PLANAR MONOLITHICS INDUSTRIES, INC.

SUCCESSIVE DETECTION LOGARITHMIC VIDEO AMPLIFIERS

(SURFACE MOUNT DEVICES)

July 29, 2012

Prepared by
Peter Wood
<table>
<thead>
<tr>
<th>Rpt.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SDLVA, 0.1 to 2.0GHz, 65dB Dynamic Range, 14pin Flat pack</td>
</tr>
<tr>
<td>2</td>
<td>SDLVA, 300 to 800MHz, 65dB Dynamic Range, 10pin Flat pack</td>
</tr>
<tr>
<td>3</td>
<td>SDLVA, 0.1 to 2.0 GHz, 65dB Dynamic Range, 14pin Flat pack</td>
</tr>
<tr>
<td>4</td>
<td>SDLVA, 700 to 1300MHz, 77dB Dynamic Range, 16pin Flat pack</td>
</tr>
<tr>
<td>5</td>
<td>SDLVA, 300 to 2000MHz, 80dB Dynamic Range, 16pin Flat pack</td>
</tr>
<tr>
<td>6</td>
<td>SDLVA, 130 to 190MHz, 70dB Dynamic Range, 10pin Flat pack</td>
</tr>
</tbody>
</table>
DESCRIPTION

THE MODEL SDLVAC-0120-70 SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA) OPERATES OVER THE 0.1 TO 2.0 GHz RANGE (USEFUL RANGE UP TO 2.5 GHz) AND SLVAC-06135 IS OPTIMIZED OVER THE 500 MHz TO 1.35 GHz FREQUENCY RANGE. THESE UNITS HAVE A DYNAMIC RANGE OF 65 TO 70 dB, A TSS OF -67 dBm AND A NOMINAL VIDEO BANDWIDTH OF 20 MHz. FURTHERMORE, THESE UNITS ARE DESIGNED USING CUTTING EDGE GaAs TECHNOLOGY WHICH PROVIDES STUNNING PERFORMANCE AND RELIABILITY IN A COMPACT PACKAGE MAKING IT AN OPTIMUM SOLUTION FOR HIGH SPEED CHANNELIZED RECEIVER APPLICATIONS. THESE UNITS OFFER TYPICAL FAST RISE TIME ≤ 20 ns, RAPID FALL TIME ≤ 20 ns AND SLOPE DELAY TIME OF 8 nsec. THE LOG SLOPE IS 25 mV/DB AND THE LOG ACCURACY IS LESS THAN ±1.0 dB OVER THE -60 TO 0 dBm POWER INPUT RANGE. DYNAMIC RANGE CAN BE EXTENDED TO -65/+5 WITH LOG ERROR OF ±1.5 dB. OPTIONS ARE AVAILABLE WITH ADJUSTABLE LOGGING SLOPE AND DC OFFSETS.

SPECIFICATIONS

- FREQUENCY RANGE:
  - AMPL Model No: SDLVAC: 0120-70: 0.1 TO 2.0 GHz (USEFUL RANGE TO 2.5 GHz)
  - AMPL Model No: SLVAC: 06135: 0.6 TO 1.35 GHz
- DYNAMIC RANGE: > 65 dB
- LOG LINEARITY: ±1.2 dB MAX. (-60 dBm TO 0 dBm), ±0.8 dB TYPICAL
  ±1.5 dB MAX. (-65 dBm TO +5 dBm), ±1.2 dB TYPICAL
- MINIMUM LOGGING RANGE: -60 dBm (-65 dBm TYPICAL)
- MAXIMUM LOGGING RANGE: +5 dBm (+8 dBm TYPICAL)
- VSWR INPUT: 1.8:1 MAXIMUM (1.5:1 TYPICAL)
- TANGENTIAL SENSITIVITY: -65 dBm MINIMUM (70 dBm TYPICAL)
- LIMITED IF OUTPUT: -14 dBm (MINIMUM)
- MAXIMUM RF INPUT POWER: +10 dBm
- LOG VIDEO OUTPUT:
  - OUTPUT COUPLING: DC
  - MAXIMUM OUTPUT VOLTAGE: 2.7 VOLTS
  - RISE TIME: 25 ns MAXIMUM
  - FALL TIME: 30 ns MAXIMUM
  - SETTLING TIME: 40 ns MAXIMUM
  - DC OFFSET: 0.1 V NOMINAL
  - SLOPE: 25 mV/DB NOMINAL
  - LOG SLOPE VARIATION WITH FREQUENCY: ±0.5 mV/DB (OVER 80 MHz RF BANDWIDTH)
  - LOG SLOPE VARIATION WITH TEMPERATURE: ±1 mV MAXIMUM
  - PROPAGATION DELAY: 10 ns MAXIMUM, 7 ns TYPICAL
  - VIDEO LOAD: 100 Ω TYP.
- DC POWER SUPPLY:
  - V+:+7 TO +18 VOLTS @ 50mA (NO VIDEO LOAD)
  - V-:-7 TO -18 VOLTS @ 100mA
- SIZE: 0.75" x 0.75" x 0.135"

AVAILABLE OPTIONS

- AD1: EXTENDED DYNAMIC RANGE: -80 dBm TO +5 dBm
- AD2: HIGHER LIMITED IF OUTPUT
- AD3: ALTERNATE LOG SLOPES
- AD4: EXTERNAL ADJUST FOR SLOPE
- AD5: HIGH POWER RF CW/PEAK PROTECTION
- AD8: SCREENED TO MIL-STD-883 (MODIFIED VISUAL INSPECTION)

MECHANICAL OUTLINE

SERIAL NUMBER

R0.060 TYP.

0.135

+0.012±0.002

0.750 0.500

0.100

TYP.

+5V

-5V

GND

VIDEO

RF OUTPUT

RF IN

GND

+5V

-5V

GND

REVISIONS

07/13/93

0

A

ORIGINAL RELEASE

07/13/93

0

A

PRODUCT FEATURE

SDLVAC-0120-70
SLVAC-06135

0.1 TO 2.0 GHz, DC-COUPLED, SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER
(WITH INTERNAL REGULATED POWER SUPPLIES) AND VIDEO BUFFER

PLANAR MONOLITHICS INDUSTRIES
7311F GROVE RD., FREDERICK, MD. 21701

TEL: (301) 831-4257 FAX: (301) 662-4938

PRODUCT FEATURE

SDLVAC-0120-70
SLVAC-06135

0.1 TO 2.0 GHz, DC-COUPLED, SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER
(WITH INTERNAL REGULATED POWER SUPPLIES) AND VIDEO BUFFER

SIZE: A
SHEET 1 OF 2
DWG: A 100-3213
### SUMMARY TEST DATA

ON
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIED--SDLVLA

<table>
<thead>
<tr>
<th>NO</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>REMARKS</th>
<th>QA/QC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FREQUENCY RANGE</td>
<td>300 TO 800 MHz</td>
<td>300 TO 800 MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>INPUT VSWR</td>
<td>1.8:1 (MAX)</td>
<td>1.16:1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>LOGGING RANGE</td>
<td>-60 dB TO +5 dB (MIN) PLOTS ATTACHED</td>
<td>-60 dB TO +5 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>TSS</td>
<td>-65 dBm (MIN)</td>
<td>-65 dBm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>LOG LINEARITY: @ -60 TO 0 dBm</td>
<td>±1.2 dB (MAX)</td>
<td>±0.89 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>@-65 TO +5dBm</td>
<td>±1.5 dB (MAX)</td>
<td>±1.66 dB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>RISE TIME (10% TO 90% POINTS)</td>
<td>25 nSec (MAX)</td>
<td>11 nS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>FALL TIME (90% TO 10% POINTS)</td>
<td>30 nSec (MAX)</td>
<td>12 nS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>SETTLING TIME</td>
<td>40 nSEC (MAX)</td>
<td>36 nS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>LIMITED IF OUTPUT</td>
<td>-16 dBm (TYPICAL)</td>
<td>-15.96 dBm TO -16.54 dBm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>DC POWER @ +5 VDC (NO LOAD)</td>
<td>30 mA (MAX)</td>
<td>12 mA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>VIDEO LOAD</td>
<td>100 OHMS MINIMUM</td>
<td>100 OHMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>DC POWER @ -5 VDC (NO LOAD)</td>
<td>170 mA (MAX)</td>
<td>120 mA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

QA / QC APPROVAL: ___________________________ DATED: 3/16/07
### LOG TRANSFER WITH FREQUENCY @ -54 °C

**MODEL:** SDLVAC-0120-70M  **OPTION:** 0308  **SERIAL No.:** PM703793  
**TESTED BY:** Loc Chau  
**DATE:** March 1, 2007

#### Frequency

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Intercept (mV)</th>
<th>Slope (mV/dB)</th>
<th>Limited IF Output (dBm)</th>
<th>Measured Value (mV)</th>
<th>Error (mV)</th>
</tr>
</thead>
</table>

**LINEARITY (-60 TO 0 dBm):** ± 1.35  
**LINEARITY (-65 TO +5 dBm):** ± 1.35

![Graph](image-url)
### Frequency Response

**300 MHz**
- **Intercept (mV):** 1521
- **Slope (mV/dB):** 27.07
- **Limited IF Output (dBm):**
  - Measured Value (mV): -224, -110, 7, 176, 296, 436, 577, 686, 847, 975, 1108, 1260, 1389, 1538, 1644

**550 MHz**
- **Intercept (mV):** 1467
- **Slope (mV/dB):** 25.78
- **Limited IF Output (dBm):**
  - Measured Value (mV): -191, -86, 44, 180, 298, 435, 566, 682, 826, 946, 1074, 1220, 1340, 1483, 1584
  - Error (mV): -16.45, -16.27, -16.16, -16.06, -15.97, -15.94, -15.99, -16.00, -16.01, -16.02, -16.01, -16.03, -16.05

**800 MHz**
- **Intercept (mV):** 1373
- **Slope (mV/dB):** 23.98
- **Limited IF Output (dBm):**
  - Measured Value (mV): -161, -59, 56, 173, 274, 402, 526, 636, 772, 885, 1007, 1143, 1258, 1394, 1490
  - Error (mV): -16.34, -16.16, -16.10, -16.06, -16.01, -15.94, -15.96, -15.99, -16.01, -16.03, -16.02, -16.03, -16.07

**Linearity**
- **(-60 to 0 dBm):** ± 0.89
- **(-65 to +5 dBm):** ± 1.06

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**Graph:**
- **Video Output (mV):** vs **Input Power (dBm)**
- **300 MHz GHz**
- **550 MHz GHz**
- **800 MHz GHz**
<table>
<thead>
<tr>
<th>Frequency</th>
<th>Intercept (mV)</th>
<th>Slope (mV/dB)</th>
<th>Limited I' Output (dBm)</th>
<th>Error (mV)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1360</td>
<td>26.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1307</td>
<td>25.52</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1211</td>
<td>23.82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**LINEARITY**

- **(-60 TO 0dBm)** ± 0.86
- **(-65 TO +5dBm)** ± 1.47

### Graph

- **300 MHz GHz**
- **550 MHz GHz**
- **800 MHz GHz**
### SUMMARY TEST DATA

**ON**

SUCCESSIVE DETECTION LOG VIDEO AMPLIFIED--SDLVA

<table>
<thead>
<tr>
<th>NO</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>REMARKS QA/QC</th>
</tr>
</thead>
<tbody>
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<td>FREQUENCY RANGE</td>
<td>300 TO 800 MHz</td>
<td>300 TO 800 MHz</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>INPUT VSWR</td>
<td>1.8:1 (MAX)</td>
<td>1.18:1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>LOGGING RANGE</td>
<td>-60 dB TO +5 dB (MIN)</td>
<td>-60 dB TO +5 dB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PLOTS ATTACHED</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>TSS</td>
<td>-65 dBm (MIN)</td>
<td>-65 dBm</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>LOG LINEARITY: @ -60 TO 0 dBm</td>
<td>±1.2 dB (MAX)</td>
<td>0.91 dB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>@-65 TO +5dBm</td>
<td>±1.5 dB(MAX)</td>
<td>0.92 dB</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>RISE TIME (10% TO 90% POINTS)</td>
<td>25 nSec (MAX)</td>
<td>12 nS</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>FALL TIME (90% TO 10% POINTS)</td>
<td>30 nSec (MAX)</td>
<td>12 nS</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>SETTLING TIME</td>
<td>40 nSEC (MAX)</td>
<td>34 nS</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>LIMITED IF OUTPUT</td>
<td>-16 dBm (TYPICAL)</td>
<td>-15.29 dBm TO</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>-15.81 dBm</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>DC POWER @ +5 VDC (NO LOAD)</td>
<td>30 mA (MAX)</td>
<td>12 mA</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>VIDEO LOAD</td>
<td>100 OHMS MINIMUM</td>
<td>100 OHMS</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>DC POWER @ -5 VDC (NO LOAD)</td>
<td>170 mA (MAX)</td>
<td>119 mA</td>
<td></td>
</tr>
</tbody>
</table>

QA / QC APPROVAL: ________________________________  DATED: 3/6/07  

PAGE 1 OF 1
## LOG TRANSFER WITH FREQUENCY @ -54 °C

**MODEL:** SDLVAC-0120-70M  **OPTION:** 0308  **SERIAL No.:** PM703794  
**TESTED BY:** Loc Chau  
**DATE:** March 1, 2007

<table>
<thead>
<tr>
<th>Frequency</th>
<th>INTERCEPT (mV)</th>
<th>SLOPE (mV/dB)</th>
<th>LIMITED IF OUTPUT (dBm)</th>
</tr>
</thead>
</table>

**LINEARITY(-60 TO 0dBm)** ± 1.19  
**LINEARITY(-65 TO +5dBm)** ± 1.19

### Graph

![Graph showing log transfer with frequency at -54 °C](image)

**300 MHz GHz**

**550 MHz GHz**

**800 MHz GHz**
LOG TRANSFER WITH FREQUENCY @ 25 °C
MODEL: SDLVAC-0120-70M OPTION: 0308 SERIAL No.: PM703794
TESTED BY: Loc Chau
DATE: March 1, 2007

Frequency

<table>
<thead>
<tr>
<th>Frequency</th>
<th>INTERCEPT (mV)</th>
<th>SLOPE (mV/dB)</th>
<th>LIMITED IF OUTPUT (dBm)</th>
</tr>
</thead>
</table>

LINEARITY(-60 TO 0dBm) ± 0.91
LINEARITY(-65 TO +5dBm) ± 0.92

300 MHz GHZ
550 MHz GHZ
800 MHz GHZ
<table>
<thead>
<tr>
<th>Frequency</th>
<th>INTERCEPT (mV)</th>
<th>Slope (mV/DB)</th>
<th>Limited IF Output (dBm)</th>
<th>Measured Value (mV)</th>
<th>Error (mV)</th>
</tr>
</thead>
</table>

**Linearities:**
- 300 MHz: ± 0.72
- 550 MHz: ± 1.32
- 800 MHz: ± 1.32
# SUMMARY TEST DATA

**SUCCESSIVE DETECTION LOG VIDEO AMPLIFIED--SDLVLA**

<table>
<thead>
<tr>
<th>NO.</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FREQUENCY RANGE</td>
<td>300 TO 800 MHz</td>
<td>300 TO 800 MHz</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>INPUT VSWR</td>
<td>1.8:1 (MAX)</td>
<td>1.8:1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>LOGGING RANGE</td>
<td>-60 dB TO +5 dB</td>
<td>-60 dB TO +5 dB</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>TSS</td>
<td>-65 dBm (MIN)</td>
<td>-65 dBm</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>LOG LINEARITY: @ -60 TO 0 dBm</td>
<td>±1.2 dB (MAX)</td>
<td>0.84 dB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>@ 65 TO +5dBm</td>
<td>±1.5 dB (MAX)</td>
<td>1.09 dB</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>RISE TIME (10% TO 90% POINTS)</td>
<td>25 nSec (MAX)</td>
<td>10 nS</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>FALL TIME (90% TO 10% POINTS)</td>
<td>30 nSec (MAX)</td>
<td>12 nS</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>SETTLING TIME</td>
<td>40 nSEC (MAX)</td>
<td>34 nS</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>LIMITED IF OUTPUT</td>
<td>-16 dBm (TYPICAL)</td>
<td>-15.96 dBm TO 16.61 dBm</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>DC POWER @ +5 VDC (NO LOAD)</td>
<td>30 mA (MAX)</td>
<td>12 mA</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>VIDEO LOAD</td>
<td>100 OHMS MINIMUM</td>
<td>100 OHMS</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>DC POWER @ -5 VDC (NO LOAD)</td>
<td>170 mA (MAX)</td>
<td>119 mA</td>
<td></td>
</tr>
</tbody>
</table>

QA / QC APPROVAL: ___________  DATED: 3/6/07
LOG TRANSFER WITH FREQUENCY @ -54 °C
MODEL: SDLVAC-0120-70M        OPTION : 0308        SERIAL No.: PM703795
TESTED BY: Loc Chau
DATE: March 1, 2007

<table>
<thead>
<tr>
<th>Frequency</th>
<th>INTERCEPT (mV)</th>
<th>SLOPE (mV/db)</th>
<th>LIMITED IF OUTPUT (dBm)</th>
<th>Measured Value (mV)</th>
<th>Error (mV)</th>
</tr>
</thead>
</table>

LINEARITY(-60 TO 0dBm) ± 1.24
LINEARITY(-65 TO +5dBm) ± 1.24
<table>
<thead>
<tr>
<th>Frequency</th>
<th>INTERCEPT (mV)</th>
<th>SLOPE (mV/dB)</th>
<th>LIMITED RF OUTPUT (dBm)</th>
<th>Measured Value (mV)</th>
<th>Error (mV)</th>
<th>LIMITED IF OUTPUT (dBm)</th>
<th>Measured Value (mV)</th>
<th>Error (mV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>550 MHz</td>
<td>1463</td>
<td>25.74</td>
<td>-16.52 -16.31 -16.18 -16.08 -15.99 -15.97 -16.00 -16.01 -16.02 -16.03 -16.04 -16.05 -16.06 -16.08</td>
<td>-193 -87 42 177 295 433 563 679 824 943 1071 1216 1336 1479 1579</td>
<td>Measured Value (mV)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LINEARITY(-60 TO 0dBm) ± 0.84
LINEARITY(-65 TO +5dBm) ± 0.94

