



Compliance Testing, LLC

Previously Flom Test Lab

EMI, EMC, RF Testing Experts Since 1963

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Test Report

Prepared for: JVCKenwood USA Corporation

Model: NX-340-K2, NX-340-M2, NX-340-M3, NX-340U-K2, NX-340-P

Description: UHF Digital Transceiver

Serial Number: N/A

FCC ID: ALH443801

IC: 282D-443801

To

FCC Part 90

Date of Issue: January 30, 2015

On the behalf of the applicant:

JVCKenwood USA Corporation
Communications Division
3970 Johns Creek Court
Suwanee, GA 30024

Attention of:

Joel Berger, Research & Development
Ph: (678) 474-4722
E-Mail: JBerger@us.jvckenwood.com

Prepared By
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Project No: p14b0028

Alex Macon
Project Test Engineer

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All results contained herein relate only to the sample tested.



Test Report Revision History

| Revision | Date | Revised By | Reason for Revision |
|----------|------------------|-------------|---------------------|
| 1.0 | January 29, 2015 | Alex Macon | Original Document |
| 2.0 | February 3, 2015 | Amanda Reed | Added IC model name |
| | | | |
| | | | |



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ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to the joint ISO-ILAC-IAF Communiqué dated January 2009).

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to <http://www.compliancetesting.com/labscope.html> for current scope of accreditation.

Testing Certificate Number: **2152.01**



FCC Site Reg. #349717

IC Site Reg. #2044A-2

Non-accredited tests contained in this report:

N/A



The Applicant has been cautioned as to the following:

15.21: Information to the User

The user's 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 an 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.



Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II, Part 2, Subpart J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, and the following individual Parts: FCC Part 90.

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 603C, 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 specified testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

| Environmental Conditions | | |
|--------------------------|--------------|-----------------|
| Temp (°C) | Humidity (%) | Pressure (mbar) |
| 21.4 – 22.2 | 43.1 – 44.9 | 973.8 – 977.5 |

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

EUT Description

Model: NX-340-K2, NX-340-M2, NX-340-M3, NX-340U-K2, NX-340-P

Description: UHF Digital Transceiver

Serial Number: N/A

Additional Information:

EUT is an occupation push to talk radio

EUT Operation during Tests

EUT was in normal operating mode.

Accessories: None

Cables: None

Modifications: None



Test Result 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 | N/A | See Note 1 |
| 90.210, 2.1049 | Emission Masks (Occupied Bandwidth) | Pass | |
| 2.1047 | Audio Low Pass Filter (Voice Input) | N/A | See Note 1 |
| 2.1047 | Audio Frequency Response | N/A | See Note 1 |
| 2.1047(a) | Modulation Limiting | N/A | See Note 1 |
| 90.213 | Frequency Stability (Temperature Variation) | N/A | See Note 1 |
| 90.213 | Frequency Stability (Voltage Variation) | N/A | See Note 1 |
| 90.214 | Transient Frequency Behavior | Pass | |
| 2.202 | Necessary Bandwidth Calculation | Pass | |

Note 1: Report is intended for a Class 2 Permissive Change which is adding two new modulation bandwidths. This test is not applicable as the addition would not alter these measurements.



Carrier Output Power (Conducted)

Name of Test:

Carrier Output Power (Conducted)

Engineer: Alex Macon

Test Equipment Utilized:

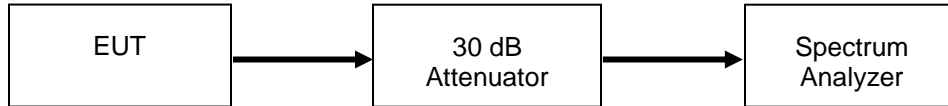
i00331

Test Date: 1/28/15

Measurement Procedure

The Equipment Under Test (EUT) was connected to a spectrum analyzer through a 30 dB Power attenuator. All cable and attenuator losses were input into the spectrum analyzer as a reference level offset to ensure accurate readings were obtained.

Test Setup



High Power Transmitter Peak Output Power

| Tuned Frequency (MHz) | Recorded Measurement (dBm) | Result |
|-----------------------|----------------------------|--------|
| 406.15 | 37.03 | Pass |
| 418.05 | 37.0 | Pass |
| 429.95 | 37.01 | Pass |
| 450.05 | 36.99 | Pass |
| 460.05 | 36.97 | Pass |
| 469.95 | 36.97 | Pass |



Conducted Spurious Emissions

Name of Test:

Conducted Spurious Emissions

Engineer: Alex Macon

Test Equipment Utilized:

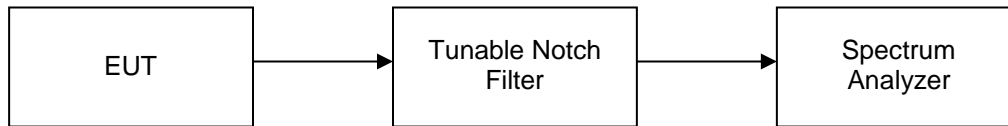
i00118, i00124, i00331, i00432

Test Date: 1/29/15

Test Procedure

The EUT 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. Only the worst case plots are included

