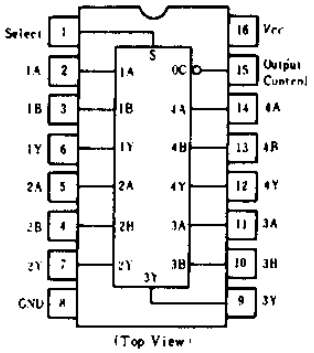
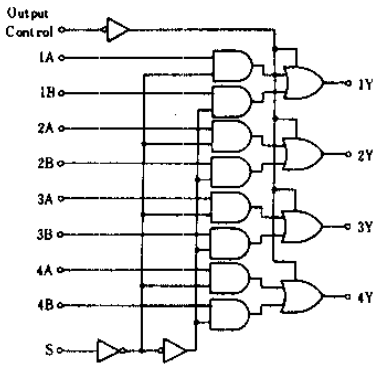
HD74LS257 ●Quadruple 2-line-to-1-line Data Selectors/Multiplexers (with non inverted 3-state outputs)

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.

■PIN ARRANGEMENT



■BLOCK DIAGRAM



■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	℃
Storage temperature range	T_{stg}	−65～+150	℃

■FUNCTION TABLE

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

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

■ELECTRICAL CHARACTERISTICS (Ta=−20～+75℃)

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}=4.75V, V_{IH}=2V, V_{IL}=0.8V, I_{OH}=−2.6mA		2.4	–	–	V
		V_{OL}	V_{CC}=4.75V, V_{IH}=2V, V_{IL}=0.8V	I_{OL}=8mA	–	–	0.5	V
				I_{OL}=4mA	–	–	0.4	
Input current	S	I_{IH}	V_{CC}=5.25V, V_I=2.7V		–	–	40	μA
	S except				–	–	20	
	S	I_{IL}	V_{CC}=5.25V, V_I=0.4V		–	–	−0.8	mA
	S except				–	–	−0.4	
	S	I_I	V_{CC}=5.25V, V_I=7V		–	–	0.2	mA
	S except				–	–	0.1	
Output current		I_{OZ}	V_{CC}=5.25V, V_{IH}=2V	V_O=2.4V	–	–	20	μA
				V_O=0.4V	–	–	−20	
Short-circuit output current		I_{OS}	V_{CC}=5.25V		−30	–	−130	mA
Supply current**	All outputs high	I_{CC}	V_{CC}=5.25V		–	5.9	10	mA
	All outputs low				–	9.2	16	
	All outputs off				–	10	19	
Input clamp voltage		V_{IK}	V_{CC}=4.75V, I_{IN}=−18mA		–	–	−1.5	V

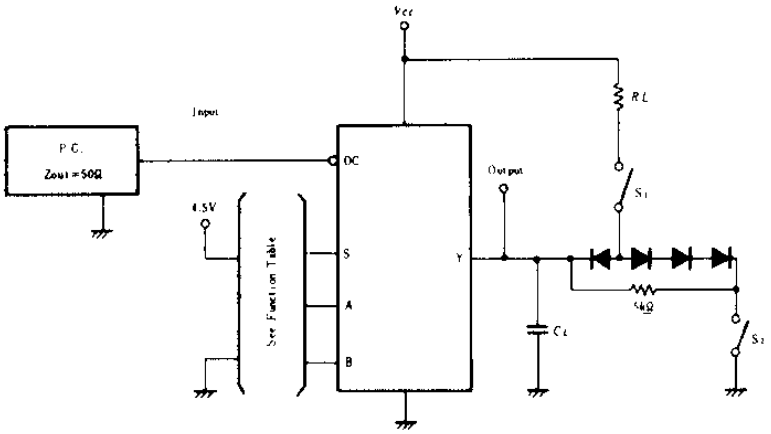
* V_{CC}=5V, Ta=25°C
** I_{CC} is measured with all outputs open and all possible inputs grounded while achieving the stated output conditions.

