



Compliance Testing, LLC
Previously Flom Test Lab
RF, EMC and Safety Testing Experts Since 1963

toll-free: (866) 311-3268

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<http://www.ComplianceTesting.com>

info@ComplianceTesting.com

Date: May 14, 2010

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Spot LLC
Equipment: COMM
FCC ID: L2V-COMM
FCC Rules: 15.247

To Whom It May Concern:

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 the authorized agent.

Sincerely yours,

John Erhard: Engineering Manager



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

Applicant: Spot LLC

FCC ID: L2V-COMM

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: L2V-COMM

Model: COMM

to

Federal Communications Commission

Rule Part(s) 15.247

Date of Report: May 14, 2010

On the Behalf of the Applicant: Spot LLC
19349 N. 12th Street
Covington, LA 70433

Attention of: Christopher Robinson
Ph: (985) 893-1048
Fax: (985) 893-1858
Email: ChrisR@globalstar.com

Supervised By:

John Erhard: Engineering Manager



Test Report Revision History

Revision	Date	Revised By	Reason for revision
1.0	May 14, 2010	J. Erhard	Original Document
2.0	June 11, 2010	J. Erhard	Add AC Conducted Emissions test data
3.0	July 13, 2010	G. Corbin	Added units of measurement to test summary tables as required



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.



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, appearing to read "John Erhard".

John Erhard: Engineering Manager

Certifying Engineer:



Table of Contents

Rule	Description	Page
	Test Report	2
2.1033(c)	General Information Required	3
	Standard Test Conditions and Engineering Practices	5
	Test Results Summary	6
15.247(b)	Peak Output Power	7
15.247(d)	Conducted Spurious Emissions	8
15.247(d),	Radiated Spurious Emissions	10
15.247(d),	Emissions At Band Edges	11
15.247(a)(2)	Occupied Bandwidth	14
15.247(e)	Transmitter Power Spectral Density (PSD)	15
15.207	A/C Powerline Conducted Emissions	16
RSS-GEN 6(b)	Receiver Spurious Emissions	17
	Test Equipment Utilized	19



Required information per ISO 17025-2005, paragraph 5.10.2:

a) **Test Report**

b) Laboratory: Compliance Testing
(FCC: 933597) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044A-1) Chandler, AZ 85225

c) Report Number: d1050015

d) Client: Spot LLC

e) Identification: COMM

Description: Transmitter

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

g) Report Date: May 14, 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.

m) Supervised by:

John Erhard: Engineering Manager

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: Spot LLC

(c)(2): **FCC ID:** L2V-COMM

Model Number: COMM

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

Please See Attached Exhibits

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

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

(c)(6): **Power Rating, W:** 0.0017
_____ Switchable _____ Variable X N/A

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

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



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 C63.10-2009 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 for current scope of accreditation.

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



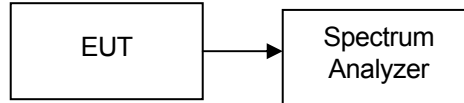
Name of Test: Peak Output Power
Specification: 15.247(b)
Test Equipment Utilized: i00008, i00320, i00331

Engineer: J. Erhard
Test Date: 5/5/2010

Test Procedure

The EUT was connected directly to a spectrum analyzer with the RBW set greater than the 6 dB bandwidth with the peak readings recorded in the following table. The cable loss was input into the analyzer as a reference level offset to ensure accurate readings.

Test Setup



Transmitter Peak Output Power

Tuned Frequency (MHz)	Recorded Measurement	Specification Limit	Result
2405	0.0017 W	1 W	Pass

Name of Test: Conducted Spurious Emissions
Specification: 15.247(d)
Test Equipment Utilized: i00008, i00320, i00331

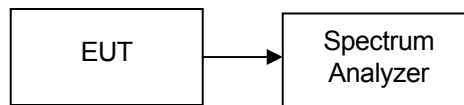
Engineer: J. Erhard
Test Date: 5/5/2010

Test Procedure

The EUT was connected to a spectrum analyzer to verify that the EUT met the requirements for spurious emissions. The cable loss was input into the analyzer as a reference level offset to ensure accurate readings. The frequency range from 30 MHz to the 10th harmonic of the fundamental transmitter was observed. The display line was set at the -20 dBc limit of -17.7 dBm.

