

Features

- Operation Voltage Range: 4.5~5.5V
- Low Power Dissipation: $I_{CC} = 1\mu A$ (Max.) @25°C
- $\pm 8mA$ output drive at 5V
- ESD Protection Exceeds JESD 22
 - 2000-V Human-Body Model (A114-A)
 - 200-V Machine Model (A115-A)
 - 1000-V Charged-Device Model (C101)

General Description

The SN74AHCT1G125DBVR-TP is a single bus buffer gate with 3-state output controlled by enable input ($\overline{OE}$). When $\overline{OE}$ is HIGH, the output is disabled.

Applications

- Motor control: Communication induction
- Graphics card
- Advanced Driver Assistance Systems (ADAS)
- Motor Drive&Control
- DLP positive projection system
- Server motherboard

Logic Diagram

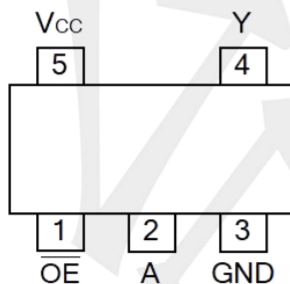


Logic symbol



IEC logic symbol

Pin Configuratio



SOT23-5

Function Table

INPUT		OUTPUT
$\overline{OE}$	A	Y
L	L	L
L	H	H
H	X	Z

ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified) (Note 2)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{CC}	-0.5 ~ 7	V
Input Voltage	V _{IN}	-0.5 ~ 7	V
Output Voltage	V _{OUT}	-0.5 ~ V _{CC} +0.5	V
Input Clamp Current	I _{IK}	-20	mA
Output Clamp Current	I _{OK}	±20	mA
Output Current	I _{OUT}	±25	mA
V _{CC} or GND Current	I _{CC}	±50	mA
Storage Temperature	T _{STG}	-65 ~ +150	°C

Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

STATIC CHARACTERISTICS (Unless otherwise specified)

PARAMETER		SYMBOL	TEST CONDITIONS	TA=25°C			TA=-40°C~+125°C			UNIT
				MIN	TYP	MAX	MIN	TYP	MAX	
Input Voltage	High-Level	V _{IH}	V _{CC} =4.5V~5.5V	2	--	--	2	--	--	V
	Low-Level	V _{IL}	V _{CC} =4.5V~5.5V	--	--	0.8	--	--	0.8	V
Output Voltage	High-Level	V _{OH}	V _{CC} =4.5V, I _{OH} =-50μA	4.4	4.5	--	--	4.4	--	V
			V _{CC} =4.5V, I _{OH} =-8mA	3.94	--	--	--	3.7	--	V
	Low-Level	V _{OL}	V _{CC} =4.5V, I _{OL} =50μA	--	--	0.1	--	--	0.1	V
			V _{CC} =4.5V, I _{OL} =8mA	--	--	0.36	--	--	0.55	V
Input Leakage Current		I _{I(LEAK)}	V _{CC} =0V~5.5V, V _{IN} =V _{CC} or GND	--	--	0.1	--	--	2	μA
Output Current, OFF-state		I _{OZ}	V _{CC} =5.5V, V _{OUT} =V _{CC} or GND	--	--	0.25	--	--	±10	μA
Quiescent Supply Current		I _Q	V _{CC} =5.5V, V _{IN} =V _{CC} or GND I _{OUT} =0	--	--	1	--	--	40	μA
Additional Quiescent Supply Current		ΔI _{CC}	V _{CC} =5.5V, One input at 3.4V, Other input at V _{CC} or GND	--	--	1.35	--	--	1.5	mA

