Lab 6: Diodes

Ideal Diode

Anode   Cathode

Ideal Diode

$$V_{Anode} > V_{Cathode}$$
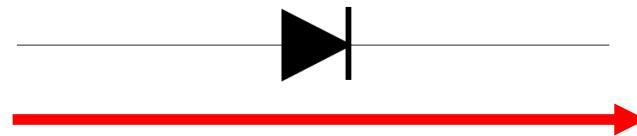
Current flows without resistance

Ideal Diode

$$V_{Anode} < V_{Cathode}$$
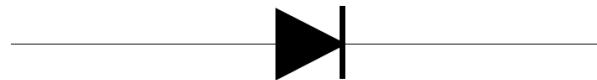
No current flow

Current only flows in one direction

# Vacuum tube diode

Anode

Cathode
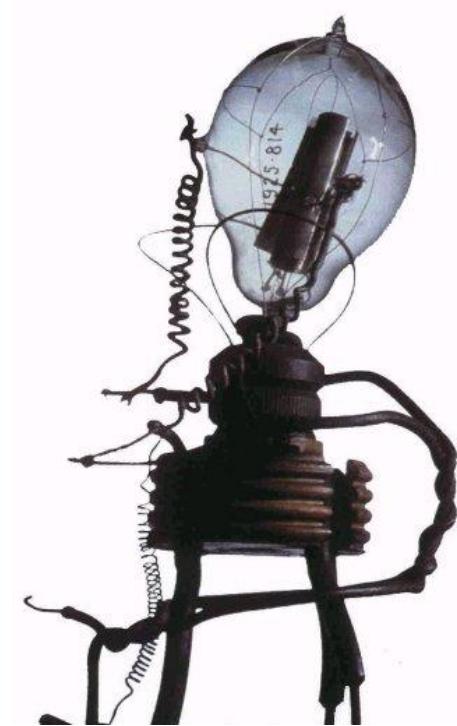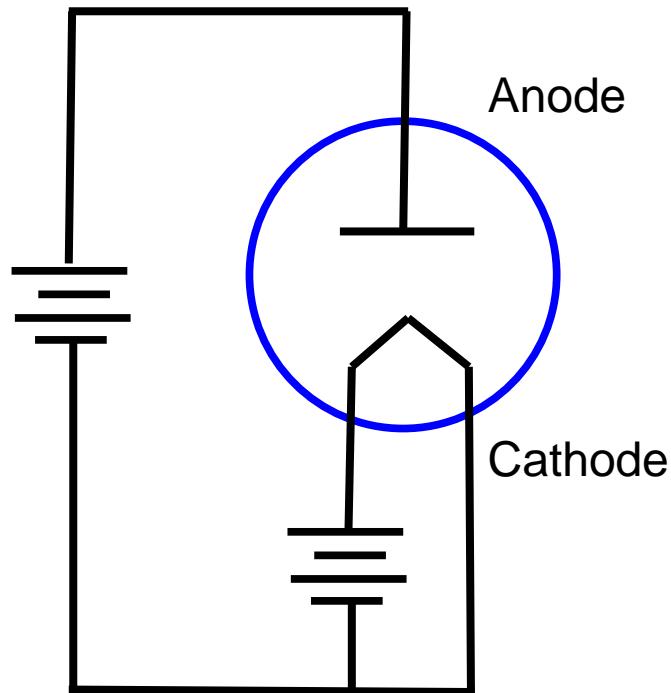

Fleming valve (1904)

