



LED Brake Lighting for Early Ford 6-Volt Systems

LED Lighting Basics, Sources, and “Do It Yourself”

**Northern Ohio Regional Group
May 16th 2008 Meeting**

Don Clink

How do we improve Early Ford brake lighting for safety?

Some solutions:

- Increase the reflective properties within the taillight housing
 - White paint
 - Reflective chrome tape
- Halogen bulbs
- Accessory 3rd Brake Lights
- LED Tail/Brake light options
 - 12 V Solutions

Some Early Ford Lighting Basics

Bulb	Number	Watts	Candle Power	Amps
Sealed Beam Headlamp	6006	50/40W		8.2/6.5A
Single Contact Brake Light	1129	16.6W	21cp	2.63A
Double Contact Tail/Brake Light	1154	16.6/.5W	21/3cp	2.63/.75A
Halogen – Double Contact Tail/Brake Light	1157 Style	55/10W		8.7/1.5

Early Ford Lighting Basic Math

Halogen Tail Light Bulb Impact on 6V/30A System

- Lights On with Original Incandescent Bulbs:
 - Headlamps 6006, 2 x 6.5A (Low Beam) = 13 Amps
 - Tail Lamps 1154, 2 x .75A = 1.5 Amp
 - Brake Lights 1154, 2 x 2.63 = 5.26 Amps
 - Total = 19.76 Amps
- Lights On with Halogen Tail Light Bulbs:
 - Headlamps 6006, 2 x 6.5A (Low Beam) = 13 Amps
 - Tail Lamps Halogen, 2 x 1.5A = 3.0 Amps
 - Brake Lights Halogen, 2 x 8.7A = 17.4 Amps
 - Total = 33.4 Amps !!
- Generator Output is 30 Amps
- Add Halogen Headlamps ??

Notes Concerning Conversion to LED Car bulbs

- **Which Color LEDs should I use ?**

- ***For best results the LED color should be the same as the lens color.***
As an example: a red lens will filter out all but the red portion of the light so if the light is all red, none or very little light will be blocked by the lens. The light from a White LED contains very little light in the red portion of the visible spectrum so most of the light would be filtered out by a red lens.

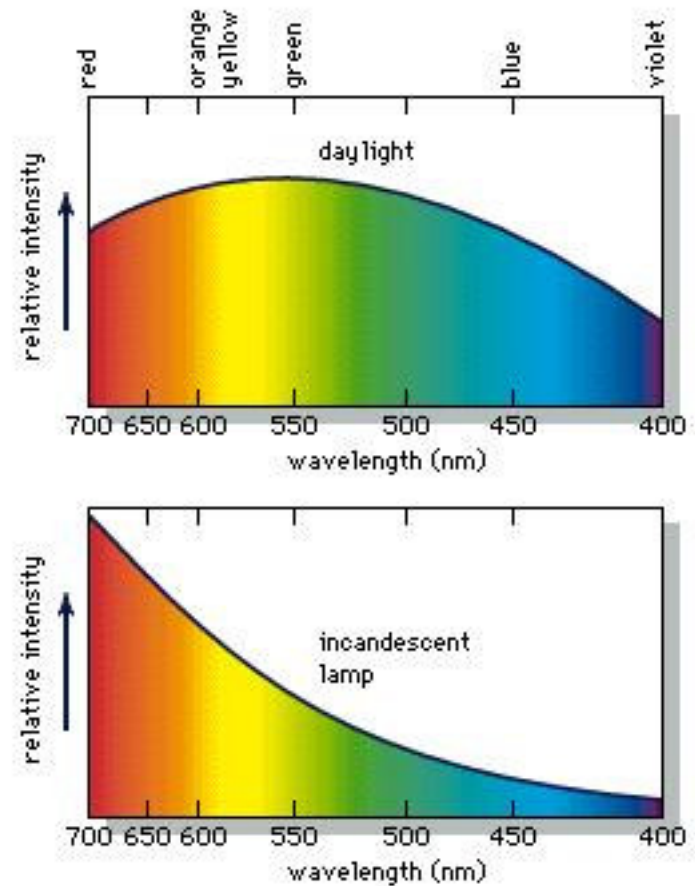
- **Brightness of LED Car Bulbs**

Most LED bulbs emit light like a flashlight, all out the end. Regular filament bulbs emit light from the end and all sides, so they will be better suited for some lighting applications than LED bulbs.

