Standards Council of Canada
Accredited Laboratory
Scope of Accreditation 75

Conseil canadien des normes
Laboratoire accrédité
Portée d'accréditation 75

TM

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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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: _____ DATE: 18 August 2004
Daxesh Thakker, Wireless Test Engineer

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.

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 %

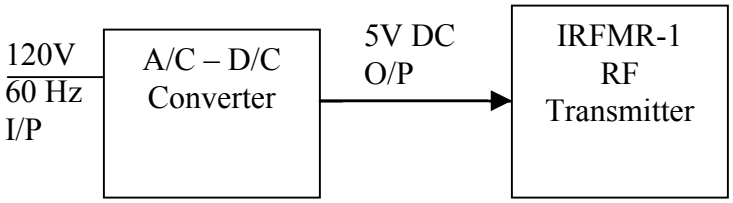
Outdoor Temperature: 18° C
Humidity: 39 %

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

Test Set-up



Section 3. Transmission Requirements

Para. No.: 15.249 (a)

Test Performed By: Daxesh Thakker	**Date of Test: May 26, 2004**

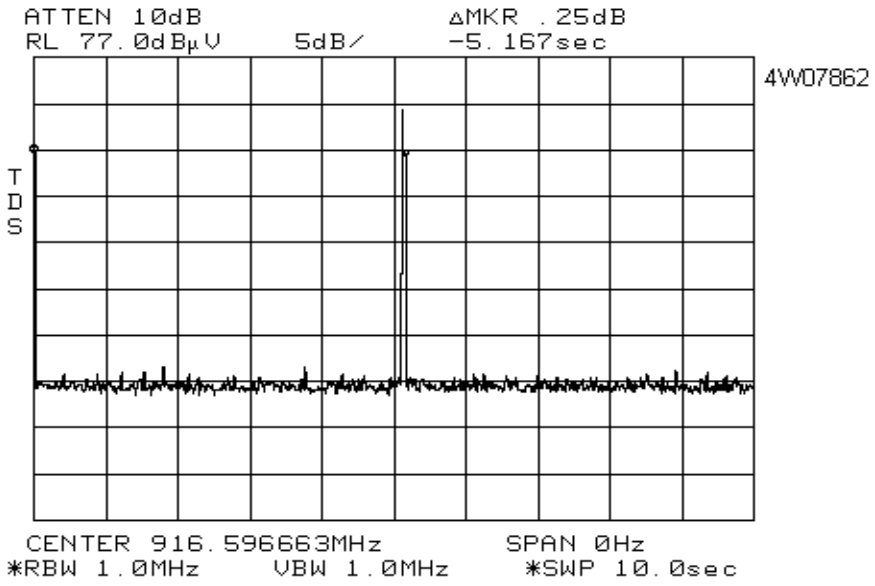
Minimum Standard: The non-momentarily operated devices in the frequency bands of 902-928 MHz, 2.4 – 2.4835 GHz & 5.725-5.875 GHz shall not exceed 50 millivolts/m (94 dBuVolts/m) field strength of the fundamental, at a distance of 3 meters.

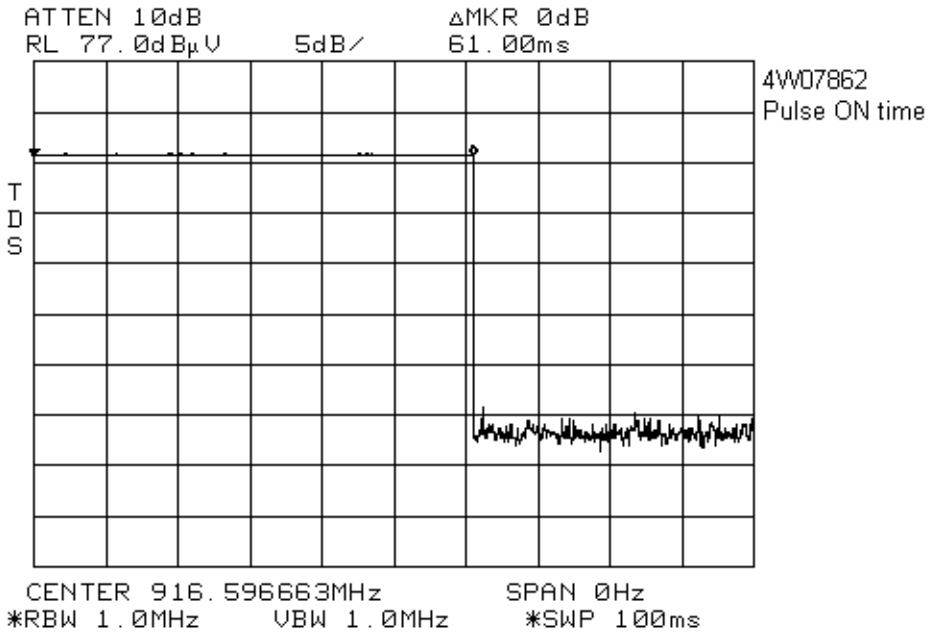
Test Results: Complied

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

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.


ATTEN 10dB
RL 77.0dBµV
5dB/
ΔMKR .25dB
-5.167sec
4W07862
TDS
CENTER 916.596663MHz
SPAN 0Hz
*RBW 1.0MHz
VBW 1.0MHz
*SWP 10.0sec


ATTEN 10dB
RL 77.0dBµV
5dB/
ΔMKR 0dB
61.00ms
4W07862
Pulse ON time
TDS
CENTER 916.596663MHz
SPAN 0Hz
*RBW 1.0MHz
VBW 1.0MHz
*SWP 100ms

Section 4. Radiated Emissions

Para. No.: 15.249 (a) - Transmitter

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

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.

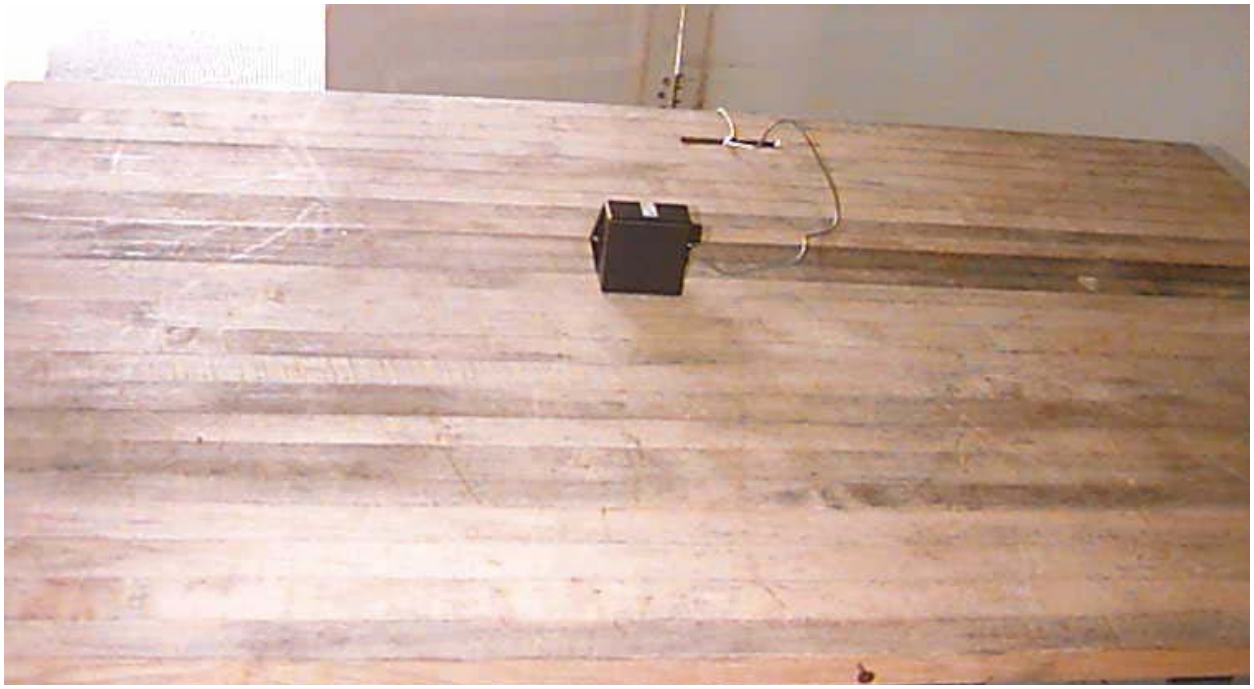
Transmitter Radiated Emissions' data.