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

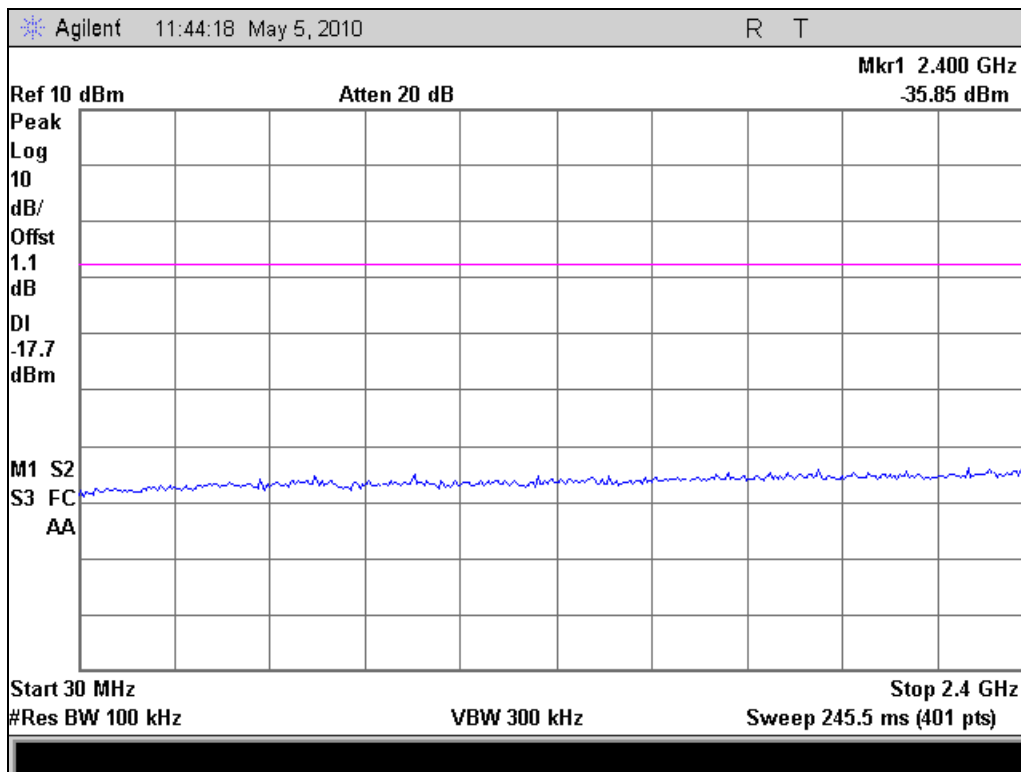
Test Setup

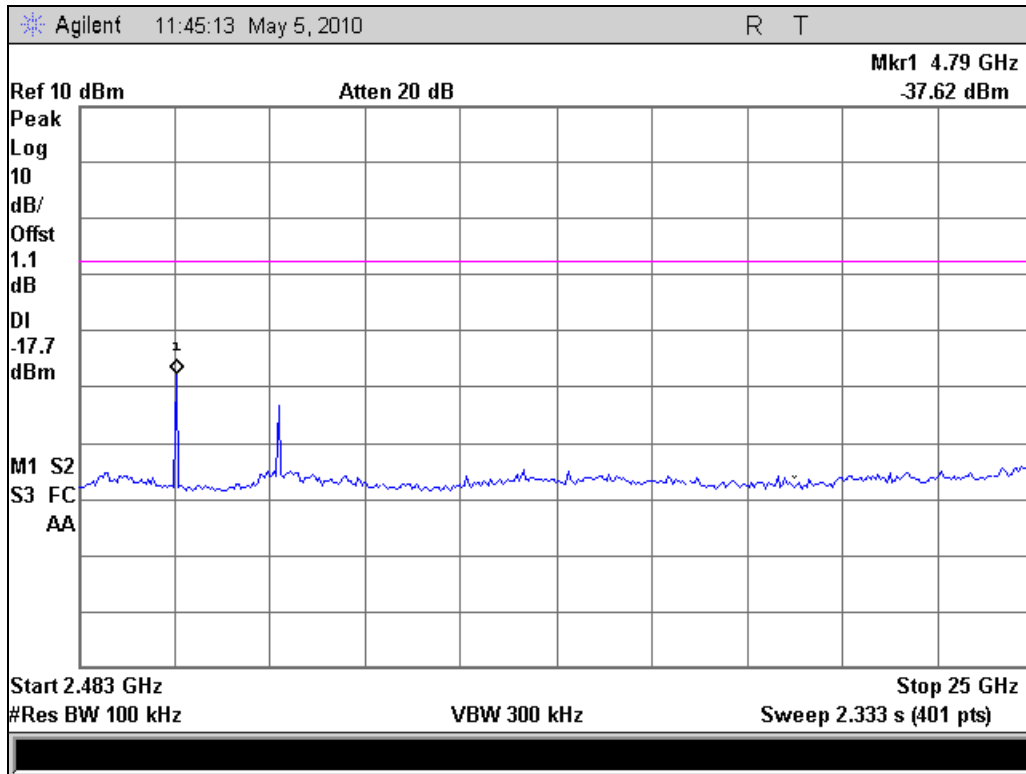


Conducted Spurious Emissions Summary Test Table

Tuned Frequency (MHz)	Emission Frequency (MHz)	Recorded Measurement (dBm)	Specification Limit	Result
2405	4790	-37.62	-20 dBc	Pass

