

What is LED and How Light Emitting Diodes Works?

Written by Administrator

Friday, 04 March 2011 23:22 - Last Updated Saturday, 19 October 2013 13:50

Introduction to How Light Emitting Diodes Works

Light emitting diodes, commonly called LEDs, are real unsung heroes in the electronics world. They do dozens of different jobs and are found in all kinds of devices. Among other things, they form the numbers on digital clocks, transmit information from remote controls, light up watches and tell you when your appliances are turned on. Collected together, they can form images on a jumbo television screen or illuminate a traffic light.

Basically, LEDs are just tiny light bulbs that fit easily into an electrical circuit. But unlike ordinary incandescent bulbs, they don't have a filament that will burn out, and they don't get especially hot. They are illuminated solely by the movement of electrons in a semiconductor material, and they last just as long as a standard transistor.

What is a Diode?

A **diode** is the simplest sort of semiconductor device. Broadly speaking, a semiconductor is a material with a varying ability to conduct electrical current. Most semiconductors are made of a poor conductor that has had **impurities** (atoms of another material) added to it. The process of adding impurities is called **doping**.

Automotive LED light from sunight are extremely reliable.(CE,ROHS,E-MARK verified) .Sunight has a strong team to control the quality of LED from all aspects. Such us, the LED chips check(brightness pattern, Lumen, humidity, efficiency.

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We use the quality PCB (printing Circuit board) to make our LED light only. PCB board is must be clear, vibrating-shock, Right size for OEM adaptor. Proper design.

Befor sales, Sunight have three times to check the quality of LED products.

Sunight's LED are standing high market in Euro, like Germany, Italian, Uk, USA, Japan.

The price of Sunight LED are slightly high than others from China.

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Sunight has built global sales net already. The Sunight products are very popular globally.

The History of L.E.D

1907: Henry Joseph Round discovers the physical effect of electroluminescence. But as he is working on a new radio direction finding method for marine vessels this discovery is initially forgotten.

1962: The first red luminescence diode, type GaAsP, is launched.

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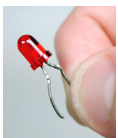
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1971: LED in other colors are available: green, orange, yellow. There are continual improvements in the output and effectiveness of all LEDs.

1993: Highly efficient InGaN diodes emitting in the blue and green spectrum are demonstrated. The conditions for creating white light are met.

1995: The first LED with white light created by luminescence conversion is launched.

Solid State Electronics Image Gallery



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Light emitting diodes form the numbers on digital clocks, send data from remote controls and light up traffic signals. See more solid state electronics pictures.

In the last few years the efficacy of colored LED increased up to amazing 100 lm/W and more depending on the color and driving conditions. A trend which will proceed in the future.

As today's white LED reaches efficacies up to 40-100 lm/W (efficiency depends on color temperature and color rendering) - they are more and more used in general lighting. In emergency lighting as well as decorative lighting, they are already established in implementation area. Today, also applications such as illuminated advertising benefit from the advantages of LED, particularly by using colored LED-modules.

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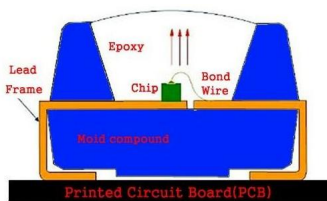
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LED Definition:

A light-emitting diode (LED) is a semiconductor diode that emits incoherent narrow-spectrum light when electrically biased in the forward direction.

Basic principles of LED (Light Emitting Diodes)

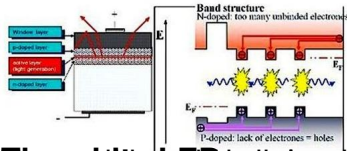


- An LED consists of several layers of semiconducting material
 - When an LED is operated with DC voltage light is generated in the active layer
 - The generated light is radiated directly or by reflections
 - In contrast to lamps, which emit a continuous spectrum, an LED emits light in a certain color
 - The color of the light depends on the used material
 - Two systems of material (AlInGaP and InGaN) are used in order to produce LED with a high luminance in all colors from blue to red and also in white (luminescence conversion).
- Therefore different voltages are necessary in order to operate the diode in conducting direction

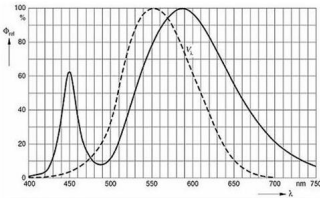
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The emission of LED is dependent on the material used. Different materials emit different colors of light. The degree of color is determined by the temperature of the LED. The temperature of the LED is dependent on the current and voltage applied to it.



Advantages of Sunlight				
Period	15th	19th	20th century...	
Lightings				
Efficiency (lm/W)	1	10-15	70-100	Target 50-110
Efficiency (rel.)	<1%	5-9%	25-30%	Target 20-30%

LEDs - The Key element to the quality of LED chips.

The life span of LED is long; it depends on various influencing factors during the manufacturing process. The life span of LED is long; it depends on various influencing factors during the manufacturing process. The life span of LED is long; it depends on various influencing factors during the manufacturing process.