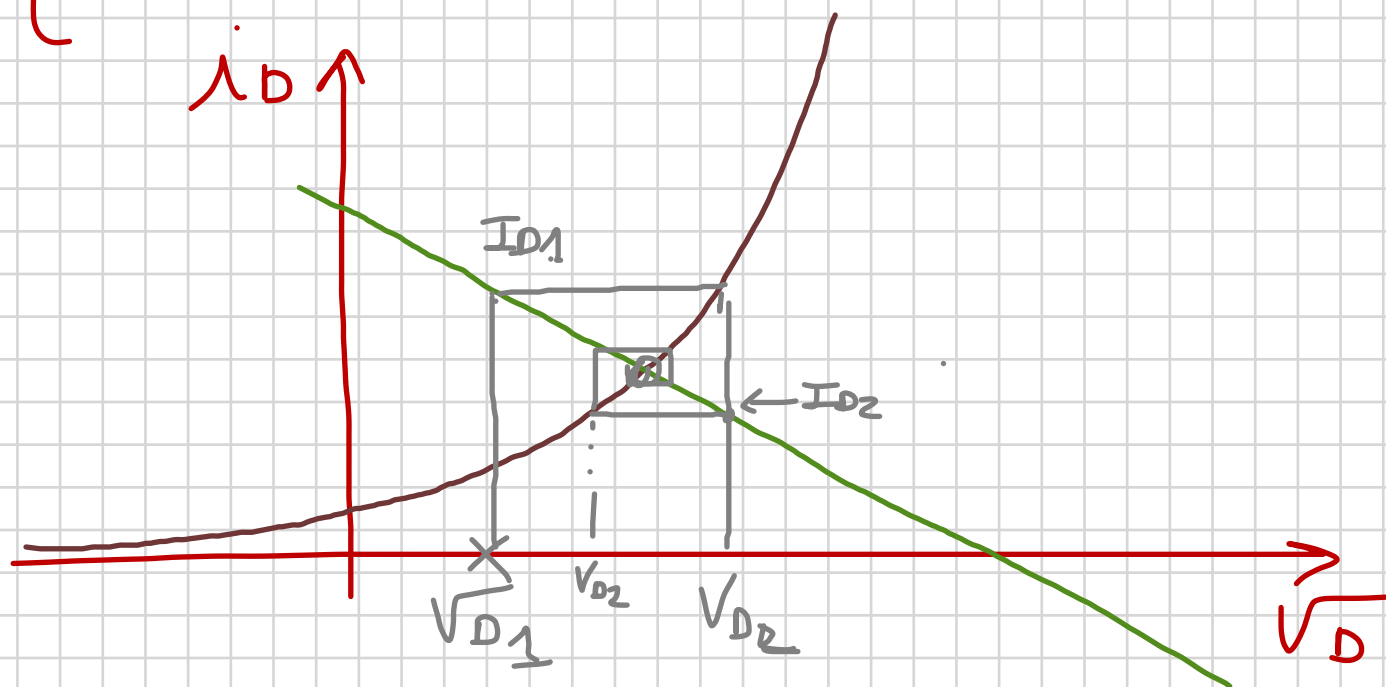


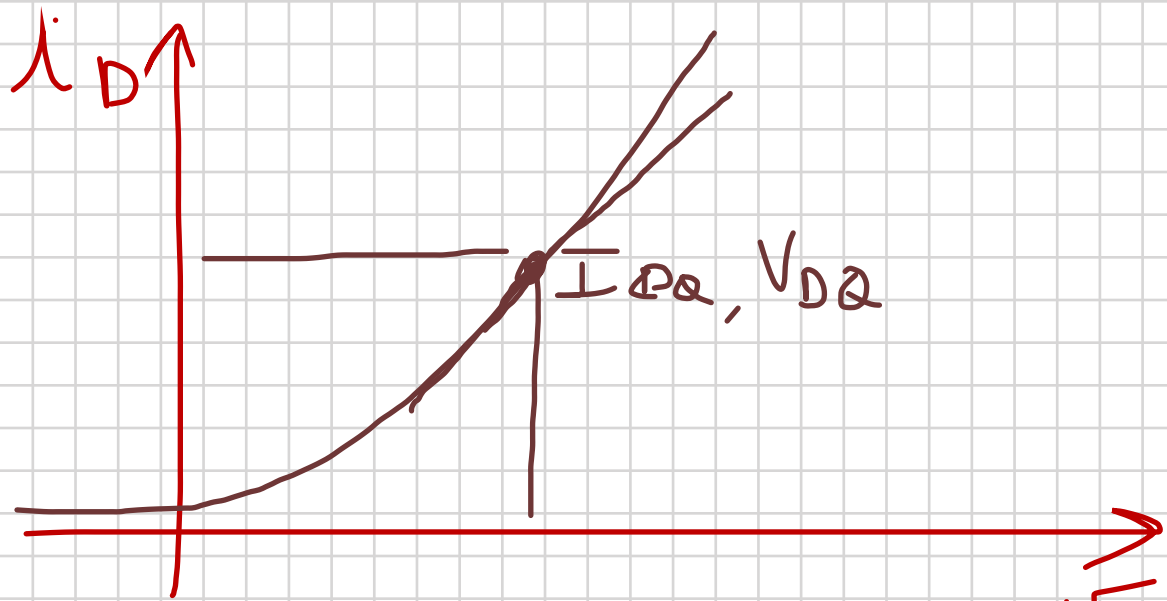
$$V_{CC} = R i_D + V_D$$

$$\begin{cases} V_D = V_{CC} - R i_D \\ i_D = f(V_D) \end{cases}$$



$$i_D = f(V_{DQ} + \Delta V) =$$

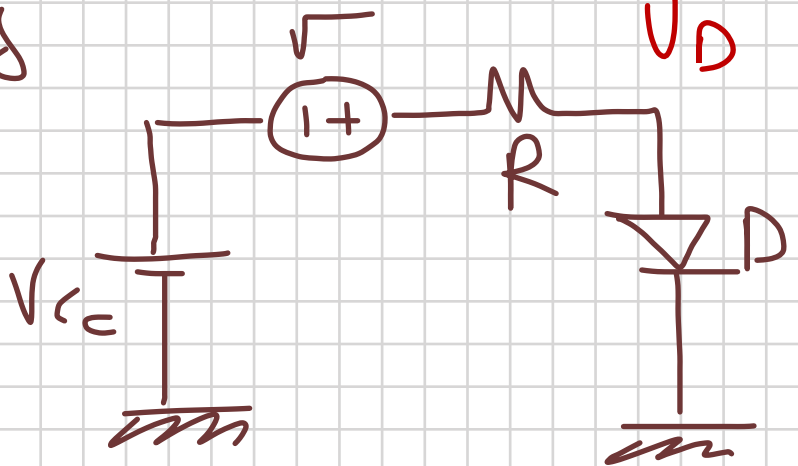
$$\Delta V - V_{DQ} = \frac{dV}{di} \Big|_Q (i - I_{DQ})$$



$$I_{DQ} = I_S$$

$$I = f(v_{DQ} + v)$$

