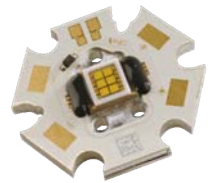
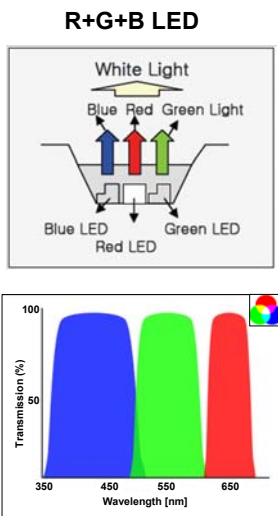


What is Visible Light Communication (VLC)?

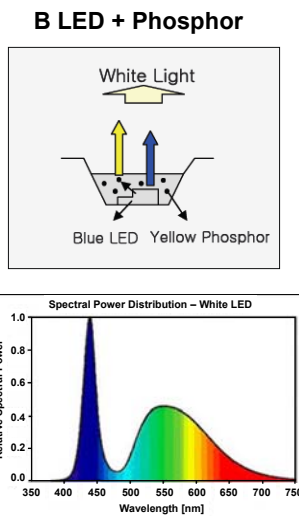
- Information is transmitted wirelessly via visible optical radiation.
- Recently emerged powerful LEDs emitting in the visible wavelength range offer significant potential for straight-forward modulation of emitted light via driving current.
- Mono-colour LEDs are already prevalent in signalling, white LEDs are entering the lighting market. Why not simultaneously use them for data transmission?



White Light-Emitting Diodes



- Average cost
- Enables WDM (3 drivers needed)
- 10+ MHz bandwidth



- Low-cost
- Simple driving
- 1-2 MHz bandwidth (due to Phosphor)

Main Features of VLC

- Wireless data transport
- Complementary to radio for wireless access
- No EMI with RF systems, no “e-smog”
→ robust use in RF-sensitive environments
- Free and unregulated spectrum
- Simple shielding by opaque surfaces
→ no crosstalk between rooms (simple network design)
→ inherently protected privacy
- Enables disjoint pico-cells and femto-cells (e.g., for inter-machine communication in industrial production, electronic lab equipment,...)
- Omnipresence of LEDs in the future signalling/lighting landscape
- Combination of signalling/lighting with data transmission over the same optical source
→ data transfer as piggyback → broadcasting hot-spots
- Suppressing the slow phosphorus component at Rx enhances the modulation bandwidth to ~20 MHz
- Attractive where light is always “on” (office, factory, medical area, public transport)

Application Fields



Conclusion

Visible Light Communications is an emerging area of optical wireless technology enabling a wide range of applications.