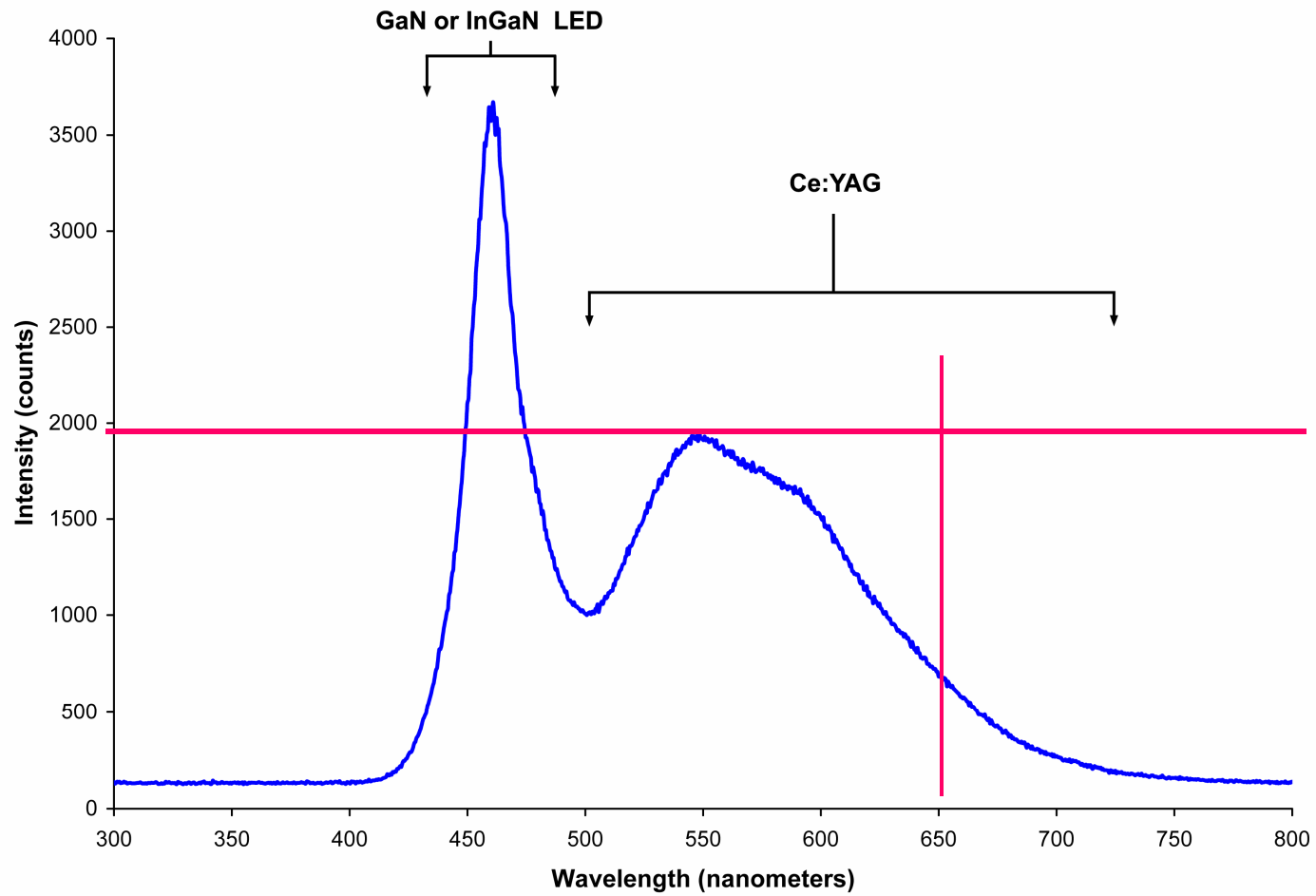
This is the same reason why we do not rate LED car bulbs in lumens or watts, the numbers would be deceptively low because the light is measured from all sides and the end on standard filament bulbs but only from the end on LED bulbs

