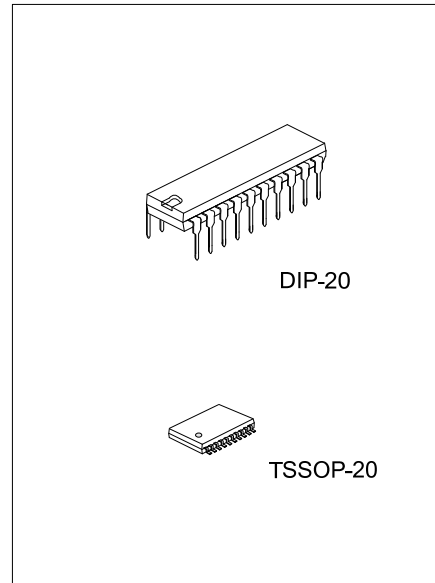




## U74HCT563

CMOS IC

### OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS



#### DESCRIPTION

The UTC **U74HCT563** are octal D-type transparent latches featuring separated D-type inputs for each latch and inverting 3-state outputs for bus-oriented applications.

#### FEATURES

- \* Operation Voltage Range: 4.5V ~ 5.5V
- \* 3-state Inverting Outputs for Bus-oriented Applications
- \* Common 3-state Output Enable Input
- \* Inputs are TTL voltage compatible

#### ORDERING INFORMATION

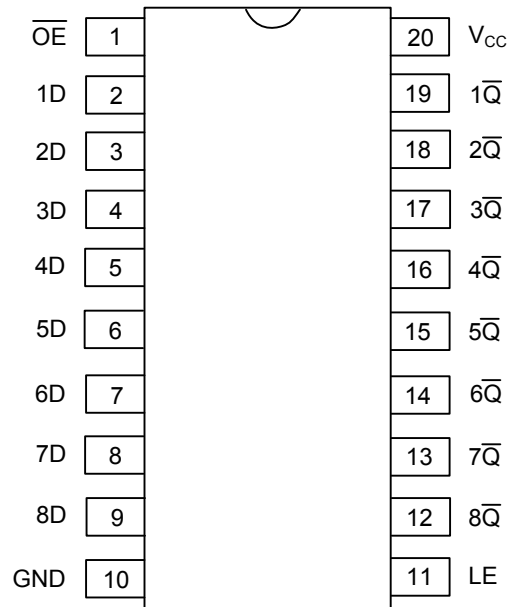
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HCT563L-D20-T	U74HCT563G-D20-T	DIP-20	Tube
-	U74HCT563G-P20-R	TSSOP-20	Tape Reel

<p>U74HCT563L-D20-T</p> <p>(1)Packing Type (2)Package Type (3)Green Package</p>	<p>(1) T: Tube, R: Tape Reel (2) D20: DIP-20, P20: TSSOP-20 (3) L: Lead Free, G: Halogen Free and Lead Free</p>
---	---

#### MARKING

DIP-20	TSSOP-20
<p>UTC □□□□ U74HCT563□ □□</p> <p>→ Date Code L: Lead Free G: Halogen Free → Lot Code</p>	<p>UTC □□□□ U74HCT563G □□</p> <p>→ Date Code → Lot Code</p>

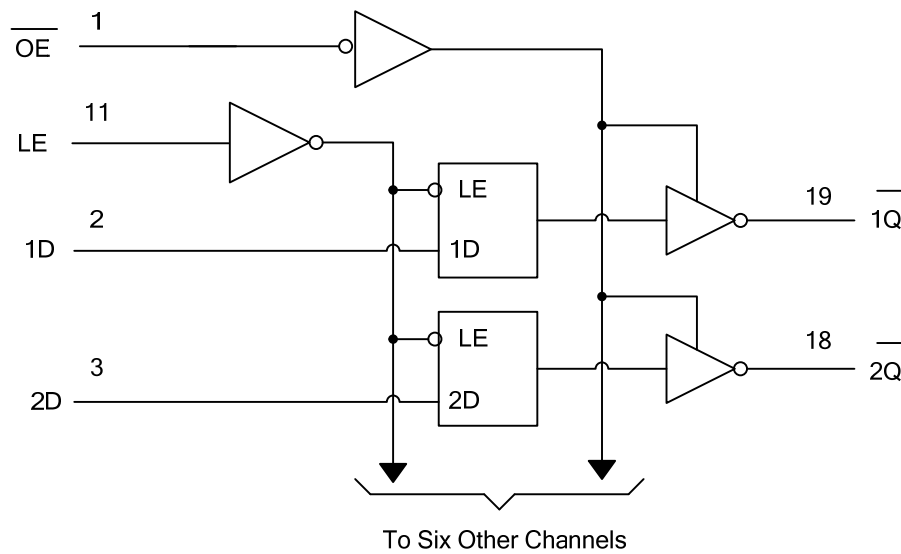
■ PIN CONFIGURATION



■ FUNCTION TABLE

INPUTS( $\overline{OE}$ )	INPUTS(LE)	INPUTS(D)	OUTPUT( $\overline{Q}$ )
L	H	H	L
L	H	L	H
L	L	X	$\overline{Q}_0$
H	X	X	Z

