



Test Report: 4W07862

Applicant: Gecko Electronics Inc
450 Des Canetons
Quebec, G2E 5W6

**Equipment Under Test:
(EUT)** IRFMR-1, RF TRANSMITTER

In Accordance With: FCC PART 15, SUBPART C, 15.249

Tested By: Nemko Canada Inc.
303 River Road, R.R. 5
Ottawa, Ontario K1V 1H2

Authorized By: 
Kevin Carr, EMC/EMI/Wireless Specialist

Date: 18 August 2004

Total Number of Pages: 21

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EQUIPMENT: IRFMR-1, RF TRANSMITTER

Section 1. Summary of Test Results

General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15, Subpart C. All tests were conducted using measurement procedure ANSI C63.4-2001. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See "Summary of Test Data".

TESTED BY: _____
Daxesh Thakker, Wireless Test Engineer

DATE: 18 August 2004

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Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada.
The tests included in this report are within the scope of this accreditation.

EQUIPMENT: IRFMR-1, RF TRANSMITTER

Summary Of Test Data

Name of Test	Para. Number	Results
Transmission Requirements	15.249 (a)	Complied
Radiated Emissions	15.249 (d)	Complied
Occupied Bandwidth	2.202	Complied
Frequency Tolerance	15.249(b) (2)	Complied
Power line Conducted Emissions	15.207	Complied

Test Conditions:**Indoor**

Temperature: 22° C

Humidity: 30 %

Outdoor

Temperature: 18° C

Humidity: 39 %

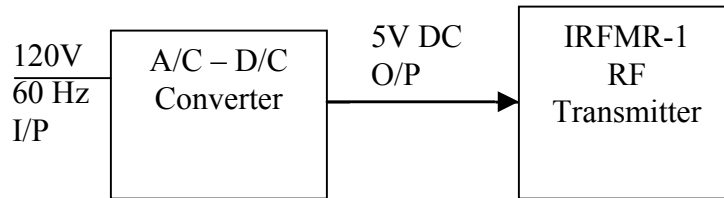
EQUIPMENT: IRFMR-1, RF TRANSMITTER

Section 2. Equipment Under Test**General Equipment Information**

Manufacturer:	Gecko Electronics Inc
Model No.:	IRFMR-1 RF TRANSMITTER
Serial No.:	None
Date Received In Laboratory:	May 26 2004
Nemko Identification No.:	Item no. 1 & 2
Tested To Standard No.:	FCC part 15, Subpart C, 15.249
Test Voltage Tx.	120 V, 60 Hz
Frequency Range (or fixed frequency): Tx.	915.85 MHz & 916.59 MHz
Field Strength (distance):	86.2 dBuVolts/m @ 3m.
Occupied Bandwidth (99% BW):	176.7 KHz
Type of Modulation:	FSK
Emission Designator (TRC-43:)	176K7F1D
Transmitter Spurious (worst case):	53.5 dBuV/m @3m @ 1831.7 MHz

EQUIPMENT: IRFMR-1, RF TRANSMITTER

Test Set-up



EQUIPMENT: IRFMR-1, RF TRANSMITTER

Section 3. Transmission Requirements

Para. No.: 15.249 (a)

Test Performed By: Daxesh Thakker	Date of Test: May 26, 2004
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Minimum Standard: The non-momentarily operated devices in the frequency bands of 902-928 MHz, 2.4 – 2.4835 GHz & 5.725-5.875 GHz shall not exceed 50 millivolts/m (94 dBuVolts/m) field strength of the fundamental, at a distance of 3 meters.

