

# TC74HC573AP, TC74HC573AF, TC74HC573AFW

(Note) The JEDEC SOP (FW) is not available in Japan.

## OCTAL D - TYPE LATCH WITH 3 - STATE OUTPUT

The TC74HC573A is a high speed CMOS OCTAL LATCH with 3 - STATE OUTPUT fabricated with silicon gate C<sup>2</sup>MOS technology.

It achieves the high speed operation similar to equivalent LSTTL while maintaining the CMOS low power dissipation.

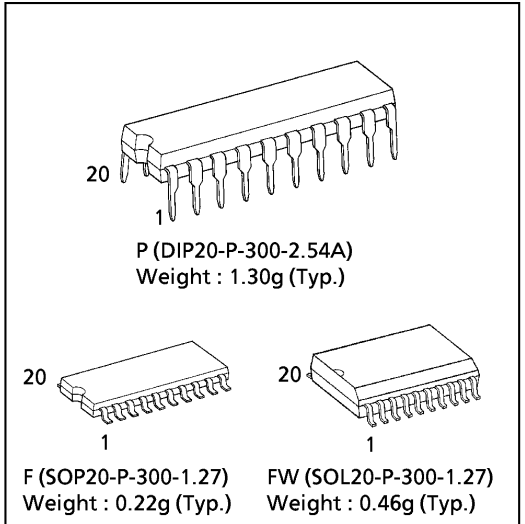
Its 8 - bit D - type latch is controlled by a latch enable input (LE) and a output enable input ( $\overline{OE}$ ).

When the  $\overline{OE}$  input is high, the eight outputs are in a high impedance state.

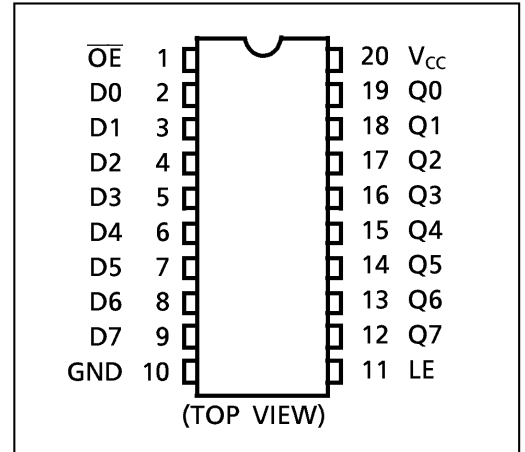
All inputs are equipped with protection circuits against static discharge or transient excess voltage.

### FEATURES:

- High Speed..... $t_{pd} = 13ns$ (typ.) at  $V_{CC} = 5V$
- Low Power Dissipation..... $I_{CC} = 4\mu A$ (Max.) at  $T_a = 25^\circ C$
- High Noise Immunity..... $V_{NIH} = V_{NIL} = 28\% V_{CC}$  (Min.)
- Output Drive Capability..... 15 LSTTL Loads
- Symmetrical Output Impedance...  $|I_{OH}| = I_{OL} = 6mA$ (Min.)
- Balanced Propagation Delays.....  $t_{pLH} \approx t_{pHL}$
- Wide Operating Voltage Range...  $V_{CC}$  (opr.) = 2V~6V
- Pin and Function Compatible with 74LS573