J.A. Fleming

Vacuum tube diode

Thermionic emission of electrons

Vacuum tube diode

Current flow

Vacuum tube diode

**Current blocked**

Semiconductor p-n junction

p-doped   **n-doped**
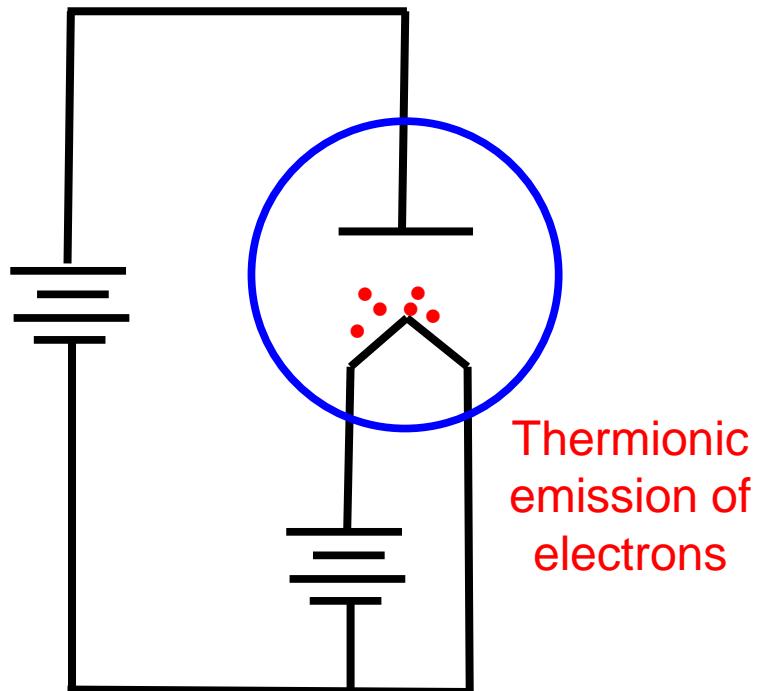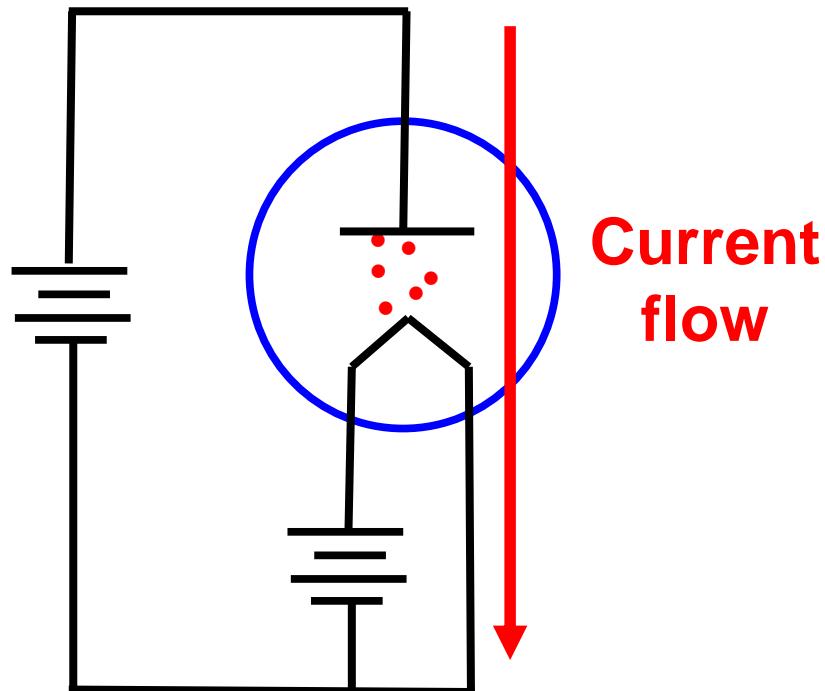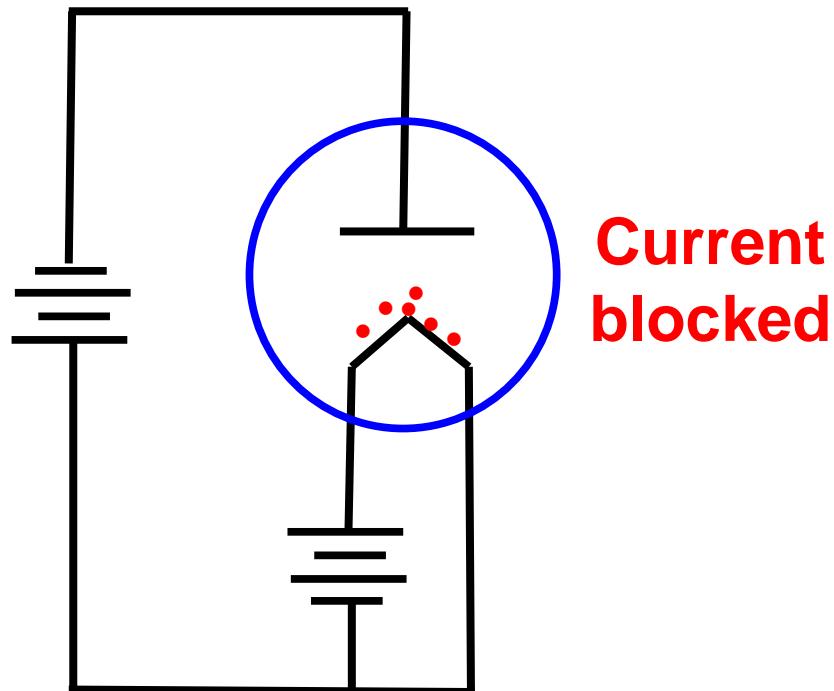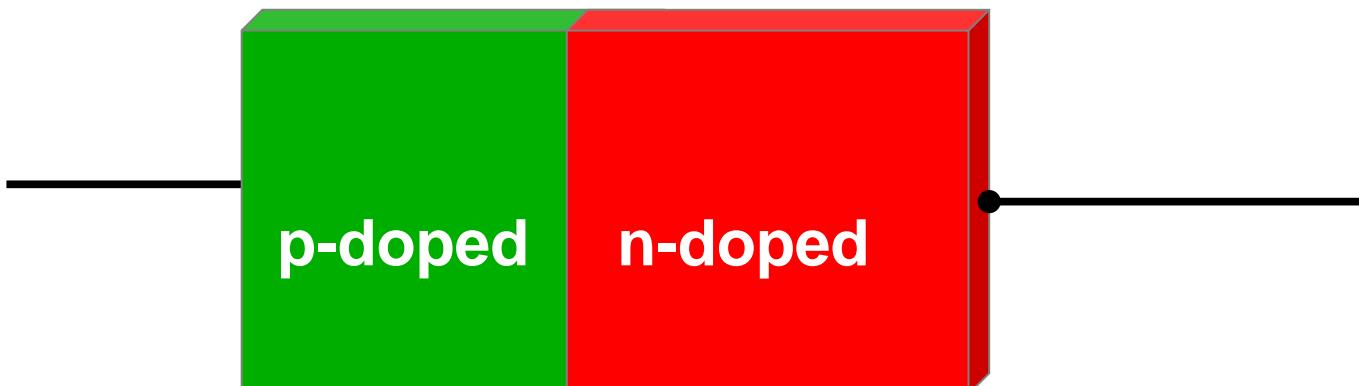
Voltage controlled alignment
of quantum mechanical energy levels

