



CD74AHC1G09

Single-channel, 2-input, 2V to 5.5V high-speed AND gate with open-drain output

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
- Latch-Up Performance Exceeds 250 mA

Application ■■

- Combine the power normal signals
- Enable digital signals

Description ■■

The CD74AHC1G09 is a single 2-input positive-AND gate with an open drain output configuration. The device performs the Boolean logic $Y = A \bullet B$ or $Y = \overline{A + B}$ in positive logic. The CD74AHC1G09 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

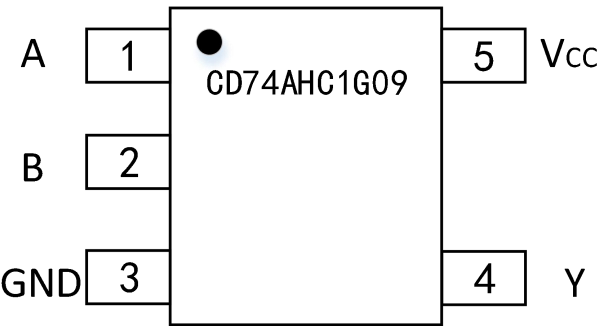


Figure 1. SOT23-5 Pin Configuration

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

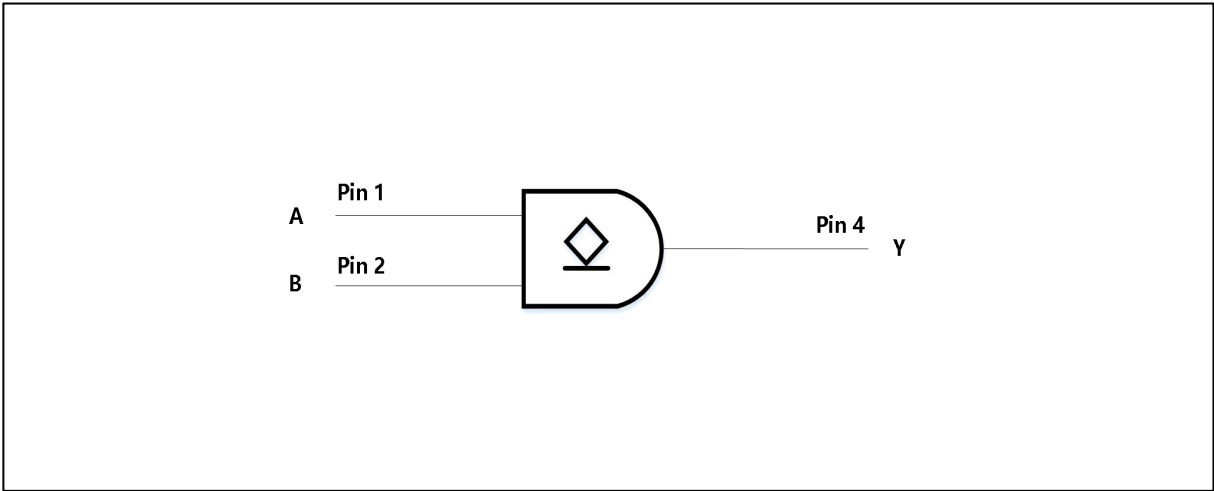


Figure 2. Functional Block Diagram

Table 2. Truth Table

Truth Table

Inputs		Output Y
A	B	
H	H	H(Z)
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})	±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)	-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 _{PD}	A or B	Y	CL = 15 pF	--	3.6	7	1	--	8	1	--	8.5	ns
t _{PD}	A or B	Y	CL = 50 pF	--	6.5	11	1.5	--	12	1.5	--	12.5	ns

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 _{PD}	A or B	Y	CL = 15 pF	--	2.5	5	1	--	6	1	--	6.5	ns
t _{PD}	A or B	Y	CL = 50 pF	--	4.6	7.5	1.5	--	8	1.5	--	8.5	ns

