

## WIDEBAND POWER AMPLIFIER MODULE, 2 - 20 GHz

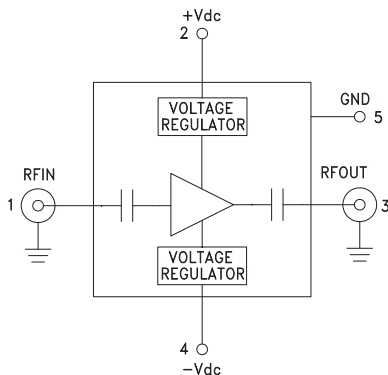


### Typical Applications

The HMC-C023 Wideband PA is ideal for:

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

### Functional Diagram



### Features

- Gain: 15 dB @ 10 GHz
- P1dB Output Power: +26 dBm @ 10 GHz
- Spurious-Free Operation
- Regulated Supply and Bias Sequencing
- Hermetically Sealed Module
- Field Replaceable SMA connectors
- 55 to +85°C Operating Temperature

### General Description

The HMC-C023 is a GaAs MMIC PHEMT Distributed Power Amplifier in a miniature, hermetic module with replaceable SMA connectors which operates between 2 and 20 GHz. The amplifier provides 15 dB of gain, +30 dBm output IP3 and up to +26 dBm of output power at 1 dB gain compression. Gain flatness is excellent from 2 - 16 GHz making the HMC-C023 ideal for EW, ECM RADAR and test equipment applications. The wideband amplifier I/Os are internally matched to 50 Ohms and are DC blocked. Integrated voltage regulators allow for flexible biasing of both the negative and positive supply pins, while internal bias sequencing circuitry assures robust operation.

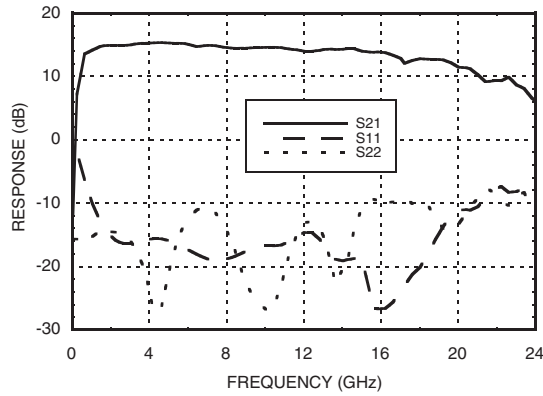
### Electrical Specifications, $T_A = +25^\circ\text{C}$ , $+V_{dc} = +11\text{V to } +16\text{V}$ , $-V_{dc} = -3\text{V to } -12\text{V}$

| Parameter                                | Min.      | Typ.  | Max. | Min.       | Typ. | Max. | Min.        | Typ. | Max. | Units |
|--|-----------|-------|------|------------|------|------|-------------|------|------|-------|
| Frequency Range                          | 2.0 - 6.0 |       |      | 6.0 - 16.0 |      |      | 16.0 - 20.0 |      |      | GHz   |
| Gain                                     | 13        | 15    |      | 11         | 14   |      | 9           | 12   |      | dB    |
| Gain Flatness                            |           | ±0.25 |      |            | ±0.5 |      |             | ±1.0 |      | dB    |
| Gain Variation Over Temperature          |           | 0.02  | 0.03 |            | 0.02 | 0.03 |             | 0.02 | 0.03 | dB/°C |
| Noise Figure                             |           | 4.0   |      |            | 4.0  |      |             | 6.0  |      | dB    |
| Input Return Loss                        |           | 17    |      |            | 18   |      |             | 12   |      | dB    |
| Output Return Loss                       |           | 13    |      |            | 12   |      |             | 10   |      | dB    |
| Output Power for 1 dB Compression (P1dB) | 23        | 26    |      | 21         | 24   |      | 19          | 22   |      | dBm   |
| Saturated Output Power (Psat)            |           | 27    |      |            | 25   |      |             | 23   |      | dBm   |
| Output Third Order Intercept (IP3)       |           | 34    |      |            | 30   |      |             | 25   |      | dBm   |
| Positive Supply Current (+IDC)           |           | 310   |      |            | 310  |      |             | 310  |      | mA    |
| Negative Supply Current (-IDC)           |           | 1.7   |      |            | 1.7  |      |             | 1.7  |      | mA    |

