

Basic Electronic Components

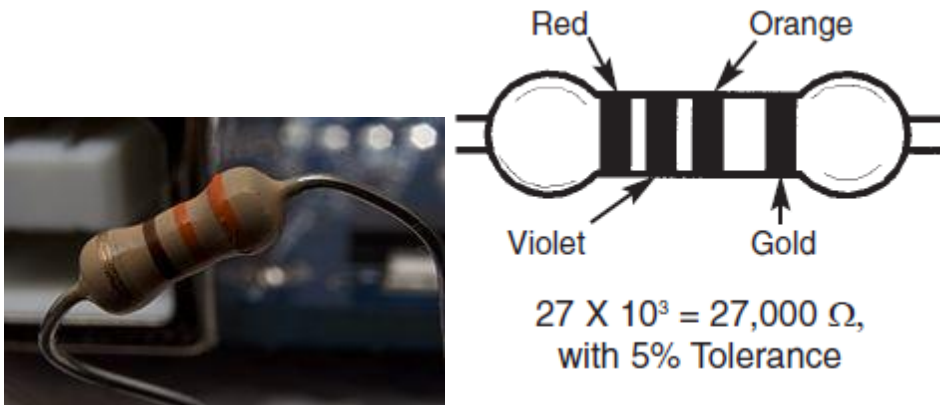
Circuit components

Resistors

The resistor's function is to reduce the flow of electric current.

This symbol  is used to indicate a resistor in a circuit diagram, known as a schematic.

Resistance value is designated in units called the "Ohm." A 1000 Ohm resistor is typically shown as 1K-Ohm (kilo Ohm), and 1000 K-Ohms is written as 1M-Ohm (megohm).




BAND 1 1st Digit		BAND 2 2nd Digit		Multiplier		Resistance Tolerance	
Color	Digit	Color	Digit	Color	Multiplier	Color	Tolerance
Black	0	Black	0	Black	1	Silver	+10%
Brown	1	Brown	1	Brown	10	Gold	+5%
Red	2	Red	2	Red	100	Brown	+1%
Orange	3	Orange	3	Orange	1,000	Red	+2%
Yellow	4	Yellow	4	Yellow	10,000	Orange	+3%
Green	5	Green	5	Green	100,000	Green	+5%
Blue	6	Blue	6	Blue	1,000,000	Blue	+25%
Violet	7	Violet	7	Silver	0.01	Violet	+1%
Gray	8	Gray	8	Gold	0.1		
White	9	White	9				

Capacitors


The capacitor's function is to store electricity, or electrical energy.

The capacitor also functions as a filter, passing alternating current (AC), and blocking direct current (DC).

This symbol  is used to indicate a capacitor in a circuit diagram.




Inductors

An inductor (or reactor) is a passive electrical component that can store energy in a magnetic field created by the electric current passing through it. This symbol  is used to indicate a coil in a circuit diagram. An inductor's ability to store magnetic energy is measured by its inductance, in units of henries. Typically an inductor is a conducting wire shaped as a coil; the loops help to create a strong magnetic field inside the coil due to Ampere's Law. Inductors called chokes are used as parts of filters in power supplies or to block AC signals from passing through a circuit.



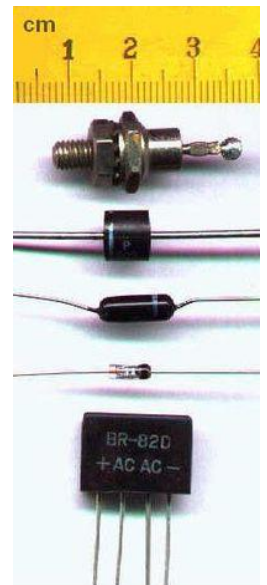
Semiconductors

- **Diodes**

A diode is a semiconductor device which allows current to flow through it in only one direction. Although a transistor is also a semiconductor device, it does not operate the way a diode does. A diode is specifically made to allow current to flow through it in only one direction. This symbol  is used to indicate a diode in a circuit diagram.