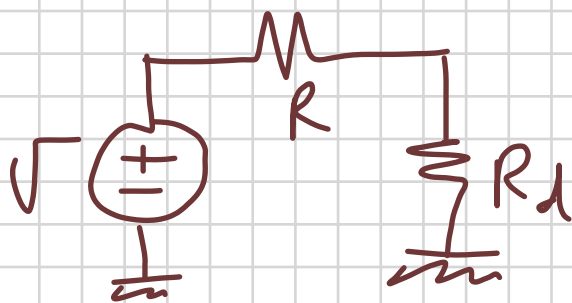
$$i_D = I_{DQ} + \left. \frac{df}{dv} \right|_{v_{DQ}} v =$$



$$= i_D = I_{DQ} + G_d v = I_C + i_d$$

$$G_d = \frac{1}{R_d}$$

$$i_d = \frac{v}{R_d}$$



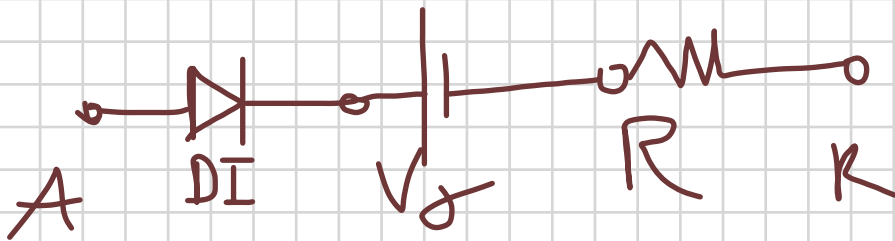
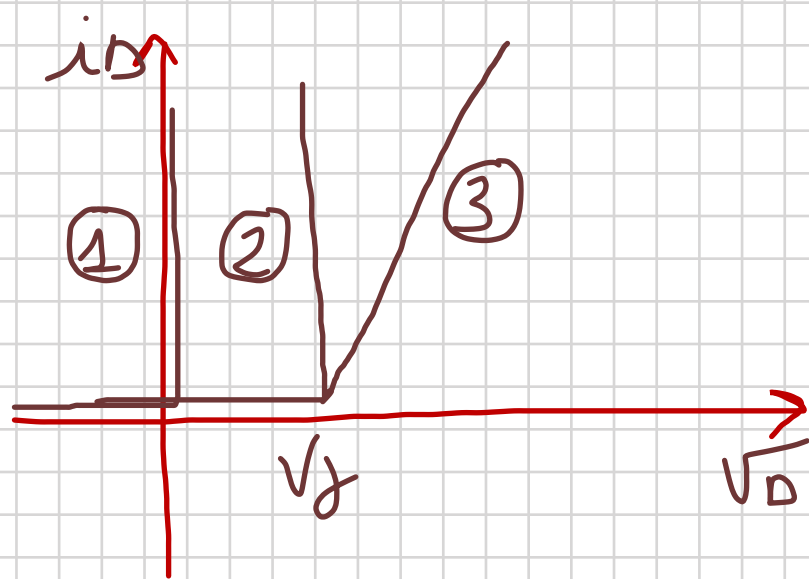
$$i_D = I_S \left(e^{\frac{v_D}{\eta V_T}} - 1 \right)$$

$$v_D \gg \eta V_T$$

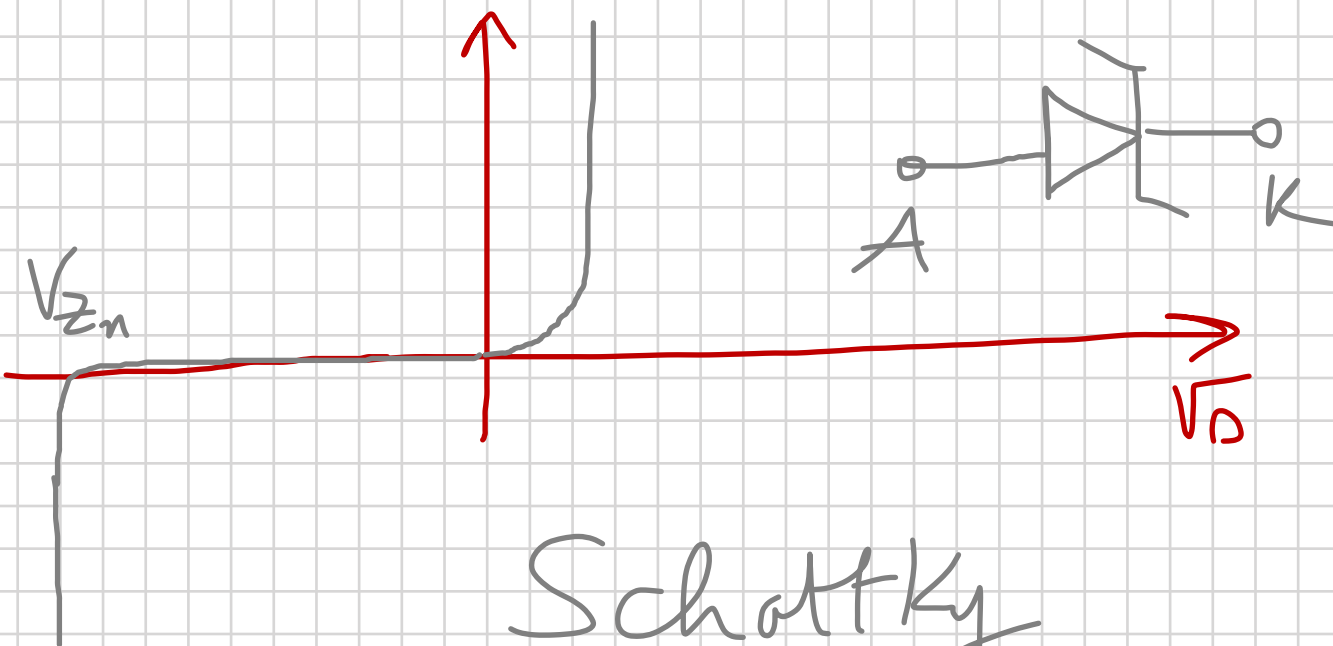
$$v_D \approx 10 \eta V_T$$

$$i_D = I_S e^{\frac{v_D}{\eta V_T}}$$

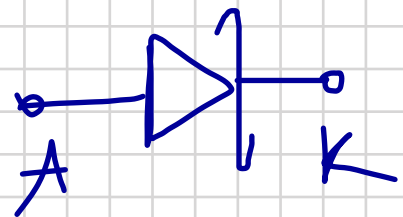
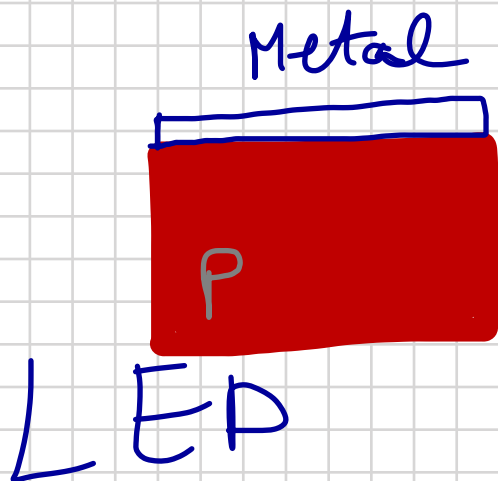
$$R_D = \frac{dv_D}{di_D} = \frac{\eta V_T}{i_D}$$



ZENER

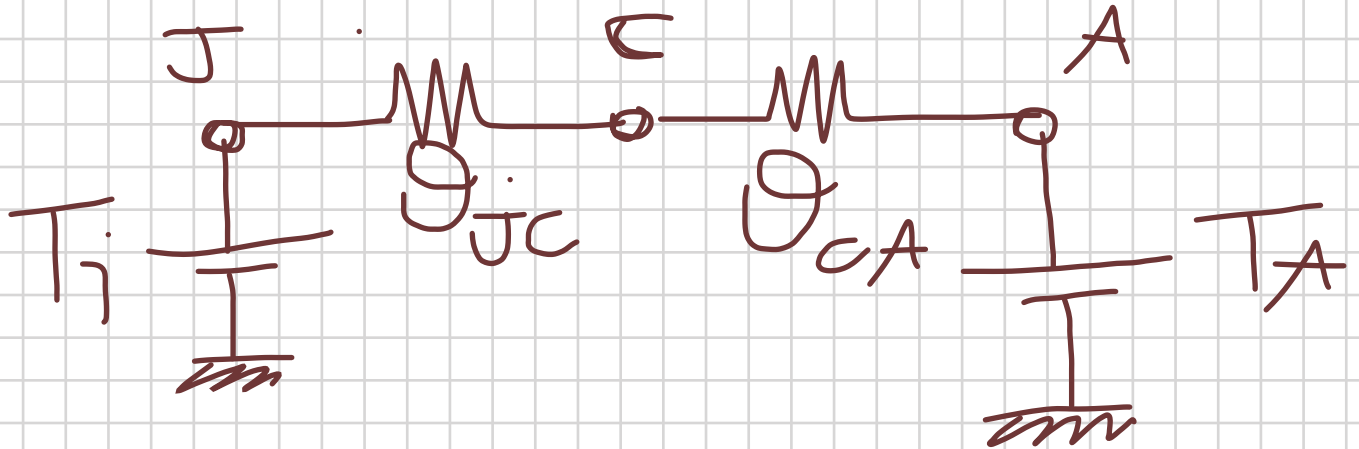


Schottky



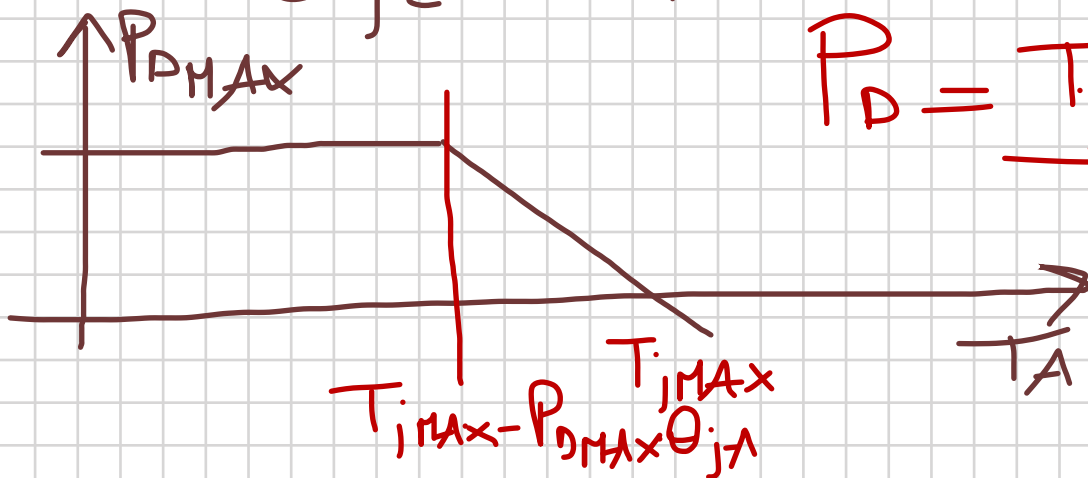
$$P_D = \sqrt{D} i_D$$

$$P_D = R i_D^2$$



$$P_D = \frac{T_j - T_c}{\theta_{jc}} = \frac{T_c - T_A}{\theta_{ca}}$$

$$P_D = \frac{T_j - T_A}{\theta_{jc} + \theta_{ca}}$$



$$P_D = \frac{T_{j\text{MAX}} - T_A}{\theta_{jA}}$$

