



U74AHC573

CMOS IC

OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

DESCRIPTION

The **U74AHC573** is an octal transparent D-type latch with 3-state outputs, and it has 8 channels.

When the \overline{OE} input is low and the LE input is high, the Q outputs follow the D inputs. When \overline{OE} is low and LE is low, the Q outputs are latched at the logic levels of the D inputs.

When the \overline{OE} input is high, the outputs are in the high-impedance. The \overline{OE} does not affect the internal operations of the latches. Old data can be retained or new data can be entered while the outputs are in the high-impedance state.

To ensure the high-impedance state during power up or power down, \overline{OE} should be tied to V_{CC} through a pull-up resistor; the minimum value of the resistor is determined by the current-sinking capability of the driver.

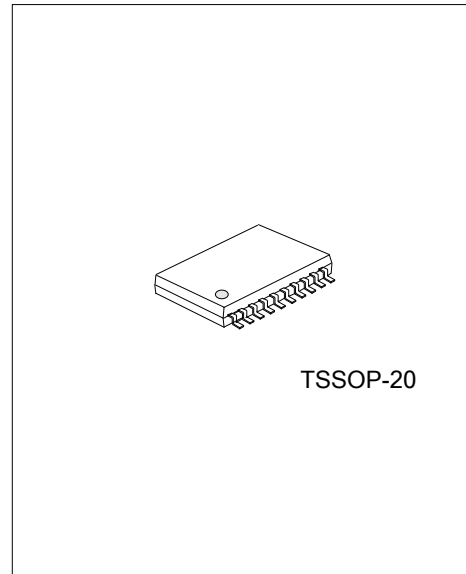
FEATURES

- * Operate from 2V to 5.5V
- * Inputs Accept Voltages to 5.5V
- * Max t_{PD} of 13ns at $V_{CC}=3.3V$, $C_L=15pF$
- * Typ $V_{OL} < 0.36V$ at $V_{CC}=4.5V$, $I_{OL}=8mA$, $T_A=25^\circ C$
- * Typ $V_{OH} > 3.94V$ at $V_{CC}=4.5V$, $I_{OH}=-8mA$, $T_A=25^\circ C$

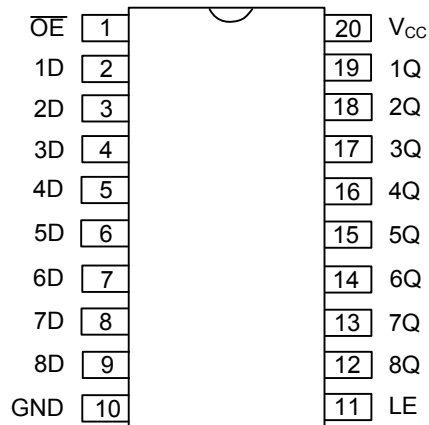
ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74AHC573L-P20-R	U74AHC573G-P20-R	TSSOP-20	Tape Reel
U74AHC573L-P20-T	U74AHC573G-P20-T	TSSOP-20	Tube

<p>U74AHC573L-P20-R</p> <p>(1)Packing Type (2)Package Type (3)Lead Free</p>	<p>(1) R: Tape Reel, T: Tube (2) P20: TSSOP-20 (3) G: Halogen Free, L: Lead Free</p>
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■ PIN CONFIGURATION

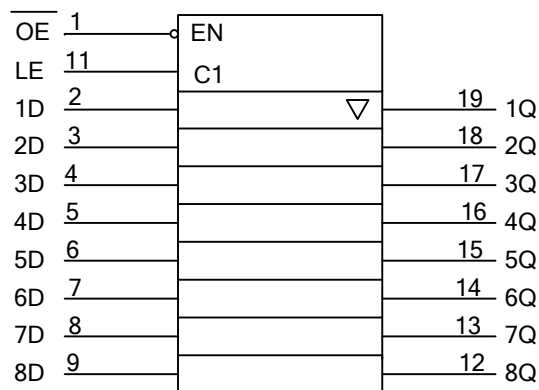


■ FUNCTION TABLE

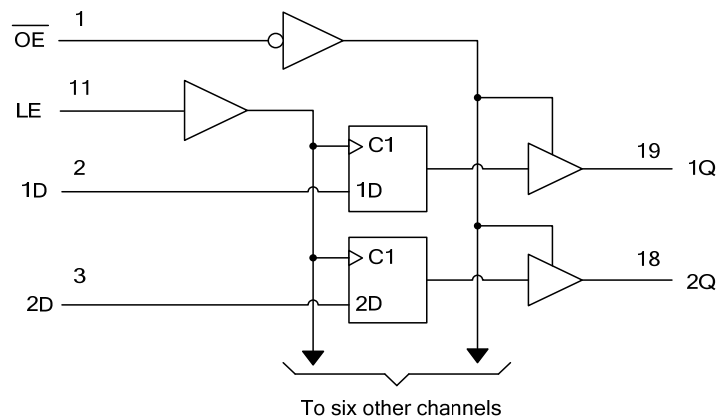
INPUTS(\overline{OE})	INPUTS(LE)	INPUTS(D)	OUTPUT(Q)
L	H	H	H
L	H	L	L
L	L	X	Q_0
H	X	X	Z

