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Job Number: 676068
File Number: MC15600
Date: 31 May 07
Model: 8965
FCC ID: U78-8965001
IC ID: 7153A-8965001

Electromagnetic Compatibility Test Report

For

Dortronics Systems Inc.

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Test Report Details

Tests Performed By: **Underwriters Laboratories Inc.
1285 Walt Whitman Rd.
Melville, NY 11747**

Tests Performed For: **Dortronics Systems Inc.
1668 Sag Harbor Turnpike
Sag Harbor, NY 11963**

Applicant Contact: **John FitzPatrick
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Test Report Date: **31 May 07**

Product Type: **Proximity Reader**

Product standards **FCC Part 15, Subpart B & C; RSS-GEN; RSS-210**

Model Number: **8965**

Sample Serial Number: **Prototype**

EUT Category: **Low Power Transmitter**

Testing Start Date: **23 Mar 07**

Date Testing Complete: **27 Mar 07**

Overall Results: Compliant

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Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
31 May 07	Original	--	--

1.0 G E N E R A L - Product Description

1.1 Equipment Description

This system provides a stand-alone programmable access control system based on the GSC Secure Card proximity card technology or on Wiegand output devices. The system consists of a controller with relays to operate a single door or two independent doors.

The controller supports two input devices, which can be Secure RFID readers, Wiegand output devices (reader, keypad etc.) or a combination of the two types. The Secure Card RFID readers can be mounted up to 50 meters from the controller with a simple 3-wire connection. The readers are fully potted and suitable for mounting outdoors. Tampering with these readers will not compromise the systems security. The Secure Card Technology prevents cards being duplicated, further enhancing the system security. Programming the system is very simple and requires a Master Tag or Master PIN code to put the unit into programming mode. In this mode tags or PINs can be added or deleted and relay operation configured. A jumper setting allows tags or PINs to be added automatically to both readers/keypads or to allow each reader or keypad to have its own set of tags/PINs.

The optional Tag Simulator / Programming Unit, when used in conjunction with the Master tag, can be used for deleting lost tags. It can also be used for adding tags. Transactions are stored in the controller's non-volatile memory with a date & time stamp. The data logging software provided with the system allows a PC to set the controller's date & time settings and to download the transactions.

1.2 Equipment Marking Plate

None

1.3 Device Configuration During Test

1.3.1 Equipment Used During Test:

Use	Product Type	Manufacturer	Model	Comments
EUT	Proximity Reader	Dortronics Systems Inc.	8965	None

Note: **EUT** - Equipment Under Test, **AE** - Auxiliary/Associated Equipment, or **SIM** - Simulator (Not Subjected to Test)

1.3.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m (Y/N)	Cable Shielded (Y/N)	Comments
0	Enclosure	N/E	—	—	None
1	Mains	DC	N	N	None

Note:
 AC = AC Power Port DC = DC Power Port N/E = Non-Electrical
 I/O = Signal Input or Output Port (Not Involved in Process Control)
 TP = Telecommunication Ports

1.3.3 EUT Internal Operating Frequencies:

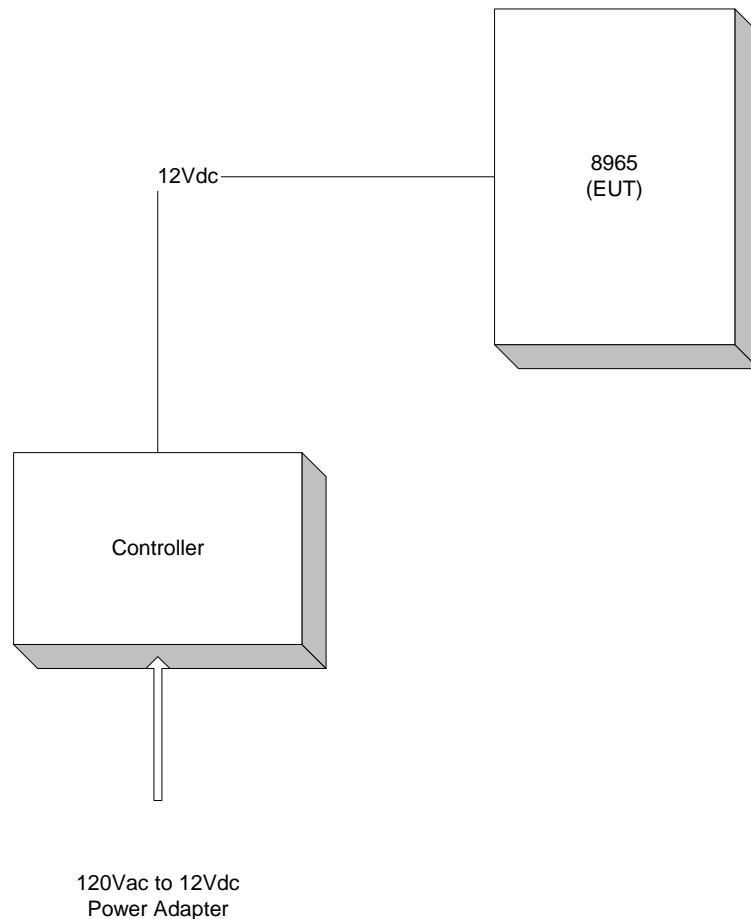
Frequency (MHz)	Description
0.125	Carrier Frequency

1.3.4 Power Interface:

Mode # /Rated	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
1	12Vdc	-	-	DC	-	None

1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



1.5 EUT Operation Modes

Mode #	Description
1	EUT is transmitting and receiving, simultaneously. This device operates with its transmit and receive circuitry on continuously.

1.6 EUT Configurations

Mode #	Description
1	The EUT receives 12Vdc input power from an external power adapter (not typically sold with EUT). Additional signal leads are terminated a controller.

