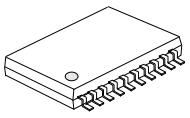
U74HCT373

CMOS IC

OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS



TSSOP-20

■ DESCRIPTION

The **U74HCT373** 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

* Inputs are TTL-Voltage Compatible
* Operate from 4.5V to 5.5V
* Inputs Accept Voltages to 5.5V
* Max t_{PD} of 21ns at V_{CC}=5.5V, C_L=50pF
* Typ V_{OL}< 0.26V at V_{CC}=4.5V, I_{OL}=6mA, T_A=25°C
* Typ V_{OH}> 3.94V at V_{CC}=4.5V, I_{OH}=-6mA, T_A=25°C

■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HCT373L-P20-R	U74HCT373G-P20-R	TSSOP-20	Tape Reel
U74HCT373L-P20-T	U74HCT373G-P20-T	TSSOP-20	Tube

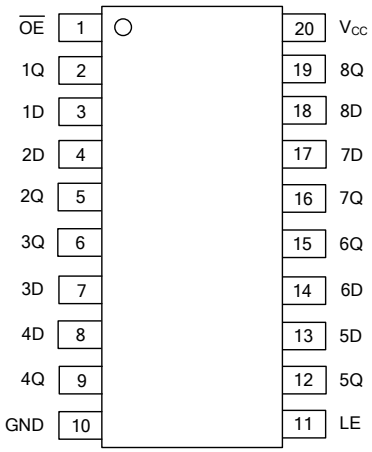
U74HCT373L-P20-T

(1)Packing Type
(2)Package Type
(3)Lead Free

(1) R: Tape Reel, T: Tube
(2) P20: TSSOP-20
(3) G: Halogen Free, L: Lead Free

Copyright © 2011 Unisonic Technologies Co., Ltd

■ PIN CONFIGURATION

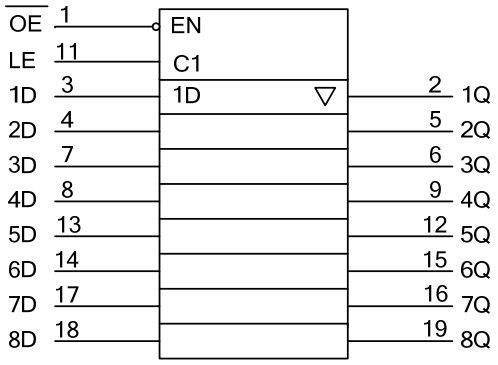


■ FUNCTION TABLE

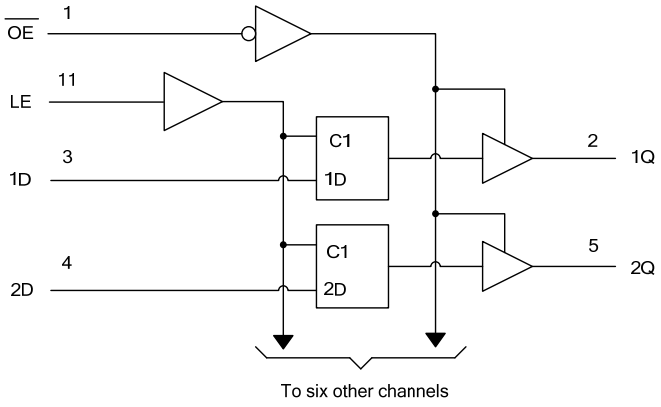
INPUTS($\overline{OE}$)	INPUTS(LE)	INPUTS(D)	OUTPUT(Q)
L	H	H	H
L	H	L	L
L	L	X	Q_0
H	X	X	Z

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 3)	V_I	-0.5 ~ 7	V
Output voltage (Note 3)	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	±35	mA
V_{CC} or GND current	I_{CC}	±70	mA
Storage temperature	T_{STG}	-65 ~ +150	℃

Note: 1. 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.
2. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

■ RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}	4.5		5.5	V
High-Level Input Voltage	V_{IH}	2			V
Low-Level Input Voltage	V_{IL}			0.8	V
Input Voltage	V_{IN}	0		5.5	V
Output Voltage	V_{OUT}	0		V_{CC}	V
Input Rise or Fall Times	t_R, t_F			500	ns/V
Operating free-air temperature	T_A	-40		85	℃

