

## 10GHz Frequency Divider by 4 Fixed Modulus Prescaler

### GaAs Monolithic Microwave IC

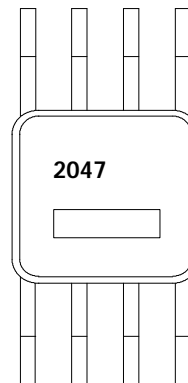
#### Description

The CND2047 is a low power consumption very high speed divider by 4 GaAs prescaler manufactured with a 0.7 $\mu$ m self aligned implanted MESFET process.

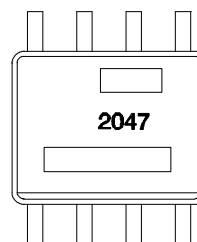
The design is full differential input/output that allows direct drive into 50 $\Omega$  load.

The CND2047 is available in chip form and in 2 packages form:

- \* low cost SOIC8 plastic package
- \* 8 lead Flat Pack ceramic surface mount package



FTP8 ceramic 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@8 Ghz at 25°C and
  - 5dBm@8Ghz at 125°C
- | Low phase noise: -139dBc/Hz at 1KHz

#### Main Characteristics

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 FTP8	9	10		GHz
	SOIC8	8	9		

ESD Protections: Electrostatic discharge sensitive device observe handling precautions!

## Electrical Characteristics in FTP8 Ceramic Package and 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	8.25	8.75		GHz
Idd	Supply current		60	75	mA

Typical design information over the temperature range of -55°C to +125°C  
( Vdd=5V, Zo=50 Ω )

Symbol	Parameter	Min	Typ	Max	Unit
Fmax	Maximum input frequency				
	differential input Pin= -5dBm	8	8.5		GHz
	Pin= 0dBm	8.25	8.75		Ghz
	one input Pin= -5dBm	7.5	8		Ghz
	Pin= 0dBm	8	8.5		Ghz
Pout	Output power	-4	-1.5		dBm
Idd	Supply current		60	75	mA

Typical design information over the temperature range of -55°C to +125°C.  
( Vdd=3.3V, Zo=50 Ω )

Symbol	Parameter	Min	Typ	Max	Unit
Fmax	Maximum input frequency				
	differential input Pin= -5dBm	7.5	8		GHz
	Pin= 0dBm	8	8.5		Ghz
	one input Pin= -5dBm	7	7.5		Ghz
	Pin= 0dBm	7.5	8		Ghz
Pout	Output power	-7	-4.5		dBm
Idd	Supply current		40	55	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	8.5	9		GHz
Idd	Supply current		60	75	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= -5dBm	8	8.5		GHz
	Pin= 0dBm	8.5	9		Ghz
	one input Pin= -5dBm	7.25	7.75		Ghz
	Pin= 0dBm	7.75	8.25		Ghz
Pout	Output power	-4	-1.5		dBm
Idd	Supply current		60	75	mA

Typical design information over the temperature range of -40°C to +85°C.  
( Vdd=3.3V, Zo=50 Ω )

Symbol	Parameter	Min	Typ	Max	Unit
Fmax	Maximum input frequency				
	differential input Pin= -5dBm	7	7.5		GHz
	Pin= 0dBm	7.5	8		Ghz
	one input Pin= -5dBm	6.5	7		Ghz
	Pin= 0dBm	6.75	7.25		Ghz
Pout	Output power	-7	-4.5		dBm
Idd	Supply current		40	55	mA

**Absolute Maximum Ratings (1)**

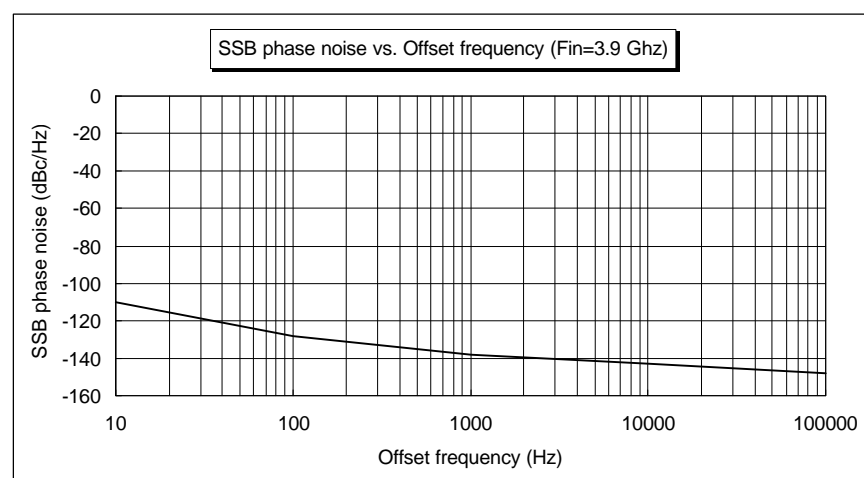
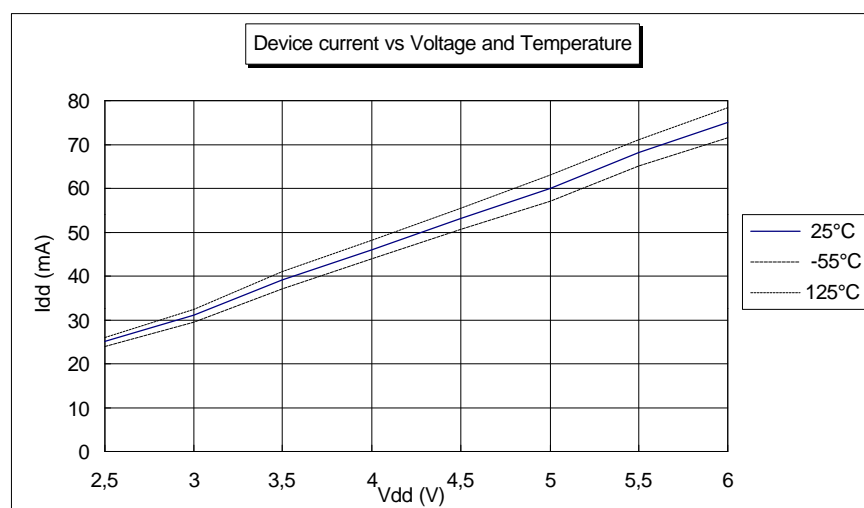
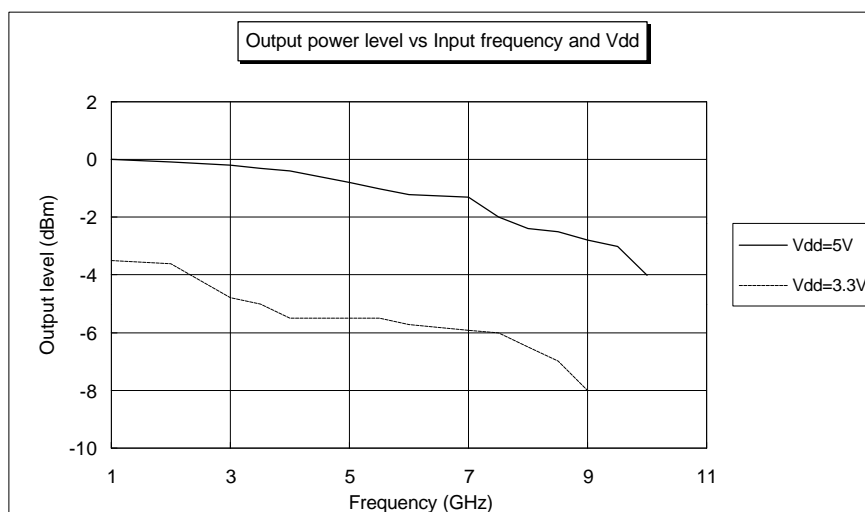
Tamb= 25°C