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

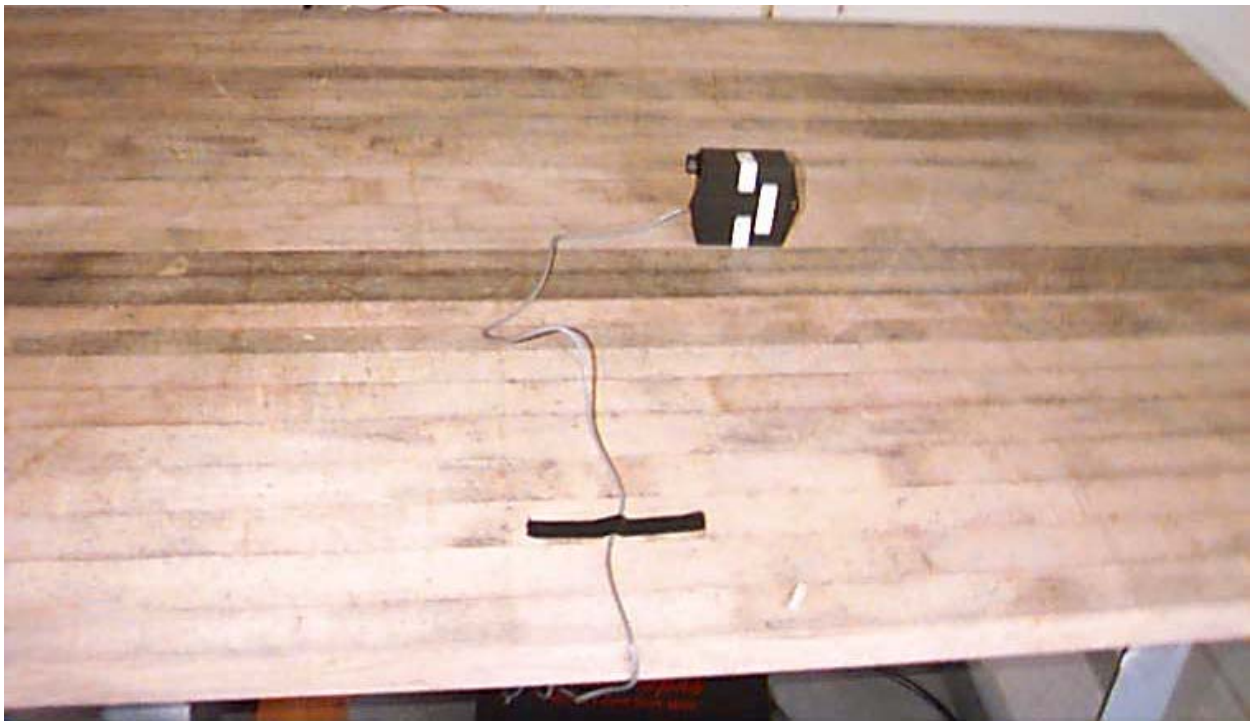
Note 1: Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole
Note 2: Detector Legend: Q-Peak = 120 kHz RBW, Peak = 1.0 MHz RBW
Note 3: The EUT was searched up to 10th harmonics of the fundamental.

Notes:	Measurement Receiver = H.P.8565E, RBW/VBW = 1/3MHz, using a peak detector Measurement Receiver = ESVS30, 120kHz RBW using a Q-Peak detector

Radiated Emission Setup photo-
Front View:



Rear View



Section 5. Frequency Stability

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

Test Performed By: Daxesh Thakker	**Date of Test: June 22, 2004**

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

Section 6. Power line Conducted Emissions

Para. No.: 15.207

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

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.

