PASTERNACK
an INFINITE brand

40 dB Gain, 4 Watt P1dB, 20 MHz to 1 GHz, GaN Power Amplifier, SMA, 44 dBm IP3, 32% PAE, 6 dB NF, with Heatsink

TECHNICAL DATA SHEET PE15A4072

The PE15A4072 is a GaN power amplifier, operating from 20 to 1000 MHz and designed for use in a wide range of general purpose applications. Impressive broadband typical performance includes 40 dB gain, +36 dBm P1dB, 32% PAE, and an output 3rd order intercept point of +44 dBm. This exceptional technical performance is achieved through the use of a hybrid MIC design and advanced GaN power devices. The amplifier requires a +24V DC power supply and operates over a temperature range of -30°C to +65°C. The rugged package includes an integrated heatsink to ensure optimal thermal dissipation, and supports SMA female connectors and RFI ground pins. And for highly reliable operation, the module is guaranteed to meet MIL-STD-202 environmental test conditions for Humidity, Shock, Vibration, and Altitude.

Features

- GaN Semiconductor Technology
- 20 to 1000 MHz Frequency Range
- P1dB 4 Watts typ
- Small Signal Gain: 40 dB typ
- Gain Flatness: ±0.5 dB typ.
- Output IP3: 47 dBm typ.
- Power Added Efficiency: 32%
- 50 Ohm Input and Output Matched
- -30°C to +65°C Operating Temperature
- Noise Figure: 6 dB typ
- Single DC Positive Supply: +24V @ 630 mA
- Field Replaceable SMA Female connectors
- Designed to meet MIL-STD-202 Test Conditions

Applications

- Electronic Warfare
- Electronic Countermeasures
- Radar Systems
- Telecom Infrastructure
- Test Instrumentation
- Communication Systems
- Satellite Communications
- Microwave Radio Systems
- Driver Amplifier
- High Power Output Amplifier

Electrical Specifications (TA = +25°C , Zs = ZL = 50 Ohms)

Description	Minimum	Typical	Maximum	Units
Frequency Range	20		1,000	MHz
Small Signal Gain	38	40		dB
Gain Flatness		±0.5	±0.8	dB
Efficiency (PAE)* (Pout = +36 dBm)	28	32		%
Output Power at Pout @ Pin = 0 dBm	+35	+36		dBm
Output 3rd Intercept Point*	+43	+47		dBm
IMD3 (Two Tone +20 dBm Output)	45	48		dBc
Reverse Isolation*	-45	-50		dB
Noise Figure*		6	7	dB
Impedance (Input)		50		Ohms
Impedance (Output)		50		Ohms
Input VSWR*		1.5:1	2:1	
Output VSWR*		1.5:1	2:1	
Operating DC Voltage	+18	+24	+28	Volts
Quiescent Current Biased		630	670	mA

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Pasternack Enterprises, Inc. • P.O. Box 16759, Irvine, CA 92623
Phone: (866) 727-8376 or (949) 261-1920 • **Fax:** (949) 261-7451
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Electrical Specification Notes:
*f = 500 MHz

Absolute Maximum Rating

Parameter	Rating	Units
RF Input Power	+10	dBm
Supply Voltage	+28	V
Operating Temperature	-30 to +65	°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	3.75 in [95.25 mm]
Width	2 in [50.8 mm]
Height	1.913 in [48.59 mm]
Weight	0.6125 lbs [277.83 g]
Input Connector	SMA Female
Output Connector	SMA Female
Bias Connector	Solder Pin

Environmental Specifications

Humidity	MIL-STD-202F, Method 103B, Condition B
Shock	MIL-STD-202F, Method 213B, Condition B
Vibration	MIL-STD-202F, Method 204D, Condition B
Altitude	MIL-STD-202F, Method 105C, Condition B

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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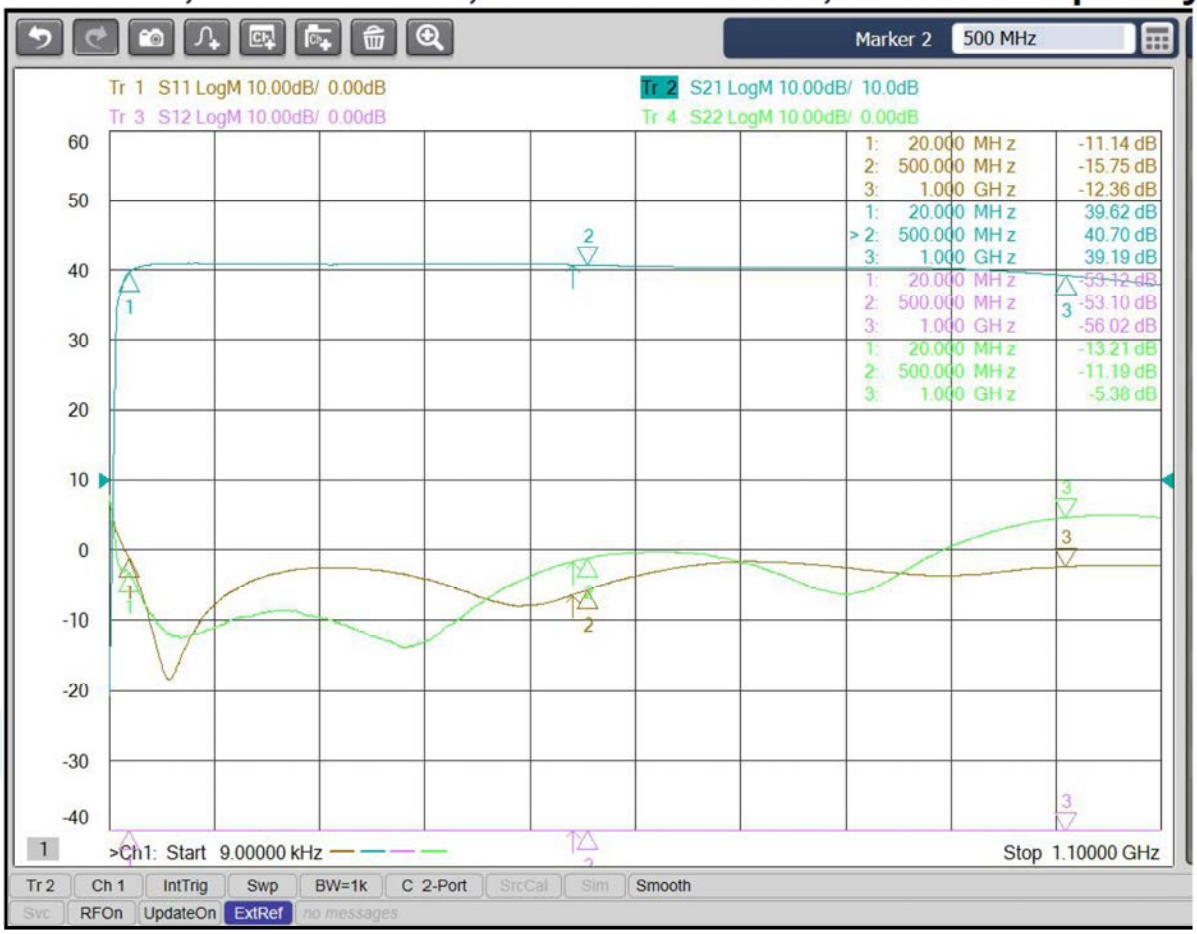
TECHNICAL DATA SHEET PE15A4072

Typical Performance Data

Gain S21, Isolation S12, Return Loss S11, S22 vs Frequency



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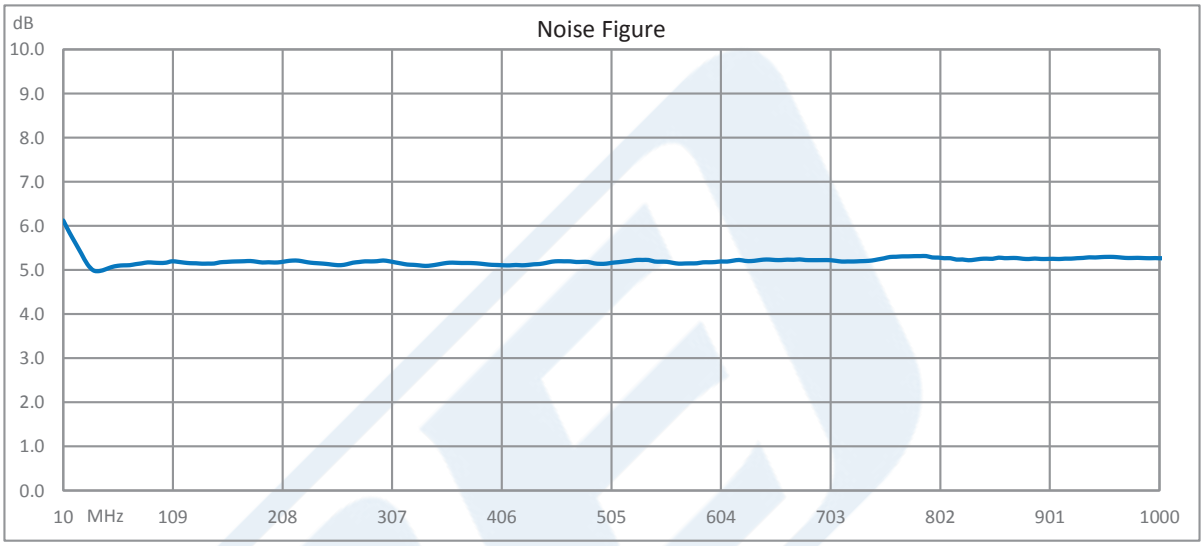

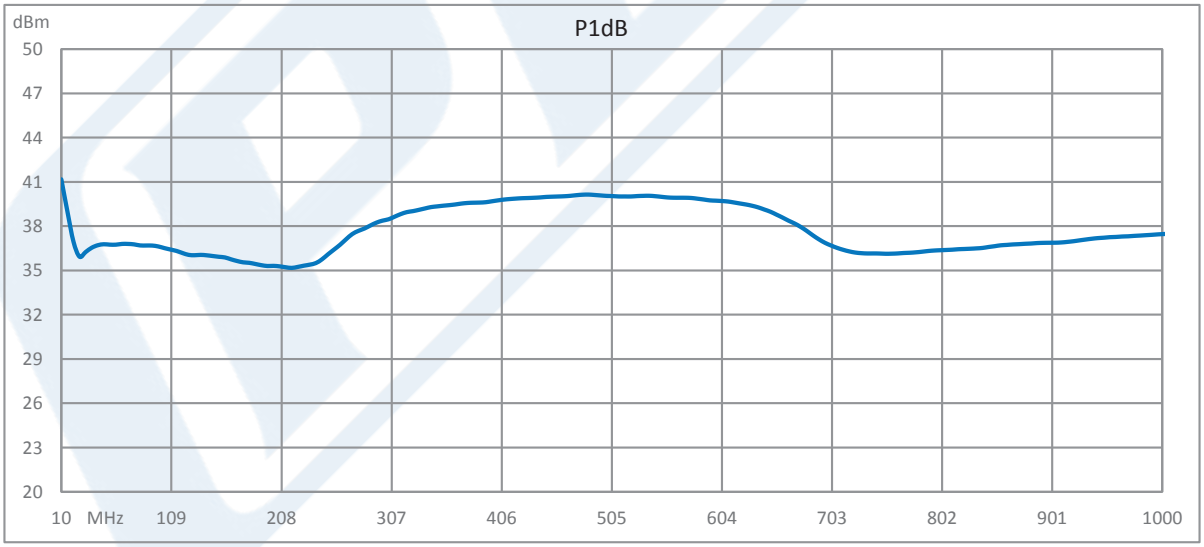

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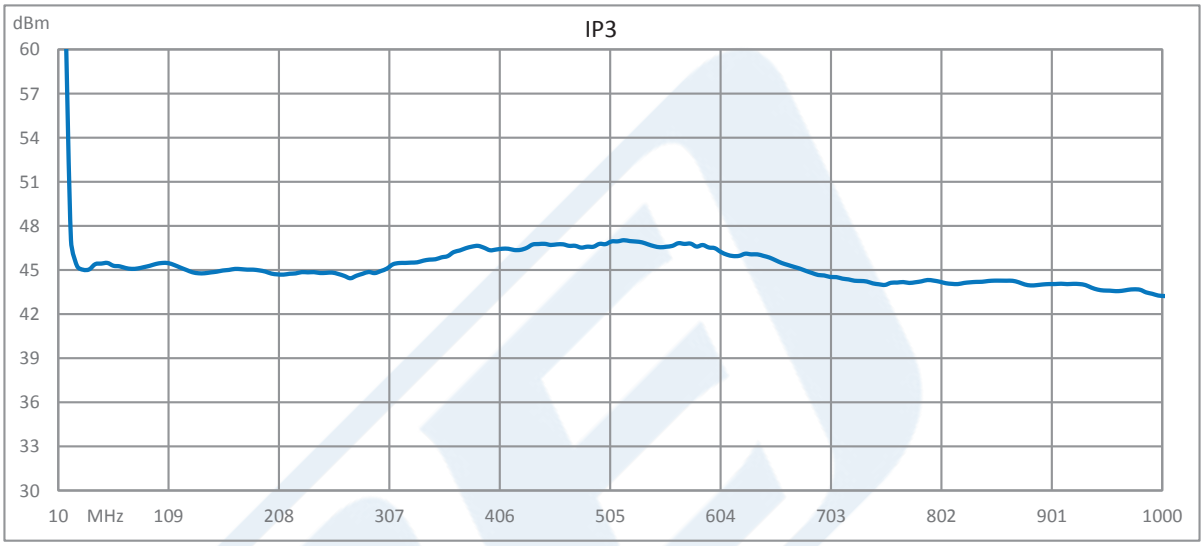

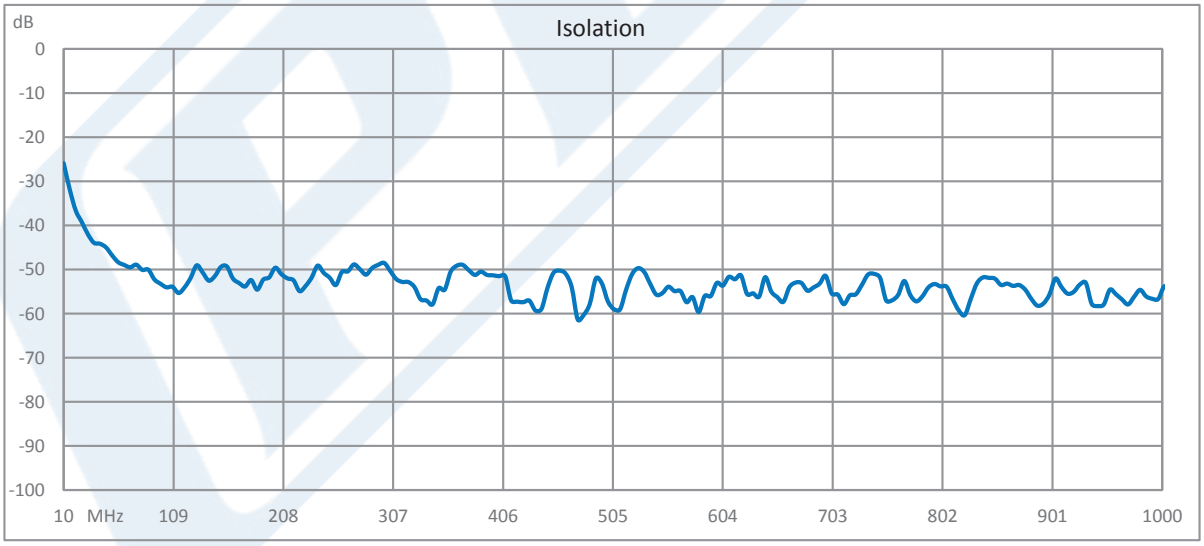

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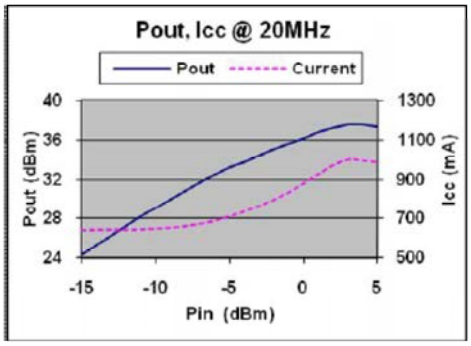
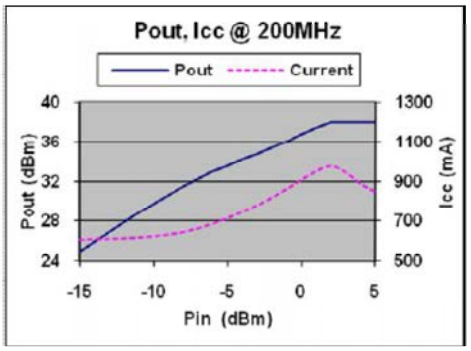
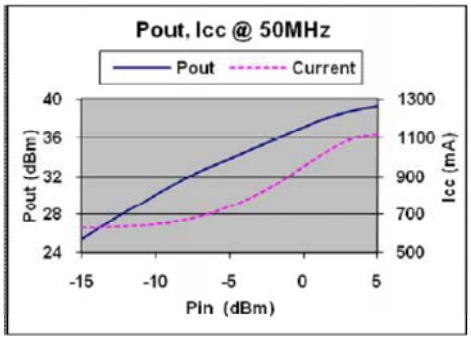
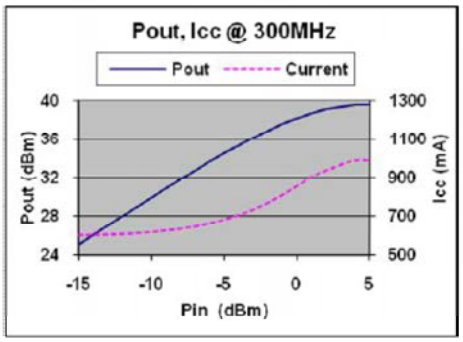
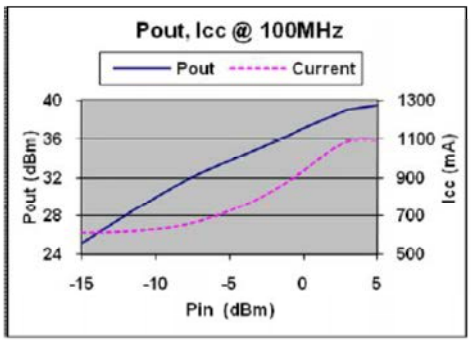
Typical Performance @ +25 °C

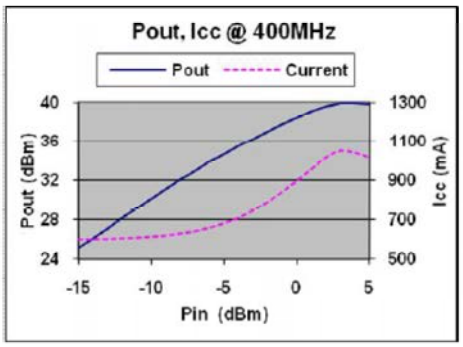












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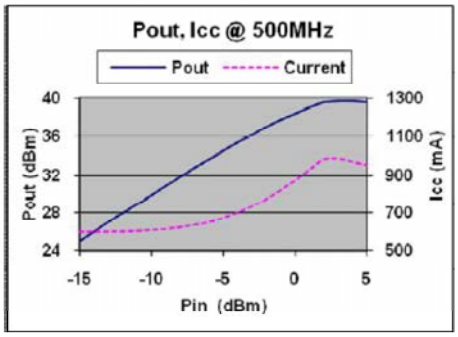
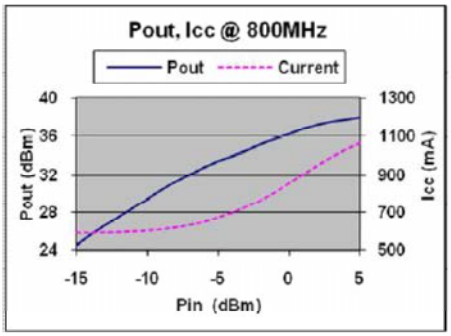
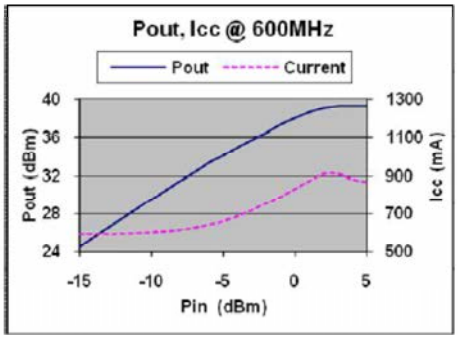
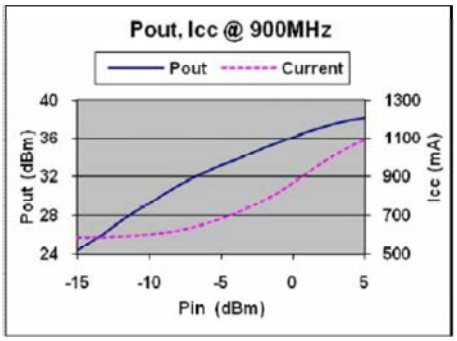
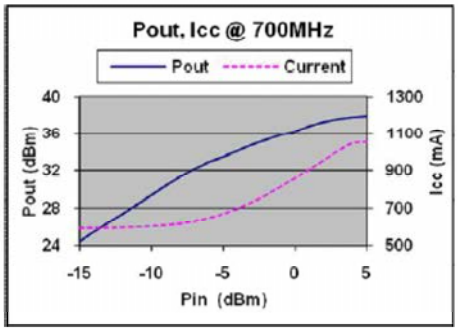
Typical Performance @ +25 °C

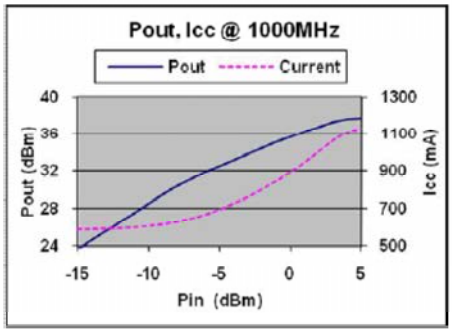












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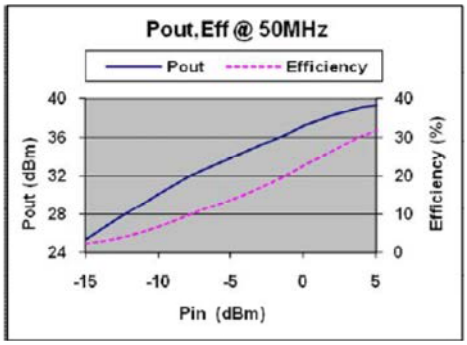
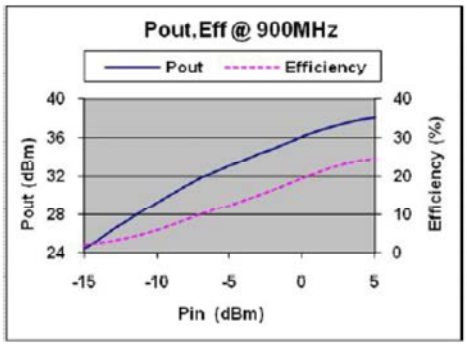
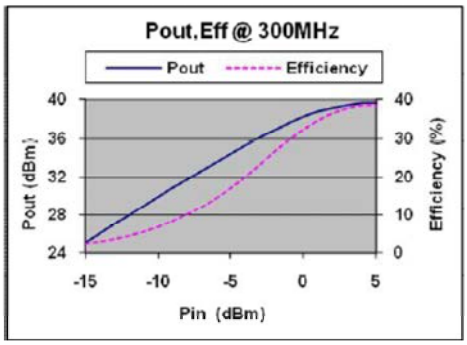
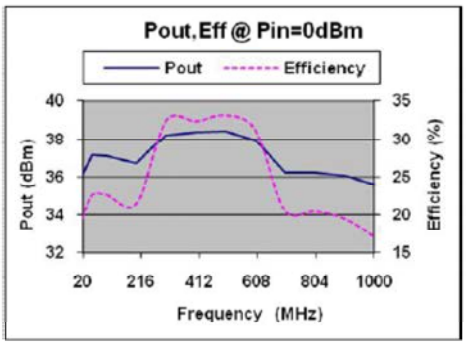
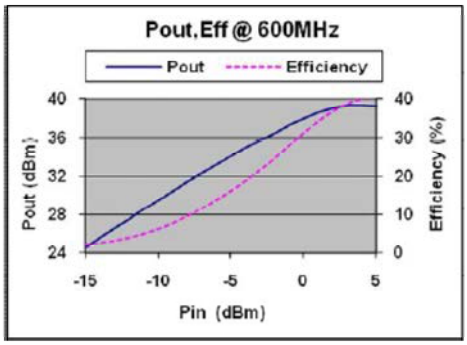
Typical Performance @ +25 °C

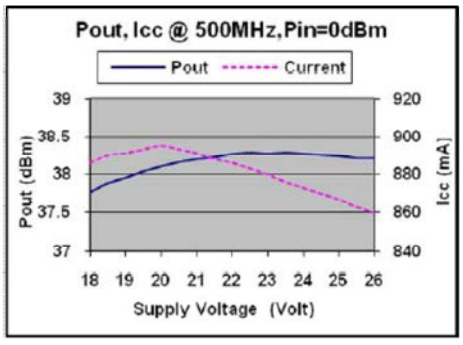












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URL: https://www.pasternack.com/40-db-gain-1-ghz-high-power-high-gain-amplifier-sma-pe15a4072-p.aspx

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PE15A4072 CAD Drawing

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