



CD74AHC1G00

Single-channel 2-input, 2V to 5.5V NAND gate

Version: Rev 1.0.0 Date: 2025-6-25

Features ■■

- Operating Range 2 V to 5.5 V
- Maximum tpd of 6.5 ns at 5 V
- Low Power Consumption, 10-μA Maximum ICC
- ±8-mA Output Drive at 5 V
- Schmitt-Trigger Action at All Inputs Makes the Circuit Tolerant for Slower Input Rise and Fall Time
- ESD Protection Exceeds JESD 22
2kV Human-Body Model
200V Machine Model
1kV Charged-Device Model

Application ■■

- IP Phones
- Notebook PCs
- Printers
- Access Control and Security
- Solar Inverters
- Personal Electronics

Description ■■

The CD74AHC1G00 performs the Boolean function $Y = \overline{A \cdot B}$ or $Y = \overline{A} + \overline{B}$ in positive logic.
The CD74AHC1G00 are available in SOT23-5 packages.

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Pin Configurations

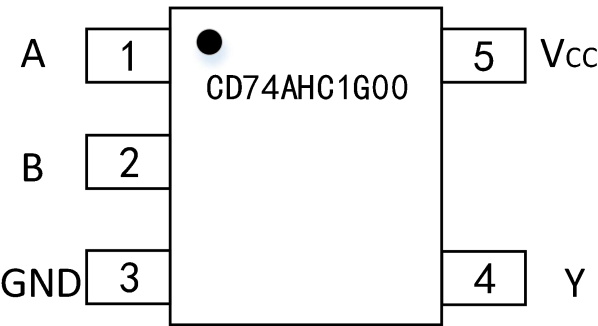


Figure 1. SOT23-5 Pin Configuration

Pin Description

Table 1. Pin description

Pin No.	Pin Name		Description
1	A	I	Input A
2	B	I	Input B
3	GND	--	Ground Pin
4	Y	O	Output Y
5	V _{CC}	--	Power Pin

Functional Block diagram

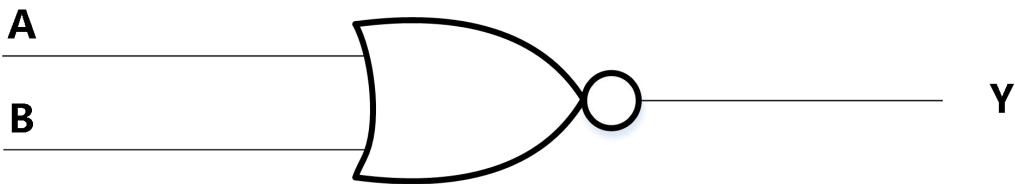


Figure 2. Functional Block Diagram

Table 2. Truth Table

Truth Table

Inputs		Output Y
A	B	
H	H	L
L	X	H
X	L	H

Absolute Maximum Ratings

Parameter	Range
Supply Voltage(V_{CC})	-0.5 V to +7 V
Input Voltage(V_I)	-0.5 V to +7 V
Output Voltage(V_O)	-0.5 V to $V_{CC}+0.5$ V
Input Clamp Current(I_{IK})	-20mA(Max),@ $V_I < 0$
Output Clamp Current(I_{OK})	± 20 mA(Max),@ $V_O < 0$ or $V_O > V_{CC}$
Continuous Output Current(I_O)	± 25 mA(Max),@ $V_O=0$ to V_{CC}
Continuous Current Through V_{CC} or GND	± 50 mA(Max)
Junction Temperature(T_J)	150°C(Max)
Storage Temperature(T_{stg})	-65°C~150°C
ESD	2 kV(HBM) ,1kV(CDM),200V(MM)

Operating Temperatures Range

参数	范围
Supply Voltage(V _{CC})	2 V to +5.5 V
High Level Input Voltage(V _{IH})	1.5 V(min) @V _{CC} =2 V ,2.1 V(min) @V _{CC} =3 V ,3.85 V(min) @V _{CC} =5.5 V
Low Level Input Voltage(V _{IL})	0.5 V(max) @V _{CC} =2 V ,0.9 V(max) @V _{CC} =3 V,1.65 V(max) @V _{CC} =5.5 V
Input Voltage(V _I)	0 V to +5.5 V
Output Voltage(V _O)	0 V to +V _{CC} V
High Level Output Current	-50µA(max) @V _{CC} =2 V,-4mA(max) @V _{CC} =3.3 V ±0.3 V , -8mA(max) @V _{CC} =5 V ±0.5 V
Low Level Output Current(I _{OL})	50µA(max) @V _{CC} =2 V ,4mA(max) @V _{CC} =3.3 V ±0.3 V , 8mA(max) @V _{CC} =5 V ±0.5 V
Input transition rise or fall rate(Δt/Δv)	100ns/v@V _{CC} =3.3 v±0.3 v,20ns/v@V _{CC} =5 v±0.5 v
Operating Free Air Temperature(T _A)	-55°C to + 125°C

Electrical Characteristics

Over operating free-air temperature range (unless otherwise noted)

Table 3.

Parameter	+25°C			−40° C to +125° C			Test Conditions	UNIT
	Min	Typ	Max	Min	Typ	Max		
Output Characteristics								
VOH	1.9	2	--	1.9	--	--	IOH = −50 μA,V _{CC} =2V	V
	2.9	3	--	2.9	--	--	IOH = −50 μA,V _{CC} =3V	
	4.4	4.5	--	4.4	--	--	IOH = −50 μA,V _{CC} =4.5V	
	2.58	--	--	2.4 8	--	--	IOH = −4mA,V _{CC} =3V	
	3.94	--	--	3.8	--	--	IOH = −8mA,V _{CC} =4.5V	
VOL	--	--	0.1	--	--	0.1	IOH = 50 μA,V _{CC} =2V	V
	--	--	0.1	--	--	0.1	IOH = 50 μA,V _{CC} =3V	
	--	--	0.1	--	--	0.1	IOH = 50 μA,V _{CC} =4.5V	
	--	--	0.36	--	--	0.44	IOH = 4mA,V _{CC} =3V	
	--	--	0.36	--	--	0.44	IOH = 8mA,V _{CC} =4.5V	
I _I	--	--	±0.1	--	--	±1	VI = 5.5 V or GND,V _{CC} =0V to	μA

							5.5V	
I _{CC}	--	--	1	--	--	10	V _I = V _{CC} or GND, I _O = 0, V _{CC} = 5.5V	μA
C _I	--	2	10	--	--	10	V _I = V _{CC} or GND, V _{CC} = 5V	pF

Switching Characteristics, V_{CC} = 3.3 V ± 0.3 V; over recommended operating free-air temperature range (unless otherwise noted)

Table 4.

Parameter	From (Input)	To (Output)	Output Capacitance	+25°C			−40° C to +85° C			−40° C to +125° C			UNIT
				Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Switching Characteristics													
t _{PLH}	A or B	Y	CL = 15 pF	--	5.5	7.9	1	--	9.5	1	--	10.5	ns
t _{PHL}				--	5.5	7.9	1	--	9.5	1	--	10.5	
t _{PLH}	A or B	Y	CL = 50 pF	--	8	11.4	1	--	13	1	--	14	ns
t _{PHL}				--	8	11.4	1	--	13	1	--	14	

Switching Characteristics, V_{CC} = 5 V ± 0.5 V; over recommended operating free-air temperature range (unless otherwise noted)

Table 5.

Parameter	From (Input)	To (Output)	Output Capacitance	+25°C			−40° C to +85° C			−55° C to +125° C			UNIT
				Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Switching Characteristics													
t _{PLH}	A or B	Y	CL = 15 pF	--	3.7	5.5	1	--	6.5	1	--	7	ns
t _{PHL}				--	3.7	5.5	1	--	6.5	1	--	7	
t _{PLH}	A or B	Y	CL = 50 pF	--	5.2	7.5	1	--	6.5	1	--	9	ns
t _{PHL}				--	5.2	7.5	1	--	6.5	1	--	9	

Operating Characteristics (V_{CC} = 5 V, T_A = 25°C)