Test Results: Complied

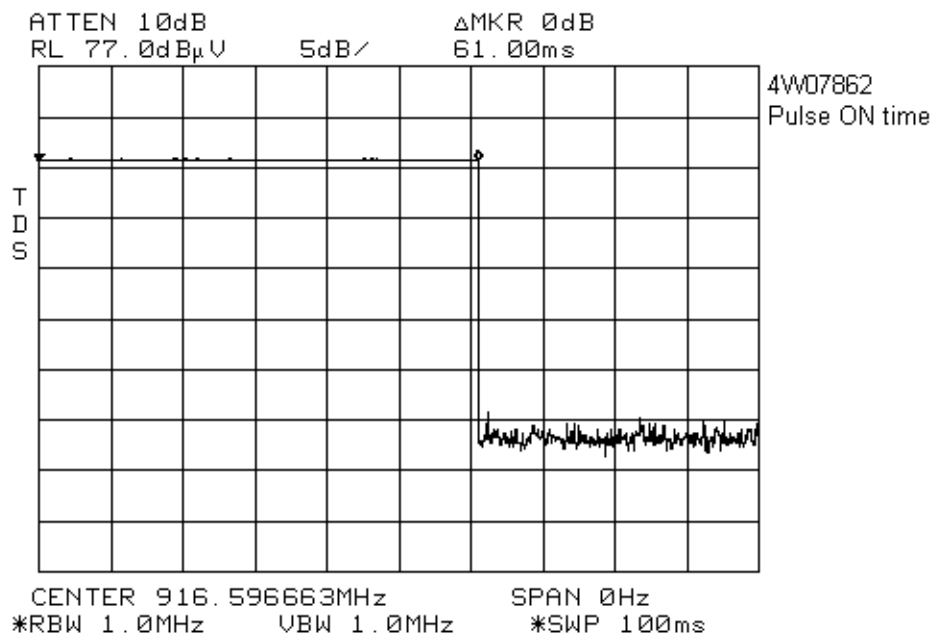
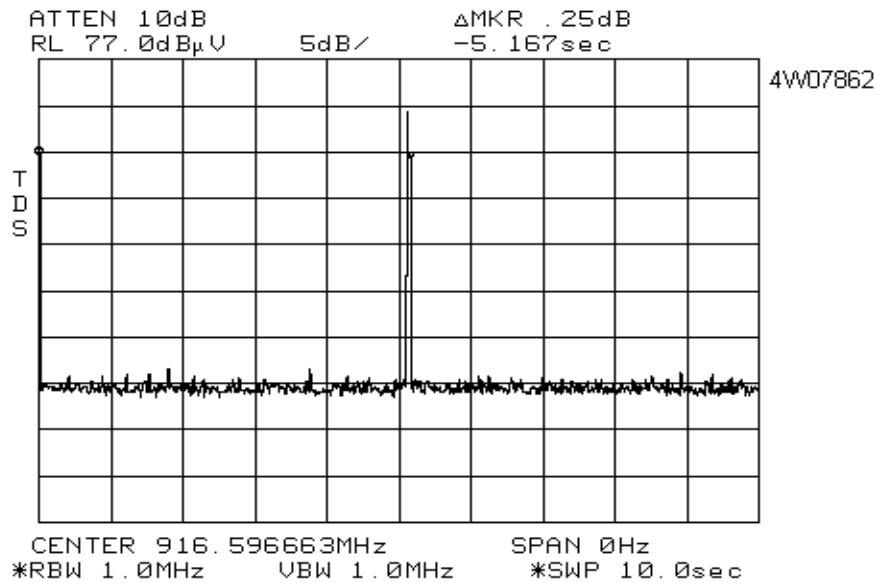
Test Data: Compliance was determined by verification of technical specifications and a functional test on the equipment.

EQUIPMENT: IRFMR-1, RF TRANSMITTER

Rationale for Compliance with Transmission Requirements

15.249 (a)	The EUT is transmitting one 61 mSec pulse at every 5 seconds interval. The EUT is non-momentarily operated device.
15.249 (a)	The EUT transmits in the frequency band of 902-928 MHz.

EQUIPMENT: IRFMR-1, RF TRANSMITTER



EQUIPMENT: IRFMR-1, RF TRANSMITTER

Section 4. Radiated Emissions

Para. No.: 15.249 (a) - Transmitter

Test Performed By: Daxesh Thakker	Date of Test: July 21, 2004
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Minimum Standard:

Fundamental Frequency (MHz)	Field Strength of Fundamental (millivolts/m @ 3m)	Field Strength of harmonics (millivolts/m @ 3m)
902-928	50	0.5
2400-2483.5	50	0.5
5725-5875	50	0.5

Test Results: Complied

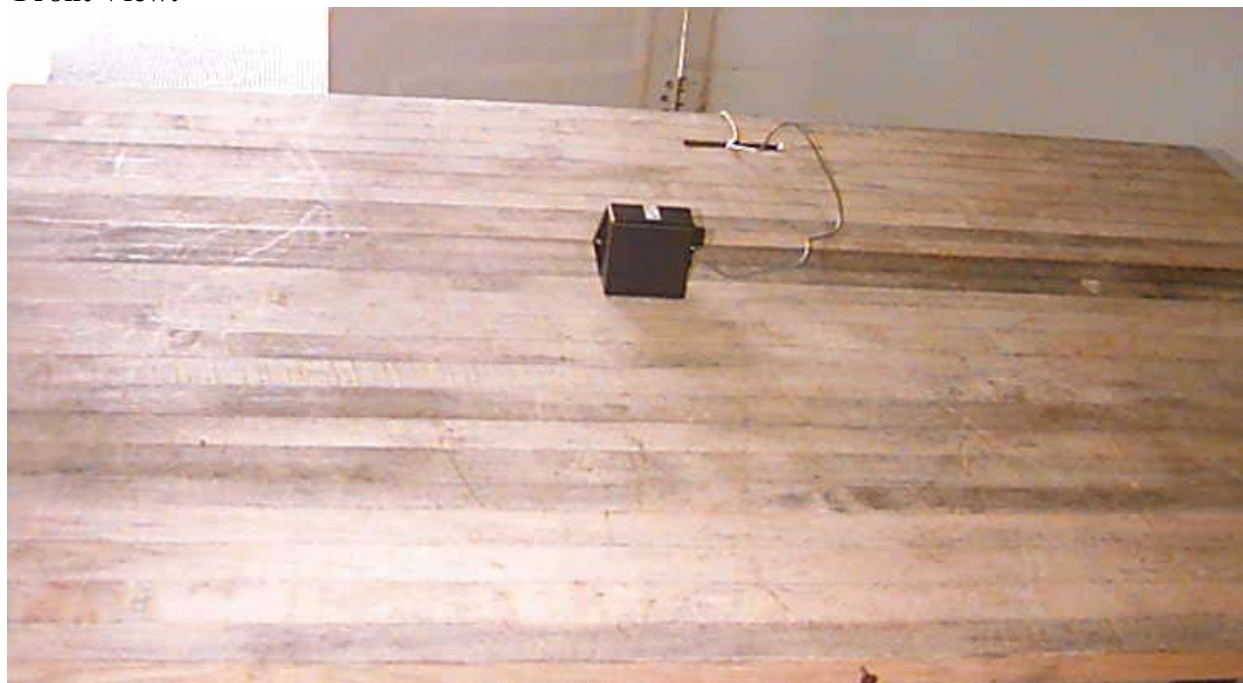
Test Data: As per attached tabulated data.

*EQUIPMENT: IRFMR-1, RF TRANSMITTER***Transmitter Radiated Emissions' data.**

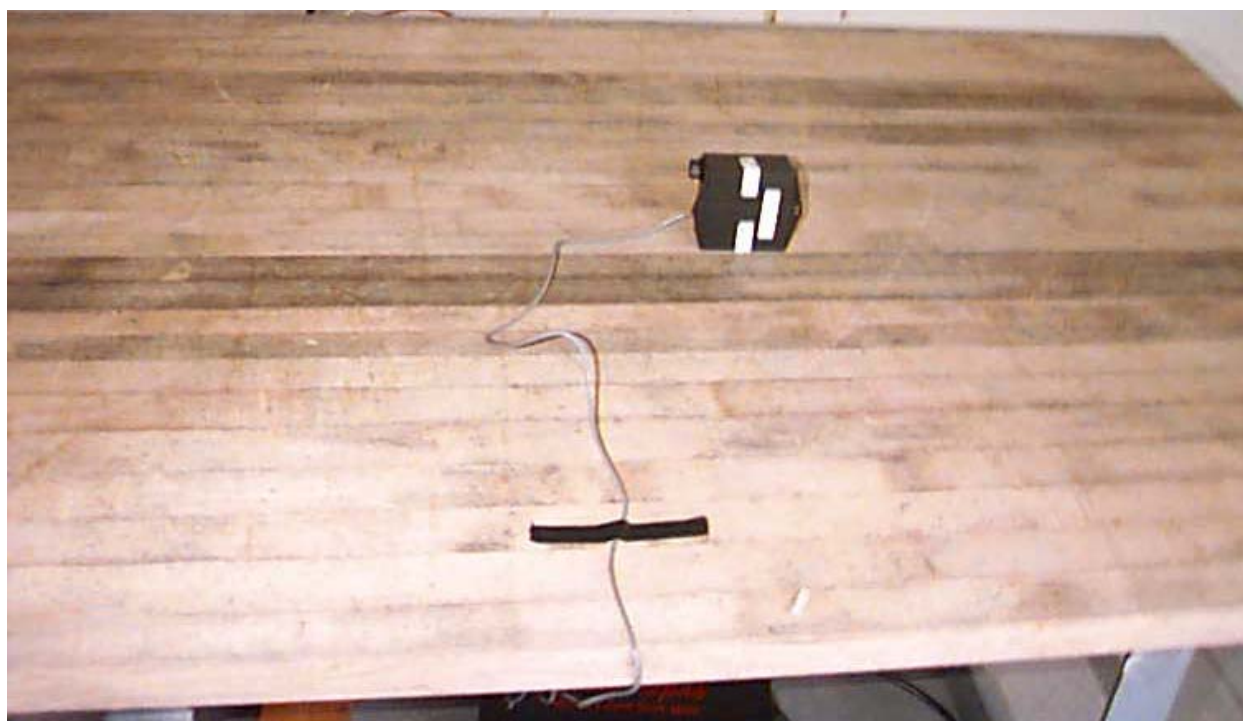
Test Date: July 21, 2004											
Engineer's Name: Daxesh Thakker											
Temperature (C°): 22								Humidity : 39 %			
Tested as per Table Top											
Test Distance (meters): 3								Range: A			
Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dBμV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Field Strength (dBμV/ m)	Limit (dBμV/ m)	Margin (dB)	Detector	Amp.
915.8500	ED4	V	53.7	28.5	N/A	4.0	86.2	94.0	7.8	Q-Peak	-
915.8500	ED4	H	49.5	28.5	N/A	4.0	82.0	94.0	12.0	Q-Peak	-
1831.7000	Horn2	V	67.7	28.2	46.6	3.9	53.5	54.0	0.5	Peak	1-2GHz
1831.7000	Horn2	H	65.1	28.1	46.6	3.9	51.3	54.0	2.7	Peak	1-2GHz
2747.5500	Horn2	V	71.6	30.3	56.6	5.7	50.8	54.0	3.2	Peak	2-4GHz
2747.5500	Horn2	H	74.5	30.3	56.6	5.7	53.5	54.0	0.5	Peak	2-4GHz
3663.5400	Horn2	V	64.7	32.7	54.9	7.0	49.4	54.0	4.6	Peak	2-4GHz
3663.5400	Horn2	H	64.4	32.7	54.9	7.0	49.2	54.0	4.8	Peak	2-4GHz
4579.8910	Horn2	V	61.1	34.3	53.3	7.7	49.6	54.0	4.4	Peak	4-8GHz
4579.8910	Horn2	H	62.2	34.1	53.3	7.7	50.9	54.0	3.1	Peak	4-8GHz
5495.1000	Horn2	V	58.7	34.4	51.2	8.7	50.7	54.0	3.3	Peak	4-8GHz
5495.1000	Horn2	H	59.5	34.6	51.2	8.7	51.7	54.0	2.3	Peak	4-8GHz
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Peak = 1.0 MHz RBW Note 3: The EUT was searched up to 10th harmonics of the fundamental.											
Notes:		Measurement Receiver = H.P.8565E, RBW/VBW = 1/3MHz, using a peak detector Measurement Receiver = ESVS30, 120kHz RBW using a Q-Peak detector									

