PASTERNACK
an INFINITE brand

45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA

TECHNICAL DATA SHEET PE15A5078

The PE15A5078 is a Class AB high power amplifier with an integrated Heatsink/Cooling Fan assembly that operates in L-Band from 800 MHz to 2000 MHz and generates 45 Watts (typ) of CW RF power and 20 Watts of linear power with 5% EVM @ 43 dBm. The module utilizes the latest Gallium Nitride (GaN) semiconductor technology with 45% power efficiency. The amplifier package design features a small form factor of <10in³ that's ideal for size, weight, and power (SWaP) constrained applications used in broadband RF telemetry, tactical communication, electronic warfare, and unmanned aircraft systems, as well as software defined radios. Impressive typical performance includes 55 dB of linear gain, 2.0:1 VSWR, +44 dBm third order intercept point, and low harmonic suppression of -25 dBc. Additionally with a nominal 0 dBm (1 mW) RF input power, the amplifier can provide 45 dB of gain and near-constant envelope and complex waveforms such as OFDM, QAM, DVB-T, etc. Operating voltage is +28 Vdc with 3A of DC current. Additional features include overvoltage protection, reverse voltage protection, and logic on/off control. 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 integrated heatsink with cooling fan operates at +28Vdc and includes an accessory cable with banana plugs. 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 PEHFL0000 that can be used at the output of the power amplifier. This lowpass RF filter 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 L-Band and offers rejection levels of greater than 25 dB from 3.25 GHz to 5 GHz. The filter is offered in a miniature SMA connectorized package.

Features

- 45W GaN High Power Amplifier
- Integrated Heatsink/Cooling Fan Assembly
- L Band Class AB Design
- Frequency Range: 800 MHz to 2000 MHz
- 55 dB linear Gain
- VSWR: 1.9:1
- +44 dBm IP3
- 20W Linear Power with 5% EVM @ 43 dBm
- PAE: 45%
- Small Form Factor Rugged Mil-Grade Package
- 50 Ohm Design
- Female SMA RF Connectors
- +28Vdc @ 3A DC current
- -40°C to +85°C Operating Baseplate Temperature
- Output Harmonic Filter Accessory Option

Applications

- Broadband RF Telemetry
- RF Communications Systems
- Electronic Warfare - Airborne Electronic Attack
- Unmanned Aircraft Systems (UAS)
- Unmanned Ground Vehicles (UGV), Software Defined Radios
- Data Links
- Transmitters
- Test & Measurement
- Telecom Infrastructure

Electrical Specifications (TA = +25°C, DC Voltage = 28Volts, DC Current = 3A)

Description	Minimum	Typical	Maximum	Units
Frequency Range	0.8		2	GHz
Small Signal Gain		60		dB
Gain Flatness		±5		dB
Input Power (CW)		+0		dBm
Pout at Sat.	35	46		Watts
Efficiency (PAE)		45		%
Output Power at 1 dB Compression Point		+33		dBm

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: 45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA PE15A5078

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

45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA

TECHNICAL DATA SHEET PE15A5078

Output 3rd Order Intercept Point		+44		dBm
Output Mismatch			10:1	
2nd Harmonics			-17	dBc
3rd Harmonics			-18	dBc
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input VSWR		1.9:1	2.3:1	
Switching Speed for On/Off Switch Gate			2	usec
Operating DC Voltage	27	28	30	Volts
Operating DC Current		3		A
Quiescent Current Biased ()		650		mA
Operating Temperature Range	-40		+85	°C

Performance by Frequency

Description	F1	F2	F3	Units
Frequency Condition	800	1500	2000	MHz
Output Power @ 1dB Compression, Typ	33	31	30	dBm
Small Signal Gain, Typ (@-40dBm Input)	60	58	56	dB
Third Order Intercept Point	44	42	44	dBm

Absolute Maximum Rating

Parameter	Rating	Unit
Max Device Voltage	32	V
Max Device Current	4.75	A
Max RF Input Power, Z_L = 50 Ω	15	dBm
Max Operating Temperature (ambient)	60	°C
Max Operating Temperature (baseplate)	85	°C
Max Storage Temperature	85	°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: 45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA PE15A5078