Russel Ohl (1939)

Current

Voltage

Reverse bias (V < 0)   Forward bias (V > 0)
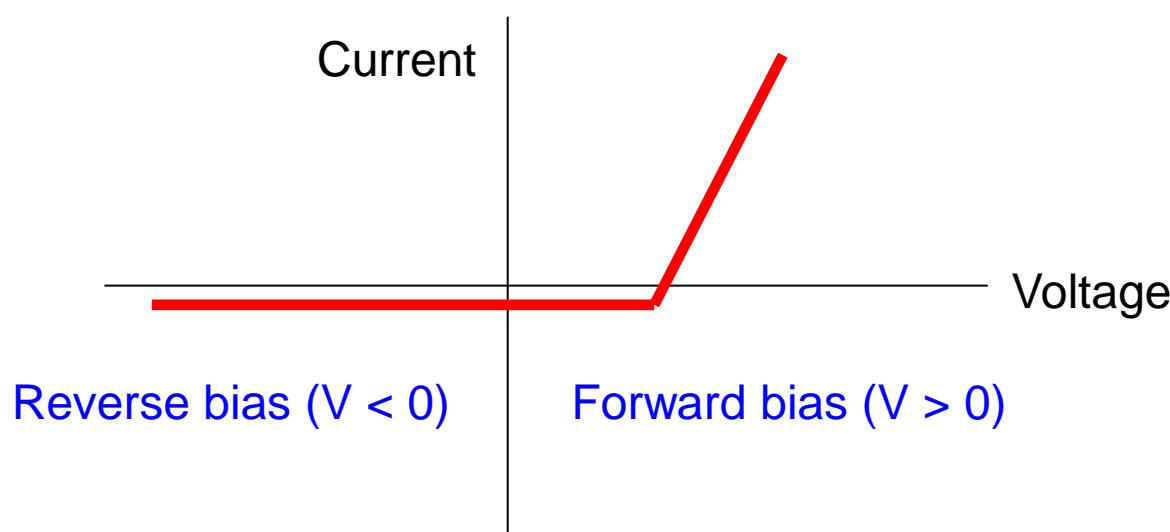
Semiconductor p-n junction
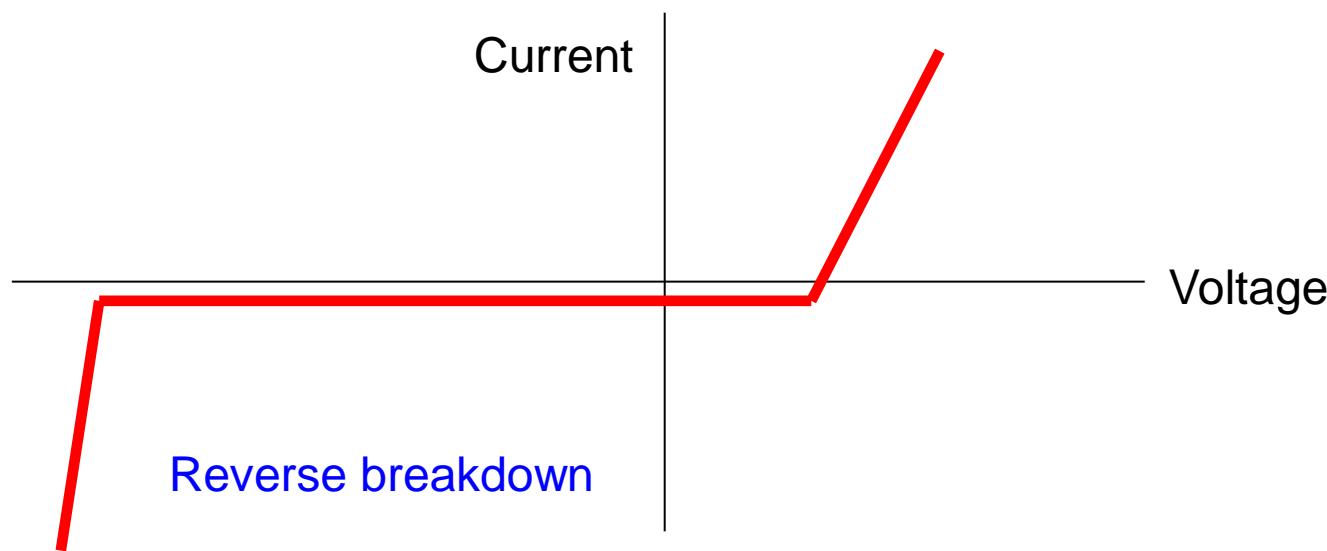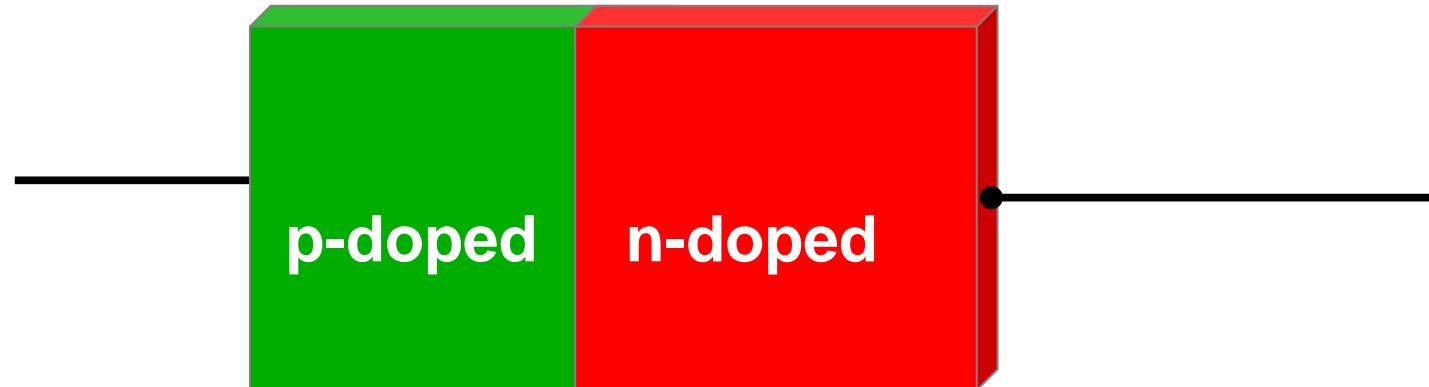
RECTIFICATION: Half-wave rectifier
