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Date: February 23, 2007

Federal Communications Commission  
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Sand Network Systems  
Equipment: OEM TRX  
FCC ID: UQT-WDMXOEMPCBF  
FCC Rules: 15.247

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

Filing fees are attached.

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,

Hoosamuddin S. Bandukwala, Lab Director

enclosure(s)  
cc: Applicant  
HSB/mdw

Flom Test Labs  
3356 North San Marcos Place, Suite 107  
Chandler, Arizona 85225-7176  
(866) 311-3268 phone, (480) 926-3598 fax

FCC ID: UQT-WDMXOEMPCBF  
MFA p06a0002, d06b0033



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## Transmitter Certification

of

**FCC ID: UQT-WDMXOEMPCBE**  
Model: OEM TRX

to

**Federal Communications Commission**

Rule Part(s) 15.247

Date of revised report: February 23, 2007

**On the Behalf of the Applicant:**

Sand Network Systems

**At the Request of:**

Sand Network Systems  
434 Payran St  
Petaluma, CA 94952

Attention of:

Hans Lau  
(707)778-8990 x205  
[hans@sandsys.com](mailto:hans@sandsys.com)

Supervised by:

Hoosamuddin S. Bandukwala, Lab Director

## List of Exhibits

(FCC **Certification** (Transmitters) - Revised 9/28/98)

Applicant: Sand Network Systems

FCC ID: UQT-WDMXOEMPCBF

**By Applicant:**

1. Letter of Authorization
2. Confidentiality Request: 0.457 And 0.459
3. Identification Drawings, 2.1033(c)(11)
  - Label
  - Location of Label
  - Compliance Statement
  - Location of Compliance Statement
4. Photographs, 2.1033(c)(12)
5. Documentation: 2.1033(c)
  - (3) User Manual
  - (10) Schematic Diagram
  - (10) Circuit Description
  - Block Diagram
  - Parts List
7. MPE Report

**By M.F.A. Inc.:**

- A. Testimonial & Statement of Certification

**The Applicant has been cautioned as to the following:****15.21            Information to the User.**

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

**15.27(a)        Special Accessories.**

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

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Required information per IS 17025-2005, paragraph 13.2:

a)

**Test Report**

b) Laboratory:  
(FCC: 31040/SIT)  
(Canada: IC 2044)

Flom Test Lab  
3356 N. San Marcos Place, Suite 107  
Chandler, AZ 85225

c) Report Number:

d06b0033

d) Client:

Sand Network Systems  
434 Payran St  
Petaluma, CA 94952

e) Identification:

OEM TRX  
FCC ID: UQT-WDMXOEMPCBF

EUT Description:

Wireless Lighting Hardware interface

f) EUT Condition:

Not required unless specified in individual tests.

g) Report Date:  
EUT Received:

February 23, 2007

h, j, k):

As indicated in individual tests.

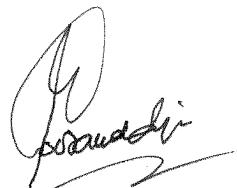
i) Sampling method:

No sampling procedure used.

l) Uncertainty:

In accordance with MFA internal quality manual.

m) Supervised by:



Hoosamuddin S. Bandukwala, Lab Director

n) Results:

The results presented in this report relate only to the item tested.

o) Reproduction:

This report must not be reproduced, except in full, without written permission from this laboratory.

Sub-part

2.1033(c)(14):

## Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057 and the following individual Parts:

- 15 – Radio Frequency Devices
- 21 – Domestic Public Fixed Radio Services
- 22 – Public Mobile Services
- 22 Subpart H - Cellular Radiotelephone Service
- 22.901(d) - Alternative technologies and auxiliary services
- 23 – International Fixed Public Radiocommunication services
- 24 – Personal Communications Services
- 74 Subpart H - Low Power Auxiliary Stations
- 80 – Stations in the Maritime Services
- 80 Subpart E - General Technical Standards
- 80 Subpart F - Equipment Authorization for Compulsory Ships
- 80 Subpart K - Private Coast Stations and Marine Utility Stations
- 80 Subpart S - Compulsory Radiotelephone Installations for Small Passenger Boats
- 80 Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes
- 80 Subpart U - Radiotelephone Installations Required by the Bridge-to-Bridge Act
- 80 Subpart V - Emergency Position Indicating Radio Beacons (EPIRB'S)
- 80 Subpart W - Global Maritime Distress and Safety System (GMDSS)
- 80 Subpart X - Voluntary Radio Installations
- 87 – Aviation Services
- 90 – Private Land Mobile Radio Services
- 94 – Private Operational-Fixed Microwave Service
- 95 Subpart A - General Mobile Radio Service (GMRS)
- 95 Subpart C - Radio Control (R/C) Radio Service
- 95 Subpart D - Citizens Band (CB) Radio Service
- 95 Subpart E - Family Radio Service
- 95 Subpart F - Interactive Video and Data Service (IVDS)
- 97 - Amateur Radio Service
- 101 – Fixed Microwave Services

## Standard Test Conditions and Engineering Practices

### A2LA

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“A2LA has accredited Flom Test Labs, Inc. Chandler, AZ for technical competence in the field of Electrical Testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO 17025:2005 ‘General Requirements for the Competence of Testing and Calibration Laboratories’ and any additional program requirements in the identified field of testing.”

Please refer to [www.a2la.org](http://www.a2la.org) for current scope of accreditation.

Certificate Number: **2152.01**

## List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,  
Volume II, Part 2 and to

15.247

Sub-part 2.1033

(c)(1): **Name and Address of Applicant:**

Sand Network Systems  
434 Payran St  
Petaluma, CA 94952

**Manufacturer:**

Sand Network Systems  
434 Payran St  
Petaluma, CA 94952

(c)(2): **FCC ID:** UQT-WDMXOEMPCBF

**Model Number:** OEM TRX

(c)(3): **Instruction Manual(s):**

Please see attached exhibits

(c)(4): **Type of Emission:** FHSS (TDMA)

(c)(5): **Frequency Range, MHz:** 2402 to 2479

(c)(6): **Power Rating, Watts:** 0.275  
\_\_\_\_ Switchable      \_\_\_\_ Variable       N/A

(c)(7): **Maximum Power Rating, Watts:** 1 Watt

**DUT Results:** Passes  Fails \_\_\_\_\_

**Subpart 2.1033 (continued)**

(c)(8): Voltages & currents in all elements in final RF stage, including final transistor or solid-state device:

Collector Current, A	= per manual
Collector Voltage, Vdc	= per manual
Supply Voltage, Vdc	= 6 - 14

(c)(10): **Circuit Diagram/Circuit Description:**

Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

Please see attached exhibits

(c)(11): **Label Information:**

Please see attached exhibits

(c)(12): **Photographs:**

Please see attached exhibits

(c)(13): **Digital Modulation Description:**

       Attached Exhibits  
 N/A

(c)(14): **Test and Measurement Data:**

Follows

**Name of Test:** RF Power Output (Radiated)

**Specification:** 47 CFR 15.247(a)

**Test Equipment:** As per attached page

#### Measurement Procedure (Radiated)

1. The EUT was placed on an open-field site and its radiated field strength at a known distance was measured by means of a spectrum analyzer. Equivalent loading was calculated from the equation  $P_t = (E \times R)^2 / 49.2$  watts, where  $R = 3m$ .
2. Measurement accuracy is  $\pm 1.5$  dB.

