

1 Watt P1dB, 6 GHz to 12 GHz, Medium Power  
Amplifier with Heatsink, SMA, 47 dB Gain, 6.5 dB NF



## PE15A4060F

### Features

- 6 to 12 GHz Frequency Range
- P1dB 1 Watt min.
- Small Signal Gain: 40 dB min.
- Gain Flatness:  $\pm 2.5$  dB max.
- Noise Figure 6 dB max.
- 50 Ohm Input and Output Matched
- 0 to 50°C Operating Temperature
- Unconditionally Stable
- Single DC Positive Supply
- Built-in DC Voltage Regulator
- Field Replaceable SMA Female connectors
- Integrated Finned Heatsink with Cooling Fan

### Applications

- Electronic Warfare
- Electronic Countermeasures
- Radar Systems
- Telecom Infrastructure
- Test Instrumentation
- Communication Systems
- Satellite Communications
- Microwave Radio Systems
- Driver Amplifier
- High Power Output Amplifier

### Description

The PE15A4060F is a coaxial medium power amplifier with finned heatsink and cooling fan, operating in the 6 to 12 GHz frequency range. The amplifier offers 1 Watt of P1dB minimum and 47 dB small signal gain minimum, with gain flatness of  $\pm 2.5$  dB max. The Power Amplifier / Heatsink Fan assembly requires a single +12 Vdc supply using voltage and ground wires that attach to the heatsink terminal block. The Power Amplifier has an internal regulator with DC capacitors. Operational temperature range is 0°C to 50°C. The integrated design comes fully assembled and effectively maintains an adequate baseplate temperature for highly reliable operation. Additionally, the amplifier module supports field replaceable connectors and is designed to meet MIL-STD-202F environmental test conditions for Humidity, Shock, Vibration, and Altitude.

### Electrical Specifications (TA = +25°C, DC Voltage = +12Volts, DC Current = 2.66A)

Description	Min	Typ	Max	Unit
Frequency Range	6		12	GHz
Small Signal Gain	40	47		dB
Gain Flatness			$\pm 2.5$	dB
Output Power at 1 dB Compression Point	+30	+30.5		dBm
Noise Figure 1			6.5	dB
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input VSWR			2:1	
Output VSWR			2:1	
Operating DC Voltage		+12		Volts
Operating DC Current		2.66		A
Operating Temperature Range	0		+50	°C

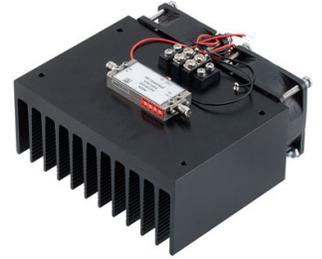
### Mechanical Specifications

#### Size

Length

5.51 in [139.95 mm]

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Width	5.1 in [129.54 mm]
Height	2.36 in [59.94 mm]
Weight	3 lbs [1.36 kg]
Input Connector	SMA Female
Output Connector	SMA Female
Bias Connector	Solder Pin
Heatsink Fin Material	6063-T5 Aluminum Alloy Black Anodine finish

### Environmental Specifications

#### Temperature

Operating Range	0 to +50 deg C
Storage Range	-40 to +100 deg C
Humidity	MIL-STD-202F, Method 103B, Condition B
Shock	MIL-STD-202F, Method 213B, Condition B
Vibration	MIL-STD-202F, Method 204D, Condition B
Altitude	MIL-STD-202F, Method 105C, Condition B

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

### Plotted and Other Data

Notes:

- Values at 25 °C, sea level
- Heatsink Included

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### Amplifier Power-up Precautions

