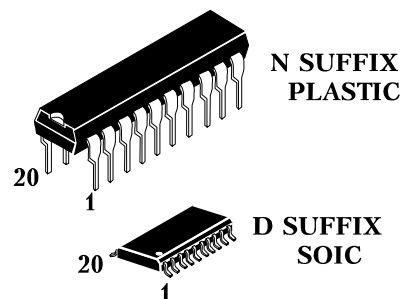


IN74LV374

OCTAL D-TYPE FLIP-FLOP POSITIVE EDGE-TRIGGER (3-STATE)

IN74LV374 are compatible by pinning with KP555IP23, KP1533IP13, IN74HC374A and IN74HCT374A series. Input voltage levels are compatible with standard CMOS levels.

- Output voltage levels are compatible with input levels of CMOS, NMOS and TTL ICs.
- Supply voltage range from 2.0 to 3.2 V
- LOW input current: 1.0 μ A; 0.1 μ A at T = 25 °C
- Output current 8 mA
- Latch current value not less than 150 mA at T = 125 °C
- ESD acceptable values: not less than 2000 V as per HBM, and not less than 200 V as per MM



ORDERING INFORMATION

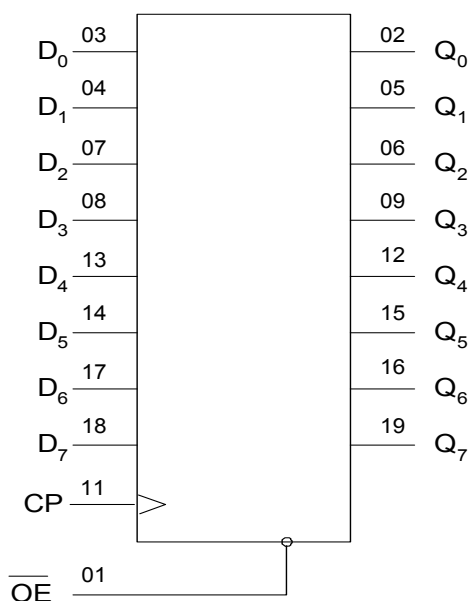
IN74LV374N Plastic DIP

IN74LV374D SOIC

T_A = -40° to 125° C

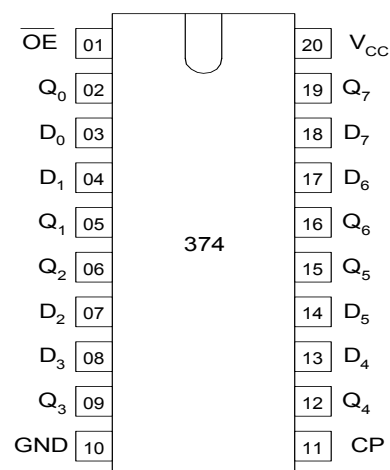
for all packages

BLOCK DIAGRAM



Pin 20 = V_{CC}
Pin 10 = GND

PIN ASSIGNMENT



FUNCTION TABLE

Inputs			Output
OE	CP	Dn	Qn
L	┌	H	H
L	┌	L	L
L	L, H, ┌	X	no change
H	X	X	Z

IN74LV374

ABSOLUTE MAXIMUM RATINGS*

Symbol	Parameter	Rating	Unit
V_{CC}	Supply voltage	-0.5 to +5.0	V
I_{IK}^{*1}	Input diode current	± 20	mA
I_{OK}^{*2}	Output diode current	± 50	mA
I_O^{*3}	Output source or sink current	± 35	mA
I_{CC}	Bus driver outputs	± 70	mA
I_{GND}	Ground current	± 70	mA
P_D	Power dissipation per package, Plastic DIP ^{*4} SOIC ^{*4}	750 500	mW
Tstg	Storage temperature range	-65 to +150	°C

* In absolute maximum ratings modes functioning is not guaranteed. Upon lifting the absolute maximum ratings functioning is guaranteed at the recommended operating conditions.

*1 Provide $V_I < -0.5 \text{ V}$ or $V_I > V_{CC} + 0.5 \text{ V}$.

*2 Provide $V_O < -0.5 \text{ V}$ or $V_O > V_{CC} + 0.5 \text{ V}$.

*3 Provide $-0.5 \text{ V} < V_O < V_{CC} + 0.5 \text{ V}$.

