

# HD74LV1GT126A

Bus Buffer Gate with 3-state Output

# HITACHI

ADE-205-333E (Z)

6th. Edition  
Jan. 2002

## Description

The HD74LV1GT126A has a bus buffer gate with 3-state output in a 5 pin package. Output is disabled when the associated output enable (OE) input is low. To ensure the high impedance state during power up or power down, OE should be connected to  $V_{cc}$  through a pull-down resistor; the minimum value of the resistor is determined by the current sourcing capability of the driver. Low voltage and high speed operation is suitable for the battery powered products (e.g., notebook computers), and the low power consumption extends the battery life.

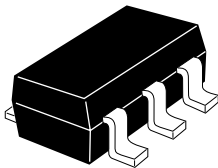
## Features

- The basic gate function is lined up as hitachi uni logic series.
- Supplied on emboss taping for high speed automatic mounting.
- TTL compatible input level.  
Supply voltage range : 4.5 to 5.5 V  
Operating temperature range :  $-40$  to  $+85^{\circ}\text{C}$
- All inputs  $V_{ih}$  (Max.) = 5.5 V (@  $V_{cc} = 0$  V to 5.5 V)  
All outputs  $V_o$  (Max.) = 5.5 V (@  $V_{cc} = 0$  V, Output : Z)
- Output current  $\pm 12$  mA (@  $V_{cc} = 4.5$  V to 5.5 V)
- All the logical input has hysteresis voltage for the slow transition.
- Package type

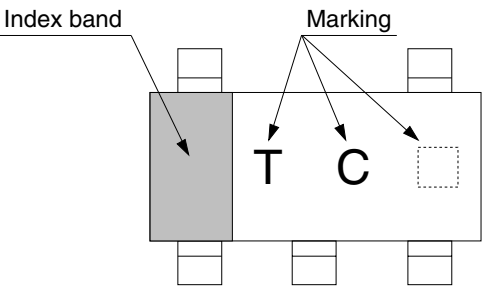
Package type	Package code	Package suffix	Taping code
CMPAK-5 pin	CMPAK-5	CM	E (3,000 pcs / Reel)
VSON-5 pin	TNP-5D	VS	E (3,000 pcs / Reel)


Outline and Article Indication

• HD74LV1GT126A

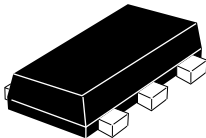


CMPAK-5

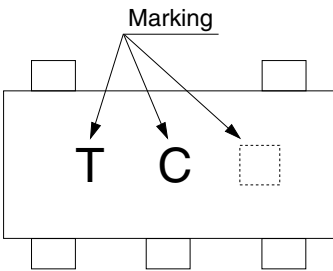


 = Control code  
( — or blank)

