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MICROWAVE CORPORATION v00.0808



HMC451LP3 / 451LP3E

GaAs PHEMT MMIC MEDIUM POWER AMPLIFIER, 5 - 18 GHz

Typical Applications

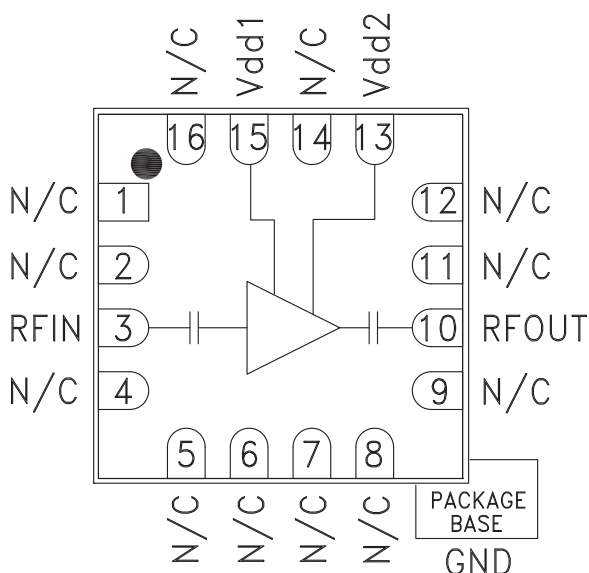
The HMC451LP3(E) is ideal for:

- Microwave Radio & VSAT
- Military & Space
- Test Equipment & Sensors
- Fiber Optics
- LO Driver for HMC Mixers

Features

- Gain: 18 dB
- Saturated Power: +21 dBm @ 18% PAE
- Output IP3: +28 dBm
- Single Supply: +5V @ 120 mA
- 50 Ohm Matched Input/Output
- 16 Lead 3x3mm SMT Package: 9mm²

Functional Diagram



General Description

The HMC451LP3(E) is an efficient GaAs PHEMT MMIC Medium Power Amplifier housed in a leadless RoHS compliant SMT package. Operating between 5 and 18 GHz, the amplifier provides 18 dB of gain, +21 dBm of saturated power and 18% PAE from a single +5V supply. This 50 Ohm matched amplifier does not require any external components and the RF I/O's are DC blocked, making it an ideal linear gain block or LO driver for HMC mixers. The HMC451LP3(E) eliminates the need for wire bonding, and allows the use of surface mount manufacturing techniques.

Electrical Specifications, $T_A = +25^\circ\text{C}$, $V_{dd1} = V_{dd2} = +5\text{V}$

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range	5 - 16			16 - 18			GHz
Gain	15	18		12.5	16		dB
Gain Variation Over Temperature		0.02	0.03		0.02	0.03	dB/°C
Input Return Loss		13			13		dB
Output Return Loss		12			8		dB
Output Power for 1 dB Compression (P1dB)	16.5	19.5		16	19		dBm
Saturated Output Power (Psat)		21			20		dBm
Output Third Order Intercept (IP3)		28			25		dBm
Noise Figure		7			7		dB
Supply Current (Idd)		120	150		120	150	mA

For price, delivery and to place orders: Hittite Microwave Corporation, 20 Alpha Road, Chelmsford, MA 01824

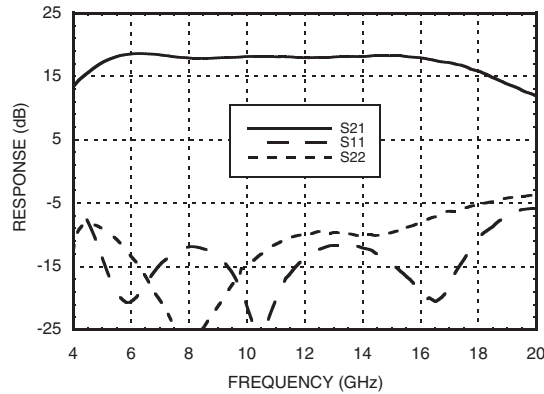
Phone: 978-250-3343 Fax: 978-250-3373 Order On-line at www.hittite.com

Application Support: Phone: 978-250-3343 or apps@hittite.com

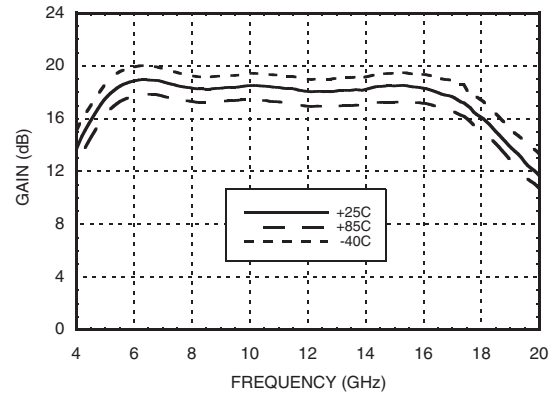
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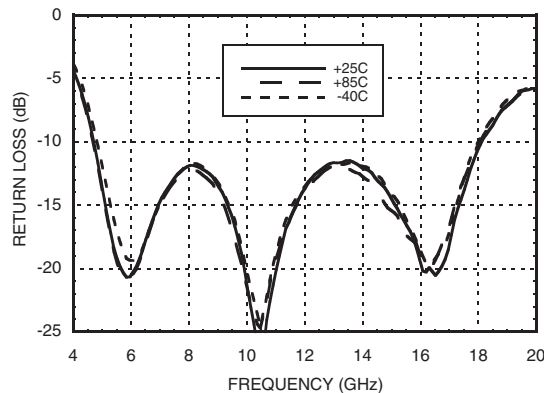
Broadband Gain & Return Loss



