

HD74LS257 • Quadruple 2-line-to-1-line Data Selectors/Multiplexers (with non inverted 3-state outputs)

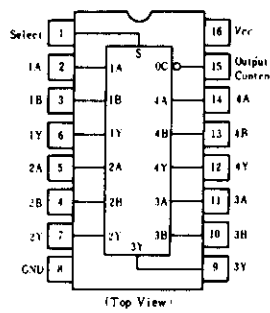
This multiplexer features three-state outputs that can interface directly with and drive data lines of bus-organized systems. With all but one of the common outputs disabled (at a high-impedance state) the low impedance of the single enabled output will drive the bus line to a high or low logic level.

To minimize the possibility that two outputs will attempt to take a common bus to opposite logic levels, the output-enable circuitry is designed such that the output disable times are shorter than the output enable times.

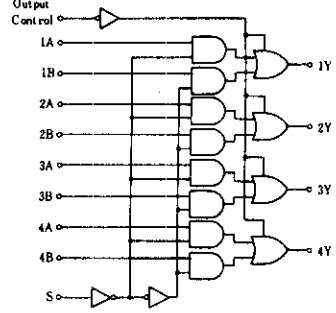
■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	7.0	V
Input voltage	V_{IN}	7.0	V
Output voltage (off-state)	$V_{O(off)}$	5.5	V
Operating temperature range	T_{opr}	-20 ~ +75	°C
Storage temperature range	T_{stg}	-65 ~ +150	°C

■ PIN ARRANGEMENT



■ BLOCK DIAGRAM



■ FUNCTION TABLE

OC	Inputs			Outputs
	S	A	B	
H	X	X	X	Z
L	L	L	X	L
L	L	H	X	H
L	H	X	L	L
L	H	X	H	H

Note) H; high level, L; low level, X; irrelevant
Z; off (high-impedance) state of a 3-state output

■ ELECTRICAL CHARACTERISTICS ($T_a = -20 \sim +75^\circ\text{C}$)

Item		Symbol	Test Conditions	min	typ*	max	Unit	
Input voltage		V_{IH}		2.0	—	—	V	
		V_{IL}		—	—	0.8	V	
Output voltage		V_{OH}	$V_{CC} = 4.75\text{V}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}, I_{OH} = -2.6\text{mA}$	2.4	—	—	V	
		V_{OL}	$V_{CC} = 4.75\text{V}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}$	$I_{OL} = 8\text{mA}$	—	—	0.5	V
				$I_{OL} = 4\text{mA}$	—	—	0.4	
Input current	S	I_{IH}	$V_{CC} = 5.25\text{V}, V_I = 2.7\text{V}$	—	—	40	μA	
	S except			—	—	20		
	S	I_{IL}		$V_{CC} = 5.25\text{V}, V_I = 0.4\text{V}$	—	—	-0.8	mA
	S except				—	—	-0.4	
	S				I_I	$V_{CC} = 5.25\text{V}, V_I = 7\text{V}$	—	
S except	—	—	0.1					
Output current		I_{OZ}	$V_{CC} = 5.25\text{V}, V_{IH} = 2\text{V}$	$V_O = 2.4\text{V}$	—	—	20	μA
				$V_O = 0.4\text{V}$	—	—	-20	
Short-circuit output current		I_{OS}	$V_{CC} = 5.25\text{V}$	-30	—	-130	mA	
Supply current**	All outputs high	I_{CC}	$V_{CC} = 5.25\text{V}$	—	5.9	10	mA	
	All outputs low			—	9.2	16		
	All outputs off			—	10	19		
Input clamp voltage		V_{IK}	$V_{CC} = 4.75\text{V}, I_{IN} = -18\text{mA}$	—	—	-1.5	V	

* $V_{CC} = 5\text{V}, T_a = 25^\circ\text{C}$

** I_{CC} is measured with all outputs open and all possible inputs grounded while achieving the stated output conditions.

