

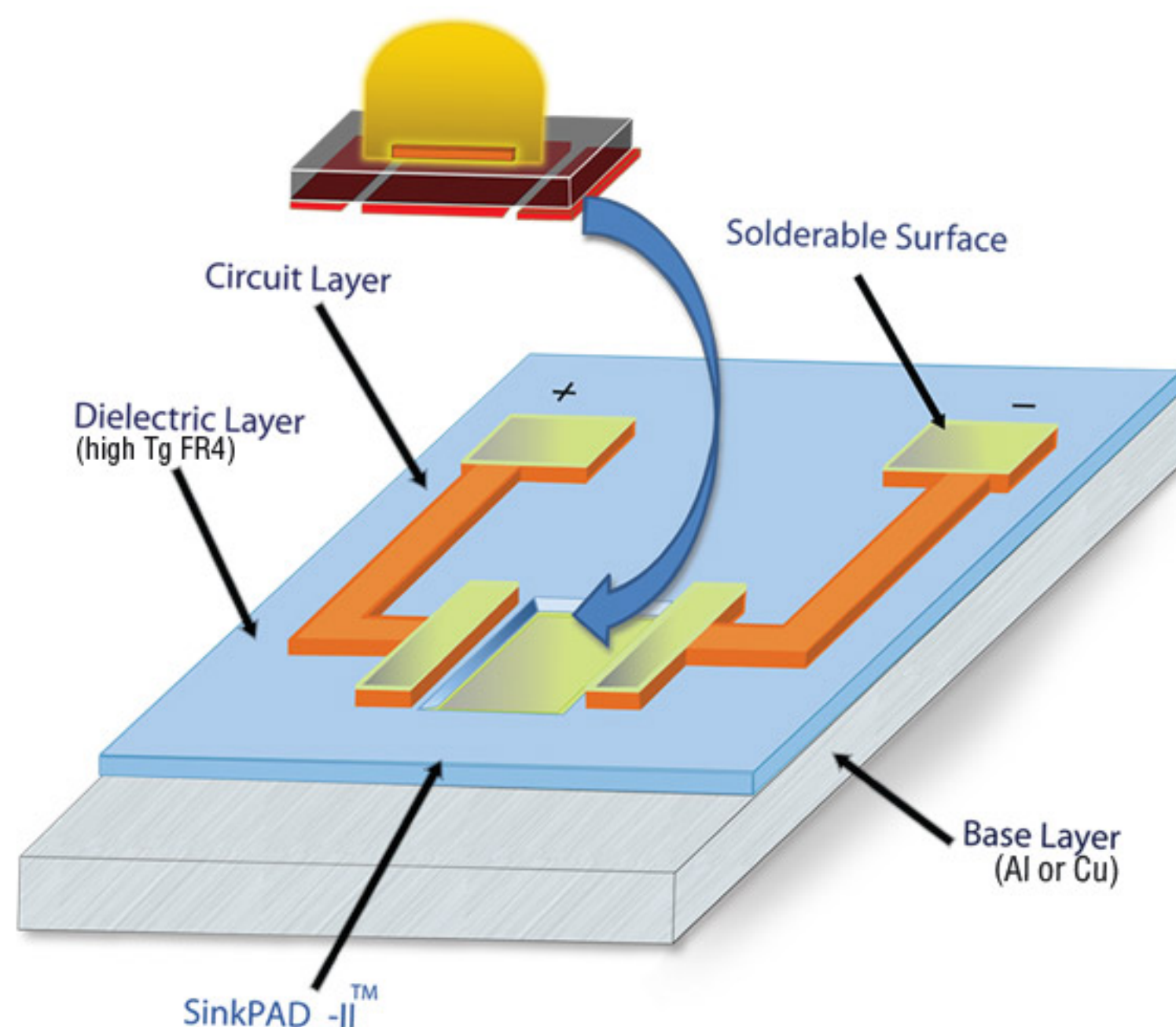
SinkPAD-II™ (Gen2) Technical Data Sheet

Dielectric Property

Property	Value	Test Method (IPC-TM-650 or as noted)
Thermal Property		
Thermal Conductivity	0.4 W/mK	ASTM D5930
Thermal Conductivity Of SinkPAD-II™ pad material	CP-A series	210.0 W/mK
	CP-C series	385.0 W/mK
Glass Transition (Tg)	170° C	2.4.25
Decomposition Temp (Td)	340° C	ASTM D3850
T260 Deg. C (TMA)	60 minutes	ASTM D3850
T288 Deg. C (TMA)	>15 minutes	ASTM D3850
CTE in x/y/z <Tg	13/14/40 ppm/oC	2.4.24
CTE x/y/z >Tg	14/17/220 ppm/oC	2.4.24
Max Operating Temp.	120° C	UL 796
Electrical Property		
Dielectric Constant	4.04	2.5.5.9
Dissipation factor	0.0192 (1GHz)	2.5.5.9
Volume Resistivity	7.0 E 14Ω-m	2.5.17.1
Surface Resistivity	2.0 E 14Ω-m	2.5.17.1
Electrical Strength	54,1350 (kV/mm, V/mil)	2.5.6.2
Dielectric Breakdown	>50 kV	2.5.6
Arc Resistance	115 sec	2.5.1
Mechanical & Chemical Property		
Peel Strength >17um Cu	7.0 (1.25) lb/inch (N/mm)	2.4.8.3
Flexural Strength	77 kpsi	2.4.4
Moisture Absorption	0.15%	2.6.2.1
Flammability	V-0	UL-94
Solder Float	Pass	2.4.13

