



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

**Date:** November 20, 2008

Federal Communications Commission  
Via: Electronic Filing

**Attention:** Authorization & Evaluation Division

**Applicant:** Privaris, Inc.  
**Equipment:** PRI-LRT-04  
**FCC ID:** THX-LRT04-01  
**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,

Hoosamuddin S. Bandukwala, Lab Director

Flom Test Labs  
3356 N. San Marcos Place, Suite 107  
Chandler, Arizona 85225-7176  
(866) 311-3268 phone, (480) 926-3598 fax

p0880012, d08b0014 Rev 3.0

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

**Applicant:** Privaris, Inc.

**FCC ID:** THX-LRT04-01

**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



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

## Test Report

for

**FCC ID: THX-LRT04-01**

**Model: PRI-LRT-04**

to

**Federal Communications Commission**

Rule Part(s) 15.247

**Date Of Report:** November 20, 2008

**On the Behalf of the Applicant:** Privaris, Inc.  
650 Peter Jefferson Parkway, Suite 330  
Charlottesville, VA 22911

**Attention of:** Larry Yost  
Phone: 434-244-4219; fax: 434-293-8212  
E-mail: lyost@privaris.com

Sincerely yours,

Hoosamuddin S. Bandukwala, Lab Director



## Revision History

Revision	Date	Revised By	Reason for revision
1.0	November 20, 2008	M.Wyman	Original Document
2.0	January 5, 2009	M.Wyman	Response TCB RT
3.0	January 14, 2009	M. Wyman	Added Graph

**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.**

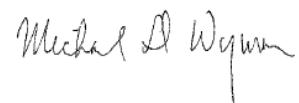
Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply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



Performed by:

Michael Wyman

Flom Test Labs  
3356 N. San Marcos Place, Suite 107  
Chandler, Arizona 85225-7176  
(866) 311-3268 phone, (480) 926-3598 fax

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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: d08b0014

d) Client: Privaris, Inc.

e) Identification: PRI-LRT-04

Description: Lane Transceiver

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

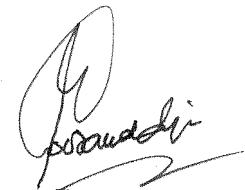
g) Report Date: November 20, 2008  
EUT Received:

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

i) Sampling method: No sampling procedure used.

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

Sincerely yours,



Hoosamuddin S. Bandukwala, Lab Director

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,  
Volume II, Part 2 and to

15.247

**Sub-Part 2.1033**

(c)(1):

**Name and Address of Applicant:** Privaris, Inc.

(c)(2): **FCC ID:** THX-LRT04-01

**Model Number:** PRI-LRT-04

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

Please See Attached Exhibits

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

(c)(5): **FREQUENCY RANGE, MHz:** 2405 – 2476

(c)(6): **Power Rating, W:** 0.101  
 Switchable       Variable       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  
 The EUT must be professionally installed  
 The antenna requirement does not apply

**The unit was tested with a vertical antenna with a gain of 1.5 dBi.**

**(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 C63.4-2003, FCC DTS Guide March 23, 2005, 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	

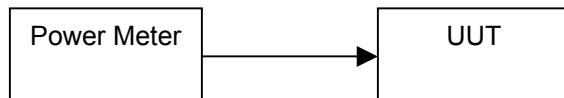
**Name of Test:** Peak Output Power  
**Specification:** 15.247(b)  
**Test Equipment Utilized** i00228, i00317

**Engineer:** M.Wyman  
**Test Date:** 11/07/2008

### Test Procedure

The UUT was connected directly to a power meter input. The peak readings were taken and the result was then compared to the limit.

### Test Setup



### Transmitter Peak Output Power

Tuned Frequency MHz	Recorded Measurement	Specification Limit	Result
2405.000000	0.101mW	1 W	Pass
2439.000000	0.088mW	1 W	Pass
2476.000000	0.096mW	1 W	Pass

**Name of Test:** Conducted Spurious Emissions  
**Specification:** 15.247(d)  
**Spec. Limit:** -20 dBC  
**Test Equipment Utilized** i00029

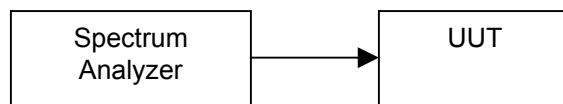
**Engineer:** M.Wyman  
**Test Date:** 12/3/08

### Test Procedure

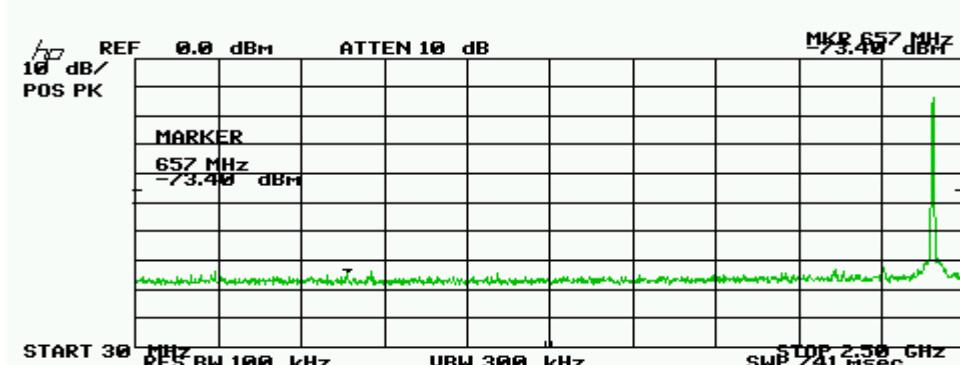
The UUT was connected directly to a spectrum analyzer to verify that the UUT met the requirements for spurious emissions. The reference level was offset for the peak power output with the resolution bandwidth set for 100 KHz. The frequency range from 30 MHz to the 10<sup>th</sup> harmonic of the fundamental 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

