Flom Test Lab
EMI, EMC, RF Testing Experts Since 1963
toll-free: (866) 311-3268
fax: (480) 926-3598
www.flomlabs.com
info@flomlabs.com

Date: January 15, 2009

Applicant: E.F. Johnson Company
123 N. State Street
Waseca, MN 56093

Attention of: John Oblak, VP of Standards and Regulatory Affairs
(507) 837-5116; Fax: (507) 837-5120
E-mail: joblak@efjohnson.com

Equipment: 242-531G
FCC ID: ATH2425313
FCC Rules: Part 90

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.

Once a Telecommunication Certification Body (TCB) issues a Grant the Federal Communication Commission (FCC) has 30 days to review the application 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.

For any additional information please contact us.

Thank you.

Sincerely yours,

John Erhard

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).

Date: January 15, 2009

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: E.F. Johnson Company
Equipment: 242-531G
FCC ID: ATH2425313
FCC Rules: Part 90

Dear Gentleman:

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.

Best regards,

John Erhard

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Test Report

for

Model: 242-531G

to

Federal Communications Commission

Rule Part(s) Part 90

Date of report: January 15, 2009

On the Behalf of the Applicant: E.F. Johnson Company

At the Request of: E.F. Johnson Company
123 N. State Street
Waseca, MN 56093

Attention of: John Oblak, VP of Standards and Regulatory Affairs
(507) 837-5116; Fax: (507) 837-5120
E-mail: joblak@efjohnson.com

Reviewed by: John Erhard

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

Test Report Revision History

Revision	Date	Revised By	Reason for revision
1.0	January 15, 2009	J Erhard	Original Document
2.0	February 2, 2009	S Valentine	Update fax #, VP title & Manufacturer Info
3.0	February 6, 2009	Jo Erhard	Label Emissions masks

List of Exhibits

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

Applicant: E.F. Johnson Company

FCC ID: ATH2425313

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: John Erhard

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

Table of Contents

Required information per ISO 17025-2005, paragraph 5.10.2:

a)	**Test Report**
b) Laboratory: (FCC: 31040/SIT) (Canada: IC 2044-A)	Flom Test Lab 3356 N. San Marcos Place, Suite 107 Chandler, AZ 85225
c) Report Number:	d0910010
d) Client:	E.F. Johnson Company 123 N. State Street Waseca, MN 56093
e) Identification:	242-531G
EUT Description:	5300ES Series Mobile Radio
f) EUT Condition:	Not required unless specified in individual tests.
g) Report Date: EUT Received:	January 15, 2009
h, j, k):	As indicated in individual tests.
i) Sampling method:	No sampling procedure used.
l) Measurement Uncertainty:	In accordance with FTL internal quality manual.
m) Reviewed by:	John Erhard
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

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; 90 sub part I

Standard Test Conditions and Engineering Practices

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

In accordance with ANSI/TIA-603-C-2003, 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, 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 for current scope of accreditation.

Certificate number: 2152.01

CERT NO: 2152-01

FCC OATS Reg. #933597

IC Reg. # 2044A-1

List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to Part 90Sub-part 2.1033

(c)(1):

Name and Address of Applicant: E.F. Johnson Company
123 N. State Street
Waseca, MN 56093

Manufacturer: McDonald Technologies
1920 Diplomat Drive
Farmers Branch, TX 75234

(c)(2):**FCC ID**: ATH2425313

Model Number: 242-531G

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

Please see attached exhibits

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

(c)(5): **Frequency Range, MHz**: 138 - 150-174 (138 MHz for Canada only)

(c)(6): **Power Rating, Watts**: 60 or 15

____ Switchable ____ Variable ____ N/A

FCC Grant Note:

(c)(7): **Maximum Allowable Power, Watts**: 300

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	=	
Collector Voltage, Vdc	=	
Supply Voltage, Vdc	=	13.6

(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
_x_ N/A

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

Follows

Test Results Summary

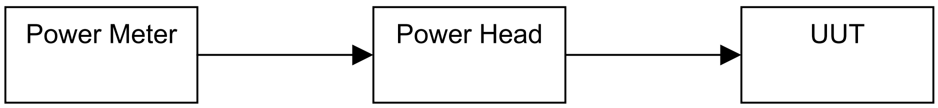
Specification	Test Name	Pass, Fail, N/A	Comments
2.1046	Carrier Output Power (Conducted)	Pass	
2.1051	Unwanted Emissions (Transmitter Conducted)	Pass	
2.1053	Field Strength of Spurious Radiation	Pass	
90.210	Emission Masks (Occupied Bandwidth)	Pass	
2.1047	Audio Low Pass Filter (Voice Input)	Pass	
2.1047	Audio Frequency Response	Pass	
2.1047	Modulation Limiting	Pass	
90.213	Frequency Stability (Temperature Variation)	Pass	
90.213	Frequency Stability (Voltage Variation)	Pass	

Name of Test: Carrier Output Power (Conducted)
Specification: 2.1046
Test Equipment Utilized: i00005, i00228, i00317
Engineer: J Erhard
Test Date: 1/9/2009

Measurement Procedure

The Unit Under Test (UUT) was connected directly to a power meter input. The peak readings were taken and the result was then compared to the limit.

Test Setup



High Power Transmitter Peak Output Power

Tuned Frequency MHz	Recorded Measurement	Result
138	47.70	Pass
150	47.71	Pass
174	47.70	Pass

138 MHz is required for Industry Canada only.

Low Power Transmitter Peak Output Power

Tuned Frequency MHz	Recorded Measurement	Result
138	41.65	Pass
150	41.76	Pass
174	41.74	Pass

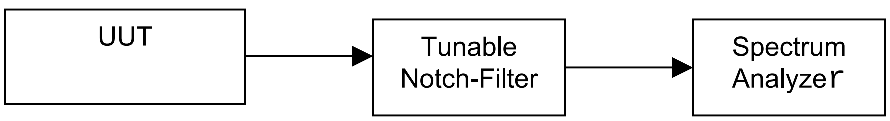
138 MHz is required for Industry Canada only.

Name of Test: Conducted Spurious Emissions
Specification: 2.1051 **Engineer: J Erhard**
Test Equipment Utilized: i00005, i00321, i00331 **Test Date: 1/9/09**

Test Procedure

The UUT was connected directly to a spectrum analyzer to verify that the UUT met the requirements for spurious emissions. A tunable notch filter was utilized to ensure the fundamental did not put the spectrum analyzer into compression. The resolution bandwidth set for 100 kHz and the reference level was adjusted to ensure the system had sufficient dynamic range to measure spurious emissions The frequency range from 30 MHz to the 10th harmonic of the fundamental transmitter was observed and plotted. The limit line was set for –25 dBm for comparison to RSS-119 which is the more stringent limit.

Test Setup



High Power Conducted Spurious Emissions Summary Test Table

Tuned Frequency MHz	Spurious Frequency MHz	Measured Spurious Level (dBm)	Specification Limit (dBm)	Result
138	414	-40.96	-25	Pass
150	301	-38.16	-25	Pass
174	350	-43.89	-25	Pass

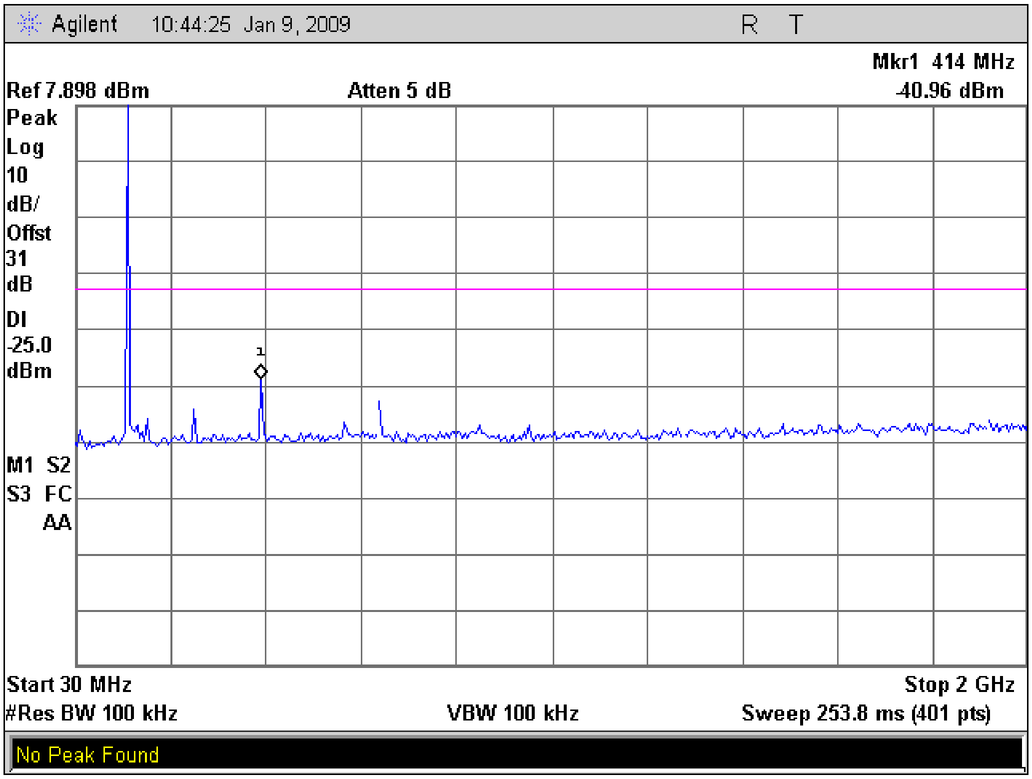
138 MHz is for Industry Canada only.

Low Power Conducted Spurious Emissions Summary Test Table

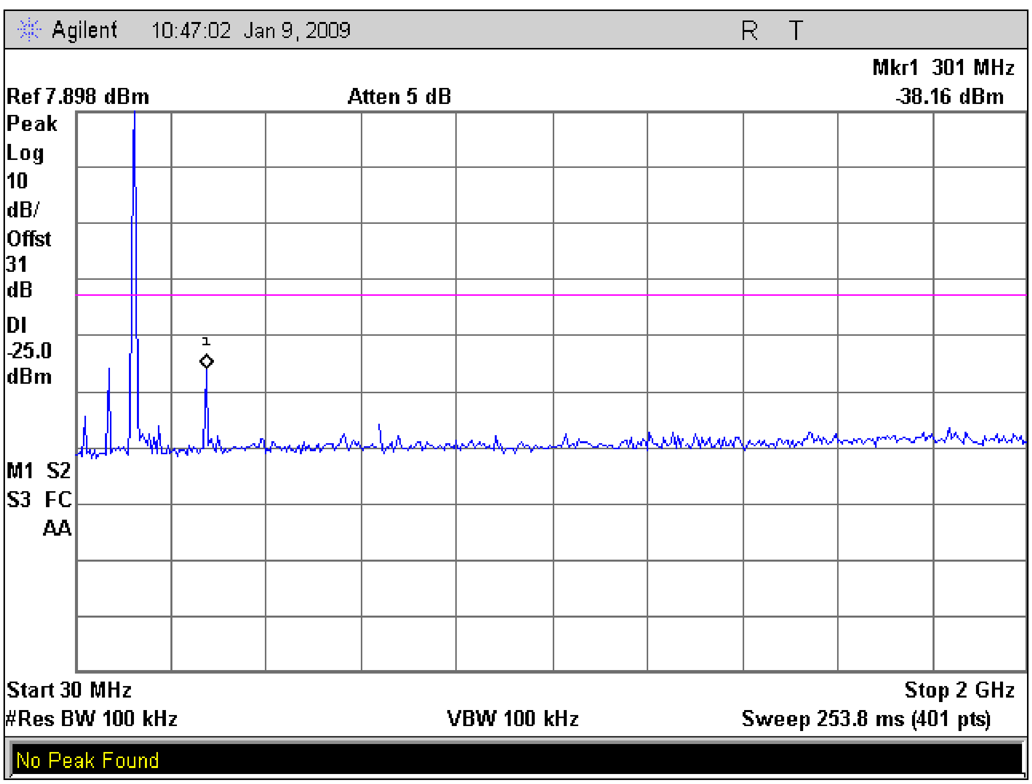
Tuned Frequency MHz	Spurious Frequency MHz	Measured Spurious Level (dBm)	Specification Limit (*dBm)	Result
138	414	-42.71	-25	Pass
150	301	-35.16	-25	Pass
174	350	-48.62	-25	Pass

138 MHz is for Industry Canada only.

138 MHz High Power



150 MHz High Power



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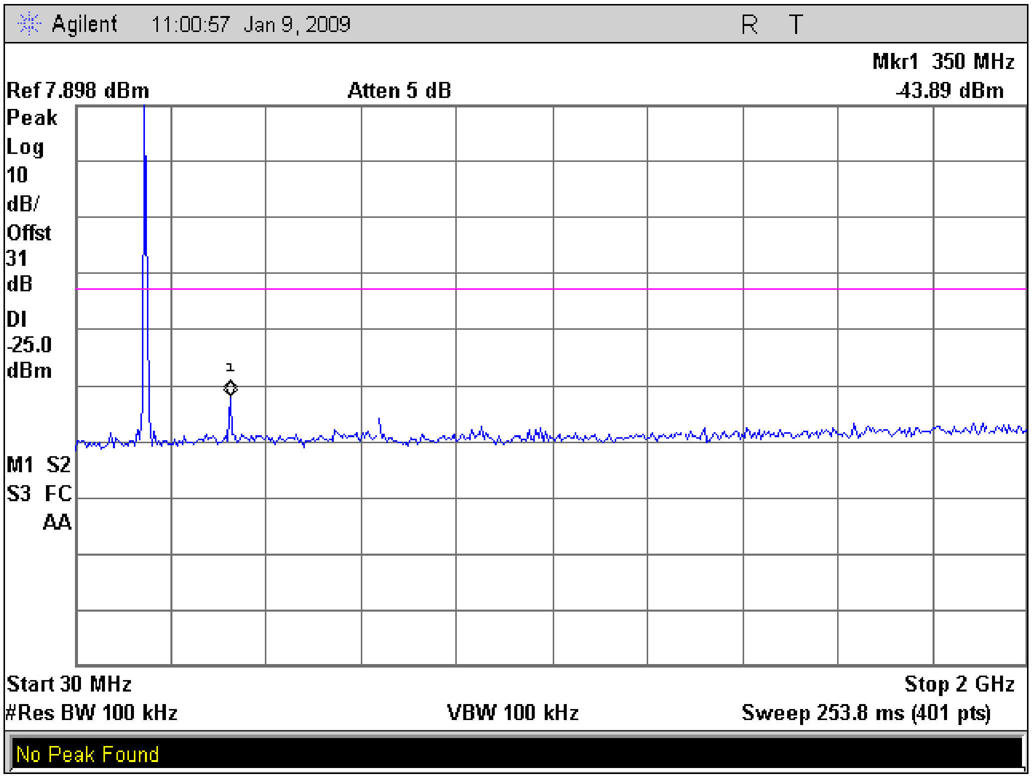
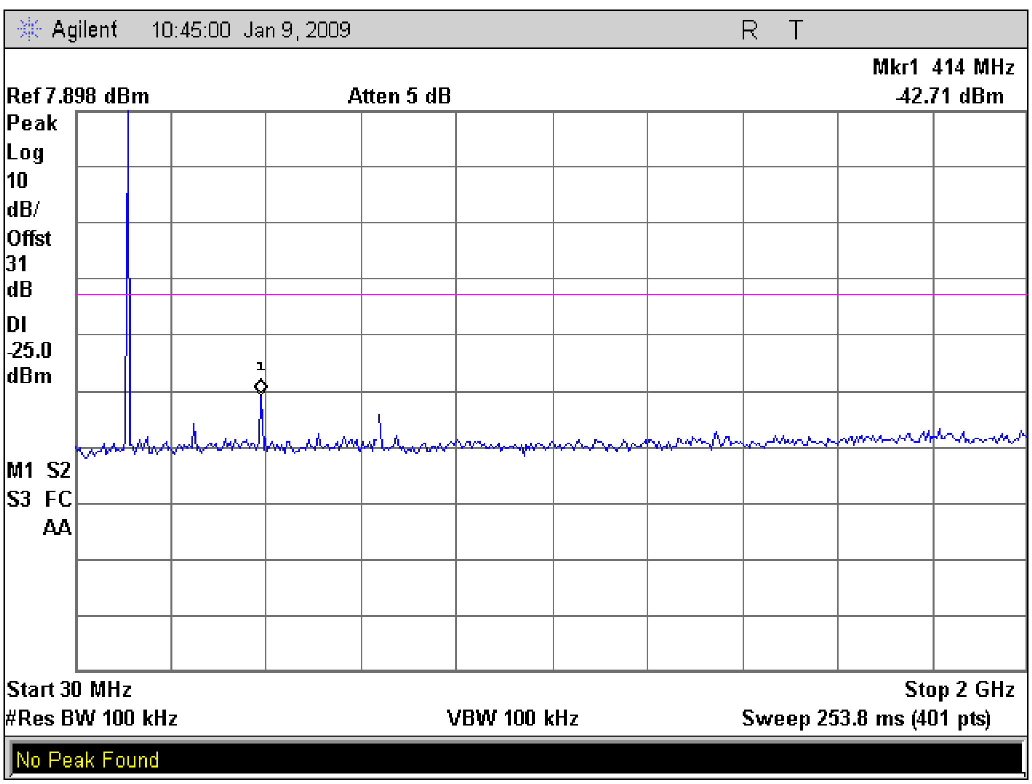
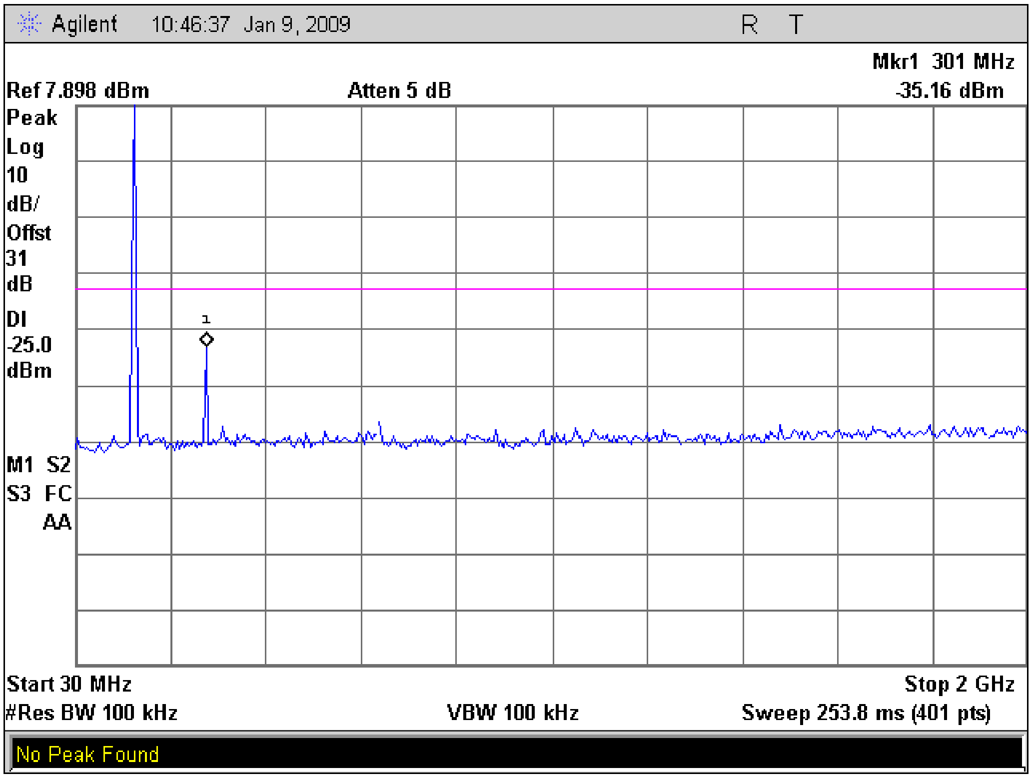
174 MHz High Power



