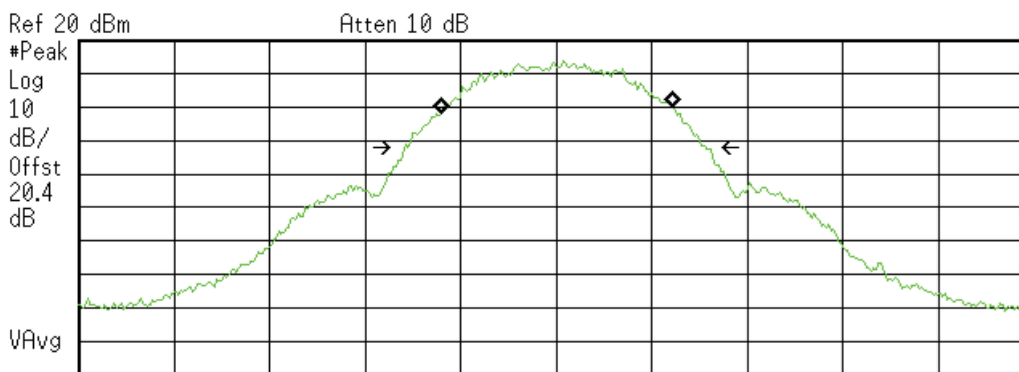
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 760.641 Hz  
**x dB Bandwidth** 316.985 kHz

### Output

Agilent 20:00:52 Aug 7, 2014

L



Center 737 MHz Span 1 MHz  
 #Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
 243.8241 kHz

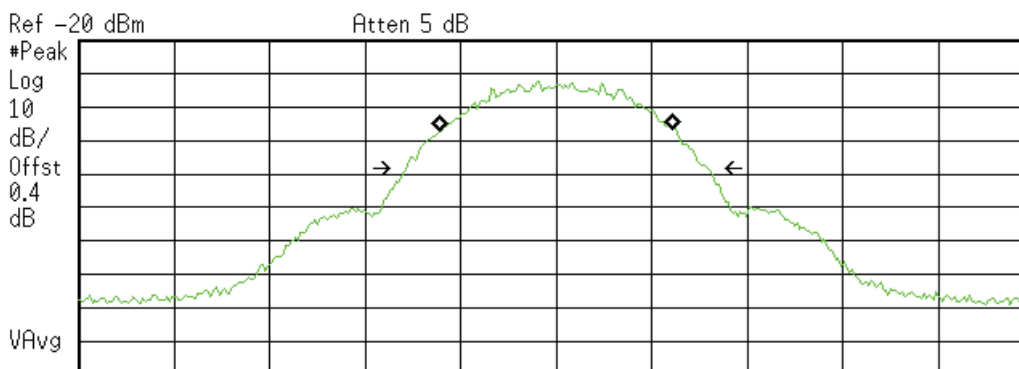
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 753.516 Hz  
**x dB Bandwidth** 316.109 kHz

### 746-757 MHz Band Input

Agilent 20:13:15 Aug 7, 2014

L



Center 751.5 MHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
245.1021 kHz

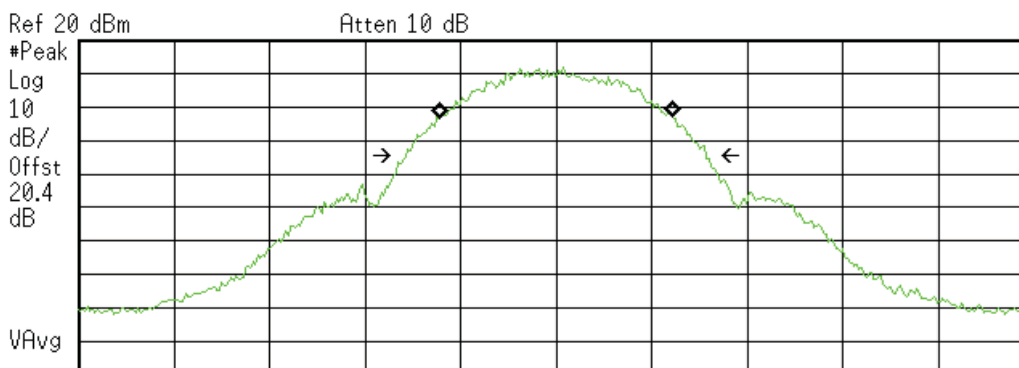
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 223.644 Hz  
**x dB Bandwidth** 317.849 kHz

### Output

Agilent 20:06:50 Aug 7, 2014

L



Center 751.5 MHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
246.0604 kHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

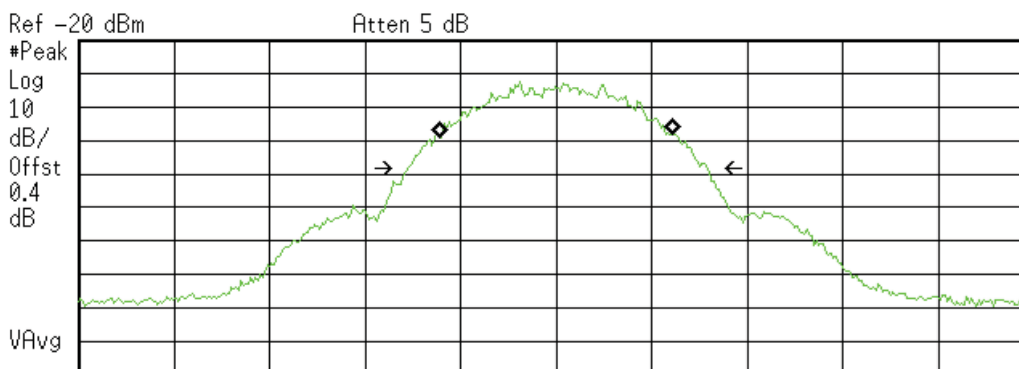
**Transmit Freq Error** -167.355 Hz  
**x dB Bandwidth** 313.721 kHz



### 869-894 MHz Band Input

Agilent 19:50:56 Aug 7, 2014

L



Center 881.5 MHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
244.4146 kHz

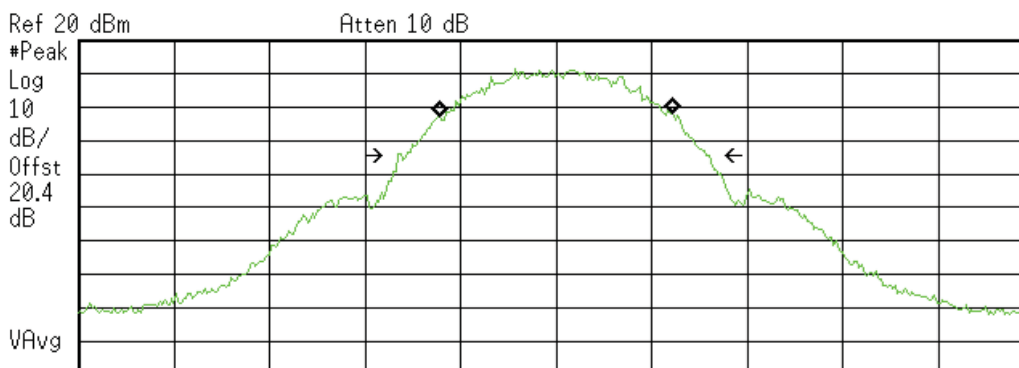
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 425.593 Hz  
**x dB Bandwidth** 315.213 kHz

### Output

Agilent 20:03:17 Aug 7, 2014

L



Center 881.5 MHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
245.5513 kHz

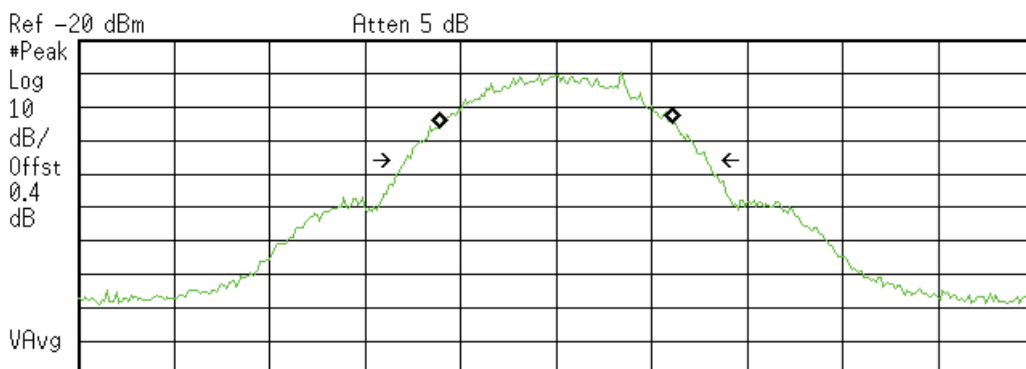
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 412.354 Hz  
**x dB Bandwidth** 317.341 kHz

### 1930-1995 MHz Band Input

Agilent 19:53:24 Aug 7, 2014

L



Ref -20 dBm Atten 5 dB  
Center 1.96 GHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
245.0425 kHz

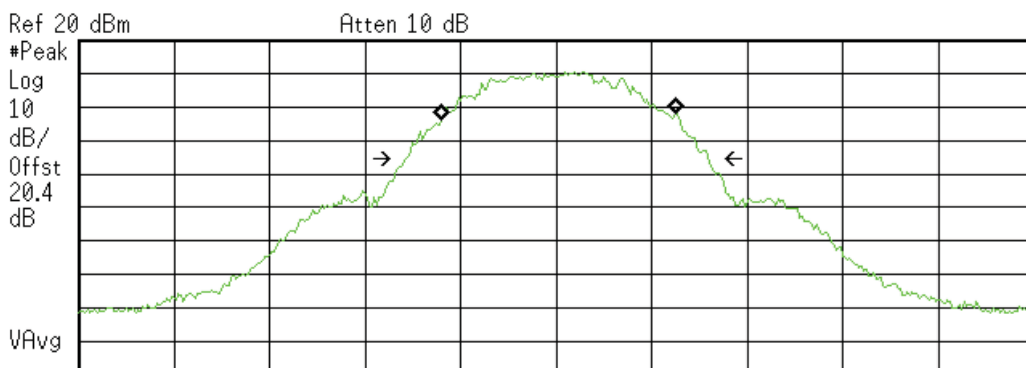
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** -126.347 Hz  
**x dB Bandwidth** 315.469 kHz

### Output

Agilent 20:04:09 Aug 7, 2014

L



Ref 20 dBm Atten 10 dB  
Center 1.96 GHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
246.1833 kHz

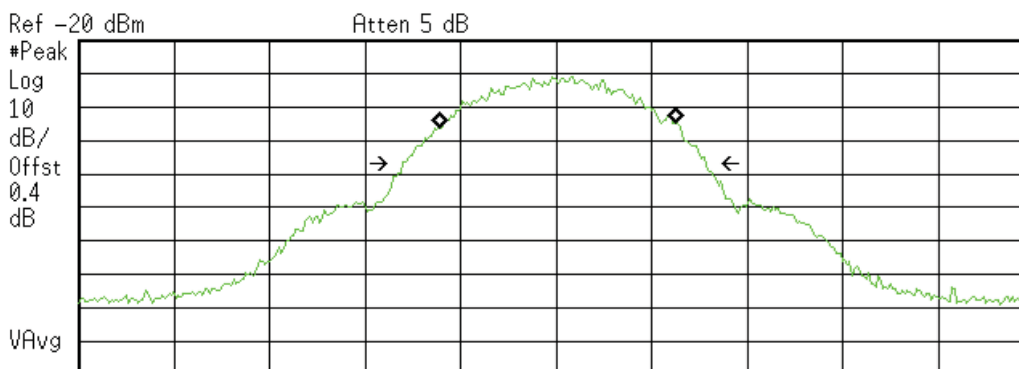
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 2.182 kHz  
**x dB Bandwidth** 316.151 kHz

### 2110-2155 MHz Band Input

Agilent 19:55:18 Aug 7, 2014

L



Center 2.132 GHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
245.0448 kHz

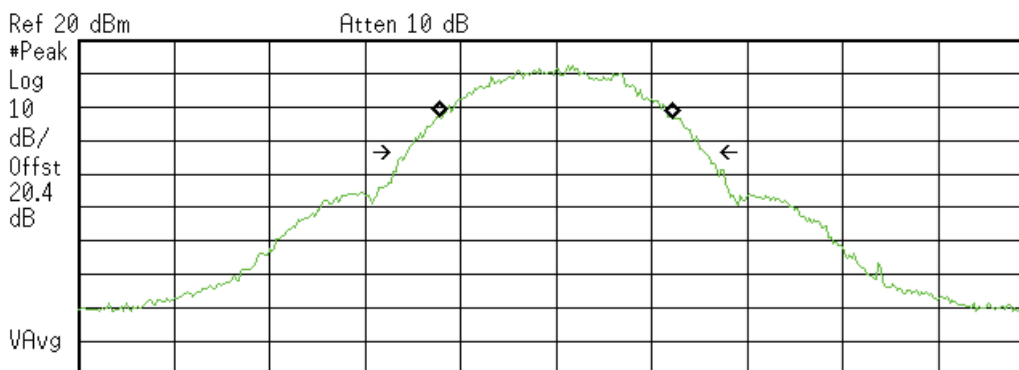
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 1.461 kHz  
**x dB Bandwidth** 316.749 kHz

### Output

Agilent 19:58:48 Aug 7, 2014

L



Center 2.132 GHz Span 1 MHz  
#Res BW 3 kHz VBW 10 kHz Sweep 114.4 ms (401 pts)

**Occupied Bandwidth**  
245.9804 kHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

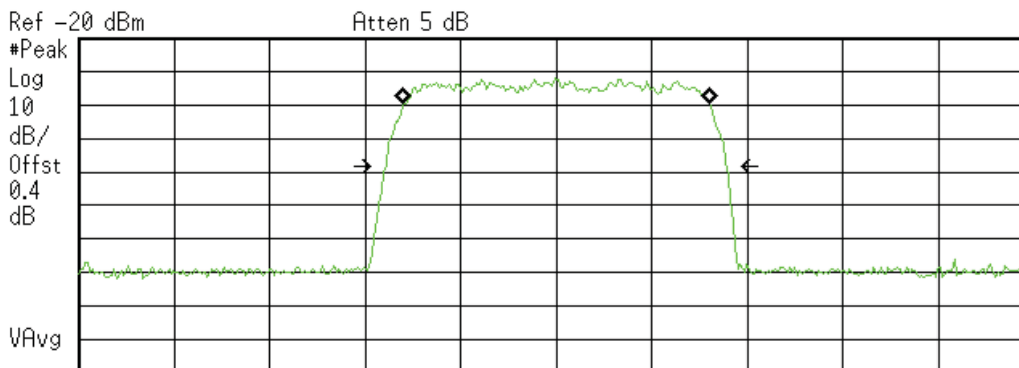
**Transmit Freq Error** 893.903 Hz  
**x dB Bandwidth** 312.161 kHz



### Downlink (CDMA Signal) 728-746 MHz Band Input

Agilent 19:34:24 Aug 7, 2014

L



Center 737 MHz Span 4 MHz  
 #Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2724 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

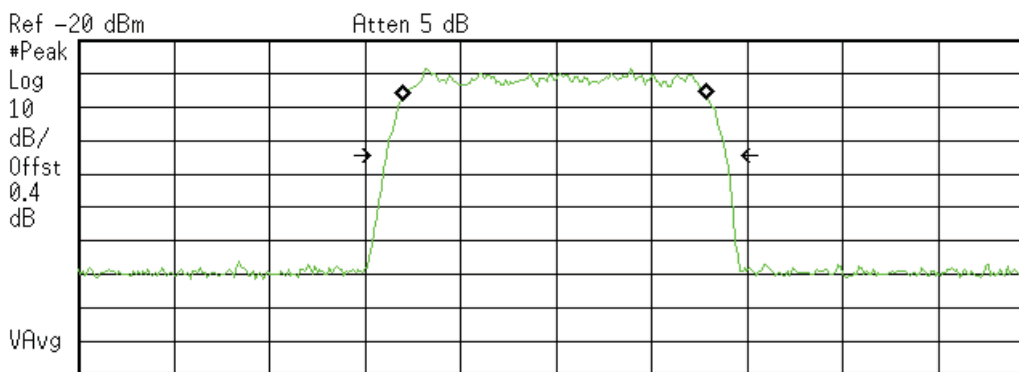
**Transmit Freq Error** 1.500 kHz  
**x dB Bandwidth** 1.426 MHz



### Output

Agilent 19:35:27 Aug 7, 2014

L



Center 737 MHz Span 4 MHz  
 #Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2692 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

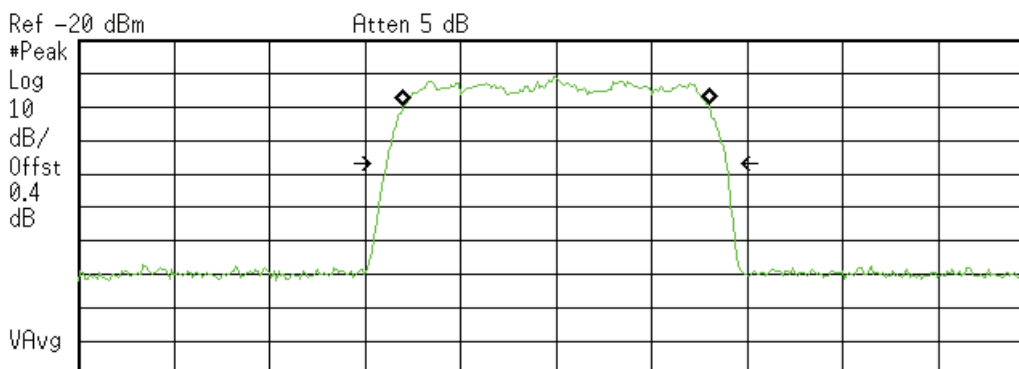
**Transmit Freq Error** -1.151 kHz  
**x dB Bandwidth** 1.420 MHz



### 746-757 MHz Band Input

Agilent 19:32:34 Aug 7, 2014

L



Ref -20 dBm  
Center 751.5 MHz  
#Res BW 30 kHz  
VBW 100 kHz  
Span 4 MHz  
Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2732 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

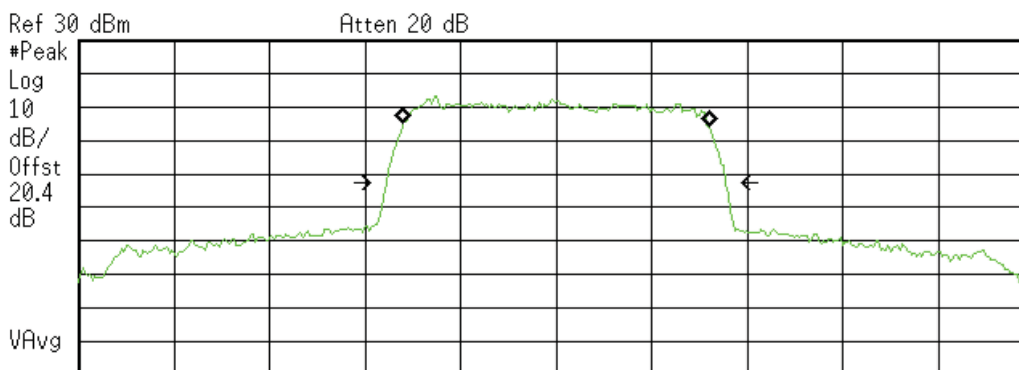
**Transmit Freq Error** -282.620 Hz  
**x dB Bandwidth** 1.424 MHz



### Output

Agilent 19:30:31 Aug 7, 2014

L



Ref 30 dBm  
Center 751.5 MHz  
#Res BW 30 kHz  
VBW 100 kHz  
Span 4 MHz  
Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2736 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

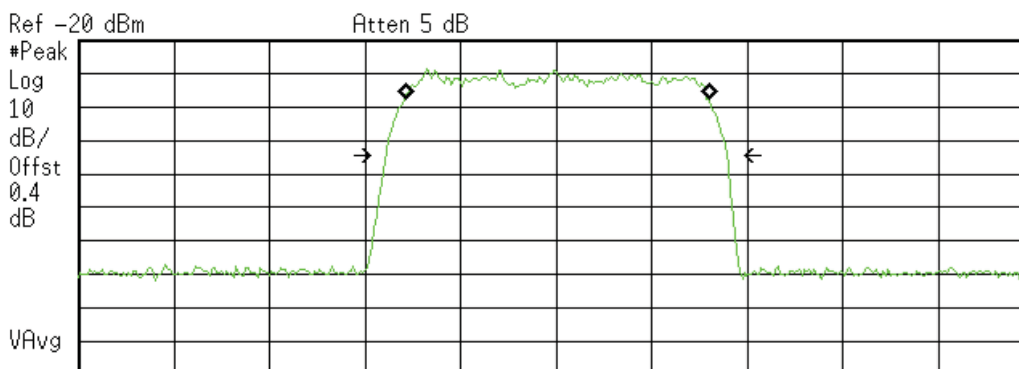
**Transmit Freq Error** -978.996 Hz  
**x dB Bandwidth** 1.419 MHz



### 869-894 MHz Band Input

Agilent 19:37:44 Aug 7, 2014

L



Center 881.5 MHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2700 MHz

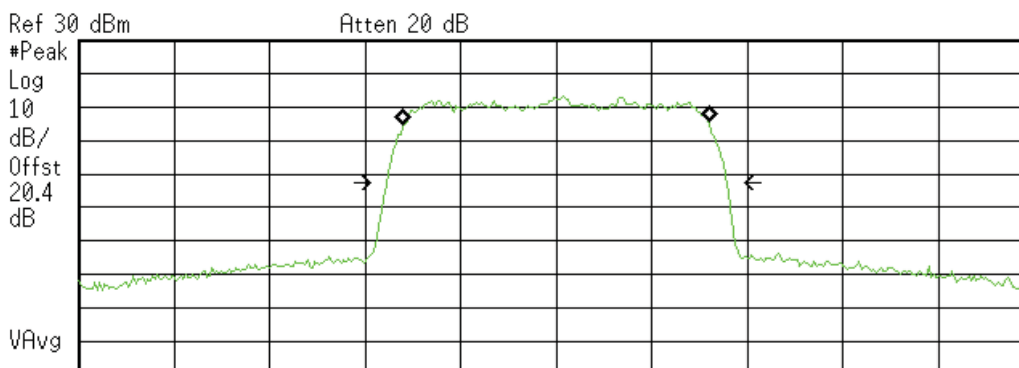
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 662.805 Hz  
**x dB Bandwidth** 1.428 MHz

### Output

Agilent 19:23:20 Aug 7, 2014

L



Center 881.5 MHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2730 MHz

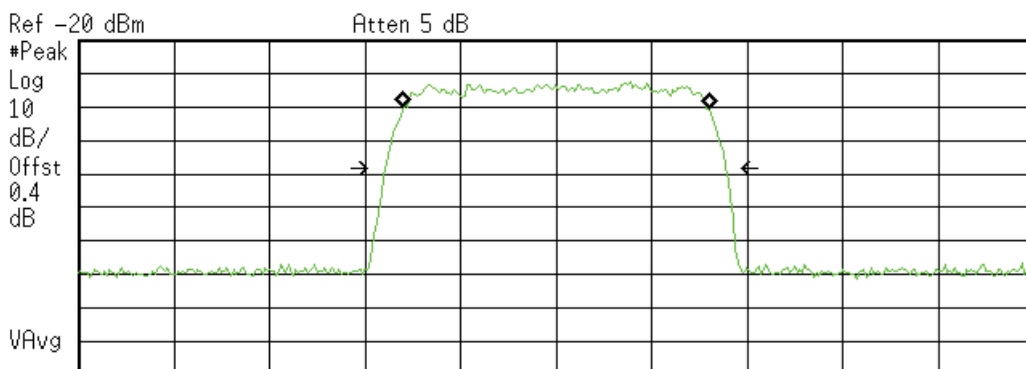
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 1.238 kHz  
**x dB Bandwidth** 1.424 MHz

### 1930-1995 MHz Band Input

Agilent 19:38:41 Aug 7, 2014

L



Ref -20 dBm Atten 5 dB  
Center 1.96 GHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2727 MHz

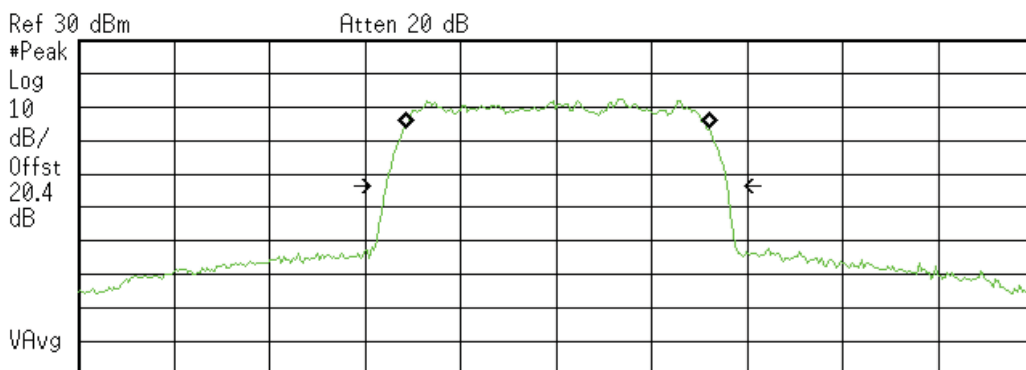
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** -863.971 Hz  
**x dB Bandwidth** 1.426 MHz

### Output

Agilent 19:27:15 Aug 7, 2014

L



Ref 30 dBm Atten 20 dB  
Center 1.96 GHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2690 MHz

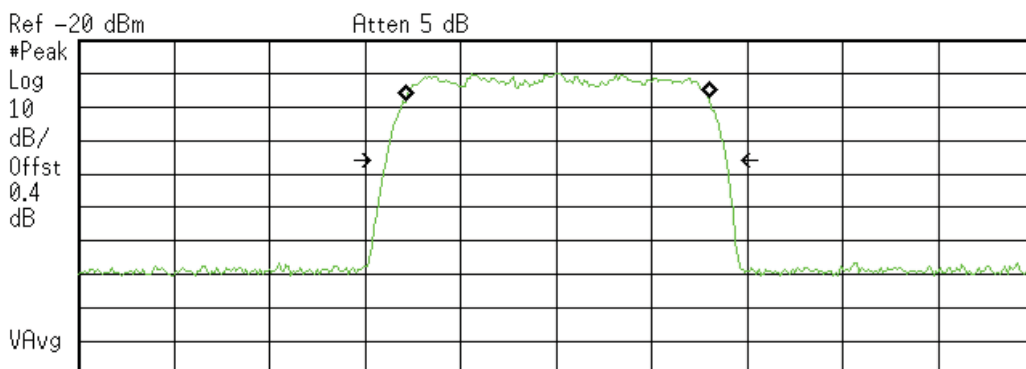
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 1.805 kHz  
**x dB Bandwidth** 1.428 MHz

### 2110-2155 MHz Band Input

Agilent 19:42:04 Aug 7, 2014

L



Center 2.132 GHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2721 MHz

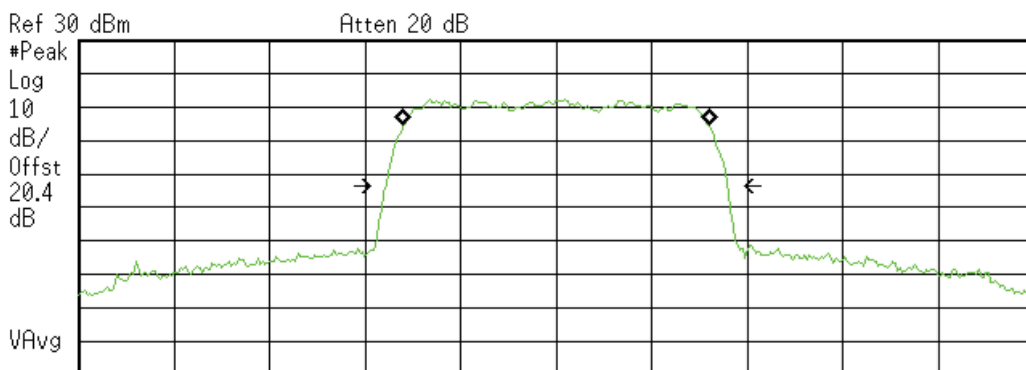
**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 955.391 Hz  
**x dB Bandwidth** 1.426 MHz

### Output

Agilent 19:29:03 Aug 7, 2014

L



Center 2.132 GHz Span 4 MHz  
#Res BW 30 kHz VBW 100 kHz Sweep 5 ms (401 pts)

**Occupied Bandwidth**  
1.2741 MHz

**Occ BW % Pwr** 99.00 %  
**x dB** -26.00 dB

**Transmit Freq Error** 967.885 Hz  
**x dB Bandwidth** 1.431 MHz



## Intermodulation

**Name of Test:** Intermodulation  
**Test Equipment Utilized:** i00405, i00331

**Engineer:** Mike Graffeo  
**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.

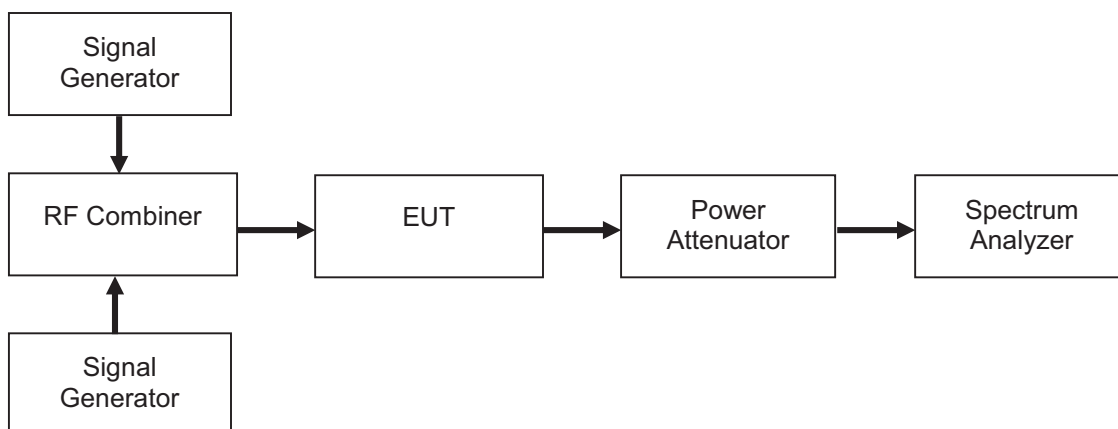
All losses for the combiner and cables were accounted for.

