Engineering and Testing for EMC and Safety Compliance

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FCC Part 15.249 & IC RSS-210
Certification Application Report

Test Lab:	Applicant:
Rhein Tech Laboratories, Inc. Tel: 703-689-0368 360 Herndon Parkway Fax: 703-689-2056 Suite 1400 Herndon, VA 20170 EMail: atcbinfo@rheintech.com Web: http://www.rheintech.com	Identec Solutions Inc. Tel: 250-860-6567 Suite 200, 1358 St. Paul Street Kelowna, BC V1Y 2E1 Canada Contact: Barry Allen

FCC ID/ IC:	O2E-ILR-ICARD350/ 3538B-ICARD350	**Test Report Date:**	May 29, 2008
Platform:	N/A	**RTL Work Order #:**	2008094
Model:	i-CARD CF-350	**RTL Quote #:**	QRTL08-232
American National Standard Institute:	ANSI C63.4-2003: Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz		
FCC Classification:	DXX – Part 15 Low Power Communication Device Transmitter		
FCC Rule Part(s)/Guidance:	Part 15.249 (10-01-06): Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz, and 24.0-24.25 GHz (10-01-07)		
Industry Canada:	RSS-210: Low Power License-Exempt Communications Devices (Issue 7)		
Digital Interface Information :	N/A		

Frequency Range (MHz)	Output Power (W)	Frequency Tolerance	Emission Designator
920 – 921	N/A	N/A	114KF1D

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards. Furthermore, there was no deviation from, additions to, or exclusions from, the applicable parts of FCC Part 2, FCC Part 15, and ANSI C63.4.

Signature: _____ Date: May 29, 2008

Typed/Printed Name: Desmond A. Fraser Position: President

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1 General Information

1.1 Scope

FCC Rules Part 15.249: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz, and 24.0-24.25 GHz.

IC RSS-210 Section A2.9: 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz.

1.2 Modifications

The firmware power setting control was set to 14 decimal for compliance.

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Rhein Tech Laboratories (RTL), 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 2003).

1.4 Related Submittal(s)/Grant(s)

This is an original certification application for Identec Solutions, Inc. Model i-CARD CF-350, FCC ID: O2E-ILR-ICARD350, IC: 3538B-ICARD350.

2 Test Information

2.1 Test Justification

The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. The low channel at 920 MHz and the high channel at 921 MHz were tested and investigated from 9 kHz to 10 GHz. Data for both channels is presented in this report. The test results relate only to the item that was tested.

2.2 Exercising the EUT

The EUT was provided with software to continuously transmit during testing. The carrier was also checked to verify that the information was being transmitted. There were no deviations from the test standard(s) and/or methods. The IF, LO, and up to the 2nd LO, were investigated and tested, and found to be compliant.

2.3 Test Result Summary

Table 2-1: Test Result Summary with FCC Rules and Regulations

Standard	Test	Pass/Fail or N/A
FCC 15.249(a)	Radiated Emissions	Pass
FCC 15.207	AC Line Conducted Emissions	Pass
RSS-Gen	20 dB Bandwidth	N/A

2.4 Test System Details

The test sample was received on April 30, 2008. The FCC Identifiers for all equipment, plus descriptions of all cables used in the tested system, are shown in the table below.

Table 2-2: Equipment under Test (EUT)

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
RFID Reader	Identec Solutions, Inc.	i-CARD CF-350	08032C0036	O2E-ILR-ICARD350	N/A	18405
Patch Antenna	Identec Solutions, Inc.	i-PATCH PSION1 1.0	N/A	N/A	N/A	18404
Antenna	Identec Solutions, Inc.	N/A	N/A	N/A	N/A	18407

