



Nemko Test Report: 11870RUS1rev1

Applicant: AvaLAN Wireless
125A Castle Drive
Madison, AL 35758
USA

Equipment Under Test: AW900 v4
(E.U.T.)

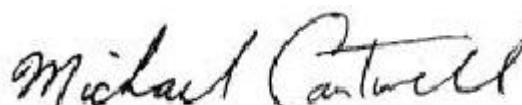
In Accordance With: **FCC Part 15, Subpart C, 15.247**
Digital Transmission System Transmitter

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

TESTED BY: 

David Light, Senior Wireless Engineer

DATE: 28 April, 2008

APPROVED BY: 

Mike Cantwell, Frontline Manager

DATE: 29 April, 2008

Number of Pages: 45

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Section 1. Summary of Test Results

Manufacturer: AvaLAN Wireless Systems

Model No.: AW900 v4

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 Part 15, Subpart C, Paragraph 15.247 for Digital Transmission Systems. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made in a semi-anechoic chamber. A description of the test facility is on file with the FCC and Industry Canada.

- | | | | |
|-------------------------------------|----------------------------|-------------------------------------|---------------------|
| <input checked="" type="checkbox"/> | New Submission | <input checked="" type="checkbox"/> | Production Unit |
| <input type="checkbox"/> | Class II Permissive Change | <input type="checkbox"/> | 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".



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Nemko USA, Inc.

EQUIPMENT: AW900 v4

FCC PART 15, SUBPART C
Digital Transmission Systems
Test Report No.: 11870RUS1rev1

Summary of Test Data

NAME OF TEST	PARA. NO.	RESULT
Powerline Conducted Emissions	15.207(a)	Complies
Minimum 6 dB Bandwidth	15.247(a)(2)	Complies
Maximum Peak Power Output	15.247(b)(3)	Complies
Spurious Emissions (Antenna Conducted)	15.247(d)	Complies
Spurious Emissions (Restricted Bands)	15.247(d)/15.209(a)	Complies
Peak Power Spectral Density	15.247(e)	Complies

Footnotes:

Section 2. Equipment Under Test (E.U.T.)**General Equipment Information**

Frequency Band (MHz):	902-928	2400-2483.5	5725-5850
	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Operating Frequency of Test Sample: 903.125 to 926.01467 MHz

6 dB Bandwidth: 1.4 MHz

Peak Power Output: +18.9 dBm (77.6 mW)

Spectral Density: +7.9 dBm

Input Power: 6 Vdc

User Frequency Adjustment: Dip Switches

Description of EUT

The AW900 v4 is a Point to Multipoint Wireless Ethernet solution that enables any remote Ethernet Device, such as Wi-Fi Access Points, surveillance cameras, VoIP phones, point of sale devices, or kiosks.

The device incorporates four antennas:

- 1). Dipole Antenna S467AM-915S, 2 dBi
- 2). Double Collinear Omni Antenna MG602S, 8 dBi Gain
- 3). YAGI Antenna ACY15-L, 15 dBi
- 4). Panel Antenna ANT-A-2226-1, 12.5 dBi gain

System Diagram

The device is a stand alone module for integration into an Ethernet modem.

Nemko USA, Inc.

EQUIPMENT: AW900 v4

FCC PART 15, SUBPART C
Digital Transmission Systems
Test Report No.: 11870RUS1rev1

Section 3. Occupied Bandwidth

NAME OF TEST: Occupied Bandwidth	PARA. NO.: 15.247(a)(2)
TESTED BY: David Light	DATE: 16 April 2008

Test Results: Complies.

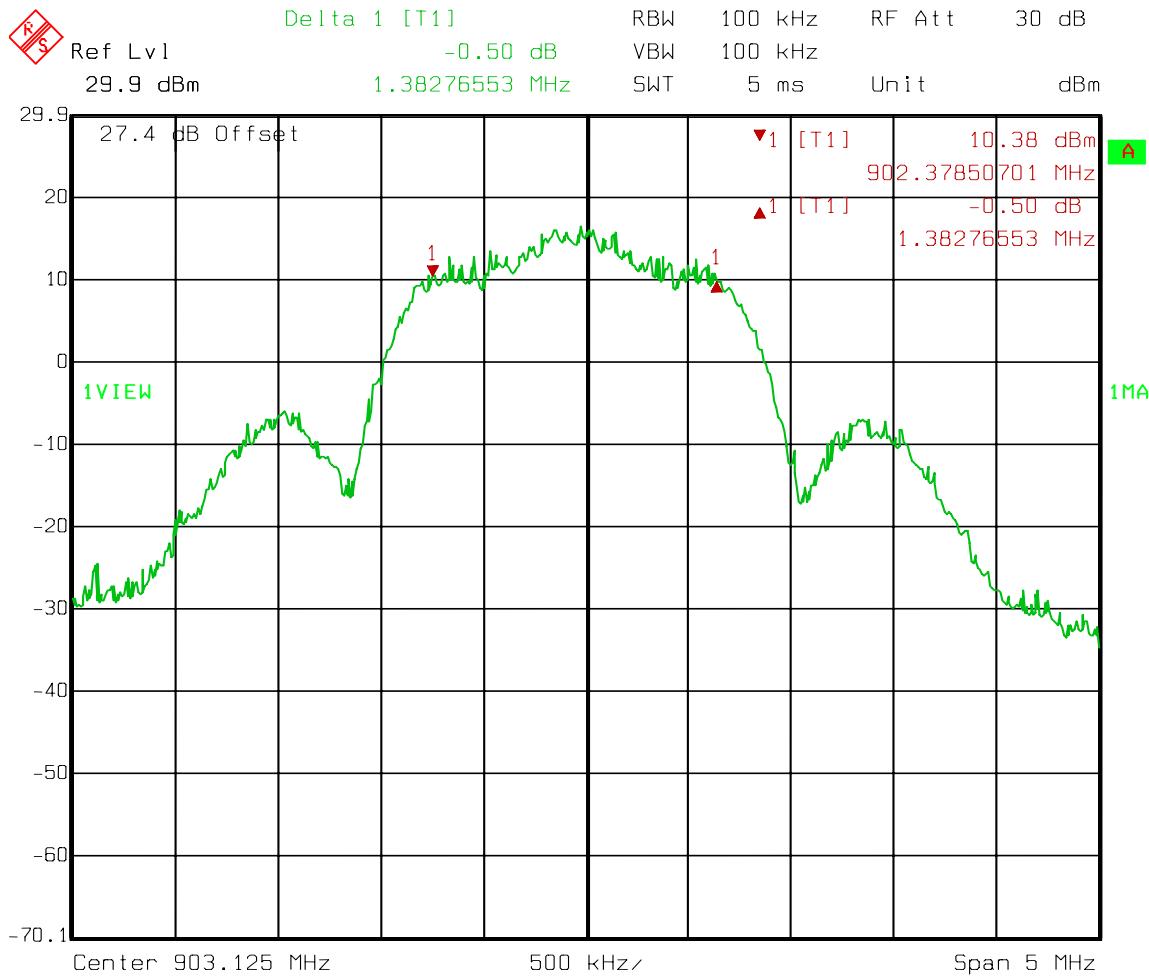
Measurement Data: See 6 dB BW plot
Measured 6 dB bandwidth: 1.4 MHz
Channel Separation: 2.083 MHz

Test Conditions: 35 %RH
20 °C

Measurement Uncertainty: +/-1x10⁻⁷ ppm

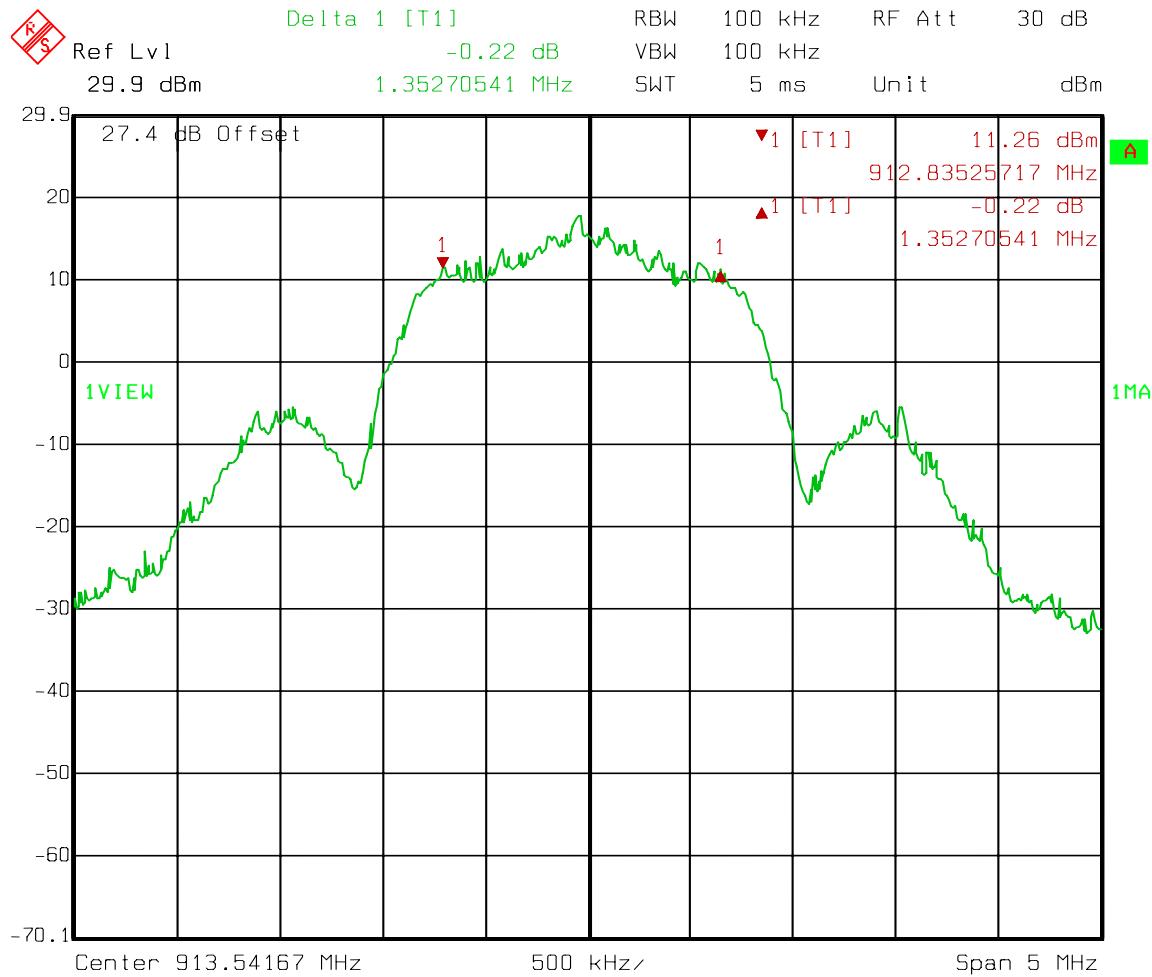
Test Equipment Used: 1082-1036-1472-1469