### PIN ASSIGNMENT

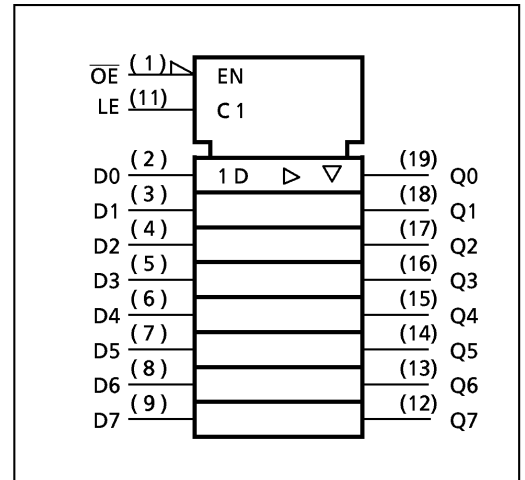


### TRUTH TABLE

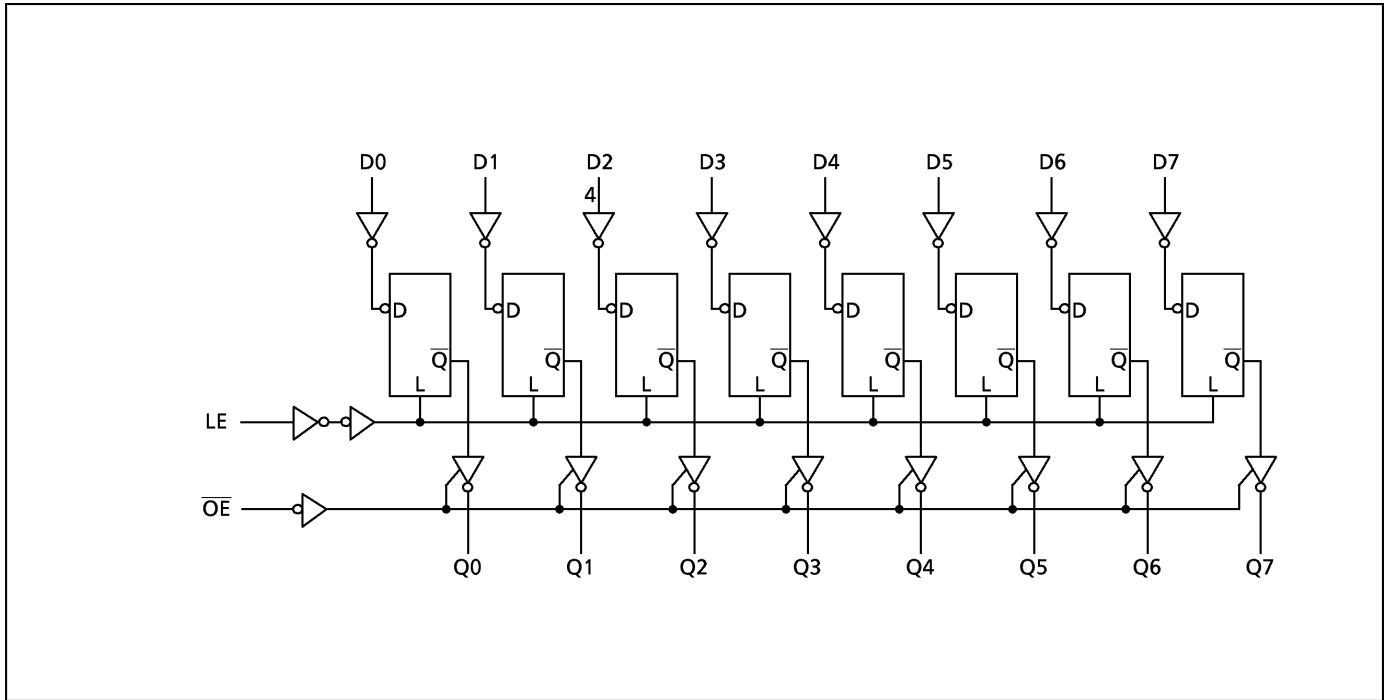
INPUTS			OUTPUT
$\overline{OE}$	LE	D	Q
H	X	X	HZ
L	L	X	Q <sub>n</sub>
L	H	L	L
L	H	H	H

X : Don't Care  
 HZ : High Impedance  
 Q<sub>n</sub> : Q outputs are latched at the time when the LE input is taken to a low logic level.

### IEC LOGIC SYMBOL



SYSTEM DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage Range	$V_{CC}$	-0.5~7	V
DC Input Voltage	$V_{IN}$	-0.5~ $V_{CC}+0.5$	V
DC Output Voltage	$V_{OUT}$	-0.5~ $V_{CC}+0.5$	V
Input Diode Current	$I_{IK}$	$\pm 20$	mA
Output Diode Current	$I_{OK}$	$\pm 20$	mA
DC Output Current	$I_{OUT}$	$\pm 35$	mA
DC $V_{CC}$ /Ground Current	$I_{CC}$	$\pm 75$	mA
Power Dissipation	$P_D$	500 (DIP)* / 180 (SOP)	mW
Storage Temperature	$T_{stg}$	-65~150	°C

\*500mW in the range of  $T_a = -40^\circ\text{C} \sim 65^\circ\text{C}$ . From  $T_a = 65^\circ\text{C}$  to  $85^\circ\text{C}$  a derating factor of  $-10\text{mW}/^\circ\text{C}$  shall be applied until 300mW.

## RECOMMENDED OPERATING CONDITIONS

PARAMETER	SYMBOL	VALUE	UNIT
Supply Voltage	$V_{CC}$	2~6	V
Input Voltage	$V_{IN}$	0~ $V_{CC}$	V
Output Voltage	$V_{OUT}$	0~ $V_{CC}$	V
Operating Temperature	$T_{opr}$	-40~85	°C
Input Rise and Fall Time	$t_r, t_f$	0~1000 ( $V_{CC} = 2.0\text{V}$ ) 0~500 ( $V_{CC} = 4.5\text{V}$ ) 0~400 ( $V_{CC} = 6.0\text{V}$ )	ns

## DC ELECTRICAL CHARACTERISTICS

PARAMETER	SYMBOL	TEST CONDITION	$V_{CC}$ (V)	$T_a = 25^\circ\text{C}$			$T_a = -40 \sim 85^\circ\text{C}$		UNIT	
				MIN.	TYP.	MAX.	MIN.	MAX.		
High - Level Input Voltage	$V_{IH}$		2.0 4.5 6.0	1.50 3.15 4.20	— — —	— — —	1.50 3.15 4.20	— — —	V	
Low - Level Input Voltage	$V_{IL}$		2.0 4.5 6.0	— — —	— — —	0.50 1.35 1.80	— — —	0.50 1.35 1.80	V	
High - Level Output Voltage	$V_{OH}$	$V_{IN} = V_{IH}$ or $V_{IL}$	$I_{OH} = -20\mu\text{A}$	2.0	1.9	2.0	—	1.9	—	V
				4.5	4.4	4.5	—	4.4	—	
			$I_{OH} = -6\text{ mA}$ $I_{OH} = -7.8\text{ mA}$	4.5	4.18	4.31	—	4.13	—	V
				6.0	5.68	5.80	—	5.63	—	
Low - Level Output Voltage	$V_{OL}$	$V_{IN} = V_{IH}$ or $V_{IL}$	$I_{OL} = 20\mu\text{A}$	2.0	—	0.0	0.1	—	0.1	V
				4.5	—	0.0	0.1	—	0.1	
			$I_{OL} = 6\text{ mA}$ $I_{OL} = 7.8\text{ mA}$	4.5	—	0.17	0.26	—	0.33	V
				6.0	—	0.18	0.26	—	0.33	
3 - State Output Off - State Current	$I_{OZ}$	$V_{IN} = V_{IH}$ or $V_{IL}$ $V_{OUT} = V_{CC}$ or GND	6.0	—	—	$\pm 0.5$	—	$\pm 5.0$	$\mu\text{A}$	
Input Leakage Current	$I_{IN}$	$V_{IN} = V_{CC}$ or GND	6.0	—	—	$\pm 0.1$	—	$\pm 1.0$		
Quiescent Supply Current	$I_{CC}$	$V_{IN} = V_{CC}$ or GND	6.0	—	—	4.0	—	40.0		

