# Drift current

$$\vec{v}_e = -\mu_e \vec{E} \qquad \vec{v}_h = \mu_h \vec{E}$$

$$\vec{J}_{e,drift} = -en\vec{v}_e \qquad \vec{J}_{h,drift} = ep\vec{v}_h$$

$$\vec{J}_{drift} = \sigma_e \vec{E} + \sigma_h \vec{E}$$

# Diffusion current

$$\vec{\Phi}_e = -D_e \vec{\nabla} n \qquad \vec{\Phi}_h = -D_h \vec{\nabla} p$$

$$\vec{J}_{e,diff} = -e\vec{\Phi}_e \qquad \vec{J}_{h,diff} = e\vec{\Phi}_h$$

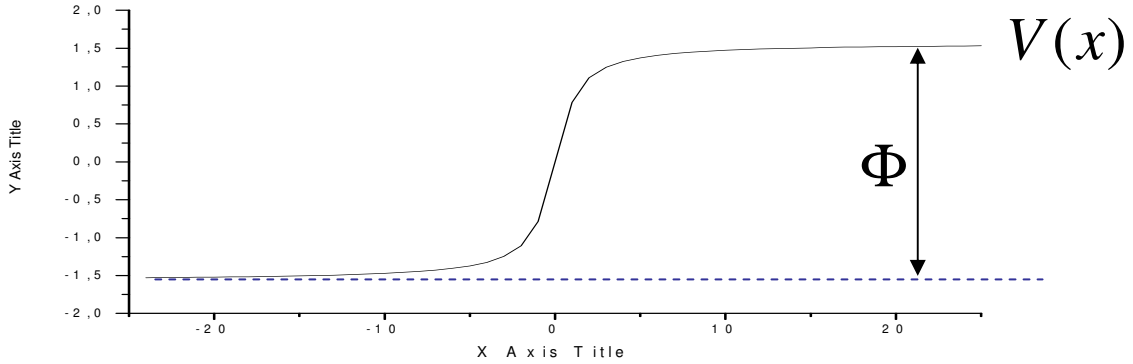
$$\vec{J}_{diff} = eD_e \vec{\nabla} n - eD_h \vec{\nabla} p$$