Dielectric values referenced from ISOLA 185HR and ITEQ Datasheet

SinkPAD -II™ is a 2nd generation printed circuit board technology with a primary focus of solving thermal issues. Medium to High Power LEDs are constantly evolving, although the need to remove heat from that LED remains constant. SinkPAD's focus is to lower junction temperature of the LED by using a Direct Thermal Path. Lower junction temperature increases LED life, LED brightness, lumen output, product reliability and can even reduce dollars per Lumen.



SinkPAD-II™ is a cavity approach circuit board. It is approx. 3-5mil (75-125um) deep. Typical assembly process will work with standard 5-6mil thick stencil.

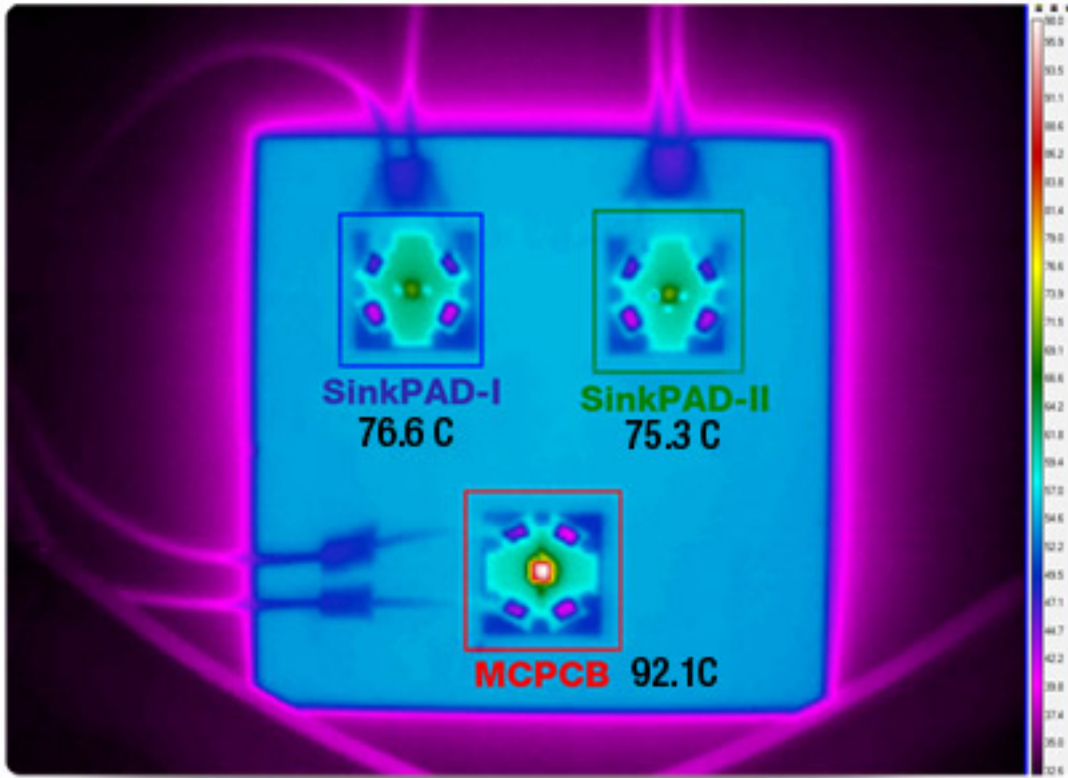
SinkPAD-II™ Product Family (CP Series)

SinkPAD P/N	Base Metal	Base Metal Thickness
CP-A30	ALUMINUM	~0.032" (~0.80mm)
CP-A40	ALUMINUM	~0.040" (~1.00mm)
CP-A60*	ALUMINUM	~0.059" (~1.50mm)
CP-C40	COPPER	~0.040" (~1.00mm)
CP-C60*	COPPER	~0.059" (~1.50mm)

* Most running product ** Other thicknesses may available upon request

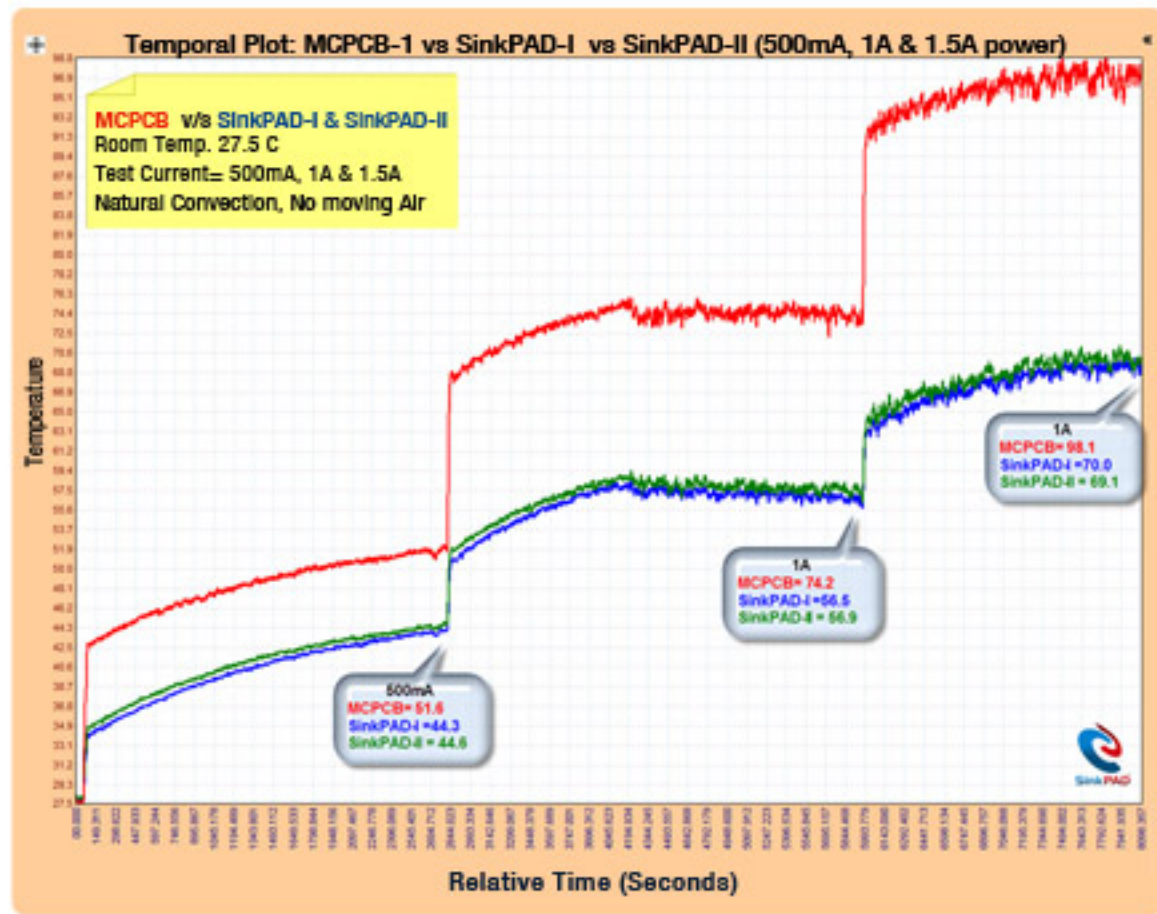
Customer is responsible for testing its suitability for their application SinkPAD provides this engineering data for design guidance only

THERMAL TEST



LEDs radiate minimal heat into the space around the source. ALL of the heat generated by the LED must be conducted away by physical means (a conduction path). If the heat is not conducted away and LED gets too hot, it cannot function properly. The PCB selected for an application needs to have the best thermal path possible in order to avoid LED thermal run away. SinkPAD-II™ technology eliminates the use of dielectric material between the thermal LED pad and the base metal, therefore providing a Direct Thermal Path.

