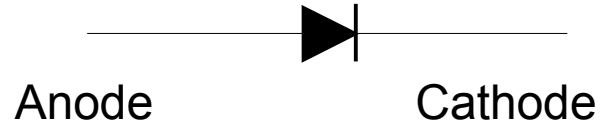
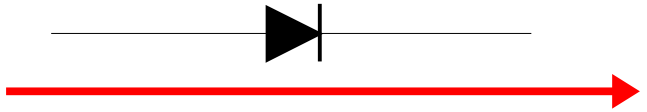
Lab 6: Diodes

Ideal Diode



Ideal Diode

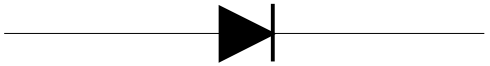
$V_{Anode} > V_{Cathode}$



Current flows without resistance

Ideal Diode

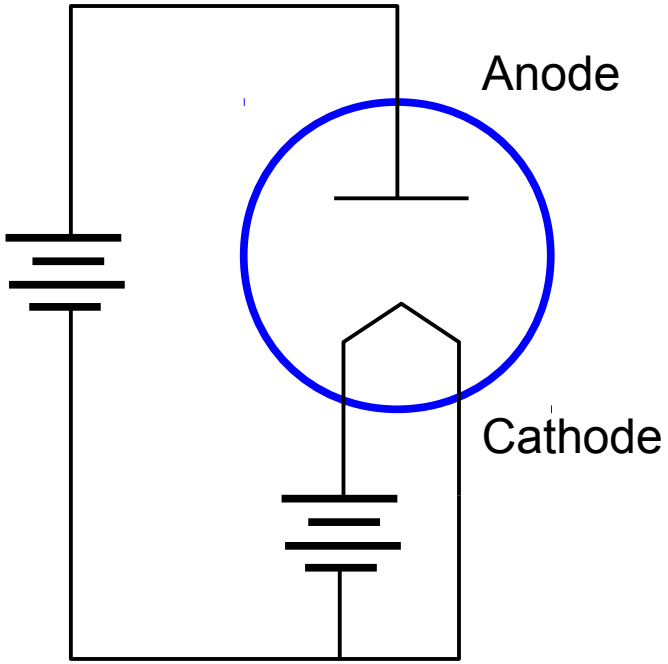
$V_{anode} < V_{Cathode}$



No current flow

Current only flows in one direction

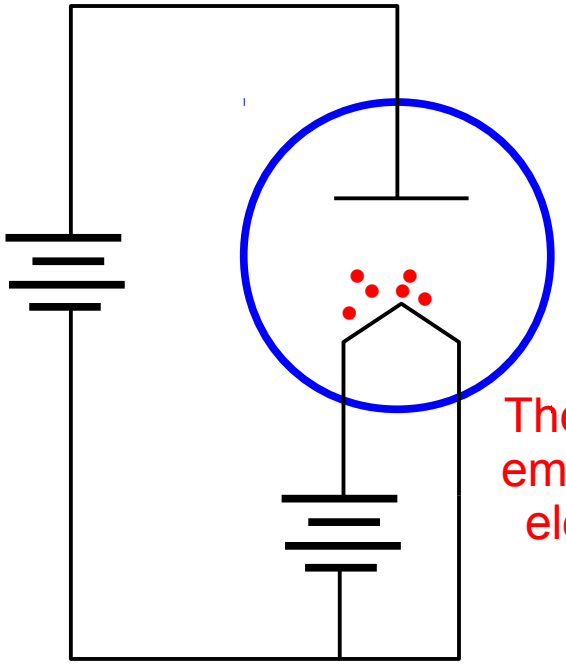
Vacuum tube diode



Fleming valve (1904)

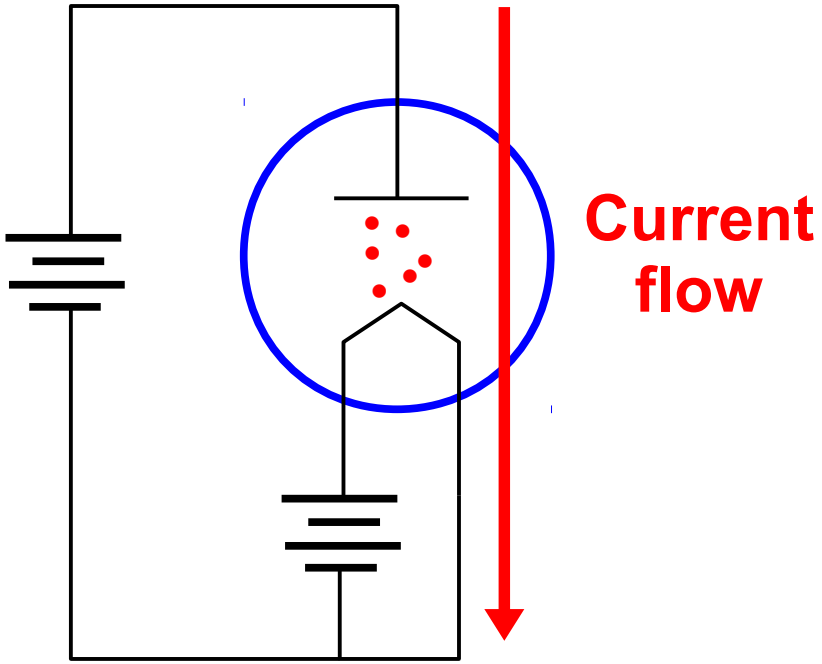
J.A. Fleming

Vacuum tube diode

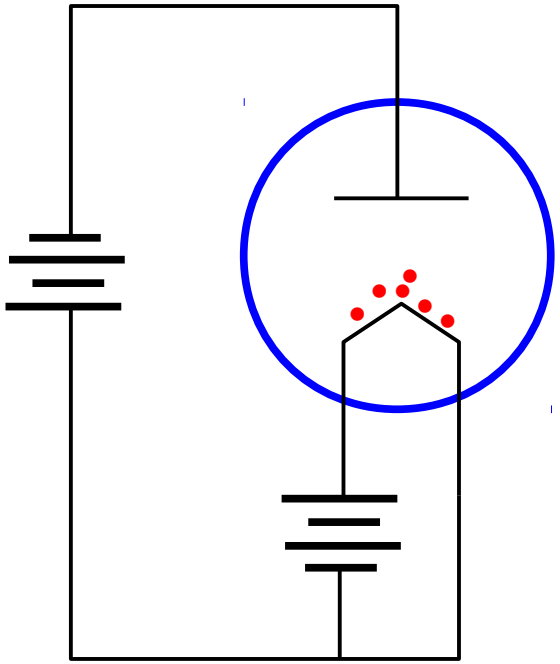


Thermionic emission of electrons

