

**FEATURES**

- 8-bit parallel storage register inputs
- Shift register has direct overriding load and clear
- Output capability: standard
- I<sub>CC</sub> category: MSI

**GENERAL DESCRIPTION**

The 74HC597 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 74HC597 consist each of an 8-bit storage register feeding a parallel-in, serial-out 8-bit shift register. Both the storage register and the shift register have positive edge-triggered clocks. The shift register also has direct load (from storage) and clear inputs.

**QUICK REFERENCE DATA**

GND = 0 V; T<sub>amb</sub> = 25 °C; t<sub>r</sub> = t<sub>f</sub> = 6 ns

SYMBOL	PARAMETER	CONDITIONS	TYPICAL		UNIT
			HC	HCT	
t <sub>PHL</sub> / t <sub>PLH</sub>	propagation delay SH <sub>CP</sub> to Q	C <sub>L</sub> = 15 pF; V <sub>CC</sub> = 5 V	17	20	ns
	ST <sub>CP</sub> to Q		25	29	ns
	$\overline{PL}$ to Q		21	26	ns
f <sub>max</sub>	maximum clock frequency SH <sub>CP</sub>		96	83	MHz
C <sub>I</sub>	input capacitance		3.5	3.5	pF
C <sub>PD</sub>	power dissipation capacitance per package	notes 1 and 2	29	32	pF

**Notes**

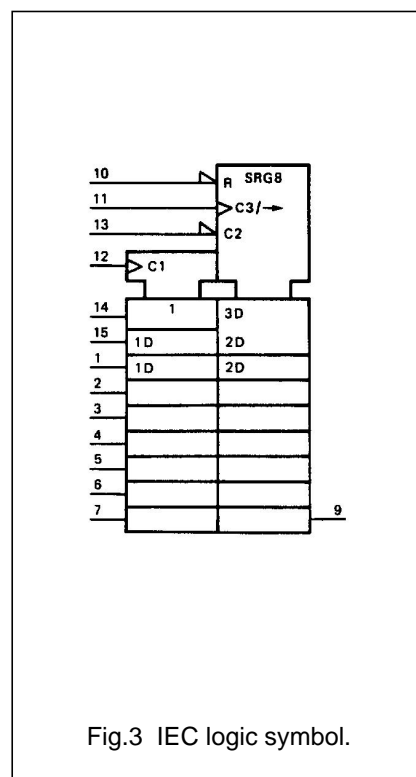
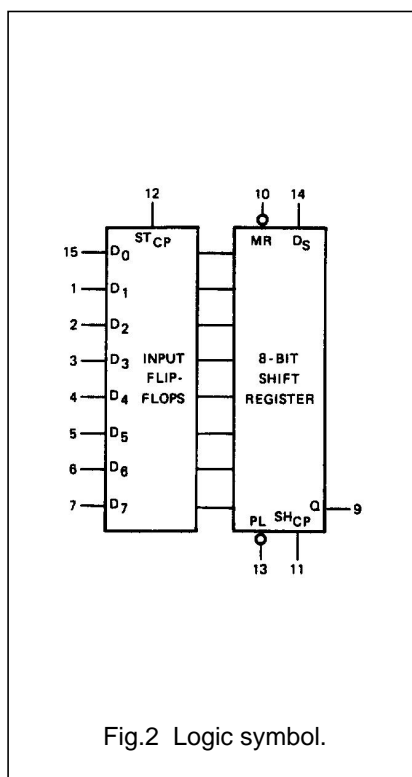
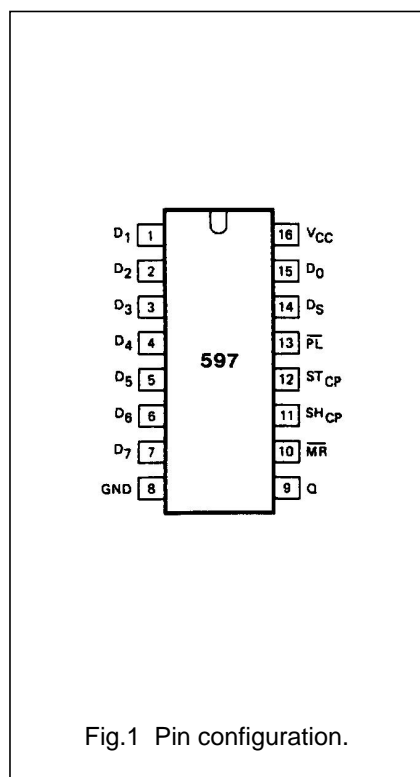
1. C<sub>PD</sub> is used to determine the dynamic power dissipation (P<sub>D</sub> in μW):  

$$P_D = C_{PD} \times V_{CC}^2 \times f_i + \sum (C_L \times V_{CC}^2 \times f_o)$$
 where:  
 f<sub>i</sub> = input frequency in MHz  
 f<sub>o</sub> = output frequency in MHz  
 $\sum (C_L \times V_{CC}^2 \times f_o)$  = sum of outputs  
 C<sub>L</sub> = output load capacitance in pF  
 V<sub>CC</sub> = supply voltage in V
2. For HC the condition is V<sub>I</sub> = GND to V<sub>CC</sub>  
 For HCT the condition is V<sub>I</sub> = GND to V<sub>CC</sub> – 1.5 V

