



43 dB Gain, 3 Watt P1dB, 14.4 GHz to 15.4 GHz, Medium Power Amplifier, SMA Input, SMA Output, 41 dBm IP3

TECHNICAL DATA SHEET

PE15A5021

PE15A5021 is a 3 Watt Ku Band high gain power coaxial amplifier operating in the 14.4 to 15.4 GHz frequency range. The amplifier offers 40 dBm min of saturated power, 43 dB typical small signal gain with the gain flatness of ± 2.0 dB typical and provides a high OIP3 of 41 dBm typical. This excellent technical performance is achieved through the use of hybrid MIC design, advanced GaAs devices and is ideal for High Data Rate Communications, Pulsed Applications including Radar, and Medical and Laboratory Applications. The amplifier requires a +15V DC typical power supply. The connectorized SMA module is unconditionally stable and includes built-in voltage regulation, load VSWR protection, low and high Bias Protection and 1 reverse bias protection. The amplifier operates over the temperature range of -20°C and $+85^{\circ}\text{C}$.

Features

- 14.4 GHz to 15.4 GHz Frequency Range
- P1dB 3 Watt typ
- Small Signal Gain: 43 dB typ
- Gain Flatness: ± 0.5 typical
- OIP3 41 dBm typ
- 50 Ohms Input and Output Matched
- Unconditionally Stable
- Regulated Supply & Bias Sequencing
- Overvoltage Protection
- Low and High Bias Protection
- Load VSWR Protection

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 = $+25^{\circ}\text{C}$, DC Voltage = 15Volts)

Description	Minimum	Typical	Maximum	Units
Frequency Range	14.4		15.4	GHz
Small Signal Gain		43		dB
Gain Flatness		± 0.5		dB
Output Power at 1 dB Compression Point	+34	+34.8		dBm
Output 3rd Order Intercept Point		+41		dBm
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input Return Loss		-13	-10	dB
Rise/Fall Time		<1		usec
Operating DC Voltage	12	15	36	Volts
Quiescent Current		30		mA
Operating Current at 2W CW		1.5		A
Operating Temperature Range	-10		+85	$^{\circ}\text{C}$

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Protections

Description	Value
Max RF Input	+10 dBm
Load VSWR @ 3 Watts	∞ at all amplitudes / phase angles
Over Voltage	Unit will shut down if input voltage exceeds +36 VDC
Under Voltage	Unit requires a minimum of +9 VDC to enable. Unit will also shut down if VDC falls below +9 V during operation.
True Reverse	Unit will not enable and will not draw current if +VDC and Ground are reversed ³

3. Current may be drawn if the +VDC is tied to chassis ground. Current will not go through the unit.

Mechanical Specifications

Size

Length	3.25 in [82.55 mm]
Width	2.25 in [57.15 mm]
Height	0.5 in [12.7 mm]
Weight	0.396 lbs [179.62 g]
Input Connector	SMA Female
Output Connector	SMA Female

Environmental Specifications

Temperature

Operating Range	-10 to +85 deg C
Storage Range	-55 to +100 deg C
Humidity	95
Altitude	up to 30,000 ft

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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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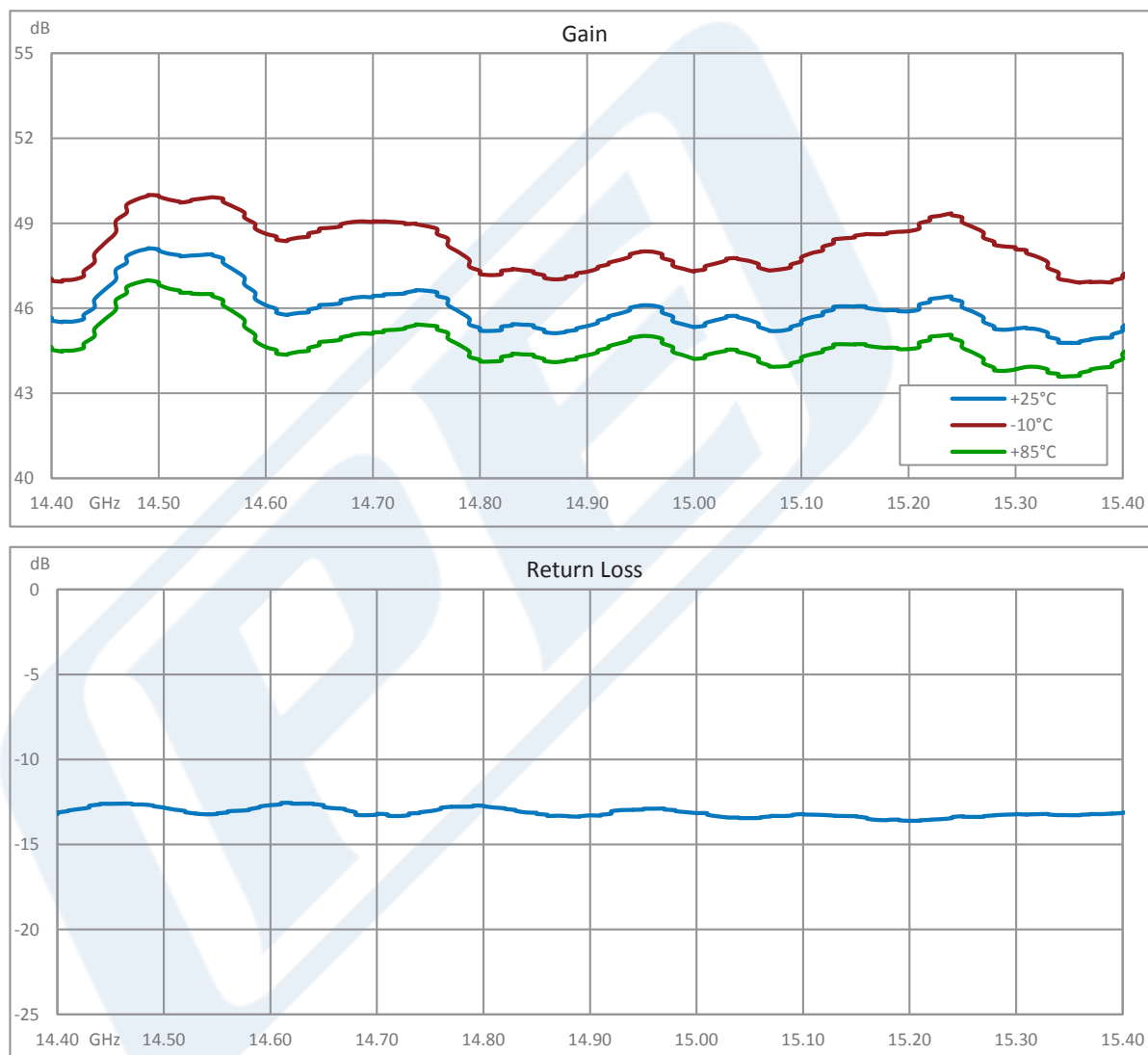


