

General Description

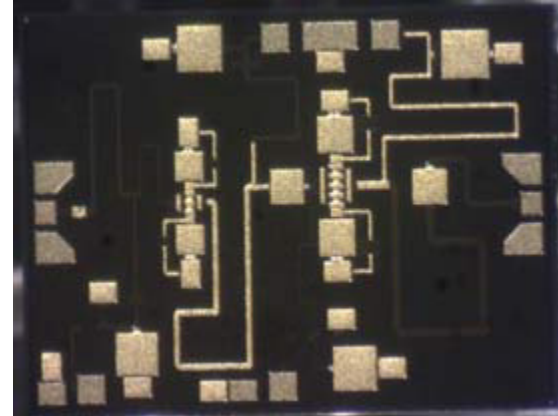
The **VWA500066AC** is a 2 stages analog medium power MMIC amplifier operating in the frequency range 9.2 to 10.5GHz.

The device is a cascaded 2 stages auto biased amplifier designed in 0.25µm pHEMT process.

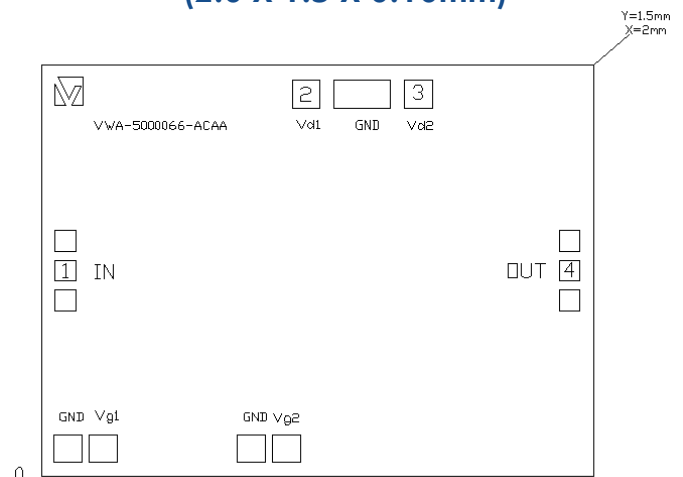
The device is capable of more than +23dBm output power at Psat, and provide more than 22dB of gain from 9.2 to 10.5GHz with less than 1dB of Gain variation.

The Design has been optimized to provide high efficiency, supply current is as low as 120mA with VD=+8V, when delivering +23dBm output power.

*S2P file can be provided for system design simulation.
DXF file is also available for mechanical design.*



Pin out and dimensions (2.0 X 1.5 X 0.10mm)



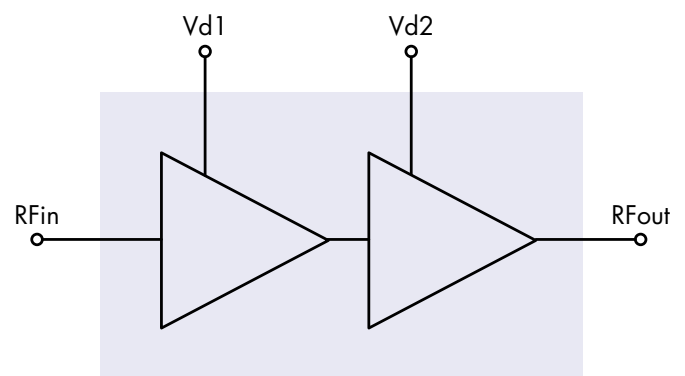
Features

- 2 stages Medium Power pHEMT GaAs MMIC
- Single Bias, Low power consumption < 1W
- Bandwidth : 9.2 to 10.5GHz
- High Output Psat : +23dBm
- High P1dB : + 22dBm
- High gain: 22dB
- 50Ω, AC coupled RF input and output,
- Power supply: 120mA @ +8V
- Small size: 2 x 1.5 x 0.10mm

Applications

- X band Medium Power amplifier
- Radar / ECM / ECCM
- Test and measurement
- Broadband communication

Functional Block Diagram



Typical Characteristics

Test conditions unless otherwise noted :

