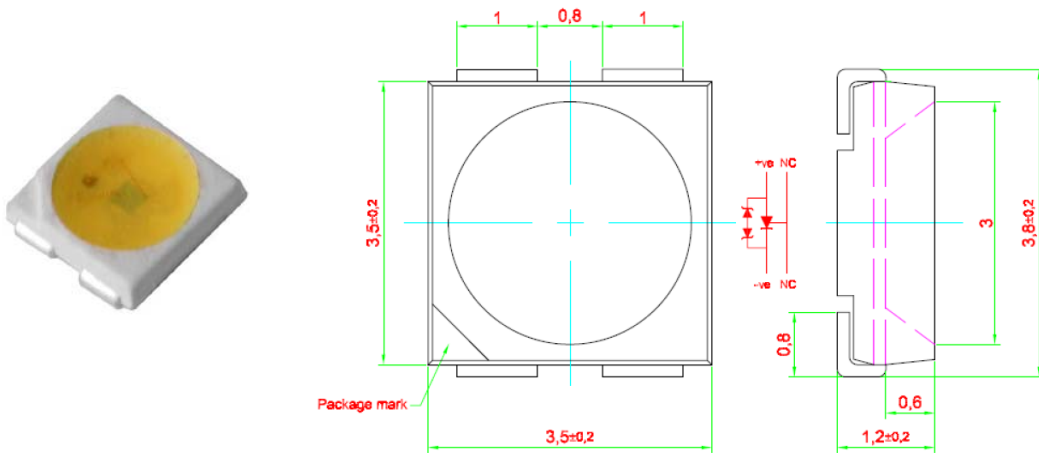


**Background**

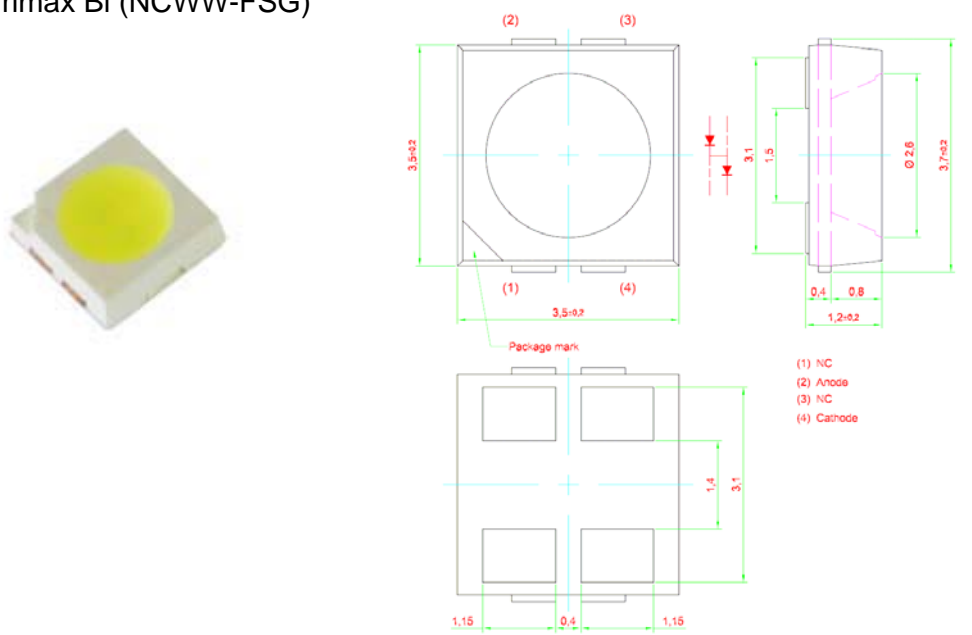
Dominant is currently offering 3 series of LED package product with electrically isolated thermal pad. The thermal pad provides an effective channel for heat transfer and optimizes thermal resistance from the LED chip junction to the thermal pad. The pad is electrically isolated from the anode or cathode of the LED and can be soldered or attached directly to grounded elements on the board or heat sink system.

