
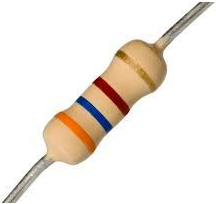

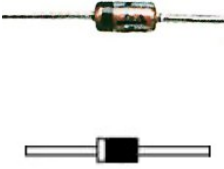
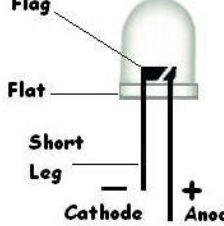

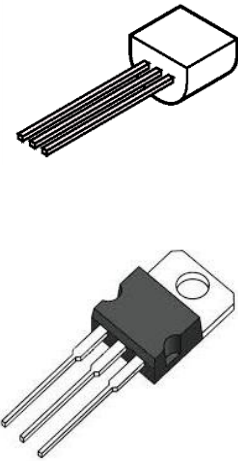




COMPONENT RECOGNITION

It is important that students understand the symbols, designations and general principles of the various electronic components before they begin their project.

CAPACITORS		<p>Capacitor is used to store electric charge. It acts as short circuit with AC and open circuit with DC.</p> <p>The capacitor's positive and negative leads can be identified by two methods: (1) The stripe on the capacitor's body marks the negative lead or (2) the short lead is negative.</p> <p>There are different types of capacitors e.g: Disk Ceramic Capacitor, Electrolytic Capacitor.</p> <p>DISK CERAMIC CAPACITOR These are a round disk with two leads. They can be placed either way round. The value is marked on one side.</p> <p>ELECTROLYTIC CAPACITOR These have a cylindrical body with a stripe down one side. The stripe indicates the negative lead and the other lead is positive - these must be connected correctly or the PCB will not work. The electrolytic capacitor will be damaged and may cause damage or injury if it is installed in the wrong direction and power is applied.</p>
RESISTORS		<p>A resistor is a passive two-terminal electrical component that implements electrical resistance as a circuit element. Resistors act to reduce current flow, and, at the same time, act to lower voltage levels within circuits.</p> <p>Resistors have a cylindrical body and are marked with coloured bands. The coloured bands are used to mark the value of the resistor. You should refer to the component parts list to identify the correct value resistors. The resistors and their values are marked on the PCB.</p> <p>Resistors do not need to be placed in any particular direction. However, the convention is that horizontal resistors are mounted with the gold (tolerance) band to the right and vertical resistors to the bottom.</p>

<p>LIGHT DEPENDANT RESISTISTOR (LDR)</p>		<p>An LDR is a component that has a (variable) resistance that changes with the light intensity that falls upon it. This allows them to be used in light sensing circuits.</p> <p>Light dependent resistors come in different shapes and colours. LDRs are very useful in many electronic circuits, especially in alarms, switching devices, clocks, street lights and more.</p>
<p>DIODE</p>		<p>A diode is a discrete component that allows current to flow in one direction only. It is a polarised component with two leads, called the cathode (the negative end) and the anode (the positive end). The cathode is marked with a band at that end of the diodes body.</p> <p>Small signal diodes and Zener diodes usually have a glass body. Power diodes usually have a black plastic body.</p> <p>The position of diodes and their direction are marked on the PCB.</p>
<p>LIGHT EMITTING DIODE (LED)</p>		<p>Light emitting diode (LED) is a light-generating device which is often used to indicate when a device is on. LEDs only work in one direction. They must be correctly oriented or they will not work. The negative lead can be identified in one of three ways (although not all LEDs use methods 2 & 3).</p> <p>The methods are:</p> <ol style="list-style-type: none"> 1) The flag (the larger connection inside the body) identifies the negative lead. This is visible when the LED is held up to the light. All LEDs use this method. 2) The short leg is negative 3) A flat on the ridge, around the base of the LED is on the negative side.
<p>INFRARED TRANSMITTER LED</p>		<p>Infrared transmitter LED is a type of LED that works in the invisible light spectrum. You will not know if it is working by looking at it. It has 2 leads and will not work if incorrectly positioned on the PCB. It uses the same methods as the LED shown above to identify the negative and positive leads.</p>

<p style="writing-mode: vertical-rl; transform: rotate(180deg);">TRANSISTORS</p>		<p>A transistor is a miniature electronic component that can do two different jobs. It can work either as an amplifier or a switch:</p> <p>Different transistors may look the same, but if any transistors are wrongly placed the PCB won't work. The transistors have 3 leads (legs). The Emitter (E), Base (B) and the Collector (C). Connect the leads as per the markings, and refer to the illustrations to identify the leads for each type of transistor – connecting these correctly is critical.</p> <p>Correct positioning of the transistors is important. Although the transistors appear to be the same, they are not interchangeable and must be placed in the correct position and orientation. The transistor leads are a snug fit and it may be necessary to wiggle them gently from side to side to fit them into the holes. Solder the transistors to the PCB the trim the legs.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">INTEGRATED CIRCUITS (IC)</p>		<p>An integrated circuit (IC), sometimes called a <i>chip</i> or microchip, is a semiconductor on which thousands or millions of tiny resistors, capacitors, and transistors are fabricated. An IC can function as an amplifier, oscillator, timer, counter, computer memory or microprocessor. An IC is categorized as either linear (analogue) or digital depending on its intended application.</p> <p>Integrated Circuits (IC) look like beetles with lots of legs, from 8 to 40 legs are common. They have a notch (or dimple) at one end. ICs must be placed on the PCB with the notch facing in the direction, as shown on the PCB. If power is connected to the PCB with these facing the wrong way, the PCB will not work and the Integrated Circuit will be permanently damaged.</p> <p>Do NOT mount the I.C. into the socket when soldering as it may be damaged during soldering.</p>
<p style="writing-mode: vertical-rl; transform: rotate(180deg);">INDUCTOR</p>		<p>An inductor is a passive electronic component that stores energy in the form of an electromagnetic field. In its simplest form. It consists of a wire loop or coil. They can also look like large resistors, and can be mounted in either direction</p>