

VRFA0039V1 - BD



Ka-Band 5W GaAs MMIC High Power Amplifier

Preliminary Datasheet v1.0

Features

- Frequency Range: 25 to 27GHz
- CW 1dB Compression Point 35dBm
- Efficiency at 1dB Compression 20% typ
- Bias: $V_d = 8V$, $I_{dq} = 2.4A$
- Die Size: 4 x 5.94 x 0.1 mm

Description

The VRFA0039V1-BD is a 5W CW GaAs high power amplifier MMIC which operates over the frequency range of 25GHz to 27GHz. The amplifier typically delivers a small signal gain of +22dB, 1dB output compression of +35dBm with a typical efficiency of 20%. The VRFA0039V1-BD draws 2.4A quiescent from a +8VDC supply. The RF ports are DC blocked and matched to 50Ω. Typical applications for the VRFA0039V1 include satellite communications.



Electrical Specifications

$T = +70^{\circ}C$ baseplate, $V_{DD} = +8V$, $I_{dq} = 2.4A$

Parameter	Specification			Unit
	Max.	Typ.	Min.	
Frequency Bandwidth	25		27	GHz
Small Signal Gain		22		dB
P1dB Output Power		35		dBm
Return Loss		-6		dB
Power Added Efficiency (PAE)		20		%

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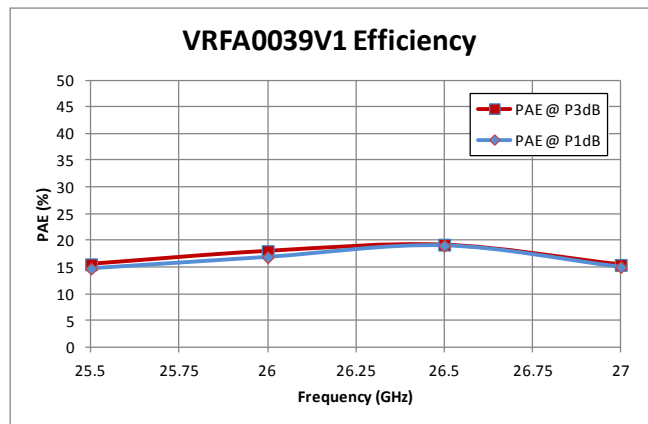
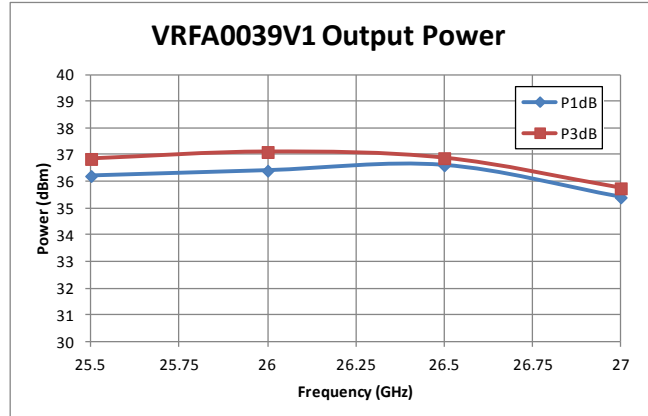
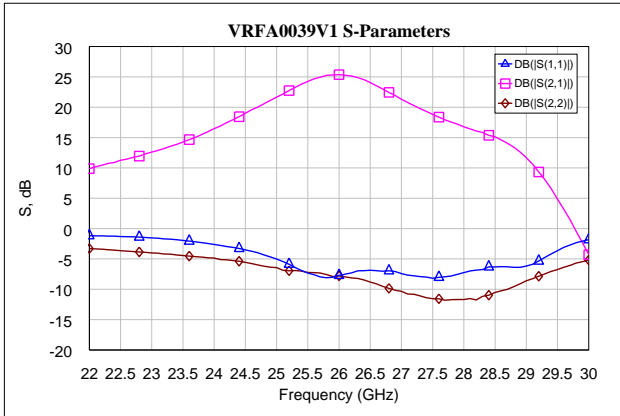


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Measured Performance (on wafer)

$T = +70^{\circ}\text{C}$ baseplate, $V_{DD} = +8\text{V}$, $I_{dq} = 2.4\text{A}$