- Tamb = 25°C
- Vdd = +8V
- Idd = 120mA

Symbol	Parameter	Min	Typ	Max	Unit
F	Frequency Range @ 3dB	9.2		10.5	GHz
G	Gain	22	23		dB
ΔG	Gain flatness		+/- 0.5		dB
NF	Noise figure @ 10GHz		7		dB
S11	Input return loss		-14		dB
S22	Output return loss		-14		dB
P1dB	Output power @ 1dB compression		22		dBm
PSat	Saturated output power		23		dBm
Vdd	Drain supply voltage		8		V
Idd	Supply current		120		mA

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

Absolute Maximum Ratings

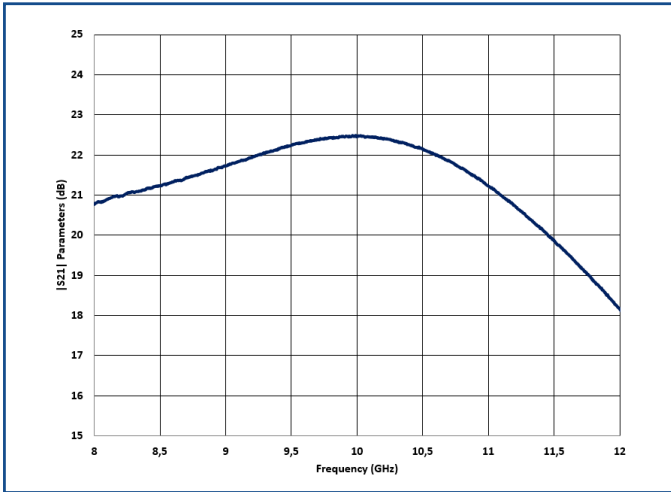
Symbol	Maximum Ratings	Min	Max	Unit
Vdd	Positive External DC bias voltage		8.5	V
Pin max	RF input power (In)		+7	dBm
Tj	Junction temperature		150	°C
T process	Temperature process max 10 secondes		290	°C
Pcw	Continuous power dissipation (@ 85°C)		1.2	W

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.

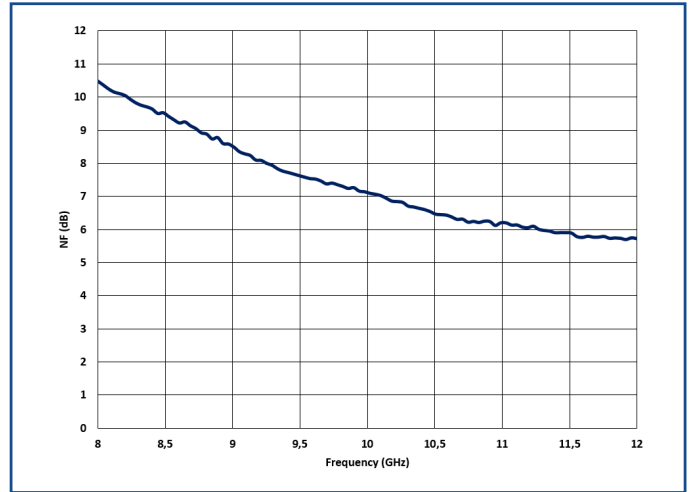
RF "Probe Measurement"

Typical curves (V_{dd}=8V)

