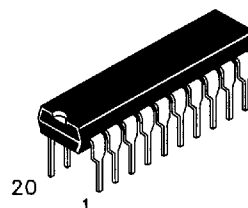


Octal 3-State Non-Inverting Transparent Latch

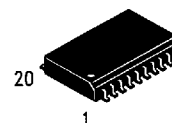
Pinout for the 'HC373A and 'HCT373A are identical to the LS373. The Output Enable input does not affect the state of the latches, but when the Output Enable is high, all device outputs are forced to the high-impedence state. Thus, data may be latched even when the outputs are not enabled. Data is latched at the falling edge of Latch Enable.

- **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**

DV74HC373A DV74HCT373A

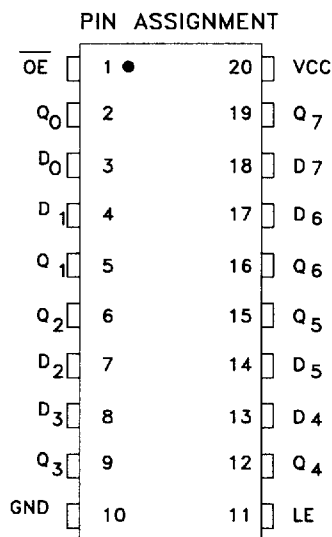
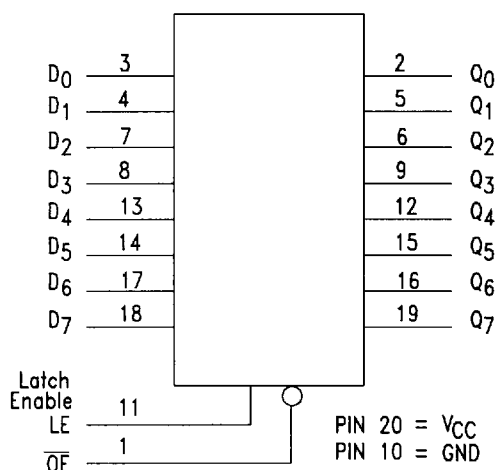


N Suffix
Plastic DIP
AVG-005 Case



D Suffix
Plastic SOP
AVG-006 Case

373A



TRUTH TABLE
(Each Flip-Flop)

Inputs			Output
Output Enable	Latch Enable	D	Q
L	H	H	H
L	H	L	L
L	L	X	NC
H	X	X	Z

H = High Logic Level
L = Low Logic Level
Z = High Impedance
X = Don't Care
NC = No Change

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 SOP Package	750 500	mW
T _{stg}	Storage Temperature	- 65 to +150	°C
T _L	Lead Temperature, 1 mm from Case for 10 Seconds	260	°C

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 — 373A

DC ELECTRICAL CHARACTERISTICS

Symbol	Parameter	Conditions	V _{CC} (V)	Guaranteed Limit			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 Impedence)	V _{IN} =V _{IL} or V _{IH} V _{OUT} =V _{CC} or GND	6.0	±0.5	±5.0	±10.0	μA
I _{CC}	Maximum Quiescent Supply Current	V _{IN} = V _{CC} or GND I _{OUT} = 0 μA	6.0	4.0	40	160	μA

AC CHARACTERISTICS over full operating conditions (C_L = 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 4.5 6.0	125 25 21	155 31 26	190 38 32	ns
t _{PLH} , t _{PHL}	Maximum Propagation Delay Time, Latch Enable to Q	2.0 4.5 6.0	140 28 24	175 35 30	210 42 36	ns
t _{PLZ} , t _{PHZ}	Maximum Propagation Delay Time, Output Disable to Q	2.0 4.5 6.0	150 30 26	190 38 33	225 45 38	ns
t _{PZL} , t _{PZH}	Maximum Propagation Delay Time, Output Enable to Q	2.0 4.5 6.0	150 30 26	190 38 33	225 45 38	ns
t _{TLH} , t _{THL}	Maximum Output Transition Time, any Output	2.0 4.5 6.0	60 12 10	75 15 13	90 18 15	ns

Symbol	Parameter	Vcc (v)	Guaranteed Limits			Unit
			+25°C to -55°C	≤ 85° C	≤ 125° C	
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 .Latch) 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
		36	

TIMING REQUIREMENTS (C_L = 50 pF, Input t_r = t_f = 6.0 ns)

Symbol	Parameter	Vcc (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	25		30		40		ns
		4.5	5.0		6.0		8.0		
		6.0	5.0		6.0		7.0		
t _h	Minimum Hold Time, Latch Enable to Input D	2.0	5.0		5.0		5.0		ns
		4.5	5.0		5.0		5.0		
		6.0	5.0		5.0		5.0		
t _w	Minimum Pulse Width, Latch Enable	2.0	60		75		90		ns
		4.5	12		15		18		
		6.0	10		13		15		

HCT — 373A

373A

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}	MaximumLow 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	mA
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} =2.4 V, Any One Input V _{IN} = V _{CC} or GND, Other Inputs I _{OUT} = 0 μA	V _{cc} (V)	> - 55°C	25°C to 125°C	mA
			5.5	2.9	2.4	

AC CHARACTERISTICS ($V_{CC} = 5.0\text{ V} \pm 10\%$, $C_L = 50\text{ pF}$, Input $t_r = t_f = 6.0\text{ ns}$)

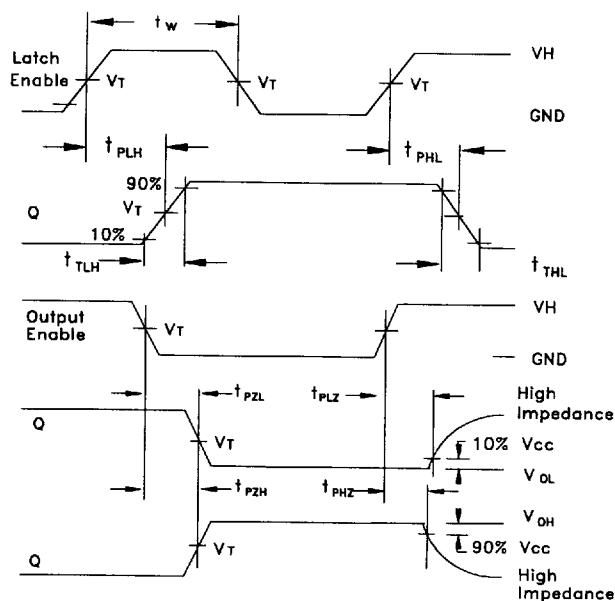
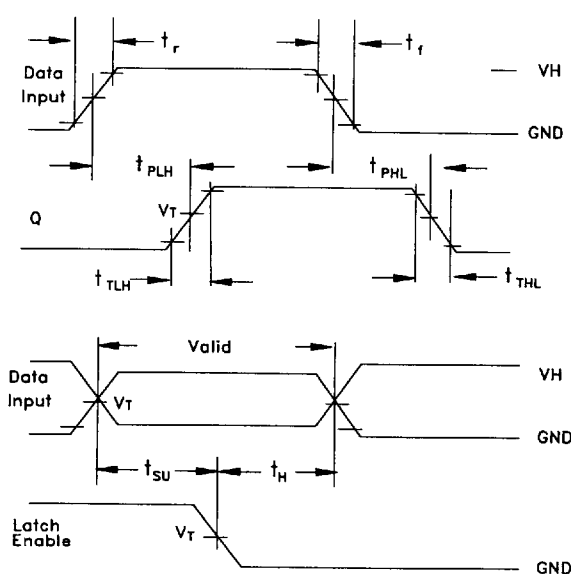
Symbol	Parameter	Guaranteed Limits			Unit
		25°C to 55°C	$\leq 85^\circ\text{C}$	$\leq 125^\circ\text{C}$	
t_{PLH} , t_{PHL}	Maximum Propagation Delay Input D to Output Q	28	35	42	ns
t_{PLH} , t_{PHL}	Maximum Propagation Delay Time, Latch Enable to Q	32	40	48	ns
t_{PLZ} , t_{PHZ}	Maximum Propagation Delay Time, Output Disable to Q	30	38	45	ns
t_{PZL} , t_{PZH}	Maximum Propagation Delay Time, Output Enable to Q	35	44	53	ns
t_{TLH} , t_{THL}	Maximum Output Transition Time, any Output	12	15	18	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

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
		65	

TIMING REQUIREMENTS ($V_{CC} = 5.0\text{ V} \pm 10\%$, Input $t_r = t_f = 6.0\text{ ns}$)

Timing Requirements (VCC = 3.0 V ±10%, Input tr = tr = 6.0 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	10		13.0		15.0		ns
t _w	Minimum Pulse Width, Latch Enable	12		15.0		18.0		ns

SWITCHING WAVEFORMS



Input threshold voltage, $V_T = 50\% V_{CC}$ for HC; 1.3V for HCT
 $V_H - V_{CC}$ for HC, 3 V for HCT