



6 GHz to 18 GHz, Log Amplifier, 50 mV/dB  
Log Slope, 40 dBm Log Range, SMA

TECHNICAL DATA SHEET

PE15A2004

The PE15A2004 is a Detector Log Video Amplifier (DLVA) that operates at 6 GHz to 18 GHz Frequency Range. The DLVA utilizes GaAs semiconductor technology which is beneficial for high speed applications while maintaining flatness and accuracy throughout the desired frequency band. The PE15A2004 can process up to 40 dB of dynamic range with log linearity of +/- 1 dB. The log slope is 50 mV/dB with a fast recovery time of 150 nsec typical. The 50 ohm hybrid circuit assembly is enclosed in a rugged metal package with SMA connectors. The design is highly reliable and designed to meet MIL-STD-202 environmental test conditions including humidity, shock and vibration.

**Features**

- 50 dB Detector Log Video Amplifier
- Log Slope 50 mV/dB
- Rise Time 20 ns Max
- Fall Time 45 ns Max
- Recovery Time 150 ns Typ
- TSS -40 dBm Min
- Designed for MIL-STD-202F Conditions

**Applications**

- Electronic Warfare
- Test & Measurement
- Military & Space
- Radar
- Military Communications Systems
- Telecommunications
- Data Communications

**Electrical Specifications**

| Description                        | Minimum | Typical | Maximum | Units |
|------------------------------------|---------|---------|---------|-------|
| Frequency Range                    | 6       |         | 18      | GHz   |
| Frequency Flatness                 |         |         | ±1      | dB    |
| Video Output Range @ 50 Ohms Load  | 0       |         | 2.5     | V     |
| Tangential Signal Sensitivity      | -40     |         |         | dB    |
| Log Range                          | -40     |         | +0      | dBm   |
| Useful Range                       | -40     |         | +5      | dBm   |
| Log Linearity                      |         |         | ±1      | dB    |
| Log Linearity Error                |         |         | ±1      | dB    |
| Log Slope (± 10% Tolerance)        |         | 50      |         | mV/dB |
| Log Slope Accuracy (Average Slope) |         |         | ±4      | %     |
| Rise Time (10% to 90%)             |         |         | 20      | ns    |
| Settling Time                      |         |         | 45      | ns    |
| Recovery Time                      |         | 150     | 300     | ns    |
| Input VSWR                         |         |         | 2.5:1   |       |
| Positive Power Supply 75 mA        |         |         | 15      | Volts |
| Negative Power Supply 75 mA        |         |         | -15     | Volts |
| Operating Temperature Range        | -54     |         | +85     | deg C |
| Storage Temperature Range          | -65     |         | +100    | deg C |

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [6 GHz to 18 GHz, Log Amplifier, 50 mV/dB Log Slope, 40 dBm Log Range, SMA PE15A2004](#)



6 GHz to 18 GHz, Log Amplifier, 50 mV/dB  
Log Slope, 40 dBm Log Range, SMA

## TECHNICAL DATA SHEET

PE15A2004

\*Note: Do Not Supply +V Without -V Supplied, As Well As This May Destroy The Unit.

### Mechanical Specifications

#### Size

|        |                     |
|--------|---------------------|
| Length | 2.2 in [55.88 mm]   |
| Width  | 1.5 in [38.1 mm]    |
| Height | 0.4 in [10.16 mm]   |
| Weight | 0.087 lbs [39.46 g] |

### Environmental Specifications

|                   |                                   |
|-------------------|-----------------------------------|
| 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 |

**Compliance Certifications** (see [product page](#) for current document)

### Plotted and Other Data

Notes:

- Values at +25 °C, sea level

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [6 GHz to 18 GHz, Log Amplifier, 50 mV/dB Log Slope, 40 dBm Log Range, SMA PE15A2004](#)



