ANALOG DEVICES

HMC-C020

v03.0310

WIDEBAND POWER AMPLIFIER MODULE, 17 - 24 GHz

Typical Applications

The HMC-C020 Wideband PA is ideal for:

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

Features

Gain: 22 dB

P1dB Output Power: +24 dBm

Noise Figure: 3.5 dB

Spurious-Free Operation

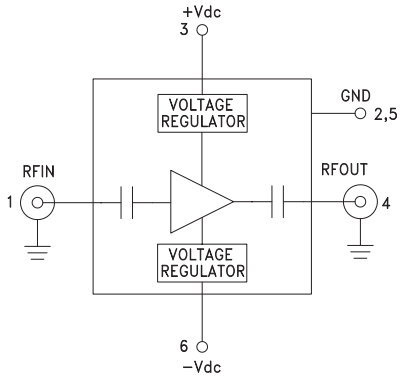
Regulated Supply and Bias Sequencing

Hermetically Sealed Module

Field Replaceable 2.92mm connectors

-55 °C to +85 °C Operating Temperature

Functional Diagram



General Description

The HMC-C020 is a GaAs MMIC PHEMT Power Amplifier in a miniature, hermetic module with replaceable 2.92mm connectors which operates between 17 and 24 GHz. The amplifier provides 22 dB of gain, 3.5 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-C020 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.

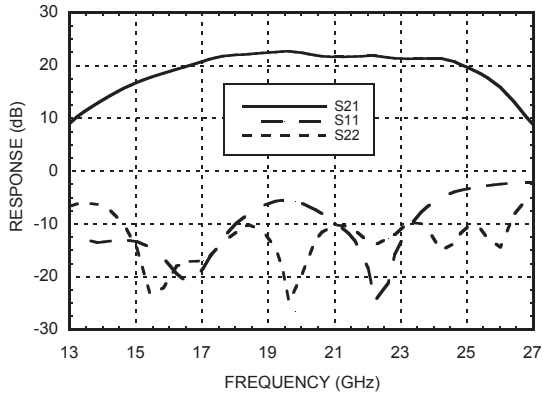
Electrical Specifications, T_A = +25° C, +Vdc = +8V to +15V, -Vdc = -4V to -10V*

Parameter	Min.	Typ.	Max.	Min.	Typ.	Max.	Units
Frequency Range		17 - 20			20 - 24		GHz
Gain	19	22	24	19	22	24	dB
Gain Flatness		±1.0			±0.5		dB
Gain Variation Over Temperature		-0.03	-0.04		-0.03	-0.04	dB/ °C
Noise Figure		3.5	5.5		4.5	6.5	dB
Input Return Loss		7			7		dB
Output Return Loss		10			10		dB
Output Power for 1 dB Compression (P1dB)	20	23		20	24		dBm
Saturated Output Power (Psat)		25			26		dBm
Output Third Order Intercept (IP3)		33			33		dBm
Positive Supply Current (+IDC)		250			250		mA
Negative Supply Current (-IDC)		5.2			5.2		mA

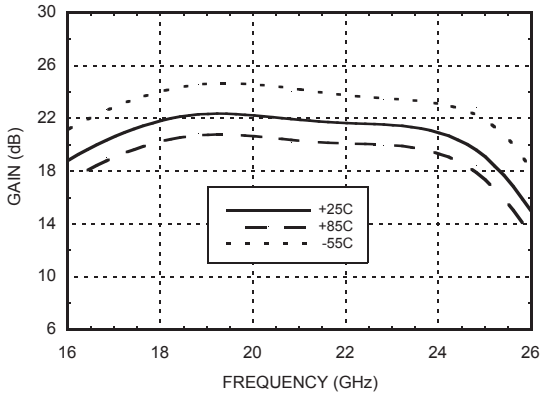
* Data recorded at +Vdc = +12V and - Vdc = -5V