• HD74LV1GT126A



VSON-5



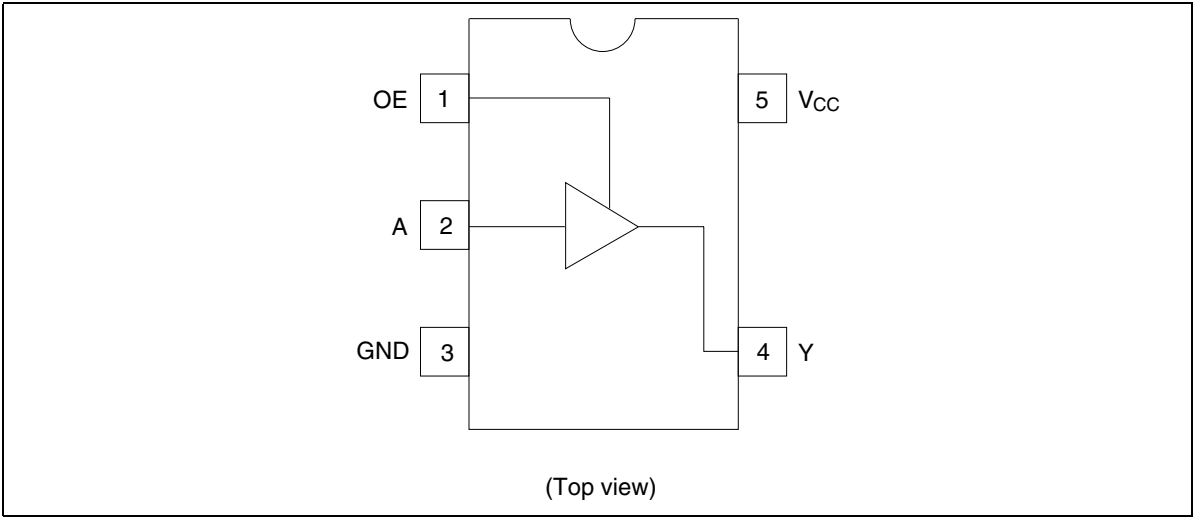
 = Control code

Function Table

Inputs		Output Y
OE	A	
H	H	H
H	L	L
L	X	Z

H : High level  
L : Low level  
X : Immaterial  
Z : High impedance

Pin Arrangement



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit	Test Conditions
Supply voltage range	$V_{CC}$	-0.5 to 7.0	V	
Input voltage range <sup>*1</sup>	$V_I$	-0.5 to 7.0	V	
Output voltage range <sup>*1,2</sup>	$V_O$	-0.5 to $V_{CC} + 0.5$ -0.5 to 7.0	V	Output : H or L $V_{CC}$ : OFF or Output : Z
Input clamp current	$I_{IK}$	-20	mA	$V_I < 0$
Output clamp current	$I_{OK}$	±50	mA	$V_O < 0$ or $V_O > V_{CC}$
Continuous output current	$I_O$	±25	mA	$V_O = 0$ to $V_{CC}$
Continuous current through $V_{CC}$ or GND	$I_{CC}$ or $I_{GND}$	±50	mA	
Maximum power dissipation at $T_a = 25^{\circ}\text{C}$ (in still air) <sup>*3</sup>	$P_T$	200	mW	
Storage temperature	$T_{stg}$	-65 to 150	°C	

- Notes:     The absolute maximum ratings are values which must not individually be exceeded, and furthermore no two of which may be realized at the same time.
1. The input and output voltage ratings may be exceeded if the input and output clamp-current ratings are observed.
  2. This value is limited to 5.5 V maximum.
  3. The maximum package power dissipation was calculated using a junction temperature of 150°C.

Recommended Operating Conditions

Item	Symbol	Min	Max	Unit	Conditions
Supply voltage range	$V_{CC}$	4.5	5.5	V	
Input voltage range	$V_I$	0	5.5	V	
Output voltage range	$V_O$	0 0	$V_{CC}$ 5.5	V	Output : Z
Output current	$I_{OH}$	—	12	mA	$V_{CC} = 4.5$ to $5.5$ V
	$I_{OL}$	—	-12	mA	$V_{CC} = 4.5$ to $5.5$ V
Input transition rise or fall rate	$\Delta t / \Delta v$	0	20	ns / V	$V_{CC} = 4.5$ to $5.5$ V
Operating free-air temperature	$T_a$	-40	85	°C	

Note:    Unused or floating inputs must be held high or low.

## Electrical Characteristic

- $T_a = -40$  to  $85^\circ\text{C}$

Item	Symbol	$V_{cc}$ (V) *	Min	Typ	Max	Unit	Test condition
Input voltage	$V_{IH}$	4.5 to 5.5	2.0	—	—	V	
	$V_{IL}$	4.5 to 5.5	—	—	0.8		
Hysteresis voltage	$V_H$	5.0	—	0.15	—	V	$V_T^+ - V_T^-$
Output voltage	$V_{OH}$	Min to Max	$V_{CC}-0.1$	—	—	V	$I_{OH} = -50\ \mu\text{A}$
		4.5	3.8	—	—		$I_{OH} = -12\ \text{mA}$
	$V_{OL}$	Min to Max	—	—	0.1		$I_{OL} = 50\ \mu\text{A}$
		4.5	—	—	0.55		$I_{OL} = 12\ \text{mA}$
Input current	$I_{IN}$	0 to 5.5	—	—	$\pm 1$	$\mu\text{A}$	$V_{IN} = 5.5\ \text{V}$ or GND
Quiescent supply current	$I_{CC}$	5.5	—	—	10	$\mu\text{A}$	$V_{IN} = V_{CC}$ or GND, $I_O = 0$
	$\Delta I_{CC}$	5.5	—	—	1.5	$\text{mA}$	One input $V_{IN} = 3.4\ \text{V}$ , other input $V_{CC}$ or GND
Output leakage current	$I_{OFF}$	0	—	—	5	$\mu\text{A}$	$V_{IN}$ or $V_O = 0$ to $5.5\ \text{V}$
Input capacitance	$C_{IN}$	5.0	—	3.0	—	$\text{pF}$	$V_{IN} = V_{CC}$ or GND

Note: For conditions shown as Min or Max, use the appropriate values under recommended operating conditions.

