



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

toll-free: (866) 311-3268

fax: (480) 926-3598

<http://www.ComplianceTesting.com>

[info@ComplianceTesting.com](mailto:info@ComplianceTesting.com)

**Date:** June 16, 2010

Federal Communications Commission  
Via: Electronic Filing

**Attention:** Authorization & Evaluation Division

**Applicant:** Technology Solutions (UK) Ltd

**Equipment:** 1116  
UHF RFID Reader

**FCC ID:** S6J-1116

**FCC Rules:** 15.247

On behalf of the Applicant, enclosed please find Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

We trust the same is in order. If you should need any further information, kindly contact the writer who is authorized to act as agent.



## List of Exhibits

(FCC **Certification** (Transmitters) - Revised 9/28/98)

**Applicant:** Technology Solutions (UK) Ltd

**FCC ID:** S6J-1116

**By Applicant:**

1. Letter of Authorization
2. Identification Drawings
  - ☐ Id Label
  - ☐ Location Info
  - ☐ Attestation Statement (S)
  - ☐ Location of Compliance Statement
3. Documentation: 2.1033(B)
  - (3) User Manual (S)
  - (4) Operational Description
  - (5) Block Diagram
  - (5) Schematic Diagram
  - (7) External Photographs
  - Internal Photographs
  - Parts List
  - Active Devices

**By Compliance Testing:**

- A. Testimonial & Statement of Certification
- B. Statement of Qualifications



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## Test Report

for

**FCC ID:** S6J-1116

**Model:** 1116

to

**Federal Communications Commission**

Rule Part(s) 15.247

**Date of Report:** June 16, 2010

**On the Behalf of the Applicant:** Technology Solutions (UK) Ltd  
Suite C,  
Loughborough Technology Centre,  
Epinal Way,  
Loughborough,  
Leicestershire,  
United Kingdom  
LE11 3GE

**Attention of:** Dr. David Evans, Managing Director  
Ph: +44 (0) 1509 238248  
Fax: +44 (0) 1509 220020  
E-mail: [david.evans@tsl.uk.com](mailto:david.evans@tsl.uk.com)



## Test Report Revision History

| Revision | Date      | Revised By | Reason for revision  |
|----------|-----------|------------|--|
| 1.0      | 5/16/2010 | G. Corbin  | Original Document  |
| 2.0      | 8/17/2010 | G. Corbin  | Added Channel Spacing, Revised DCCF and Conducted Emission Test Data |
|          |           |            |  |
|          |           |            |  |



## Testimonial And Statement Of Certification

**This is to certify that:**

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data is true and correct.

A handwritten signature in black ink that reads "Greg Corbin".

Certifying Engineer:

Greg Corbin



**The applicant has been cautioned as to the following:**

15.21 Information to 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 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.



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*Required information per ISO 17025-2005, paragraph 5.10.2:*

|                      |  |
|----------------------|--|
| a)                   | <b>Test Report</b>   |
| b) Laboratory:       | Compliance Testing   |
| (FCC: 933597)        | 3356 N. San Marcos Place, Suite 107  |
| (Canada: IC 2044A-1) | Chandler, AZ 85225   |
| c) Report Number:    | d1060003   |
| d) Client:           | Technology Solutions (UK) Ltd  |
| e) Identification:   | 1116   |
| Description:         | UHF RFID Reader  |
| f) EUT Condition:    | Not required unless specified in individual tests.   |
| g) Report Date:      | June 16, 2010  |
| h, j, k):            | As indicated in individual tests.  |
| i) Sampling method:  | No sampling procedure used.  |
| l) Uncertainty:      | In accordance with Compliance Testing internal quality manual.                                       |
| n) Results:          | The results presented in this report relate only to the item tested.                                 |
| o) Reproduction:     | This report must not be reproduced, except in full, without written permission from this laboratory. |





### List of General Information Required For Certification

Tested in Accordance with FCC Rules and Regulations, Volume II, Part 2 and to 15.247.

#### Sub-Part 2.1033

(c)(1):

**Name and Address of Applicant:** Technology Solutions (UK) Ltd

(c)(2): **FCC ID:** S6J -1116

**Model Number:** 1116

(c)(3): **Instruction Manual(s):**

Please See Attached Exhibits

(c)(4): **Type of Emission:** 148KD2D

(c)(5): **FREQUENCY RANGE, MHz:** 902.75 – 927.25

(c)(6): **Power Rating, W:** 0.928

\_\_\_\_\_ Switchable

\_\_\_\_\_ Variable

  X   N/A

(c)(7): **Maximum Power Rating, W:** 1

15.203: **Antenna Requirement:**

- X   The antenna is permanently attached to the EUT
- \_\_\_\_\_ The antenna uses a unique coupling
- \_\_\_\_\_ The EUT must be professionally installed
- \_\_\_\_\_ The antenna requirement does not apply

**The unit was tested with an integrated antenna having a gain of 3 dBi.**



**Subpart 2.1033** (continued)

(c)(8): **Circuit Diagram/Circuit Description:**

Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

Please See Attached Exhibits

(c)(9): **Label Information:**

Please See Attached Exhibits

(c)(10): **Photographs:**

Please See Attached Exhibits

(c)(11): **Digital Modulation Description:**

     Attached Exhibits

**X** N/A

(c)(12): **Test and Measurement Data:**

Follows



Sub-part  
2.1033(b):

### Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2 and the following individual Parts:

15.247                      Operation within bands 902-928, 2400-2483.5, 5725-5850 MHz

### Standard Test Conditions and Engineering Practices

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

In accordance with ANSI C63.4-2009, ANSI C63.10-2009, FCC DA 00-705, 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.

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

### A2LA

"A2LA has accredited Compliance Testing in Chandler, AZ for technical competence in the field of Electrical testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO 17025:2005 'General Requirements for the Competence of Testing and Calibration Laboratories' and any additional program requirements in the identified field of testing."

Please refer to [www.a2la.org](http://www.a2la.org) for current scope of accreditation.

Certificate number: 2152.01



TESTING CERT# 2152.01

**FCC OATS Reg. #933597**

**IC O.A.T.S. Number: 2044A-1**

**Test Results Summary**

| Specification                | Test Name                         | Pass, Fail, N/A | Comments |
|------------------------------|-----------------------------------|-----------------|----------|
| 15.247(b)                    | Peak Output Power                 | Pass            |          |
| 15.247(d)                    | Conducted Spurious Emissions      | Pass            |          |
| 15.247(d), 15.209(a), 15.205 | Radiated Spurious Emissions       | Pass            |          |
| 15.247(d), 15.209(a), 15.205 | Emissions At Band Edges           | Pass            |          |
| 15.247(a)                    | Occupied Bandwidth                | Pass            |          |
| 15.247(a)                    | Dwell Time                        | Pass            |          |
| 15.247(a)                    | Number of Hopping Channels        | Pass            |          |
| 15.247(a)                    | Channel Spacing                   | Pass            |          |
| 15.207                       | A/C Powerline Conducted Emissions | Pass            |          |
| RSS-GEN 6(b)                 | Receiver Spurious Emission        | Pass            |          |

**Accessories:**

| Qty | Type                     | Make, Model                 | S/N           |
|-----|--------------------------|-----------------------------|---------------|
| 1   | Handheld Mobile Computer | Symbol Technologies, MC7090 | 6153520800145 |
| 1   | AC to DC Adapter         | Motorola, EADP-16BB A       | W9D0948106174 |

**Cables:**

| Qty | Type                        | Length, m | Shield | Shielded Hood | Ferrite |
|-----|-----------------------------|-----------|--------|---------------|---------|
| 1   | ActiveSync and Charge cable | 2         | None   | None          | None    |



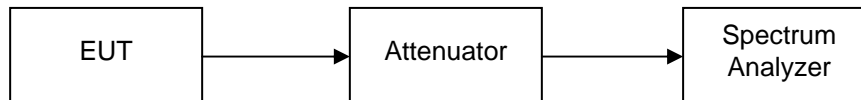
**Name of Test:** Peak Output Power  
**Specification:** 15.247(b)  
**Test Equipment Utilized:** i00331

**Engineer:** G. Corbin  
**Test Date:** 6/11/2010

### Test Procedure

The EUT was connected as shown in test setup. The attenuator and cable insertion loss was added to the spectrum analyzer as a reference level offset before peak readings were taken and the result was then compared to the limit.

### Test Setup



### Transmitter Peak Output Power

| Tuned Frequency<br>MHz | Recorded Measurement<br>Watt | Specification Limit<br>Watt | Result |
|------------------------|------------------------------|-----------------------------|--------|
| 902.75                 | 0.803                        | 1                           | Pass   |
| 915.25                 | 0.928                        | 1                           | Pass   |
| 927.25                 | 0.809                        | 1                           | Pass   |



**Name of Test:** Conducted Spurious Emissions  
**Specification:** 15.247(d)  
**Test Equipment Utilized:** i00331

**Engineer:** G. Corbin  
**Test Date:** 6/16/2010

### Test Procedure

The EUT was connected as shown in the test set-up to verify that the EUT met the requirements for conducted spurious emissions. The reference level was offset for filter and attenuator insertion loss and the resolution bandwidth set for 1 MHz. The frequency range from 30 MHz to the 10<sup>th</sup> harmonic of the fundamental transmitter was observed. Only detectable spurious emissions were recorded and plotted. The conducted peak output power is added to the recorded measurement to provide the corrected level dBc

Only the worst case is recorded in the Conducted Spurious Emissions Summary Test Table.