■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING(unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	$V_{CC}$	-0.5~7.0	V
Input Voltage	$V_{IN}$	-0.5~ $V_{CC}+0.5$	V
Output Voltage(active mode)	$V_{OUT}$	-0.5~ $V_{CC}+0.5$	V
Input Clamp Current ( $V_{IN}<0$ )	$I_{IK}$	±20	mA
Output Clamp Current ( $V_{OUT}<0$ )	$I_{OK}$	±20	mA
Output Current	$I_{OUT}$	±35	mA
$V_{CC}$ or GND Current	$I_{CC}$	±70	mA
Storage Temperature	$T_{STG}$	-65 ~ +150	°C

Notes: 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		0.8	V
Input Voltage	$V_{IN}$	0		$V_{CC}$	V
Output Voltage	$V_{OUT}$	0		$V_{CC}$	V
Input Transition Rise or Fall Rate	$t_T$	0		500	ns
Operating free-air temperature	$T_A$	-40		85	°C

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
High-Level Input Voltage	$V_{IH}$	$V_{CC}=4.5\text{V}\sim 5.5\text{V}$	2.0	1.6		V
Low-Level Output Voltage	$V_{IL}$	$V_{CC}=4.5\text{V}\sim 5.5\text{V}$		1.2	0.8	V
High-Level Output Voltage, QA-QH	$V_{OH}$	$V_{CC}=4.5\text{V}, I_{OH}=-20\mu\text{A}$	4.4	4.499		V
		$V_{CC}=4.5\text{V}, I_{OH}=-6\text{mA}$	3.98	4.3		V
Low-Level Output Voltage, QA-QH	$V_{OL}$	$V_{CC}=4.5\text{V}, I_{OL}=20\mu\text{A}$		0.001	0.1	V
		$V_{CC}=4.5\text{V}, I_{OH}=6\text{mA}$		0.17	0.26	V
High-Level Output Voltage, QH'	$V_{OH}$	$V_{CC}=4.5\text{V}, I_{OH}=-20\mu\text{A}$	4.4	4.499		V
		$V_{CC}=4.5\text{V}, I_{OH}=-4\text{mA}$	3.98	4.3		V
Low-Level Output Voltage, QH'	$V_{OL}$	$V_{CC}=4.5\text{V}, I_{OL}=20\mu\text{A}$		0.001	0.1	V
		$V_{CC}=4.5\text{V}, I_{OH}=4\text{mA}$		0.17	0.26	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=5.5\text{V}, V_{IN}=V_{CC}$ or GND		±0.1	±100	nA
Output OFF -State Current	$I_{OZ}$	$V_{CC}=5.5\text{V}, V_{OUT}=V_{CC}$ or GND		±0.01	±0.5	μA
Quiescent Supply Current	$I_{CC}$	$V_{CC}=5.5\text{V}, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			8	μA
Additional Quiescent Supply Current	$\Delta I_{CC}$	$V_{CC}=5.5\text{V}$ , One input at 0.5V or 2.4V, other inputs at 0 or $V_{CC}$		1.4	2.4	mA
Input Capacitance	$C_{IN}$	$V_{CC}=5.5\text{V}, V_{IN}=V_{CC}$ or GND		3	10	pF

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

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Pulse duration, LE high	$t_w$	$V_{CC}=4.5\text{V}$	20			ns
		$V_{CC}=5.5\text{V}$	17			
Setup Time, data before LE↓	$t_{SU}$	$V_{CC}=4.5\text{V}$	10			ns
		$V_{CC}=4.5\text{V}$	9			
Hold Time, data after LE↓	$t_H$	$V_{CC}=4.5\text{V}$	5			ns
		$V_{CC}=5.5\text{V}$	5			

■ DYNAMIC CHARACTERISTICS ( $T_A=25^\circ\text{C}$ ,  $R_L=1\text{k}\Omega$ , unless otherwise specified)

$C_L=50\text{pF}$

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (D) to output ( $\bar{Q}$ )	$t_{pd}$ ( $t_{PLH}/t_{PHL}$ )	$V_{CC}=4.5\text{V}$		28	35	ns
		$V_{CC}=5.5\text{V}$		24	32	ns
Propagation delay from input (LE) to output ( $\bar{Q}$ )	$t_{pd}$ ( $t_{PLH}/t_{PHL}$ )	$V_{CC}=4.5\text{V}$		30	35	ns
		$V_{CC}=5.5\text{V}$		28	32	ns
3-state output enable time from input ( $\overline{OE}$ ) to output ( $\bar{Q}$ )	$t_{en}$ ( $t_{PZL}/t_{PZH}$ )	$V_{CC}=4.5\text{V}$		28	35	ns
		$V_{CC}=5.5\text{V}$		25	32	ns
3-state output disable time from input ( $\overline{OE}$ ) to output ( $\bar{Q}$ )	$t_{dis}$ ( $t_{PLZ}/t_{PHZ}$ )	$V_{CC}=4.5\text{V}$		25	35	ns
		$V_{CC}=5.5\text{V}$		24	32	ns
Output transition time, ( $\bar{Q}$ )	$t_t$ ( $t_R/t_F$ )	$V_{CC}=4.5\text{V}$		10	12	ns
		$V_{CC}=5.5\text{V}$		9	11	ns

