

Full Wave Rectifier

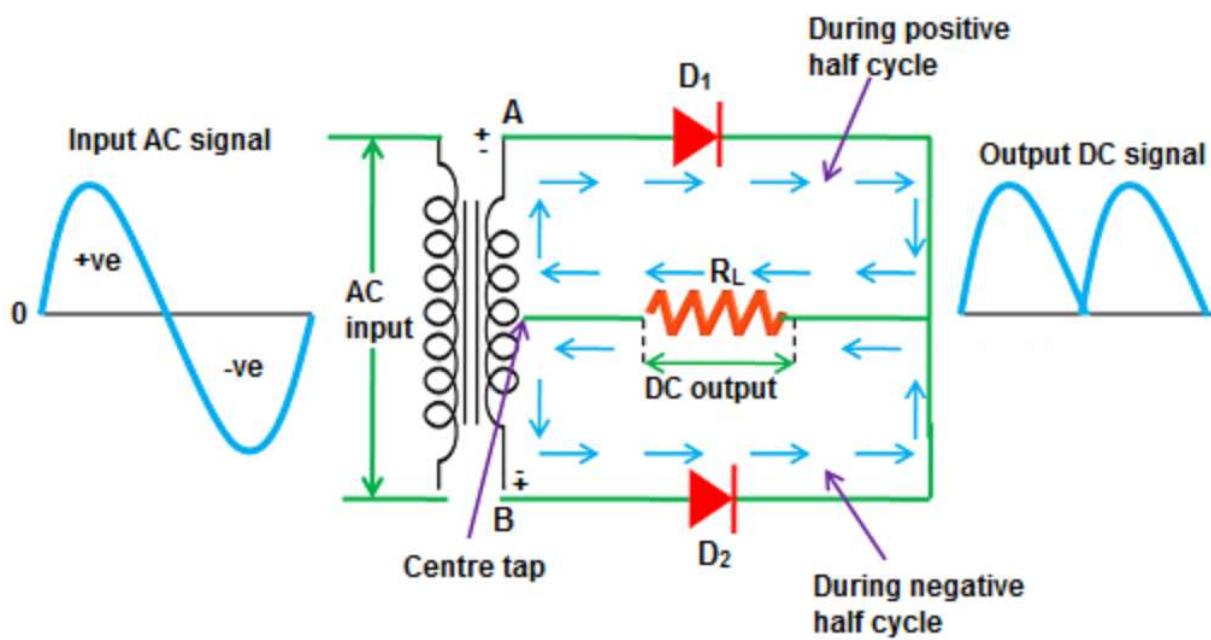
LECTURE 4

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Full Wave Rectifier

- ❑ A full wave rectifier is a type of rectifier which converts both half cycles of the AC signal into pulsating DC signal.
- ❑ The full wave rectifier is further classified into two types: center tapped full wave rectifier and full wave bridge rectifier

Center Tapped Full Wave Rectifier



Average Value - Full Wave Rectifier

Peak inverse voltage (PIV)

Peak inverse voltage or peak reverse voltage is the maximum voltage a diode can withstand in the reverse bias condition.

If the applied voltage is greater than the peak inverse voltage, the diode will be permanently destroyed.

The peak inverse voltage (PIV) = $2V_{smax}$

Ripple Factor of Full Wave Rectifier

The ripple factor is used to measure the amount of ripples present in the output DC signal.

A high ripple factor indicates a high pulsating DC signal while a low ripple factor indicates a low pulsating DC signal.

Ripple factor is defined as the ratio of ripple voltage to the pure DC voltage.

