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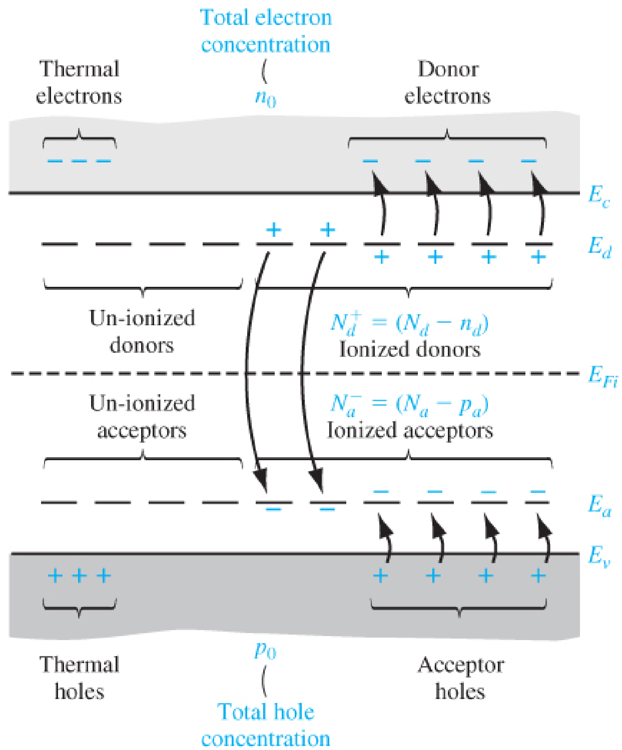

Figure 4.14 | Energy-band diagram of a compensated semiconductor showing ionized and un-ionized donors and acceptors.

$N_d \equiv$ donor doping concentration (#/m^3 or #/cm^3). These are initially charge neutral.

$N_a \equiv$ acceptor doping concentration (#/m^3 or #/cm^3) . These are initially charge neutral.

$N_d^+ \equiv$ concentration of ionized donors (#/m^3 or #/cm^3). These are **positive** as they lost their electron to conduction band or (less likely) they lost an electron to acceptors.

$N_a^- \equiv$ acceptor doping concentration (#/m^3 or #/cm^3) . These are **negative** as they gained an electron from valence band or (less likely) they gained an electron from donors.

$n_d \equiv$ concentration of donors that did not ionize (#/m^3 or #/cm^3). These are neutral.

$p_a \equiv$ concentration of acceptors that did not ionize (#/m^3 or #/cm^3). These are neutral.

$n_0 \equiv$ total concentration of electrons in conduction band (#/m^3 or #/cm^3). These are **negative**.

$p_0 \equiv$ total concentration of holes in valence band (#/m^3 or #/cm^3). These are **positive**.