*4 When operating in the temperature range of 70°C to 125°C power dissipation value decreases

- for Plastic DIP by 12 mW/°C

- for SOIC by 8 mW/°C

RECOMMENDED OPERATING MODES

Symbol	Parameter	Min	Max	Unit
V_{CC}	Supply voltage	1.2	3.6	V
V_{IN}	Input voltage	0	V_{CC}	V
V_{OUT}	Output voltage	0	V_{CC}	V
T_A	Operating ambient temperature range. For all types packages	-40	125	°C
t_{LH}, t_{HL}	Input rise and fall times $V_{CC} = 1.2 \text{ V}$ $V_{CC} = 2.0 \text{ V}$ $V_{CC} = 3.0 \text{ V}$ $V_{CC} = 3.6 \text{ V}$	0	1000 700 500 400	ns

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DC CHARACTERISTICS

Symbol	Parameter	Test conditions	V _{CC} , V	Limits						Unit
				25°C		-40°C to 85°C		125°C		
				min	max	min	max	min	max	
V _{IH}	HIGH level input voltage	V _O = V _{CC} - 0.1 V	1.2	0.9	-	0.9	-	0.9	-	V
			2.0	1.4	-	1.4	-	1.4	-	
			3.0	2.1	-	2.1	-	2.1	-	
			3.6	2.5	-	2.5	-	2.5	-	
V _{IL}	LOW level input voltage	V _O = 0.1 V	1.2	-	0.3	-	0.3	-	0.3	V
			2.0	-	0.6	-	0.6	-	0.6	
			3.0	-	0.9	-	0.9	-	0.9	
			3.6	-	1.1	-	1.1	-	1.1	
V _{OH}	HIGH level output voltage	V _I = V _{IH} or V _{IL} I _O = -50 μA	1.2	1.1	-	1.0	-	1.0	-	V
			2.0	1.92	-	1.9	-	1.9	-	
			3.0	2.92	-	2.9	-	2.9	-	
			3.6	3.52	-	3.5	-	3.5	-	
		3.0	2.48	-	2.34	-	2.20	-	V	
V _{OL}	LOW level output voltage	V _I = V _{IH} or V _{IL} I _O = 50 μA	1.2	-	0.09	-	0.1	-	0.1	V
			2.0	-	0.09	-	0.1	-	0.1	
			3.0	-	0.09	-	0.1	-	0.1	
			3.6	-	0.09	-	0.1	-	0.1	
		3.0	-	0.33	-	0.4	-	0.5	V	
I _I	Input leakage current	V _I = V _{CC} или 0 V	3.6	-	±0.1	-	±1.0	-	±1.0	μA
I _{OZ}	Output OFF-state current	3-state outputs V _I = V _{IL} or V _{IH} V _O = V _{CC} or 0 V	3.6	-	±0.5	-	±5	-	±10	μA
I _{CC}	Supply current	V _I = V _{CC} or 0 V I _O = 0 μA	3.6	-	8.0	-	80	-	160	μA

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AC CHARACTERISTICS ($C_L=50$ pF, $t_{LH} = t_{HL} = 6.0$ ns)

Symbol	Parameter	Test conditions	V_{CC} , V	Limits						Unit
				25°C		-40°C to 85°C		125°C		
				min	max	min	max	min	max	
t_{PHL}, t_{PLH} from CP to Qn	Propagation delay	Figure 1	1.2	-	180	-	230	-	270	ns
			2.0	-	45	-	56	-	68	
			3.0	-	27	-	34	-	41	
t_{PHZ}, t_{PLZ} from OE to Qn	Propagation delay	Figure 3	1.2	-	160	-	200	-	240	ns
			2.0	-	38	-	57	-	68	
			3.0	-	25	-	36	-	43	
t_{PZH}, t_{PZL} from OE to Qn	Propagation delay	Figure 3	1.2	-	160	-	200	-	240	ns
			2.0	-	38	-	48	-	58	
			3.0	-	23	-	29	-	35	
t_{THL}, t_{TLH}	HIGH-to-LOW and LOW-to- HIGH transition time	Figure 1	1.2	-	75	-	100	-	120	ns
			2.0	-	16	-	20	-	24	
			3.0	-	10	-	13	-	15	
t_w	Clock pulse width HIGH or LOW	Figure 1	1.2	250	-	350	-	540	-	ns
			2.0	18	-	23	-	28	-	
			3.0	11	-	14	-	17	-	
t_{SU}	Set-up time Dn to CP	Figure 2	1.2	45	-	50	-	100	-	ns
			2.0	13	-	17	-	20	-	
			3.0	8	-	10	-	12	-	
t_H	Hold time Dn to CP	Figure 2	1.2	25	-	25	-	25	-	ns
			2.0	5	-	5	-	5	-	
			3.0	5	-	5	-	5	-	
fc	CP maximum pulse frequency	Figure 1	2.0	-	27	-	22	-	18	MHz
			3.0	-	46	-	37	-	31	
C_I	Input capacitance		3.0	-	7	-	-	-	pF	
C_{PD}	Power dissipation capacitance (per flip-flop)	$V_I = 0$ V or V_{CC}	3.0	-	34	-	-	-	pF	

