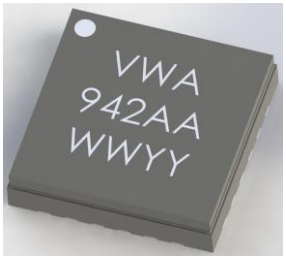


VWA 0000942 AA

2 to 20 GHz – 15 dB – 27 dBm
Medium Power QFN MMIC

General description

The **VWA 0000942 AA** is a MMIC distributed amplifier in a 5x5mm 24 leads Plastic Surface Mount Package (ROHS).
This component uses VWA5000056AA Vectrawave die.

The device is operating in the frequency range 2 to 20 GHz and is capable of +27 dBm of output power in saturation regime. Linear gain is typically of 15 dB. The Design has been optimized to provide high efficiency, typical operating supply current is as low as 290 mA with a drain voltage at +8 V.

Applications

- Wideband MPA
- Radar / ECM / ECCM
- Test and measurement
- Broadband / datalink communication

Features

- Distributed amplifier pHEMT GaAs MMIC
- Wideband : 2 to 20 GHz
- High output Psat : +27 dBm
- Small signal gain: 15 dB
- 50Ω RF input and output
- AC coupled RF input, DC coupled RF output
- Power supply: 290 mA @ +8 V (typical conditions)
- Package : QFN 5x5 mm 24 Lead

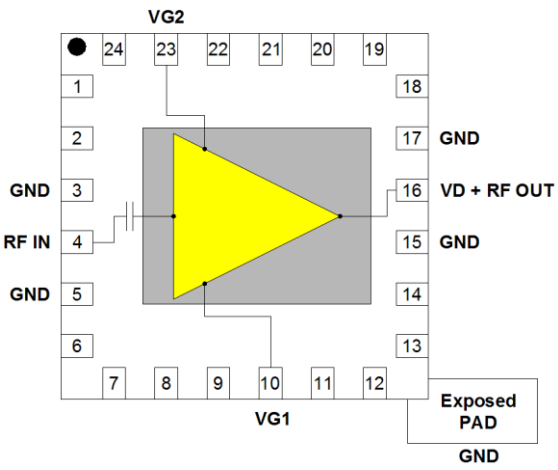
Tools

S2P file can be provided for system design simulation.
DXF drawing file is available for mechanical design.
Evaluation board available on request.

Ordering information

Product code	Definition
VWA 0000942 AA	QFN 5x5 mm 24 Lead MPA
VWA 0000960 AA	VWA 0000942 AA Evaluation Board

Functional diagram / Pinout



TOP VIEW

PINOUT			
PIN	NAME	PIN	NAME
1	NC	13	NC
2	NC	14	NC
3	GND	15	GND
4	RF IN	16	VD + RF OUT
5	GND	17	GND
6	NC	18	NC
7	NC	19	NC
8	NC	20	NC
9	NC	21	NC
10	VG1	22	NC
11	NC	23	VG2
12	NC	24	NC

Typical Characteristics (Ambient temperature T= 25°C)

Operating conditions:
Drain voltage : VD=+8V
VG2= +3V
VG1 : adjusted between -1V and 0V to obtain Drain current ID=290 mA(*)
(Typically VG= -0.25 V)

Measured parameters	Symbol	Min	Typ	Max	Unit
Frequency range	F	2		20	GHz
Small signal gain	G		15		dB
Small signal gain flatness	ΔG		+/-1.6		dB
Input return loss	S11		-13	-6	dB
Output return loss	S22		-13	-7	dB
Output power at 1dB compression	P1dB		25		dBm
Saturated output power	PSat	25	27		dBm
Drain supply voltage	VD		+ 8		V
Supply current (*)	ID		290		mA

