

Octal 3-State Noninverting Transparent Latch

Pinouts for the 'HC573A and 'HCT573A are identical to the LS573. Both devices are similar in function to the 'HC373A but have the Data inputs on the opposite side of the package from the outputs to facilitate PC board layout.

The Output Enable input does not affect the state of the latches, but when the Output Enable is high, all device outputs are forced to the high-impedence state. Thus, data may be latched even when the outputs are not enabled.

- Output Drive Capability: 15 LSTTL Loads
- Outputs Directly Interface to CMOS, NMOS, and TTL
- Operating Voltage Range: 2 to 6 V
- Low Input Current: 1 μ A
- DC, AC parameters guaranteed from -55°C to 125°C

DV74HC573A
DV74HCT573A

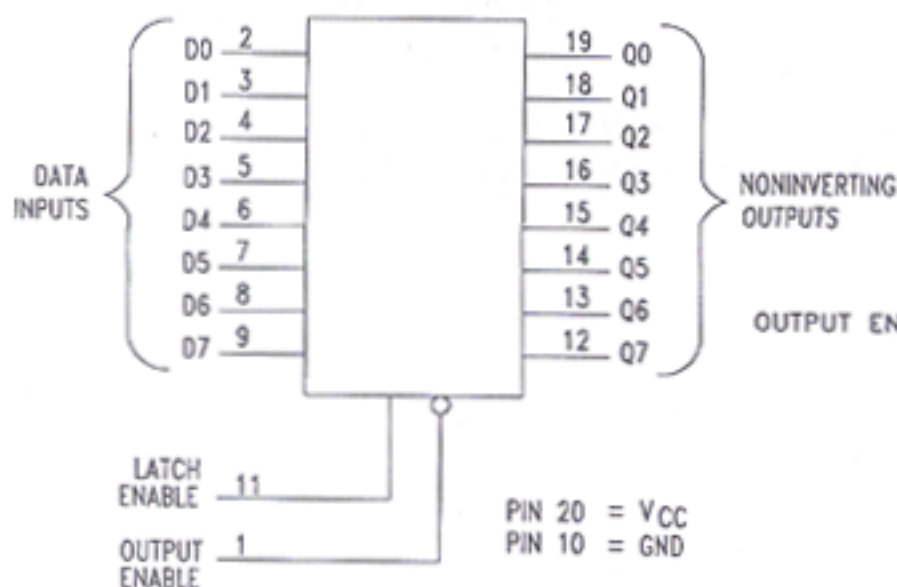


N Suffix
Plastic DIP
AVG-005 Case



D Suffix
Plastic SOP
AVG-006 Case

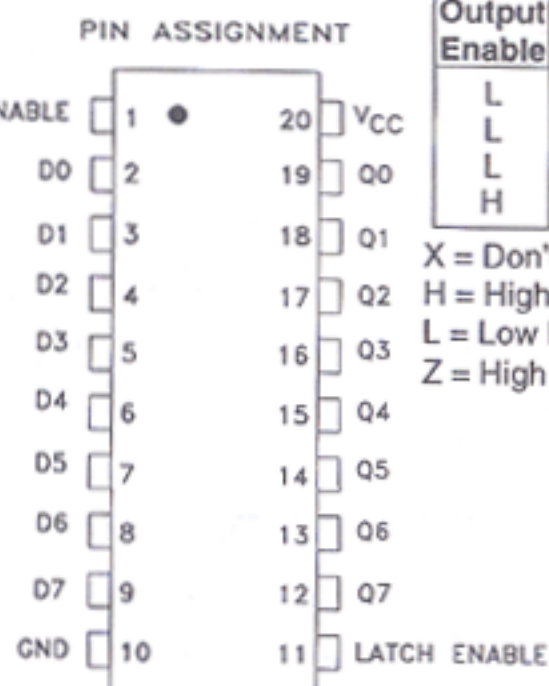
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TRUTH TABLE
(Each Flip-Flop)

Inputs			Output
Output Enable	Latch Enable	D	Q
L	H	H	H
L	H	L	L
L	L	X	no change
H	X	X	Z

X = Don't Care
H = High Logic Level
L = Low Logic Level
Z = High Impedence



ABSOLUTE MAXIMUM RATINGS

Maximum ratings are those values beyond which damage to the device may occur.