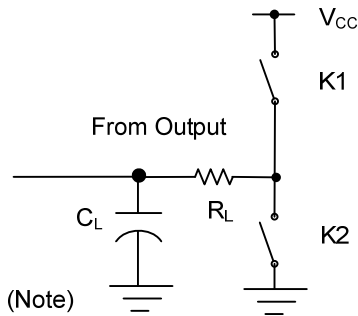
$C_L=150\text{pF}$

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (D) to output ( $\bar{Q}$ )	$t_{pd}$ ( $t_{PLH}/t_{PHL}$ )	$V_{CC}=4.5\text{V}$		36	52	ns
		$V_{CC}=5.5\text{V}$		32	47	ns
Propagation delay from input (LE) to output ( $\bar{Q}$ )	$t_{pd}$ ( $t_{PLH}/t_{PHL}$ )	$V_{CC}=4.5\text{V}$		40	52	ns
		$V_{CC}=5.5\text{V}$		38	47	ns
3-state output enable time from input ( $\overline{OE}$ ) to output ( $\bar{Q}$ )	$t_{en}$ ( $t_{PZL}/t_{PZH}$ )	$V_{CC}=4.5\text{V}$		35	52	ns
		$V_{CC}=5.5\text{V}$		29	47	ns
Output transition time, ( $\bar{Q}$ )	$t_t$ ( $t_R/t_F$ )	$V_{CC}=4.5\text{V}$		18	42	ns
		$V_{CC}=5.5\text{V}$		16	38	ns

■ OPERATING CHARACTERISTICS

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

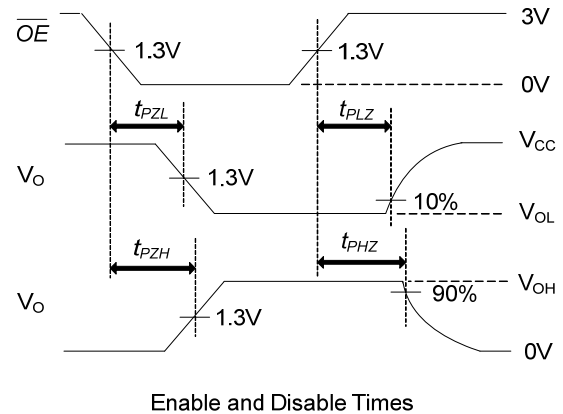
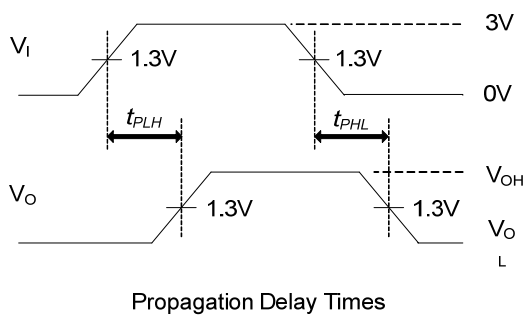
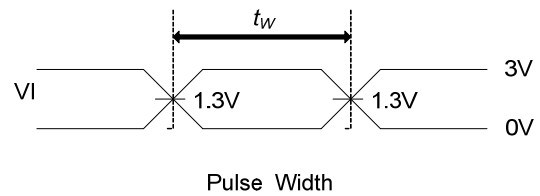
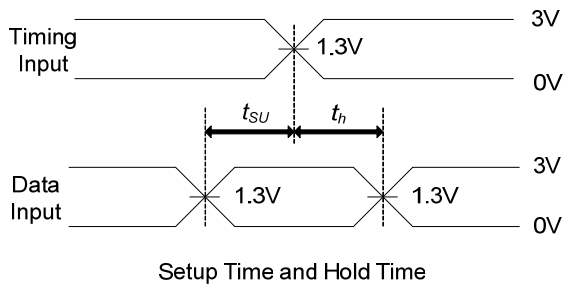
## TEST CIRCUIT AND WAVEFORMS



TEST	K1	K2
$t_{PLH}/t_{PHL}$	Open	Open
$t_{PHZ}/t_{PZH}$	Open	Close
$t_{PLZ}/t_{PZL}$	Close	Open

Note:  $C_L$  includes probe and jig capacitance.

$$PRR \leq 1\text{MHz}, Z_o = 50\Omega, t_r \leq 6\text{ns}, t_f \leq 6\text{ns}$$



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.