Test Data – Occupied Bandwidth



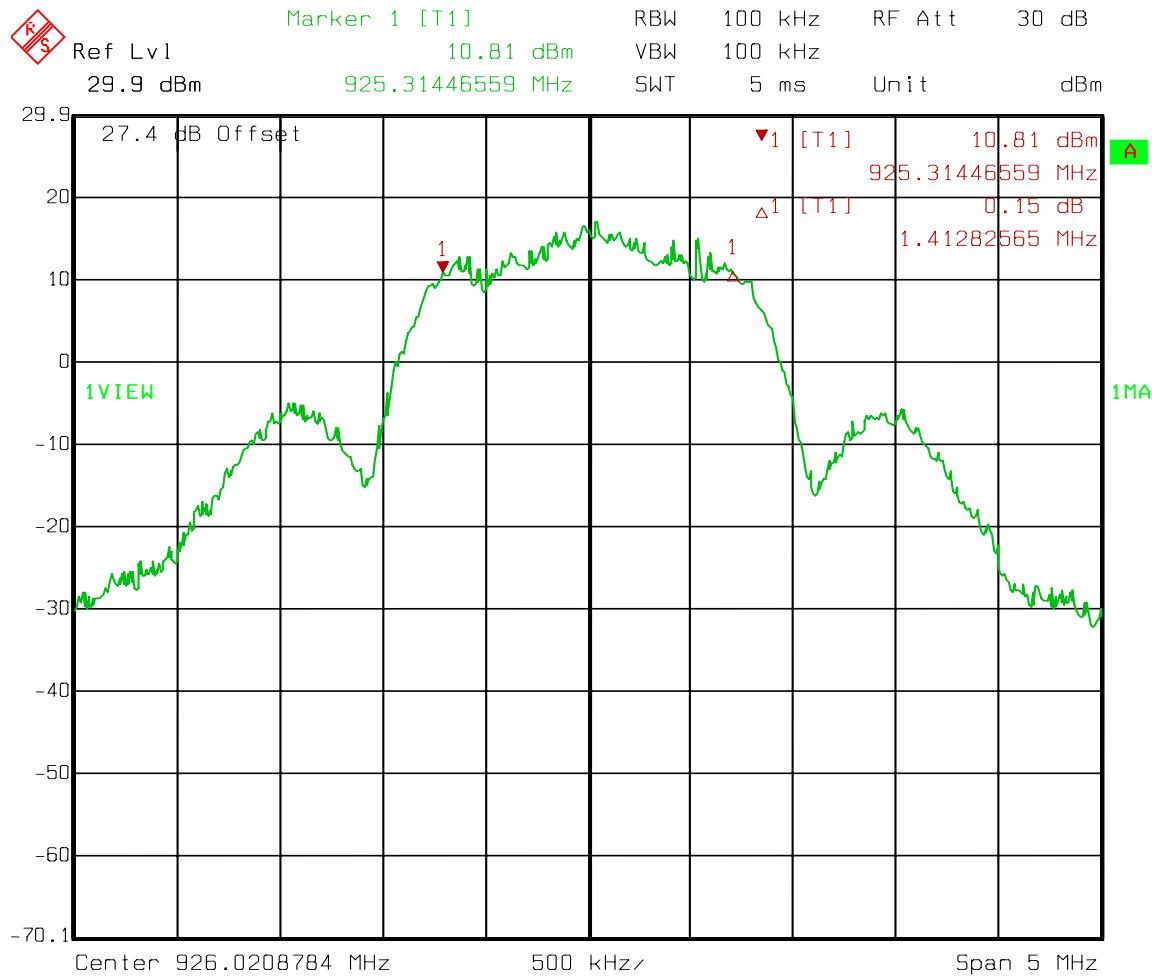
Date: 16.APR.2008 09:22:29

Test Data – Occupied Bandwidth



Date: 16.APR.2008 09:20:14

Test Data – Occupied Bandwidth



Date: 16.APR.2008 09:14:52

Section 4. Maximum Peak Output Power

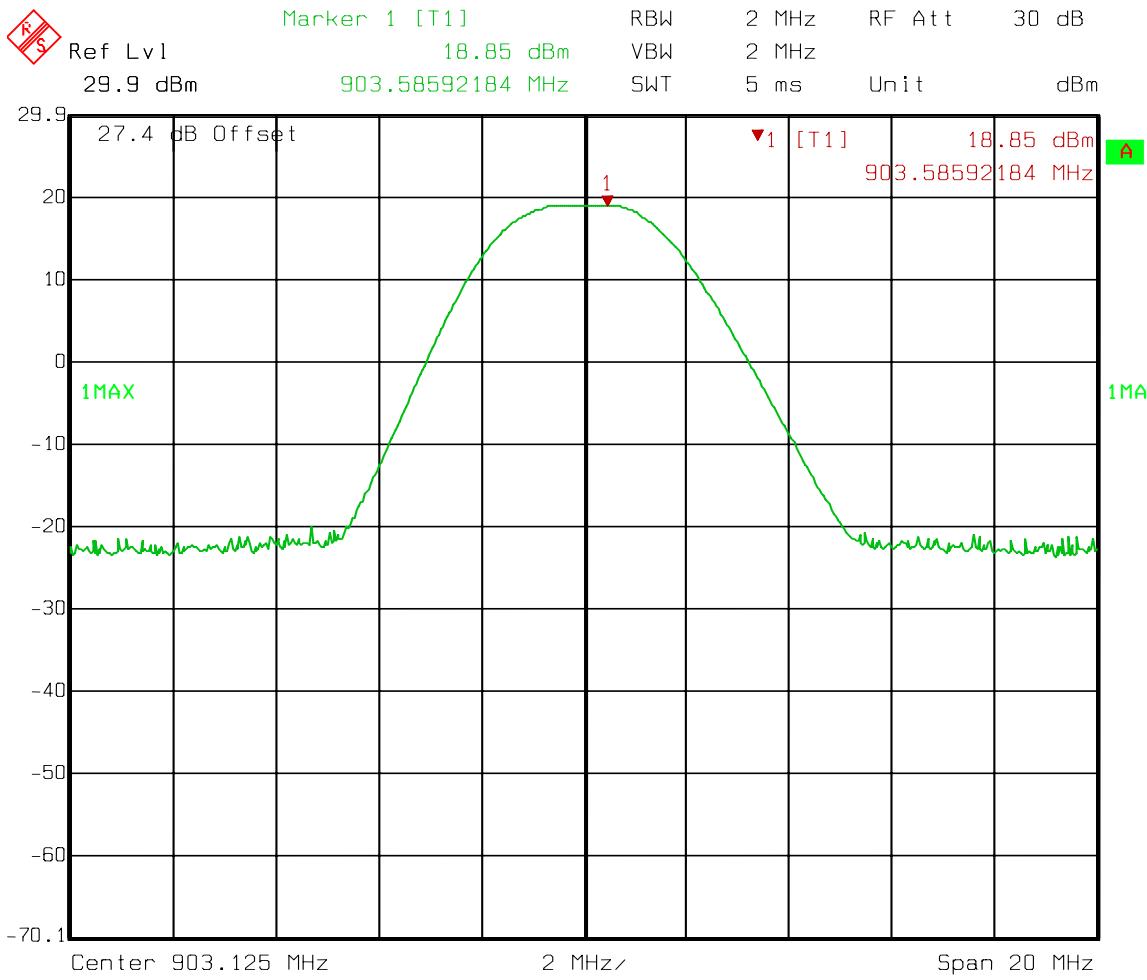
NAME OF TEST: Maximum Peak Output power	PARA. NO.: 15.247(b)(3)
TESTED BY: David Light	DATE: 16 April 2008

Test Results: Complies.**Measurement Data:** Refer to attached data**Test Conditions:** 35 %RH
20 °C**Measurement Uncertainty:** +/-1.7 dB**Test Equipment Used:** 1036-1082-1472-1469

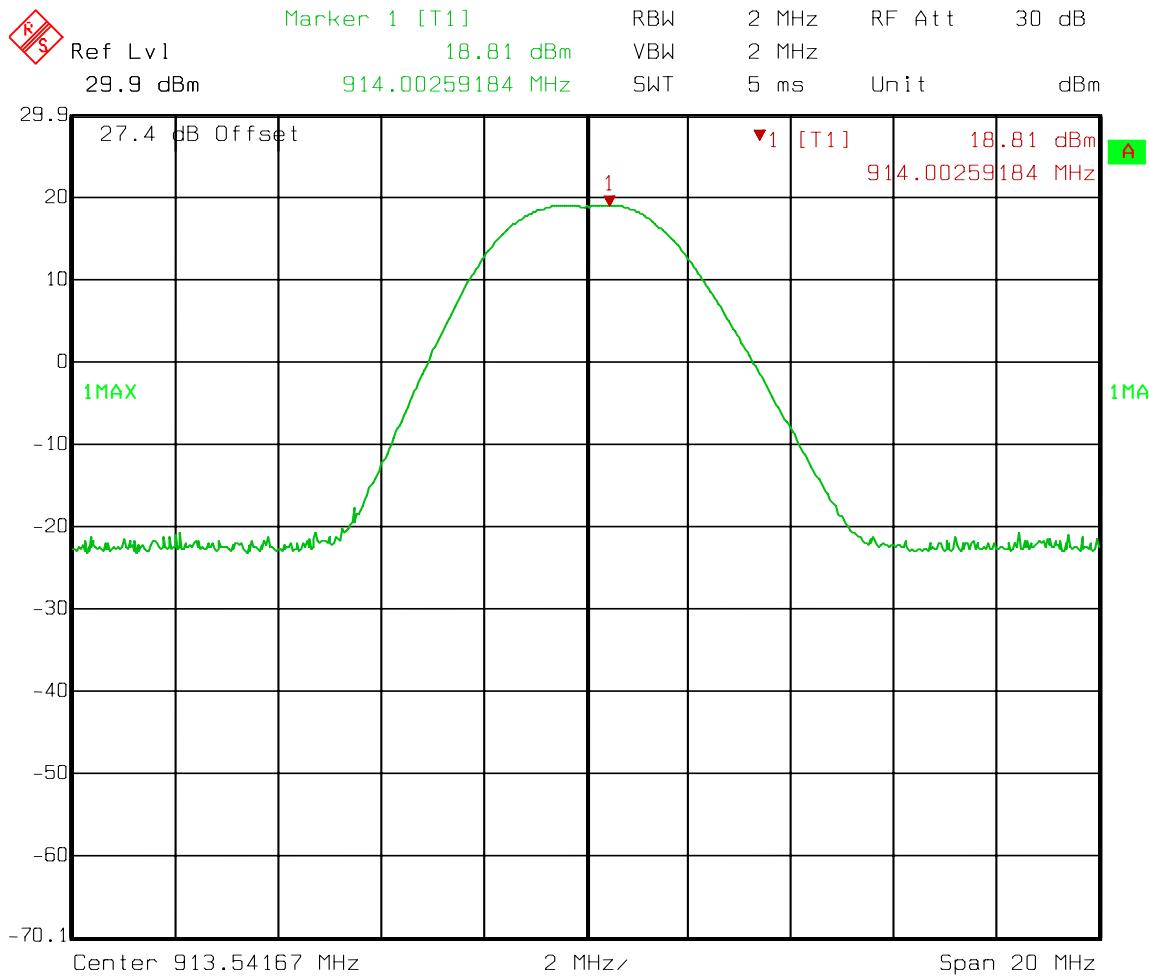
- This device was tested at +/- 15% input power per 15.31(e), with no variation in output power.
- For battery powered equipment, the device was tested with a fresh battery per 15.31(e).
- The device was tested on three channels per 15.31(l).
- This test was performed radiated.

