



43 dB Gain, 10 Watt Psat, 30 MHz to 2.5 GHz,
 High Power GaN Amplifier, SMA

TECHNICAL DATA SHEET

PE15A5011

The PE15A5011 is a 10W Class AB, High Gain GaN Linear Power Amplifier operating in the 0.03 to 2.5 GHz frequency range. The amplifier offers high linear transmit power with superior EVM performance. It's capable of supporting any signal type and modulation format, including but not limited to 3-4G telecom, WLAN, OFDM, DVB, and CW/AM/FM. The latest device technologies and design methods are employed to offer high power density, efficiency, and linearity in a small, lightweight package. The amplifier has a Wide Dynamic Range with impressive typical performance including 40 dBm Psat, 43 dB small signal gain, and +/- 2 dB gain flatness. The driver amplifier has a built-in voltage regulation with a versatile DC Supply of +9V to +36V and is unconditionally stable. Other desirable features include bias sequencing, and reverse bias protection for added reliability. The amplifier operates over the temperature range of -20°C and +80°C. An available heatsink (PE15C5013) is recommended to maintain an optimum baseplate temperature during operation.

Features

- 0.03 GHz to 2.5 GHz Frequency Range
- Psat 10 Watts typ
- Small Signal Gain: 43 dB typ
- Gain Flatness: ±2.0 dB maximum
- Switching Speed 1 usec typical
- Superior EVM performance
- Versatile DC Supply of +9V to +36V
- 50 Ohms Input and Output Matched
- Unconditionally Stable
- Integrated DC Voltage Regulation & Bias Sequencing
- SMA Female RF Connectors
- DC/Control Connector 7W2 D Sub
- Over/Under/Reverse Voltage Protection
- Temperature Compensation
- High Speed On/Off Control

Applications

- L-band Military Radar
- Commercial Air Traffic Control
- Weather & Earth Observation Satellites
- Radar & Communication Systems
- High Gain Driver Power Amplifier
- High Gain Output Power Amplifier

Electrical Specifications (TA = +25°C)

Description	Minimum	Typical	Maximum	Units
Frequency Range	0.03		2.5	GHz
Small Signal Gain		43		dB
Gain Flatness			±2	dB
Input Power (CW)			+12	dBm
Pout at Sat.	+36	+40		dBm
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input Return Loss	-12	-14		dB
Switching Speed for On/Off Switch Gate		1	2	uS
TTL Control	"1": On, "0": Off, Enable: 5V, Disable: 0V			
Operating DC Voltage	+9	+28	+32	Volts
Operating DC Current		1.2		A
Quiescent Current Biased		200		mA
Operating Temperature Range	-20		+80	°C

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Electrical Specification Notes:

Gain flatness recorded represents a peak-to-peak measurement across the entire operating band. Gain Flatness is typically much lower across significant portions of this band.

Mechanical Specifications

Size

Length	3.75 in [95.25 mm]
Width	2 in [50.8 mm]
Height	1.063 in [27 mm]
Weight	0.699 lbs [317.06 g]
Input Connector	SMA Female
Output Connector	SMA Female
Cooling	HEATSINK REQUIRED use PE15C5013

Environmental Specifications

Temperature

Operating Range	-20 to +80 deg C
Storage Range	-65 to +150 deg C
PA Baseplate Shutoff Temperature	90 deg C
Humidity	0-100%
Shock	MIL-STD-810
Vibration	MIL-STD-810
Altitude	0-30,000 ft

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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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.