Vacuum tube diode

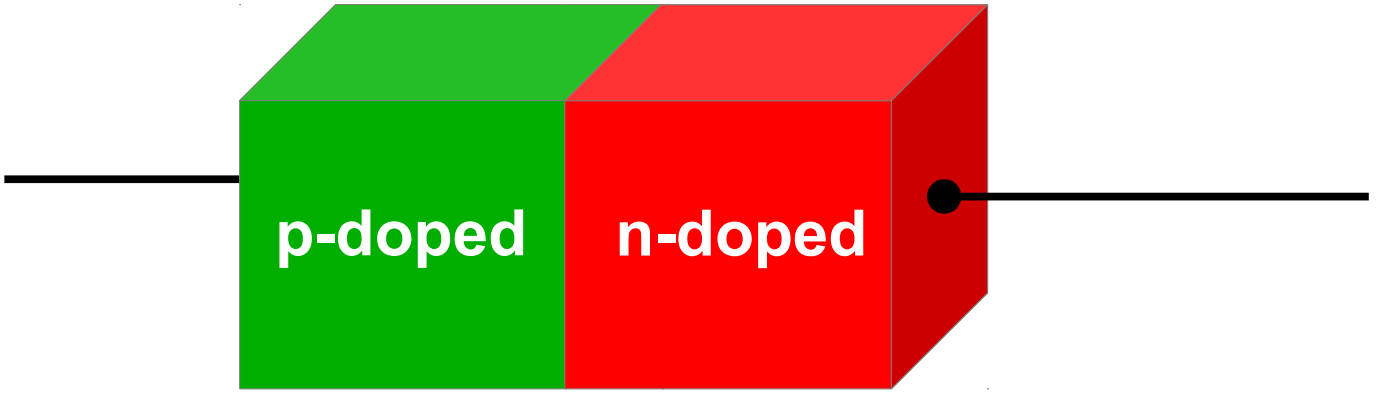


Vacuum tube diode



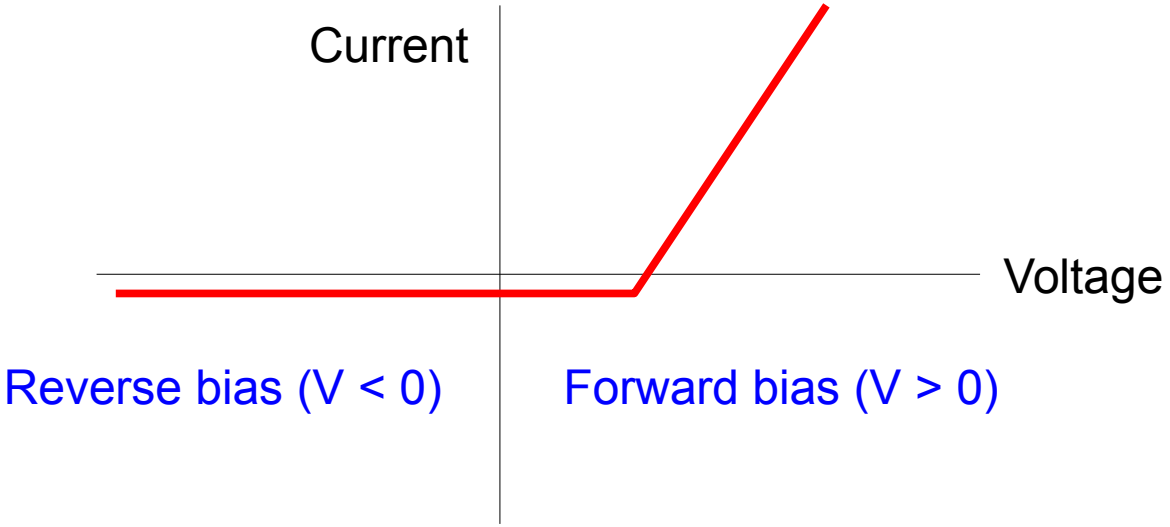