EQUIPMENT: IRFMR-1, RF TRANSMITTER

**Radiated Emission Setup photo-
Front View:**



Rear View



EQUIPMENT: IRFMR-1, RF TRANSMITTER

Section 5. Frequency Stability

Para. No.: 15.249 (b) (2)

Test Performed By: Daxesh Thakker	Date of Test: June 22, 2004
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Limit: +/-0.001%, +/- 10ppm

Test Results: Complied.

Test Data: See the table.

STV = 120 volts, 60 Hz.

Voltage Stability

	Ref. Freq.	Measured	Variance	
Voltage	(MHz)	(MHz)	(Hz)	ppm
85% X STV	915.847715	915.847528	187	0.2
115% X STV	915.847715	915.847580	135	0.1

Temperature Stability @ STV

	Ref. Freq.	Measured	Variance	
Deg. Cel.	(MHz)	(MHz)	(Hz)	ppm
-20	915.847715	915.852799	-5084	-5.6
50	915.847715	915.841715	6000	6.6

Ref. Freq. (20Deg. C): 915.847715 MHz
 1 ppm = 0.000915848 MHz
 1 ppm = 915.847715 Hz

*EQUIPMENT: IRFMR-1, RF TRANSMITTER***Section 6. Power line Conducted Emissions**

Para. No.: 15.207

Test Performed By: Daxesh Thakker	Date of Test: June 17, 2004
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Limit:

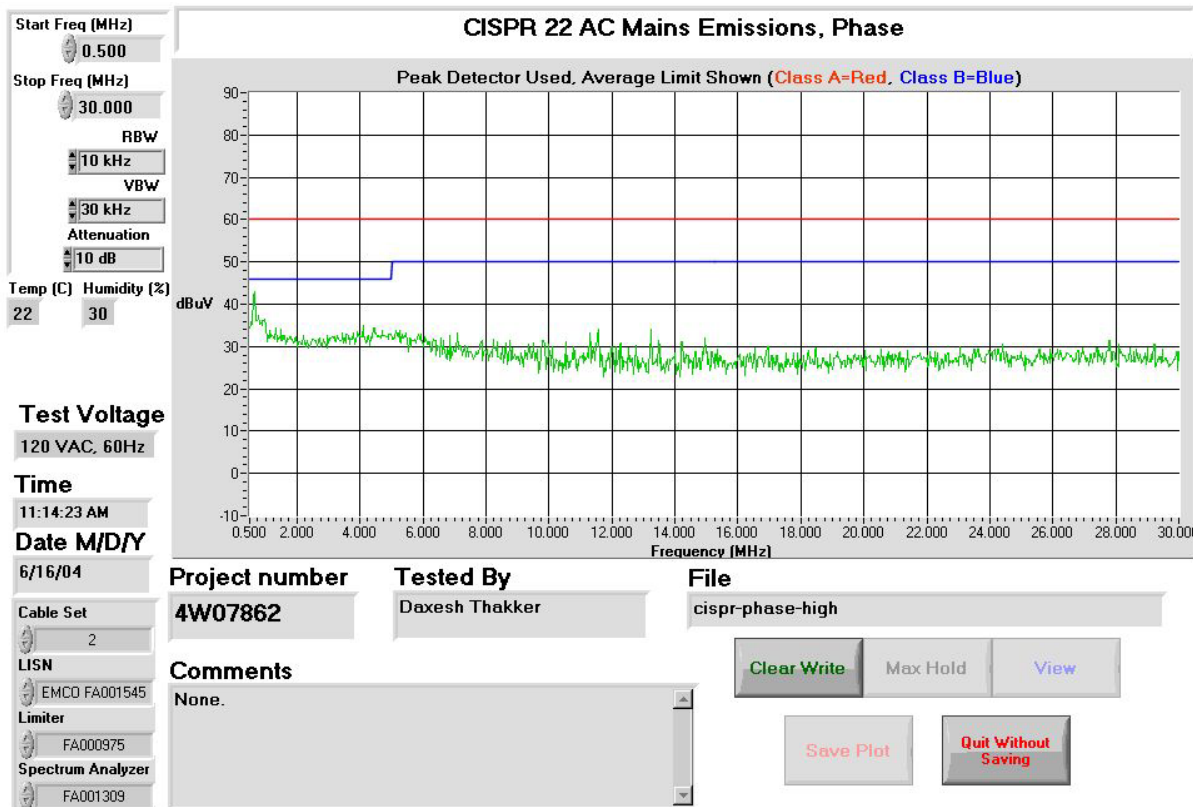
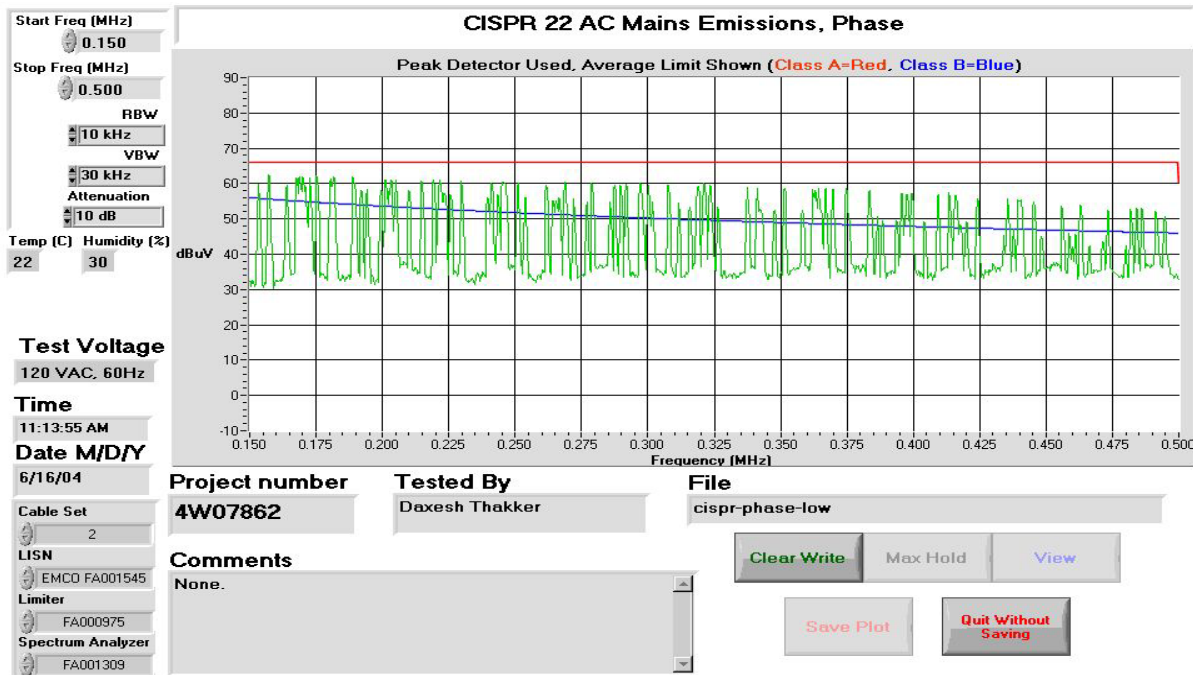
Limits For Conducted Disturbance At The Mains Ports: Paragraph No. 15.207 for Class A			
Frequency Range MHz	Limits dB(μV)		Result (Pass/Fail)
	Quasi-Peak	Average	
0.15 to 0.50	79	66	N/A
0.50 to 30	73	60	
Limits For Conducted Disturbance At The Mains Ports: Paragraph No. 15.207 for Class B			
Frequency Range MHz	Limits dB(μV)		Result (Pass/Fail)
	Quasi-Peak	Average	
0.15 to 0.50	66 to 56	56 to 46	PASS
0.5 to 5	56	46	
5 to 30	60	50	
Notes			
1. The lower limit shall apply at the transition frequency.			
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50MHz.			