IN74LV374

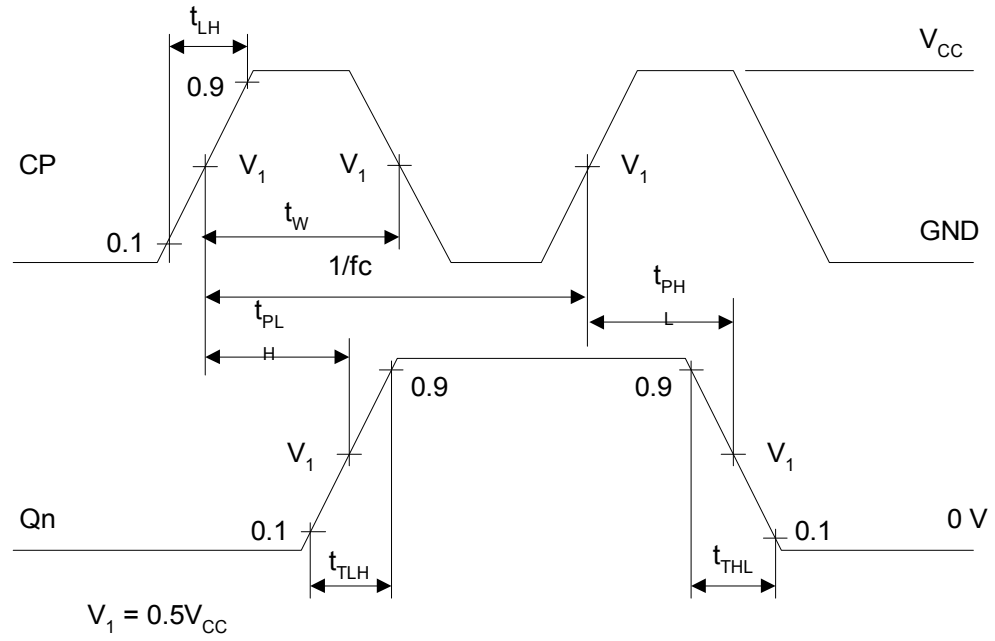


Figure 1- Time diagram

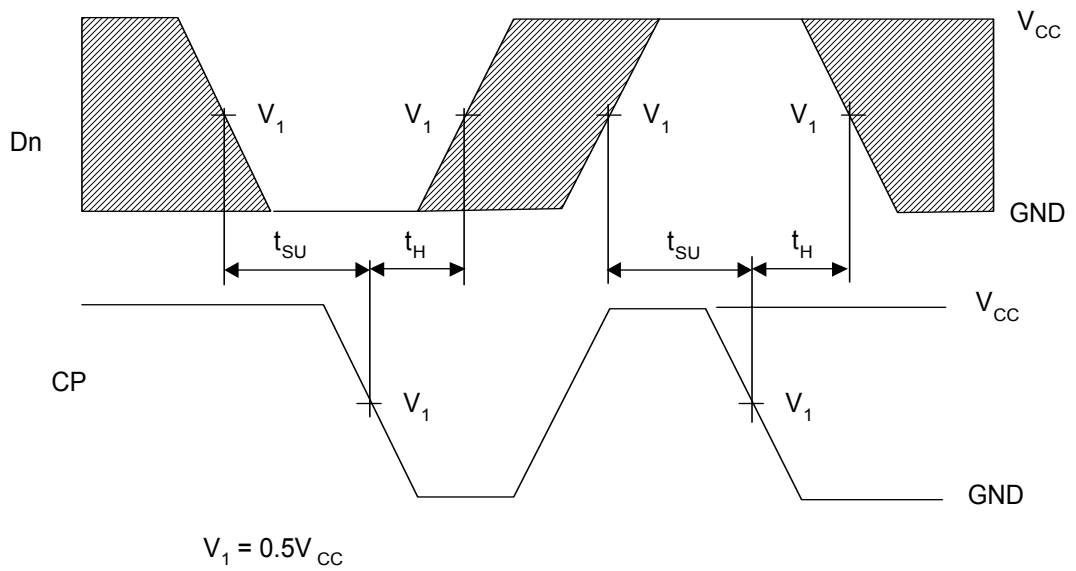
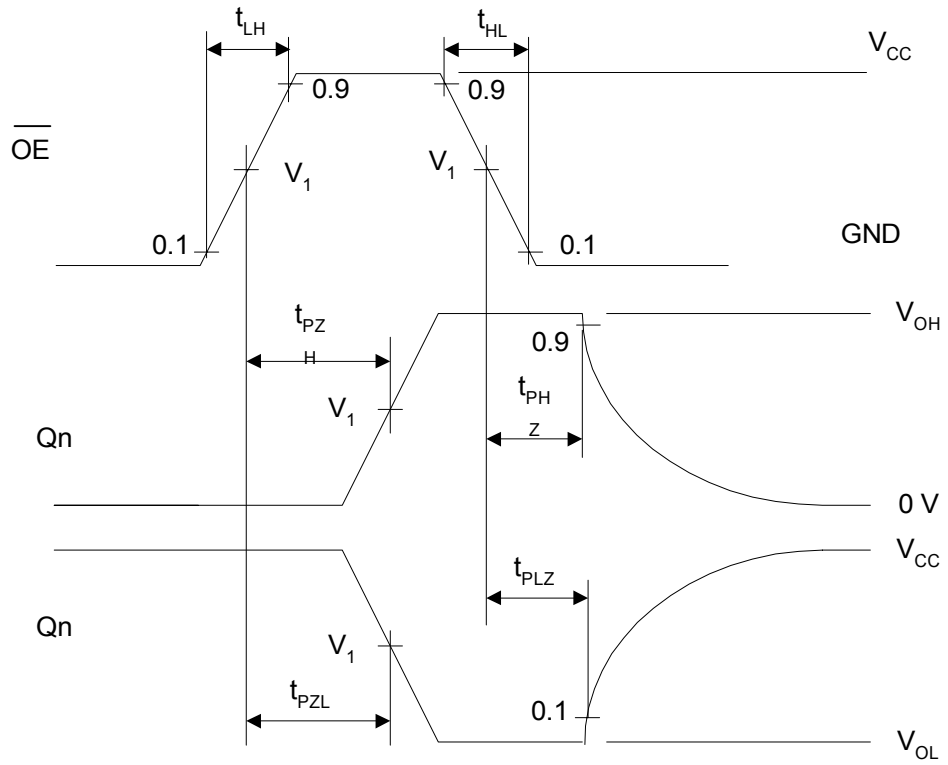


