



Hex Inverter

Description

The SKCD4069 consists of six independent CMOS inverter circuits, each featuring high anti-interference capability and driving capacity. During normal operation, V_{DD} is typically connected to the power supply and V_{SS} to ground. Unused input pins must be connected to V_{DD} , V_{SS} , or other input pins. This device is suitable for general-purpose inverter applications that do not require medium-power TTL driving or logic level conversion functions.

The SKCD4069 is available in SOP-14 and DIP-14 package types.

Features

- Wide operating voltage range: 3~15V
- Standardized symmetric output characteristics
- Fast output response
- Low quiescent current: $I_{DD} < 1\mu A$

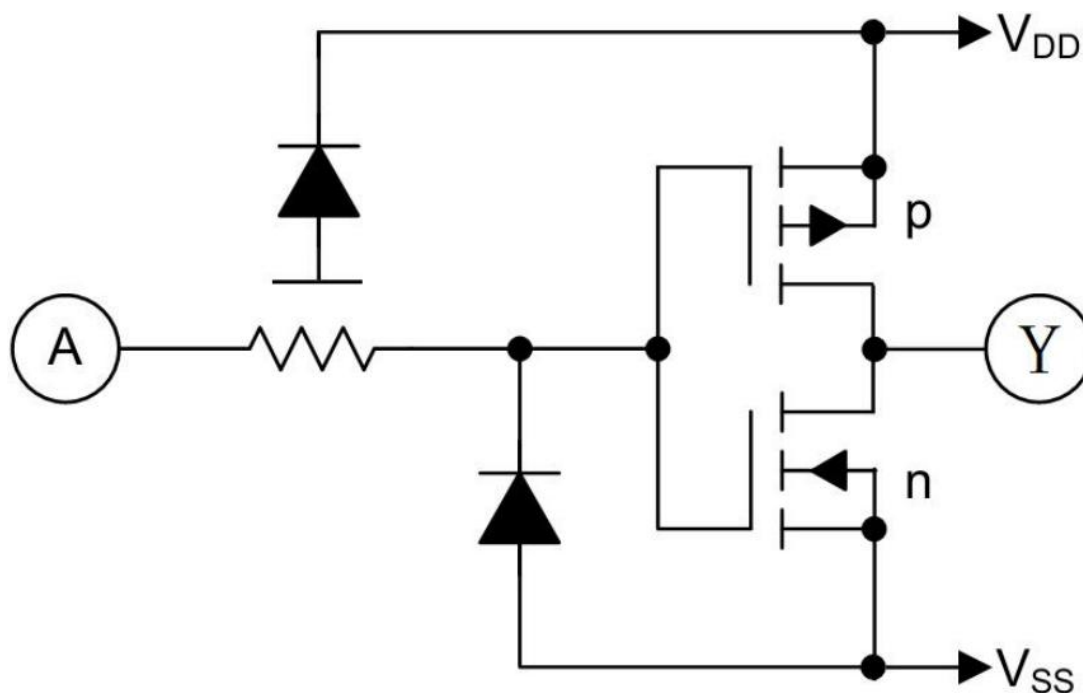
Applications

- Logic inversion
- Pulse shaping
- Oscillators
- High input impedance amplifiers

Ordering Information

Type	Marking	Package
SKCD4069-P14	CD4069	SOP-14
SKCD4069-H14	CD4069	DIP-14

Functional Block Diagram(single channel)



Output Logic Expression: $Y = \overline{A}$



Pin Description

Pin No.	Pin Name	I/O	Description	Pin Configuration Diagram
1	A1	I	Channel 1 Input	The diagram shows a 14-pin package with pins numbered 1 to 14. Pins 1 through 6 are on the left side, and pins 7 through 14 are on the right side. Pin 7 is labeled V_{SS} and pin 14 is labeled V_{DD}. The pins are connected to various channels: A1, Y1, A2, Y2, A3, Y3, A4, Y4, A5, Y5, A6, and Y6.
2	Y1	O	Channel 1 Output	
3	A2	I	Channel 2 Input	
4	Y2	O	Channel 2 Output	
5	A3	I	Channel 3 Input	
6	Y3	O	Channel 3 Output	
7	V _{SS}	P	Negative Power Supply	
8	Y4	O	Channel 4 Output	
9	A4	I	Channel 4 Input	
10	Y5	O	Channel 5 Output	
11	A5	I	Channel 5 Input	
12	Y6	O	Channel 6 Output	
13	A6	I	Channel 6 Input	
14	V _{DD}	P	Positive Power Supply	