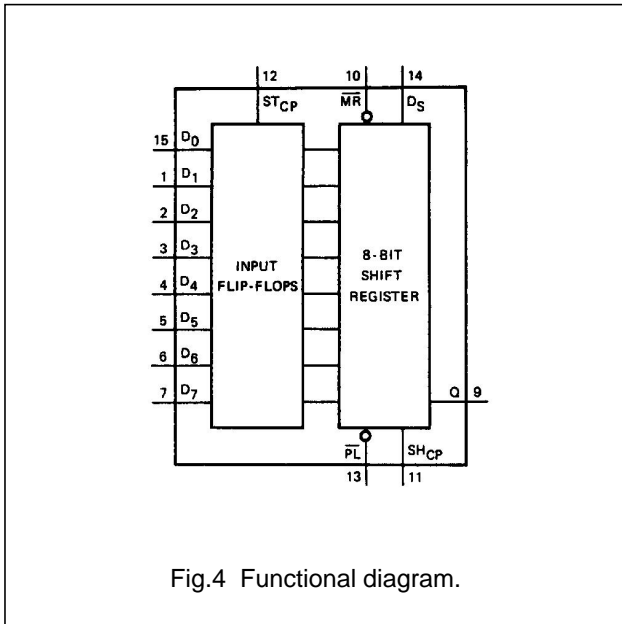
# XD74HC597 DIP16 / XL74HC597 SOP16

## PIN DESCRIPTION

PIN NO.	SYMBOL	NAME AND FUNCTION
8	GND	ground (0 V)
9	Q	serial data output
10	$\overline{MR}$	asynchronous reset input (active LOW)
11	SH <sub>CP</sub>	shift clock input (LOW-to-HIGH, edge-triggered)
12	ST <sub>CP</sub>	storage clock input (LOW-to-HIGH, edge-triggered)
13	$\overline{PL}$	parallel load input (active LOW)
14	D <sub>S</sub>	serial data input
15, 1, 2, 3, 4, 5, 6, 7	D <sub>0</sub> to D <sub>7</sub>	parallel data inputs
16	V <sub>CC</sub>	positive supply voltage



# XD74HC597 DIP16 / XL74HC597 SOP16



## FUNCTION TABLE

ST <sub>CP</sub>	SH <sub>CP</sub>	$\overline{PL}$	$\overline{MR}$	FUNCTION
↑	X	X	X	data loaded to input latches
↑	X	L	H	data loaded from inputs to shift register
no clock edge	X	L	H	data transferred from input flip-flops to shift register
X	X	L	L	invalid logic, state of shift register indeterminate when signals removed
X	X	H	L	shift register cleared
X	↑	H	H	shift register clocked $Q_n = Q_{n-1}$ , $Q_0 = D_S$

