

Why an LED requires a series resistor?

LED is always connected to the power supply through a series resistor. This resistor is called as "Ballast resistor" which protects LED from damage due to excess current. It regulates the forward current to the LED to a safer limit and protects it from burning. Value of the resistor determines the forward current and hence the brightness of LED. The simple equation $V_s - V_f / I_f$ is used to select the resistor value. V_s represent input voltage of the circuit, V_f the forward voltage drop of LED and I_f , the allowable current through the LED. The resulting value will be in Ohms. It is better to restrict the current to a safer limit of 20 mA.

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