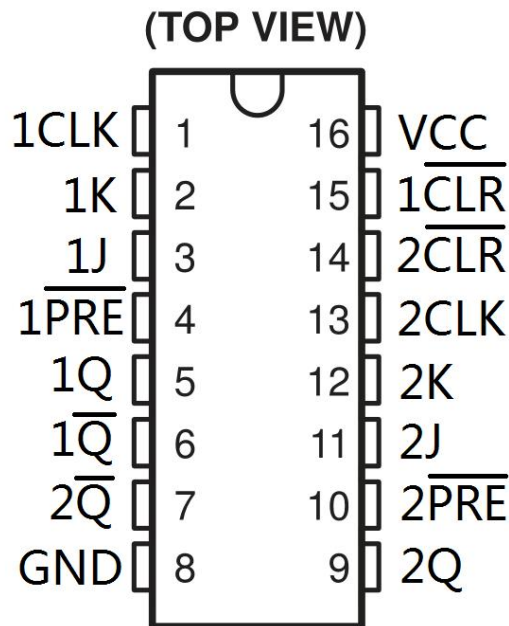


1. DESCRIPTION

These devices contain independent J-K negative-edge-triggered flip-flops. A low level at the preset and 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 J and K inputs meeting the setup time requirements are transferred to the outputs on the negative-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 J and K inputs may be changed without affecting the levels at the outputs. These versatile flip-flops can perform as toggle flip-flops by tying J and K high.

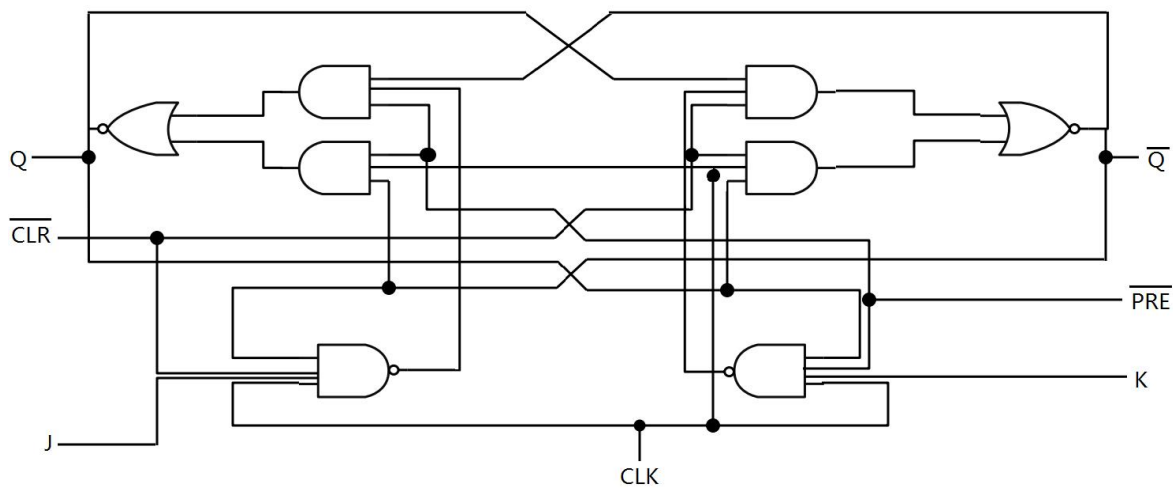
The XD74LS112 family is characterized for operation from 0°C to 70°C.

2. PIN CONFIGURATIONS

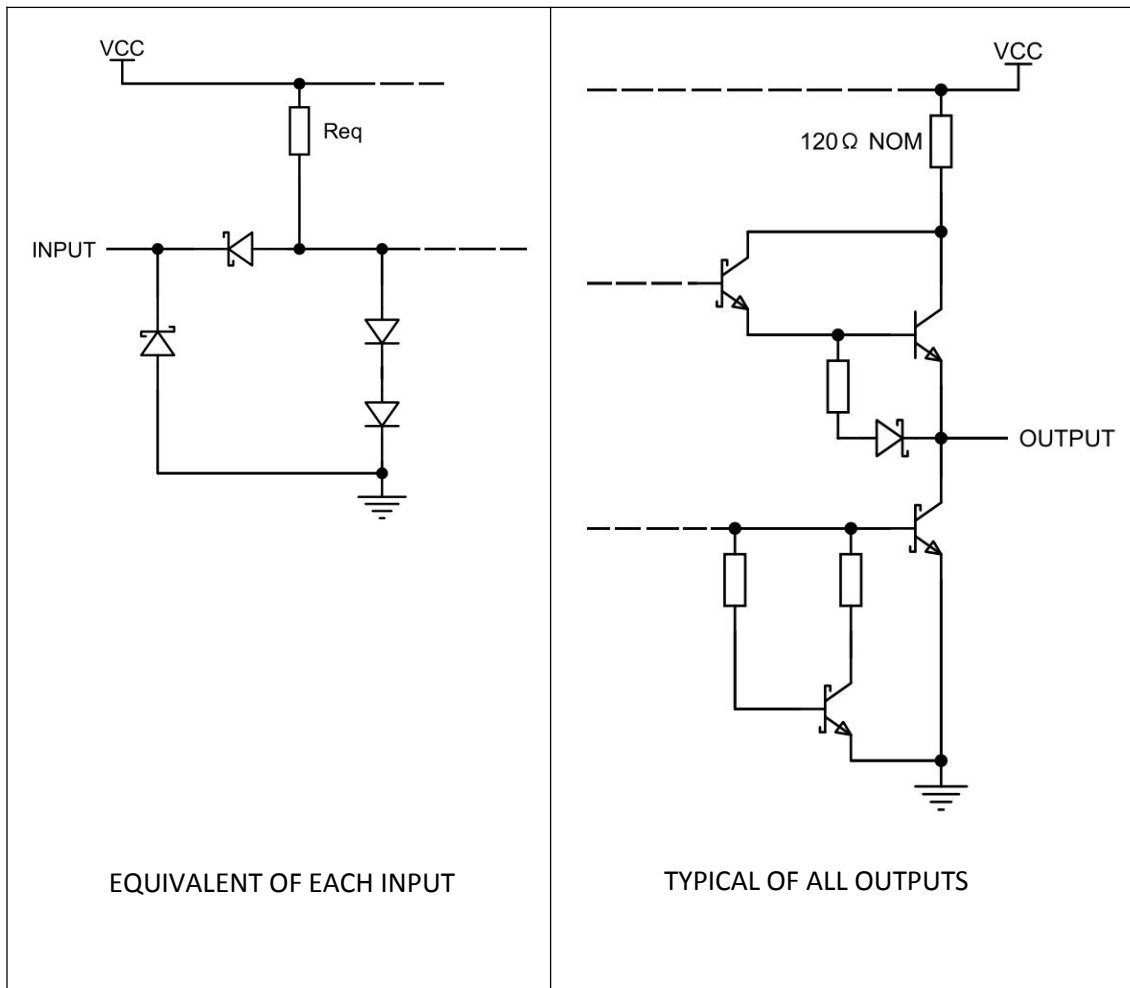


INPUTS					OUTPUTS	
$\overline{\text{PRE}}$	$\overline{\text{CLR}}$	CLK	J	K	Q	$\overline{Q}$
L	H	X	X	X	H	L
H	L	X	X	X	L	H
L	L	X	X	X	H $\uparrow$	H $\uparrow$
H	H	$\downarrow$	L	L	Q_0	Q_0
H	H	$\downarrow$	H	L	H	L
H	H	$\downarrow$	L	H	L	H
H	H	$\downarrow$	H	H	TOGGLE	
H	H	H	X	X	Q_0	$\overline{Q_0}$

3. LOGIC DIAGRAMS(positive logic)



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 : 74LS112.....	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

			74LS112			UNIT
			MIN	NOM	MAX	
V _{CC}	Supply voltage		4.75	5	5.25	V
V _{IH}	High-level input voltage		2			V
V _{IL}	Low-level input voltage				0.8	V
I _{OH}	High-level output current				-0.4	mA
I _{OL}	Low-level output current				8	mA
f _{clock}	Clock frequency		0		30	MHz
t _w	Pulse duration	CLK high	20			ns
		$\overline{\text{PRE}}$ or $\overline{\text{CLR}}$ low	25			
t _{su}	Set up time-before CLK↓	Data high or low	20			ns
		$\overline{\text{CLR}}$ inactive	25			
		$\overline{\text{PRE}}$ inactive	20			
t _h	Hold time-data after CLK↓		0			ns
T _A	Operating free-air temperature		0		70	°C

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

PARAMETER		TEST CONDITIONS†	74LS112			UNIT
			MIN	TYP‡	MAX	
V _{IK}		V _{CC} = MIN, I _I = -18 mA	-1.5			V
V _{OH}		V _{CC} = MIN, V _{IH} = 2 V, I _{OH} = -0.4 mA, V _{IL} = MAX	2.7	3.4		V
V _{OL}		V _{CC} = MIN, V _{IH} = 2 V, V _{IL} = MAX, I _{OL} = 8 mA	0.25	0.4		V
			0.35	0.5		
I _I	J or K	V _{CC} = MAX, V _I = 7 V			0.1	mA
	$\overline{\text{CLR}}$ or $\overline{\text{PRE}}$				0.3	
					0.4	
I _{IH}	J or K	V _{CC} = MAX, V _I = 2.7 V			20	μA
	$\overline{\text{CLR}}$ or $\overline{\text{PRE}}$				60	
					80	
I _{IL}	J or K	V _{CC} = MAX, V _I = 0.4 V			-0.4	mA
	$\overline{\text{CLR}}$ or $\overline{\text{PRE}}$				-0.8	
I _{OS} §		V _{CC} = MAX See Note 2	-20		-100	mA
I _{CC} (Totall)		V _{CC} = MAX See Note 3		4	6	mA

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

[‡] All typical values are at V_{CC} = 5 V, T_A = 25 °C.

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

NOTES 2: For certain devices where state commutation can be caused by shorting an output to ground, an equivalent test may be performed with V_O = 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.

NOTES 3: With all outputs open, I_{CC} is measured with the Q and $\overline{\text{Q}}$ outputs high in turn. At the time of measurement, the clock input is grounded.

8. SWITCHING CHARACTERISTICS, V_{CC} = 5 V, T_A = 25 °C

PARAMETER	FROM(INPUT)	TO (OUTPUT)	TEST CONDITIONS	MIN	TYP	MAX	UNIT
f _{max}			C _L =15 pF,R _L =2kΩ, See Note 4	30	45		MHz
t _{PLH}	$\overline{\text{CLR}}$ or CLK	Q or $\overline{\text{Q}}$			15	20	ns
t _{PHL}					15	20	ns

NOTE 4: 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
XD74LS112	XD74LS112	DIP16	19.05 * 6.35	-0 to 70	MSL3	Tube 25	1000

10. DIMENSIONAL DRAWINGS