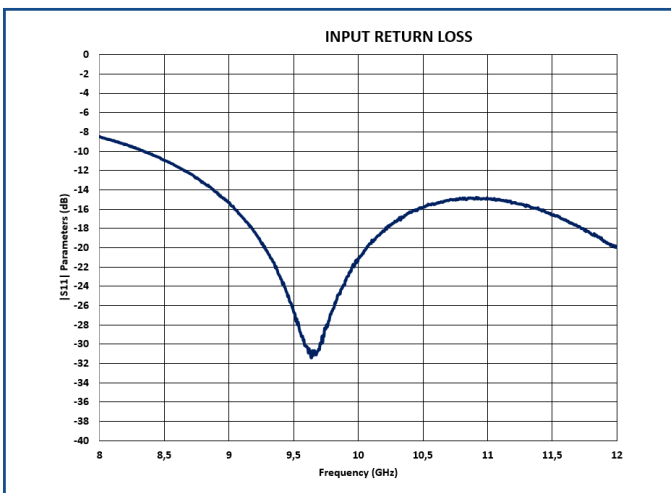
Small signal gain parameters



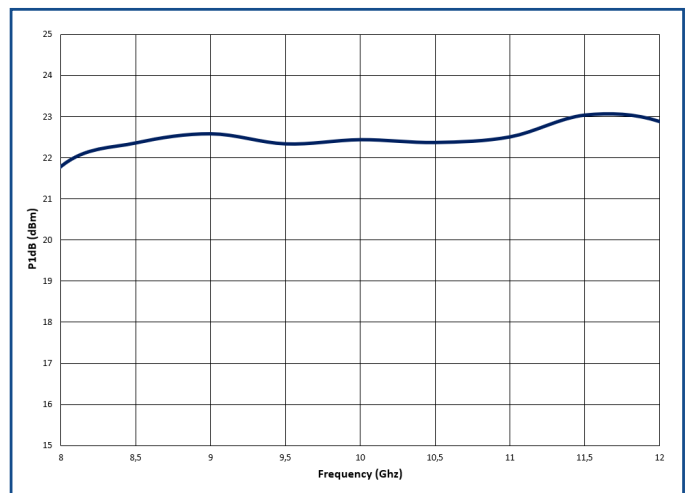
Noise Figure parameters



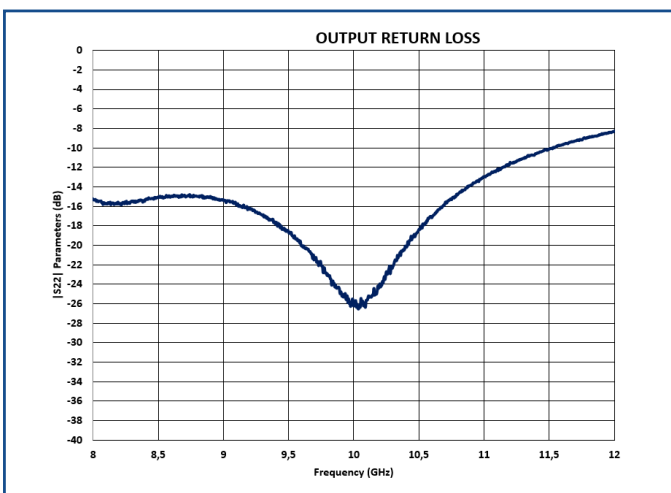
Input return loss parameters



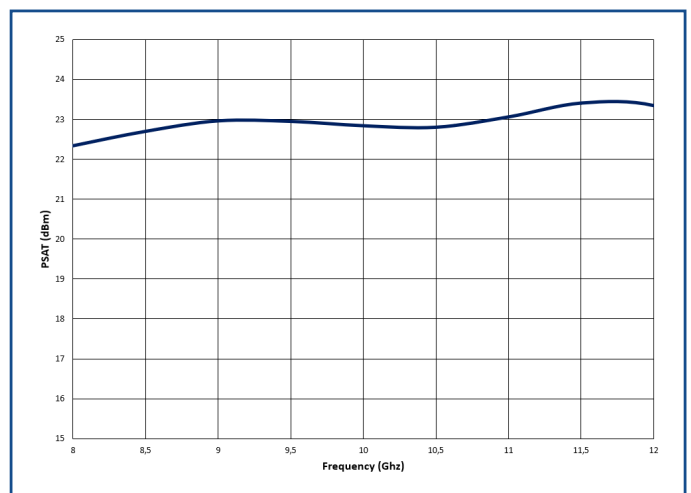
Output power @ 1dB compression point versus frequency



