

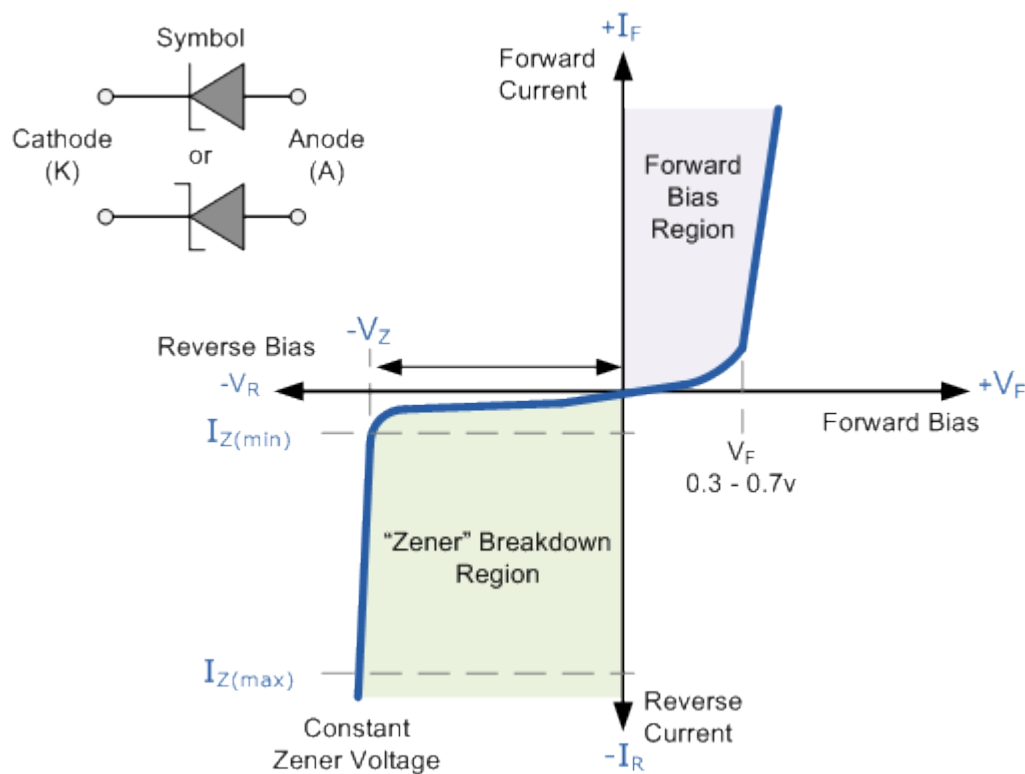
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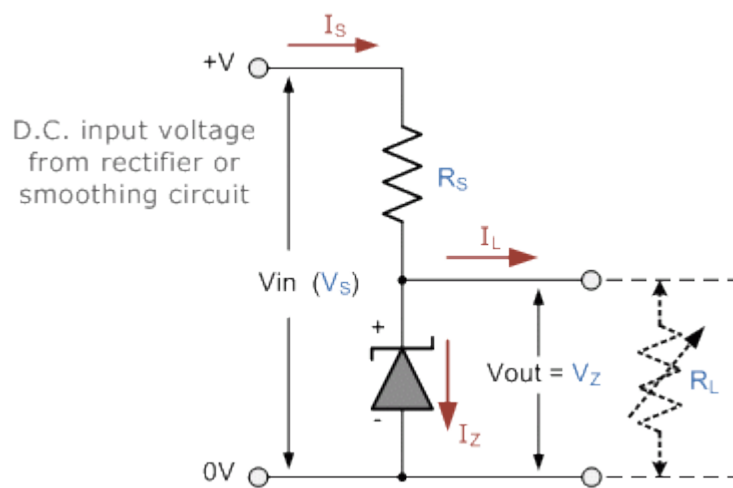
MECHATRONICS

1. **Zener Diodes** are widely used as Shunt Voltage Regulators to regulate voltage across small loads. Zener Diodes have a sharp reverse breakdown voltage and breakdown voltage will be constant for a wide range of currents.

(i) I-V Characteristics Curve;



(ii). Circuit Diagram;



2(a). Watt= 5amp

Current (I) = 500mA

$V_s = 20V_{max}$

$v_s = \text{watt}/\text{current}$

$$= 5/500$$

$$= 10V$$

$R_s = V/I$

$$= 20-10 / 500$$

$$= 20\Omega$$

(b). Current at 500Ω

$$I = v_z/R_L$$

$$= 10/500$$

$$= 0.02A$$