Switching Characteristics

- $V_{CC} = 5.0 \pm 0.5\text{ V}$

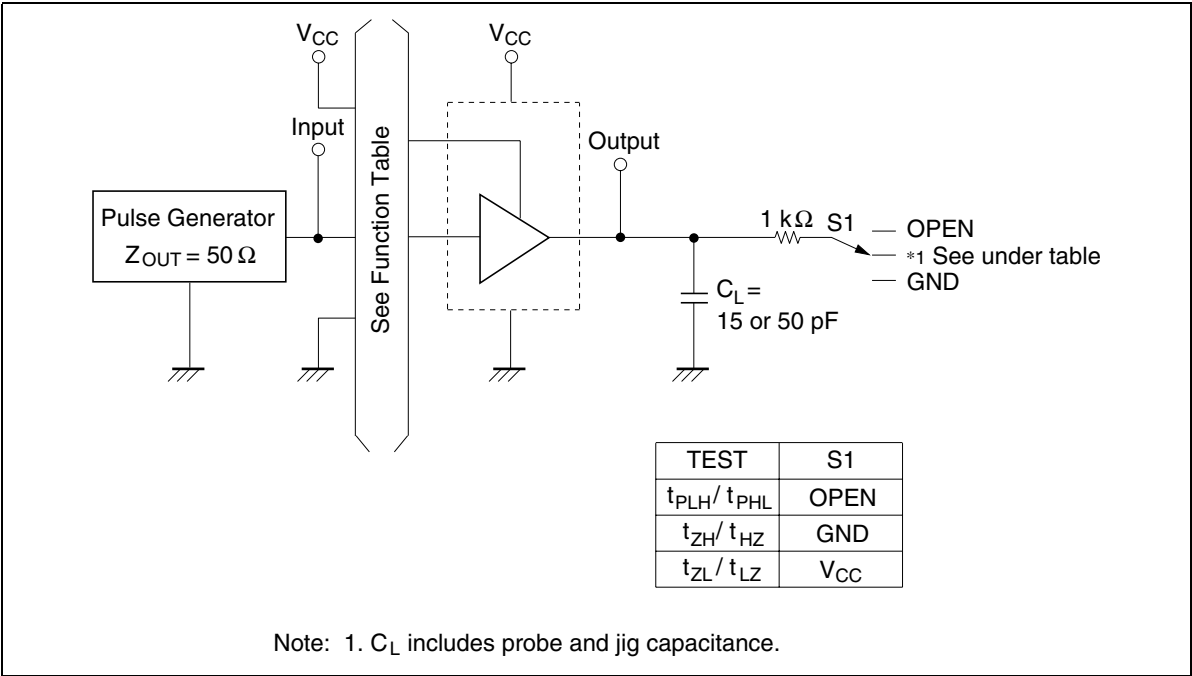
Item	Symbol	Ta = 25°C			Ta = -40 to 85°C		Unit	Test Conditions	FROM (Input)	TO (Output)
		Min	Typ	Max	Min	Max				
Propagation delay time	$t_{PLH}$	—	3.5	5.5	1.0	6.5	ns	$C_L = 15\text{ pF}$	A	Y
	$t_{PHL}$	—	4.6	7.5	1.0	8.5		$C_L = 50\text{ pF}$		
Enable time	$t_{ZH}$	—	3.6	5.1	1.0	6.0	ns	$C_L = 15\text{ pF}$	OE	Y
	$t_{ZL}$	—	4.6	7.1	1.0	8.0		$C_L = 50\text{ pF}$		
Disable time	$t_{HZ}$	—	3.3	6.8	1.0	8.0	ns	$C_L = 15\text{ pF}$	OE	Y
	$t_{LZ}$	—	4.3	8.8	1.0	10.0		$C_L = 50\text{ pF}$		

Operating Characteristics

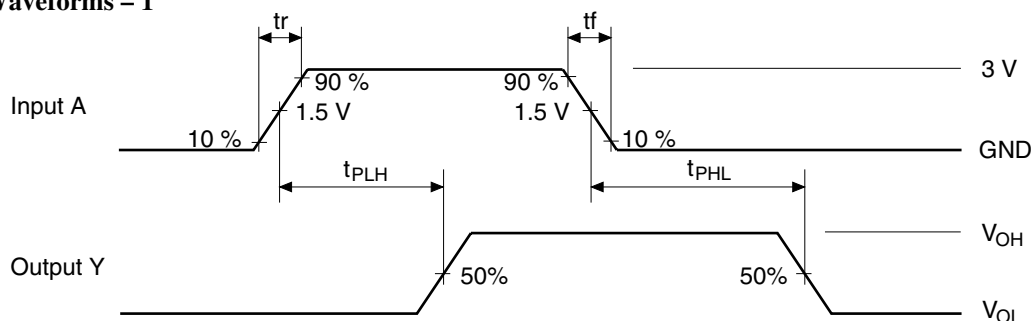
- $C_L = 50\text{ pF}$

Item	Symbol	$V_{CC}$ (V)	Ta = 25°C			Unit	Test Conditions
			Min	Typ	Max		
Power dissipation capacitance	$C_{PD}$	5.0	—	11.5	—	pF	f = 10 MHz