Current blocked

Semiconductor p-n junction

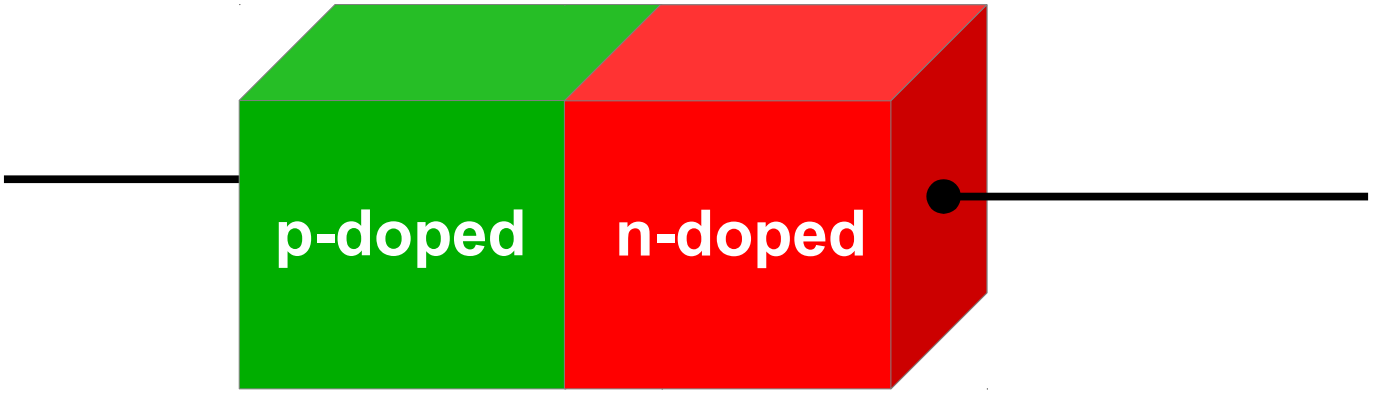


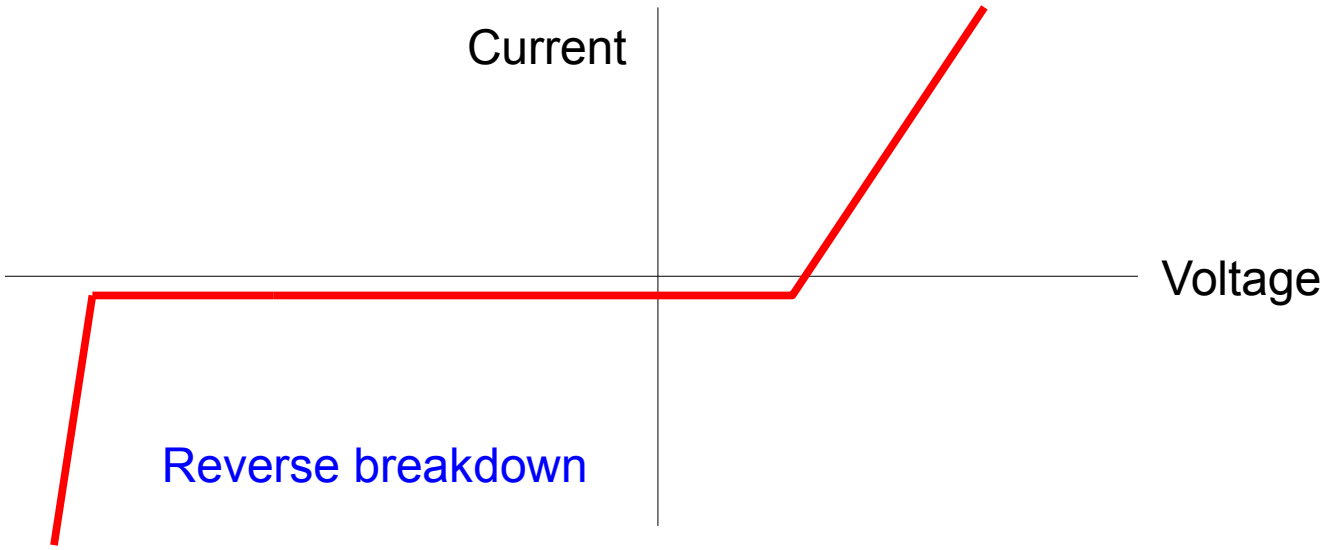
Russel Ohl (1939)

