

Electronics with the Modular System

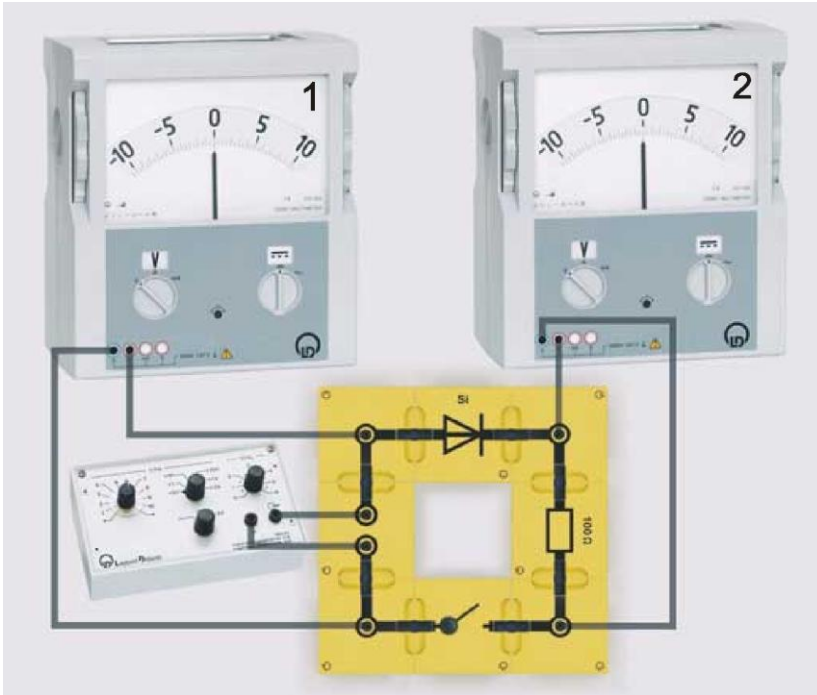
Basic Electronic Circuits
Semiconductor diodes

Diode as a rectifier

Objective of the experiment

To demonstrate the working principle of a diode as rectifier in an AC circuit.

Setup



Apparatus

1	539 035	Diode Si, BST
1	539 009	Resistor 100 Ω, BST
1	539 025	Toggle switch, BST
1	539 003	Connector block BST, straight, 2 sockets
4	539 005	Connector blocks BST, 90° angle with socket
8	539 000	Bridging plug, BST
2	531 906	Demo multimeter, passive
1	522 621	Function generator S 12
6	500 644	Safety connection lead, 100 cm
1	301 300	Demonstration experiment frame
1	301 301	Adhesive magnetic board
Recommended		
	575 211	Oscilloscope
	575 24	Screened cable BNC/4mm

Carrying out the experiment

- Set up the circuit. In addition, adjust the function generator to a frequency of approx. 0.3 Hz (sine wave) and to maximum amplitude.
- Close the toggle switch and observe the pointer deflections on demo multimeters 1 and 2.
- Open the toggle switch again.
- Turn the diode 180° and repeat the experiment.

Observation

On demo multimeter 1, the pointer deflects alternately in a positive and negative direction.

On demo multimeter 2, the pointer only deflects in a positive direction.

After turning the diode 180°, the pointer deflects in a negative direction on demo multimeter 2.

Evaluation

An AC voltage can be rectified with a diode.

In an alternating voltage, the polarity of the voltage changes at intervals of $\frac{T}{2}$ ($T = \frac{1}{f}$).

The diode alternates at the same frequency in the forward and reverse direction.

Depending on the direction of the diode in the circuit, either the positive or negative half cycle of the AC voltage is cut off in the reverse direction.

The resulting voltage is called a pulsating DC voltage.

Note

Pulsating DC voltage can also be displayed with an oscilloscope.