P(x > t) t

Threshold

$$J_p(x)$$
$$J_p(x + \Delta x)$$

 Δx

p

 $Volume = A \cdot \Delta x$

n-type

$$\Delta p(0) = p_n$$

$$\Delta p(\infty) = 0$$

 p_{n0}

$$p_{n0} + \Delta p(x)$$

 L_p

 I_{sc}

 V_{oc}

 $I_D(V_D)$

 V_D

 I_{dark}

 I_{light}

 V_D

 v_d

 C_j

 C_{diff}

 g_d

 E_g

Band Gap Energy E Wave Vector k

 ${\rm GaAs}$

 Si

InP

Ge

 $\rm In_{.53}Ga_{.47}As$

1.2 1.4

1.6 1.8

Wavelength λ (μ m) Absorption Coefficient α [cm]⁻¹ Penetration Depth $1/\alpha$ [μ m]