

Universal Avionics Systems Corporation

ADDENDUM TEST REPORT TO 91992-8B

Unilink, UL-801

Tested To The Following Standards:

FCC Part 87

Report No.: 91992-8C

Date of issue: January 30, 2012



This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

TABLE OF CONTENTS

Administrative Information	3
Test Report Information	3
Revision History	3
Report Authorization	4
Test Facility Information	4
Site Registration & Accreditation Information	4
Summary of Results	5
Conditions During Testing.....	5
Equipment Under Test.....	6
Peripheral Devices	6
FCC Part 87.....	7
87.131 - RF Power Output	7
87.133 - Frequency Stability	10
87.135- Occupied Bandwidth	13
87.139- Conducted Spurious Emissions / Adjacent Channel Power	19
87.139 - Spurious Radiation Emissions	33
Supplemental Information.....	40
Measurement Uncertainty	40
Emissions Test Details.....	40

ADMINISTRATIVE INFORMATION

Test Report Information

REPORT PREPARED FOR:

Universal Avionics Systems Corporation
11351 Willows Road N.E.
Redmond , WA 98052-2552

Representative: Roger Dieterich
Customer Reference Number: J23093

DATE OF EQUIPMENT RECEIPT:

DATE(S) OF TESTING:

REPORT PREPARED BY:

Joyce Walker
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Project Number: 91992

May 25, 2011

May 25 –June 1, 2011

Revision History

Original: Testing of the Unilink, UL-801 to FCC Part 87.

Addendum A: To change “Mode A” to “Mode A (A2D)”, change “Mode B” to “VDL Mode 2 (G1D)”, added modes tested under the “Conditions During Testing” section, added modes tested to data sheets, added clarification to the Power Output test data table, and added (G1D) to placed that referenced D8PSK.

Addendum B: To correct the Limit Columns on page 11 from 20 to 30 in the upper block and from 2 to 5 in the lower block. Additional corrections to page 11 in the lower block title from VDL Mode 2(G1) to VDL Mode 2(G1D).

Addendum C: Added a laptop computer to the Peripherals List. Plots were added to section 87.135 OBW. In Section 87.139 Conducted Spurious Emission / Adjacent Channel Power the following changes were made: Clarifications were added to the table of results, plots were added, corrections were made to the tabular data headers from dBuV to dBm and current plot was corrected. In Section 87.139 Spurious Radiated Emissions the following corrections were made: Modified the equipment list, corrected the title on the Emission Mask from K to D, deleted tabular data and replaced it with a data table and added a plot.

Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



Steve Behm
Director of Quality Assurance & Engineering Services
CKC Laboratories, Inc.

Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
22116 23rd Drive S.E., Suite A
Bothell, WA 98021-4413

Site Registration & Accreditation Information

Location	CB #	Japan	Canada	FCC
Bothell	US0081	R-2296, C-2506, T-1489 & G-284	3082C-1	318736

SUMMARY OF RESULTS

Standard / Specification: FCC Part 87

Description	Test Procedure/Method	Results
RF Power Output	FCC 87.131 / TIA / EIA 603-C	Pass
Frequency Stability	FCC 87.133 / TIA / EIA 603-C	Pass
Occupied Bandwidth	FCC 87.135 / TIA / EIA 603-C	Pass
Spurious Emissions at Antenna Terminal	FCC 87.139 / TIA / EIA 603-C	Pass
Field Strength of Spurious Radiation	FCC 87.139 / TIA / EIA 603-C	Pass

Conditions During Testing

This list is a summary of the conditions noted for or modifications made to the equipment during testing.

Summary of Conditions
Tested in two configurations: Mode A (A2D) VDL Mode 2 (G1D)

EQUIPMENT UNDER TEST (EUT)

EQUIPMENT UNDER TEST

Unilink

Manuf: Universal Avionics Systems Corporation

Model: UL-801

Serial: 114

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device.

Laptop Using QualDiag V1.5.0. Software

Manuf : Compaq

Model : N610c

Serial : 6J28KT81X01E

FCC PART 87

This report contains Transmitter emissions test results under United States Federal Communications Commission (FCC) Title 47 CFR Part 87 requirements for Aviation Services.

87.131 - RF Power Output

Engineer Name: A. del Angel

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
P05389	Attenuator	766-10	Narda	12/11/2009	12/11/2011
P05747	Attenuator	PE7004-20	Pasternack	3/18/2010	3/18/2012
P05435	Attenuator	PE7015-10	Pasternack	9/8/2010	9/8/2012
02872	Spectrum Analyzer	E4440A	Agilent	8/25/2009	8/25/2011

Test Setup

Temp: 21°C
 Humidity: 34%
 Pressure: 101.2kPa
 Frequency Range: 9kHz -1.36975GHz

Spectrum analyzer is connected to the EUT's antenna through a 20ft cable attached to the antenna port. The Engineer will use 40dB of external attenuation.

Testing is being performed per TIA / EIA 603-C.

Test Data

Part 87.131 Output Power

Frequency	Input Voltage	Mode A (A2D)		VDL Mode 2 (G1D)	
		Peak	Average	Peak	Average
LOW	85%	47.0dBm	43.0dBm	44.7dBm	43.13dBm
	100%	47.3dBm	43.37dBm	45.1dBm	43.08dBm
	115%	47.8dBm	43.69dBm	45.3dBm	43.58dBm
MID	85%	47.1dBm	43.2dBm	45.6dBm	43.38dBm
	100%	47.4dBm	43.28dBm	45.7dBm	43.78dBm
	115%	47.6dBm	43.42dBm	45.6dBm	43.41dBm
HIGH	85%	45.6dBm	42.15dBm	43.9dBm	42.36dBm
	100%	46.6dBm	42.72dBm	44.2dBm	42.68dBm
	115%	47.2dBm	43.35dBm	44.8dBm	42.55dBm

Note: Input voltage is relative to the EUT's input voltage (supplied voltage of 28VDC)

Test Setup Photos





87.133 - Frequency Stability

Engineer Name: A. del Angel

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
02757	Temperature Chamber	Bemco	F100/350-8	1/6/2011	1/6/2013
P05747	Attenuator	PE7004-20	Pasternack	3/18/2010	3/18/2012
P05435	Attenuator	PE7015-10	Pasternack	9/8/2010	9/8/2012
02872	Spectrum Analyzer	E4440A	Agilent	8/25/2009	8/25/2011

Test Setup

Temp: 21°C
 Humidity: 34%
 Pressure: 101.2kPa
 Frequency Range: 118-136.975MHz

Spectrum analyzer is connected to the EUT's antenna through a 20ft cable attached to the antenna port.
 We will use 30dB of external attenuation.
 EUT is located inside the temperature chamber.
 Temperature will vary from -30°C to +50°C in 10°C steps.
 Measurements will be taken after the EUT temp has stabilized.

Testing is being performed per TIA / EIA 603-C.

Test Data

Part 87.133 Frequency Stability

Mode A (A2D)							
	LOW	MID	HIGH	LOW	MID	HIGH	Limit
Temp °C	Freq	Freq	Freq	PPM	PPM	PPM	PPM
-30	117.999903	127.499972	136.84997	-0.8220339	-0.2196078	-0.21922	30
-20	117.999984	127.499968	136.850012	-0.1355932	-0.2509804	0.087687	30
-10	118	127.499966	136.849996	0	-0.2666667	-0.02923	30
0	117.999996	127.500004	136.849956	-0.0338983	0.03137255	-0.32152	30
10	117.999985	127.499997	136.849974	-0.1271186	-0.0235294	-0.18999	30
20	117.999961	127.499939	136.849957	-0.3305085	-0.4784314	-0.31421	30
30	117.999919	127.499949	136.849959	-0.6864407	-0.4	-0.2996	30
40	117.999949	127.499937	136.849962	-0.4322034	-0.4941176	-0.27768	30
50	117.999965	127.500014	136.849994	-0.2966102	0.10980392	-0.04384	30

VDL Mode 2 (G1D)							
	LOW	MID	HIGH	LOW	MID	HIGH	Limit
Temp °C	Freq	Freq	Freq	PPM	PPM	PPM	PPM
-30	118.00012	127.500082	136.97507	1.01694915	0.64313726	0.511042	5
-20	117.9999	127.500056	136.975044	-0.8474576	0.43921569	0.321227	5
-10	118.00006	127.50018	136.974903	0.50847458	1.41176471	-0.70816	5
0	117.999792	127.499874	136.974841	-1.7627119	-0.9882353	-1.1608	5
10	118.000152	127.499876	136.974825	1.28813559	-0.972549	-1.27761	5
20	117.999906	127.499861	136.97489	-0.7966102	-1.0901961	-0.80307	5
30	117.999864	127.499761	136.975098	-1.1525424	-1.8745098	0.715459	5
40	117.999796	127.499889	136.974739	-1.7288136	-0.8705882	-1.90546	5
50	117.999831	127.499863	136.975151	-1.4322034	-1.0745098	1.102391	5

Test Setup Photos



87.135 - Occupied Bandwidth

Engineer Name: A. del Angel

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
P05389	Attenuator	766-10	Narda	12/11/2009	12/11/2011
P05747	Attenuator	PE7004-20	Pasternack	3/18/2010	3/18/2012
P05748	Attenuator	PE7004-20	Pasternack	5/11/2010	5/11/2012
02872	Spectrum Analyzer	E4440A	Agilent	8/25/2009	8/25/2011
03227	Cable	32026-29080-29080-84	Astrolab	5/2/2011	5/2/2013

Test Setup

Temp: 21°C
 Humidity: 34%
 Pressure: 101.2kPa
 Frequency Range: 9kHz -1.36975GHz

Spectrum analyzer is connected to the EUT's antenna through a 20ft cable attached to the antenna port. The Engineer will use 50dB of external attenuation.