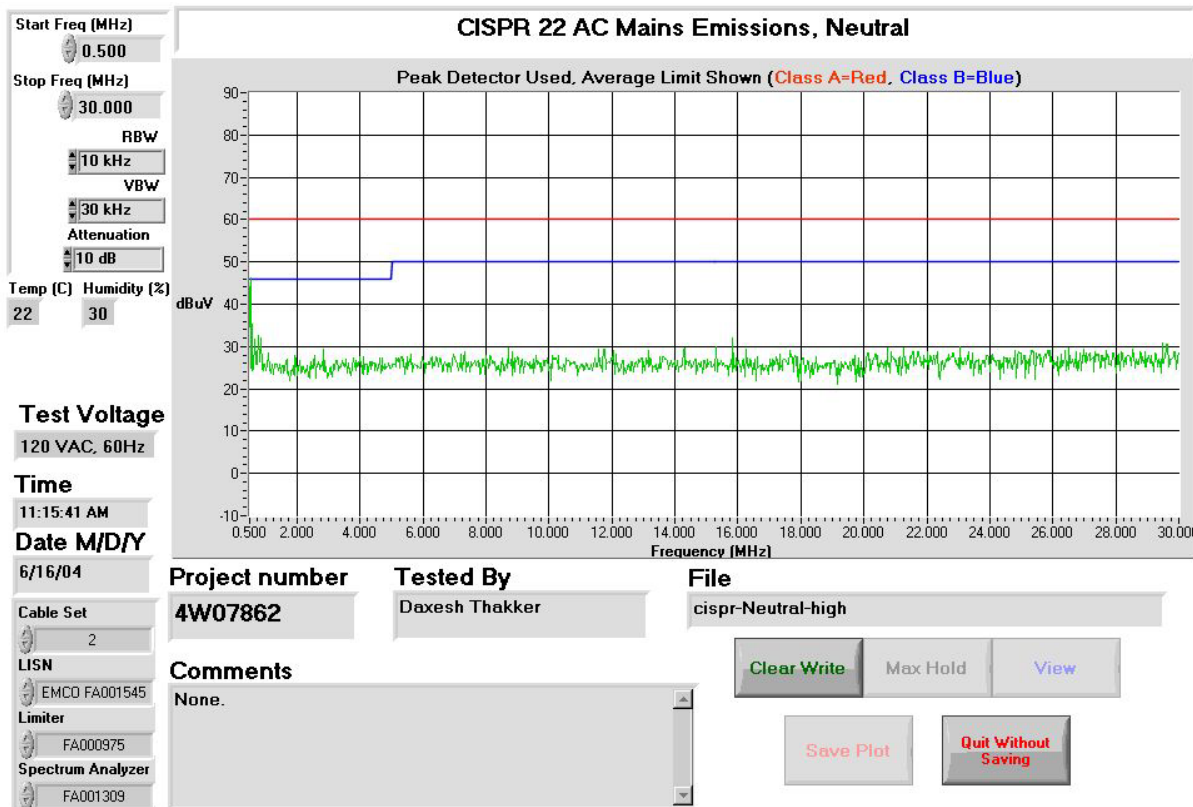
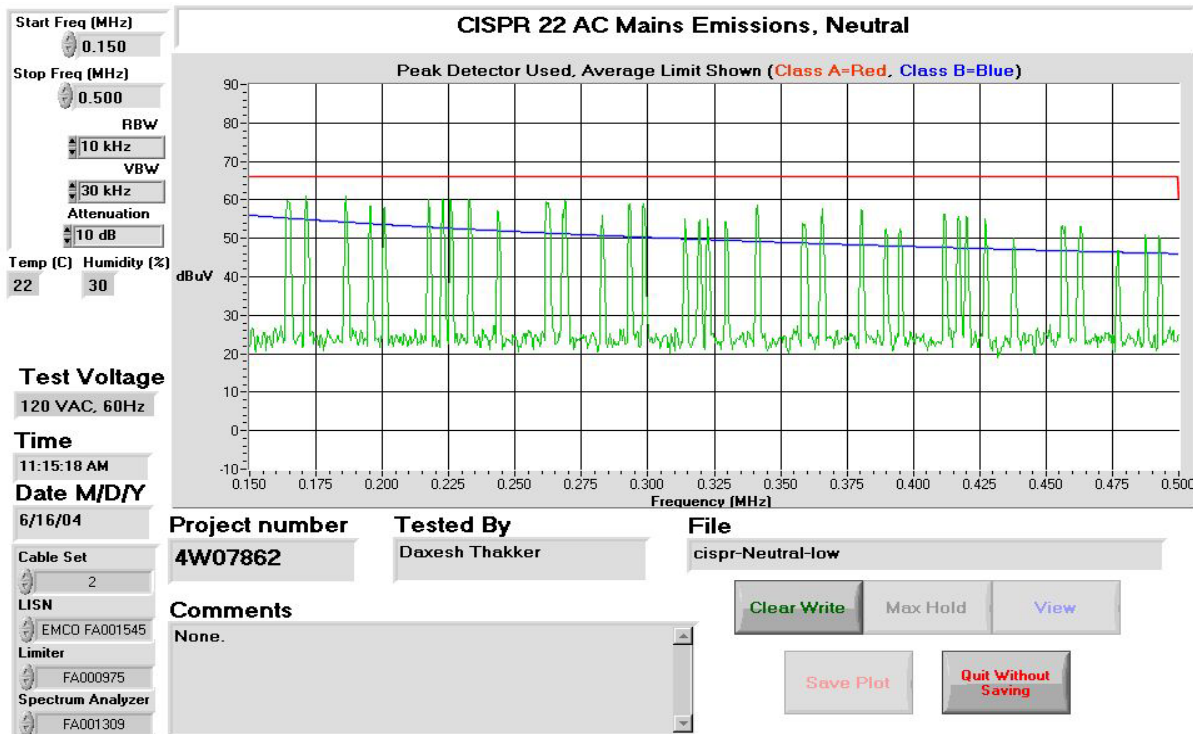
Test Results: Complied**Test Data:** See attached graphs and table.

