

74HC573D-HX/74HC573S-HX OCTAL TRANSPARENT D-TYPE LATCHES WITH 3-STATE OUTPUTS

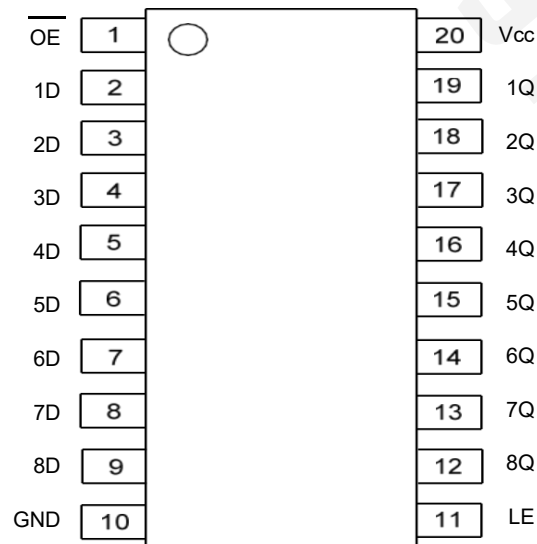
Description

The 74HC573D-HX/74HC573S-HX is an elegant, high-performance octal transparent D-type latch—featuring tri-state output capability across all eight independently controllable channels.

Features

- ★ Operate from 2V to 6V
- ★ Max t_{PD} of 57ns 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 $V_{CC} = 4.5V$, $T_A = 25^\circ C$
- ★ Latch-up performance ≤ 250 mA
- ★ ESD protection:
 - HBM: ANSI/ESDA/JEDEC JS-001 2023 exceeds 2500 V
 - CDM: ANSI/ESDA/JEDEC JS-002 2022 exceeds 1500 V

Pin Configuration

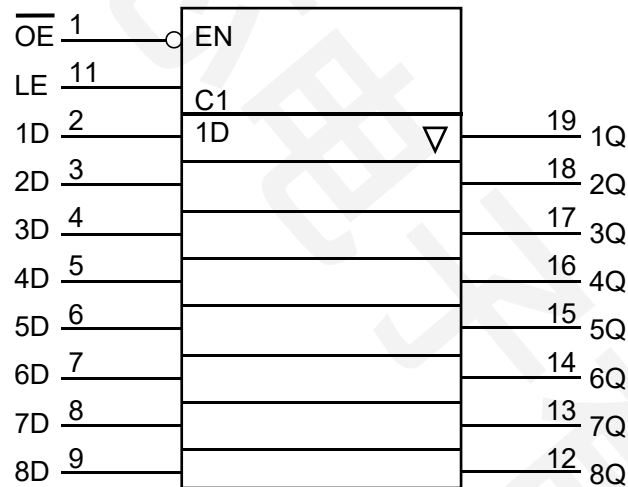


Function table

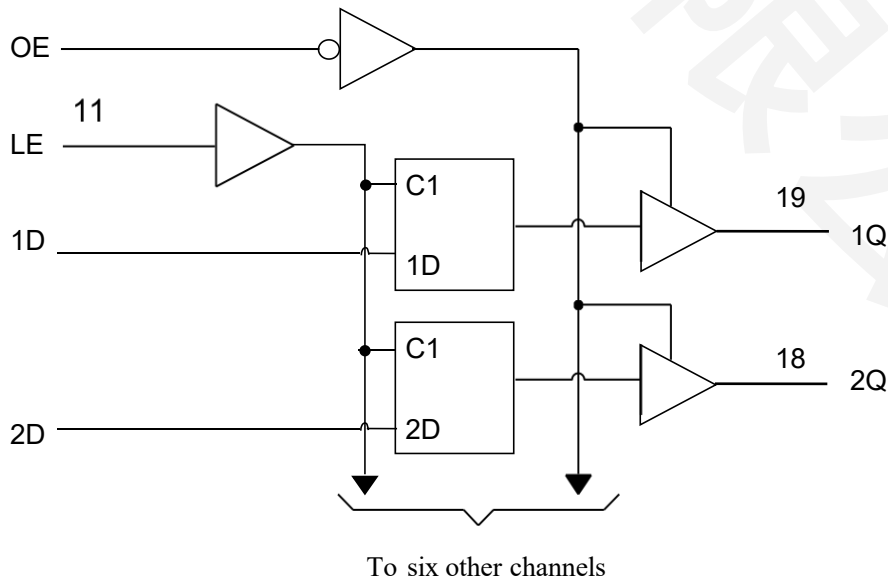
INPUTS(OE)	INPUTS(LE)	INPUTS(D)	OUTPUT(Q)
L	H	H	H
L	H	L	L
L	L	X	Q0
H	X	X	Z

