



## Test Report

Prepared for: Spot, LLC

Model: STX3

Description: Transmitter, Modular Satellite

FCC ID: L2V-STX3

To

FCC Part 25

Date of Issue: March 17, 2015

On the behalf of the applicant: **Spot, LLC**  
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**Alex Macon**  
Project Test Engineer

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**Test Report Revision History**

<b>Revision</b>	<b>Date</b>	<b>Revised By</b>	<b>Reason for Revision</b>
1.0	5/20/13	Alex Macon	Original Document
2.0	10/3/13	Alex Macon	Updated Power limit
3.0	3/13/15	Alex Macon	Data was taken with a 3dB antenna in correction. Manufacturer would like report updated for a 5.1 dB antenna. Updated Antenna Gain to 5.1 dB on pg. 7 and pg. 19
4.0	3/17/15	Alex Macon	Removed unnecessary data for class II permissive change



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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 below.

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

Testing Certificate Number: **2152.01**



**FCC OATS Reg. #933597**

**IC Reg. #2044A-1**

**Non-accredited tests contained in this report:**

**N/A**



## Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2 and the following individual Parts: FCC Part 25 Satellite Communications.

## 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, section 6.1.9, 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		
Temp (°C)	Humidity (%)	Pressure (mbar)
26.9 – 28.0	25.5 – 28.7	966.0 – 970.5

Measurement results, unless otherwise noted, are worst case measurement.

### EUT Description

**Model:** STX3

**Description:** Transmitter, Modular Satellite

**FCC ID:** L2V-STX3

### Additional Information:

The STX 3 is a simplex Satellite transmitter designed to send small packets of user defined data to a network of low earth orbiting (LEO) satellites using the Globalstar simplex satellite network. The received data is then forwarded to a user defined network interface that may be in the form of an FTP host, email account, or HTTP host where the user will interpret the data for further processing.

## EUT Operation during Tests

EUT is placed in “Modulation Mode” using the Manufacturer’s supplied jumper connections which enable the unit to continuously transmit a test packet. The EUT is connected to a DC power supply and is supplied with a measured 3.3 volts.

**Accessories:** None

**Cables:** None

**Modifications:** None



## Test Result Summary

Specification	Test Name	Pass, Fail, N/A	Comments
25.204	Power Limits	Pass	
25.202(f)	Emissions Limitations for Mobile Earth Stations	Pass	
25.202(f)	Emissions Mask	N/A	Test will not be altered by increased antenna gain
25.216(c)(g)(i)	Emissions Limits for Mobile Earth Stations	N/A	Test will not be altered by increased antenna gain
25.202(d)	Frequency Tolerance	N/A	Test will not be altered by increased antenna gain



## Power Limits

**Name of Test:**

Power Limits

**Test Equipment Utilized:**

i00008, i00331

**Engineer:** Alex Macon

**Test Date:** 5/7/2013

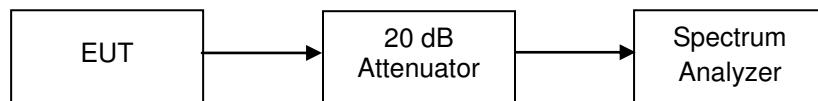
## Test Procedure

The UUT was connected to a Spectrum analyzer through a 20 dB attenuator. Attenuator and cable losses were input into the analyzer as a reference level offset to ensure accurate measurements were obtained. All measurements were made in a 1 MHz RBW. The EIRP is a summation of the conducted power, the antenna gain, and the bandwidth correction factor.

Bandwidth correction formula:

$$10 \log(1/2.3) = 3.6 \text{ dBm}$$

## Test Setup



## Transmitter Peak Output Power

Tuned Frequency (MHz)	Conducted Output Power (dBm)	Bandwidth CF (dB)	Antenna Gain (dBi)	EIRP Output Power (dBm)	Specification Limit
1611.25	16.23	3.6	5.1	24.93	No limit for Mobile Earth Stations
1613.75	15.71	3.6	5.1	24.41	No limit for Mobile Earth Stations
1616.25	15.39	3.6	5.1	24.09	No limit for Mobile Earth Stations
1618.75	15.35	3.6	5.1	24.05	No limit for Mobile Earth Stations



## Emissions Limits for Mobile Earth Stations

**Name of Test:** Emissions Limits for Mobile Earth Stations  
**Test Equipment Utilized:** i00008, i00331

**Engineer:** Alex Macon  
**Test Date:** 5/13/13

### Test Procedure

The EUT was connected directly to a spectrum analyzer to verify that the EUT met the requirements for emission limits. Attenuator and cable losses were input into the analyzer as a reference level offset to ensure accurate measurements were obtained.

