

## LOW NOISE AMPLIFIER MODULE, 1.8 - 4.2 GHz

### Features

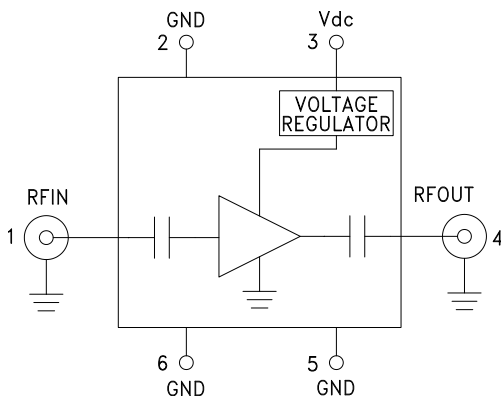
- Noise Figure: 1.2 dB @ 2.4 GHz
- Gain: 26 dB
- OIP3: +26 dBm
- P1dB Output Power: +15.5 dBm
- 50 Ohm Matched Input/Output
- Hermetically Sealed Module
- Field Replaceable SMA Connectors
- 55 °C to +85 °C Operating Temperature

### Typical Applications

The HMC-C045 LNA is ideal for:

- Telecom Infrastructure
- Microwave Radio & VSAT
- Military & Space
- Test Instrumentation

### Functional Diagram



### General Description

The HMC-C045 is a GaAs MMIC pHEMT Low Noise Amplifier in a miniature, hermetic module which operates between 1.8 and 4.2 GHz. This high dynamic range low noise amplifier module provides 26 dB of gain, sub-2 dB noise figure and up to +26 dBm of output IP3 while operating from a single positive supply between +8V and +15V. The amplifier I/Os are internally matched to 50 Ohms and DC blocked for robust performance. The module features removable coaxial connectors which can be detached to allow direct connection of the I/O pins to a microstrip or coplanar circuit.

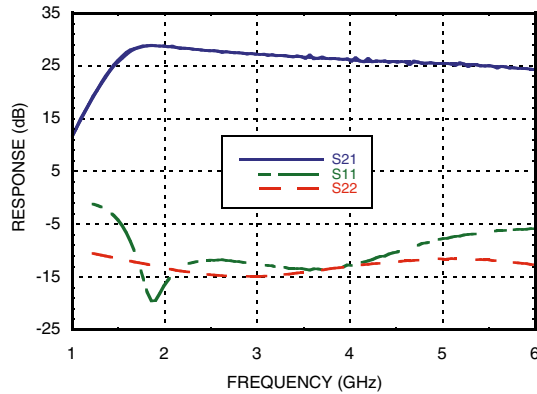
### Electrical Specifications, $T_A = +25^\circ\text{C}$ , $V_{dc} = +12\text{V}$

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range	1.8 - 4.2			2.0 - 3.8			GHz
Gain	23	26		23	26		dB
Gain Variation Over Temperature		0.03	0.05		0.03	0.05	dB/ °C
Noise Figure		1.2	2.5		1.2	2.0	dB
Input Return Loss		13			13		dB
Output Return Loss		13			13		dB
Output Power for 1 dB Compression (P1dB)	12.5	15.5		12.5	15.5		dBm
Saturated Output Power (Psat)		17.5			17.5		dBm
Output Third Order Intercept (IP3)		26			26		dBm
Supply Current		105	140		105	140	mA

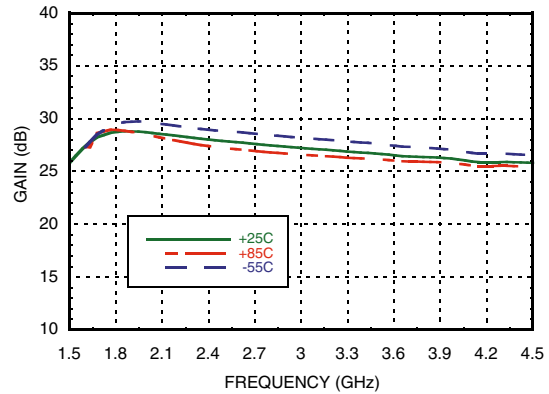


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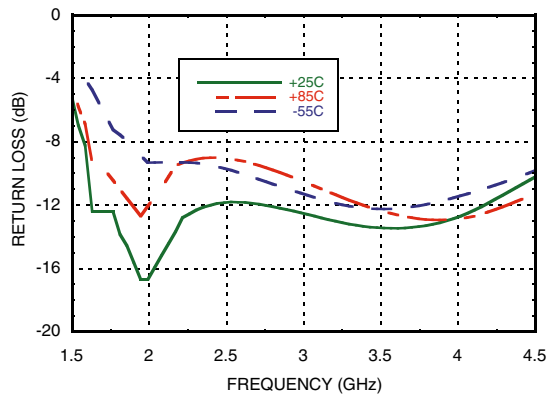
**Broadband Gain & Return Loss**



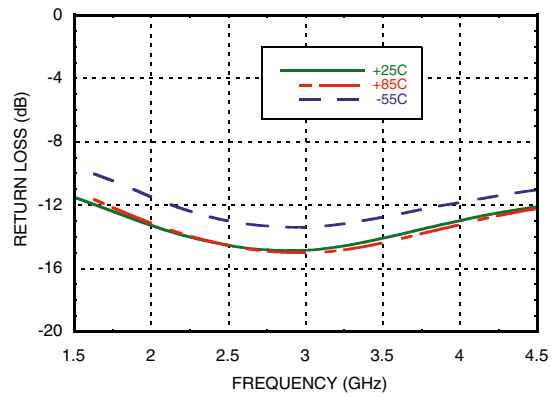
**Gain vs. Temperature**



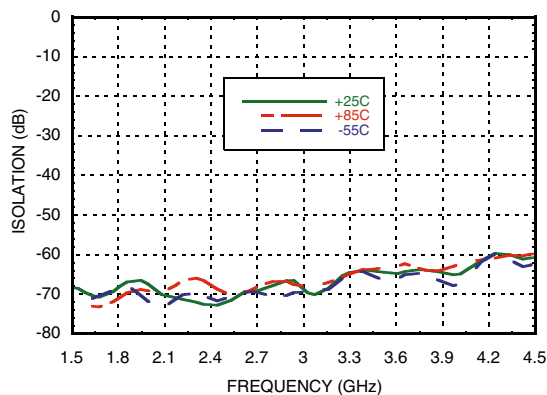
**Input Return Loss vs. Temperature**



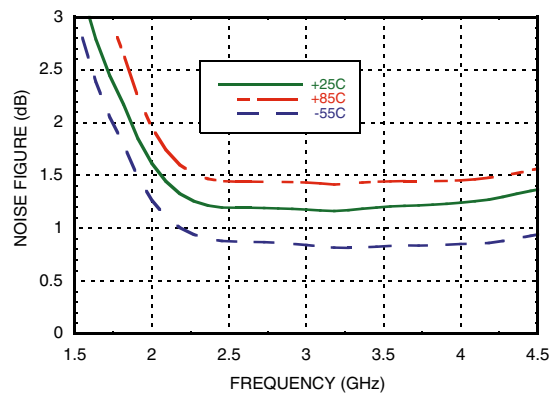
**Output Return Loss vs. Temperature**



**Reverse Isolation vs. Temperature**



**Noise Figure vs. Temperature**



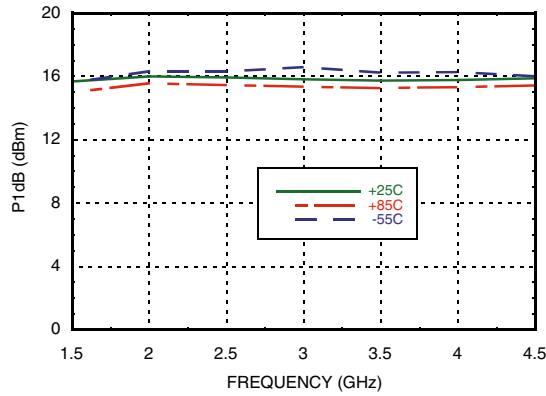
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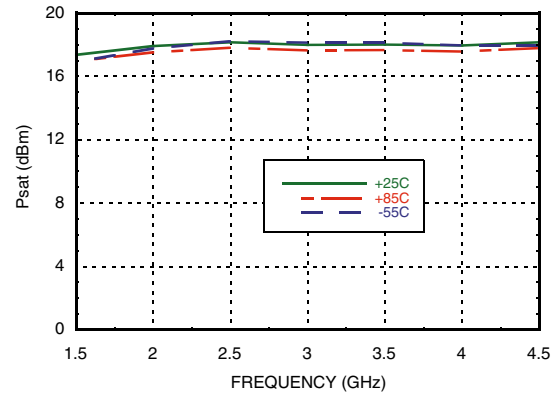


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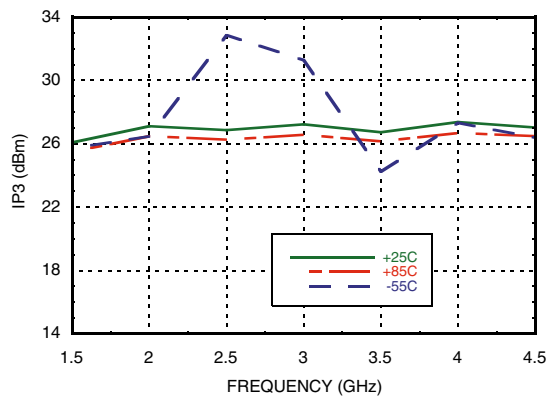
**Output P1dB vs. Temperature**



**Output Psat vs. Temperature**



**Output IP3 vs. Temperature**



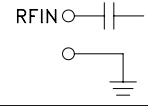

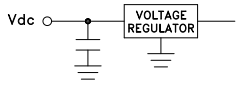
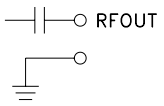
**Absolute Maximum Ratings**

Bias Supply Voltage (Vdc)	+15 Vdc
RF Input Power (RFIN)	+0 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

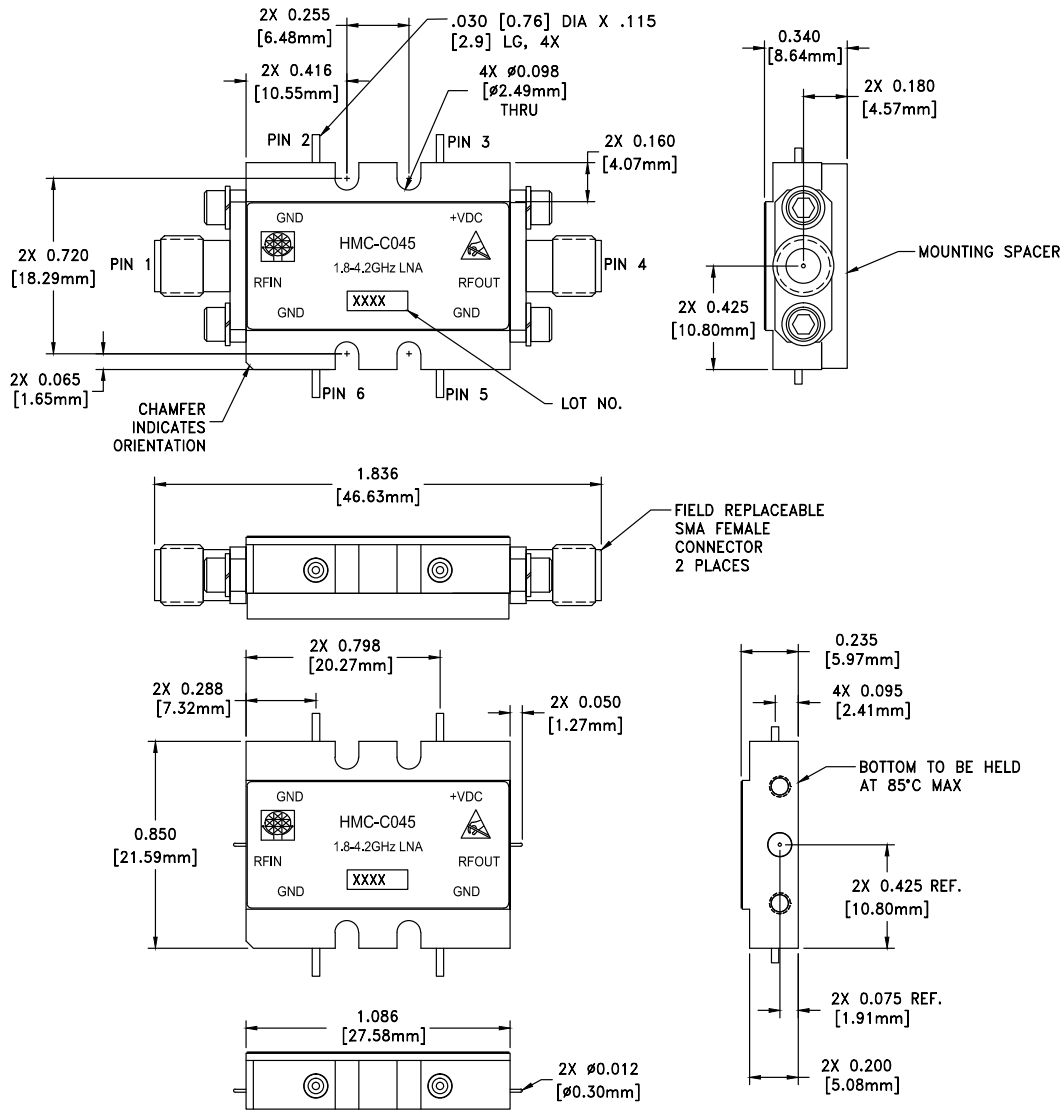

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**Pin Descriptions**

Pin Number	Function	Description	Interface Schematic
1	RFIN & RF Ground	RF input connector, coaxial female, field replaceable. This pin is AC coupled and matched to 50 Ohms.	
2, 5, 6	GND	One of these pins must be connected to power supply ground.	
3	Vdc	Power supply voltage for the amplifier.	
4	RFOUT & RF Ground	RF output connector, coaxial female, field replaceable. This pin is AC coupled and matched to 50 Ohms.	



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**Outline Drawing**



VIEW SHOWN WITH CONNECTORS AND MOUNTING SPACER REMOVED

**Package Information**

Package Type	C-10
Package Weight [1]	18.7 gms [2]
Spacer Weight	3.3 gms [2]

[1] Includes the connectors

[2] ±1 gms Tolerance

**NOTES:**

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. FINISH: GOLD PLATE OVER NICKEL PLATE
3. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS]
4. TOLERANCES:
  - 4.1 .XX = ±0.02
  - 4.2 .XXX = ±0.010
5. FIELD REPLACEABLE SMA CONNECTORS

**LOW NOISE AMPLIFIER  
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