

HX4069-S CMOS six-way inverter

General situation

HX4069-S is composed of six CMOS inverter circuits, this device is mainly used as a general purpose inverter, that is, applied to circuits that do not require power TTL driver and logic level conversion function.

Main feature

Standardized symmetrical output characteristics

Power supply voltage: 3 ~ 16V

Input voltage: 0 ~ VDD

Fast output response

Low static current: $I_{DD} < 1\mu A$

Application field

Logical reversal

oscillator

High input impedance amplifier

Input levels are compatible with LSTTL

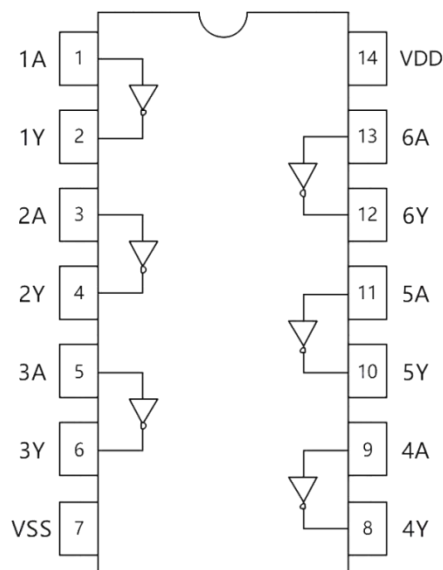
5V, 10V, 15V Three-speed parameter

Symmetrical output capability

Maximum input current: $1\mu A$ (15V, All temperature ranges)

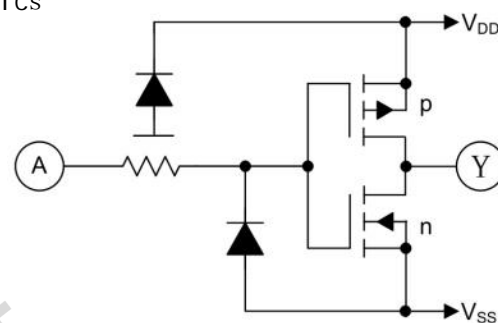
Operating temperature range: $-20^{\circ}C$ to $+85^{\circ}C$.

Pin specification



Serial number	Pin definition	Serial number	Pin definition
1	1 Channel input	14	Power source
2	1 Channel output	13	6 Channel input
3	2 Channel input	12	6 Channel output
4	2 Channel output	11	5 Channel input
5	3 Channel input	10	5 Channel output
6	3 Channel output	9	4 Channel input
7	Ground	8	4 Channel output

Internal block diagram



Output logical expression: $Y = \bar{A}$

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Limiting maximum parameter

Argument	Symbol	Min	Max
Supply voltage	VDD	-0.5V	18V
Input voltage	VIN	-0.5V	VDD+0.5V
Input current	IIN	-10mA	+10mA
Storage temperature	Tstg	-65°C	150°C
Junction temperature	TJ	-	150°C
Welding temperature	-	-	265°C

Note: Exceeding the above limit value may cause permanent damage to the chip.

Recommended working conditions

Argument	Symbol	Min	Max
Operating voltage	VDD	3V	16V
Input voltage	VIN	0V	VDD
Operating temperature	TA	-25°C	85°C

Electrical characteristics – Time parameters

Argument	Test condition	Min	Typ	Max	Unit	
t _{PHL}	CL = 50pF RL = 200KΩ VIN = 1KHz, D = 50% 方波 tr = tf ≤ 20ns	VDD = 5V	-	35	110	ns
		VDD = 10V	-	22	60	ns
		VDD = 15V	-	32	50	ns
t _{PLH}		VDD = 5V	-	46	110	ns
		VDD = 10V	-	30	60	ns
		VDD = 15V	-	20	50	ns
t _{THL}	VDD = 5V	-	52	200	ns	
	VDD = 10V	-	26	100	ns	
	VDD = 15V	-	54	80	ns	
t _{TLH}	VDD = 5V	-	75	200	ns	
	VDD = 10V	-	40	100	ns	
	VDD = 15V	-	36	80	ns	
CIN	Any Input	-	-	15	pF	