Analyzer Settings: RBW/VBW = 2 MHz, Peak Detector

Test Data – Peak Power

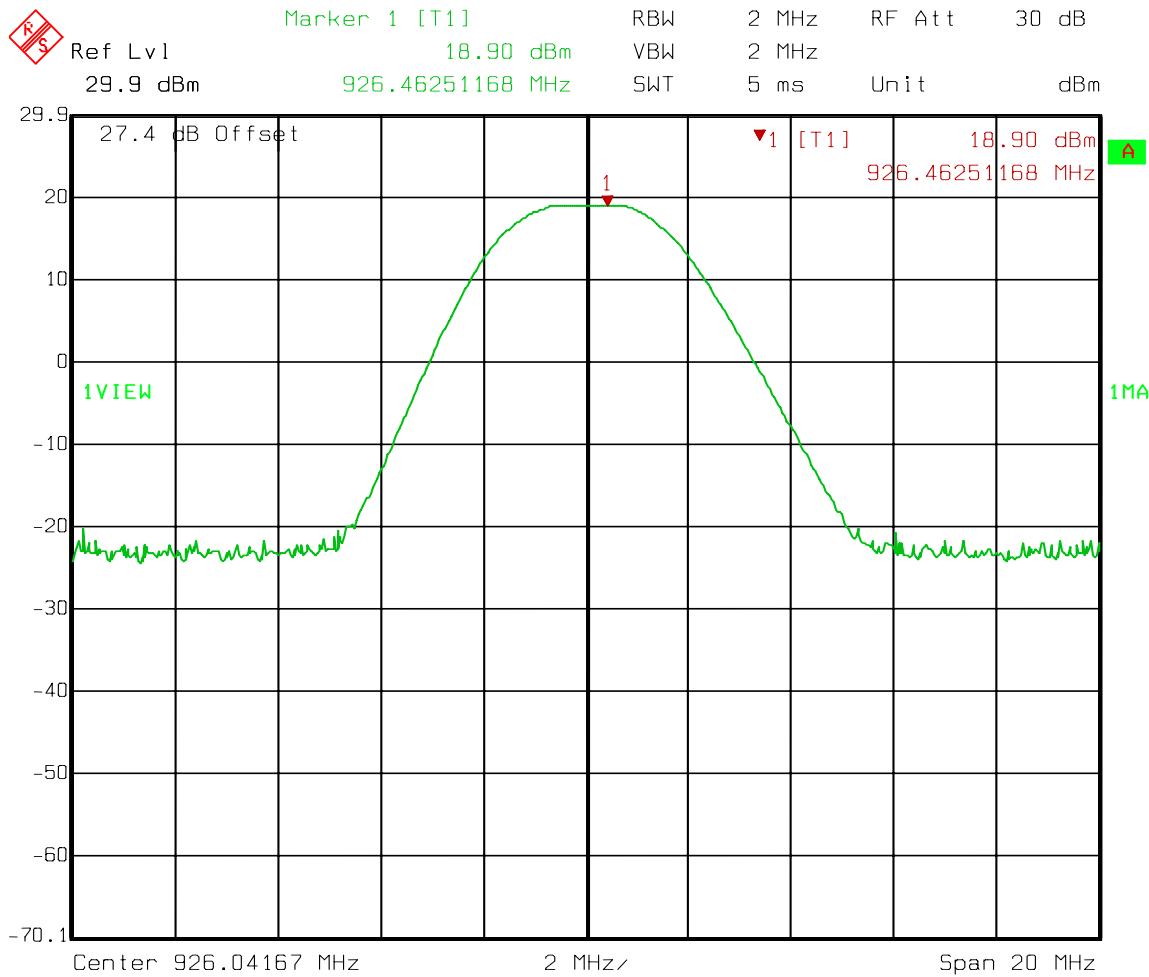


Test Data – Peak Power



Date: 16.APR.2008 09:19:07

Test Data – Peak Power



Date: 16.APR.2008 09:17:52

Nemko USA, Inc.

EQUIPMENT: AW900 v4

FCC PART 15, SUBPART C

Digital Transmission Systems

Test Report No.: 11870RUS1rev1

Section 5 Spurious Emissions at Antenna Terminals

NAME OF TEST: Spurious Emissions at Antenna Terminals PARA. NO.: 15.247 (d)

TESTED BY: David Light DATE: 16 April 2008

Test Results: Complies.

Measurement Data: See attached plots.

Test Conditions: 35 %RH
20 °C

Measurement Uncertainty: +/-1.7 dB

Test Equipment Used: 1036-1082-1472-1469

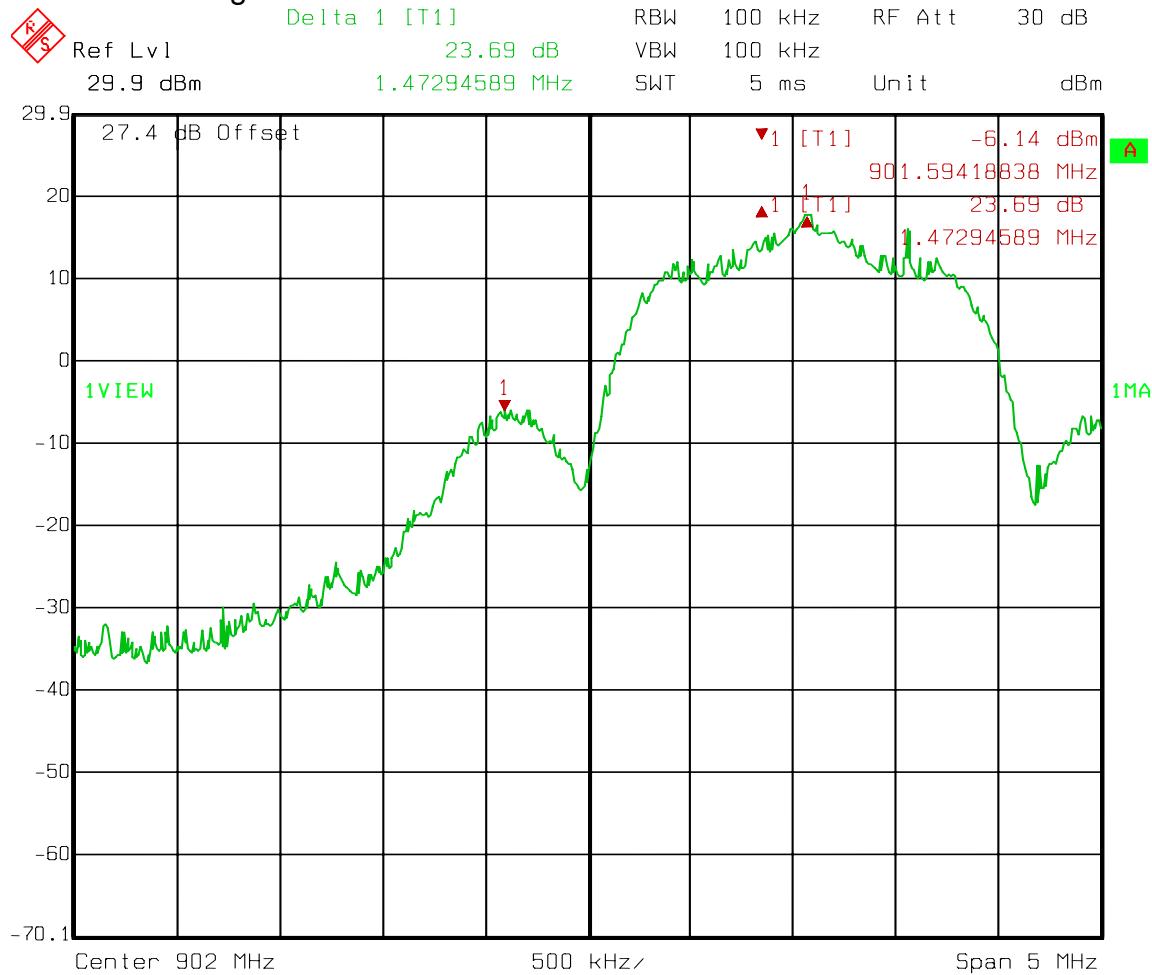
Analyzer Settings: RBW/VBW = 100 kHz, Peak Detector

Receiver conducted spurious emissions:

The worst-case antenna conducted spurious emission is -69.4 dBm at 912.4 MHz.

