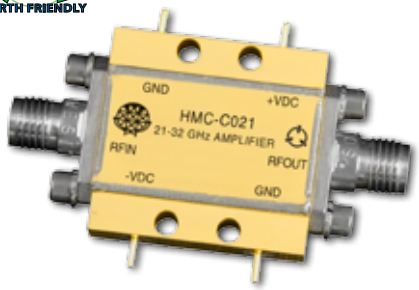
ANALOG DEVICES

HMC-C021

v04.0711

WIDEBAND POWER AMPLIFIER MODULE, 21 - 31 GHz



Features

Gain: 15 dB @ 27 GHz

P1dB Output Power: +24 dBm @ 27 GHz

Noise Figure: 5 dB @ 27 GHz

Spurious-Free Operation

Regulated Supply and Bias Sequencing

Hermetically Sealed Module

Field Replaceable 2.92mm connectors

-55 °C to +85 °C Operating Temperature

Typical Applications

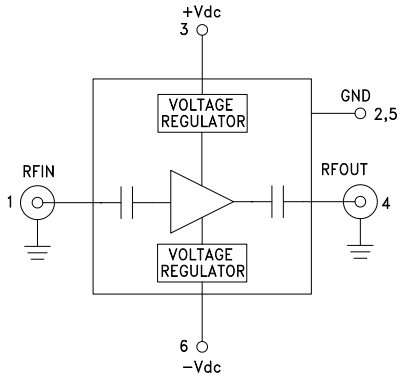
The HMC-C020 Wideband PA is ideal for:

- Microwave Radio & VSAT
- Military & Space
- Test & Lab Instrumentation

General Description

The HMC-C021 is a GaAs MMIC pHEMT Distributed Power Amplifier in a miniature, hermetic module with replaceable 2.92mm connectors which operates between 21 and 31 GHz. The amplifier provides 15 dB of gain, 5 dB noise figure, +33 dBm output IP3 and up to +24 dBm of output power at 1 dB gain compression. The wideband amplifier I/Os are internally matched to 50 Ohms and are DC blocked making the HMC-C021 ideal for EW, ECM RADAR and test equipment applications. Integrated voltage regulators allow for flexible biasing of both the negative and positive supply pins, while internal bias sequencing circuitry assures robust operation.

Functional Diagram



Electrical Specifications, T_A = +25° C, +Vdc = +8V to +15V, -Vdc = -4.5V to -10V*

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range		21 - 24			24 - 31		GHz
Gain	13	16	18	12	15	18	dB
Gain Flatness		±0.20			±1.0		dB
Gain Variation Over Temperature		-0.03	-0.04		-0.03	-0.04	dB/ °C
Noise Figure		5.0	7.0		5.0	7.0	dB
Input Return Loss		7			7		dB
Output Return Loss		7			10		dB
Output Power for 1 dB Compression (P1dB)	20	23		20	23		dBm
Saturated Output Power (Psat)		24			24		dBm
Output Third Order Intercept (IP3)		30			34		dBm
Positive Supply Current (+IDC)		215			215		mA
Negative Supply Current (-IDC)		5.8			5.8		mA

