



**Flom Test Labs**  
EMI, EMC, RF Testing Experts Since 1963

toll-free: (866) 311-3268  
fax: (480) 926-3598  
<http://www.flomlabs.com>  
[info@flomlabs.com](mailto:info@flomlabs.com)

**Date:** April 22, 2008

Federal Communications Commission  
Via: Electronic Filing

**Attention:** Authorization & Evaluation Division

**Applicant:** Global Microwave Systems, Inc  
**Equipment:** MDT-B, ISM BAND  
**FCC ID:** KPB-MDT-BF3B  
**FCC Rules:** 15.247

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

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

Sincerely yours,

John Erhard

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

**Applicant:** Global Microwave Systems, Inc

**FCC ID:** KPB-MDT-BF3B

**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 F.T.L. Inc.**

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



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## Test Report

for

**FCC ID:** KPB-MDT-BF3B  
**Model:** MDT-B, ISM BAND

to

**Federal Communications Commission**

Rule Part(s) 15.247

**Date Of Report:** April 22, 2008

**On the Behalf of the Applicant:** Global Microwave Systems, Inc  
1916 Palomar Oaks Way  
Suite 100  
Carlsbad, CA 92008

**Attention of:** Tom Meyers  
Ph: 760-496-0055  
Fax: 760-496-0057  
Email: [tomm@gmsinc.com](mailto:tomm@gmsinc.com)

Supervised By:

John Erhard

## Revision History

Revision	Date	Revised By	Reason for revision
1.0	April 22, 2008	J. Erhard	Original Document

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

**15.21 Information to User.**

The users 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.**

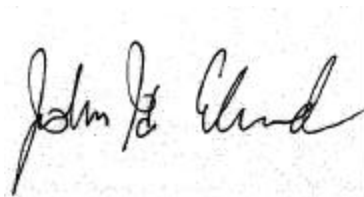
Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply 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.

## 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 are true and correct.

A handwritten signature in black ink, appearing to read "John Erhard", is written over a light gray grid background.

John Erhard

Certifying Engineer:

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

a) **Test Report**

b) Laboratory: Flom Test Lab, Inc.  
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107  
(Canada: IC 2044A-1) Chandler, AZ 85225

c) Report Number: d0840030

d) Client: Global Microwave Systems, Inc

e) Identification: MDT-B, ISM BAND  
FCC ID: KPB-MDT-BF3B  
Description: 5.8 GHz TX

f) EUT Condition: Not required unless specified in individual tests.

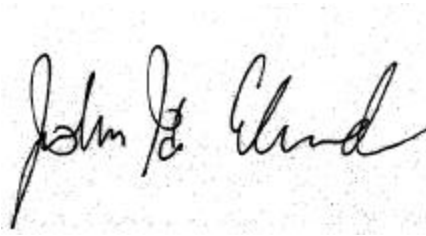
g) Report Date: April 22, 2008

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with FTL internal quality manual.

m) Supervised by:



John Erhard

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

In Accordance with FCC Rules and Regulations,  
15.247

### Sub-Part 2.1033

(c)(1):

**Name and Address of Applicant:** Global Microwave Systems, Inc

(c)(2): **FCC ID:** KPB-MDT-BF3B

**Model Number:** MDT-B, ISM BAND

(c)(3): **Instruction Manual(s):** Please See Attached Exhibits

(c)(4): **Type of Emission:** DTS

(c)(5): **FREQUENCY RANGE, MHz:** 5730 to 5845

(c)(6): **Power Rating, W:** 851 mW  
                   \_\_\_\_\_ Switchable                   \_\_\_\_\_ Variable                     x   N/A

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

### 15.203: Antenna Requirement:

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

**The unit was tested with an omni-directional antenna with a gain of 2 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

☒ 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 C63.4-2003, FCC DTS Guide March 23, 2005, KDB 558074, 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 Flom Test Labs, Inc. 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



**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)(2)	Occupied Bandwidth	Pass	
15.247(e)	Transmitter Power Spectral Density	Pass	
15.207	A/C Powerline Conducted Emissions	Pass	

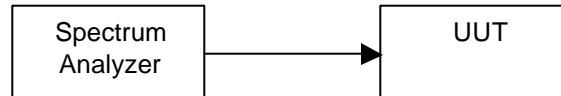
**Name of Test:** Peak Output Power  
**Specification:** 15.247(b)  
**Test Equipment Utilized** i00331

**Test Date:** 4/17/2008

### Test Procedure

The UUT was connected to a spectrum analyzer. The peak readings were taken with the analyzer RBW set to 5 MHz. Using the formula  $10 \log (BW/RBW) + \text{power found in KDB 558074 method 3}$  the peak power was calculated and the result was then compared to the limit.

### Test Setup



### QPSK Transmitter Peak Output Power

Tuned Frequency MHz	Bandwidth MHz	Recorded Measurement dB	Calculated Power dB	Specification Limit	Result
5730	6 MHz	27.55	28.34	1 W	Pass
5787	6 MHz	27.36	28.15	1 W	Pass
5845	6 MHz	27.22	28.01	1 W	Pass
5730	8 MHz	27.26	29.30	1 W	Pass
5787	8 MHz	26.74	28.78	1 W	Pass
5845	8 MHz	26.92	28.96	1 W	Pass

### 64-QAM Transmitter Peak Output Power

Tuned Frequency MHz	Bandwidth MHz	Recorded Measurement dB	Calculated Power dB	Specification Limit	Result
5730	6 MHz	26.26	27.05	1 W	Pass
5787	6 MHz	26.54	27.33	1 W	Pass
5845	6 MHz	26.42	27.21	1 W	Pass
5730	8 MHz	26.23	27.27	1 W	Pass
5787	8 MHz	25.80	27.84	1 W	Pass
5845	8 MHz	26.15	28.19	1 W	Pass

**Name of Test:** Conducted Spurious Emissions  
**Specification:** 15.247(d)  
**Spec. Limit** -20 dBc  
**Test Equipment Utilized** i00331

**Test Date:** 4/18/2008

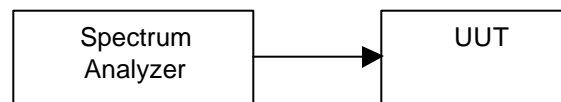
### Test Procedure

The UUT was connected directly to a spectrum analyzer to verify that the UUT met the requirements for spurious emissions. The reference level was offset for the peak power output with 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 reference level 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.

Only the 8-MHz bandwidth was tested, as this is worst case.

### Test Setup



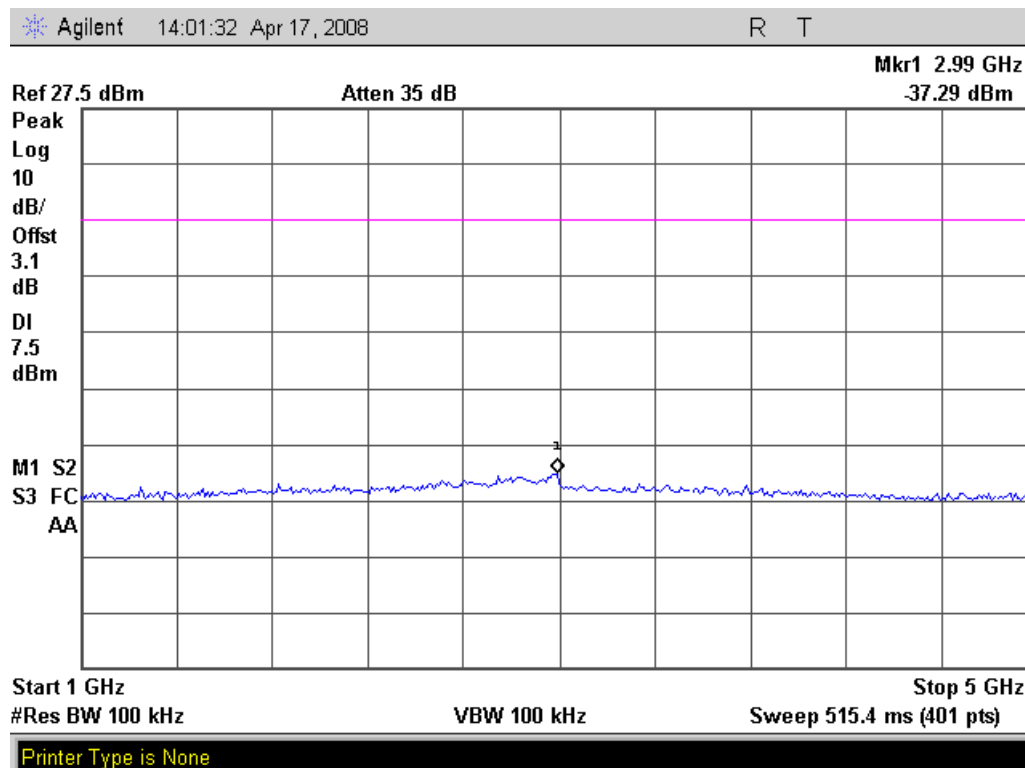
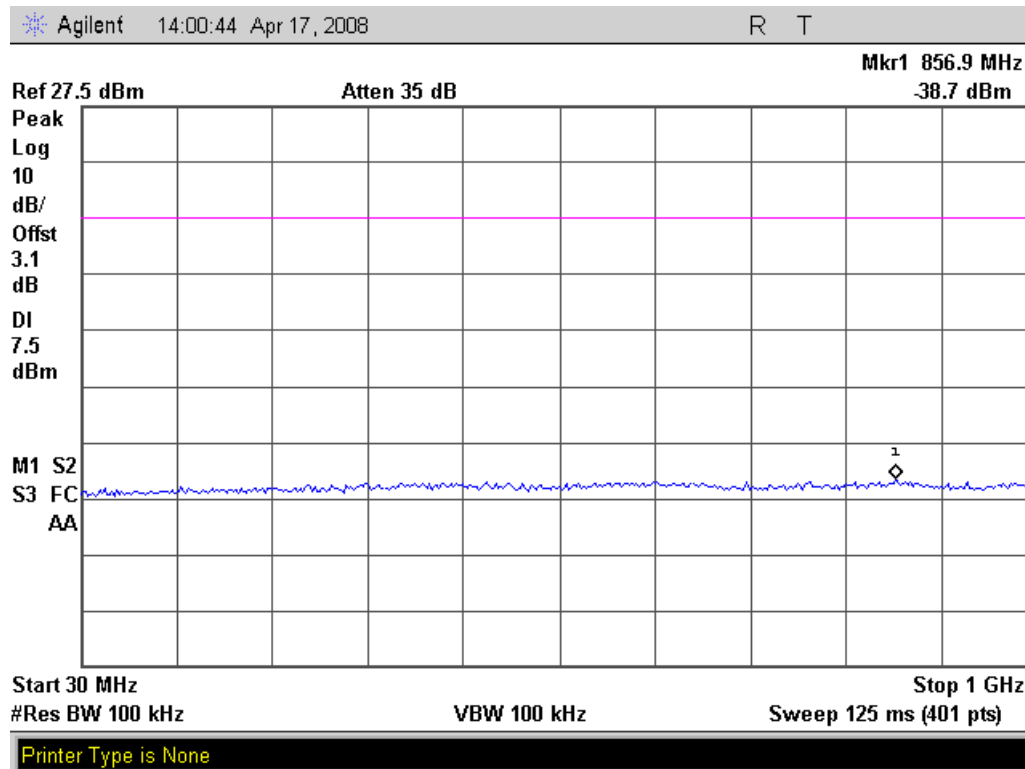
**QPSK Conducted Spurious Emissions Summary Test Table**

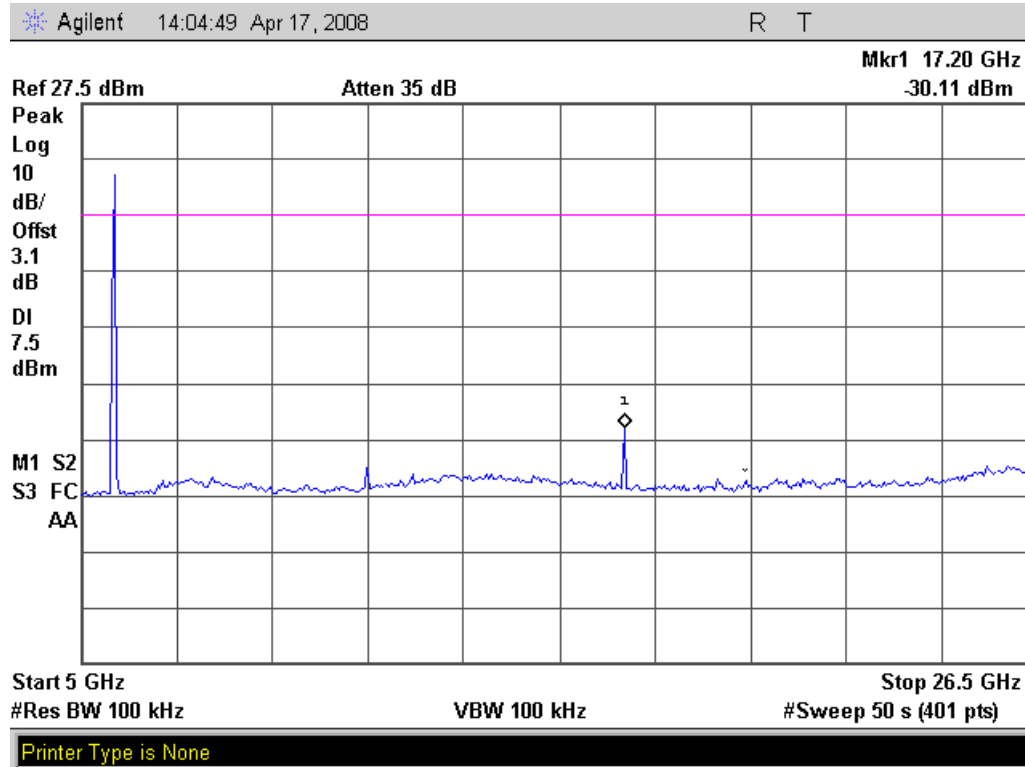
Tuned Frequency MHz	Emission Frequency	Recorded Measurement dB	Reference Level dB	Corrected Measurement dBc	Specification Limit	Result
5730	17200	-30.11	27.50	-57.60	-20 dBc	Pass
5787	17360	-36.79	27.50	-64.29	-20 dBc	Pass
5845	17520	-35.77	27.50	-63.27	-20 dBc	Pass

**64-QAM Conducted Spurious Emissions Summary Test Table**

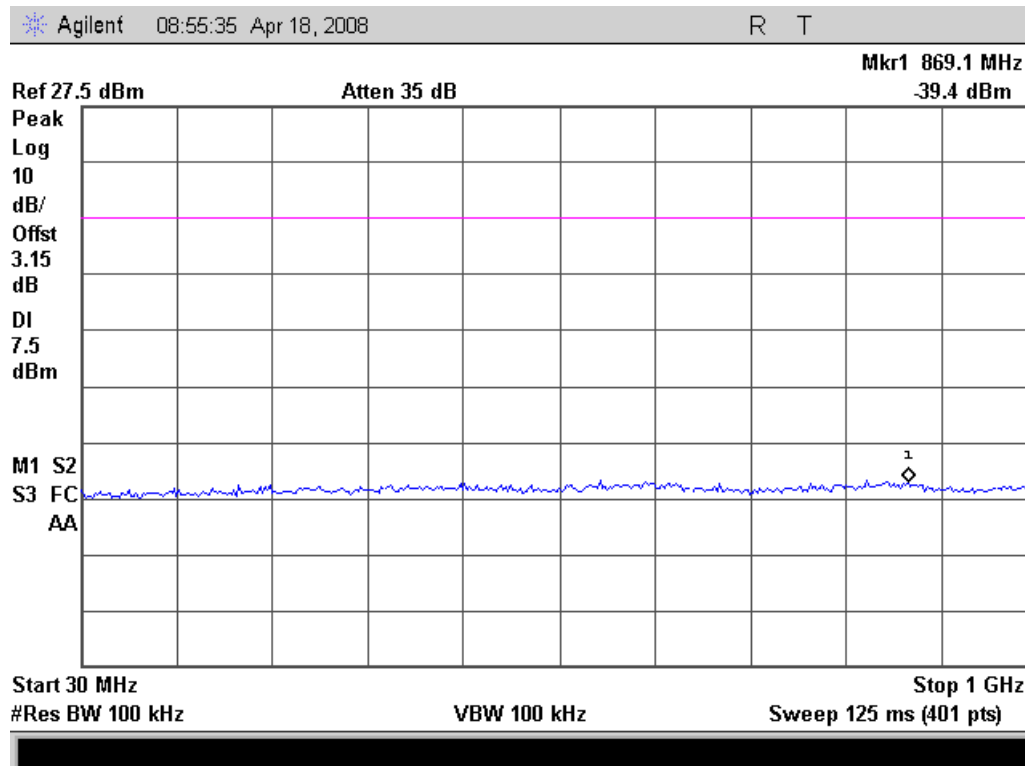
Tuned Frequency MHz	Emission Frequency MHz	Recorded Measurement dB	Reference Level dB	Corrected Measurement dBc	Specification Limit	Result
5730	17200	-34.63	26.26	-60.89	-20 dBc	Pass
5787	26070	-37.72	26.26	-63.98	-20 dBc	Pass
5845	26020	-38.73	26.26	-64.99	-20 dBc	Pass

