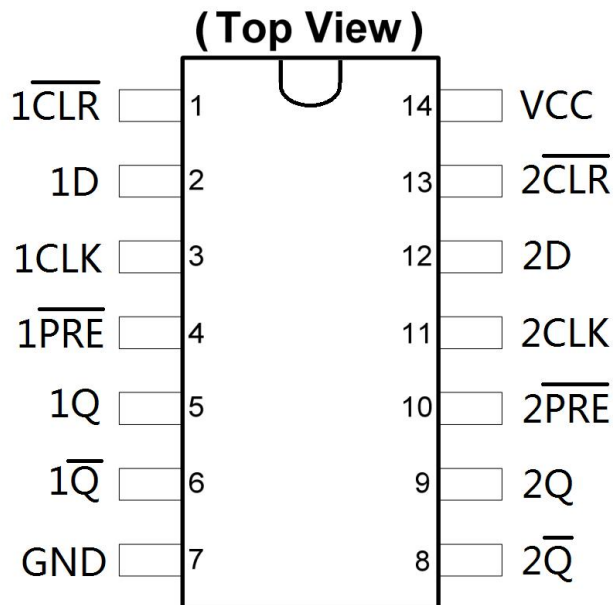


## 1. DESCRIPTION

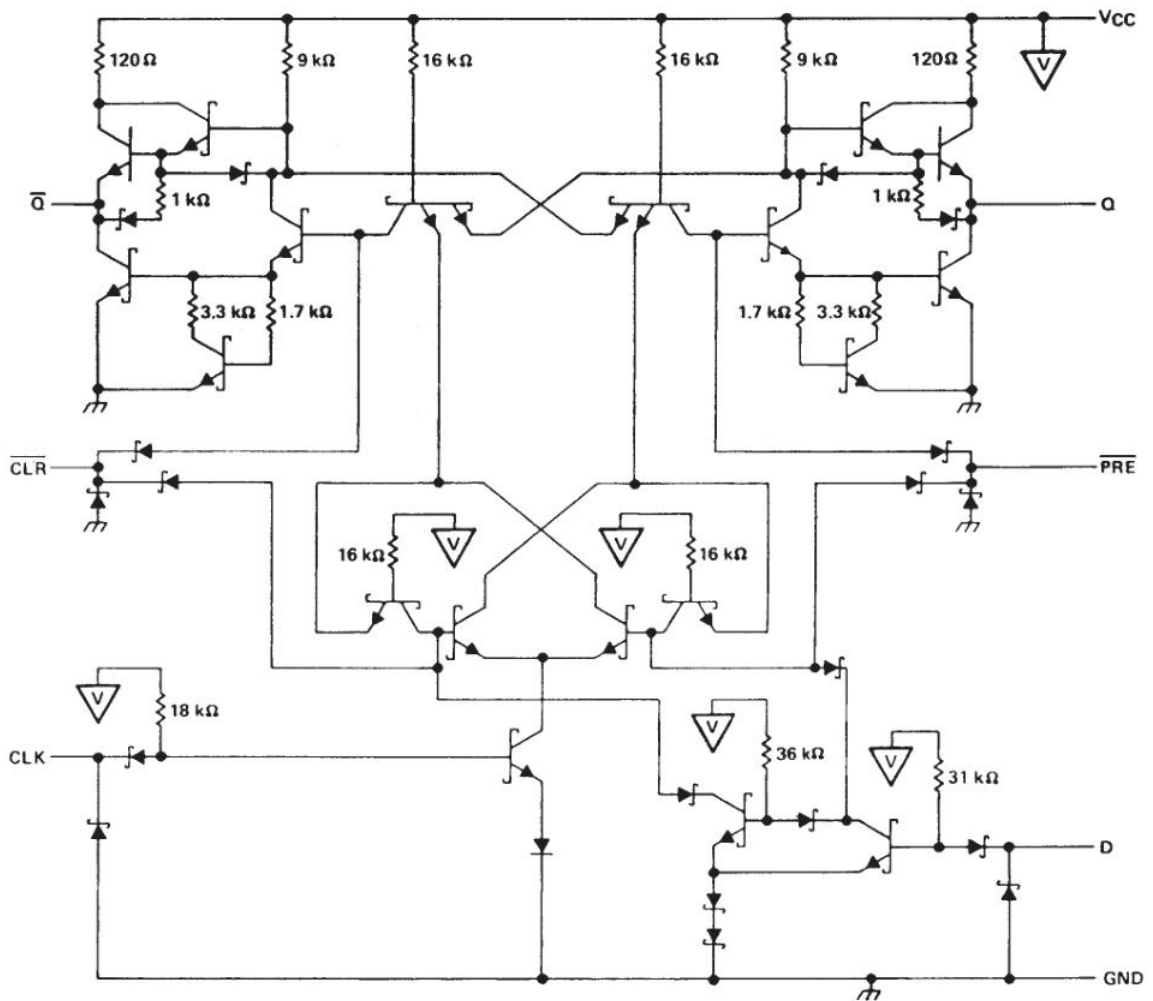
These devices contain two independent D-type positive-edge-triggered flip-flops. A low level at the preset or clear inputs sets or resets the outputs regardless of the levels of the other inputs. When preset and clear are inactive (high), data at the D input meeting the setup time requirements are transferred to the outputs on the positive-going edge of the clock pulse. Clock triggering occurs at a voltage level and is not directly related to the rise time of the clock pulse. Following the hold time interval, data at the D input may be changed without affecting the levels at the outputs.

