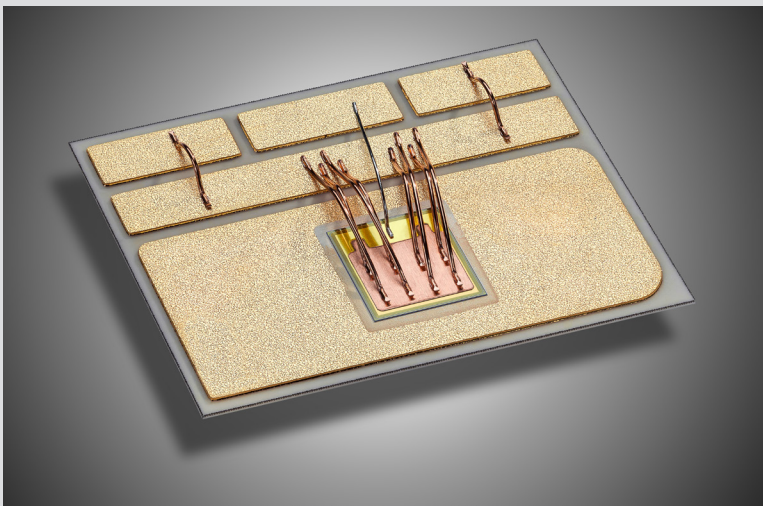


DIE TOP SYSTEM[®] DPIS⁽¹⁾ Get the most out of your power module



Key benefits

Die protection to enable Cu wire bonding with high yield.
Pre-applied sinter paste & adhesive dot to simplify the assembly.

Best performance:

- Die current capability increases > 50% vs. aluminium wire.
- > 50x longer lifetime vs. solder die attach and Al-wire on system level.
- Enables higher junction temperatures of more than 200°C
- Superior robustness vs. other solutions (e.g. clips).

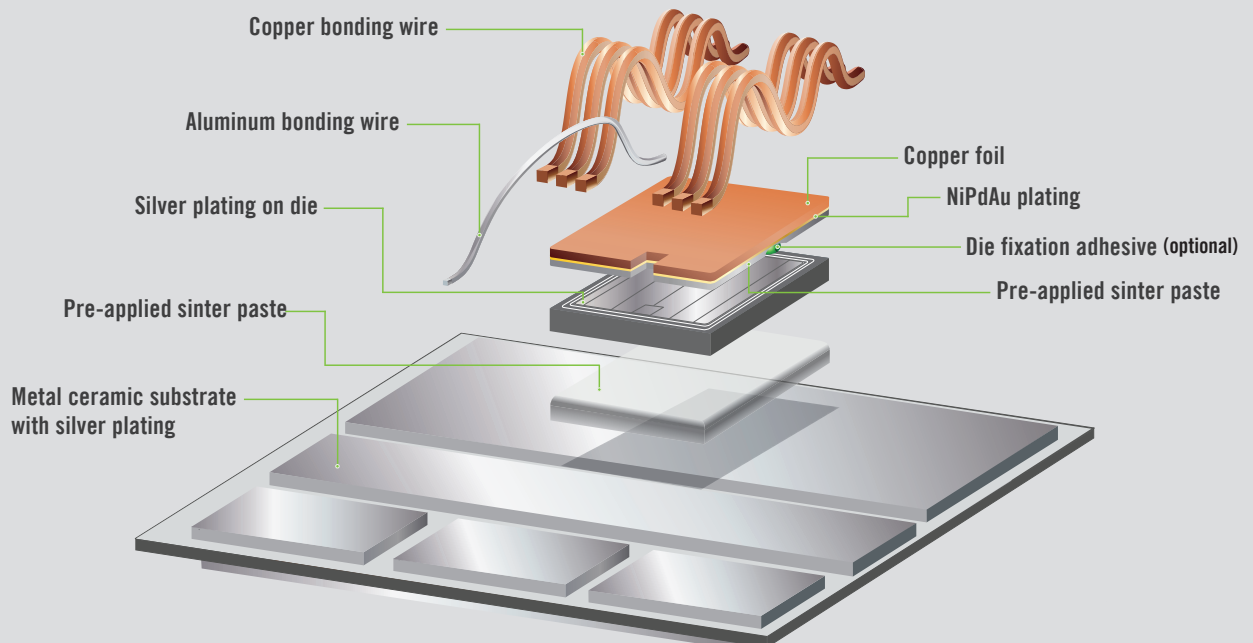
Maximised profitability:

- Significant reduction of power derating or reduction of chip size.

One component material solution

DTS[®] is one component consisting of:

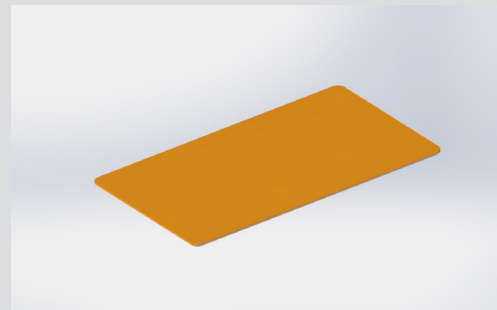
- Copper foil with functional surfaces
- Die fixation adhesive dots
- Pre-applied/ Pre-dried sinter paste
- Matched Cu bonding material



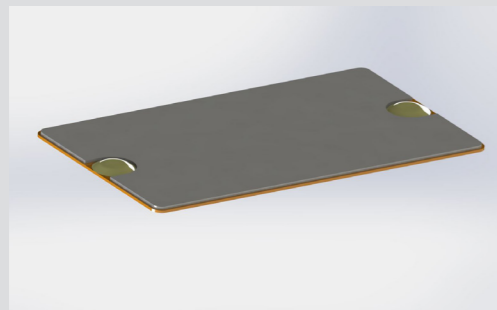
*Picture: substrate layout by courtesy of Fraunhofer IISB

(1) Development Product Information Sheet, preliminary values

DTS® is customized to the die⁽¹⁾:

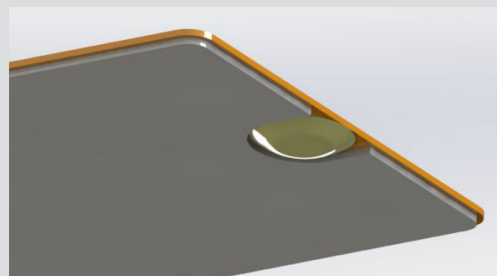


Bond substrate and functional surface	
Core material	Cu
Functional surfaces (optional)	NiPdAu, NiAu, NiAg
Thermal conductivity	max 390 W/mK
Tensile strength (R_m)	200 - 400 N/mm ²
Hardness, adjustable by special treatment	40 - 200 HV



Pre-applied Ag-sinter layer	
Sinter paste type	ASP 034-04; ASP 338-14; ASP 338-28
Sinter pressure	10 - 30 MPa
Sinter temperature	230 - 280 °C
Sinter time	1 - 5 min
Thermal conductivity	>150 W/mK
Cleaning	Not needed

Process parameters depend on customer design etc. - we can support you to find optimal process for your application

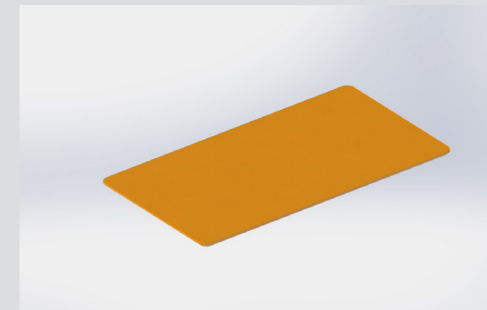


Pre-applied die fixation adhesive (optional)	
Adhesive type	B-stage ⁽²⁾
Die placement conditions	80 - 150 °C
Cleaning	Not needed

