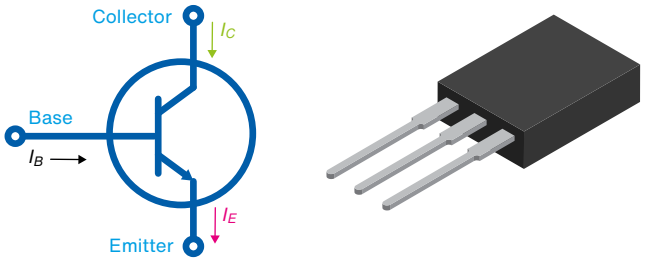
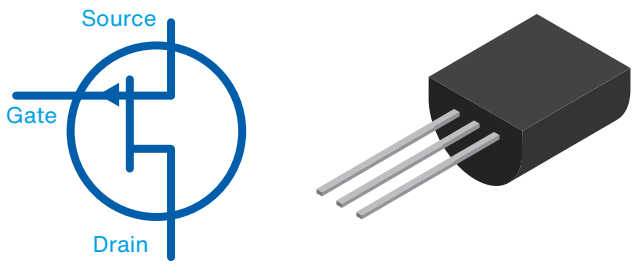
Classification

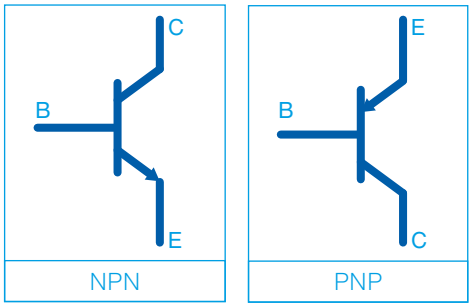


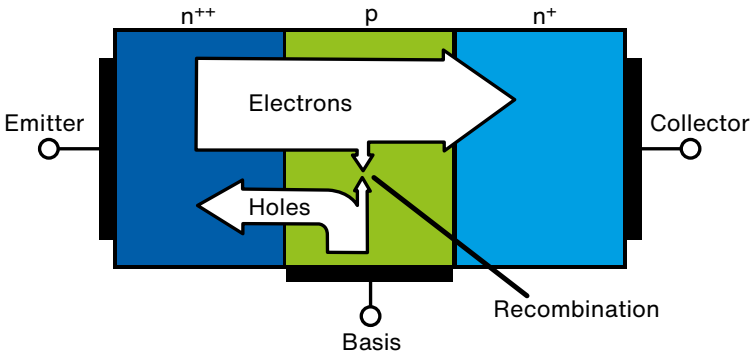
A bipolar transistor has terminals labeled base (B), collector (C), and emitter (E). A small current at the base terminal can control or switch a much larger current between the collector and emitter terminals.



For a field-effect transistor, the terminals are labeled gate, source, and drain, and a voltage at the gate can control a current between source and drain.

Circuit symbols





Bipolar Junction Transistor (BJT)

Bipolar transistors conduct by using both majority and minority carriers. The bipolar junction transistor is a combination of two junction diodes and is formed of either a thin layer of p-type semiconductor sandwiched between two n-type semiconductors (NPN), or a thin layer of n-type semiconductor sandwiched between two p-type semiconductors (PNP).

Metal Oxide Semiconductor FET (MOSFET)

The MOSFET is a type of field-effect transistor fabricated by the controlled oxidation of a semiconductor, typically silicon. The voltage at the insulated gate determines the device's conductivity, making it useful for amplifying or switching electronic signals.

	n-channel	p-channel
depletion		
enhancement		

JFETs (Junction-gate field effect transistor)

The field-effect transistor uses either electrons (in n-channel FET) or holes (in p-channel FET) for conduction. In a FET, the drain-to-source current flows via a conducting channel that connects the source region to the drain region. When a voltage is applied between the gate and source terminals, the conductivity varies in relation to the resulting electric field. As the gate-source voltage (V_{GS}) increases, the drain-source current (I_{DS}) increases with V_{GS}. The junction FET gate forms a p–n diode with the channel which lies between the source and drains.