EQUIPMENT: IRFMR-1, RF TRANSMITTER

AC Power line Conducted Emissions:

Test Date: June 17, 2004					
Engineer's Name: Daxesh Thakker					
Temperature (C°): 21			Humidity %: 15		
Tested as per (Table Top/Floor Standing): Table Top					
Spectrum plots for each frequency band can be found at the back of this section. Any Emissions that were above or within 5 dB of the average limits were remeasured with a receiver and recorded. . *All plots were generated with a peak detector.					
Port under test: AC Input			Test Voltage: 120VAC, 60Hz		
Receiver Results (if applicable) :					
Conductor	Frequency (MHz)	Detector	Level dB(μV)	Limit dB(μV)	Margin dB
Phase	0.15	Quasi-Peak	51.7	66.0	14.3
Phase	0.15	Average	1.5	56.0	54.5
Phase	0.325	Quasi-Peak	47.9	59.6	11.7
Phase	0.325	Average	1	49.6	48.6
Phase	0.5	Quasi-Peak	39.4	56.0	16.6
Phase	0.5	Average	-0.3	46.0	46.3
Neutral	0.15	Quasi-Peak	51.9	66.0	14.1
Neutral	0.15	Average	1.3	56.0	54.7
Neutral	0.325	Quasi-Peak	48.1	59.6	11.5
Neutral	0.325	Average	0.6	49.6	49.0
Neutral	0.5	Quasi-Peak	40	56.0	16.0
Neutral	0.5	Average	-0.2	46.0	46.2
Notes:					