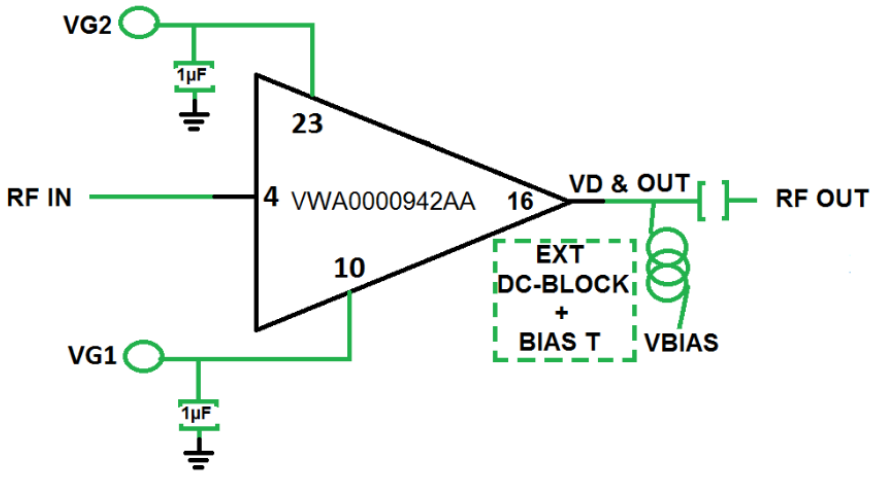
(*) : without RF input signal

Absolute maximum ratings

Maximum ratings	Symbols	Min	Max	Units
Drain voltage	VD		+9	V
Gate voltage first stage	VG1	-2.5		V
Gate voltage second stage	VG2	-1	VD/2	V
CW RF input power	Pin		+18	dBm
Continuous power dissipation	Pcw		3.3	W
Storage temperature	Tst	-55	+125	°C
Operating temperature	Top	-40	+85	°C

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

Application circuit



1µF : 0402 capacitor, must be placed as close as possible to the QFN access

Biasing procedure

Switch on

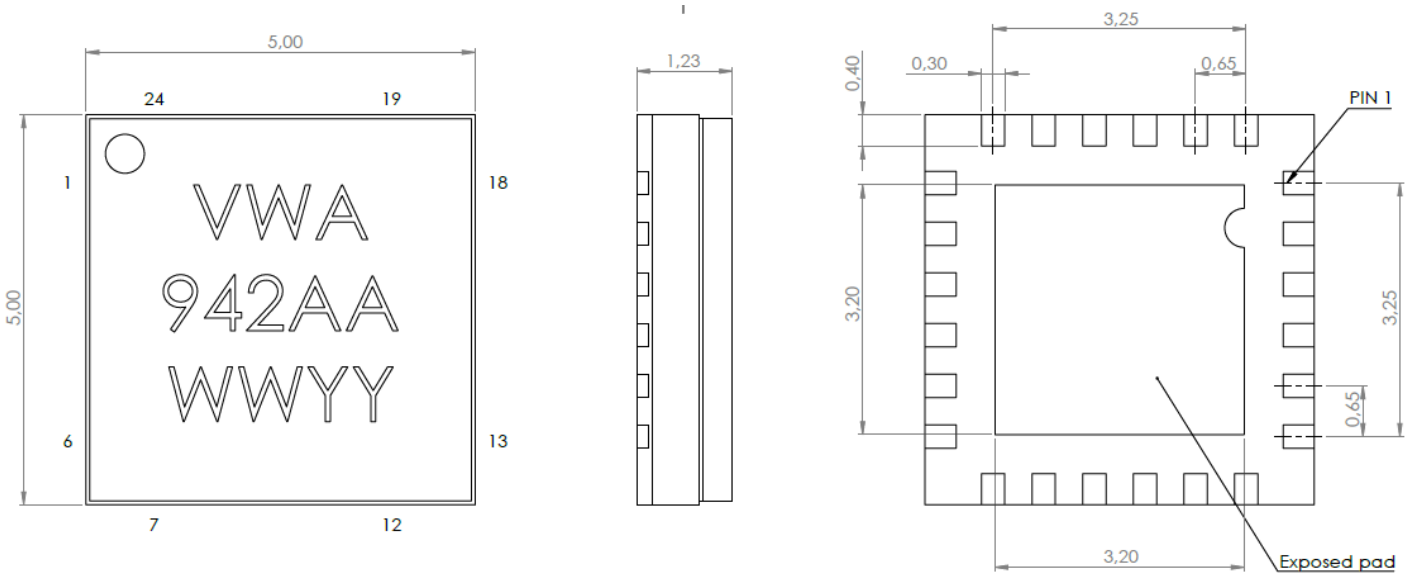
1. Set VG1 to -1V
2. Set VD to +8V
3. Set VG2 to +3V
4. Increase VG1 to obtain ID = 290mA (typically VG = -0.25V)
5. Turn RF ON