Voltage controlled alignment
of quantum mechanical energy levels

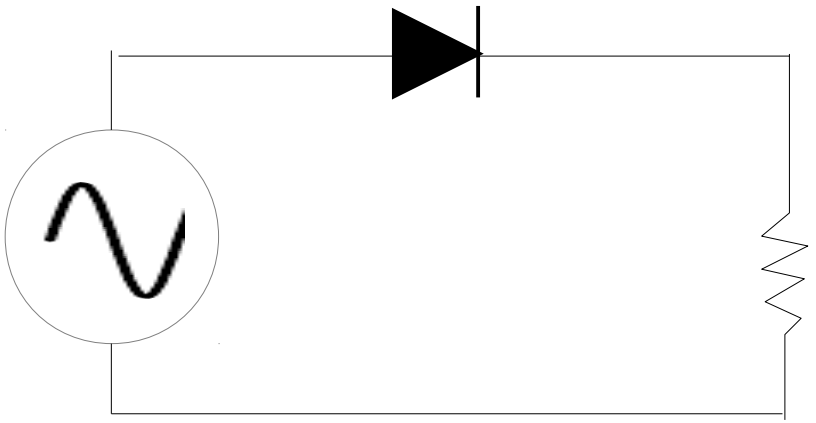


Semiconductor p-n junction

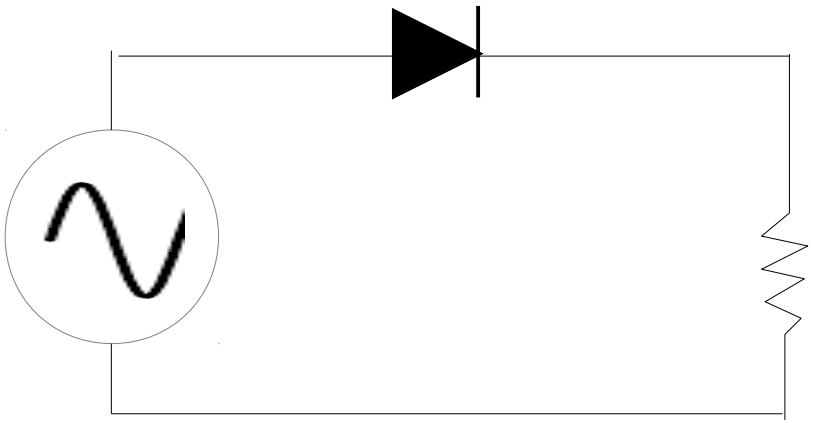




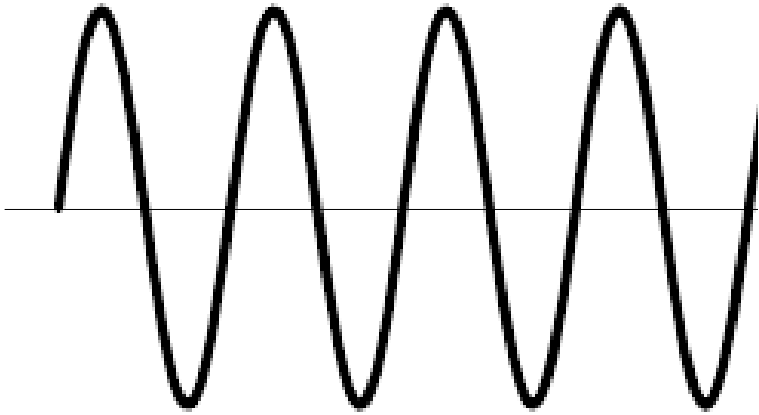
RECTIFICATION: Half-wave rectifier



