



**Nemko USA, Inc.**  
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**Test Report:** 2007 074583 Arena Tx FCC

**Project number:** 4583-1

**Applicant:** SDP Engineering  
17 Spectrum Pointe Suite #508  
Lake Forest, CA 92630


**Equipment Under Test (EUT):** Wireless Multimedia Entertainment System


**Model:** Arena Tx

**FCC ID:** VIRARENATX

**In Accordance With:** FCC Part 15 Subpart C, 15.247

**Tested By:** Nemko USA Inc.  
11696 Sorrento Valley Road, Suite F  
San Diego, CA 92121

**Authorized By:**   
Michael T. Krumweide, EMC Supervisor

  
Alan Laudani, EMC Test Engineer

**Date:** August 29, 2007

**Total Number of Pages:** 41

## 2.1.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. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made on an open area test site. A description of the test facility is on file with the FCC.

The assessment summary is as follows:

**Apparatus Assessed:** Wireless Multimedia Entertainment System  
Model Arena Tx

**Specification:** FCC Part 15 Subpart C, 15.247

**Date Received in Laboratory:** July 5, 2007

**Compliance Status:** Complies

**Exclusions:** None

**Non-compliances:** None

#### Report Release History:

REVISION	DATE	COMMENTS
-	July 20, 2007	Prepared By: Ferdinand S. Custodio
-	July 20, 2007	Initial Release: Mike T. Krumweide
A	August 29, 2007	Prepared By: Ferdinand S. Custodio
A para. 2.4	August 29, 2007	Release Alan Laudani

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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TESTED BY: \_\_\_\_\_

  
Ferdinand S. Custodio, EMC Test Engineer

Date: July 20, 2007

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## Section 2: Equipment Under Test

### 2.1 Product Identification

The Equipment Under Test was a Transmitting System composed of two units identified as follows:

Arena Head  
Arena Hub

### 2.2 Samples Submitted for Assessment

The following samples of the apparatus have been submitted for type assessment:

Sample No.	Description	Serial No.
WHUB001	Arena Hub	WHUB001
WTX001	Arena Head	WTX001

### 2.4 Theory of Operation

The Arena Tx is a Wireless Multimedia Entertainment System. Pre-packetized Multimedia content is fed in digital form into the Hub unit, where the modulator converts this into an OFDM signal. The OFDM signal is then modulated onto a fiber optic cable which carries it to the remote Head unit. The Head demodulates the RF from the fiber and amplifies the signal for transmission from the antenna.

The components are off the shelf. The radio consists of two 19 inch racks within easy carry boxes with the RF modulator/fiber optic multiplexer in the Arena Hub and the RF amp in another separated by fiber-optic cable up to 10,000 ft. The RF modulator would be modulated with the simultaneous input of several video cameras and digital information and feed the Arena Head containing the RF amplifier, to which the antenna is connected. The system installed professionally with RF power meters to verify power out.

[Rev. A. Wording of the Theory of Operation was changed to conform to the revised intended use of the RF system.]

## **2.5 Technical Specifications of the EUT**

<b>Manufacturer:</b>	WiseDV
<b>Operating Frequency:</b>	906.5 MHz to 923.5 MHz in the 902-928 MHz Band
<b>Rated Power:</b>	774.5mW
<b>Modulation:</b>	OFDM
<b>Antenna Data:</b>	5.8dBi at 902-928 MHz
<b>Antenna Connector:</b>	Type N
<b>Power Source:</b>	110VAC

## **Section 3: Test Conditions**

### **3.1 Specifications**

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.247

Operation within the bands 902-928 MHz, 2400-2483.5 MHz,  
5725-5850 MHz and 24.0-24.25 GHz bands.

### **3.2 Deviations From Laboratory Test Procedures**

No deviations from Laboratory Test Procedure

### **3.3 Test Environment**

All tests were performed under the following environmental conditions:

Temperature range	:	20.5 – 23.3 °C
Humidity range	:	26 - 65 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 1% of rated voltages

### 3.4 Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
534	Spectrum Analyzer Display	HP	85662A	2534A10452	4/2/2007	4/02/08
535	Spectrum Analyzer	HP	85680A	2517A01757	5/11/2007	5/11/08
538	Quasi-Peak Adapter	HP	85650A	2521A00588	4/9/2007	4/09/08
805	LISN	Solar	9348-50-R-24-BNC	992823	12/1/2006	12/01/07
559	High Pass Filter	Solar	8310-1.0	844823	4/4/2007	04/04/08
682	Transient Limiter	HP	11974A	3107A02633	12/12/2006	12/12/07
147	LISN	EMCO	3825/2	9009-1700	8/8/2006	8/08/07
128	Antenna	Electro-Metrics	3104	2882	11/10/2006	11/10/07
111	Antenna, LPA	EMCO	3146	1382	8/7/06	8/7/07
842	Preamplifier		Nemko	na	Verified	7-10-07
529	Antenna, DRWG	EMCO	3115	2505	8/31/2006	8/31/07
915	EMI Test Receiver 20 Hz- 26.5	Rohde & Schwarz	1088.7490.26	837491/0002	2/6/2007	2/06/08
897	Spectrum Analyzer	Rohde & Schwarz	FSP	837620/009	8/11/2006	8/11/2007
835	Spectrum Analyzer	Rohde & Schwarz	RHDFSEK	829058/005	6/20/2007	6/20/08

## **Section 4: Observations**

### **4.1 Modifications Performed During Assessment**

No modifications were performed during assessment.

### **4.2 Record Of Technical Judgements**

No technical judgements were made during the assessment.

### **4.3 EUT Parameters Affecting Compliance**

The user of the apparatus could not alter parameters that would affect compliance.

### **4.4 Test Deleted**

No Tests were deleted from this assessment.

### **4.5 Additional Observations**

There were no additional observations made during this assessment.



## Section 5: Results Summary

This section contains the following:

### FCC Part 15 Subpart C: Test Results

The column headed "Required" indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

- N No: not applicable / not relevant  
Y Yes: Mandatory i.e. the apparatus shall conform to these test.  
N/T Not Tested, mandatory but not assessed. (See section 4.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

### 5.1 FCC Part 15 Subpart C: Test Results

Part 15	Test Description	Required	Result
15.247(b)(3)	Maximum peak output power of systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands	Y	Pass
15.209 (a)	Radiated Emissions within Restricted Bands	Y	Pass
15.247(a)(2)	Minimum 6dB RF Bandwidth	Y	Pass
15.247 (d)	Out-of-band Emissions	Y	Pass
15.247(e)	Power Spectral Density for Digitally Modulated Devices	Y	Pass
15.207	Transmitter and Receiver AC Power Lines Conducted Emission Limit	Y	Pass

## Appendix A: Test Results

### Clause 15.209(a) Radiated Emissions within Restricted Bands

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (uV/meter)	Measurement Distance (meter)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	3
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, **the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.** Attenuation below the general limits specified in Sec. 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a), must also comply with the radiated emission limits specified in Sec. 15.209(a) (see Sec. 15.205(c)).

### Test Conditions:

<b>Sample Number:</b>	WHUB001 and WTX001	<b>Temperature:</b>	75.0°F
<b>Date:</b>	7-10-07	<b>Humidity:</b>	65 %
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	A. Laudani
		<b>Laboratory:</b>	SOATS

### Test Results:

See Attached Plots.

### Additional Observations:

The Spectrum was searched from 30MHz to the 10<sup>th</sup> Harmonic.

There are no emissions found that do not comply to the restricted bands defined in FCC Part 15 Subpart C, 15.205 or Part 15.247(d). The EUT was measured on three orthogonal axes. Measurements below 1GHz were performed at 3m with a Quasi-Peak detector while Average detector was used above 1GHz.

## Radiated Emissions 30 MHz to 1000 MHz

Math: Corrected Reading = Max of Vertical or Horizontal measured + Antenna Factor + Cable Loss – preamplifier (if used).

CR/SL Dif = Limit - Corrected Reading. Pass if result is negative.

$$38.2 = 26.4 + 10.7 + 1.1 - (0) \text{ no preamp required.}$$
$$38.2 - 40 = -1.8$$
[illegible]

FCC ID: VIRARENATX

## Radiated Emissions: To 10th Harmonic

## Radiated Emissions Data

Job # : 4583-1-EMC Date : 7-10-07  
NEX #: 87547 Time : 12:30 pm  
Staff : AAL

Page 1 of 1

Client Name : SDP Engineering  
EUT Name : wiseDV  
EUT Model # : \_\_\_\_\_  
EUT Serial # : \_\_\_\_\_  
EUT Config. : Transmit

EUT Voltage :	<u>120</u>
EUT Frequency :	<u>60</u>
Phase:	<u>1</u>
NOATS	<u>          </u>
SOATS	<u>X</u>
Distance:	<u>3m</u>

Specification : CFR47 Part 15, Subpart B, Class B

Loop Ant. #:	NA	
Bicon Ant. #:	NA	Temp. (°C) : 21
Log Ant. #:	NA	Humidity (%) : 65
DRG Ant. #	529	Spec An. #: 835
Dipole Ant. #:	NA	Spec An. Display #: 835
Cable LF#:	NA	QP #: NA
Cable HF#:	60ft	PreSelect#: NA
Preamp LF#:	NA	
Preamp HF#	842	

Quasi-Peak	RBW: <u>120 kHz</u>
	Video Bandwidth <u>300 kHz</u>
Peak	RBW: <u>1 MHz</u>
	Video Bandwidth <u>3 MHz</u>
Average	RBW: <u>1 MHz</u>
	Video Bandwidth <u>10 Hz</u>

Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated.

Measurements above 1 GHz are Average values, unless otherwise stated.

No emissions found over 2nd harmonics (~2700 MHz)

[illegible]

**Clause 15.247(a)(2) Minimum 6dB RF Bandwidth**

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

**Test Conditions:**

<b>Sample Number:</b>	WHUB001 and WTX001	<b>Temperature:</b>	74°F
<b>Date:</b>	July 5, 2007	<b>Humidity:</b>	50%
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	Alan Laudani
		<b>Laboratory:</b>	Nemko

**Test Results:****6dB Bandwidth:**

The antenna port of the EUT was connected to the input of a spectrum analyzer through a 40dB attenuator. Analyzer RES BW was set to 100 kHz. For each RF output channel investigated, the spectrum analyzer center frequency was set to the channel carrier. A PEAK output reading was taken, a DISPLAY line was drawn 6 dB lower than PEAK level. The 6 dB bandwidth was determined from where the channel output spectrum intersected the display line.

Channel Range	6 dB Bandwidth
Low (906.5 MHz)	7.62MHz
Mid (915.0 MHz)	7.58MHz
High (923.5 MHz)	7.64MHz



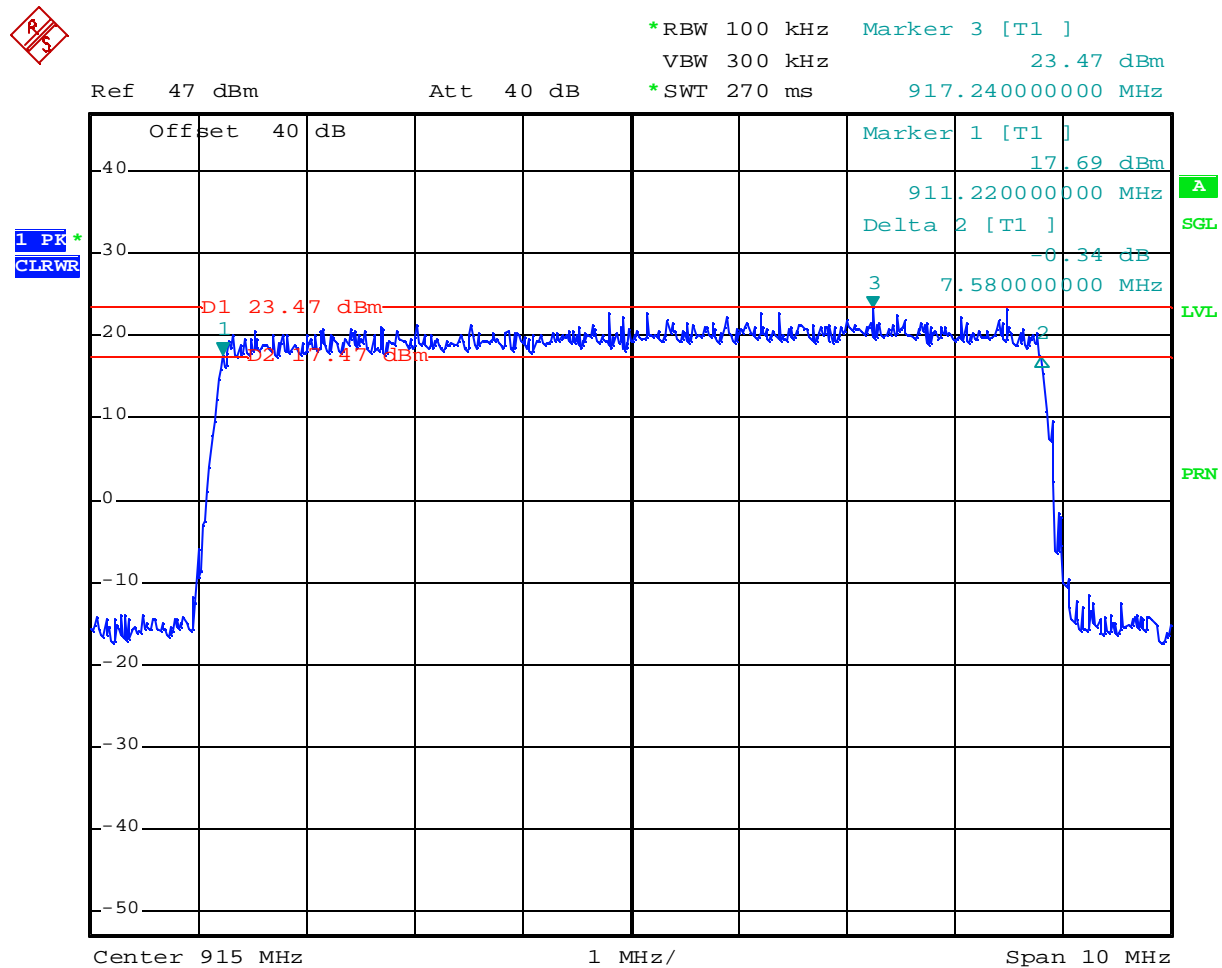
DATE	DESCRIPTION	AMOUNT	CHECK NO.	BANK
10/1/2023	DEPOSIT	1000.00		CHASE
10/5/2023	PAYROLL	500.00	1001	CHASE
10/10/2023	RENT	200.00	1002	CHASE
10/15/2023	UTILITIES	75.00	1003	CHASE
10/20/2023	SALES	300.00	1004	CHASE
10/25/2023	DEPOSIT	1000.00		CHASE
10/30/2023	PAYROLL	500.00	1005	CHASE
10/31/2023	RENT	200.00	1006	CHASE
11/1/2023	UTILITIES	75.00	1007	CHASE
11/5/2023	SALES	300.00	1008	CHASE
11/10/2023	DEPOSIT	1000.00		CHASE
11/15/2023	PAYROLL	500.00	1009	CHASE
11/20/2023	RENT	200.00	1010	CHASE
11/25/2023	UTILITIES	75.00	1011	CHASE
11/30/2023	SALES	300.00	1012	CHASE
12/1/2023	DEPOSIT	1000.00		CHASE
12/5/2023	PAYROLL	500.00	1013	CHASE
12/10/2023	RENT	200.00	1014	CHASE
12/15/2023	UTILITIES	75.00	1015	CHASE
12/20/2023	SALES	300.00	1016	CHASE
12/25/2023	DEPOSIT	1000.00		CHASE
12/30/2023	PAYROLL	500.00	1017	CHASE
12/31/2023	RENT	200.00	1018	CHASE
1/1/2024	UTILITIES	75.00	1019	CHASE
1/5/2024	SALES	300.00	1020	CHASE
1/10/2024	DEPOSIT	1000.00		CHASE
1/15/2024	PAYROLL	500.00	1021	CHASE
1/20/2024	RENT	200.00	1022	CHASE
1/25/2024	UTILITIES	75.00	1023	CHASE
1/30/2024	SALES	300.00	1024	CHASE
1/31/2024	DEPOSIT	1000.00		CHASE
2/1/2024	PAYROLL	500.00	1025	CHASE
2/5/2024	RENT	200.00	1026	CHASE
2/10/2024	UTILITIES	75.00	1027	CHASE
2/15/2024	SALES	300.00	1028	CHASE
2/20/2024	DEPOSIT	1000.00		CHASE
2/25/2024	PAYROLL	500.00	1029	CHASE
2/28/2024	RENT	200.00	1030	CHASE
2/29/2024	UTILITIES	75.00	1031	CHASE
3/1/2024	SALES	300.00	1032	CHASE
3/5/2024	DEPOSIT	1000.00		CHASE
3/10/2024	PAYROLL	500.00	1033	CHASE
3/15/2024	RENT	200.00	1034	CHASE
3/20/2024	UTILITIES	75.00	1035	CHASE
3/25/2024	SALES	300.00	1036	CHASE
3/30/2024	DEPOSIT	1000.00		CHASE
3/31/2024	PAYROLL	500.00	1037	CHASE
4/1/2024	RENT	200.00	1038	CHASE
4/5/2024	UTILITIES	75.00	1039	CHASE
4/10/2024	SALES	300.00	1040	CHASE
4/15/2024	DEPOSIT	1000.00		CHASE
4/20/2024	PAYROLL	500.00	1041	CHASE
4/25/2024	RENT	200.00	1042	CHASE
4/30/2024	UTILITIES	75.00	1043	CHASE
5/1/2024	SALES	300.00	1044	CHASE
5/5/2024	DEPOSIT	1000.00		CHASE
5/10/2024	PAYROLL	500.00	1045	CHASE
5/15/2024	RENT	200.00	1046	CHASE
5/20/2024	UTILITIES	75.00	1047	CHASE
5/25/2024	SALES	300.00	1048	CHASE
5/30/2024	DEPOSIT	1000.00		CHASE
5/31/2024	PAYROLL	500.00	1049	CHASE
6/1/2024	RENT	200.00	1050	CHASE
6/5/2024	UTILITIES	75.00	1051	CHASE
6/10/2024	SALES	300.00	1052	CHASE
6/15/2024	DEPOSIT	1000.00		CHASE
6/20/2024	PAYROLL	500.00	1053	CHASE
6/25/2024	RENT	200.00	1054	CHASE
6/30/2024	UTILITIES	75.00	1055	CHASE
7/1/2024	SALES	300		

