PASTERNACK
an INFINITE brand

VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA

TECHNICAL DATA SHEET PE15B5007

The PE15B5007 is a Class AB high power Bi-Directional Amplifier that operates in VHF/UHF bands from 225 MHz to 512 MHz. This amplifier generates 16 watts typical Psat (4W linear) RF output power to boost performance of datalinks and transmitters. The design is highly efficient with 35% efficiency and the small form factor package is ideal for size, weight, and power (SWaP) constrained applications used in broadband RF telemetry, tactical communication, electronic warfare, and unmanned aircraft and ground systems, as well as software defined radios. Impressive typical performance includes 36 dB of transmit gain, 15 dB of receive gain, 8 µsec switching speed, and harmonic suppression of -13 dBc. Operating voltage is +28 Vdc with 1.6A of DC current. Additional features include manual T/R control, single power supply, and overvoltage protection. For TTL logic on/off control, transmit mode uses 0V or ground and receive mode uses N/C or +5V. The rugged Mil-Grade assembly supports female SMA RF input/output connectors and a micro-D 9 pin socket command control connector with an accessory cable assembly included. The operating baseplate temperature range is -40°C to +85°C and the unit is guaranteed to withstand up to 95% relative humidity, altitude levels up to 30,000 ft, and random vibration and shock profiles (see chart below). Pasternak also offers an accessory Harmonic filter option, model PEHFL0001 that can be used at the output of the PE15B5007 power amplifier. This lowpass RF filter covers 2.5 GHz to 6 GHz and has low insertion loss with power handling up to 50W and specifically designed to reduce harmonics at the output of transmitters operating at up through C-Band and offers rejection levels of greater than 20 dB from 8 GHz to 10 GHz. The filter is offered in a miniature SMA connectorized package.

Features

- Bi-Directional GaN High Power Amplifier
- 16W Psat (4W Liner) Output Power
- VHF/UHF Band Class AB Design
- Frequency Range: 225 MHz to 512 MHz
- 36 dB Transmit Gain
- 15 dB Receive Gain
- Manual T/R Control
- Switching Speed 8 usec
- PAE: 35%
- +5V TTL Logic Control
- Small Form Factor Rugged Mil-Grade Package
- 50 Ohm Design
- Female SMA RF Connectors
- +28Vdc @ 1.6A DC Current
- -40°C to +85°C Operating Baseplate Temperature
- Output Harmonic Filter Accessory Option

Applications

- Unmanned Aircraft (UAS) Group 2 &3
- Unmanned Ground Vehicles (UGV)
- RF Telemetry
- RF Communications Systems
- Software Defined Radios
- Data Links
- Transmitters
- Test & Measurement
- Telecom Infrastructure

Electrical Specifications (TA = +25°C, DC Voltage = 28Volts DC Current = 1.6A)

Transmit

Description	Minimum	Typical	Maximum	Units
Frequency Range	225		512	MHz
Output Power (Linear) *		4		Watts
Psat Output Power		16		Watts
RF Input Power		+5	+10	dBm
Gain Flatness			±0.75	dB
Gain Flatness Over Temperature		1		dB
2nd Harmonics			-13	dBc
Spurious			-50	dBc

Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA PE15B5007

Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
Phone: (866) 727-8376 or (949) 261-1920 • **Fax:** (949) 261-7451
Sales@Pasternack.com • Techsupport@Pasternack.com

PASTERNACK
an INFINITE brand

VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA

TECHNICAL DATA SHEET PE15B5007

Operating DC Voltage	10	28	32	Volts
Current Draw		1.6	2.5	A
Quiescent Current (biased)		340		mA
Switching Time		8	10	uSec
Efficiency		35		%
Output Mismatch VSWR			10:1	
Input VSWR		2:1		

*-33 dBc ACLR, PIN = 5 dBm

Receive

Description	Minimum	Typical	Maximum	Units
1 dB Compression Point		+3		dBm
Gain		15		dB
Gain Flatness			±0.5	dB
Noise Figure		2.5		dB
Current Draw		175	200	mA

Protections

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current @ 10 VDC	7.0	A
Max Device Current @ 28 VDC	2.75	A
Max Device Current @ 32 VDC	2.5	A
Max RF Input Power @ ANT Port, Z_L = 50 Ω	+30	dBm
Max RF Input Power @ XCVR Port, Z_L = 50 Ω	+20	dBm
Max Operating Temperature (baseplate)	85	°C
Max Storage Temperature	100	°C

ESD Sensitive Material, Transport material in Approved ESD bags. Handle only in approved ESD Workstation.

Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA PE15B5007

Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
Phone: (866) 727-8376 or (949) 261-1920 • **Fax:** (949) 261-7451
Sales@Pasternack.com • Techsupport@Pasternack.com

PASTERNACK
an INFINITE brand

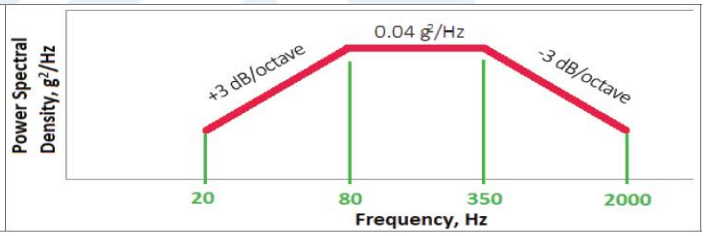
VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA

TECHNICAL DATA SHEET PE15B5007

Mechanical Specifications

Size	
Length	2.34 in [59.44 mm]
Width	2.34 in [59.44 mm]
Height	0.7 in [17.78 mm]
Weight	0.2 lbs [90.72 g]
RF Connector (Input)	SMA Female
RF Connector (Output)	SMA Female
DC Connector	Micro-D, 9-Pin Socket

Environmental Specifications

Vibration / Shock Profile (Random profile in x,y, z axis, as per Figure for 15 minute duration in each axis)	

Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA PE15B5007

Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
Phone: (866) 727-8376 or (949) 261-1920 • **Fax:** (949) 261-7451
Sales@Pasternack.com • Techsupport@Pasternack.com

VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA

Temperature	
Operating Range	-40 to +85 deg C
Storage Range	-55 to +85 deg C
Humidity	95%
Altitude	MIL-STD-810F Method 5004

Compliance Certifications (see product page for current document)

Plotted and Other Data

Notes:

- Values at +25 °C, sea level

Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA PE15B5007

Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
Phone: (866) 727-8376 or (949) 261-1920 • **Fax:** (949) 261-7451
Sales@Pasternack.com • Techsupport@Pasternack.com

VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA

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.

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA PE15B5007

Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
Phone: (866) 727-8376 or (949) 261-1920 • **Fax:** (949) 261-7451
Sales@Pasternack.com • Techsupport@Pasternack.com

PASTERNACK
an INFINITE brand

VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA

TECHNICAL DATA SHEET PE15B5007

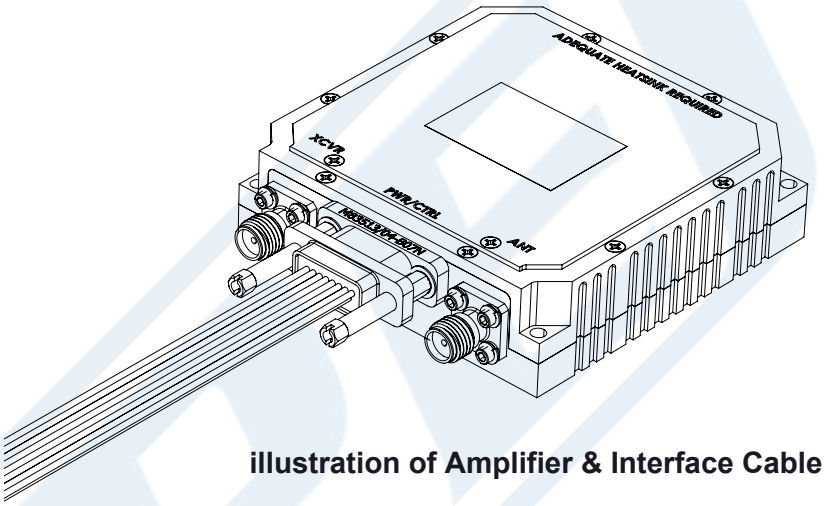


illustration of Amplifier & Interface Cable

Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA PE15B5007

Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
Phone: (866) 727-8376 or (949) 261-1920 • **Fax:** (949) 261-7451
Sales@Pasternack.com • Techsupport@Pasternack.com

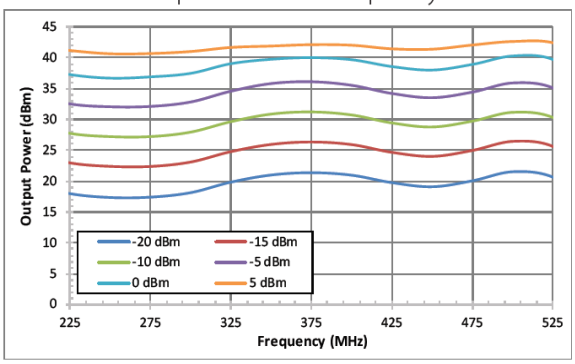
PASTERNACK
an INFINITE brand

VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA

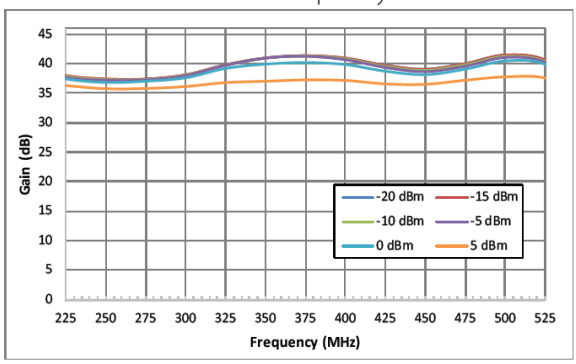
TECHNICAL DATA SHEET PE15B5007

Typical Performance Data

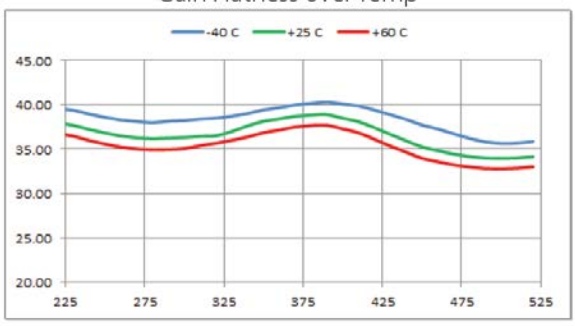
Output Power vs. Frequency



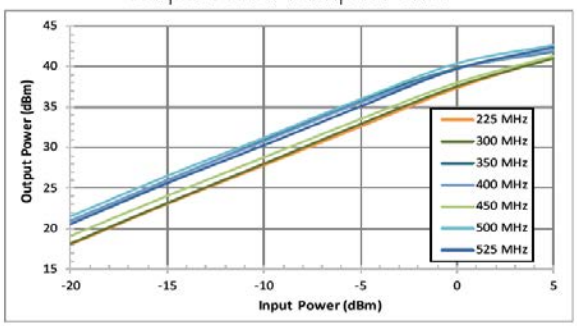
Gain vs. Frequency



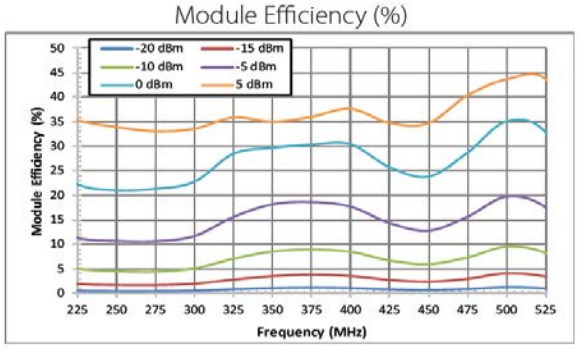
Gain Flatness over Temp



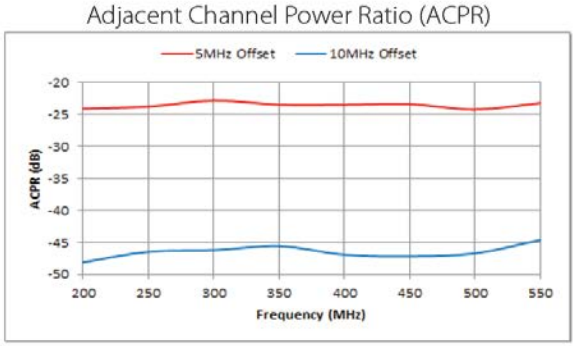
Output Power vs. Input Power



Module Efficiency (%)



