



# Flom Test Labs

EMI, EMC, RF Testing Experts Since 1963

toll-free: (866) 311-3268  
fax: (480) 926-3598  
<http://www.flomlabs.com>  
[info@flomlabs.com](mailto:info@flomlabs.com)

**Date:** July 3, 2008

**Applicant:** Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

**Attention of:** Jim Andersen, Senior Electrical Engineer  
Tel: 402 465 7048  
Fax: 402 467 3279  
Bosch Communications Systems  
E-mail: [jim.andersen@us.bosch.com](mailto:jim.andersen@us.bosch.com)

**Equipment:** BTR-80N Base Station  
**FCC ID:** B5DM528  
**FCC Rules:** 74 H

Gentlemen:

Enclosed please find your copy of the Engineering Test Report for which you are subject to the restrictions as listed on the attached summary.

As you know, the FCC, after a TCB issues a Grant, still has 30 days to review a submission and request added information. It is your decision whether or not to market the equipment subject to a possible recall before the end of the 30 days.

If your equipment is still retained by us, it will be returned to you 30 days after approval is achieved. Our invoice for services has been directed to your Accounts Payable Department.

Should you need any clarification, just fax or phone. Thank you again for this order - it has been a pleasure to be of service.

Sincerely yours,

Hoosamuddin S. Bandukwala, Lab Director

enclosure(s)  
HSB/je

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

p0850005, d0870004 Rev 2.0



## Memo

**Date:** July 3, 2008

**Applicant:** Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

**Equipment:** BTR-80N Base Station  
**FCC ID:** B5DM528

Please note that the enclosed Reports reflect the results of tests performed to the currently published Federal Communications Commissions Rules and Regulations.

Should the FCC's Examiners' interpretations request new and unpublished requirements, we will be pleased to provide them. We will invoice you accordingly, i.e. for the time spent on re-testing, providing the amended pages and/or Reports and for the time necessary to be spent on electronic filing. We will of course provide you with copies of any of the additions.

We regret any added expense to the Applicants, but of late the FCC continues to change their requirements without any prior written publication and/or notices.

As in the past, we will continue to provide all liaison with the FCC necessary for the successful conclusion of your project and the receipt of your Grant of Equipment Authorization.

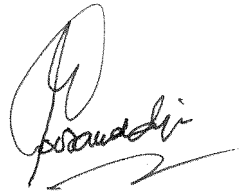
Sincerely yours,

Hoosamuddin S. Bandukwala, Lab Director

## Summary of Restrictions

1. All submissions to the FCC are subject to **their** Examiner's interpretation.
2. Please allow from 60 to 90 days before hearing from the FCC with regard to any submission.
3. The FCC can set aside any action; modify or set aside any action, within 30 days. (FCC Rule 1.108, 1.113).
4. Under Rule 2.803, if device is not type accepted/certificated then it must **not** be sold, leased, offered for sale, imported, shipped or distributed or advertised for sale.
5. FCC can revoke its certificates at any time if the equipment does not meet or **continue** to meet their Rules. (Rule Parts 2.927, 2.939).
6. FCC can request a sample at any time (2.936).

Flom Test Lab



Hoosamuddin S. Bandukwala, Lab Director



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**Date:** July 3, 2008

Federal Communications Commission  
Via: Electronic Filing

**Attention:** Authorization & Evaluation Division

**Applicant:** Telex Communications, Inc.  
**Equipment:** BTR-80N Base Station  
**FCC ID:** B5DM528  
**FCC Rules:** 74 H

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.

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/je

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

p0850005, d0870004 Rev 3.0



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## Test Report

for

FCC ID: B5DM528

**Model:** BTR-80N Base Station

to

**Federal Communications Commission**

Rule Part(s) 74 H

Date of report: July 3, 2008

**At the Request of:**

Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

**Attention of:**

Jim Andersen, Senior Electrical Engineer  
Tel: 402 465 7048  
Fax: 402 467 3279  
Bosch Communications Systems  
E-mail: [jim.andersen@us.bosch.com](mailto:jim.andersen@us.bosch.com)

Supervised by:

Hoosamuddin S. Bandukwala, Lab Director

## Revision History

Revision	Date	Revised By	Reason for revision
1.0	July 3, 2008	J Erhard	Original Document
2.0	July 21, 2008	J Erhard	Update manufacturer contact information. Edit mask data per RSS 123 standard.
3.0	August 8, 2008	J Erhard	Edit output power for 608 MHz

List of Exhibits

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

**Applicant:** Telex Communications, Inc.

**FCC ID:** B5DM528

**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
  - (9) Tune Up Info
  - (10) Schematic Diagram
  - (10) Circuit Description
  - Block Diagram
  - Parts List
  - Active Devices
6. MPE/SAR Report

**By F.T.L.:**

- 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.

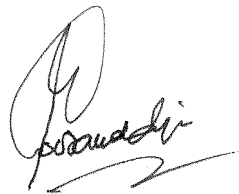


## Testimonial and Statement of Certification

**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

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Required information per ISO 17025-2005, paragraph 5.10.2:

a) **Test Report**

b) Laboratory: Flom Test Lab  
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107  
(Canada: IC 2044-A) Chandler, AZ 85225

c) Report Number: d0870004

d) Client: Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

e) Identification: BTR-80N Base Station  
FCC ID: B5DM528

EUT Description: 482-608 MHz

f) EUT Condition: Not required unless specified in individual tests.

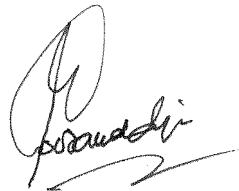
g) Report Date: July 3, 2008  
EUT Received:

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with FTL 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.

Accessories used during testing:

Type	Quantity	Manufacturer	Model	Serial No.	FCC ID
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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:

<u>X</u>	74 Subpart H - Low Power Auxiliary Stations
<u>X</u>	RSS - 123

## Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with TIA-603-C-2004, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Measurement results, unless otherwise noted, are worst-case measurements.

### **A2LA**

“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



**IC O.A.T.S. Number: 2044A-1**

## List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,  
Volume II, Part 2 and to part 74 HSub-part 2.1033

(c)(1):

**Name and Address of Applicant:** Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

**Manufacturer:** Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

(c)(2): **FCC ID:** B5DM528

**Model Number:** BTR-80N Base Station

(c)(3): **Instruction Manual(s):** Please see attached exhibits

(c)(4): **Type of Emission:** FM

(c)(5): **Frequency Range, MHz:** 482 to 608

(c)(6): **Power Rating, Watts:** 223 mW  
\_\_\_\_\_ Switchable \_\_\_\_\_ Variable \_\_\_\_\_ N/A

**FCC Grant Note:** None

(c)(7): **Maximum Power Rating, Watts:** 250 W

**DUT Results:** Passes \_\_\_\_\_ x \_\_\_\_\_ 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	=	57mA
Collector Voltage, Vdc	=	4.75
Supply Voltage, Vac	=	120

(c)(9): **Tune-Up Procedure:**

Please see attached exhibits

(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

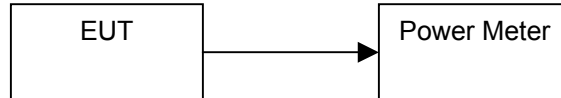
**Name of Test:** Carrier Output Power (Conducted)  
**Specification:** 2.1046(a)  
**Test Equipment Utilized:** i00228, i00317

**Test Date:** 6/18/2008

**Test Procedure**

The EUT was connected directly to a power meter input. The peak readings were taken and the result was then compared to the limit.

**Test Setup**



**Transmitter Peak Output Power**

Tuned Frequency MHz	Recorded Measurement	Specification Limit	Result
482	23.3 dBm	250 mW	Pass
545	23.5 dBm	250 mW	Pass
608	23.32 dBm	250 mW	Pass



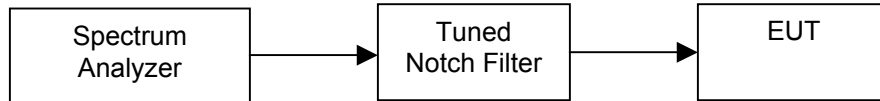
**Name of Test:** Unwanted Emissions (Transmitter Conducted)  
**Specification:** 2.1051  
**Test Equipment Utilized:** i00331 **Test Date:** 6/25/2008

**Test Procedure**

The EUT was connected directly to a spectrum analyzer to verify that the EUT met the requirements for spurious emissions. The EUT was tested to the RSS-123 Issue 1, Rev. 2 November 6, 1999 requirements, as they are more stringent than the FCC limits. A tuned notch filter was used to suppress the fundamental frequency to prevent erroneous readings. The frequency range from 30 MHz to the 10<sup>th</sup> harmonic of the fundamental transmitter was observed.

Only the worst-case emission from each tuned frequency is recorded in the Conducted Spurious Emissions Summary Test Table.

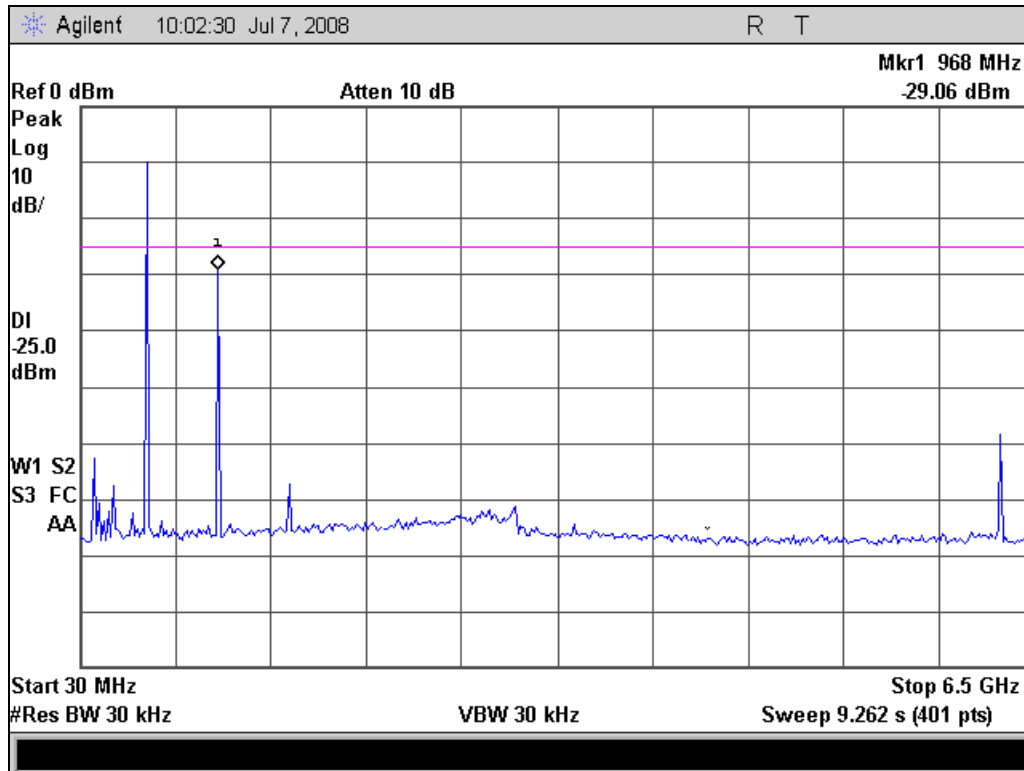
**Test Setup**



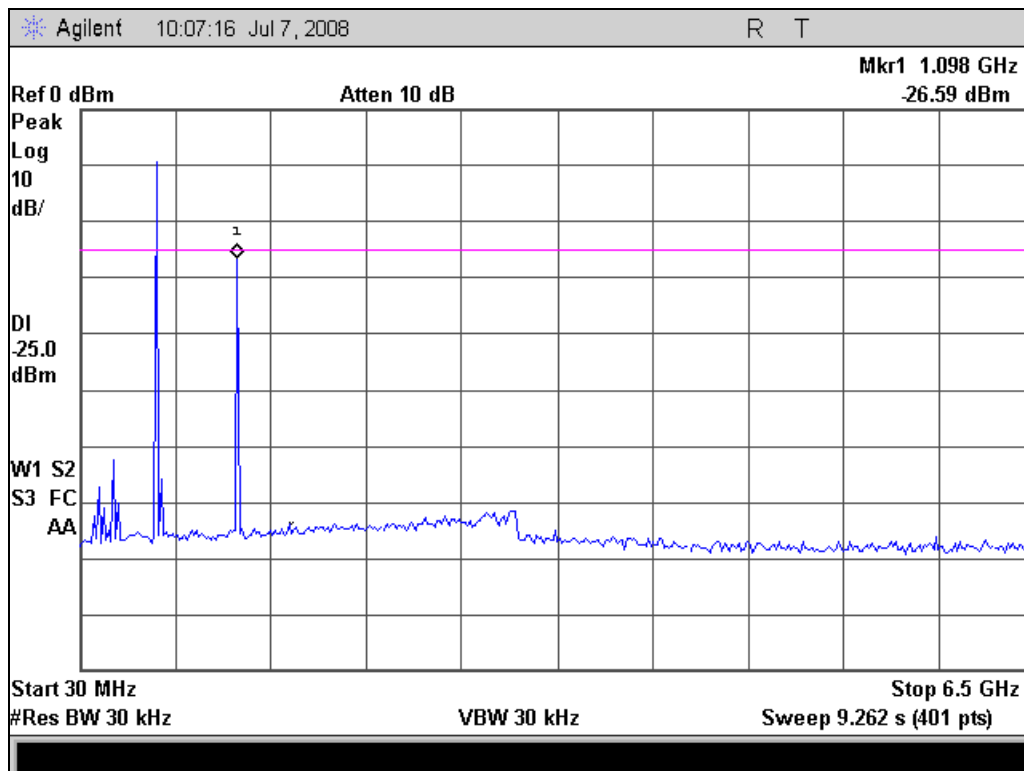
**Unwanted Emissions (Transmitter Conducted) Summary Test Table**

Tuned Frequency MHz	Emission Frequency MHz	Recorded Measurement	Specification Limit	Result
482	968	-29.06	-25 dBm	Pass
545	1098	-26.59	-25 dBm	Pass
608	1211	-30.39	-25 dBm	Pass

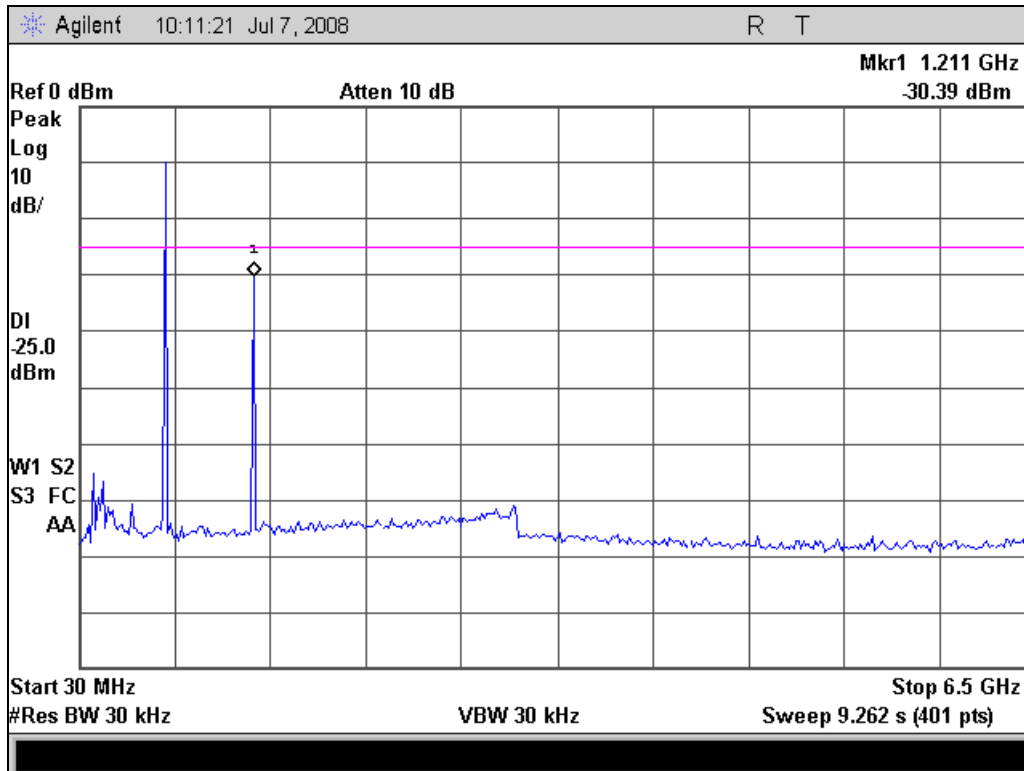
### 482 MHz Unwanted Emissions



### 545 MHz Unwanted Emissions



### 608 MHz Unwanted Emissions



**Name of Test:** Field Strength of Spurious Radiation  
**Specification:** 2.1053(a)  
**Test Equipment Utilized:** i00049, i00089, i00103