Absolute Maximum Ratings

Parameter	Symbol	Limit	Unit
Supply Voltage(referenced to VSS pin)	V _{DD}	-0.5~18	V
Input Voltage(all pins)	V _{IN}	-0.5~V _{DD} +0.5	V
Input Current(any input)	I _{IN}	±10	mA
Operating Temperature	T _A	-20~+85	°C
Maximum Operating Junction Temperature	T _J	150	°C
Storage Temperature	T _S	-65~+150	°C
Soldering Temperature(10s)	T _W	260	°C

Recommended Operating Conditions(V_{SS}=0, V_TA=25°C unless otherwise specified)

Parameter	Symbol	Min	Max	Unit
Supply Power	V _{DD}	3	15	V
Input Voltage	V _{IN}	0	V _{DD}	V



DC Electrical Characteristics ($V_{SS}=0V$, $T_A=25^{\circ}C$ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Quiescent Current	I_{DD}	$V_{DD}=5V, V_{IN}=0V$ or $5V$	0	-	1	μA
		$V_{DD}=10V, V_{IN}=0V$ or $10V$	0	-	1	
		$V_{DD}=15V, V_{IN}=0V$ or $15V$	0	-	1	
Input Current	I_{IN}	$V_{DD}=15V, V_{IN}=0\sim 15V$	-1	-	1	μA
Low Level Input Voltage	V_{IL}	$V_{DD}=5V, V_O=4.5V$	-	-	1	v
		$V_{DD}=10V, V_O=9.5V$	-	-	2	
		$V_{DD}=15V, V_O=13.5V$	-	-	2.5	
High Level Input Voltage	V_{IH}	$V_{DD}=5V, V_O=0.5V$	4	-	-	V
		$V_{DD}=10V, V_O=1V$	8	-	-	
		$V_{DD}=15V, V_O=1.5V$	12.5	-	-	
Low Level Output Voltage	V_{OL}	$V_{DD}=5V, V_{IN}=5V$	-	0	0.05	V
		$V_{DD}=10V, V_{IN}=10V$	-	0	0.05	
		$V_{DD}=15V, V_{IN}=15V$	-	0	0.05	
High Level Output Voltage	V_{OH}	$V_{DD}=5V, V_{IN}=0V$	4.95	5	-	V
		$V_{DD}=10V, V_{IN}=0V$	9.95	10	-	
		$V_{DD}=15V, V_{IN}=0V$	14.95	15	-	
Low Level Output Current	I_{OL}	$V_{DD}=5V, V_O=0.4V$	1.1	2.2	-	mA
		$V_{DD}=10V, V_O=0.5V$	2.5	5	-	
		$V_{DD}=15V, V_O=1.5V$	9	18	-	
High Level Output Current	I_{OH}	$V_{DD}=5V, V_O=4.6V$	-	-1.2	-0.6	mA
		$V_{DD}=10V, V_O=9.5V$	-	-2.6	-1.3	
		$V_{DD}=15V, V_O=13.5V$	-	-7.2	-3.6	

AC Electrical Characteristics ($V_{SS}=0V, T_A=25^{\circ}C, C_L=50pF, R_L=200K\Omega$ unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Propagation Delay Time (input-output)	t_{PHL}	$V_{DD}=5V$	-	35	110	ns
		$V_{DD}=10V$	-	22	60	
		$V_{DD}=15V$	-	32	50	
Propagation Delay Time (input-output)	t_{PLH}	$V_{DD}=5V$	-	46	110	ns
		$V_{DD}=10V$	-	30	60	
		$V_{DD}=15V$	-	20	50	
Output Transition Time	t_{THL}	$V_{DD}=5V$	-	52	200	ns
		$V_{DD}=10V$	-	26	100	
		$V_{DD}=15V$	-	54	80	
Output Transition Time	t_{TLH}	$V_{DD}=5V$	-	75	200	ns
		$V_{DD}=10V$	-	40	100	
		$V_{DD}=15V$	-	36	80	
Input Capacitance	C_{IN}	Any Input	-	-	15	pF



Typical Applications

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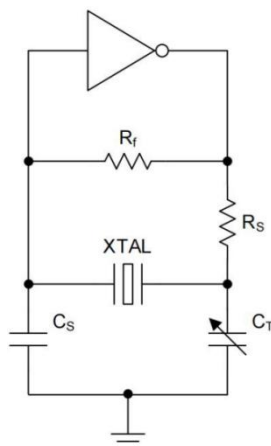
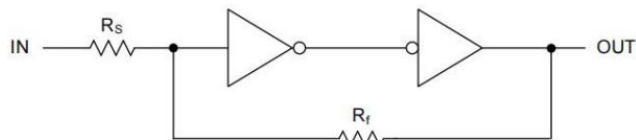