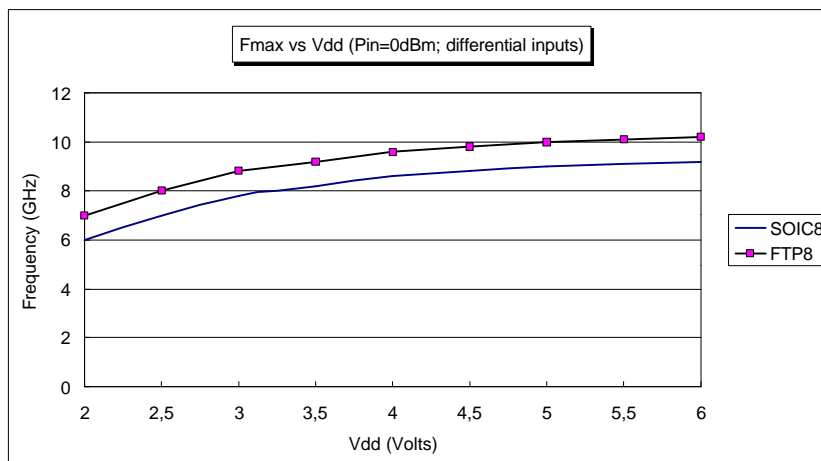
Symbol	Parameter	Values	Units
Vdd	Drain voltage	7	V
Pin	Maximum input power	15	dBm
Top	Operating temperature range SOIC8	-40 to +85	°C
	Die form / FTP8	-55 to +125	
Tstg	Storage temperature range	-65 to +175	°C