# QPSK Conducted Spurious Emissions 5730 MHz

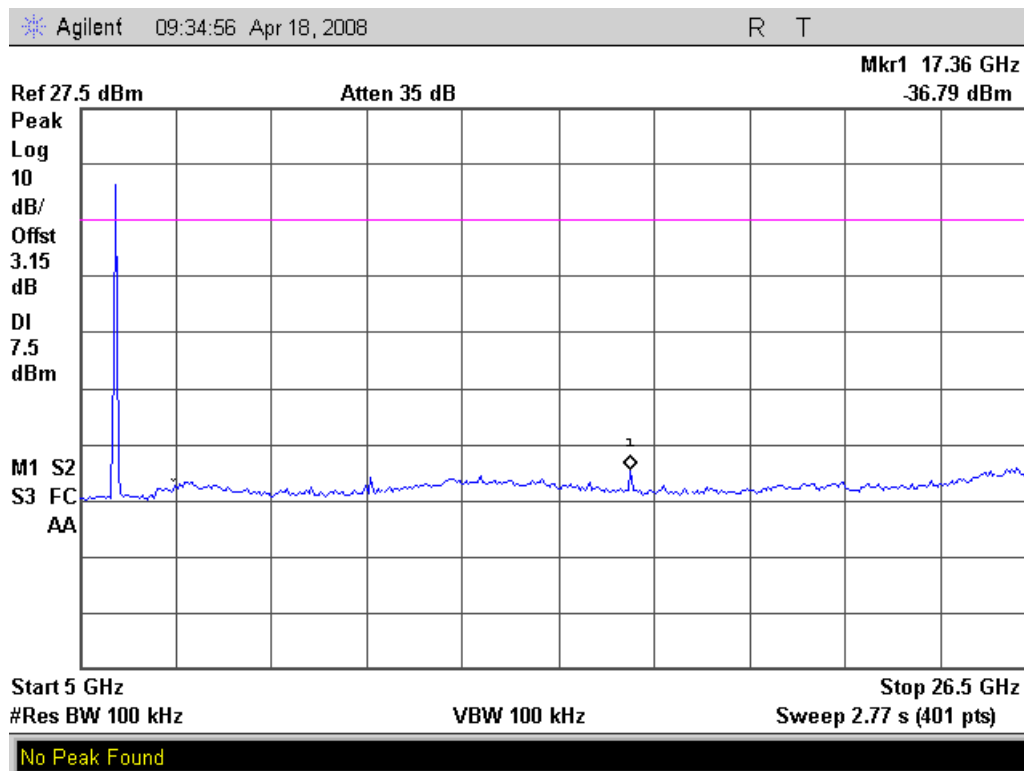
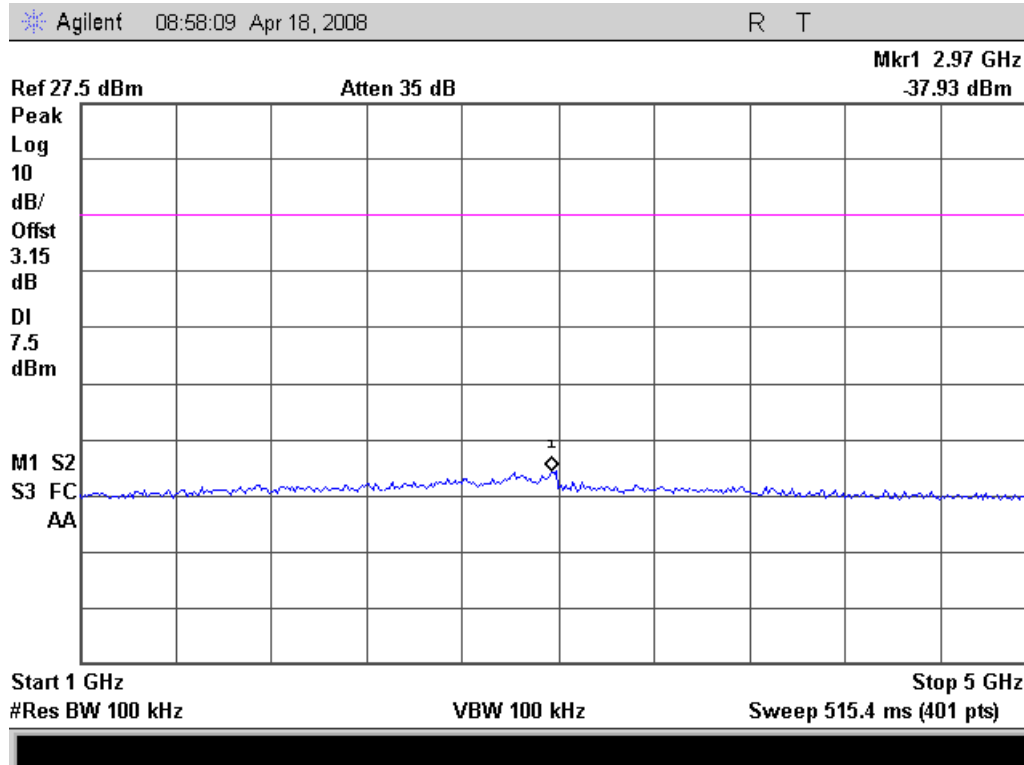




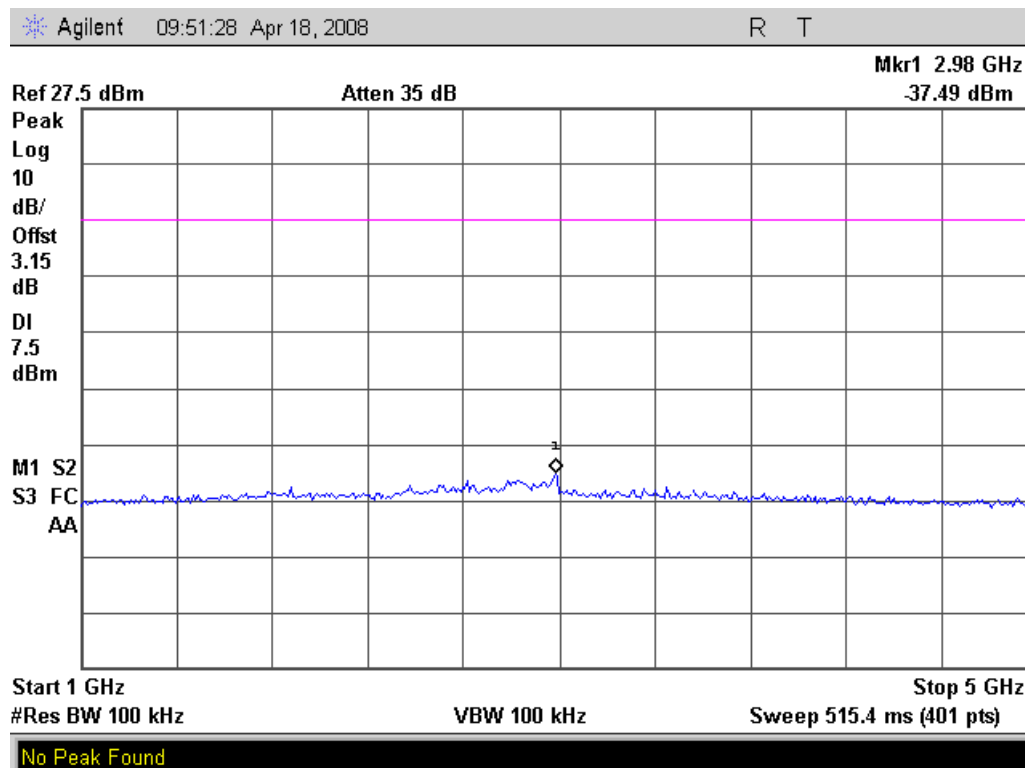
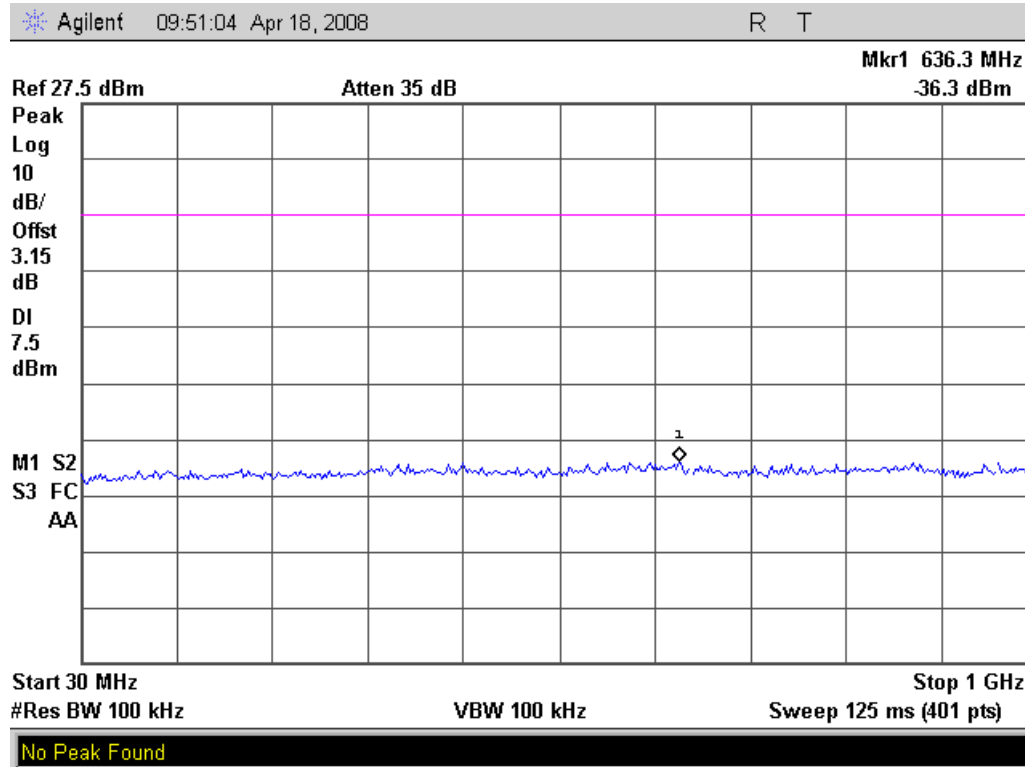
### QPSK Conducted Spurious Emissions 5787 MHz

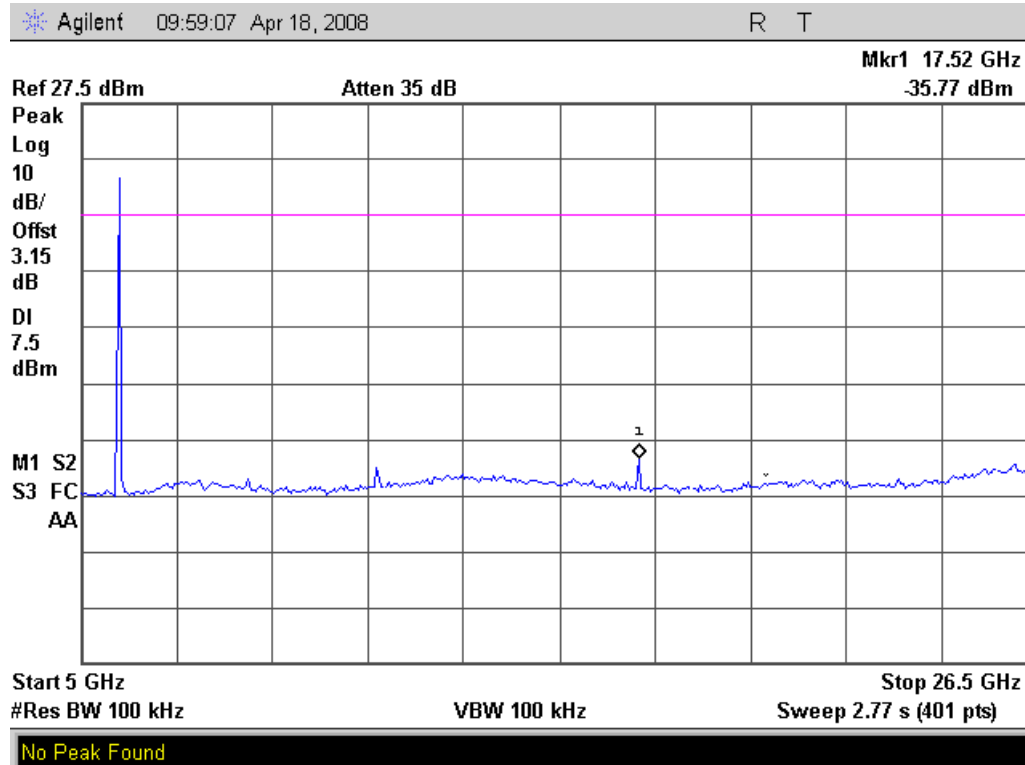




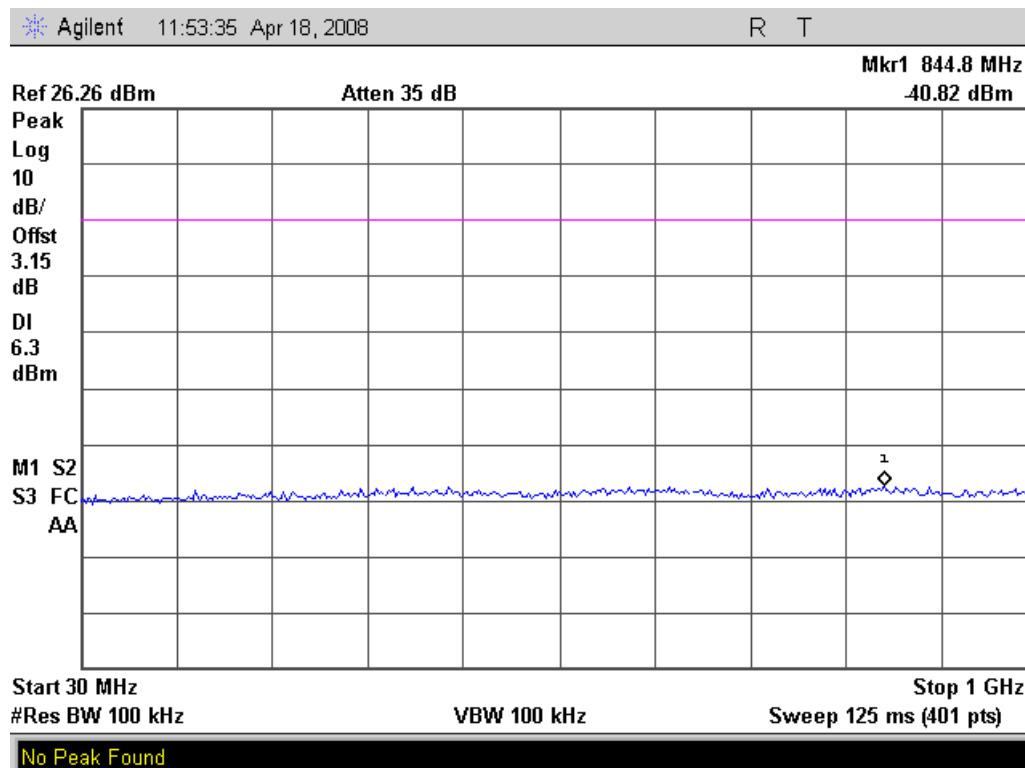


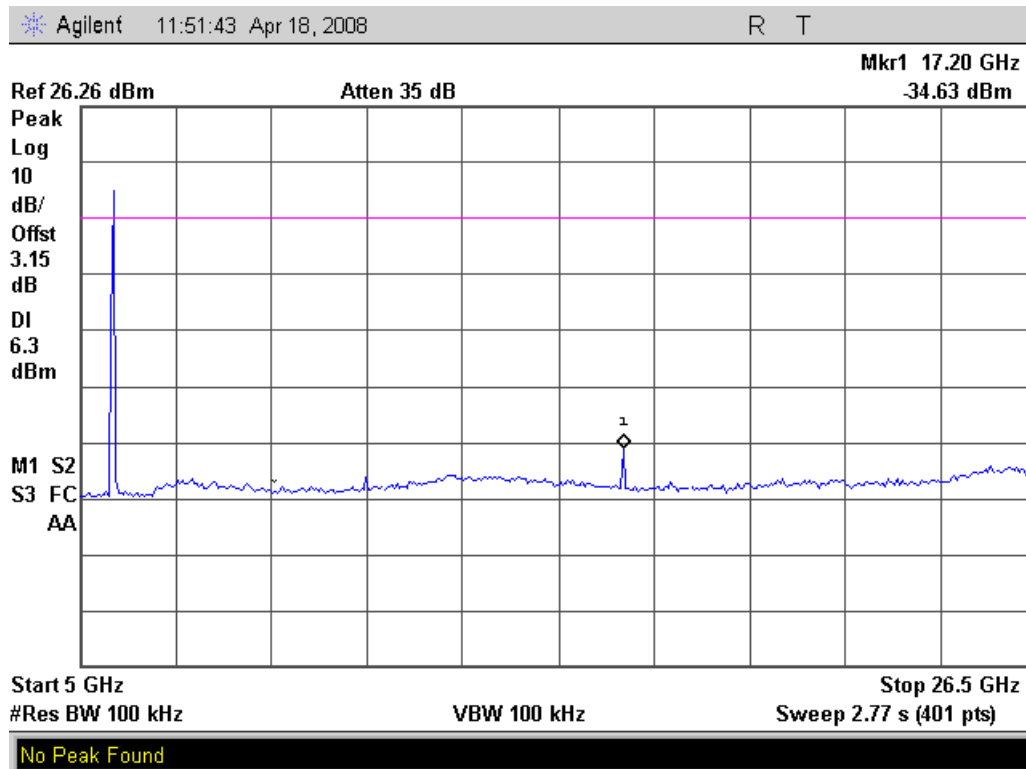
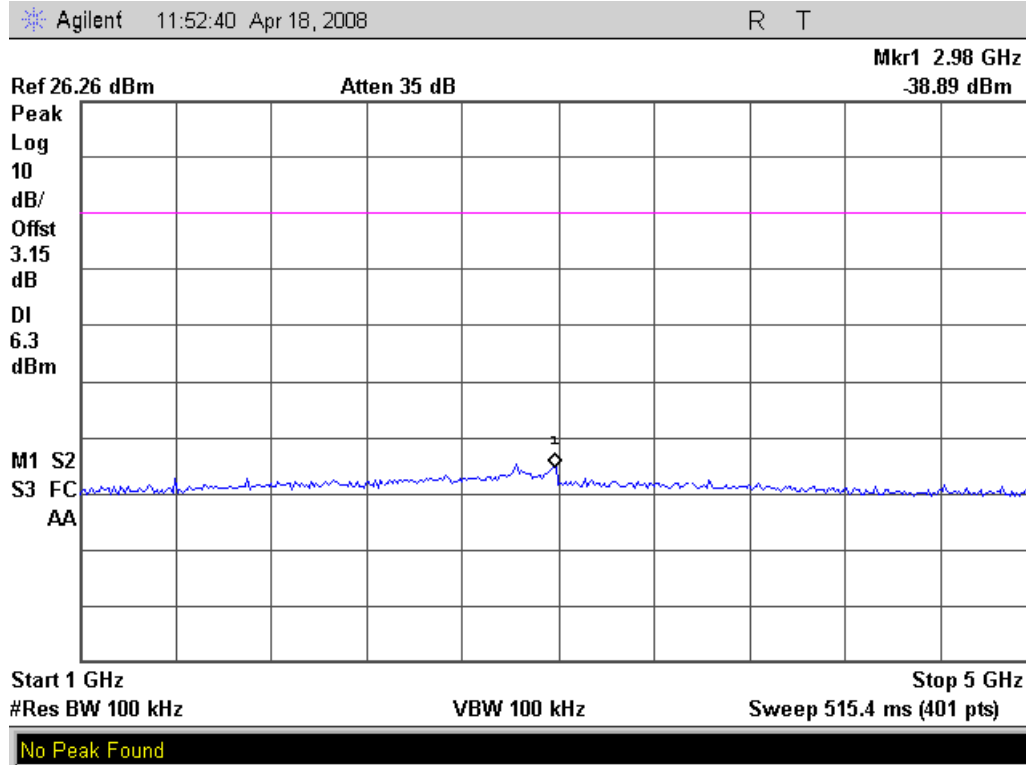
# QPSK Conducted Spurious Emissions 5845 MHz