*EQUIPMENT: IRFMR-1, RF TRANSMITTER***AC Power line Conducted Emissions Plots**

EQUIPMENT: IRFMR-1, RF TRANSMITTER

EQUIPMENT: IRFMR-1, RF TRANSMITTER

Section 7. Occupied Bandwidth

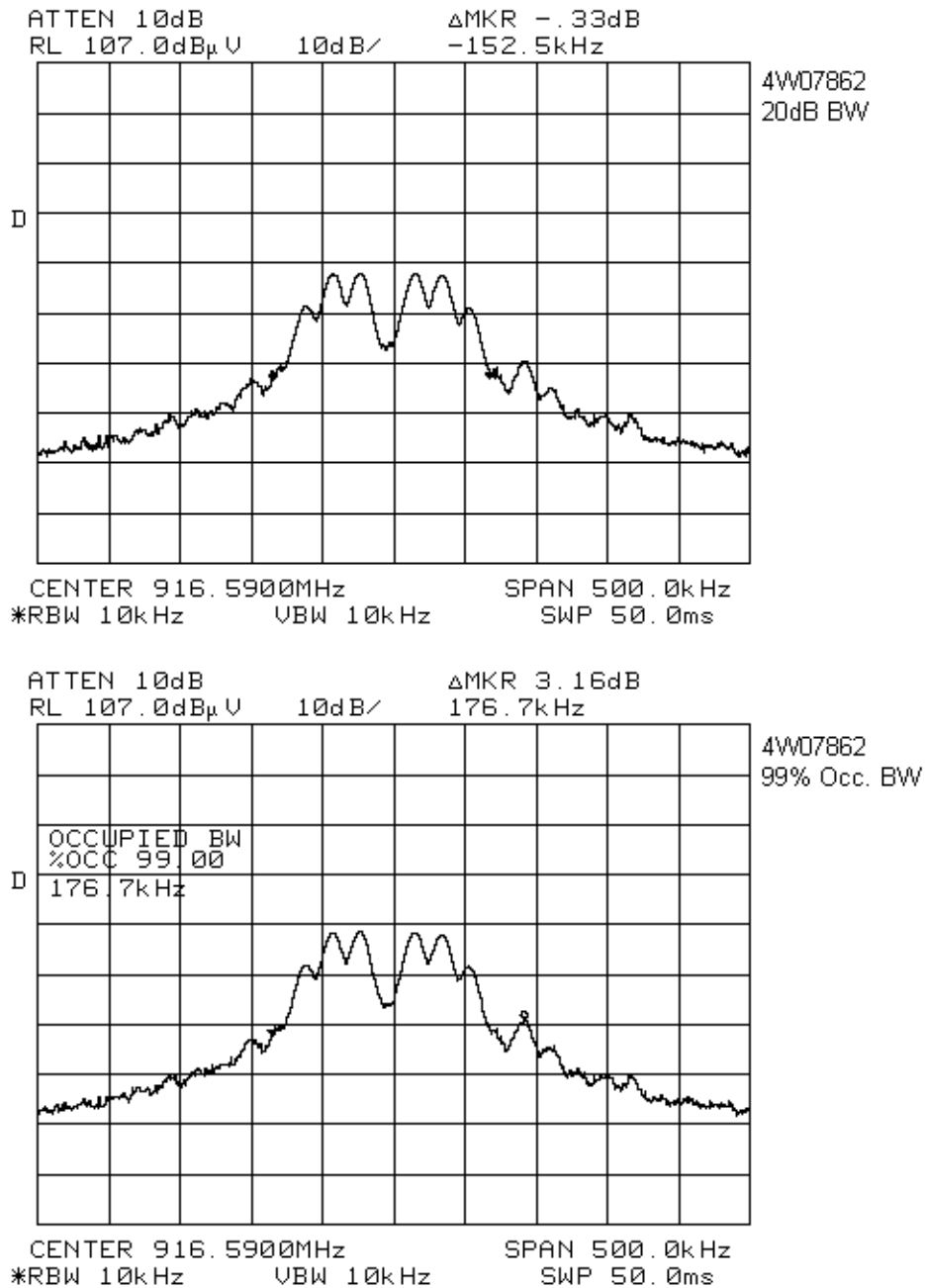
Para. No.: 2.202

Test Performed By: Daxesh Thakker	Date of Test: June 17, 2004
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Test Results: Complied.

Test Data: See attached graphs.