DYNAMIC CHARACTERISTICS

(Input: $t_R, t_F \leq 3\text{ns}$; $\text{PRR} \leq 1\text{MHz}$, Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A = 25^\circ\text{C}$			$T_A = -40^\circ\text{C} \sim +125^\circ\text{C}$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from A to Y	t_{PLH}	$V_{CC} = 5V \pm 0.5V, C_L = 15\text{pF}$	--	4.8	7	1	--	9	ns
	t_{PHL}		--	4.8	7	1	--	9	ns
Turn-on time OE to Y	t_{PZH}		--	5.1	7.5	1	--	9	ns
	t_{PZL}		--	5.1	7.5	1	--	9	ns
Turn-off time OE to Y	t_{PHZ}		--	4.1	6.8	1	--	8.5	ns
	t_{PLZ}		--	4.1	6.8	1	--	8.5	ns
Propagation delay from A to Y	t_{PLH}	$V_{CC} = 5V \pm 0.5V, C_L = 50\text{pF}$	--	6.1	9	1	--	10	ns
	t_{PHL}		--	6.1	9	1	--	10	ns
Turn-on time OE to Y	t_{PZH}		--	6.2	9	1	--	10	ns
	t_{PZL}		--	6.2	9	1	--	10	ns
Turn-off time OE to Y	t_{PHZ}		--	5.8	8.8	1	--	11	ns
	t_{PLZ}		--	5.8	8.8	1	--	11	ns

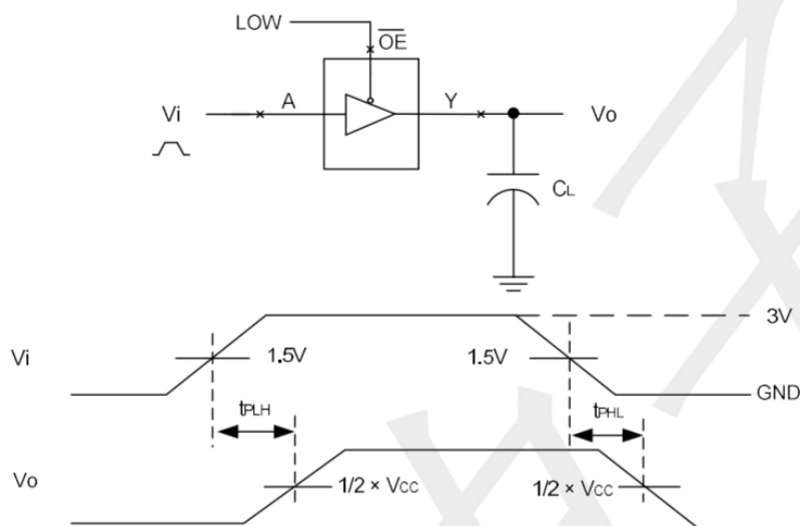
OPERATING CHARACTERISTICS ($T_A = 25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C_{IN}	$V_{CC} = 5V, V_{IN} = V_{CC}$ or GND	--	4	10	pF
Output Capacitance	C_{OUT}	$V_{CC} = 5V, V_{OUT} = V_{CC}$ or GND	--	10	--	pF
Power Dissipation Capacitance	C_{PD}	No load, $f = 1\text{MHz}, V_{CC} = 5V$	--	14	--	pF

RECOMMENDED OPERATING COMDITIONS

PARAMETER	SYMBOL	CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		4.5	--	5.5	V
Input Voltage	V_{IN}		0	--	5.5	V
Output Voltage	V_{OUT}		0	--	V_{CC}	V
Input Transition Rise or Fall Rate	$\Delta t / \Delta V$	$V_{CC} = 5.0 \pm 0.5V$	--	--	20	ns/V
Operating Temperature	T_A		-40	--	+125	$^\circ\text{C}$

TEST CIRCUIT AND WAVEFORMS



Note: C_L includes probe and jig capacitance.

