



U74HC574

CMOS IC

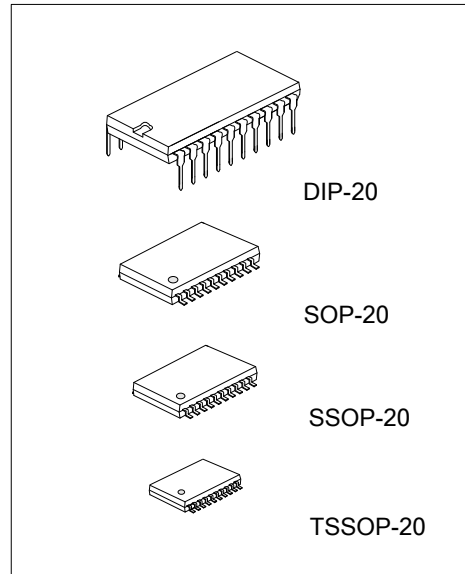
OCTAL EDGE-TRIGGERED D-TYPE FLIP-FLOPS WITH 3-STATE OUTPUTS

DESCRIPTION

The **U74HC574** is a octal edge-triggered D-type flip-flops with 3-state outputs, and it has 8 channels.

FEATURES

- * Operate from 2V to 6V
- * Max t_{pd} of 66ns at 4.5 V
- * Typical $V_{OL} < 0.17V$ at $V_{CC}=4.5V, T_A=25^\circ C$
- * Typical $V_{OH} > 4.3V$ at $V_{CC}=4.5V, T_A=25^\circ C$



ORDERING INFORMATION

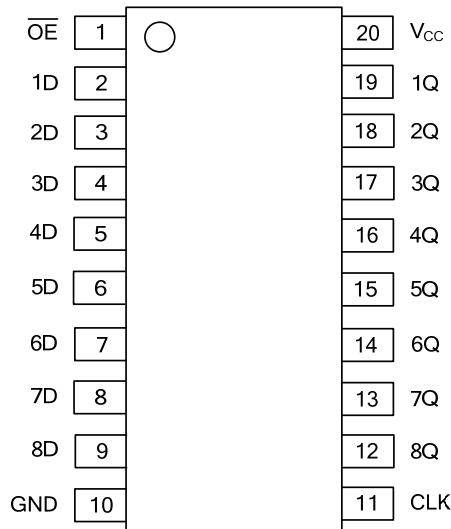
Ordering Number		Package	Packing
Lead Free	Halogen Free		
U74HC574L-D20-T	U74HC574G-D20-T	DIP-20	Tube
-	U74HC574G-S20-R	SOP-20	Tape Reel
-	U74HC574G-R20-R	SSOP-20	Tape Reel
-	U74HC574G-P20-R	TSSOP-20	Tape Reel

<p>U74HC574L-D20-T</p> <p>(1) Packing Type (2) Package Type (3) Green Package</p>	<p>(1) R: Tape Reel, T: Tube (2) D20: DIP-20, P20: TSSOP-20, R20: SSOP-20, S20: SOP-20 (3) L: Lead Free, G: Halogen Free and Lead Free</p>
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MARKING

DIP-20	SOP-20 / SSOP-20 / TSSOP-20
<p>Date Code L: Lead Free G: Halogen Free Lot Code</p>	<p>Date Code Lot Code</p>

■ PIN CONFIGURATION

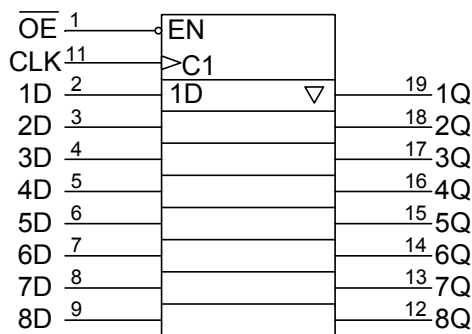


■ FUNCTION TABLE

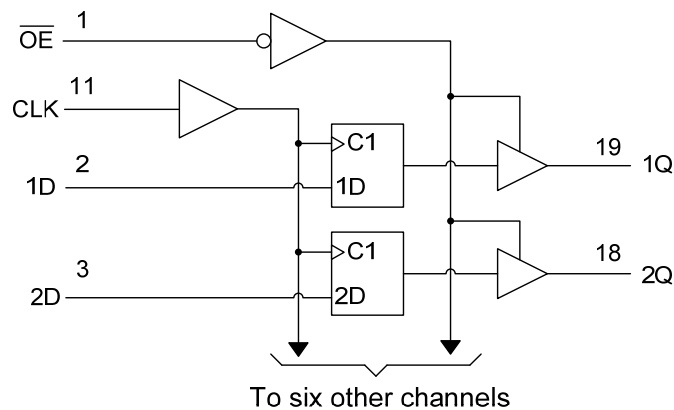
INPUTS(OE)	INPUTS(CLK)	INPUTS(D)	OUTPUT(Q)
L	↑	H	H
L	↑	L	L
L	L/H	X	Q ₀
H	X	X	Z