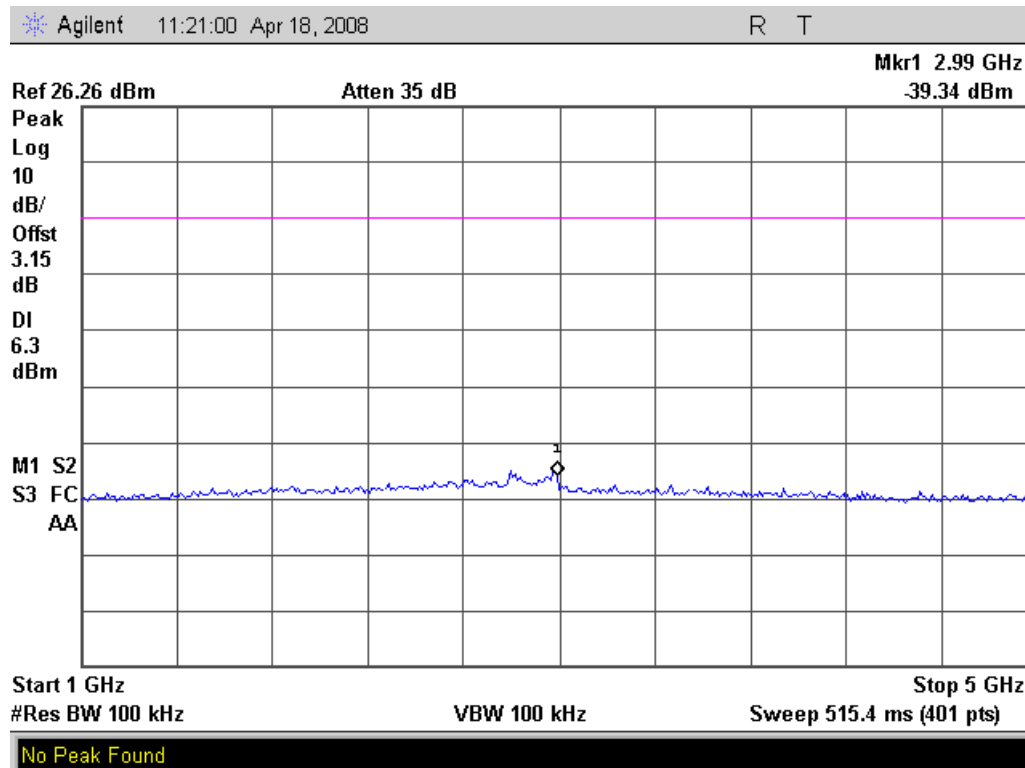
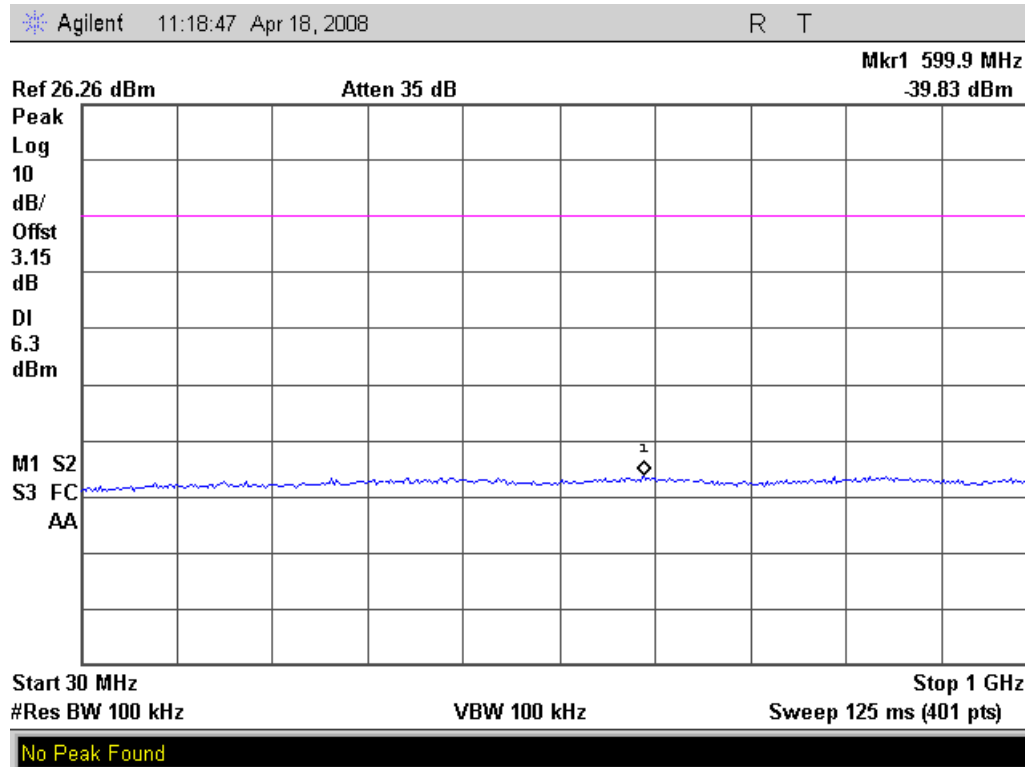


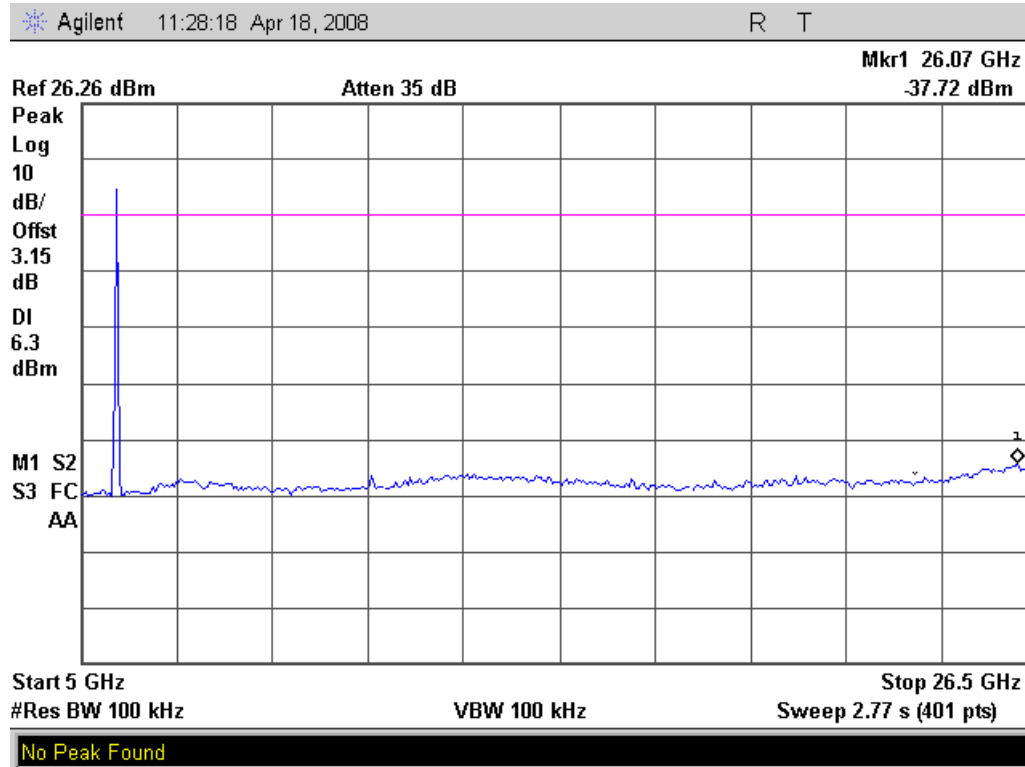
### 64-QAM Conducted Spurious Emissions 5730 MHz



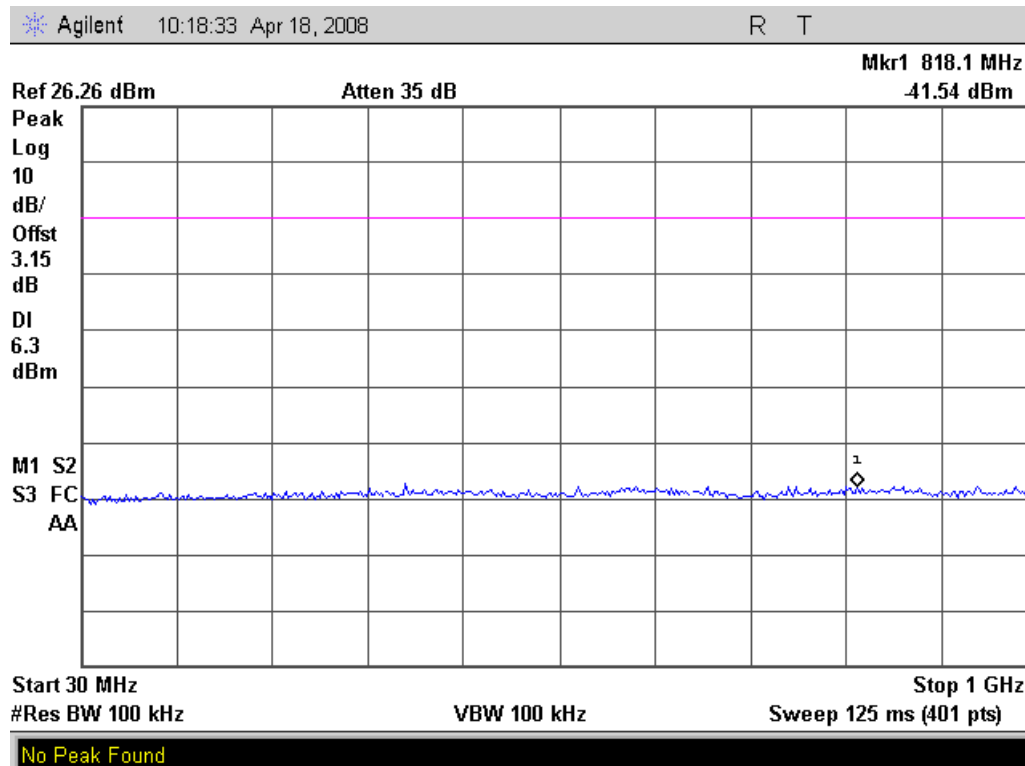


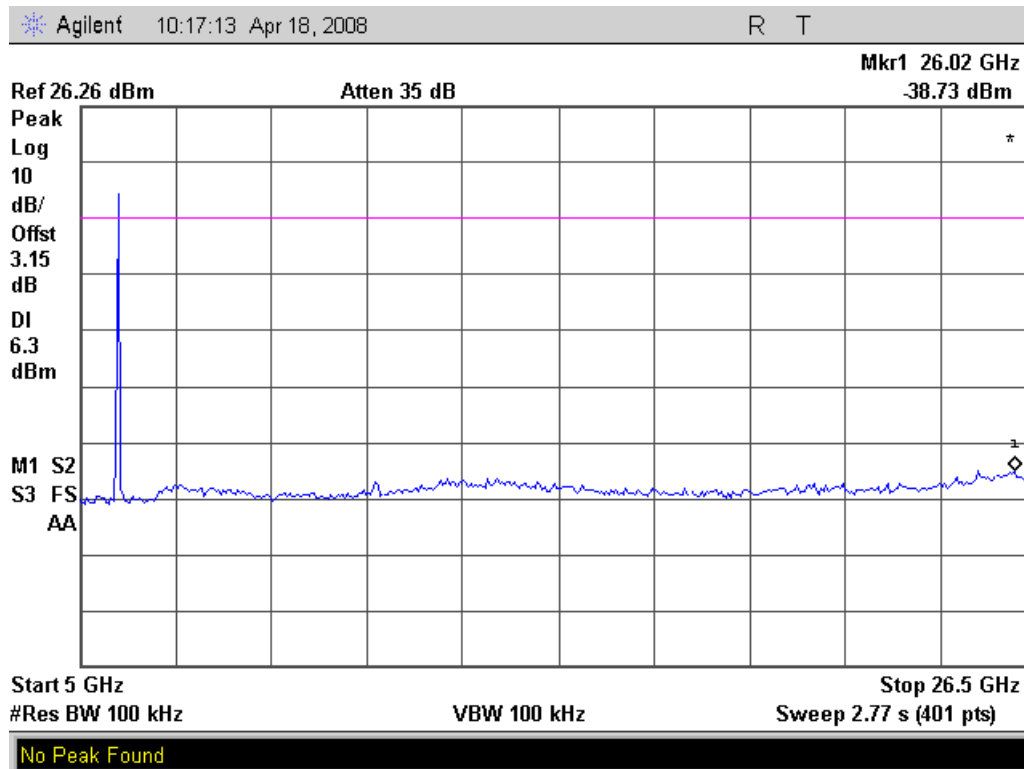
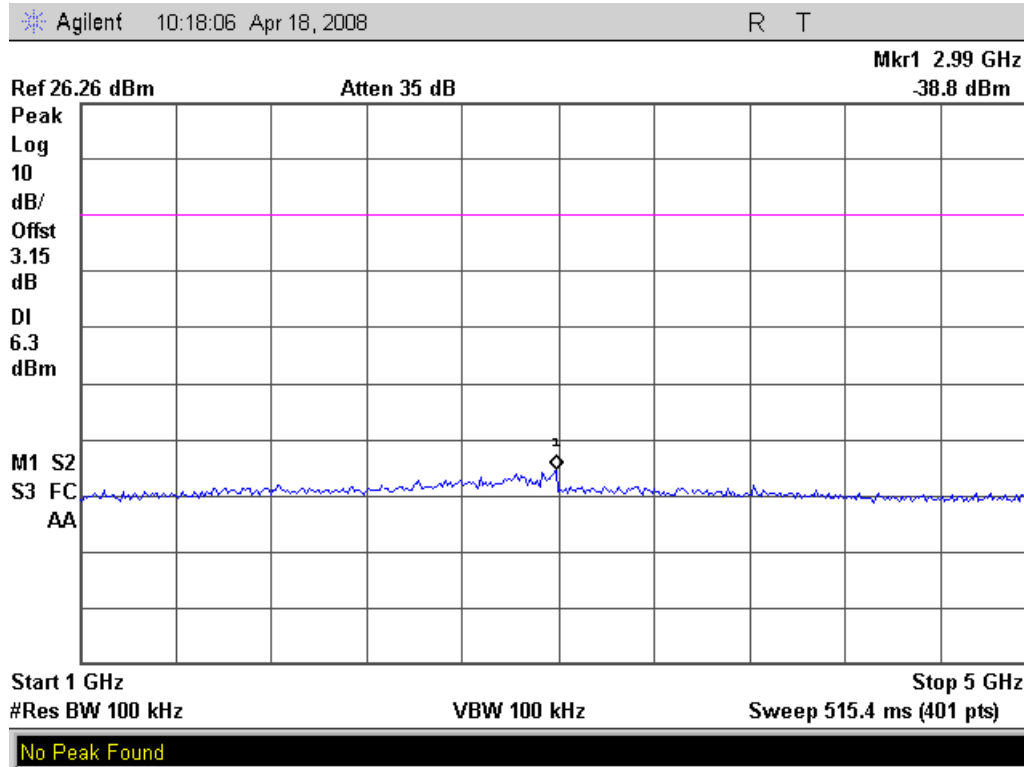
# 64-QAM Conducted Spurious Emissions 5787 MHz





### 64-QAM Conducted Spurious Emissions 5845 MHz





**Name of Test:** Radiated Spurious Emissions  
**Specification:** 15.247(d), 15.209(a), 15.205  
**Spec. Limit** See Table  
**Test Equipment Utilized** i00103, i00331

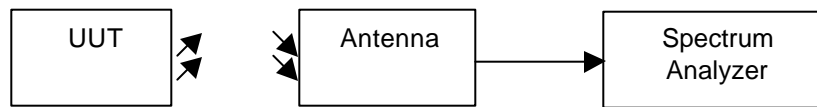
**Test Date:** 4/21/2008

### Test Procedure

The UUT was tested in a semi-anechoic chamber set 3m from the receiving antenna. A spectrum analyzer with an integrated average detector was used to verify that the UUT met the requirements for Radiated Spurious Emissions. The antenna and cable correction factors were input into the spectrum analyzer to ensure accurate readings. The spectrum for each tuned frequency was examined to the 10<sup>th</sup> harmonic.

Only the 8-MHz bandwidth was tested, as it is worst case.

### Test Setup



Detector Settings	RBW	VBW
Peak	1 MHz	1 MHz
Average	1 MHz	1 MHz

### QPSK Radiated Spurious Emissions

Tuned Freq (MHz)	Emission Freq (MHz)	Peak Monitored Level (dBuV/m)	Peak Limit (dBuV/m)	Average Monitored Level (dBuV/m)	Average Limit (dBuV/m)	Result
5730	11460	55.37	74.0	48.41	54.0	Pass
5787	11574	55.11	74.0	48.57	54.0	Pass
5845	11690	56.16	74.0	48.92	54.0	Pass

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

### 64- QAM Radiated Spurious Emissions

Tuned Freq (MHz)	Emission Freq (MHz)	Peak Monitored Level (dBuV/m)	Peak Limit (dBuV/m)	Average Monitored Level (dBuV/m)	Average Limit (dBuV/m)	Result
5730	11460	55.22	74.0	49.06	54.0	Pass
5787	11574	55.89	74.0	48.38	54.0	Pass
5845	11690	55.21	74.0	48.60	54.0	Pass

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



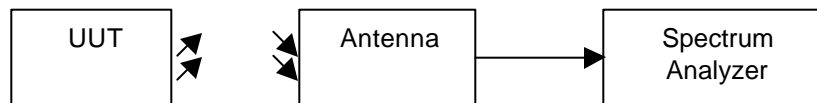
**Name of Test:** Emissions At Band Edges  
**Specification:** 15.247(d), 15.209(a), 15.205  
**Limit** -20 dBc and for restricted band 54 dBuV average and 74 dBuV peak  
**Test Equipment Utilized** i00103, i00331 **Test Date:** 4/21/2008

### Test Procedure

The UUT was tested in a semi-anechoic chamber set 3m from the receiving transducer. A spectrum analyzer was used to verify that the UUT met the requirements for band edge with both peak and average measurements. The antenna and cable correction factors were input into the spectrum analyzer to ensure accurate readings.

Only the 8-MHz bandwidth was measured, as it is the worst case.

### Test Setup



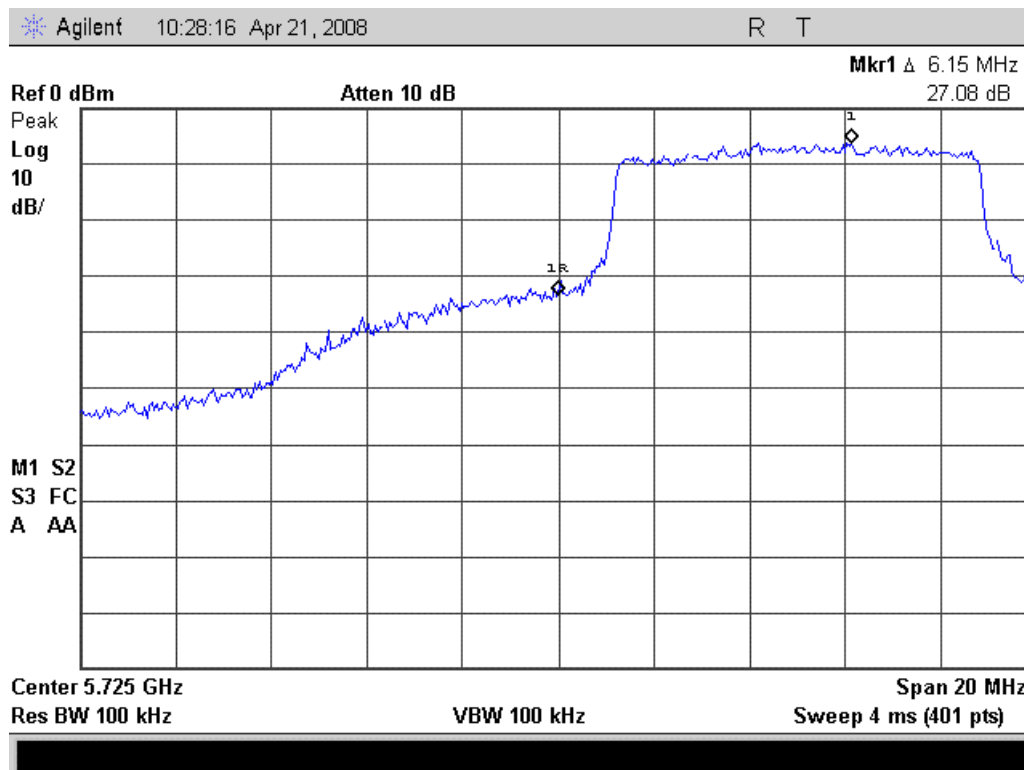
### QPSK Band Edge Emissions Summary

Tuned Freq (MHz)	Emission Freq (MHz)	Monitored Level dBc	Detector	Limit	Result
5730	5725	-27.08	Peak	-20 dBc	Pass
5845	5850	-27.43	Peak	-20 dBc	Pass

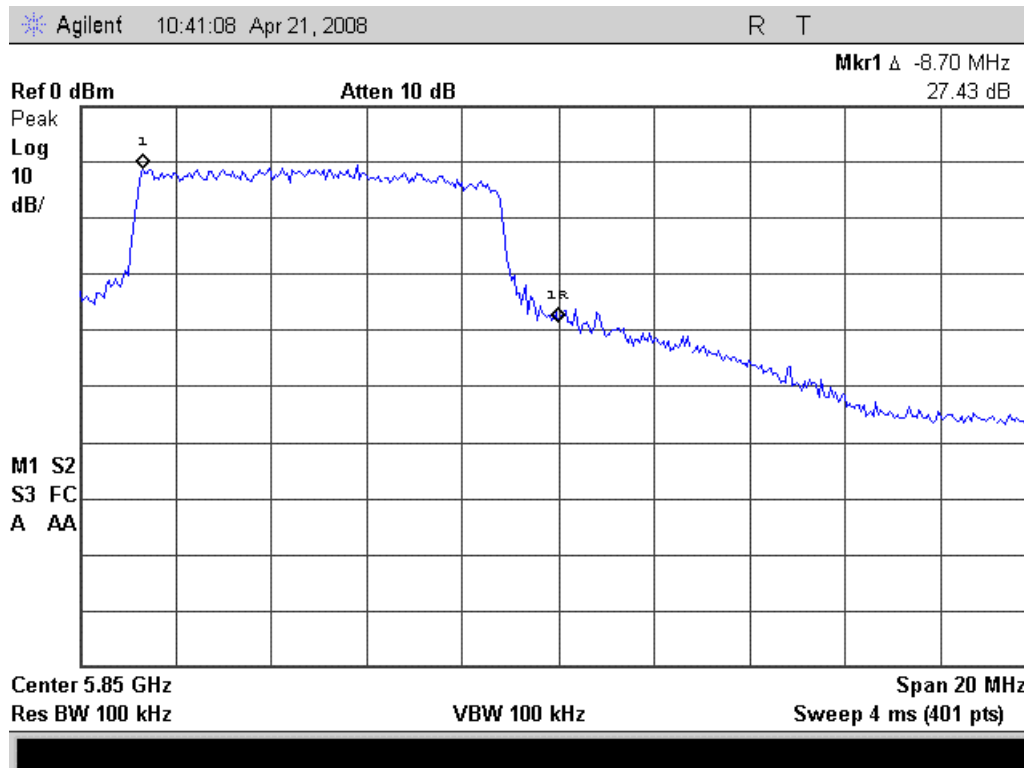
### 64-QAM Band Edge Emissions Summary

Tuned Freq (MHz)	Emission Freq (MHz)	Monitored Level dBc	Detector	Limit	Result
5730	5725	-26.30	Peak	-20 dBc	Pass
5845	5850	-32.37	Peak	-20 dBc	Pass

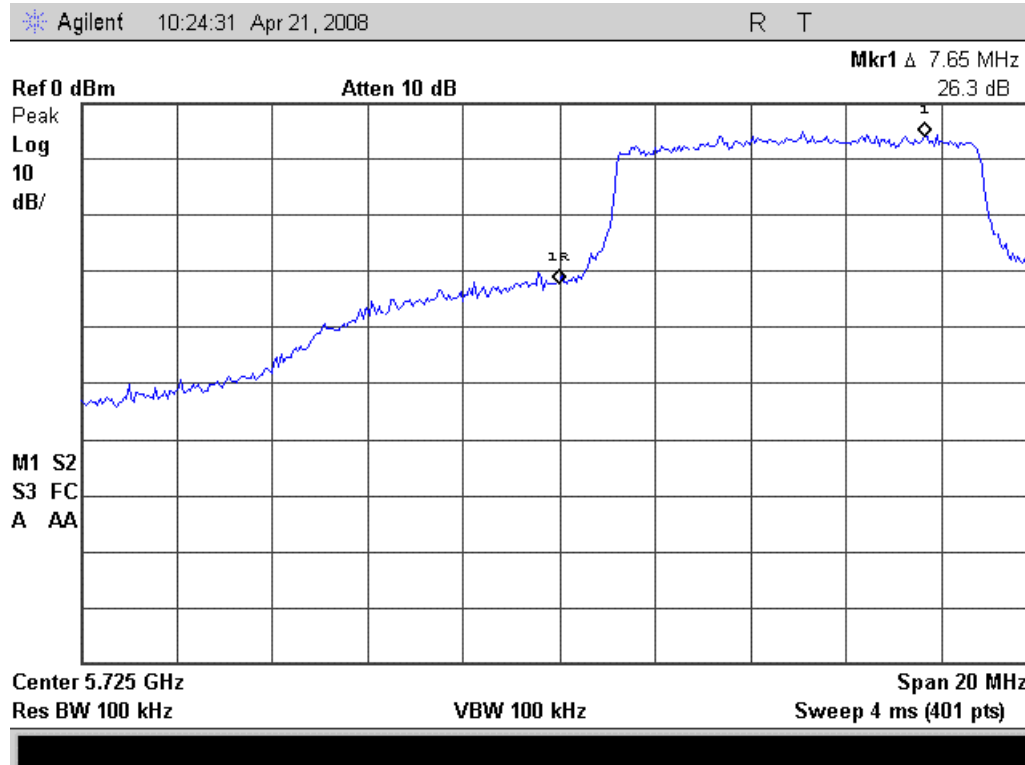
# QPSK Band Edge 5725 MHz



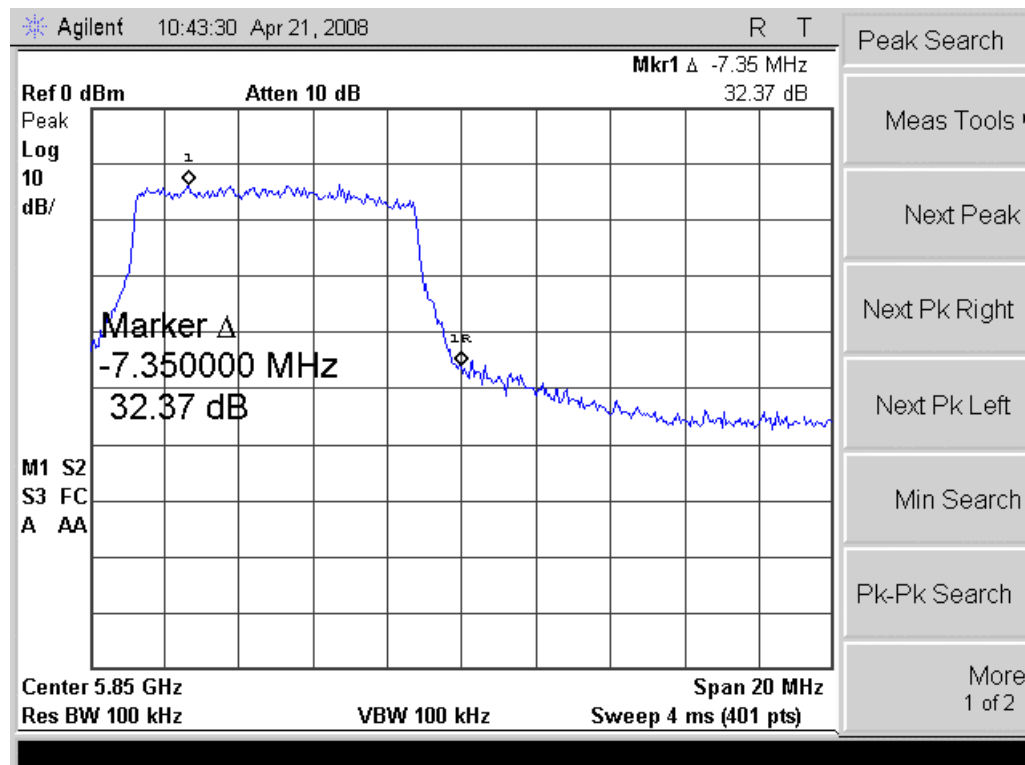
# QPSK Band Edge 5850 MHz



### 64-QAM Band Edge 5725 MHz



### 64-QAM Band Edge 5850 MHz



**Name of Test:** Occupied Bandwidth  
**Specification:** 15.247(a)(2)  
**Limit** BW = 500 KHz  
**Test Equipment Utilized** i00331

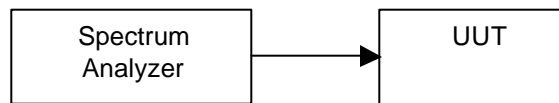
**Test Date:** 4/17/2008

### Test Procedure

The UUT was connected directly to a spectrum analyzer. The Span was set wide enough to capture the entire transmit spectrum and the resolution bandwidth was set to at least 1% of the span. The analyzer was set to max hold and when the entire spectrum was captured the 6dB was measured to verify the bandwidth met the specification.

Only the 6-MHz bandwidth was measured, as it is the worst case.

### Test Setup



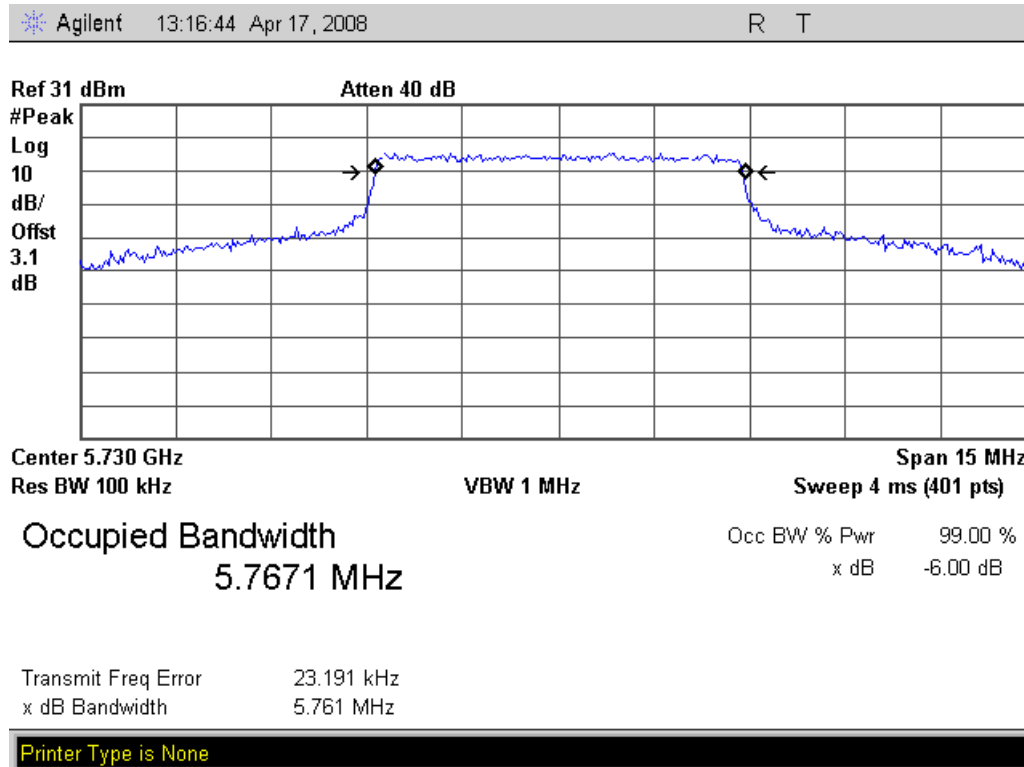
### QPSK Occupied Bandwidth Summary

Frequency MHz	Recorded Measurement	Specification Limit	Result
5730	5.7671 MHz	= 500 KHz	Pass
5787	5.7541 MHz	= 500 KHz	Pass
5845	5.8334 MHz	= 500 KHz	Pass