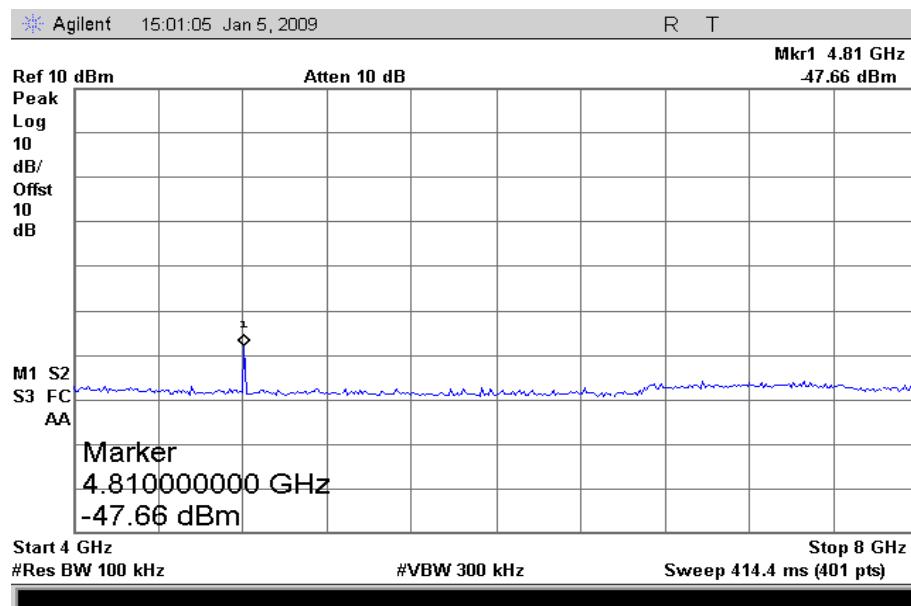
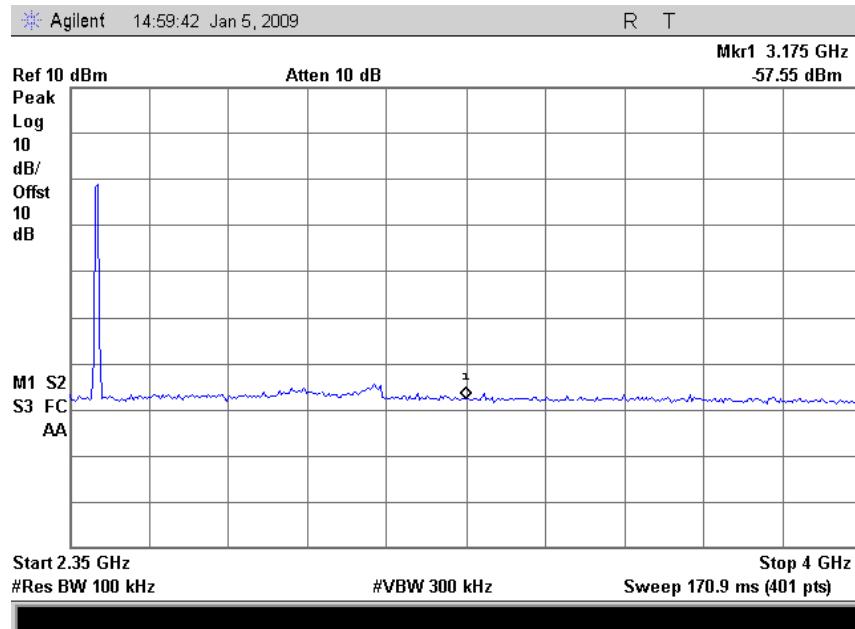
Only the worst case is recorded in the Conducted Spurious Emissions Summary Test Table.