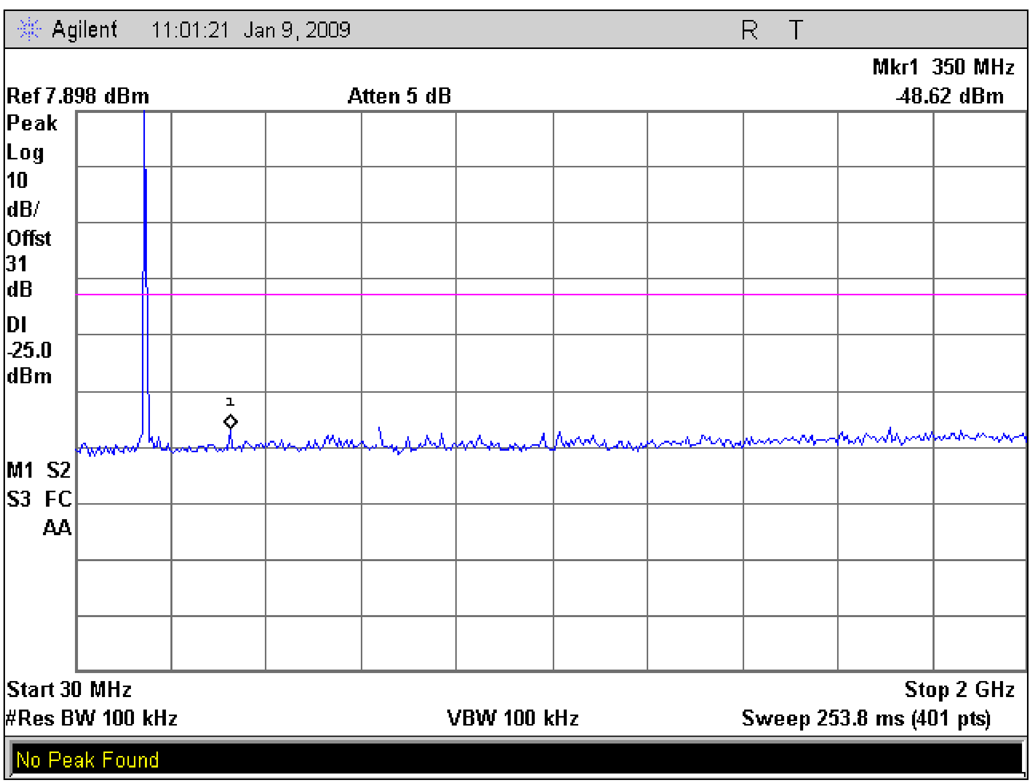
138 MHz Low Power



150 MHz Low Power



1741 MHz Low Power



Name of Test:	Field Strength of Spurious Radiation	
Specification:	2.1053	**Engineer: J Erhard**
Test Equipment Utilized:	i00005, i00037, i00039, i00042, i00048, i00049, i00088, i00089, I00091, i00103, i00266	**Test Date: 1/14/2009**

Test Procedure

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
3) Sweep Speed ≤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 ± 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.

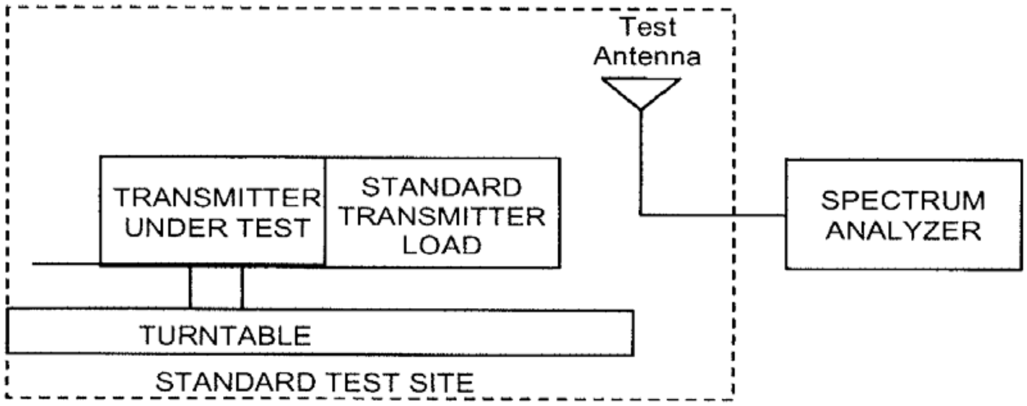
L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps J) and K) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.

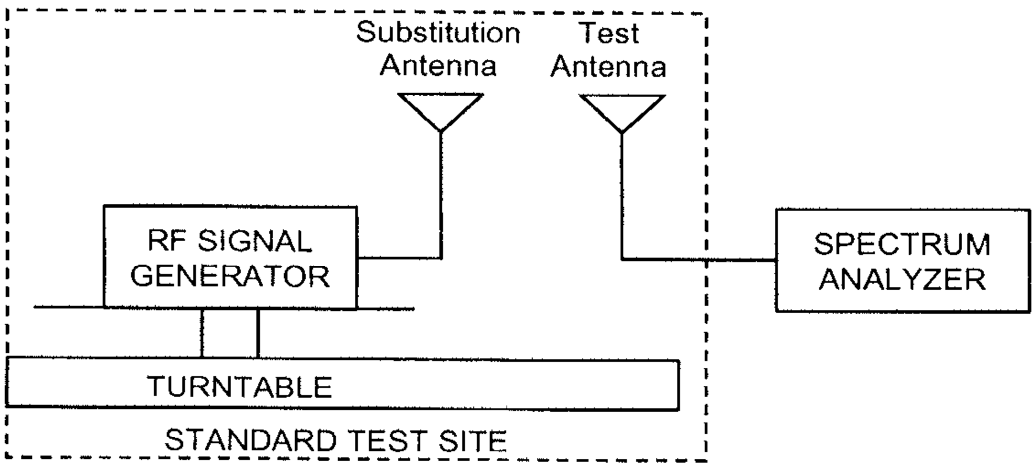
M) The levels recorded in step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions dB = **$10\log_{10}$(TX power in watts/0.001) – the levels in step l)**

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

Test Setup


Test
Antenna
TRANSMITTER
UNDER TEST
STANDARD
TRANSMITTER
LOAD
SPECTRUM
ANALYZER
TURNTABLE
STANDARD TEST SITE


Substitution
Antenna
Test
Antenna
RF SIGNAL
GENERATOR
SPECTRUM
ANALYZER
TURNTABLE
STANDARD TEST SITE

Test Results

138 MHz High Power

Emission Frequency (MHz)	Measured Level (dBm)	Correction Factor (dB)	Corrected Value (dBm)	Limit (dBm) ERP/EIRP	Result
276.027	-53.5	16.3	-37.2	-25	Pass
414.033	-54.9	19.4	-35.5	-25	Pass
552.033	-63.2	22.4	-40.8	-25	Pass

150 MHz High Power

Emission Frequency (MHz)	Monitored Level (dBm)	Correction Factor (dB)	Corrected Value (dBm)	Limit (dBm) ERP/EIRP	Result
300.036	-53.4	16.5	-36.9	-25	Pass
450.041	-54.0	19.4	-34.6	-25	Pass
600.041	-58.1	23.1	-35.0	-25	Pass

174 MHz High Power

Emission Frequency (MHz)	Monitored Level (dBm)	Correction Factor (dB)	Corrected Value (dBm)	Limit (dBm) ERP/EIRP	Result
348.029	-57.9	17.4	-40.5	-25	Pass
522.033	-53.9	21.0	-32.9	-25	Pass
696.042	-59.7	24.2	-35.5	-25	Pass

138 MHz Low Power

Emission Frequency (MHz)	Measured Level (dBm)	Correction Factor (dB)	Corrected Value (dBm)	Limit (dBm) ERP/EIRP	Result
276.031	-49.1	16.3	-32.8	-25	Pass
414.051	-56.4	19.4	-37.0	-25	Pass
552.033	-55.8	22.4	-33.4	-25	Pass

150 MHz Low Power

Emission Frequency (MHz)	Monitored Level (dBm)	Correction Factor (dB)	Corrected Value (dBm)	Limit (dBm) ERP/EIRP	Result
300.033	-45.0	16.5	-28.5	-25	Pass
450.033	-61.7	19.4	-42.3	-25	Pass
600.038	-55.8	23.1	-32.7	-25	Pass

174 MHz Low Power

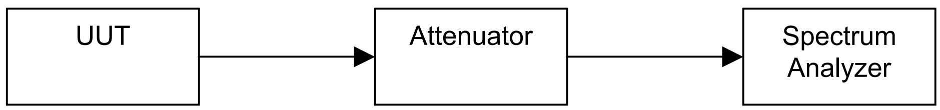
Emission Frequency (MHz)	Monitored Level (dBm)	Correction Factor (dB)	Corrected Value (dBm)	Limit (dBm) ERP/EIRP	Result
348.037	-54.3	17.4	-36.9	-25	Pass
522.029	-58.3	21.0	-37.3	-25	Pass
696.096	-59.8	24.2	-35.6	-25	Pass

No other emissions were detected. All emissions were greater than –25 dBm.

Name of Test: Emission Masks (Occupied Bandwidth)
Specification: 90.210 **Engineer: J Erhard**
Test Equipment Utilized: i00005, i00321, i00331 **Test Date: 1/12/2009**

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. A modulation frequency of 2.5 kHz at a level of 500 mVPP was input into the UUT for the analog tests and an internal test pattern was utilized for the digital input.