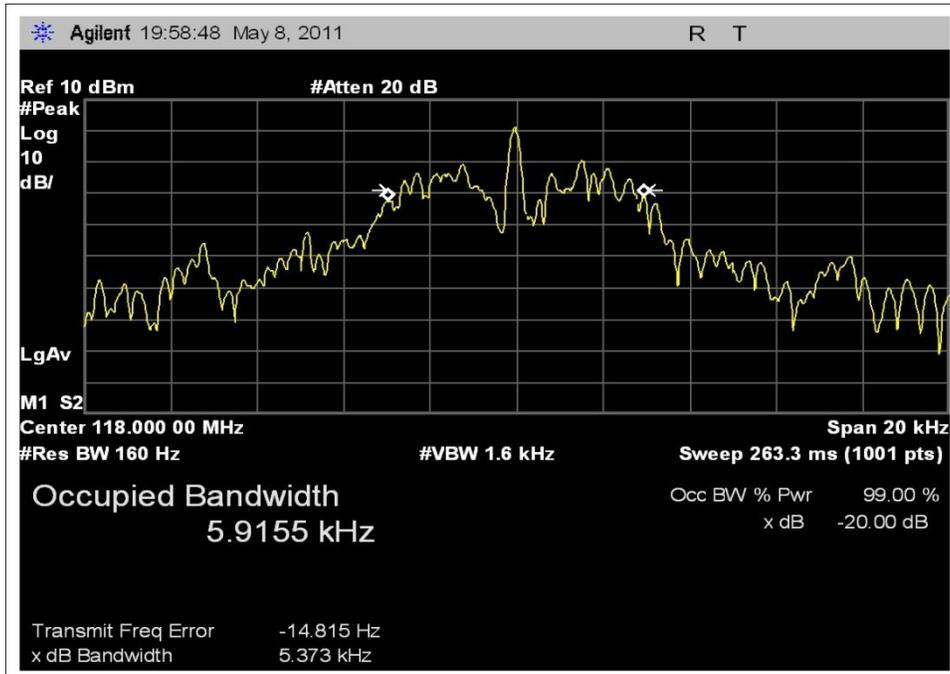
Testing is being performed per TIA / EIA 603-C.

Test Data

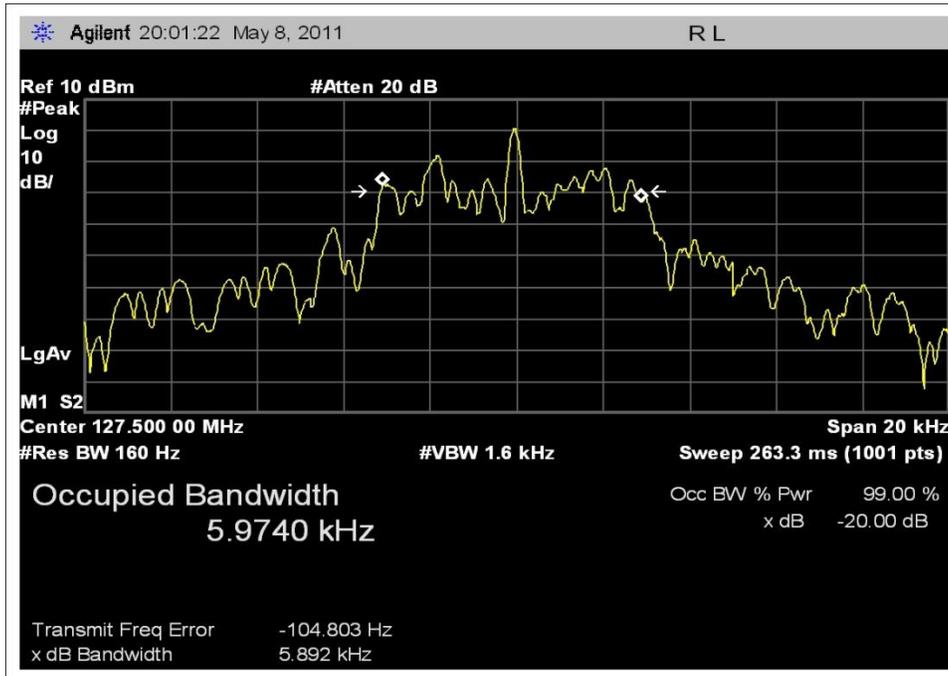
Part 87.135 Bandwidth of Emissions

Mode A (A2D)

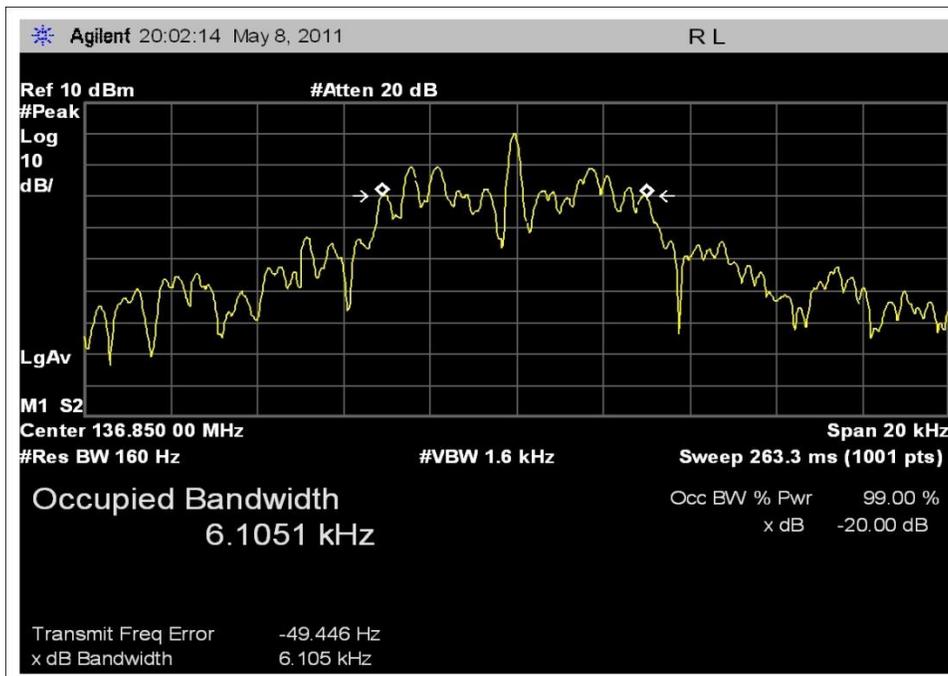
Frequency	Bandwidth	Bandwidth Limit
Low	5.373kHz	13kHz
Mid	5.892kHz	13kHz
High	6.105kHz	13kHz



Low



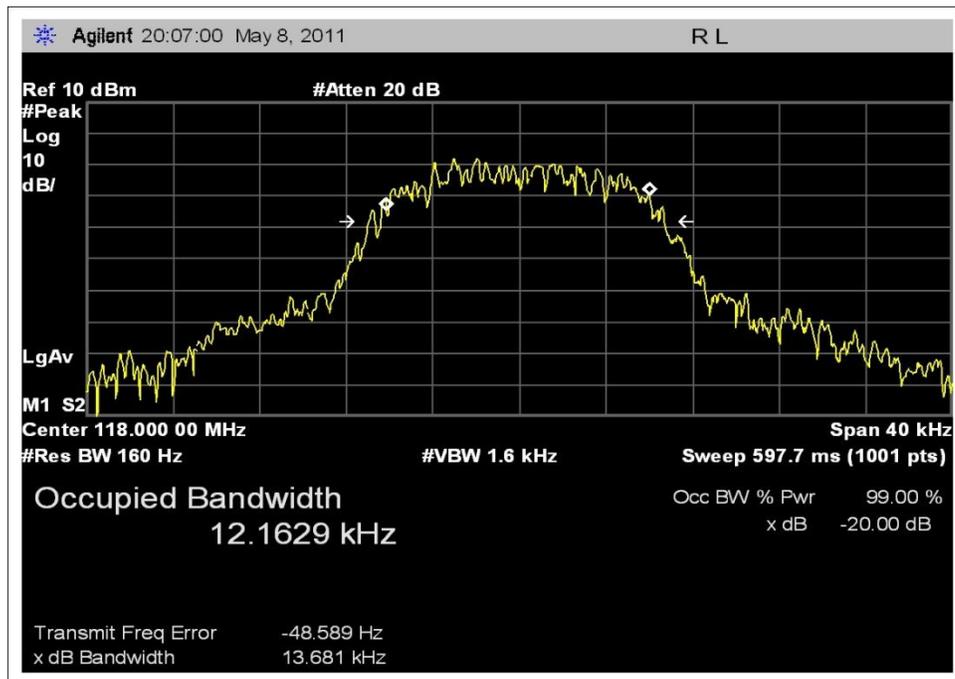
Middle



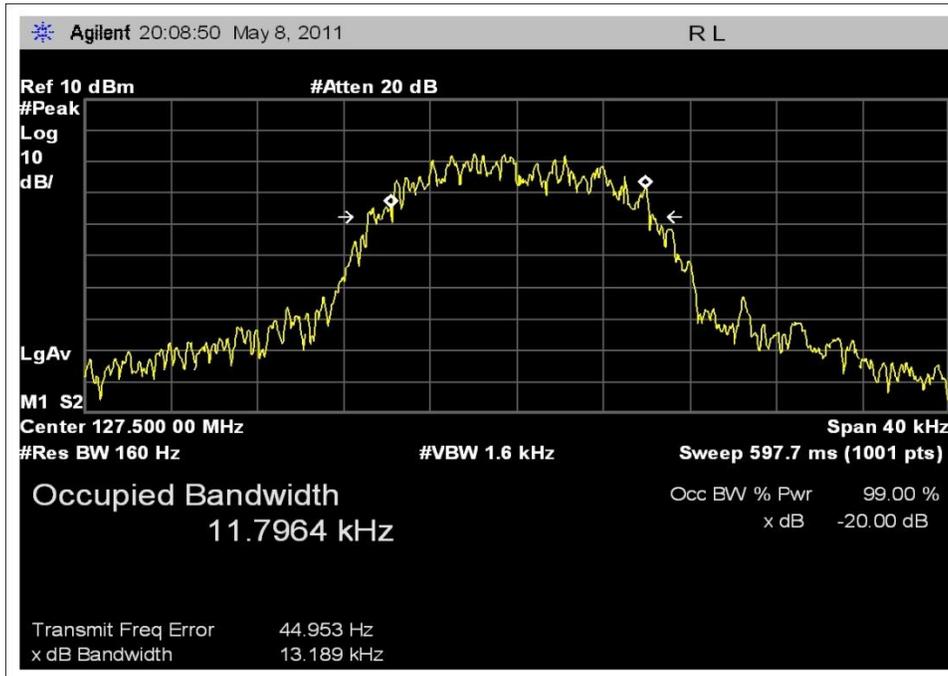
High

VDL Mode 2 (G1D)