■ ELECTRICAL CHARACTERISTICS (T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage High-Level	V_{OH}	V_{CC}=4.5V, I_{OH}=-20μA	4.4	4.499		V
		V_{CC}=4.5V, I_{OH}=-6mA	3.98	4.3		
Output Voltage Low-Level	V_{OL}	V_{CC}=4.5V, I_{OL}=20μA		0.001	0.1	V
		V_{CC}=4.5V, I_{OL}=6mA		0.17	0.26	
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=5.5V, V_{IN}=0 or 5.5V		±0.1	±100	nA
Leakage Current (For Output in High-Impedance State)	I_{OZ}	V_{CC}=5.5V, V_{IN}=V_{IH} or V_{IH}, V_{OUT}=0 or 5.5V		±0.01	±0.5	μA
Quiescent Supply Current	I_{CC}	V_{CC}=5.5V, V_{IN}=V_{CC} or GND, I_{OUT}=0			8	μA
Additional quiescent supply current	ΔI_{CC}	V_{CC}=5.5V,one Input at 0.5V or3.4V, Other Inputs at V_{CC} or GND		1.4	2.4	mA
Input Capacitance	C_I	V_{CC}=4.5V to 5V		3	10	pF

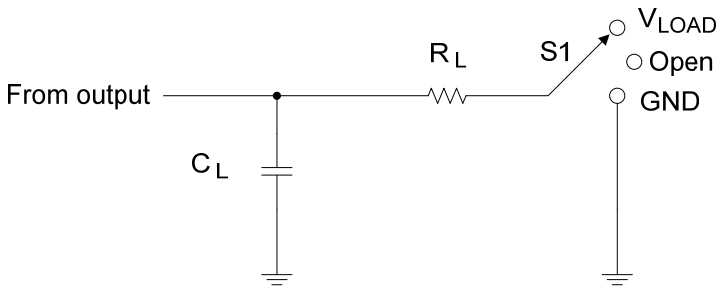
■ SWITCHING CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
From D to Q	t_{PD} (t_{PLH}/t_{PHL})	V_{CC}=4.5V, C_L=50pF		25	35	ns
		V_{CC}=5.5V, C_L=50pF		21	32	
		V_{CC}=4.5V, C_L=150pF		32	52	
		V_{CC}=5.5V, C_L=150pF		27	47	
From LE to Q		V_{CC}=4.5V, C_L=50pF		28	35	
		V_{CC}=5.5V, C_L=50pF		25	32	
		V_{CC}=4.5V, C_L=150pF		38	52	
		V_{CC}=5.5V, C_L=150pF		36	47	
From $\overline{OE}$ to Q	t_{EN} (t_{PZL}/t_{PZH})	V_{CC}=4.5V, C_L=50pF		26	35	ns
		V_{CC}=5.5V, C_L=50pF		23	32	
		V_{CC}=4.5V, C_L=150pF		33	52	
		V_{CC}=5.5V, C_L=150pF		28	47	
From $\overline{OE}$ to Q	t_{DIS} (t_{PLZ}/t_{PHZ})	V_{CC}=4.5V, C_L=50pF		23	35	ns
		V_{CC}=5.5V, C_L=50pF		22	32	
Output transition rise/fall time	t_T (t_R/t_F)	V_{CC}=4.5V, C_L=50pF		10	12	ns
		V_{CC}=5.5V, C_L=50pF		9	11	
		V_{CC}=4.5V, C_L=150pF		18	42	
		V_{CC}=5.5V, C_L=150pF		16	38	
Pulse Width, LE high	t_W	V_{CC}=4.5V	20			ns
		V_{CC}=5.5V	17			
Setup Time, data before LE ↓	t_{SU}	V_{CC}=4.5V	10			ns
		V_{CC}=5.5V	9			
Hold Time, data after LE ↓	t_H	V_{CC}=4.5V	10			ns
		V_{CC}=5.5V	10			

■ OPERATING CHARACTERISTICS(T_A=25°C)

PARAMETER	SYMBOL	TEST CONDITIONS	RATINGS	UNIT
Power Dissipation Capacitance	C_{PD}	No Load	50	pF

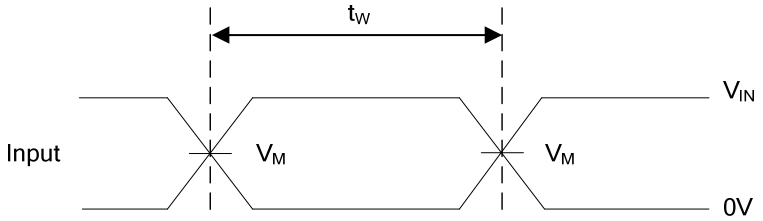
■ TEST CIRCUIT AND WAVEFORMS



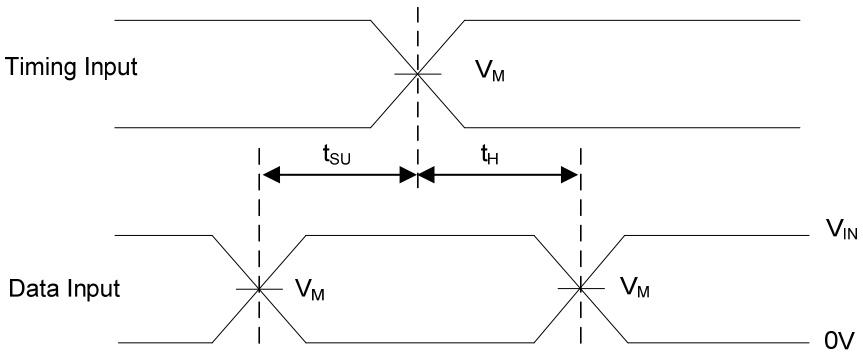
Test Circuit

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					
5V±0.5V	V_{CC}	≤3ns	$V_{CC}/2$	V_{CC}	15pF 50pF	1kΩ	0.5V

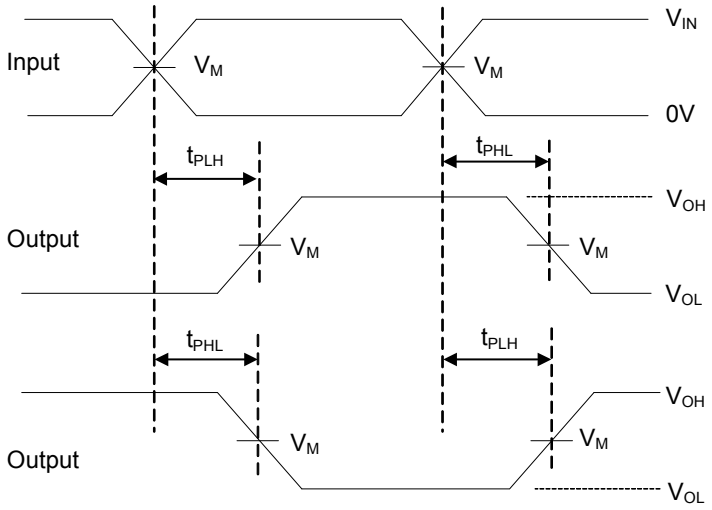


Pulse Duration

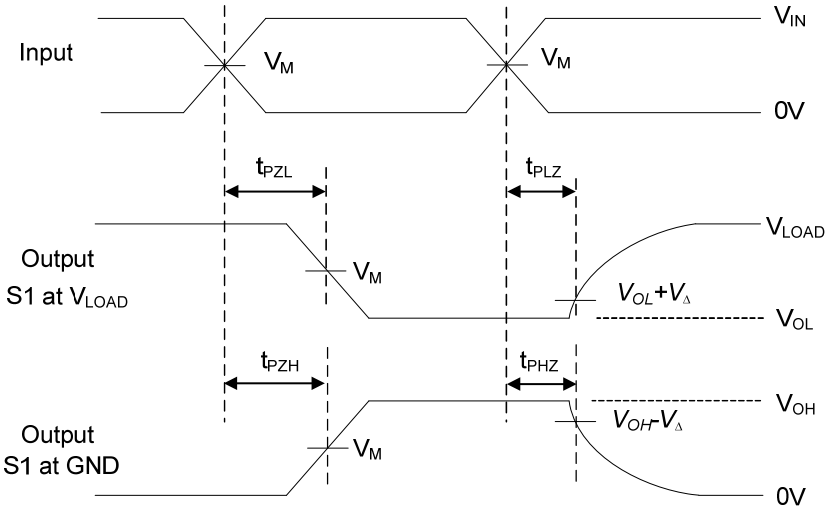


Setup and Hold Times

■ TEST CIRCUIT AND WAVEFORMS(Cont.)



Voltage Waveforms Propagation Delay Times



Voltage Waveforms Enble and Disable Times

Note: A. C_L includes probe and jig capacitance.

B. P_{RR} ⩽1MHz, Z_O = 50Ω, t_R ⩽6ns, t_F ⩽6ns.

UTC assumes no responsibility for equipment failures that result from using products at values that exceed, even momentarily, rated values (such as maximum ratings, operating condition ranges, or other parameters) listed in products specifications of any and all UTC products described or contained herein. UTC products are not designed for use in life support appliances, devices or systems where malfunction of these products can be reasonably expected to result in personal injury. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice.