

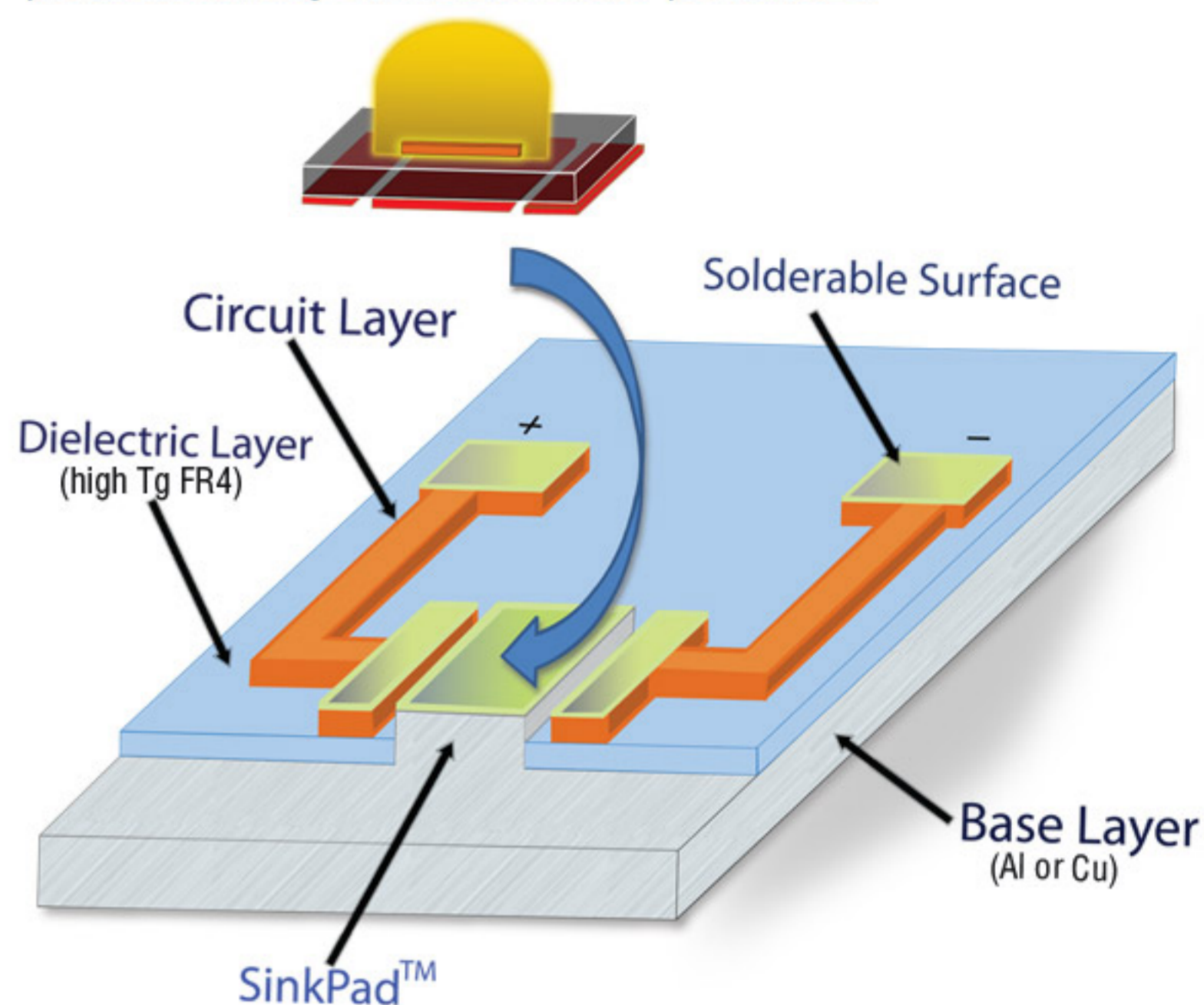
Technical Data Sheet

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™ pad material	SP-A series	210.0 W/mK
	SP-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™ is a printed circuit board technology. The Primary focus of the SinkPAD™ Technology is to solve thermal problems of the rapidly evolving medium to high power LED applications with demanding thermal performance, although it can be used in many other applications. Its **Direct Thermal Path** capability **reduces LED junction temperature** compare to traditional FR-4 PCB, MCPCB or Aluminum PCB. Lower junction temperature increases LED life, LED brightness, increase lumens per LED, increases product reliability and reduce dollar per lumens.