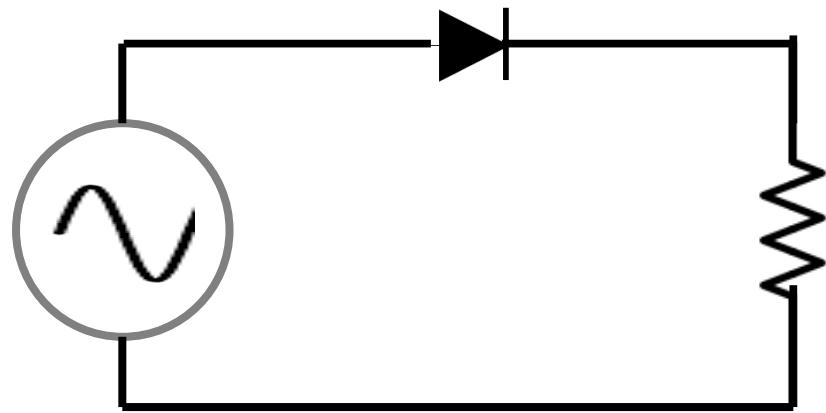
# RECTIFICATION: Half-wave rectifier
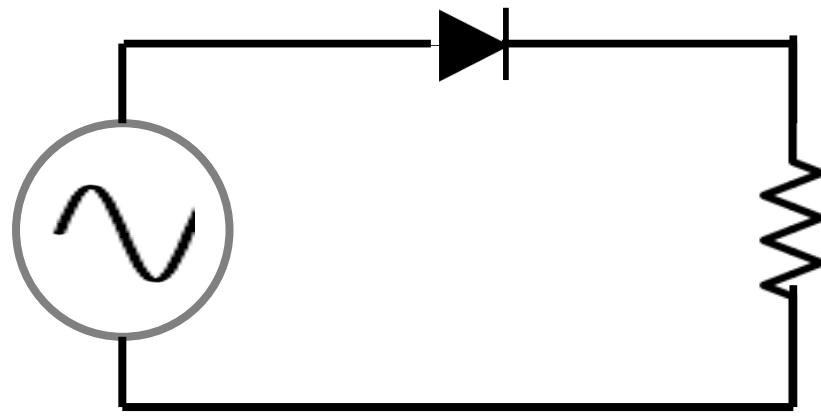
Input current
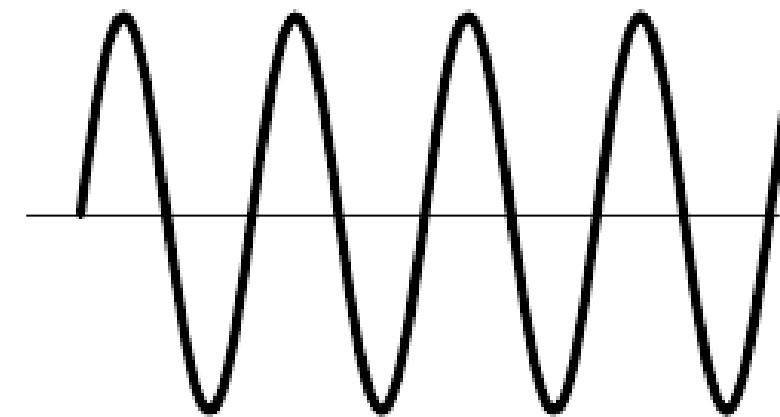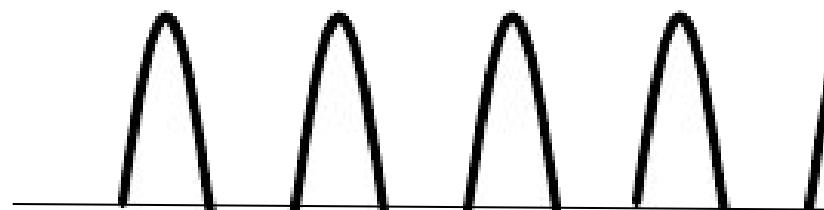
Resistor (output) current