## Notes

1. H = HIGH voltage level  
 L = LOW voltage level  
 X = don't care  
 ↑ = LOW-to-HIGH CP transition

XD74HC597 DIP16 / XL74HC597 SOP16

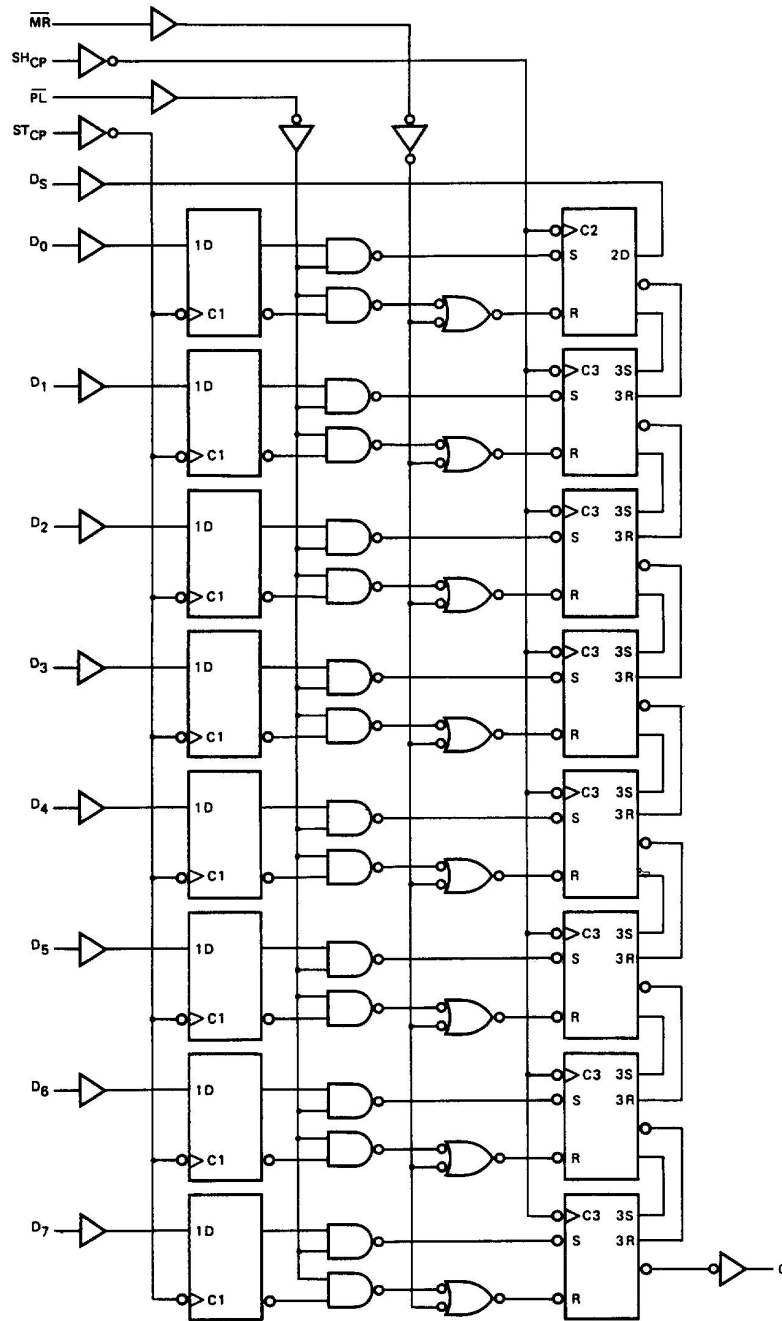


Fig.5 Logic diagram.

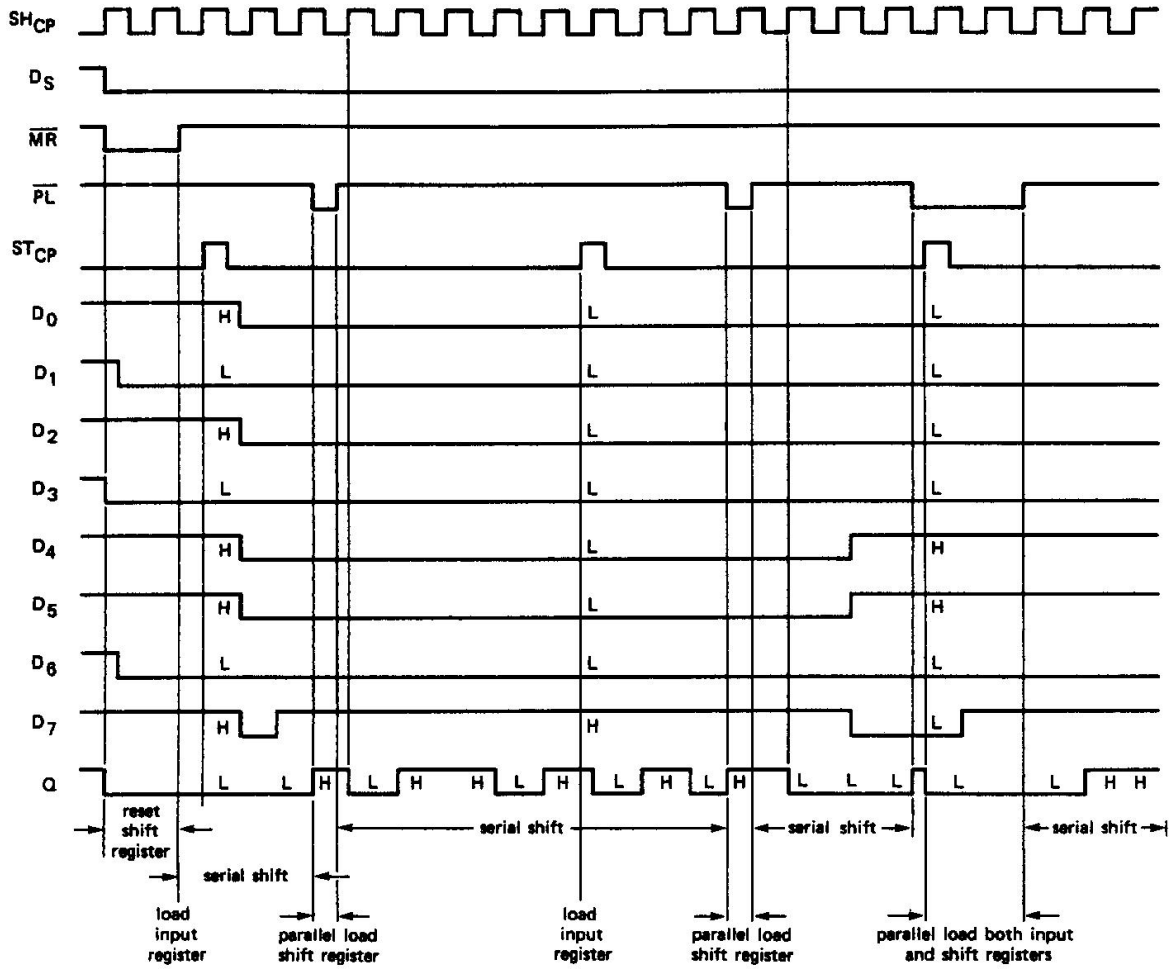


Fig.6 Timing diagram.

