



Compliance Testing, LLC

Previously Flom Test Lab

RF, EMC and Safety Testing Experts Since 1963

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<http://www.ComplianceTesting.com>
info@ComplianceTesting.com

Date: December 28, 2010

Attention: Authorization & Evaluation Division

Applicant: ECotality North America
430 S 2nd Ave
Phoenix, AZ 85003

Equipment: RFID Board Version 1.4

FCC ID: Y5X53339474278

FCC Rules: 15.225

Enclosed please find your copy of the Engineering Test Report for which you are subject to the restrictions as listed on the attached summary.

This report may not be reproduced, except in full, without written permission from Compliance Testing, LLC.
Please retain a copy of this report for your archival purposes.

Once a Telecommunication Certification Body (TCB) issues a Grant the Federal Communication Commission (FCC) has 30 days to review the application and request added information. It is your decision whether or not to market the equipment subject to a possible recall before the end of the 30 days.

If your equipment is still retained by us, it will be returned to you 30 days after approval is achieved.

Our invoice for services has been directed to your Accounts Payable Department.

For any additional information please contact us.

Sincerely,

Compliance Testing



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Test Report

for

FCC ID: Y5X53339474278

Model: RFID Board Version 1.4

to

Federal Communications Commission

Rule Part(s) 15.225

Date of Report: December 28, 2010

On the Behalf of the Applicant: ECotality North America
430 S 2nd Ave
Phoenix, AZ 85003

Attention of: Dimitri Hochard, Sr. Product Engineer
Ph: (602) 716-9576
Fax: (602) 256-2606
E-mail: dhochard@etecevs.com

By
Compliance Testing, LLC
3356 N. San Marcos Place, Suite 107
Chandler, Arizona 85225-7176
(866) 311-3268 phone, (480) 926-3598 fax



Test Report Revision History

Revision	Date	Revised By	Reason for revision
1.0	December 28, 2010	J. Erhard	Original Document
2.0	January 27, 2011	J. Erhard	Add test data for pedestal host
3.0	March 17, 2011	J. Erhard	Add test data for Industry Canada



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 is true and correct.

A handwritten signature in black ink, appearing to read "John Erhard".

John Erhard: Engineering Manager

Certifying Engineer:



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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

(b)(1):
Name and Address of Applicant: ECotality North America
430 S 2nd Ave
Phoenix, AZ 85003

(b)(2):
FCC ID: Y5X53339474278
Model Number: RFID Board Version 1.4

(b)(3):
Instruction Manual(s): Please See Exhibits

(b)(4):
Theory of Operation: Please See Exhibits

(b)(5):
Block Diagram: Please See Exhibits

(b)(6):
Test Report: Contained Herein

(b)(7):
Test Setup Photos: Please See Exhibits

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



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.

Environmental Conditions		
Temperature	Humidity	Pressure
79 Degrees Fahrenheit	26%	30.05 inches of Mercury

A2LA

“A2LA has accredited Compliance Testing LLC 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 Reg. # 2044A-1



Test Results Summary

Specification	Test Name	Pass, Fail, N/A	Comments
15.225(a)	Fundamental Field Strength	Pass	
15.225(b)(c)(d)	Out of Band Spurious Emissions	Pass	
15.225(e)	Frequency Stability	Pass	
12.209	Radiated Emissions	Pass	
12.207	Conducted Powerline Emissions	Pass	
RSS-GEN	99% Bandwidth	Pass	



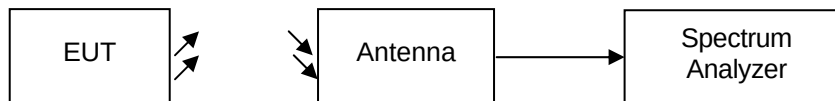
Name of Test: Field Strength
Specification: 15.225(a)(b)(c)(d)
Test Equipment Utilized: i00326, i00379

Engineer: J. Erhard
Test Date: 12/27/2010 – 1/27/2011

Test Procedure

The EUT was tested on an anechoic chamber at a distance of 1 meter from the receiving loop antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Fundamental Field Strength. The antenna correction and distance correction factors were summed with the quasi-peak measurement to ensure accurate readings were obtained. The following table indicates the highest emission in each of the indicated bands.