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

45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA

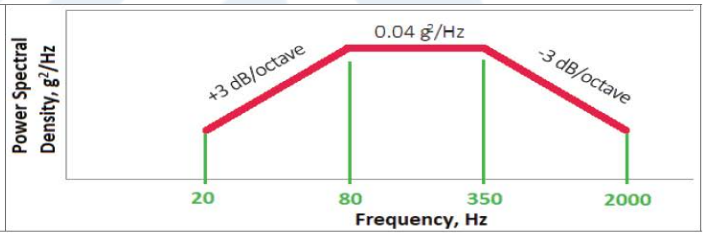
TECHNICAL DATA SHEET PE15A5078

Mechanical Specifications

Size

Length	4.5 in [114.3 mm]
Width	3.5 in [88.9 mm]
Height	0.61 in [15.49 mm]
Weight	1.8 lbs [816.47 g]
Input Connector	SMA Female
Output Connector	SMA Female
Bias Connector	9-Pin Micro-D Socket

Environmental Specifications

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

Temperature

Operating Range	-40 to +85 deg C
Storage Range	-55 to +85 deg C
Humidity	95% Non-Condensing
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: 45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA PE15A5078

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

45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, 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: 45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA PE15A5078

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

45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA

TECHNICAL DATA SHEET PE15A5078

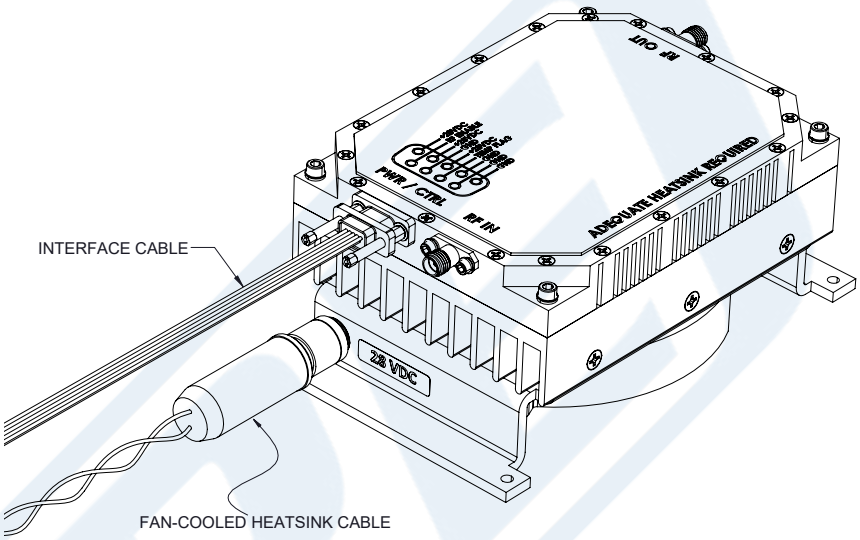


illustration of Amplifier & Heatsink.

Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: 45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA PE15A5078