Conducted Spurious Emissions 2405 MHz



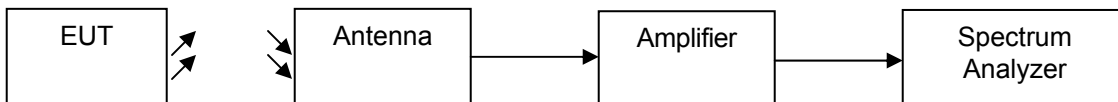


Name of Test: Radiated Spurious Emissions
Specification: 15.247(d), 15.209(a), 15.205
Test Equipment Utilized: i00008, i00028, i00103, i00320, i00331
Engineer: J. Erhard
Test Date: 5/6/2010

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 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 10th harmonic.

Test Setup



Detector Settings	RBW	VBW	Span
Peak	1 MHz	3 MHz	as necessary
Average	1 MHz	3 MHz	as necessary

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
2405	4810	48.44	74.0	42.31	54.0	Pass
2405	7215	49.55	74.0	41.58	54.0	Pass
2405	9620	56.12	74.0	48.86	54.0	Pass

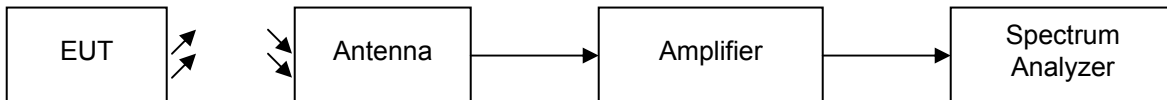
No other emissions were detectable. All emissions were greater than -20 dBc.

Name of Test: Emissions At Band Edges
Specification: 15.247(d), 15.209(a), 15.205
Test Equipment Utilized: i00008, i00028, i00103, i00320, i00331
Engineer: J. Erhard
Test Date: 5/6/2010

Test Procedure

The EUT was tested in a semi-anechoic chamber set 3m from the receiving transducer. A spectrum analyzer was used to verify that the EUT 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

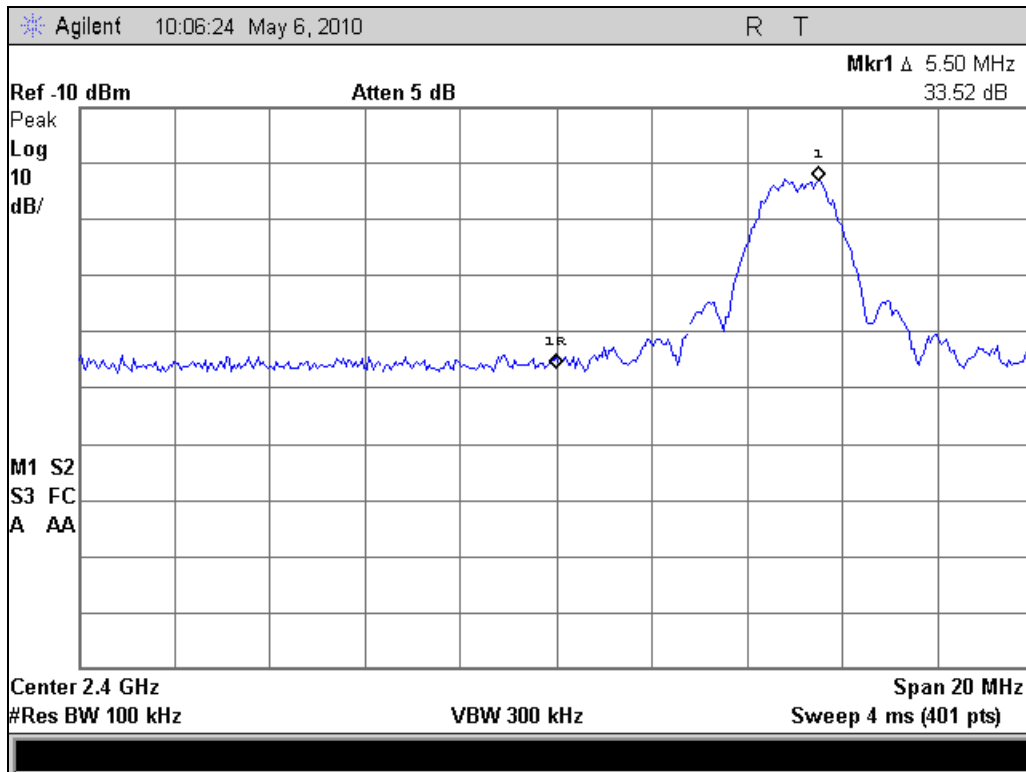
Tuned Freq (MHz)	Emission Freq (MHz)	Monitored Level (dBc)	Detector	Limit (dBc)	Result
2405	2400	-33.52	Peak	-20	Pass

