

General Description

The **VWA5000091AA** is a transceiver designed on a 0.25µm HEMT (High Electron Mobility Transistor) process on GaN/SiC technology. The device is packaged in a 8x8 mm 56 leads Plastic Surface Mount Package (ROHS).

This component uses VWA 5000091AA VectraWave die.

The device covers the 8.5 to 10.5GHz bandwidth. It is including a switch used to commute the receiver or the transmitter channel to the common access. The transmitter channel is composed by a 3 stages power amplifier and is capable to deliver more than +40dBm of output power at the common access. The receiver channel is composed by 2 low noise amplifiers.

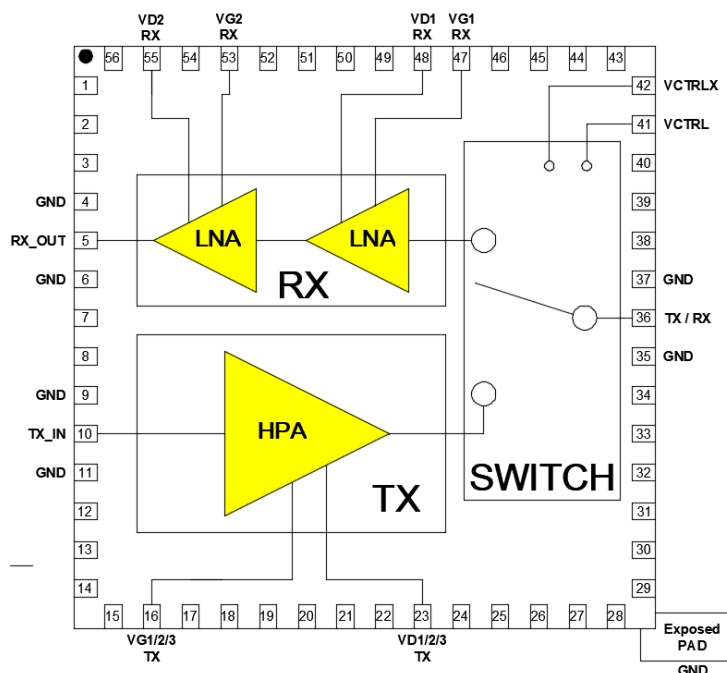
Features

- Transceiver HEMT GaN/SiC MMIC.
- Wide band: 8.5 to 10.5GHz.
- 50ΩRF AC coupled TX Input, RX Output, Common
- Tx Output Psat : 40dBm
- Tx Gain >+20dB
- Rx Gain >+30dB
- Rx Noise Figure : 5dB
- Package: QFN 8x8 mm 56 Lead

Applications

- T/R Module
- Radar/ECM/ECCM
- Test and measurement
- Front end Module

Pins Assignment & Functional Block Diagram



Electrical Specifications

Test conditions unless otherwise noted:

- Tamb.= +25°C

Symbol	Parameter	Min	Typ	Max	Unit
F	Frequency range	8.5		10.5	GHz
BW	Operating Bandwidth		2000		MHz

Tx Mode with input signal in pulsed mode (width : 10μs, Duty cycle : 10%)

Symbol	Parameter	Min	Typ	Max	Unit
Tx Gain	Tx Small signal gain		22		dB
Tx S11	Tx Input return loss		-8		dB
Tx S22	Tx Output return loss		-7		dB
Tx Pout	Tx Output power		40		dBm
Tx PAE	Tx Associated Power Added Efficiency		25 (TBC)		%
Tx I _D	Tx Associated Drain current			2.5	A
Tx V _D	Tx Drain voltage		28		V

Rx Mode (Constant Wave)

Symbol	Parameter	Min	Typ	Max	Unit
Rx Gain	Rx Small signal gain		33		dB
Rx NF	Rx Noise Figure		5		dB
Rx S11	Rx Input return loss		-8		dB
Rx S22	Rx Output return loss		-10		dB
Rx I _D	Rx Associated Drain current		160		mA
Rx V _D	Rx Drain voltage		18		V

Recommended Operating Conditions

Symbol	Parameter	Values	Unit
Tx $V_{D1/2/3}$	Tx Drain voltage	28	V
Tx $I_{DQ}(I_{DQ1/2/3})$	Tx Drain quiescent current	280	mA
Tx $V_{G1/2/3}$	Tx Gate voltage	-2.3(typ)	V
Tx V_{CTRL_X}	Tx Complementary Swicth control	-40	V
Tx V_{CTRL}	Tx Swicth control	0	V
Rx $V_D(V_{D1}, V_{D2})$	Rx Drain (first and second LNA)	18	V
Rx $V_G(V_{G1}, V_{G2})$	Rx Gate (first and second LNA)	-2	V
Rx $I_D(I_{D1} + I_{D2})$	Rx Drain	160	mA
Rx V_{CTRL_X}	Rx Complementary Swicth control	0	V
Rx V_{CTRL}	Rx Swicth control	-40	V