2.0 Summary

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

2.1 Deviations from standard test methods

None

2.2 Device Modifications Necessary for Compliance

None

2.3 Reference Standards

Standard Number	Standard Name	Standard Date
FCC Part 15, Subpart B, Class A	Code of Federal Regulations, Part 15, Subpart B, Radio Frequency Devices	2006
FCC Part 15, Subpart C, Section 15.207 & 15.209	Code of Federal Regulations, Part 15, Subpart C, Radio Frequency Devices	2006
RSS-210, Issue 6	Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment	2005
RSS-GEN, Issue 1	General Requirements and Information for the Certification of Radiocommunication Equipment	2005

2.4 Results Summary

Requirement – Test	Result (Complaint / Non-Compliant)*
15.207 Conducted Emissions Limits 150kHz to 30MHz	Compliant
15.209 Radiated Emissions Limits 9kHz to 1GHz	Compliant
5.9 Emissions Bandwidth	Compliant



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Any information and documentation involving UL Mark services are provided on behalf of Underwriters Laboratories Inc. (UL) or any authorized licensee of UL.

3.0 Calibration of Equipment Used for Measurement

All test equipment and test accessories are calibrated on a regular basis. The maximum time between calibrations is one year or the manufacturers' recommendation, whichever is less.

All test equipment calibrations are traceable to the National Institute of Standards and Technology (NIST); therefore, all test data recorded in this report is traceable to NIST.

4.0 EMISSIONS TEST RESULTS

The emissions tests were performed according to following regulations:

----- United States -----

FCC Part 15, Subpart B	Code of Federal Regulations, Part 15, Subpart B, Radio Frequency Devices: 2006
FCC Part 15, Subpart C, Section 15.207 & 15.209	Code of Federal Regulations, Part 15, Subpart C, Radio Frequency Devices: 2006

----- Canada -----

RSS-210, Issue 6	Low-power License-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment; September 2005
RSS-GEN, Issue 1	General Requirements and Information for the Certification of Radiocommunication Equipment; September 2005

Unless specified otherwise in the individual Methods, the tests shall be conducted under the following ambient conditions. Confirmation of these conditions shall be verified at the time the test is conducted.

Ambient Temperature, °C	22.5 ± 2.5	Relative Humidity, %	45 ± 15	Barometric Pressure, mBar	950 ± 150
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4.1 Test Conditions and Results – MAINS TERMINAL – CONDUCTED EMISSIONS

Test Description	Measurements were made on a ground plane. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.	
Basic Standard	FCC Part 15, Subpart C	
UL LPG	80-EM-S0026	
	Frequency range on each side of line	Measurement Point
Fully configured sample scanned over the following frequency range	150kHz to 30MHz	Mains
Limits		
Frequency (MHz)	Limit (dB μ V)	
	Quasi-Peak	Average
0.15-.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50
Supplementary information: None		

Table 1 Conducted Emissions EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

Table 2 Conducted Emissions Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
Conducted Emissions – Shield Room			
Spectrum Analyzer	Agilent	E7405A	19695
LISN	EMCO	3825/2R	ME5-629
Switch Driver	HP	11713A	44403
RF Switch Box	UL	2	44400
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	43736

