



TLCA02981

Ka-Band MMIC Amplifier

Description

The TLCA02981 is a broadband, two-stage, general purpose MMIC amplifier. A 0.25µm PHEMT process was chosen to provide greater than 18 dB gain over the 20 to 34 GHz band, with low power consumption. The broadband gain provided by the TLCA02981 makes it an excellent candidate for use in radar or communication systems.

Features

- 0.25µm PHEMT Process
- 20 to 34 GHz
- Small-signal gain > 18 dB
- PSAT ≥ 23dBm
- Chip Dimensions 2.17 x 1.3 x 0.1 mm

Maximum

Ratings

Symbol	Parameter	Rating
V _D	Positive Supply Voltage	6 V
V _G	Negative Supply Voltage	-2 V
I _D	Positive Supply Current	200 mA
T _C	Operating Temperature	-50 to 130 °C
T _{STG}	Storage Temperature	-65 to 150 °C

Performance

Summary (At 25 C, 50 ohm system)

	Min	Typ	Max	
Frequency	20		34	GHz
P1dB	20	23	24	dBm
PAE	19	20	21	%
Small Signal Gain	16	18	20	dB
Drain Supply Voltage	3	4	5	V
Gate Supply Voltage	-1.0	-0.3	-0.1	V
Drain Supply Current	75	100	150	mA

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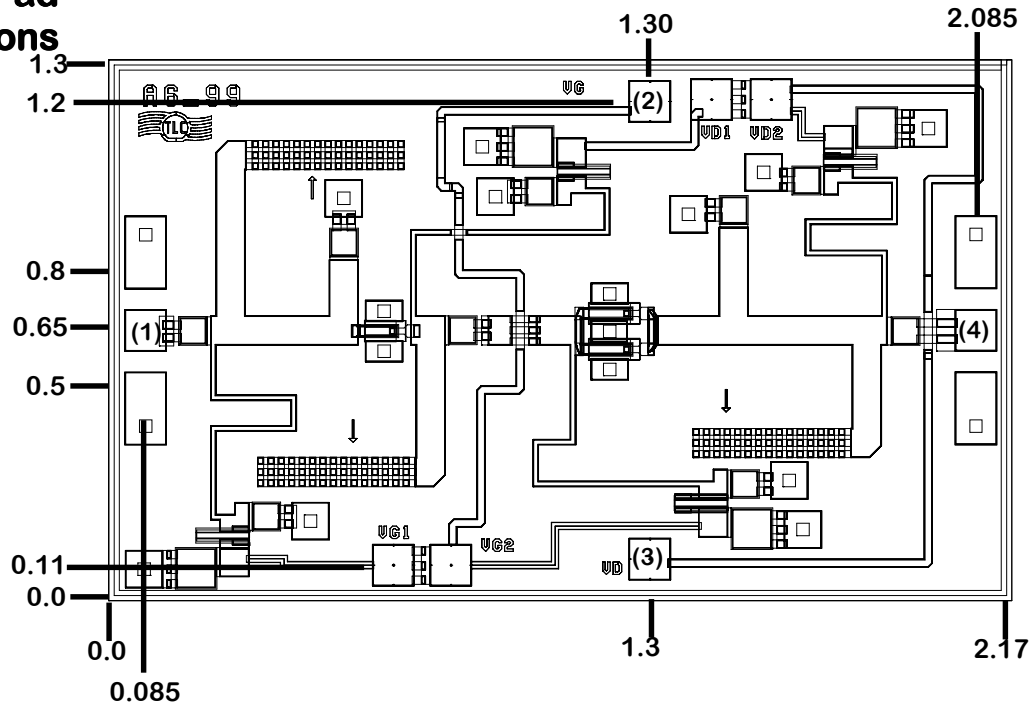
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Recommended

Operating Procedure

1. Set RF/IF input power to 0 dBm.
2. Slowly apply gate supply voltage of -0.5 V to V_G .
3. Slowly apply drain supply voltage of 2.0 V to V_D , I_D should be between $100 - 150\text{ mA}$.
4. Set RF to desired input power.
5. Adjust gate and drain supply voltages to given specifications, or to maximize gain.
6. Turn off in the following sequence:
 - i. Turn off RF input power
 - ii. Turn off drain supply voltage (VD)
 - iii. Turn off gate supply voltage (VG)