![Graph](image-url)
LOG TRANSFER WITH FREQUENCY @ 85 °C
MODEL: SDLVAC-0120-70M        OPTION : 0308        SERIAL No. : PM703795
TESTED BY: Loc Chau
DATE: March 1, 2007

<table>
<thead>
<tr>
<th>Frequency</th>
<th>INTERCEPT (mV)</th>
<th>SLOPE (mV/dB)</th>
<th>LIMITED IF OUTPUT (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800 MHz</td>
<td>1206</td>
<td>23.78</td>
<td>-16.88 -16.43 -16.23 -16.10 -16.06 -16.04 -16.04 -16.05 -16.05 -16.06 -16.06 -16.06 -16.06 -16.11 -16.13</td>
</tr>
</tbody>
</table>

LINEARITY(-60 TO 0dBm) ± 0.85
LINEARITY(-65 TO +5dBm) ± 1.47
# SUMMARY TEST DATA

**ON**

SUCCESSIVE DETECTION LOG VIDEO AMPLIFIED--SDLVLA

<table>
<thead>
<tr>
<th>NO.</th>
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<td>FREQUENCY RANGE</td>
<td>300 TO 800 MHz</td>
<td>300 TO 800 MHz</td>
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</tr>
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<td>2</td>
<td>INPUT VSWR</td>
<td>1.8:1 (MAX)</td>
<td>1.8:1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>LOGGING RANGE</td>
<td>-60 dB TO +5 dB (MIN) PLOTS ATTACHED</td>
<td>-60 dB TO +5 dB</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>TSS</td>
<td>-65 dBm (MIN)</td>
<td>-65 dBm</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>LOG LINEARITY: @-60 TO 0 dBm @-65 TO +5dBm</td>
<td>±1.2 dB (MAX)</td>
<td>±1.5 dB (MAX)</td>
<td>0.83 dB</td>
</tr>
<tr>
<td>6</td>
<td>RISE TIME (10% TO 90% POINTS)</td>
<td>25 nSec (MAX)</td>
<td>19 nS</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>FALL TIME (90% TO 10% POINTS)</td>
<td>30 nSec (MAX)</td>
<td>12 nS</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>SETTLING TIME</td>
<td>40 nSEC (MAX)</td>
<td>34 nS</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>LIMITED IF OUTPUT</td>
<td>-16 dBm (TYPICAL)</td>
<td>-15.99 dBm TO -16.52 dBm</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>DC POWER @ +5 VDC (NO LOAD)</td>
<td>30 mA (MAX)</td>
<td>12 mA</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>VIDEO LOAD</td>
<td>100 OHMS MINIMUM</td>
<td>100 OHMS</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>DC POWER @ -5 VDC (NO LOAD)</td>
<td>170 mA (MAX)</td>
<td>119 mA</td>
<td></td>
</tr>
</tbody>
</table>

QA / QC APPROVAL: ___________________________  DATED: 3/6/07
LOG TRANSFER WITH FREQUENCY @ -54 °C
MODEL: SDLVAC-0120-70M        OPTION : 0308        SERIAL No. :PM703796
TESTED BY: Loc Chau
DATE: March 1, 2007

<table>
<thead>
<tr>
<th>Frequency</th>
<th>INTERCEPT (mV)</th>
<th>SLOPE (mV/dB)</th>
<th>LIMITED IF OUTPUT (dBm)</th>
</tr>
</thead>
</table>

Error (mV)
- Measured Value (mV)
- Linearity (-65 TO +5dBm) ± 1.15

Planar Monolithics Industries
7311-G Grove Road, Frederick, MD 21704 USA
Tel: 301-631-1579  Fax: 301-662-2029
Email: Sales@PlanarMonolithics.com
URL: www.PlanarMonolithics.com
ISO 9001:2000 Certified
## LOG TRANSFER WITH FREQUENCY @ 25 °C

**MODEL: SDLVAC-0120-70M**  **OPTION :0308**  **SERIAL No.:PM703796**

**TESTED BY:** Loc Chau  
**DATE:** March 1, 2007

### Frequency

<table>
<thead>
<tr>
<th>Frequency</th>
<th>INTERCEPT (mV)</th>
<th>SLOPE (mV/dB)</th>
<th>LIMITED IF OUTPUT (dBm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>300 MHz</td>
<td>1527</td>
<td>27.05</td>
<td>-16.52 -16.77 -16.10</td>
</tr>
<tr>
<td>550 MHz</td>
<td>1471</td>
<td>25.73</td>
<td>-16.45 -16.31 -16.20</td>
</tr>
<tr>
<td>800 MHz</td>
<td>1377</td>
<td>23.98</td>
<td>-16.36 -16.21 -16.14</td>
</tr>
</tbody>
</table>

### Intercept and SLOPE

- **300 MHz:**
  - Intercept: 1527 mV
  - SLOPE: 27.05 mV/dB
  - Limited IF Output: -16.52 dBm

- **550 MHz:**
  - Intercept: 1471 mV
  - SLOPE: 25.73 mV/dB
  - Limited IF Output: -16.45 dBm

- **800 MHz:**
  - Intercept: 1377 mV
  - SLOPE: 23.98 mV/dB
  - Limited IF Output: -16.36 dBm

### Measured Value (mV)

- **300 MHz:**
  - Intercept: 1527 mV
  - SLOPE: 27.05 mV/dB
  - Limited IF Output: -16.52 dBm

- **550 MHz:**
  - Intercept: 1471 mV
  - SLOPE: 25.73 mV/dB
  - Limited IF Output: -16.45 dBm

- **800 MHz:**
  - Intercept: 1377 mV
  - SLOPE: 23.98 mV/dB
  - Limited IF Output: -16.36 dBm

### Linear Error

- **300 MHz:** ± 0.83
- **550 MHz:** ± 0.83
- **800 MHz:** ± 0.83

### Linear Difference

- **300 MHz:** ± 1.01
- **550 MHz:** ± 1.01
- **800 MHz:** ± 1.01

---

**PLANAR MONOLITHICS INDUSTRIES**  
**7311-G GROVE ROAD, FREDERICK, MD 21704 USA**  
**TEL: 301-631-1579  FAX: 301-662-2029**  
**URL: WWW.PLANARMONOLITHICS.COM**  
**EMAIL: SALES@PLANARMONOLITHICS.COM**  
**ISO 9001:2000 CERTIFIED**
<table>
<thead>
<tr>
<th>Frequency</th>
<th>INTERCEPT (mV)</th>
<th>SLOPE (mV/\text{dB})</th>
<th>LIMITED IF OUTPUT (dBm)</th>
<th>VIDEO OUTPUT (mV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>800 MHz</td>
<td>1227</td>
<td>24.08</td>
<td>-16.88 -16.41 -16.19 -16.07 -16.01 -15.96 -16.00 -16.00 -16.02 -16.02 -16.03 -16.03 -16.05 -16.09</td>
<td>Measured Value (mV)</td>
</tr>
<tr>
<td></td>
<td>-310 -208 -103 18 136 247 379 490 617 742 858 994 1114 1246 1347</td>
<td>-16.88 -16.41 -16.19 -16.07 -16.01 -15.96 -16.00 -16.00 -16.02 -16.02 -16.03 -16.03 -16.05 -16.09</td>
<td>Error (mV)</td>
<td></td>
</tr>
</tbody>
</table>

**LINEARITY**

- **(-60 TO 0 dBm)**: ± 0.95
- **(-65 TO +5 dBm)**: ± 1.55
DESCRIPTION

THE MODEL SDLVAC–0120–70M–YK IS A MINIATURE SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA) THAT OPERATES OVER THE 300 MHz TO 800 MHz RANGE. THIS UNIT HAS A DYNAMIC RANGE ≥ 65 dB, A TSS OF -65 dBm AND A MINIMUM VIDEO BANDWIDTH OF 10 MHz.

SPECIFICATIONS

- FREQUENCY RANGE: 300 MHz–800 MHz
- DYNAMIC RANGE: ≥ 65 dB
- TANGENTIAL SENSITIVITY: -65 dBm MAXIMUM (TEST DATA TO BE TAKEN AT -54°C, +25°C, AND +85°C)
- LOG SLOPE: 23 mV/db MIN TO 28 mV/db MAX WITH ADJUSTABLE RESISTOR (300Ω MINIMUM)
- LOG LINEARITY: ±1.2 dB MAX (−65 dBm TO 0 dBm AT 25°C) (TEST DATA TO BE TAKEN AT +25°C)
- ±1.5 dB MAX (−65 dBm TO +5 dBm AT −54°C TO 85°C) (TEST DATA TO BE TAKEN AT −54°C, AND +85°C)
- ±1.7 dB MAX (−65 dBm TO +5 dBm AT −54°C TO 85°C) (TEST DATA TO BE TAKEN AT −54°C, +25°C, +85°C AND +95°C)
- MAXIMUM RF INPUT POWER: +10 dBm
- LIMITED IF OUTPUT: −16 ± 3 dBm
- LIMITED IF OUTPUT FLATNESS: ±3 dB MAX
- IF SMALL SIGNAL GAIN: 45 dB MIN
- INPUT VSWR: 2.0:1 MAX
- IF OUTPUT VSWR: 2.0:1 MAX
- IF OUTPUT IMPEDANCE: 50 Ω NOMINAL
- IF INPUT IMPEDANCE: 50 Ω NOMINAL
- LOG VIDEO OUTPUT:
  - OUTPUT COUPLING: DC
  - MAXIMUM OUTPUT VOLTAGE: 2.7 VOLTS (TEST DATA TO BE TAKEN AT −54°C, +25°C, AND +95°C)
  - RISE TIME: 25 nS MAXIMUM, 300 MHz TO 800 MHz
  - FALL TIME: 80 nS MAXIMUM, 300 MHz TO 800 MHz
  - PROPAGATION DELAY (THROUGHPUT TIME): 40 nS MAXIMUM, 300 MHz TO 800 MHz
  - DC OFFSET: 0 ±75 mV, EXTERNALLY ADJUSTABLE RESISTOR
  - VIDEO BANDWIDTH: 10 MHz MIN
  - LOG VIDEO IMPEDANCE: 100 Ω (NOMINAL)
- DC POWER SUPPLY (REGULATED TO 0.1%)
  +5 VOLTS @ 70mA
  −5.2 VOLTS @ 200mA
- SIZE: 0.395" x 0.280" x 0.090"

NOTE: ALL TEST DATA ARE TAKEN AT +25°C EXCEPT WHERE NOTED.

MECHANICAL OUTLINE

PLANAR MONOLITHICS INDUSTRIES
7311-F GROVE ROAD, FREDERICK MD 21704
TEL: (301) 631-1579

PRODUCT FEATURE
SDLVAC–0120–70M–YK
RKS–7LW4233–003
300 MHz TO 800 MHz, MINIATURE DC-COUPLED, SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER

SIZE: A
SHEET: 1 OF 3
DWG: #100-3214-3
DESCRIPTION

THE MODEL SDLVAC-0120-70M-YK IS A MINIATURE SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA) THAT OPERATES OVER THE 300 MHZ TO 800 MHZ RANGE. THIS UNIT HAS A DYNAMIC RANGE ≥ 65 dB, A TSS OF −65 dBm AND A MINIMUM VIDEO BANDWIDTH OF 10 MHZ.

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ±0.020
   X.XXX ±0.010
3) WEIGHT: 0.3 OZ NOMINAL

PLANAR MONOLITHICS INDUSTRIES
7311-F GROVE ROAD, FREDERICK MD 21704
TEL: (301)-631-1579

PRODUCT FEATURE
SDLVAC-0120-70M-YK
RKS-7LW4233-003

SIZE A
SHEET 2 OF 3
DWG. # 100-3214-3
DESCRIPTION

The model SDLVAC-0120-70M-YK is a miniature successive detection log video amplifier (SDLVA) that operates over the 300 MHz to 800 MHz range. This unit has a dynamic range ≥ 65 dB, a TSS of −65 dBm, and a minimum video bandwidth of 10 MHz.

FUNCTIONAL SCHEMATIC

*CAUTION*

Typical resistor value 300Ω to 100kΩ

Absolute lowest recommended value is 300Ω (less than 300Ω may result in damage)
TECHNICAL REPORT

ON

0.2 TO 2.0 GHz

≥65 dB DYNAMIC RANGE

25 nS FAST RISE TIME

MINIATURE "FLAT-PACK"
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER

WITH

INTERNAL REGULATORS

PMI MODEL NO: SDLVAC-0120-70

(SERIAL NUMBERS: PM70506 AND PM70507)

DESIGNED

BY

A. K. GORWARA

TESTED

BY

B. BAKER

REPORTED

BY

P. D. WOOD

JANUARY 19, 1998

PLANAR MONOLITHICS INDUSTRIES, INC.
CORPORATE & ENGINEERING OFFICES: 1112 PERKIOMENVILLE ROAD, PERKIOMENVILLE, PA 18074
SALES & MANUFACTURING OFFICE: 7311-G GROVE ROAD, FREDERICK, MD 21704
TEL No: 301-662-4700  •  FAX No: 301-662-4938  •  E-MAIL: AMCPMI@AOL.COM
DESCRIPTION

THE MODEL SDLVAC-0120-70 SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA) OPERATES OVER THE 0.1 TO 2.0 GHZ RANGE (USEFUL RANGE UP TO 2.5 GHZ) AND SDLVAC-06135 IS OPTIMIZED OVER THE 600 MHZ TO 1.35 GHZ FREQUENCY RANGE. THESE UNITS HAVE A DYNAMIC RANGE OF 65 TO 70 DB, A TSS OF -57 dBm AND A NOMINAL VIDEO BANDWIDTH OF 20 MHZ. FURTHERMORE, THESE UNITS ARE DESIGNED USING CUTTING EDGE GaAs TECHNOLOGY WHICH PROVIDES STUNNING PERFORMANCE AND RELIABILITY IN A COMPACT PACKAGE MAKING IT AN OPTIMUM SOLUTION FOR HIGH SPEED CHANNELIZED RECEIVER APPLICATIONS. THESE UNITS OFFER TYPICAL FAST RISE TIME ≤ 20ns, RAPID FALL TIME ≤ 20ns AS WELL AS SUPERIOR DELAY TIME OF 8 nsec.

THE LOG SLOPE IS 25mV/dB AND THE ACCURACY IS LESS THAN ±1.0 dB OVER THE +60 TO 0 dBm POWER INPUT RANGE. DYNAMIC RANGE CAN BE EXTENDED TO -65 dBm WITH LOG ERROR OF ±1.5 dB. OPTIONS ARE AVAILABLE WITH ADJUSTABLE LOGGING SLOPE AND DC OFFSETS. GUARANTEED RISE TIMES ARE LESS THAN 25 ns AND MAXIMUM RECOVERY TIMES ARE LESS THAN 30 ns. RECOVERY TIMES AT LOWER POWER ARE FASTER.

THE SDLVAC-0120-70 SDLVA IS COMMERCIALLY SCREENED AND CHARACTERIZED FROM -55° TO +85°C. SIZES AVAILABLE ARE 0.75" x 0.75" x 0.135" OR TO ANY OTHER CUSTOMIZED CONFIGURATION DESIRED.

