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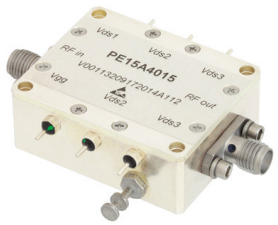

4 Watt Psat, 8 GHz to 11 GHz, High Power GaAs Amplifier, SMA, 28 dB Gain

TECHNICAL DATA SHEET PE15A4015

PE15A4015 is a broadband 4 W GaAs PHEMT MMIC-based coaxial power amplifier module designed to be used in a wide range of commercial and defense applications in the 8 to 11 GHz frequency range. The amplifier offers 28 dB small signal gain with ±3 dB gain flatness. This performance is achieved through the use of advanced GaAs PHEMT MMIC circuitry. The amplifier requires manual voltage sequencing (see pages 4 & 5) and operates over the temperature range of -40°C to 85°C. This Innovative design is characterized by light weight (45 g) and small size (1.5"x1.2"x0.56"). An available finned heatsink (model PE15C5014) is recommended to maintain an optimum baseplate temperature during operation.

Features

- 8 GHz to 11 GHz Frequency Range
- P1dB Output Power: 32 dBm typ
- Psat: 36 dBm typ
- Small Signal Gain: 28 dB typ
- Gain Flatness: ±3 dB typ
- Power Added Effiency @Psat: 25%
- Noise Figure: 10 dB
- 50 Ohm Input and Output Matched
- -40 to +85°C Operating Temperature
- Unconditionally Stable
- Small Size & Light Weight
- EAR99 (No Export License Required)
- Manual Voltage Sequencing
- Optional Heatsink Available: Model PE15C5014

Applications

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

Electrical Specifications (TA = +25°C, Vds = +5V , Idsq = 2.0 A, Vgg = -2.6V**)

Description	Minimum	Typical	Maximum	Units
Frequency Range	8		11	GHz
Small Signal Gain	24	28		dB
Gain Flatness		±3		dB
Pout at Sat.		+36		dBm
Efficiency Psat		25		%
Output Power at 1 dB Compression Point		+32		dBm
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input Return Loss		10		dB
Output Return Loss		6		dB
Operating DC Drain Source Voltage		5	6	Volts
Operating DC Gate Source Voltage		-2.6	-3	Volts
Operating Temperature Range	-40		+85	°C
Thermal Resistance		2.3		°C/W

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: 4 Watt Psat, 8 GHz to 11 GHz, High Power GaAs Amplifier, SMA, 28 dB Gain PE15A4015

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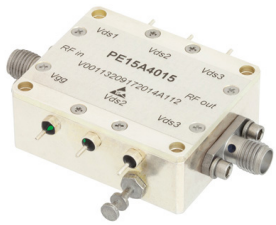

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Absolute Maximum Rating

Parameter	Rating	Units
Drain Source Voltage, Vds 1,2,3	+6	Volts
Gate Source Voltage, Vdd	-3	Volts
Drain Source Current Idsq 1	0.2	A
Drain Source Current Idsq 2	0.9	A
Drain Source Current Idsq 3	2	A
Continuous Dissipation at 25°C	20	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

Length	1.2 in [30.48 mm]
Width	1.5 in [38.1 mm]
Height	0.56 in [14.22 mm]
Weight	0.112 lbs [50.8 g]
Input Connector	SMA Female
Output Connector	SMA Female

Environmental Specifications

Temperature

Operating Range	-40 to +85 deg C
Storage Range	-55 to +135 deg C

Compliance Certifications (see product page for current document)

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.

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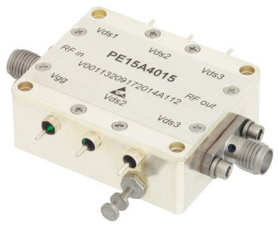

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Amplifier Power-up Precautions

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.

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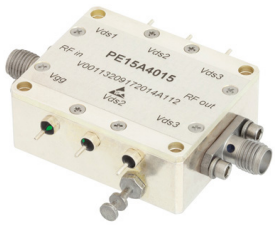

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TECHNICAL DATA SHEET PE15A4015

GaAs PHEMT MMIC-Based Power up sequence

1. Connect common ports
   a. Connect single GND lead
   b. Connect all -Vgg ports together**
   c. Connect all +Vds 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 -Vgg voltage -2.6 Vgg (Always apply -Vgg first).
5. Apply the +Vds +5 Volts (always apply +Vds second).