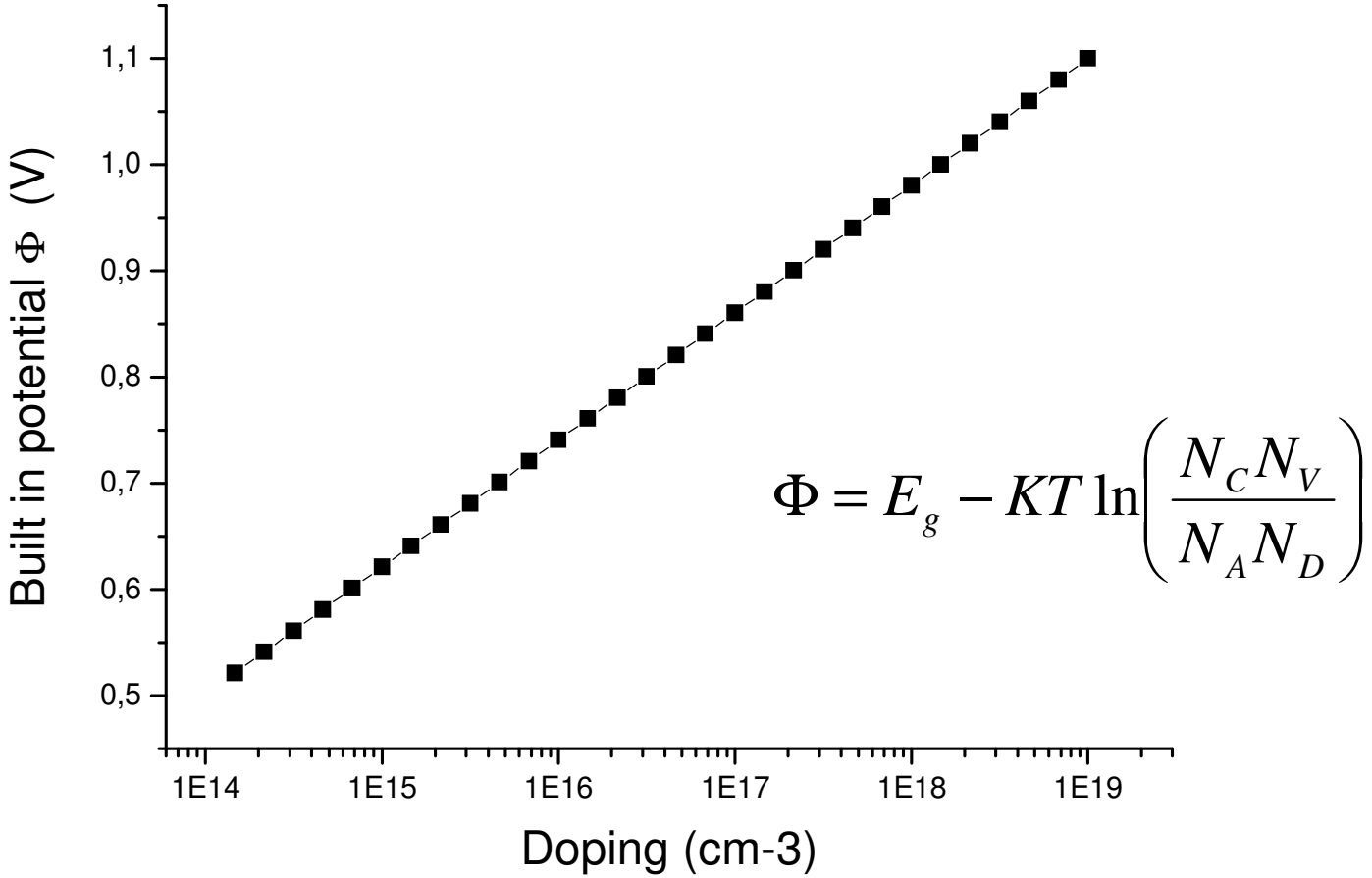
$$\vec{J}_e = \sigma_e \vec{E} + eD_e \vec{\nabla} n$$