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Typical Performance Data



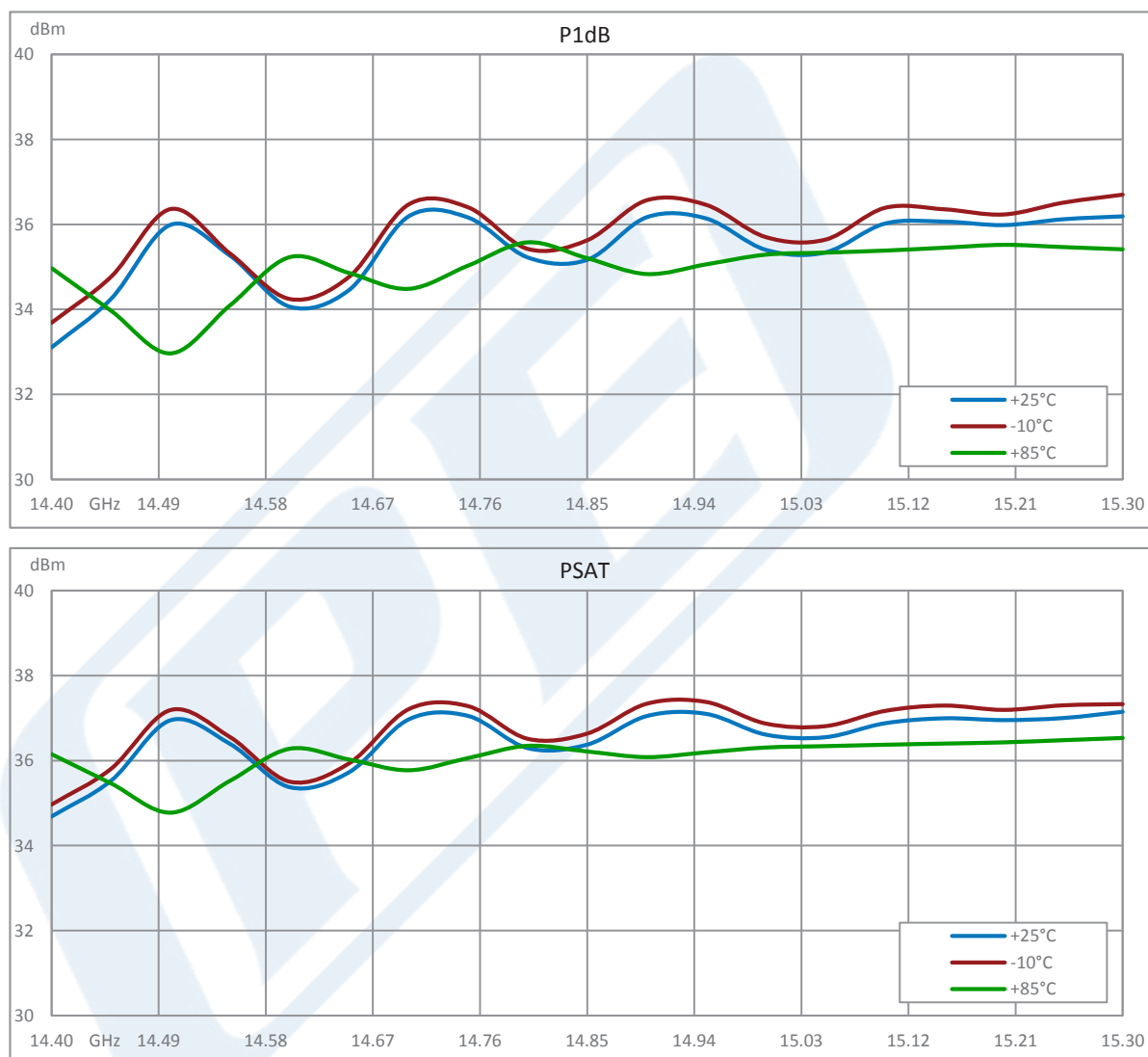
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