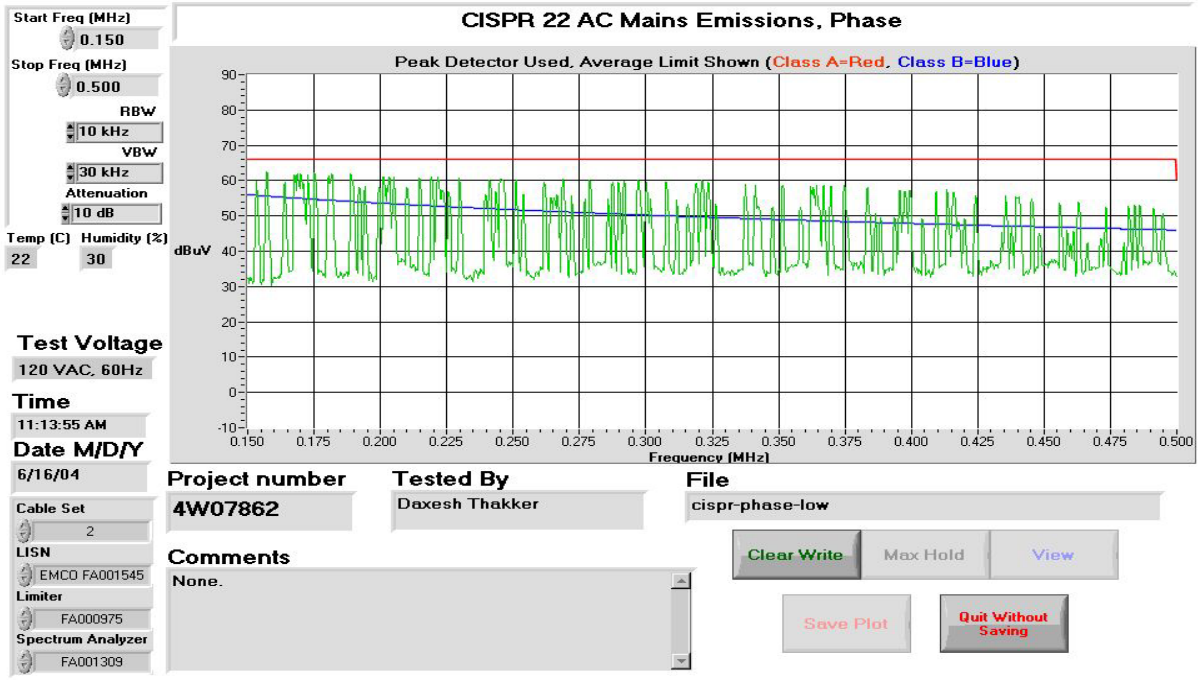
AC Power line Conducted Emissions:

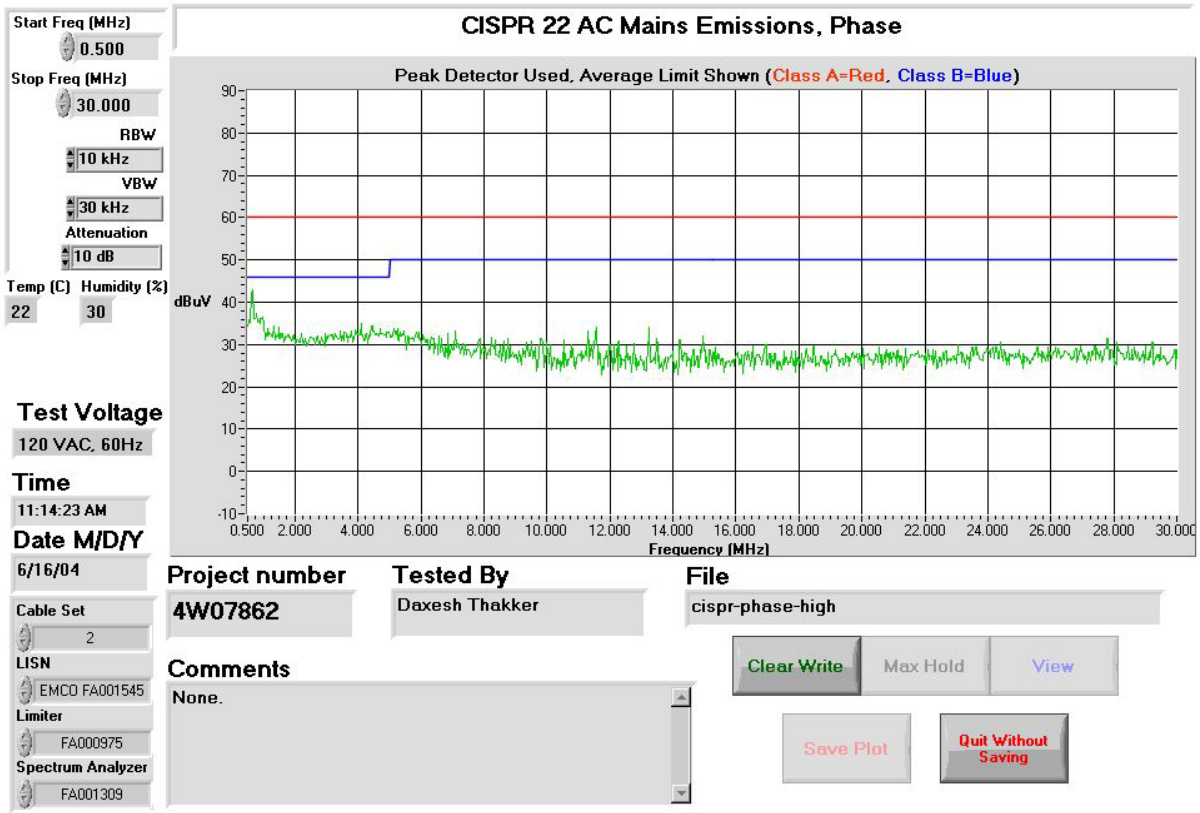
Test Date: June 17, 2004	
Engineer's Name: Daxesh Thakker	
Temperature (C°): 21	Humidity %: 15
Tested as per (Table Top/Floor Standing): Table Top	
Spectrum plots for each frequency band can be found at the back of this section. Any Emissions that were above or within 5 dB of the average limits were 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) :	