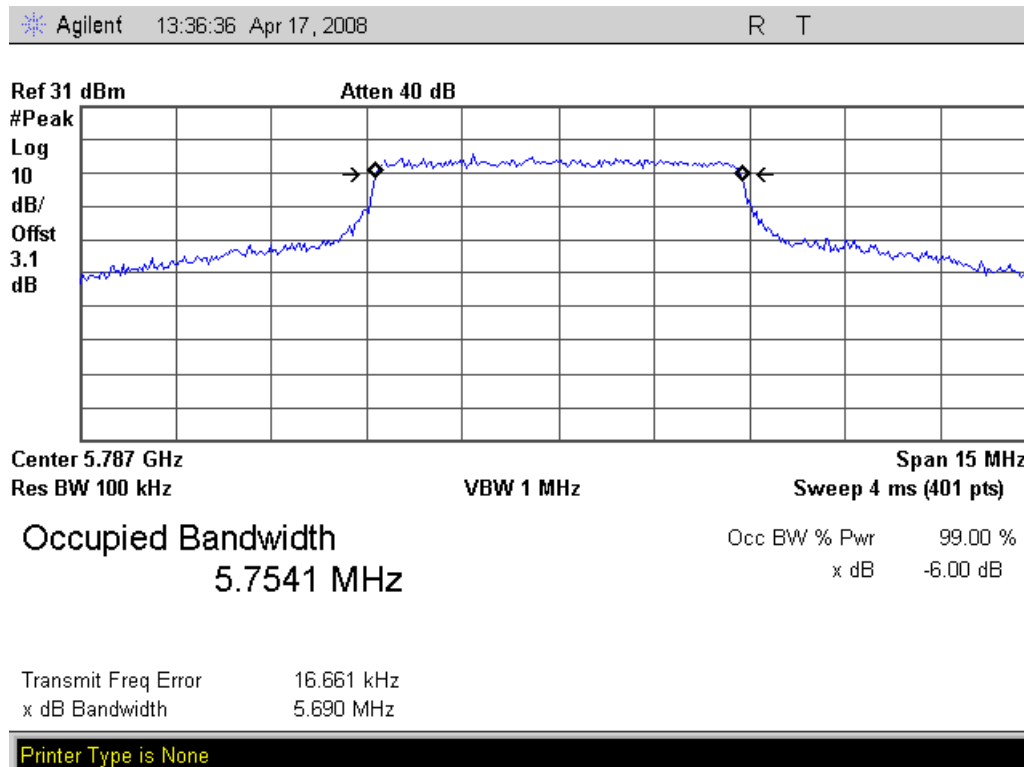
### 64-QAM Occupied Bandwidth Summary

Frequency MHz	Recorded Measurement	Specification Limit	Result
5760	5.7720 MHz	= 500 KHz	Pass
5787	5.7599 MHz	= 500 KHz	Pass
5845	5.7527 MHz	= 500 KHz	Pass

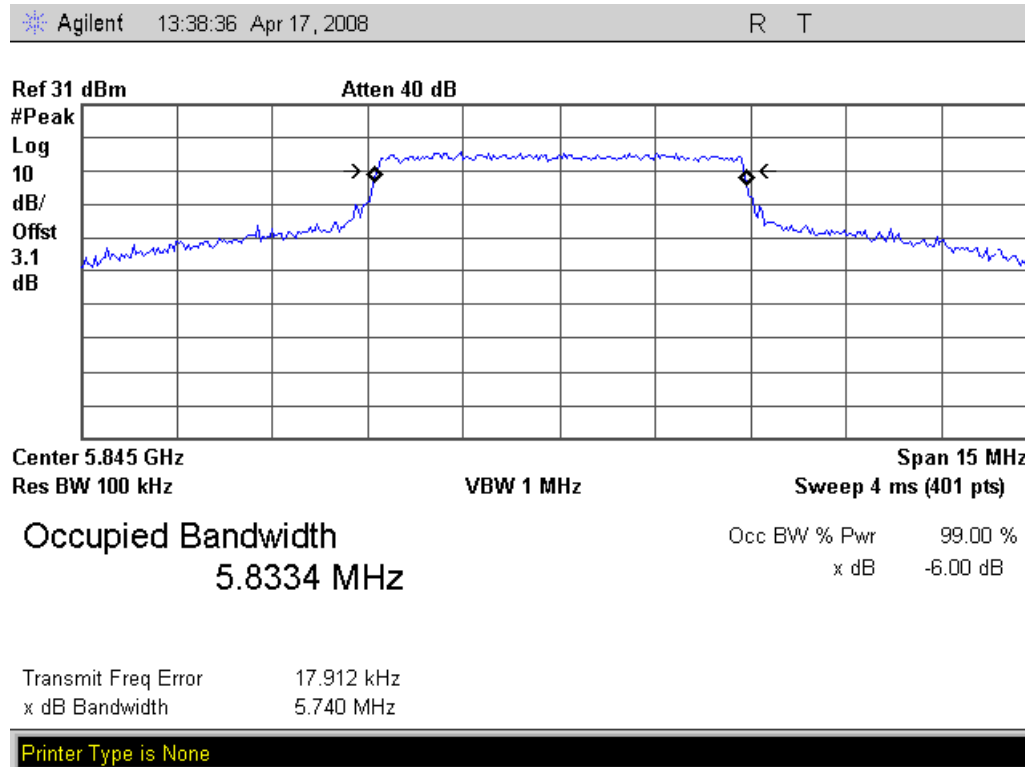
### QPSK 5730 MHz Bandwidth



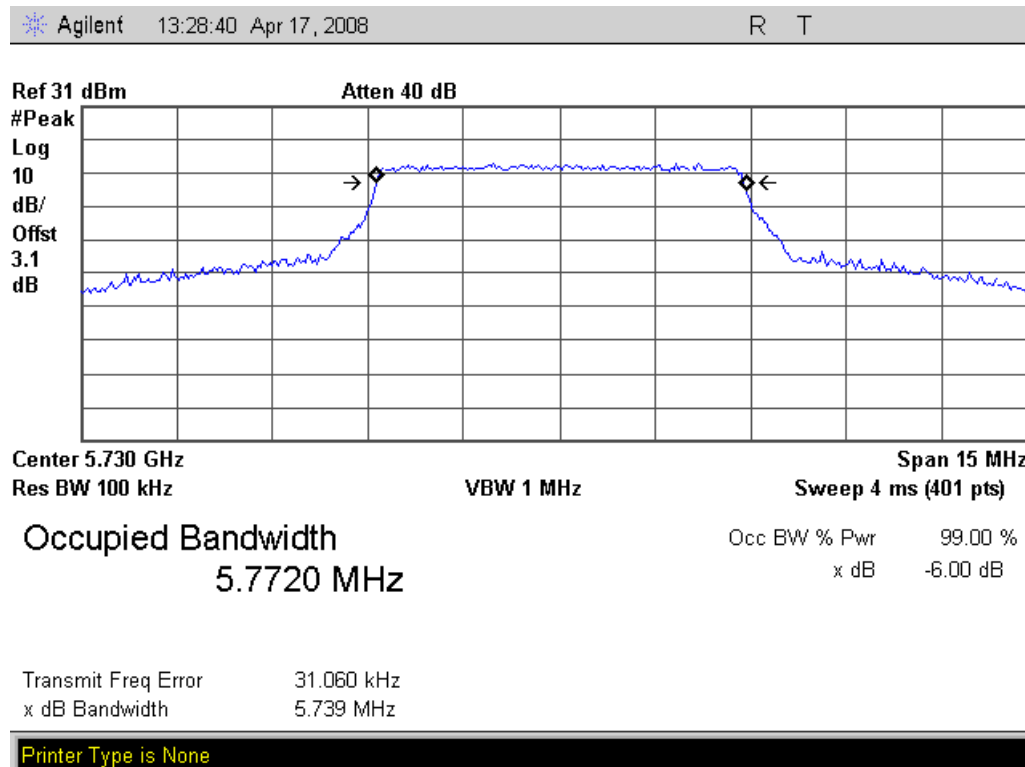
### QPSK 5787 MHz Bandwidth



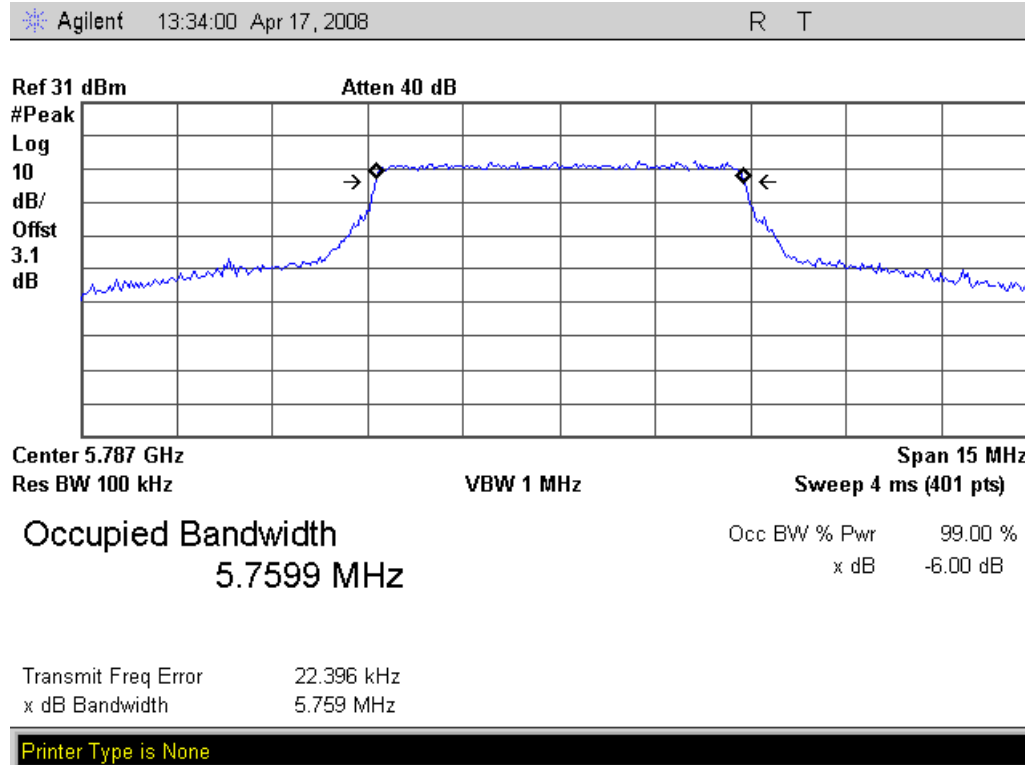
### QPSK 5845 MHz Bandwidth



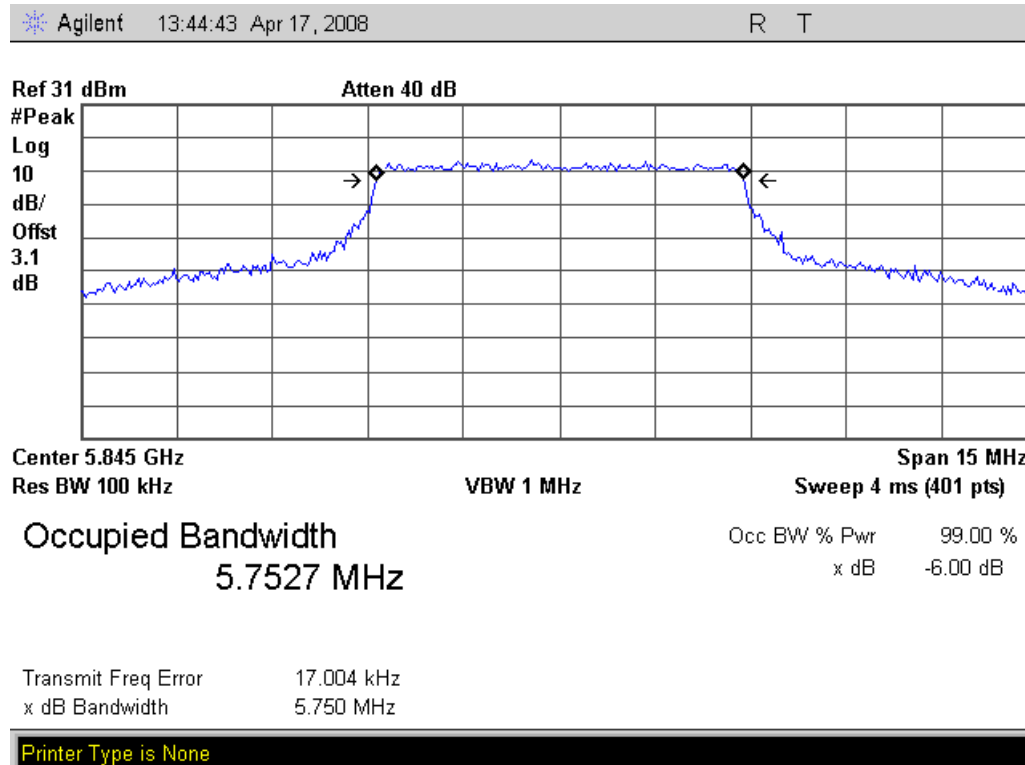
### 64-QAM 5730 MHz Bandwidth



## 64-QAM 5787 MHz Bandwidth



## 64-QAM 5845 MHz Bandwidth



**Name of Test:** Transmitter Power Spectral Density (PSD)  
**Specification:** 15.247(e)  
**Limit** 8 dBm in any 3 kHz Bandwidth  
**Test Equipment Utilized** i00331

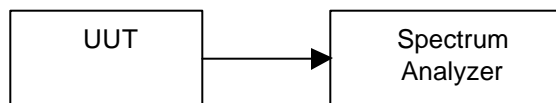
**Test Date:** 4/19/2008

### Test Procedure

The UUT was connected directly to a spectrum analyzer. The Span was set to 1.5 MHz and the resolution bandwidth was set to 3 KHz. The analyzer was set for a sweep time of 500 seconds. When the entire spectrum was captured the marker peak function of the analyzer was utilized to verify the PSD met the specification.

6, 7, and 8 MHz bandwidths were all measured in both QPSK and 64-QAM modulation modes.

### Test Setup



### QPSK PSD Summary

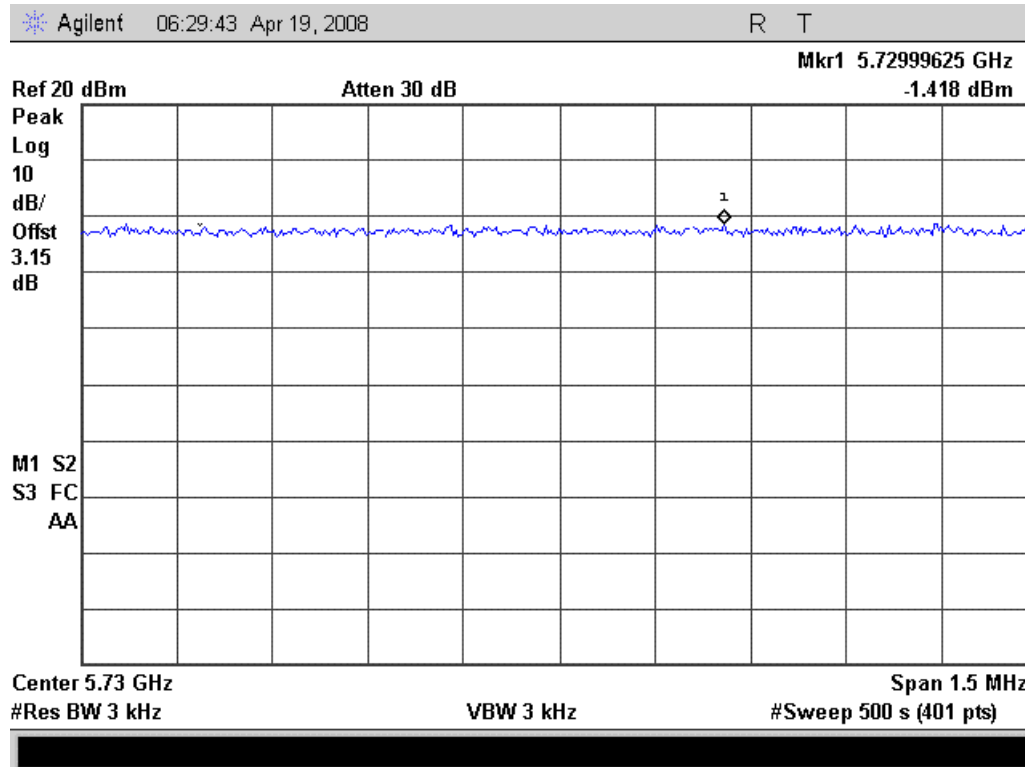
Frequency MHz	TX Bandwidth	Recorded Measurement	Specification Limit	Result
5730	6 MHz	-1.418 dB	8 dBm	Pass
5730	7 MHz	-2.404 dB	8 dBm	Pass
5730	8 MHz	-2.984 dB	8 dBm	Pass
5787	6 MHz	-1.121 dB	8 dBm	Pass
5787	7 MHz	-2.668 dB	8 dBm	Pass
5787	8 MHz	-2.683 dB	8 dBm	Pass
5845	6 MHz	-0.897 dB	8 dBm	Pass
5845	7 MHz	-1.244 dB	8 dBm	Pass
5845	8 MHz	-2.680 dB	8 dBm	Pass

### 64-QAM PSD Summary

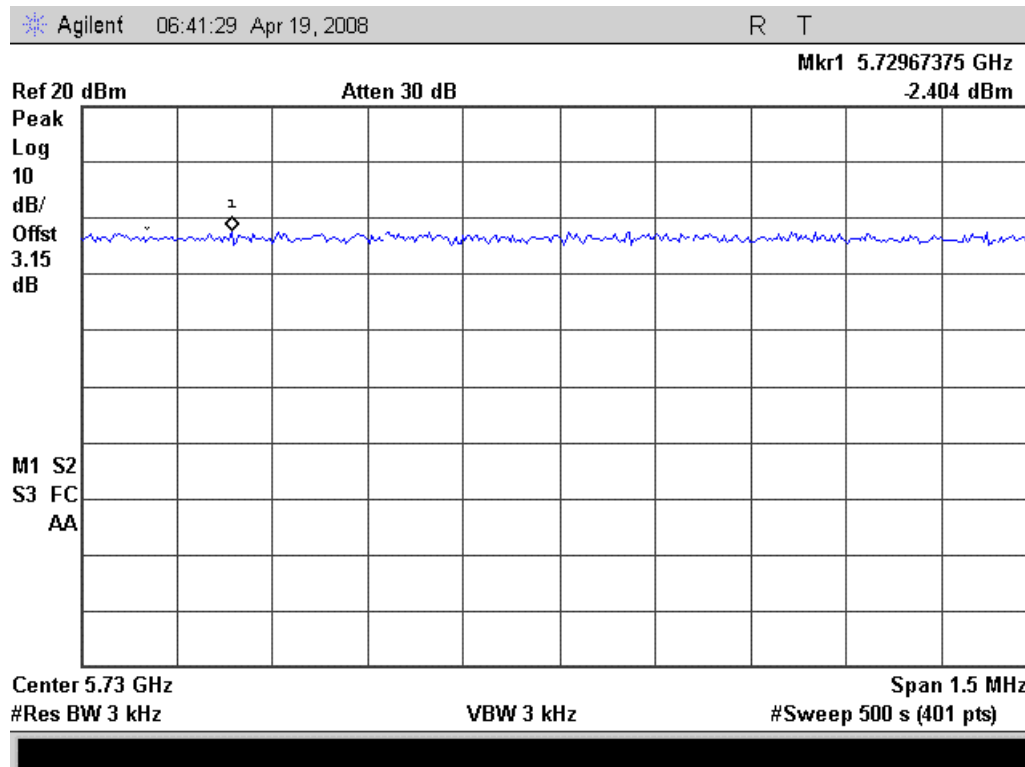
Frequency MHz	TX Bandwidth	Recorded Measurement	Specification Limit	Result
5730	6 MHz	-3.729 dB	8 dBm	Pass
5730	7 MHz	-5.514 dB	8 dBm	Pass
5730	8 MHz	-5.532dB	8 dBm	Pass
5787	6 MHz	-4.045 dB	8 dBm	Pass
5787	7 MHz	-5.019 dB	8 dBm	Pass
5787	8 MHz	-6.221 dB	8 dBm	Pass
5845	6 MHz	-2.702 dB	8 dBm	Pass
5845	7 MHz	-3.915 dB	8 dBm	Pass
5845	8 MHz	-4.809 dB	8 dBm	Pass



