

# HD74LS253

## Dual 4-line-to-1-line Data Selectors / Multiplexers (with three-state outputs)

REJ03D0468-0300

Rev.3.00

Jul.15.2005

This data selector / multiplexer contains inverters and drivers to supply fully complementary, on-ship, binary decoding data selection to AND-OR gates.

Separate output control inputs are provided for each of the two four-line sections. The three-state outputs can interface with and drive data lines of bus-organized systems. With all but one of the common outputs disabled (at high-impedance state) the low-impedance of the single enabled output will drive the bus line to a high or low logic level.

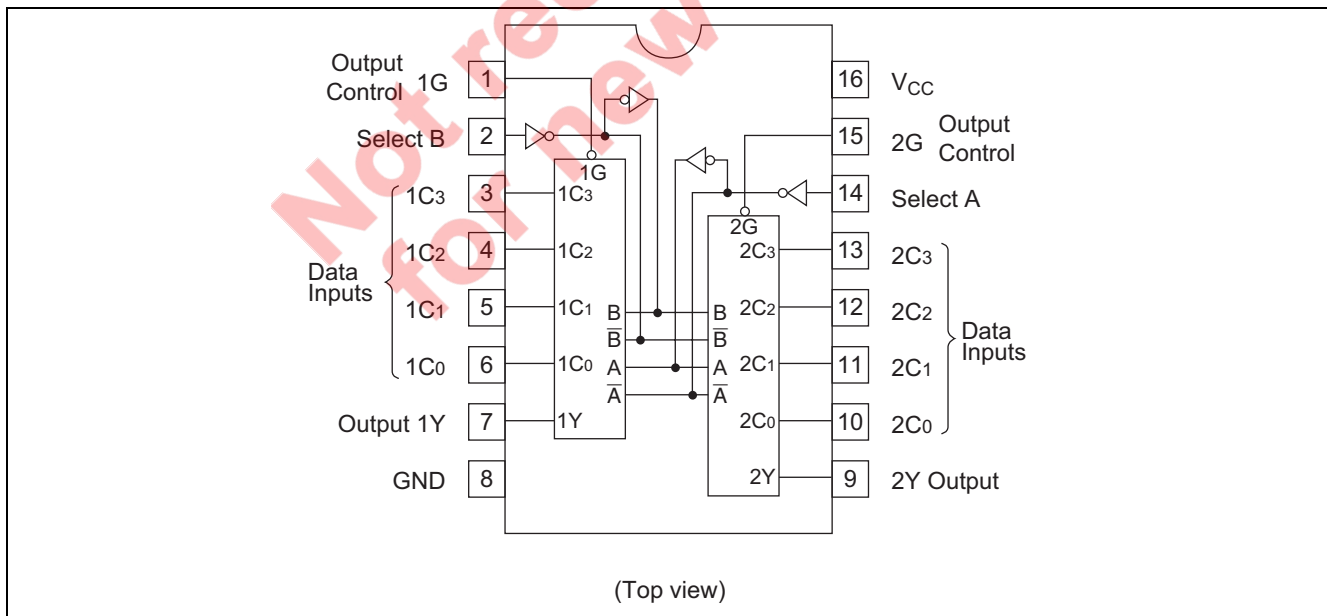
### Features

- Ordering Information

Part Name	Package Type	Package Code (Previous Code)	Package Abbreviation	Taping Abbreviation (Quantity)
HD74LS253P	DILP-16 pin	PRDP0016AE-B (DP-16FV)	P	—
HD74LS253FPEL	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

