

VRFA0120-BD



C-Band 40W GaN MMIC Power Amplifier

Preliminary Datasheet v1

Features

- Frequency Range: 5.2GHz to 5.6GHz
- Saturated Pulsed Output Power: 47dBm
(Pulse width = 30 μ s and Duty Cycle = 1%)
- PAE: >42%
(Pulse width = 30 μ s and Duty Cycle = 1%)
- Small signal gain: >46dB
- Bias: Vd = 30V, Vg = -3.4V



Description

The VRFA0120-BD is a 40W GaN high power amplifier MMIC which operates over the frequency range of 5.2GHz to 5.6GHz. The amplifier typically delivers a small signal gain of 46dB, saturated output power Psat of 47dBm with a typical efficiency of 42% under pulsed conditions. The RF ports are DC blocked and matched to 50 Ω . The VRFA0120-BD is designed on an European space qualified technology and typical applications include satellite communications.

Electrical Specifications

T = 25°C baseplate, Vd = 30V

Parameter	Specification			Unit
	Min.	Typ.	Max.	
Frequency Bandwidth	5.2		5.6	GHz
Small Signal Gain		46		dB
Saturated Output Power (Pulsed)		47		dBm
Power Added Efficiency (Pulsed)		42		%
I/P Return Loss		-10		dB

VRFA0120-BD

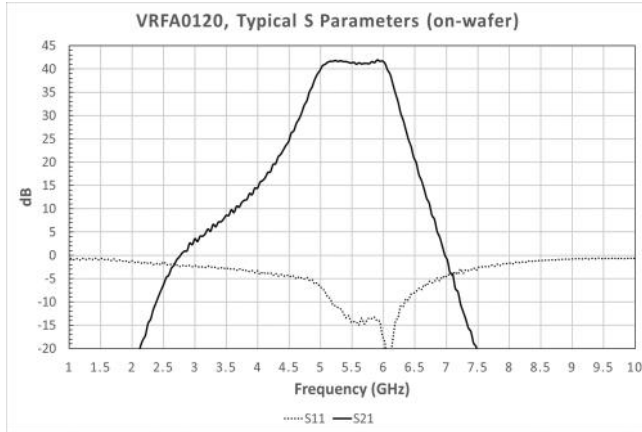


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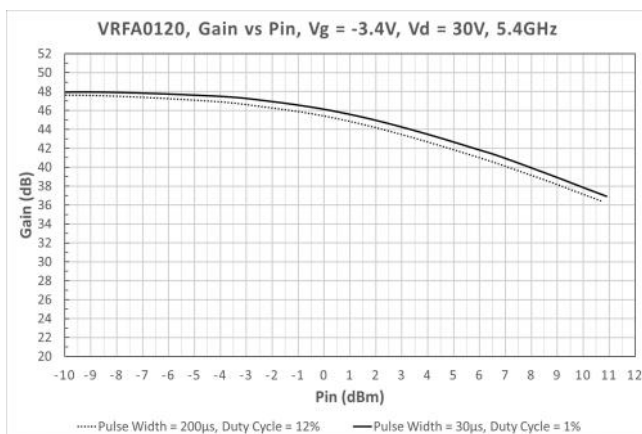
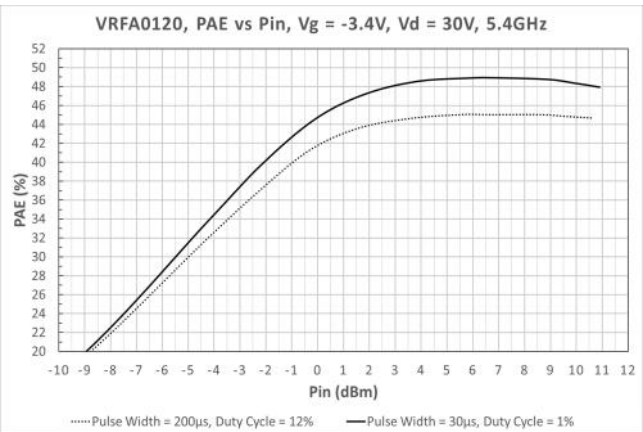
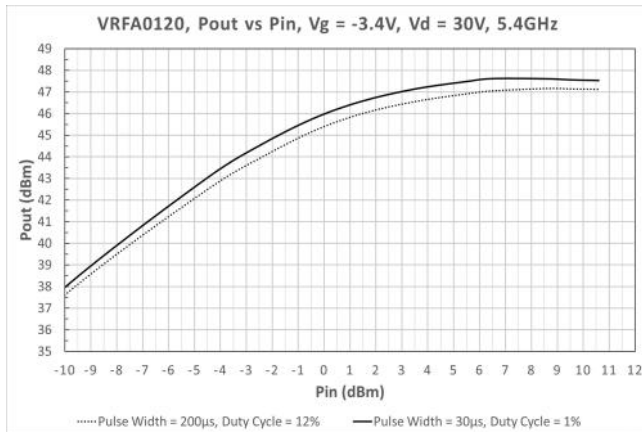
Measured Performance (on wafer)

