

HD74LS251

1 of 8 Data Selector / Multiplexer (with strobe and three-state outputs)

REJ03D0467-0300

Rev.3.00

Jul.15.2005

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.

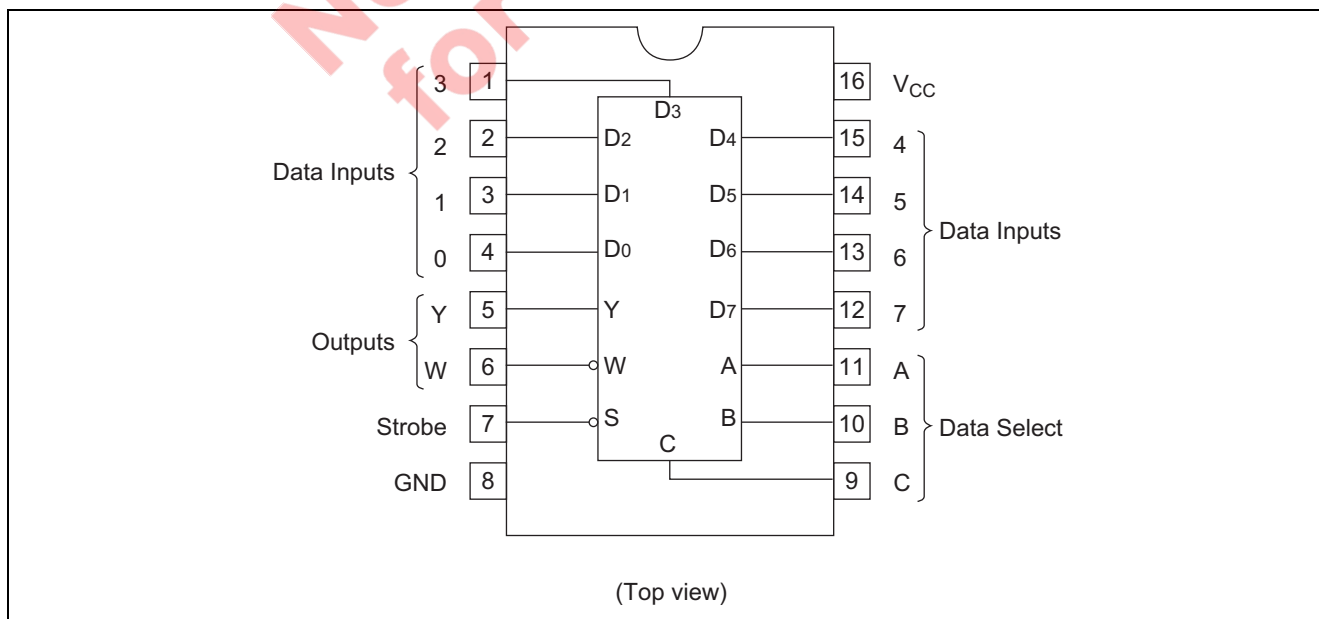
Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS251P	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74LS251FPEL	SOP-16 pin (JEITA)	PRSP0016DH-B (FP-16DAV)	FP	EL (2,000 pcs/reel)

Note: Please consult the sales office for the above package availability.