Test Data – Spurious Emissions at Antenna Terminals

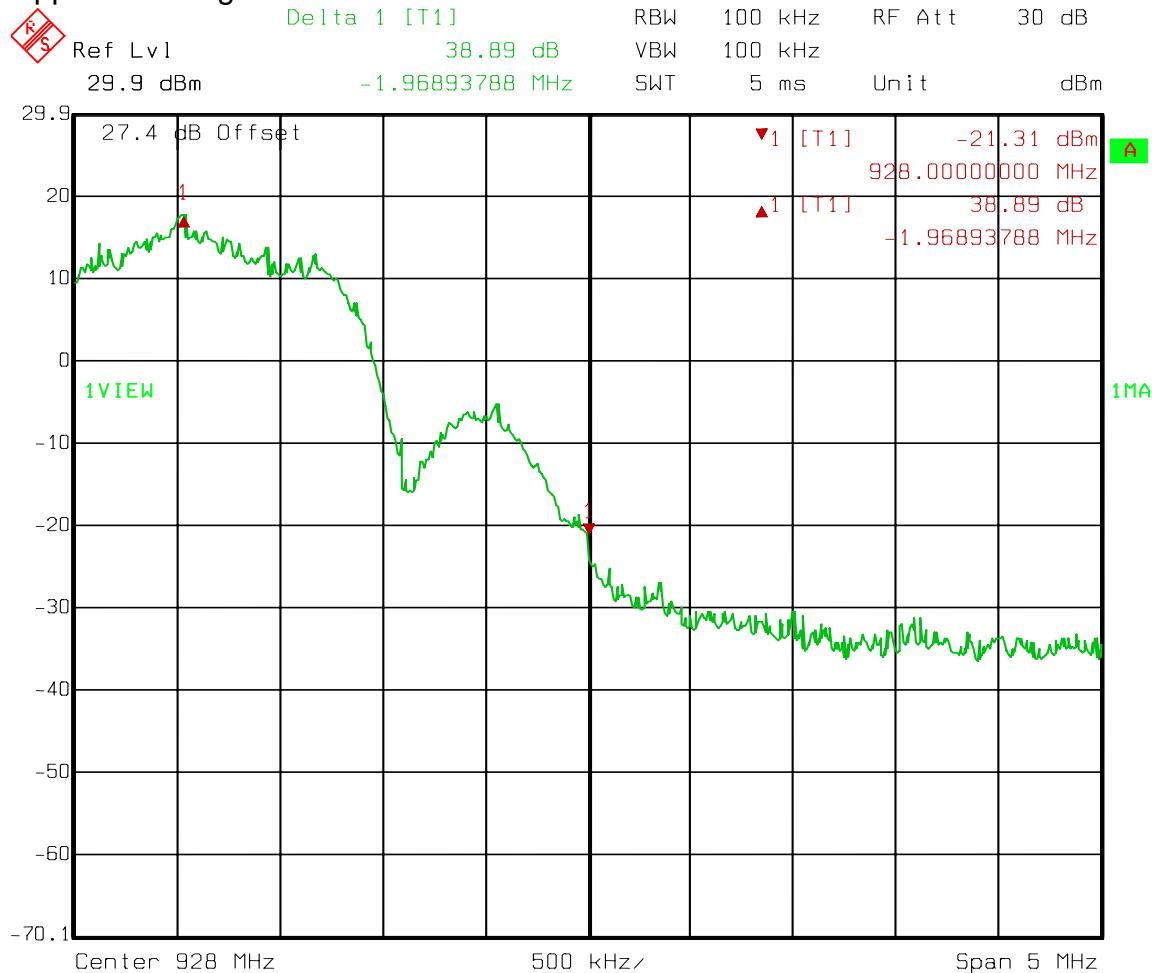
Lower Band Edge



Date: 16.APR.2008 09:23:25

Test Data – Spurious Emissions at Antenna Terminals

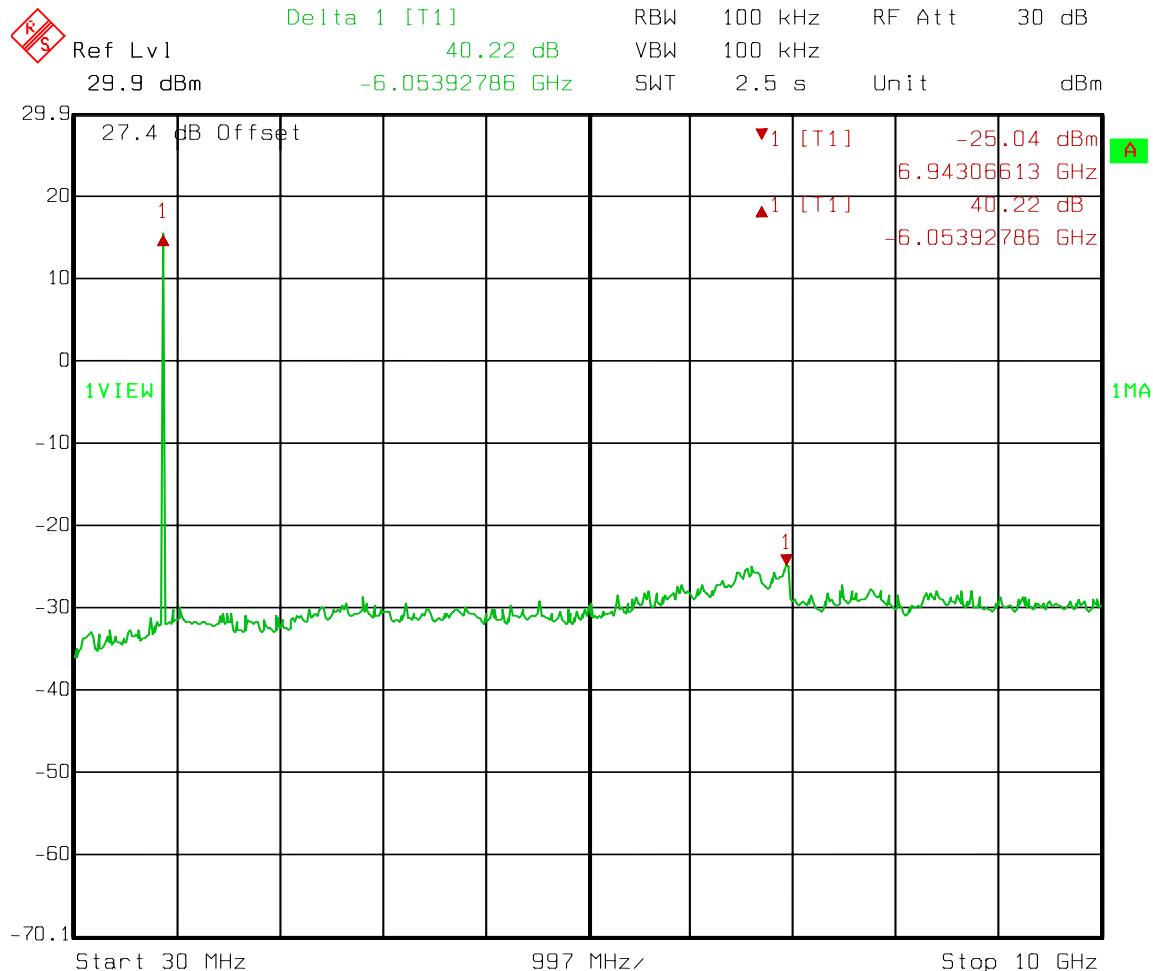
Upper Bandedge



Date: 16.APR.2008 09:16:21

Test Data – Spurious Emissions at Antenna Terminals

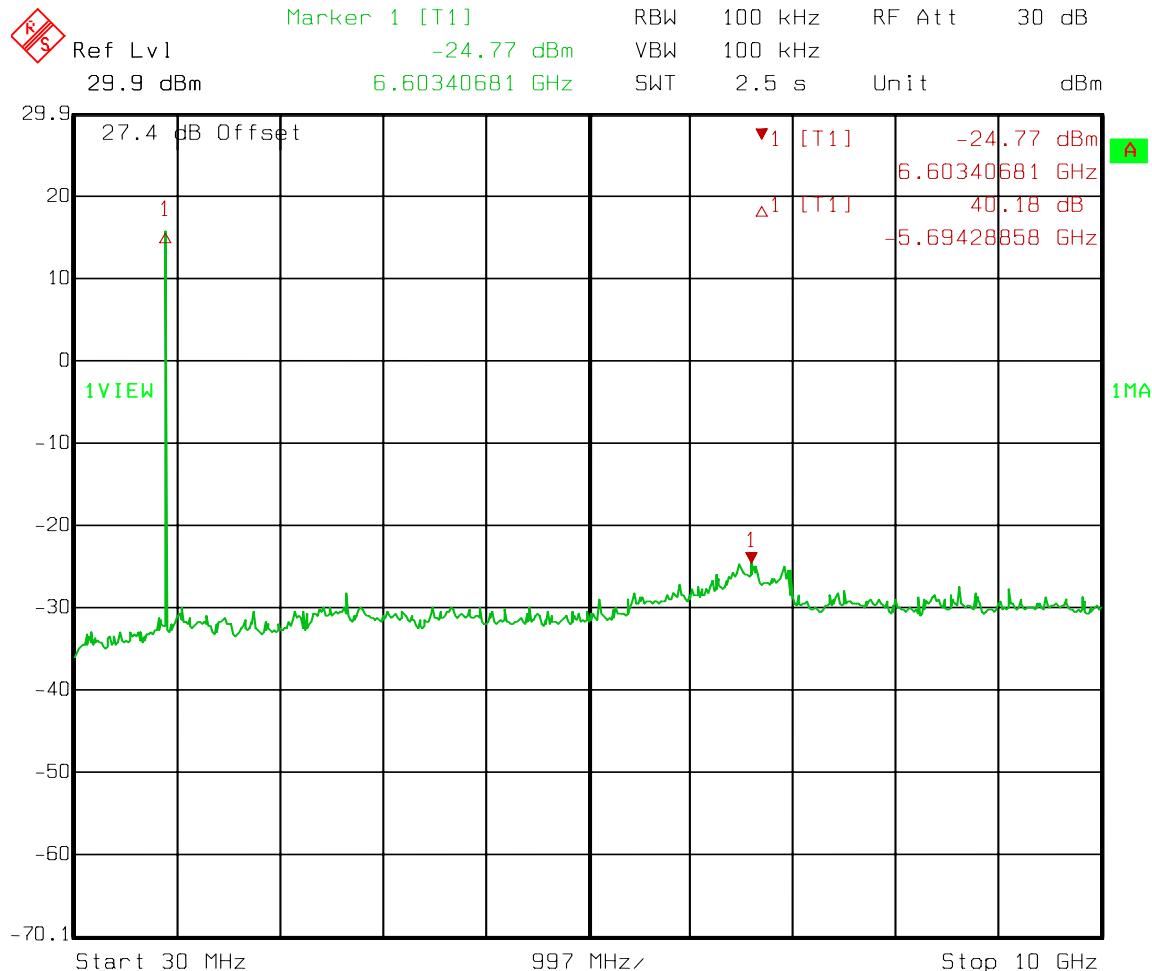
Low Channel



Date: 16.APR.2008 09:24:40

Test Data – Spurious Emissions at Antenna Terminals

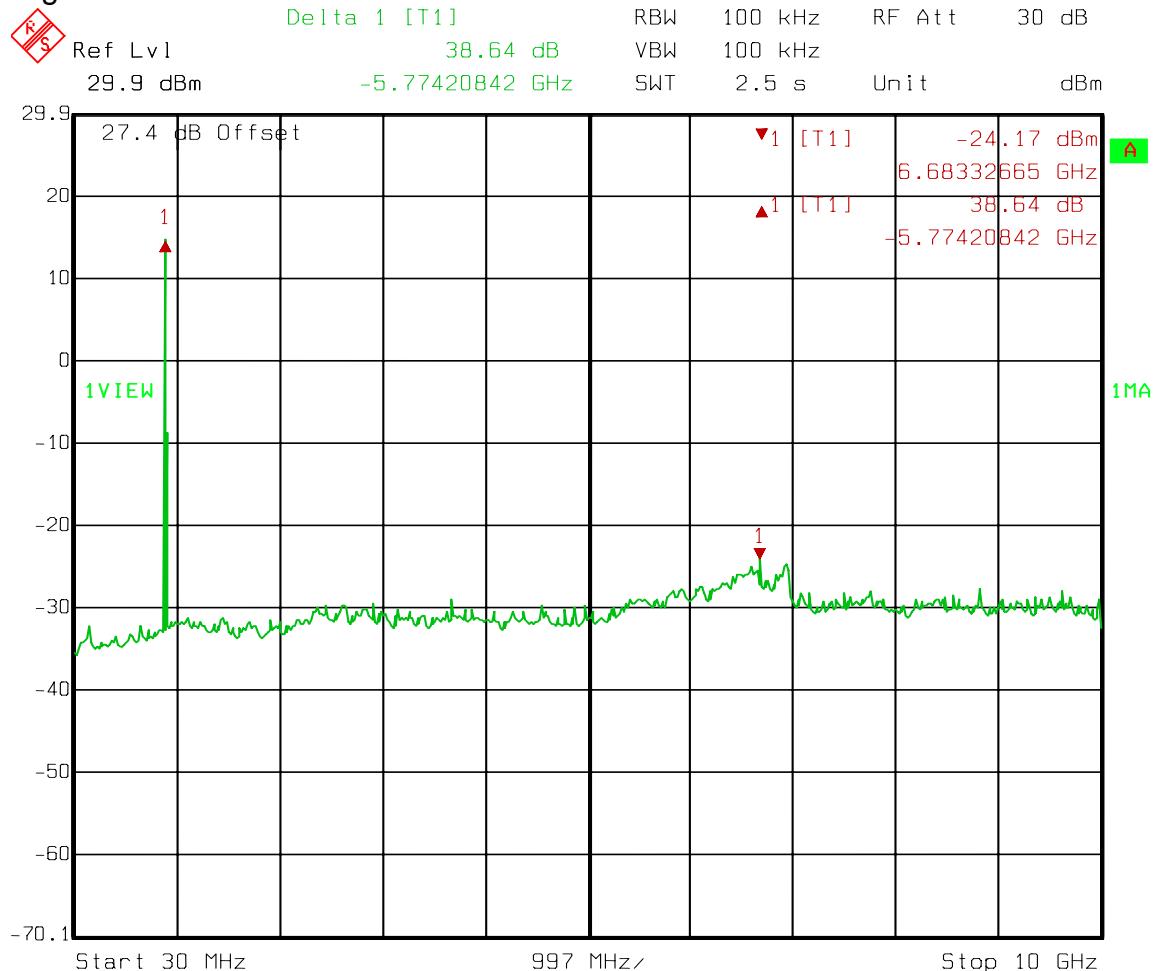
Mid Channel



Date: 16.APR.2008 09:25:37

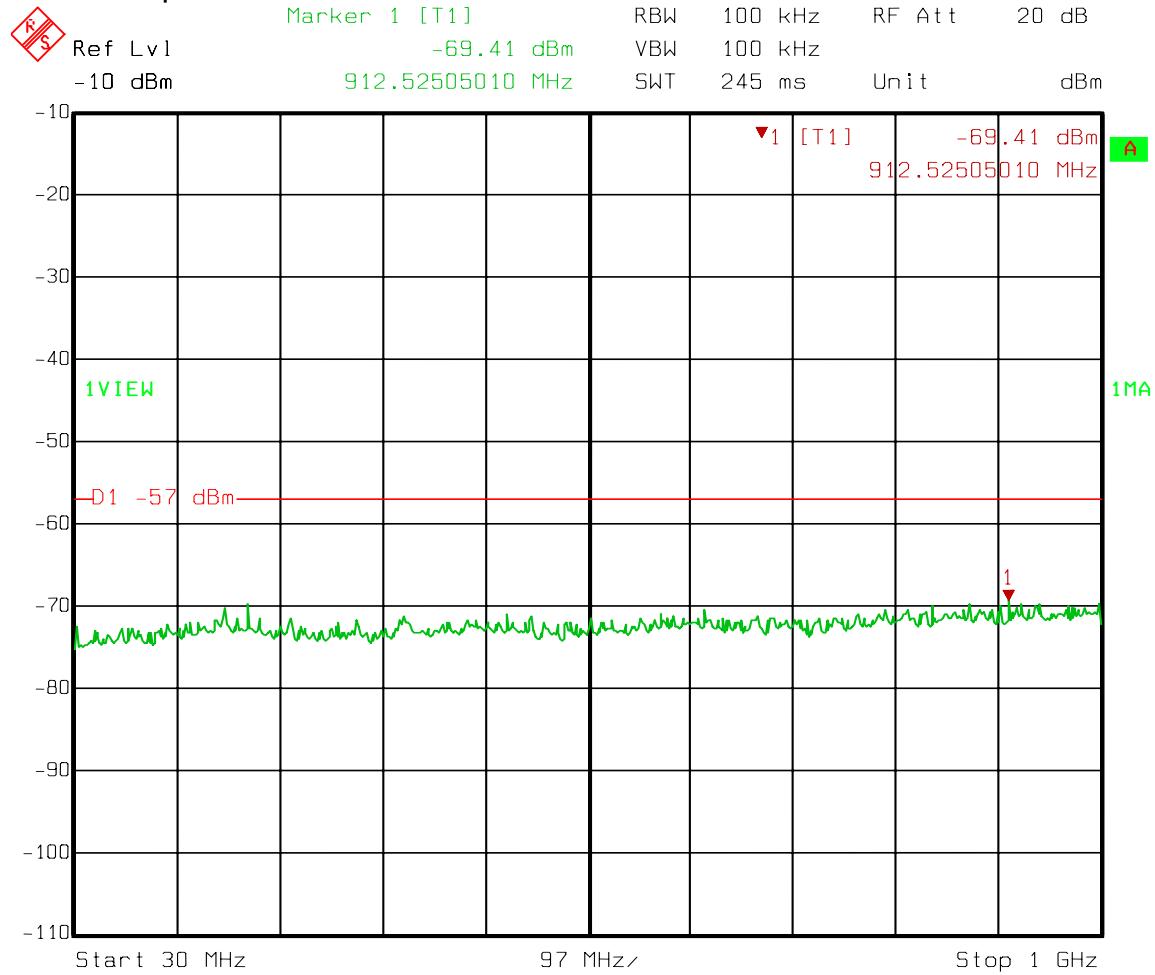
Test Data – Spurious Emissions at Antenna Terminals

