



6.5 dB NF, 16 dBm Psat, 2 GHz to 18 GHz, Low Phase Noise Amplifier 12.5 dB Gain, SMA

TECHNICAL DATA SHEET

PE15A1030

The PE15A1030 is a low phase noise amplifier that operates across the frequency range from 2 GHz to 18 GHz. The design utilizes leading edge GaAs HBT MMIC technology and exhibits ultra low phase noise of -160 dBc/Hz @ 10 kHz offset frequency. The design also exhibits high dynamic range with typical performance that includes 12.5 dB of small signal gain, 6.5 dB noise figure, up to +13 dBm of output power at P1dB, +20 dBm output IP3, while using a +5V single DC supply. The wideband distributed amplifier design input/output ports are internally matched to 50 ohms and are DC blocked. The drop-in package is hermetically sealed with field replaceable SMA connectors and has an operating temperature range of -55°C to +85°C. And for added confidence, this rugged package assembly is designed to meet MIL-STD-883 test conditions for Hermeticity and Temperature Cycle.

Features

- Low Phase Noise Amplifier
- Wide frequency band
- Highly Linear GaAs HBT MMIC Technology
- Phase Noise -160 dBc/Hz @ 10KHz offset
- Gain 12.5 dB typ
- Output IP3 +20 dBm
- P1dB up to +13 dBm
- Hermetically Sealed Module
- Mil Spec Compliant
- Field Replaceable SMA Connectors
- -55°C to +85°C Operating Temperature

Applications

- Electronic Warfare
- Microwave Radio
- VSAT
- Radar
- Space Systems
- Test Instrumentation
- Telecom Infrastructure

Electrical Specifications (TA = +25°C, DC Voltage = 5Vdc, DC Current = 80mA)

Description	Minimum	Typical	Maximum	Units
Frequency Range	2		18	GHz
Small Signal Gain		12.5		dB
Output at 1 dB Compression Point		+13		dBm
Saturated Output Power (Psat)		+16		dBm
Noise Figure		6.5		dB
Operating DC Voltage		5		Volts
Operating DC Current		80		mA
Operating Temperature Range	-55		+85	°C

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Performance by Frequency

Description	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range		8 - 12.5		2 - 18			GHz
Gain	10.5	13.5		9.5	12.5		dB
Gain Flatness		±1.2			±2.2		dB
Gain Variation Over Temperature		0.021			0.027		dB/ °C
Noise Figure		4.5			6.5		dB
Input Return Loss		18			16		dB
Output Return Loss		17			15		dB
Output Power For 1 dB Compression (P1dB)	13	15		8	13		dBm
Saturated Output Power (Psat)		18.5			16		dBm
Output Third Order Intercept (IP3)		22.5			20		dBm
Phase Noise @ 100 Hz		-140			-150		dBc/Hz
Phase Noise @ 1 KHz		-150			-150		dBc/Hz
Phase Noise @ 10 KHz		-160			-150		dBc/Hz
Phase Noise @ 1 MHz		-165			-160		dBc/Hz
Supply Current		80	104		80	104	mA

Mechanical Specifications

Size

Length 0.64 in [16.26 mm]
 Width 0.7 in [17.78 mm]
 Height 0.29 in [7.37 mm]

Weight 0.055 lbs [24.95 g]

Connector Option Field Replaceable
 Input Connector SMA Female
 Output Connector SMA Female

Environmental Specifications

Temperature

Operating Range -55 to +85 deg C
 Storage Range -65 to +150 deg C

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Temperature Cycling
Hermetic Seal

ESD Sensitivity



MIL-STD-883, Method 101C, Cond B
Gross Leak MIL-STD-883 Method 1014C1/Fine Leak
MIL-STD-883, Method 1014A2, 5 x 10-8 atm cc
ESD Sensitive Material, Transport material in Approved
ESD bags. Handle only in ESD Workstation.