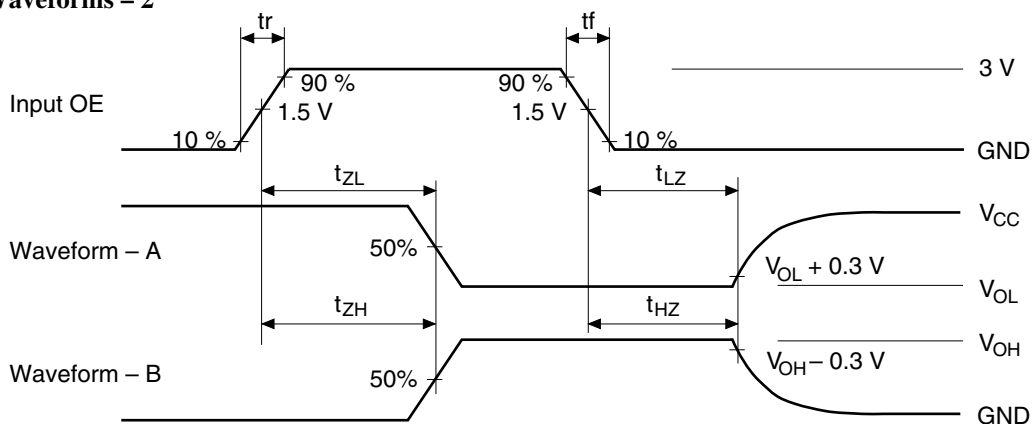
Test Circuit



## • Waveforms – 1



## • Waveforms – 2



Notes: 1.  $t_r \leq 3 \text{ ns}$ ,  $t_f \leq 3 \text{ ns}$

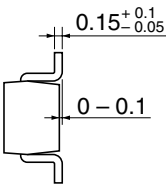
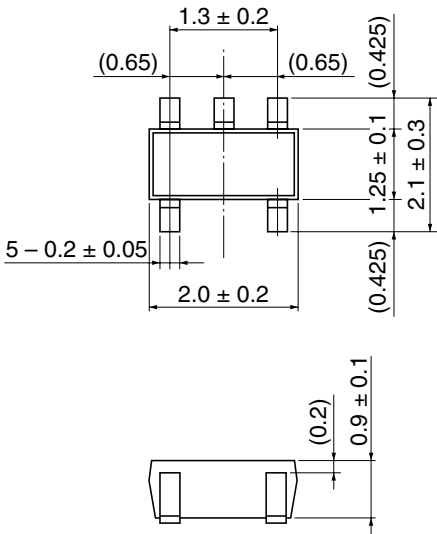
2. Input waveform :  $\text{PRR} \leq 1 \text{ MHz}$ , duty cycle 50%

3. Waveform – A is for an output with internal conditions such that the output is low except when disabled by the output control.

4. Waveform – B is for an output with internal conditions such that the output is high except when disabled by the output control.

Package Dimensions

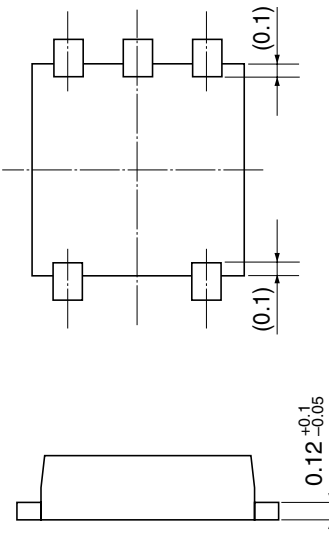
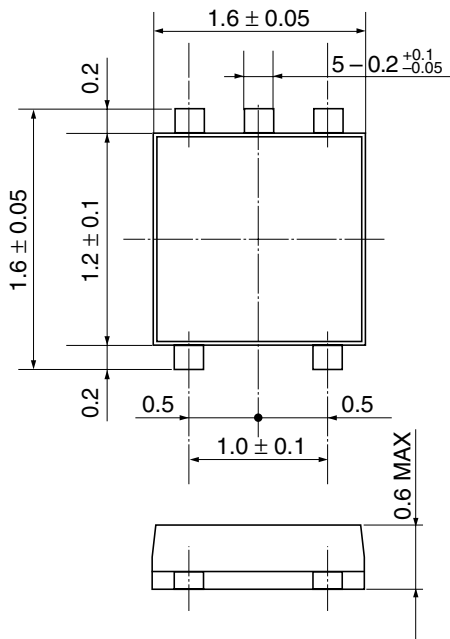
As of July, 2001  
Unit: mm



Hitachi Code	CMPAK-5(T)
JEDEC	—
JEITA	Conforms
Mass (reference value)	0.006 g



As of July, 2001  
Unit: mm



Hitachi Code	TNP-5D
JEDEC	—
JEITA	—
Mass (reference value)	0.002 g

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