Figure 2 - Time diagram

IN74LV374

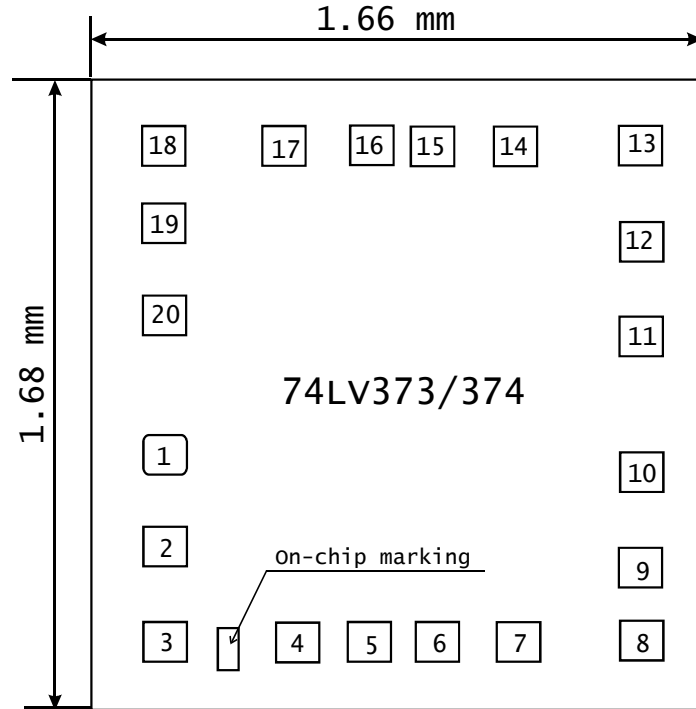


$$V_1 = 0.5V_{CC}$$

Figure 3 - Time diagram

IN74LV374

Drawing of the chip



Pads allocation Table

Pad number	coordinates (counted from lower left corner), mm		Pad size, mm
	X	Y	
01	0.142	0.628	0.108 x 0.108
02	0.142	0.377	0.108 x 0.108
03	0.142	0.125	0.108 x 0.108
04	0.498	0.125	0.108 x 0.108
05	0.693	0.125	0.108 x 0.108
06	0.871	0.125	0.108 x 0.108
07	1.095	0.125	0.108 x 0.108
08	1.423	0.130	0.108 x 0.108
09	1.423	0.329	0.108 x 0.108
10	1.423	0.587	0.108 x 0.108
11	1.423	0.949	0.108 x 0.108
12	1.423	1.198	0.108 x 0.108
13	1.423	1.447	0.108 x 0.108
14	1.085	1.447	0.108 x 0.108
15	0.868	1.447	0.108 x 0.108
16	0.696	1.447	0.108 x 0.108
17	0.461	1.447	0.108 x 0.108
18	0.142	1.447	0.108 x 0.108
19	0.142	1.245	0.108 x 0.108
20	0.142	0.997	0.108 x 0.108