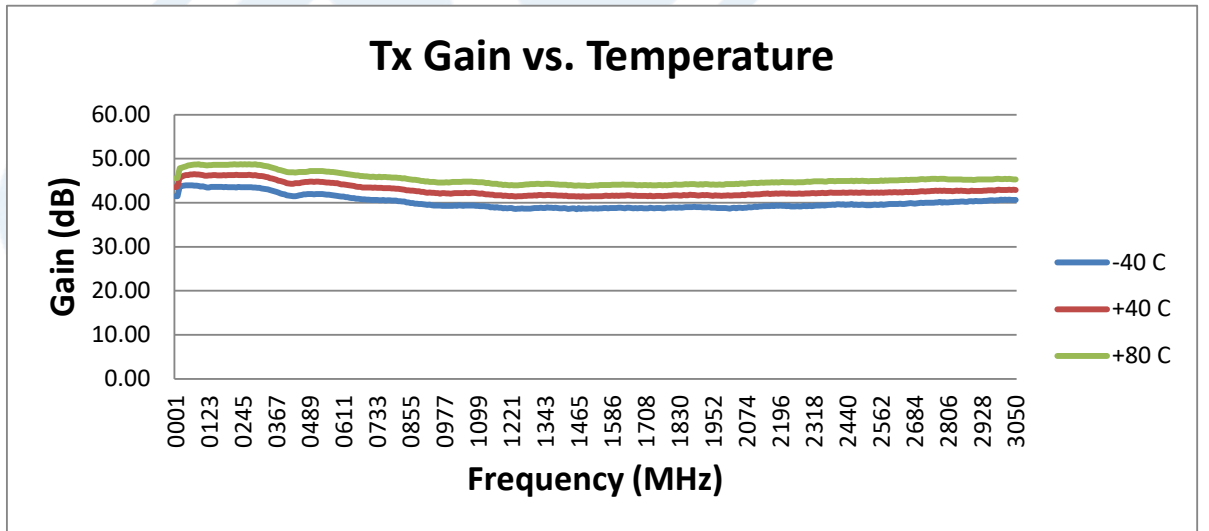
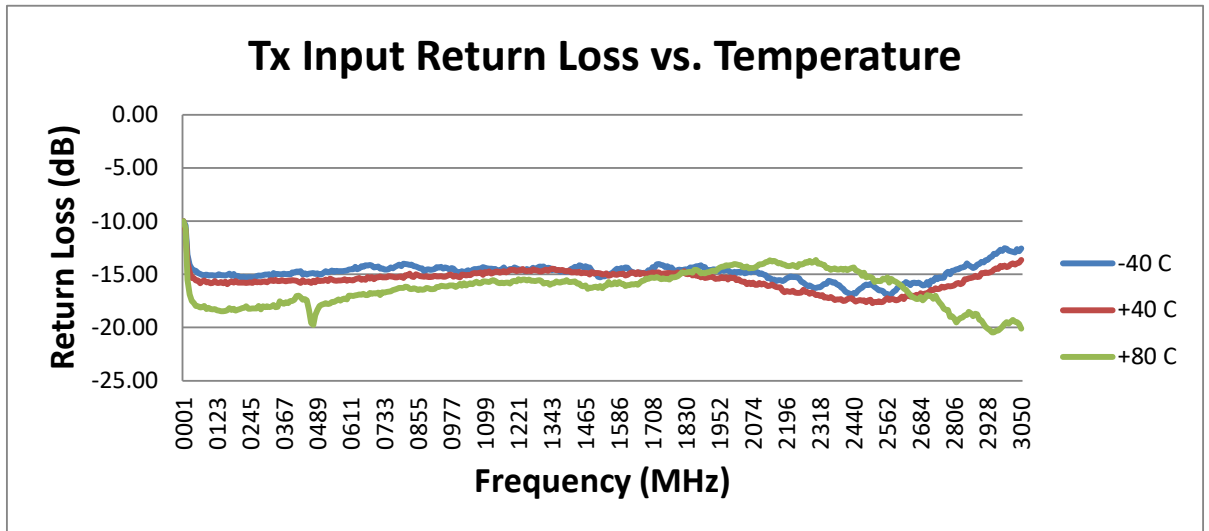
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Typical Performance Data

