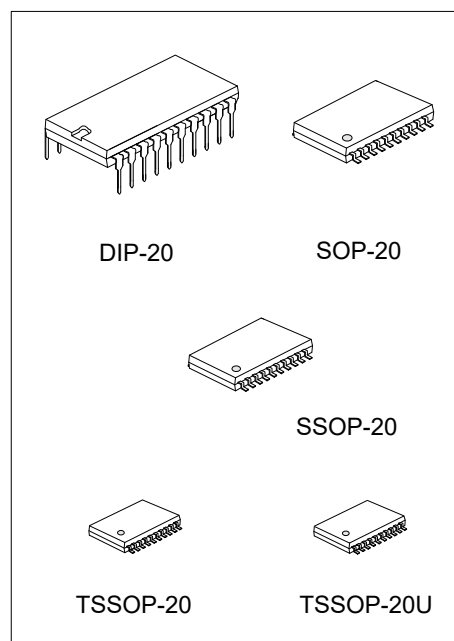


**U74HC574****CMOS IC****OCTAL EDGE-TRIGGERED
D-TYPE FLIP-FLOPS
WITH 3-STATE OUTPUTS****DESCRIPTION**

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

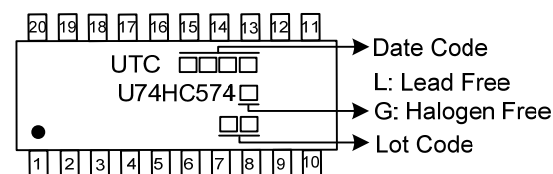
FEATURES

- * 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 $V_{CC}=4.5V$, $T_A=25^{\circ}C$

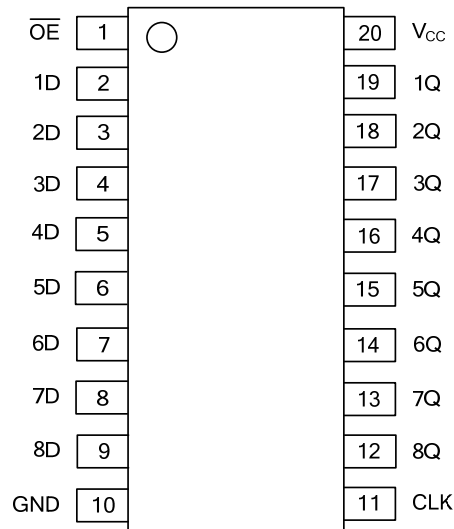
**ORDERING INFORMATION**

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

U74HC574G-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, P20: TSSOP-20, ULA: TSSOP-20U (3) G: Halogen Free and Lead Free, L: Lead Free
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MARKING

PIN CONFIGURATION

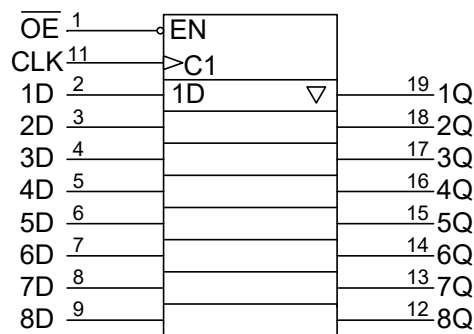


FUNCTION TABLE

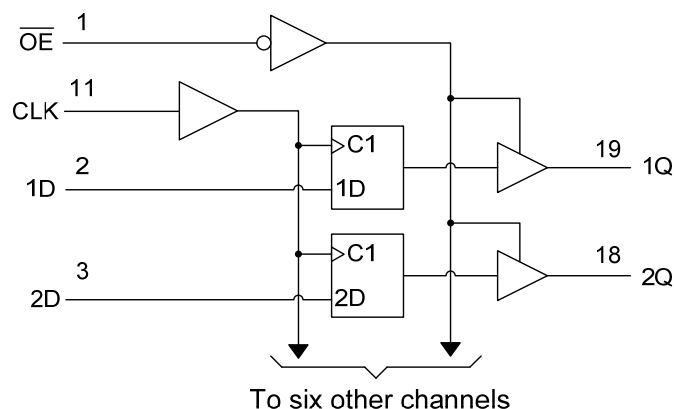
INPUTS(OE)	INPUTS(CLK)	INPUTS(D)	OUTPUT(Q)
L	↑	H	H
L	↑	L	L
L	L / H	X	Q ₀
H	X	X	Z