Pin Arrangement

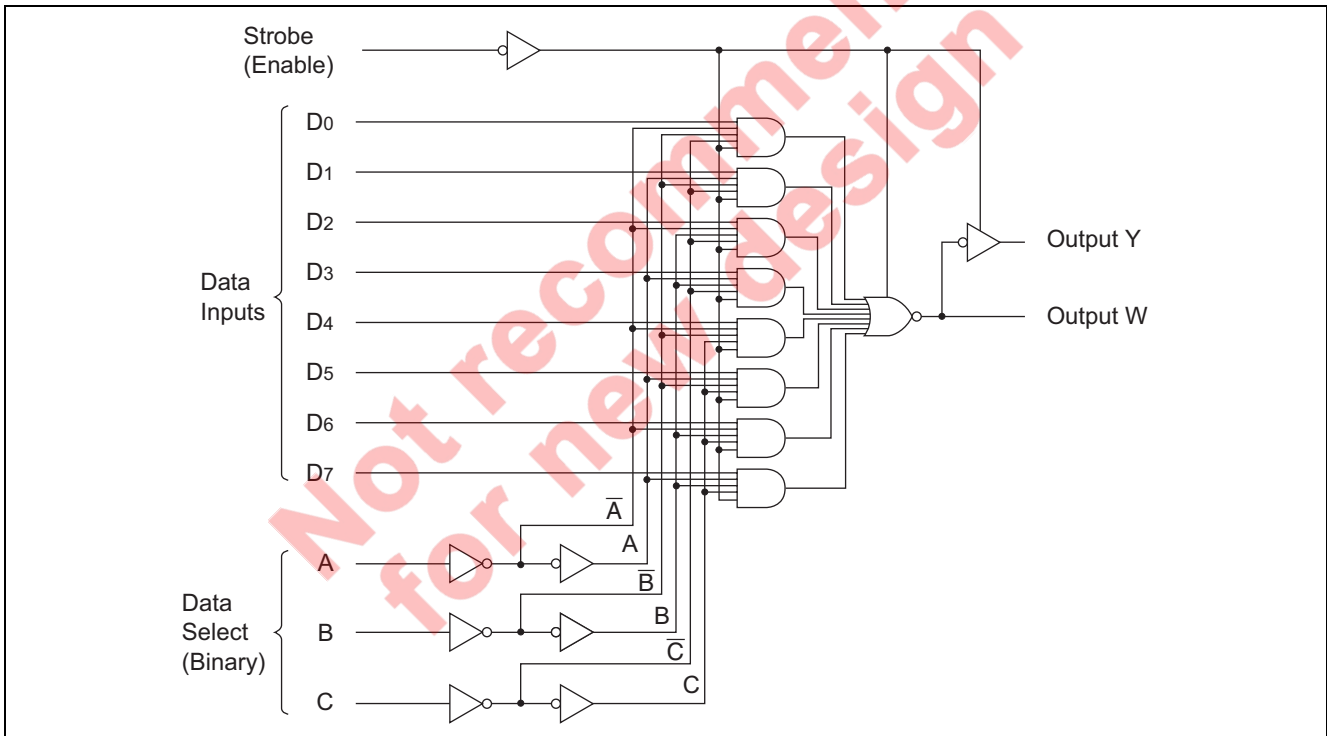


Function Table

Inputs				Outputs	
Select			Strobe	Y	W
C	B	A	S		
X	X	X	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. D₀ through D₇; the level of the respective D input.

Block Diagram



Absolute Maximum Ratings

Item	Symbol	Ratings	Unit
Supply voltage	V _{CC}	7	V
Input voltage	V _{IN}	7	V
Output voltage (off-state)	V _{O (off)}	5.5	V
Operating temperature	T _{opr}	-20 to +75	°C
Power dissipation	P _T	400	mW
Storage temperature	T _{stg}	-65 to +150	°C

Note: Voltage value, unless otherwise noted, are with respect to network ground terminal.

Recommended Operating Conditions

Item	Symbol	Min	Typ	Max	Unit
Supply voltage	V_{CC}	4.75	5.00	5.25	V
Output current	I_{OH}	—	—	-2.6	mA
	I_{OL}	—	—	8	mA
Operating temperature	T_{opr}	-20	25	75	°C

Electrical Characteristics

(Ta = -20 to +75 °C)

