



CD74AHC1G08

Single-channel, dual-input, 2V to 5.5V high-speed AND 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
- Latch-Up Performance Exceeds 250 mA

Application ■■

- Sensors
- Cable Solutions
- E-Books
- Embedded PCs
- Barcode Scanners
- Fingerprint Biometrics
- Server Motherboard and PSU
- Software Defined Radios (SDR)
- Video Communications Systems
- Network-Attached Storage (NAS)
- Wireless Data Access Cards, Headsets,
- Keyboards, Mice, and LAN Cards
- Field Transmitter: Temperature or

Description ■■

The CD74AHC1G08 device is a single 2-input positive-AND gate. The device performs the Boolean function $Y = A \bullet B$ or $Y = \overline{A + B}$ in positive logic.

The CD74AHC1G08 are available in SOT23-5 packages.

Contents

Features.....

- 1 -

Application.....

- 1 -

Description.....

- 1 -

Pin Configurations.....

- 3 -

Pin Description.....

- 3 -

Functional Block diagram.....

- 3 -

Absolute Maximum Ratings.....

- 4 -

Operating Temperatures Range.....

- 4 -

Electrical Characteristics.....

- 5 -

Typical Electrical Characteristics.....

- 7 -

Typical Application.....

- 7 -

Package Outline Dimensions.....

- 8 -

Package/Ordering Information.....

- 9 -

Revision Log.....

- 10 -

Pin Configurations

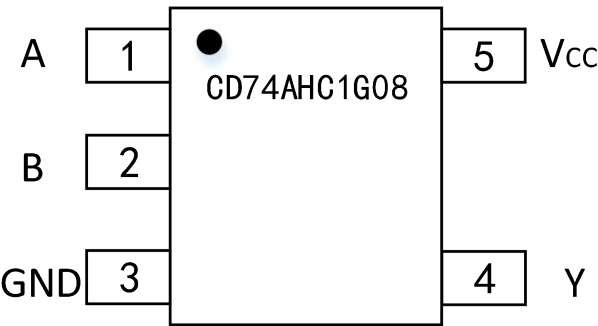


Figure 1. SOT23-5 Pin Configuration

Pin Description

Table 1. Pin description

Pin No.	Pin Name		Description
1	A	I	Data Input
2	B	I	Data Input
3	GND	--	Ground
4	Y	O	Data Output
5	VCC	--	Power

Functional Block diagram

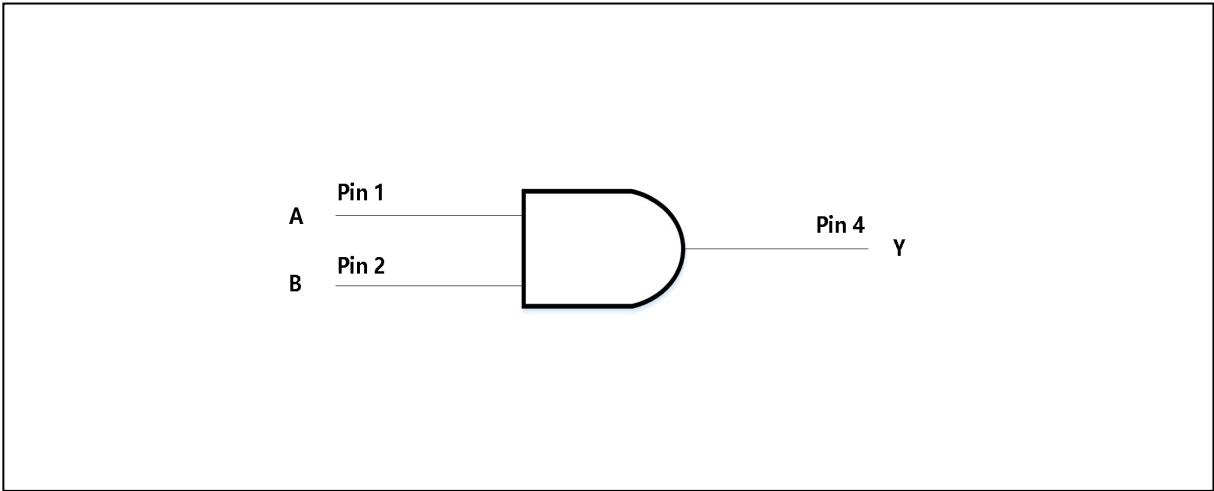


Figure 2. Functional Block Diagram

Table 2. Truth Table

Truth Table

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

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

Parameter	Range
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@VCC=3.3 v±0.3 v,20ns/v@VCC=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	--	--	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	--	4	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 or B	Y	CL = 15 pF	--	6.2	8.8	1	--	10.5	1	--	11	ns
t _{PHL}				--	6.2	8.8	1	--	10.5	1	--	11	
t _{PLH}	A or B	Y	CL = 15 pF	--	8.7	12.3	1	--	14	1	--	14.5	ns
t _{PHL}				--	8.7	12.3	1	--	14	1	--	14.5	

