HD74LS251 ● 1 of 8 Data Selectors/Multiplexers (with strobe and three-state outputs)

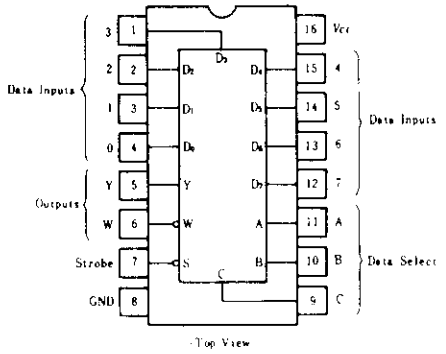
This data selector/multiplexer contains full on-chip binary decoding to select one-of-eight data sources and features a strobe-controlled 3-state output.

The strobe must be at a low logic level to enable this device. The 3-state outputs permit a number of outputs to be connected to a common bus.

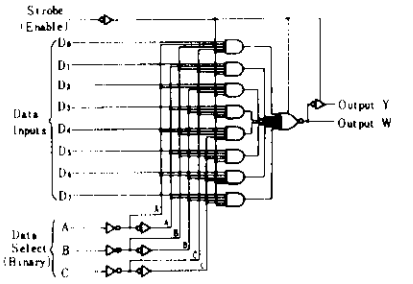
When the strobe input is high, both outputs are in a high-impedance state in which both the upper and lower transistors of each totem-pole output are off, and the output neither drives nor loads the bus significantly. When the strobe is low, the outputs are activated and operate as standard TTL totem-pole outputs.

To minimize the possibility that two outputs will attempt to take a common bus to opposite logic levels, the output control circuitry is designed so that the average output disable time is shorter than the average output enable time.

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

■FUNCTION TABLE

Inputs				Outputs	
SELECT			STROBE	Y	W
C	B	A	S		
×	×	×	H	Z	Z
L	L	L	L	D_0	$\overline{D_0}$
L	L	H	L	D_1	$\overline{D_1}$
L	H	L	L	D_2	$\overline{D_2}$
L	H	H	L	D_3	$\overline{D_3}$
H	L	L	L	D_4	$\overline{D_4}$
H	L	H	L	D_5	$\overline{D_5}$
H	H	L	L	D_6	$\overline{D_6}$
H	H	H	L	D_7	$\overline{D_7}$

Notes) 1. H; high level, L; low level, X; irrelevant
2. Z; high impedance (off-state)
3. D_0 through D_7; the level of the respective D input.

■ELECTRICAL CHARACTERISTICS ($Ta = -20 \sim +75°C$)

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}=4.75V, 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}=4mA	–	–	0.4	V
			I_{OL}=8mA	–	–	0.5	
Input current	I_{IH}	V_{CC}=5.25V, V_I=2.7V		–	–	20	μA
	I_{IL}	V_{CC}=5.25V, V_I=0.4V		–	–	−0.4	mA
	I_I	V_{CC}=5.25V, V_I=7V		–	–	0.1	mA
Output current	I_{OZ}	V_{CC}=5.25V, V_{IH}=2V	V_O=2.7V	–	–	20	μA
			V_O=0.4V	–	–	−20	
Short-circuit output current	I_{OS}	V_{CC}=5.25V		−30	–	−130	mA
Supply current**	I_{CC}	V_{CC}=5.25V	ConditionA	–	6.1	10	mA
			ConditionB	–	7.1	12	
Input clamp voltage	V_{IK}	V_{CC}=4.75V, I_{IN}=−18mA		–	–	−1.5	V

* V_{CC}=5V, Ta=25°C

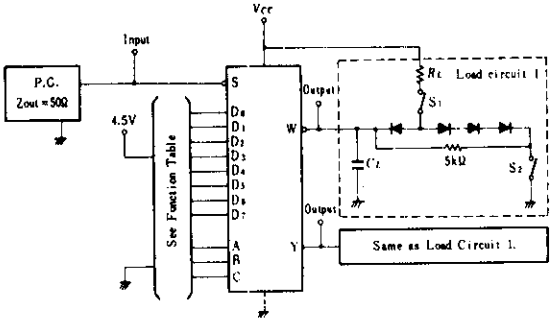
** I_{CC} is measured with the outputs open and all data and select inputs at 4.5V under the following conditions:
A. Strobe grounded, B. Strobe at 4.5V