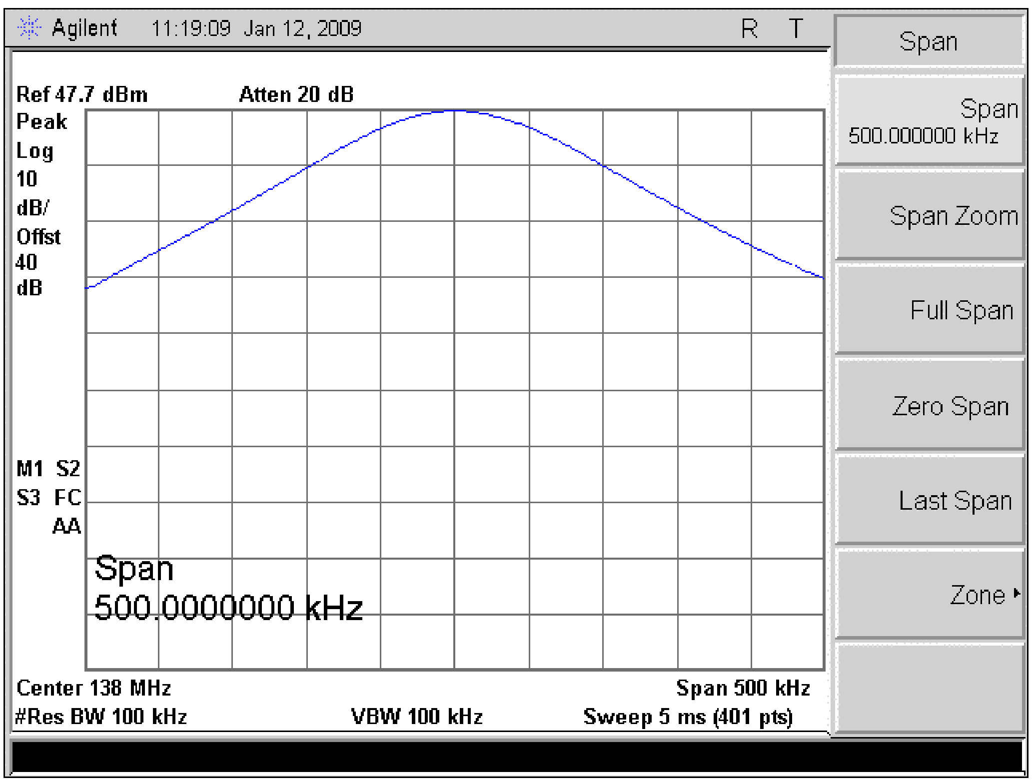
Test Setup



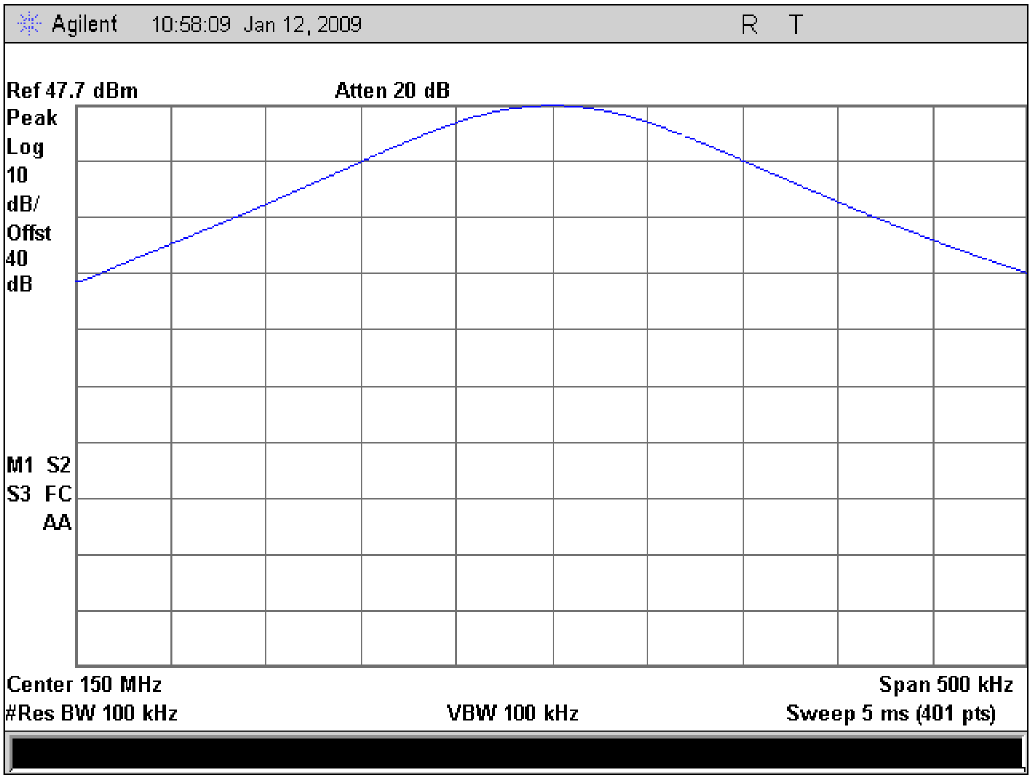
Occupied Bandwidth Plots

High Power Reference

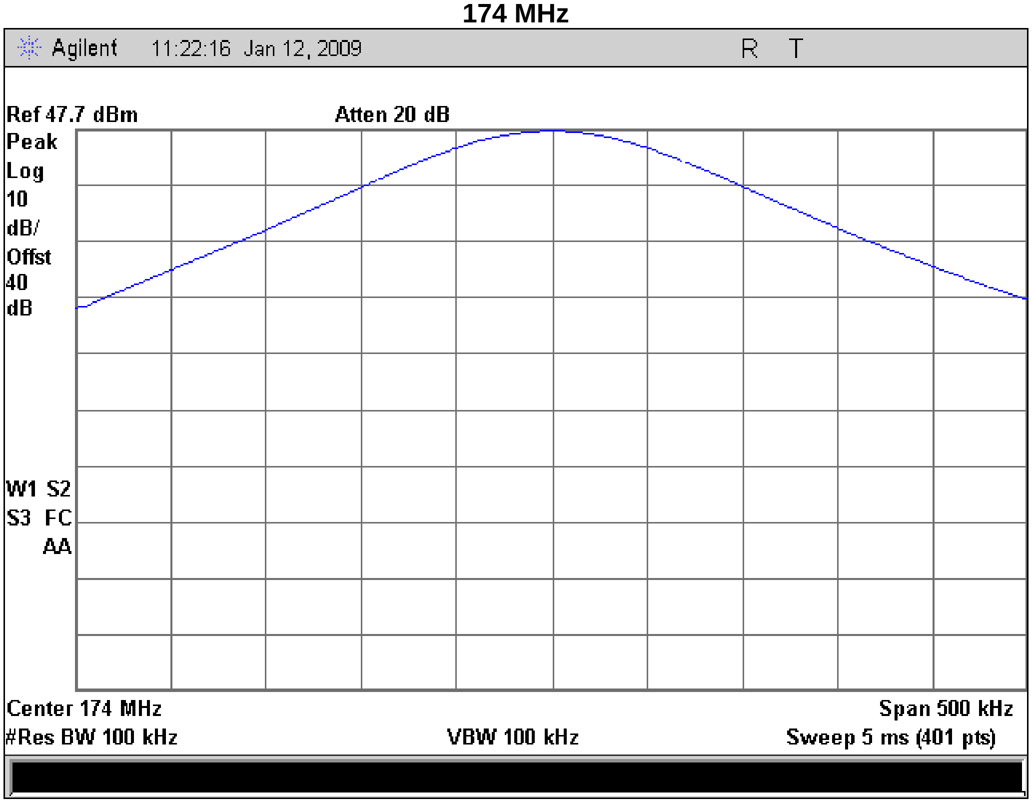
138 MHz



150 MHz

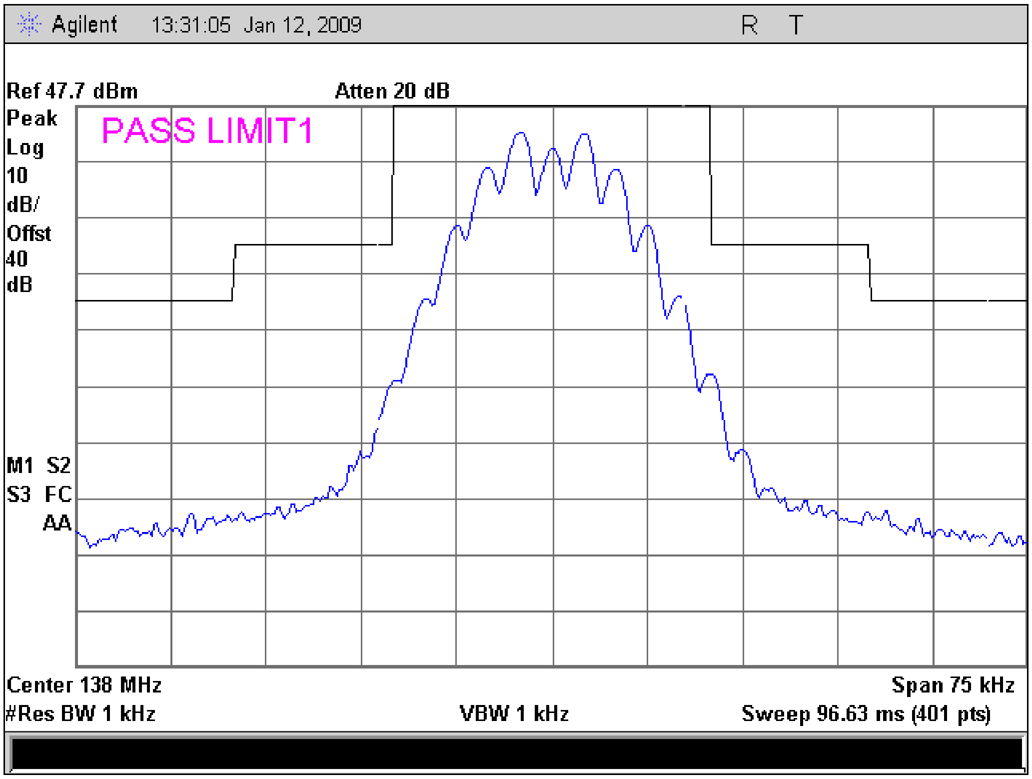


174 MHz

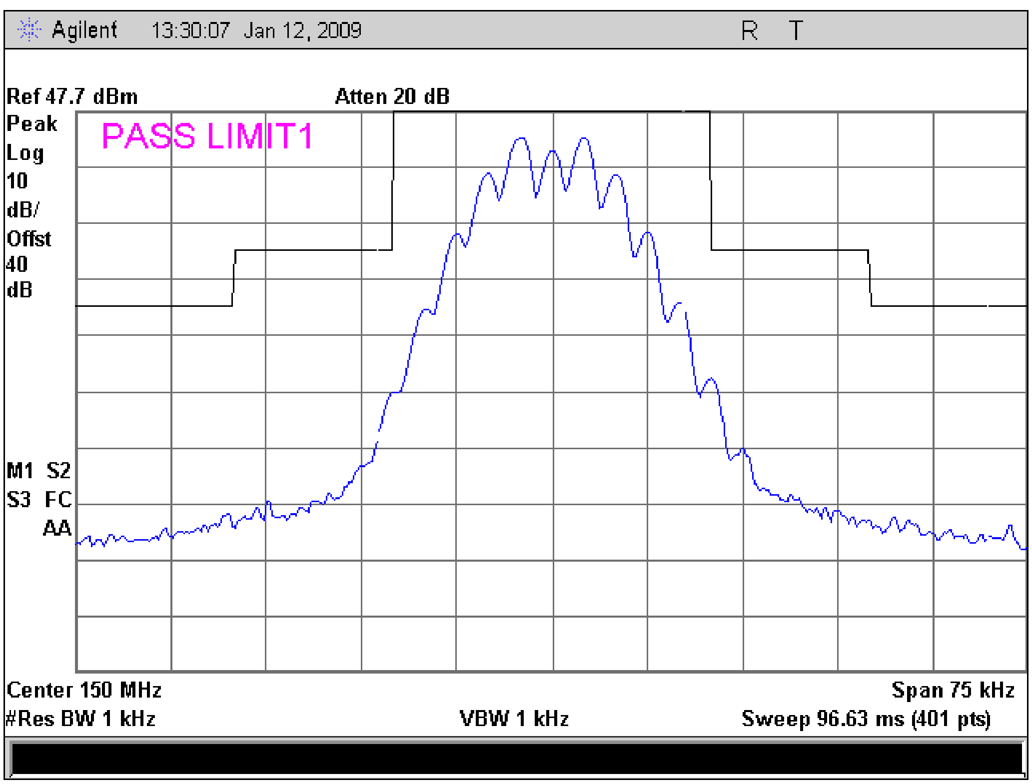


25 kHz Analog Input High Power

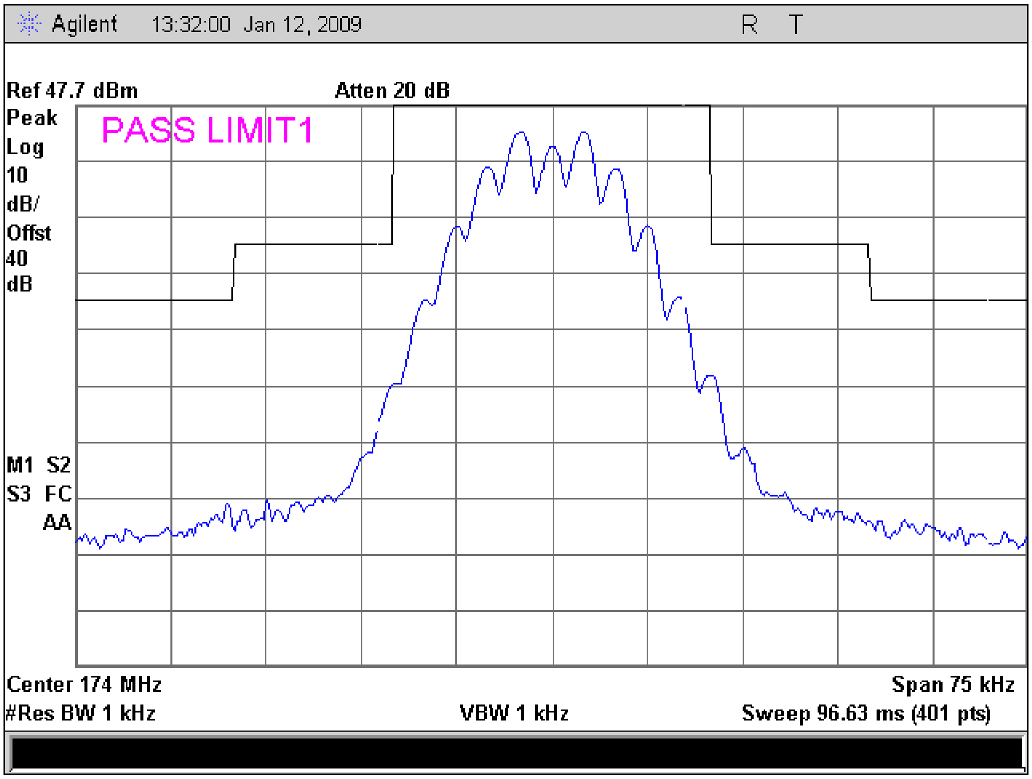
138 MHz Mask B



150 MHz Mask B

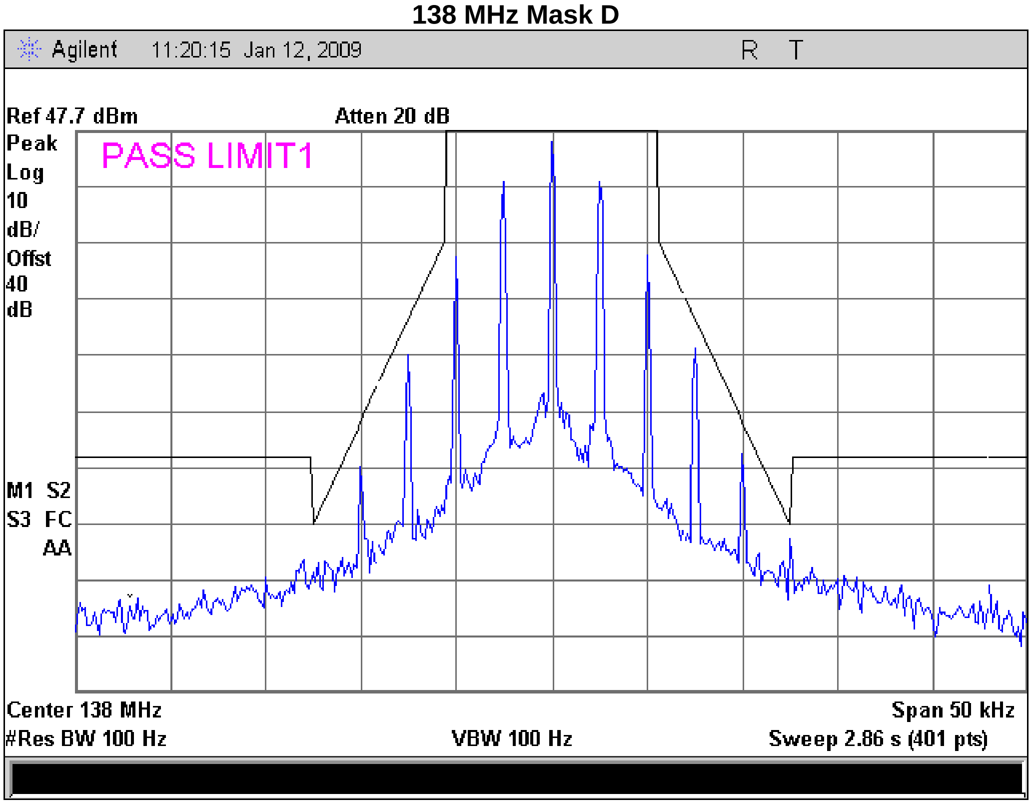


174 MHz Mask B

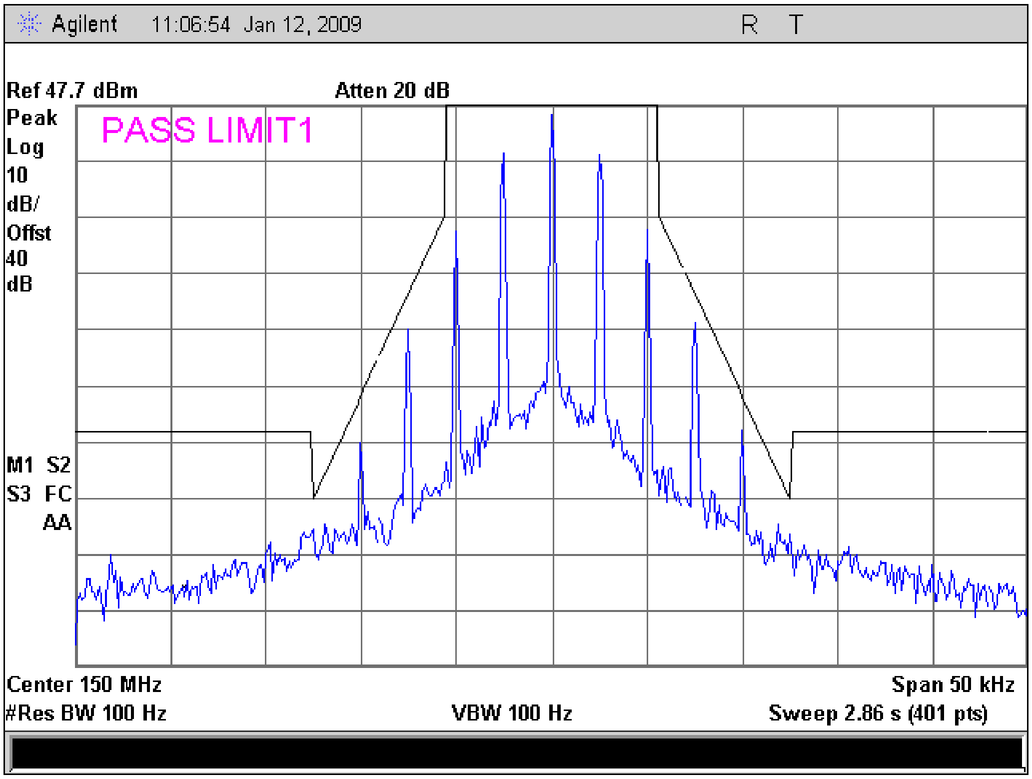


12 kHz Analog Input High Power

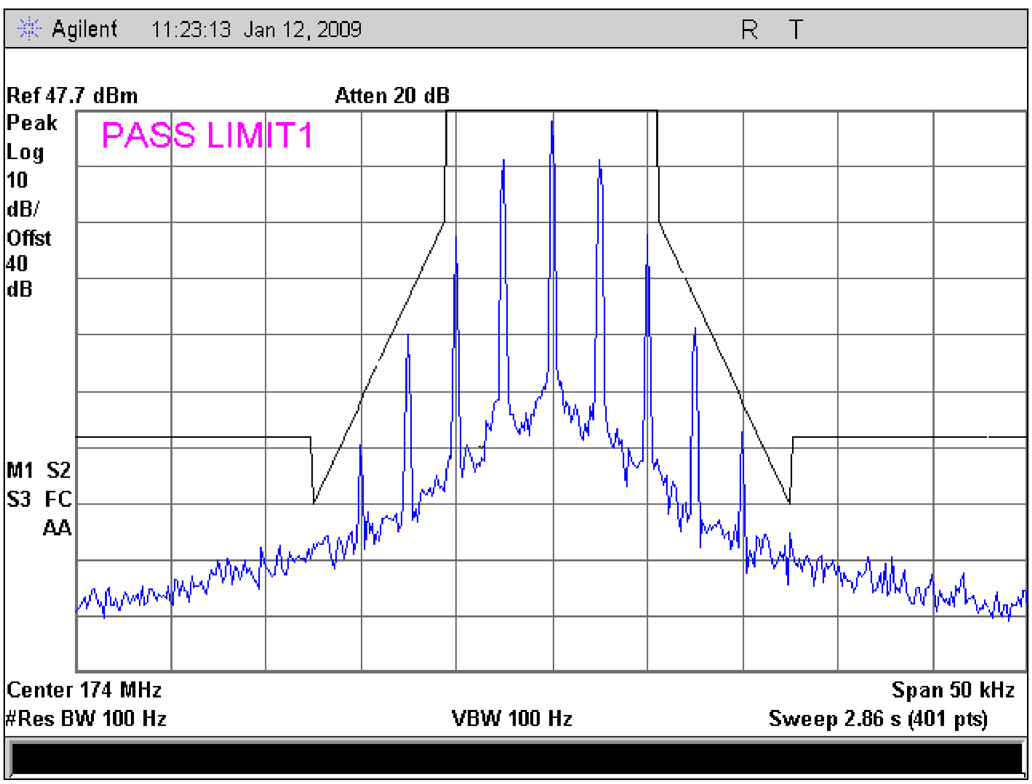
138 MHz Mask D



150 MHz Mask D

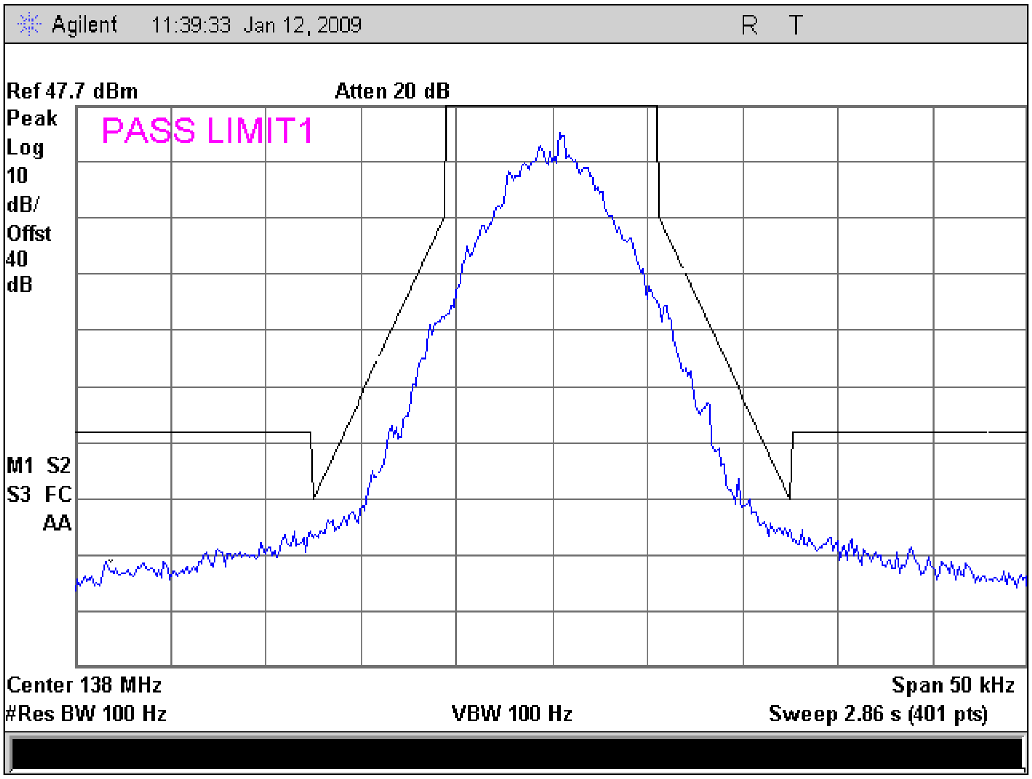


174 MHz Mask D

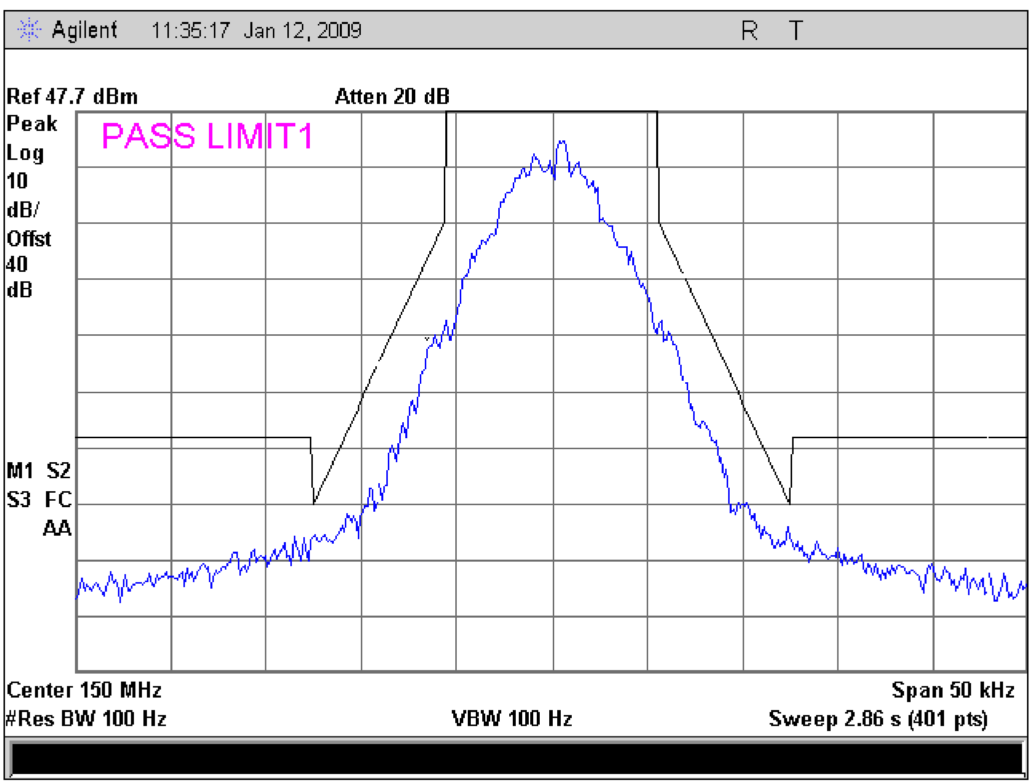


12 kHz Digital Input High Power

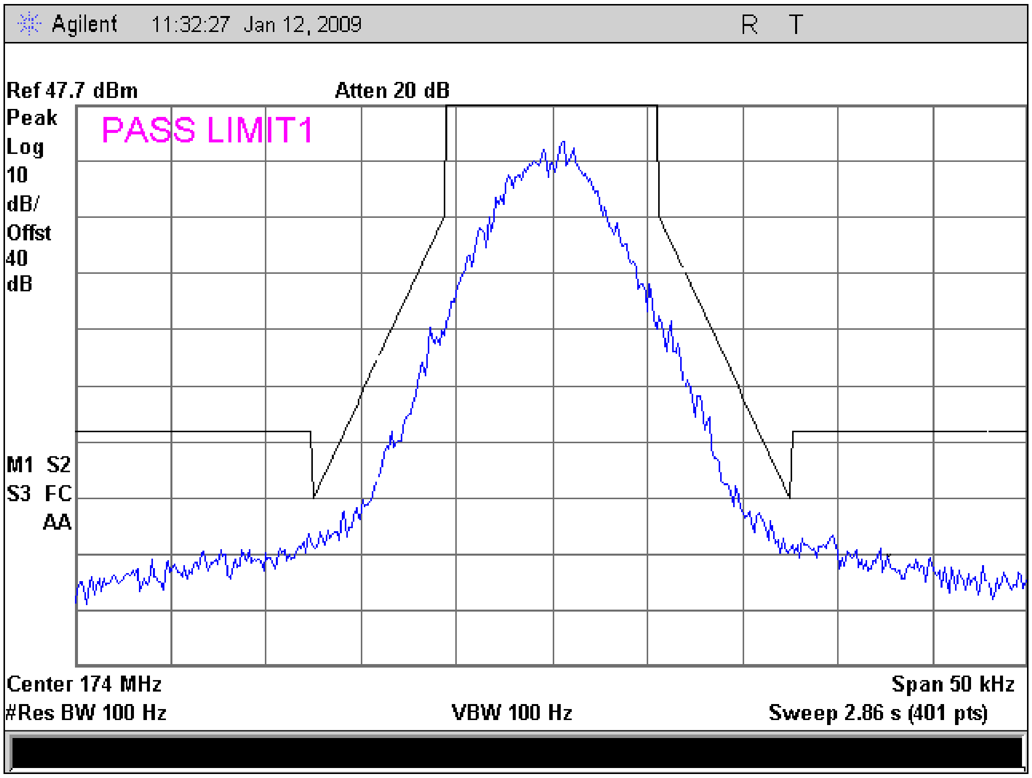
138 MHz Mask D



150 MHz Mask D

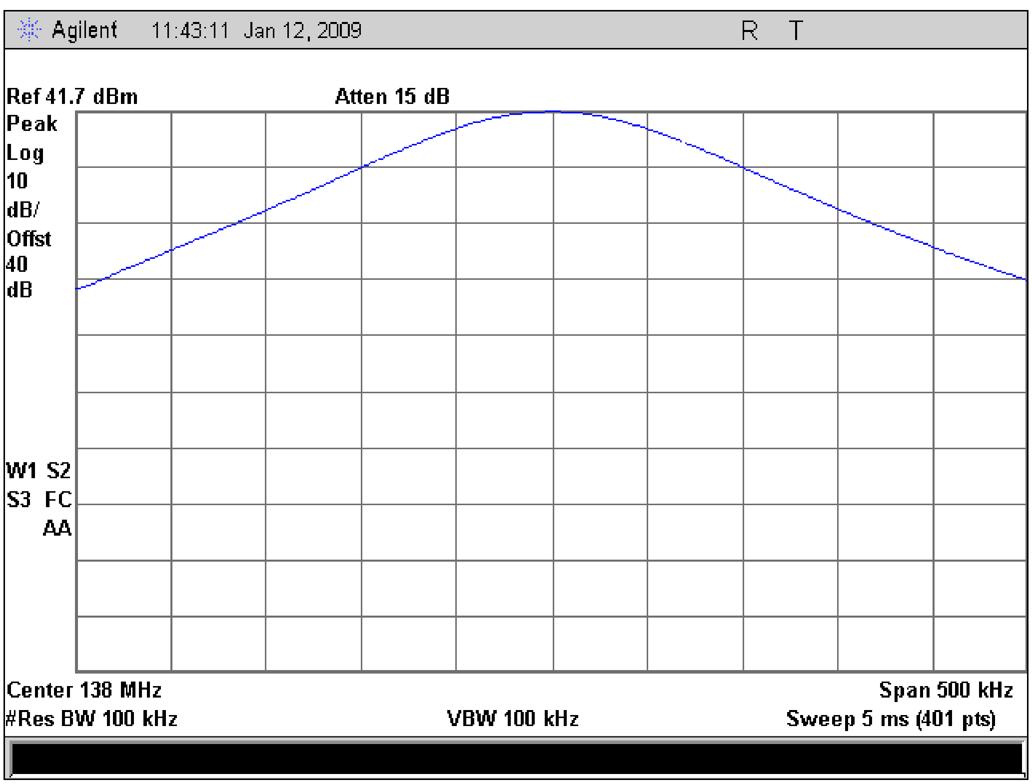


174 MHz Mask D

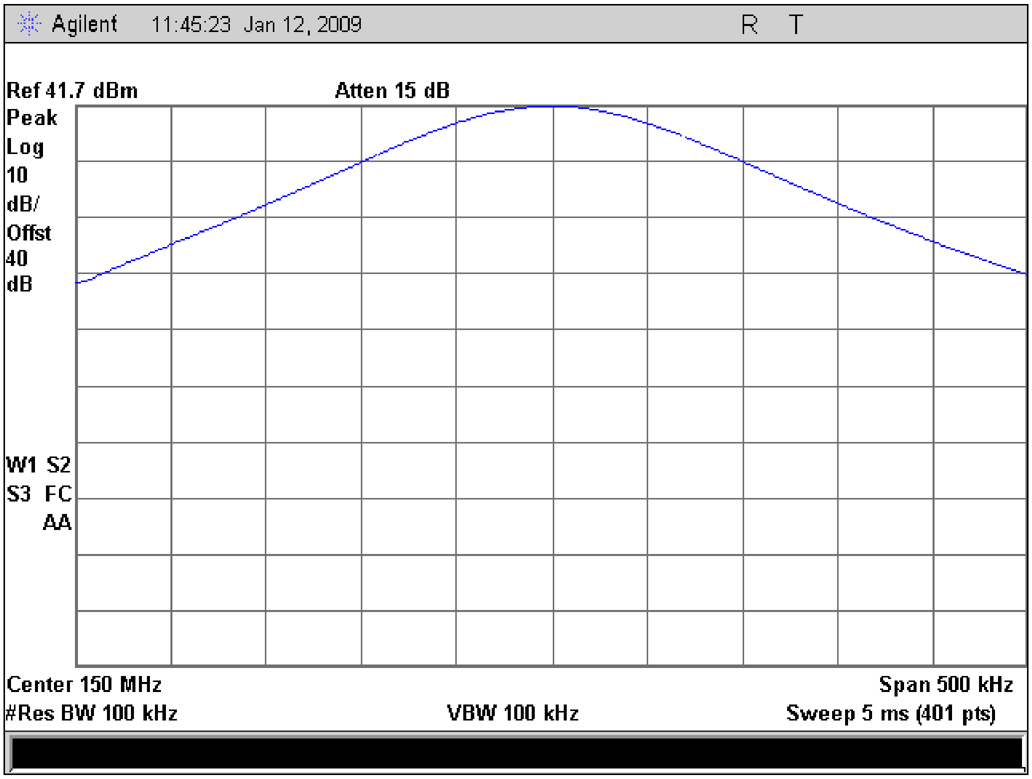


Low Power Reference

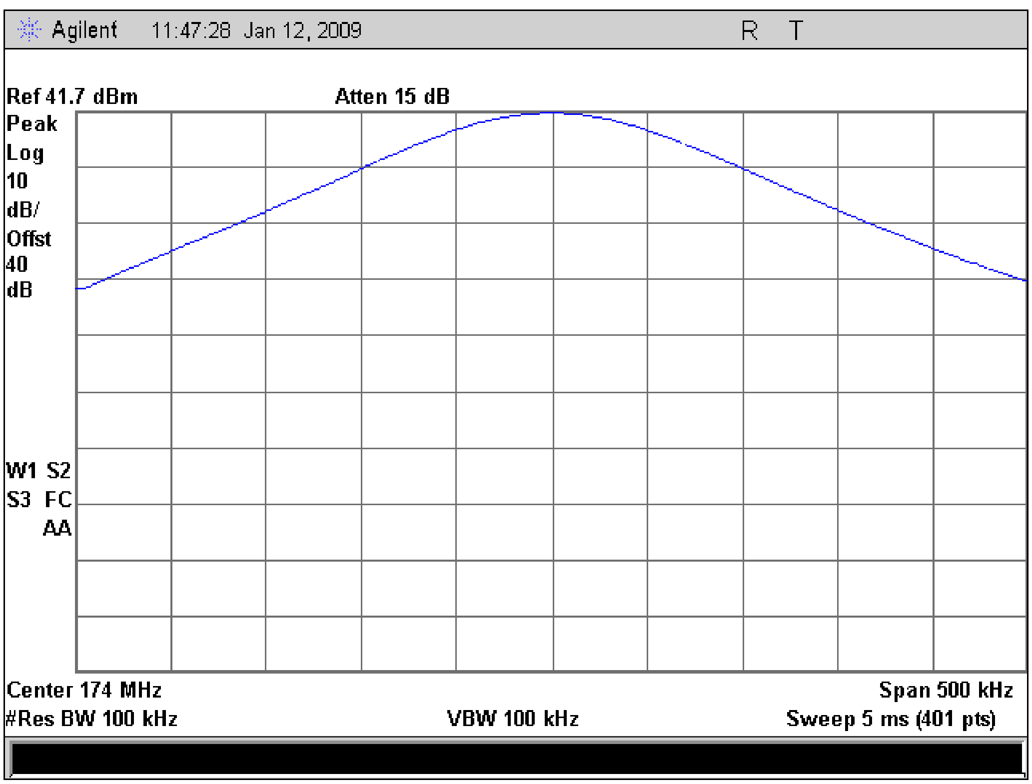
138 MHz



150 MHz

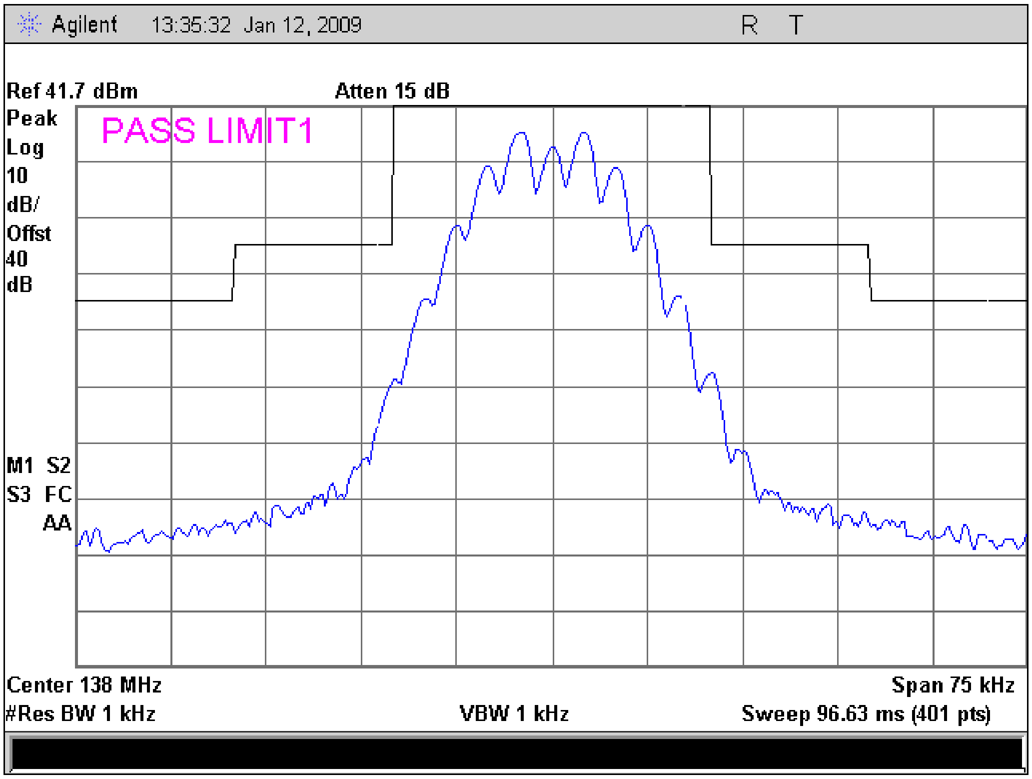


174 MHz

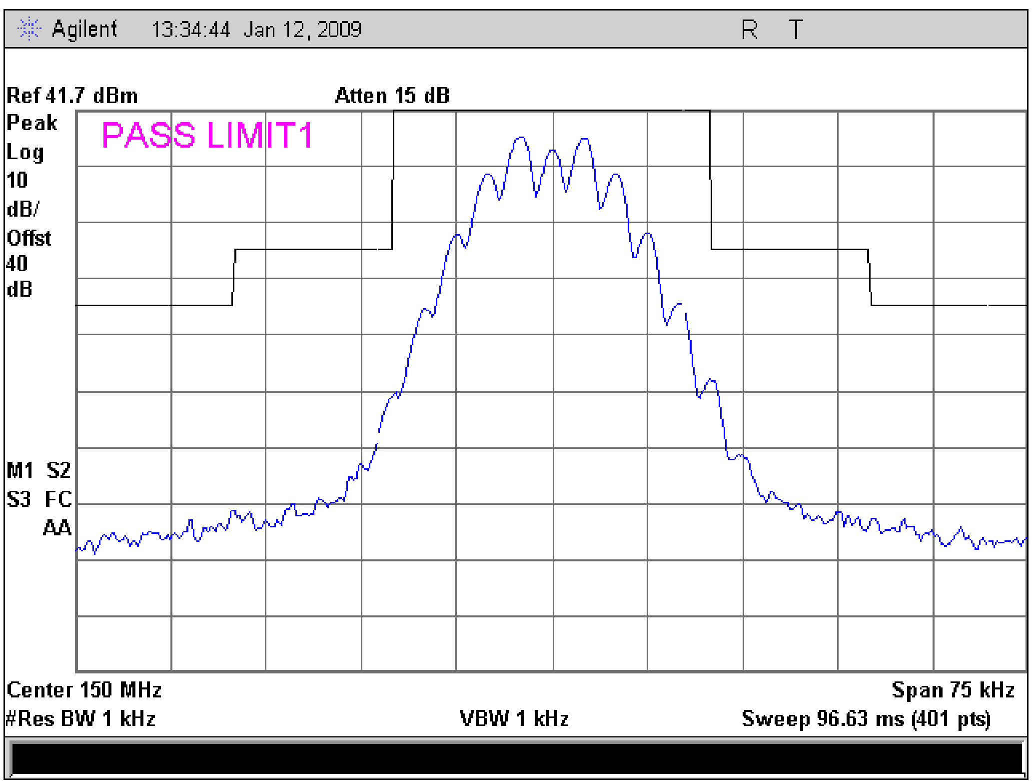


25 kHz Analog Input Low Power

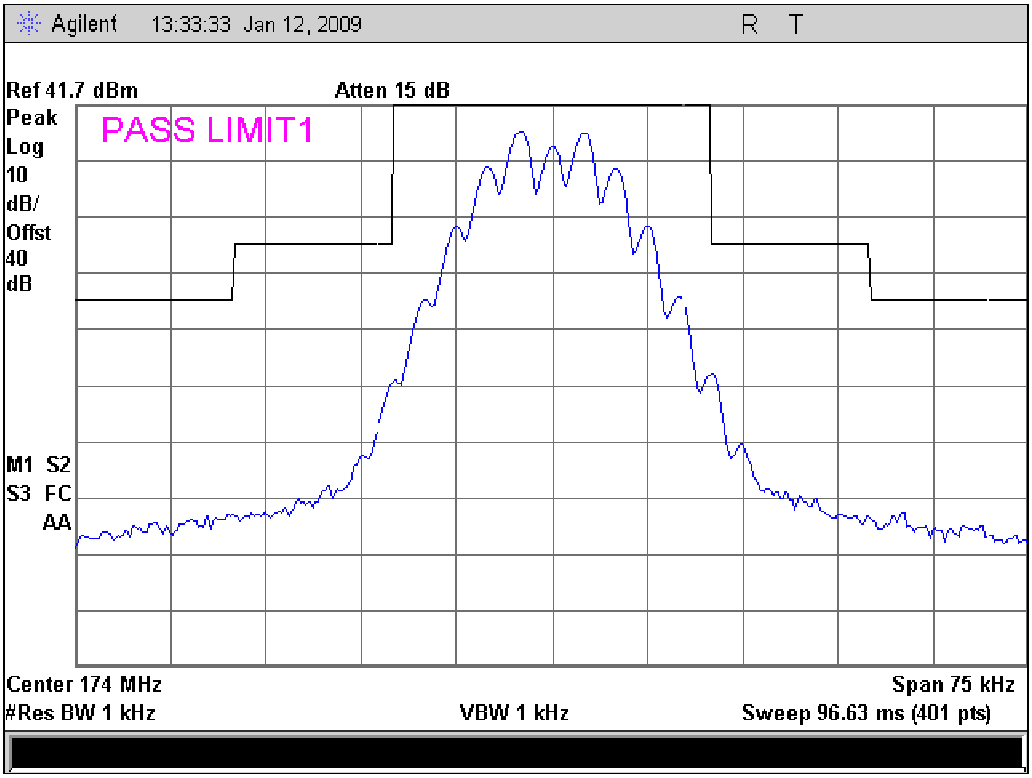
138 MHz Mask B



150 MHz Mask B

