

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

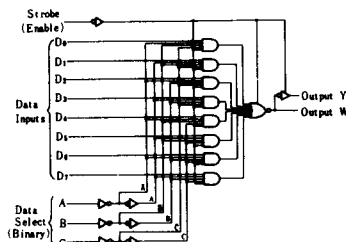
This data selector/multiplexer contains full on-chip binary decoding to select one-of-eight data sources and features a strobe-controlled 3-state output.

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.

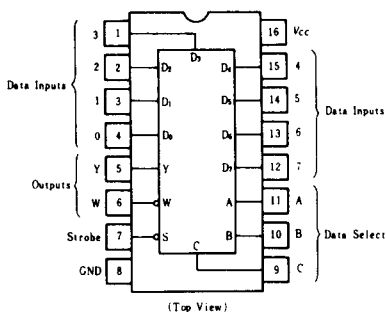
When the strobe input is high, both outputs are in a high-impedance state in which both the upper and lower transistors of each totem-pole output are off, and the output neither drives nor loads the bus significantly. When the strobe is low, the outputs are activated and operate as standard TTL totem-pole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

■ BLOCK DIAGRAM



■ PIN ARRANGEMENT



■ ABSOLUTE MAXIMUM RATINGS

Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}	7.0	V
Input voltage	V_{IH}^*	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		
X	X	X	H	Z	Z
L	L	L	L	\bar{D}_0	\bar{D}_0
L	L	H	L	\bar{D}_1	\bar{D}_1
L	H	L	L	\bar{D}_2	\bar{D}_2
L	H	H	L	\bar{D}_3	\bar{D}_3
H	L	L	L	\bar{D}_4	\bar{D}_4
H	L	H	L	\bar{D}_5	\bar{D}_5
H	H	L	L	\bar{D}_6	\bar{D}_6
H	H	H	L	\bar{D}_7	\bar{D}_7

- Notes) 1. H; high level, L; low level, X; irrelevant
 2. Z; high impedance (off-state)
 3. \bar{D}_i through \bar{D}_7 ; the level of the respective D input.

■ 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}	$V_{CC} = 4.75\text{V}, V_{IH} = 2\text{V}, V_{IL} = 0.8\text{V}$	—	—	0.4	V
Input current	I_{IH}	$V_{CC} = 5.25\text{V}, V_I = 2.7\text{V}$	—	—	20	μA
	I_{IL}	$V_{CC} = 5.25\text{V}, V_I = 0.4\text{V}$	—	—	-0.4	mA
	I_I	$V_{CC} = 5.25\text{V}, V_I = 7\text{V}$	—	—	0.1	mA
Output current	I_{OZ}	$V_{CC} = 5.25\text{V}, V_{IH} = 2\text{V}$	—	—	20	μA
			—	—	-20	
Short-circuit output current	I_{OS}	$V_{CC} = 5.25\text{V}$	-30	—	-130	mA
Supply current**	I_{CC}	$V_{CC} = 5.25\text{V}$	Condition A	6.1	10	mA
			Condition B	7.1	12	
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 the outputs open and all data and select inputs at 4.5V under the following conditions:
 A. Strobe grounded, B. Strobe at 4.5V



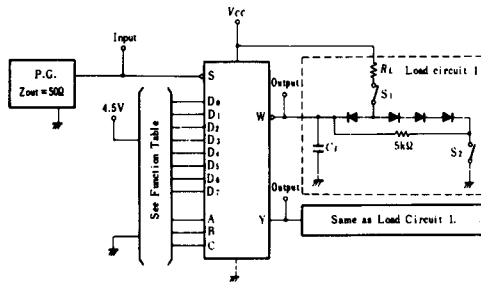
HD74LS251

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

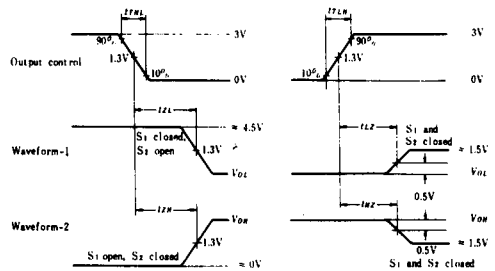
Item	Inputs	Outputs	Symbol	Test Conditions	min	typ	max	Unit
Propagation delay time	A, B, C (4 level)	Y	t_{PLH}	$C_L = 15pF$ $R_L = 2k\Omega$	—	29	45	ns
			t_{PHL}		—	28	45	
	A, B, C (3 level)	W	t_{PLH}		—	20	33	
			t_{PHL}		—	21	33	
	Data	Y	t_{PLH}		—	17	28	
			t_{PHL}		—	18	28	
	Data	W	t_{PLH}		—	10	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}	$C_L = 5pF$ $R_L = 2k\Omega$	—	30	45	ns
			t_{LZ}	—	15	25		
	Strobe	W	t_{HZ}	—	37	55		
			t_{LZ}	—	15	25		

■ TESTING METHOD

1) Test Circuit



Waveform



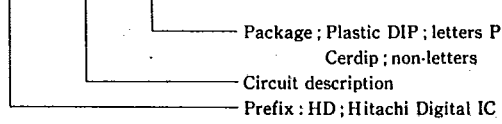
- Notes)
1. Input pulse: $t_{PLH} \leq 15ns$, $t_{PHL} \leq 6ns$, $PRR=1MHz$, duty cycle = 50%.
 2. C_L includes probe and jig capacitance.
 3. All diodes are 1S2074 $\text{\textcircled{R}}$.
 4. Waveform-1 is for an output with internal conditions such that the output is low except when disabled by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

PACKAGING INFORMATION

T-90-20

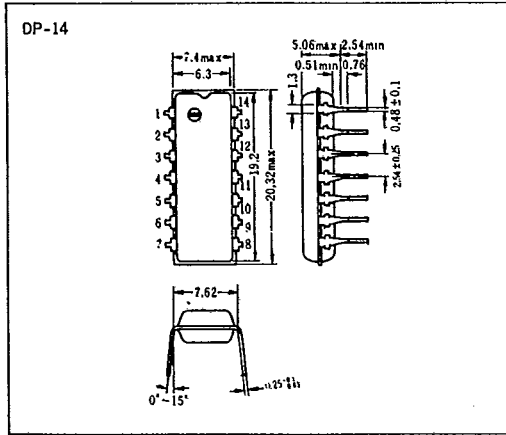
Factory orders for circuits described in this databook should include a three-part type number as explained in the following example.