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	--	4.3	5.9	1	--	7	1	--	7.5	ns
t _{PHL}				--	4.3	5.9	1	--	7	1	--	7.5	
t _{PLH}	A or B	Y	CL = 50 pF	--	5.8	7.9	1	--	9	1	--	9.5	ns
t _{PHL}				--	5.8	7.9	1	--	9	1	--	9.5	

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

Parameter	Test Conditions	TYP	UNIT
Cpd Power dissipation capacitance	No load, f = 1 MHz	18	pF

Typical Electrical Characteristics

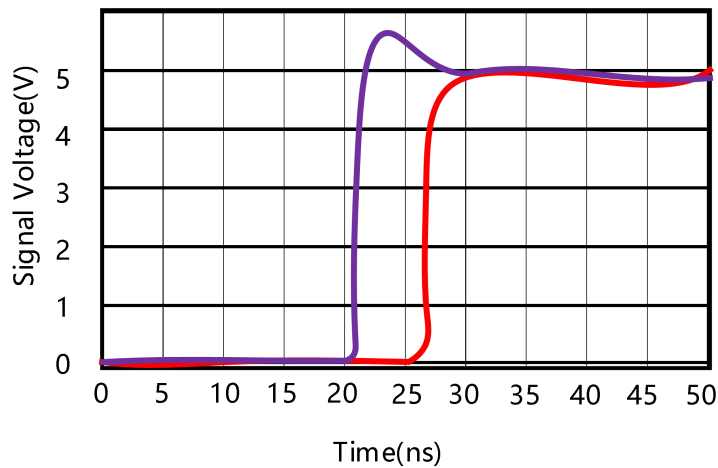


Figure 3.Response Time vs Output Voltage ($T_A = 25^{\circ}\text{C}$, $V_A = 5\text{ V}$)

Typical Application

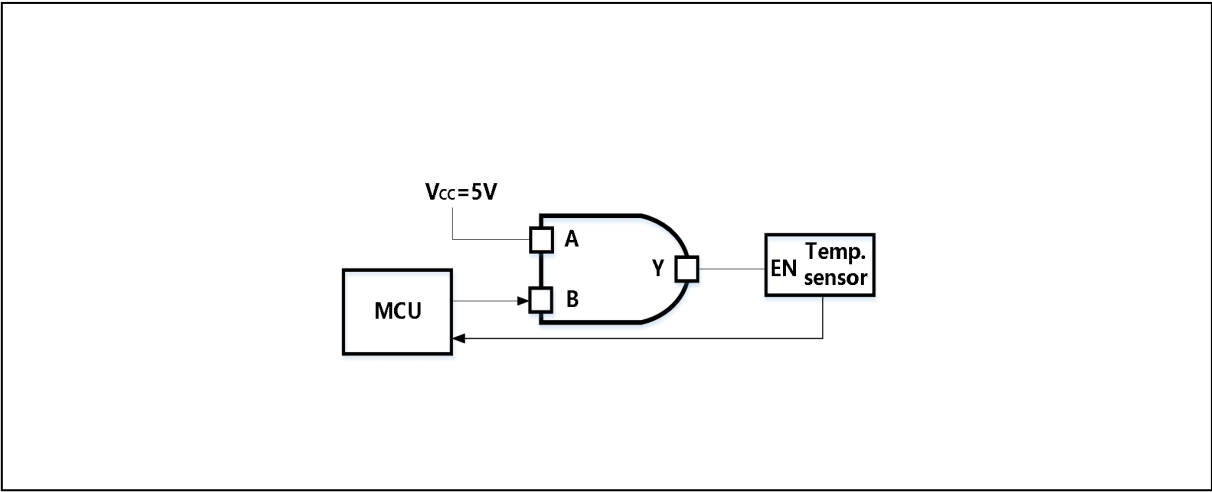
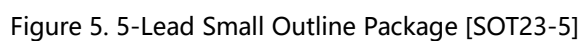


Figure 4. Power Sequencing Application

SOT23-5



Package/Ordering Information

MODEL	TEMPERATURE	PACKAGE DESCRIPTION	PACKAGE OPTION
CD74AHC1G08AST	-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	