$$\vec{J}_h = \sigma_h \vec{E} - eD_h \vec{\nabla} p$$

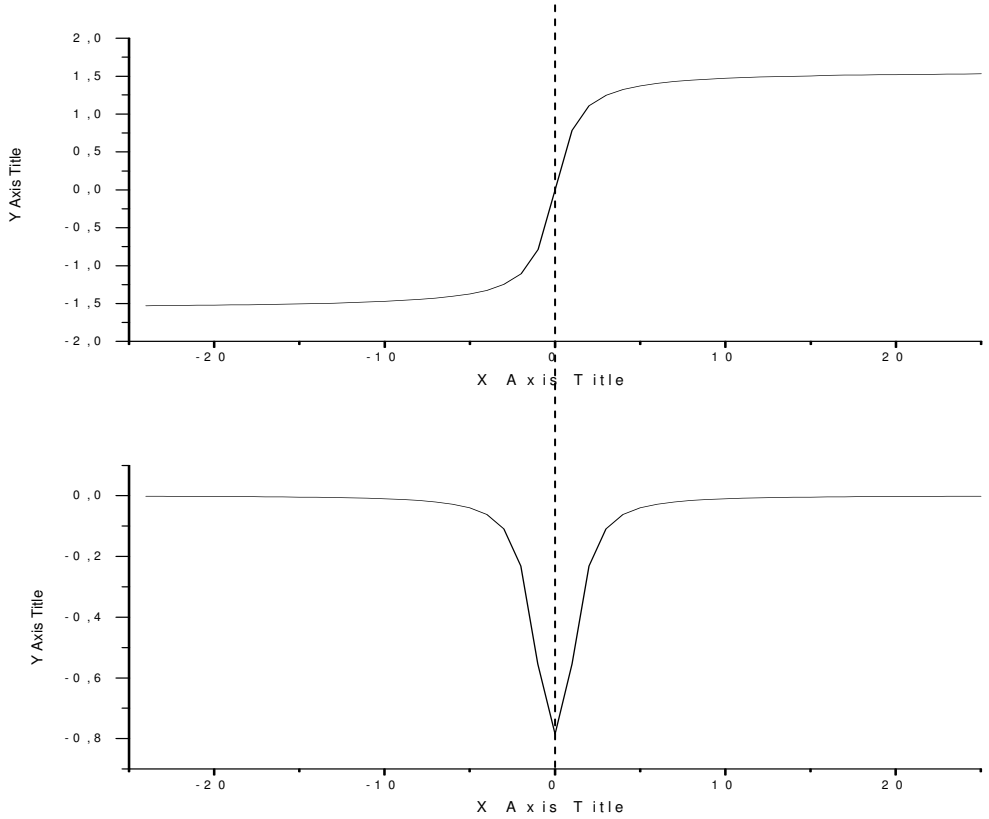
Drift Diffusion

Giunzione pn



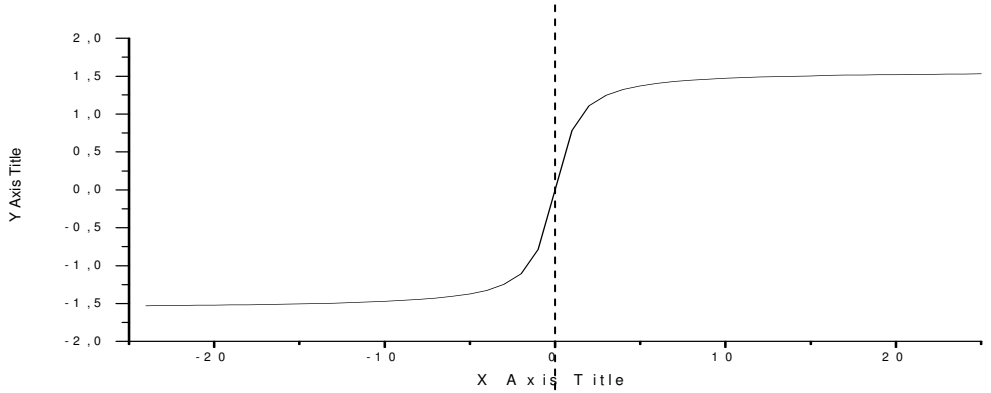
Giunzione pn



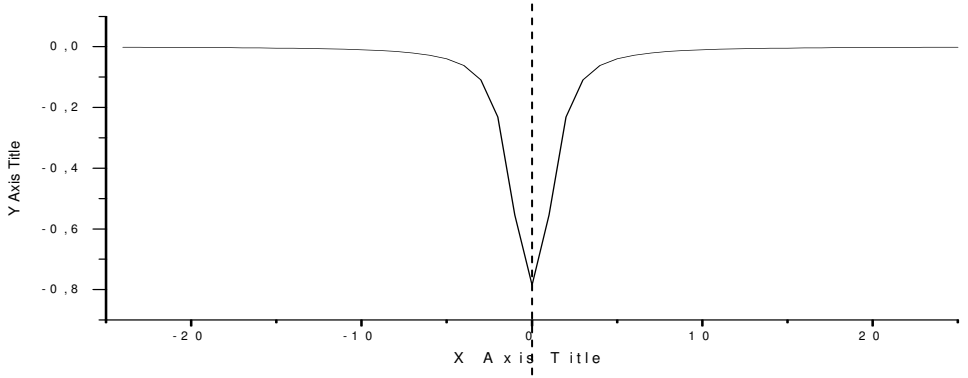