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Output capability: standard  
 $I_{CC}$  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		
		74HC597							$V_{CC}$ (V)	WAVEFORMS	
		+25			-40 to +85		-40 to +125				
		min.	typ.	max.	min.	max.	min.				max.
$t_{PHL}/t_{PLH}$	propagation delay SH <sub>CP</sub> to Q		55 20 16	175 35 30		220 44 37		265 53 45	ns	2.0 4.5 6.0	Fig.7
$t_{PHL}$	propagation delay MR to Q		58 21 17	175 35 30		220 44 37		265 53 45	ns	2.0 4.5 6.0	Fig.8
$t_{PHL}/t_{PLH}$	propagation delay ST <sub>CP</sub> to Q		80 29 23	250 50 43		315 63 54		375 75 64	ns	2.0 4.5 6.0	Fig.7
$t_{PHL}/t_{PLH}$	propagation delay PL to Q		69 25 20	215 43 37		270 54 46		325 65 55	ns	2.0 4.5 6.0	Fig.9
$t_{THL}/t_{TLH}$	output transition time		19 7 6	75 15 13		95 19 16		110 22 19	ns	2.0 4.5 6.0	Fig.9
$t_W$	ST <sub>CP</sub> pulse width HIGH or LOW	80 16 14	11 4 3		100 20 17		120 24 20		ns	2.0 4.5 6.0	Fig.7
$t_W$	SH <sub>CP</sub> pulse width HIGH or LOW	80 16 14	14 5 4		100 20 17		120 24 20		ns	2.0 4.5 6.0	Fig.7
$t_W$	MR pulse width LOW	80 16 14	22 8 6		100 20 17		120 24 20		ns	2.0 4.5 6.0	Fig.8
$t_W$	PL pulse width LOW	80 16 14	22 8 6		100 20 17		120 24 20		ns	2.0 4.5 6.0	Fig.9
$t_{rem}$	removal time MR to SH <sub>CP</sub>	60 12 10	-3 -1 -1		75 15 13		90 18 15		ns	2.0 4.5 6.0	Fig.10
$t_{su}$	set-up time D <sub>n</sub> to ST <sub>CP</sub>	60 12 10	8 3 2		75 15 13		90 18 15		ns	2.0 4.5 6.0	Fig.11

# XD74HC597 DIP16 / XL74HC597 SOP16

SYMBOL	PARAMETER	T <sub>amb</sub> (°C)							UNIT	TEST CONDITIONS	
		74HC597								V <sub>CC</sub> (V)	WAVEFORMS
		+25			-40 to +85		-40 to +125				
		min.	typ.	max.	min.	max.	min.	max.			
t <sub>su</sub>	set-up time D <sub>S</sub> to SH <sub>CP</sub>	60 12 10	11 4 3		75 15 13		90 18 15		ns	2.0 4.5 6.0	Fig.11
t <sub>su</sub>	set-up time $\overline{PL}$ to SH <sub>CP</sub>	60 12 10	11 4 3		75 15 13		90 18 15		ns	2.0 4.5 6.0	Fig.12
t <sub>h</sub>	hold time D <sub>n</sub> to ST <sub>CP</sub>	5 5 5	-3 -1 -1		5 5 5		5 5 5		ns	2.0 4.5 6.0	Fig.11
t <sub>h</sub>	hold time $\overline{PL}$ , D <sub>S</sub> to SH <sub>CP</sub>	5 5 5	-6 -2 -2		5 5 5		5 5 5		ns	2.0 4.5 6.0	Fig.11
f <sub>max</sub>	maximum pulse frequency SH <sub>CP</sub>	6.0 30 35	29 87 104		4.8 24 28		4.0 20 24		MHz	2.0 4.5 6.0	Fig.7

### Note to HCT types

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

INPUT	UNIT LOAD COEFFICIENT
D <sub>S</sub>	0.25
D <sub>n</sub>	0.30
$\overline{PL}$ , $\overline{MR}$	1.50
ST <sub>CP</sub> , SH <sub>CP</sub>	1.50