Output return loss parameters



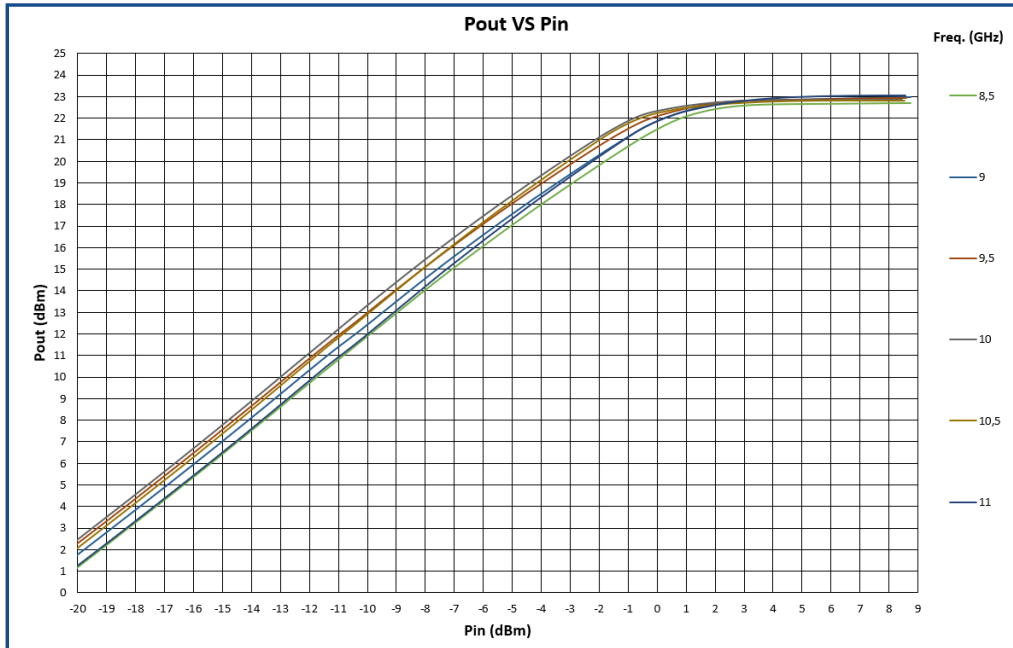
Output saturation power versus frequency



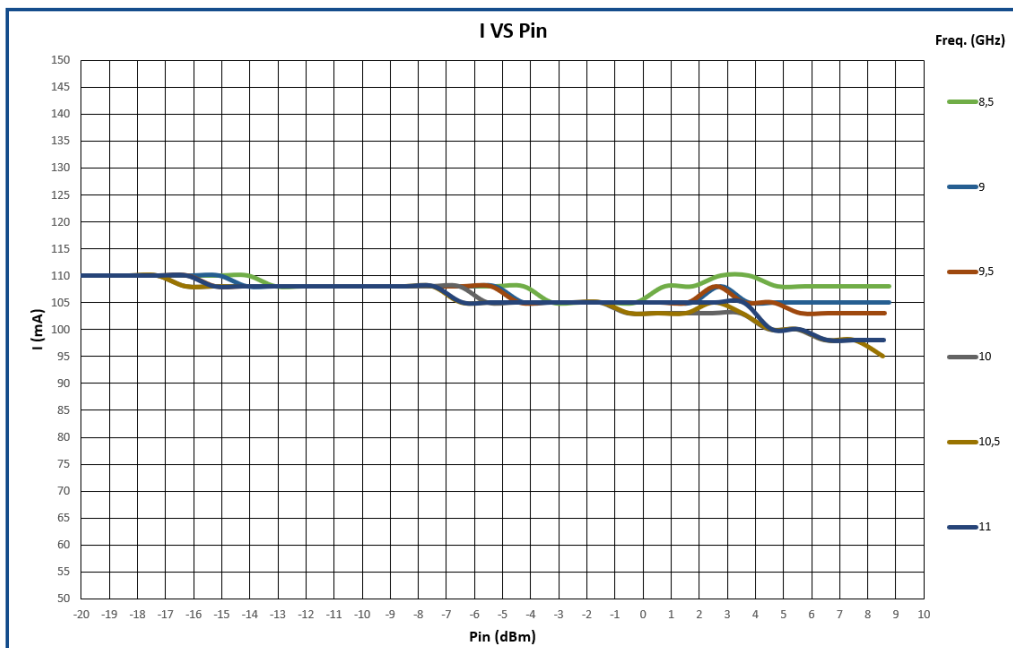
RF "Probe Measurement"

Typical curves (Vdd=8V)

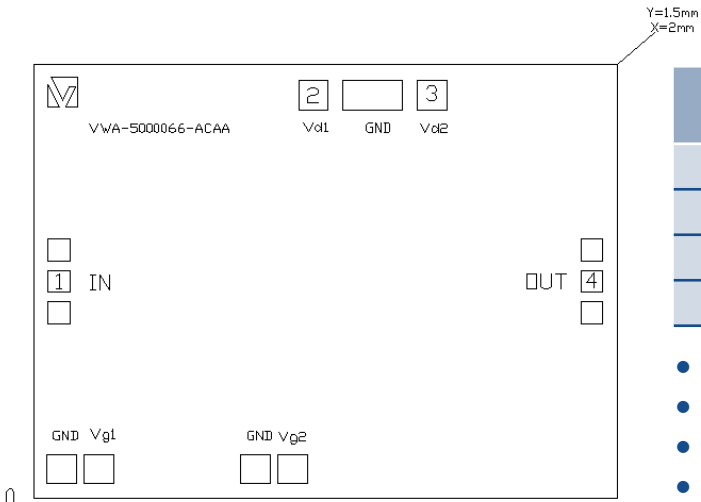
Output power versus Input power for various frequency (8.5-11GHz)