High Channel



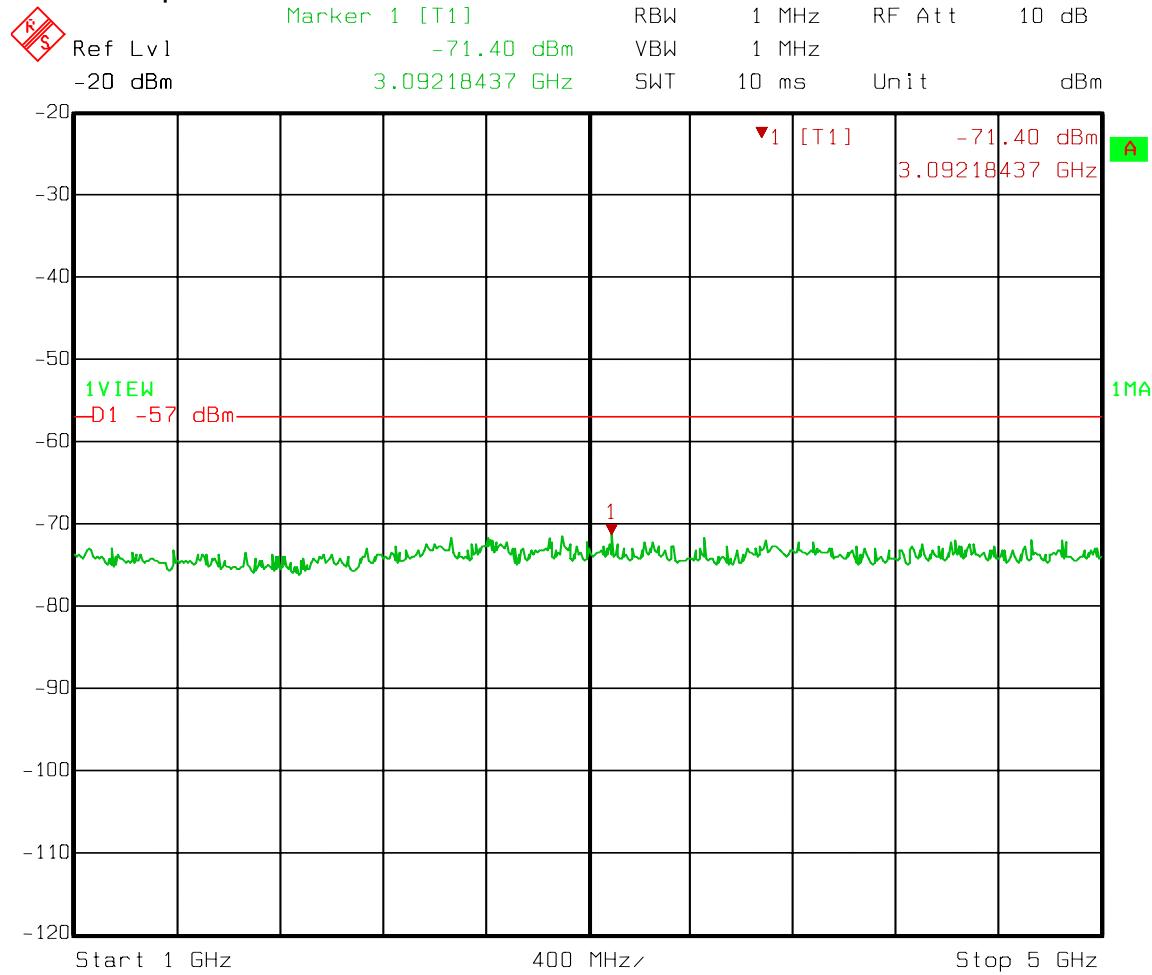
Date: 16.APR.2008 09:26:38

Receiver spurious



Date: 16.APR.2008 09:38:17

Receiver spurious



Date: 16.APR.2008 09:38:55

Section 6. Radiated Emissions

NAME OF TEST: Radiated Emissions	PARA. NO.: 15.247 (d)
TESTED BY: Scott Oates	DATE: 16 April 2008

Test Results: Complies.**Measurement Data:** See attached table.**Test Conditions:** 35 %RH
20 °C**Measurement Uncertainty:** +/-1.7 dB**Test Equipment Used:** 1464-1484-1485-993-1016**Notes:**

- For handheld devices, the EUT was tested on three orthogonal axis'
- The device was tested from 30 MHz to the tenth harmonic of the highest fundamental frequency per 15.33
- The device was tested on three channels per 15.31(l).
- All emissions within 20 dB of the specification are reported per 15.31(o)

RBW=VBW=100 kHz below 1000 MHz

RBW=VBW=1 MHz above 1000 MHz (Peak)

RBW= 1 MHz VBW=10 Hz (Average)

The worst case radiated receiver emission was 42.2 dBuV/m @ 3m at 950 MHz. This is 3.8 dB below the specification limit.

Radiated Emissions

Dipole Antenna S467AM-915S

Freq MHz	Rdng dB μ V	Cable dB	Cable dB	Horn dB	Pre-A dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
2709.448	50.2	+0.8	+2.8	+29.3	-32.7	+0.0	50.4	54.0	-3.6	Vert
Low Channel										
2709.449	48.0	+0.8	+2.8	+29.3	-32.7	+0.0	48.2	54.0	-5.8	Horiz
3612.597	47.8	+0.8	+2.8	+30.3	-32.4	+0.0	49.3	54.0	-4.7	Vert
3612.598	43.0	+0.8	+2.8	+30.3	-32.4	+0.0	44.5	54.0	-9.5	Horiz
4515.743	41.2	+1.0	+3.1	+32.1	-31.6	+0.0	45.8	54.0	-8.2	Vert
4515.755	39.5	+1.0	+3.1	+32.1	-31.6	+0.0	44.1	54.0	-9.9	Horiz
5418.895	42.2	+1.2	+3.5	+33.6	-31.9	+0.0	48.6	54.0	-5.4	Vert
5418.907	35.8	+1.2	+3.5	+33.6	-31.9	+0.0	42.2	54.0	-11.8	Horiz
2740.699	45.7	+0.8	+2.9	+29.4	-32.7	+0.0	46.1	54.0	-7.9	Horiz
Mid Channel										
2740.708	49.0	+0.8	+2.9	+29.4	-32.7	+0.0	49.4	54.0	-4.6	Vert
3654.270	47.5	+0.8	+2.8	+30.4	-32.3	+0.0	49.2	54.0	-4.8	Vert
3654.270	41.7	+0.8	+2.8	+30.4	-32.3	+0.0	43.4	54.0	-10.6	Horiz
4567.833	41.3	+1.0	+3.1	+32.3	-31.8	+0.0	45.9	54.0	-8.1	Vert
4567.833	37.7	+1.0	+3.1	+32.3	-31.8	+0.0	42.3	54.0	-11.7	Horiz
2778.203	45.0	+0.8	+2.9	+29.4	-32.7	+0.0	45.4	54.0	-8.6	Horiz
High Channel										
2778.203	48.5	+0.8	+2.9	+29.4	-32.7	+0.0	48.9	54.0	-5.1	Vert
3704.263	42.3	+0.8	+2.8	+30.6	-32.2	+0.0	44.3	54.0	-9.7	Horiz
3704.263	47.8	+0.8	+2.8	+30.6	-32.2	+0.0	49.8	54.0	-4.2	Vert
4630.326	37.0	+1.0	+3.2	+32.5	-32.0	+0.0	41.7	54.0	-12.3	Horiz
4630.326	38.7	+1.0	+3.2	+32.5	-32.0	+0.0	43.4	54.0	-10.6	Vert

All measurements are PEAK unless otherwise noted.

The EUT was modulated 99% or more.

Radiated Emissions

Double Collinear Omni Antenna MG602S

Freq MHz	Rdng dB μ V	Cable dB	Cable dB	Horn dB	Pre-A dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
2709.453	50.3	+0.8	+2.8	+29.3	-32.7	+0.0	50.5	54.0	-3.5	Vert
Low Channel										
2709.453	51.0	+0.8	+2.8	+29.3	-32.7	+0.0	51.2	54.0	-2.8	Horiz
3612.600	49.5	+0.8	+2.8	+30.3	-32.4	+0.0	51.0	54.0	-3.0	Vert
3612.600	46.8	+0.8	+2.8	+30.3	-32.4	+0.0	48.3	54.0	-5.7	Horiz
4515.742	42.0	+1.0	+3.1	+32.1	-31.6	+0.0	46.6	54.0	-7.4	Horiz
4515.746	41.8	+1.0	+3.1	+32.1	-31.6	+0.0	46.4	54.0	-7.6	Vert
5418.894	36.5	+1.2	+3.5	+33.6	-31.9	+0.0	42.9	54.0	-11.1	Horiz
5418.898	37.0	+1.2	+3.5	+33.6	-31.9	+0.0	43.4	54.0	-10.6	Vert
6322.048	41.2	+1.3	+3.9	+34.9	-30.7	+0.0	50.6	54.0	-3.4	Vert
2740.694	48.5	+0.8	+2.9	+29.4	-32.7	+0.0	48.9	54.0	-5.1	Vert
Mid Channel										
2740.696	49.2	+0.8	+2.9	+29.4	-32.7	+0.0	49.6	54.0	-4.4	Horiz
3654.262	44.5	+0.8	+2.8	+30.4	-32.3	+0.0	46.2	54.0	-7.8	Horiz
3654.264	48.3	+0.8	+2.8	+30.4	-32.3	+0.0	50.0	54.0	-4.0	Vert
4567.825	40.0	+1.0	+3.1	+32.3	-31.8	+0.0	44.6	54.0	-9.4	Horiz
4567.827	41.5	+1.0	+3.1	+32.3	-31.8	+0.0	46.1	54.0	-7.9	Vert
2778.203	47.7	+0.8	+2.9	+29.4	-32.7	+0.0	48.1	54.0	-5.9	Vert
High Channel										
2778.203	49.7	+0.8	+2.9	+29.4	-32.7	+0.0	50.1	54.0	-3.9	Horiz
3704.263	45.5	+0.8	+2.8	+30.6	-32.2	+0.0	47.5	54.0	-6.5	Vert
3704.263	41.0	+0.8	+2.8	+30.6	-32.2	+0.0	43.0	54.0	-11.0	Horiz
4630.326	40.3	+1.0	+3.2	+32.5	-32.0	+0.0	45.0	54.0	-9.0	Horiz