Test Setup



Field Strength (Wall Mount)

Frequency Band (MHz)	Measured Frequency (MHz)	Monitored Level (dBuV/m)	Distance CF (dB)	Antenna CF (dB)	Corrected Measurement (dBuV/m)	Limit (dBuV/m)	Result
13.110-13.410	13.221	14.91	59.1	17.8	-61.99	40.51	Pass
13.410-13.553	13.553	75.28	59.1	17.8	-1.62	50.47	Pass
13.553-13.567	13.56	85.25	59.1	17.8	8.35	84.00	Pass
13.567-13.710	13.567	68.25	59.1	17.8	-8.65	50.47	Pass
13.710-14.010	13.857	9.558	59.1	17.8	-67.342	40.51	Pass

Field Strength (Pedestal)

Frequency Band (MHz)	Measured Frequency (MHz)	Monitored Level (dBuV/m)	Distance CF (dB)	Antenna CF (dB)	Corrected Measurement (dBuV/m)	Limit (dBuV/m)	Result
13.110-13.410	13.381	27.83	59.1	17.8	-49.07	40.51	Pass
13.410-13.553	13.553	65.79	59.1	17.8	-11.11	50.47	Pass
13.553-13.567	13.558	75.95	59.1	17.8	-0.95	84.00	Pass
13.567-13.710	13.567	59.33	59.1	17.8	-17.57	50.47	Pass
13.710-14.010	13.947	28.17	59.1	17.8	-48.73	40.51	Pass

* Note. Cable correction factors are not included in this measurement as the low loss of the high quality TWINAX cable at low frequencies is practically non-existent.



