PASTERNACK
an INFINITE brand

53 dB Gain, 200 Watt Psat, 1.5 MHz to 30 MHz, High Power LDMOS Amplifier, Class AB, Type N Output

TECHNICAL DATA SHEET PE15A5109

The PE15A5109 is a high power amplifier that operates from 1.5 MHz to 30 MHz and generates 200 watts of saturated output power. The module utilizes LDMOS and chip-and-wire technology in the manufacturing process that ensures state-of-the-art power performance with excellent power-to-volume ratio that's ideal for jamming, EMC, and test and measurement applications. This Class AB amplifier is designed for a 50 ohm input/output impedance and offers high efficiency and high linearity, operating over a wide dynamic range with impressive typical performance that includes 53 dB of gain, -60 dBc spurious suppression, and -10 dBc harmonics at 100W. The design has input RF power handling capability up to +10 dBm max without damage, and can handle a load VSWR at Pout of 100W of 3.0:1 for all load phase and amplitude conditions under continuous operation. Typcial DC bias requirements include +28V and 15A of current at 200W. The module uses an SMA female connector on the RF input, and an N Type female connector on the RF output. The DC interface incorporates a D-Sub 7 pin male connector for DC bias, Shutdown with TTL logic control, Current and Temperature monitor functions. A mating D-Sub socket connector is included. The rugged amplifier design operates over a wide temperature range from -20°C to +60°C, and can withstand relative humidity exposure up to 95% maximum. An available heatsink with cooling fan (model PE15G5068F) is recommended to maintain an optimum baseplate temperature during operation.

Features

- LDMOS High Power Amplifier Design
- 1.5 MHz to 30 MHz Frequency Range
- Psat 200 Watts typ
- Gain: 53 dB typ
- Gain Flatness +/- 2 dB
- -60 dBc Spurious Suppression
- DC Bias +28VDC @ 15A Current
- Max RF Input Power +10 dBm
- Shutdown with TTL Logic Control
- Current and Temperature Monitor features
- 50 Ohms Input and Output Matched
- Instantaneous Broadband
- Built-In control and protection circuits
- Class AB
- SMA Female input and N-Type Female output connectors
- D-Sub Control Connector with Mating Female Connector
- Operational Temperature -20°C to +60°C
- Optional Heatsink Available: Model PE15G5068F

Applications

- Military Radio
- Commmunication Systems
- High Gain Power Amplifier
- Jamming
- EMC
- Test and Measurement

Electrical Specifications (TA = +25°C, DC Voltage = +28Volts, DC Current = 15A)

Description	Minimum	Typical	Maximum	Units
Frequency Range	1.5		30	MHz
Small Signal Gain		53		dB
Input Power (CW)			+10	dBm
Pout at Sat.		+53		dBm
Harmonics @100 Watts		-10		dBc
Spurious		-60		dBc
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input Return Loss			-10	dB
Operating DC Voltage	+24	+28	+32	Volts
Operating DC Current*		15		A

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Operating Temperature Range	-20	+60	°C

*@Pout=200W
Electrical Specification Notes:
Allow for 20% Increased DC Current during initial power-up stage

Absolute Maximum Rating

Parameter	Rating
Input RF drive level without damage	+10 dBm (Max)
Load VSWR @ POUT =100W	∞ @ all load phase & amplitude for duration of 1 minute; 3:1 @ all load phase & amplitude continuous
Over Temperature	85°C shutdown

Mechanical Specifications

Size

Length	7.5 in [190.5 mm]
Width	5.9 in [149.86 mm]
Height	1.2 in [30.48 mm]
Weight	3.8 lbs [1.72 kg]
Input Connector	SMA Female
Output Connector	N Female
Bias Connector	7-Pin D-Subminiature Male
Cooling	Baseplate Conduction

Environmental Specifications

Temperature

Operating Range	-20 to +60 deg C
Storage Range	-30 to +75 deg C
Humidity	95%

Compliance Certifications (see product page for current document)

Plotted and Other Data

Notes:
- Values at +25 °C, sea level

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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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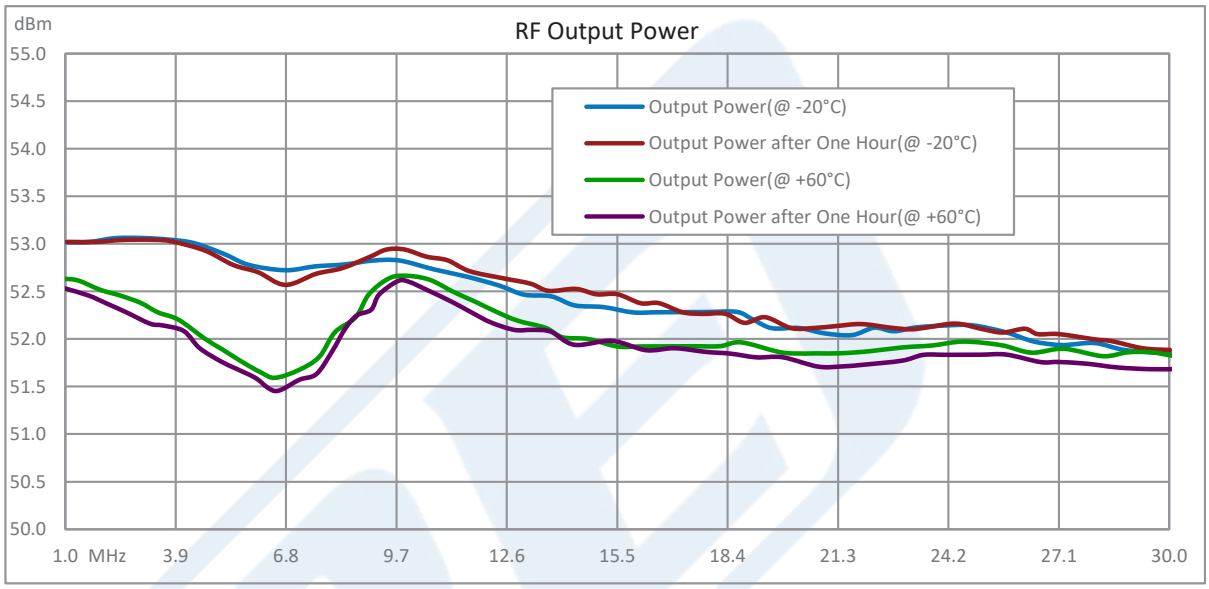
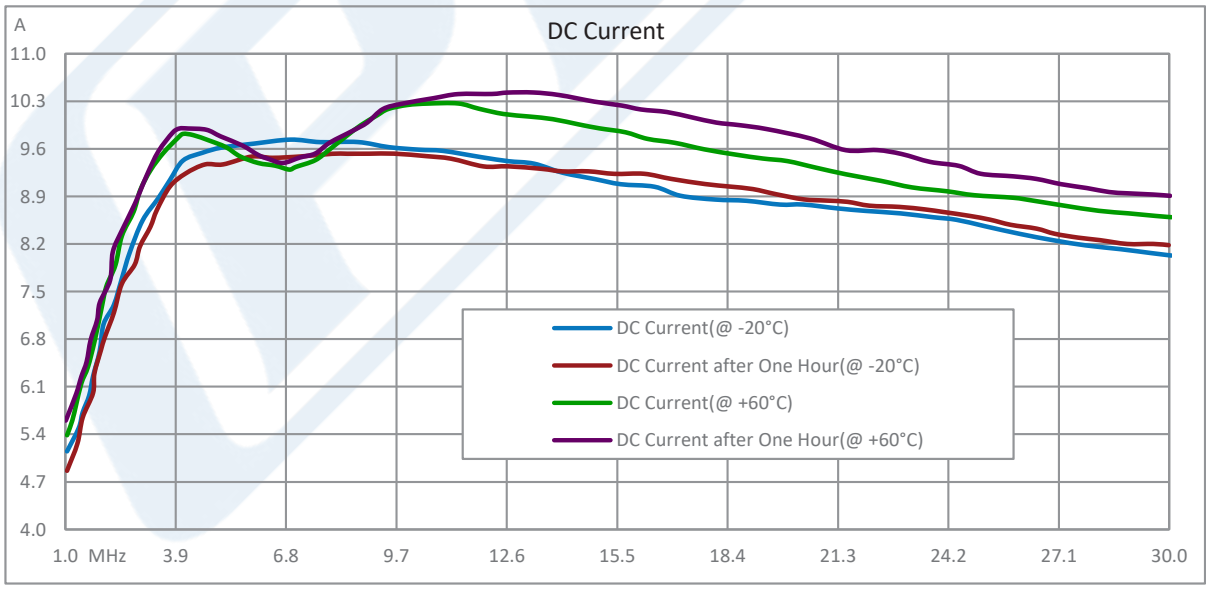
Typical Performance Data