**TIMING REQUIREMENTS ( Input  $t_r = t_f = 6ns$  )**

PARAMETER	SYMBOL	TEST CONDITION	$V_{CC}$ (V)	Ta = 25°C		Ta = -40~85°C	UNIT
				TYP.	LIMIT	LIMIT	
Minimum Pulse Width ( LE )	$t_{W(H)}$		2.0	—	75	95	ns
			4.5	—	15	19	
			6.0	—	13	16	
Minimum Set-up Time ( Data )	$t_s$		2.0	—	50	65	
			4.5	—	10	13	
			6.0	—	9	11	
Minimum Hold Time ( Data )	$t_h$		2.0	—	5	5	
			4.5	—	5	5	
			6.0	—	5	5	

**AC ELECTRICAL CHARACTERISTICS ( Input  $t_r = t_f = 6ns$  )**

PARAMETER	SYMBOL	TEST CONDITION	CL (pF)	$V_{CC}$ (V)	Ta = 25°C			Ta = -40~85°C		UNIT
					MIN.	TYP.	MAX.	MIN.	MAX.	
Output Transition Time	$t_{TLH}$ $t_{THL}$		50	2.0	—	20	60	—	75	ns
				4.5	—	6	12	—	15	
				6.0	—	5	10	—	13	
Propagation Delay Time ( LE-Q )	$t_{pLH}$ $t_{pHL}$		50	2.0	—	50	115	—	145	
				4.5	—	15	23	—	29	
				6.0	—	13	20	—	25	
			150	2.0	—	60	155	—	195	
				4.5	—	20	31	—	39	
				6.0	—	17	26	—	33	
Propagation Delay Time ( D-Q )	$t_{pLH}$ $t_{pHL}$		50	2.0	—	42	110	—	140	
				4.5	—	14	22	—	28	
				6.0	—	12	19	—	24	
			150	2.0	—	57	150	—	190	
				4.5	—	19	30	—	38	
				6.0	—	16	26	—	32	
Output Enable time	$t_{pZL}$ $t_{pZH}$	$R_L = 1k\Omega$	50	2.0	—	55	140	—	175	
				4.5	—	17	28	—	35	
				6.0	—	14	24	—	30	
			150	2.0	—	66	180	—	225	
				4.5	—	22	36	—	45	
				6.0	—	19	31	—	38	
Output Disable time	$t_{pLZ}$ $t_{pHZ}$	$R_L = 1k\Omega$	50	2.0	—	40	125	—	155	
				4.5	—	17	25	—	31	
				6.0	—	15	21	—	26	
Input Capacitance	$C_{IN}$				—	5	10	—	10	pF
Output Capacitance	$C_{OUT}$				—	10	—	—	—	
Power Dissipation Capacitance	$C_{PD} (1)$				—	51	—	—	—	

Note (1)  $C_{PD}$  is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

Average operating current can be obtained by the equation :

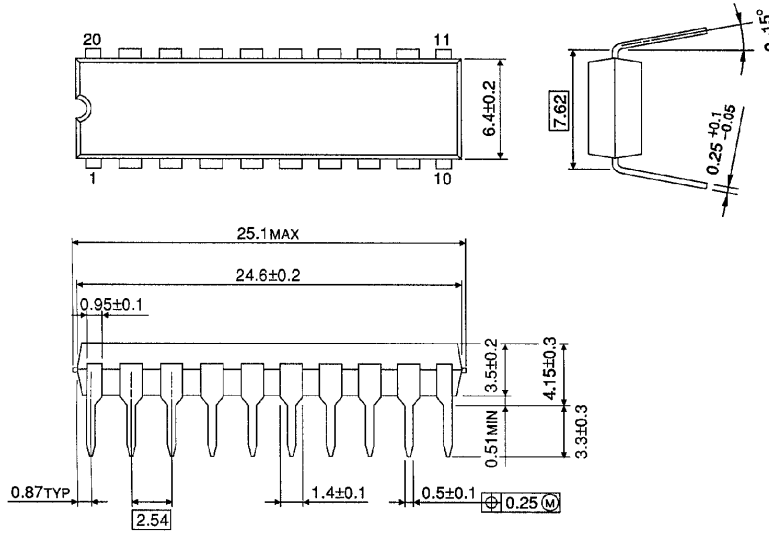
$$I_{CC} (opr) = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC} / 8 \text{ (per Latch)}$$

