



CD74AHC1G125

Single-channel 2V to 5.5V Buffer with Tri-State Output

Version: Rev 1.0.0 Date: 2025-6-25

Features ■■

- Operating Range 2 V to 5.5 V
- Maximum t_{pd} of 8 ns at 5 V
- Low Power Consumption, 10- μ A Maximum I_{CC}
- ± 8 -mA Output Drive at 5 V

Application ■■

- Projectors
- TVs
- Servers
- Motor Controls: AC Induction
- Patient Monitoring
- Electronic Points of Sale

Description ■■

The CD74AHC1G125 device is a single bus buffer gate/line driver with 3-state output. The output is disabled when the output-enable (OE) input is high. When OE is low, true data is passed from the A input to the Y output.

The CD74AHC1G125 are available in SOT23-5 packages.

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Pin Configurations

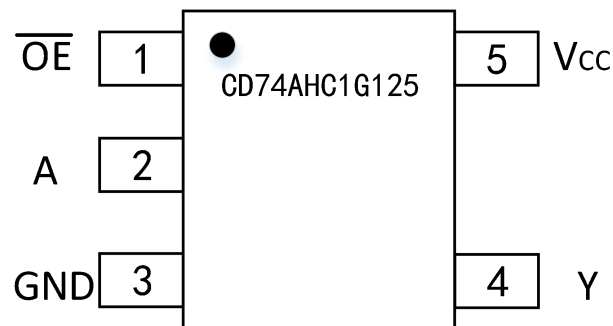


Figure 1. SOT23-5 Pin Configuration

Pin Description

Table 1. Pin description

Pin No.	Pin Name		Description
1	$\overline{\text{OE}}$	I	Output Enable
2	A	I	Input A
3	GND	--	Ground Pin
4	Y	O	Output Y
5	VCC	--	Power Pin

Functional Block diagram

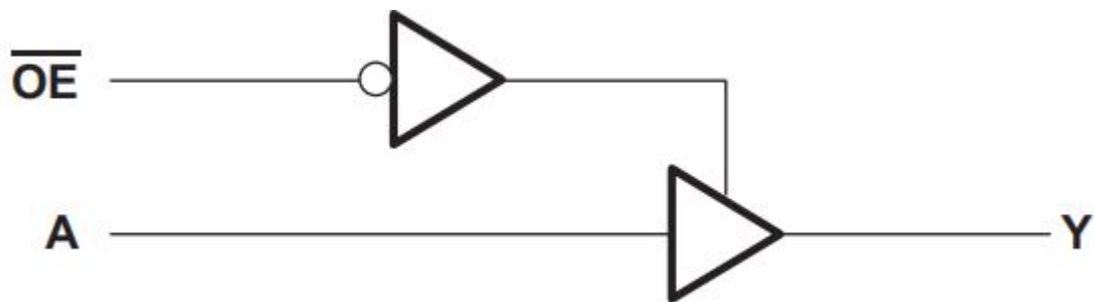


Figure 2. Functional Block Diagram

Table 2. Truth Table

Truth Table

Inputs		Output Y
$\overline{\text{OE}}$	A	
L	H	H
L	L	L
H	X	Z

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})	-40°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	-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	--	--	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 _{OZ}	--	--	±0.25	--	--	±2.5	VI = VCC or GND,V _{CC} = 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
Co	--	10	--	--	--	--	VI = VCC or GND,V _{CC} = 5.5V	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			−55° C to +125° C			UNIT
				Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	
Switching Characteristics													
t _{PLH}	A	Y	CL = 15 pF	--	5.6	8	1	--	9.5	1	--	10.5	ns
t _{PHL}				--	5.6	8	1	--	9.5	1	--	10.5	
t _{PZH}	OE	Y	CL = 15 pF	--	5.4	8	1	--	9.5	1	--	10.5	ns
t _{PZL}				--	5.4	8	1	--	9.5	1	--	10.5	
t _{PHZ}	OE	Y	CL = 15 pF	--	7	9.7	1	--	11.5	1	--	12.5	ns
t _{PLZ}				--	7	9.7	1	--	11.5	1	--	12.5	
t _{PLH}	A	Y	CL = 50 pF	--	8.1	11.5	1	--	13	1	--	14	ns
t _{PHL}				--	8.1	11.5	1	--	13	1	--	14	
t _{PZH}	OE	Y	CL = 50 pF	--	7.9	11.5	1	--	13	1	--	14	ns
t _{PZL}				--	7.9	11.5	1	--	13	1	--	14	
t _{PHZ}	OE	Y	CL = 50 pF	--	9.5	13.2	1	--	15	1	--	16	ns
t _{PLZ}				--	9.5	13.2	1	--	15	1	--	16	

Switching Characteristics, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$; over recommended operating free-air temperature range, $V_{CC} = 5\text{ V} \pm 0.5\text{ V}$ (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	--	3.8	5.5	1	--	6.5	1	--	7	ns
t _{PHL}				--	3.8	5.5	1	--	6.5	1	--	7	
t _{PZH}	OE	Y	CL = 15 pF	--	3.6	5.1	1	--	6	1	--	6.5	ns
t _{PZL}				--	3.6	5.1	1	--	6	1	--	6.5	
t _{PHZ}	OE	Y	CL = 15 pF	--	4.6	6.8	1	--	8	1	--	8.5	ns
t _{PLZ}				--	4.6	6.8	1	--	8	1	--	8.5	
t _{PLH}	A	Y	CL = 50 pF	--	5.3	7.5	1	--	8.5	1	--	9.5	ns
t _{PHL}				--	5.3	7.5	1	--	8.5	1	--	9.5	
t _{PZH}	OE	Y	CL = 50 pF	--	5.1	7.1	1	--	8	1	--	9	ns
t _{PZL}				--	5.1	7.1	1	--	8	1	--	9	

t _{PHZ}	OE	Y	CL = 50 pF	--	6.1	8.8	1	--	10	1	--	11	ns
t _{PLZ}				--	6.1	8.8	1	--	10	1	--	11	

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

Parameter	Test Conditions	TYP	UNIT
Cpd Power dissipation capacitance	No load, f = 1 MHz	14	pF

