



ACE74HC04

6V High Speed Inverter

Description

ACE74HC04 is CMOS single inverter gate. The device is fabricated with advanced CMOS technology to achieve ultra high speed with high output drive while maintaining low static power dissipation over a very broad V_{CC} operating range. The device is specified to operate over the 1.65V to 6.0V V_{CC} range. Inputs tolerate voltage up to 6V independent of V_{CC} operating voltage.

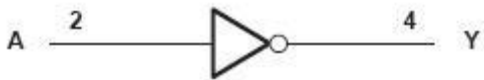
Features

- Ultra High Speed; TPD 8.5 ns Typ into 50 pF at 5V V_{CC}
- High Output Drive; ±16 mA at 5V V_{CC}
- Broad V_{CC} Operating Range; 1.65V to 6.0V
- Low Power Consumption, 1μA Max I_{CC}
- Schmitt Trigger Action at input makes the circuit tolerant for slower input rise and fall time

Application

- Cell phone and other portable device
- 3G module

Function Diagram



Absolute Maximum Ratings

Parameter	Symbol	Max	Unit
Supply voltage range	V _{CC}	-0.5~7	V
Input voltage range	V _{IN}		
Output voltage range	V _{OUT}		
DC Input Diode Current	I _{IK}	±20	mA
DC Output Diode Current	I _{OK}		
DC Output Current	I _{OL} /I _{OH}	±25	
Storage Temperature Range	T _{stg}	-40~150	°C
Package Power Dissipation @ +70°C	P _d	200	mW

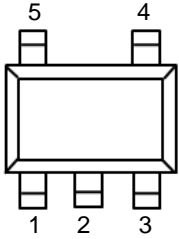


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Packaging Type

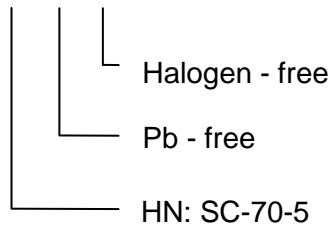
SC-70-5



SC-70-5	Description
1	NC
2	A
3	GND
4	Y
5	V _{CC}

Ordering information

ACE74HC04 XX + H



Thermal Resistance Rating

Parameter	Device	Symbol	Limit	Unit
Package thermal impedance	SC-70-5	Θ_{JA}	142	°C/W

Recommended Operating Condition

Parameter	Symbol	Min	Max	Units
Supply voltage	V _{CC}	1.65	6	V
Input voltage	V _{IN}	0	V _{CC}	
Output voltage	V _{OUT}	0	V _{CC}	
High-level input voltage	V _{IH}	V _{CC} =2V	1.3	
		V _{CC} =3V	1.8	
		V _{CC} =6V	3.2	
Low-level input voltage	V _{IL}	V _{CC} =2V	0.7	
		V _{CC} =3V	1.0	
		V _{CC} =6V	2.2	
High-level output current	I _{OH}	V _{CC} =2V	-50	
		V _{CC} =3.3±0.3V	-8	mA
		V _{CC} =6±0.5V	-16	
Low-level output current	I _{OL}	V _{CC} =2V	50	μA
		V _{CC} =3.3±0.3V	8	mA



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	$V_{CC}=6\pm 0.5V$			16	
Input transition rise or fall rate	$V_{CC}=3.3\pm 0.3V$	$\Delta t/\Delta v$		100	ns/V
	$V_{CC}=6\pm 0.5V$			20	
Operation Temperature		T_A		-40~85	$^{\circ}C$

Electrical Characteristics (unless otherwise noted)

Parameter	Test condition	Vcc	Min.	Max.	Unit
I _I	V _I =6.0V or GND	0V to 6.0V		±1	μA
I _{CC}	V _I =V _{CC} or GND, I _O =0	6.0V		1	μA
C _i	V _I =V _{CC} or GND	5.0V		10	pF
V _{OH}	I _{OH} =-50μA	2.0V	1.9		V
		3.0V	2.9		
		5.0V	4.9		
	I _{OH} =-8mA	3.0V	2.6		
	I _{OH} =-16mA	5.0V	4.5		
V _{OL}	I _{OH} =-50μA	2.0V		0.1	
		3.0V		0.1	
		5.0V		0.1	
	I _{OH} =-8mA	3.0V		0.4	
	I _{OH} =-16mA	5.0V		0.5	

Switching Characteristics (V_{CC}=3.3V±0.3V)

Parameter	Input	Output	Load capacitance	Min.	Max.	Unit
t _{PLH}	A	Y	CL=15pF	1	8.5	ns
t _{PHL}						
t _{PLH}	A	Y	CL=50pF	1	12	
t _{PHL}						

Switching Characteristics (V_{CC}=6.0V±0.5V)

Parameter	Input	Output	Load capacitance	Min.	Max.	Unit
t _{PLH}	A	Y	CL=15pF	1	6.5	ns
t _{PHL}						
t _{PLH}	A	Y	CL=50pF	1	8.5	
t _{PHL}						



