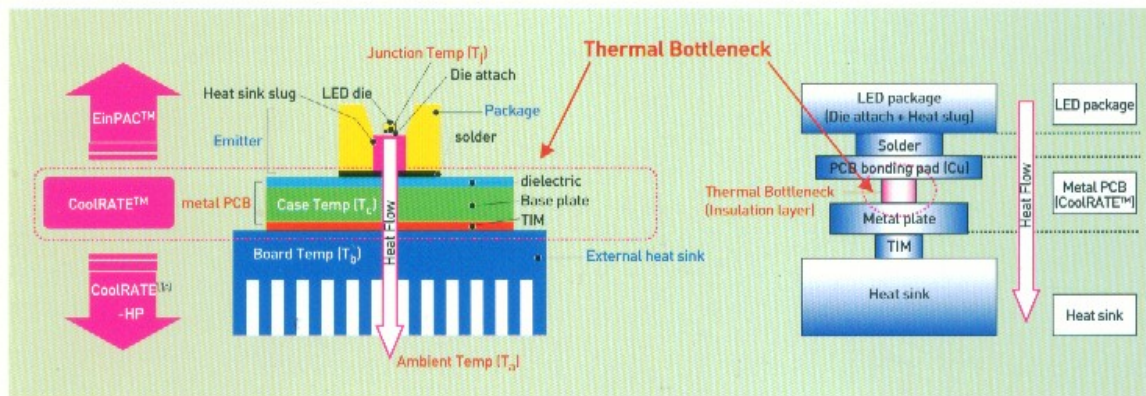


CoolRATE™ Metal PCB for High Brightness LED

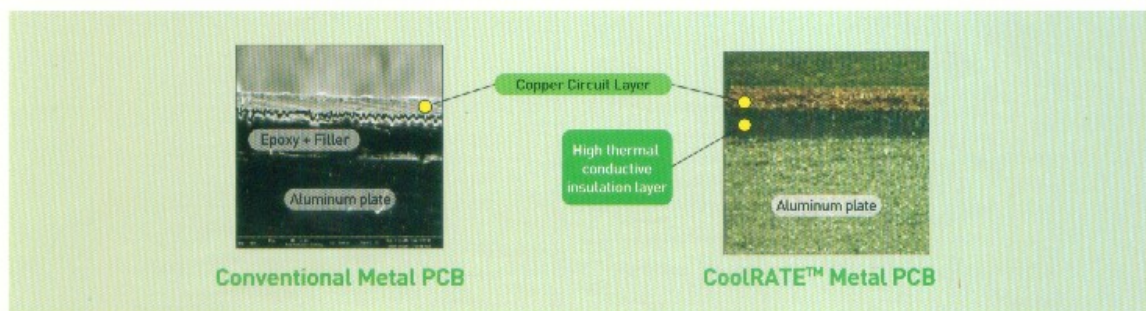
The most important part of LED application is thermal management technology of junction temperature in LED chips, which mainly determine the life time, reliability, and brightness efficiency, etc.

CoreSEM has developed the world best fabrication technology of high thermal conductive insulation layer in Metal PCB (CoolRATE™), which is key technology since most of thermal resistance is induced by the insulation layer of Metal PCB. While as the insulation of conventional product is epoxy resin and ceramic filler to enhance thermal conductivity, CoolRATE™ applied thinner inorganic material layer which originally has high thermal conductivity. We hope that CoolRATE™ would be the world best thermal solution for your LED application

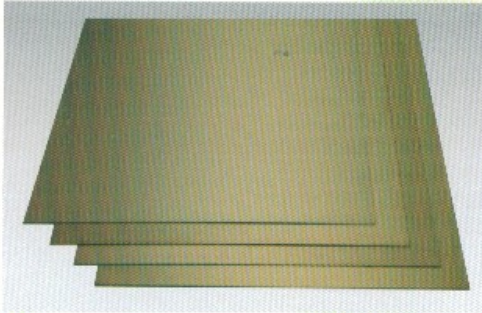
Thermal path in LED module



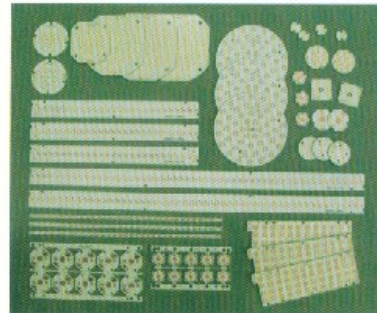
Cross-sectional image of Metal PCB



CoolRATE™ Product type



CCL (Copper Clad Laminate)



CoolRATE™ Metal PCB

Product Specification

Items	Unit	SA-05	SC-10	Remark
Insulation Thickness	μm	40	45	30
Thermal conductivity	W/mK	5.0	10.0	20
Breakdown voltage	kV(DC)	2.5	2.0	> 5.0
Surface resistance	Ω	2.0x10 ¹⁰	2.0x10 ¹⁰	
Glass transition temp	°C	120	120	
Peel strength	Kgf/cm	2.2	2.2	
Solder resistance	sec	> 120	> 120	
Copper thickness	μm	35	35	70, 105
Base metal plate	-	Al 3003	Al 3003	1050, 5052
Base metal thickness	mm	1.5	1.5	0.5, 1.0, 2.0

Product Handling & Shelf Life

1. Reflow oven soldering process is strongly recommended due to CoolRATE's very high thermal conductivity. In case of manual soldering, please make soldering the LED package to the metal PCB on the hot plate.
2. The hardness of CoolRATE's insulation layer is rather higher, please be careful of drill bit or press cutting process.