

CMOS BASED D FLIP FLOP

DHARSHNAA K, BANNARI AMMAN INSTITUTE OF TECHNOLOGY

ABSTRACT:

A flip flop is an electronic circuit with two stable states that can be used to store binary data. The stored data can be changed by applying varying inputs. Flip-flops and latches are fundamental building blocks of digital electronics systems used in computers, communications, and many other types of systems. Both are used as data storage elements. It is the basic storage element in sequential logic. But first, let's clarify the difference between a latch and a flip-flop. Flip flops can be used extensively to transfer the data. For this purpose, shift register is used. A shift register is a register which is able to shift or transfer its content within itself without changing the order of the bits. It may be designed to shift or transfer data either left or right. The data is shifted or transferred one bit at a time, when a clock pulse is applied. The shift register can be used for temporary storage of data. The shift register is used for multiplication and division where bit shifting is required. The shift register can be built using RS, JK or D flip flops.

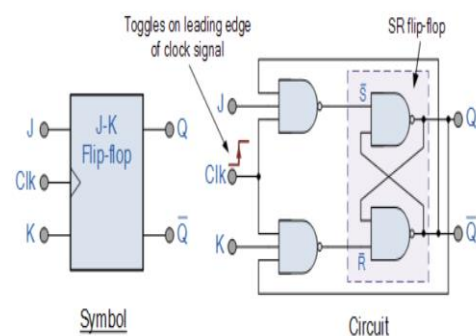
REFERENCE CIRCUIT DETAILS:

In simple words, If J and K data input are different (i.e., high and low) then the output Q takes the value of J at the next clock edge. If J and K are both low then no change occurs. If J and K are both high at the clock edge then the output will toggle from one state to the other.

JK Flip-Flops can function as Set or Reset Flip-flops

DIAGRAM:

The Basic JK Flip-flop



REFERENCE TRUTH TABLE:

Trigger	Inputs		Output				Inference
			Present State		Next State		
CLK	J	K	Q	Q'	Q	Q'	
	x	x	-		-		Latched
	0	0	0	1	0	1	No Change
			1	0	1	0	
	0	1	0	1	0	1	Reset
			1	0	0	1	
	1	0	0	1	1	0	Set
			1	0	1	0	
	1	1	0	1	1	0	Toggles
			1	0	0	1	

REFERENCE:

https://www.electronics-tutorials.ws/sequential/seq_2.html