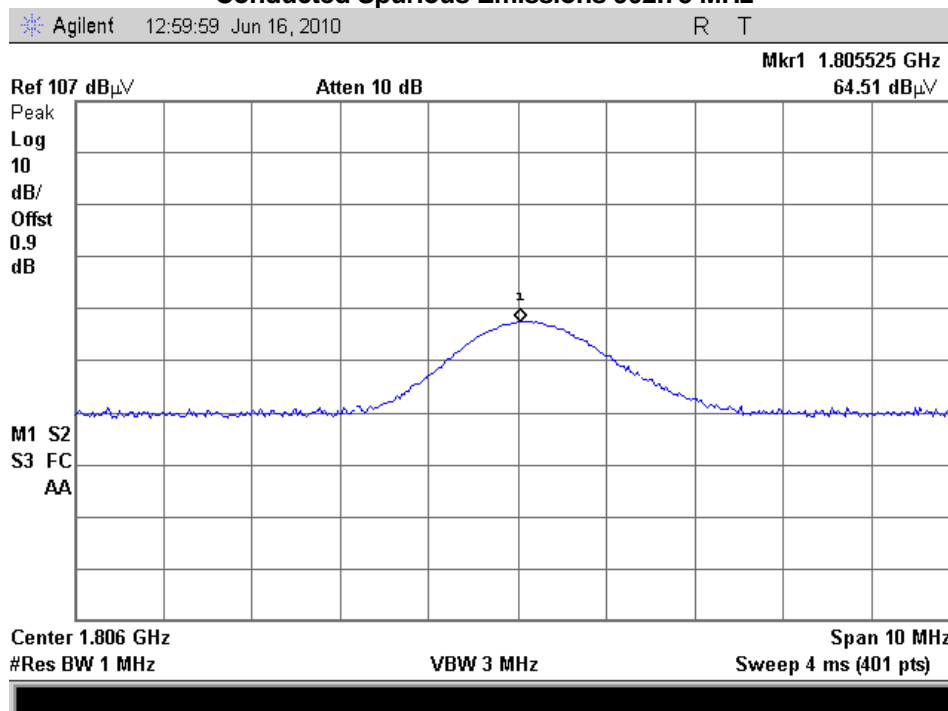
### Test Setup

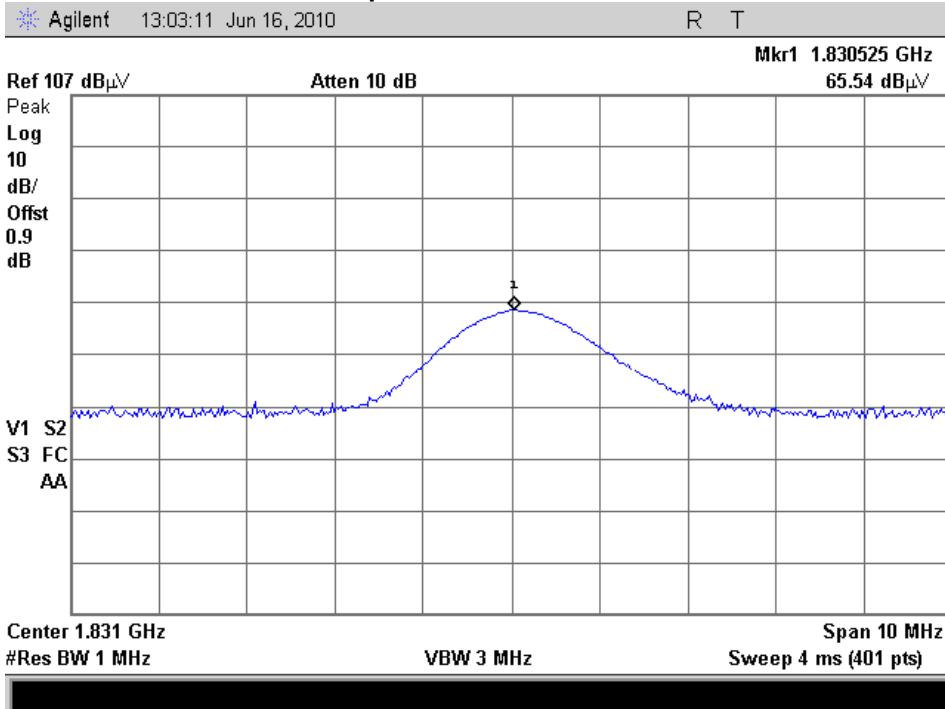
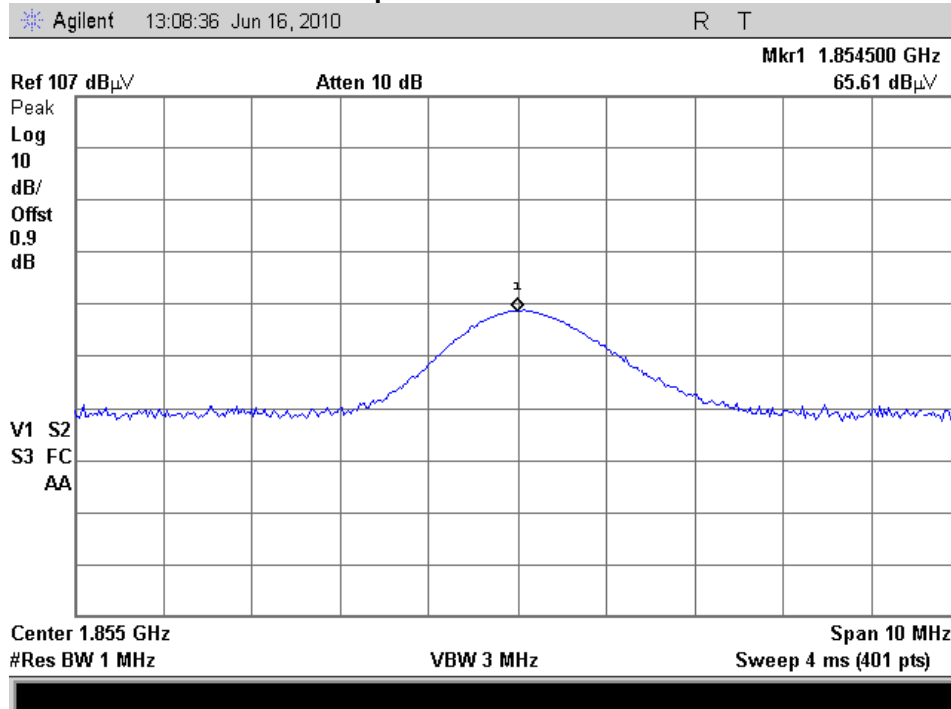


### Conducted Spurious Emissions Summary Test Table

| Tuned Frequency MHz | Emission Frequency MHz | Recorded Measurement dBuV | Peak Output Power dBuV | Corrected Measurement dBc | Specification Limit dBc | Result |
|---------------------|------------------------|---------------------------|------------------------|---------------------------|-------------------------|--------|
| 902.75              | 1.8055                 | 64.51                     | 136.03                 | -71.52                    | -20                     | Pass   |
| 915.25              | 1.8305                 | 64.54                     | 136.66                 | -72.12                    | -20                     | Pass   |
| 927.25              | 1.85454                | 65.61                     | 136.07                 | -70.46                    | -20                     | Pass   |

### Conducted Spurious Emissions 902.75 MHz



**Conducted Spurious Emissions 915.25 MHz****Conducted Spurious Emissions 927.25 MHz**



**Name of Test:** Radiated Spurious Emissions  
**Specification:** 15.247(d), 15.209(a), 15.205  
**Test Equipment Utilized:** i00028, i00033, i00103, i00267, i00331, i00364  
**Engineer:** G. Corbin  
**Test Date:** 7/19/2010

### Test Procedure

The EUT was tested in a semi-anechoic chamber set 3m from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Radiated Spurious Emissions. The antenna, band reject filter and cable correction factors were summed with the amplifier gain and input into the spectrum analyzer as an offset to ensure accurate readings. The spectrum for each tuned frequency was examined to the 10<sup>th</sup> harmonic.

The average value of the spurious emission was calculated by adding the Duty Cycle Correction Factor (DCCF) to the peak emission reading per C63.10 section 7.5 (The procedure for determining average value of pulsed emissions)

Duty Cycle Correction Factor (dB) =  $20\log(T1/T2)$

T1 = "On Time" for 1 pulse of a pulse train or 100 mS maximum

T2 = period of 1 complete pulse train or 100 mS maximum

The customer supplied the pulse information to calculate the Duty Cycle Correction Factor. Since T2 was >100 mS, 100 mS was used in the calculation.

T1 = 16 mS

T2 = 150 mS actual, 100 mS used in calculation

DCCF (dB) =  $20\log(16\text{mS}/100\text{mS}) = -15.9 \text{ dB}$

### Test Setup



| Detector Settings | RBW   | VBW   | Span         |
|-------------------|-------|-------|--------------|
| Peak              | 1 MHz | 3 MHz | As Necessary |

### Radiated Spurious Emissions

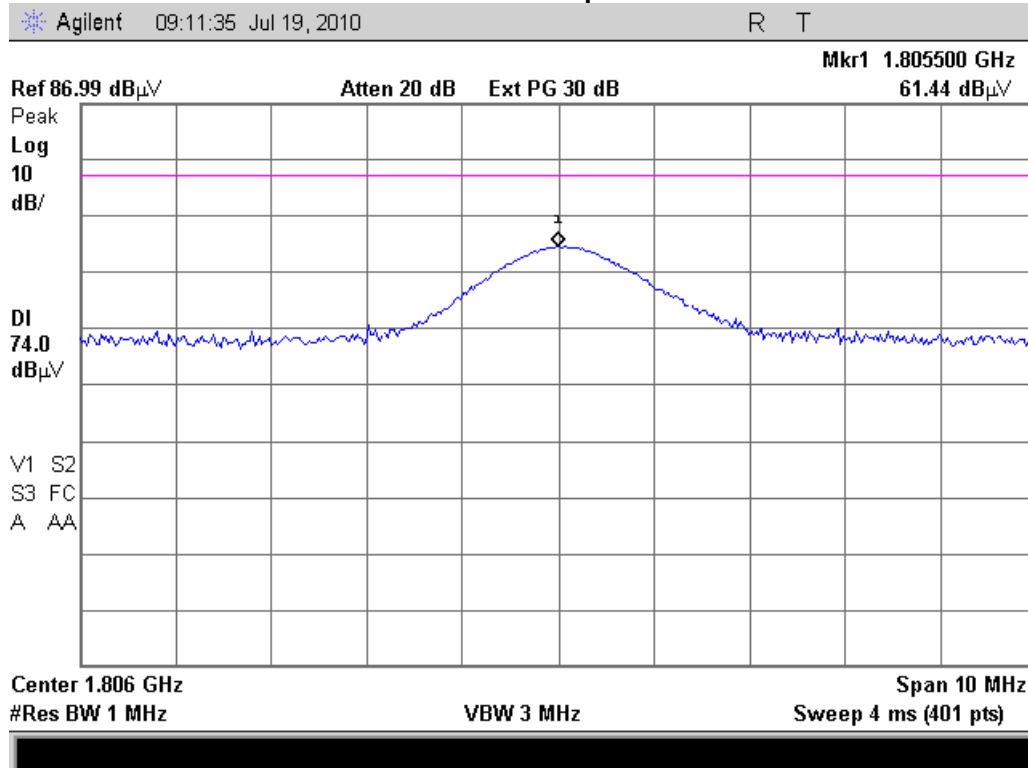
| Tuned Freq (MHz) | Emission Freq (MHz) | Peak Level Measured (dBuV/m) | Peak Limit (dBuV/m) | DCCF (dB) | Average Level Calculated (dBuV/m) | Average Limit (dBuV/m) | Result |
|------------------|---------------------|------------------------------|---------------------|-----------|-----------------------------------|------------------------|--------|
| 902.75           | 1805.5              | 61.4                         | 74                  | -15.9     | 45.5                              | 54                     | Pass   |
| 902.75           | 2708.2              | 65.1                         | 74                  | -15.9     | 49.2                              | 54                     | Pass   |
| 902.75           | 3611                | 67.6                         | 74                  | -15.9     | 51.7                              | 54                     | Pass   |
| 902.75           | 4513.7              | 52.2                         | 74                  | -15.9     | 36.3                              | 54                     | Pass   |
| 902.75           | 5416.5              | 54.1                         | 74                  | -15.9     | 38.2                              | 54                     | Pass   |
| 915.25           | 1830.5              | 66.5                         | 74                  | -15.9     | 50.6                              | 54                     | Pass   |
| 915.25           | 2745.7              | 65.6                         | 74                  | -15.9     | 49.7                              | 54                     | Pass   |
| 915.25           | 3661                | 63.8                         | 74                  | -15.9     | 47.9                              | 54                     | Pass   |
| 915.25           | 4576.2              | 55.4                         | 74                  | -15.9     | 39.5                              | 54                     | Pass   |
| 915.25           | 5491.5              | 49.1                         | 74                  | -15.9     | 33.2                              | 54                     | Pass   |
| 927.25           | 1854.5              | 62.3                         | 74                  | -15.9     | 46.4                              | 54                     | Pass   |
| 927.25           | 2781.7              | 62.8                         | 74                  | -15.9     | 46.9                              | 54                     | Pass   |
| 927.25           | 3709                | 55.4                         | 74                  | -15.9     | 39.5                              | 54                     | Pass   |
| 927.25           | 4636.2              | 57.1                         | 74                  | -15.9     | 41.2                              | 54                     | Pass   |
| 927.25           | 5563.5              | 50.3                         | 74                  | -15.9     | 34.4                              | 54                     | Pass   |

No other emissions were detectable. All emissions were greater than -20 dBc.

