12GHz Frequency Divider by 4 Fixed Modulus Prescaler

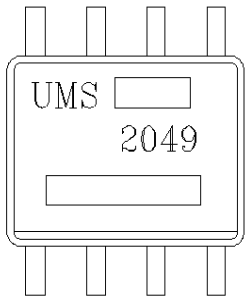
GaAs Monolithic Microwave IC

preliminary

Description

The CND2049 is a low power consumption very high speed divider by 4 GaAs prescaler manufactured with a 0.7µm self aligned implanted MESFET process.
The design is full differential input/output that allows direct drive into 50Ω load.

The CND2049 is available in chip form and in package form:
* low cost SOIC8 plastic package



SOIC8 plastic package

Main Features

Very broad operating frequency range
Low power dissipation: 300mW
Single supply operation: 3V to 5V
High input sensitivity:
-10dBm@10 Ghz at 25°C
Low phase noise: -139dBc/Hz at 1KHz

Main Characteristics

at Tamb= +25°C

Symbol	Parameter		Min	Typ	Max	Unit
Vdd	Drain voltage		3	5	6	V
Pdiss	Power dissipation		120	300	400	mW
Fmax	Maximum input frequency	SOIC8	11	12		GHz

ESD Protections: Electrostatic discharge sensitive device observe handling precautions!

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Electrical Characteristics in die form

Guaranteed electrical specifications over the temperature range of
-55°C to +125°C but tested at Tamb=25°C under configuration described in Fig.1
(Vdd=5V ; Differential inputs; Pin=0dBm ; Zo=50 Ω)

Symbol	Parameter	Min	Typ	Max	Unit
Fmax	Maximum input frequency	11.5	12.5		GHz
Idd	Supply current		60	80	mA

Electrical Characteristics in SOIC8 package

Guaranteed electrical specifications over the temperature range of
-40°C to +85°C but tested at Tamb=25°C under configuration described in Fig.1
(Vdd=5V ; Differential inputs; Pin=0dBm ; Zo=50 Ω)

Symbol	Parameter	Min	Typ	Max	Unit
Fmax	Maximum input frequency	11	11.5		GHz
Idd	Supply current		60	80	mA

Typical design information over the temperature range of -40°C to +85°C
(Vdd=5V, Zo=50 Ω)

Symbol	Parameter	Min	Typ	Max	Unit
Fmax	Maximum input frequency				
	differential input Pin= 0dBm	11	11.5		GHz
	one input Pin= 0dBm	10.5	11		Ghz
Pout	Output power	-4	-1.5		dBm
Idd	Supply current		60	80	mA

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Absolute Maximum Ratings (1)

Tamb= 25°C

Symbol	Parameter	Values	Units
Vdd	Drain voltage	7	V
Pin	Maximum input power	15	dBm
Top	Operating temperature range SOIC8	-40 to +85	°C
	Die form	-55 to +125	
Tstg	Storage temperature range	-65 to +175	°C

(1) Operation of this device above anyone of these parameters may cause permanent damage