**Test Date:** 7/1/2008

### Measurement Procedure

#### Definition:

Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies that 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  $\geq 3$  times Resolution Bandwidth, or 30 kHz (22.917)
  - 3) Sweep Speed  $\leq 2000$  Hz/second
  - 4) Detector Mode = Mean or Average Power
- C) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a non-radiating load that is placed on the turntable. The RF cable to this load should be of minimum length.
- D) 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).
- E) 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.
- F) Repeat step E) for each spurious frequency with the test antenna polarized vertically.
- G) Reconnect the equipment as illustrated.
- H) Keep the spectrum analyzer adjusted as in step B).
- I) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.
- J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
- K) Repeat step J) with both antennas vertically polarized for each spurious frequency.
- L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps J) and K) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.
- M) The levels recorded in step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions dB =  $10\log_{10}(\text{TX power in watts}/0.001) - \text{the levels in step I)}$

*NOTE: It is permissible that other antennas provided can be referenced to a dipole.*

## Measurement Results

### 482 MHz Transmitter Unwanted Emissions

Tuned Freq (MHz)	Emission Freq (MHz)	Monitored Level (dBm)	Correction Factor (dB)	Corrected Value (dBm)	Limit** (dBm)	Result
482	964	-55.3	27.6	-27.7	-25	Pass
482	1445	-57.4	28.9	-28.5	-25	Pass

No other emissions were detectable. All emissions were greater than -20 dBc.

### 545 MHz Transmitter Unwanted Emissions

Tuned Freq (MHz)	Emission Freq (MHz)	Monitored Level (dBm)	Correction Factor (dB)	Corrected Value (dBm)	Limit** (dBm)	Result
545	1089	-59.3	27.5	-31.8	-25	Pass
545	1634	-57.6	29.8	-27.8	-25	Pass

No other emissions were detectable. All emissions were greater than -20 dBc.

### 608 MHz Transmitter Unwanted Emissions

Tuned Freq (MHz)	Emission Freq (MHz)	Monitored Level (dBm)	Correction Factor (dB)	Corrected Value (dBm)	Limit** (dBm)	Result
608	1216	-54.7	-28.0	-26.7	-25	Pass
608	1824	-57.0	-30.8	-26.2	-25	Pass

No other emissions were detectable. All emissions were greater than -20 dBc.

\*\*The Industry Canada limit from RSS-123 Issue 1, Rev. 2 November 6, 1999 is used as it is more stringent.

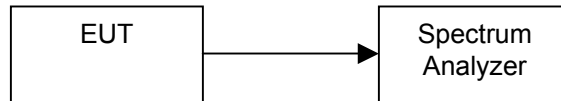
**Name of Test:** Emission Masks (Occupied Bandwidth)  
**Specification:** 2.1049(c)(1)  
**Test Equipment Utilized:** i00331

**Test Date:** 6/30/2008

### Test Procedure

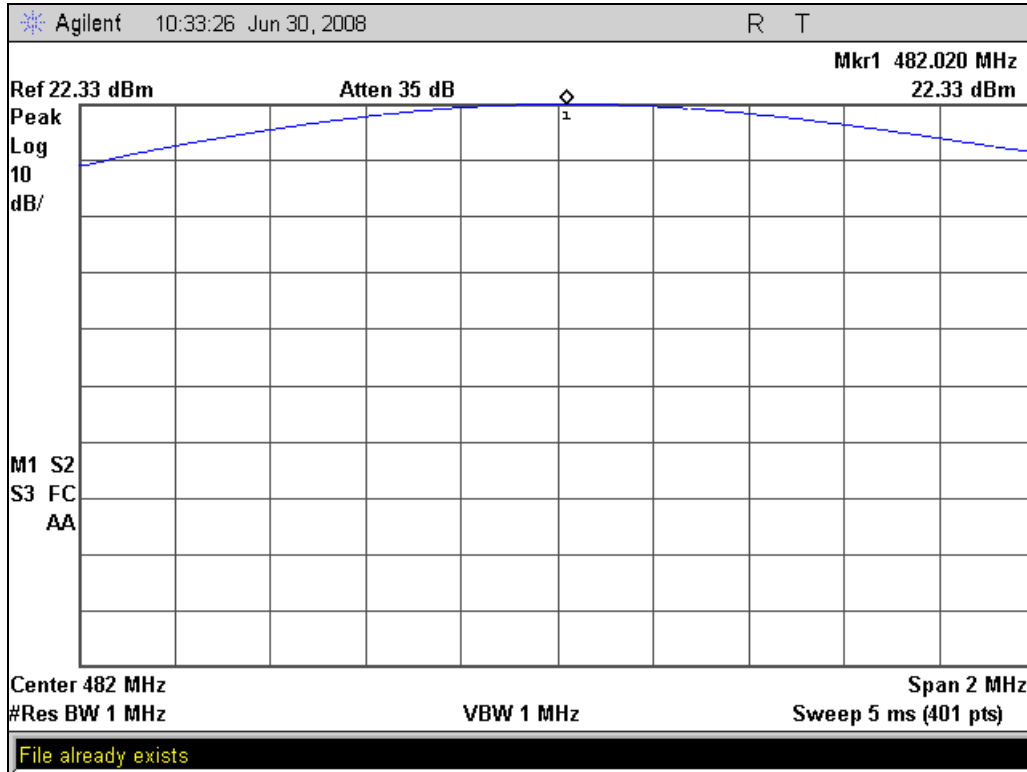
The EUT was connected directly to a spectrum analyzer to verify that the EUT meets the required emissions mask. A reference level plot is provided to verify that the peak power was established prior to testing the mask.

