

## GaAs MMIC LOW NOISE AMPLIFIER, 24 - 36 GHz

### Typical Applications

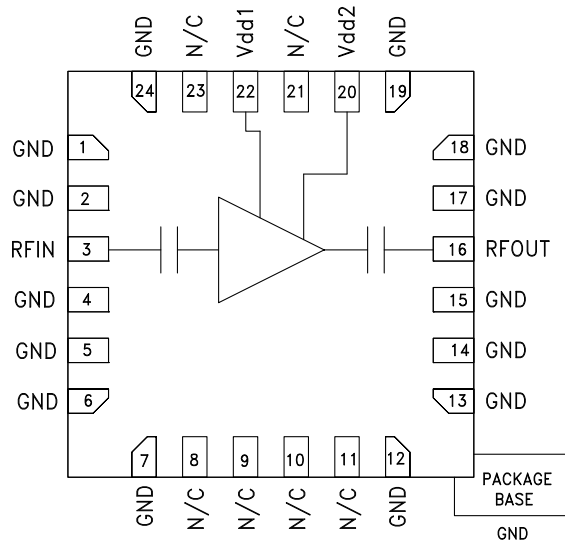
The HMC263LP4E is ideal for:

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

### Features

- Low Noise Figure: 2.2 dB
- High Gain: 20 dB
- Single Positive Supply: +3V or +5V
- DC Blocked RF I/Os
- No External Matching
- 24 Lead 4x4mm QFN Package: 16mm<sup>2</sup>

### Functional Diagram



### General Description

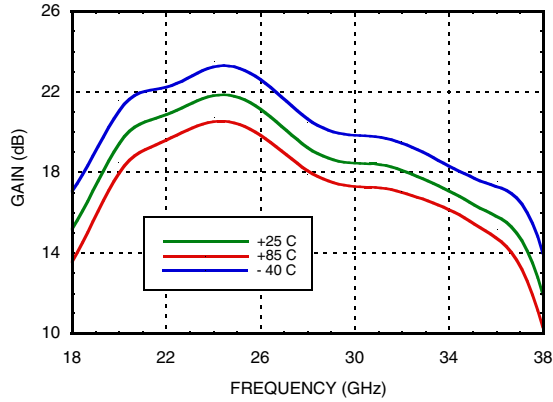
The HMC263LP4E is a GaAs MMIC Low Noise Amplifier (LNA) which covers the frequency range of 24 to 36 GHz and is housed in a leadless plastic SMT package. The HMC263LP4E utilizes a GaAs PHEMT process offering 20 dB gain from a single bias supply of + 3V @ 58 mA with a noise figure of 2.2 dB. The HMC263LP4E may be used in conjunction with HMC264LC3B or HMC265LM3 mixers to realize a millimeterwave system receiver. The RF I/Os are DC blocked and matched to 50 Ohms requiring no external components.

### Electrical Specifications, $T_A = +25^\circ C$ , $V_{dd} = +3V$

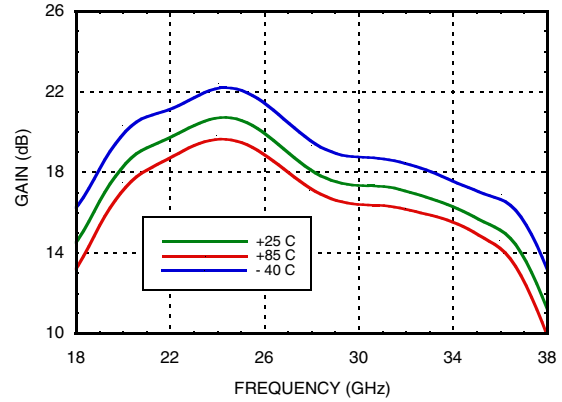
Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range	24 - 27			27 - 32			32 - 36			GHz
Gain	19	21	27	17	19	23	15	17	20	dB
Gain Variation Over Temperature		0.03			0.03			0.03		dB/°C
Noise Figure		2.0	3.0		2.2	3.0		2.5	4.0	dB
Input Return Loss		12			9			11		dB
Output Return Loss		10			9			9		dB
Output Power for 1 dB Compression (P1dB)		6			8			9		dBm
Saturated Output Power (P <sub>sat</sub> )		9			11			12		dBm
Output Third Order Intercept (IP3)		16			18			20		dBm
Supply Current (I <sub>dd</sub> ) (@ V <sub>dd</sub> = +3V)		58	77		58	77		58	77	mA

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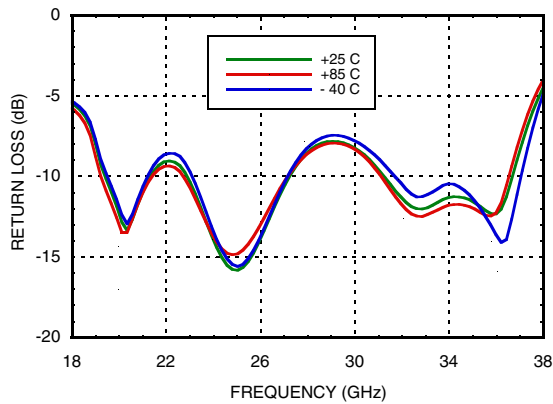
**Gain vs. Temperature @ Vdd = +3V**



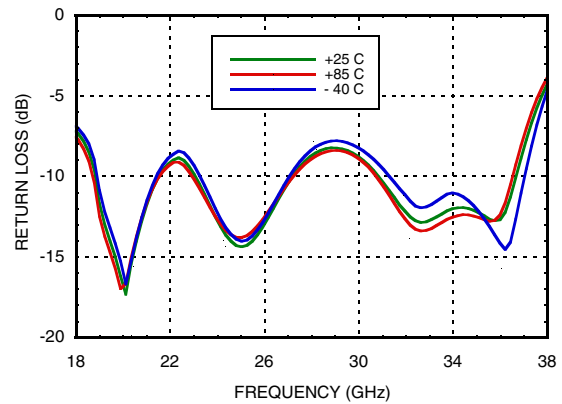
**Gain vs. Temperature @ Vdd = +5V**



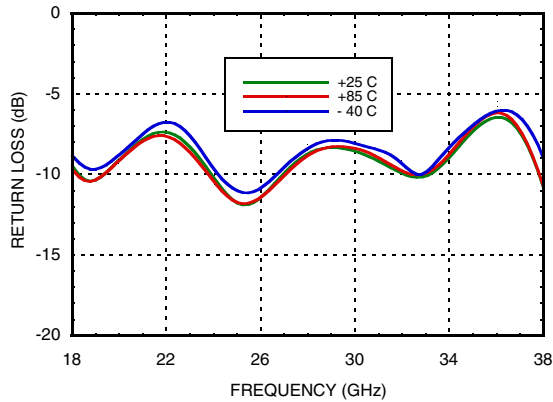
**Input Return Loss @ Vdd = +3V**



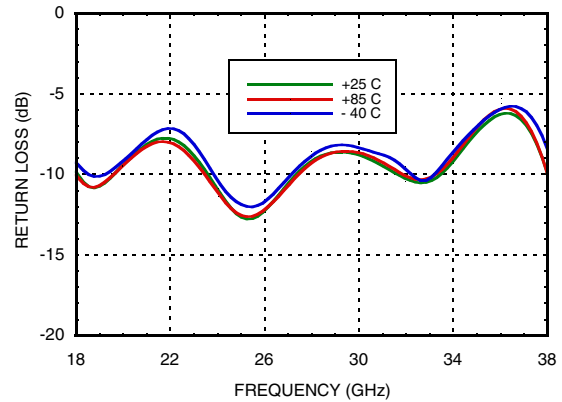
**Input Return Loss @ Vdd = +5V**



**Output Return Loss @ Vdd = +3V**

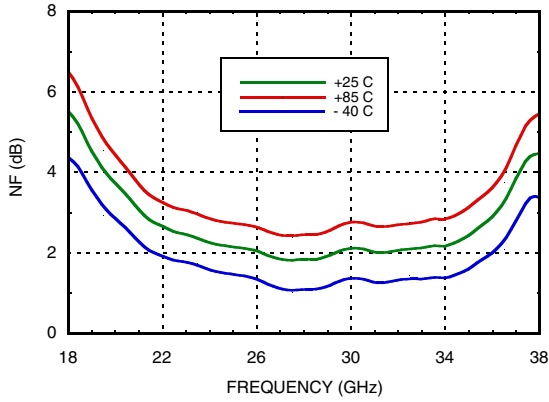


**Output Return Loss @ Vdd = +5V**

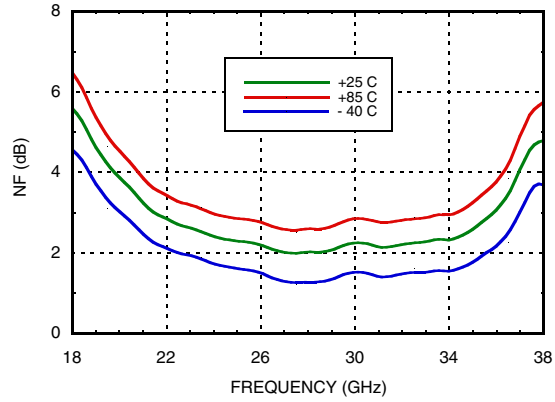


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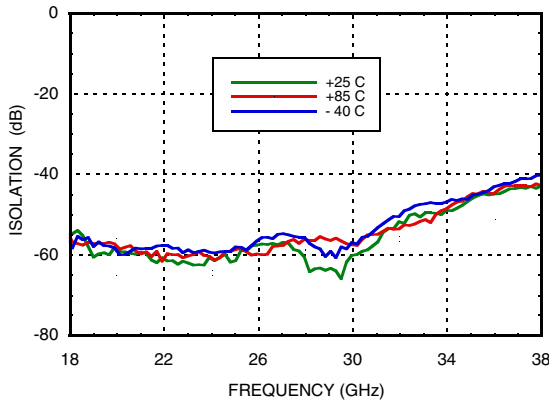
**Noise Figure vs. Temperature @ Vdd = +3V**



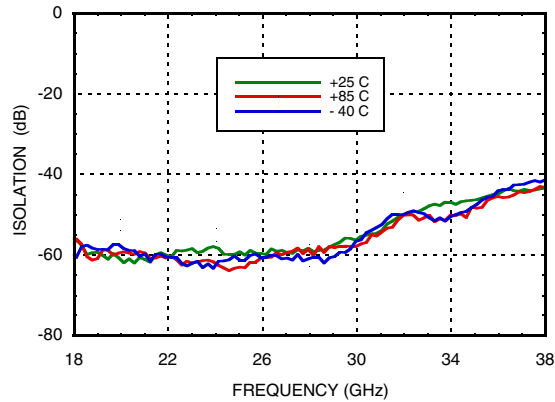
**Noise Figure vs. Temperature @ Vdd = +5V**



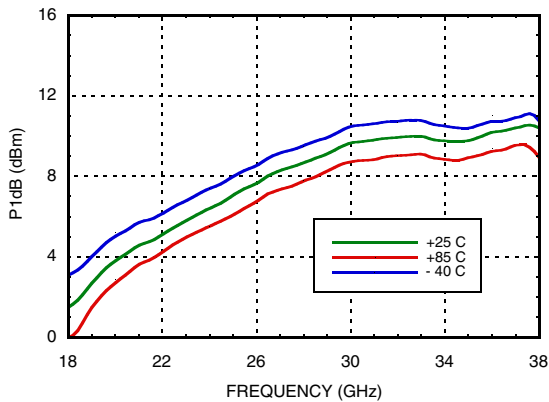
**Isolation @ Vdd = +3V**



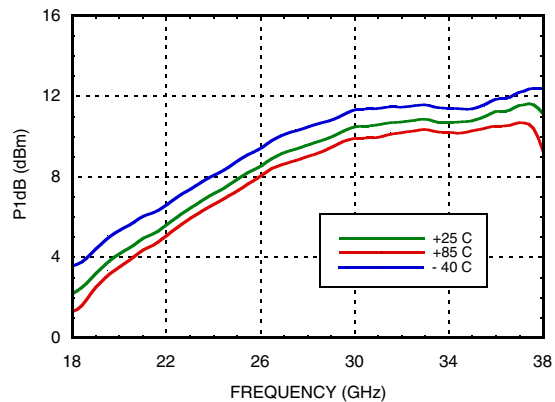
**Isolation @ Vdd = +5V**



**Output P1dB @ Vdd = +3V**

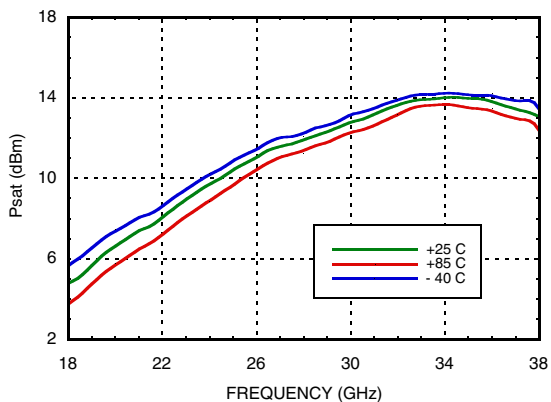


**Output P1dB @ Vdd = +5V**

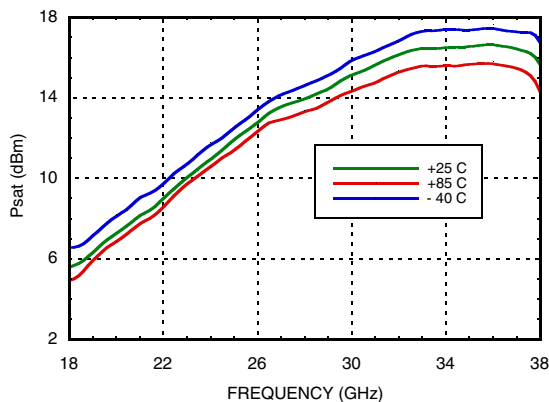


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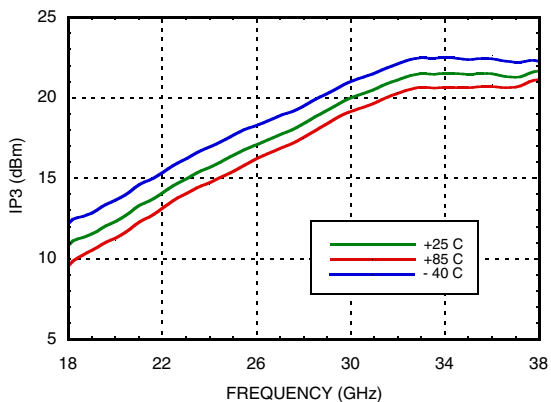
**Psat @ Vdd = +3V**



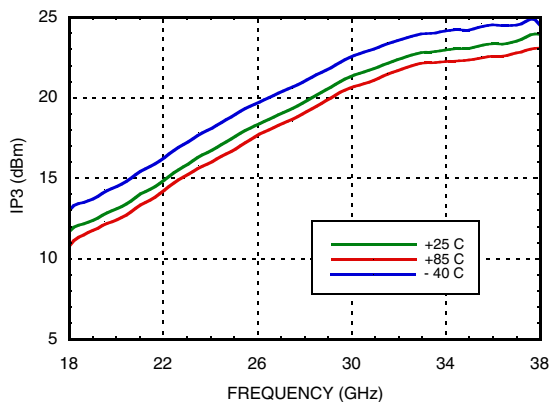
**Psat @ Vdd = +5V**



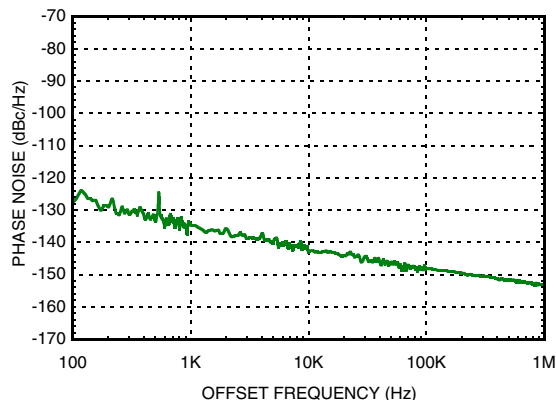
**Output IP3 @ Vdd = +3V**



**Output IP3 @ Vdd = +5V**



**Additive Phase Noise Vs Offset Frequency,  
RF Frequency = 30 GHz,  
RF Input Power = -8 dBm (P1dB)**



## GaAs MMIC LOW NOISE AMPLIFIER, 24 - 36 GHz

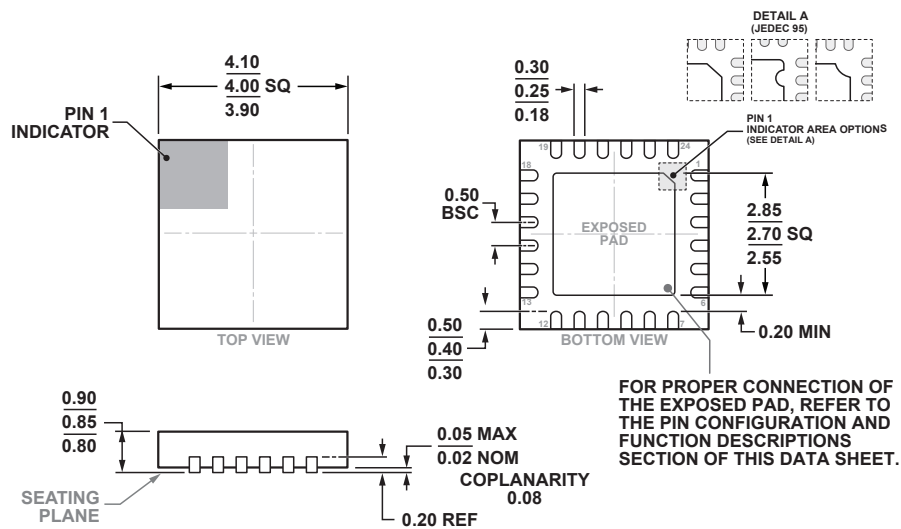
### Absolute Maximum Ratings

Drain Bias Voltage (Vdd1, Vdd2)	+5.5 Vdc
RF Input Power (RFIN)(Vdd = +3 Vdc)	-5 dBm
Channel Temperature	175 °C
Continuous P <sub>diss</sub> (T = 85 °C) (derate 7.7 mW/°C above 85 °C)	0.7 W
Thermal Resistance (channel to ground paddle)	130 °C/W
Storage Temperature	-65 to +150 °C
Operating Temperature	-40 to +85 °C



ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS

### Outline Drawing



COMPLIANT TO JEDEC STANDARDS MO-220-VGGD-8.

24-Lead Lead Frame Chip Scale Package [LFCSP]  
4 mm × 4 mm Body and 0.85 mm Package Height  
(CP-24-16)

Dimensions shown in millimeters.

### Package Information

Part Number	Package Body Material	Lead Finish	MSL Rating	Package Marking <sup>[1]</sup>
HMC263LP4E	RoHS-compliant Low Stress Injection Molded Plastic	100% matte Sn	MSL3 <sup>[2]</sup>	H263 XXXX

[1] 4-Digit lot number XXXX

[2] Max peak reflow temperature of 260 °C

## GaAs MMIC LOW NOISE AMPLIFIER, 24 - 36 GHz

### Pin Description

Pin Number	Function	Description	Interface Schematic
1, 2, 4 - 7, 12 - 15, 17 - 19, 24	GND	Package bottom has exposed metal paddle that must be connected to RF/DC ground.	
3	RFIN	This pin is AC coupled and matched to 50 Ohm.	
8 - 11, 21, 23	N/C	Not connected.	
16	RFOUT	This pin is AC coupled and matched to 50 Ohm.	
22, 20	Vdd1, Vdd2	Power supply for the 4-stage amplifier. See application circuit for required external components.	

### Application Circuit

