

Glossary Terminology of General Purpose Resistors

Fusible Resistor (Fuse Resistor, Circuit Protect Resistor)

A resistor designed to protect a circuit against overload; its resistance limits current flow and thereby protects against surges when power is first applied to a circuit; its fuse characteristic opens the circuit when current drain exceeds design limits.

Thermal Cutoff Resistor

The maximum nominal resistance value at which the rated power can be applied continuously without exceeding the maximum working voltage is the critical resistance value. The rated voltage is equal to the maximum working voltage in the critical resistance value. If the circuit designs permits, the choice of a high ohmic value resistor or divider network will eliminate this consideration.

A thermal fuse is a cutoff which uses a one-time fusible link. Unlike the thermostat which automatically resets itself when the temperature drops, the thermal fuse is more like an electrical fuse: a single-use device that cannot be reset and must be replaced when it fails or is triggered. A thermal fuse is most useful when the overheating is a result of a rare occurrence, such as failure requiring repair (which would also replace the fuse) or replacement at the end of service life.

Token offers “Thermal Cut-off Resistor”, a thermal Cut-offs is a fusible alloy and a resistor is a voltage divider, both are surrounded by a ceramic cement with special resin. Under normal operating temperatures the fusible alloy joins the two lead wires within the body of the cutoff and the power resistor acts as a normal function resistor. When the preset temperature of the cutoff is reached, the fusible alloy melts and with the aid of the special resin, complete cutoff is ensured.

Thermal fuse resistors are usually found in heat-producing electrical appliances such as coffeemakers and hair dryers. They function as safety devices to disconnect the current to the heating element in case of a malfunction (such as a defective thermostat) that would otherwise allow the temperature to rise to dangerous levels, possibly starting a fire.

Anti-Surge Resistor (RCR)

Surges in electronic circuits are caused by internal conditions — switching operations from other electronic components or due to external conditions on the AC power mains — switching operations in the power grid or from nearby lightning strikes, either directly to the power distribution system or to nearby ground. Electronic products have to be surge immune to ensure their continued reliable operation if subjected to realistic levels of surge voltages, and they are required to comply with safety requirements. Token's RCR series is a perfect fit when an anti-surge resistor is required.

Light Dependent Resistor (LDR)

A photoresistor or light dependent resistor or cadmium sulfide (CdS) cell is a resistor whose resistance decreases with increasing incident light intensity. It can also be referenced as a photoconductor.

A photoresistor is made of a high resistance semiconductor. If light falling on the device is of high enough frequency, photons absorbed by the semiconductor give bound electrons enough energy to jump into the conduction band. The resulting free electron (and its hole partner) conduct electricity, thereby lowering resistance.

Carbon Composition Resistor (CCR)

CCR is made up of a solid rod of conductive composite material, the chemical composition of which is altered to produce different resistance values. The general composition consists of the carbon conductor and ceramic filler materials. By altering the ratio of filler to conductor it is possible to change the resistance value. Interference-fit end caps are attached to the rods, leads are welded onto these caps, and the resistor body is then protected with a specially formulated epoxy coating. The resistors are then colour code marked.

Ayrton-Perry Winding

Winding of two wires in parallel but opposite directions to give better cancellation of magnetic fields than is obtained with a single winding.

Wirewound technology has long been known as a leading technology for power resistor needs. The most critical drawback with this technology is that it is inherently inductive. This is logical given that a wirewound inductor and a wirewound resistor are made with essentially the same materials and processes. This fact limits the use of wirewounds for applications with high switching speeds, which require low inductance.

Now the same standard wirewounds can be used for these applications by using a non-inductively wound version. This manufacturing method greatly reduces the inductance of any given resistor size and value combination, however it does not completely eliminate the inductance. A non-inductively wound wirewound has one winding in one direction and one in the other direction; known as Ayrton Perry winding. This non-inductive winding is available in all Token standard wire-wound resistor series.