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	5	pF

Typical Electrical Characteristics

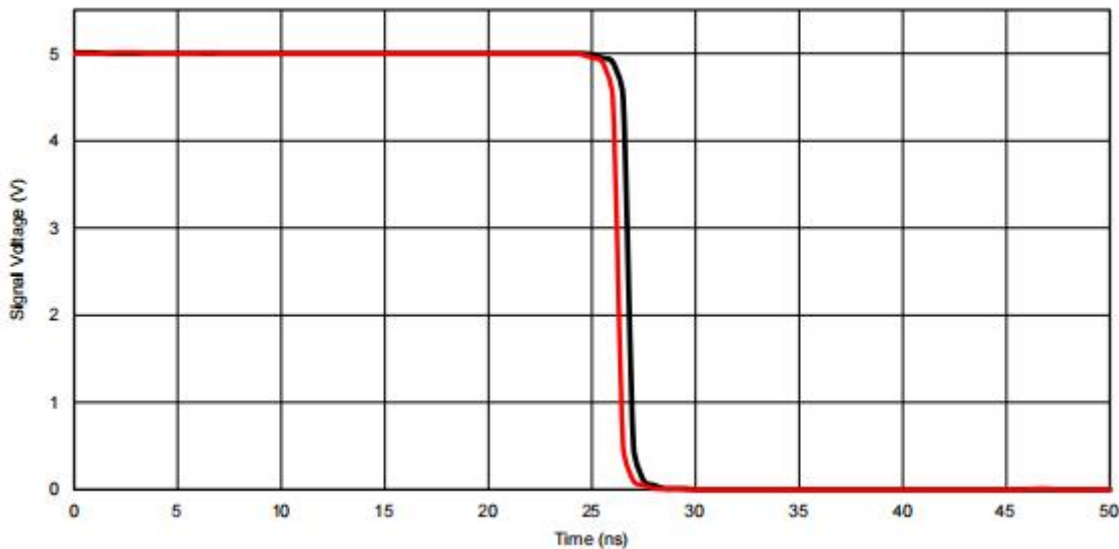


Figure 3. T_{PD} Across V_{CC} at 25°C

Typical Application

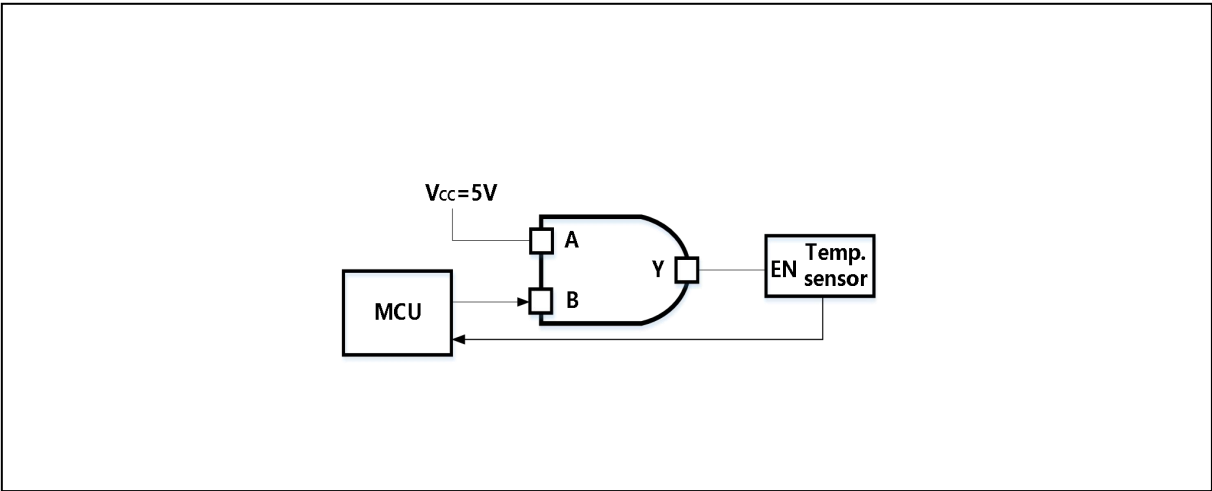


Figure 4. Power Sequencing Application

