



Test Report

Prepared for: L-3 Aviation Products

Model: 228E5733-00

Description: AFIRS 228S Satellite Data Unit

Serial Number: N/A

FCC ID: IB2AFIRS228S0

To

FCC Part 25

Date of Issue: November 24, 2018

On the behalf of the applicant:

L-3 Aviation Products
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Attention of:

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Poona Saber
Project Test Engineer

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Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	7/19/2018	Poona Saber	Original Document



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ILAC / A2LA

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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**



FCC Site Reg. #349717

IC Site Reg. #2044A-2

Non-accredited tests contained in this report:

N/A

Standard Test Conditions and Engineering Practices

Unless otherwise indicated, the procedures contained in ANSI C63.26-2015 were observed during testing.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

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

Unless otherwise indicated in the specific measurement results, the ambient temperature was maintained within the range of 10° to 40°C (50° to 104°F) and the relative humidity levels were in the range of 10% to 90%.

Environmental Conditions		
Temperature (°C)	Humidity (%)	Pressure (mbar)
25.24	33.85	969.47

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.

Prior to testing the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

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

EUT Description

Model: 228E5733-00

Description: AFIRS 228S Satellite Data Unit

Firmware: N/A

Software: N/A

Serial Number: N/A

Additional Information: Iridium sitcom system used in aircrafts which utilizes an authorized emission designator of 41K7V7W. This is a Class II permissive change application on FCC ID: IB2AFIRS228S0 based on hardware changes on the unit and Power, Power mask and conducted spurious emissions testing has been repeated to verify the performance of the unit based on part 25 rule part.

EUT Operation during Tests

The EUT was placed in a test mode by the manufacturer. The test mode allowed the device to transmit continuously on high mid and low channels.

Test Result Summary

Specification	Test Name	Pass, Fail, N/A	Comments
25.204	Power Limits	Pass	
25.202(f)	Emissions Mask	Pass	
25.216(c)(g)(i) 25.202(f)	Emissions Limits for Mobile Earth Stations	Pass	

Power Limits

Engineer: Poona Saber

Test Date: 7/18/2018

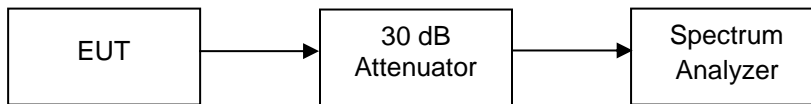
Test Procedure

The UUT was connected to a Spectrum analyzer through a 30 dB attenuator. Attenuator and cable losses were input into the analyzer as a reference level offset to ensure accurate measurements were obtained. The EIRP is a summation of the conducted power and the antenna gain.

The following setting on spectrum analyzer is used for measuring average power of the fundamental:

- a) Set the RBW \geq OBW.
- b) Set VBW \geq 3 \times RBW.
- c) Set span \geq 2 \times OBW.
- d) Sweep time \geq 10 \times (number of points in sweep) \times (transmission symbol period).
- e) Detector = peak.
- f) Trace mode = max hold.
- g) Allow trace to fully stabilize.
- h) Use the peak marker function to determine the peak amplitude level.

Test Setup

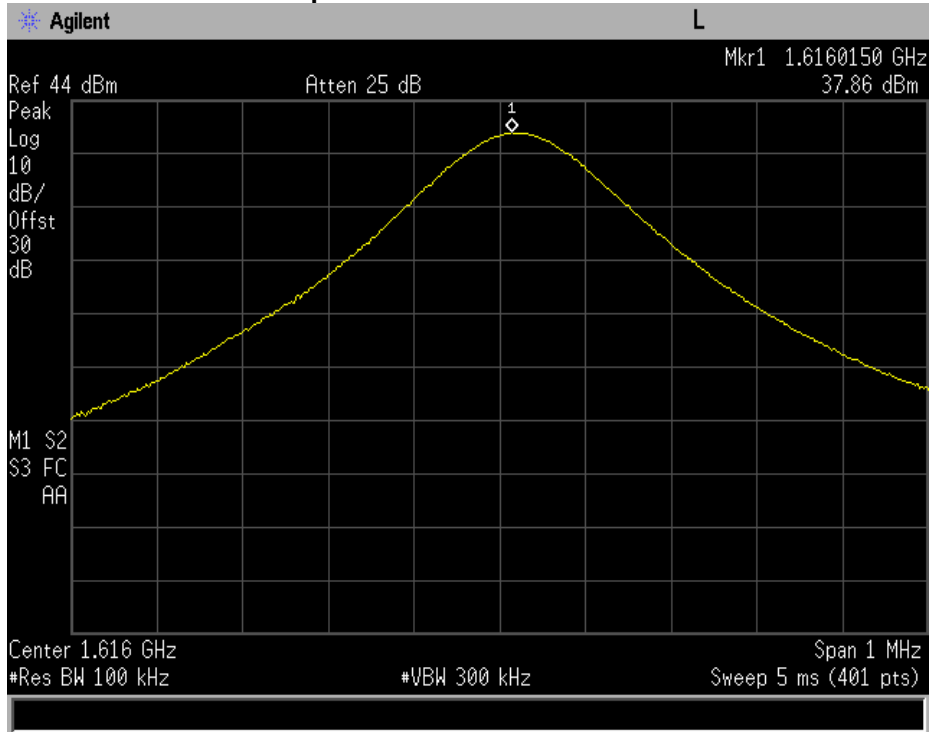


Transmitter Average Output Power

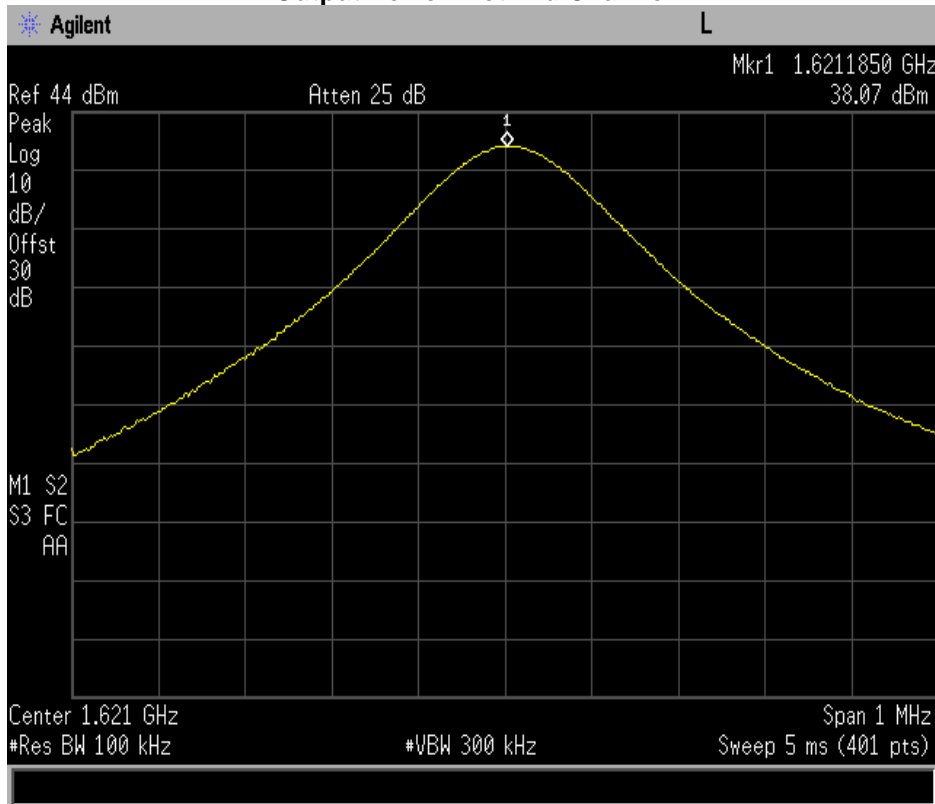
Tuned Frequency (MHz)	Conducted Output Power (dBm)	Antenna Gain (dBi)	EIRP Output Power (dBm)	Specification Limit
1616.02	37.86	3	40.86	No limit for Mobile Earth Stations
1621.18	38.07	3	41.07	No limit for Mobile Earth Stations
1625.97	37.49	3	40.49	No limit for Mobile Earth Stations



