

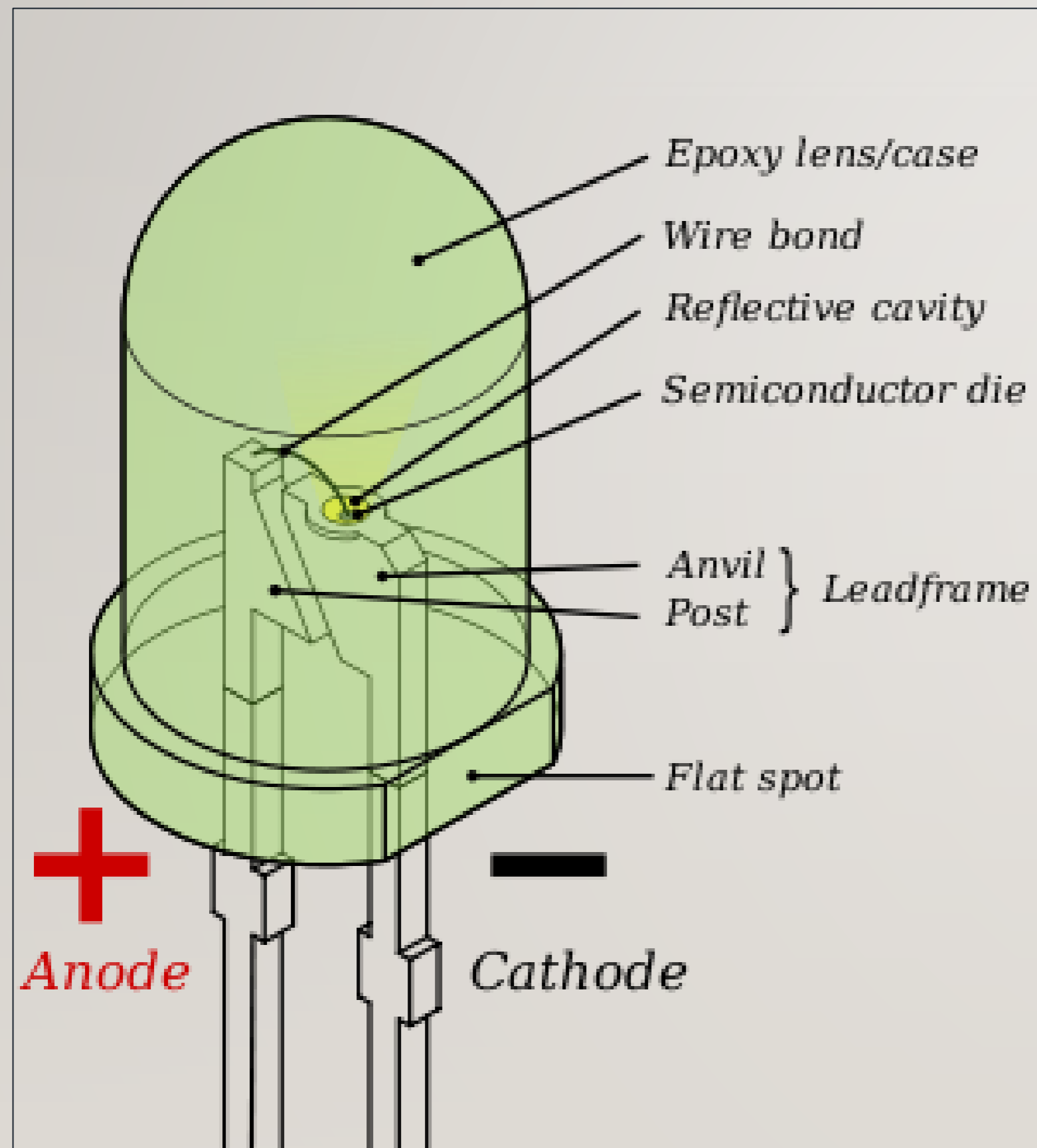
SISTEM KOMUNIKASI OPTIK

- **MATERI 6**
- **Light Emitting Diodes (LED)**

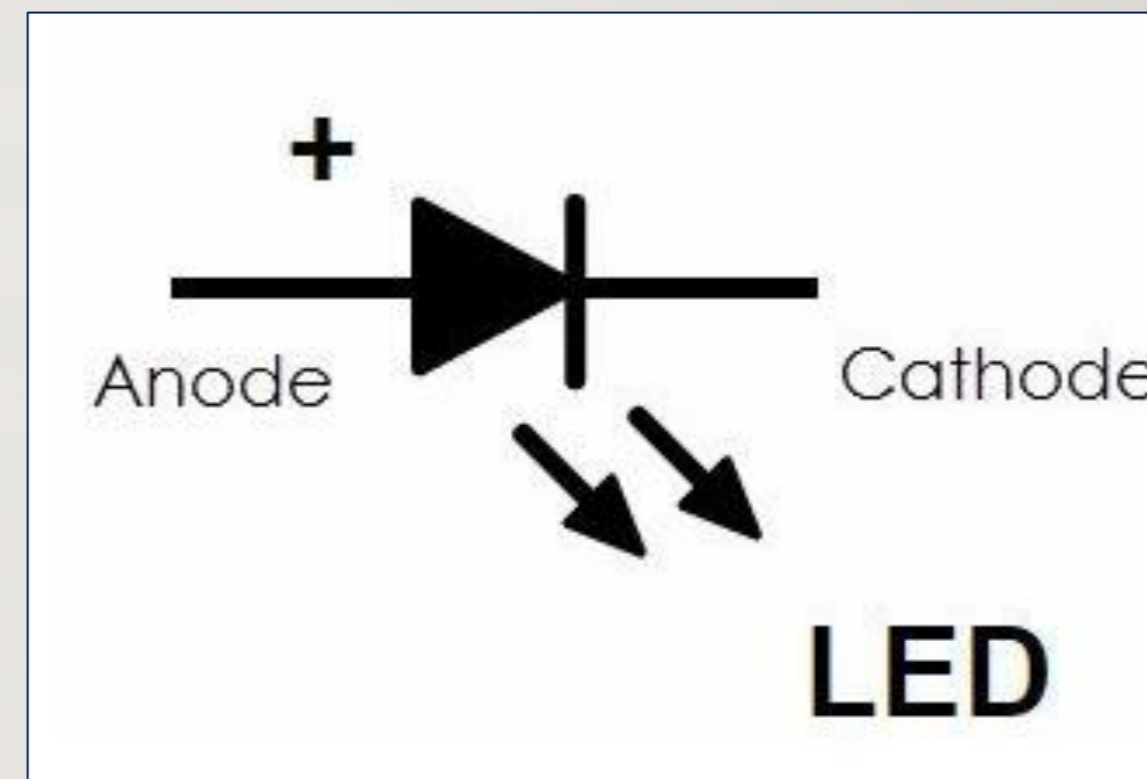
- D3 Teknologi Telekomunikasi – Fakultas Ilmu Terapan



APA ITU LED ?



Gambar 1. Penampang LED



Gambar 2. Simbol LED

- DIODA SEMIKONDUKTOR
- CAHAYA KROMATIK
- $\lambda = 850 \text{ nm}$ \rightarrow LEBAR SPEKTRAL 40 nm
- $\lambda = 1300 \text{ nm}$ \rightarrow LEBAR SPEKTRAL 80 nm

Sumber Referensi :

<https://www.electroschematics.com/light-emitting-diode-how-it-works/>

<https://electronicscoach.com/difference-between-led-and-laser.html>

Gerd, Keiser, 2010, *Optical Fiber Communications*, 4th edition, McGraw Hill, International Edition