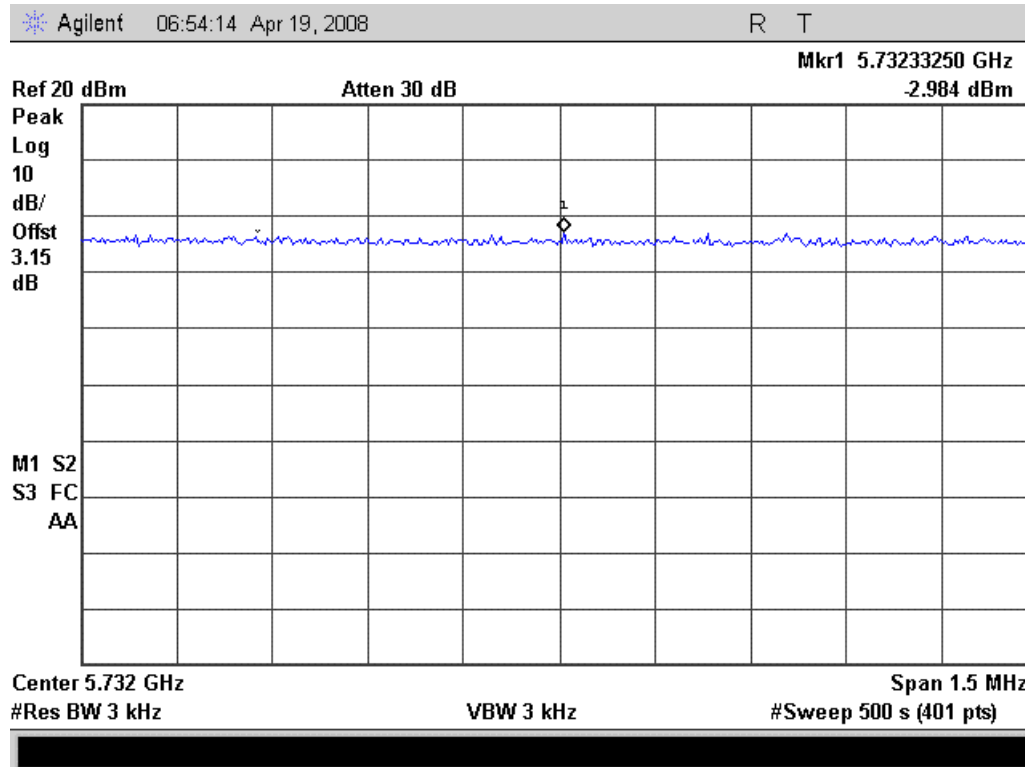
### 5730 MHz QPSK 6MHz PSD



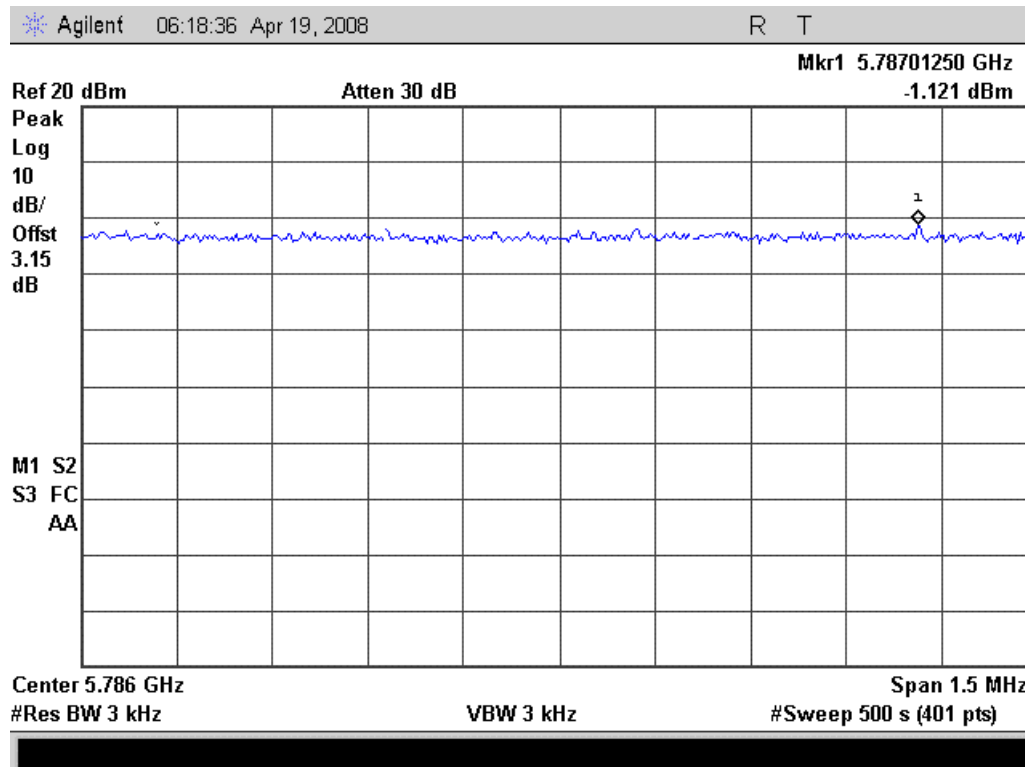
### 5730 QPSK 7MHz PSD



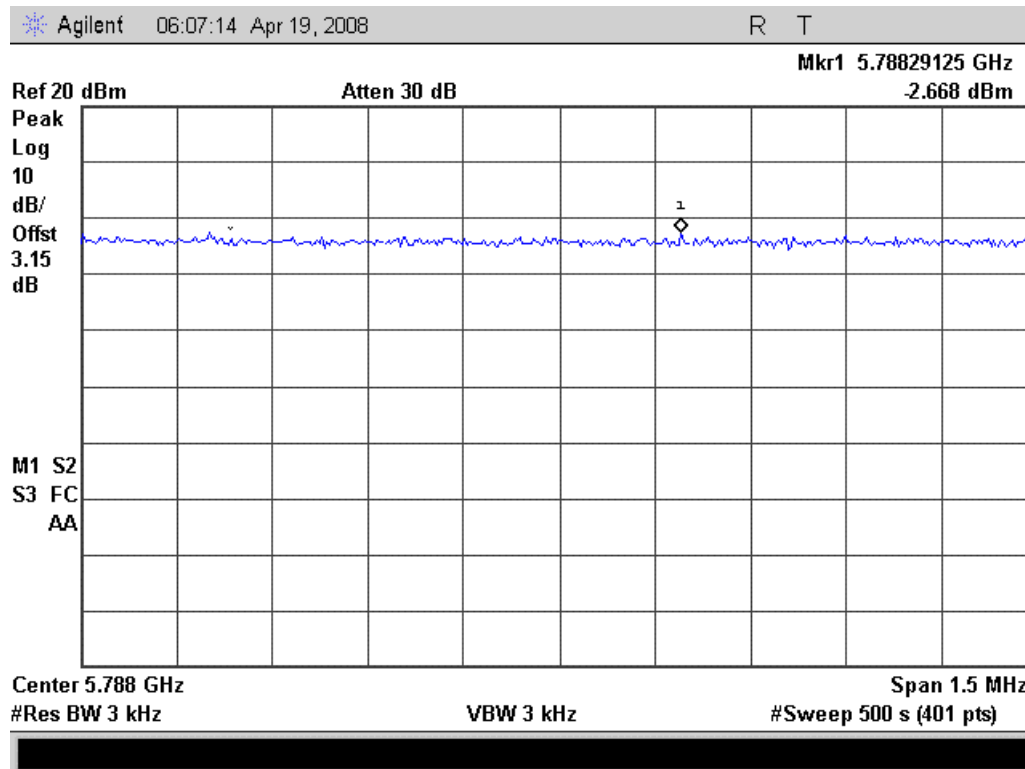
### 5730 QPSK 8MHz PSD



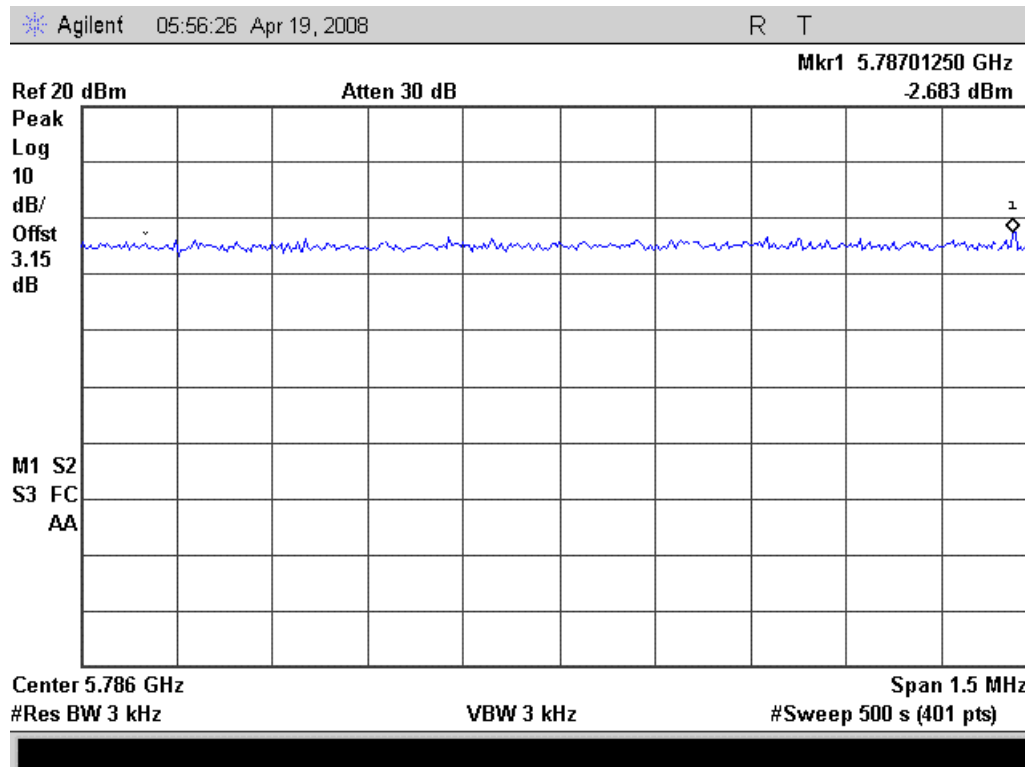
### 5787 QPSK 6MHz PSD



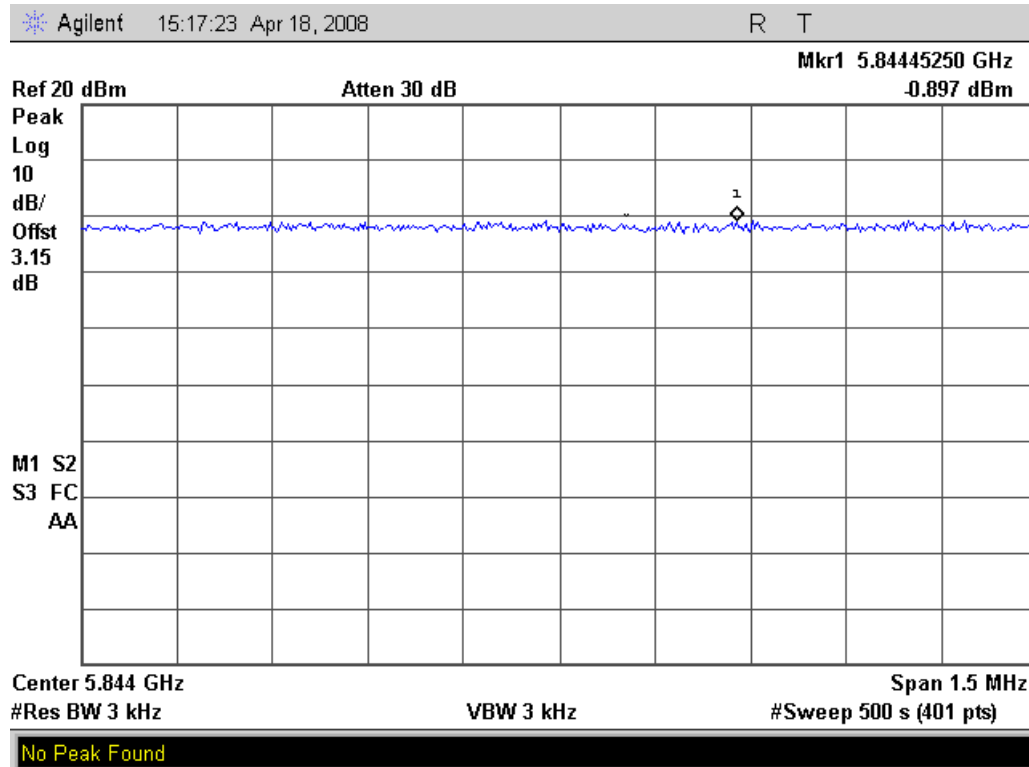
### 5787 QPSK 7MHz PSD



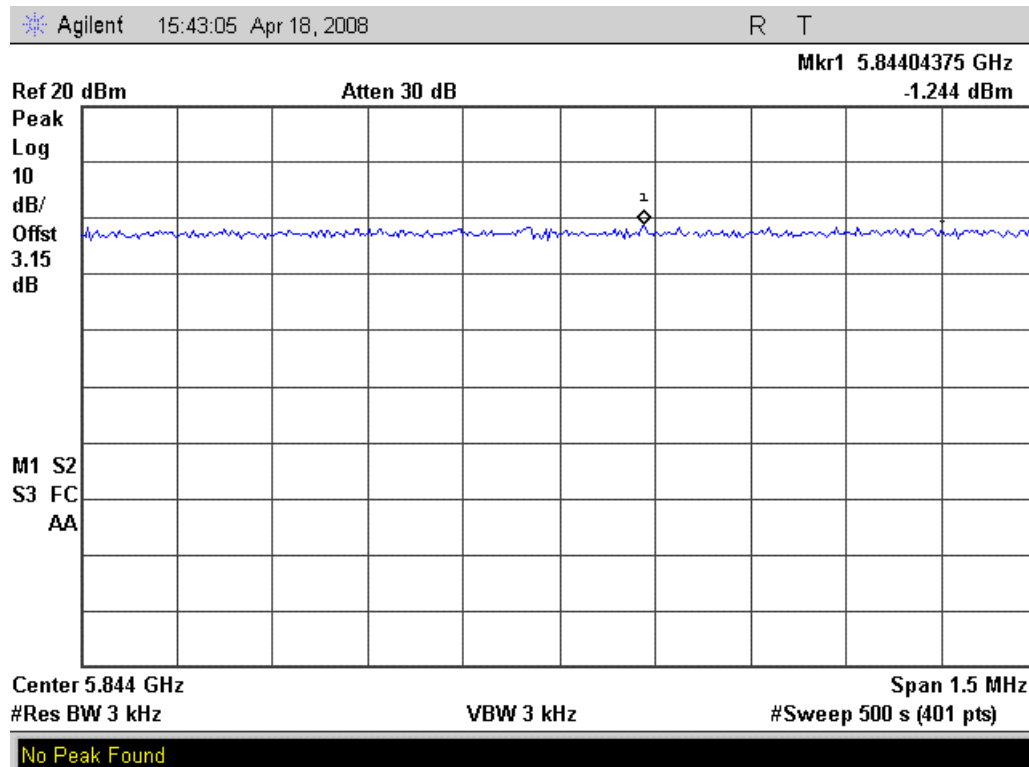
### 5787 QPSK 8MHz PSD



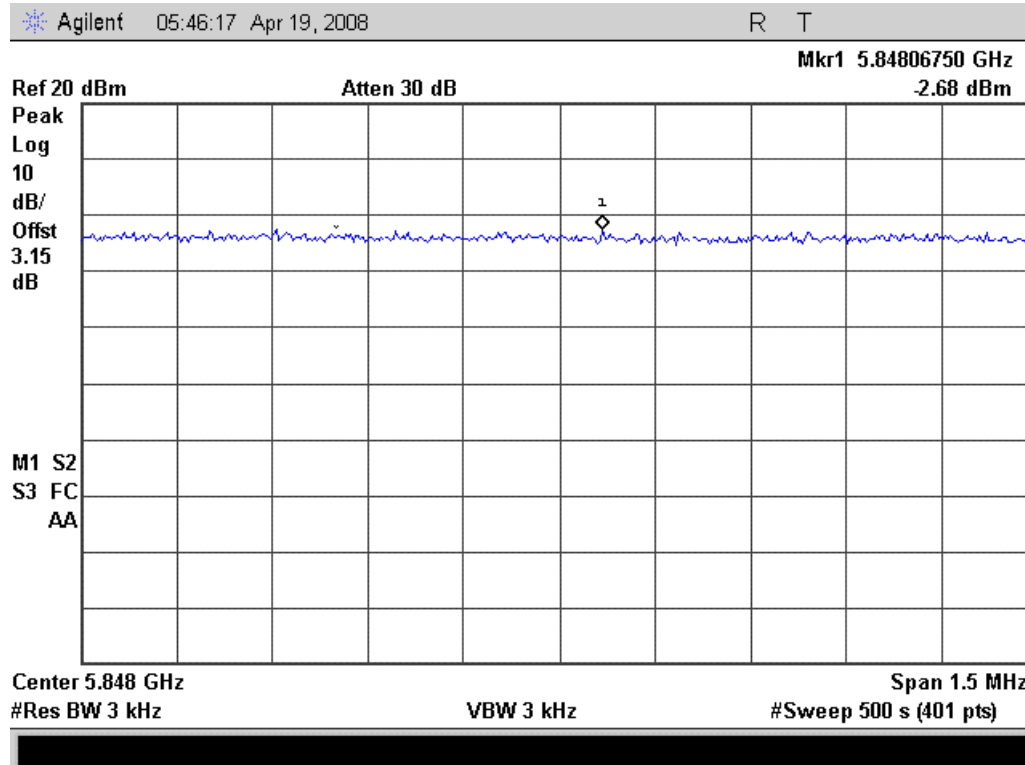
### 5845 QPSK 6MHz PSD



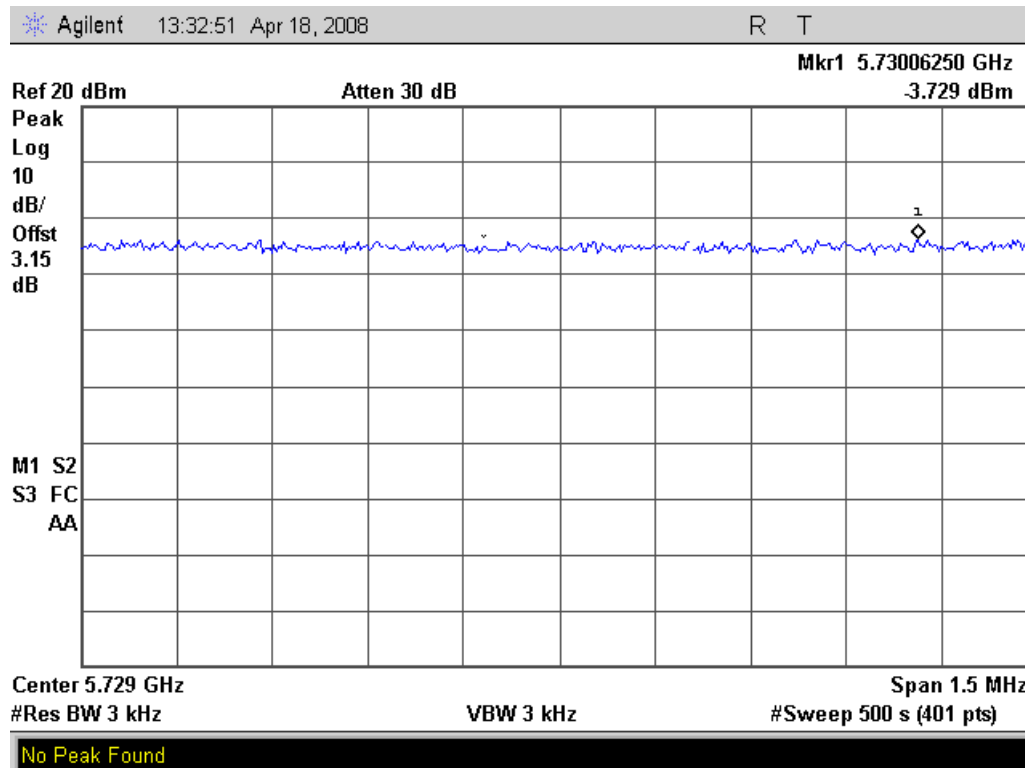
### 5845 QPSK 7MHz PSD



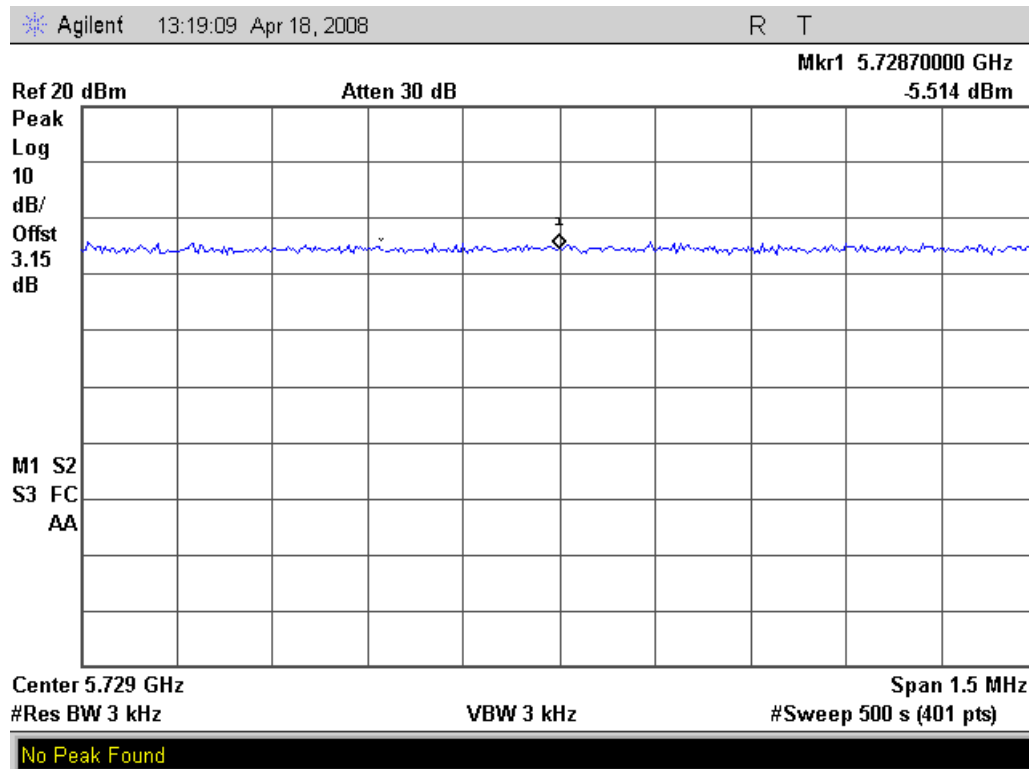
### 5845 QPSK 8MHz PSD



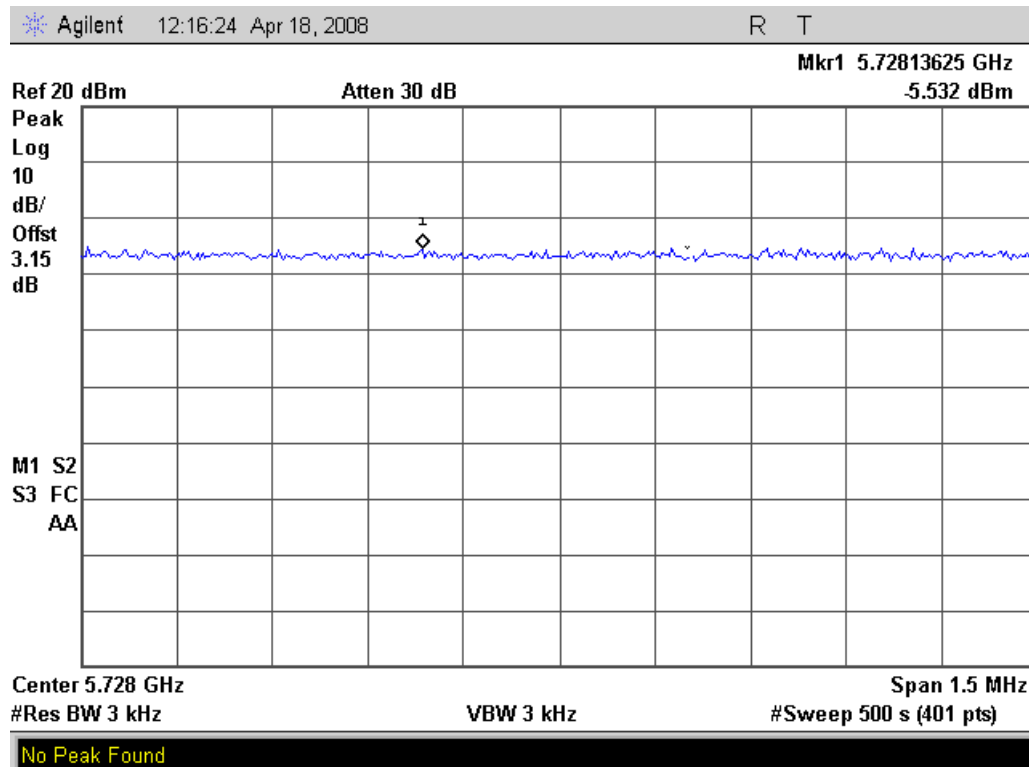
### 5730 64-QAM 6MHz PSD



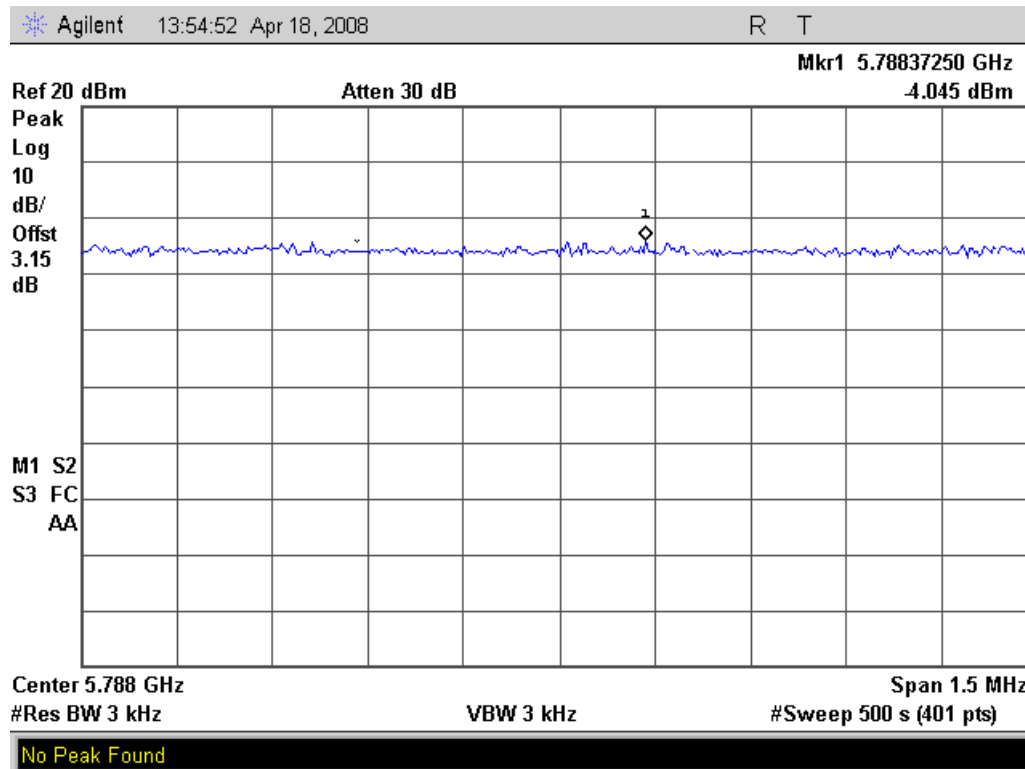