Package Outline Dimensions

SOT23-5

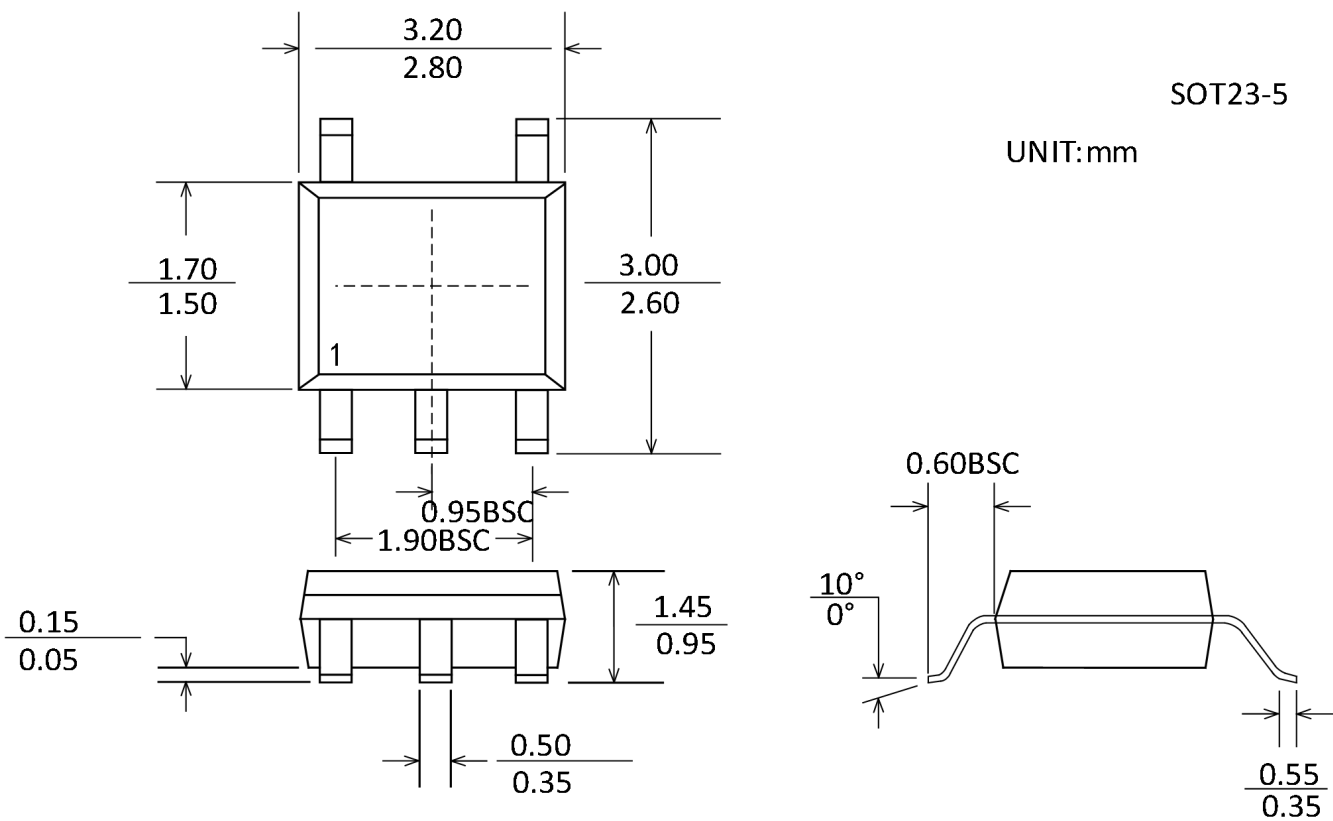


Figure 5. 5-Lead Small Outline Package [SOT23-5]

Package/Ordering Information

MODEL	TEMPERATURE	PACKAGE DESCRIPTION	PACKAGE OPTION
CD74AHC1G09AST	-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	