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

■ LOGIC SYMBOL



■ LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING ($T_A=25^\circ\text{C}$, 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
Operating Temperature	T_{OPR}	-40 ~ + 85	$^\circ\text{C}$
Storage Temperature	T_{STG}	-65 ~ + 150	$^\circ\text{C}$

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.

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Junction to Ambient	DIP-20	θ_{JA}	52	$^\circ\text{C/W}$
	SOP-20		80	$^\circ\text{C/W}$
	SSOP-20		96	$^\circ\text{C/W}$
	TSSOP-20		103	$^\circ\text{C/W}$

■ RECOMMENDED OPERATING CONDITIONS ($T_A=25^\circ\text{C}$, 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}	$V_{CC}=2.0\text{V}$	1.5			V
		$V_{CC}=4.5\text{V}$	3.15			
		$V_{CC}=6.0\text{V}$	4.2			
Low-level Input Voltage	V_{IL}	$V_{CC}=2.0\text{V}$			0.5	V
		$V_{CC}=4.5\text{V}$			1.35	
		$V_{CC}=6.0\text{V}$			1.8	
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	$V_{CC}=2.0\text{V}$	0		1	μs
		$V_{CC}=4.5\text{V}$	0		0.5	
		$V_{CC}=6.0\text{V}$	0		0.4	

■ 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}	$V_{CC}=2.0\text{V}, I_{OH}=-20\mu\text{A}$	1.9	1.998		V
		$V_{CC}=4.5\text{V}, I_{OH}=-20\mu\text{A}$	4.4	4.499		
		$V_{CC}=6.0\text{V}, I_{OH}=-20\mu\text{A}$	5.9	5.999		
		$V_{CC}=4.5\text{V}, I_{OH}=-6\text{mA}$	3.98	4.3		
		$V_{CC}=6.0\text{V}, I_{OH}=-7.8\text{mA}$	5.48	5.8		
Output Voltage Low-Level	V_{OL}	$V_{CC}=2.0\text{V}, I_{OL}=20\mu\text{A}$		0.002	0.1	V
		$V_{CC}=4.5\text{V}, I_{OL}=20\mu\text{A}$		0.001	0.1	
		$V_{CC}=6.0\text{V}, I_{OL}=20\mu\text{A}$		0.001	0.1	
		$V_{CC}=4.5\text{V}, I_{OL}=6\text{mA}$		0.17	0.26	
		$V_{CC}=6.0\text{V}, I_{OL}=7.8\text{mA}$		0.15	0.26	
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=6.0\text{V}, V_{IN}=V_{CC}$ or GND		± 0.1	± 100	nA
Disable Output Leakage Current	I_{OZ}	$V_{CC}=6.0\text{V}, V_{OUT}=V_{CC}$ or GND		± 0.01	± 0.5	μA
Quiescent Supply Current	I_Q	$V_{CC}=6.0\text{V}, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			8	μA
Input Capacitance	C_{IN}	$V_{CC}=2.0\text{V} \sim 6.0\text{V}$		3	10	pF