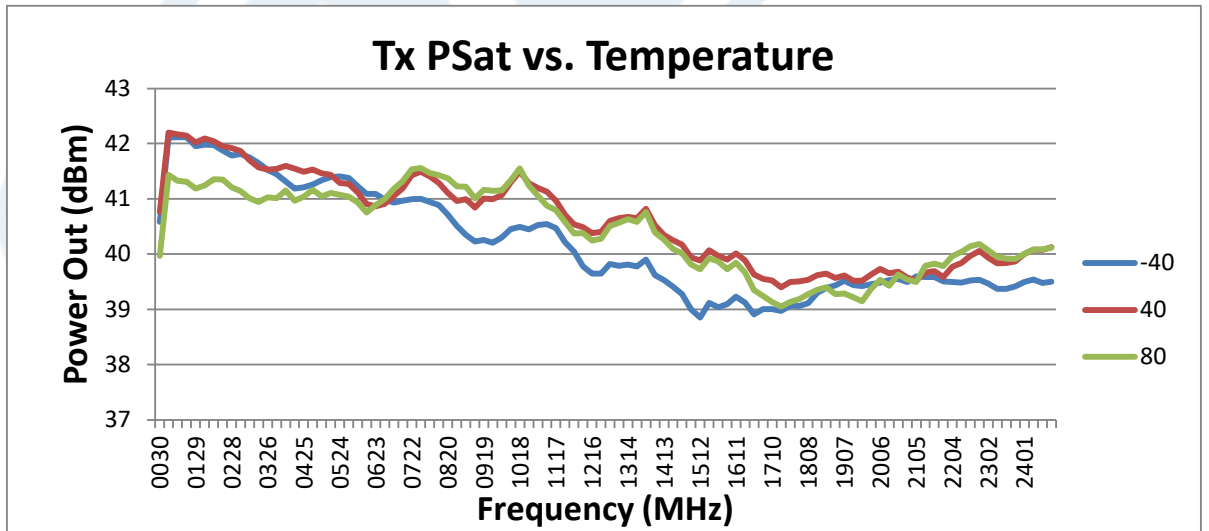
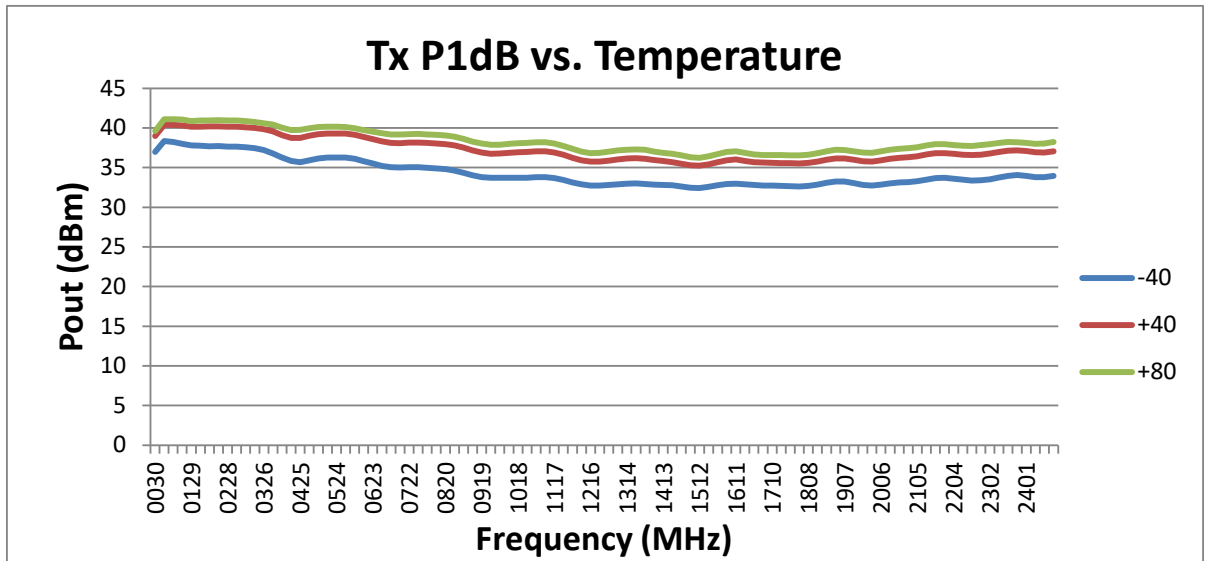