SPECIFICATIONS

- FREQUENCY RANGE: SDLVAC-0120-70 0.1 TO 2.0 GHz (USEFUL RANGE TO 2.5 GHz)
  SDLVAC-06135 0.6 TO 1.35 GHz
- DYNAMIC RANGE
- LOG LINEARITY
- MINIMUM LOGGING RANGE
- MAXIMUM LOGGING RANGE
- VSWR INPUT
- TANGENTIAL SENSITIVITY
- LIMITED IF OUTPUT
- MAXIMUM RF INPUT POWER
- LOG VIDEO OUTPUT: OUTPUT COUPLING
- DC POWER SUPPLY
- SIZE

<table>
<thead>
<tr>
<th>PIN 1 IDENTIFIER</th>
<th>0.750</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.500</td>
<td></td>
</tr>
<tr>
<td>0.100</td>
<td>TYP.</td>
</tr>
<tr>
<td>0.060</td>
<td></td>
</tr>
<tr>
<td>0.075</td>
<td></td>
</tr>
<tr>
<td>0.010±0.002</td>
<td></td>
</tr>
<tr>
<td>0.135</td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: X.XX ±0.020
3) WEIGHT: 0.5 OZ

ENVIRONMENTAL RATINGS

- TEMPERATURE 55° TO +85°C (OPERATING)
  -60° TO +100°C (STORAGE)
- HUMIDITY MIL-STD-202F, METHOD 103B CONDITION B
- SHOCK MIL-STD-202F, METHOD 213B CONDITION B
- VIBRATION MIL-STD-202F, METHOD 204D CONDITION B
- ALTITUDE MIL-STD-202F, METHOD 105C CONDITION B
- TEMPERATURE CYCLE MIL-STD-202F, METHOD 107D CONDITION A

PLANAR MONOLITHICS INDUSTRIES
1112 PERKOMENVILLE RD., PERKOMEN, PA. 19574
TEL: (215) 754-9230

PRODUCT FEATURE
SDLVAC-0120-70
SDLVAC-06135

0.1 TO 2.0 GHZ, DC-COUPLED, SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (WITH INTERNAL REGULATED POWER SUPPLIES) AND VIDEO BUFFER

SIZE A SHEET 1 OF 2

AD05, A06
FUNCTIONAL SCHEMATIC

PLANAR MONOLITHICS INDUSTRIES, INC.
CORPORATE & ENGINEERING OFFICES: 1112 PERKIOMENVILLE ROAD, PERKIOMENVILLE, PA 18074
SALES & MANUFACTURING OFFICE: 7311-G GROVE ROAD, FREDERICK, MD 21704
TEL No: 301-662-4700 * FAX No: 301-662-4938 * E-MAIL: AMCPMI@AOL.COM
## Test Data on SDLVAC-0120-70M S/N: PM70506

**Form:** SMB-P61119E

**Job No:** P61119E

**Model No:** SDLVAC-0120-70

**Serial No:** PM70506

**Customer:** MB ELECTRONIQUE

**Tested By:** Bob

**Date:** 5/26/97

### Summary Test Data

<table>
<thead>
<tr>
<th>Test Item No.</th>
<th>Parameters</th>
<th>Specified Value</th>
<th>Measured Value</th>
<th>Remarks QA/QC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Frequency Range</td>
<td>0.1 To 2 Ghz (min)</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Dynamic Range</td>
<td>-60 To + 5 dBm (min)</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Log Linearity Error</td>
<td>+/− 1.5 dB (max)</td>
<td>-1.4 dB</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Log Slope</td>
<td>Adjustable</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Offset</td>
<td>Adjustable</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Rise Time</td>
<td>25 ns (max)</td>
<td>16.3 ns</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Fall Time</td>
<td>30 ns (max)</td>
<td>30.5 ns</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Limited Output</td>
<td>-14 dBm Typical</td>
<td>-14 dBm</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>VSWR - Input</td>
<td>1.8:1 (max)</td>
<td>Pass</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>DC Power - 7 Volts</td>
<td>180 mA (max)</td>
<td>143 mA</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>DC Power + 7 Volts</td>
<td>40 mA (max)</td>
<td>26 mA</td>
<td></td>
</tr>
</tbody>
</table>

**Production Manager Approval:**

**Dated:** 5/30/97

**QA/QC Approval:**

**Dated:** 5/30/97

---

**PLANAR MONOLITHICS INDUSTRIES, INC.**

CORPORATE & ENGINEERING OFFICES: 1112 PERKIOMENVILLE ROAD, PERKIOMENVILLE, PA 18074

SALES & MANUFACTURING OFFICE: 7311-G GROVE ROAD, FREDERICK, MD 21704

TEL No: 301-662-4700 • FAX No: 301-662-4938 • E-MAIL: AMCPMI@AOL.COM
LOG TRANSFER WITH FREQUENCY  S/N: PM70506

SDLVAC-0120-70  S/N PM70506

LOG TRANSFER WITH FREQUENCY

VIDEO OUTPUT (VOLTS)

RF INPUT POWER (dBm)

+ 0.2 GHz  + 0.6 GHz  + 1 GHz  + 1.35 GHz  + 2 GHz

2.5  2  1.5  1  0.5  0

-70  -60  -50  -40  -30  -20  -10  0  10

+ 25 C, 5/30/97

PLANAR MONOLITHICS INDUSTRIES, INC.
CORPORATE & ENGINEERING OFFICES: 1112 PERKOMENVILLE ROAD, PERKOMENVILLE, PA 18074
SALES & MANUFACTURING OFFICE: 7311-G GROVE ROAD, FREDERICK, MD 21704
TEL No: 301-662-4700  *  FAX No: 301-662-4938  *  E-MAIL: AMCPMI@AOL.COM
## TEST DATA ON SDLVAC-0120-70M S/N: PM70507

**FORM:** SMB-P61119E

**JOB NO:** P61119E

**DATE:** 5/30/97

### SUMMARY TEST DATA ON SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER—SDLVAC

<table>
<thead>
<tr>
<th>TEST ITEM NO.</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>REMARKS QA/QC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FREQUENCY RANGE</td>
<td>0.1 TO 2 Ghz (min)</td>
<td>PASS</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>DYNAMIC RANGE</td>
<td>-60 TO + 5 dBm (min)</td>
<td>PASS</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>LOG LINEARITY ERROR</td>
<td>+/- 1.5 dB (max)</td>
<td>±0.6dB</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>LOG SLOPE</td>
<td>ADJUSTABLE</td>
<td>PASS</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>OFFSET</td>
<td>ADJUSTABLE</td>
<td>PASS</td>
<td>✓</td>
</tr>
<tr>
<td>6</td>
<td>RISE TIME</td>
<td>25 ns (max)</td>
<td>18.2 Sec</td>
<td>✓</td>
</tr>
<tr>
<td>7</td>
<td>FALL TIME</td>
<td>30 ns (max)</td>
<td>25.0 Sec</td>
<td>✓</td>
</tr>
<tr>
<td>8</td>
<td>LIMITED OUTPUT</td>
<td>-14 dBm Typical</td>
<td>-16dBm</td>
<td>✓</td>
</tr>
<tr>
<td>9</td>
<td>VSWR - INPUT</td>
<td>1.8:1 (max)</td>
<td>PASS</td>
<td>✓</td>
</tr>
<tr>
<td>10</td>
<td>DC POWER - 7 VOLTS</td>
<td>180 mA (max)</td>
<td>127mA</td>
<td>✓</td>
</tr>
<tr>
<td>11</td>
<td>DC POWER + 7 VOLTS</td>
<td>40 mA (max)</td>
<td>25mA</td>
<td>✓</td>
</tr>
</tbody>
</table>

**PRODUCTION MANAGER APPROVAL:**

**DATED:** 5/30/97

**QA/QC APPROVAL:**

**DATED:** 5/30/97
LOG TRANSFER WITH FREQUENCY S/N: PM70507

PLANAR MONOLITHICS INDUSTRIES, INC.
CORPORATE & ENGINEERING OFFICES: 1112 PERKIOMENVILLE ROAD, PERKIOMENVILLE, PA 18074
SALES & MANUFACTURING OFFICE: 7311-G GROVE ROAD, FREDERICK, MD 21704
TEL No: 301-662-4700  FAX No: 301-662-4938  E-MAIL: AMCPMI@ADL.COM
THE MODEL SDLVAC-0120-70 SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA) OPERATES OVER THE 0.1 TO 2.0 GHz RANGE (USEFUL RANGE UP TO 2.5 GHz) AND SDLVAC-06135 IS OPTIMIZED OVER THE 600 MHz TO 1.35 GHz FREQUENCY RANGE. THESE UNITS HAVE A DYNAMIC RANGE OF 65 TO 70 dB, A TSS OF –67 dBm AND A NOMINAL VIDEO BANDWIDTH OF 20 MHz. FURTHERMORE, THESE UNITS ARE DESIGNED USING CUTTING EDGE GaAs TECHNOLOGY WHICH PROVIDES STUNNING PERFORMANCE AND RELIABILITY IN A COMPACT PACKAGE MAKING IT AN OPTIMUM SOLUTION FOR HIGH SPEED CHANNELIZED RECEIVER APPLICATIONS. THESE UNITS OFFER TYPICAL FAST RISE TIMES, RAPID FALL TIMES AS WELL AS SUPERIOR DELAY TIME OF 8 ns.

THE LOG SLOPE IS 25mV/DB AND THE ACCURACY IS LESS THAN ±1.0 dB OVER THE 60 TO 0 dBm POWER INPUT RANGE. DYNAMIC RANGE CAN BE EXTENDED TO –65/+5 DBm WITH LOG ERRORS OF ±1.5 dB. OPTIONS ARE AVAILABLE WITH ADJUSTABLE LOGGING SLOPE AND DC OFFSETS. GUARANTEED RISE TIMES ARE LESS THAN 25 ns AND MAXIMUM RECOVERY TIMES ARE LESS THAN 30 ns. RECOVERY TIMES AT LOWER POWER ARE FASTER.

THE SDLVAC-0120-70 SDLVA IS COMMERCIALY SCREENED AND CHARACTERIZED FROM –55° TO +85°C. SIZES AVAILABLE ARE 0.75” x 0.75” x 0.135” OR TO ANY OTHER CUSTOMIZED CONFIGURATION DESIRED.

SPECIFICATIONS

- FREQUENCY RANGE:
  - AMX MODEL NO: SDLVAC-0120-70: 0.1 TO 2.0 GHz (USEFUL RANGE TO 2.5 GHz)
  - AMX MODEL NO: SDLVAC-06135: 0.6 TO 1.35 GHz

- DYNAMIC RANGE: > 65 dB

- LOG LINEARITY: ±1.2 dB MAX. (–60 dBm TO 0 dBm), ±0.8 dB TYPICAL
  ±1.5 dB MAX. (–65 dBm TO +5 dBm), ±1.2 dB TYPICAL

- MINIMUM LOGGING RANGE: –60 dBm (–65 dBm TYPICAL)

- MAXIMUM LOGGING RANGE: +5 dBm (+8 dBm TYPICAL)

- VSWR INPUT: 1.8:1 MAXIMUM (1.5:1 TYPICAL)

- TANGENTIAL SENSITIVITY: –65 dBm MINIMUM (–70 dBm TYPICAL)

- LIMITED IF OUTPUT: –14 dBm (MINIMUM)

- MAXIMUM RF INPUT POWER: +10 dBm

- LOG VIDEO OUTPUT:
  - OUTPUT COUPLING: DC
  - MAXIMUM OUTPUT VOLTAGE: 2.7 VOLTS
  - RISE TIME: 25 ns MAXIMUM
  - FALL TIME: 30 ns MAXIMUM
  - SETTLING TIME: 40 ns MAXIMUM
  - DC OFFSET: 0.1 V NOMINAL
  - SLOPE: 25 mV/DB NOMINAL
  - LOG SLOPE VARIATION WITH FREQUENCY: ±0.5 mV/DB (OVER 80 MHz RF BANDWIDTH)
  - LOG SLOPE VARIATION WITH TEMPERATURE: ±0.1 mV MAXIMUM
  - PROPAGATION DELAY: 10 ns MAXIMUM, 7 ns TYPICAL
  - VIDEO LOAD: 100 Ω ± 10%

- DC POWER SUPPLY: +7 to +18 Volts @ 50mA (NO VIDEO LOAD)
  - –7 to –18 Volts @ 100mA

- SIZE: 0.75” x 0.75” x 0.135”

AVAILABLE OPTIONS

- AD1: EXTENDED DYNAMIC RANGE –80dBm TO +5dBm
- AD2: HIGHER LIMITED IF OUTPUT
- AD3: ALTERNATE LOG SLOPES
- AD4: EXTERNAL ADJUST FOR LOG SLOPE
- AD5: HIGH POWER RF CW/PEAK PROTECTION
- AD6: OTHER VIDEO LOADS
- AD8: SCREENED TO MIL-STD-883 (MODIFIED VISUAL INSPECTION)

PLANAR MONOLITHICS INDUSTRIES
7311F GROVE RD., FREDERICK, MD. 21701
TEL: (301) 831-4257 FAX: (301) 662-4938

PRODUCT FEATURE
SDLVAC-0120-70
SDLVAC-06135

0.1 TO 2.0 GHz, DC-COUPLED, SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER
(WITH INTERNAL REGULATED POWER SUPPLIES) AND VIDEO BUFFER

SIZE: A
SHEET 1 OF 2
DWG: # 100-3213
FUNCTIONAL SCHEMATIC

+7 TO +18V

VOLTAGE REGULATOR

+5V

RF INPUT

4

1

2

6

7

8

10

14

13

11

RF OUTPUT

VIDEO OUTPUT

-5V

OFFSET

3

-7 TO -18V

VOLTAGE REGULATOR

5

SLOPE

PLANAR MONOLITHICS INDUSTRIES
7311 F GROVE RD., FREDERICK, MD. 21701
TEL: (301) 831-4257 FAX: (301) 662-4938

PRODUCT FEATURE
SDLVAC-0120-70.
SLVAC-06135

0.1 TO 2.0 GHz, DC-COUPLED, SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER
(WITH INTERNAL REGULATED POWER SUPPLIES) AND VIDEO BUFFER

APPRAOCH  DATE

M. L. P. 01/13/03

CHECKED

SIZE A  SHEET 2 OF 2  DWG. # 100-3213
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
<table>
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<th>REV.</th>
<th>DESCRIPTION</th>
<th>DATE</th>
<th>APPROVED</th>
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<tr>
<td>A</td>
<td>ORIGINAL RELEASE</td>
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<td>R. AFABLE</td>
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**CONTRACT NO:**

**PLANAR MONOLITHICS INDUSTRIES, Inc.**

Frederick, MD 21704

**ACCEPTANCE TEST PROCEDURE (ATP)**

**STANDARD SDLVA**

PMI MODEL No: SLVAC-06135

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<td>R. Artim</td>
<td>12-11-92</td>
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<tr>
<td>CHECK'D BY</td>
<td>P. Wood</td>
<td>11-19-03</td>
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<td>ENGINEER</td>
<td>R. Afable</td>
<td>11-19-03</td>
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<td>PRODUCTION</td>
<td></td>
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<tr>
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**SIZE:** A  **CAGE CODE:** 0ZXZ8  **REV:** A  **SCALE:** N/A  **DWG No:** SLVAC-ATP-01/1103

Planar Monolithics Industries, Inc., 7311-G Grove Road, Frederick, Maryland 21704
Telephone: 301-631-1579, Facsimile: 301-662-2029, Email: sales@planarmonolithics.com
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<th>PAGE</th>
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<td>TEST EQUIPMENT BLOCK DIAGRAM &amp; FIGURE 2</td>
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<td>7.0</td>
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<td>8.0</td>
<td>TEST DATA SHEETS I, II &amp; III</td>
</tr>
<tr>
<td>9.0</td>
<td>MANUFACTURING TRAVELER FOR SLVAC-06135M</td>
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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).

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

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 is 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 prior 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 exceed 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 from 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**

**SUMMARY TEST DATA**

**ON**

SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA)

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<table>
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<table>
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<th>REMARKS QA/QC</th>
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<td>2</td>
<td>DYNAMIC RANGE</td>
<td>≥ 65 dB (minimum)</td>
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<td></td>
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<tr>
<td>3</td>
<td>LOG LINEARITY (@600 MHz)</td>
<td>≥ 1.2 dB max (-60 dBm to 10 dBm)</td>
<td>≥ 0.8 dB (typical)</td>
<td>≥ 1.2 dB (typical)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥ 1.5 dB max (-65 dBm to 5 dBm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>LOG LINEARITY (@1.0 GHz)</td>
<td>≥ 1.2 dB max (-60 dBm to 0 dBm)</td>
<td>≥ 0.8 dB (typical)</td>
<td>≥ 1.2 dB (typical)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>≥ 1.5 dB max (-65 dBm to 5 dBm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>LOG LINEARITY (@1.35 GHz)</td>
<td>≥ 1.2 dB max (-60 dBm to 0 dBm)</td>
<td>≥ 0.8 dB (typical)</td>
<td>≥ 1.2 dB (typical)</td>
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<td></td>
<td></td>
<td>≥ 1.5 dB max (-65 dBm to 5 dBm)</td>
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<td>6</td>
<td>MINIMUM LOGGING RANGE</td>
<td>-60 dBm</td>
<td>-65 dBm (typical)</td>
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<td>+ 8 dBm (typical)</td>
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<td>8</td>
<td>INPUT &amp; OUTPUT VSWR</td>
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<td>1.5:1 (typical)</td>
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<td>-65 dBm (minimum)</td>
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<td>LIMITED IF OUTPUT</td>
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<td>+10 dBm</td>
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<td>MAXIMUM OUTPUT VOLTAGE</td>
<td>2.7 VOLTS</td>
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### SUMMARY TEST DATA

ON
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA)

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<tr>
<td><strong>13</strong></td>
<td>RISE TIME (10% TO 90% POINTS)</td>
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<tr>
<td><strong>14</strong></td>
<td>FALL TIME (90% TO 10% POINTS)</td>
</tr>
<tr>
<td><strong>15</strong></td>
<td>LOG SLOPE VARIATION WITH FREQUENCY</td>
</tr>
<tr>
<td><strong>16</strong></td>
<td>LOG SLOPE VARIATION WITH TEMPERATURE</td>
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<tr>
<td><strong>17</strong></td>
<td>PROPAGATION DELAY</td>
</tr>
<tr>
<td><strong>18</strong></td>
<td>D.C. POWER @ +5 V ±1% (no load)</td>
</tr>
<tr>
<td><strong>19</strong></td>
<td>D.C. POWER @ -5 V ±1%</td>
</tr>
</tbody>
</table>

PRODUCTION MANAGER APPROVAL: __________________________ DATED: __________

QA/QC APPROVAL: __________________________ DATED: __________
## 9.0 MANUFACTURING TRAVELER FOR SLVAC-06135M

**FORM: 316-SD**
**REV A**

### 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  [x] MIL-STD 883  [ ] OTHER

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<th>ASSY</th>
<th>TEST</th>
<th>QA/QC</th>
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<td>1</td>
<td>CLEAN PACKAGE</td>
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<td>2</td>
<td>ASSEMBLY IN ACCORDANCE WITH PMI DRAWING NO. 300-5294</td>
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<td>3</td>
<td>WIRE BOND AUDIT: PROCESS MACHINE/OPERATOR AUDIT IN ACCORDANCE WITH PMI PROCEDURE 100-2899</td>
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<td>WIRE BOND AUDIT: LOT SAMPLE BOND STRENGTH AUDIT IN ACCORDANCE WITH PMI PROCEDURE 100-2899</td>
<td>X</td>
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<td>5</td>
<td>CAREFULLY CLEAN PACKAGE WITH DRY AIR BLOWOUT IN ACCORDANCE WITH PMI PROCEDURE NO. 100-2845</td>
<td>X</td>
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<td>6</td>
<td>INTERNAL VISUAL INSPECTION: INSPECT ASSEMBLY USING A STEREOZOOM MICROSCOPE AND FLOURESCENT RING LIGHTING IN ACCORDANCE WITH MIL-STD-883, METHOD 2017</td>
<td>X</td>
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<td>7</td>
<td>QUALITY CONFORMANCE INSPECTION, GROUP B (IN LINE) - INTERNAL VISUAL INSPECT FOR THE MATERIAL DESIGN AND CONSTRUCTION REQUIREMENTS</td>
<td>X</td>
<td>X</td>
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<td>8</td>
<td>ELECTRICAL TEST</td>
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</tr>
<tr>
<td>9</td>
<td>HERMETIC SEAL</td>
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<tr>
<td>10</td>
<td>FINE LEAK (IN ACCORDANCE WITH MIL-STD-883, METHOD 1014, CONDITION A 30 PSIG BOMB, 5 HOURS MAXIMUM LEAK RATE = 1 X 10^-7 A2M-cc/sec Ft)</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>11</td>
<td>GROSS LEAK (IN ACCORDANCE WITH MIL-STD-883, METHOD 1014, CONDITION C 30 PSIG BOMB, 5 HOURS)</td>
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<td>X</td>
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<tr>
<td>12</td>
<td>ELECTRICAL TEST</td>
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<td>X</td>
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</tr>
<tr>
<td>13</td>
<td>THERMAL SHOCK (IN ACCORDANCE WITH MIL-STD-883, METHOD 1010, AS APPLICABLE, 10 CYCLES, -40°C TO +85°C)</td>
<td>X</td>
<td>X</td>
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</tbody>
</table>

