ANALOG DEVICES

# HMC-C003

v04.1007

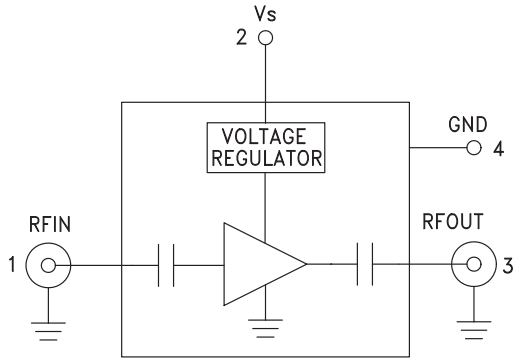
## WIDEBAND POWER AMPLIFIER MODULE, 2 - 20 GHz


## Typical Applications

The HMC-C003 Wideband PA is ideal for:

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

## Functional Diagram




## Features

P1dB Output Power: +26 dBm @ 10 GHz

Output IP3: +34 dBm

Gain: 15 dB

50 Ohm Matched Input/Output

Regulated Supply and Bias Sequencing

Hermetically Sealed Module

Field Replaceable SMA connectors

-55 to +85˚C Operating Temperature

## General Description

The HMC-C003 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 self-biased amplifier provides 15 dB of gain, +34 dBm output IP3 and up to +26 dBm of output power at 1 dB gain compression while requiring a single +12V supply. Gain flatness is excellent from 2 - 18 GHz making the HMC-C003 ideal for EW, ECM RADAR and test equipment applications. The wideband amplifier I/Os are internally matched to 50 Ohms and are internally DC blocked.

## Electrical Specifications, $T_A$ = +25° C, Vs= +11.6V to +12.4V

| Parameter | Min. | Typ. | Max. | Min. | Typ. | Max. | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency Range | | 2.0 - 6.0 | | | 6.0 - 18.0 | | | 18.0 - 20.0 | | GHz |
| Gain | 13 | 15 | | 11 | 14 | | 9 | 12 | | dB |
| Gain Flatness | | ±.025 | | | ±0.75 | | | ±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 | | | 10 | | dB |
| Output Return Loss | | 12 | | | 10 | | | 12 | | dB |
| Output Power for 1 dB Compression (P1dB) | 23 | 26 | | 20 | 24 | | 19 | 22 | | dBm |
| Saturated Output Power (Psat) | | 27 | | | 25 | | | 23 | | dBm |
| Output Third Order Intercept (IP3) | | 34 | | | 30 | | | 25 | | dBm |
| Spurious Response | | -50 | | | -60 | | | -60 | | dBc |
| Supply Current | | 310 | 350 | | 310 | 350 | | 310 | 350 | mA |



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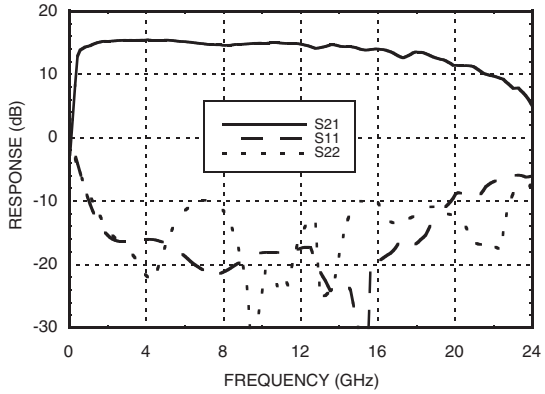
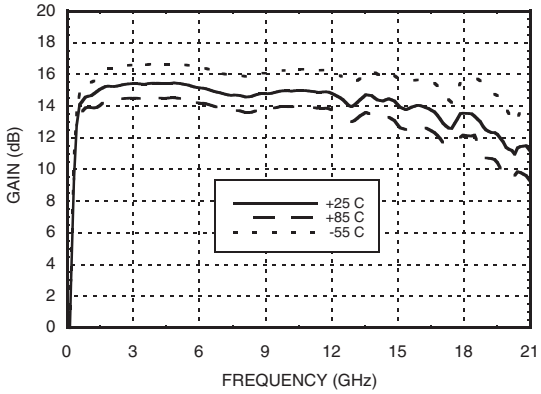
# WIDEBAND POWER AMPLIFIER MODULE, 2 - 20 GHz