Output Power Plot Low Channel

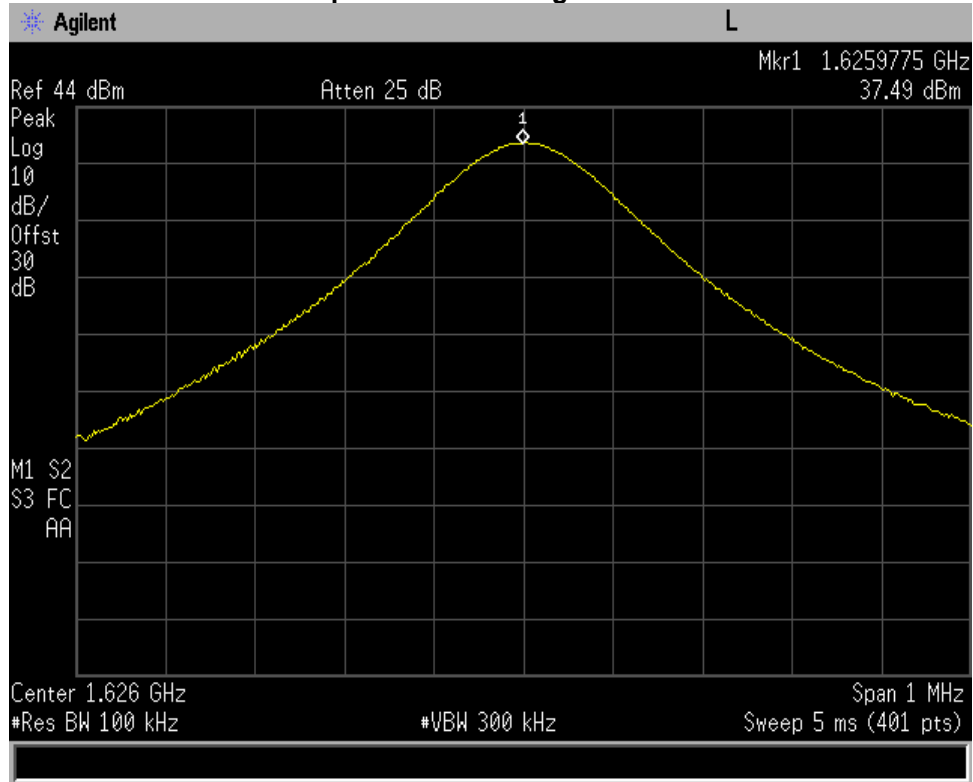


Output Power Plot Mid Channel





Output Power Plot High Channel



Emissions Limitations for Mobile Earth Stations

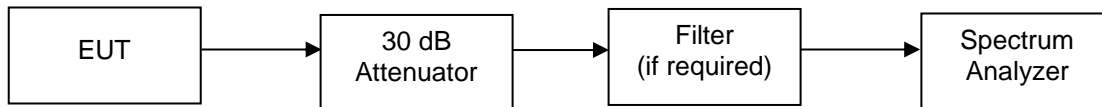
Engineer: Poona Saber

Test Date: 7/18/2018

Test Procedure

The EUT was connected directly to a spectrum analyzer and the conducted spurious emissions were measured to ensure that the EUT met the requirements specified. Only the worst-case emission at each frequency was reported. Notch and high pass filters were utilized to ensure that the fundamental power did not force the input of the spectrum analyzer into compressions. These losses in addition to cable losses were input into the analyzer as a reference level offset to ensure accurate measurements were obtained.

Test Setup



Emissions Limitations Summary Table

Tuned Frequency (MHz)	Result	Comments
1616.0188	Pass	See Plots
1620.9825	Pass	See Plots
1625.950	Pass	See Plots

See Annex A for test plots

Emission Masks

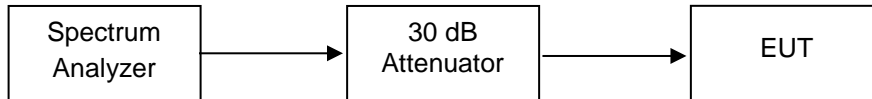
Engineer: Poona Saber

Test Date: 7/18/2018

Test Procedure

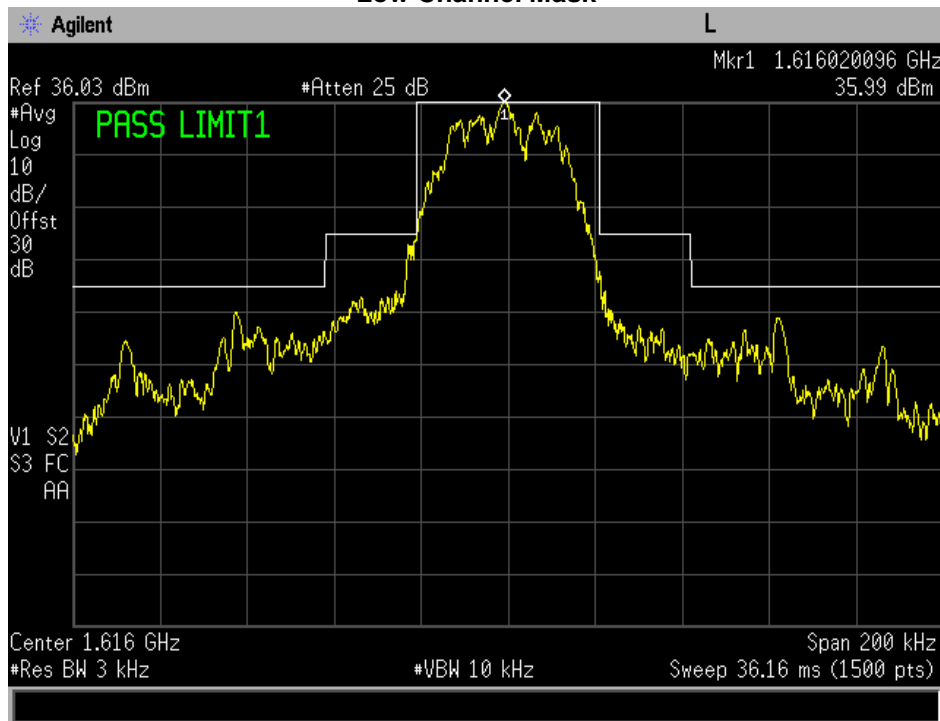
The EUT was connected directly to a spectrum analyzer to verify that the EUT met the requirements for emission mask. Attenuator and cable losses were input into the analyzer as a reference level offset to ensure accurate measurements were obtained.

Test Setup



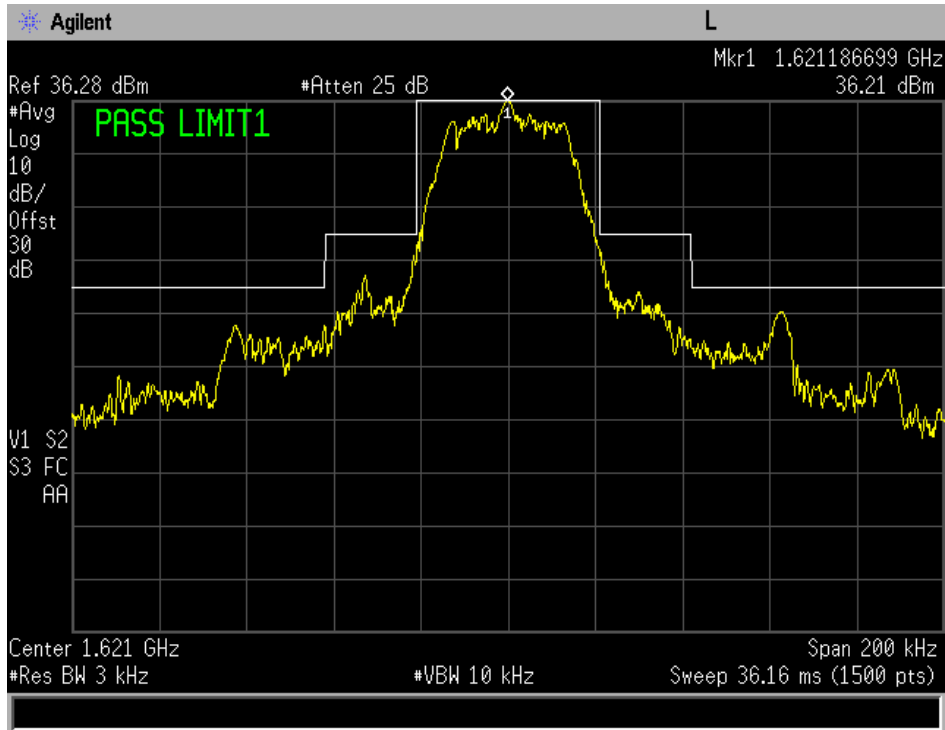
Emission Mask Plots

Low Channel Mask



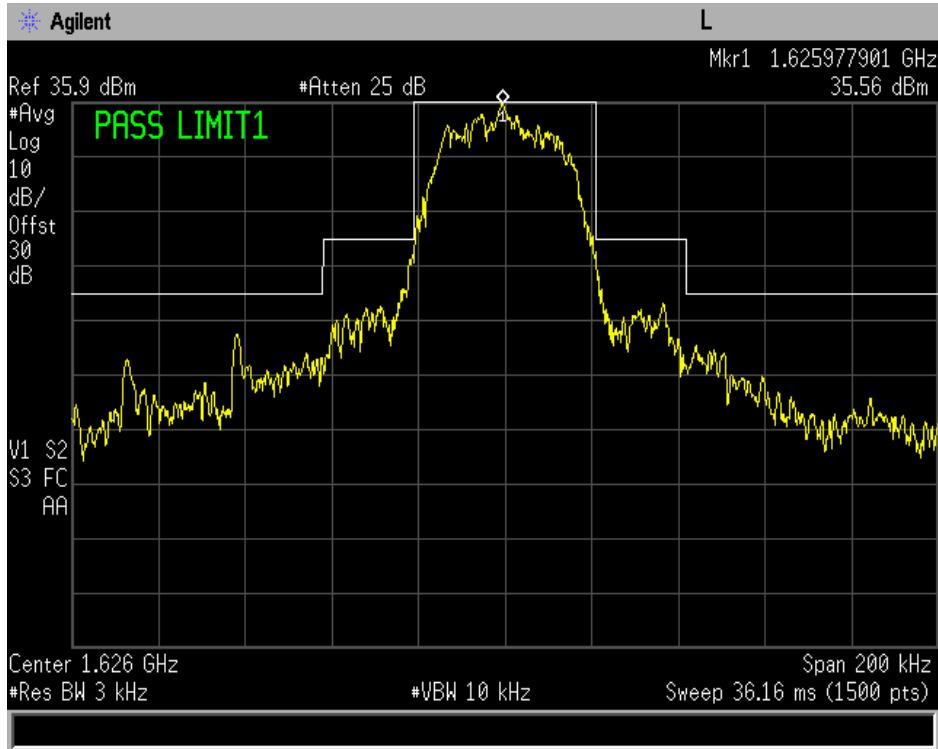


Mid Channel Mask





High Channel Mask



Test Equipment Utilized

Description	Manufacturer	Model #	CT Asset #	Last Cal Date	Cal Due Date
Spectrum Analyzer	Agilent	E4407B	i00331	11/21/2017	11/21/18

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