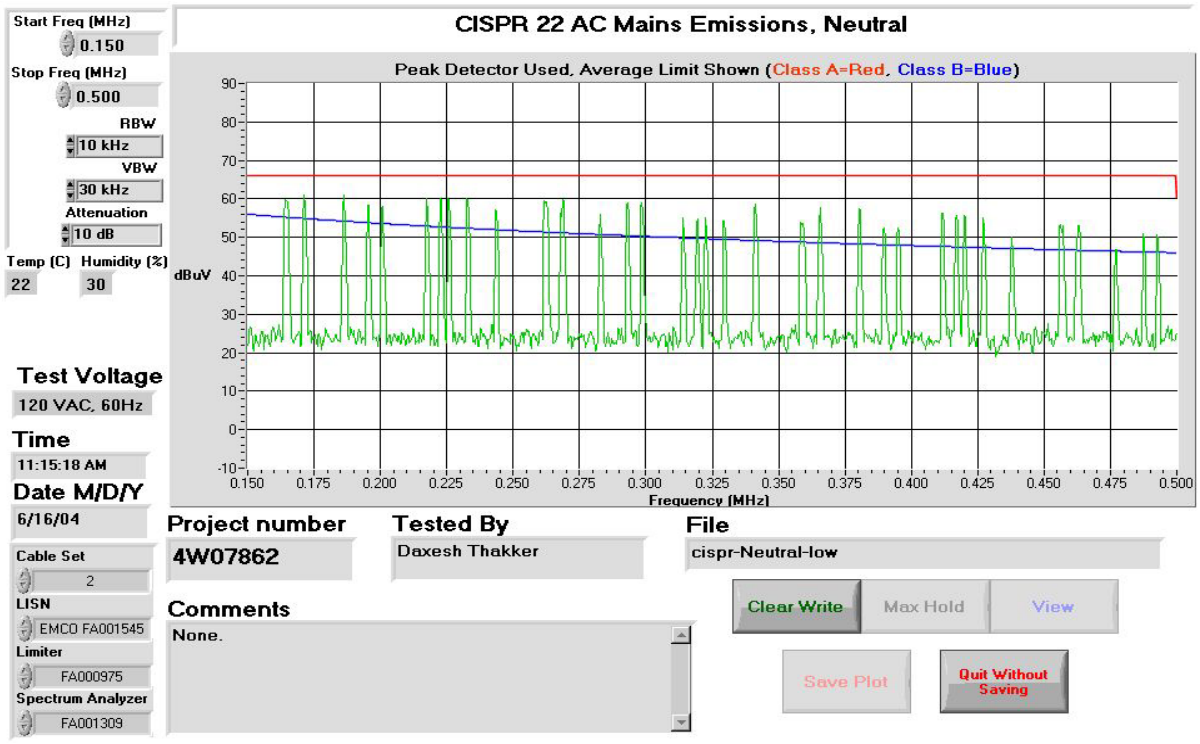
Conductor	Frequency (MHz)	Detector	Level dB(μV)	Limit dB(μV)	Margin dB
Phase	0.15	Quasi-Peak	51.7	66.0	14.3
Phase	0.15	Average	1.5	56.0	54.5
Phase	0.325	Quasi-Peak	47.9	59.6	11.7
Phase	0.325	Average	1	49.6	48.6
Phase	0.5	Quasi-Peak	39.4	56.0	16.6
Phase	0.5	Average	-0.3	46.0	46.3
Neutral	0.15	Quasi-Peak	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

