

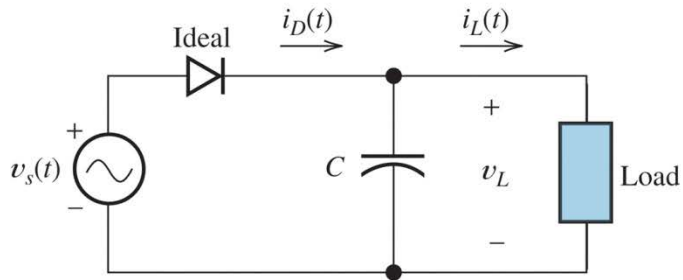
EELE 250: Circuits, Devices, and Motors

Power Supply

Converting AC to DC

- Rectifier concept: diodes
- Half-wave rectifier
- Full-wave rectifier

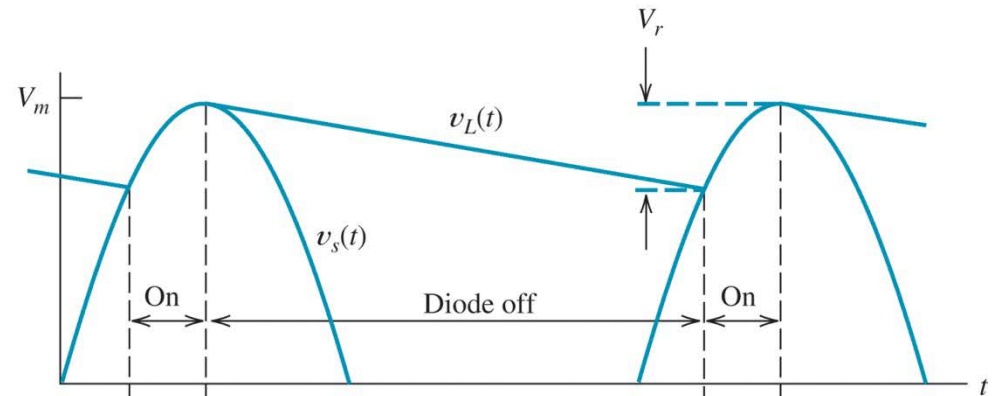
Half-wave rectifier



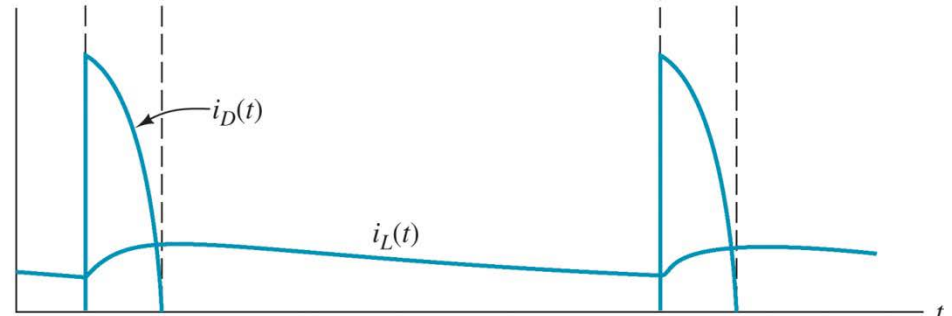
(a) Circuit diagram

Diode conducts when $v_s(t)$ is greater than voltage of capacitor.

When diode is "off," capacitor supplies current to load.

