

查询"74HCT534D-T"供应商

OCTAL D-TYPE FLIP-FLOP; POSITIVE EDGE-TRIGGER; 3-STATE; INVERTING

FEATURES

- 3-state inverting outputs for bus oriented applications
- 8-bit positive, edge-triggered register
- Common 3-state output enable input
- Output capability: bus driver
- I_{CC} category: MSI

GENERAL DESCRIPTION

The 74HC/HCT534 are high-speed Si-gate CMOS devices and are pin compatible with low power Schottky TTL (LSTTL). They are specified in compliance with JEDEC standard no. 7A.

The 74HC/HCT534 are octal D-type flip-flops featuring separate D-type inputs for each flip-flop and inverting 3-state outputs for bus oriented applications. A clock (CP) and an output enable ($\overline{OE}$) input are common to all flip-flops.

The 8 flip-flops will store the state of their individual D-inputs that meet the set-up and hold times requirements on the LOW-to-HIGH CP transition.

When $\overline{OE}$ is LOW, the contents of the 8 flip-flops are available at the outputs. When $\overline{OE}$ is HIGH, the outputs go to the high impedance OFF-state. Operation of the $\overline{OE}$ input does not affect the state of the flip-flops.

The "534" is functionally identical to the "374", but has inverted outputs.

SYMBOL	PARAMETER	CONDITIONS	TYPICAL		UNIT
			HC	HCT	
t_{PHL}/t_{PLH}	propagation delay CP to $\overline{Q}_n$	$C_L = 15 \text{ pF}$ $V_{CC} = 5 \text{ V}$	12	13	ns
f_{max}	maximum clock frequency		61	40	MHz
C_i	input capacitance		3.5	3.5	pF
C_{PD}	power dissipation capacitance per flip-flop	notes 1 and 2	19	19	pF

GND = 0 V; $T_{amb} = 25^\circ\text{C}$; $t_r = t_f = 6 \text{ ns}$

Notes

1. C_{PD} is used to determine the dynamic power dissipation (P_D in μW):

$$P_D = C_{PD} \times V_{CC}^2 \times f_i + \Sigma (C_L \times V_{CC}^2 \times f_o) \text{ where:}$$

f_i = input frequency in MHz C_L = output load capacitance in pF
 f_o = output frequency in MHz V_{CC} = supply voltage in V

$\Sigma (C_L \times V_{CC}^2 \times f_o)$ = sum of outputs

2. For HC the condition is $V_I = \text{GND to } V_{CC}$
 For HCT the condition is $V_I = \text{GND to } V_{CC} - 1.5 \text{ V}$

PACKAGE OUTLINES

20-lead DIL; plastic (SOT146).

20-lead mini-pack; plastic (SO20; SOT163A).

PIN DESCRIPTION

PIN NO.	SYMBOL	NAME AND FUNCTION
1	$\overline{OE}$	3-state output enable input (active LOW)
2, 5, 6, 9, 12, 15, 16, 19	$\overline{Q}_0$ to $\overline{Q}_7$	3-state outputs
3, 4, 7, 8, 13, 14, 17, 18	D_0 to D_7	data inputs
10	GND	ground (0 V)
11	CP	clock input (LOW-to-HIGH, edge-triggered)
20	V_{CC}	positive supply voltage

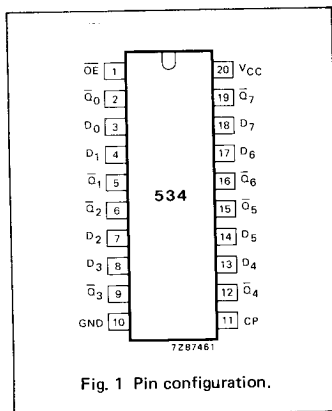


Fig. 1 Pin configuration.

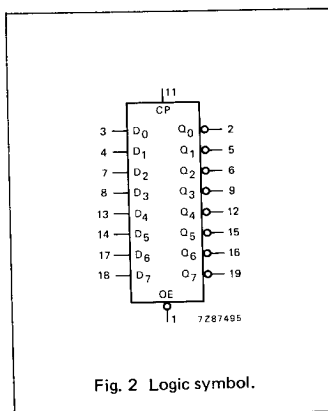


Fig. 2 Logic symbol.

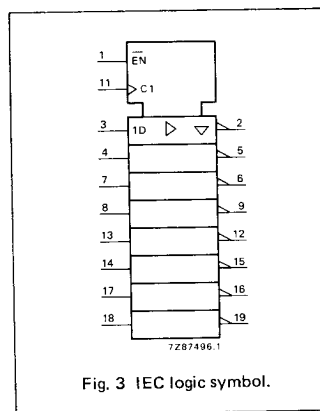


Fig. 3 IEC logic symbol.