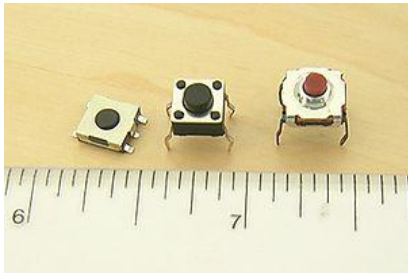
- **Transistors (MOSFETs)**

The metal–oxide–semiconductor field-effect transistor (MOSFET, MOS-FET, or MOS FET) is a transistor used for amplifying or switching electronic signals.



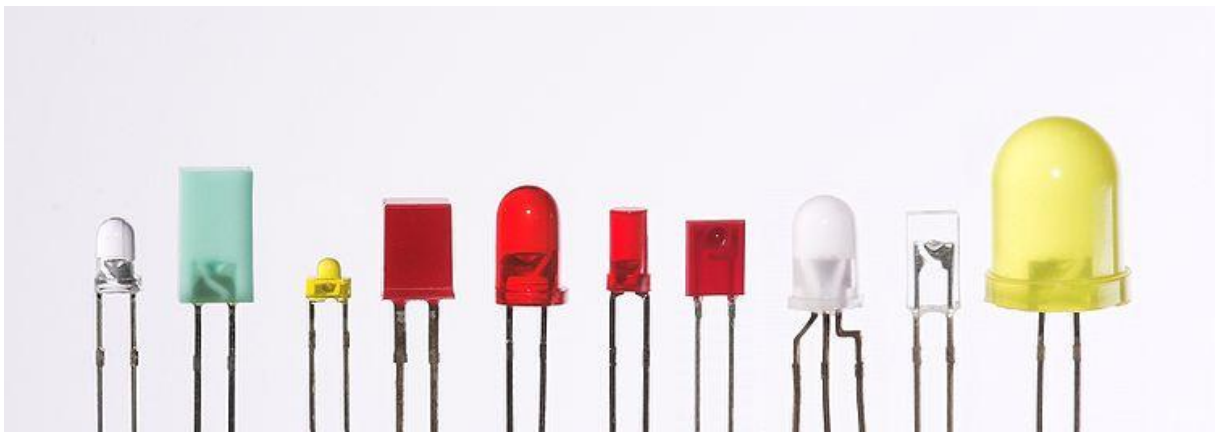
Switches

Switch is an electrical component that can break an electrical circuit, interrupting the current or diverting it from one conductor to another.



Light Emitting Diodes (LEDs)

A light-emitting diode is a semiconductor light source. LEDs are used as indicator lamps in many devices, and are increasingly used for lighting. Introduced as a practical electronic component in 1962,[2] early LEDs emitted low-intensity red light, but modern versions are available across the visible, ultraviolet and infrared wavelengths, with very high brightness.



Sensors

A sensor is a device that measures a physical quantity and converts it into a signal which can be read by an observer or by an instrument.

Couple of sensors that might be of use:

Infrared Sensor (PIR): A Passive Infrared sensor is an electronic device that measures infrared (IR) light radiating from objects in its field of view.

Motion Detector: A motion detector is a device that contains a physical mechanism or electronic sensor that quantifies motion that can be either integrated with or connected to other devices that alert the user of the presence of a moving object within the field of view

Piezoelectric sensor: A piezoelectric sensor is a device that uses the piezoelectric effect to measure pressure, acceleration, strain or force by converting them to an electrical signal.

Proximity sensor: A proximity sensor is a sensor able to detect the presence of nearby objects without any physical contact.

Microphone: A microphone is an acoustic-to-electric transducer or sensor that converts sound into an electrical signal.

Tachometer: A tachometer is an instrument that measures the rotation speed of a shaft or disk, as in a motor or other machine. The device usually displays the revolutions per minute (RPM) on a calibrated analogue dial, but digital displays are increasingly common

IMU: An inertial measurement unit, or IMU, is an electronic device that measures and reports on a craft's velocity, orientation, and gravitational forces, using a combination of accelerometers and gyroscopes.

Photodiode: A photodiode is a type of photodetector capable of converting light into either current or voltage, depending upon the mode of operation.

Actuators

An actuator is a mechanical device for moving or controlling a mechanism or system. It is operated by a source of energy, usually in the form of an electric current, hydraulic fluid pressure or pneumatic pressure, and converts that energy into some kind of motion.