1 PK \*

CLRWR

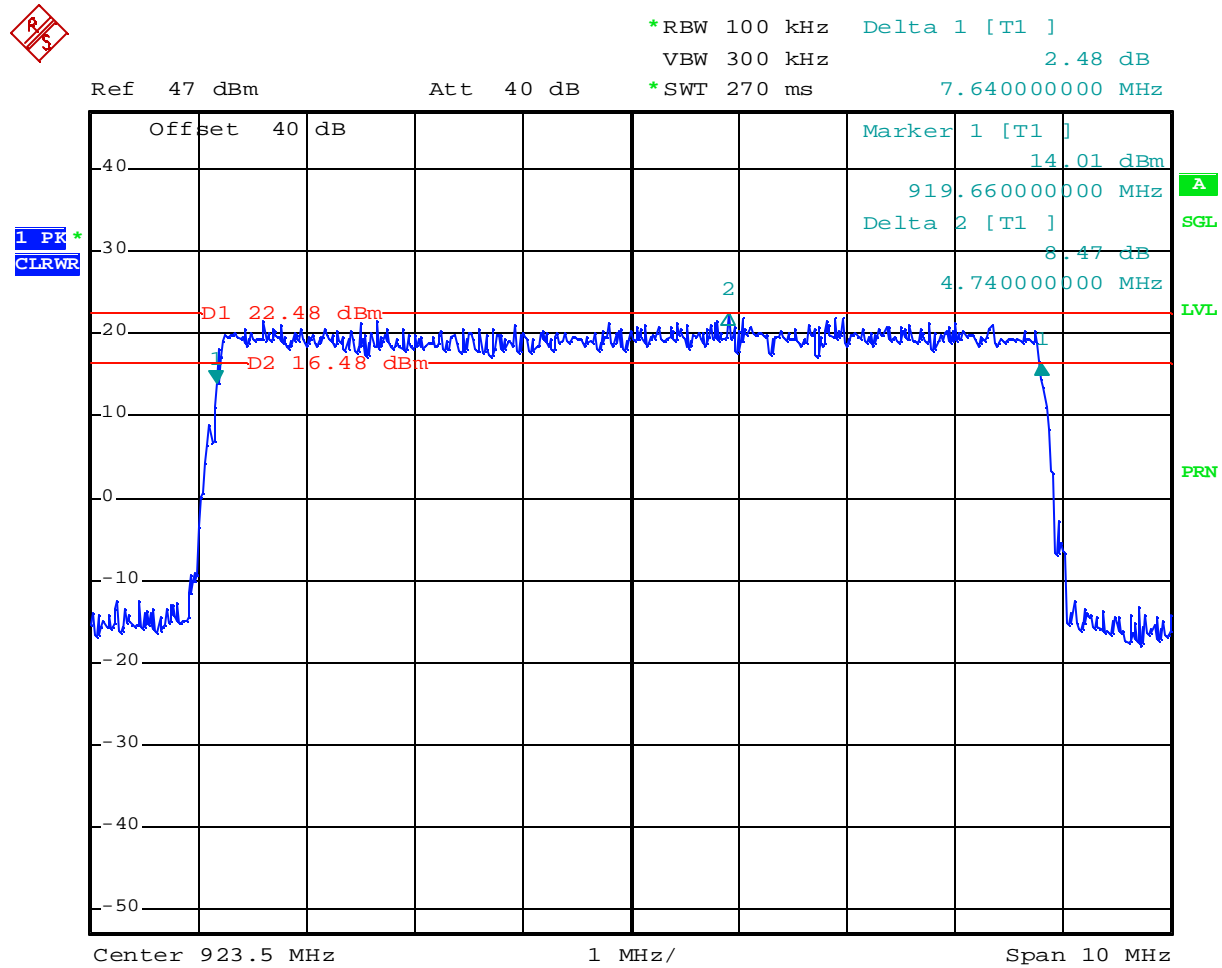
Span 10 MHz

## Low Channel 906.5 MHz



Date: 5.JUL.2007 15:56:49

### Mid Channel 915 MHz

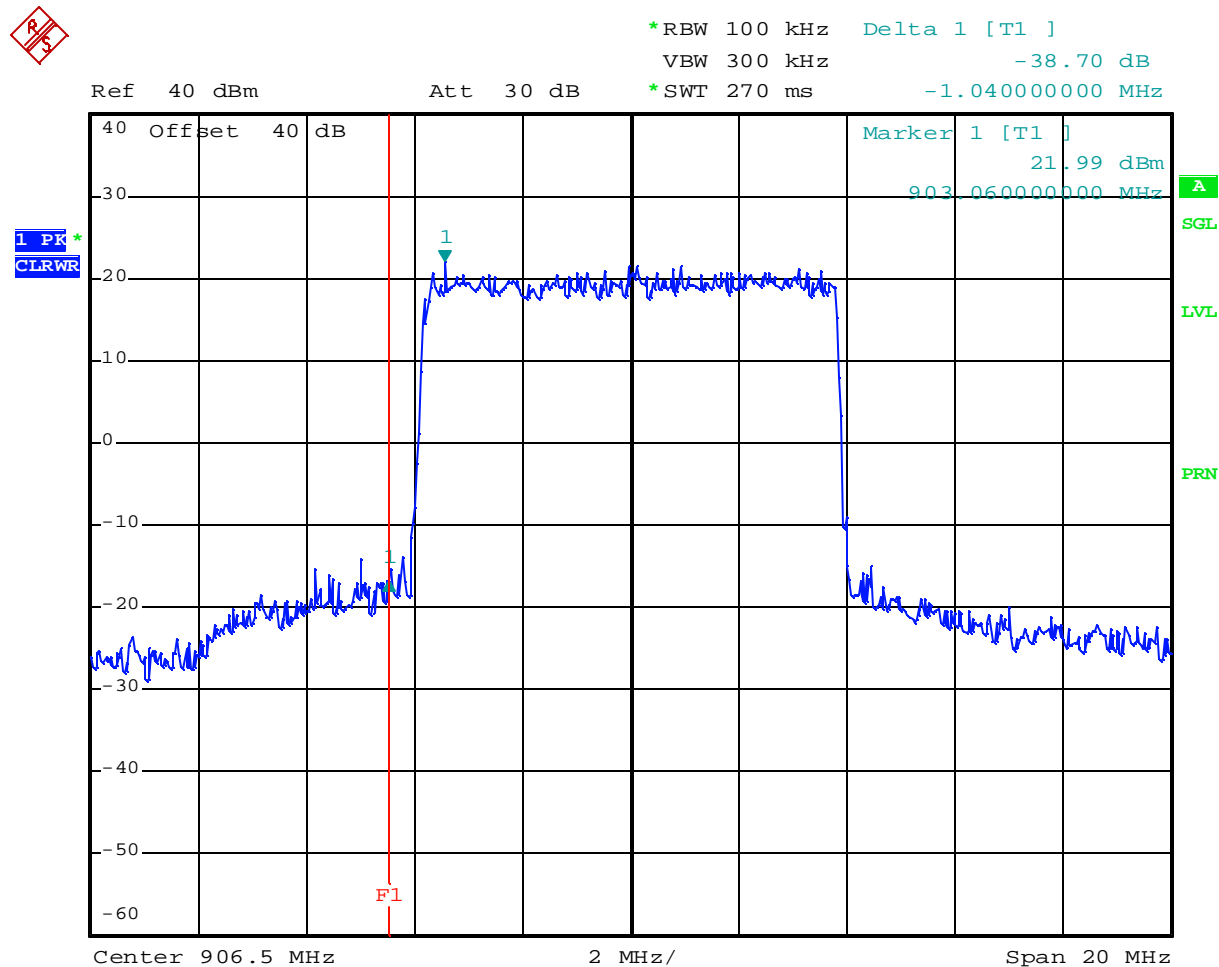


Date: 5.JUL.2007 15:50:08

### High Channel 923.5 MHz



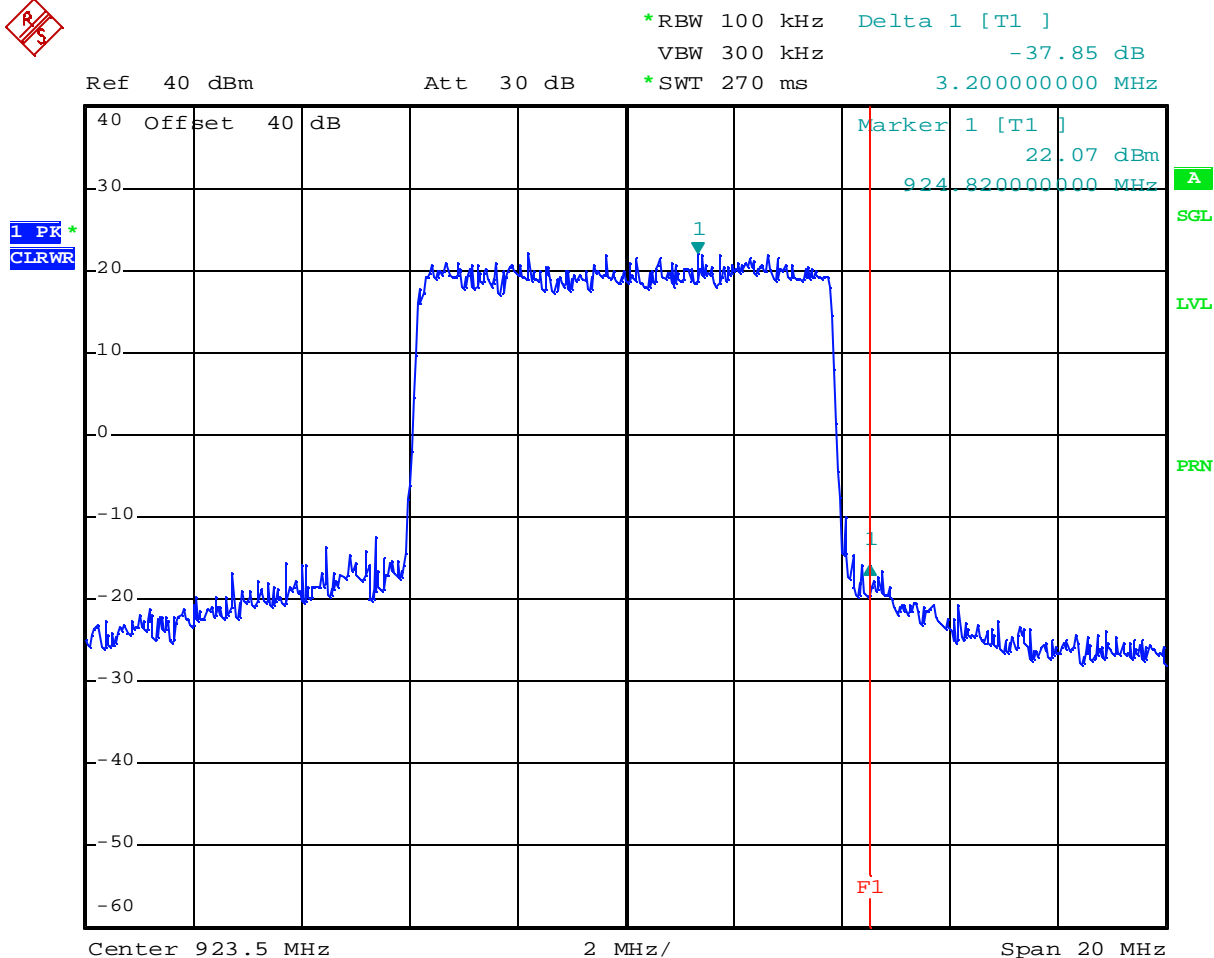
## Bandedge Measurements



Date: 5.JUL.2007 15:32:32

**Low Channel 906.5 MHz**

**Frequency line is 902MHz  
 Delta from peak to band edge is -38.70dB**



Date: 5.JUL.2007 15:36:40

**High Channel 923.5 MHz**

**Frequency line is 928MHz  
 Delta from peak to band edge is -37.85dB**

**Clause 15.247(b)(3) Maximum peak output power of systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands**

For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signalling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

**Test Conditions:**

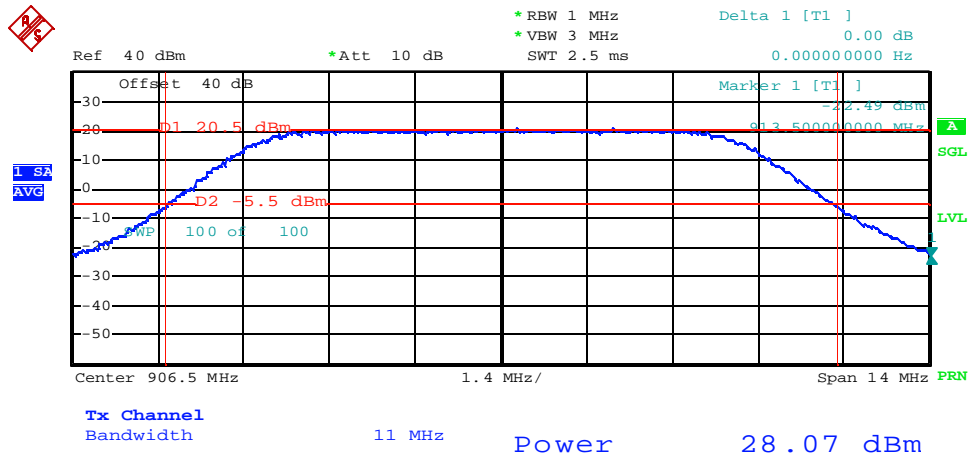
<b>Sample Number:</b>	WHUB001 and WTX001	<b>Temperature:</b>	74°F
<b>Date:</b>	July 5, 2007	<b>Humidity:</b>	50%
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	Alan Laudani
		<b>Laboratory:</b>	Nemko

**Test Results:****Conducted Output Power:**

The antenna port of the EUT was connected to the input of a spectrum analyzer through a 40dB attenuator. RBW set to 1MHz and VBW to 3MHz. Video trigger set to free run since device transmits continuously. Trace set to Average and Sweep Points set to 100. 26 db EBW (emission bandwidth) was marked and using these as the band markers, power measurements were made using the spectrum analyzers channel power measurement feature. Input voltage to the EUT was varied from 102VAV, 120VAC (nominal) and 138VAC during these measurements, only the worst case reported.

