National Semiconductor

DM74LS573
Octal D-Type Latch (with TRI-STATE® Outputs)

General Description

The 'LS573 is a high speed octal latch with buffered common Latch Enable (LE) and buffered common Output Enable ($\overline{OE}$) inputs.

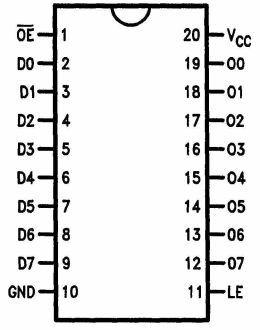
This device is functionally identical to the 'LS373, but has different pinouts. For truth tables, discussion of operations and AC and DC specifications, please refer to the 'LS373 data sheet.

Features

- Inputs and outputs on opposite sides of package allowing easy interface with microprocessors
- Useful as input or output port for microprocessors
- Functionally identical to 'LS373
- Input clamp diodes limit high speed termination effects
- Fully TTL and CMOS compatible

Connection Diagram

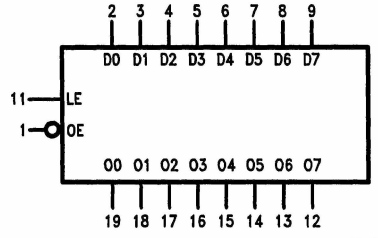
Dual-In-Line Package



TL/F/9814–1

Order Number DM74LS573WM or DM74LS573N
See NS Package Number M20B or N20A

Logic Symbol



TL/F/9814–2

V_{CC} = Pin 20
GND = Pin 10

Pin Names	Description
D0–D7	Data Inputs
LE	Latch Enable Input (Active HIGH)
$\overline{OE}$	TRI-STATE Output Enable Input (Active LOW)
O0–O7	TRI-STATE Latch Outputs

Absolute Maximum Ratings (Note)

If Military/Aerospace specified devices are required, please contact the National Semiconductor Sales Office/Distributors for availability and specifications.

Supply Voltage	7V
Input Voltage	7V
Operating Free Air Temperature Range	
DM74LS	0°C to +70°C
Storage Temperature Range	−65°C to +150°C

Note: *The "Absolute Maximum Ratings" are those values beyond which the safety of the device cannot be guaranteed. The device should not be operated at these limits. The parametric values defined in the "Electrical Characteristics" table are not guaranteed at the absolute maximum ratings. The "Recommended Operating Conditions" table will define the conditions for actual device operation.*

Recommended Operating Conditions

Symbol	Parameter	DM74LS			Units
		Min	Nom	Max	
V_{CC}	Supply Voltage	4.75	5	5.25	V
V_{IH}	High Level Input Voltage	2			V
V_{IL}	Low Level Input Voltage			0.8	V
I_{OH}	High Level Input Current			−2.6	mA
I_{OL}	Low Level Output Current			24	mA
T_A	Free Air Operating Temperature	0		70	°C

Electrical Characteristics

Over recommended operating free air temperature range (unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ (Note 1)	Max	Units
V_I	Input Clamp Voltage	V_{CC} = Min, I_I = −18 mA			−1.5	V
V_{OH}	High Level Output Voltage	V_{CC} = Min, I_{OH} = Max, V_{IL} = Max	2.7	3.4		V
V_{OL}	Low Level Output Voltage	V_{CC} = Min, I_{OL} = Max, V_{IH} = Min		0.35	0.5	V
		I_{OL} = 4 mA, V_{CC} = Min		0.25	0.4	
I_I	Input Current @ Max Input Voltage	V_{CC} = Max, V_I = 10V			1	mA
I_{IH}	High Level Input Current	V_{CC} = Max, V_I = 2.7V			20	μA
I_{IL}	Low Level Input Current	V_{CC} = Max, V_I = 0.4V			−0.4	mA
I_{OS}	Short Circuit Output Current	V_{CC} = Max (Note 2)	−30		−130	mA
I_{CC}	Supply Current	V_{CC} = Max			50	mA
I_{OZH}	TRI-STATE Output off Current High	V_{CC} = V_{CCH} V_{OZH} = 2.7V			20	μA
I_{OZL}	TRI-STATE Output off Current Low	V_{CC} = V_{CCH} V_{OZL} = 0.4V			−20	μA

Note 1: All typicals are at V_{CC} = 5V, T_A = 25°C.

Note 2: Not more than one output should be shorted at a time, and the duration should not exceed one second.

Switching Characteristics

at V_{CC} = 5V and T_A = 25°C (see Section 1 for Test Waveforms and output loading)

Symbol	Parameter	R_L = 2 kΩ, C_L = 15 pF		Units
		Min	Max	
t_{PLH} t_{PHL}	Propagation Delay Data to Q		27 18	ns
t_{PLH} t_{PHL}	Propagation Delay LE to Q		36 25	ns
t_{PZH} t_{PZL}	TRI-STATE Enable Time $\overline{OE}$ to Q		20 25	ns
t_{PHZ} t_{PLZ}	TRI-STATE Enable Time $\overline{OE}$ to Q		20 25	ns
$t_s(H)$ $t_s(L)$	Setup Time (High/Low) Data to LE	3 7		ns
$t_h(H)$ $t_h(L)$	Hold Time (High/Low) Data to LE	3 7		ns
$t_w(H)$	Pulse Width (High) Data to LE	15		ns