Test Setup

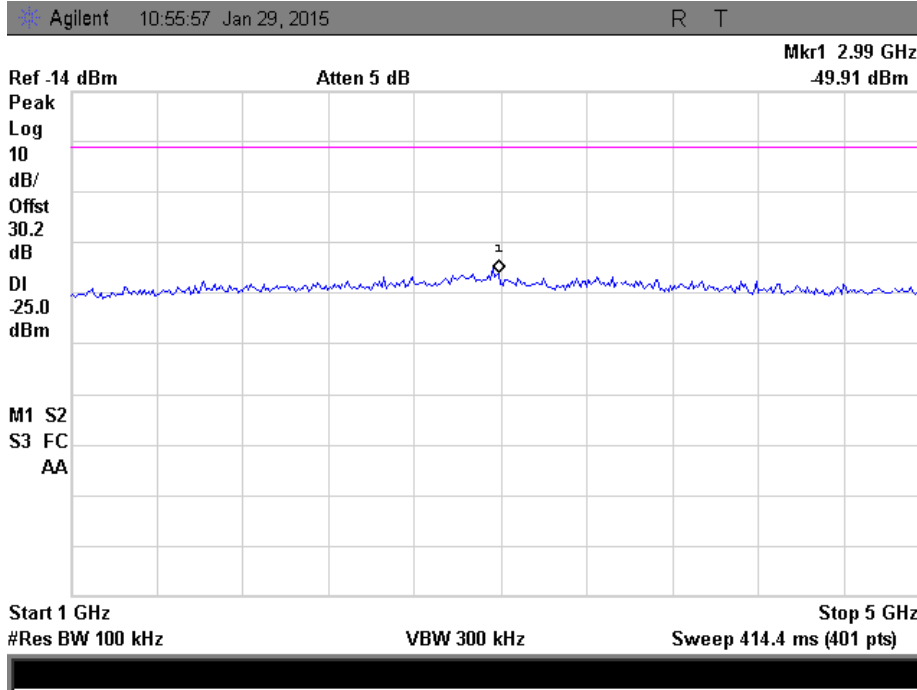


High Power Conducted Spurious Emissions Summary Test Table

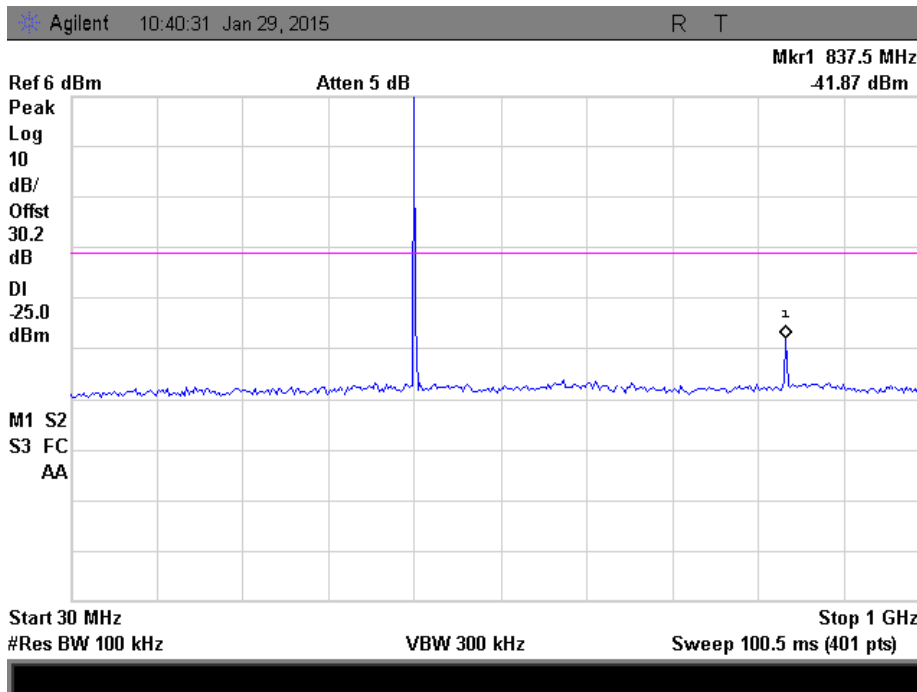
| Tuned Frequency (MHz) | Spurious Frequency (MHz) | Measured Spurious Level (dBm) | Specification Limit (dBm) | Result |
|-----------------------|--------------------------|-------------------------------|---------------------------|--------|
| 406.15 | 2990.0 | -49.91 | -25 | Pass |
| 418.09 | 837.5 | -41.87 | -25 | Pass |
| 429.95 | 861.8 | -42.84 | -25 | Pass |
| 450.05 | 422.9 | -46.41 | -25 | Pass |
| 460.05 | 759.9 | -49.51 | -25 | Pass |
| 470.05 | 941.8 | -47.39 | -25 | Pass |