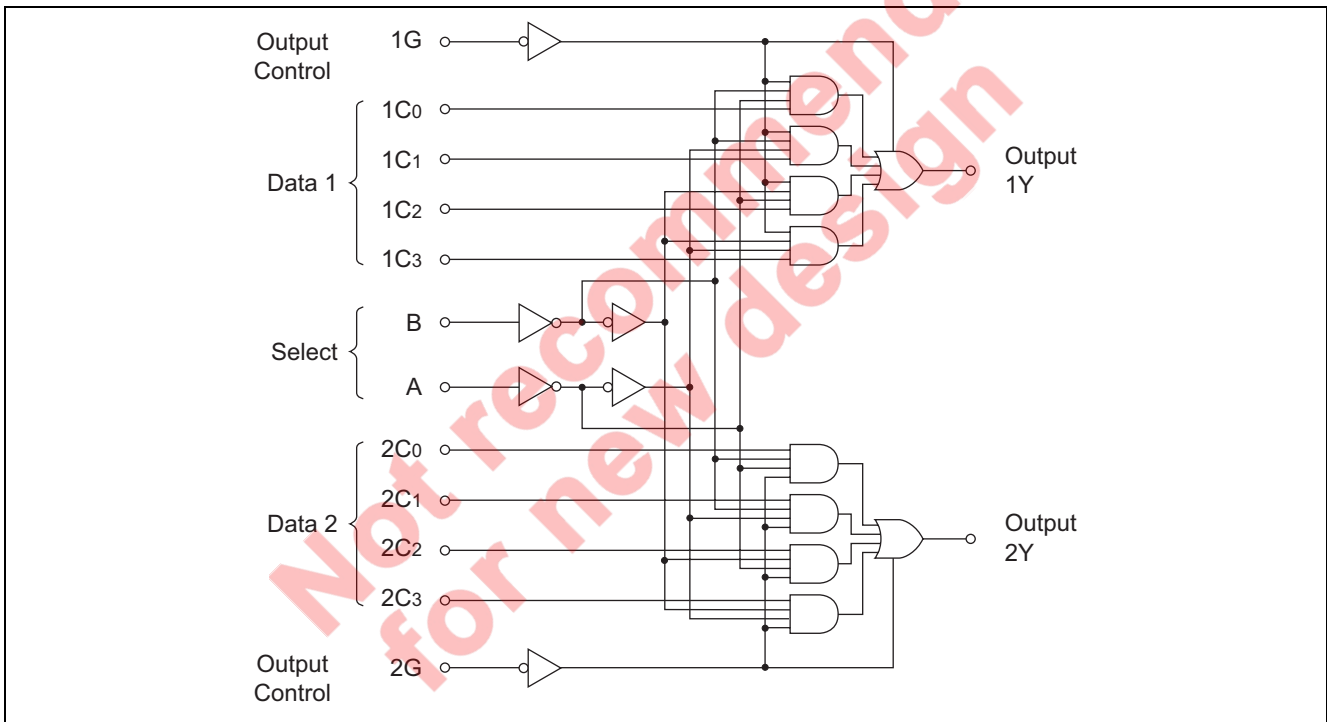


**Function Table**

Select inputs		Data inputs				Output control	Output
B	A	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	C <sub>3</sub>	G	Y
X	X	X	X	X	X	H	Z
L	L	L	X	X	X	L	L
L	L	H	X	X	X	L	H
L	H	X	L	X	X	L	L
L	H	X	H	X	X	L	H
H	L	X	X	L	X	L	L
H	L	X	X	H	X	L	H
H	H	X	X	X	L	L	L
H	H	X	X	X	H	L	H

Notes: 1. H; high level, L; low level, X; irrelevant  
 2. Address inputs A and B are common to both sections.

**Block Diagram**



**Absolute Maximum Ratings**

Item	Symbol	Ratings	Unit
Supply voltage	V <sub>CC</sub>	7	V
Input voltage	V <sub>IN</sub>	7	V
Output voltage (off-state)	V <sub>O (off)</sub>	5.5	V
Operating temperature	T <sub>opr</sub>	-20 to +75	°C
Power dissipation	P <sub>T</sub>	400	mW
Storage temperature	T <sub>stg</sub>	-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**	$I_{CC}$	—	7	12	mA	Condition A   $V_{CC} = 5.25\text{ V}$
		—	8.5	14	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 under the following conditions.

