2.5 to 5GHz / 11dB / 24dBm Medium Power Amplifier

DATA SHEET **VWA 5000060 AA**

General Description

The **VWA5000060AA** is a medium power amplifier designed on a 0.15µm pHEMT process.

The device is capable of +24dBm of output power at saturation regime. And up to +22dBm of output power at 1dB of gain compression. It provides up to 11dB of linear gain from 2.5 to 5GHz. The supply current is as low as 180mA when operating with VD= +4V.

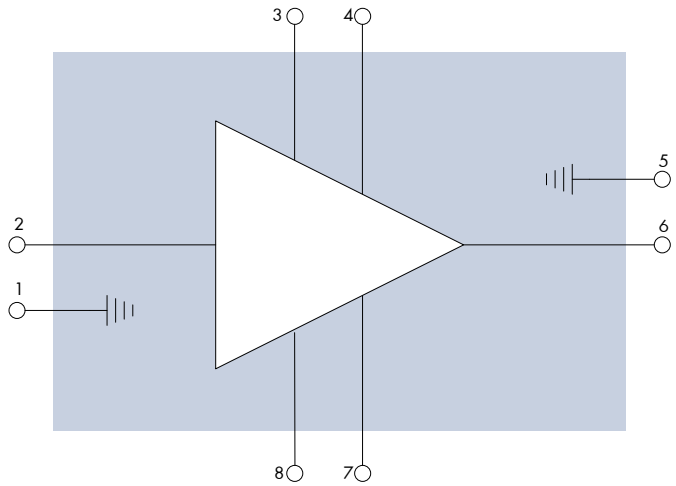
Features

- Medium Power amplifier pHEMT GaAs MMIC
- Wide band: 2.5 to 5GHz.
- Balanced amplifier
- AC coupled In, AC coupled Out
- P_{1dB} >+22dBm 2.5 to 5GHz
- P_{SAT}: +24dBm 2.5 to 5GHz
- Small signal gain: 10dB from 2.5GHz to 5GHz
- Power supply: 180mA @ +4V
- Chip size: 3.02 x 2.97 x 0.1 (mm)

Applications

- Wide Band Low Noise Amplifier
- Radar / ECM / ECCM
- Test and measurement
- Broadband / datalink communication

Pins Assignement & Functional Block Diagram



Symbol	Pad N°
RF In	2
V_G	3/8
V_D	4/7
RF Out	6
GND	1/5

Electrical Specifications

Test conditions unless otherwise noted:

- Tamb.= +25°C
- $I_{D\ QUIESCENT}$= 180mA
- V_D= +4V
- V_G= -0.4V

Symbol	Parameter	Min	Typ	Max	Unit
F	Frequency range	2.5		5	Ghz
G	Small signal gain		11		dB
ΔG	Small signal gain flatness		+/-0.3		dB
S11	Input return loss		-15	-12	dB
S22	Output return loss		-22	-20	dB
P1dB	Output P1dB from DC to 40GHz	22	23		dBm
P_{SAT}	Saturated output power		24		dBm
I_D	Supply current		180	280	mA
V_D	Drain voltage		4		V

Environmental parameters

Symbol	Parameter	Values	Unit
Top	Operating temperature range	-40/+85	°C
Tst	Storage temperature range	-55/+85	°C

Absolute Maximum Ratings

Symbol	Parameter	Min	Max	Unit
V_D	Drain bias voltage		6.5	V
Pin	RF input power		20	dBm
Tj	Junction temperature		150	°C
T process	Temperature process max 20 seconds		325	°C
Pcw	Continuous power disspation		2.5	W

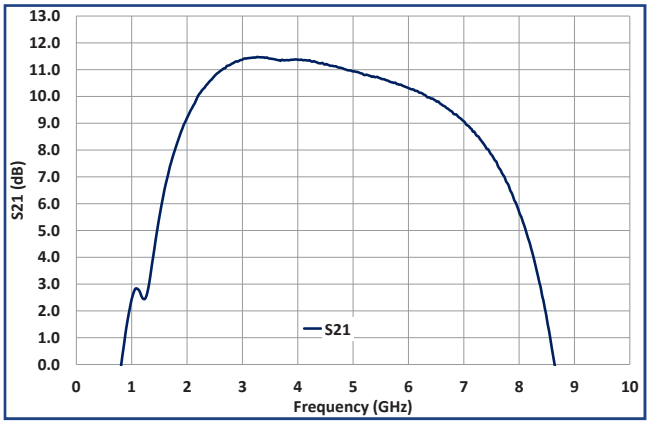
Operation of this device above any of these parameters may cause permanent damage.

