Compliance Testing, LLC
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FCC CFR47 Part 90
Test Report

Prepared for: ISC Technologies, Inc

FCC ID: SS6ISC-T8411

Model: ISC-T8411

Description: Licensed Non-Broadcast Station Transmitter

To

Federal Communications Commission

Rule Part(s) 22, 90

Date of Issue: June 7, 2011

On the Behalf of the Applicant:	**ISC Technologies, Inc** **301 Oak Street** **Quincy, IL 62301**
Attention of:	**Tim Anderson, Vice President** **Ph: (217) 221-0985** **Fax: (217) 221-9775** **E-mail: anderson@illinoissignal.com**

Prepared by
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Project No: p1120005

Greg Corbin

Project Test Engineer

Test Report Revision History

Revision	Date	Revised By	Reason for revision
1.0	June 7, 2011	Greg Corbin	Original Document

The applicant has been cautioned as to the following

15.21 - Information to 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 marked 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.

Table of Contents

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.

Standard Test Conditions and Engineering Practices

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

In accordance with ANSI/C63.4-2009, 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.

Environmental Conditions		
Temperature	**Humidity**	**Pressure**
27 deg C	20.7%	967.8 mbar

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

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 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 in the table below.

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

Testing Certificate Number: **2152.01**

ACCREDITED
TESTING CERT
#2152.01

FCC OATS Reg, #933597

IC Reg. #2044A-1

Non-accredited tests contained in this report:

N/A

List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to Part 90

Sub-part 2.1033
(c)(1):

Name and Address of Applicant: ISC Technologies, Inc.
301 Oak Street
Quincy, IL 62301

Manufacturer: ISC Technologies, Inc.
301 Oak Street
Quincy, IL 62301

(c)(2):**FCC ID**: SS6ISC-T8411

Model Number: ISC-T8411

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

Please see attached exhibits

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

(c)(5): **Frequency Range, MHz**: 150 - 174

(c)(6): **Power Rating, Watts:** 254.683

____ Switchable **X** Variable ____ N/A

FCC Grant Note: The output power is continuously variable from the value listed in this entry to 40%-45% of the value listed.

(c)(7): **Maximum Allowable Power, Watts:** 500

DUT Results: Passes **X** Fails _____

Test Results Summary

Specification	Test Name	Pass, Fail, N/A	Comments
2.1046, 22.535(b) 90.205(s)	Carrier Output Power (Conducted)	Pass	
2.1051, 22.359	Unwanted Emissions (Transmitter Conducted)	Pass	
2.1049, 22.357, 90.210	Emission Masks (Occupied Bandwidth)	Pass	

Accessories

Qty	Type	Make, Model	S/N
1	Attenuator – 30 dB	Bird, 8329	N/A
1	Attenuator – 10dB	Narda, 779	N/A

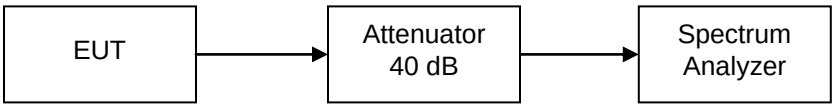
Carrier Output Power (Conducted)

Name of Test:	Carrier Output Power (Conducted)	
Specification:	2.1046, 22.535(b), 90.205(s)	**Engineer**: Greg Corbin
Test Equipment Utilized:	i00118, i00172, i00331	**Test Date**: 6/6/2011

Measurement Procedure

The Equipment under Test (EUT) was connected directly to a spectrum analyzer input. The peak readings were taken and the result was then compared to the limit.

Test Setup



Transmitter Peak Output Power

Tuned Frequency	Recorded Measurement		Result
MHz	dBm	Watts	
152.24	54.06	254.683	Pass
162	52.71	186.637	Pass
174	53.23	210.377	Pass

Note: Measured Output Power is within 20% of the manufacturers rated output power per 90.205(s)

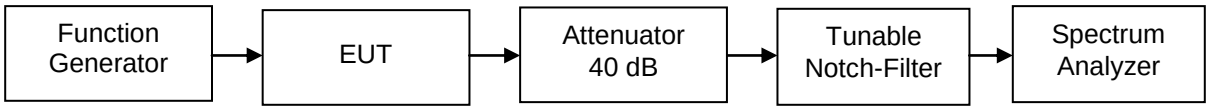
Conducted Spurious Emissions

Name of Test: Conducted Spurious Emissions
Specification: 2.1051, 22.359 **Engineer**: Greg Corbin
Test Equipment Utilized: i00118, i00126, i00172, i00331 **Test Date**: 3/11/2011

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 frequency range from 30 MHz to the 10th harmonic of the fundamental transmitter was observed and plotted. A modulation frequency of 1200 Hz square wave at a level of 4 v p-p was input to the 2 level input of the EUT. The deviation in the control software was set to 3000 Hz.

