ACCEPTANCE TEST PROCEDURE
(ATP)

FOR

STANDARD
SUCCESSIVE DETECTION LOGARITHMIC VIDEO AMPLIFIER (SDLVA)
PMI MODEL No: SLVAC-06135

PMI Drawing Number:
SLVAC-ATP-01/1103, Revision-A
Reference Previous Drawing No: AMC DWG, AH-01/1092, Rev. A

Planar Monolithics Industries, Inc., 7311-G Grove Road, Frederick, Maryland 21704
Telephone: 301-631-1579, Facsimile: 301-662-2029, Email: sales@planarmonolithics.com

REVISIONS				
ZONE	REV.	DESCRIPTION	DATE	APPROVED
	A	ORIGINAL RELEASE	11/19/03	R. AFABLE

REV. STATUS OF SHEETS	REV												
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12
REV. STATUS OF SHEETS	REV												
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12

CONTRACT NO:					
TITLE	*NAME*	*DATE*	*PLANAR MONOLITHICS INDUSTRIES, Inc.* Frederick, MD 21704		
DRAWN BY	R. Artim	12-11-92			
CHECK'D BY	P. Wood	11-19-03			
APPROVED	R. Afable	11-19-03	ACCEPTANCE TEST PROCEDURE (ATP) STANDARD SDLVA PMI MODEL No: SLVAC-06135		
ENGINEER	R. Afable	11-19-03			
PRODUCTION					
QA/QC			SIZE: A	CAGE CODE: 0ZXZ8	DWG No: SLVAC-ATP-01/1103
			REV: A	SCALE: N/A	

TABLE OF CONTENTS

1.0 SCOPE:

The purpose of this document is to provide an electrical testing procedure for the Planar Monolithics Industries, Inc. Standard Successive Detection Logarithmic Video Amplifiers (SDLVA), aka: Successive Detection Log Amplifiers (SDLVA), aka: Successive Log Video Amplifiers (SLVA), which are based upon the PMI Model No: SLVAC-06135. This procedure is only to be performed by a qualified and trained test technician experienced in the testing and handling of RF and Microwave MMIC Devices.

2.0 EQUIPMENT LIST:

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

LIST OF APPROVED TEST EQUIPMENT

S/N	ITEM	MAKER	MODEL
1	RF Source	Gigatronic	12000A
2	Power Meter	Gigatronic	8541
3	2 Power Supplies	Agilent	E3631A
4	Detector	Gigatronic	80401A
5	2 Ammeters	Fluke	75
6	Digital Multimeter	Hewlett Parkard	34401A
7	Oscilloscope	TEK	465B
8	Spectrum Analyzer	Agilent	E4407B

3.0 ASSEMBLY INSPECTION / TEST:

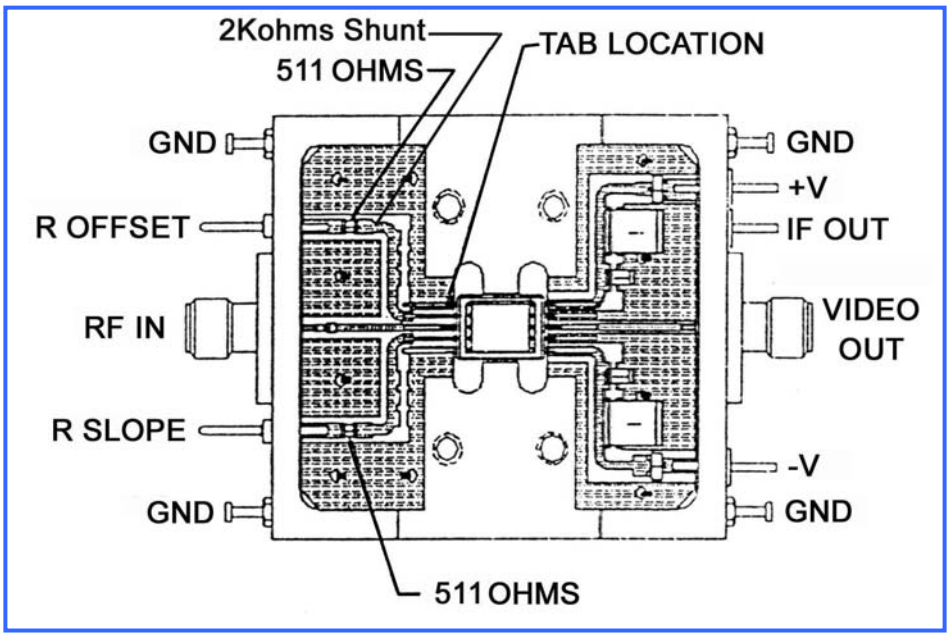
All Successive Detection Log Amplifiers shall be subjected to the assembly, screening and quality conformance inspection operations outlined in 9.0, Manufacturing Traveler for SLVAC-06135M.