SinkPAD™ Circuit boards are available in various thicknesses as well as base metal types. See Product Family table for detail.

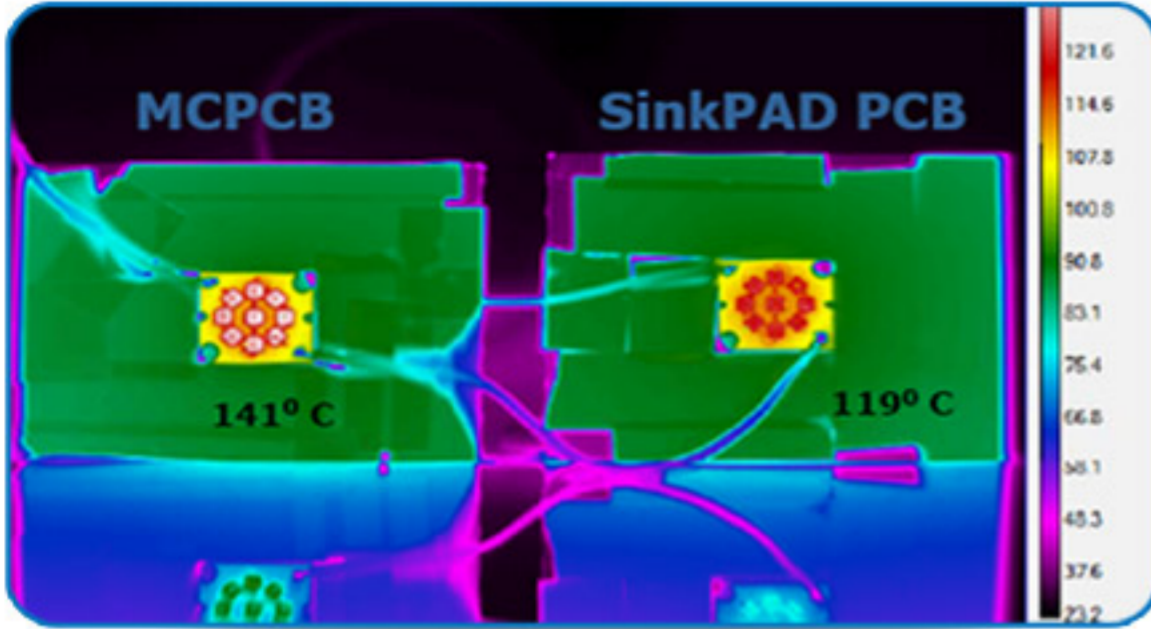
SinkPAD™ Product Family (SP Series)

