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EXP.NO: 3

Name of experiment: Full-Wave Rectifier (FWR)

Purpose of experiment:

A full wave rectifier is defined as a rectifier that converts the complete cycle of alternating current into pulsating DC.

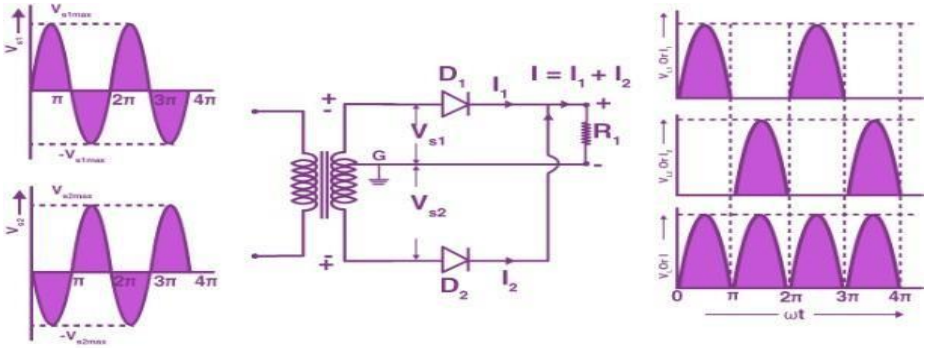
Apparatus:

AC power supply or standard transformer. Breadboard, 2 Semiconductor Diode, and 1KΩ Resistor, Connecting Wires.

Theory:

Unlike half wave rectifiers that utilize only the half wave of the input AC cycle, full wave rectifiers utilize the full cycle. The lower efficiency of the half wave rectifier can be overcome by the full wave rectifier.

The circuit of the full wave rectifier can be constructed in two ways. The first method uses a center tapped transformer and two diodes. This arrangement is known as a center tapped full wave rectifier. The second method uses a standard transformer with four diodes arranged as a bridge. This is known as a bridge rectifier. In the next section, we will restrict the discussion to the centre tapped full wave rectifier only.



Input voltage waveform — Output voltage waveform

The circuit of the full wave rectifier consists of a step-down transformer and two diodes that are connected and center tapped. The output voltage is obtained across the connected load resistor.

Advantages of Full Wave Rectifier

- The rectification efficiency of full wave rectifiers is double that of half wave rectifiers. The efficiency of half wave rectifiers is 40.6% while the rectification efficiency of full wave rectifiers is 81.2%.
- The ripple factor in full wave rectifiers is low hence a simple filter is required. The value of ripple factor in full wave rectifier is 0.482 while in half wave rectifier it is about 1.21.
- The output voltage and the output power obtained in full wave rectifiers are higher than that obtained using half wave rectifiers.

The only disadvantage of the full wave rectifier is that they need more circuit elements than the half wave rectifier which makes, making it costlier.

Procedure

1. Connect the circuit as shown in Fig.2.1 using an AC power supply (Function generator) or standard transformer, a diode, a 1kΩ resistor (RL)
2. Display the input and output signal on the oscilloscope.
3. Tabulate your measurement result in a table as shown.

Load	V(v)	I(mA)
50 ohm		
75 ohm		
100 ohm		
150 ohm		
200 ohm		
500 ohm		