"Physics of Semiconductor Devices"
S.M.Sze

- **Tranzystory bipolarne.**

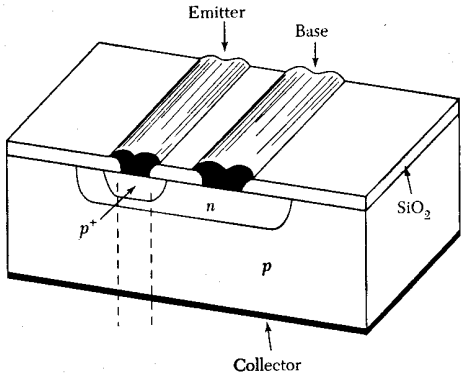

Fig. 1 Perspective view of a silicon p-n-p bipolar transistor.

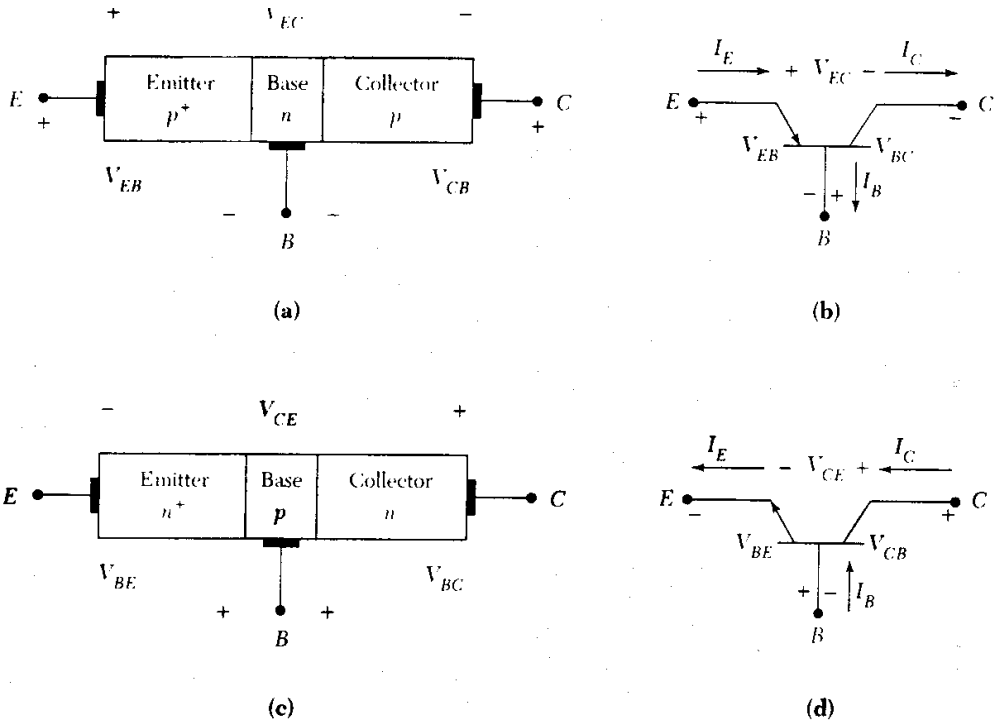

Fig. 2 (a) Idealized one-dimensional schematic of a p-n-p bipolar transistor and (b) its circuit symbol. (c) Idealized one-dimensional schematic of an n-p-n bipolar transistor and (d) its circuit symbol.

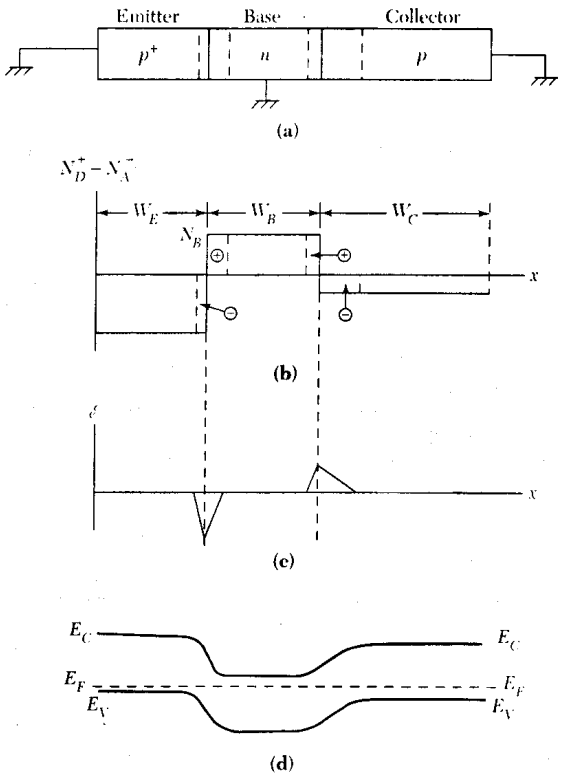

Fig. 3 (*a*) A *p-n-p* transistor with all leads grounded (at thermal equilibrium). (*b*) Doping profile of a transistor with abrupt impurity distributions. (*c*) Electric-field profile. (*d*) Energy band diagram at thermal equilibrium.