**CAUTION:** ESD SENSITIVE DEVICE
### Operational Stages

<table>
<thead>
<tr>
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<th>OPERATIONAL STAGES</th>
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<td>ELECTRICAL TEST</td>
<td>X</td>
<td>X</td>
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</tr>
<tr>
<td>15</td>
<td>BURN-IN (96 HOURS POWER-ON BURN IN AT +85°C)</td>
<td>X</td>
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<tr>
<td>16</td>
<td>FINAL ELECTRICAL TEST/QUALITY CONFORMANCE INSPECTION</td>
<td>X</td>
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</tr>
<tr>
<td>17</td>
<td>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).</td>
<td>X</td>
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<tr>
<td>18</td>
<td>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.</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>PACKAGE AND SHIPMENT (IN ACCORDANCE WITH PMI PROCEDURE No. 100-2341 AND 100-2342).</td>
<td>SHIP</td>
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### Rework

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<th>DESCRIPTION</th>
<th>ASSY DATE</th>
<th>QC DATE</th>
<th>NOTES</th>
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</table>

CAUTION: ESD SENSITIVE DEVICE

Page 2 of 2
SUMMARY

TEST DATA

ON

700 TO 1,300 MHz
(0.3 TO 2.0 GHz UNITS ALSO AVAILABLE)

25nS HIGH SPEED

≥78dB ULTRA-HIGH DYNAMIC RANGE

LOW AM/PM CONVERSION

SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER COMPACT (SDLVAC)

PMI MODEL No:
SDLVAC-0120-70LM

WITH OPTIONS: 07103 & JS
SERIAL No: PM911143, PM911144 AND PM911146

DESIGNED
BY
FRANK RETHMEIER & DANIEL J. VESCUSO

TESTED
BY
FRANK RETHMEIER

REPORT
BY
PETER WOOD

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
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- RESPONSE TIME (RISE & FALL) ......................................... PAGE 7

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NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
FEATURES:

- 700 TO 1300 MHz FREQUENCY RANGE
- 78dB HIGH DYNAMIC RANGE

SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA)
PMI MODEL NO: SDLVAC-0120-70LM
WITH OPTIONS: 07103 & JS

SPECIFICATIONS:

- INPUT FREQUENCY: 700 TO 1300 MHz (0.3 TO 2.0 GHz AVAILABLE)
- INPUT FREQUENCY: 100 MHz WIDE SUBBAND
- DYNAMIC RANGE: 78 dB MINIMUM (80dB TYPICAL)
- DYNAMIC RANGE: 1.8:1 MAXIMUM (1.5:1 TYPICAL)
- INPUT & OUTPUT VSWR: -76 dBm MAXIMUM (-82 dBm TYPICAL)
- INPUT & OUTPUT VSWR: -75dBm TO +3dBm
- TANGENTIAL SIGNAL SENSITIVITY (TSS): ±1.5dB MAXIMUM (±1.0dB TYPICAL)
- LOGGING RANGE: 25mV/dB (OTHER SLOPES AVAILABLE)
- LOGGING RANGE: ±1.5mV/dB (OVER 100 MHz RF BANDWIDTH)
- LOG SLOPE VARIATION OVER FREQUENCY: ±2.5mV/dB MAXIMUM
- LOG SLOPE VARIATION OVER TEMPERATURE: ±2.5 dB MAXIMUM
- LOG LINEARITY: ±2.5° MAXIMUM
- UNIT TO UNIT PHASE TRACKING: 25nS MAXIMUM, 20nS TYPICAL
- FALL TIME (90% TO 10% POINTS): 40nS MAXIMUM (10% INPUT PULSE TO WITHIN 0.5 dB)
- RISE TIME (10% TO 90% POINTS): 50nS MAXIMUM (90% INPUT PULSE TO WITHIN 0.5 dB)
- SETTLING TIME: ≤8 dB
- RECOVERY TIME: 10nS MAXIMUM (7nS TYPICAL)
- LIMITED IF OUTPUT: ≤-60, 50°C
- AM/PM: 1.2°/dB MAXIMUM
- OUTPUT COUPLING: DC
- PROPAGATION DELAY: 20 MHz MINIMUM
- NOISE FIGURE: 100Ω MINIMUM
- VIDEO BANDWIDTH: +5vdc @ 115mA (NO LOAD)
- VIDEO LOAD: -5vdc @ 145mA (NO LOAD)
- DC POWER SUPPLIES: 0.50"(L) X 0.375"(W) X 0.075"(H) (PINS EXCLUDED)

NOVEMBER 22th, 2000

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Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpml@aol.com
MECHANICAL OUTLINE

ENVIRONMENTAL SPECIFICATIONS

TEMPERATURE : -55°C to +85°C Operating
               -65°C to +125°C Non-Operating


VIBRATION : MIL-STD-202F, Method 204D Cond. B


TEMPERATURE CYCLE : MIL-STD-202F, Method 107D Cond. A

NOVEMBER 22Nd, 2000

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Tel: 301-662-4700  Fax: 301-662-4838  Website: www.AMWAVE.com  E-mail: amcpml@aol.com

Page 4
FUNCTIONAL SCHEMATIC
DESCRIPTION
The model SDLVAC-0120-70LM option 07103 is a miniature successive detection log video amplifier (SDLVA) operates over the 700 mHz to 1.3 GHz using 2 (two) hybrid IC/MMIC chips of our existing SDLVAC-0120-70M units.

SPECIFICATIONS
- INPUT FREQUENCY
  - 0.7 TO 1.30 GHz
  - 100 MHz wide subband
  - 77 dB
- DYNAMIC RANGE
- LOG VIDEO OUTPUT:
  - SLOPE
  - LOG SLOPE VARIATION WITH FREQUENCY
  - LOG SLOPE VARIATION WITH TEMPERATURE
  - INSTANTANEOUS LOG SLOPE
  - VIDEO OUTPUT IMPEDANCE
  - VIDEO BANDWIDTH
- INPUT LEVEL
- OPERATING TEMPERATURE
- LOG ERROR (LINEARITY)
- SUPPLY
- NOISE FIGURE
- LIMITED IF OUTPUT
- SIZE

ENVIRONMENTAL RATINGS
- TEMPERATURE
  - -5°C TO +85°C (OPERATING)
  - -65°C TO +100°C (STORAGE)
- HUMIDITY
  - MIL-STD-202F, METHOD 103B COND. B
- SHOCK
  - MIL-STD-202F, METHOD 213B COND. B
- VIBRATION
  - MIL-STD-202F, METHOD 2040 COND. B
- ALTITUDE
  - MIL-STD-202F, METHOD 105C COND. B
- TEMPERATURE CYCLE
  - MIL-STD-202F, METHOD 107D COND. A

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: ±0.020
3) WEIGHT: 0.2 OZ
RESPONSE TIME (RISE & FALL)
HORIZONTAL SCALE: 20nS PER DIVISION

RISE TIME: 20nS

FALL TIME: 30nS
SECTION 1

FINAL TEST DATA

AND

DATA OVER TEMPERATURE

ON

700 TO 1,300 MHz
(0.3 TO 2.0 GHz UNITS ALSO AVAILABLE)

25nS HIGH SPEED

≥78dB ULTRA-HIGH DYNAMIC RANGE

LOW AM/PM CONVERSION

SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER COMPACT (SDLVAC)

PMI MODEL No:
SDLVAC-0120-70LM
WITH OPTIONS: 07103 & JS

S/N: PM911143

NOVEMBER 22th, 2000

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Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
## SUMMARY TEST DATA
ON
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER--SDLVVA

### Form: 304-SD

<table>
<thead>
<tr>
<th>TEST ITEM NO.</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>REMARKS QA/QC</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>FREQUENCY RANGE</td>
<td>0.7 TO 1.3 Ghz (min)</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>DYNAMIC RANGE</td>
<td>77 dB (min)</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>LOG LINEARITY -75 to 3 dBm</td>
<td>±1.5 dB (min)</td>
<td>+0.93 dB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LOG LINEARITY 0 to +85°C</td>
<td>±2.5 dB (min)</td>
<td>-1.13 dB</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>LOG SLOPE</td>
<td>SEE PLOTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>TSS (TANGENTIAL SENSITIVITY)</td>
<td>- 76 dBm (min)</td>
<td>-32 dBm</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>VSWR (INPUT)</td>
<td>1.8:1 (max)</td>
<td>1.63:1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>LIMITED OUTPUT</td>
<td>- 20 dBm (min)</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>RISE TIME</td>
<td>25 nSEC (max)</td>
<td>24 nS</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>FALL TIME</td>
<td>30 nSEC (max)</td>
<td>25 nS</td>
<td></td>
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<tr>
<td>10</td>
<td>CURRENT DRAW + 5 Volts</td>
<td>115 mA (max)</td>
<td>+94 mA</td>
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</tr>
<tr>
<td>11</td>
<td>CURRENT DRAW - 5 Volts</td>
<td>145 mA (max)</td>
<td>-130 mA</td>
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</tr>
</tbody>
</table>

**JOB NO:** 90618PE

**DATE:** 11-20-99

**CUSTOMER:** LOCKEED MARTIN

**TESTED BY:** F.R.

**MODEL NO:** SDLVAC-0120-70LM

**SERIAL NO:** PM911143

---

**NOVEMBER 22th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC.,** 7311-G Grove Road, Frederick, MD 21704

Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpml@aol.com

**SEC. 1  PAGE 2**
PLOT OF LOG SLOPE OVER TEMPERATURE @ 700 MHz
AS MEASURED @ +25°C, +85°C & 0°C S/N: PM911143
PLOT OF LOG ERROR OVER TEMPERATURE @ 700 MHz
AS MEASURED @ +25°C, +85°C & 0°C, S/N: PM911143

NOVEMBER 22th, 2000

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Tel: 301-662-4700 Fax: 301-662-4838 Website: www.AMWAVE.com E-mail: amcpmi@aol.com

SEC. 1 PAGE 4
<table>
<thead>
<tr>
<th>DC POWER IN (mW)</th>
<th>DC POWER OUT (mW)</th>
<th>POWER GAIN (dB)</th>
<th>LOG SLOPE</th>
<th>LOG OFFSET</th>
<th>SCALE FACTOR</th>
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<tbody>
<tr>
<td>0</td>
<td>2.62</td>
<td>2.50</td>
<td>-1.52</td>
<td>-1.52</td>
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<tr>
<td>0.5</td>
<td>2.62</td>
<td>2.53</td>
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<td>-1.52</td>
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<tr>
<td>1</td>
<td>2.62</td>
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<td>2.53</td>
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<td>-1.52</td>
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</table>

**Note:** Log slope and offset calculated at 10Ω dynamic range (+42mV to -74dBm) using log slope of -35dB/10Ω. Power gain calculated at +25°C.
PLOT OF LOG SLOPE OVER TEMPERATURE @ 1.0 GHz
AS MEASURED @ +25°C, +85°C & 0°C S/N: PM911143

NOVEMBER 22th, 2000

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Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com
PLOT OF LOG ERROR OVER TEMPERATURE @ 1.0 GHz
AS MEASURED @ +25°C, +85°C & 0°C, S/N: PM911143

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
# Tabulated Test Data from 0°C to +85°C @ 1 GHz

**S/N:** PM911143

## RF Power in dBm

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<tr>
<th></th>
<th>&gt;35 Degrees C</th>
<th>&gt;20 Degrees C</th>
<th>&gt;15 Degrees C</th>
<th>&gt;10 Degrees C</th>
<th>&gt;5 Degrees C</th>
<th>&gt;0 Degrees C</th>
<th>&lt;5 Degrees C</th>
<th>&lt;10 Degrees C</th>
<th>&lt;15 Degrees C</th>
<th>&lt;20 Degrees C</th>
<th>&lt;35 Degrees C</th>
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<tr>
<td></td>
<td>VIDEO OUT (VOLTS)</td>
<td>LIMITED IF OUT (dBm)</td>
<td>VIDEO OUT (VOLTS)</td>
<td>LIMITED IF OUT (dBm)</td>
<td>VIDEO OUT (VOLTS)</td>
<td>LIMITED IF OUT (dBm)</td>
<td>VIDEO OUT (VOLTS)</td>
<td>LIMITED IF OUT (dBm)</td>
<td>VIDEO OUT (VOLTS)</td>
<td>LIMITED IF OUT (dBm)</td>
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<td>-16.3</td>
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<td>-72</td>
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<td>-18.8</td>
<td></td>
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<tr>
<td>-73</td>
<td>0.432</td>
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<td>0.46</td>
<td>-17.4</td>
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<tr>
<td>-74</td>
<td>0.416</td>
<td>-19.5</td>
<td>0.444</td>
<td>-17.8</td>
<td>0.404</td>
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<tr>
<td>-75</td>
<td>0.406</td>
<td>-19.9</td>
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<td>-16.1</td>
<td>0.392</td>
<td>-20.3</td>
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</table>

## DC Power @ 0-Volts

<table>
<thead>
<tr>
<th></th>
<th>+94 mA</th>
<th>+92 mA</th>
<th>+91 mA</th>
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</thead>
<tbody>
<tr>
<td>DC Power @ 0-Volts</td>
<td>-131 mA</td>
<td>-136 mA</td>
<td>-130 mA</td>
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## Log Slope

<table>
<thead>
<tr>
<th></th>
<th>27.3163 mV/dB</th>
</tr>
</thead>
</table>

## Log Error in dB

<table>
<thead>
<tr>
<th></th>
<th>0.60</th>
<th>2.09</th>
<th>0.73</th>
</tr>
</thead>
</table>

*Log error is calculated at 77-85 dynamic range (+2 dBm to -74 dBm) using log slope at +25 degrees C as a reference.*
PLOT OF LOG SLOPE OVER TEMPERATURE @ 1.3 GHz
AS MEASURED @ +25°C, +85°C & 0°C S/N: PM911143

NOVEMBER 22th, 2000
PLOT OF LOG ERROR OVER TEMPERATURE @ 1.3 GHz
AS MEASURED @ +25°C, +85°C & 0°C, S/N: PM911143

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
**SUMMARY TEST DATA**
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER

**PMI MODEL No:** SDLVAC-0120-70LM -07103-JS  
**TEST ENGINEER:** FRANK RETHMEIER  
**SERIAL NUMBERS:** PM911143, PM911144 AND PM911146

---

**TABULATED DATA AS MEASURED FROM 0°C TO +85°C**

@ 1.3 GHz, S/N: PM911143

<table>
<thead>
<tr>
<th>DC POWER INPUT</th>
<th>DC POWER OUTPUT</th>
<th>DC POWER OUTPUT</th>
<th>DC POWER OUTPUT</th>
</tr>
</thead>
<tbody>
<tr>
<td>+105 mA</td>
<td>-115 mA</td>
<td>+105 mA</td>
<td>-115 mA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>LOG SLOPE</th>
<th>best fit straight line</th>
<th>log g and r</th>
<th>log g and r</th>
</tr>
</thead>
<tbody>
<tr>
<td>-1.13</td>
<td>2.38</td>
<td>-5.80</td>
<td>-1.13</td>
</tr>
</tbody>
</table>

---

**NOVEMBER 22th, 2000**

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704  
Tel: 301-662-4700 Fax: 301-662-4838 Website: www.AMWAVE.com E-mail: amcpml@aol.com  
SEC. 1 PAGE 11
SECTION 2

FINAL TEST DATA

AND

DATA OVER
TEMPERATURE

ON

700 TO 1,300 MHz
(0.3 TO 2.0 GHz UNITS ALSO AVAILABLE)

25nS HIGH SPEED

≥78dB ULTRA-HIGH DYNAMIC RANGE

LOW AM/PM CONVERSION

SUCCESSIONAL DETECTION LOG VIDEO AMPLIFIER COMPACT
(SDLVAC)

PMI MODEL No:
SDLVAC-0120-70LM

WITH OPTIONS: 07103 & JS

S/N: PM911144

NOVEMBER 22th, 2000
### SUMMARY TEST DATA ON S/N: PM911144

**SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER**

**CUSTOMER:** Lockheed Martin  
**JOB NO:** 90618PE  
**MODEL NO:** SDLVAC-0120-70LM  
**SERIAL NO:** PM911144  
**DATE:** 11-30-99  
**TESTED BY:** F.R.