Figure 1. Typical Crystal Oscillator Circuit

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Upper Switching Point :

$$V_P = \frac{R_S + R_f}{R_f} \times \frac{V_{DD}}{2}$$

Lower Switching Point :

$$V_N = \frac{R_f - R_S}{R_f} \times \frac{V_{DD}}{2}$$

$$R_f > R_S$$

Figure 2. Input Pulse Shaping Circuit

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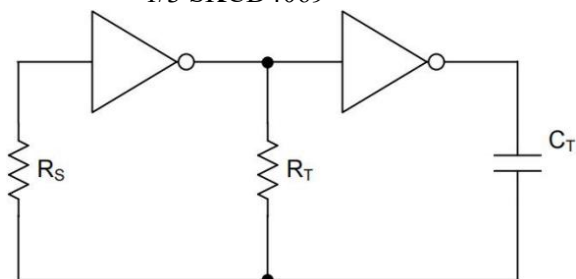


Figure 3. Typical RC Oscillator Circuit

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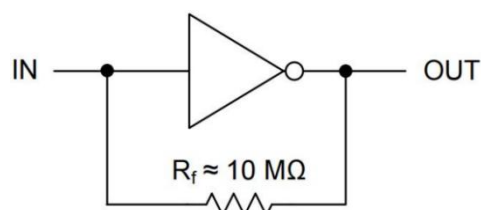


