
VWA-50025-AAAA
**45 GHz – 11 dB – 16 dBm
Low Noise MMIC**

Description

The **VWA-50025-AAAA** is an analog Low Noise/medium power MMIC amplifier for ultra wide band applications up to 45GHz, with flat group delay.

The device is designed in 0.15µm low noise pHEMT process.

The device is capable of more than +15 dBm output power at 1 dB compression point, and provide more than 11dB of gain from DC to 43 GHz with less than 1 dB of Gain variation with an excellent group delay up to 43GHz (less than +/- 3ps). The Design has been optimized to provide high efficiency, supply current is as low as 90mA with Vb=+8V.

The MMIC integrates an output power monitoring function: a 24 dB tap coupler delivers the image of the output level on a dedicated pad, and a peak detector is available on the die. Connecting the input of the peak detector to the tap coupler output will generate a DC signal, at the output of the detector, monitoring the output signal. A reference diode is also available for temperature stabilization of the detector function.

S2P file can be provided for system design simulation.

GDSII file is also available for mechanical design.

Features

- LN pHEMT GaAs MMIC
- Wide band : DC – 43 GHz @ 1dB
- Flat group delay
- 50Ω RF Single ended input and output
- DC coupled
- Low power consumption < 0.8W
- Positive voltage supply +8V
- Integrated output power tap coupler
- Integrated output level detection
- Reference diode output
- 2.97 x 1.52 x 0.10 mm

Applications

- Wide band Low Noise amplifier
- Radar / ECM / ECCM
- Test and measurement
- Fiber transmission: 10 to 50 Gbps
- Broadband communication

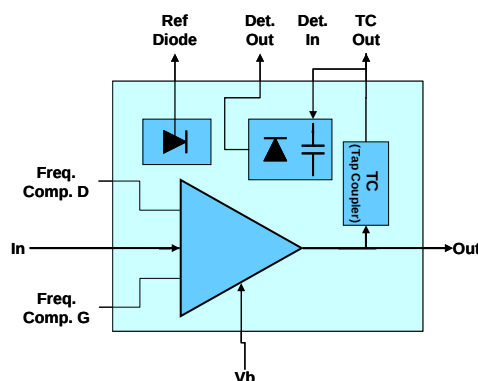
Ordering information

Product code

VWA 50025 AA



**Pin out and dimensions
(2.97 X 1.52 X 0.10 mm)**



Functional Block Diagram

Typical Characteristics: Tamb = 25°C, Vdd = +8V, Idd = 90mA.

Parameter	Symbol	Min	Typ	Max	Unit
Frequency range	F		45		GHz
Gain	G		11		dB
Gain flatness	ΔG		1		dB
Noise figure @ 10 GHz	NF		2		dB
Input adaptation	S11		12		dB
Output adaptation	S22		12		dB
Output power @ 1dB compression	P1dB		15		dBm
Saturated output power	PSat		16		dBm
Group delay variation	$\Delta\Phi$		+/- 3		ps
Output tap coupler ratio	TC		24		dB
Drain supply voltage	Vdd		8		V
Supply current	Idd		100		mA

Environment Parameters	Symbols	Min	Max	Units
Storage temperature	Tst	-65	+150	°C
Operating temperature	Top	-55	+85	°C

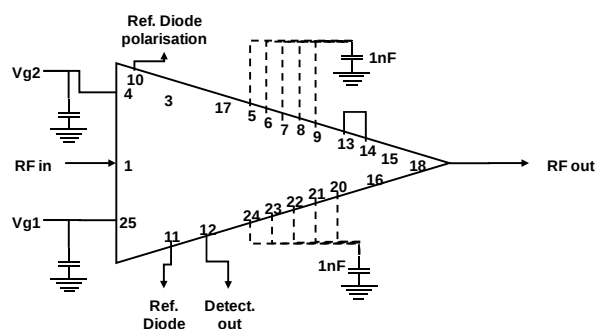
Absolute maximum ratings

Maximum ratings	Symbols	Min	Max	Units
Positive External DC bias voltage	Vdd		9	V
RF input power (In)	Pin max		+20	dBm
Temperature process max 20 secondes	T process		325	°C
Continuous power dissipation (@ 85°C)	Pcw		0,8	W