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

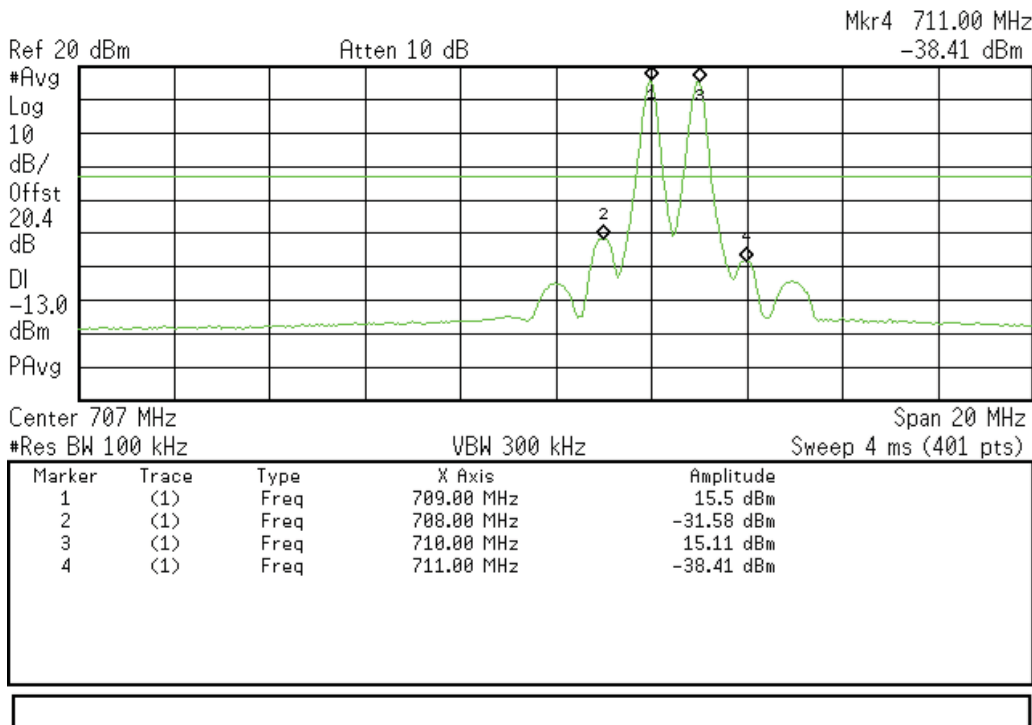




### Intermodulation Uplink Test Results at AGC (GSM Signal) 698 - 716 MHz Band

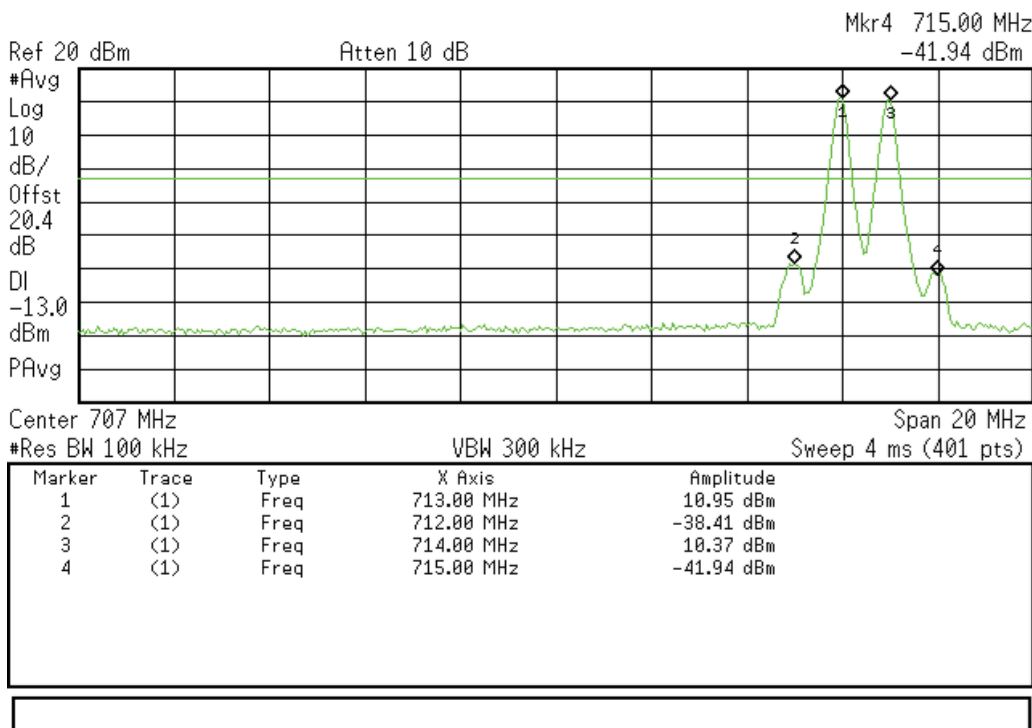
Agilent 10:42:15 Aug 13, 2014

L



Agilent 10:45:04 Aug 13, 2014

L

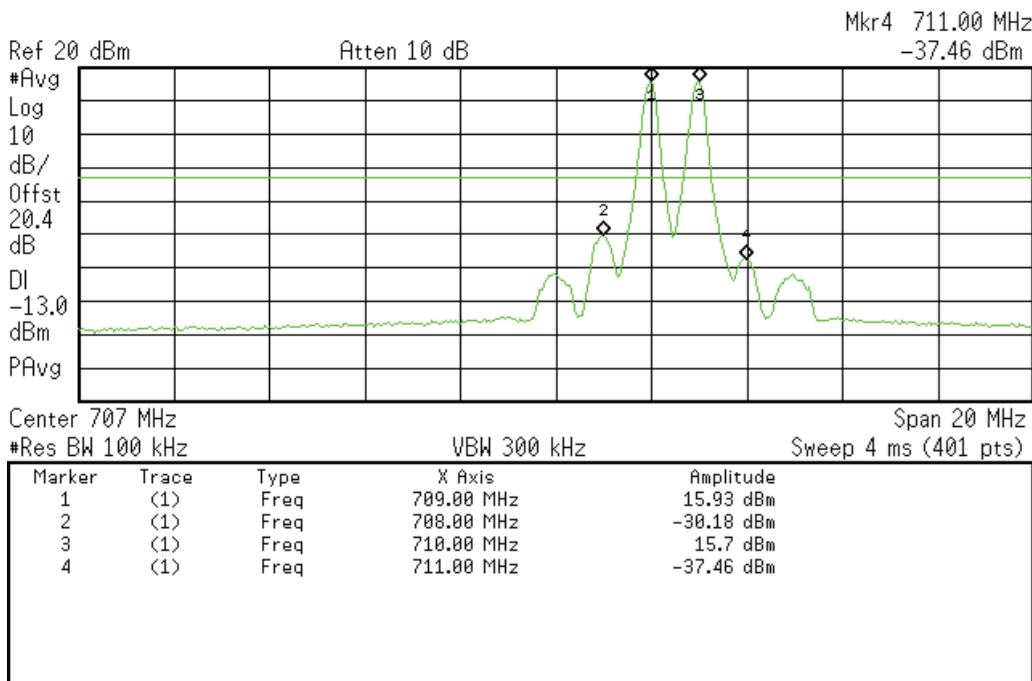




**Intermodulation Uplink Test Results at 3db above AGC (GSM Signal)  
698 - 716 MHz Band**

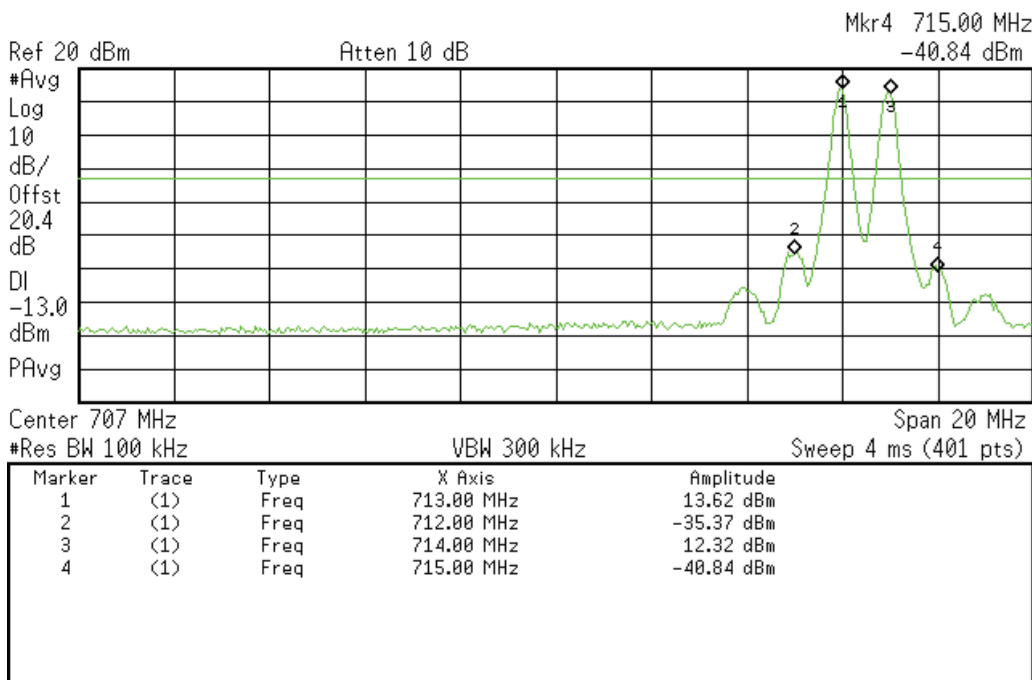
Agilent 10:42:47 Aug 13, 2014

L



Agilent 10:45:16 Aug 13, 2014

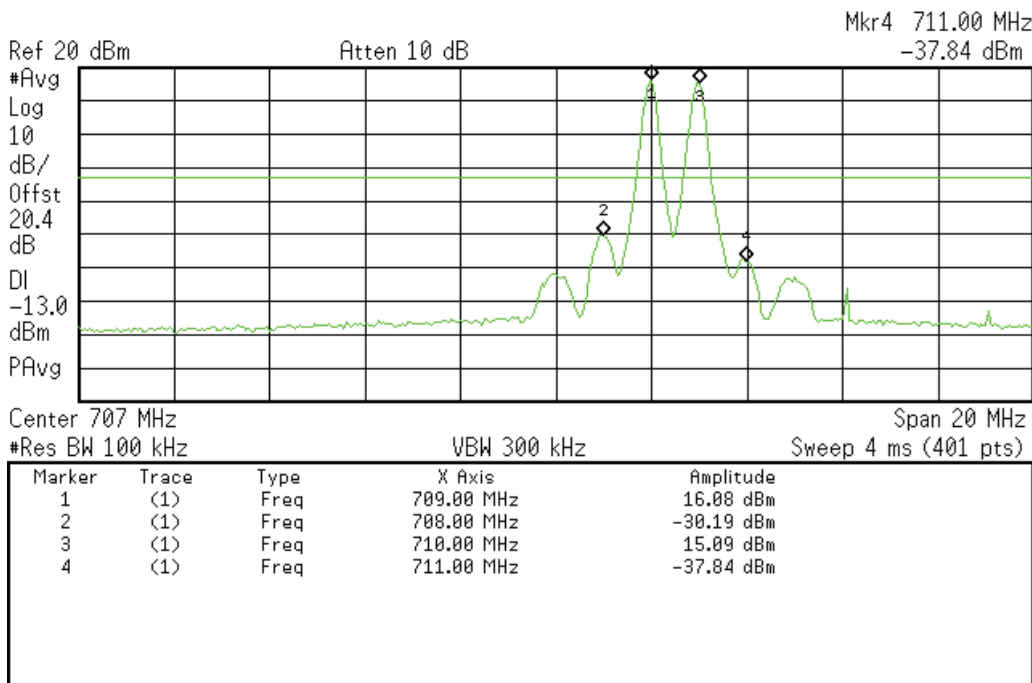
L



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

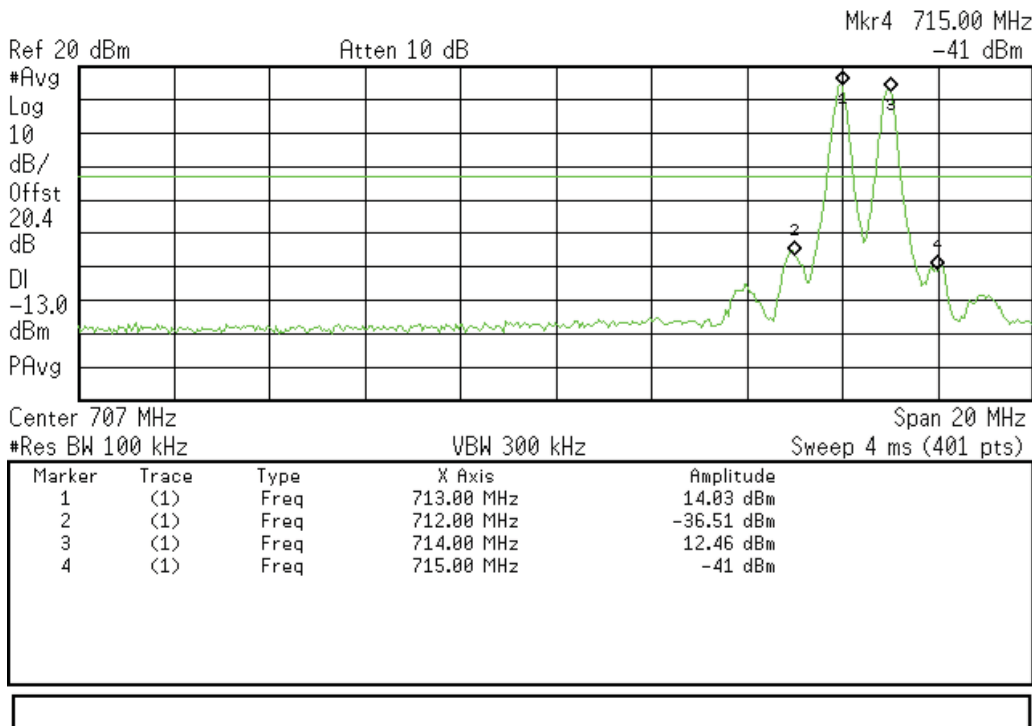
Agilent 10:43:08 Aug 13, 2014

L



Agilent 10:45:30 Aug 13, 2014

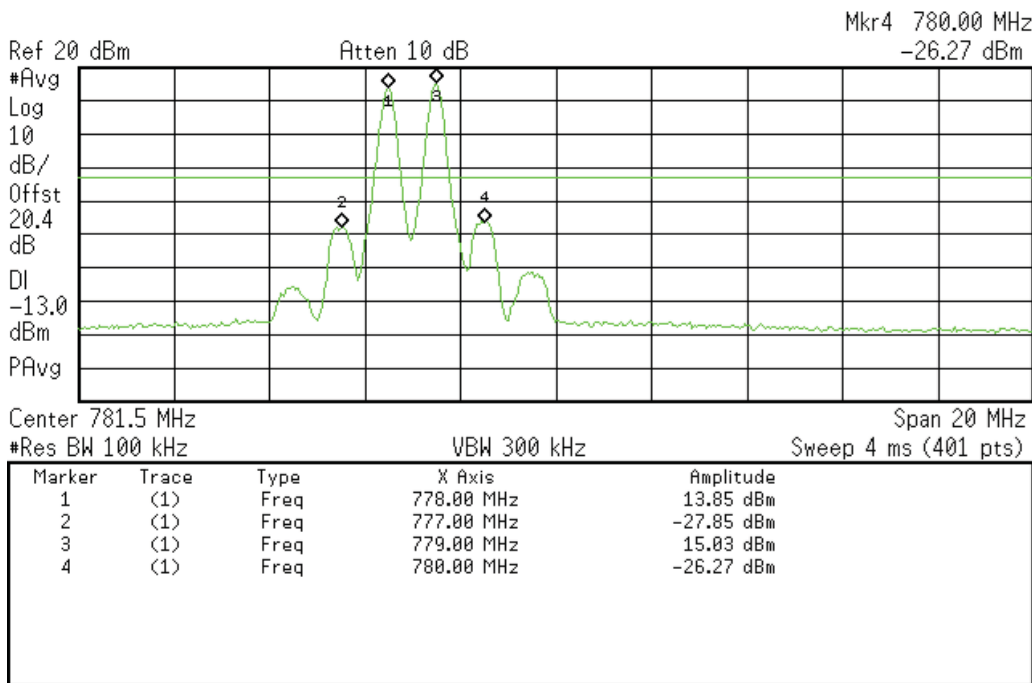
L



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

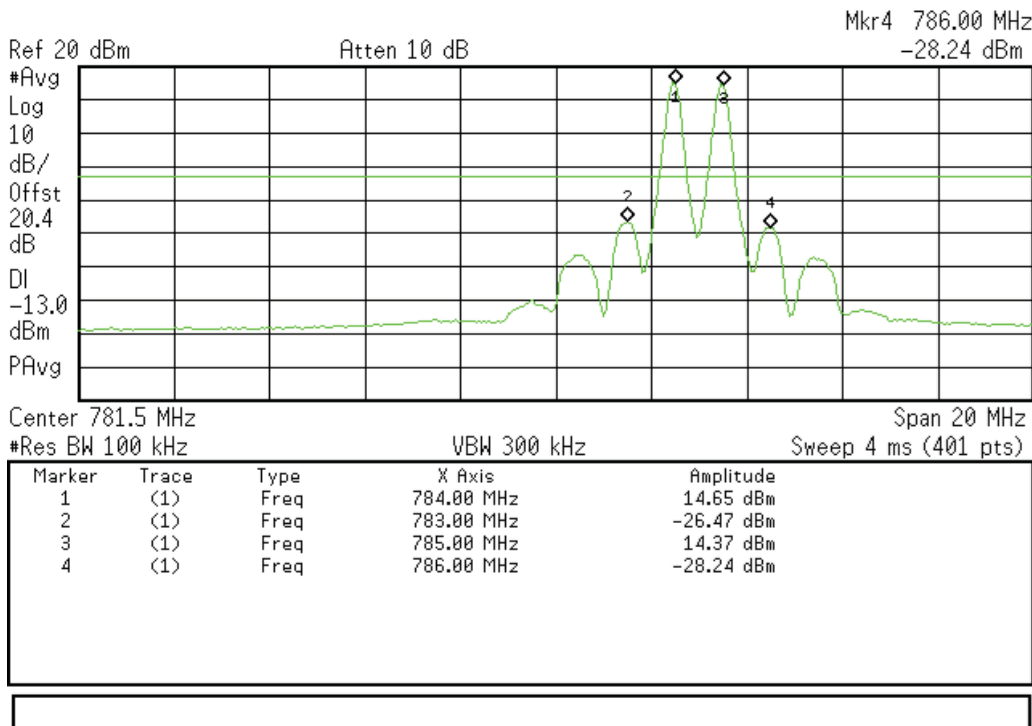
Agilent 10:49:02 Aug 13, 2014

L



Agilent 10:52:33 Aug 13, 2014

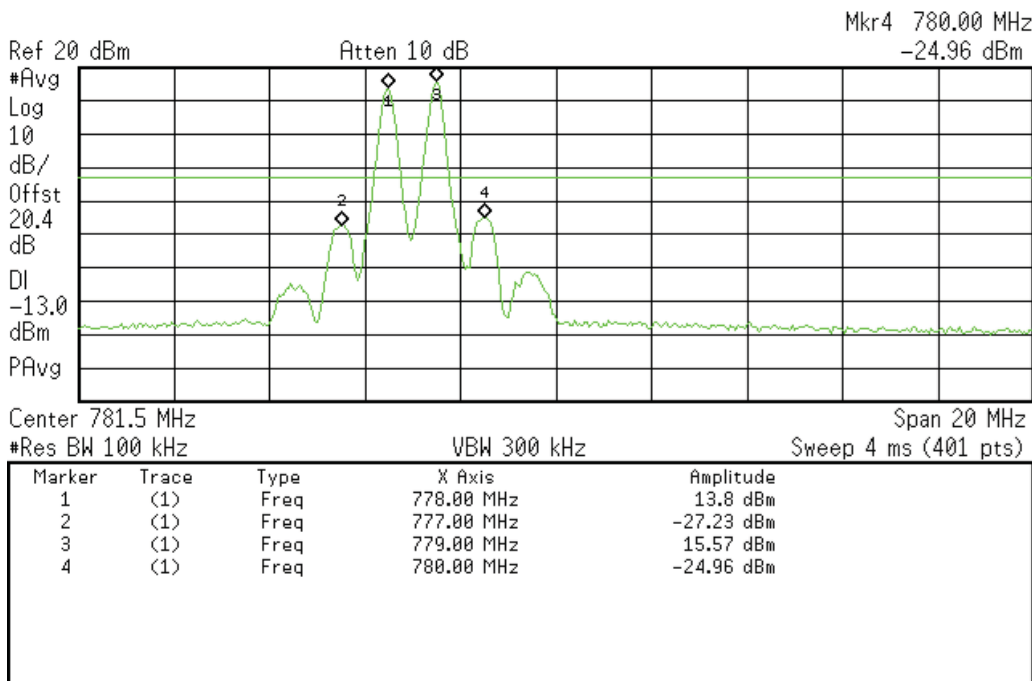
L



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

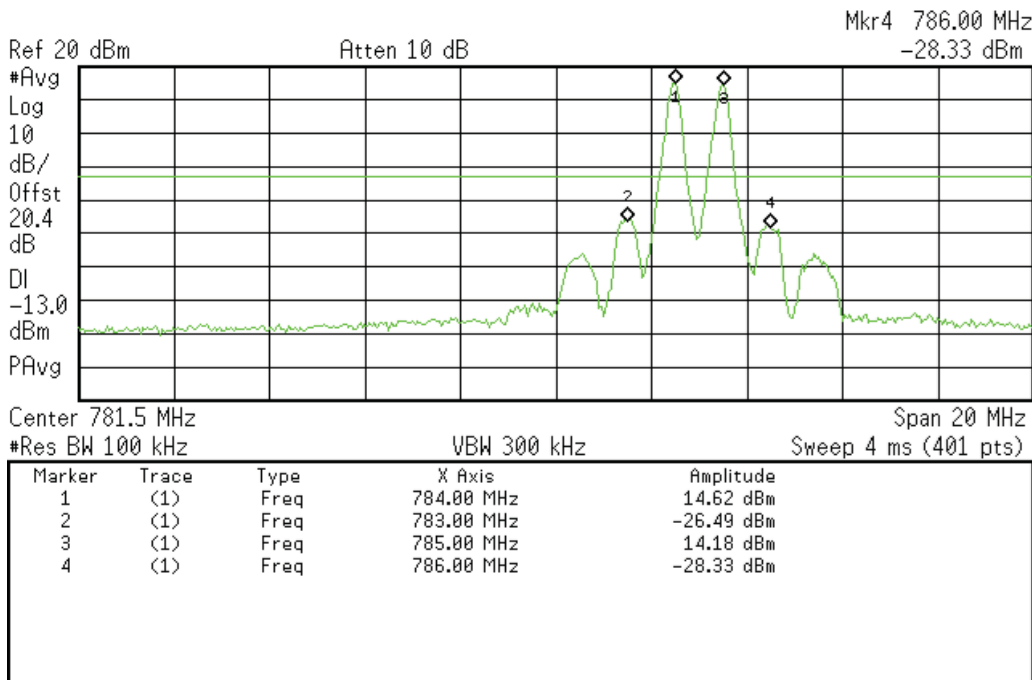
Agilent 10:49:20 Aug 13, 2014

L



Agilent 10:52:47 Aug 13, 2014

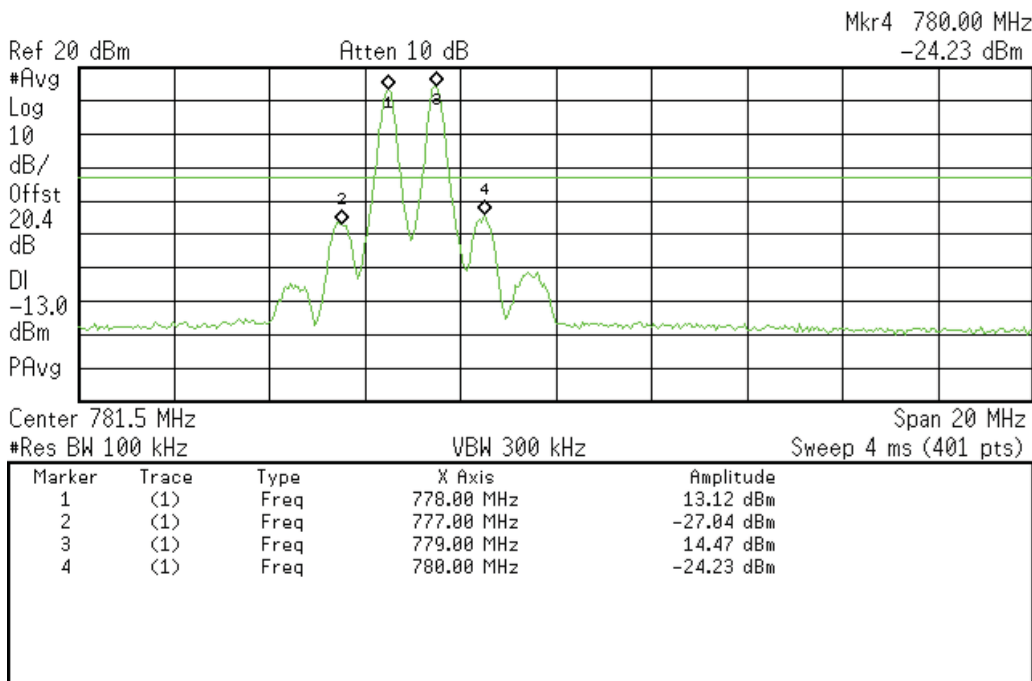
L



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

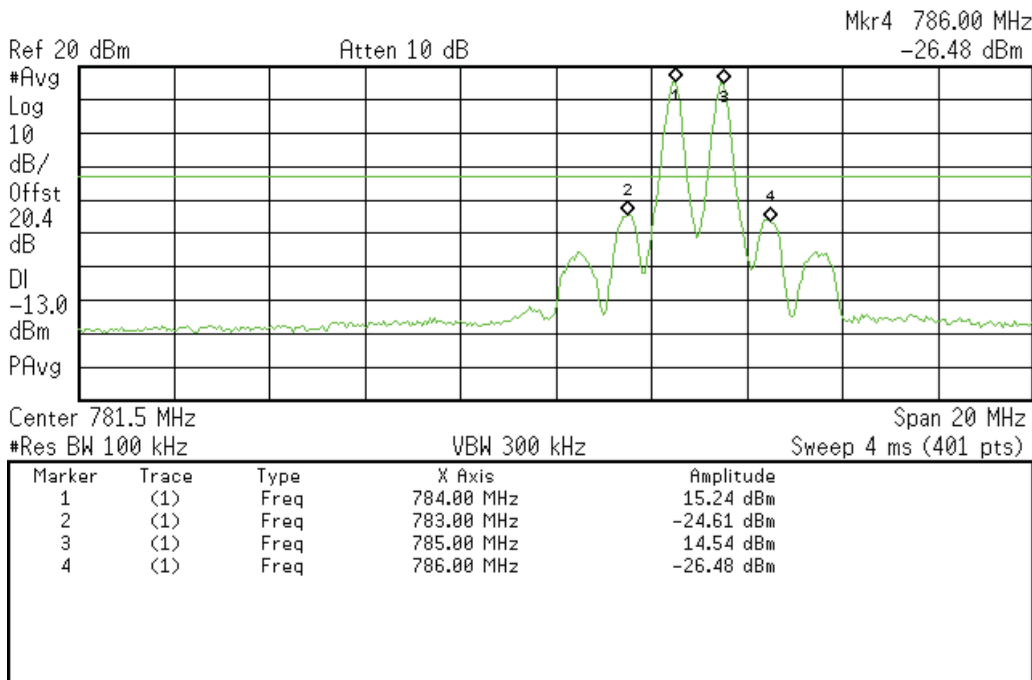
Agilent 10:49:31 Aug 13, 2014

L



Agilent 10:52:59 Aug 13, 2014

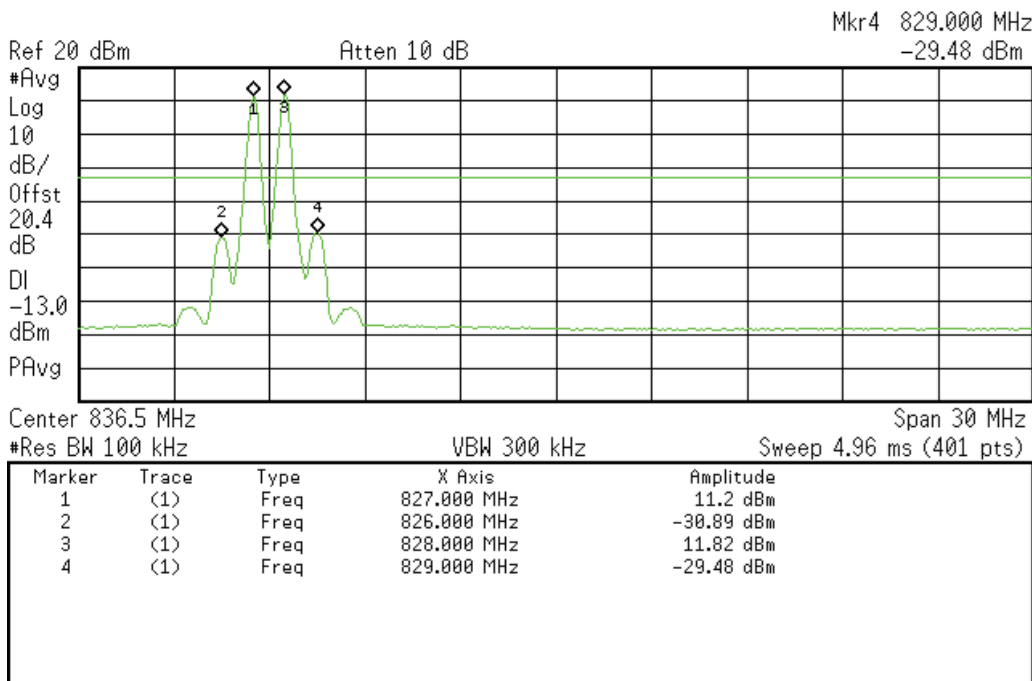
L



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

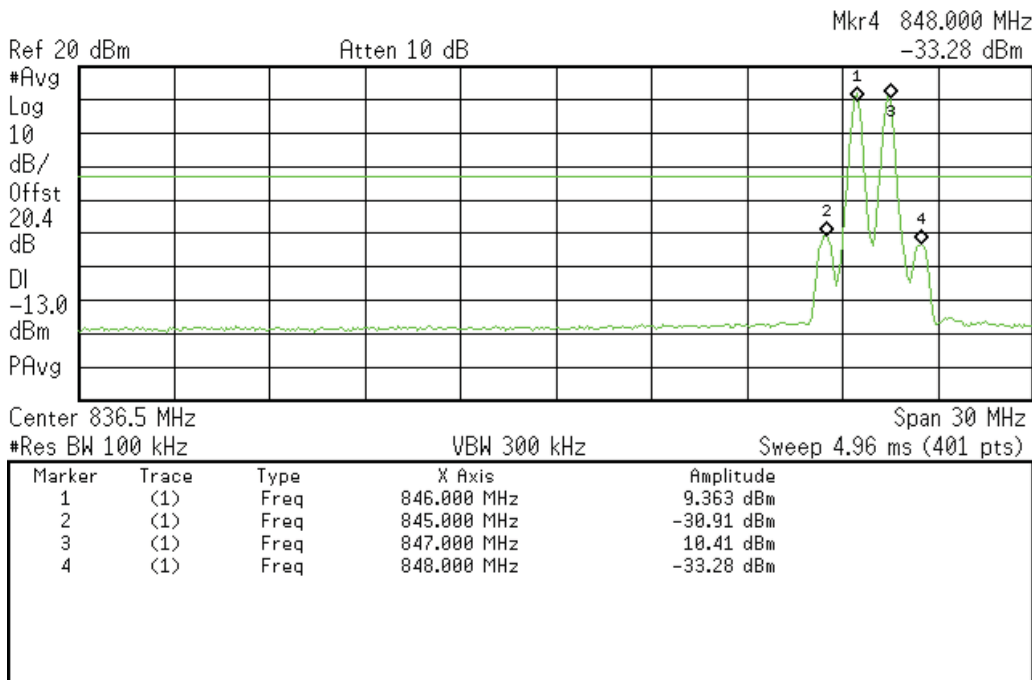
Agilent 10:58:10 Aug 13, 2014

L



Agilent 11:02:48 Aug 13, 2014

L

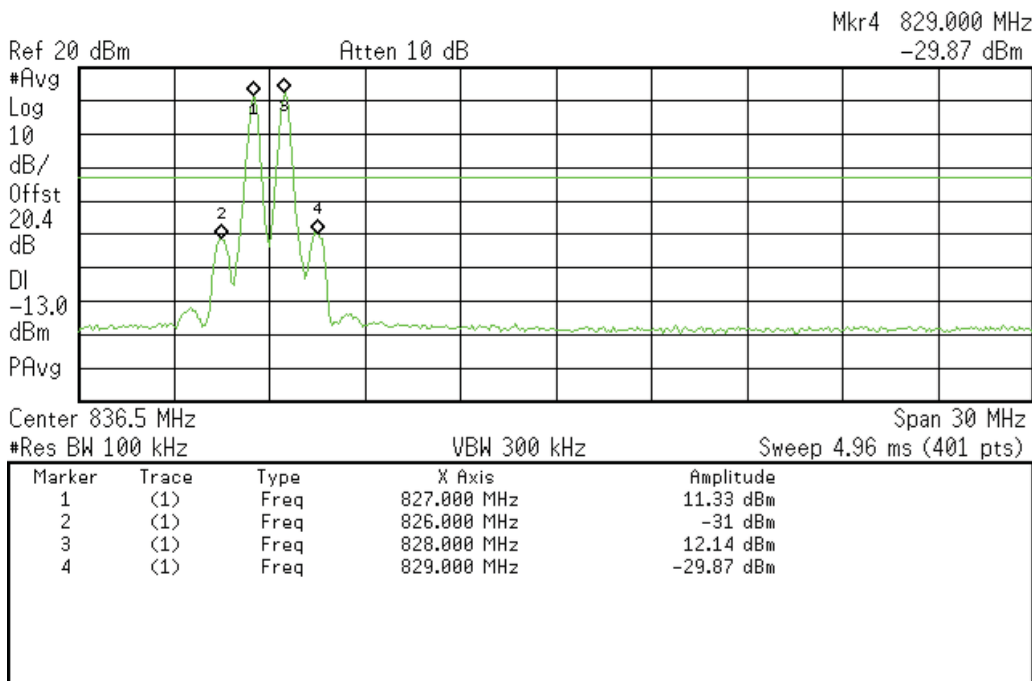




**Intermodulation Uplink Test Results at 3db above AGC (GSM Signal)  
824-849 MHz Band**

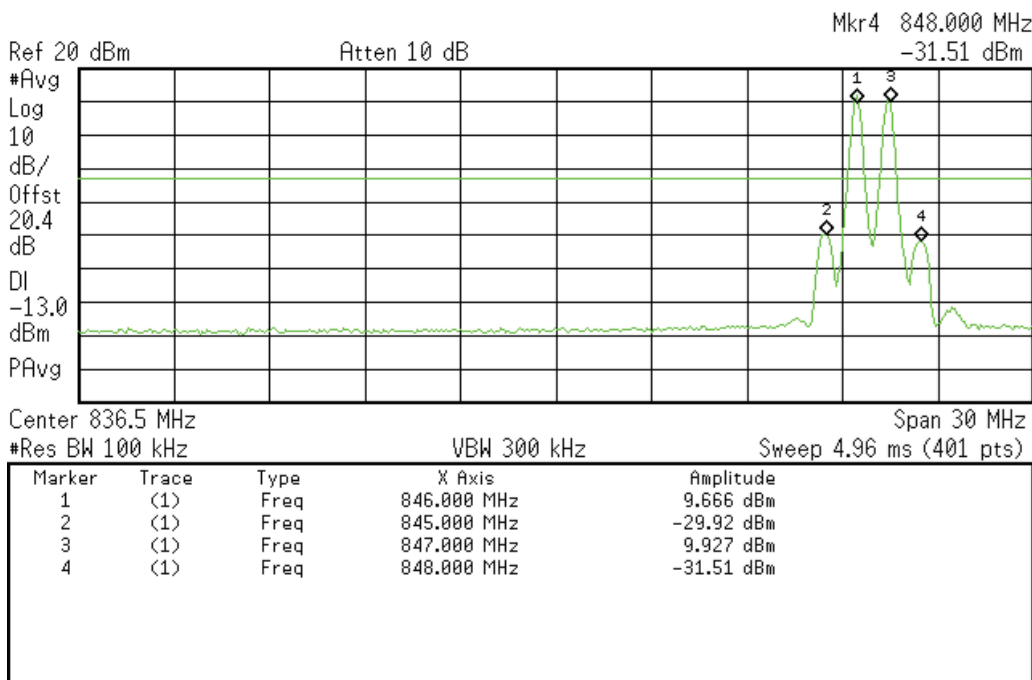
Agilent 10:58:22 Aug 13, 2014

L



Agilent 11:03:05 Aug 13, 2014

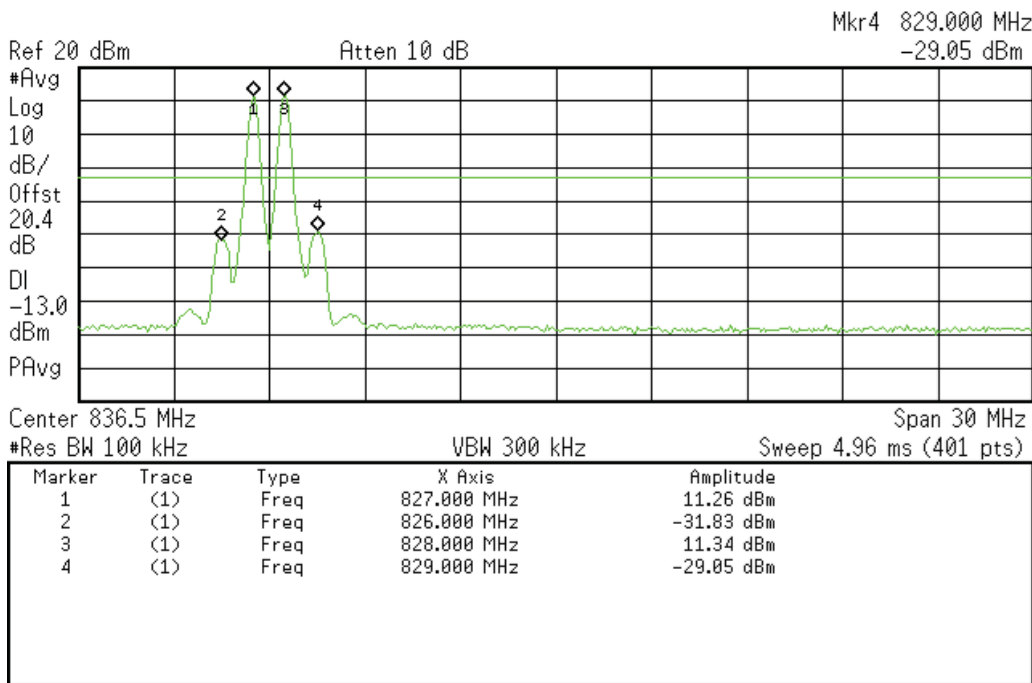
L



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

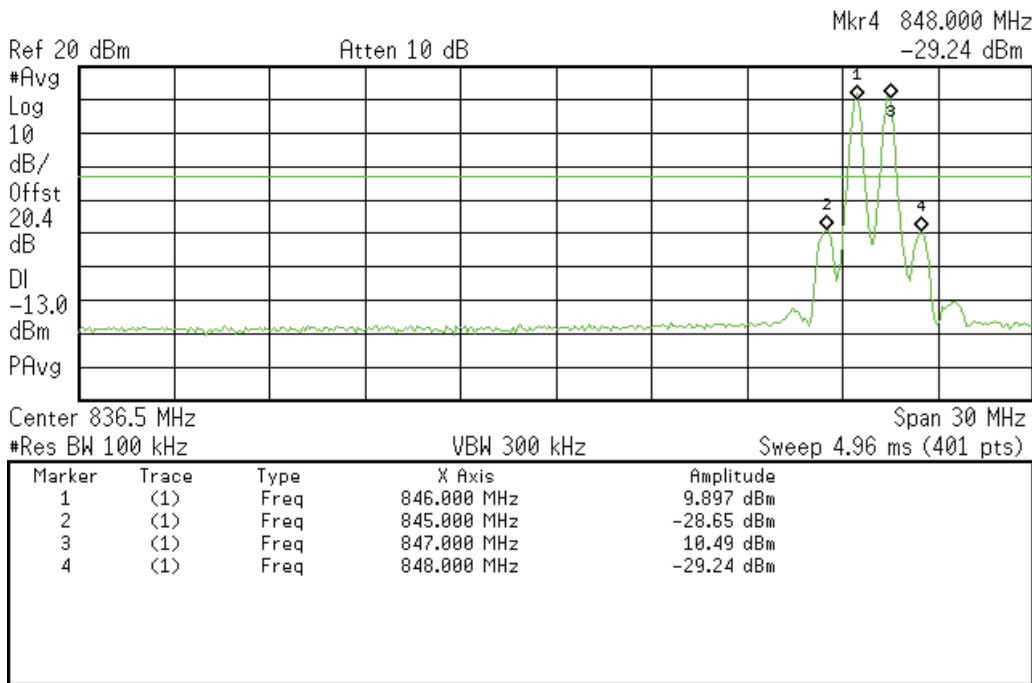
Agilent 10:58:35 Aug 13, 2014

L



Agilent 11:03:20 Aug 13, 2014

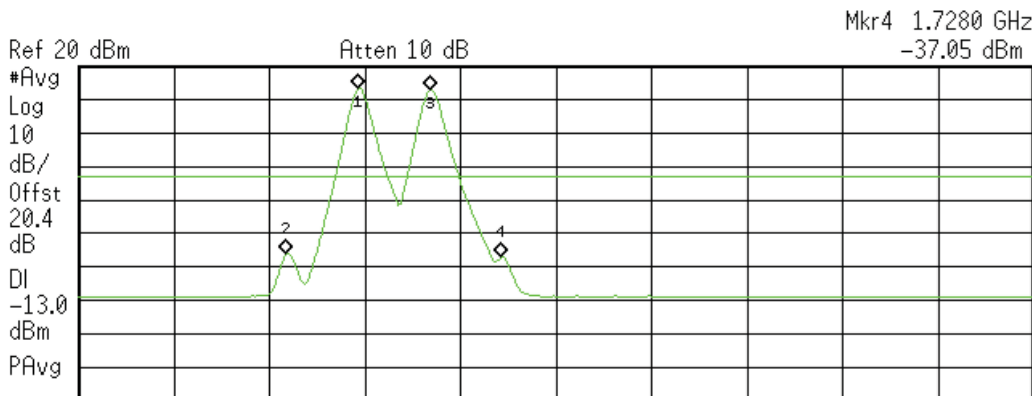
L



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

Agilent 11:09:36 Aug 13, 2014

L

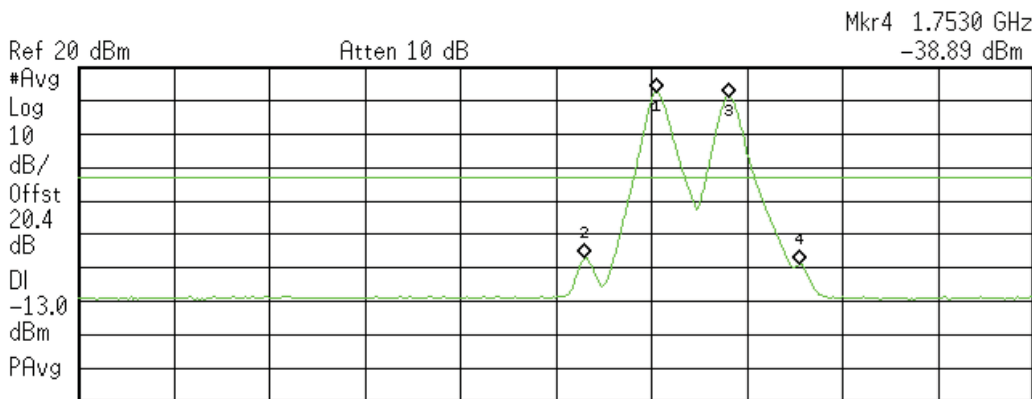


Center 1.732 GHz Span 80 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 1.7160 GHz | 13.35 dBm  |
| 2      | (1)   | Freq | 1.7100 GHz | -35.96 dBm |
| 3      | (1)   | Freq | 1.7220 GHz | 12.78 dBm  |
| 4      | (1)   | Freq | 1.7280 GHz | -37.05 dBm |