Figure 4. High Input Impedance Amplifier

Test Circuit

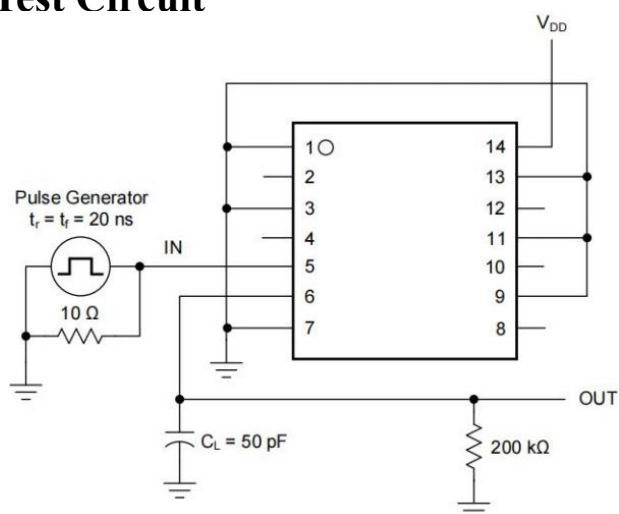


Figure 5. AC Electrical Characteristics Test Circuit

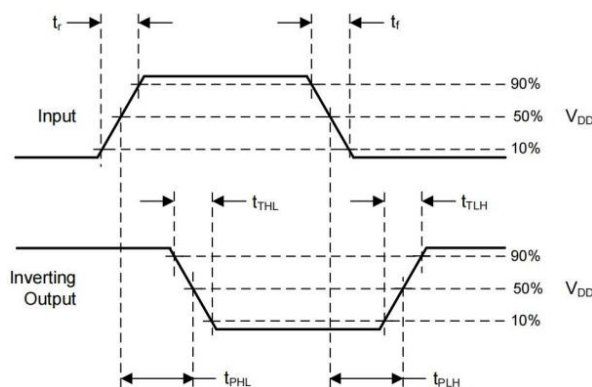


Figure 6. AC Electrical Characteristics Test Waveform

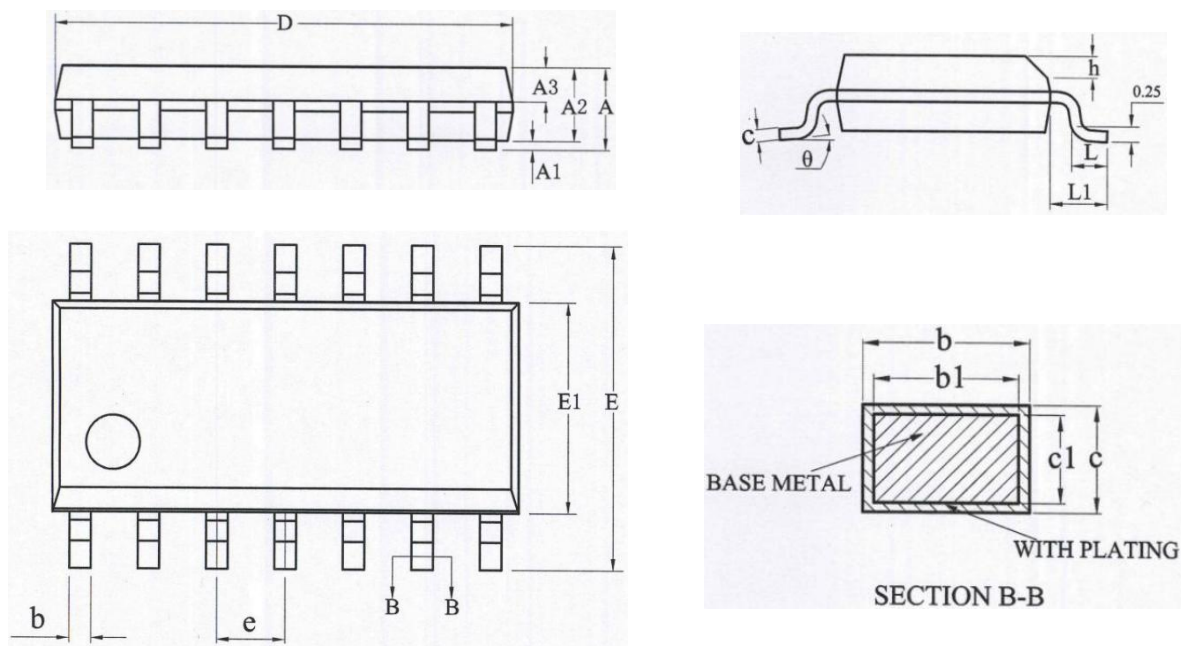


SKCD4069

Package Information

SOP-14

Dimensions in mm



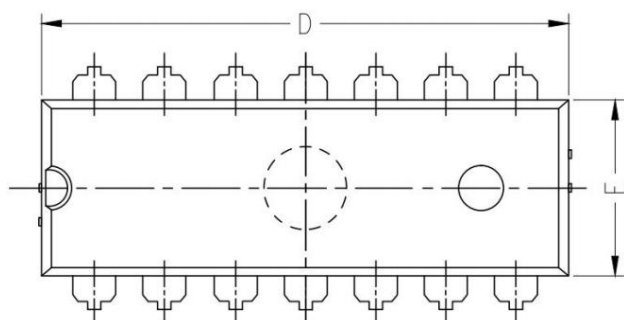
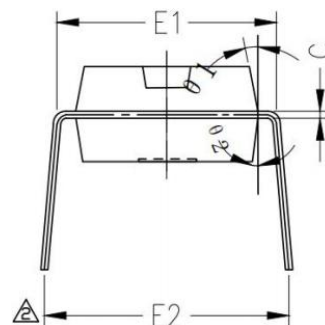
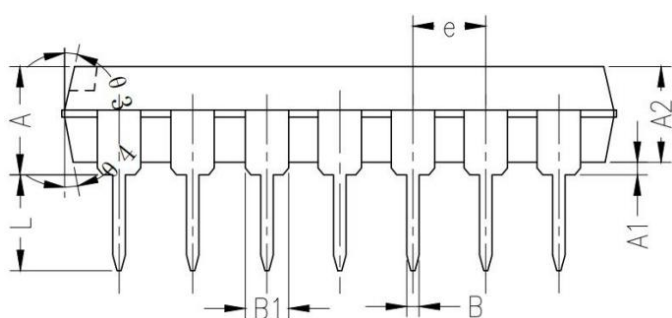
Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	-	-	1.75	D	8.55	8.65	8.75
A1	0.10	-	0.225	E	5.80	6.00	6.20
A2	1.30	1.40	1.50	E1	3.80	3.90	4.00
A3	0.60	0.65	0.70	e	1.27 (BSC)		
b	0.39	-	0.47	h	0.25	-	0.50
b1	0.38	0.41	0.44	L	0.50	-	0.80
c	0.20	-	0.24	L1	1.05 (REF)		
c1	0.19	0.20	0.21	θ	0°	-	8°



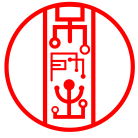
Package Information

DIP-14

Dimensions in mm



Symbol	Dimensions In Millimeters			Symbol	Dimensions In Millimeters		
	Min	Nom	Max		Min	Nom	Max
A	3.75	3.81	3.95	E1	7.35	7.62	7.85
A1	0.51	-	-	e	2.54 (BSV)		
A2	3.20	3.30	3.45	L	3.00	3.30	3.60
B	0.38	0.48	0.56	E2	8.00	8.40	8.80
B1	1.52 (BSC)			θ1	9°	-	15°
C	0.20	0.25	0.34	θ2	7°	-	13°
D	18.80	19.05	19.30	θ3	8°	-	14°
E	6.20	6.35	6.50	θ4	5°	-	12°



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