**All 5 Vds voltage pins (Vds1, Vds2, Vds3) can be tied together using external wiring to a common voltage source (+5 Vdc typical). The gate voltage of -2.6 Vgg is applied only to the single Vgg voltage pin.

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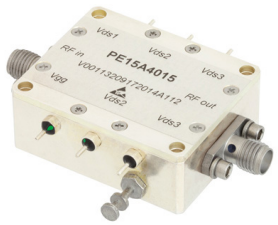

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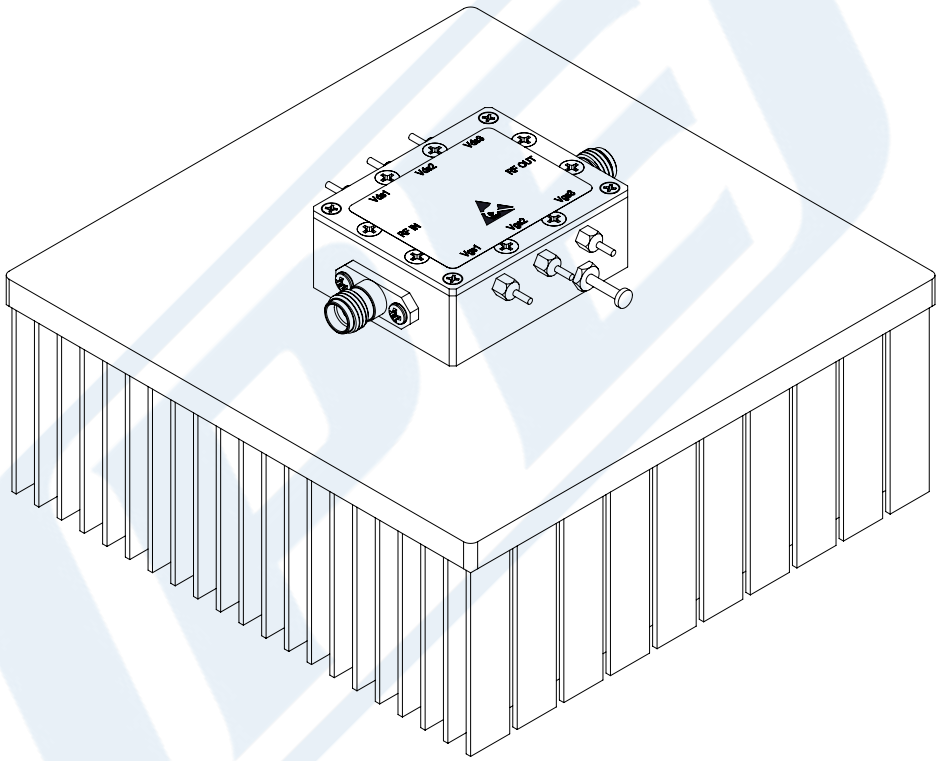

illustration of Amplifier mounted on Heatsink.
Heatsink model PE15C5014 sold separately.
(Picture shown for Reference Only)

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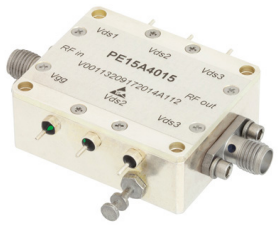