HD 74LS00 P

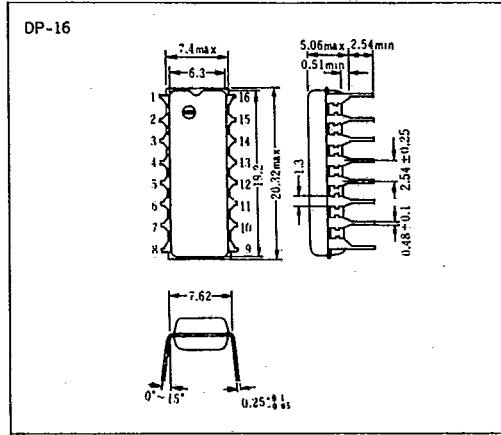


■ Plastic DIP

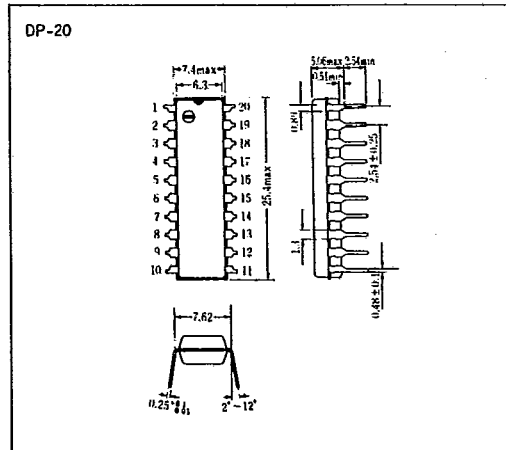
● 14 Pin



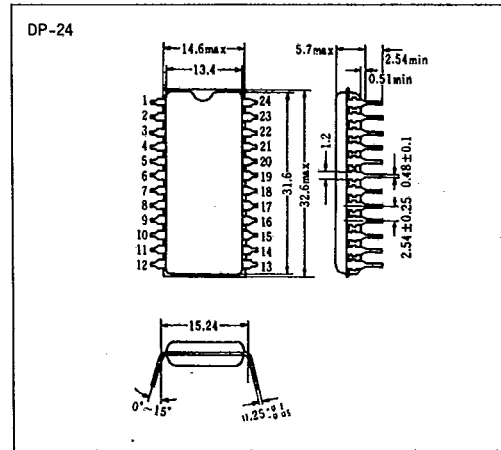
● 16 Pin



● 20 Pin



● 24 Pin

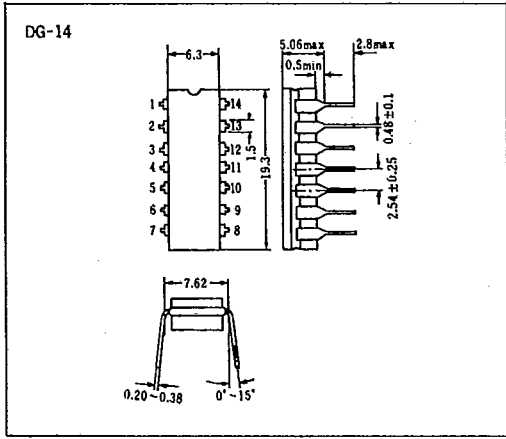


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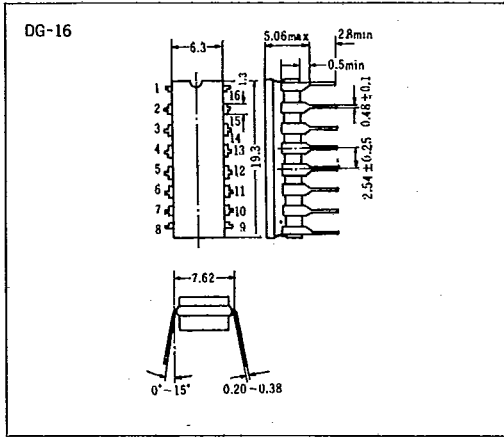
PACKAGING INFORMATIONS

■ Cerdip

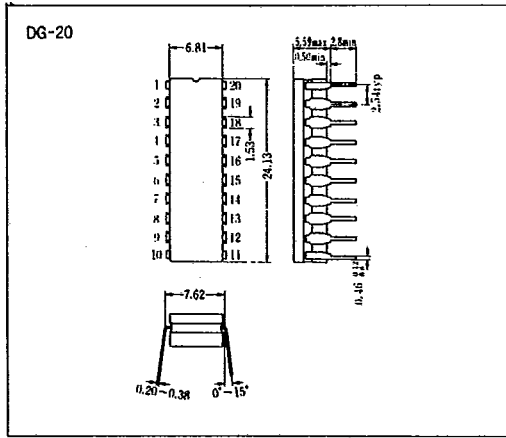
● 14 Pin



● 16 Pin



● 20 Pin



● 24 Pin