■SWITCHING CHARACTERISTICS (V_{CC} = 5V, Ta = 25℃)

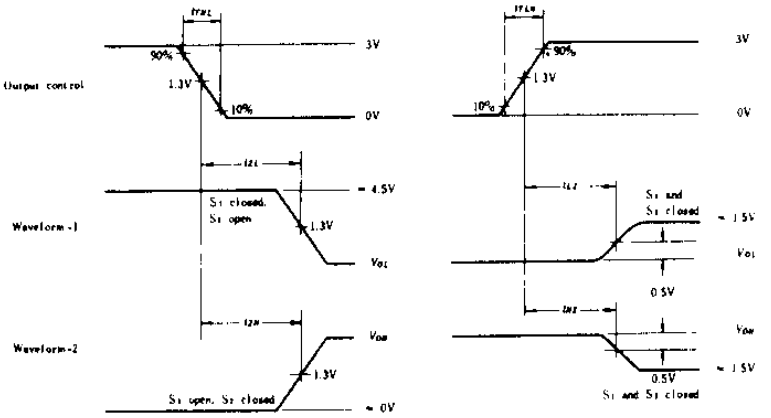
Item	Inputs	Output	Symbol	Test Conditions	min	typ	max	Unit
Propagation delay time	A, B	Y	t_{PLH}	R_L = 2kΩ, C_L = 15pF	–	12	18	ns
			t_{PHL}		–	12	18	
	S	Y	t_{PLH}		–	14	21	ns
			t_{PHL}		–	14	21	
Output enable time	OC	Y	t_{ZH}		–	20	30	ns
			t_{ZL}		–	20	30	
Output disable time	OC	Y	t_{HZ}	R_L = 2kΩ,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

■TESTING METHOD

1) Test Circuit

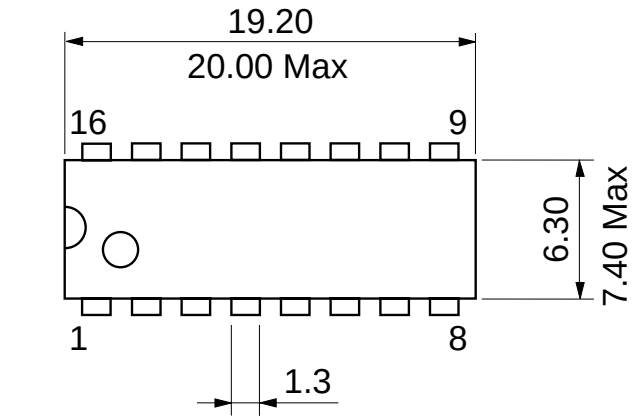


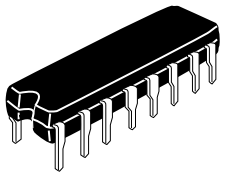
Waveform

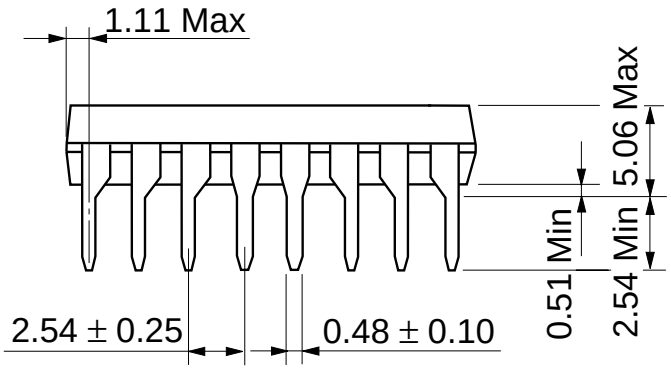


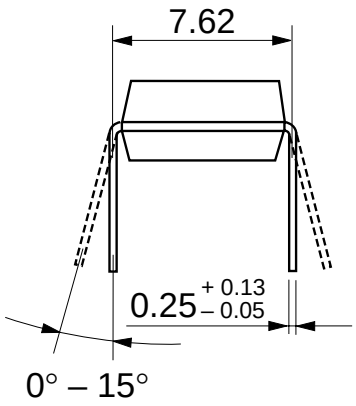
Notes) 1. Input pulse: $t_{TLH} \leqq 15$ns, $t_{THL} \leqq 6$ns, PRR = 1MHz, duty cycle = 50%.
2. C_L includes probe and jig capacitance.
3. All diodes are 1S2074 Ⓗ.
4. Waveform-1 is for an output with internal conditions such that the output is low except when disabled by the output control.
5. Waveform-2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