Figure 1 Test Setup for Conducted Emissions

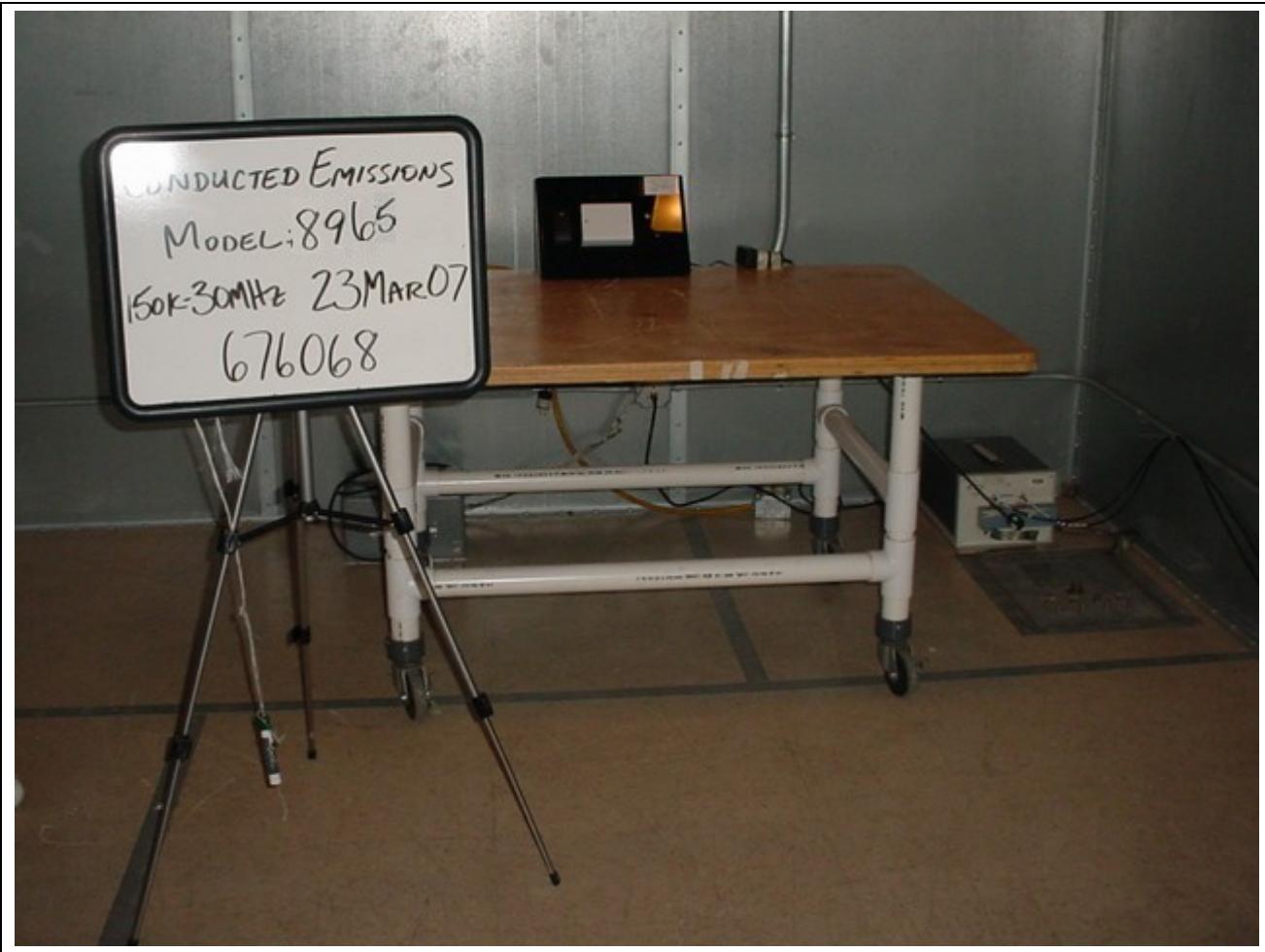


Figure 2 Conducted Emissions Graph

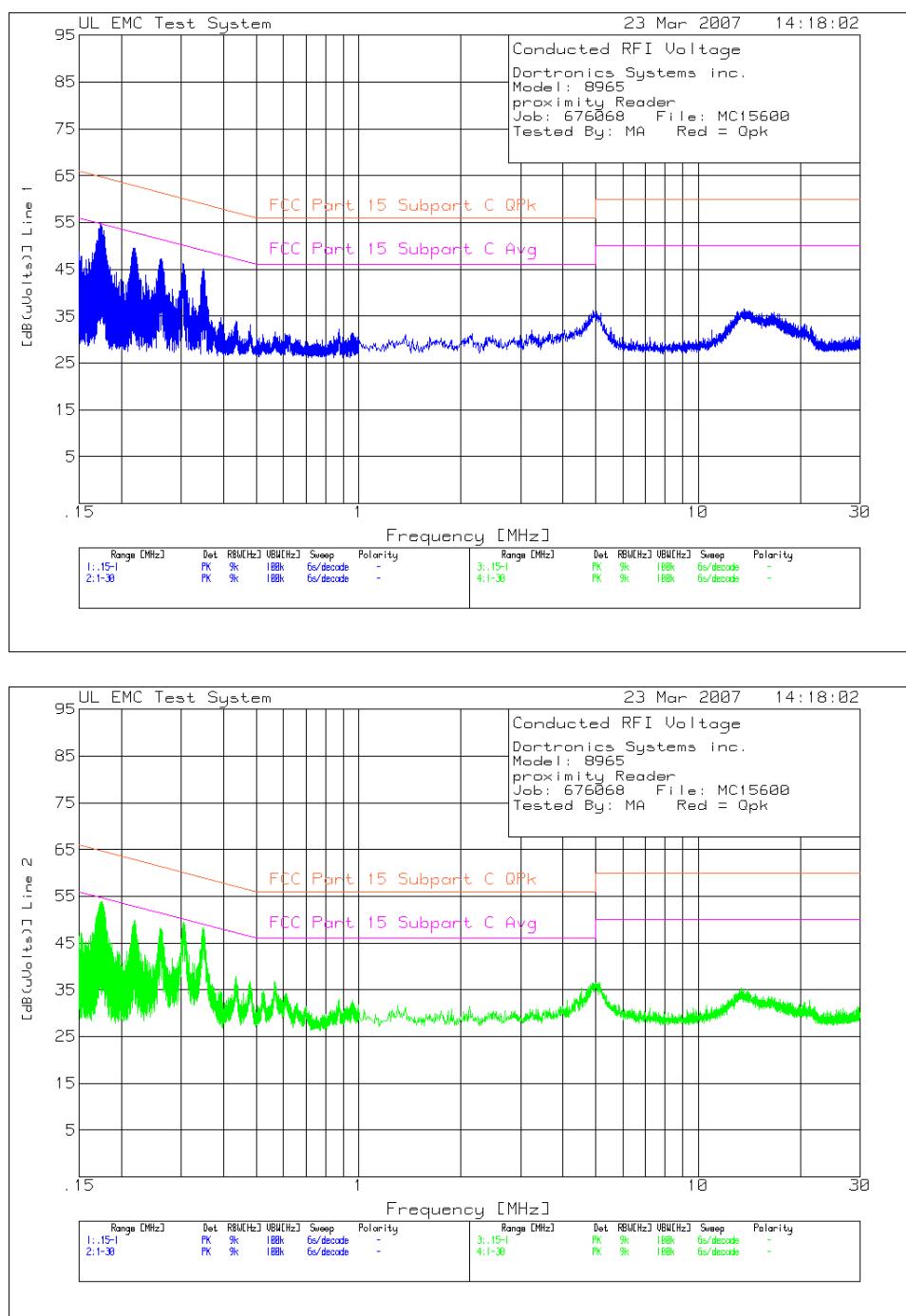


Table 3 Conducted Emissions Data Points

Dortronics Systems Inc.

Model: 8965

Proximity Reader

Job: 676068 File: MC15600

Tested By: MA Red = Qpk

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
<hr/>									
Line 1 .15 - 1MHz									
1 .17332	42.82 pk	11.7	0 Margin [dB]	54.52	64.8	54.8	-	-	-
2 .21806	38.37 pk	11.2	0 Margin [dB]	49.57	62.9	52.9	-	-	-
3 .26174	36.24 pk	11	0 Margin [dB]	47.24	61.4	51.4	-	-	-
4 .30351	35.45 pk	10.8	0 Margin [dB]	46.25	60.1	50.1	-	-	-
5 .34739	34.37 pk	10.7	0 Margin [dB]	45.07	59	49	-	-	-
12 .15021	36.69 pk	12	0 Margin [dB]	48.69	66	56	-	-	-
					-17.31	-7.31	-	-	-
<hr/>									
Line 2 .15 - 1MHz									
6 .17438	42.24 pk	11.7	0 Margin [dB]	53.94	64.7	54.7	-	-	-
7 .21848	38.63 pk	11.2	0 Margin [dB]	49.83	62.9	52.9	-	-	-
8 .25983	37.21 pk	11	0 Margin [dB]	48.21	61.4	51.4	-	-	-
9 .30414	38.64 pk	10.8	0 Margin [dB]	49.44	60.1	50.1	-	-	-
10 .34803	37.58 pk	10.7	0 Margin [dB]	48.28	59	49	-	-	-
11 .15148	35.23 pk	12	0 Margin [dB]	47.23	65.9	55.9	-	-	-
					-18.67	-8.67	-	-	-

LIMIT 1: FCC Part 15 Subpart C QPk

LIMIT 2: FCC Part 15 Subpart C Avg

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

pk - Peak detector

qp - Quasi-Peak detector

av - Average detector

avlg - denotes average log detection

Dortronics Systems Inc.