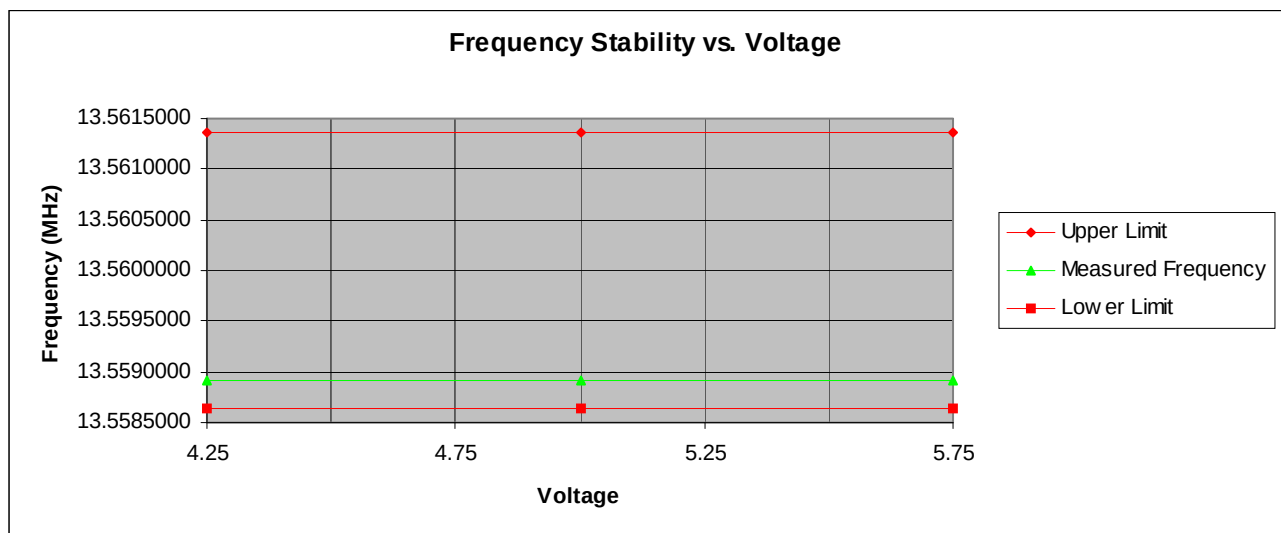
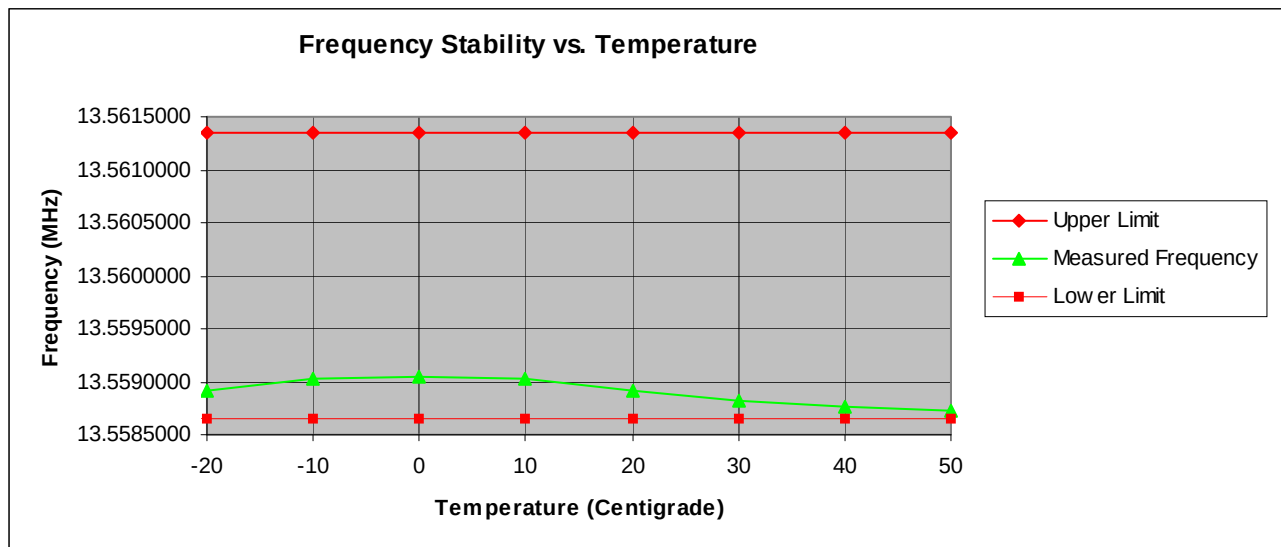
Name of Test: Frequency Stability
Specification: 15.225(e)
Test Equipment Utilized: i00027, i00029, i00319, i00343, i0035

Engineer: J. Erhard
Test Date: 12/28/2010

Test Procedure

The EUT was placed in an environmental test chamber and a frequency counter was utilized to verify that the frequency stability met the requirement for frequency stability across the temperature range from -20°C to +50°C. A variable DC power supply was used to vary the voltage from 85% to 115% of the rated voltage.

Test Setup





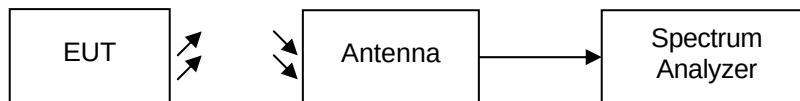
Name of Test: Radiated Emissions
Specification: 15.209
Test Equipment Utilized: i00033, i00267

Engineer: J. Erhard
Test Date: 12/27/2010 – 1/26/2011

Test Procedure

The EUT was tested on an Open Area Test Site (OATS) at a distance of 3 meters from the receiving antenna. A spectrum analyzer was used to verify that the UUT met the requirements for Radiated Emissions. The spectrum for each tuned frequency was examined beyond the 10th harmonic.

