

Emergency Lighting using LED 12V Strip lighting

(5/4/2016)



The result is light enough in weight to be easily back packed until a battery is found. There is likely to be lots of abandoned cars in a real emergency. The unit is designed to take the battery close to where the light is needed. In case the battery needs to stay in the vehicle, wire can be found locally, due the abundance of wire in cars, and extension cords likely to be easily found. The flexible strip allows for directing the light in a specific working direction. The unit is made from a waterproof “Cool White” 5050 120-degree SMD LEDs as found to be the most light-power efficient. 5 meter strings can be purchased from eBay for around \$9.00 and up.

In the circuit below $R1 = 75$ ohm 2 watt used for switching to low level of light. On Low at 12.16 V it draws 40.6 ma and uses about 0.5 Watt of power. On High at 12.16v it draws about 198 ma and uses about 2.4 watts of power. The following table shows typically how long it would produce light when running contentiously using a 100 amp-hr battery (typical car battery) that is fully charged.

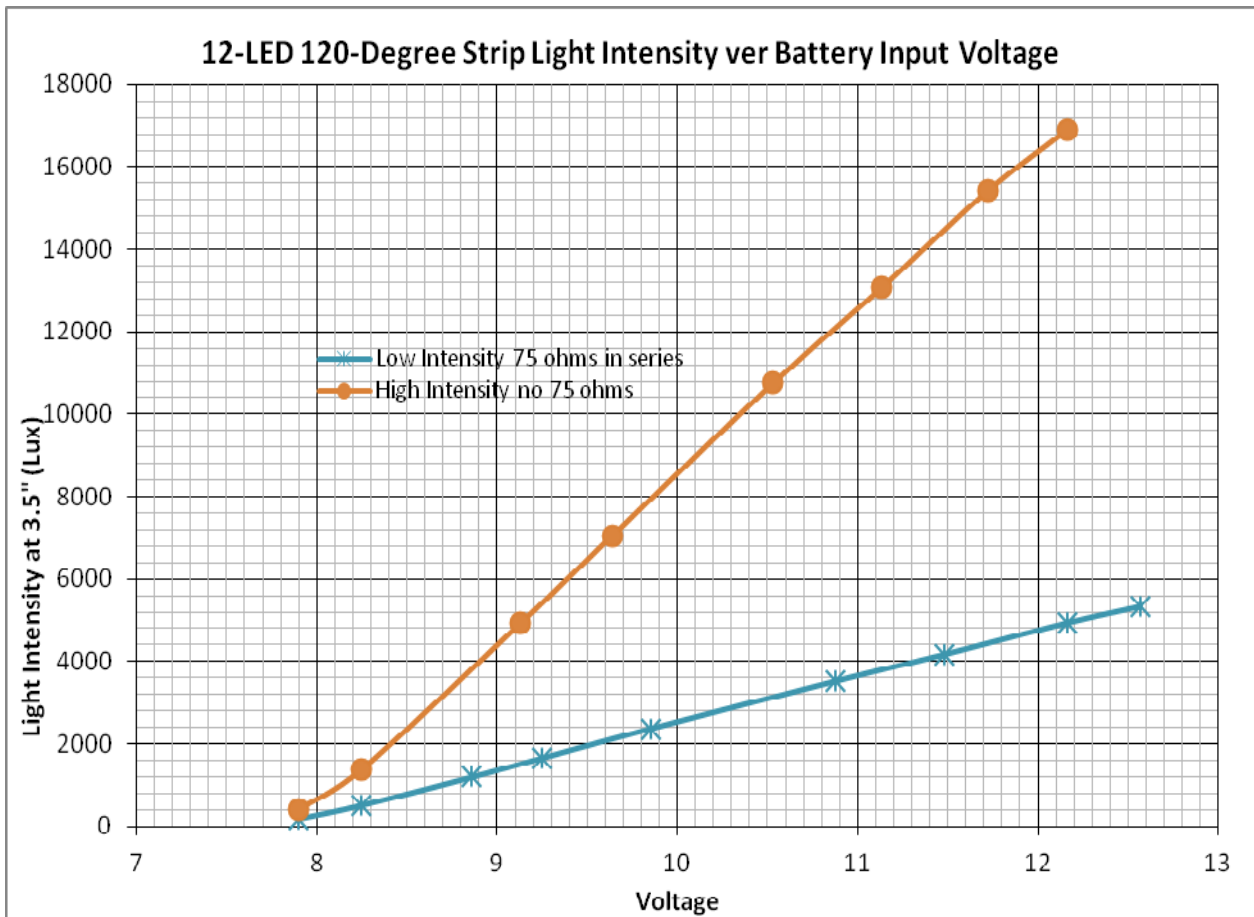
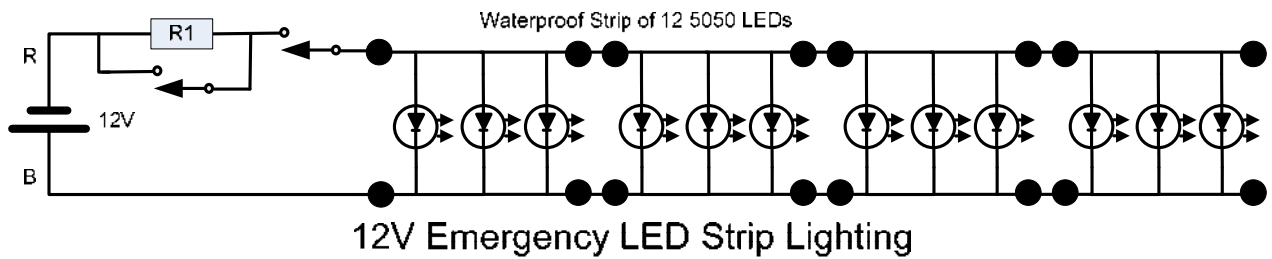
100 amp-hr battery would last about		
Switch On	Hours	Days
Low	2463	103
High	505	21

Low intensity at low voltage is the most efficient use of one’s power to produce light from these strings. On the average this string is about 42% more (power usage) efficient at producing light on “Low light” setting as compared to on the “High light” setting.

The following table shows the amount of wide angle light that is given off by the 12 LEDs in this strip light string. It will give off light all the way down to 8 volts. It is not designed to operate much above 12 volts. I have tested it to 15 volts but it tends to weaken permently the light output. I recommend staying below 13 volts.

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As a foot note: If there is plans to recharge the battery one does not want to go below some voltage between 11.0 and say 12 volts for a 12 volt battery. Rechargeable batteries are made of multiple cells. Over use and time each cell develops a different capacity (amp-hr). What happens during a deep discharge below 12 volts is one or more of the weaker cells can reverse and become charged in reverse voltage. The majority of the stronger cells pump electrons in a given discharging direction the weaker cell first goes to zero then charges up in reverse. This effectively ruins the cell and it becomes leaky and self discharges rapidly after being recharged in the original direction. Thus the battery then doesn't hold a charge and is considered no good. So if during use one sees a rechargeable battery starting to rapidly discharge compared to what it should be doing then one can assume a weak cell and stop at that point and recharge. At this point a full equalization charge (over charging until all cells have near equal voltage) would be desirable if one has the extra power available.