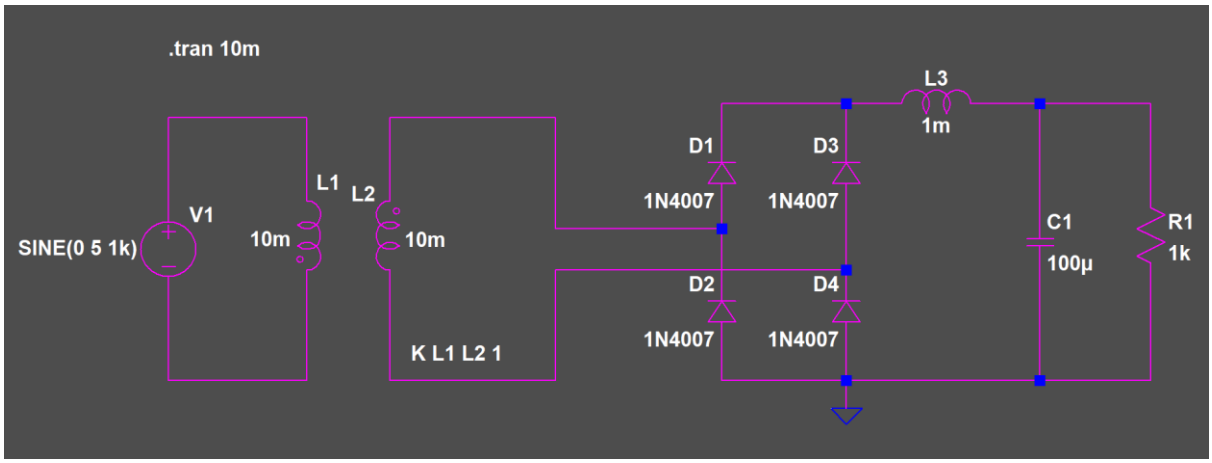
FULLWAVE RECTIFIER



Circuit Components :

AC voltage source, transformer unit, 1N4007 diode x 4, resistor 1k ohm, capacitor 100u Farad, inductor 1m Henry.

Definition :

A full wave rectifier converts the entire alternating current (AC) waveform into direct current (DC), unlike a half wave rectifier that only rectifies one half of the AC cycle.

It utilizes both the positive and negative halves of the input AC signal.

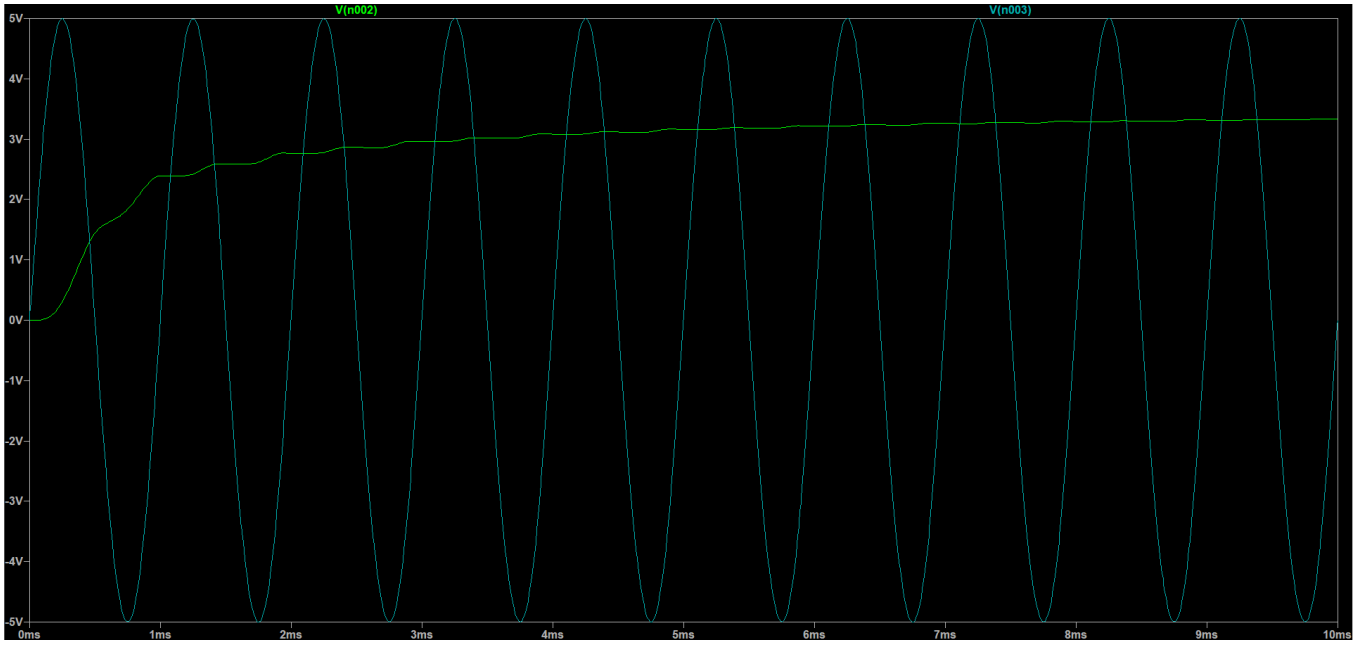
Bridge Full Wave Rectifier: Uses four diodes arranged in a bridge configuration. Each pair of diodes conducts during alternating halves of the AC cycle, making it more efficient as it doesn't require a centre-tapped transformer.

Operation:

In both types, the diodes allow current to pass only during their forward-bias state, blocking reverse current. This results in a unidirectional current output that follows the shape of the AC waveform.

The output voltage is pulsating DC, requiring filtering (often with a capacitor) to smooth it into a more constant DC voltage.

Waveforms: (simulated to 10ms)



Input waveform: Pure AC signal

Output waveform: Pulsating DC

Efficiency and Ripple Factor:

Full wave rectifiers are more efficient than half wave rectifiers (about 81% vs. 40.6% for half wave).The ripple factor, which represents the smoothness of the DC output, is lower for full wave rectifiers, making them preferable in applications requiring more stable DC output.

Applications:

Used in power supplies to convert AC to DC in various electronic devices.

Common in battery chargers, radio signals, and power distribution systems.