Switch off

1. Turn RF OFF
2. Decrease VG1 to -1V
3. Set VG2 to 0V
4. Set VD to 0V
5. Set VG1 to 0V

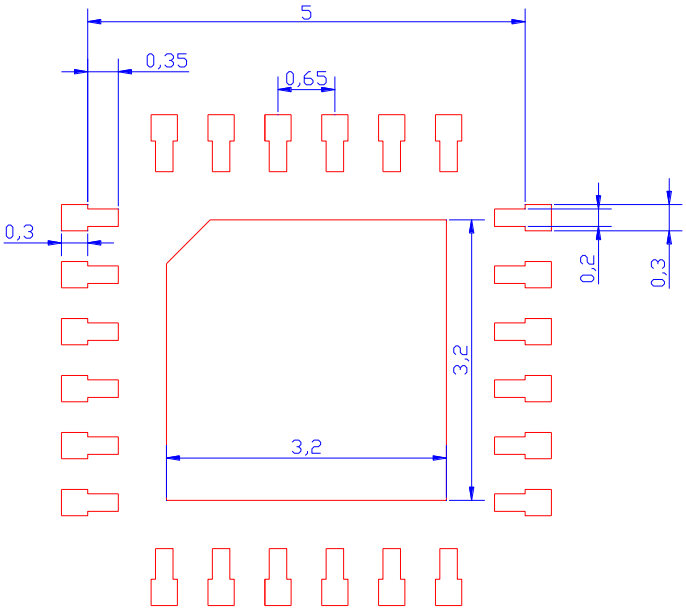
- Always apply VG1 before applying VD
- This stress may cause permanent damage on component.

Mechanical Drawing

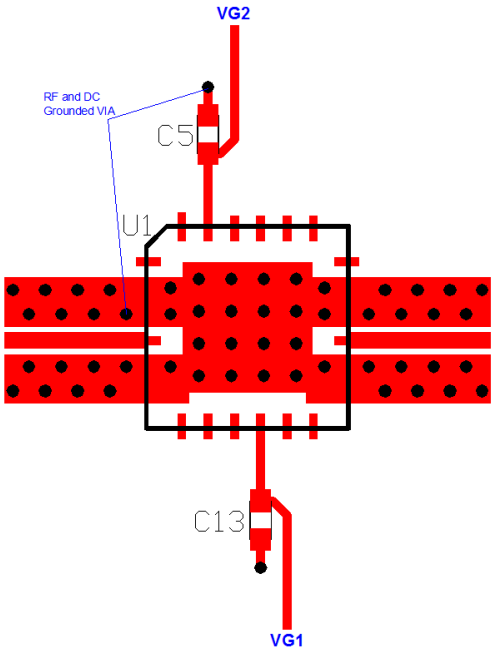


- QFN exposed PAD must be connected to ground (RF and DC).

Recommended Land pattern



Suggested Board Layout



C5, C13 : 0402 1µF/16V capacitor
Substrate : RO4350B, thickness 0.254mm

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 0000942 AA** device.