Restricted Band Emissions Summary

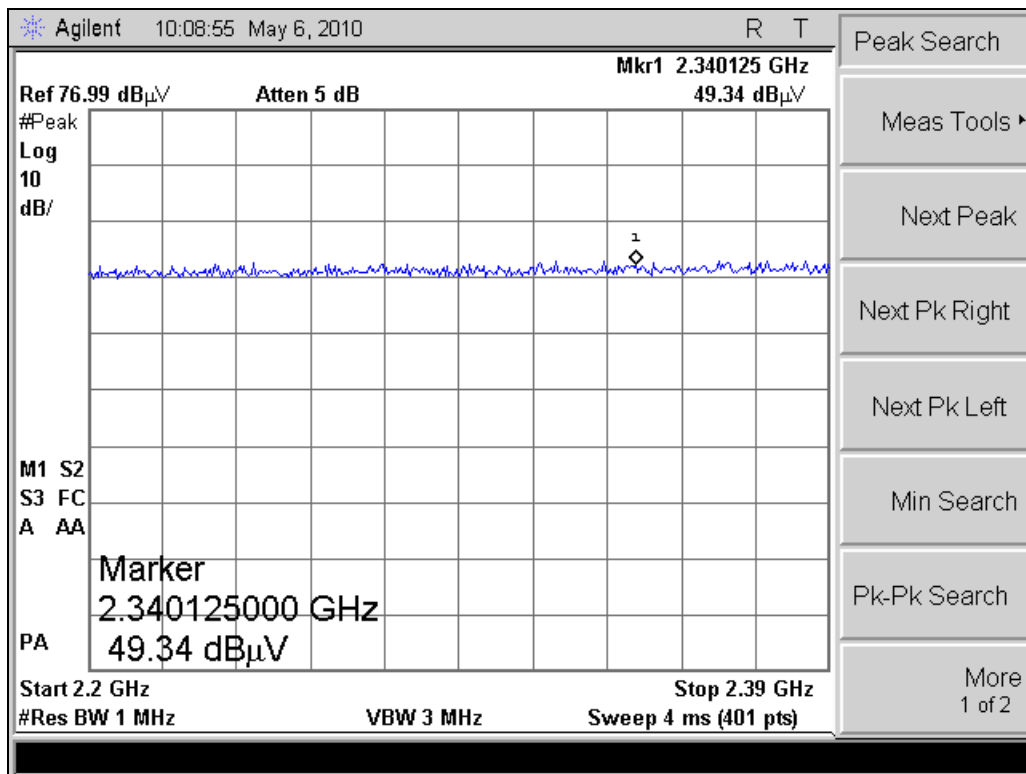
Tuned Freq (MHz)	Emission Freq (MHz)	Monitored Level (dBuV/m)	Detector	Limit (dBuV/m)	Result
2405	2340.125	49.34	Peak	74	Pass
2405	2340.125	41.55	Average	54	Pass