MMIC Layout and Bond Pad Locations



Units: millimeters

Bond Pad 1 (RF Input)	0.1x0.1
Bond Pad 2 (VG)	0.1x0.1
Bond Pad 3 (VD)	0.1x0.1
Bond Pad 4 (RF Output)	0.1x0.1

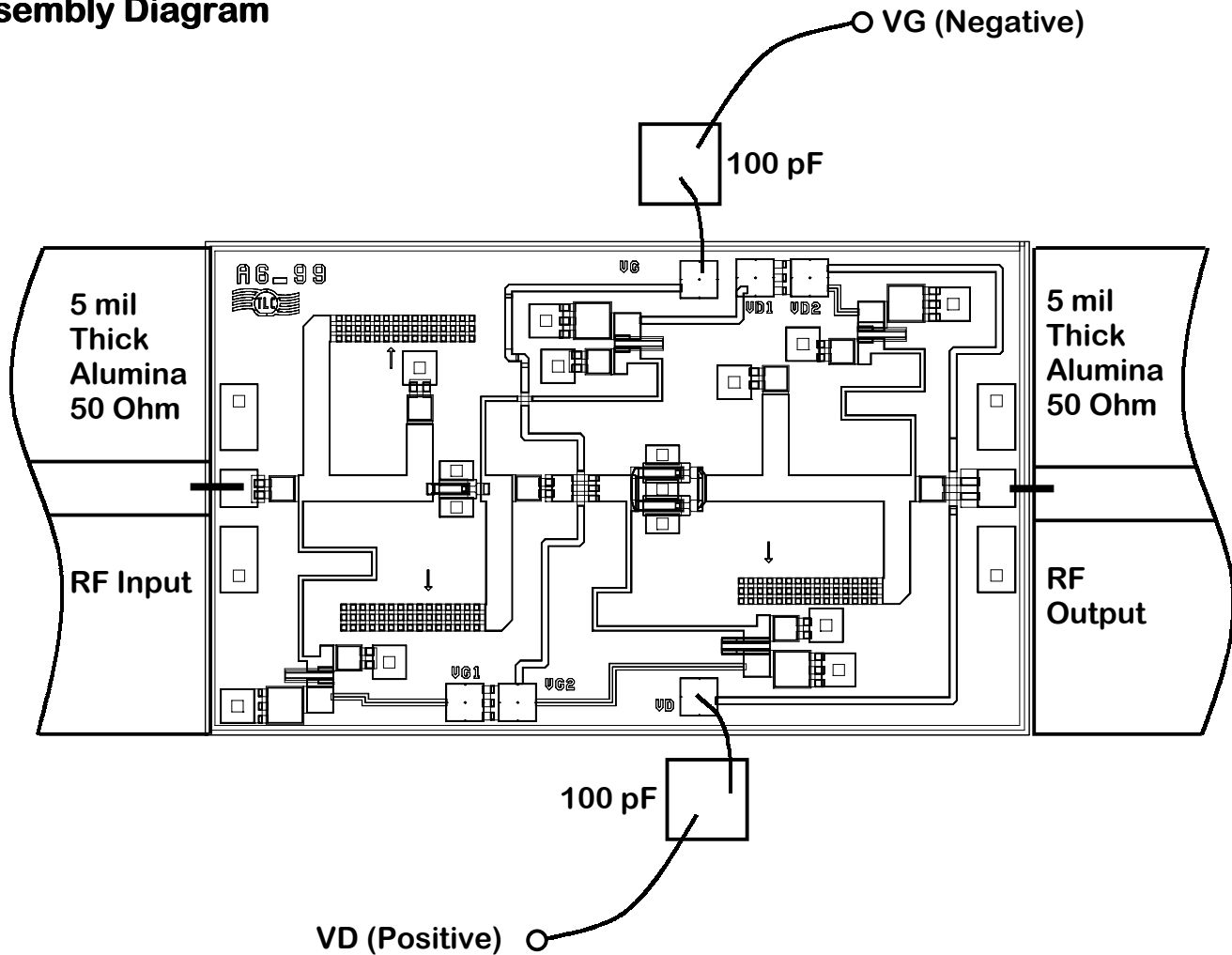
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Recommended Assembly Diagram



Note: Use one (1) 0.002" by 0.0005" gold ribbon or two (2) 0.0005" wire for bonding the RF input and output. Mount chip using silver epoxy (e.g. Epo-Tek H32C) or Gold-Tin (AuSn:80/20) solder. For best heat sinking, use either gold plated copper or composite matrix material, e.g. Thermocon.