LED Runs Cooler With SinkPAD-II™



Street Lights



LED Lamps



Automobiles



Commercial Lights



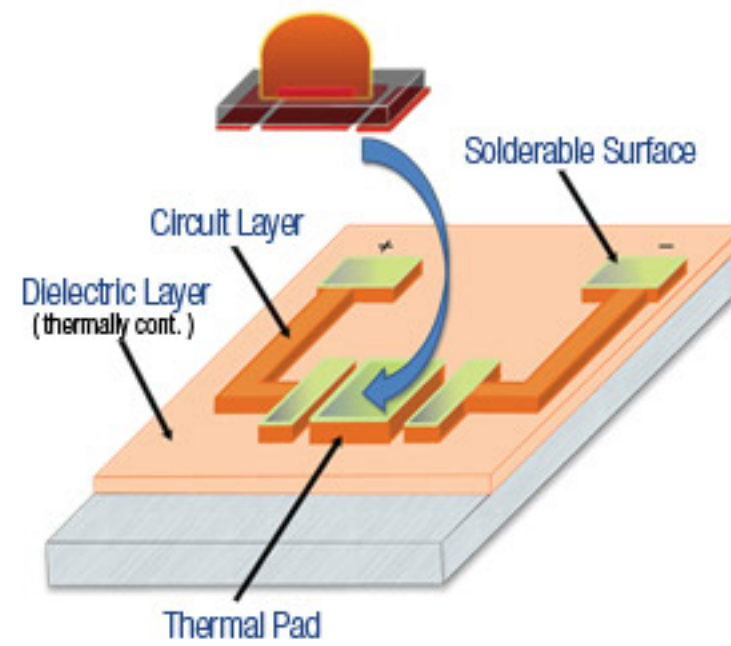
Interior Lights



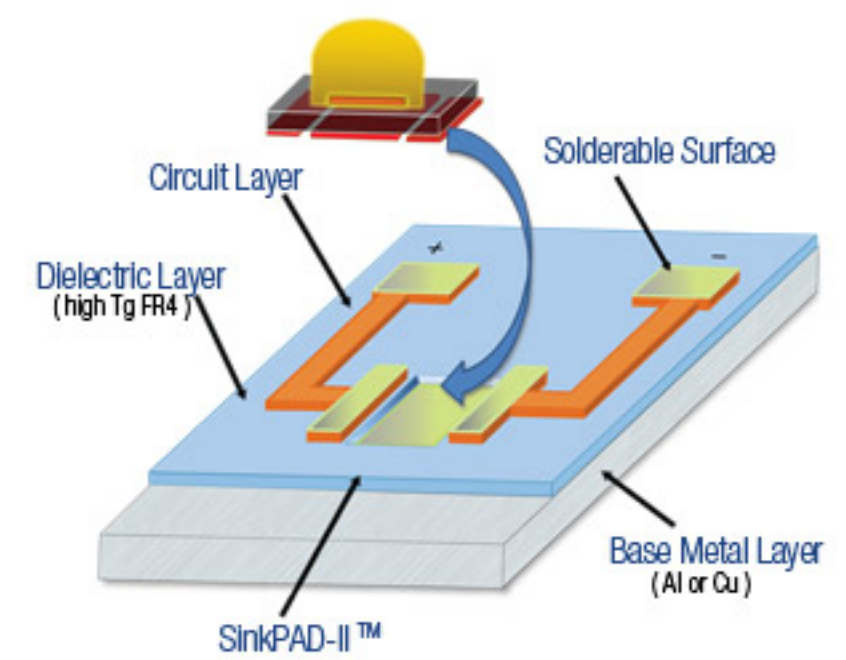
Exterior Lights

Metal Core PCB's use a dielectric layer to bond the circuit layer to the base metal. The key to the thermal performance of this MCPCB then lies in its dielectric layer. SinkPAD-II™ has overcome this limitation by eliminating the dielectric under the thermal pad only, providing a Direct Thermal Path which lowers the LED Junction Temperature.

COMPARISON OF "MCPCB" & "SinkPAD-II™ PCB"



- Higher Thermal Resistance
- Slow Heat Transfer Rate
- Special Dielectric Required
- Thick Base Metal Required
- Metal Insulated Thermally From The LED



- Direct Thermal Path (Cavity Approach)
- Cavity Depth ~3-5mil (75-125um)
- Fast Heat Transfer Rate
- Metal Is Connected Thermally To The LED
- Epoxy Or Standard Dielectric Can Be Used
- "No" PCB Design Change Required

SinkPAD-II™ Benefits

- Better or Same Thermal Performance as SinkPAD-I™
- SinkPAD-II™ enables "Direct Thermal Path" in densely placed LED designs
- 210 – 385 W/m.K Heat Transfer Rate
- Direct Thermal Path
- Lower LED Junction Temperature
- Enable to Drive LED Harder i.e. More Lumens per LED
- Achieve Same Light Output with Fewer LEDs i.e. Reduce Fixture Cost
- Most Economical Direct Thermal Path Solution
- Direct Replacement for MCPCB and Aluminum PCB
- No Design Change (Existing MCPCB Design can be Used)
- Flat Surface on Backside of the PCB
- UL Approved

Disclaimer

SinkPAD provides this engineering data for design guidance only. Users of SinkPAD™ technology are reminded that they bear the responsibility for testing for their applications. Any information furnished by SinkPAD LLC., its licensees and representative is believed to be accurate, but users of the technology must bear all responsibility for the use and testing of the product since SinkPAD LLC., its licensees and representatives cannot be aware of all potential uses. SinkPAD LLC. makes no warranties as to the applicability, fitness or suitability of SinkPAD™ technology for any specific or general uses. SinkPAD LLC. shall not be liable for incidental or consequential damages of any kind.