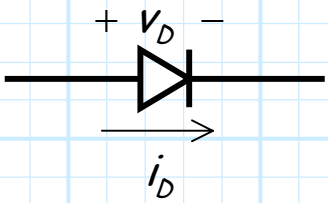
3.2 Terminal Characteristics of Junction Diodes (pp.147-153)



HO: The Junction Diode Curve

HO: The Junction Diode Equation

A. The Forward Bias Region

$$i_D = I_s\left(e^{v_D/nV_T} - 1\right)$$

$$\approx I_s\, e^{v_D/nV_T} \qquad \text{for} \quad v_D \gg nV_T$$

Example: $I_s = 10^{-12}$, n=1

v_D(V)	i_D
0.4	
0.5	
0.6	
0.7	
0.8	
0.9	

$$v_D \simeq 0.7 \ \ V$$

a)

b)

HO: The Junction Diode Forward Bias Equation

HO: Example: A Junction Diode Circuit

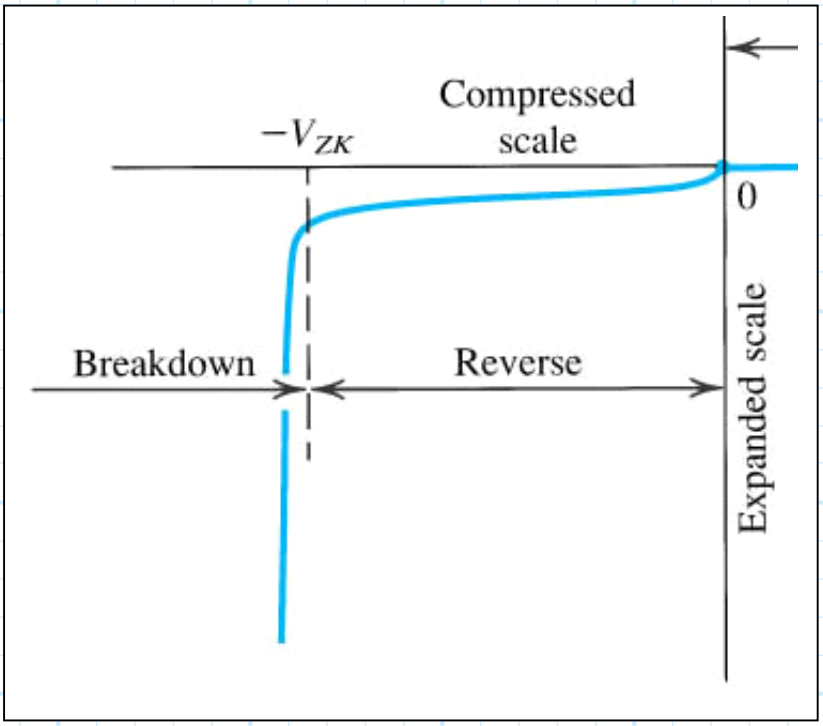
B. The Reverse Bias Region

$$i_D = I_s\left(e^{v_D/nV_T} - 1\right)$$

$$\approx -I_s \qquad \text{for} \quad v_D \ll -nV_T$$

HO: Forward and Reverse Bias Approximations

C. The Breakdown Region


Compressed
scale
$-V_{ZK}$
0
Breakdown
Reverse
Expanded scale

D. Power Dissipation in Junction Diodes

f.b. →

r.b →

b.d →