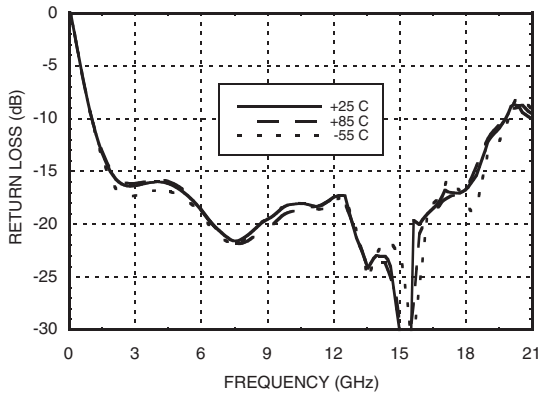
### Gain & Return Loss



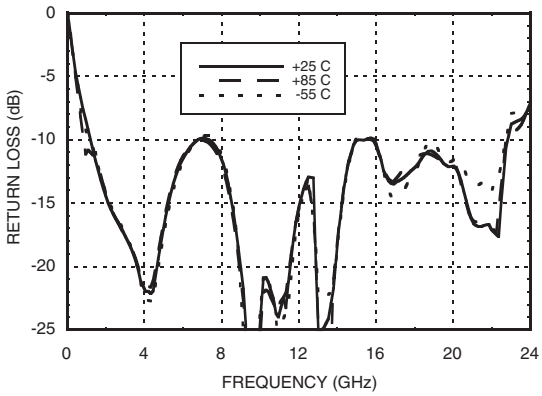

### Gain vs. Temperature



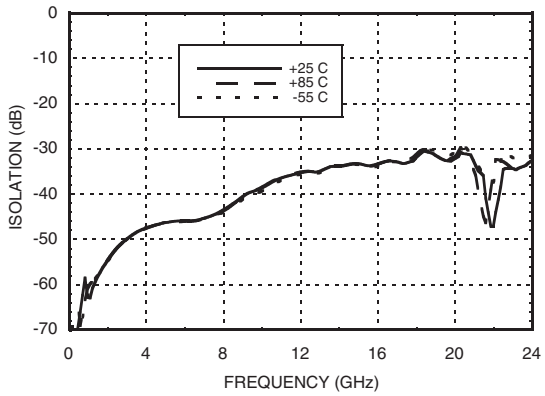

### Input Return Loss vs. Temperature



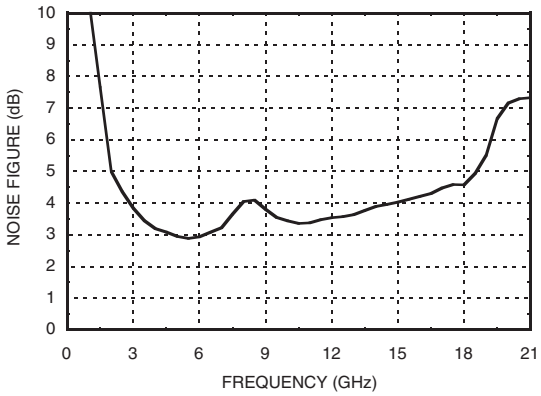

### Output Return Loss vs. Temperature




### Reverse Isolation vs. Temperature




### Noise Figure



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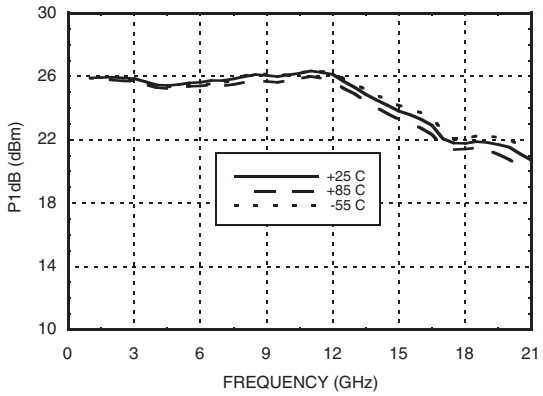
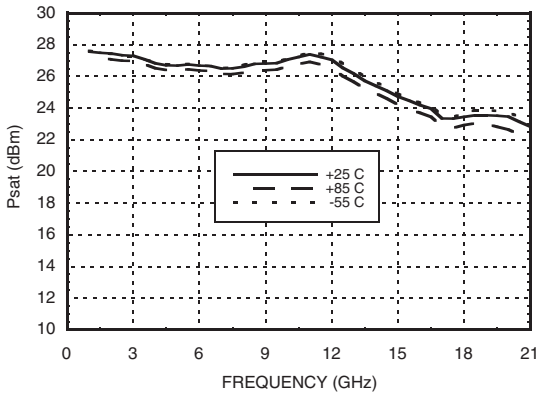
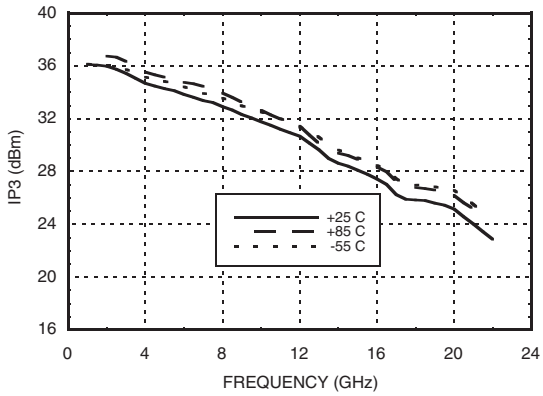
### P1dB vs. Temperature




### Psat vs. Temperature




### Output IP3 vs. Temperature

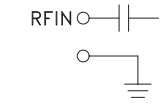
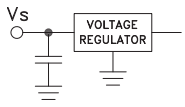
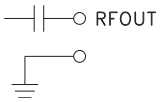



### Absolute Maximum Ratings

| | |
|---|---|
| Bias Supply Voltage (Vs) | +11 Vdc to +13 Vdc |
| RF Input Power (RFIN) | +23 dBm |
| Storage Temperature | -65 to +150 °C |
| Operating Temperature | -55 to +85 °C |

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

### 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 | Vs | 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 | GND | Power supply ground. |   |



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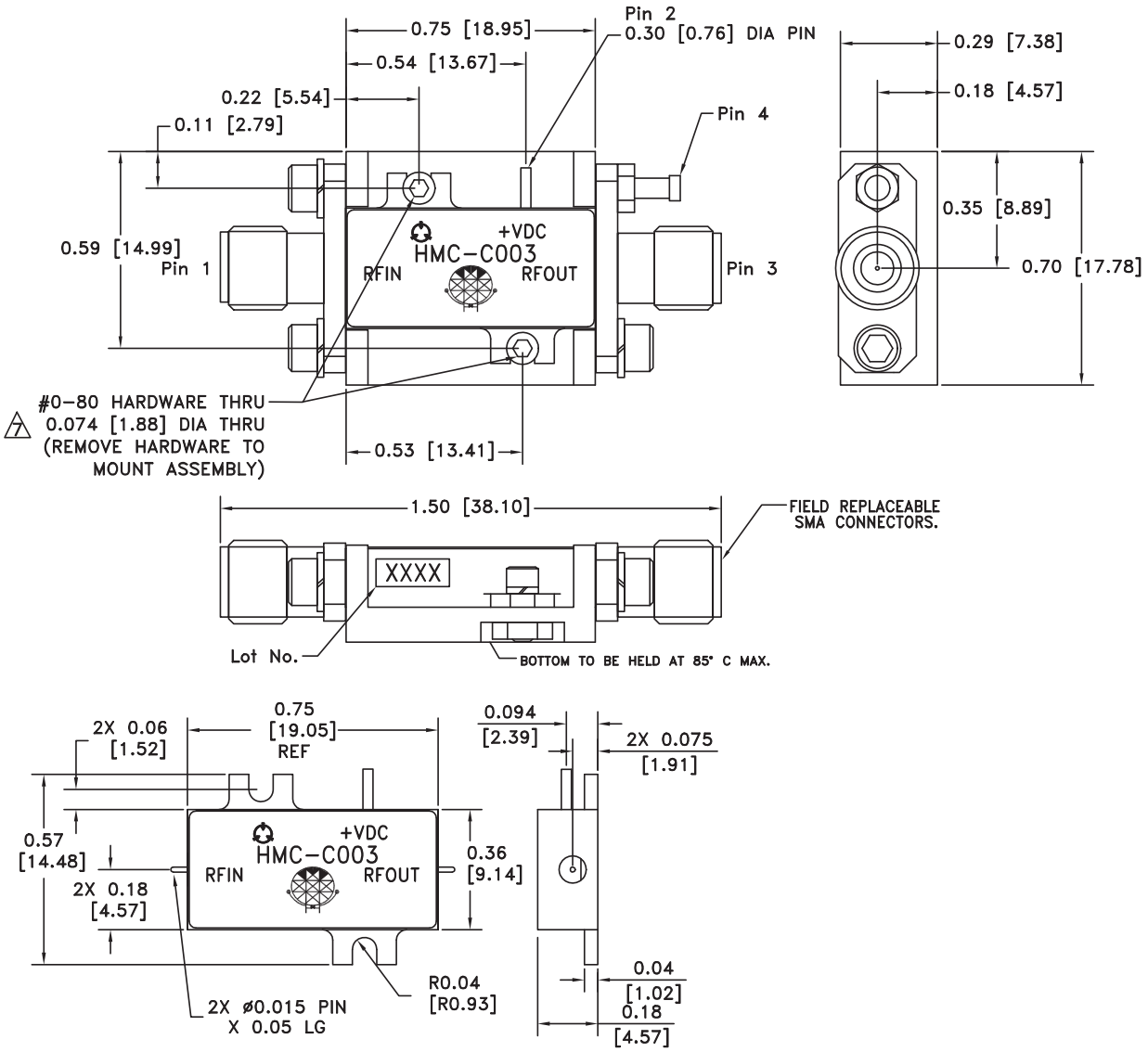
## Outline Drawing




## Package Information

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

[1] Includes the connectors

[2] ±1 gms Tolerance

NOTES:

1. PACKAGE, LEADS, COVER MATERIAL: KOVAR™
2. BRACKET 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.
7. TO MOUNT MODULE TO SYSTEM PLATFORM REPLACE 0 -80 HARDWARE WITH DESIRED MOUNTING SCREWS.



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