4.0 ELECTRICAL TESTING:

4.1 GENERAL GUIDELINES:

Preliminary Electrical Testing is performed before hermetic sealing and optionally before burn-in. Final Electrical/Summary Testing is performed after burn-in as indicated in 9.0. All electrical testing shall be performed in an SDLVA evaluation unit, hereafter referred to as the "Test Fixture". This Test Fixture in diagrammed below in Figure 1.

FIGURE 1: TEST FIXTURE



(PMI Model No: TF-01-0520)

4.2 PRECAUTIONS:

The following precautions must be observed when testing the SLVA-06135 in the test fixture. The SLVA-06135 shall hereafter be referred to as the "Device Under Test" or DUT.

1. These devices are susceptible to damage resulting from electrostatic discharge (ESD). Every precaution shall be taken during device handling and testing to prevent static buildup. Operator and equipment must be properly grounded.

2. All testing before hermetic sealing shall be done in a particle-free, "clean room" environment.

3. The DUT shall be installed in the test fixture with the tabbed lead in the indicated position. The lid or open side of the carrier shall be facing upwards.

4. All DUT leads shall be in their correct position in the test fixture. No shorting to adjacent electrical traces shall occur.

5. DC power shall be applied only when the DUT is properly positioned in the test fixture with the test fixture cover screwed into position using 4-40 0.25" screws. DC power shall be disconnected proior to removing the DUT from the test fixture.

6. The DC voltages, both positive and negative, applied directly to the DUT shall not exceed 5.5 volts. The test fixture has a reverse protection diode in series with the +V and –V, therefore the +V and –V shall not exeed 6.0 volts. The optimum voltages applied directly to the DUT are ±5 volts. It is critical that +V and –V be well regulated to protect the DUT form overvoltage and also to obtain accurate measurements. The test fixture shall also be well grounded.

7. The minimum resistance from R SLOPE to ground is 300 Ohms. A 511 Ohm resistor shall be in series with the DUT and the R SLOPE pin on the test fixture.

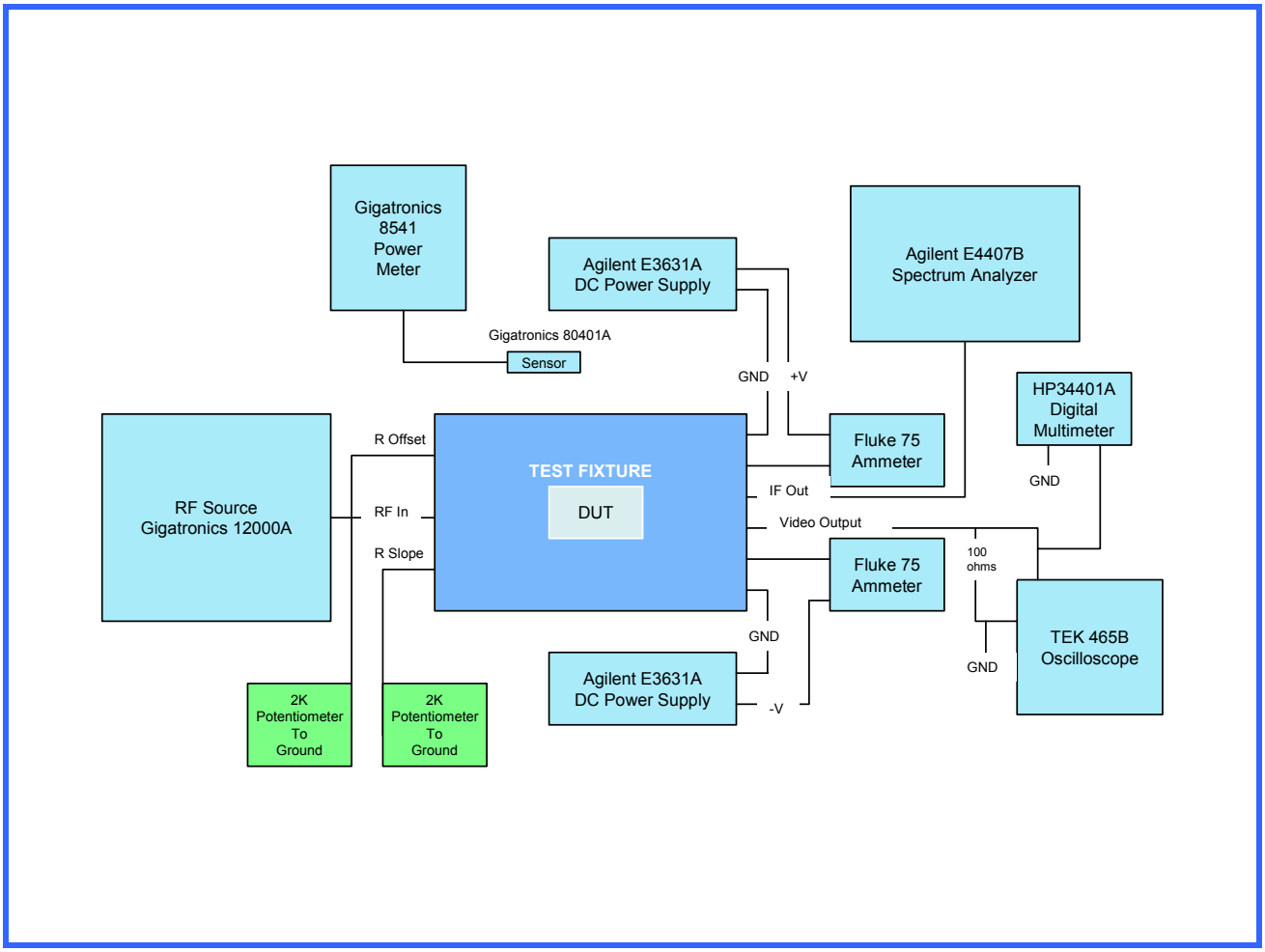
8. The minimum load on the VIDEO OUT is 95 Ohms. Avoid loading the VIDEO OUT with excessive capacitance. All testing shall be done with a 100 Ohm video load.