$$V(x)$$

$$E(x) = -\frac{dV}{dx}$$

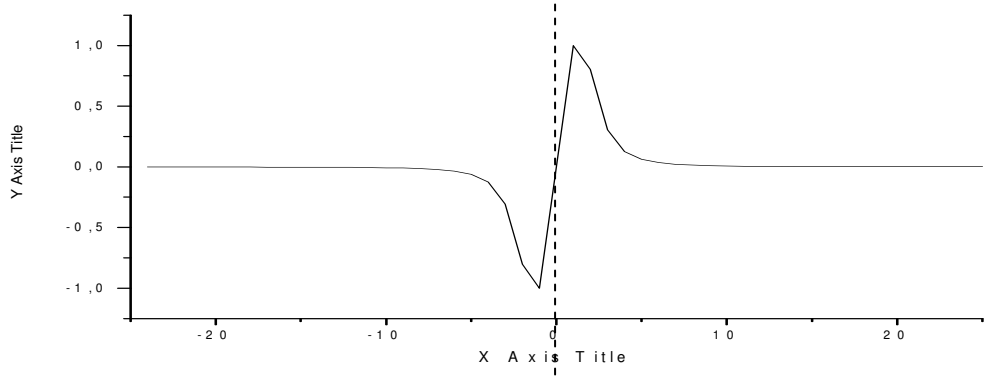
Giunzione pn




$$V(x)$$

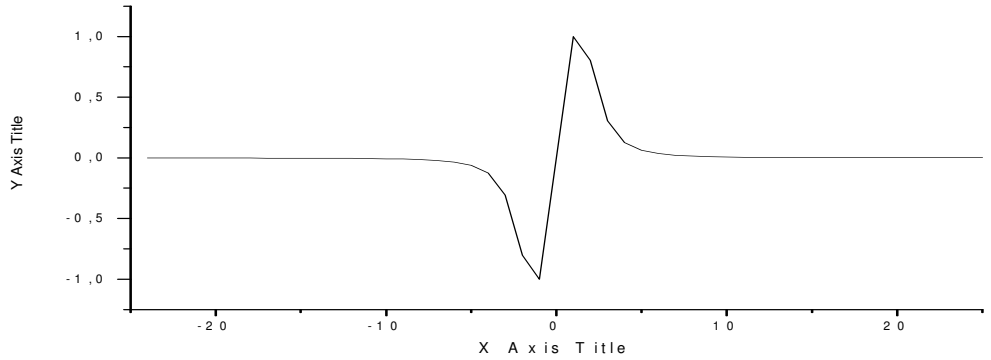



$$E(x) = -\frac{dV}{dx}$$