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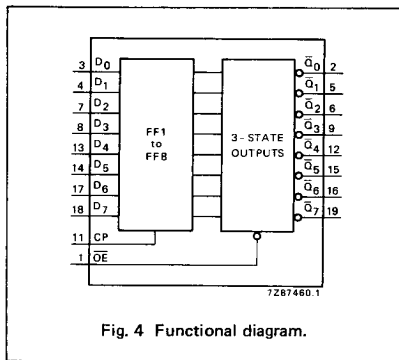


Fig. 4 Functional diagram.

FUNCTION TABLE

OPERATING MODES	INPUTS			INTERNAL FLIP-FLOPS	OUTPUTS $\bar{Q}_0$ to $\bar{Q}_7$
	$\bar{OE}$	CP	D_n		
load and read register	L L	$\uparrow$ $\uparrow$	l h	L H	H L
load register and disable outputs	H H	$\uparrow$ $\uparrow$	l h	L H	Z Z

H = HIGH voltage level
h = HIGH voltage level one set-up time prior to the LOW-to-HIGH CP transition

L = LOW voltage level
l = LOW voltage level one set-up time prior to the LOW-to-HIGH CP transition

Z = high impedance OFF-state
 $\uparrow$ = LOW-to-HIGH clock transition

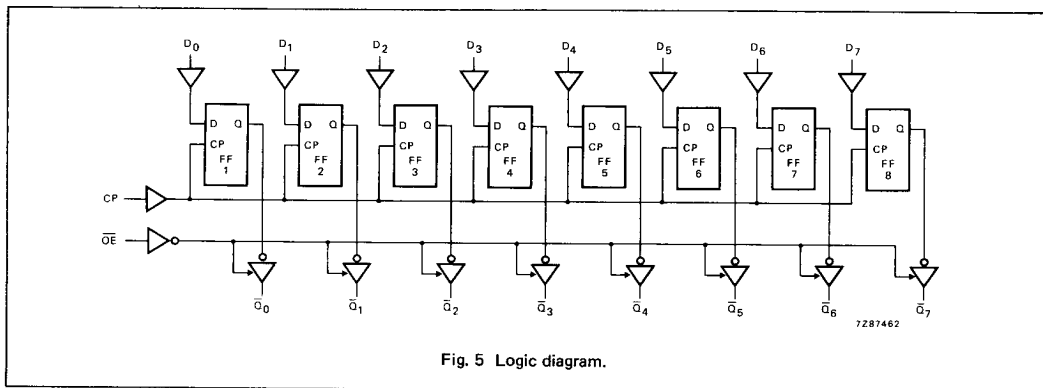


Fig. 5 Logic diagram.

[查询"74HCT534D-T"供应商](#)**DC CHARACTERISTICS FOR 74HC**

For the DC characteristics see chapter "HCMOS family characteristics", section "Family specifications".

Output capability: bus driver

I_{CC} category: MSI

AC CHARACTERISTICS FOR 74HC

GND = 0 V; t_r = t_f = 6 ns; C_L = 50 pF

SYMBOL	PARAMETER	T _{amb} (°C)						UNIT	TEST CONDITIONS		
		74HC							V _{CC} V	WAVEFORMS	
		+25			−40 to +85		−40 to +125				
		min.	typ.	max.	min.	max.	min.				max.
t _{PHL} / t _{PLH}	propagation delay CP to $\overline{Q}_n$		41 15 12	165 33 28		205 41 35		250 50 43	ns	2.0 4.5 6.0	Fig. 6
t _{PZH} / t _{PZL}	3-state output enable time OE to $\overline{Q}_n$		33 12 10	150 30 26		190 38 33		225 45 38	ns	2.0 4.5 6.0	Fig. 7
t _{PHZ} / t _{PLZ}	3-state output disable time OE to $\overline{Q}_n$		41 15 12	150 30 26		190 38 33		225 45 38	ns	2.0 4.5 6.0	Fig. 7
t _{THL} / t _{TLH}	output transition time		14 5 4	60 12 10		75 15 13		90 18 15	ns	2.0 4.5 6.0	Fig. 6
t _W	clock pulse width HIGH or LOW	80 16 14	19 7 6		100 20 17		120 24 20		ns	2.0 4.5 6.0	Fig. 6
t _{su}	set-up time D _n to CP	60 12 10	6 2 2		75 15 13		90 18 15		ns	2.0 4.5 6.0	Fig. 8
t _h	hold time D _n to CP	5 5 5	−3 −1 −1		5 5 5		5 5 5		ns	2.0 4.5 6.0	Fig. 8
f _{max}	maximum clock pulse frequency	6.0 30 35	18 55 66		4.8 24 28		4.0 20 24		MHz	2.0 4.5 6.0	Fig. 6

[查询"74HCT534D-T"供应商](#)**DC CHARACTERISTICS FOR 74HCT**

For the DC characteristics see chapter "HCMOS family characteristics", section "Family specifications".