Band Edge 2400 MHz

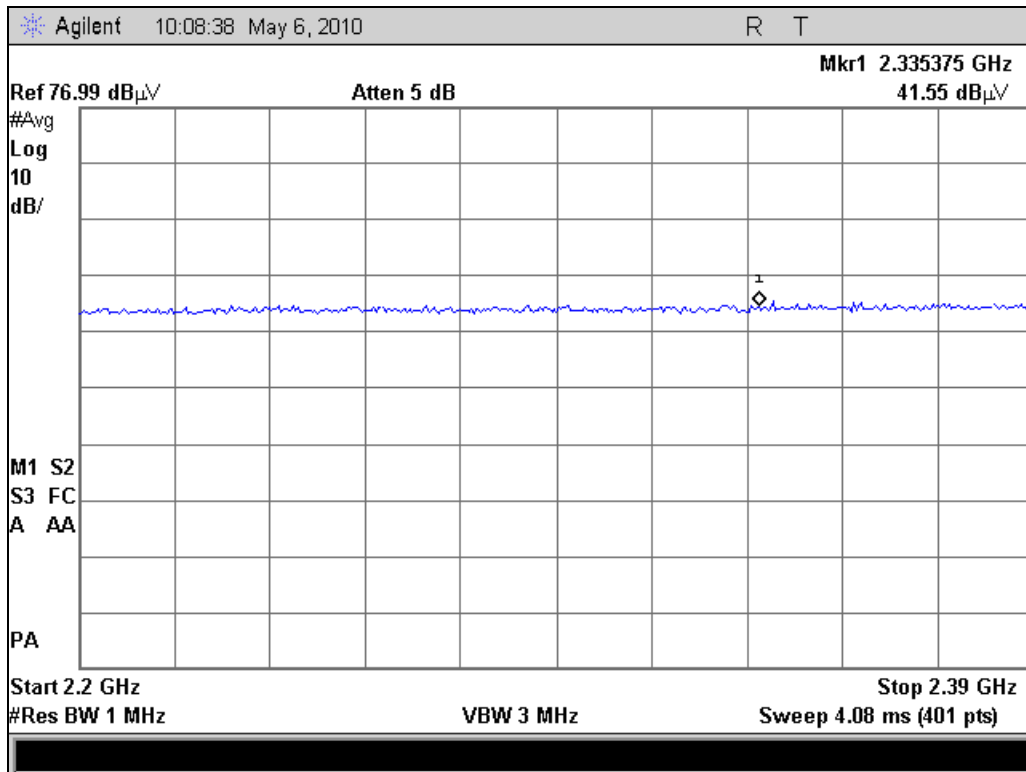


Restricted Band 2390 MHz Peak





Restricted Band 2390 MHz Average



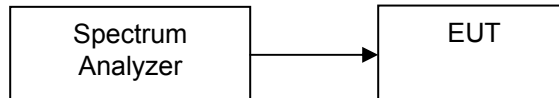
Name of Test: Occupied Bandwidth
Specification: 15.247(a)(2)
Test Equipment Utilized: i00008, i00320, i00331

Engineer: J. Erhard
Test Date: 5/5/2010

Test Procedure

The EUT 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



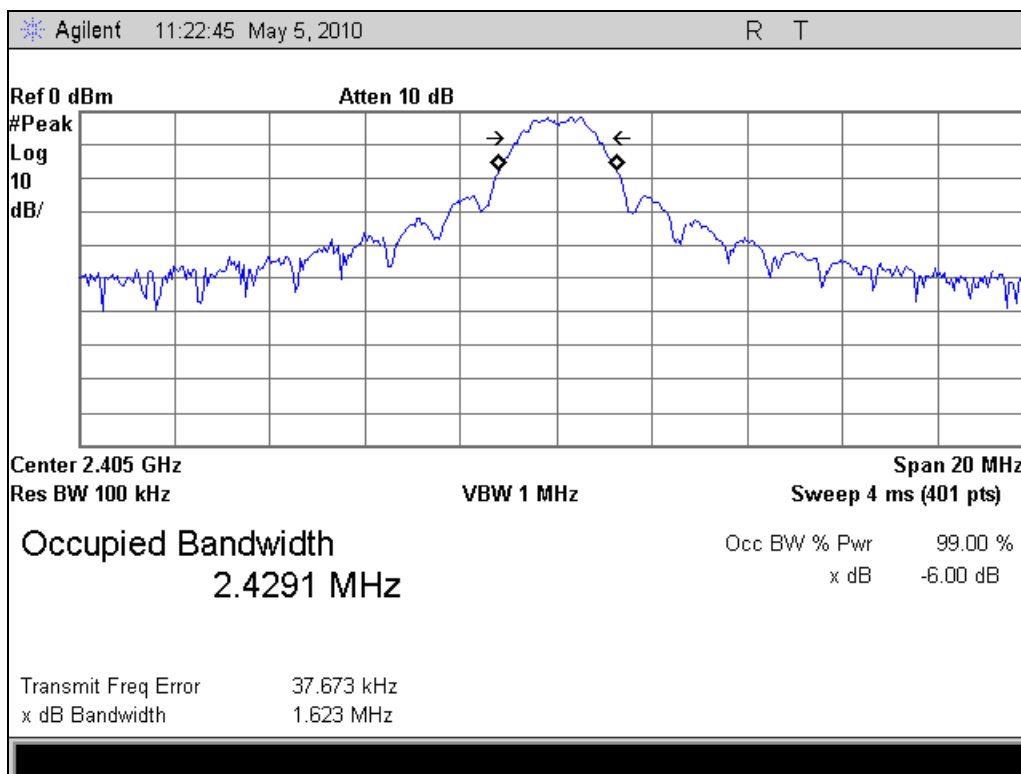
Occupied Bandwidth Summary

Frequency MHz	Recorded Measurement	Specification Limit	Result
2405	1.623 MHz	≥ 500 KHz	Pass

99% Bandwidth Summary

Frequency MHz	Recorded Measurement	Result
2405	2.4291 MHz	Pass

Bandwidth 2405 MHz

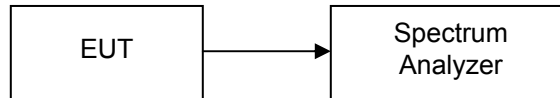


Name of Test: Transmitter Power Spectral Density (PSD)
Specification: 15.247(e) **Engineer: J. Erhard**
Test Equipment Utilized: i00008, i00320, i00331 **Test Date: 5/5/2010**

Test Procedure

The EUT 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.