KELEBIHAN DAN KEKURANGAN LED

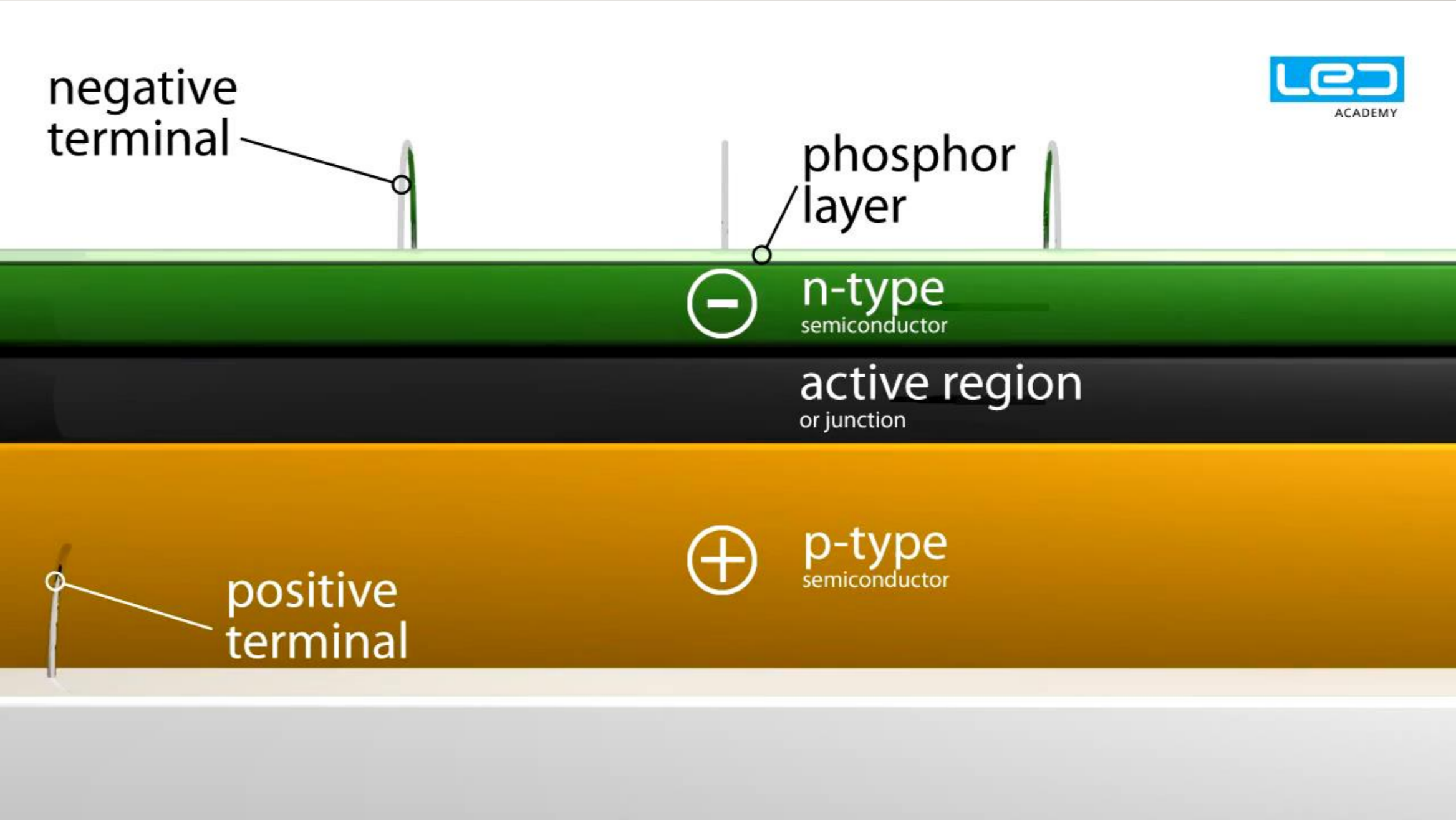
