



Condura®.prime Active Metal Brazed (AMB) Si₃N₄ Substrates

Silicon nitride offers excellent mechanical properties (high bending strength, high fracture toughness) and high thermal conductivity that makes it an ideal substrate material for high-reliable power electronics modules.

The outstanding mechanical robustness of Si₃N₄ enables brazing with thick Cu layers offering additional thermal capacity to dissipate load peaks. Thus baseplates become obsolete for certain applications.

AMB-Si₃N₄ substrates combine best mechanical robustness with excellent heat dissipation properties featuring very high power densities. Optimal performance and reliability can be achieved by using silver sintering, **Die Top System (DTS®)** and Cu bonding technology. This setup also enables utilizing the full potential of wide bandgap (WBG) semiconductors (SiC, GaN).

For your specific needs, we identify the optimal material combination from our broad product portfolio: metal ceramic substrates with functional surfaces optimized for our sintering, soldering and bonding solutions.

Key features of AMB-Si₃N₄

- Best in class reliability
- Enables thick Cu layers (e.g. 0.8mm)
- Thinner ceramics vs. AlN achieving same thermal resistance
- Thermal conductivity > 80 W/m·K of Si₃N₄ ceramic

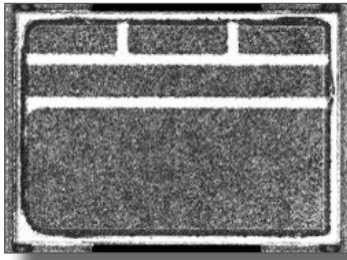
Special features

- Best quality functional surfaces, e.g. Ag finish optimized for silver sintering technology
- Pre-applied sinter / solder

Heraeus offers:

- Reliable IATF 16949 certified supply of Condura®.prime (as well as Condura®.classic & Condura®.extra)
- Engineering Services (Simulation, Prototype Design & Assembly, Testing and Qualification, Material Analysis)
- To be your competent **one-stop materials solutions partner!**

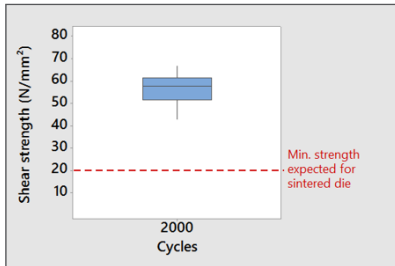
Testing — after 2,000 Thermal Cycles -40°C/+150°C



SAM

No copper delamination observable in ultrasonic testing

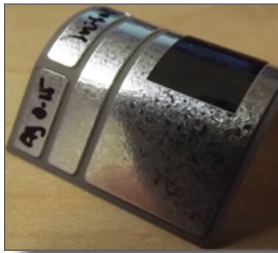
- Sinter paste LTS 338-28P2
- 0.32 mm AMB-Si₃N₄ with 0.3 mm Cu
- AMB functional surface 0.15 µm Ag



Shear strength

High shear strength due to the strong and reliable bonding of the silver sinter layer and optimized Ag finish of AMB-Si₃N₄

- Sinter paste LTS 338-28P2
- 0.32 mm AMB-Si₃N₄ with 0.3 mm Cu
- AMB functional surface 0.15 µm Ag



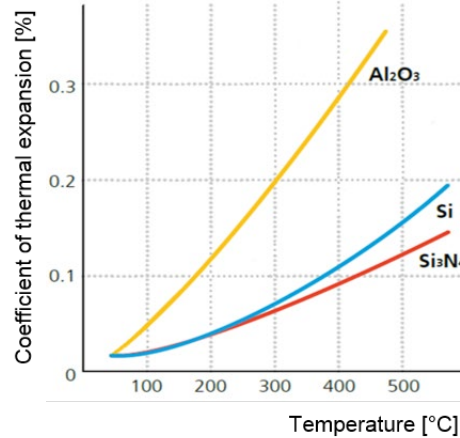
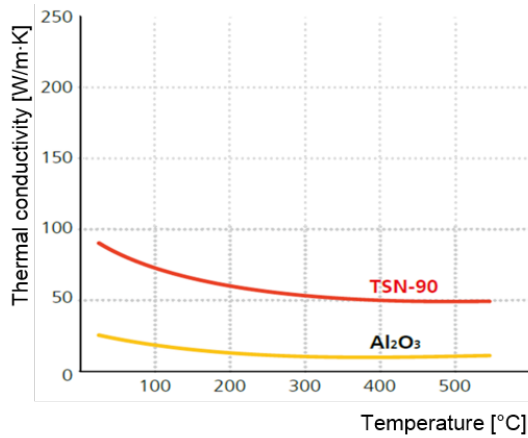
Bending test

No die delamination, high bending strength

- Sinter paste LTS 338-28P2
- 0.32 mm AMB-Si₃N₄ with 0.3 mm Cu
- AMB functional surface 0.15 µm Ag

Sintering conditions: 10 MPa, 230 °C, 3 min

Physical properties ideal for high-reliable modules using Ag sintering / Die Top System



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