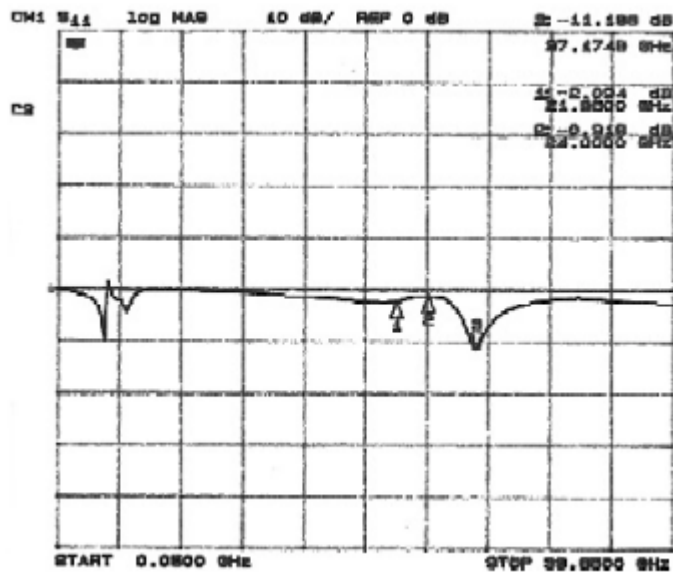
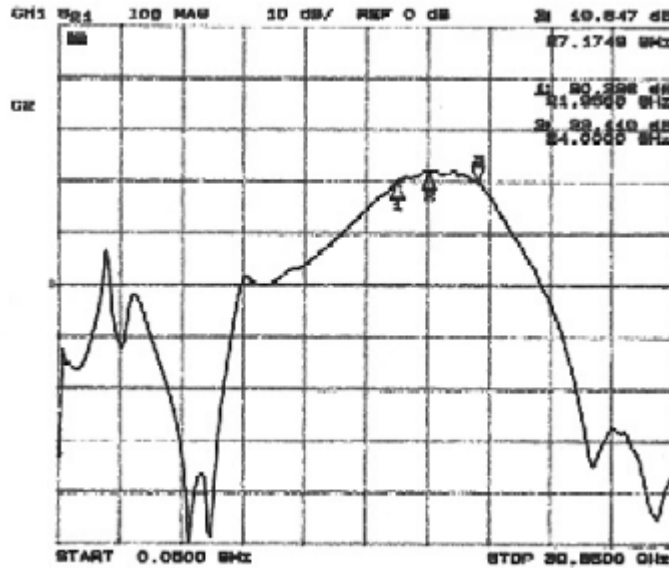
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Performance Capabilities



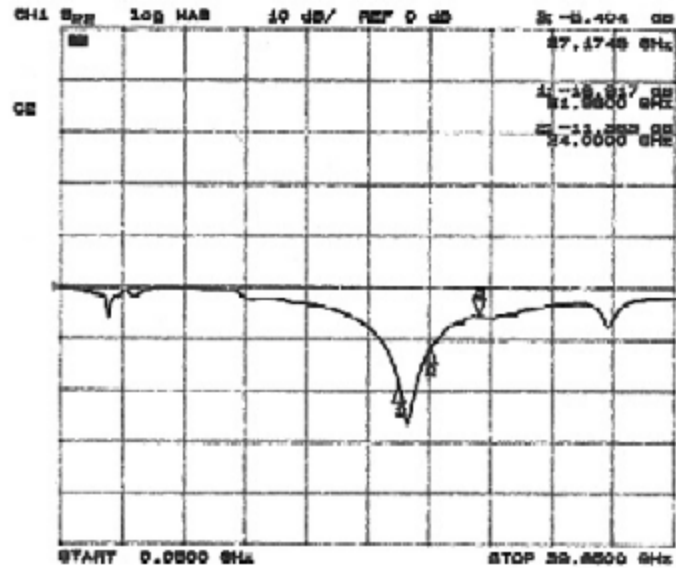
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Performance Capabilities



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TLC issues test data on all parts sold. If additional testing is required, please send inquiry to the sales department. TLC reserves the right to change the performance data and specifications without notice.

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