Incandescent Color Spectrum

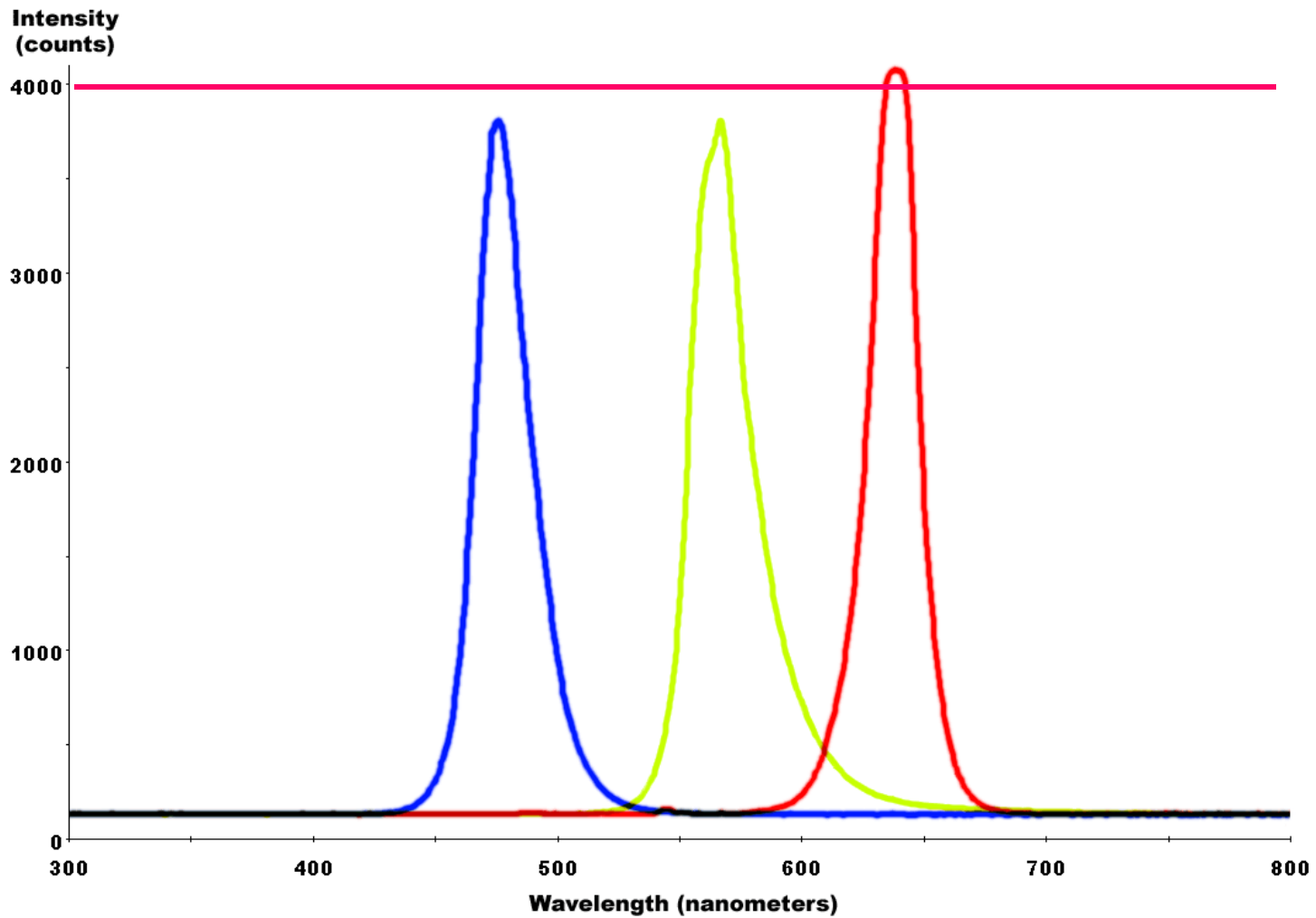
- All colors present in varying intensities



