

MITSUBISHI LSTTLs M74LS367AP

HEX BUS DRIVERS WITH 3-STATE OUTPUTS

DESCRIPTION

The M74LS367AP is a semiconductor integrated circuit containing 6 buffers with 3-state output and is provided with output control inputs $\overline{1OC}$ and $\overline{2OC}$, which are common to 4 circuits and 2 circuits, respectively.

FEATURES

- Provided with output control inputs common to 4 circuits and 2 circuits.
- High fan-out
- High breakdown input voltage
- Wide operating temperature range ($T_a = -20 \sim +75^\circ\text{C}$)

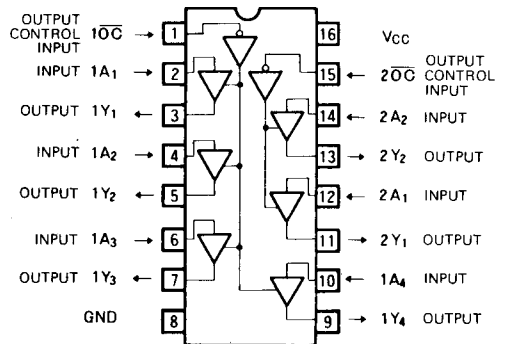
APPLICATION

General purpose, for use in industrial and consumer equipment.

FUNCTIONAL DESCRIPTION

When \overline{OC} is low, high appears in the output Y if input A is high, and low appears if A is low. When \overline{OC} is high, Y is put in the high-impedance state irrespective of the status of A. For this reason, this device is most suitable for use as a bus line driver.

PIN CONFIGURATION (TOP VIEW)



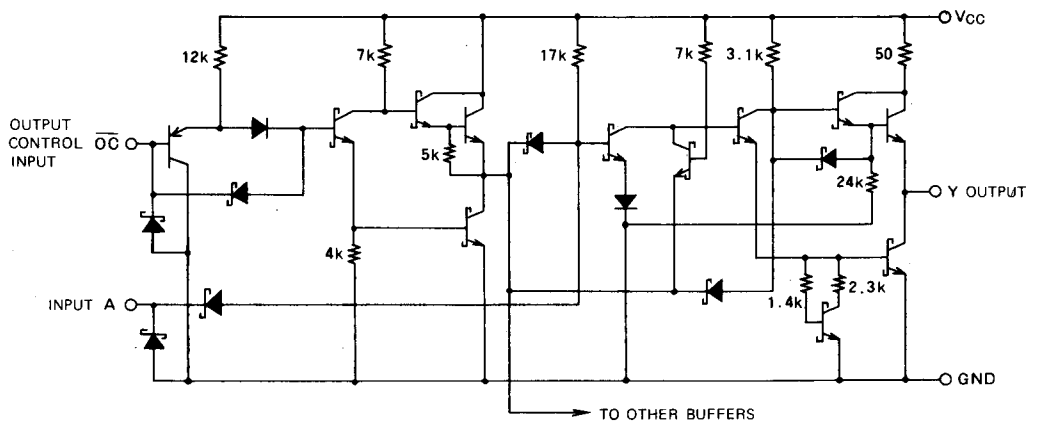
Outline 16P4

FUNCTION TABLE (Note 1)

\overline{OC}	A	Y
L	L	L
L	H	H
H	X	Z

Note 1: X : irrelevant
Z : high-impedance

CIRCUIT SCHEMATIC (EACH BUFFER)



UNIT : Ω

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ABSOLUTE MAXIMUM RATINGS ($T_a = -20 \sim +75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Conditions	Limits	Unit
V_{CC}	Supply voltage		$-0.5 \sim +7$	V
V_I	Input voltage		$-0.5 \sim +15$	V
V_O	Output voltage	Off-state	$-0.5 \sim +5.5$	V
T_{opr}	Operating free-air ambient temperature range		$-20 \sim +75$	$^\circ\text{C}$
T_{stg}	Storage temperature range		$-65 \sim +150$	$^\circ\text{C}$