Typical Performance

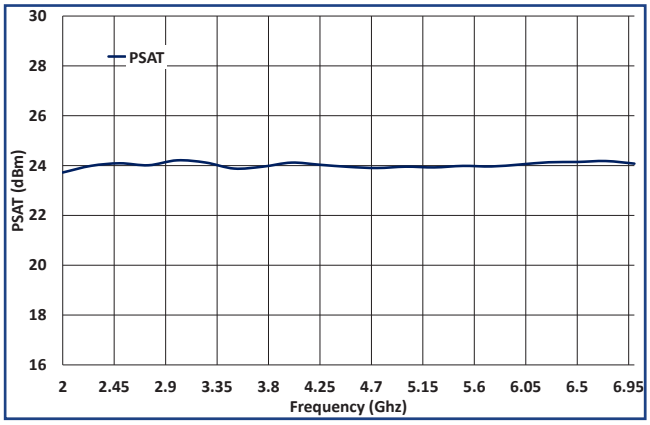
Test conditions unless otherwise noted:

- Tamb.= +25°C
- V_D= +4V
- I_D= 180mA
- V_G= -0.4V

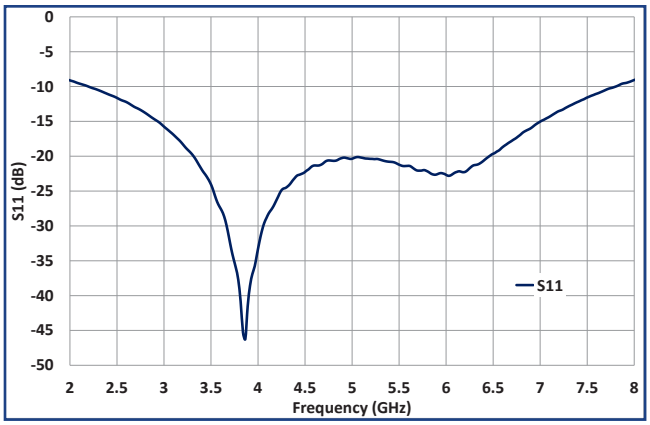
Small Signal Gain



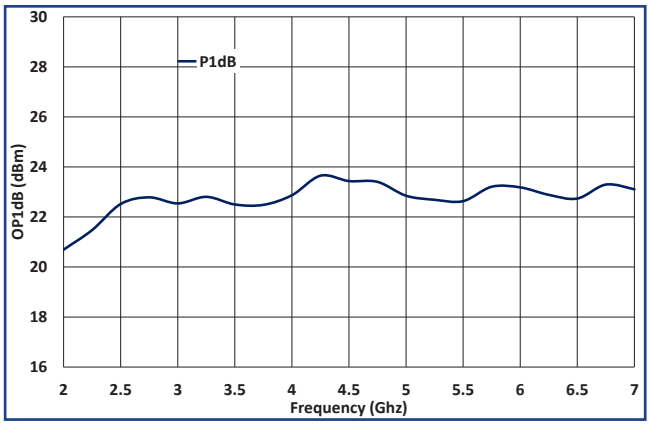
Saturated Output Power



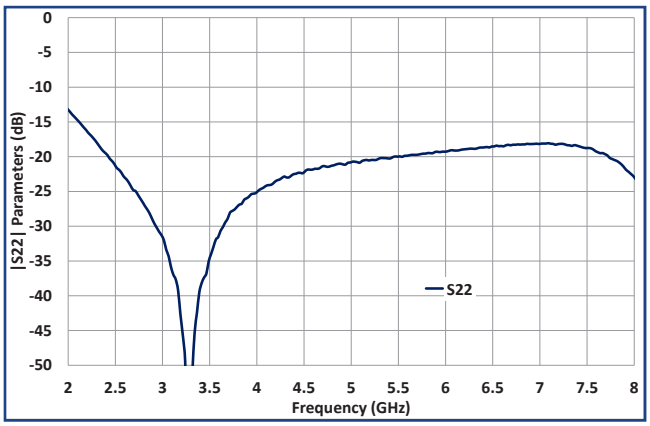
Input Return Loss



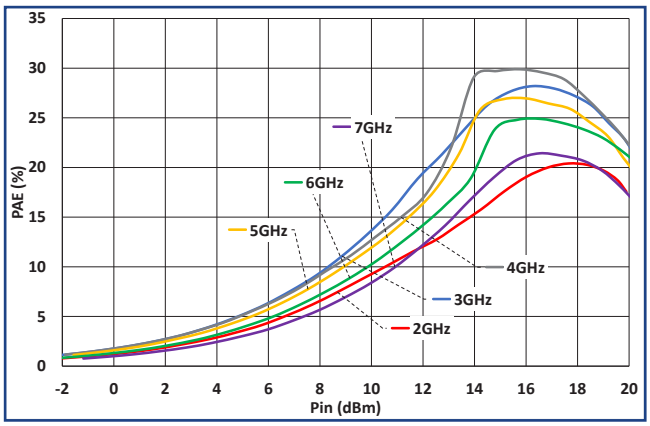
Output P1dB



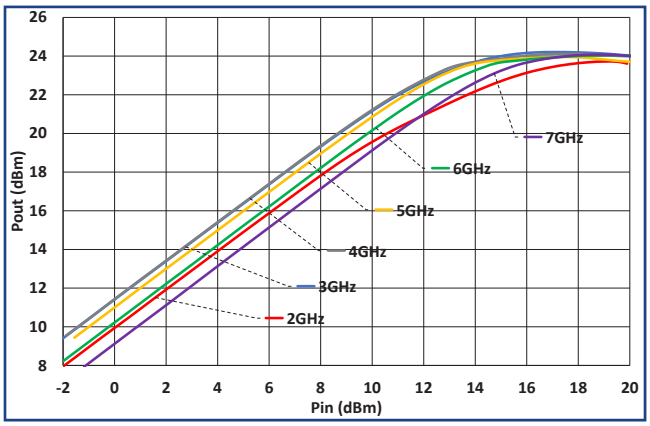
