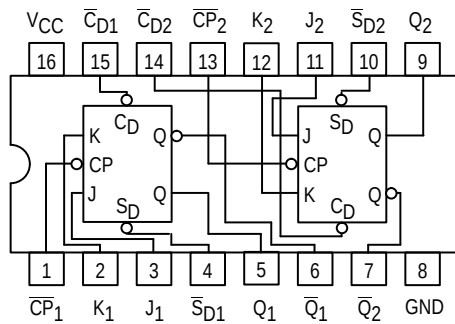




DUAL JK NEGATIVE EDGE-TRIGGERED FLIP-FLOP

The MC74F112 contains two independent, high-speed JK flip-flops with Direct Set and Clear inputs. Synchronous state changes are initiated by the falling edge of the clock. Triggering occurs at a voltage level of the clock and is not directly related to the transition time. The J and K inputs can change when the clock is in either state without affecting the flip-flop, provided that they are in the desired state during the recommended setup and hold times relative to the falling edge of the clock. A LOW signal on $\bar{S}_D$ or $\bar{C}_D$ prevents clocking and forces Q or $\bar{Q}$ HIGH, respectively. Simultaneous LOW signals on $\bar{S}_D$ and $\bar{C}_D$ force both Q and $\bar{Q}$ HIGH.

CONNECTION DIAGRAM



FUNCTION TABLE (Each Half)

Inputs		Output
@ t_n		@ $t_n + 1$
J	K	Q
L	L	Q_n
L	H	L
H	L	H
H	H	$\bar{Q}_n$

Asynchronous Inputs:

- LOW Input to $\bar{S}_D$ sets Q to HIGH level
- LOW Input to $\bar{C}_D$ sets Q to LOW level
- Clear and Set are independent of clock
- Simultaneous LOW on $\bar{C}_D$ and $\bar{S}_D$ makes both Q and $\bar{Q}$ HIGH

H = HIGH Voltage Level

L = LOW Voltage Level

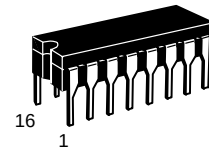
t_n = Bit time before clock pulse

$t_n + 1$ = Bit time after clock pulse

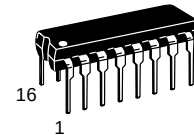
MC74F112

DUAL JK NEGATIVE EDGE-TRIGGERED FLIP-FLOP

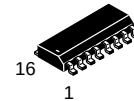
FAST™ SCHOTTKY TTL



J SUFFIX
CERAMIC
CASE 620-09



N SUFFIX
PLASTIC
CASE 648-08

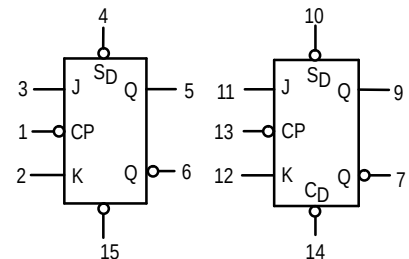


D SUFFIX
SOIC
CASE 751B-03

ORDERING INFORMATION

MC74FXXXJ Ceramic
MC74FXXXN Plastic
MC74FXXXD SOIC

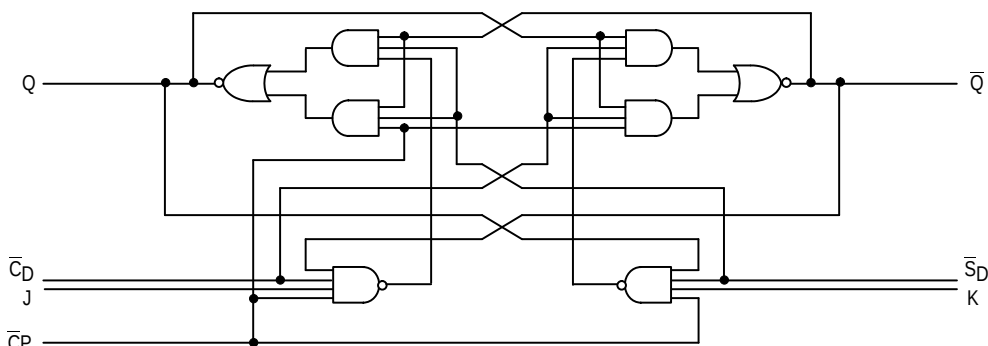
LOGIC SYMBOL



VCC = PIN 16
GND = PIN 8

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LOGIC DIAGRAM (one half shown)



