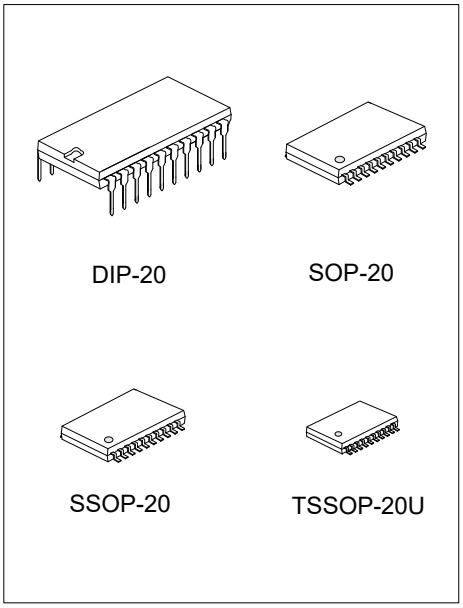
U74HC373

CMOS IC

OCTAL D-TYPE TRANSPARENT LATCH



■ DESCRIPTION

The **U74HC373** consists of eight D-type transparent latches with 3-state outputs. When letch-enable (LE) is high, the latches operate at the transparent mode, and the latches' output will change

corresponding with the data present at D0 to D7. When output-enable ($\overline{OE}$) is low, the contents of the latches will be present at the outputs. The outputs will be in the high impedance when $\overline{OE}$ goes high.

■ FEATURES

* Operation Voltage Range: 2 ~ 6V
* Drive Up to 15 LSTTL Loads
* 3-State Outputs
* Output Capability Suitable for Bus Driving

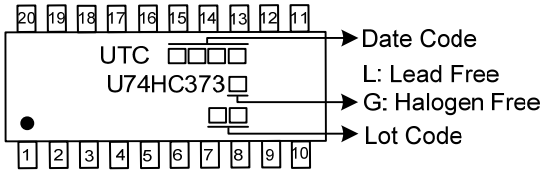
■ ORDERING INFORMATION

Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC373L-D20-T	U74HC373G-D20-T	DIP-20	Tube
U74HC373L-S20-R	U74HC373G-S20-R	SOP-20	Tape Reel
U74HC373L-R20-R	U74HC373G-R20-R	SSOP-20	Tape Reel
U74HC373L-ULA-R	U74HC373G-ULA-R	TSSOP-20U	Tape Reel

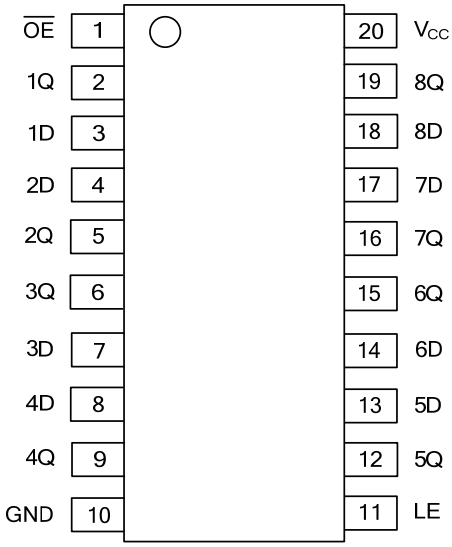
U74HC373G-D20-T
(1)Packing Type
(2)Package Type
(3)Green Package

(1) T: Tube, R: Tape Reel
(2) D20: DIP-20, S20: SOP-20, R20: SSOP-20, ULA: TSSOP-20U
(3) G: Halogen Free and Lead Free, L: Lead Free