## 2. PIN CONFIGURATIONS

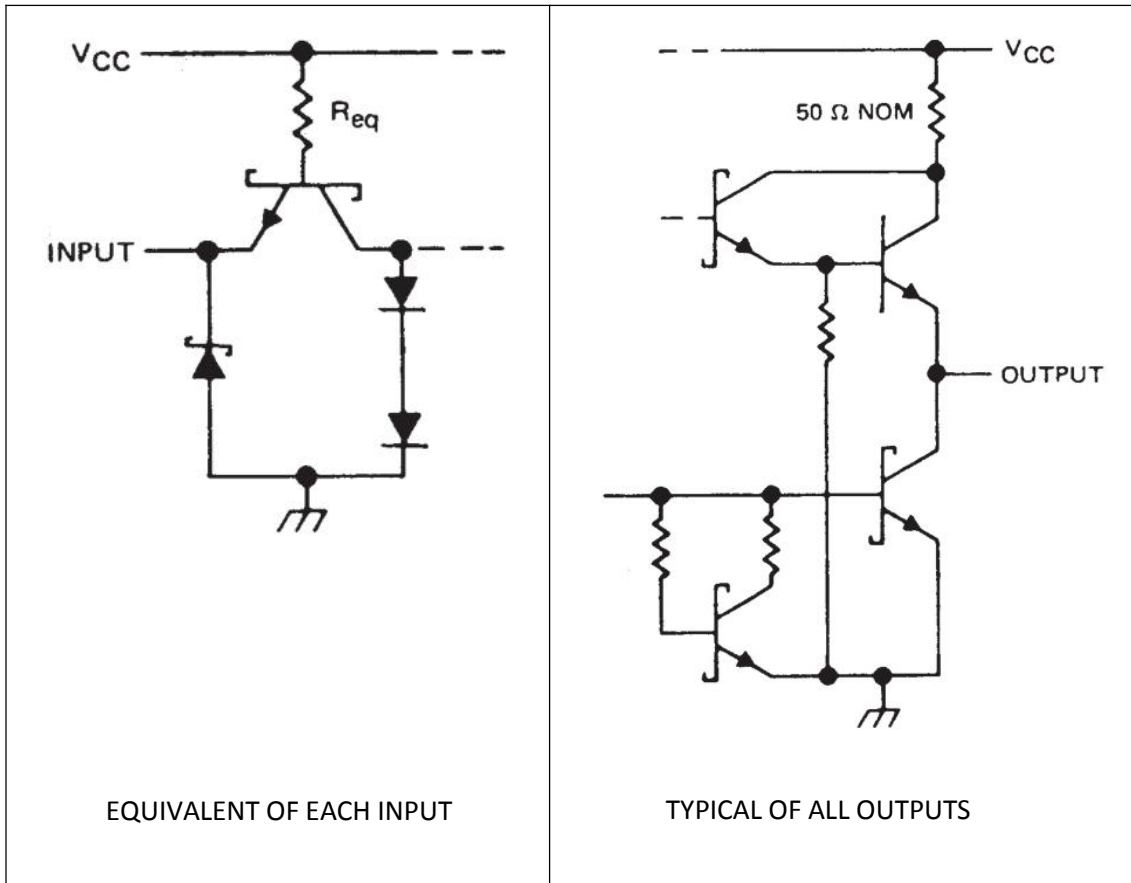


INPUTS				OUTPUTS	
$\overline{\text{PRE}}$	$\overline{\text{CLR}}$	CLK	D	Q	$\overline{\text{Q}}$
L	H	X	X	H	L
H	L	X	X	L	H
L	L	X	X	H $\uparrow$	H $\uparrow$
H	H	$\uparrow$	H	H	L
H	H	$\uparrow$	L	L	H
H	H	L	X	Q <sub>0</sub>	$\overline{\text{Q}}_0$

### 3. SCHEMATICS



**4. SCHEMATICS OF INPUTS AND OUTPUTS**



**5. ABSOLUTE MAXIMUM RATINGS OVER OPERATING FREE-AIR TEMPERATURE RANGE (UNLESS OTHERWISE NOTES)**

Supply voltage, $V_{CC}$ (see Note 1).....	7V
Input voltage, $V_I$ : 74LS74.....	7V
Operating free-air temperature range: DIP package.....	0°C to 70°C
Storage temperature range, $T_{stg}$ .....	-65°C to 150°C

NOTES 1: Voltage values are with respect to the network ground terminal.

## 6. RECOMMENDED OPERATING CONDITIONS

		74LS74			UNIT
		MIN	NOM	MAX	
V <sub>CC</sub>	Supply voltage	4.75	5	5.25	V
V <sub>IH</sub>	High-level input voltage	2			V
V <sub>IL</sub>	Low-level input voltage			0.8	V
I <sub>OH</sub>	High-level output current			-0.4	mA
I <sub>OL</sub>	Low-level output current			8	mA
f <sub>clock</sub>	Clock frequency	0		25	MHz
t <sub>w</sub>	Pulse duration	CLK high		25	ns
		PRE or CLR low		25	