Adjacent Channel Power Ratio (ACPR)



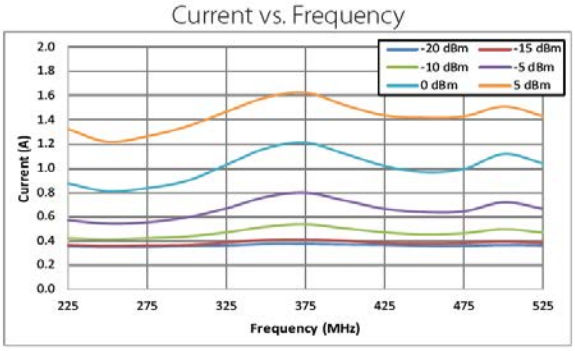
Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA PE15B5007

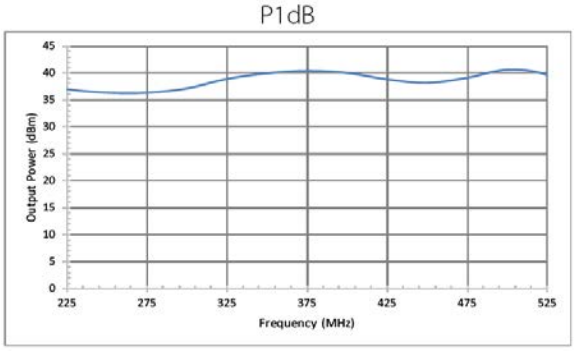
Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
Phone: (866) 727-8376 or (949) 261-1920 • **Fax:** (949) 261-7451
Sales@Pasternack.com • Techsupport@Pasternack.com

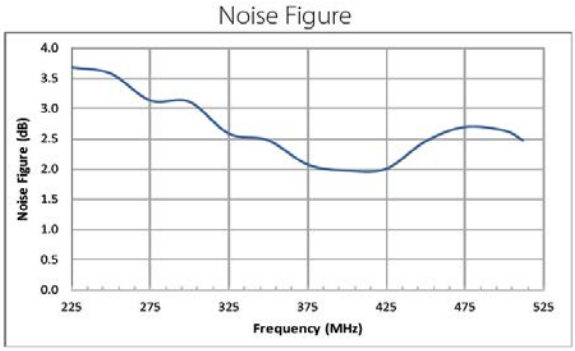
PASTERNACK
an INFINITE brand

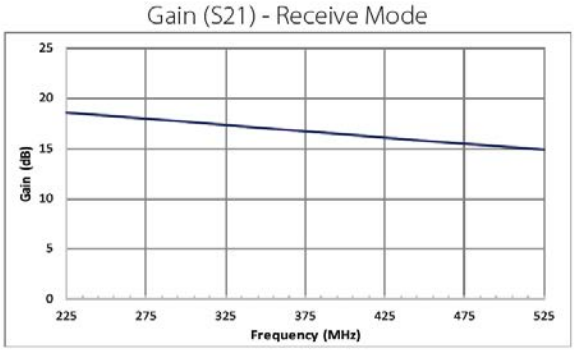
VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA

TECHNICAL DATA SHEET PE15B5007









VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA 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: VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA PE15B5007

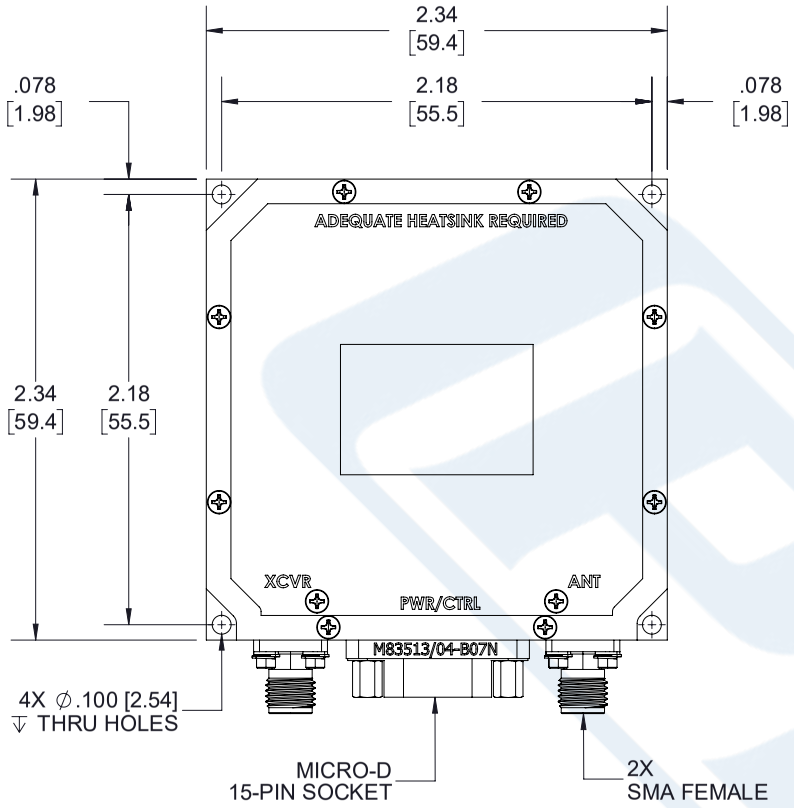
URL: https://www.pasternack.com/high-power-bi-directional-amplifier-16-watts-512-mhz-sma-pe15b5007-p.aspx

