

TM5020

DC - 20 GHz Medium Power Amplifier



Product Features

High P1dB Output Power: +22 dBm
High Gain: 17 dB
Low Noise Figure: 2.5 dB down to DC
DC Supply: +8 V @ 160 mA
50 Ohm Matched Input/Output
Die size: 2.97 x 1.54 x 0.1 mm

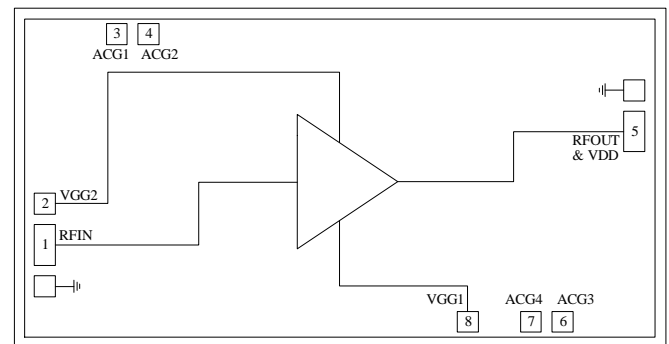
Applications

- Test Instrumentation
- Microwave Radio
- Driver Amplifier
- Fiber Optics
- Compatible with Both Epoxy and Eutectic Die Attachment

General Description

The TM5020 is a GaAs MMIC medium power amplifier which operates from DC to 20 GHz. The amplifier delivers 17 dB of gain with a corresponding output 1dB compression point of +22 dBm and a noise figure of 2.5 dB. The TM5020 is a 50 ohm matched design which eliminates the need for RF port matching. The die is 4 mil thick and the backside is plated for simultaneous RF and DC ground.

Functional Diagram



Electrical Specifications, VDD = 8.0 V, VGG2 = 1.5V, T_A = 25 °C

Parameter	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range		DC - 10			10 - 20		GHz
Gain		18			17		dB
Input Return Loss		-25			-15		dB
Output Return Loss		-17			-20		dB
Output P1dB		22.5			21.5		dBm
Saturated Output Power		24			23.5		dBm
Output Third Order Intercept (OIP 3)		33			28		dBm
Noise Figure (NF)		2.5			2.5		dB
Supply Current		160			160		mA

