

PLATE 6 Well and substrate contacts.

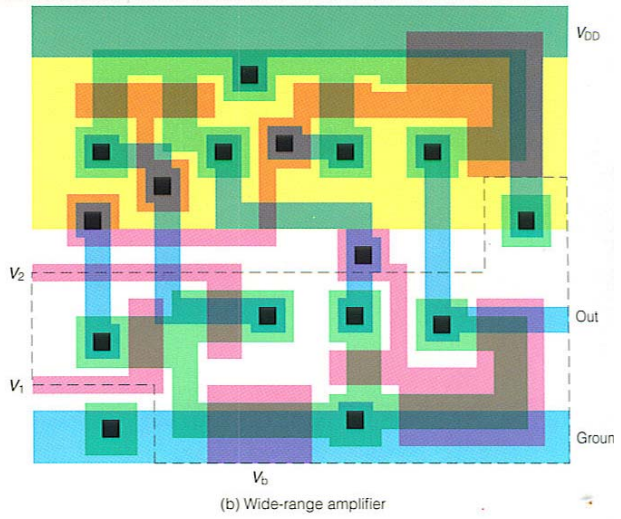
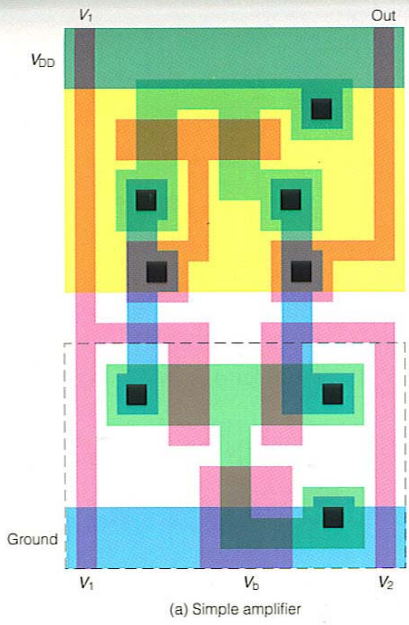
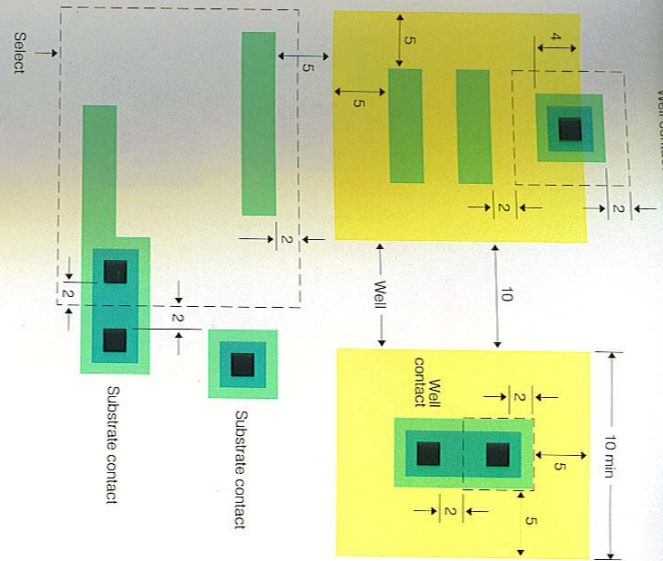


PLATE 7 Transconductance amplifiers.

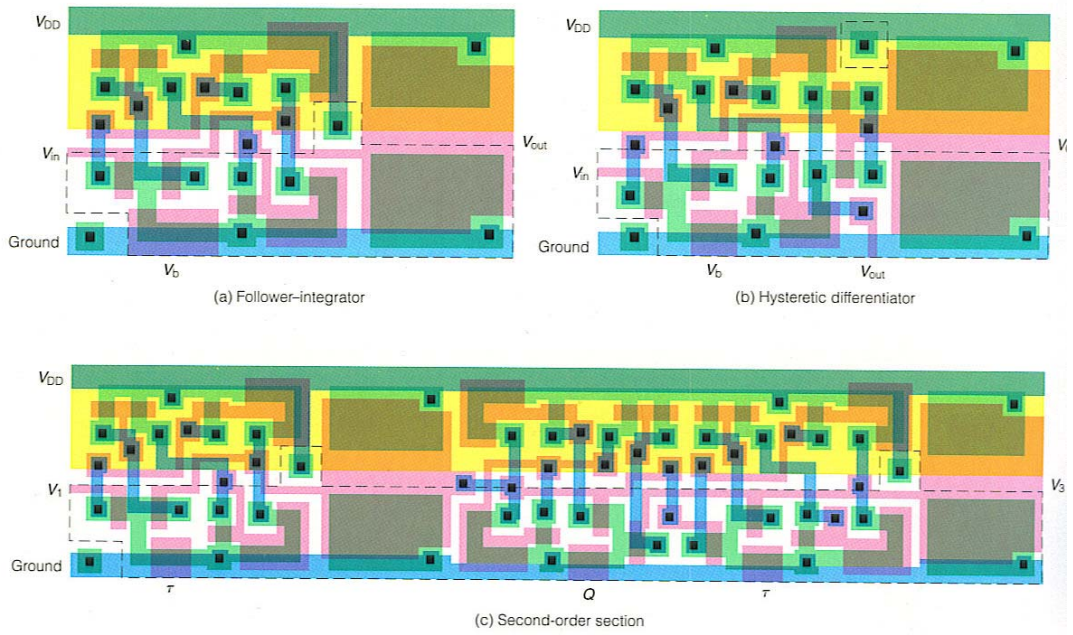


PLATE 8 Circuits implementing time-domain operations.

NEURONS

CHAPTER 4

The basic *anatomical* unit in the nervous system is a specialized cell called the **neuron**. An artist's view of a typical neuron is shown in Figure 4.1. Many extensions of the single cell are long and filamentary; these structures are called **processes**. Every neuron plays several functional roles in a neural system:

1. Metabolic machinery within the cell provides a power source for information-processing functions. In addition, the cell enforces a certain unity for biochemical mechanisms throughout its extent.
2. A tree of processes called **dendrites** is covered with special structures called **synapses**, where junctions are formed with other neurons. These synaptic contacts are the primary information-processing elements in neural systems.
3. Processes act as wires, conveying information over a finite spatial extent. The resistance of fine dendrites allows the potential at their tips to be computed with only partial coupling to other computations in the tree.
4. Temporal integration of signals occurs over the short term through charge storage on the capacitance of the cell membrane, and over the longer term by means of internal second messengers and complex biochemical mechanisms.