Materials for Power Devices and Electronic

Bonding Materials

NAGASE | Delivering next.

MAX4022 - Next Generation Die Attachment

Features

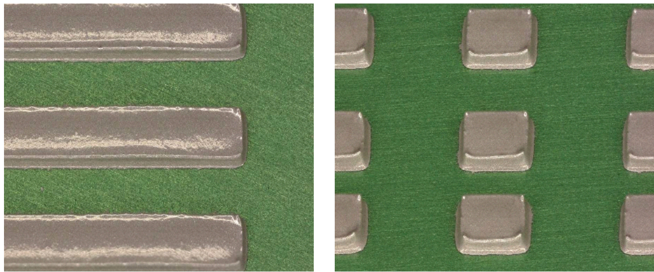
- Bonding without chip damage
- High thermal conductivity and high heat resistance
- Die attachment for various power devices, LED’s, LD’s and RF devices

Brand New Products in our MAX series - MAX534 and MAY5342

- Simple bonding process without dedicated pressure instruments
- Bondable with bare Cu substrates more than 50 Mpa die shear strength
- High thermal conductivity such as 300 W/m K
- Reduction of sintering time to 200 °C for 30 min. Or 250 °C for 5 min. At peak temperature.
- Covering from 0.5 mm² (MAX5342) to 8 mm² (MAX534) chips

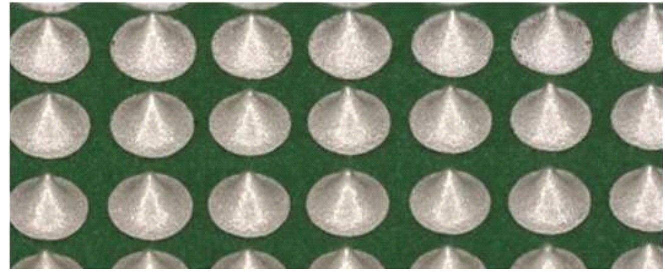
Large-Area Printing with MAX534

- MAX534 (1 to 8 mm² chip)
- Excellent printability and sharp resolution



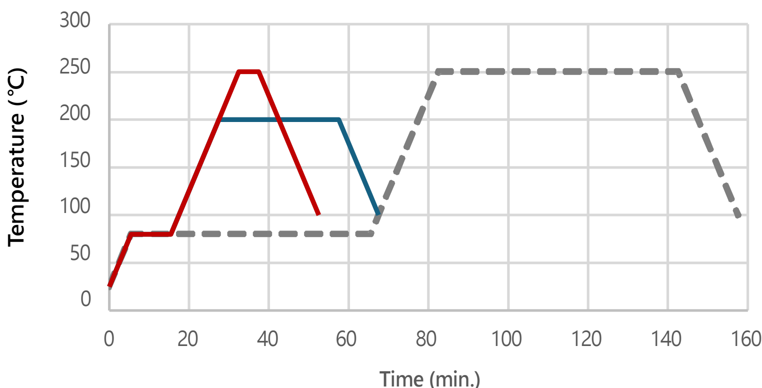
Micro-Application with MAX5342

- MAX5342 (0.5 to 4 mm² chip)
- Precise micro-chip application by dispensing or pin-transferring



Achieved a Reduction in Process Time

Heating Profile



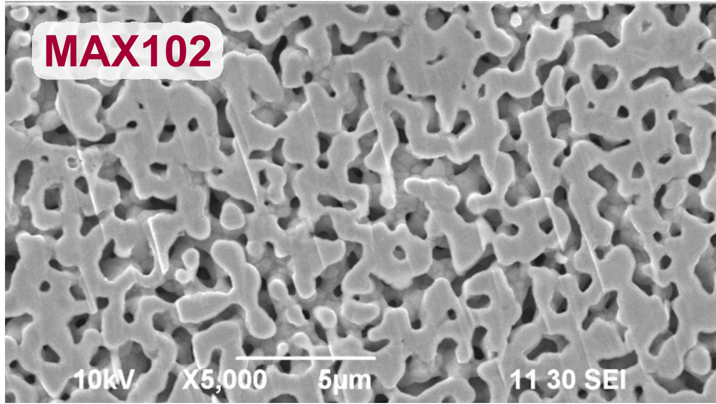
Conventional product — MAX534 200℃ in N2 or air — MAX534 250℃ in N2

