

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	--	Original Release	08/17/07	

REV STATUS	REV	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SHEETS	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

REV STATUS	REV																
SHEETS	SHEET	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32

CONTRACT No.:			<p align="center">Planar Monolithics Industries, Inc. 7311-G Grove Road, Frederick, MD 21704</p>
		DATE	
DRAWN	E. Elder	8/17/07	<p align="center">ACCEPTANCE TEST PROCEDURE MODEL: SLVAC-0102-70M OPT: LA LOGARITHMIC AMPLIFIER SUCCESSIVE DETECTION CONSTANT PHASE</p>
CHECK	E. Elder	8/17/07	
APPD.	R. Afable	8/17/07	
ENGR.	S. Kuhn	8/17/07	
PROD.	L. Chau	8/17/07	
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PLANAR MONOLITHICS INDUSTRIES, INC.
7311-G GROVE RD., FREDERICK MD.21704
TEL: 301-631-1579 FAX: 301-662-2029
URL: WWW.PLANARMONOLITHICS.COM
E-MAIL: SALES@PLANARMONOLITHICS.COM
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ACCEPTANCE
TEST PROCEDURE
(ATP)

FOR

PMI MODEL NUMBER: SLVAC-0102-70M OPTION LA

LOGARITHMIC AMPLIFIER
SUCCESSIVE DETECTION
CONSTANT PHASE



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 7311-G GROVE RD., FREDERICK MD.21704
 TEL: 301-631-1579 FAX: 301-662-2029
 URL: WWW.PLANARMONOLITHICS.COM
 E-MAIL: SALES@PLANARMONOLITHICS.COM
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 7311-G GROVE RD., FREDERICK MD.21704
 TEL: 301-631-1579 FAX: 301-662-2029
 URL: WWW.PLANARMONOLITHICS.COM
 E-MAIL: SALES@PLANARMONOLITHICS.COM
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1.0 SCOPE

The purpose of this document is to provide an electrical testing procedure for PMI Model SLVAC-0102-70M Option LA, the Successive Detection Logarithmic Amplifier. This procedure is only to be performed by a test technician experienced in the testing of RF and microwave devices.

2.0 EQUIPMENT LIST

The following equipment, or equivalent, are to be used in conjunction with this Acceptance Test Procedure (ATP) provided that all said equipments have displayed a valid calibration notice that can be traced to the National Institute of Standards and Technologies (NIST).

TABLE OF APPROVED TEST EQUIPMENT
 TABLE I

Item Number	ITEM	MANUFACTURER	MODEL NUMBER
1	RF Source	Hewlett Packard	8350B
1a	RF Source, Plug-In	Hewlett Packard	83692A
2	Power Meter	Gigatronic	8541/8541C
2a	Power Sensor	Gigatronic	80401A
3	Power Supply (2 needed)	Agilent	3631A
4	Ammeter (2 needed)	Fluke	75
5	Multi-meter	HP	34401A
6	Oscilloscope	Tektronix	TDS3054/TDS3014B
7	Vector Network Analyzer	Agilent	N5230A

3.0 GENERAL TESTING GUIDLINES

Preliminary Acceptance Testing is performed before hermetic sealing and optionally before burn-in, as indicated in paragraph 4.0. Final Electrical Testing is performed after burn-in as indicated in paragraph 5.0. All electrical testing shall be performed in a test fixture, shown in Figure I. All tests to be done @ 25°C. All test procedure SCD references specify Litton Amecom Drawing Number 991106.

3.1 PRECAUTIONS

The following precautions must be observed when testing the SLVAC-0102-70M Option LA in the test fixture. The SLVAC-0102-70M Option LA shall hereafter be referred to as the "Device Under Test" or DUT.

- 3.1.1 All testing before hermetic sealing shall be done in a particle-free, "clean room" environment.
- 3.1.2 The DUT shall be installed in the test fixture situated such that the green insulated feedthru is connected to the + voltage terminal in the upper left side of the fixture. The open side of the carrier shall be facing upwards.



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 7311-G GROVE RD., FREDERICK MD.21704
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- 3.1.3 All DUT leads shall be in their correct position in the test fixture. No shorting to adjacent electrical traces shall occur.
- 3.1.4 DC power shall be applied only when the DUT is properly positioned in the test fixture with the rubber mounting bracket secured in position. DC power shall be disconnected prior to removing the DUT from the test fixture.
- 3.1.5 The DC voltage shall be +5V and -5V. The test fixture shall also be grounded properly.