Test Setup

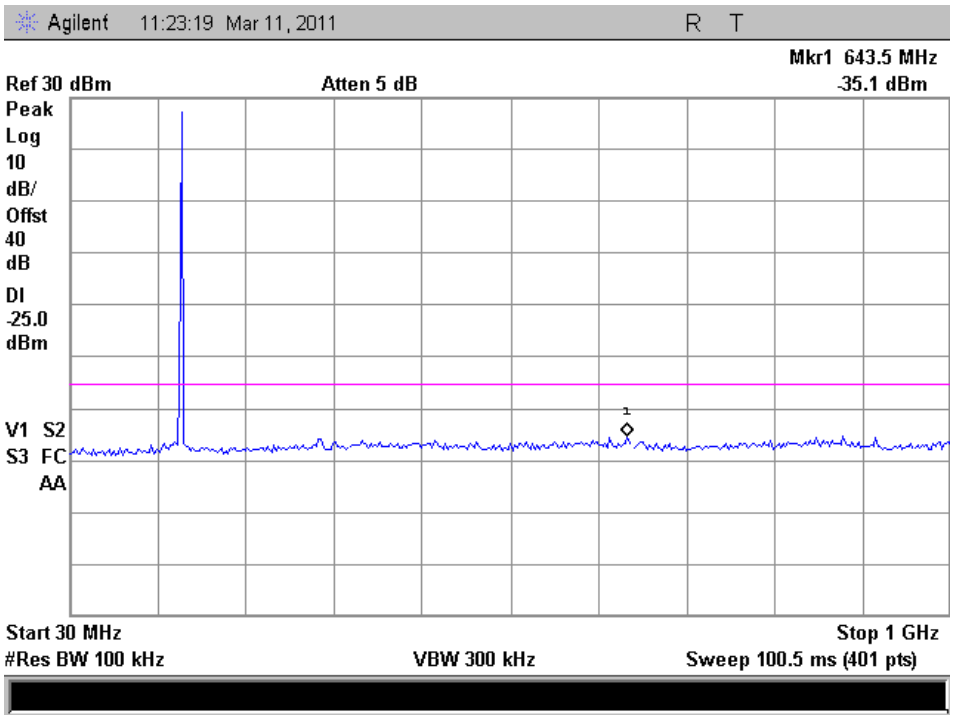


Conducted Spurious Emissions Summary Test Table

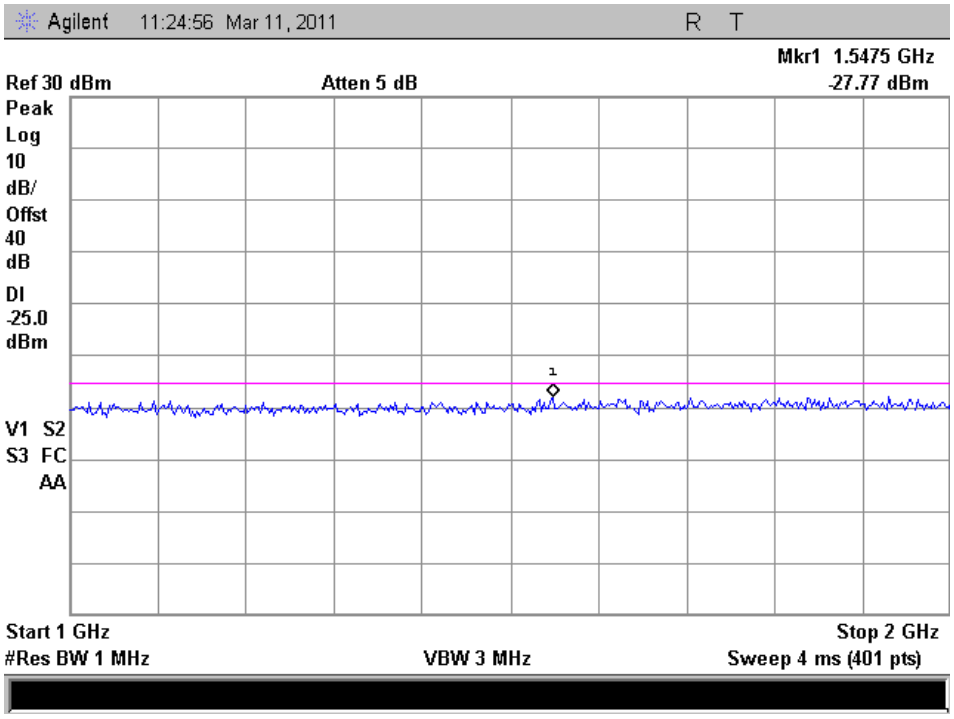
Tuned Frequency (MHz)	Spurious Frequency (MHz)	Measured Spurious Level (dBm)	Specification Limit (dBm)	Result
152.24	1547.5	-27.7	- 20	Pass
162	1767.5	-30.7	- 20	Pass
174	1692.5	-30.7	- 20	Pass