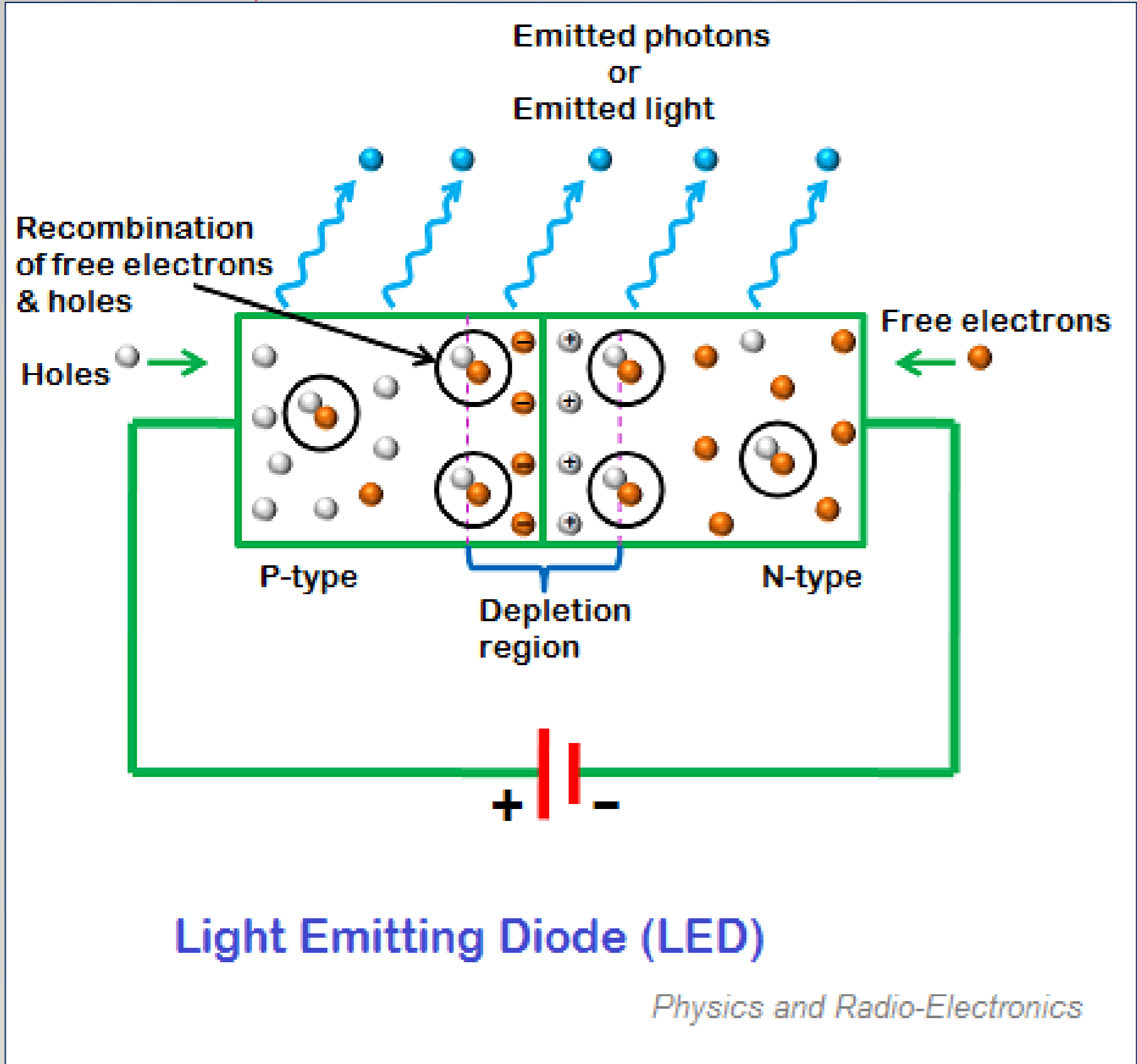
KELEBIHAN

