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:
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FCC ID/ IC:	O2E-ILR-IQ350THH/ 3538B-IQ350THH	**Test Report Date:**	May 12, 2008
Platform:	N/A	**RTL Work Order #:**	2008093
Models:	i-B350T/i-Q350T	**RTL Quote #:**	QRTL08-231
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
919 – 920	N/A	N/A	117KF1D

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, Industry Canada RSS-210, and ANSI C63.4.

Signature: _____ Date: May 12, 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 38 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. Models i-B350T/i-Q350T, FCC ID: O2E-ILR-IQ350THH, IC: 3538B-IQ350THH. Family certification is being sought for IC.

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 919 MHz and the high channel at 920 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	N/A
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. This application covers two models: the i-B350T and the i-Q350T. The i-Q350T responds to a command from a reader, while the i-B350T simply transmits the same telegram on a pre-programmed time interval. The hardware for both models is identical.

Table 2-2: Equipment under Test (EUT)

Part	Manufacturer	Model	S/N	FCC ID	Cable Description	RTL Bar Code
RFID Tag	Identec Solutions, Inc.	i-B350T	0.430.000.500	O2E-ILR-IQ350THH	N/A	18408
RFID Tag	Identec Solutions, Inc.	i-B350T	0.430.000.501	O2E-ILR-IQ350THH	N/A	18409
RFID Tag	Identec Solutions, Inc.	i-B350T	0.430.000.502	O2E-ILR-IQ350THH	N/A	18410
RFID Tag	Identec Solutions, Inc.	i-B350T	0.430.000.503	O2E-ILR-IQ350THH	N/A	18411
RFID Tag	Identec Solutions, Inc.	i-B350T	0.430.000.504	O2E-ILR-IQ350THH	N/A	18412

2.5 Configuration of Tested System

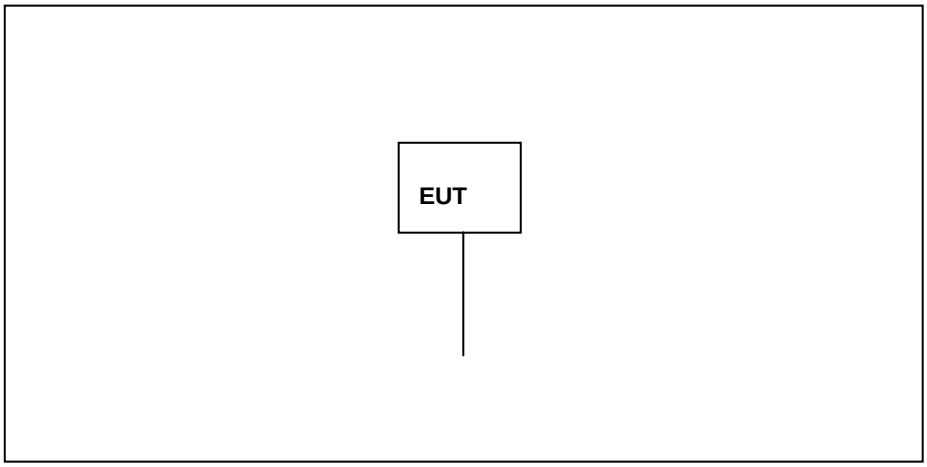

Figure 2-1: Worst Case Configuration of System under Test

3 Conducted AC Emissions – FCC §15.207 & IC RSS-Gen

Not applicable – the EUT is strictly battery operated.

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

4.1 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.

4.2 Radiated Emission Limits Test Data

Table 4-1: Radiated Emissions Fundamental Emissions

Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dBm)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
919	QP	92.3	-2.0	90.3	94.0	-3.7	Pass
920	QP	93.2	-2.0	91.2	94.0	-2.8	Pass

Table 4-2: Radiated Emissions Fundamental 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 7, 2007
Test Engineer	Signature	Date of Test

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

5.1 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.

Table 5-1: 919 MHz – Peak Measurements

Frequency (MHz)	Peak Analyzer Reading (dBuV)	Polarity	Site Correction Factor (dBm)	Peak Level Corrected (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)	Result
1838	53.4	H	1.5	54.9	74	-19.1	Pass
2757	50.7	H	-2.3	48.4	74	-25.6	Pass
4595	42.5	H	4.7	47.2	74	-26.8	Pass
5514	49.2	H	5.6	54.8	74	-19.2	Pass
6433	38.0	H	5.7	43.7	74	-30.3	Pass
7352	37.2	H	7.0	44.2	74	-29.8	Pass

Table 5-2: 920 MHz – Peak Measurements

Frequency (MHz)	Peak Analyzer Reading (dBuV)	Polarity	Site Correction Factor (dBm)	Peak Level Corrected (dBuV/m)	Peak Limit (dBuV/m)	Peak Margin (dB)	Result
1840	52.9	H	1.4	54.3	74	-19.7	Pass
2760	55.5	H	-2.4	53.1	74	-20.9	Pass
3680	50.3	H	-1.4	48.9	74	-25.1	Pass
4600	41.8	H	4.7	46.5	74	-27.5	Pass
5520	48.5	H	5.6	54.1	74	-19.9	Pass
6440	40.5	H	5.7	46.2	74	-27.8	Pass

Table 5-3: 919 MHz – Average Measurements

Frequency (MHz)	Average Analyzer Reading (dBuV)	Polarity	Site Correction Factor (dBm)	Average Level Corrected (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)	Result
1838	51.8	H	1.5	53.3	54	-0.7	Pass
2757	48.4	H	-2.3	46.1	54	-7.9	Pass
3676	41.8	H	-1.4	40.4	54	-13.6	Pass
4595	40.7	H	4.7	45.4	54	-8.6	Pass
5514	47.8	H	5.6	53.4	54	-0.6	Pass
7352	35.7	H	7.0	42.7	54	-11.3	Pass

Table 5-4: 920 MHz – Average Measurements

Frequency (MHz)	Average Analyzer Reading (dBuV)	Polarity	Site Correction Factor (dBm)	Average Level Corrected (dBuV/m)	Average Limit (dBuV/m)	Average Margin (dB)	Result
1840	51.8	H	1.4	53.2	54	-0.8	Pass
2760	54.5	H	-2.4	52.1	54	-1.9	Pass
3680	46.3	H	-1.4	44.9	54	-9.1	Pass
4600	39.9	H	4.7	44.6	54	-9.4	Pass
5520	45.6	H	5.6	51.2	54	-2.8	Pass
7360	34.7	H	7.2	41.9	54	-12.1	Pass

Table 5-5: Radiated Spurious 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 7, 2007
Test Engineer	Signature	Date of Test

6 Occupied Bandwidth –IC RSS-Gen §4.6.1

6.1 Occupied Bandwidth Test Procedure

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

6.2 Modulated Bandwidth Test Data

Table 6-1: 20 dB Modulated Bandwidths

Frequency (MHz)	99% Occupied Bandwidth (kHz)
919	116.6
920	112.9

Table 6-2: 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 5, 2008
Test Engineer	Signature	Date of Test

7 Conclusion

The data in this measurement report shows that Identec Solutions, Inc. Models i-B350T/i-Q350T; FCC ID: O2E-ILR-IQ350THH, and IC: 3538B-IQ350THH, complies with all the applicable requirements of Parts 2 and 15 of the FCC Rules, and Industry Canada RSS-210.