Note: H: HIGH voltage level, L: LOW voltage level.

■ LOGIC SYMBOL



■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply voltage	V_{CC}	-0.5 ~ 7	V
Input voltage (Note 2)	V_I	-0.5 ~ 7	V
Output voltage (Note 2)	V_O	-0.5 ~ $V_{CC} + 0.5$	V
Input clamp current	I_{IK}	-20	mA
Output clamp current	I_{OK}	±20	mA
Output current	I_O	±25	mA
V_{CC} or GND current	I_{CC}	±75	mA
Operating Temperature	T_{OPR}	-40 ~ +85	°C
Storage temperature	T_{STG}	-65 ~ +150	°C

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2		5.5	V
High-Level Input Voltage	V_{IH}	$V_{CC} = 2\text{ V}$	1.5			V
		$V_{CC} = 3\text{ V}$	2.1			
		$V_{CC} = 5.5\text{ V}$	3.85			
Low-Level Input Voltage	V_{IL}	$V_{CC} = 2\text{ V}$			0.5	V
		$V_{CC} = 3\text{ V}$			0.9	
		$V_{CC} = 5.5\text{ V}$			1.65	
Input Voltage	V_{IN}		0		5.5	V
Output Voltage	V_{OUT}		0		V_{CC}	V
High-Level Output Current	I_{OH}	$V_{CC} = 2\text{ V}$			-50	μA
		$V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$			-4	
		$V_{CC} = 5\text{ V} \pm 0.5\text{ V}$			-8	
Low-Level Output Current	I_{OL}	$V_{CC} = 2\text{ V}$			50	μA
		$V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$			4	
		$V_{CC} = 5\text{ V} \pm 0.5\text{ V}$			8	
Input Rise or Fall Times	t_R, t_F	$V_{CC} = 3.3\text{ V} \pm 0.3\text{ V}$			100	ns/V
		$V_{CC} = 5\text{ V} \pm 0.5\text{ V}$			20	

■ ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage High-Level	V_{OH}	$V_{CC}=2\text{V}, I_{OH}=-50\mu\text{A}$	1.9			V
		$V_{CC}=3\text{V}, I_{OH}=-50\mu\text{A}$	2.9			
		$V_{CC}=4.5\text{V}, I_{OH}=-50\mu\text{A}$	4.4			
		$V_{CC}=3\text{V}, I_{OH}=-4\text{mA}$	2.58			
		$V_{CC}=4.5\text{V}, I_{OH}=-8\text{mA}$	3.94			
Output Voltage Low-Level	V_{OL}	$V_{CC}=2\text{V}, I_{OL}=50\mu\text{A}$			0.1	V
		$V_{CC}=3\text{V}, I_{OL}=50\mu\text{A}$			0.1	
		$V_{CC}=4.5\text{V}, I_{OL}=50\mu\text{A}$			0.1	
		$V_{CC}=3\text{V}, I_{OL}=4\text{mA}$			0.36	
		$V_{CC}=4.5\text{V}, I_{OL}=8\text{mA}$			0.36	
Input Leakage Current	$I_{(LEAK)}$	$V_{CC}=0\text{V} \sim 5.5\text{V}, V_{IN}=0$ or 5.5V			±0.1	μA
Leakage Current (For output in high-impedance state)	I_{OZ}	$V_{CC}=5.5\text{V}, V_{IN}=V_{IH}$ or $V_{IH}, V_{OUT}=0$ or 5.5V			±0.25	μA
Quiescent Supply Current	I_Q	$V_{CC}=5.5\text{V}, V_{IN}=V_{CC}$ or $\text{GND}, I_{OUT}=0$			4	μA
Input Capacitance	C_I	$V_{CC}=5\text{V}, V_{IN}=V_{CC}$ or GND		2.5	10	pF
Output Capacitance	C_O	$V_{CC}=5\text{V}, V_{OUT}=V_{CC}$ or GND		3.5		pF