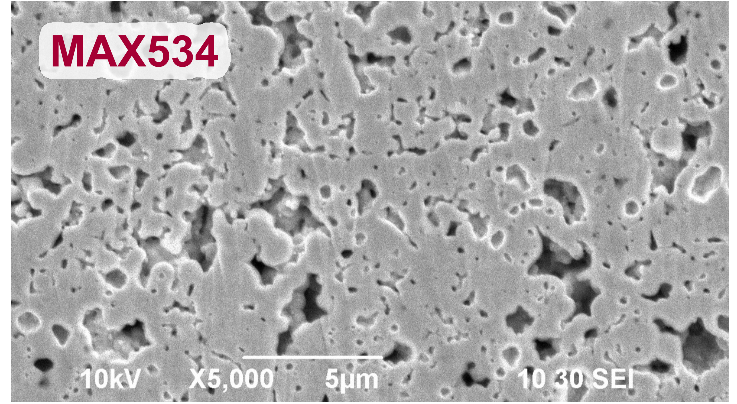
Reduced Sintering Time, Overcoming the Limitations of Existing Non-Pressure Materials

- Sintering available at peak temperature at 200 °C for 30 min or 250 °C for 5 min
- MAX534 reduces process time to one/third compared to conventional non-pressure sintering for 8 mm² chips
- Suitable for use in both air and N_2 atmosphere

High Bonding Reliability

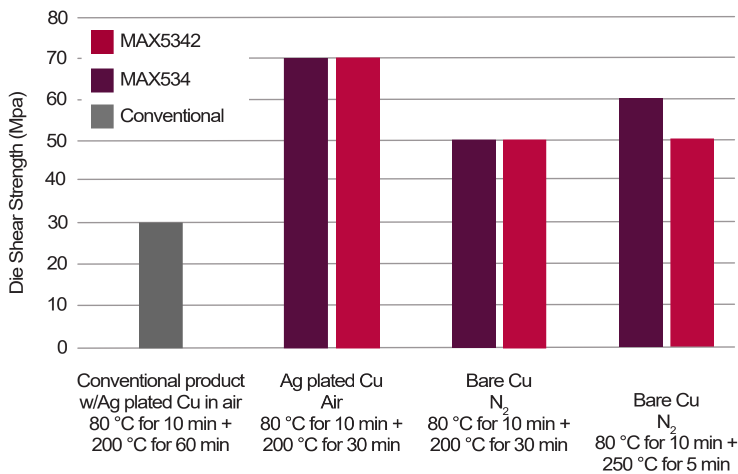
Improved sintering density compared with conventional products.



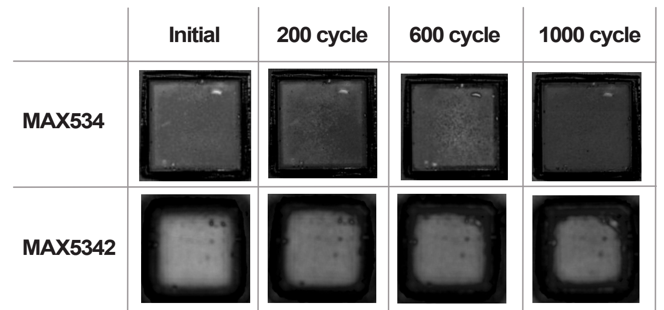


Die Share Strength Test

Si chip: 2.5 mm², sputtered with gold



Thermal Cycling Test



	MAX534	MAX5342
Chip	Si/Ti-Ni-Au 0.2 mmT x 8 mm	Si/Ti-Ni-Au 0.54 mmT x 2.5 mm
Substrate	Bare copper, 1.0 mmT	
Profile	80 °C/10 min + 250 °C/5 min in N_2	80 °C/10 min + 200 °C/30 min in N_2
Thermal Cycle	-55 ⟺ +150 °C, 30 min	
Obervation	Reflection Image of Scanning Acousitc Tomography	

Item	Unit	MAX534	MAX5342	Test Method
Chip Size	Mm square	1 to 8	0.5 to 4	-
Application	-	Printing & Dispensing	Dispensing & Pin Transferring	-
Sintering Temperature	-	200 °C for 30 min or 250 °C for 5 min	200 °C for 30 min or 250 °C for 5 min	-
		Non-Pressure	Non-Pressure	-
Appearance	-	Silver Paste	Silver Paste	Visual Inspection
Die Shear Strength	MPa	50 (Cu)	50 (Cu)	W/ Bond Tester
Vickers Hardness	-	26	21	JIS Z 2224
Young's Modulus	GPa	21	17	Nano Indentation Method
Coefficient of Thermal Expansion	ppm	19	19	TMA
Thermal Conductivity	W/m*K	300	300	Xenon Flash Method
Thermal Resistivity	°C/W	<0.03	<0.03	Steady State Method
Volume Resistivity	Ω * cm	3.9×10^{-6}	6.2×10^{-6}	JIS Z 7194
Target Substrates	-	Au, Ag, Cu	Au, Ag, Cu	-
Storage Condition	-	10 °C for 6 months	10 °C for 6 months	-

The data and recommended conditions contained in this brochure are based on our research, but we do not guarantee the performance when used for your own applications. Please check the quality compatibility before use.

Find out more

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