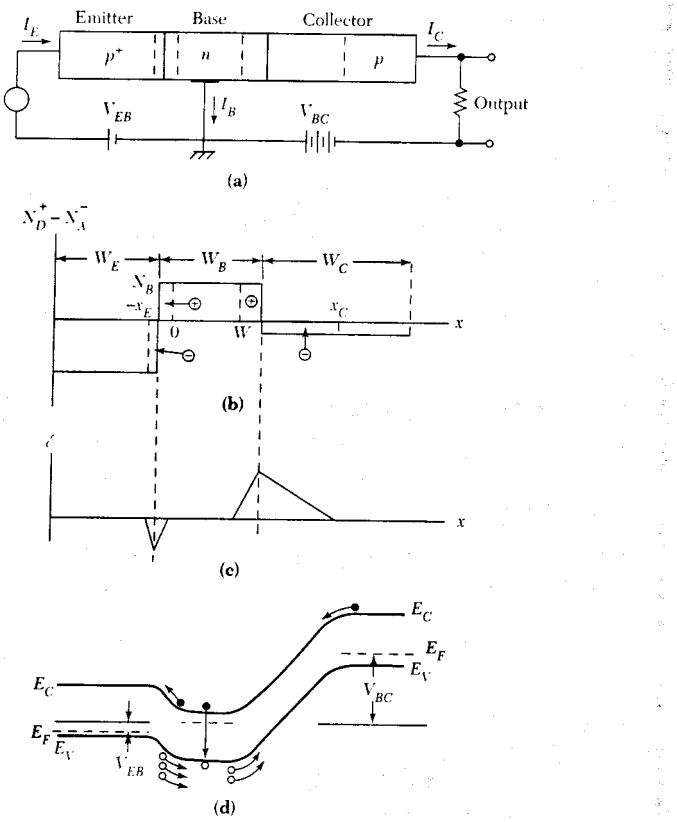

Fig. 4 (*a*) The transistor shown in Fig. 3 under the active mode of operation.[3] (*b*) Doping profiles and the depletion regions under biasing conditions. (*c*) Electric-field profile. (*d*) Energy band diagram.

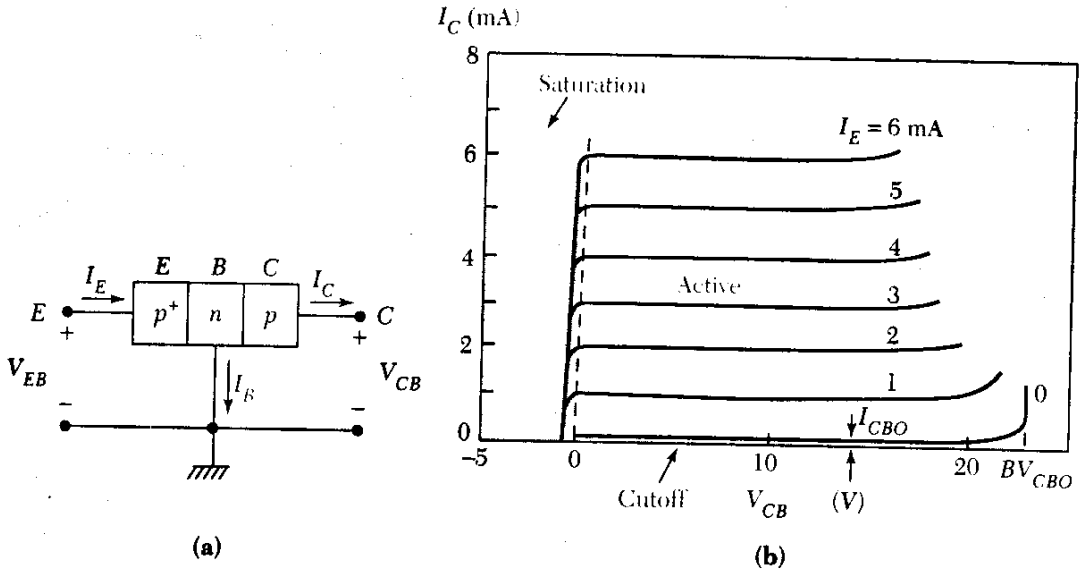

Fig. 8 (*a*) Common-base configuration of a *p-n-p* transistor. (*b*) Its output current-voltage characteristics.