Recommended Absolute Maximum Ratings ^[1]

Parameter	Symbol	Value	Notes
Drain Bias Voltage	V_d	+10V	
Gate Bias Voltage	V_g	-5V	
Gate Current	I_g	30mA	
RF input power	RF_{in}	+20dBm	
Power Dissipation	P_d		Related to Junction Temperature
Junction Temperature	T_j	200°C	For maximum median device lifetime, T_j should be minimised
Storage Temperature	$T_{storage}$	-55 to 150°C	

^[1] Operation outside these conditions may cause permanent damage to the device. Combination of maximum rating conditions may reduce the values. Device performance at these ratings is not implied.

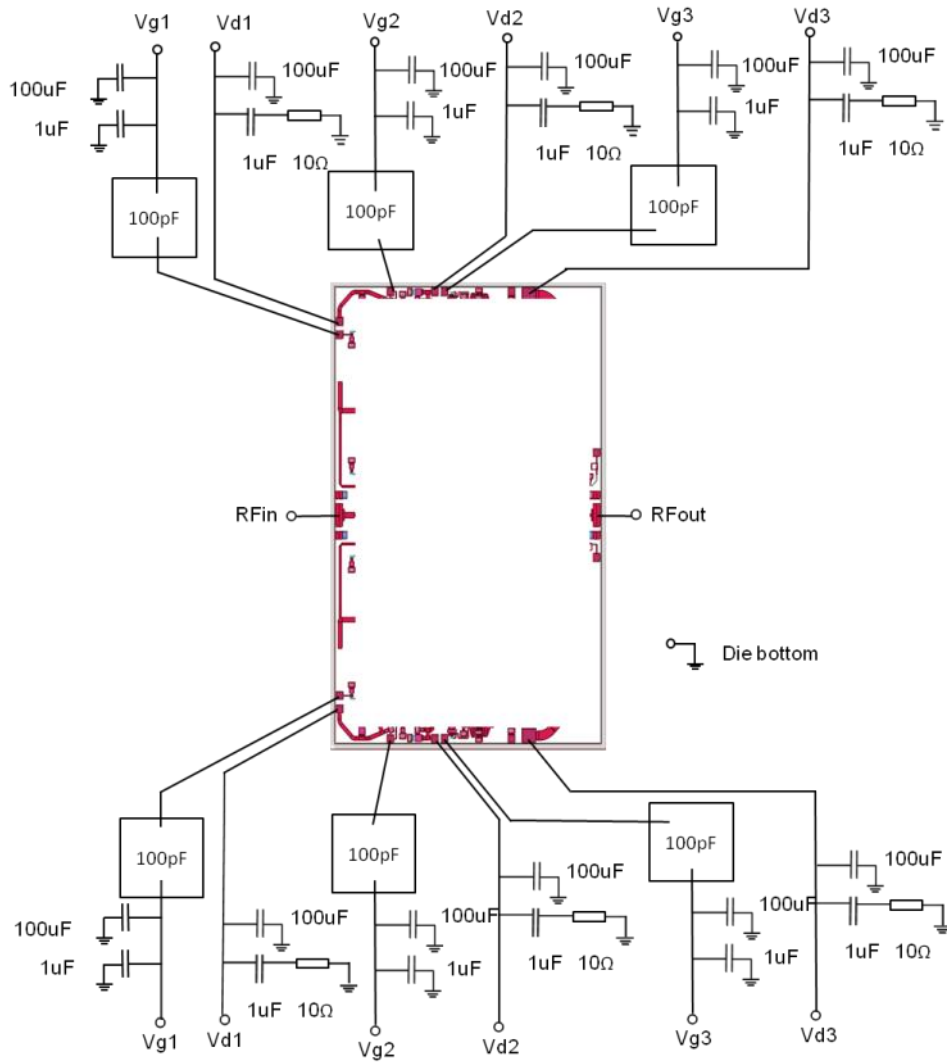
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Assembly & Bonding Diagram



Die Size	4mm x 5.94mm
Die Thickness	100μm
Minimum Bondpad opening	70μm x 70μm

Minimal length (0.15nH) are recommended for RF bondwires. The RF input and output ports are DC blocked.

GaAs devices are ESD sensitive and precautions should be observed during storage, handling, assembly and testing.

