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

TECHNICAL DATA SHEET PE15A5011

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 and efficiency over 40%. The amplifier has a Wide Dynamic Range with 40 dBm typical saturated power, 43 dB typical small signal gain, ±2.0 dB gain flatness maximum. The driver amplifier requires a +32V maximum DC power supply, is unconditionally stable and includes built-in voltage regulation, bias sequencing, and reverse bias protection for added reliability. The amplifier operates over the temperature range of -20°C and +80°C.

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 and Efficiency over 40%
- 50 Ohms Input and Output Matched
- Unconditionally Stable
- Regulated Supply & Bias Sequencing
- SMA Female RF Connectors
- DC/Control Connector 7W2 D Sub

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, DC Voltage = 12Volts, DC Current = 2.8A)

Description	Minimum	Typical	Maximum	Units
Frequency Range	0.03		2.5	GHz
Small Signal Gain		43		dB
Gain Flatness			±2	dB
Input Power (CW)			+5	dBm
Pout at Sat.	+38	+40		dBm
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input Return Loss		-13		dB
Switching Speed for On/Off Switch Gate		1,000	2,000	usec
TTL Control		“1”: On, “0”: Off, Enable: 5V, Disable: 0V		
Operating DC Voltage	9	12	32	Volts
Operating DC Current			2.8	A
Operating DC Current @ 12 Volt			2.8	A
Operating DC Current @ 28 Volt			1.2	A
Operating Temperature Range	-20		+80	°C

Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: 43 dB Gain, 10 Watt Psat, 30 MHz to 2.5 GHz, High Power GaN Amplifier, SMA PE15A5011

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Mechanical Specifications

Size	
Length	3.75 in [95.25 mm]
Width	2 in [50.8 mm]
Height	0.52 in [13.21 mm]
Weight	0.699 lbs [317.06 g]
Input Connector	SMA Female
Output Connector	SMA Female
Cooling	HEATSINK REQUIRED use PE15C5013 or PE15G5011F

Environmental Specifications

Temperature	
Operating Range	-20 to +80 deg C
Storage Range	-65 to +150 deg C
Humidity	95%
Shock	MIL-STD-810F Method 516.5
Vibration	MIL-STD-810F Method 516.5
Altitude	30000

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.) Preform 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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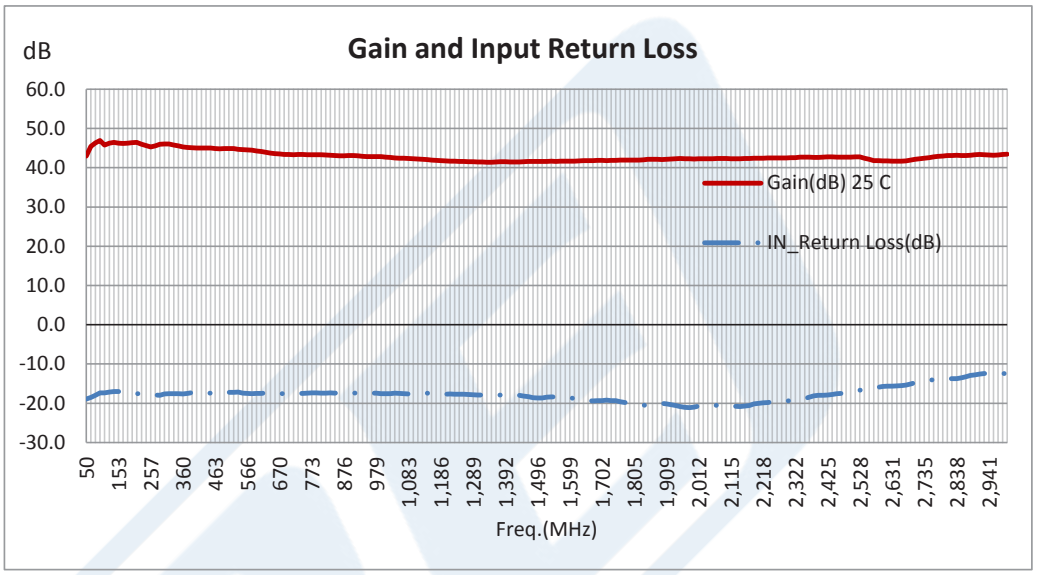
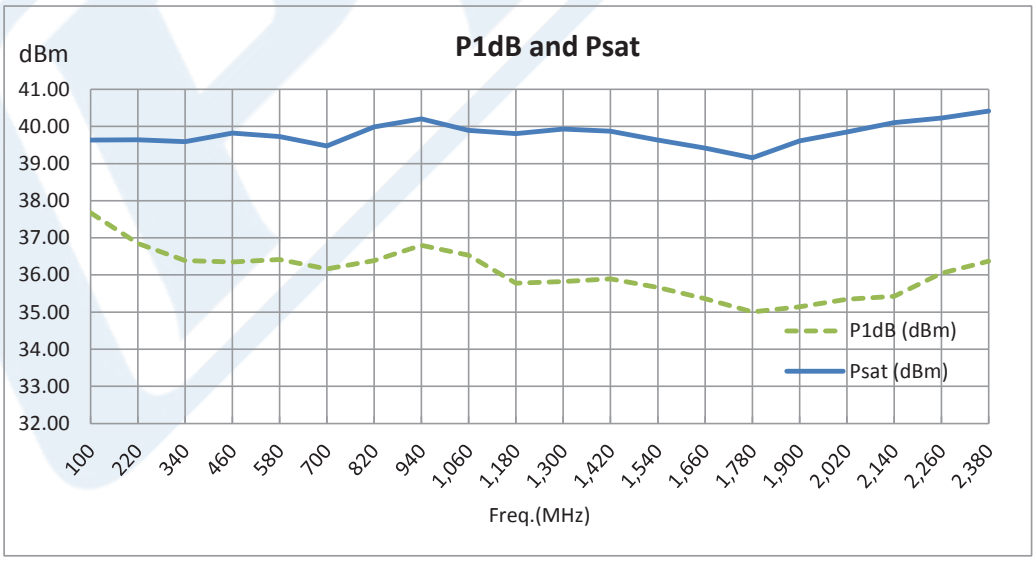
Typical Performance Data





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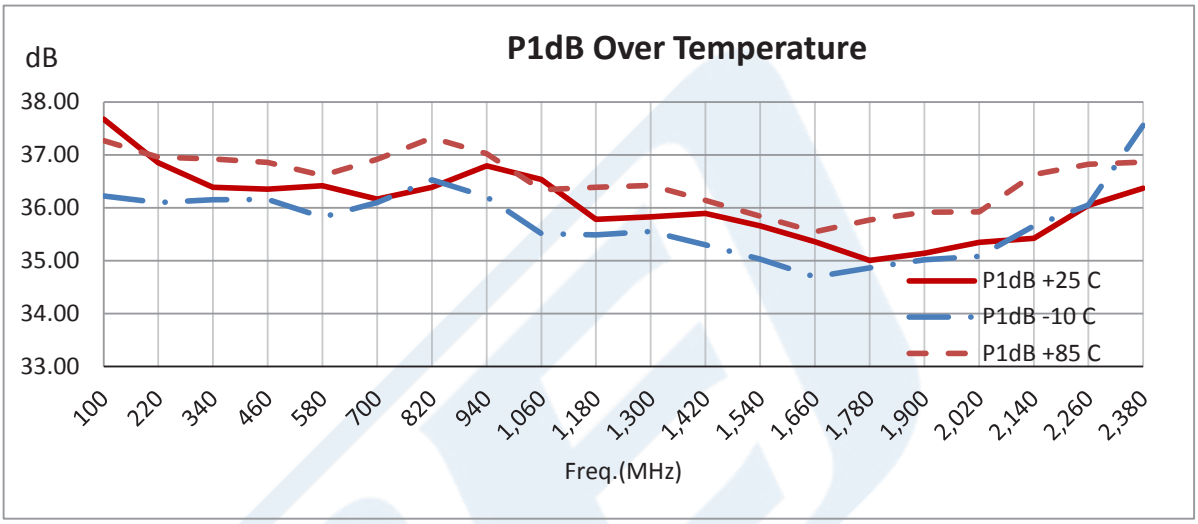

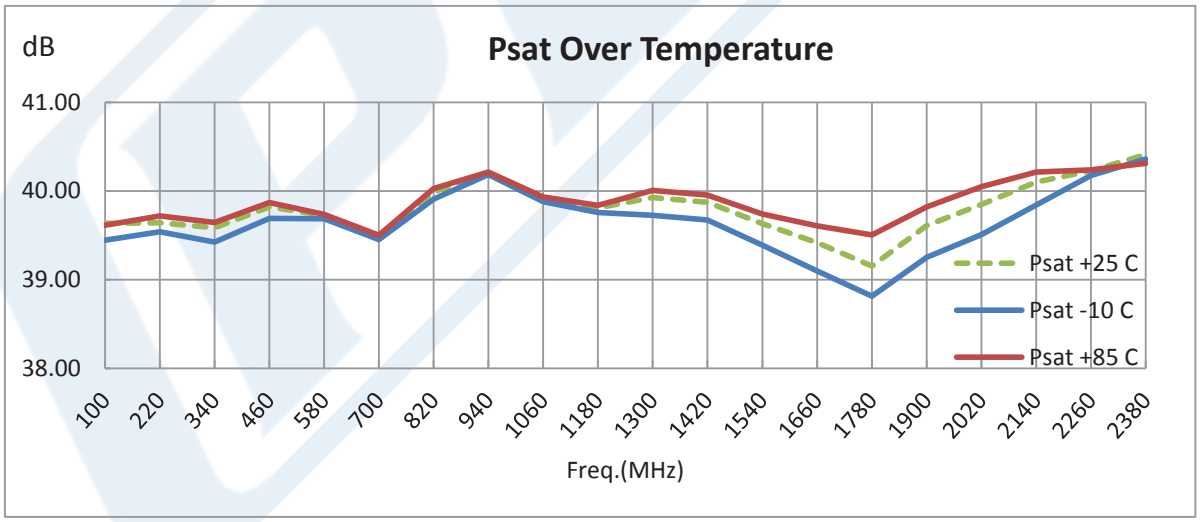

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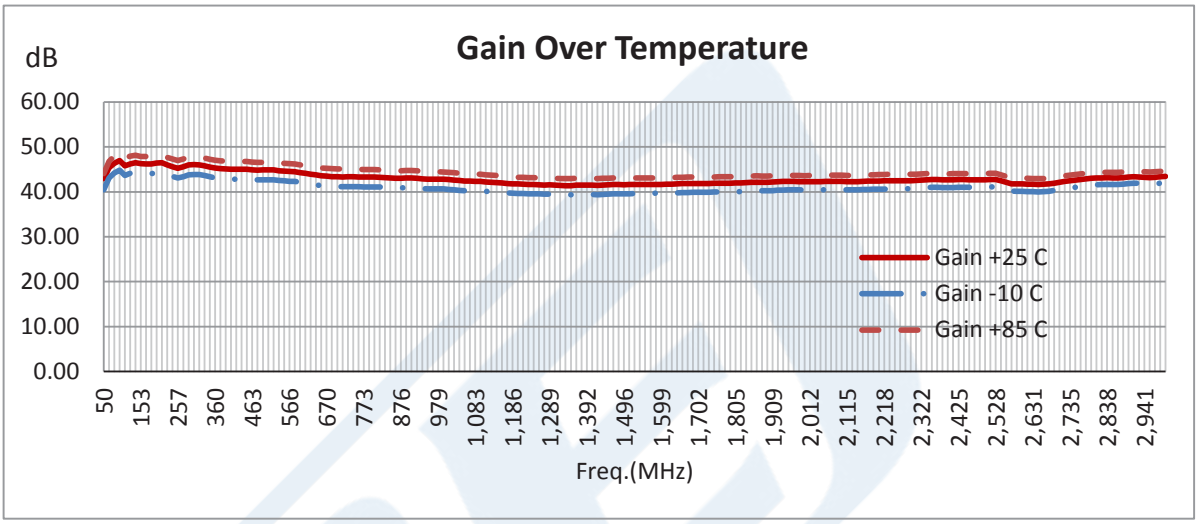

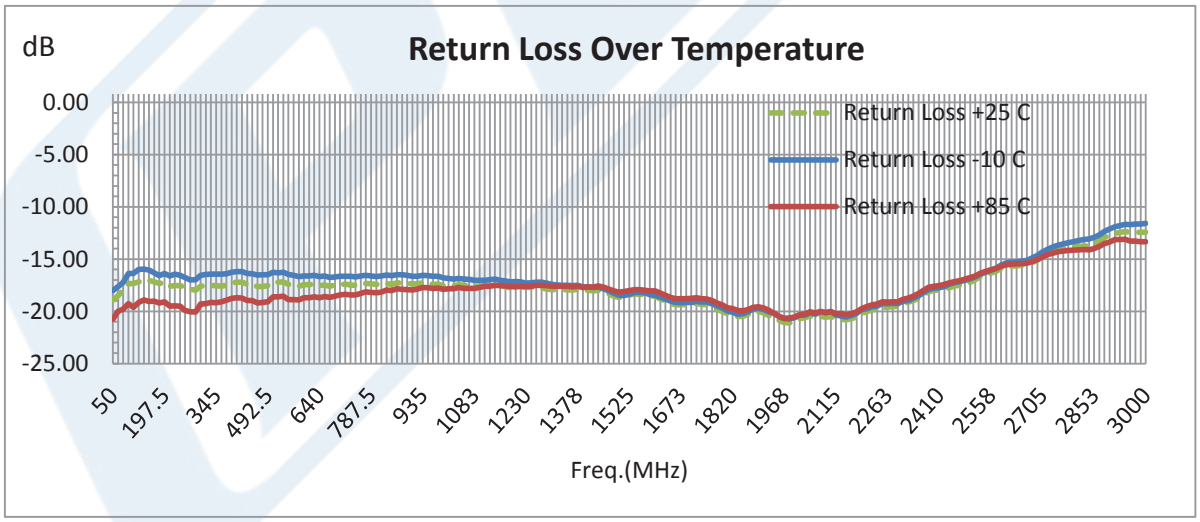

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URL: https://www.pasternack.com/43-db-gain-2.5-ghz-high-power-high-gain-amplifier-sma-pe15a5011-p.aspx