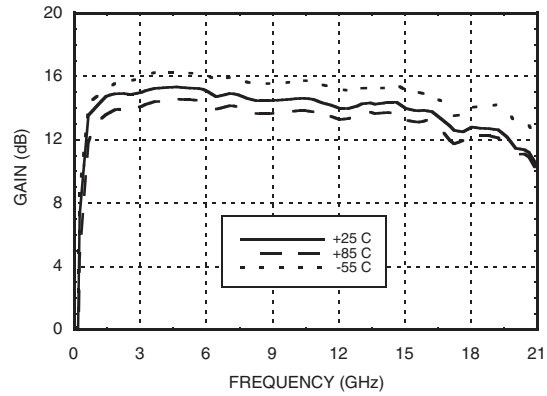


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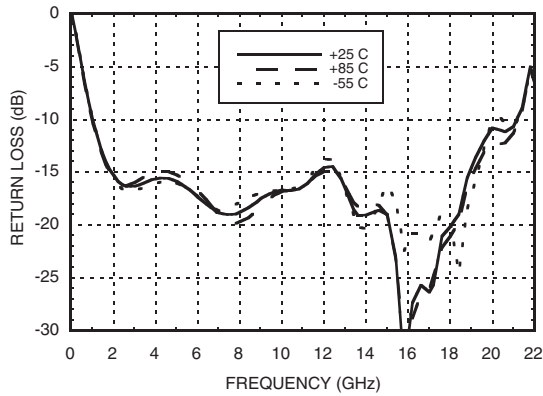
**Gain & Return Loss**