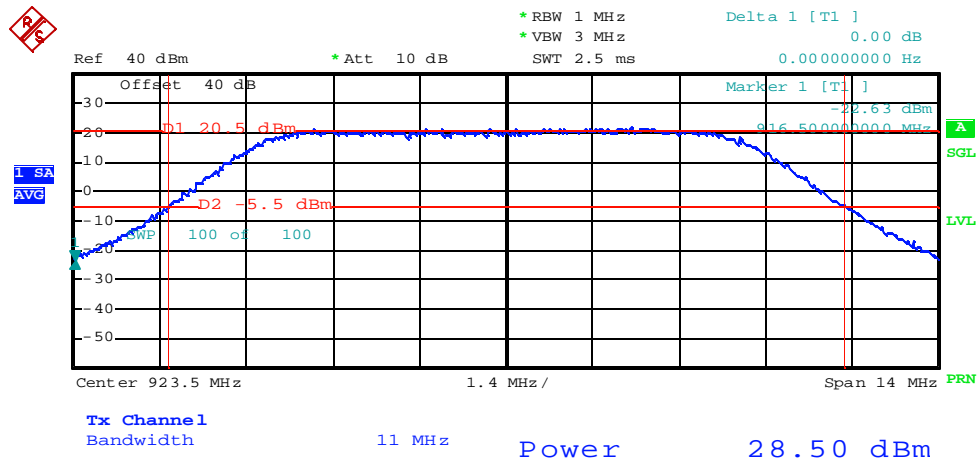
Channel	Frequency	Measured Output Power (W)
Low	906.5 MHz	641.2 mW
Mid	915.0 MHz	774.5 mW
High	923.5 MHz	707.9 mW

$$\begin{aligned}\text{EIRP} &= 10\log(0.7745) + 30 + \text{Ant. Gain} \\ &= 28.89\text{dBm} + 5.8\text{dBi} \\ &= 34.7\text{dBm}\end{aligned}$$



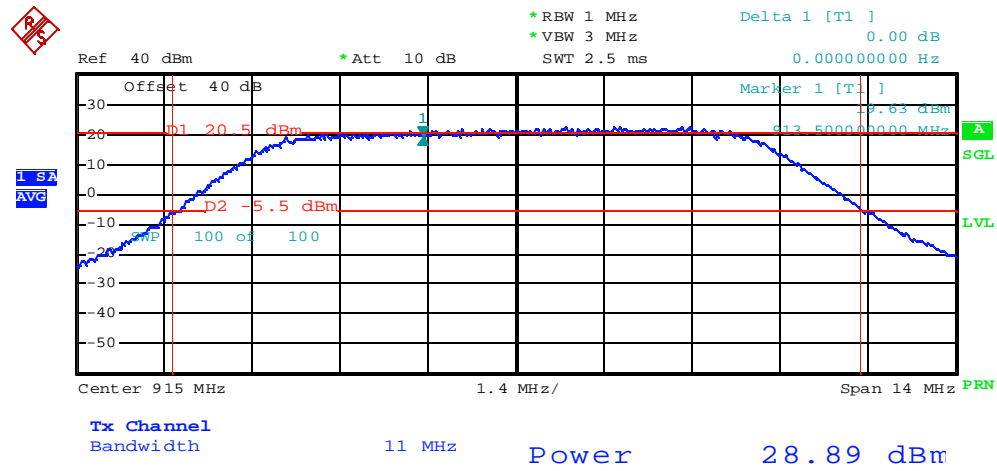
Date: 5.JUL.2007 15:09:06

## Low Channel



Date: 5.JUL.2007 15:07:37

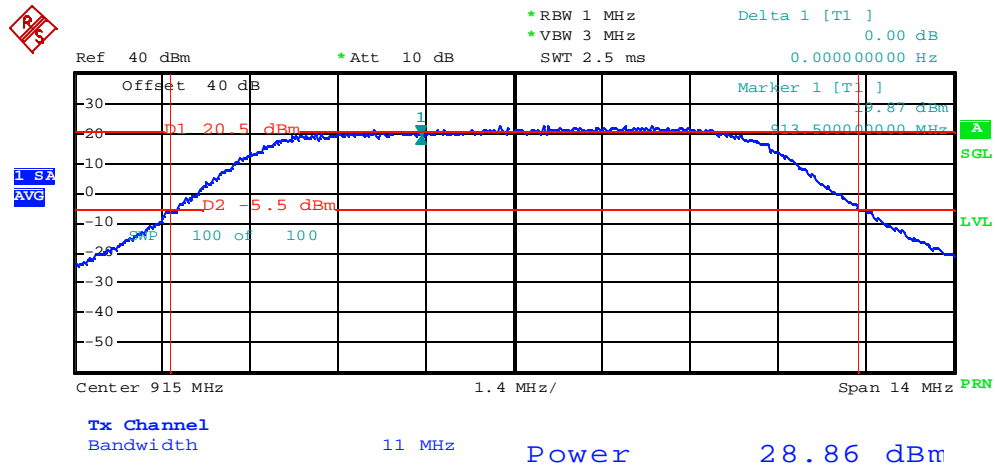
## High Channel



Date: 5.JUL.2007 15:10:26

## Nominal Voltage Mid Channel

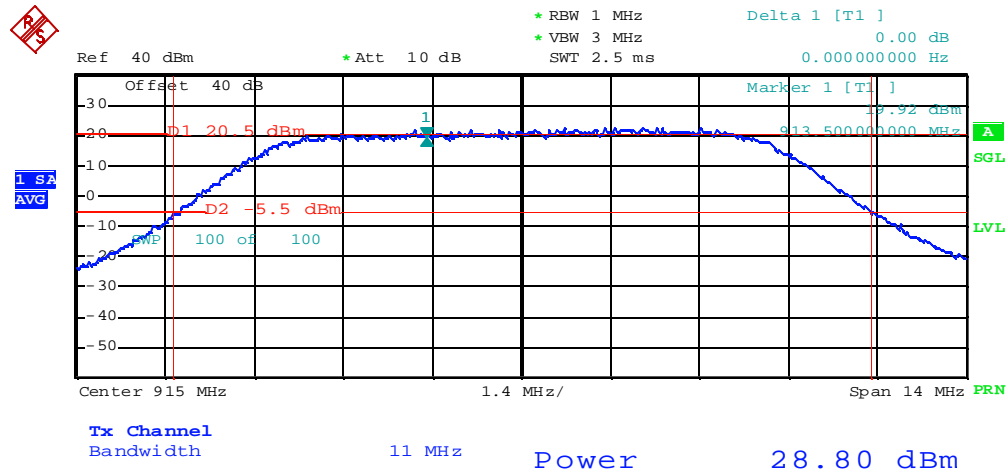
FCC ID: VIRARENATX



Date: 5.JUL.2007 15:14:47

**85% Nominal Voltage Mid Channel**

FCC ID: VIRARENATX



Date: 5.JUL.2007 15:17:04

## 115% Nominal Voltage Mid Channel



**Clause 15.247(d) Spurious Emissions (RF Antenna Conducted Test)**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

**Test Conditions:**

<b>Sample Number:</b>	WHUB001 and WTX001	<b>Temperature:</b>	74°F
<b>Date:</b>	December 18, 2006	<b>Humidity:</b>	50%
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	Alan Laudani
		<b>Laboratory:</b>	Nemko

**Test Results:**

See Attached Plots.

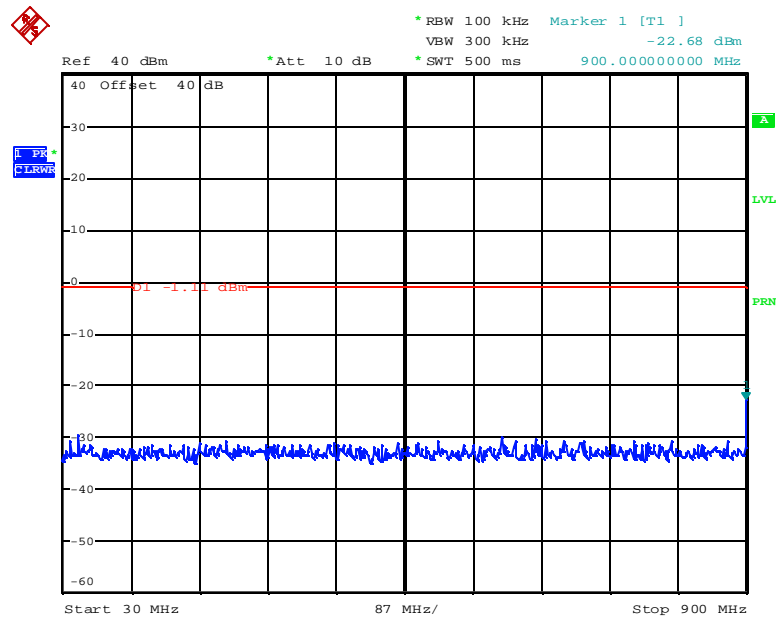
The transmitter output was connected to the spectrum analyzer via a low loss cable. RBW was set to 100kHz and VBW to 300kHz with suitable frequency span and appropriate sweep time.

For this test, the highest maximum output power was used as reference. Using Mid Channel reading of 774.5mW, a limit of -1.1dBm was utilized. The EUT was investigated for spurious emission on Low, Mid and High channels.

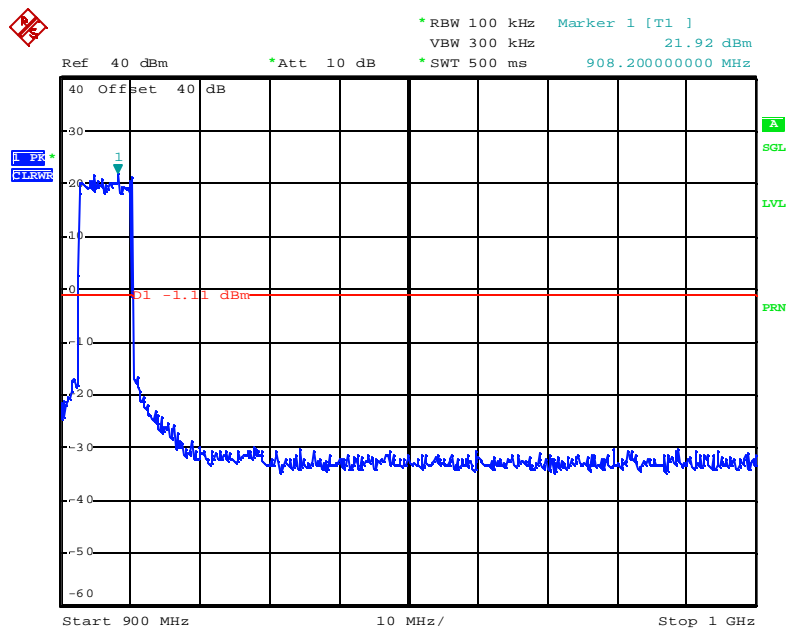
$$\begin{aligned}\text{dBm} &= 10\log(0.7745) + 30 \\ &= 28.89 \text{ dBm} \\ \text{Limit} &= 28.89 - 30 \\ &= -1.11 \text{ dBm}\end{aligned}$$

FCC ID: VIRARENATX

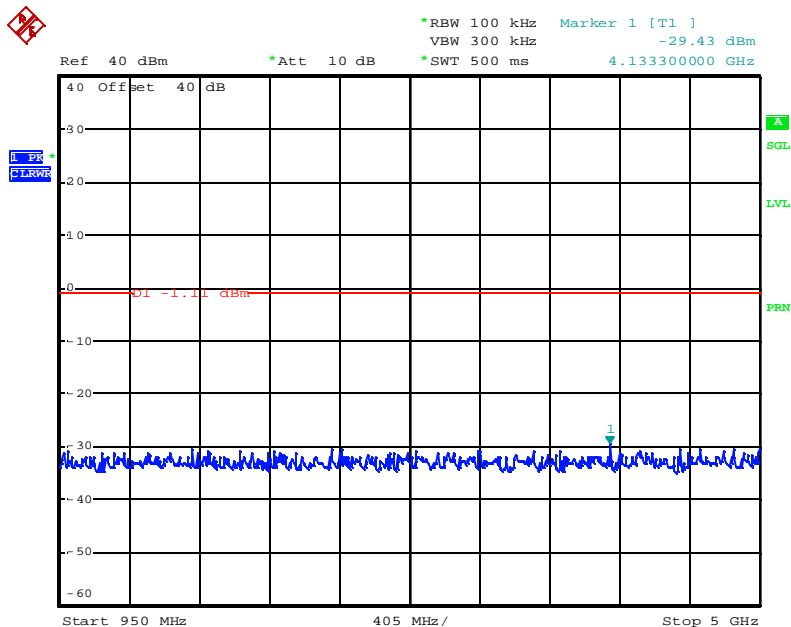
## Low Channel (906.5 MHz)



