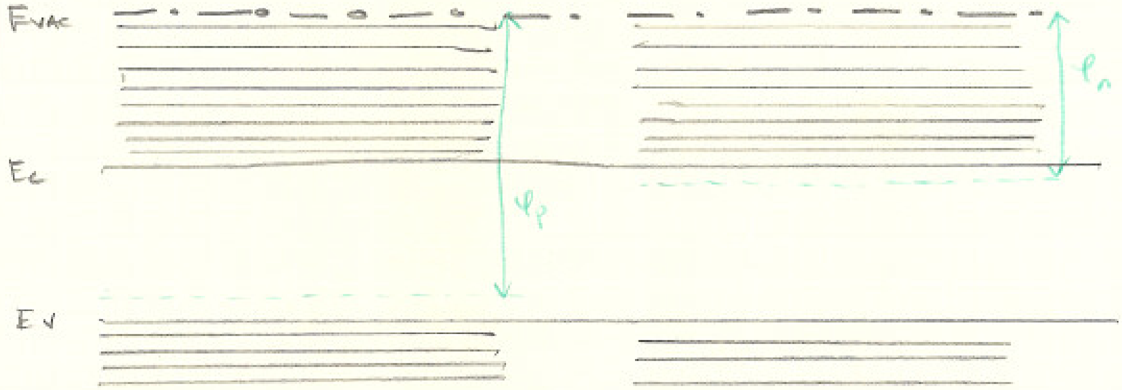
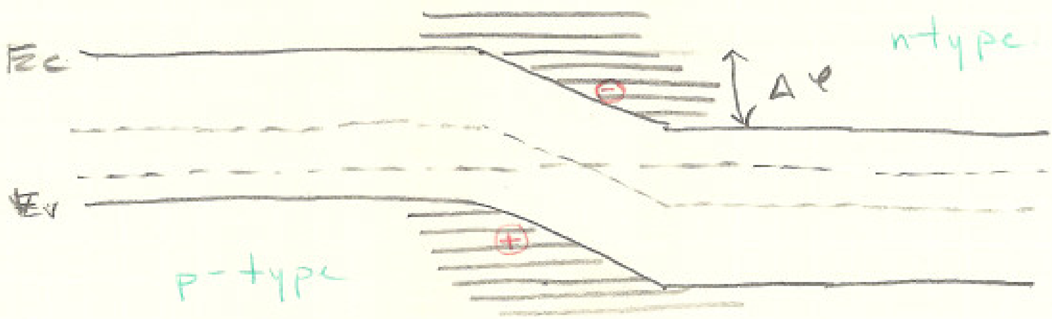


when two types of semiconductor, energy levels appear as.



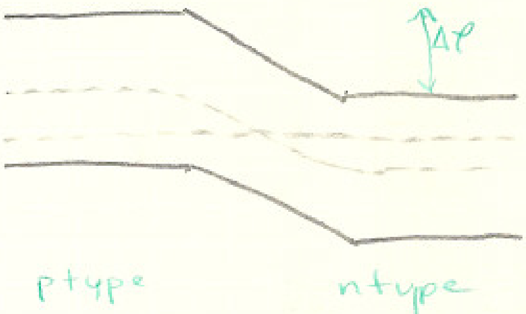
$$\Delta\varphi = \varphi_p - \varphi_n$$

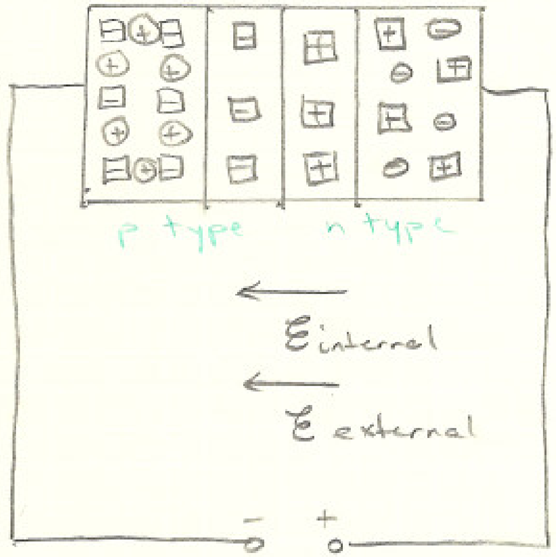
$$\boxed{\Delta\varphi = f(T)}$$

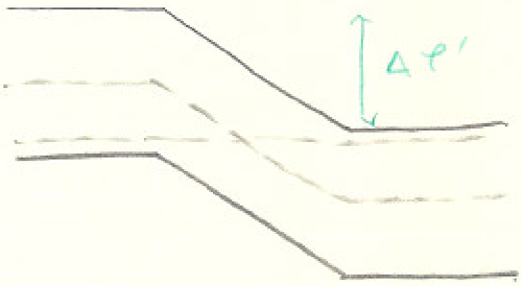
the electrons / hole can't cross the junction because of the energy level that they are at.

the drift currents then become zero.