Conducted Spurious Emission Test Plots

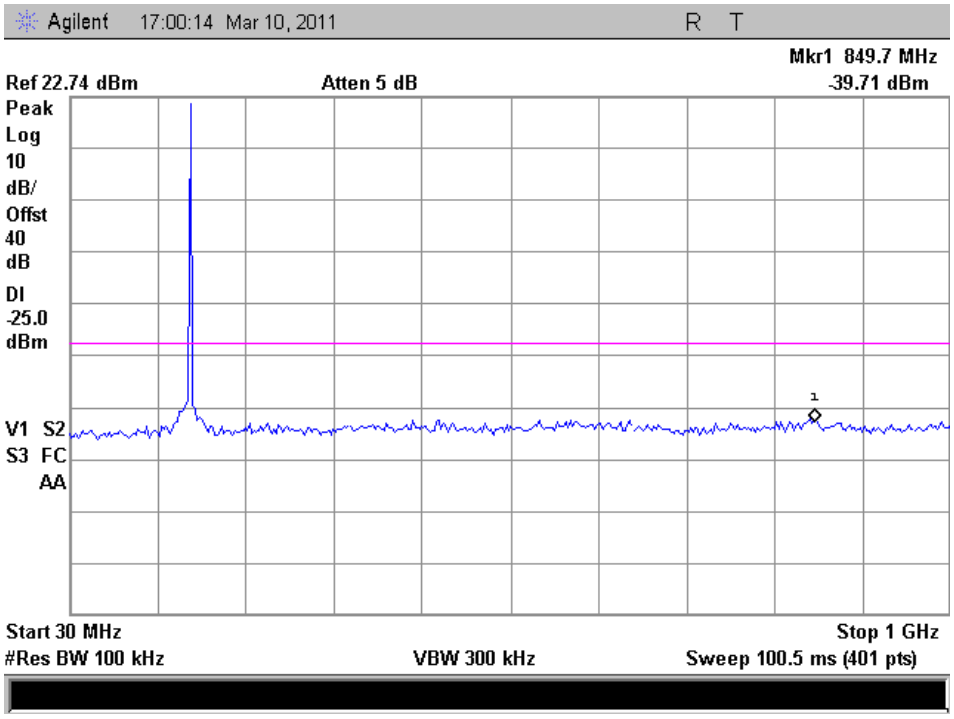
Tuned Frequency = 152.24 MHz
30 MHz – 1 GHz