406.15 MHz

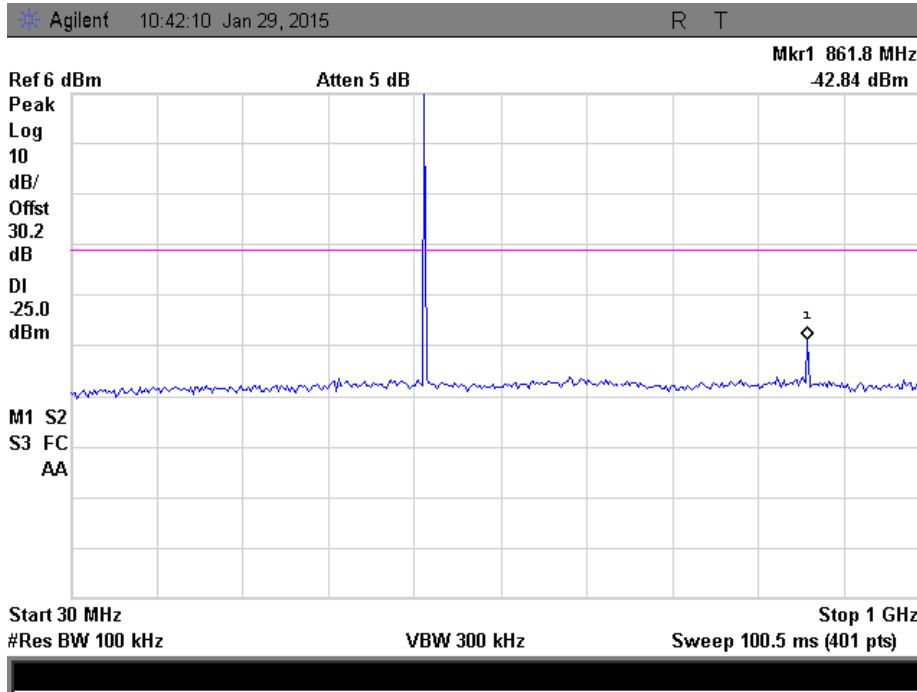


418.05 MHz

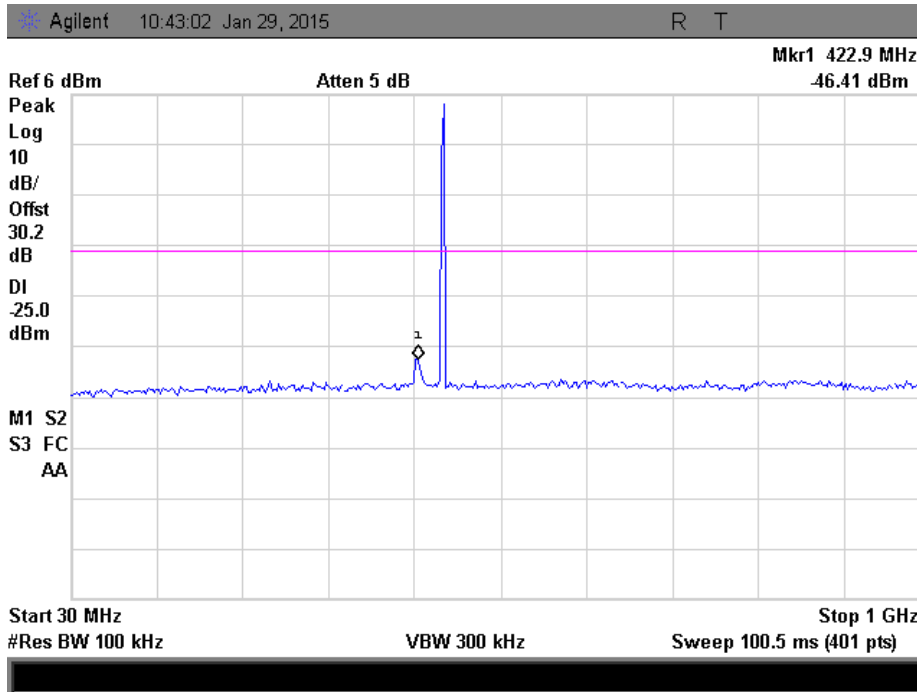




429.95 MHz

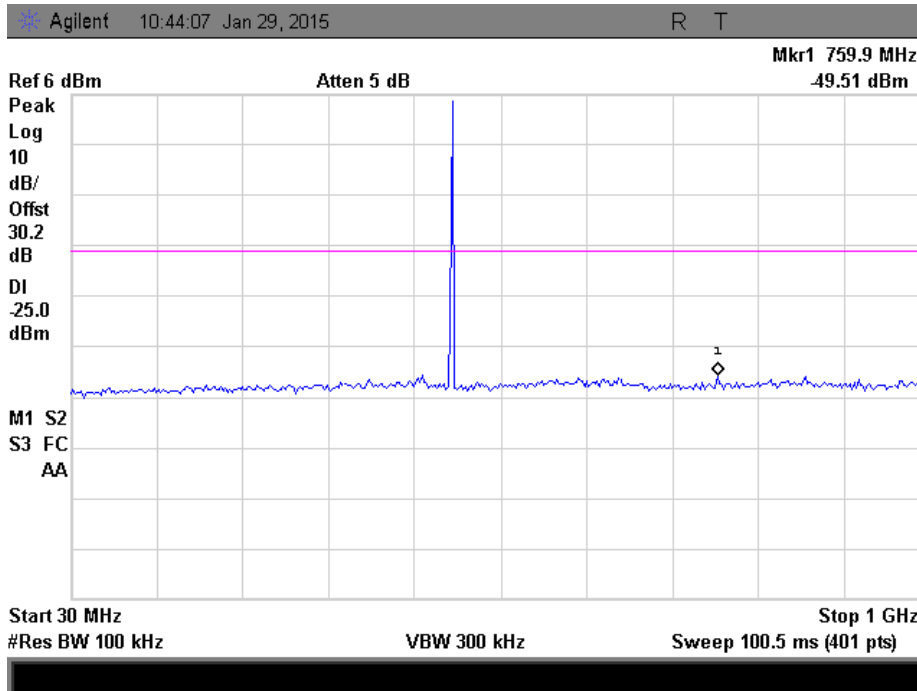


450.05 MHz

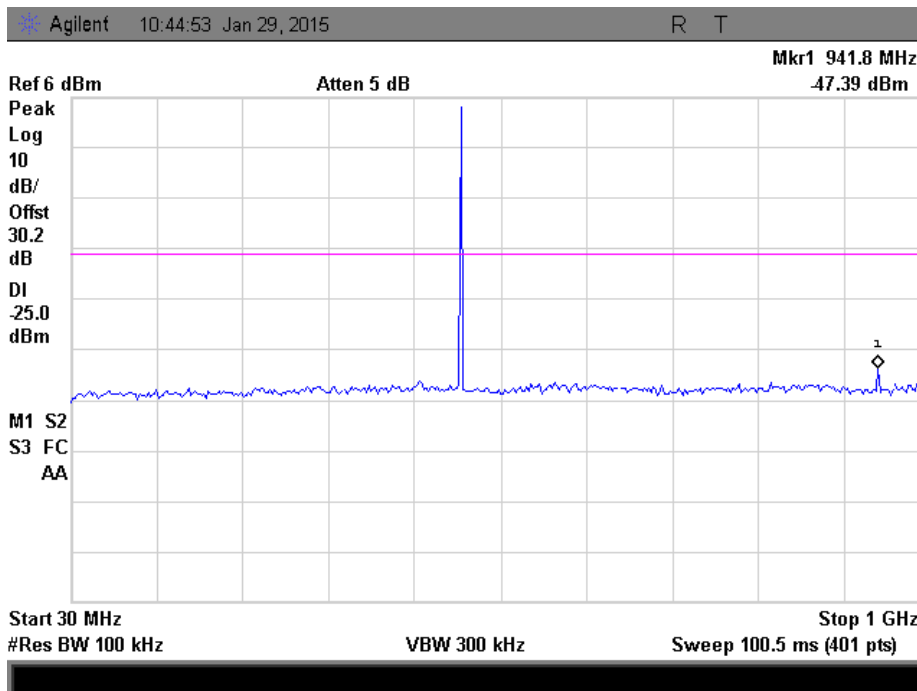




460.05 MHz



469.95 MHz





Emission Masks (Occupied Bandwidth)

Name of Test:

Emission Masks (Occupied Bandwidth)