RECTIFICATION: Bridge rectifier
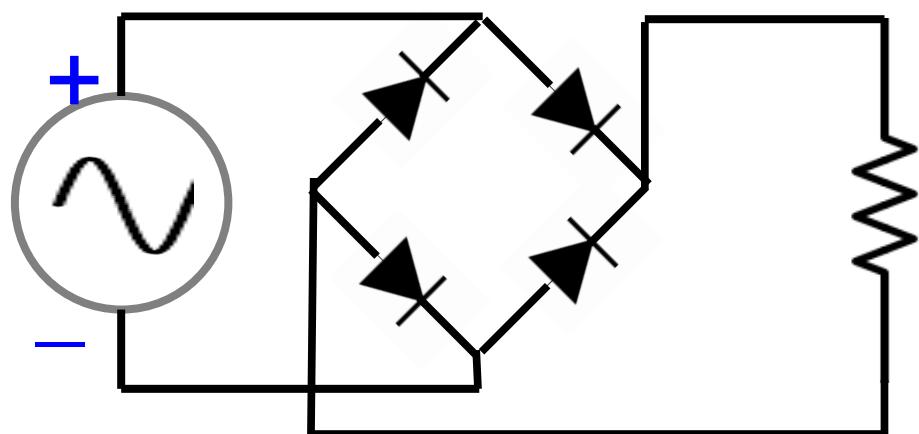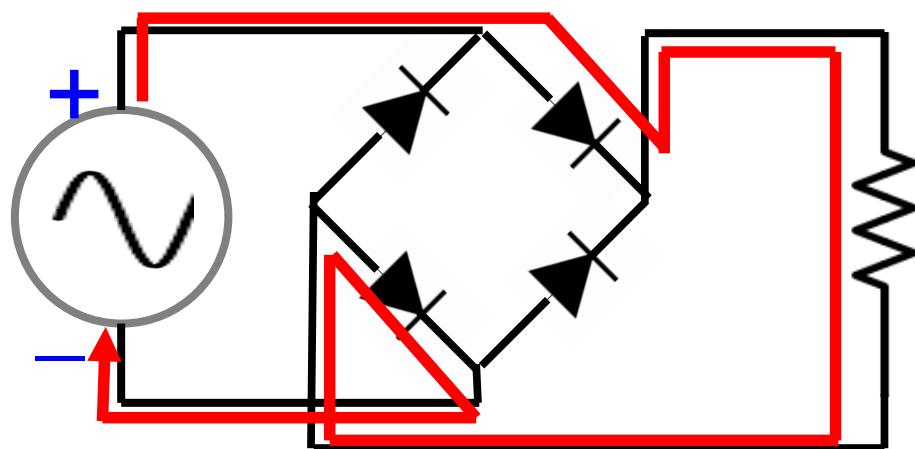
RECTIFICATION: Bridge rectifier