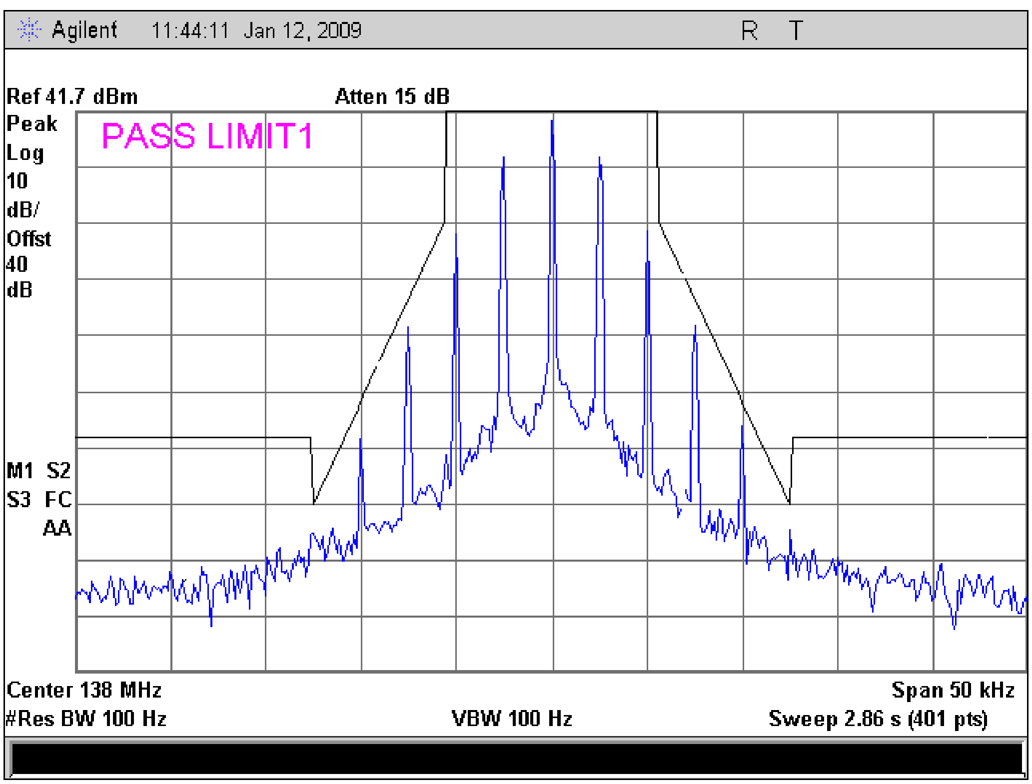


174 MHz Mask B

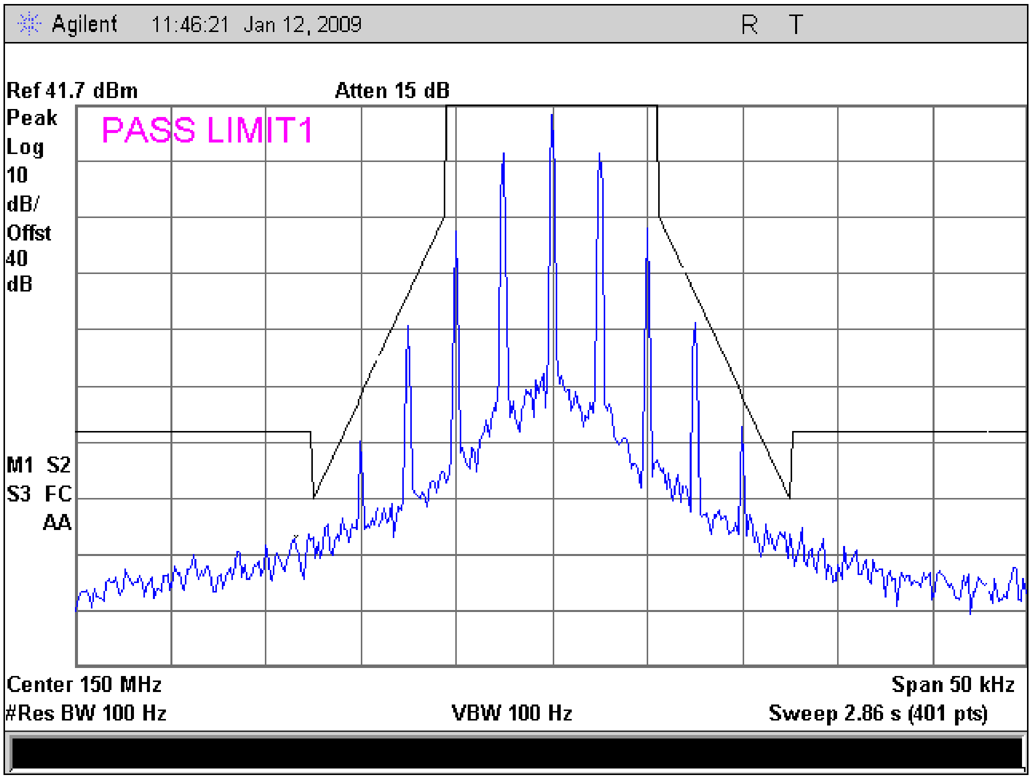


12 kHz Analog Input Low Power

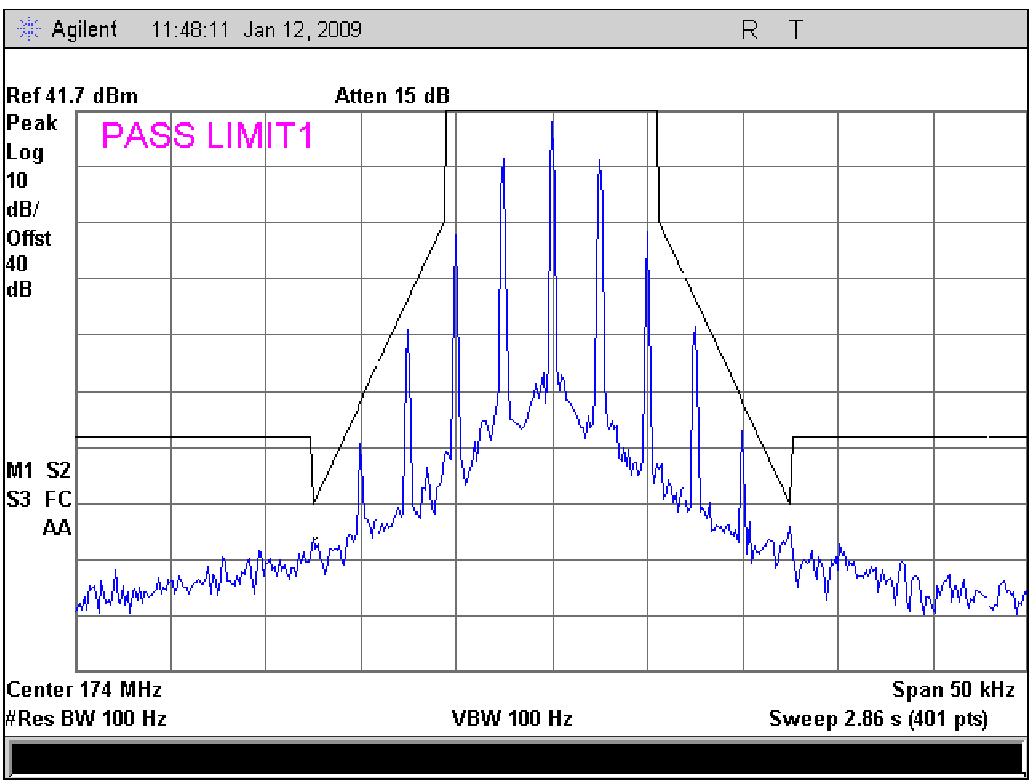
138 MHz Mask D



150 MHz Mask D

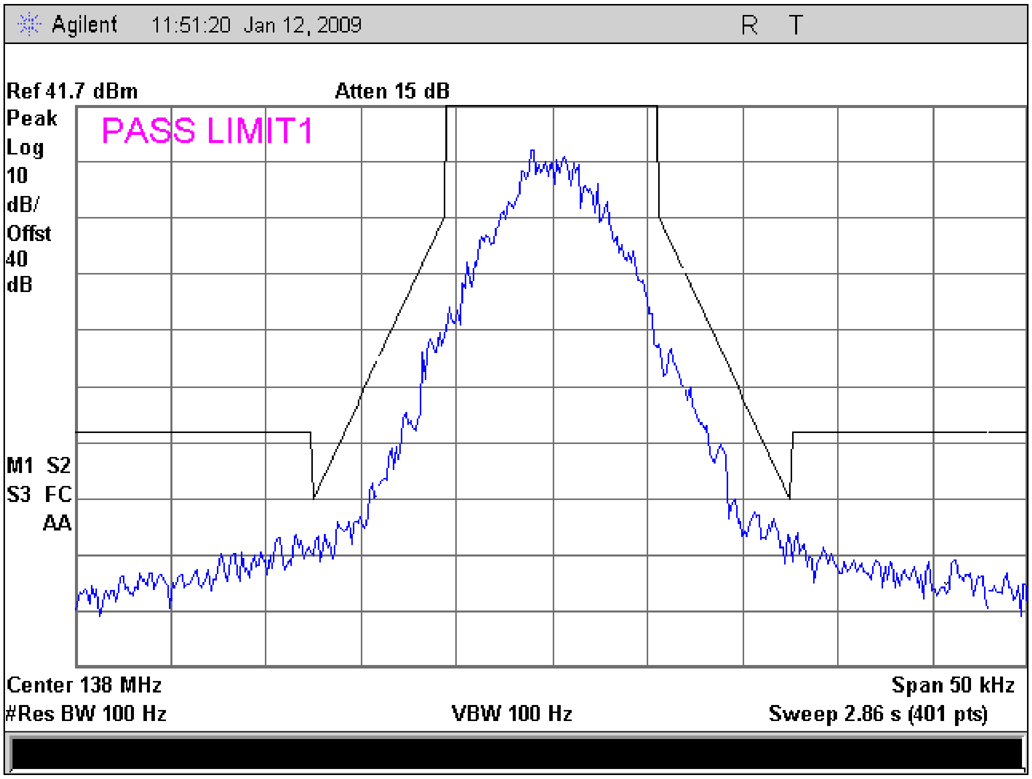


174 MHz Mask D

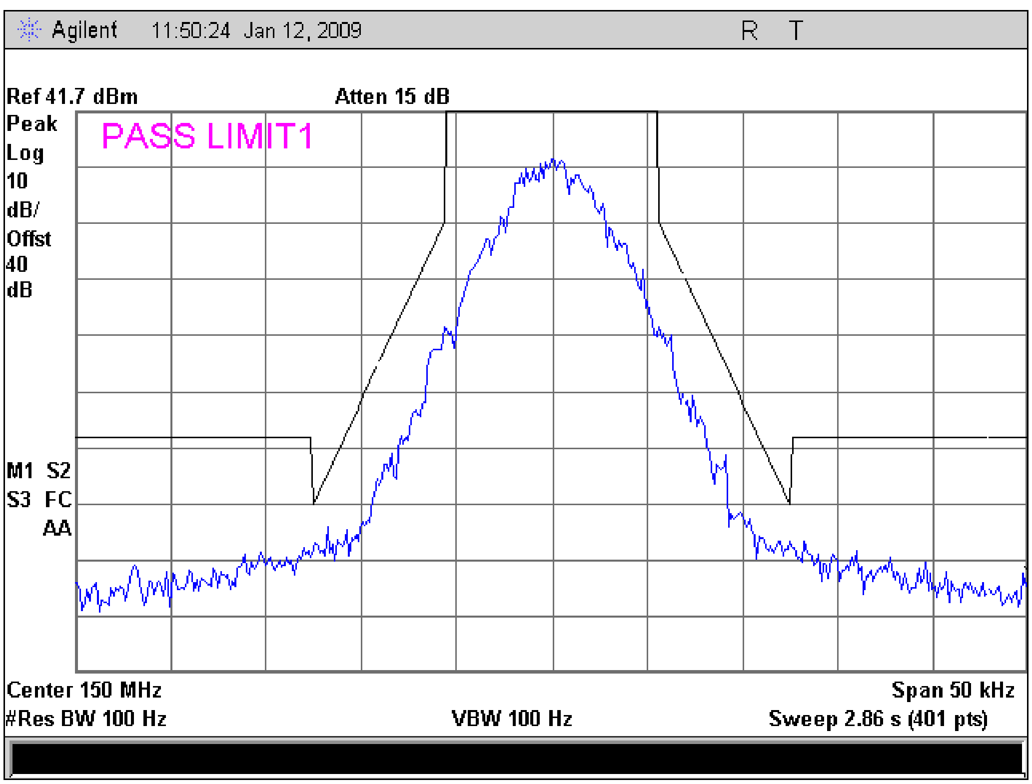


12 kHz Digital Input Low Power

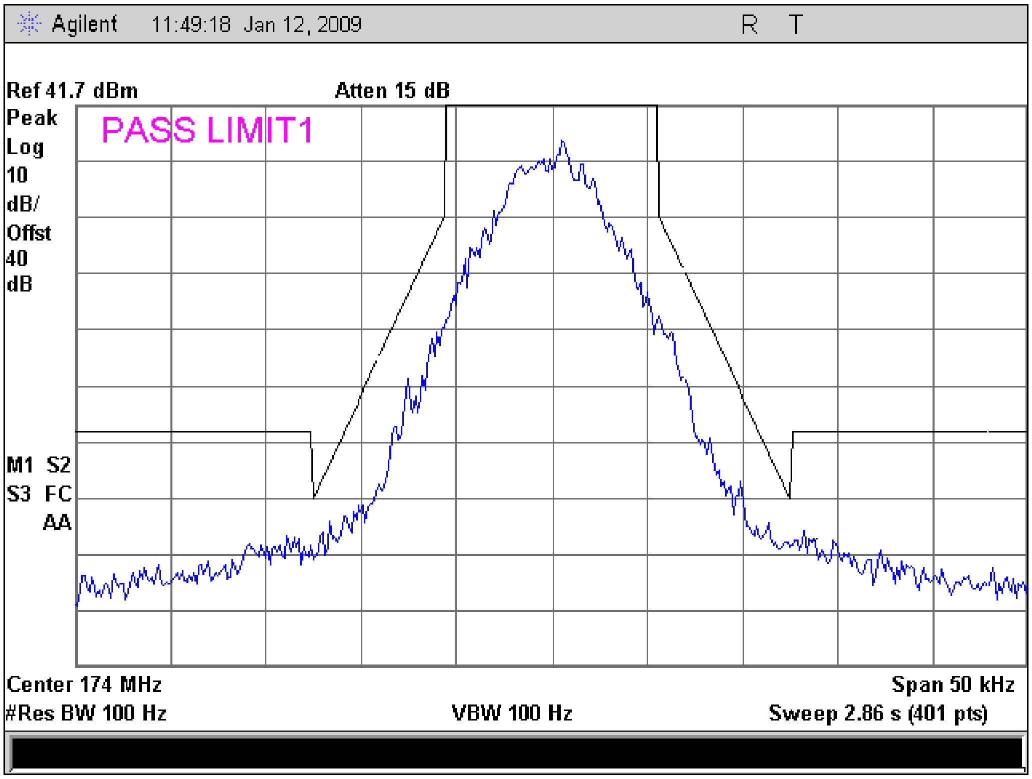
138 MHz Mask D



150 MHz Mask D



174 MHz Mask D



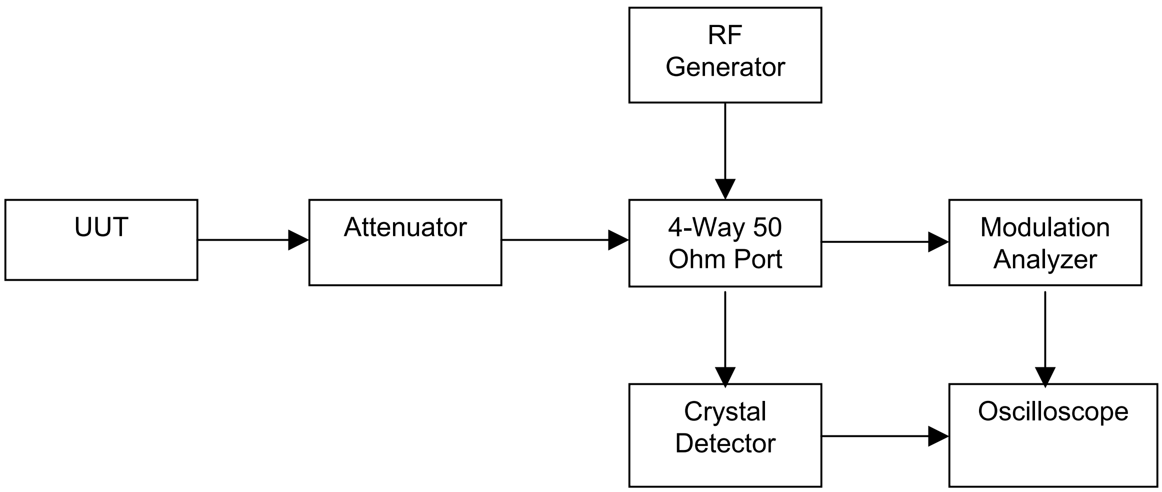
Name of Test: Transient Frequency Behavior
Specification: 90.214
Test Equipment Utilized: i00005, i00159, i00318, i00321, i00324

