



6 Watt Psat, 5.5 GHz to 9.5 GHz, High Power Amplifier,
23.5 dB Gain, 47 dBm IP3, 8.5 dB NF, SMA

TECHNICAL DATA SHEET

PE15A5009

PE15A5009 is a broadband 6 W GaAs PHEMT MMIC-based coaxial power amplifier module designed to be used in a wide range of commercial and defense applications in the 5.5 to 9.0 GHz frequency range. The amplifier offers 23.5 dB small signal gain with the gain flatness of ± 2 dB. This performance is achieved through the use of advanced GaAs PHEMT MMIC circuitry. The amplifier operates over the temperature range of -40°C to 85°C , and characterized by a light weight (45 g) and small size (1.5"x1.2"x0.56"). To facilitate an effective heat dissipation structure, the amplifier module has 4 screw slots for mounting to a heat sink.

Features

- 5.5 GHz to 9.5 GHz Frequency Range
- P1dB Output Power: 37.5 dBm
- Psat: 38 dBm
- Small Signal Gain: 23.5 dB
- Gain Flatness: ± 2 dB
- Power Added Efficiency @Psat: 26%
- 50 Ohm Input and Output Matched
- -40°C to $+85^{\circ}\text{C}$ Operating Temperature
- Small Size & Light Weight
- EAR99 (No Export License Required)

Applications

- Telecom Infrastructure
- Fixed Microwave Backhaul
- Microwave Radio Systems
- Military & Space
- Radar & Sensors
- Satellite Communication
- Driver Amplifier
- High Power Output Amplifier
- General Purpose Amplification

Electrical Specifications (TA = $+25^{\circ}\text{C}$, Vds1,2,3 = 8V, Idsq1 = 0.25A, Idsq2 = 0.66A, Idsq3 = 1.6A, Vgs1,2,3 = -0.87V)

| Description | Minimum | Typical | Maximum | Units |
|--|---------|---------|---------|----------------------|
| Frequency Range | 5.5 | | 9.5 | GHz |
| Small Signal Gain | | 23.5 | | dB |
| Gain Flatness | | ± 2 | | dB |
| Psat | | +38 | | dBm |
| Efficiency Psat | | 26 | | % |
| Output Power at 1 dB Compression Point | | +37.5 | | dBm |
| Output 3rd Order Intercept Point | | +47 | | dBm |
| Noise Figure | | 8.5 | | dB |
| Input Return Loss | | 13 | | dB |
| Output Return Loss | | 8 | | dB |
| Operating Temperature Range | -40 | | +85 | $^{\circ}\text{C}$ |
| Thermal Resistance | | 4.1 | | $^{\circ}\text{C/W}$ |

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [6 Watt Psat, 5.5 GHz to 9.5 GHz, High Power Amplifier, 23.5 dB Gain, 47 dBm IP3, 8.5 dB NF, SMA PE15A5009](#)



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Absolute Maximum Rating

| Parameter | Rating | Units |
|------------------------------------|--------------|-------|
| Drain Source Voltage | +9 | Volts |
| Gate Source Voltage | -3 | Volts |
| Drain Source Current | 0.3 | A |
| Gate Source Current | 1 | A |
| Drain source current | 2 | A |
| Continuous Dissipation at 25°C | 30 | W |
| Channel Temperature | 175 | °C |
| Operating Temperature (base-plate) | -40 to +85 | °C |
| Storage Temperature | -55° to +135 | °C |



ESD Sensitive Material,
Transport material in
Approved ESD bags.
Handle only in approved
ESD Workstation.

Mechanical Specifications

Size

Input Connector
Output Connector

SMA Female
SMA Female

Environmental Specifications

Temperature

Operating Range
Storage Range

-40 to +85 deg C
-55 to +135 deg C

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Compliance Certifications (visit www.Pasternack.com for current document)

RoHS Compliant

REACH Compliant

12/17/2014

Plotted and Other Data

Notes:

- Values at +25 °C, sea level
- ESD Sensitive Material, Transport material in Approved ESD bags. Handle only in approved ESD Workstation.
- Heat Sink Required for Proper Operation, Unit is cooled by conduction to heat sink. The amplifier module has 4 screw slots for mounting to a heat sink.
- DO NOT apply Vds without proper negative voltage on Vgs pins.



- GaAs PHEMT MMIC-Based Power up sequence
 1. Connect common ports
 - a. Connect single GND lead
 - b. Connect all -Vg ports together
 - c. Connect all +Vd ports together
 2. Connect the load, attenuator to protect the VNA.
 3. Connect the input port, may have an attenuator at the input (perform the CAL with the loads before connecting the amplifier to the VNA).
 4. Apply the -Vg voltage at close to -Vg Pinch off (Start at -1.9Volts, except for PE15A4014 and PE15A4015 use -3.0).
 5. Apply the +Vd voltage.
 6. Adjust the -Vg to the ideal negative voltage (approximately -1.1Volts to -0.97Volts, except for PE15A4014 and PE15A4015 use -2.6 to -2.4 see datasheet), observe the gain and power output.

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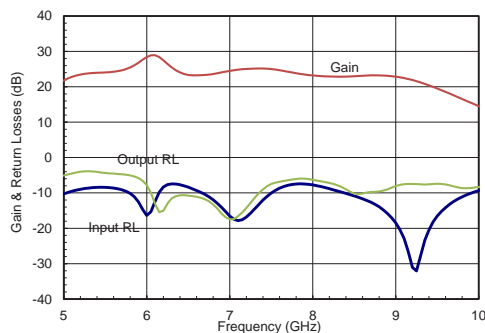


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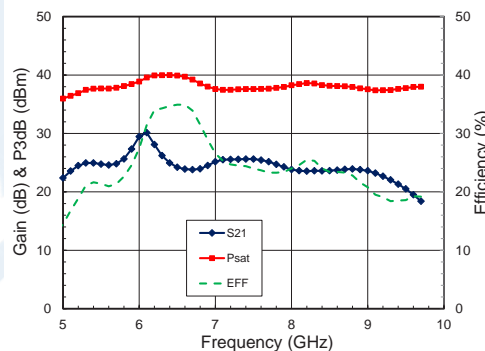
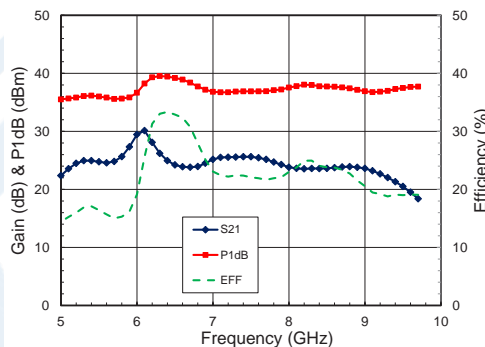
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Typical Performance Data



* Biased at $V_{ds1,2,3}=8V$, $I_{dsq1}=0.25A$, $I_{dsq2}=0.66A$, $I_{dsq3}=1.6A$, $V_{gs1,2,3}=-0.87V$.