<table>
<thead>
<tr>
<th>TEST ITEM NO.</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>QA/QC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FREQUENCY RANGE</td>
<td>0.7 TO 1.3 GHz (min)</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>DYNAMIC RANGE</td>
<td>77 dB (min)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>LOG LINEARITY</td>
<td>-75 to 3 dBm +1.5 dB (min)</td>
<td>+1.30 dB -1.04 dB</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LOG LINEARITY</td>
<td>0 to +85°C +2.5dB (min)</td>
<td>+1.60 dB -2.25 dB</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>LOG SLOPE</td>
<td>SEE PLOTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>TSS (TANGENTIAL SENSITIVITY)</td>
<td>-76 dBm (min)</td>
<td>-840 dBm</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>VSWR (INPUT)</td>
<td>1.8:1 (max)</td>
<td>1.69:1</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>LIMITED OUTPUT</td>
<td>-20 dBm (min)</td>
<td>OK</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>RISE TIME</td>
<td>25 nSEC (max)</td>
<td>22 nS</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>FALL TIME</td>
<td>30 nSEC (max)</td>
<td>26 nS</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>CURRENT DRAW + 5 Volts</td>
<td>115 mA (max)</td>
<td>+85 mA</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>CURRENT DRAW - 5 Volts</td>
<td>145 mA (max)</td>
<td>-137 mA</td>
<td></td>
</tr>
</tbody>
</table>

**PRODUCTION MANAGER APPROVAL:**  
**DATED:** NOV 22, 1999  
**QA/QC APPROVAL:**  
**DATED:** NOV 22, 1999

**NOVEMBER 22th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704**  
**Tel:** 301-662-4700  
**Fax:** 301-662-4938  
**Website:** www.AMwave.com  
**E-mail:** amcpml@aol.com

**SEC. 2 PAGE 2**
SUMMARY TEST DATA
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER

PMI MODEL No : SDLVAC-0120-70LM -07103-JS
TEST ENGINEER : FRANK RETHEMER
SERIAL NUMBERS : PM911143, PM911144 AND PM911145

PLOT OF LOG SLOPE OVER TEMPERATURE @ 700 MHz
AS MEASURED @ +25°C, +85°C & 0°C S/N: PM911144

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4838  Website: www.AMWAVE.com  E-mail: amcpml@aol.com

SEC. 2 PAGE 3
PLOT OF LOG ERROR OVER TEMPERATURE @ 700 MHz
AS MEASURED @ +25°C, +85°C & 0°C, S/N: PM911144

NOVEMBER 22th, 2000
### SUMMARY TEST DATA
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER

**PMI MODEL No:** SDLVAC-0120-70LM -07103-JS  
**TEST ENGINEER:** FRANK RETHMEIER  
**SERIAL NUMBERS:** PM911143, PM911144 AND PM911145

### TABULATED DATA AS MEASURED FROM 0°C TO +85°C

#### @ 700 MHz, S/N: PM911144

<table>
<thead>
<tr>
<th>OVP Detector</th>
<th>700 MHz</th>
<th>1KHz</th>
<th>2KHz</th>
<th>5KHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15.8</td>
<td>15.6</td>
<td>15.6</td>
<td>15.6</td>
</tr>
<tr>
<td>2</td>
<td>2.51</td>
<td>2.49</td>
<td>2.47</td>
<td>2.45</td>
</tr>
<tr>
<td>3</td>
<td>2.53</td>
<td>2.51</td>
<td>2.49</td>
<td>2.47</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OVP Detector</th>
<th>10KHz</th>
<th>20KHz</th>
<th>50KHz</th>
<th>100KHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>15.8</td>
<td>15.6</td>
<td>15.6</td>
<td>15.6</td>
</tr>
<tr>
<td>2</td>
<td>2.51</td>
<td>2.49</td>
<td>2.47</td>
<td>2.45</td>
</tr>
<tr>
<td>3</td>
<td>2.53</td>
<td>2.51</td>
<td>2.49</td>
<td>2.47</td>
</tr>
</tbody>
</table>

#### NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704  
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpml@aol.com

SEC. 2 PAGE 5
PLOT OF LOG SLOPE OVER TEMPERATURE @ 1.0 GHz
AS MEASURED @ +25°C, +85°C & 0°C S/N: PM911144

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com
PLOT OF LOG ERROR OVER TEMPERATURE @ 1.0 GHz
AS MEASURED @ +25°C, +85°C & 0°C, S/N: PM911144
## SUMMARY TEST DATA

### SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER

**PMI MODEL No:** SDLVAC-0120-70LM-07103-JS  
**TEST ENGINEER:** FRANK RETHMEIER  
**SERIAL NUMBERS:** PM911143, PM911144 AND PM911145

### TABULATED DATA AS MEASURED FROM 0°C TO +85°C

**@ 1.0 GHz, S/N: PM911144**

<table>
<thead>
<tr>
<th>Degrees C</th>
<th>Video (mV)</th>
<th>AGC (mV)</th>
<th>DC Power (mW)</th>
<th>LO2 (mV)</th>
<th>DC Power @ 38 kHz</th>
<th>BEST LOG GAIN @ 6 GHz</th>
<th>LOG LOG GAIN @ 6 GHz</th>
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<tbody>
<tr>
<td>0</td>
<td>2.28</td>
<td>0.38</td>
<td>0.001</td>
<td>-10.5</td>
<td>-1.7</td>
<td>0.22</td>
<td>-0.7</td>
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<tr>
<td>10</td>
<td>2.31</td>
<td>0.39</td>
<td>-1.0</td>
<td>-11.5</td>
<td>-1.7</td>
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<td>-1.0</td>
</tr>
<tr>
<td>20</td>
<td>2.32</td>
<td>0.41</td>
<td>-2.0</td>
<td>-12.5</td>
<td>-1.7</td>
<td>-2.5</td>
<td>-1.0</td>
</tr>
<tr>
<td>30</td>
<td>2.35</td>
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<td>-3.0</td>
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<td>40</td>
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<td>-4.0</td>
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<td>2.37</td>
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<td>-6.5</td>
<td>-1.0</td>
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<td>-1.7</td>
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<td>-1.0</td>
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<td>-1.0</td>
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<td>-1.0</td>
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<td>-1.0</td>
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<td>-12.5</td>
<td>-1.0</td>
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<tr>
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<td>-1.7</td>
<td>-13.5</td>
<td>-1.0</td>
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<td>-14.5</td>
<td>-1.0</td>
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<td>150</td>
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<td>-25.5</td>
<td>-1.7</td>
<td>-15.5</td>
<td>-1.0</td>
</tr>
</tbody>
</table>

**NOVEMBER 22th, 2000**

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704  
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpml@aol.com
PLOT OF LOG SLOPE OVER TEMPERATURE @ 1.3 GHz
AS MEASURED @ +25°C, +85°C & 0°C S/N: PM911144

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4938 Website: www.AMWAVE.com  E-mail: amcpni@aol.com
SEC. 2 PAGE 9
PLOT OF LOG ERROR OVER TEMPERATURE @ 1.3 GHz
AS MEASURED @ +25°C, +85°C & 0°C, S/N: PM911144

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpml@aol.com

SEC. 2 PAGE 10
### Tabulated Data as Measured from 0°C to +85°C

**@ 1.3 GHz, S/N: PM911144**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value 1</th>
<th>Value 2</th>
<th>Value 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>VCC (V)</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
</tr>
<tr>
<td>IIN (mA)</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>OOS (mA)</td>
<td>50</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>GOS (mV)</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>GOS SLOPE</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>LOG SLOPE</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
<tr>
<td>LOG GAIN</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>LOG SENSE</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>LOG OFFSET</td>
<td>0.5</td>
<td>0.5</td>
<td>0.5</td>
</tr>
</tbody>
</table>

**Notes:**
- **VCC** (Voltage): 5.0 V
- **IIN** (Input Current): 100 mA
- **OOS** (Output Offset): 50 mA
- **GOS** (Gain Offset): 100 mV
- **LOG SLOPE** and **LOG GAIN** values are 1.0 and 20, respectively.

**November 22nd, 2000**

Planar Monolithics Industries, Inc., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpml@aol.com

Sec. 2 Page 11
SECTION 3

FINAL TEST DATA
AND
DATA OVER TEMPERATURE ON
700 TO 1,300 MHz
(0.3 TO 2.0 GHz UNITS ALSO AVAILABLE)
25nS HIGH SPEED
>78dB ULTRA-HIGH DYNAMIC RANGE
LOW AM/PM CONVERSION

SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER COMPACT
(SDLVAC)

PMI MODEL No:
SDLVAC-0120-70LM
WITH OPTIONS: 07103 & JS

S/N: PM911146

NOVEMBER 22th, 2000
## SUMMARY TEST DATA

**SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER**

PMI MODEL No.: SDLVAC-0120-70LM -07103-JS  
TEST ENGINEER: FRANK RETHMEIER  
SERIAL NUMBERS: PM911143, PM911144 AND PM911146

**FINAL TEST DATA ON S/N: PM911146**

FORM: 304-SD

JOB NO: 90618PE

**SUMMARY TEST DATA**  
**ON**  
**SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER--SDLVA**

<table>
<thead>
<tr>
<th>TEST ITEM NO.</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FREQUENCY RANGE</td>
<td>0.7 TO 1.3 Gzh (min)</td>
<td><strong>OK</strong></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>DYNAMIC RANGE</td>
<td>77 dB (min)</td>
<td><strong>OK</strong></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>LOG LINEARITY</td>
<td>-75 to 3 dBm</td>
<td><strong>+1.04 dB</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>±1.5 dB (min)</td>
<td><strong>-1.28 dB</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>LOG LINEARITY</td>
<td>0 to +85°C</td>
<td><strong>+20.9 dB</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>±2.5dB (min)</td>
<td><strong>-17.0 dB</strong></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>LOG SLOPE</td>
<td>SEE PLOTS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>TSS (TANGENTIAL SENSITIVITY)</td>
<td>- 76 dBm (min)</td>
<td><strong>-81.6 dBm</strong></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>VSWR (INPUT)</td>
<td>1.8:1 (max)</td>
<td><strong>1.65:1</strong></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>LIMITED OUTPUT</td>
<td>- 20 dBm (min)</td>
<td><strong>OK</strong></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>RISE TIME</td>
<td>25 nSEC (max)</td>
<td><strong>210S</strong></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>FALL TIME</td>
<td>30 nSEC (max)</td>
<td><strong>-250S</strong></td>
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</tr>
<tr>
<td>10</td>
<td>CURRENT DRAW + 5 Volts</td>
<td>115 mA (max)</td>
<td><strong>+91mA</strong></td>
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<td>11</td>
<td>CURRENT DRAW - 5 Volts</td>
<td>145 mA (max)</td>
<td><strong>-135mA</strong></td>
<td></td>
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</tbody>
</table>

**PRODUCTION MANAGER APPROVAL:**

DATED: NOV 2 2 1999

**QA/QC APPROVAL:**

DATED: NOV 22 1999

---

**NOVEMBER 22th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704**
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com

**SEC. 3 PAGE 2**
PLOT OF LOG SLOPE OVER TEMPERATURE @ 700 MHz
AS MEASURED @ +25°C, +85°C & 0°C S/N: PM911146

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com

SEC. 3 PAGE 3
PLOT OF LOG ERROR OVER TEMPERATURE @ 700 MHz
AS MEASURED @ +25°C, +85°C & 0°C, S/N: PM911146

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
### SUMMARY TEST DATA
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER

**PMI MODEL No:** SDLVAC-0120-70LM -0703-JS  
**TEST ENGINEER:** FRANK RETHMEIER  
**SERIAL NUMBERS:** PM91143, PM91144 AND PM91146

#### TABULATED DATA AS MEASURED FROM 0°C TO +85°C

@ 700 MHz, S/N: PM91146

<table>
<thead>
<tr>
<th>Temperature (°C)</th>
<th>RF Power (dBm)</th>
<th>DC Output (mV)</th>
<th>Log Slope</th>
<th>Gain (dB)</th>
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#### NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704  
Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com

SEC. 3 PAGE 5
SUMMARY TEST DATA
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER

PMI MODEL No.: SDLVAC-0120-70LM-07103-JS
TEST ENGINEER: FRANK RETHMEIER
SERIAL NUMBERS: PM911143, PM911144 AND PM911146

PLOT OF LOG SLOPE OVER TEMPERATURE @ 1.0 GHz
AS MEASURED @ +25°C, +85°C & 0°C S/N: PM911146

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com

SEC. 3 PAGE 6
PLOT OF LOG ERROR OVER TEMPERATURE @ 1.0 GHz
AS MEASURED @ +25°C, +85°C & 0°C, S/N: PM911146

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMwave.com  E-mail: amcpmi@aol.com
### Tabulated Data as Measured from 0°C to +85°C

@ 1.0 GHz, S/N: PM911146

<table>
<thead>
<tr>
<th>Degree C</th>
<th>Video Out (Volts)</th>
<th>Limited if Out (dBm)</th>
<th>Limited if Out (dBm)</th>
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<tbody>
<tr>
<td>-16</td>
<td>2.45</td>
<td>-16.1</td>
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<tr>
<td>-12</td>
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<td>-8</td>
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<td>-4</td>
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<td>+12</td>
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<tr>
<th>DC Power of 1 Volts</th>
<th>+88 mA</th>
<th>-128 mA</th>
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<tr>
<td></td>
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**NOVEMBER 22th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704**

Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpml@aol.com

SEC. 3 PAGE 8
PLOT OF LOG SLOPE OVER TEMPERATURE @ 1.3 GHz
AS MEASURED @ +25°C, +85°C & 0°C S/N: PM911146

NOVEMBER 22th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4838 Website: www.AMWAVE.com E-mail: amcpmi@aol.com
SEC. 3 PAGE 9
PLT OF LOG ERROR OVER TEMPERATURE @ 1.3 GHz
AS MEASURED @ +25°C, +85°C & 0°C, S/N: PM911146
## Tabulated Test Data from 0 to +85 Degrees C @ 1.3 GHz

S/N: PM911146

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<tr>
<th>RF Power in (dBm)</th>
<th>+50 Degrees C</th>
<th>+55 Degrees C</th>
<th>+60 Degrees C</th>
<th>+65 Degrees C</th>
<th>+70 Degrees C</th>
<th>+75 Degrees C</th>
<th>+80 Degrees C</th>
<th>+85 Degrees C</th>
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<tr>
<td></td>
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<td>LIMITED IF OUT (dBm)</td>
<td>VIDEO OUT VOLTS</td>
<td>LIMITED IF OUT (dBm)</td>
<td>VIDEO OUT VOLTS</td>
<td>LIMITED IF OUT (dBm)</td>
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<td>0.346</td>
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</table>

**Notes:**
- DC Power @ 5 Volts: +91 mA, +76 mA, +86 mA
- DC Power @ 5 Volts: -129 mA, -135 mA, -129 mA
- Log Slope: 24.443 mV/dB
- Log Error @ 5 dB: -1.28, -1.39, -1.70

*Log Error is calculated at 77 dB Dynamic Range (+2 dBm to -74 dBm) using Log Slope at +50 Degrees C as a reference.*
DESCRIPTION
THE MODEL SDLVAC-0120-70LM OPTION JS, OPTION 0713 IS A MINIATURE SUCCESSIVE
DETECTION LOG VIDEO AMPLIFIER (SDLVLA), IT OPERATES OVER THE 700 MHz TO 1.3 GHz
RANGE USING 2 (TWO) HYBRID MIC/MMIC CHIPS OF OUR EXISTING SDLVAC-0120-70M UNITS.

SPECIFICATIONS
- INPUT FREQUENCY: 0.7 TO 1.30 GHz
- DYNAMIC RANGE: 77 dB
- LOG VIDEO OUTPUT:
  - SLOPE: FIXED BETWEEN 10 AND 40 mV/DB
  - LOG SLOPE VARIATION WITH FREQUENCY: ±0.5 mV/DB OVER 100 MHz SUBBAND
  - LOG SLOPE VARIATION WITH TEMPERATURE: ±1 mV/DB OVER OPERATING TEMPERATURE
  - INSTANTANEOUS LOG SLOPE: ±25% WITHIN DYNAMIC RANGE
- VIDEO OUTPUT IMPEDANCE: 100 Ω
- VIDEO BANDWIDTH: 20 MHz MINIMUM
- INPUT LEVEL: -70 dBm TO +8 dBm
- OPERATING TEMPERATURE: 0°C TO +85°C
- LOG ERROR (LINEARITY): ±1.5 dB FROM BEST FIT LINE OVER DYNAMIC RANGE.
- SUPPLY:
  - -5V @ 250 mA MAXIMUM,
  - +5V @ 100 mA MAXIMUM
- NOISE FIGURE: ≤ 8 dB
- LIMITED IF OUTPUT: -20 dBm MINIMUM FOR INPUT LEVELS ≥ -60 dBm, 50 OHMS
- SIZE: 0.500" x 0.400" x 0.090"
- WEIGHT: 0.2 OUNCES

ENVIRONMENTAL RATINGS
- TEMPERATURE: -0°C TO +85°C (OPERATING), -65°C TO +100°C (STORAGE)
- HUMIDITY: MIL-STD-202F, METHOD 103B CONDITION B
- SHOCK: MIL-STD-202F, METHOD 213B CONDITION B
- VIBRATION: MIL-STD-202F, METHOD 204D CONDITION B
- ALTITUDE: MIL-STD-202F, METHOD 105C CONDITION B
- TEMPERATURE CYCLE: MIL-STD-202F, METHOD 107D CONDITION A

NOTE: SPECIFICATIONS WILL VARY OVER OPERATING TEMPERATURE
NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION

PLANAR MONOLITHICS INDUSTRIES
FREDERICK, MARYLAND

PRODUCT FEATURE
SDLVAC-0120-70LM
OPTION: JS, 07103

0.7 TO 1.30 GHz SUCCESSIVE DETECTOR LOG VIDEO AMPLIFIER
DESCRIPTION

The model SDLVAC-0120-70LM Option JS, Option 0713 is a miniature successive detection log video amplifier (SDLVA). It operates over the 700 MHz to 1.3 GHz range using 2 (two) hybrid MIC/MMIC chips of our existing SDLVAC-0120-70M units.

PIN 1 IDENTIFIER

- N/C
- 1 -5V
- 2 GND
- 3 +5V
- N/C
- 4 RF IN
- 5 GND
- N/C

SDLVAC 0120-70LM
OPTION JS, 07103

S/N: ____________

△ PMI

VIDEO OUT 10
GND 9
GND 8
N/C

RF OUT 7
GND 6
N/C

0.015 ±0.003 16 PLACES
0.003 MAX 4 PLACES
0.075

0.010±0.002 16 PLACES

0.042

0.240 MIN.

0.500

0.050

0.100

0.240 MIN.

0.030 MIN.
DESCRIPTION

THE MODEL SDLVAC-0120-70LM OPTION JS, OPTION 0713 IS A MINIATURE SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SDLVA). IT OPERATES OVER THE 700 MHZ TO 1.3 GHZ RANGE USING 2 (TWO) HYBRID MIC/MMIC CHIPS OF OUR EXISTING SDLVAC-0120-70M UNITS.