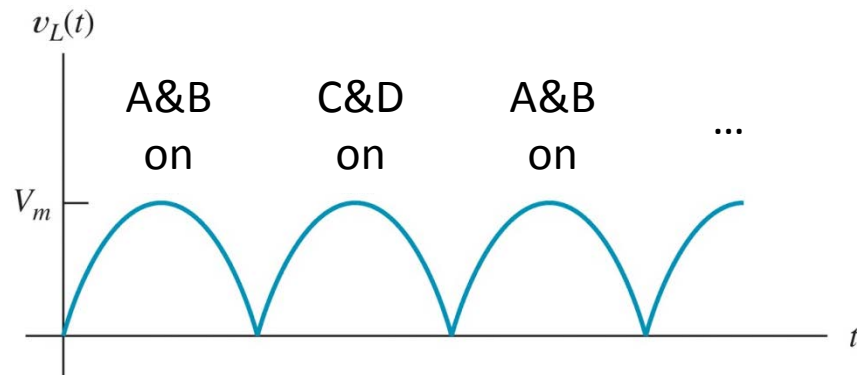
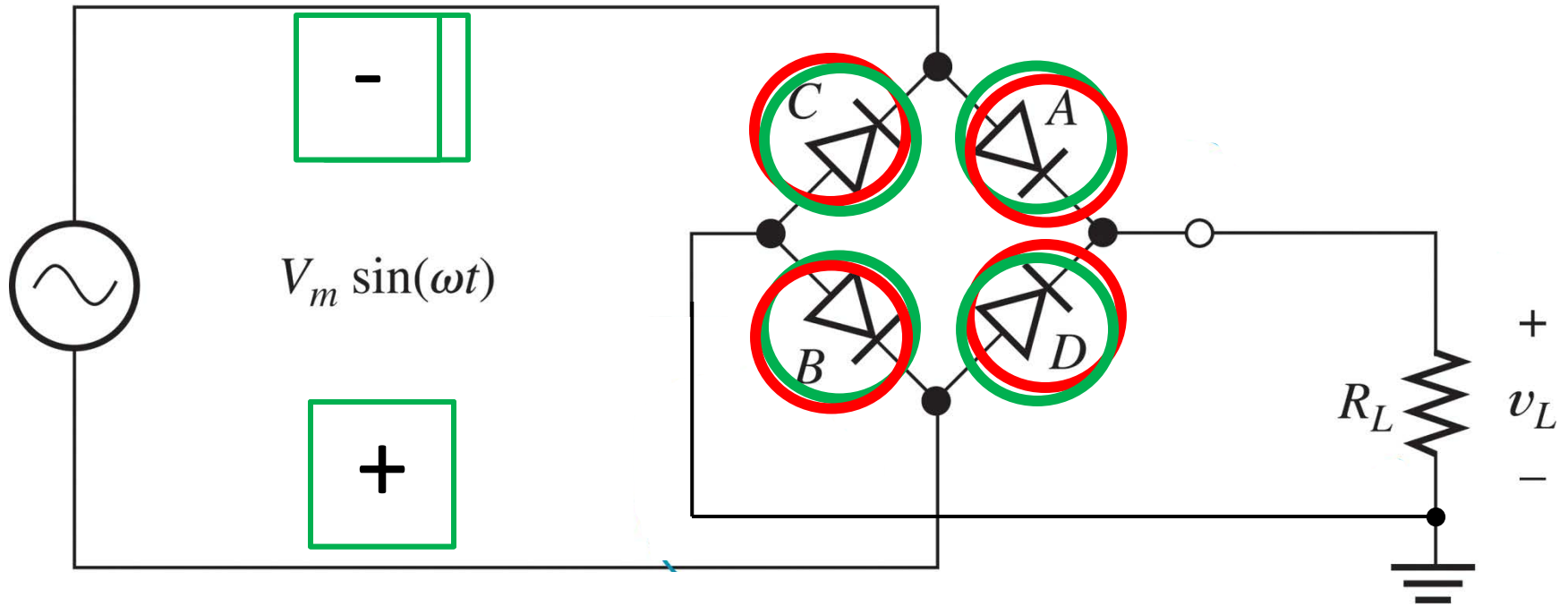


