

## Description

CD4069 is an inverter designed using advanced CMOS technology, featuring low power consumption and wide operating voltage range. It integrates six independent inverter circuits internally, with high noise immunity and driving capability.

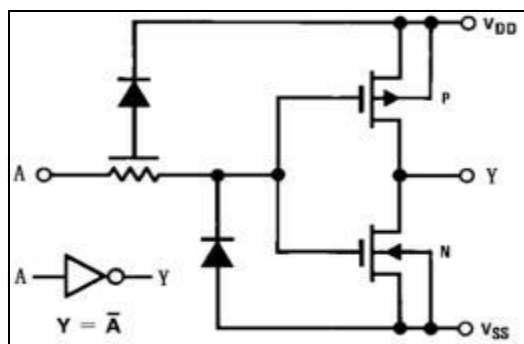
## Feature

- Low input current:  $I_{IN} \leq 1\mu A$ , @  $V_{IN} = V_{DD} = 15V$ ,  $T_a = 25^\circ C$
- Wide operating voltage range: 3.0V to 15.0V
- Low quiescent power consumption:  $I_{DD} \leq 4\mu A$ , @  $V_{DD} = 15V$ ,  $T_a = 25^\circ C$
- Package: DIP14, SOP14

## Application

- Digital logic drive
- Wireless doorbell
- Industrial control applications
- Other application areas

### logical diagram of principles



### Truth table

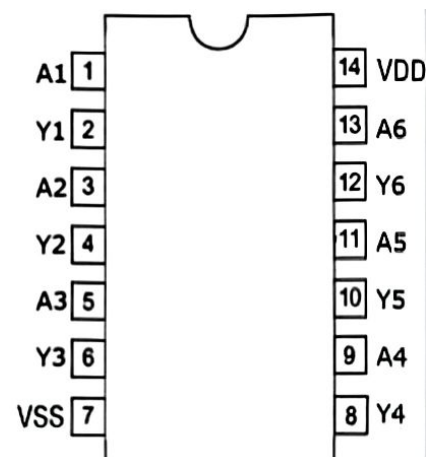
Input	Output
A	Y
L	H
H	L

H = High Logic Level

L = Low Logic Level

### Pin configuration and function

Pin No.	Pin Name	Pin No.	Pin Name
DIP14/SOP14		DIP14/SOP14	
1	A1	14	V <sub>DD</sub>
2	Y1	13	A6
3	A2	12	Y6
4	Y2	11	A5
5	A3	10	Y5
6	Y3	9	A4
7	V <sub>SS</sub>	8	Y4



## Maximum ratings

Parameter	Symbol	Value	Unit
power supply voltage	$V_{DD}$	-0.5 ~ 18	V
input voltage	$V_{IN}$	-0.5+ $V_{SS}$ ~ $V_{DD}$ +0.5V	V
power consumption	$P_D$	500	mW
operating temperature	$T_A$	0 ~ 70	°C
storage temperature	$T_S$	-65 ~ 150	°C
pin soldering temperature	$T_W$	260, 10s	°C

### Note:

Extreme parameters refer to the maximum limits that must not be exceeded under any circumstances. Exceeding these limits may lead to physical damage or degradation of the product. Additionally, operating near these extreme parameters does not guarantee proper functionality of the chip.

## Recommended working conditions

Symbol	Parameter	Min	Typ	Max	Unit
$V_{DD}$	Operating voltage	2.5		15	V
$V_{IN}$ 、 $V_{out}$	Input-output voltage	0		$V_{DD}$	V
$T_A$	Operating temperature	0		60	°C