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

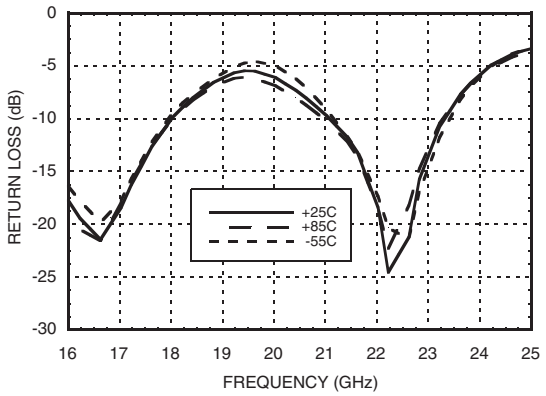
Gain & Return Loss



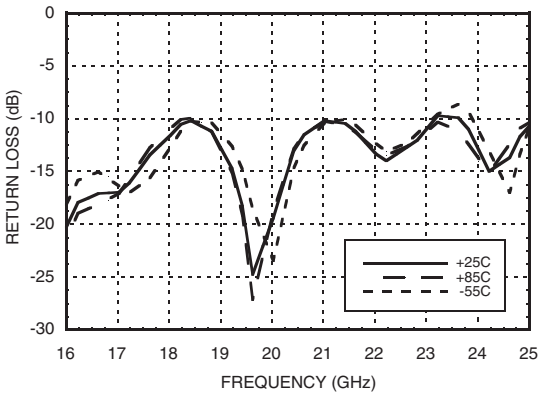
Gain vs. Temperature



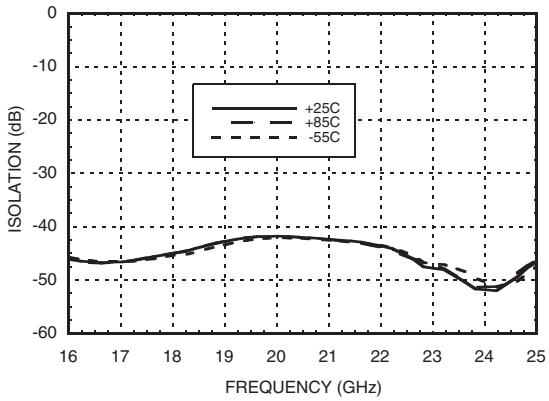
Input Return Loss vs. Temperature



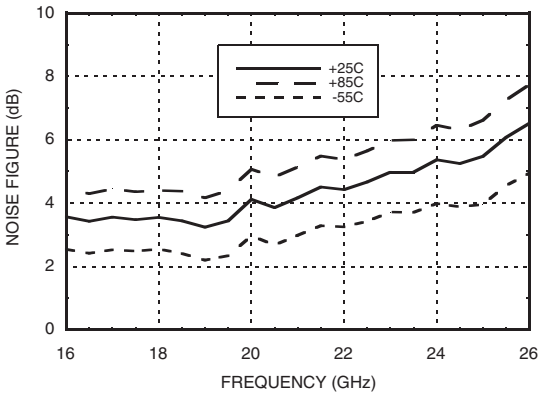
Output Return Loss vs. Temperature



Reverse Isolation vs. Temperature



Noise Figure vs. Temperature



For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

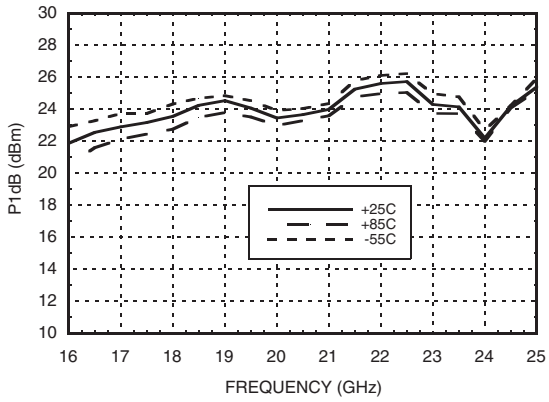
ANALOG DEVICES

HMC-C020

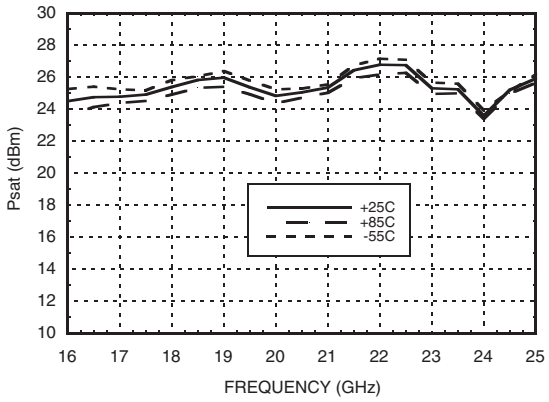
v03.0310

WIDEBAND POWER AMPLIFIER MODULE, 17 - 24 GHz

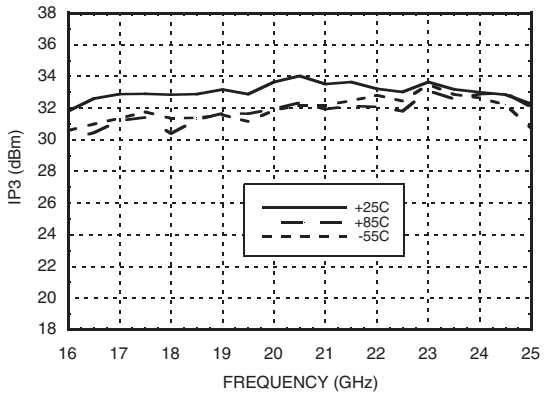
P1dB vs. Temperature



Psat vs. Temperature



Output IP3 vs. Temperature



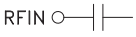
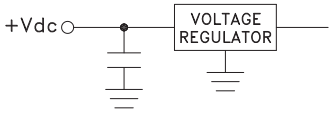
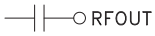
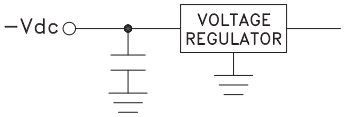
Absolute Maximum Ratings