Radiated Emissions

YAGI Antenna ACY15-L

Freq MHz	Rdng dB μ V	Cable dB	Cable dB	Horn dB	Pre-A dB	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
2709.423	57.5	+0.8	+2.8	+29.3	-32.7	+0.0	57.7	74.0	-16.3	Horiz
Low Channel										
2710.053	46.0	+0.8	+2.8	+29.3	-32.7	+0.0	46.2	54.0	-7.8	Horiz
Average										
2709.438	49.5	+0.8	+2.8	+29.3	-32.7	+0.0	49.7	54.0	-4.3	Vert
3612.511	50.0	+0.8	+2.8	+30.3	-32.4	+0.0	51.5	54.0	-2.5	Horiz
3612.597	49.7	+0.8	+2.8	+30.3	-32.4	+0.0	51.2	54.0	-2.8	Vert
4515.787	45.2	+1.0	+3.1	+32.1	-31.6	+0.0	49.8	54.0	-4.2	Horiz
4515.750	41.0	+1.0	+3.1	+32.1	-31.6	+0.0	45.6	54.0	-8.4	Vert
5418.825	39.7	+1.2	+3.5	+33.6	-31.9	+0.0	46.1	54.0	-7.9	Horiz
5418.894	36.5	+1.2	+3.5	+33.6	-31.9	+0.0	42.9	54.0	-11.1	Vert
6322.039	34.9	+1.3	+3.9	+34.9	-30.7	+0.0	44.3	54.0	-9.7	Horiz
6322.048	38.8	+1.3	+3.9	+34.9	-30.7	+0.0	48.2	54.0	-5.8	Vert
2740.698	54.7	+0.8	+2.9	+29.4	-32.7	+0.0	55.1	74.0	-18.9	Horiz
Mid Channel										
2738.915	33.8	+0.8	+2.9	+29.4	-32.7	+0.0	34.2	54.0	-19.8	Horiz
Average										
2740.701	51.7	+0.8	+2.9	+29.4	-32.7	+0.0	52.1	54.0	-1.9	Vert
3654.264	45.5	+0.8	+2.8	+30.4	-32.3	+0.0	47.2	54.0	-6.8	Horiz
3654.267	46.2	+0.8	+2.8	+30.4	-32.3	+0.0	47.9	54.0	-6.1	Vert
4567.827	39.7	+1.0	+3.1	+32.3	-31.8	+0.0	44.3	54.0	-9.7	Horiz
4567.831	41.2	+1.0	+3.1	+32.3	-31.8	+0.0	45.8	54.0	-8.2	Vert
2778.203	51.8	+0.8	+2.9	+29.4	-32.7	+0.0	52.2	54.0	-1.8	Horiz
High Channel										
2778.203	51.2	+0.8	+2.9	+29.4	-32.7	+0.0	51.6	54.0	-2.4	Vert
3704.263	43.2	+0.8	+2.8	+30.6	-32.2	+0.0	45.2	54.0	-8.8	Horiz
3704.263	46.3	+0.8	+2.8	+30.6	-32.2	+0.0	48.3	54.0	-5.7	Vert
4630.327	37.5	+1.0	+3.2	+32.5	-32.0	+0.0	42.2	54.0	-11.8	Horiz
4630.327	40.0	+1.0	+3.2	+32.5	-32.0	+0.0	44.7	54.0	-9.3	Vert
5556.396	37.3	+1.2	+3.5	+33.7	-31.8	+0.0	43.9	54.0	-10.1	Horiz

Radiated Emissions

Panel Antenna ANT-A-2226-1

Freq MHz	Rdng dB μ V	Cable	Cable	Horn	Pre-A	Dist Table	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar Ant
		dB	dB	dB	dB					
2709.450	53.0	+0.8	+2.8	+29.3	-32.7	+0.0	53.2	54.0	-0.8	Vert
Low Channel										
2709.453	51.3	+0.8	+2.8	+29.3	-32.7	+0.0	51.5	54.0	-2.5	Horiz
3612.597	46.2	+0.8	+2.8	+30.3	-32.4	+0.0	47.7	54.0	-6.3	Vert
3612.599	44.0	+0.8	+2.8	+30.3	-32.4	+0.0	45.5	54.0	-8.5	Horiz
4515.732	42.0	+1.0	+3.1	+32.1	-31.6	+0.0	46.6	54.0	-7.4	Horiz
4515.746	42.2	+1.0	+3.1	+32.1	-31.6	+0.0	46.8	54.0	-7.2	Vert
5418.884	35.8	+1.2	+3.5	+33.6	-31.9	+0.0	42.2	54.0	-11.8	Horiz
5418.898	36.7	+1.2	+3.5	+33.6	-31.9	+0.0	43.1	54.0	-10.9	Vert
2740.697	50.2	+0.8	+2.9	+29.4	-32.7	+0.0	50.6	54.0	-3.4	Vert
Mid Channel										
2740.698	50.5	+0.8	+2.9	+29.4	-32.7	+0.0	50.9	54.0	-3.1	Horiz
3654.266	43.7	+0.8	+2.8	+30.4	-32.3	+0.0	45.4	54.0	-8.6	Horiz
3654.269	46.5	+0.8	+2.8	+30.4	-32.3	+0.0	48.2	54.0	-5.8	Vert
4567.832	44.0	+1.0	+3.1	+32.3	-31.8	+0.0	48.6	54.0	-5.4	Vert
4567.835	40.3	+1.0	+3.1	+32.3	-31.8	+0.0	44.9	54.0	-9.1	Horiz
2778.203	48.5	+0.8	+2.9	+29.4	-32.7	+0.0	48.9	54.0	-5.1	Vert
High Channel										
2778.206	48.7	+0.8	+2.9	+29.4	-32.7	+0.0	49.1	54.0	-4.9	Horiz
3704.268	41.2	+0.8	+2.8	+30.6	-32.2	+0.0	43.2	54.0	-10.8	Horiz
3704.276	44.8	+0.8	+2.8	+30.6	-32.2	+0.0	46.8	54.0	-7.2	Vert
4630.332	39.2	+1.0	+3.2	+32.5	-32.0	+0.0	43.9	54.0	-10.1	Horiz
4630.333	42.0	+1.0	+3.2	+32.5	-32.0	+0.0	46.7	54.0	-7.3	Vert

Nemko USA, Inc.

EQUIPMENT: AW900 v4

FCC PART 15, SUBPART C
Digital Transmission Systems
Test Report No.: 11870RUS1rev1

Section 7. Peak Power Spectral Density

NAME OF TEST: Peak Power Spectral Density	PARA. NO.: 15.247(e)
TESTED BY: David Light	DATE: 16 April 2008

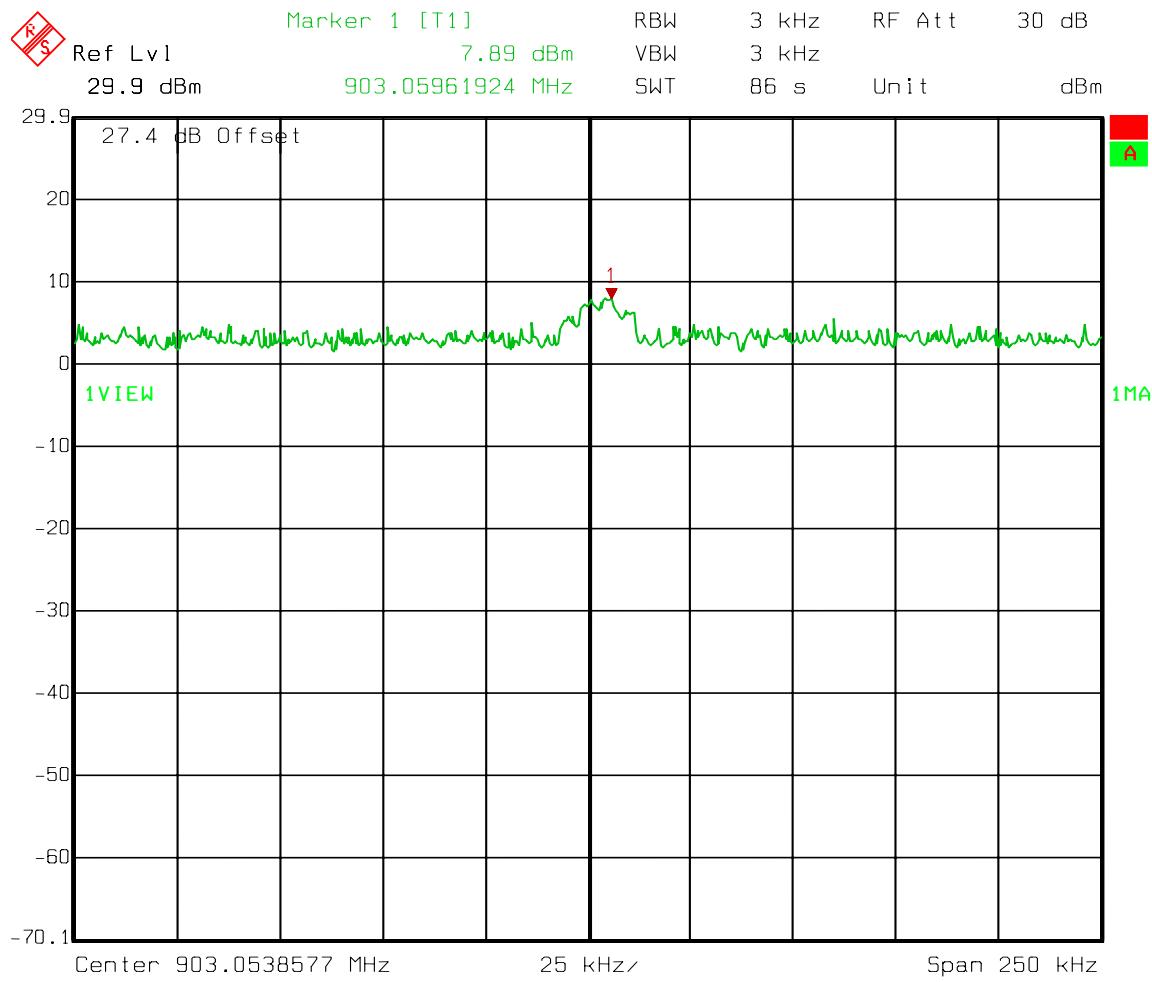
Test Results: Complies.

Measurement Data: See attached data..