PN	Package
CD4069D	DIP14
CD4069	SOP14

**DC electrical characteristics:**  $T_A=25^{\circ}\text{C}$ 

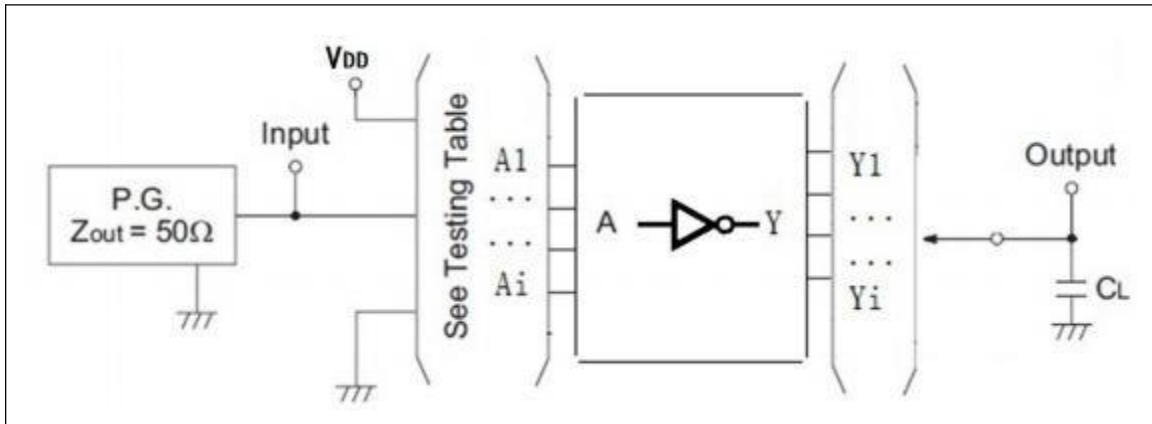
Symbol	Parameter	Test Condition	Min	Typ	Max	Unit	$V_{DD}$ (V)	
$V_{IH}$	high-level input voltage	$ I_o  \leq 1\mu\text{A}$	$V_o = 0.5\text{V}$	4.0			V	5
			$V_o = 1\text{V}$	8.0			V	10
			$V_o = 1.5\text{V}$	12.0			V	15
$V_{IL}$	low-level input voltage	$ I_o  \leq 1\mu\text{A}$	$V_o = 4.5\text{V}$			1.0	V	5
			$V_o = 9\text{V}$			2.0	V	10
			$V_o = 13.5\text{V}$			3.0	V	15
$V_{OH}$	high-level output voltage	$ I_{OUT}  < 1\mu\text{A}$		4.95			V	5
				9.95			V	10
				14.95			V	15
$V_{OL}$	low-level output voltage	$ I_{OUT}  < 1\mu\text{A}$		0	0.05		V	5
				0	0.05		V	10
				0	0.05		V	15
$I_{IN}$	input current	$V_{IN}=V_{DD}$ or $V_{SS}$		0	1.0	$\mu\text{A}$	15	
$I_{OH}$	high-level output current	$V_o = 4.5\text{V}$		-1.4	-0.45	mA	5	
		$V_o = 9\text{V}$		-3.0	-1.2	mA	10	
		$V_o = 13.5\text{V}$		-10	-3	mA	15	
$I_{OL}$	low-level output current	$V_o = 0.4\text{V}$	0.45	3.3		mA	5	
		$V_o = 0.5\text{V}$	1.0	12		mA	10	
		$V_o = 1.5\text{V}$	3.0	24		mA	15	
$I_{DD}$	operating current	$V_{IN}=V_{DD}$ or $V_{SS}$			1.0	$\mu\text{A}$	5	
					2.0	$\mu\text{A}$	10	
					4.0	$\mu\text{A}$	15	

**AC electrical characteristics:**  $T_A=25^{\circ}\text{C}$ , refer to test method

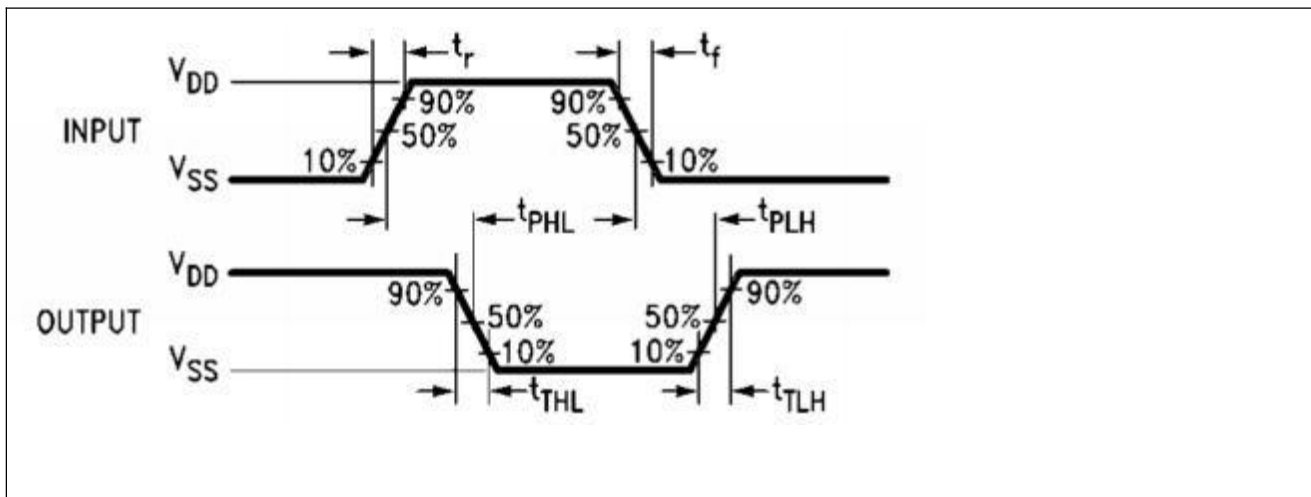
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Maximum propagation delay time A to Y	$t_{PHL}$	$V_{DD}=5\text{V}$ $C_L=51\text{pF}$		32		ns
	$t_{PLH}$			42		ns
	$t_{PHL}$	$V_{DD}=10\text{V}$ $C_L=51\text{pF}$		23		ns
	$t_{PLH}$			32		ns
	$t_{PHL}$	$V_{DD}=15\text{V}$ $C_L=51\text{pF}$		25		ns
	$t_{PLH}$			27		ns