Item	Symbol	min.	typ.*	max.	Unit	Condition
Input voltage	V_{IH}	2.0	—	—	V	
	V_{IL}	—	—	0.8	V	
Output voltage	V_{OH}	2.4	—	—	V	$V_{CC} = 4.75\text{ V}$, $V_{IH} = 2\text{ V}$, $V_{IL} = 0.8\text{ V}$, $I_{OH} = -2.6\text{ mA}$
	V_{OL}	—	—	0.4	V	$I_{OL} = 4\text{ mA}$ $V_{CC} = 4.75\text{ V}$, $V_{IH} = 2\text{ V}$, $I_{OL} = 8\text{ mA}$ $V_{IL} = 0.8\text{ V}$
Input current	I_{IH}	—	—	20	μA	$V_{CC} = 5.25\text{ V}$, $V_I = 2.7\text{ V}$
	I_{IL}	—	—	-0.4	mA	$V_{CC} = 5.25\text{ V}$, $V_I = 0.4\text{ V}$
	I_I	—	—	0.1	mA	$V_{CC} = 5.25\text{ V}$, $V_I = 7\text{ V}$
Output current	I_{OZ}	—	—	20	μA	$V_O = 2.7\text{ V}$ $V_{CC} = 5.25\text{ V}$, $V_{IH} = 2\text{ V}$
		—	—	-20	μA	$V_O = 0.4\text{ V}$
Short-circuit output current	I_{OS}	-30	—	-130	mA	$V_{CC} = 5.25\text{ V}$
Supply current**	I_{CC}	—	6.1	10	mA	Condition A $V_{CC} = 5.25\text{ V}$
		—	7.1	12	mA	Condition B
Input clamp voltage	V_{IK}	—	—	-1.5	V	$V_{CC} = 4.75\text{ V}$, $I_{IN} = -18\text{ mA}$

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

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

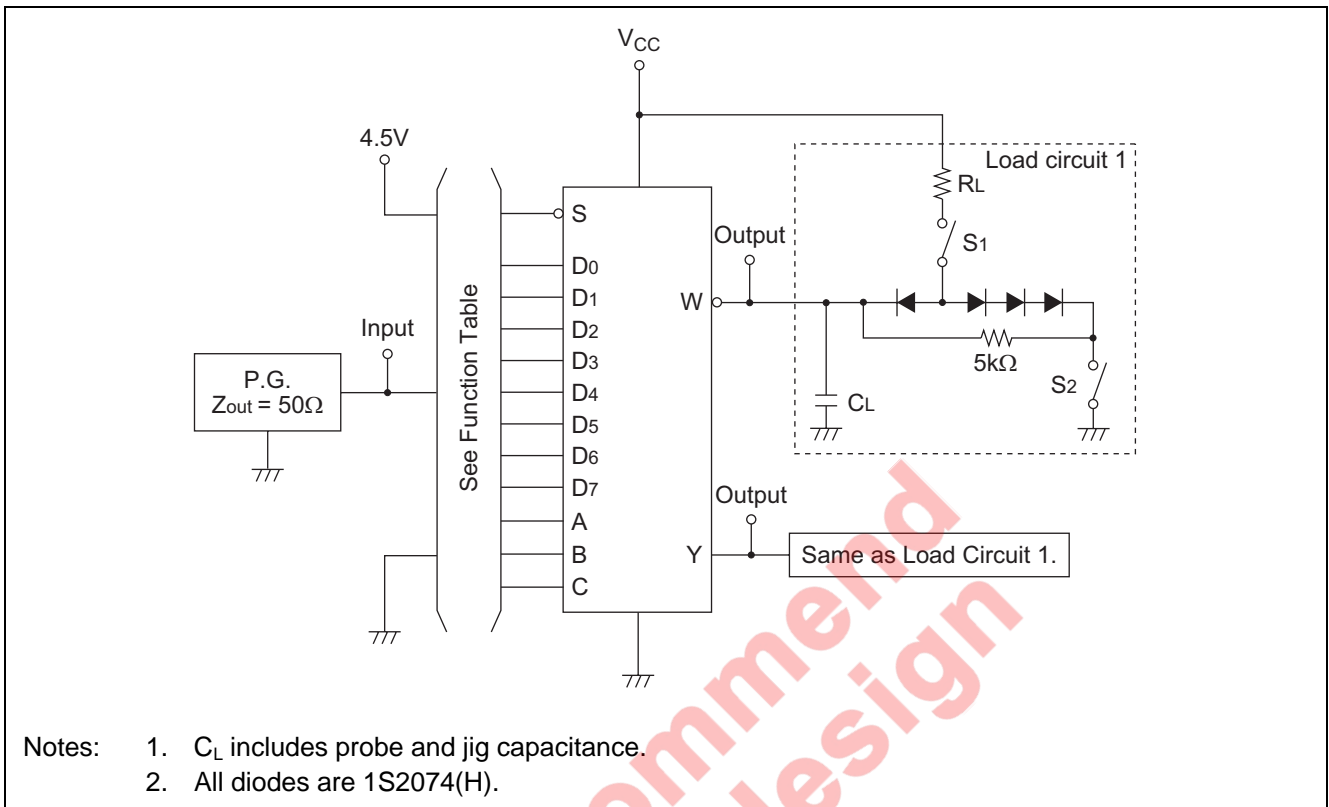
Switching Characteristics

(V_{CC} = 5 V, Ta = 25°C)