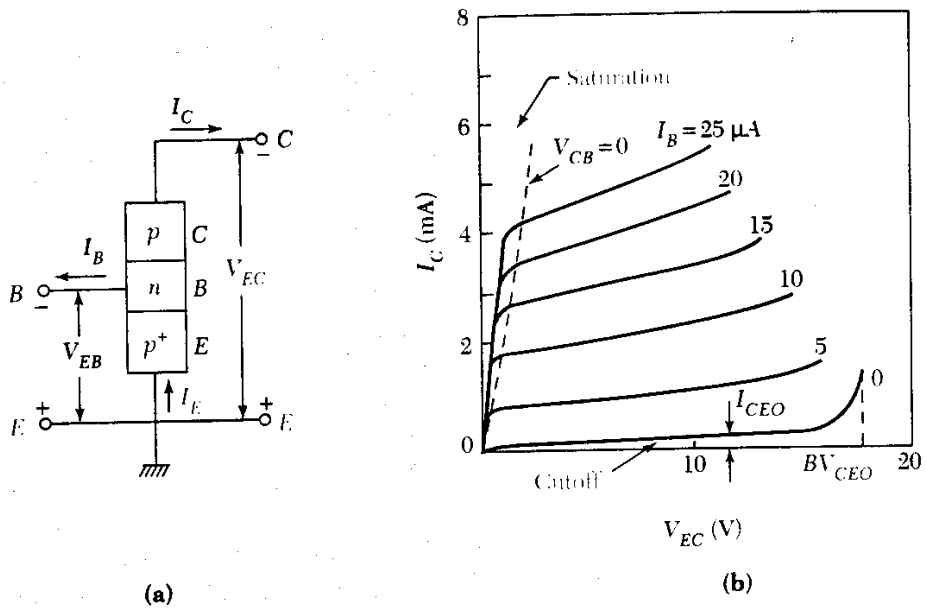

Fig. 10 (*a*) Common-emitter configuration of a *p-n-p* transistor. (*b*) Its output current-voltage characteristics.

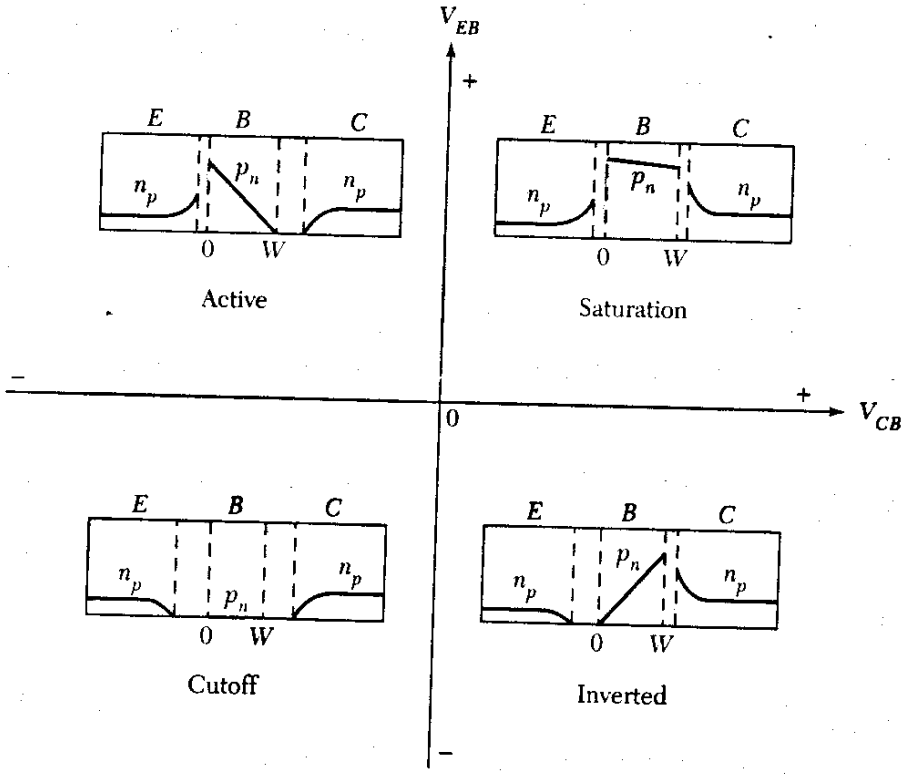

Fig. 7 Junction polarities and minority carrier distributions of a *p-n-p* transistor under four modes of operation.