Test Setup



Radiated Emissions (Wall mount)

Emission Freq (MHz)	Measured Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
42.550	23.7	40.0	-16.3
142.850	22.6	43.0	-20.4
237.300	26.4	46.0	-19.6
428.900	30.7	46.0	-15.3
708.550	29.8	46.0	-16.2
968.000	32.7	46.0	-13.3

Radiated Emissions (Pedestal)

Emission Freq (MHz)	Measured Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)
38.6	17.69	40	-22.31
138.590	23.72	40	-16.28
286.010	43.55	46	-2.45
352.270	19.95	46	-26.05
556.750	20.12	46	-25.88
725.650	24.48	46	-21.52



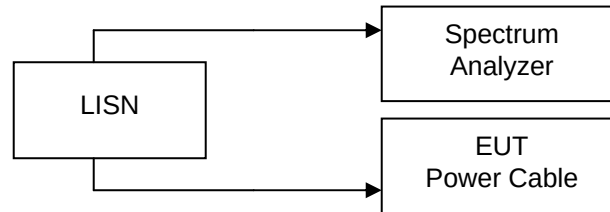
Name of Test: Powerline Conducted Emissions
Specification: 15.207
Test Equipment Utilized: i00270, i00379

Engineer: J. Erhard
Test Date: 12/27/2010

Test Procedure

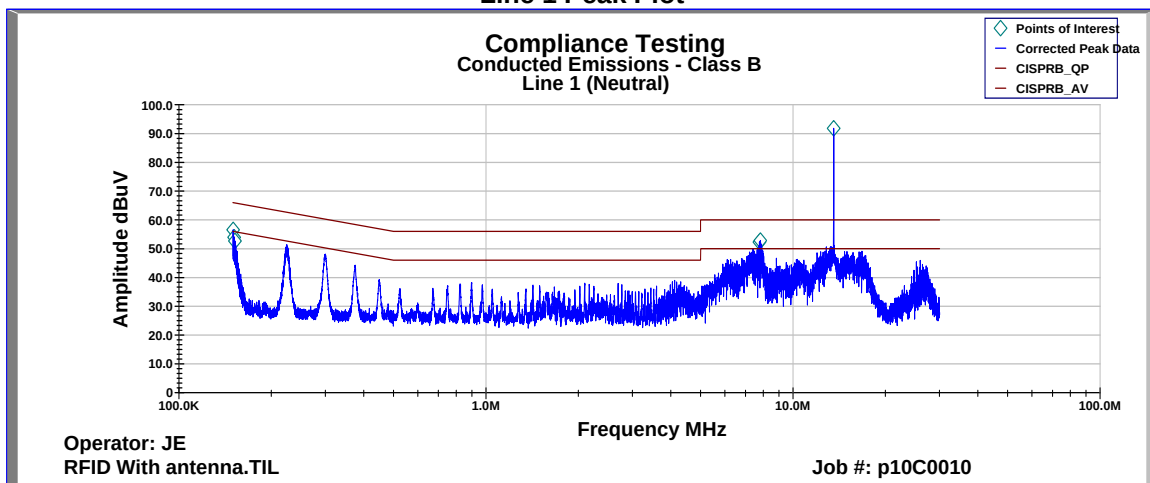
The EUT power cable connected to a LISN and the monitored output of the LISN was connected directly to a spectrum analyzer. The conducted emissions from 150 kHz to 30 MHz were monitored and compared to the specification limits. The average measurements were the worst-case and are recorded in the tables below.