#### Measurement Results

g06b0128: 2006-Nov-09 Thu 14:39:00

State: 2:High Power

Ambient Temperature:  $23^\circ\text{C} \pm 3^\circ\text{C}$

Amps Mode:

Frequency Tuned, MHz	Frequency Emission, MHz	dBuV/m Meter	CF, dB	dBuV, dB
2405.000000	2405.000000	76.4	35.44	121.5
2405.000000	2405.000000	76.82	35.44	121.9
2443.000000	2443.800000	85.76	35.58	131
2479.000000	2479.000000	87.46	35.71	132.8

**Name of Test:** Carrier Output Power (Conducted)

**Specification:** 47 CFR 15.247 (b)

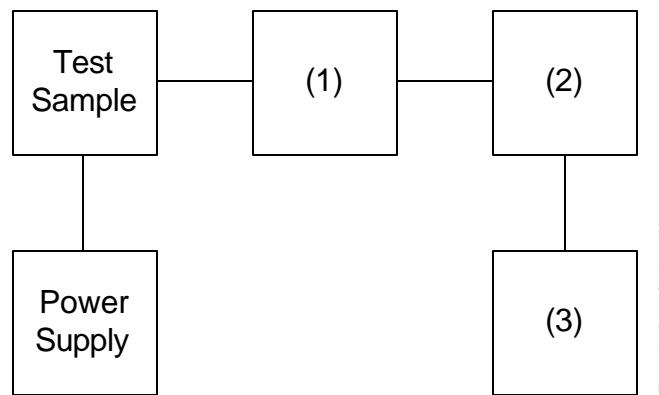
**Guide:** ANSI C-63.4 2005

### Measurement Procedure

A) The EUT was connected to a resistive coaxial attenuator of normal load impedance, and the unmodulated output power was measured by means of an RF Power Meter.

B) Measurement accuracy is  $\pm 3\%$ .

### Transmitter Test Set-Up: RF Power Output



	Asset	Description	s/n	Cycle	Last Cal
(1)	<b>Coaxial Attenuator</b>				
X	i00231/2	PASTERACK PE7021-30 (30 dB)	231 or 232	N/A	NCR
	i00122/3	NARDA 766 (10 dB)	7802 or 7802A	N/A	NCR
(2)	<b>Power Meters</b>				
X	i00321	HP 8901A Power Mode	2239A02170	12 mo.	Sep-06
(3)	<b>Frequency Counter</b>				
X	i00321	HP 8901A Frequency Mode	2239A02170	12 mo.	Sep-06

**Name of Test:** Carrier Output Power (Conducted)

**Measurement Results**  
(Worst case)

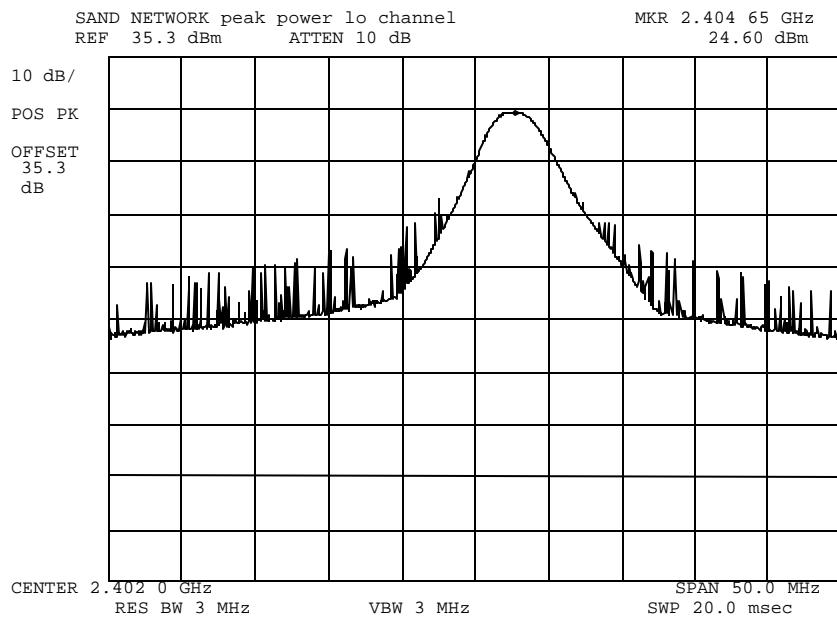
Frequency of Carrier, MHz = 2478, 2443, 2402  
Ambient Temperature = 23°C ± 3°C

Power Setting	Frequency, MHz	RF Power, Watts
High	2478.0000	0.275
High	2443.0000	0.275
High	2402.0000	0.275

**Name of Test:** Peak Output Power (15.247(b))

g06b0137: 2006-Nov-27 Mon 11:11:00  
 State: 0:General

Ambient Temperature: 23°C ± 3°C



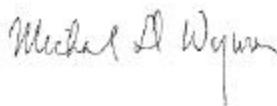
Power:

PEAK POWER 24.60 dBm

Modulation:

FHSS  
 LOW CHANNEL

Performed by:

  
 Michael Wyman

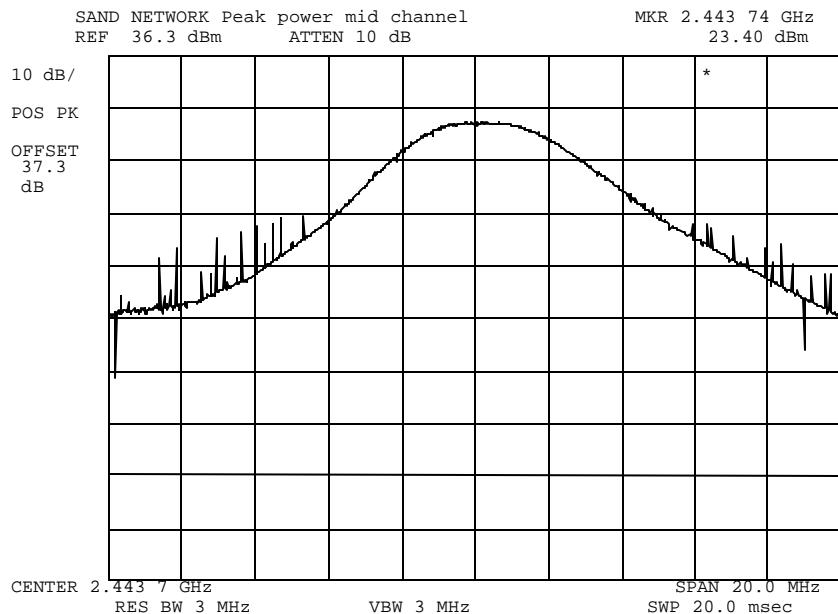
**Name of Test:** Peak Output Power (15.247(b))