Products With Electrical Isolated Thermal Pad:

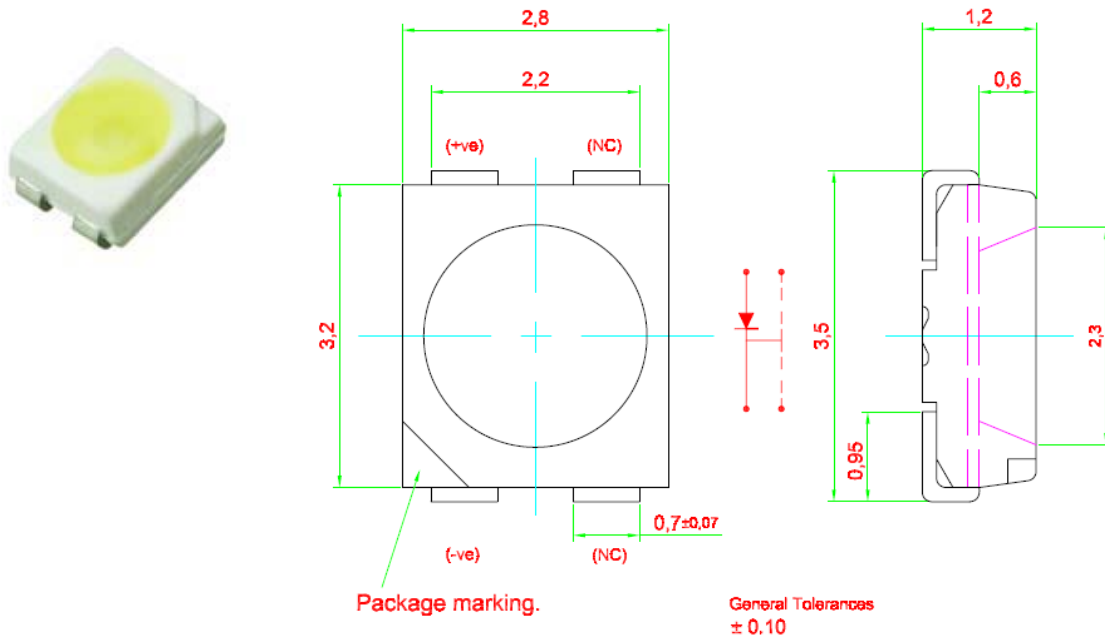
(I) DomiPlus (DPW-EJG)



(II) Primax Bi (NCWW-FSG)



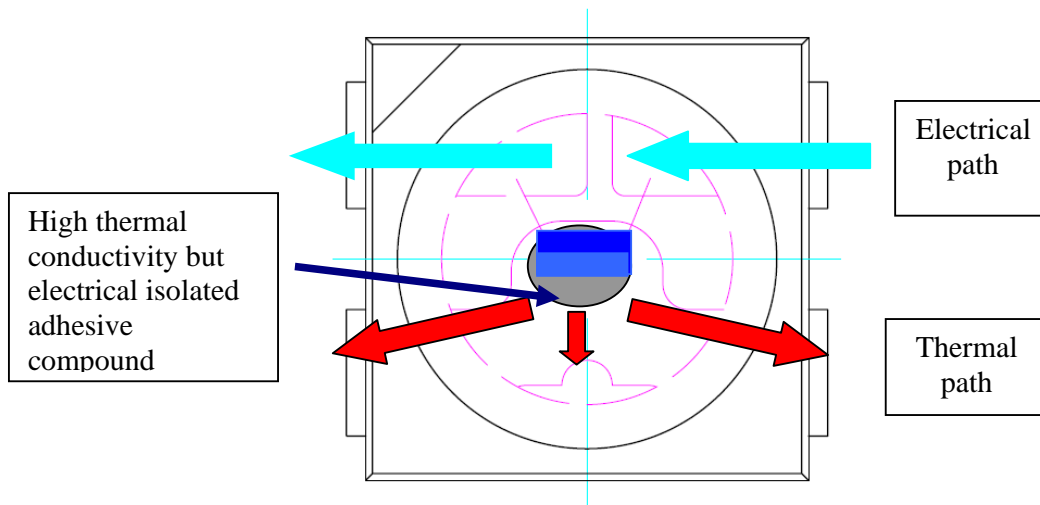
(III) Multi LED Thin (DTW-FJG)



For all the 3 products above, the NC pad denote the electrical isolated thermal pad.

