

curamik[®] ADVANTAGE

Technical data sheet – Features to customize your substrate

Solder Stop

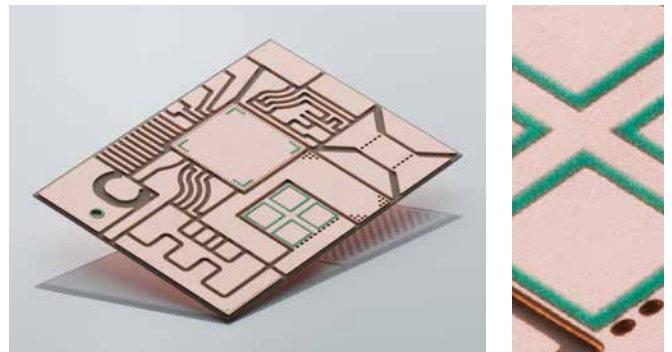
curamik provides Solder Stop to avoid solder bridges and to build solder barriers for different functional areas.

Advantages

- // Separates soldering areas from wire bond and other functional areas
- // Applicable on different surfaces

Customer benefits

- // Simplifies supply chain
- // Enhances soldering process
- // Streamlined and stable process flow



	standard type
Temperature resistance	≤ 288 °C / 10 sec.
Width	min. 0.4 mm ± 0.2 mm
Position tolerance	± 0.2 mm

Partial Discharge Free

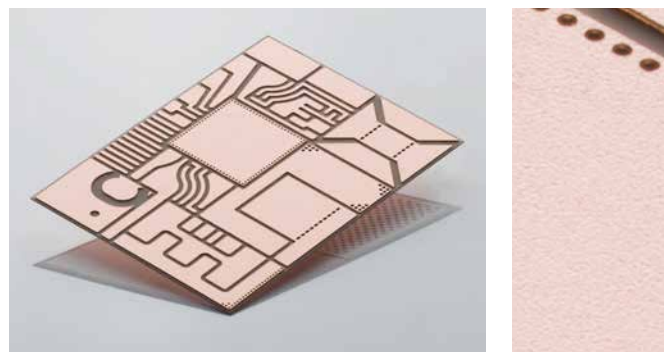
Partial discharge is a localized dielectric breakdown, caused by voids, which reduces lifetime. curamik offers partial discharge free DBC substrates for high voltage applications.

Advantages

- // Treatment of DBC master cards to close voids
- // Quasi void free DBC substrate

Customer benefits

- // Substrates free of partial discharge for modules up to 1.7 kV (blocking voltage)
- // Longer lifetime and higher reliability of the entire inverter/converter system



Partial discharge	< 10 pC @ 3.8 kV
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Ni and NiAu Plating

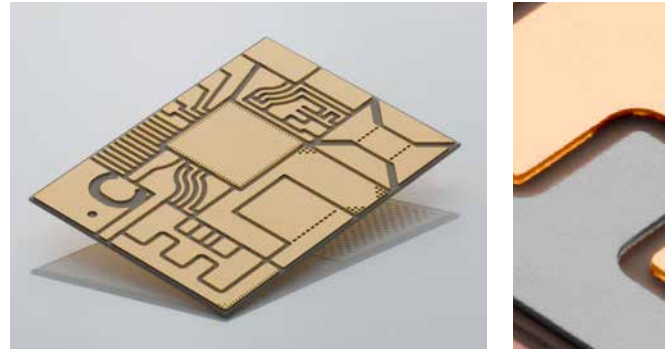
curamik offers a nickel and nickel-gold plating for surface finishing of ceramic substrates. All processes are in-house wet chemical depositions.

Advantages

- // Protects surface from oxidation and environmental conditions
- // Improves solder wettability

Customer benefits

- // Simplifies supply chain
- // Enhances soldering process
- // Improves optical appearance of baseplate-less modules



Electroless Ni	3 – 7 µm (8% ± 2% P)
Electroless NiAu	Ni: 3 – 7 µm (8% ± 2% P) Au Class A: 0.01 – 0.05 µm Au Class B: 0.03 – 0.13 µm

Ag Plating

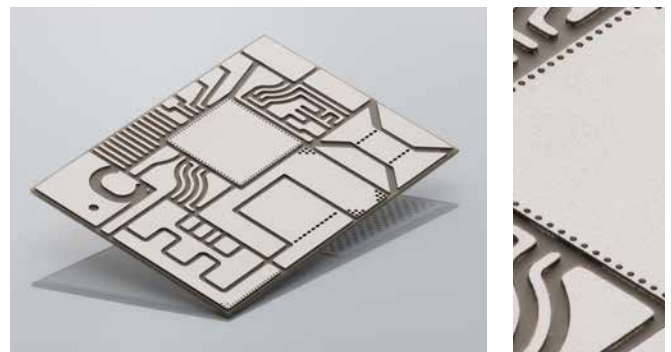
curamik offers an emersion silver plating for surface finishing of ceramic substrates. All processes are in-house wet chemical depositions.