4.0 ACCEPTANCE TEST PROCEDURE

- 4.1 FREQUENCY (REFERENCE SCD PARAGRAPH 3.3.2)
 - 4.1.1 The SDLVA shall meet all of its specifications from 131.5 MHz to 188.5 MHz. If the DUT does not function over the full frequency range in any of the following tests, the unit does not meet the frequency requirements. If all tests are met, record the full **frequency range** as test item #1 on the data sheet.
- 4.2 DYNAMIC RANGE (REFERENCE SCD PARAGRAPH 3.3.3)
 - 4.2.1 The SDLVA shall meet all of its specifications for the dynamic range of 5 dBm to -65 dBm. If the DUT does not function over the full dynamic range in any of the following tests, the unit does not meet the dynamic range requirements. If all tests are met, record the **dynamic range** as test item #2 on the data sheet.
- 4.3 RF INPUT IMPEDANCE AND VOLTAGE STANDING WAVE RATIO (REFERENCE SCD PARAGRAPH 3.3.4)
 - 4.3.1 Connect test fixture as shown in Figure II. Calibrate VNA. Set frequency range on VNA from 120 MHz to 200 MHz.
 - 4.3.2 Check **input VSWR** on S11 from VNA. The RF input impedance shall be 50Ω with a maximum VSWR of 1.8:1. Record input VSWR as test item #3 on the data sheet.
- 4.4 LOG VIDEO OUTPUT VOLTAGE (REFERENCE SCD PARAGRAPH 3.3.7)
 - 4.4.1 Connect test fixture as shown in Figure III. Calibrate RF for power levels of +5 dBm to -65 dBm.
 - 4.4.2 Turn RF source "ON". Set RF source to 160 MHz. Record **log video output voltage** from voltmeter. Record as test item #4 on the data sheet. The RF input at -60 dBm shall produce 375 mV ±100 mV at the log video output. RF input at 0 dBm shall produce 1.875 V ±100 mV at the log video output.
- 4.5 LOG VIDEO LINEARITY (REFERENCE SCD PARAGRAPH 3.3.8)
 - 4.5.1 Connect test fixture as shown in Figure IV. Calibrate RF for power levels of +5 dBm to -65 dBm.
 - 4.5.2 Set RF source to 120 MHz. Measure the log video output voltage versus input amplitude. Plot the approximate straight line (best fit). Record at 5 dB increments over the dynamic range. Check the **log video linearity** by making sure the line is within ±1.0 dB. Record power meter value.
 - 4.5.3 Repeat at 160 MHz.
 - 4.5.4 Repeat at 200 MHz.
- 4.6 TANGENTIAL SENSITIVITY AND LOG VIDEO BASELINE (REFERENCE SCD PARAGRAPH 3.3.9)
 - 4.6.1 Connect test fixture as shown in Figure IV. Calibrate RF for power levels of +5 dBm to -65 dBm.
 - 4.6.2 Set RF source to pulse RF input, then set frequency to 160 MHz. Measure **tangential sensitivity**



