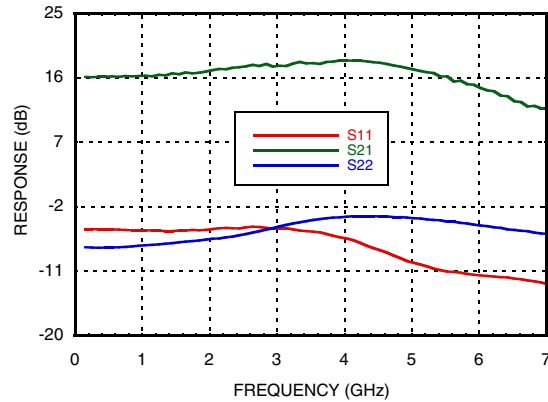
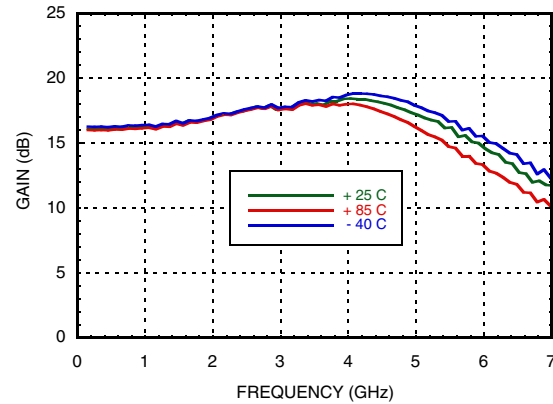
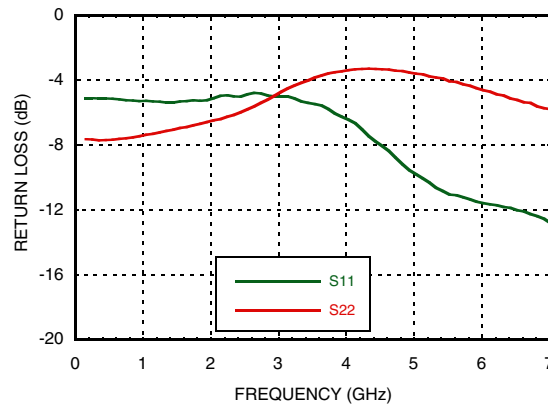
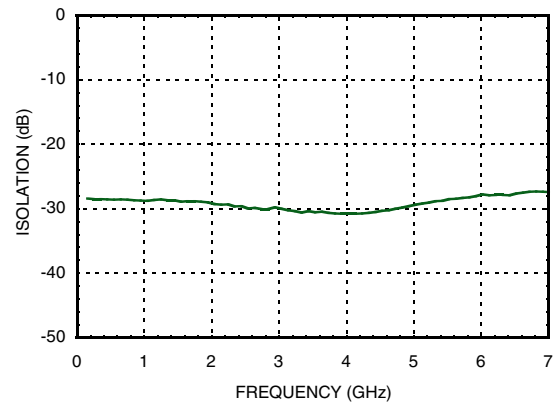
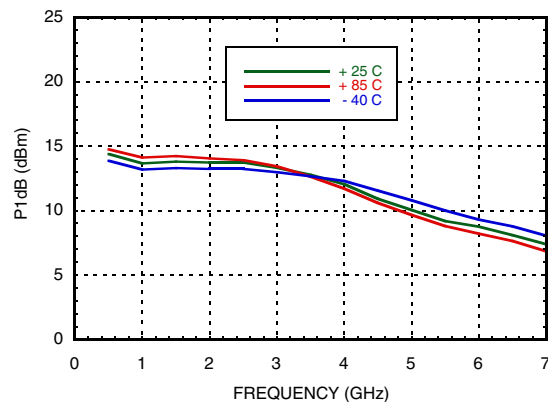
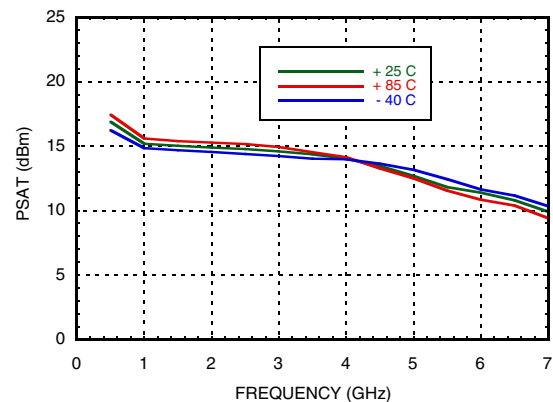
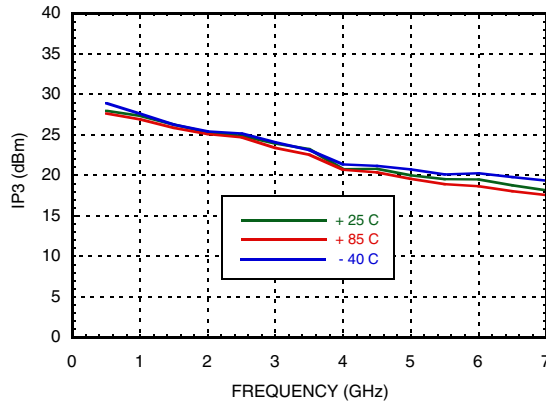


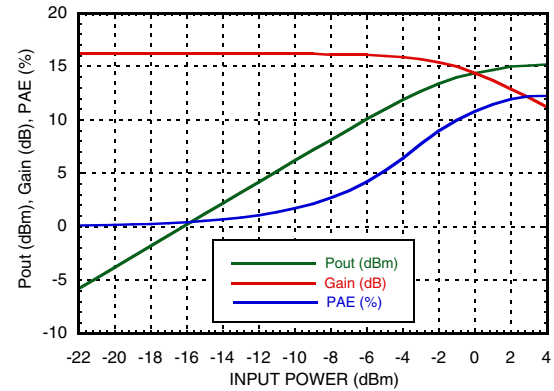
**GaAs InGaP HBT MMIC BROADBAND
AMPLIFIER GAIN BLOCK, DC - 6 GHz**
Gain & Return Loss

Gain vs. Temperature

Input & Output Return Loss

Reverse Isolation

P1dB vs. Temperature

Psat vs. Temperature


**GaAs InGaP HBT MMIC BROADBAND
AMPLIFIER GAIN BLOCK, DC - 6 GHz**

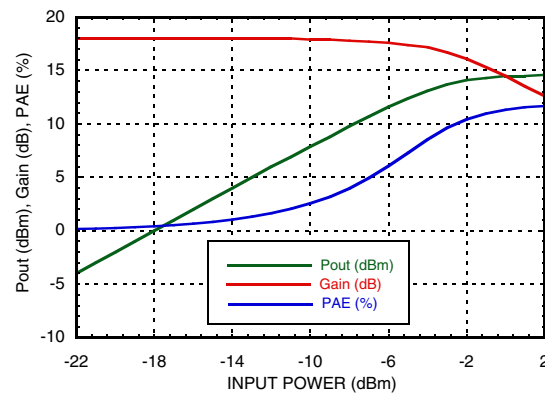
Output IP3 vs. Temperature



Power Compression @ 1 GHz



Power Compression @ 3 GHz



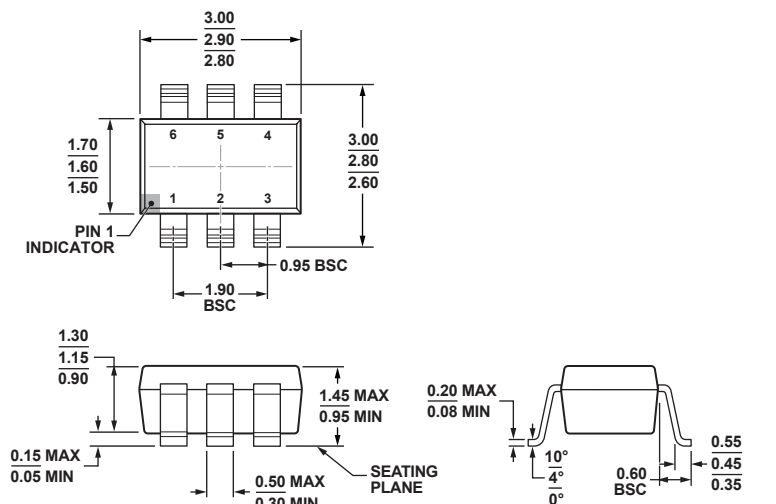
**GaAs InGaP HBT MMIC BROADBAND
AMPLIFIER GAIN BLOCK, DC - 6 GHz**
Absolute Maximum Ratings

Collector Bias Voltage (Vcc)	+5.5 Vdc
RF Input Power (RFIN)(Vcc = +5Vdc)	+20 dBm
Junction Temperature	150 °C
Continuous P _{diss} (T = 85 °C) (derate 3.99 mW/°C above 85 °C)	0.259 W
Thermal Resistance (junction to pin 2 lead) ^[1]	251 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C
ESD Sensitivity (HBM)	Class 1A



**ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS**

[1] Pin 2 REQUIRES good thermal attachment to the PCB

Outline Drawing


COMPLIANT TO JEDEC STANDARDS MO-178-AB

6-Lead Small Outline Transistor Package [SOT-23]
(RJ-6)

Dimensions shown in millimeters.

Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking ^[3]
HMC313	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 ^[1]	H313 XXXX
HMC313TR	Low Stress Injection Molded Plastic	Sn/Pb Solder	MSL1 ^[1]	313 XXXX
HMC313E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 ^[2]	313E XXXX
HMC313ETR	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL1 ^[2]	313E XXXX

[1] Max peak reflow temperature of 235 °C

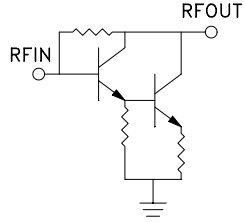
[2] Max peak reflow temperature of 260 °C

[3] 4-Digit lot number XXXX

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

GaAs InGaP HBT MMIC BROADBAND AMPLIFIER GAIN BLOCK, DC - 6 GHz

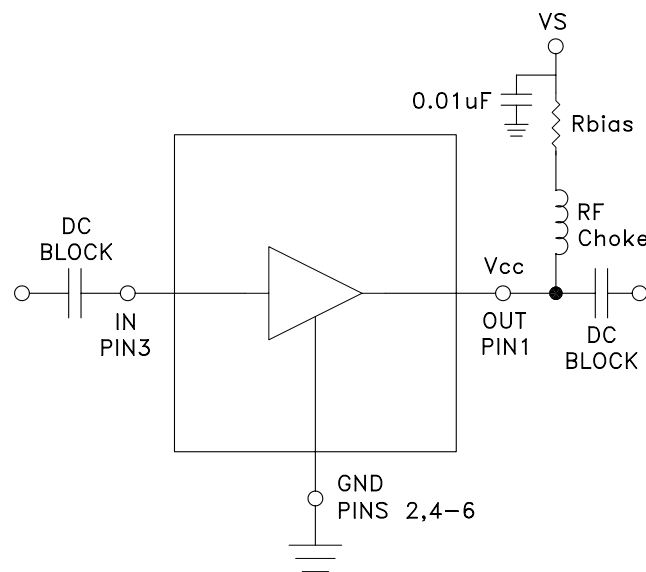
Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1	RFOUT	This pin is DC coupled. An off chip DC blocking capacitor is required.	
3	RFIN	This pin is DC coupled. An off chip DC blocking capacitor is required.	
2, 4-6	GND	These pins must be connected to RF/DC ground.	

Application Circuit

Recommended Bias Resistor Values for $I_{CC} = 50\text{ mA}$, $R_{bias} = (V_s - 5.0) / I_{CC}$

Supply Voltage (V_s)	5V	6V	8V
$R_{BIAS}\text{ VALUE}$	0 Ω	20 Ω	62 Ω
$R_{BIAS}\text{ POWER RATING}$		¼ W	½ W

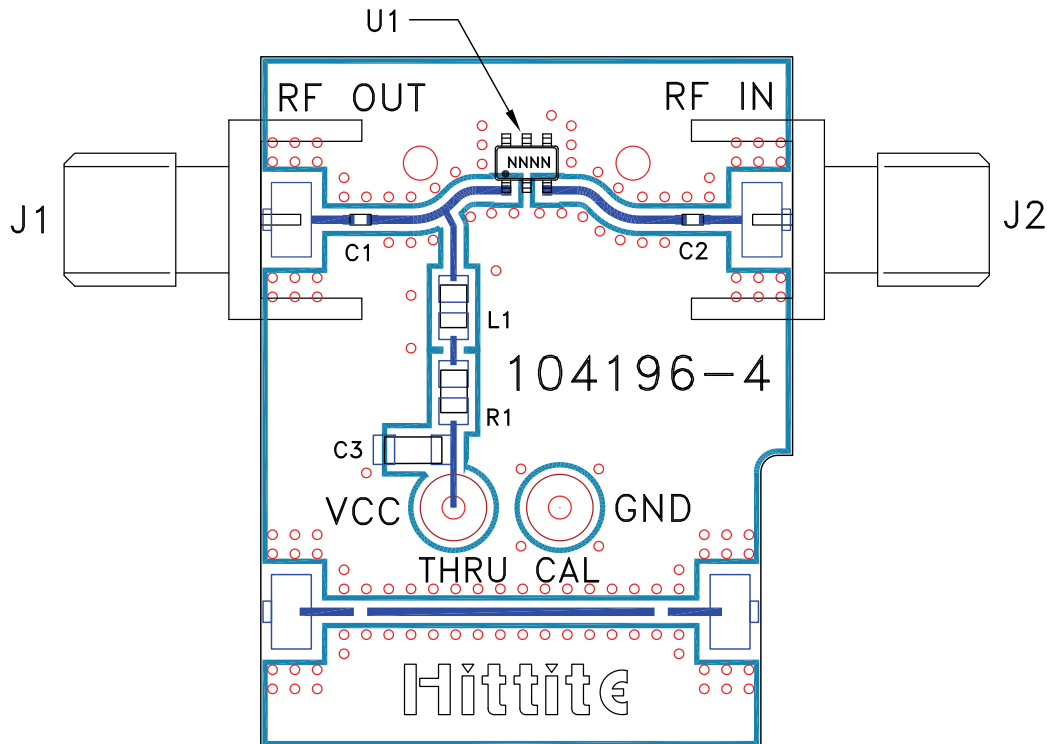


Note:

1. Select R_{bias} to achieve desired V_{CC} voltage on Pin 1.
2. External Blocking Capacitors are required on Pins 1 & 3.

**GaAs InGaP HBT MMIC BROADBAND
AMPLIFIER GAIN BLOCK, DC - 6 GHz**

Evaluation PCB



List of Materials for Evaluation PCB 104217 [1]

Item	Description
J1 - J2	PCB Mount SMA Connector
C1 - C2	100 pF Capacitor, 0402 Pkg.
C3	100 pF Capacitor, 0805 Pkg.
L1	22 nH Inductor, 0805 Pkg.
R1	22 Ω Resistor, 0805 Pkg.
U1	HMC313 / HMC313E
PCB [2]	104196 Evaluation PCB

[1] Reference this number when ordering complete evaluation PCB

[2] Circuit Board Material: Arlon 25FR or Roger 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 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 circuit board shown is available from Analog Devices, upon request.