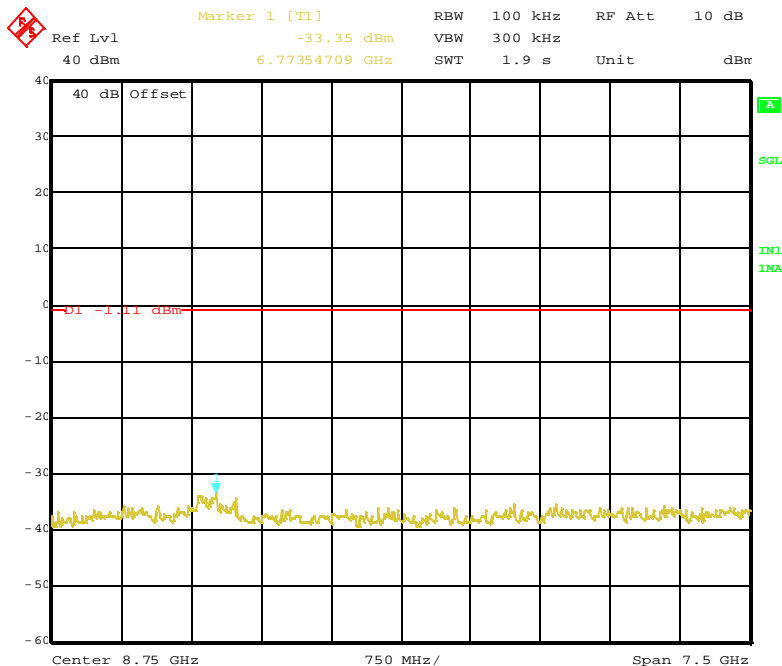
Date: 5.JUL.2007 16:30:27



Date: 5.JUL.2007 16:31:16



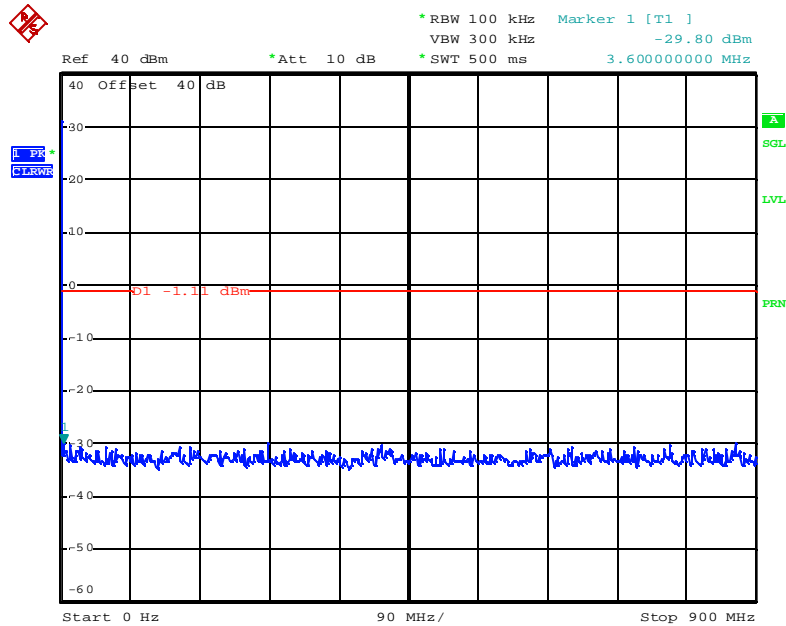
Date: 5.JUL.2007 16:31:55



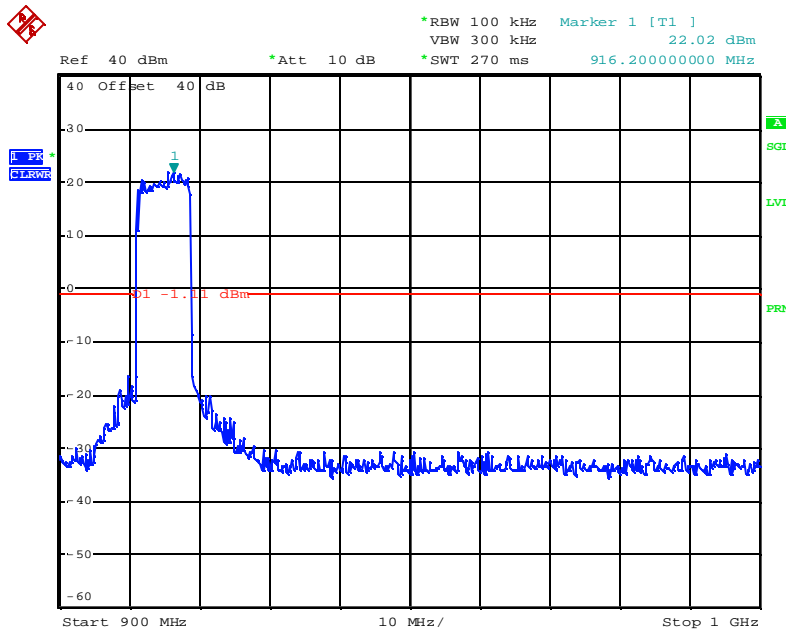
Date: 5.JUL.2007 15:32:55

Center frequency 8.75 GHz w/ Span 7.5 => Start 5 GHz--- End 12.5 GHz

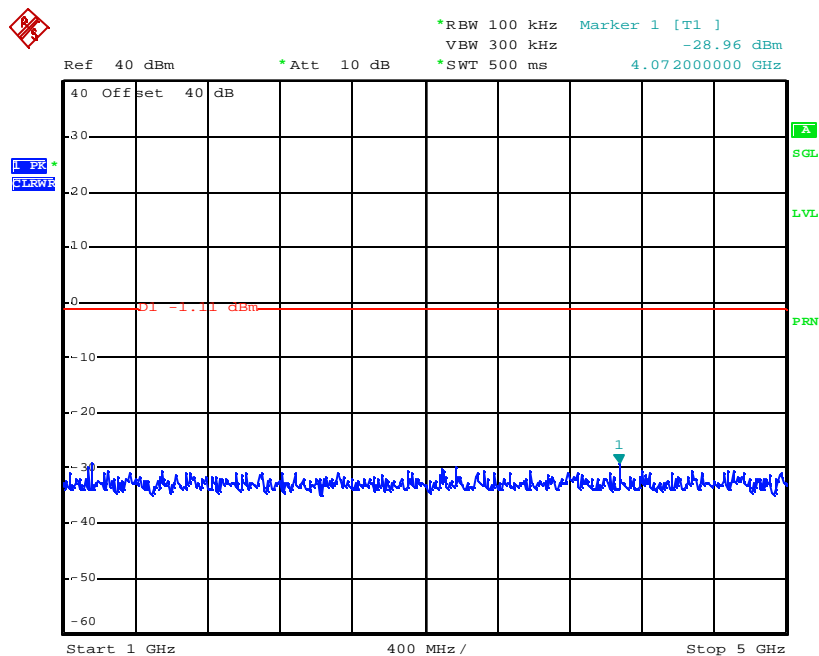
## Mid Channel (915.0 MHz)



