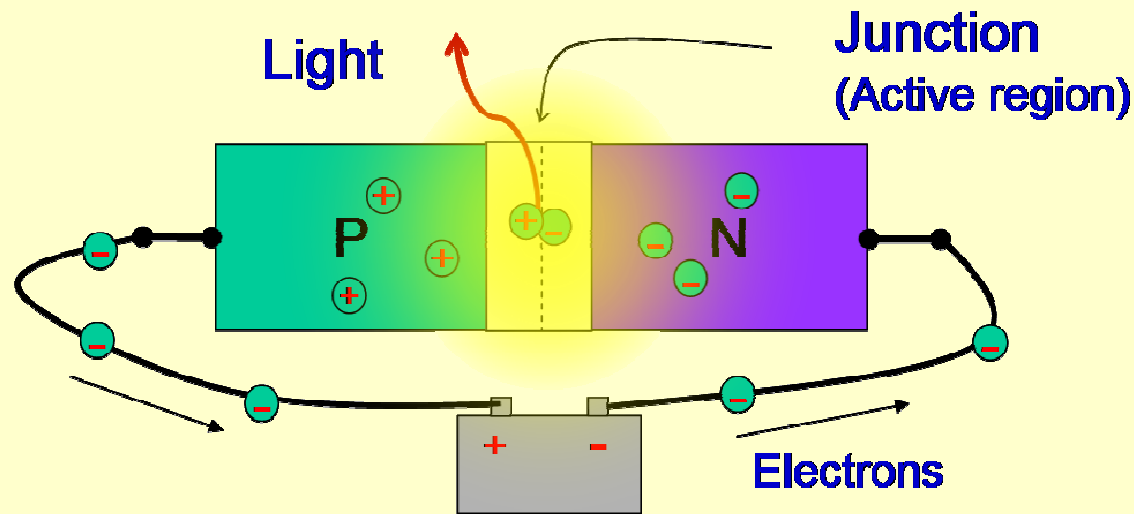
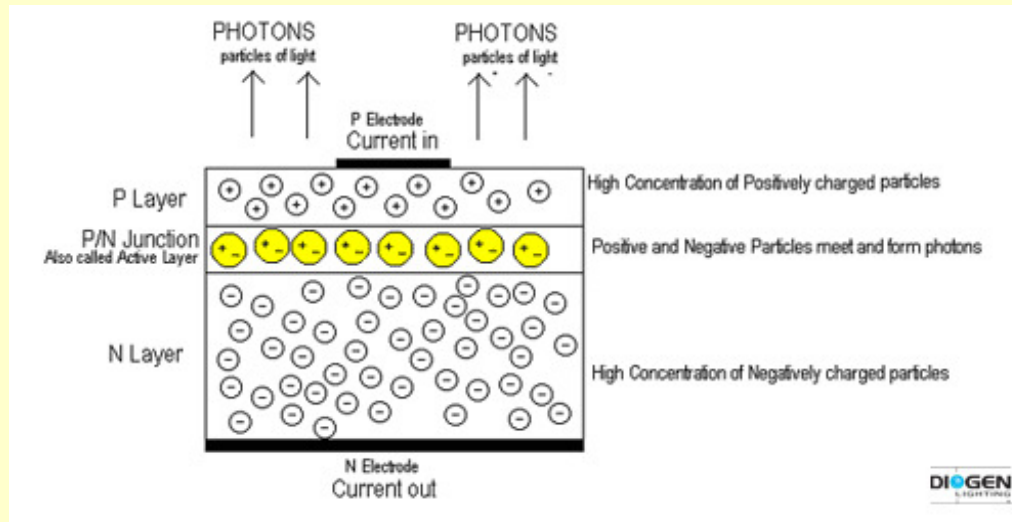


**What the Heck is a LED
or SSL and How do
They Make Light?**



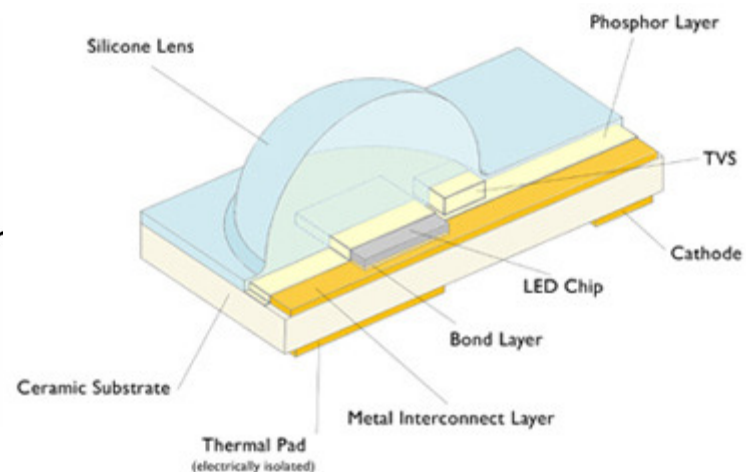
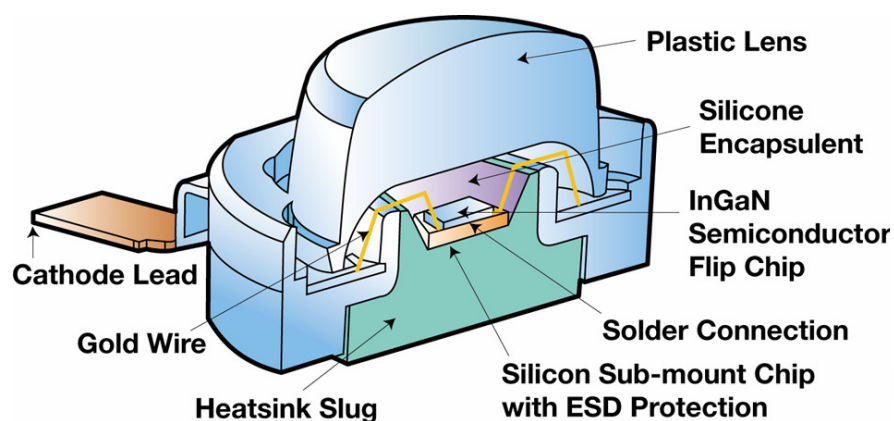
- LED's are simple semiconductor diodes
- Semiconductors are materials with varying ability to conduct electrical current
- The diodes are formed by combining two slightly different semiconductor materials to form a PN junction
- A diode allows current to flow in one direction but not the other



- ‘P’ material: Has a slight “deficiency” of electrons (for molecular bonding) when forming a crystal.
- ‘N’ material: Has excess electrons left over from the crystal bonding process, which can move and carry current.
- Photons (light) are generated when the positive and negative charges recombine.

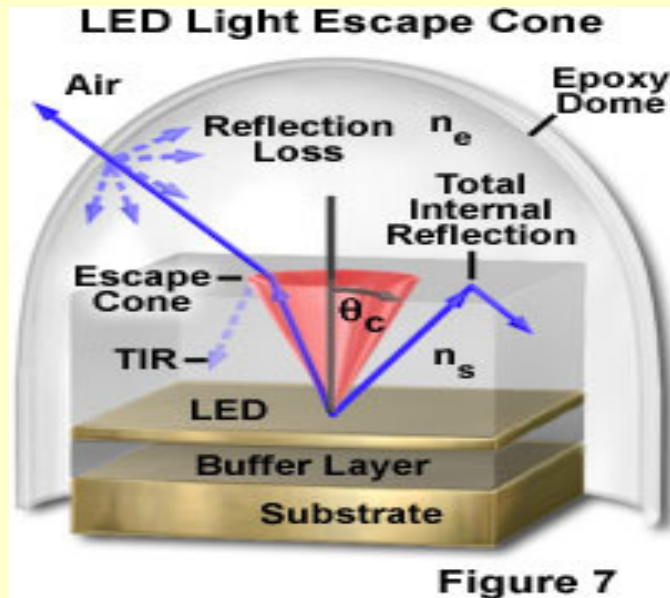
What is a 'Power' LED?

(Power LED's are Used for Lighting Applications)



- Raw LED chips are packaged into an emitter
- An emitter can contain one or many chips
- An emitter package typically includes primary optics, a heatsink and leads to attach power
- A Power LED is the generic term for a roughly 1.2W (@350mA) or higher emitter package

LED's Are Like Photon Snow Domes



- Photons are emitted in all directions
- The refractive index of the chip is different from the surrounding medium or encapsulate material
- The light produced gets partially reflected back into the chip, where it may be absorbed producing additional heat (bad)
- Often more than half of the emitted light is reflected back into the LED package (real bad)