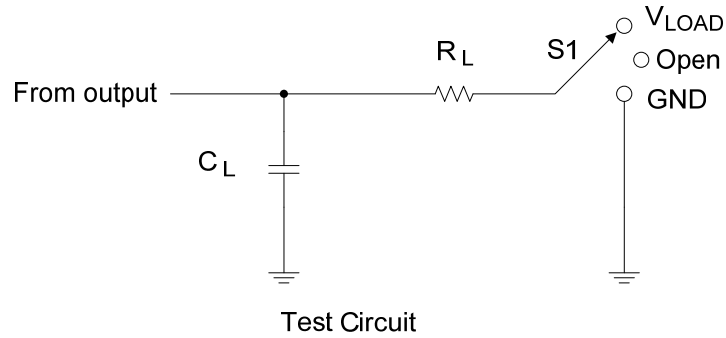
SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
From D to Q	t_{PLH}/t_{PHL}	$V_{CC}=3.3V\pm 0.3V, C_L=15pF$		7	11	ns
		$V_{CC}=3.3V\pm 0.3V, C_L=50pF$		9.5	14.5	
		$V_{CC}=5V\pm 0.5V, C_L=15pF$		4.5	6.8	
		$V_{CC}=5V\pm 0.5V, C_L=50pF$		6	8.8	
From LE to Q		$V_{CC}=3.3V\pm 0.3V, C_L=15pF$		7.6	11.9	
		$V_{CC}=3.3V\pm 0.3V, C_L=50pF$		10.1	15.4	
		$V_{CC}=5V\pm 0.5V, C_L=15pF$		5	7.7	
		$V_{CC}=5V\pm 0.5V, C_L=50pF$		6.5	9.7	
From \overline{OE} to Q	t_{PZL}/t_{PZH}	$V_{CC}=3.3V\pm 0.3V, C_L=15pF$		7.3	11.5	ns
		$V_{CC}=3.3V\pm 0.3V, C_L=50pF$		9.8	15	
		$V_{CC}=5V\pm 0.5V, C_L=15pF$		5.2	7.7	
		$V_{CC}=5V\pm 0.5V, C_L=50pF$		6.7	9.7	
From \overline{OE} to Q	t_{PLZ}/t_{PHZ}	$V_{CC}=3.3V\pm 0.3V, C_L=15pF$		8.3	11	ns
		$V_{CC}=3.3V\pm 0.3V, C_L=50pF$		10.7	14.5	
		$V_{CC}=5V\pm 0.5V, C_L=15pF$		5.2	7.7	
		$V_{CC}=5V\pm 0.5V, C_L=50pF$		6.7	9.7	
Pulse Width, LE high	t_w	$V_{CC}=3.3V\pm 0.3V$	5			ns
		$V_{CC}=5V\pm 0.5V$	5			
Setup Time, data before LE ↓	t_{SU}	$V_{CC}=3.3V\pm 0.3V$	3.5			ns
		$V_{CC}=5V\pm 0.5V$	3.5			
Hold Time, data after LE ↓	t_H	$V_{CC}=3.3V\pm 0.3V$	1.5			ns
		$V_{CC}=5V\pm 0.5V$	1.5			

OPERATING CHARACTERISTICS ($T_A=25^\circ C$, unless otherwise specified)

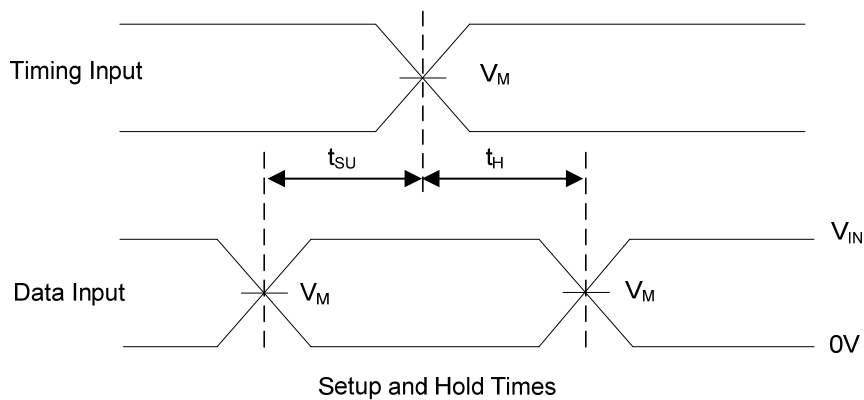
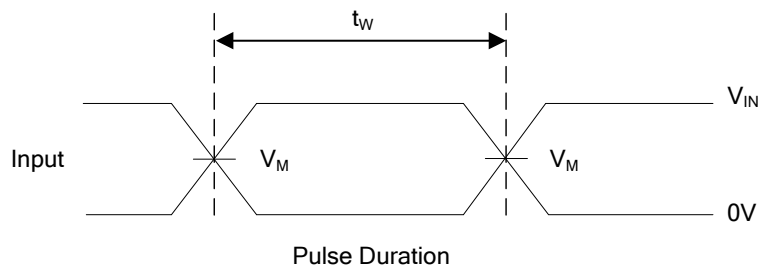
PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Power Dissipation Capacitance	C_{PD}	No load, $f=1MHz$	16	pF

■ TEST CIRCUIT AND WAVEFORMS

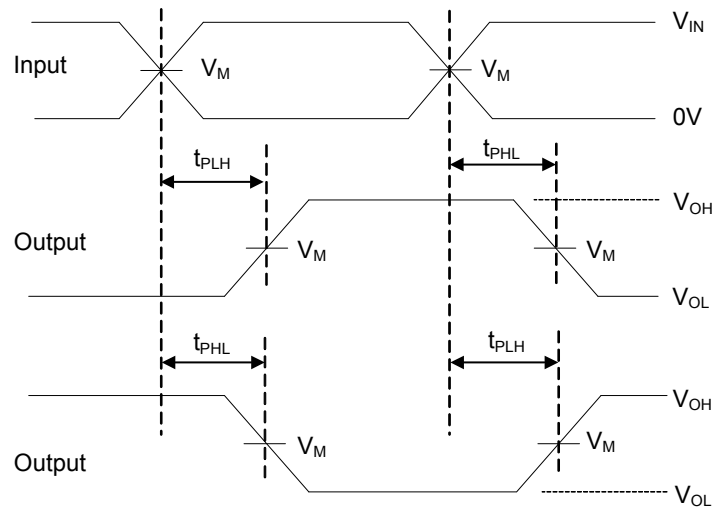


TEST	S1
t_{PLH}/t_{PHL}	Open
t_{PLZ}/t_{PZL}	V_{LOAD}
t_{PHZ}/t_{PZH}	GND

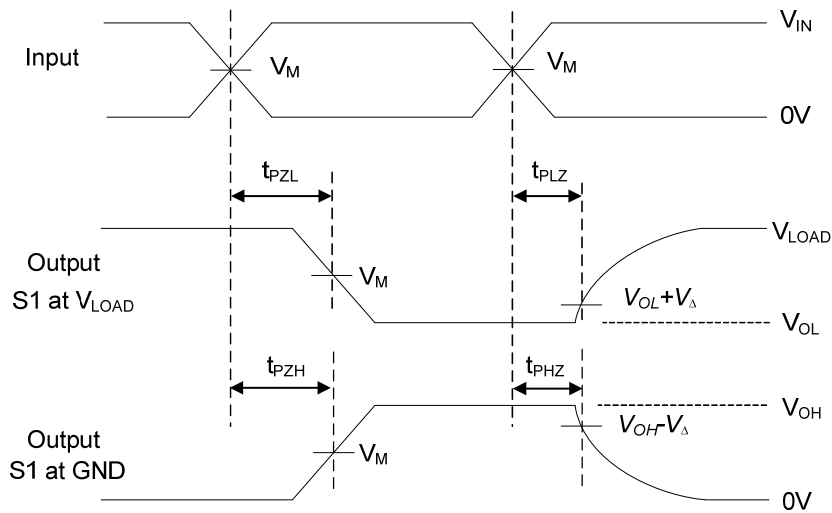
V_{CC}	Input		V_M	V_{LOAD}	C_L	R_L	V_Δ
	V_{IN}	t_R, t_F					
$3.3V \pm 0.3V$	V_{CC}	$\leq 3ns$	$V_{CC}/2$	V_{CC}	15pF	1k Ω	0.3V
					50pF		
$5V \pm 0.5V$	V_{CC}	$\leq 3ns$	$V_{CC}/2$	V_{CC}	15pF	1k Ω	0.5V
					50pF		



■ TEST CIRCUIT AND WAVEFORMS(Cont.)



Voltage Waveforms Propagation Delay Times



Voltage Waveforms Enable and Disable Times

Note: A. C_L includes probe and jig capacitance.

Note: B. $P_{RR} \leq 1\text{MHz}$, $Z_O = 50\Omega$, $t_R \leq 3\text{ns}$, $t_F \leq 3\text{ns}$.

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