### Test Setup

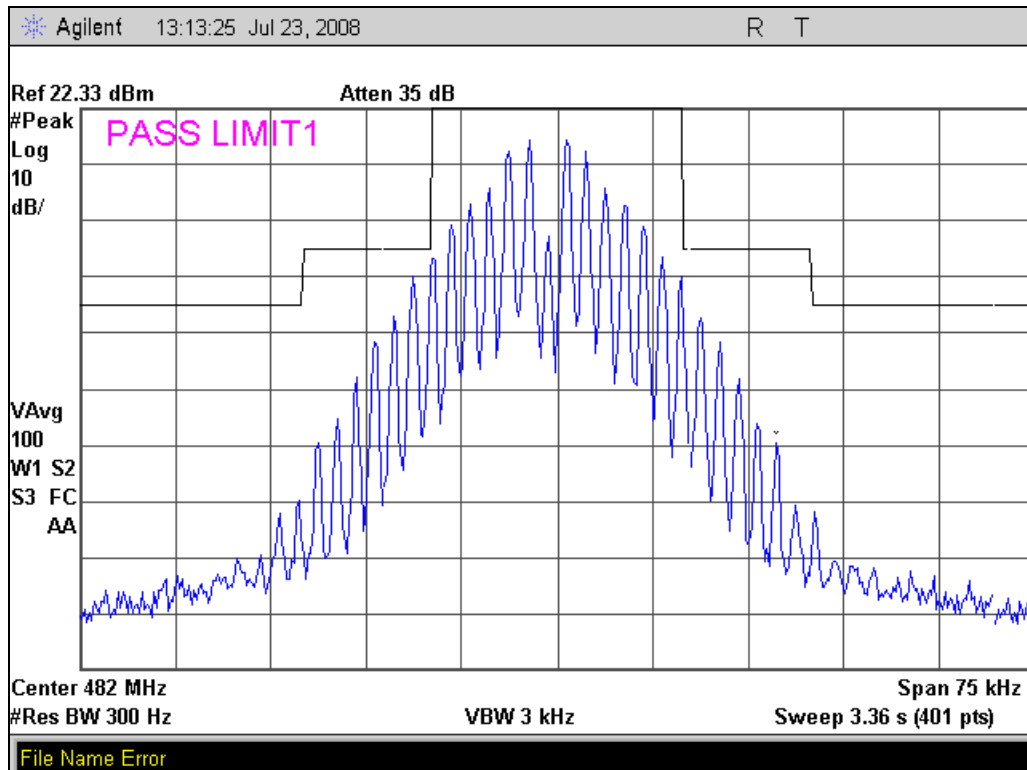


### Emission Mask Plots

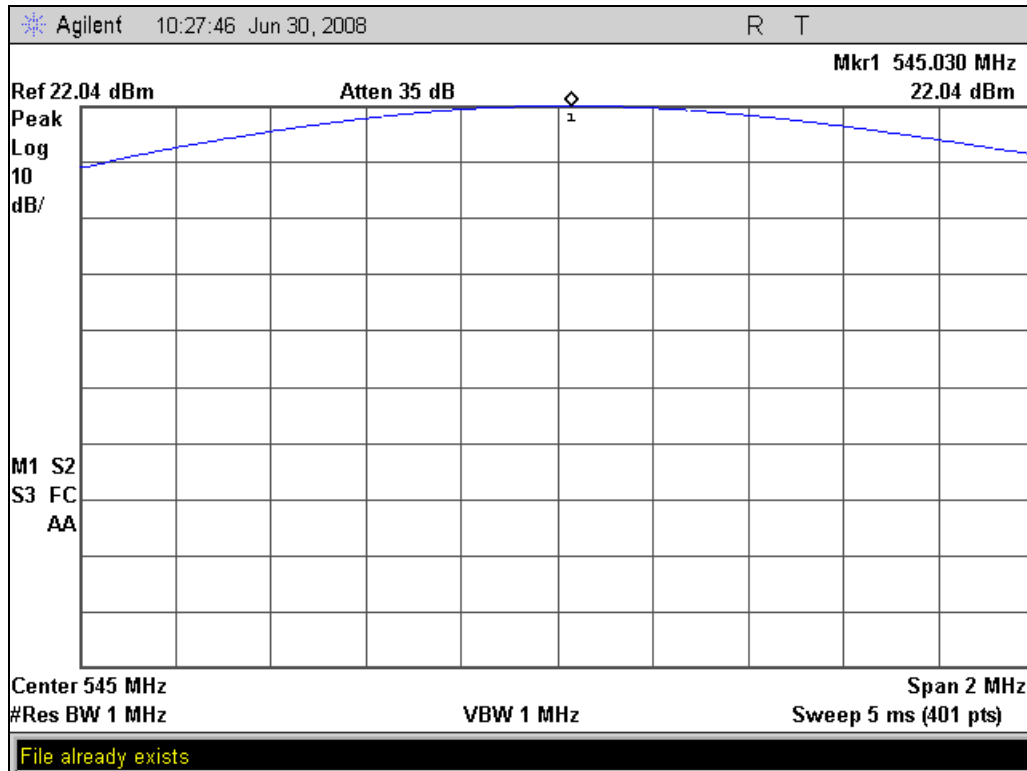
#### 482 Reference Level



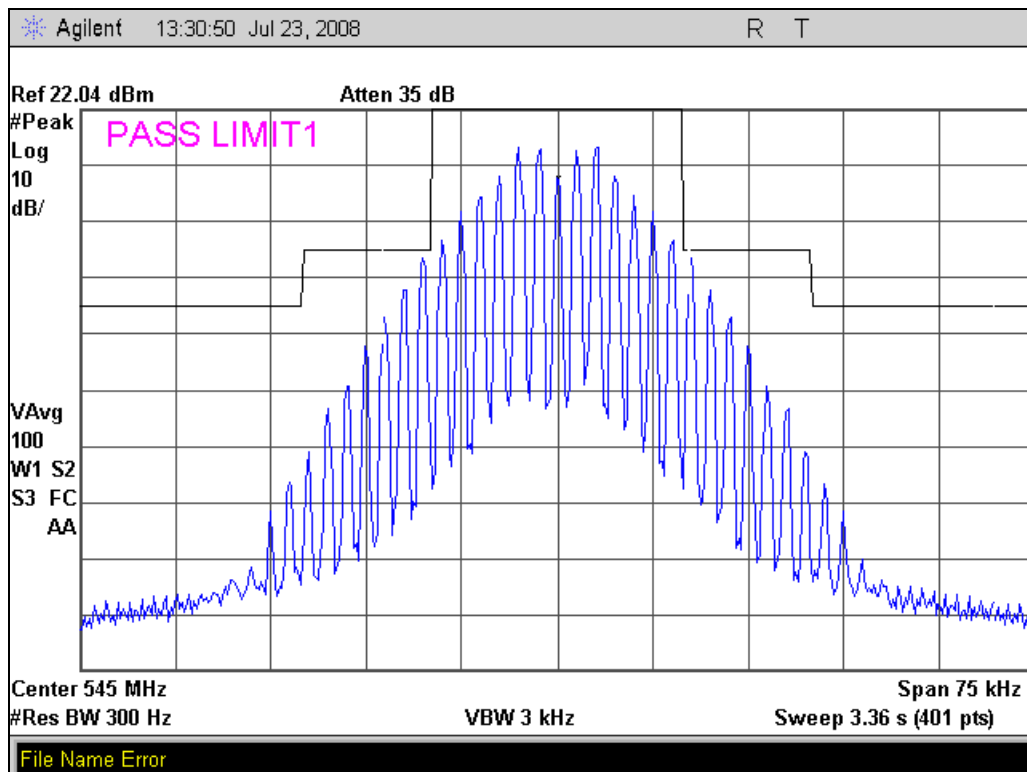
#### 482 Emission Mask



### 545 Reference Level

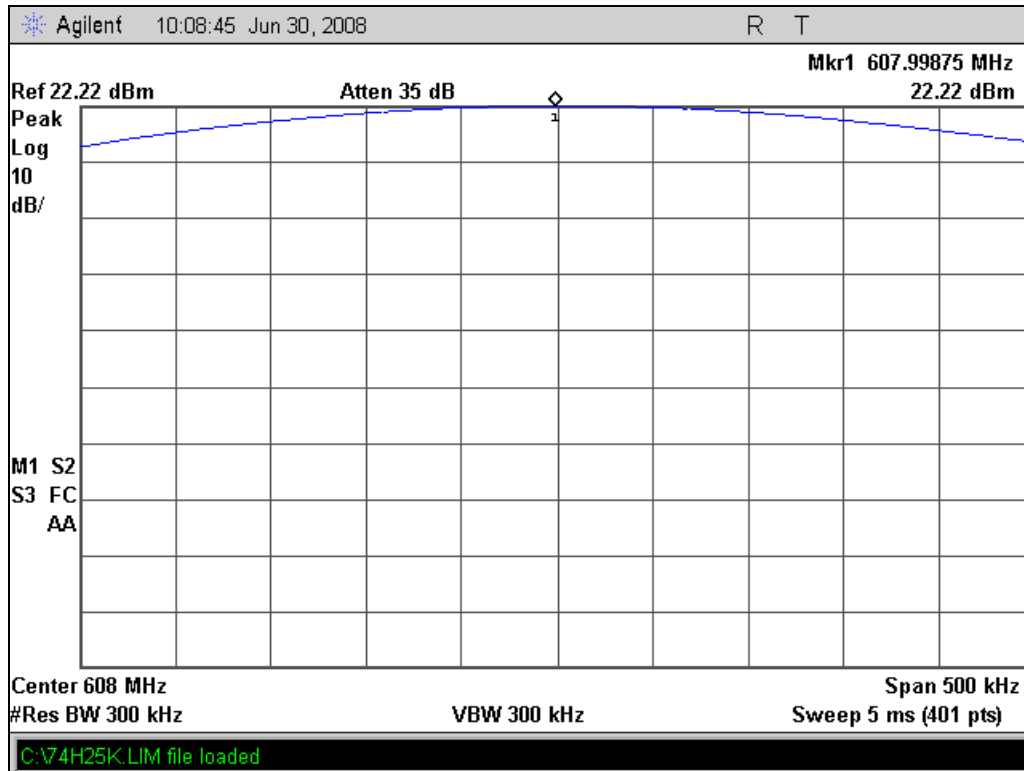


### 545 Emission Mask

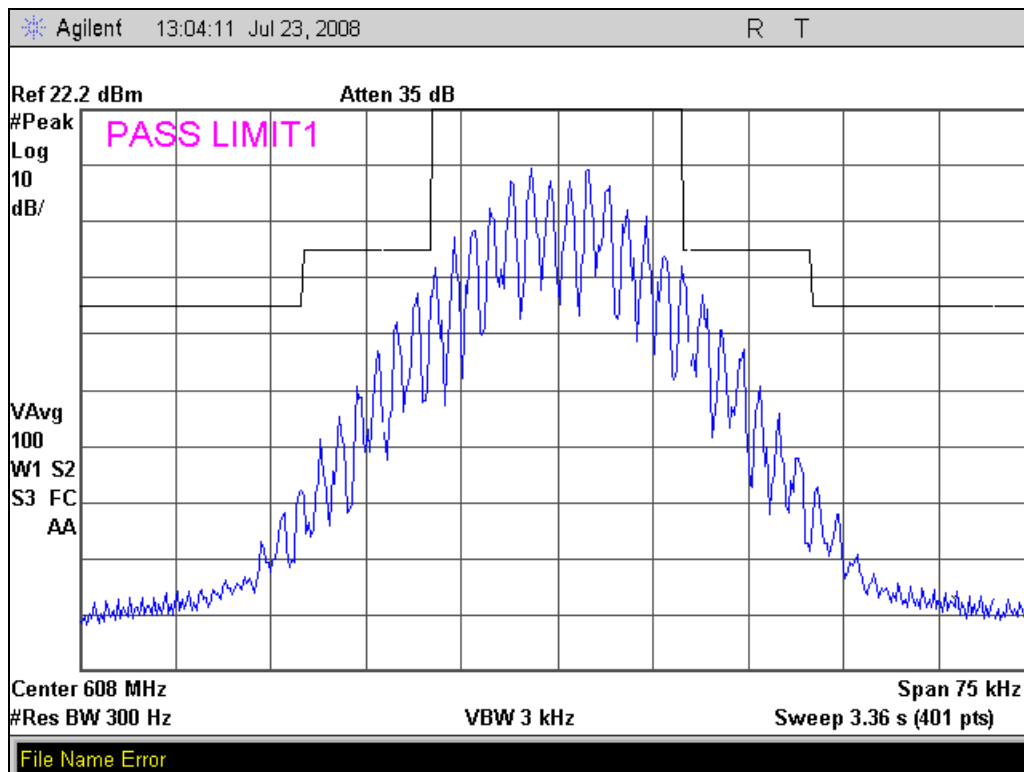




### 608 Reference Level



### 608 Emission Mask



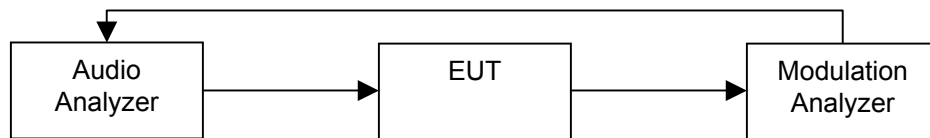
**Name of Test:** Audio Low Pass Filter  
**Specification:** 2.1047(a)  
**Test Equipment Utilized:** i00321, i00324

**Test Date:** 7/1/2008

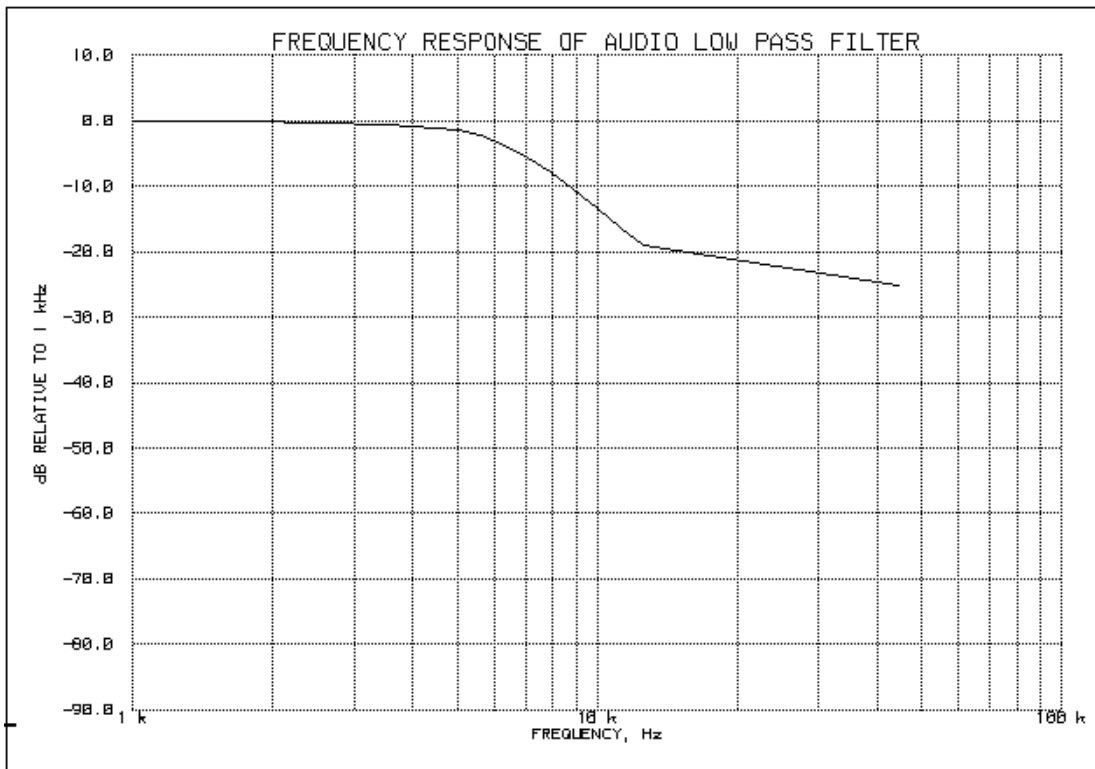
**Measurement Procedure**

- A) The EUT and test equipment were set up such that the audio input was connected at the input to the modulation limiter, and the modulated stage.
- B) The audio output was connected at the output to the modulated stage.