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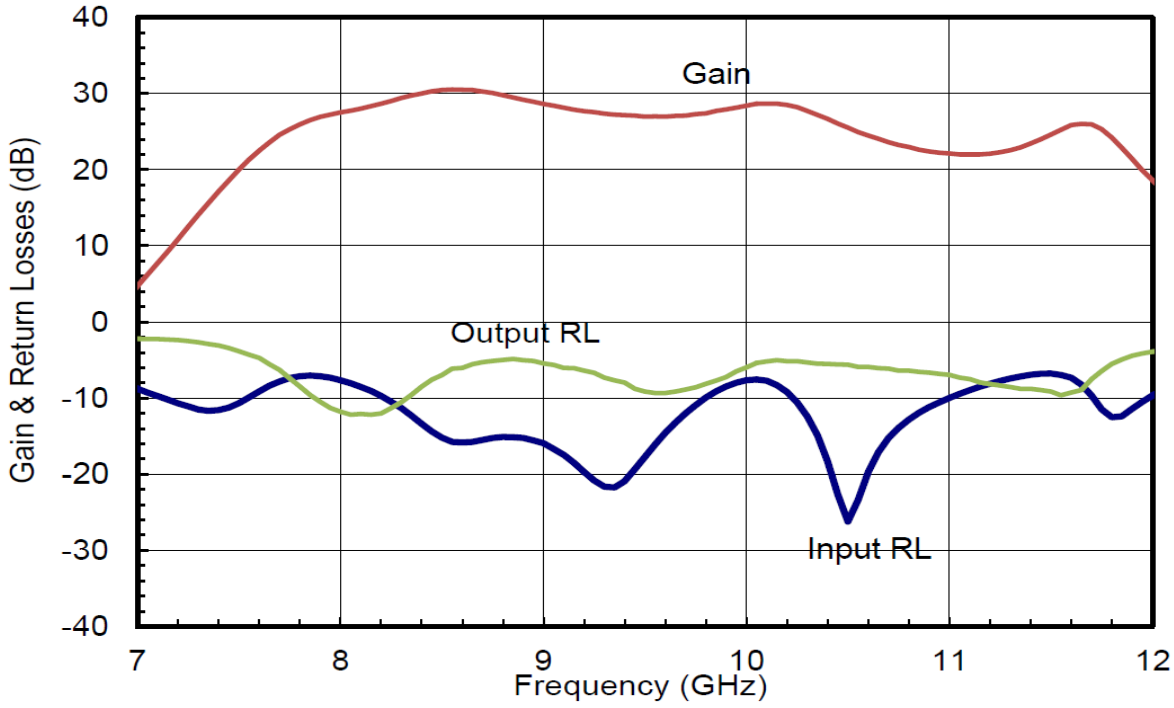
Typical Performance Data



*Bias is V_{ds} = +5V , I_{dsq} = 2.0 A, V_{gg} = -2.6V.

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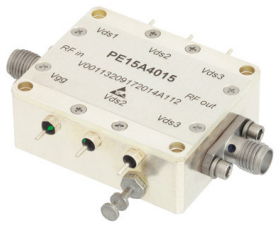

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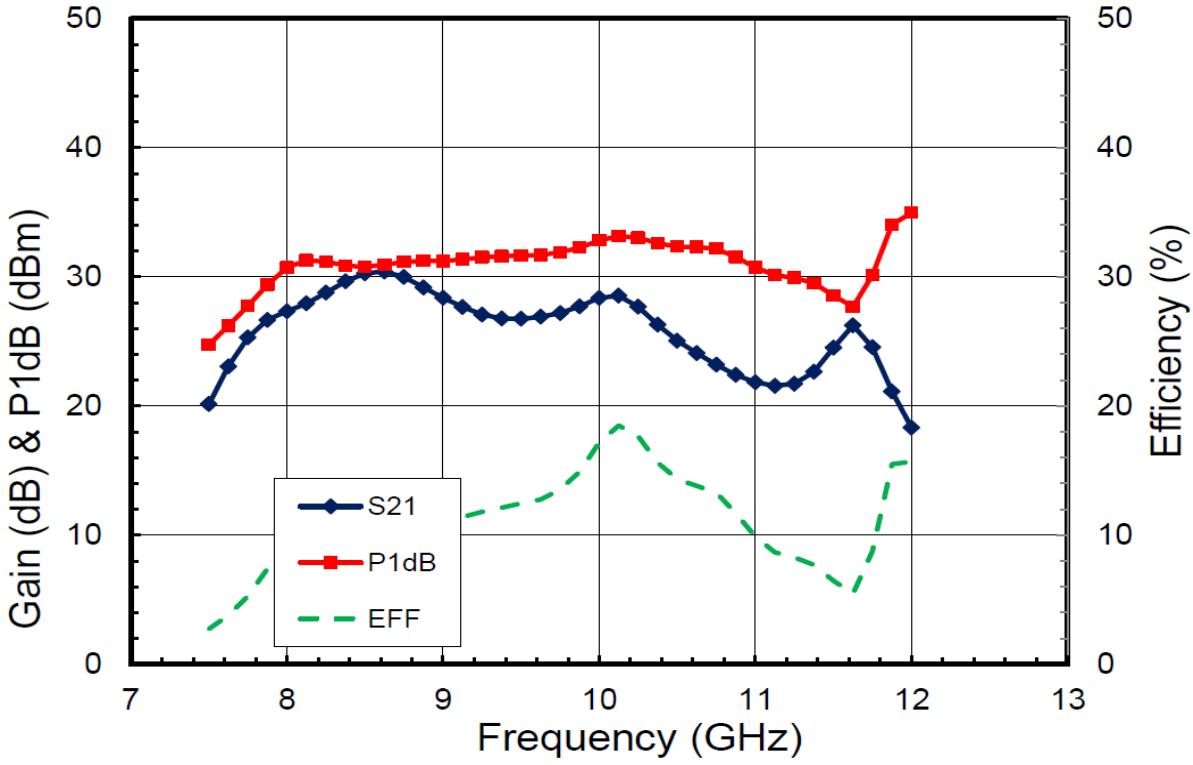