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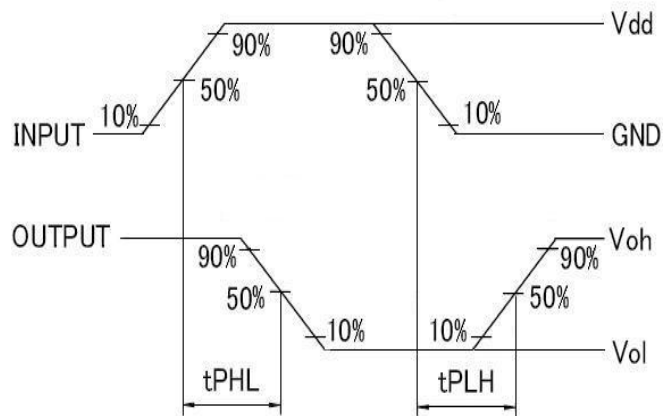
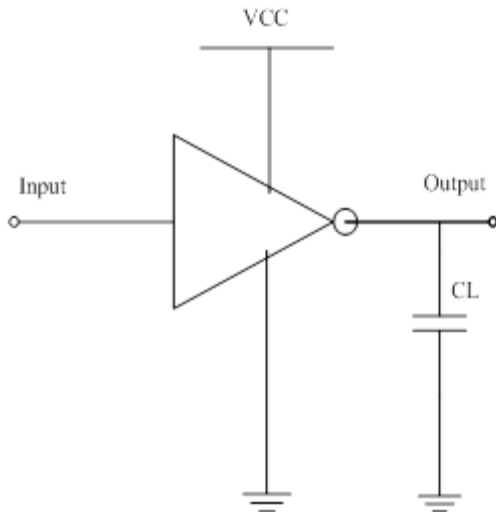
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Switching Characteristics

($V_{CC}=5.0V$, $T_A=25^\circ C$)

Parameter	Symbol	Test condition	Typ.	Unit
Power dissipation capacitance	Cpd	No load, $f=1MHz$	12	pF

Parameter Measurement Information



Note:

- The outputs are measured one at a time, with one input transition per measurement.
- All parameters and waveforms are not applicable to all devices.
- CL includes probe and jig capacitance
- All input pulses are supplied by generators having the following characteristics: $PRR \leq 1 MHz$, $ZO = 50 \Omega$, $t_r \leq 3 ns$, $t_f \leq 3 ns$

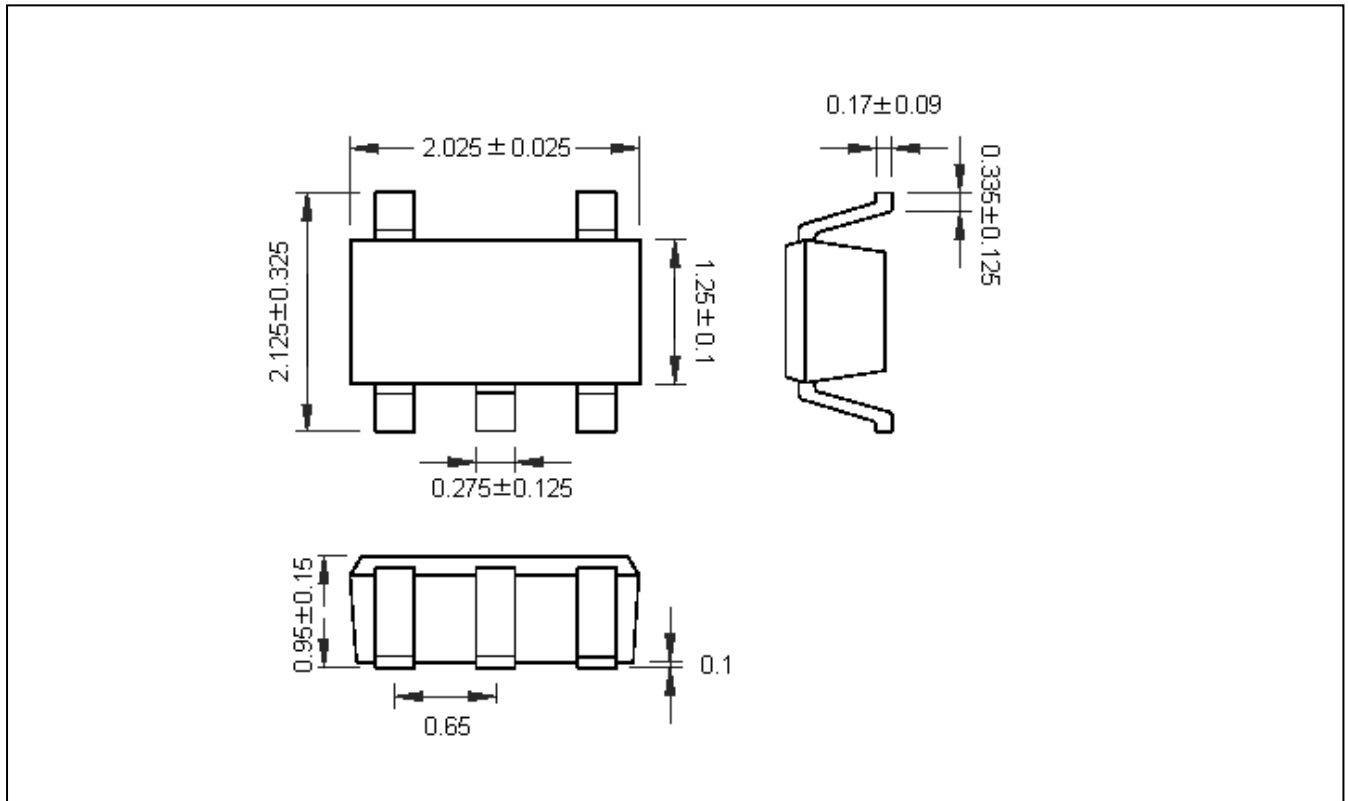


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Packing Information

SC-70-5





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Notes

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1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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