Parameter	Test Conditions	TYP	UNIT
C _{pd} Power dissipation capacitance	No load, f = 1 MHz	9.5	pF

Typical Electrical Characteristics

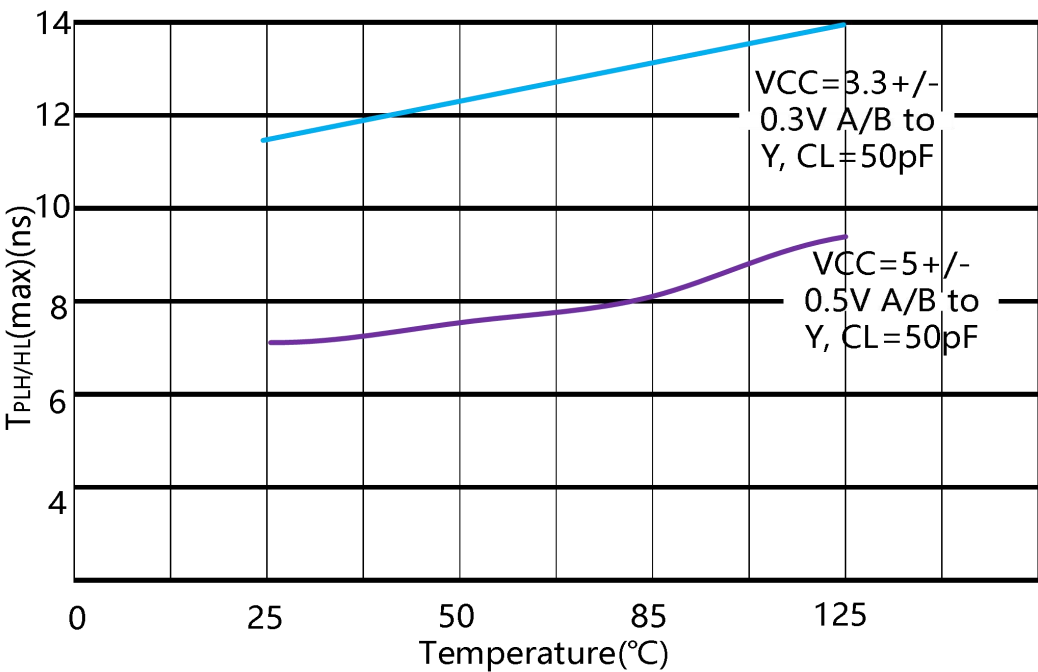


Figure 3.Propagation Delay vs Temperature

Typical Application

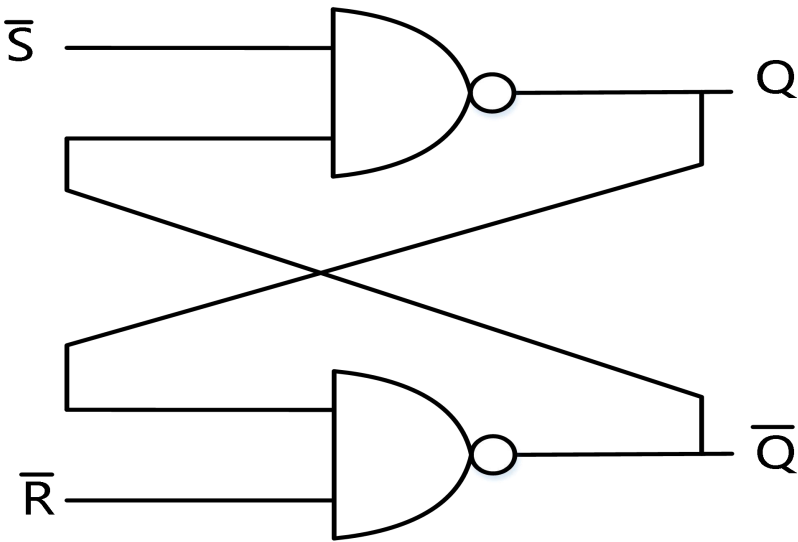


Figure 4. Typical Application Schematic

Package Outline Dimensions

SOT23-5