RECOMMENDED OPERATING CONDITIONS ($T_a = -20 \sim +75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Limits			Unit
		Min	Typ	Max	
V_{CC}	Supply voltage	4.75	5	5.25	V
I_{OH}	High-level output current	$V_{OH} \geq 2.4\text{V}$	0	-2.6	mA
I_{OL}	Low-level output current	$V_{OL} \leq 0.4\text{V}$	0	12	mA
		$V_{OL} \leq 0.5\text{V}$	0	24	mA

ELECTRICAL CHARACTERISTICS ($T_a = -20 \sim +75^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ*	Max	
V_{IH}	High-level input voltage		2			V
V_{IL}	Low-level input voltage				0.8	V
V_{IC}	Input clamp voltage	$V_{CC} = 4.75\text{V}$, $I_{IC} = -18\text{mA}$			-1.5	V
V_{OH}	High-level output voltage	$V_{CC} = 4.75\text{V}$, $V_I = 0.8\text{V}$ $V_I = 2\text{V}$, $I_{OH} = -2.6\text{mA}$	2.4	3.1		V
V_{OL}	Low-level output voltage	$V_{CC} = 4.75\text{V}$ $V_I = 0.8\text{V}$		0.25	0.4	V
		$I_{OL} = 12\text{mA}$ $I_{OL} = 24\text{mA}$		0.35	0.5	V
I_{OZH}	Off-state high-level output current	$V_{CC} = 5.25\text{V}$, $V_I(\overline{OC}) = 2\text{V}$, $V_O = 2.4\text{V}$			20	μA
I_{OZL}	Off-state low-level output current	$V_{CC} = 5.25\text{V}$, $V_I(\overline{OC}) = 2\text{V}$, $V_O = 0.4\text{V}$			-20	μA
I_{IH}	High-level input current	$V_{CC} = 5.25\text{V}$, $V_I = 2.7\text{V}$			20	μA
		$V_{CC} = 5.25\text{V}$, $V_I = 10\text{V}$			0.1	mA
I_{IL}	Low-level input current	\overline{OC} $V_{CC} = 5.25\text{V}$, $V_I = 0.4\text{V}$			-0.4	mA
		A $V_{CC} = 5.25\text{V}$	$V_I(\overline{OC}) = 0.4\text{V}$ $V_I = 0.4\text{V}$ $V_I(\overline{OC}) = 2\text{V}$ $V_I = 0.5\text{V}$			-0.4
I_{OS}	Short-circuit output current	$V_{CC} = 5.25\text{V}$, $V_O = 0\text{V}$	-40		-225	mA
I_{CC}	Supply current	$V_{CC} = 5.25\text{V}$, $V_I = 0\text{V}$, $V_I(\overline{OC}) = 4.5\text{V}$		14	24	mA

* : All typical values are at $V_{CC} = 5\text{V}$, $T_a = 25^\circ\text{C}$.

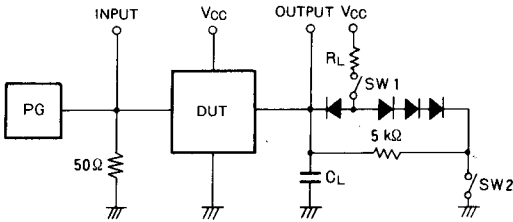
Note 2: All measurements should be done quickly, and not more than one output should be shorted at a time.

SWITCHING CHARACTERISTICS ($V_{CC} = 5\text{V}$, $T_a = 25^\circ\text{C}$, unless otherwise noted)

Symbol	Parameter	Test conditions	Limits			Unit
			Min	Typ	Max	
t_{PLH}	Low-to-high-level, high-to-low-level output propagation time, from input A to output Y	$C_L = 45\text{pF}$ (Note 3)		7	16	ns
t_{PHL}				10	22	ns
t_{PZH}	Output enable time to high-level	$R_L = 667\Omega$, $C_L = 45\text{pF}$ (Note 3)		13	35	ns
t_{PZL}	Output enable time to low-level	$R_L = 667\Omega$, $C_L = 45\text{pF}$ (Note 3)		15	40	ns
t_{PHZ}	Output disable time from high-level	$R_L = 667\Omega$, $C_L = 5\text{pF}$ (Note 3)		13	30	ns
t_{PLZ}	Output disable time from low-level	$R_L = 667\Omega$, $C_L = 5\text{pF}$ (Note 3)		16	35	ns