Engineer: J Erhard
Test Date: 1/14/2009

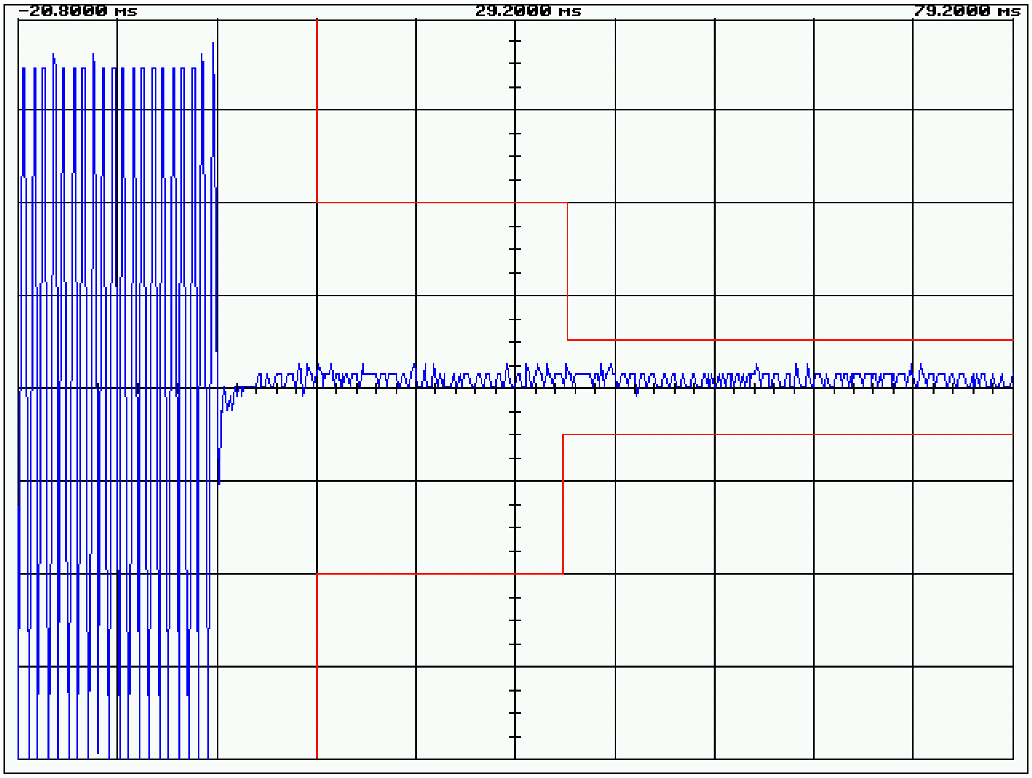
Measurement Procedure

The EUT was setup as shown on the attached page, following TIA-603-C steps a, b, and c as a *guide*. An RF signal generator modulated with a 1 kHz tone and the deviation set to the bandwidth under test tuned to the same frequency as the UUT at a level 30 dBc. An oscilloscope setup using TIA-603 steps j and k was utilized to monitor the carrier on and off time.

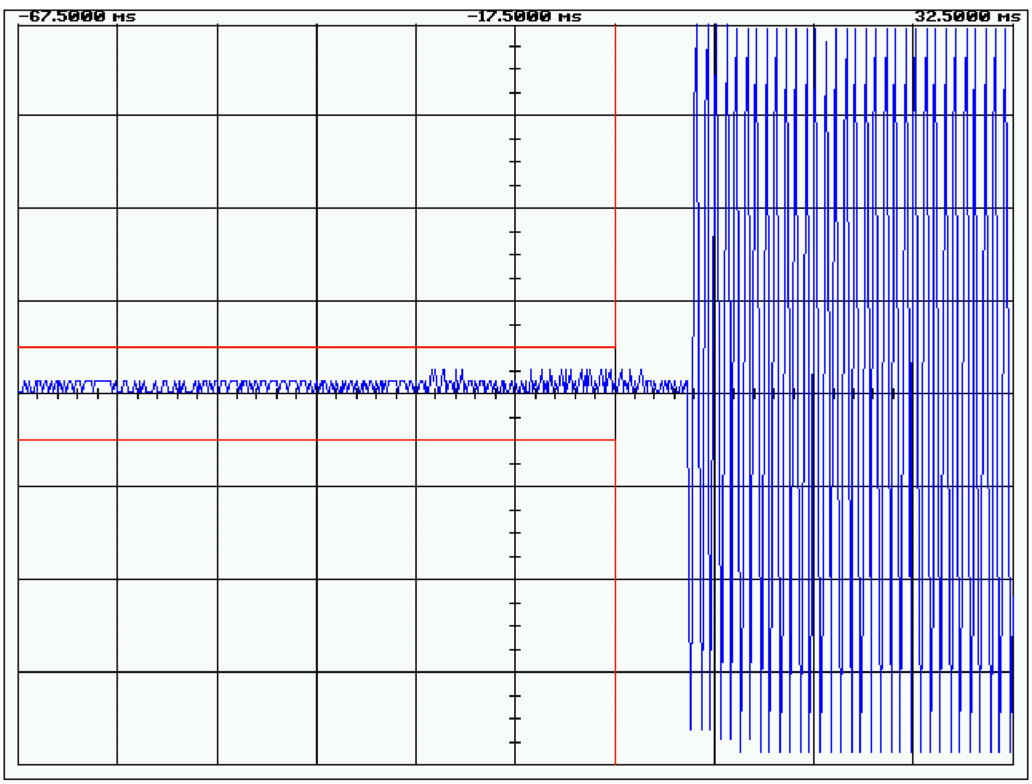
Test Setup



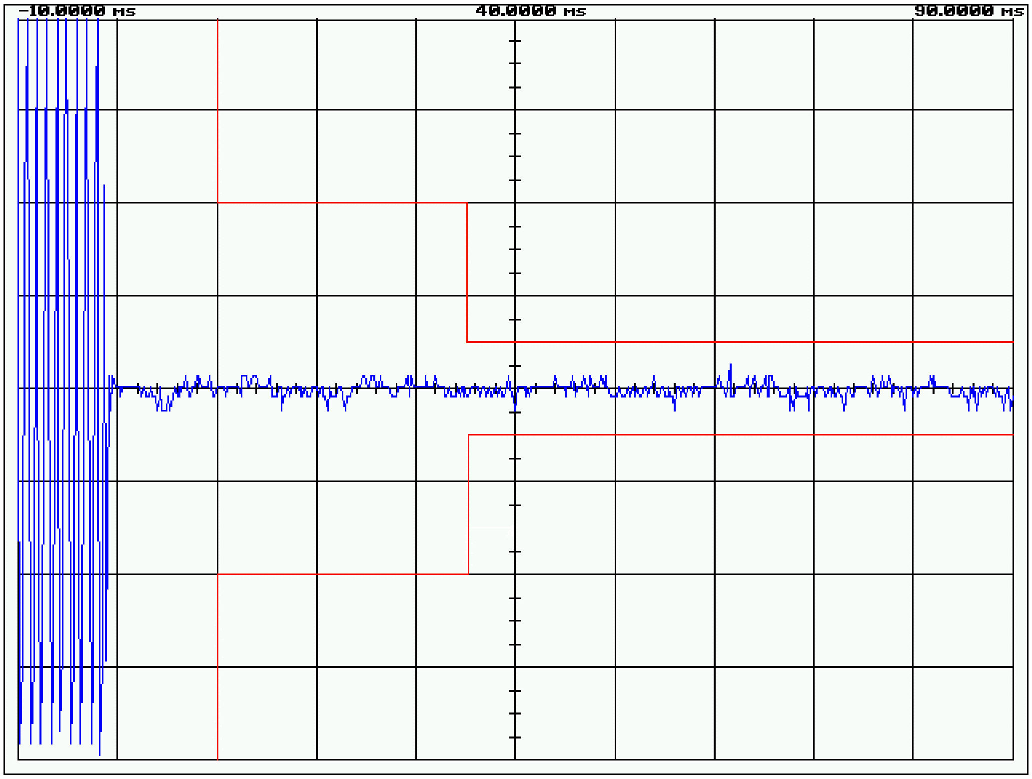
Test Results 25 kHZ On Time



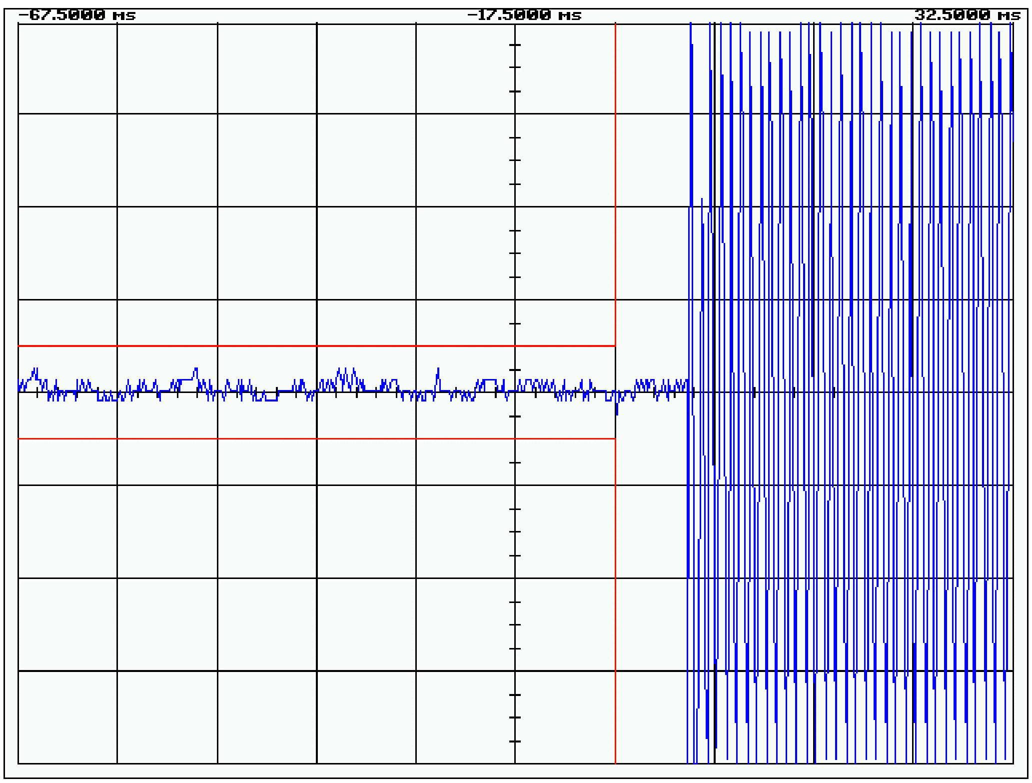
Test Results 25 kHZ Off Time



Test Results 12.5 kHZ On Time



Test Results 12.5 kHZ Off Time

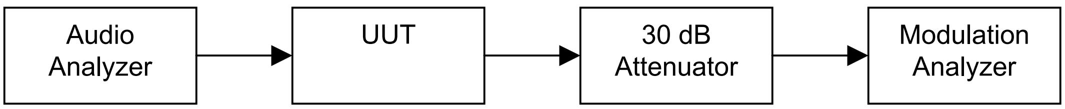


Name of Test: Audio Low Pass Filter (Voice Input)
2.1047 2.1047 **Engineer: J Erhard**
Test Equipment Utilized: i00005, i00321, i00324 **Test Date: 1/14/2008**

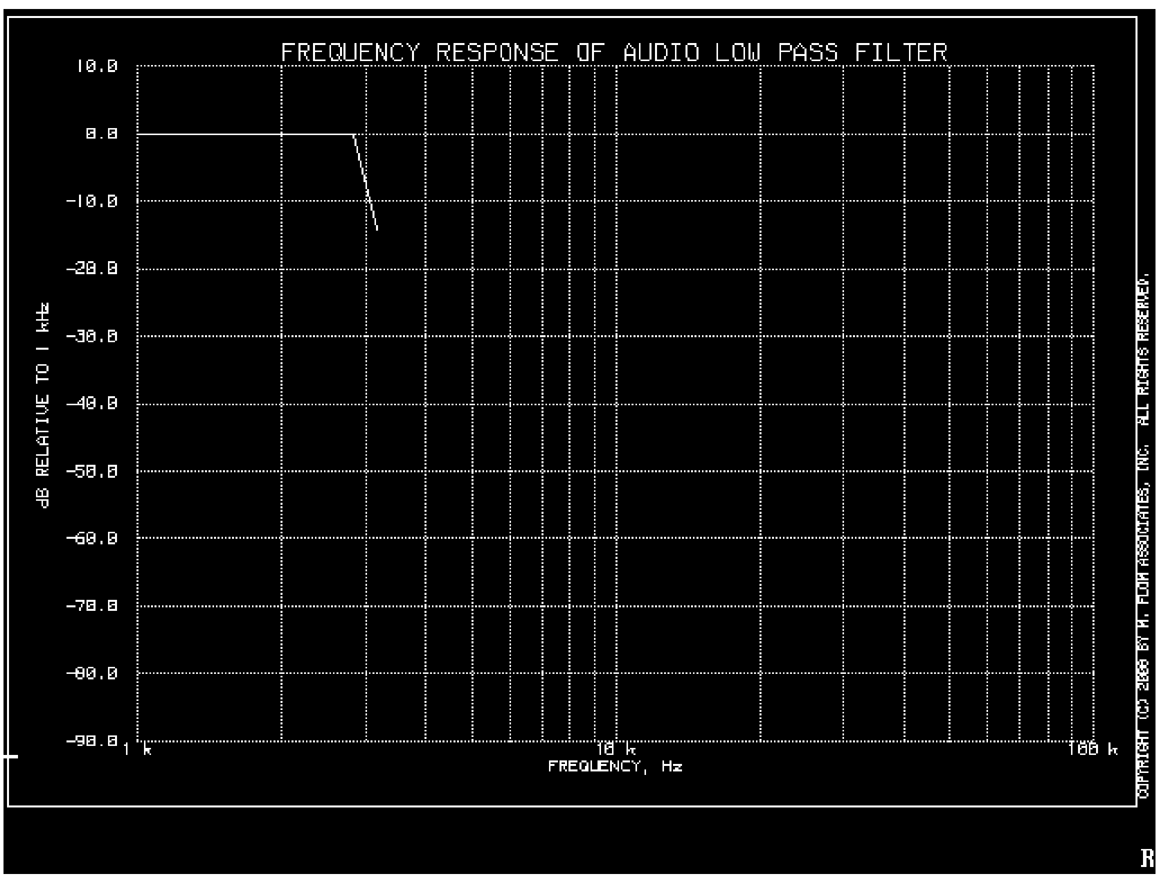
Measurement Procedure

A) The UUT 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



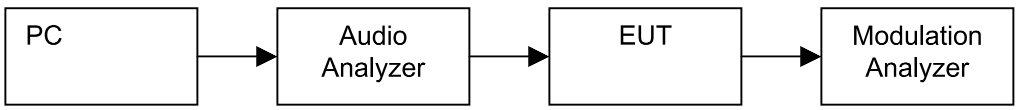
This unit is a digital radio and the roll-off for the filter is very linear in the operational band and sharp out of the band,

Name of Test:	Audio Frequency Response	
Specification:	2.1047	**Engineer: J Erhard**
Test Equipment Utilized:	i00005, i00321, i00324	**Test Date: 1/14/2009**

Measurement Procedure

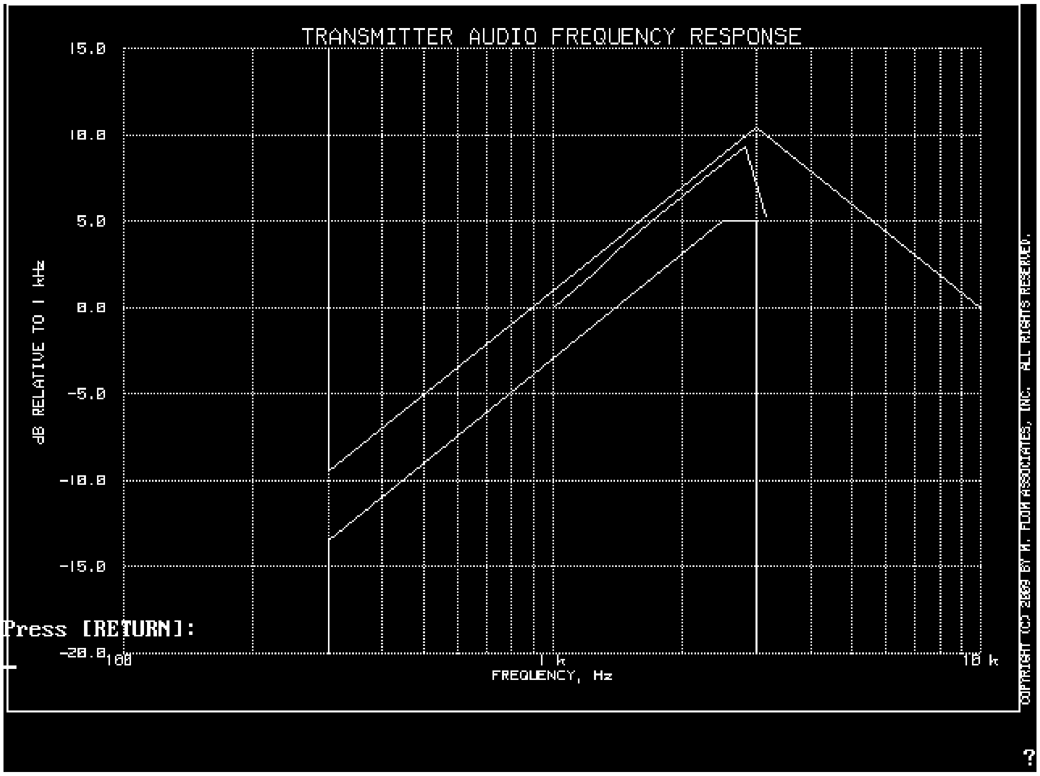
A) The EUT and test equipment were set up as shown below.
B) The audio signal generator was connected to the audio input circuit/microphone of the EUT.
C) The audio signal input was adjusted to obtain 20% modulation at 1 kHz, and this point was taken as the 0 dB reference level.
D) With input levels 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.