Output capability: bus driver

I_{CC} category: MSI

Note to HCT types

The value of additional quiescent supply current (ΔI_{CC}) for a unit load of 1 is given in the family specifications. To determine ΔI_{CC} per input, multiply this value by the unit load coefficient shown in the table below.

INPUT	UNIT LOAD COEFFICIENT
$\overline{OE}$	1.25
CP	0.90
D _n	0.35

AC CHARACTERISTICS FOR 74HCT

GND = 0 V; $t_r = t_f = 6$ ns; $C_L = 50$ pF

SYMBOL	PARAMETER	T _{amb} (°C)							UNIT	TEST CONDITIONS	
		74HCT								V _{CC} V	WAVEFORMS
		+25			−40 to +85		−40 to +125				
		min.	typ.	max.	min.	max.	min.	max.			
t _{PHL} / t _{PLH}	propagation delay CP to $\overline{Q}_n$		16	30		38		45	ns	4.5	Fig. 6
t _{PZH} / t _{PZL}	3-state output enable time $\overline{OE}$ to $\overline{Q}_n$		16	30		38		45	ns	4.5	Fig. 7
t _{PHZ} / t _{PLZ}	3-state output disable time $\overline{OE}$ to $\overline{Q}_n$		18	30		38		45	ns	4.5	Fig. 7
t _{THL} / t _{TLH}	output transition time		5	12		15		18	ns	4.5	Fig. 6
t _W	clock pulse width HIGH or LOW	23	14		29		35		ns	4.5	Fig. 6
t _{su}	set-up time D _n to CP	12	4		15		18		ns	4.5	Fig. 8
t _h	hold time D _n to CP	5	−1		5		5		ns	4.5	Fig. 8
f _{max}	maximum clock pulse frequency	22	36		18		15		MHz	4.5	Fig. 6

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AC WAVEFORMS

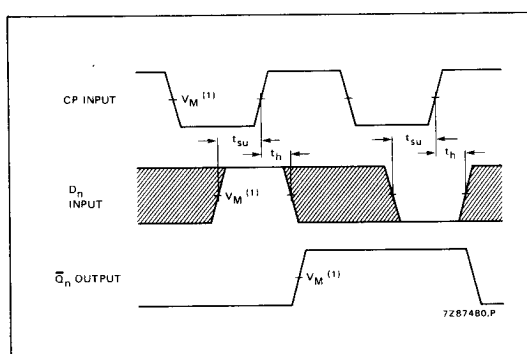
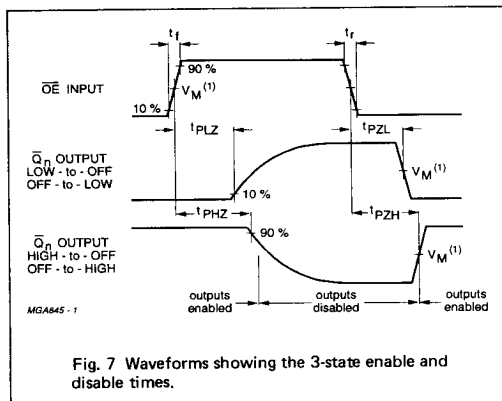
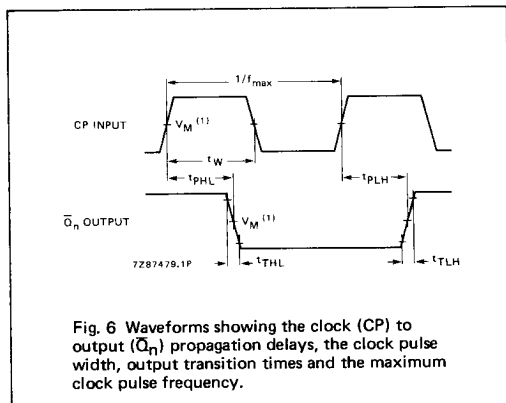


Fig. 8 Waveforms showing the data set-up and hold times for D_n input.

Note to Fig. 8

The shaded areas indicate when the input is permitted to change for predictable output performance.

Note to AC waveforms

- (1) HC : $V_M = 50\%$; $V_I = \text{GND to } V_{CC}$.
HCT: $V_M = 1.3\text{ V}$; $V_I = \text{GND to } 3\text{ V}$.