Unit: mm



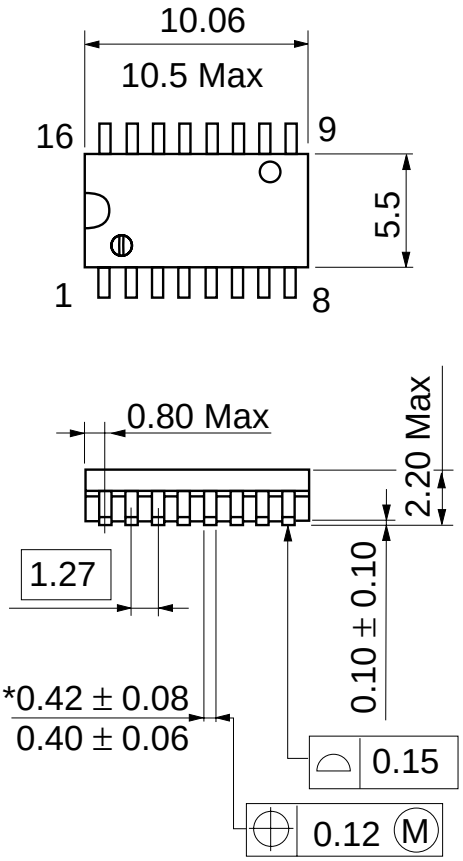


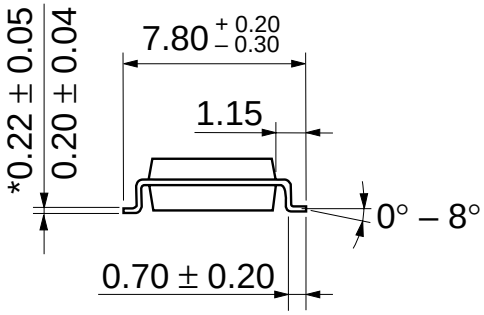


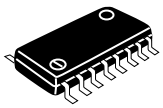


Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g

Unit: mm



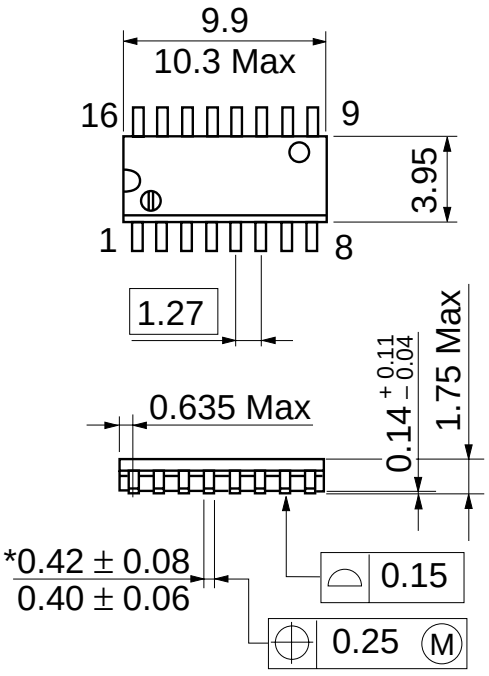


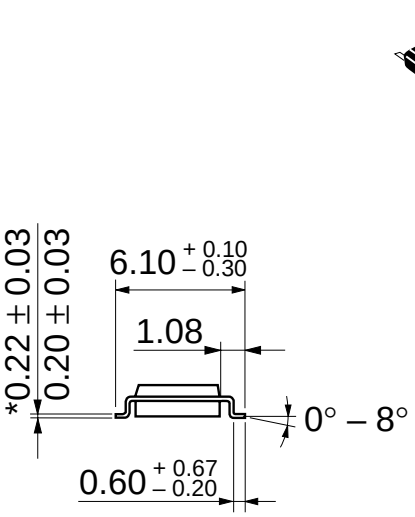


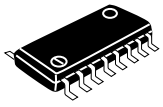
*Dimension including the plating thickness
Base material dimension

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

Unit: mm







*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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