Agilent 11:12:39 Aug 13, 2014

L



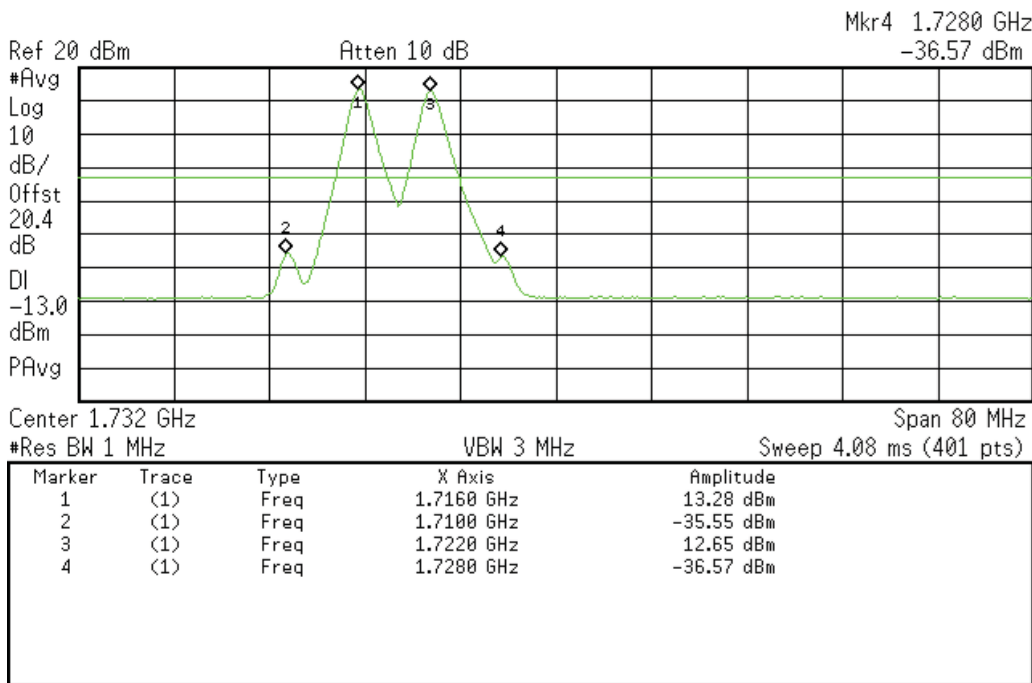
Center 1.732 GHz Span 80 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 1.7410 GHz | 12.5 dBm   |
| 2      | (1)   | Freq | 1.7350 GHz | -36.94 dBm |
| 3      | (1)   | Freq | 1.7470 GHz | 11.06 dBm  |
| 4      | (1)   | Freq | 1.7530 GHz | -38.89 dBm |

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

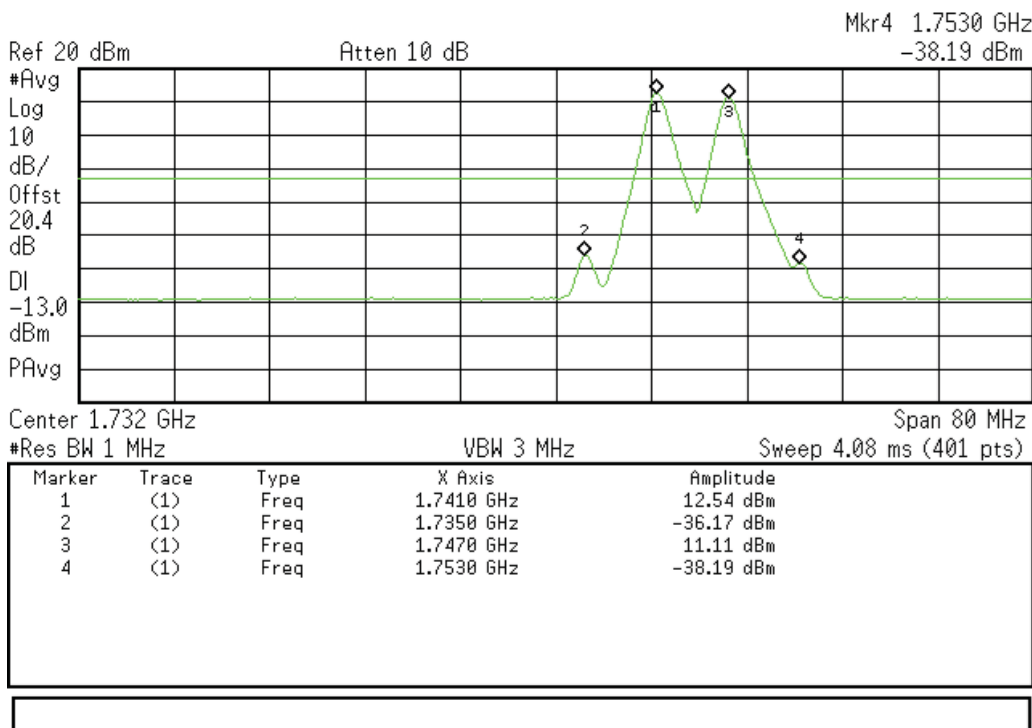
Agilent 11:09:53 Aug 13, 2014

L



Agilent 11:12:56 Aug 13, 2014

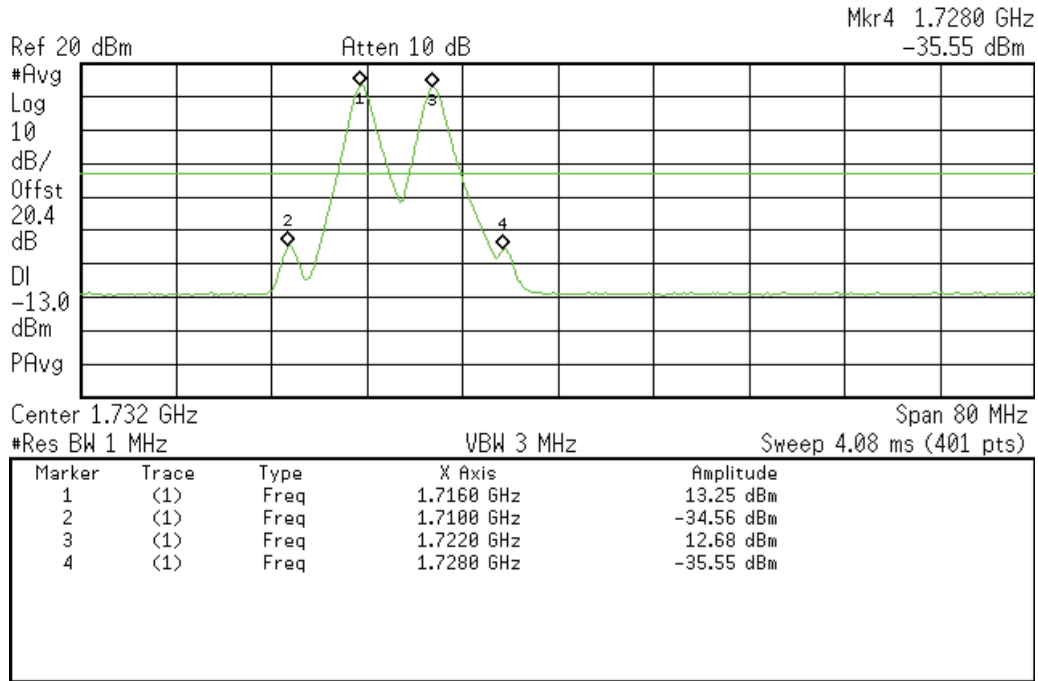
L



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

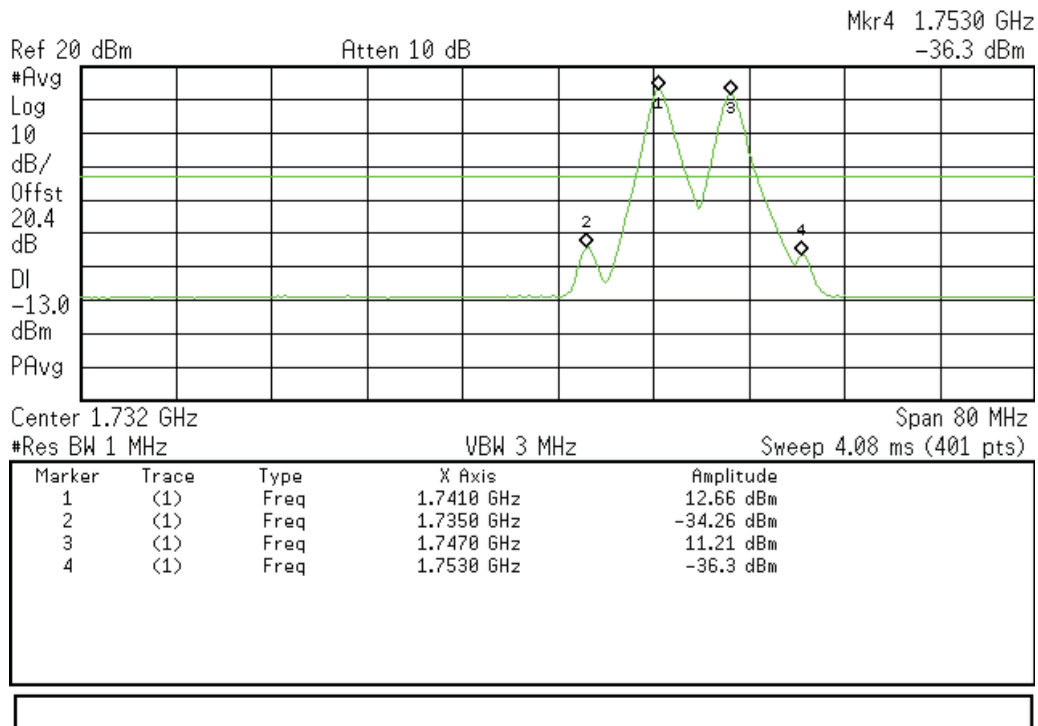
Agilent 11:10:05 Aug 13, 2014

L



Agilent 11:13:10 Aug 13, 2014

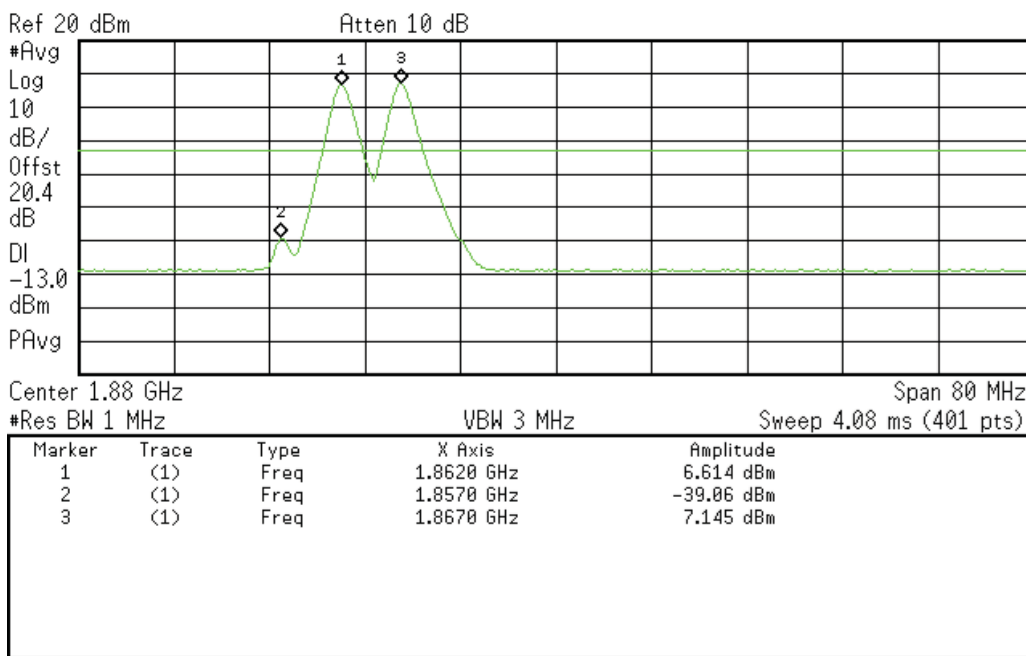
L



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

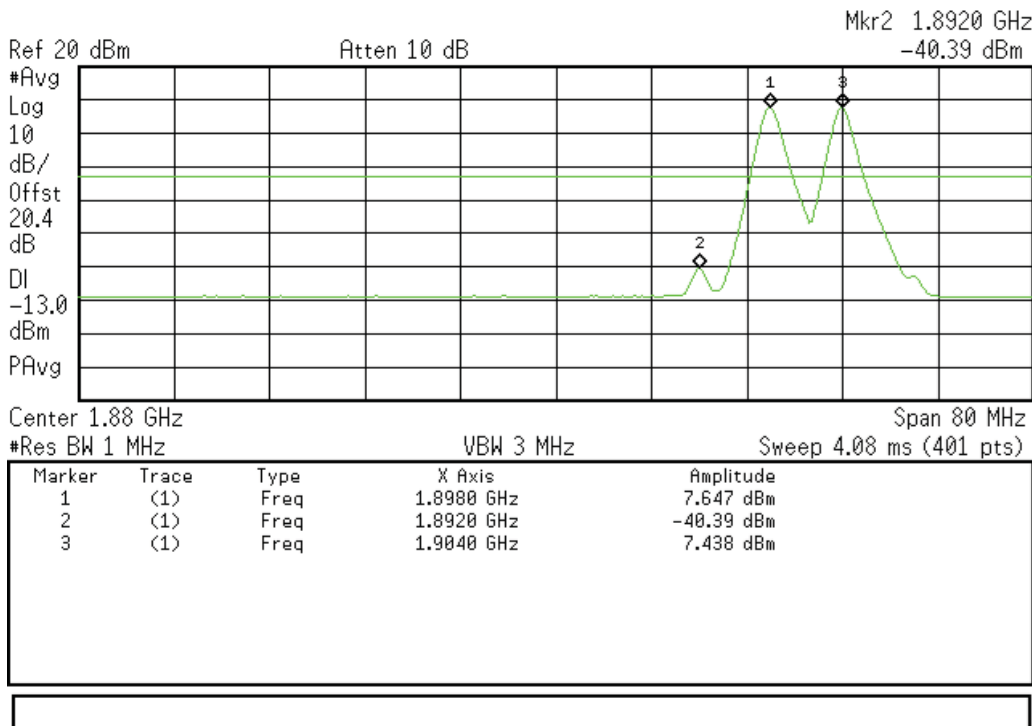
Agilent 11:16:59 Aug 13, 2014

L



Agilent 11:19:20 Aug 13, 2014

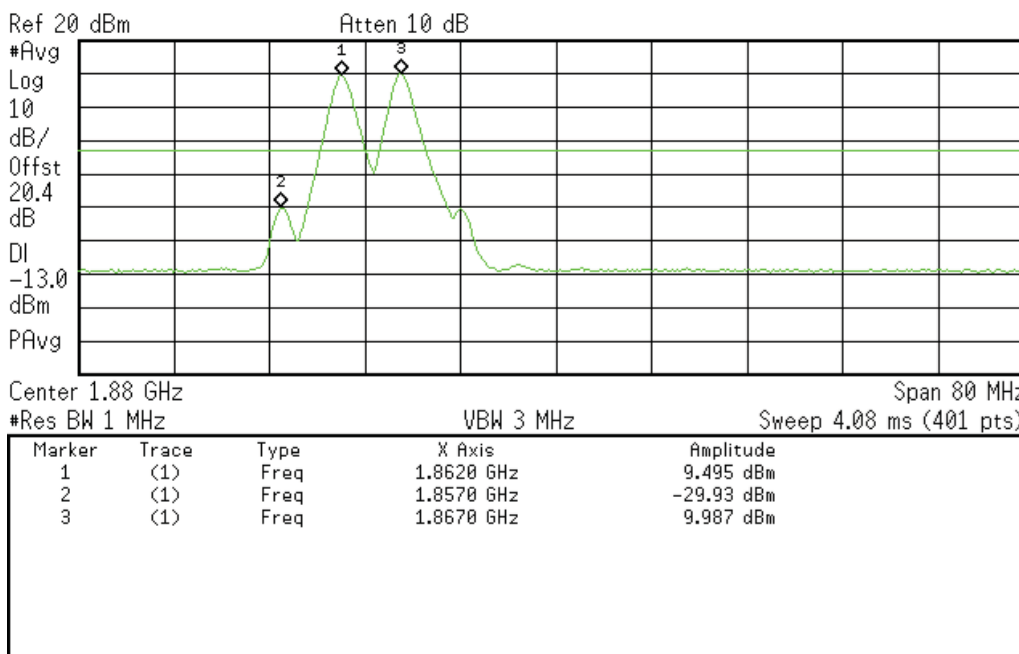
L



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

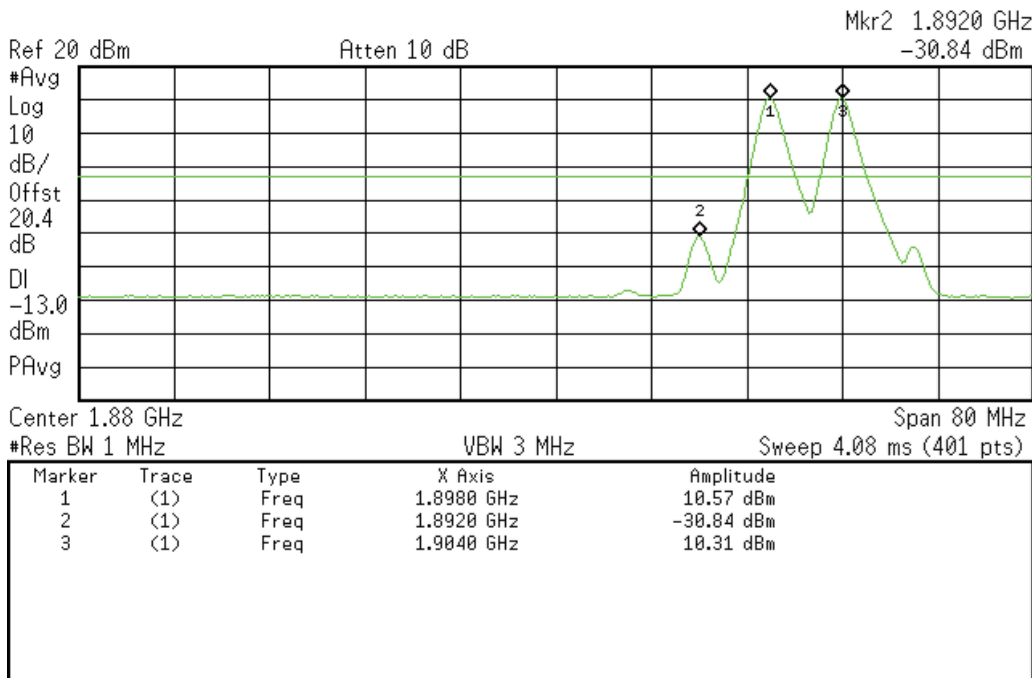
Agilent 11:17:22 Aug 13, 2014

L



Agilent 11:19:40 Aug 13, 2014

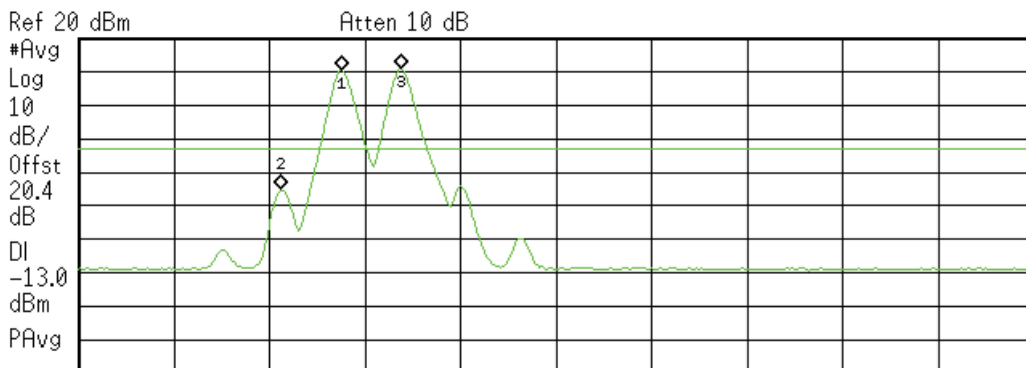
L



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

Agilent 11:17:38 Aug 13, 2014

L

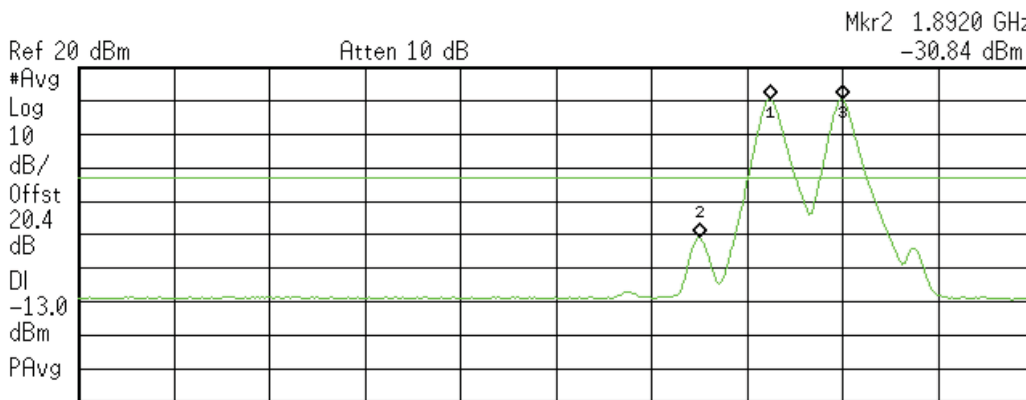


Center 1.88 GHz Span 80 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 1.8620 GHz | 10.47 dBm  |
| 2      | (1)   | Freq | 1.8570 GHz | -25.09 dBm |
| 3      | (1)   | Freq | 1.8670 GHz | 10.97 dBm  |

Agilent 11:19:40 Aug 13, 2014

L



Center 1.88 GHz Span 80 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

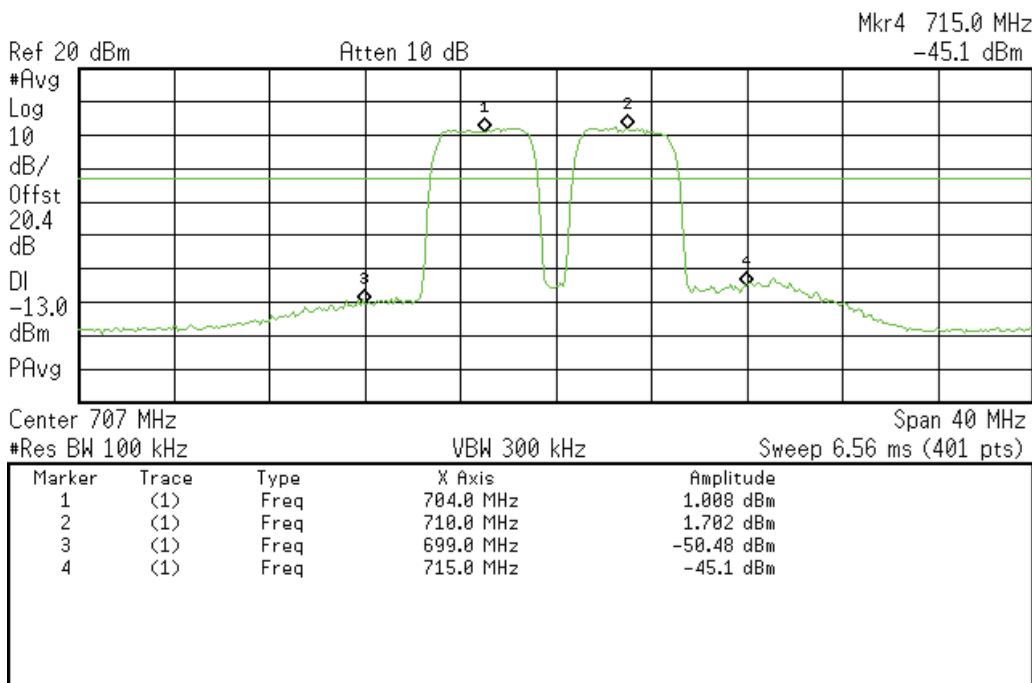
| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 1.8980 GHz | 10.57 dBm  |
| 2      | (1)   | Freq | 1.8920 GHz | -30.84 dBm |
| 3      | (1)   | Freq | 1.9040 GHz | 10.31 dBm  |