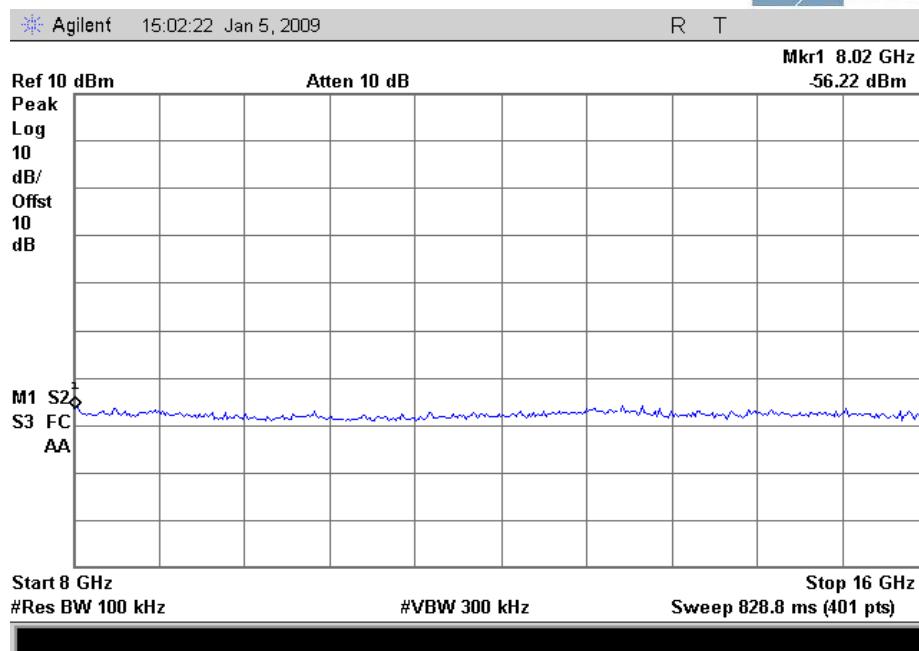
### Test Setup

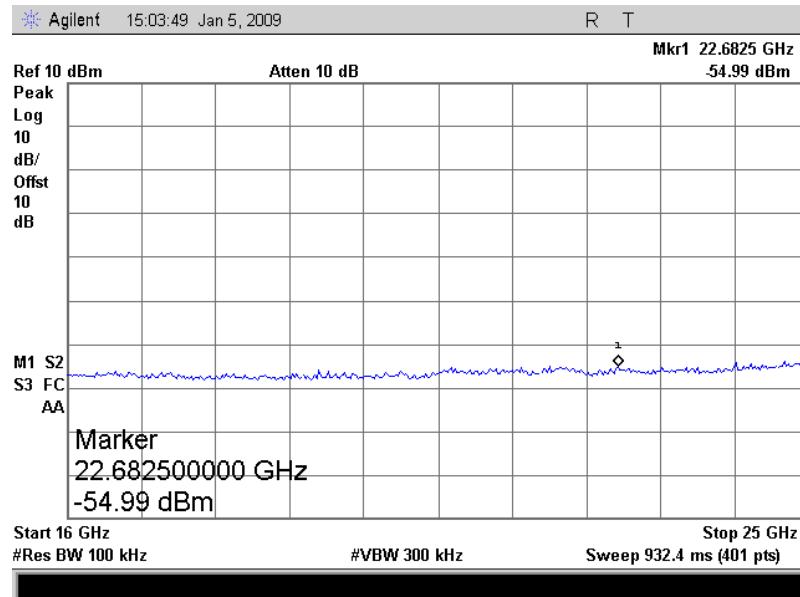


### Conducted Spurious Emissions 2405 MHz

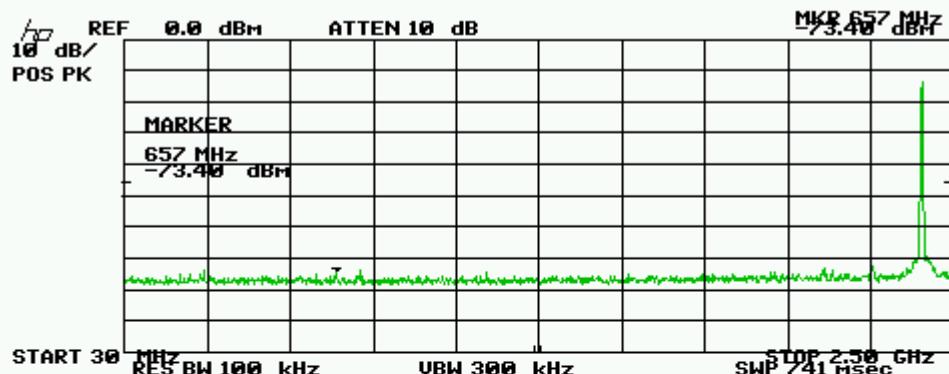


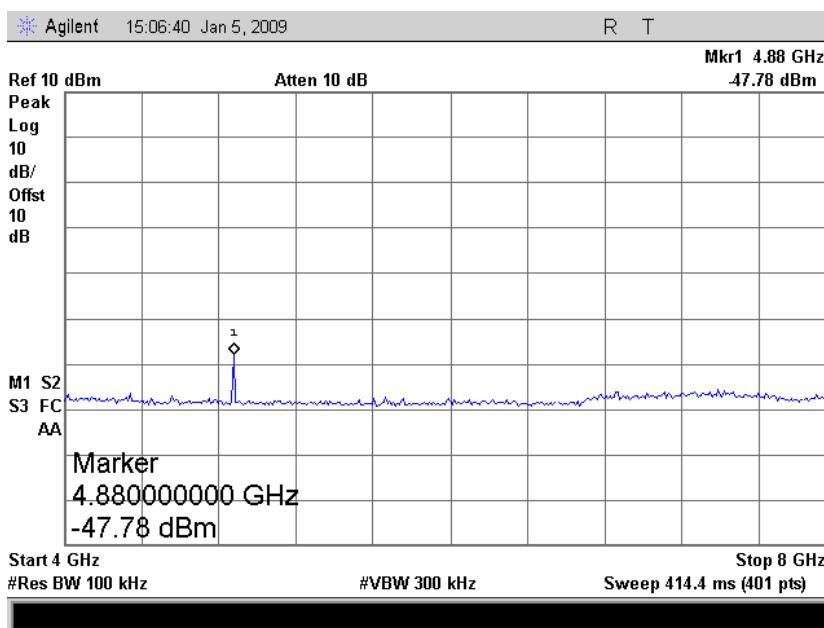
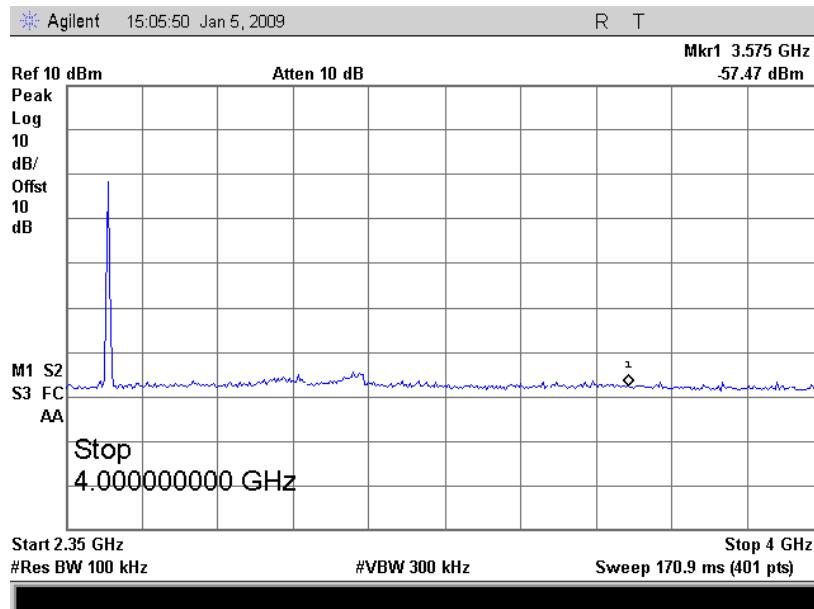