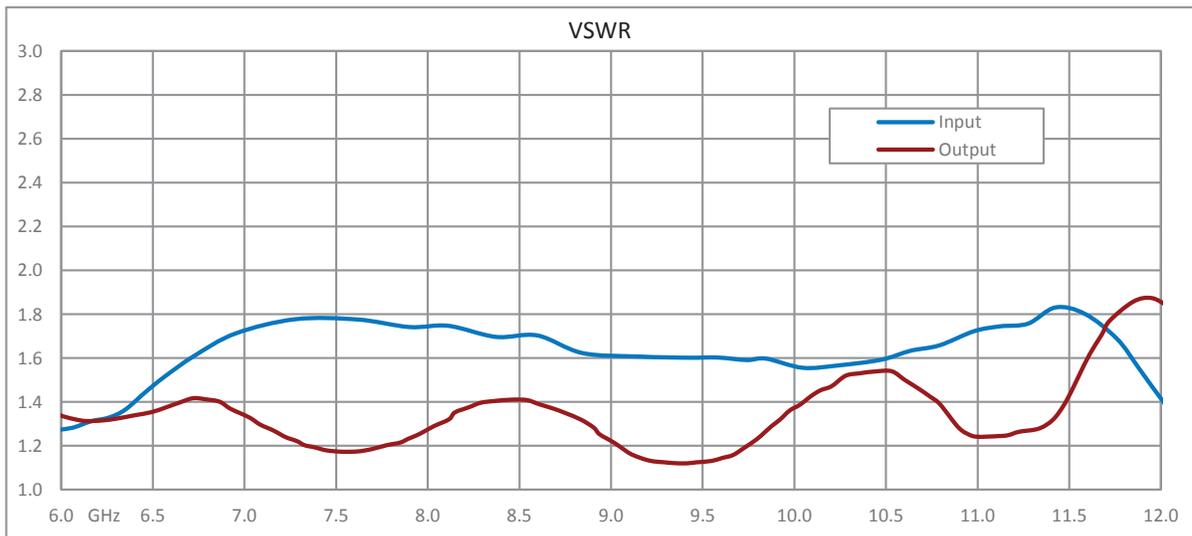
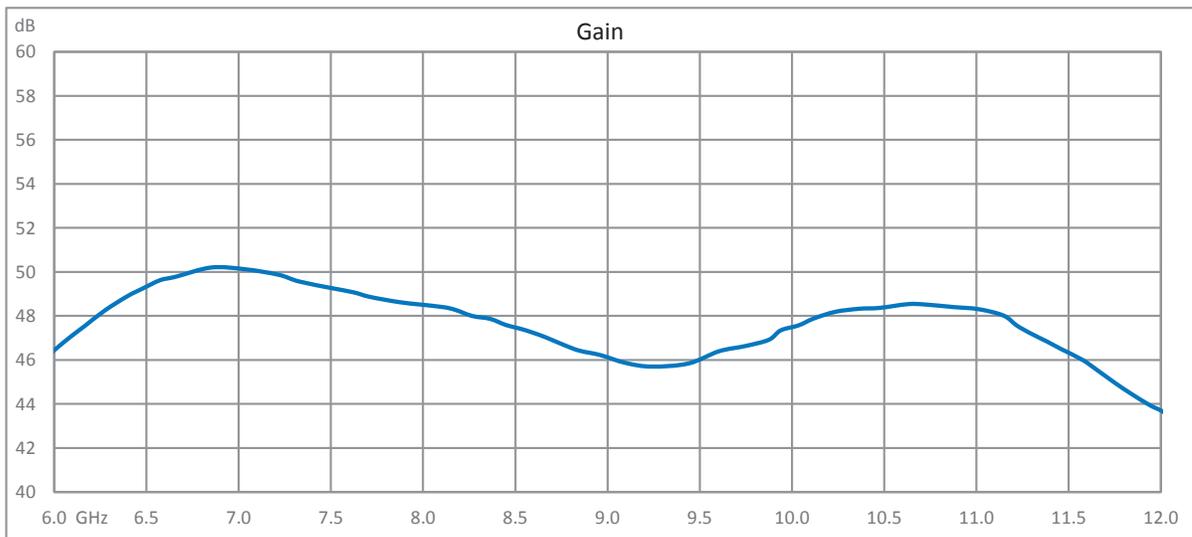
- 1.) Confirm that proper ESD precautions and controls are always in place before handling any Amplifier module.
- 2.) Confirm adequate thermal management is in place to effectively dissipate heat away from the Amplifier