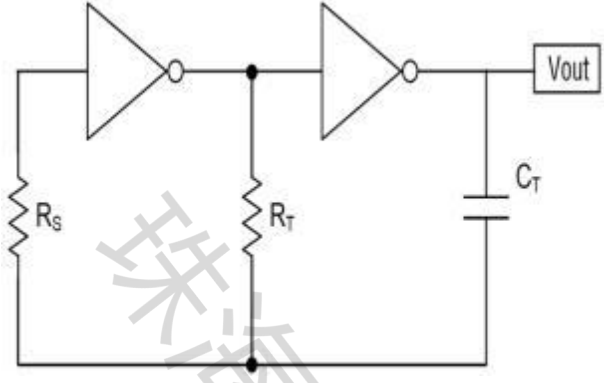
Electrical characteristics – Static parameters

(No special instructions, TA=25°C)

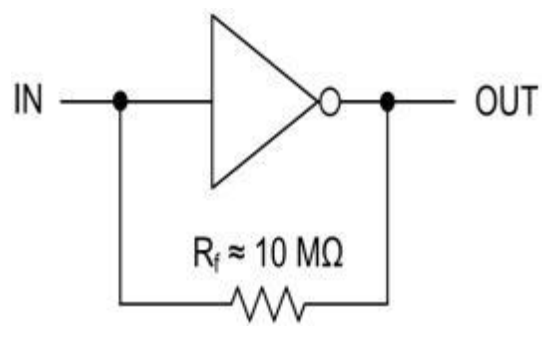
Symbol	Argument	Test condition		Min	Typ	Max	Unit
VOL	Output low level voltage	VIN= 5V	VDD= 5V	-	0	0.05	V
		VIN = 10V	VDD= 10V	-	0	0.05	
		VIN = 15V	VDD= 15V	-	0	0.05	
VOH	Output high level voltage	VIN= 0V	VDD= 5V	4.95	5	-	V
		VIN= 0V	VDD= 10V	9.95	10	-	
		VIN= 0V	VDD= 15V	14.95	15	-	
VIL	Input low-level voltage	Vo = 4.5V	VDD= 5V	-	-	1	V
		Vo = 9.5V	VDD= 10V	-	-	2	
		Vo = 13.5V	VDD= 15V	-	-	2.5	
VIH	Input high level voltage	Vo = 0.5V	VDD= 5V	4	-	-	V
		Vo= 1V	VDD= 10V	8	-	-	
		Vo = 1.5V	VDD= 15V	12.5	-	-	
IIL	Output low level current	Vo = 0.4V	VDD= 5V	1.1	2.2	-	mA
		Vo = 0.5V	VDD= 10V	2.5	5	-	
		Vo = 1.5V	VDD= 15V	9	18	-	
IOH	Output high level current	Vo = 4.6V	VDD= 5V	-	-1.2	-0.6	mA
		Vo = 9.5V	VDD= 10V	-	-2.6	-1.3	
		Vo = 13.5V	VDD= 15V	-	-7.2	-3.6	
IIN	Input current	VIN=0V~15V	VDD=15V	-1	-	1	uA
IDD	Supply current	VIN=0V or 5V	VDD= 5V	-	-	1	uA
		VIN=0V or 10V	VDD= 10V	-	-	1	
		VIN=0V or 15V	VDD= 15V	-	-	1	