CONFIDENTIAL AND PROPRIETARY

PLANAR MONOLITHICS INDUSTRIES
FREDERICK, MARYLAND

FUNCTIONAL SCHEMATIC
SDLVAC-0120-70LM
OPTION: JS, 07103
0.7 TO 1.30 GHZ SUCCESSIVE DETECTOR LOG VIDEO AMPLIFIER

PART NO. A 0ZZX8
PIECE NO. 100-4871
DRAWN GDD
08/02/08
REDRAWN GDD
08/10/08
ISSUED SHEET 3 OF 3

CONFIDENTIAL AND PROPRIETARY
DESCRIPTION

The SDLVAC-0120-80 is a miniature successive detection log video amplifier (SDLVA) that operates over the 300 MHz to 2.0 GHz frequency range. This SDLVA offers 80 dB high dynamic range.

SPECIFICATIONS

- **Input Frequency**: 0.3 to 2.0 GHz
- **Dynamic Range**: 80 dB
- **VSWR**: 2:1 minimum
- **Log Video Output**:
  - Slope: Fixed between 10 and 50 mV/db
  - Log Slope Variation with Frequency: ±0.5 dB over 100 MHz subband
  - Log Slope Variation with Temperature: ±1 dB over operating temperature
  - Instantaneous Log Slope: ±25% within dynamic range
  - Video Output Impedance: 100 Ω
  - Video Bandwidth: 20 MHz minimum
- **Input Level**: -75 dBm to +5 dBm
- **Operating Temperature**: -40°C to 85°C
- **Log Error (Linearity)**: ±1 dB from best fit line over dynamic range.
- **Supply**: -5V @ 135 mA maximum, +5V @ 80 mA maximum
- **Noise Figure**: ≤ 8 dB
- **Limited IF Output**: -20 dBm minimum for input levels ≥ -60 dBm, 50 ohms
- **Size**: 0.500” x 0.400” x 0.080”

ENVIRONMENTAL RATINGs

- **Temperature**: -40°C to +85°C (operating), -65°C to +100°C (storage)
- **Humidity**: MIL-STD-202F, Method 103B Cond. B
- **Shock**: MIL-STD-202F, Method 213B Cond. B
- **Vibration**: MIL-STD-202F, Method 204D Cond. B
- **Altitude**: MIL-STD-202F, Method 105C Cond. B
- **Temperature Cycle**: MIL-STD-202F, Method 107D Cond. A

Notes: The above specifications are subject to change or revision.

REVISIONS

- Original Release: 4/4/00

MECHANICAL OUTLINE

Planar Monolithics Industries
Frederick, Maryland

Product Feature
SDLVAC-0120-80

Notes:
1) Dimensions are in inches
2) Tolerances: X.XX ±0.020
   X.XXX ±0.010
3) Weight: 0.2 oz

PMI

Size A
Sheet 1 of 1

Dwg. #100-5401
DESCRIPTION

THE MODEL SLVAC-0102-70M OPTION LA IS A MINIATURE SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SLA) IMPLEMENTED WITH WIDE-BAND HYBRID MIC/MIC/MMIC TECHNOLOGY OPERATING OVER THE 120 MHz TO 260 MHz BANDWIDTH AND ABLE TO DETECT NOISE IN THE 10 MHz TO 1 GHz RANGE.

SPECIFICATIONS

- INPUT FREQUENCY: 130 TO 190 MHz
- DYNAMIC RANGE: +5 dBm TO -65 dBm
- RF INPUT IMPEDANCE: 50 OHMS
- INPUT VSWR: 1.8:1 MAXIMUM, 1.5:1 TYPICAL
- MAXIMUM POWER: +15 dBm
- LOAD IMPEDANCE: 93 OHMS
- LOG VIDEO OUTPUT IMPEDANCE: SOURCE IMPEDANCE 5:1 OHM
- LOG VIDEO OUTPUT VOLTAGE: 0 dBm ±375 mV ±100 mV (±150 MHz)
- LOG VIDEO LINEARITY (BEST FIT): ±1 dB @ 25°C
- LOG VIDEO BASELINE: ±75 dBm MINIMUM
- TANGENTIAL SENSITIVITY: ±72 dBm MINIMUM
- LOG VIDEO VERSUS FREQUENCY: ±1 dB (±375 mV @ 150 MHz)
- LOG VIDEO VERSUS TEMPERATURE: ±2.25 dB
- LOG VIDEO RISE TIME: 32 μS MAXIMUM
- LOG VIDEO FALL TIME: 35 μS MAXIMUM
- LOG VIDEO BANDWIDTH: 15 MHz MINIMUM TO 30 MHz MAXIMUM
- RF OUTPUT VSWR: 2.5:1
- RF OUTPUT IMPEDANCE: 50 OHMS
- LIMITED RF OUTPUT LEVEL: ±2 dBm ±1 dBm
- LIMITED RF OUTPUT PHASE SHIFT VERSUS AMPLITUDE: ±0.3°/dB
- PHASE TRACKING VERSUS FREQUENCY: ANY TWO UNITS SHALL TRACK WITHIN ±2° MAXIMUM
- DC POWER: ±45 mW @ 200 mA, ±5 mW @ 100 mA
- DC POWER SUPPLY PROTECTION: ±6.5 V MAXIMUM, -6.5 V MINIMUM

ENVIRONMENTAL RATINGS

- TEMPERATURE: -40°C TO +71°C (OPERATING)
- THERMAL SHOCK: MIL-STD-883, METHOD 1010 -40°C TO +85°C
- SEAL TEST: MIL-STD-883, METHOD 1014

NOTES:
- SPECIFICATIONS MAY VARY DURING OPERATING TEMPERATURE.
- THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION.

PLANAR MONOLITHICS INDUSTRIES, INC.
7311 G GROVE ROAD
FREDERICK, MARYLAND 21704 USA
TEL: 301-631-1579 FAX: 301-662-2029
WEBSITE: www.planarnanolithics.com
E-MAIL: sales@planarnanolithics.com
ISO 9001-2000 CERTIFIED

PRODUCT FEATURE
SLVAC-0102-70M
OPTION: LA

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION.
DESCRIPTION

The model SLVAC-0102-70M option LA is a miniature successive detection log video amplifier (SDLVA) implemented with wideband hybrid MIC/MMIC technology operating over the 120 MHz to 200 MHz bandwidth and able to detect noise in the 10 MHz to 1 GHz range.

MECHANICAL OUTLINE

PIN OUT

<table>
<thead>
<tr>
<th>PIN</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>+5V</td>
</tr>
<tr>
<td>2</td>
<td>-5V</td>
</tr>
<tr>
<td>3</td>
<td>GND</td>
</tr>
<tr>
<td>4</td>
<td>RF IN</td>
</tr>
<tr>
<td>5</td>
<td>GND</td>
</tr>
<tr>
<td>6</td>
<td>GND</td>
</tr>
<tr>
<td>7</td>
<td>LIMITED RF OUT</td>
</tr>
<tr>
<td>8</td>
<td>GND</td>
</tr>
<tr>
<td>9</td>
<td>GND</td>
</tr>
<tr>
<td>10</td>
<td>LOG VIDEO OUT</td>
</tr>
</tbody>
</table>

PLANAR MONOLITHICS INDUSTRIES, INC.

7311-G GROVE ROAD
FREDERICK, MARYLAND 21704 USA
TEL: 301-631-1579 FAX: 301-662-2029
WEBSITE: www.planarmonolithicsindustries.com
E-MAIL: sales@planarmonolithics.com
ISO 9001:2000 CERTIFIED
The model SLVAC-0102-70M option LA is a miniature successive detection log video amplifier (SDLVA) implemented with wideband hybrid MIC/MMIC technology operating over the 120 MHz to 200 MHz bandwidth and able to detect noise in the 10 MHz to 1 GHz range.
SUMMARY

TEST DATA

ON

131.5 TO 188.5 MHz
(50 TO 400 MHz UNITS ALSO AVAILABLE)

30nS HIGH SPEED

≥70dB DYNAMIC RANGE

LOW AM/PM CONVERSION

SUCCESSIVE LOG VIDEO AMPLIFIER COMPACT
(SLVAC)

PMI MODEL No:

SLVAC-0102-70M-LA

SERIAL No: PM010540, PM010544, PM010546 AND PM010549

DESIGNED
BY
FRANK RETHMEIER & DANIEL J. VESCUSO

TESTED
BY
FRANK RETHMEIER

REPORT
BY
PETER WOOD

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com
FEATURES:

- 30nS HIGH SPEED
- 70 dB DYNAMIC RANGE
  (OTHER DYNAMIC RANGES UP TO 90dB ALSO AVAILABLE)
- 131.5 TO 188.5 MHz FREQUENCY RANGE
  (FREQUENCY RANGE FROM 50 MHz TO 400 MHz AVAILABLE)

SUCCESSIVE LOG VIDEO AMPLIFIER COMPACT (SLVAC)
PMI MODEL NO: SDLVA-0102-70-LA

SPECIFICATIONS:

- FREQUENCY
  : 131.5 MHz TO 188.5 MHz
  (FREQUENCY RANGES FROM 50 MHz TO 400 MHz)

- DYNAMIC RANGE
  : +5 dBm TO -65 dBm
  (OTHER DYNAMIC RANGES UP TO 90dB ALSO AVAILABLE)

- INPUT VSWR
- OUTPUT VSWR

- TANGENTIAL SIGNAL SENSITIVITY (TSS)

- LOG VIDEO OUTPUT VOLTAGE @ 160 MHz
  : -72 dBm

- LOG LINEARITY @ 25°C

- LOG LINEARITY FROM -40°C TO +71°C

- LOG VIDEO VARIATION OVER FREQUENCY
  (131.5 MHz TO 188.5 MHz)
  : ±1.0 dB FROM BEST FIT STRAIGHT LINE

- LOG VIDEO VARIATION OVER TEMPERATURE
  (-40°C TO +71°C)
  : ±1.5 dB FROM BEST FIT STRAIGHT LINE

- LOG VIDEO RISE TIME (10% TO 90% POINTS)
  : 35 nS

- LOG VIDEO FALL TIME (90% TO 10% POINTS)
  : 35 nS

- LIMITED RF OUTPUT POWER LEVEL
  : +2 (±1) dBm

- LIMITED RF OUTPUT PHASE SHIFT OVER INPUT
  POWER IN 10dB INCREMENTS
  : ±0.3°/dB (±3°/10 dB)

- PHASE TRACKING OVER FREQUENCY
  (131.5 MHz TO 188.5 MHz)
  : ±2° FOR ANY TWO UNITS

- DC POWER SUPPLIES
  : +5 vdc (±0.25vdc) @ 200mA MAX.
  : -5 vdc (±0.25vdc) @ 100mA MAX.
  : 0.805" (W) X 0.805" (L) X 0.125" (H)

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: smcpmi@aol.com

Page 2
**MECHANICAL OUTLINE**

![Mechanical Outline Diagram](image)

**ENVIRONMENTAL SPECIFICATIONS**

- **TEMPERATURE**
  - -55°C to +85°C Operating
  - -55°C to +125°C Non-Operating

- **HUMIDITY**
  - MIL-STD-202F, Method 103B Cond. B

- **SHOCK**

- **VIBRATION**
  - MIL-STD-202F, Method 204D Cond. B

- **ALTITUDE**

- **TEMPERATURE CYCLE**
  - MIL-STD-202F, Method 107D Cond. A

**OCTOBER 25th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704**
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com
DESCRIPTION

THE MODEL SLVAC-0102-70M OPTION LA IS A MINIATURE SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER (SOLVA) IMPLEMENTED WITH WIDEBAND HYBRID MIC/MICMIC TECHNOLOGY OPERATING OVER THE 120 MHZ TO 200 MHZ BANDWIDTH AND ABLE TO DETECT NOISE IN THE 10 MHZ TO 1 GHZ RANGE.

SPECIFICATIONS

- INPUT FREQUENCY
- DYNAMIC RANGE
- RF INPUT IMPEDANCE
- VSWR
- MAXIMUM POWER
- LOAD IMPEDANCE
- LOG VIDEO OUTPUT IMPEDANCE
- LOG VIDEO OUTPUT VOLTAGE
  - AT 150 MHZ
- LOG VIDEO LINEARITY (BEST FIT)
- LOG VIDEO BASELINE
- TANGENTIAL SENSITIVITY
- LOG VIDEO VERSUS FREQUENCY
- LOG VIDEO VERSUS TEMPERATURE
- LOG VIDEO RISE TIME
- LOG VIDEO FALL TIME
- LOG VIDEO BANDWIDTH
- RF OUTPUT VSWR
- RF OUTPUT IMPEDANCE
- LIMITED RF OUTPUT LEVEL
- LIMITED RF OUTPUT PHASE
- SHIFT VERSUS AMPLITUDE
- PHASE TRACKING VERSUS FREQUENCY
- DC POWER
- DC POWER PROTECTION

Environmental Ratings

- TEMPERATURE
- THERMAL SHOCK
- SEAL TEST

NOTES:
1) DIMENSIONS ARE IN INCHES
2) TOLERANCES: XXX ±0.020
3) WEIGHT: 0.35 OZ

PLANAR MONOLITHICS INDUSTRIES
FREDERICK, MARYLAND

PRODUCT FEATURE
SLVAC-0102-70M
OPTION LA

SIZE A  SHEET 1 OF 1  REV.  100-4537

Page 5

OCTOBER 25TH, 2000

Tel: 301-862-4700  Fax: 301-862-4038  Website: www.PMIMWave.com

SUMMARY TEST DATA
SUCCESIVE LOG VIDEO AMPLIFIER COMPACT
MODEL NO: SLVAC-0102-70M
SERIAL NO: PMI09549 AND PMI0949

NOTE: THE ABOVE SPECIFICATIONS ARE SUBJECT TO CHANGE OR REVISION
SUMMARY TEST DATA
SUCCESSIVE LOG VIDEO AMPLIFIER COMPACT
PMI MODEL No: SLVAC-0102-70-LA
SERIAL No: PM010540, PM010544, PM010546 AND PM010549

SUMMARY
TEST DATA
ON
131.5 TO 188.5 MHz
(50 TO 400 MHz UNITS ALSO AVAILABLE)
30nS HIGH SPEED
≥70dB DYNAMIC RANGE
LOW AM/PM CONVERSION

SUCCESSIVE LOG VIDEO AMPLIFIER COMPACT
(SLVAC)

PMI MODEL No:
SLVAC-0102-70M-LA

SERIAL No: PM010540
AS TESTED OVER FREQUENCY AND TEMPERATURE

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com

Page 6
## SUMMARY TEST DATA

**SUCCESSIVE LOG VIDEO AMPLIFIER COMPACT**

PMI MODEL No: SLVAC-0102-70-LA

SERIAL No: PM010540, PM010544, PM010546 AND PM010549

### FINAL TEST DATA FOR S/N: PM010540

**FORM: 313-SD**

**JOB NO: 909237B**

### SUMMARY TEST DATA

**ON**

SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER—SLVAC

<table>
<thead>
<tr>
<th>TEST ITEM No.</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>REMARKS QA/QC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FREQUENCY RANGE</td>
<td>121.5 MHz TO 125.5 MHz</td>
<td>&lt;0.5 %</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>DYNAMIC RANGE</td>
<td>+1.5 dBm TO -45.48 dBm</td>
<td>0.5 dB</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>INPUT VSWR</td>
<td>1.8:1 (3.2:1 typical)</td>
<td>1.8:1</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>LOG VIDEO OUTPUT VOLTAGE @ 160 MHz</td>
<td>+0.375 V ± 0.1 V @ ±0.48 dBm</td>
<td>478 V</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>LOG LINEARITY @ 25°C</td>
<td>±1.9 dB FROM BEST FIT STRAIGHT LINE</td>
<td>+0.32 dB</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>LOG LINEARITY FROM -4°C TO +71°C (FIRST UNIT ONLY)</td>
<td>±1.5 dB FROM BEST FIT STRAIGHT LINE</td>
<td>+0.47 dB</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>TANGENTIAL SENSITIVITY</td>
<td>-72 dBm</td>
<td>-72 dBm</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>LOG VIDEO VS. FREQUENCY FROM 121.5 MHz TO 125.5 MHz</td>
<td>±1.8 dB FROM TEST VALUE @ 160 MHz</td>
<td>-1.07 dB</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>LOG VIDEO VS. TEMPERATURE FROM -4°C TO +71°C (FIRST UNIT ONLY)</td>
<td>±2.25 dB FROM TEST VALUE @ 25°C</td>
<td>-0.98 dB</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>LOG VIDEO RISE TIME</td>
<td>20 ns</td>
<td>30 ns</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>LOG VIDEO FALL TIME</td>
<td>35 ns</td>
<td>30 ns</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>OUTPUT VSWR</td>
<td>1.51</td>
<td>2.76:1</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>LIMITED RF OUTPUT POWER LEVEL</td>
<td>+2.1 dBm</td>
<td>-78.28 dB</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>LIMITED RF OUTPUT PHASE SHIFT VS. INPUT POWER (10 dB INCREMENTS)</td>
<td>±0.375 dB</td>
<td>0.375 dB</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>PHASE TRACKING VS. FREQUENCY FROM 121.5 MHz TO 125.5 MHz</td>
<td>±2° FOR ANY TWO UNITS</td>
<td>See data</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>CURRENT DRAW @ ±5 V ±0.25 V</td>
<td>200 mA</td>
<td>192 mA</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>CURRENT DRAW @ ±5 V ±0.25 V</td>
<td>100 mA</td>
<td>20 mA</td>
<td></td>
</tr>
</tbody>
</table>

**PRODUCTION MANAGER APPROVAL:**

**QA/QC APPROVAL:**

**OCTOBER 25th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704**

Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com
LOG SLOPE PLOT AS MEASURED @ 25°C
OVER 131.5 MHZ, 160 MHZ AND 188.5 MHZ FREQUENCY RANGES
SERIAL No: PM010540

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
### LOG SLOPE TABULATED DATA AS MEASURED @ 25°C