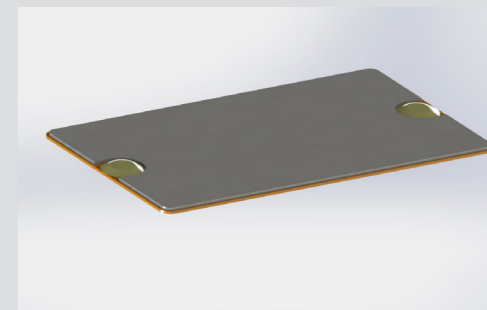
(1) Development Product Information Sheet, preliminary values

(2) The adhesive is not sticky at room temperature. It is activated by heat (>80 °C during placement) and additional heat (during sintering) removes the majority of adhesive constituents

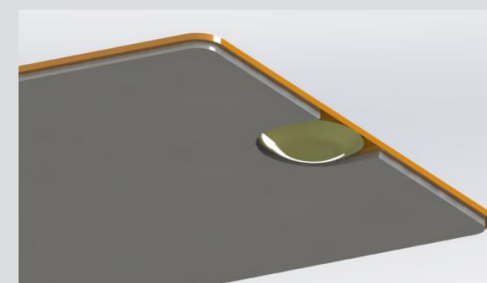
DTS® Design Rules⁽¹⁾



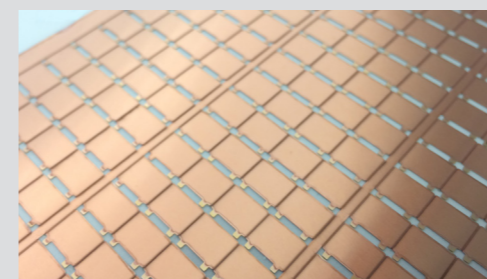
Bond substrate	
Thickness	30 - 200 µm
Aspect ratio thickness: width	min. 1 : 3
Aspect ratio length: width	max 10:1
Min radius	: 50µm



Pre-applied Ag-sinter layer	
Typical bond line thickness (BLT)	typ. 25 - 35 µm after pressure sintering
Distance between Cu edge and sinter paste	(0.0 mm for full-cut DTS)



Pre-applied die fixation adhesive	
Adhesive dot size	1 or 2 dots, diameter ≈ 0.9 mm
Adhesive height	Adapted to sinter paste thickness (higher than dried sinter paste)
Position	At the border of the die (preferred on unused die area / no wire bonding on PAA position); proposal will be made based on die design



Package	
Package form	Semiconductor die wafer frame packed in vacuum sealed moisture barrier bags
Wafer size	12" outside, 8" inside
Pick and place	DTS® are singularized and ready for pick and place
Typical # of parts on one wafer	DTS® 3.5 x 3.5 mm: approx. 1,200 pcs DTS® 5 x 7 mm: approx. 600 pcs DTS® 10 x 10 mm: approx. 200 pcs


(1) Development Product Information Sheet, preliminary values

DTS® Handling & Storage⁽¹⁾

Handling and Storage	
Shipping	Temperature⁽³⁾: 5 - 40 °C Humidity: Keep packed at dry place
Storage conditions	Room temperature⁽³⁾: 15 - 25 °C Humidity: Keep originally packed at dry place
Shelf life	Originally packed: 6 month after shipment date ⁽³⁾
Processing	Open the original package in clean room only. Floor life: Total processing time after opening max. 2 days Not used DTS® parts should be put back in the moisture barrier bag and should be stored in nitrogen atmosphere, max. storage time 2 weeks

03.2019, Layout: ASK/ AH/ AZM

MSDS for relevant constituents of the DTS® (sinter paste, adhesive) are available upon request.

Heraeus and  cooperate in the field of Danfoss BondBuffer technology. Heraeus DTS® may be used under certain Danfoss and Heraeus IP rights. Details are set forth in a declaration to customers.

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