**Operating Concept For LED Package With Isolated Thermal Pad**

For LED with isolated thermal pad, the LED chip usually will be attached to the bottom lead frame using highly thermal conductive but electrical insulated adhesive compound. The LED chip is placed in a manner to allow the shortest thermal path from LED chip to heatsink/pcb via bottom lead.

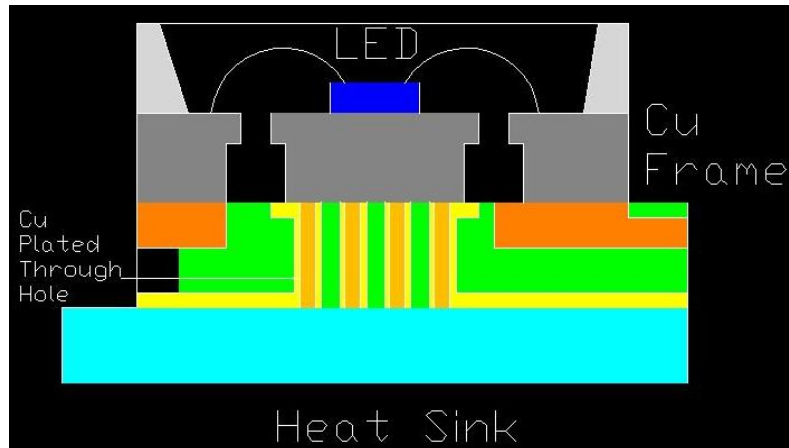


**PCB Design Recommendation**

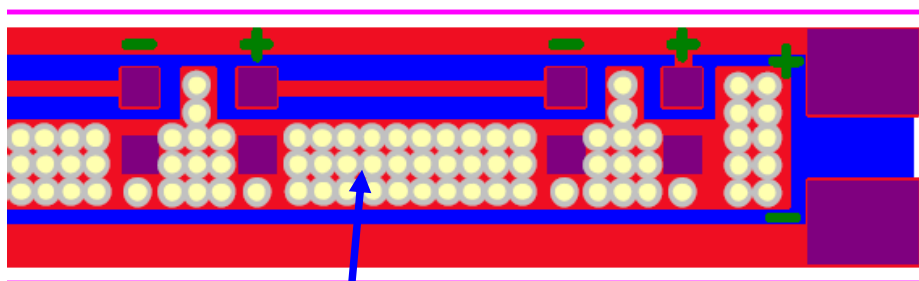
Using LED package with electrical isolated thermal pad, the module heat dissipation performance can be enhanced by using following pcb design material and methodology:

**(I) Standard dual side FR4 PCB with plated through copper via**

Copper plated through hole via can be added to the inexpensive dual side FR4 pcb. The NC lead on the LED is soldered to the NC pad on the pcb. The base copper layer of the NC pad is connected to the back of FR4 copper layer through the plated via hole. By using this construction, maximum thermal conductivity can be achieved direct from the front to the back of the PCB.