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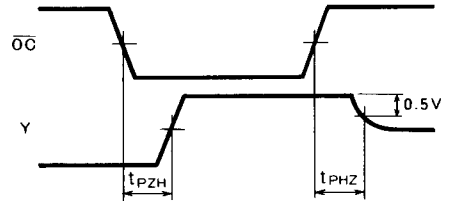
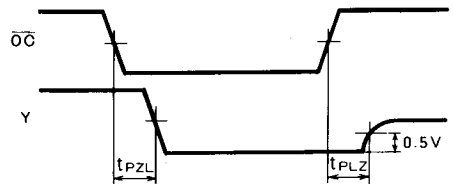
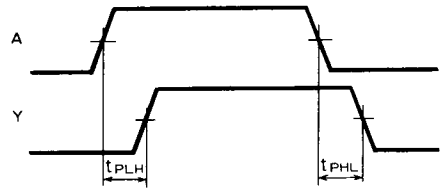
Note 3: Measurement circuit



Symbol	SW 1	SW 2
t_{PZH}	Open	Closed
t_{PZL}	Closed	Open
t_{PLZ}	Closed	Closed
t_{PHZ}	Closed	Closed

- (1) The pulse generator (PG) has the following characteristics:
 $PRR = 1\text{MHz}$, $t_r = 6\text{ns}$, $t_f = 6\text{ns}$, $t_w = 500\text{ns}$,
 $V_p = 3V_{p.p.}$, $Z_o = 50\Omega$
- (2) All diodes are switching diodes ($t_{rr} \leq 4\text{ns}$)
- (3) C_L includes probe and jig capacitance.

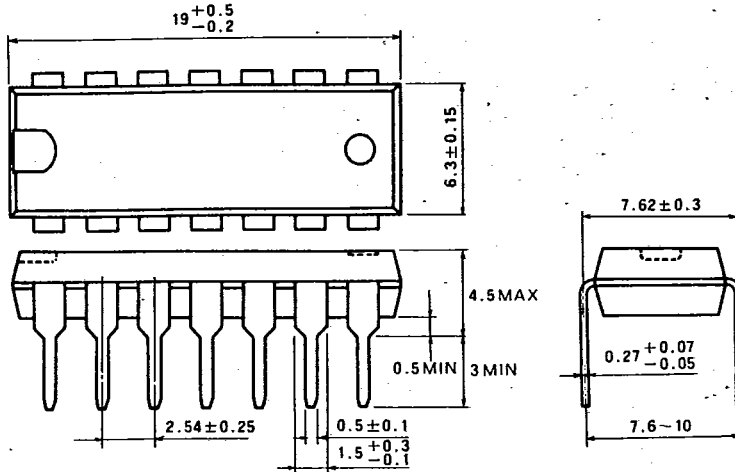
TIMING DIAGRAM (Reference level = 1.3V)



T-90-20

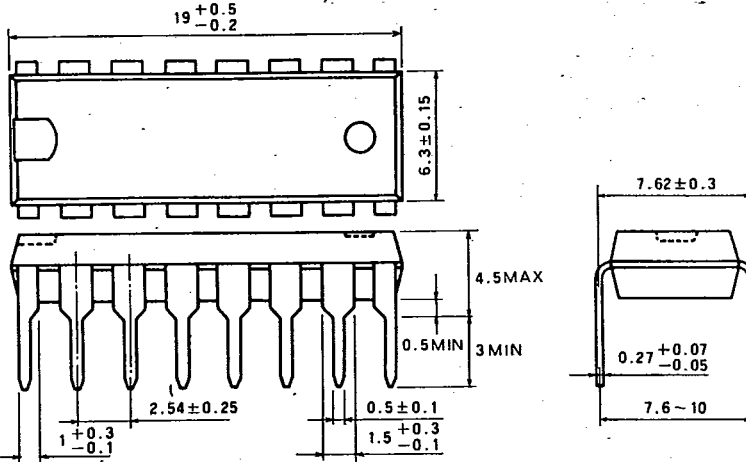
TYPE 14P4 14-PIN MOLDED PLASTIC DIL

Dimension in mm



TYPE 16P4 16-PIN MOLDED PLASTIC DIL

Dimension in mm



TYPE 20P4 20-PIN MOLDED PLASTIC DIL

Dimension in mm

