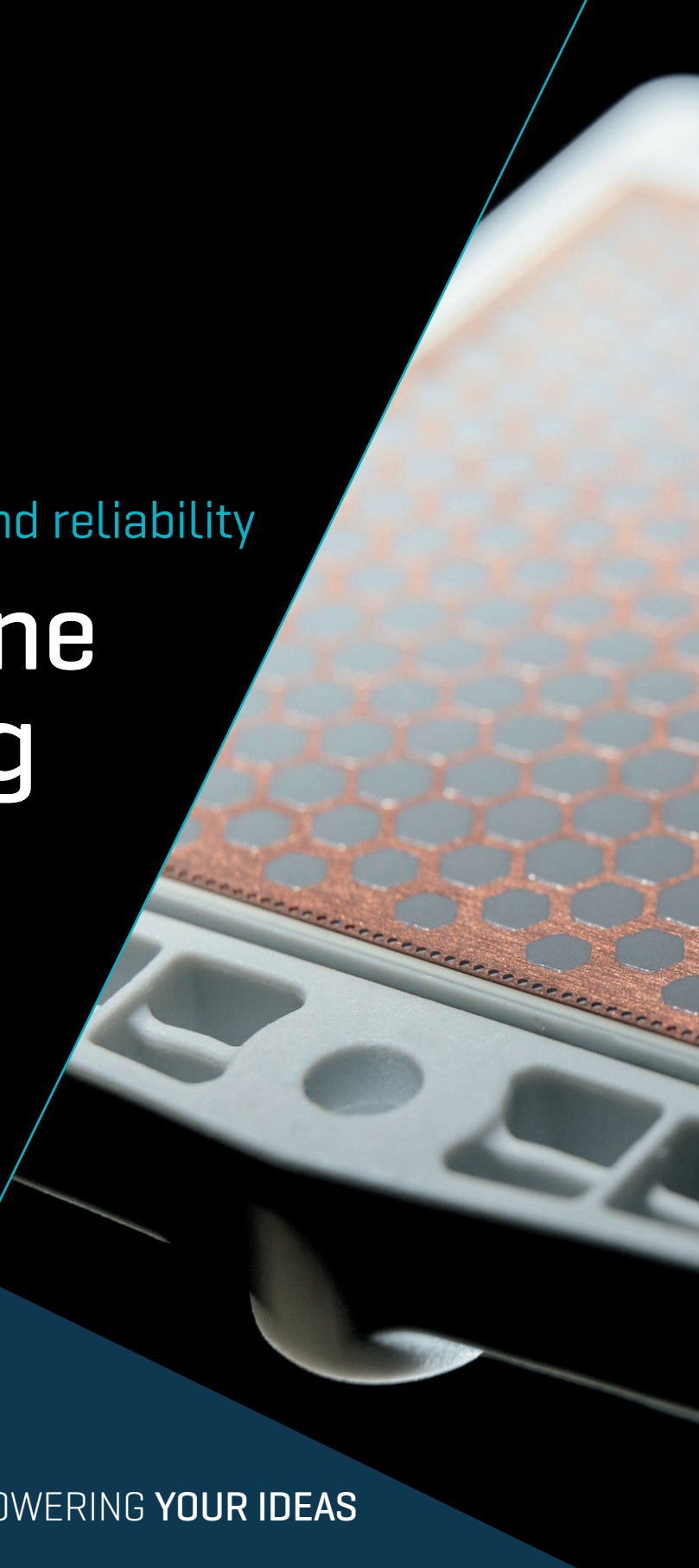
Vincotech

Performance and reliability

All in one housing



EMPOWERING **YOUR IDEAS**

The new baseplate-less packages with VINcoPress technology

Performance and reliability - all in one housing

Vincotech has extended its portfolio of **baseplate-less, 12-mm, low-inductive power modules** with two new housings. The new *flow* E3 modules bring the benefits of industry-standard *flow* E housings to the higher power range and help engineers to extend their current designs to higher power levels while keeping mechanical changes small.

Additionally the *flow* S3 and *flow* E3 modules feature VINcoPress and advanced die-attach technologies. Both provide the widely valued pre-applied phase-change thermal interface material (PC-TIM), the choice between solder or press-fit pins and and optional AlN DCB.