### Measurement Results

g06b0135: 2006-Nov-20 Mon 10:51:00

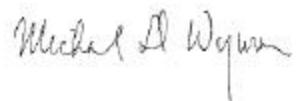
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:  
Modulation:

PEAK POWER 23.40 dBm  
MID CHANNEL



Performed by:

Michael Wyman

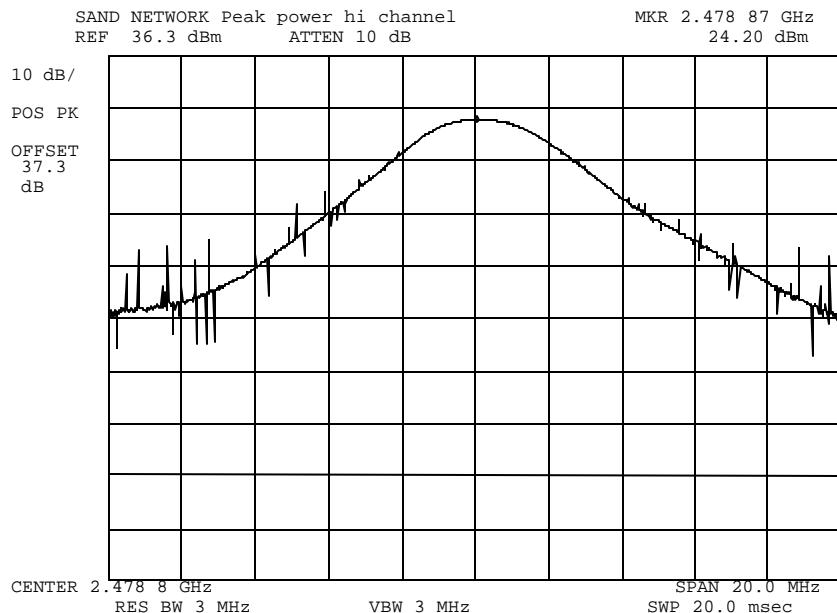
**Name of Test:** Peak Output Power (15.247(b))

### Measurement Results

g06b0134: 2006-Nov-20 Mon 10:48:00

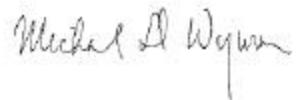
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:  
Modulation:

PEAK POWER 24.20 dBm  
HIGH CHANNEL



Performed by:

Michael Wyman

**Name of Test:** Unwanted Emissions (Transmitter Conducted)

**Specification:** 47CFR 15.247

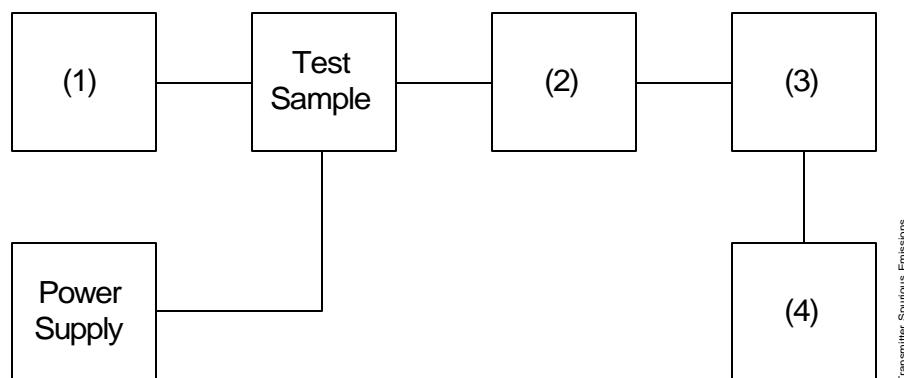
### Measurement Procedure

A) The emissions were measured for the worst case as follows:

- 1). within a band of frequencies defined by the carrier frequency plus and minus one channel.
- 2). from the lowest frequency generated in the EUT and to at least the 10th harmonic of the carrier frequency, or 40 GHz, whichever is lower.

B) The magnitude of spurious emissions that are attenuated more than 20 dB below the permissible value need not be specified.

### Transmitter Test Set-Up: Spurious Emission



Asset	Description	s/n		
<b>(1) Audio Oscillator/Generator</b>				
i00324	HP 8903B Audio Analyzer	3011A09079	12 mo.	Oct-06
i00002	HP 3336B Synthesizer / Level Gen.	1931A01465	N/A	NCR
<b>(2) Coaxial Attenuator</b>				
i00231/2	PASTERNACK PE7021-30 (30 dB)	231 or 232	N/A	NCR
i0012/3	NARDA 766 (10 dB)	7802 or 7802A	N/A	NCR
<b>(3) Filters; Notch, HP, LP, BP</b>			N/A	NCR
<b>(4) Spectrum Analyzer</b>				
i00048	HP 8566B Spectrum Analyzer	2511A01467	12 mo.	Aug-06
X i00029	HP 8563E Spectrum Analyzer	3213A00104	12 mo.	Jan-06

**Name of Test:** Unwanted Emissions (Transmitter Conducted)

**Measurement Results**  
 (Worst Case)

Summary:

Frequency of carrier, MHz	=	2478, 2443, 2402
Spectrum Searched, GHz	=	0 to 10 x $F_C$
All Other Emissions	=	= 20 dB Below Limit

Tabulated Results follow:

**Measurement Results**

State:

Ambient Temperature: 23°C ± 3°C

Peak Conducted Power 24.60 dBm

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBm	Level, dBc
2402.000	4808.783333	-38.0	-62
2402.000	7205.416667	-60.7	-84.7
2402.000	9605.300000	-60.5	-84.5
2402.000	12009.883333	-61.3	-85.3
2402.000	14407.233333	-56.8	-80.8
2402.000	16816.316667	-58.3	-82.3
2402.000	19216.566667	-58.8	-82.8

Peak Conducted Power 23.40 dBm

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBm	Level, dBc
2443.000	4889.000000	-60.3	-84.3
2443.000	7328.250000	-60.5	-84.5
2443.000	9773.300000	-60.4	-84.4
2443.000	12216.600000	-61.2	-85.2
2443.000	14662.700000	-58.6	-82.6
2443.000	17097.800000	-59.3	-83.3
2443.000	19542.066667	-59.7	-83.7

Peak Conducted Power 24.20 dBm

Frequency Tuned, MHz	Frequency Emission, MHz	Level, dBm	Level, dBc
2478.000	4957.883333	-44.8	-68.8
2478.000	7431.966667	-57.8	-81.8
2478.000	9913.600000	-60.7	-84.7
2478.000	12390.283333	-57.9	-81.9
2478.000	14871.633333	-56.6	-80.6
2478.000	17341.383333	-58.6	-82.6
2478.000	19824.016667	-59.7	-83.7