6 GHz to 18 GHz, Log Amplifier, 50 mV/dB  
Log Slope, 40 dBm Log Range, SMA

TECHNICAL DATA SHEET

PE15A2004

**Amplifier Power-up Precautions**

- 1.) Confirm that proper ESD precautions and controls are always in place before handling any Amplifier module.
- 2.) Confirm adequate thermal management is in place to effectively dissipate heat away from the Amplifier package. The Amplifier operational baseplate temperature must be within the operational temperature range stated in the Amplifier datasheet. Depending on the design and thermal requirements, using a heatsink with cooling fan is always recommended for safe reliable operation. A heat sink without a cooling fan may also be used. Damage caused from overheating will void the warranty.
- 3.) Confirm adequate system grounding is established. The DC power supply and Amplifier must have a common ground in order to operate properly.
- 4.) Power Amplifiers may require additional DC Current when initially powered-up. Depending on the design, the input current draw could range from an additional 10% to 100% above the maximum rated DC current of the Amplifier. This varies based on product part number.
- 5.) Confirm the DC power supply, if limited, is set to allow for additional start-up current that's rated for the Power Amplifier.
- 6.) Confirm the system is designed and calibrated for 50 ohms. Any impedance mismatch may cause performance issues.
- 7.) Perform a CALIBRATION (if required) with the loads before connecting the Amplifier to the Network Analyzer to ensure proper performance.
- 8.) Use a fixed attenuator between the signal source and input port of the Amplifier to optimize the input VSWR match.
- 9.) Confirm the input power level at the input port of the amplifier does not exceed the maximum rated limit for input power (as stated in the Amplifier datasheet).  
 $P_{in}$  for Small Signal Gain = P1dB-SSG-10 dB  
 $P_{in}$  for P1dB = P1dB-SSG+1 dB
- 10.) Confirm the Network Analyzer is always connected to the Amplifier first before DC power is applied to the Amplifier.
- 11.) As long as the input and output ports of the amplifier are connected to a 50Ohm load and RF signal power is applied, the Amplifier can be powered up with DC voltage.
- 12.) Confirm the Amplifier output load is matched for a 50 Ohm impedance and will not exceed the maximum rated VSWR or Return Loss limit for the Amplifier. Exceeding the maximum rated VSWR or Return Loss limit will result in reflected signal power that could damage the Amplifier and void the warranty.
- 13.) **Power Amplifier connected to an Antenna for signal transmission** - It's strongly recommended to use a high power fixed attenuator pad or an Isolator between the output port of the Amplifier and input port to the antenna. Any reflected signal power due to impedance mismatch will likely damage the Amplifier and void the warranty.
- 14.) The attenuator or isolator used at the output port of the Amplifier must be rated to handle the output power level and operational frequency band of the amplifier.

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [6 GHz to 18 GHz, Log Amplifier, 50 mV/dB Log Slope, 40 dBm Log Range, SMA PE15A2004](#)



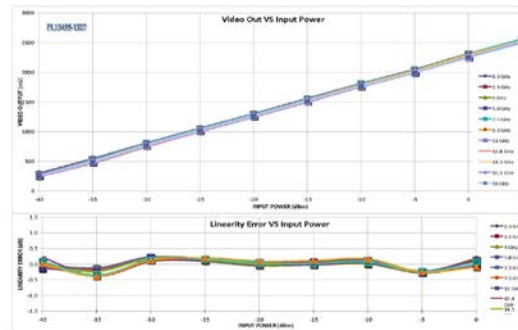
6 GHz to 18 GHz, Log Amplifier, 50 mV/dB  
Log Slope, 40 dBm Log Range, SMA

TECHNICAL DATA SHEET

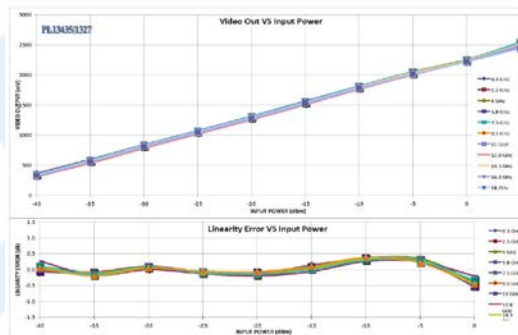
PE15A2004

Typical Performance Data

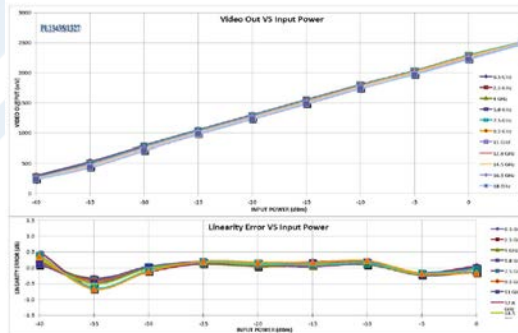
Log Transfer Plot and Linearity Error at 25 degrees C



Log Transfer Plot and Linearity Error at -54 degrees C



Log Transfer Plot and Linearity Error at 85 degrees C



Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [6 GHz to 18 GHz, Log Amplifier, 50 mV/dB Log Slope, 40 dBm Log Range, SMA PE15A2004](#)



