



CD74AHC1G02

Single-channel 2-input, 2V to 5.5V NOR 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 ■■

- Infotainment
- Printers
- Cameras
- PCs, Notebooks
- E-Meters
- Body Control Modules

Description ■■

This device contains a single 2-input NOR gate that performs the Boolean function $Y = \overline{A} \times \overline{B}$ or $Y = \overline{A+B}$ in positive logic.

The CD74AHC1G02 are available in SOT23-5 packages.

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Pin Configurations

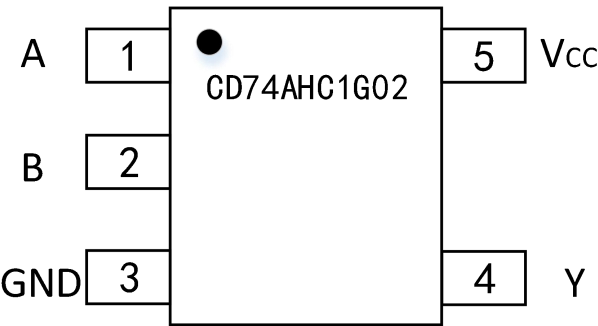


Figure 1. SOT23-5 Pin Configuration

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

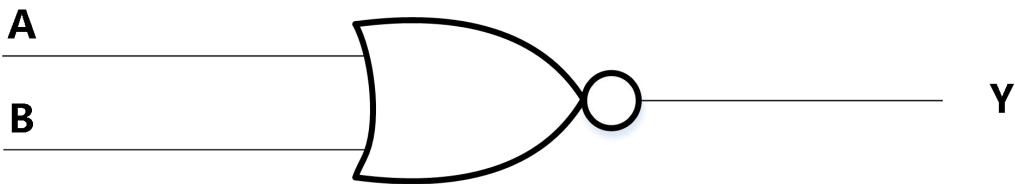


Figure 2. Functional Block Diagram

Table 2. Truth Table

Truth Table

Inputs		Output Y
A	B	
H	X	L
X	H	L
L	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})	±20mA(Max),@V _O < 0 or V _O > V _{CC}
Continuous Output Current(I _O)	±25mA(Max),@V _O =0 to V _{CC}
Continuous Current Through V _{CC} or GND	±50mA(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	-50 μ A(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})	50 μ A(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($\Delta t/\Delta v$)	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)	-40°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 5.5V	μA
I _{CC}	--	--	1	--	--	10	VI = VCC or GND, IO = 0,V _{CC} = 5.5V	μA
C _I	--	2	10	--	--	10	VI = VCC 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	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	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	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	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
Cpd Power dissipation capacitance	No load, f = 1 MHz	15	pF