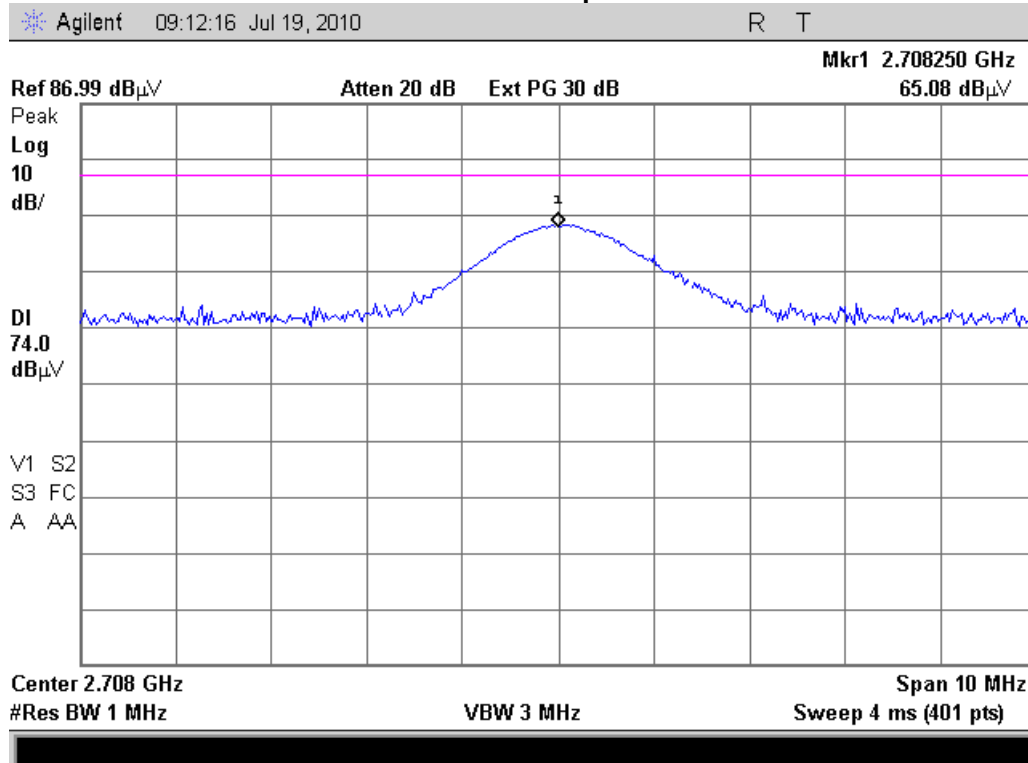




**Tuned Frequency = 902.75 MHz**  
**2<sup>nd</sup> Harmonic - peak**

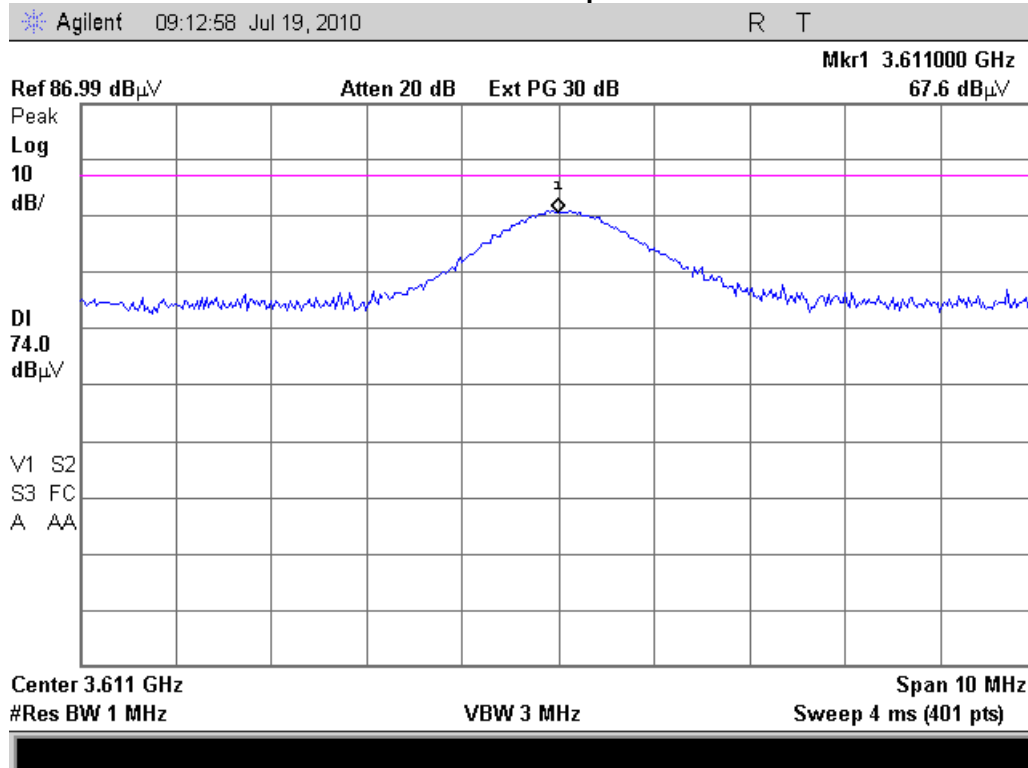


**Tuned Frequency = 902.75 MHz**  
**3<sup>rd</sup> Harmonic - peak**

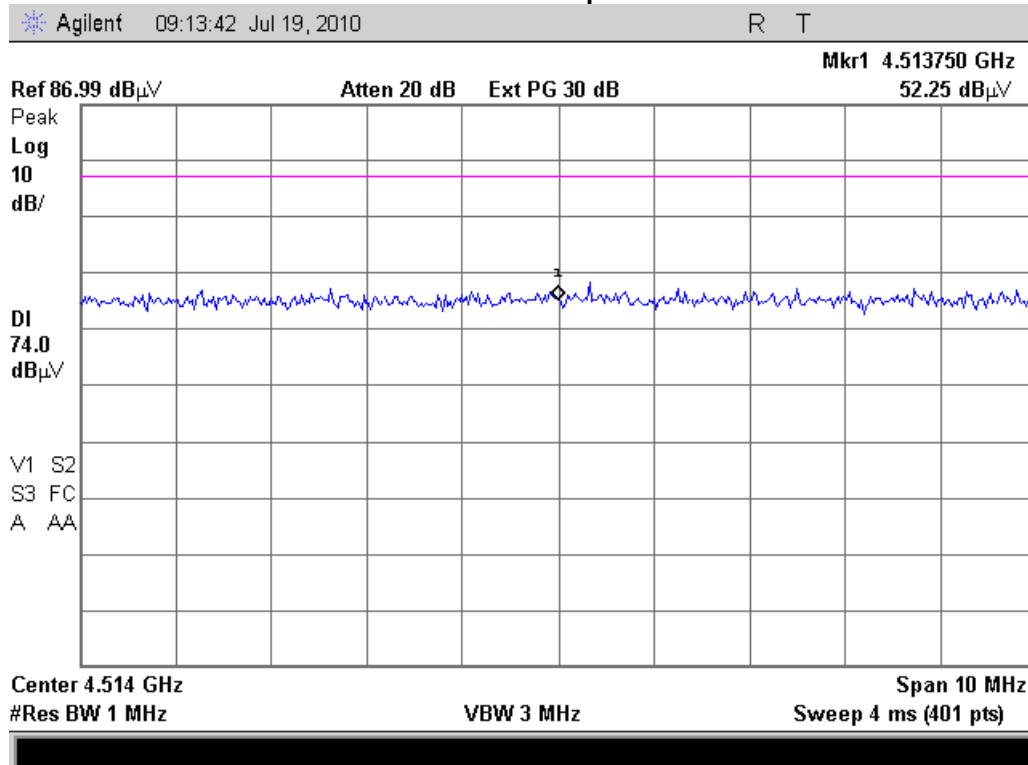




**Tuned Frequency = 902.75 MHz  
4th Harmonic - peak**

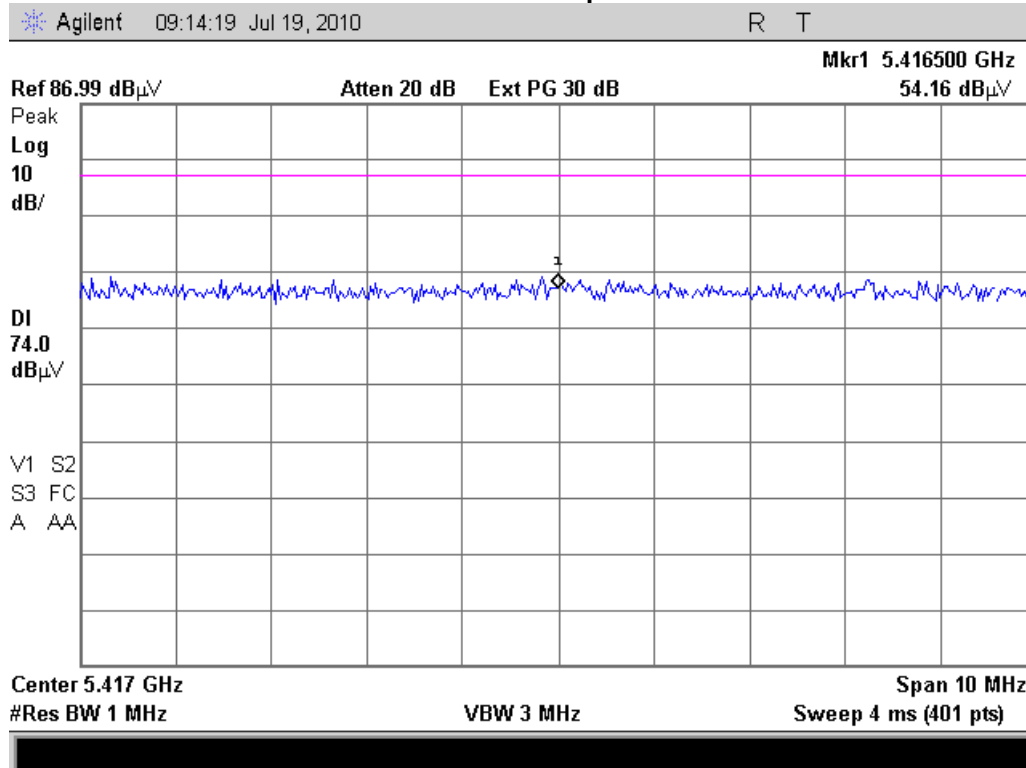


**Tuned Frequency = 902.75 MHz  
5th Harmonic - peak**

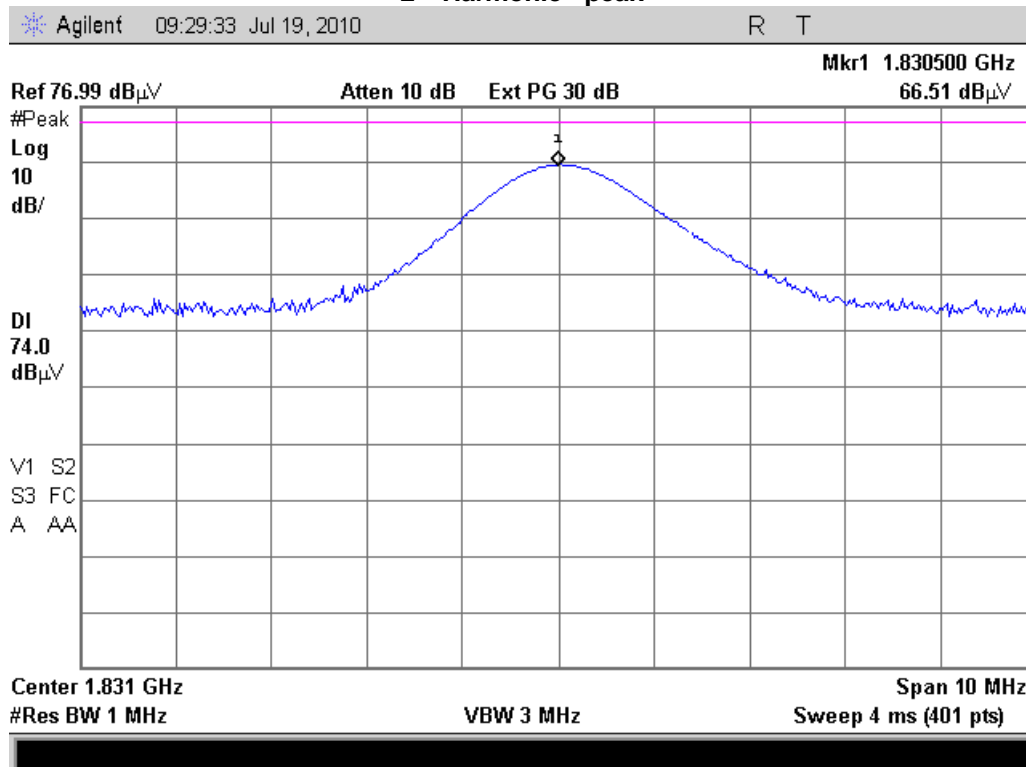




**Tuned Frequency = 902.75 MHz**  
**6th Harmonic - peak**

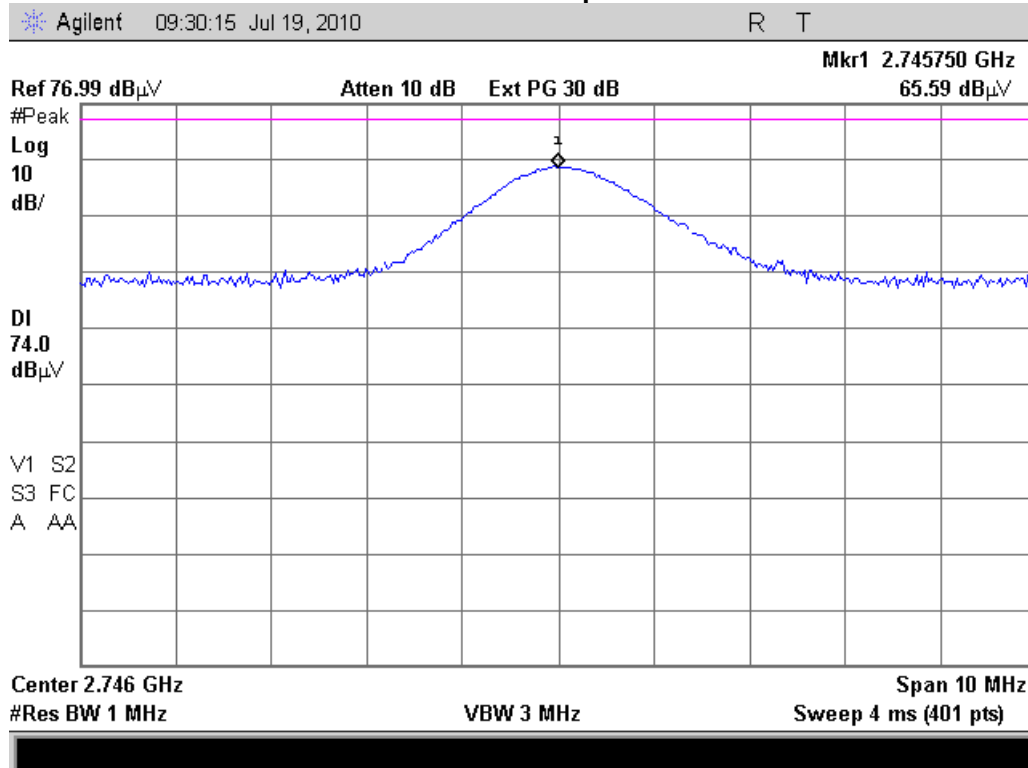


**Tuned Frequency = 915.25 MHz**  
**2<sup>nd</sup> Harmonic - peak**

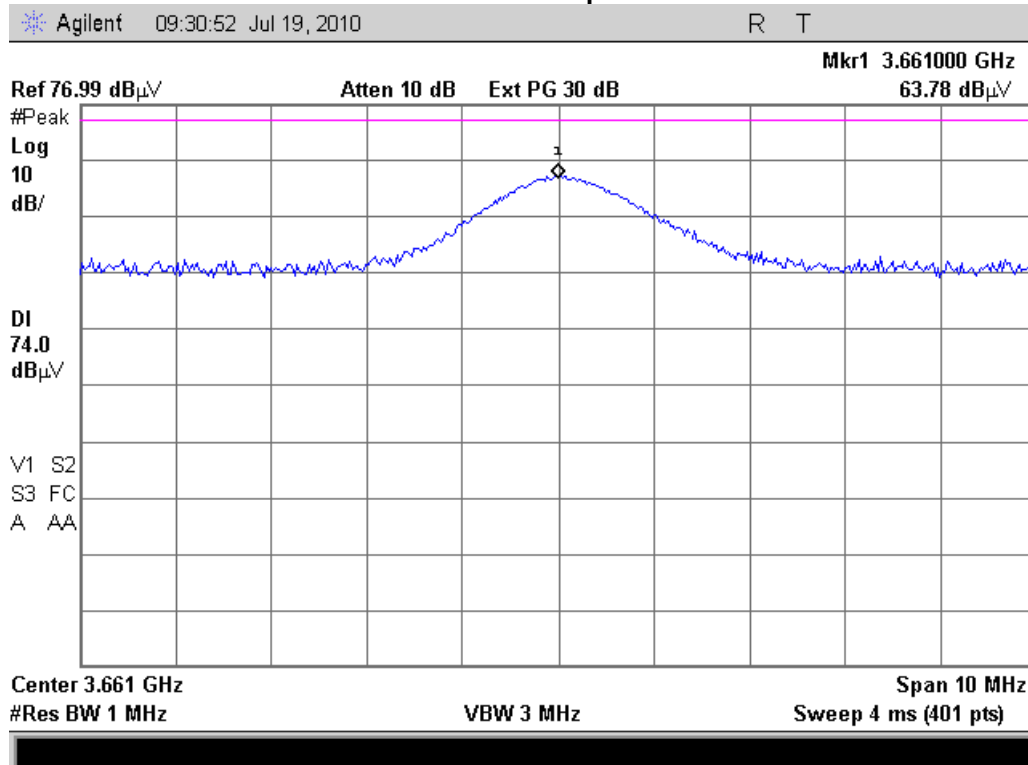




**Tuned Frequency = 915.25 MHz**  
**3<sup>rd</sup> Harmonic - peak**

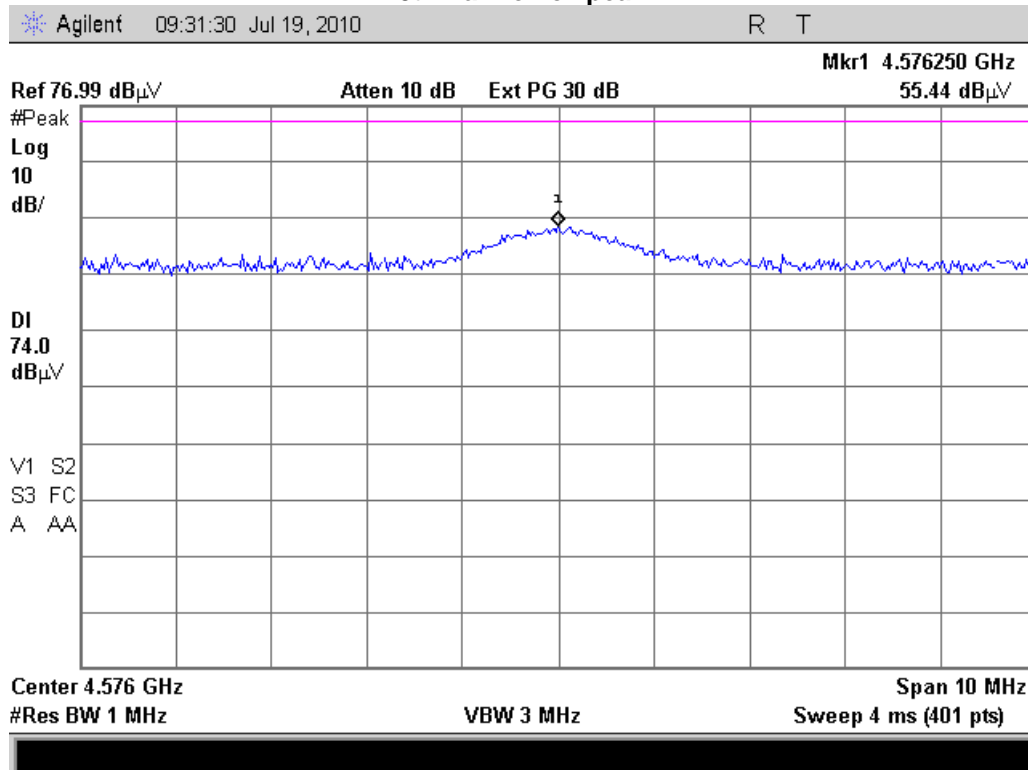


**Tuned Frequency = 915.25 MHz**  
**4th Harmonic - peak**

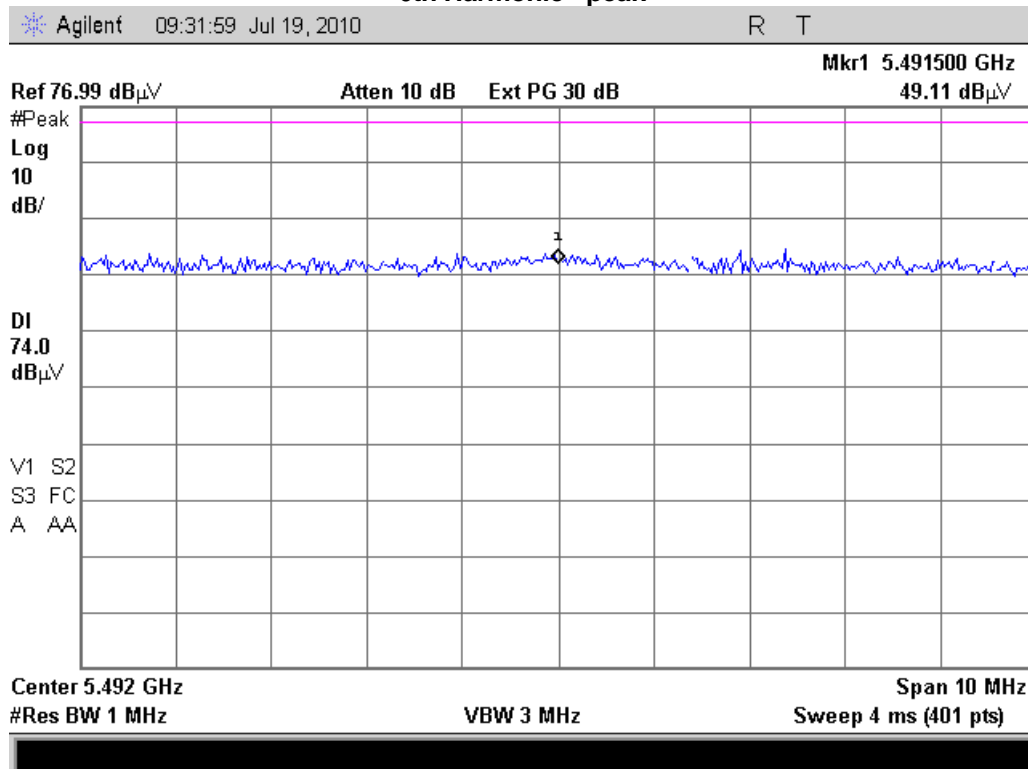




**Tuned Frequency = 915.25 MHz  
5th Harmonic - peak**

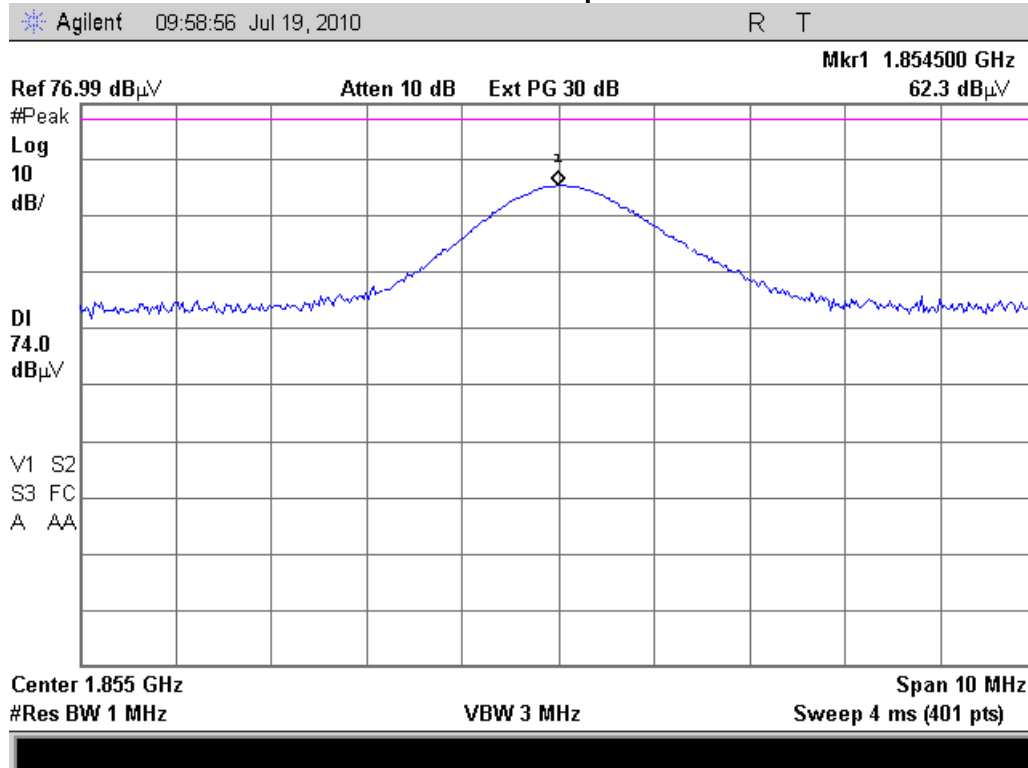


**Tuned Frequency = 915.25 MHz  
6th Harmonic - peak**