Test Setup

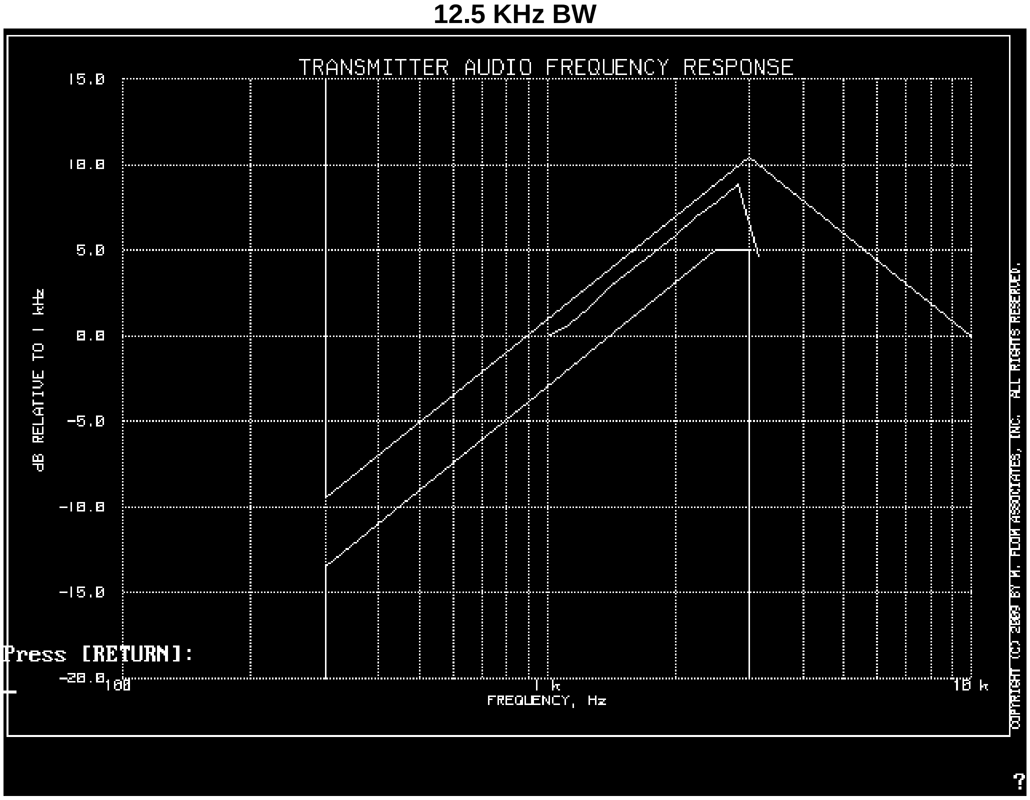


Test Results

25 KHz BW



12.5 KHz BW



Name of Test:	Modulation Limiting	
Specification:	2.1047(a)	**Engineer: J Erhard**
Test Equipment Utilized:	i00005, i00321, i00324	**Test Date: 1/14/2009**

Measurement Procedure

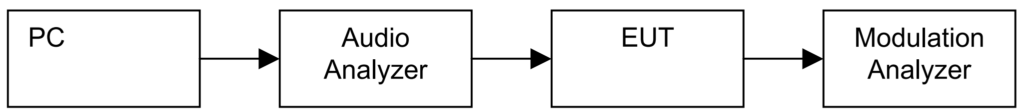
A) The signal generator was connected to the input of the EUT as shown below.

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 (±1.5 kHz deviation) to at least 20 dB higher than the saturation point.

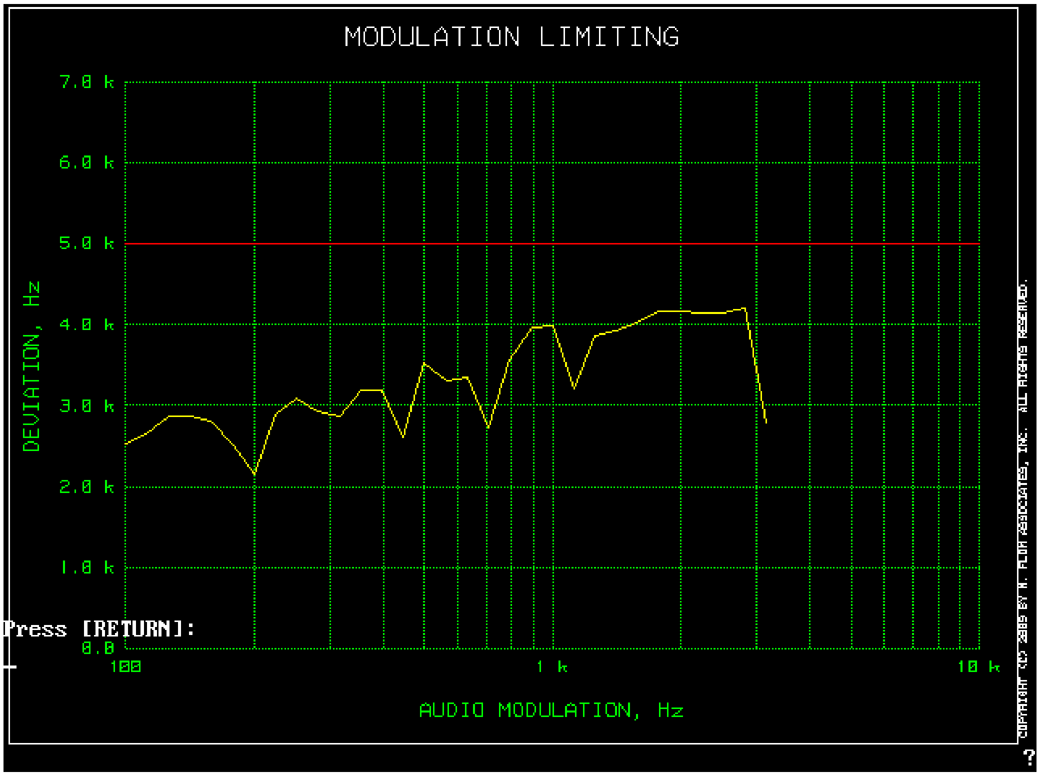
D) Measurements were performed for both negative and positive modulation and the respective results were recorded.