White LED Color Spectrum



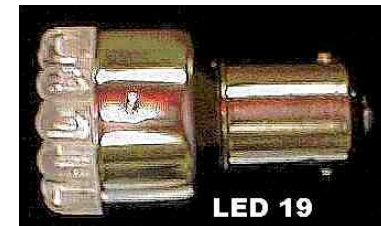
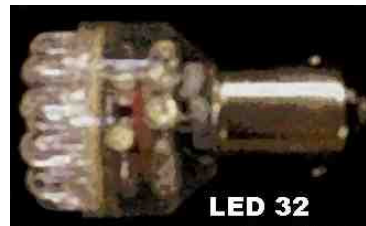
Blue, Yellow, Red LED Bulb Color Spectrum



HighSpeed Motors LED Bulbs

HIGHSPEED MOTORS

HIGHSPEED CORPORATION
 5280 Route 309
 Center Valley, PA 18034
 (610) 390-3105
 Email: georger@highspeedmotors.com



	6 VOLT POSITIVE GROUND LED BULBS REPLACE BOTH SINGLE OR DUAL FILAMENT INCANDESCENT BULBS ! TAIL, BRAKE AND TURN LIGHTS.		
6P01	LED, 19,WHITE, single/dual filament, positive ground, non-index base bulb		\$20.00
6P03	LED, 32,WHITE, single/dual filament, positive ground, non-index base bulb		\$28.00
6P04	LED, 32,WHITE, single/dual filament, positive ground, index base bulb		\$28.00

SuperBrightLEDs.com

<http://www.superbrightleds.com/cgi-bin/store/commerce.cgi?product=OTHER>

- **1156-x19-6V LED bulb - 6 Volt**
(Single Contact for Brake)



19-LED 6 Volt replacement bulb
15mm Single Intensity Bayonet Base
With 19 Wide Viewing Angle LEDs

Non-Polarized bulb can be with Positive or Negative ground vehicle
Available with Red, Amber or White LEDs

\$ 7.95

- **1157-x19-6V LED bulb - 6 Volt**
(Dual Contact for Brake and Tail)



19-LED 6 Volt replacement bulb
15mm Dual Intensity Base
With 19 Wide Viewing Angle LEDs

Non-Polarized bulb can be with Positive or Negative ground vehicle
Available with Red, Amber or White LEDs

\$ 7.95

LED Bulbs With Turn Signals

- **Turn signal issues with LED bulbs**
 - LED brake/tail lamps will not flash with thermal flasher units due to their extremely low current draw. One fix is the installation of Load Resistors which are wired across (in parallel with) the turn signal bulbs to simulate the load of a standard filament bulb.
 - If there is a standard bulb in the circuit (front turn signal lamp), the flashers will work

RL-650 Tail Light Load Resistor kit

6 Ohm, 50 Watt load resistor kit

Solves most LED turn signal problems

Connect one across each LED turn signal bulb to simulate filament Tail/Turn signal bulbs

\$ 4.95



Brake-Lighter LED 3rd Brake Light

L.E.D. 3RD BRAKELIGHT



12" LONG 7/8" DEEP 5/8" HIGH (PATENT PENDING)

**LOW PROFILE DESIGN
FITS ALL CLASSIC & MODIFIED CARS**

- Simple Mount on Window Without Drilling or Cutting
- Available in 6 Volt and 12 Volt Models
- \$49.95 Plus Shipping – Pay by Check or Use a Credit Card

J & L Enterprises, Inc. • Tel: 860-916-3582 • www.jandlenterprise.com



7/8" Deep 12" Long 5/8" High (PATENT PENDING)

J & L Enterprises, Inc.
83 Hopkins Road • Ellington, CT 06029 • Tel: 860-916-3582 • Email: jsbieback@sbcglobal.net

Brake-Lighter LED 3rd Brake Light

<http://jandlenterprise.com/products/brakelighter.htm>

FEATURES:

- Highly visible third LED light to supplement your existing brake lights
- Mounts on inside of rear window
- Low profile – fits on bottom edge of window
- 12 or 6 volt – positive or negative ground
- Easy to wire with clear diagrams and instructions
- Comes with “T” taps, wire connectors, high-grade suction cups and 3M double face adhesive dots (Very High Bond)
- 10 foot wire – 22 gauge flat wire (4 color leads)
- The wire is connected directly to the taillight wires
- Flashes with your directional signals (if you have them)
- High impact resistance plastic housing (black)
- Size: 12” long – 5/8” high – 7/8 deep
- 32 LED's
- Dark smoked lens