t <sub>su</sub>	Set up time-before CLK↑	High-level data		20	ns
		Low-level data		20	
t <sub>h</sub>	Hold time-data after CLK↑	5			ns
T <sub>A</sub>	Operating free-air temperature	0		70	°C

## 7. ELECTRICAL CHARACTERISTICS OVER RECOMMENDED OPERATING FREE-AIR RANGE (UNLESS OTHERWISE NOTED)

PARAMETER		TEST CONDITIONS†	74LS74			UNIT
			MIN	TYP‡	MAX	
V <sub>IK</sub>		V <sub>CC</sub> = MIN, I <sub>I</sub> = -18 mA			-1.5	V
V <sub>OH</sub>		V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, I <sub>OH</sub> = -0.4 mA, V <sub>IL</sub> = MAX	2.7	3.4		V
V <sub>OL</sub>		V <sub>CC</sub> = MIN, V <sub>IH</sub> = 2 V, V <sub>IL</sub> = MAX, I <sub>OL</sub> = 8 mA	0.25	0.4		V
			0.35	0.5		
I <sub>I</sub>	D or CLK	V <sub>CC</sub> = MAX, V <sub>I</sub> = 7 V			0.1	mA
	CLR or PRE				0.2	
I <sub>IH</sub>	D or CLK	V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.7 V			20	μA
	CLR or PRE				40	
I <sub>IL</sub>	D or CLK	V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.4 V			-0.4	mA
	CLR or PRE				-0.8	
I <sub>OS</sub> §		V <sub>CC</sub> = MAX See Note 4	-20		-100	mA
I <sub>CC</sub> (Totall)		V <sub>CC</sub> = MAX See Note 2		4	8	mA

† For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions.