Typical Electrical Characteristics

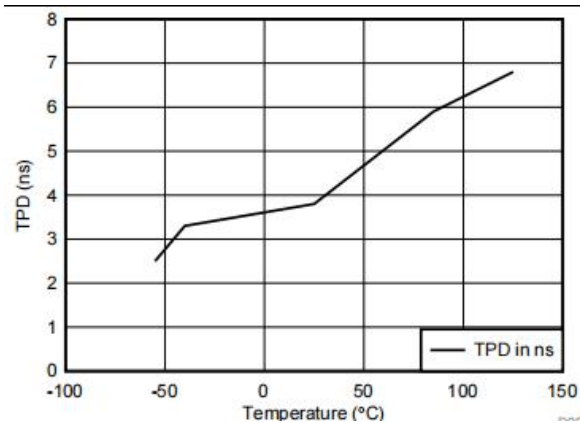


Figure 3.TPD vs Temperature

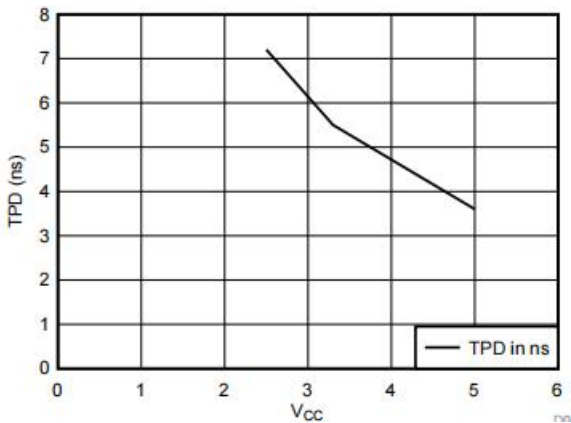


Figure 3.TPD vs VCC at 25°C

Typical Application

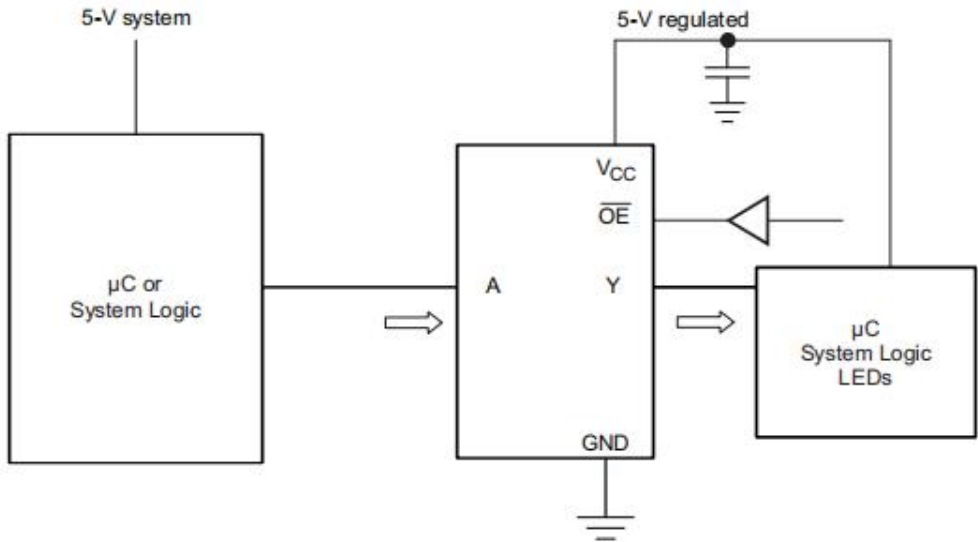


Figure 5. Typical Applicatio

Package Outline Dimensions

SOT23-5

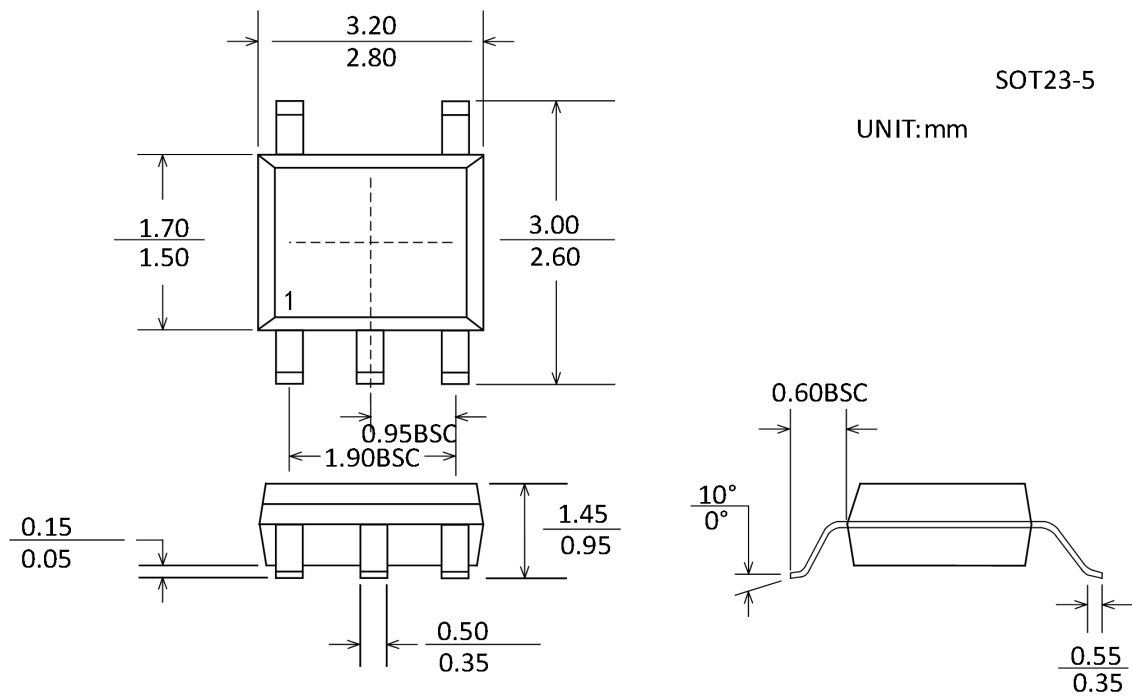


Figure 5.

5-Lead Small Outline Package [SOT23-5]

Package/Ordering Information

MODEL	TEMPERATURE	PACKAGE DESCRIPTION	PACKAGE OPTION
CD74AHC1G125AST	-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	