### 5730 64-QAM 7MHz PSD



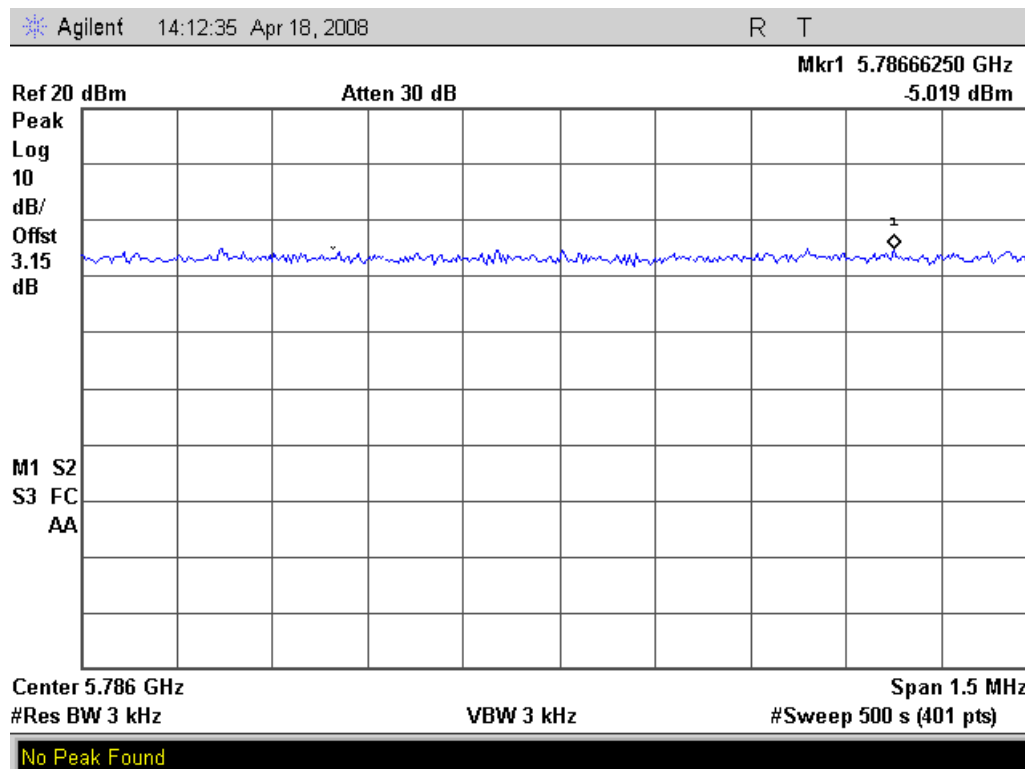
### 5730 64-QAM 8MHz PSD



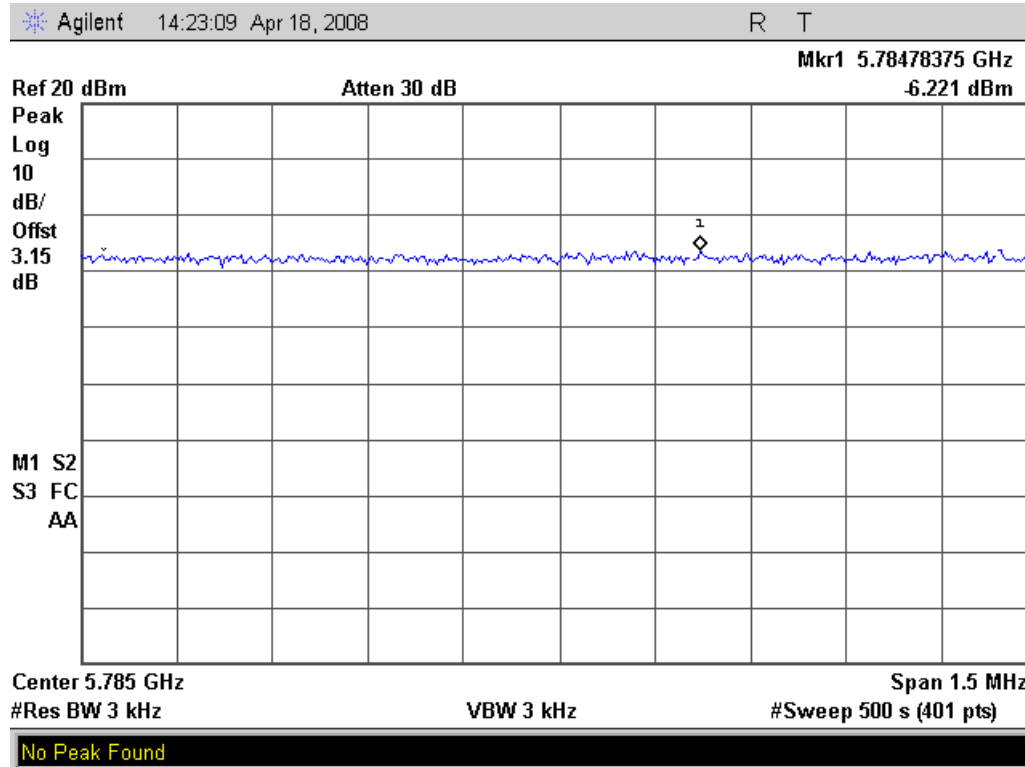
### 5787 64-QAM 6MHz PSD



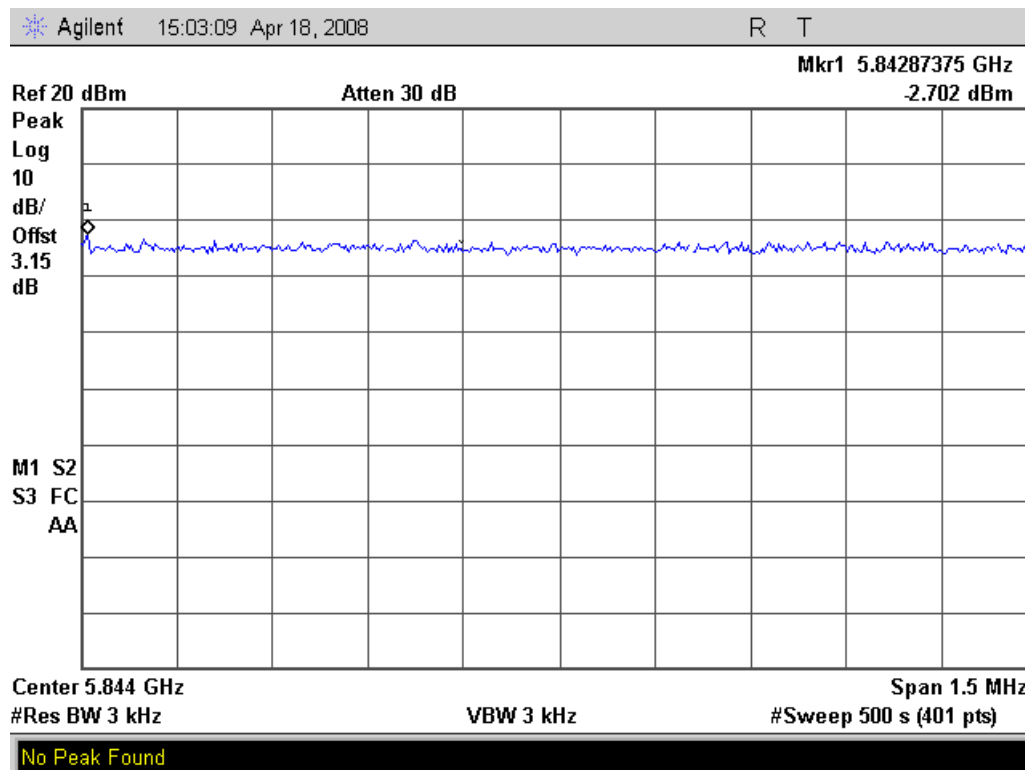
### 5787 64-QAM 7MHz PSD



### 5787 64-QAM 8MHz PSD

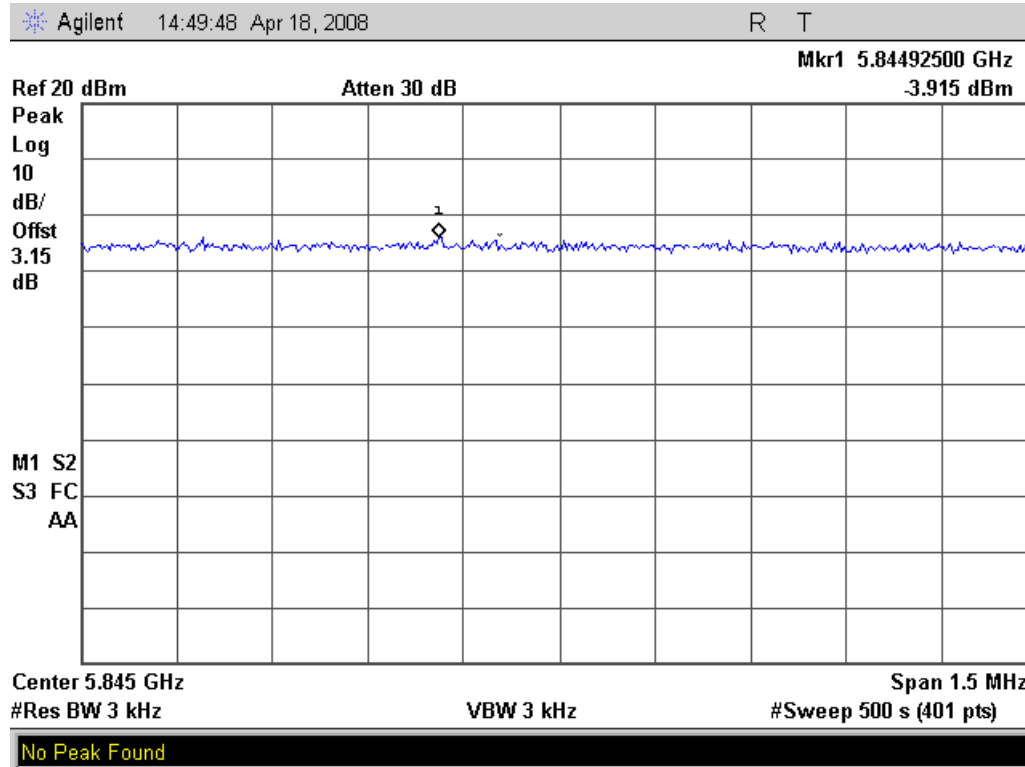


### 5845 64-QAM 6MHz PSD

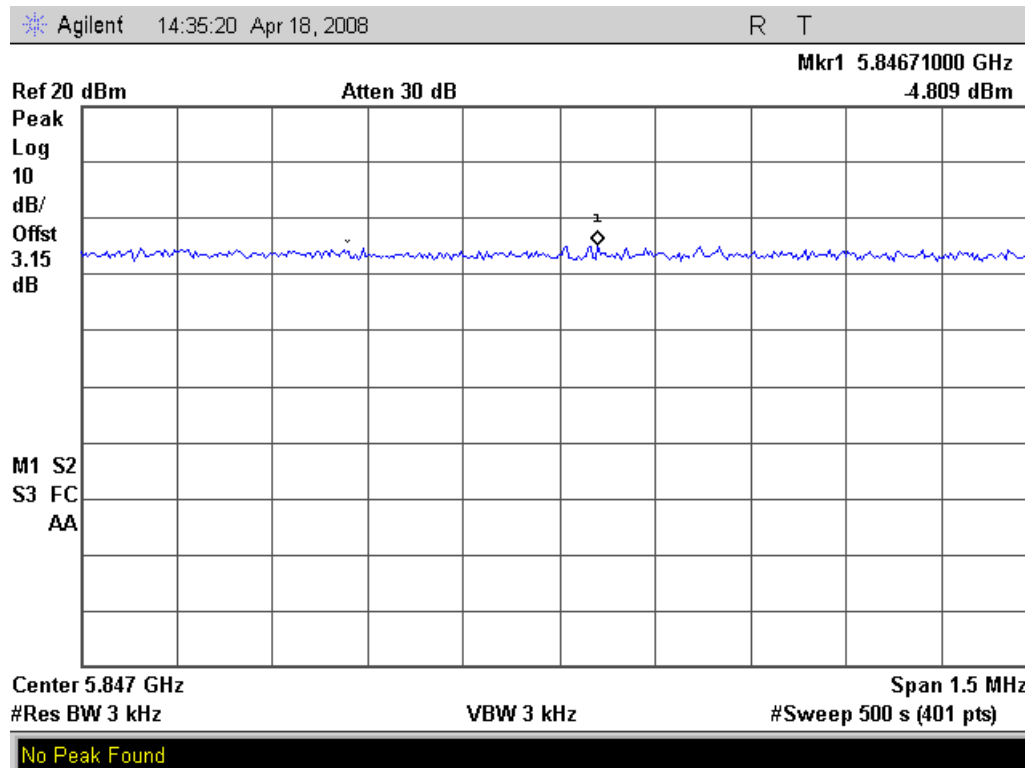




# 5845 64-QAM 7MHz PSD



# 5845 64-QAM 8MHz PSD



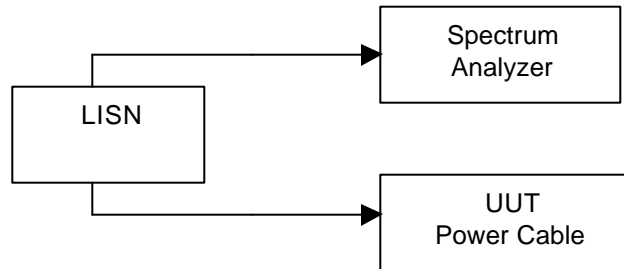
**Name of Test:** A/C Powerline Conducted Emissions  
**Specification:** 15.207  
**Test Equipment Utilized** i00033, i00270

**Test Date:** 4/19/2008

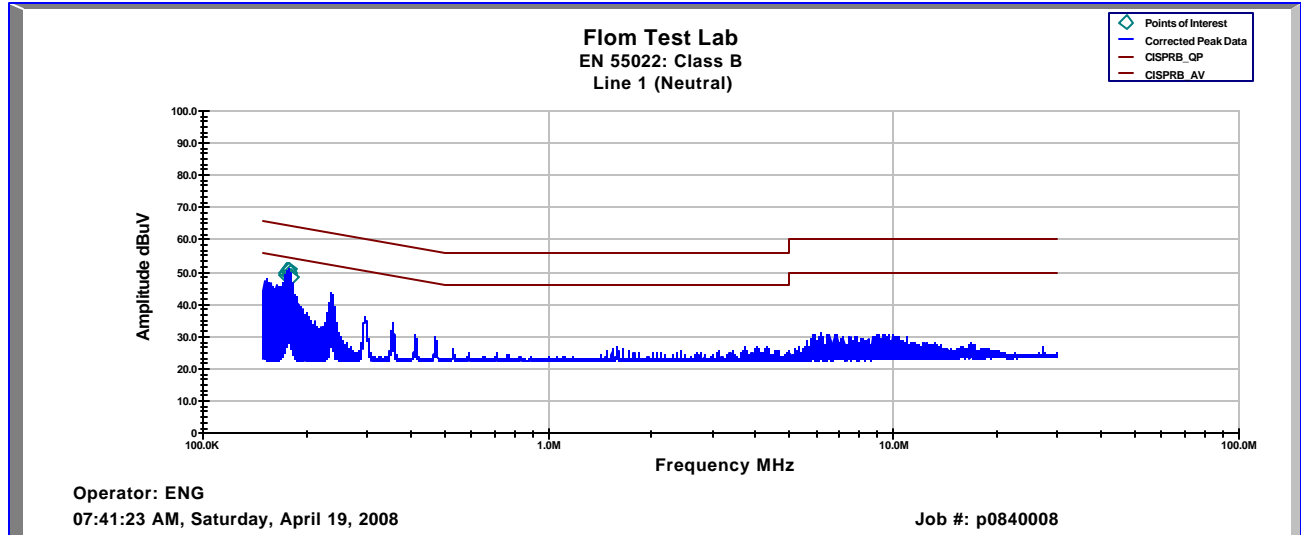
### Test Procedure

The UUT 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 average measurements were the worst-case and are recorded in the tables below.