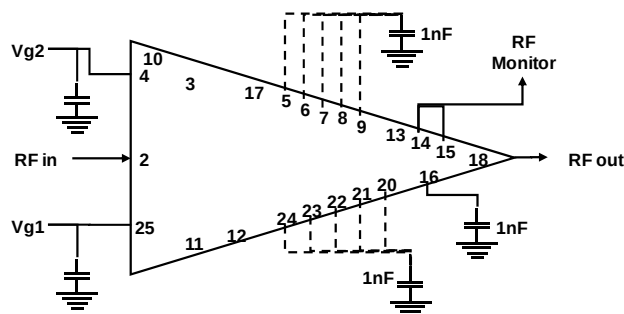
Care should be taken to avoid supply transient and over voltage. Over voltage above the maximum specified in absolute maximum rating section may cause permanent damage to the device.

Application circuit

with internal detector



with external detector



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VWA 50025 AA xx DS Rev1.0

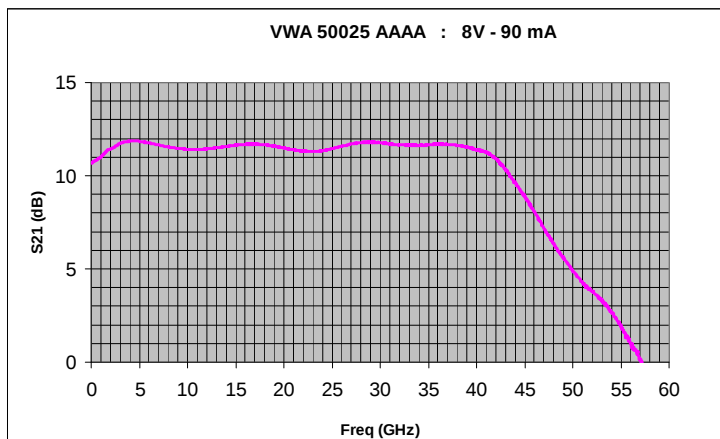
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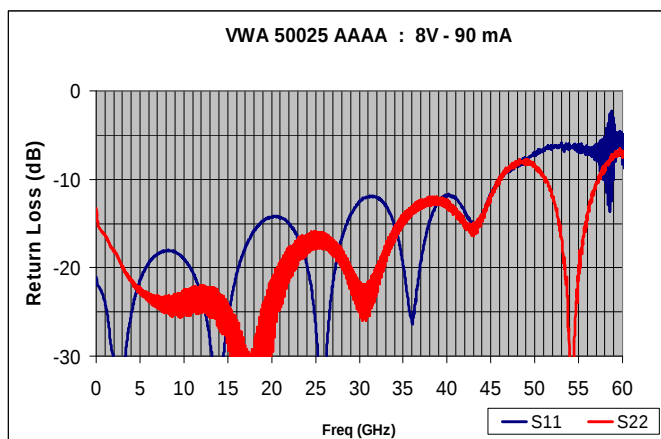
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Probe measurement: Typical curves

Gain (dB) vs frequency (GHz)

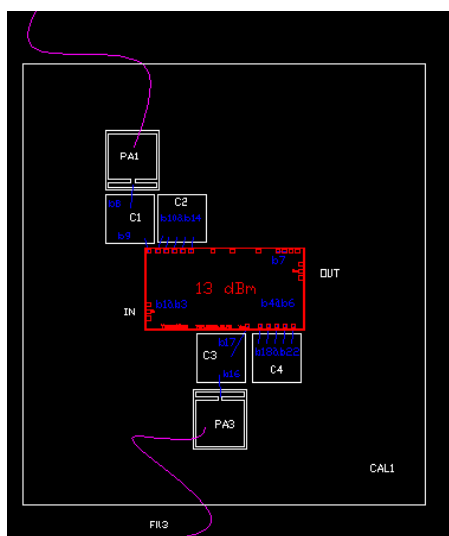


Return Loss (dB) vs frequency (GHz)

