



Project: 07ME02442  
File: MC15007  
Date: March 23, 2007  
Model: NEXTGen  
FCC ID: U8X-NB0024GXX

Underwriters Laboratories Inc.  
1285 Walt Whitman Rd.  
Melville, NY 11747

[www.ul.com/emc](http://www.ul.com/emc)  
631-271-6200

## Electromagnetic Compatibility Test Report

For

### Environment One Corporation

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## Test Report Details

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

Tests Performed For: **Environment One Corporation  
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Niskayuna, NY 12309**

Applicant Contact: **Mr. Skip Murrell**  
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Test Report Date: **March 23, 2007**

Product Type: **Pump with RFID module**

Product standards **FCC Part 15 Subpart C**

Model Number: **NEXTGen**

Sample Serial Number: **Prototype**

Sample Tag Number: **0877471001**

Sample Receive Date: **30 January 2007**

EUT Category: **RFID Low Power Radio Transmitter**

Testing Start Date: **15 February 2007**

Date Testing Complete: **15 February 2007**

**Overall Results:** **Compliant**

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## Report Revision History

Revision Date	Description	Revised By	Revision Reviewed By
March 23, 2007	Original	-	-

## 1.0 G E N E R A L - Product Description

The equipment under test is a sewage pump with built in RFID. The operation of the devices is described as follows:

- Microcontroller runs a start up diagnostic
- RFID Controller Chip sends out 125kHz Signal
- Transponder assembly receives the signal, extracts energy from it to provide DC power to Transponder Circuit.
  - Transponder checks alarm and on/off pressure switch state (are switches open or closed)
  - Based on the switch states, the transponder will return a signal;
    - Both Switches Inactive 150 Hz
    - On/Off Active Only 300 Hz
    - Alarm Active Only 600 Hz
    - On/Off & Alarm Active 1200 Hz
  - The transponder continuously monitors the switches
- Transceiver receives the signal back from the Transponder and;
  - Both Switches Inactive 150 Hz
    - Idle
  - On/Off Active Only 300 Hz
    - Pump is powered
  - Alarm Active Only 600 Hz
    - Alarm is powered
  - On/Off & Alarm Active 1200 Hz
    - Pump and Alarm is powered
  - If the transceiver loses or detects a frequency not within +/- 30% of the above, the Alarm will be powered and the pump will be off.
- If the Transceiver loses power, the Alarm contact will be closed, the pump contacts will open

## 1.1 Device Configuration During Test

The device was tested as a stand-alone device with a simulated switchbox for alarm and level conditions.

### 1.1.1 Equipment Used During Test:

Use*	Product Type	Manufacturer	Model	Comments
EUT	Pump with 125kHz RFID module	Environment One	NEXTGen	None
SIM	Switchbox	Environment One	NA	Used to simulate alarm condition and level conditions

\* Use = EUT - Equipment Under Test, ACC - Accessory (Not Subjected to Test), or SIM - Simulator (Not Subjected to Test)

### 1.1.2 Input/Output Ports:

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
0	Enclosure	N/E	-	-	None
1	Mains	AC	Y	N	None

\*AC = AC Power Port DC = DC Power Port N/E = Non-Electrical

I/O = Signal Input or Output Port (Not Involved in Process Control)

PMC = Process Measurement and Control Port

### 1.1.3 EUT Internal Operating Frequencies:

Frequency (MHz)	Description	Frequency (MHz)	Description
125kHz	Transmitter frequency	600 Hz	Alarm Active Only
150 Hz	Both Switches Inactive	1200 Hz	On/Off & Alarm Active
300 Hz	On/Off Active Only	-	-

### 1.1.4 Power Interface:

Mode #	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Phases (#)	Comments
Rated	120/240	-	-	AC-60Hz	1	None

### 1.2 EUT Operation Modes:

Mode #	Description
1	Continuously transmitting and receiving.

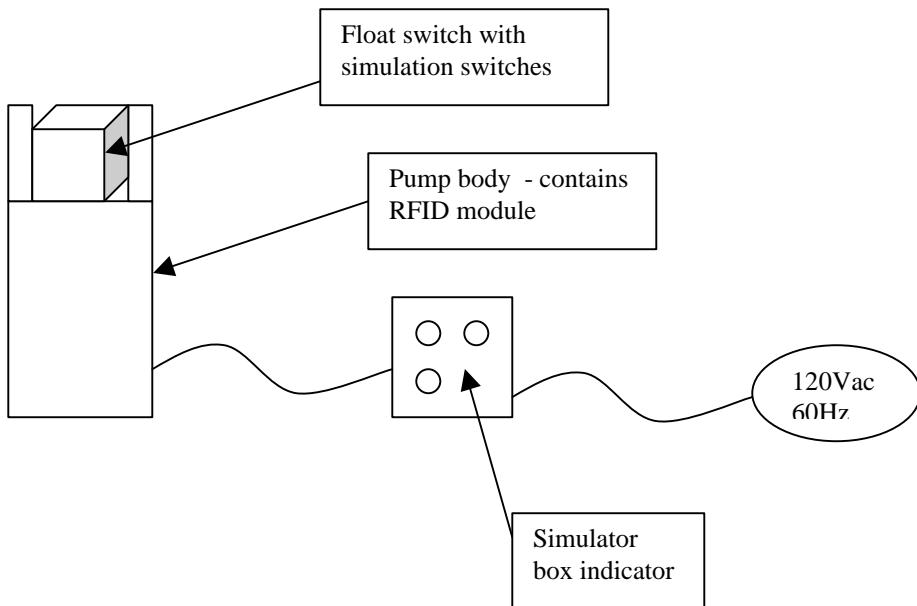
### 1.3 EUT Configuration Modes:

Mode #	Description
1	Pump configured with float switch.

"The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report"

## 1.4 Block Diagram:

The diagram below illustrates the configuration of the equipment above.



## 1.5 Deviations from standard test methods

Not Applicable

## 1.6 Device Modifications Necessary for Compliance

Not Applicable.

## 1.7 Test Summary

<b>Product Standards</b>	FCC Part 15, 2006 Subpart B and Subpart C ,
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<b>Summary of EMC Emission Tests</b>	<b>Standard</b>	<b>Test Name</b>	<b>Limit</b>	<b>Result</b>
	FCC Part 15	Conducted Emissions	15.107, 15.207	1
	FCC Part 15	Radiated Emissions	15.109 15.209	1

### Remarks:

- 1) Compliant – Indicates no modifications required for compliance.
- 2) Modifications required to comply as described in Section 1.6
- 3) The input to the RF circuitry is fed by a regulated dc supply. Testing was only performed at the input line frequency shown since variations in the mains supply will not affect the regulated voltage to the transmitter circuitry.

## 2.0 Conclusion:

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.

The equipment under test has

met the technical requirements as defined under section(s) 5.0

Test Start Date:	February 15, 2007
Test Completion Date:	February 15, 2007

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### **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 what is recommended by the manufacturer, 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 REGULATIONS

The emissions tests were performed according to following regulations:

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

FCC Part 15, Subpart C 15.107, 15.109	Code of Federal Regulations, Part 15, Subpart B, Radio Frequency Devices: 2006
FCC Part 15, Subpart C 15.207, 15.209	Code of Federal Regulations, Part 15, Subpart C, Radio Frequency Devices: 2006

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

Ambient Temperature, °C 22.5 ± 2.5	Relative Humidity, % 45 ± 15	Barometric Pressure, mBar 950 ± 150
---------------------------------------	---------------------------------	--

TEST TITLE: Conducted Emissions Test – Mains & I/O Lines

METHOD

Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. For all equipment, except floor-standing equipment, the EUT was located 40cm from a vertical conducting surface. All power was connected to the system through Line Impedance Stabilization Networks (LISN) and distance between the EUT and the LISN was 80cm or more. Conducted voltage measurements on mains lines were made at the output of the LISN. Conducted Current measurements on I/O lines are made with the current probe.

One fully configured sample was scanned over the following frequency range

Frequency range on each side of line	Measurement Point	
150kHz to 30MHz	Voltage	Mains

Mode*		
Power	Operation	Configuration
1	1	1

\*See Power Interface EUT Operating Modes and Configurations for details

Spectrum Analyzer Settings				
Measurement Frequency	Preliminary Peak Scan		Final Detection	
	Resolution Bandwidth	Video Bandwidth	Quasi-Peak Bandwidth	Average Video Bandwidth
9kHz to 150kHz	10kHz	10kHz	200Hz	1Hz
150kHz to 30MHz	100kHz	100kHz	9kHz	1Hz

The following test parameters shall be established prior to test.

Parameter	Value	Units
Laboratory Ambient Temperature	10 to 40	°C
Relative Humidity	10 to 90	%

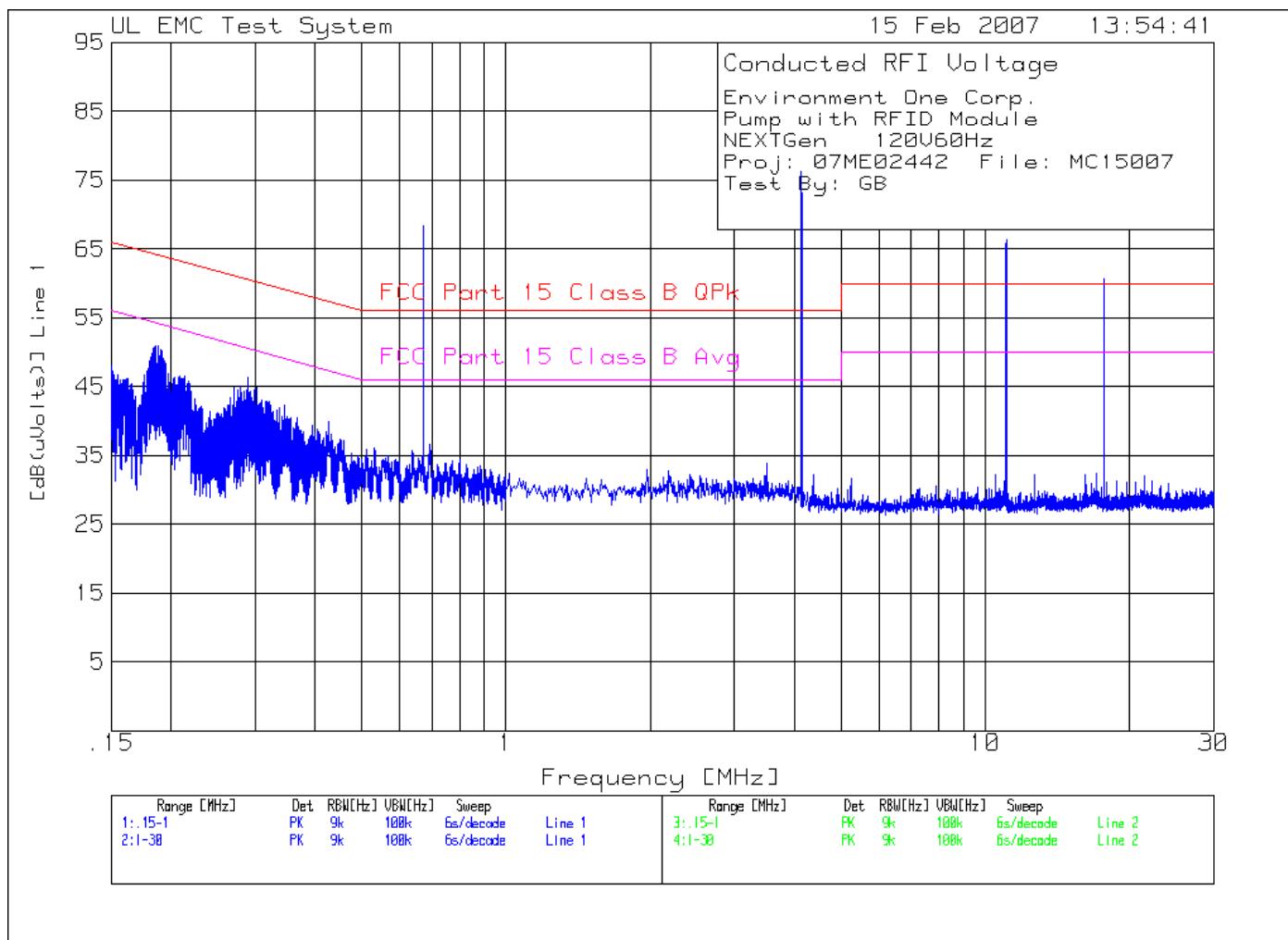
Limits

Frequency (MHz)	Limit (dB $\mu$ V)	
	Quasi-Peak	Average
0.15 to 0.5	66-56	56-46
0.5 to 5	56	46
5 to 30	60	50

RESULTS

Ambient Conditions at the time of test.	Value	Units
Temperature:	22.5	°C
Humidity:	29	%RH
Pressure:	1004	Mbar
Test Date	15 Feb 07	

The results of this test **complied** with the requirements.