### Test Setup



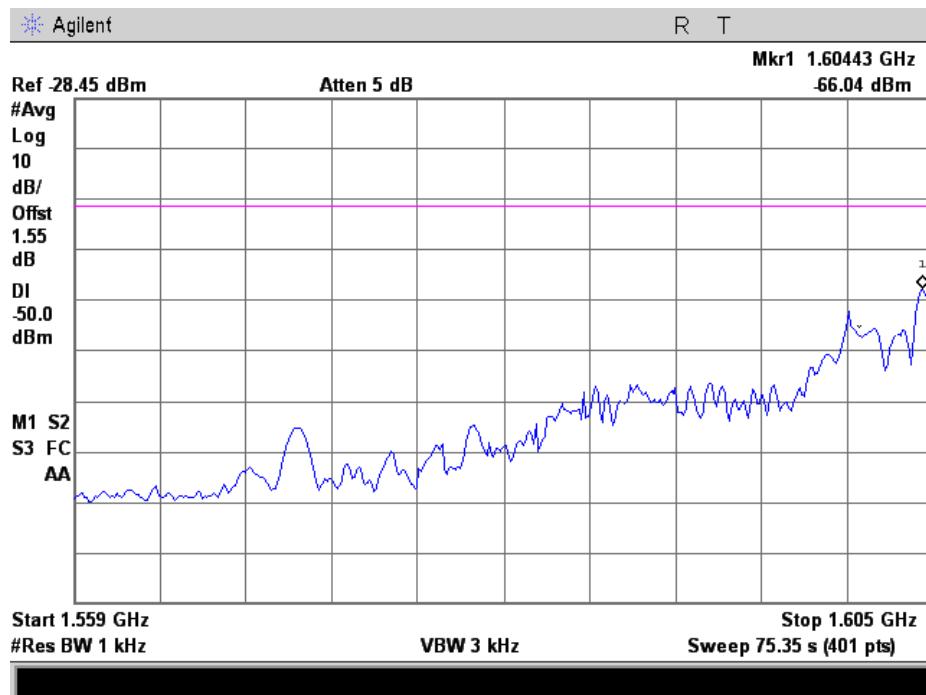
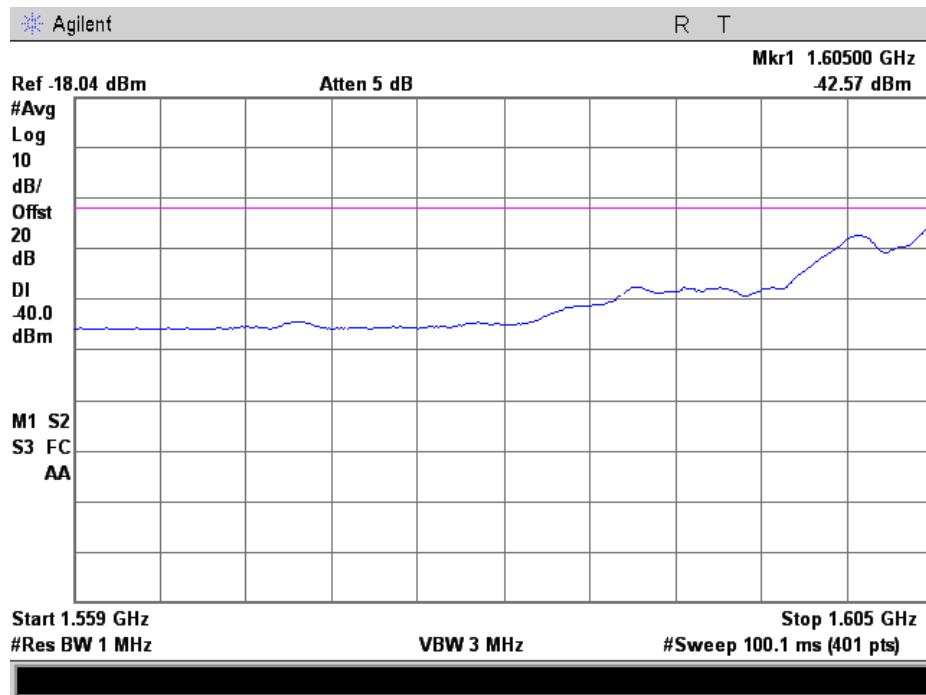
### Test Summary

Frequency (MHz)	RBW	Peak Measurement (dBm)	Peak Freq	Peak Measurement (dBW)	Limit (dBW)	Margin w/3dB gain antenna	Margin w/5.1dB gain antenna
1611.25	1MHz	-42.6	1605.0	-72.6	-70.0	2.6	0.5
	1kHz	-66.0	1604.4	-96.0	-70.0	26.0	23.9
1613.75	1MHz	-45.1	1603.6	-75.1	-70.0	5.1	3.0
	1kHz	-70.9	1603.1	-100.9	-70.0	30.9	28.8
1616.75	1MHz	-46.6	1605.0	-76.6	-70.0	6.6	4.5
	1kHz	-77.9	1605.0	-107.9	-70.0	37.9	35.8
1618.25	1MHz	-53.1	1605.0	-83.1	-70.0	13.1	11.0
	1kHz	-81.6	1604.0	-111.6	-70.0	41.6	39.5
1611.25	1MHz	5.8	1610.0	-24.2	0.0	24.2	12.1
	1kHz	-32.6	1609.5	-62.6	0.0	62.6	44.5
1613.75	1MHz	-26.3	1610.0	-56.3	0.0	56.3	44.2
	1kHz	-58.7	1610.0	-88.7	0.0	88.7	76.6
1616.75	1MHz	-42.3	1610.0	-72.3	0.0	72.3	60.2
	1kHz	-70.0	1605.6	-100.0	0.0	100.0	34.5
1618.25	1MHz	-44.1	1610.0	-74.1	0.0	74.1	62.0
	1kHz	-69.8	1608.1	-99.8	0.0	99.8	64.3
1559-1610	1MHz	-60.3	1569.0	-90.3	-80.0	10.3	8.2

\*The following plots are referenced to a 3dBi antenna and are included to show the foundation of the data above.

