



Nemko Test Report: 6L0208RUS1

Applicant: RF Monolithics, Inc.
4441 Sigma Road
Dallas, TX 75244
USA

**Equipment Under Test:
(E.U.T.)** GTW-1

In Accordance With: **FCC Part 15, Subpart C, 15.249**
For 900 MHz Transmitters

Tested By: Nemko USA Inc.
802 N. Kealy
Lewisville, Texas 75057-3136

Authorized By:

A handwritten signature in black ink, appearing to read 'Kevin Rose', with a long horizontal flourish extending to the right.

Kevin Rose Wireless Engineer

Date: June 29, 2006

EQUIPMENT: GTW-1

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EQUIPMENT: GTW-1

Section 1. Summary Of Test Results

Manufacturer: RF Monolithics, Inc.

Model No.: GTW-1

Serial No.: None

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 FCC Part 15.249. All tests were conducted using measurement procedure ANSI C63.4-2003. Radiated Emissions were made on an open area test site.

New Submission

Production Unit

Class II Permissive Change

Pre-Production Unit

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".



NVLAP LAB CODE: 100426-0

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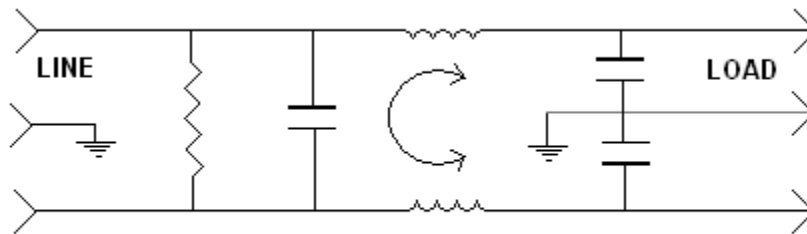
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EQUIPMENT: GTW-1
Summary Of Test Data

NAME OF TEST	PARA. NO.	RESULT
Conducted Emissions	15.207	Complies
Radiated Emissions	15.249	Complies

Modifications Made During Testing:

- 1) Added CORCOM EMI filter p/n 3EEB2 to EUT for suppression of emissions on powerline. A filter with the same electrical characteristics will need to be incorporated into final design.



EQUIPMENT: GTW-1

Section 2. General Equipment Specification

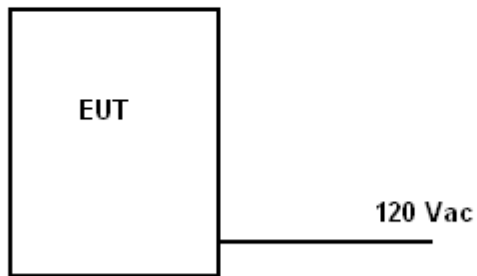
Frequency Range:	Single	
Operating Frequency(ies) of Sample:	904 MHz	
Tunable Bands:	N/A	
Number of Channels:	One	
Channel Spacing:	NA	
User Frequency Adjustment:	None	
Integral Antenna	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

EQUIPMENT: GTW-1

Description of EUT

System uses a MESH network topology on 904 Mhz to transmit and receive data. Data is then sent to a WEB based portal

System Diagram



EQUIPMENT: GTW-1

Section 3. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207
TESTED BY: David Light	DATE: 5/25/06

Minimum Standard: Paragraph No. 15.207

Frequency of Conducted Emission (MHz)	Limit (dBmV) Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency.

Test Results: Complies. The worst case emission is 38.16 dBμV at 806.7 kHz on L2. This is 7.84 dB below the average limit of 46 dBμV. This is a PEAK measurement.

Measurement Data: See attached plots.