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

LOGIC SYMBOL



LOGIC DIAGRAM



■ ABSOLUTE MAXIMUM RATING (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
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	$V_{CC}=2.0V$	0		1	μs
		$V_{CC}=4.5V$	0		0.5	μs
		$V_{CC}=6.0V$	0		0.4	μs
Operating Temperature	T_A		-40		+125	°C

■ THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	DIP-20	52	°C/W
	SOP-20	80	°C/W
	SSOP-20	96	°C/W
	TSSOP-20	103	°C/W
	TSSOP-20U		

■ ELECTRICAL CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^{\circ}C$			$T_A=-40\sim+125^{\circ}C$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-level Input Voltage	V_{IH}	$V_{CC}=2.0V$	1.5			1.5			V
		$V_{CC}=4.5V$	3.15			3.15			V
		$V_{CC}=6.0V$	4.2			4.2			V
Low-level Input Voltage	V_{IL}	$V_{CC}=2.0V$			0.5			0.5	V
		$V_{CC}=4.5V$			1.35			1.35	V
		$V_{CC}=6.0V$			1.8			1.8	V
Output Voltage High-Level	V_{OH}	$V_{CC}=2.0V, I_{OH}=-20\mu A$	1.9	1.998		1.9			V
		$V_{CC}=4.5V, I_{OH}=-20\mu A$	4.4	4.499		4.4			V
		$V_{CC}=6.0V, I_{OH}=-20\mu A$	5.9	5.999		5.9			V
		$V_{CC}=4.5V, I_{OH}=-6mA$	3.98	4.3		3.7			V
		$V_{CC}=6.0V, I_{OH}=-7.8mA$	5.48	5.8		5.2			V
Output Voltage Low-Level	V_{OL}	$V_{CC}=2.0V, I_{OL}=20\mu A$		0.002	0.1			0.1	V
		$V_{CC}=4.5V, I_{OL}=20\mu A$		0.001	0.1			0.1	V
		$V_{CC}=6.0V, I_{OL}=20\mu A$		0.001	0.1			0.1	V
		$V_{CC}=4.5V, I_{OL}=6mA$		0.17	0.26			0.4	V
		$V_{CC}=6.0V, I_{OL}=7.8mA$		0.15	0.26			0.4	V
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=6.0V, V_{IN}=V_{CC}$ or GND		±0.1	±100			±1000	nA
Disable Output Leakage Current	I_{OZ}	$V_{CC}=6.0V, V_{OUT}=V_{CC}$ or GND		±0.01	±0.5			±10	μA
Quiescent Supply Current	I_Q	$V_{CC}=6.0V, V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$			8			160	μA

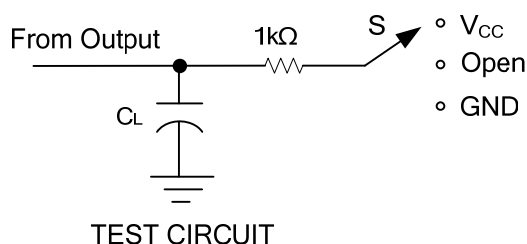
SWITCHING CHARACTERISTICS (See TEST CIRCUIT AND WAVEFORMS)

PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (CLK) to output (Q)	t _{PLH} /t _{PHL}	V _{CC} =2.0V, C _L =50pF		90	180			225	ns
		V _{CC} =4.5V, C _L =50pF		28	36			45	ns
		V _{CC} =6.0V, C _L =50pF		24	31			38	ns
		V _{CC} =2.0V, C _L =150pF		105	265			330	ns
		V _{CC} =4.5V, C _L =150pF		36	53			66	ns
		V _{CC} =6.0V, C _L =150pF		31	46			57	ns
Output enable time from input ($\overline{OE}$) to output (Q)	t _{PZL} /t _{PZH}	V _{CC} =2.0V, C _L =50pF		77	150			210	ns
		V _{CC} =4.5V, C _L =50pF		26	30			42	ns
		V _{CC} =6.0V, C _L =50pF		23	26			36	ns
		V _{CC} =2.0V, C _L =150pF		95	235			315	ns
		V _{CC} =4.5V, C _L =150pF		32	47			63	ns
		V _{CC} =6.0V, C _L =150pF		28	41			55	ns
Output disable time from input ($\overline{OE}$) to output (Q)	t _{PLZ} /t _{PHZ}	V _{CC} =2.0V, C _L =50pF		52	150			190	ns
		V _{CC} =4.5V, C _L =50pF		24	30			38	ns
		V _{CC} =6.0V, C _L =50pF		22	26			32	ns
Maximum Clock Frequency	f _{MAX}	V _{CC} =2.0V, C _L =50pF	6	11		4			MHz
		V _{CC} =4.5V, C _L =50pF	30	36		20			MHz
		V _{CC} =6.0V, C _L =50pF	36	40		24			MHz
		V _{CC} =2.0V, C _L =150pF	6			4			MHz
		V _{CC} =4.5V, C _L =150pF	30			20			MHz
		V _{CC} =6.0V, C _L =150pF	36			24			MHz
Clock Frequency	f _{CLOCK}	V _{CC} =2.0V			6			4	MHz
		V _{CC} =4.5V			30			20	MHz
		V _{CC} =6.0V			38			24	MHz
Pulse Width	t _w	V _{CC} =2.0V	80			120			ns
		V _{CC} =4.5V	16			24			ns
		V _{CC} =6.0V	14			20			ns
Setup Time	t _{SU}	V _{CC} =2.0V	100			125			ns
		V _{CC} =4.5V	20			25			ns
		V _{CC} =6.0V	17			21			ns
Hold Time	t _H	V _{CC} =2.0V	5			5			ns
		V _{CC} =4.5V	5			5			ns
		V _{CC} =6.0V	5			5			ns

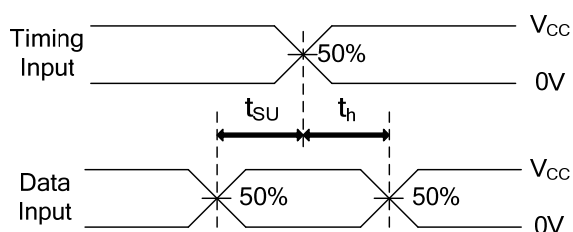
OPERATING CHARACTERISTICS (Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Input Capacitance	C _{IN}	V _{CC} =2.0V~6.0V		3	10	pF
Power Dissipation Capacitance	C _{PD}	No Load		100		pF

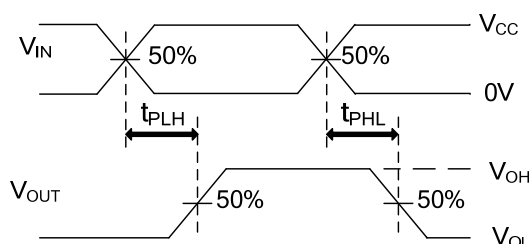
■ TEST CIRCUIT AND WAVEFORMS



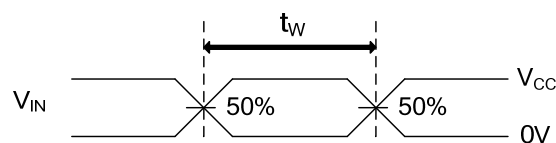
TEST	S
t_{PLH}/t_{PHL}	Open
t_{PHZ}/t_{PZH}	GND
t_{PLZ}/t_{PZL}	V_{CC}



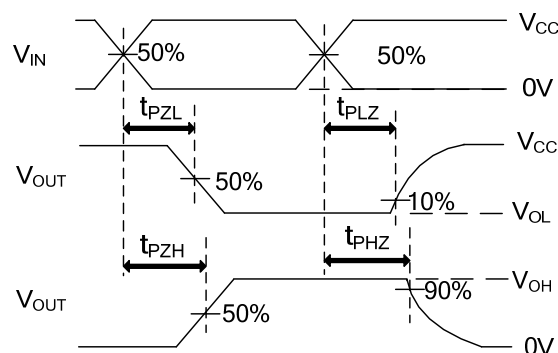
SETUP TIME AND HOLD TIME



PROPAGATION DELAY TIMES



PULSE WIDTH



ENABLE AND DISABLE TIMES

Note: C_L includes probe and jig capacitance.
 $PRR \leq 1\text{MHz}$, $Z_o = 50\Omega$, $t_R \leq 6\text{ns}$, $t_F \leq 6\text{ns}$.

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