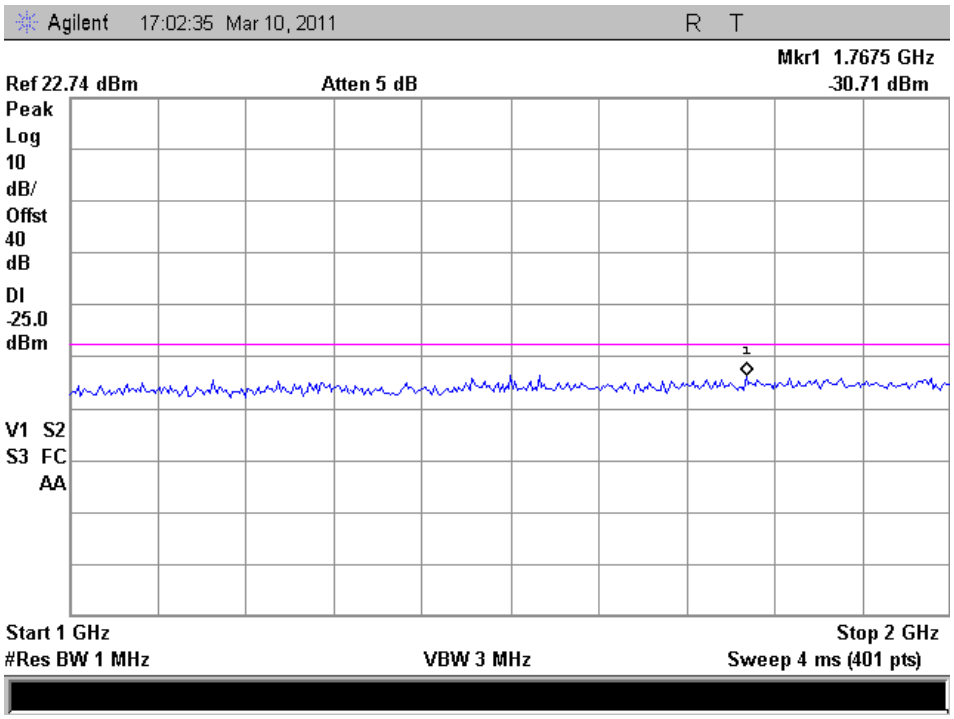
Tuned Frequency = 152.24 MHz
1 - 2 GHz



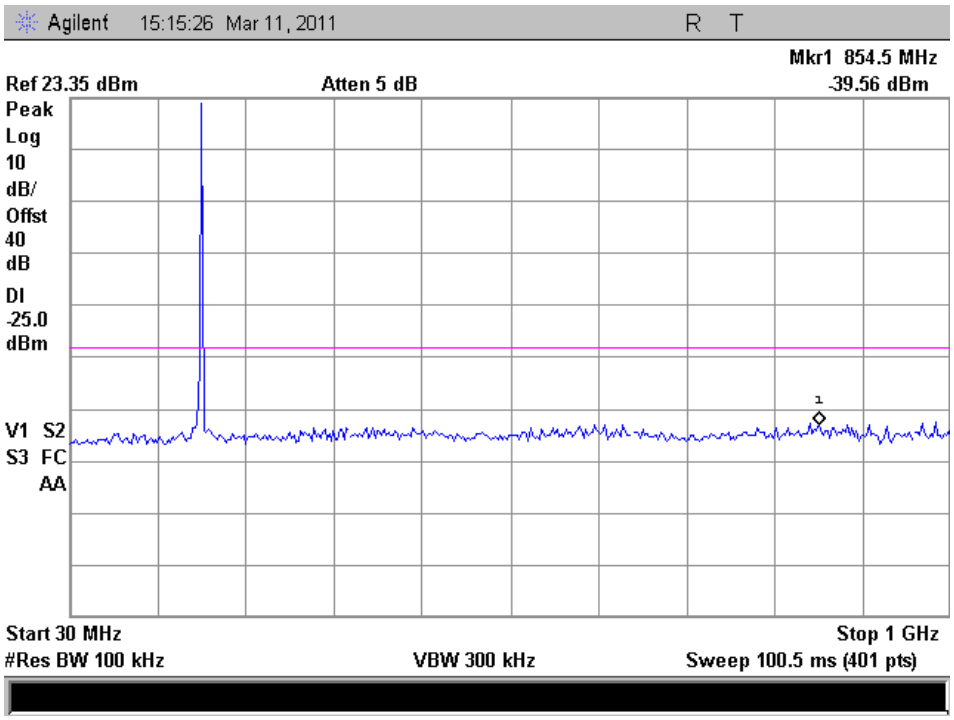
Tuned Frequency = 162 MHz
30 MHz – 1 GHz



