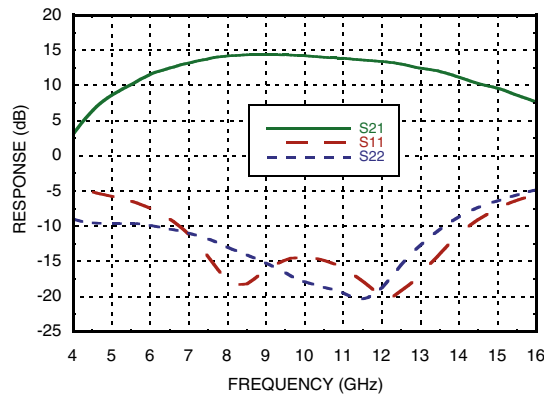


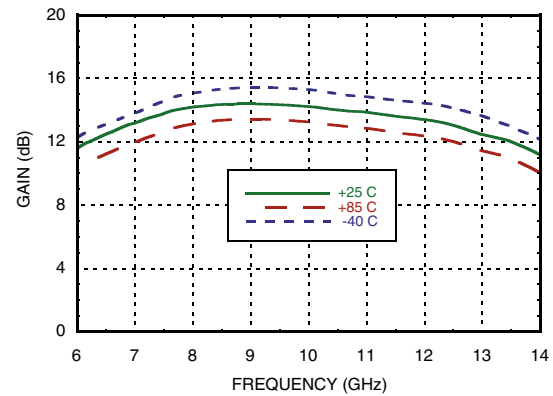


**GaAs pHEMT MMIC MEDIUM
POWER AMPLIFIER, 6.5 - 13.5 GHz**

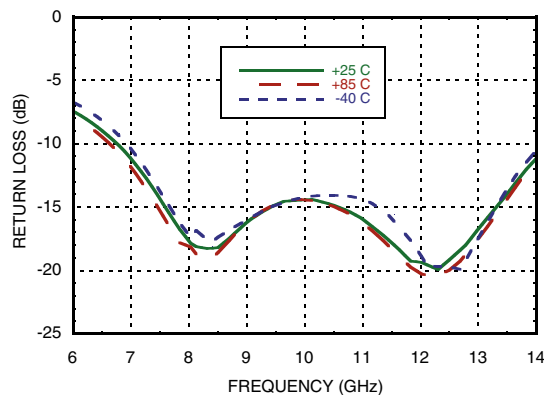
Broadband Gain & Return Loss



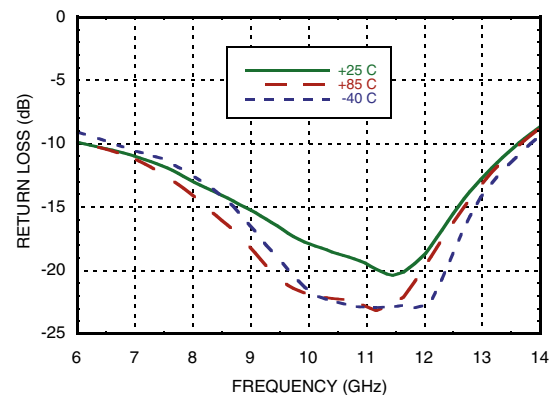
Gain vs. Temperature



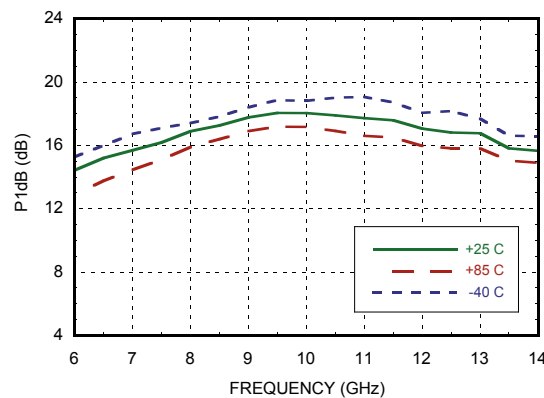
Input Return Loss vs. Temperature



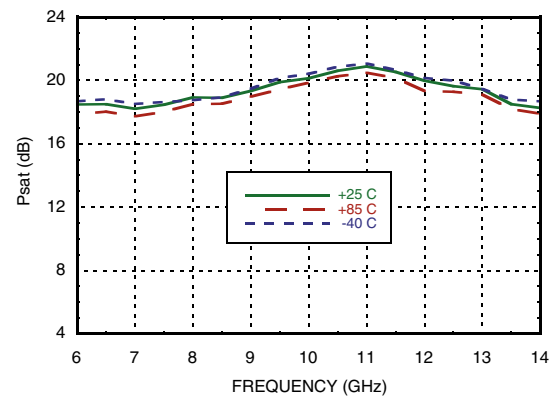
Output Return Loss vs. Temperature



P1dB vs. Temperature



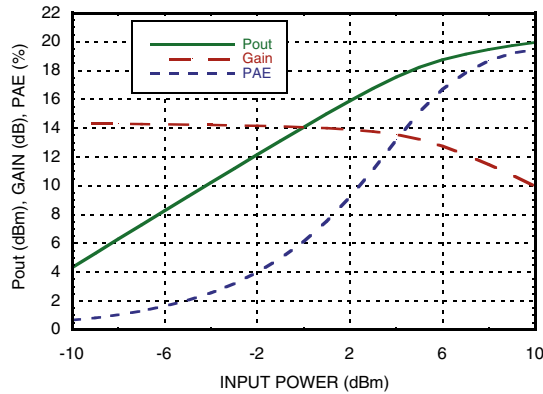
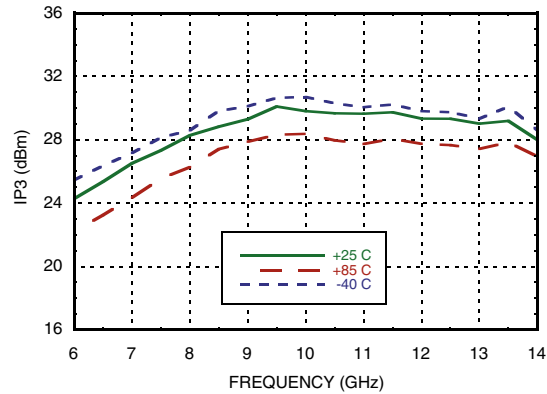
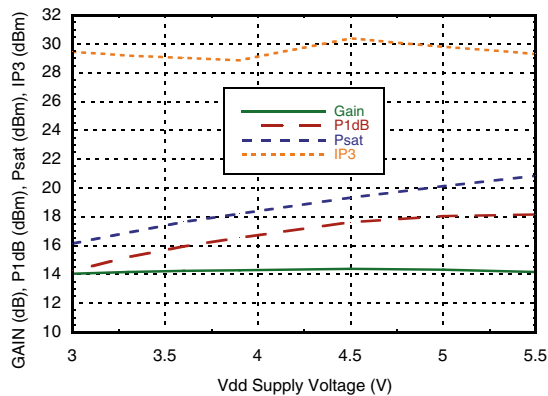
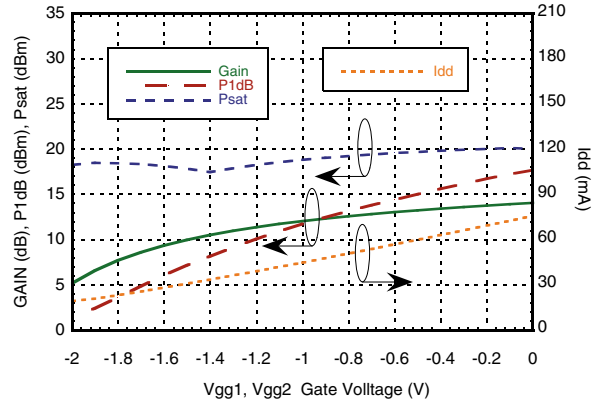
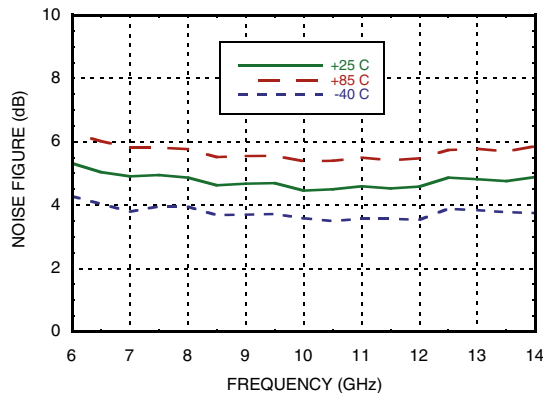
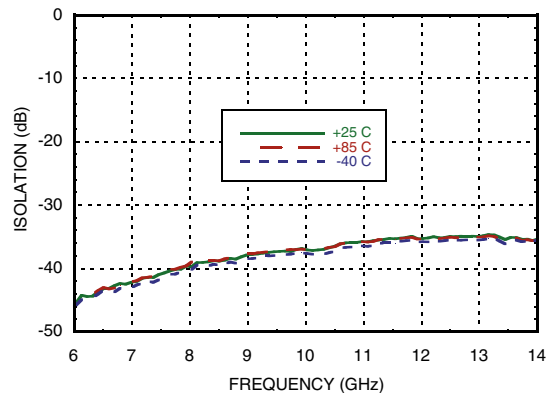
Psat vs. Temperature





HMC441LP3 / 441LP3E

GaAs pHEMT MMIC MEDIUM POWER AMPLIFIER, 6.5 - 13.5 GHz

Power Compression @ 10 GHz

Output IP3 vs. Temperature

**Gain, Power & Output IP3
vs. Supply Voltage @ 10 GHz**

**Gain, Power & Idd
vs. Gate Voltage @ 10 GHz**

Noise Figure vs. Temperature

Reverse Isolation vs. Temperature




GaAs pHEMT MMIC MEDIUM POWER AMPLIFIER, 6.5 - 13.5 GHz

Absolute Maximum Ratings

Drain Bias Voltage (Vdd)	+6 Vdc
Gate Bias Voltage (Vgg1,Vgg2)	-8 to 0 Vdc
RF Input Power (RFIN)(Vdd = +5 Vdc)	+15 dBm
Channel Temperature	175 °C
Continuous P _{diss} (T = 85 °C) (derate 8.5 mW/°C above 85 °C)	0.76 W
Thermal Resistance (channel to ground paddle)	118.2 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C

Typical Supply Current vs. Vdd

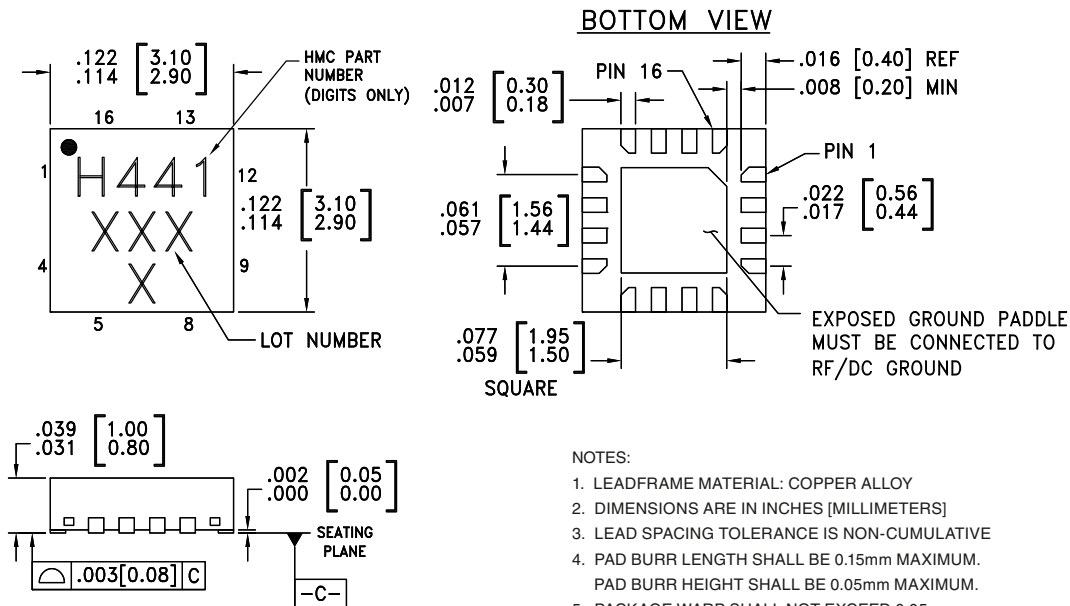
Vdd (V)	I _{dd} (mA)
+5.5	92
+5.0	90
+4.5	88
+3.3	83
+3.0	82

Note: Amplifier will operate over full voltage range shown above



ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking ^[3]
HMC441LP3	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 ^[1]	441 XXXX
HMC441LP3E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 ^[2]	441 XXXX

[1] Max peak reflow temperature of 235 °C

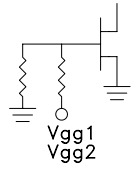
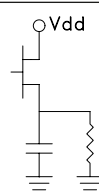
[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX

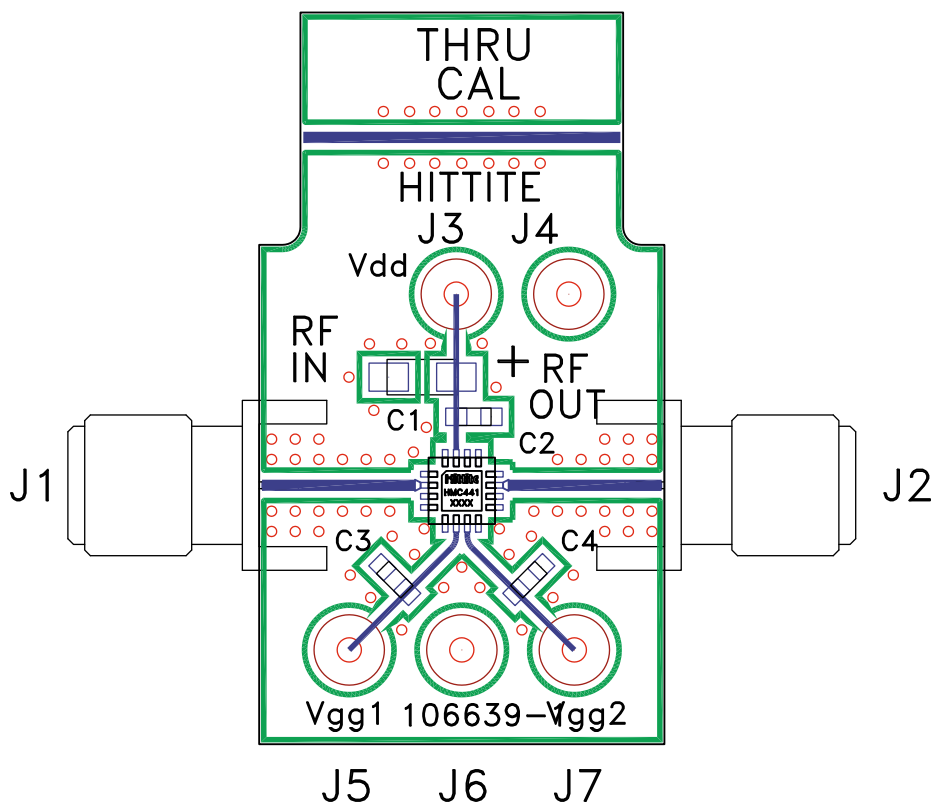
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**GaAs pHEMT MMIC MEDIUM
POWER AMPLIFIER, 6.5 - 13.5 GHz**
Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 3-5, 8-10, 12-14, 16	N/C	This pin may be connected to RF/DC ground.	
2	RFIN	This pin is AC coupled and matched to 50 Ohms.	RFIN ○ — —
6, 7	Vgg1, Vgg2	Optional gate control for amplifier. If left open, the amplifier will run at standard current. Negative voltage applied will reduce current.	
11	RFOUT	This pin is AC coupled and matched to 50 Ohms.	— —○ RFOUT
15	Vdd	Power Supply Voltage for the amplifier. An external bypass capacitor of 100 pF is required.	
	GND	Package bottom must be connected to RF/DC ground.	○ GND

Evaluation PCB



List of Materials for Evaluation PCB 106705 [1]

Item	Description
J1 - J2	PCB Mount SMA Connector
J3 - J7	DC Pin
C1	4.7 μ F Capacitor, Tantalum
C2 - C4	100 pF Capacitor, 0402 Pkg.
U1	HMC441LP3 / HMC441LP3E Amplifier
PCB [2]	106639 Evaluation PCB, 10 mils

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Rogers 4350

The circuit board used in the final 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.