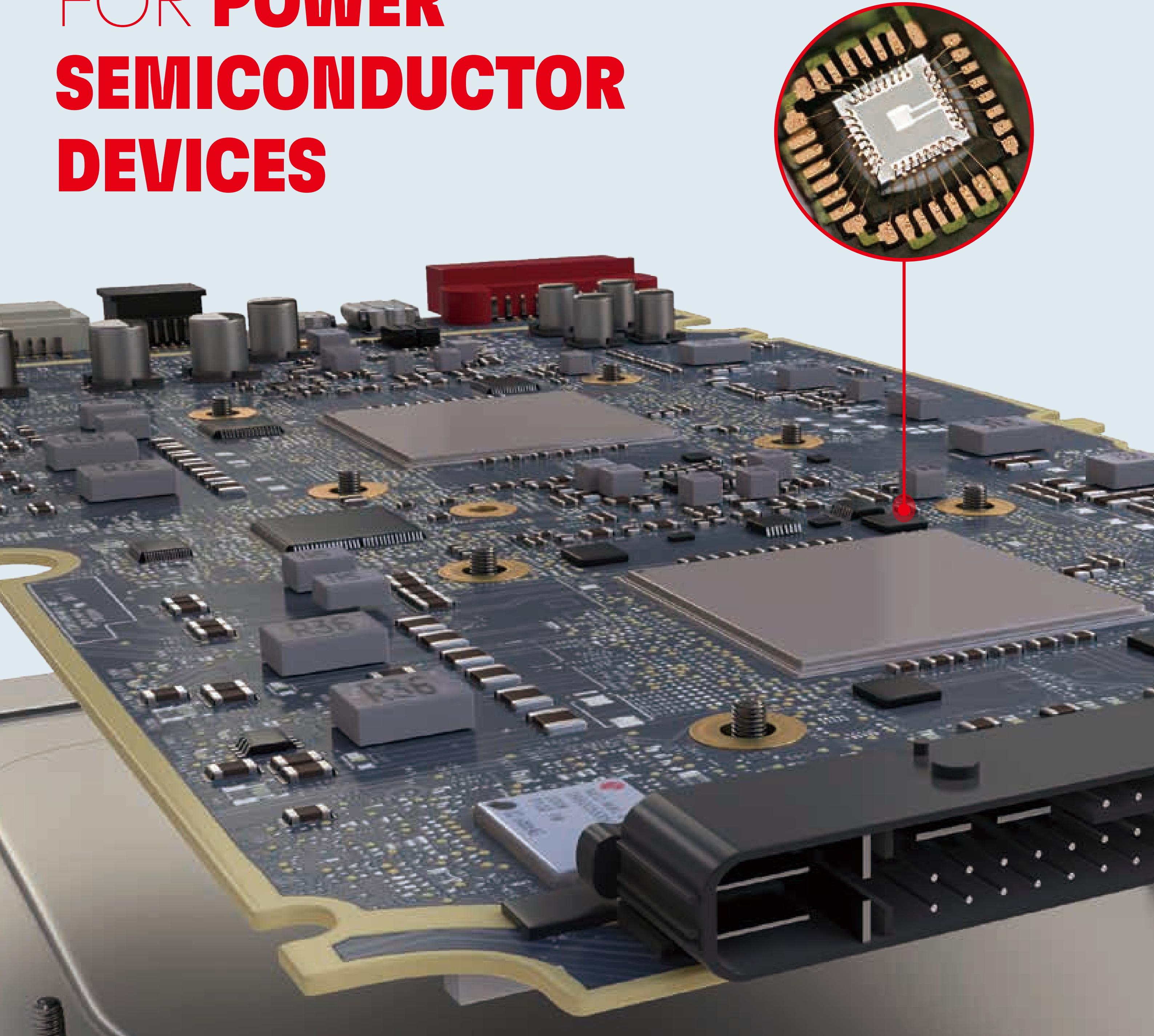
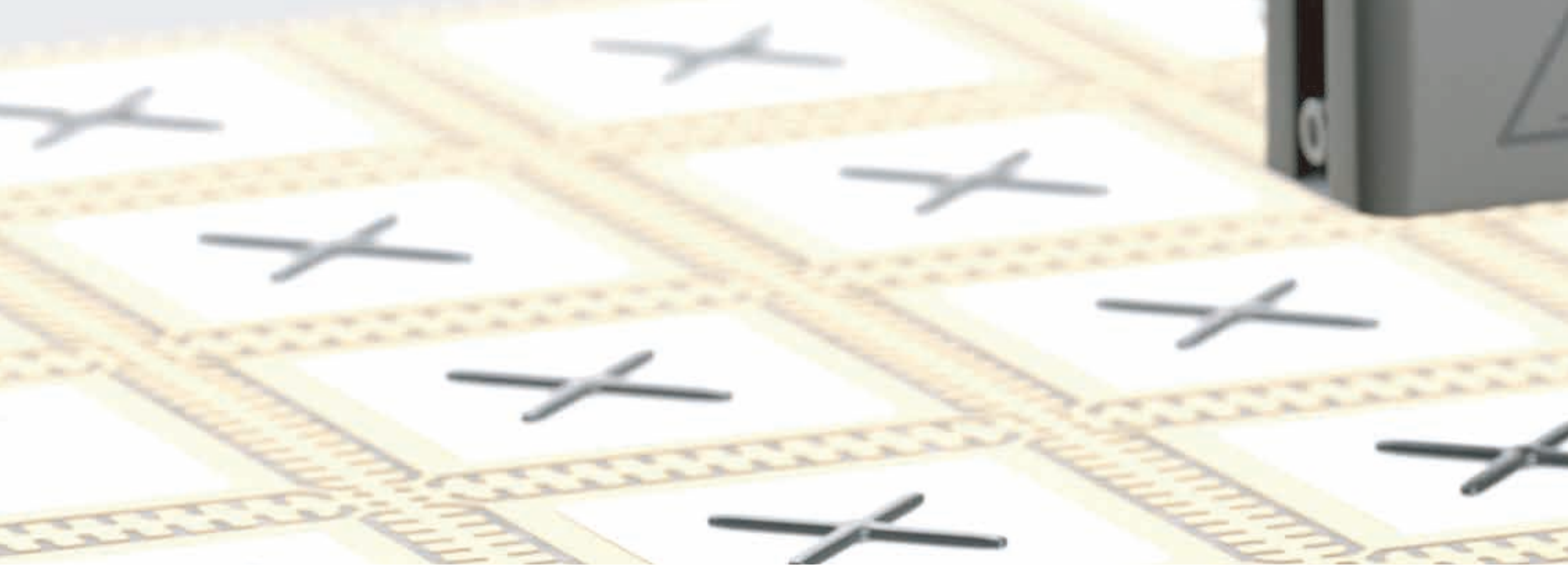
HIGH THERMAL, AUTOMOTIVE GRADE 0, CONDUCTIVE DIE ATTACH PASTE FOR POWER SEMICONDUCTOR DEVICES