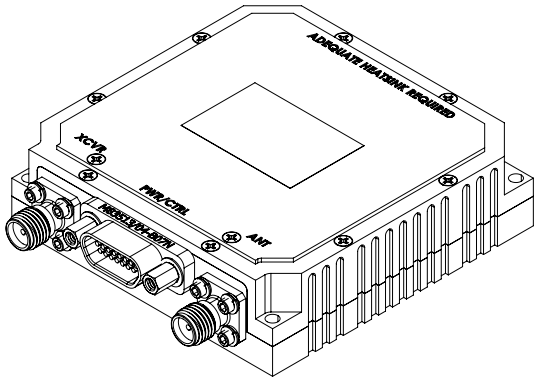
Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
Phone: (866) 727-8376 or (949) 261-1920 • **Fax:** (949) 261-7451
Sales@Pasternack.com • Techsupport@Pasternack.com

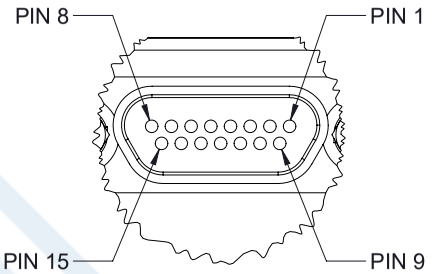
PE15B5007 CAD Drawing

VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA

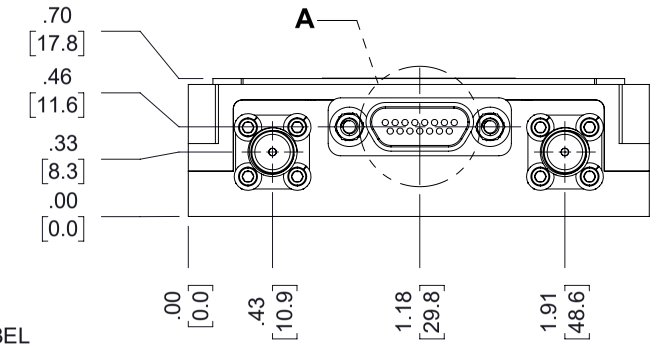
REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	6/15/2020	T.GALLA







DETAIL A



Pinout		
Pin #	**I/O**	**Function**
1,7,8,10,11,14,15	I	GND
3,4,5,6,12,13	I	DC Power (+10V to +32V)
2	0	Over Temperature Flag 0V = Temperature Fault +5V = No Fault
9	I	T/R Enable (+5V Logic) Manual Mode 0V or GND = Transmit +5V or NC = Receive

LABEL

PASTERNACK an INFINITE brand
www.pasternack.com
PE15B5007
V001923YYYYMMDDXXXX

THESE COMMODITIES, TECHNOLOGY OR SOFTWARE WERE EXPORTED FROM THE UNITED STATES IN ACCORDANCE WITH THE EXPORT ADMINISTRATION REGULATIONS. DIVERSION CONTRARY TO U.S. LAW PROHIBITED.

