RENESAS

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.

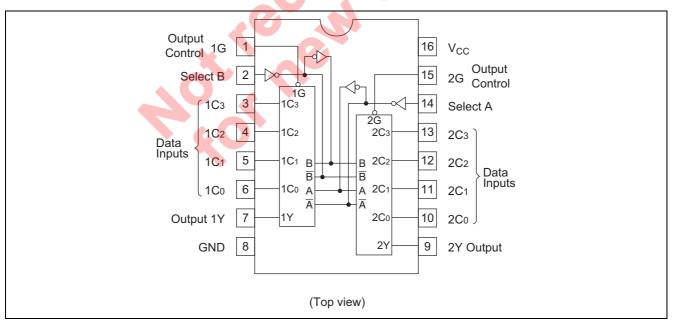
Features

• Ordering Information

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





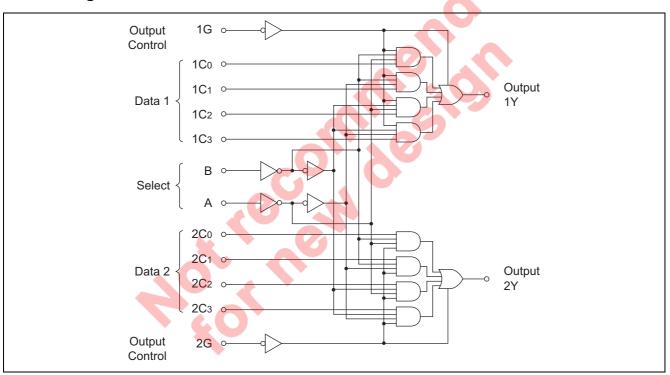
Function Table

Select	inputs		Data i	Output control	Output		
В	A	Co	C ₁	C ₂	C ₃	G	Y
Х	Х	Х	Х	Х	Х	Н	Z
L	L	L	Х	Х	Х	L	L
L	L	Н	Х	Х	Х	L	Н
L	Н	Х	L	Х	Х	L	L
L	Н	Х	Н	Х	Х	L	Н
Н	L	Х	Х	L	Х	L	L
Н	L	Х	Х	Н	Х	L	Н
Н	Н	Х	Х	Х	L	L	L
Н	Н	Х	Х	Х	Н	L	Н

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

ltem	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	Topr	-20 to +75	°C
Power dissipation	PT	400	mW
Storage temperature	Tstg	-65 to +150	٥C

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



Recommended Operating Conditions

Item	Symbol	Min	Тур	Max	Unit
Supply voltage	V _{CC}	4.75	5.00	5.25	V
Output current	I _{OH}	—	—	-2.6	mA
Output current	I _{OL}	—	—	8	mA
Operating temperature	Topr	-20	25	75	°C

Electrical Characteristics

 $(Ta = -20 \text{ to } +75 \ ^{\circ}\text{C})$

ltem	Symbol	min.	typ.*	max.	Unit	Condition
Input voltage	VIH	2.0	—		V	
Input voltage	VIL	_	—	0.8	V	
	V _{OH}	2.4	_	_	V	$\label{eq:VCC} \begin{array}{l} V_{CC} = 4.75 \ \text{V}, \ \text{V}_{\text{IH}} = 2 \ \text{V}, \ \text{V}_{\text{IL}} = 0.8 \ \text{V}, \\ I_{OH} = -2.6 \ \text{mA} \end{array}$
Output voltage	M	—	—	0.4	V	$I_{OL} = 4 \text{ mA}$ $V_{CC} = 4.75 \text{ V}, V_{IH} = 2 \text{ V},$
	V _{OL}			0.5	V	I _{OL} = 8 mA V _{IL} = 0.8 V
	IIн			20	μA	V _{CC} = 5.25 V, V _I = 2.7 V
Input current	I _{IL}	—	—	-0.4	mA	$V_{CC} = 5.25 \text{ V}, \text{ V}_{I} = 0.4 \text{ V}$
	li I	—	—	0.1	mA	$V_{CC} = 5.25 \text{ V}, \text{ V}_{I} = 7 \text{ V}$
	I _{OZ}	—	—	20		$V_0 = 2.7 V$ $V_{CC} = 5.25 V, V_{IH} = 2 V$
Output current		_	—	-20	μA	$V_0 = 0.4 V$ $V_{CC} = 3.23 V, V_{IH} = 2 V$
Short-circuit output current	l _{os}	-30	_	-130	mA	V _{CC} = 5.25 V
Supply current**	I _{CC}	—	7	12	mA	Condition A $V_{CC} = 5.25 V$
		—	8.5	14	mA	Condition B $V_{CC} = 5.25 V$
Input clamp voltage	VIK			-1.5	V	$V_{CC} = 4.75 \text{ V}, \text{ I}_{IN} = -18 \text{ mA}$

Notes: * $V_{CC} = 5 V$, Ta = 25°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.

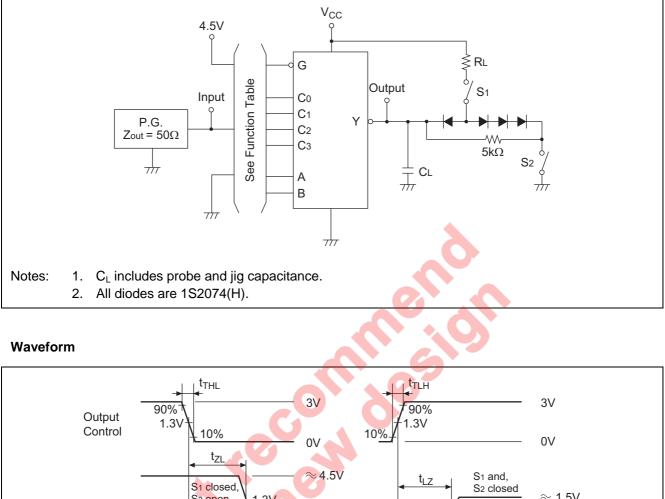
Switching Characteristics

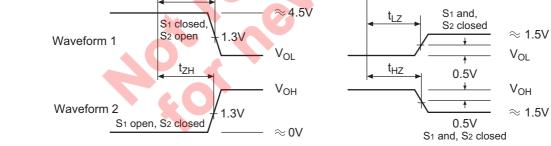
 $(V_{CC} = 5 V, Ta = 25^{\circ}C)$

Item	Symbol	Inputs	Output	min.	typ.	max.	Unit	Condition
Propagation delay time	t _{PLH}	Data	Y	—	17	25	ns	C _L = 15 pF, R _L = 2 kΩ
	t _{PHL}	Dala		—	13	20		
	t _{PLH}	Select	Y	—	30	45		
	t _{PHL}			—	21	32		$R_L = 2 k\Omega$
Output enable time	t _{ZH}	Output	v	—	15	28		
	t _{ZL}	Control	I	—	15	23	115	
Output disable time	t _{HZ}	Output	V	—	27	41	ns	$C_L = 5 \text{ pF},$ $R_L = 2 \text{ k}\Omega$
	t _{LZ}	Control	I	—	18	27	115	$R_L = 2 k\Omega$

Testing Method

Test Circuit



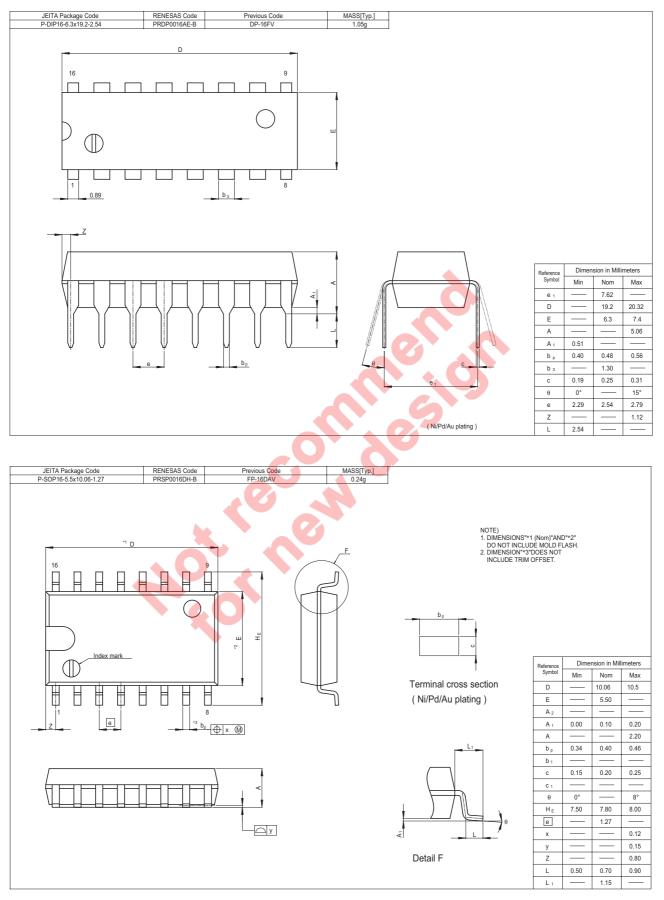


Notes: 1. Input pulse; $t_{TLH} \le 15$ ns, $t_{THL} \le 6$ ns, PRR = 1 MHz, duty cycle = 50%

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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