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

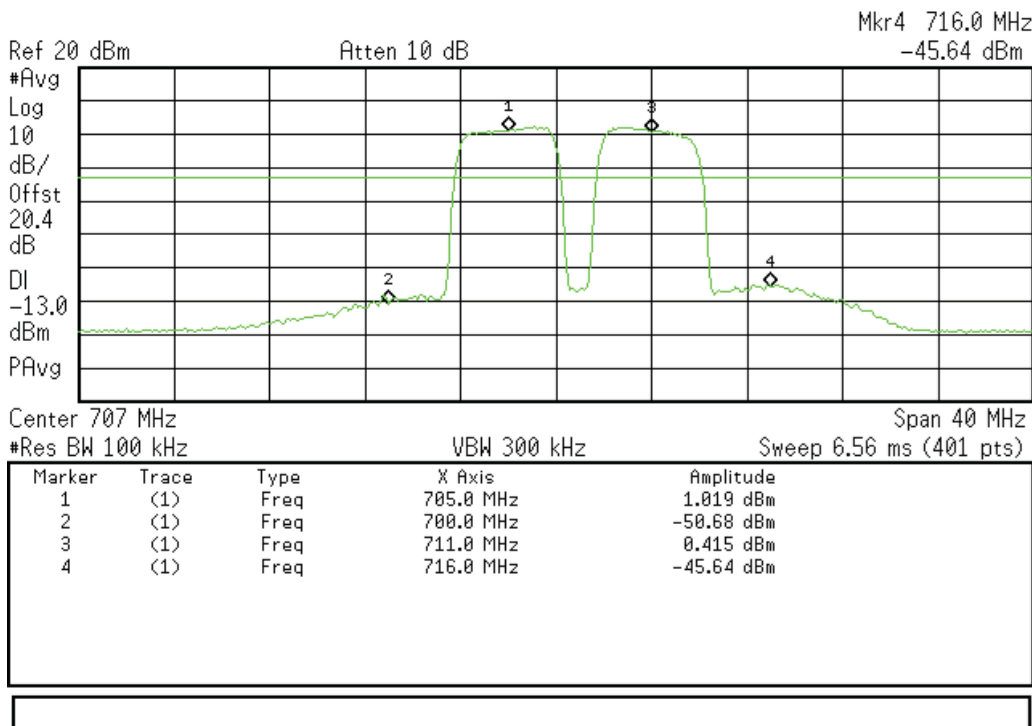
Agilent 16:51:25 Aug 12, 2014

L



Agilent 17:30:08 Aug 12, 2014

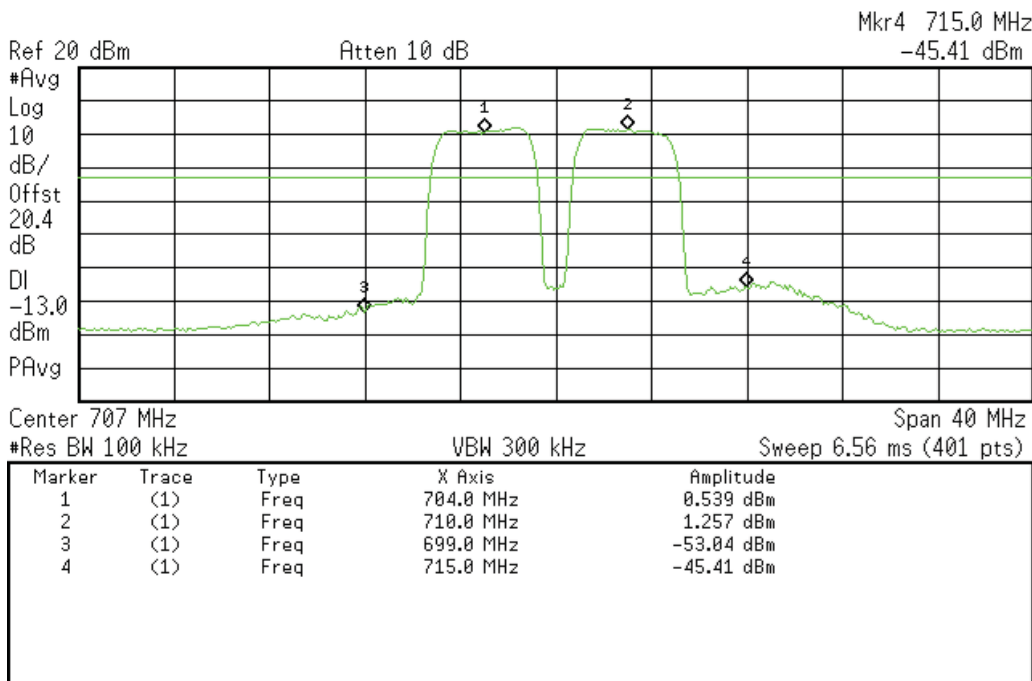
L



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

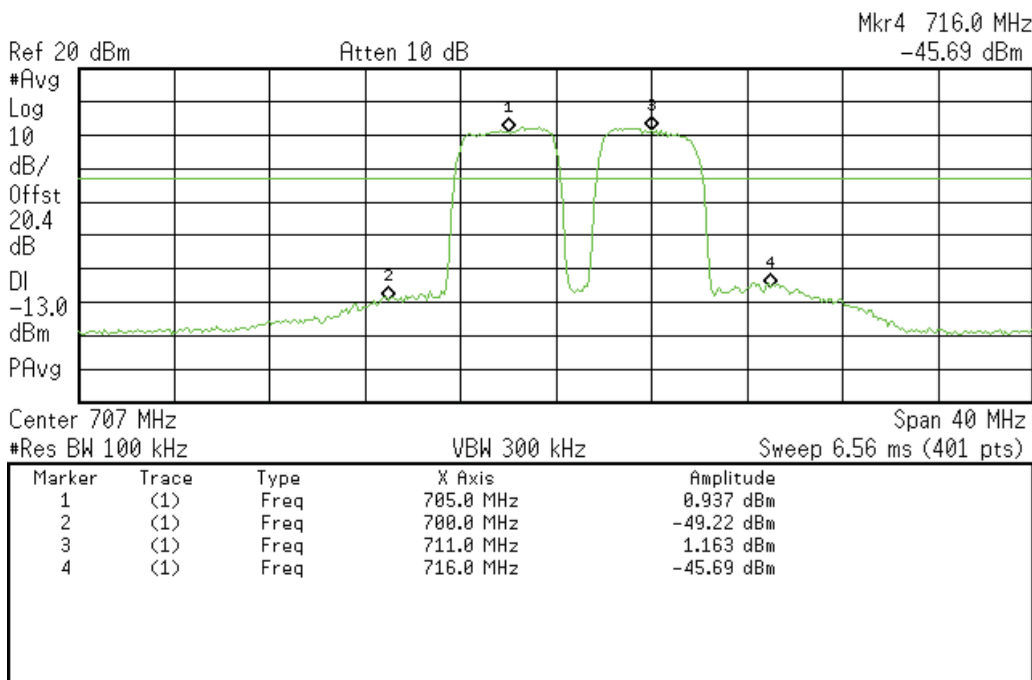
Agilent 16:52:38 Aug 12, 2014

L



Agilent 17:30:52 Aug 12, 2014

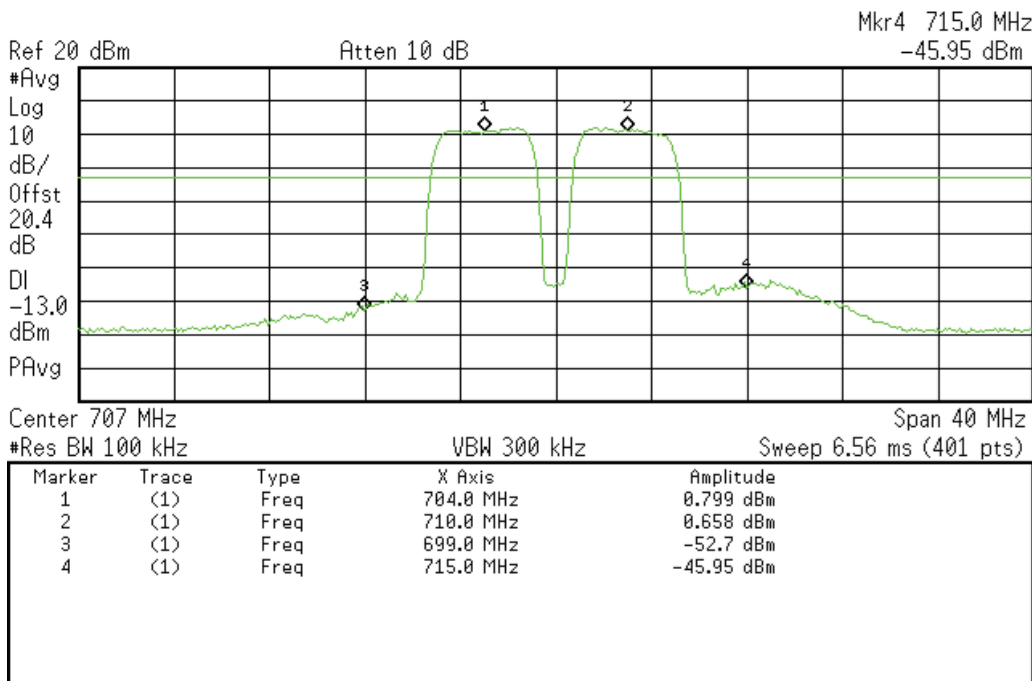
L



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

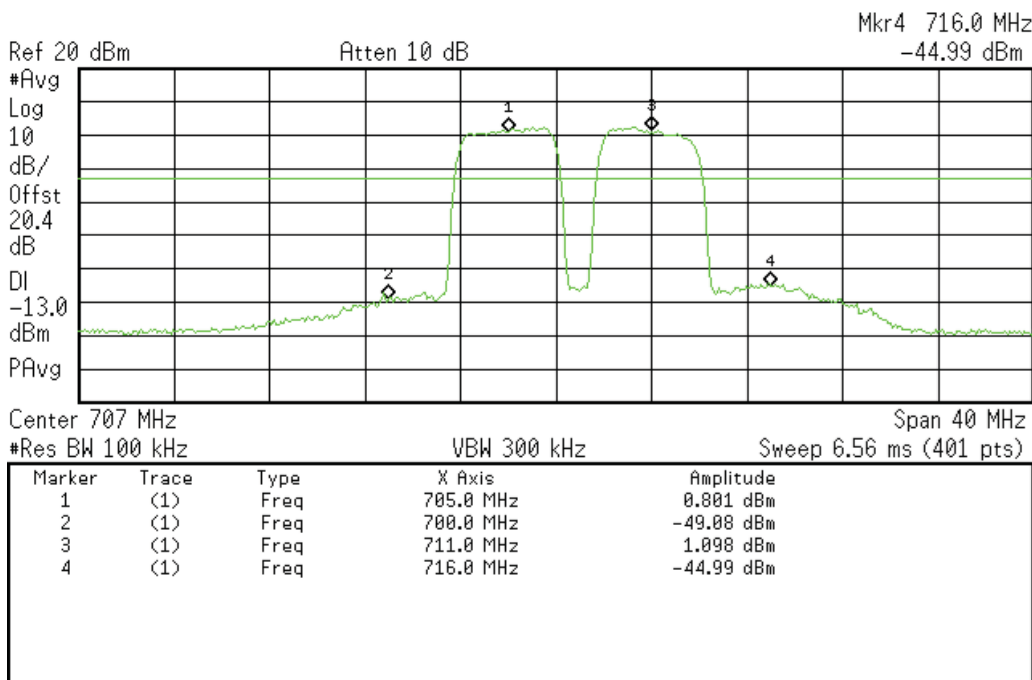
Agilent 16:53:32 Aug 12, 2014

L



Agilent 17:31:22 Aug 12, 2014

L

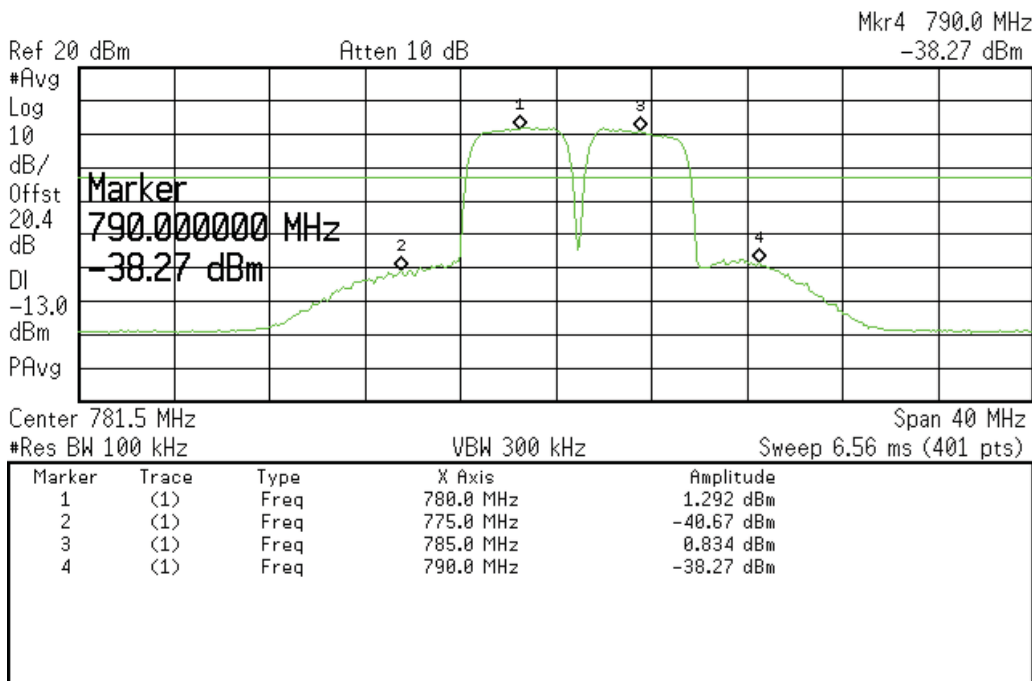




### Intermodulation Uplink Test Results at AGC (CDMA Signal) 776-787 MHz Band

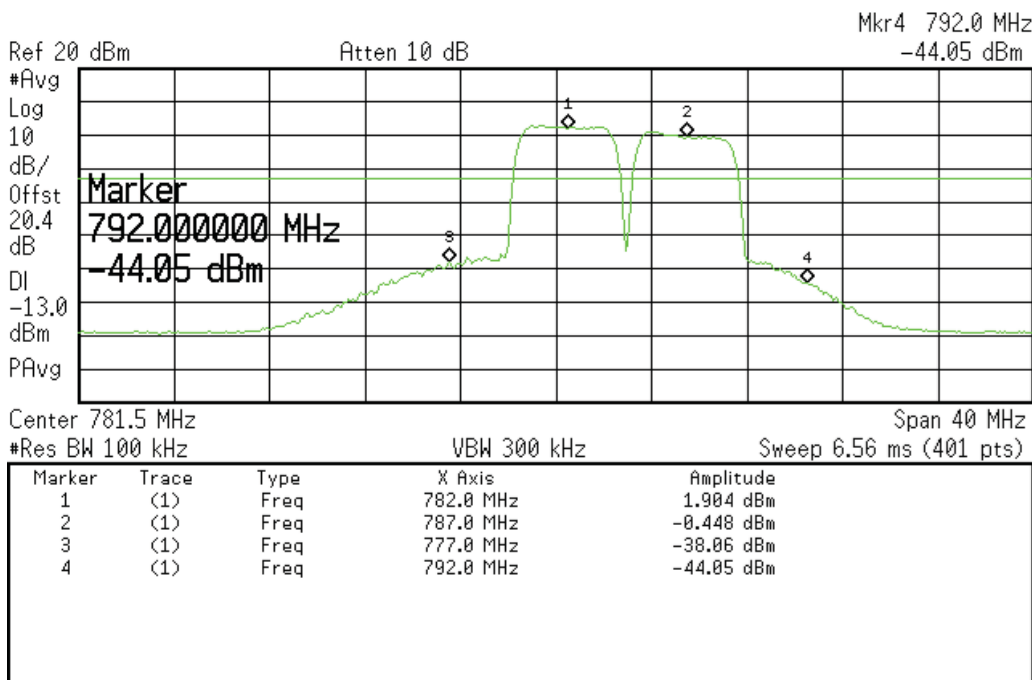
Agilent 17:01:12 Aug 12, 2014

L



Agilent 17:09:58 Aug 12, 2014

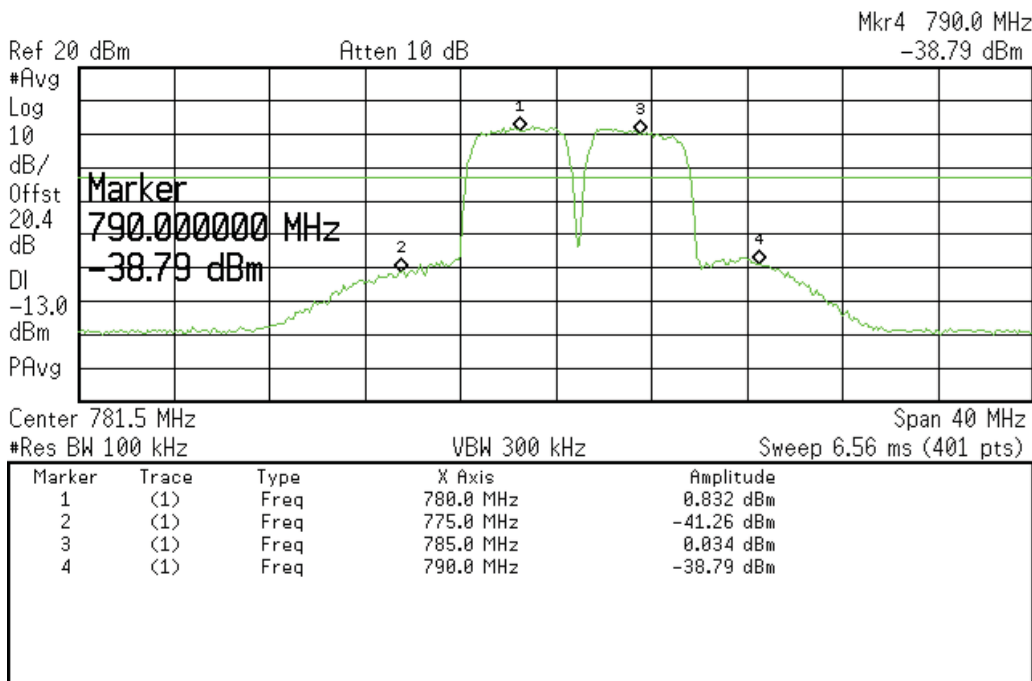
L



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

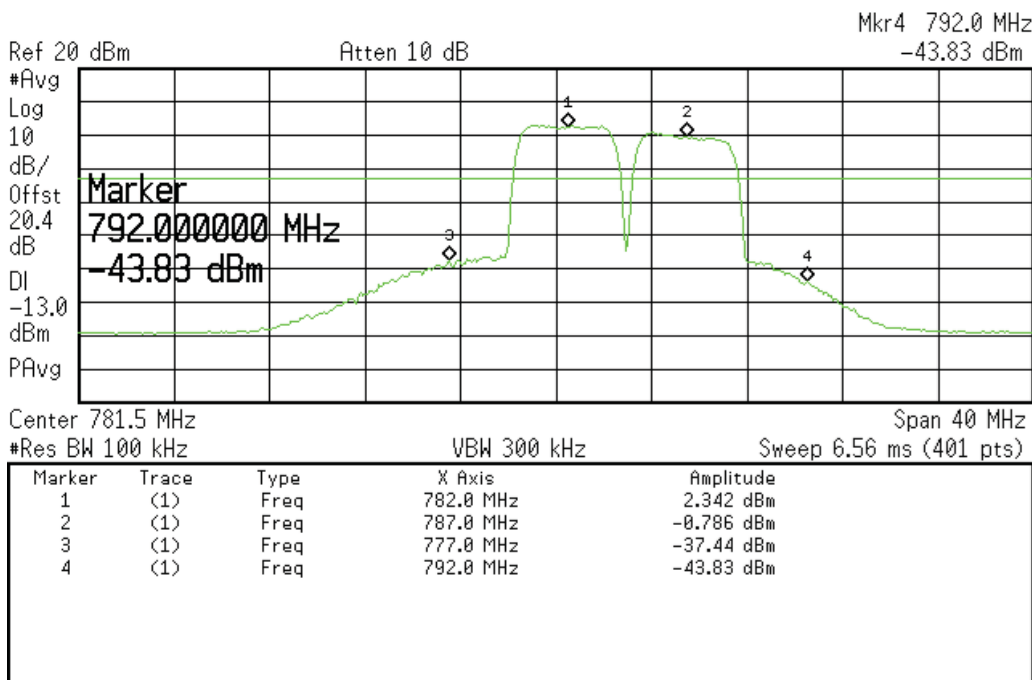
Agilent 17:02:31 Aug 12, 2014

L

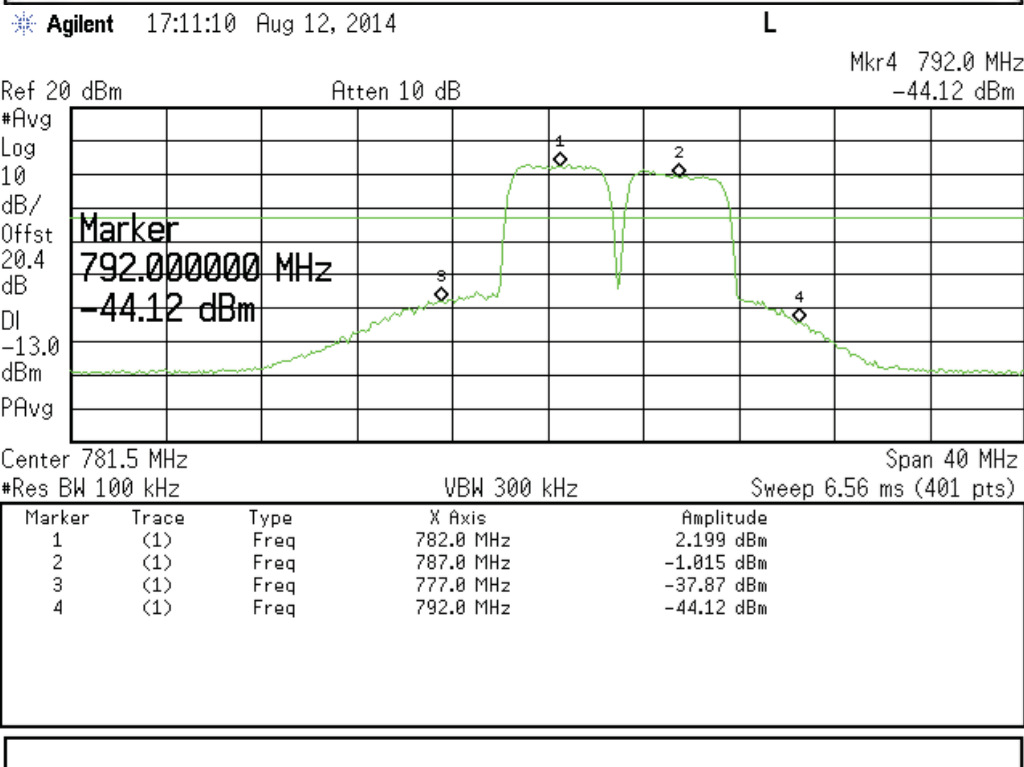
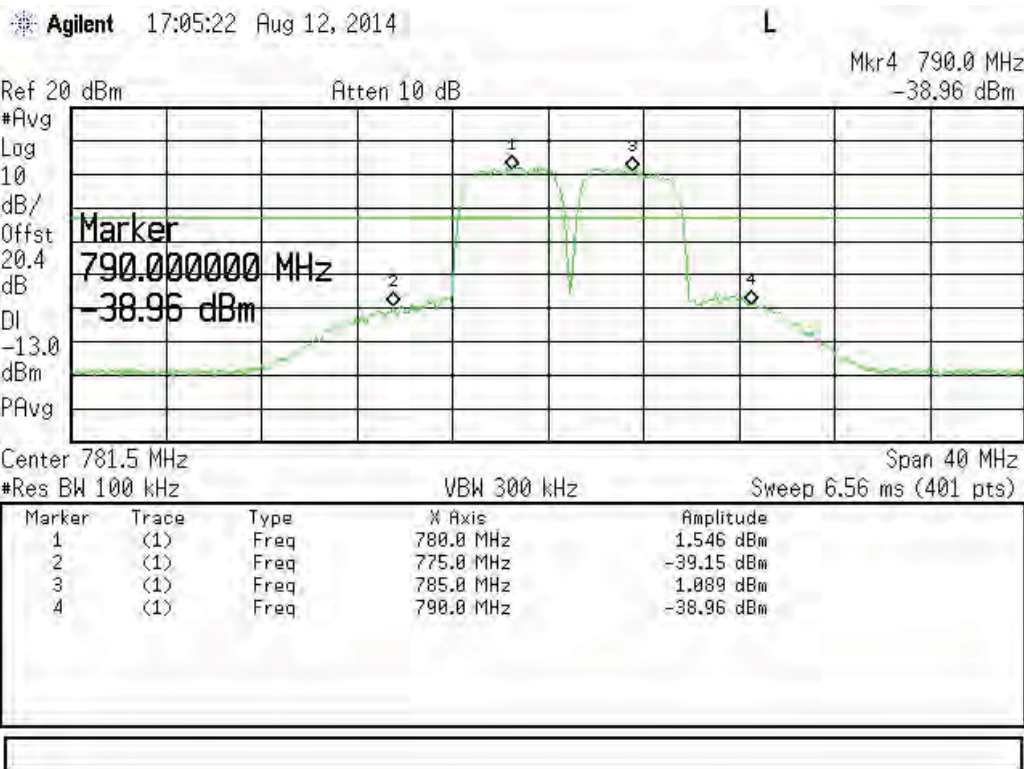


Agilent 17:10:36 Aug 12, 2014

L



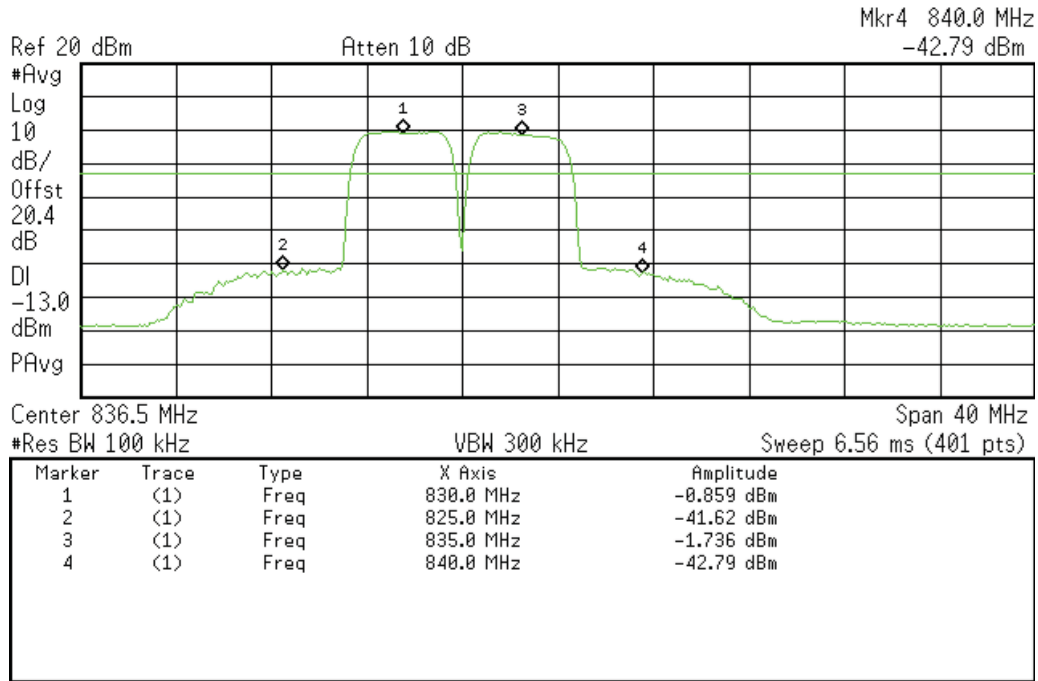
**Intermodulation Uplink Test Results at 6db above AGC (CDMA Signal)  
776-787 MHz Band**



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

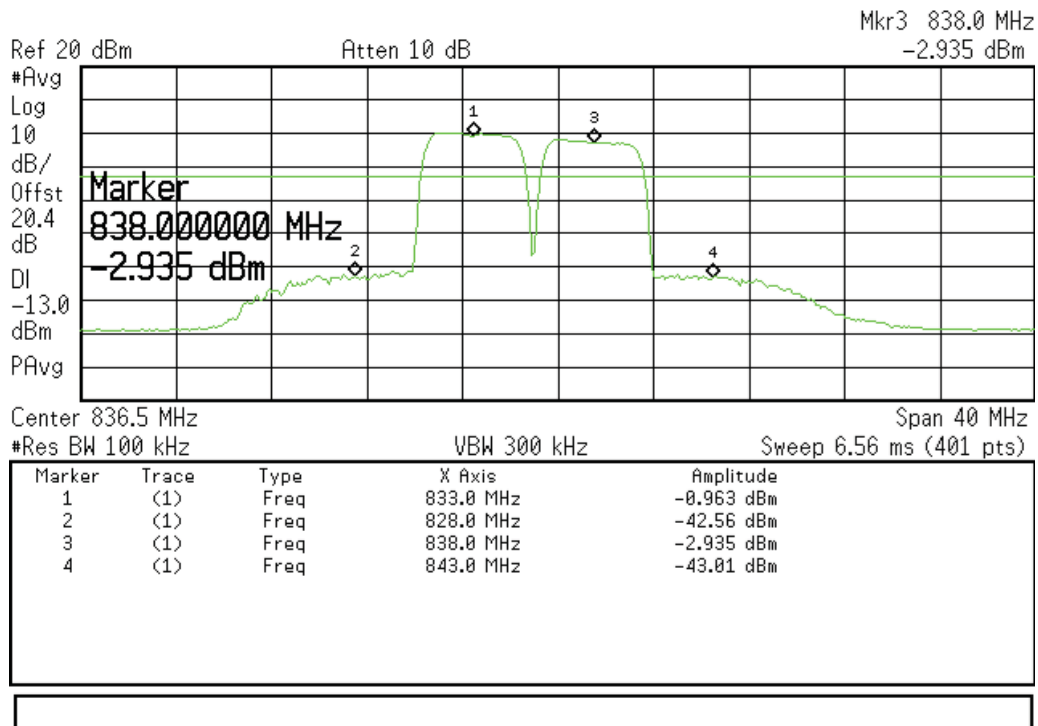
Agilent 17:17:37 Aug 12, 2014

L



Agilent 17:22:00 Aug 12, 2014

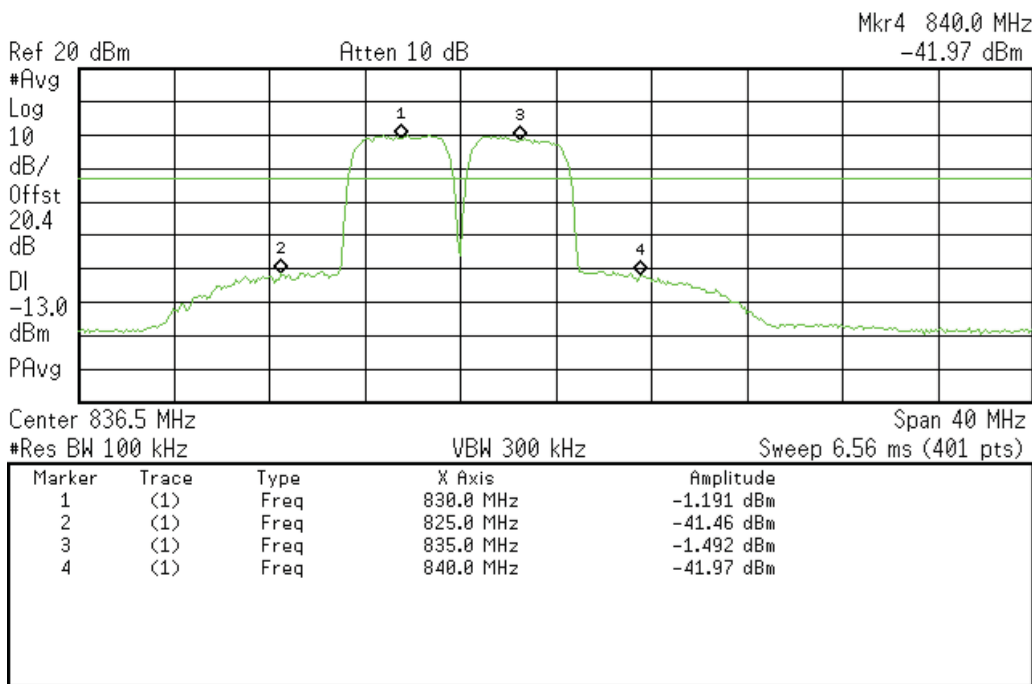
L



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

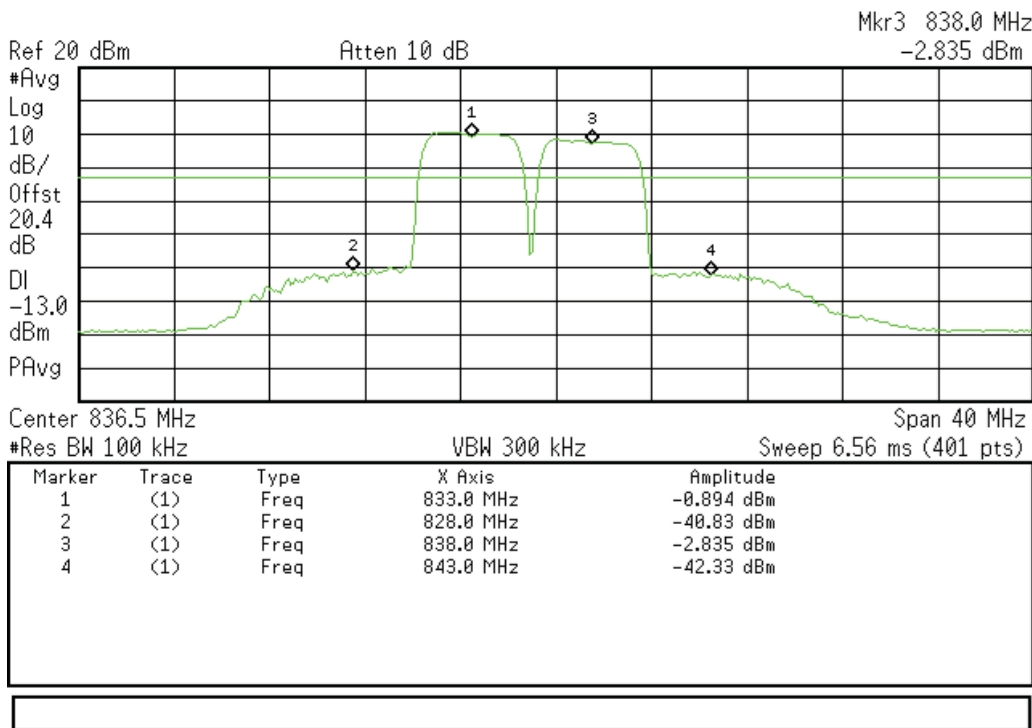
Agilent 17:18:34 Aug 12, 2014

L



Agilent 17:23:12 Aug 12, 2014

L

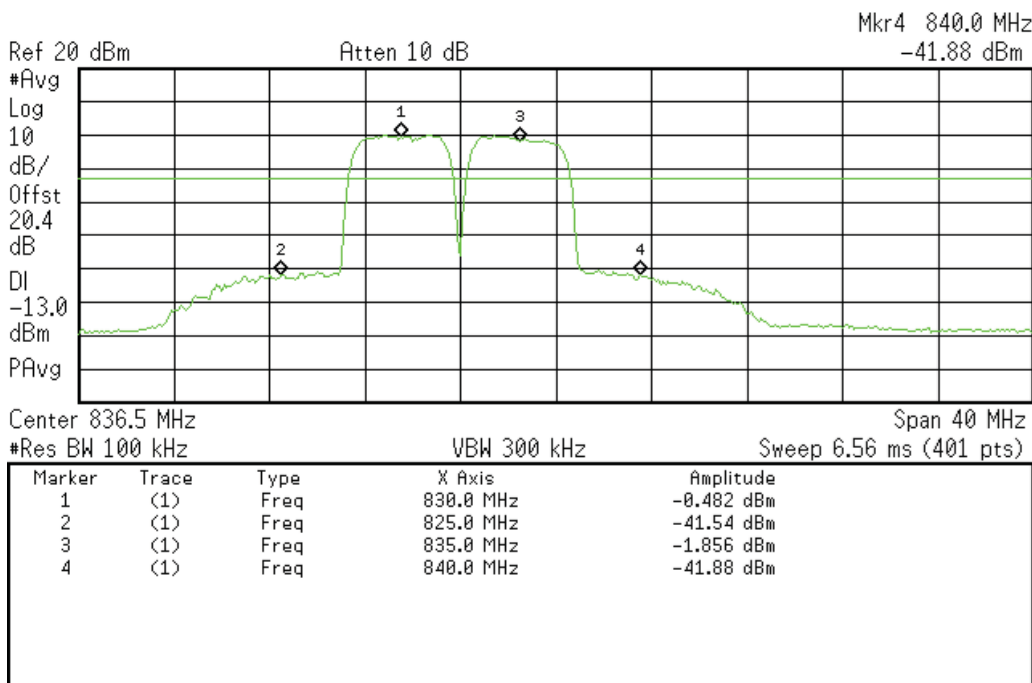




**Intermodulation Uplink Test Results at 6db above AGC (CDMA Signal)  
824-849 MHz Band**

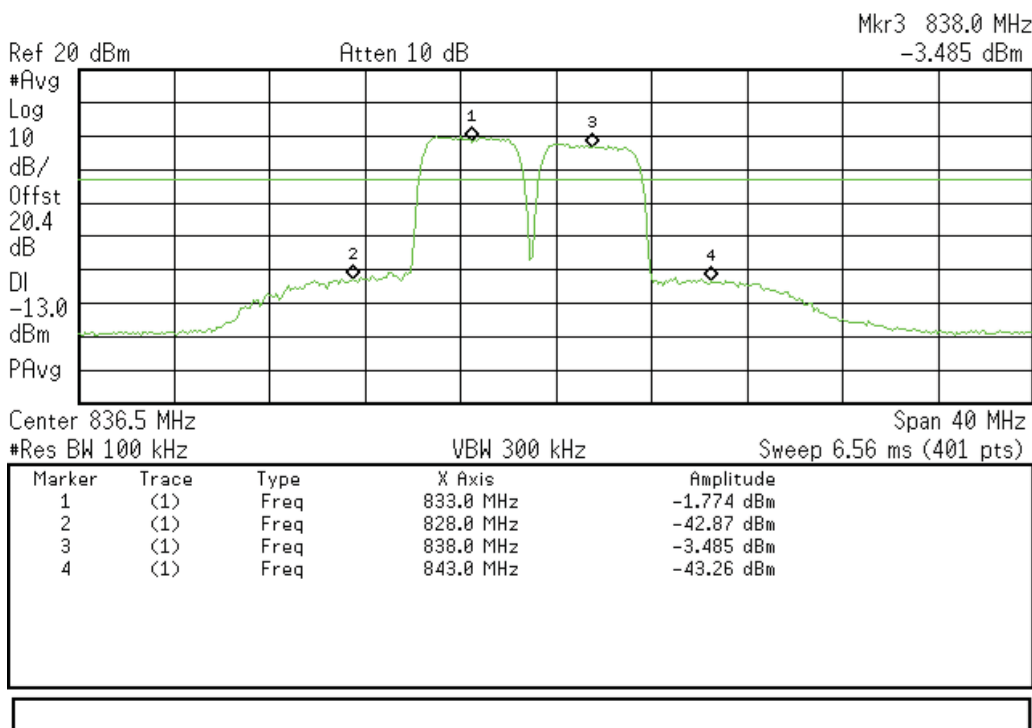
Agilent 17:19:11 Aug 12, 2014

L



Agilent 17:23:54 Aug 12, 2014

L

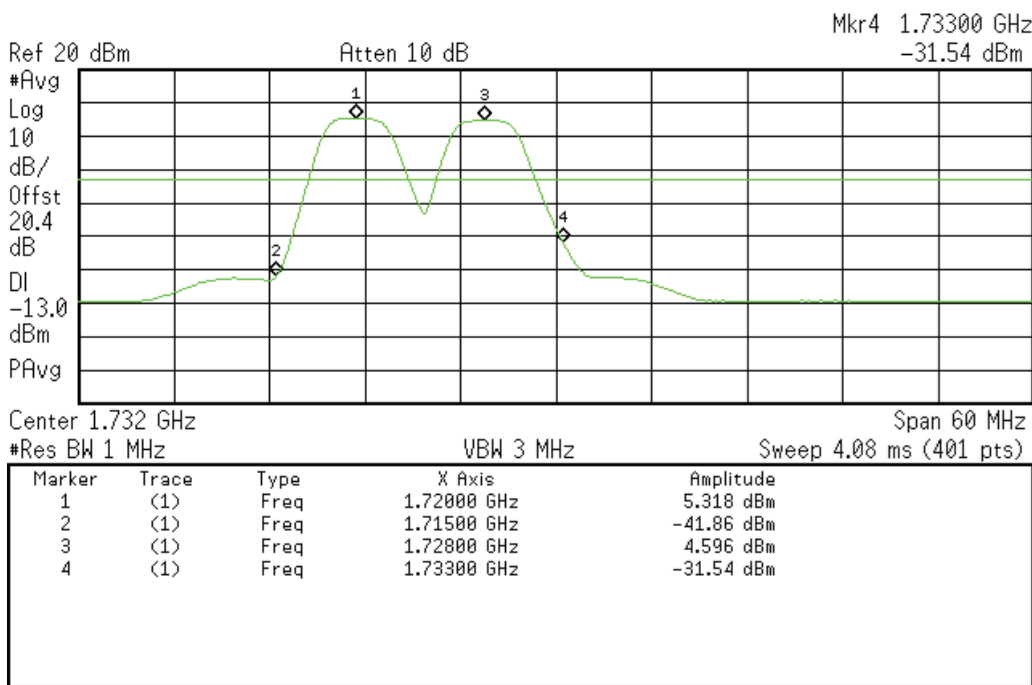




**Intermodulation Uplink Test Results at AGC (CDMA Signal)  
1710-1755 MHz Band**

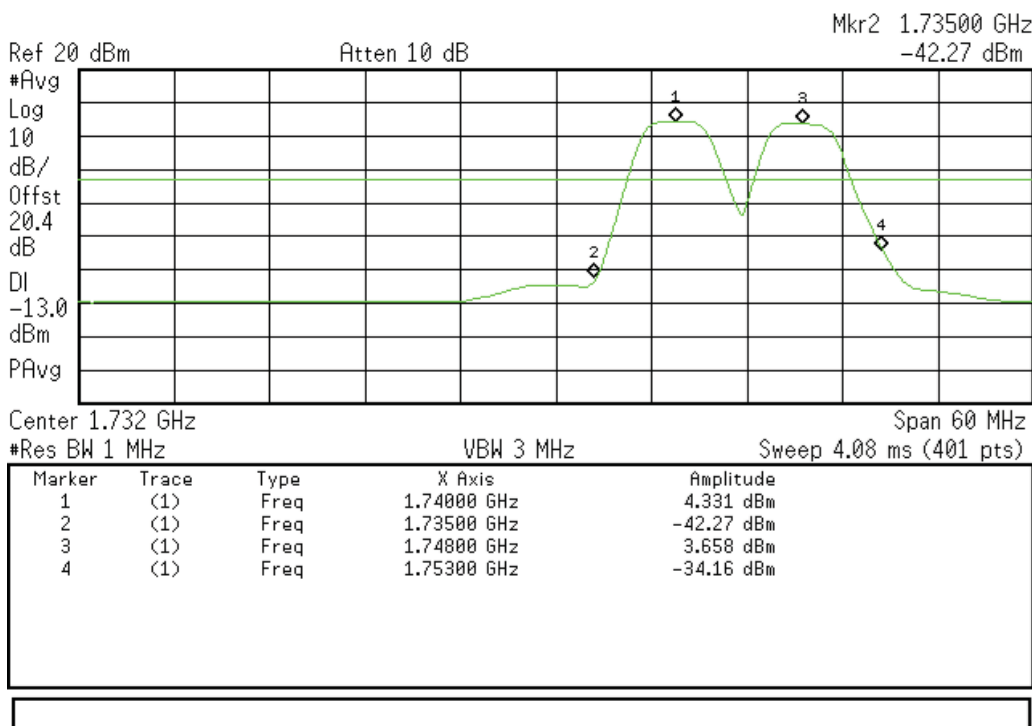
Agilent 17:36:01 Aug 12, 2014

L



Agilent 17:39:56 Aug 12, 2014

L

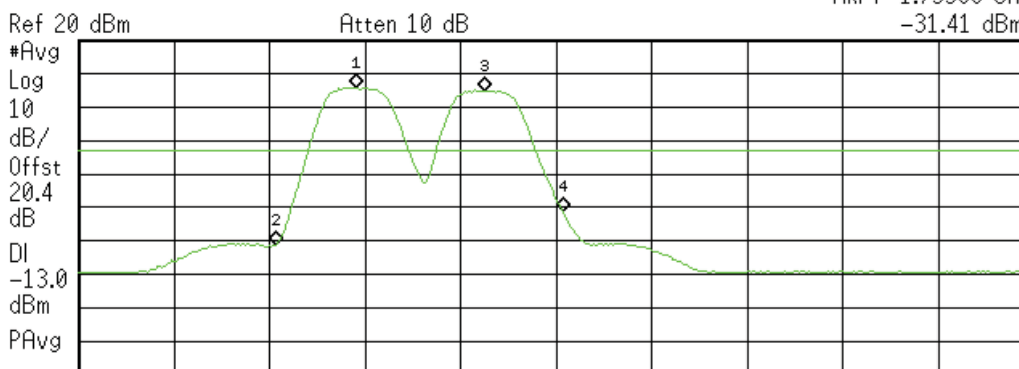


**Intermodulation Uplink Test Results at 3db above AGC (CDMA Signal)  
1710-1755 MHz Band**

Agilent 17:36:51 Aug 12, 2014

L

Mkr4 1.73300 GHz  
-31.41 dBm



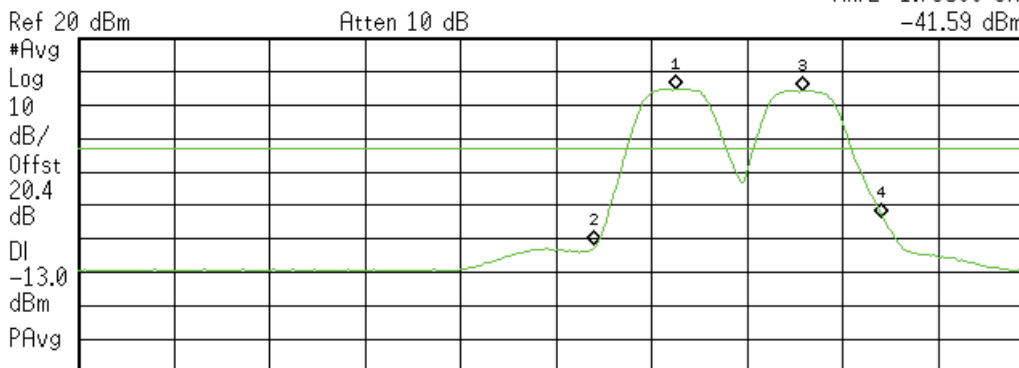
Center 1.732 GHz Span 60 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

| Marker | Trace | Type | X Axis      | Amplitude  |
|--------|-------|------|-------------|------------|
| 1      | (1)   | Freq | 1.72800 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 |