**Transmitter Test Set-Up**



**Measurement Results**



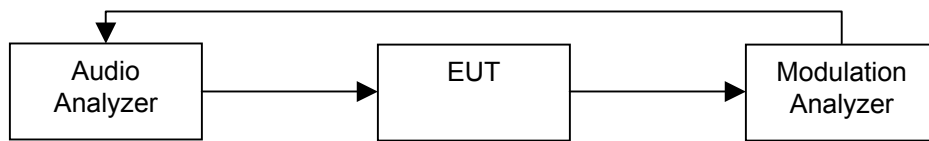
**Name of Test:** Audio Frequency Response  
**Specification:** 2.1047(a)  
**Test Equipment Utilized:** i00321, i00324

**Test Date:** 7/1/2008

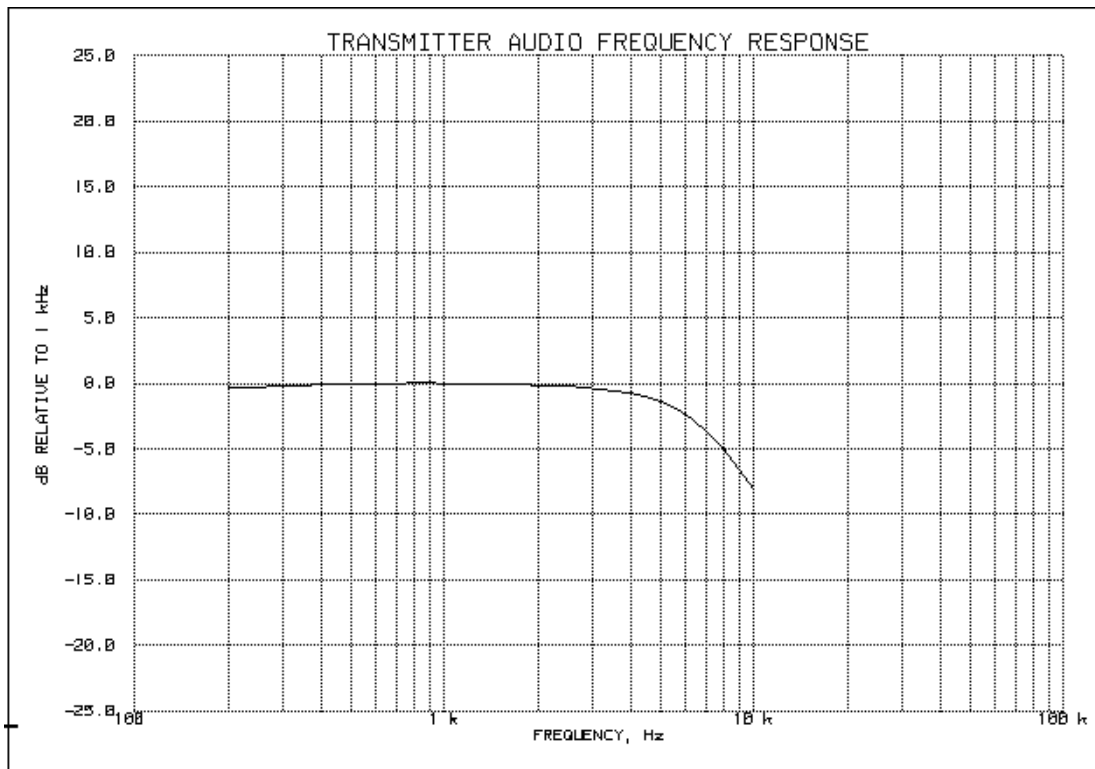
**Measurement Procedure**

- A) The EUT and test equipment were set up as shown below.
- B) The audio signal generator was connected to the audio input circuit/microphone of the EUT.
- C) The audio signal input was adjusted to obtain 20% modulation at 1 kHz, and this point was taken as the 0 dB reference level.
- D) With input levels held constant and below limiting at all frequencies, the audio signal generator was varied from 100 Hz to 50 kHz.
- E) The response in dB relative to 1 kHz was measured, using the HP 8901A Modulation Meter.

**Transmitter Test Set-Up**



**Measurement Results**



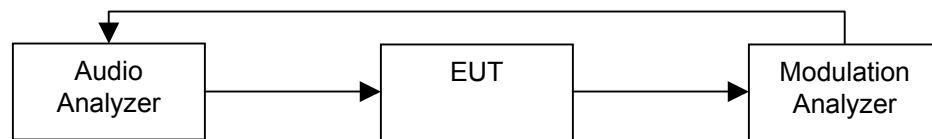
**Name of Test:** Modulation Limiting  
**Specification:** 2.1047(b)  
**Test Equipment Utilized:** i00321, i00324

**Test Date:** 7/1/2008

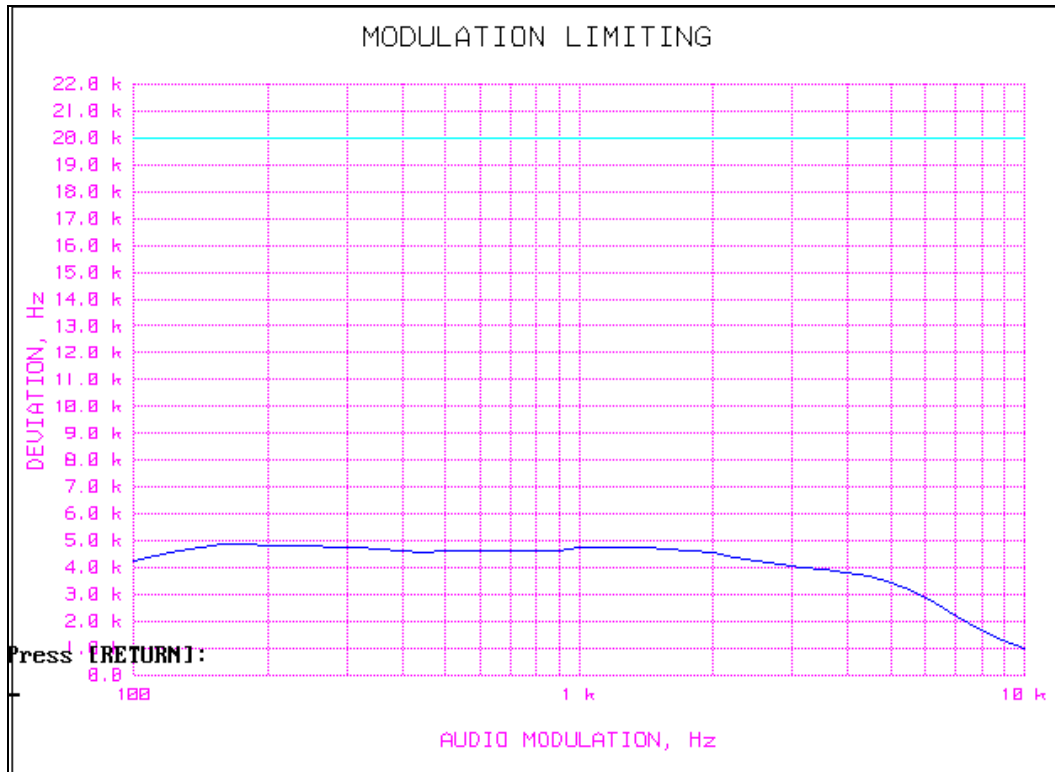
### Measurement Procedure

- A) The signal generator was connected to the input of the EUT as shown below.
- B) The modulation response was measured for each of three frequencies (one of which was the frequency of maximum response), and the input voltage was varied and was observed on an HP 8901A Modulation Analyzer.
- C) The input level was varied from 30% modulation ( $\pm 1.5$  kHz deviation) to at least 20 dB higher than the saturation point.
- D) Measurements were performed for both negative and positive modulation and the respective results were recorded.

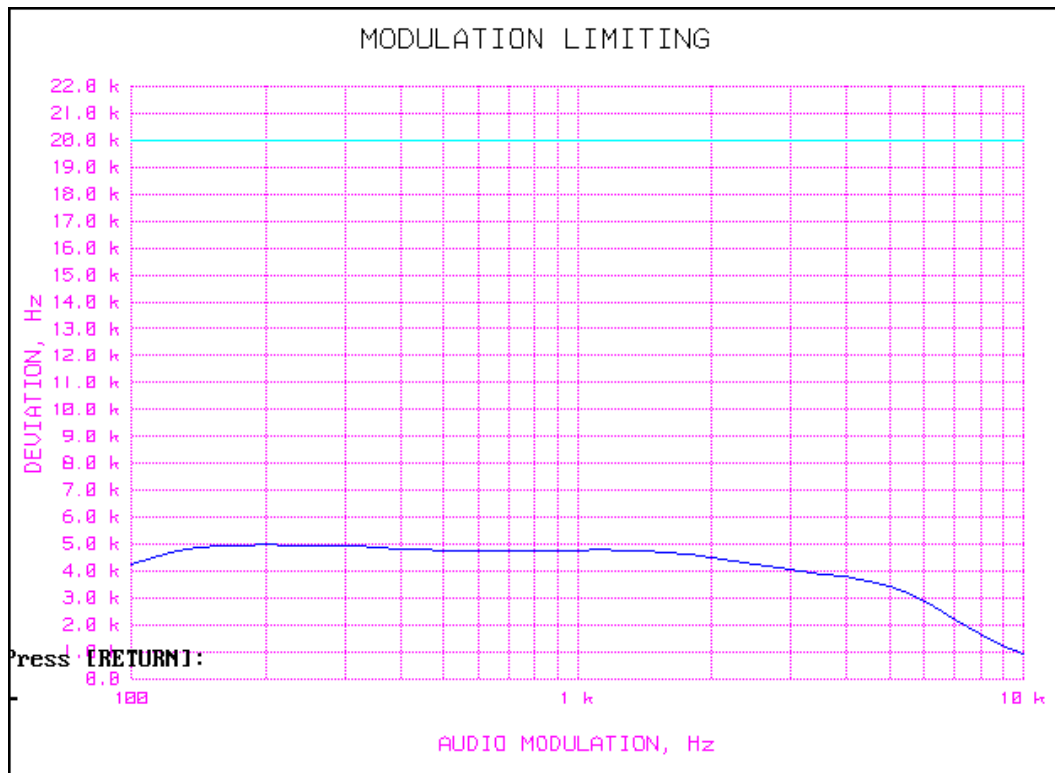
### Transmitter Test Set-Up



Measurement Results Positive Peaks



Measurement Results Negative Peaks



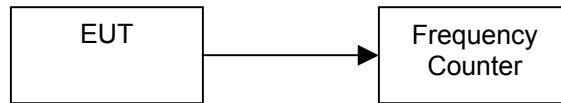
**Name of Test:** Frequency Stability (Temperature Variation)  
**Specification:** 2.1055(a)(1)  
**Test Equipment Utilized:** i00019, i00027