Symbol	Parameter	Value	Unit
V _{CC}	DC Supply Voltage (Referenced to GND)	- 0.5 to +7.0	V
V _{IN}	DC Input Voltage (Referenced to GND)	- 1.5 to V _{CC} +1.5	V
V _{OUT}	DC Output Voltage (Referenced to GND)	- 0.5 to V _{CC} +0.5	V
I _{IN}	DC Input Current, per Pin	± 20	mA
I _{OUT}	DC Output Sink/Source Current, per Pin	± 35	mA
I _{CC}	DC VCC or GND Current per Output Pin	± 75	mA
P _D	Power Dissipation in Still Air	Plastic DIP: 750 SOP Package: 500	mW
T _{stg}	Storage Temperature	- 65 to +150	°C
T _L	Lead Temperature, 1 mm from Case for 10 Seconds	260	°C
	Plastic DIP or SOP Package		

GUARANTEED OPERATING CONDITIONS

Symbol	Parameter	Min	Max	Unit
V _{CC}	DC Supply Voltage (Referenced to GND)	2.0	6.0	V
V _{IN} , V _{OUT}	DC Input Voltage, Output Voltage (Referenced to GND)	0	V _{CC}	V
T _A	Ambient Temperature	-55	+125	°C
t _r , t _f	Input Rise and Fall Time: HC: V _{CC} =2.0V HCT: V _{CC} =5.5V / HC: V _{CC} =4.5V HC: V _{CC} =6.0V	0 0 0	1000 500 400	ns

HC — 573A

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} (V)	Guaranteed Limits			Unit
				25°C to -55°C	≤ 85°C	≤ 125°C	
V _{IH}	Minimum High Level Input Voltage	V _{OUT} = V _{CC} -0.1 V I _{OUT} ≤ 20 μA	2.0 4.5 6.0	1.50 3.15 4.20	1.50 3.15 4.20	1.50 3.15 4.20	V
V _{IL}	Maximum Low Level Input Voltage	V _{OUT} = 0.1V I _{OUT} ≤ 20 μA	2.0 4.5 6.0	0.50 1.35 1.80	0.50 1.35 1.80	0.50 1.35 1.80	V
V _{OH}	Minimum High Level Output Voltage	V _{IN} = V _{IH} I _{OUT} ≤ 20 μA	2.0 4.5 6.0	1.90 4.40 5.90	1.90 4.40 5.90	1.90 4.40 5.90	V
		V _{IN} = V _{IH} I _{OUT} ≤ 6.0 mA I _{OUT} ≤ 7.8 mA	4.5 6.0	3.98 5.48	3.84 5.34	3.70 5.20	V
V _{OL}	Maximum Low Level Output Voltage	V _{IN} = V _{IL} I _{OUT} ≤ 20 μA	2.0 4.5 6.0	0.10 0.10 0.10	0.10 0.10 0.10	0.10 0.10 0.10	V
		V _{IN} = V _{IL} I _{OUT} ≤ 6.0 mA I _{OUT} ≤ 7.8 mA	4.5 6.0	0.26 0.26	0.33 0.33	0.40 0.40	V
I _{IN}	Maximum Input Leakage Current	V _{IN} =V _{CC} or GND	6.0	±0.1	±1.00	±1.00	μA
I _{OZ}	Maximum 3-State Current (Output in High Impedance State)	V _{IN} =V _{IL} or V _{IH} V _{OUT} =V _{CC} or GND	6.0	-0.5	-5.0	-10.0	mA
I _{CC}	Maximum Quiescent Supply Current	V _{IN} = V _{CC} or GND I _{OUT} = 0 μA	6.0	4	40	160	μA

AC CHARACTERISTICS over full operating conditions (CL = 50 pF, Input t_r = t_f = 6 ns)

Symbol	Parameter	V _{CC} (V)	Guaranteed Limits			Unit
			+25°C to -55°C	≤ 85°C	≤ 125°C	
t _{PLH} , t _{PHL}	Maximum Propagation Delay, Input D to Q	2.0	150	190	225	ns
		4.5	30	38	45	
		6.0	26	33	38	
t _{PLH} , t _{PHL}	Maximum Propagation Delay Time, Latch Enable to Q	2.0	160	200	240	ns
		4.5	32	40	48	
		6.0	27	34	41	
t _{PLZ} , t _{PHZ}	Maximum Propagation Delay Time, Output Disable to Q	2.0	150	190	225	ns
		4.5	30	38	45	
		6.0	26	33	38	
t _{PZL} , t _{PZH}	Maximum Propagation Delay Time, Output Enable to Q	2.0	150	190	225	ns
		4.5	30	38	45	
		6.0	26	33	38	

Symbol	Parameter	V _{CC} (V)	Guaranteed Limits			Unit
			+25°C to -55°C	≤ 85°C	≤ 125°C	
t _{LUH} , t _{HL}	Maximum Output Transition Time, any Output	2.0 4.5 6.0	60 12 10	75 15 13	90 18 15	ns
C _{IN}	Maximum Input Capacitance		10	10	10	pF
C _{OUT}	Maximum Three-State Output Capacitance (Output in High-Impedance State)		15	15	15	pF

C _{PD}	Power Dissipation Capacitance (Per Buffer) Used to determine the no-load dynamic power consumption: P _D = C _{PD} V _{CC} ² f + I _{CC} V _{CC}	Typical @ 25°C, V _{CC} = 5.0 V	pF
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TIMING REQUIREMENTS (C_L = 50 pF, Input t_r = t_f = 6.0 ns)