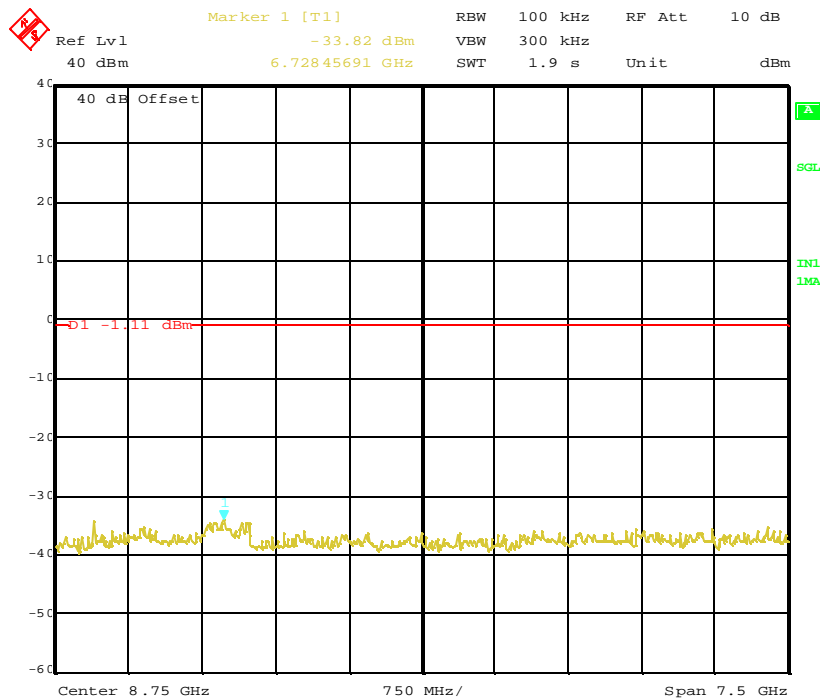
Date: 5.JUL.2007 16:32:29



Date: 5.JUL.2007 16:27:01



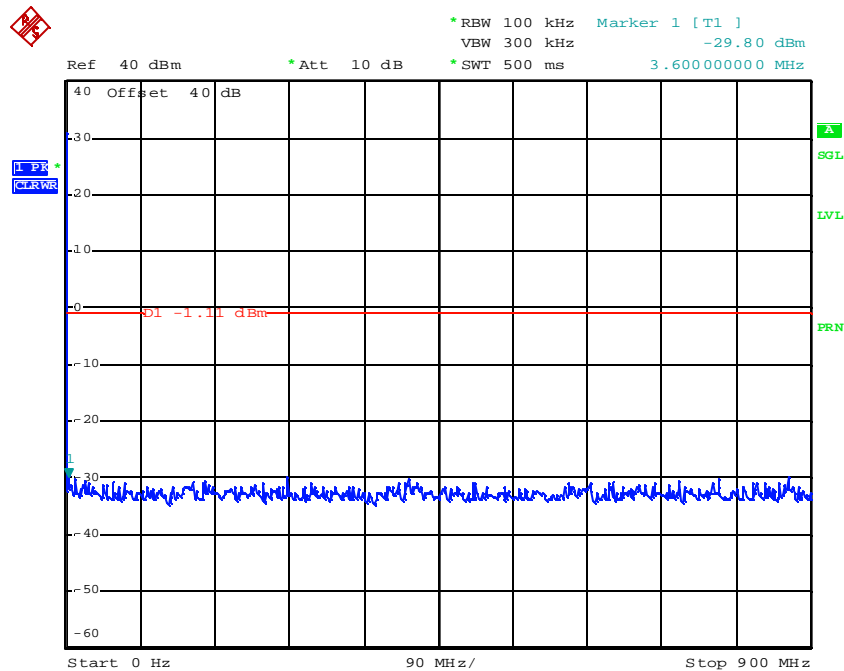
Date: 5.JUL.2007 16:27:46



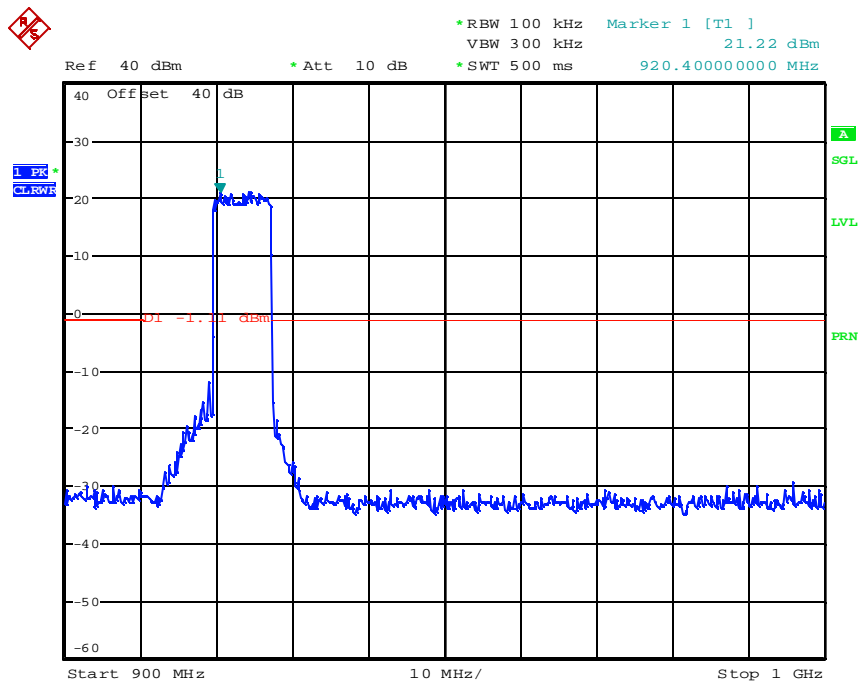
Date: 5.JUL.2007 15:33:40

Center frequency 8.75 GHz w/ Span 7.5 => Start 5 GHz--- End 12.5 GHz

## High Channel (923.5 MHz)

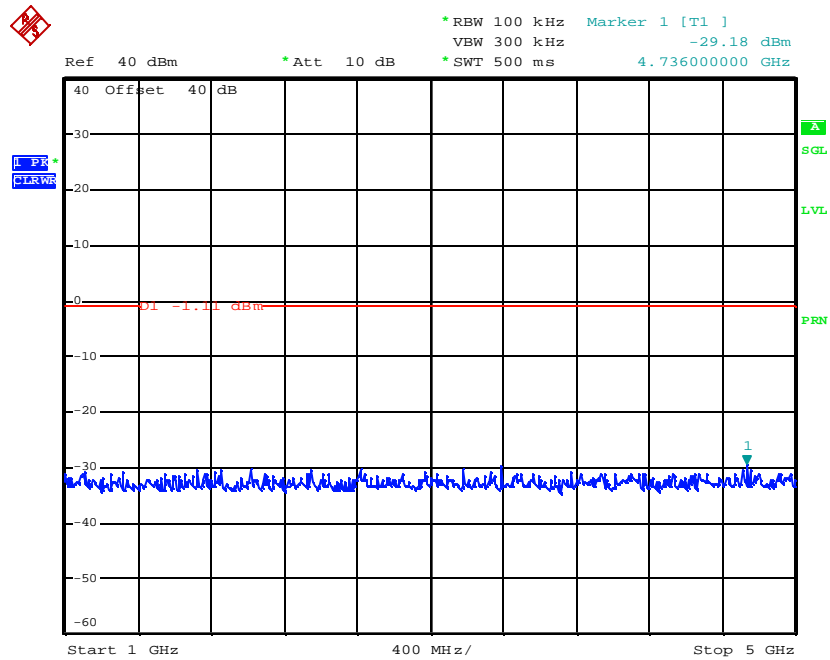


Date: 5.JUL.2007 16:32:29

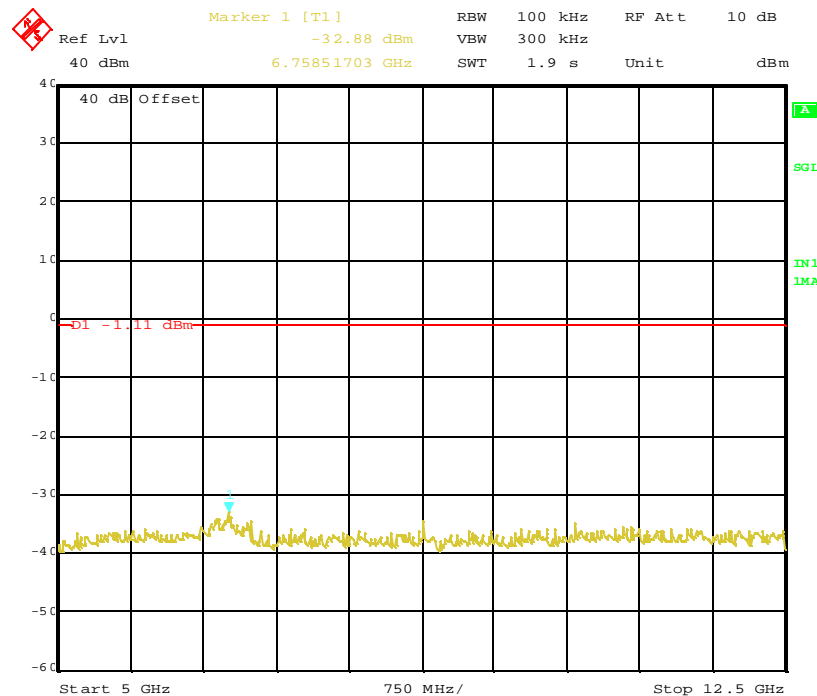


Date: 5.JUL.2007 16:33:06

FCC ID: VIRARENATX



Date: 5.JUL.2007 16:33:42



Date: 5.JUL.2007 15:27:27

**Clause 15.247(e) Power Spectral Density for Digitally Modulated Devices**

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

**Test Conditions:**

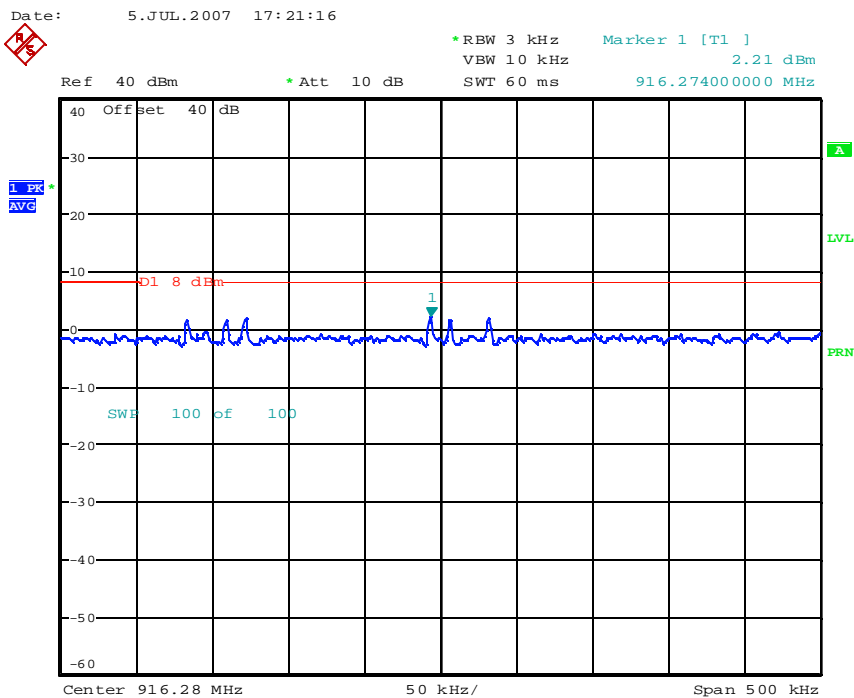
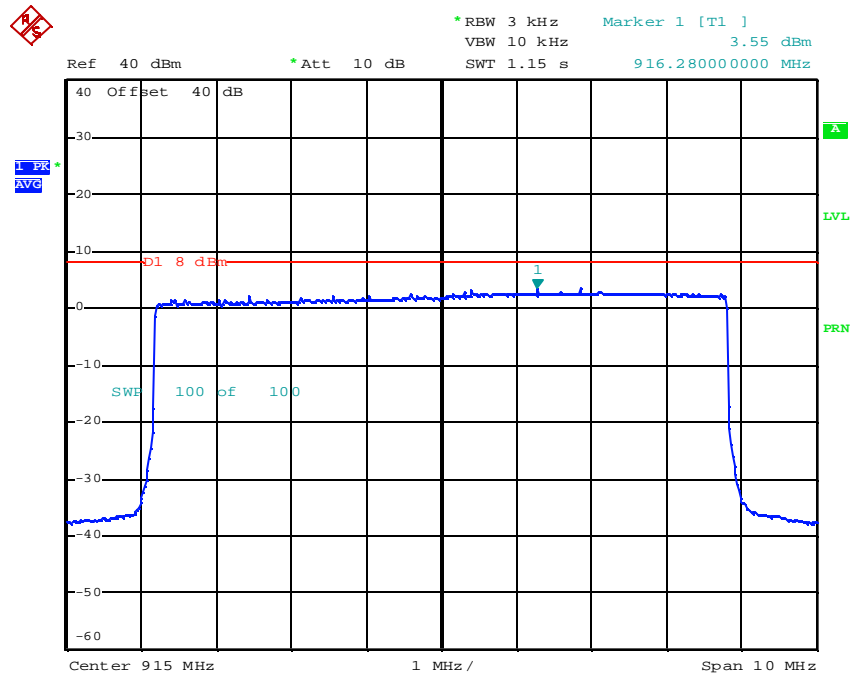
<b>Sample Number:</b>	WHUB001 and WTX001	<b>Temperature:</b>	74°F
<b>Date:</b>	July 5, 2007	<b>Humidity:</b>	50%
<b>Modification State:</b>	Lo/Mid/High Channels	<b>Tester:</b>	Alan Laudani
		<b>Laboratory:</b>	Nemko

**Test Results:**

The transmitter output was connected to the spectrum analyzer, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 300kHz VBW, set sweep time = span/3kHz for a full response of the mixer in the spectrum analyzer.

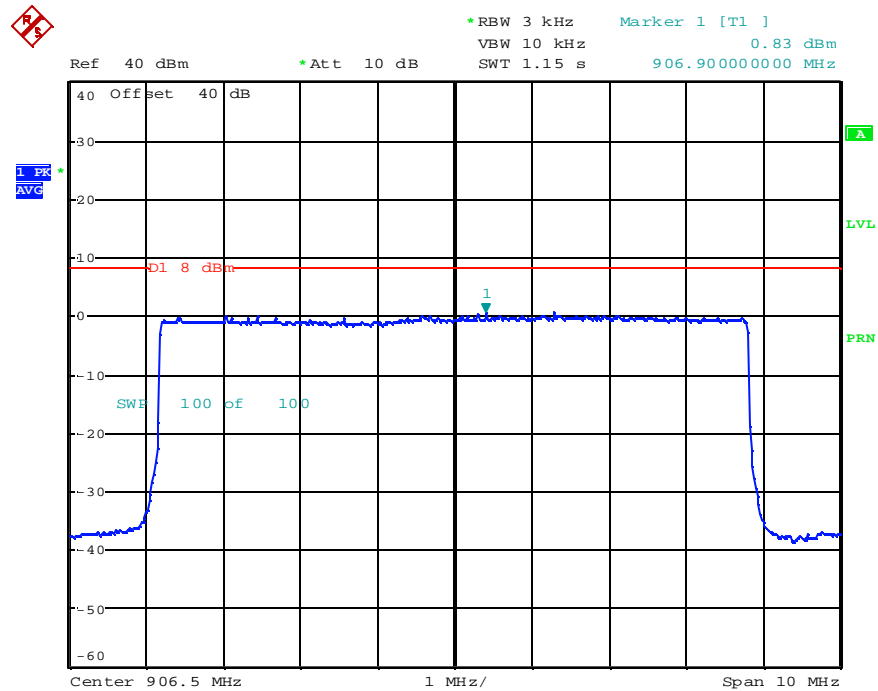
Channel	Channel Frequency (MHz)	RF Power Level in 3KHz BW	Maximum Limit (dBm)	PASS/FAIL
LO	906.5	1.23	8	Pass
MID	915.0	2.21	8	Pass
HIGH	923.5	1.84	8	Pass