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7311-G GROVE RD., FREDERICK MD.21704
TEL: 301-631-1579 FAX: 301-662-2029
URL: WWW.PLANARMONOLITHICS.COM
E-MAIL: SALES@PLANARMONOLITHICS.COM
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- from the video output on the oscilloscope. The tangential sensitivity of the DUT shall be -72 dBm maximum. Record as test item #6 on the data sheet.
- 4.6.3 Take plot from paragraph 4.5 (above). Use best fit straight line to calculate straight-line voltage at -75 dBm RF input. Verify that the measured **log video baseline** voltage is less than the calculated straight line -75 dBm voltage point. Record as test item #7 on data sheet.
- 4.7 LOG VIDEO VERSUS FREQUENCY (REFERENCE SCD PARAGRAPH 3.3.10)
- 4.7.1 Using data recorded in 4.5 (above), verify the log video output voltage does not vary more than an amount corresponding to ± 1 dB from the value at 160 MHz for any input amplitude in the dynamic range.
- 4.7.2 Record the **log video versus frequency** as test item #8 on the data sheet.
- 4.8 LOG VIDEO RISE TIME (REFERENCE SCD PARAGRAPH 3.3.12)
- 4.8.1 Connect test fixture as shown in Figure IV. Set RF source for pulse RF output at -10 dBm with a pulse width of 1 μ s.
- 4.8.2 Measure the **rise time** from the 10% point to the 90% point on the leading edge of the waveform on the oscilloscope. Record the rise time as test item #9 on the data sheet.
- 4.9 LOG VIDEO FALL TIME (REFERENCE SCD PARAGRAPH 3.3.13)
- 4.9.1 Connect test fixture as shown in Figure IV. Set RF source for pulse RF output at 10 dBm with a pulse width of 1 μ s.
- 4.9.2 Measure the **fall time** from the 90% point to the 10% point on the trailing edge of the waveform on the oscilloscope. Record the fall time as test item #10 on the data sheet.
- 4.10 RF OUTPUT IMPEDANCE AND VSWR (REFERENCE SCD PARAGRAPH 3.3.15)
- 4.10.1 Connect test fixture as shown in Figure II. Calibrate VNA. Set frequency range on VNA from 120 MHz to 200 MHz.
- 4.10.2 Check **output VSWR** on S22 from VNA. The RF input impedance shall be 50 Ω with a maximum VSWR of 2.5:1. Record input VSWR as test item #11 on the data sheet.
- 4.11 LIMITED RF OUTPUT LEVEL (REFERENCE SCD PARAGRAPH 3.3.16)
- 4.11.1 Using data recorded in 4.5 (above), verify that the **output power level of the limited RF output** is 2.75 dBm \pm 0.75 dBm for any input within the dynamic range and frequency range.
- 4.11.2 Record high and low values of output power as test item #12 on the data sheet.
- 4.12 LIMITED RF OUTPUT PHASE SHIFT VERSUS AMPLITUDE (REFERENCE SCD PARAGRAPH 3.3.17)
- 4.12.1 Connect test fixture as shown in Figure II. Calibrate VNA.
- 4.12.2 Set VNA to -65 dBm. Set VNA to record data for reference. Set VNA to -60 dBm. Record worst case phase difference. Set VNA to record data for reference.
- 4.12.3 Repeat for -55 dBm.
- 4.12.4 Repeat for -45 dBm.
- 4.12.5 Repeat for -35 dBm.
- 4.12.6 Repeat for -25 dBm.



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7311-G GROVE RD., FREDERICK MD.21704
TEL: 301-631-1579 FAX: 301-662-2029
URL: WWW.PLANARMONOLITHICS.COM
E-MAIL: SALES@PLANARMONOLITHICS.COM
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- 4.12.7 Repeat for -15 dBm.
- 4.12.8 Repeat for -8 dBm.
- 4.12.9 Repeat for -5 dBm.
- 4.12.10 Repeat for 0 dBm.
- 4.12.11 Repeat for +5 dBm.
- 4.12.12 Determine worst case phase difference. Record value as **limited RF output phase shift versus amplitude** in test item #13 on the data sheet.
- 4.13 PHASE TRACKING VERSUS FREQUENCY (REFERENCE SCD PARAGRAPH 3.3.18)
 - 4.13.1 Connect test fixture as shown in Figure II. Calibrate VNA.
 - 4.13.2 Set VNA at +5 dBm. Record absolute phase at 10 MHz integrals from 130 MHz to 190 MHz.
 - 4.13.3 Repeat at -30 dBm.
 - 4.13.4 Repeat at -65 dBm.
 - 4.13.5 Calculate phase versus frequency slope between points. Verify that the phase between adjacent points is within $12^{\circ} \pm 4^{\circ}/10$ MHz. Record **phase tracking versus frequency** as test item #14 on the data sheet.
- 4.14 POWER SUPPLY CURRENT (REFERENCE SCD PARAGRAPH 3.3.19)
 - 4.14.1 Connect test fixture as shown in Figure IV.
 - 4.14.2 Measure **power supply current** and record as test items #15 and 16 on the data sheets. Current on the +5V supply shall not exceed 200 mA. Current on the -5V supply shall not exceed 100 mA.