Engineer: Alex Macon

Test Equipment Utilized

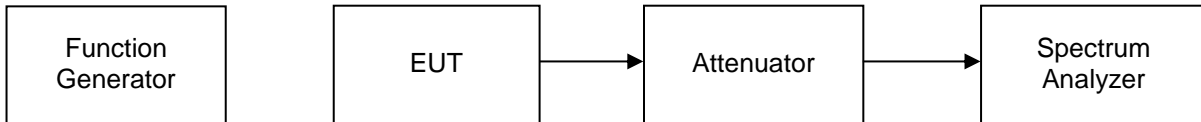
i00118, i00331

Test Date: 1/28/15

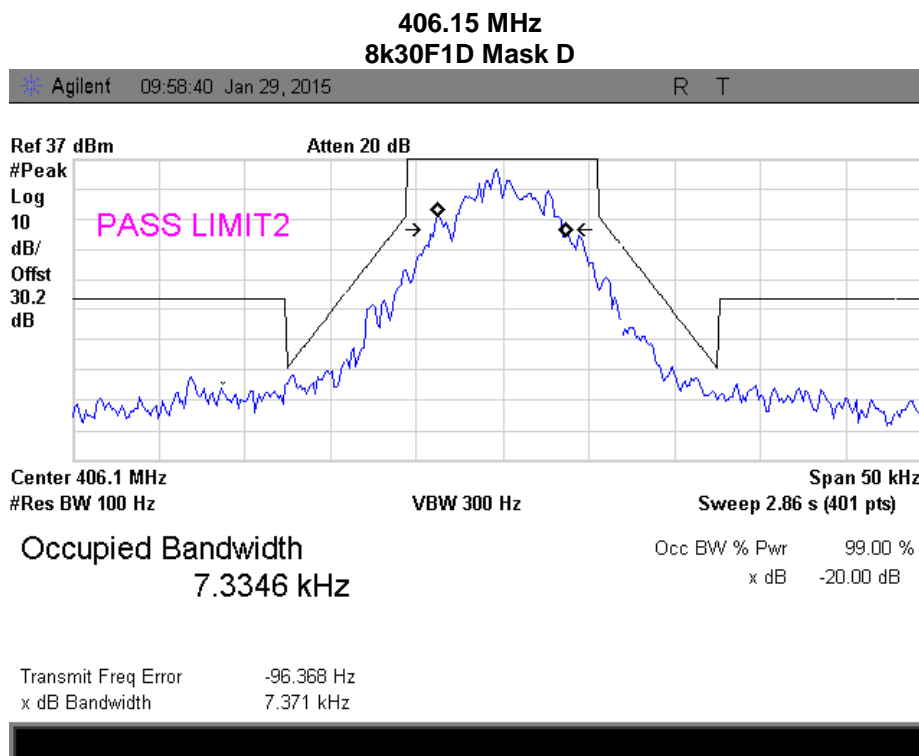
Measurement Procedure

The EUT was connected directly to a spectrum analyzer to verify that the EUT meets the required emissions mask. A modulation frequency of 2.5 kHz at a level of 100 mVPP was input into the EUT.

Test Setup



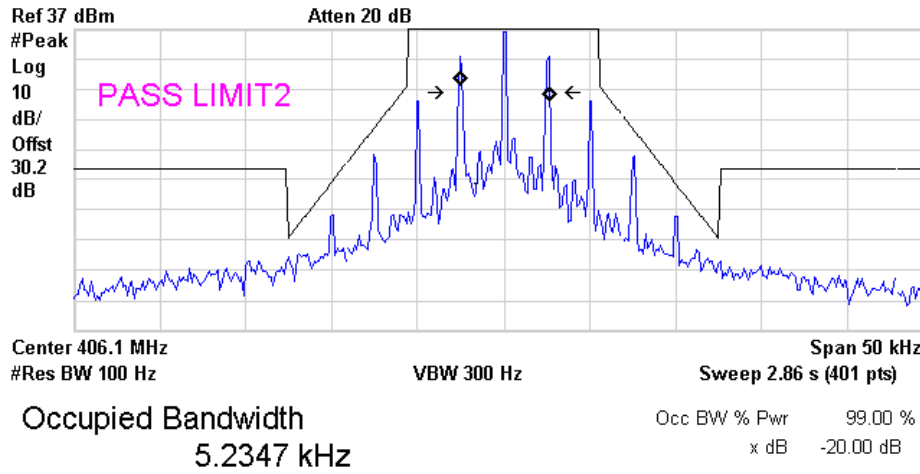
Occupied Bandwidth Plots





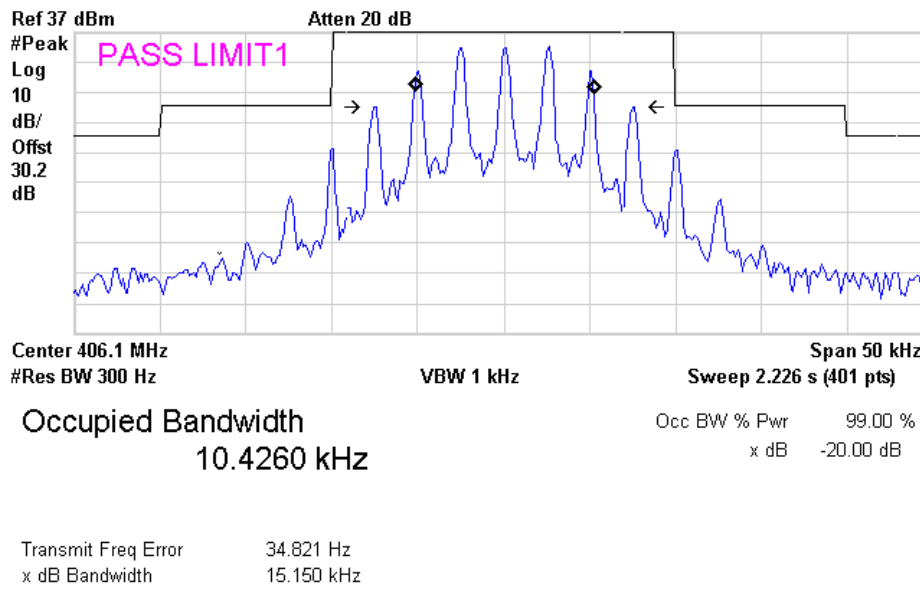
**406.15 MHz
8k30F1E Mask D**

Agilent 09:59:28 Jan 29, 2015 R T



**406.15 MHz
16K0F3E Mask B**

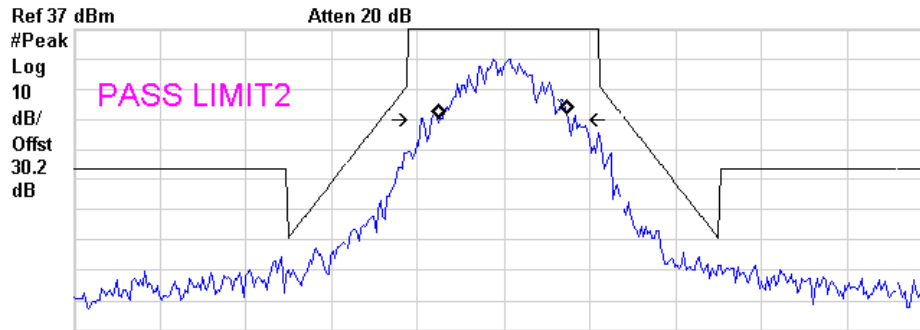
Agilent 10:00:56 Jan 29, 2015 R T





418.05 MHz
8k30F1D Mask D

Agilent 10:04:57 Jan 29, 2015 R T



Center 418.1 MHz Span 50 kHz
#Res BW 100 Hz VBW 300 Hz Sweep 2.86 s (401 pts)

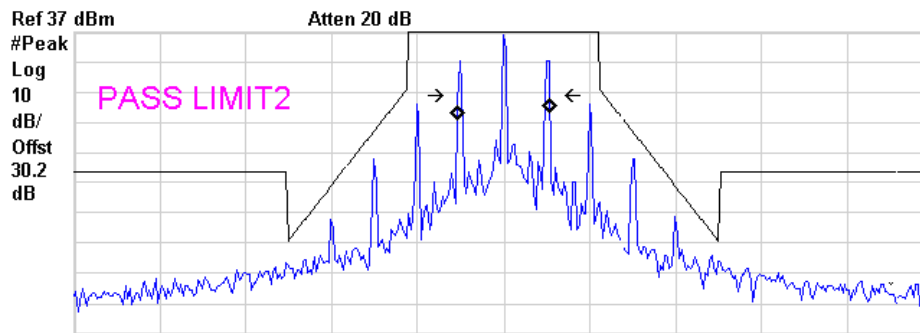
Occupied Bandwidth
7.4640 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -71.248 Hz
x dB Bandwidth 8.937 kHz