‡ All typical values are at V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25 °C.

§ Not more than one output should be shorted at a time.

NOTES 2: With all outputs open, I<sub>CC</sub> is measured with the Q and  $\bar{Q}$  outputs high in turn. At the time of measurement, the clock input is grounded.

NOTES 4: For certain devices where state commutation can be caused by shorting an output to ground, an equivalent test may be performed with V<sub>O</sub> = 2.25V and 2.125V for the 54 family and the 74 family, respectively, with the minimum and maximum limits reduced to one half of their stated values.

## 8. SWITCHING CHARACTERISTICS, V<sub>CC</sub> = 5 V, T<sub>A</sub> = 25 °C

PARAMETER	FROM (INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
f <sub>max</sub>			C <sub>L</sub> = 15 pF, R <sub>L</sub> = 2kΩ, See Note 3	25	33		MHz
t <sub>PLH</sub>	CLR or CLK	Q or $\bar{Q}$			13	25	ns
t <sub>PHL</sub>					25	40	ns

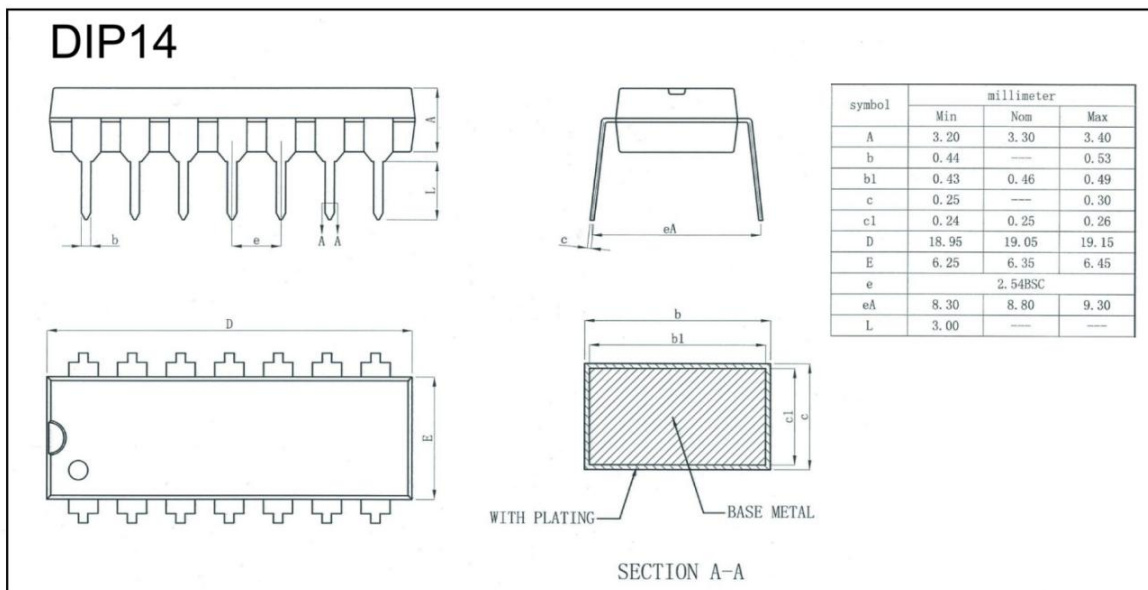
NOTE 3: Load circuits and voltage waveforms are shown in Section 1.

## 9. ORDERING INFORMATION

### Ordering Information

Part Number	Device Marking	Package Type	Body size (mm)	Temperature (°C)	MSL	Transport Media	Package Quantity
XD74LS74	XD74LS74	DIP14	19.05 * 6.35	-0 to 70	MSL3	Tube 25	1000

## 10. DIMENSIONAL DRAWINGS



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