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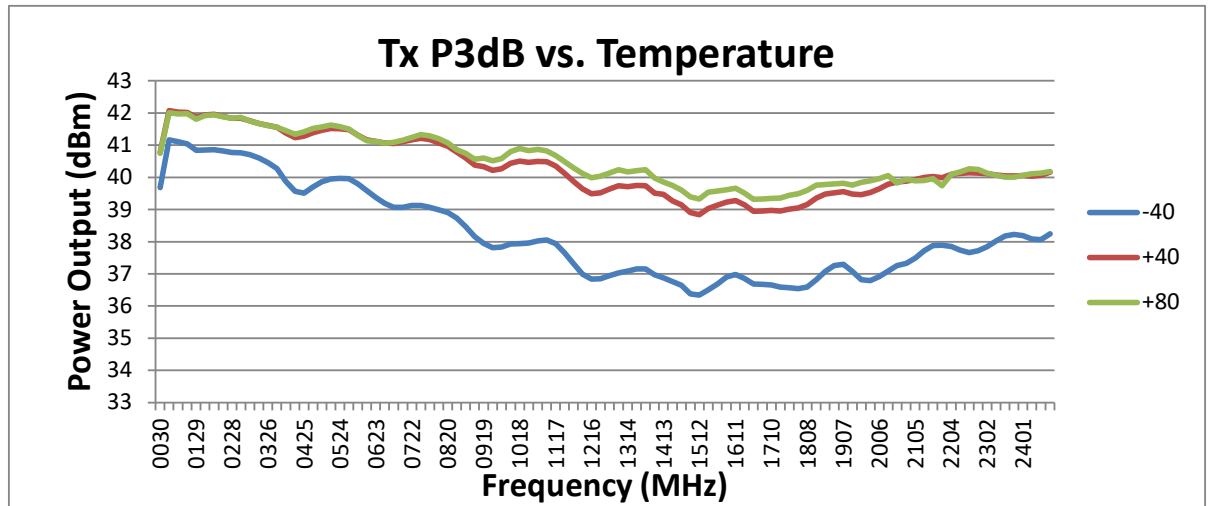
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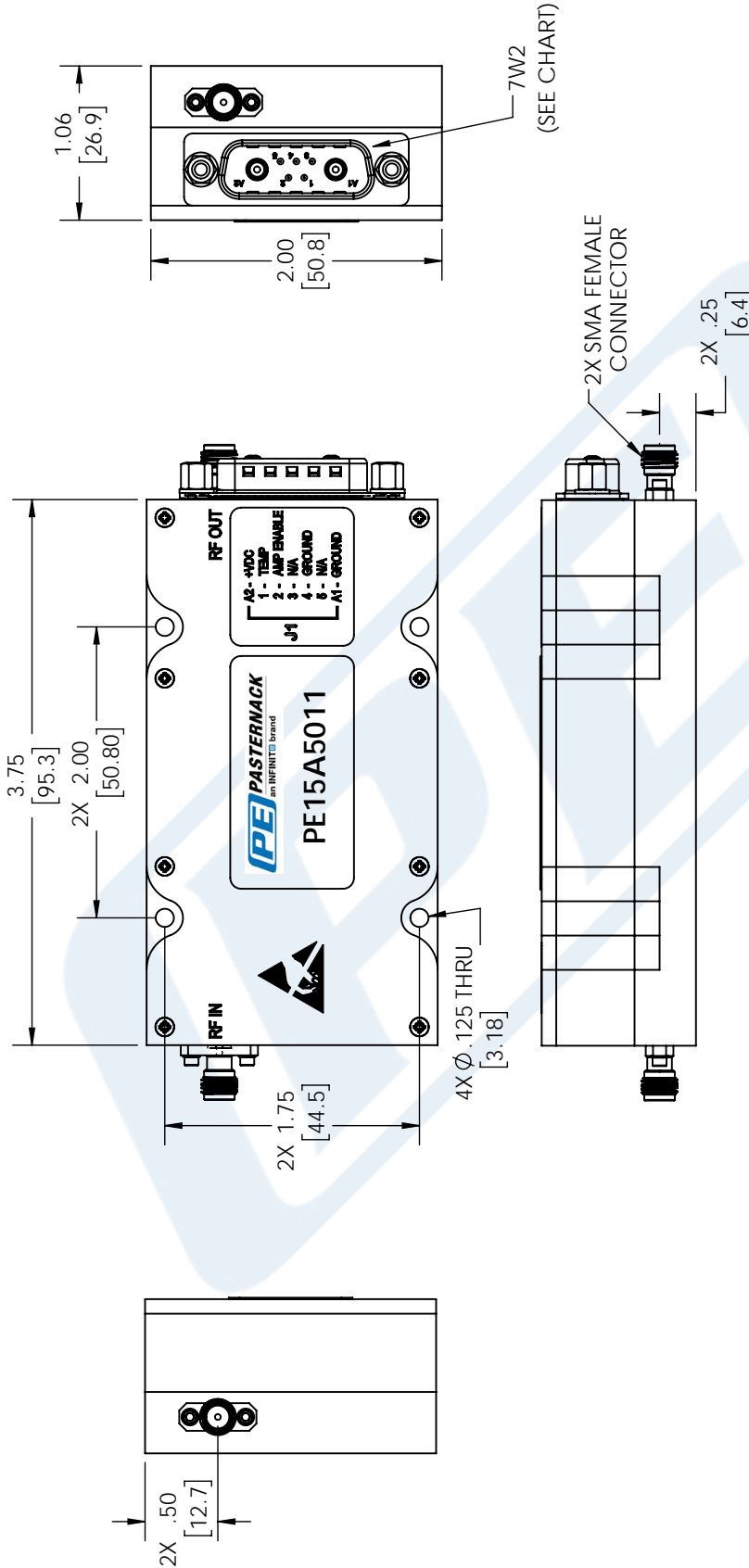
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The information contained in this document is accurate to the best of our knowledge and representative of the part described herein. It may be necessary to make modifications to the part and/or the documentation of the part, in order to implement improvements. 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.