Typical Electrical Characteristics

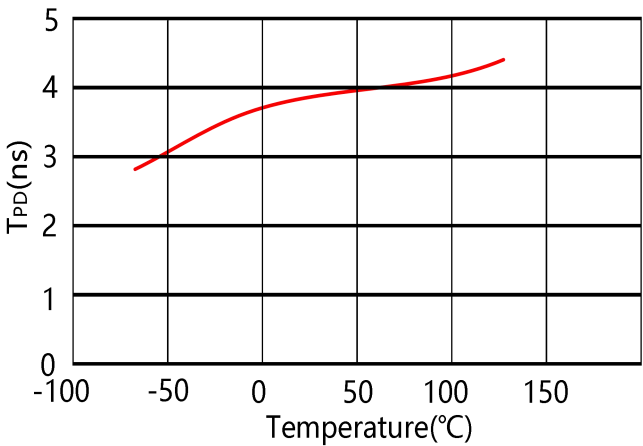


Figure 3. T_{PD} vs Temperature

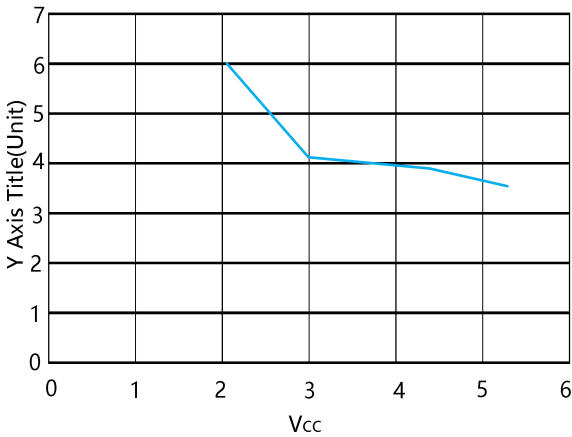


Figure 4. T_{PD} vs V_{CC} at 25°C

Typical Application

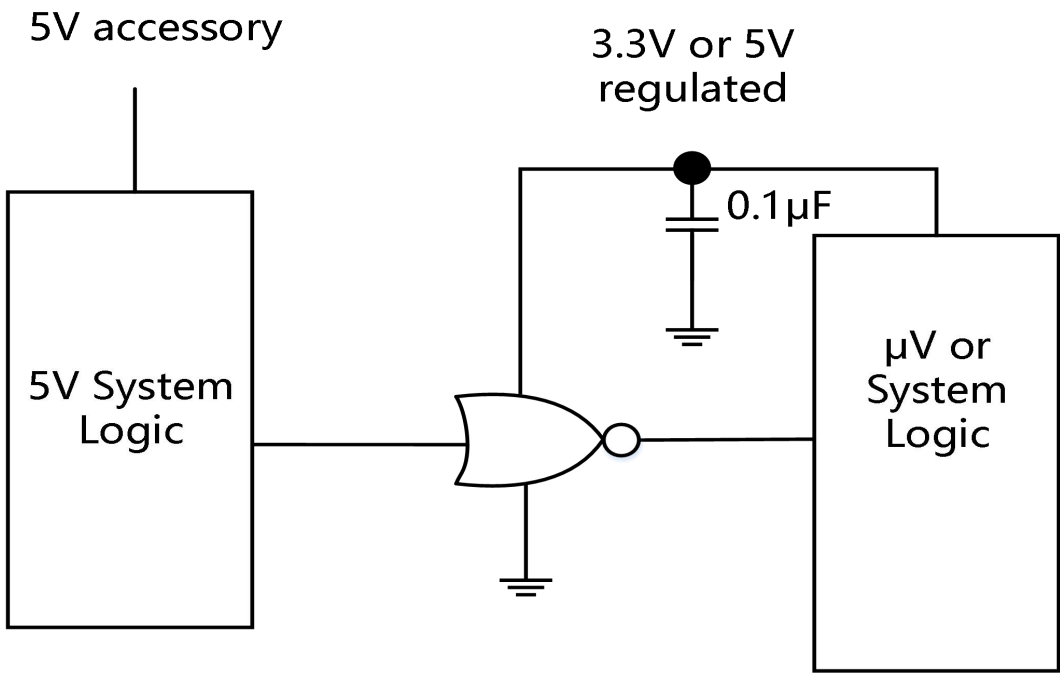


Figure 5. Typical Application Schematic

Package Outline Dimensions

SOT23-5

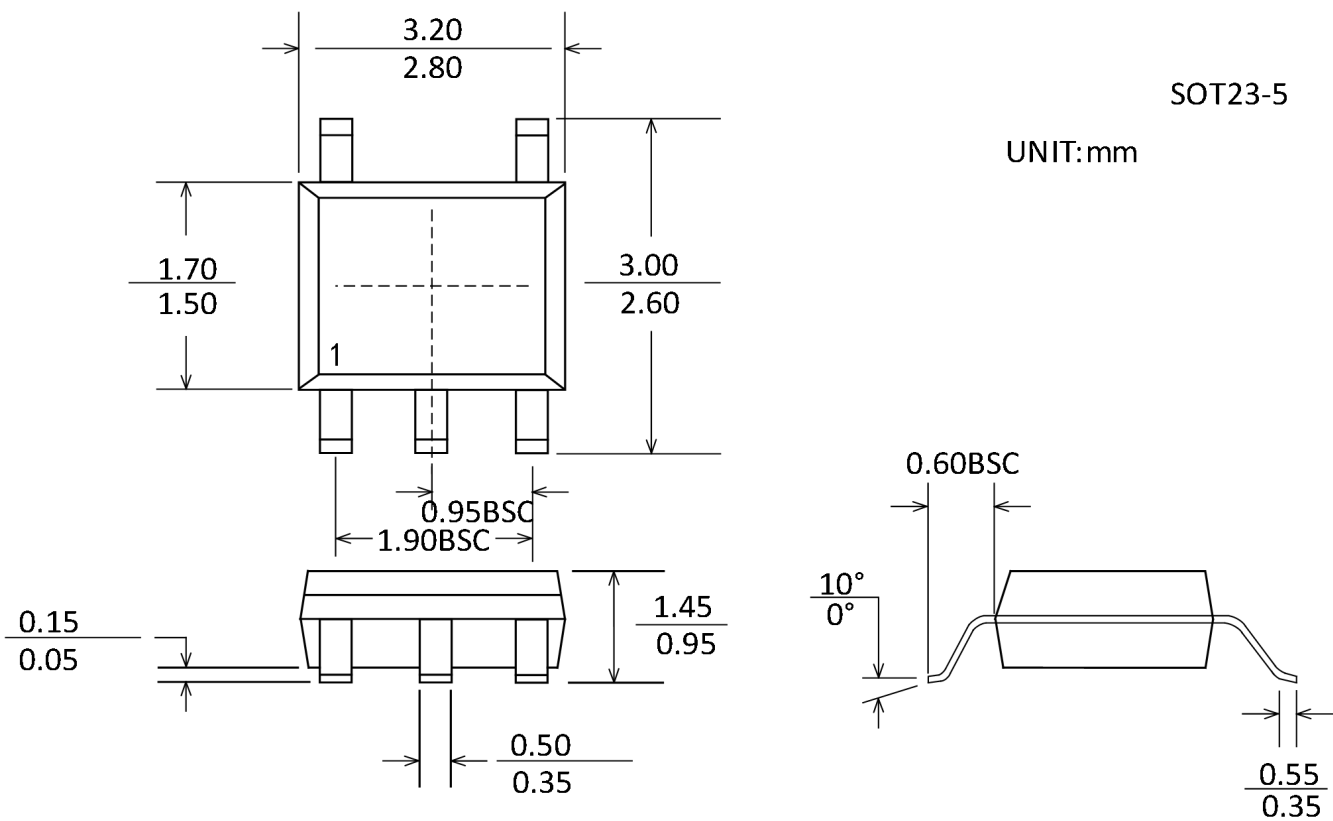


Figure 5. 5-Lead Small Outline Package [SOT23-5]

Package/Ordering Information

MODEL	TEMPERATURE	PACKAGE DESCRIPTION	PACKAGE OPTION
CD74AHC1G02AST	-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	