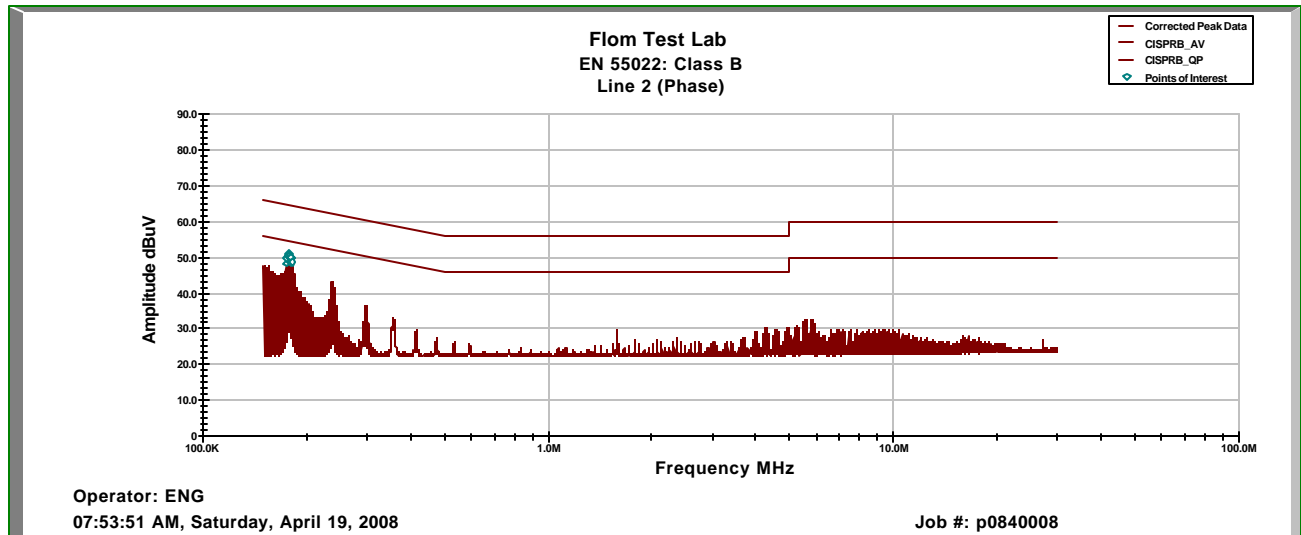
### Test Setup



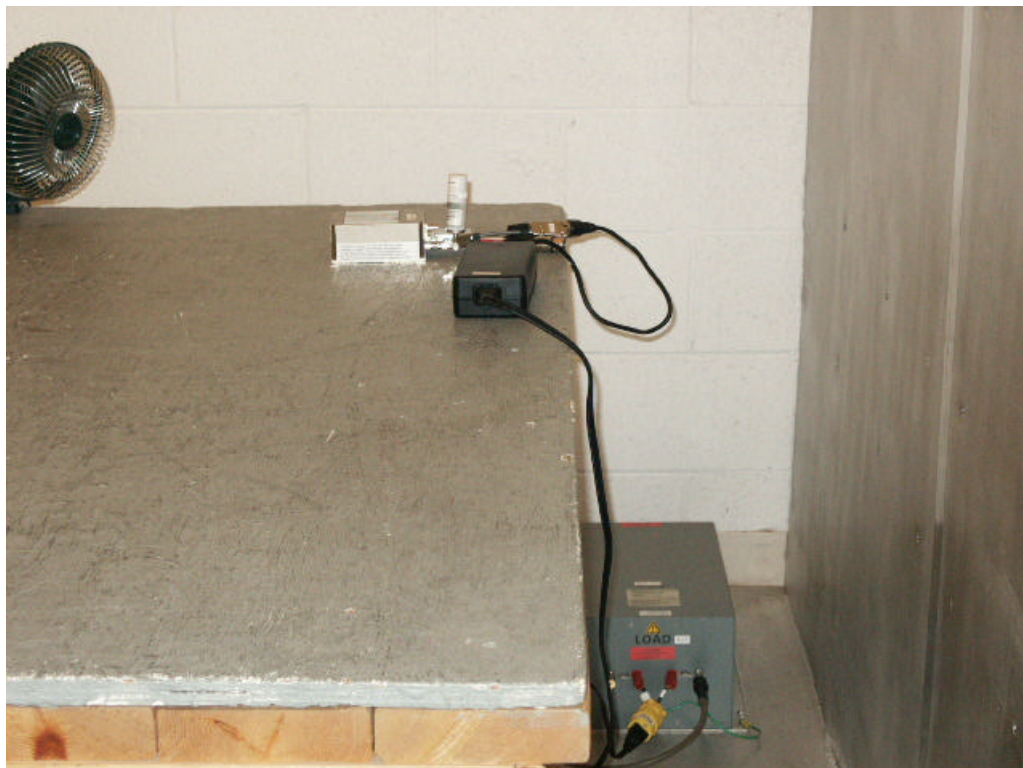
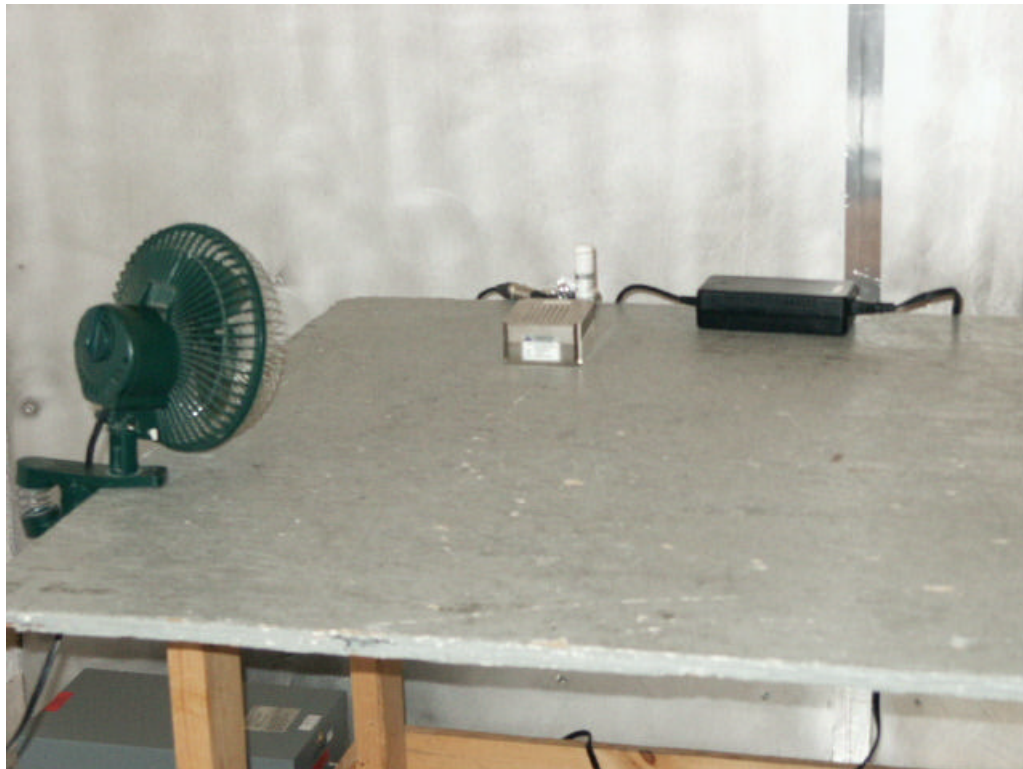
### Line 1 Test Results



### Line 2 Test Results



All peak emissions are below the quasi-peak limits no additional testing is required.



### Test Equipment Utilized

Description	MFG	Model Number	FTL Asset Number	Last Cal Date	Cal Due Date
Spectrum Analyzer	HP	85462A	i00033	10/1//2007	10/1//2008
Horn Antenna	EMCO	3115	i00103	10/4/2006	10/4/2009
LISN	FCC	FCC-LISN-50-32-2-01	i00270	10/22/2007	10/22/2009
Spectrum Analyzer	HP	E4407B	i00331	410/31/2007	10/31/2008

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