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

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

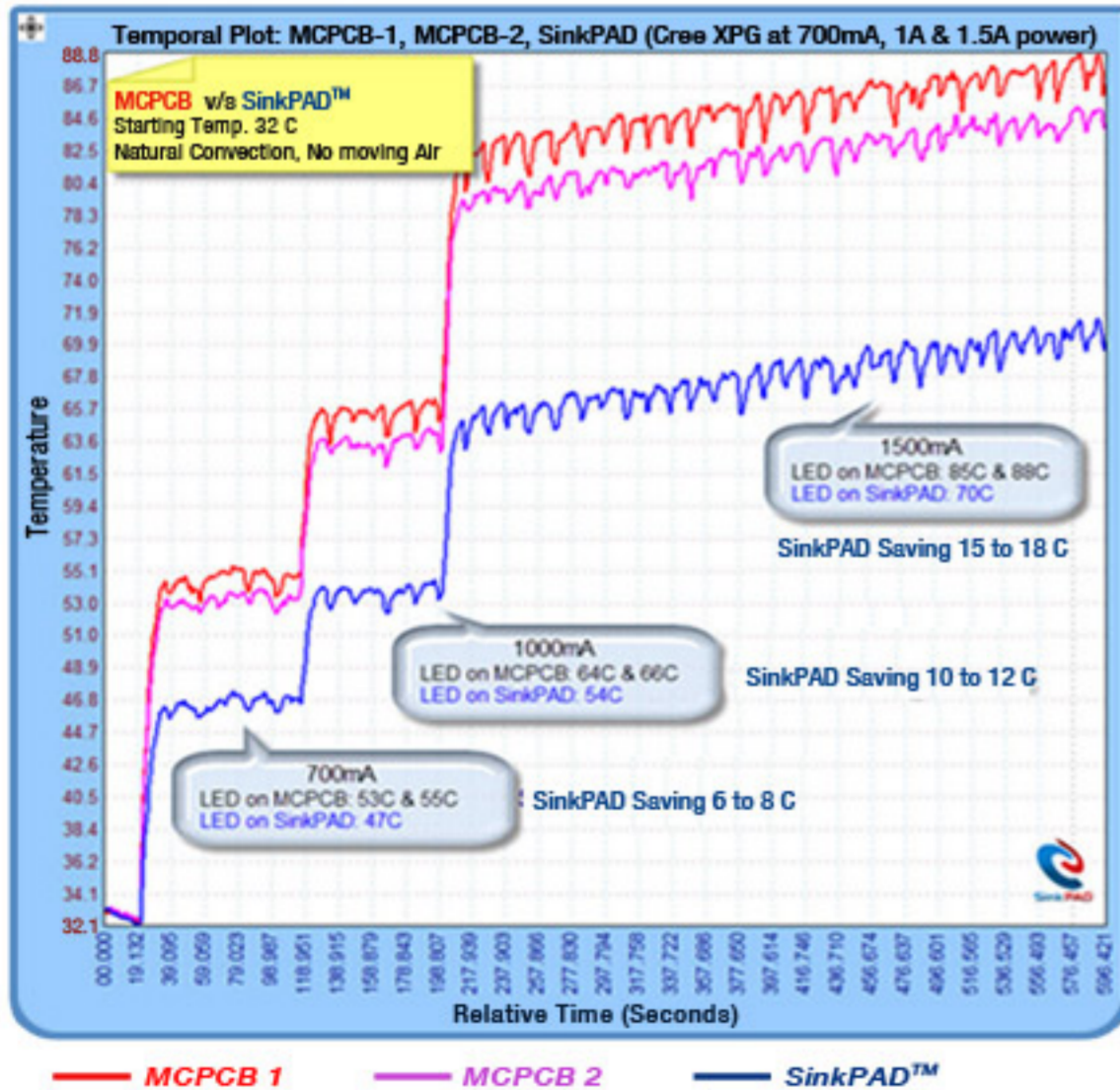
Customer is responsible for testing its suitability for their application SinkPAD provides this engineering data for design guidance only