* Data recorded at +Vdc = +12V and - Vdc = -5V

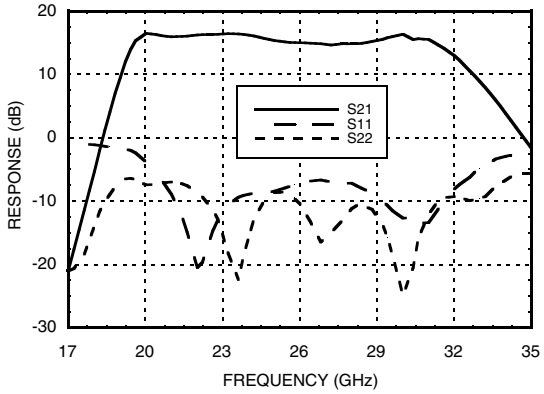
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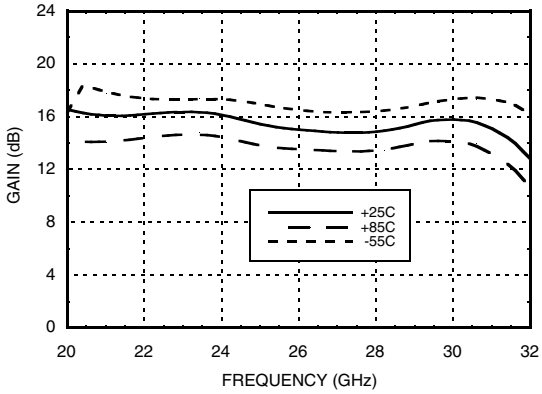
RoHS✓ EARTH FRIENDLY