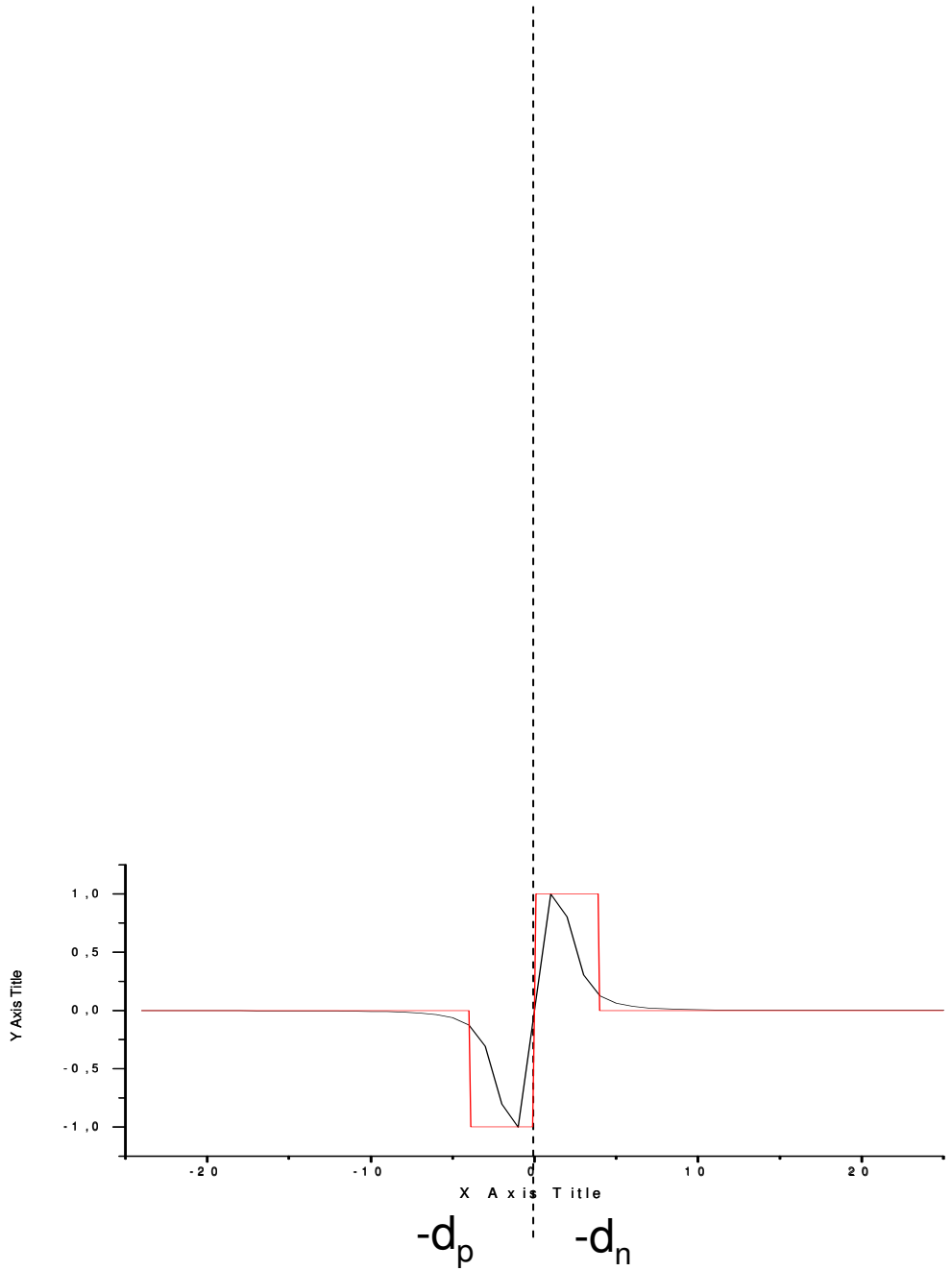

$$\rho(x) = \varepsilon \frac{dE}{dx}$$

# Giunzione pn



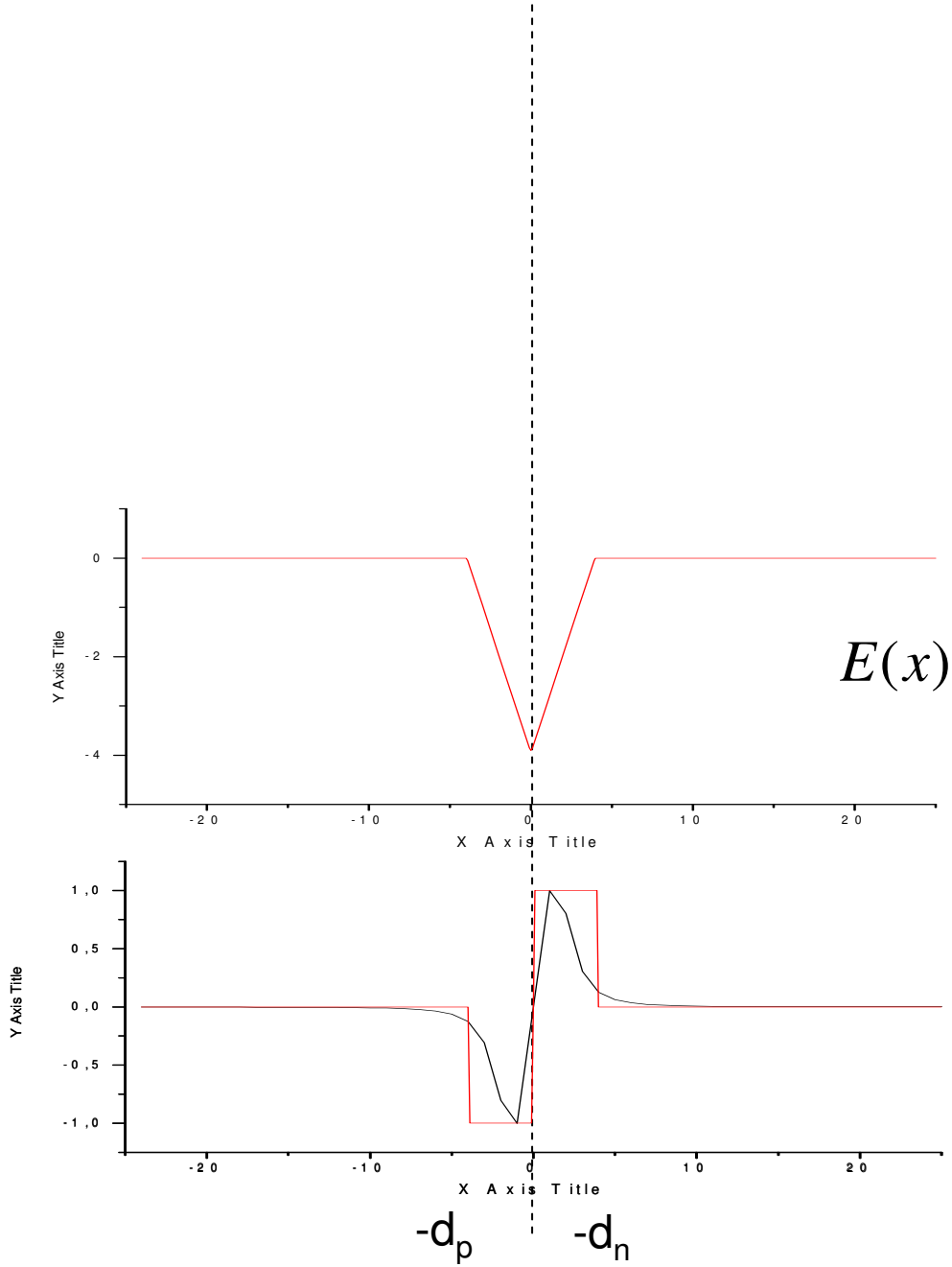

$$\rho(x) = \varepsilon \frac{dE}{dx}$$

Giunzione pn




$$\rho(x) = \varepsilon \frac{dE}{dx}$$