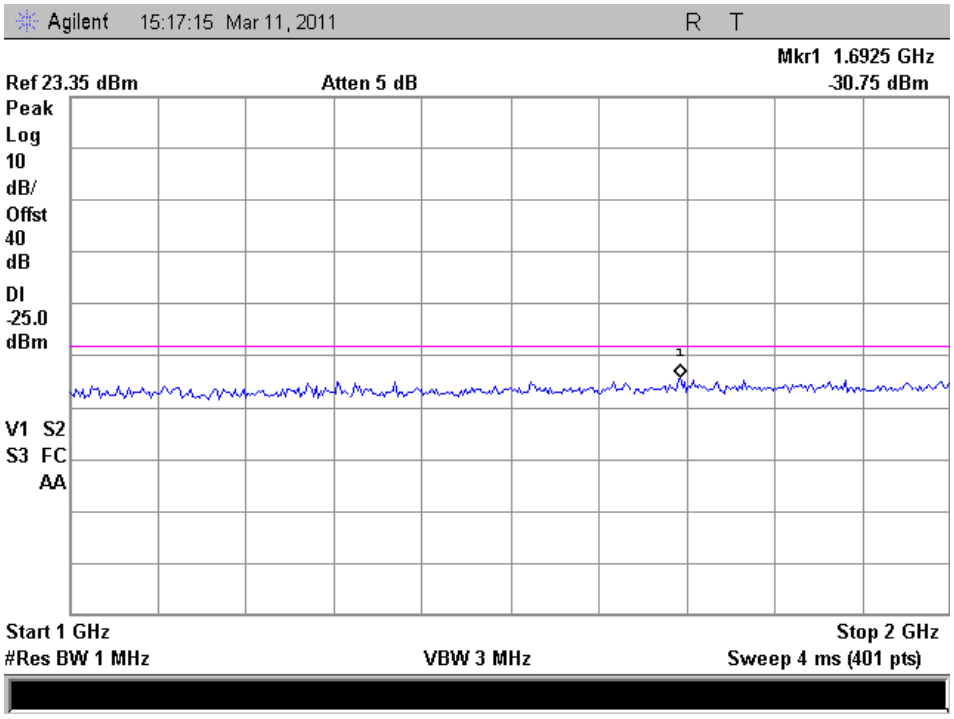
Tuned Frequency = 162 MHz
1 - 2 GHz



Tuned Frequency = 174 MHz
30 MHz – 1 GHz



Tuned Frequency = 174 MHz
1 - 2 GHz



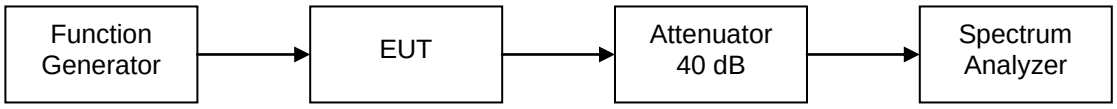
Emission Masks (Occupied Bandwidth)

Name of Test:	Emission Masks (Occupied Bandwidth)	
Specification:	2.1049, 22.357, 90.210(d)	**Engineer**: Greg Corbin
Test Equipment Utilized:	i00118, i00172, i00331	**Test Date**: 6/6/2011

Test Procedure

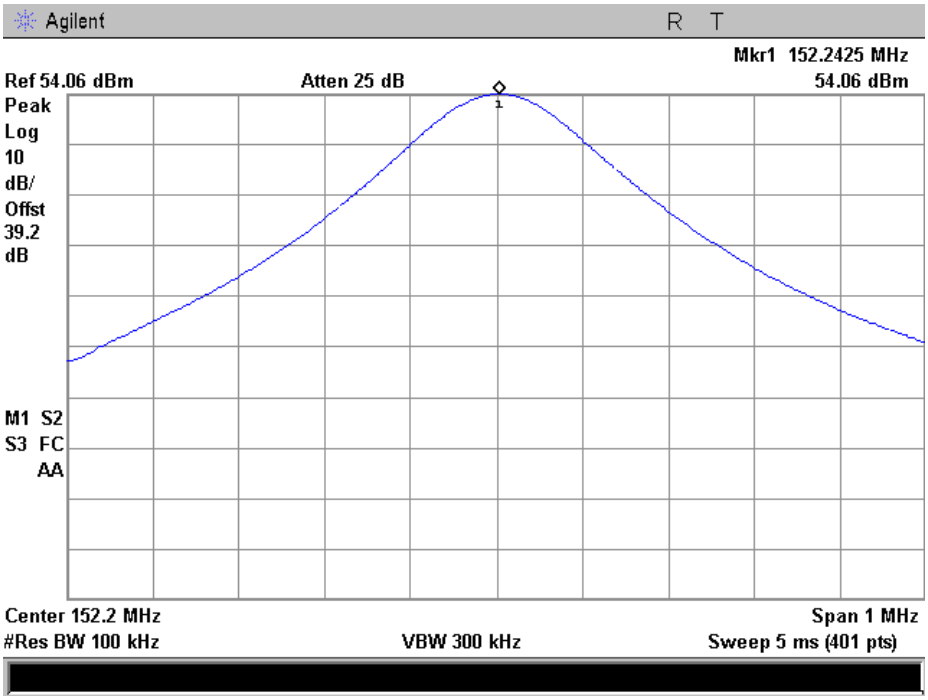
The EUT was connected directly to a spectrum analyzer to verify that the EUT meets the required emissions mask. A reference level plot is provided to verify that the peak power was established prior to testing the mask. A modulation frequency of 1200 Hz square wave at a level of 4 v p-p was input to the 2 level input of the EUT. The deviation in the control software was set to 3000 Hz.