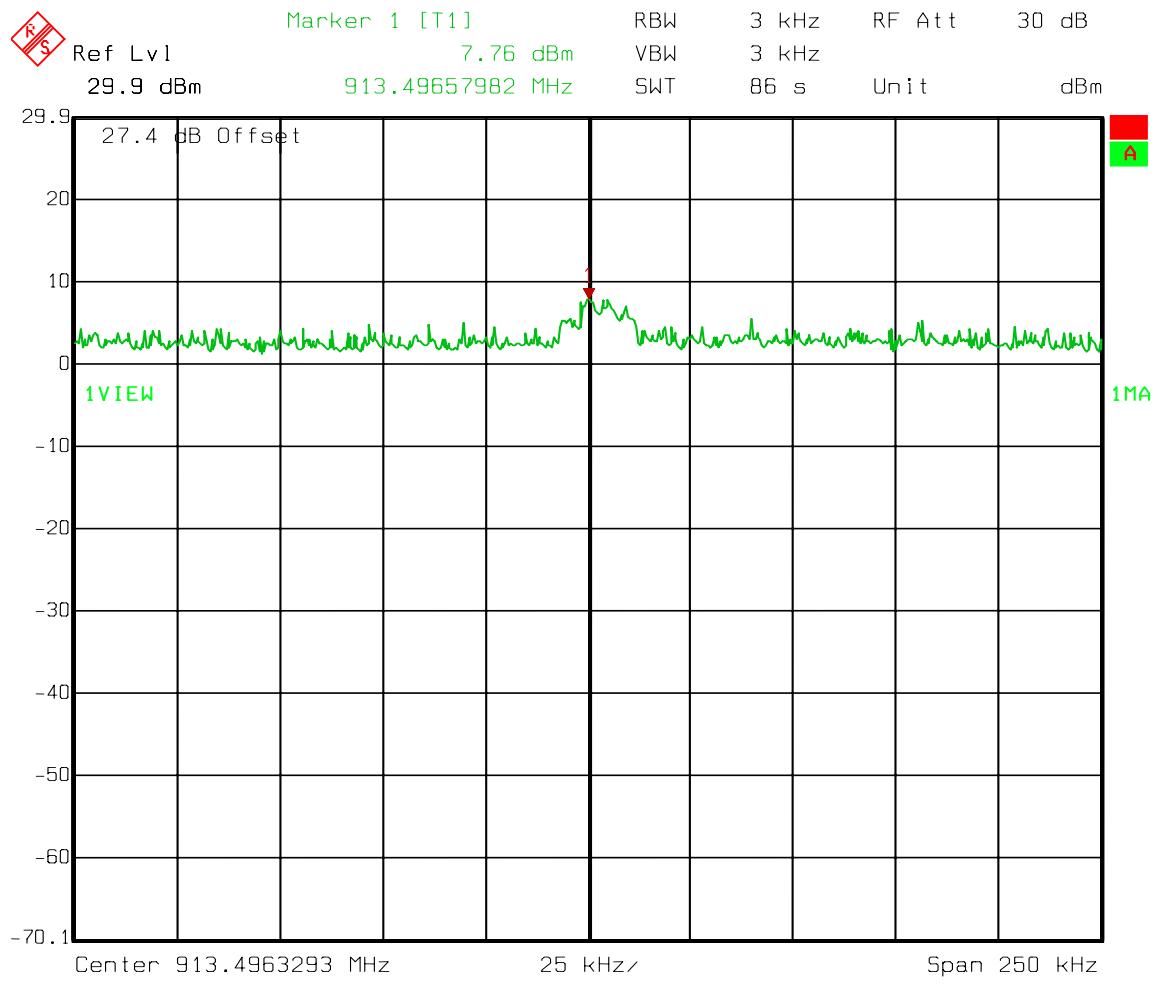
Test Conditions: 35 %RH
20 °C

Measurement Uncertainty: +/-1.7 dB

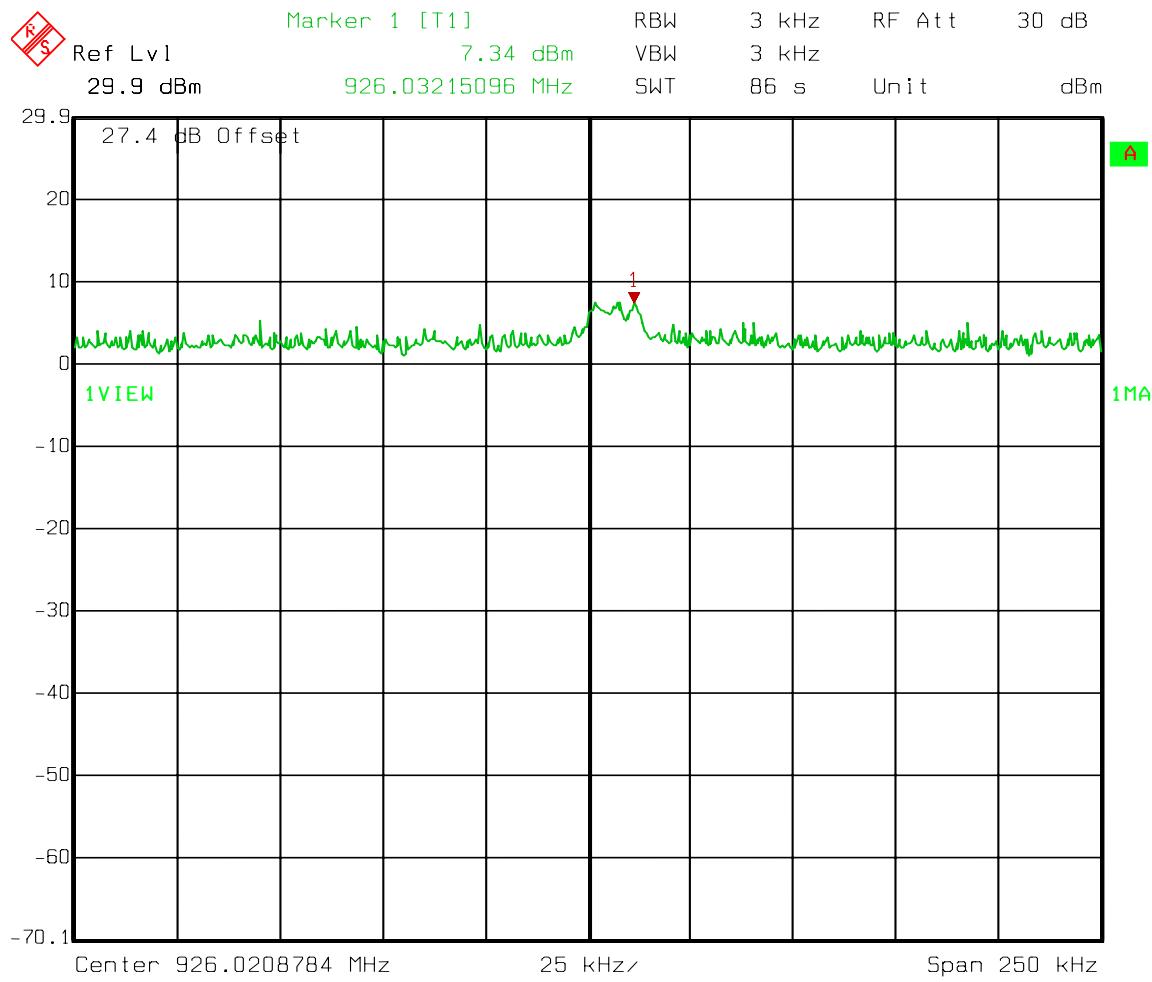
Test Equipment Used: 1036-102-1472-1469

Peak Power Spectral Density

Date: 16.APR.2008 09:00:42

Peak Power Spectral Density

Date: 16.APR.2008 09:04:25

Peak Power Spectral Density

Date: 16.APR.2008 09:07:36

Nemko USA, Inc.

EQUIPMENT: AW900 v4

FCC PART 15, SUBPART C
Digital Transmission Systems
Test Report No.: 11870RUS1rev1

Section 8. Powerline Conducted Emissions

NAME OF TEST: Powerline Conducted Emissions	PARA. NO.: 15.207(a)
TESTED BY: Scott Oates	DATE: 18 April 2008

Test Results: Complies.

Measurement Data: See attached plots.

Measurement Uncertainty: +/- 1.7 dB

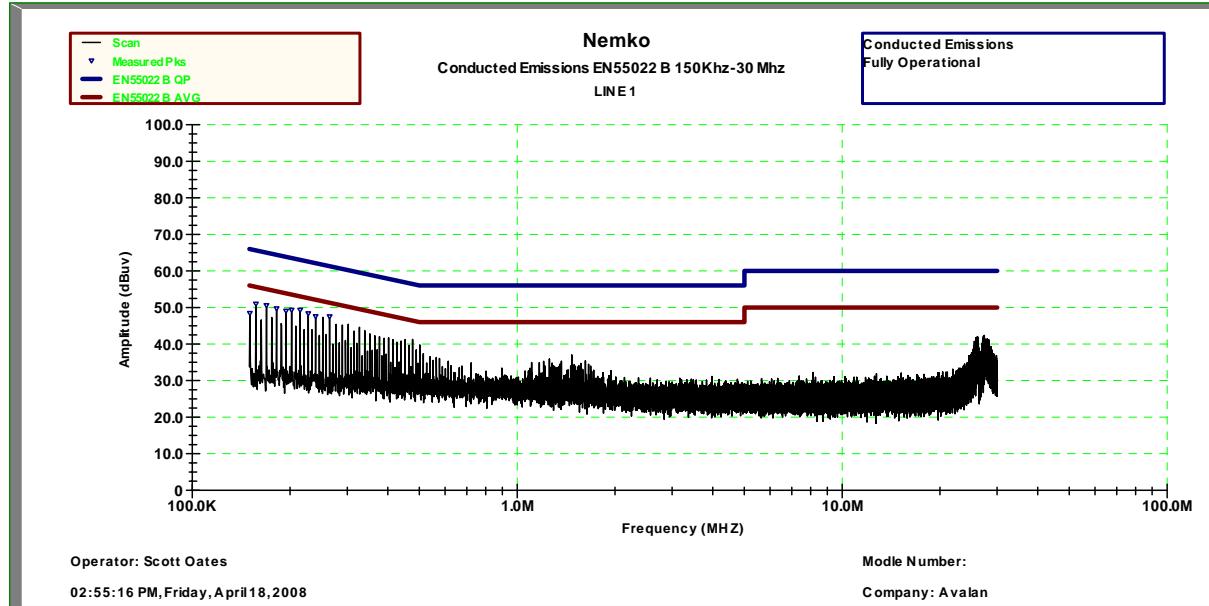
Test Conditions: 35 %RH
20 °C

Measurement Uncertainty: +/-1.7 dB

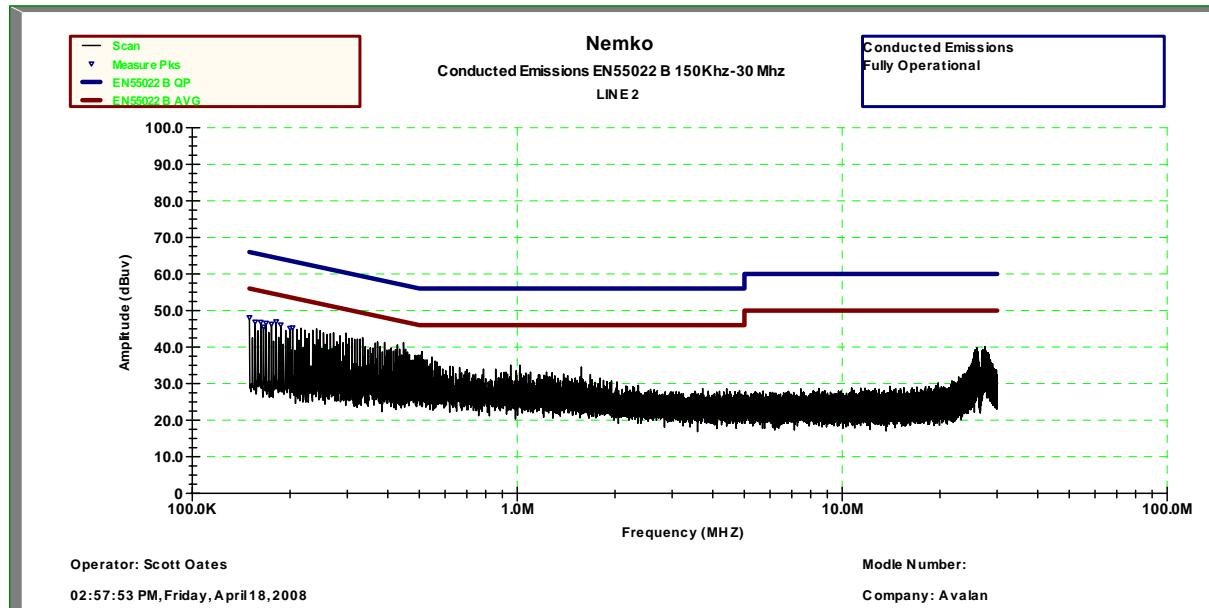
Test Equipment Used: 1258-1325-1194-1663

Test Data – Powerline Conducted Emissions

Line One



Line Two



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EQUIPMENT: AW900 v4

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Digital Transmission Systems
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Test Data – Powerline Conducted Emissions

Section 9. Test Equipment List

Nemko ID	Description	Manufacturer Model Number	Serial Number	Calibration Date	Calibration Due
1036	SPECTRUM ANALYZER	ROHDE & SCHWARZ FSEK30	830844/006	05/26/06	05/26/08
1082	CABLE 2m	Astrolab 32027-2-29094-72TC	N/A	CBU	N/A
1472	20db Attenuator DC 18 Ghz	Omni Spectra 20600-20db	NONE	CBU	N/A
1469	10 db Attenuator DC 18 Ghz	MCL Inc. BW-S10W2 10db-2WDC	NONE	CBU	N/A
1464	Spectrum analyzer	Hewlett Packard 8563E	3551A04428	01/24/07	01/24/09
1484	Cable	Storm PR90-010-072	N/A	05/02/07	05/01/08
1485	Cable	Storm PR90-010-216	N/A	05/02/07	05/01/08
1016	Pre-Amp	HEWLETT PACKARD 8449A	2749A00159	05/01/07	04/30/08
993	Horn antenna	A.H. Systems SAS-200/571	XXX	08/31/07	08/30/08
1258	LISN .15mhz-30mhz	EMCO 3825/2	1305	06/20/07	06/19/08
1325	CABLE, .5m	Nemko USA, Inc. RG223	N/A	06/09/07	06/09/08
1194	CABLE, 7m	Nemko USA, Inc. RG214	N/A	06/09/07	06/09/08
1663	Spectrum Analyzer	Rhode & Schwarz FSP3	100073	07/23/07	07/23/09

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EQUIPMENT: AW900 v4

FCC PART 15, SUBPART C
Digital Transmission Systems
Test Report No.: 11870RUS1rev1

ANNEX A - TEST DETAILS

Nemko USA, Inc.