BrakeLighter Operation:

The BrakeLighter will turn “on” when you apply your brakes. If you have directional signals, the left and right half of the third light will flash accordingly to which direction you are signaling. If you activate your four way flashers, the BrakeLighter will flash also. The BrakeLighter will do everything your present brakes are doing but function as a third light

Brake Light Switch

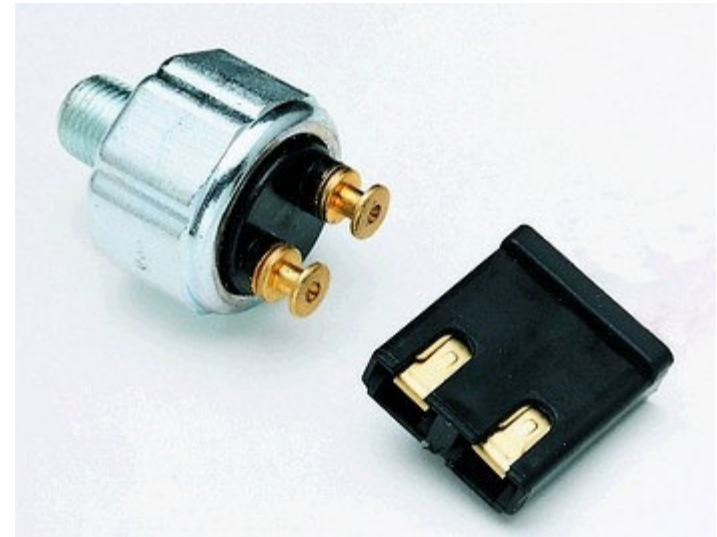
HYDRAULIC BRAKE SWITCH - LOW PRESSURE

High quality switch. Much longer life than previous models available anywhere. Fits most cars, 20-50 pounds pressure required instead of stock units that don't come on until 60-120 pounds pressure. Standard 1/8 Pipe Thread. It is compatible with Silicon Brake Fluid.

Attention: This updated version of this trusty switch is D.O.T. compliant which includes silicone fluid compatibility and it is capable of 200-300% more cycles.