$j_n^{drift} = 0$ $\qquad$ $j_p^{drift} = 0$





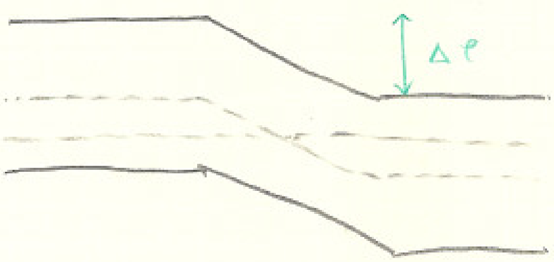


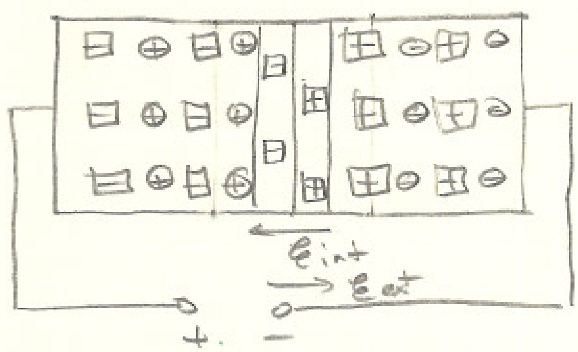
$$\mathcal{E} = \mathcal{E}_{int} + \mathcal{E}_{ext.}$$

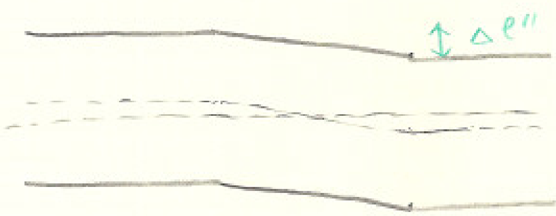
note: as the external voltage increases width of the depetition region.

$$\boxed{\Delta e' = \Delta e + qV_{ex}}$$

with voltage applied in the opposite direction the reverse occurs.







$$\mathcal{E} = \mathcal{E}_{int} - \mathcal{E}_{ext.}$$

$$\boxed{\Delta e'' = \Delta e - qV_{eq}}$$

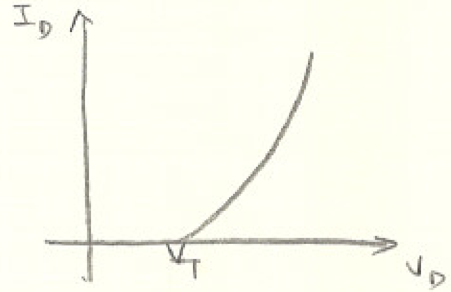
Once $\Delta e'' = 0$, or $\mathcal{E}_{int} = \mathcal{E}_{ext}$

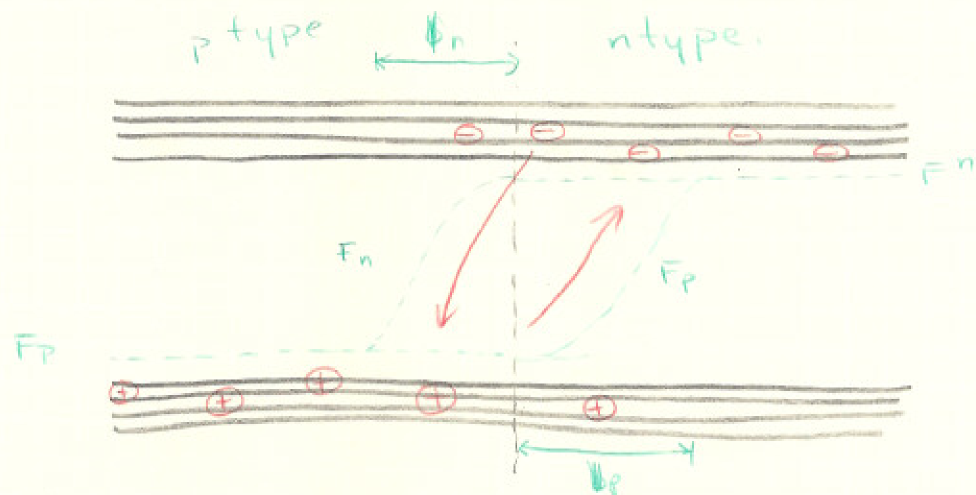
we call the $V_{THRESHOLD}$ (Voltage thereshold.)

$$\Delta e'' = \Delta e - q_0 V_T = 0$$

$$\boxed{V_T = \frac{\Delta e}{q_0}}$$

$$\therefore V_T = f(T)$$

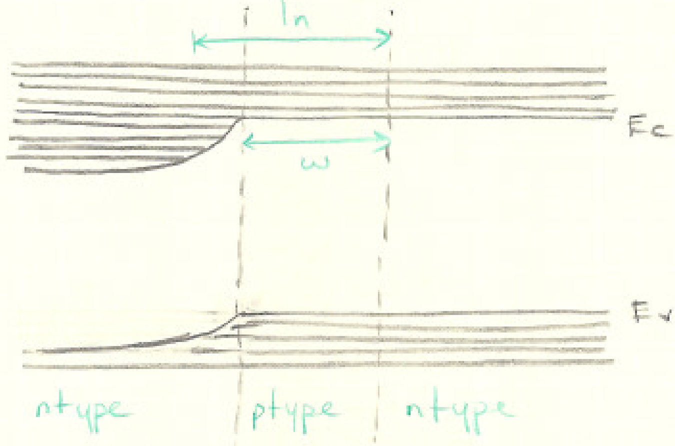




F_p & F_n : quasi Fermi levels.

here, the holes and the electrons combine

l_n, l_p : are the distances from the border that we can find electrons and holes



$\boxed{l_n > \omega}$