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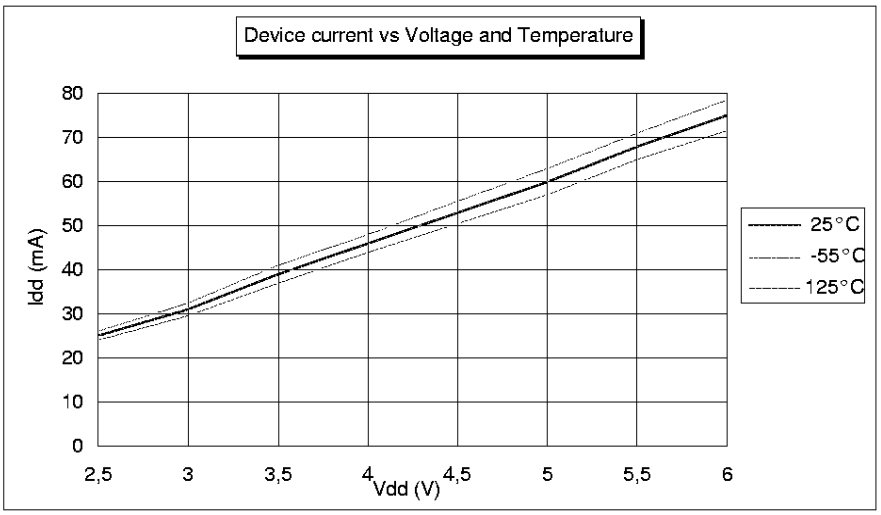
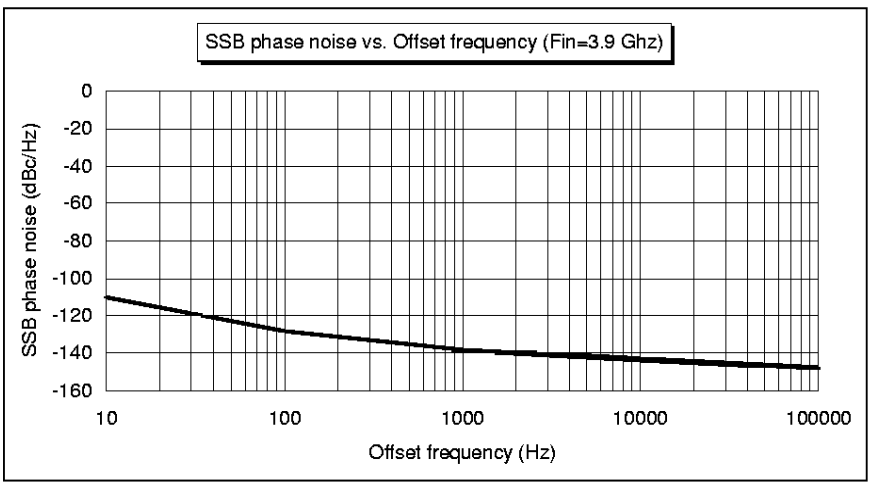
Typical Characteristics

Tamb= 25°C, Zo=50Ω, Vdd=5V





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Typical bias tuning

Tamb=25°C

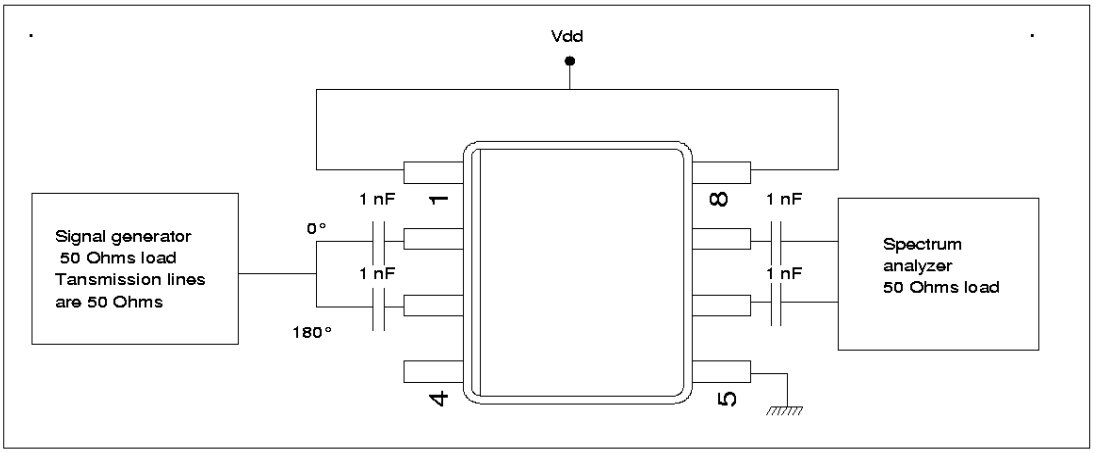

Fig.1 : Typical measurement and RF biasing configuration
(differential inputs)