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
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	$^{\circ}\text{C}/\text{W}$
	SOP-20		80	$^{\circ}\text{C}/\text{W}$

Recommended Operating Conditions

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
		$V_{CC}=6.0\text{V}$	4.2			V
Low-level Input Voltage	V_{IL}	$V_{CC}=2.0\text{V}$	0		0.5	V
		$V_{CC}=4.5\text{V}$	0		1.35	V
		$V_{CC}=6.0\text{V}$	0		1.8	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	$V_{CC}=2.0\text{V}$	0		1	μs
		$V_{CC}=4.5\text{V}$	0		0.5	μs
		$V_{CC}=6.0\text{V}$	0		0.4	μs
Operating Temperature	T_A	-	-40		+125	$^{\circ}\text{C}$

Electrical characteristics ($T_A=25^{\circ}\text{C}$, Unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	$T_A=25^{\circ}\text{C}$			$T_A=-40\sim+125^{\circ}\text{C}$			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
High-level Input Voltage	V_{IH}	$V_{CC}=2.0\text{V}$	1.5	-	-	1.5	-	-	V
		$V_{CC}=4.5\text{V}$	3.15	-	-	3.15	-	-	V
		$V_{CC}=6.0\text{V}$	4.2	-	-	4.2	-	-	V
Low-level Input Voltage	V_{IL}	$V_{CC}=2.0\text{V}$	0	-	0.5	-	-	0.5	V
		$V_{CC}=4.5\text{V}$	0	-	1.35	-	-	1.35	V
		$V_{CC}=6.0\text{V}$	0	-	1.8	-	-	1.8	V
Output Voltage High- Level	V_{OH}	$V_{CC}=2.0\text{V}$, $I_{OH}=-20\mu\text{A}$	1.9	1.995	-	1.9	-	-	V
		$V_{CC}=4.5\text{V}$, $I_{OH}=-20\mu\text{A}$	4.4	4.490	-	4.4	-	-	V
		$V_{CC}=6.0\text{V}$, $I_{OH}=-20\mu\text{A}$	5.9	5.980	-	5.9	-	-	V
		$V_{CC}=4.5\text{V}$, $I_{OH}=-6\text{mA}$	3.98	4.3	-	3.7	-	-	V
		$V_{CC}=6.0\text{V}$, $I_{OH}=-7.8\text{mA}$	5.48	5.8	-	5.2	-	-	V
Output Voltage Low- Level	V_{OL}	$V_{CC}=2.0\text{V}$, $I_{OL}=20\mu\text{A}$	-	2	100	-	-	100	mV
		$V_{CC}=4.5\text{V}$, $I_{OL}=20\mu\text{A}$	-	20	100	-	-	100	mV
		$V_{CC}=6.0\text{V}$, $I_{OL}=20\mu\text{A}$	-	30	100	-	-	100	mV
		$V_{CC}=4.5\text{V}$, $I_{OL}=6\text{mA}$	-	150	260	-	-	400	mV
		$V_{CC}=6.0\text{V}$, $I_{OL}=7.8\text{mA}$	-	160	260	-	-	400	mV
Input Leakage Current	$I_{I(LEAK)}$	$V_{CC}=6.0\text{V}$, $V_{IN}=V_{CC}$ or GND	-	± 0.1	± 100	-	-	± 1000	nA
Disable Output Leakage Current	I_{OZ}	$V_{CC}=6.0\text{V}$, $V_{OUT}=V_{CC}$ or GND	-	± 0.01	± 0.5	-	-	± 10	μA
Quiescent Supply Current	I_Q	$V_{CC}=6.0\text{V}$, $V_{IN}=V_{CC}$ or GND, $I_{OUT}=0$	-	-	8	-	-	160	μA

Switching characteristics (See TEST CIRCUIT AND WAVEFORMS)

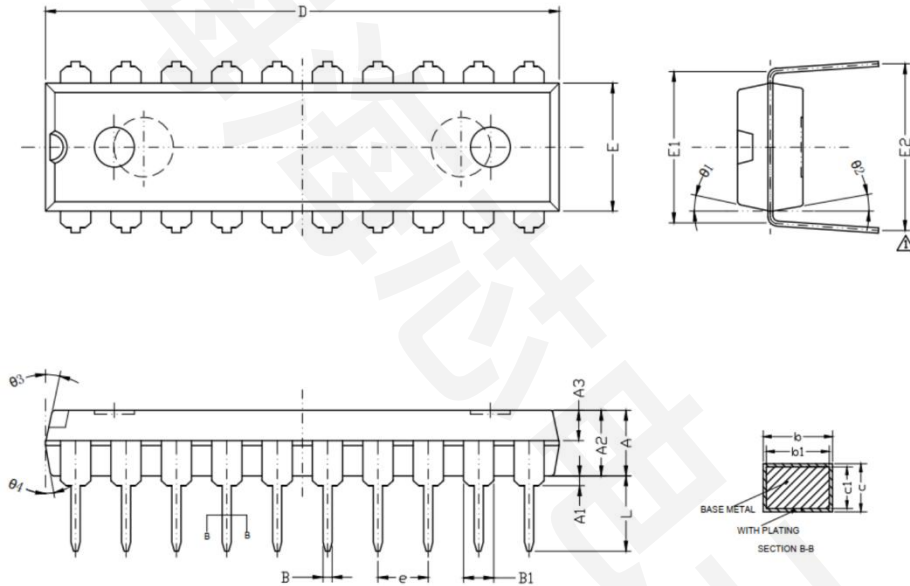
PARAMETER	SYMBOL	TEST CONDITIONS	T _A =25°C			T _A =-40~+125°C			UNIT
			MIN	TYP	MAX	MIN	TYP	MAX	
Propagation delay from input (D) to output (Q)	t _{PLH} /t _{PHL}	V _{CC} =2.0V, C _L =50pF	-	47	175	-	-	225	ns
		V _{CC} =4.5V, C _L =50pF	-	20	35	-	-	45	ns
		V _{CC} =6.0V, C _L =50pF	-	17	30	-	-	38	ns
		V _{CC} =2.0V, C _L =150pF	-	95	200	-	-	255	ns
		V _{CC} =4.5V, C _L =150pF	-	33	40	-	-	51	ns
		V _{CC} =6.0V, C _L =150pF	-	21	34	-	-	43	ns
Propagation delay from input (LE) to output (Q)	t _{PLH} /t _{PHL}	V _{CC} =2.0V, C _L =50pF	-	50	175	-	-	220	ns
		V _{CC} =4.5V, C _L =50pF	-	18	35	-	-	45	ns
		V _{CC} =6.0V, C _L =50pF	-	14	30	-	-	38	ns
		V _{CC} =2.0V, C _L =150pF	-	103	225	-	-	285	ns
		V _{CC} =4.5V, C _L =150pF	-	33	45	-	-	58	ns
		V _{CC} =6.0V, C _L =150pF	-	29	38	-	-	48	ns
Output enable time from input (OE) to output (Q)	t _{PZL} /t _{PZH}	V _{CC} =2.0V, C _L =50pF	-	55	150	-	-	210	ns
		V _{CC} =4.5V, C _L =50pF	-	20	30	-	-	42	ns
		V _{CC} =6.0V, C _L =50pF	-	16	26	-	-	36	ns
		V _{CC} =2.0V, C _L =150pF	-	85	200	-	-	270	ns
		V _{CC} =4.5V, C _L =150pF	-	29	40	-	-	54	ns
		V _{CC} =6.0V, C _L =150pF	-	26	34	-	-	47	ns
Output disable time from input (OE) to output (Q)	t _{PLZ} /t _{PHZ}	V _{CC} =2.0V, C _L =50pF	-	30	150	-	-	225	ns
		V _{CC} =4.5V, C _L =50pF	-	12	30	-	-	45	ns
		V _{CC} =6.0V, C _L =50pF	-	10	26	-	-	38	ns
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	50	-	-	75	-	-	ns
		V _{CC} =4.5V	10	-	-	15	-	-	ns
		V _{CC} =6.0V	9	-	-	13	-	-	ns
Hold Time	t _h	V _{CC} =2.0V	20	-	-	24	-	-	ns
		V _{CC} =4.5V	5	-	-	5	-	-	ns
		V _{CC} =6.0V	5	-	-	5	-	-	ns

