BACKGROUND

The key enablers for large scale adoption of LED for general illumination and the more lucrative high power segments are thermal optimization and optical design of the luminaires. As LED chip manufacturers continue to push the boundary of output power above 200W for outdoor applications, thermal management would be critical as the efficiency and reliability decreases exponentially with increasing junction temperature. A well designed and engineered secondary optics is also critical to achieve optimal luminance levels and light distribution uniformity.

OBJECTIVES

The LED CIP aims to raise the LED industries’ capabilities in designing reliable and efficient luminaires. The CIP scope covers optical and thermal design and simulation, prototyping support, reliability testing as well as knowledge transfer to enhance the technical capabilities of LED companies in Singapore.
CIP ON LED OPTICAL/THERMAL MANAGEMENT & PROTOTYPING

SCOPE/DelIVERABLES

- Simulation for one luminaire on optical and thermal properties
- Measurement for one luminaire on optical and thermal properties
- One day training on brief introduction on the following topics:
  1. Optics terminology, design, simulation and measurement of LEDs
  2. Thermal terminology, design, simulation and measurement of LEDs
  3. Reliability analysis on LEDs
- Customized scope based on our capabilities for specific applications are available on request. More advanced topics or application specific training are also available.

POTENTIAL BENEFITS

- System design consultation to improve functional performance and reliability
- Use of simulation tools to validate optical and thermal design before prototyping to minimize schedule risk and cost
- Pre-certification measurements using state-of-the-art facilities in compliance with industry standards prior to certification to minimize schedule risk and cost
- Failure analysis to determine root-cause and recommendations for design improvement
- Knowledge transfer through class room and lab based training

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