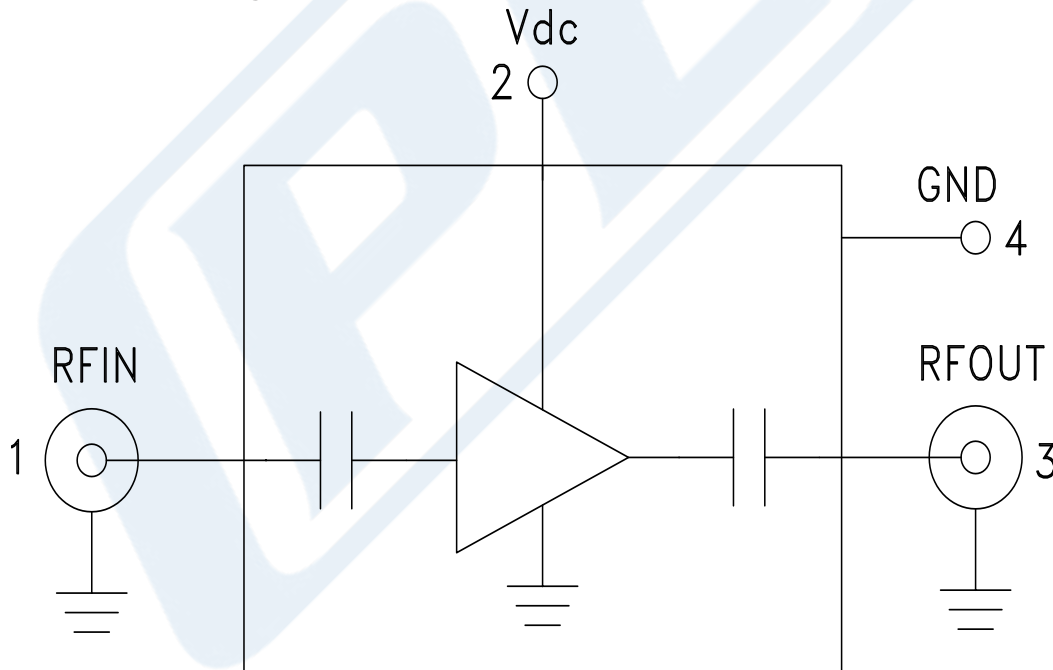
Compliance Certifications (see [product page](#) for current document)

Plotted and Other Data

Notes:

- Values at +25 °C, sea level

Functional Block Diagram



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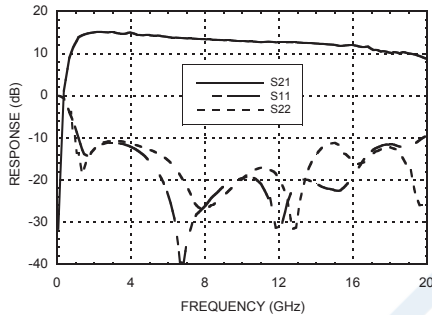
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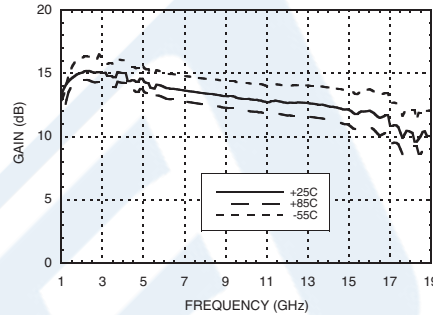
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Typical Performance Data