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

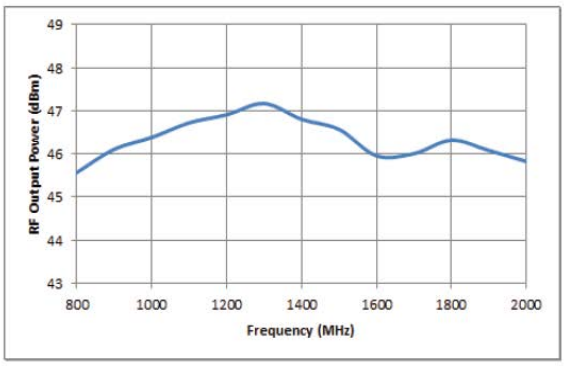
PASTERNACK
an INFINITE brand

45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA

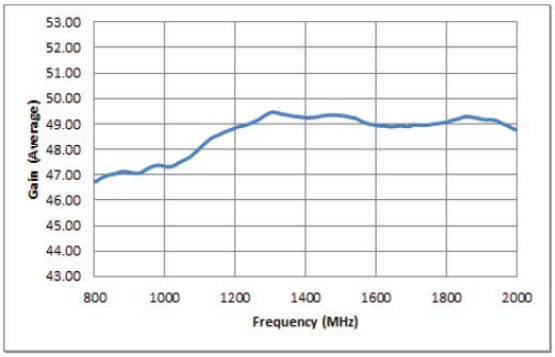
TECHNICAL DATA SHEET PE15A5078

Typical Performance Data

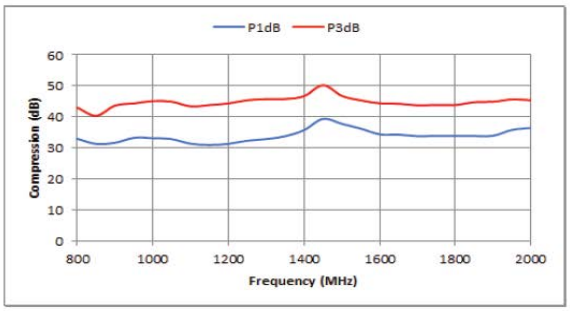
RF Output Power



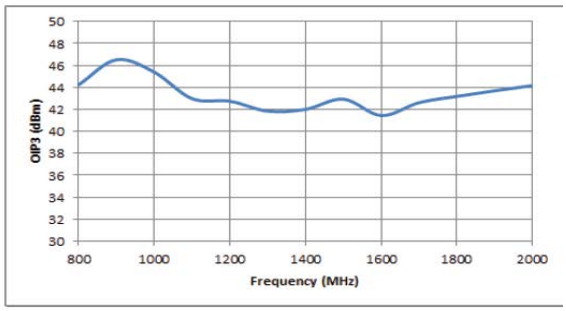
Gain



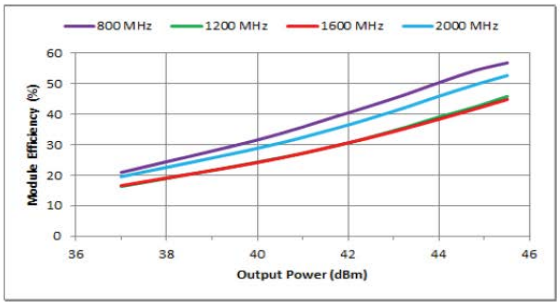
P1dB & P3dB



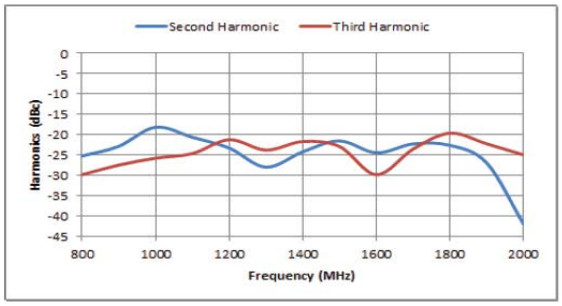
OIP3



Efficiency



Harmonics (@ Psat)



Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: 45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA PE15A5078

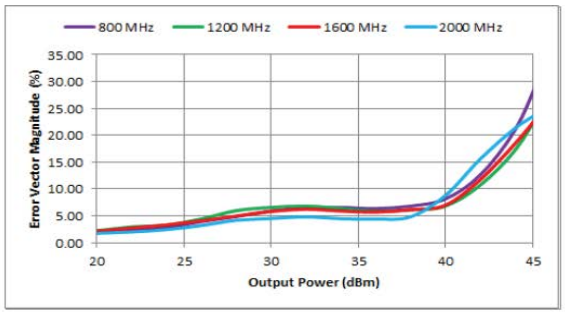
Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
Phone: (866) 727-8376 or (949) 261-1920 • **Fax:** (949) 261-7451
Sales@Pasternack.com • Techsupport@Pasternack.com

PASTERNACK
an INFINITE brand

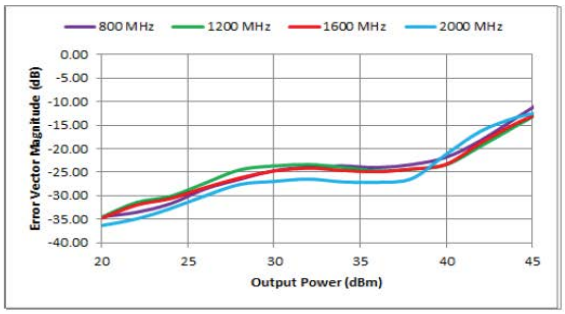
45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA

TECHNICAL DATA SHEET PE15A5078

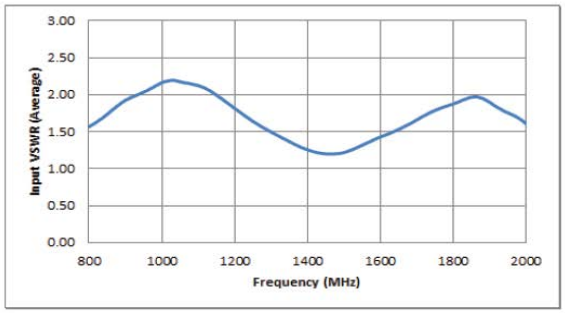
Error Vector Magnitude (%) [w/ OFDM Waveform]



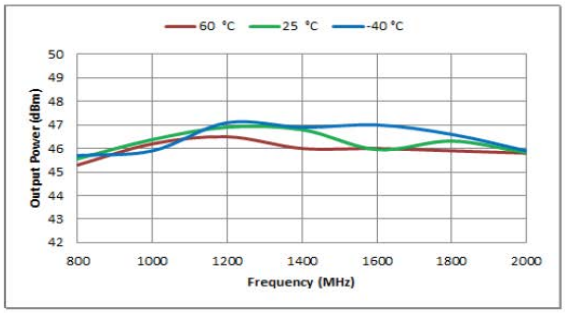
Error Vector Magnitude (dB) [w/ OFDM Waveform]



Input VSWR



Power Out vs. Temperature (ambient)



45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, 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.

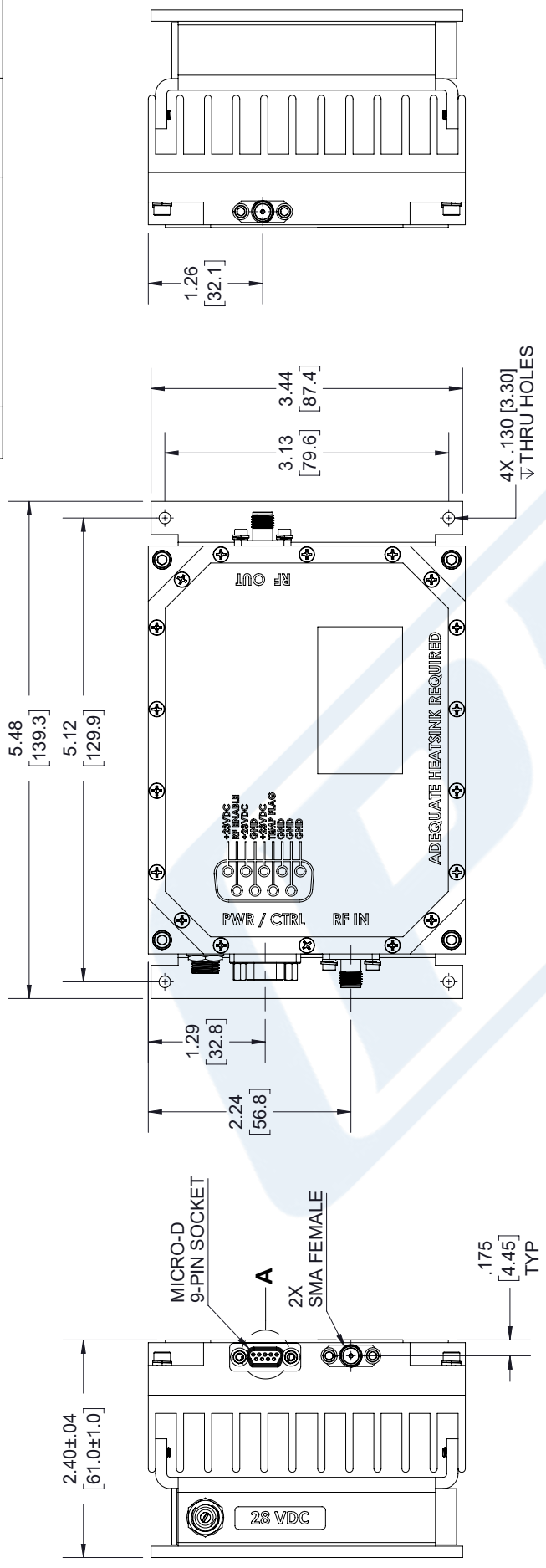
Click the following link (or enter part number in “SEARCH” on website) to obtain additional part information including price, inventory and certifications: 45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan, 800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA PE15A5078

URL: https://www.pasternack.com/60-db-gain-2-ghz-medium-power-high-gain-amplifier-sma-pe15a5078-p.aspx

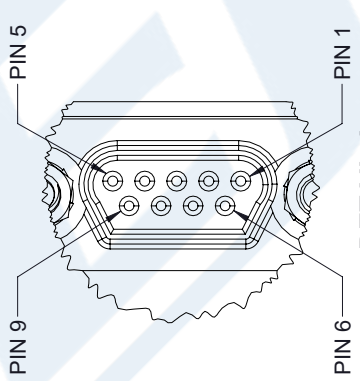
Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
Phone: (866) 727-8376 or (949) 261-1920 • **Fax:** (949) 261-7451
Sales@Pasternack.com • Techsupport@Pasternack.com

PE15A5078 CAD Drawing

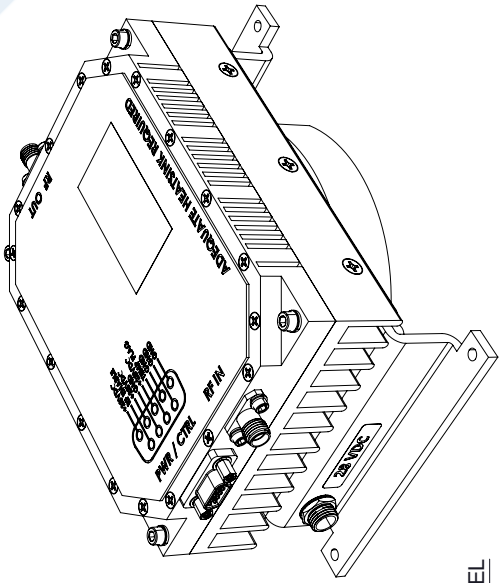
45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan,
800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA



Pinout		
Pin #	I/O	Function
3,4,5	I	DC Power (+28 Volts)
1,2,6,8	I	Ground
7	O	Over Temperature Flag 0V = Temperature Fault +5V = No Fault
9	I	RF Enable 0V or GND = RF ON +5V or NC = RF OFF



DETAIL A



LABEL

PASTERNACK® an INFINITE brand
www.pasternack.com
PE15A5078
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.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	5/28/2020	T.GALLA

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.

THIRD-ANGLE PROJECTION

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

SIZE	CAGE CODE	DRAWN BY	ITEM NO.	REV
A	53919	K.DANG	PE15A5078	A

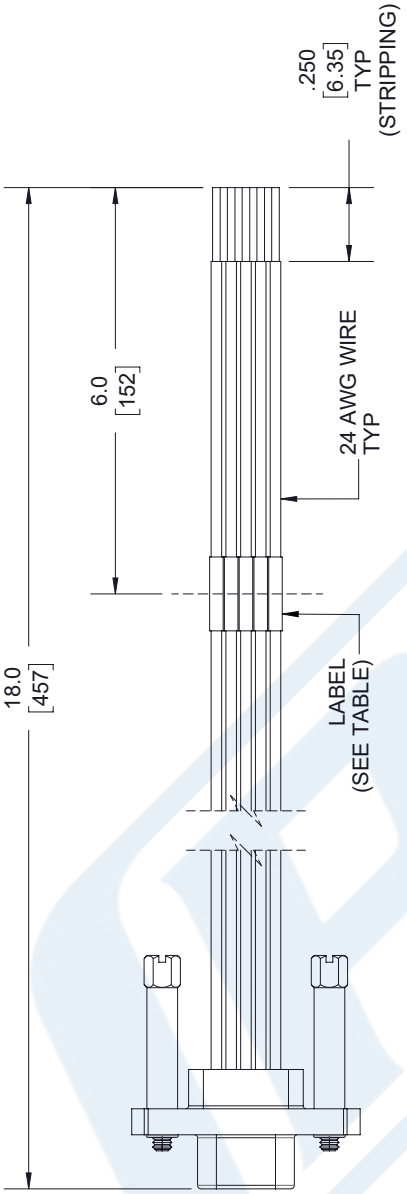
SHEET	OF	SCALE
1	4	N/A

T-Rev.D

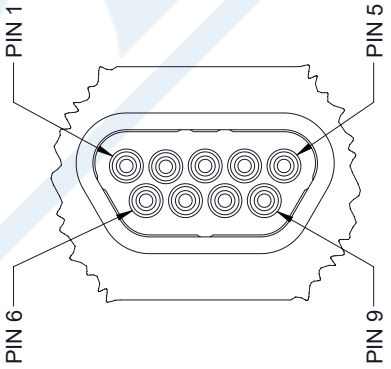
PE15A5078 CAD Drawing

45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan,
800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA

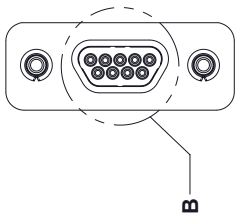
INTERFACE CABLE



Pinout	
Pin #	Wire Color	Label
1	Black	GND
2	Brown	GND
3	Red	+ 28V
4	Orange	+ 28V
5	Yellow	+ 28V
6	Green	GND
7	Blue	Temp Flag
8	Purple	GND
9	Gray	RF Enable



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	PE15A5078	A

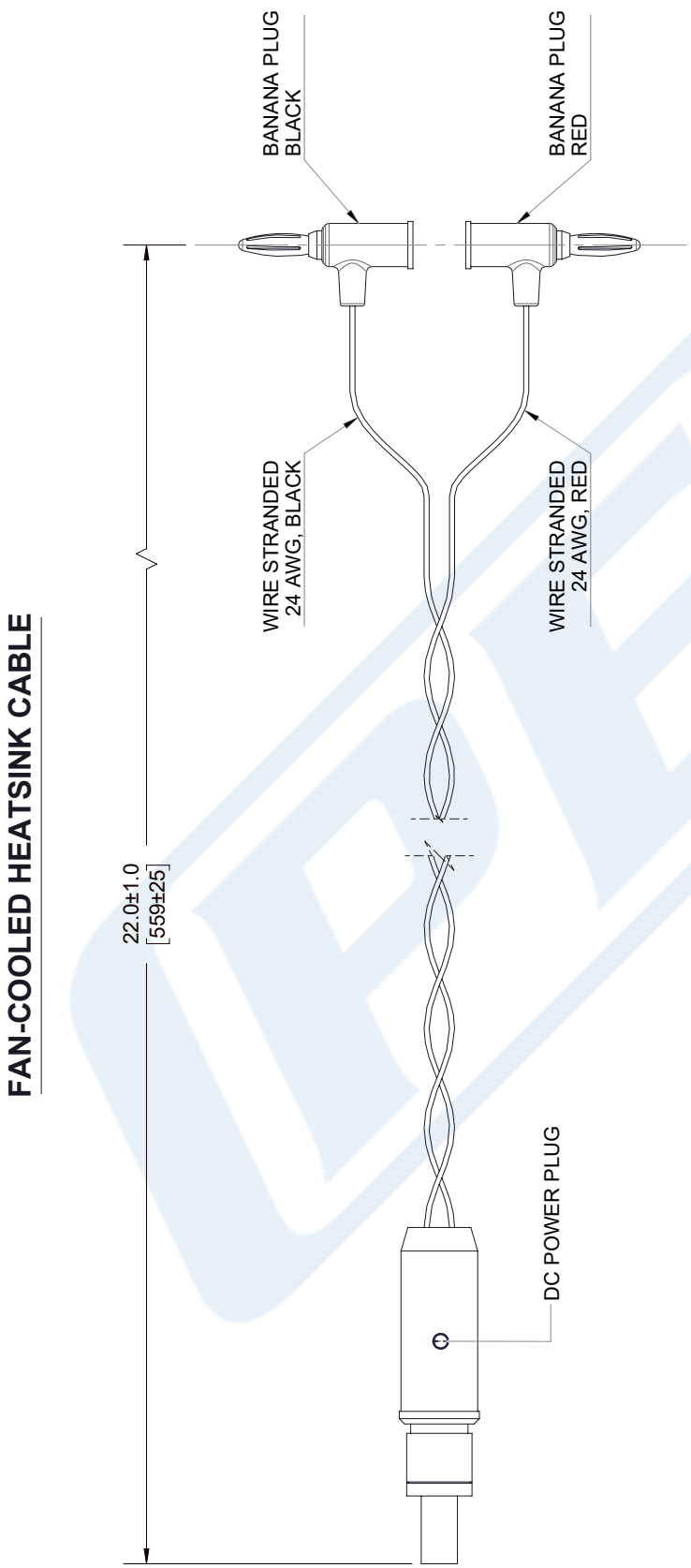
SHEET 2 OF 4
SCALE N/A

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

PE15A5078 CAD Drawing

45 Watt GaN Power Amplifier with Integrated Heatsink and Cooling fan,
800 MHz to 2000 MHz, Class AB, L-Band, 45% Efficiency, 28V, SMA



THIRD-ANGLE PROJECTION

SHEET 3 OF 4

SCALE N/A

REV A

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

SIZE	CAGE CODE	DRAWN BY	ITEM NO.
A	53919	K.DANG	PE15A5078

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.

T-Rev.D