Agilent 17:40:27 Aug 12, 2014

L

Mkr2 1.73500 GHz  
-41.59 dBm



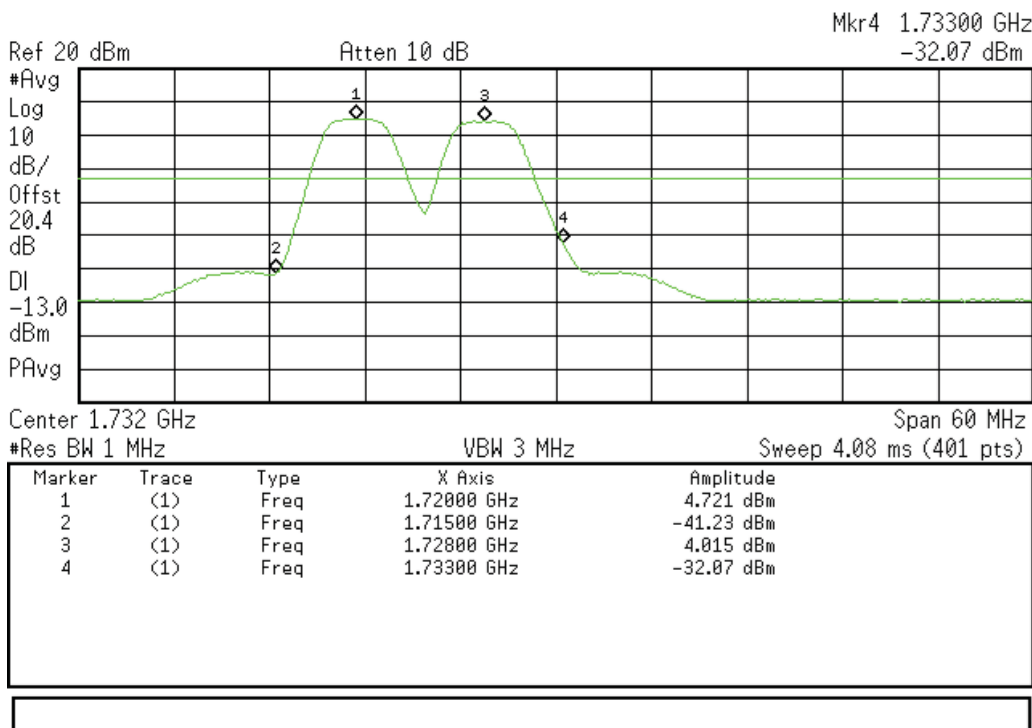
Center 1.732 GHz Span 60 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

| 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**

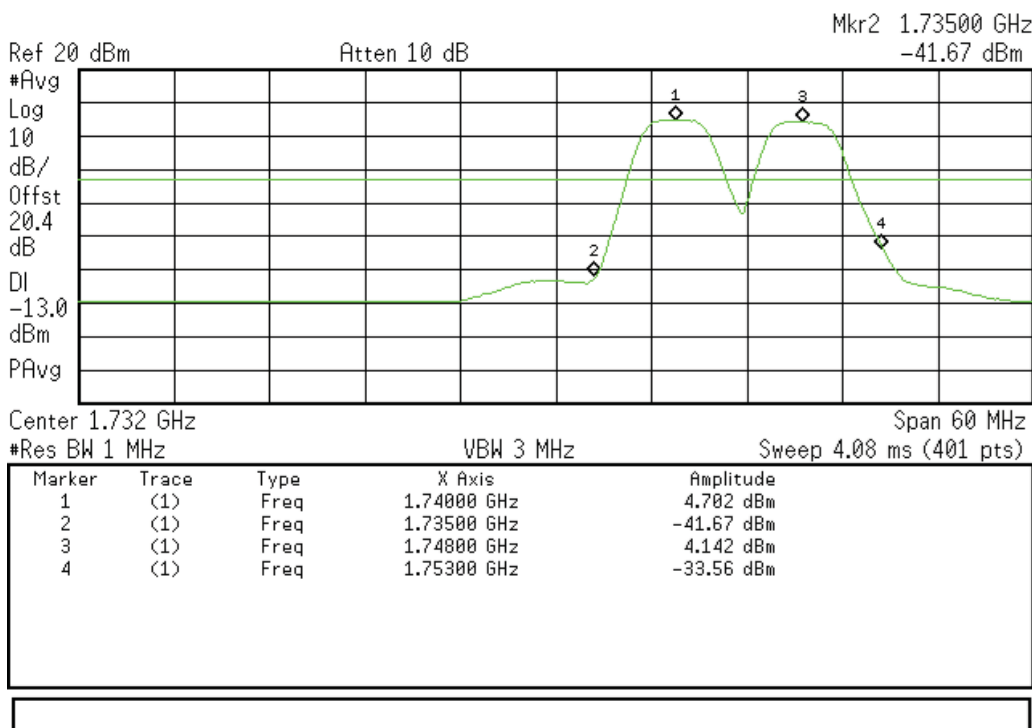
Agilent 17:37:05 Aug 12, 2014

L



Agilent 17:40:41 Aug 12, 2014

L

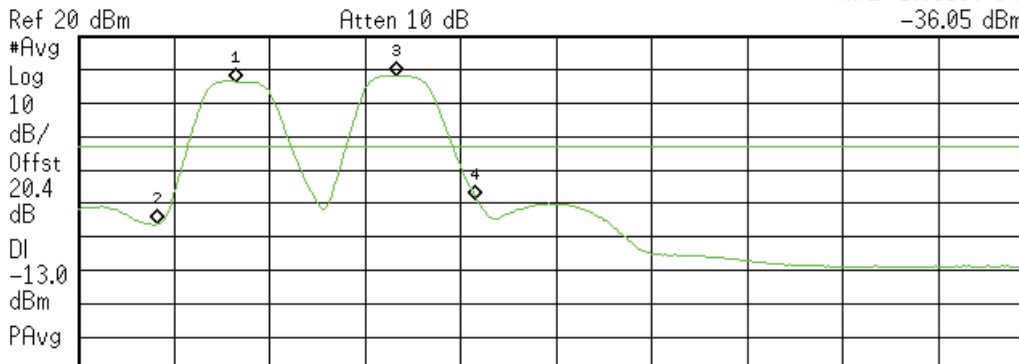


**Intermodulation Uplink Test Results at AGC (CDMA Signal)  
1850-1915 MHz Band**

Agilent 17:47:59 Aug 12, 2014

L

Mkr2 1.85500 GHz  
-36.05 dBm



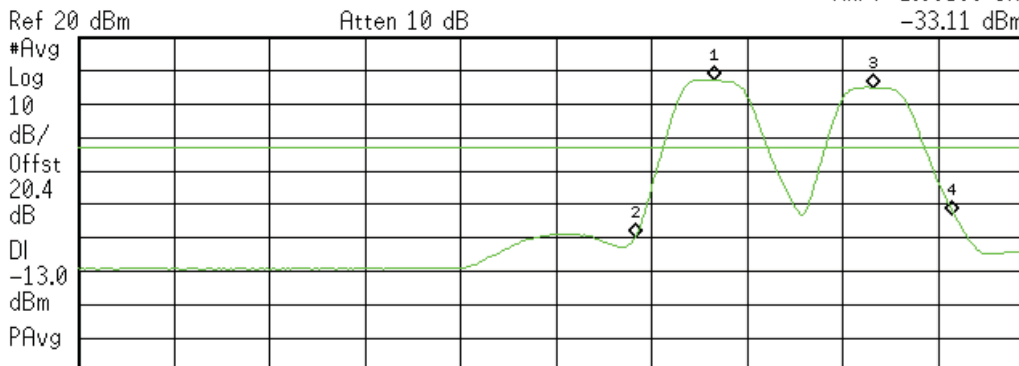
Center 1.88 GHz Span 60 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

| 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  |

Agilent 17:44:28 Aug 12, 2014

L

Mkr4 1.90500 GHz  
-33.11 dBm



Center 1.88 GHz Span 60 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

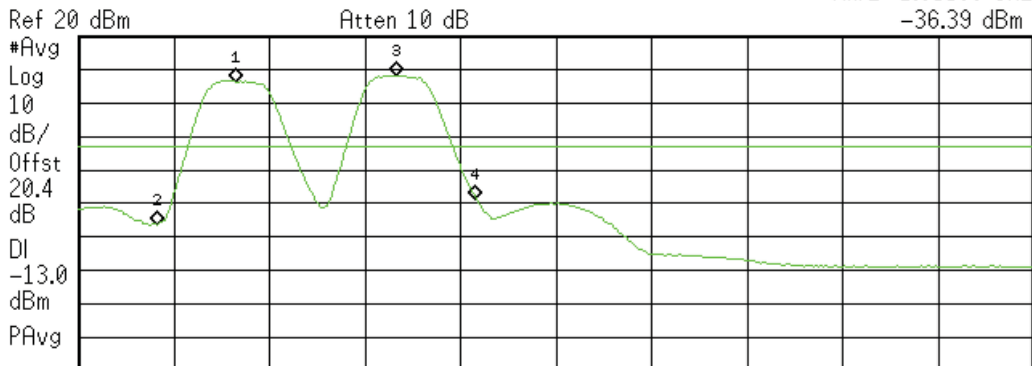
| Marker | Trace | Type | X Axis      | Amplitude  |
|--------|-------|------|-------------|------------|
| 1      | (1)   | Freq | 1.89000 GHz | 7.054 dBm  |
| 2      | (1)   | Freq | 1.88500 GHz | -39.83 dBm |
| 3      | (1)   | Freq | 1.90000 GHz | 4.864 dBm  |
| 4      | (1)   | Freq | 1.90500 GHz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

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

Agilent 17:48:41 Aug 12, 2014

L

Mkr2 1.85500 GHz  
-36.39 dBm



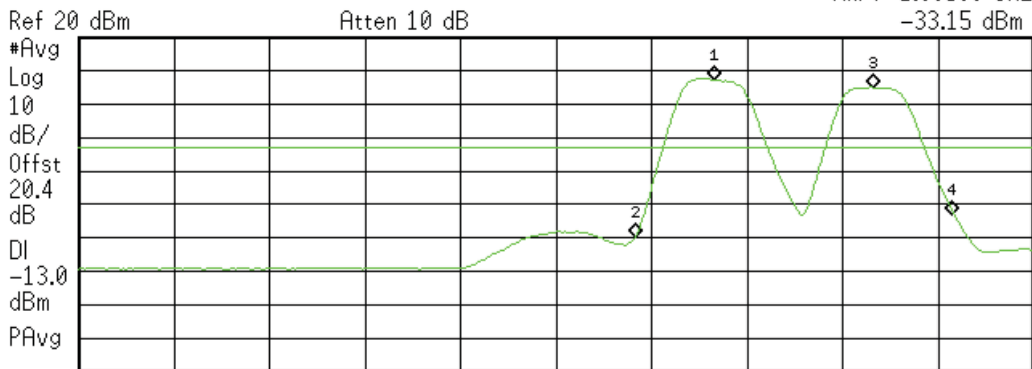
Center 1.88 GHz Span 60 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

| 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 |

Agilent 17:45:12 Aug 12, 2014

L

Mkr4 1.90500 GHz  
-33.15 dBm



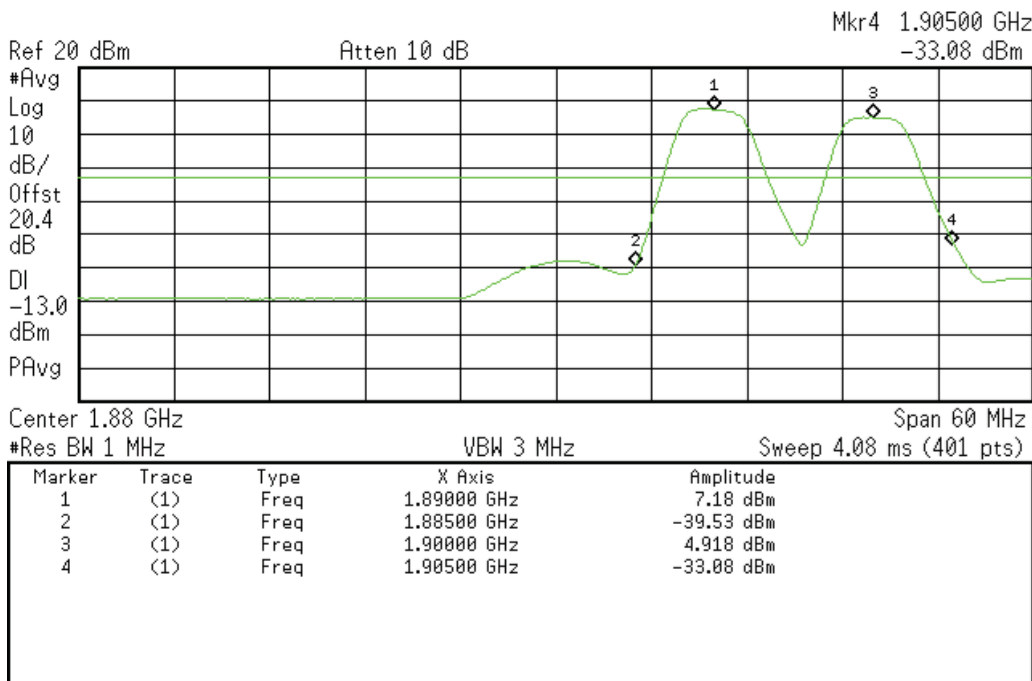
Center 1.88 GHz Span 60 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

| 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**

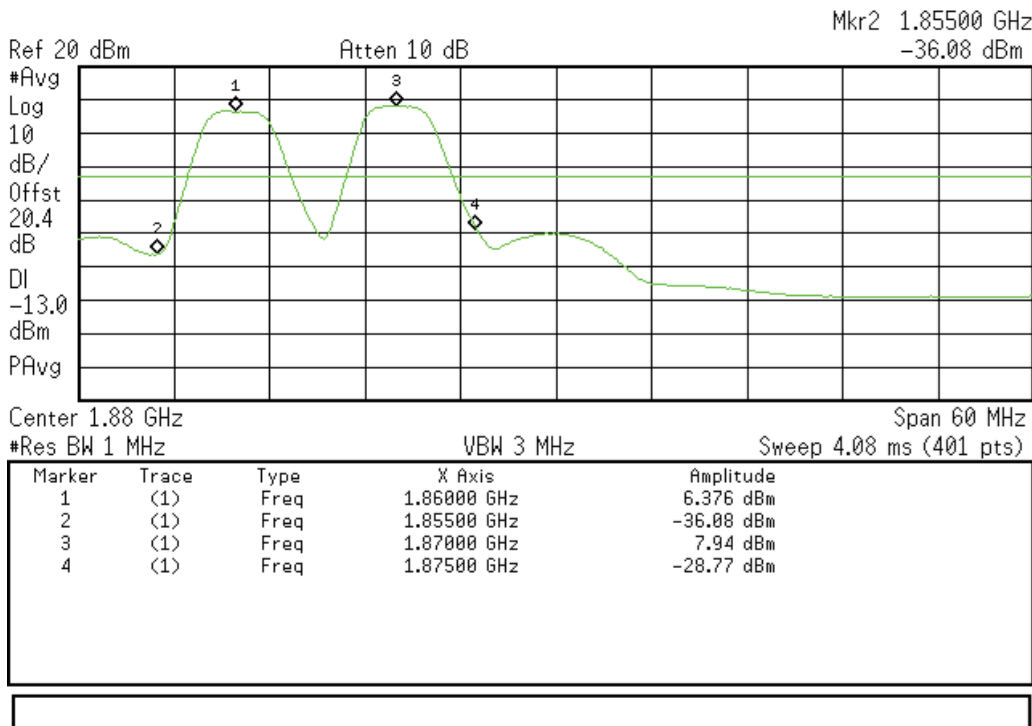
Agilent 17:45:25 Aug 12, 2014

L



Agilent 17:49:18 Aug 12, 2014

L

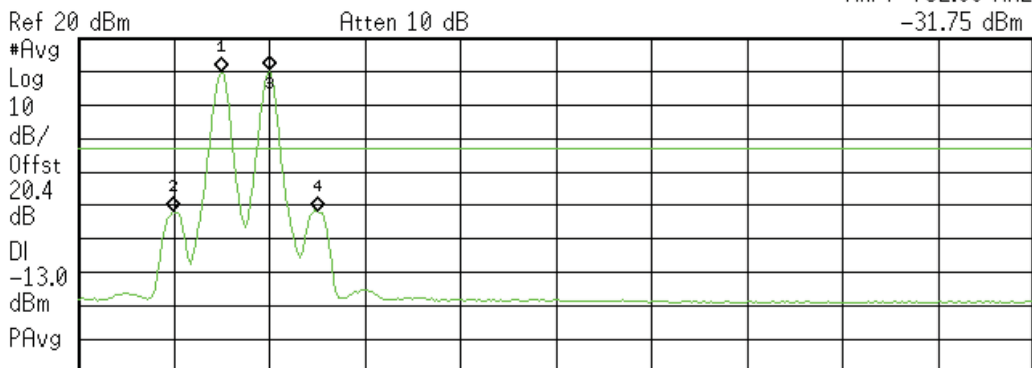


**Intermodulation Downlink Test Results at AGC (GSM Signal)  
728-746 MHz Band**

Agilent 09:46:01 Aug 13, 2014

L

Mkr4 732.00 MHz  
-31.75 dBm



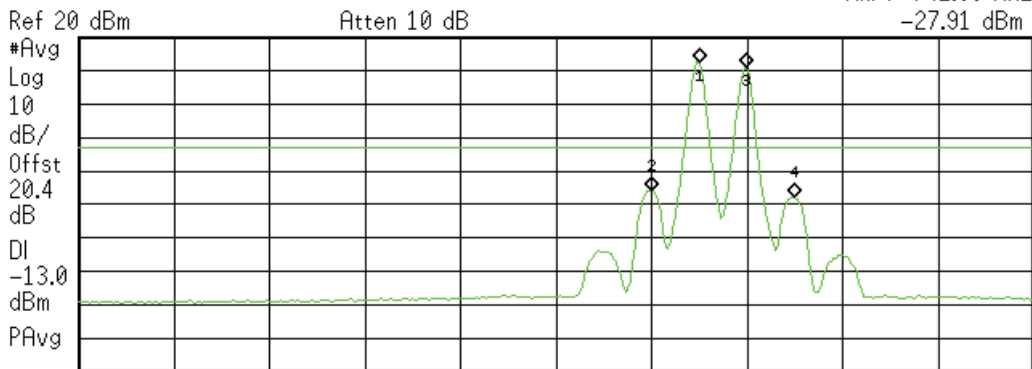
Center 737 MHz Span 20 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 4 ms (401 pts)

| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 730.00 MHz | 10.18 dBm  |
| 2      | (1)   | Freq | 729.00 MHz | -31.65 dBm |
| 3      | (1)   | Freq | 731.00 MHz | 10.35 dBm  |
| 4      | (1)   | Freq | 732.00 MHz | -31.75 dBm |

Agilent 09:48:51 Aug 13, 2014

L

Mkr4 742.00 MHz  
-27.91 dBm



Center 737 MHz Span 20 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 4 ms (401 pts)

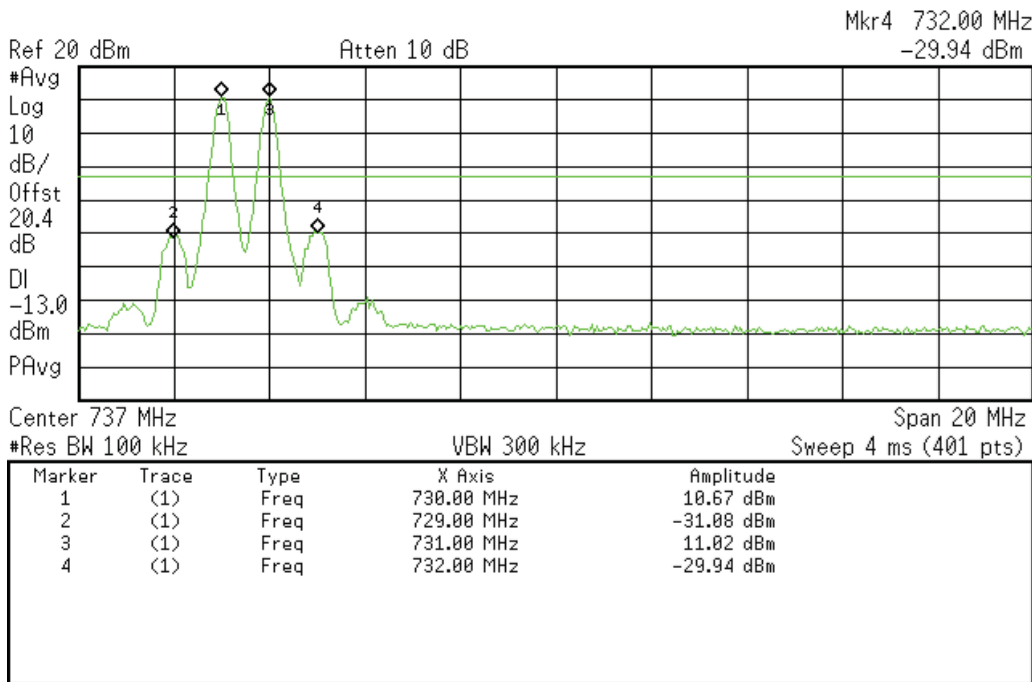
| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 740.00 MHz | 12.4 dBm   |
| 2      | (1)   | Freq | 739.00 MHz | -25.81 dBm |
| 3      | (1)   | Freq | 741.00 MHz | 11.04 dBm  |
| 4      | (1)   | Freq | 742.00 MHz | -27.91 dBm |