**Test Date:** 6/30/08

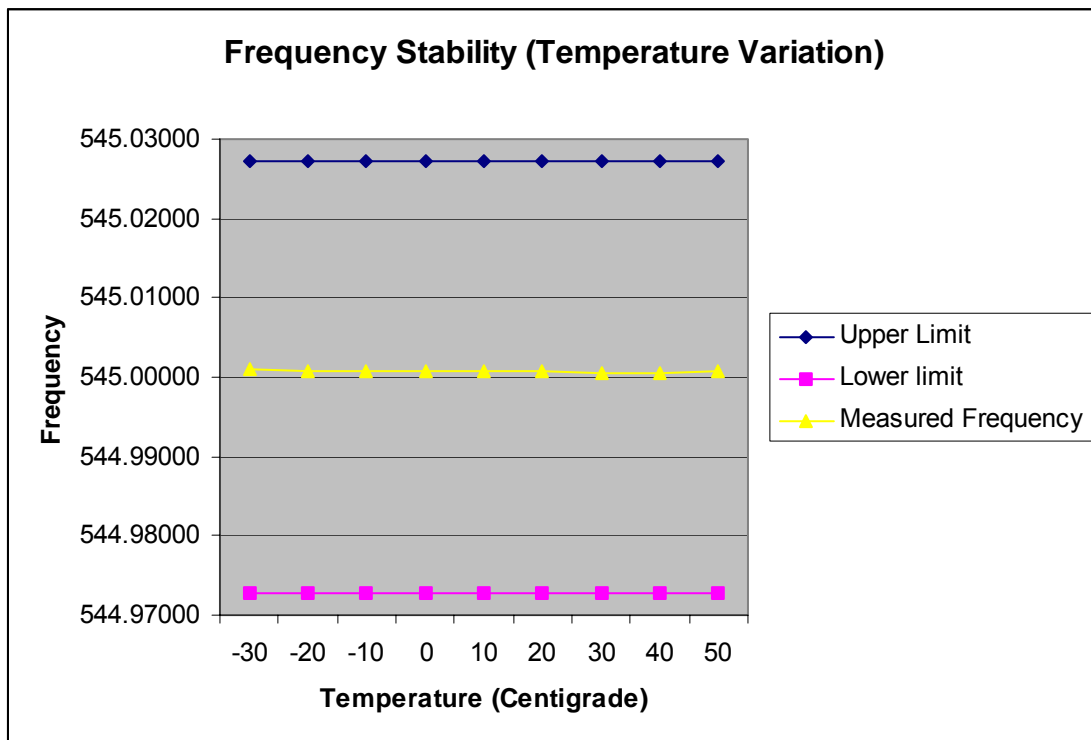
**Measurement Procedure**

The EUT was placed in an environmental test chamber and the RF output was connected directly to a frequency counter. The temperature was varied from -30°C to 50°C in 10°C increments. After a sufficient time for temperature stabilization the RF output frequency was measured.

**Measurement Setup**



**Measurement Results**



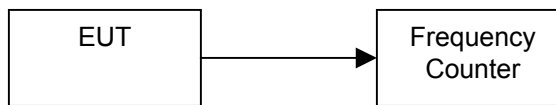
**Name of Test:** Frequency Stability (Voltage Variation)  
**Specification:** 2.1055(b)(1)  
**Test Equipment Utilized:** i00027, i00108

**Test Date:** 6/30/8

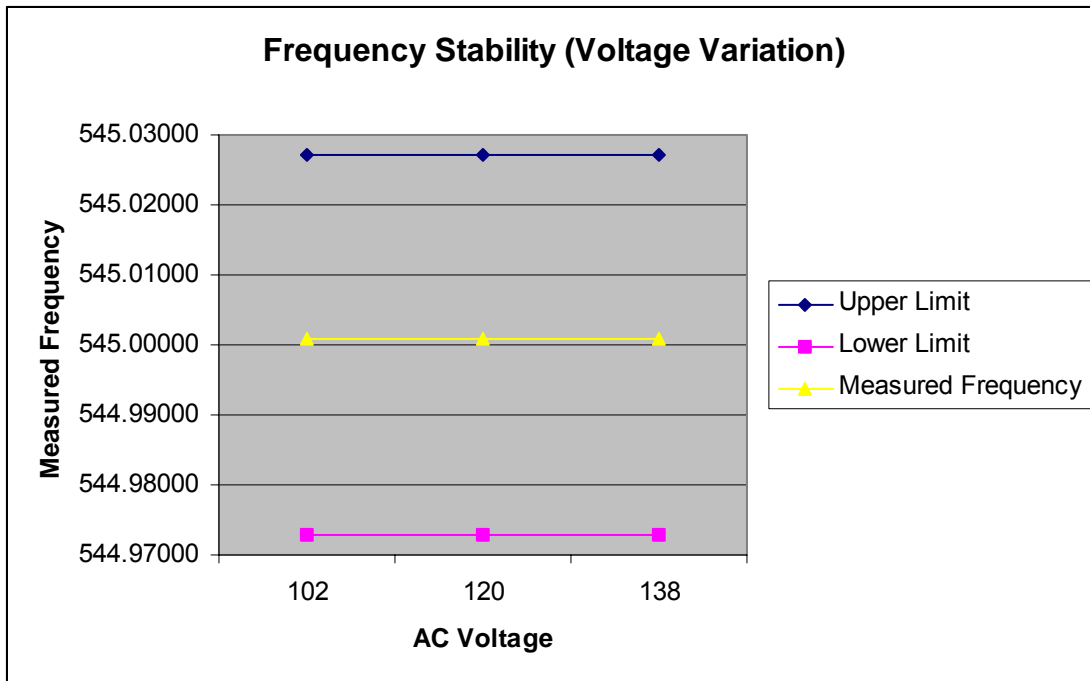
**Measurement Procedure**

The EUT was placed in a temperature chamber at  $25\pm 5^{\circ}\text{C}$  and connected directly to a frequency counter and variable power supply. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value and the RF output was measured.

**Measurement Setup**



**Measurement Results**



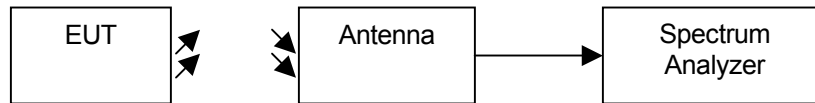
**Name of Test:** Receiver Spurious Emissions  
**Specification:** RSS 123 Section 8.0(i)  
**Test Equipment Utilized:** i00049, i00088, i00089, i00103

**Test Date:** 6/19/2008

**Test Procedure**

The EUT was tested in an Open Area Test Site (OATS) set 3m from the receiving transducer. A spectrum analyzer was used to verify that the EUT met the requirements for Receiver Spurious Emissions. The EUT was tested by rotating it 360° with the antennas in both the vertical and horizontal orientation and raised from 1 to 4 meters to ensure the TX signal levels were maximized. The spectrum from 30 MHz to 3 times the highest tunable frequency was examined.

**Test Setup**



Settings Below 1 GHz

RBW = 100 KHz

Sample Calculations

Corrected Level = Recorded Level + Correction factor

Correction factor = ACF + Cable loss

Settings Above 1 GHz

RBW = 1 MHz

**Receiver Spurious Emissions**

Emission Freq (MHz)	Measured Value (dBuV/m)	Correction Factor (dB)	Corrected Value (dBuV/m)	Limit (dBuV/m)	Margin dB
59.946	23.5	-0.3	23.2	39.1	-15.9
203.606	30.6	4.5	35.1	43.5	-8.4
371.031	23.8	7.2	31.0	46.4	-15.4
587.044	27.4	11.5	38.9	46.4	-7.5
783.144	23.8	13.7	37.5	46.4	-8.9
960.69	23.8	17.2	41.0	49.5	-8.5



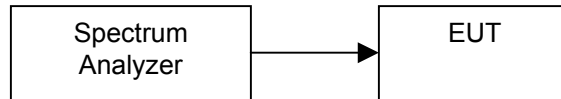
**Name of Test:** 99% Bandwidth  
**Specification:** RSS 123 Section 5.5  
**Test Equipment Utilized:** i00331

**Test Date:** 6/30/2008

**Test Procedure**

The EUT was connected directly to a spectrum analyzer. The Span was set wide enough to capture the entire transmit spectrum and the resolution bandwidth was set to at least 1% of the span. The analyzer was set to max hold and when the entire spectrum was captured the 99% bandwidth was measured.