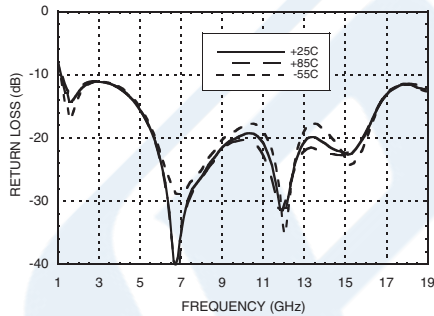
Gain & Return Loss



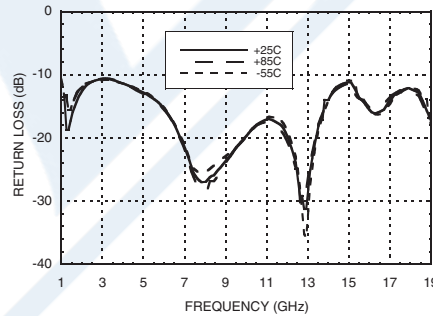
Gain vs. Temperature



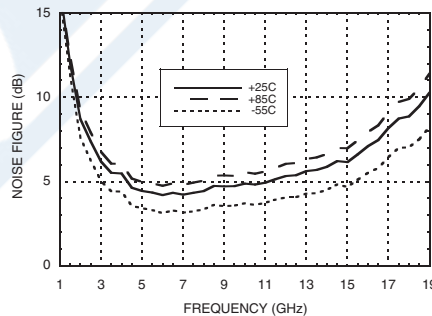
Input Return Loss vs. Temperature



Output Return Loss vs. Temperature



Noise Figure vs. Temperature



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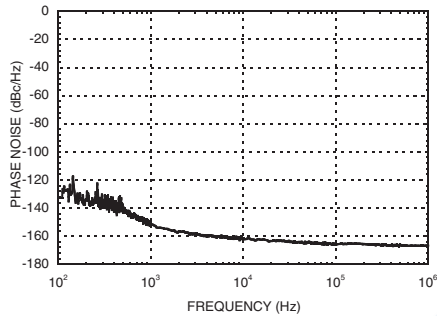


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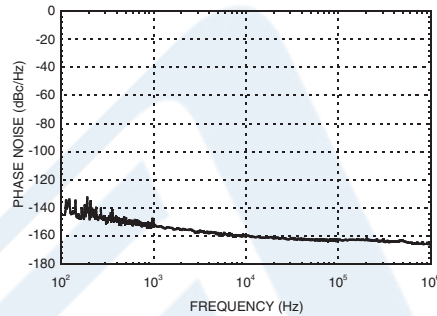
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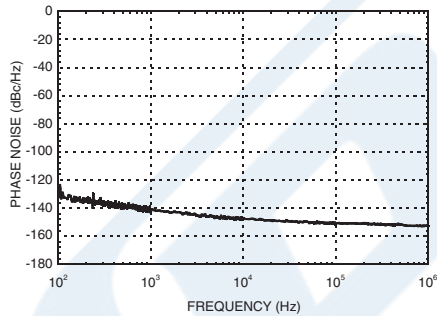
Phase Noise at Psat @ 2 GHz