Advantages

- // Suitable for silver sintering process
- // Best adhesion of silver pastes on DBC and AMB substrates

Customer benefits

- // Simplifies supply chain
- // Increased reliability of silver sintered joints
- // Suitable for wire bonding and ultra sonic welding



Electroless Ag	0.1 – 0.6 µm
Typ. shear strength (silver sintered)	15 N/mm ²

Selective Ag Plating

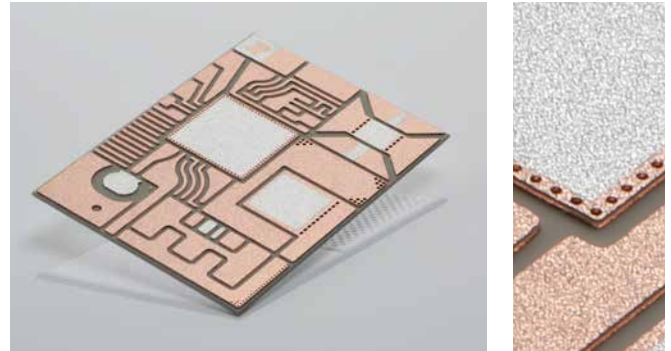
curamik offers selective emersion silver plating for surface finishing of ceramic substrates. All processes are in-house wet chemical depositions.

Advantages

- // Suitable for silver sintering processes
- // Best adhesion of silver pastes on DBC and AMB substrates
- // Selective plating of functional areas

Customer benefits

- // Keeps bare copper surface where needed
- // Simplifies supply chain
- // Increased reliability of silver sintered joints
- // Suitable for wire bonding and ultra sonic welding



Electroless Ag	0.1 – 0.6 µm
Typ. shear strength (silver sintered)	15 N/mm ²

Controlled Surface Roughness

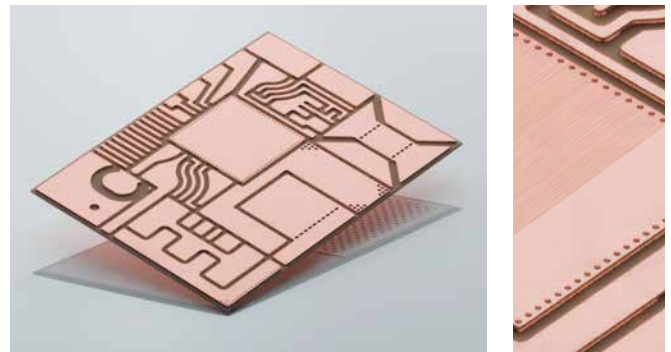
curamik offers three types of surface roughness for substrates: Standard (no treatment), chemical or mechanical treatment.

Advantages

- // Standard roughness is suitable for traditional wire bonding and soldering processes
- // Chemical or mechanical treatments offer lower roughness for advanced bonding and joining technologies

Customer benefits

- // Suitable for thin wire bonding
- // Improves sintering quality
- // Simplifies supply chain



Standard	$R_{max} = 50 \mu\text{m}; R_a \leq 3 \mu\text{m}; R_z \leq 16 \mu\text{m}$
Mechanical	$R_{max} = 50 \mu\text{m}; R_z \leq 6 \mu\text{m}$
Chemical	$R_{max} = 50 \mu\text{m}; R_z \leq 7 \mu\text{m}$

Laser-drilled Holes

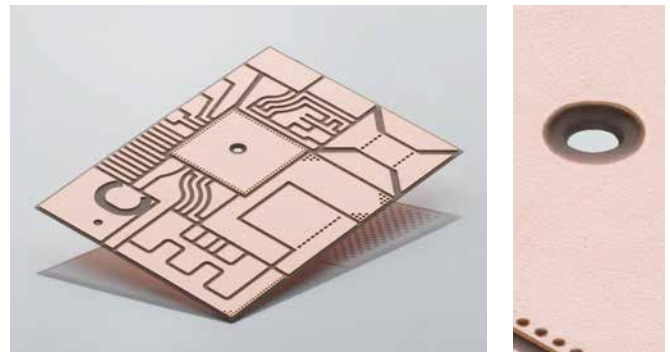
curamik offers substrates with ceramic through holes for feed through connections or easy-mounting.

Advantages

- // Isolated holes enable usage of regular metal screws
- // Ready-to-use: Isolated holes don't affect insulation strength

Customer benefits

- // Fast and easy mounting of packaged power module
- // Simplifies supply chain and reduces assembly steps and time



Min. hole diameter	1 mm
Lasering tolerance	+0.05 mm / -0.2 mm

Data Matrix Code

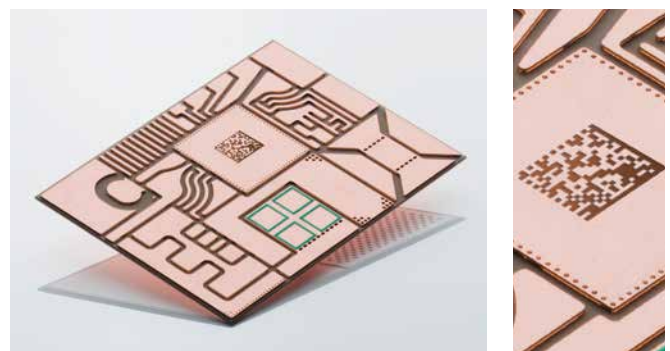
curamik offers a Data Matrix Code for all kinds of ceramic substrates. The data content can be either text or numeric.

Advantages

- // 100 % in line quality control of each lasered Data Matrix Code
- // Guaranteed readability (A-F) according to AIP DPM-1-2006
- // Individual code content according to customer requests

Customer benefits

- // Full traceability for the entire power module supply chain
- // Failure analysis by backtracking on substrates batch level



Available size	2.3 mm x 2.3 mm or 3 mm x 3 mm
Single dot size	0.164 mm x 0.164 mm
Data content	14 x 14 dots enable data content of 10 – 16 alphanumeric characters
Position tolerance	± 0.3 mm

Step Etching

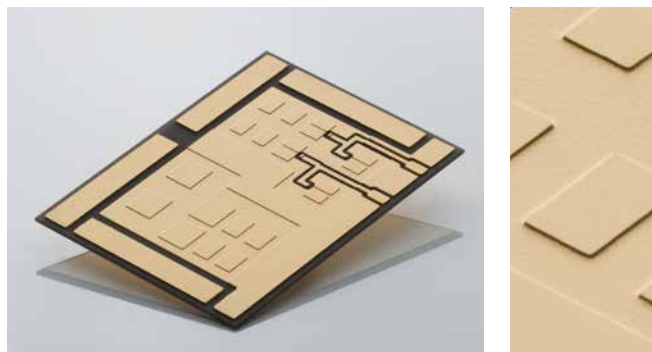
curamik offers integrated copper steps and cavities produced in a step etching process.

Advantages

- // two different copper levels possible on both sides
- // builds cavities and steps for chip bonding
- // enables smaller modules and double sided cooling

Customer benefits

- // supports new chip contacting methods, such as double sided cooling
- // Double sided cooling enables longer lifetimes due to the elimination of weak points
- // Bond wires can be replaced by a second substrate with special integrated copper steps



Typical copper levels	500 µm etched to 200 µm 300 µm etched to 150 µm
Typical tolerances	± 40 µm

Organic Surface Protection

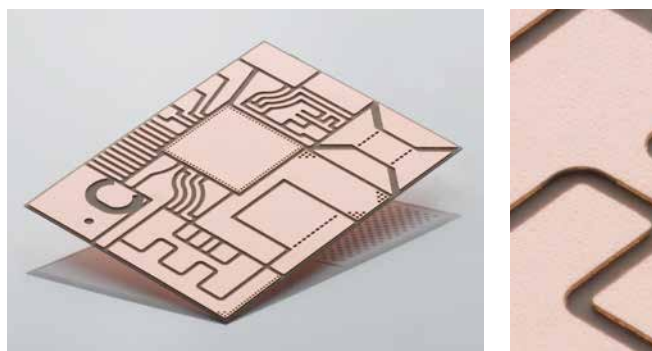
curamik offers an organic surface protection to prevent the oxidation of copper during power module production process.

Advantages

- // Barrier against oxidation to ensure full workability during wire bonding and soldering processes
- // Withstands 24 hours at 85°C and 85% humidity without oxidation
- // Good alternative to final platings like Ni or NiAu

Customer benefits

- // Longer usability during production processes without any oxidation
- // Improves wire bonding and soldering processes
- // Improves optical appearance of baseplate-less modules



Temperature-humidity-test	85°C / 85% RH 24h without oxidation
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