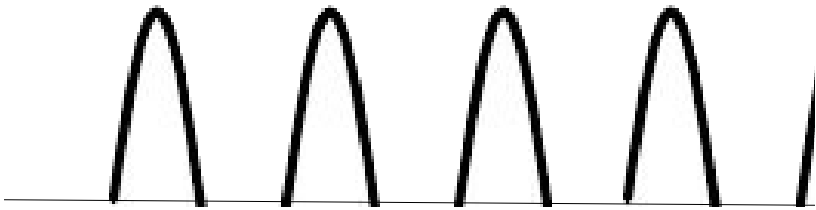
RECTIFICATION: Half-wave rectifier



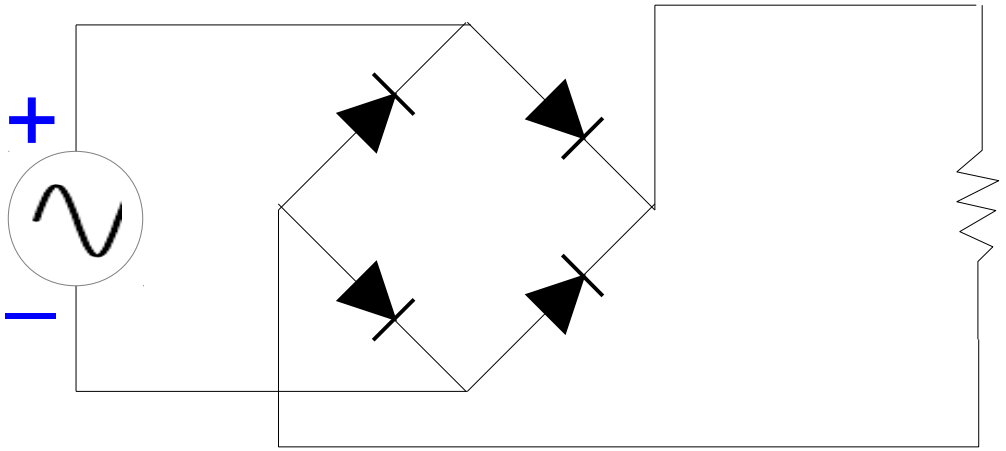
Input current



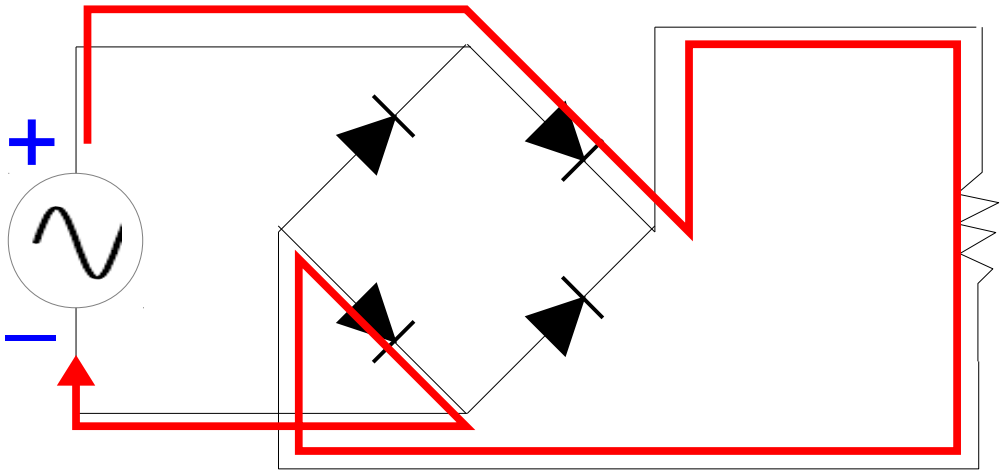
Resistor (output) current



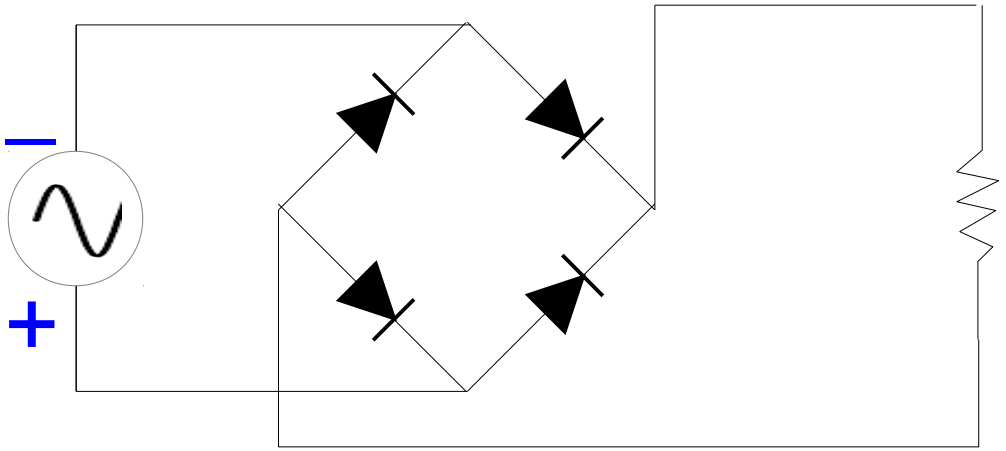
RECTIFICATION: Bridge rectifier