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%L / -0

ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

PASTERNACK an INFINITE brand
Pasternack Enterprises, Inc.
P.O.Box 16759, Irvine, CA 92623.
Phone: 1.949.261.1920 | 1.866.727.8376
Fax: 1.949.261.7451
Website: www.pasternack.com
E-mail: sales@pasternack.com

THIRD-ANGLE PROJECTION

SHEET 1 OF 3

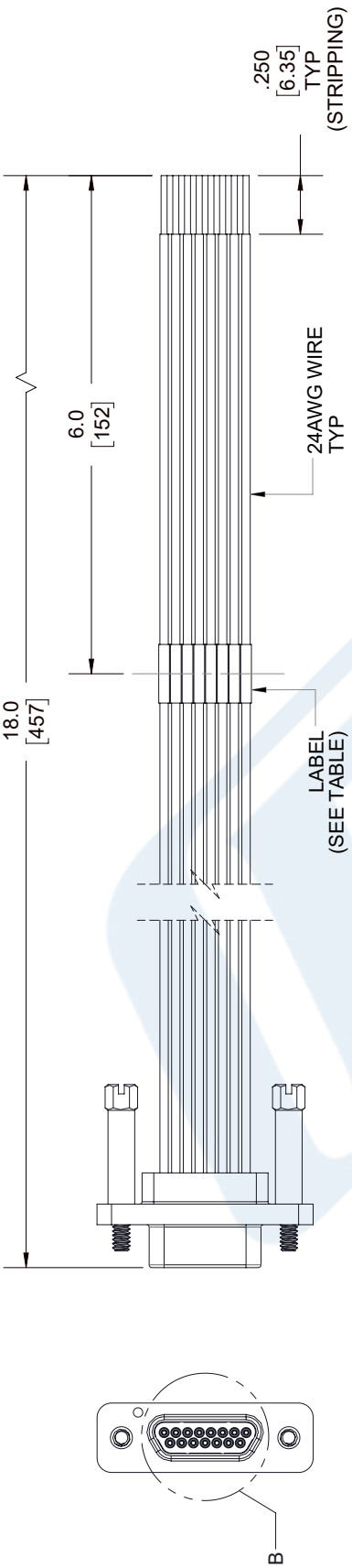
SCALE N/A

SIZE	CAGE CODE	DRAWN BY	ITEM NO.	REV
A	53919	K.DANG	PE15B5007	A

PE15B5007 CAD Drawing

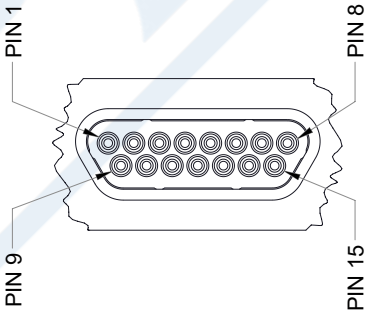
VHF/UHF BiDirectional Amplifier, 225 MHz to 512 MHz 16W Psat, 35% Efficiency, 8 usec Switching, 36dB Tx Gain, Manual T/R Control, SMA

INTERFACE CABLE



Pinout

Pin #	Wire Color	Label
1	Black	GND
2	Brown	Temp Flag
3	Red	+10V to +32V
4	Orange	+10V to +32V
5	Yellow	+10V to +32V
6	Green	+10V to +32V
7	Blue	GND
8	Purple	GND
9	Gray	T/R Enable
10	White	GND
11	Pink	GND
12	Light Green	+10V to +32V
13	Black / White	+10V to +32V
14	Brown / White	GND
15	Red / White	GND



DETAIL B

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%L / -0

ALL DIMENSIONS SHOWN ARE FOR REFERENCE ONLY.

PASTERNACK® an INFINITE brand

Pasternack Enterprises, Inc.
P.O.Box 16759, Irvine, CA 92623.
Phone: 1.949.261.1920 | 1.866.727.8376
Fax: 1.949.261.7451
Website: www.pasternack.com
E-mail: sales@pasternack.com

THIRD-ANGLE PROJECTION

SIZE	CAGE CODE	DRAWN BY	ITEM NO.	REV
A	53919	K.DANG	PE15B5007	A

SHEET 2 OF 3

SCALE N/A

THESE COMMODITIES, TECHNOLOGY OR SOFTWARE WERE EXPORTED FROM THE UNITED STATES IN ACCORDANCE WITH THE EXPORT ADMINISTRATION REGULATIONS. DIVERSION CONTRARY TO U.S. LAW PROHIBITED.

T-Rev.D