APPLICATION OBJECTIVES

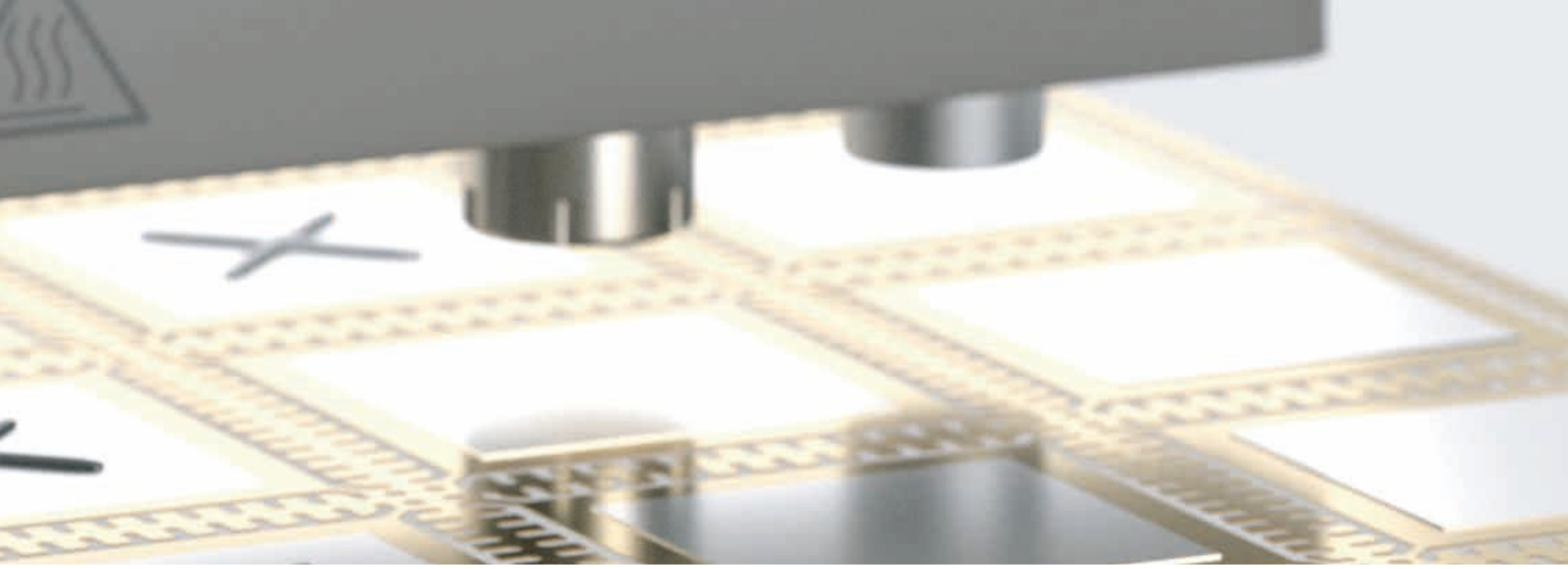
- A customer was designing a single-die QFN package using more cost-effective and reliable copper (Cu) leadframes. The bare Cu leadframe was selected because of its excellent adhesion to mold compound materials and lower cost versus conventional PPF and silver (Ag)-coated Cu leadframes.
- The customer also specified Cu wire instead of gold (Au) wire for the wirebond interconnects to further reduce cost.
- Because the power semiconductor device(s) will be used in industrial applications, exceptional reliability, electrical (RDSon), and thermal (W/m-K) performance are necessary. Elevated operational temperature significantly influences die performance. In this case, the die may experience temperatures as high as 150°C.

PERFORMANCE REQUIREMENTS

- The die attach material thermal capability is critical to achieving the desired performance of packages with Cu leadframes and Cu wire. It is in direct contact with the die and provides the most targeted path for heat dissipation.
- Elevated resistance between the die and the package will generate considerable heat, reducing the device's energy efficiency. The die attach layer is a key contributor to electrical resistance, RDS(on), so a material that can lower resistance and improve energy efficiency is needed.
- The material should have a high modulus at high temperatures (200°C - 250°C) to enable wire bonding without non-stick on pad (NSOP) failures.
- In addition to Cu leadframes, die attach paste compatibility with other leadframe finishes and backside metalized or non-metalized die is preferred so that the material can be integrated with different package designs.

Discover more about Henkel's high-reliability die attach solutions HERE.
Learn about all of Henkel's materials for automotive semiconductor packaging. **DOWNLOAD THIS BROCHURE**.

Speak with someone on the Henkel team about LOCTITE Ablestik ABP 6395T or any of the company's advanced die attach paste and film solutions.
Visit **https://www.contact.henkel-adhesives.com** to get in touch.



HENKEL SOLUTION

Henkel developed a die attach paste chemistry platform for the high thermal, low electrical resistance, and high reliability required for power semiconductor packages.

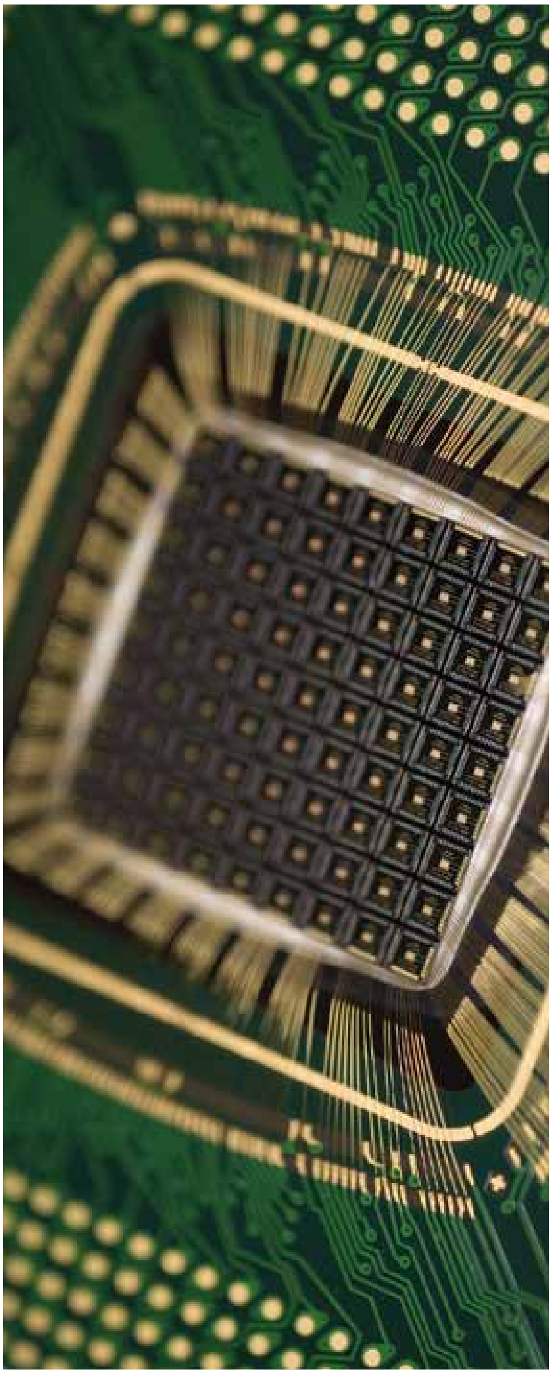
The material used in this case, LOCTITE Ablestik ABP 6395T, is built on the new platform.
Its unique epoxy chemistry and Ag loading approach provide:

- Excellent thermal conductivity characteristics (30 W/m-K without sintering).
- Low stress.
- Low electrical resistance for good RDS(on).

The material meets the most stringent reliability standards for different leadframe and die finish combinations. Automotive Grade 0 and MSL 1 reliability are achieved with most die/leadframe pairings with die sizes up to 3.0 mm x 3.0 mm. Competitive materials achieved MSL 1 but could only deliver 25 W/m-K thermal conductivity.

Using LOCTITE Ablestik ABP 6395T, this customer proceeded with its new power QFN design, reducing cost by approximately 2% per device.

LOCTITE Ablestik 6395T is also sustainable and complies with rigorous safety standards. The material is halogen-free and RoHS-compliant, with no hazardous materials detected in third-party testing.



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