**Name of Test:** Field Strength of Spurious Radiation

**Specification:** 47 CFR 15.209(a)

**Guide:** ANSI C.63.4 2005

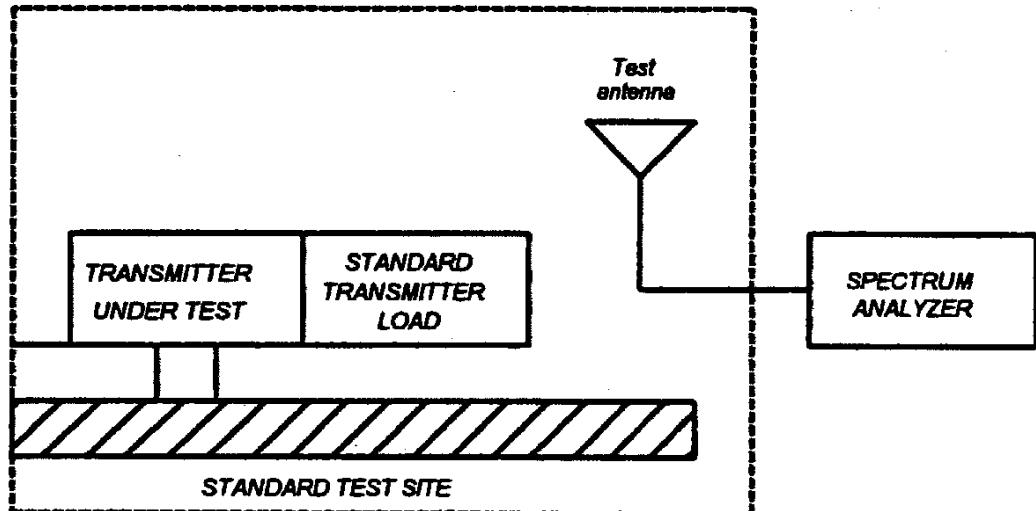
### Measurement Procedure

#### Definition:

Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

#### Method of Measurement:

- A) Connect the equipment as illustrated
- B) Adjust the spectrum analyzer for the following settings:
  - 1) Resolution Bandwidth 100 kHz (<1 GHZ), 1 MHZ (> 1GHz).
  - 2) Video Bandwidth = 3 times Resolution Bandwidth, or 30 kHz (22.917)
  - 3) Sweep Speed  $\leq$ 2000 Hz/second
  - 4) Detector Mode = Mean or Average Power
- D) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into the Highest Gain antenna is placed on the turntable. The RF cable to this load should be of minimum length.
- E) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to  $\pm$  the test bandwidth (see section 1.3.4.4).
- F) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.
- G) Repeat step E) for each spurious frequency with the test antenna polarized vertically.



### Test Equipment

Asset	Description	s/n	Cycle	Last Cal
<b>Transducer</b>				
	i00088 EMCO 3109-B 25MHz-300MHz	2336	12 mo.	Oct-05
X	i00089 Aprel 2001 200MHz-1GHz	001500	12 mo.	Oct-05
X	i00103 EMCO 3115 1GHz-18GHz	9208-3925	12 mo.	Sep-06
X	I00273 A R A 18 GHz-26GHz	MWH-1826 /B	.	NCR
<b>Amplifier</b>				
X	i00028 HP 8449A	2749A00121	12 mo.	Jun-06
<b>Spectrum Analyzer</b>				
X	i00029 HP 8563E	3213A00104	12 mo.	Jan-06
	i00033 HP 85462A	3625A00357	12 mo.	Oct-05
<b>Substitution Generator</b>				
	i00067 HP 8920A Communication TS	3345U01242	12 mo.	Jun-06
	i00207 HP 8753D Network Analyzer	3410A08514	12 mo.	May-06

**Name of Test:** Field Strength of Spurious Radiation 15.209

### Measurement Results

g06c0069: 2006-Dec-18 Mon 10:03:00

STATE: 2:High Power

Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Field Strength, (Peak) dBuV/m	Peak Limit, dBuV/m	Margin, dB
2402.000000	4809.722750	27.8	54.0	-26.2
2402.000000	7214.569417	13.7	54.0	-40.3
2402.000000	9613.769417	12.8	54.0	-41.2

g06c0067: 2006-Dec-14 Thu 11:02:00

STATE: 2:High Power

Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Field Strength, (Peak) dBuV/m	Peak Limit, dBuV/m	Margin, dB
2443.000000	4887.754387	18.4	54.0	-35.6
2443.000000	7331.635220	15.6	54.0	-38.4

g06c0068: 2006-Dec-18 Mon 08:14:00

STATE: 2:High Power

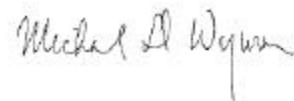
Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Field Strength, dBuV/m	Limit, dBuV/m	Margin. dB
2478.000000	2483.500000*	65.4	74.0	-8.6
2478.000000	2483.500000*	50.2	54.0	-3.80
2478.000000	4957.731667	32.3	54.0	-21.7
2478.000000	7436.594001	25.5	54.0	-28.5
2478.000000	9915.194001	14.3	54.0	-39.7

**Remark:**

 Note: Observations were made for the 4<sup>th</sup> through the 10<sup>th</sup> harmonic. No discernable spurious signals could be detected.

\* Restricted Band



Performed by:

Michael Wyman

**Name of Test:** Occupied Bandwidth

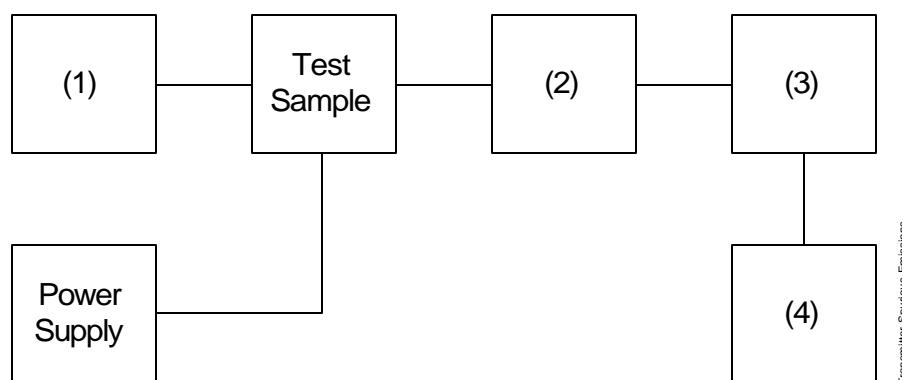
**Specification:** 47 CFR 15.247

**Guide:** ANSI C.63.4 2005

### Measurement Procedure

- A) The EUT and test equipment were set up as shown below
- B) For EUTs supporting digital modulation, the digital modulation mode was operated to its maximum extent.
- C) The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

