

27 - 31 GHz GaAs High Power Amplifier MMIC

Preliminary Data Sheet

27 - 31 GHz HPA

- Two-Stage Monolithic Microwave Integrated Circuit (MMIC) HEMT Amplifier
- Input/Output matched to 50 Ω
- Frequency range: 27 GHz to 31 GHz
- Gain > 11 dB
- $P_{-1dB} > 26$ dBm
- $P_{SAT} > 28$ dBm
- Chip size: 2.71 mm $\times$ 3.0 mm

ESD: Electrostatic discharge sensitive device, observe handling precautions!

Description

This two-stage GaAs MMIC high power amplifier is intended for use in radio link applications. It provides an output power of 26 dBm at 1 dB gain compression. The device is fabricated with a 0.18 micron Pseudomorphic InGaAs/AlGaAs/GaAs High Electron Mobility Transistor processing technology.

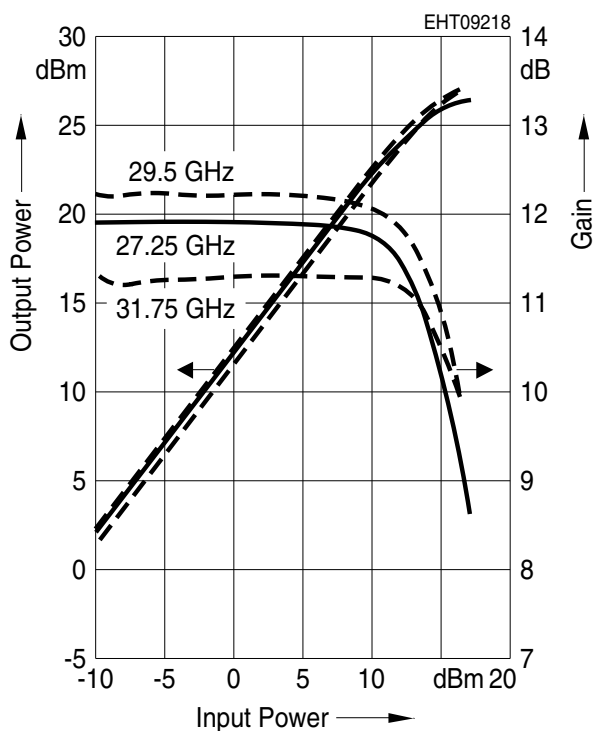
Type	Marking	Ordering Code	Package
27 - 31 GHz HPA	–	on request	Chip

Electrical Specifications ($V_G = 0.3$ V, $V_D = 5$ V, $I_D = 1020$ mA)

Parameter	Limit Values			Unit	Test Conditions
	min.	typ.	max.		
Frequency Range	27	–	31	GHz	–
P_{-1dB} @ 30 GHz	–	26	–	dBm	–
P_{SAT} @ 30 GHz	–	28	–	dBm	–
Gain @ 30 GHz	–	11	–	dB	–
Input Return Loss	–	< – 10	–	dB	–
Output Return Loss	–	< – 10	–	dB	–

Measured Data (on chip measurements)

 $V_{GS} = 0.3 \text{ V}$, $V_{DS} = 5 \text{ V}$, $I_{DS1} = 380 \text{ mA}$; $I_{DS2} = 640 \text{ mA}$;

 $f = 27.25 \text{ GHz}$, 29.5 GHz , 31.75 GHz

Maximum Ratings

Parameter	Symbol	Value	Unit
Drain voltage	V_D	5	V
Gate voltage	V_G	- 2 ... + 0.8	V

Technology Data

Parameter	Value
Chip thickness	75 μm
Chip size	2.71 mm $\times$ 3.0 mm
DC/RF Bond pads	100 μm $\times$ 100 μm /80 μm $\times$ 80 μm
Bond pad material	Au (plated gold)
Chip passivation	SiN (silicon nitride)

Recommendation of Bonding Conditions

Parameter	Thermocompression Nailhead, without Ultrasonic	Wedge Bonding	Bond Pull Test Mil 883, > 2 g
Table Temp.	250 °C	250 °C	1 : 2.5 g
Tool Temp.	180 °C	150 °C	2 : 3.1 g
Scrub	100 Hz	–	3 : 3.2 g
Bond Force	50 g	25 g	4 : 3.0 g
Wire Diameter	25 µm	17 µm	5 : 2.8 g

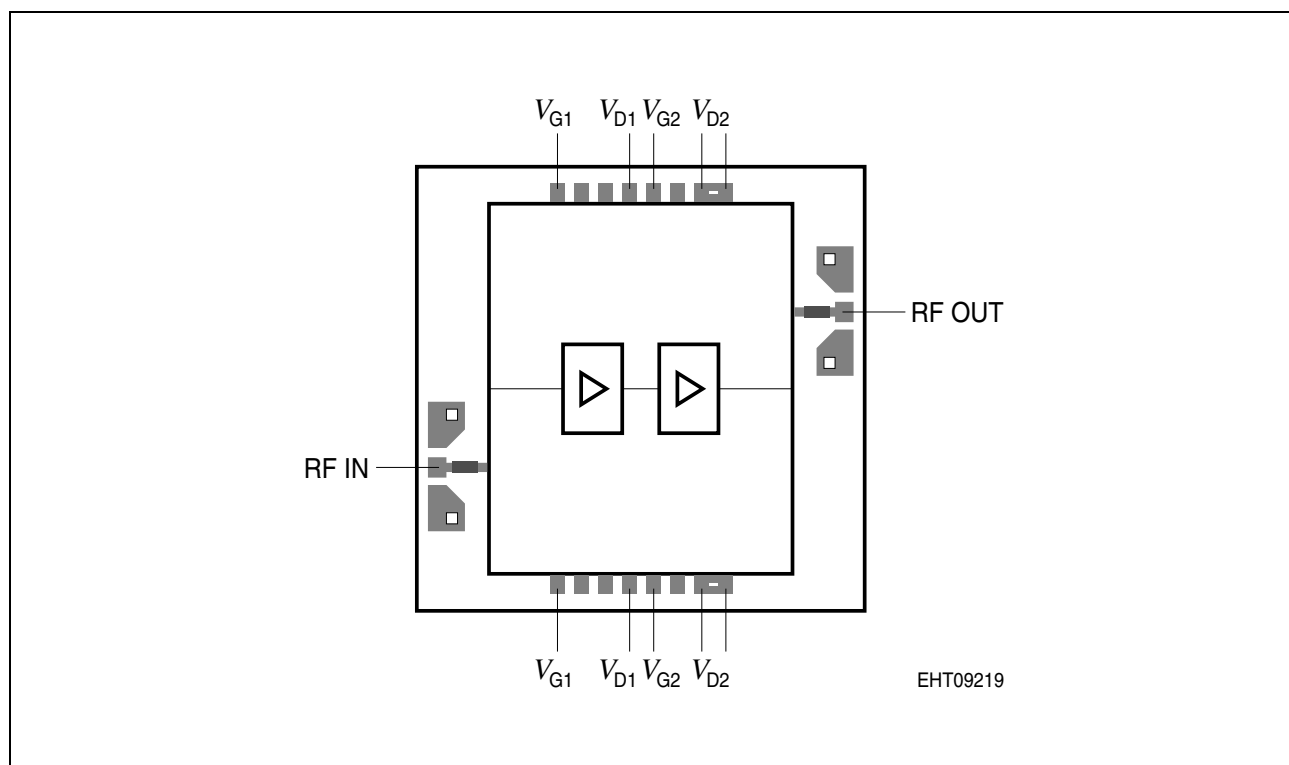


Figure 1 Bond Plan