PE15A5011 CAD Drawing

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REVISIONS		
REV.	DESCRIPTION	DATE
A	INITIAL RELEASE	09/07/2021
		APPROVED
		TGALLA



PIN	DESCRIPTION	SPECIFICATION
A1	GROUND	VDC GROUND
A2	+VDC	+9 TO +36VDC
1	TEMP SENSOR	TEMP MONITOR: TEMP IN DegC=(Vout-0.5V)*100
2	AMP ENABLE	TTL HI (+5V) OR NO CONNECTION=ENABLE, TTL LO (0V)=DISABLE
3	NO CONNECTION	NO CONNECTION
4	GROUND	GROUND
5	NO CONNECTION	NO CONNECTION

NOTE:
HEAT SINK REQUIRED FOR PROPER OPERATION,
UNIT IS COOLED BY CONDUCTING TO HEATSINK

UNLESS OTHERWISE SPECIFIED
LEADING DIMENSIONS ARE INCHES
DIMENSIONS IN [] ARE MILLIMETERS

TOLERANCES:
.X = ±.2 [5.08] | FRACTIONS ± 1/32
.XX = ±.02 [.51] | ANGLES ± 1°
.XXX = ±.005 [.13] |
CABLE LENGTH (L), TOLERANCES:
L ≤ 12 [305] = ±1 [25] / -0
12 [305] < L ≤ 60 [1524] = ±2 [51] / -0
60 [1524] < L ≤ 120 [3048] = ±4 [102] / -0
120 [3048] < L ≤ 300 [7620] = ±6 [152] / -0
300 [7620] < L = ±5% / -0

ALL DIMENSIONS SHOWN
ARE FOR REFERENCE ONLY.

THIRD-ANGLE PROJECTION

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SCALE N/A

REV A

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an INFINITE brand

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SIZE A | CAGE CODE 53919 | DRAWN BY BPUCHASKI | ITEM NO. PE15A5011

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