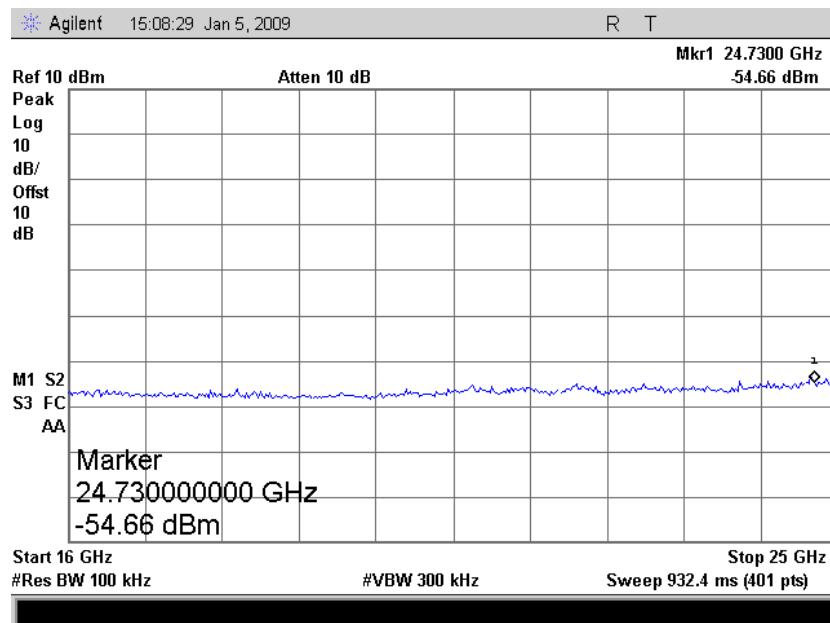




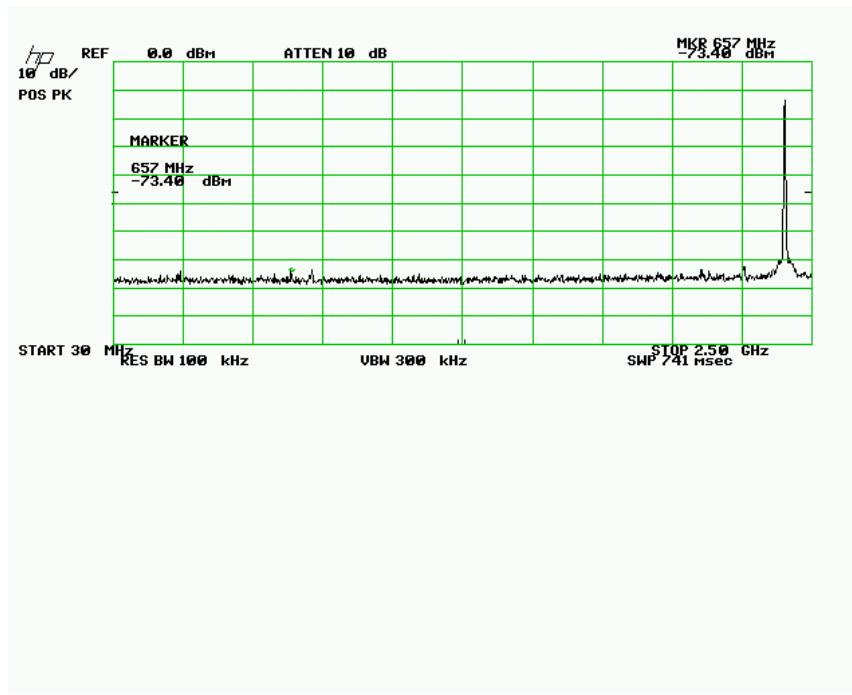
### Conducted Spurious Emissions 2439 MHz