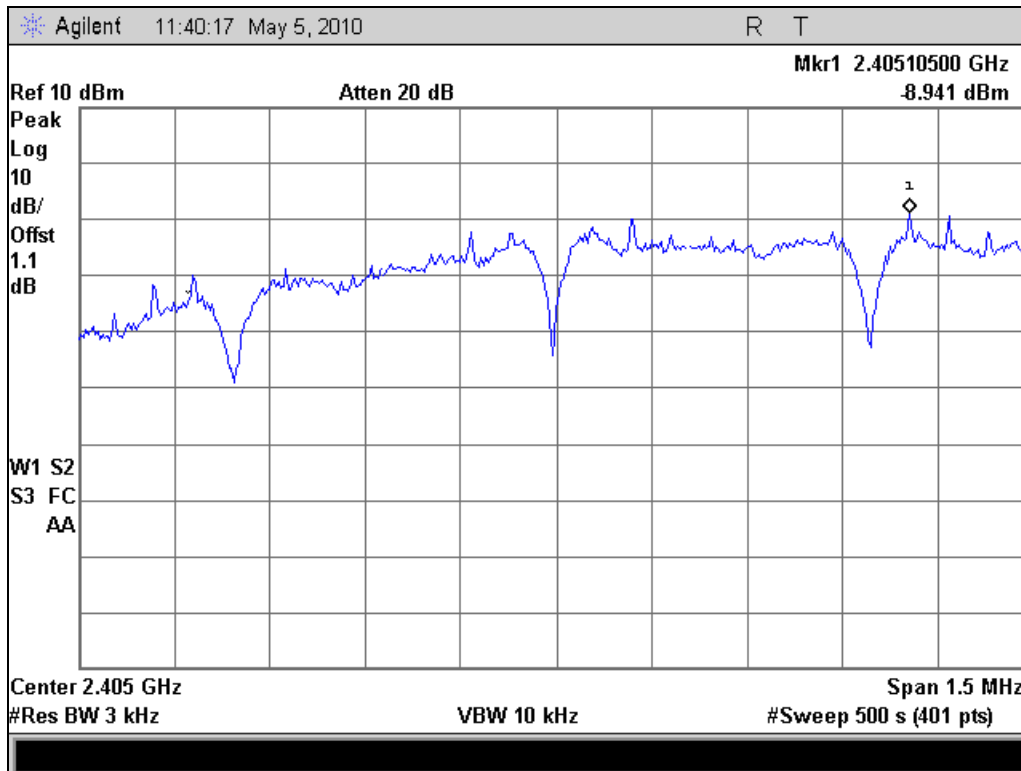
Test Setup



PSD Summary

Frequency MHz	Recorded Measurement	Specification Limit	Result
2405	-8.941 dBm	8 dBm	Pass

PSD 2405 MHz



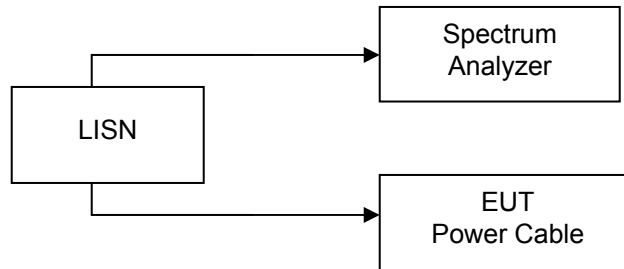
Name of Test: A/C Powerline Conducted Emissions
 Specification: 15.207
 Test Equipment Utilized: i00033, i00270

Engineer: J. Erhard
 Test Date: 6/11/2010

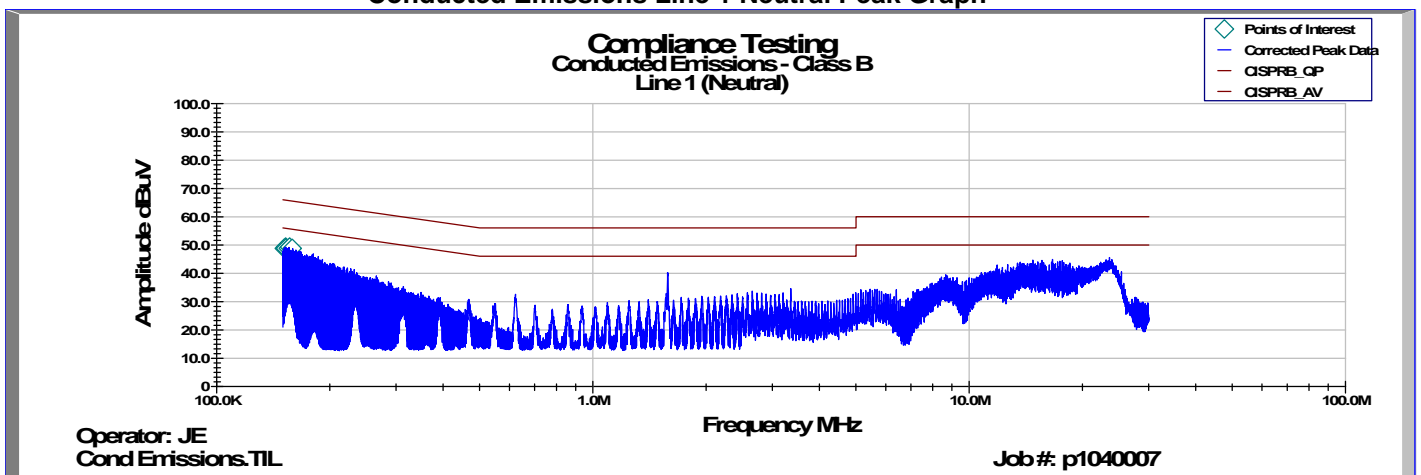
Test Procedure

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.