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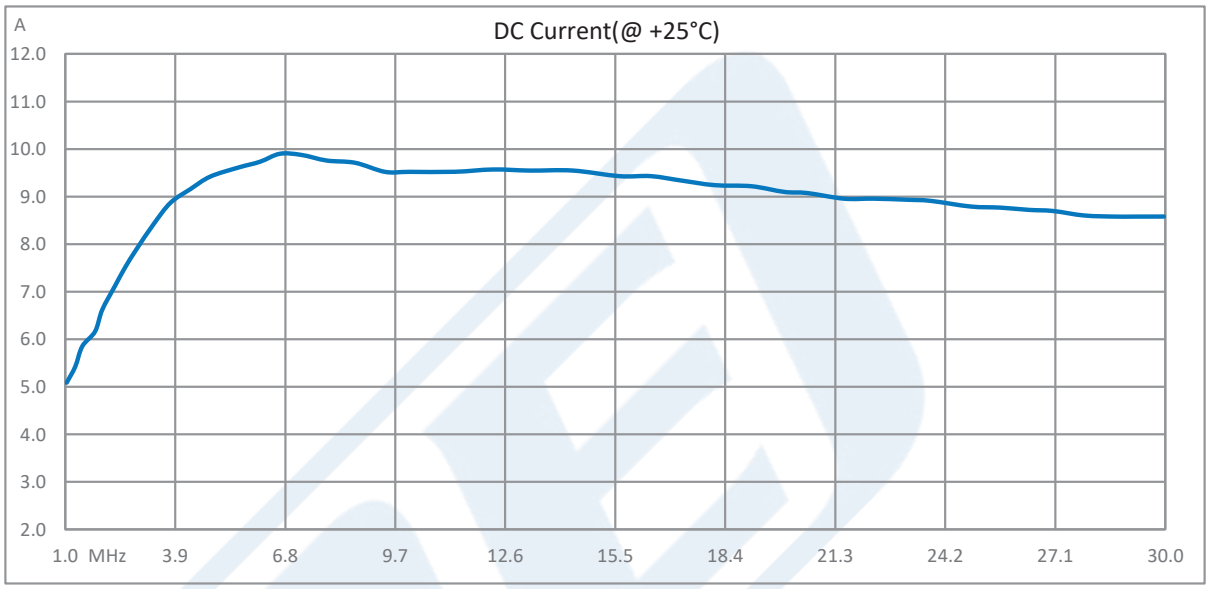