### Transmitter Test Set-Up: Occupied Bandwidth



Asset	Description	s/n	Cycle	Last Cal
<b>(1) Audio Oscillator/Generator</b> i00324	HP 8903B Modulation Meter	3011A09079	12 mo.	Oct-06
<b>(2) Coaxial Attenuator</b> X i00231/2 i00123	PASTERNACK PE7021-30 (30 dB) NARDA 766 (10 dB)	231 or 232 7802A	N/A N/A	NCR NCR
<b>(3) Interface</b> X i00021	HP 8954A Transceiver Interface	2146A00159	N/A	NCR
<b>(4) Spectrum Analyzer</b> i00048 X i00029	HP 8566B Spectrum Analyzer HP 8563E Spectrum Analyzer	2511A01467 3213A00104	12 mo. 12 mo.	Aug-06 Jan-06

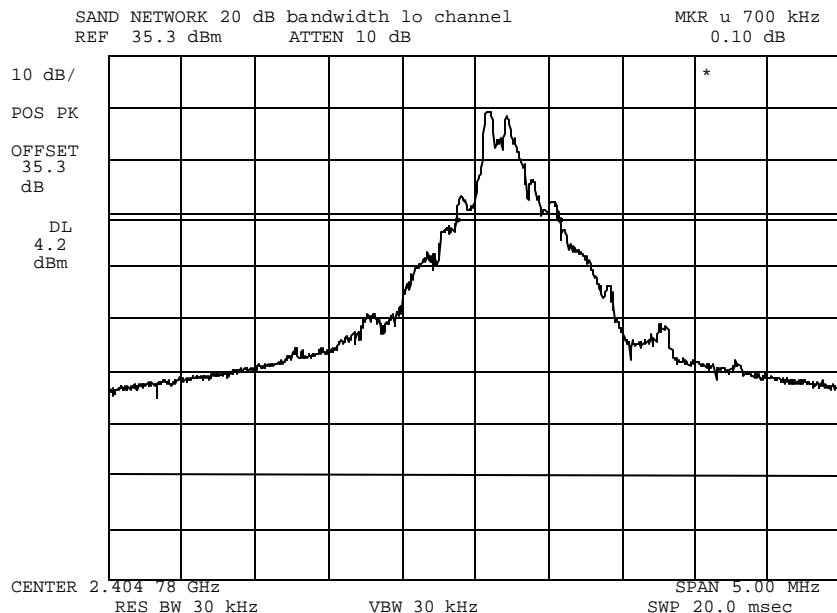
**Name of Test:** 20 dB Bandwidth (15.247(a))

### Measurement Results

g06b0138: 2006-Nov-27 Mon 14:09:00

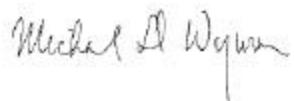
State: 0:General

Ambient Temperature: 23°C ± 3°C



Power:  
Bandwidth

High  
.700 MHz  
LO CHANNEL



Performed by:

Michael Wyman

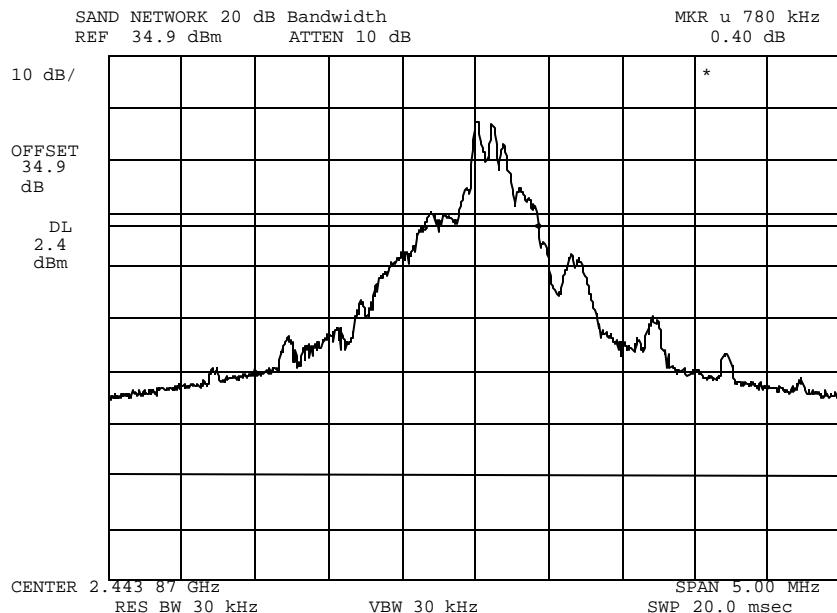
**Name of Test:** 20 dB Bandwidth (15.247(a))

### Measurement Results

g06b0144: 2006-Nov-29 Wed 13:48:00

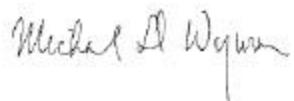
State: 0:General

Ambient Temperature:  $23^{\circ}\text{C} \pm 3^{\circ}\text{C}$



Power:  
 Bandwidth

HIGH  
 .780 MHz  
 MID CHANNEL



Performed by:

Michael Wyman

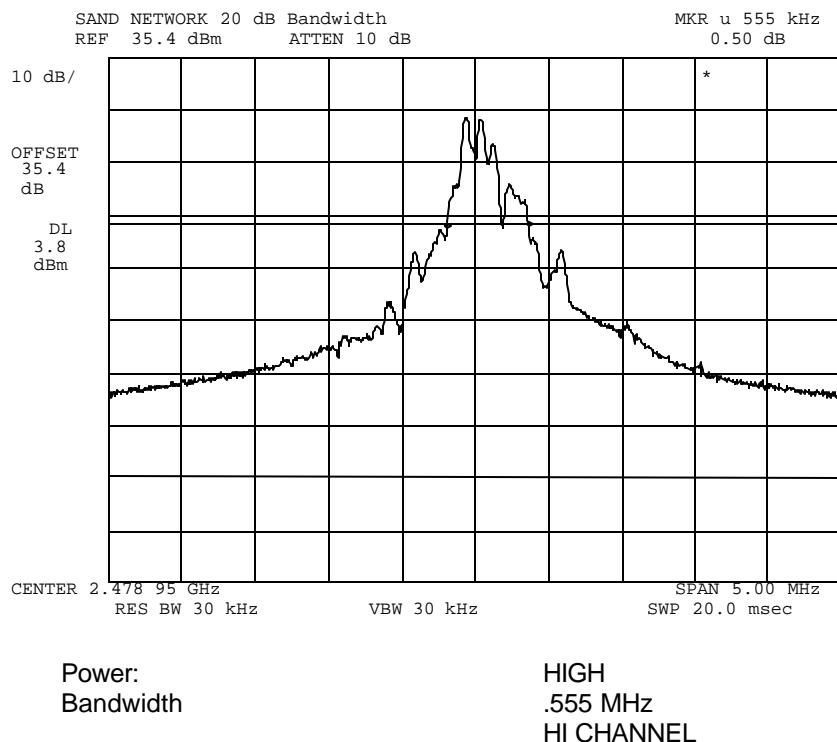
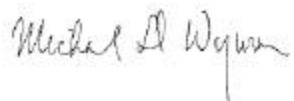
**Name of Test:** 20 db Bandwidth (15.247(a))