$T = 25^{\circ}\text{C}$ baseplate, $V_d = 30\text{V}$



Measured Performance (in test jig)

$T = 25^{\circ}\text{C}$ baseplate, $V_d = 30\text{V}$



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Recommended Absolute Maximum Ratings ^[1]

Parameter	Symbol	Value	Notes
Drain bias voltage	Vd	55V	
Gate bias voltage	Vg	-20V	
Gate Current	Ig	5mA	
RF input power	RFin	15dBm	
Junction Temperature	T _j	160°C/230°C	160°C for space applications/230°C for non-space applications 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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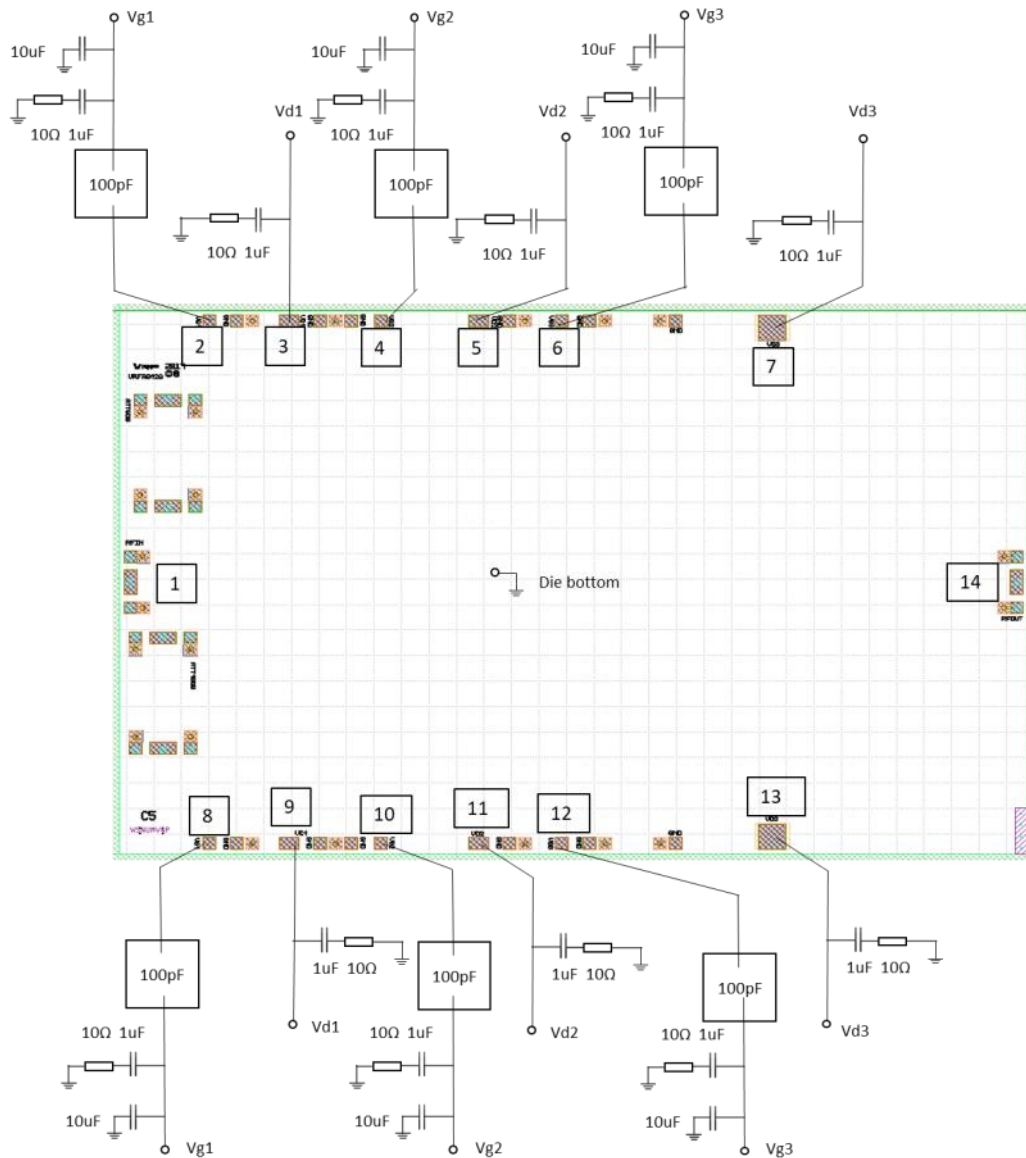


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Assembly & Bonding Diagram

(Please consult VIPER RF if operated in different pulsed conditions)



ID	PAD	NOTE
1	RF IN	
2, 4, 6, 8, 10, 12	Gate	Vg = -3.4V typical
3,5,7,9, 11, 13	Drain	Vd = 30V typical
14	RF OUT	
Die Bottom	GND	

Die Size	6.7mm x 4.36mm
Die Thickness	100μm
Minimum Bondpad opening	100μm x 100μm

Optimum length (0.24nH) are recommended for RF bondwires. The RF input and output ports are DC blocked.

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