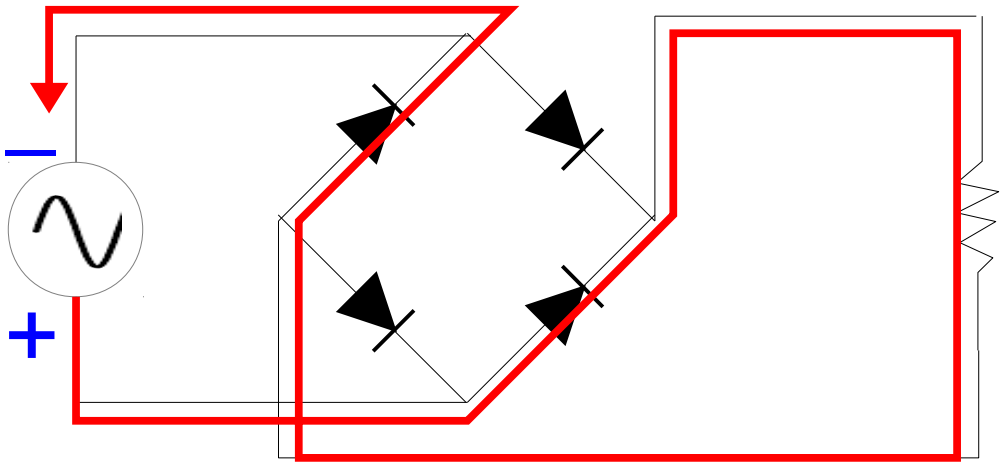
RECTIFICATION: Bridge rectifier



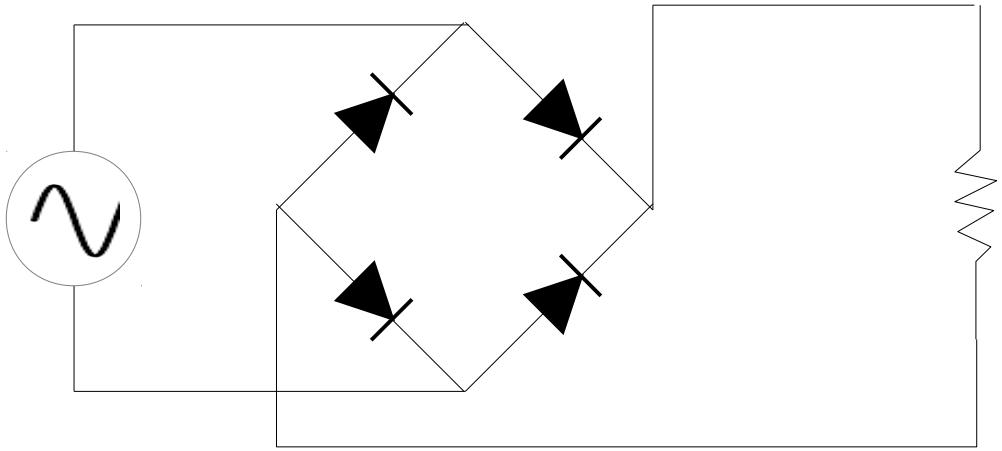
RECTIFICATION: Bridge rectifier



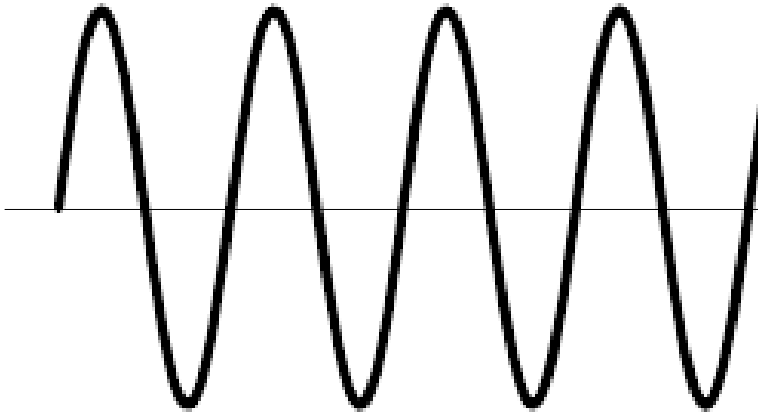
RECTIFICATION: Bridge rectifier



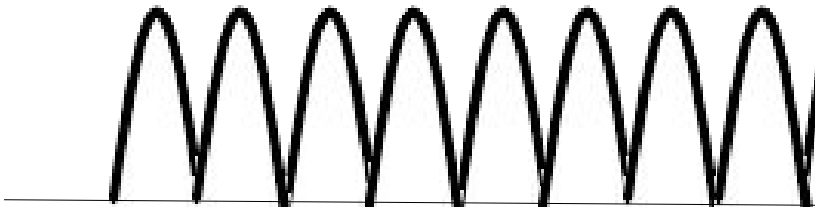