Model: 8965

Proximity Reader

Job: 676068 File: MC15600

Tested By: MA Red = Qpk

Test Frequency	Meter Reading [MHz]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level [dB(uVolts)]	Limit:1	2	3	4
<hr/>								
Line 1 .15 - 1MHz								
.17332	27.06	ave	11.7	0	38.76	64.8	54.8	-
				Margin [dB]:		-26.04	-16.04	-
.21806	21.43	ave	11.2	0	32.63	62.9	52.9	-
				Margin [dB]:		-30.27	-20.27	-
.26174	23.42	ave	11	0	34.42	61.4	51.4	-
				Margin [dB]:		-26.98	-16.98	-
.30351	24.37	ave	10.8	0	35.17	60.1	50.1	-
				Margin [dB]:		-24.93	-14.93	-
.34739	21.3	ave	10.7	0	32	59	49	-
				Margin [dB]:		-27	-17	-
Line 2 .15 - 1MHz								
.17438	27.17	ave	11.7	0	38.87	64.7	54.7	-
				Margin [dB]:		-25.83	-15.83	-
.21848	23.2	ave	11.2	0	34.4	62.9	52.9	-
				Margin [dB]:		-28.5	-18.5	-
.25983	27.93	ave	11	0	38.93	61.4	51.4	-
				Margin [dB]:		-22.47	-12.47	-
.30414	31.84	ave	10.8	0	42.64	60.1	50.1	-
				Margin [dB]:		-17.46	-7.46	-
.34803	30.53	ave	10.7	0	41.23	59	49	-
				Margin [dB]:		-17.77	-7.77	-
.15175	10.72	ave	12	0	22.72	65.9	55.9	-
				Margin [dB]:		-43.18	-33.18	-

NOTE: "+" - Indicates an emission level in excess of the applicable limit (s).

pk - Peak detector

qp - Quasi-Peak detector

av - Average detector

avlg - denotes average log detection

ave - denotes average detection

LIMIT 1: FCC Part 15 Subpart C QPk

LIMIT 2: FCC Part 15 Subpart C Avg

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

4.2 Test Conditions and Results – RADIATED EMISSIONS

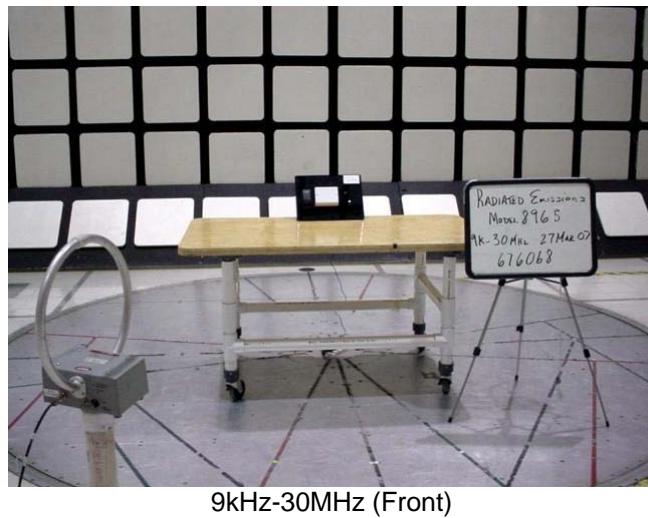
Test Description	Measurements were made in a 10-meter semi-anechoic chamber that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 10-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at various heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.	
Basic Standard	FCC Part 15, Subpart C	
UL LPG	80-EM-S0029	
Fully configured sample scanned over the following frequency range	Frequency range	Measurement Point
	9kHz – 30MHz	(3 meter measurement distance)
		30MHz – 1GHz
Limits		
Frequency (MHz)	Limit (dB μ V/m)	
	Quasi-Peak	Average
0.009 to 0.49	128.5-93.8	NA
0.49 to 1.705	73.8-62.97	NA
1.705 to 30	69.5	NA
30 to 88	40	NA
88 to 216	43.5	NA
216 to 960	46	NA
960 to 1000	54	NA
Supplementary information: Use average final detection in the following frequency bands: 9-90kHz, 110-490kHz. All other ranges use quasi-peak detection.		

Table 4 Radiated Emissions EUT Configuration Settings

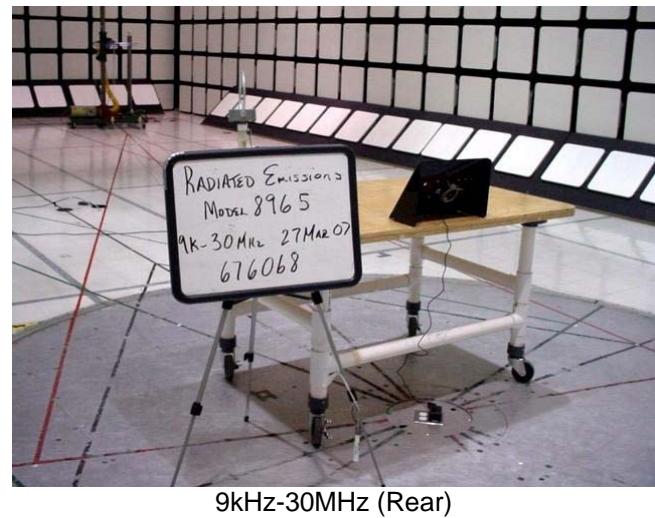
Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

Table 5 Radiated Emissions Test Equipment

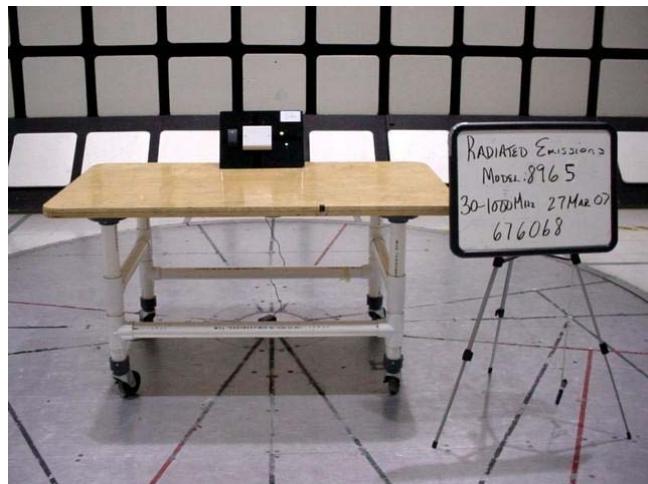
Test Equipment Used			
Description	Manufacturer	Model	Identifier
60Hz-30MHz			
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
Active Loop Antenna	EMCO	6507	ME5A-288
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268
30-1000MHz			
EMI Receiver	Rohde & Schwarz	ESIB26	ME5B-081
Bicon Antenna	Schaffner	VBA6106A	43441
Log-P Antenna	Schaffner	UPA6109	54
Switch Driver	HP	11713A	ME7A-627
System Controller	Sunol Sciences	SC99V	44396
Camera Controller	Panasonic	WV-CU254	44395
RF Switch Box	UL	1	44398
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4268