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

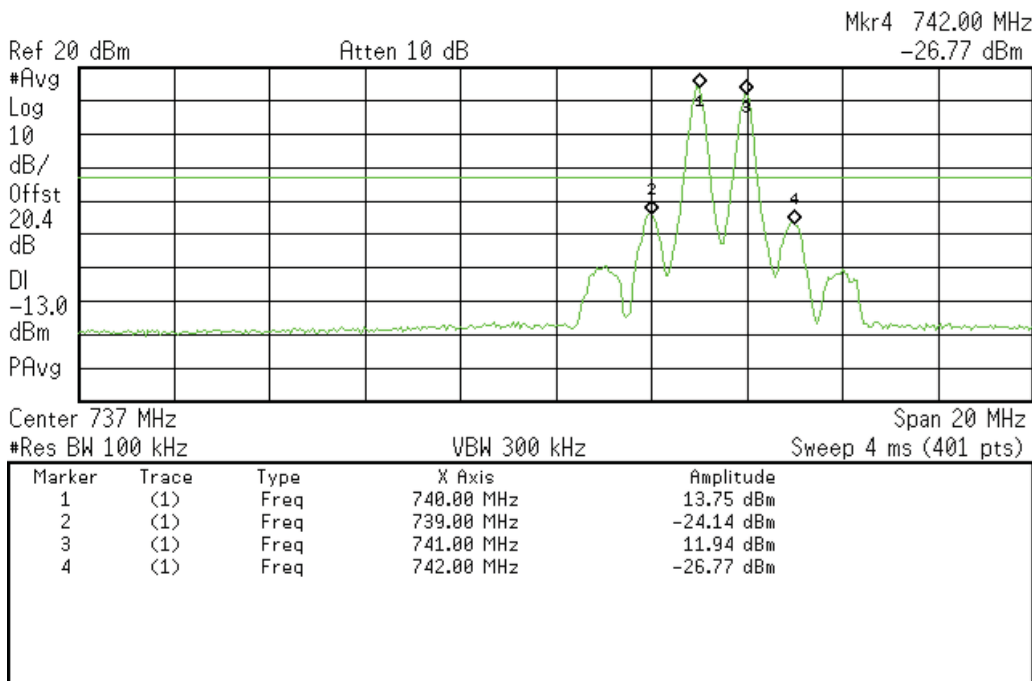
Agilent 09:46:31 Aug 13, 2014

L



Agilent 09:49:22 Aug 13, 2014

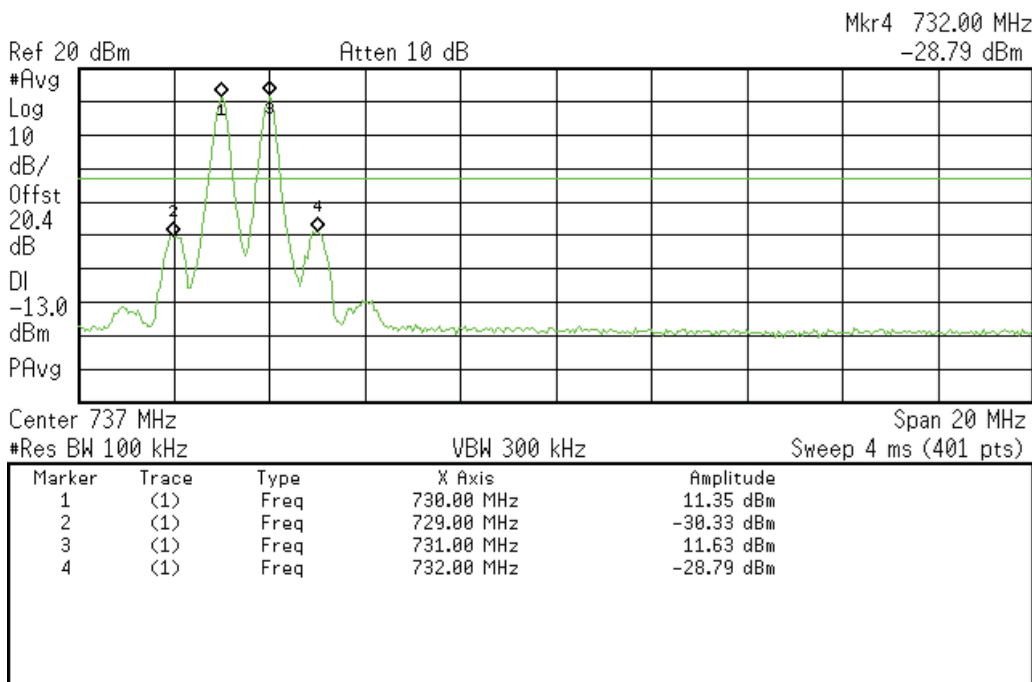
L



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

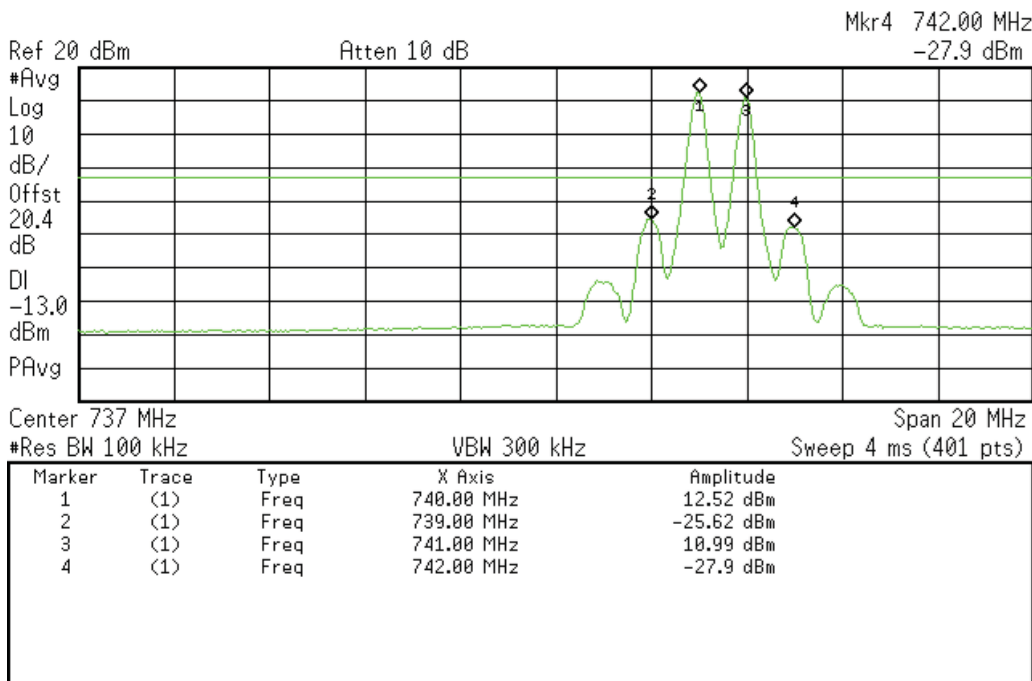
Agilent 09:46:46 Aug 13, 2014

L



Agilent 09:51:54 Aug 13, 2014

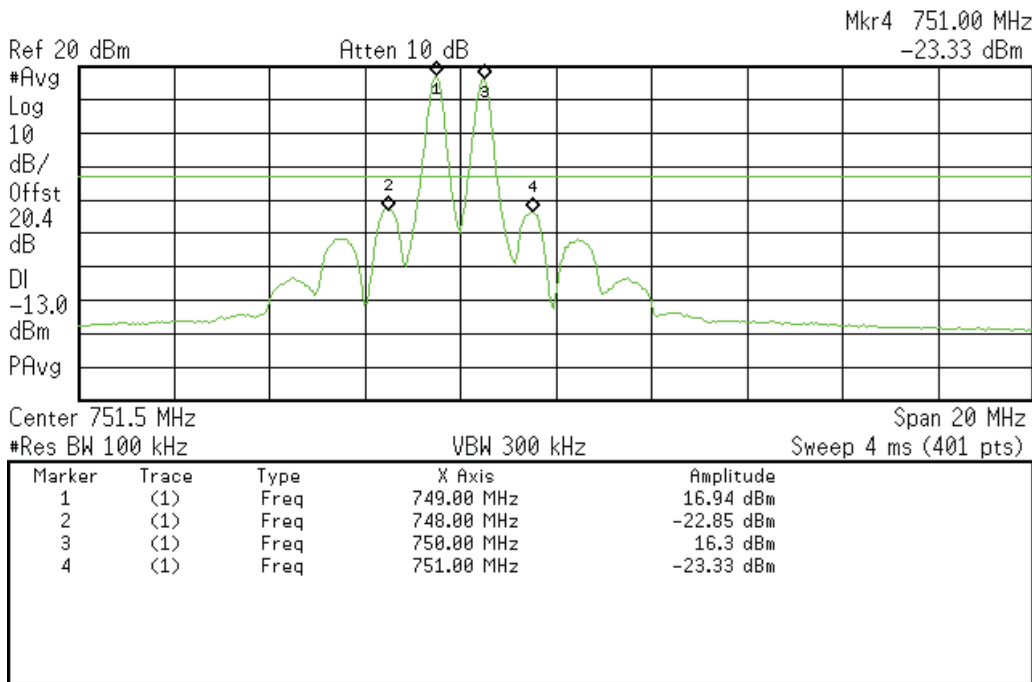
L



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

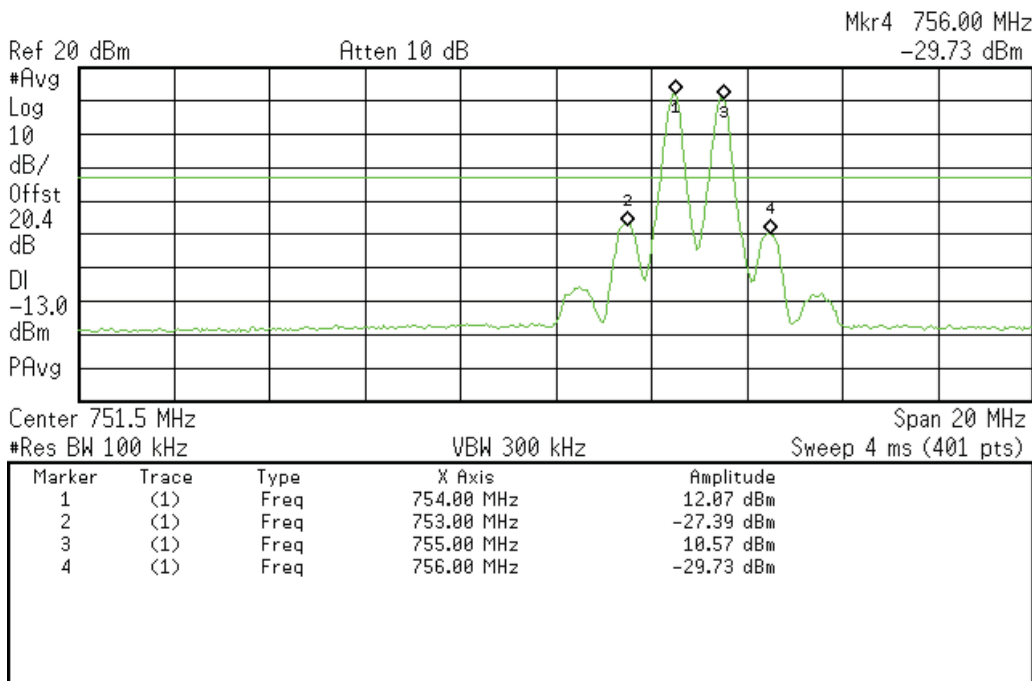
Agilent 09:54:46 Aug 13, 2014

L



Agilent 09:59:06 Aug 13, 2014

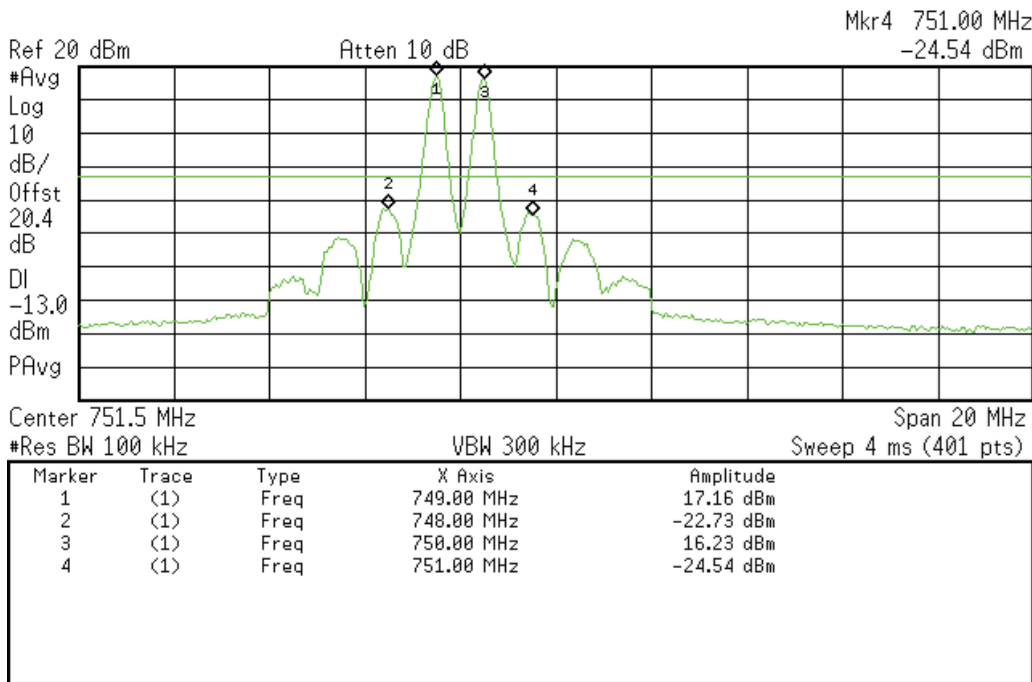
L



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

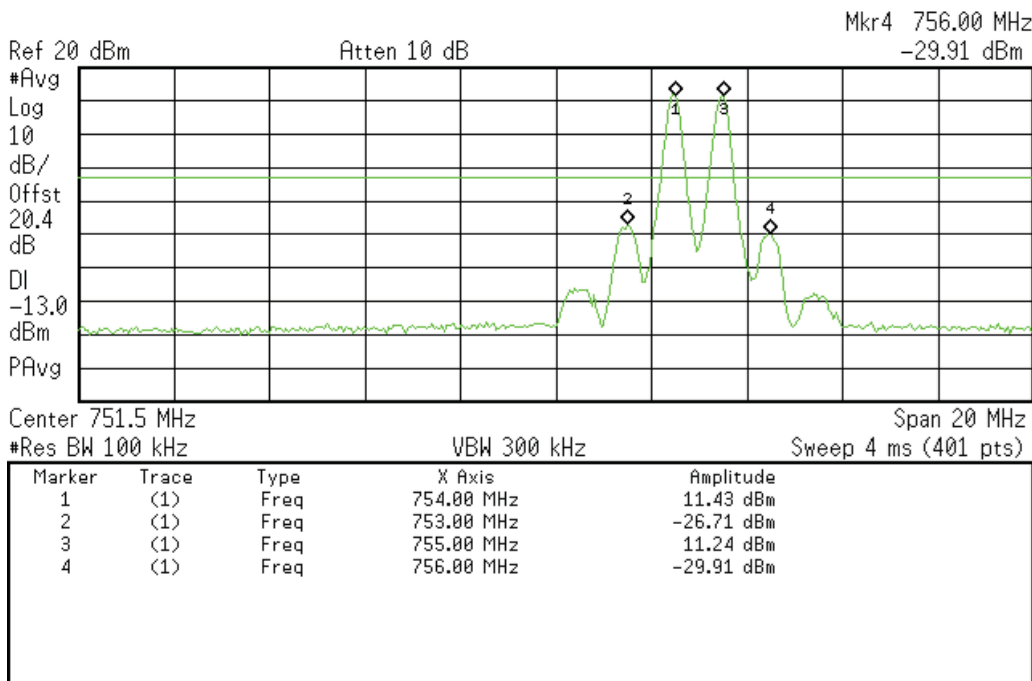
Agilent 09:55:04 Aug 13, 2014

L



Agilent 09:59:21 Aug 13, 2014

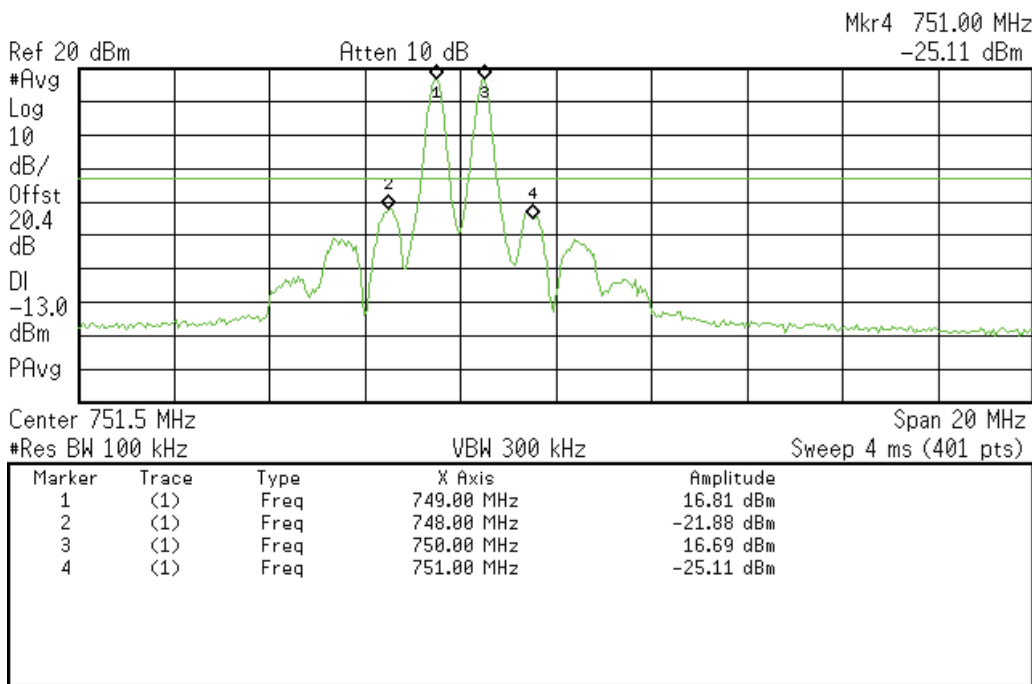
L



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

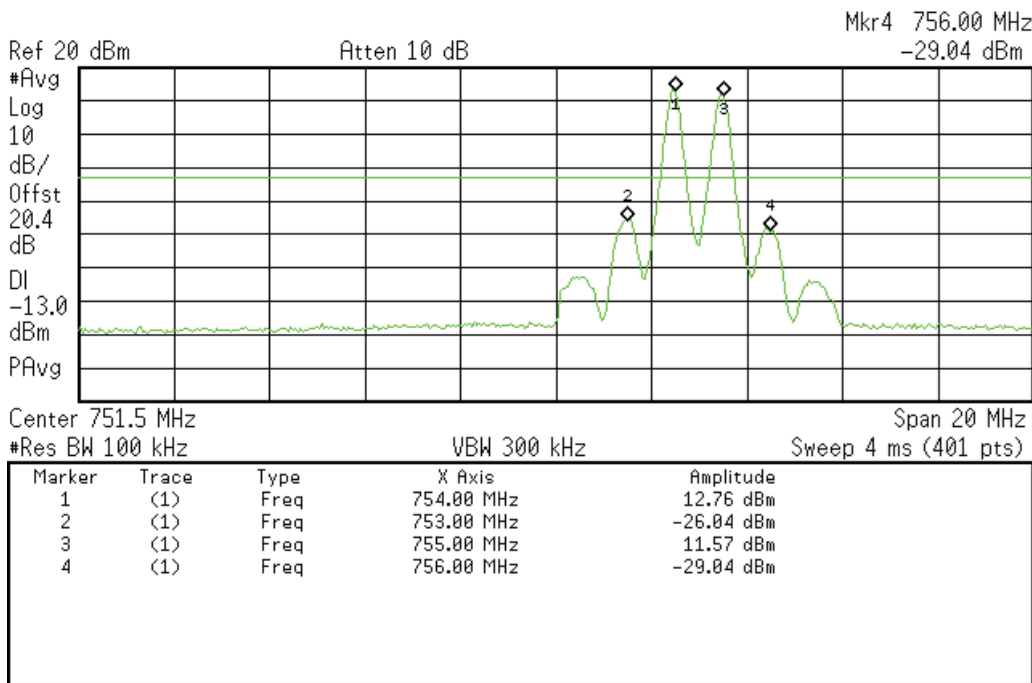
Agilent 09:55:23 Aug 13, 2014

L



Agilent 09:59:34 Aug 13, 2014

L

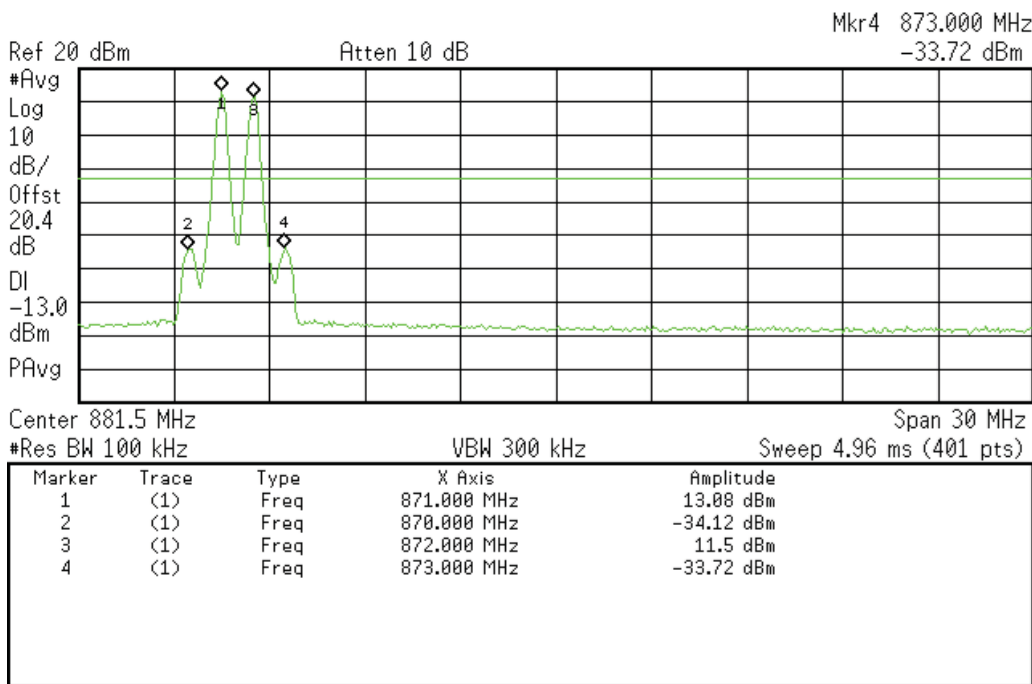




### Intermodulation Downlink Test Results at AGC (GSM Signal) 869-894 MHz Band

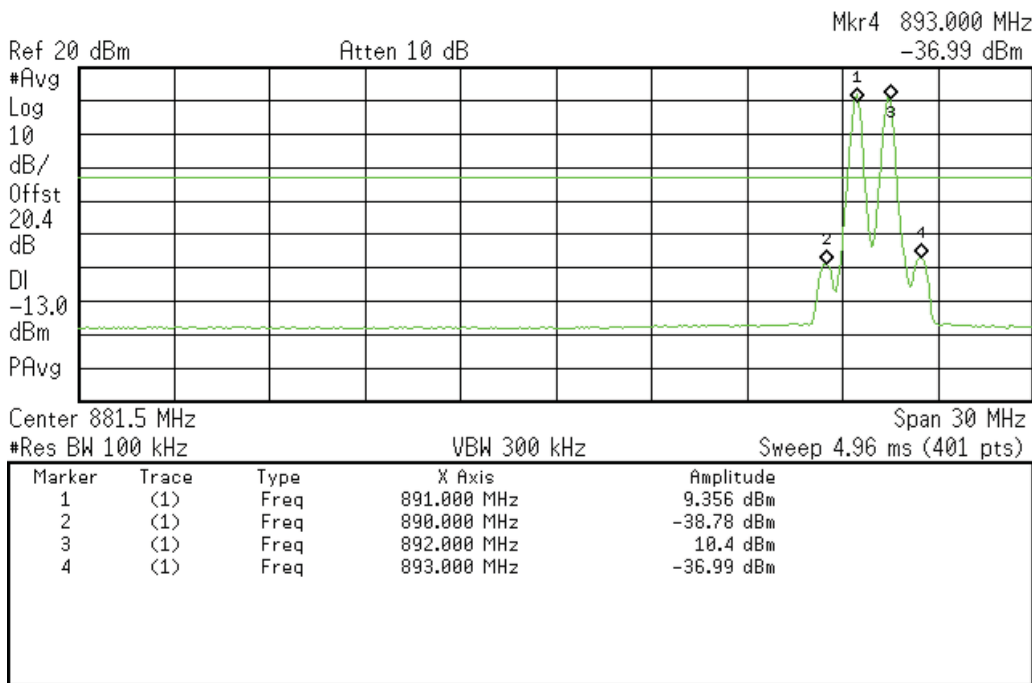
Agilent 10:03:56 Aug 13, 2014

L



Agilent 10:06:55 Aug 13, 2014

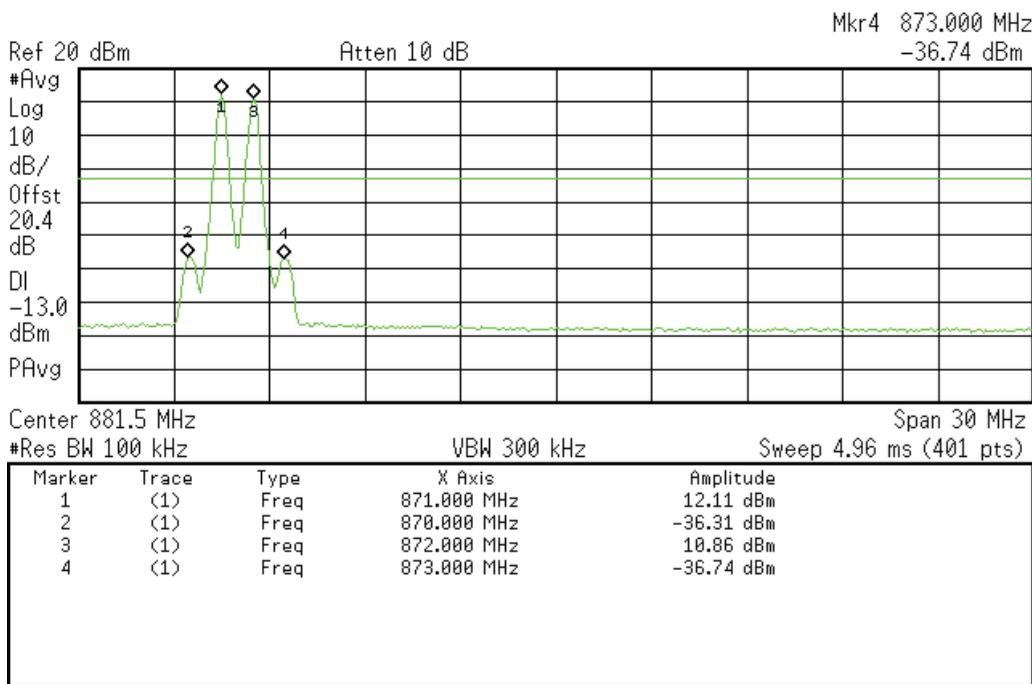
L



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

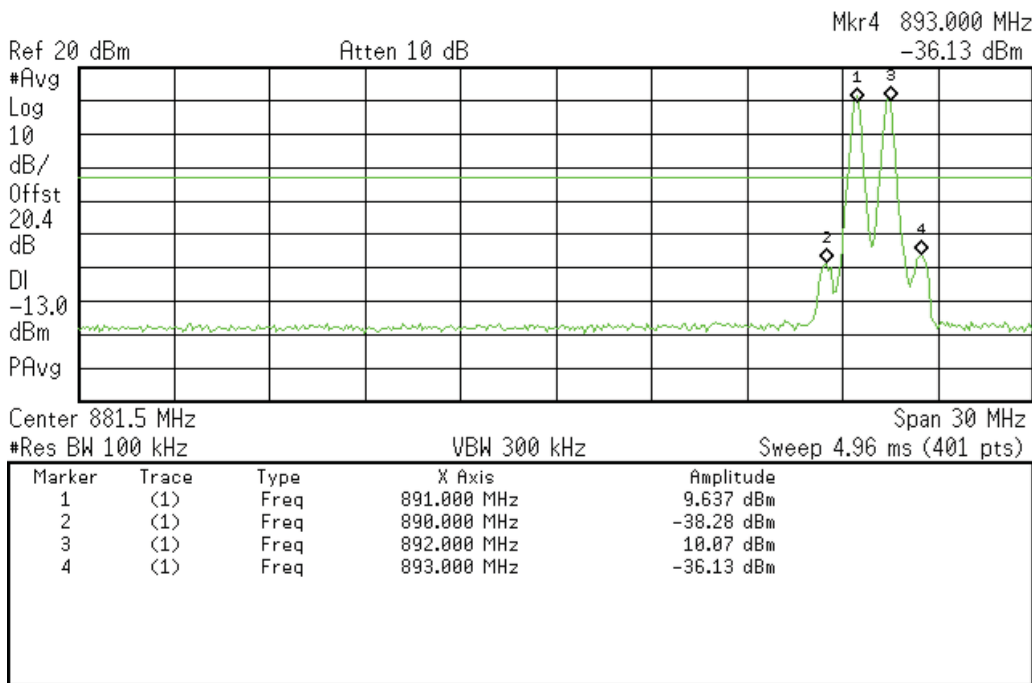
Agilent 10:03:29 Aug 13, 2014

L



Agilent 10:07:12 Aug 13, 2014

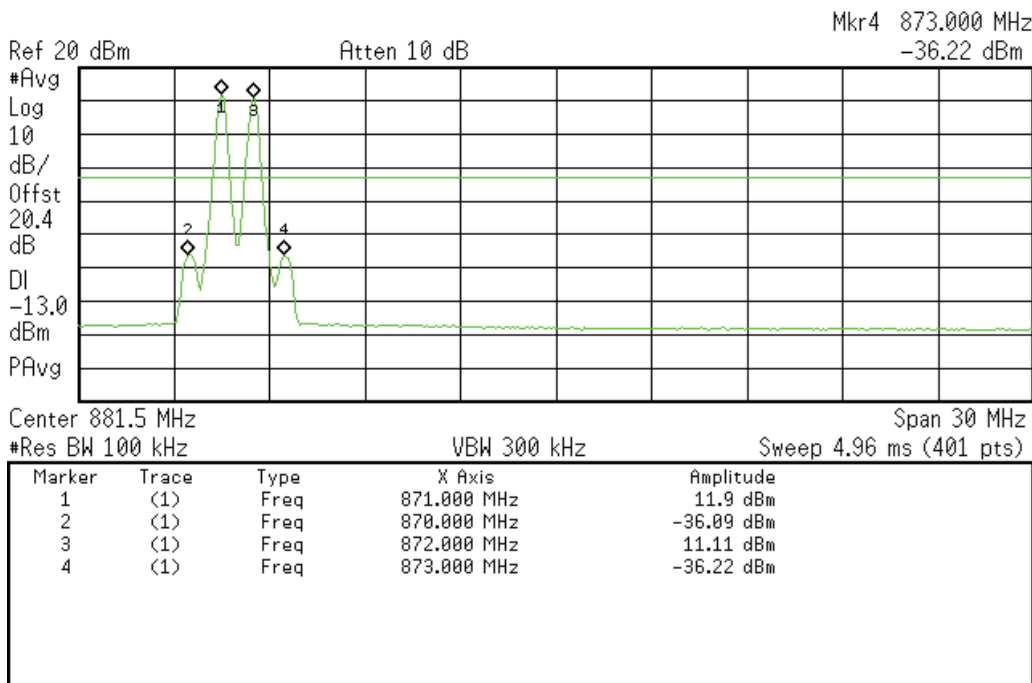
L



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

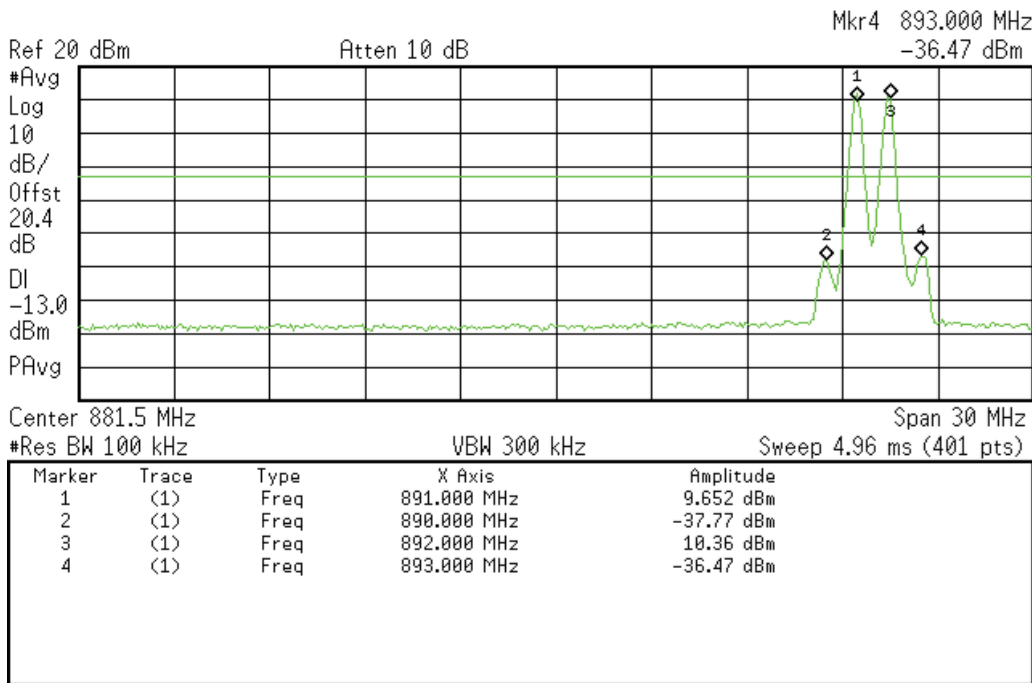
Agilent 10:03:07 Aug 13, 2014

L



Agilent 10:07:25 Aug 13, 2014

L



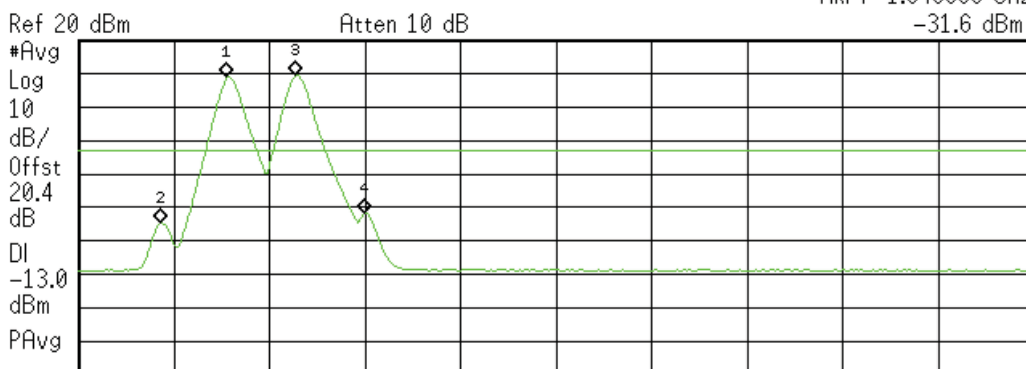


**Intermodulation Downlink Test Results at AGC (GSM Signal)  
1930-1995 MHz Band**

Agilent 10:21:39 Aug 13, 2014

L

Mkr4 1.946000 GHz  
-31.6 dBm



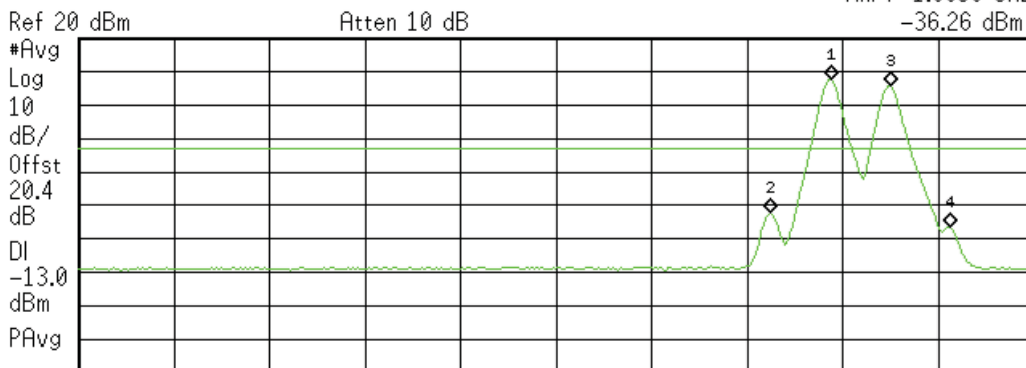
Center 1.96 GHz Span 70 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

| 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  |

Agilent 10:26:11 Aug 13, 2014

L

Mkr4 1.9930 GHz  
-36.26 dBm



Center 1.96 GHz Span 80 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

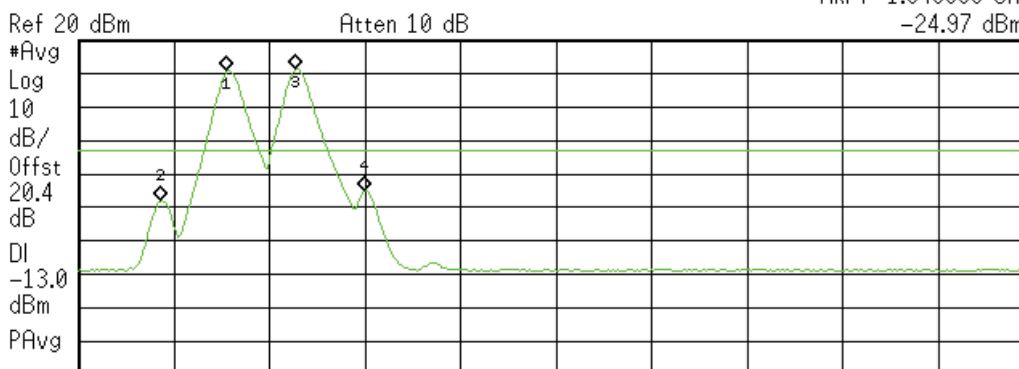
| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 1.9830 GHz | 7.561 dBm  |
| 2      | (1)   | Freq | 1.9780 GHz | -32.33 dBm |
| 3      | (1)   | Freq | 1.9880 GHz | 5.736 dBm  |
| 4      | (1)   | Freq | 1.9930 GHz | -36.26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

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

Agilent 10:22:17 Aug 13, 2014

L

Mkr4 1.946000 GHz  
-24.97 dBm



Center 1.96 GHz Span 70 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

| 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 |

Agilent 10:26:27 Aug 13, 2014

L

Mkr4 1.9930 GHz  
-32.89 dBm



Center 1.96 GHz Span 80 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

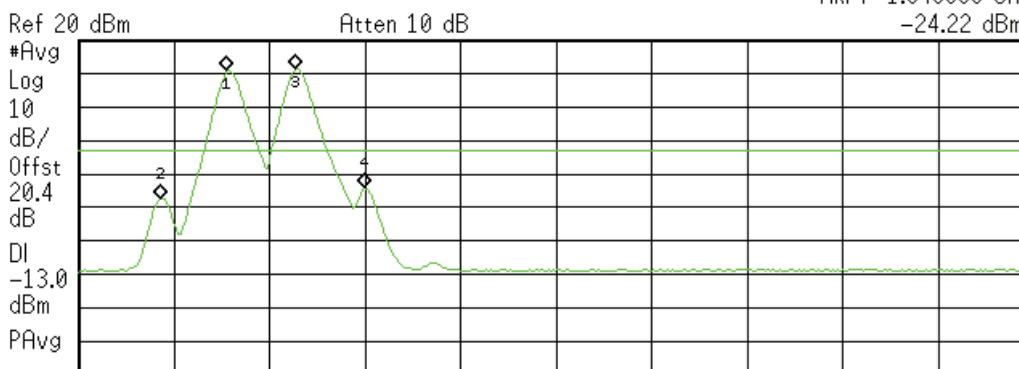
| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 1.9830 GHz | 8.752 dBm  |
| 2      | (1)   | Freq | 1.9780 GHz | -28.71 dBm |
| 3      | (1)   | Freq | 1.9880 GHz | 6.834 dBm  |
| 4      | (1)   | Freq | 1.9930 GHz | -32.89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

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

Agilent 10:22:36 Aug 13, 2014

L

Mkr4 1.946000 GHz  
-24.22 dBm



Center 1.96 GHz Span 70 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

| 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 |

Agilent 10:26:44 Aug 13, 2014

L

Mkr4 1.9930 GHz  
-31.39 dBm



Center 1.96 GHz Span 80 MHz  
#Res BW 1 MHz VBW 3 MHz Sweep 4.08 ms (401 pts)

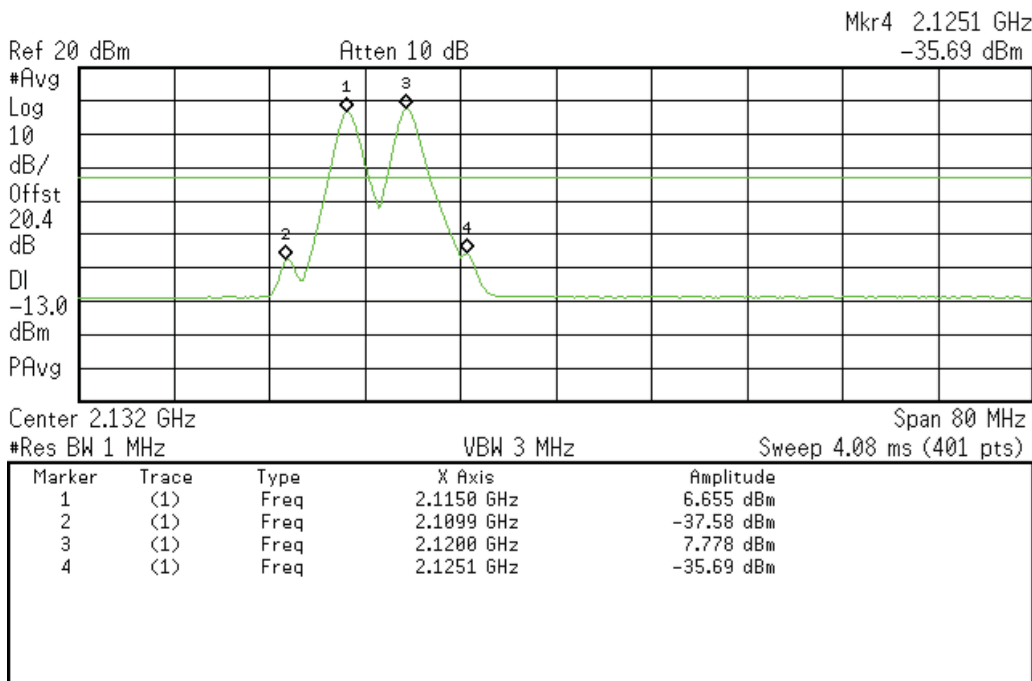
| Marker | Trace | Type | X Axis     | Amplitude  |
|--------|-------|------|------------|------------|
| 1      | (1)   | Freq | 1.9830 GHz | 8.755 dBm  |
| 2      | (1)   | Freq | 1.9780 GHz | -27.14 dBm |
| 3      | (1)   | Freq | 1.9880 GHz | 6.886 dBm  |
| 4      | (1)   | Freq | 1.9930 GHz | -31.39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