**OVER 131.5 MHz, 160 MHz AND 188.5 MHz FREQUENCY RANGES**

**SERIAL No: PM010540**

<table>
<thead>
<tr>
<th>FREQUENCY</th>
<th>LOG SLOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>131.5 MHz</td>
<td></td>
</tr>
<tr>
<td>160 MHz</td>
<td></td>
</tr>
<tr>
<td>188.5 MHz</td>
<td></td>
</tr>
</tbody>
</table>

**TABLE:**

<table>
<thead>
<tr>
<th>FREQUENCY</th>
<th>LOG SLOPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>131.5 MHz</td>
<td>+2.98</td>
</tr>
<tr>
<td>160 MHz</td>
<td>+2.08</td>
</tr>
<tr>
<td>188.5 MHz</td>
<td>+2.08</td>
</tr>
</tbody>
</table>

**OCTÓBER 25th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704**

Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
LOG SLOPE @ 160 MHz OVER TEMPERATURE

-40°C, 25°C AND +71°C

SERIAL No: PM010540

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com
**SUMMARY TEST DATA**

**SUCCESSIVE LOG VIDEO AMPLIFIER COMPACT**

**PMI MODEL No:** SLVAC-0102-70-LA

**SERIAL No:** PM010540, PM010544, PM010546 AND PM010549

---

**TABULATED DATA 160 MHz AS MEASURED**

**AT -40°C, 25°C AND +71°C**

**SERIAL No:** PM010540

---

<table>
<thead>
<tr>
<th>Temperature</th>
<th>0°C</th>
<th>10°C</th>
<th>20°C</th>
<th>30°C</th>
<th>40°C</th>
<th>50°C</th>
<th>60°C</th>
<th>70°C</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>S/N</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Input Level</strong></td>
<td>0.1 V</td>
<td>0.2 V</td>
<td>0.3 V</td>
<td>0.4 V</td>
<td>0.5 V</td>
<td>0.6 V</td>
<td>0.7 V</td>
<td>0.8 V</td>
</tr>
<tr>
<td><strong>Output Level</strong></td>
<td>1.5 V</td>
<td>2.0 V</td>
<td>2.5 V</td>
<td>3.0 V</td>
<td>3.5 V</td>
<td>4.0 V</td>
<td>4.5 V</td>
<td>5.0 V</td>
</tr>
</tbody>
</table>

---

**OCTOBER 25th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704**

Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
ABSOLUTE PHASE AT -20dBm INPUT POWER

SERIAL No: PM010540

CH2 S21 phase 45° / REF 0°

<table>
<thead>
<tr>
<th>Frequency (GHz)</th>
<th>Phase (°)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1900</td>
<td>12.372</td>
</tr>
<tr>
<td>0.1300</td>
<td>75.565</td>
</tr>
<tr>
<td>0.1450</td>
<td>58.141</td>
</tr>
<tr>
<td>0.1600</td>
<td>42.869</td>
</tr>
<tr>
<td>0.1750</td>
<td>26.356</td>
</tr>
</tbody>
</table>

START 0.1300 GHz  STOP 0.1900 GHz

OCTOBER 25th, 2000

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Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
LIMITED IF OUTPUT PHASE SHIFT OVER INPUT POWER
SERIAL No: PM010540

AM/PM
-65 → +5
S/N PM010540

CH2 S21/M phase 10° / REF 0°

MARKER 1
190 MHz

START 0.1300 GHz
STOP 0.1900 GHz

INPUT AND OUTPUT VSWR

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com
AS MEASURED FROM 130 MHz TO 190 MHz

INPUT
VSWR
1.13:1

OUTPUT
VSWR
1.83:1

OCTOBER 25th, 2000
SUMMARY TEST DATA
SUCCESSIVE LOG VIDEO AMPLIFIER COMPACT
PMI MODEL No: SLVAC-0102-70-LA
SERIAL No: PM010540, PM010544, PM010546 AND PM010549

VIDEO SIGNAL RISE AND FALL
RISE TIME = 10% RF TO 90% RF
FALL TIME = 90% RF TO 10% RF

30 nS RISE TIME
20 Nanosecond Per Division
SERIAL No: PM010540

30 nS FALL TIME
20 Nanoseconds Per Division
SERIAL No: PM010540

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVER.com E-mail: amcpmi@aol.com

Page 15
SUMMARY

TEST DATA

ON

131.5 TO 188.5 MHz
(50 TO 400 MHz UNITS ALSO AVAILABLE)

30nS HIGH SPEED

≥70dB DYNAMIC RANGE

LOW AM/PM CONVERSION

SUCCESSIVE LOG VIDEO AMPLIFIER COMPACT
(SLVAC)

PMI MODEL No:
SLVAC-0102-70M-LA

SERIAL No: PM010544, 46 & 49

AS TESTED OVER FREQUENCY AT 25°C

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com

Page 16
### SUMMARY TEST DATA

**SUCCESSIVE LOG VIDEO AMPLIFIER COMPACT**

**PMI MODEL No:** SLVAC-0102-70-LA  
**SERIAL No:** PM010540, PM010544, PM010546 AND PM010549

#### FINAL TEST DATA FOR S/N: PM010544

**FORM:** 313-SD

**JOB No:** 9092475S

**SUMMARY TEST DATA**

**ON**

**SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER—SDLVAC**

<table>
<thead>
<tr>
<th>TEST ITEM NO.</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>REMARKS QA/QC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FREQUENCY RANGE</td>
<td>131.5 MHz TO 183.5 MHz</td>
<td>0.6</td>
<td>✔</td>
</tr>
<tr>
<td>2</td>
<td>DYNAMIC RANGE</td>
<td>6.5 dBm TO -65 dBm</td>
<td>5.6</td>
<td>✔</td>
</tr>
<tr>
<td>3</td>
<td>INPUT VSWR</td>
<td>1.5 : 1 (1.5 : 1 typical)</td>
<td>1.2 : 1</td>
<td>✔</td>
</tr>
<tr>
<td>4</td>
<td>LOG VIDEO OUTPUT VOLTAGE @ 100 MHz</td>
<td>±0.375 V ± 0.1 V @ -60 dBm</td>
<td>492 mV</td>
<td>✔</td>
</tr>
<tr>
<td>5</td>
<td>LOG LINEARITY @ 25°C</td>
<td>±1.9 dB FROM BEST FIT STRAIGHT LINE</td>
<td>+0.64 dB</td>
<td>✔</td>
</tr>
<tr>
<td>6</td>
<td>LOG LINEARITY FROM -40°C TO +71°C</td>
<td>±1.5 dB FROM BEST FIT STRAIGHT LINE</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>7</td>
<td>TANGENTIAL SENSITIVITY</td>
<td>-72 dBm</td>
<td>-72 dBm</td>
<td>✔</td>
</tr>
<tr>
<td>8</td>
<td>LOG VIDEO VS. FREQUENCY FROM 131.5 MHz TO 183.5 MHz</td>
<td>±1.9 dB FROM THE VALUE @ 100 MHz</td>
<td>+0.78 dB</td>
<td>-0.53 dB</td>
</tr>
<tr>
<td>9</td>
<td>LOG VIDEO VS. TEMPERATURE FROM -40°C TO +71°C (FIRST UNIT ONLY)</td>
<td>±2.25 dB FROM THE VALUE @ 25°C</td>
<td>/</td>
<td>/</td>
</tr>
<tr>
<td>10</td>
<td>LOG VIDEO RISE TIME</td>
<td>79 ns</td>
<td>30 ns</td>
<td>✔</td>
</tr>
<tr>
<td>11</td>
<td>LOG VIDEO FALL TIME</td>
<td>35 ns</td>
<td>30 ns</td>
<td>✔</td>
</tr>
<tr>
<td>12</td>
<td>OUTPUT VSWR</td>
<td>1.5:1</td>
<td>2.05:1</td>
<td>✔</td>
</tr>
<tr>
<td>13</td>
<td>LIMITED RF OUTPUT POWER @ VSWR</td>
<td>±2 ±1 dBm</td>
<td>1.31 ±2.16 dBm</td>
<td>✔</td>
</tr>
<tr>
<td>14</td>
<td>LIMITED RF OUTPUT PHASE SHIFT VS. INPUT POWER (18 dB INCREMENTS)</td>
<td>±2.3°dB (5°/18 dB)</td>
<td>±5.1° dB</td>
<td>✔</td>
</tr>
<tr>
<td>15</td>
<td>PHASE TRACKING VS. FREQUENCY FROM 131.5 MHz TO 183.5 MHz</td>
<td>±2° FOR ANY TWO UNITS</td>
<td>See data</td>
<td>✔</td>
</tr>
<tr>
<td>16</td>
<td>CURRENT DRAW @ +5 V ± 0.25 V</td>
<td>100 mA</td>
<td>145 mA</td>
<td>✔</td>
</tr>
<tr>
<td>17</td>
<td>CURRENT DRAW @ -5 V ± 0.25 V</td>
<td>100 mA</td>
<td>15 mA</td>
<td>✔</td>
</tr>
</tbody>
</table>

**PRODUCTION MANAGER APPROVAL:** [Signature]  
**DATED:** 10/19/00

**QA/QC APPROVAL:** [Signature]  
**DATED:** 10/19/00

**OCTOBER 25th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704**

Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com

Page 17
LOG SLOPE PLOT AS MEASURED @ 25°C
OVER 131.5 MHZ, 160 MHZ AND 188.5 MHZ FREQUENCY RANGES

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com
# LOG SLOPE TABULATED DATA AS MEASURED @ 25°C

**OVER 131.5 MHz, 160 MHz AND 188.5 MHz FREQUENCY RANGES**

**SERIAL No: PM010544**

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Log Slope</th>
<th><strong>1st</strong></th>
<th><strong>2nd</strong></th>
<th><strong>3rd</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>131.5 MHz</td>
<td>2.09</td>
<td>2.09</td>
<td>2.09</td>
<td>2.09</td>
</tr>
<tr>
<td>160 MHz</td>
<td>2.09</td>
<td>2.09</td>
<td>2.09</td>
<td>2.09</td>
</tr>
<tr>
<td>188.5 MHz</td>
<td>2.09</td>
<td>2.09</td>
<td>2.09</td>
<td>2.09</td>
</tr>
</tbody>
</table>

**OCTOBER 25th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704**

Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
ABSOLUTE PHASE AT -20dBm INPUT POWER
SERIAL No: PM010544
## SUMMARY TEST DATA

**SUCCESSIVE LOG VIDEO AMPLIFIER COMPACT**

**PMI MODEL No:** SLVAC-0102-70-LA  
**SERIAL No:** PM010540, PM010544, PM010546 AND PM010549  

### FINAL TEST DATA FOR S/N: PM010546

**FORM:** 312-SD  
**REPORT No:** PT08-SLVAC-PW-1000  
**JOB No:** 99921PS  
**DATE:** 10/18/00

### SUMMARY TEST DATA ON SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER-SLVA

**CUSTOMER:** LITTON AGECOM  
**JOB No:** 99921PS  
**MODEL No:** SLVAC-1002-70M  
**SERIAL No:** PM010546  
**TESTED BY:**  
**DATE:** 10/18/00

<table>
<thead>
<tr>
<th>TEST ITEM NO.</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>REMARKS QA/QC</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FREQUENCY RANGE</td>
<td>121.5 MHz TO 181.5 MHz</td>
<td>91.4</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>DYNAMIC RANGE</td>
<td>5 dBm TO -65 dBm</td>
<td>see plot</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>INPUT VSWR</td>
<td>1.3:1 (1.5:1 typical)</td>
<td>1.0:1</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>LOG VIDEO OUTPUT VOLTAGE @ 160 MHz</td>
<td>+0.775 V ± 0.1 V @ 0 dBm</td>
<td>413 mV</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>LOG LINEARITY @ 25°C</td>
<td>±1.0 dB FROM BEST FIT STRAIGHT LINE</td>
<td>+0.5 dB</td>
<td>✓</td>
</tr>
<tr>
<td>6</td>
<td>LOG LINEARITY FROM -40°C TO +71°C (FIRST UNIT ONLY)</td>
<td>±1.5 dB FROM BEST FIT STRAIGHT LINE</td>
<td>-0.5 dB</td>
<td>✓</td>
</tr>
<tr>
<td>7</td>
<td>TANGENTIAL SENSITIVITY</td>
<td>-72 dBm</td>
<td>-72 dBm</td>
<td>✓</td>
</tr>
<tr>
<td>8</td>
<td>LOG VIDEO VS. FREQUENCY FROM 121.5 MHz TO 181.5 MHZ</td>
<td>±1.0 dB FROM THE VALUE @ 160 MHz</td>
<td>+1.0 dB</td>
<td>✓</td>
</tr>
<tr>
<td>9</td>
<td>LOG VIDEO VS. TEMPERATURE FROM -40°C TO +71°C (FIRST UNIT ONLY)</td>
<td>±2.25 dB FROM THE VALUE @ 25°C</td>
<td>-0.25 dB</td>
<td>✓</td>
</tr>
<tr>
<td>10</td>
<td>LOG VIDEO RISE TIME</td>
<td>30 ms</td>
<td>30 ms</td>
<td>✓</td>
</tr>
<tr>
<td>11</td>
<td>LOG VIDEO FALL TIME</td>
<td>35 ms</td>
<td>35 ms</td>
<td>✓</td>
</tr>
<tr>
<td>12</td>
<td>OUTPUT VSWR</td>
<td>1.5:1</td>
<td>2.0:1</td>
<td>✓</td>
</tr>
<tr>
<td>13</td>
<td>LIMITED RF OUTPUT POWER LEVEL</td>
<td>+2±1 dBm</td>
<td>±0.5...2.22 dBm</td>
<td>✓</td>
</tr>
<tr>
<td>14</td>
<td>LIMITED RF OUTPUT PHASE SHIFT VS. INPUT POWER (18 dB INCREMENTS)</td>
<td>±0.3°/dB (±3°/18 dB)</td>
<td>±0.8°/dB</td>
<td>✓</td>
</tr>
<tr>
<td>15</td>
<td>PHASE TRACKING VS. FREQUENCY FROM 121.5 MHz TO 181.5 MHZ</td>
<td>±2° FOR ANY TWO UNITS</td>
<td>see data</td>
<td>✓</td>
</tr>
<tr>
<td>16</td>
<td>CURRENT DRAW @ ±5 V ±0.25 V</td>
<td>200 mA</td>
<td>145 mA</td>
<td>✓</td>
</tr>
<tr>
<td>17</td>
<td>CURRENT DRAW @ -5 V ±0.25 V</td>
<td>100 mA</td>
<td>±16 mA</td>
<td>✓</td>
</tr>
</tbody>
</table>

**PRODUCTION MANAGER APPROVAL:**  
**Dated:** 10/19/00  
**QA/QC APPROVAL:**  
**Dated:** 10/19/00

---

**OCTOBER 25th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704**

Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com
LOG SLOPE PLOT AS MEASURED @ 25°C
OVER 131.5 MHz, 160 MHz AND 188.5 MHz FREQUENCY RANGES
SERIAL No: PM010546

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmii@aol.com

Page 23
<table>
<thead>
<tr>
<th>RF POWER IN (dBm)</th>
<th>160 MHz</th>
<th>180 MHz</th>
<th>131.5 MHz</th>
<th>131.6 MHz</th>
<th>188.5 MHz</th>
<th>188.6 MHz</th>
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<tbody>
<tr>
<td></td>
<td>VIDEO OUT (VOLTS)</td>
<td>LIMITED IF OUT (dBm)</td>
<td>VIDEO OUT (VOLTS)</td>
<td>LIMITED IF OUT (dBm)</td>
<td>VIDEO OUT (VOLTS)</td>
<td>LIMITED IF OUT (dBm)</td>
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<tr>
<td>0</td>
<td>2.03</td>
<td>2.2</td>
<td>2.04</td>
<td>2.2</td>
<td>2.02</td>
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<tr>
<td>5</td>
<td>1.801</td>
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<td>1.809</td>
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<td>1.781</td>
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<td>-20</td>
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<td>2.2</td>
<td>1.624</td>
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<td>1.567</td>
<td>2.2</td>
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<td>2.2</td>
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<tr>
<td>-55</td>
<td>1.564</td>
<td>2.2</td>
<td>1.566</td>
<td>2.2</td>
<td>1.566</td>
<td>2.2</td>
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<tr>
<td>-60</td>
<td>1.562</td>
<td>2.2</td>
<td>1.564</td>
<td>2.2</td>
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<td>2.2</td>
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<td>-65</td>
<td>1.560</td>
<td>2.2</td>
<td>1.563</td>
<td>2.2</td>
<td>1.563</td>
<td>2.2</td>
</tr>
</tbody>
</table>

DC POWER @ +5 VOLTS = +14 mA
DC POWER @ -5 VOLTS = -10 mA
LOG SLOPE = 24.2660 mV/dB
LOG ERROR IN dB = 0.91
LOG ERROR IN dB = -0.88
FREQUENCY FLATNESS = -0.68
LOG VIDEO FROM THE VALUE = 1.03
# SUMMARY TEST DATA

ON
SUCCESSIVE DETECTION LOG VIDEO AMPLIFIER—SDLVA

<table>
<thead>
<tr>
<th>TEST ITEM NO.</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>FREQUENCY RANGE</td>
<td>131.5 MHz TO 188.5 MHz</td>
<td>0 U.</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>DYNAMIC RANGE</td>
<td>+5 dBm TO -55 dBm</td>
<td>see plot</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>INPUT VSWR</td>
<td>1.3 : 1 (0.5 : 1 typical)</td>
<td>1.05 : 1</td>
<td>✓</td>
</tr>
<tr>
<td>4</td>
<td>LOG VIDEO OUTPUT VOLTAGE @ 160 MHz</td>
<td>+0.375 V @ 0.1 V @ -60 dBm</td>
<td>338 mV</td>
<td>✓</td>
</tr>
<tr>
<td>5</td>
<td>LOG LINEARITY @ 25°C</td>
<td>±1.0 dB FROM BEST FIT STRAIGHT LINE</td>
<td>±0.47 dB</td>
<td>✓</td>
</tr>
<tr>
<td>6</td>
<td>LOG LINEARITY FROM -40°C TO +71°C (FIRST UNIT ONLY)</td>
<td>±1.5 dB FROM BEST FIT STRAIGHT LINE</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>7</td>
<td>TANGENTIAL SENSITIVITY</td>
<td>-72 dBm</td>
<td>-72 dBm</td>
<td>✓</td>
</tr>
<tr>
<td>8</td>
<td>LOG VIDEO VS. FREQUENCY FROM 131.5 MHz TO 188.5 MHz</td>
<td>±1.8 dB FROM THE VALUE @ 160 MHz</td>
<td>+0.57 dB</td>
<td>✓</td>
</tr>
<tr>
<td>9</td>
<td>LOG VIDEO VS. TEMPERATURE FROM -40°C TO +71°C (FIRST UNIT ONLY)</td>
<td>±2.25 dB FROM THE VALUE @ 25°C</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>10</td>
<td>LOG VIDEO RISE TIME</td>
<td>29 ms</td>
<td>30.5 ms</td>
<td>✓</td>
</tr>
<tr>
<td>11</td>
<td>LOG VIDEO FALL TIME</td>
<td>35 ms</td>
<td>33.5 ms</td>
<td>✓</td>
</tr>
<tr>
<td>12</td>
<td>OUTPUT VSWR</td>
<td>1.5 : 1</td>
<td>1.5 : 1</td>
<td>✓</td>
</tr>
<tr>
<td>13</td>
<td>LIMITED RF OUTPUT POWER LEVEL</td>
<td>+2 dBm</td>
<td>1.25 dB</td>
<td>1.82 dB</td>
</tr>
</tbody>
</table>

## TESTED BY:

[Signature]

DATE: 10/18/00

# QA/QC APPROVAL

[Signature]

Dated: 10/19/00

---

**OCTOBER 25th, 2000**

**PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704**

Tel: 301-662-4700 Fax: 301-662-4938 Website: www.AMWAVE.com E-mail: amcpmi@aol.com
LOG SLOPE PLOT AS MEASURED @ 25°C
OVER 131.5 MHz, 160 MHz AND 188.5 MHz FREQUENCY RANGES
SERIAL No: PM010549

PLOT OF LOG SLOPE OVER FREQUENCY @ 25 DEGREES C

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com
**Tabulated Test Data @ 131.5 MHz, 160 MHz and 188.5 MHz @ 25 Degrees C**

<table>
<thead>
<tr>
<th>RF Power (dBm)</th>
<th>160 MHz</th>
<th>160 MHz</th>
<th>160 MHz</th>
<th>160 MHz</th>
<th>160 MHz</th>
<th>160 MHz</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Video Out (Volts)</td>
<td>Limited IP Out (dBm)</td>
<td>Video Out (Volts)</td>
<td>Limited IP Out (dBm)</td>
<td>Video Out (Volts)</td>
<td>Limited IP Out (dBm)</td>
</tr>
<tr>
<td>0</td>
<td>1.94</td>
<td>1.74</td>
<td>1.96</td>
<td>1.82</td>
<td>1.929</td>
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<td>1.768</td>
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<td>1.74</td>
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<tr>
<td>-36</td>
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<td>1.74</td>
<td>0.23</td>
<td>1.82</td>
<td>0.237</td>
<td>1.62</td>
</tr>
</tbody>
</table>

**DC Power +5 Volts**
- 148 mA

**DC Power -5 Volts**
- 19 mA

**LOG SLOPE**
- 24.372

**Best Fit Straight Line**
- 0.47

**Log Error in dB**
- 0.48

**Random Number Generation**
- Log Video from the Value
  - 0.63
  - 0.67
SUMMARY TEST DATA
SUCCESSIVE LOG VIDEO AMPLIFIER COMPACT
PMI MODEL No: SLVAC-0102-70-LA
SERIAL No: PM010540, PM010544, PM010546 AND PM010549

ABSOLUTE PHASE AT -20dBm INPUT POWER
SERIAL No: PM010549

OCTOBER 25th, 2000

PLANAR MONOLITHICS INDUSTRIES, INC., 7311-G Grove Road, Frederick, MD 21704
Tel: 301-662-4700  Fax: 301-662-4938  Website: www.AMWAVE.com  E-mail: amcpmi@aol.com

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### REVISIONS

<table>
<thead>
<tr>
<th>ZONE</th>
<th>REV.</th>
<th>DESCRIPTION</th>
<th>DATE</th>
<th>APPROVED</th>
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### CONTRACT No.:

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<td>E. Elder</td>
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</tr>
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<td>R. Afable</td>
</tr>
<tr>
<td>ENGR.</td>
<td>S. Kuhn</td>
</tr>
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<td>L. Chau</td>
</tr>
<tr>
<td>QC.</td>
<td>D. Bruder</td>
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Planar Monolithics Industries, Inc.
7311-G Grove Road, Frederick, MD 21704

ACCEPTANCE TEST PROCEDURE

MODEL: SLVAC-0102-70M OPT: LA
LOGARITHMIC AMPLIFIER
SUCCESSIVE DETECTION
CONSTANT PHASE

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

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.
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
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 μs.

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 μs.

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 50Ω 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 ±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.
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° ±4°/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.
5.0 SAMPLE DATA SHEET

071-LVA-DTA

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

<table>
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<tr>
<th>TEST ITEM NO.</th>
<th>PARAMETERS</th>
<th>SPECIFIED VALUE</th>
<th>MEASURED VALUE</th>
<th>REMARKS Q/A/QC</th>
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</tr>
<tr>
<td>2</td>
<td>DYNAMIC RANGE</td>
<td>+5 dBm TO -65 dBm</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>INPUT VSWR</td>
<td>1.8:1 (1.5:1 TYPICAL)</td>
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<td>+0.375V ± 0.1V @ -60 dBm</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>+1.875V ± 0.1V @ 0 dBm</td>
<td></td>
<td></td>
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<tr>
<td>5</td>
<td>LOG LINEARITY @ 25°C</td>
<td>±1.0 dB FROM BEST FIT STRAIGHT LINE</td>
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<td>6</td>
<td>TANGENTIAL SENSITIVITY</td>
<td>-72 dBm MAXIMUM</td>
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<td>7</td>
<td>LOG VIDEO OUTPUT BASELINE</td>
<td>SHALL NOT EXCEED VALUE @ 75 dBm</td>
<td></td>
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<td>8</td>
<td>LOG VIDEO VS. FREQUENCY FROM 120 MHz TO 200 MHz</td>
<td>±1.0 dB FROM 1 HE VALUE @ 160 MHz</td>
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<td>9</td>
<td>LOG VIDEO TIME</td>
<td>32 nSec</td>
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<td>10</td>
<td>LOG VIDEO FALL TIME</td>
<td>35 nSec</td>
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<td>11</td>
<td>OUTPUT VSWR</td>
<td>2.5:1</td>
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<td>12</td>
<td>LIMITED RF OUTPUT POWER LEVEL</td>
<td>+2.75 ± 0.75 dBm</td>
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<td>13</td>
<td>LIMITED RF OUTPUT PHASE SHIFT VS. INPUT POWER (10 dB INCREMENTS)</td>
<td>±0.3°/dB (±3°/10dB) PER SCD 3.17</td>
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<td>PHASE TRACKING VS. FREQUENCY FROM 131.5 MHz TO 188.5 MHz</td>
<td>12±4°/10 MHz</td>
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<td>PARAMETERS</td>
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<td>------------------------------</td>
<td>-----------------</td>
<td>----------------</td>
<td>---------------</td>
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<tr>
<td>15</td>
<td>CURRENT DRAW @ +5V ± 0.25V</td>
<td>200 mA</td>
<td></td>
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<tr>
<td>16</td>
<td>CURRENT DRAW @ -5V ± 0.25V</td>
<td>100 mA</td>
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QA / QC APPROVAL: ____________________________ DATED: ________________
### REVISIONS

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### MEAN TIME BETWEEN FAILURE ANALYSIS

**MODEL:** SLVAC-0102-70M **OPT:** LA  
**LOGARITHMIC AMPLIFIER**  
**SUCCESIVE DETECTION**  
**CONSTANT PHASE**

**SIZE:** A  
**FSCM:** 0ZXZ8  
**DRAWING No.:** 150-S013-000

**REV:** -  
**SCALE:** N/A  
**SHEET 1 OF 11**
MEAN TIME BETWEEN FAILURE ANALYSIS (MTBF)

FOR

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

LOGARITHMIC AMPLIFIER
SUCCESSIVE DETECTION
CONSTANT PHASE
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<td>3.1</td>
<td>RELIABILITY ANALYSIS METHODOLOGY</td>
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<td>3.2</td>
<td>MATHEMATICAL MODEL</td>
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<td>3.3</td>
<td>QUALITY FACTORS</td>
<td>7</td>
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<td>3.4</td>
<td>ENVIRONMENTAL CONDITIONS</td>
<td>8</td>
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<tr>
<td>3.5</td>
<td>PARTS COUNT FAILURE RATE CALCULATIONS</td>
<td>8</td>
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<tr>
<td><strong>TABLE 1</strong></td>
<td>FAILURE RATE DATA SUMMARY</td>
<td><strong>9</strong></td>
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<tr>
<td><strong>APPX A</strong></td>
<td>RELIABILITY FAILURE RATE DATA TABULATION</td>
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1.0 INTRODUCTION AND SUMMARY

This document presents the American Microwave Corporation Reliability Prediction Report performed on the Successive Detection Logarithmic Amplifier. It was analyzed for Mean Time Between Failure (MTBF) in accordance with Task 203 of MIL-STD-785B; paragraph 2.4 of Task 100 of MIL-STD-756B; and the Parts Count Analysis method of MIL-HDBK-217F(N1/2), Appendix A.

The Successive Detection Logarithmic Amplifier was found to have a Mean Time Between Failure (MTBF) of 111,694.40 hours of operation. This statement is fully supported by the reliability mathematical model presented in Section 3.0, the Table 1 Failure Rate Data Summary and the detailed reliability parts count failure rate data tables presented in the Appendix A of this report.

1.1 Scope

This report reflects the Successive Detection Logarithmic Amplifier reliability design analysis performed from project inception through the issue date of this document. This report is limited to electronic parts.

1.2 Objectives

Through this report, Planar Monolithics seeks to provide a prediction of the Successive Detection Logarithmic Amplifier MTBF, to evaluate it's current and potential reliability, to provide information in order to assist in directing and planning for reliability and related program efforts and to identify design features which are critical to reliability.

2.0 APPLICABLE DOCUMENTS

2.1 Military Specification Documents

MIL-STD-756B, N1, Reliability Modeling and Prediction
31 August 1982

MIL-STD-785B, Reliability Program for Systems and Equipment
15 September 1980 Development and Production
MIL-HDBK-217F(N1/2), Reliability Prediction of Electronic Equipment
2.2 Commercial/Bellcore Documents


2.3 Planar Monolithics Documents

Successive Detection Logarithmic Amplifier Parts Lists and Engineering Drawings

3.0 RELIABILITY ANALYSIS

3.1 Reliability Analysis Methodology

The parts count method of reliability prediction used in this analysis is MIL-HDBK-217F(N1/2), “Reliability Prediction Procedure for Electronic Equipment”, Appendix A.

3.2 Reliability Mathematical Model

The Reliability model MTBF reflects the reliability of all electrical parts in the equipment. Their failure rates are summarized in Table 1, by assembly, and presented in appendices tables by part type.

The Mathematical Model used in determining the Successive Detection Logarithmic Amplifier reliability is known as the series model. This model is based on the equation:

\[ R(t) = e^{-\lambda t} \]

Where:

- \( R(t) \) = Reliability of the Successive Detection Logarithmic Amplifier
- \( t \) = Elapsed operation time, in hours
- \( \lambda \) = Successive Detection Logarithmic Amplifier failure rate, in parts per million hours (ppmh)
The assumption is that if any part fails during operation, the Successive Detection Logarithmic Amplifier is considered to have failed as a whole, and maintenance is required. The reliability of the Successive Detection Logarithmic Amplifier, \( R(t) \), is the combined probability of the individual parts reliability, where the unit contains quantity \( n \) parts:

\[
R(t) = \prod_{i=1}^{n} R(t)_i
\]

Where: \( R(t)_i = \) reliability of part, \( i \), over time, \( t, e^{-\lambda_i t} \)

The summation of all Successive Detection Logarithmic Amplifier part failure rates provides the system failure rate, see Table 1. Thus, the system MTBF is determined by taking the reciprocal of the summation of the failure rates of all the Successive Detection Logarithmic Amplifier parts:

\[
MTBF = \int_0^\infty R(t)dt = \frac{1}{\sum_{i=1}^{n} \lambda_i}
\]

The analysis presented in this report contains no redundancy. Thus, the total Successive Detection Logarithmic Amplifier MTBF is 111,694.40 hours of operation.

The parts count reliability prediction method reflects the generic part types, quantities and qualities used, and considers the operational environment impact. These factors are combined in the following mathematical model:

\[
\lambda_A = \sum_{i=1}^{n} N_i(\lambda_G \pi_Q)_i
\]

where:

\[
\lambda_A = \text{total failure rate (parts per million hours) of the Successive Detection Logarithmic Amplifier.}
\]
\( \lambda_G = \) generic failure rate for a given environment for the ith generic part of an assembly.

\( \pi_Q = \) quality factor for the ith generic part of an assembly.

\( N_i = \) quantity of the ith generic part of an assembly.

\( n = \) number of different generic part categories.

The failure rate model modifiers, quantity, quality factor and generic failure rate are listed under their respective columns in the appendix tables.

The modifiers are numerical multipliers for the individual generic parts failure rate. The quality factor, \( \pi_Q \), designation is listed in the data tabulation Specification/Quality Level column for each part.

3.3 Quality Factors

American Microwave Corporation's use of commercial or mil-spec parts throughout the Successive Detection Logarithmic Amplifier is reflected in the quality factors, presented in the tables of Appendix A. The exact quality is presented for each part under the specification and quality factor columns of the failure rate data sheets.

The learning factor, \( \pi_L \), is equal to 1.0 for American Microwave Corporation's production conditions and field experience.

3.4 Environmental Conditions

All part generic failure rates include the effects of environment factors. The appropriate environment factor for the Successive Detection Logarithmic Amplifier is Airborne Inhabited Fighter (AIF). For AIF, the semiconductor junction temperature, \( T_J \), is 75 degrees Celsius, and the other parts ambient temperature, \( T_A \), is 55 degrees Celsius.

3.5 Parts Count Failure Rate Calculations

The parts count reliability prediction procedure conducted on the Successive
Detection Logarithmic Amplifier provides the data upon which part failure rates are assigned for reliability prediction. The failure rate model of each component was determined and the associated failure rates were calculated and listed in the data tabulation sheets of the appendices using the generic reliability failure rates determined per MIL-HDBK-217F, Notice 1/2, Appendix A, “Parts Count Reliability Prediction”.

The various failure rate model modifiers are listed in the appendices on detailed Failure Rate Data tables under "π" columns for each factor. The "π" factors are numerical multipliers for parts quality levels. The Quality "π" factor, πQ, is determined from the part procurement specification or information available at the time of analysis.
# RELIABILITY PARTS COUNT FAILURE RATE DATA SUMMARY

## Table 1, Successive Detection Logarithmic Amplifier

<table>
<thead>
<tr>
<th>Assembly/ Parts List</th>
<th>Quantity</th>
<th>Failure Rate in Parts Per Million Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>991106-2/</td>
<td>1</td>
<td>8.95300</td>
</tr>
<tr>
<td>100-5295-1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total System Failure Rate = 8.95300 Parts Per Million Hours.

Total System Mean Time Between Failure (MTBF) = 111,694.40 Hours.
APPENDIX A

1.1.1 Reliability Parts Count Failure Rate Data Tabulation for the Successive Detection Logarithmic Amplifier
# RELIABILITY PARTS COUNT FAILURE RATE DATA

**System:** Successive Detection Logarithmic Amplifier

**Assembly:** 991106-2

**Parts List:** 100-5295-1

**Environment:** Airborne, Inhabited Fighter (AIF)

<table>
<thead>
<tr>
<th>Description/ Generic Part Type</th>
<th>Specification/ Quality Level</th>
<th>Quantity</th>
<th>Quality Factor (Pi Q)</th>
<th>Failure Rate in Parts Per Million Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrated Circuit/ MOS, Digital 1001-3000 Gates</td>
<td>Mil-M-38510/ B</td>
<td>1</td>
<td>1.00</td>
<td>0.1000</td>
</tr>
<tr>
<td>Integrated Circuit/ Linear 1-100 Transistors</td>
<td>Mil-M-38510/ B</td>
<td>4</td>
<td>1.00</td>
<td>0.0620</td>
</tr>
<tr>
<td>Integrated Circuit/ Linear 301-1K Transistors</td>
<td>Mil-M-38510/ B</td>
<td>1</td>
<td>1.00</td>
<td>0.1900</td>
</tr>
<tr>
<td>Resistor/ RM Fixed Film Chip</td>
<td>Mil-R-55342/ Mil-Spec</td>
<td>20</td>
<td>3.00</td>
<td>0.1100</td>
</tr>
<tr>
<td>Capacitor/ CDR Ceramic Chip</td>
<td>Mil-C-55681/ Mil-Spec</td>
<td>28</td>
<td>3.00</td>
<td>0.0150</td>
</tr>
<tr>
<td>Coil/ Radio Frequency, Fixed</td>
<td>Mil-C-15305/ Mil-Spec</td>
<td>1</td>
<td>1.00</td>
<td>0.0150</td>
</tr>
<tr>
<td>Connector/ Printed Circuit Board</td>
<td>Mil-Spec</td>
<td>1</td>
<td>1.00</td>
<td>0.1100</td>
</tr>
<tr>
<td>Interconnect Assy./ Printed Circuit Board (PCB)</td>
<td>Mil-Spec</td>
<td>1</td>
<td>1.00</td>
<td>0.4300</td>
</tr>
</tbody>
</table>

Total Assembly Quantity of Parts = 57

Total Assembly Failure Rate = 8.95300 Parts Per Million Hours.