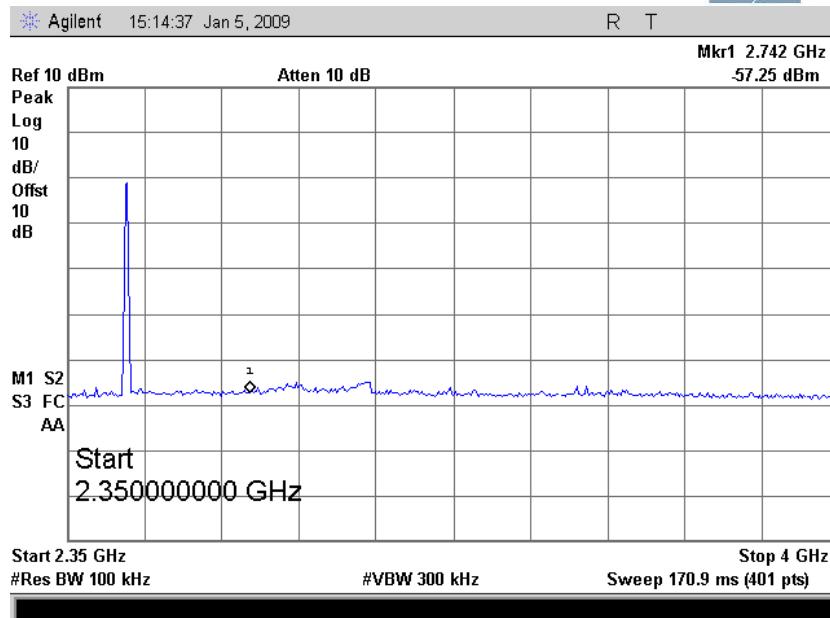


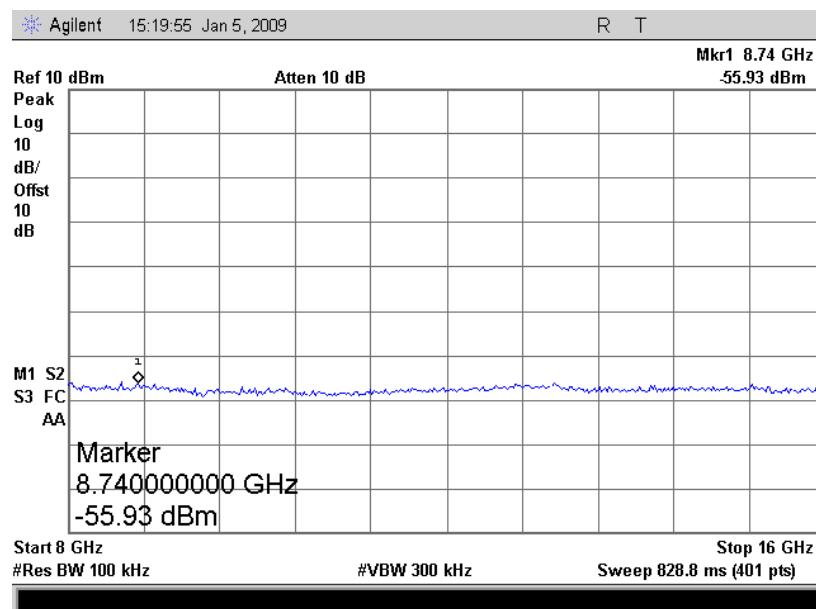
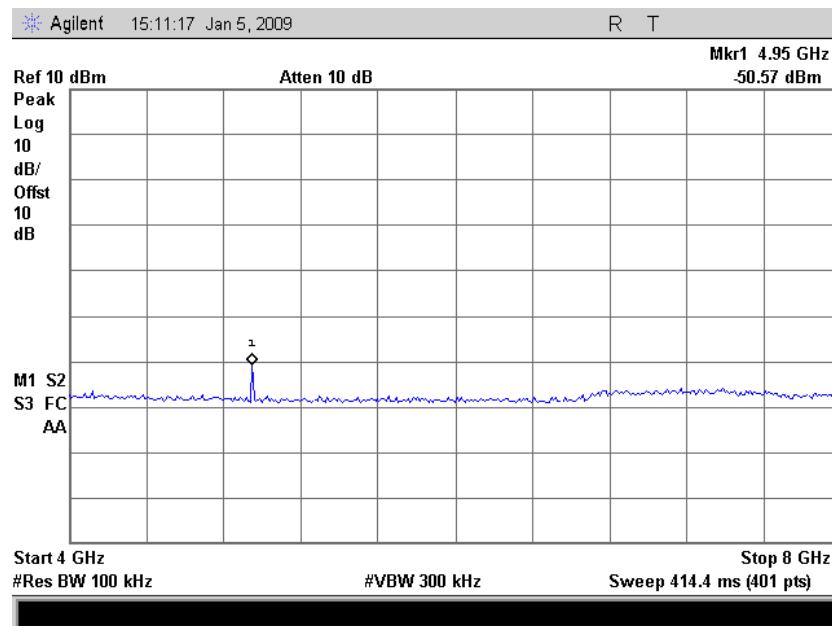


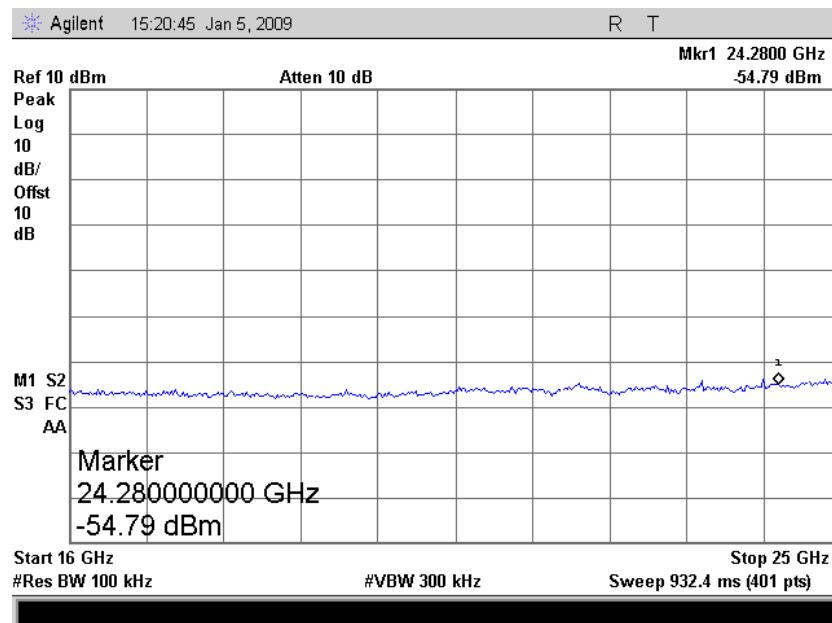


### Conducted Spurious Emissions 2475 MHz









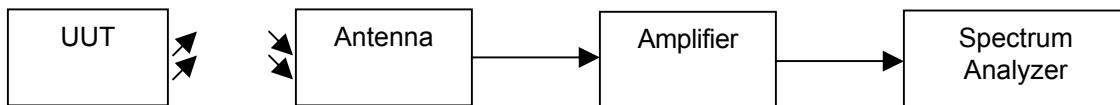
**Name of Test:** Radiated Spurious Emissions  
**Specification:** 15.247(d), 15.209(a), 15.205  
**Test Equipment Utilized** i00271, i00028, i00029

**Engineer:** M.Wyman  
**Test Date:** 12/09/08

### Test Procedure

The UUT was tested in a semi-anechoic chamber set 3m from the receiving antenna. A spectrum analyzer was used to verify that the UUT met the requirements for Radiated Spurious Emissions. The antenna 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.