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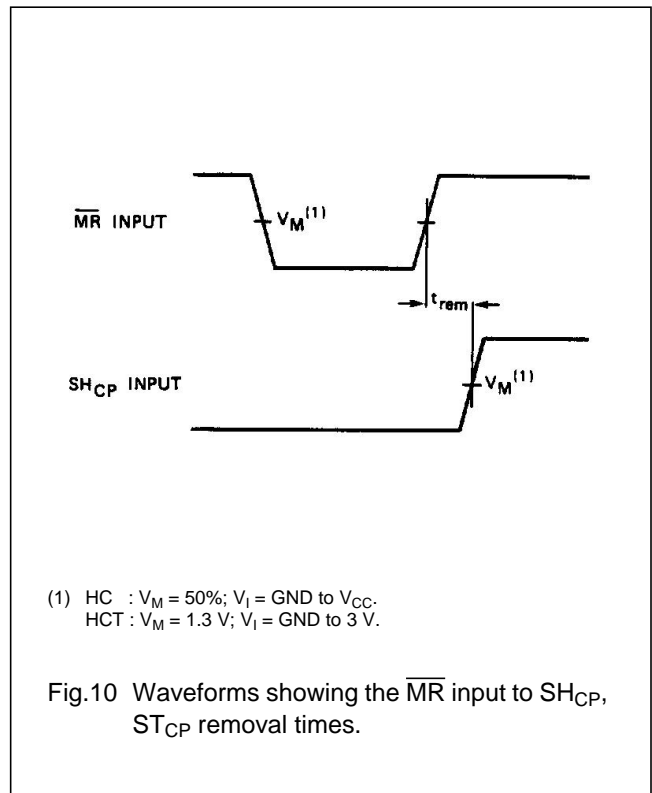
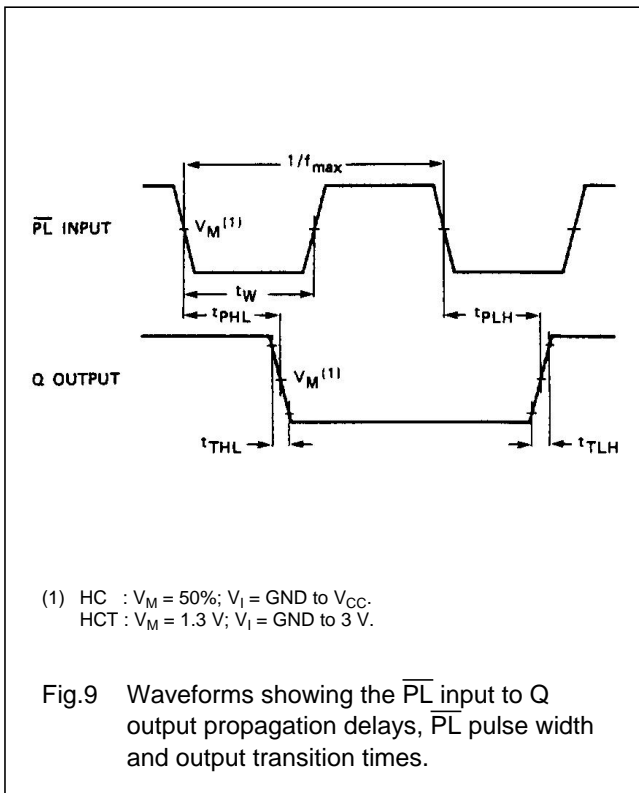
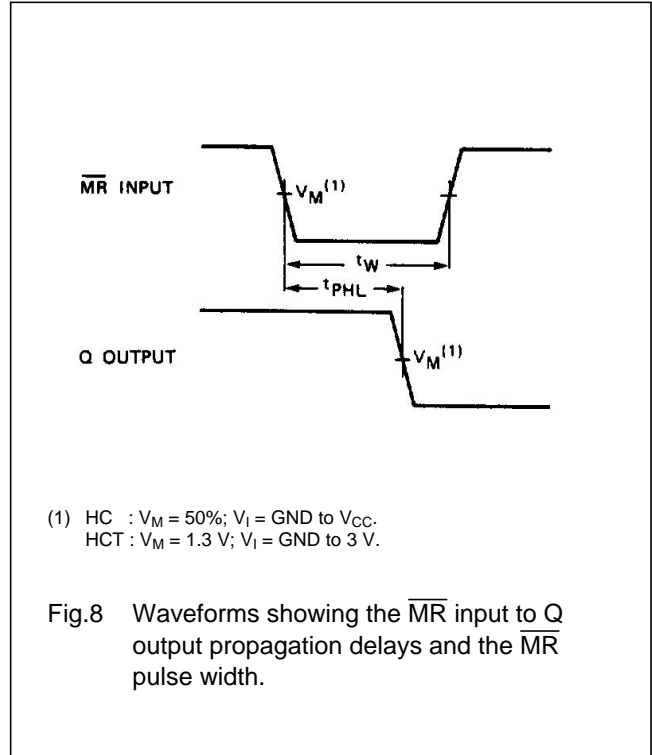
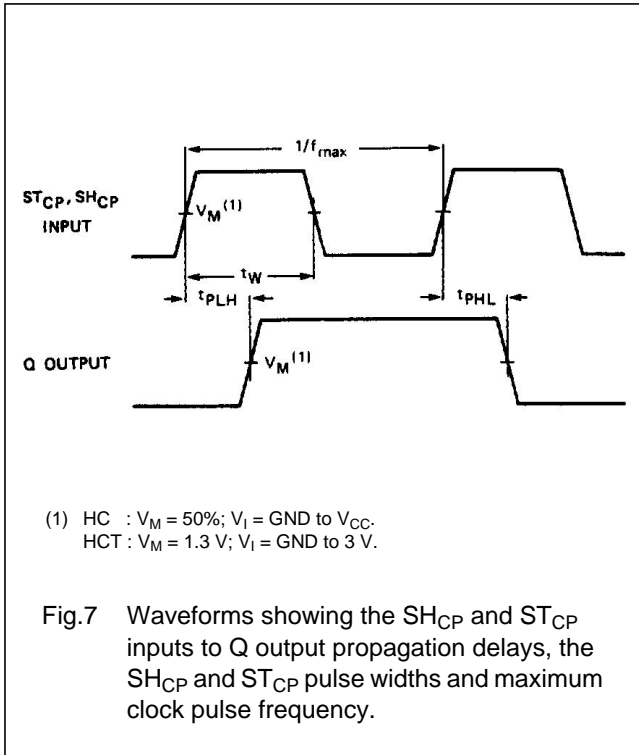
## AC WAVEFORMS FOR 74HC597