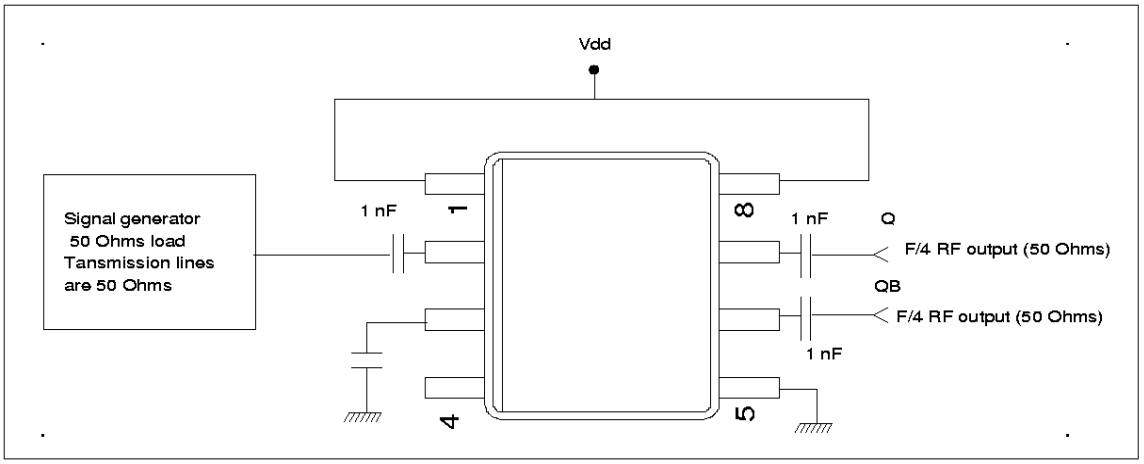

Fig.2 : RF biasing configuration with single input

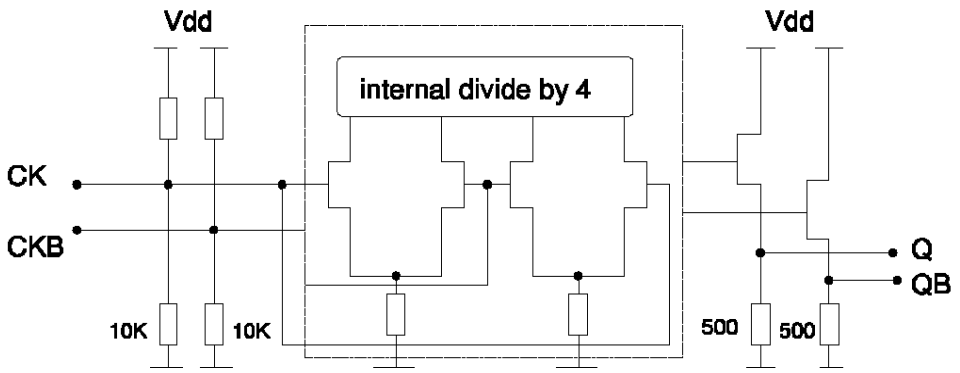

Fig.3 : Chip block diagram

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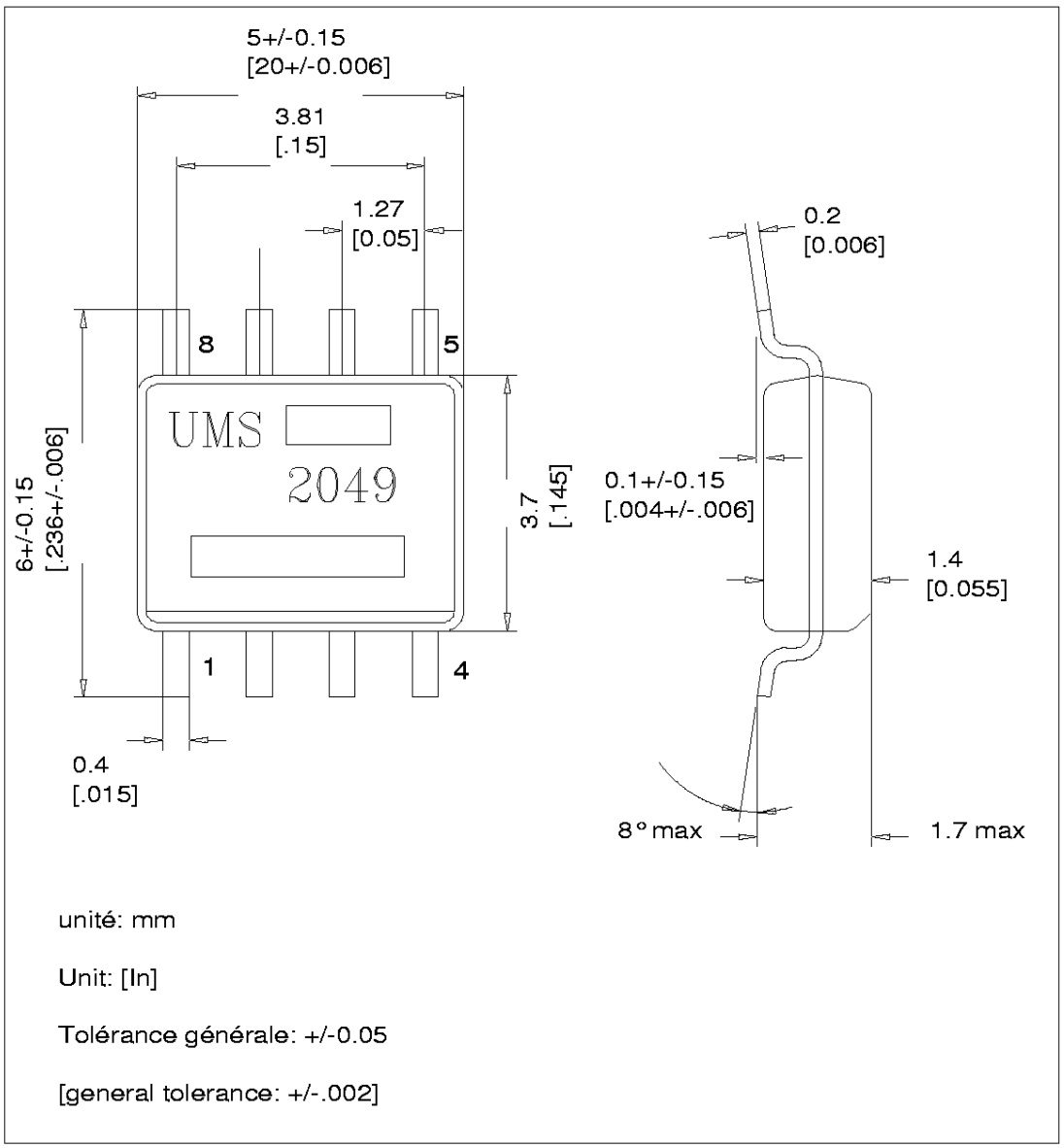
SOIC8 Mechanical Data