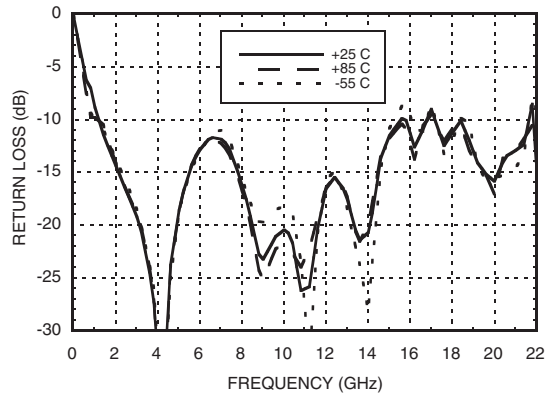
**Gain vs. Temperature**



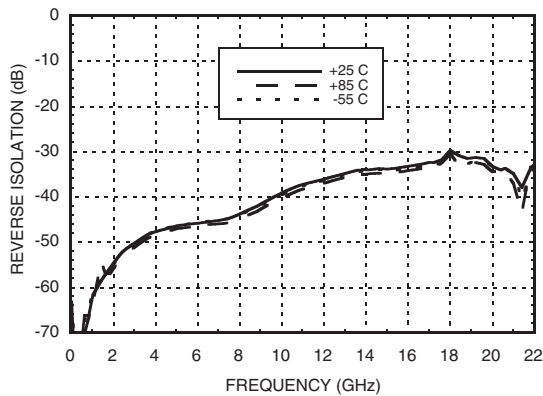
**Input Return Loss vs. Temperature**



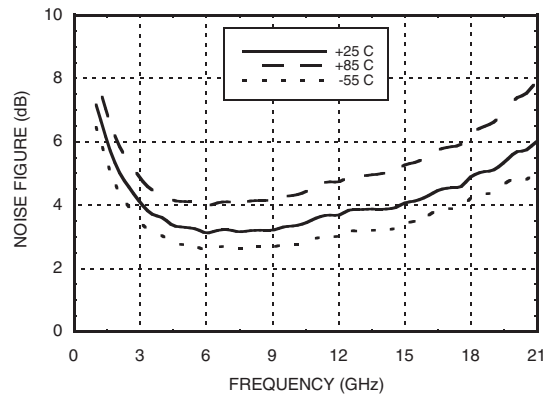
**Output Return Loss vs. Temperature**



**Reverse Isolation vs. Temperature**



**Noise Figure vs. Temperature**



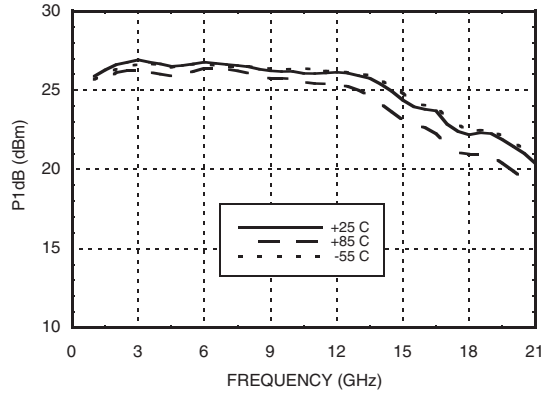
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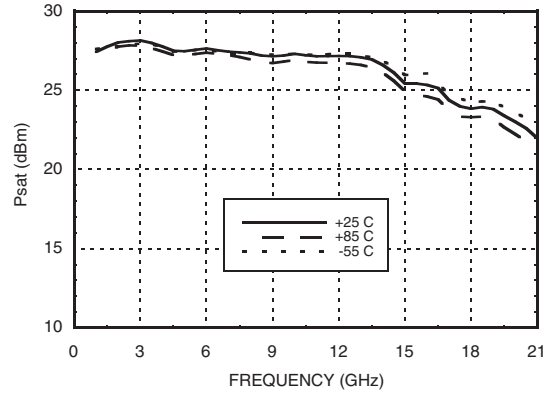


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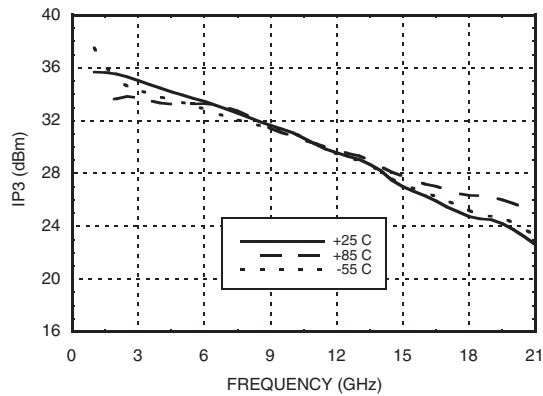
**P1dB vs. Temperature**



**Psat vs. Temperature**



**Output IP3 vs. Temperature**



**Absolute Maximum Ratings**

|                                     |                |
|-------------------------------------|----------------|
| Positive Bias Supply Voltage (+Vdc) | +17V Max       |
| Negative Bias Supply (-Vdc)         | -16V Min.      |
| RF Input Power (RFIN)               | +23 dBm        |
| Storage Temperature                 | -65 to +150 °C |
| Operating Temperature               | -55 to +85 °C  |

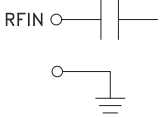
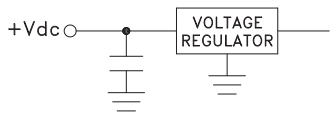
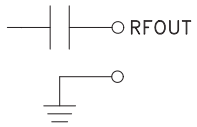
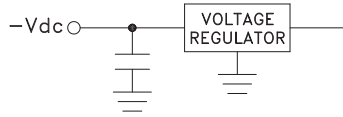



**ELECTROSTATIC SENSITIVE DEVICE  
OBSERVE HANDLING PRECAUTIONS**

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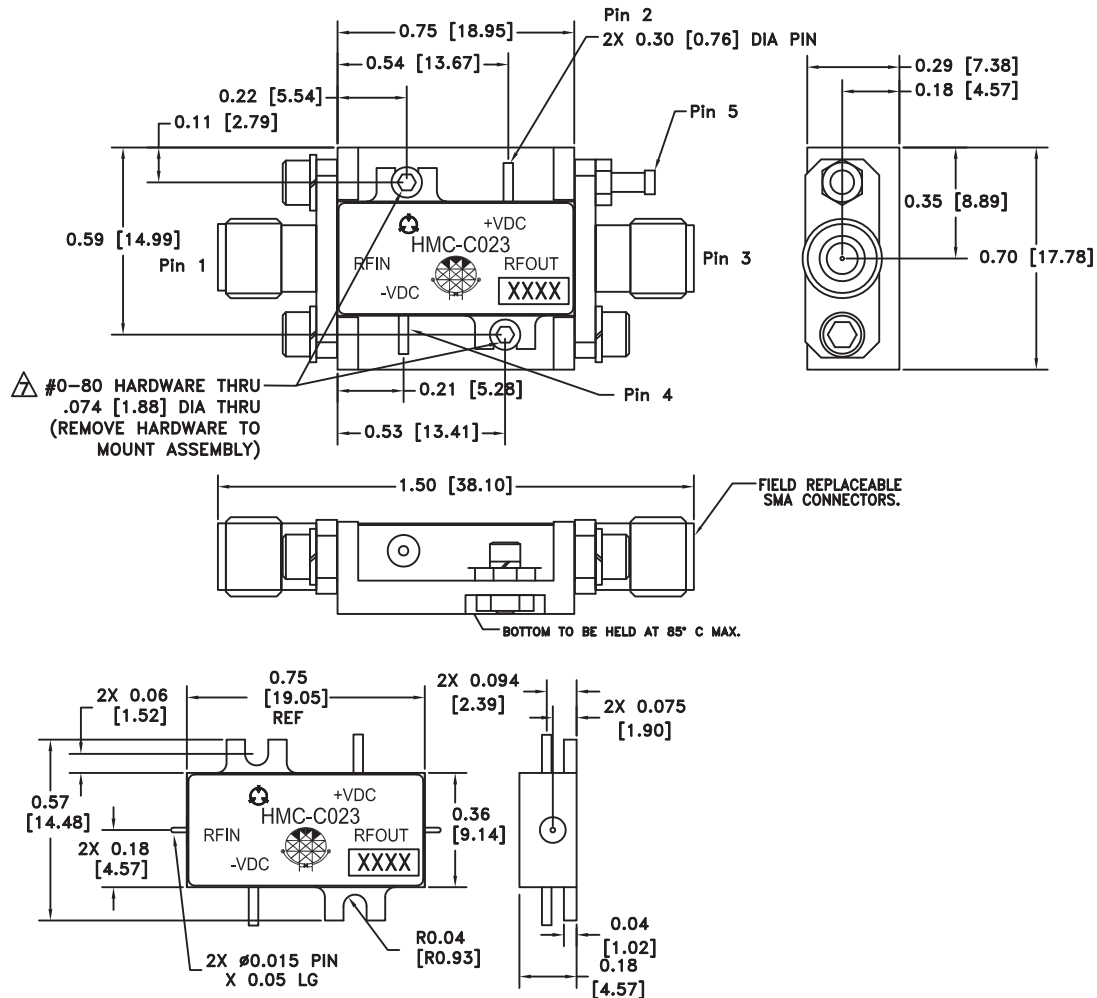
### Pin Descriptions

| Pin Number | Function          | Description   | Interface Schematic  |
|------------|-------------------|---|--|
| 1          | RFIN & RF Ground  | RF input connector, SMA female, field replaceable. This pin is AC coupled and matched to 50 Ohms. |   |
| 2          | +Vdc              | Positive power supply voltage for the amplifier.  |   |
| 3          | RFOUT & RF Ground | RF output connector, SMA female. This pin is AC coupled and matched to 50 Ohms.                   |   |
| 4          | -Vdc              | Negative power supply voltage for the amplifier   |   |
| 5          | GND               | Power supply ground.  |  |



**WIDEBAND POWER AMPLIFIER  
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**Outline Drawing**



**Package Information**

|                               |                         |
|-------------------------------|-------------------------|
| Package Type                  | C-2B                    |
| Package Weight <sup>[1]</sup> | 11.2 gms <sup>[2]</sup> |
| Spacer Weight                 | N/A                     |

[1] Includes the connectors

[2] ±1 gms Tolerance

**NOTES:**

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. SPACER MATERIAL: ALUMINUM
3. PLATING: ELECTROLYTIC GOLD 50 MICROINCHES MIN., OVER ELECTROLYTIC NICKEL 75 MICROINCHES MIN.
4. ALL DIMENSIONS ARE IN INCHES [MILLIMETERS].
5. TOLERANCES ±.005 [0.13] UNLESS OTHERWISE SPECIFIED.
6. FIELD REPLACEABLE SMA CONNECTORS. TENSOLITE 5602 - 5CCSF OR EQUIVALENT.

△ TO MOUNT MODULE TO SYSTEM PLATFORM REPLACE 0 - 80 HARDWARE WITH DESIRED MOUNTING SCREWS.

**Notes:**

v02.1007

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