Operating characteristics

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	-	50	-	pF

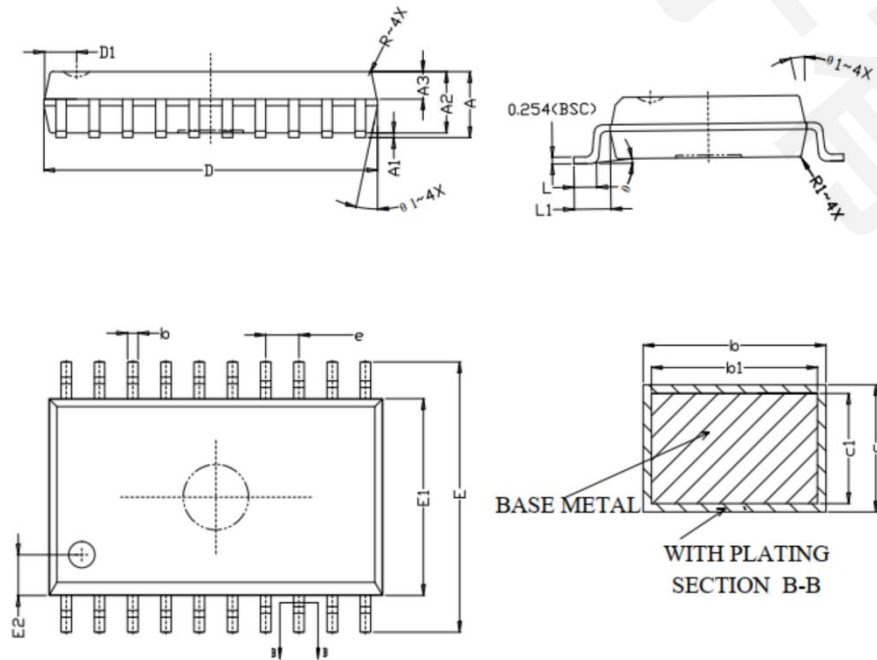
Package information

DIP 20 package information



SYMBOL	MILLIMETER		
	MIN	MIN	MAX
A	3.60	3.80	4.00
A1	0.51	--	--
A2	3.20	3.30	3.40
A3	1.47	1.52	1.57
B	0.44	--	0.53
B1	1.52(BSC)		
b	0.44	--	0.53
b1	0.43	0.46	0.48
c	0.25	--	0.31
c1	0.24	0.25	0.26
D	25.7	25.9	26.1
E	6.35	6.55	6.75
E1	7.62(BSC)		
E2	8.00	8.40	8.80
e	2.54(BSC)		
L	3.00	--	3.60
θ1	8°	~	14°
θ2	6°	~	12°
θ3	8°	~	14°
θ4	6°	~	12°

SOP 20 package information



SYMBOL	MILLIMETER		
	MIN	MIN	MAX
A	--	--	2.615
A1	0.10	--	0.30
A2	2.29	2.34	2.39
A3	0.99	1.043	1.07
b	0.39	--	0.47
b1	0.38	0.41	0.44
c	0.25	--	0.29
c1	0.24	0.25	0.26
D	12.65	12.75	12.85
D1	1.225(BSC)		
E	10.10	10.30	10.50
E1	7.40	7.50	7.60
E2	1.55(BSC)		
e	1.27(BSC)		
L	0.854	0.864	0.874
L1	1.403(REF)		
θ	0°	~	8°
θ1	6°	~	15°
R/R1	R1.27(BSC)		