package. The Amplifier operational baseplate temperature must be within the operational 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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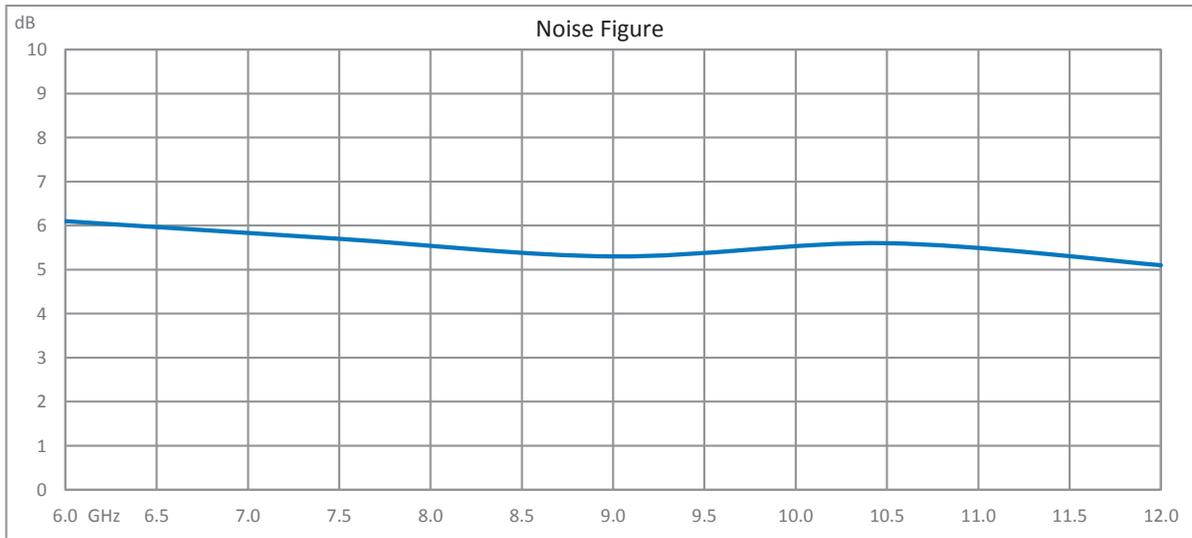
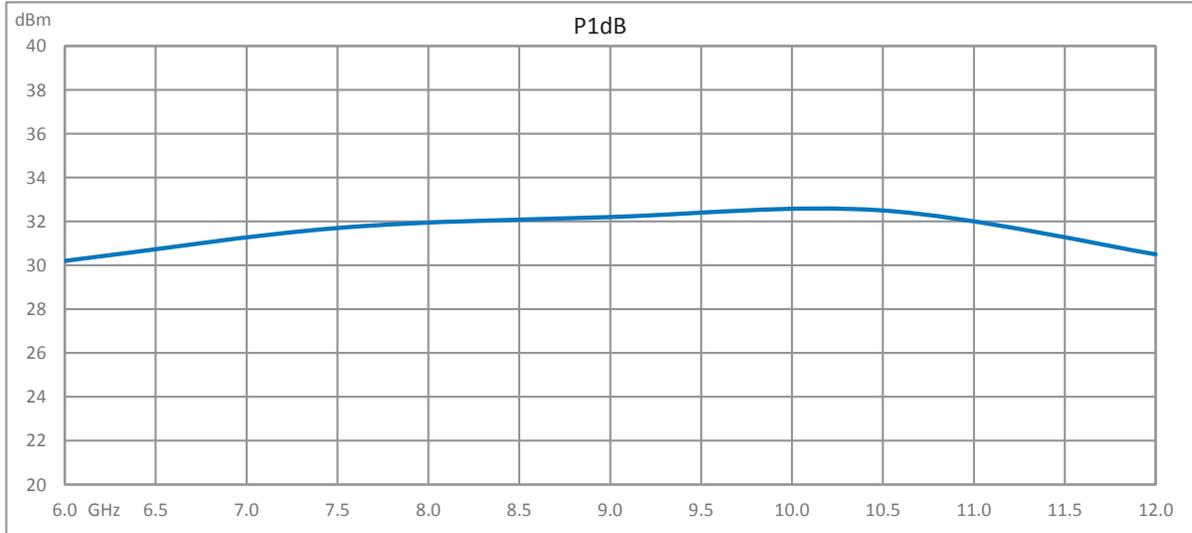
### Typical Performance Data



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1 Watt P1dB, 6 GHz to 12 GHz, Medium Power Amplifier with Heatsink, SMA, 47 dB Gain, 6.5 dB NF 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.

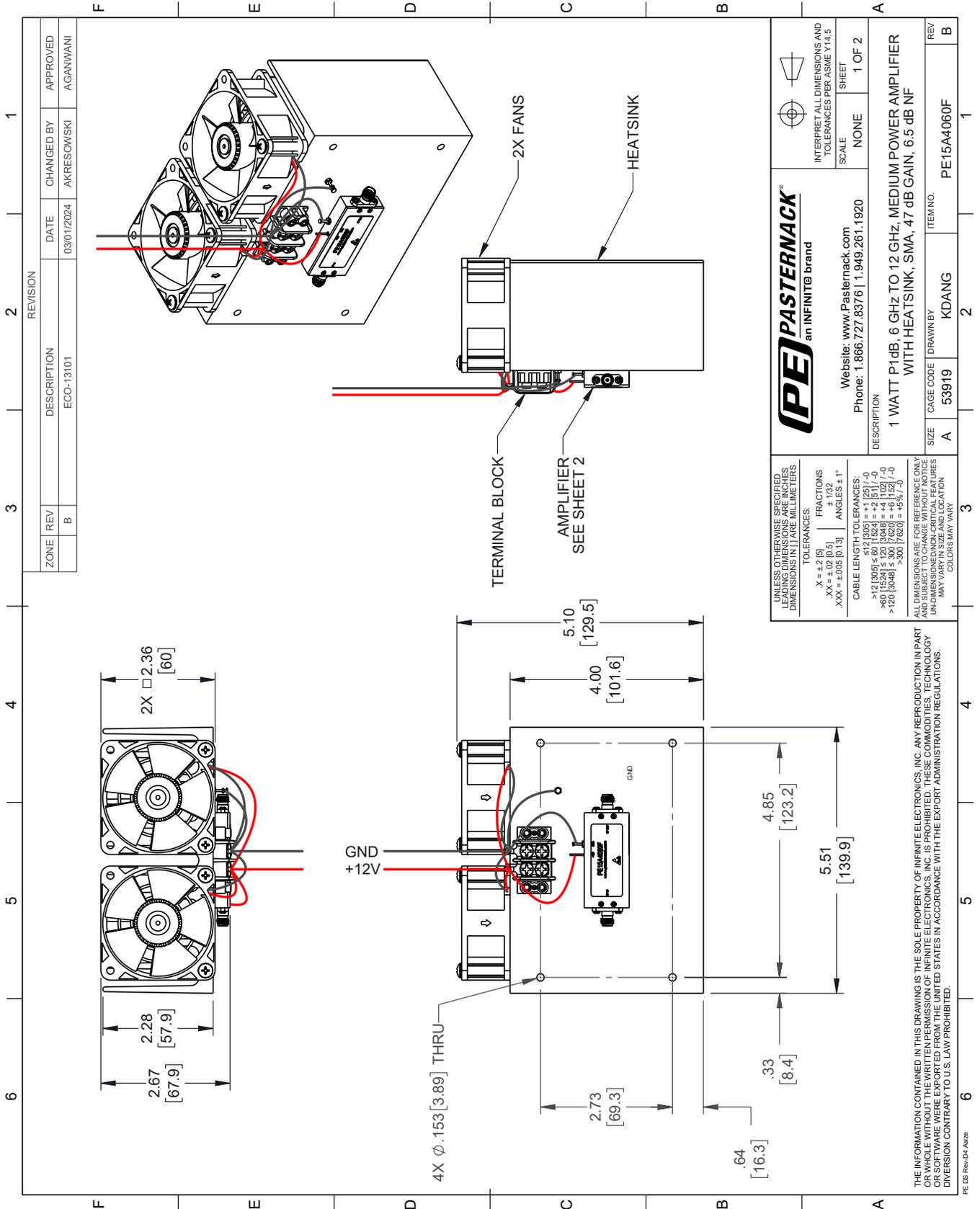
Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [1 Watt P1dB, 6 GHz to 12 GHz, Medium Power Amplifier with Heatsink, SMA, 47 dB Gain, 6.5 dB NF PE15A4060F](https://www.pasternack.com/12-ghz-medium-power-amplifier-47-db-gain-sma-pe15a4060f-p.aspx)

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# PE15A4060F CAD Drawing

1 Watt P1dB, 6 GHz to 12 GHz, Medium Power Amplifier with Heatsink, SMA, 47 dB Gain, 6.5 dB NF



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SCALE: NONE  
SHEET: 1 OF 2

INTERPRET ALL DIMENSIONS AND TOLERANCES PER ASME Y14.5

DESCRIPTION: 1 WATT P1dB, 6 GHz TO 12 GHz, MEDIUM POWER AMPLIFIER WITH HEATSINK, SMA, 47 dB GAIN, 6.5 dB NF

ITEM NO: PE15A4060F

SIZE: A  
CAGE CODE: 53919  
DRAWN BY: KDANG

REVISION: B

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

TOLERANCES:  
 .X = ±.2 [5]  
 .XX = ±.02 [0.5]  
 .XXX = ±.005 [0.13]  
 FRACTIONS: ±.1/32  
 ANGLES: ±1°

CABLE LENGTH TOLERANCES:  
 <12 [305] ≤ 60 [1524] = ±.1 [25] / -0  
 >60 [1524] ≤ 120 [3048] = ±.4 [102] / -0  
 >120 [3048] ≤ 300 [7620] = ±.6 [15] / -0  
 >300 [7620] = ±.6 [15] / -0

ALL DIMENSIONS ARE FOR REFERENCE ONLY. UNDIMENSIONED NON-CRITICAL FEATURES MAY VARY IN SIZE AND LOCATION. COLORS MAY VARY.

