

ENGINEERING  
TOMORROW

*Danfoss*

Danfoss Bond Buffer® (DBB®)

More **current, robustness** and  
**power density**

Up to  
**15 times**

higher lifetime  
with Danfoss Bond  
Buffer®.

[siliconpower.danfoss.com](http://siliconpower.danfoss.com)



### KEY BENEFITS

- Increase life time by a factor of 15

OR

- increase power output by 30%
- Junction temperature up to 175 °C

Danfoss Bond Buffer® (DBB®) is a breakthrough to current aluminium based bonding and joining technology. With copper layer on the semiconductor, sintering and copper bond wire, DBB® ushers the new era in module packaging.

The increasingly ambitious requirements of the automobile, industry and renewable energy markets demand that power modules must increase in both – power density and lifetime.

State-of-the-art module concepts have reached their limitations in terms of power density, current carrying capability and reliability. Connection technologies for the semiconductors are a bottleneck of their performance.

#### What is DBB®?

To overcome the limitation of current module technology a new bonding and joining technology for power modules has been developed. The solder joint between the DCB-substrate and the semiconductor is replaced by a sintered joint. In addition, a copper plate is sintered on top of the semiconductor surface metallization, and traditional aluminum bond wires are replaced by copper wires.

The combination of these improvements – sintered connection between semiconduction and DBC-substrate, the sintered copper Bond Buffer and copper bond wires – is known as Danfoss Bond Buffer® (DBB®) technology.

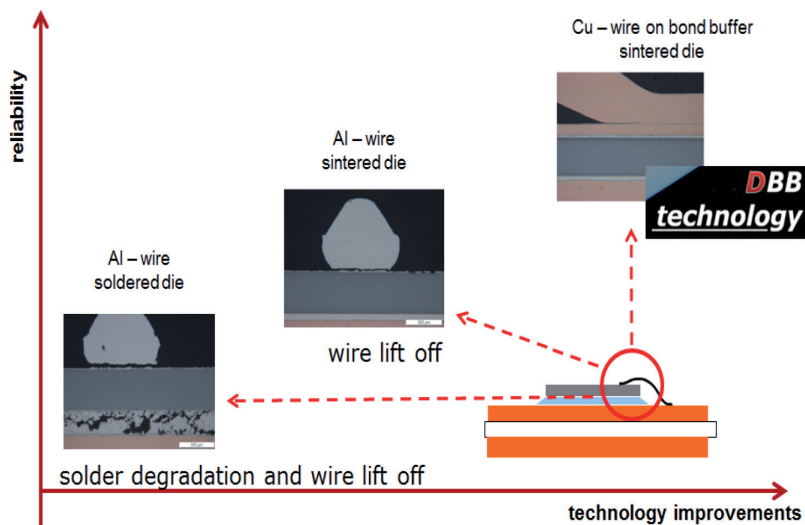
#### SUPERIOR YET FLEXIBLE

Unlike other new technologies in bonding and joining, DBB® is semiconductor source independent.

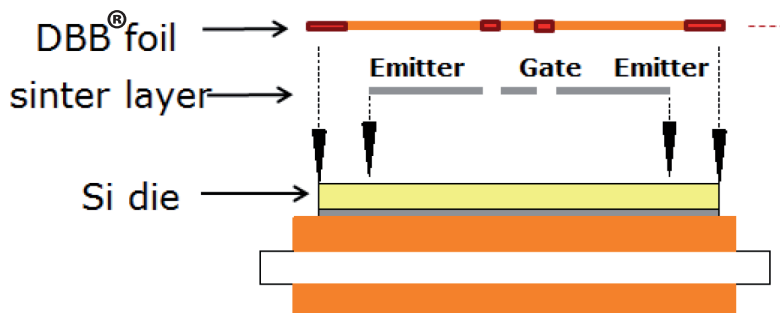
DBB® technology is available both in custom specific as well industry standard packaging.

No changes in gate driver, resistors or any other passive component is needed when replacing an existing module to comparable DBB® module.

## Copper wire and sintered die improves performance



## DBB® – the ultimate in bonding-and-joining technology



- A thin copper foil (bond buffer) sintered onto the upper surface of semiconductor, increases the thermal capacitance. This layer provides uniform current distribution (e.g. in short circuit conditions) and better heat dissipation.
- This universal top layer can be used for most power semiconductors.
- Copper bond wires replace aluminum bond wires. Copper bond wires offer extra current carrying capacity and better heat conduction and dissipation.
- Sintering instead of soldering prevents solder degradation. And reduces the thermal resistance  $R_{th}$ .
- Use of copper bond wires, bond buffer layer and sintering technology provides Cu-to-Cu mono metal joints thus providing excellent electrical and thermal performance and reliability.

# Danfoss Silicon Power

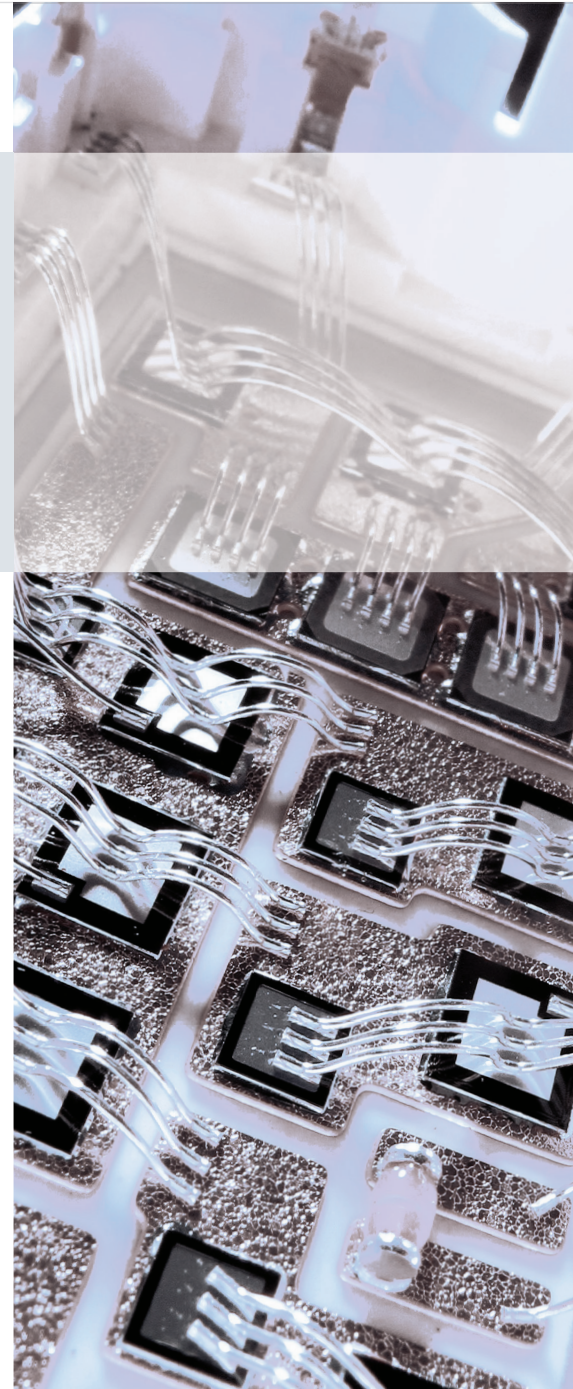
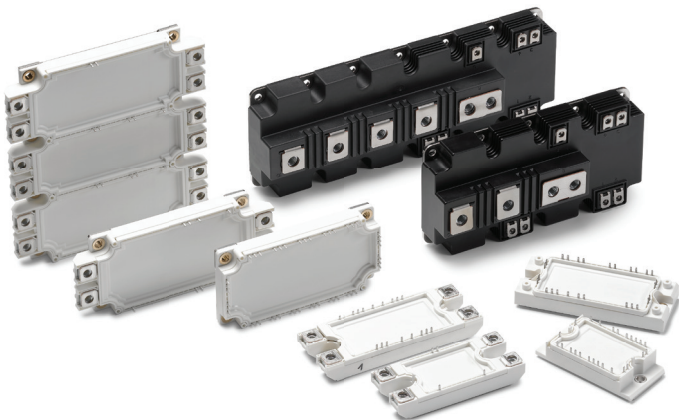
Based in Flensburg, Germany, Danfoss Silicon Power is a leading developer of customer specific IGBT and MOSFET modules and power stacks for power intensive applications.

Our power modules and power stacks are a preferred choice in demanding automotive and wind power applications and a wide variety of industrial applications.

Our 35,000 m<sup>2</sup> research, development and production facility is certified according ISO 9001, ISO/TS 16949, ISO 14001, ISO 50001 and OHSAS 18001. This enables us to quickly transfer

development projects to high volume production that can be integrated seamlessly into our customers' supply chain with full focus on quality.

Danfoss Silicon Power is a subsidiary of the Danfoss Group, the largest industrial company in Denmark. Danfoss employs more than 24,000 people in 100 countries within development, production, sales and support.



**Danfoss Silicon Power GmbH**, Husumer Strasse 251, 24941 Flensburg, Germany, Tel. +49 461 4301-40, Fax +49 461 4301-4310  
[www.siliconpower.danfoss.com](http://www.siliconpower.danfoss.com), E-mail: [dsp-sales@danfoss.com](mailto:dsp-sales@danfoss.com)

Danfoss can accept no responsibility for possible errors in catalogues, brochures and other printed material. Danfoss reserves the right to alter its products without notice. This also applies to products already on order provided that such alterations can be made without subsequent changes being necessary in specifications already agreed. All trademarks in this material are property of the respective companies. Danfoss and the Danfoss logotype are trademarks of Danfoss A/S. All rights reserved.