2.5 Configuration of Tested System

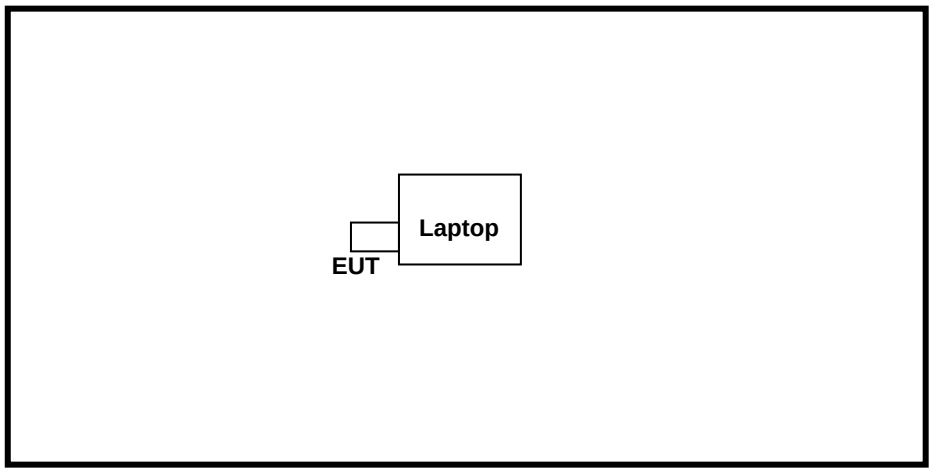


Figure 2-1: Worst Case Configuration of System under Test

3 Radiated Emission Limits Fundamental Emissions – FCC §15.249 & IC RSS-210 §A2.9

3.1 Radiated Emission Limits Test Procedure

Radiated Emissions of the fundamentals were tested at three meters, and meet the quasi-peak limit of 50 mV/m. The EUT was tested in all three orthogonal planes for the low and high channels; the worst case emissions are shown. Quasi-peak measurements were taken and are compared to the quasi-peak limit.

3.2 Radiated Emission Limits Test Data

Table 3-1: Radiated Emissions Fundamental Emissions

Patch Antenna

Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dBm)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
920	QP	88.9	-2.0	86.9	94.0	-7.1	Pass
921	QP	87.8	-2.0	85.8	94.0	-8.2	Pass

Whip Antenna

Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dBm)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
920	QP	92.6	-2.0	90.6	94.0	-3.4	Pass
921	QP	94.4	-2.0	92.4	94.0	-1.6	Pass

4 Radiated Emission Limits Radiated Harmonics – FCC §15.249 & IC RSS-210 §A2.9

4.1 Radiated Emission Limits Test Procedure

Radiated emissions of the harmonics were tested at three meters, and meet the requirements of 500 microvolts/meter in average mode, and 20 dB higher in peak mode, per 15.249(e). The EUT was tested in all three orthogonal planes.

All harmonic and spurious emissions were more than 20 dB below the limit; per 15.31(o), no data is being reported.

Table 4-1: Radiated Emissions Test Equipment

RTL Asset	Manufacturer	Model	Part Type	Serial Number	Calibration Date
900791	Chase	CBL6111B	Bilog Antenna (30 MHz – 2000 MHz)	N/A	9/21/08
900932	Hewlett Packard	8449B OPT H02	Preamplifier 1-26.5 GHz (29 dB gain)	3008A00505	5/16/2008
901132	Par Electronics	N/A	Notch Filter	N/A	2/1/09
900905	Rhein Tech Laboratories, Inc.	PR-1040	Pre Amplifier 40 dB (10 MHz – 2 GHz)	1006	5/16/08
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	6/14/10
900323	EMCO	3160-07	Horn Antenna (8.2 - 12.4 GHz)	9605-1054	6/14/10
900321	EMCO	3161-03	Horn Antenna (4.0 - 8.2 GHz)	9508-1020	6/14/10
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	6/13/08
901425	Insulated Wire, Inc.	KPS-1503-2400-KPS	RF cable, 20'	NA	10/08/08
901424	Insulated Wire Inc.	KPS-1503-360-KPS	RF cable 36"	NA	10/08/08
900878	Rhein Tech Laboratories, Inc.	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901242	Rhein Tech Laboratories, Inc.	WRT-000-0003	Wood rotating table	N/A	Not Required

Test Personnel:

Daniel Baltzell		May 8, 2007
Test Engineer	Signature	Date Of Test

5 Occupied Bandwidth – IC RSS-Gen §4.6.1

5.1 Occupied Bandwidth Test Procedure

The 99% emission bandwidth was measured using a 50 ohm spectrum analyzer's automated occupied bandwidth measurement function.