■ MARKING



■ PIN CONFIGURATION

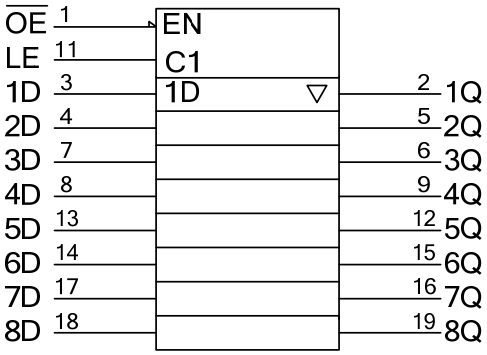


■ FUNCTION TABLE

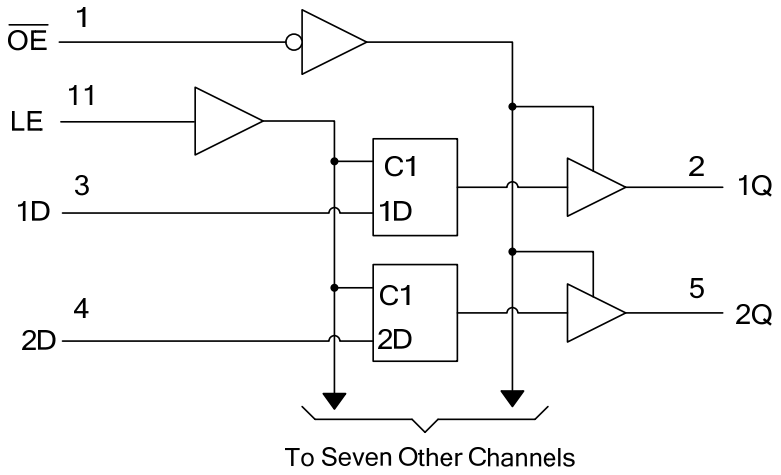
INPUTS($\overline{OE}$)	INPUTS(LE)	INPUTS(D)	OUTPUT(Q)
L	H	H	H
L	H	L	L
L	L	X	Q_0
H	X	X	Z

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

■ LOGIC SYMBOL



■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING (Unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V_{CC}	-0.5 ~ 7	V
V_{CC} or GND Current	I_{CC}	±70	mA
Output Current	I_{OUT}	±35	mA
Input Clamp Current	I_{IK}	±20	mA
Output Clamp Current	I_{OK}	±20	mA
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 (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Supply Voltage	V_{CC}		2	5	6	V
High-level Input Voltage	V_{IH}	V_{CC}=2.0V	1.5			V
		V_{CC}=4.5V	3.15			V
		V_{CC}=6.0V	4.2			V
Low-level Input Voltage	V_{IL}	V_{CC}=2.0V	0		0.5	V
		V_{CC}=4.5V	0		1.35	V
		V_{CC}=6.0V	0		1.8	V
Input Voltage	V_{IN}		0		V_{CC}	V
Output Voltage	V_{OUT}	High or low state	0		V_{CC}	V
Input Rise or Fall Times	t_R, t_F	V_{CC}=2.0V			1	μs
		V_{CC}=4.5V			0.5	μs
		V_{CC}=6.0V			0.4	μs
Operating Temperature	T_A		-40		+125	°C

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-20	θ_{JA}	75	°C/W
	SOP-20		100	°C/W
	SSOP-20		115	°C/W
	TSSOP-20U		120	°C/W

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage High-Level	V_{OH}	V_{CC}=2.0V, I_{OH}=-20μA, V_{IN}=V_{IH} or V_{IL}	1.9	1.998		V
		V_{CC}=4.5V, I_{OH}=-20μA, V_{IN}=V_{IH} or V_{IL}	4.4	4.499		V
		V_{CC}=6.0V, I_{OH}=-20μA, V_{IN}=V_{IH} or V_{IL}	5.9	5.999		V
		V_{CC}=4.5V, I_{OH}=-6mA, V_{IN}=V_{IH} or V_{IL}	3.98	4.3		V
		V_{CC}=6.0V, I_{OH}=-7.8mA, V_{IN}=V_{IH} or V_{IL}	5.48	5.8		V
Output Voltage Low-Level	V_{OL}	V_{CC}=2.0V, I_{OL}=-20μA, V_{IN}=V_{IH} or V_{IL}		2	100	mV
		V_{CC}=4.5V, I_{OL}=-20μA, V_{IN}=V_{IH} or V_{IL}		1	100	mV
		V_{CC}=6.0V, I_{OL}=-20μA, V_{IN}=V_{IH} or V_{IL}		1	100	mV
		V_{CC}=4.5V, I_{OL}=6mA, V_{IN}=V_{IH} or V_{IL}		170	260	mV
		V_{CC}=6.0V, I_{OL}=7.8mA, V_{IN}=V_{IH} or V_{IL}		150	260	mV
Input Leakage Current	$I_{I(LEAK)}$	V_{CC}=6.0V, V_{IN}=V_{CC} or 0		±0.1	±100	nA
Disable Output Leakage Current	I_{OZ}	V_{CC}=6.0V, V_{OUT}=V_{CC} or 0		±0.01	±0.5	μA
Quiescent Supply Current	I_Q	V_{CC}=6.0V, V_{IN}=V_{CC} or 0, I_{OUT}=0			8	μA
Input Capacitance	C_{IN}	V_{CC}=2.0V~6.0V		3	10	pF

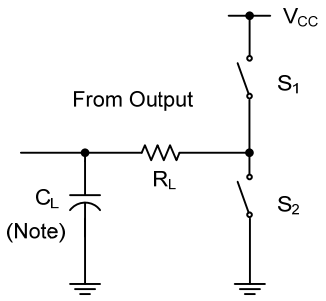
■ SWITCHING CHARACTERISTICS (see test circuit and waveforms)

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Propagation delay from input (D) to output (Q)	t_{PLH}/t_{PHL}	V_{CC}=2.0V	C_L=50pF		58	150	ns
		V_{CC}=4.5V			15	30	ns
		V_{CC}=6.0V			13	26	ns
		V_{CC}=2.0V	C_L=150pF		82	200	ns
		V_{CC}=4.5V			22	40	ns
		V_{CC}=6.0V			19	34	ns
Propagation delay from input (LE) to output (Q)		V_{CC}=2.0V	C_L=50pF		73	175	ns
		V_{CC}=4.5V			18	35	ns
		V_{CC}=6.0V			15	30	ns
		V_{CC}=2.0V	C_L=150pF		100	225	ns
		V_{CC}=4.5V			24	45	ns
		V_{CC}=6.0V			20	38	ns
Output enable time from input ($\overline{OE}$) to output (Q)	t_{PZL}/t_{PZH}	V_{CC}=2.0V	C_L=50pF		65	150	ns
		V_{CC}=4.5V			17	30	ns
		V_{CC}=6.0V			14	26	ns
		V_{CC}=2.0V	C_L=150pF		90	200	ns
		V_{CC}=4.5V			23	40	ns
		V_{CC}=6.0V			19	34	ns
Output disable time from input ($\overline{OE}$) to output (Q)	t_{PLZ}/t_{PHZ}	V_{CC}=2.0V	C_L=50pF		50	150	ns
		V_{CC}=4.5V			15	30	ns
		V_{CC}=6.0V			13	26	ns
to Q	t_T	V_{CC}=2.0V	C_L=150pF		28	60	ns
		V_{CC}=4.5V			8	12	ns
		V_{CC}=6.0V			6	10	ns
Pulse Width	t_W	V_{CC}=2.0V			80		ns
		V_{CC}=4.5V			16		ns
		V_{CC}=6.0V			14		ns
Setup Time	t_{SU}	V_{CC}=2.0V			50		ns
		V_{CC}=4.5V			10		ns
		V_{CC}=6.0V			9		ns
Hold Time	t_H	V_{CC}=2.0V			20		ns
		V_{CC}=4.5V			10		ns
		V_{CC}=6.0V			10		ns

■ OPERATING CHARACTERISTICS (Unless otherwise specified)

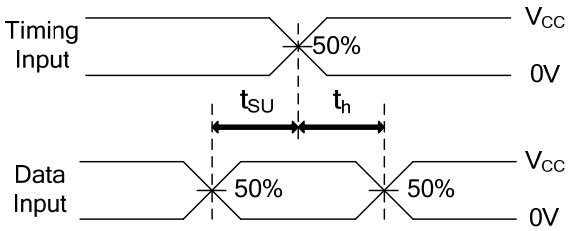
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Power Dissipation Capacitance	C_{PD}	No Load		100		pF

■ TEST CIRCUIT AND WAVEFORMS

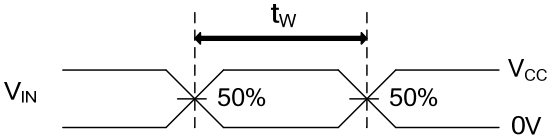


TEST CIRCUIT

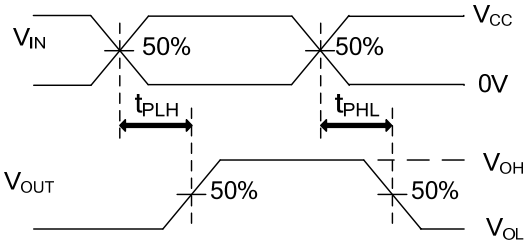
	R_L	C_L	S_1	S_2
t_{PZH}	1kΩ	50pF, 150pF	Open	Closed
t_{PZL}			Closed	Open
t_{PHZ}	1kΩ	50pF	Open	Closed
t_{PLZ}			Closed	Open
t_{PHL}	-	50pF, 150pF	Open	Open
t_{PLH}				



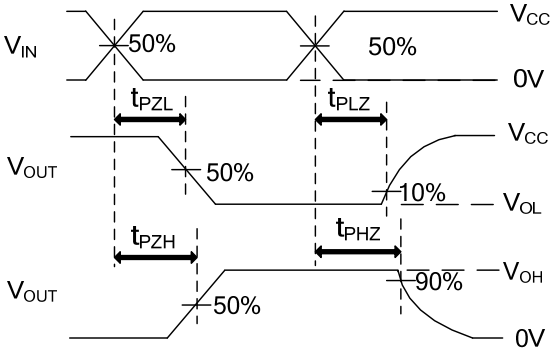
SETUP TIME AND HOLD TIME



PULSE WIDTH



PROPAGATION DELAY TIMES



ENABLE AND DISABLE TIMES

Notes: 1. C_L includes probe and jig capacitance.
2. All input pulses are supplied by generators having the following characteristics: PRR ≤1MHz, Z_O= 50Ω, t_r=6ns, t_f=6ns.