

Thermal and Mechanical Testing

Solder Point Temperature Analysis

Measuring solder point (case) temperature of the LEDs used in a luminaire is useful for determining the junction temperature and thus predicting lifetime. For more information on measuring case temperature, refer to Cree's Application note on Soldering & Handling.

A thermocouple (TC1) was attached to the solder point of one of the LEDs. A second thermocouple (TC2) was attached to the heat sink and a third (TC3) was used to monitor the ambient room temperature, which averaged 23°C. The temperatures measured over a period of approximately 2 hours. Based on the measured solder-point temperature (T_{sp}), the operating wattage of the LED and the typical thermal resistance of 5°C/W for the XT-E, the resulting calculated junction temperature is 58.5°C with a maintained heatsink running temperature of 36.1°C.

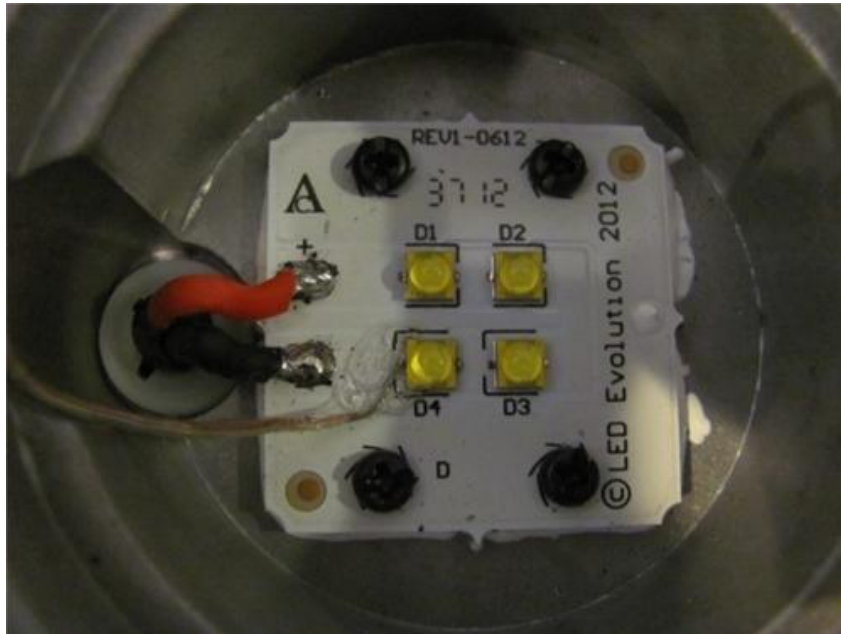


Figure 11: Thermal Testing Set-up