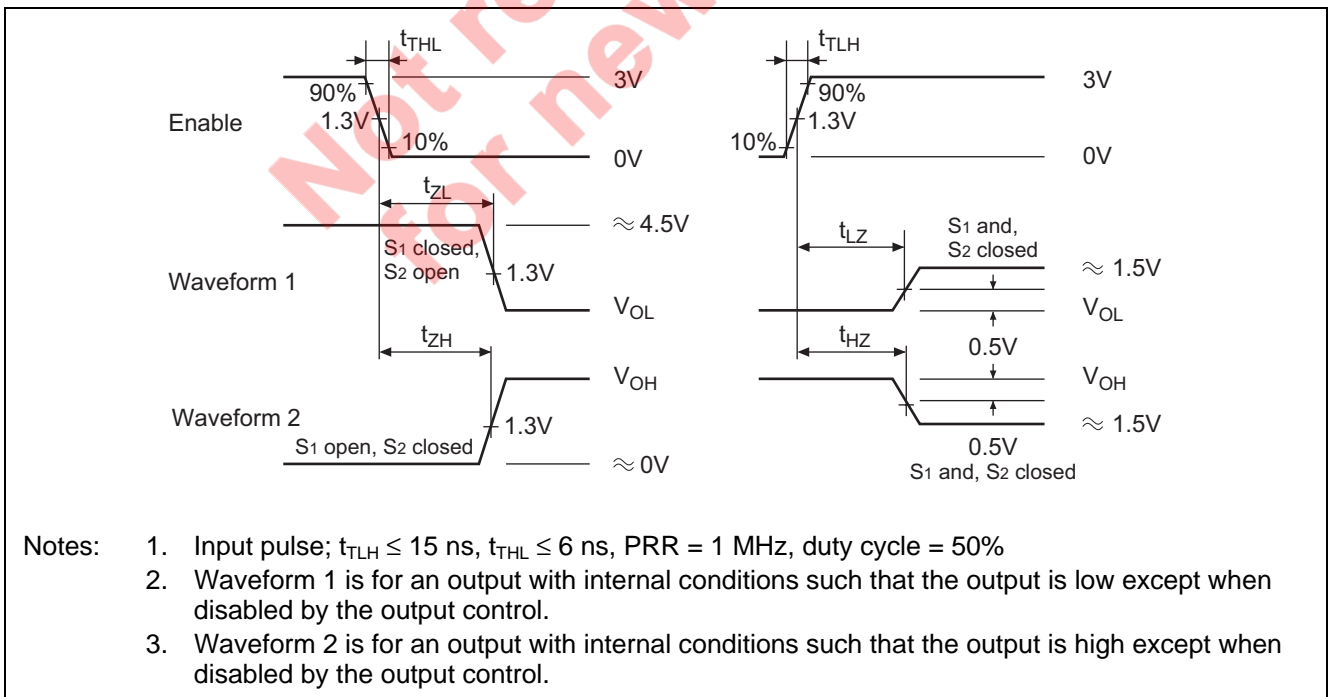
Item	Symbol	Inputs	Outputs	min.	typ.	max.	Unit	Condition
Propagation delay time	t_{PLH}	A, B, C (4 level)	Y	—	29	45	ns	$C_L = 15\text{ pF}$, $R_L = 2\text{ k}\Omega$
	t_{PHL}			—	28	45		
	t_{PLH}	A, B, C (3 level)	W	—	20	33		
	t_{PHL}			—	21	33		
	t_{PLH}	Data	Y	—	17	28		
	t_{PHL}			—	18	28		
	t_{PLH}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