Ron Francis Wiring
167 Keystone Road
Chester, PA 19013

<http://www.ronfrancis.com>

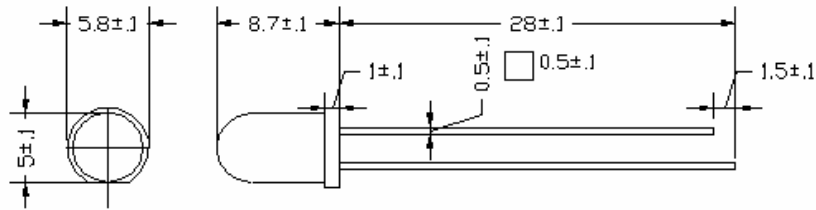


12 Volt Options – Lots!

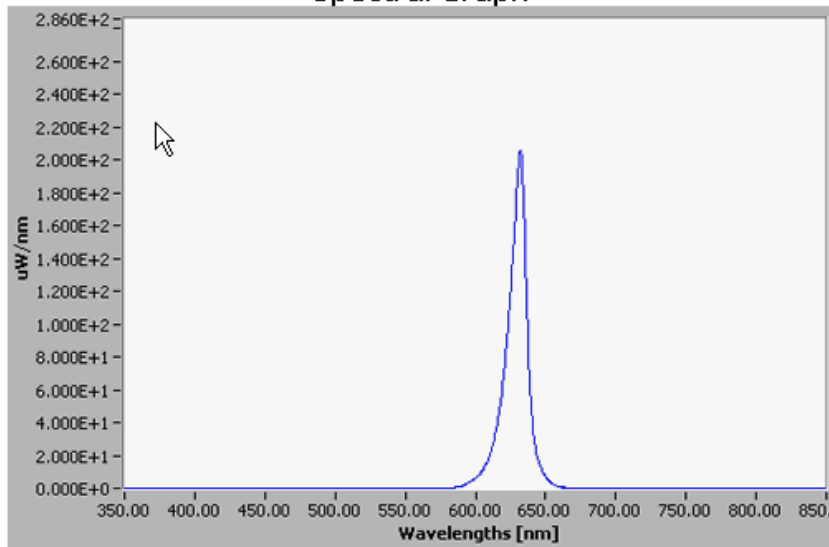


- Cool-LEDs.com, Shiny-Hiney.com, RodWorx.com

5MM LED Bulbs - Red



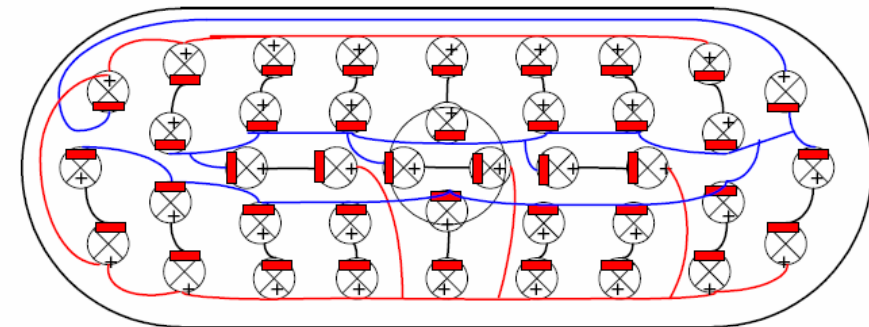
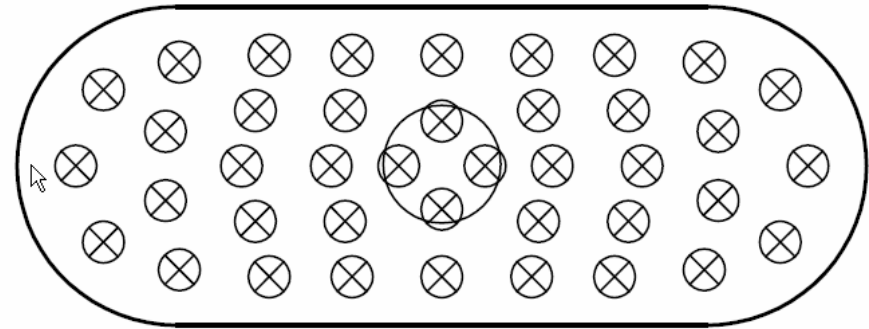
Spectral Graph



- Power Dissipation – 150 Milliwatts/Bulb
- Typical Forward Current – 20 Milliamps/Bulb
 - 50 LED array draws 1 Amp, 6 Watts
- Forward Voltage – 2.0 Volts/Bulb
- 5MM Bulb can use a 13/64" drill hole
- 1000 bulbs = \$25.00, including shipping

'46 – '48 Ford Tail/Brake Lights “How To”

- 40 LEDs per lens patterned after available 12v versions
- LEDs mounted on thin aluminum base plate that fits inside the taillight lens
 - Aluminum sheets available from Home Depot in ‘Heating’ department
 - 13/64” Drill Holes
- LEDs are ‘Super Glued’ onto base
 - Aligned for 2-bulbs in series
- LED Leads are bent and cut to form common buss
- Current limiting resistors and an isolation diode are added
- 1157 bulb is sacrificed for the base to solder the LED array wires to



