

## 4.2.2 Diode Water Analogy

A diode (or rectifier) acts as a one-way gate to current flow—see the water analogy in Fig. 4.13. Current flows in the direction of the arrow, from anode (+) to cathode (–), provided the *forward voltage*  $V_F$  across it exceeds what's called the *junction threshold voltage*. As a general rule of thumb, silicon p-n junction diodes have about a 0.6-V threshold, germanium diodes a 0.2-V threshold, and Schottky diodes a 0.4-V threshold. However, don't take this rule too seriously, because with real-life components, you'll find these thresholds may be a few tenths of a volt off. For example, it's entirely possible for a p-n junction diode's threshold to be anywhere between 0.6 and 1.7 V; for germanium, 0.2 to 0.4 V; and for Schottky diodes, 0.15 to 0.9 V.

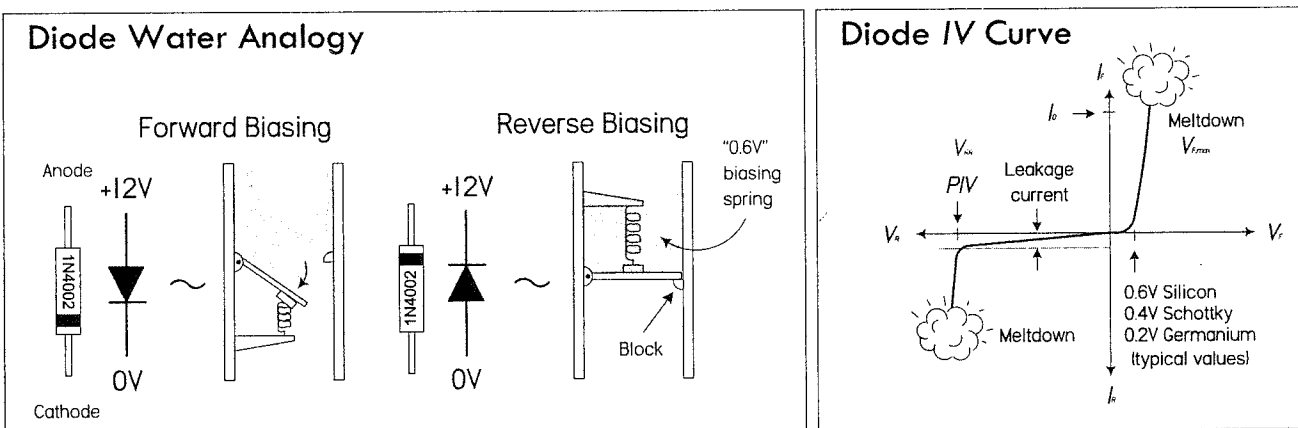


FIGURE 4.13

In terms of limits, avoid supplying a diode with a forward current  $I_F$  beyond its *peak current rating* ( $I_{Omax}$ ). If you do, you'll get internal junction meltdown. Likewise avoid applying a reverse voltage  $V_R$  any bigger than the diode's *peak inverse voltage* (PIV) rating. This, too, can render a diode worthless. See the graph in Fig. 4.13.