Figure 3 Test setup for Radiated Emissions

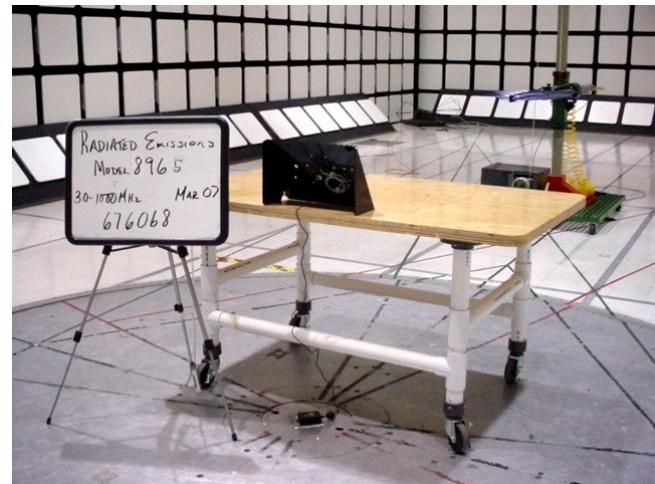
9kHz-30MHz (Front)



9kHz-30MHz (Rear)



30-1000MHz (Front)



30-1000MHz (Rear)

Figure 4 Radiated Emissions Graph

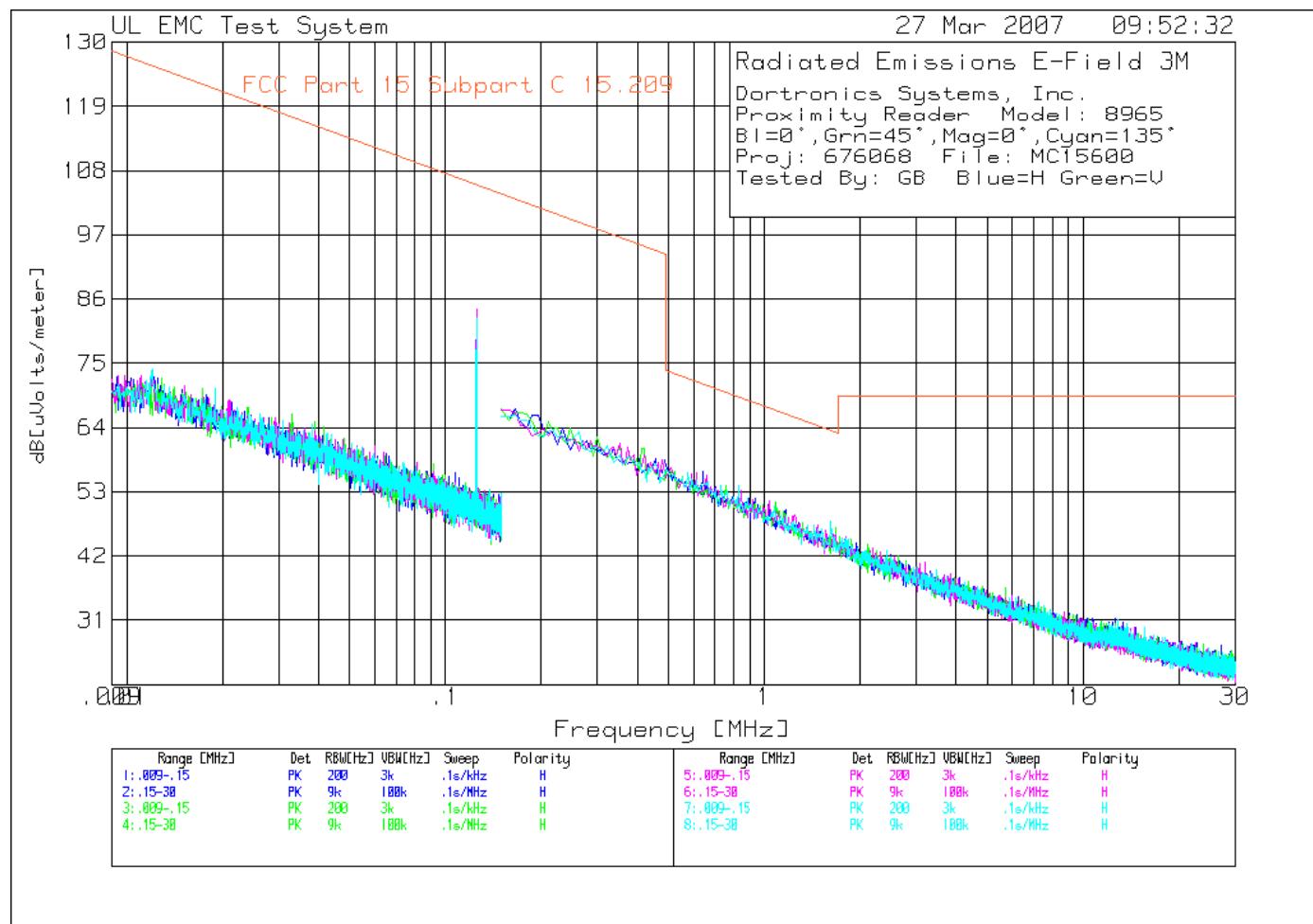


Table 6 Radiated Emissions Data Points

Dortronics Systems, Inc.
 Proximity Reader Model: 8965
 Bl=0°, Grn=45°, Mag=0°, Cyan=135°
 Proj: 676068 File: MC15600
 Tested By: GB Blue=H Green=V