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

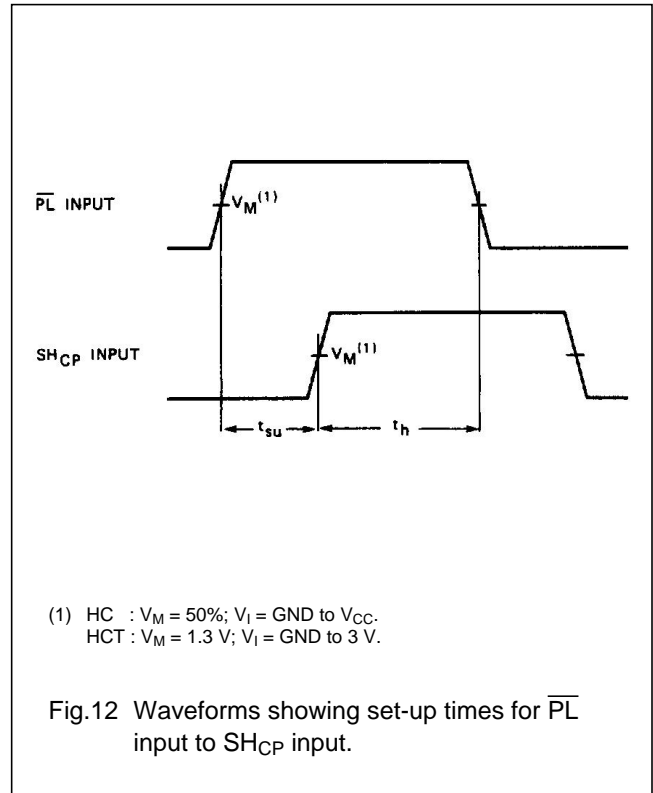
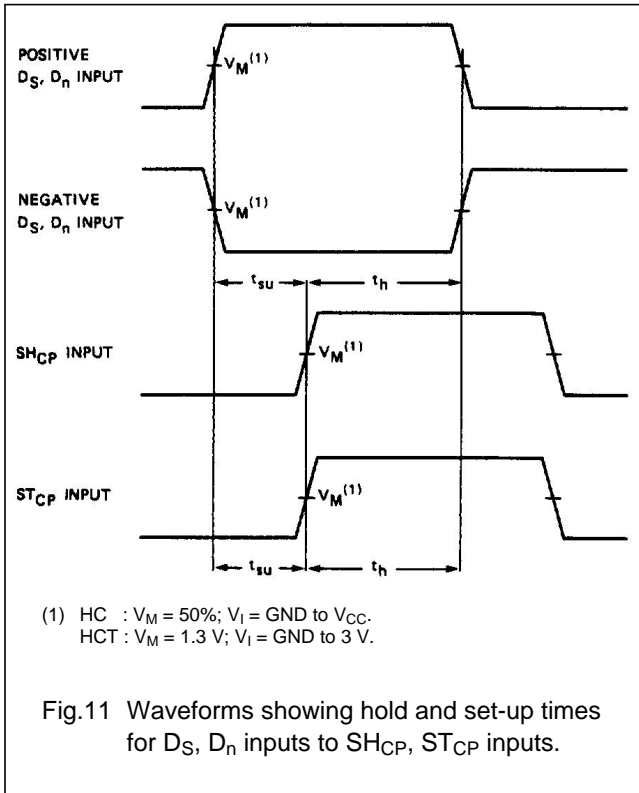
SYMBOL	PARAMETER	T <sub>amb</sub> (°C)								UNIT	TEST CONDITIONS	
		74HC597									V <sub>CC</sub> (V)	WAVEFORMS
		+25			-40 to +85		-40 to +125					
		min.	typ.	max.	min.	max.	min.	max.				
t <sub>PHL</sub> / t <sub>PLH</sub>	propagation delay SH <sub>CP</sub> to Q		23	40		50		60	ns	4.5	Fig.7	
t <sub>PHL</sub>	propagation delay MR to Q		28	49		61		74	ns	4.5	Fig.8	
t <sub>PHL</sub> / t <sub>PLH</sub>	propagation delay ST <sub>CP</sub> to Q		33	57		71		86	ns	4.5	Fig.7	
t <sub>PHL</sub> / t <sub>PLH</sub>	propagation delay PL to Q		30	52		65		78	ns	4.5	Fig.9	
t <sub>THL</sub> / t <sub>TLH</sub>	output transition time		7	15		19		22	ns	4.5	Fig.9	
t <sub>w</sub>	SH <sub>CP</sub> pulse width HIGH or LOW	16	7		20		24		ns	4.5	Fig.7	
t <sub>w</sub>	ST <sub>CP</sub> pulse width HIGH or LOW	16	6		20		24		ns	4.5	Fig.7	
t <sub>w</sub>	$\overline{\text{MR}}$ pulse width LOW	25	14		31		38		ns	4.5	Fig.8	
t <sub>w</sub>	$\overline{\text{PL}}$ pulse width LOW	20	10		25		30		ns	4.5	Fig.9	
t <sub>rem</sub>	removal time $\overline{\text{MR}}$ to SH <sub>CP</sub>	12	-2		15		18		ns	4.5	Fig.10	
t <sub>su</sub>	set-up time D <sub>n</sub> to ST <sub>CP</sub>	12	5		15		18		ns	4.5	Fig.11	
t <sub>su</sub>	set-up time D <sub>S</sub> to SH <sub>CP</sub>	12	2		15		18		ns	4.5	Fig.11	
t <sub>su</sub>	set-up time $\overline{\text{PL}}$ to SH <sub>CP</sub>	12	4		15		18		ns	4.5	Fig.12	
t <sub>h</sub>	hold time D <sub>n</sub> to ST <sub>CP</sub>	5	-1		5		5		ns	4.5	Fig.11	
t <sub>h</sub>	hold time $\overline{\text{PL}}$ , D <sub>S</sub> to SH <sub>CP</sub>	5	-2		5		5		ns	4.5	Fig.11	
f <sub>max</sub>	maximum pulse frequency SH <sub>CP</sub>	30	75		24		20		MHz	4.5	Fig.7	