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Typical application

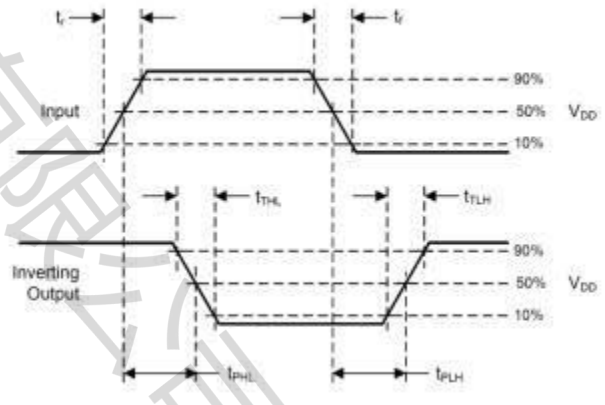
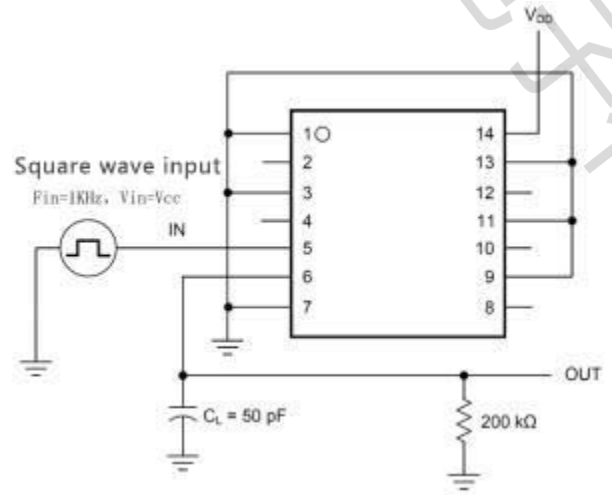


Typical RC oscillating circuit



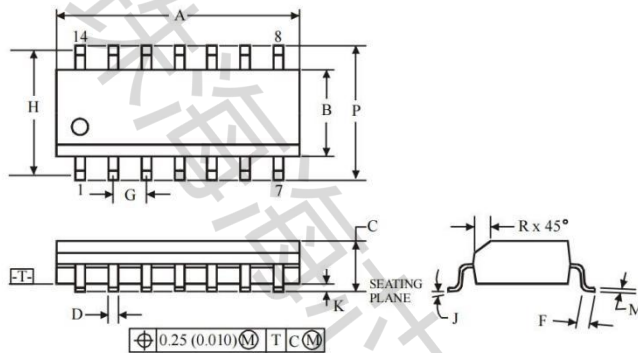
High input impedance amplifier

Time parameter test circuit



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SOP14 (Package Outline Dimensions)

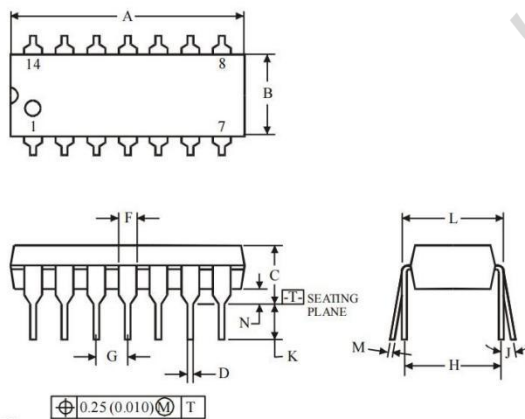


Symbol	Dimension, mm	
	MIN	MAX
A	8.55	8.75
B	3.8	4
C	1.35	1.75
D	0.33	0.51
F	0.4	1.27
G	1.27	
H	5.27	
J	0°	8°
K	0.1	0.25
M	0.19	0.25
P	5.8	6.2
R	0.25	0.5

NOTES:

1. Dimensions A and B do not include mold flash or protrusion.
2. Maximum mold flash or protrusion 0.15 mm (0.006) per side for A; for B - 0.25 mm (0.010) per side.

DIP14 (Package Outline Dimensions)



Symbol	Dimension, mm	
	MIN	MAX
A	18.67	19.69
B	6.1	7.11
C	5.33	
D	0.36	0.56
F	1.14	1.78
G	2.54	
H	7.62	
J	0°	10°
K	2.92	3.81
L	7.62	8.26
M	0.2	0.36
N	0.38	

NOTES:

1. Dimensions "A", "B" do not include mold flash or protrusions.
Maximum mold flash or protrusions 0.25 mm (0.010) per side.

Part Number	Package Type	Package	quantity
HX4069-S	SOP-14	Taping	2500