

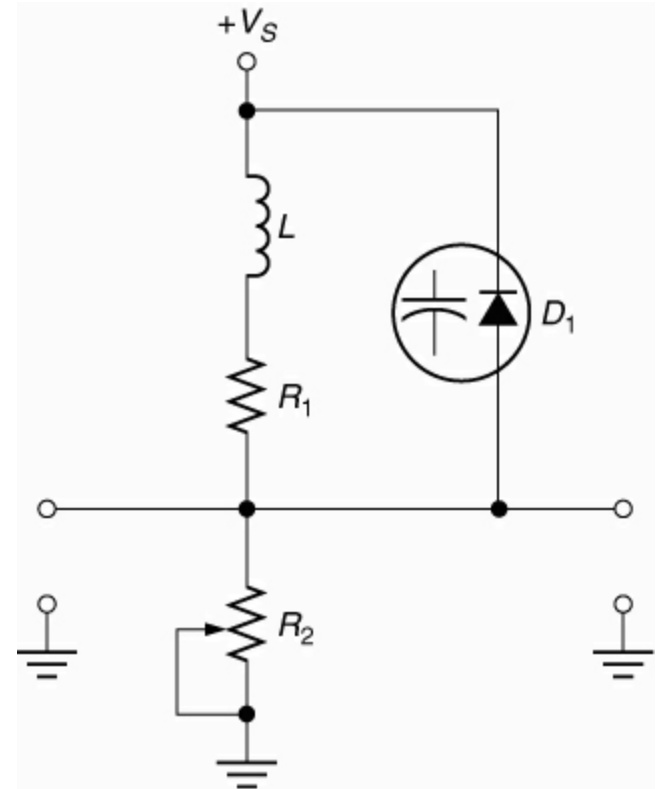
Varactor Specifications

- **Diode capacitance temperature coefficient (TC_C)** – The amount by which varactor capacitance changes with changes in temperature.
 - Temperature has little effect on the capacitance rating of most varactors.
- **Diode capacitance (C_t)** – The rated value (or range) of C for a varactor at a specific value of V_R .
- **Capacitance ratio (C_R)** – The factor by which C changes from one specified value of V_R to another.

Varactor-Tuned LC Circuit

- The varactor acts as a voltage-controlled capacitance.
 - The R_2 setting is varied to adjust varactor capacitance.
- The varactor capacitance determines (in part) the resonant frequency of the LC circuit.

$$f_r = \frac{1}{2\pi\sqrt{LC}}$$

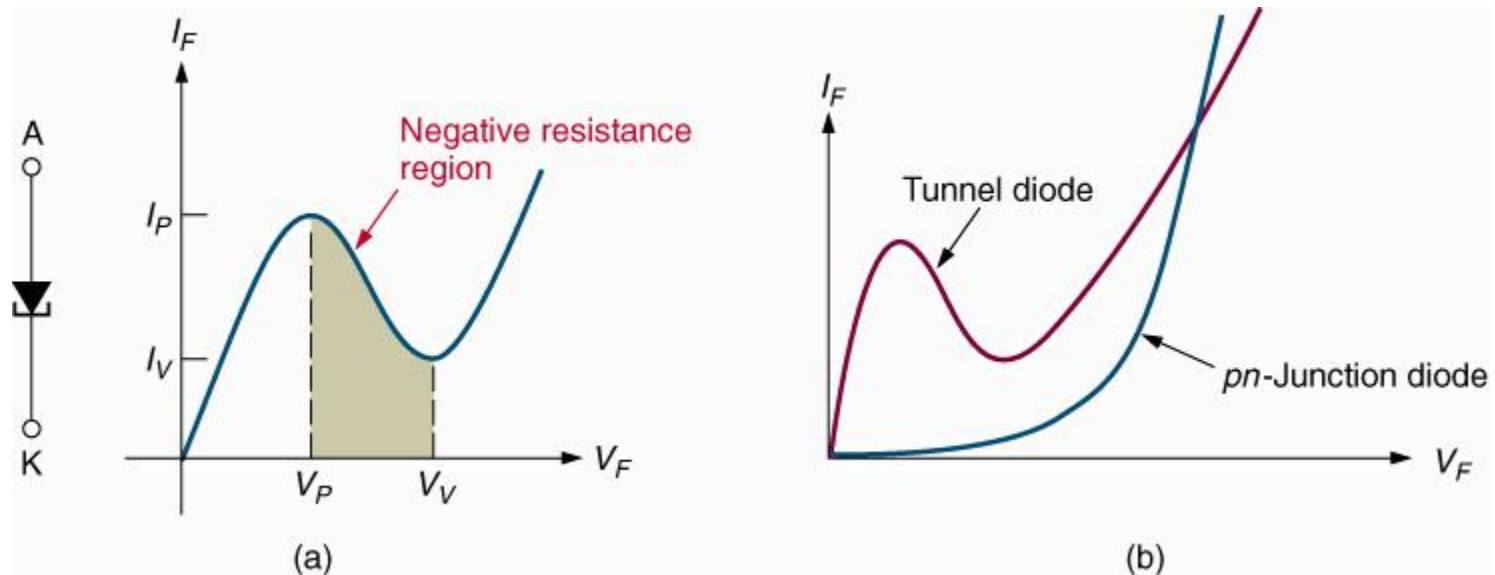


Tunnel Diodes

- Tunnel diodes are heavily-doped, making them suitable for use in high-frequency communications circuits.
 - They are commonly used in ultra-high frequency (UHF) circuits. UHF circuits operate in the range of 100 MHz to 3 GHz.
 - Tunnel diodes exhibit a property referred to as negative resistance.

Negative Resistance

- Negative resistance – A term used to describe any device with current and voltage values that are inversely related.
 - The negative resistance portion of the tunnel diode curve falls between its peak and valley voltage and current values.



Tunnel Diode Oscillator

- Oscillator – A circuit that converts dc to ac. An ac signal generator.
 - The tunnel diode oscillator is also referred to as a negative resistance oscillator.