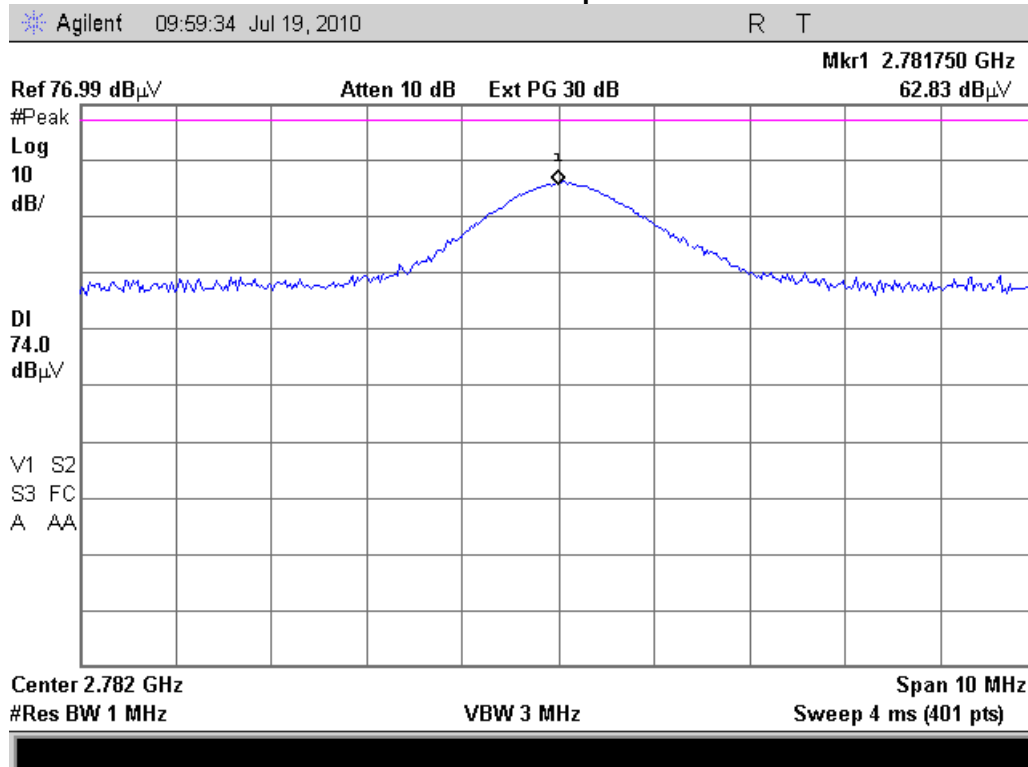




**Tuned Frequency = 927.25 MHz**  
**2<sup>nd</sup> Harmonic - peak**

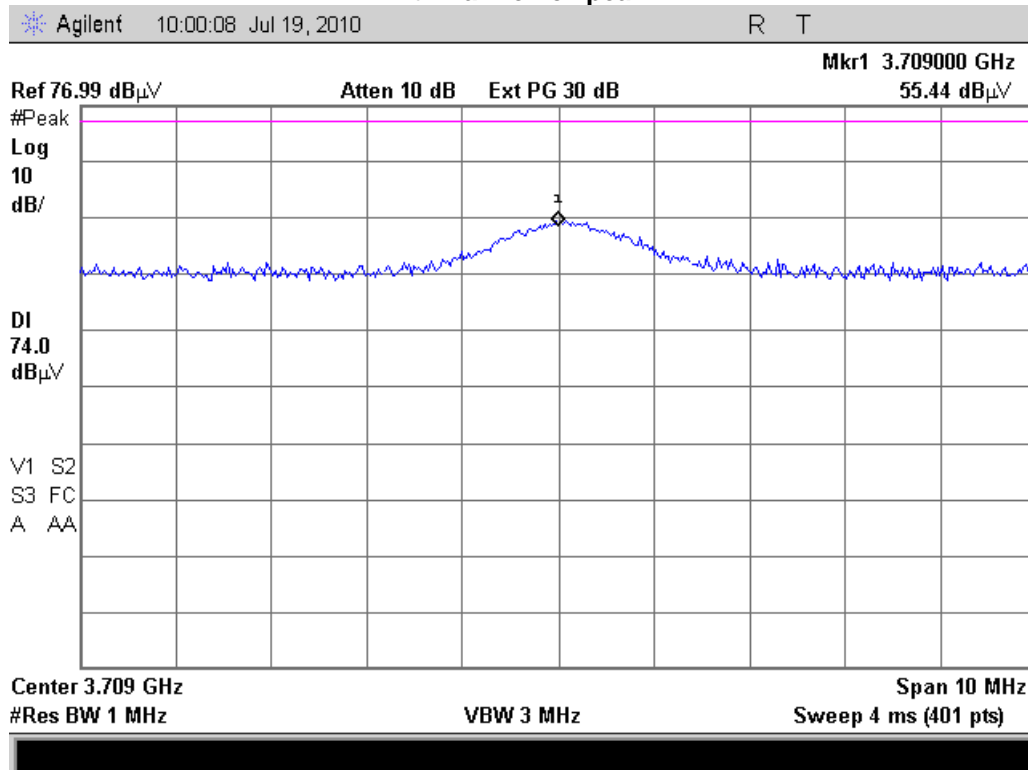


**Tuned Frequency = 927.25 MHz**  
**3<sup>rd</sup> Harmonic - peak**

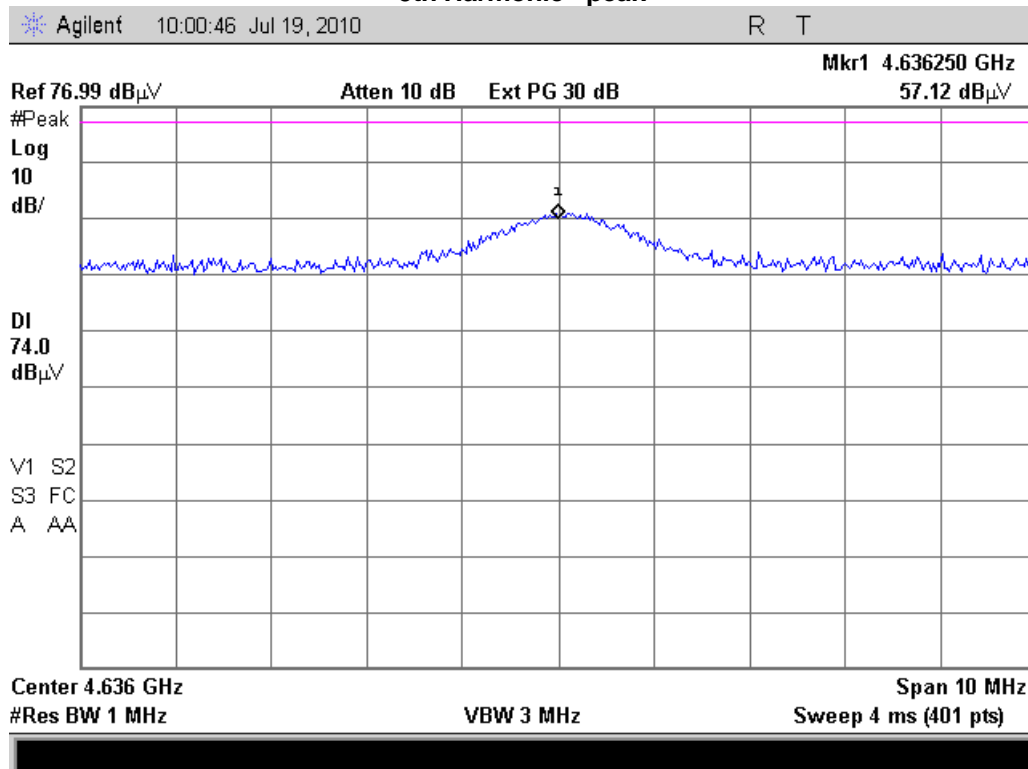




**Tuned Frequency = 927.25 MHz**  
**4th Harmonic - peak**

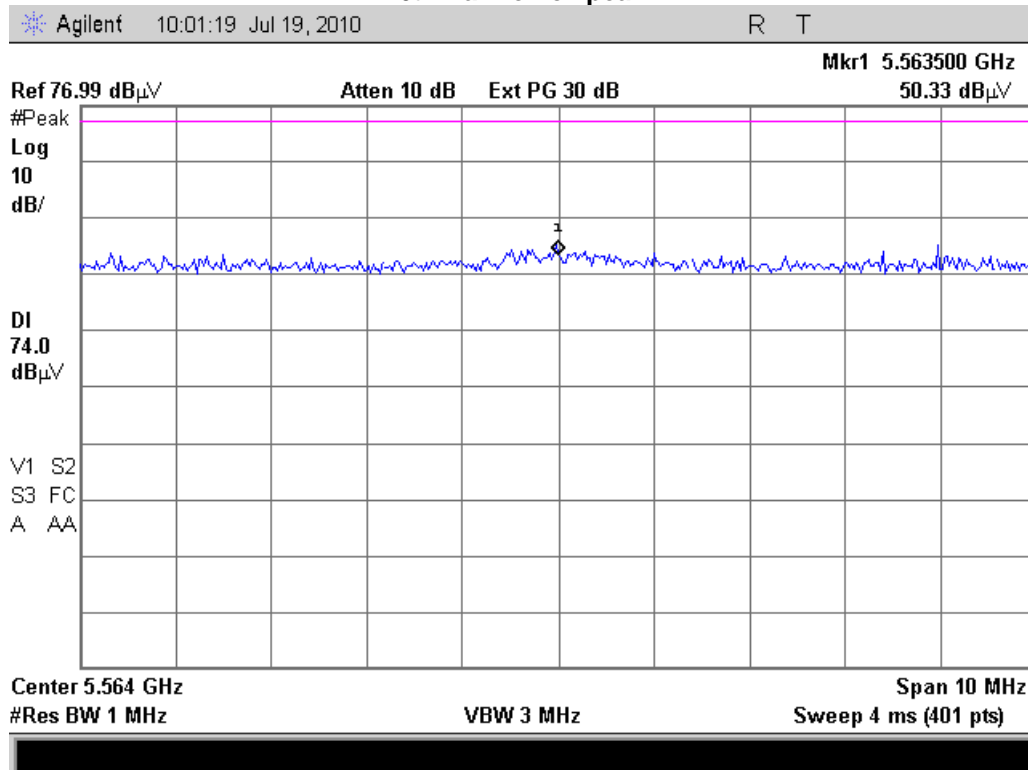


**Tuned Frequency = 927.25 MHz**  
**5th Harmonic - peak**





**Tuned Frequency = 927.25 MHz  
6th Harmonic - peak**







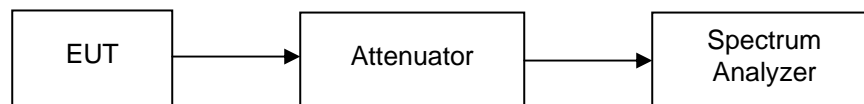
**Name of Test:** Emissions At Band Edges  
**Specification:** 15.247(d), 15.209(a), 15.205  
**Test Equipment Utilized:** i00331

**Engineer:** G. Corbin  
**Test Date:** 6/16/2010

### Test Procedure

Band Edge measurements were performed using the procedure outlined in C63.10-2009, section 7.7.9 (Band-edge measurements for RF conducted emissions). This procedure allows for the Band edge to be measured conducted, with and without the frequency hopping enabled. The attenuator and cable insertion loss was added to the spectrum analyzer as a reference level offset.