Output Return Loss



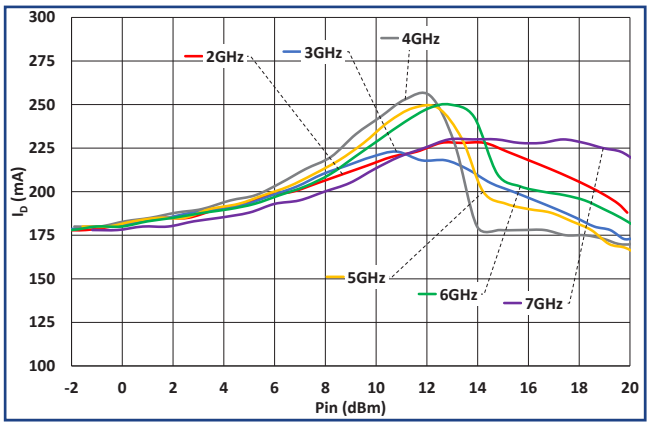
Associated Power Added Efficiency



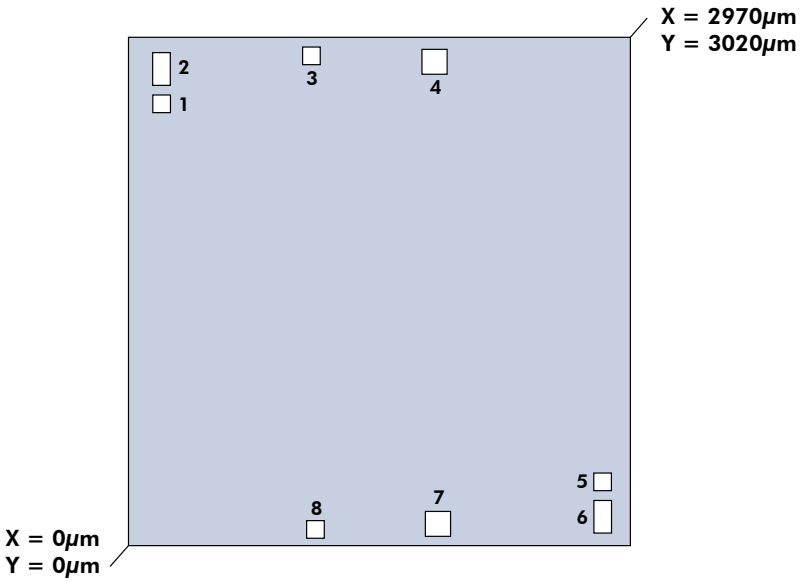
Output Power vs Input Power for various Frequency



Drain Current vs Input Power for various Frequency



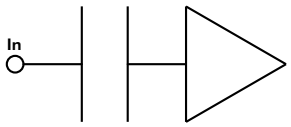
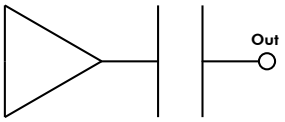
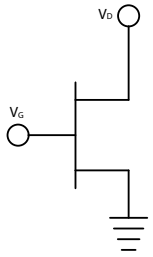
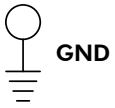
Die Layout