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PE15A5011 CAD Drawing

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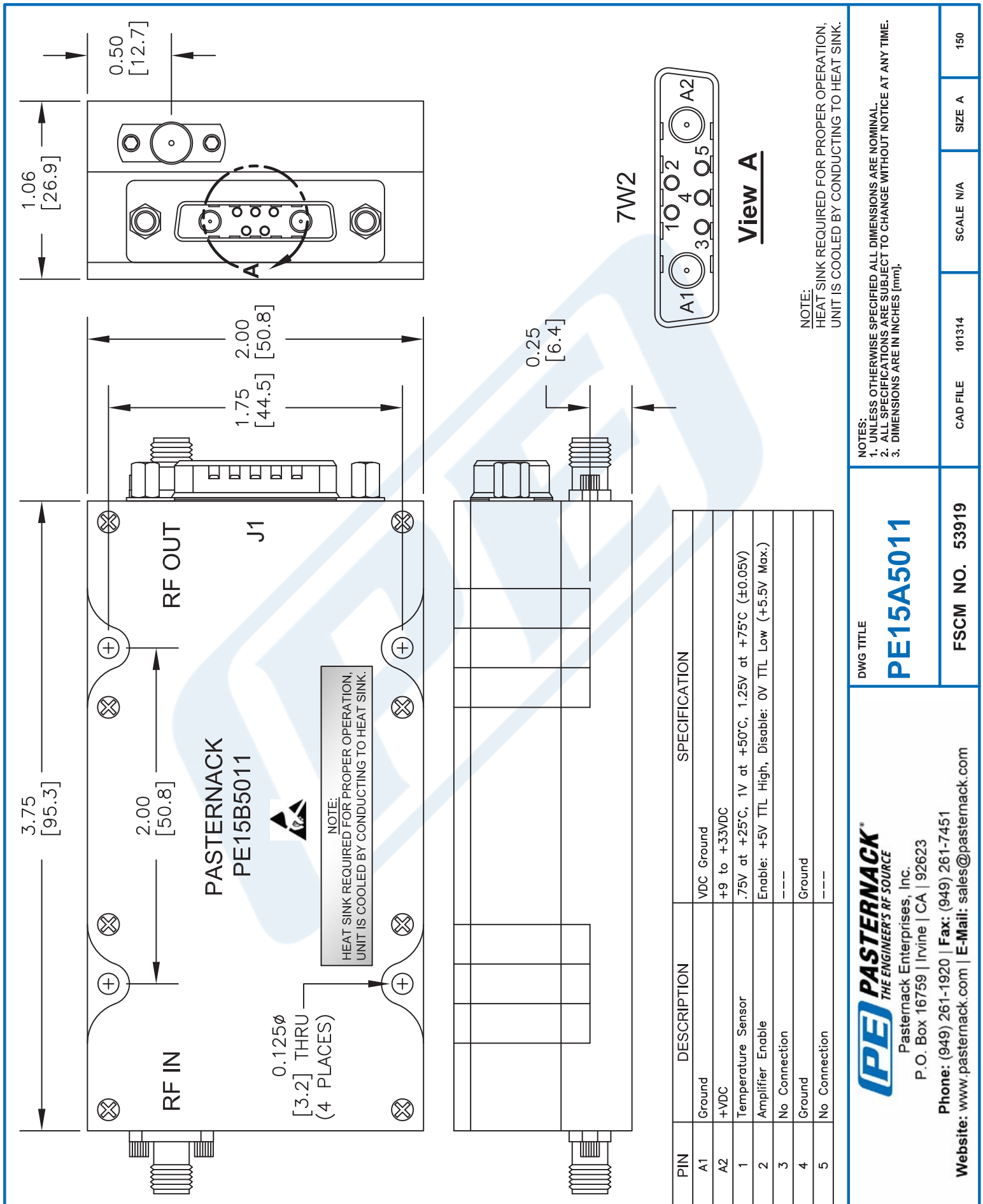

PIN	DESCRIPTION	SPECIFICATION
A1	Ground	VDC Ground
A2	+VDC	+9 to +33VDC
1	Temperature Sensor	.75V at +25°C, 1V at +50°C, 1.25V at +75°C (±0.05V)
2	Amplifier Enable	Enable: +5V TTL High, Disable: 0V TTL Low (+5.5V Max.)
3	No Connection	---
4	Ground	Ground
5	No Connection	---

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].

CAD FILE	101314	SCALE N/A	SIZE A	150

DWG TITLE: PE15A5011

FSCM NO. 53919

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