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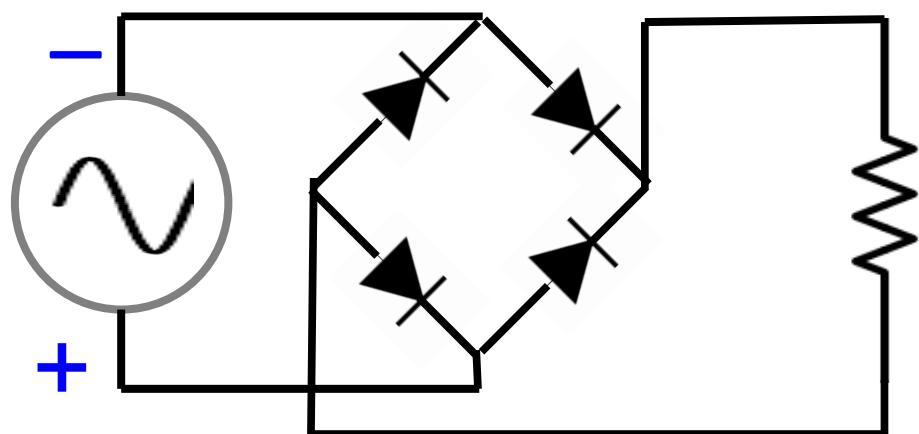
RECTIFICATION: Bridge rectifier
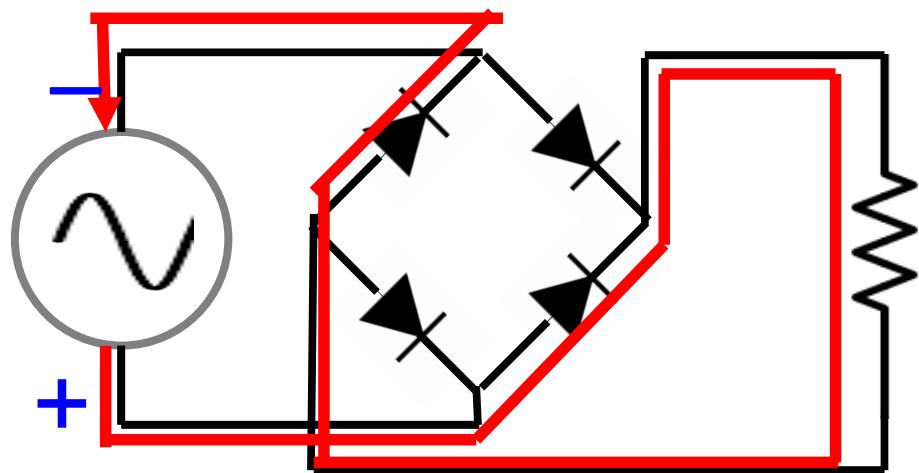
# RECTIFICATION: Bridge rectifier
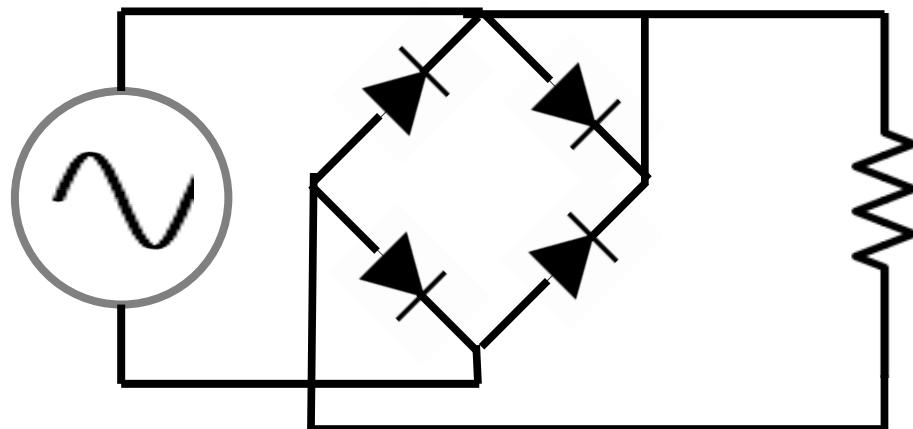
Input current
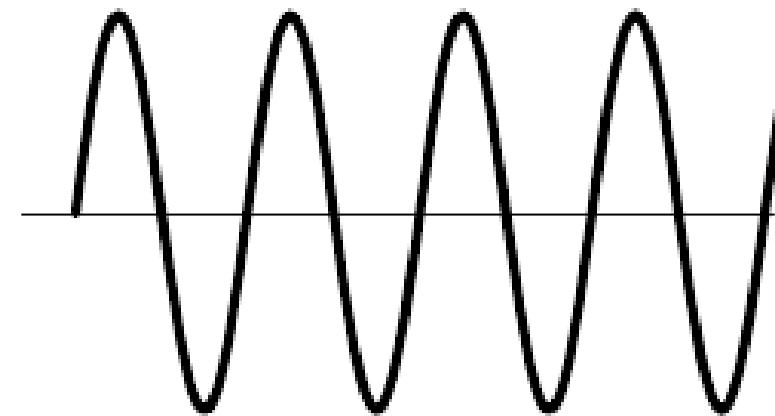
Resistor (output) current