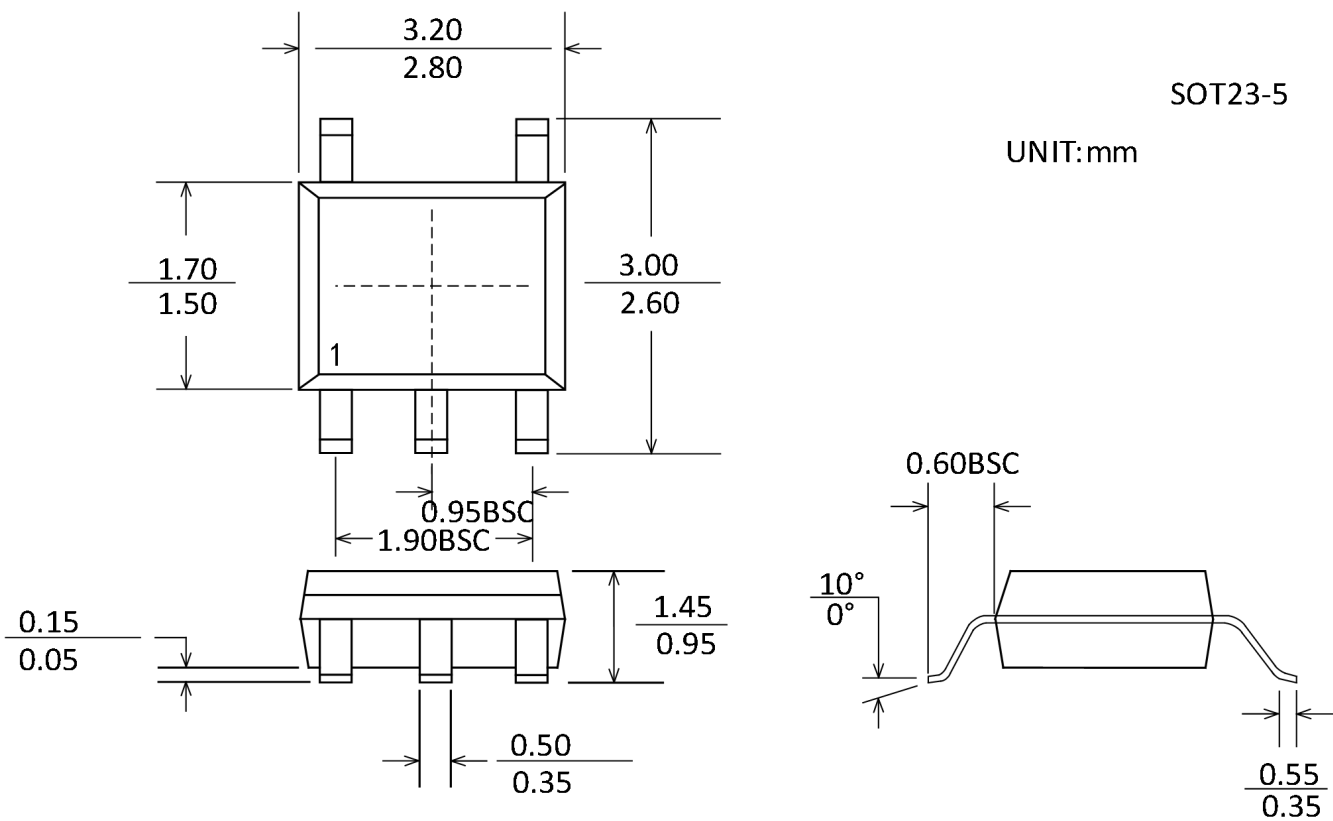


Figure 5. 5-Lead Small Outline Package [SOT23-5]

Package/Ordering Information

MODEL	TEMPERATURE	PACKAGE DESCRIPTION	PACKAGE OPTION
CD74AHC1G00AST	-40°C~125°C	SOT23-5	Tape and Reel,3000

Revision Log

Version	Revision date	Change content	Reason for Change	Modified by	Reviewed By	Note
V1.0	2025.6.25	Initial version	Regular update	WW	LYL	