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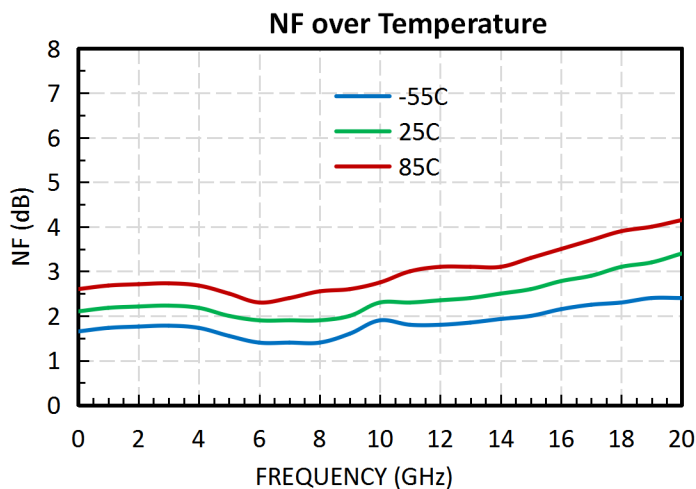
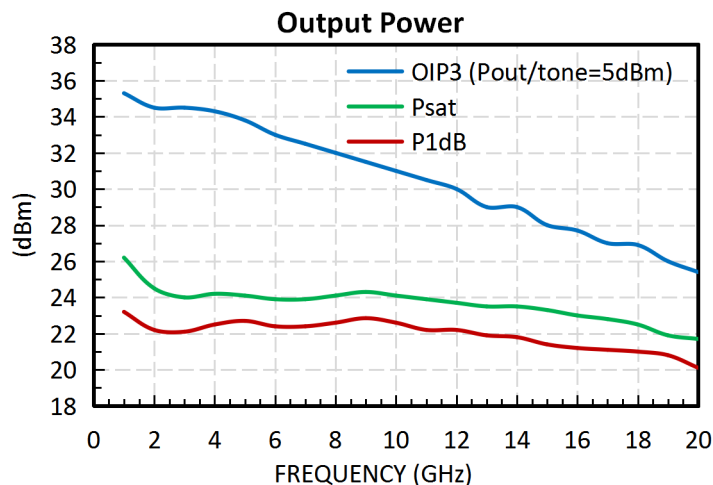
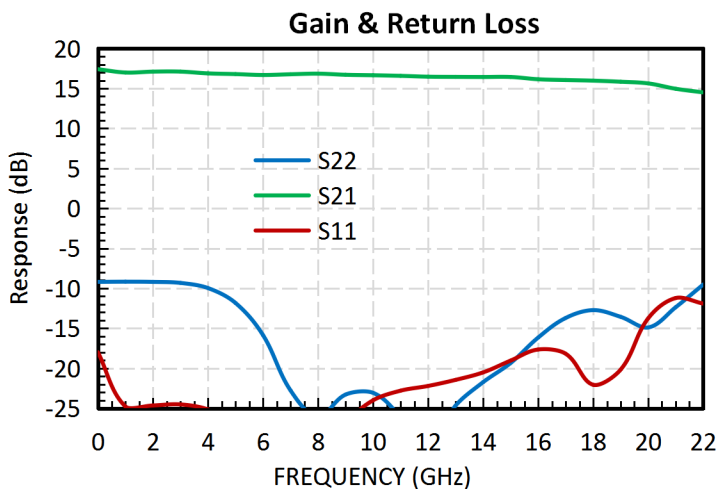
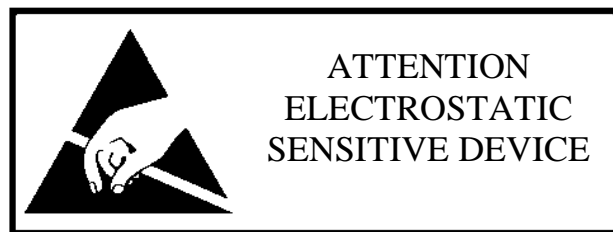


Absolute Maximum Ratings

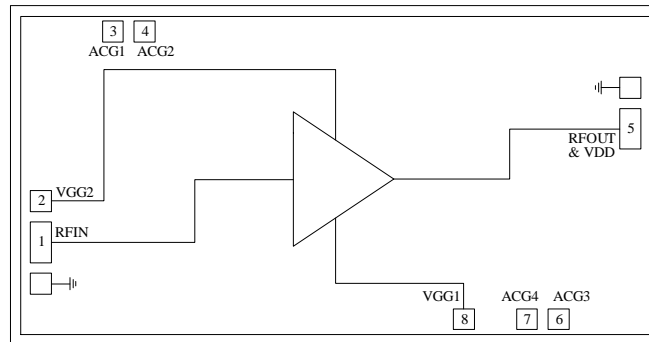
Parameter	Rating
Storage Temperature	-65 to 150 °C
Operating Temperature	-55 to 85 °C
Drain Voltage	+9 V
Gate Voltage VGG1	-2 to 0 V
Gate Voltage VGG2	VDD-8 to VDD
Channel Temperature	175 °C
Thermal Resistance (Channel to die bottom)	31 °C/W