RECTIFICATION: Bridge rectifier



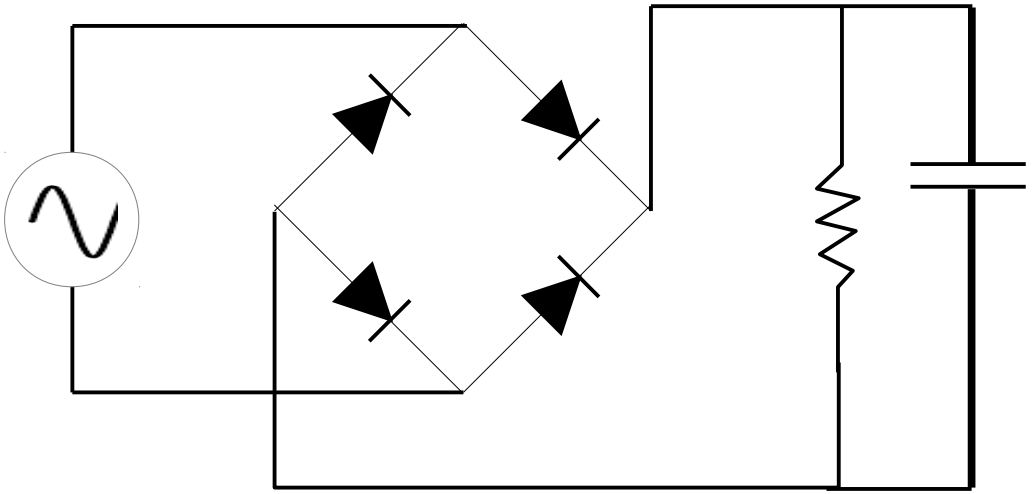
Input current



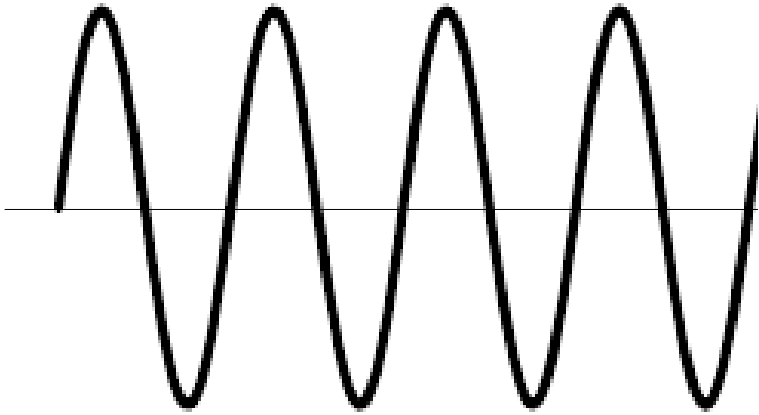
Resistor (output) current



FILTERED RECTIFICATION



Input current



Resistor (output) current

VOLTAGE RIPPLE