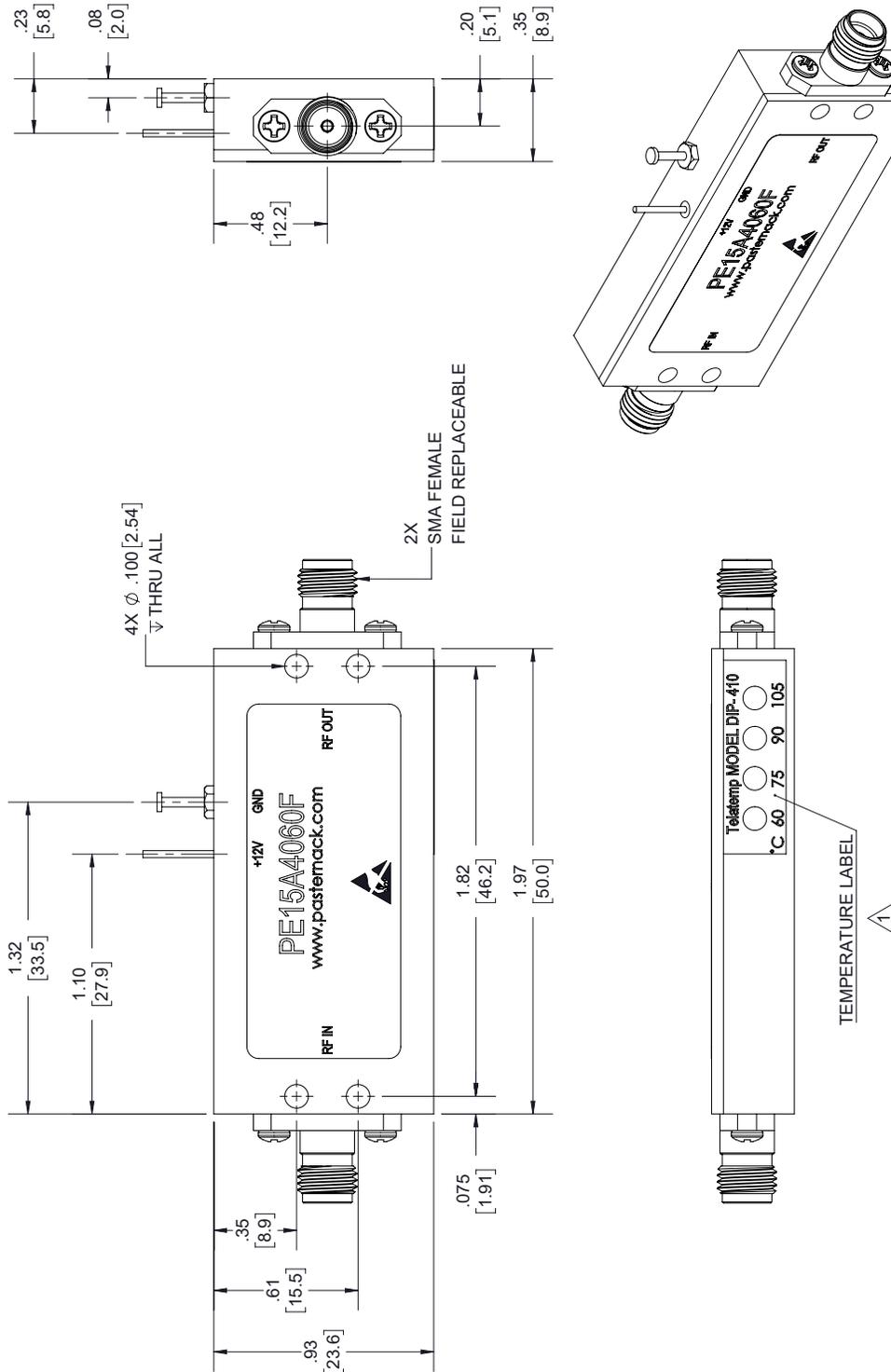
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PE DS Rev-D4 Add2

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## AMPLIFIER DETAIL



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TOLERANCES: X±.2 [5.08] FRACTIONS .XX±.01 [.25] ±1/32 .XXX±.005 [.13] ANGLES ±1°		SHEET 2 OF 2	
ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.		SCALE N/A	
THIRD-ANGLE PROJECTION	SIZE [CAGE]	DRAWN BY	REV
	A 53919	K.DANG	A
		PART NUMBER	PE15A4060F

NOTE:  
1. WARRANTY VOID IF REMOVED.

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