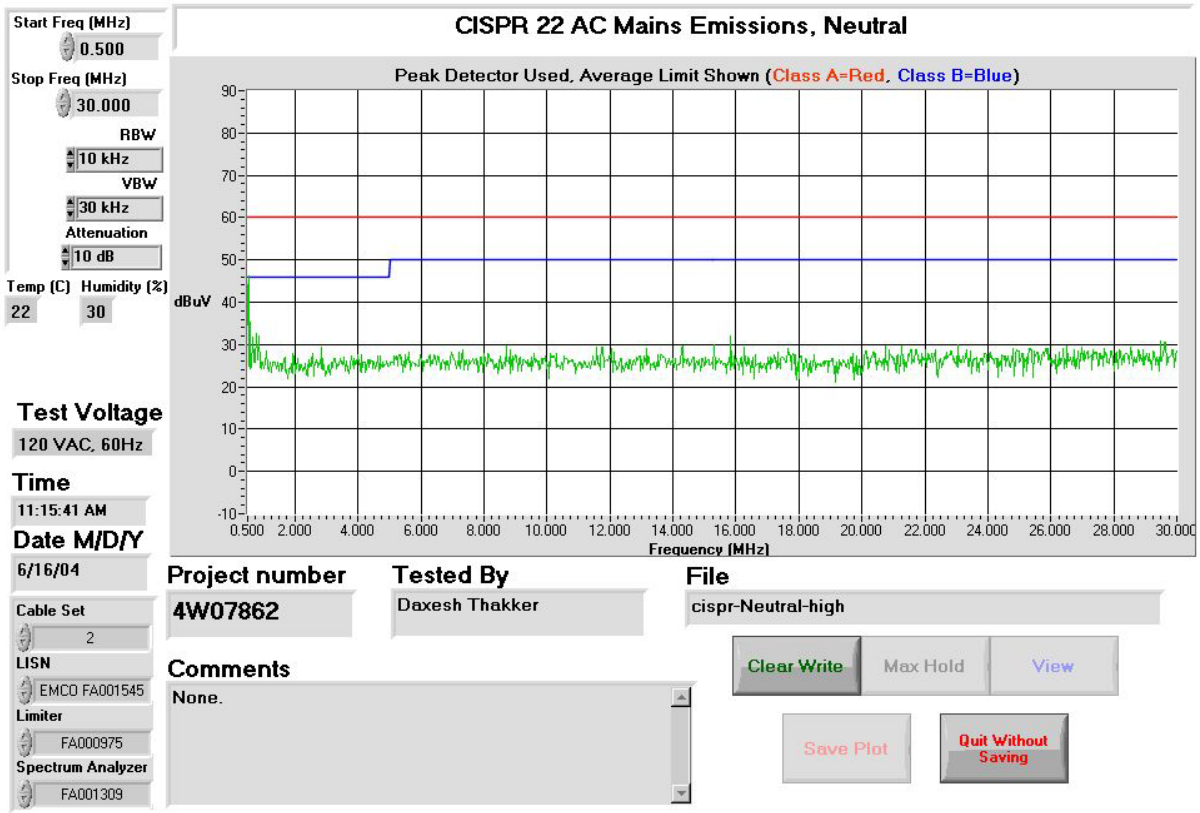
Notes:	