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 7311-G GROVE RD., FREDERICK MD.21704
 TEL: 301-631-1579 FAX: 301-662-2029
 URL: WWW.PLANARMONOLITHICS.COM
 E-MAIL: SALES@PLANARMONOLITHICS.COM
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5.0 SAMPLE DATA SHEET

071-LVA-DTA



PLANAR MONOLITHICS INDUSTRIES, INC.
 7311-G GROVE ROAD, FREDERICK, MARYLAND 21704
 TEL: 301-662-4700 FAX: 301-662-2029
 URL: WWW.PLANARMONOLITHICS.COM
 EMAIL: SALES@PLANARMONOLITHICS.COM
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SUMMARY TEST DATA ON

SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA)

CUSTOMER: NORTHROP GRUMMAN JOB NO: _____
 MODEL NO: SLVAC-0102-70M TESTED BY: _____
 OPTION NO: LA NORTHROP P/N: 991106-2 REV. L
 SERIAL NO: _____ DATE: _____

TEST ITEM NO:	PARAMETERS	SPECIFIED VALUE	MEASURED VALUE	REMARKS QA/QC
1	FREQUENCY RANGE	130 MHz TO 190 MHz		
2	DYNAMIC RANGE	+5 dBm TO -65 dBm		
3	INPUT VSWR	1.8:1 (1.5:1 TYPICAL)		
4	LOG VIDEO OUTPUT VOLTAGE @ 160 MHz	+0.375V ± 0.1V @ -60 dBm +1.875V ± 0.1V @ 0 dBm		
5	LOG LINEARITY @ 25°C	±1.0 dB FROM BEST FIT STRAIGHT LINE		
6	TANGENTIAL SENSITIVITY	-72 dBm MAXIMUM		
7	LOG VIDEO OUTPUT BASELINE	SHALL NOT EXCEED VALUE @ -75 dBm		
8	LOG VIDEO VS. FREQUENCY FROM 120 MHz TO 200 MHz	±1.0 dB FROM THE VALUE @ 160 MHz		
9	LOG VIDEO RISE TIME	32 nSec		
10	LOG VIDEO FALL TIME	35 nSec		
11	OUTPUT VSWR	2.5:1		
12	LIMITED RF OUTPUT POWER LEVEL	+2.75 ± 0.75 dBm		
13	LIMITED RF OUTPUT PHASE SHIFT VS. INPUT POWER (10 dB INCREMENTS)	±0.3°/dB (±3°/10dB) PER SCD 3.17		
14	PHASE TRACKING VS. FREQUENCY FROM 131.5 MHz TO 188.5 MHz	12±4°/10 MHz		



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 7311-G GROVE RD., FREDERICK MD.21704
 TEL: 301-631-1579 FAX: 301-662-2029
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TEST ITEM NO:	PARAMETERS	SPECIFIED VALUE	MEASURED VALUE	REMARKS QA/QC
15	CURRENT DRAW @ +5V ± 0.25V	200 mA		
16	CURRENT DRAW @ -5V ± 0.25V	100 mA		

QA / QC APPROVAL: _____ DATED: _____



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 7311-G GROVE RD., FREDERICK MD.21704
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FIGURE I

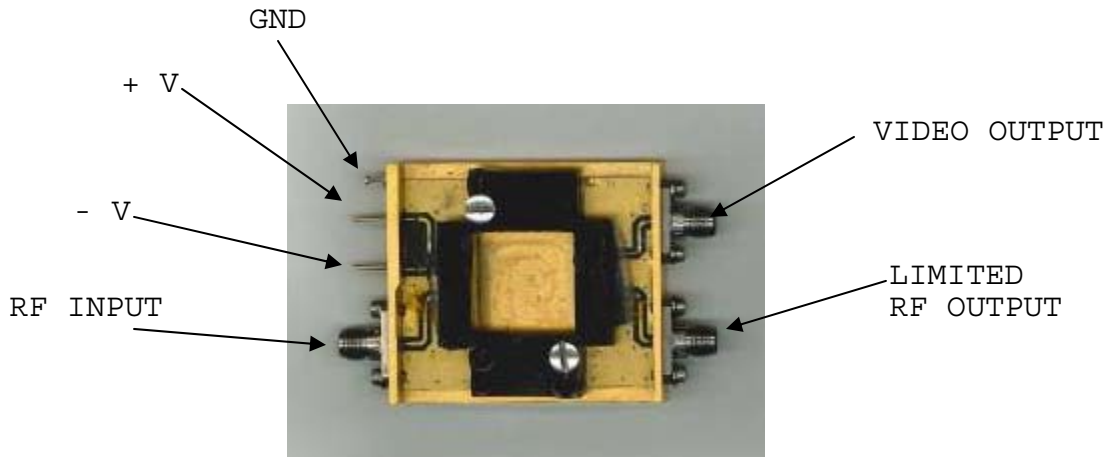


FIGURE II

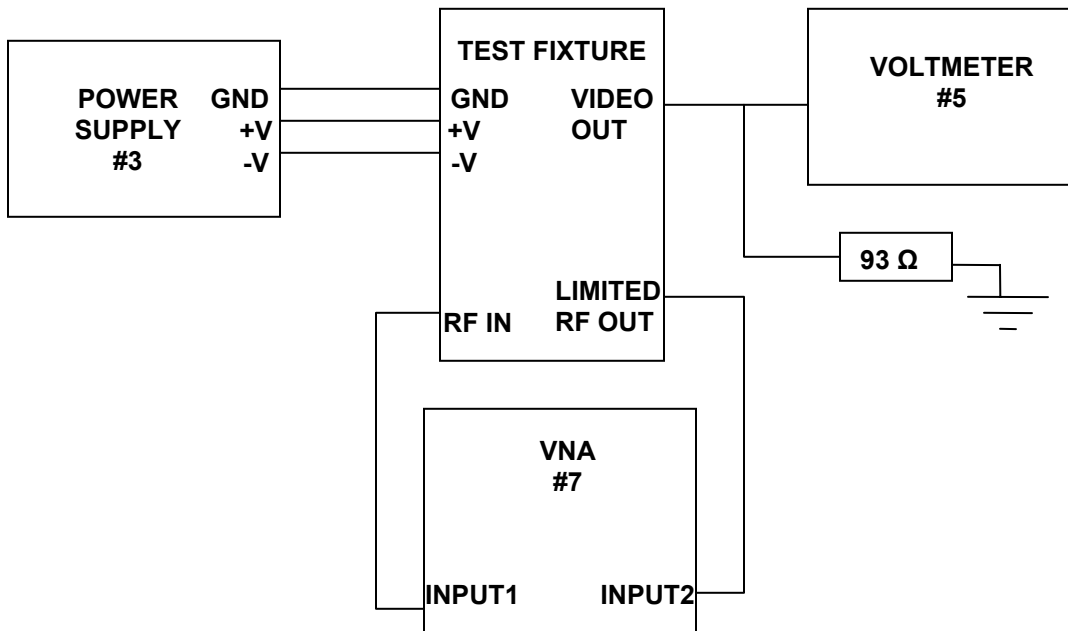




FIGURE III

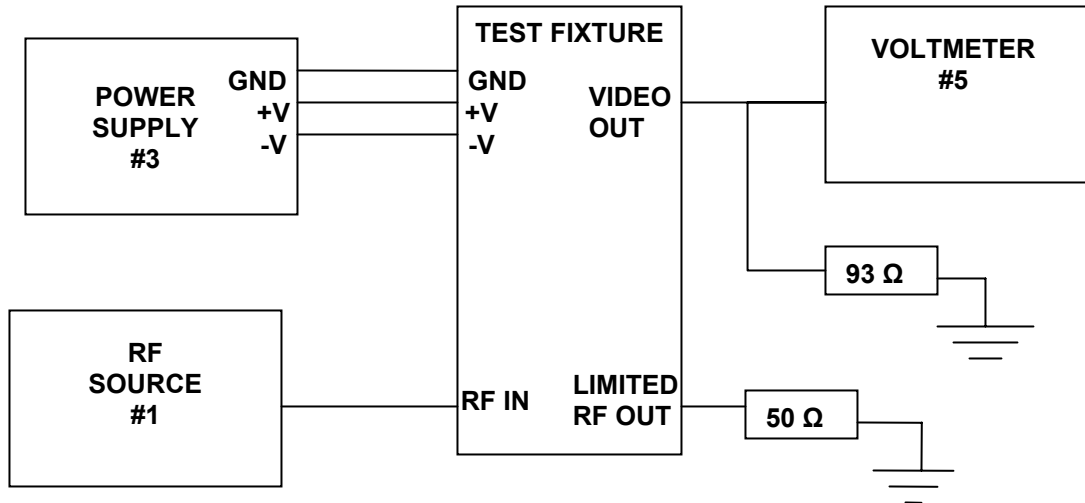


FIGURE IV