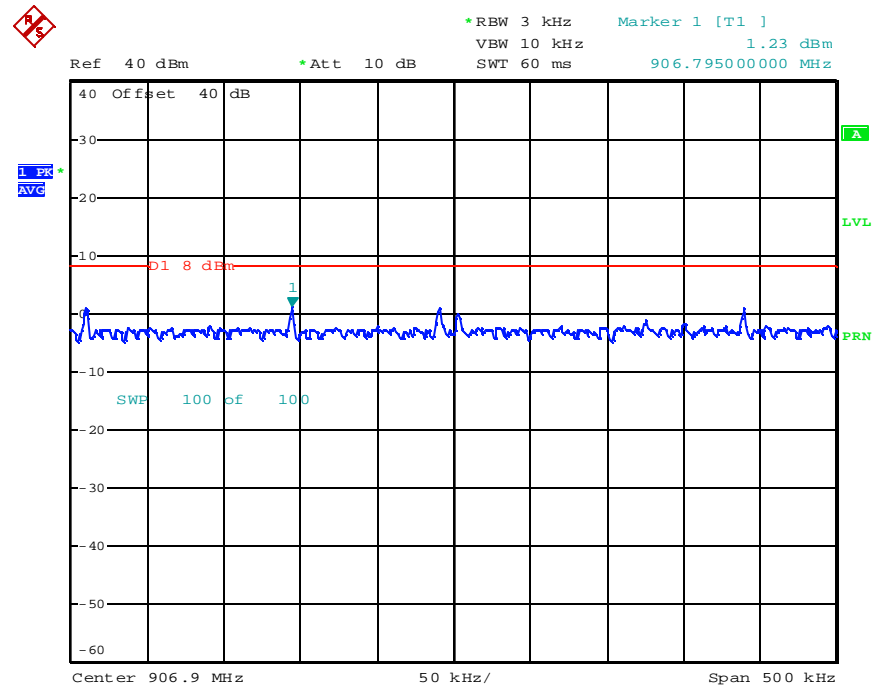


Date: 5.JUL.2007 17:21:49

### Mid Channel 915 MHz

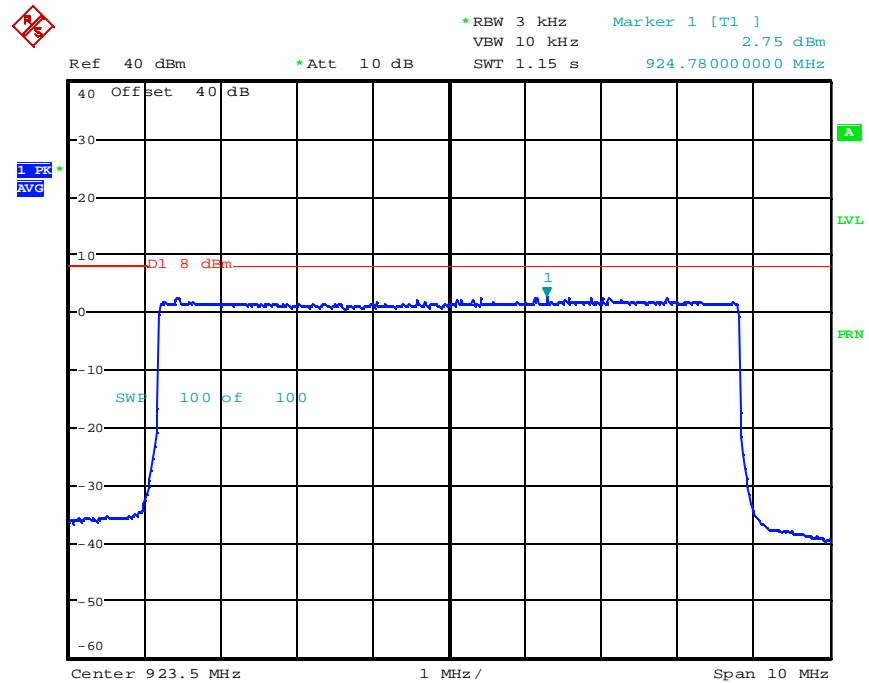


Date: 5.JUL.2007 17:24:30

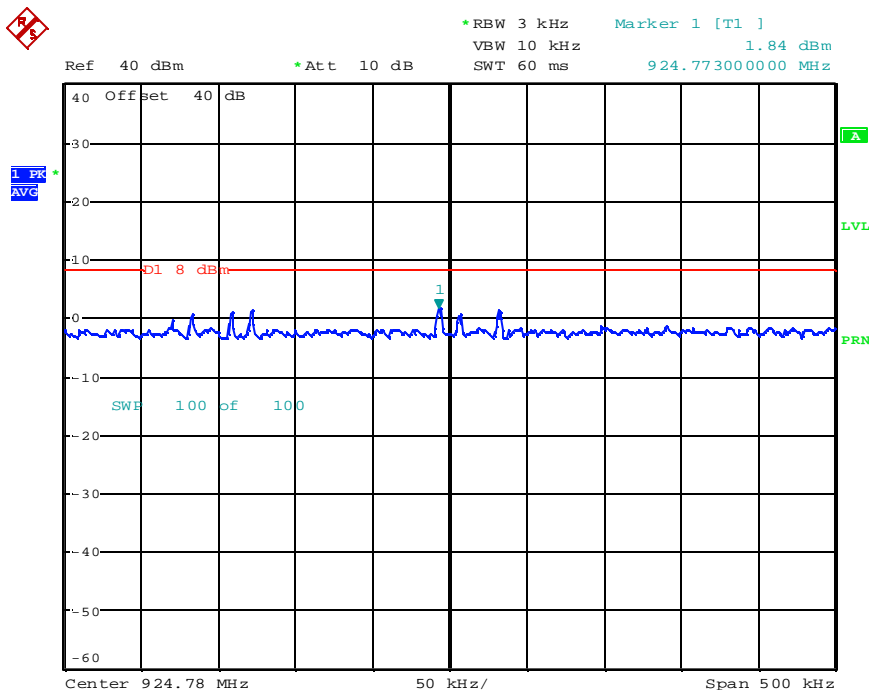


Date: 5.JUL.2007 17:25:00

### Low Channel 906.5 MHz



Date: 5.JUL.2007 17:16:47



Date: 5.JUL.2007 17:17:38

## High Channel 923.5 MHz

**Section 15.207 Power line Conducted Emissions**

(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

**AC Power Lines Conducted Emissions Limits**

Frequency range (MHz)	Conducted limit (dB $\mu$ V)	
	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 Conditions:**

<b>Sample Number:</b>	WHUB001 and WTX001	<b>Temperature:</b>	69°F
<b>Date:</b>	July 5, 2007	<b>Humidity:</b>	26 %
<b>Modification State:</b>	Mid Channel RF max	<b>Tester:</b>	Ferdinand Custodio
		<b>Laboratory:</b>	Nemko Shield Room 1

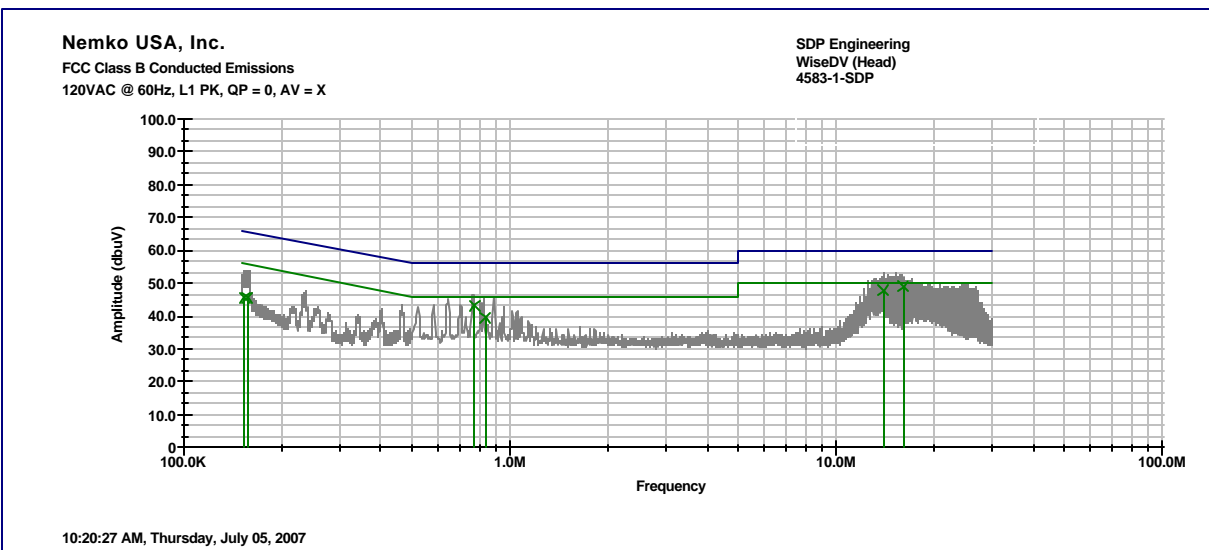
**Test Results:**

See Attached Plots.

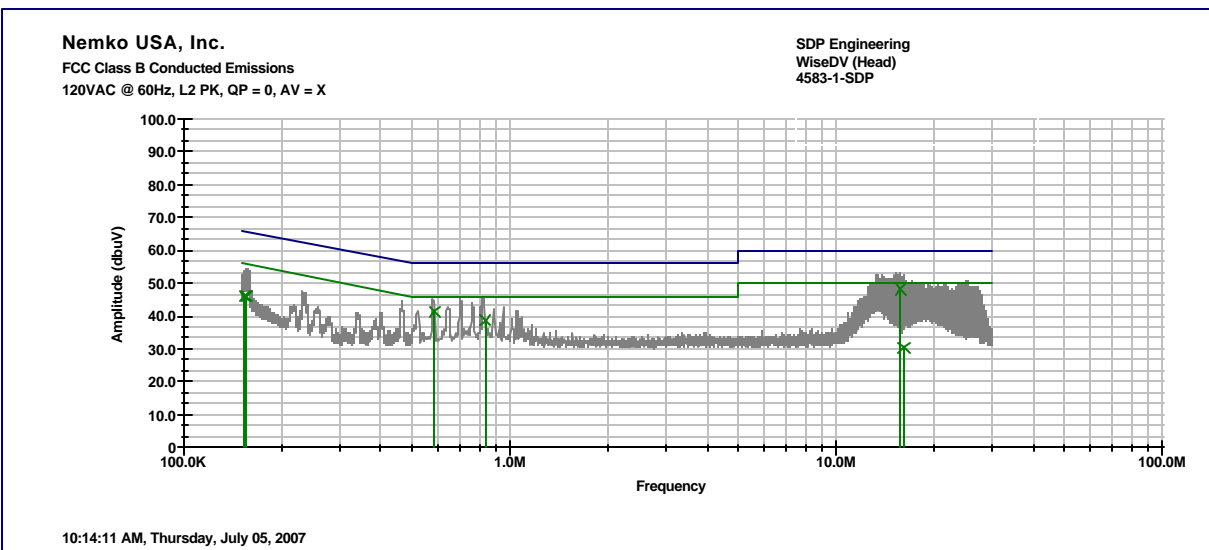
**Additional Observations:**

Green limit line is Average limit and blue limit line is Quasi-peak limit.

