



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

Date: March 20, 2012

Applicant: Southwest Microwave, Inc.
9055 S. McKerny Street
Tempe, AZ 85284

Attention of: Edward J. Foley, Vice President, Engineering
Ph: (480) 783-0201
E-Mail: edf@southwestmicrowave.com

Equipment: Intrepid 330
Digital Microwave Field Disturbance Sensor

Attached is a copy of your Test Report(s) per the testing standards requested.
This report may not be reproduced, except in full, without written permission from Compliance Testing.
Please retain a copy of this report for your archival records.

The attached report indicates that the sample submitted for testing complied with relevant requirements of the pertinent standards we tested to.

If you are seeking an FCC Grant or other Certification requiring approval from a regulatory authority via a Certification Body (TCB or FCB), you may submit this report along with your application for review.

For EU, Production units meeting these standards can now be marketed after completion of the Manufacturer's Declaration of Conformity (DoC) and application of the CE marking.

Our invoice for services has been directed to your Accounts Payable Department, with a copy attached for your reference.

Should anything need clarification, do not hesitate to call or FAX.

It has been a pleasure to work with you and we do thank you for your order.

Sincerely,

Compliance Testing, LLC



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Test Report

Prepared for: Southwest Microwave, Inc

Model: Intrepid 330

Description: Digital Microwave Field Disturbance Sensor

To

FCC Part 1.1310

Date of Issue: March 15, 2012

On the behalf of the applicant:

Southwest Microwave, Inc.
9055 S. McKerny Street
Tempe, AZ 85284

Attention of:

Edward J. Foley, Vice President, Engineering
Ph: (480) 783-0201
E-Mail: edf@southwestmicrowave.com

Prepared By
Compliance Testing, LLC
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Project No: p1230003

John Erhard
Project Test Engineer

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Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	March 15, 2012	John Erhard	Original Document



Compliance Testing, LLC
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ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009)

The tests results contained within this test report all fall within our scope of accreditation, unless below.

Please refer to <http://www.compliancetesting.com/labscope.html> for current scope of accreditation.

Testing Certificate Number: **2152.01**



FCC OATS Reg, #933597

IC Reg. #2044A-1

Non-accredited tests contained in this report:

N/A



Description

The EUT is a 24.125 GHz microwave point to point proximity detector.

This is a mobile device used in Controlled Exposure environment.

Limits - Controlled Exposure 47 CFR 1.1310 Table 1, (A)

0.3-3.0 MHz:	Limit [mW/cm ²] = 100
3.0-30 MHz:	Limit [mW/cm ²] = (900/f ²)
30-300 MHz:	Limit [mW/cm ²] = 1.0
300-1500 MHz:	Limit [mW/cm ²] = f/300
1500-100,000 MHz:	Limit [mW/cm ²] = 5

Test Frequencies, MHz	24125
Power, Conducted, W (P)	0.009
Antenna Gain Isotropic	0 dBi
Antenna Gain Numeric (G)	1
Antenna Type	Array
Distance (R)	20 cm

Power Density Calculations	Formula:	$S = PG / 4R^2$
	Power Density (S) =	0.00178
	Limit =	5.0

END OF TEST REPORT



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Test Report

Prepared for: Southwest Microwave, Inc

Model: Intrepid 330

Description: Digital Microwave Field Disturbance Sensor

To

FCC Part 15.245

Date of Issue: March 15, 2012

On the behalf of the applicant:

Southwest Microwave, Inc.
9055 S. McKemy Street
Tempe, AZ 85284

Attention of:

Edward J. Foley, Vice President, Engineering
Ph: (480) 783-0201
E-mail: edf@southwestmicrowave.com

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Project No: p1230003

John Erhard
Project Test Engineer

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Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	March 15, 2012	John Erhard	Original Document



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Testing Certificate Number: **2152.01**



FCC OATS Reg, #933597

IC Reg. #2044A-1

Non-accredited tests contained in this report:

N/A



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 part may employ other methods of ensuring that the special accessories are provided to the consumer, without an additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.



Standard Test Conditions 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.

Environmental Conditions		
Temperature (Deg C)	Humidity (%)	Pressure (mbar)
24.60	17.90	972.800

EUT Description

Model: Intrepid 330

Description: Digital Microwave Field Disturbance Sensor

Firmware: N/A

Software: N/A

Additional Information: 24.125 GHz Transmitter

EUT Operation during Tests

The EUT hardware is in a normal operating configuration set to transmit and receive upon the application of power.