(b) Voltage waveforms

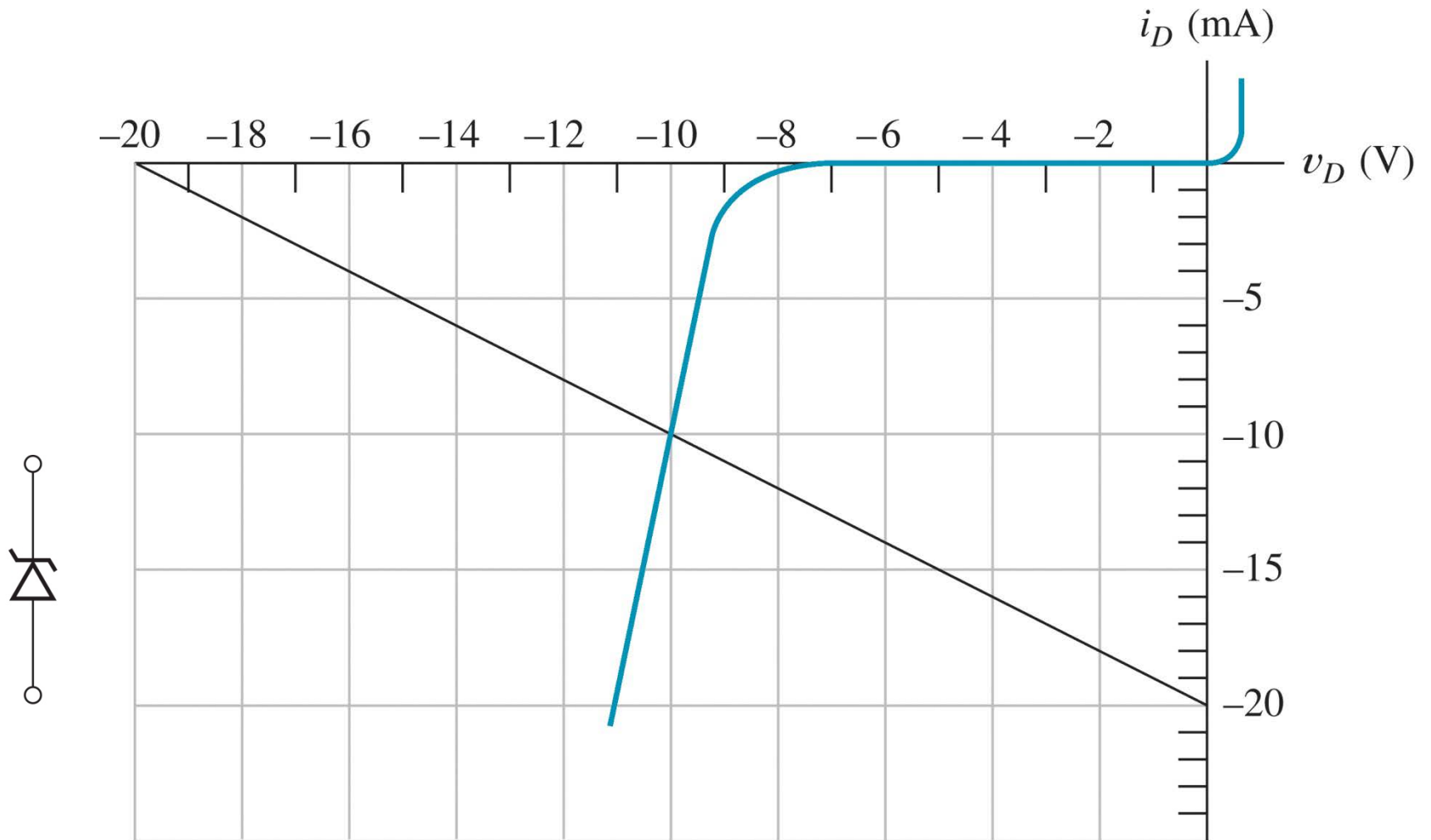


(c) Current waveforms

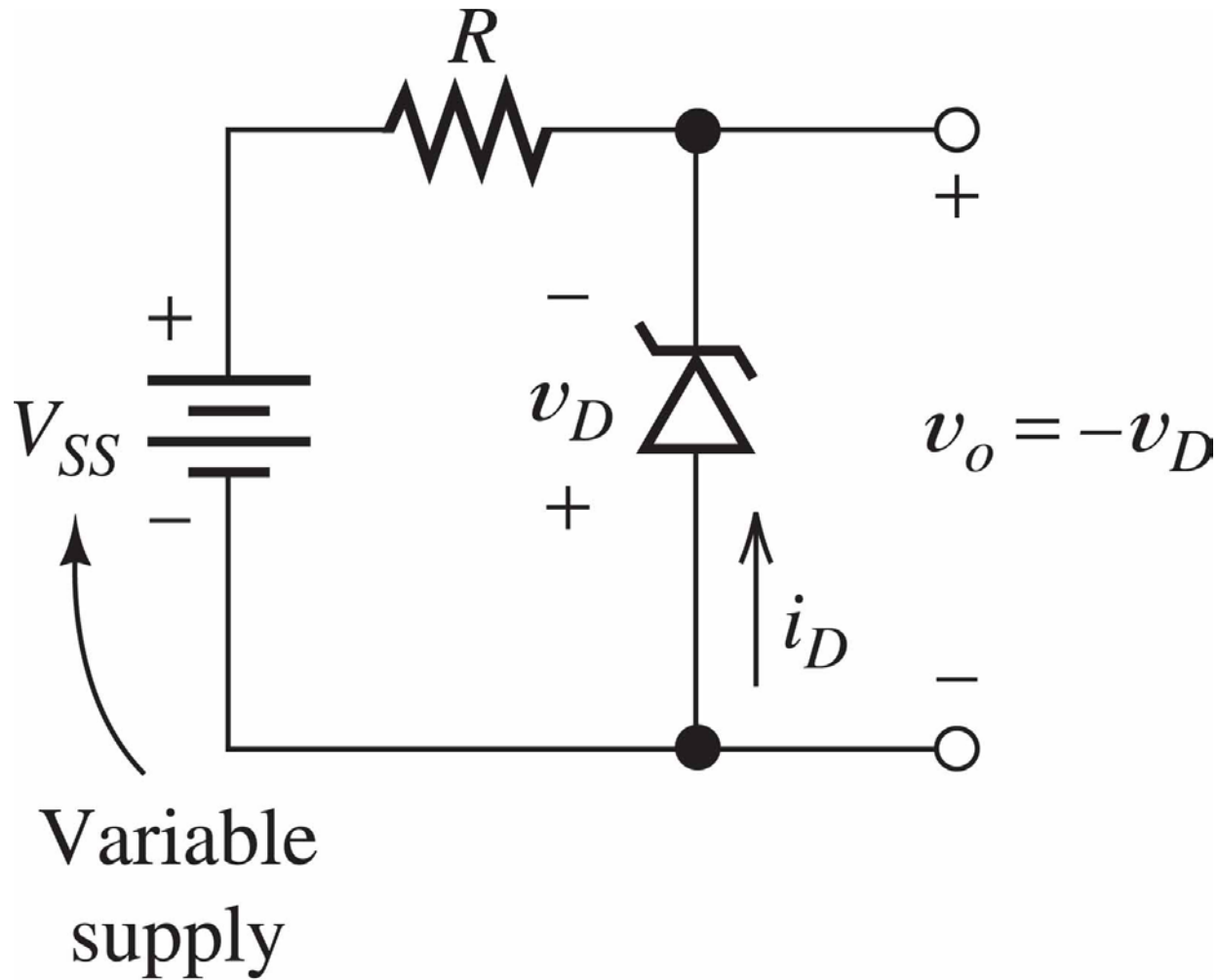
Full-wave rectifier



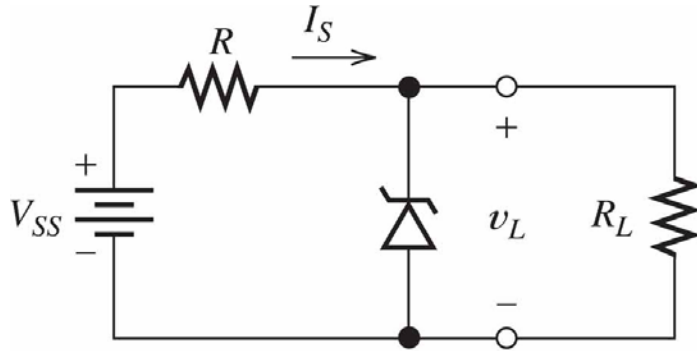
Zener Diode



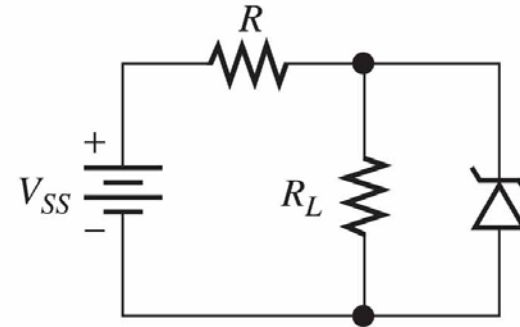
Zener Diode for Voltage Regulation



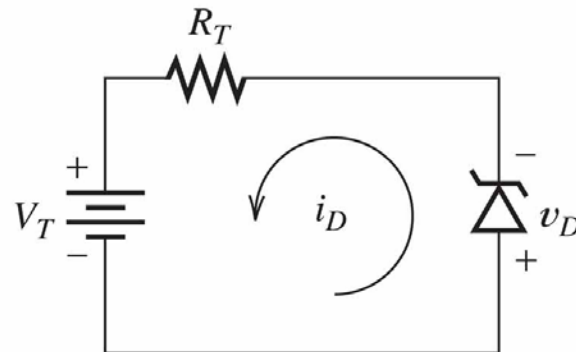
Zener Regulator with Load



(a) Regulator circuit with load