WIDEBAND POWER AMPLIFIER MODULE, 21 - 31 GHz

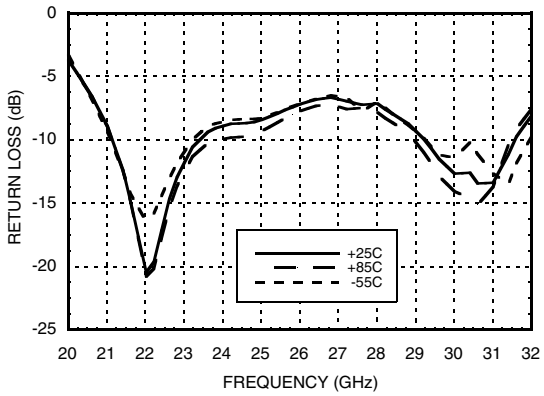
Gain & Return Loss



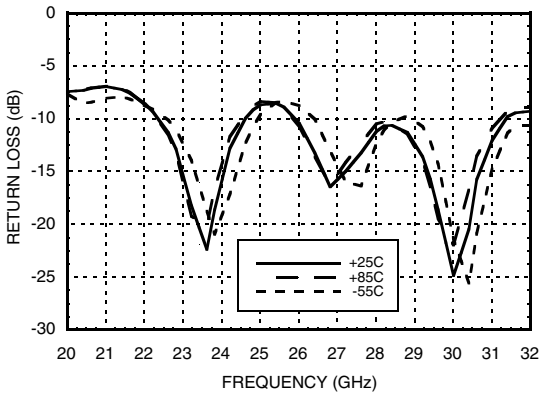
Gain vs. Temperature



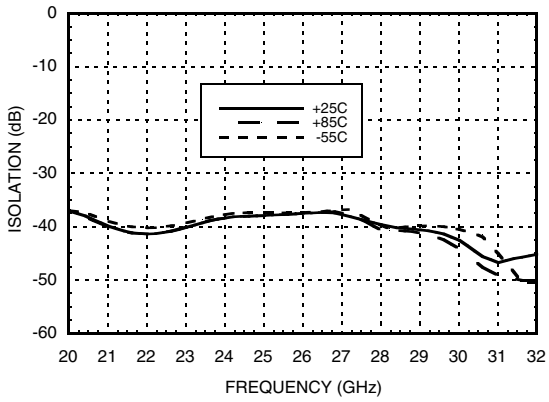
Input Return Loss vs. Temperature



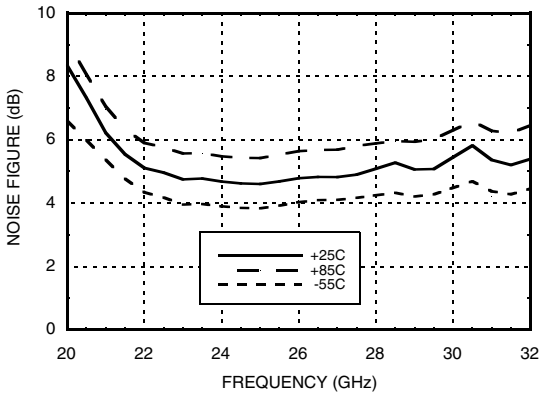
Output Return Loss vs. Temperature



Reverse Isolation vs. Temperature



Noise Figure vs. Temperature



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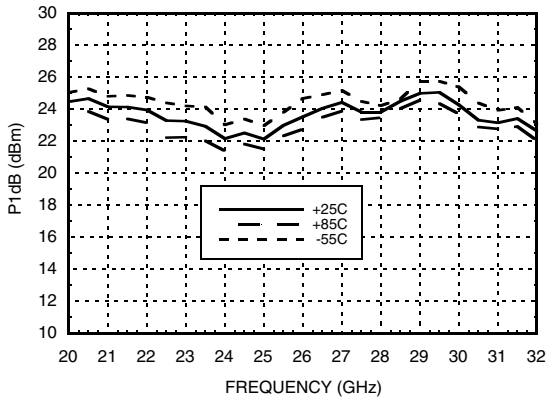
ANALOG DEVICES

HMC-C021

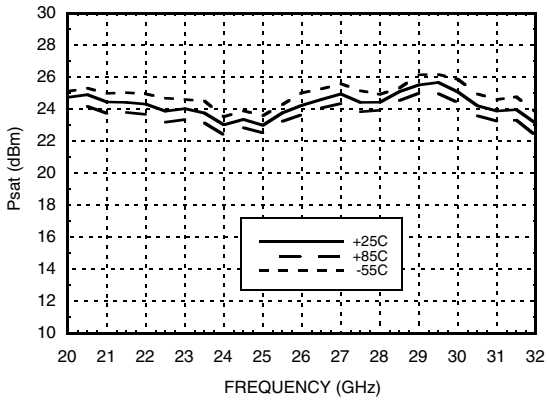
v04.0711

WIDEBAND POWER AMPLIFIER MODULE, 21 - 31 GHz

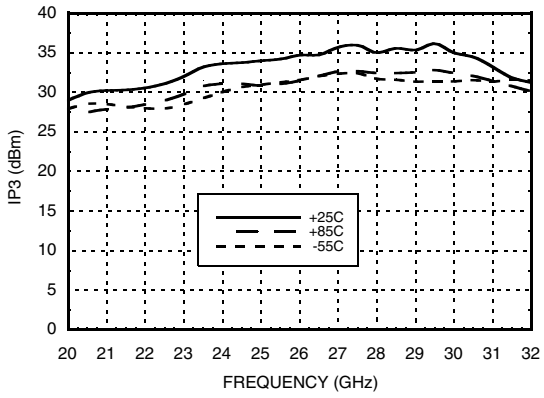
P1dB vs. Temperature



Psat vs. Temperature



Output IP3 vs. Temperature



Absolute Maximum Ratings

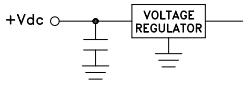
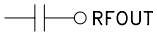
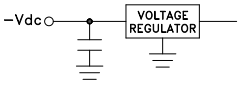
Positive Bias Supply Voltage (+Vdc)	+17V Max
Negative Bias Supply (-Vdc)	-16V Min.
RF Input Power (RFIN)	+20 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