Environment One Corp.

Pump with RFID Module

NEXTGen 120V60Hz

Proj: 07ME02442 File: MC15007

Test By: GB

Frequency	Meter	Gain/Loss	Transducer	Level	Limit:1	2
[MHz]	Reading	Factor	Factor	[dB(uVolts)]		
	[dB(uV)]	[dB]	[dB]			
<hr/>						
Line 1 .15 - 1MHz						
0.18138	37.72 pk	11.6	0	49.32	64.4	54.4
			Margin [dB]		-15.08	-5.08
0.18626	39.51 pk	11.5	0	51.01	64.2	54.2
			Margin [dB]		-13.19	-3.19
0.19092	38.94 pk	11.5	0	50.44	64	54
			Margin [dB]		-13.56	-3.56
0.19453	37.27 pk	11.4	0	48.67	63.8	53.8
			Margin [dB]		-15.13	-5.13
0.2134	35.2 pk	11.3	0	46.5	63.1	53.1
			Margin [dB]		-16.6	-6.6
0.2893	35.52 pk	10.9	0	46.42	60.5	50.5
			Margin [dB]		-14.08	-4.08
0.67327	57.91 pk	10.4	0	68.31	56	46
			Margin [dB]		12.31	22.31
Line 1 1 - 30MHz						
04.1322	65.89 pk	10.4	0	76.29	56	46
			Margin [dB]		20.29	30.29
011.05488	55.62 pk	10.7	0	66.32	60	50
			Margin [dB]		6.32	16.32
017.71714	49.83 pk	10.9	0	60.73	60	50
			Margin [dB]		.73	10.73

pk - Peak detector

qp - Quasi-Peak detector

av - Average detector

LIMIT 1: FCC Part 15 Class B QPk

LIMIT 2: FCC Part 15 Class B Avg

Environment One Corp.  
Pump with RFID Module  
NEXTGen 120V60Hz  
Proj: 07ME02442 File: MC15007

Test By: GB

Test Frequency	Meter Reading	Gain/Loss Factor	Transducer Factor	Level [dB(uVolts)]	Limit:1	2
[MHz]	[dB(uV)]	[dB]	[dB]			
<hr/>						
Line 1 .15 - 1MHz						
0.67272	19.45 qp	10.4	0	29.85	56	46
			Margin [dB]:		-26.15	-16.15
Line 1 1 - 30MHz						
4.14401	12.74 qp	10.4	0	23.14	56	46
			Margin [dB]:		-32.86	-22.86
11.0537	5.62 qp	10.7	0	16.32	60	50
			Margin [dB]:		-43.68	-33.68
17.6898	1.13 qp	10.9	0	12.03	60	50
			Margin [dB]:		-47.97	-37.97

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

pk - Peak detector

qp - Quasi-Peak detector

av - Average detector

LIMIT 1: FCC Part 15 Class B QPk

LIMIT 2: FCC Part 15 Class B Avg

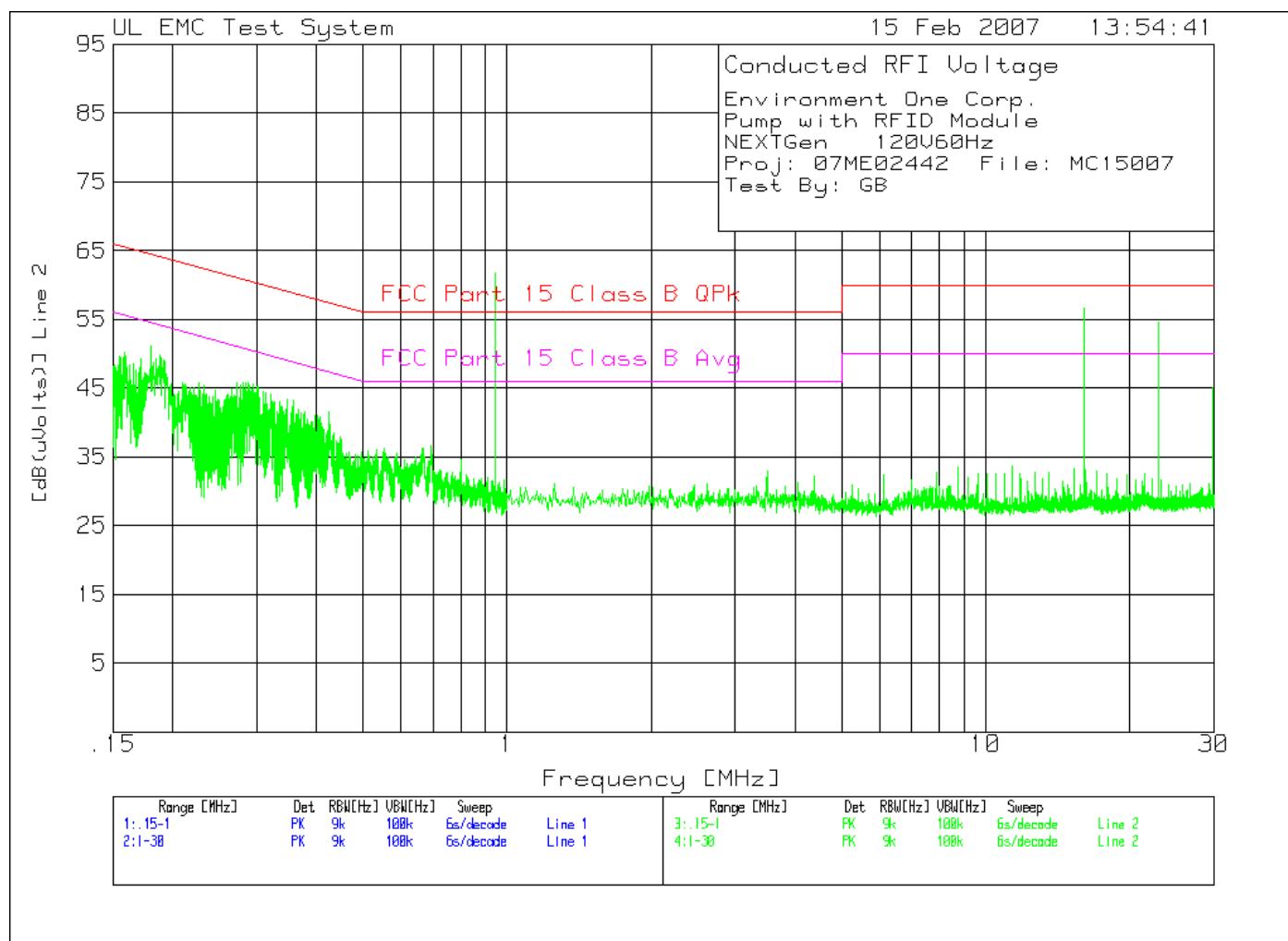
Environment One Corp.  
Pump with RFID Module  
NEXTGen 120V60Hz  
Proj: 07ME02442 File: MC15007  
Test By: GB

Test Frequency	Meter Reading	Gain/Loss Factor	Transducer Factor	Level [dB(uVolts)]	Limit:1	2
[MHz]	[dB(uV)]	[dB]	[dB]			
<hr/>						
Line 1 .15 - 1MHz						
0.18138	24.39	ave	11.6	0 35.99	64.4	54.4
				Margin [dB]:	-28.41	-18.41
0.18626	26.26	ave	11.5	0 37.76	64.2	54.2
				Margin [dB]:	-26.44	-16.44
0.19092	26.6	ave	11.5	0 38.1	64	54
				Margin [dB]:	-25.9	-15.9
0.19453	26.65	ave	11.4	0 38.05	63.8	53.8
				Margin [dB]:	-25.75	-15.75
0.2134	25.56	ave	11.3	0 36.86	63.1	53.1
				Margin [dB]:	-26.24	-16.24
0.2893	19.62	ave	10.9	0 30.52	60.5	50.5
				Margin [dB]:	-29.98	-19.98
0.67327	15.97	ave	10.4	0 26.37	56	46
				Margin [dB]:	-29.63	-19.63
Line 1 1 - 30MHz						
4.1322	9.51	ave	10.4	0 19.91	56	46
				Margin [dB]:	-36.09	-26.09
11.05488	2.61	ave	10.7	0 13.31	60	50
				Margin [dB]:	-46.69	-36.69
17.71714	-4.07	ave	10.9	0 6.83	60	50
				Margin [dB]:	-53.17	-43.17

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

pk - Peak detector  
qp - Quasi-Peak detector  
av - Average detector

LIMIT 1: FCC Part 15 Class B QPk  
LIMIT 2: FCC Part 15 Class B Avg



Environment One Corp.

Pump with RFID Module

NEXTGen 120V60Hz

Proj: 07ME02442 File: MC15007

Test By: GB

Frequency	Meter Reading	Gain/Loss Factor	Transducer Factor	Level [dB(uVolts)]	Limit:1	2
[MHz]	[dB(uV)]	[dB]	[dB]			
<hr/>						
Line 2 .15 - 1MHz						
0.15869	38.28 pk	11.9	0	50.18	65.5	55.5
			Margin [dB]		-15.32	-5.32
0.18074	39.59 pk	11.6	0	51.19	64.5	54.5
			Margin [dB]		-13.31	-3.31
0.18795	38.29 pk	11.5	0	49.79	64.1	54.1
			Margin [dB]		-14.31	-4.31
0 .27191	34.91 pk	10.9	0	45.81	61.1	51.1
			Margin [dB]		-15.29	-5.29
0.28697	34.93 pk	10.9	0	45.83	60.6	50.6
			Margin [dB]		-14.77	-4.77
0.29439	34.85 pk	10.8	0	45.65	60.4	50.4
			Margin [dB]		-14.75	-4.75
0.30223	34.46 pk	10.8	0	45.26	60.2	50.2
			Margin [dB]		-14.94	-4.94
0.31008	33.77 pk	10.8	0	44.57	60	50
			Margin [dB]		-15.43	-5.43
0.42436	30.96 pk	10.6	0	41.56	57.4	47.4
			Margin [dB]		-15.84	-5.84
0.94593	51.43 pk	10.4	0	61.83	56	46
			Margin [dB]		5.83	15.83
Line 2 1 - 30MHz						
16.07508	45.28 pk	11.4	0	56.68	60	50
			Margin [dB]		-3.32	6.68
22.94712	43.38 pk	11.2	0	54.58	60	50
			Margin [dB]		-5.42	4.58
29.83362	33.58 pk	11.4	0	44.98	60	50
			Margin [dB]		-15.02	-5.02
Line 2 .15 - 1MHz						
0.94519	9.76 qp	10.4	0	20.16	56	46
			Margin [dB]:		-35.84	-25.84
Line 2 1 - 30MHz						
16.0773	2.36 qp	11.4	0	13.76	60	50
			Margin [dB]:		-46.24	-36.24
22.9181	5.61 qp	11.2	0	16.81	60	50
			Margin [dB]:		-43.19	-33.19

pk - Peak detector

qp - Quasi-Peak detector

av - Average detector

LIMIT 1: FCC Part 15 Class B QPk

LIMIT 2: FCC Part 15 Class B Avg

Environment One Corp.  
 Pump with RFID Module  
 NEXTGen 120V60Hz  
 Proj: 07ME02442 File: MC15007  
 Test By: GB

No.	Frequency [MHz]	Test Reading [dB(uV)]	Meter Factor [dB]	Gain/Loss Factor	Transducer Factor	Level	Limit:1	2
						[dB]	[dB(uVolts)]	
<hr/>								
Line 2 .15 - 1MHz								
.15869	28.37	ave	11.9	0	40.27	65.5	55.5	
				Margin [dB]:		-25.23	-15.23	
.18074	29.96	ave	11.6	0	41.56	64.5	54.5	
				Margin [dB]:		-22.94	-12.94	
.18795	29.73	ave	11.5	0	41.23	64.1	54.1	
				Margin [dB]:		-22.87	-12.87	
.27191	23.03	ave	10.9	0	33.93	61.1	51.1	
				Margin [dB]:		-27.17	-17.17	
.28697	24.6	ave	10.9	0	35.5	60.6	50.6	
				Margin [dB]:		-25.1	-15.1	
.29439	24.45	ave	10.8	0	35.25	60.4	50.4	
				Margin [dB]:		-25.15	-15.15	
.30223	20.78	ave	10.8	0	31.58	60.2	50.2	
				Margin [dB]:		-28.62	-18.62	
.31008	6.99	ave	10.8	0	17.79	60	50	
				Margin [dB]:		-42.21	-32.21	
.42436	20.61	ave	10.6	0	31.21	57.4	47.4	
				Margin [dB]:		-26.19	-16.19	
.94593	4.66	ave	10.4	0	15.06	56	46	
				Margin [dB]:		-40.94	-30.94	
Line 2 1 - 30MHz								
16.07508	-4.89	ave	11.4	0	6.51	60	50	
				Margin [dB]:		-53.49	-43.49	
22.94712	-4.09	ave	11.2	0	7.11	60	50	
				Margin [dB]:		-52.89	-42.89	
29.83362	-3.35	ave	11.4	0	8.05	60	50	
				Margin [dB]:		-51.95	-41.95	

pk - Peak detector  
 qp - Quasi-Peak detector  
 av - Average detector

LIMIT 1: FCC Part 15 Class B QPk  
 LIMIT 2: FCC Part 15 Class B Avg



Conducted Emissions Test Setup

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Spectrum Analyzer	Agilent Technologies	E7405A	US41160343	3 Jan 07	3 Jan 08
50Ω LISN	EMCO	EC - 3825/2	ME5-629	8 Feb 07	8 Feb 08
Hygrometer/Temp/RH Indicator	Cole -Parmer	99760-00	43736	10 Jan 07	10 Jan 08
			Ranges	Temp: 0°C-55°C/32° to 131°F	
				Humidity: 25% to 95 %RH	
				RH % Indicator: 0-100 RH	
Test Accessories Used					
Description	Manufacturer	Model	Identifier	Char/ Valid Date	Due
Measurement Software	UL	UL EMI Software	Version 9.3	17 Nov 06	NA

TEST TITLE: Radiated Emissions Test

#### METHOD

Measurements were made in a 10-meter semi-anechoic chamber that complies to ANSI C63.4.

In the frequency range of 30 to 1000MHz, 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 1, 2, 3 and 4 meter 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.

In the frequency range of 9kHz to 30MHz, preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at 1 meter height. An active loop antenna was rotated at 0°, 45°, 90°, and 135° points about the vertical axis. Peak scans were taken for each test configuration.

One fully configured sample was scanned over the following frequency range:

Electric fields:	9kHz - 30MHz	(3 meter measurement distance) See Note
	30MHz - 1GHz	(10 meter measurement distance)

Note: Due to a high noise floor above 150kHz, the antenna was moved in to 1 meter to measure the 2<sup>nd</sup> through 5<sup>th</sup> harmonics to ensure they were not above the level of the fundamental frequency. The limit was extrapolated to 1 meter using the 40dB/decade rule to compare the measured data to the limit.

Mode*		
Power	Operation	Configuration
1	1	1

\*See Power Interface EUT Operating Modes and Configurations for details

Measurement Frequency	Preliminary Peak Scan		Final Detection	
	Resolution Bandwidth	Video Bandwidth	Quasi-Peak Bandwidth	Average Video Bandwidth
9kHz to 150kHz	10kHz	1MHz	200Hz	1Hz
150kHz to 30MHz	100kHz	1MHz	9kHz	1Hz
30 to 1000MHz	1MHz	1MHz	120kHz	1Hz

The following test parameters shall be established prior to test.

Parameter	Value	Units
Laboratory Ambient Temperature	10 to 40	°C
Relative Humidity	10 to 90	%

Limits

Frequency (MHz)	Limit (dB $\mu$ V/m)
	Quasi-Peak
0.009 to 0.490	128.5 – 93.8
0.490 to 1.705	73.8 – 62.97
1.705 to 30	69.5
30 to 88	39
88 to 216	43.5
216 to 960	46.4
960 to 1000	49.5

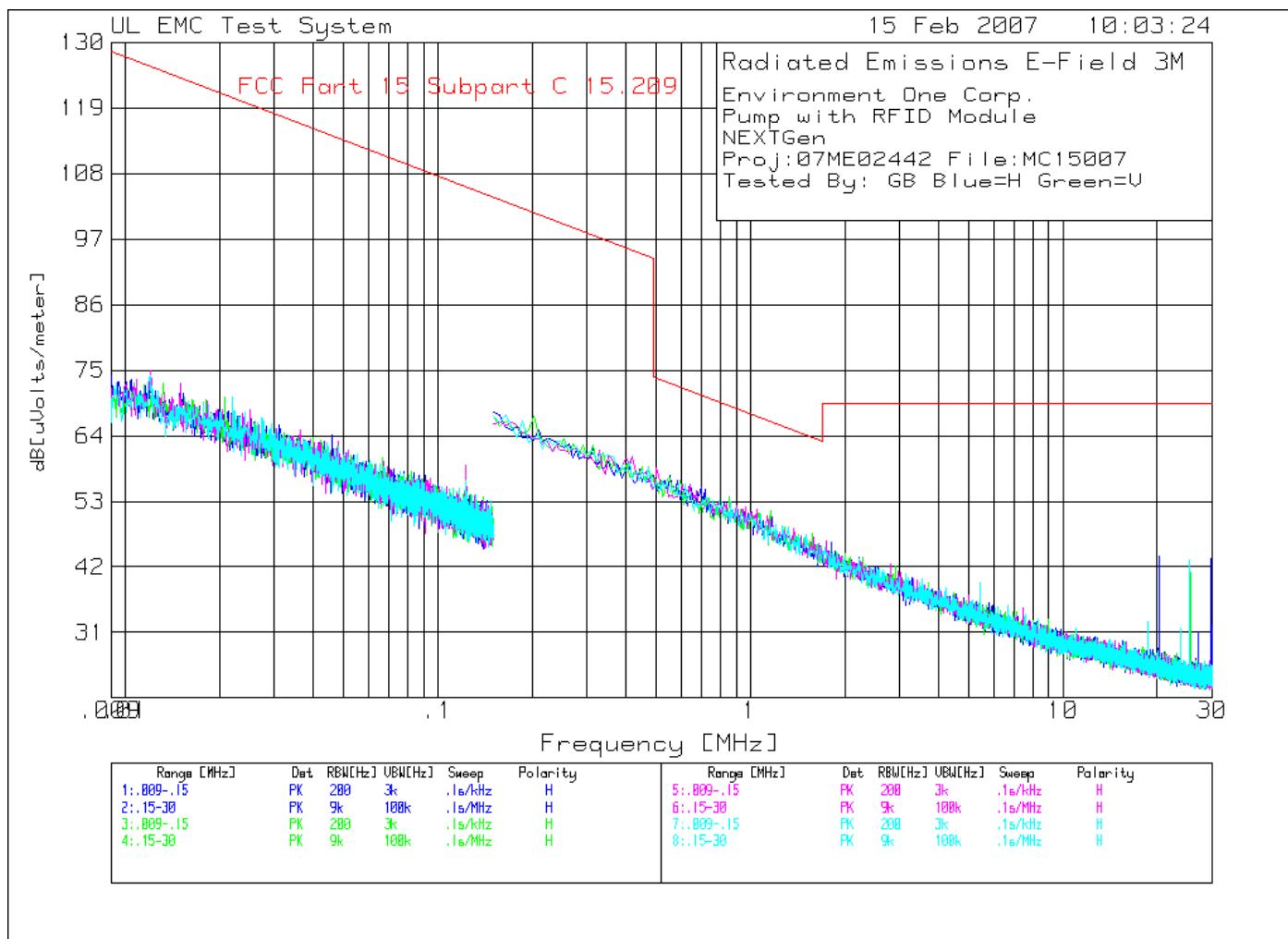
  

Frequency (MHz)	Limit (dB $\mu$ V/m)
	Average
0.009 to 0.90	128.5 – 108.5
0.110 to 0.490	106.8 – 93.8

RESULTS

Ambient Conditions at the time of test.	Value	Units
Temperature:	24.5	°C
Humidity:	24	%RH
Pressure:	999	Mbar
Test Date	15 Feb 07	

The results of this test **complied** with the requirements.



Environment One Corp.  
Pump with RFID Module  
NEXTGen  
Proj:07ME02442 File:MC15007  
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
0° .15 - 30MHz -----						
3	20.24407	27.16 pk	.3	16.3	43.76	69.5
	Azimuth:121	Height:100	Horz	Margin [dB]		-25.74
6	29.80593	26.62 pk	.3	16.4	43.32	69.5
	Azimuth:31	Height:100	Horz	Margin [dB]		-26.18
45° .15 - 30MHz -----						
2	.20225	51.83 pk	.1	15.4	67.33	101.5
	Azimuth:149	Height:120	Horz	Margin [dB]		-34.17
5	25.54377	24.45 pk	.3	16.2	40.95	69.5
	Azimuth:271	Height:120	Horz	Margin [dB]		-28.55
90° .009 - .15MHz -----						
1	.12331	42.78 pk	.1	16.2	59.08	105.8
	Azimuth:300	Height:140	Horz	Margin [dB]		-46.72
135° .15 - 30MHz -----						
4	25.27506	26.68 pk	.3	16.2	43.18	69.5
	Azimuth:121	Height:159	Horz	Margin [dB]		-26.32

LIMIT 1: FCC Part 15 Subpart C 15.209

pk - Peak detector

qp - Quasi-Peak detector

Environment One Corp.

Pump with RFID Module

NEXTGen

Proj:07ME02442 File:MC15007

Tested By: GB Blue=H Green=V

Test Frequency	Meter Reading [MHz]	Gain/Loss Factor [dB(uV)]	Transducer Factor [dB]	Level dB[uVolts/meter]	Limit:1	
0° .009 - .15MHz	.1232	45.26 ave	.1	16.2	61.56	105.8
Azimuth: 291 Height:143 Horz				Margin [dB]:	-44.24	
0° .15 - 30MHz**	.2464	44.34 qp	.1	15.4	59.84	79.8
Azimuth: 311 Height:100 Horz				Margin [dB]:	-29.96	
	.3496	41.39 qp	.1	15.4	56.89	76.7
Azimuth: 311 Height:100 Horz				Margin [dB]:	-29.81	
	.4728	38.61 qp	.1	15.4	54.11	74.1
Azimuth: 311 Height:100 Horz				Margin [dB]:	-29.99	

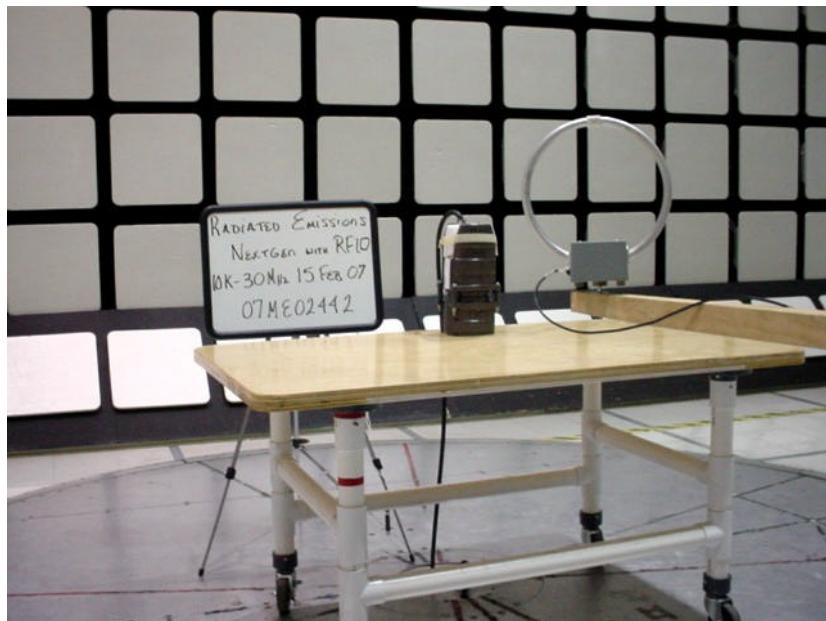
\*\* Measurements made at 1-meter distance to overcome noise floor.

LIMIT 1: FCC Part 15 Subpart C 15.209

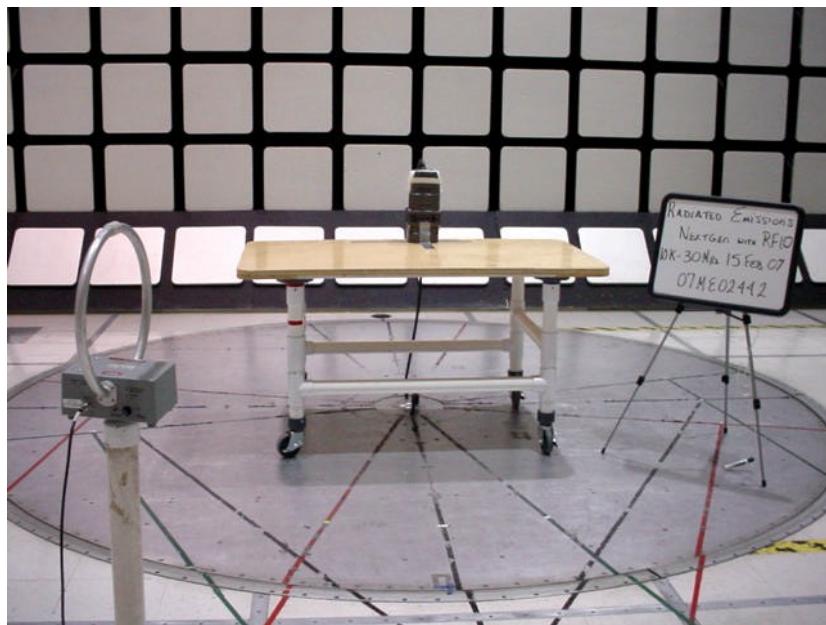
pk - Peak detector

qp - Quasi-Peak detector

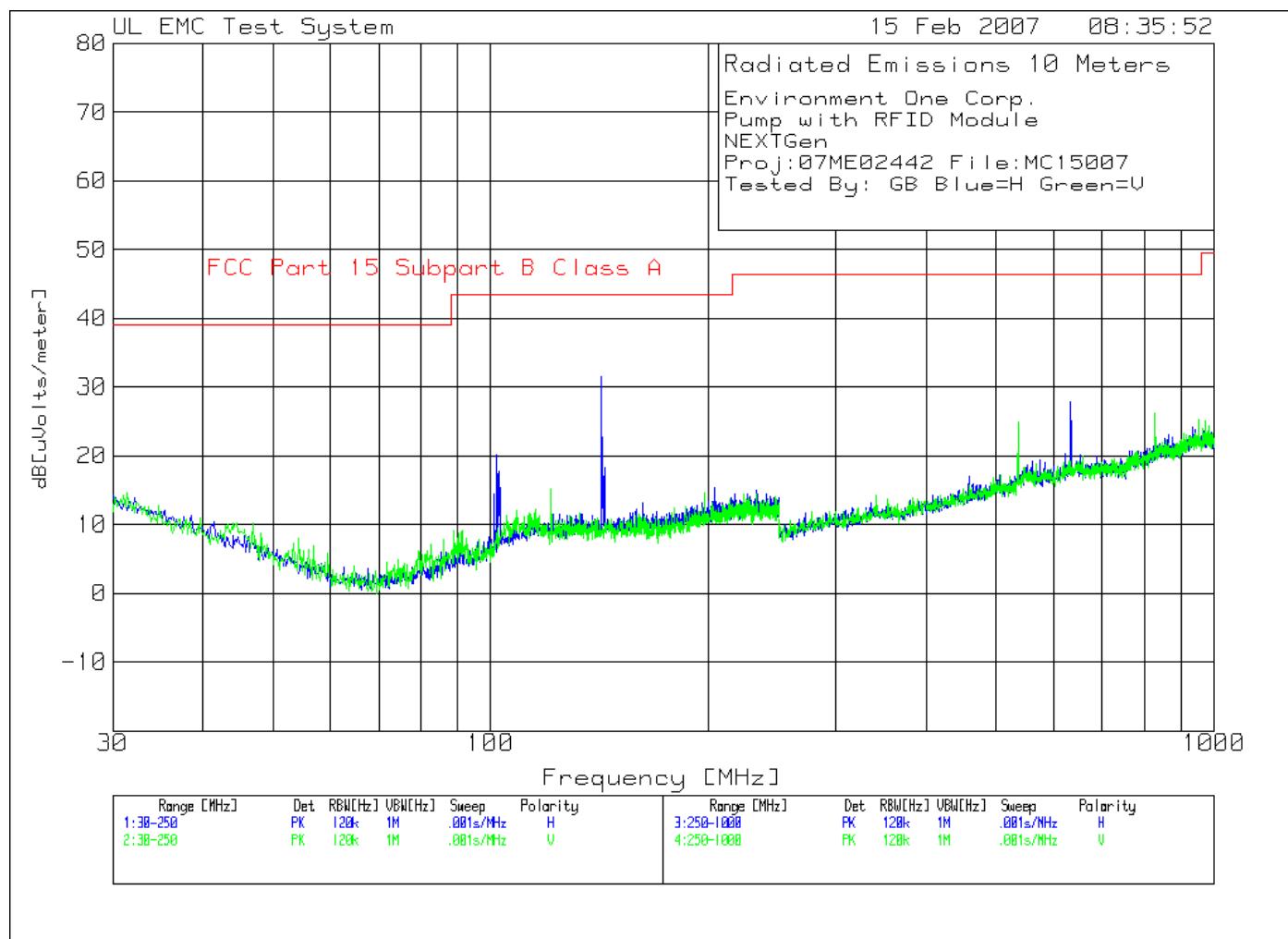
av - Average detector



Radiated Emissions 9kHz – 30MHz (1-meter measurement distance)



Radiated Emissions 9kHz – 30MHz (3-meter measurement distance)



Environment One Corp.

Pump with RFID Module

NEXTGen

Proj:07ME02442 File:MC15007

Tested By: GB Blue=H Green=V

Test Meter Gain/Loss Transducer Level Limit:1

Frequency	Reading	Factor	Factor	dB[uVolts/meter]
[MHz]	[dB(uV)]	[dB]	[dB]	

=====

Horizontal 30 - 250MHz -----

101.9146	44.48 pk	-35.7	11.3	20.08	43.5
	Azimuth:346	Height:400	Horz	Margin [dB]	-23.42
141.9813	52.85 pk	-35.7	14.4	31.55	43.5
	Azimuth:321	Height:250	Horz	Margin [dB]	-11.95

Vertical 30 - 250MHz -----

121.1408	37.54 pk	-35.8	13.4	15.14	43.5
	Azimuth:158	Height:101	Vert	Margin [dB]	-28.36

Horizontal 250 - 1000MHz -----

632.7552	38.71 pk	-31.3	20.4	27.81	46.4
	Azimuth:88	Height:400	Horz	Margin [dB]	-18.59

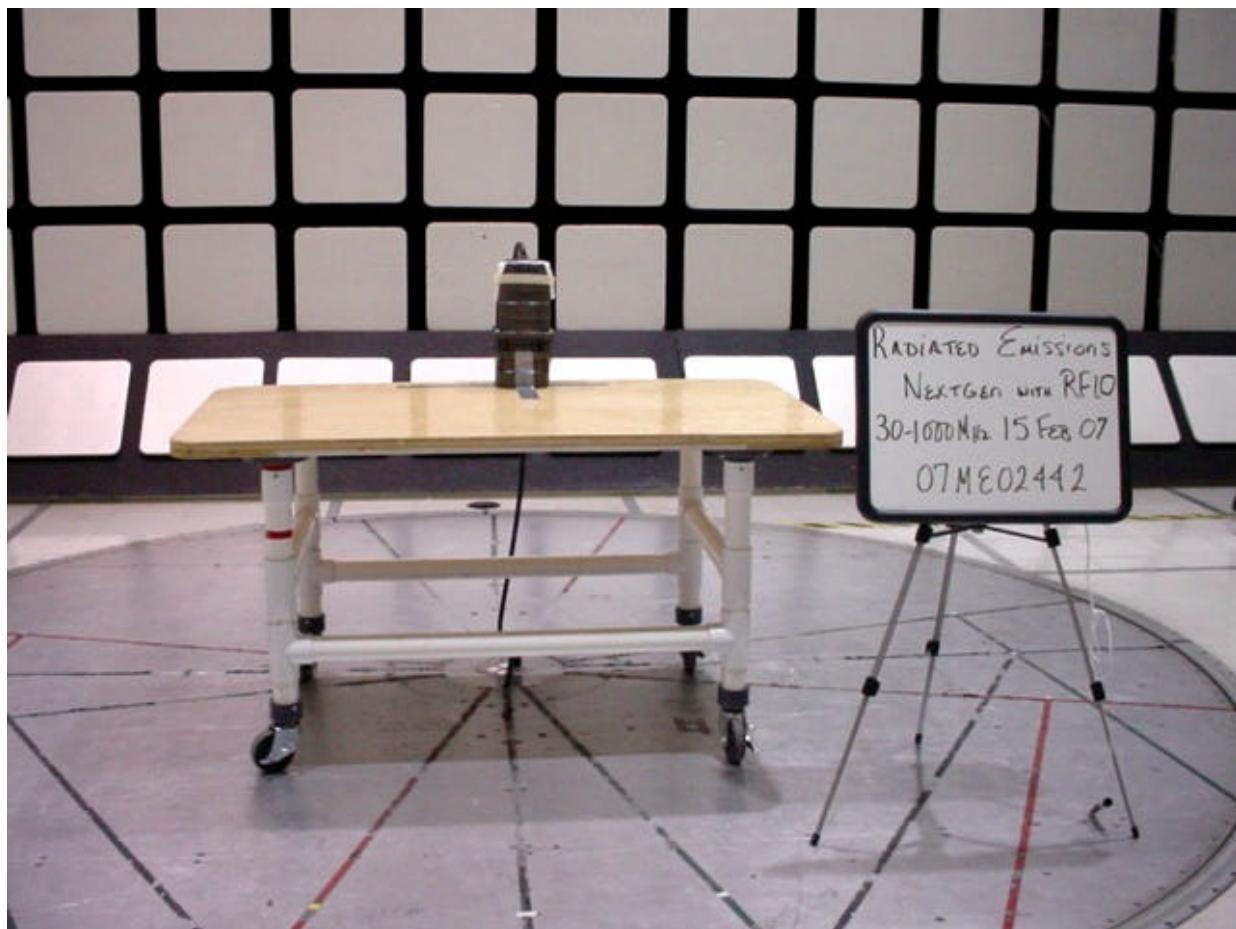
Vertical 250 - 1000MHz -----

535.6905	38.36 pk	-32.2	18.7	24.86	46.4
	Azimuth:89	Height:299	Vert	Margin [dB]	-21.54
828.8859	34.73 pk	-31.7	23.1	26.13	46.4
	Azimuth:50	Height:199	Vert	Margin [dB]	-20.27

LIMIT 1: FCC Part 15 Subpart B Class A

pk - Peak detector

qp - Quasi-Peak detector



Radiated Emissions 30-1000MHz Test Setup

Test Equipment Used					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
EMI Receiver	Rohde & Schwarz	ESIB 26	ME5B-081	14 Nov 06	14 Nov 07
Biconical Antenna	Schaffner	VBA 6106A	SN: 22681	14 Aug 06	14 Aug 07
Log Periodic Antenna	Schaffner	UPA 6109	SN: 22987	18 Aug 06	18 Aug 07
Active Loop	EMCO	6507	ME5A-288	21 Jun 06	30 Jun 07
Hygrometer/Temp/RH Indicator	Cole -Parmer	99760-00	ME4-268	15 Aug 06	15 Aug 07
			Ranges	Temp: 0°C-55°C/32° to 131°F Humidity: 25% to 95 %RH RH % Indicator: 0-100 RH	

Test Accessories Used					
Description	Manufacturer	Model	Identifier	Char/Valid Date	Due
10-Meter Chamber	TDK/Lindgren	FACT 5	NA	June 2006	NA
Measurement Software	UL	UL EMI Software	Version 9.3	23 Oct 06	NA

## 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 and accepted in a letter dated September 24, 1997 (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.

U.S. Identifier Number: US0113