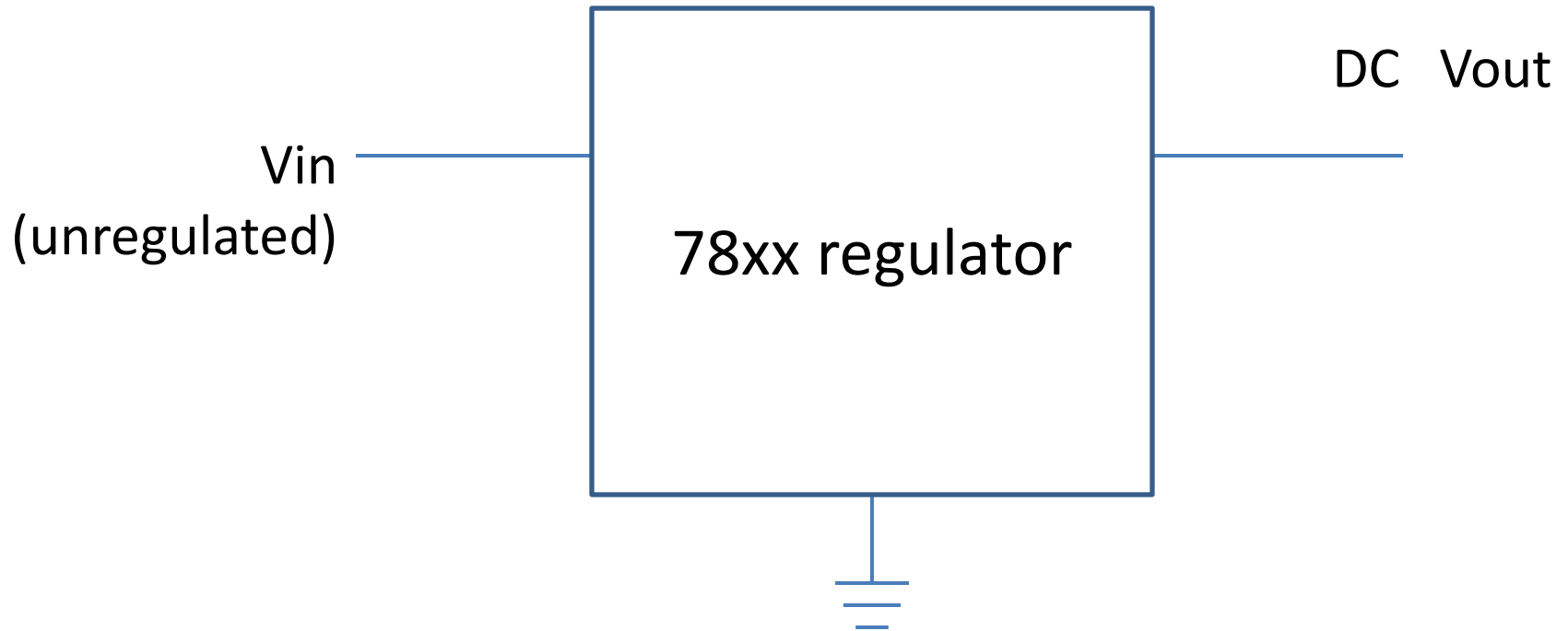


(b) Circuit of (a) redrawn



(c) Circuit with linear portion replaced by Thévenin equivalent

3-Terminal Voltage Regulator



Example: Dual Regulated Supply

