

Basic Electronics

Electronics involves the harnessing of electricity to perform specific functions. In order to control the flow of electrons, which carry the electrical charge, certain principles have been discovered and/or developed. From these principles, a number of simple (and not so simple) electronic devices have been developed.

Basic Principle #1

Electrons flows from a source to a destination, with a measurable pressure, resistance to that pressure, and resulting flow.

Basic Principle #2

By providing resistance to the pressure (Voltage) provided by the source, the actual amount of electron flow (Current) can be regulated.

Basic Principle #3 (Ohm's Law)

Resistance equals Voltage divided by Current
 $R=E/I$ or $I=E/R$ or $E=IR$

AC vs. DC

DC (Direct Current) flows in one direction only.

AC (Alternating Current) periodically flows in one direction, then the other.

Examples:

Battery (DC)

Wall outlet (AC)

Voltage Source

Provide a known amount of voltage into the system.

Resistors

Limit the flow of electrical current through them.

Capacitors

Store electrical current, block direct current while passing alternating current

Diodes

Allow the flow of current in one direction only.

Transistors

Remotely controllable 'valves' or 'gates', which allow through variable amounts of current based on the control signal.

Integrated Circuits

Complete circuits on a single chip, which may consist of numerous resistors, capacitors, transistors, etc.