The formula for ripple factor is

$$\gamma = \sqrt{\left(\frac{V_{rms}}{V_{DC}} \right)^2 - 1}$$

$$\gamma = 0.48$$

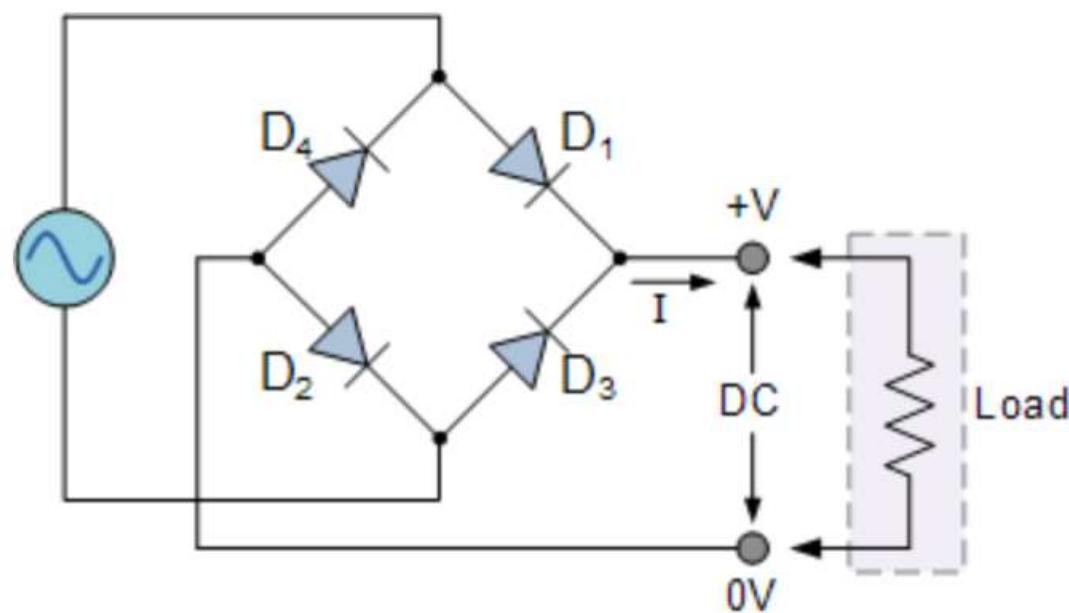
Efficiency of Full Wave Rectifier

Rectifier efficiency (η) is the ratio between the output DC power and the input AC power. The formula for the efficiency is equal to:

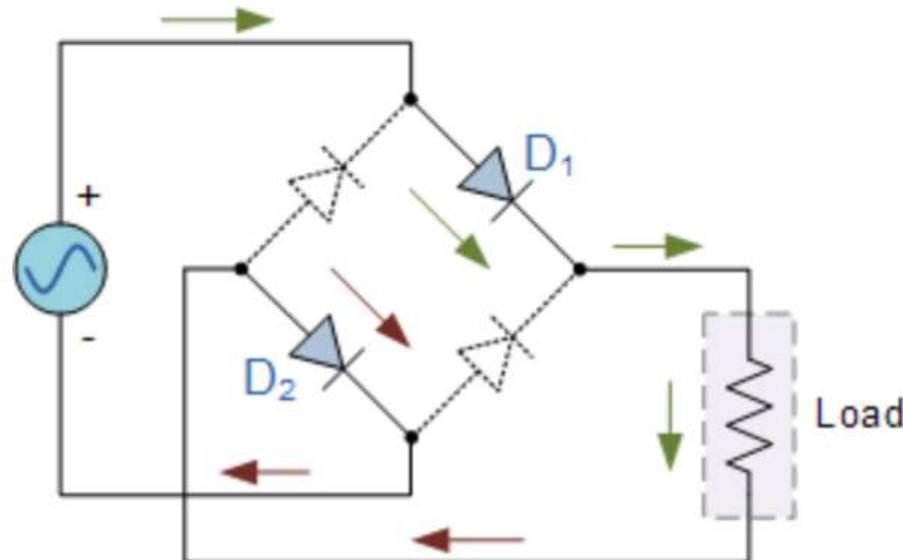
$$\eta = \frac{P_{dc}}{P_{ac}}$$

The rectifier efficiency of a full wave rectifier is 81.2%.