GUARANTEED OPERATING RANGES

Symbol	Parameter		Min	Typ	Max	Unit
V _{CC}	Supply Voltage	74	4.5	5.0	5.5	V
T _A	Operating Ambient Temperature Range	74	0	25	70	°C
I _{OH}	Output Current — High	74			–1.0	mA
I _{OL}	Output Current — Low	74			20	mA

DC CHARACTERISTICS OVER OPERATING TEMPERATURE RANGE (unless otherwise specified)

Symbol	Parameter		Limits			Unit	Test Conditions	
			Min	Typ	Max			
V _{IH}	Input HIGH Voltage		2.0			V	Guaranteed Input HIGH Voltage	
V _{IL}	Input LOW Voltage				0.8	V	Guaranteed Input LOW Voltage	
V _{IK}	Input Clamp Diode Voltage				–1.2	V	I _{IN} = –18 mA	V _{CC} = MIN
V _{OH}	Output HIGH Voltage	74	2.5	3.4		V	I _{OH} = –1.0 mA	V _{CC} = 4.50 V
		74	2.7	3.4		V	I _{OH} = –1.0 mA	V _{CC} = 4.75 V
V _{OL}	Output LOW Voltage			0.35	0.5	V	I _{OL} = 20 mA	V _{CC} = MIN
I _{IH}	Input HIGH Current				20	μA	V _{CC} = MAX, V _{IN} = 2.7 V	
					100	μA	V _{CC} = MAX, V _{IN} = 7.0 V	
I _{IL}	Input LOW Current (J and K Inputs)				–0.6	mA	V _{CC} = MAX, V _{IN} = 0.5 V	
	(C _P Inputs)				–2.4	mA		
	(C _D and S _D Inputs)				–3.0	mA		
I _{OS}	Output Short Circuit Current (Note 2)		–60		–150	mA	V _{CC} = MAX, V _{OUT} = 0 V	
I _{CC}	Power Supply Current			12	19	mA	V _{CC} = MAX, V _{CP} = 0 V	

NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under guaranteed operating ranges.
- Not more than one output should be shorted at a time, nor for more than 1 second.

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AC CHARACTERISTICS

Symbol	Parameter	74F		74F		Unit
		$T_A = +25^{\circ}\text{C}$ $V_{CC} = +5.0\text{ V}$ $C_L = 50\text{ pF}$		$T_A = 0^{\circ}\text{C to } +70^{\circ}\text{C}$ $V_{CC} = 5.0\text{ V} \pm 10\%$ $C_L = 50\text{ pF}$		
		Min	Max	Min	Max	
f _{max}	Maximum Clock Frequency	110				MHz
t _{PLH}	Propagation Delay	2.0	6.5	2.0	7.5	ns
t _{PHL}	$\overline{\text{CP}}_n$ to Q_n or $\overline{Q}_n$	2.0	6.5	2.0	7.5	
t _{PLH}	Propagation Delay	2.0	6.5	2.0	7.5	ns
t _{PHL}	$\overline{\text{CD}}_n$ or $\overline{\text{SD}}_n$ to Q_n or $\overline{Q}_n$	2.0	6.5	2.0	7.5	

AC OPERATING REQUIREMENTS

Symbol	Parameter	74F			74F		Unit
		$T_A = +25^{\circ}\text{C}$ $V_{CC} = +5.0\text{ V}$			$T_A = 0^{\circ}\text{C to } +70^{\circ}\text{C}$ $V_{CC} = 5.0\text{ V} \pm 10\%$		
		Min	Typ	Max	Min	Max	
t_S (H)	Setup Time, HIGH or LOW	4.0			4.0		ns
t_S (L)	J_N or K_N to $\overline{CP}_N$	3.0			3.0		
t_H (H)	Hold Time, HIGH or LOW	0			0		
t_H (L)	J_N or K_N to $\overline{CP}_N$	0			0		
t_W (H)	$\overline{CP}_N$ Pulse Width, HIGH	4.5			4.5		ns
t_W (L)	or LOW	4.5			4.5		
t_W (L)	$\overline{CD}_N$ or $\overline{SD}_N$ Pulse Width, LOW	4.5			4.5		ns
t_{rec}	Recovery Time $\overline{CD}_N$ or $\overline{SD}_N$ to CP	4.0			5.0		ns