### Test Setup



Detector Settings	RBW	VBW	Span
Peak	1 MHz	1 MHz	as necessary
Average	1 MHz	10 Hz	0 Hz

### Radiated Spurious Emissions

Emission Freq (MHz)	Peak Monitored Level (dBuV/m)	Peak Limit (dBuV/m)	Average Limit (dBuV/m)	Result
125.010000	20.2	74.0	54.0	Pass
266.672000	27.8	74.0	54.0	Pass
399.862000	17.4	74.0	54.0	Pass
475.213000	17.5	74.0	54.0	Pass
500.126000	18.3	74.0	54.0	Pass

All of the peak measurements were much less than the average limit so no average data was given. 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

**Engineer:** M.Wyman

**Test Equipment Utilized**

dBuV average and 74 dBuV peak

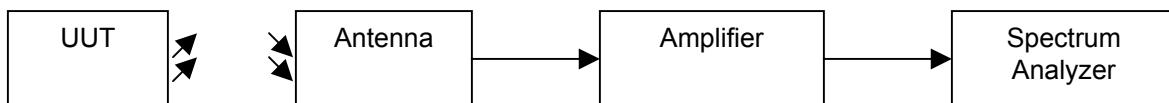
i00028, i00329, i00271

**Test Date:** 11/24/08

### 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 cable and transducer correction factors were input into the analyzer as a reference level offset to ensure accurate readings were obtained.

### Test Setup



### Band Edge Emissions Summary

#### Band Edge 2400.0 MHz

Tuned Freq (MHz)	Emission Freq (MHz)	Monitored Level	Detector	Limit	Result
2405.000	2404.85	-39.7dBc	Peak	-20 dBc	Pass

#### Band Edge 2483.5 MHz

Tuned Freq (MHz)	Emission Freq (MHz)	Monitored Level	Detector	Limit	Result
2476.000	2474.8	-51.5dBc	Peak	-20 dBc	Pass
2476.000	2474.8	36.9dBuV/m	Avg	54dBuV/m	Pass

### Restricted Band Emissions Summary

#### Restricted Band 2483.5 MHz

Tuned Freq (MHz)	Emission Freq (MHz)	Monitored Level (dBuV/m)	Detector	Limit (dBuV/m)	Result
2476.000	2483.6	48.5	Peak	74	Pass
2476.000	2483.5	36.9	Avg	54	Pass

#### Restricted Band 2390 MHz

Tuned Freq (MHz)	Emission Freq (MHz)	Monitored Level (dBuV/m)	Detector	Limit (dBuV/m)	Result
2406.000	2390.000	45.5	Peak	74	Pass
2406.000	2390.000	39.8	Avg	54	Pass

No observable signals either harmonics or restricted bands were seen about the band edges to the 10<sup>th</sup> harmonic.

**Flom Test Labs**

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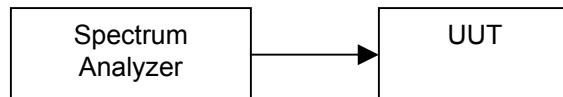
**Name of Test:** Occupied Bandwidth  
**Specification:** 15.247(a)(2)  
**Limit:** BW  $\geq$  500 KHz  
**Test Equipment Utilized** i00329

**Engineer:** M.Wyman  
**Test Date:** 12/4/08

### Test Procedure

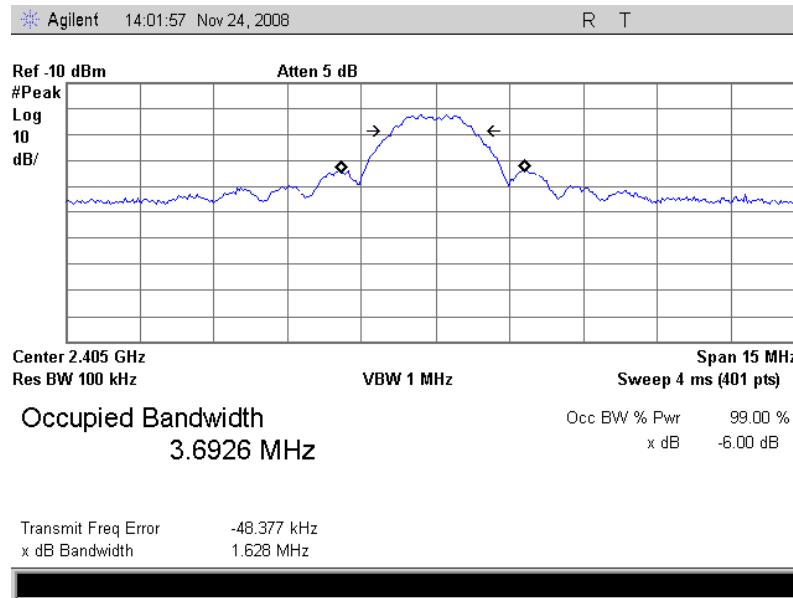
The UUT was connected directly to a spectrum analyzer. The Span was set wide enough to capture the entire transmit spectrum and the resolution bandwidth was set to at least 1% of the span. The analyzer was set to max hold and when the entire spectrum was captured the 6dB and 99% bandwidths were measured to verify the bandwidth met the specification.

### Test Setup



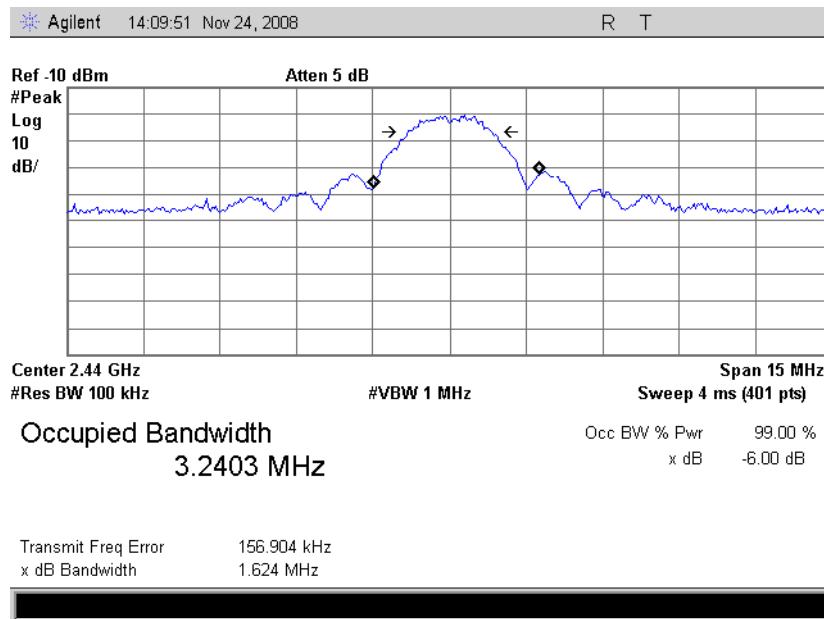
### Occupied Bandwidth Summary

Frequency MHz	Recorded Measurement	Specification Limit	Result
2405.000	1.628MHz	$\geq$ 500 KHz	Pass
2439.000	1.624MHz	$\geq$ 500 KHz	Pass
2476.000	1.614MHz	$\geq$ 500 KHz	Pass

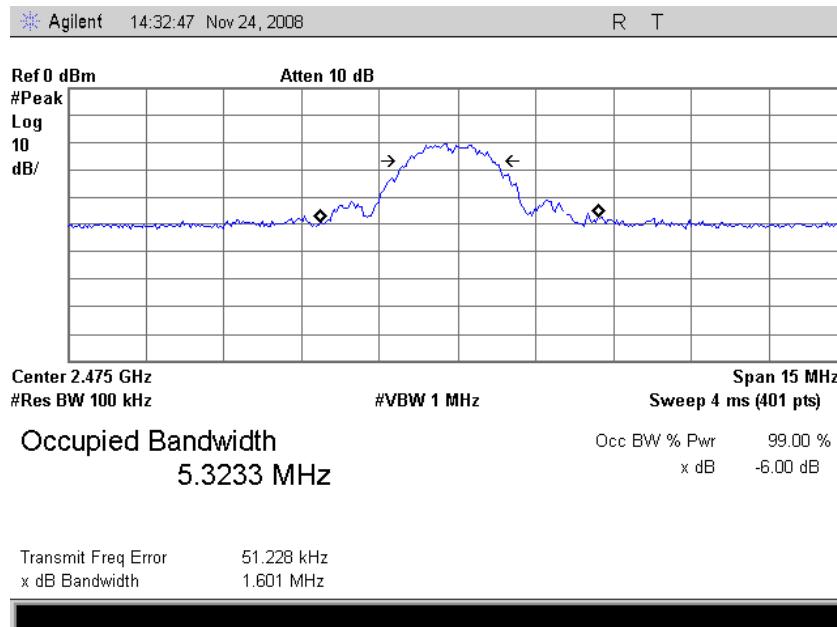


99%Bandwidth = 3.693MHz

### 2441MHz Occupied Bandwidth



99% Bandwidth = 3.240MHz



99% Bandwidth = 5.323MHz

**Name of Test:** Transmitter Power Spectral Density (PSD)

**Specification:** 15.247(e)

**Limit:** 8 dBm in any 3 kHz Bandwidth

**Test Equipment Utilized** i00329

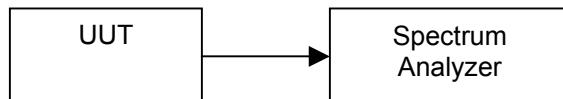
**Engineer:** M.Wyman

**Test Date:** 12/04/08

### 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.

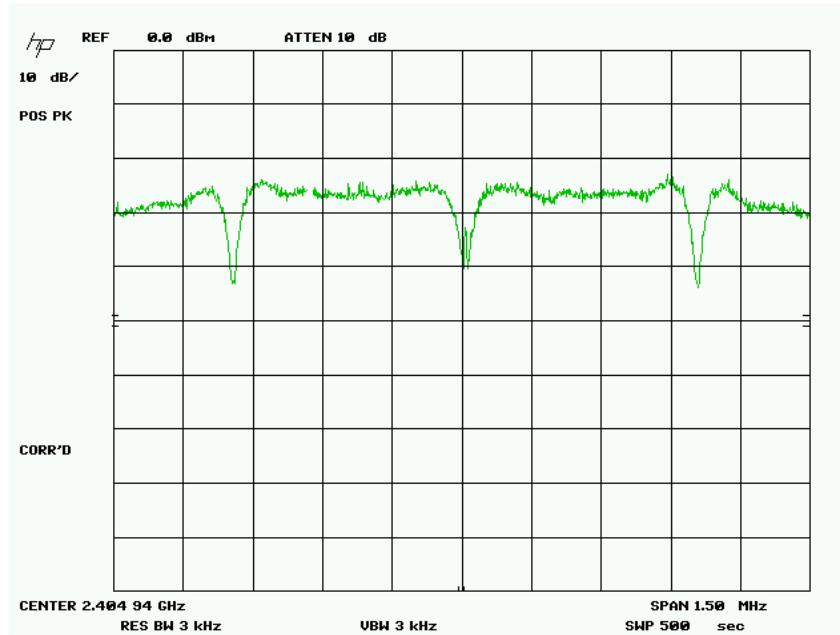
### Test Setup



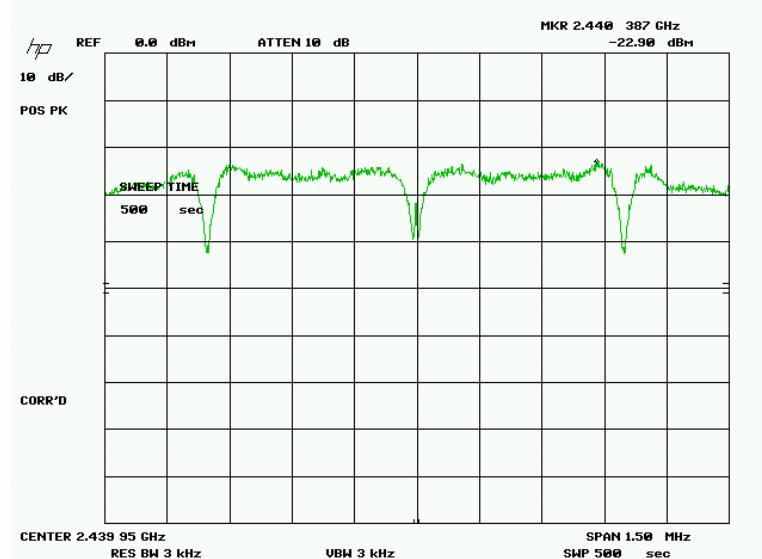
### PSD Summary

Frequency MHz	Recorded Measurement	Specification Limit	Result
2405	-22.3	8 dBm	Pass
2439	-22.9	8 dBm	Pass
2476	-22.4	8 dBm	Pass