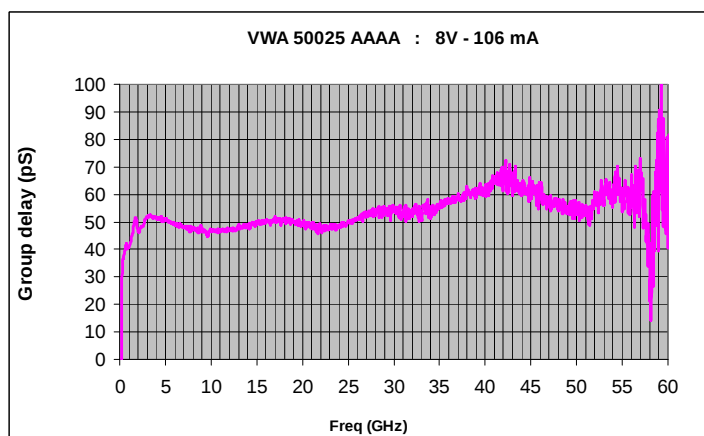


Probe Test configuration

C1, C2, C3, C4: 1000 pF capacitor

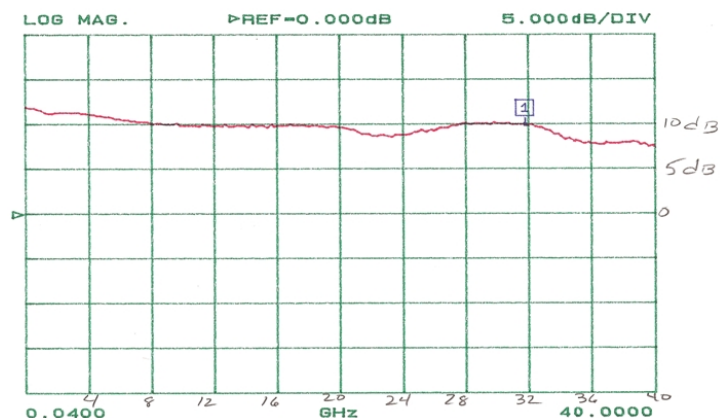


Group Delay (ps) vs frequency (GHz)

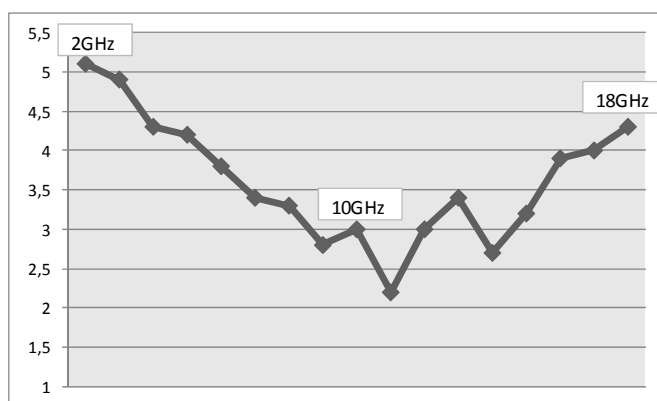


VWA 50025 AAAA Typical Performances in a "K Connector Evaluation Housing"

Gain (dB) vs frequency (GHz)



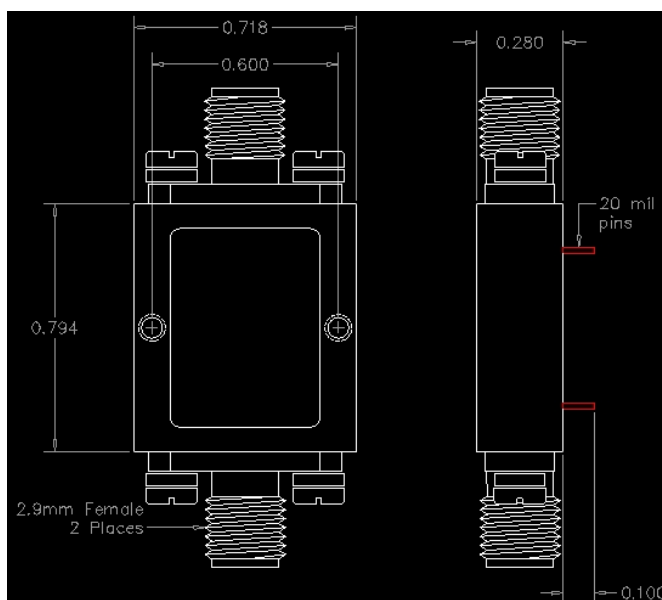
Noise Figure (dB) vs frequency (GHz)