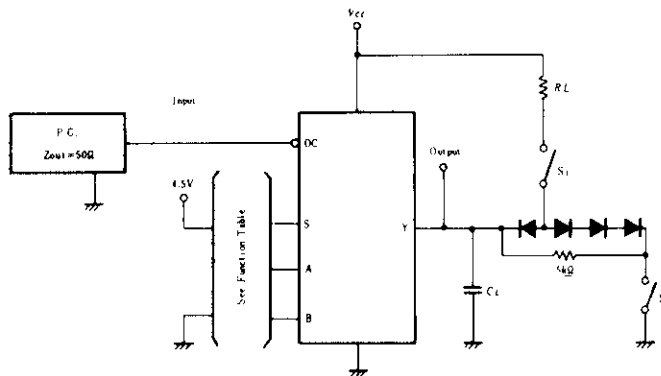
HD74LS257

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

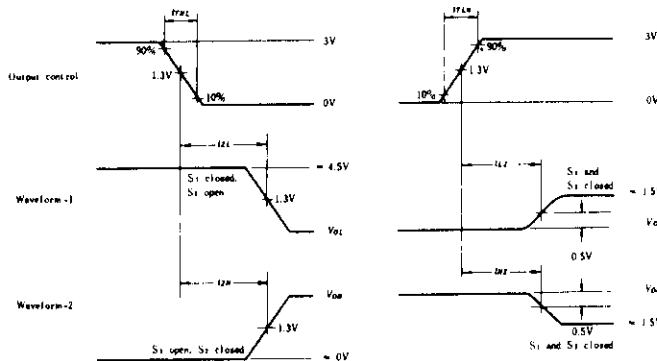
Item	Inputs	Output	Symbol	Test Conditions	min	typ	max	Unit
Propagation delay time	A, B	Y	t_{PLH}	$R_L = 2k\Omega$ $C_L = 15pF$	—	12	18	ns
			t_{PHL}		—	12	18	
	S	Y	t_{PLH}		—	14	21	ns
			t_{PHL}		—	14	21	
Output enable time	OC	Y	t_{ZH}	$R_L = 2k\Omega$ $C_L = 5pF$	—	20	30	ns
			t_{ZL}		—	20	30	
Output disable time	OC	Y	t_{HZ}		—	18	30	ns
			t_{LZ}		—	16	25	

TESTING METHOD

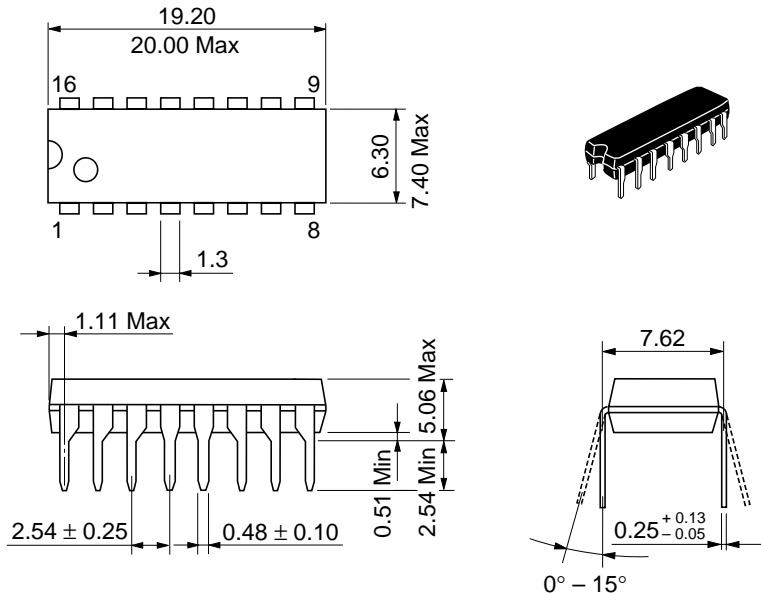
1) Test Circuit



Waveform



- Notes)
1. Input pulse: $t_{TLH} \leq 15ns$, $t_{THL} \leq 6ns$, $PRR=1MHz$, duty cycle = 50%.
 2. C_L includes probe and jig capacitance.
 3. All diodes are 1S2074 \oplus .
 4. Waveform-1 is for an output with internal conditions such that the output is low except when disabled by the output control.
 5. Waveform-2 is for an output with internal conditions such that the output is high except when disabled by the output control.



Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g



*Dimension including the plating thickness
Base material dimension

Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.24 g



*Dimension including the plating thickness
 Base material dimension

Hitachi Code	FP-16DN
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	0.15 g

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