DN74LS257A

Quad 2-line to 1-line Data Selectors / Multiplexers (with 3-state Outputs)

■ Description

DN74LS257A contains four 2-line to 1-line data selector/multiplexer circuits with 3-state outputs.

■ Features

- Common output-control input for all four circuits
- Common select input for all four circuits
- 3-state outputs
- Wide operating temperature range (Ta = −20 to +75°C)

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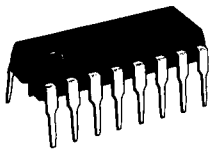

16-pin plastic DIL package

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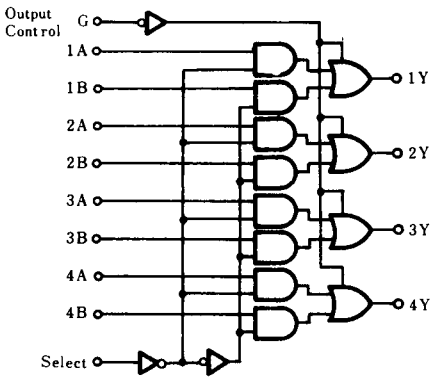
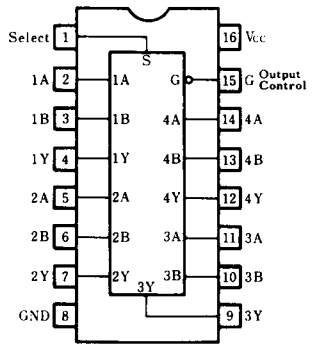
16-pin Panaflat package (SO-16D)

■ Logic diagram



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}			24	mA
Operating temperature range	Topr	−20	25	75	℃

■ DC characteristics ($Ta = -20 \sim +75℃$)

Parameter		Sym	Test conditions		Min	Typ*	Max	Unit
Input voltage		V_{IH}			2.0			V
		V_{IL}					0.8	V
Output voltage		V_{OH}	$V_{CC}=4.75V$, $V_{IH}=2V$, $V_{IL}=0.8V$,	$I_{OH}=-2.6mA$	2.4	3.1		V
		V_{OL1}	$V_{CC}=4.75V$, $V_{IH}=2V$, $V_{IL}=0.8V$	$I_{OL}=12mA$		0.25	0.4	V
		V_{OL2}		$I_{OL}=24mA$		0.35	0.5	V
Input current	S	I_{IH}	$V_{CC}=5.25V$, $V_I=2.7V$				40	μA
	Inputs other than S						20	μA
	S	I_{IL}	$V_{CC}=5.25V$, $V_I=0.4V$				−0.8	mA
	Inputs other than S						−0.4	mA
	S	I_I	$V_{CC}=5.25V$, $V_I=7V$				0.2	mA
	Inputs other than S						0.1	mA
Output current**		I_{OZH}	$V_{CC}=5.25V$, $V_{IH}=2V$	$V_O=2.4V$			20	μA
		I_{OZL}		$V_O=0.4V$			−20	μA
Output short circuit current***		I_{OS}	$V_{CC}=5.25V$, $V_O=0V$		−15		−130	mA
Input clamp voltage		V_{IK}	$V_{CC}=4.75V$, $I_I=-18mA$				−1.5	V
**** Supply current	All outputs HIGH	I_{CC}	$V_{CC}=5.25V$			6.2	10	mA
	All outputs LOW					10	16	mA
	All outputs OFF					12	19	mA

* When constant at V_{CC} = 5V, Ta = 25°C.

** OFF condition (high impedance condition).

*** Only one output at a time short circuited to GND. Also, short circuit time to GND within 7 seconds.

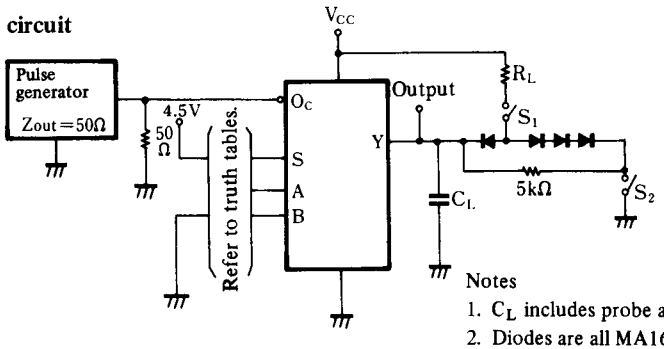
**** Measured with all outputs open and all possible inputs grounded in the range that fulfills the desired output condition.

■ Switching characteristics ($V_{CC}=5V$, $Ta=25℃$)

Parameter	Sym	Inputs	Outputs	Test conditions	Min	Typ	Max	Unit
Propagation delay time	t_{PLH}	A, B	Y	$C_L=45pF$, $R_L=667Ω$		12	18	ns
	t_{PHL}					12	18	ns
	t_{PLH}	S	Y			14	21	ns
	t_{PHL}					14	21	ns
Output enable time	t_{ZH}	G	Y			20	30	ns
	t_{HZ}					20	30	ns
Output disable time	t_{HZ}	G	Y	$C_L=5pF$, $R_L=667Ω$		18	30	ns
	t_{LZ}					16	25	ns

※ Switching parameter measurement information

1. Measurement circuit

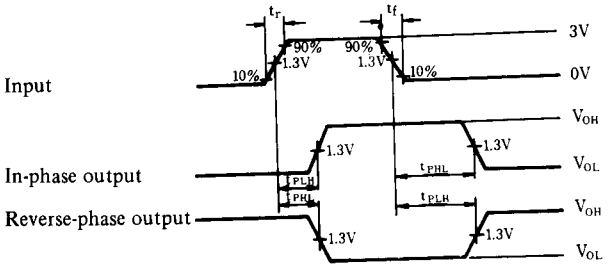


Notes

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

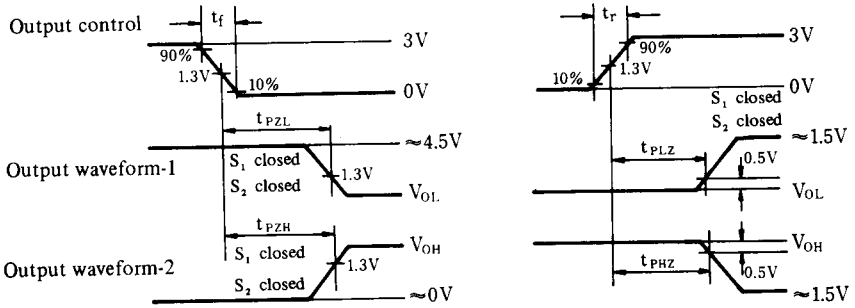
2. Waveforms

Waveforms-1



Notes
1. Input waveform: $t_r \leqq 15ns$, $t_f \leqq 6ns$, PRR = 1MHz, duty cycle = 50%.

Waveforms-2



Notes
1. Input waveform: $t_r \leqq 15ns$, $t_f \leqq 6ns$, PRR = 1MHz, 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.

■ Truth tables

Inputs				Outputs
G	S	A	B	
H	×	×	×	Z
L	L	L	×	L
L	L	H	×	H
L	H	×	L	L
L	H	×	H	H

Notes
1. H: HIGH voltage level.
2. L: LOW voltage level.
3. X: Either HIGH or LOW; doesn't matter.
4. Z: High impedance.