418.05 MHz
8k30F1E Mask D

Agilent 10:04:07 Jan 29, 2015 R T



Center 418.1 MHz Span 50 kHz
#Res BW 100 Hz VBW 300 Hz Sweep 2.86 s (401 pts)

Occupied Bandwidth
5.3250 kHz

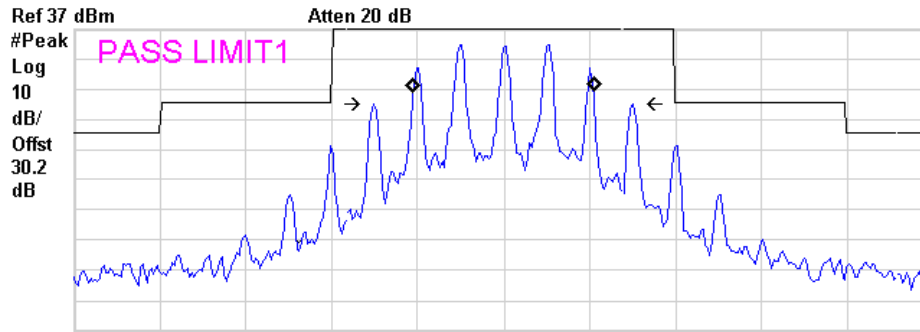
Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error 16.657 Hz
x dB Bandwidth 5.363 kHz



418.05 MHz
16K0F3E Mask B

Agilent 10:02:22 Jan 29, 2015 R T



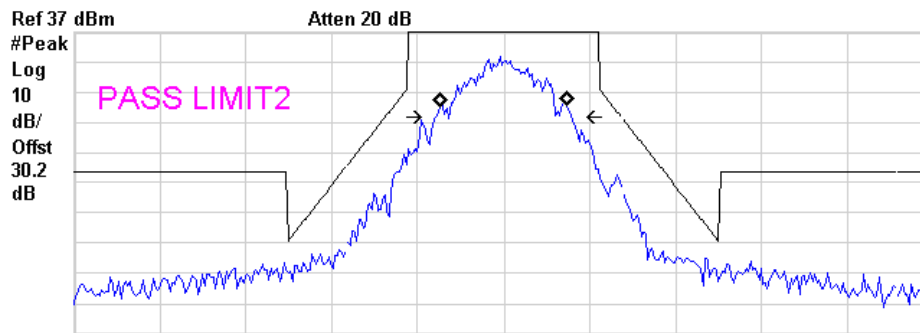
Center 418.1 MHz Span 50 kHz
#Res BW 300 Hz VBW 1 kHz Sweep 2.226 s (401 pts)

Occupied Bandwidth 10.4446 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -6.288 Hz
x dB Bandwidth 15.064 kHz

429.95 MHz
8k30F1D Mask D

Agilent 10:06:08 Jan 29, 2015 R T



Center 429.9 MHz Span 50 kHz
#Res BW 100 Hz VBW 300 Hz Sweep 2.86 s (401 pts)

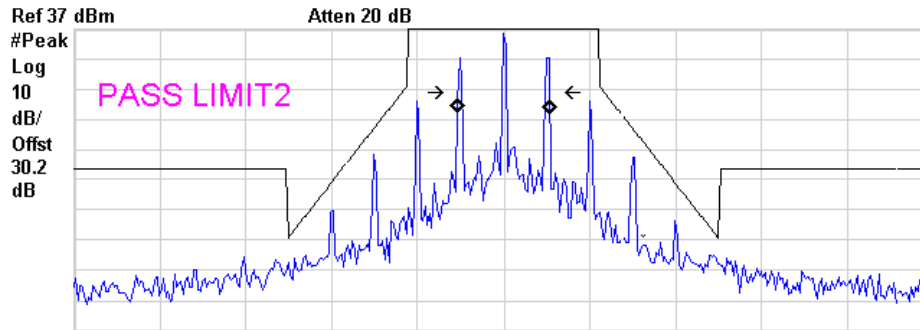
Occupied Bandwidth 7.2176 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error 3.165 Hz
x dB Bandwidth 7.812 kHz



429.95 MHz
8k30F1E Mask D

Agilent 10:06:46 Jan 29, 2015 R T



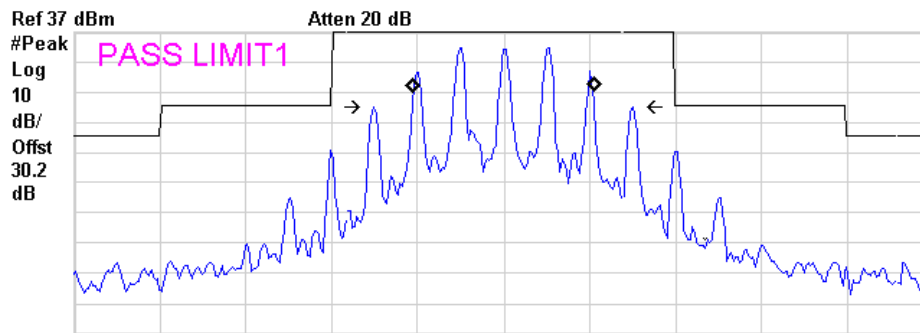
Center 429.9 MHz Span 50 kHz
#Res BW 100 Hz VBW 300 Hz Sweep 2.86 s (401 pts)

Occupied Bandwidth 5.3204 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error 18.789 Hz
x dB Bandwidth 5.363 kHz

429.95 MHz
16K0F3E Mask B

Agilent 10:07:41 Jan 29, 2015 R T



Center 429.9 MHz Span 50 kHz
#Res BW 300 Hz VBW 1 kHz Sweep 2.226 s (401 pts)

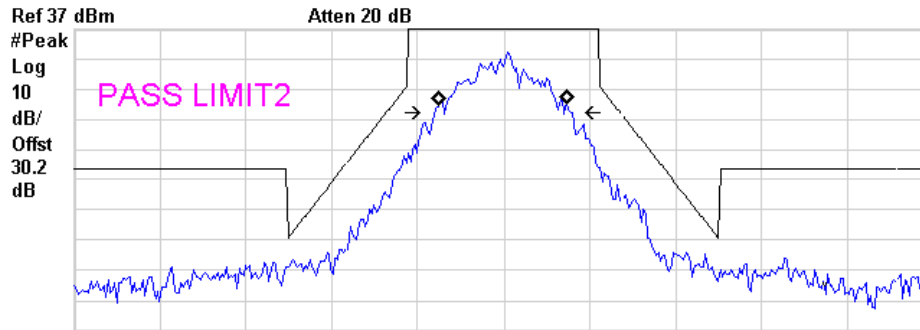
Occupied Bandwidth 10.4056 kHz
Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -7.766 Hz
x dB Bandwidth 15.031 kHz