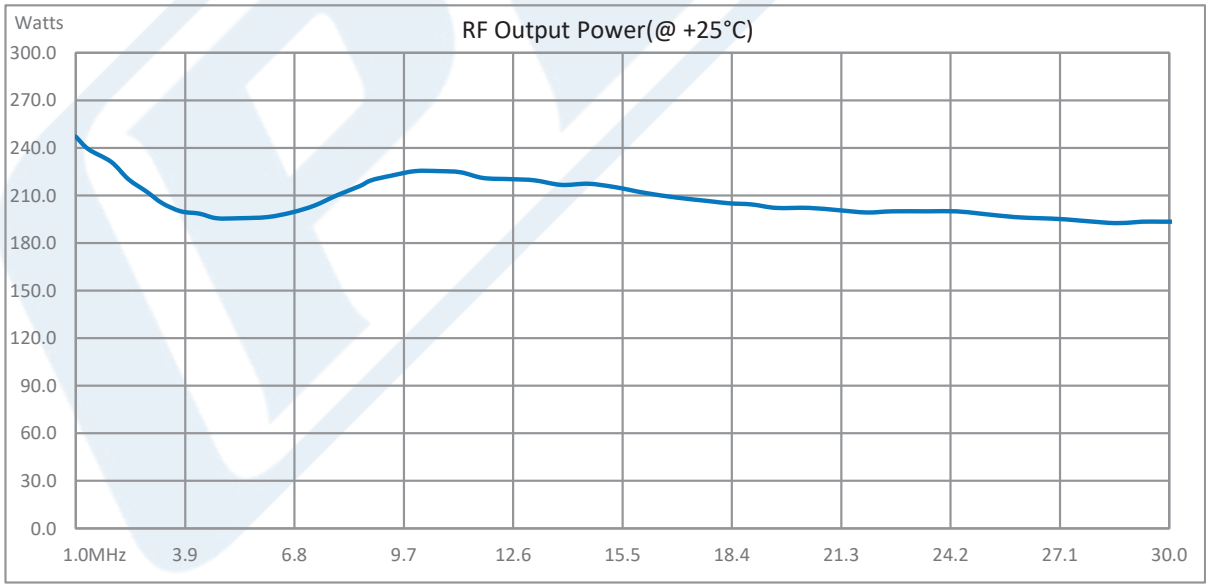

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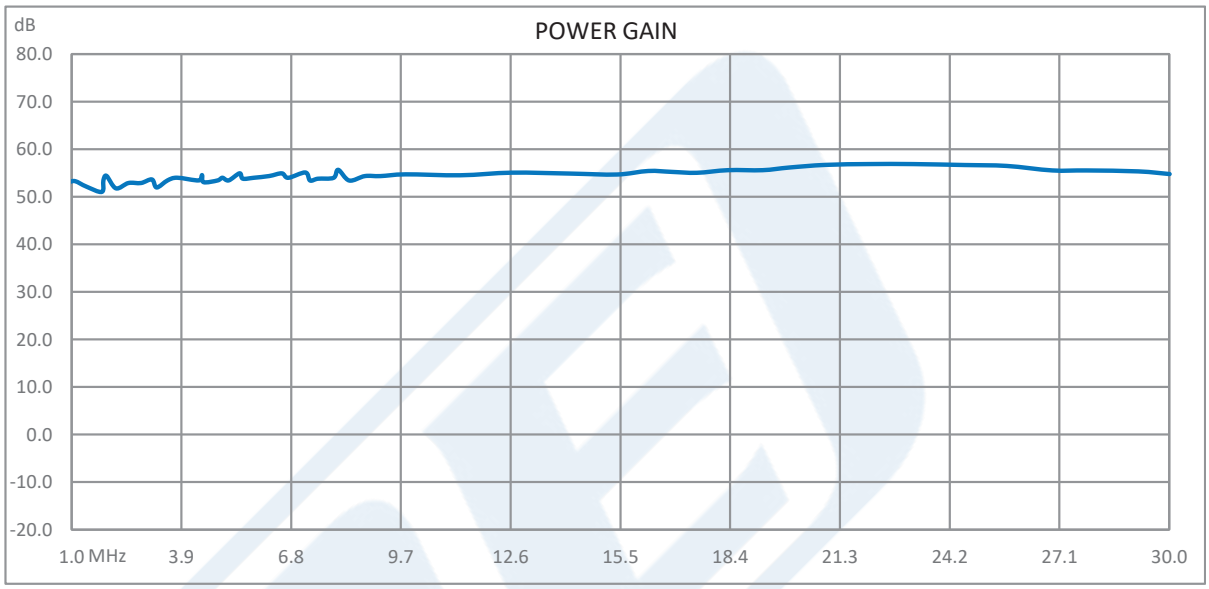

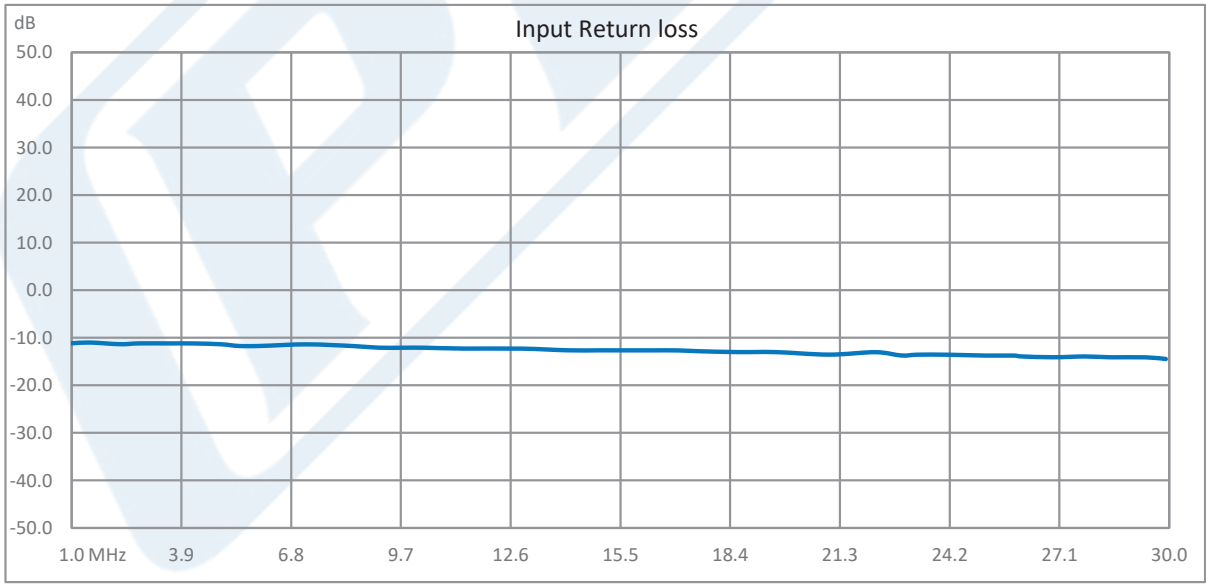

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URL: https://www.pasternack.com/53-db-gain-30-mhz-high-power-high-gain-amplifier-sma-pe15a5109-p.aspx

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PE15A5109 CAD Drawing

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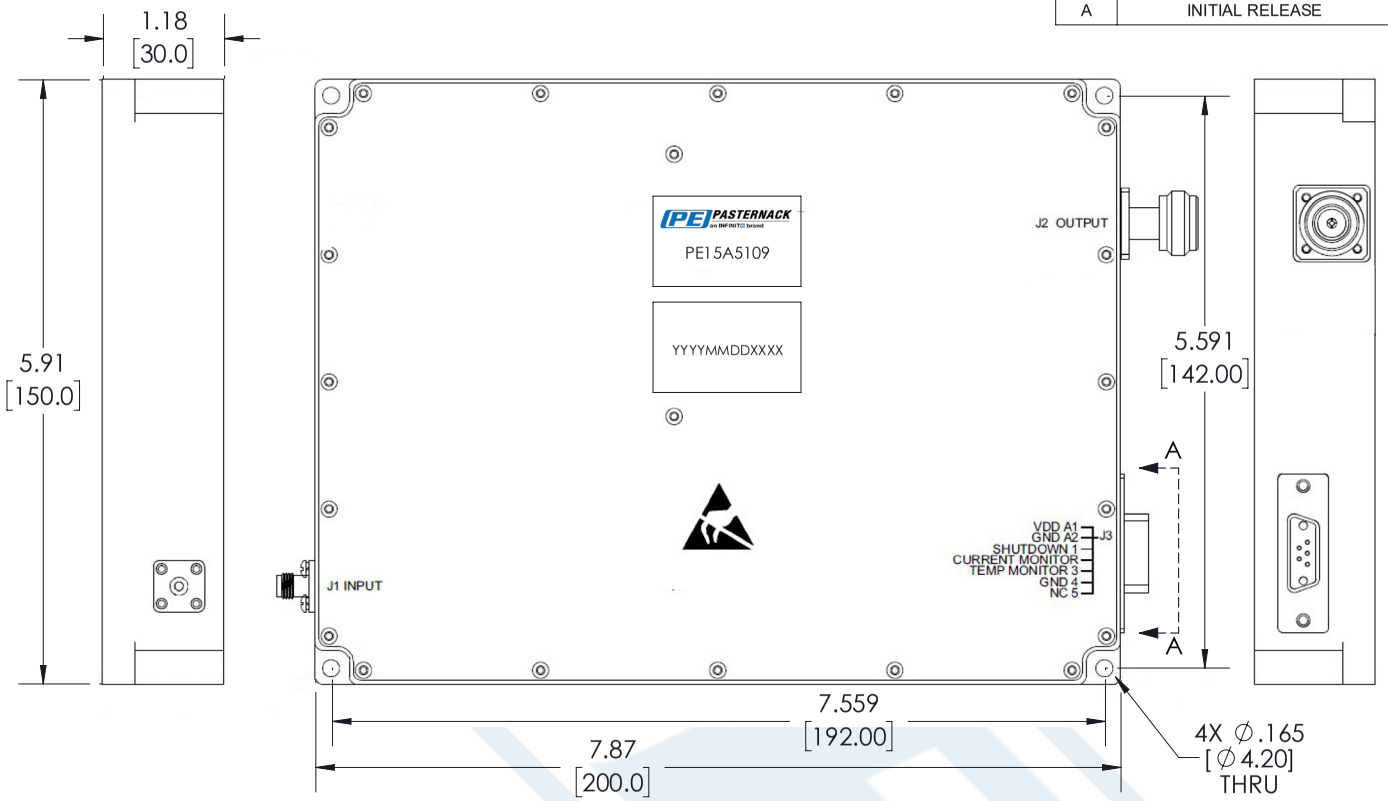
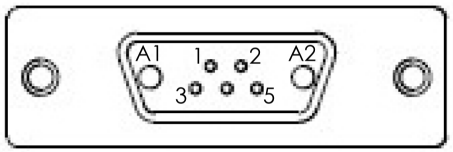
REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	02/08/2022	TGALLA





VIEW A-A

HYBRID D-SUB 7-PIN, MALE		
PIN #	DESCRIPTION	SPECIFICATIONS
A1	VDD	28 VDC
A2	GND	Ground
1	SHUTDOWN	Amplifier Disable: TTL Logic High (3.3V) (Internally Pulled-Low)
2	CURRENT MONITOR	Analog voltage relative to IDD @ 100mV per Ampere
3	TEMP MONITOR	Analog voltage relative to Module's Temperature @ 10 mV/°C
4	GND	Ground
5	NC	No connection

NOTES:

1. ADEQUATE HEATSINK REQUIRED.

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.

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THIRD-ANGLE PROJECTION

SHEET 1 OF 1

SCALE N/A

SIZE	CAGE CODE	DRAWN BY	ITEM NO.	REV
A	53919	BPUCHASKI	PE15A5109	A