### Measurement Results

g06b0146: 2006-Nov-29 Wed 15:23:00

State: 0:General

Ambient Temperature: 23°C ± 3°C

Performed by:

Michael Wyman

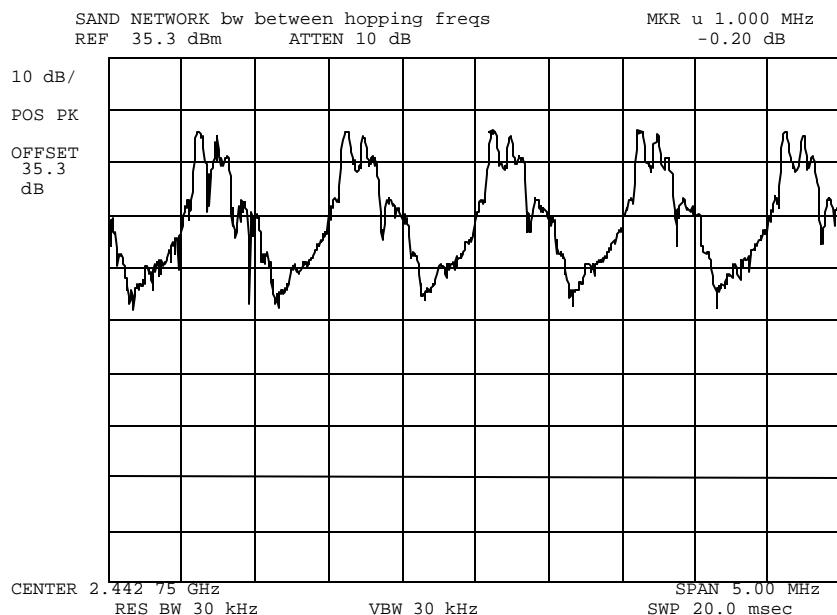
**Name of Test:** Carrier Frequency Separation (15.247(a))

### Measurement Results

g06b0139: 2006-Nov-27 Mon 14:29:00

State: 0:General

Ambient Temperature: 23°C ± 3°C



Power:  
Modulation:

HIGH  
FHSS  
Hopping

Performed by:

Michael Wyman

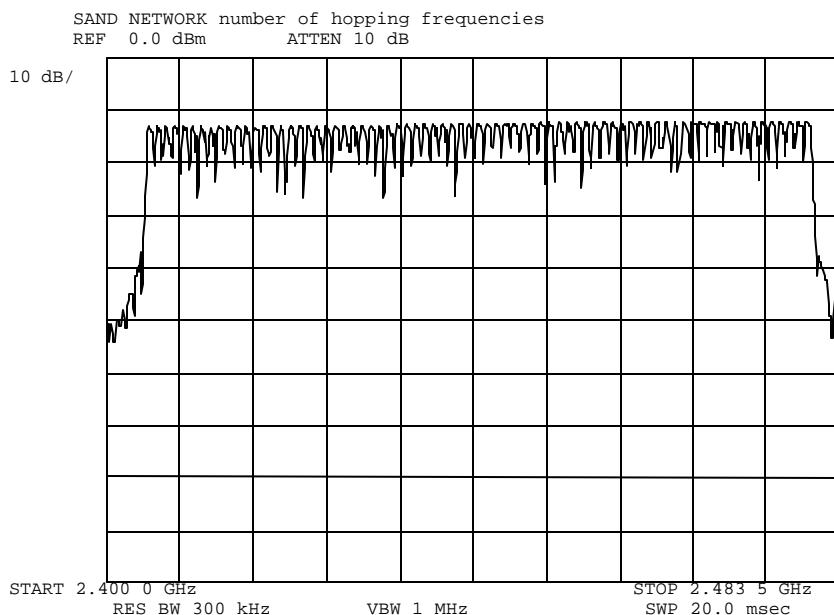
**Name of Test:** Number of Hopping Frequencies (15.247(a))

### Measurement Results

g06b0132: 2006-Nov-20 Mon 08:31:00

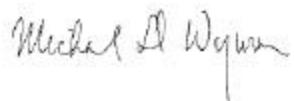
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:  
 Modulation:

HIGH  
 FHSS  
 # HOPPING FREQS 75



Performed by:

Michael Wyman

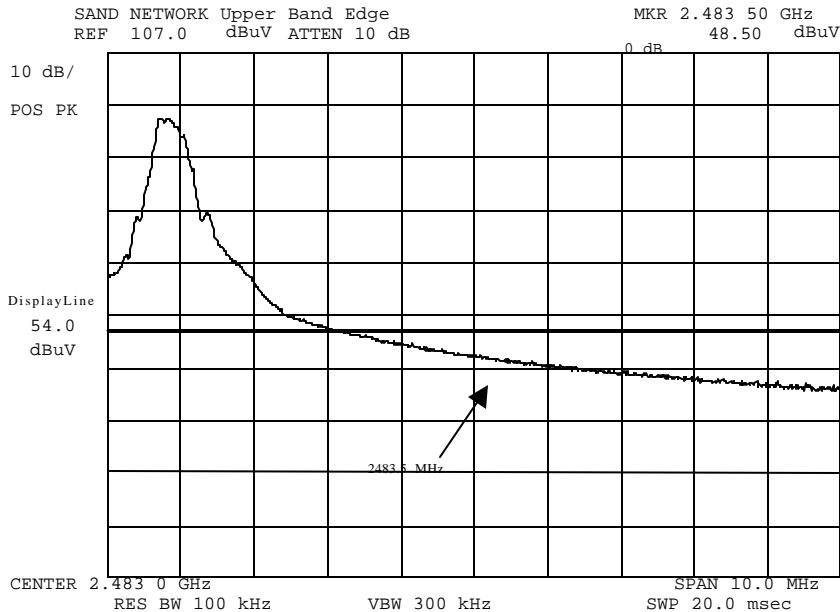
Name of Test: Band Edge Compliance (Conducted)15.247(c )

### Measurement Results

g06b0140: 2006-Nov-27 Mon 15:18:00

State: 0:General

Ambient Temperature: 23°C ± 3°C



Power:

UPPER EDGE

UPPER BAND EDGE

Performed by:

Michael Wyman

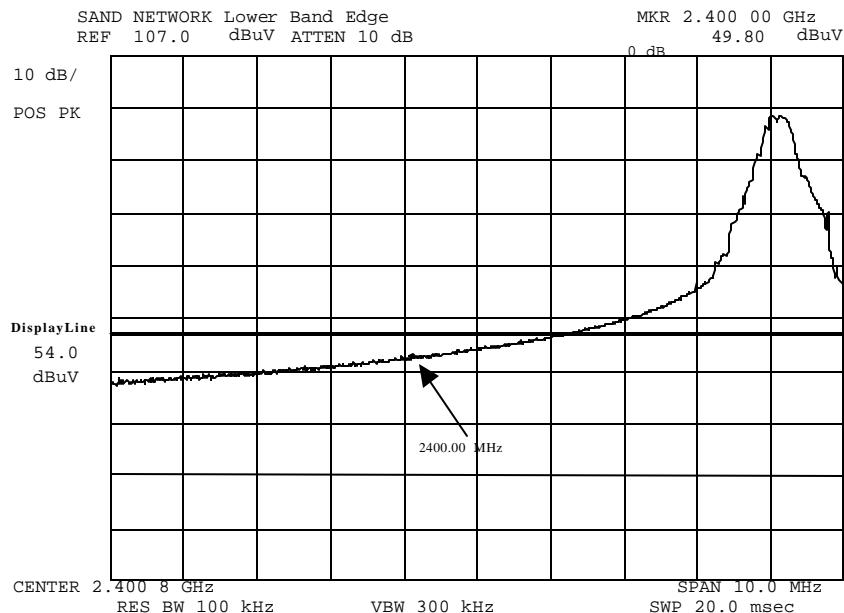
**Name of Test:** Band Edge Compliance (Conducted)15.247(c )