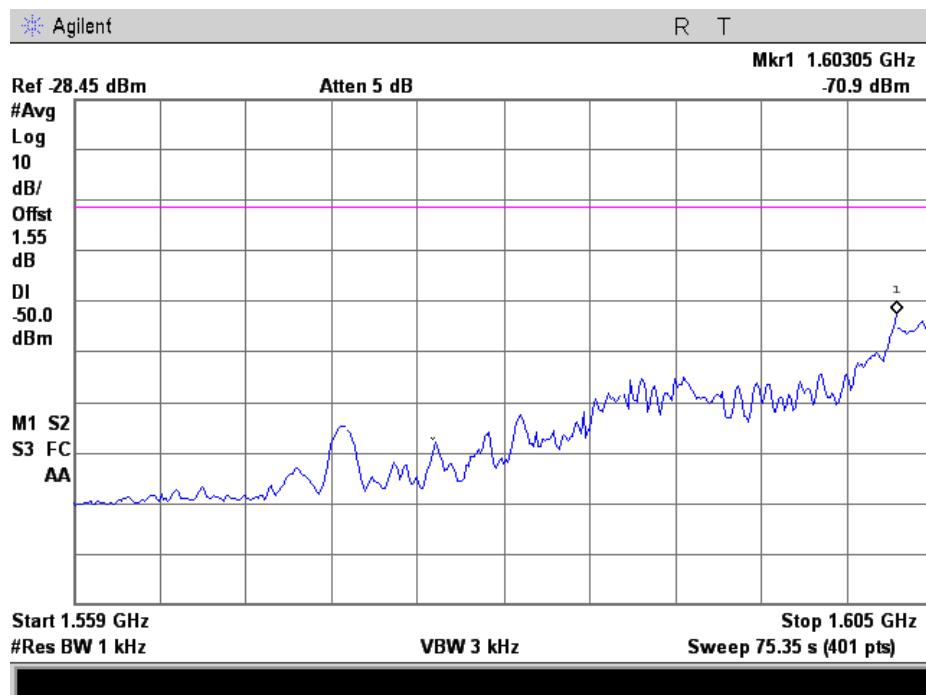
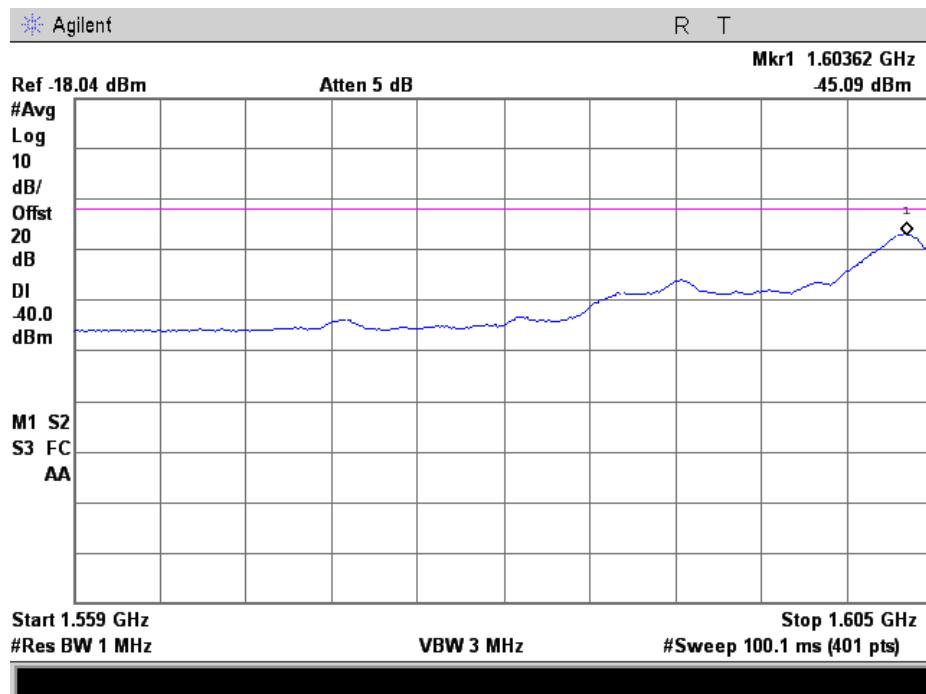