6 GHz to 18 GHz, Log Amplifier, 50 mV/dB  
Log Slope, 40 dBm Log Range, SMA

TECHNICAL DATA SHEET

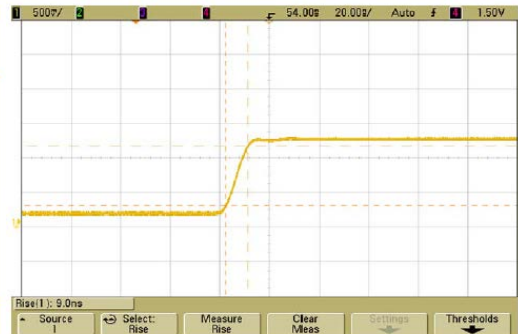
PE15A2004

Pulse Response

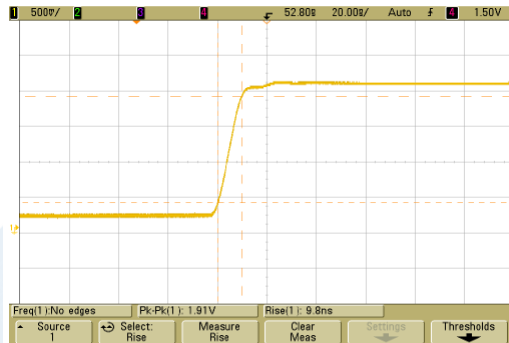
Rise Time at 25 Degrees C. 18GHz at 0dBm



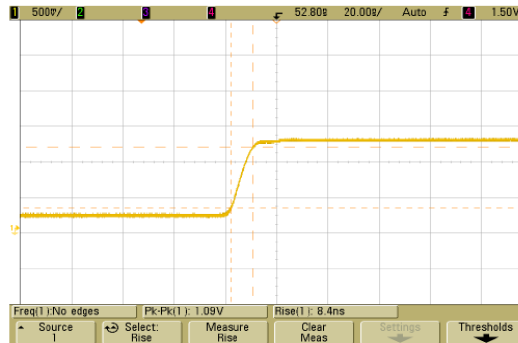
Rise Time at 25 Degrees C. 18GHz at -20dBm



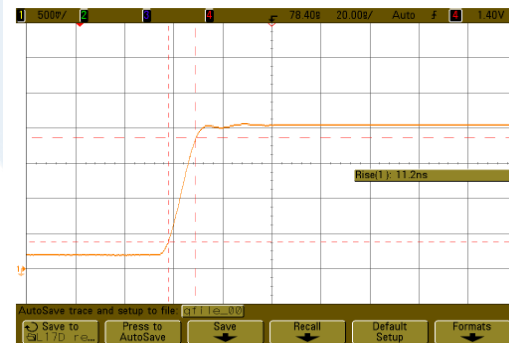
Rise Time at -54 Degrees C. 18GHz at 0dBm



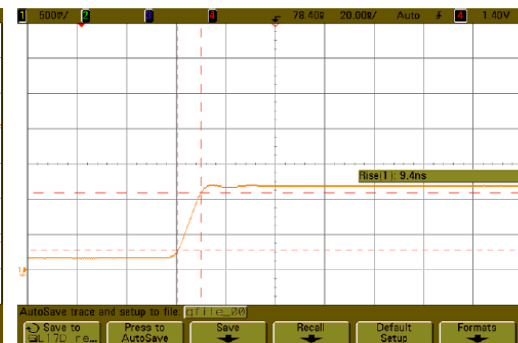
Rise Time at -54 Degrees C. 18GHz at -20dBm



Rise Time at 85 Degrees C. 18GHz at 0dBm



Rise Time at 85 Degrees C. 18GHz at -20dBm



Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [6 GHz to 18 GHz, Log Amplifier, 50 mV/dB Log Slope, 40 dBm Log Range, SMA PE15A2004](#)



6 GHz to 18 GHz, Log Amplifier, 50 mV/dB  
Log Slope, 40 dBm Log Range, SMA

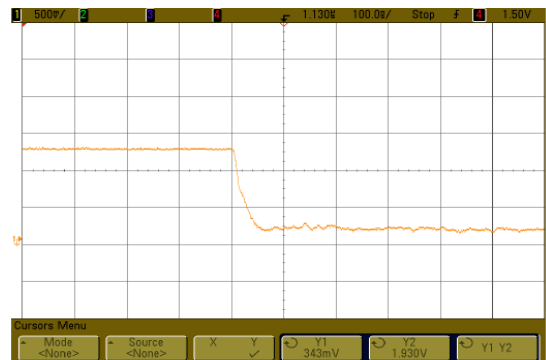
TECHNICAL DATA SHEET

PE15A2004

Recovery Time at 25 Degrees C. 18GHz at 0dBm



Recovery Time at 25 Degrees C. 18GHz at -20dBm



Recovery Time at -54 Degrees C. 18GHz at 0dBm



Recovery Time at -54 Degrees C. 18GHz at -20dBm



Recovery Time at 85 Degrees C. 18GHz at 0dBm



Recovery Time at 85 Degrees C. 18GHz at -20dBm



Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [6 GHz to 18 GHz, Log Amplifier, 50 mV/dB Log Slope, 40 dBm Log Range, SMA PE15A2004](#)