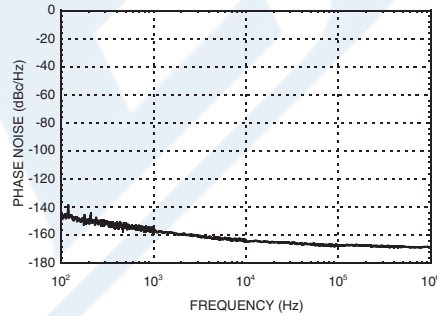
Phase Noise at Psat @ 12 GHz



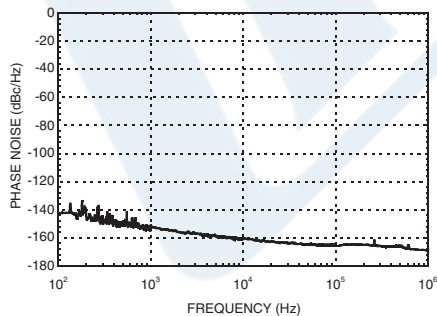
Phase Noise at Psat @ 18 GHz



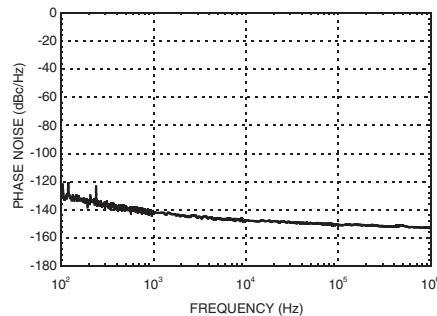
Phase Noise at P1dB @ 2 GHz



Phase Noise at P1dB @ 12 GHz



Phase Noise at P1dB @ 18 GHz



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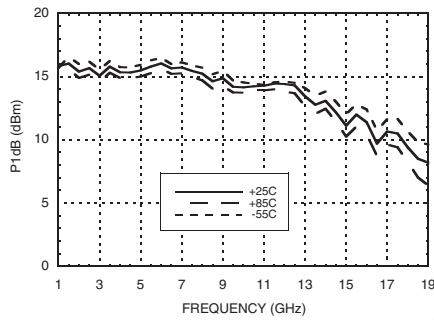


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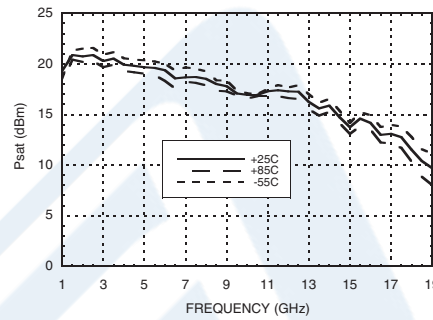
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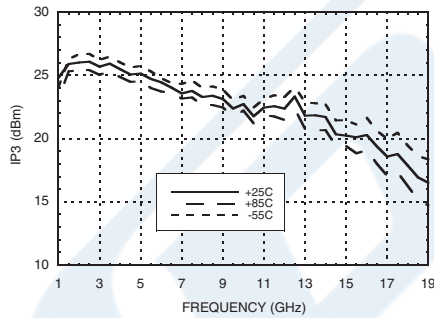
P1dB vs. Temperature