EQUIPMENT: AW900 v4

FCC PART 15, SUBPART C
Digital Transmission Systems
Test Report No.: 11870RUS1rev1

NAME OF TEST: Occupied Bandwidth

PARA. NO.: 15.247(a)(2)

Minimum Standard: The minimum 6 dB bandwidth shall be at least 500 kHz

NAME OF TEST: Maximum Peak Output Power PARA. NO.: 15.247(b)(3)

Minimum Standard: The maximum peak output power shall not exceed 1 watt.

If transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point to point operation may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceed 6 dBi.

Systems operating in the 5725 – 5850 MHz band that are used exclusively for fixed, point-to-point operation may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Direct Measurement Method For Detachable Antennas:

If the antenna is detachable, a peak power meter is used to measure the power output with the transmitter operating into a 50 ohm load. The dBi gain of the antenna(s) employed shall be reported.

Substitution Antenna Method for Integral Antennas:

The peak field strength of the carrier is measured in a worst-case configuration with a RBW > 5 times the occupied bandwidth of the transmitted waveform. For cases where the RBW of the test instrument is not sufficient, the power is measured using a peak power meter instead of the spectrum analyzer.

The RBW of the spectrum analyzer shall be set to a value greater than the measured 6 dB occupied bandwidth of the E.U.T.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Occupied Bandwidth

PARA. NO.: 15.247(a)(2)

Minimum Standard: Systems using digital modulation techniques may operate in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Method Of Measurement:

The spectrum analyzer is set as follows:

RBW = VBW = 100 kHz.

Span: Sufficient to display 6 dB bandwidth

LOG dB/div.: 10 dB

Sweep: Auto

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Spurious Emissions(conducted)	PARA. NO.: 15.247(d)
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Minimum Standard: In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits. Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency (MHz)	Field Strength (μ V/m @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

THE SPECTRUM IS SEARCHED TO THE 10th HARMONIC OF THE HIGHEST FREQUENCY GENERATED IN THE EUT.

Method Of Measurement:30 MHz - 10th harmonic plot

RBW: 100 kHz

VBW: 300 kHz

Sweep: Auto

Display line: -20 dBc

Lower Band Edge

RBW: At least 1% of span/div.

VBW: >RBW

Span: As necessary to display any spurious at band edge.

Sweep: Auto

Center Frequency: 902 MHz, 2400 MHz, or 5725 MHz

Marker: Peak of fundamental emission

Marker Δ: Peak of highest spurious level below center frequency.

Upper Band Edge

RBW: At least 1% of span/div.

VBW: >RBW

Span: As necessary to display any spurious at band edge.

Sweep: Auto

Center Frequency: 928 MHz, 2483.5 MHz, or 5850 MHz

Marker: Peak of fundamental emission

Marker Δ: Peak of highest spurious level above center frequency.

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Radiated Spurious Emissions**PARA. NO.:** 15.247(c)

Minimum Standard: In any 100kHz bandwidth outside the frequency band in which the transmitter is operating, emissions shall be at least 20 dB below the fundamental emission or shall not exceed the following field strength limits:

Emissions falling in the restricted bands of 15.205 shall not exceed the following field strength limits:

Frequency (MHz)	Field Strength (μ V/m @ 3m)	Field Strength (dB @ 3m)
30 - 88	100	40.0
88 - 216	150	43.5
216 - 960	200	46.0
Above 960	500	54.0

THE SPECTRUM WAS SEARCHED TO THE 10th HARMONIC

15.205 Restricted Bands

MHz	MHz	MHz	GHz
0.09-0.11	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.125-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	Above 38.6
13.36-13.41	1718		

Number of channels tested:

Tuning range	Number of channels tested	Channel location in band
1 MHz or less	1	middle
1 to 10 MHz	2	top and bottom
more than 10 MHz	3	top, middle, bottom

NAME OF TEST: Transmitter Power Density**PARA. NO.:** 15.247(d)

Minimum Standard: The transmitted power density averaged over any 1 second interval shall not be greater than +8 dBm in any 3 kHz bandwidth.

Method Of Measurement: The spectrum analyzer is set as follows:

RBW: 3 kHz
VBW: >3 kHz
Span: => measured 6 dB bandwidth
Sweep: Span(kHz)/3 (i.e. for a span of 1.5 MHz the sweep rate is $1500/3 = 500$ sec.)
LOG dB/div.: 2 dB

Note: For devices with spectrum line spacing =< 3 kHz, the RBW of the analyzer is reduced until the spectral lines are resolved. The measurement data is normalized to 3 kHz by summing the power of all the individual spectral lines within a 3 kHz band in linear power units.

For Devices With Integral Antenna:

For devices with non-detachable antennas, the received field strength is peaked and the spectrum analyzer is set as above. The peak emission level is then measured and converted to a field strength by adding the appropriate antenna factor and cable loss. This field strength is then converted to an equivalent isotropic radiated power using the same method as described for Peak Power output.

Number of channels tested:

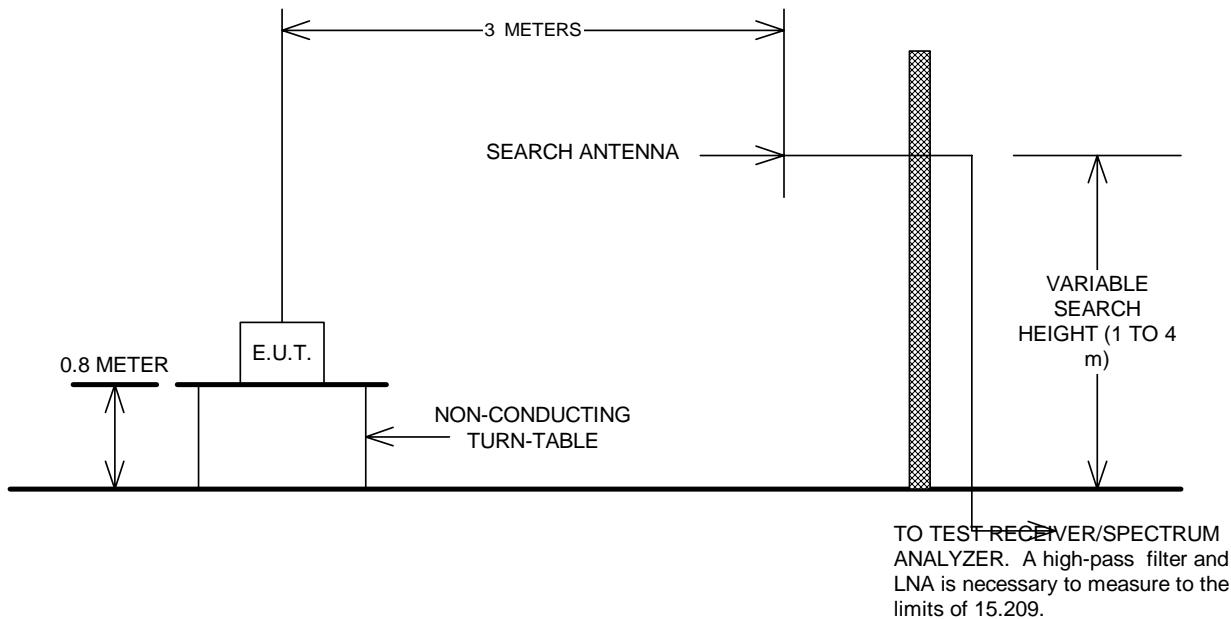
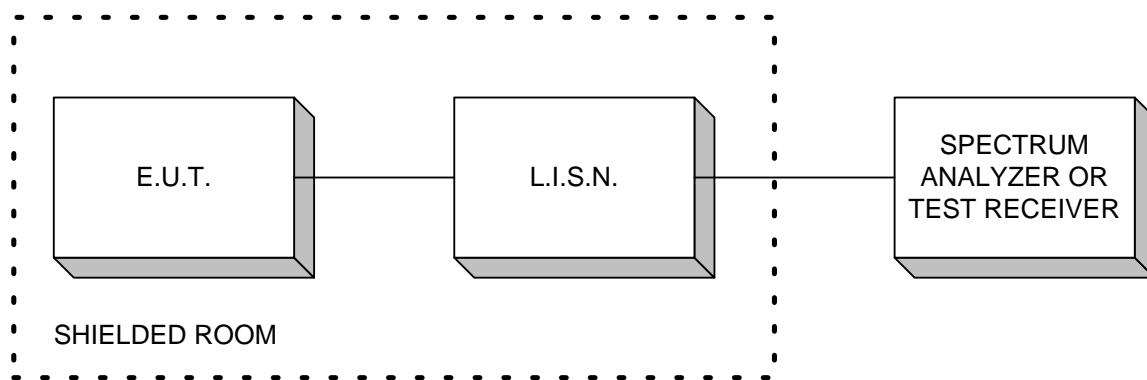
Tuning Range	Number Of Channels Tested	Channel Location In Band
1 MHz or Less	1	Middle
1 to 10 MHz	2	Top And Bottom
More Than 10 MHz	3	Top, Middle, Bottom

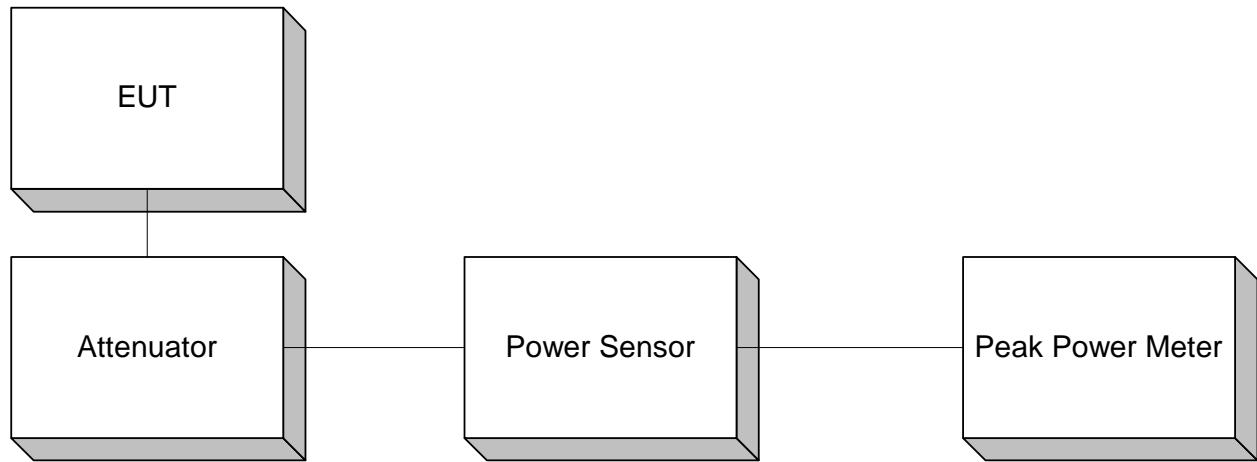
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EQUIPMENT: AW900 v4

FCC PART 15, SUBPART C
Digital Transmission Systems
Test Report No.: 11870RUS1rev1

ANNEX B - TEST DIAGRAMS

Test Site For Radiated Emissions**Conducted Emissions**

Peak Power At Antenna Terminals

Note: A spectrum analyzer may be substituted for Peak Power Meter given that the measurement bandwidth is sufficient to capture the 60 dB bandwidth of the transmitter.

**Minimum 6 dB Bandwidth
Peak Power Spectral Density
Spurious Emissions (conducted)**