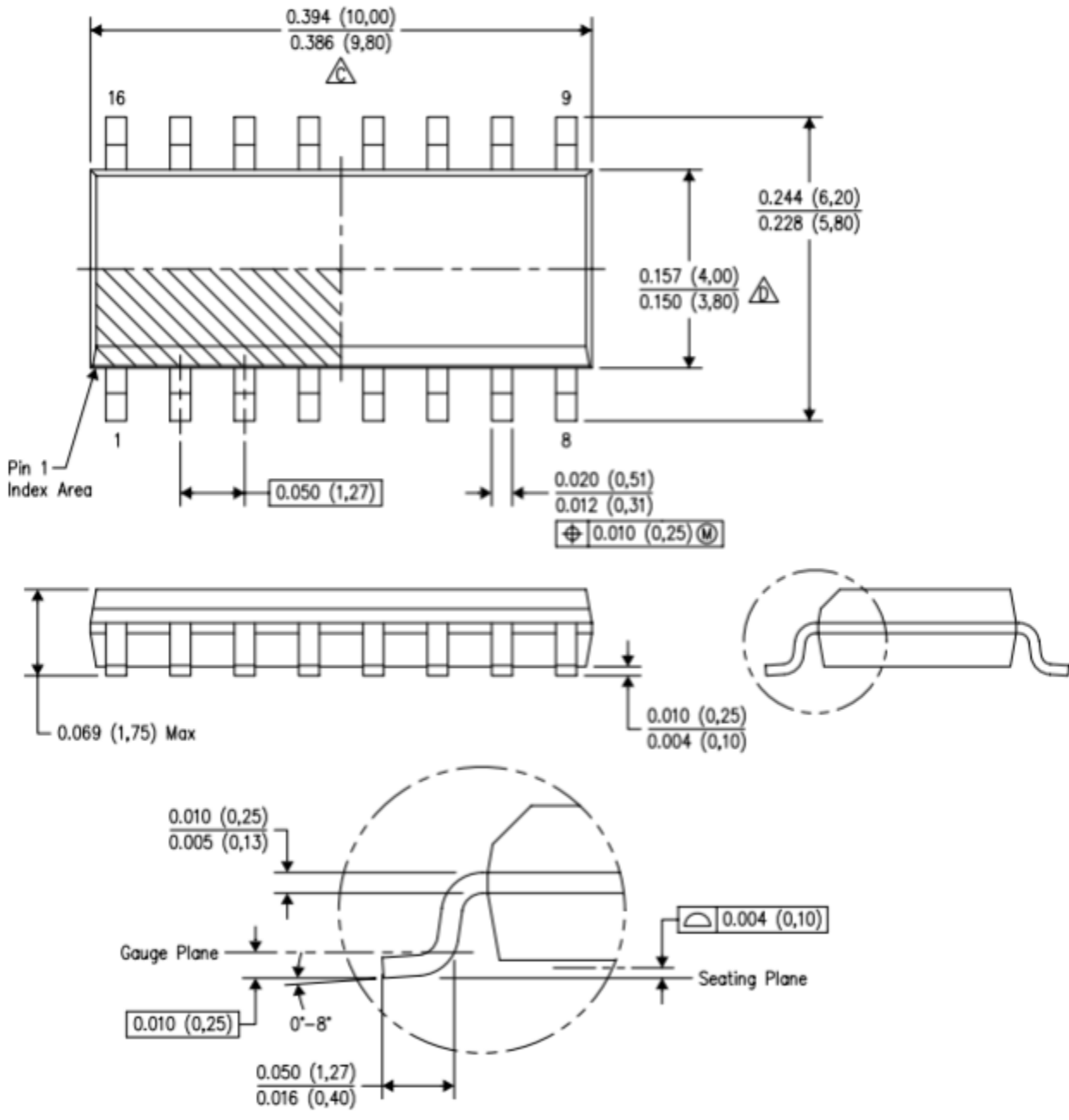
**AC WAVEFORMS**



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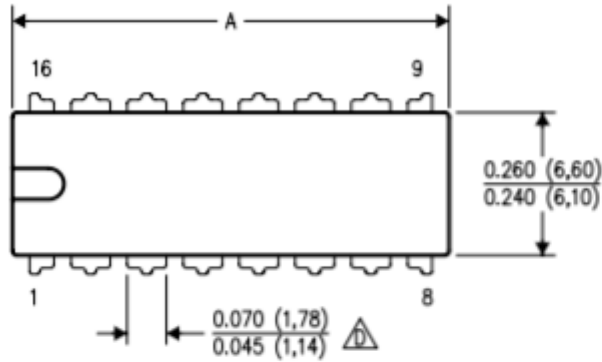


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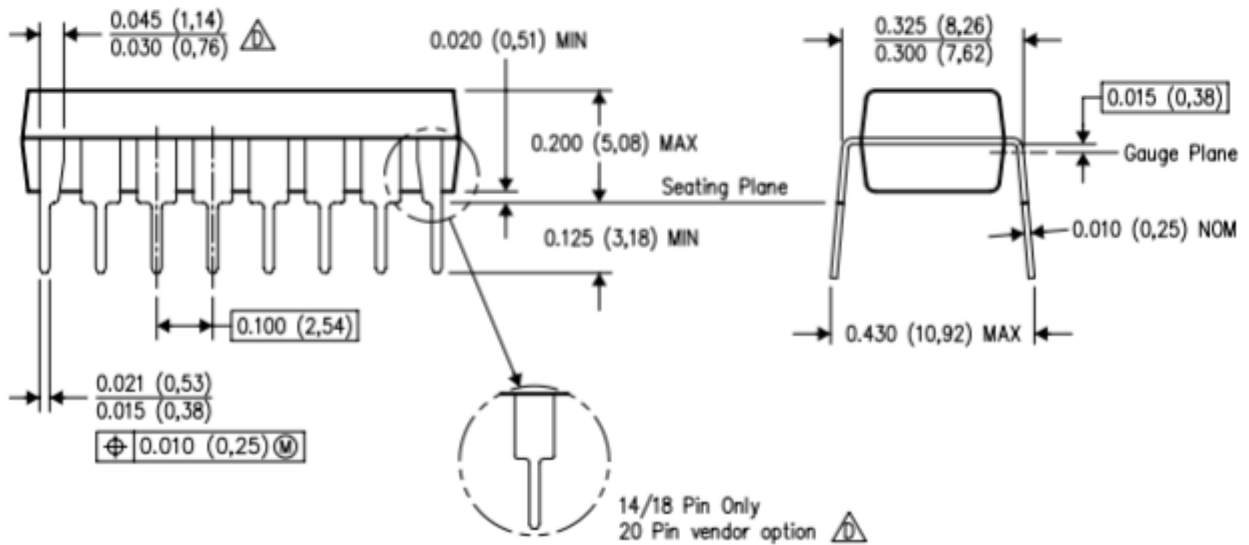


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## DIP16



DIM \ PINS **	14	16	18	20
A MAX	0.775 (19,69)	0.775 (19,69)	0.920 (23,37)	1.060 (26,92)
A MIN	0.745 (18,92)	0.745 (18,92)	0.850 (21,59)	0.940 (23,88)
MS-001 VARIATION	AA	BB	AC	AD



以上信息仅供参考. 如需帮助联系客服人员。谢谢 XINLUDA