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

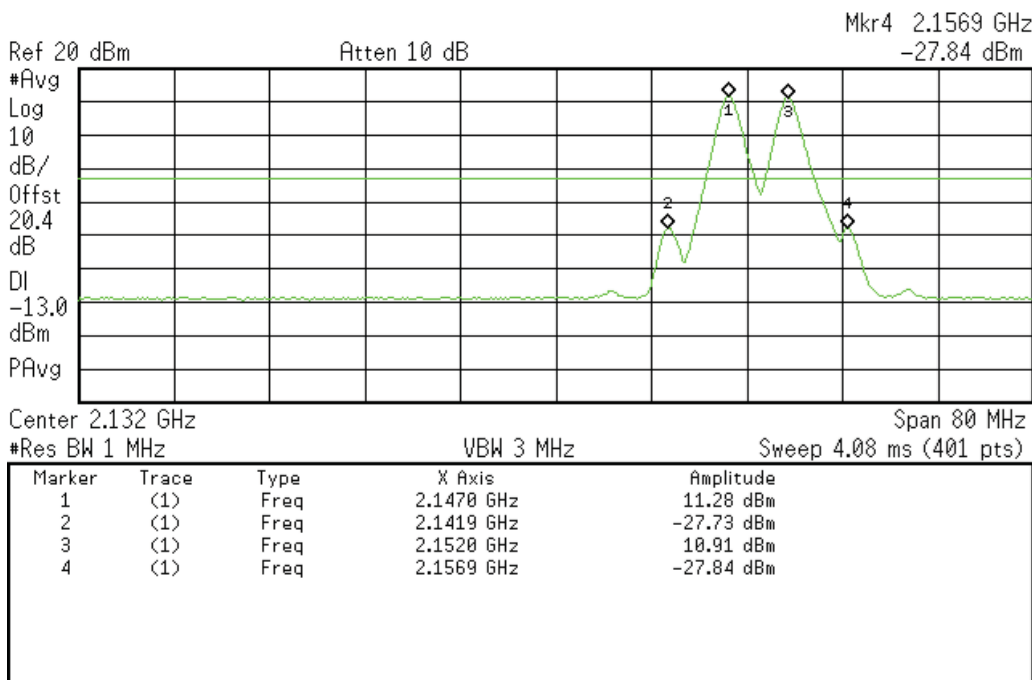
Agilent 10:29:16 Aug 13, 2014

L



Agilent 10:32:20 Aug 13, 2014

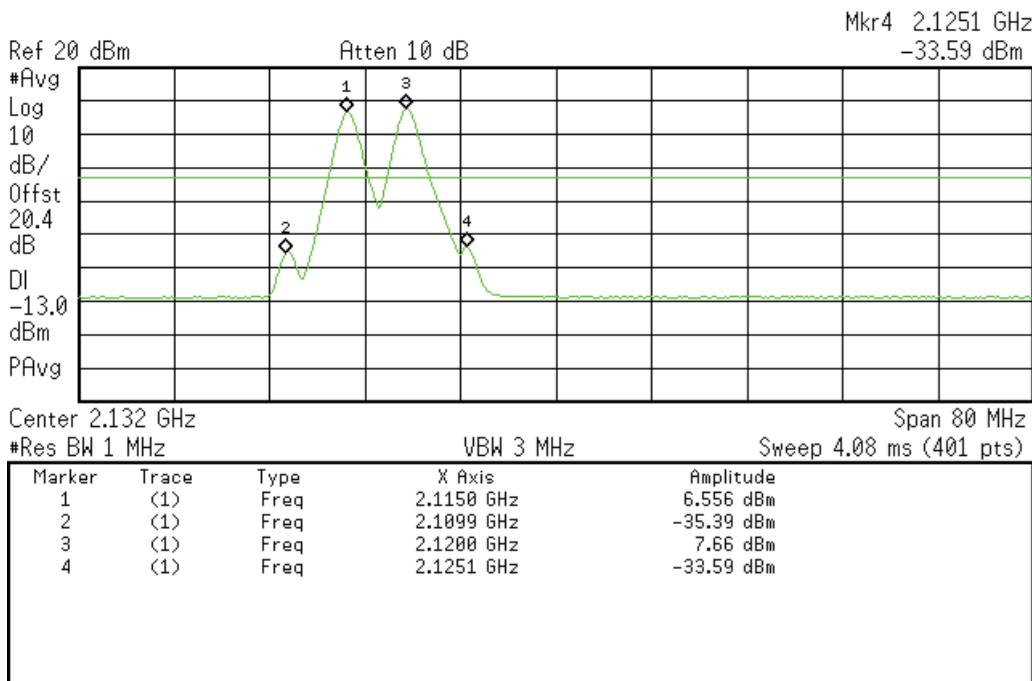
L



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

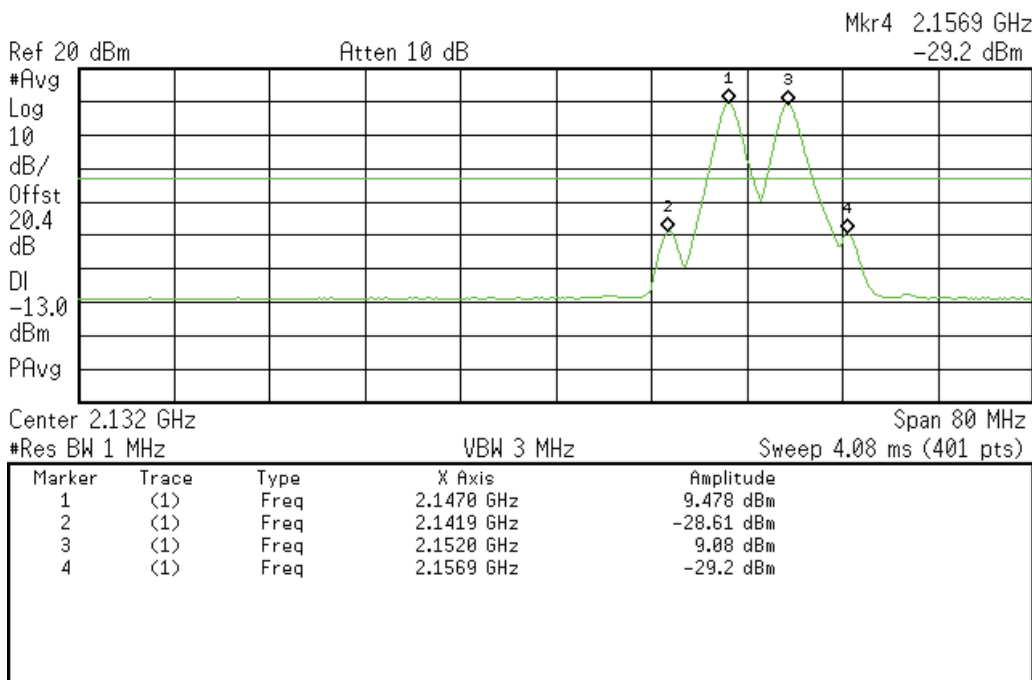
Agilent 10:29:47 Aug 13, 2014

L



Agilent 10:31:39 Aug 13, 2014

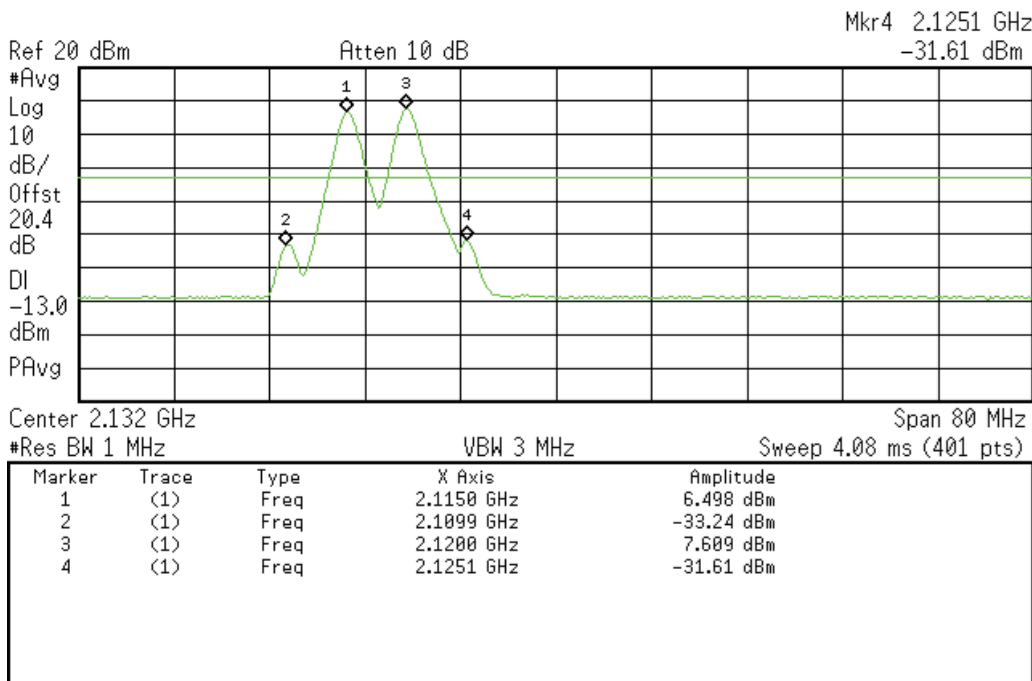
L



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

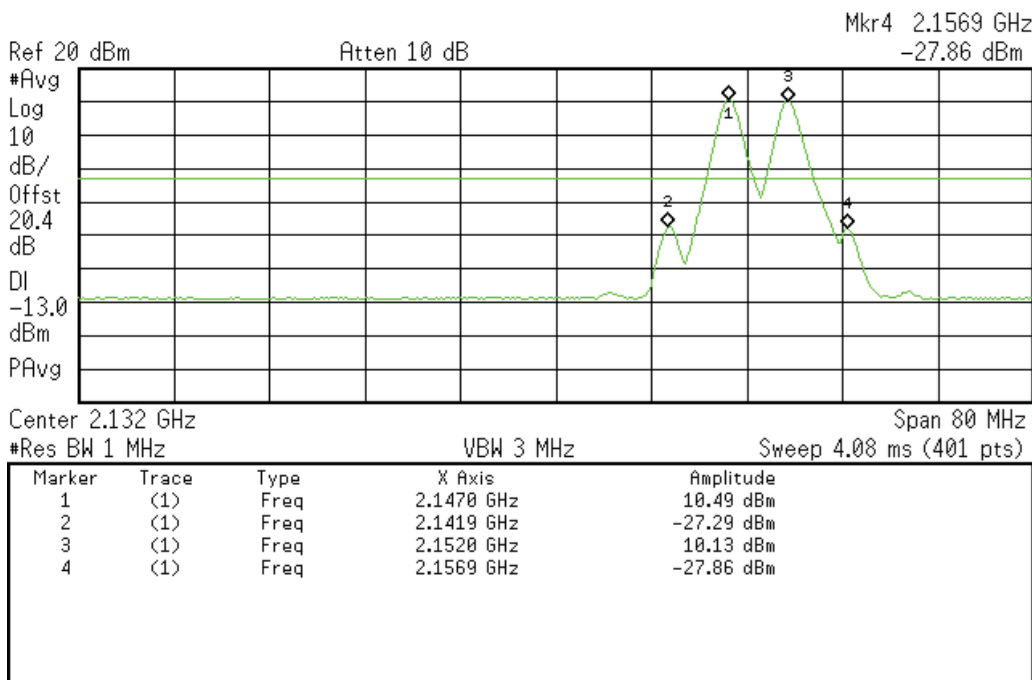
Agilent 10:30:02 Aug 13, 2014

L



Agilent 10:32:54 Aug 13, 2014

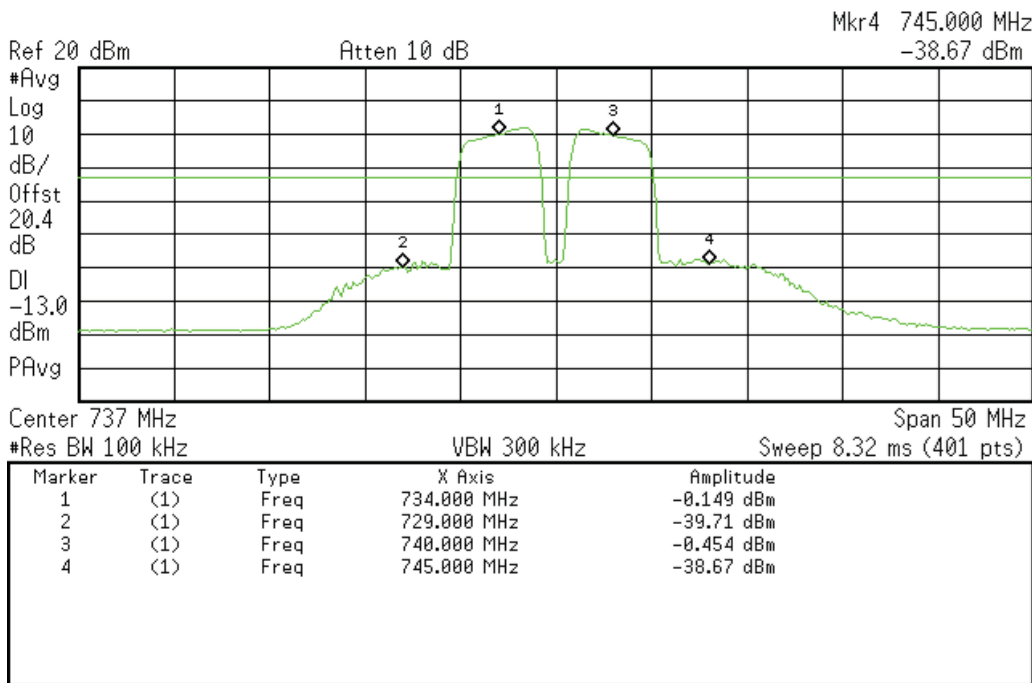
L



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

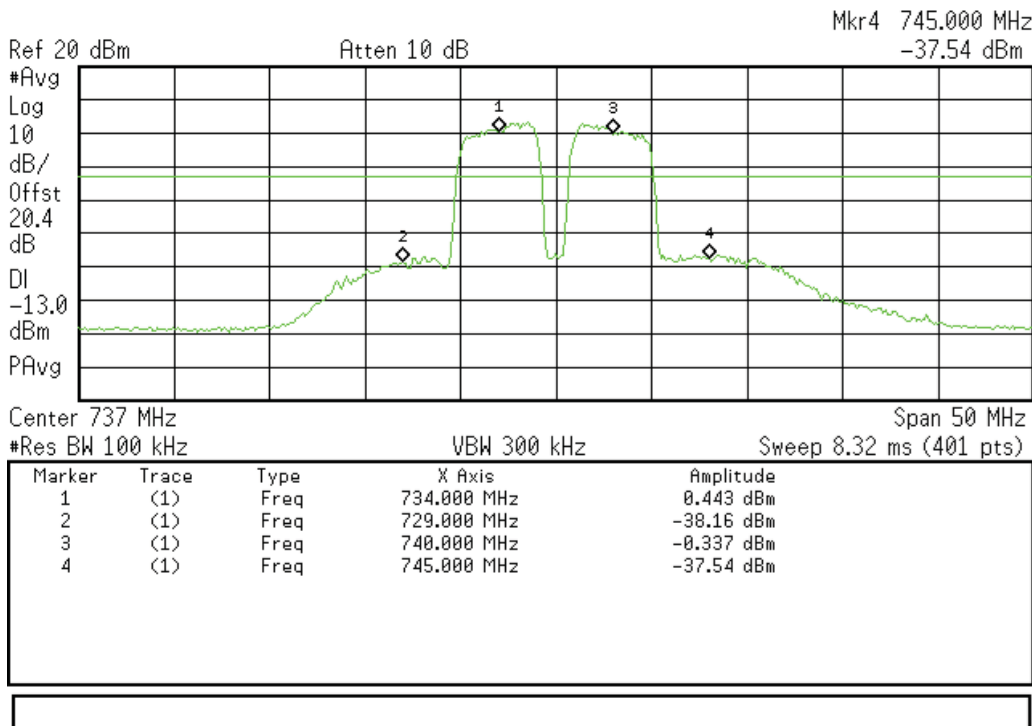
Agilent 07:44:31 Aug 13, 2014

L



Agilent 07:45:33 Aug 13, 2014

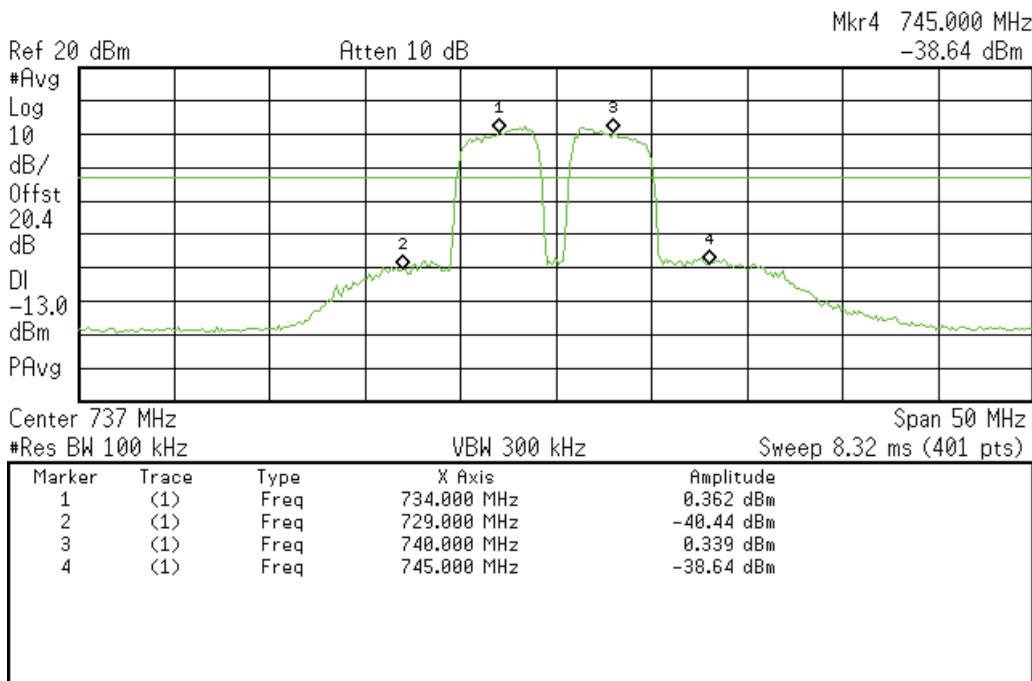
L



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

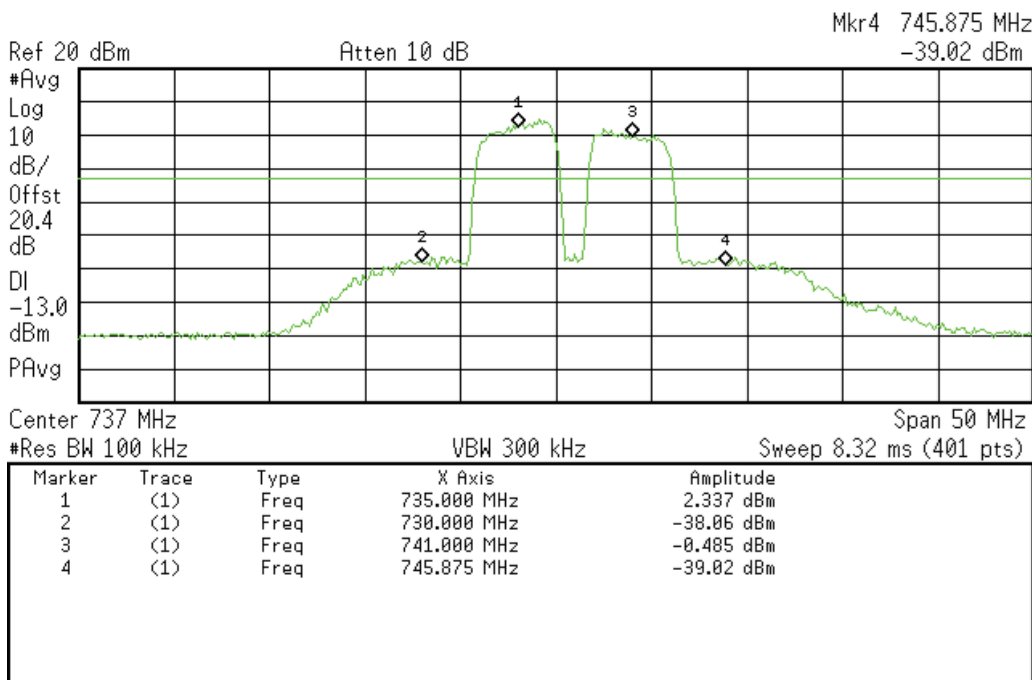
Agilent 07:45:17 Aug 13, 2014

L



Agilent 07:48:58 Aug 13, 2014

L

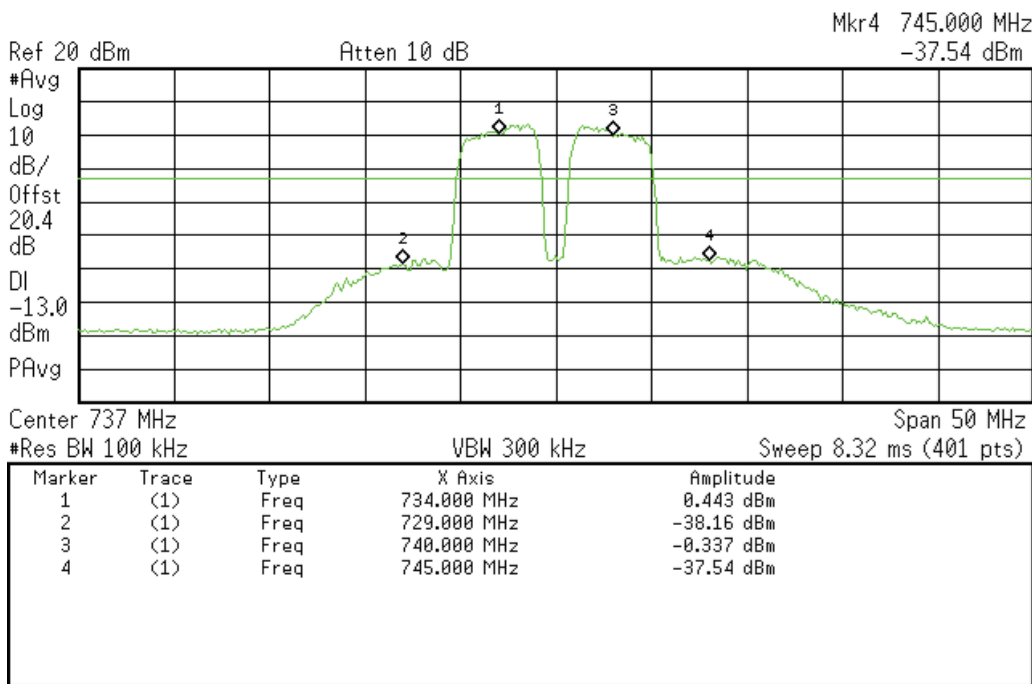




**Intermodulation Downlink Test Results at 6db above AGC (CDMA Signal)  
728-746 MHz Band**

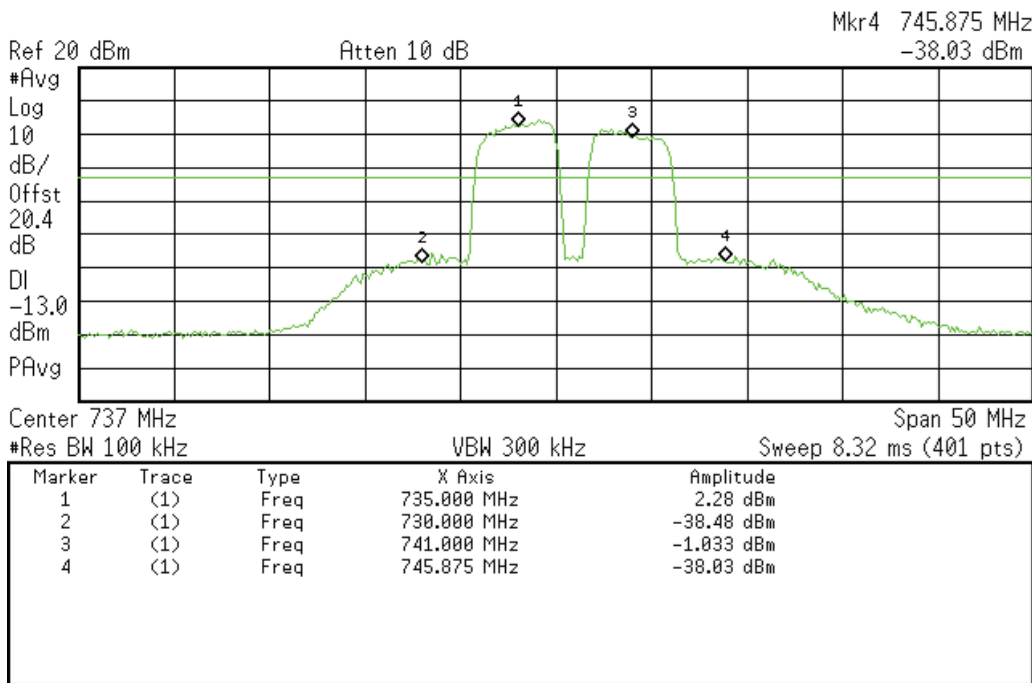
Agilent 07:45:33 Aug 13, 2014

L



Agilent 07:49:11 Aug 13, 2014

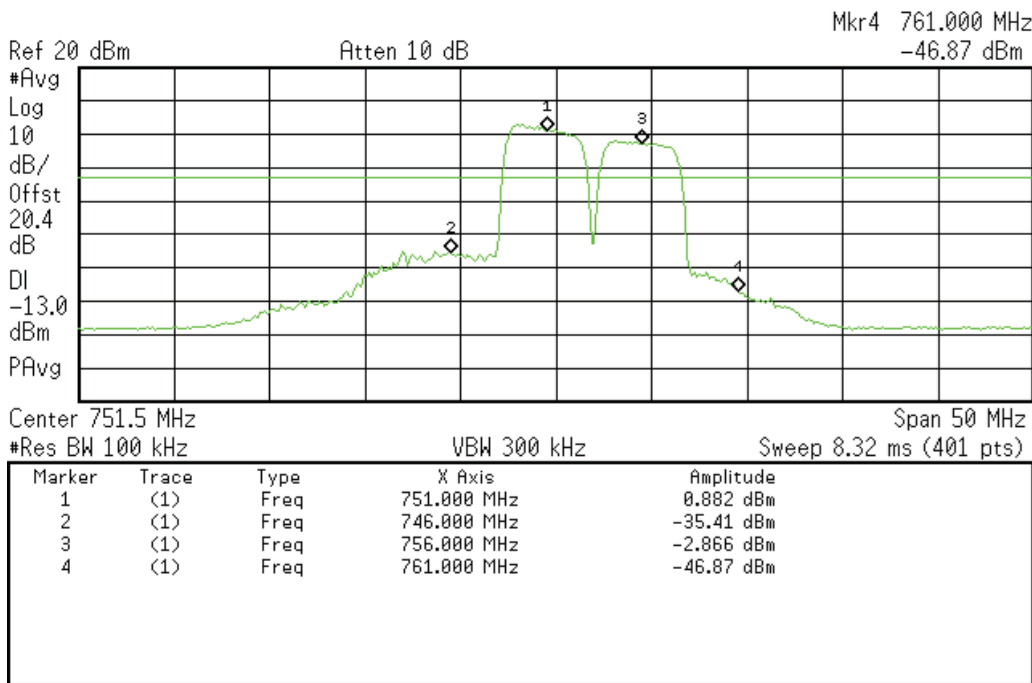
L



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

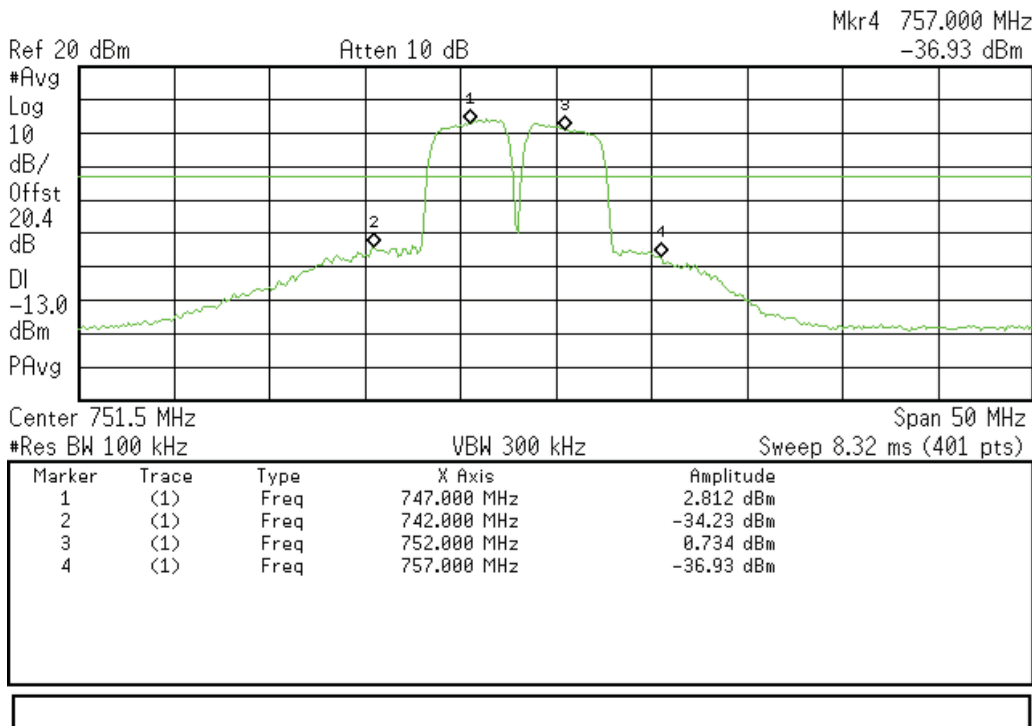
Agilent 08:09:49 Aug 13, 2014

L



Agilent 08:14:53 Aug 13, 2014

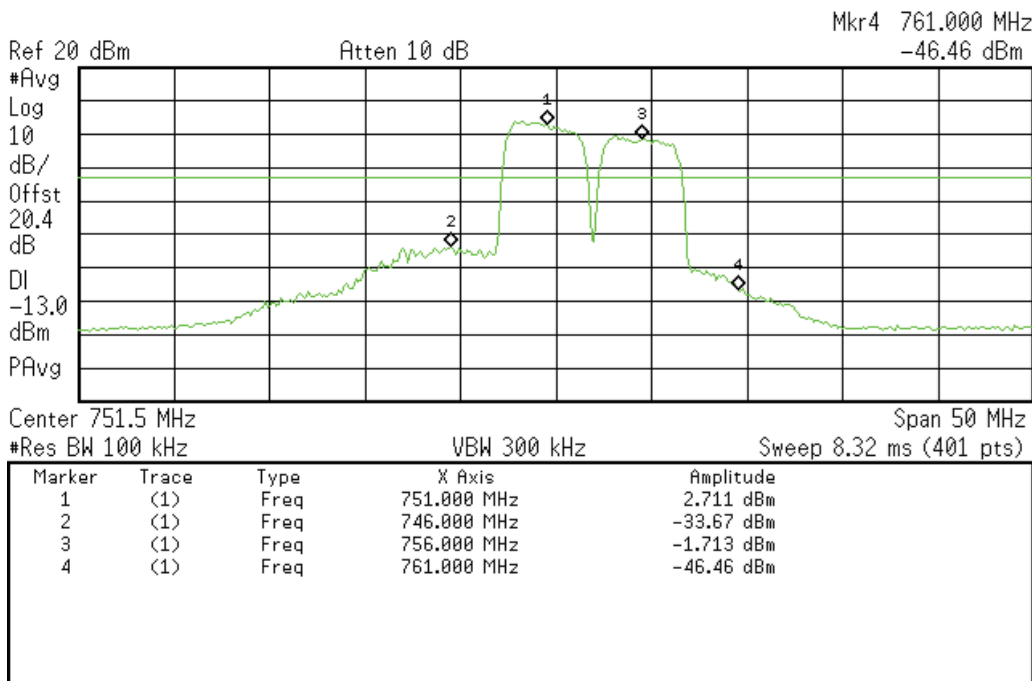
L



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

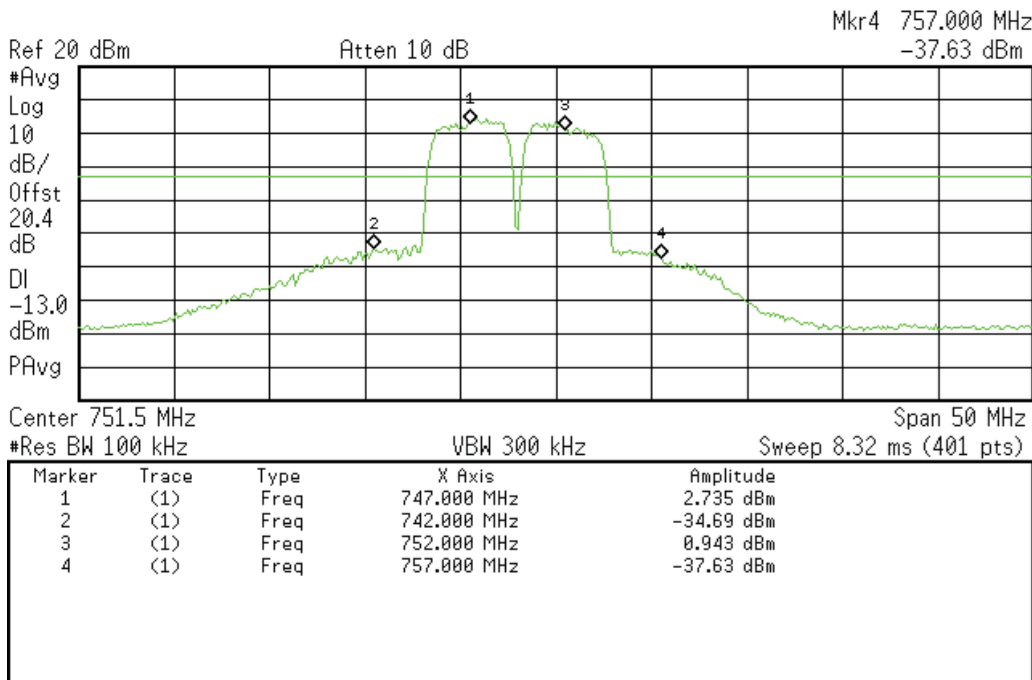
Agilent 08:10:53 Aug 13, 2014

L



Agilent 08:15:24 Aug 13, 2014

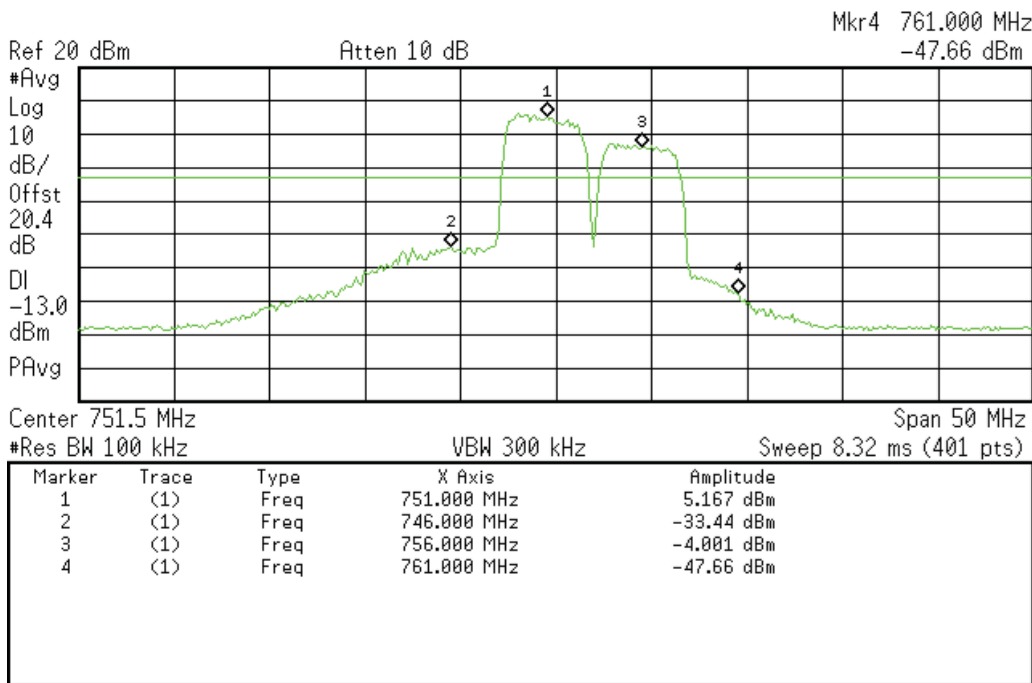
L



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

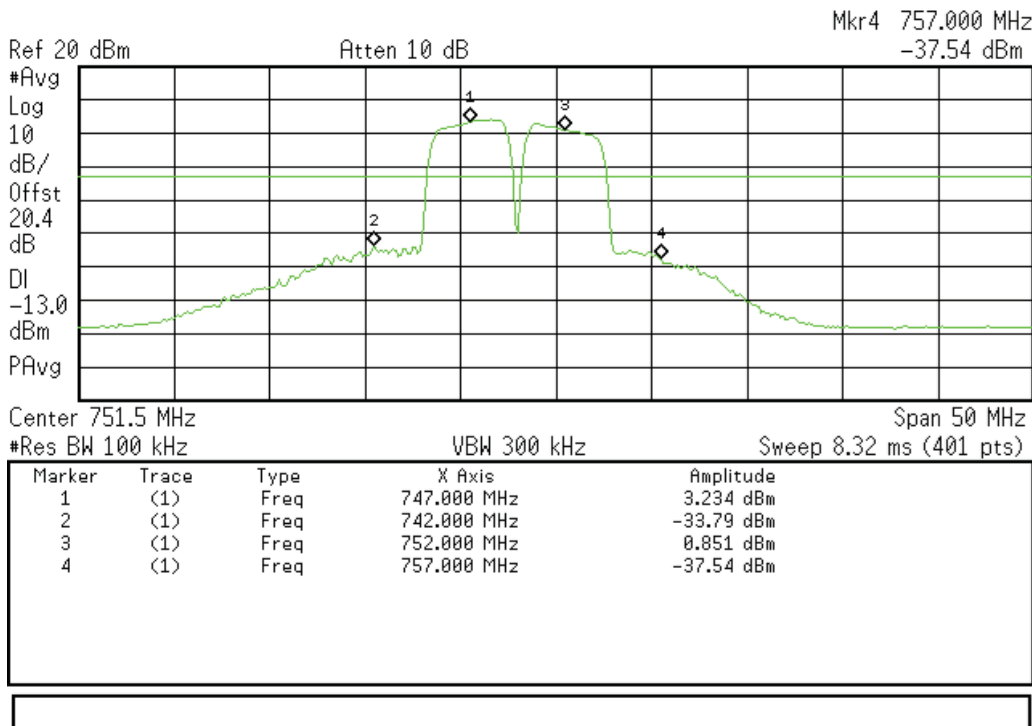
Agilent 08:11:06 Aug 13, 2014

L



Agilent 08:15:47 Aug 13, 2014

L

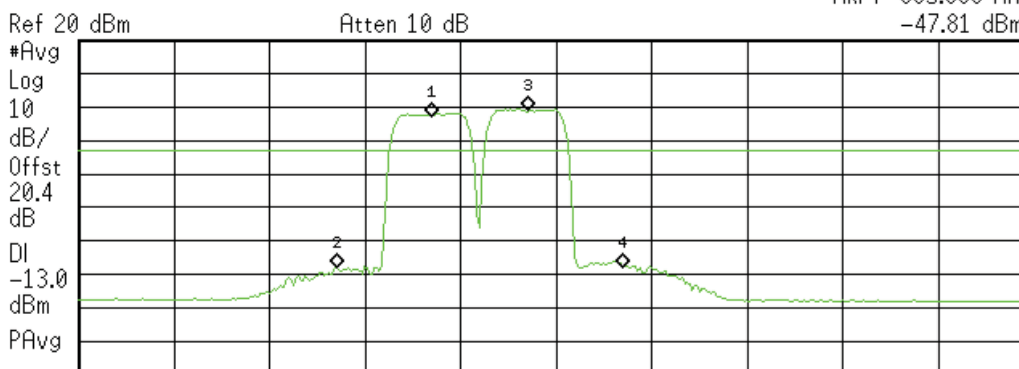


**Intermodulation Downlink Test Results at AGC (CDMA Signal)  
869-894 MHz Band**

Agilent 08:17:32 Aug 13, 2014

L

Mkr4 885.000 MHz  
-47.81 dBm



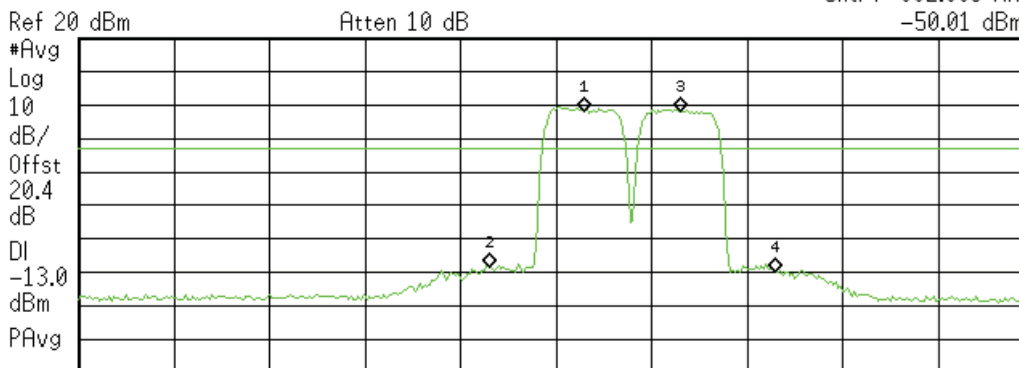
Center 881.5 MHz Span 50 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 8.32 ms (401 pts)

| Marker | Trace | Type | X Axis      | Amplitude  |
|--------|-------|------|-------------|------------|
| 1      | (1)   | Freq | 875.000 MHz | -2.829 dBm |
| 2      | (1)   | Freq | 878.000 MHz | -47.89 dBm |
| 3      | (1)   | Freq | 880.000 MHz | -1.286 dBm |
| 4      | (1)   | Freq | 885.000 MHz | -47.81 dBm |