Fig-1 Propagation delay from A to Y

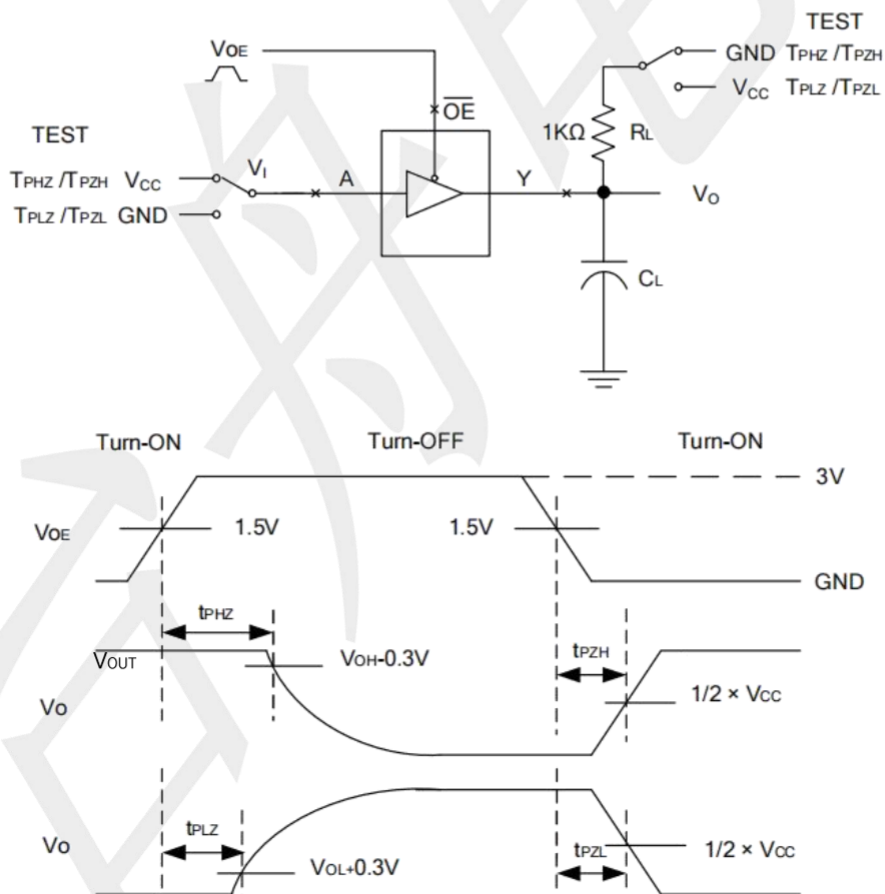
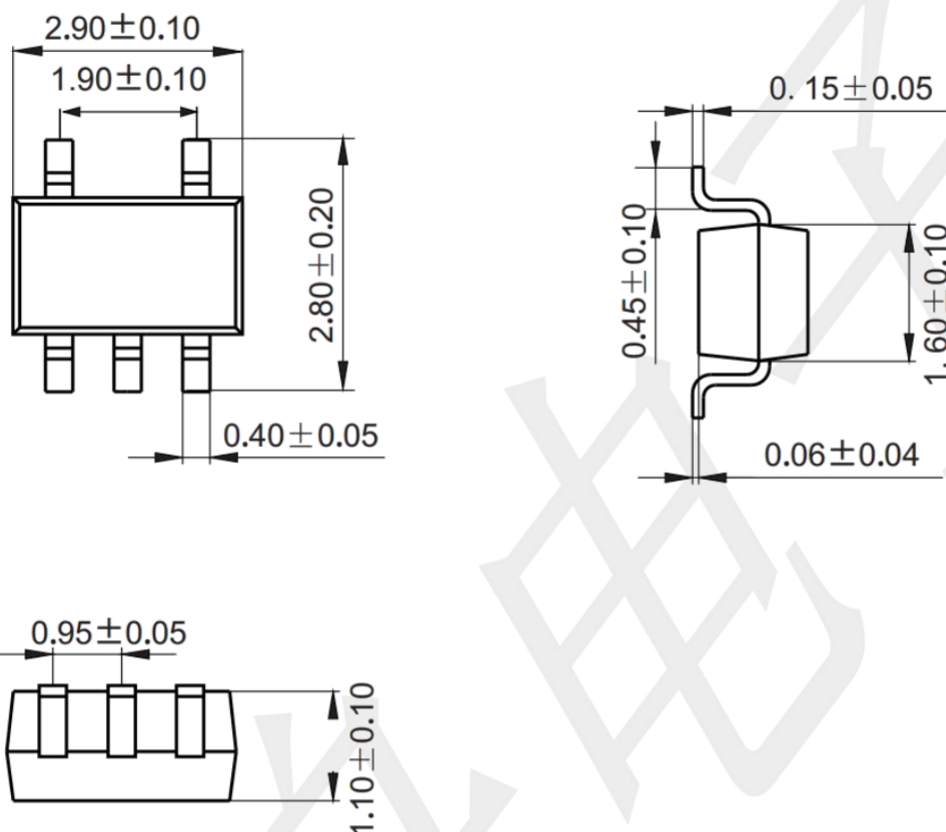


Fig-2 The turn-on and turn-off times.

Package information (Unit: mm)

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Mounting Pad Layout (Unit: mm)