Equipment Used: 1258-1112-704-1659-813-674

Measurement Uncertainty: +/- 1.7 dB

Temperature: 22 °C

Relative Humidity: 40 %

EQUIPMENT: GTW-1

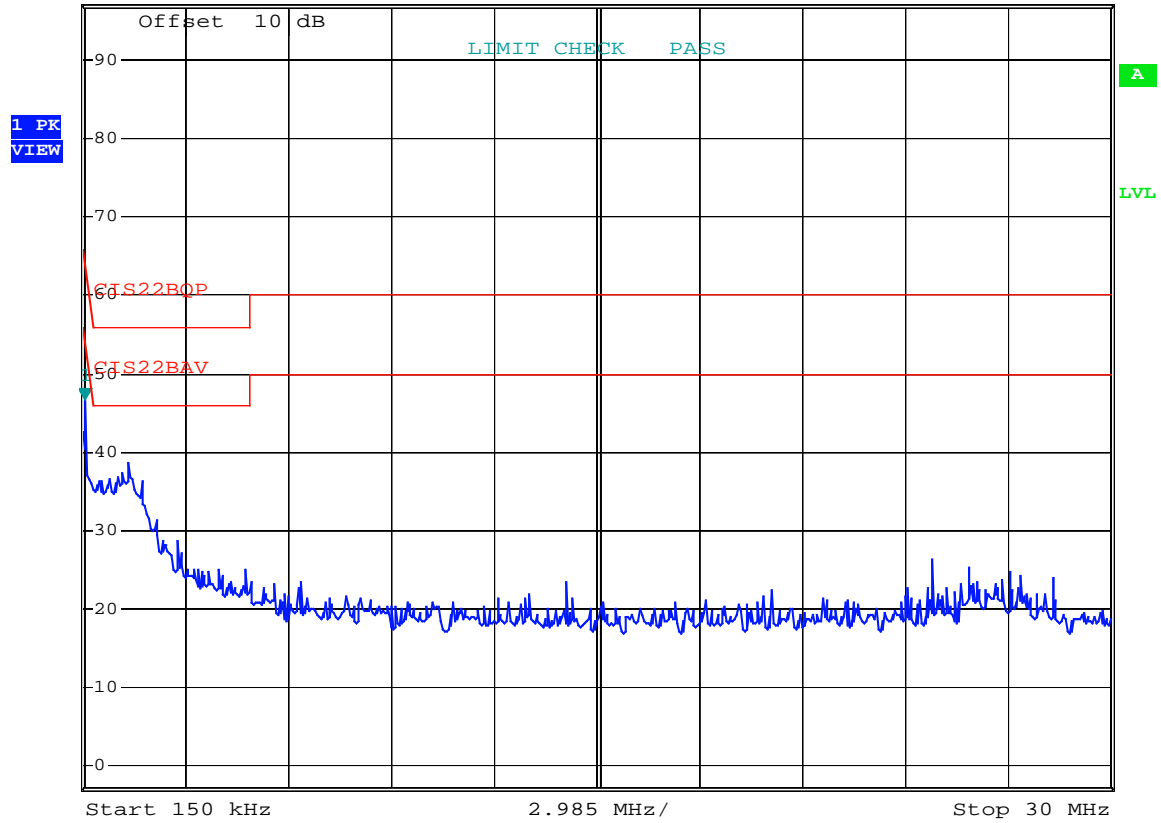
Test Data – Powerline Conducted Emissions

Line 1



MARKER 1
209.7 kHz
Ref 97 dBµV Att 10 dB

*RBW 10 kHz Marker 1 [T1]
VBW 30 kHz 46.64 dBµV
SWT 300 ms 209.70000000 kHz



Date: 25.MAY.2006 09:00:28

EQUIPMENT: GTW-1

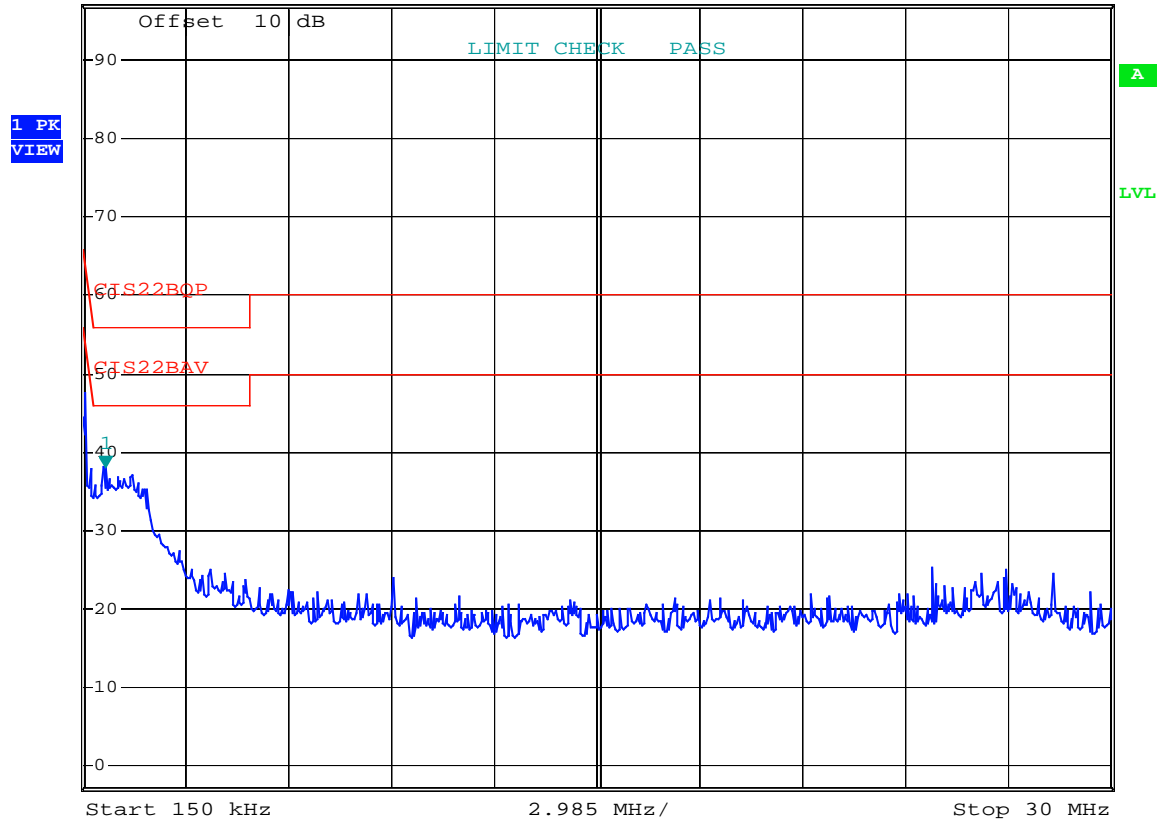
Test Data – Powerline Conducted Emissions

Line 2



MARKER 1
806.7 kHz
Ref 97 dBμV Att 10 dB

*RBW 10 kHz Marker 1 [T1]
VBW 30 kHz 38.18 dBμV
SWT 300 ms 806.70000000 kHz



Date: 25.MAY.2006 08:58:40

EQUIPMENT: GTW-1
Conducted Photographs



EQUIPMENT: GTW-1

Section 4. Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.249
TESTED BY: David Light	DATE: 6/17/06

Minimum Standard: Para no. 15.249

(a) The field strengths shall not exceed the following:

Fundamental (MHz)	Field Strength (mV/m)	Field Strength (dBµV)	Harmonic (mV/m)	Harmonic (dBµV)
902-928	50	94	0.5	54

(b) Field strength limits are specified at a distance of 3 metres.

(c) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated limits of 15.209 whichever is the less attenuation.

(d) ...for frequencies above 1000 MHz, the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

Test Results: Complies

Measurement Data: See attached table.

EQUIPMENT: GTW-1

Test Data - Radiated Emissions

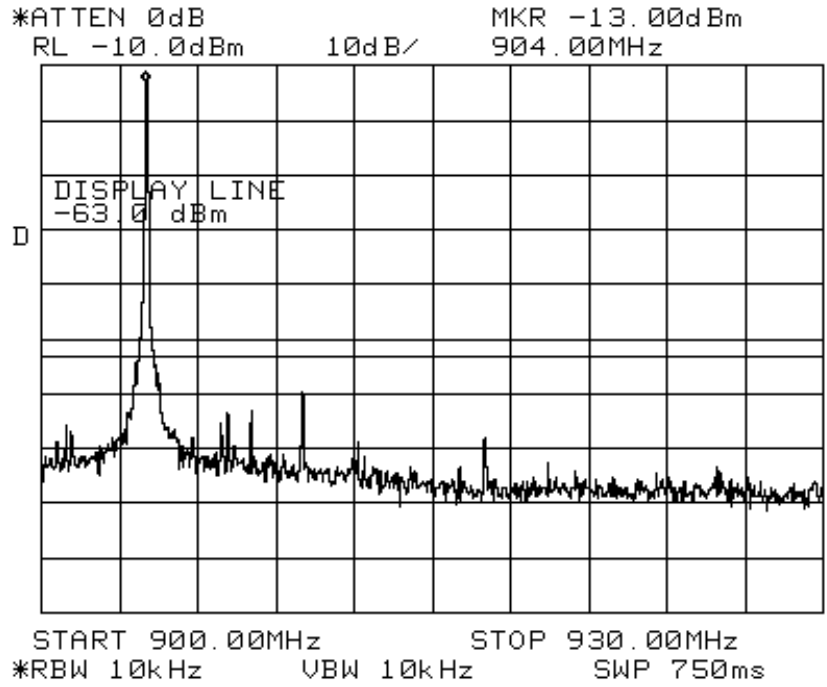
Radiated Emissions Data											
Complete	<u> X </u>		Job # : <u>6L0208</u>			Test # : <u>Radiated 1</u>					
Preliminary	<u> </u>		Page <u> 1 </u>			of <u> 1 </u>					
Client Name :	<u>RF Monolithics</u>										
EUT Name :	<u>904 MHz Transmitter</u>										
EUT Model # :	<u>None</u>										
EUT Part # :	<u>GTW-1</u>										
EUT Serial # :	<u>None</u>										
EUT Config. :	<u>Tx ON</u>										
Specification :	<u>15.249</u>					Reference :					
Rod. Ant. # :	<u> </u>		Temp. (deg. C) :	<u> 22 </u>		Date :	<u>05/17/06</u>				
Bicon Ant.# :	<u> 760 </u>		Humidity (%) :	<u> 40 </u>		Time :	<u> 1:00 </u>				
Log Ant.# :	<u> 759 </u>		EUT Voltage :	<u> 120 </u>		Staff :	<u>David Light</u>				
Horn Ant.# :	<u> 993 </u>		EUT Frequency :	<u> 60 </u>		Photo ID :	<u>NA</u>				
Cable 1.# :	<u> 1484 </u>		Phase :	<u> Single </u>		Peak Bandwidth <1GHz :	<u>100 KHz</u>				
Cable 2.# :	<u> 1514 </u>		Location :	<u> D OATS </u>		Video Bandwidth<1GHz :	<u>100 KHz</u>				
Preamp 1# :	<u> 762 </u>		Distance :	<u> 34 </u>		Peak Bandwidth >1GHz :	<u>1 MHz</u>				
Preamp 2# :	<u> na </u>										
Atten # :	<u> 1465 </u>										
Detector# :	<u> 1464 </u>										

Meas. Freq. (MHz)	Ant. Pol. (H/V)	Atten. (dB)	Meter Reading (dBuV)	Antenna Factor (dB)	Path Loss (dB)	RF Gain (dB)	Corrected Reading (dBuV/m)	Spec. limit (dBuV/m)	CR/SL Diff. (dB)	Pass Fail Unc.	QP readings Comment
6L0209											
904	V	0	85	23.6	9.2	27.9	89.9	94.0	-4.1	Pass	Peak / Carrier
904	H	0	79.2	23.6	9.2	27.9	84.1	97.0	-12.9	Pass	Peak / Carrier
1808	V	10	46.2	27	2.7	21.8	54.1	74.0	-19.9	Pass	Peak
1808	V	10	38.5	27	2.7	21.8	46.4	54.0	-7.6	Pass	Average
2712	V	0	49.3	29.3	3.6	32.5	49.7	54.0	-4.3	Pass	Peak
3616	V	0	42.3	30.3	3.6	31.8	44.4	54.0	-9.6	Pass	Peak
4520	V	0	41.5	32.1	4.1	31.0	46.7	54.0	-7.3	Pass	Peak
5424	V	0	44.8	33.6	4.7	28.6	54.5	74.0	-19.5	Pass	Peak
5425	V	0	40.2	33.6	5.7	28.6	50.9	54.0	-3.1	Pass	Average
6328	V	0	38.8	34.9	4.7	31.7	46.7	54.0	-7.3	Pass	Peak
7232	V	0	39.3	35.8	5.1	34.0	46.2	54.0	-7.8	Pass	Peak
8136	V	0	38.2	37.5	5.7	33.0	48.4	54.0	-5.6	Pass	Peak
9040	V	0	39	37	5.7	33.3	48.4	54.0	-5.6	Pass	Peak
1808	H	10	42.8	27	2.7	21.8	50.7	54.0	-3.3	Pass	Peak
2712	H	10	46.3	29.3	3.6	32.5	46.7	54.0	-7.3	Pass	Peak
3616	H	0	42.3	30.3	3.6	31.8	44.4	54.0	-9.6	Pass	Peak
4520	H	0	40	32.1	4.1	31.0	45.2	54.0	-8.8	Pass	Peak
5424	H	0	42.3	33.6	4.7	28.6	52.0	54.0	-2.0	Pass	Peak
6328	H	0	39.3	34.9	4.7	31.7	47.2	54.0	-6.8	Pass	Peak
7232	H	0	37.8	35.8	5.1	34.0	44.7	54.0	-9.3	Pass	Peak
8136	H	0	39.2	37.5	5.7	33.0	49.4	54.0	-4.6	Pass	Peak
9040	H	0	39.5	37	5.7	33.3	48.9	54.0	-5.1	Pass	Peak

- 1) The spectrum was searched from 30 MHz to the tenth harmonic of the carrier. All readings within 20 dB of the specification limit are reported.
- 2) Average measurements were made using 10 kHz VBW
- 3) EUT was transmitting greater than 99%
- 4) Carrier power was tested at +/- 15% of nominal voltage input with no affect on output power.

