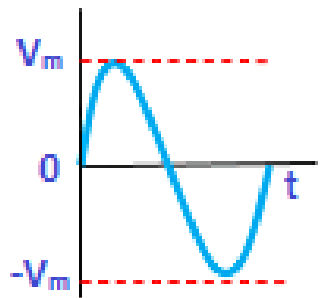


Positive Clamper

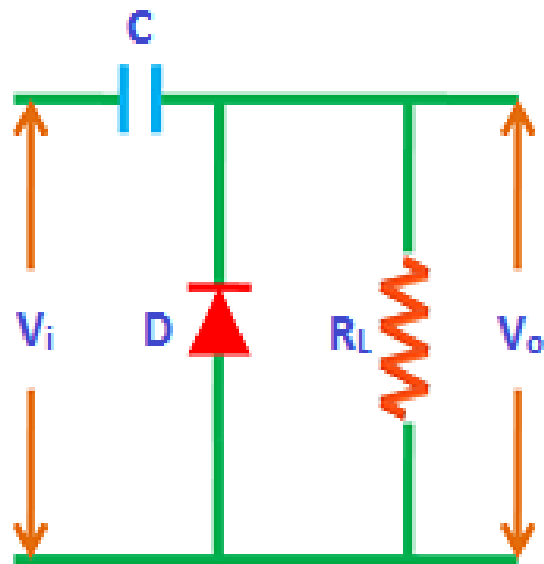
Elementrix Classes

Positive Clamper

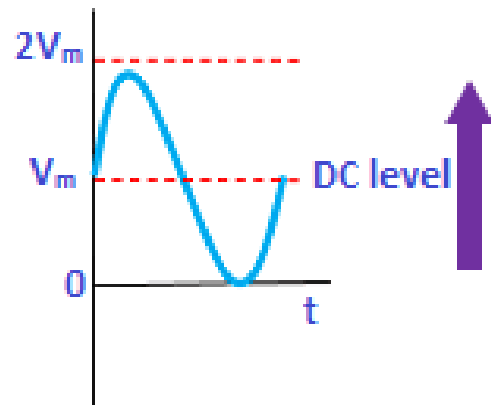
- ❑ A positive clamper is an electronic circuit that shifts the entire AC waveform of an input signal in the positive direction by adding a fixed positive DC level. The purpose of a positive clamper is to raise the baseline of the signal, ensuring that it oscillates around the newly established positive DC level.
- ❑ The positive clamper is made up of a voltage source V_i , capacitor C , diode D , and load resistor R_L . In the below circuit diagram, the diode is connected in parallel with the output load. So the positive clamper passes the input signal to the output load when the diode is reverse biased and blocks the input signal when the diode is forward biased.



Input waveform



Positive clamper



Output waveform

❖ **During negative half cycle:**

During the negative half cycle of the input AC signal, the diode is forward biased and hence no signal appears at the output. In forward biased condition, the diode allows electric current through it. This current will flow to the capacitor and charges it to the peak value of input voltage V_m . The capacitor is charged in inverse polarity (positive) with the input voltage. As input current or voltage decreases after attaining its maximum value $-V_m$, the capacitor holds the charge until the diode remains forward biased.

❖ During positive half cycle:

- During the positive half cycle of the input AC signal, the diode is reverse biased and hence the signal appears at the output. In reverse biased condition, the diode does not allow electric current through it. So the input current directly flows towards the output.
- When the positive half cycle begins, the diode is in the non-conducting state and the charge stored in the capacitor is discharged (released). Therefore, the voltage appeared at the output is equal to the sum of the voltage stored in the capacitor (V_m) and the input voltage (V_m) { I.e. $V_o = V_m + V_m = 2V_m$ } which have the same polarity with each other. As a result, the signal shifted upwards.

- The peak to peak amplitude of the input signal is $2V_m$, similarly the peak to peak amplitude of the output signal is also $2V_m$. Therefore, the total swing of the output is same as the total swing of the input.
- The basic difference between the clipper and clamper is that the clipper removes the unwanted portion of the input signal whereas the clamper moves the input signal upwards or downwards.

पढ़िए और पढ़ाइये

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