Absolute Maximum Ratings

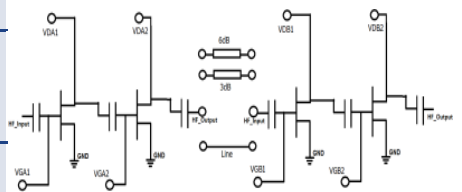
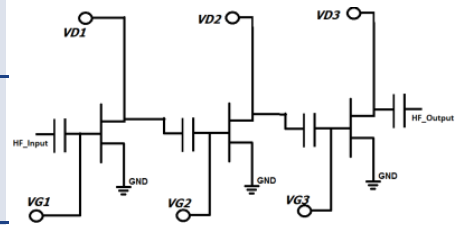
Symbol	Parameter	Values	Unit
Tx $V_{D1/2/3}$	Tx Drain voltage	35	V
Tx $I_{DQ}(I_{DQ1/2/3})$	Tx Drain quiescent current	3	A
Tx $V_{G1/2/3}$	Tx Gate voltage	-10 to -2	V
Tx Pin	Tx maximum peak input power overdrive	28	dBm
Rx Pin	Rx maximum peak input power overdrive	20	dBm
Tj	Junction temperature	225	°C

NOTA : The component can't be used in TX CW mode.

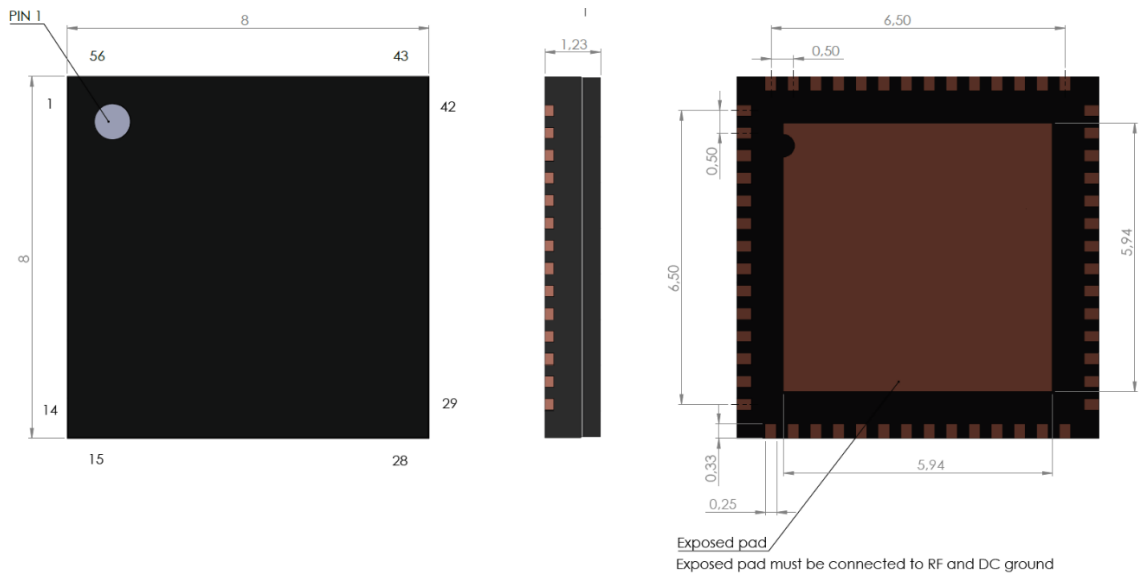
Operation of this device above any of these parameters may cause permanent damage.

PIN Description

Pin Number	Name	Description	Electrical interface
10	Tx In	TX_HPA Amplifier input, this access is AC coupled and internally matched to 50 Ω.	
16	$V_{G1/2/3TX}$	TX_HPA Gate biasing input access.	
23	$V_{D1/2/3TX}$	TX_HPA Drain biasing input access	
31	Tx Out	TX_Output / RX Input, this access is AC coupled and internally matched to 50 Ω.	
41, 42	V_{CTRL} V_{CTRLX}	V_{CTRL} and V_{CTRLX} are complementary switching control access for TX to RX mode commutation	
47,53	V_{G2RX} V_{G1RX}	RX_LNA Gate biasing input accesses.	
48, 55	V_{D2RX} V_{D1RX}	RX_LNA Drain biasing input accesses.	
5	Rx Out	RX_LNA Output, this access is AC coupled and internally matched to 50 Ω.	
4, 6, 9, 11, 35, 37	GND	These Pins must be connected to RF and DC Ground	
Die Bottom	GND	Die must be connected to RF and DC Ground	



Mechanical Drawing



Ordering Information

Product Code	Definition
VWA 0001129 AA	8.5 to 10.5 GHz/20dB/40dBm GaN/SiC transceiver QFN 8x8mm

Associated Material

Material	Status
Evaluation Board	Contact factory
Mechanical files (DXF)	Contact factory

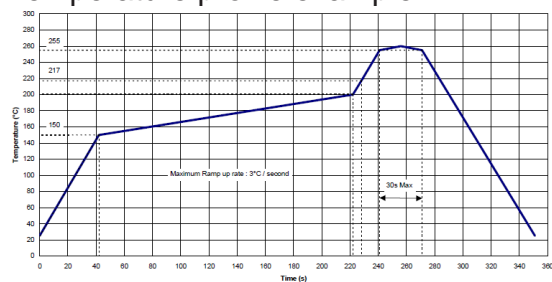
Product Compliance Information

Solderability :

Solder Stencil thickness : 127µm

Solder : SAC 305 (ROHS)

Temperature profile example:



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

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