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Renesas Technology Corp.
Customer Support Dept.
April 1, 2003

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Remember to give due consideration to safety when making your circuit designs, with appropriate measures such as (i) placement of substitutive, auxiliary circuits, (ii) use of nonflammable material or (iii) prevention against any malfunction or mishap.

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

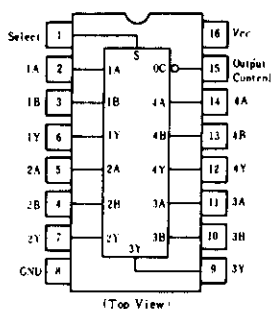
This multiplexer features three-state outputs that can interface directly with and drive data lines of bus-organized systems. With all but one of the common outputs disabled (at a high-impedance state) the low impedance of the single enabled output will drive the bus line to a high or low logic level.

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.

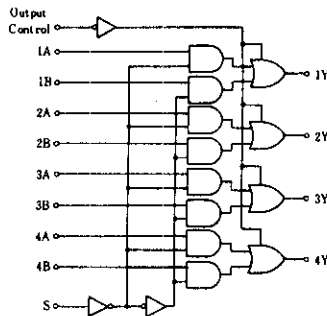
■ ABSOLUTE MAXIMUM RATINGS

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}	$V_{CC}=4.75\text{V}, V_{IH}=2\text{V}, I_{OL}=8\text{mA}$	—	—	0.5	V
			$V_{IL}=0.8\text{V}, I_{OL}=4\text{mA}$	—	—	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	$V_{CC}=5.25\text{V}, V_I=7\text{V}$	—	—	0.2	mA
	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

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

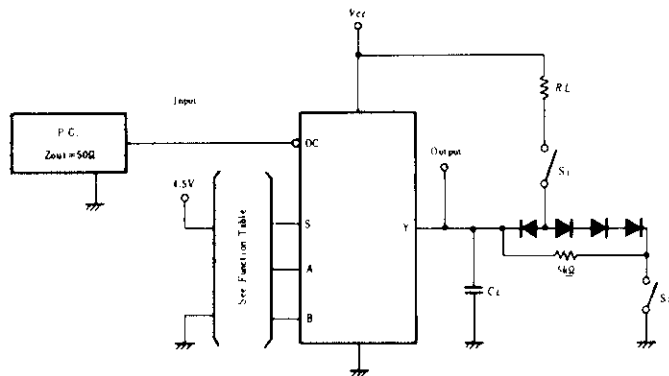
** I_{CC} is measured with all outputs open and all possible inputs grounded while achieving the stated output conditions.

SWITCHING CHARACTERISTICS (V_{CC}=5V, Ta=25°C)

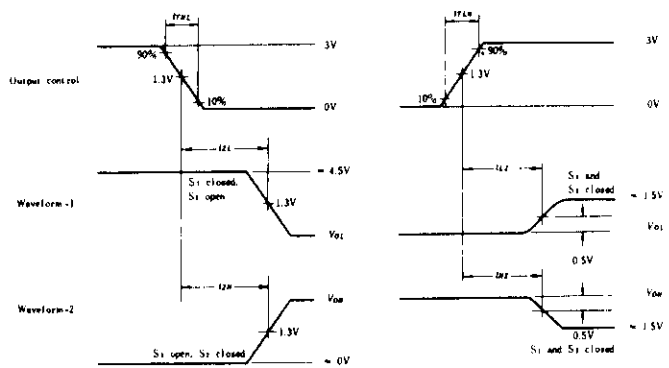
Item	Inputs	Output	Symbol	Test Conditions	min	typ	max	Unit
Propagation delay time	A, B	Y	t _{PLH}	R _L = 2kΩ C _L = 15pF	—	12	18	ns
			t _{PHL}		—	12	18	
	S	Y	t _{PLH}		—	14	21	ns
			t _{PHL}		—	14	21	
Output enable time	OC	Y	t _{ZH}	R _L = 2kΩ C _L = 5pF	—	20	30	ns
			t _{ZL}		—	20	30	
Output disable time	OC	Y	t _{HZ}		—	18	30	ns
			t _{LZ}		—	16	25	

TESTING METHOD

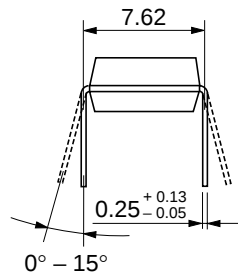
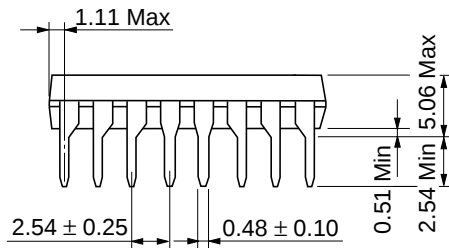
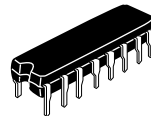
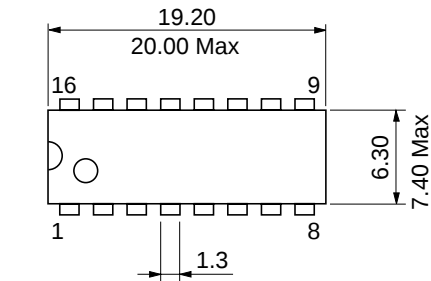
1) Test Circuit



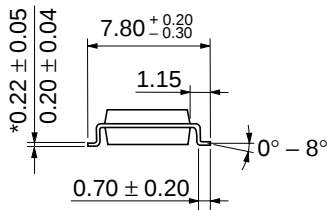
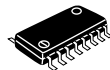
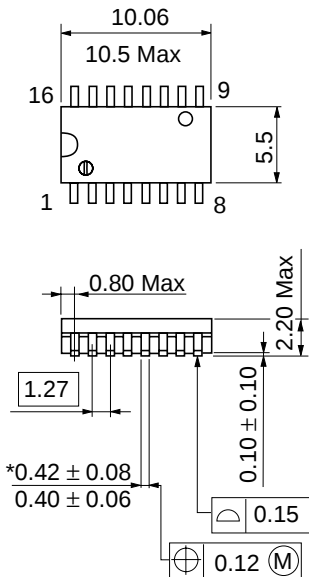
Waveform



- Notes)
1. Input pulse: $t_{PLH} \leq 15\text{ns}$, $t_{PHL} \leq 6\text{ns}$, $PRR=1\text{MHz}$, duty cycle = 50%.
 2. C_L includes probe and jig capacitance.
 3. All diodes are 1S2074 Ⓢ .
 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.

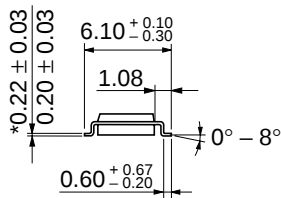
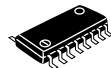
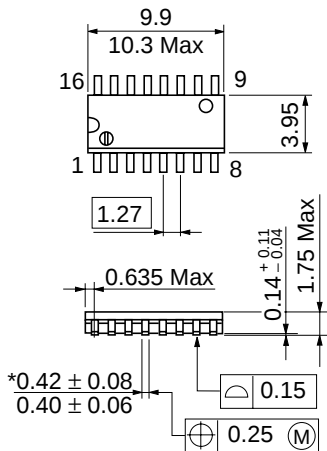


Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g



*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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