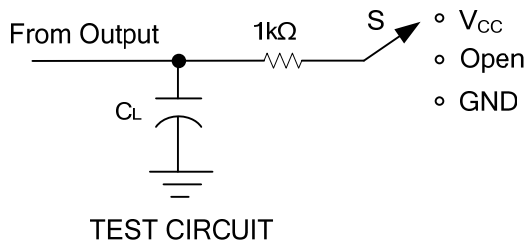
■ SWITCHING CHARACTERISTICS (See TEST CIRCUIT AND WAVEFORMS)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Propagation delay from input (CLK) to output (Q)	t_{PLH}/t_{PHL}	$V_{CC}=2.0V, C_L=50pF$		90	180	ns
		$V_{CC}=4.5V, C_L=50pF$		28	36	
		$V_{CC}=6.0V, C_L=50pF$		24	31	
		$V_{CC}=2.0V, C_L=150pF$		105	265	
		$V_{CC}=4.5V, C_L=150pF$		36	53	
		$V_{CC}=6.0V, C_L=150pF$		31	46	
Output enable time from input (\overline{OE}) to output (Q)	t_{PZL}/t_{PZH}	$V_{CC}=2.0V, C_L=50pF$		77	150	ns
		$V_{CC}=4.5V, C_L=50pF$		26	30	
		$V_{CC}=6.0V, C_L=50pF$		23	26	
		$V_{CC}=2.0V, C_L=150pF$		95	235	
		$V_{CC}=4.5V, C_L=150pF$		32	47	
		$V_{CC}=6.0V, C_L=150pF$		28	41	
Output disable time from input (\overline{OE}) to output (Q)	t_{PLZ}/t_{PHZ}	$V_{CC}=2.0V, C_L=50pF$		52	150	ns
		$V_{CC}=4.5V, C_L=50pF$		24	30	
		$V_{CC}=6.0V, C_L=50pF$		22	26	
Maximum Clock Frequency	f_{MAX}	$V_{CC}=2.0V, C_L=50pF$	6	11		MHz
		$V_{CC}=4.5V, C_L=50pF$	30	36		
		$V_{CC}=6.0V, C_L=50pF$	36	40		
		$V_{CC}=2.0V, C_L=150pF$	6			
		$V_{CC}=4.5V, C_L=150pF$	30			
		$V_{CC}=6.0V, C_L=150pF$	36			
Clock Frequency	f_{CLOCK}	$V_{CC}=2.0V$			6	MHz
		$V_{CC}=4.5V$			30	
		$V_{CC}=6.0V$			38	
Pulse Width	t_w	$V_{CC}=2.0V$	80			ns
		$V_{CC}=4.5V$	16			
		$V_{CC}=6.0V$	14			
Setup Time	t_{SU}	$V_{CC}=2.0V$	100			ns
		$V_{CC}=4.5V$	20			
		$V_{CC}=6.0V$	17			
Hold Time	t_H	$V_{CC}=2.0V$	5			ns
		$V_{CC}=4.5V$	5			
		$V_{CC}=6.0V$	5			

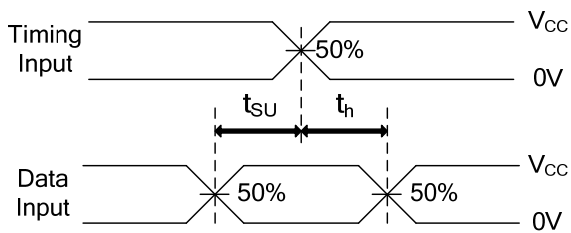
■ OPERATING CHARACTERISTICS ($T_A=25^\circ C$, unless otherwise specified)

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

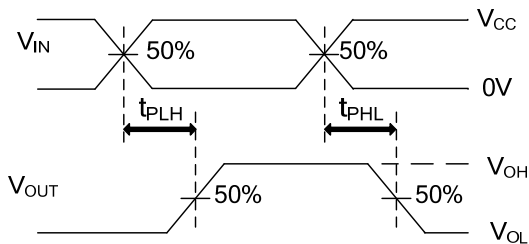
■ TEST CIRCUIT AND WAVEFORMS



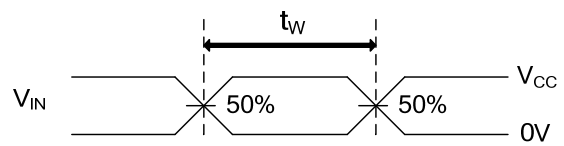
TEST	S
t _{PLH} /t _{PHL}	Open
t _{PHZ} /t _{PZH}	GND
t _{PLZ} /t _{PZL}	V _{CC}



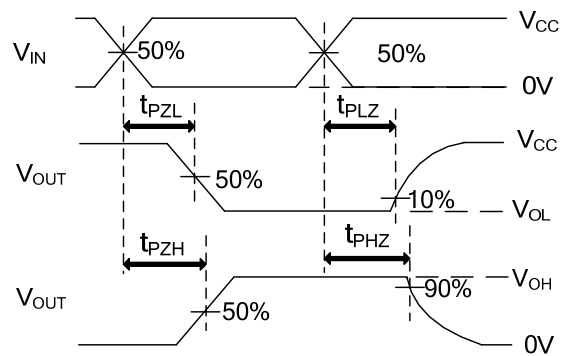
SETUP TIME AND HOLD TIME



PROPAGATION DELAY TIMES



PULSE WIDTH



ENABLE AND DISABLE TIMES

Note: C_L includes probe and jig capacitance.
 PRR ≤ 1MHz, Z_o = 50Ω, t_R ≤ 6ns, t_F ≤ 6ns.

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