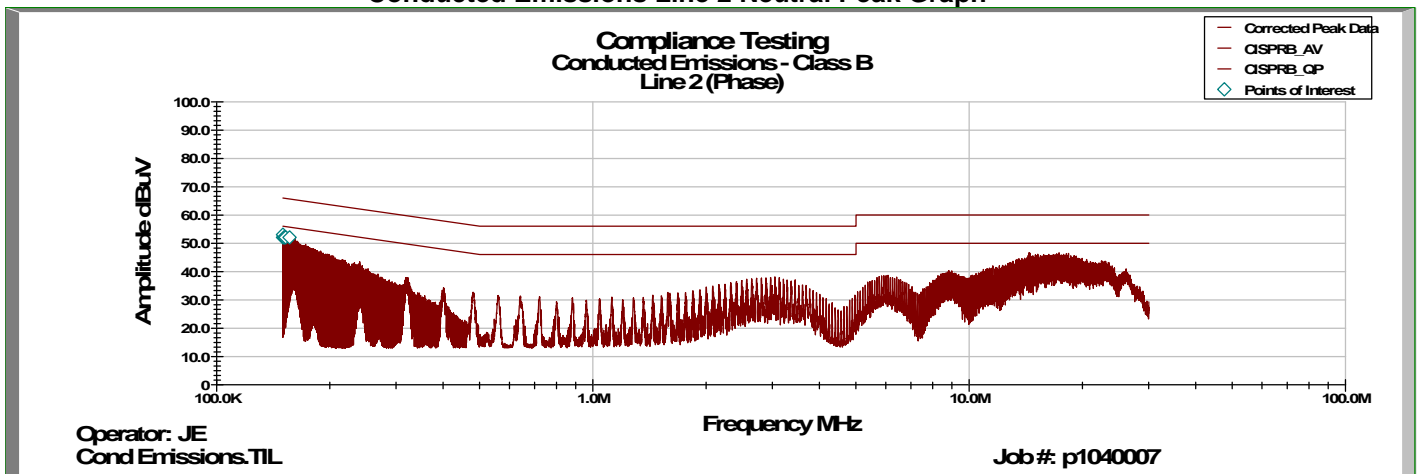
Test Setup



Conducted Emissions Line 1 Neutral Peak Graph



Conducted Emissions Line 2 Neutral Peak Graph



All peak values are below the quasi-peak and average limits.

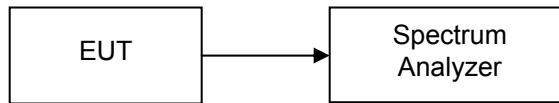
Name of Test: Receiver Spurious Emissions
Specification: RSS-GEN 6(b)
Test Equipment Utilized: i00008, i00320, i00331

Engineer: J. Erhard
Test Date: 5/5/2010

Test Procedure

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

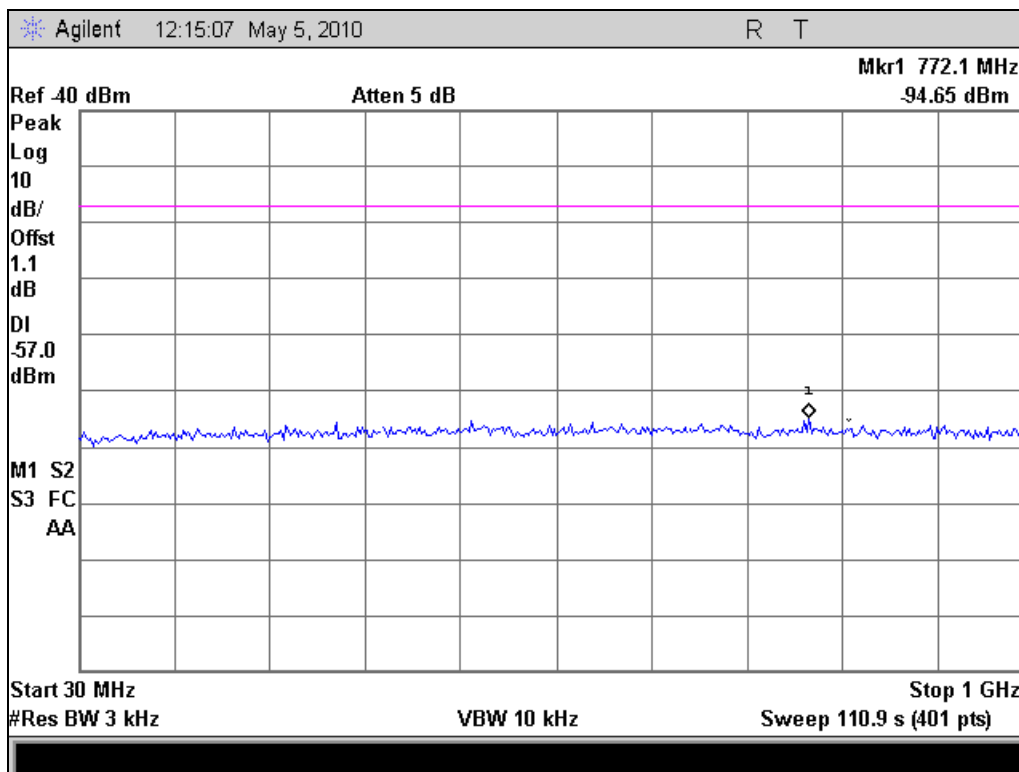
Test Setup

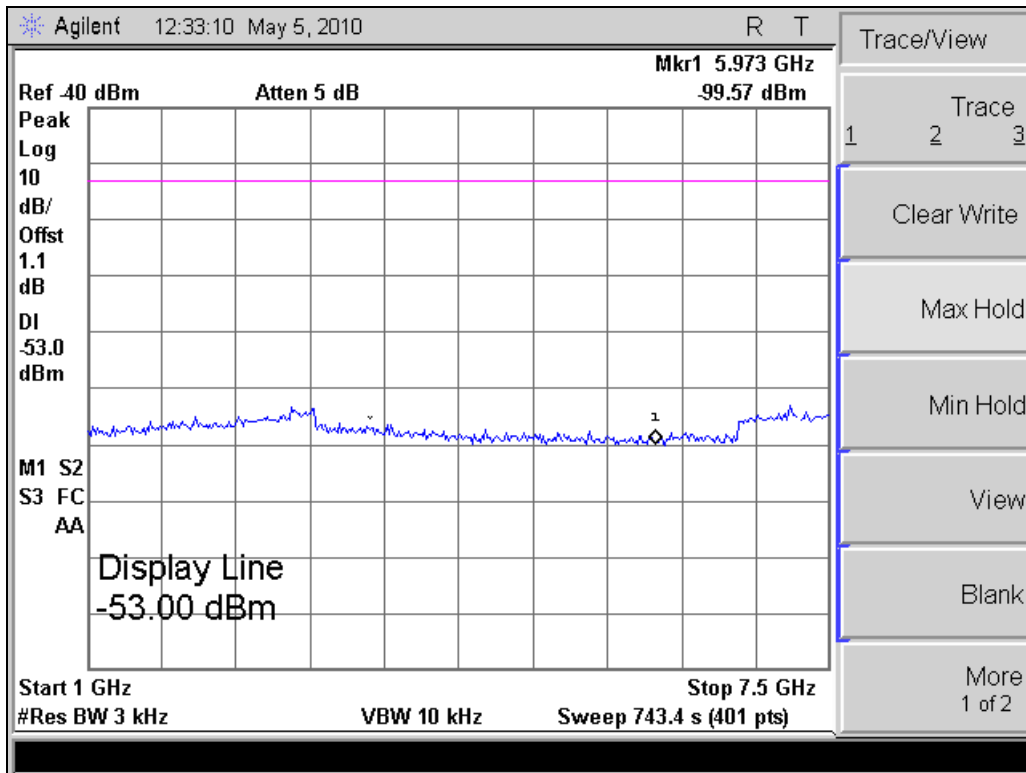


Receiver Spurious Emissions Summary

Frequency MHz	Recorded Measurement	Specification Limit	Result
30 MHz – 1 GHz	-94.65 dBm	-57 dBm	Pass
1 GHz – 7.5 GHz	-95.00 dBm	-53 dBm	Pass

Receiver Spurious Emissions







Test Equipment Utilized

Description	MFG	Model Number	CT Asset Number	Last Cal Date	Cal Due Date
DC Power Supply	Kenwood	PR18-3A	i00008	NCR	NCR
RF Amplifier	Agilent	8449A	i00028	6/29/2009	6/26/2010
Spectrum Analyzer	HP	8546A	i00033	11/4/2009	11/4//2010
Horn Antenna	EMCO	3115	i00103	11/25/2008	11/25/2010
LISN	FCC	FCC-LISN-50-32-2-01	i00270	9/17/2008	9/17/2010
DMM	Fluke	75III	i00320	2/16/2010	2/16/2011
Spectrum Analyzer	Agilent	E4407B	i00331	11/3/2009	11/3/2010

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