

ALPHA[®] POWERBOND[®] SOLDER PREFORMS

Designed for High Temperature, High Reliability, Lead-Free Power Applications

DESCRIPTION

ALPHA PowerBond Solder Preforms are lead-free, high-reliability alloy preforms with Antimony (Sb) content ranging from 5 to 10%. The use of SnSb has emerged as a viable Pb-free solder alloy for power module applications, such as die and module attach, due to its increased strength and thermal fatigue resistance.

ALPHA PowerBond 2110 preforms balance high creep resistance of the Sn90Sb10 system with high thermal conductivity for power semiconductor devices operating with high junction temperatures. The alloy composition has been particularly tailored with improved wetting and low voiding.

ALPHA PowerBond 2050 preforms expand upon industry standard Sn95Sb5 alloys to provide improved wetting characteristics.

ALPHA PowerBond Solder Preforms comply with applicable environmental standards, including RoHS for use in products requiring a Pb-free material. They are manufactured with 99.99% alloy purity (4N) ensuring the highest performance from the alloy.

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

FEATURES AND BENEFITS

ALPHA PowerBond 2110 Solder Preforms

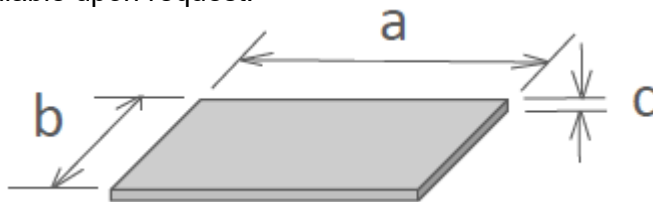
Features	Benefits
High creep resistance & tensile strength with higher thermal conductivity than traditional alloys, both high Pb and high Sn	High reliability alloys yielding improved thermal stress performance, ideal for power module applications.
Higher solidus temperature than Sn3.5Ag, SAC305, and Innot alloys	Supports higher die and module level operating temperatures
Excellent voiding with improved wetting.	Suitable for interconnects to a wide variety of surface finishes, including Cu and Ni
Designed specifically for power module applications	Compatible with reflow equipment capable of reduction environment and vacuum soldering

ALPHA PowerBond 2050 Solder Preforms

Features	Benefits
Higher creep resistance than traditional power module alloys Sn3.5Ag and SAC305	Superior resistance to thermal stress in power module applications
Superior wettability compared to traditional Sn5Sb alloys.	Capable with multiple solderable surfaces, including Cu and Ni
Designed specifically for power module applications	Compatible with reflow equipment capable of reduction environment and vacuum soldering

PRODUCT INFORMATION

ALPHA PowerBond Solder Preforms are available in square or rectangle sizes. Other shapes and sizes are available upon request.



Dimension (mm)	Min (mm)	Max (mm)
$a \pm 0.05\text{mm}$	1.50	58.0
$b \pm 0.05\text{mm}$	1.50	58.0
$c \pm 10\%$	0.10	0.50

APPLICATION GUIDELINES

ALPHA PowerBond Solder Preforms can be used on all levels of a power semiconductor package as a lead-free alternative. PowerBond 2110 is ideal for die attach applications requiring operational junction temperatures up to 175 °C which translates to efficiency and reliability gains in the application. Both PowerBond 2110 and PowerBond 2050 provide for excellent heat dissipation in power semiconductor substrate attach applications. The PowerBond family of alloys are best processed in a reduction environment, typically formic acid or forming gas. These alloys are also compatible with vacuum soldering methods.

TECHNICAL DATA

Physical Properties	Units	PowerBond 2110	PowerBond 2050
Alloy Composition	%	Sn/10Sb/3Ag/1Cu + X	Sn/5Sb + X
Melting Temperature Range (30 °C/min)	°C	222 / 266	232 / 240
Thermal Conductivity	W/mK	52.1	46.1
Specific Heat	J/gK	0.3	0.22
Density	g/cm ³	7.3	7.2
Tensile Strength (150 °C)	MPa	19.2	13.2
Yield Strength (150 °C)	MPa	8.8	6.0
Elongation (150 °C)	%	57.9	67.1

RECYCLING SERVICES

We provide safe and efficient recycling services to help companies meet their environmental and legislative requirements and at the same time, maximize the value of their waste streams.

Our service collects solder dross, solder scrap, and various forms of solder paste waste. Please contact your local sales representative for recycling capabilities in your area or [link here](#).



SAFETY & WARNING

It is recommended that the company/operator read and review the Safety Data Sheets for the appropriate health and safety warnings before use. **Safety Data Sheets are available at MacdermidAlpha.com/assembly-solutions/knowledge-base.**

STORAGE

Manual handling of ALPHA PowerBond Solder Preforms is not recommended. If preforms must be handled, gloves and vacuum pens are required to prevent impurities from grease or oils from building up and/or causing physical damage. It is recommended not to open more packages as will be used in a typical work shift. To ensure maximum shelf life and reduce oxidation, store all open preform packaging types in a nitrogen cabinet or similar low oxygen environment.

CONTACT INFORMATION

To confirm this document is the most recent version, please contact Assembly@MacDermidAlpha.com

www.macdermidalpha.com

<p>North America 109 Corporate Blvd. South Plainfield, NJ 07080, USA 1.800.367.5460</p>	<p>Europe Unit 2, Genesis Business Park Albert Drive Woking, Surrey, GU21 5RW, UK 44.01483.758400</p>	<p>Asia 8/F., Paul Y. Centre 51 Hung To Road Kwun Tong, Kowloon, Hong Kong 852.3190.3100</p>
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Also read carefully warning and safety information on the Safety Data Sheet. This data sheet contains technical information required for safe and economical operation of this product. READ IT THOROUGHLY PRIOR TO PRODUCT USE . Emergency safety directory assistance: US 1 202 464 2554, Europe + 44 1235 239 670, Asia + 65 3158 1074, Brazil 0800 707 7022 and 0800 172 020, Mexico 01800 002 1400 and (55) 5559 1588

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