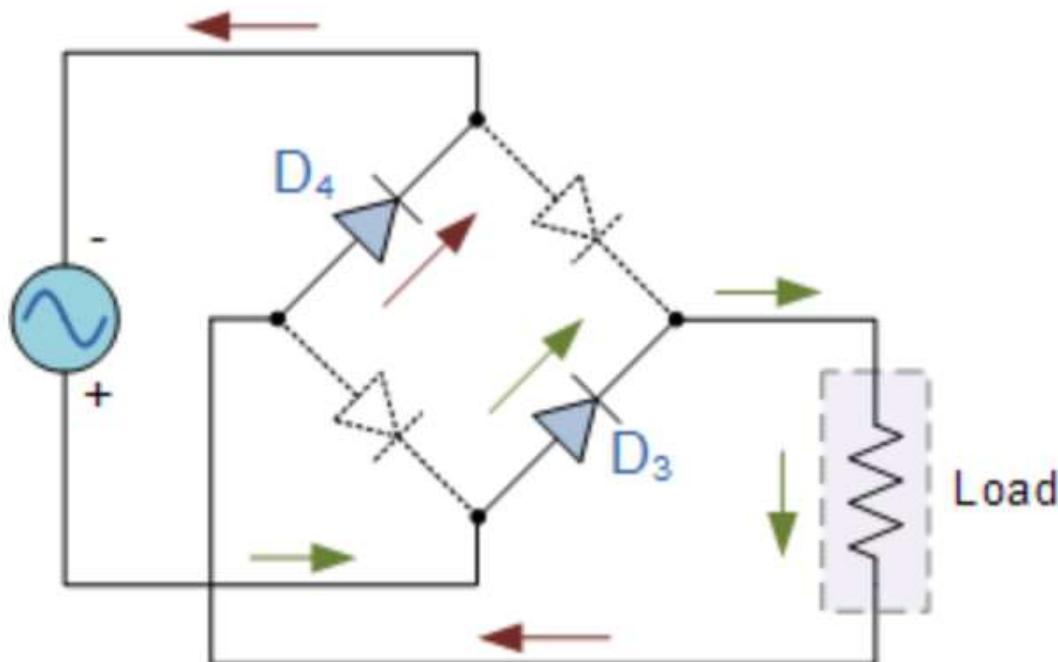
The Diode Bridge Rectifier



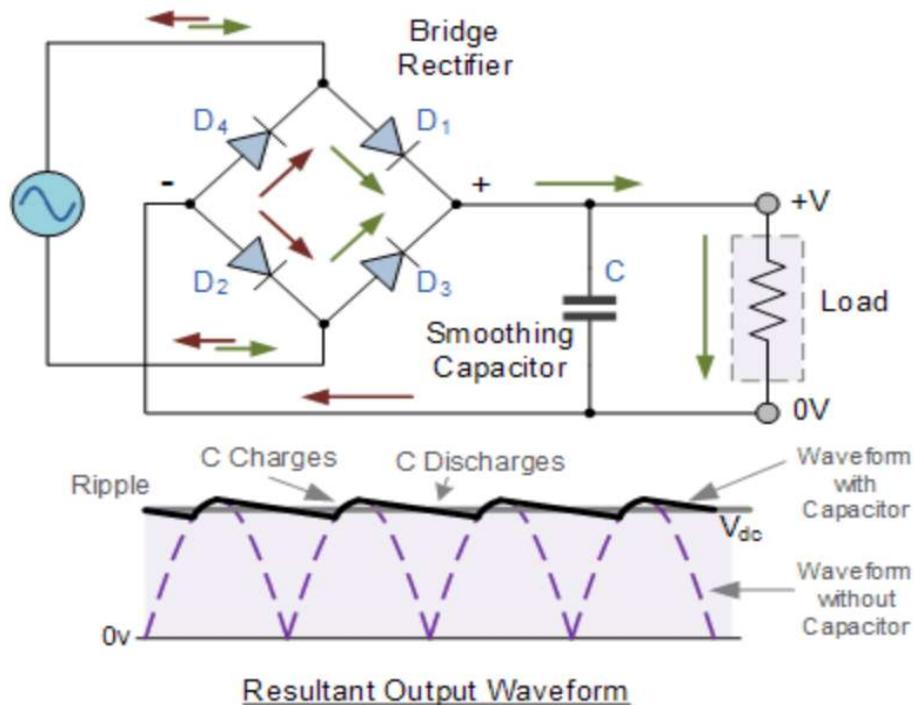
The Positive Half-cycle



The Negative Half-cycle



Full-wave Rectifier with Smoothing Capacitor



Thank You