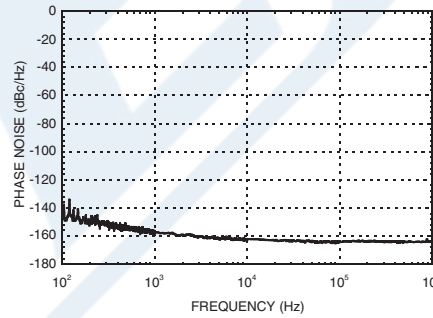
Psat vs. Temperature



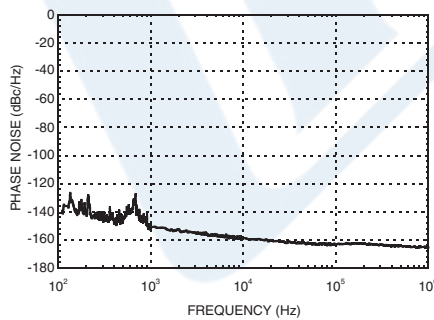
Output IP3 vs. Temperature



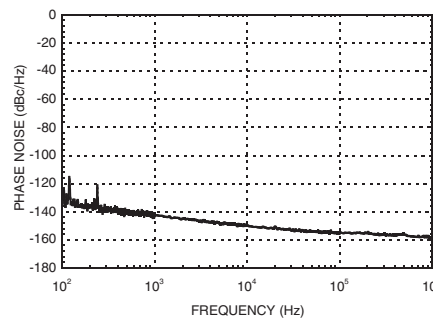
Phase Noise at Pout = 0 dBm @ 2 GHz



Phase Noise at Pout = 0 dBm @ 12 GHz



Phase Noise at Pout = 0 dBm @ 18 GHz



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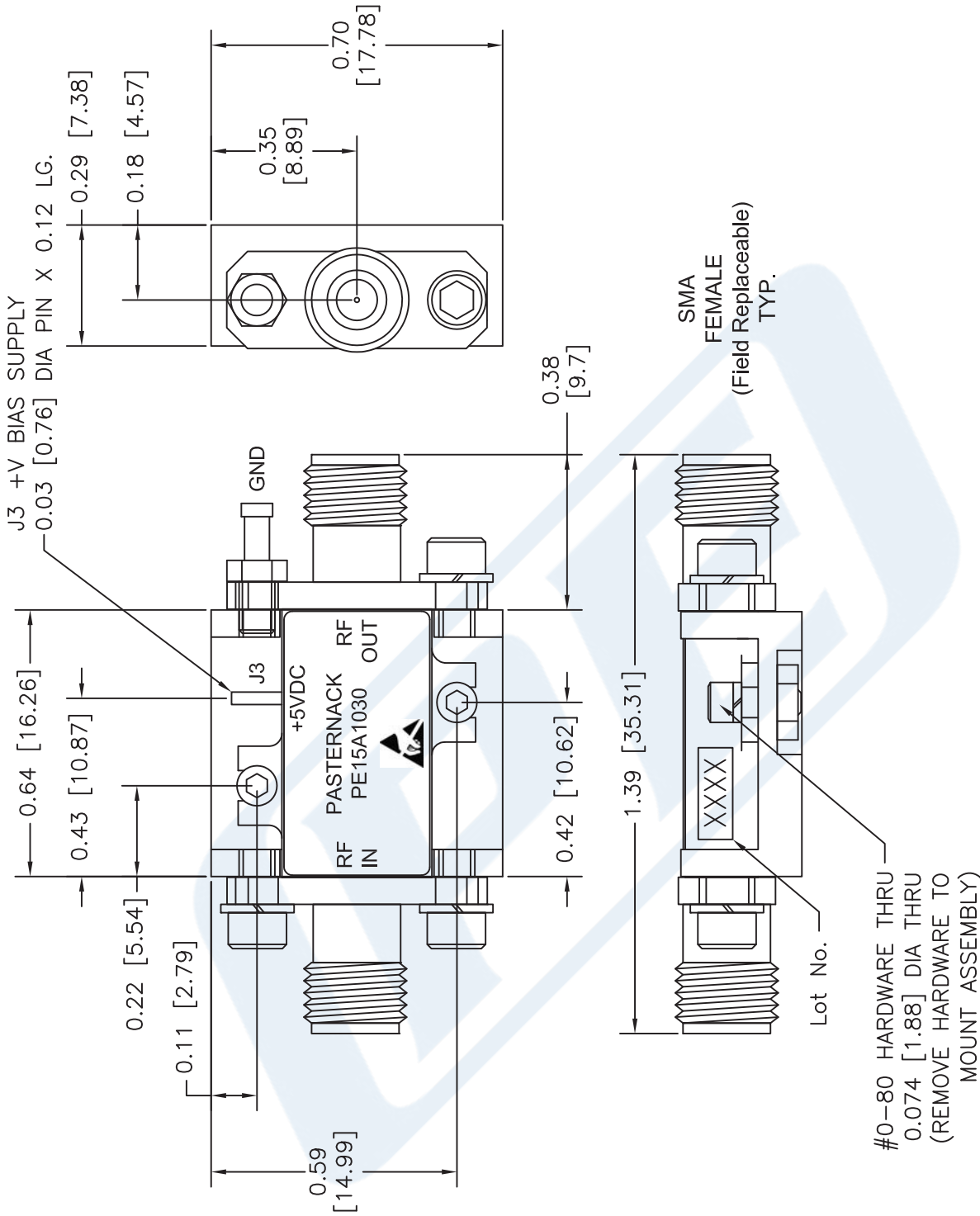
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PE15A1030 CAD Drawing

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

DWG TITLE

PE15A1030

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].

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FSCM NO. 53919

CAD FILE 051016

SCALE N/A

SIZE A

2233