### Test Setup



### Band Edge Emissions Summary without Frequency Hopping enabled

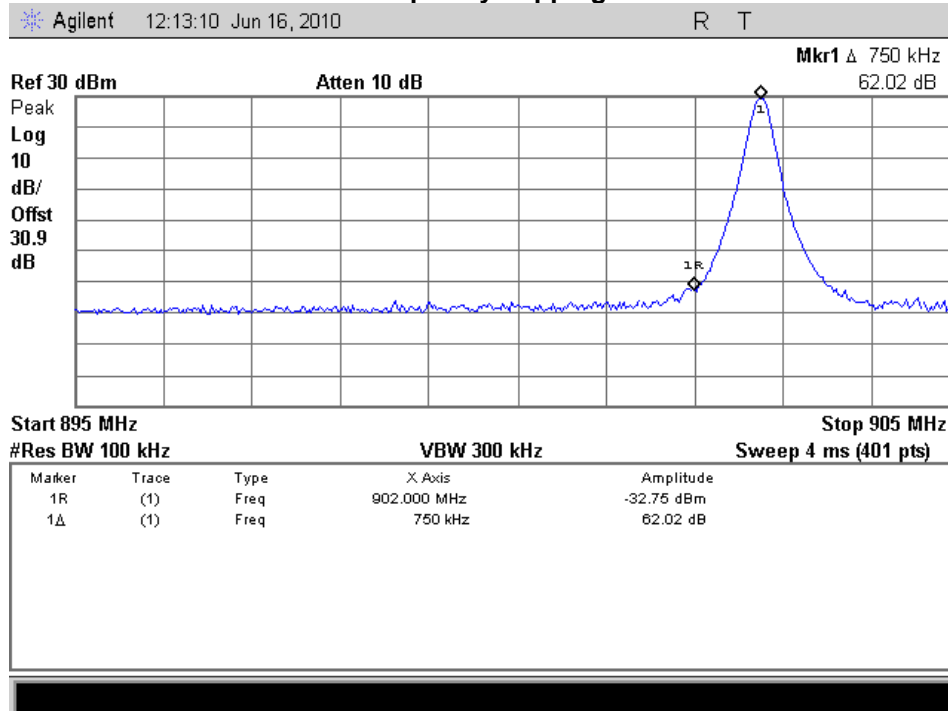
| Tuned Freq (MHz) | Emission Freq (MHz) | Monitored Level (dBc) | Detector | Limit (dBc) | Result |
|------------------|---------------------|-----------------------|----------|-------------|--------|
| 902.75           | 902.00              | -62.0                 | Peak     | -20         | Pass   |
| 927.25           | 928.00              | -59.9                 | Peak     | -20         | Pass   |

### Band Edge Emissions Summary with Frequency Hopping enabled

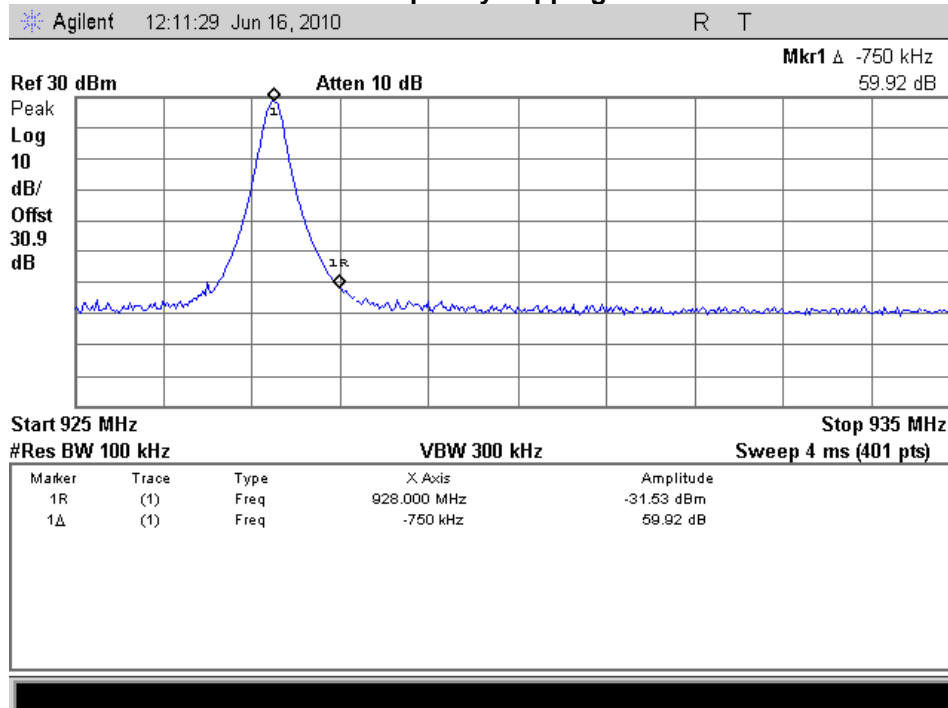
| Tuned Freq (MHz) | Emission Freq (MHz) | Monitored Level (dBc) | Detector | Limit (dBc) | Result |
|------------------|---------------------|-----------------------|----------|-------------|--------|
| 902.75           | 902.00              | -61.9                 | Peak     | -20         | Pass   |
| 927.25           | 928.00              | -60.3                 | Peak     | -20         | Pass   |