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

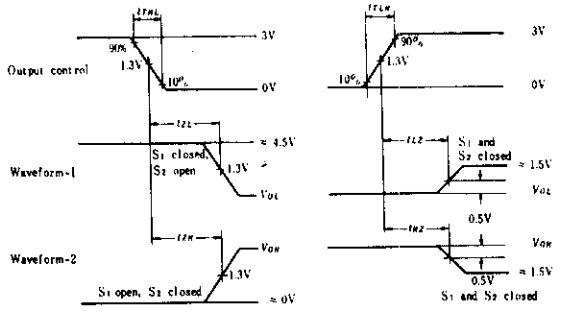
Item	Inputs	Outputs	Symbol	Test Conditions	min	typ	max	Unit
Propagation delay time	A, B, C (4 level)	Y	t_{PLH}	C_L=15pF R_L=2kΩ	–	29	45	ns
			t_{PHL}		–	28	45	
	A, B, C (3 level)	W	t_{PLH}		–	20	33	
			t_{PHL}		–	21	33	
	Data	Y	t_{PLH}		–	17	28	
			t_{PHL}		–	18	28	
	Data	W	t_{PLH}		–	10	15	
			t_{PHL}		–	9	15	
Output enable time	Strobe	Y	t_{ZH}		–	30	45	ns
			t_{ZL}		–	26	40	
	Strobe	W	t_{ZH}		–	17	27	
			t_{ZL}		–	24	40	
Output disable time	Strobe	Y	t_{HZ}	C_L=5pF R_L=2kΩ	–	30	45	ns
			t_{LZ}		–	15	25	
	Strobe	W	t_{HZ}		–	37	55	
			t_{LZ}		–	15	25	

■TESTING METHOD

1) Test Circuit

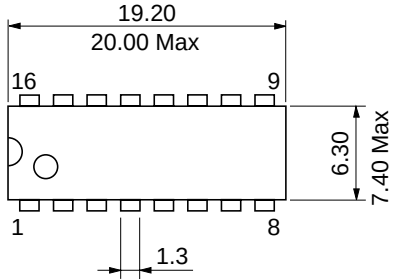


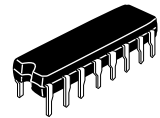
Waveform

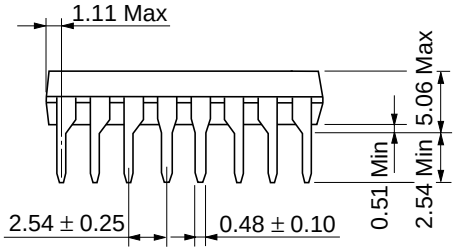


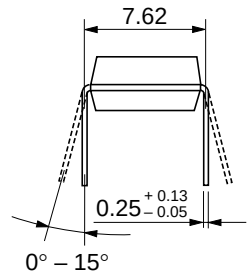
Notes) 1. Input pulse: $t_{TLH} \leqq 15$ns, $t_{THL} \leqq 6$ns, PRR=1MHz, duty cycle = 50%.
2. C_L includes probe and jig capacitance.
3. All diodes are 1S2074 Ⓗ.
4. Waveform-1 is for an output with internal conditions such that the output is low except when disabled by the output control.
5. Waveform-2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

Unit: mm



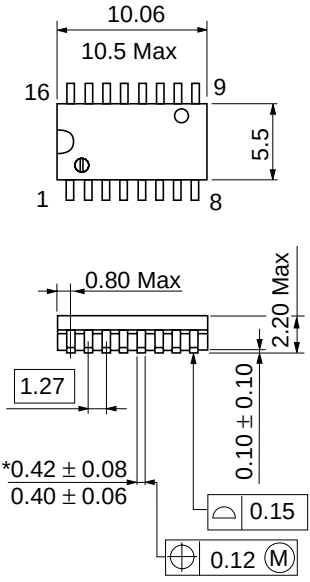


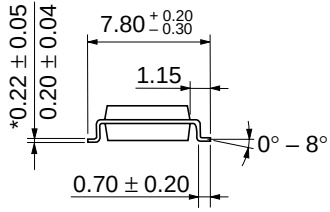


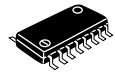


Hitachi Code	DP-16
JEDEC	Conforms
EIAJ	Conforms
Weight (reference value)	1.07 g

Unit: mm



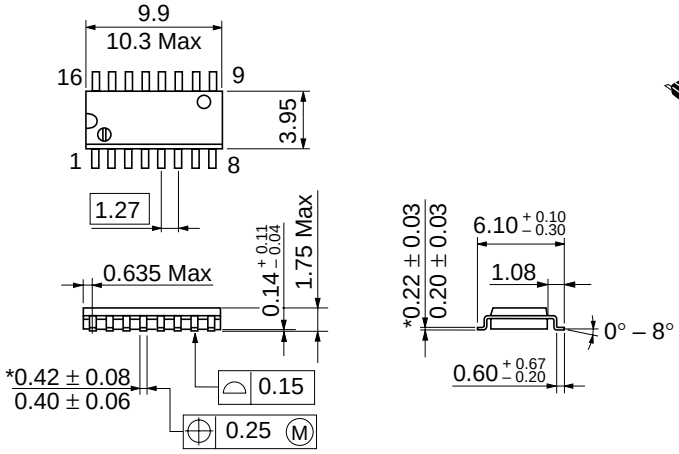




Hitachi Code	FP-16DA
JEDEC	—
EIAJ	Conforms
Weight (reference value)	0.24 g

*Dimension including the plating thickness
Base material dimension

Unit: mm



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

*Dimension including the plating thickness
Base material dimension

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