EQUIPMENT: GTW-1

Bandedges



EQUIPMENT: GTW-1
Radiated Photographs



EQUIPMENT: GTW-1

Section 5. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1258	LISN .15mhz-30mhz	EMCO 0	1305	04/19/06	04/19/07
1112	Cable 1.1m	Nemko USA, Inc. RG223	0	04/20/06	04/20/07
704	FILTER, HIGH PASS, 5 KHz	SOLAR 7930-5.0	933126	04/20/06	04/20/07
1659	Spectrum Analyzer	Rhode & Schwarz FSP	973353	01/10/06	01/10/07
813	CABLE, 5.7m	Nemko USA, Inc. RG223	N/A	03/09/06	03/09/07
760	Antenna biconical	Electro Metrics MFC-25	477	08/04/05	08/04/06
759	ANTENNA, LOG PERIODIC	A.H. SYSTEMS SAS-200/510	556	02/13/06	02/13/07
1484	Cable 2.0-18.0 Ghz	Storm PR90-010-072	N/A	08/26/05	08/26/06
1485	Cable 2.0-18.0 Ghz	Storm PR90-010-216	N/A	08/26/05	08/26/06
1465	10 db Attenuator DC 8.0 Ghz	Midwest Microwave 292/10db	NONE	CBU	N/A
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	04/20/06	04/20/07
791	PREAMP, 25dB	Nemko USA, Inc. LNA25	398	04/20/06	04/20/07
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/14/05	01/15/07
1481	Microwave Highpass Filter	K & L 3DH1-2000/T8000-0/0	4	Cal B4 Use	N/A
993	Horn antenna	A.H. Systems SAS-200/571	XXX	08/01/05	08/02/07
674	LIMITER	HP 11947A	3107A02200	04/19/06	04/19/07

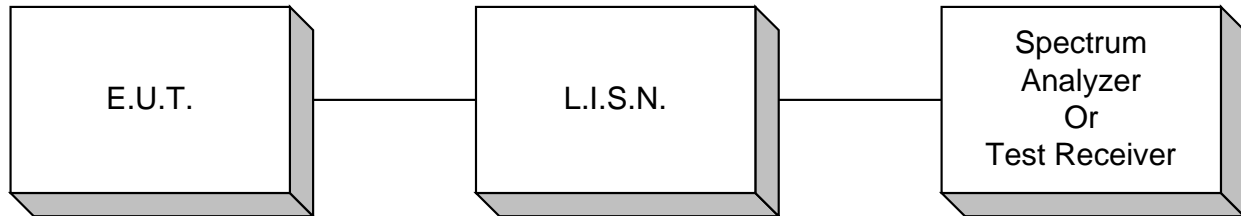
Nemko USA, Inc.

FCC PART 15, SUBPART C
FOR 900 MHz TRANSMITTERS
REPORT NO.: 6L0208RUS1

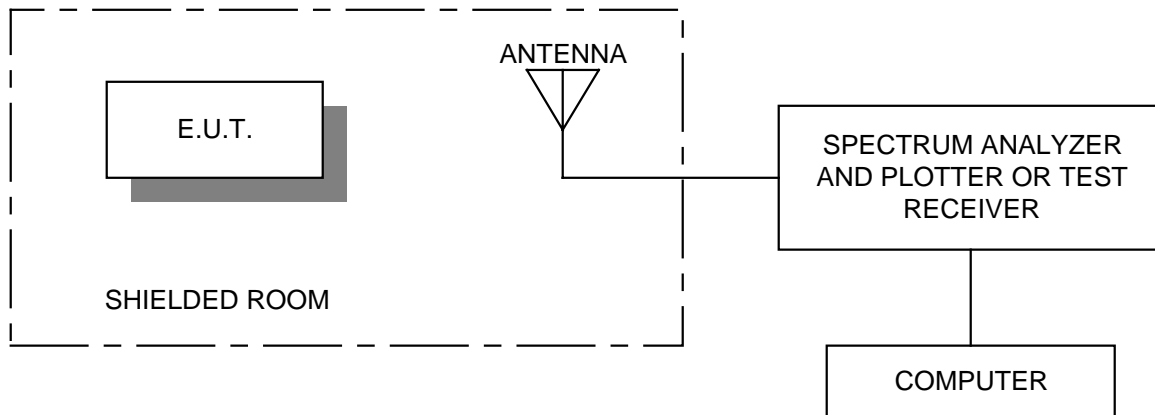
EQUIPMENT: GTW-1

ANNEX A
TEST DIAGRAMS

EQUIPMENT: GTW-1
Conducted Emissions



Radiated Prescan



EQUIPMENT: GTW-1

Test Site For Radiated Emissions