Drain current versus Input power for various frequency (8.5-11GHz)



Pin out and pad description



Pad	Function	X (μm)	Y (μm)	Size (μm x μm)
1	RFin	82	742	75 x 75
2	Vd1	948	1370	100 x 100
3	Vd2	1356	1370	100 x 100
4	RFout	1880	742	75 x 75

- Die size: 2.0 X 1.5 X 0.10 mm³
- Bias pads dimensions (2,3) = 100 x 100 μm²
- RF in and RF out pad dimensions (1,4) = 75 x 75 μm²
- Die bottom must be connected to ground (RF and DC)

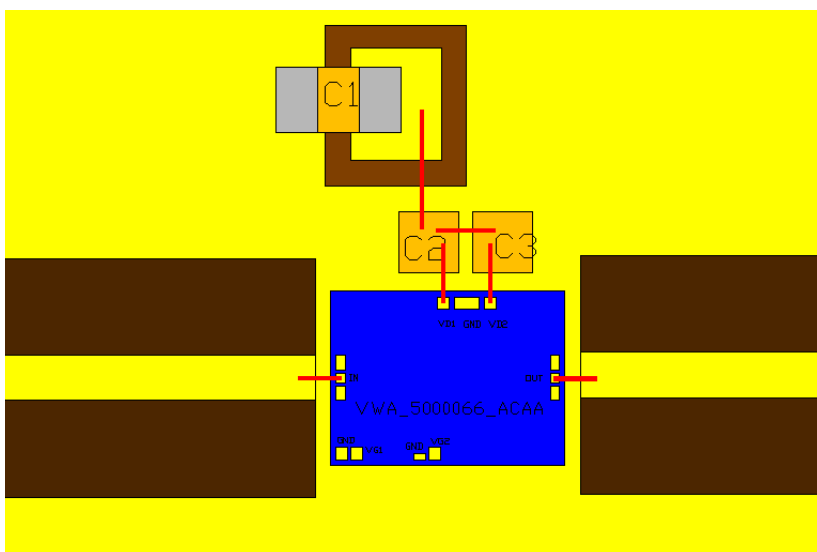
RF wires and Biasing

This device requires only one bias supply, nominally +8V.

First order decoupling capacitors should be MIM type and placed as close as possible to the die. Typically, a D20, 100pF is recommended for decoupling Drain and Gate accesses (Pins 2, 3).

Second order decoupling capacitor should be a 1μF capacitor (SMD type, size 0402).

The next figure shows a typical mounting configuration:



First layer capacitors (C2 & C3) :

2 x single layer capacitors, value 100pF, close to the die

Second layer capacitors (C1) :

1μF, 0402 size

RFin and RFout :

2 gold wires (wedge 25μm)
Length < 300μm

Ordering Information

Product Code	Definition
VWA 5000066 AC	9.2 to 10.5GHz – 22dB – 22dBm Single Bias Medium Power Amplifier MMIC

Associated Material

Product Code	Definition
Packaged die	Contact factory
Die Evaluation Board (die EVB)	Contact factory
Packaged die Evaluation Board (packaged die EVB)	Contact factory
Mechanical files (DXF)	Contact factory
Measurements files (S2P)	Contact factory

Product Compliance Information

Solderability :

Use only AuSn (80/20) solder and limit exposure to temperature above 300 °C TO 3-4 minutes, maximum

ESD Sensitivity Rating :

Test : Human Body Model (HBM)
Standard : JEDEC Standard JESD22-A114



CAUTION ! ESD-Sensitive device

RoHS-Compliance :

This part is compliant with EU 2011/65/ EU RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

This product also has the following attributes:

- Lead Free
- Halogen Free (Chlorine, Bromine)
- Antimony Free
- TBBP-A (C15H12Br4O2) Free
- PFOS Free
- SVHC Free

Contact Information

For the latest specifications, additional product information, worldwide sales and distribution locations, and information about Vectrawave:

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