SUMITOMO BAKELITE CO., LTD.

PRESS RELEASE

Sumitomo Bakelite Co., Ltd.
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Development of High-Tg Epoxy Molding Compounds for Next-Generation SiC Power Modules

SUMIKON™ EME-G785 Series Achieves Industry-Leading Tg of 230°C for Solid Epoxy Materials

- Resolving the Trade-off Between High Tg and Low Stress with Proprietary Technology -

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Sumitomo Bakelite Co., Ltd. (Headquarters: Shinagawa-ku, Tokyo; President and Representative Director: Shinichi Kajiya) has developed the SUMIKON™ EME-G785 Series, a new epoxy molding compounds for next-generation SiC power modules, achieving a glass transition temperature (Tg) of 230°C - one of the highest levels in the industry* for solid epoxy materials. Mass production has now commenced.
This product successfully combines ultra-high heat resistance and low stress characteristics, which have been difficult to achieve simultaneously with conventional epoxy molding compounds, and contributes significantly to the miniaturization, higher output, and improved reliability of power modules.
*Based on our research

Background: Overcoming the “Heat Resistance Barrier” to Unlock the Potential of SiC

As the world moves toward carbon neutrality, the adoption of SiC power semiconductors is rapidly expanding in applications such as xEVs, data centers, and renewable energy systems, due to their ability to significantly reduce power loss.

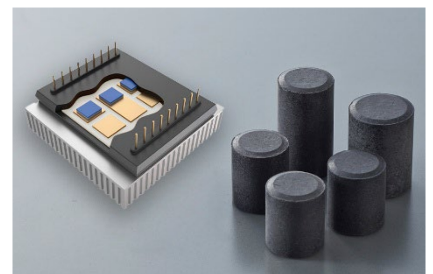
While SiC devices can operate at high temperatures exceeding 200°C, conventional encapsulation materials have struggled to provide sufficient heat resistance. Increasing the Tg of epoxy molding compounds above 200°C typically leads to higher crosslink density, resulting in increased elastic modulus (stiffness). This creates a critical trade-off, where thermal stress during heat cycling can cause delamination and cracks.

As a result, although high Tg values were theoretically achievable, practical application had been extremely challenging.

Key Features and Breakthrough Technologies of the “G785 Series”

■ Industry-Leading Tg of 230°C

The G785 Series achieves a Tg of 230°C by enhancing the rigidity of the polymer backbone and optimizing crosslink density. This enables the material to maintain its physical properties even in high temperature operating environments, ensuring long-term insulation reliability for SiC power modules.



SUMIKON™ EME-G785 Series

■ Resolving the Trade-off Between High Tg and Low Stress

While increasing Tg generally leads to higher modulus in epoxy materials, the G785 Series leverages advanced low-stress technology to suppress modulus increase and reduce internal stress.

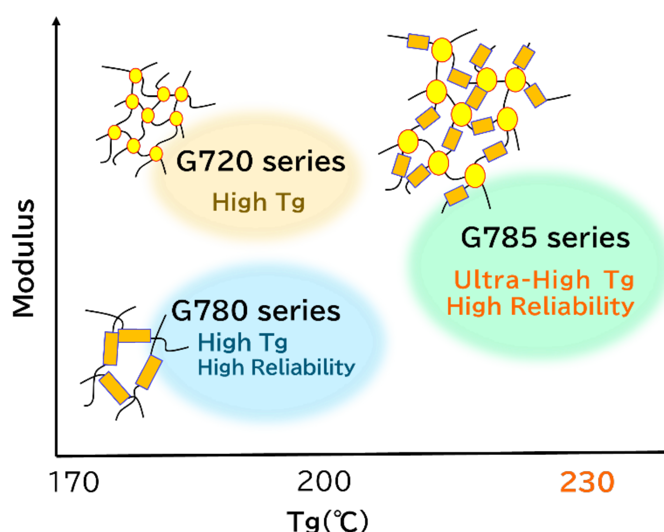
This minimizes warpage within the power module and prevents delamination from chips and substrates, as well as resin cracking. The material achieves an ideal balance - “high rigidity with flexibility” - required for advanced power modules, delivering superior packaging reliability.

■ Enabling Miniaturization and Higher Power Density

The excellent heat resistance enables compatibility with sintered materials and solder bonding to cooling components, contributing to improved heat dissipation performance.

As a result, the G785 Series supports the miniaturization and higher power density of power modules, maximizing the intrinsic performance of SiC devices.

Reference: Comparison with Conventional Products



Item	Unit	G720 Series	G780 Series	**G785 Series**
Status	–	Mass production	Mass production	Mass production started
Tg	°C	195	195	230
Weight loss (250°C/ 1000 hr)	%	>2	<2	<2

Future Outlook

Our company positions the G785 Series as a strategic product for next-generation power electronics and aims to achieve sales of ¥10 billion by fiscal year 2030.
The company will continue to support innovation in power module structures through advanced materials development, contributing to energy efficiency across a wide range of applications.

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