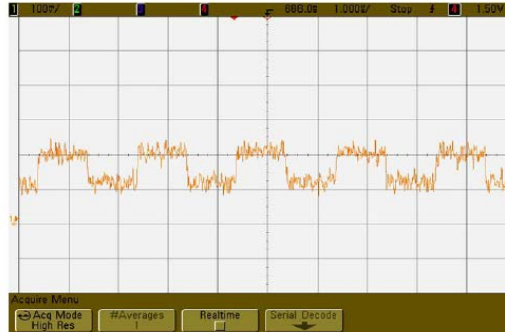
6 GHz to 18 GHz, Log Amplifier, 50 mV/dB  
Log Slope, 40 dBm Log Range, SMA

TECHNICAL DATA SHEET

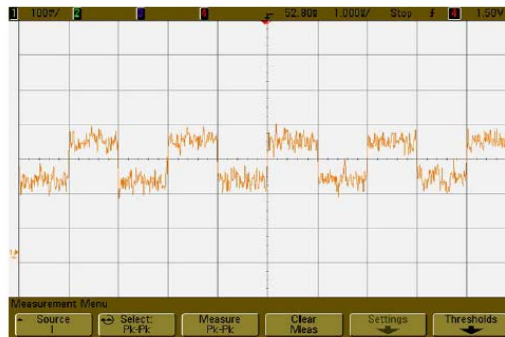
PE15A2004

TSS performance

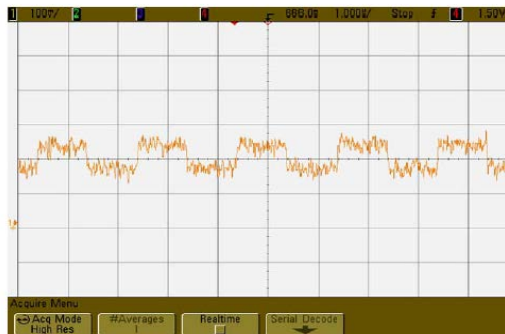
25 Degrees C. 18GHz at -42dBm



-54 Degrees C. 18GHz at -42dBm



85 Degrees C. 18GHz at -42dBm



Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [6 GHz to 18 GHz, Log Amplifier, 50 mV/dB Log Slope, 40 dBm Log Range, SMA PE15A2004](#)



6 GHz to 18 GHz, Log Amplifier, 50 mV/dB  
Log Slope, 40 dBm Log Range, SMA

TECHNICAL DATA SHEET

PE15A2004

VSWR

25 Degrees C at -20 dBm



-54 Degrees C at -20 dBm



85 Degrees C at -20 dBm



6 GHz to 18 GHz, Log Amplifier, 50 mV/dB Log Slope, 40 dBm Log Range, SMA from Pasternack Enterprises has same day shipment for domestic and International orders. Our RF, microwave and millimeter wave products maintain a 99.4% availability and are part of the broadest selection in the industry.

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [6 GHz to 18 GHz, Log Amplifier, 50 mV/dB Log Slope, 40 dBm Log Range, SMA PE15A2004](#)