Test Setup

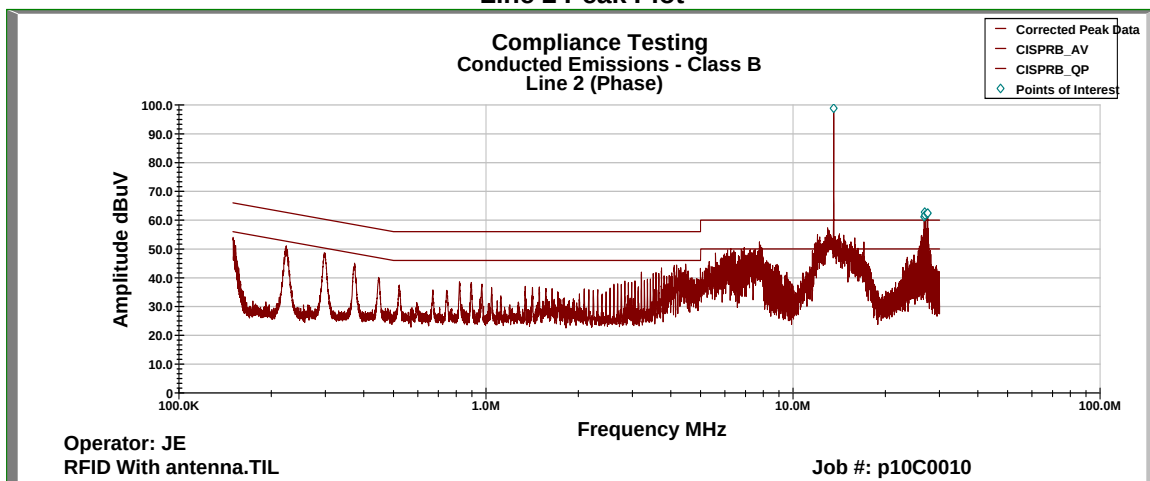


Test Results with Antenna

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)
13.559 MHz	81.16	0	0.692	10	91.856	50	41.856
7.8326 MHz	29.16	0	0.524	10	39.683	50	-10.317
7.7702 MHz	27.88	0	0.522	10	38.404	50	-11.596
150.47 KHz	38.51	0.3	0.041	10	48.85	55.987	-7.137
150.3 KHz	38.75	0.3	0.037	10	49.085	55.991	-6.907
150.02 KHz	38.96	0.3	0.043	10	49.304	55.999	-6.696

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)
27.417 MHz	26.29	0.2	1.051	10	37.54	50	-12.46
27.336 MHz	28.73	0.2	1.047	10	39.981	50	-10.019
26.895 MHz	30.58	0.2	1.04	10	41.82	50	-8.18
26.82 MHz	30.48	0.2	1.039	10	41.722	50	-8.278
26.746 MHz	28.6	0.2	1.039	10	39.836	50	-10.164
13.559 MHz	93.49	0	0.692	10	104.18	50	54.18

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)
13.559 MHz	81.152	0	0.692	10	91.844	60	31.844
7.8326 MHz	38.865	0	0.524	10	49.388	60	-10.612
7.7702 MHz	38.527	0	0.522	10	49.048	60	-10.952
150.47 KHz	42.623	0.295	0.041	10	52.959	65.987	-13.028
150.3 KHz	42.955	0.297	0.037	10	53.288	65.991	-12.703
150.02 KHz	43.139	0.3	0.043	10	53.482	65.999	-12.518