Testing Method

Test Circuit

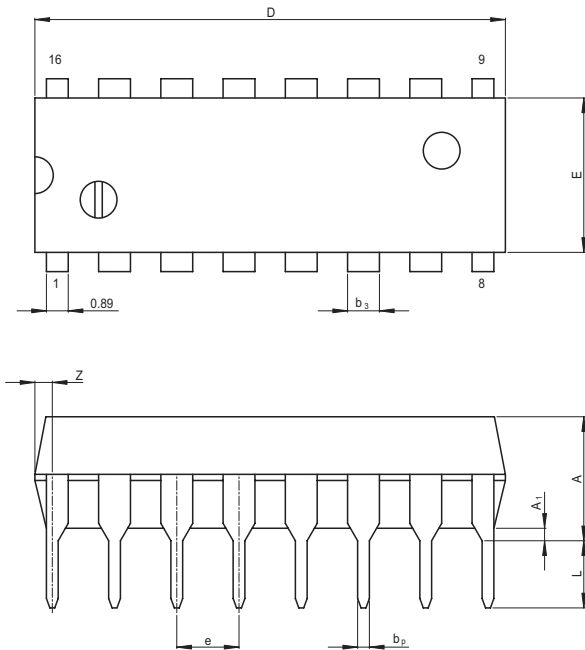


Waveform



Package Dimensions

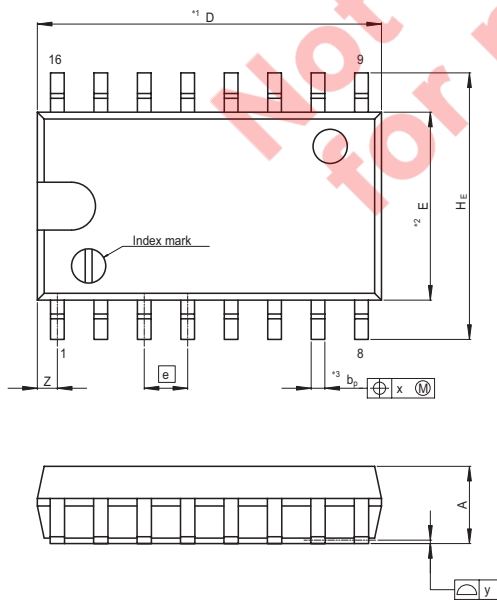
JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-DIP16-6.3x19.2-2.54	PRDP0016AE-B	DP-16FV	1.05g



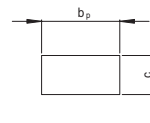
Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
e ₁	—	7.62	—
D	—	19.2	20.32
E	—	6.3	7.4
A	—	—	5.06
A ₁	0.51	—	—
b _P	0.40	0.48	0.56
b ₃	—	1.30	—
c	0.19	0.25	0.31
θ	0°	—	15°
e	2.29	2.54	2.79
Z	—	—	1.12
L	2.54	—	—

(Ni/Pd/Au plating)

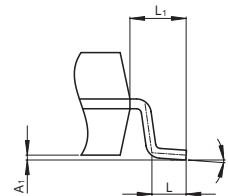
JEITA Package Code	RENESAS Code	Previous Code	MASS[Typ.]
P-SOP16-5.5x10.06-1.27	PRSP0016DH-B	FP-16DAV	0.24g



NOTE)
 1. DIMENSIONS**1 (Nom)**AND**2 DO NOT INCLUDE MOLD FLASH.
 2. DIMENSION**3**DOES NOT INCLUDE TRIM OFFSET.



Terminal cross section
(Ni/Pd/Au plating)



Detail F

Reference Symbol	Dimension in Millimeters		
	Min	Nom	Max
D	—	10.06	10.5
E	—	5.50	—
A ₂	—	—	—
A ₁	0.00	0.10	0.20
A	—	—	2.20
b _P	0.34	0.40	0.46
b ₁	—	—	—
c	0.15	0.20	0.25
c ₁	—	—	—
θ	0°	—	8°
H _E	7.50	7.80	8.00
e	—	1.27	—
x	—	—	0.12
y	—	—	0.15
Z	—	—	0.80
L	0.50	0.70	0.90
L ₁	—	1.15	—

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