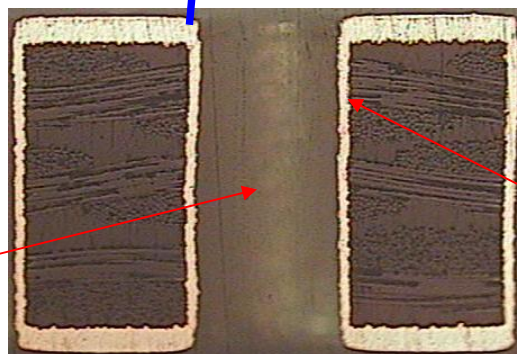


Example DomiPlus FR4 light strip design



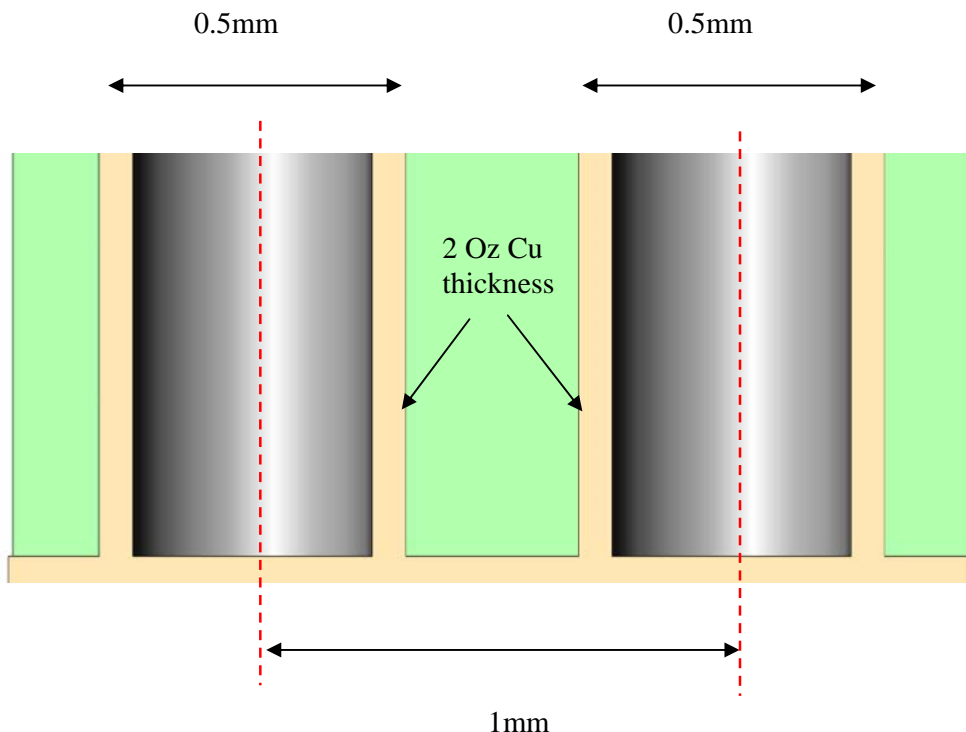
PCB Cross Section

Through Hole Copper Plated Via On PCB



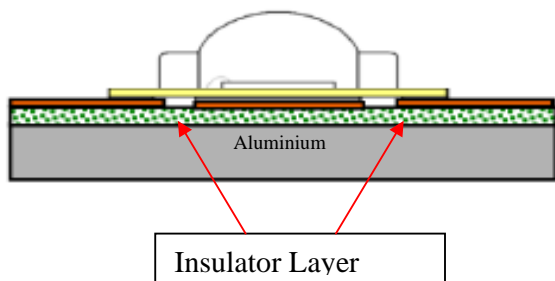
Continuous layer of copper from top to the bottom of PCB for heat conduction

The recommended through hole diameter is 0.5mm and the hole to hole pitch of 1mm. The proposed plated through hole copper thickness is 2Oz ( ~ 70um ). All the recommended specification above is well within typical pcb fabrication capability in order not to incur extra cost or yield loss in standard pcb manufacturing process.



**(II) MCPCB With Isolated Thermal Post**

With the new development in MCPCB process, now it is possible to selectively laminate FR4 pcb on the etched/stamped aluminium/copper core. The LED electrical isolated thermal pad can be directly soldered to the bulk aluminium/copper core. This new concept eliminated the thermal bottleneck faced by conventional MCPCB which insulator layer is sandwiched in between laminated FR4 and metal core.



- Without isolated thermal pad, standard LED package can only use conventional MCPCB. There is an electrically/thermal insulated layer in between the electrical track and metal core which causing poor thermal performance

→ Using LED with isolated thermal pad, the thermal pad can be directly soldered to the aluminium base and allow superior thermal performance