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

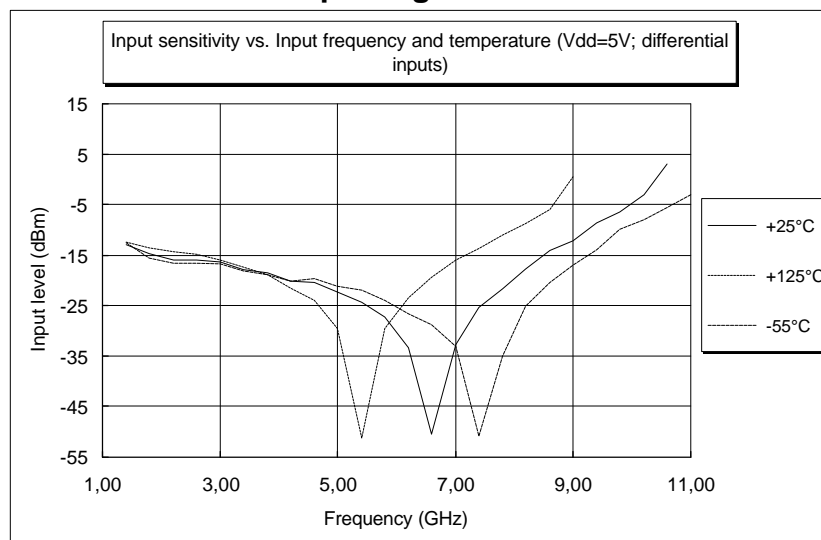
## Typical Characteristics

Tamb= 25°C, Zo=50Ω, Vdd=5V

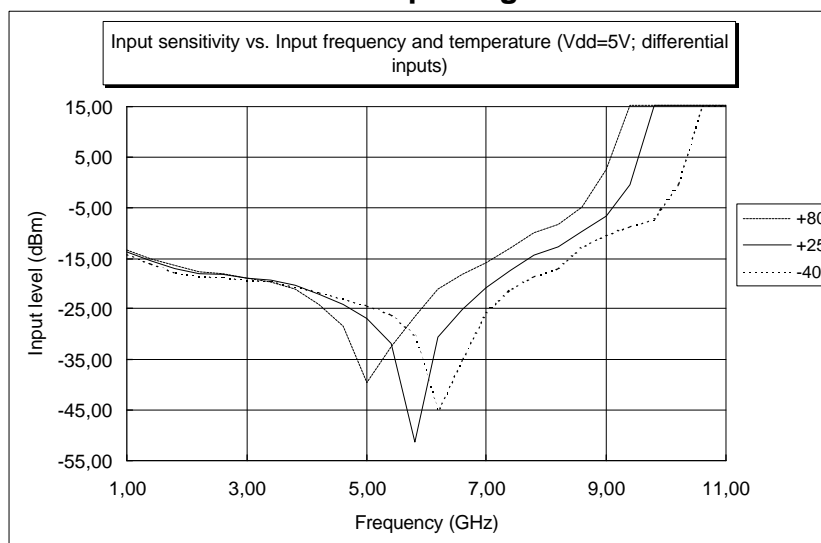




### FTP8 package / Die form



### SOIC8 package



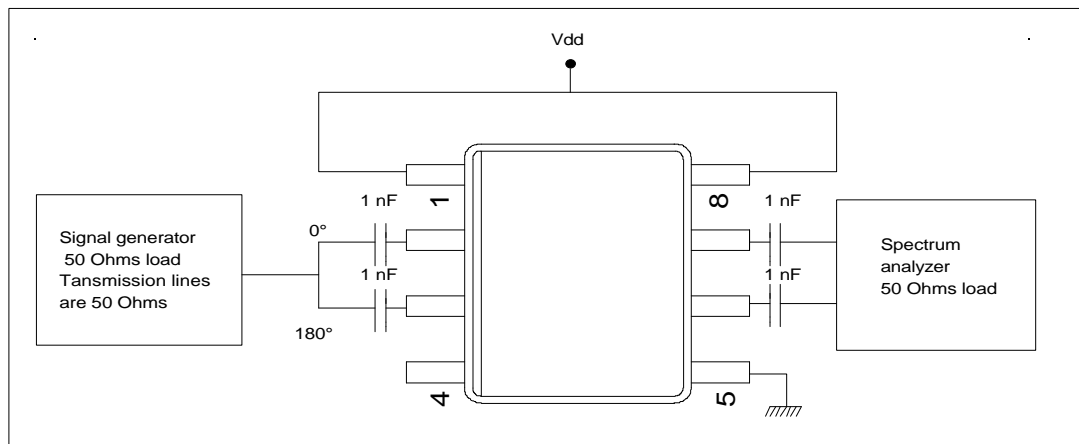
**Typical bias tuning**T<sub>amb</sub>=25°C