6 GHz to 18 GHz, Log Amplifier, 50 mV/dB  
Log Slope, 40 dBm Log Range, SMA

## TECHNICAL DATA SHEET

PE15A2004

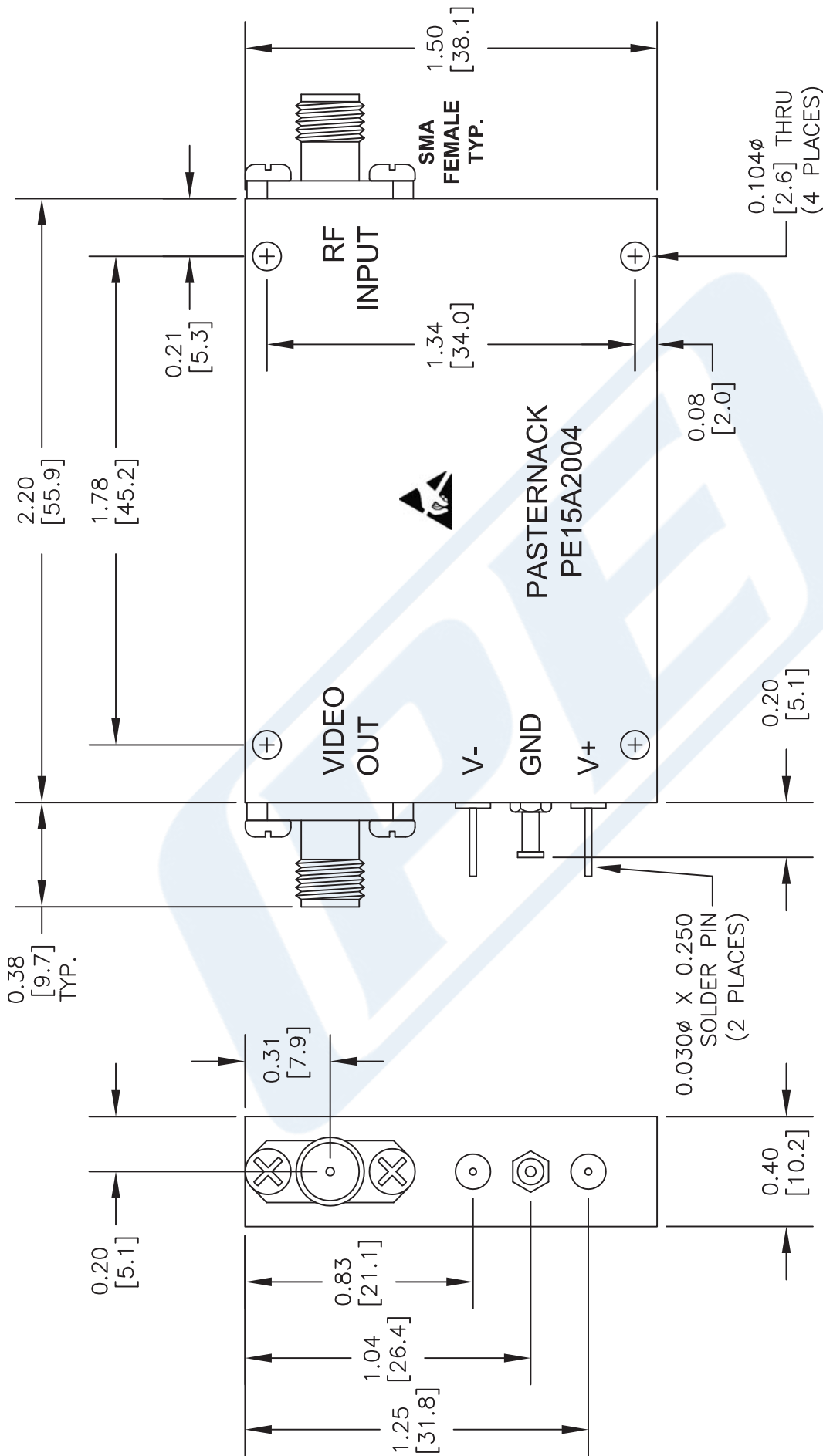
Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [6 GHz to 18 GHz, Log Amplifier, 50 mV/dB Log Slope, 40 dBm Log Range, SMA PE15A2004](https://www.pasternack.com/6-18-ghz-log-amplifier-50-mv-db-40-dbm-log-range-sma-pe15a2004)

URL: <https://www.pasternack.com/6-18-ghz-log-amplifier-50-mv-db-40-dbm-sma-pe15a2004-p.aspx>

The information contained in this document is accurate to the best of our knowledge and representative of the part described herein. It may be necessary to make modifications to the part and/or the documentation of the part, in order to implement improvements. Pasternack reserves the right to make such changes as required. Unless otherwise stated, all specifications are nominal. Pasternack does not make any representation or warranty regarding the suitability of the part described herein for any particular purpose, and Pasternack does not assume any liability arising out of the use of any part or documentation.

# PE15A2004 CAD Drawing

6 GHz to 18 GHz, Log Amplifier, 50 mV/dB Log Slope, 40 dBm Log Range, SMA



DWG TITLE

**PE15A2004**

NOTES:  
 1. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE NOMINAL.  
 2. ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AT ANY TIME.  
 3. DIMENSIONS ARE IN INCHES [mm].

FSCM NO. 53919

CAD FILE 092414

SCALE N/A

SIZE A

2233



Pasternack Enterprises, Inc.  
 P.O. Box 16759 | Irvine | CA | 92623  
 Phone: (949) 261-1920 | Fax: (949) 261-7451  
 Website: www.pasternack.com | E-Mail: sales@pasternack.com