### Band Edge 902.75 MHz Without Frequency hopping enabled

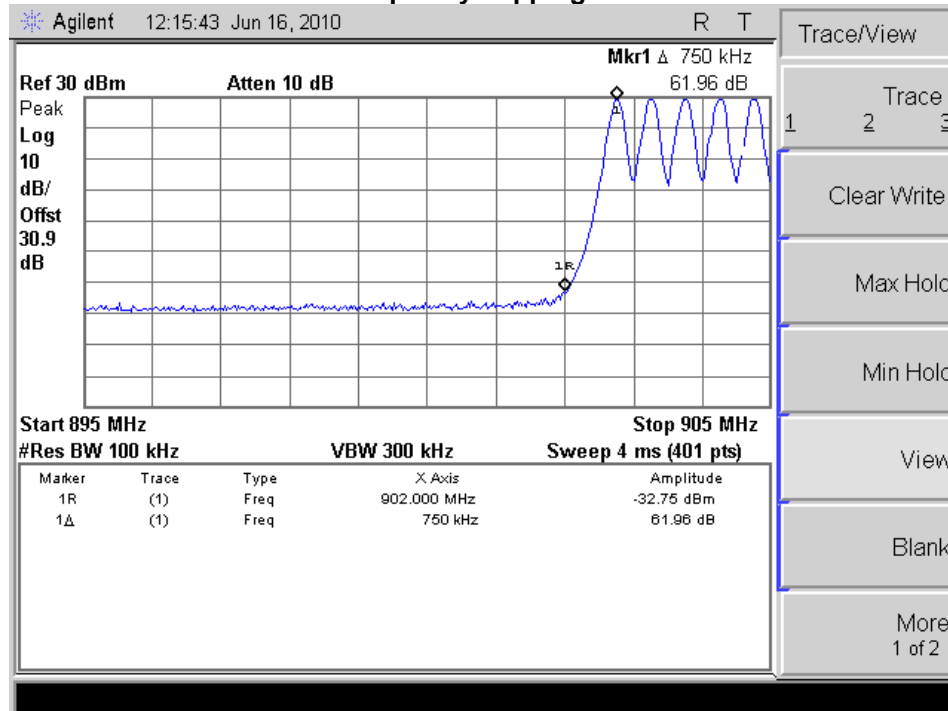


### Band Edge 927.25 MHz Without Frequency hopping enabled

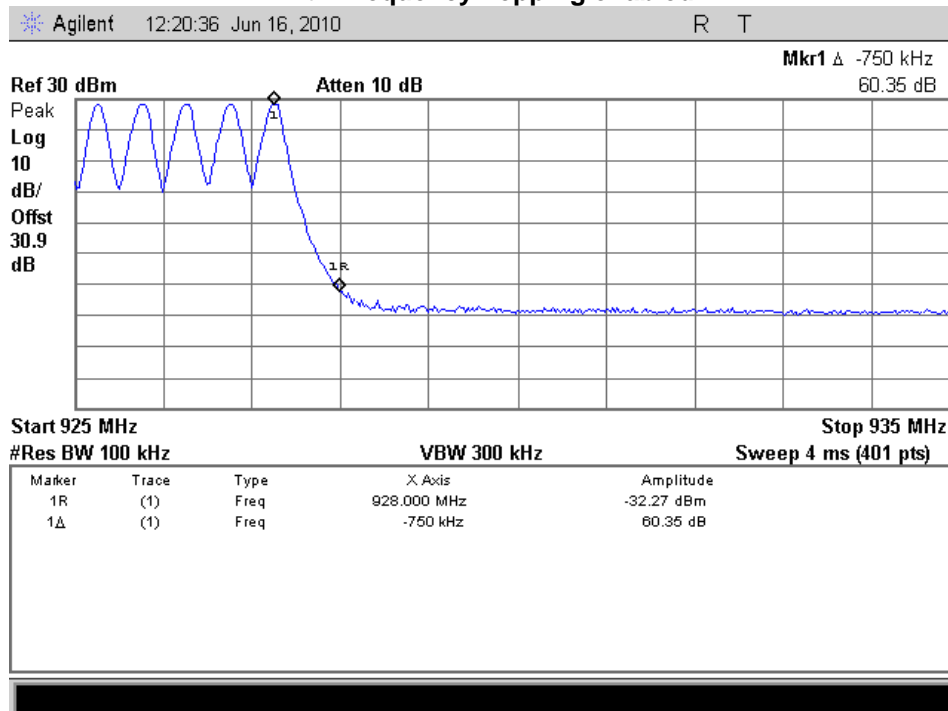




### Band Edge 902.75 MHz With Frequency hopping enabled



### Band Edge 927.25 MHz With Frequency hopping enabled





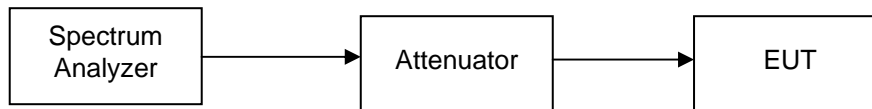
**Name of Test:** Occupied Bandwidth  
**Specification:** 15.247(a)  
**Test Equipment Utilized:** i00331

**Engineer:** G. Corbin  
**Test Date:** 7/20/2010

### Test Procedure

The EUT was connected directly to a spectrum analyzer. The cable and attenuator insertion loss was entered into the spectrum analyzer as a reference level offset. The Span was set wide enough to capture the entire transmit spectrum. The RBW was set to  $\geq 1\%$  of the necessary BW. The analyzer was set to max hold and when the entire spectrum was captured the 20dB and 99% bandwidths were measured using the Occupied Bandwidth tool on the spectrum analyzer to verify the bandwidth met the specification.

### Test Setup



### 20 dB Bandwidth Summary

| Frequency MHz | Recorded Measurement | Specification Limit | Result |
|---------------|----------------------|---------------------|--------|
| 902.75        | 137.414 kHz          | 500 kHz             | Pass   |
| 915.25        | 147.950 kHz          | 500 kHz             | Pass   |
| 927.25        | 145.212 kHz          | 500 kHz             | Pass   |

### 99% Bandwidth Summary

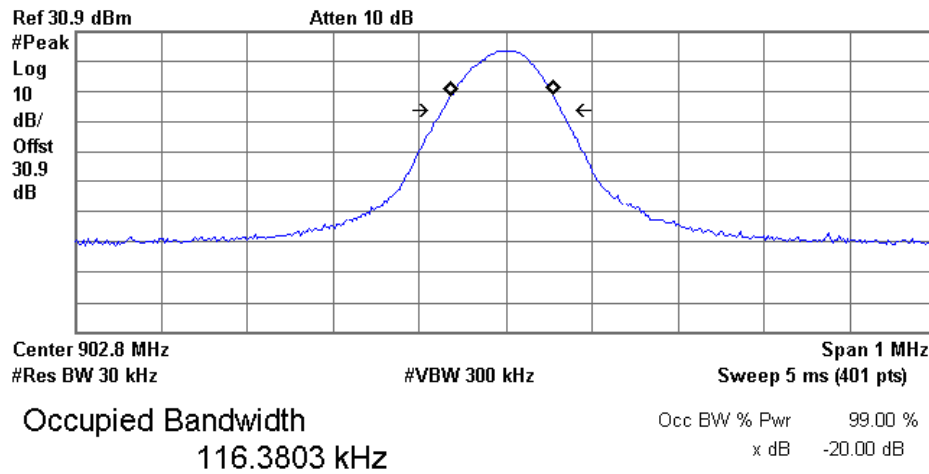
| Frequency MHz | Recorded Measurement | Result |
|---------------|----------------------|--------|
| 902.75        | 116.3803 kHz         | Pass   |
| 915.25        | 124.8070 kHz         | Pass   |
| 927.25        | 121.8475 kHz         | Pass   |



# Occupied Bandwidth Tuned Frequency = 902.75 MHz

Agilent 10:18:41 Jul 20, 2010

R T



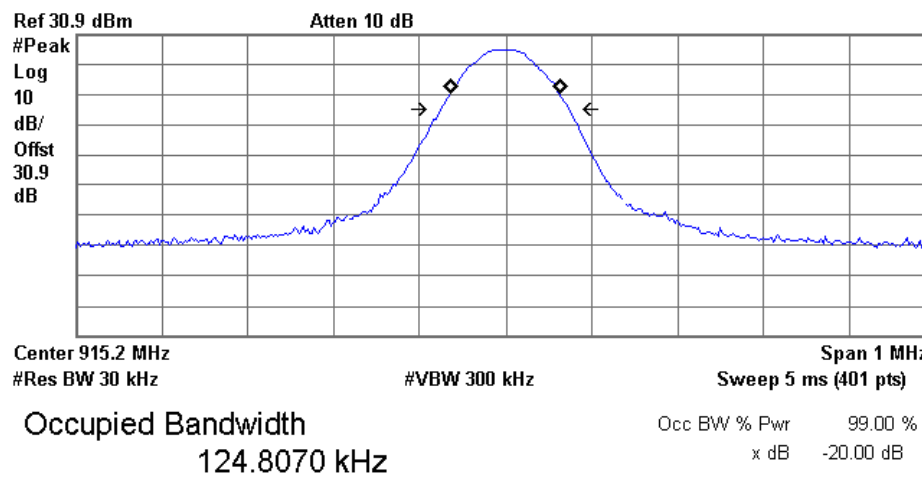
Transmit Freq Error -4.158 kHz  
x dB Bandwidth 137.414 kHz



### Occupied Bandwidth Tuned Frequency = 915.25 MHz

Agilent 10:19:53 Jul 20, 2010

R T

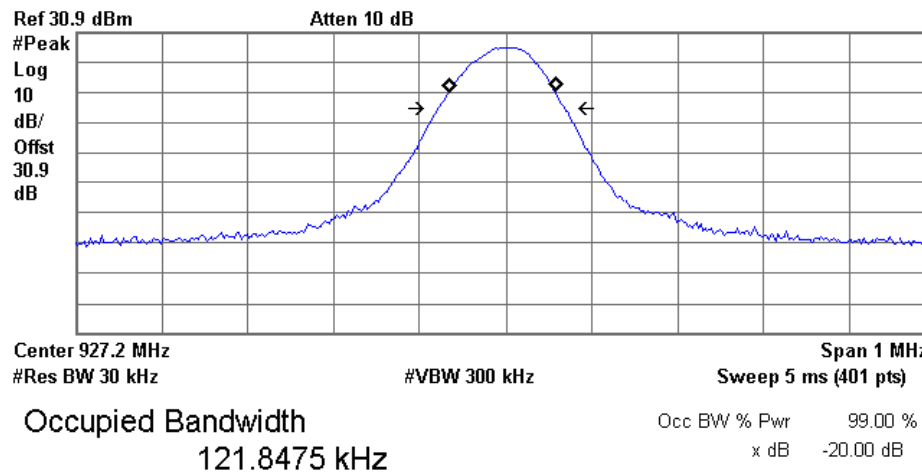


Transmit Freq Error -821.956 Hz  
x dB Bandwidth 147.950 kHz

### Occupied Bandwidth Tuned Frequency = 927.25 MHz

Agilent 10:20:56 Jul 20, 2010

R T



Transmit Freq Error -4.218 kHz  
x dB Bandwidth 145.212 kHz



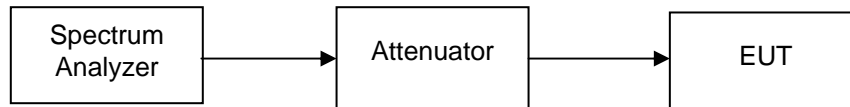
Name of Test: Dwell Time  
Specification: 15.247(a)  
Test Equipment Utilized: i00331

Engineer: G. Corbin  
Test Date: 6/10/2010

### Test Procedure

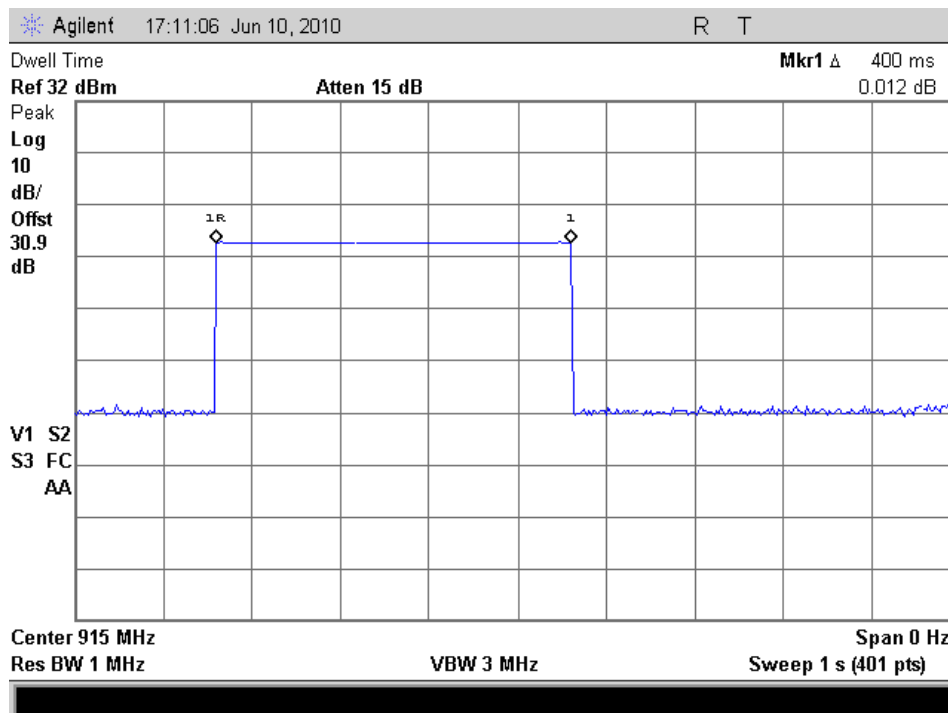
The EUT was connected directly to a spectrum analyzer. The EUT was set to hopping mode with the spectrum analyzer set to 0 span. A single transmission was captured and the dwell time was verified.