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

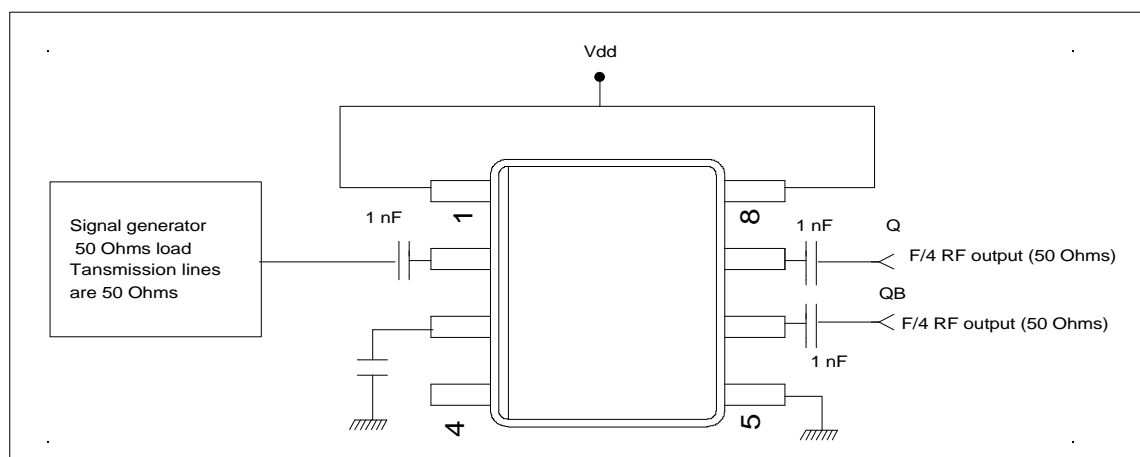


Fig.2 : RF biasing configuration with single input

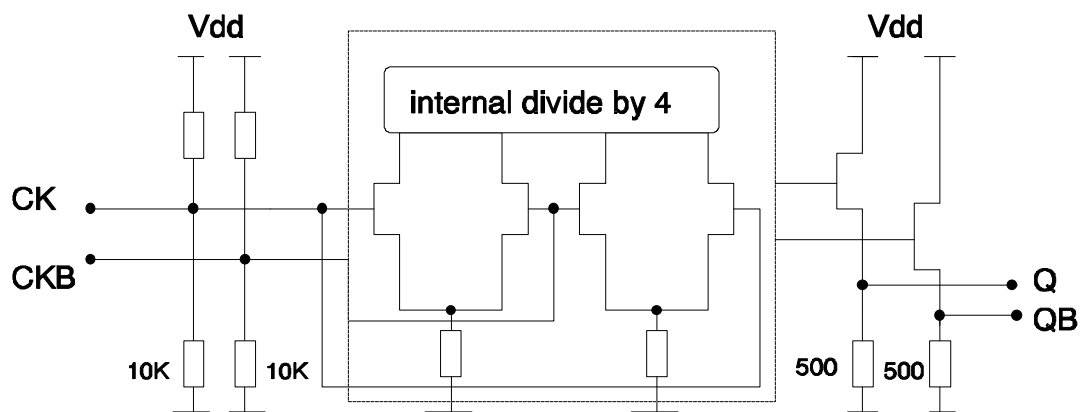
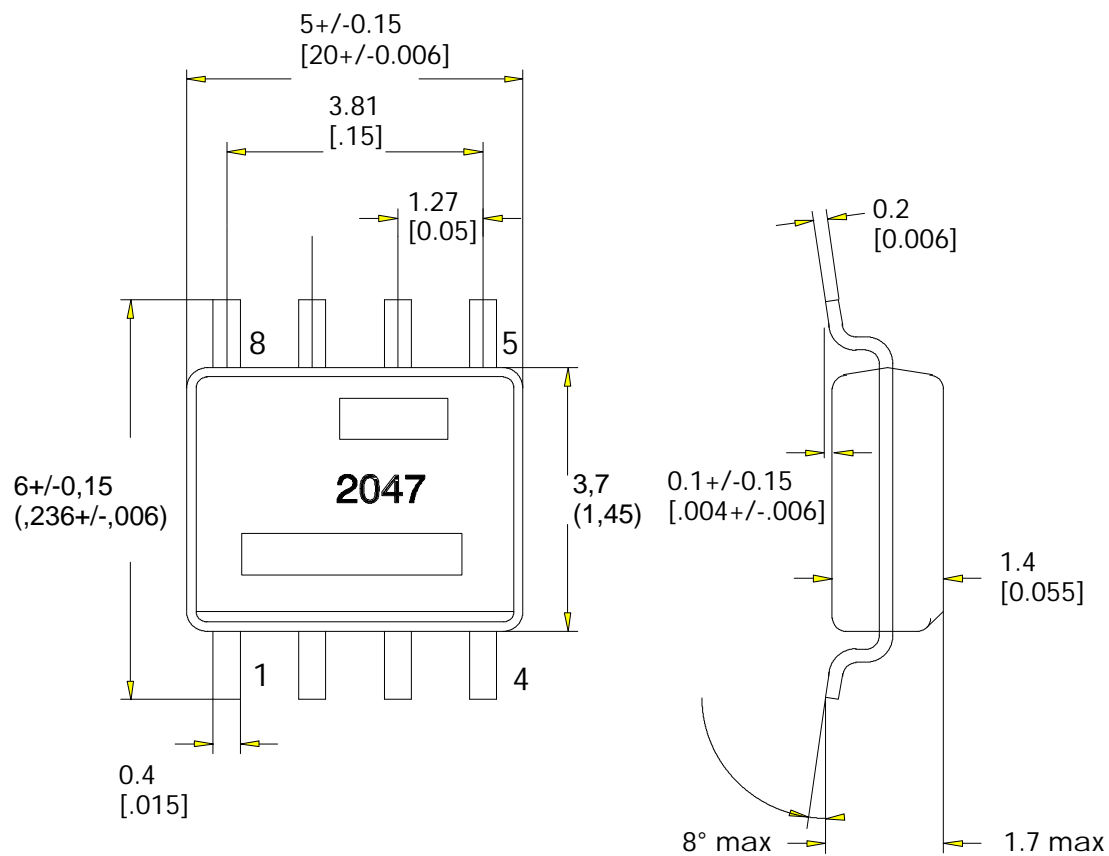


Fig.3 : Chip block diagram

## SOIC8 Mechanical Data



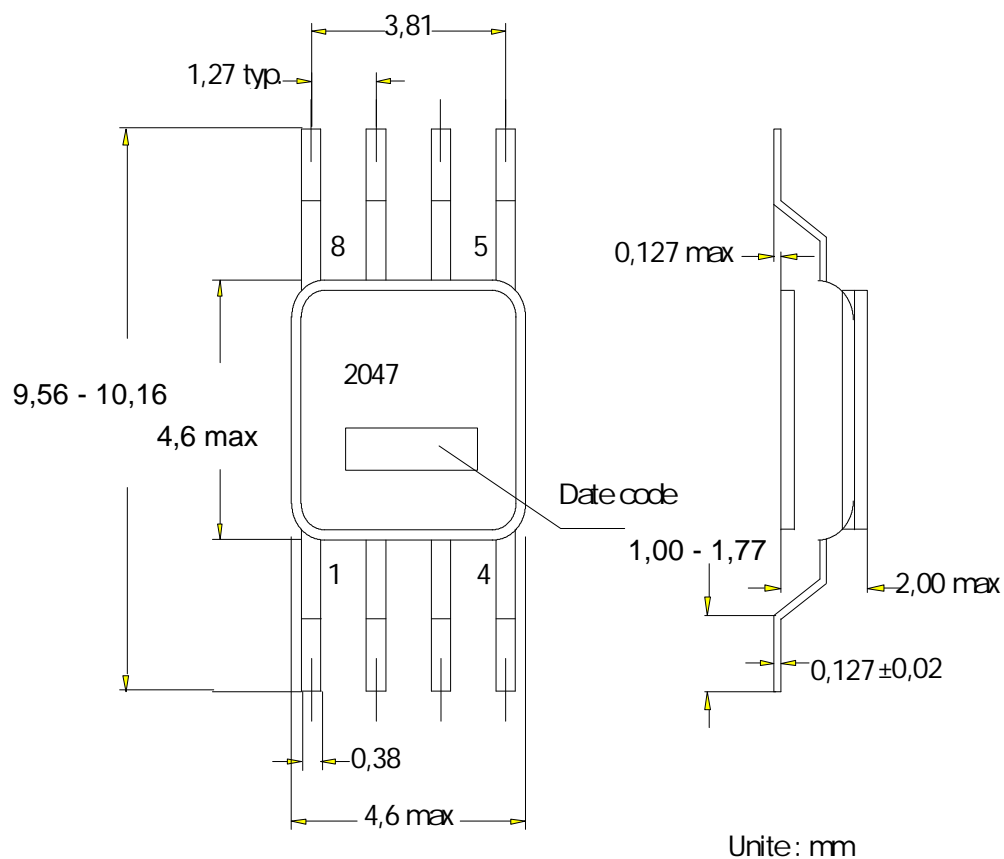
unité: mm

Unit: [In]

Tolérance générale: +/-0.05

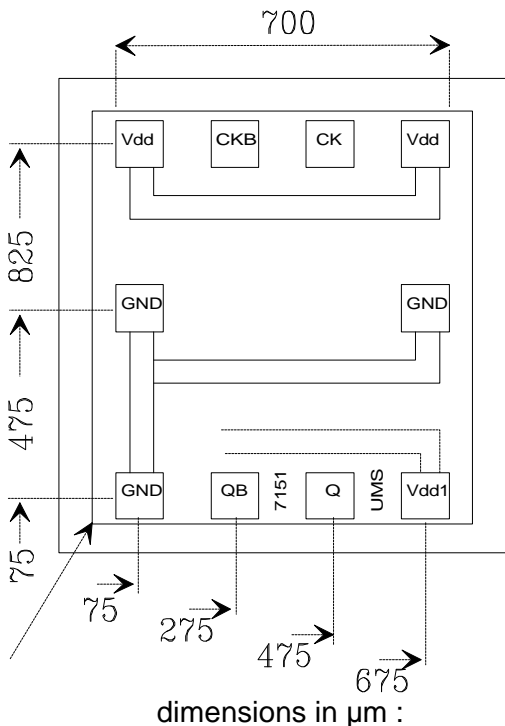
[general tolerance: +/-0.002]

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

**FTP8 Mechanical Data**

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

## Chip Mechanical Data



1050 (+10 /-100) \* 900 (+10 /-100)

Thickness= 300μm ± 20μm

Pads area: 100\*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.

## Ordering Information

Chip form :CND2047-99F/00  
 FTP8 Package :CND2047-SNF/23  
 SOIC8 Package :CND2047-DAF/20

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