ELECTROSTATIC SENSITIVE DEVICE
OBSERVE HANDLING PRECAUTIONS

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Pin Descriptions

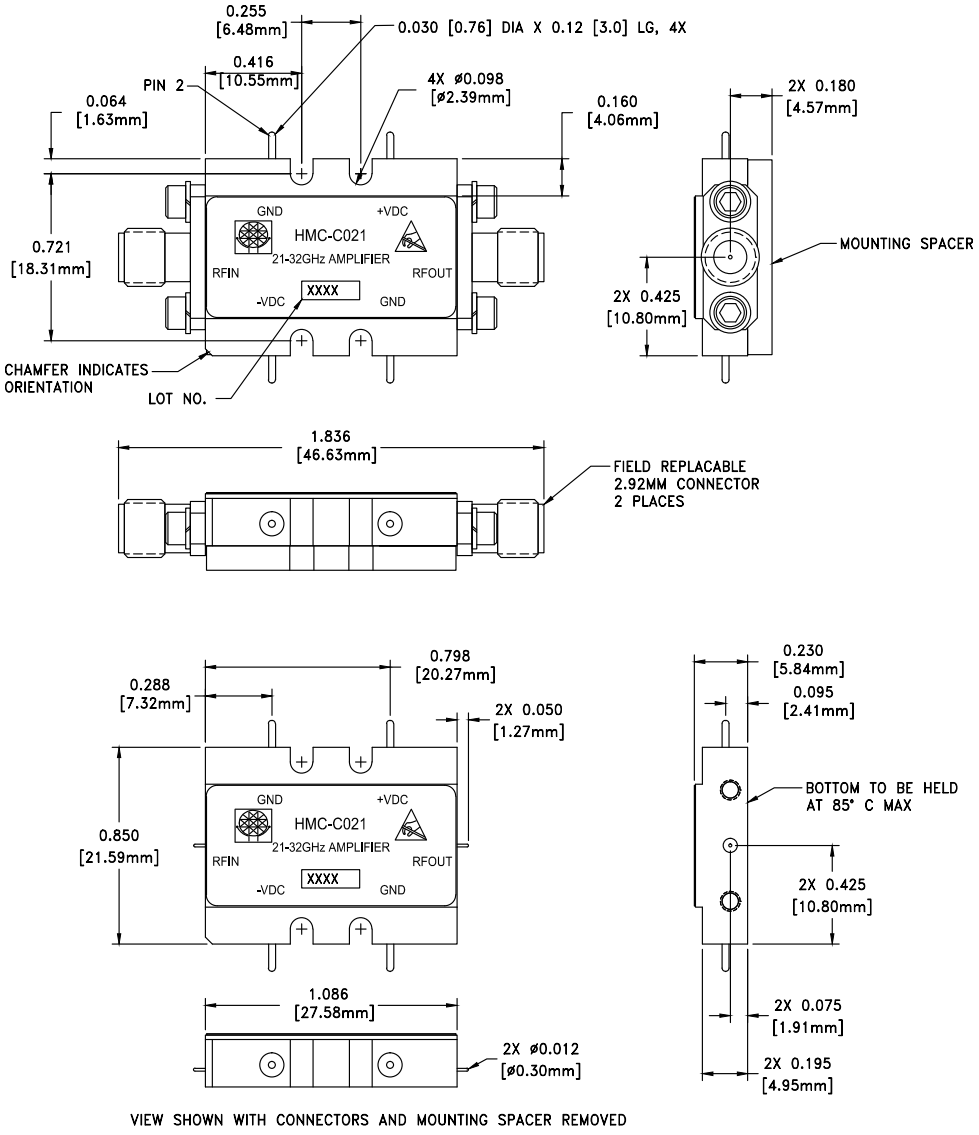
Pin Number	Function	Description	Interface Schematic
1	RFIN	RF input connector, 2.92mm female, field replaceable. This pin is AC coupled and matched to 50 Ohms.	
2, 5	GND	Power supply ground.	
3	+Vdc	Positive power supply voltage for the amplifier.	
4	RFOUT	RF output connector, 2.92mm female. This pin is AC coupled and matched to 50 Ohms.	
6	-Vdc	Negative power supply voltage for the amplifier	

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WIDEBAND POWER AMPLIFIER MODULE, 21 - 31 GHz

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 2.92mm CONNECTORS
   TENSOLITE 231CCSF OR EQUIVALENT

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