### Test Setup



| Tuned Frequency MHz | Dwell Time mS | Limit ms | Result |
|---------------------|---------------|----------|--------|
| 915.25              | 400           | 400      | Pass   |

### Dwell Time





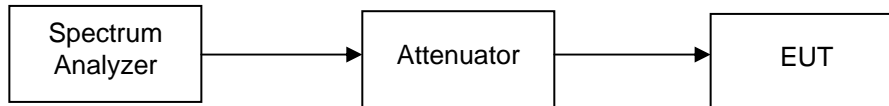
Name of Test: Number of Hopping Channels  
Specification: 15.247(a)  
Test Equipment Utilized: i00331

Engineer: G. Corbin  
Test Date: 6/10/2010

### Test Procedure

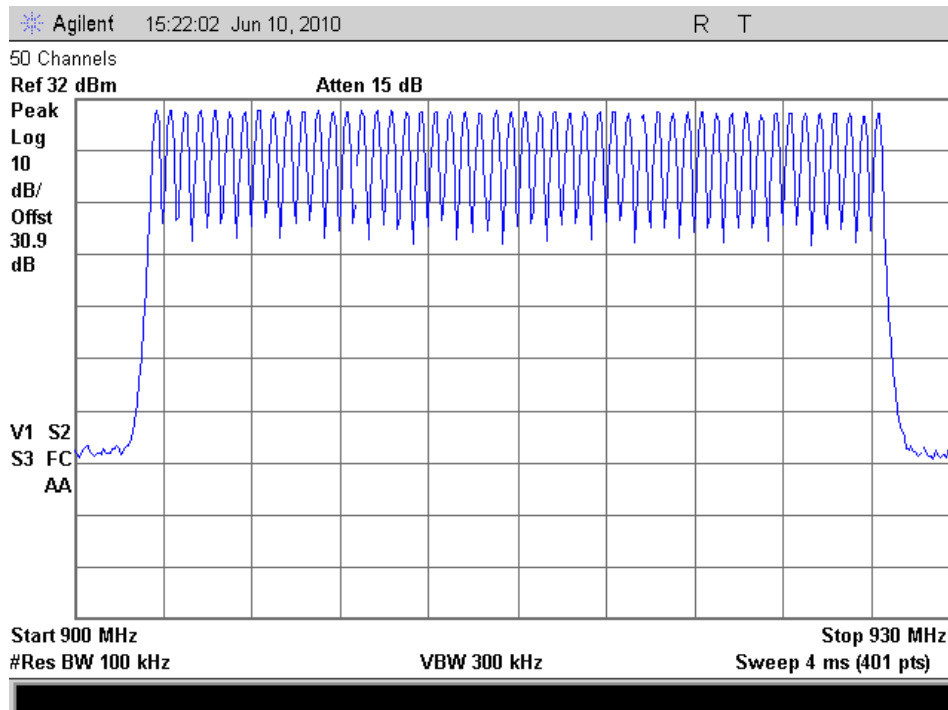
The EUT was connected directly to a spectrum analyzer. The Span was set to the specified band end points. The EUT was then set to operate in hopping mode. The MAX HOLD function of the spectrum analyzer was utilized to verify the number of hopping channels.

### Test Setup



| Tuned Frequency MHz | Number of Hopping Channels | Limit minimum | Result |
|---------------------|----------------------------|---------------|--------|
| 902 - 928           | 50                         | 50            | Pass   |

### Number of Hopping Channels







**Name of Test:** Channel Spacing  
**Specification:** 15.247(a)  
**Test Equipment Utilized:** i00331

**Engineer:** G. Corbin  
**Test Date:** 6/10/2010

### Test Procedure

The measurement was recorded per the test method listed in C63.10 section 7.7.2

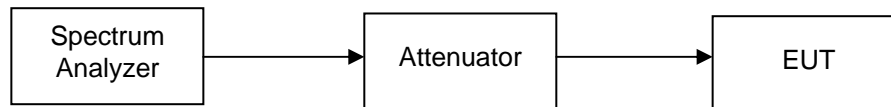
The EUT was set to operate in hopping mode. The MAX HOLD function of the spectrum analyzer was utilized to capture two adjacent hopping channels.

### Limit

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20 dB bandwidth of the hopping channel, whichever is greater.

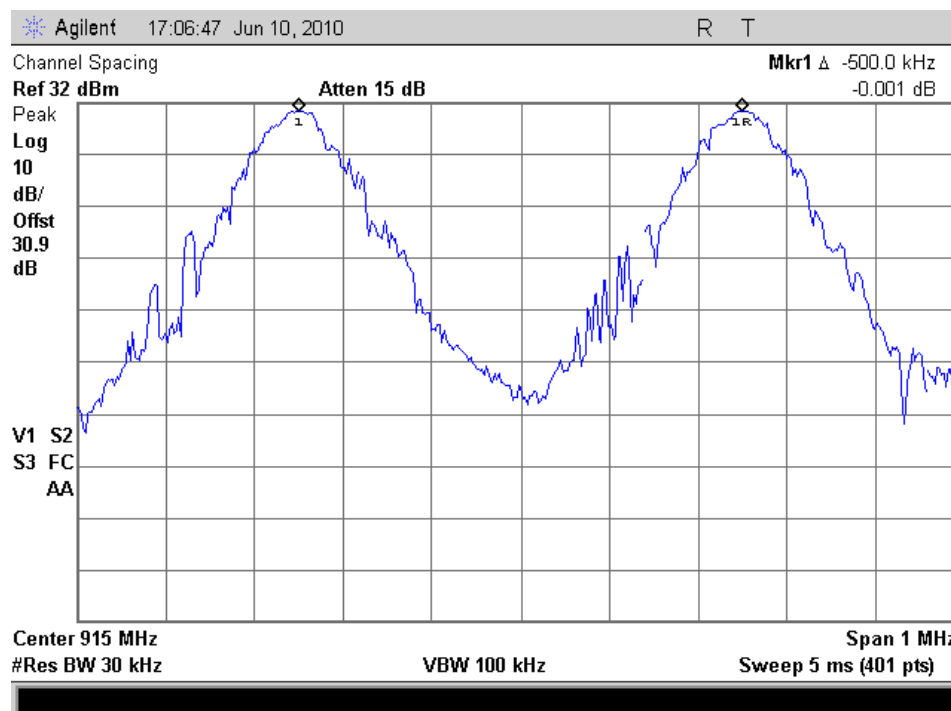
20 dB BW = 147.95 KHz

### Test Setup



| Channel Spacing | 20 dB Bandwidth | Limit<br>As a minimum –<br>25 KHz or 20 dB BW of the hopping<br>channel whichever is greater. | Result |
|-----------------|-----------------|---|--------|
| 500 kHz         | 147.95 kHz      | 147.95 kHz minimum  | Pass   |

### Channel Spacing





**Name of Test:** A/C Powerline Conducted Emissions  
**Specification:** 15.207  
**Test Equipment Utilized:** i00033, i00270

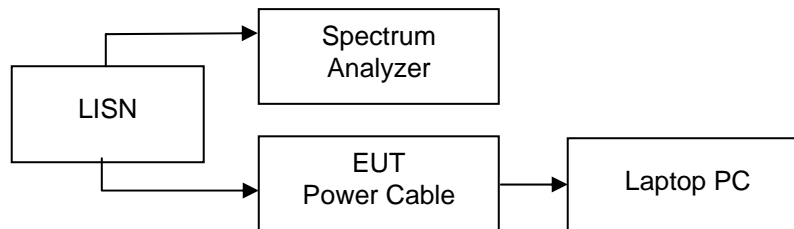
**Engineer:** G. Corbin  
**Test Date:** 6/15/2010

### Test Procedure

The EUT power cable connected to a LISN and the monitored output of the LISN was connected directly to a spectrum analyzer. The conducted emissions from 150 kHz to 30 MHz were monitored and compared to the specification limits.

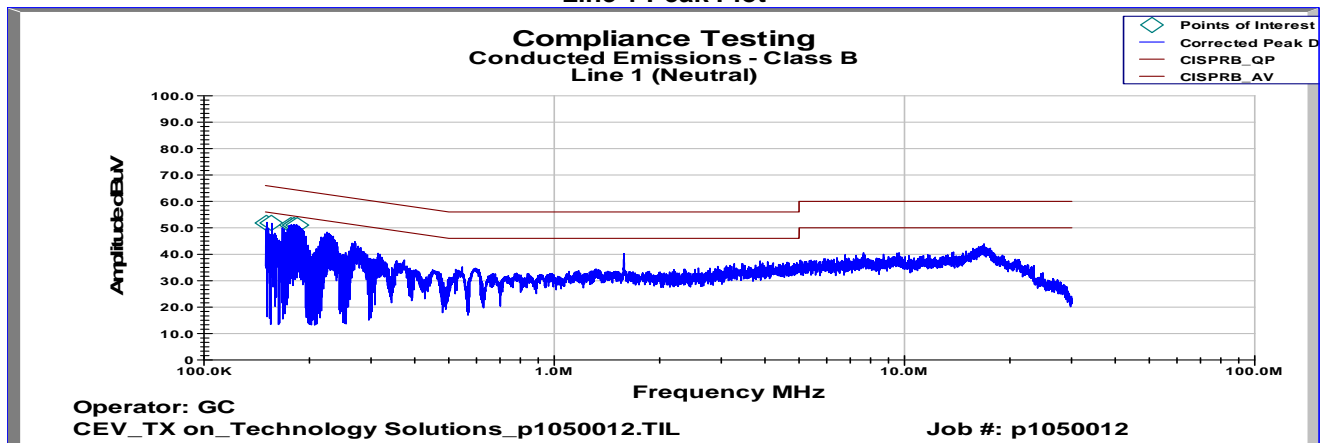
The Conducted Emissions data was recorded with the transmitter turned on. The EUT is connected to a pc via a USB cable when using the activesync function to transfer data from the portable computer to another pc.

### Test Setup

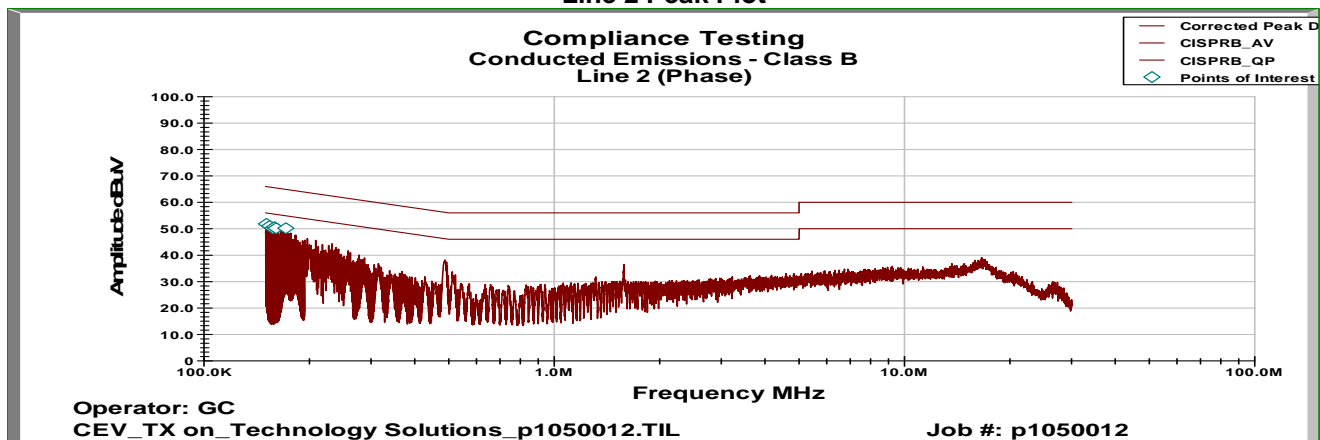


### Conducted Emissions Test Results

#### Line 1 Peak Plot



#### Line 2 Peak Plot



**Line 1 Neutral AVG Detector**

| Frequency  | Measured Data (dBuV) | LISN Corr Fact (dB) | Cable Loss (dB) | Attenuator (dB) | L1 Final Data (dBuV) | CISPR/FCC Limit (dBuV) | AVG Margin (dB) |
|------------|----------------------|---------------------|-----------------|-----------------|----------------------|------------------------|-----------------|
| 185.4 KHz  | 20.62                | 0.20                | 0.004           | 10.000          | 30.824               | 54.989                 | -24.165         |
| 178.74 KHz | 23.49                | 0.20                | 0.011           | 10.000          | 33.701               | 55.179                 | -21.478         |
| 174.36 KHz | 20.77                | 0.20                | 0.016           | 10.000          | 30.986               | 55.304                 | -24.318         |
| 174.28 KHz | 20.38                | 0.20                | 0.015           | 10.000          | 30.599               | 55.306                 | -24.708         |
| 150.44 KHz | 14.80                | 0.30                | 0.041           | 10.000          | 25.133               | 55.988                 | -30.855         |
| 150.17 KHz | 14.74                | 0.30                | 0.042           | 10.000          | 25.084               | 55.995                 | -30.911         |