No.	Test Frequency [MHz]	Meter Reading [dB (uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
<hr/>									
45° .009	- .15MHz	45.72 pk	.1	20.6	66.42	117.3	-	-	-
3	.03287	Azimuth:136	Height:120	Margin [dB]		-50.88	-	-	-
4	.03896	Azimuth:149	Height:120	Margin [dB]		115.8	-	-	-
						-50.82	-	-	-
<hr/>									
45° .15	- .30MHz	46.83 pk	.1	15.4	62.33	98.1	-	-	-
6	.29929	Azimuth:55	Height:120	Margin [dB]		-35.77	-	-	-
<hr/>									
90° .009 - .15MHz									
5	.12512	Azimuth:224	Height:140	Margin [dB]	16.2	84.35	105.7	-	-
						-21.35	-	-	-
<hr/>									
135° .009 - .15MHz									
1	.01205	Azimuth:354	Height:160	Margin [dB]	45.81 pk	- .1	28.2	73.91	126
									-52.09
2	.01899	Azimuth:6	Height:160	Margin [dB]	46.07 pk	.3	24.4	70.77	122
									-51.23

LIMIT 1: FCC Part 15 Subpart C 15.209

LIMIT 2: NONE

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

pk - Peak detector

qp - Quasi-Peak detector

av - Average detector

avlg - denotes average log detection

ave - denotes average detection

tm - Trace Math Result

Figure 5 Radiated Emissions Graph

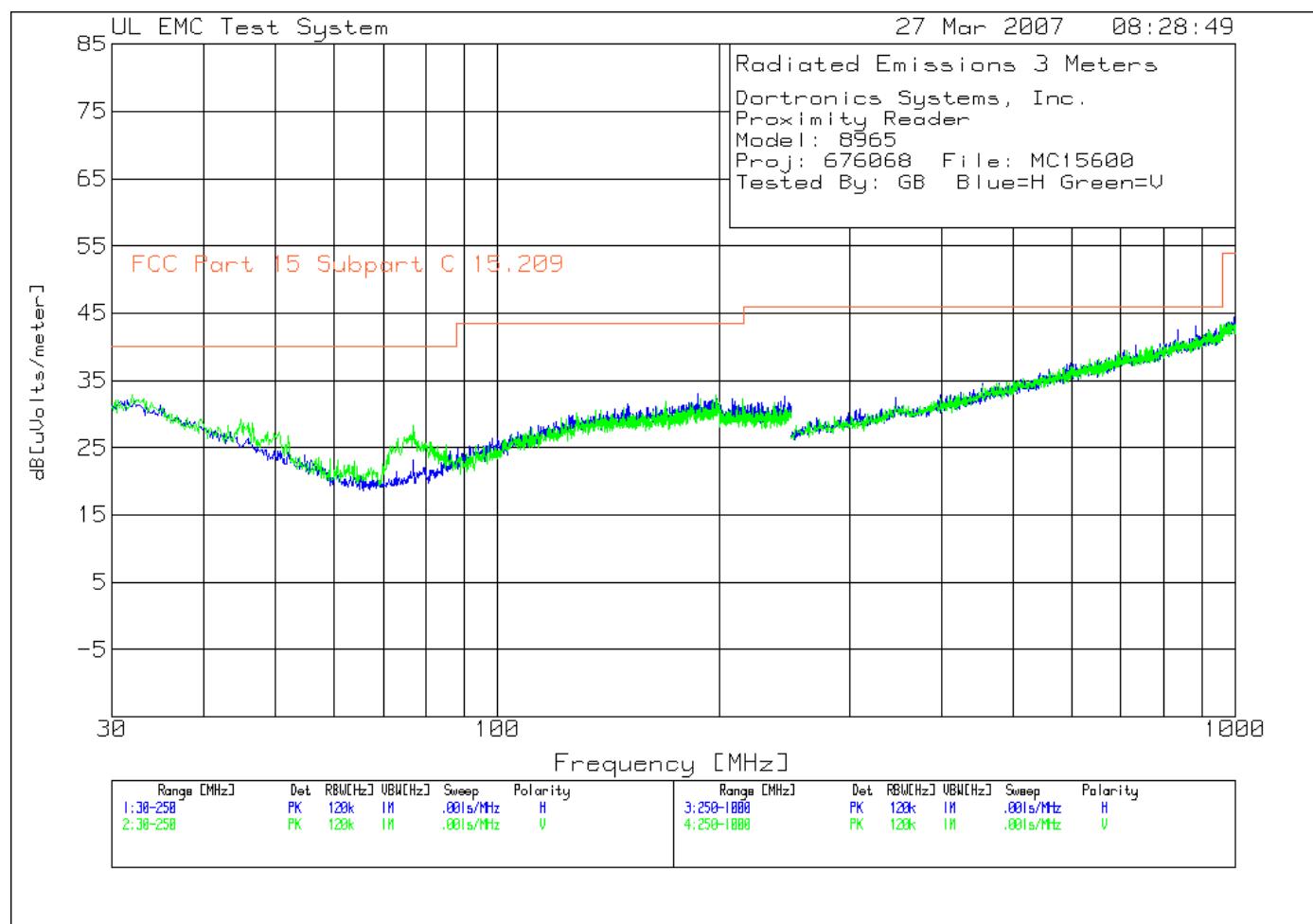


Table 7 Radiated Emissions Data Points

Dortronics Systems, Inc.

