



50 dB Gain, 50 Watt P1dB, 800 MHz to 1 GHz,
High Power Amplifier, SMA, 66 dBm IP3

TECHNICAL DATA SHEET

PE15A5010

PE15A5010 is a GaAs power amplifier module operating in the 0.800 to 1.0 GHz frequency range. The amplifier offers 50 Watts typ of P1dB Output power, 50 dB typical small signal gain, gain flatness of ± 0.5 dB typical, and 66 dBm typ OIP3. The amplifier delivers almost 5 Watts of multicarrier GSM power. This excellent technical performance is achieved through the use of hybrid MIC design and advanced GaAs PHEMT devices. The driver amplifier requires typically a +12V DC power supply. The connectorized SMA module is unconditionally stable and includes built-in voltage regulation, load VSWR protection, reverse bias protection, and thermal protection for added reliability. The amplifier operates over the temperature range of -40°C and $+85^{\circ}\text{C}$. This rugged package has female SMA connectors, DC/control filter feed thrus, and is designed to meet MIL-STD-810 environmental conditions.

Features

- 0.800 GHz to 1.0 GHz Frequency Range
- P1dB 50 Watts typ
- 5 Watts typ of multicarrier GSM
- Small Signal Gain: 50 dB min
- Gain Flatness: ± 0.5 typical
- 50 Ohms Input and Output Matched
- Unconditionally Stable
- Regulated Supply & Bias Sequencing
- Overvoltage Protection
- Thermal Protection
- Designed to Meet MIL-STD-810 Conditions

Applications

- GSM communications
- Military Radar
- Commercial Air Traffic Control
- Weather & Earth Observation Satellites
- Radar & Communication Systems
- Cellular Infrastructure
- Broadcast Infrastructure
- Telecom Infrastructure
- High Gain Output Power Amplifier

Electrical Specifications (TA = $+25^{\circ}\text{C}$, DC Voltage = 12Volts, DC Current = 15A)

Description	Minimum	Typical	Maximum	Units
Frequency Range	800		1,000	MHz
Small Signal Gain		50		dB
Gain Flatness		± 0.5	± 2	dB
Output Power at 1 dB Compression Point		+47		dBm
Output 3rd Order Intercept Point		+66		dBm
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input Return Loss	-15	-20		dB
TTL Control	"1": On, "0": Off, Enable: 5V, Disable: 0V			
Rise/Fall Time		<1		usec
Operating DC Voltage	11	12	13	Volts
Standby DC Current		400		mA
Operating DC Current		15		A
Operating Temperature Range	-40		+85	$^{\circ}\text{C}$

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Protections

ENVIRONMENTAL / PROTECTIONS			
PARAMETER	MIN	MAX	UNIT
Operating Temp. (Housing Temp.)	-40	+85	°C
Storage Temp Range	-60	+100	°C
Humidity Range	0-100		%
Altitude	0-30,000		ft.
Shock / Vibration	MIL-STD-810 and equivalents		--
Load VSWR @ P1dB	Open / Short Output Protection		--
PA Baseplate Shutoff Temperature	+ 90		°C

Absolute Maximum Rating

Parameter	Rating	Units
Source Voltage	+15	Volts
RF input Power	-5	dBm
Operating Temperature (base-plate)	-10 to +85	°C
Storage Temperature	-55 to +100	°C



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

Mechanical Specifications

Size

Length	7.5 in [190.5 mm]
Width	3.97 in [100.84 mm]
Height	0.79 in [20.07 mm]
Weight	1.593 lbs [722.57 g]
Input Connector	SMA Female
Output Connector	SMA Female
Cooling	HEATSINK REQUIRED

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Environmental Specifications

Temperature

Operating Range -40 to +85 deg C
Storage Range -60 to +100 deg C

Humidity 95
Shock MIL-STD-810F Method 500.4
Vibration MIL-STD-810F Method 500.4
Altitude MIL-STD-810F Method 500.4

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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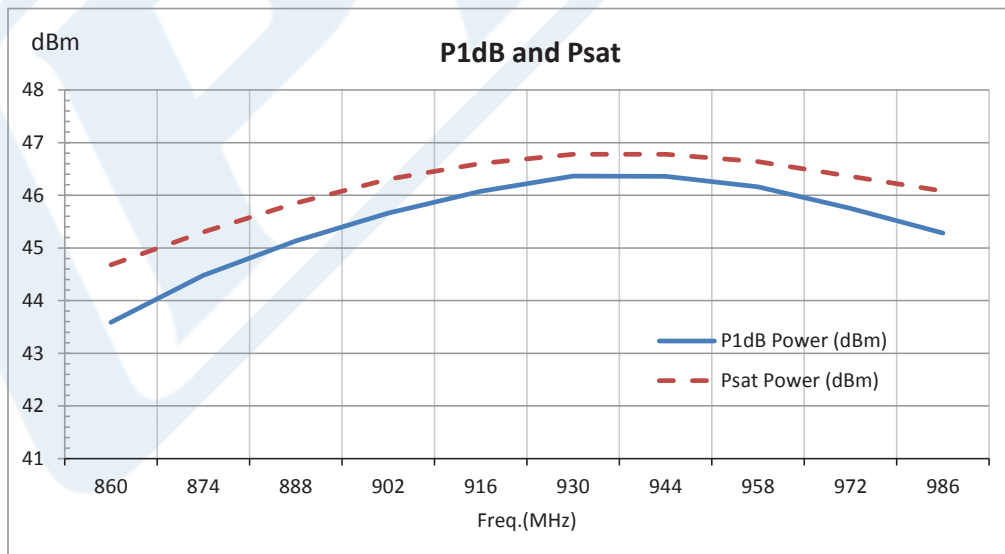
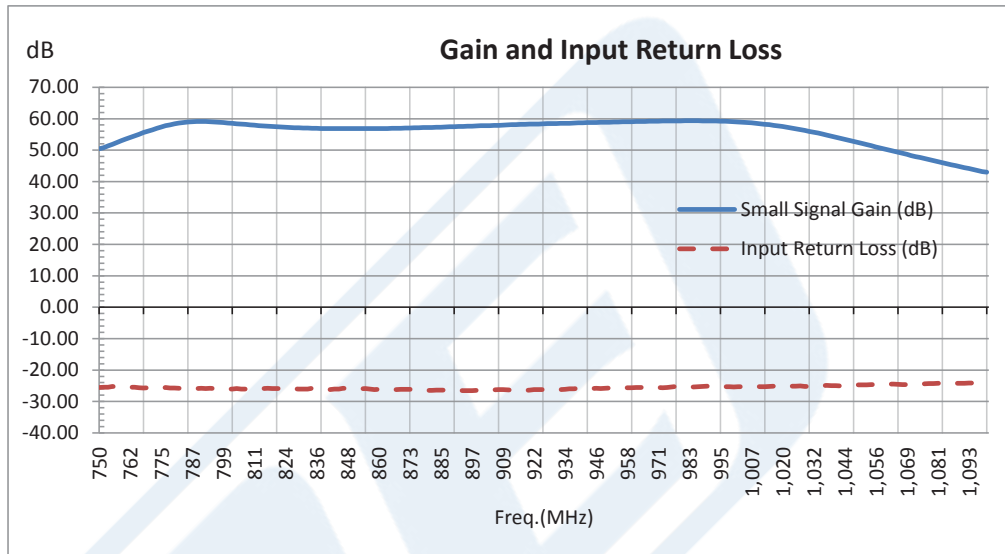


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Typical Performance Data



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-70 dBc IMD Plot
2 Tone Output Power: 35.5 dBm, 14.6A

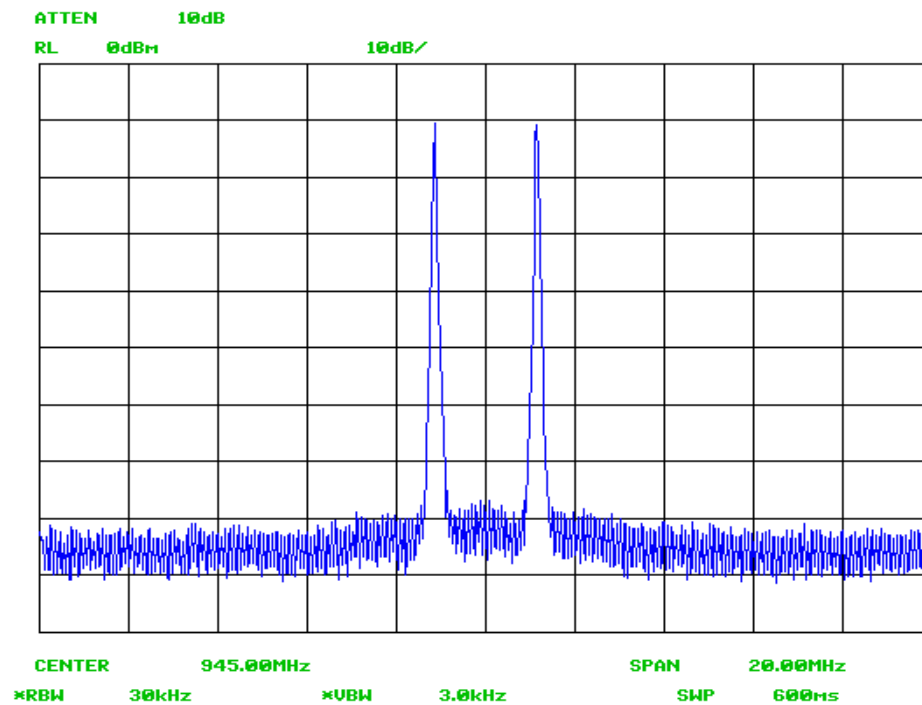


Figure 1. Typical 2 Tone OIP3 Data

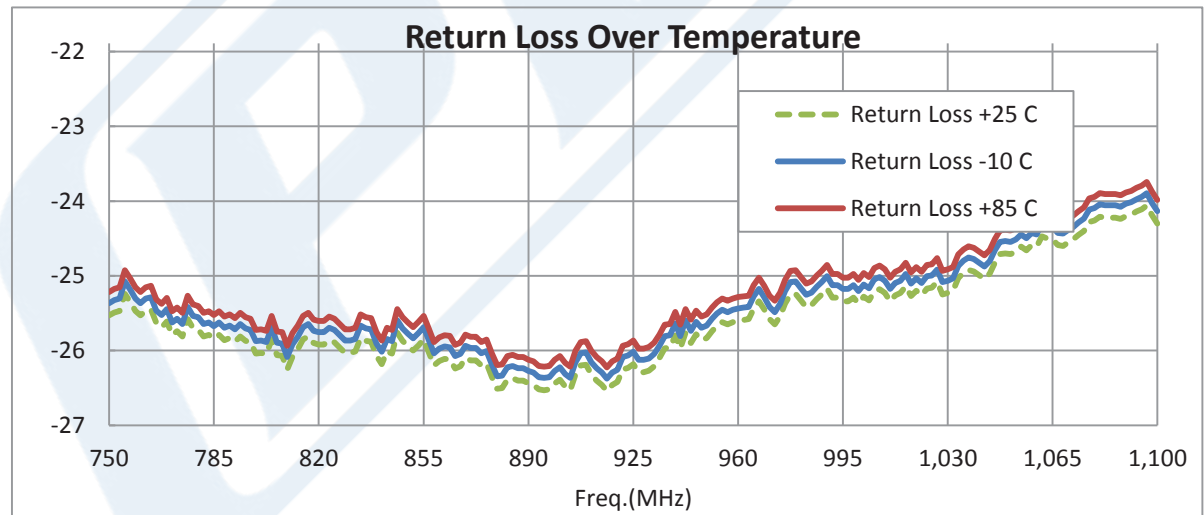
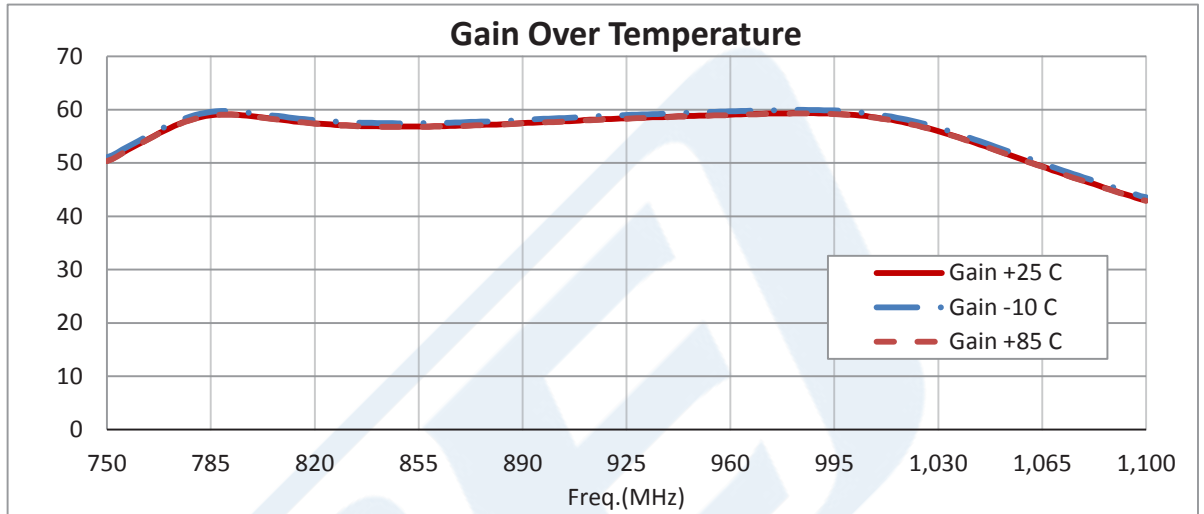
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50 dB Gain, 50 Watt P1dB, 800 MHz to 1 GHz, High Power Amplifier, SMA, 66 dBm IP3 from Pasternack Enterprises has same day shipment for domestic and International orders. Our RF, microwave and millimeter wave products maintain a 99.4% availability and are part of the broadest selection in the industry.

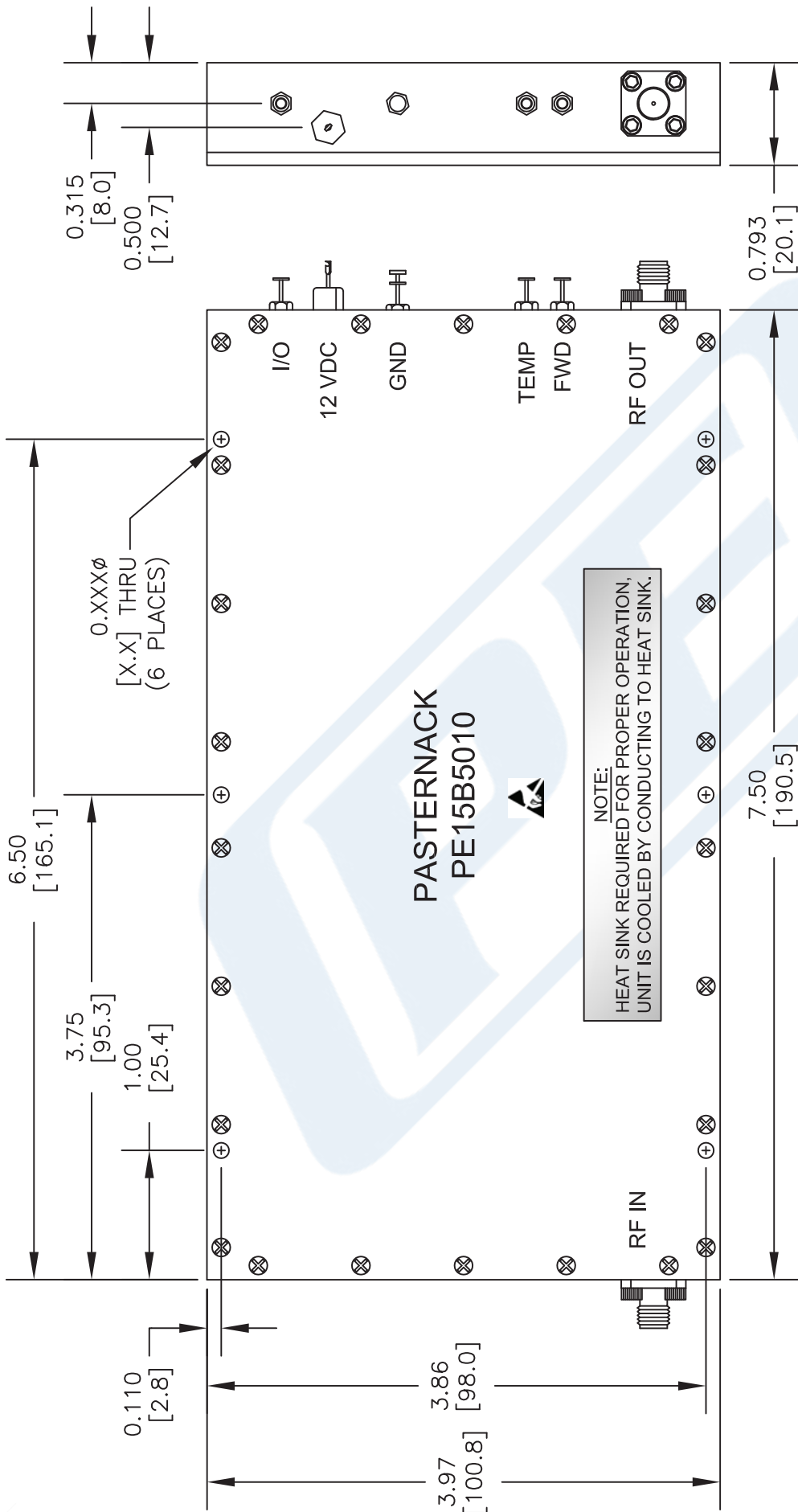
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URL: <https://www.pasternack.com/58-db-gain-2-ghz-high-power-high-gain-amplifier-ip3-sma-pe15a5010-p.aspx>

The information contained in this document is accurate to the best of our knowledge and representative of the part described herein. It may be necessary to make modifications to the part and/or the documentation of the part, in order to implement improvements. Pasternack reserves the right to make such changes as required. Unless otherwise stated, all specifications are nominal. Pasternack does not make any representation or warranty regarding the suitability of the part described herein for any particular purpose, and Pasternack does not assume any liability arising out of the use of any part or documentation.

PE15A5010 CAD Drawing

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PIN	DESCRIPTION	SPECIFICATION
RF Input	-11 dBm typ.	Input Connector
RF Output	+47 dBm (50W) P1dB	Output Connector
On/Off	TTL Logic On/Off	High=On, Low=Off
+12VDC	DC Input Range	+12VDC, 15 Amps typ. *
GND	Ground Turret	---
TEMP	Temperature Pin	.75V at +25°C, 1V at +50°C, 1.25V at +75° (±0.05V)
FWD	Forward Power Detention (RMS)	3.0V @ +34 dBm

* SPECIFIED OPERATION AT +12V, HOWEVER, UNIT CAN BE RUN FROM +10 VDC TO +14 VDC.

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

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].

DWG TITLE
PE15A5010

FSCM NO. 53919

CAD FILE 051514

SCALE N/A

SIZE A 150

PE PASTERNAK
 THE ENGINEERS' RF SOURCE
 Pasternack Enterprises, Inc.
 P.O. Box 16759 | Irvine | CA | 92623
 Phone: (949) 261-1920 | Fax: (949) 261-7451
 Website: www.pasternack.com | E-Mail: sales@pasternack.com