25.216(c) 1611.25 MHz



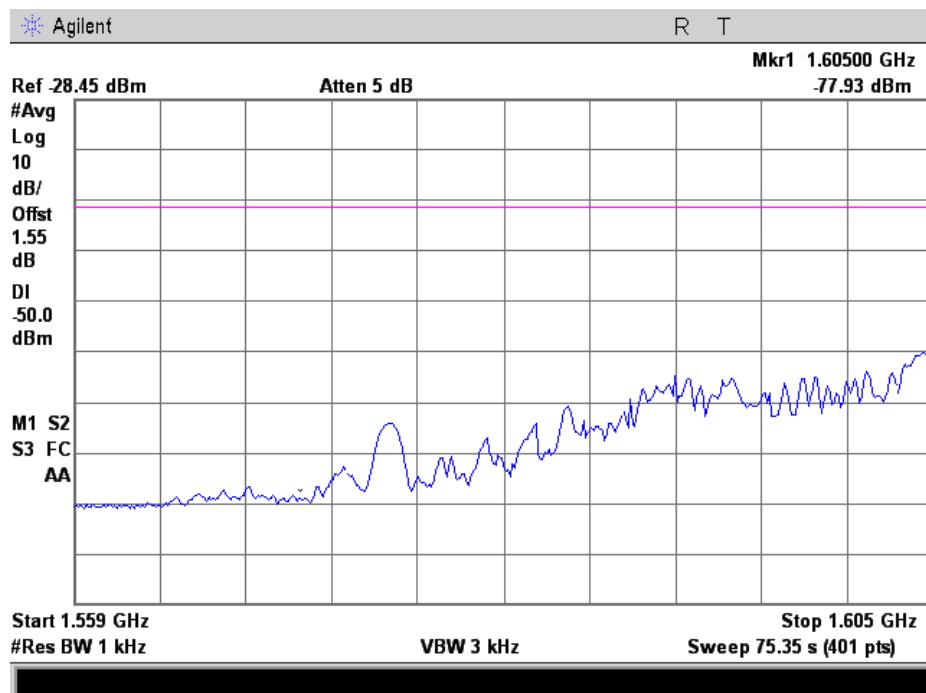
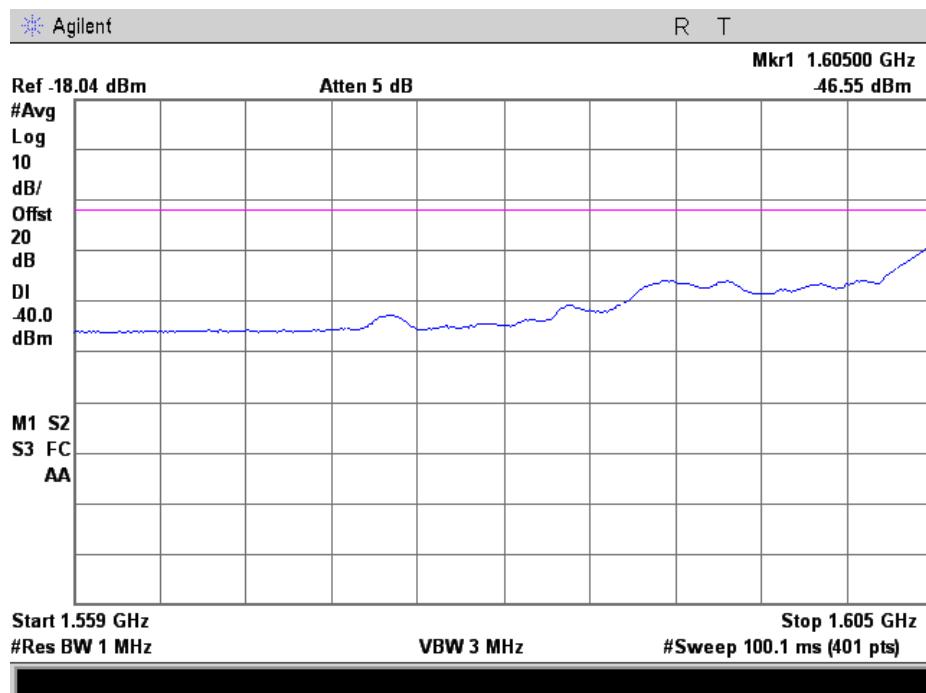


25.216(c) 1613.75 MHz



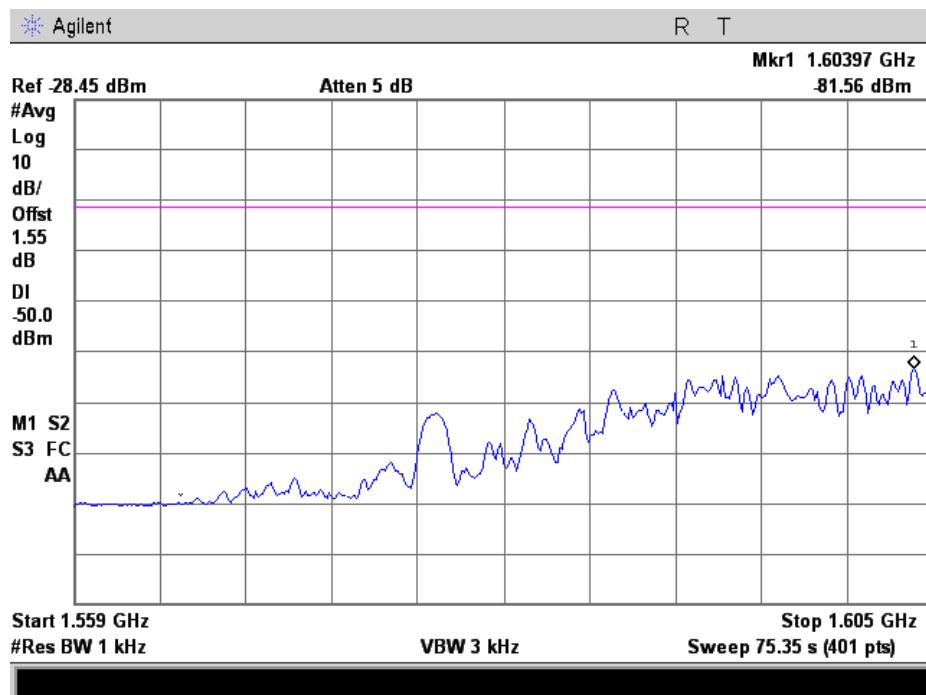
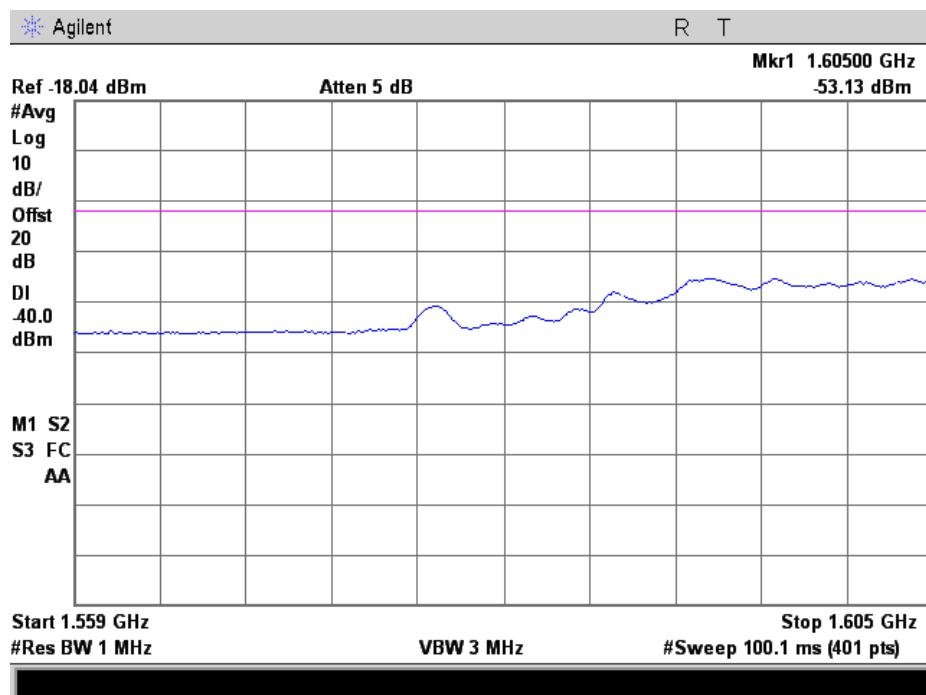


25.216(c) 1616.75 MHz



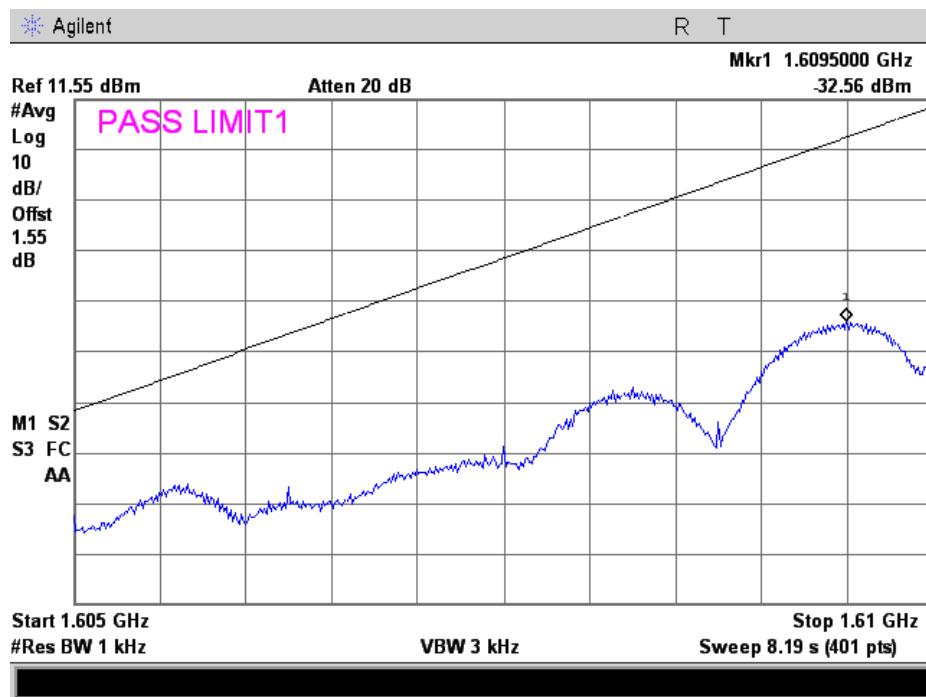
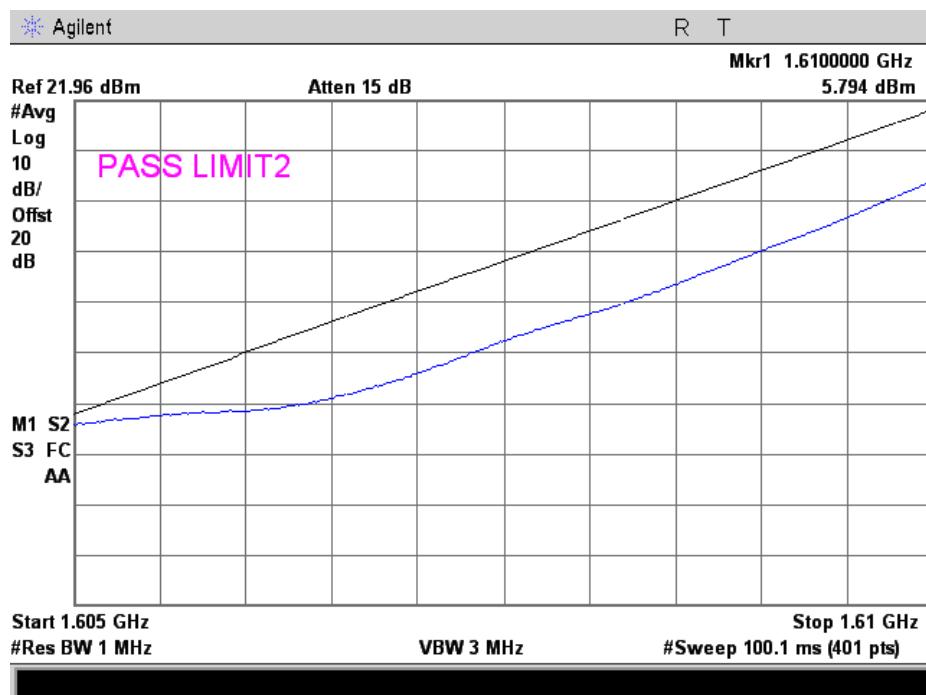


25.216(c) 1618.25 MHz



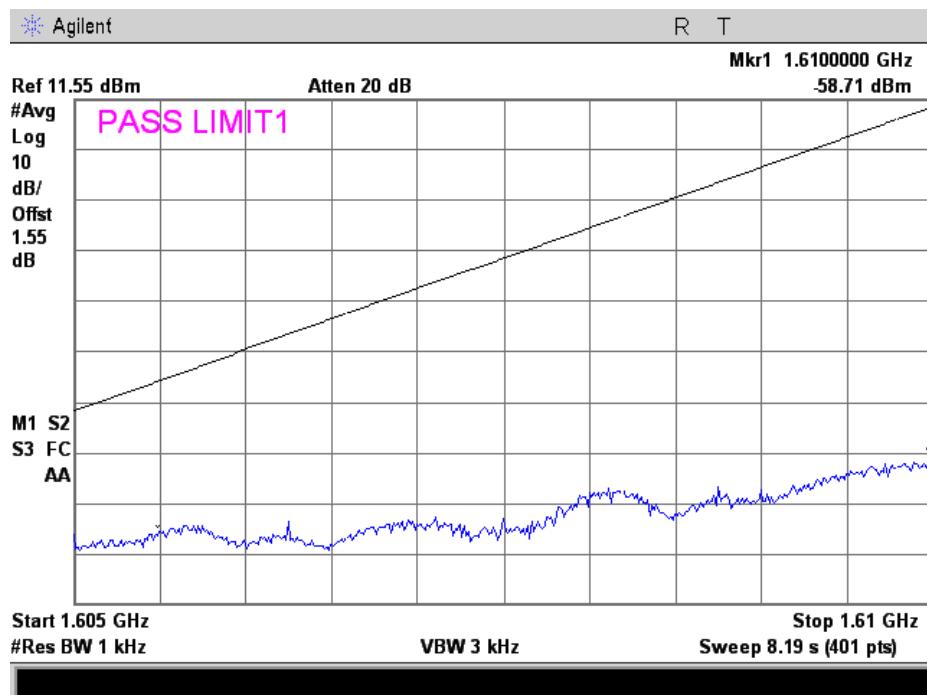
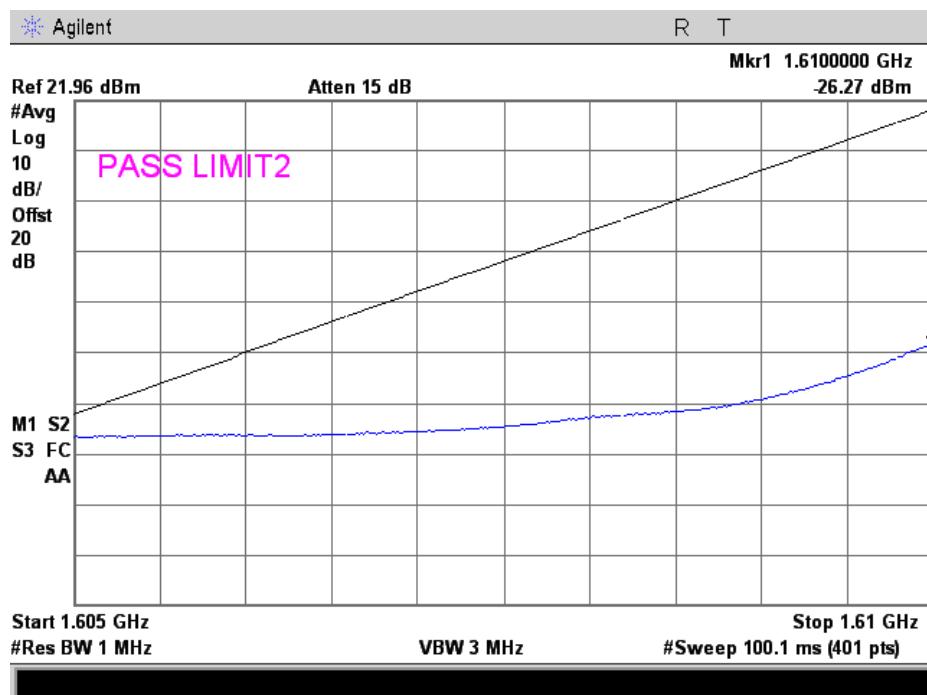


25.216(g) 1611.25 MHz



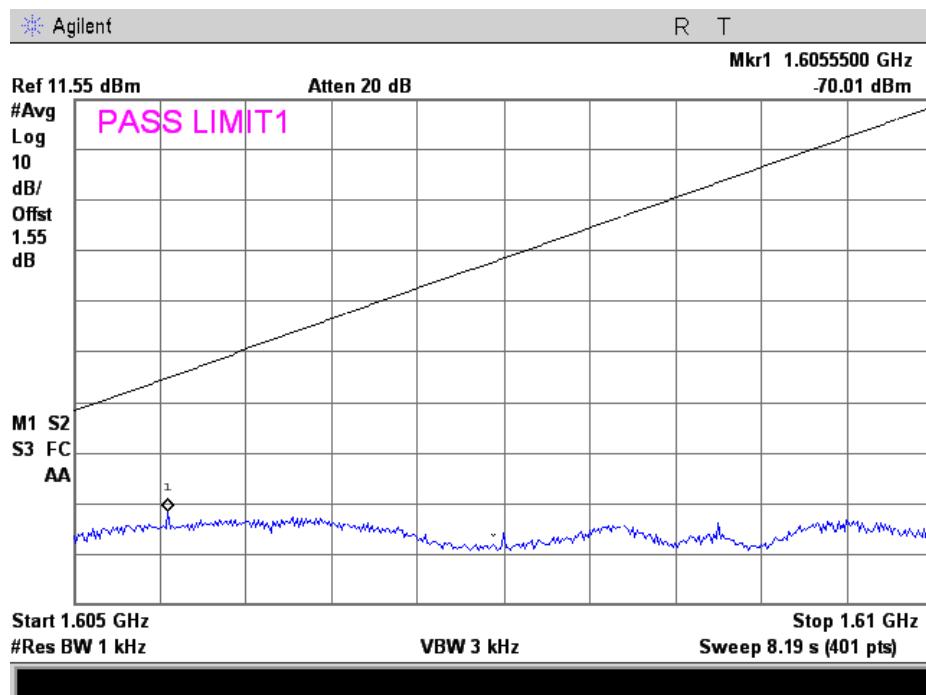
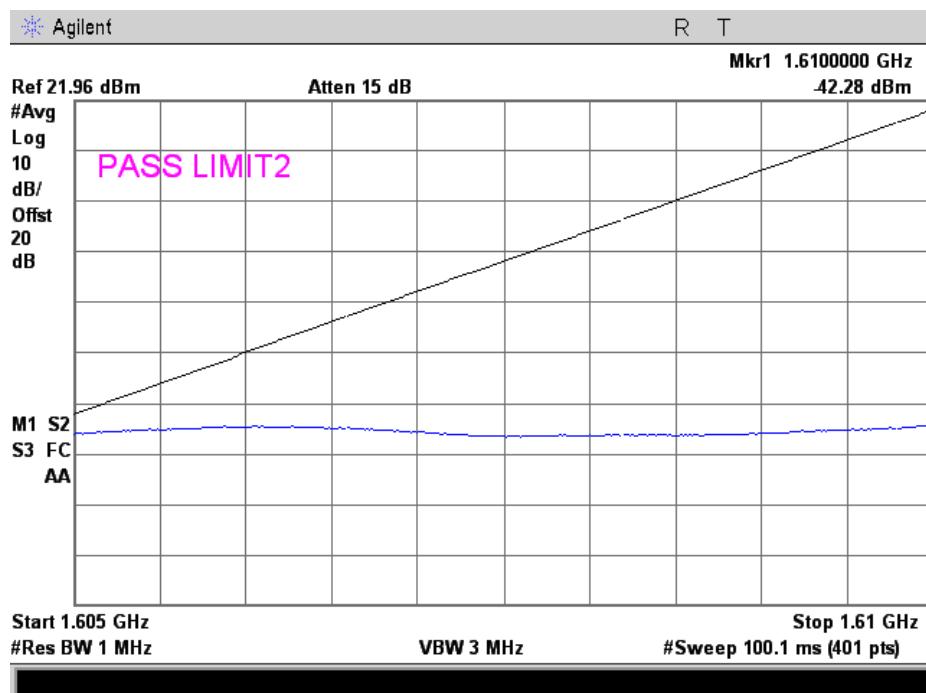