A; All inputs grounded, B; Output control at 4.5 V, all inputs grounded.

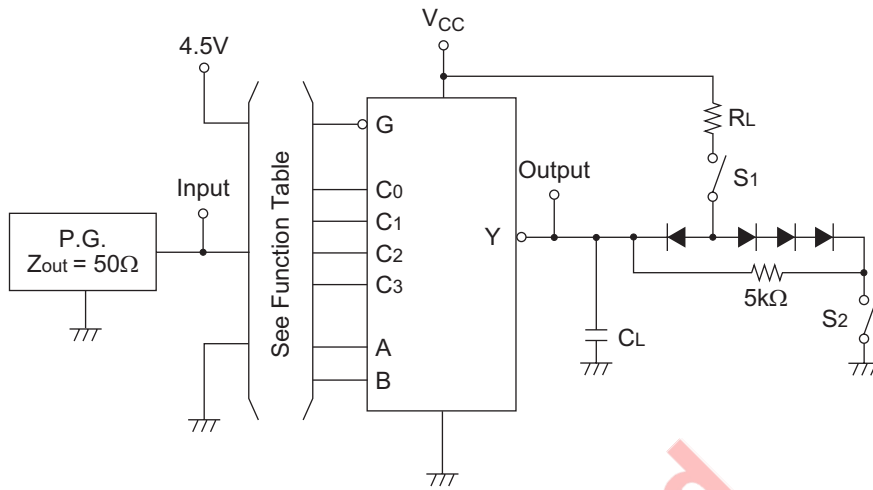
## Switching Characteristics

(V<sub>CC</sub> = 5 V, Ta = 25°C)

Item	Symbol	Inputs	Output	min.	typ.	max.	Unit	Condition
Propagation delay time	$t_{PLH}$	Data	Y	—	17	25	ns	$C_L = 15\text{ pF}$ , $R_L = 2\text{ k}\Omega$
	$t_{PHL}$			—	13	20		
	$t_{PLH}$	Select	Y	—	30	45		
	$t_{PHL}$			—	21	32		
Output enable time	$t_{ZH}$	Output Control	Y	—	15	28	ns	
	$t_{ZL}$	Control	Y	—	15	23		
Output disable time	$t_{HZ}$	Output Control	Y	—	27	41	ns	$C_L = 5\text{ pF}$ , $R_L = 2\text{ k}\Omega$
	$t_{LZ}$	Control	Y	—	18	27		

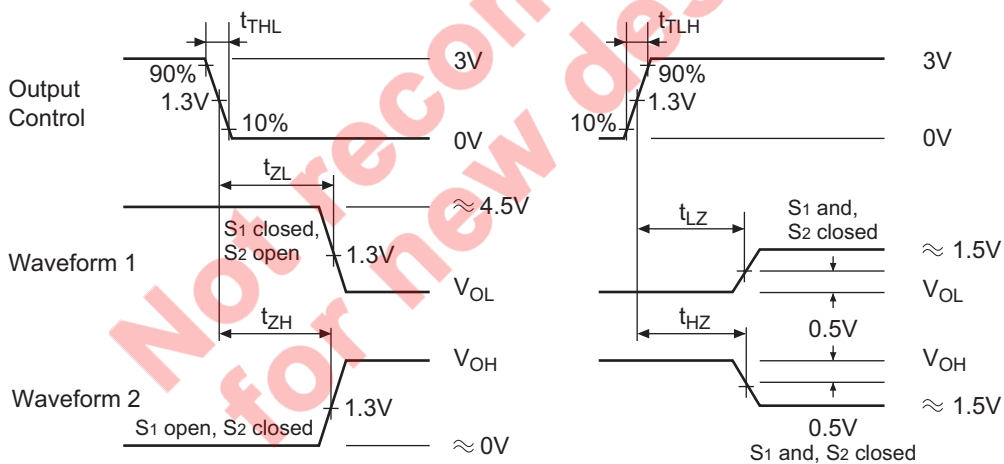
## Testing Method

### Test Circuit



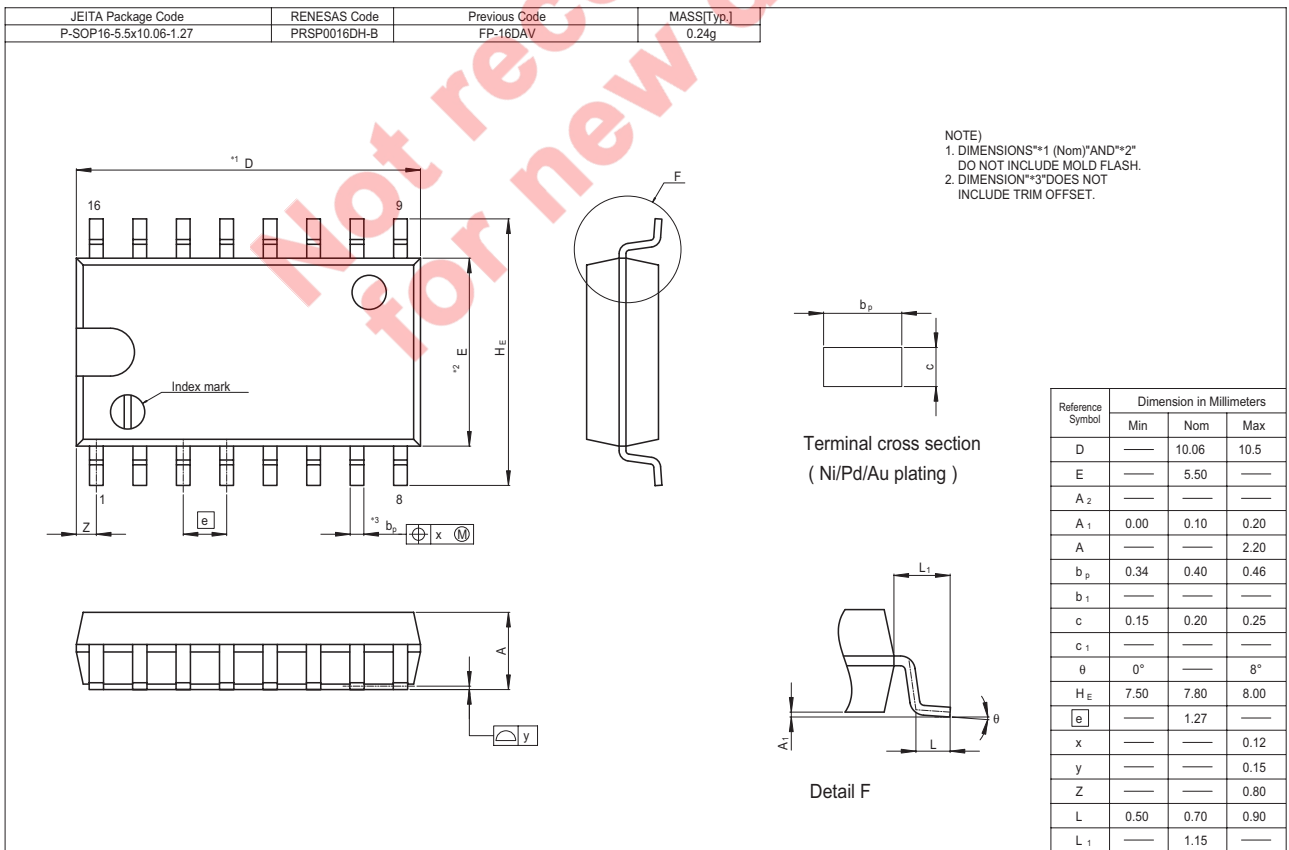
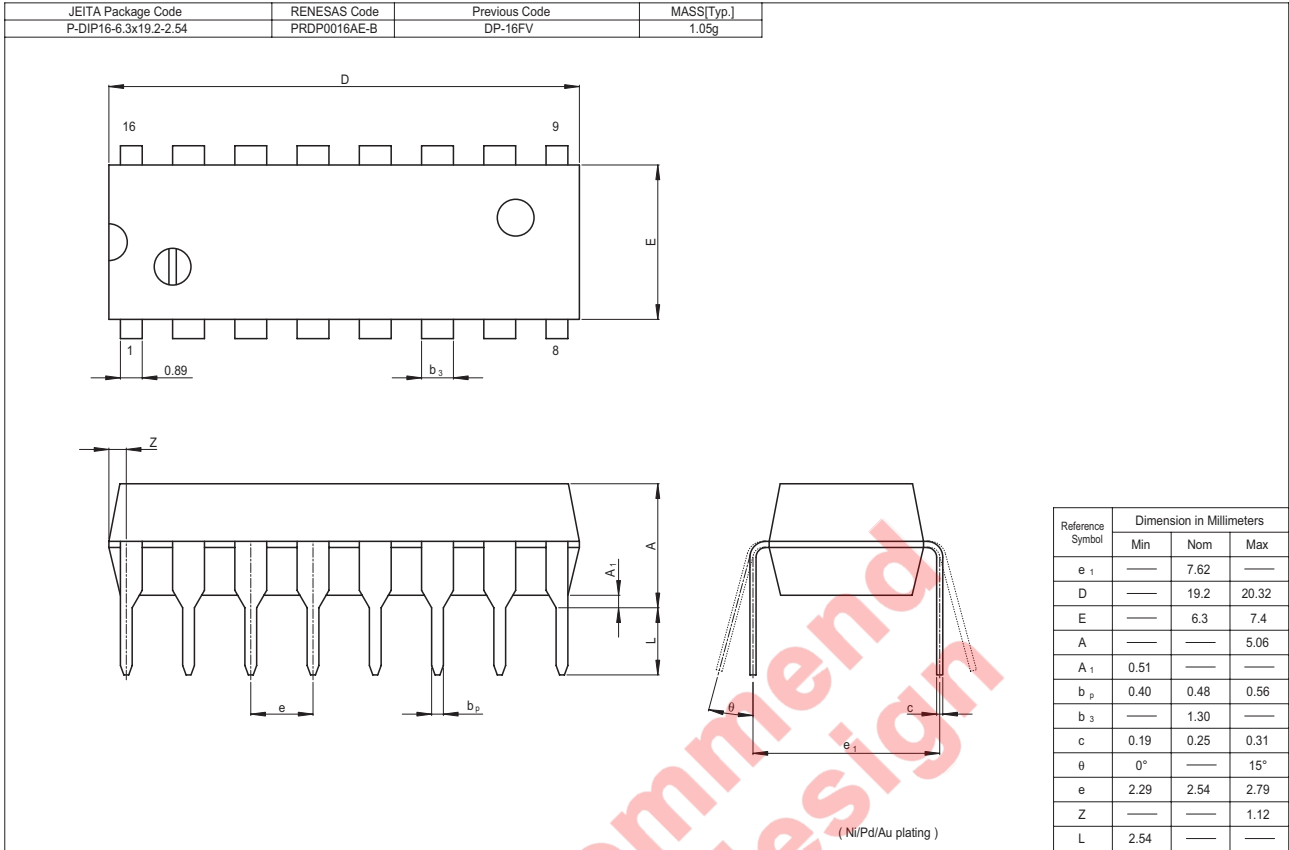
- Notes:
1.  $C_L$  includes probe and jig capacitance.
  2. All diodes are 1S2074(H).

### Waveform



- Notes:
1. Input pulse;  $t_{TLH} \leq 15$  ns,  $t_{THL} \leq 6$  ns, PRR = 1 MHz, duty cycle = 50%
  2. Waveform 1 is for an output with internal conditions such that the output is low except when disabled by the output control.
  3. Waveform 2 is for an output with internal conditions such that the output is high except when disabled by the output control.

Package Dimensions



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