9. The maximum RF Input Power must not exceed 10.5 dBm.

5.0 TEST EQUIPMENT BLOCK DIAGRAM:

The DUT is tested using equipment arranged as shown in Figure 2. The Power Meter and Sensor shall be used to verify the RF input power levels prior to testing.

FIGURE 2: TEST EQUIPMENT BLOCK DIAGRAM



6.0 PRELIMINARY ELECTRICAL TEST PROCEDURE:

All Preliminary Electrical Tests are as shown on Test Data sheets shown in 8.0.

6.1 Test Item 1, Negative Current Draw

1. Apply DC voltage to the test fixture at +V and –V to ensure the positive and negative voltages to the DUT are ±5 volts.

2. Measure the negative current draw.

3. If negative current draw is less than or equal to the specified value given in the test data sheet, a "Pass" condition exists, otherwise "Fail" the unit.

6.2 Test Item 2, Positive Current Draw

1. Measure the positive current draw.

2. If positive current draw is less than or equal to the specified value given in the test data sheet, a "Pass" condition exists, other "Fail" the unit.

6.3 Test Item 3, Offset Adjustability

1. Apply a +5 dBm CW (1GHz) RF Input to the DUT.

2. Short the R OFFSET (with 511 Ohms in series) to Ground and observe the Video Output. The Video Output should increase by at least 45mV.

6.4 Test Item 4, Slope Adjustability

1. Note the DC Video Output of the DUT with +5 dBm and -65 dBm CW (600MHz, 1.0GHz & 1.35GHz) RF Input.

2. Short the R SLOPE (with 511 Ohms in series) to Ground and observe the Video Output. The Video

Output should increase in relation to the Input RF Power.

6.5 Test Item 5, Tangential Sensitivity (TSS)

1. Apply a -67 dBm CW (1.0GHz) RF Input to the DUT.

2. Pulse Modulate the RF Input with a square wave and observe the DUT Video Output on the oscilloscope (oscilloscope bandwidth equal to 20 MHz).

3. Vary the RF Input CW power less than or equal to the specified value given in the test data sheet, then a "Pass" condition exists, otherwise "Fail" the unit.

4. If TSS occurs at an RF Input CW power less than or equal to the specified value given in the test data sheet, then a "Pass" condition exists, otherwise "Fail".

7.0 FINAL ELECTRICAL / SUMMARY TEST PROCEDURE

All Final / Summary Electrical Tests are recorded data as measured during testing as shown on the Test Data Sheets of 8.0.