Accessories: None

Cables: None

Modifications: None

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



Test Results Summary

Specification	Test Name	Pass, Fail, N/A	Comments
15.245(b)	Field Strength of Fundamental Emissions	Pass	
15.245(b)	Field Strength of Radiated Emissions	Pass	
15.245(b)	Band Edge, Lower & Upper Edges	Pass	
15.207	DC Powerline Conducted Emissions	Pass	



Field Strength of Fundamental Emissions

Name of Test: Field Strength of Fundamental Emissions

Specification: 15.245(b)

Engineer: John Erhard

Test Equipment Utilized: i00193, i00273, i00331

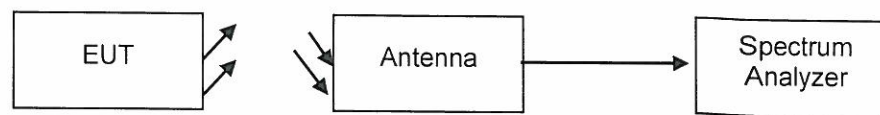
Test Date: 3/14/2012

Test Procedure

The EUT was tested in a semi anechoic chamber at a distance of 3 meters from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Fundamental Field Strength.

All measurements and limits were converted to dBm for ease of comparison.

Test Setup



Field Strength of Fundamental Emissions

Tuned Freq (MHz)	Measured Level (dBm)	Limit (dBm)	Result
24125	9.66	41 Peak	Pass
24125	9.56	21 Average	Pass



Field Strength of Radiated Emissions

Name of Test: Field Strength of Radiated Emissions

Specification: 15.245(b)

Engineer: John Erhard

Test Equipment Utilized: i00193, i00394, i00331

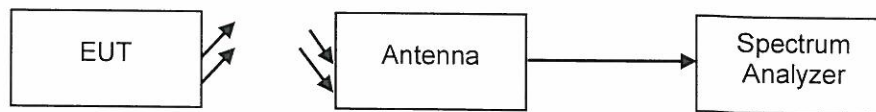
Test Date: 3/14/2012

Test Procedure

The EUT was tested in a semi anechoic chamber at a distance of 3 meters from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Field Strength of Radiated Emissions.

All measurements and limits were converted to dB/uV for ease of comparison.

Test Setup



Field Strength of Radiated Emissions

Emission Freq (MHz)	Measured Value (dBuV/m)	Limit (dBuV/m)	Result
48250	23.11	88	Pass
72375	23.62	88	Pass
94412	19.82	54.0	Pass



Band Edge, Lower & Upper Edges

Name of Test: Band Edge, Lower & Upper Edges

Specification: 15.245(b)

Engineer: John Erhard

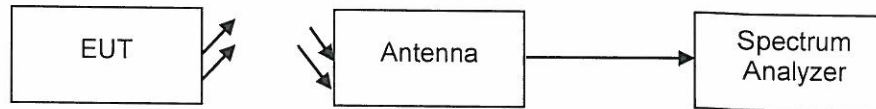
Test Equipment Utilized: i00193, i00273, i00331

Test Date: 3/14/2012

Test Procedure

The EUT was tested in a semi anechoic chamber at a distance of 3 meters from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for the upper and lower band edge.

Test Setup



Band Edge Summary

Frequency (MHz)	Recorded Measurement (dBc)	Limit (dBc)	Result
24075	-50.93	50	Pass
24175	-56.64	50	Pass



15.207 D/C Powerline Conducted Emissions

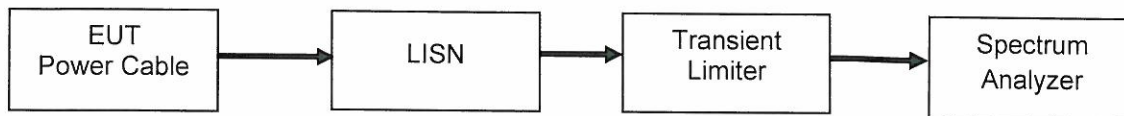
Name of Test: D/C Powerline Conducted Emissions
Test Equipment Utilized: i00379, i00123, i00270

Engineer: John Erhard
Test Date: 3/14/2012

Test Procedure

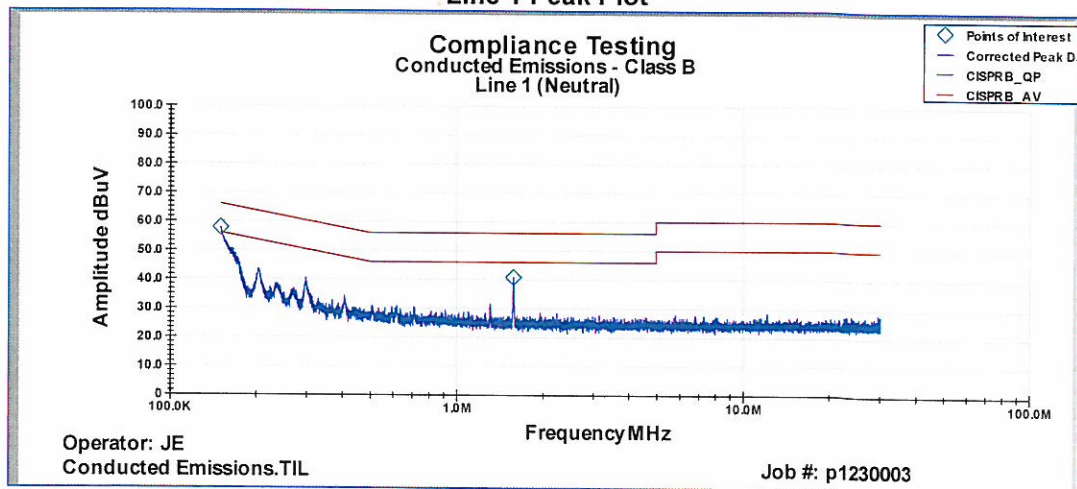
The EUT power cable was connected to a LISN and the monitored output of the LISN was connected to a transient limiter, which then connected directly to a spectrum analyzer. The conducted emissions from 150 kHz to 30 MHz were measured and compared to the specification limits. The device was powered by a 12 VDC battery. The normal operating voltage is 10 – 60 VDC.