Test method

Test connection diagram



Waveform measurement schematic

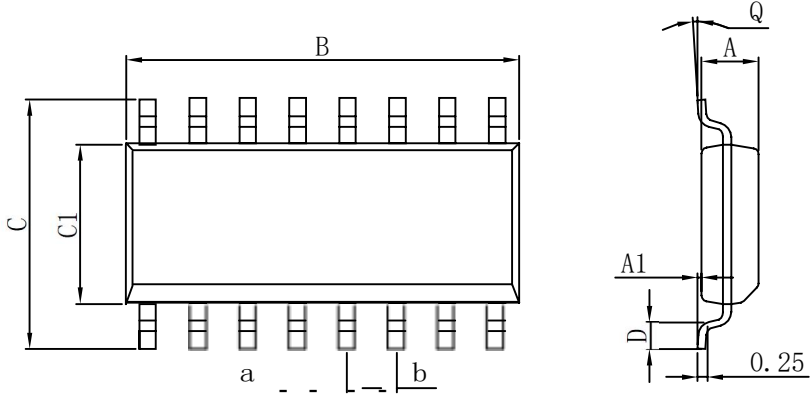


Note:

1. See Testing Table - Refers to corresponding test items in the AC electrical characteristics table.
2.  $C_L$  capacitor is an external surface-mount capacitor (0603), placed near the output pin with capacitorground connected to chip  $V_{SS}$ .
3. Input: Port input level,  $f=1\text{MHz}$ ,  $D=50\%$  square wave,  $t_r=t_f \leq 20\text{ns}$ .
4. Output: Y terminal output test

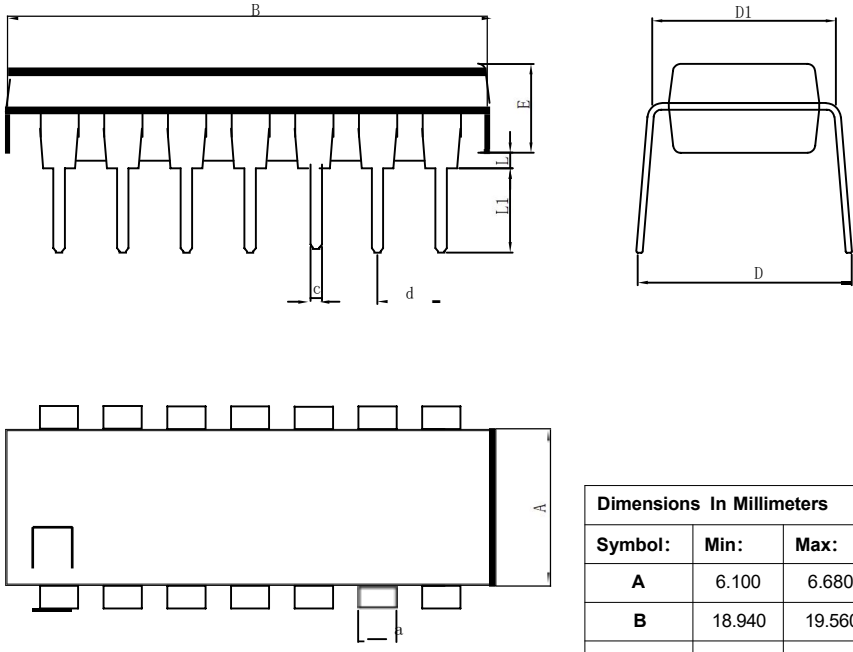
## Package

### SOP14



Dimensions In Millimeters					
Symbol:	Min:	Max:	Symbol:	Min:	Max:
A	4.520	4.620	D	0.400	0.950
A1	0.100	0.250	Q	0°	8°
B	8.500	9.000	a	0.420 TYP	
C	5.800	6.250	b	1.270 TYP	
C1	3.800	4.000			

### DIP14



Dimensions In Millimeters					
Symbol:	Min:	Max:	Symbol:	Min:	Max:
A	6.100	6.680	L	0.500	0.800
B	18.940	19.560	L1	3.000	3.600
D	8.200	9.200	a	1.524 TYP	
D1	7.42	7.820	c	0.457 TYP	
E	3.100	3.550	d	2.540 TYP	