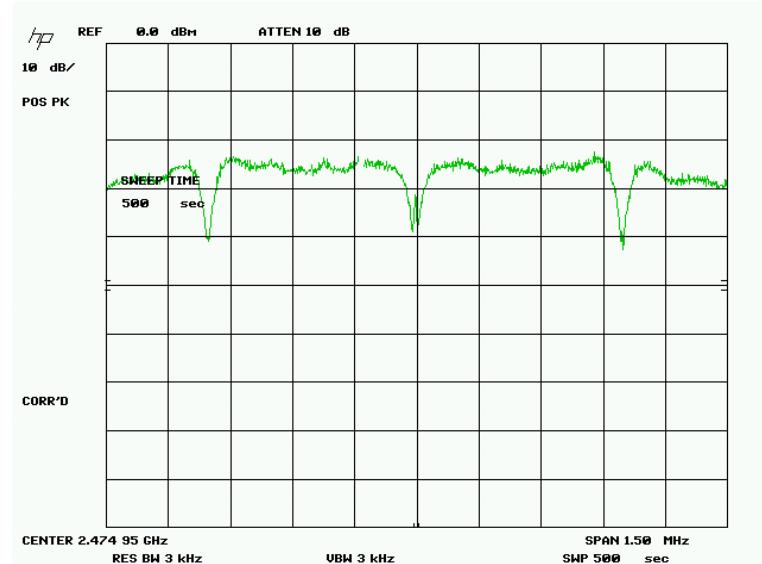
### PSD 2405 MHz



### PSD 2439 MHz



### PSD 2476 MHz



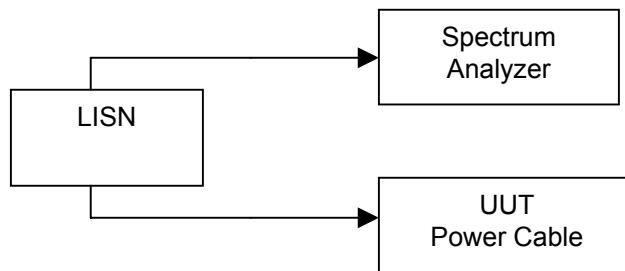
**Name of Test:** A/C Powerline Conducted Emissions  
**Specification:** 15.207  
**Test Equipment Utilized** i00270, i00329

**Engineer:** M.Wyman  
**Test Date:** 12/05/08

### 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



### L1 – Phase Test Results

Emission Frequency	Monitored Level (dBuV/m)	LISN Factor (dB)	Cable Correction Factor	Attenuation (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Result
172.27 KHz	13.17	0.2	10	23.39	65.36	-41.98	Pass
170.07 KHz	13.32	0.2	10	23.54	65.43	-41.89	Pass
165.82 KHz	13.91	0.2	10	24.14	65.55	-41.41	Pass
159.78 KHz	17.46	0.2	10	27.7	65.72	-38.02	Pass
158.24 KHz	17.81	0.22	10	28.07	65.76	-37.7	Pass
158.05 KHz	17.83	0.22	10	28.09	65.77	-37.68	Pass
157.72 KHz	17.81	0.22	10	28.07	65.78	-37.71	Pass
157.43 KHz	17.72	0.23	10	27.98	65.79	-37.8	Pass
157.32 KHz	17.78	0.23	10	28.04	65.79	-37.75	Pass
156.86 KHz	17.25	0.23	10	27.52	65.8	-38.28	Pass

### L2 - Neutral Test Results

Emission Frequency	Monitored Level (dBuV/m)	LISN Factor (dB)	Cable Correction Factor	Attenuation (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Result
168.3 KHz	12.95	0.2	10	23.17	65.48	-42.3	Pass
167.36 KHz	12.21	0.2	10	22.43	65.5	-43.07	Pass
161.27 KHz	15.86	0.2	10	26.09	65.68	-39.59	Pass
160.37 KHz	16.79	0.2	10	27.03	65.7	-38.68	Pass
160.19 KHz	17	0.2	10	27.23	65.71	-38.48	Pass
159.79 KHz	17.07	0.2	10	27.31	65.72	-38.41	Pass
159.09 KHz	17.56	0.21	10	27.81	65.74	-37.93	Pass
157.66 KHz	17.09	0.22	10	27.35	65.78	-38.43	Pass
157.05 KHz	26.02	0.23	10	36.29	65.8	-29.51	Pass
155.15 KHz	15.99	0.25	10	26.28	65.85	-39.57	Pass

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**Test Equipment Utilized**

Description	MFG	Model Number	FTL Asset Number	Last Cal Date	Cal Due Date
RF Pre-Amplifier	HP	8449	i00028	1/23/07	1/23/09
Spectrum Analyzer	HP	8563E	i00029	5/5/08	5/5/09
Horn Antenna	ARA	1181A	i00271	3/6/08	3/6/09
Power Meter	HP	E4418B	i00228	10/1/08	10/1/09
LISN	FCC	FCC-LISN-50-32-2-01	i00270	09/17/08	09/17/10
Power sensor	HP	8481A	i00317	10/1/08	10/01/09
Spectrum Analyzer	HP	8566B	i00329	5/5/08	5/5/09

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