THERMAL TEST



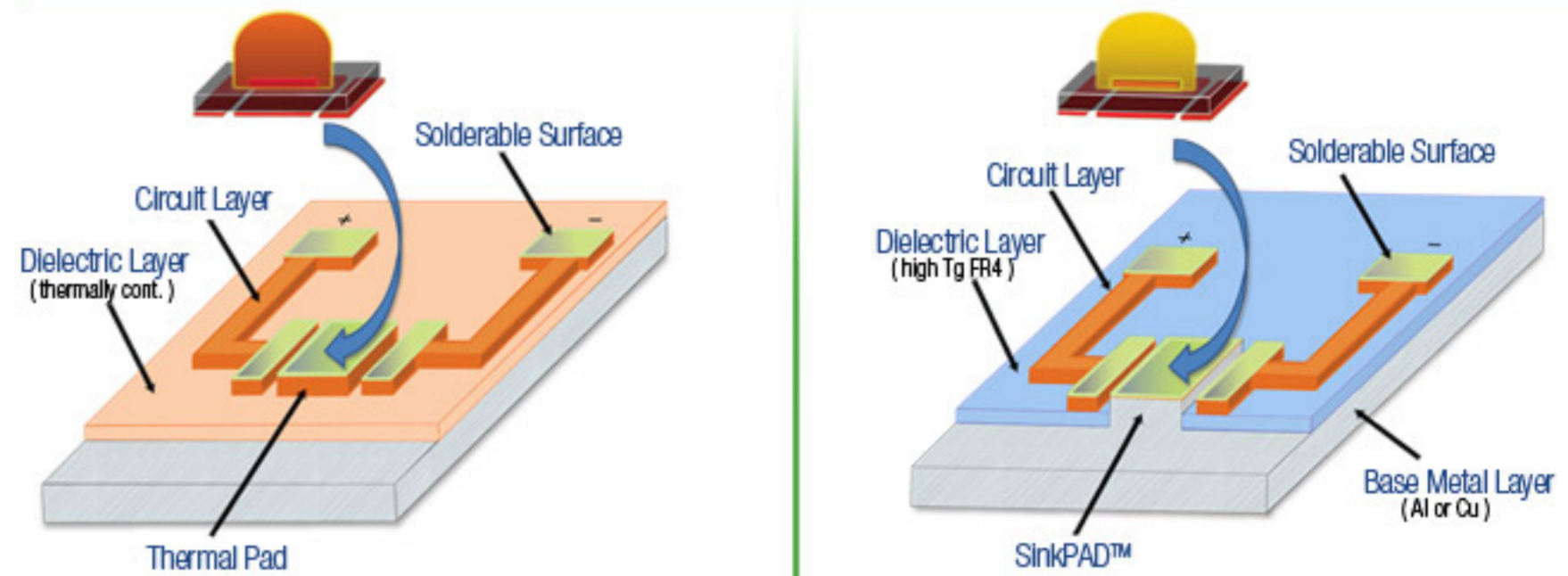
LEDs radiate minimal heat into the space around the source. This means that ALL of the heat generated by the LEDs must be conducted away from the source by physical means (a conduction path). If the heat is not conducted away, and the LEDs get too hot, the LED cannot function properly and can be permanently damaged, causing the light to change to an unacceptable color and shortened lifespan. Ensure that the PCB you select has the least thermal resistance in order to avoid LED thermal run away. SinkPAD™ PCB approach eliminates use of a dielectric material completely from a conduction thermal path providing “Direct Thermal Path”.

LED Runs Cooler With SinkPAD™



Metal Core PCB and standard FR-4 with thermal vias are commonly used circuit board materials to dissipate heat from a medium to high Power LEDs. In case of Metal Core PCB, MCPCB (often known as Aluminum PCB) uses a thermally conductive dielectric layer to bond circuit layer with base metal (Aluminum or copper) layer. The key to thermal performance of MCPB lies in its dielectric layer. Even though thermally conductive dielectric has higher thermal performance compared to standard dielectric material it is still a weakest link in the conduction thermal path in the MCPCB. SinkPAD™ PCB approach overcomes this limitation and eliminates use of a dielectric material completely from a conduction thermal path. SinkPAD™ Technology provides “Direct Thermal Path”, lowering LED junction temperature.

COMPARISON OF “MCPCB” & “SinkPAD™ PCB”



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

- Direct Thermal Path
- Fast Heat Transfer Rate
- Standard Dielectric Used
- Thinner Base Metal Options
- Metal Is Connected Thermally To The LED
- Epoxy Or Any Typical Dielectric Can Be Used
- “No” PCB Design Change Required

SinkPAD™ Benefits

- 210 to 385W/m.K heat transfer rate
- Direct Thermal Path
- Lower LED Junction Temperature
- Longer LED life
- Enables to drive LED harder. i.e. more lumens per LED
- Enables to get 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 required. i.e. existing MCPCB design can be used
- UL Approved



Street Lights



LED Lamps



Automobiles



Commercial Lights



Interior Lights



Exterior Lights

Disclaimer

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