

Beat the heat

Google Thermostats, Usb Fans, Led Lights



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Reasons to start your research at your local Library



The Library Triple Play

1. Protect your computer

- A computer should always have the most recent **updates** installed for spam filters, anti-virus and anti-spyware software and a secure firewall.



Or, you could make your own...



Make your own usb fan



Ice behind a Fan Trick



Ice behind a Fan Trick Pro Level



<https://www.youtube.com/watch?v=5NuvzWaBulw>

Beat the Heat: Get smart LED Lights

A **light-emitting diode (LED)** is a two-lead semiconductor light source. It is a **p-n junction diode** that emits light when activated.^[k] When a suitable **voltage** is applied to the leads, **electrons** are able to recombine with **electron holes** within the device, releasing energy in the form of **photons**. This effect is called **electroluminescence**, and the color of the light (corresponding to the energy of the photon) is determined by the energy **band gap** of the semiconductor. LEDs are typically small (less than 1 mm²)^[l]
https://en.wikipedia.org/wiki/Light-emitting_diode

- The energy consumed by a 100-watt GLS incandescent bulb produces around 12% heat, 83% IR and only 5% visible light. In contrast, a typical LED might produce 15% visible light and 85% heat.
<https://www.ledlighting.com/led-light-bulbs-heat/>



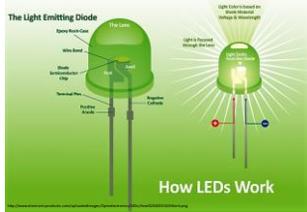
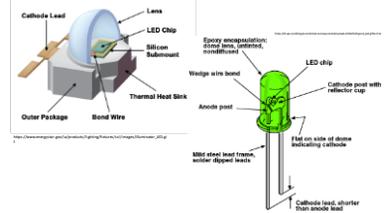
Most LEDs were made in the very common 5 mm T1 and 3 mm T1 packages, but with rising power output, it has grown increasingly necessary to shed excess heat to maintain reliability, so more complex packages have been adapted for efficient heat dissipation. Packages for state-of-the-art **high-power LEDs** bear little resemblance to early LEDs.
https://en.wikipedia.org/wiki/Light-emitting_diode



Beat the Heat: Get Smart LED

- Most significantly, the junction temperature affects the lifetime of the LED. Unlike other light sources, LEDs don't tend to fail catastrophically (although a small number do, especially if you cook them); instead, the output of the LED decreases over time.
- The ambient temperature and the drive current both affect the junction temperature of LEDs. Other influences are the nature of the light output, whether it is steady state or pulsed, and the LED wattage per unit area of surface that dissipates heat.
<http://www.infomagnate.com/articles/2005/05/fact-or-fiction-lets-look-at-heat-in-leds>

- The key factor is the thermal path from the LED junction to ambient i.e. the outside of the package.
- Heat should be conducted away from the LED in an efficient manner, and then removed from the area by convection. This latter process can be passive, involving convection from the outside of the package or from a finned heatsink with a large surface area, while higher-power arrays may require active convection using forced air cooling (i.e. a fan) or water cooling.
- It's imperative that the thermal performance of the entire system is taken into account. For example, LEDs have been placed into IP-rated fixtures that are used as floodlights. This creates a sealed skin around the LED module, forming an air pocket which prevents efficient thermal transfer to the outside surface. The lack of a radiator is a sign that heat sinking isn't a major consideration in the design – which can lead to significant long-term problems.



https://www.youtube.com/watch?v=4gh_g0c4A

- The Best Smart Light Bulbs of 2017
<http://www.pcmag.com/article2/0,2817,2483488,00.asp>
- The Best Smart LED Light Bulbs
<http://thewirecutter.com/reviews/best-smart-led-light-bulbs/>



Top 5 best Smart Wi-Fi Thermostats



<https://www.youtube.com/watch?v=3M85G50W1>

Smart Thermostats

Honeywell Lyric: <http://yourhome.honeywell.com/lyric>

Schneider Electric Wiser Air: <http://www.schneider-electric.us/en/p...>

Honeywell Wi-Fi Smart Thermostat: <http://yourhome.honeywell.com/en/prod...>

Nest Learning Thermostat: <https://nest.com/thermostat/meet-nest...>

Ecobee3: <https://www.ecobee.com/>

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