

DN74LS373 *N74LS373*

Octal D-type Transparent Latches (with 3-state Outputs)

Description

DN74LS373 contains eight 3-state output D-type latch circuits with common output-control enable inputs for all circuits.

Features

- 3-state high fan-out outputs ($I_{OH} = 24\text{mA}$, $I_{OH} = -2.6\text{mA}$)
- pnp output-control and enable inputs for small input load coefficient
- High noise margin for enable input (hysteresis width = 400mV typical)
- Eight circuits for high mounting density
- Common output-control and enable inputs for all eight circuits
- Wide operating temperature range ($T_a = -20$ to $+75^\circ\text{C}$)

Truth tables

Outputs	Enable Inputs		Outputs
	G	D	
L	H	H	H
L	H	L	L
L	L	X	Q_0
H	X	X	Z

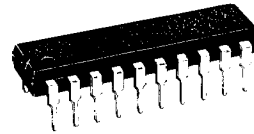
Notes

1. H: HIGH voltage level.
2. L: LOW voltage level.
3. X: Either HIGH or LOW; doesn't matter.
4. Z: High impedance.
5. Q_0 : Q level before determination of the input conditions shown in the table.

Recommended operating conditions

Parameter	Sym	Min	Typ	Max	Unit
Supply voltage	V_{CC}	4.75	5.00	5.25	V
	I_{OH}			-2.6	mA
Output current	I_{OL}			24	mA
Operating temperature range	T_{op}	-20	25	75	$^\circ\text{C}$
Pulse width	"H"	15			ns
	"L"	15			ns
Set-up time	t_{su}	5 ↓			ns
Hold time	t_h	20 ↓			ns

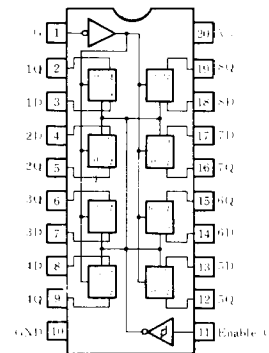
Note: ↓ : Change from HIGH to LOW.

P-3

20-pin plastic DIL package

P-6

20-pin Panaflat package (SO-20D)

Pin configuration (top view)

■ 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}	$V_{CC} = 4.75\text{V}$, $V_{IH} = 2\text{V}$ $V_{IL} = 0.8\text{V}$, $I_{OH} = -26\text{mA}$	2.4	3.1		V
	V_{OL1}	$V_{CC} = 4.75\text{V}$ $V_{IH} = 2\text{V}$		0.25	0.4	V
	V_{OL2}	$V_{IL} = 0.8\text{V}$ $I_{OL} = 24\text{mA}$		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}	$V_{CC} = 5.25\text{V}$ $V_{IH} = 2\text{V}$			-20	μA
	I_{OZ2}	$V_O = 0.4\text{V}$ $V_O = 2.7\text{V}$			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}	$V_{CC} = 5.25\text{V}$		24	40	mA

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

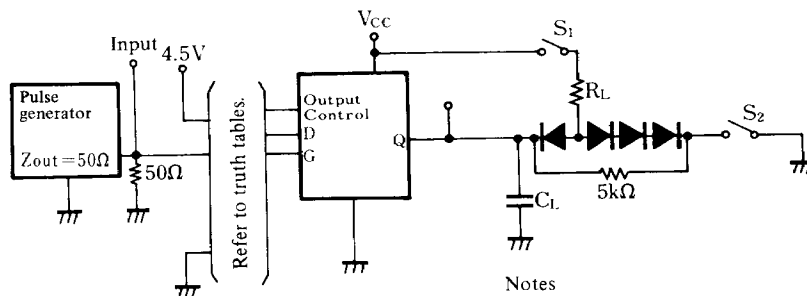
** Only one output at a time short circuited to GND. Also, short circuit time to GND within 1 second.

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

Switching characteristics (V _{CC} = 5 V, I _A = 20 mA)								
Parameter	Sym	Inputs	Outputs	Test conditions	Min	Typ	Max	Unit
Propagation delay time	t _{PLH}	Data	any Q	C _L = 45 pF R _L = 667 Ω		12	18	ns
	t _{PHL}					12	18	ns
	t _{PLH}	Clock or Enable	any Q			20	30	ns
	t _{PHL}					18	30	ns
	t _{PZH}	Output Control	any Q		15	28	ns	
	t _{PZL}				25	36	ns	
	t _{PHZ}	Output Control	any Q	C _L = 5 pF R _L = 667 Ω		12	20	ns
	t _{PLZ}				15	25	ns	

※ Switching parameter measurement information

1. Measurement circuit

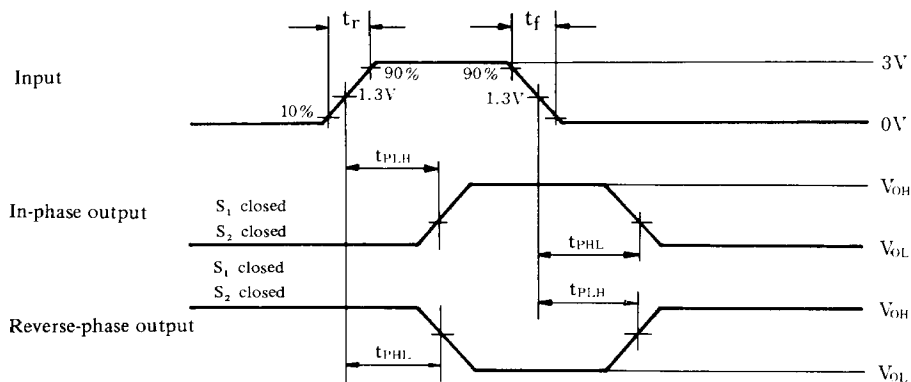


Notes

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

2. Waveforms

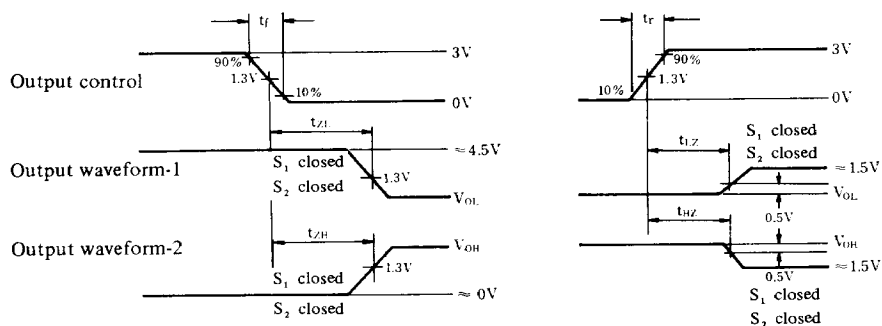
Waveforms-1



Notes

1. Input waveform: $t_r \leq 15\text{ns}$, $t_f \leq 6\text{ns}$, $\text{PRR} = 1\text{MHz}$, 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_{PHL} , S_1 and S_2 are ON.