Symbol	Parameter	V _{CC} (V)	Guaranteed Limits						Unit
			25°C to -55°C		≤ 85°C		≤ 125°C		
			Min	Max	Min	Max	Min	Max	
t _{su}	Minimum Setup Time, Input D to Latch Enable	2.0	50		65		75		ns
		4.5	10		13		15		
		6.0	9		11		13		
t _h	Minimum Hold Time, Latch Enable to Input D	2.0	5		5		5		ns
		4.5	5		5		5		
		6.0	5		5		5		
t _w	Minimum Pulse Width, Latch Enable	2.0	75		95		110		ns
		4.5	15		19		22		
		6.0	13		16		19		

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DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter		Conditions	V _{CC} (V)	Guaranteed Limits			Unit
					+25°C to -55°C	≤ 85°C	≤125°C	
V _{IH}	Minimum High Level Input Voltage		V _{OUT} = 0.1V or V _{CC} - 0.1 I _{OUT} = ≤20 μA	4.5 5.5	2.0 2.0	2.0 2.0	2.0 2.0	V
V _{IL}	Maximum Low Level Input Voltage		V _{OUT} = 0.1V or V _{CC} - 0.1 V I _{OUT} = ≤20 μA	4.5 5.5	0.8 0.8	0.8 0.8	0.8 0.8	V
V _{OH}	Minimum High Level Output Voltage		V _{IN} = V _{IL} or V _{IH} I _{OUT} ≤ 20 μA	4.5 5.5	4.4 5.4	4.4 5.4	4.4 5.4	V
			V _{IN} = V _{IL} or V _{IH} I _{OUT} ≤ 6 mA	4.5	3.98	3.84	3.7	V
V _{OL}	Maximum Low Level Output Voltage		V _{IN} = V _{IL} or V _{IH} I _{OUT} ≤ 20 μA	4.5 5.5	0.1 0.1	0.1 0.1	0.1 0.1	V
			V _{IN} = V _{IL} or V _{IH} I _{OUT} ≤ 6 mA	4.5	0.26	0.33	0.4	V
I _{IN}	Maximum Input Leakage Current		V _{OUT} =V _{CC} or GND	5.5	±0.1	±1.0	±1.0	μA
I _{OZ}	Maximum 3-State Current (Output in High Impedance State)		V _{IN} =V _{IL} or V _{IH} V _{OUT} =V _{CC} or GND	5.5	±0.5	±5.0	±10.0	μA
I _{CC}	Maximum Quiescent Supply Current		V _{IN} = V _{CC} or GND I _{OUT} = 0 μA	5.5	4.0	40.0	160	μA
ΔI _{CC}	Additional Quiescent Supply Current	V _{IN} =2.4V, Any One Input V _{IN} =V _{CC} or GND, Other Inputs I _{OUT} =0μA	5.5	≥ -55°C		25°C to 125°C		mA
				2.9		2.4		

AC CHARACTERISTICS ($C_L = 50\text{pF}$, Input $t_r = t_f = 6.0\text{ ns}$)

Symbol	Parameter	Guaranteed Limits			Unit
		25°C to – 55°C	≤ 85°C	≤ 125° C	
tPLH, tPHL	Maximum Propogation Delay Input D to Output Q	30	38	45	ns
tPLH, tPHL	Maximum Propogation Delay Time, Latch Enable to Q	30	38	45	ns
tPLZ, tPHZ	Maximum Propogation Delay Time, Output Disable to Q	28	35	42	ns
tPZL, tPZH	Maximum Propogation Delay Time, Output Enable to Q	28	35	42	ns
tTLH, tTHL	Maximum Output Transition Time, any Output	12	15	18	ns
CIN	Maximum Input Capacitance	10	10	10	pF
COUT	Maximum Three-State Output Capacitance (Output in High -Impedance State)	15	15	15	pF
CPD	Power Dissipation Capacitance (Per Enabled Output) Used to determine the no-load dynamic power consumption: $P_D = C_{PD} V_{CC}^2 f + I_{CC} V_{CC}$	Typical @ 25°C, $V_{CC} = 5.0\text{ V}$			pF
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TIMING REQUIREMENTS ($V_{CC} = 5.0\text{ V} \pm 10\%$, Input $t_r = t_f = 6.0\text{ ns}$.)

Symbol	Parameter	Guaranteed Limits						Unit
		25°C to -55°C		≤ 85°C		≤ 125°C		
		Min	Max	Min	Max	Min	Max	
t _{su}	Minimum Setup Time, Input D to Latch Enable	10		13.0		15.0		ns
t _h	Minimum Hold Time, Latch Enable to Input D	5.0		5.0		5.0		ns
t _w	Minimum Pulse Width, Latch Enable	15		19.0		22.0		ns

SWITCHING WAVEFORMS

Input and Output Threshold Voltage:
 $V_T = 50\% V_{CC}$ for HC; 1.3V for HCT
 $V_H = V_{CC}$ for HC, 3V for HCT