Agilent 08:21:54 Aug 13, 2014

L

Cntr4 892.993 MHz  
-50.01 dBm



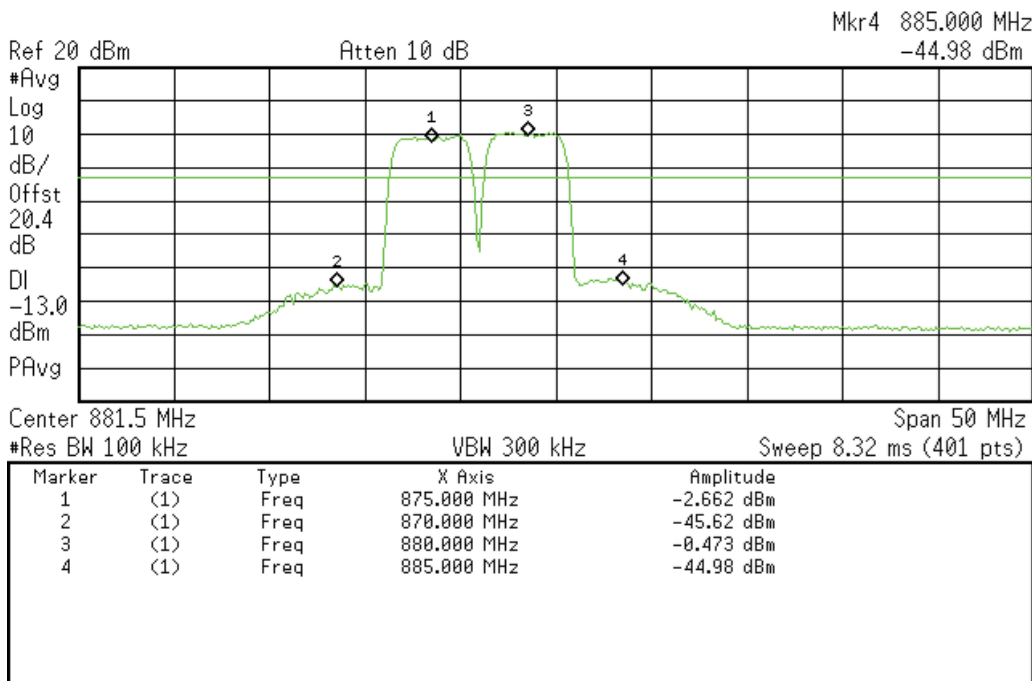
Center 881.5 MHz Span 50 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 8.32 ms (401 pts)

| 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**

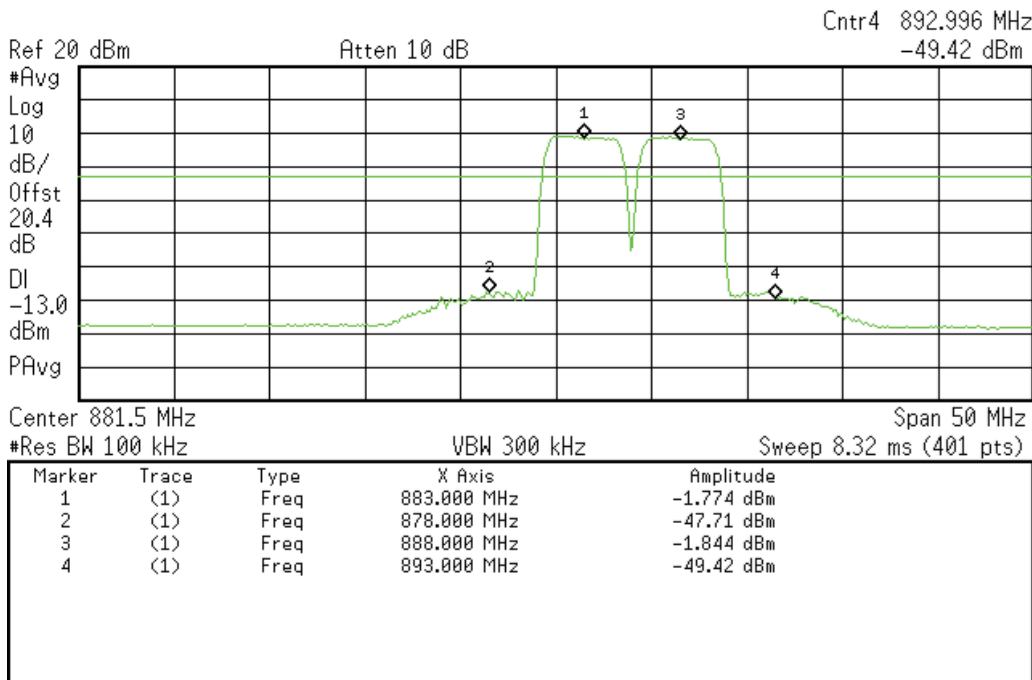
Agilent 08:18:19 Aug 13, 2014

L



Agilent 08:22:30 Aug 13, 2014

L



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

Agilent 08:18:33 Aug 13, 2014

L

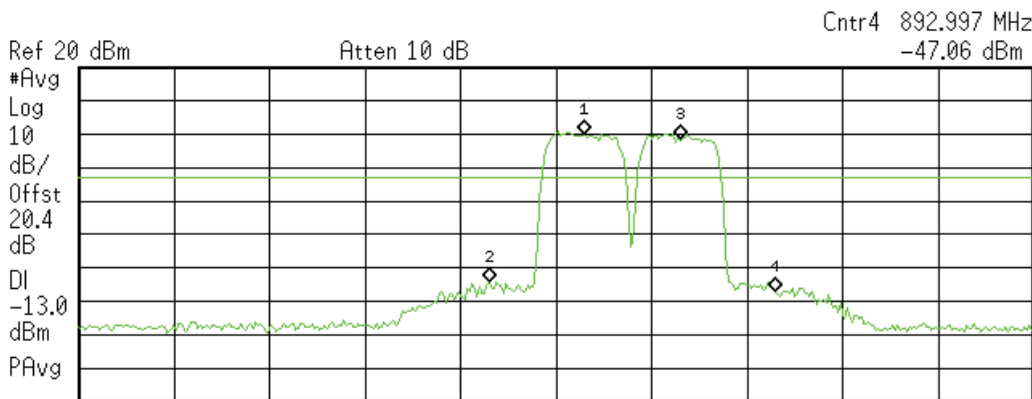


Center 881.5 MHz Span 50 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 8.32 ms (401 pts)

| 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 |

Agilent 08:22:55 Aug 13, 2014

L



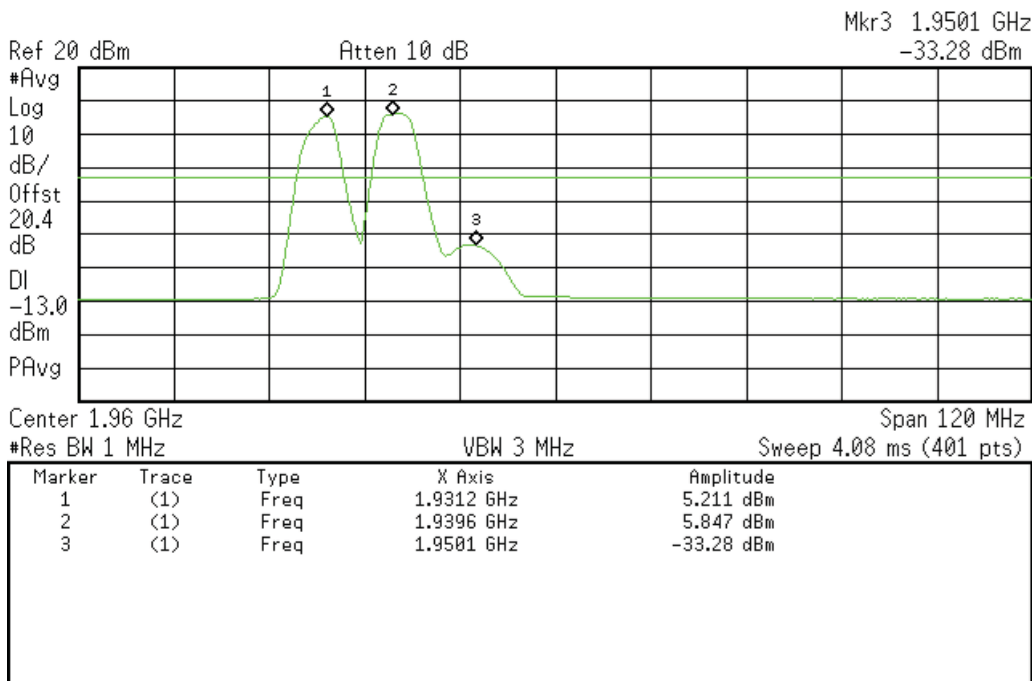
Center 881.5 MHz Span 50 MHz  
#Res BW 100 kHz VBW 300 kHz Sweep 8.32 ms (401 pts)

| 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**

Agilent 09:17:02 Aug 13, 2014

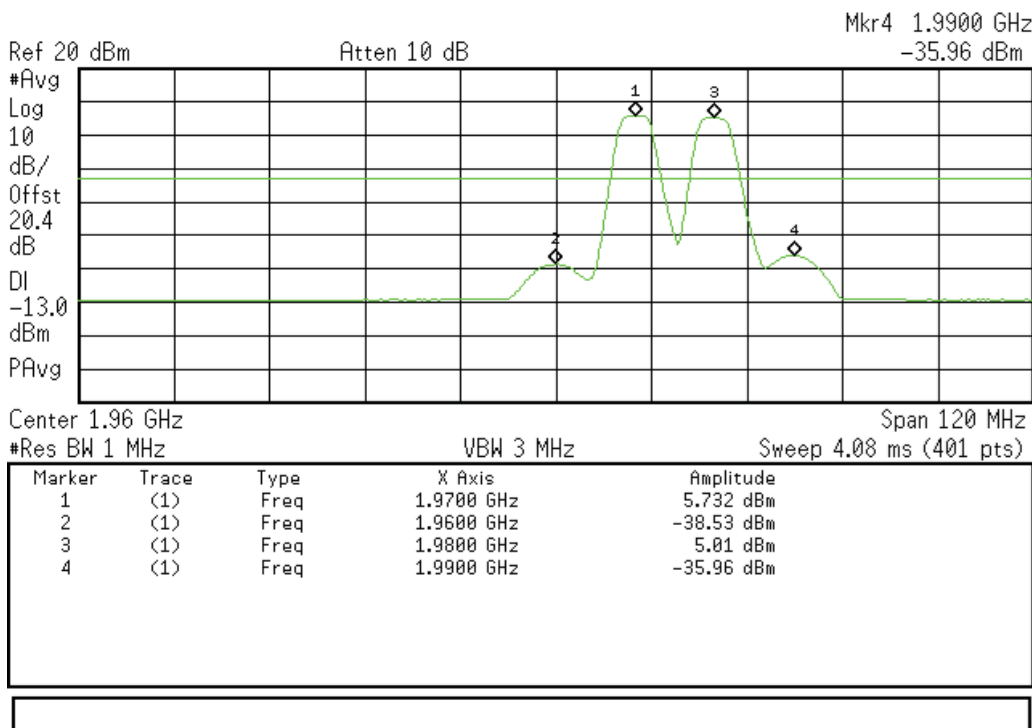
L



4

Agilent 09:20:28 Aug 13, 2014

L

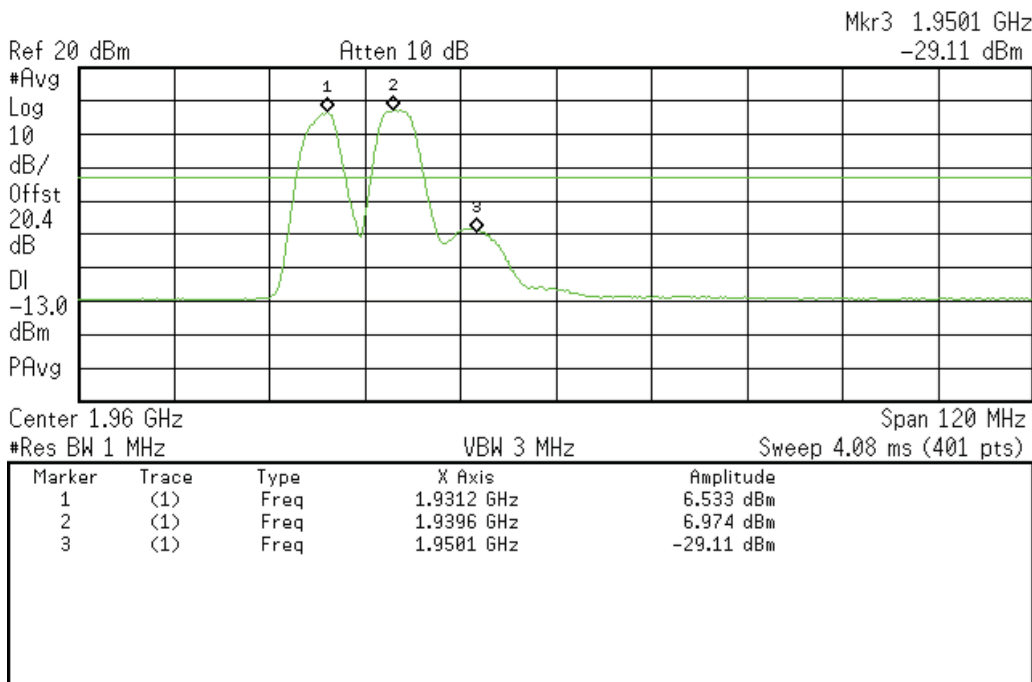




**Intermodulation Downlink Test Results at 3db above AGC (CDMA Signal)  
1930-1995 MHz Band**

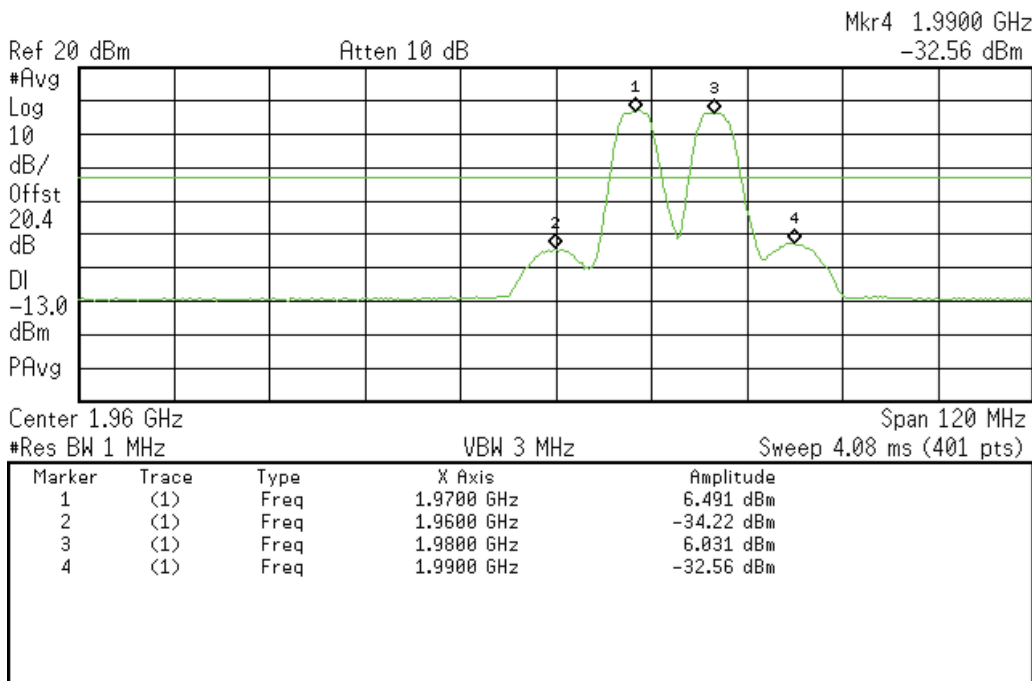
Agilent 09:17:43 Aug 13, 2014

L



Agilent 09:20:56 Aug 13, 2014

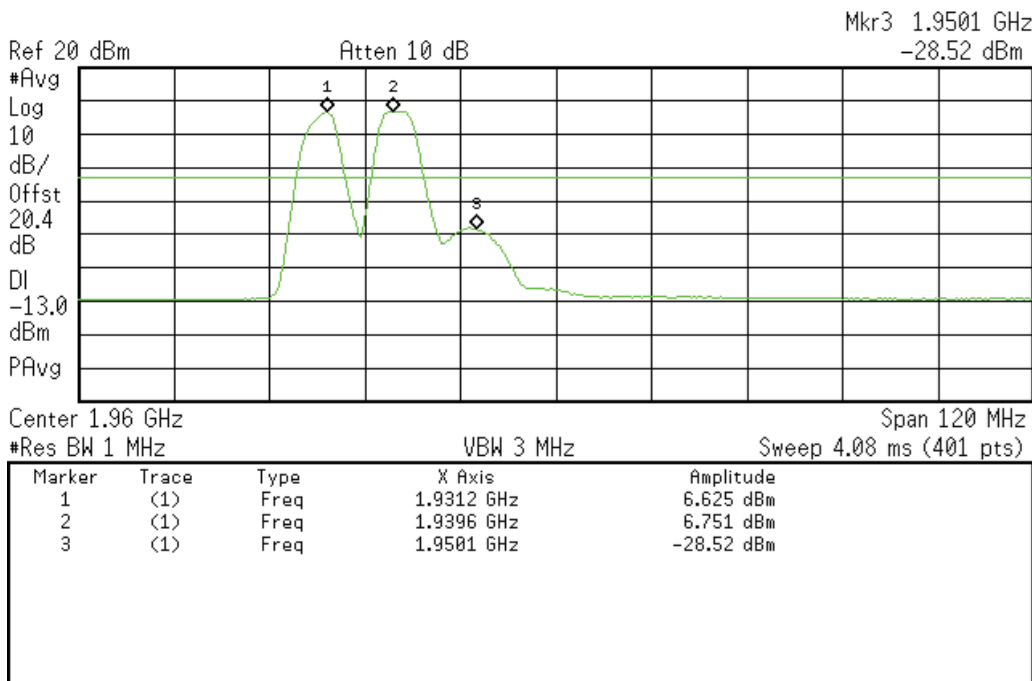
L



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

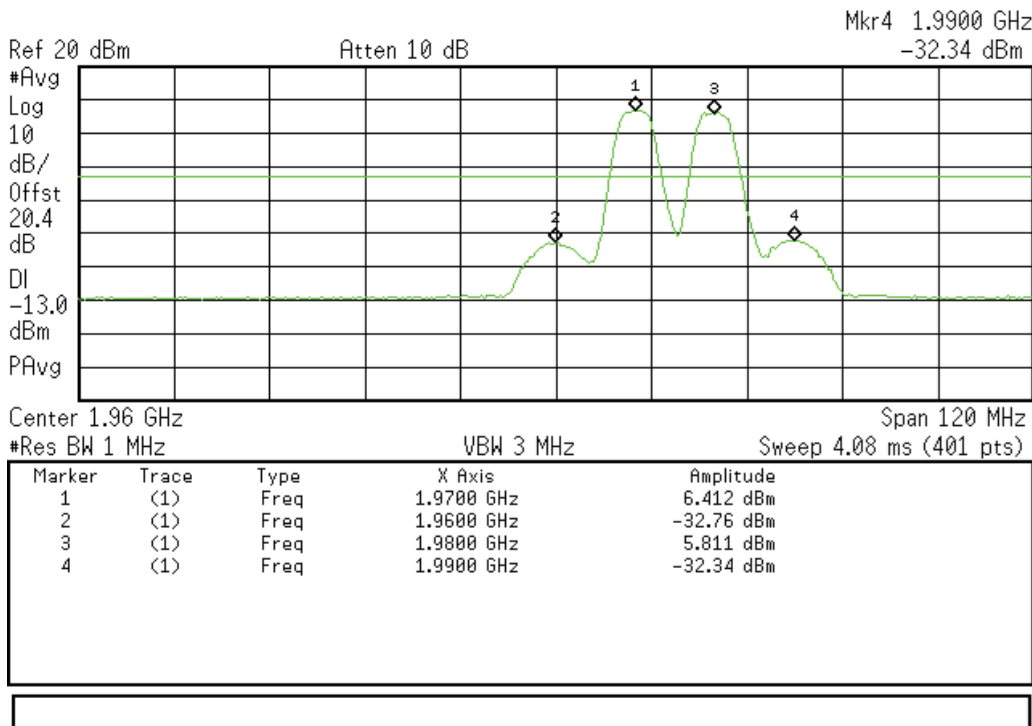
Agilent 09:17:57 Aug 13, 2014

L



Agilent 09:21:16 Aug 13, 2014

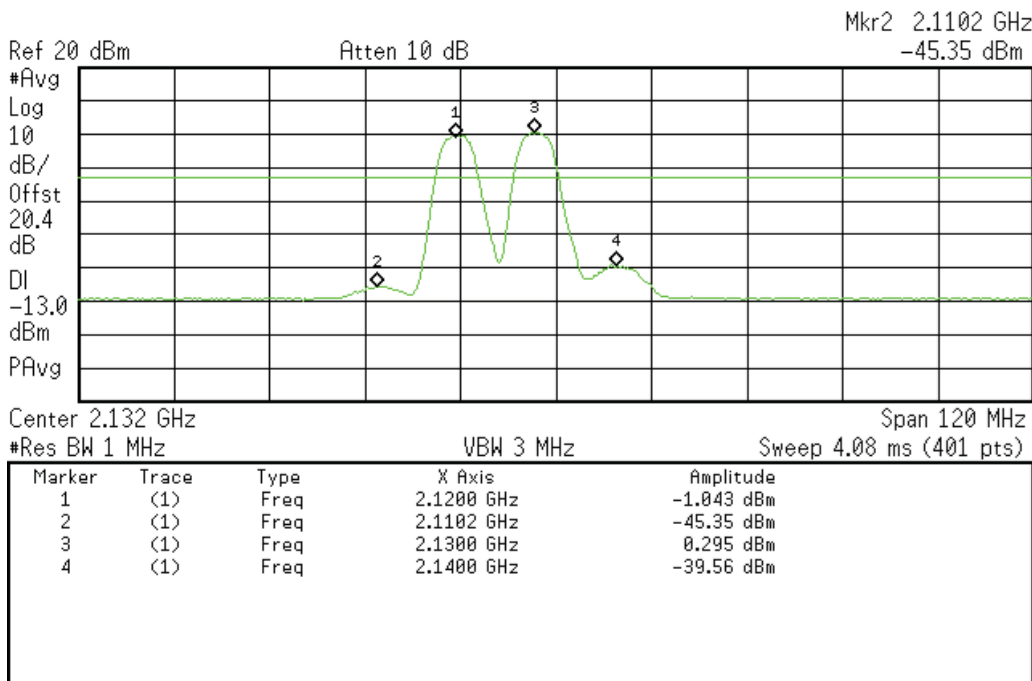
L



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

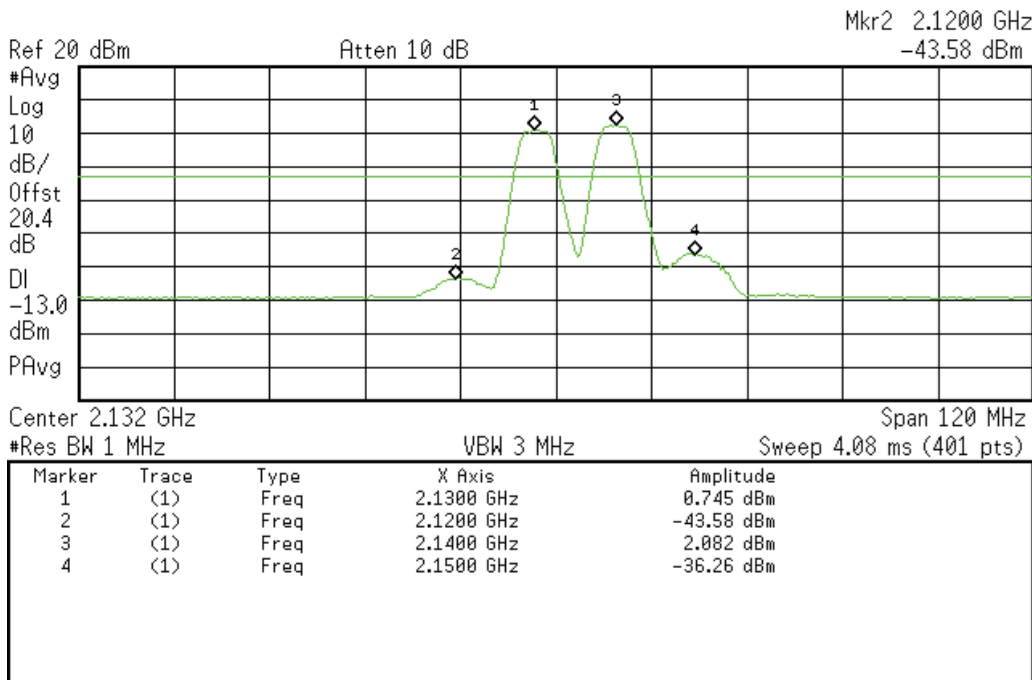
Agilent 09:25:10 Aug 13, 2014

L



Agilent 09:28:07 Aug 13, 2014

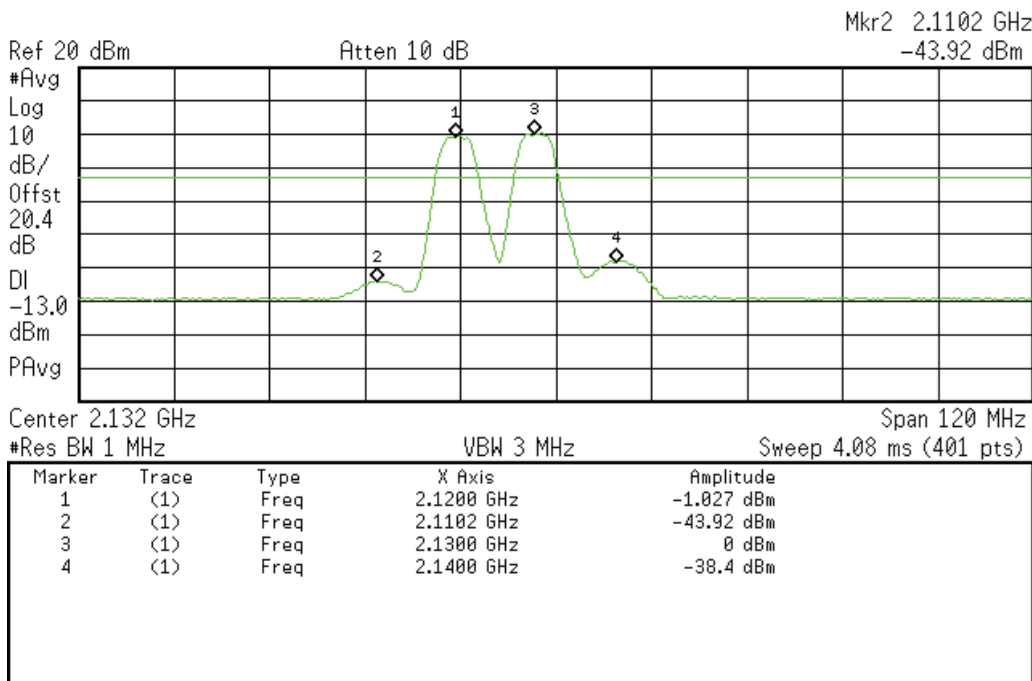
L



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

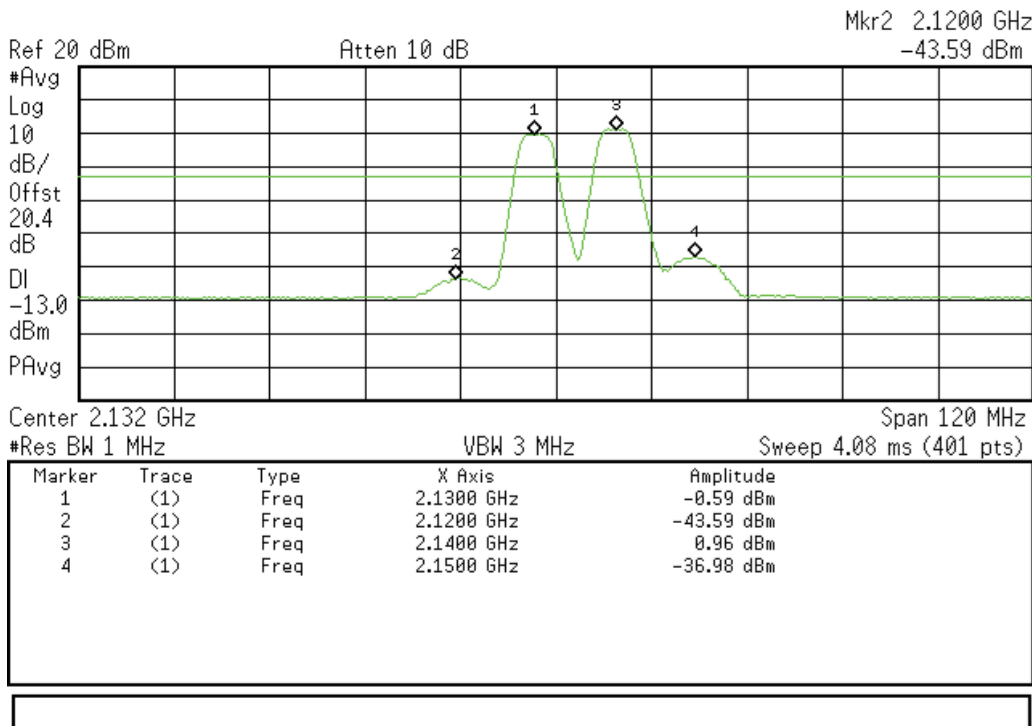
Agilent 09:25:55 Aug 13, 2014

L



Agilent 09:28:33 Aug 13, 2014

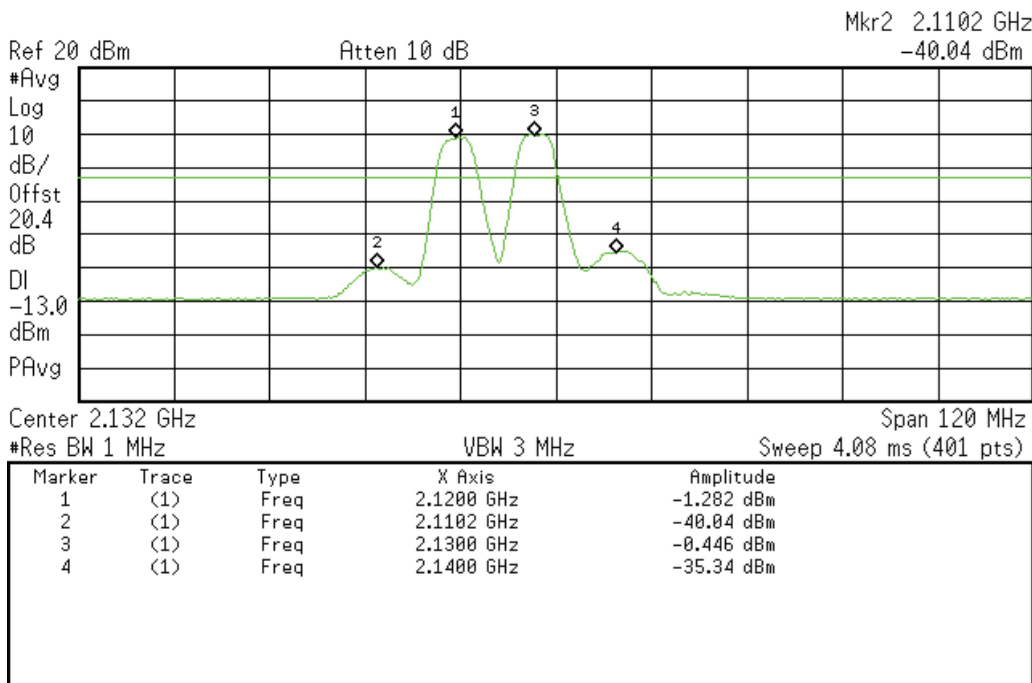
L



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

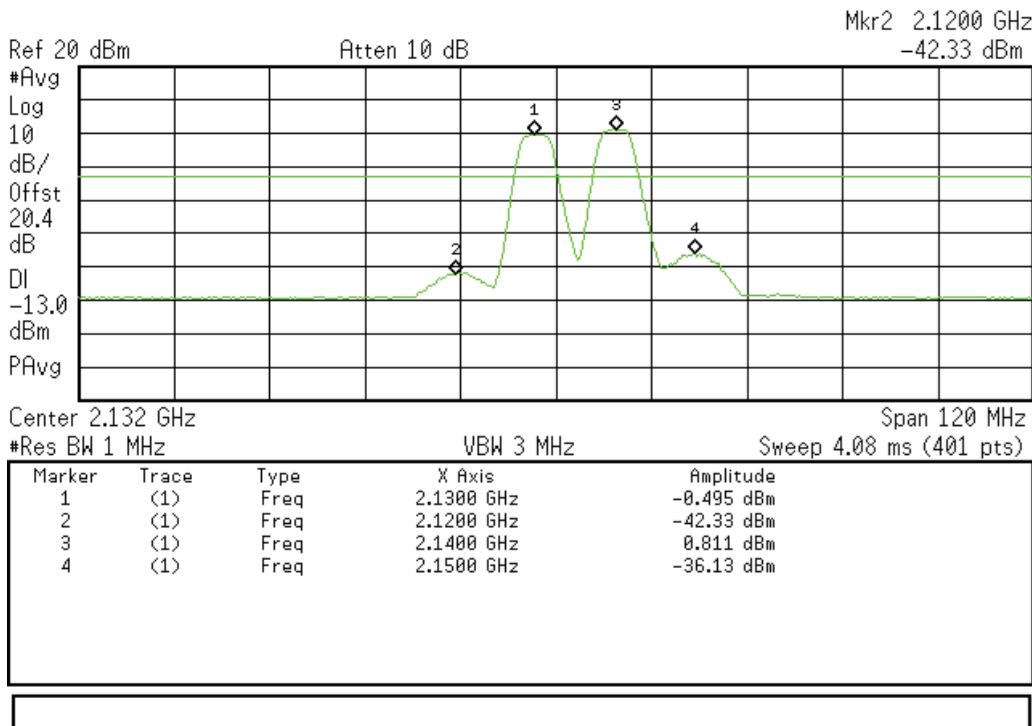
Agilent 09:26:12 Aug 13, 2014

L



Agilent 09:29:02 Aug 13, 2014

L



**Noise Figure Test**

**Name of Test:** Noise Figure  
**Test Equipment Utilized:** i00444, i00445 i00450

**Engineer:** Mike Graffeo  
**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