Test Setup

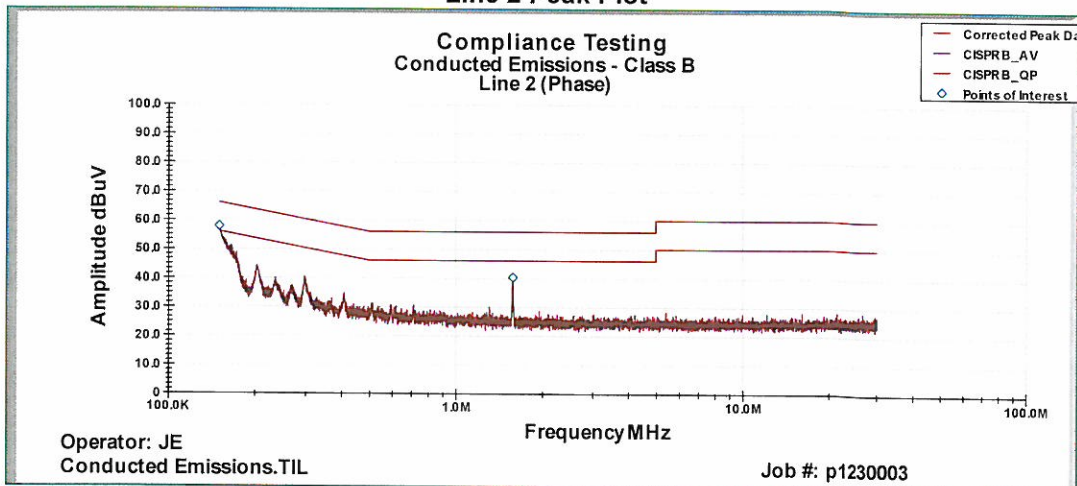


Conducted Emissions Test Results

Line 1 Peak Plot



Line 2 Peak Plot





Line 1 Neutral Avg Detector

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L1 Final Data (dBuV)	Limit (dBuV)	Avg Margin (dB)
1.5813 MHz	27.09	0.00	0.059	10.100	37.253	46.000	-8.747
150.03 KHz	41.48	0.30	0.020	10.200	51.998	55.999	-4.001

Line 2 Phase Avg Detector

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L2 Final Data (dBuV)	Limit (dBuV)	Avg Margin (dB)
1.5787 MHz	26.91	0.00	0.059	10.100	37.066	46.000	-8.934
150.01 KHz	41.69	0.30	0.020	10.200	52.210	56.000	-3.790

Line 1 Neutral QP Detector

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L1 Final Data (dBuV)	Limit (dBuV)	QP Margin (dB)
1.5813 MHz	29.621	0.000	0.059	10.100	39.780	56.000	-16.220
150.03 KHz	45.557	0.300	0.020	10.200	56.076	65.999	-9.923

Line 2 Phase QP Detector

Frequency	Measured Value (dBuV)	LISN Corr. Fact (dB)	Cable Loss (dB)	Transient Limiter (dB)	L2 Final Data (dBuV)	Limit (dBuV)	QP Margin (dB)
1.5787 MHz	29.71	0.00	0.059	10.100	39.866	56.000	-16.134
150.01 KHz	45.82	0.30	0.020	10.200	56.343	66.000	-9.657

No other signals were within 20 dB of the limit.



Test Equipment Utilized

Description	Manufacturer	Model Number	CT Asset #	Last Cal Date	Cal Due Date
Harmonic Mixer	HP	11970A	i00193	6/21/11	6/21/12
Horn antenna	ARA	MWH-1826/B	i00273	4/20/2009	4/20/2012
Humidity / Temp Meter	Newport	IBTHX-W-5	i00282	11/5/11	11/5/12
Spectrum Analyzer	Agilent	E4407B	i00331	5/24/11	5/24/12
Standard Gain Horn Kit	Pacific Millimeter Products	Mixer Mdl: MD1A 60 – 90 GHz Horn Mdl: EM 90 – 140 GHz Horn Mdl: FM	i00394	NCR	NCR
Transient Limiter	Com-Power	LIT-930	i00123	Verified on:	3/14/2012
LISN	FCC	FCC-LISN-50-32-2-01	i00270	9/30/10	9/30/12
Spectrum Analyzer	Agilent	E7405A	i00379	12/14/11	12/14/12

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