450.05 MHz 8k30F1D Mask D

Agilent 10:10:43 Jan 29, 2015 R T



Center 450.1 MHz Span 50 kHz
#Res BW 100 Hz VBW 300 Hz Sweep 2.86 s (401 pts)

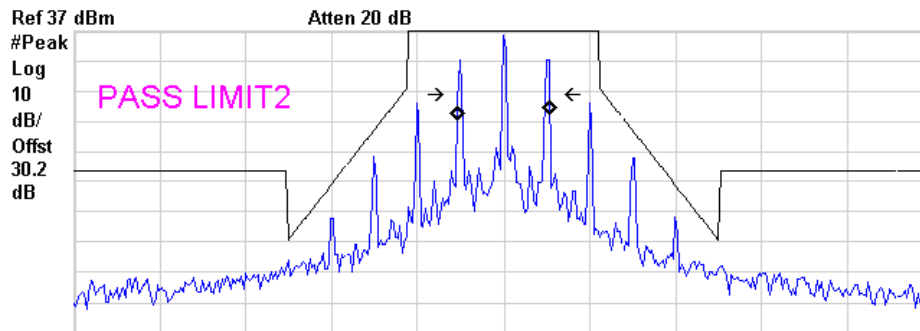
Occupied Bandwidth
7.3634 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -36.994 Hz
x dB Bandwidth 7.821 kHz

450.05 MHz 8k30F1E Mask D

Agilent 10:09:54 Jan 29, 2015 R T



Center 450.1 MHz Span 50 kHz
#Res BW 100 Hz VBW 300 Hz Sweep 2.86 s (401 pts)

Occupied Bandwidth
5.3319 kHz

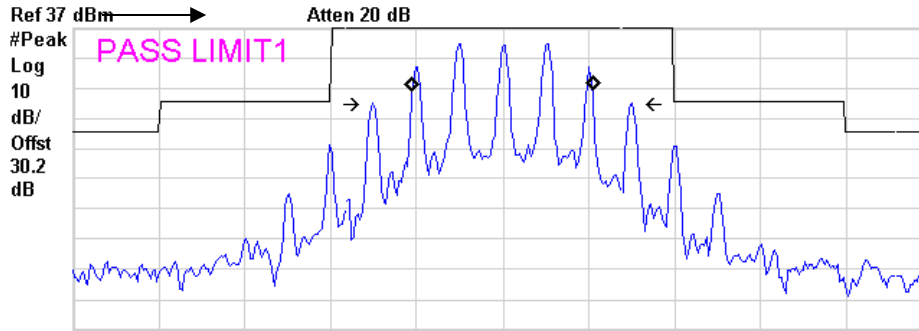
Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error 13.255 Hz
x dB Bandwidth 5.364 kHz



450.05 MHz 16K0F3E Mask B

Agilent 10:08:38 Jan 29, 2015 R T



Center 450.1 MHz #Res BW 300 Hz VBW 1 kHz Sweep 2.226 s (401 pts)

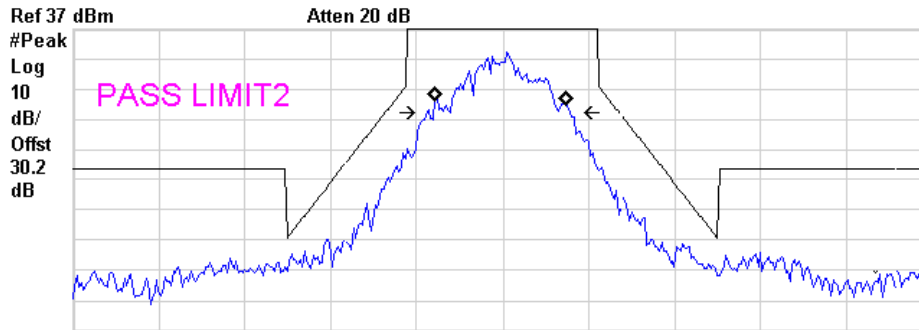
Occupied Bandwidth
10.4282 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -6.021 Hz
x dB Bandwidth 15.067 kHz

460.05 MHz 8k30F1D Mask D

Agilent 10:12:19 Jan 29, 2015 R T



Center 460.1 MHz #Res BW 100 Hz VBW 300 Hz Sweep 2.86 s (401 pts)

Occupied Bandwidth
7.5176 kHz

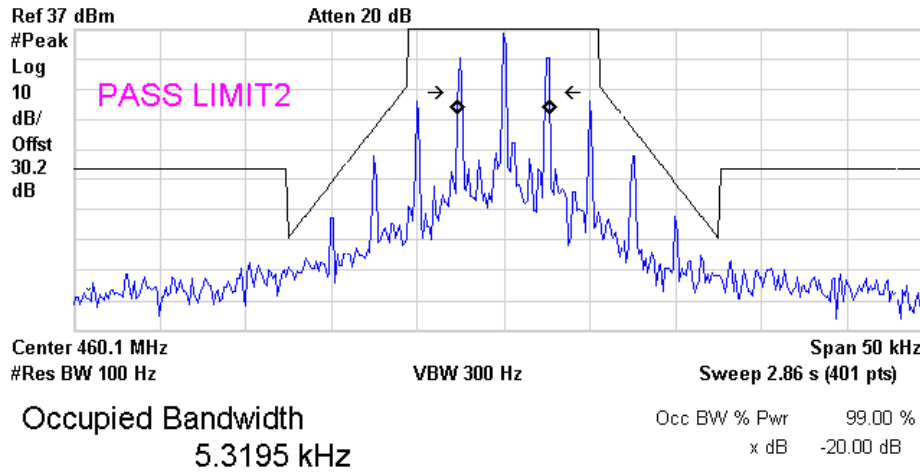
Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -131.047 Hz
x dB Bandwidth 8.221 kHz