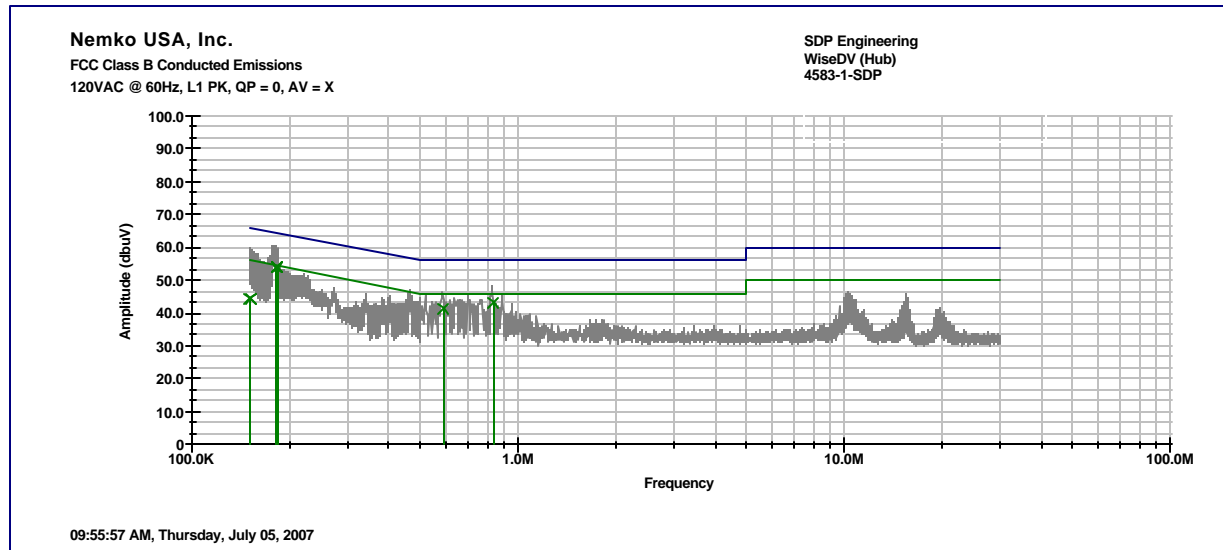
Instrumentation settings are 9kHz RBW/30kHz VBW for Average measurements and 100kHz RBW/100kHz VBW for Peak measurements.



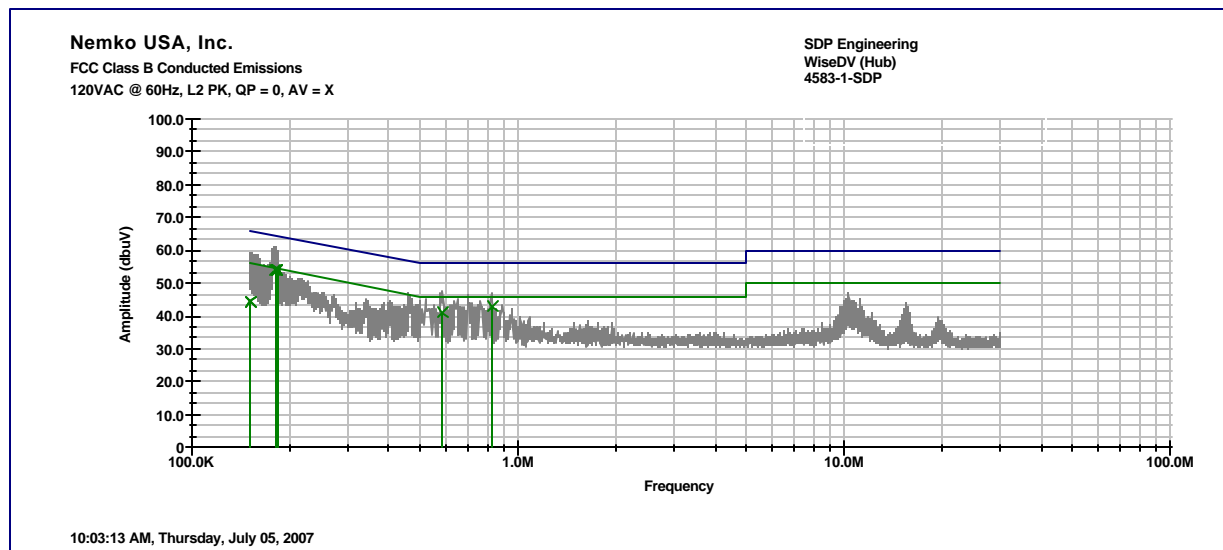
**Line 1 (Head)**



**Line 2 (Head)**



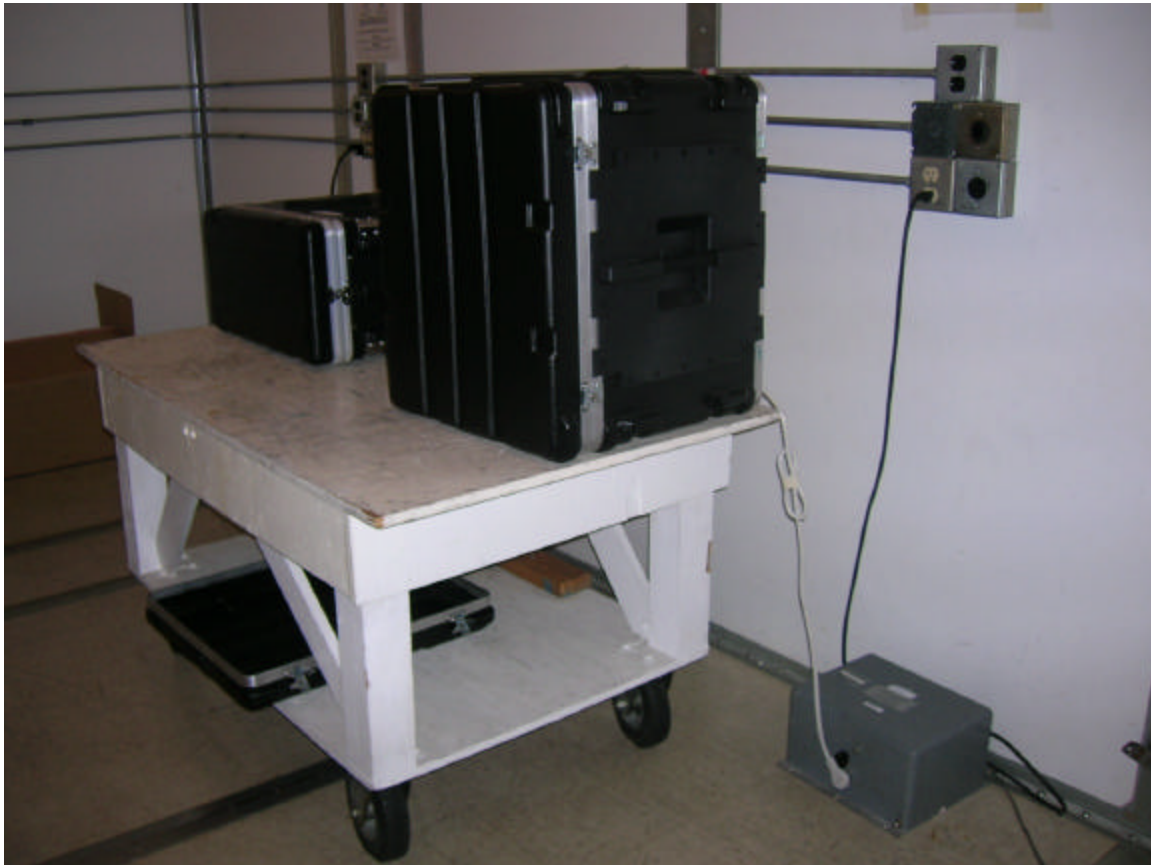
**Line 1 (Hub)**



**Line 2 (Hub)**

## Appendix B: Photos of Test Setups

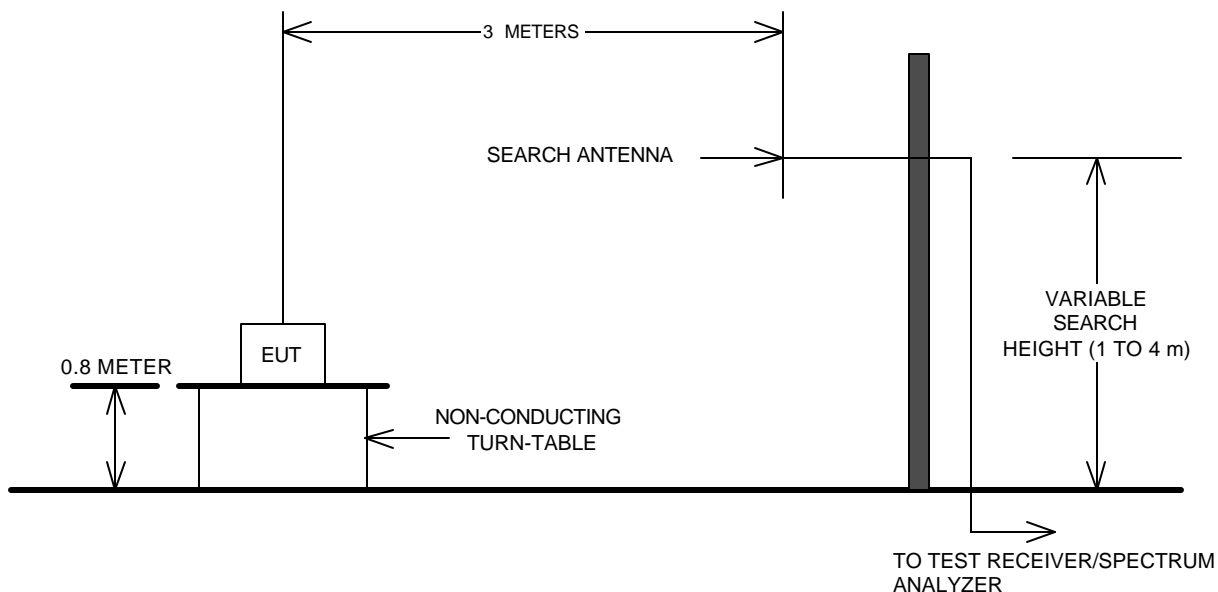




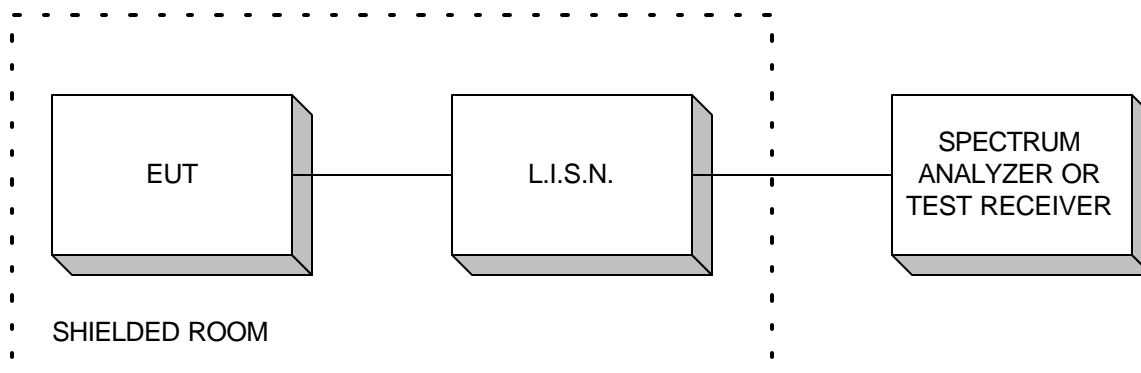


## Appendix C: Block Diagram of Test Setups

### Test Site For Radiated Emissions



### Conducted Emissions



### Conducted Emissions at Antenna terminals