And the total  $C_{PD}$  when n pcs. of Latch operate can be gained by the following equation:

$$C_{PD}(\text{total}) = 33 + 18 \cdot n$$

**DIP 20PIN PACKAGE DIMENSIONS (DIP20-P-300-2.54A)**

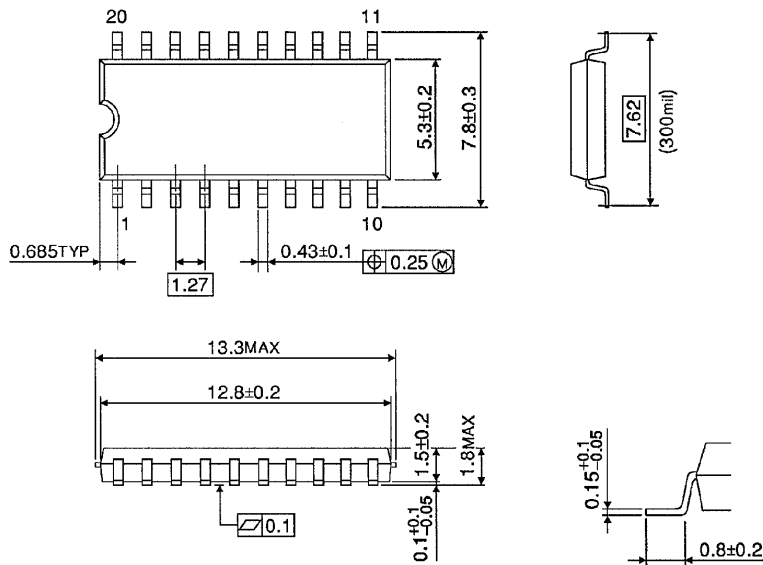
Unit in mm



Weight : 1.30g (Typ.)

**SOP 20PIN (200mil BODY) PACKAGE DIMENSIONS (SOP20-P-300-1.27)**

Unit in mm

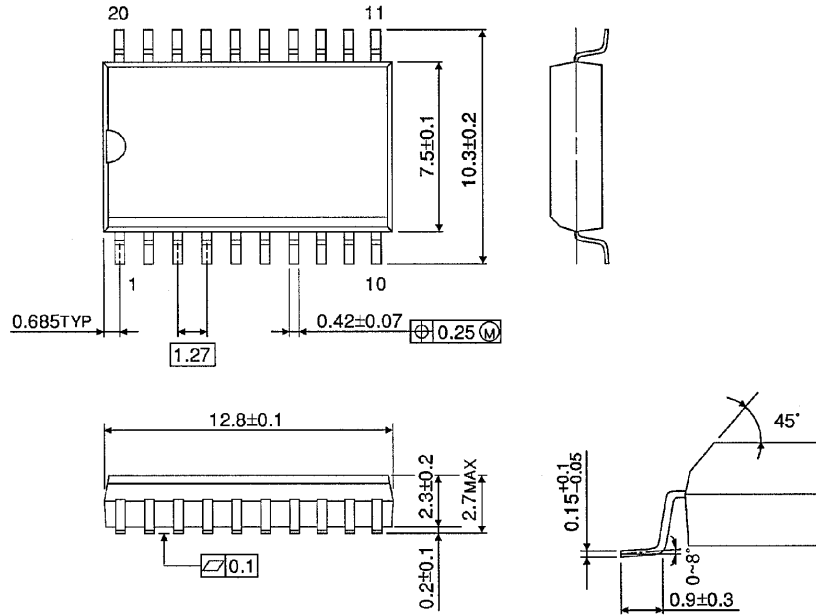


Weight : 0.22g (Typ.)

**SOP 20PIN (300mil BODY) PACKAGE DIMENSIONS (SOL20-P-300-1.27)**

Unit in mm

(Note) This package is not available in Japan.



Weight : 0.46g (Typ.)

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