Test Setup

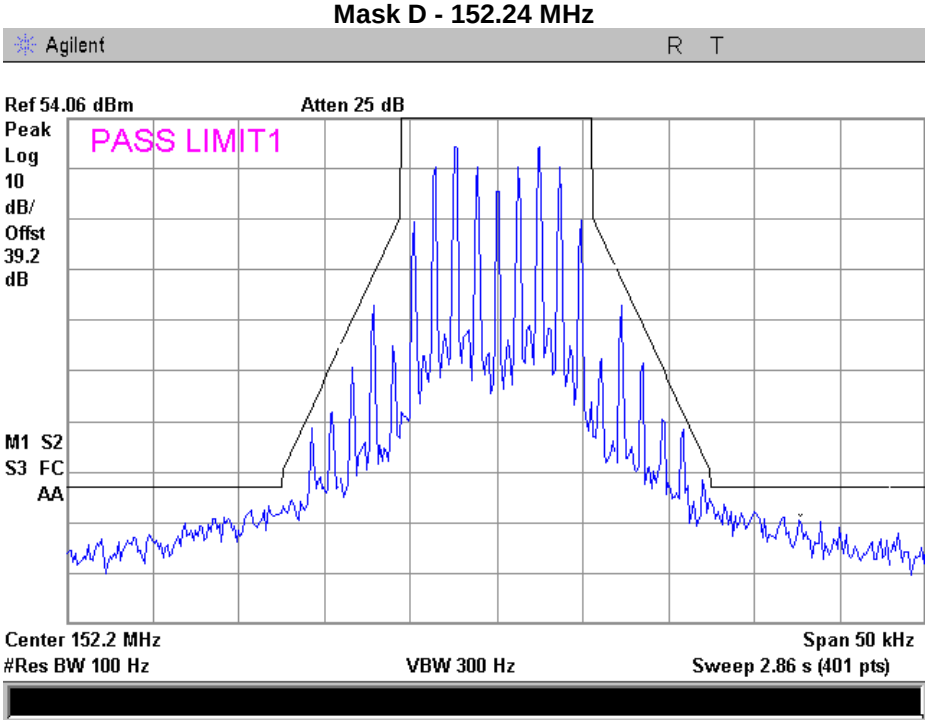


Occupied Bandwidth Plots

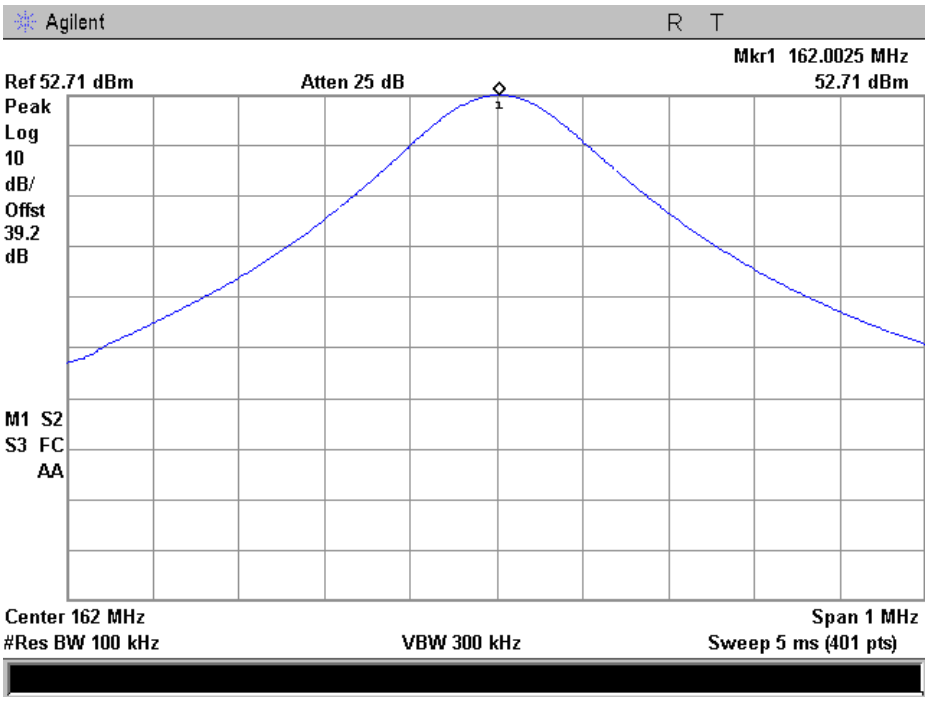
Reference 152.24 MHz



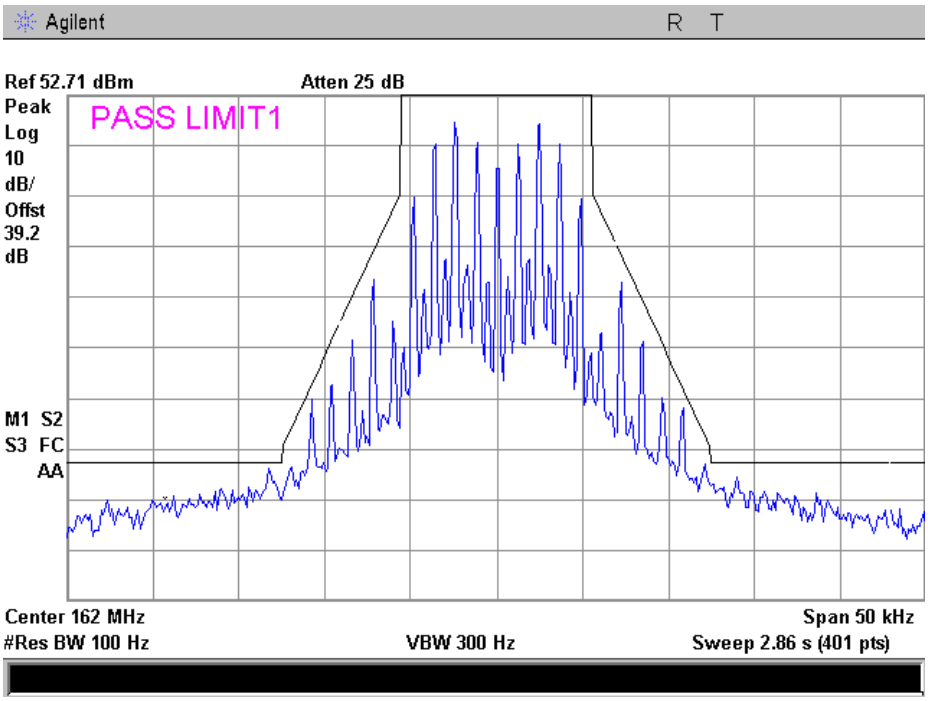
Mask D - 152.24 MHz



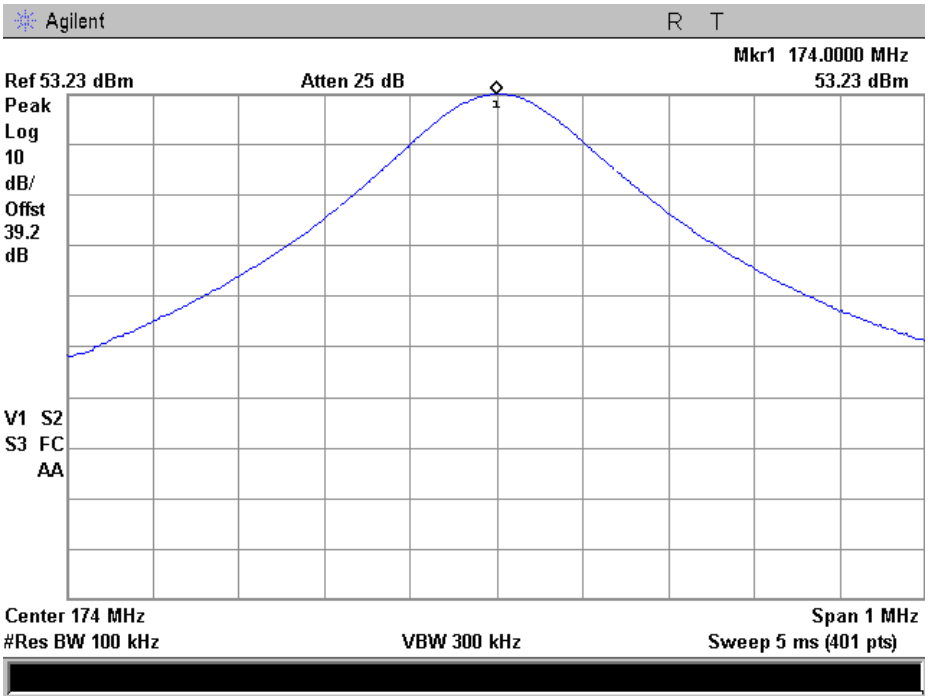
Reference 162 MHz



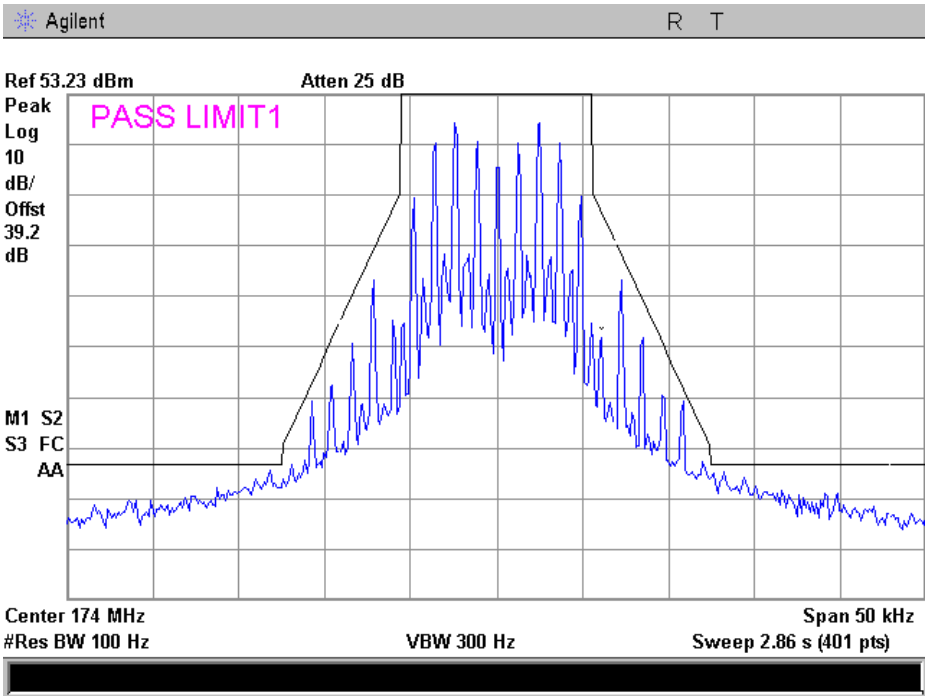
Mask D - 162 MHz



Reference 174 MHz



Mask D - 174 MHz



Necessary Bandwidth Calculations

Name of Test: Necessary Bandwidth Calculations
Specification: 2.202, 90.209 **Engineer**: Greg Corbin
Test Equipment Utilized: N/A **Test Date:** 6/6/2011

Modulation = 9K6F1D

Necessary Bandwidth Calculation:

Data Rate (R) Kbps	=	2.4
Maximum Deviation (D), kHz	=	3
Necessary Bandwidth (B_N), kHz	=	2.4D+1.0R
	=	9.6

Modulation = 5K60F2D

Necessary Bandwidth Calculation:

Data Rate (R) Kbps	=	0.5
Maximum Deviation (D), kHz	=	2.125
Necessary Bandwidth (B_N), kHz	=	2.4D+1.0R
	=	5.6

Test Equipment Utilized

Description	Manufacturer	Model Number	CT Asset No.	Last Cal Date	Cal Due Date
Function Generator	HP	33120A	i00118	Verify When	Use
Tunable Notch Filter	Eagle	TNF-1-(100-500MHz)	i00126	Verify When	Use
Attenuator – 30 dB 2000 watt	Bird	8329	i00172	Verify When	Use
Humidity / Temp Meter	Newport	IBTHX-W-5	i00282	11/11/10	11/11/11
Spectrum Analyzer	Agilent	E4407B	i00331	12/20/10	12/20/11

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