

24 - 28 GHz GaAs Doubler MMIC

Preliminary Data Sheet

24 - 28 GHz Doubler

- Monolithic Microwave Integrated Circuit (MMIC)
Frequency Doubler (coplanar design)
- Input/Output matched to 50 Ω
- Input frequency range: 12 GHz to 14 GHz
- Output frequency range: 24 GHz to 28 GHz
- Chip size: 2.5 mm $\times$ 1.0 mm

ESD: Electrostatic discharge sensitive device, observe handling precautions!

Description

This GaAs MMIC Frequency Doubler is intended for use in radio link applications. It provides a gain of -8 dB at an input frequency of 14 GHz. The device is fabricated with a 0.13 micron Pseudomorphic InGaAs/AlGaAs/GaAs High Electron Mobility Transistor processing technology.

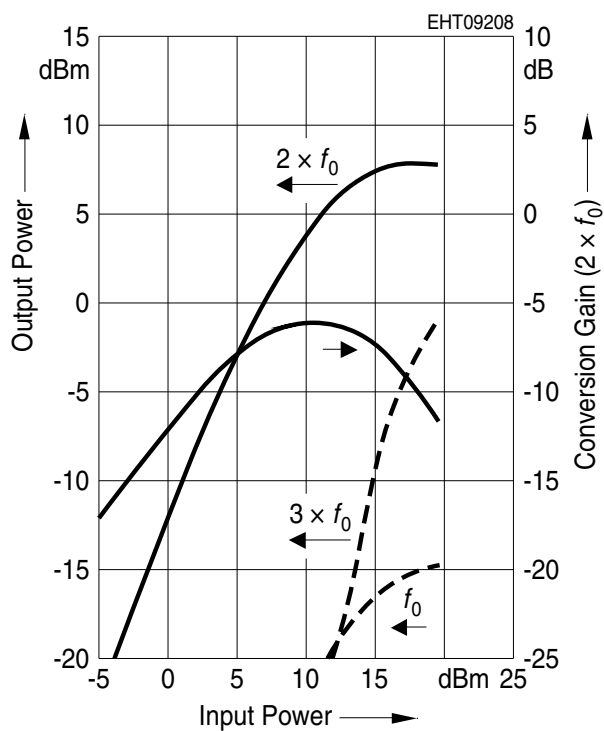
Type	Marking	Ordering Code	Package
24 - 28 GHz Doubler	–	on request	Chip

Electrical Specifications ($V_{DS} = 3$ V)

Parameter	Limit Values			Unit	Test Conditions
	min.	typ.	max.		
Input frequency range f_0	12	–	14	GHz	–
Gain	–	-8	–	dB	–
Input power	8	–	15	dBm	–
Output power at f_0	–	< -15	–	dBm	–
V_{GS}	-1	-0.5	0	V	–
I_{DS} @ 14 dBm input power	–	40	–	mA	–

Measured Data (on chip measurements)

$f_0 = 12.75$ GHz, $V_{GS} = -0.5$ V,
 $V_{DS} = 3$ V



Technology Data

Parameter	Value
Chip thickness	95 μm
Chip size	2.5 mm × 1.0 mm
DC/RF Bond pads	100 μm × 100 μm/70 μm × 70 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

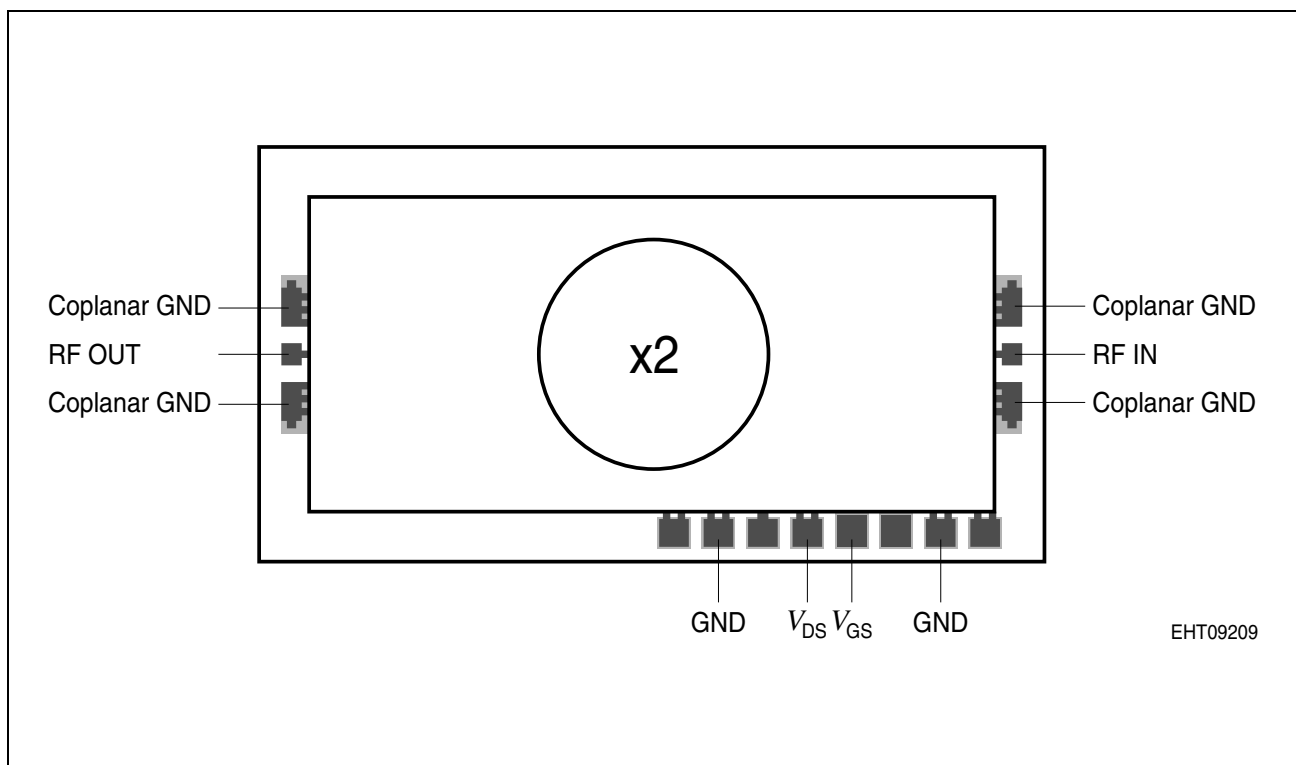


Figure 1 Bond Plan

Capacitors with approximately 100 pF should be used to block the V_{GS} and V_{DS} bias pads to ground.