Proximity Reader

Model: 8965

Proj: 676068 File: MC15600

Tested By: GB Blue=H Green=V

No.	Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
<hr/>									
Vertical 30 - 250MHz -----									
1	44.8232	17.19 pk	-.2	12.2	29.19	40	-	-	-
	Azimuth:11	Height:101	Vert	Margin [dB]		-10.81	-	-	-
2	48.7859	16.85 pk	-.2	10.7	27.35	40	-	-	-
	Azimuth:95	Height:101	Vert	Margin [dB]		-12.65	-	-	-
3	52.0147	17.54 pk	-.2	9.5	26.84	40	-	-	-
	Azimuth:95	Height:101	Vert	Margin [dB]		-13.16	-	-	-
4	76.6711	22.06 pk	-.1	6.4	28.36	40	-	-	-
	Azimuth:358	Height:101	Vert	Margin [dB]		-11.64	-	-	-
<hr/>									
Horizontal 250 - 1000MHz -----									
5	836.3909	18.04 pk	1.5	22.9	42.44	46	-	-	-
	Azimuth:358	Height:400	Horz	Margin [dB]		-3.56	-	-	-
6	883.4223	18.42 pk	1.6	23	43.02	46	-	-	-
	Azimuth:274	Height:400	Horz	Margin [dB]		-2.98	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

LIMIT 2: NONE

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

pk - Peak detector

qp - Quasi-Peak detector

av - Average detector

avlg - denotes average log detection

ave - denotes average detection

tm - Trace Math Result

Dortronics Systems, Inc.
Proximity Reader
Model: 8965
Proj: 676068 File: MC15600
Tested By: GB Blue=H Green=V

Test Frequency [MHz]	Meter Reading [dB(uV)]	Gain/Loss Factor [dB]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	2	3	4
<hr/> Horizontal 250 - 1000MHz								
836.4	18.41	qp 1.5	22.9	42.81	46	-	-	-
Azimuth: 139	Height:315	Horz		Margin [dB]:	-3.19	-	-	-
883.4	18.75	qp 1.6	23	43.35	46	-	-	-
Azimuth: 205	Height:222	Horz		Margin [dB]:	-2.65	-	-	-

LIMIT 1: FCC Part 15 Subpart C 15.209

LIMIT 2: NONE

LIMIT 3: NONE

LIMIT 4: NONE

LIMIT 5: NONE

LIMIT 6: NONE

pk - Peak detector

qp - Quasi-Peak detector

av - Average detector

avlg - Average log detector

ave - Average detector

4.3 Test Conditions and Results – OCCUPIED BANDWIDTH

Test Description	Measurements were made in the laboratory environment. A loop antenna tuned to the transmit frequency was attached to the input of a spectrum analyzer. The device was operated and the spectrum analyzer resolution bandwidth set per the appropriate standard.	
Basic Standard	RSS-GEN	
	Frequency range	Measurement Point
Fully configured sample scanned over the following frequency range	125kHz	Enclosure

Analyzer Settings	
RBW	50 Hz
VBW	200 Hz
Span	5 kHz
Sweep Time	10 s

Table 8 Occupied Bandwidth EUT Configuration Settings

Power Interface Mode #	EUT Configurations Mode #	EUT Operation Mode #
1	1	1
Supplementary information: None		

Table 9 Occupied Bandwidth Test Equipment

Test Equipment Used			
Description	Manufacturer	Model	Identifier
60Hz-30MHz			
EMI Receiver	Rohde & Schwarz	ESIB40	34968
Passive Loop	EMCO	EM-6871	ME5A-612
Temp/Humidity/Pressure Meter	Cole Parmer	99760-00	4848

Job Number: 676068 File Number: MC15600 Page 25 of 30
Model Number: 8965 FCC ID: U78-8965001
Client Name: Dortronics Systems Inc.

Figure 6 Test setup for Radiated Emissions

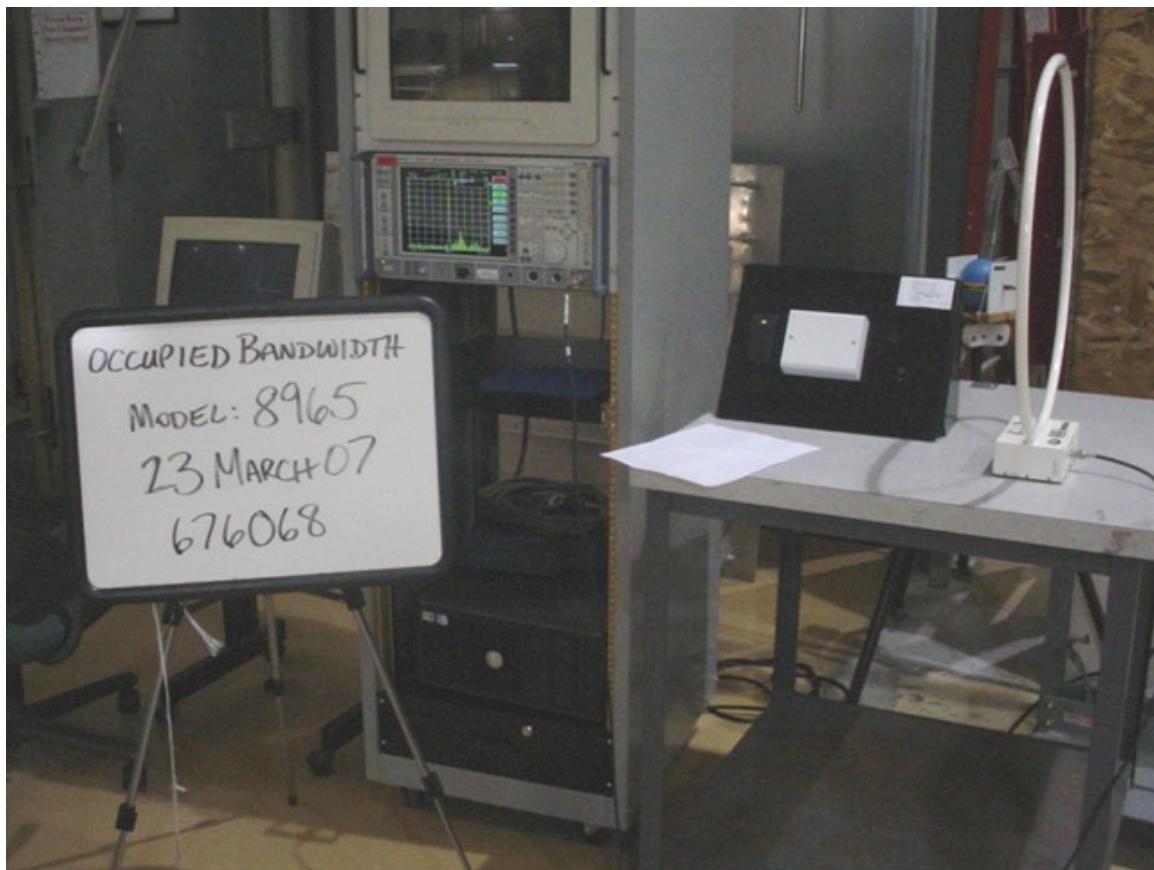
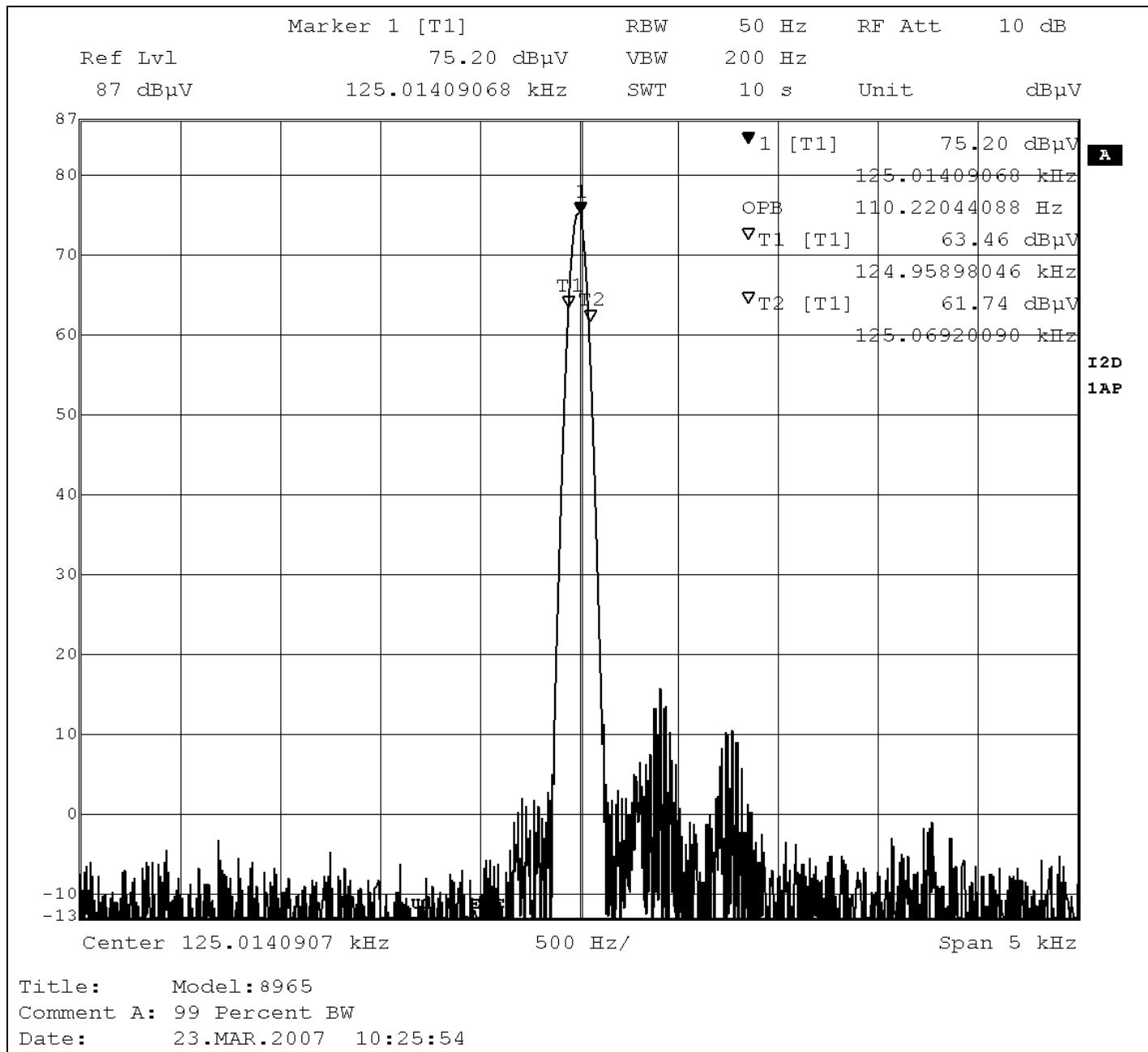


Figure 7 Occupied Bandwidth Graph



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Model Number: 8965 FCC ID: U78-8965001
Client Name: Dortronics Systems Inc.

5.0 IMMUNITY TEST RESULTS

Not Applicable

Appendix A

Accreditations and Authorizations



NVLAP Lab code: 100255-0

NVLAP: Recognized under the National Voluntary Laboratory Accreditation Program (NVLAP) for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC EN17025 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. For a full scope listing see <http://ts.nist.gov/ts/htdocs/210/214/scopes/1002550.htm>



FCC: Details of the measurement facilities used for these tests have been filed with the Federal Communications Commission's Laboratory in Columbia, Maryland (Ref. No. 91040).



Industry Canada Industrie Canada

Industry of Canada: Accredited by Industry Canada for performance of radiated measurements. Our test site complies with RSP 100, Issue 7, Section 3.3. File #: IC 2181



VCCI: Accepted as an Associate Member to the VCCI. The measurement facilities detailed in this test report have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. Registration Nos.: (Radiated Emissions) R-797, (Conducted Emissions) C-832, C-833, C-834 and (Conducted Emissions - Telecommunications Ports) T-160.



ICASA: ICASA (Independent Communications Authority of South Africa) has appointed UL as a Designated Test Laboratory to test Telecommunications equipment for type approval in compliance with CISPR 22 to assist in fulfilling its mandate under section 54(1) of the Telecommunications Act, 1996 (Act 103 of 1996).



NIST/CAB: Validated by the European Commission as a U.S. Conformity Assessment Body (CAB) of the U.S.-EU Mutual Recognition Agreement (MRA) for the Electromagnetic Compatibility - Council Directive 89/336/EEC, Article 10 (2). Also validated for the Telecommunication Equipment-Council Directive 99/5/EC, Annex III and IV, Identification Number: 0983.

NIST/CAB: Provisioned to act as a U.S. Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the Asia Pacific Economic Cooperation (APEC) MRA between the American Institute in Taiwan (AIT) and the United States. Our laboratory is considered qualified to test equipment subject to the applicable EMC regulations of the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) which require testing to CNS 13438 (CISPR 22).

NIST/CAB: Recognized by the Infocomm Development Authority of Singapore (IDA) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Our laboratory is provisionally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA. Our scope of designation includes IDA TS EMC (CISPR 22), IEC 61000-4-2, -4-3, -4-4, -4-5, and -4-6