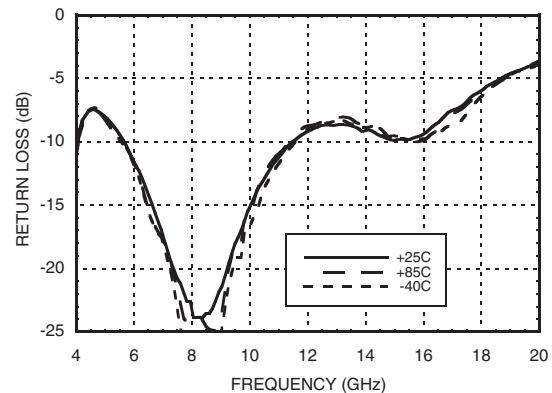
Gain vs. Temperature



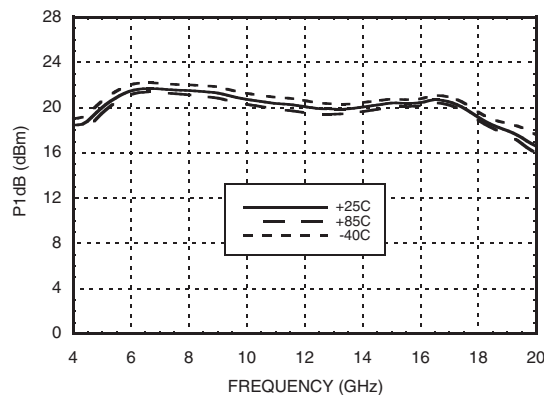
Input Return Loss vs. Temperature



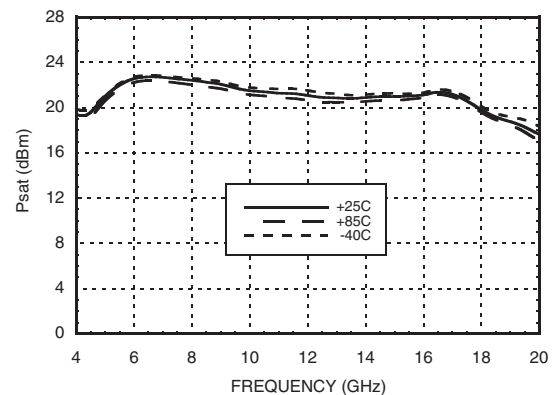
Output Return Loss vs. Temperature



P1dB vs. Temperature



Psat vs. Temperature





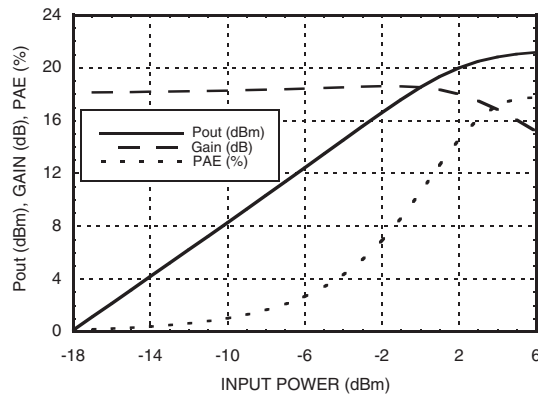
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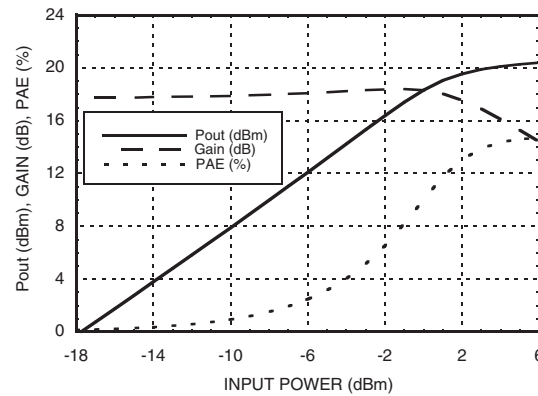
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GaAs PHEMT MMIC MEDIUM POWER AMPLIFIER, 5 - 18 GHz

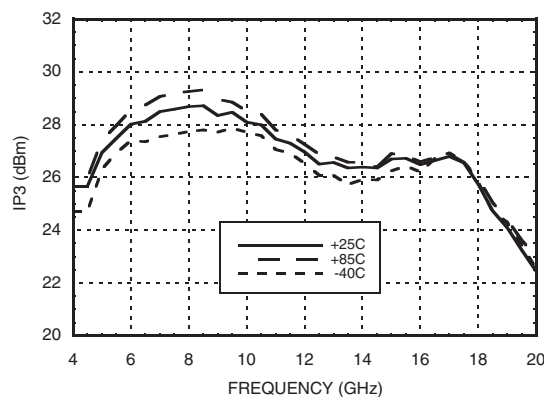
Power Compression @ 10 GHz



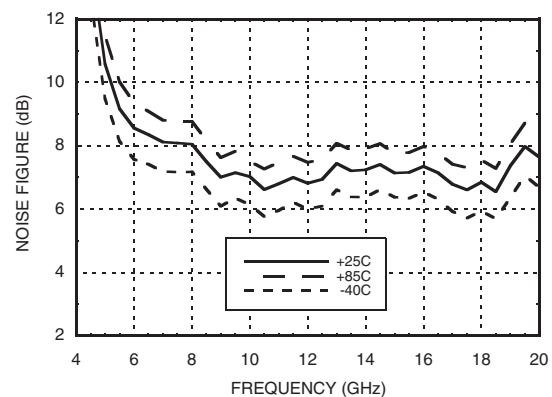
Power Compression @ 17 GHz



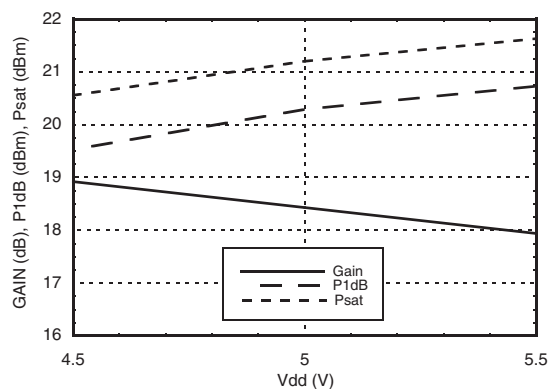
Output IP3 vs. Temperature



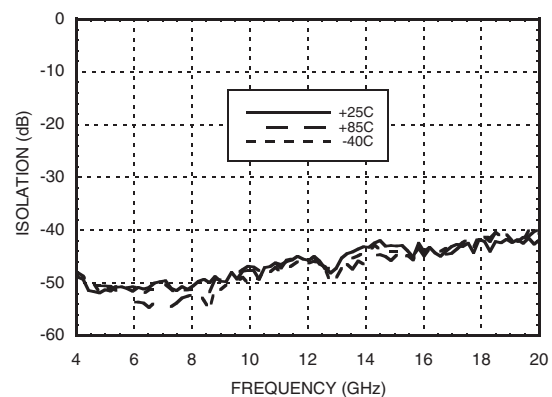
Noise Figure vs. Temperature



**Gain, P1dB & PSAT
vs. Supply Voltage @ 11 GHz**



Reverse Isolation vs. Temperature



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**GaAs PHEMT MMIC MEDIUM
POWER AMPLIFIER, 5 - 18 GHz**

Drain Bias Voltage ($V_{dd_1} = V_{dd_2}$)	+5.5V
RF Input Power (RFIN)($V_{dd} = +5V_{dc}$)	+10 dBm
Channel Temperature	150 °C
Continuous Pdiss (T = 85 °C) (derate 12.8 mW/°C above 85 °C)	0.83 W
Thermal Resistance (channel to ground paddle)	78 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

Vdd ₁ = Vdd ₂ (V)	Idd ₁ + Idd ₂ (mA)
+4.5	120
+5.0	122
+5.5	124

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The diagram illustrates the layout of a 16x13 HMC Part Number label. The label is divided into two main sections: the top section for the HMC Part Number (digits only) and the bottom section for the Lot Number. The top section contains the HMC Part Number (digits only) and the Lot Number. The bottom section contains the Lot Number. The label is divided into two main sections: the top section for the HMC Part Number (digits only) and the bottom section for the Lot Number. The top section contains the HMC Part Number (digits only) and the Lot Number. The bottom section contains the Lot Number.

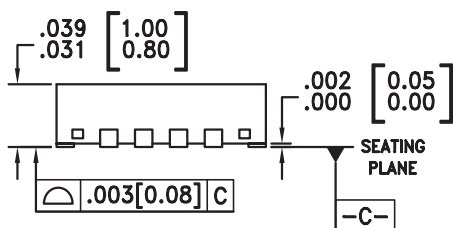


Diagram of a square package with dimensions and labels:

- Top dimensions: .012 [0.30] / .007 [0.18] (left), .016 [0.40] REF / .008 [0.20] MIN (right)
- Left dimensions: .061 [1.56] / .057 [1.44] (outer), .077 [1.95] / .059 [1.50] (inner)
- Right dimensions: .022 [0.56] / .017 [0.44] (inner)
- Labels: PIN 16, PIN 1, EXPOSED GROUND PADDLE MUST BE CONNECTED TO RF/DC GROUND
- Shape: SQUARE

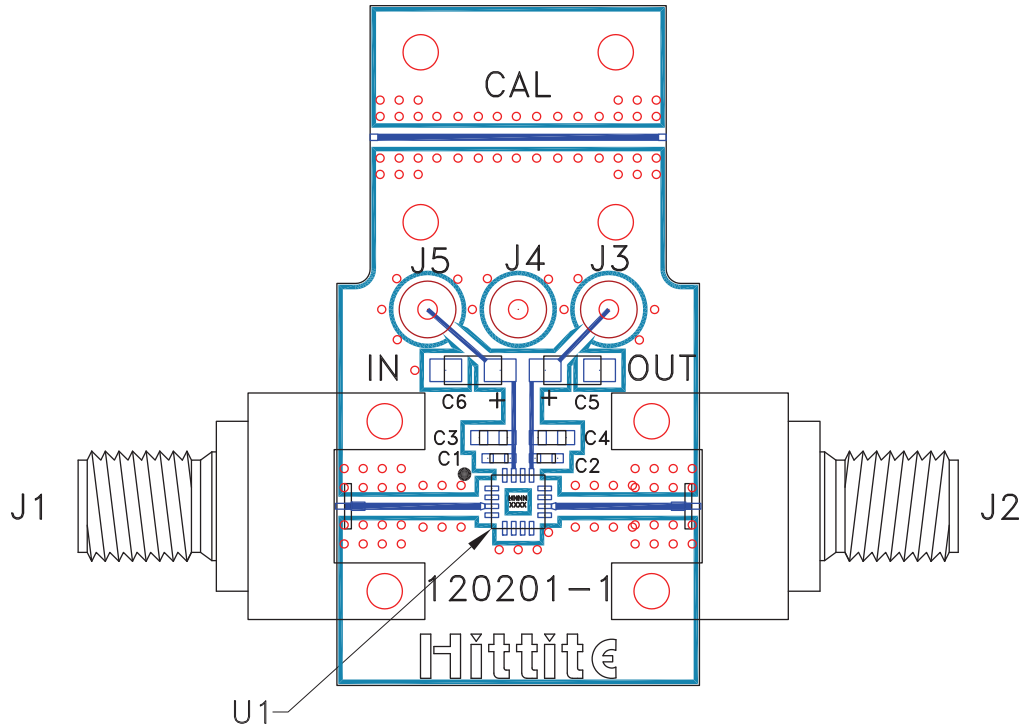
1. LEADFRAME MATERIAL: COPPER ALLOY
2. DIMENSIONS ARE IN INCHES [MILLIMETERS]
3. LEAD SPACING TOLERANCE IS NON-CUMULATIVE
4. PAD BURR LENGTH SHALL BE 0.15mm MAXIMUM.
5. PAD BURR HEIGHT SHALL BE 0.05mm MAXIMUM.
6. PACKAGE WARP SHALL NOT EXCEED 0.05mm.
7. ALL GROUND LEADS AND GROUND PADDLE MUST BE SOLDERED TO PCB RF GROUND.
8. REFER TO HITTITE APPLICATION NOTE FOR SUGGESTED LAND PATTERN.

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking ^[3]
HMC451LP3	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 ^[1]	451 XXXX
HMC451LP3E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 ^[2]	<u>451</u> XXXX

[3] 4-Digit lot number XXXX

Application Support: Phone: 978-250-3343 or apps@hittite.com

Evaluation PCB



List of Materials for Evaluation PCB 120202 ^[1]

Item	Description
J1 - J2	PCB Mount SMA Connector
J3 - J5	DC Pin
C1, C2	100 pF Capacitor, 0402 Pkg.
C3, C4	1000 pF Capacitor, 0603 Pkg.
C5, C6	2.2 μ F Capacitor, Tantalum
U1	HMC451LP3(E) Amplifier
PCB [2]	120201 Evaluation PCB

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Arlon 25FR

The circuit board used in the application should use RF circuit design techniques. Signal lines should have 50 Ohm impedance while the package ground leads and exposed paddle should be connected directly to the ground plane similar to that shown. A sufficient number of via holes should be used to connect the top and bottom ground planes. The evaluation board should be mounted to an appropriate heat sink. The evaluation circuit board shown is available from Hittite upon request.



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- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

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