Web LED Calculator – LedCalc.com

.:GURU

Supply Voltage

VOLTS

Voltage Drop Across LED

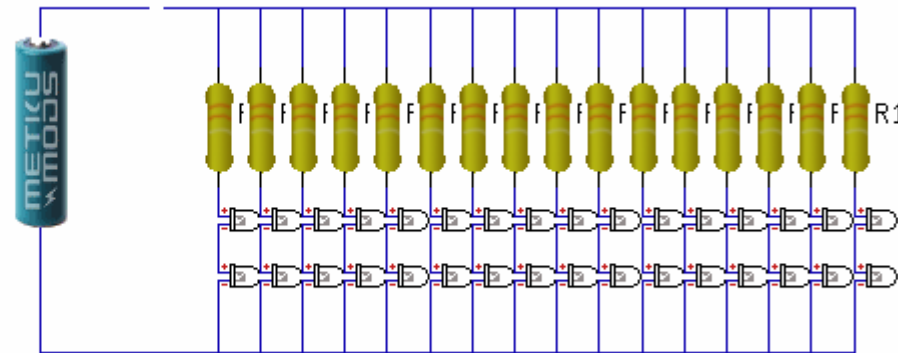
VOLTS

Desired LED Current

MILLIAMPS

How many leds connected

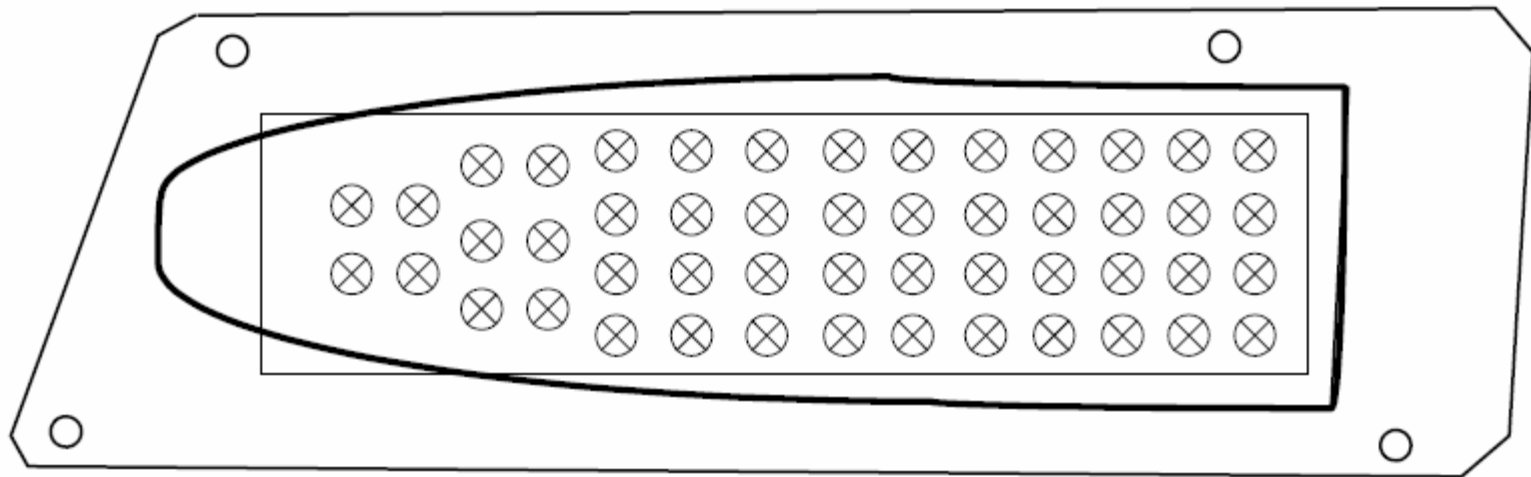
Click To Calculate



Exact calculated resistance <input type="text" value="75"/> OHMS	Nearest higher rated resistor <input type="text" value="82 Ohm"/> 	Wattage recommendation for the resistor <input type="text" value="1/8"/> WATTS	Circuit's total current consumption <input type="text" value="292.7"/> mA
Power dissipated by the Resistor <input type="text" value="27"/> mW	R1	Actual Single LED Current <input type="text" value="18.3"/> mA	Power dissipated by the LED <input type="text" value="37"/> mW
		Exact calculated resistance <input type="text" value=""/> OHMS	Nearest higher rated resistor <input type="text" value=""/>

1947 Mercury Taillight – 50 LED Array

- “A Work-in-progress”



36 Lamp LED Array Conversion to 6V

- Available from SuperBrightLEDs.com
- Small, 3MM bulbs, arranged in 2 bulb series patterns on 1- 1/2” square assembly
- Can be setup for 6V, Positive Ground, by changing current limiting resistors, reversing the isolation diode, and the socket base leads
- Can be used as the basis for many ‘Custom’ taillight applications



1157-PCB-R36 Red LED lamp

12VDC 1157 Base (dual intensity) with 1-1/2 square LED cluster

36 Red LED lamp designed for restricted access and right angle applications

Select Narrow 15 degree or Wide 100 degree Beam Pattern

\$ 9.95

Questions?