FILTERED RECTIFICATION
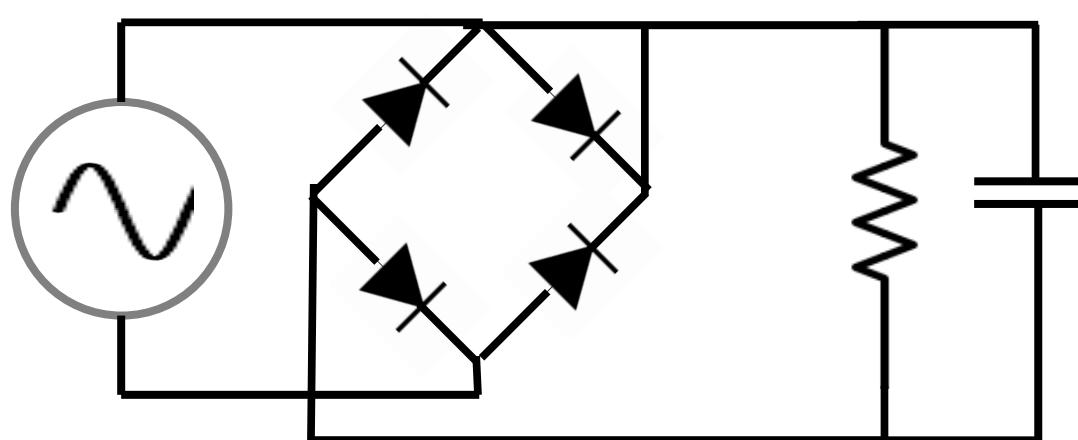
Input current
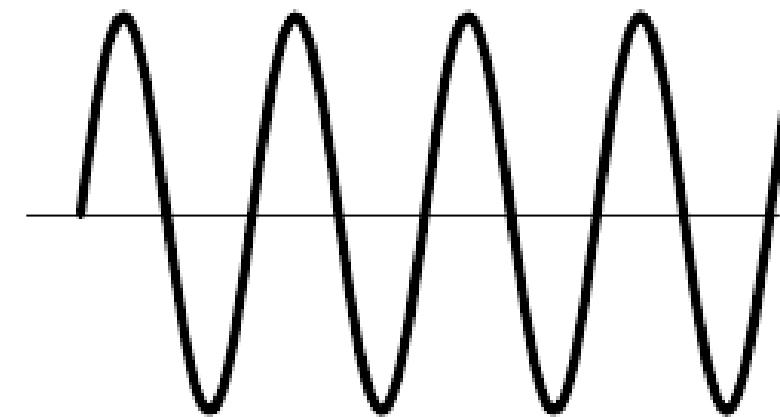
Resistor (output) current

VOLTAGE RIPPLE