

# Polyramic® Resins

For Electronic Laminates



POLYMER-TO-CERAMIC™ TECHNOLOGY



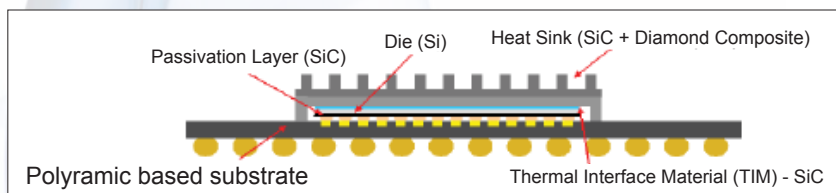
Starfire® Systems has developed a class of electronic laminate resins that combine the performance advantages of ceramics with the processing ease of organic polymers. Laminates produced with our SPR-684 material are low loss, high modulus, and allow for critical management of CTE. They are designed to meet the toughest packaging requirements needed for the next generation of mobile devices. Polyramic® resins can be engineered to produce a variety of substrate configurations with different physical, electrical, and thermal properties. Using SPR-684 as a base material, laminators can construct packaging systems using various fabrics and additives.

## Materials Description

The materials used consist of polysiloxane copolymers and other inorganic materials. There are no VOC's or solvents present in SPR-684.

## Polyramic® by Starfire Systems

- Low CTE, High Modulus material
- Compatible with existing laminating processes
- RoHS compliant
- Enable lead-free solder use
- Naturally UL-94 V-0
- Meet halogen free industry requirements



## Laminate Properties\* (Tailorable)

Reinforcement Fabric Style	1080 E-glass	
Resin Content	40 - 55%	
Dielectric Constant (@ 1.5GHz)	2.9 - 4.2	
Dielectric Loss Factor (@ 1.5GHz)	0.0015 - 0.01	
Thermal Conductivity	0.29 W/m-K	
CTE (x,y)	5 - 10 ppm	
CTE (z)	50 - 200 ppm	
Flammability Rating	UL-94: V-0	
Environmental	Halogen Free (IPC); RoHS Compliant	
T-288	>60 min	
Process Temperature	Flexure Strength	Flexure Modulus
220°C	320 – 420 MPa	30 – 34 GPa

\*May be influenced on resin content and fillers present in formulation.

## Warranty

No analysis of this product is permitted. The data provided relates only to the material identified above, as supplied by Starfire Systems®, Inc. (SSI). Because conditions and methods of use of our products are beyond our control, this information should not be used as a substitution for customer's tests to ensure that SSI's products are safe, effective, and fully satisfactory for the intended end use. SSI's sole warranty is that the product will meet sales specifications in effect at the time of shipment.