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

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

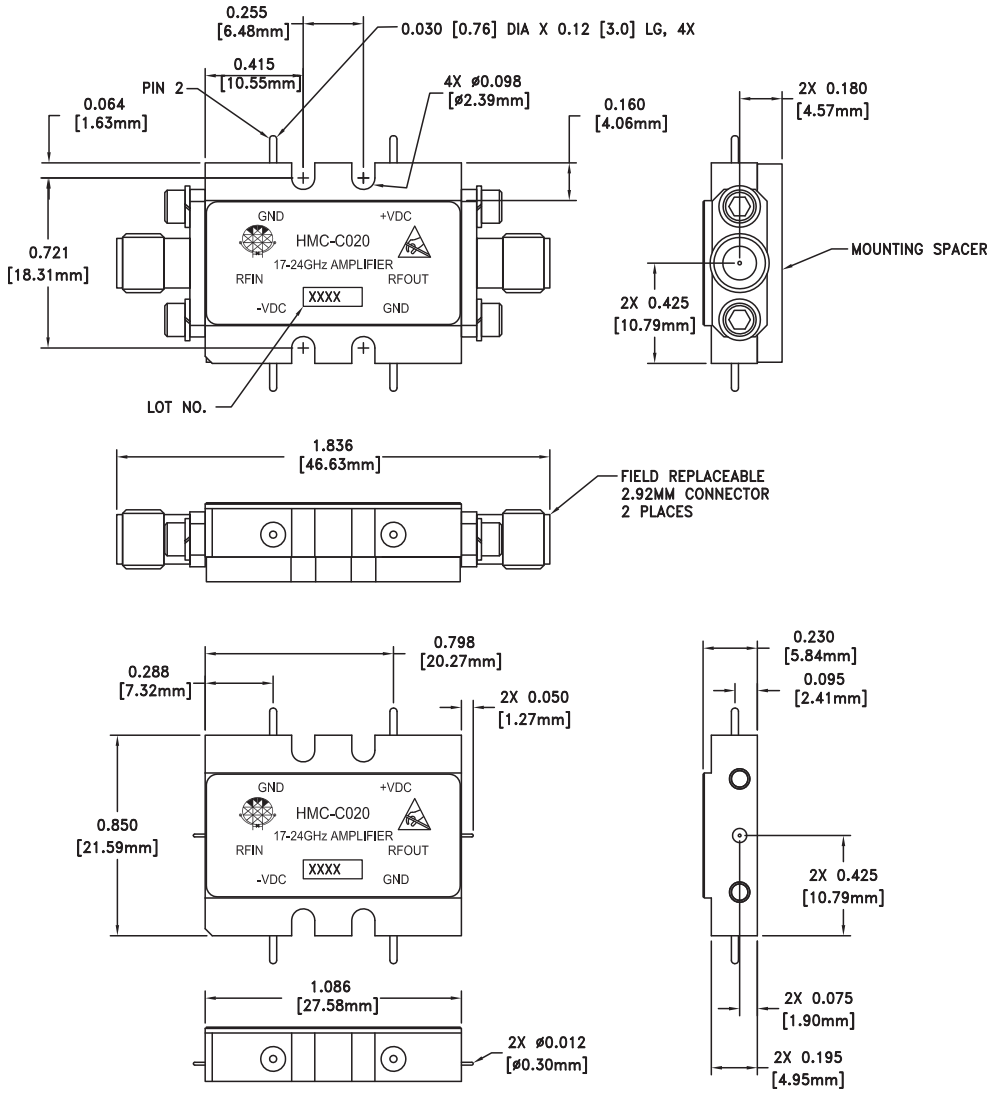
Pin Descriptions

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	

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

WIDEBAND POWER AMPLIFIER MODULE, 17 - 24 GHz

Outline Drawing



VIEW SHOWN WITH CONNECTORS 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

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

Notes:

For price, delivery, and to place orders: Analog Devices, Inc., One Technology Way, P.O. Box 9106, Norwood, MA 02062-9106
Phone: 781-329-4700 • Order online at www.analog.com
Application Support: Phone: 1-800-ANALOG-D

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Analog Devices Inc.:

HMC-C020