5.2 Modulated Bandwidth Test Data

Table 5-1: 20 dB Modulated Bandwidths

Frequency (MHz)	99% Occupied Bandwidth (kHz)
920	112.5
921	114.0

Table 5-2: Modulated Bandwidth Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
901413	Agilent Technologies	E4448A	Spectrum Analyzer	US44020346	6/13/08

Test Personnel:

Daniel Baltzell		May 7, 2008
Test Engineer	Signature	Date Of Test

6 Conducted Limits – FCC §15.207 & IC RSS-Gen

6.1 Site and Test Description

The power line conducted emissions measurements were performed in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was assembled on a wooden table 80 centimeters high. Power was fed to the EUT through a 50-ohm/50 microhenry Line Impedance Stabilization Network (LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. A second LISN, the peripheral LISN, provides isolation for the EUT test peripherals. This peripheral LISN was also fed A.C. power. A metal power outlet box, which is bonded to the ground plane and electrically connected to the peripheral LISN, powers the EUT host peripherals.

The spectrum analyzer was connected to the AC line through an isolation transformer. The 50-ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar 100 kHz high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 100 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable).

The analyzer's 6 dB bandwidth was set to 9 kHz. Video filter less than 10 times the resolution bandwidth is not used. Average measurements are performed in linear mode using a 10 kHz resolution bandwidth, a 1 Hz video bandwidth, and by increasing the sweep time in order to obtain a calibrated measurement. The emission spectrum was scanned from 150 kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limits were measured and have been recorded.

6.2 Test Limits

Line-Conducted Emissions		
	Limit (dBµV)	
Frequency (MHz)	**Quasi-Peak**	**Average**
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5.00	56	46
5.00 to 30.00	60	50

6.3 Conducted Emissions Test Data

Table 6-1: Conducted Emissions Test Data - Neutral Side – Line 1

Temperature: 75.8°F Humidity: 29%									
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	CISPR B QP Limit (dBuV)	CISPR B QP Margin (dBuV)	CISPR B AV Limit (dBuV)	CISPR B AV Margin (dBuV)	Pass/ Fail
0.224	Pk	44.1	0.2	44.3	62.7	-18.4	52.7	-8.4	Pass
0.275	Pk	46.8	0.2	47.0	61.0	-14.0	51.0	-4.0	Pass
0.384	Pk	41.6	0.2	41.8	58.2	-16.4	48.2	-6.4	Pass
0.493	Pk	35.7	0.2	35.9	56.1	-20.2	46.1	-10.2	Pass
0.740	Pk	36.5	0.3	36.8	56.0	-19.2	46.0	-9.2	Pass
1.740	Pk	33.7	0.9	34.6	56.0	-21.4	46.0	-11.4	Pass

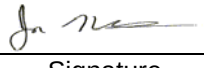
Table 6-2: Conducted Emissions Test Data – Hot Side – Line 2

Temperature: 75.8°F Humidity: 29%									
Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	CISPR B QP Limit (dBuV)	CISPR B QP Margin (dBuV)	CISPR B AV Limit (dBuV)	CISPR B AV Margin (dBuV)	Pass/ Fail
0.169	Qp	46.7	0.2	46.9	65.0	-18.1	55.0	-8.1	Pass
0.225	Pk	46.9	0.2	47.1	62.6	-15.5	52.6	-5.5	Pass
0.340	Pk	42.2	0.2	42.4	59.2	-16.8	49.2	-6.8	Pass
0.424	Pk	42.5	0.2	42.7	57.4	-14.7	47.4	-4.7	Pass
0.620	Pk	38.2	0.3	38.5	56.0	-17.5	46.0	-7.5	Pass
1.650	Pk	34.7	0.8	35.5	56.0	-20.5	46.0	-10.5	Pass

Table 6-3: Conducted Emissions Test Equipment

RTL Asset	Manufacturer	Model	Part Type	Serial Number	Calibration Date
900897	Hewlett Packard	8567A	Spectrum Analyzer (100 Hz - .15 GHz)	2727A00535	4/2/2009
900896	Hewlett Packard	85662A	Spectrum Analyzer Display Section	2816A16471	4/2/2009
900901	Hewlett Packard	85650A	Quasi-Peak Adapter	3145A01599	4/2/2009
900729	Solar	8130	Filter	947306	N/A
901082	AFJ International	LS16/110VAC	16A LISN	16010020081	2/4/2009

Test Personnel:

Jon Wilson		May 28, 2008
Test Engineer	Signature	Date Of Test

7 Conclusion

The data in this measurement report shows that Identec Solutions, Inc. Model i-CARD CF-350; FCC ID: O2E-ILR-ICARD350, IC: 3538B-ICARD350, complies with all the applicable requirements of Parts 2 and 15 of the FCC Rules, and Industry Canada RSS-210.