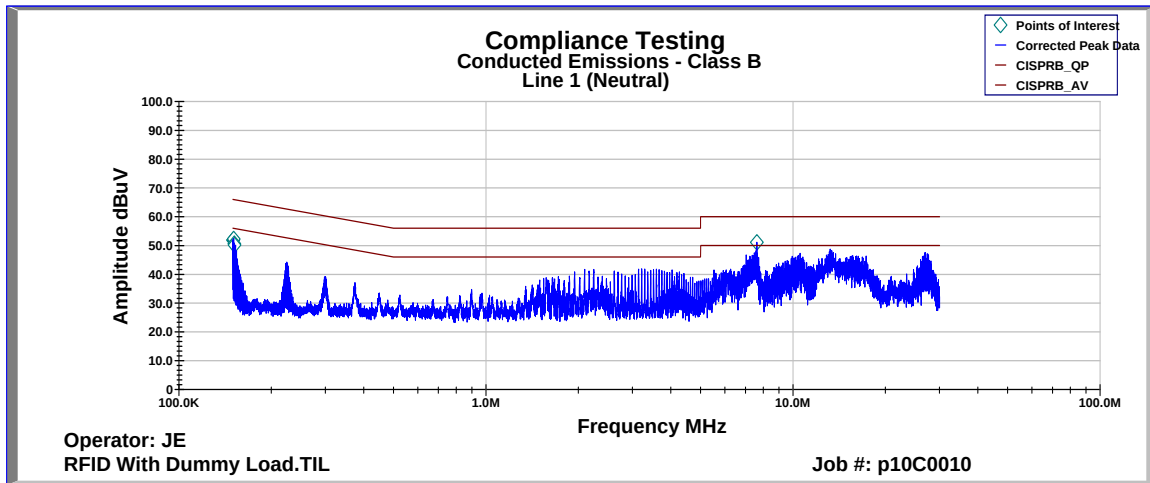
Line 2 Phase QP Detector

Frequency	Measured Data (dBuV)	LISN Corr Fact (dB)	Cable Loss (dB)	Attenuator (dB)	L2 Final Data (dBuV)	CISPR/FCC Limit (dBuV)	QP Margin (dB)
27.417 MHz	30.08	0.2	1.051	10	41.327	60	-18.673
27.336 MHz	31.36	0.2	1.047	10	42.603	60	-17.397
26.895 MHz	33.04	0.2	1.04	10	44.282	60	-15.718
26.82 MHz	33.22	0.2	1.039	10	44.46	60	-15.54
26.746 MHz	32.16	0.2	1.039	10	43.398	60	-16.602
13.559 MHz	93.44	0	0.692	10	104.134	60	44.134

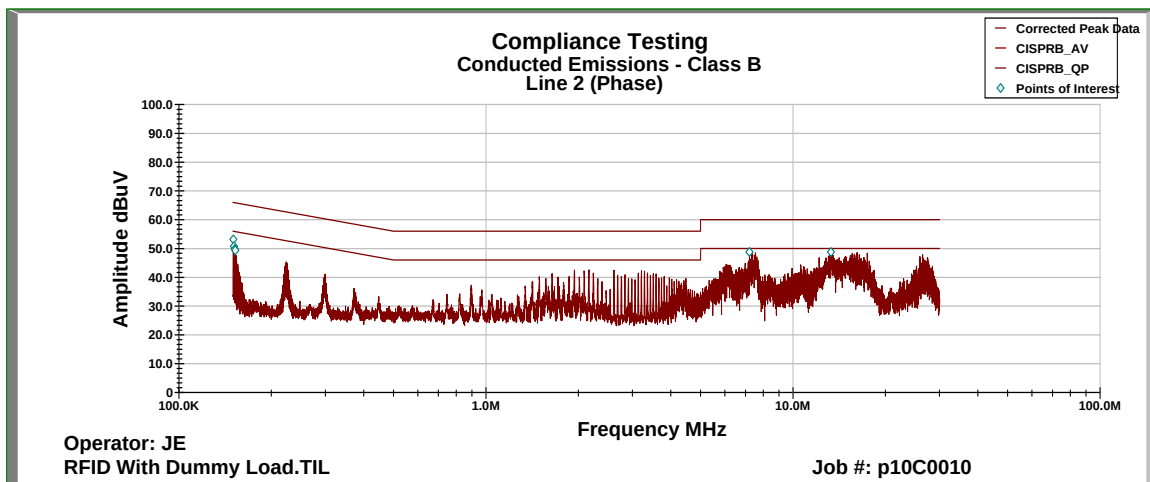


Test Results with Dummy Load

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)
7.6201 MHz	23.42	0	0.513	10	33.938	50	-16.062
150.65 KHz	30.92	0.29	0.041	10	41.256	55.981	-14.725
150.31 KHz	31.18	0.3	0.037	10	41.515	55.991	-14.477
150.21 KHz	31.29	0.3	0.041	10	41.625	55.994	-14.369
150.14 KHz	31.29	0.3	0.043	10	41.635	55.996	-14.361
150.02 KHz	31.28	0.3	0.043	10	41.618	55.999	-14.381

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)
13.273 MHz	26.01	0	0.679	10	36.686	50	-13.314
7.1941 MHz	21.88	0	0.509	10	32.385	50	-17.615
150.75 KHz	30.83	0.29	0.04	10	41.158	55.978	-14.821
150.48 KHz	31.05	0.3	0.041	10	41.39	55.986	-14.597
150.19 KHz	31.31	0.3	0.041	10	41.647	55.994	-14.348
150.02 KHz	31.44	0.3	0.043	10	41.778	56	-14.221

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)
7.6201 MHz	31.112	0	0.513	10	41.625	60	-18.375
150.65 KHz	39.758	0.293	0.041	10	50.092	65.981	-15.889
150.31 KHz	39.981	0.297	0.037	10	50.315	65.991	-15.677
150.21 KHz	40.118	0.298	0.041	10	50.456	65.994	-15.538
150.14 KHz	40.169	0.299	0.043	10	50.511	65.996	-15.485
150.02 KHz	40.163	0.3	0.043	10	50.506	65.999	-15.493

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)
13.273 MHz	32.17	0	0.679	10	42.852	60	-17.148
7.1941 MHz	30.36	0	0.509	10	40.873	60	-19.127
150.75 KHz	39.13	0.29	0.04	10	49.463	65.978	-16.516
150.48 KHz	39.31	0.3	0.041	10	49.651	65.986	-16.335
150.19 KHz	39.61	0.3	0.041	10	49.947	65.994	-16.048
150.02 KHz	39.71	0.3	0.043	10	50.05	66	-15.95



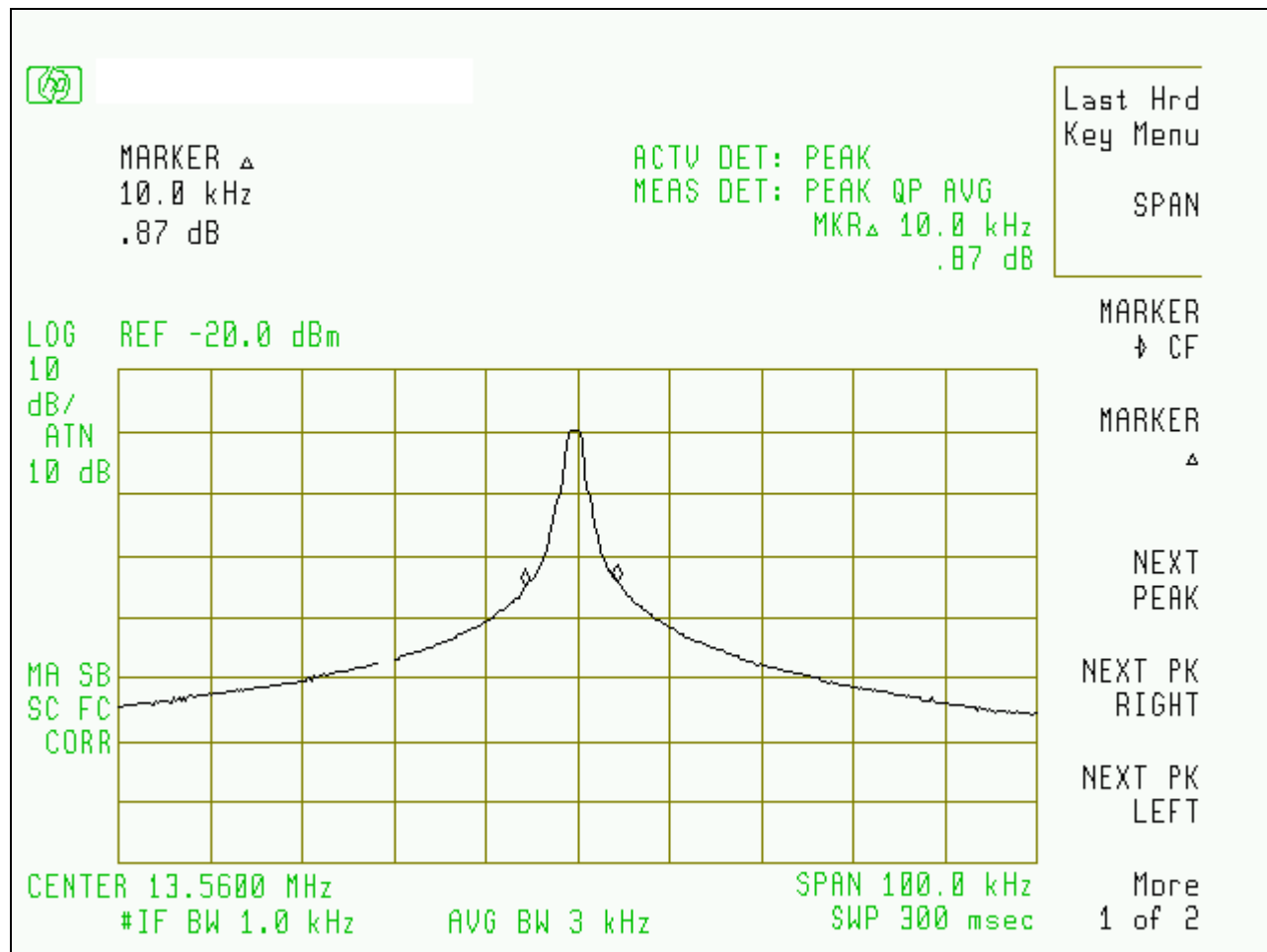
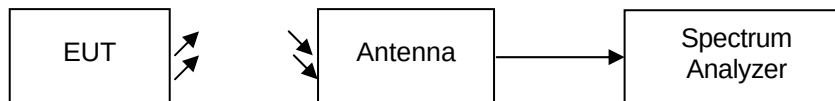
Name of Test: 99% Occupied Bandwidth
Specification: RSS-GEN
Test Equipment Utilized: i00326, i00033

Engineer: J. Erhard
Test Date: 12/27/2011

Test Procedure

The EUT was tested on an anechoic chamber at a distance of 1 meter from the receiving loop antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Fundamental Field Strength. The antenna correction and distance correction factors were summed with the quasi-peak measurement to ensure accurate readings were obtained. The following table indicates the highest emission in each of the indicated bands.

Test Setup



**Test Equipment Utilized**

Description	MFG	Model Number	CT Asset Number	Last Cal Date	Cal Due Date
Temperature Chamber	Tenney	Tenney Jr	i00027	NCR	NCR
Spectrum Analyzer	HP	8563E	i00029	9/17/2010	9/17/2011
Spectrum Analyzer	HP	85462A	i00033	10/3/2010	10/3/2011
Bi-Log Antenna	Schaffner	CBL6111C	i00267	11/21/2009	11/21/2011
LISN	FCC	FCC-LISN-50-32-2-01	i00270	9/30/2010	9/30/2012
DMM	Fluke	87 III	i00319	7/9/2010	7/9/2011
Active Loop Antenna	EMCO	6507	i00326	4/1/2009	4/1/2011
Data Logger	Fluke	Hydra	i00343	11/18/2010	11/12/2011
Power Supply	HP	6654A	i00350	NCR	NCR
Spectrum Analyzer	Agilent	E7405A	i00379	11/22/2010	11/22/2011

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