AC Power line Conducted Emissions Plots






Start Freq (MHz)
0.150
Stop Freq (MHz)
0.500
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
22
Humidity (%)
30
CISPR 22 AC Mains Emissions, Neutral
Peak Detector Used, Average Limit Shown (Class A=Red, Class B=Blue)
dBuV
Frequency (MHz)
Test Voltage
120 VAC, 60Hz
Time
11:15:18 AM
Date M/D/Y
6/16/04
Project number
4W07862
Tested By
Daxesh Thakker
File
cispr-Neutral-low
Cable Set
2
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
Comments
None.
Clear Write
Max Hold
View
Save Plot
Quit Without Saving


Start Freq (MHz)
0.500
Stop Freq (MHz)
30.000
RBW
10 kHz
VBW
30 kHz
Attenuation
10 dB
Temp (C)
22
Humidity (%)
30
CISPR 22 AC Mains Emissions, Neutral
Peak Detector Used, Average Limit Shown (Class A=Red, Class B=Blue)
dBuV
Frequency (MHz)
Test Voltage
120 VAC, 60Hz
Time
11:15:41 AM
Date M/D/Y
6/16/04
Project number
4W07862
Tested By
Daxesh Thakker
File
cispr-Neutral-high
Cable Set
2
LISN
EMCO FA001545
Limiter
FA000975
Spectrum Analyzer
FA001309
Comments
None.
Clear Write
Max Hold
View
Save Plot
Quit Without Saving

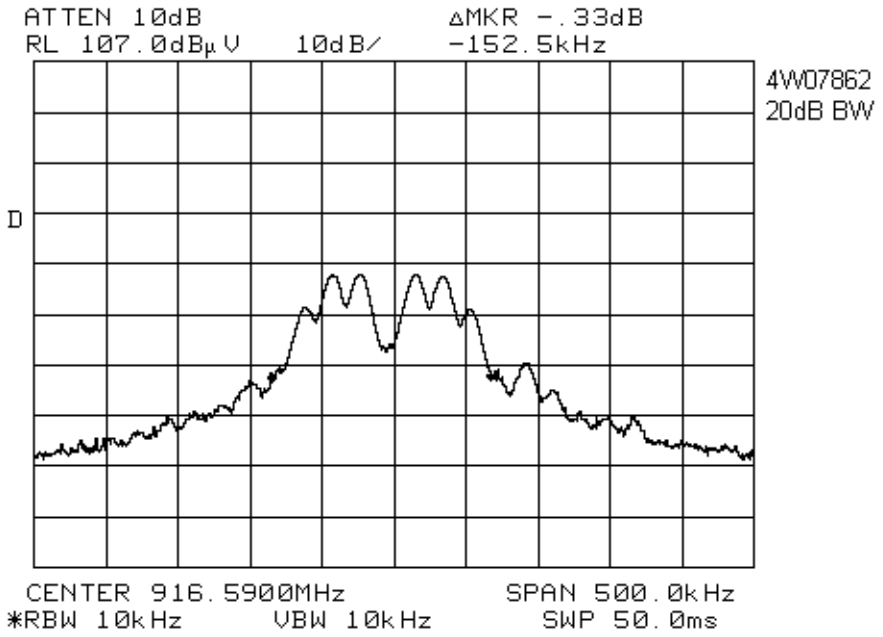
Section 7. Occupied Bandwidth

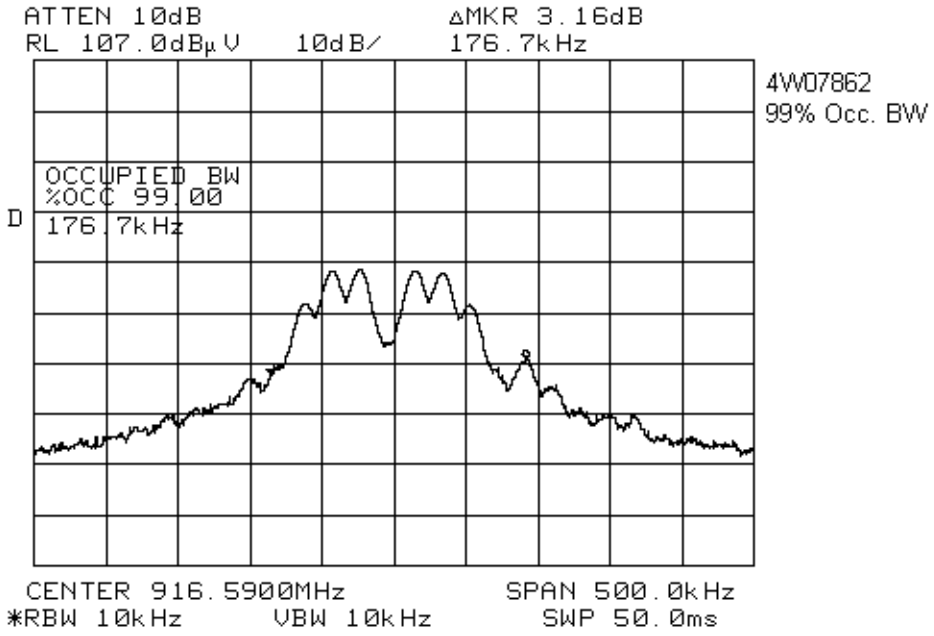
Para. No.: 2.202

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

Test Results: Complied.

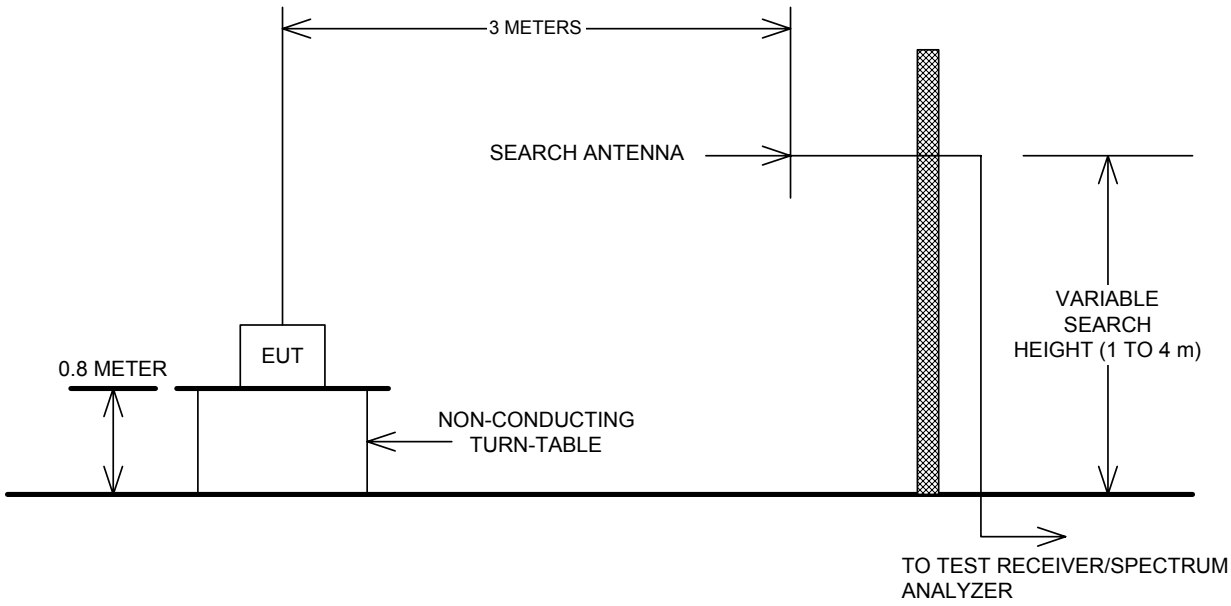
Test Data: See attached graphs.


ATTEN 10dB
RL 107.0dBµV
10dB/
ΔMKR -.33dB
-152.5kHz
4W07862
20dB BW
D
CENTER 916.5900MHz
SPAN 500.0kHz
*RBW 10kHz
VBW 10kHz
SWP 50.0ms


ATTEN 10dB
RL 107.0dBµV
10dB/
ΔMKR 3.16dB
176.7kHz
4W07862
99% Occ. BW
OCCUPIED BW
%OCC 99.00
176.7kHz
D
CENTER 916.5900MHz
SPAN 500.0kHz
*RBW 10kHz
VBW 10kHz
SWP 50.0ms

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.

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
1Year	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