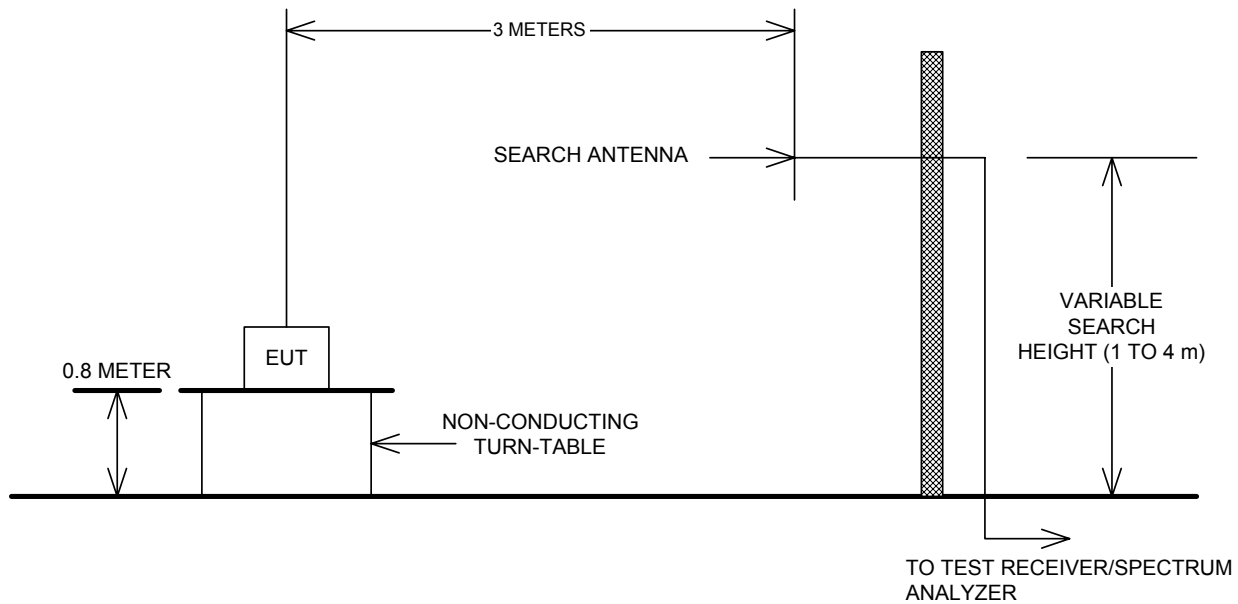
EQUIPMENT: IRFMR-1, RF TRANSMITTER



EQUIPMENT: IRFMR-1, RF TRANSMITTER

Section 8. Block Diagram

Outdoor Test Site For Radiated Emissions



The spectrum was searched up to the 10th harmonic of the fundamental frequency of operation.

EQUIPMENT: IRFMR-1, RF TRANSMITTER

Section 9. Test Equipment List

Conducted Disturbance at Mains Test Equipment Used:

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	LISN	EMCO	4825/2	FA001545	Oct. 30/03	Oct. 30/04
Extended	Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	May 26/04	May. 26/05
Extended	Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 26/04	May. 26/05
1 Year	Transient Limiter	Hewlett-Packard	1194 7A	FA000975	June. 18/04	June. 18/05
Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair						

Equipment List - Radiated Emissions

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	Spectrum Analyzer	Hewlett-Packard	8565E	FA000981	May 31/04	May 31/05
1 Year	Dipole Antenna Set	EMCO #1	3121C	FA000814	May. 09/04	May. 09/05
1 Year	Receiver	Rohde & Schwarz	ESVS-30	FA001437	July. 24/03	July. 24/04
1 Year	Horn Antenna #1	EMCO	3115	FA000649	Dec. 18/03	Dec. 18/04
1 Year	1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	June. 18/04	June. 18/05
1 Year	2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	June. 18/04	June. 18/05
1 Year	4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	June. 18/04	June. 18/05
Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair						

Section 10. Test Equipment List, 4w07862

Conducted Disturbance at Mains Test Equipment Used:

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	LISN	EMCO	4825/2	FA001545	Oct. 30/03	Oct. 30/04
Extended	Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	May 26/04	May. 26/05
Extended	Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	May 26/04	May. 26/05
1 Year	Transient Limiter	Hewlett-Packard	1194 7A	FA000975	June. 18/03	June. 18/04

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair

Equipment List - Radiated Emissions

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	Spectrum Analyzer	Hewlett-Packard	8565E	FA000981	May 31/04	May 31/05
1 Year	Dipole Antenna Set	EMCO #1	3121C	FA000814	May. 09/04	May. 09/05
1 Year	Receiver	Rohde & Schwarz	ESVS-30	FA001437	July. 24/03	July. 24/04
1 Year	Horn Antenna #1	EMCO	3115	FA000649	Dec. 18/03	Dec. 18/04
1 Year	1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	June. 18/04	June. 18/05
1 Year	2.0 – 4.0 GHz Amplifier	JCA	24-600	FA001496	June. 18/04	June. 18/05
1 Year	4.0 – 8.0 GHz Amplifier	JCA	48-600	FA001497	June. 18/04	June. 18/05
1 Year	Receiver	Rohde & Schwarz	ESH3	FA000872	Jan. 14/04	Jan. 14/05
COU	5.0 – 18.0 GHz Amplifier	NARDA	DWT-186N23U40	FA001409	COU	COU
1 Year	Active Loop Antenna	Rohde & Schwarz	HFH2-Z2	FA000631	17 May 2004	17 May 2005
1 Year	Frequency Counter	Hewlett Packard	HP5350A	2444A00135	Feb. 19/04	Feb. 19/05
1 Year	Climate Chamber	Thermotron	SM-16C	15649-S	COU	COU
1 Year	Temp. Measurement System	fluke	55	FA001247 FA001248	Feb. 17/04	Feb/ 17/05

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair