XICATO

101 Daggett Drive
San Jose, CA 95134
United States
T +1 866 223 8395

Application Note – XTM Thermal Performance with Spacer

Background

Xicato has designed a number of reference heatsinks that customers can integrate into their luminaire design. In many cases, the space behind the module in application is constrained, and there may not be enough room to fit a heatsink. A good example of this is under cabinet lighting.

In some of these situations, specifically for applications requiring approximately 720 lumens or less for XTM 19mm and 550 lumens or less for XTM 09mm output per module, no additional thermal management is necessary except module + spacer.

This document serves as a guide for when and how to properly use the module + spacer without additional heatsink.

Module Details

The XTM has a maximum Tc temperature of 90ºC. In order for module to operate with just a spacer, the XTM1980XX13CCA must be operated at 350mA or lower (or) XTM0980XX07CCA must be operated at 550mA or lower.

The spacers are made out of highly conducted aluminum. After assembly the overall height of the XTM LED module becomes the same as the XSM LED module.

XSA-271 spacer is used when the requirement is for the wires to exit out the sides. XSA-274 spacer is used when bottom feed is required. The retaining clamp can be used for wire strain relief and center feed. With perfect mounting space flatness these spacers guarantee an optimal heat transfer the LED module.

Figure shows spacer assembled with the XTM module.

Figure XSA-271 (left) and XSA-274 (right) can be installed with an XTM module to match the height of an XSM module. XSA-274 (right) includes a bottom feed alternative.

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The following are the modules and spacer information that can be used to operate maximum Tc temperature below 90°C.

Module	Spacer Part #	Drive Current (mA)	Lumen Output (lm)
XTM1980XX13CCA	XSA-271 (or) XSA-274	350	720
XTM0980XX07CCA	XSA-271 (or) XSA-274	500	550

Module Installation

The above mentioned modules with spacers can be attached to any material that can safely reach 90ºC. These materials include, but are not limited to, metals, plastics, and wood. It is important to note that although no additional heatsink is required and the modules + spacers can be directly attached to many different materials, regional and local codes for electrical, fire, and safety still apply and must be considered. The use of traditional M3x25mm machine screws may not be appropriate for securing the module to non-metal surfaces. Investigation into alternate attachment methods (other screw types, adhesives, and tapes…etc.) should be carried out based on application. Be careful not to over torque the fasteners when spacers are used in the assembly as this may damage the XTM.

Thermal Analysis

Below are the thermal simulation results for reference.

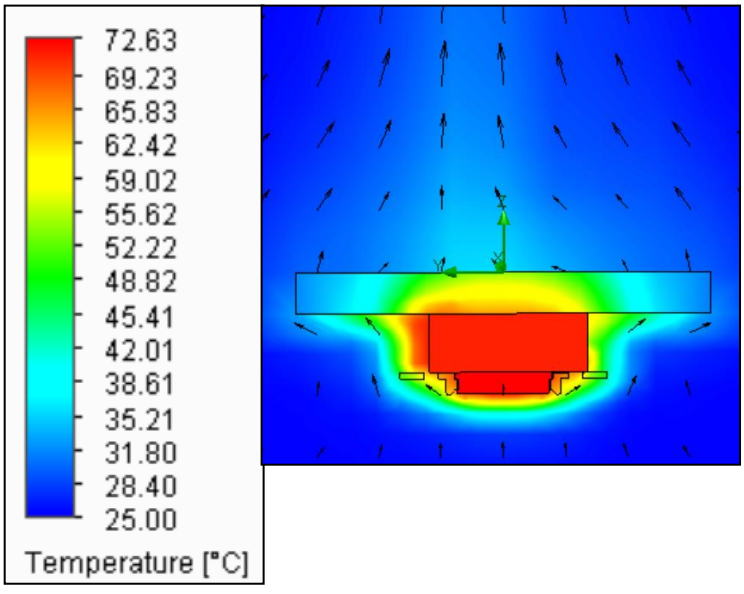

Figure 1 – XTM1980XX13CCA @ 350mA + Spacer, Mounted to Wood in a 25°C ambient. Tc = 72.63°C which is below the recommended Tc of 90°C.

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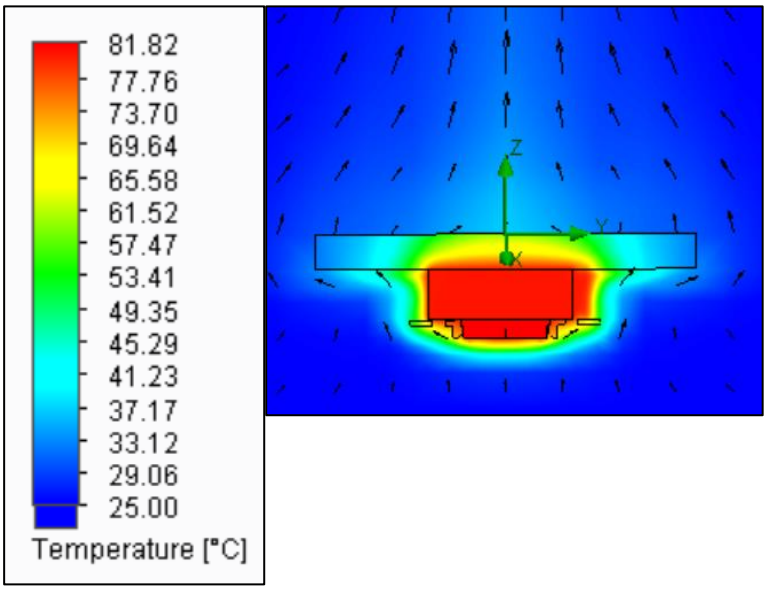

Figure 2 – XTM0980XX07CCA @ 500mA + Spacer, Mounted to Wood in a 25°C ambient. Tc = 81.82°C which is below the recommended Tc of 90°C.

Conclusion

Therefore, an aluminum spacer can be used with a XTM LED to match XSM LED module height when upgrading a fixture that was designed around a XSM LED module. Lower lumen levels do not require additional heat sinks, but it is Furthermore lower lumens don't require additional heat sinks but it is important to make sure mounting materials can tolerate the temperatures without burning and melting.
Thermal performance results may vary based upon ambient, mounting materials, drive current, luminaire construction etc. Prototype luminaires should always be constructed and tested. Please contact your account manager, or technical representative if further assistance is needed.