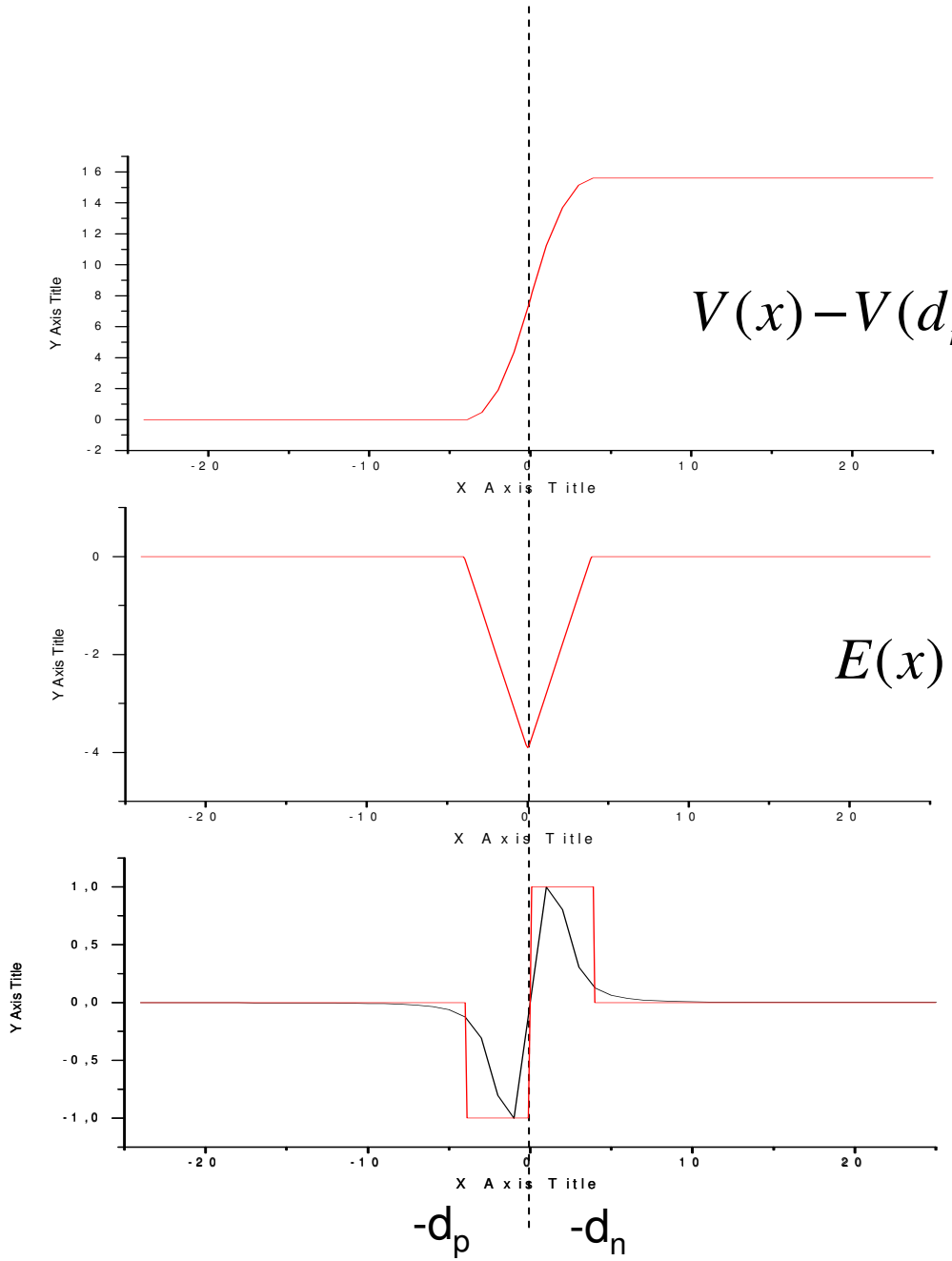
Giunzione pn




$$E(x) = \frac{1}{\varepsilon} \int_{-d_n}^{d_p} \rho(x')dx'$$

$$\rho(x) = \varepsilon \frac{dE}{dx}$$

Giunzione pn




$$V(x) - V(d_n) = -\int_{-d_n}^{x} E(x')dx'$$

$$E(x) = \frac{1}{\varepsilon}\int_{-d_n}^{d_p} \rho(x')dx'$$

$$\rho(x) = \varepsilon\frac{dE}{dx}$$

Giunzione pn

$$W = \sqrt{\frac{2\varepsilon\Phi}{e}\frac{N_D + N_A}{N_D N_A}}$$