GaAs MMIC LOW NOISE AMPLIFIER, 24 - 36 GHz

Typical Applications

The HMC263 is ideal for:

- Millimeterwave Point-to-Point Radios
- LMDS
- VSAT
- SATCOM

Features

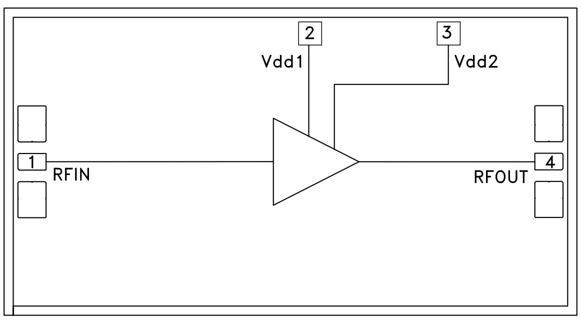
Excellent Noise Figure: 2 dB

Gain: 22 dB

Single Supply: +3V @ 58 mA

Small Size: 2.48 x 1.33 x 0.1 mm

Functional Diagram



General Description

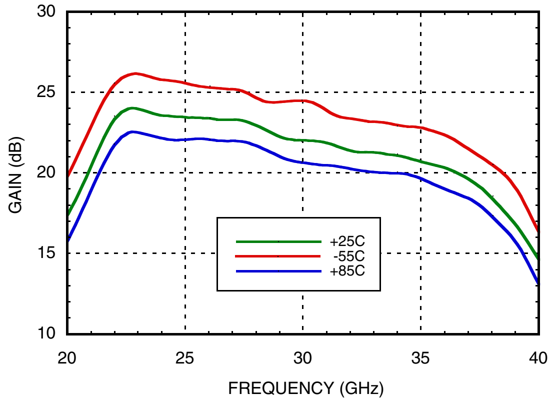
The HMC263 chip is a GaAs MMIC Low Noise Amplifier (LNA) which covers the frequency range of 24 to 36 GHz. The chip can easily be integrated into Multi-Chip Modules (MCMs) due to its small (3.29 mm2) size. The chip utilizes a GaAs PHEMT process offering 22 dB gain from a single bias supply of + 3V @ 58 mA with a noise figure of 2.0 dB. All data is with the chip in a 50 ohm test fixture connected via 0.076 mm (3 mil) diameter ribbon bonds of minimal length 0.31 mm (<12 mils). The HMC263 may be used in conjunction with HMC264 or HMC265 mixers to realize a millimeterwave system receiver.

Electrical Specifications, T_A = +25° C, Vdd = +3V

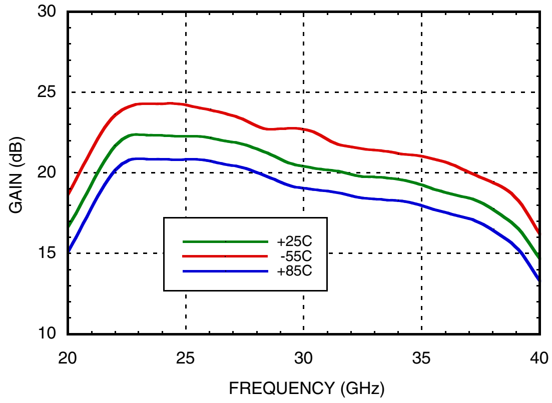
Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range		24 - 27			27 - 32			32 - 36		GHz
Gain	20	23	26	18	22	26	17	20	23	dB
Gain Variation Over Temperature		0.03	0.04		0.03	0.04		0.03	0.04	dB/°C
Noise Figure		2.5	3.3		2.0	2.5		2.1	2.6	dB
Input Return Loss	7	10		7	10		7	10		dB
Output Return Loss	7	10		9	12		8	11		dB
Output Power for 1 dB Compression (P1dB)	-1	3		1	5		4	8		dBm
Saturated Output Power (Psat)	1	5		3	7		6	10		dBm
Output Third Order Intercept (IP3)	5	10		7	13		11	17		dBm
Supply Current (Idd) (@ Vdd = +3.0V)		58	77		58	77		58	77	mA

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

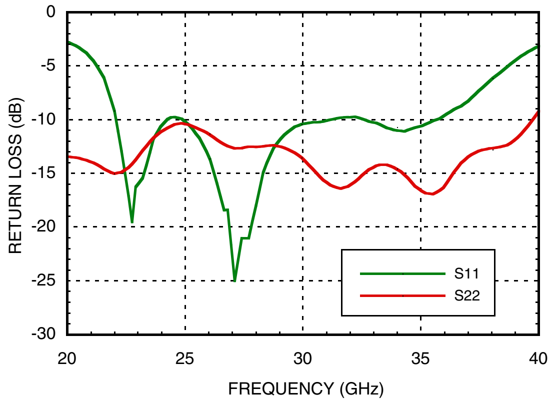
Gain vs. Temperature @ Vdd = +3V



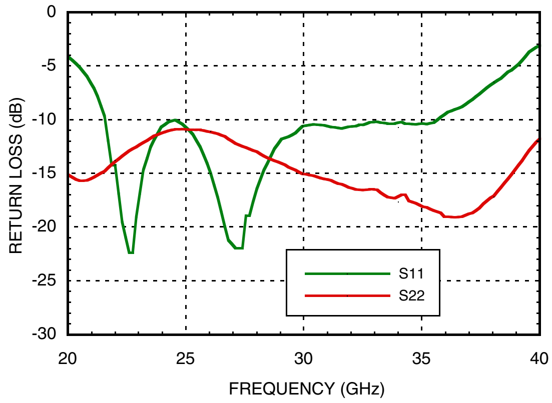
Gain vs. Temperature @ Vdd = +5V



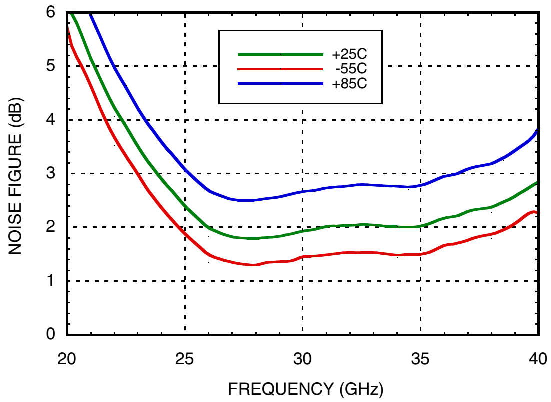
Return Loss @ Vdd = +3V



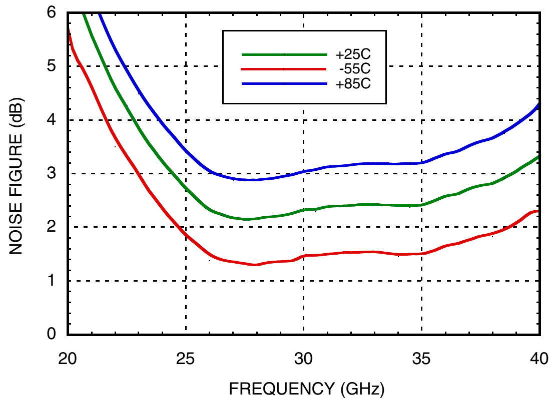
Return Loss @ Vdd = +5V



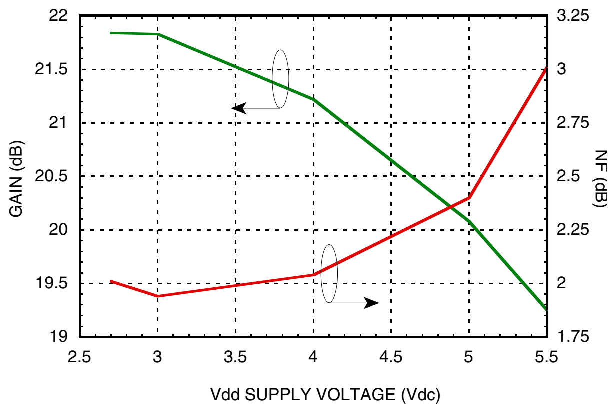
Noise Figure vs. Temperature @ Vdd = +3V



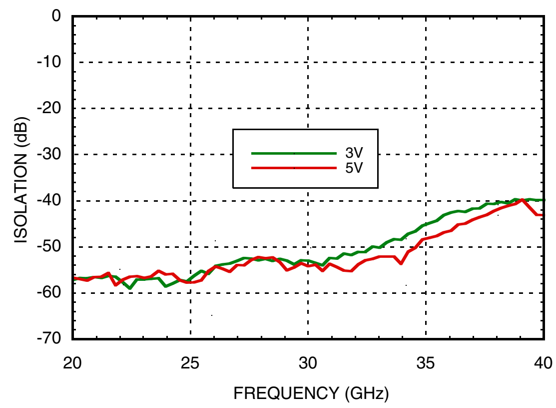
Noise Figure vs. Temperature @ Vdd = +5V



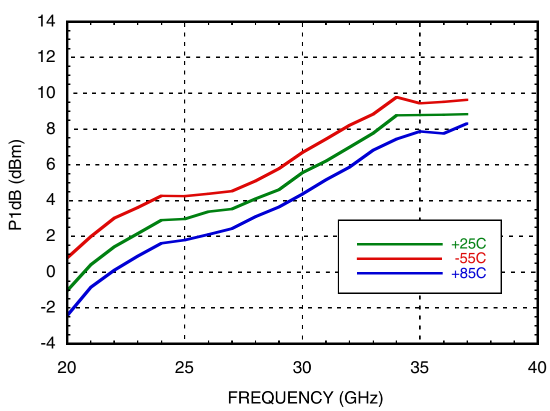
Gain & Noise Figure vs. Supply Voltage @ 30 GHz



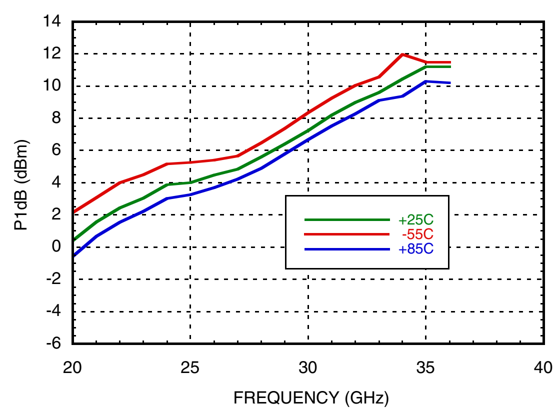
Isolation



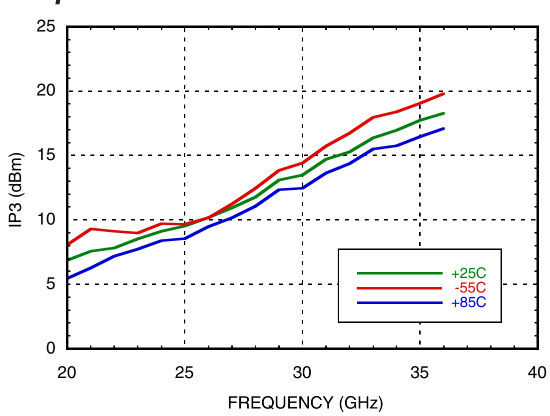
Output P1dB @ Vdd = +3V



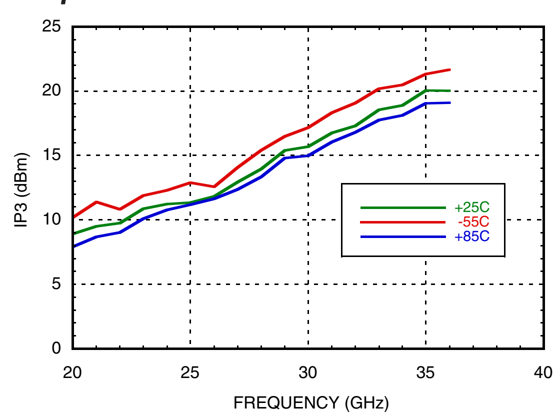
Output P1dB @ Vdd = +5V



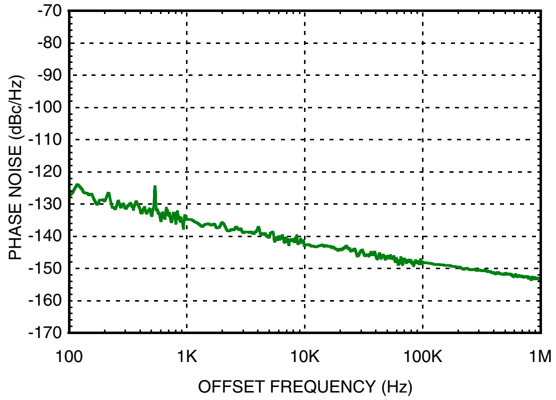
Output IP3 @ Vdd = +3V



Output IP3 @ Vdd = +5V



Additive Phase Noise Vs Offset Frequency, RF Frequency = 30 GHz, RF Input Power = -12 dBm (P1dB)

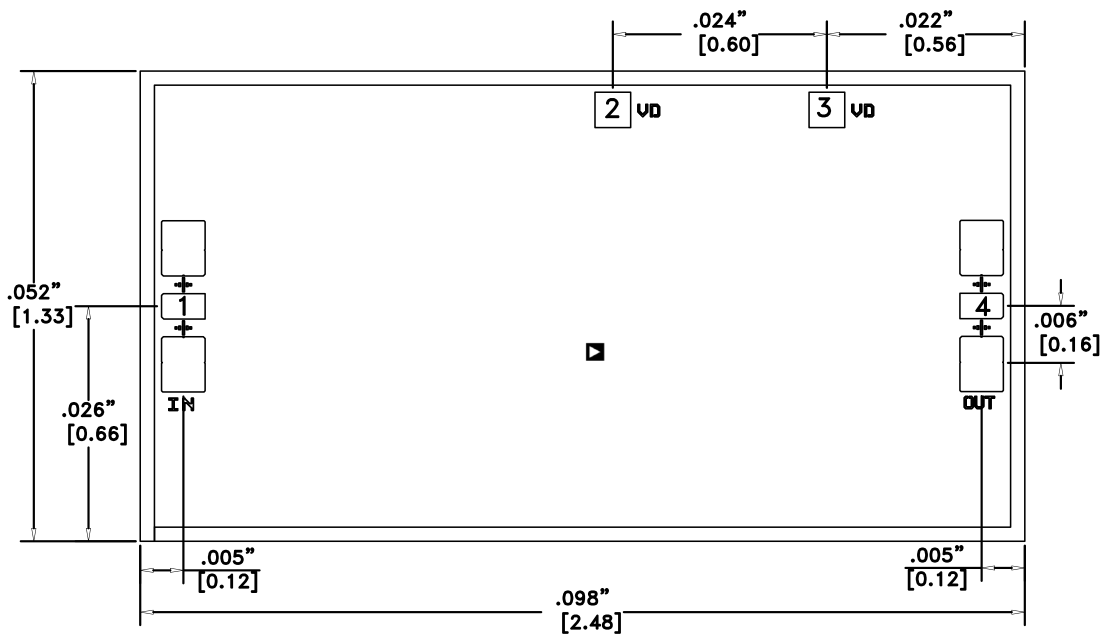


Absolute Maximum Ratings

Drain Bias Voltage (Vdd1, Vdd2)	+5.5 Vdc
RF Input Power (RFIN)(Vdd = +3 Vdc)	-5 dBm
Channel Temperature	175 °C
Continuous Pdiss (T = 85 °C) (derate 7.69 mW/°C above 85 °C)	0.692 W
Thermal Resistance (channel to die bottom)	130 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

Outline Drawing



NOTES:
1. ALL DIMENSIONS IN INCHES (MILLIMETERS)
2. ALL TOLERANCES ARE ±0.001 (0.025)
3. DIE THICKNESS IS 0.004 (0.100) BACKSIDE IS GROUND
4. BOND PADS ARE 0.004 (0.100) SQUARE
5. BOND PAD SPACING, CTR-CTR: 0.006 (0.150)
6. BACKSIDE METALLIZATION: GOLD
7. BOND PAD METALLIZATION: GOLD

Die Packaging Information [1]

Standard	Alternate
GP-2 (Gel Pack)	[2]

[1] Refer to the "Packaging Information" section for die packaging dimensions.
[2] For alternate packaging information contact Analog Devices Inc.

HMC263

v05.1017

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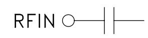
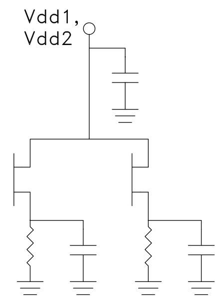
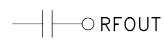
Pad Description

Pad Number	Function	Description	Interface Schematic
1	RFIN	This pad is AC coupled and matched to 50 Ohm.	
2, 3	Vdd1, Vdd2	Power supply for the 4-stage amplifier. An external RF bypass capacitor of 100 - 300 pF is required. The bond length to the capacitor should be as short as possible. The ground side of the capacitor should be connected to the housing ground.	
4	RFOUT	This pad is AC coupled and matched to 50 Ohm.	

Assembly Diagrams