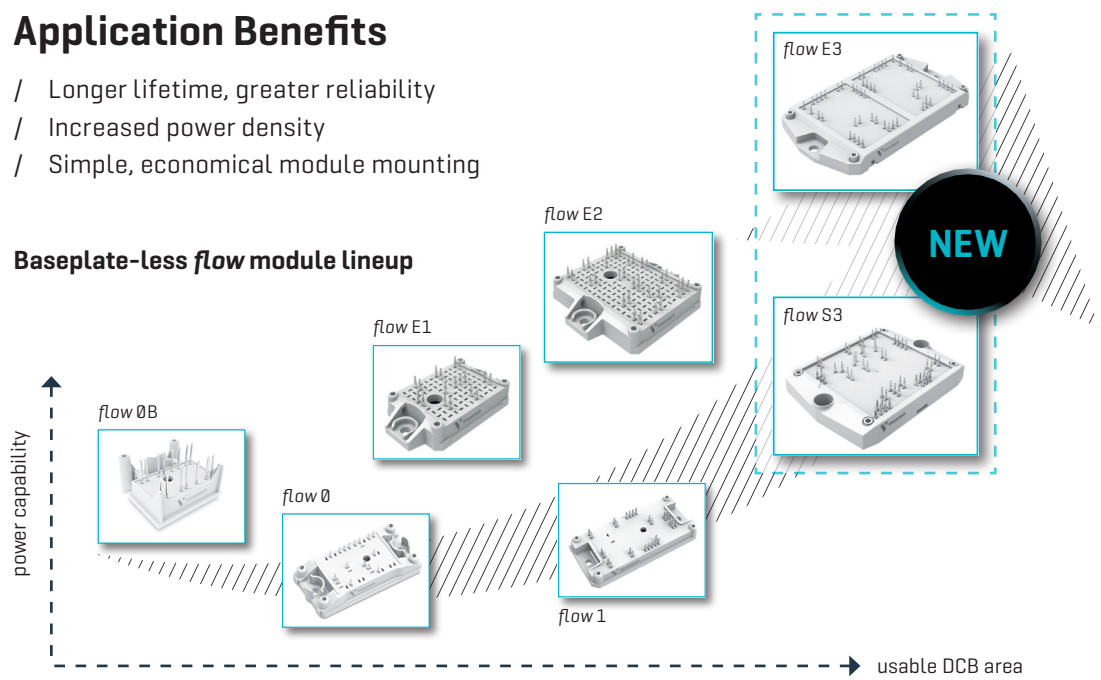
Housing Features

/ VINcoPress technology
/ Advanced die-attach technology
/ Al_2O_3 and AlN DCB available
/ Low inductive, 12mm housing
/ Pre-applied PC-TIM rated for 150°C
/ Press-fit and solder pin

Application Benefits

/ Longer lifetime, greater reliability
/ Increased power density
/ Simple, economical module mounting

Baseplate-less *flow* module lineup



VINcoPress Technology

Vincotech's direct pressed substrate technology

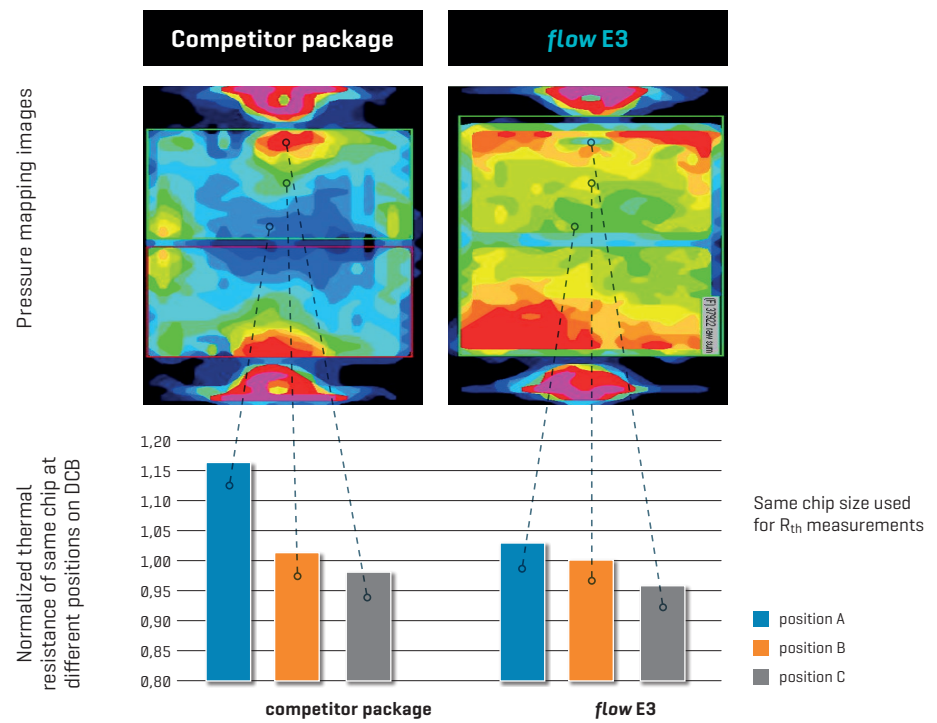
The VINcoPress technology is aiming for **superior thermal performance with improved reliability**. The novel power module packaging technology presses the entire substrate to the heatsink, directly and evenly. It distributes pressure uniformly avoiding uncontrolled force to the substrate and eliminates the cracking risk during assembly.

Key Features

/ Direct pressed substrate
/ Homogeneous pressure and R_{th} value distribution
/ Rugged and reliable heat sink assembly

Benefits

/ Higher power capability
/ Greater power density



Advanced Die-attach Technology

The next level of reliability

Chip shrinkage, design to the limit and demanding mission profiles lead to power modules operating at high temperature with high current.

This results in higher stress on the solder joints. The new advanced die-attach technology **strengthens the bond between chip and DCB**, reduces solder joint delamination related failures and improves long-term reliability.

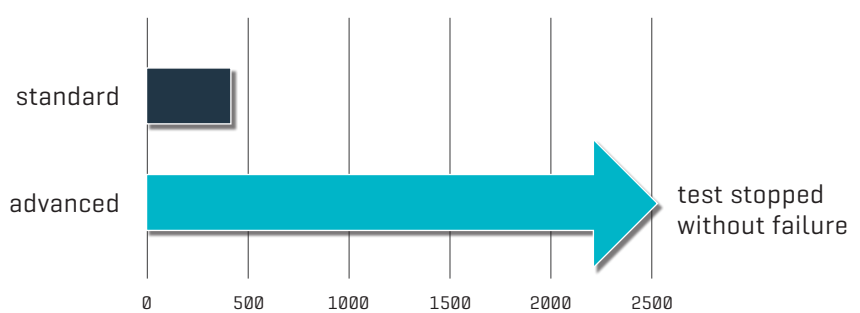
Key Features

/ Strengthens the bond between chips and copper of DCB
/ Reduces of solder joint related failures
/ Boosts power cycling capability
/ Extends operating time at high temperatures

Benefits

/ Longer lifetime, better reliability at high operation temperatures

flow S3 with advanced die-attach technology shows superior lifetime at T_{vj}=150 °C



HTFB* time to failure (hours)
*(high temperature forward bias)

Aluminum Nitride (AlN) Substrates

More options, best fit for your use case

It takes ceramic materials with higher thermal conductivity to boost baseplate-less power modules' current-carrying capability. Aluminum Nitride (AlN) can reduce the **thermal resistance** from semiconductor junction to heatsink while the VINcoPress technology maintains rugged and reliable heat sink assembly.

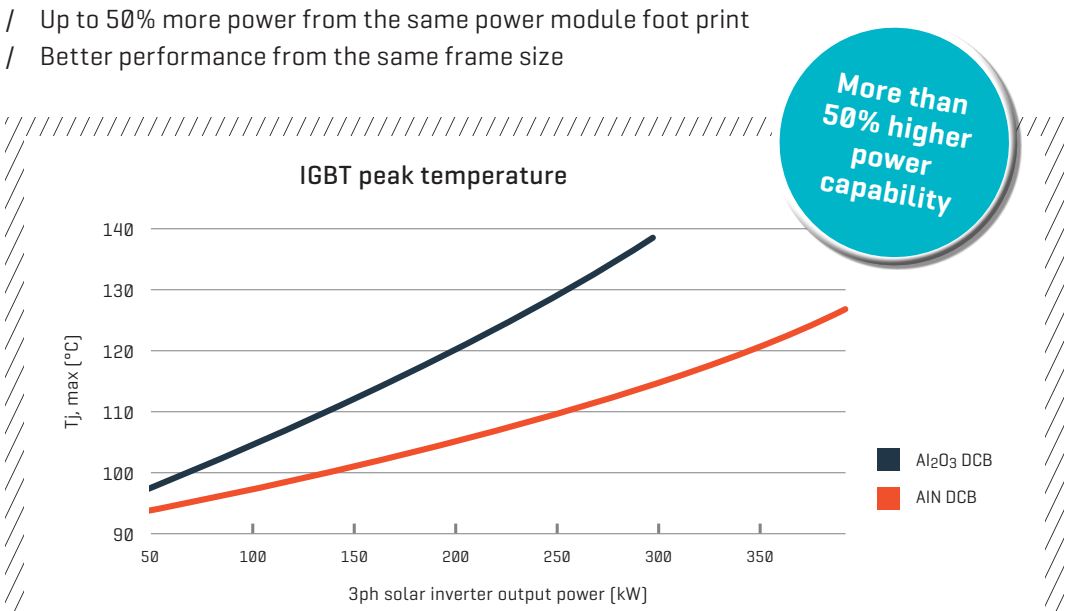
VINcoSIM, our integrated simulation environment, served to benchmark AlN DCB's peak junction temperature in comparison with Al_2O_3 using a 3-level NPC (I-type) module for a solar inverter application. It confirmed that AlN increases power capability by more than 50% at the same junction temperature.

Key Features

/ Increases power modules' current carrying capability
/ Delivers superior thermal performance
/ Decreases the thermal expansion coefficient

Benefits

/ Up to 50% more power from the same power module foot print
/ Better performance from the same frame size



Conditions: V_{dc} = 1350 V, V_{ac} = 460 V, cosphi = 0.8, f_{sw} = 16 kHz, T_{hs} = 90°C, $R_{g,on}$ = $R_{g,off}$ = 2Ω

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