Pin out	Signal
1	Vdd
2	CK
3	CKB
4	Ground
5	Ground
6	QB
7	Q
8	Vdd

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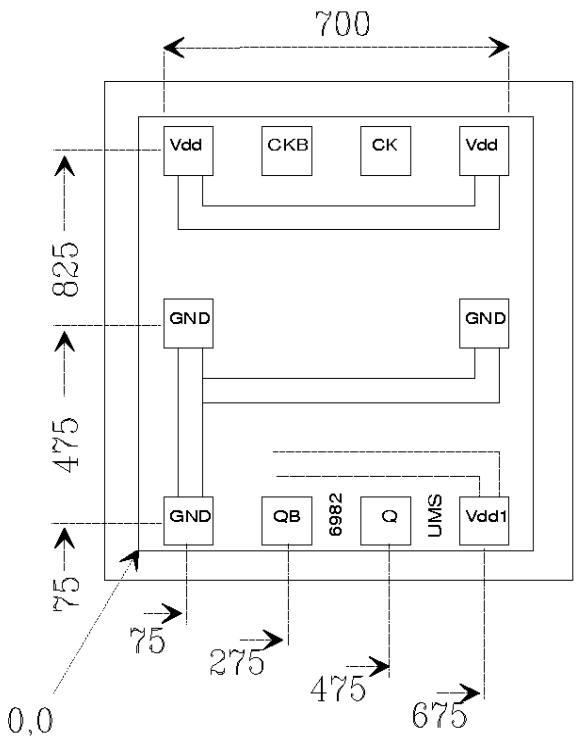
Chip Mechanical Data



dimensions in µm

Dimensions :
1050 (+10 /-100) x 900 (+10 /-100)

Thickness = 300µm ± 20µm

Pads area : 100 x 100µm

Recommended die attach

Epoxy die attach is recommended.
Minimum quantity of electrically conductive epoxy must be used, with a narrow fillet around the die after contact

Recommended bonding

Bonding pads of the product are covered with aluminium metallic layer.
Wedge or ball bonding can be used.
Aluminium wire has be used if the assembly process is up to 250°C.
Otherwise the use of gold wire is possible.
The ground bounding length should be as short as possible to optimize the use of the product.
The bonder should be properly grounded.

Note 1: Vdd1 is used to connect the output buffers (on Q/QB) and can be applied separately from Vdd.

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Ordering Information

Chip form :CND2049-99X/00
SOIC8 Package :CND2049-DAF/00

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