Test Setup

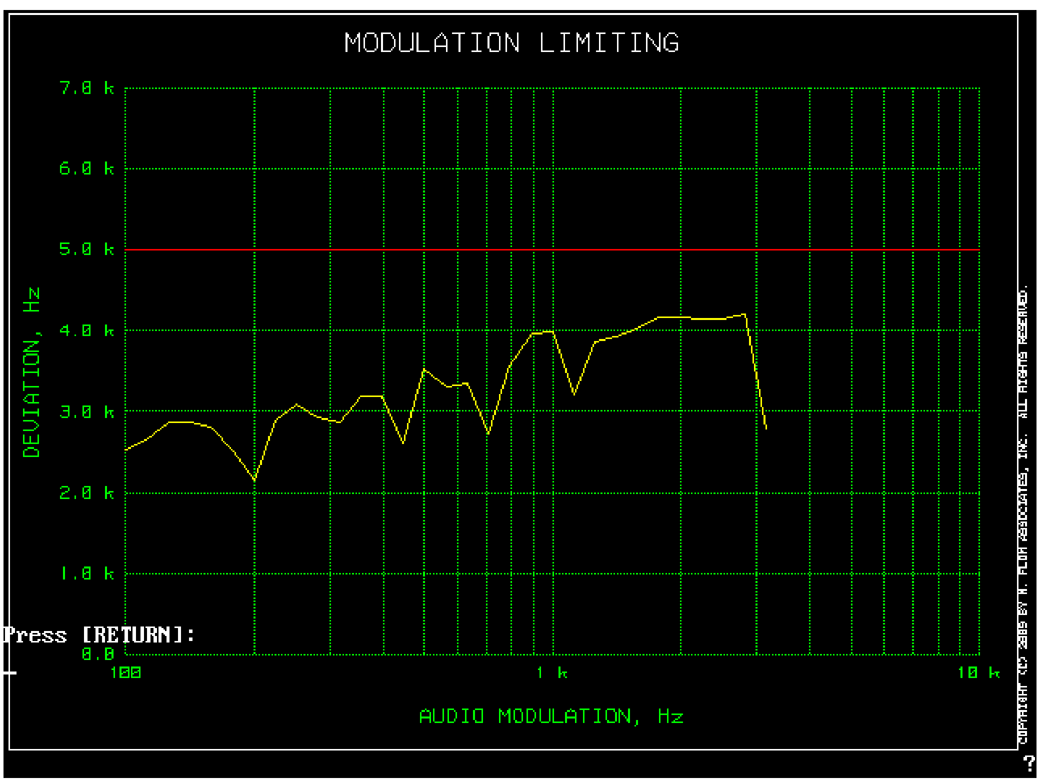


Swept Frequency

25 KHz Test Results Positive Peaks

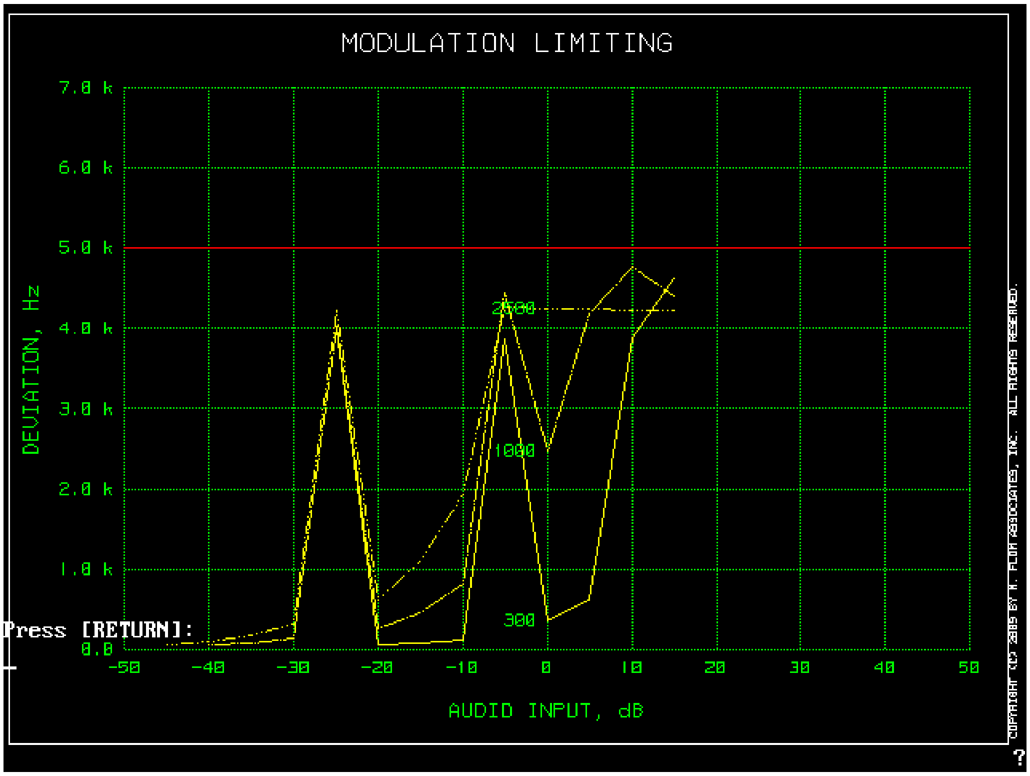


25 KHz Test Results Negative Peaks

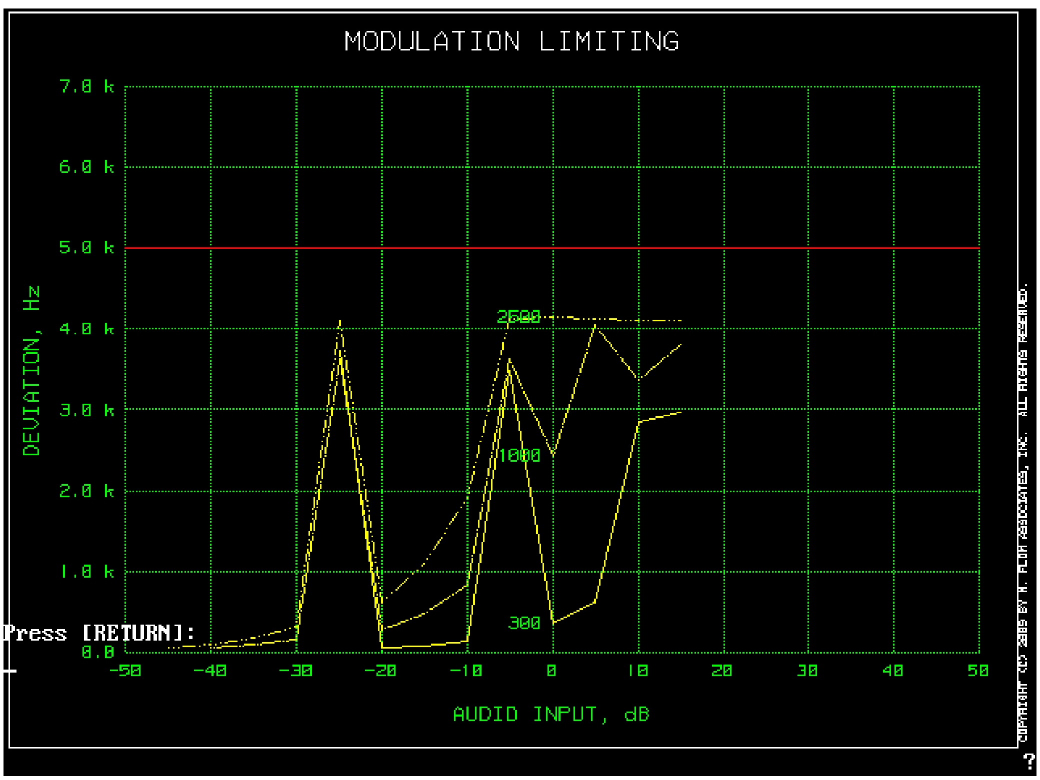


Swept Amplitude

25 KHz Test Results Positive Peaks

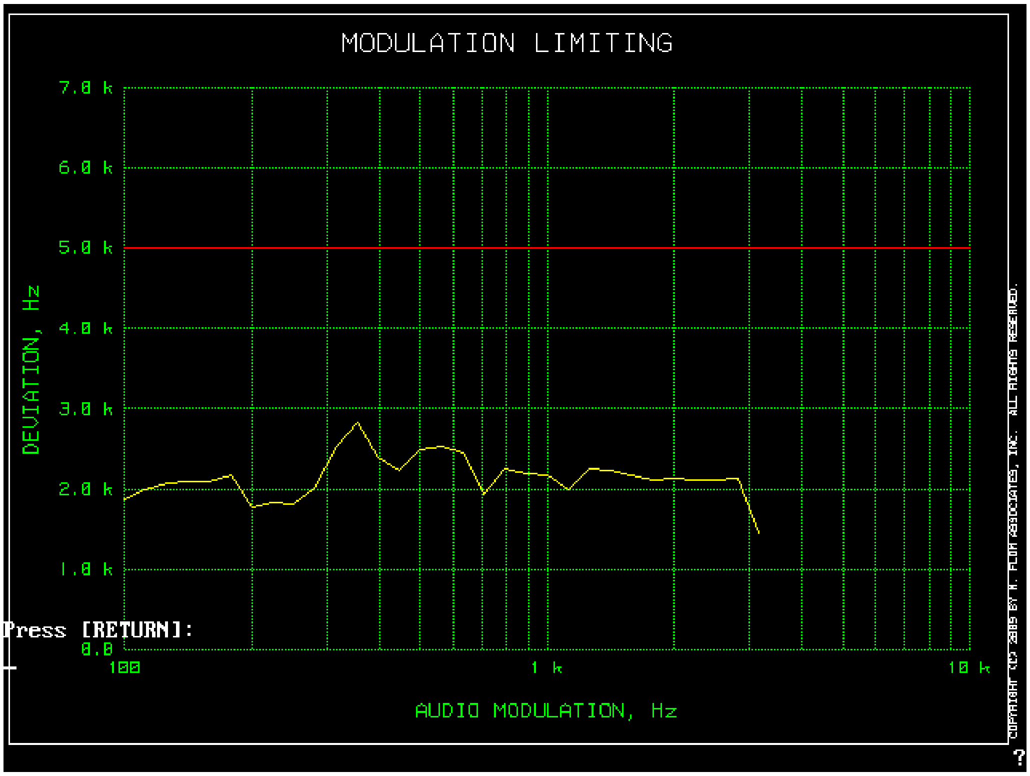


25 KHz Test Results Negative Peaks

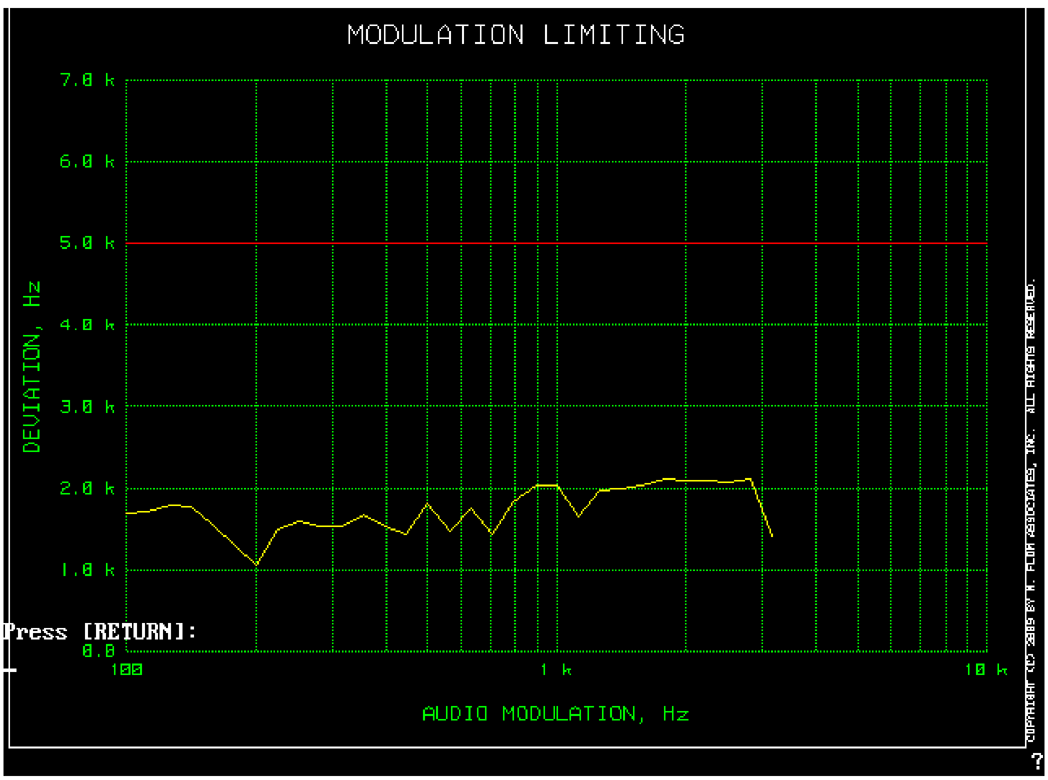


Swept Frequency

12.5 KHz Test Results Positive Peaks

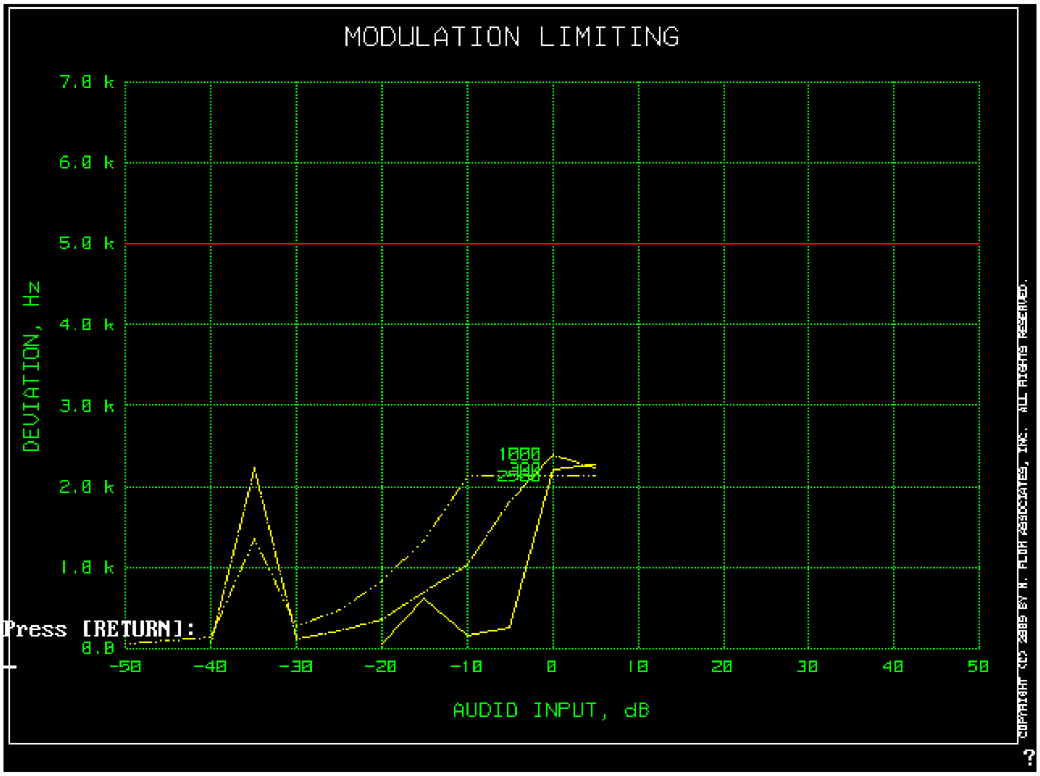


12.5 KHz Test Results Negative Peaks

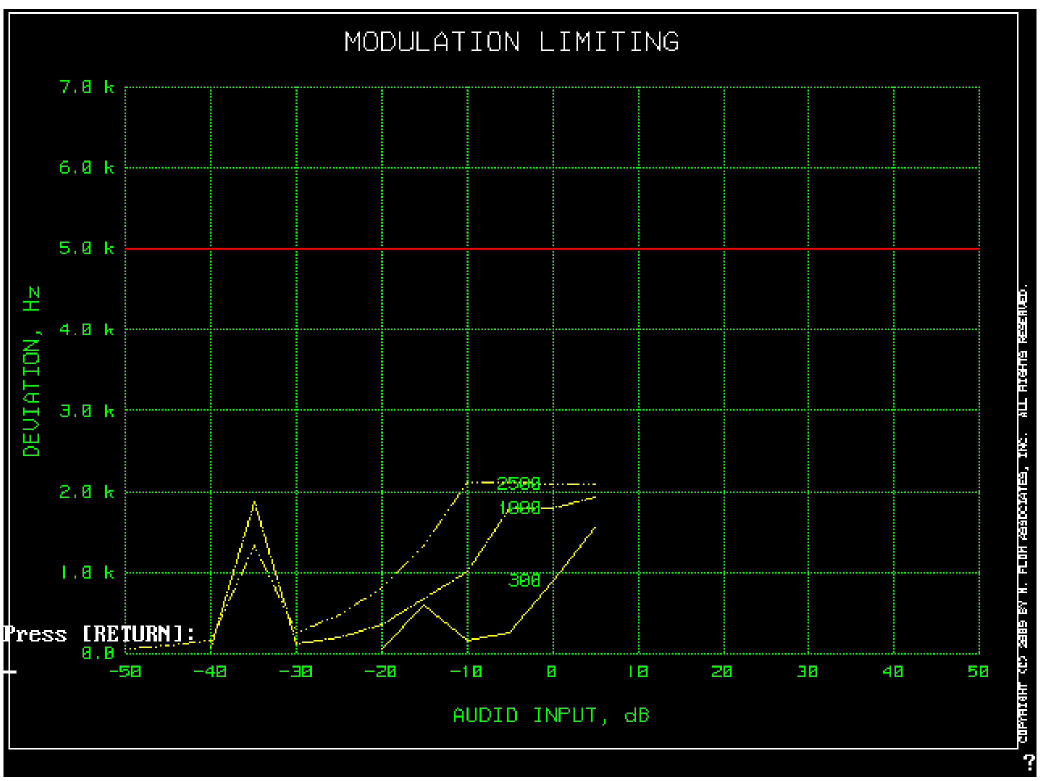


Swept Amplitude

12.5 KHz Test Results Positive Peaks



12.5 KHz Test Results Negative Peaks

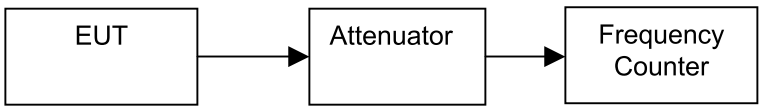


Name of Test: Frequency Stability (Temperature Variation)
Specification: 90.213 **Engineer: J Erahrd**
Test Equipment Utilized: i00005, i00019, i00027, i00319 **Test Date: 1/9/2009**

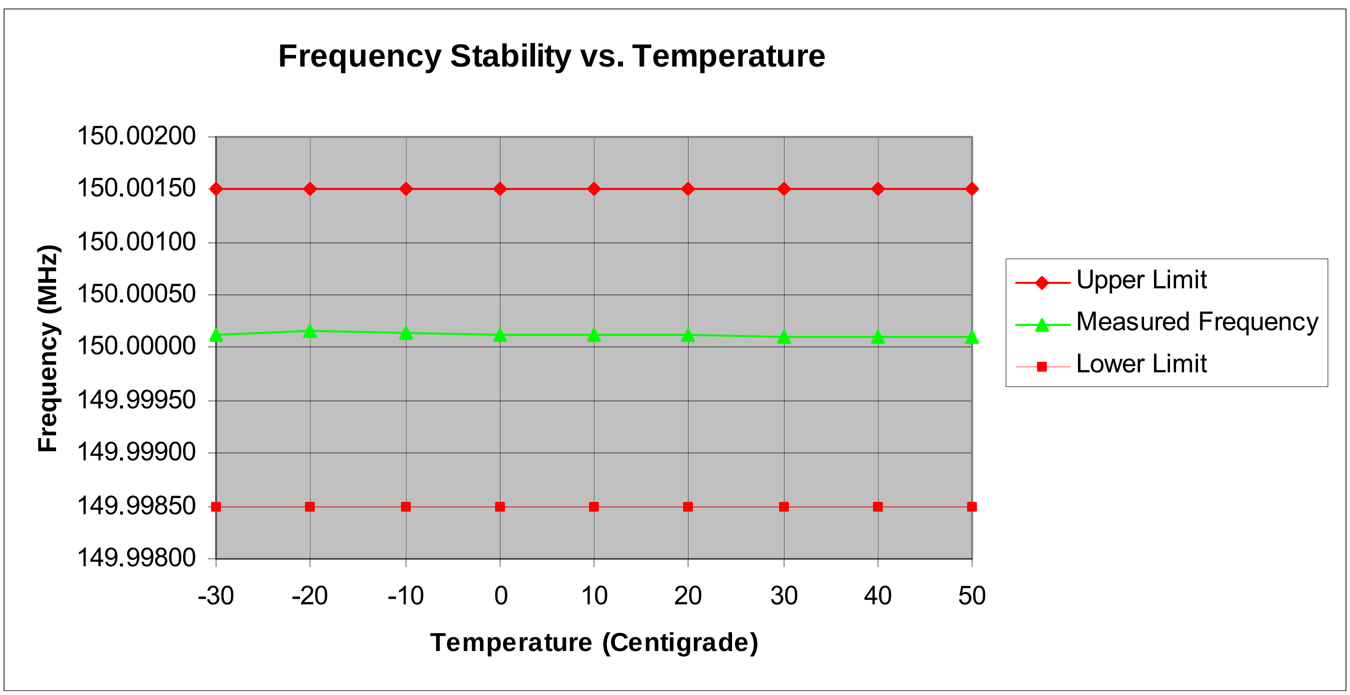
Measurement Procedure

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 -30ºC to 50ºC in 10ºC increments. After a sufficient time for temperature stabilization the RF output frequency was measured.

Measurement Setup



Measurement Results



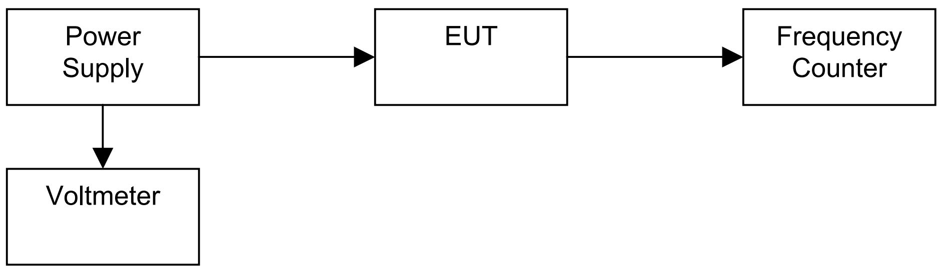
Name of Test: Frequency Stability (Voltage Variation)
Specification: 90.213
Test Equipment Utilized: i00005, i00019, i00027, i00319

Engineer: J Erhard
Test Date: 1/9/2009

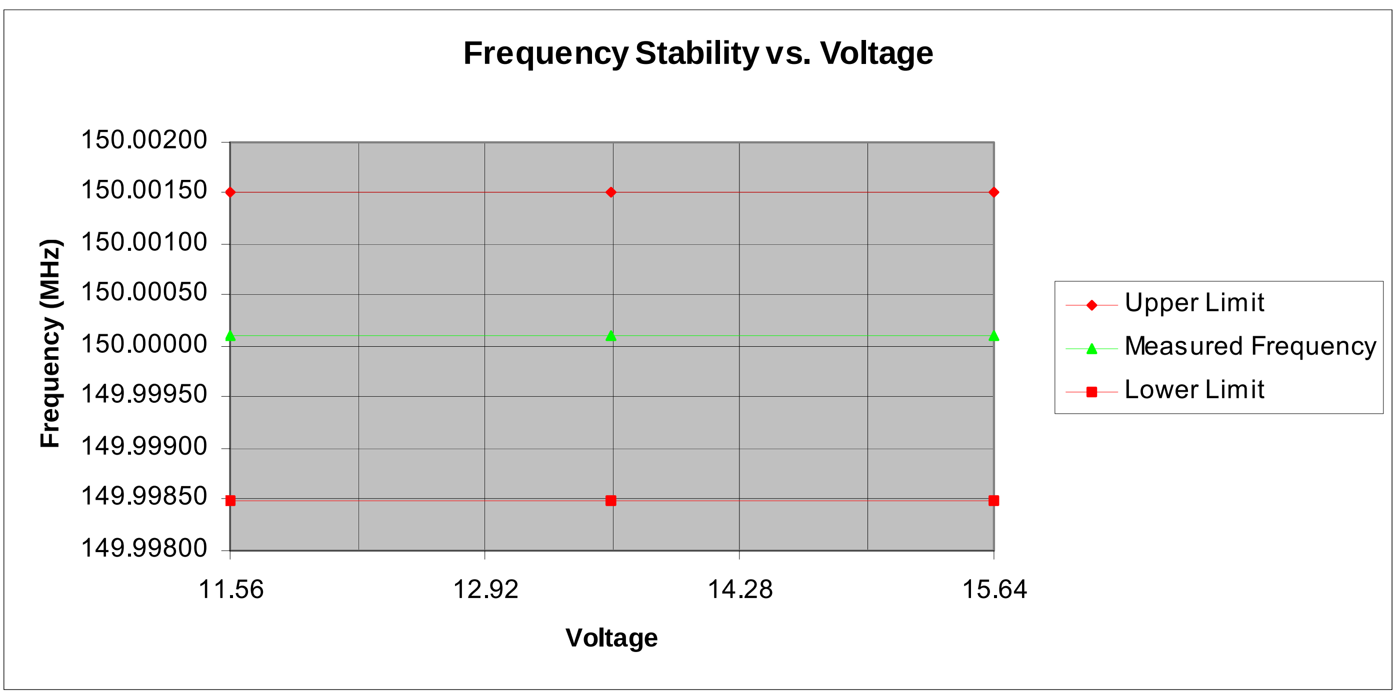
Measurement Procedure

The EUT was placed in a temperature chamber at 25±5°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



Test Equipment Utilized

Description	MFG	Model Number	FTL Asset Number	Last Cal Date	Cal Due Date
Power Supply	HP	6286A	i00005	NCR	NCR
Temperature Chamber	Tenney	Tenney Jr.	i00027	12/8/08	12/08/09
Monopole Antenna Set	Ailtech	DM-105A-T1, T2, T3	i00037, 39, 42, 48	Verified	Verified
Spectrum Analyzer	HP	8566B	i00049	8/22/08	8/22/09
Bi Con Antenna	EMCO	3109B	i00088	10/15/07	10/15/09
Log Periodic Antenna	Aprel	2001	i00089	10/22/07	10/22/09
Tunable Notch Filter	Eagle	TNF-1	i00124	NCR	NCR
Crystal Detector	HP	8472B	i00159	NCR	NCR
Power Meter	HP	E4418B	i00228	10/1/08	10/1/09
Signal Generator	R&S	SMT-03	i00266	NCR	NCR
Power sensor	HP	8482A	i00341	9/30/08	9/30/09
Digitizing Oscilloscope	HP	50402	i00318	Verified	Verified
Modulation Analyzer	HP	8901A	i00321	1/24/08	1/24/09
Audio Analyzer	HP	8903A	i00324	1/24/08	1/24/09
Spectrum Analyzer	Agilent	E4407B	i00331	11/3/08	11/3/09

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