Top View



Dimensions



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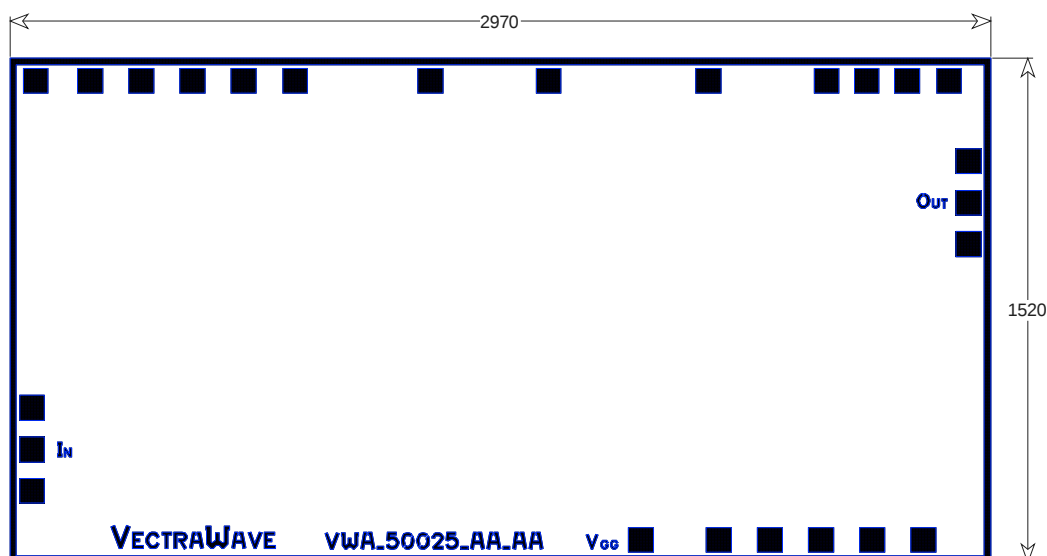
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Pin out and pad description



Pad #	Name	Description	Pad #	Name	Description
1	GND	Ground – for probe test	14	TC Out	Output power tap coupler
2	In	RF Input - DC coupled- 50Ohm matched	15	RFL	50 Ohm adaptation of TC out when used externally
3	GND	Ground – for probe test	16	C0	Connect to 1nF to ground when RFL is used
4	Vg2	Gate control 2 (positive volatge)	17	GND	Ground – for probe test
5	D0	Connect to 1nF to ground	18	Out	RF output - DC coupled- 50Ohm matched- Conect to Bias T
6	D1	Full band decoupling (same C as D0)	19	GND	Ground – for probe test
7	D2	Full band decoupling (same C as D0)	20	G0	Connect to 1nF to ground
8	D3	Full band decoupling (same C as D0)	21	G1	Full band decoupling (same C as G0)
9	D4	Full band decoupling (same C as D0)	22	G2	Full band decoupling (same C as G0)
10	VbDref	Polarization of reference diode –connect to	23	G3	Full band decoupling (same C as G0)
11	Dref	Reference diode ...	24	G4	Full band decoupling (same C as G0)
12	Det Out	Output peak detector	25	Vg1	Gate control 1...(negative voltage)
13	Det In	Input peak detector			

- All pads dimensions = 75 x 75 μm^2 ; except pad 9 dimensions = 100 x 100 μm^2
- Die thickness = 100 μm
- Die bottom must be connected to ground (RF and DC)

Handling

This product is sensitive to electrostatic discharge and should not be handled except at a static free workstation. Take precautions to prevent ESD; use wrist straps, grounded work surfaces and recognized anti-static techniques when handling the **VWA-50025-AA-AA** MMIC.



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