**Line 2 Phase AVG Detector**

| Frequency  | Measured Data (dBuV) | LISN Corr Fact (dB) | Cable Loss (dB) | Attenuator (dB) | L2 Final Data (dBuV) | CISPR/FCC Limit (dBuV) | AVG Margin (dB) |
|------------|----------------------|---------------------|-----------------|-----------------|----------------------|------------------------|-----------------|
| 155.02 KHz | 6.92                 | 0.25                | 0.039           | 10.000          | 17.212               | 55.856                 | -38.645         |
| 152.5 KHz  | 9.08                 | 0.28                | 0.042           | 10.000          | 19.393               | 55.929                 | -36.535         |
| 150.97 KHz | 11.52                | 0.29                | 0.040           | 10.000          | 21.850               | 55.972                 | -34.122         |
| 150.8 KHz  | 12.34                | 0.29                | 0.041           | 10.000          | 22.676               | 55.977                 | -33.301         |
| 150.16 KHz | 12.67                | 0.30                | 0.043           | 10.000          | 23.011               | 55.995                 | -32.984         |
| 150.05 KHz | 13.46                | 0.30                | 0.043           | 10.000          | 23.800               | 55.998                 | -32.199         |

**Line 1 Neutral QP Detector**

| Frequency  | Measured Data (dBuV) | LISN Corr Fact (dB) | Cable Loss (dB) | Attenuator (dB) | L1 Final Data (dBuV) | CISPR/FCC Limit (dBuV) | QP Margin (dB) |
|------------|----------------------|---------------------|-----------------|-----------------|----------------------|------------------------|----------------|
| 185.4 KHz  | 37.430               | 0.200               | 0.004           | 10.000          | 47.634               | 64.989                 | -17.355        |
| 178.74 KHz | 38.160               | 0.200               | 0.011           | 10.000          | 48.371               | 65.179                 | -16.808        |
| 174.36 KHz | 37.070               | 0.200               | 0.016           | 10.000          | 47.286               | 65.304                 | -18.018        |
| 174.28 KHz | 36.920               | 0.200               | 0.015           | 10.000          | 47.135               | 65.306                 | -18.171        |
| 150.44 KHz | 35.580               | 0.296               | 0.041           | 10.000          | 45.916               | 65.988                 | -20.071        |
| 150.17 KHz | 34.380               | 0.298               | 0.042           | 10.000          | 44.720               | 65.995                 | -21.275        |

**Line 2 Phase QP Detector**

| Frequency  | Measured Data (dBuV) | LISN Corr Fact (dB) | Cable Loss (dB) | Attenuator (dB) | L2 Final Data (dBuV) | CISPR/FCC Limit (dBuV) | QP Margin (dB) |
|------------|----------------------|---------------------|-----------------|-----------------|----------------------|------------------------|----------------|
| 155.02 KHz | 32.07                | 0.25                | 0.039           | 10.000          | 42.359               | 65.856                 | -23.498        |
| 152.5 KHz  | 32.94                | 0.28                | 0.042           | 10.000          | 43.257               | 65.929                 | -22.672        |
| 150.97 KHz | 33.17                | 0.29                | 0.040           | 10.000          | 43.500               | 65.972                 | -22.472        |
| 150.8 KHz  | 32.76                | 0.29                | 0.041           | 10.000          | 43.093               | 65.977                 | -22.884        |
| 150.16 KHz | 33.77                | 0.30                | 0.043           | 10.000          | 44.111               | 65.995                 | -21.884        |
| 150.05 KHz | 33.44                | 0.30                | 0.043           | 10.000          | 43.783               | 65.998                 | -22.216        |



**Name of Test:** Receiver Spurious Emissions  
**Specification:** RSS-GEN 6(b)  
**Test Equipment Utilized:** i00331

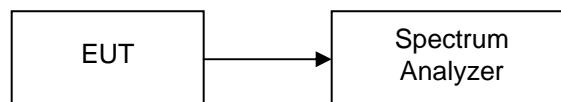
**Engineer:** G. Corbin  
**Test Date:** 6/11/2010

### Test Procedure

The EUT was connected directly to a spectrum analyzer. The receiver spurious emissions were measured in accordance to RSS-GEN.

RSS-GEN requires the measurement bandwidth to be 4 kHz. The spectrum analyzer resolution BW is 3 kHz. A bandwidth correction factor of 1.25 dB was added to the reference level offset to correct for the measurement bandwidth.

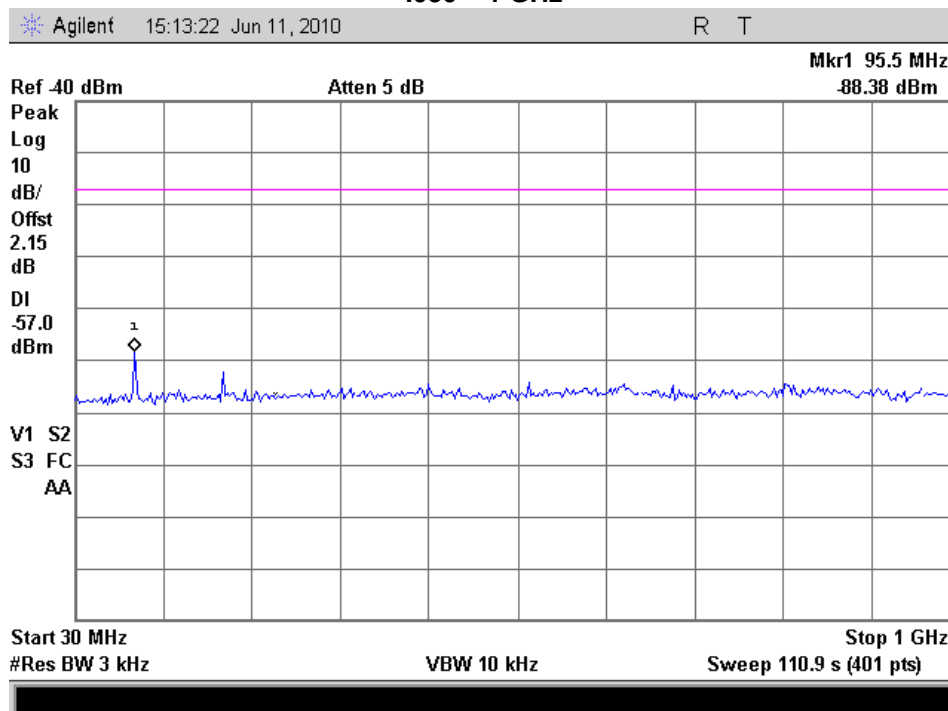
### Test Setup



### Receiver Spurious Emissions Summary

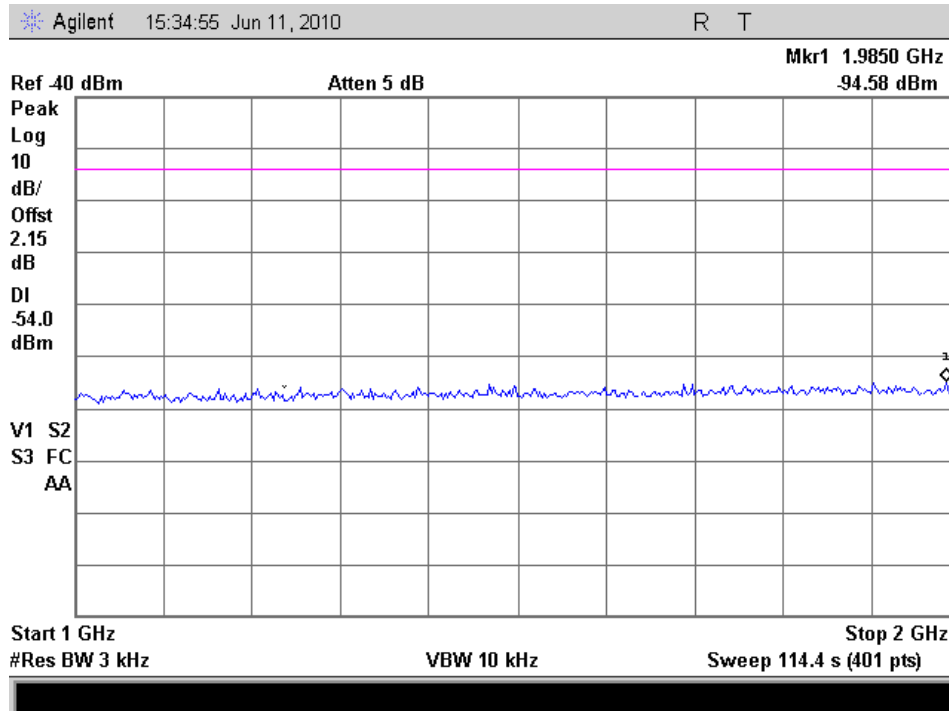
| Frequency<br>GHz | Recorded Measurement<br>dBm | Specification Limit<br>dBm | Result |
|------------------|-----------------------------|----------------------------|--------|
| .030 – 1         | -88.3                       | -57                        | Pass   |
| 1 – 3            | -92.8                       | -53                        | Pass   |

### Receiver Spurious Emissions .030 – 1 GHz

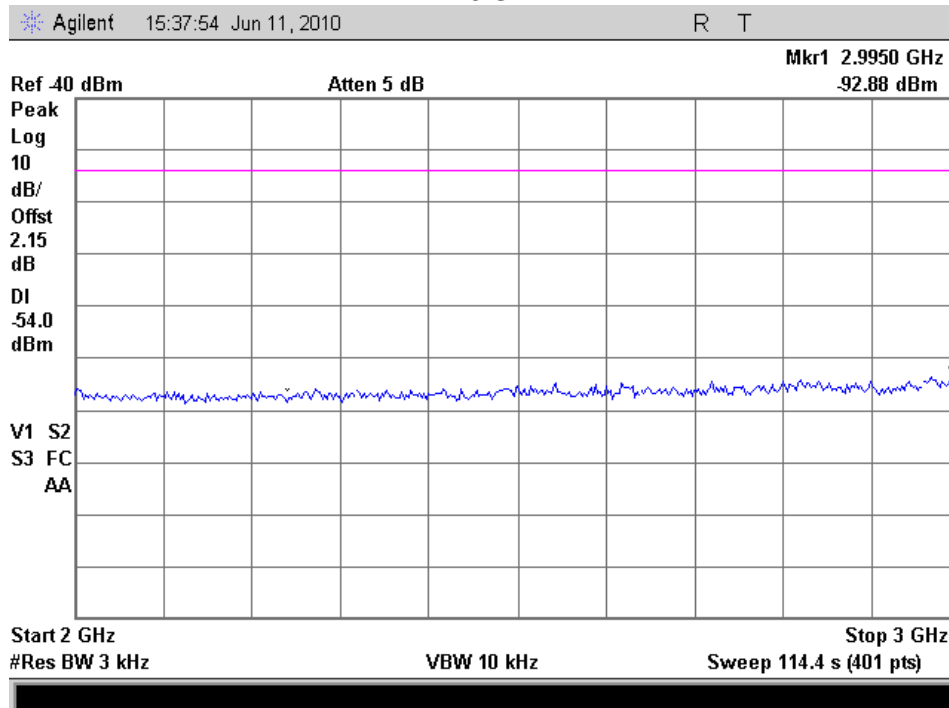




### 1 – 2 GHz



### 2 – 3 GHz



**Test Equipment Utilized**

| Description          | MFG       | Model Number        | CT Asset Number | Last Cal Date | Cal Due Date |
|----------------------|-----------|---------------------|-----------------|---------------|--------------|
| Preamplifier         | HP        | 8449A               | i00028          | 6/29/2009     | **6/29/2010  |
| EMI Receiver         | HP        | 8546A               | i00033          | 11/04/2009    | 11/04/2010   |
| Horn Antenna         | EMCO      | 3115                | i00103          | 11/25/2008    | 11/25/2010   |
| Bi-Log Antenna       | Schaffner | CBL611C             | i00267          | 11/21/2009    | 11/21/2011   |
| LISN                 | FCC       | FCC-LISN-50-32-2-01 | i00270          | 9/17/2008     | 9/17/2010    |
| Spectrum Analyzer    | Agilent   | E4407B              | i00331          | 11/03/2009    | 11/03/2010   |
| Tunable Notch Filter | Eagle     | TNF-240MFMF         | i00364          | Verify        | When used    |

\*\*Calibration has been extended for 30 days.

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