### Measurement Results

g06b0141: 2006-Nov-27 Mon 15:21:00

State: 2:High Power

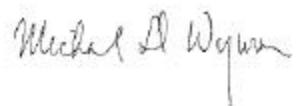
Ambient Temperature: 23°C ± 3°C



Power:

LOWER EDGE

LOWER BAND EDGE



Performed by:

Michael Wyman

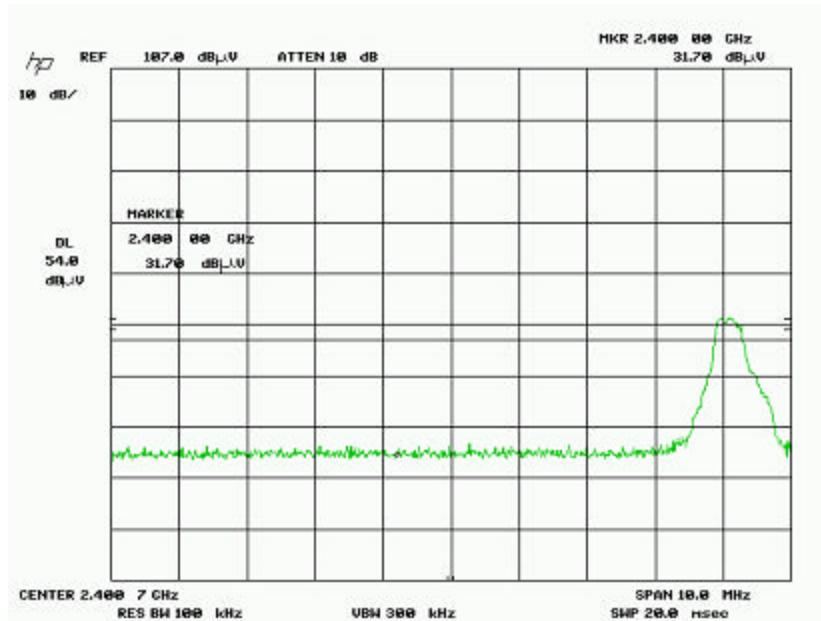
**Name of Test:** Band Edge Compliance (Radiated)15.247(c )

### Measurement Results

g06b0141: 2006-Nov-27 Mon 15:21:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C



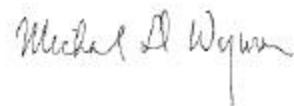
Power:

LOWER BAND EDGE

Display line set to 54.0 dBuV

Signal Amplitude 31.70 dBuV @2400MHz

Compliance was accomplished using the Marker-Delta Method to calculate the level of the decayed modulation in the restricted band. See the attached exercise for details.



Performed by:

Michael Wyman

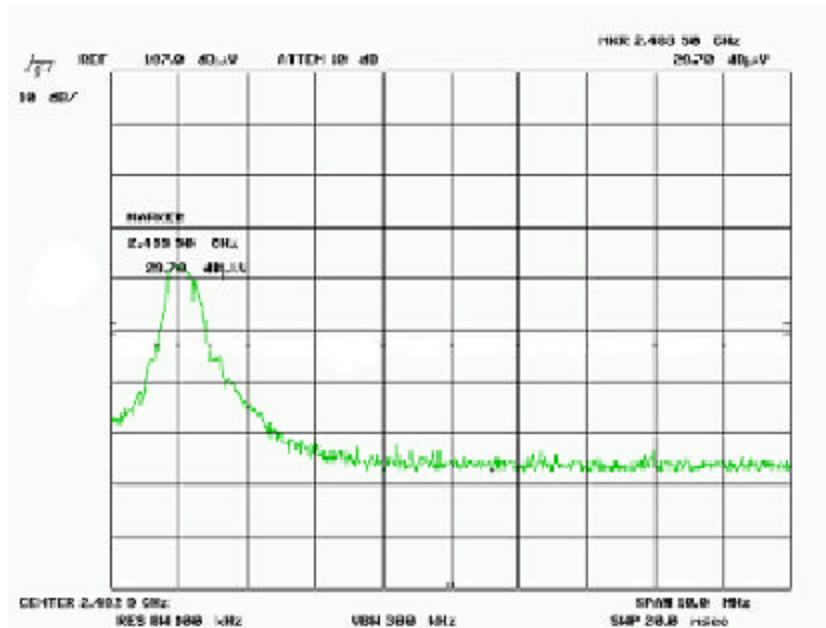
**Name of Test:** Band Edge Compliance (Radiated)15.247(c )

### Measurement Results

g06b0141: 2006-Nov-27 Mon 15:21:00

State: 2:High Power

Ambient Temperature: 23°C ± 3°C

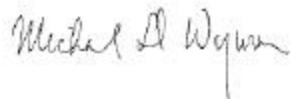


Power:

UPPER BAND EDGE  
 Marker set to 2483.5 MHz  
 Signal Amplitude 29.30 dBuV

Performed by:

Michael Wyman



**Name of Test:** A/C Powerline Conducted Emissions

**Specification:** FCC: 47 CFR 15.207

**Guide:** IEEE Standard 213

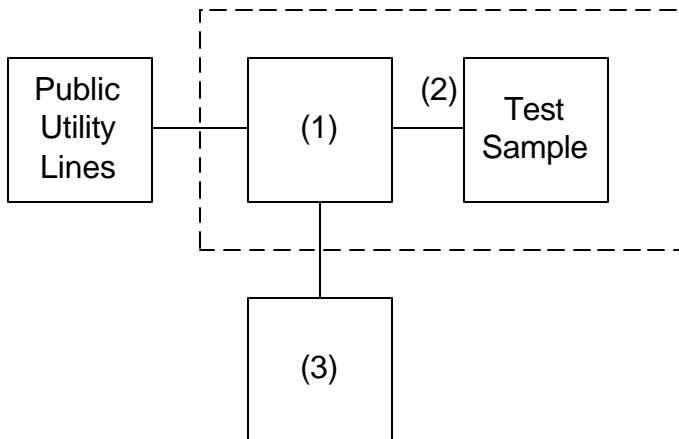
**Test Conditions:** S. T. & H.