25.216(g) 1613.75 MHz



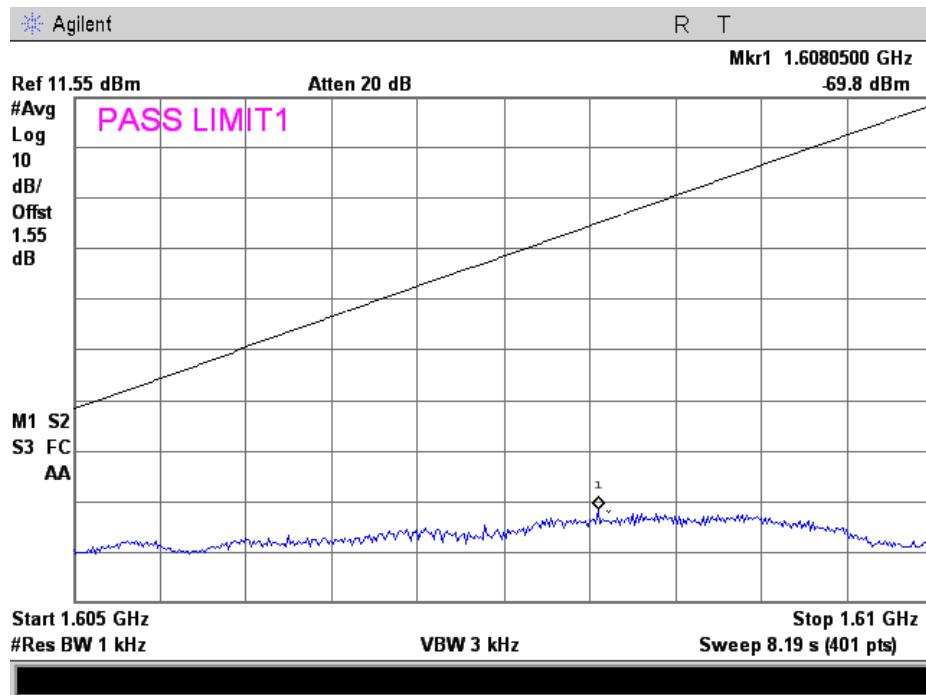
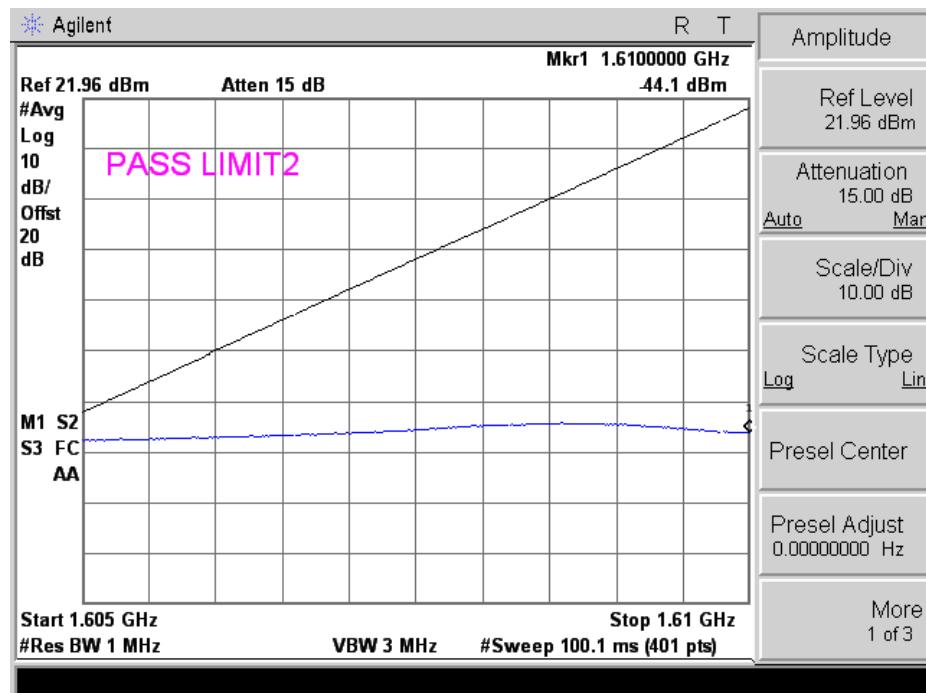


25.216(g) 1616.75 MHz



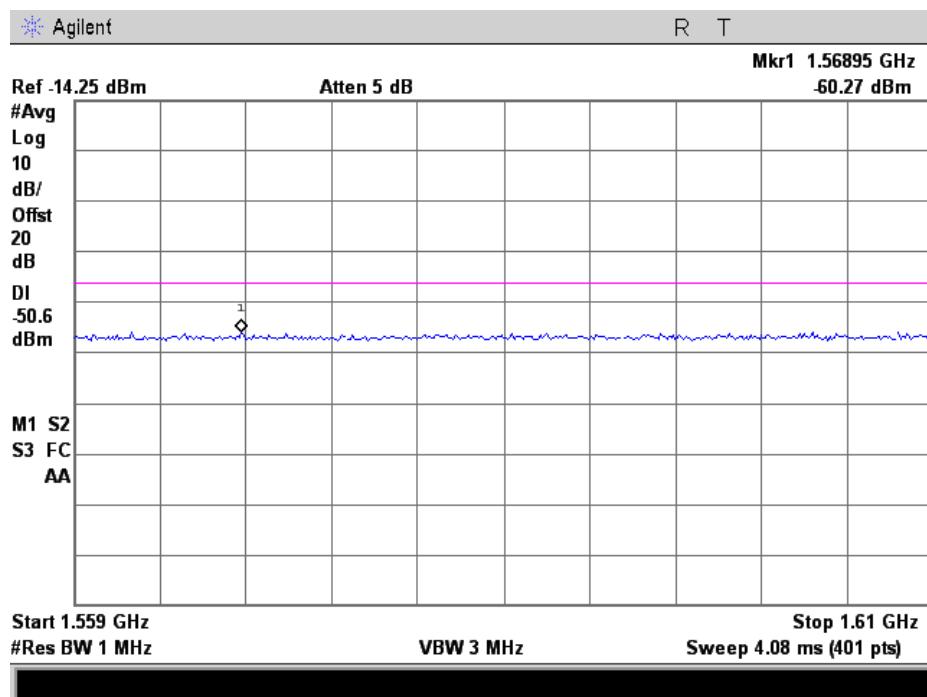


25.216(g) 1618.25 MHz





**25.216(i)**





### Test Equipment Utilized

Description	MFG	Model	CT Asset #	Last Cal Date	Cal Due Date
Power Supply	Kenwood	PR18-3A	i00008	Verified on: 5/7/13	
Temperature Chamber	Tenney	Tenney Jr	i00027	Verified on: 5/7/13	
Horn Antenna, Amplified	ARA	DRG-118/A	i00271	4/19/12	4/19/14
Spectrum Analyzer	Agilent	E4407B	i00331	4/23/13	4/23/14

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