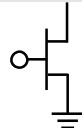
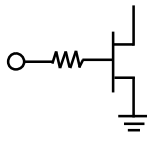
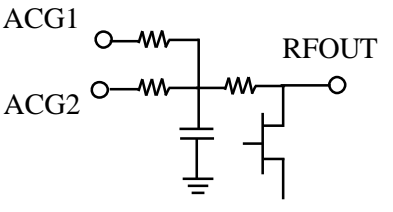
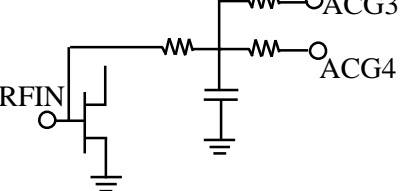
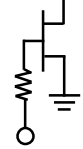
Recommended Operating Conditions

Parameter	Min	Typ	Max	Units
VDD		8		V
IDD		160		mA
VGG2		1.5		V

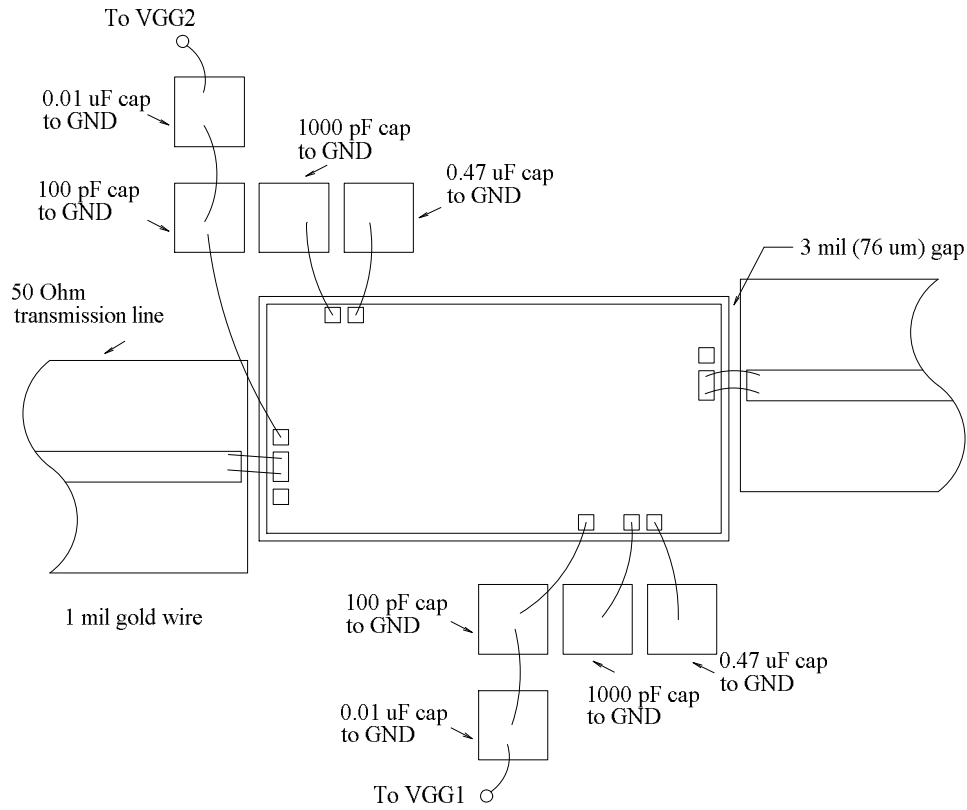


Pin Description



Pad	Function	Description	Interface Schematic
1	RFIN	50 Ohm matched and DC coupled input	
2	VGG2	Gate control 2 for amplifier. Recommended voltage is 1.5V	
3, 4	ACG1, ACG2	Low frequency AC ground termination. Attach bypass capacitor per application circuit.	
5	RFOUT & VDD	50 Ohm matched output and supply voltage. External bias-T required per application circuit.	
6, 7	ACG3, ACG4	Low frequency AC ground termination. Attach bypass capacitor per application circuit.	
8	VGG1	Gate control 1 for amplifier. Adjust this voltage for the desired IDD.	

Assembly Diagram



Application Circuit