**Test Equipment:** As per attached page

#### Measurement Procedure

1. A test sample was connected to the Public Utility lines through a LISN Ailtech Model 94641-1 (50  $\mu$ H).
2. A reference level of 250  $\mu$ V was set on the Spectrum Analyzer. The spectrum was searched over the range of 450 kHz to 30 MHz.
3. All other emissions were 20 dB or more below limit.
4.  The test sample used a charger.  
 The test sample does not use a charger.
5. Measurement Results: Attached.

### AC Powerline Conducted Measurements



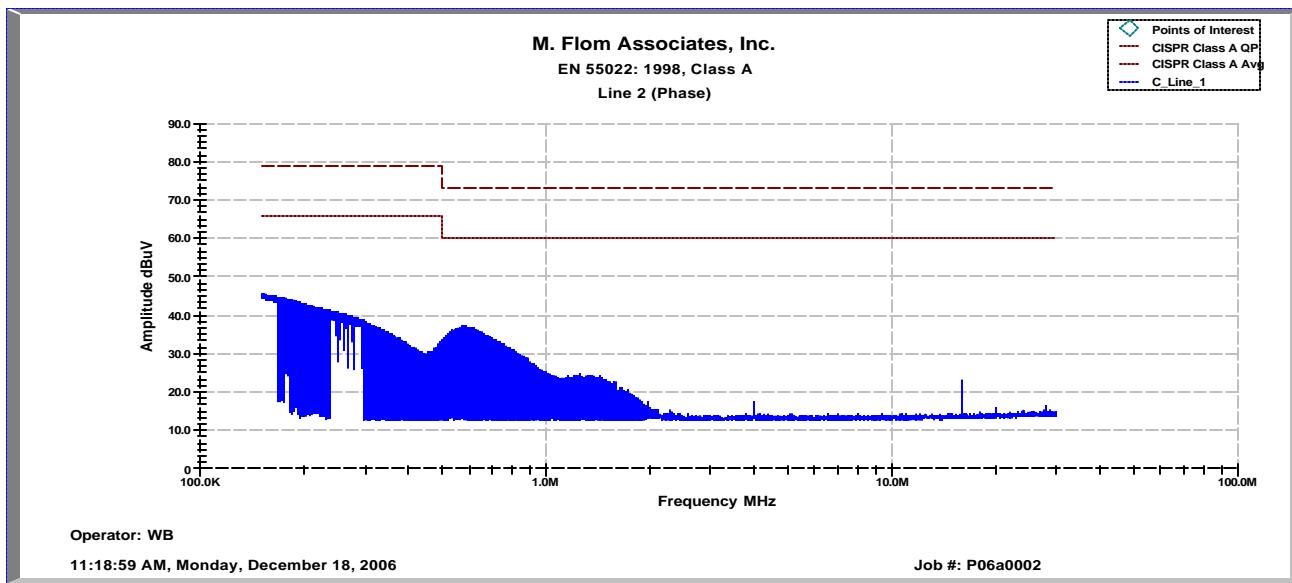
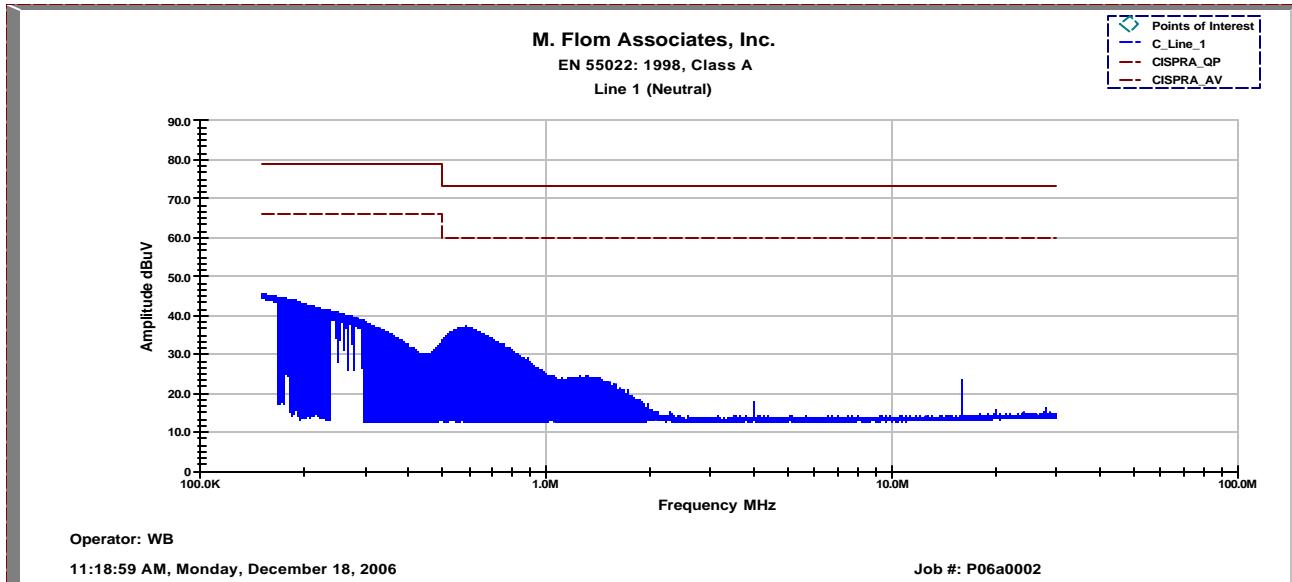
Asset	Description	s/n	Cycle	Last Cal
(as applicable)				
<b>(1) Audio Signal Generator</b>				
i00077	Singer 91221-1 (5 $\mu$ H)	0396	12 mo.	
i00155	Eaton 94641-1 (50 $\mu$ H)	178	12 mo.	Sep-06
i00167	Ailtech 94641-1 (50 $\mu$ H)	0103	12 mo.	
<b>(2) Screen Room</b>				
i00169	Lindgren 22-2/2-0	3861	N/A	None
i00170	Lindgren LG170	4999		
<b>(3) Spectrum Analyzer</b>				
i00029	HP 8563E	3213A00104	12 mo.	Jan-06
i00033	HP 85462A	3625A00357	12 mo.	Jan-06
X i00048	HP 8566B	2511AD1467	6 mo.	Jan-06

**Note:**

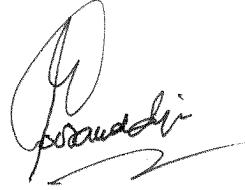
No signals were present within 20 dB of the CISPR 22 limits. See the graphs below for further clarification.

**Name of Test:** A/C Powerline Conducted Emissions

**State:**



Supervised By:

  
 Hoosamuddin S. Bandukwala, Lab Director

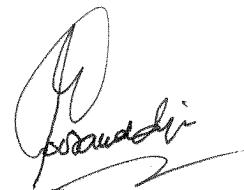
**END OF TEST REPORT**

**Testimonial  
and  
Statement of Certification**

**This is to Certify:**

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

Certifying Engineer:



Hoosamuddin S. Bandukwala, Lab Director