



LED Lite - 9-Inch LED Lite Bar

Light Emitting Diodes (LEDs) are an attractive, economical and convenient option for lighting applications. Available in a wide variety of colors and sizes, LEDs provide for low-voltage, low-cost, highly-reliable lighting solutions. Applications range from lighting in aquariums, recreational vehicles, marine & aircraft vehicles to computer case mods, under-vehicle lighting, emergency/security lighting and accent-lighting at home – the options are endless.

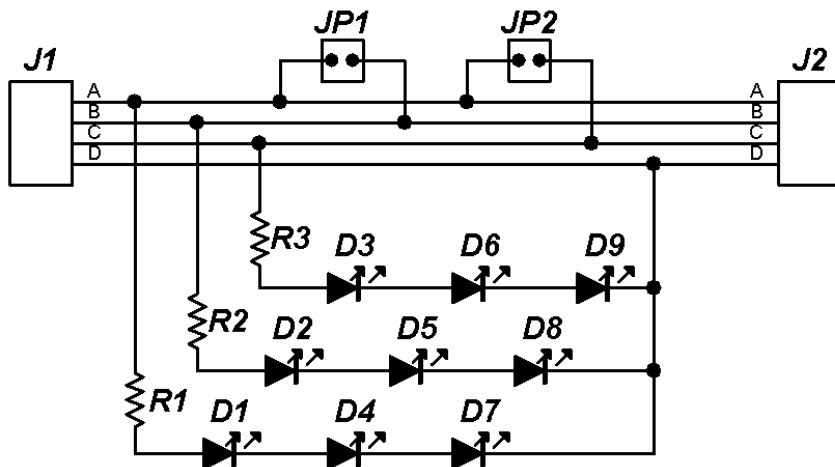
One challenge with LEDs is the mounting of the individual displays. We have produced the **LED Lite**, a versatile mounting system which holds a total of nine equally-spaced LEDs on a compact 9" x 1/2" (229mm x 13mm) display board. Shown below is the layout of the **LED Lite**, clearly showing the mounting of the nine LEDs and three resistors.



The **LED Lite** board design allows for the nine LEDs to be controlled in sets of three. As power is applied to connection "A" and "D", LEDs at position D1, D4 and D7 will illuminate. Alternately, as power is applied to connection "B" and "D", LEDs at position D2, D5 and D8 will illuminate. The last set of LEDs at D3, D6 and D9 will illuminate when power is applied to connections "C" and "D".

Common to each of the lighting options is connection "D", which is the common ground (negative or cathode); while connection "A", "B" and "C" are where power (positive voltage or anode) is applied. The schematic outlines the connectivity available on the **LED Lite** display board.

As an added convenience to the **LED Lite**, an option has been included to allow a single power supply to be utilized between connections "A" and "D" that will allow all nine LEDs to illuminate. This is accomplished by soldering a jumper across JP1 and JP2. Simply apply voltage to connections "A" and "D" and all nine LEDs will illuminate. Resistors are still required at R1, R2 and R3.



Another exclusive feature of the **LED Lite** board allows you to chain the output of one board to the input of another. Connect the "A", "B", "C" and "D" outputs on one board to the corresponding inputs on the next board. The "A", "B", "C" and "D" connections are connected straight through on the board so either end can be an input or output to connect to the next board. Care should be taken to only connect up to a maximum of four boards in the manner.

Using LEDs does require care to limit the maximum current through the circuit – this is known as Current Limiting. Current Limiting is the process of restricting or controlling the total current draw of a circuit with the use of resistors.

This is accomplished on the **LED Lite** with current limiting resistors located at positions *R1*, *R2*, and *R3*. *R1* limits the current for LEDs *D1*, *D4*, and *D7*, while *R2* limits the current through LEDs *D2*, *D5*, and *D8* while *R3* limits the current through *D3*, *D6* and *D9*.

The value of the current limiting resistor is determined by the supply voltage to the circuit, the voltage drop across each LED and the current desired through the circuit. As a rule, keep the current through each leg of the circuit to approximately 20mA to 25mA, which is normally the standard for LEDs. The chart below will assist you in determining the correct dropping resistor needed for your specific application.

For example, if you were going to run a set of Blue LEDs in an automobile, the normal battery voltage of a car is approximately 13.8v. Based on the chart, the supply voltage is between 13.5v and 14.0v and the Blue LED option shows you would require a 150 ohm dropping resistor.

If you purchased our full kit, you will find a 150-ohm resistor, which has a color code of brown-green-brown-gold. The color code was determined from the reference table below the Resistor Selection Chart. The full kit includes three resistors of each value listed for a total of 27 resistors.

Resistor Selection Chart				
LED Type/Color		Blue, UV & Green	White & Pink	Red & Yellow
LED Forward Voltage		Vf=3.5v	Vf=3.0v	Vf=2.0v
Supply Voltage	13.5v to 14.0v	150-ohm	220-ohm	330-ohm
	13.0v to 13.4v	120-ohm	200-ohm	330-ohm
	12.5v to 12.9v	100-ohm	150-ohm	330-ohm
	12.0v to 12.4v	68-ohm	150-ohm	270-ohm
	11.5v to 11.9v	43-ohm	120-ohm	270-ohm

Resistor Color Codes		
330-ohm (orange-orange-brown-gold)	270-ohm (red-violet-brown-gold)	220-ohm (red-red-brown-gold)
200-ohm (red-black-brown-gold)	150-ohm (brown-green-brown-gold)	120-ohm (brown-red-brown-gold)
100-ohm (brown-black-brown-gold)	68-ohm (blue-grey-black-gold)	43-ohm (yellow-orange-black-gold)

It is important that you use the correct current limiting resistor, as using a value too low can result in permanent damage to the LEDs in your circuit. If you use a value larger than is needed, the LEDs will not glow as brightly but no damage will occur.

As a final mounting option for your **LED Lite**, you can encase your board in a see-thru plastic or acrylic tube. This will protect the board from outside contaminants or inclement weather to prolong the usefulness of your LEDs and board. We also have available high-quality tubes complete with end caps to complete your project.