460.05 MHz 8k30F1E Mask D

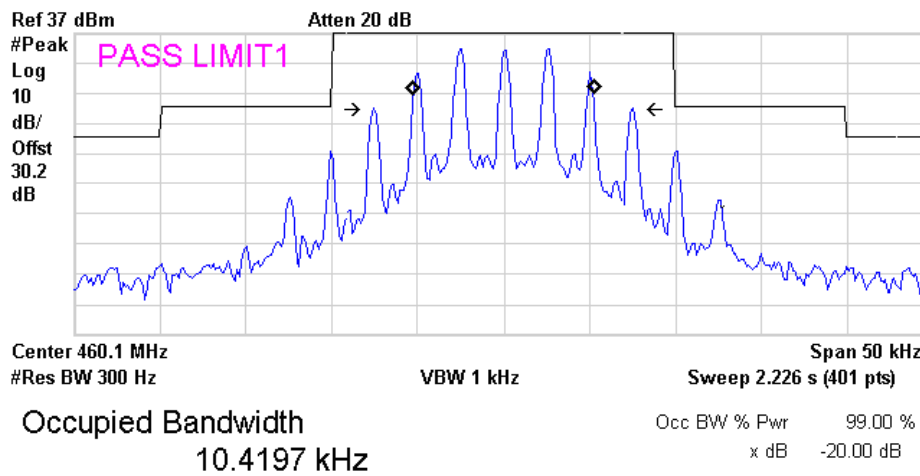
Agilent 10:12:58 Jan 29, 2015 R T



Transmit Freq Error 19.319 Hz
x dB Bandwidth 5.362 kHz

460.05 MHz 16K0F3E Mask B

Agilent 10:14:38 Jan 29, 2015 R T

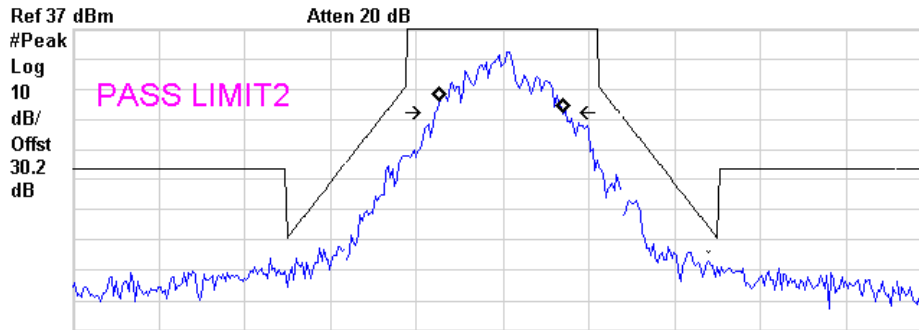


Transmit Freq Error -8.363 Hz
x dB Bandwidth 15.051 kHz



469.95 MHz
8k30F1D Mask D

Agilent 10:18:32 Jan 29, 2015 R T



Center 469.9 MHz Span 50 kHz
#Res BW 100 Hz VBW 300 Hz Sweep 2.86 s (401 pts)

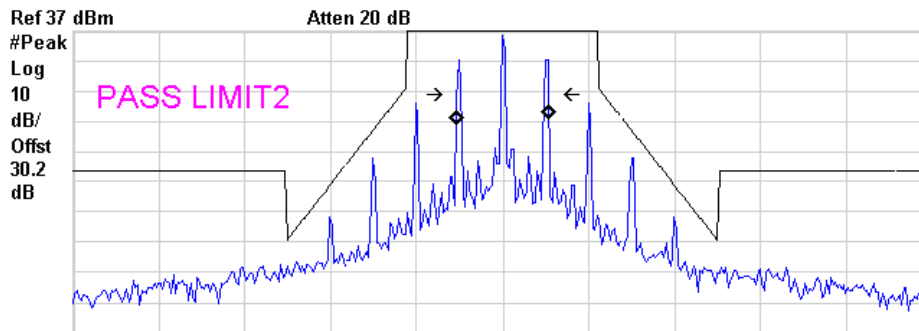
Occupied Bandwidth
7.0674 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -37.358 Hz
x dB Bandwidth 7.518 kHz

469.95 MHz
8k30F1E Mask D

Agilent 10:17:46 Jan 29, 2015 R T



Center 469.9 MHz Span 50 kHz
#Res BW 100 Hz VBW 300 Hz Sweep 2.86 s (401 pts)

Occupied Bandwidth
5.3328 kHz

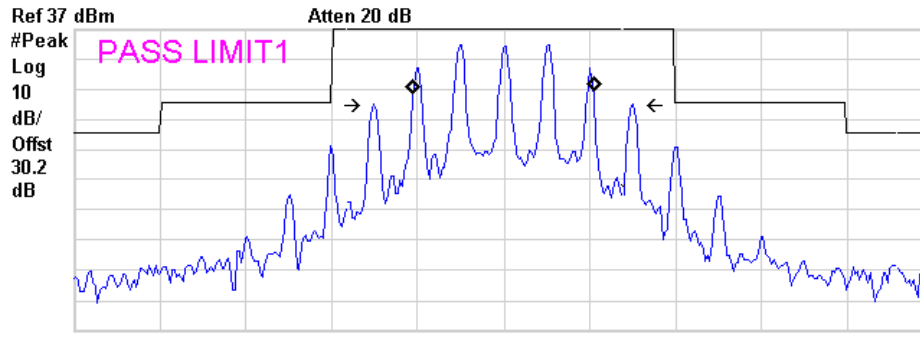
Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error 12.828 Hz
x dB Bandwidth 5.364 kHz



469.95 MHz
16K0F3E Mask B

Agilent 10:15:53 Jan 29, 2015 R T



Center 469.9 MHz Span 50 kHz
#Res BW 300 Hz VBW 1 kHz Sweep 2.226 s (401 pts)

Occupied Bandwidth
10.4486 kHz

Occ BW % Pwr 99.00 %
x dB -20.00 dB

Transmit Freq Error -9.950 Hz
x dB Bandwidth 15.076 kHz

Measured 99% Bandwidth Summary

| Tuned Frequency (MHz) | 8K30F1E | 16K0F3E | 8K30F1D |
|-----------------------|----------|-----------|----------|
| 406.15 | 5.23 kHz | 10.42 kHz | 7.33 kHz |
| 418.05 | 5.32 kHz | 10.44 kHz | 7.46 kHz |
| 429.95 | 5.32 kHz | 10.40 kHz | 7.21 kHz |
| 450.05 | 5.33 kHz | 10.42 kHz | 7.36 kHz |
| 460.05 | 5.32 kHz | 10.42 kHz | 7.51 kHz |
| 469.95 | 5.33 kHz | 10.45 kHz | 7.06 kHz |



Transient Frequency Behavior

Name of Test:

Transient Frequency Behavior

Engineer: Alex Macon

Test Equipment Utilized:

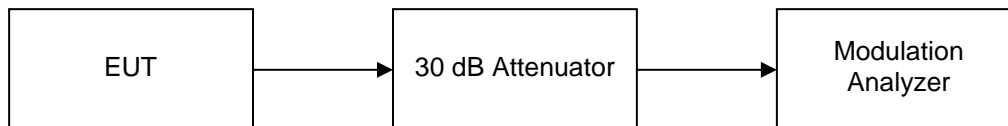
i00118, i00345

Test Date: 1/29/15

Measurement Procedure

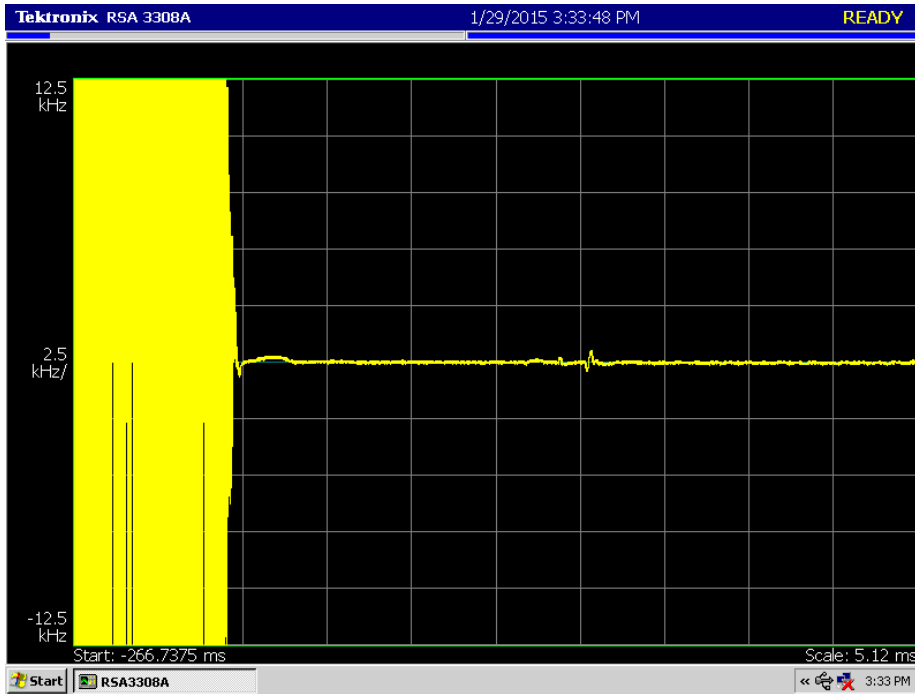
The EUT was connected directly to a modulation analyzer through a 30 dB attenuator to verify that the EUT meets the required Transient Frequency Behavior response per the specification. The modulation analyzer is a real time spectrum analyzer with integrated demodulation, audio measurement capabilities, and timing analysis. The turn on and turn off transient timing was measured and recorded.

Test Setup

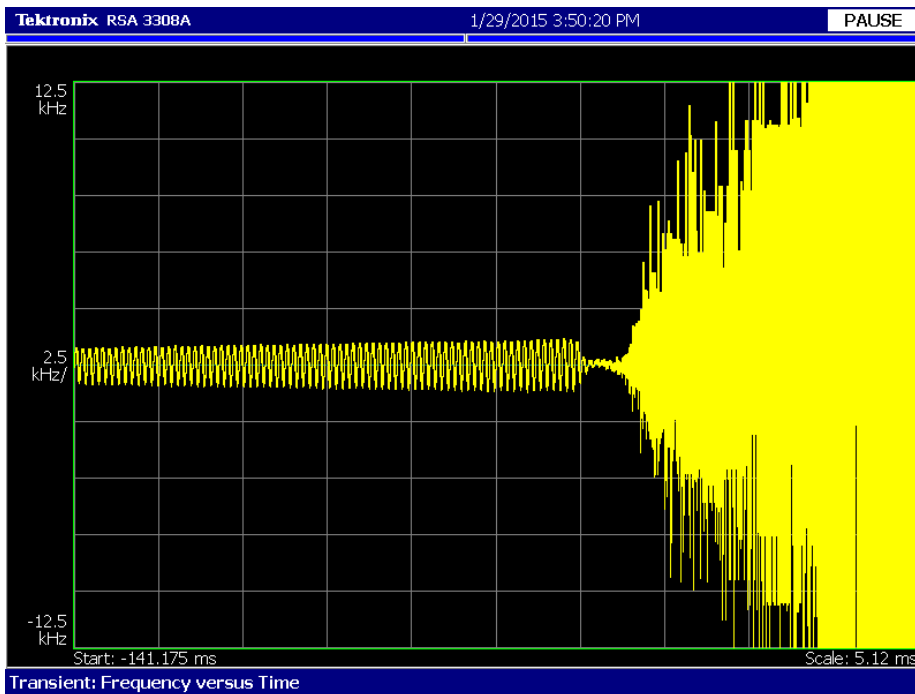




25 kHz Bandwidth Test Results On Time



Test Results Off Time





Necessary Bandwidth Calculations

Name of Test: Necessary Bandwidth Calculations
Test Specification: 2.202

Engineer: Alex Macon
Test Date: 1/29/15

| | | |
|--|---|---------------|
| Modulation = 16K0F3E (RSS-119 Only) | | |
| Necessary Bandwidth Calculation: | | |
| Maximum Modulation (M) kHz | = | 3 |
| Maximum Deviation (D), kHz | = | 5 |
| Constant Factor (K) | = | 1 |
| Necessary Bandwidth (B _N), kHz | = | (2xM)+(2xDxK) |
| | = | 16.0 |

| | | |
|--|---|---------------|
| Modulation = 8K30F1E | | |
| Necessary Bandwidth Calculation: | | |
| Maximum Modulation (M), kHz | = | 1.65 |
| Maximum Deviation (D), kHz | = | 2.5 |
| Constant Factor (K) | = | 1 |
| Necessary Bandwidth (B _N), kHz | = | (2xM)+(2xDxK) |
| | = | 8.3 |

| | | |
|--|---|-----------|
| Modulation = 8K30F1D | | |
| Necessary Bandwidth Calculation: | | |
| Data Rate (R) Kbps | = | 2.3 |
| Maximum Deviation (D), kHz | = | 2.5 |
| Necessary Bandwidth (B _N), kHz | = | 2.4D+1.0R |
| | = | 8.3 |



| | | |
|--|---|----------------------|
| Modulation = 8K30F7W | | |
| Necessary Bandwidth Calculation: | | |
| Data Rate (R) Kbps | = | 3.973 |
| Maximum Deviation (D), kHz | = | 2.5 |
| Signaling States | = | 4 |
| Constant Factor (K) | = | 1 |
| Necessary Bandwidth (B _N), kHz | = | $(R/\log_2 S) + 2DK$ |
| | = | 8.3 |



Test Equipment Utilized

| Description | Manufacturer | Model # | CT Asset # | Last Cal Date | Cal Due Date |
|----------------------|--------------|---------------------|------------|-----------------------|--------------|
| Function Generator | HP | 33120A | i00118 | Verified on: 11/30/14 | |
| Tunable Notch Filter | Eagle | TNF-1-(100-250MHz) | i00126 | Verified on:11/30/14 | |
| Spectrum Analyzer | Tektronix | RSA3308A | i00345 | 3/18/14 | 3/18/15 |
| Spectrum Analyzer | Agilent | E4407B | i00331 | 6/13/14 | 6/13/15 |
| High Pass Filter | K&L | 7IH40-980/T6000-O/O | i00432 | Verified on:11/30/14 | |

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