Pinout and Bonding Pad Coordinates

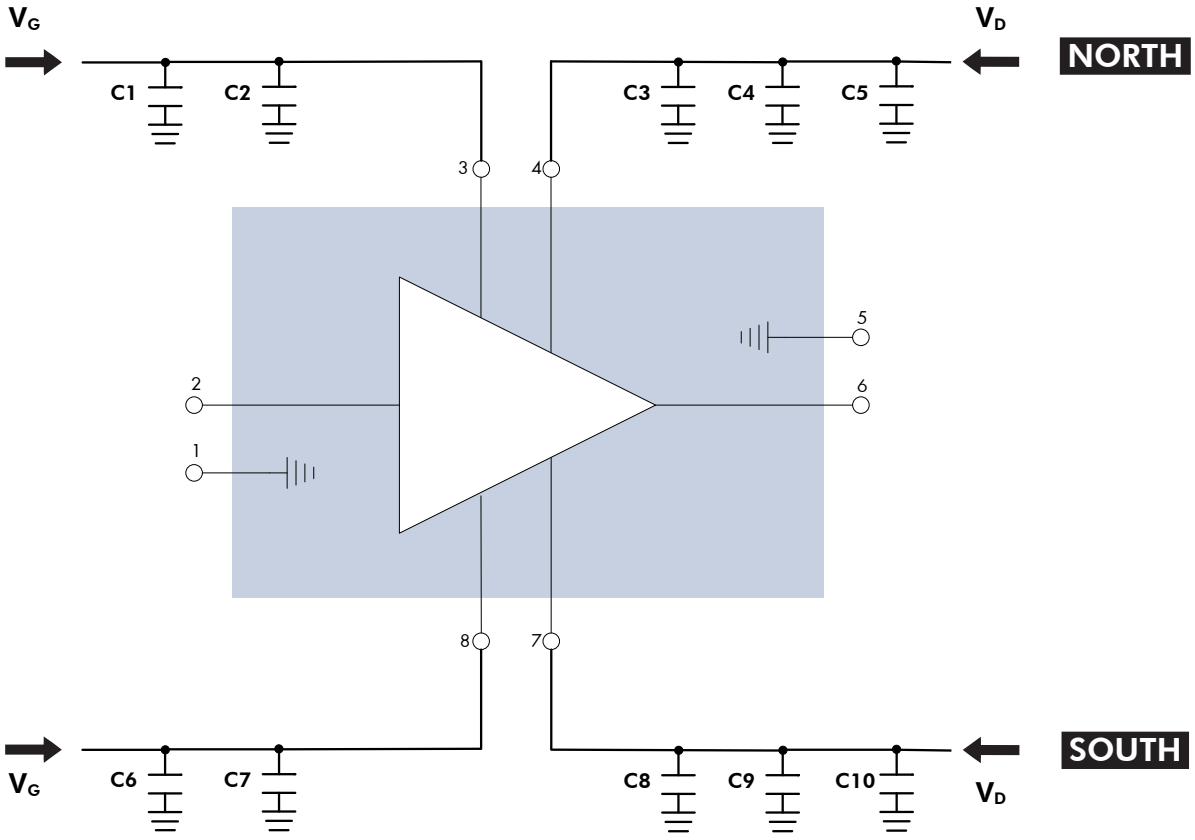
Die Pin Out				
Pad	**X (µm)**	**Y (µm)**	**Size (µm x µm)**	**Function**
1	196	2633	100x100	GND
2	198	2840	100x190	RF In
3	1084	2919	100x100	V_G_NORTH
4	1812	2883	150x150	V_D_NORTH
5	2808	381	100x100	GND
6	2808	178	100x190	RF Out
7	1833	138	150x150	V_D_SOUTH
8	1106	102	100x100	V_G_SOUTH

Die thickness = 100µm
Die bottom must be connected to ground (RF and DC)

Pin Number	Name	Description	Electrical interface
2	RF In	RF 50Ω amplifier input, AC coupled	
6	RF Out	RF 50Ω amplifier output, AC coupled	
3, 8	V_G	Gate biasing input access. Apply negative voltage before biasing the VDD accesses.	
4, 7	V_D	Drain biasing access. Apply positive voltage.	
Die Bottom	GND	Die must be connected to HF and DC Ground	

Application Circuit

- C1, C5, C6 and C10: 1µF
- C3 and C8: 51pF capcitors are MIM type and must be placed as close as possible to the die access.
- C2, C4, C7 and C9:1nF capcitors are MIM type. C2 and C7 must be placed as close as possible to the die access.



Ordering Information

Product Code	Definition
VWA 5000060 AA	2.5 to 5GHz / 11dB / 24dBm

Associated Material

Material	Status
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
Measurents 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 Sensitivy 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 (C15H12Br402) 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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