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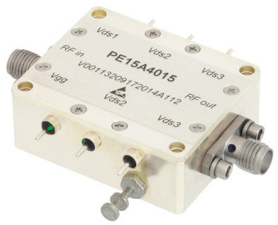

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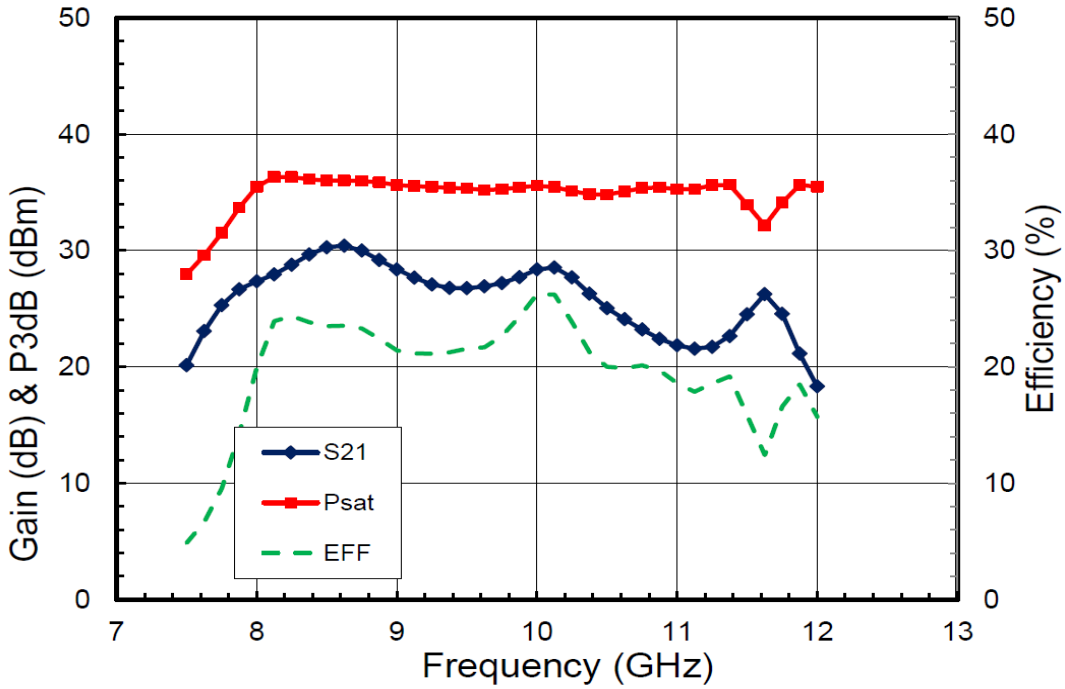

*Bias at: $V_{ds1,2,3}$ =+5V, V_{gg} = -2.6V, I_{dsq1}=0.14A, I_{dsq2}=0.56A, I_{dsq3}=1.3A.

4 Watt Psat, 8 GHz to 11 GHz, High Power GaAs Amplifier, SMA, 28 dB Gain 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.

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PE15A4015 CAD Drawing

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