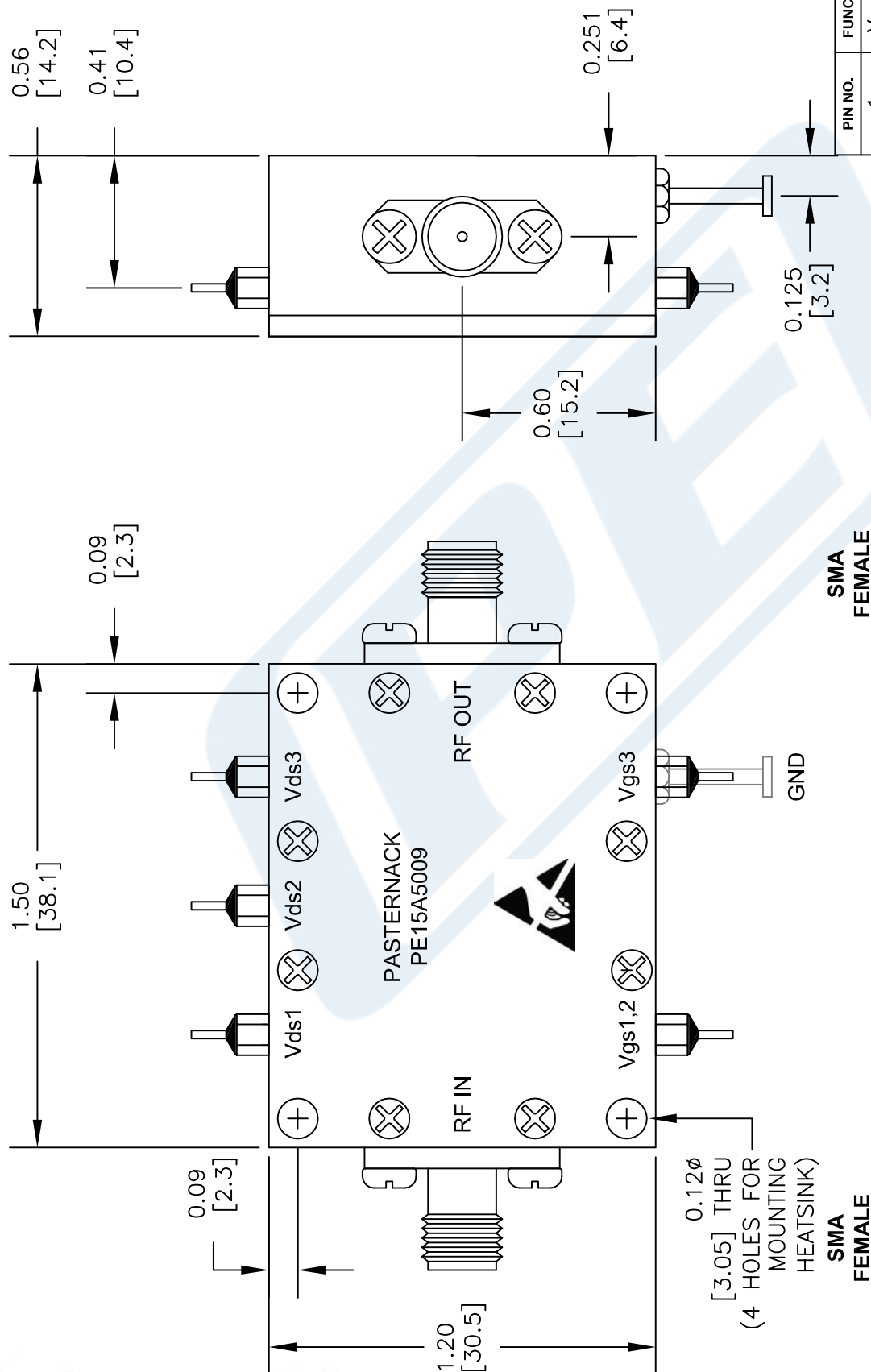
* Biased at $V_{ds1,2,3}=+8V$, $I_{dsq1}=0.25A$, $I_{dsq2}=0.66A$, $I_{dsq3}=1.6A$.

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PE15A5009

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.

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| PIN NO. | FUNCTION | BIAS |
|---------|--------------------|--------|
| 1 | V_{gs1}, V_{gs2} | -0.87V |
| 2 | NC | - |
| 3 | V_{gs3} | -0.87V |
| 4 | V_{ds3} | +8V |
| 5 | V_{ds2} | +8V |
| 6 | V_{ds1} | +8V |

- Recommended currents are : $I_{dsq1}=0.25A$, $I_{dsq2}=1.05A$ & $I_{dsq2}=1.05A$ for the first, second & third stage respectively.
- Gate $V_{gs1,2,3}$ bias of $-0.87V$ are for reference only. $V_{gs1,2,3}$ could be adjusted to vary currents going thru the module.
- Do **NOT** apply V_{dd1} & V_{dd2} & V_{dd3} without proper negative voltages.

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].
4. FITS MIL-C-17 AND EQUIVALENT CABLES.

DWG TITLE
PE15A5009

PE PASTERNAK®
THE ENGINEER'S RF SOURCE

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

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|-----------------------|----------|--------|-------|-----|------|---|-----|
| FSCM NO. 53919 | CAD FILE | 073014 | SCALE | N/A | SIZE | A | 150 |
|-----------------------|----------|--------|-------|-----|------|---|-----|