- Reliabilitas
- Rangkaian Drive
- Sensitivitas Suhu Yang Lebih Rendah
- Immunitas
- Murah

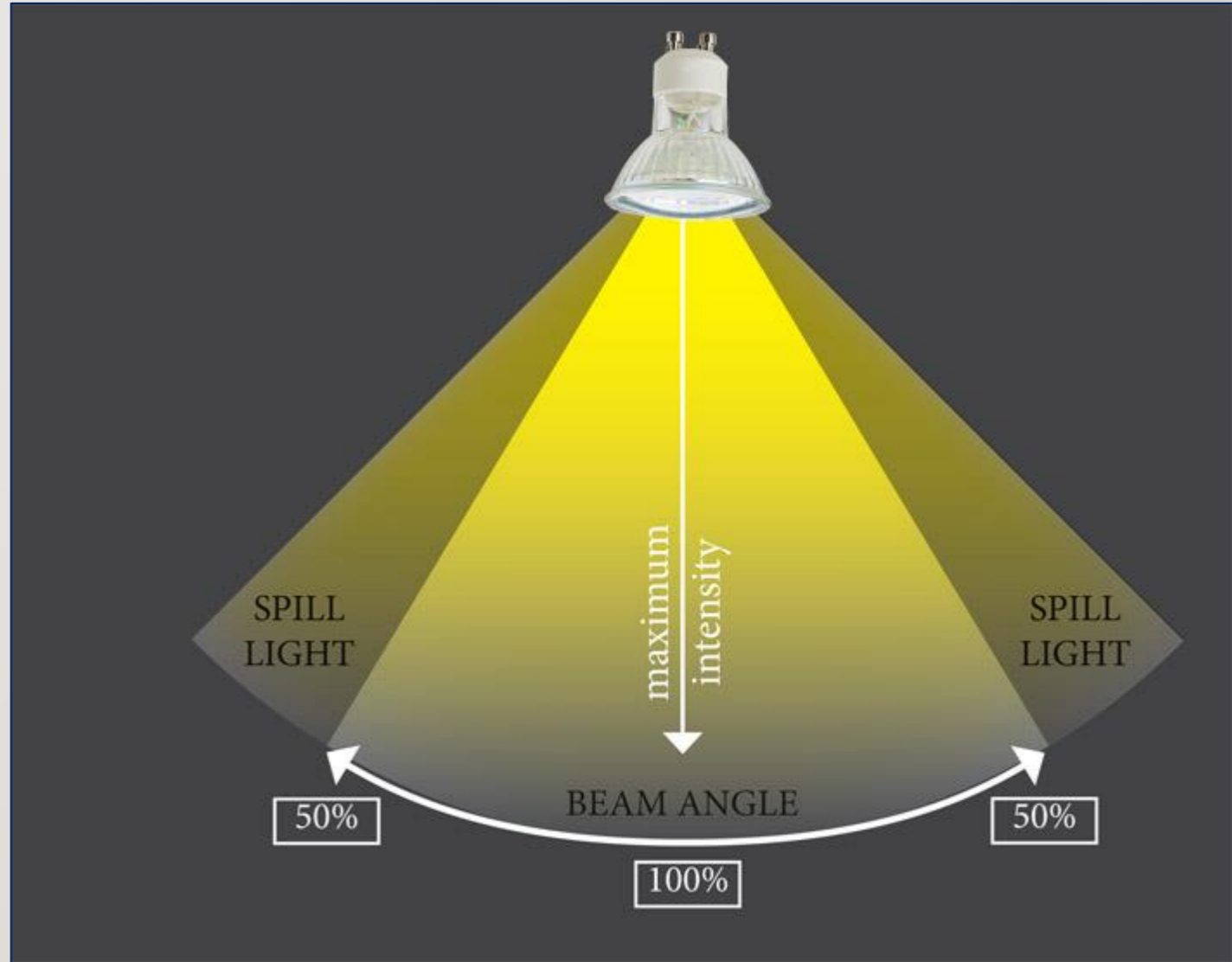
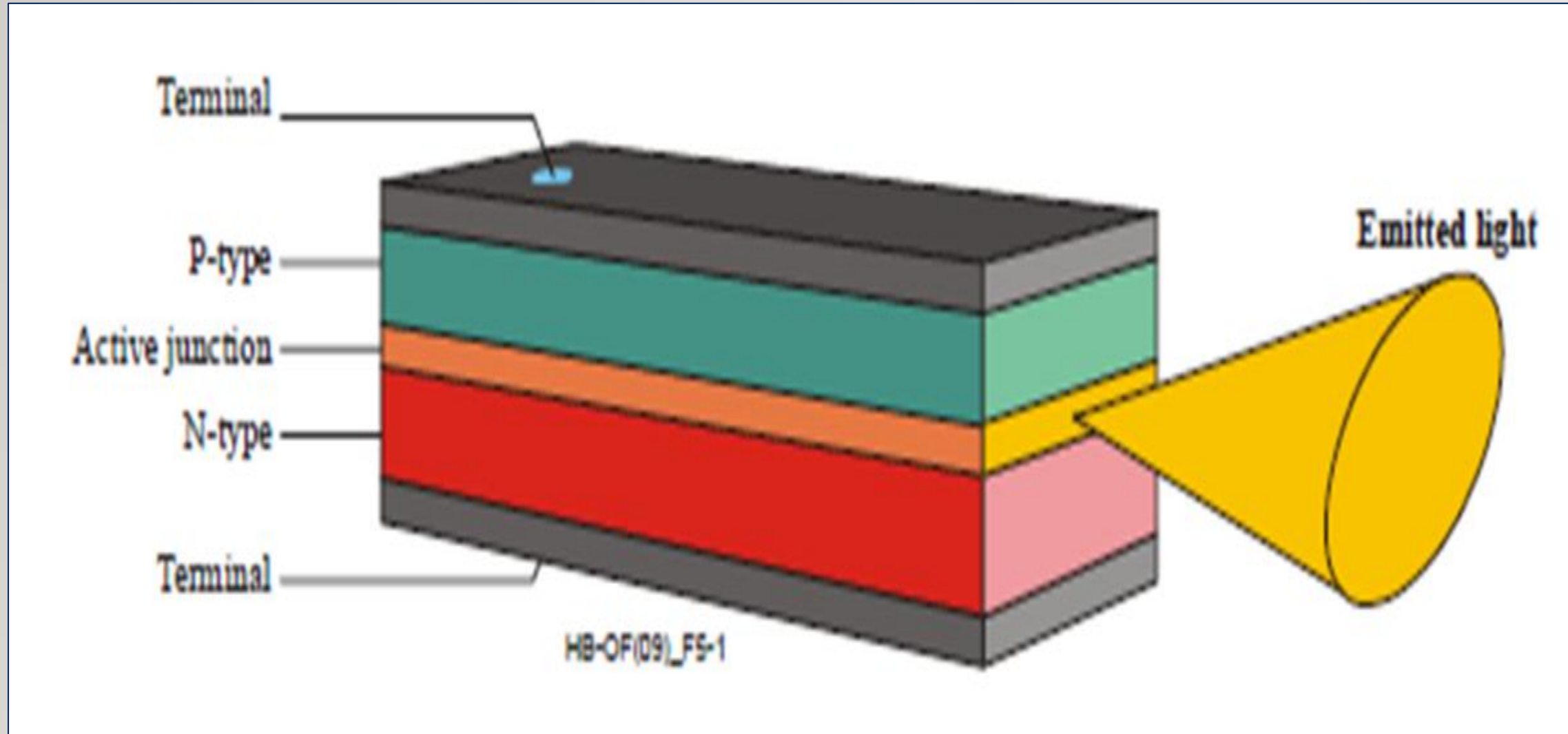
KEKURANGAN

- Tergantung Oleh Suhu
- LED Tidak Memiliki Distribusi Spectral
- Daya Power Rendah

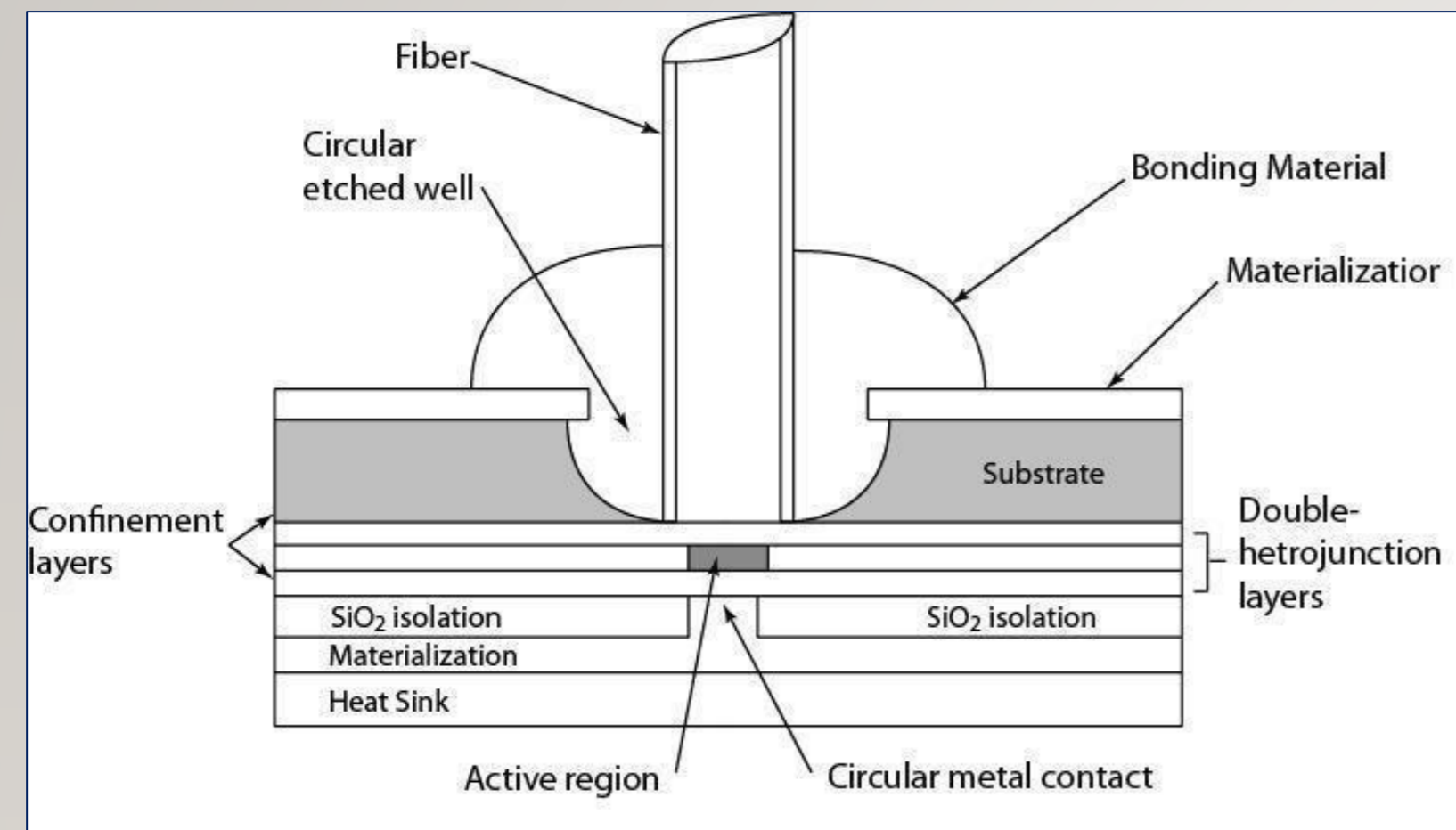
PRINSIP KERJA LED



POLA DISTRIBUSI CAHAYA LED



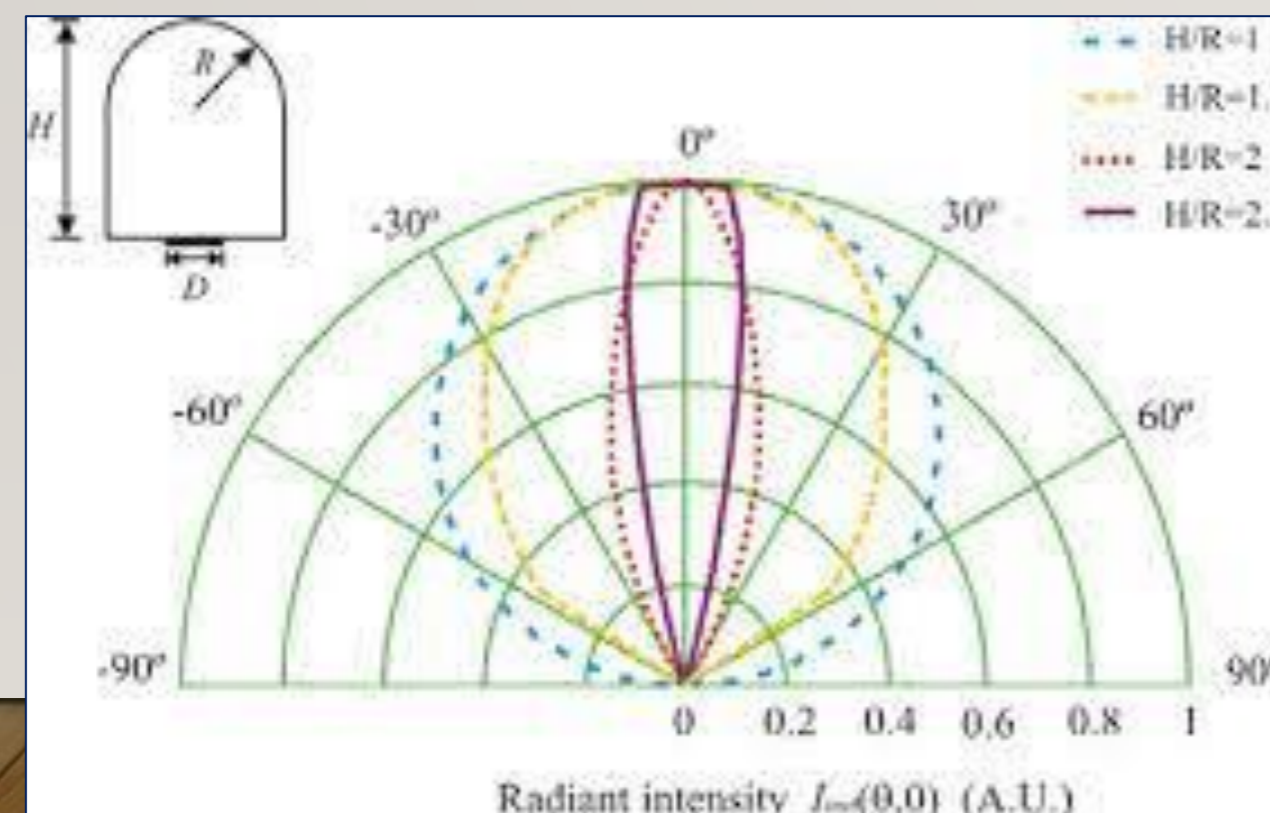
SURFACE EMITTER LED



Gambar 1. Penampang Surface Emitter LED

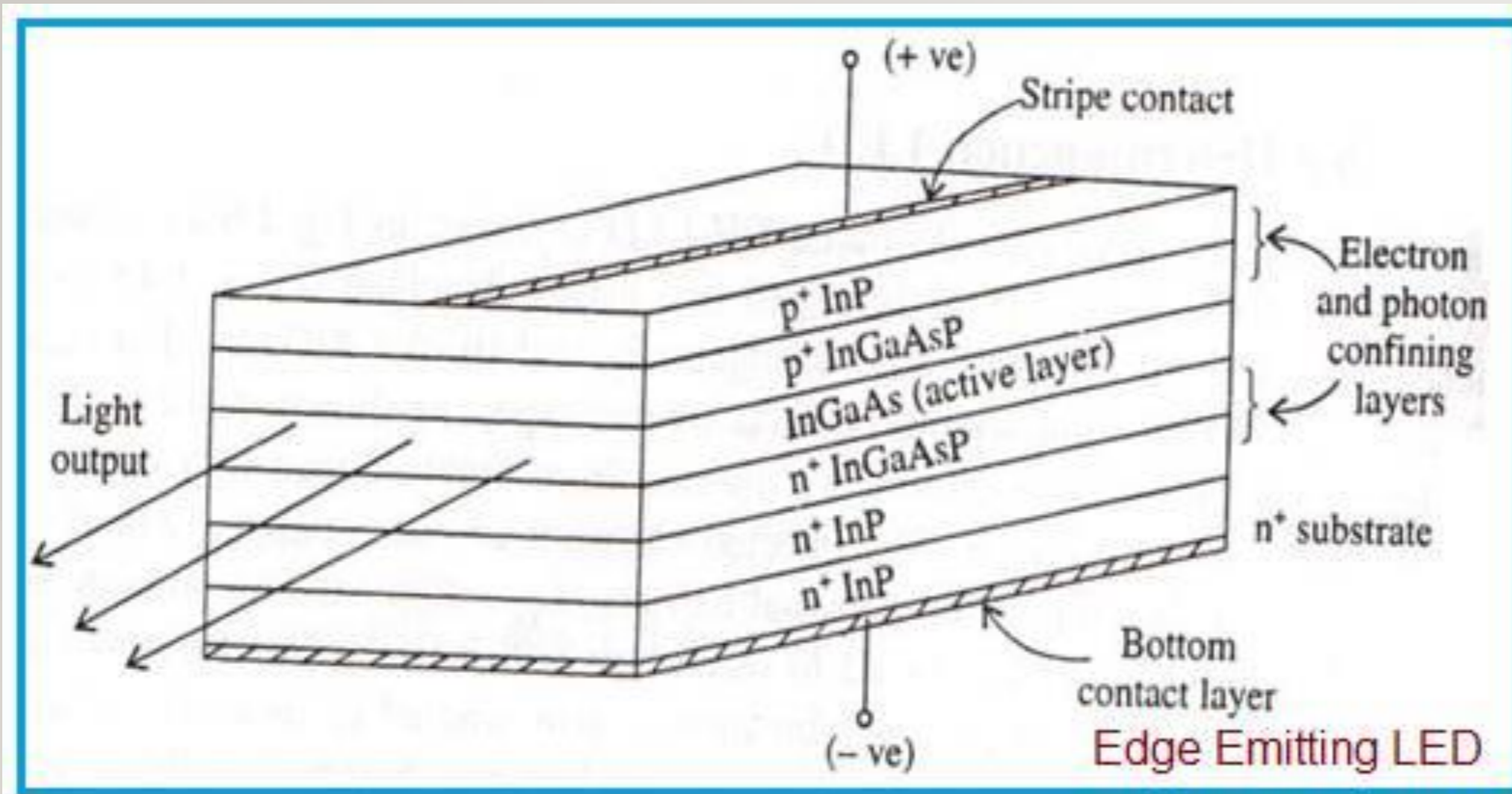
Karakteristik LED Surface Emitter LED :

- ❖ Sudut pancar 180 derajat
- ❖ Lambertian source.
- ❖ Bias maju
- ❖ Emisi cahaya melalui permukaan
- ❖ Daerah aktif berbentuk lingkaran → diameter 50 μ m
- ❖ Kemasan pigtail



Gambar 2. Lambertian Source

EDGE EMITTING LED



Karakteristik Edge Emitting LED :

- ❖ Radiasi keluaran lebih terarah
- ❖ Spektrum pancaran berbentuk ellips, emisi cahaya ke arah samping atau ujung
- ❖ Memerlukan bias maju
- ❖ Lebar spektrum keluaran sudut paralel : 120° dan sudut yang tegak lurus = $25^\circ - 35^\circ$
- ❖ Panjang gelombang emisi puncak ditentukan oleh bahan yang digunakan dengan dopan yang ditambahkan



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