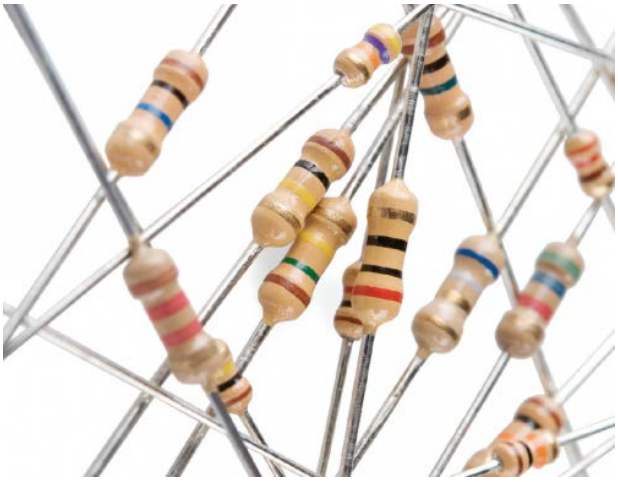
STUDY ON RESISTORS

Take a Stance, The Resist Stance

Resistors - the most ubiquitous of electronic components. They are a critical piece in just about every circuit. And they play a major role in our favorite equation, Ohm's Law.



Resistor Basics

Resistors are electronic components which have a specific, never-changing electrical resistance. The resistor's resistance **limits the flow of electrons** through a circuit.

They are **passive** components, meaning they only consume power (and can't generate it). Resistors are usually added to circuits where they complement **active** components like op-amps, microcontrollers, and other integrated circuits. Commonly resistors are used to limit current, divide voltages, and pull-up I/O lines.

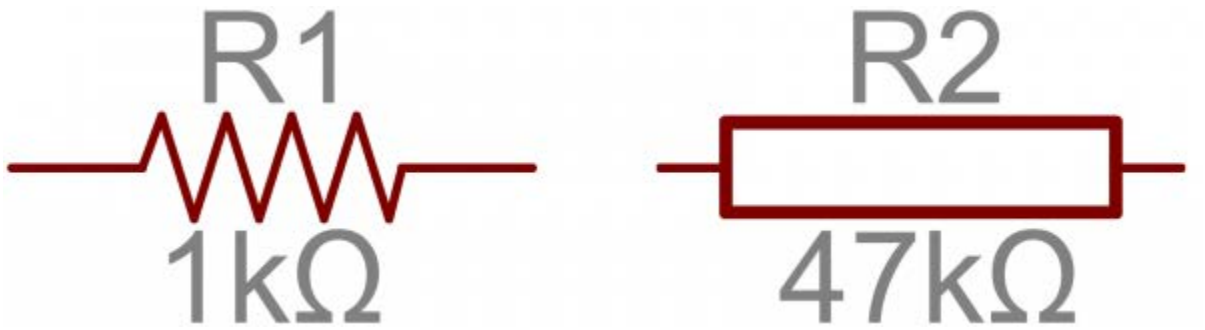
Resistor units

The electrical resistance of a resistor is measured in **ohms**. The symbol for an ohm is the greek capital-omega: Ω. The (somewhat roundabout) definition of 1Ω is the resistance between two points where 1 volt (1V) of applied potential energy will push 1 ampere (1A) of current.

As SI units go, larger or smaller values of ohms can be matched with a prefix like kilo-, mega-, or giga-, to make large values easier to read. It's very common to see resistors in the kilohm (kΩ) and megaohm (MΩ) range (much less common to see miliohm (mΩ) resistors). For example, a 4,700Ω resistor is equivalent to a 4.7kΩ resistor, and a 5,600,000Ω resistor can be written as 5,600kΩ or (more commonly as) 5.6MΩ.

Schematic symbol

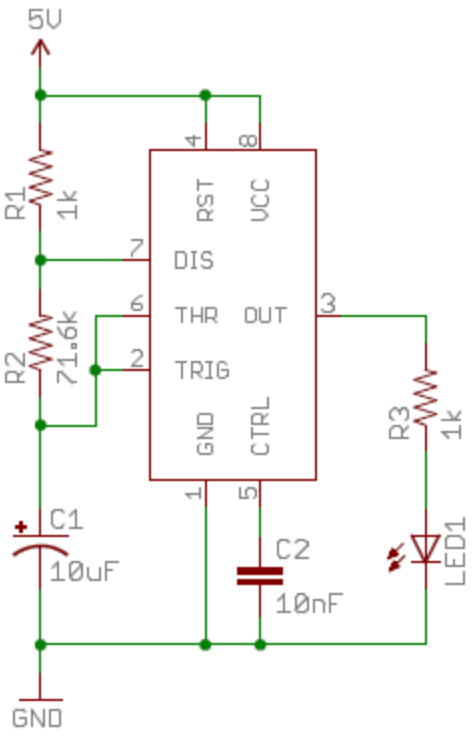
All resistors have **two terminals**, one connection on each end of the resistor. When modeled on a schematic, a resistor will show up as one of these two symbols:



Two common resistor schematic symbols. R1 is an American-style 1kΩ resistor, and R2 is an international-style 47kΩ resistor.

The terminals of the resistor are each of the lines extending from the squiggle (or rectangle). Those are what connect to the rest of the circuit.

The resistor circuit symbols are usually enhanced with both a resistance value and a name. The value, displayed in ohms, is obviously critical for both evaluating and actually constructing the circuit. The name of the resistor is usually an *R* preceding a number. Each resistor in a circuit should have a unique name/number. For example, here's a few resistors in action on a 555 timer circuit:



In this circuit, resistors play a key role in setting the frequency of the 555 timer's output. Another resistor (R3) limits the current through an LED.

Source : https://learn.sparkfun.com/tutorials/resistors