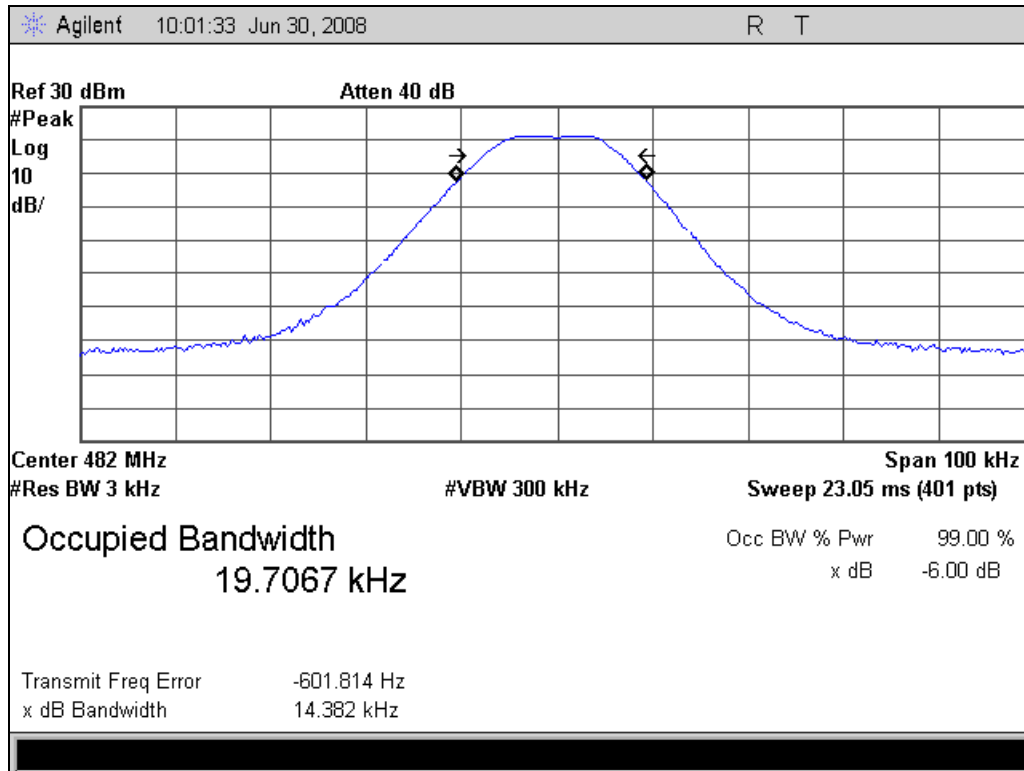
**Test Setup**



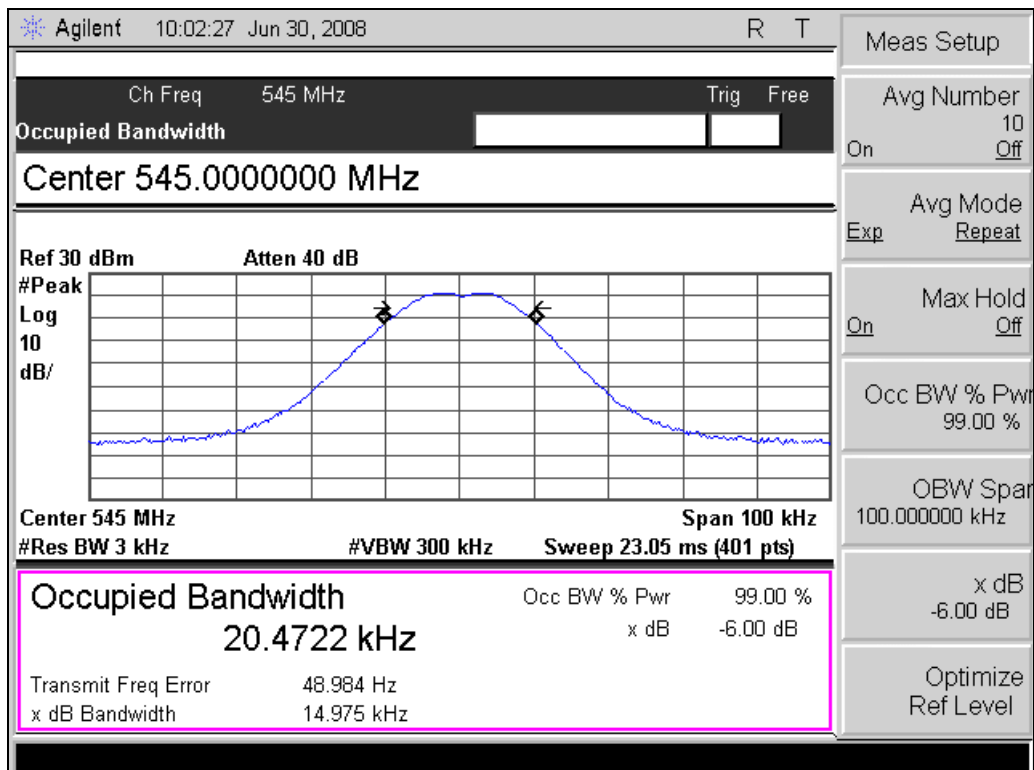
**Occupied Bandwidth Summary**

Frequency MHz	Recorded Measurement
482	19.7067 KHz
545	20.4722 KHz
608	21.0299 KHz

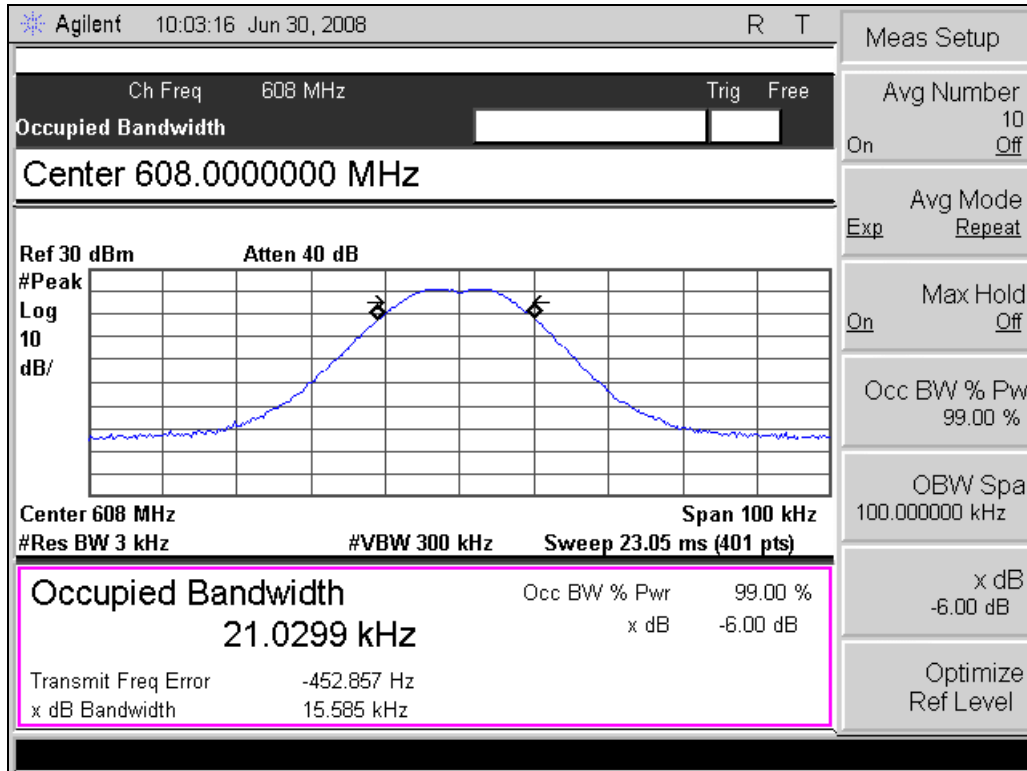
### 99% Bandwidth 482 MHz



### 99% Bandwidth 545 MHz



99% Bandwidth 608 MHz



### Test Equipment Utilized

Description	MFG	Model Number	FTL Asset Number	Last Cal Date	Cal Due Date
Frequency Counter	HP	5334B	i00019	11/2/07	11/2/08
Environmental Test Chamber	Tenny	Tenny Jr	i00027	9/25/07	9/25/08
Spectrum Analyzer	HP	8566B	i00049	8/18/07	8/18/08
Bi-conical Antenna	EMCO	3109B	i00088	10/16/07	10/16/09
Log Periodic Antenna	Aprel	2001	i00089	10/19/07	10/19/09
Horn Antenna	EMCO	3115	i00103	9/5/06	9/5/08
Variable AC Supply	Powerstat	3PN126	i00108	N/A	When Used
Tunable Notch filter	Eagle	TNF-1	i00124	N/A	When Used
Power Meter	HP	E4418B	i00228	9/6/07	9/6/08
Power Sensor	HP	8481A	i00317	9/6/07	9/6/08
Modulation Analyzer	HP	8901A	i00321	9/17/07	9/17/08
Audio Analyzer	HP	8903B	i00324	9/14/07	9/14/08
Spectrum Analyzer	HP	E4407B	i00331	10/23/07	10/23/08

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT