

DN74LS253 *N74LS253*

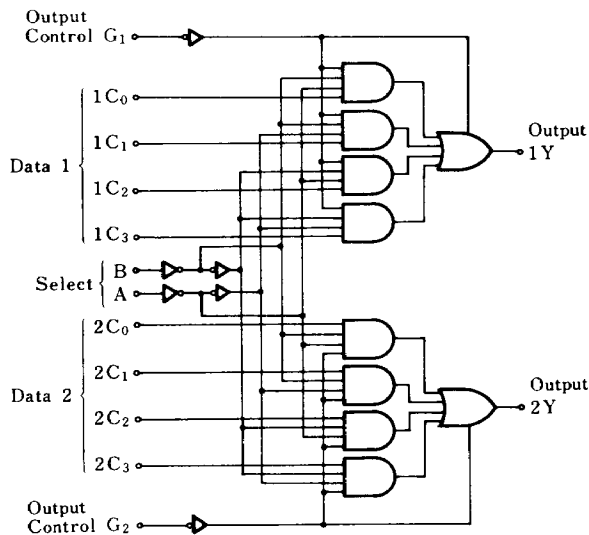
Dual 4-line to 1-line Data Selectors/Multiplexers (with 3-state Outputs)

Description

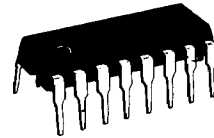
DN74LS253 contains two 4-line to 1-line data selector/multiplexer circuits with 3-state outputs.

Features

- Independent output-control inputs for each circuit
- Common selector inputs for both circuits
- 3-state outputs
- Wide operating temperature range ($T_a = -20$ to $+75^\circ\text{C}$)

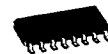
Logic diagram

P-2

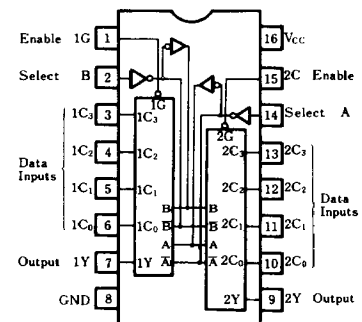


16-pin plastic DIL package

P-5



16-pin Pinflat package (SO-16D)

Pin configuration (top view)**Recommended operating conditions**

Parameter	Sym	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 range	T_{opr}	-20	25	75	$^\circ\text{C}$

■ DC characteristics ($T_a = -20 \sim +75^\circ\text{C}$)

Parameter	Sym	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	3.1		V
	V_{OL1}	$V_{CC} = 4.75\text{V}$ $V_{IH} = 2\text{V}$ $I_{OL} = 4\text{mA}$		0.25	0.4	V
	V_{OL2}	$V_{CC} = 4.75\text{V}$ $V_{IH} = 2\text{V}$ $I_{OL} = 8\text{mA}$		0.35	0.5	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_{OZ1}	$V_{CC} = 5.25\text{V}$ $V_O = 2.7\text{V}$			20	μA
	I_{OZ2}	$V_{IH} = 2\text{V}$ $V_O = 0.4\text{V}$			-20	μA
Output short circuit current**	I_{OS}	$V_{CC} = 5.25\text{V}$, $V_O = 0\text{V}$	-15		-130	mA
Input clamp voltage	V_{IK}	$V_{CC} = 4.75\text{V}$, $I_I = -18\text{mA}$			-1.5	V
Supply current	I_{CC}	$V_{CC} = 5.25\text{V}$				
		Measurement condition A		7	12	mA
		Measurement condition B		8.5	14	mA

* When constant at $V_{CC} = 5\text{V}$, $T_a = 25^\circ\text{C}$.

** Only one output at a time short circuited to GND. Also, short circuit time to GND within 1 second.

*** I_{CC} is measured with all outputs grounded and the following conditions:

A: all inputs grounded.

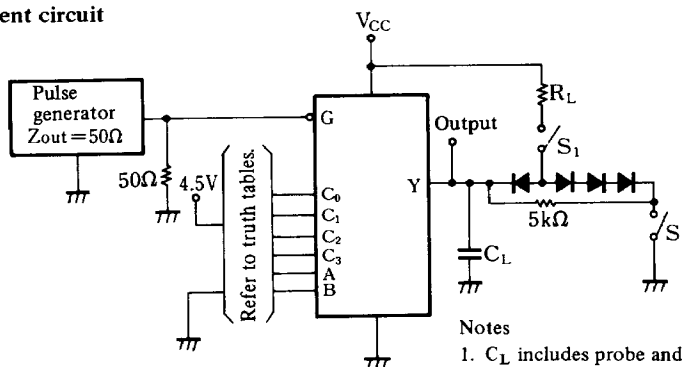
B: 4.5V applied to output control and all inputs grounded.

■ Switching characteristics ($V_{CC} = 5\text{V}$, $T_a = 25^\circ\text{C}$)

Parameter	Sym	Inputs	Outputs	Test conditions	Min	Typ	Max	Unit	
Propagation delay time	t _{PLH}	Data	Y	C _L = 15 pF R _L = 2 kΩ		17	25	ns	
	t _{PHL}					13	20	ns	
	t _{PLH}	Select	Y			30	45	ns	
	t _{PHL}					21	32	ns	
Output enable time	t _{ZH}	Output Control	Y			15	28	ns	
	t _{ZL}					15	23	ns	
Output disable time	t _{HZ}	Output Control	Y		C _L = 5 pF R _L = 2 kΩ		27	41	ns
	t _{LZ}						18	27	ns

※ Switching parameter measurement information

1. Measurement circuit

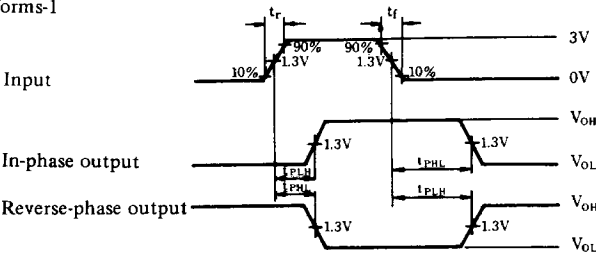


Notes

1. C_L includes probe and tool floating capacitance.
2. Diodes are all MA161 or equivalent.

2. Waveforms

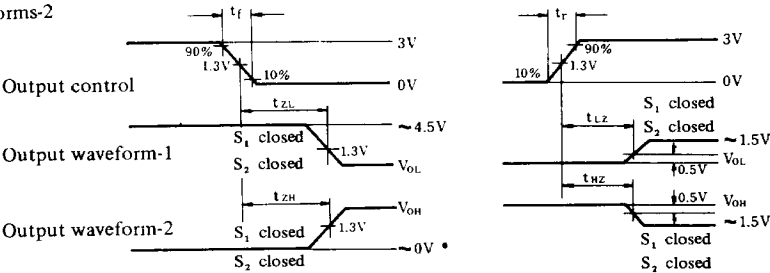
Waveforms-1



Notes

- 1. Input waveform: $t_r \leq 15\text{ns}$, $t_f \leq 6\text{ns}$, $\text{PRR} = 1\text{MHz}$, duty cycle = 50%.

Waveforms-2



Notes

- 1. Input waveform: $t_r \leq 15\text{ns}$, $t_f \leq 6\text{ns}$, $\text{PRR} = 1\text{MHz}$, duty cycle = 50%.
- 2. Except when the output is disabled by the output control, output waveform-1 occurs as a result of internal conditions such as a LOW voltage level.
- 3. Except when the output is disabled by the output control, output waveform-2 occurs as a result of internal conditions such as a HIGH voltage level.
- 4. When measuring t_{PLH} and t_{PLH} , S_1 and S_2 are closed.

■ Truth tables

Select inputs		Data inputs				Output control	Outputs
B	A	C_0	C_1	C_2	C_3	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 voltage level.
- 2. L: LOW voltage level.
- 3. X: Either HIGH or LOW; doesn't matter.
- 4. Address inputs A and B are the same for both.