7.1 Test Item 1, Negative Current Draw, as per 6.1 of this document. Record Measured Data on data sheet.

7.2 Test Item 2, Positive Currant Draw, as per 6.2 of this document. Record Measured Data on data sheet.

7.3 Test Item 3, Offset Adjustability, as per 6.3 of this document. Record Measured Data on data sheet.

7.4 Test Item 4, Log Linearity Error

1. With RF Input Frequency equal to 975 MHz and Logging Slope set same as in 6.4 of this document, apply a 0 dBm CW (975 MHz) RF Input to the DUT. Record the Video Output Measured Data on the data sheet.

2. Decrease the RF Input Power in 5 dBm steps until a -60 dBm Input level is reached, recording the Video Output voltage with each change in power.

3. Calculate the logging error. Record worst case Logging Error on data sheet.

7.5 Test Item 6, Tangential Sensitivity (TSS), as per 6.5 of this document. Record the CW Input RF power level where TSS occurs on the data sheet.

8.0 TEST DATA SHEETS:

FORM: SD-335 11/16/00

JOB NO:

SUMMARY TEST DATA
ON
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA)

CUSTOMER: _____ TESTED BY: _____
JOB NO: _____ TEMPERATURE: _____
MODEL NO: SDLVAC-0613M-A08-LA DATE: _____
SERIAL NO: _____ OPTION NO: _____

TEST ITEM NO.	PARAMETERS	SPECIFIED VALUE	MEASURED VALUE	REMARKS QA/QC
1	FREQUENCY RANGE	600-1350 MHz		
2	DYNAMIC RANGE	≥ 65 dB (minimum)		
3	LOG LINEARITY (@600 MHz) ± 1.2 dB max (-60 dBm to 0 dBm) ± 1.5 dB max (-65 dBm to 5 dBm)	± 0.8 dB (typical) ± 1.2 dB (typical)		
4	LOG LINEARITY (@1.0 GHz) ± 1.2 dB max (-60 dBm to 0 dBm) ± 1.5 dB max (-65 dBm to 5 dBm)	± 0.8 dB (typical) ± 1.2 dB (typical)		
5	LOG LINEARITY (@1.35 GHz) ± 1.2 dB max (-60 dBm to 0 dBm) ± 1.5 dB max (-65 dBm to 5 dBm)	± 0.8 dB (typical) ± 1.2 dB (typical)		
6	MINIMUM LOGGING RANGE	-60 dBm -65 dBm (typical)		
7	MAXIMUM LOGGING RANGE	+ 5 dBm + 8 dBm (typical)		
8	INPUT & OUTPUT VSWR	1.8:1 (maximum) 1.5:1 (typical)		
9	TANGENTIAL SENSITIVITY	-65 dBm(minimum) -70 dBm (typical)		
10	LIMITED IF OUTPUT	-14 dBm (minimum)		
11	MAXIMUM RF INPUT POWER	+10 dBm		
12	MAXIMUM OUTPUT VOLTAGE	2.7 VOLTS		

1

PLANAR MONOLITHICS INDUSTRIES
7311F GROVE ROAD, FREDERICK MD. 21701
TEL: (301)631-4857 FAX: (301)662-4938

SUMMARY TEST DATA
ON
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA)

CUSTOMER: _____ **TESTED BY:** _____
JOB NO: _____ **TEMPERATURE:** _____
MODEL NO: SDLVAC-0613M-A08-LA **DATE:** _____
SERIAL NO: _____ **OPTION NO:** _____

13	RISE TIME (10% TO 90% POINTS)	25 nSec (maximum)		
14	FALL TIME (90% TO 10% POINTS)	30 nSec (maximum)		
15	LOG SLOPE VARIATION WITH FREQUENCY	±0.5 mV/dB (over 80 MHz RF Bandwidth)		
16	LOG SLOPE VARIATION WITH TEMPERATURE	±1 mV (maximum) @600 MHz @1.0 GHz @1.35 GHz		
17	PROPAGATION DELAY	10 nSec (maximum) 7 nSec (typical)		
18	D.C. POWER @ +5 V ±1% (no load)	30 mA (maximum)		
19	D.C. POWER @ -5 V ±1%	170 mA (maximum)		