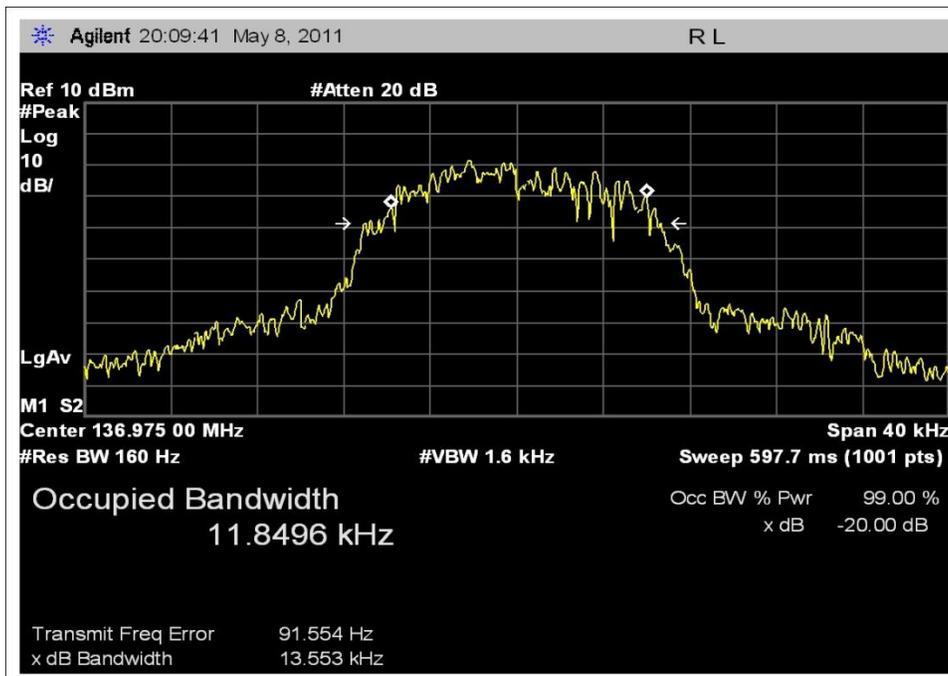
Frequency	Bandwidth	Bandwidth Limit
Low	13.681kHz	14kHz
Mid	13.189kHz	14kHz
High	13.553kHz	14kHz



Low



Middle



High

Test Setup Photos



87.139- Conducted Spurious Emissions / Adjacent Channel Power

Engineer Name: A. del Angel

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
P05389	Attenuator	766-10	Narda	12/11/2009	12/11/2011
P05747	Attenuator	PE7004-20	Pasternack	3/18/2010	3/18/2012
P05748	Attenuator	PE7004-20	Pasternack	5/11/2010	5/11/2012
02872	Spectrum Analyzer	E4440A	Agilent	8/25/2009	8/25/2011
03227	Cable	32026-29080-29080-84	Astrolab	5/2/2011	5/2/2013

Test Setup

Temp: 21°C
 Humidity: 34%
 Pressure: 101.2kPa
 Frequency Range: 9kHz -1.36975GHz

Spectrum analyzer is connected to the EUT's antenna through a 20ft cable attached to the antenna port. The Engineer will use 50dB of external attenuation. Only VDL Mode 2 (G1D) (D8PSK/G1D) has adjacent channel power requirements.

Testing is being performed per TIA / EIA 603-C.

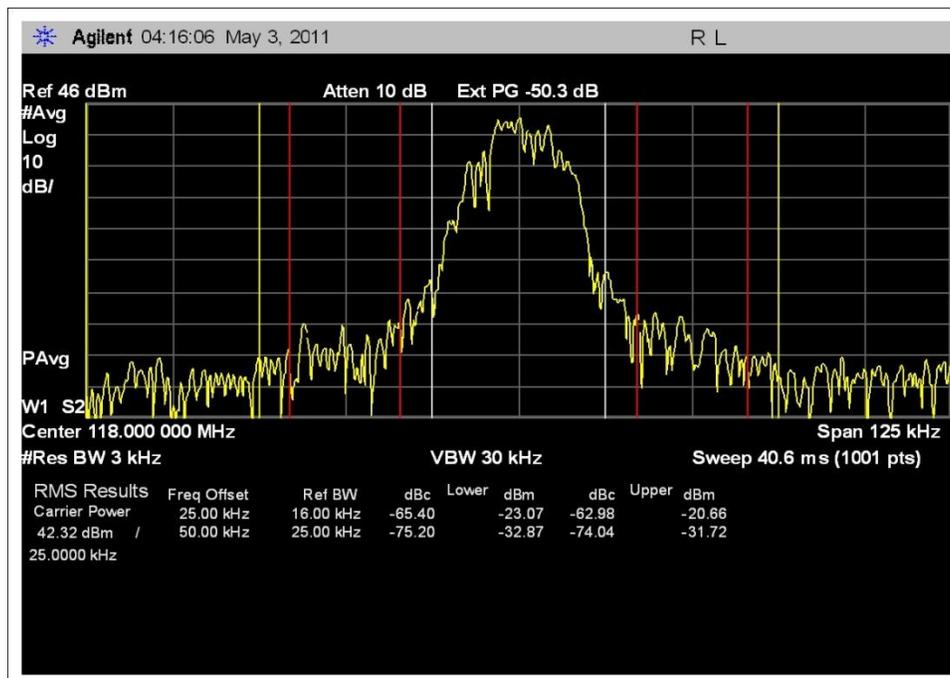
Test Data

Part 87.139 Emissions Limitations

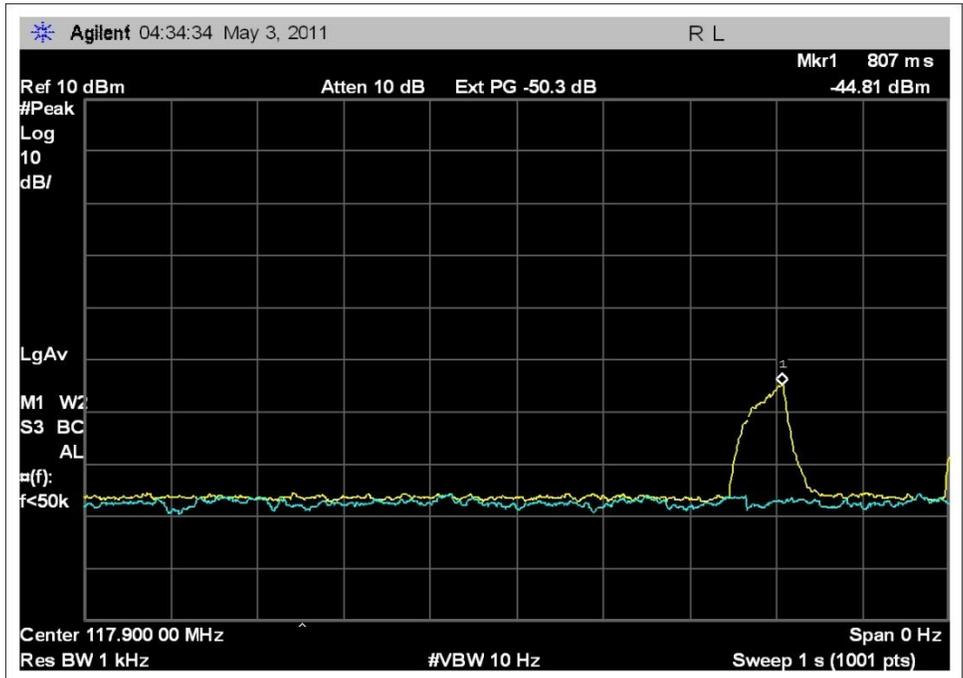
-Adjacent Channel Power-

VDL Mode 2 (G1D)							
	118MHz		127.5MHz		136.975MHz		
Channel	Lower	Upper	Lower	Upper	Lower	Upper	Mask K LIMIT
1 st	-23.07dBm	-20.66dBm	-20.22dBm	-21.82dBm	-22.36dBm	-21.26dBm	-18dBm
2 nd	-32.87dBm	-31.72dBm	-30.78dBm	-31.62dBm	-31.96dBm	-32.75dBm	-28dBm
4 th	-44.81dBm	-46.41dBm	-46.31dBm	-46.79dBm	-46.75dBm	-46.96dBm	-38dBm

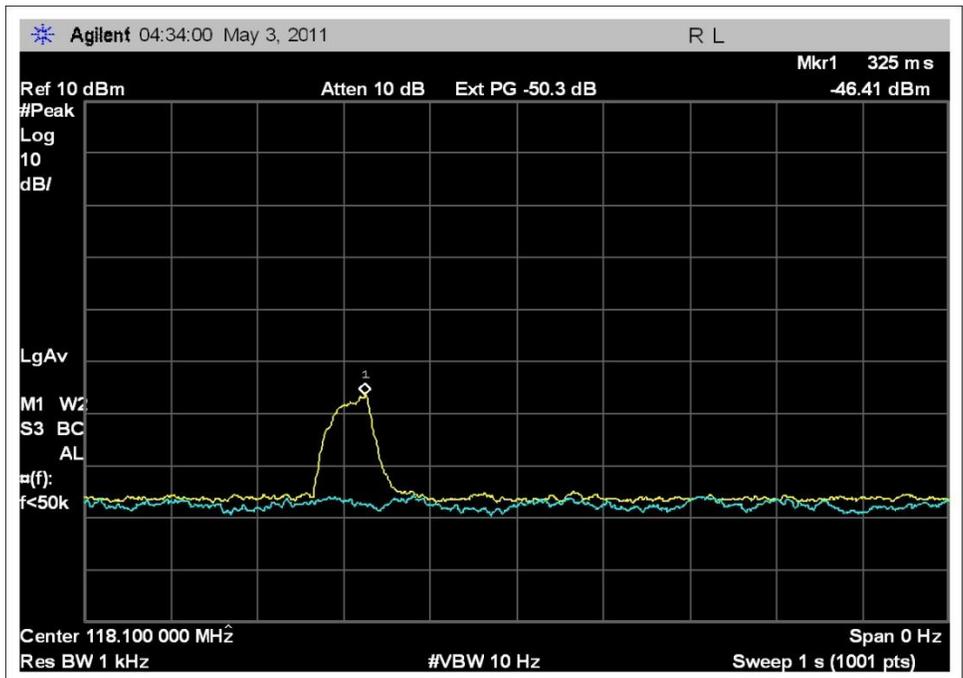
Note: Only VDL Mode 2 (G1D) (D8PSK/G1D) has adjacent channel power requirements. PSA Built in ACP measurement option was used for the 2nd and 3rd adjacent channels only. For the 4th adjacent channel a manual measurement was used due to the extremely low duration pulse.



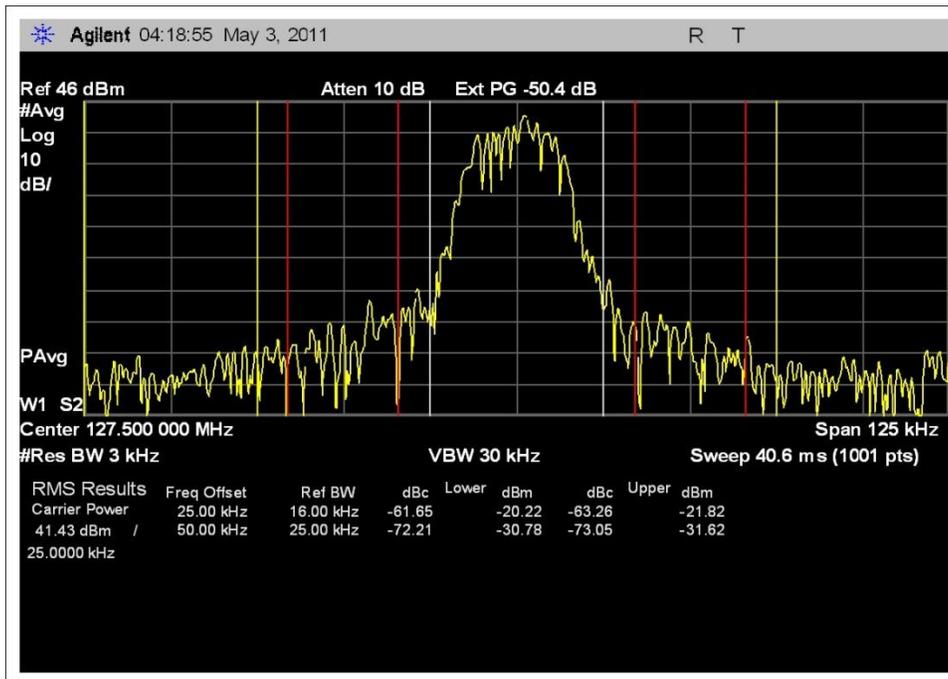
Low 2nd & 3rd Channels



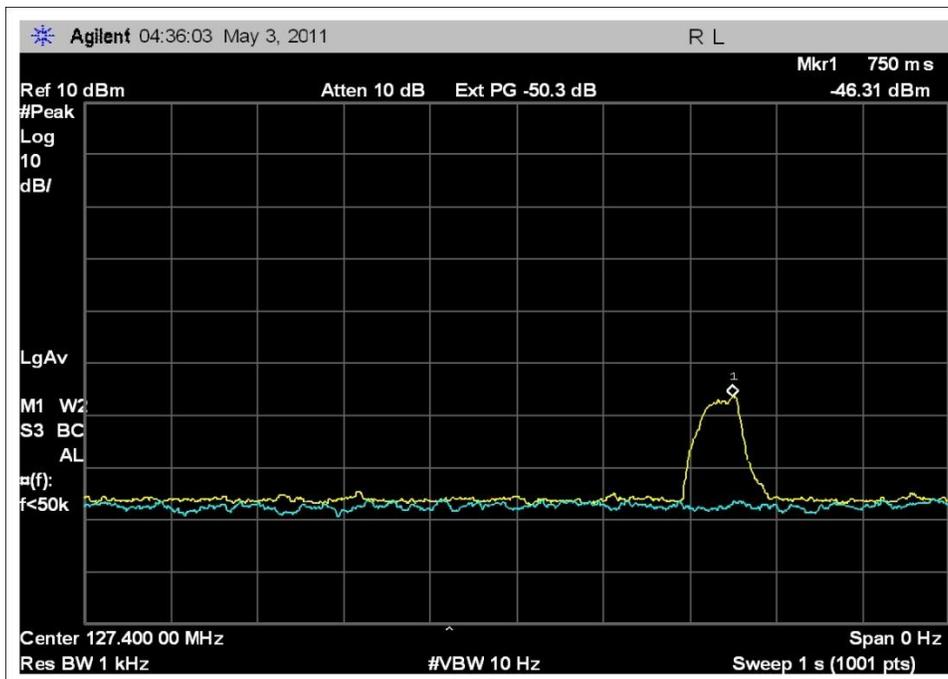
Low 4th Lower Channel



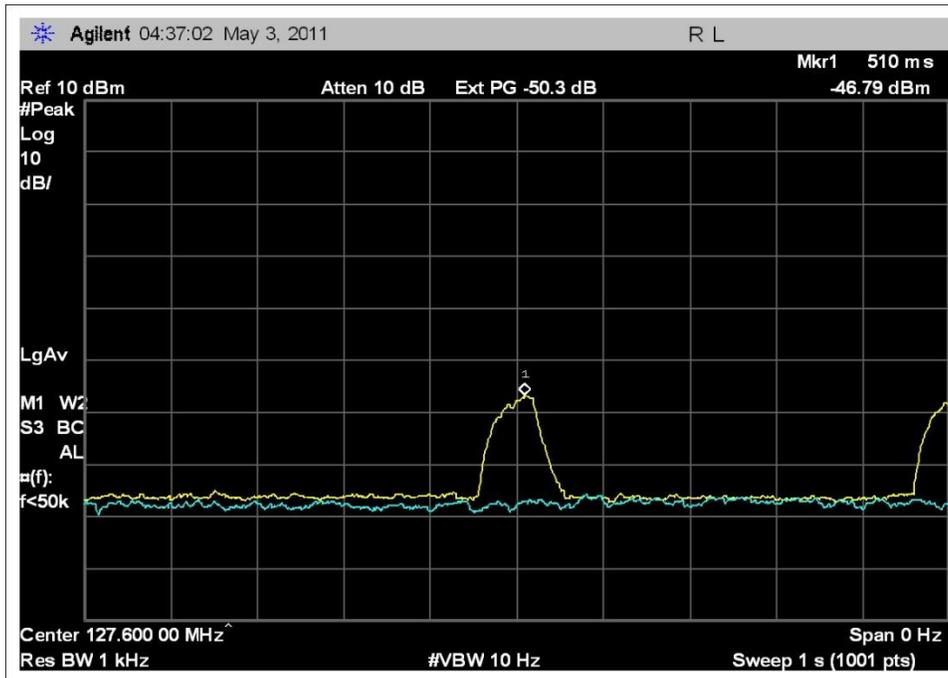
Low 4th Upper Channel



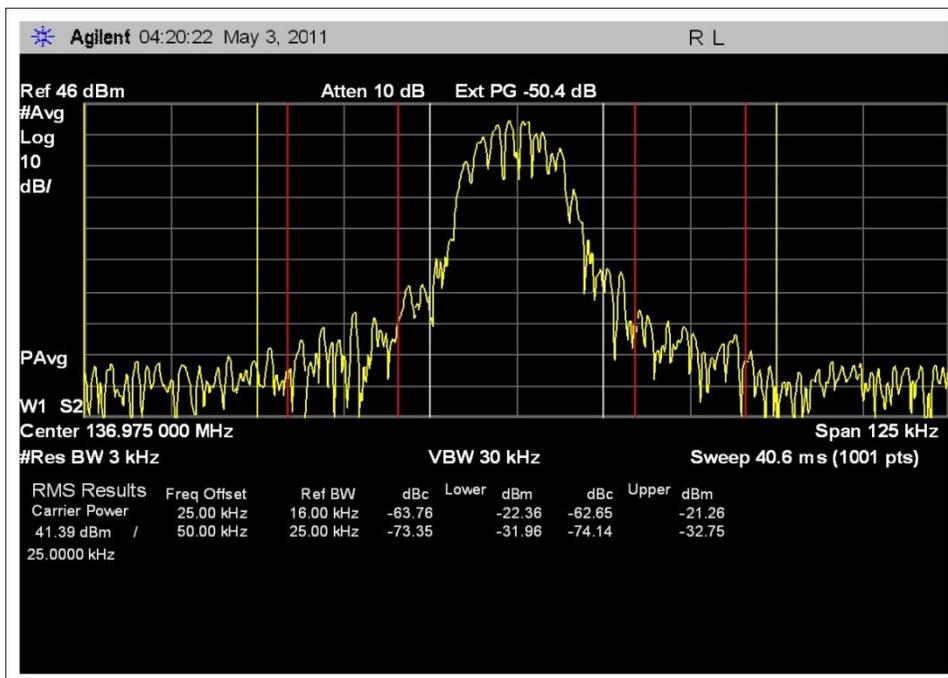
Mid 2nd & 3rd Channels



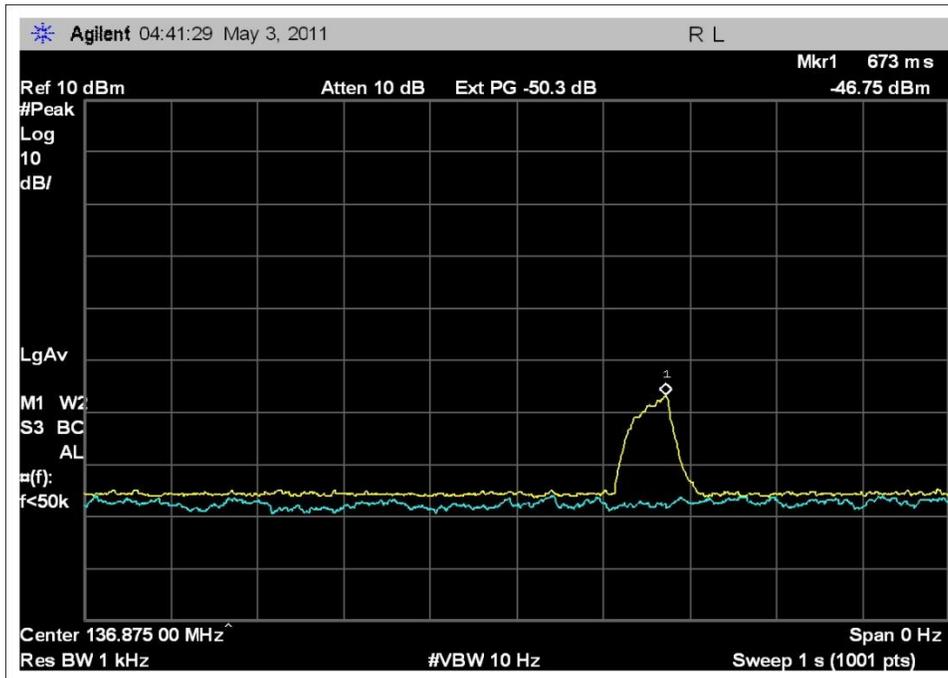
Mid 4th Lower Channel



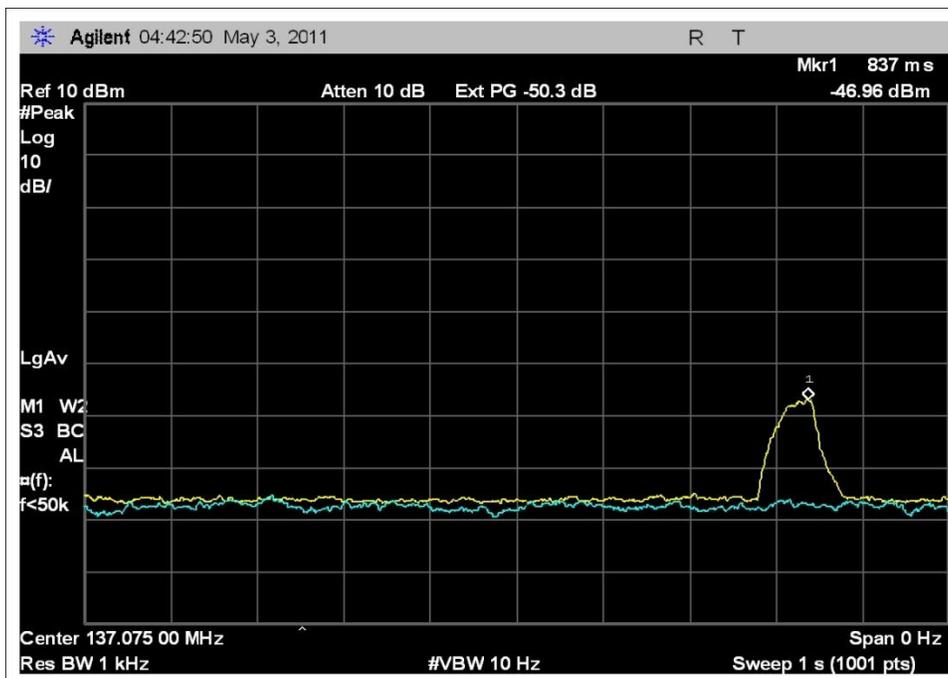
Mid 4th Upper Channel



High 2nd & 3rd Channels



High 4th Lower Channel



High 4th Upper Channel

Test Data Sheets

Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Universal Avionics Systems Corporation**
 Specification: **87.139 Conducted Spurious Emissions Mask D**
 Work Order #: **91992** Date: 5/26/2011
 Test Type: **Conducted Emissions** Time: 08:27:52
 Equipment: **Unilink** Sequence#: 3
 Manufacturer: Universal Avionics Systems Corporation Tested By: Armando del Angel
 Model: UL-801 28Vdc
 S/N: 114

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011
T1	AN03227	Cable	32026-29080-29080-84	5/2/2011	5/2/2013
T2	AN118MHz C00030	Attenuator		5/25/2011	5/25/2013
T3	AN127.5MHz C00030	Attenuator		5/25/2011	5/25/2013
T4	AN136.85MHz C00030	Attenuator		5/25/2011	5/25/2013
T5	ANP05435	Attenuator	PE7015-10	9/8/2010	9/8/2012
T6	ANP05979	Attenuator		5/25/2011	5/25/2013
T7	AN02753	High Pass Filter	6IH40-500/T3000-O/O	3/15/2010	3/15/2012
T8	ANC00031	Cable		5/26/2011	5/26/2013

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Unilink*	Universal Avionics Systems Corporation	UL-801	114

Support Devices:

Function	Manufacturer	Model #	S/N
----------	--------------	---------	-----

Test Conditions / Notes:

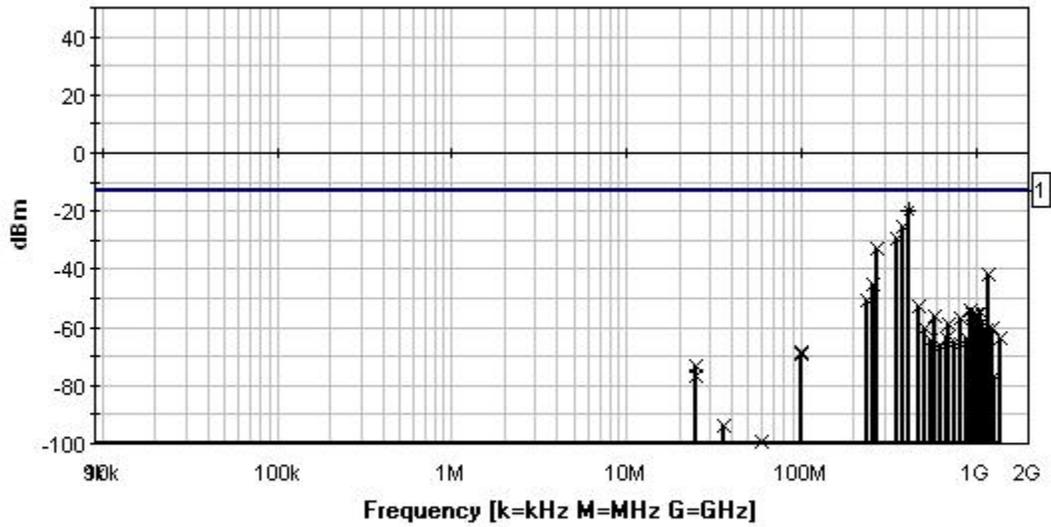
Temp: 21°C
 Humidity: 34%
 Pressure: 101.2kPa
 Frequency Range: 9kHz -1.3685GHz
 Spectrum analyzer is connected to the EUT's antenna through a 20ft cable attached to the antenna port.
 From 9kHz to 500MHz we are going to use a notch filter supplied by the customer.
 From 500-1500MHz we are going to use a high-pass filter with an extra 16dB of attenuation.
 All equipment supplied by customer has been characterized.
 Testing is being performed per TIA / EIA 603-C.
 Mode A (A2D)

Ext Attn: 0 dB

Measurement Data:		Reading listed by margin.						Test Lead: Antenna Port				
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar	
	MHz	dBm	T5	T6	T7	T8	Table	dBm	dBm	dB	Ant	
1	410.550M	-24.3	+0.6	+0.0	+0.0	+1.2	+0.0	-20.0	-13.0	-7.0	Anten	
	Ave		+0.0	+0.0	+0.0	+2.5			136.85MHz	HIGH		
^	410.550M	-14.4	+0.6	+0.0	+0.0	+1.2	+0.0	-10.1	-13.0	+2.9	Anten	
			+0.0	+0.0	+0.0	+2.5			136.85MHz	HIGH		
3	382.500M	-28.6	+0.6	+0.0	+0.4	+0.0	+0.0	-25.2	-13.0	-12.2	Anten	
			+0.0	+0.0	+0.0	+2.4			127.5MHz	MID		
4	354.000M	-32.4	+0.6	+0.2	+0.0	+0.0	+0.0	-29.3	-13.0	-16.3	Anten	
			+0.0	+0.0	+0.0	+2.3			118MHz	LOW		
5	273.700M	-35.6	+0.5	+0.0	+0.0	+0.2	+0.0	-32.9	-13.0	-19.9	Anten	
			+0.0	+0.0	+0.0	+2.0			136.85MHz	HIGH		
6	1179.999M	-62.7	+1.0	+0.0	+0.0	+0.0	+0.0	-41.5	-13.0	-28.5	Anten	
			+9.7	+5.7	+0.2	+4.6			118MHz	LOW		
7	255.000M	-47.5	+0.5	+0.0	+0.1	+0.0	+0.0	-44.9	-13.0	-31.9	Anten	
			+0.0	+0.0	+0.0	+2.0			127.5MHz	MID		
8	236.000M	-53.0	+0.5	+0.1	+0.0	+0.0	+0.0	-50.5	-13.0	-37.5	Anten	
			+0.0	+0.0	+0.0	+1.9			118MHz	LOW		
9	472.000M	-57.4	+0.6	+1.1	+0.0	+0.0	+0.0	-53.0	-13.0	-40.0	Anten	
			+0.0	+0.0	+0.0	+2.7			118MHz	LOW		
10	943.999M	-74.5	+0.9	+0.0	+0.0	+0.0	+0.0	-53.8	-13.0	-40.8	Anten	
			+9.7	+5.7	+0.3	+4.1			118MHz	LOW		
11	1061.999M	-75.8	+0.9	+0.0	+0.0	+0.0	+0.0	-55.0	-13.0	-42.0	Anten	
			+9.7	+5.7	+0.2	+4.3			118MHz	LOW		
12	957.950M	-76.0	+0.9	+0.0	+0.0	+0.0	+0.0	-55.3	-13.0	-42.3	Anten	
			+9.7	+5.7	+0.3	+4.1			136.85MHz	HIGH		
13	1019.999M	-76.1	+0.9	+0.0	+0.0	+0.0	+0.0	-55.3	-13.0	-42.3	Anten	
			+9.7	+5.7	+0.3	+4.2			127.5MHz	MID		
14	590.000M	-76.1	+0.7	+0.0	+0.0	+0.0	+0.0	-56.0	-13.0	-43.0	Anten	
			+9.7	+5.6	+1.0	+3.1			118MHz	LOW		
15	825.999M	-76.9	+0.8	+0.0	+0.0	+0.0	+0.0	-56.5	-13.0	-43.5	Anten	
			+9.7	+5.7	+0.4	+3.8			118MHz	LOW		
16	1094.800M	-79.1	+0.9	+0.0	+0.0	+0.0	+0.0	-58.2	-13.0	-45.2	Anten	
			+9.7	+5.7	+0.2	+4.4			136.85MHz	HIGH		
17	708.000M	-79.3	+0.8	+0.0	+0.0	+0.0	+0.0	-59.1	-13.0	-46.1	Anten	
			+9.7	+5.7	+0.5	+3.5			118MHz	LOW		
18	1231.651M	-81.4	+1.0	+0.0	+0.0	+0.0	+0.0	-60.0	-13.0	-47.0	Anten	
			+9.7	+5.7	+0.3	+4.7			136.85MHz	HIGH		
19	510.000M	-63.7	+0.7	+0.0	+0.0	+0.0	+0.0	-60.1	-13.0	-47.1	Anten	
			+0.0	+0.0	+0.0	+2.9			127.5MHz	MID		
20	1147.501M	-82.1	+1.0	+0.0	+0.0	+0.0	+0.0	-60.9	-13.0	-47.9	Anten	
			+9.7	+5.7	+0.3	+4.5			127.5MHz	MID		

21	1368.499M	-85.2	+1.1	+0.0	+0.0	+0.0	+0.0	-63.5	-13.0	-50.5	Anten
			+9.7	+5.7	+0.2	+5.0			136.85MHz	HIGH	
22	892.500M	-84.1	+0.9	+0.0	+0.0	+0.0	+0.0	-63.6	-13.0	-50.6	Anten
			+9.7	+5.7	+0.3	+3.9			127.5MHz	MID	
23	684.250M	-84.0	+0.8	+0.0	+0.0	+0.0	+0.0	-63.9	-13.0	-50.9	Anten
			+9.7	+5.7	+0.5	+3.4			136.85MHz	HIGH	
24	547.400M	-68.2	+0.7	+0.0	+0.0	+0.0	+0.0	-64.5	-13.0	-51.5	Anten
			+0.0	+0.0	+0.0	+3.0			136.85MHz	HIGH	
25	764.999M	-85.1	+0.8	+0.0	+0.0	+0.0	+0.0	-64.9	-13.0	-51.9	Anten
			+9.7	+5.7	+0.4	+3.6			127.5MHz	MID	
26	821.100M	-86.0	+0.8	+0.0	+0.0	+0.0	+0.0	-65.7	-13.0	-52.7	Anten
			+9.7	+5.7	+0.4	+3.7			136.85MHz	HIGH	
27	637.499M	-86.7	+0.7	+0.0	+0.0	+0.0	+0.0	-66.6	-13.0	-53.5	Anten
			+9.7	+5.7	+0.7	+3.3			127.5MHz	MID	
28	100.000M	-70.0	+0.3	+0.1	+0.0	+0.0	+0.0	-68.5	-13.0	-55.5	Anten
			+0.0	+0.0	+0.0	+1.1			118MHz	LOW	
29	100.001M	-70.7	+0.3	+0.0	+0.0	+0.2	+0.0	-69.1	-13.0	-56.1	Anten
			+0.0	+0.0	+0.0	+1.1			136.85MHz	HIGH	
30	25.001M	-84.2	+0.1	+0.0	+0.0	+10.1	+0.0	-73.5	-13.0	-60.5	Anten
			+0.0	+0.0	+0.0	+0.5			136.85MHz	HIGH	
31	1274.996M	-97.9	+1.0	+0.0	+0.0	+0.0	+0.0	-76.4	-13.0	-63.4	Anten
			+9.7	+5.7	+0.3	+4.8			127.5MHz	MID	
32	25.200M	-87.1	+0.1	+9.9	+0.0	+0.0	+0.0	-76.6	-13.0	-63.6	Anten
			+0.0	+0.0	+0.0	+0.5			118MHz	LOW	
33	35.830M	-101.2	+0.2	+6.6	+0.0	+0.0	+0.0	-93.8	-13.0	-80.8	Anten
			+0.0	+0.0	+0.0	+0.6			118MHz	LOW	
34	59.430M	-101.9	+0.2	+1.9	+0.0	+0.0	+0.0	-99.0	-13.0	-86.0	Anten
			+0.0	+0.0	+0.0	+0.8			118MHz	LOW	

CKC Laboratories, Inc. Date: 5/26/2011 Time: 08:27:52 Universal Avionics Systems Corporation W/O#: 91992
87.139 Conducted Spurious Emissions Mask D Test Lead: Antenna Port Antenna Port Sequence#: 3 Ext ATTN: 0 dB





Test Location: CKC Laboratories, Inc. • 22116 23rd Drive SE, Suite A • Bothell, WA 98021 • (425) 402-1717

Customer: **Universal Avionics Systems Corporation**
 Specification: **87.139 Conducted Spurious Emissions Mask K**
 Work Order #: **91992** Date: 5/25/2011
 Test Type: **Conducted Emissions** Time: 16:40:35
 Equipment: **Unilink** Sequence#: 2
 Manufacturer: Universal Avionics Systems Corporation Tested By: Armando del Angel
 Model: UL-801 28Vdc
 S/N: 114

Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02872	Spectrum Analyzer	E4440A	8/25/2009	8/25/2011
T1	AN03227	Cable	32026-29080-29080-84	5/2/2011	5/2/2013
T2	AN118MHz C00030	Attenuator		5/25/2011	5/25/2013
T3	AN127.5MHz C00030	Attenuator		5/25/2011	5/25/2013
T4	AN136.975MHz C00030	Attenuator		5/25/2011	5/25/2013
T5	ANP05435	Attenuator	PE7015-10	9/8/2010	9/8/2012
T6	ANP05979	Attenuator		5/25/2011	5/25/2013
T7	AN02753	High Pass Filter	6IH40-500/T3000-O/O	3/15/2010	3/15/2012
T8	ANC00031	Cable		5/26/2011	5/26/2013

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Unilink*	Universal Avionics Systems Corporation	UL-801	114

Support Devices:

Function	Manufacturer	Model #	S/N
----------	--------------	---------	-----

Test Conditions / Notes:

Temp: 21°C
 Humidity: 34%
 Pressure: 101.2kPa
 Frequency Range: 9kHz -1.36975GHz

Spectrum analyzer is connected to the EUT's antenna through a 20ft cable attached to the antenna port.
 From 9kHz to 500MHz we are going to use a notch filter supplied by the customer.
 From 500-1500MHz we are going to use a high-pass filter with an extra 16dB of attenuation.
 All equipment supplied by customer has been characterized.

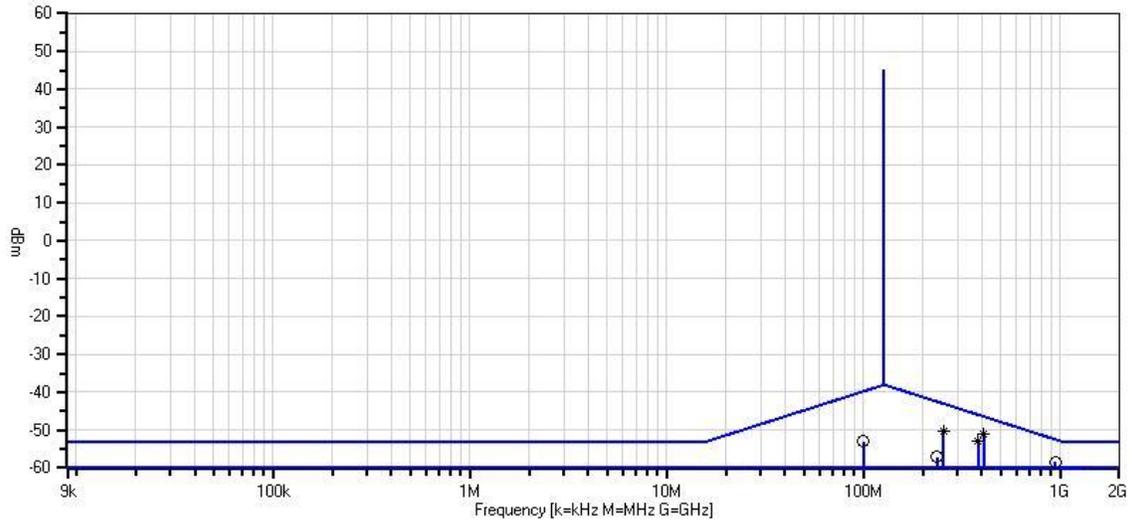
Testing is being performed per TIA / EIA 603-C.
 VDL Mode 2 (G1D)

Ext Attn: 0 dB

Measurement Data:		Reading listed by margin.						Test Lead: Antenna Port				
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar	
	MHz	dBm	T5	T6	T7	T8	Table	dBm	dBm	dB	Ant	
1	410.925M	-55.0	+0.6	+0.0	+0.0	+1.0	+0.0	-50.9	-47.0	-3.9	Anten	
	Ave		+0.0	+0.0	+0.0	+2.5			136.975 HIGH			
^	410.925M	-28.9	+0.6	+0.0	+0.0	+1.0	+0.0	-24.8	-47.0	+22.2	Anten	
			+0.0	+0.0	+0.0	+2.5			136.975 HIGH			
3	944.003M	-79.1	+0.9	+0.0	+0.0	+0.0	+0.0	-58.4	-53.0	-5.4	Anten	
			+9.7	+5.7	+0.3	+4.1			118MHz LOW			
4	382.500M	-56.3	+0.6	+0.0	+0.4	+0.0	+0.0	-52.9	-45.9	-7.0	Anten	
	Ave		+0.0	+0.0	+0.0	+2.4			127.5MHz MID			
^	382.502M	-31.6	+0.6	+0.0	+0.4	+0.0	+0.0	-28.2	-45.9	+17.7	Anten	
			+0.0	+0.0	+0.0	+2.4			127.5MHz MID			
6	255.000M	-52.9	+0.5	+0.0	+0.1	+0.0	+0.0	-50.3	-43.0	-7.3	Anten	
	Ave		+0.0	+0.0	+0.0	+2.0			127.5MHz MID			
^	255.003M	-47.4	+0.5	+0.0	+0.1	+0.0	+0.0	-44.8	-43.0	-1.8	Anten	
			+0.0	+0.0	+0.0	+2.0			127.5MHz MID			
8	1232.775M	-82.1	+1.0	+0.0	+0.0	+0.0	+0.0	-60.7	-53.0	-7.7	Anten	
			+9.7	+5.7	+0.3	+4.7			136.975 HIGH			
9	1180.015M	-82.9	+1.0	+0.0	+0.0	+0.0	+0.0	-61.7	-53.0	-8.7	Anten	
	Ave		+9.7	+5.7	+0.2	+4.6			118MHz LOW			
^	1180.001M	-68.9	+1.0	+0.0	+0.0	+0.0	+0.0	-47.7	-53.0	+5.3	Anten	
			+9.7	+5.7	+0.2	+4.6			118MHz LOW			
11	1147.498M	-83.8	+1.0	+0.0	+0.0	+0.0	+0.0	-62.6	-53.0	-9.6	Anten	
			+9.7	+5.7	+0.3	+4.5			127.5MHz MID			
12	1019.989M	-83.7	+0.9	+0.0	+0.0	+0.0	+0.0	-62.9	-53.0	-9.9	Anten	
			+9.7	+5.7	+0.3	+4.2			127.5MHz MID			
13	958.825M	-84.0	+0.9	+0.0	+0.0	+0.0	+0.0	-63.3	-52.0	-11.3	Anten	
			+9.7	+5.7	+0.3	+4.1			136.975 HIGH			
14	100.000M	-69.8	+0.3	+0.0	+0.0	+0.0	+0.0	-53.1	-39.2	-13.9	Anten	
			+9.7	+5.6	+0.0	+1.1			118MHz LOW			
15	236.005M	-59.7	+0.5	+0.1	+0.0	+0.0	+0.0	-57.2	-43.0	-14.2	Anten	
			+0.0	+0.0	+0.0	+1.9			118MHz LOW			
16	1061.999M	-88.2	+0.9	+0.0	+0.0	+0.0	+0.0	-67.4	-53.0	-14.4	Anten	
	Ave		+9.7	+5.7	+0.2	+4.3			118MHz LOW			
^	1062.008M	-74.1	+0.9	+0.0	+0.0	+0.0	+0.0	-53.3	-53.0	-0.3	Anten	
			+9.7	+5.7	+0.2	+4.3			118MHz LOW			
18	510.000M	-67.7	+0.7	+0.0	+1.0	+0.0	+0.0	-63.1	-48.0	-15.1	Anten	
			+0.0	+0.0	+0.0	+2.9			127.5MHz MID			
19	472.001M	-68.1	+0.6	+1.1	+0.0	+0.0	+0.0	-63.6	-48.0	-15.6	Anten	
			+0.0	+0.0	+0.0	+2.8			118MHz LOW			
20	892.500M	-89.4	+0.9	+0.0	+0.0	+0.0	+0.0	-68.9	-52.0	-16.9	Anten	
			+9.7	+5.7	+0.3	+3.9			127.5MHz MID			
21	826.002M	-89.4	+0.8	+0.0	+0.0	+0.0	+0.0	-69.0	-52.0	-17.0	Anten	
			+9.7	+5.7	+0.4	+3.8			118MHz LOW			
22	590.001M	-86.7	+0.7	+0.0	+0.0	+0.0	+0.0	-66.6	-49.6	-17.0	Anten	
			+9.7	+5.6	+1.0	+3.1			118MHz LOW			
23	273.950M	-63.4	+0.5	+0.0	+0.0	+0.2	+0.0	-60.7	-43.0	-17.7	Anten	
	Ave		+0.0	+0.0	+0.0	+2.0			136.975 HIGH			

^	273.950M	-39.4	+0.5	+0.0	+0.0	+0.2	+0.0	-36.7	-43.0	+6.3	Anten
			+0.0	+0.0	+0.0	+2.0			136.975 HIGH		
25	707.992M	-89.1	+0.8	+0.0	+0.0	+0.0	+0.0	-68.9	-50.9	-18.0	Anten
			+9.7	+5.7	+0.5	+3.5			118MHz LOW		
26	354.000M	-67.5	+0.6	+0.2	+0.0	+0.0	+0.0	-64.4	-45.9	-18.5	Anten
	Ave		+0.0	+0.0	+0.0	+2.3			118MHz LOW		
^	353.999M	-38.6	+0.6	+0.2	+0.0	+0.0	+0.0	-35.5	-45.9	+10.4	Anten
			+0.0	+0.0	+0.0	+2.3			118MHz LOW		
28	547.900M	-75.5	+0.7	+0.0	+0.0	+5.2	+0.0	-66.6	-48.0	-18.6	Anten
			+0.0	+0.0	+0.0	+3.0			136.975 HIGH		
29	821.850M	-90.3	+0.8	+0.0	+0.0	+0.0	+0.0	-69.9	-50.9	-19.0	Anten
			+9.7	+5.7	+0.4	+3.8			136.975 HIGH		
30	765.002M	-90.7	+0.8	+0.0	+0.0	+0.0	+0.0	-70.5	-50.9	-19.6	Anten
			+9.7	+5.7	+0.4	+3.6			127.5MHz MID		
31	25.021M	-87.4	+0.1	+0.0	+0.0	+0.0	+0.0	-71.5	-49.2	-22.3	Anten
			+9.7	+5.6	+0.0	+0.5			118MHz LOW		
32	1095.800M	-96.9	+0.9	+0.0	+0.0	+0.0	+0.0	-76.0	-53.0	-23.0	Anten
			+9.7	+5.7	+0.2	+4.4			136.975 HIGH		
33	637.505M	-93.0	+0.7	+0.0	+0.0	+0.0	+0.0	-72.9	-49.6	-23.3	Anten
			+9.7	+5.7	+0.7	+3.3			127.5MHz MID		
34	1369.750M	-99.2	+1.1	+0.0	+0.0	+0.0	+0.0	-77.5	-53.0	-24.5	Anten
			+9.7	+5.7	+0.2	+5.0			136.975 HIGH		
35	684.875M	-94.5	+0.8	+0.0	+0.0	+0.0	+0.0	-74.4	-49.6	-24.8	Anten
			+9.7	+5.7	+0.5	+3.4			136.975 HIGH		
36	1275.001M	-99.6	+1.0	+0.0	+0.0	+0.0	+0.0	-78.1	-53.0	-25.1	Anten
			+9.7	+5.7	+0.3	+4.8			127.5MHz MID		
37	25.000M	-88.3	+0.1	+0.0	+10.1	+0.0	+0.0	-77.6	-49.7	-27.9	Anten
			+0.0	+0.0	+0.0	+0.5			127.5MHz MID		
38	100.000M	-70.2	+0.3	+0.0	+0.1	+0.0	+0.0	-68.7	-39.7	-29.0	Anten
			+0.0	+0.0	+0.0	+1.1			127.5MHz MID		

CKC Laboratories, Inc. Date: 5/25/2011 Time: 16:40:35 Universal Avionics Systems Corporation WO#: 91992
 87.139 Conducted Spurious Emissions Mask K Test Lead: Antenna Port Antenna Port Sequence#: 2 Ext ATTN: 0
 dB



- Sweep Data
 - Peak Readings
 - * Average Readings
 - Readings
 - × QP Readings
 - ▼ Ambient
- 1 - 87.139 Conducted Spurious Emissions Mask K

87.139 - Spurious Radiation Emissions

Engineer Name: A. del Angel

Test Equipment					
Asset/Serial #	Description	Model	Manufacturer	Cal Date	Cal Due
AN01316	Preamp	8447D	HP	5/21/2010	5/21/2012
AN01993	Biconilog Antenna	CBL6111C	Chase	10/9/2009	10/9/2011
AN03227	Cable	32026-29080- 29080-84	Astrolab	5/2/2011	5/2/2013
ANP05360	Cable	RG214	Belden	11/8/2010	11/8/2012
ANP05547	Cable	Heliac	Andrews	5/18/2010	5/18/2012
AN02872	Spectrum Analyzer	E4440A	Agilent	8/25/2009	8/25/2011
AN01271	Preamp	83017A	HP	9/17/2009	9/17/2011
AN01467	Horn Antenna-ANSI C63.5 Calibration	3115	EMCO	5/7/2010	5/7/2012
AN03123	Cable	32026-2-29801-12	Astrolab	10/23/2009	10/23/2011
ANP05542	Cable	Heliac	Andrews	10/23/2009	10/23/2011
AN00052	Loop Antenna	6502	EMCO	6/8/2010	6/8/2012

Emissions Mask D

Operating Frequency:	118-136.985		
Channels:	118MHz, 127.5MHz, 136.985MHz.		
Highest Measured Output Power:	43.69 (dBm)=	22.9 (Watts)	
Distance:	3 meters		
Limit:	43+10Log(P)	56.60 dBc	

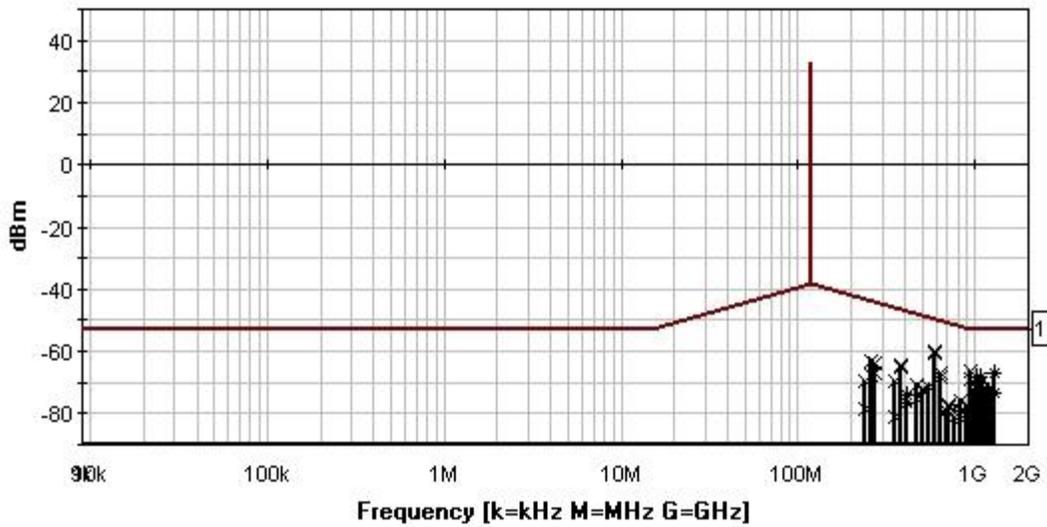
Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
410.55	-43.41	Horizontal	87.10
410.55	-43.91	Vertical	87.60
1,062.00	-44.31	Horizontal	88.00
1,020.00	-45.81	Horizontal	89.50
590.00	-45.81	Vertical	89.50
1,231.65	-45.91	Horizontal	89.60
1,062.00	-46.71	Vertical	90.40
1,231.65	-47.41	Vertical	91.10
590.00	-47.61	Horizontal	91.30
1,020.00	-49.61	Vertical	93.30
1,180.00	-51.21	Horizontal	94.90
1,094.80	-51.31	Horizontal	95.00
1,275.00	-51.81	Vertical	95.50
1,094.80	-52.71	Vertical	96.40
1,180.00	-54.71	Vertical	98.40
944.00	-56.91	Vertical	100.60
273.70	-58.01	Horizontal	101.70
382.50	-58.11	Horizontal	101.80
1,368.50	-58.51	Vertical	102.20
1,147.50	-59.01	Horizontal	102.70
1,275.00	-59.41	Horizontal	103.10
472.00	-59.51	Vertical	103.20
944.00	-59.71	Horizontal	103.40
382.50	-60.11	Vertical	103.80
255.00	-60.21	Horizontal	103.90
273.70	-60.51	Vertical	104.20
637.50	-60.61	Vertical	104.30
236.00	-60.61	Horizontal	104.30
957.95	-60.71	Vertical	104.40
637.50	-60.81	Horizontal	104.50
1,147.50	-61.31	Vertical	105.00
472.00	-61.51	Horizontal	105.20
1,368.50	-61.71	Horizontal	105.40
255.00	-62.31	Vertical	106.00
826.00	-62.61	Horizontal	106.30
957.95	-63.51	Horizontal	107.20
354.00	-64.21	Horizontal	107.90
708.00	-66.01	Vertical	109.70
826.00	-67.31	Vertical	111.00
708.00	-67.41	Horizontal	111.10
547.40	-69.61	Horizontal	113.30
547.40	-69.81	Vertical	113.50
236.00	-69.81	Vertical	113.50
684.25	-70.01	Horizontal	113.70
510.00	-70.11	Vertical	113.80
684.25	-70.21	Vertical	113.90
892.50	-70.31	Horizontal	114.00
510.00	-70.31	Horizontal	114.00
892.50	-71.41	Vertical	115.10
354.00	-71.71	Vertical	115.40
821.10	-73.31	Horizontal	117.00
765.00	-74.01	Horizontal	117.70
765.00	-74.91	Vertical	118.60
821.10	-75.71	Vertical	119.40

Emissions Mask K

Freq in MHz	Reading in dBm	Limit in dBm	Margin in dBm	Reading Type	Notes	Polarization
590	-60.1	-49.6	-10.5	Peak	118MHz - LOW	Vertical
590	-60.5	-49.6	-10.9	Peak	118MHz - LOW	Horizontal
944	-66.3	-53	-13.3	Peak	118MHz - LOW	Vertical
1275	-68.5	-53	-15.5	Ave	127.5MHz - MID	Vertical
1275	-51.3	-53	1.7	Peak	127.5MHz - MID	Vertical
944	-68.7	-53	-15.7	Peak	118MHz - LOW	Horizontal
1020	-69.8	-53	-16.8	Ave	127.5MHz - MID	Horizontal
1020	-51.9	-53	1.1	Peak	127.5MHz - MID	Horizontal
1062	-70	-53	-17	Ave	118MHz - LOW	Horizontal
1062	-49	-53	4	Peak	118MHz - LOW	Horizontal
637.5	-66.9	-49.6	-17.3	Peak	127.5MHz - MID	Horizontal
637.5	-68	-49.6	-18.4	Peak	127.5MHz - MID	Vertical
382.5	-64.4	-45.9	-18.5	Peak	127.5MHz - MID	Vertical
1062	-71.6	-53	-18.6	Ave	118MHz - LOW	Vertical
1062	-51.6	-53	1.4	Peak	118MHz - LOW	Vertical
382.5	-64.9	-45.9	-19	Peak	127.5MHz - MID	Horizontal
1020	-72.4	-53	-19.4	Ave	127.5MHz - MID	Vertical
1020	-55.1	-53	-2.1	Peak	127.5MHz - MID	Vertical
958.83	-72.3	-52	-20.3	Peak	136.975MHz - HIGH	Horizontal
255	-63.4	-43	-20.4	Peak	127.5MHz - MID	Horizontal
273.95	-63.5	-43	-20.5	Peak	136.975MHz - HIGH	Horizontal
1180	-74.7	-53	-21.7	Ave	118MHz - LOW	Horizontal
1180	-57.6	-53	-4.6	Peak	118MHz - LOW	Horizontal
1147.5	-74.8	-53	-21.8	Ave	127.5MHz - MID	Horizontal
1147.5	-60.2	-53	-7.2	Peak	127.5MHz - MID	Horizontal
1095.8	-74.8	-53	-21.8	Ave	136.975MHz - HIGH	Horizontal
1095.8	-59.6	-53	-6.6	Peak	136.975MHz - HIGH	Horizontal
1275	-75.2	-53	-22.2	Ave	127.5MHz - MID	Horizontal
1275	-60.5	-53	-7.5	Peak	127.5MHz - MID	Horizontal
1180	-75.2	-53	-22.2	Ave	118MHz - LOW	Vertical
1180	-60.2	-53	-7.2	Peak	118MHz - LOW	Vertical
1232.8	-75.5	-53	-22.5	Ave	136.975MHz - HIGH	Vertical
1232.8	-56.9	-53	-3.9	Peak	136.975MHz - HIGH	Vertical

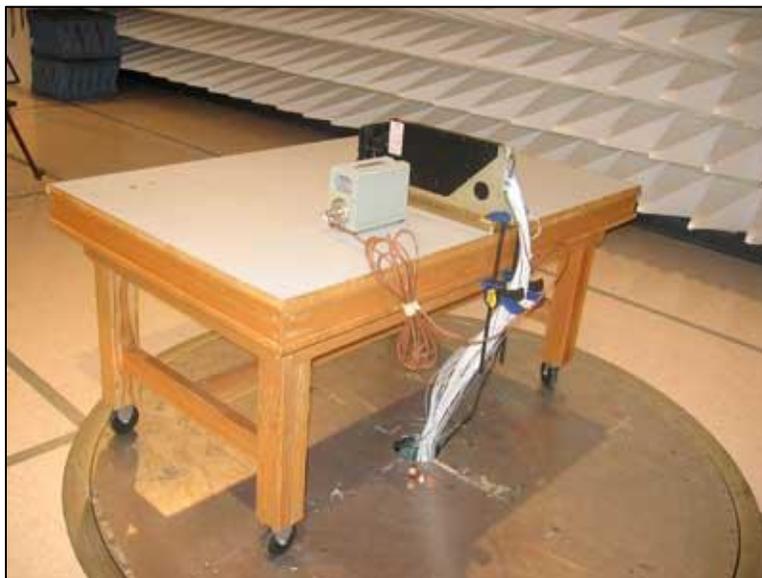
Freq in MHz	Reading in dBm	Limit in dBm	Margin in dBm	Reading Type	Notes	Polarization
1232.8	-75.8	-53	-22.8	Ave	136.975MHz - HIGH	Horizontal
1232.8	-58.7	-53	-5.7	Peak	136.975MHz - HIGH	Horizontal
472	-70.8	-48	-22.8	Peak	118MHz - LOW	Vertical
547.9	-71.2	-48	-23.2	Peak	136.975MHz - HIGH	Vertical
547.9	-71.7	-48	-23.7	Peak	136.975MHz - HIGH	Horizontal
354	-69.7	-45.9	-23.8	Peak	118MHz - LOW	Vertical
826	-75.9	-52	-23.9	Peak	118MHz - LOW	Horizontal
273.95	-67.2	-43	-24.2	Peak	136.975MHz - HIGH	Vertical
255	-67.3	-43	-24.3	Peak	127.5MHz - MID	Vertical
510	-72.4	-48	-24.4	Peak	127.5MHz - MID	Vertical
892.5	-76.9	-52	-24.9	Peak	127.5MHz - MID	Vertical
510	-72.9	-48	-24.9	Peak	127.5MHz - MID	Horizontal
892.5	-77.7	-52	-25.7	Peak	127.5MHz - MID	Horizontal
707.99	-77	-50.9	-26.1	Peak	118MHz - LOW	Vertical
236	-69.3	-43	-26.3	Peak	118MHz - LOW	Horizontal
472	-75.1	-48	-27.1	Peak	118MHz - LOW	Horizontal
708	-78.1	-50.9	-27.2	Peak	118MHz - LOW	Horizontal
958.83	-79.4	-52	-27.4	Peak	136.975MHz - HIGH	Vertical
821.85	-79	-50.9	-28.1	Peak	136.975MHz - HIGH	Horizontal
410.93	-74.1	-45.9	-28.2	Ave	136.975MHz - HIGH	Horizontal
410.93	-47.9	-45.9	-2	Peak	136.975MHz - HIGH	Horizontal
826	-80.4	-52	-28.4	Peak	118MHz - LOW	Vertical
684.88	-79.1	-49.6	-29.5	Peak	136.975MHz - HIGH	Vertical
684.88	-79.4	-49.6	-29.8	Peak	136.975MHz - HIGH	Horizontal
765	-81.4	-50.9	-30.5	Peak	127.5MHz - MID	Horizontal
765	-81.4	-50.9	-30.5	Peak	127.5MHz - MID	Vertical
821.85	-81.7	-50.9	-30.8	Peak	136.975MHz - HIGH	Vertical
410.93	-76.8	-45.9	-30.9	Ave	136.975MHz - HIGH	Vertical
410.93	-50.9	-45.9	-5	Peak	136.975MHz - HIGH	Vertical
354	-80.9	-45.9	-35	Peak	118MHz - LOW	Horizontal
236	-78.6	-43	-35.6	Peak	118MHz - LOW	Vertical

CKC Laboratories, Inc. Date: 5/26/2011 Time: 16:39:50 Universal Avionics Systems Corporation WO#: 91992
87.139 Radiated Spurious Emissions Mask K Test Distance: 3 Meters Loop Sequence#: 5 Ext ATTN: 0 dB



— Readings
 — 1 - 87.139 Radiated Spurious Emissions Mask K
 X Peak Readings
 * Average Readings

Test Setup Photos





SUPPLEMENTAL INFORMATION

Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

The reported measurement uncertainties are calculated based on the worst case of all laboratory environments from CKC Laboratories, Inc. test sites. Only those parameters which require estimation of measurement uncertainty are reported. The reported worst case measurement uncertainty is less than the maximum values derived in CISPR 16-4-2. Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2. Compliance is deemed to occur provided measurements are below the specified limits.

Emissions Test Details

TESTING PARAMETERS

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBμV/m, the spectrum analyzer reading in dBμV was corrected by using the following formula. This reading was then compared to the applicable specification limit.

SAMPLE CALCULATIONS		
	Meter reading	(dB μ V)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dB μ V/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. The following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the highest readings, this is indicated as a "QP" or an "Ave" on the appropriate rows of the data sheets. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

Peak

In this mode, the spectrum analyzer/receiver readings recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the measuring device called "peak hold," the measuring device had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the quasi-peak detector.

Average

For certain frequencies, average measurements may be made using the spectrum analyzer/receiver. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.