PRODUCTION MANAGER APPROVAL: _____ **DATED:** _____

QA/QC APPROVAL: _____ **DATED:** _____

9.0 MANUFACTURING TRAVELER FOR SLVAC-06135M

FORM: 316-SD
REV A

PLANAR MONOLITHICS INDUSTRIES
7311-G GROVE ROAD FREDERICK, MD 21704
TEL: 301-662-4700 FAX: 301-662-4938

MANUFACTURING TRAVELER FOR SLVAC-06135M

MODEL NO: SLVAC-06135M-A08-LA OPTION(S):_____ JOB NO:_____
PARTS LIST NO: 100-3141 SERIAL NO:_____
DRAWING NO: 300-3142 CUSTOMER: _____
SPECIFICATIONS: ☐ COMMERCIAL ☒ MIL-STD 883 ☐ OTHER:_____
SPECIFY:_____

STEP NO.	OPERATIONAL STAGES	ASSY	TEST	QA/QC
1	*CLEAN PACKAGE*		X	X
2	*ASSEMBLY IN ACCORDANCE WITH PMI DRAWING NO. 300-5294*		X	X
3	*WIRE BOND AUDIT: PROCESS MACHINE/OPERATOR AUDIT IN ACCORDANCE WITH PMI PROCEDURE 100-2839.*		X	X
4	*WIRE BOND AUDIT: LOT SAMPLE BOND STRENGTH AUDIT IN ACCORDANCE WITH PMI PROCEDURE 100-2839.*		X	X
5	*CAREFULLY CLEAN PACKAGE WITH DRY AIR BLOWOUT IN ACCORDANCE WITH PMI PROCEDURE NO. 100-2843.*		X	X
6	*INTERNAL VISUAL INSPECTION: INSPECT ASSEMBLY USING A STEREOZOOM MICROSCOPE AND FLOURESCENT RING LIGHTING IN ACCORDANCE WITH MIL-STD-883, METHOD 2017.*	X	X	
7	*QUALITY CONFORMANCE INSPECTION, GROUP B (IN LINE) - INTERNAL VISUAL. INSPECT FOR THE MATERIAL DESIGN AND CONSTRUCTION REQUIREMENTS.*	X	X	
8	*ELECTRICAL TEST*	X		X
9	*HERMETIC SEAL*		X	X
10	*FINE LEAK (IN ACCORDANCE WITH MIL-STD-883, METHOD 1014, CONDITION A 30 PSIG BOMB, 5 HOURS MAXIMUM LEAK RATE = 1 X 10(-7) ATM-cc/sec He).*	X		X
11	*GROSS LEAK (IN ACCORDANCE WITH MIL-STD-883, METHOD 1014, CONDITION C. 30 PSIG BOMB, 8 HOURS).*	X		X
12	*ELECTRICAL TEST*	X		X
13	*THERMAL SHOCK (IN ACCORDANCE WITH MIL-STD-883, METHOD 1010, AS APPLICABLE, 10 CYCLES, -40°C TO +85°C).*	X		X

CAUTION: ESD SENSITIVE DEVICE

Page 1 of 2

STEP NO.	OPERATIONAL STAGES	ASSY	TEST	QA/QC
14	*ELECTRICAL TEST*	X		X
15	*BURN-IN (96 HOURS POWER-ON BURN IN AT +85°C)*	X		X
16	*FINAL ELECTRICAL TEST/QUALITY CONFORMANCE INSPECTION*	X		
17	*EXTERNAL VISUAL (IN ACCORDANCE WITH MIL-STD-883, METHOD 2009 EXCEPT GLASS SEAL CRACKS SHALL BE ACCEPTABLE IF THE DEVICE PASSES FINE AND GROSS LEAK TESTS).*	X	X	
18	*QUALITY CONFORMANCE INSPECTION, GROUP B (IN-LINE) - PHYSICAL DIMENSIONS. CONFIRM THAT ALL CRITICAL DIMENSIONS AFFECTED BY THE ASSEMBLY PROCESS (e.g.> PACKAGE LENGTH, WIDTH, HEIGHT, PIN LENGTH, etc.) MEET THE REQUIREMENTS OF THE OUTLINE DRAWING.*	X	X	
19	*PACKAGE AND SHIPMENT (IN ACCORDANCE WITH PMI PROCEDURE NO. 100-2341 AND 100-2342).*	SHIPPING DEPT.	X	

REWORK

TEST/OPER#	Q.C./OPER#	DESCRIPTION	ASSY DATE	QC DATE	NOTES

CAUTION: ESD SENSITIVE DEVICE

Planar Monolithics Industries, Inc., 7311-G Grove Road, Frederick, Maryland 21704
Telephone: 301-631-1579, Facsimile: 301-662-2029, Email: sales@planarmonolithics.com