

Micromax™ 4093

Electronic Inks & Pastes

PRODUCT DESCRIPTION

Silver/Palladium/Platinum Conductor

Micromax™ 4093 has been developed as a low-cost alternative to solderable gold bearing conductors. Micromax™ 4093 is a mixed bonded conductor with superior performance over traditional Palladium Silver compositions with regard to solder leaching and silver migration.

Product benefits

- Outstanding resistance to silver migration
- Very high solder leach resistance in 62Sn/36Pb/2Ag and 63Sn/37Pb solders
- High aged adhesion
- Sprint vehicle, permitting long production runs with squeegee speeds up to 30cm/sec
- Compatibility with Micromax™ 1700 series and 1900 series resistor compositions
- Compatibility with crossover and multilayer dielectric compositions

READ ENTIRE TECHNICAL DATA SHEET BEFORE USING THIS PRODUCT

PRODUCT INFORMATION

General Properties

Value Unit

Application	Hybrid conductor
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TECHNICAL DATA

Application Technique

Value Unit

Mask mesh	200 to 325
Drying time	10 to 15 min
Drying temperature	150 °C
Recommended film thickness	15 to 17 µm
Print resolution	150 to 200 µm
Leveling time	5 to 10 min

Specific Application Suitability	Value	Unit
Solder leach resistance ¹	15	cycles

Electrical Properties	Value	Unit
Resistivity	20 to 55	mOhm per square

Storage and Stability	Value	Unit
Shelf life ²	6	months

¹62Sn/36Pb/2Ag, 1.23 dips/μm. In the case of 63Sn/37Pb 11 cycles (0.9 dips/μm). Cycle consists of dip in mildly-activated flux (Alpha 611), 10-sec dip in solder at 220°C and washing off flux residue.

²in unopened containers, from date of shipment, stable environment at room temperature between 5°C - 30°C

PROCESSING GUIDELINES

Printing

Print with 200-325 mesh stainless steel screens. Micromax™ 4093 may be printed at squeegee speeds of 5-30 cm/s (2-12.5 in/s) and at a rate of one substrate per second. At high printing speeds optimum results are obtained with a sharp squeegee, a 45° angle of attack, a force of 3 to 6N per cm (2 to 4 lbs per inch) of squeegee length and a snap-off ratio of 1/250 to 1/200 (off contact/screen width) depending on pattern size.

Drying

Allow prints to level 5-10 min at room temperature. Then dry 10-15 min at 150°C.

Firing

Dried parts should be fired on a belt furnace. Use either 30 or 60 minutes profile with a peak temperature of 850°C for 10 minutes.

Typical Physical Properties

Test	Properties
Solder Initial Acceptance* ¹ 62Sn/36Pb/2Ag	Excellent
Solder Initial Acceptance* ¹ 63Sn/37Pb	Excellent
Adhesion Initial (N)* ²	>=20
Adhesion Aged 48 hr, 150°C* ²	>=17.7
Initial, 1 Firing* ³	28N(6.4lb)
Initial, 5 Firing* ³	26N(5.9lb)

Aged 100 hr, 150°C, 1 Firing* ³	22N(5.0lb)
Aged 100 hr, 150°C, 5 Firing* ³	23N(5.5lb)
Resistance to Silver Migration Failure Time in Water Drop Test* ⁴ , (min)	> 20
Resistance to Silver Migration Failure Time 85% RH, 85°C* ⁵ , (h)	> 300

*1 Excellent characterized as complete wetting with smooth solder film after 5-sec dip at 220°C using mildly activated flux (Alpha 611).

*2 90°C wire peel test on 2x2 mm pads soldered with 62Sn/36Pb/2Ag solder at 220°C using mildly activated flux (Alpha 611).

*3 1 Firing Cycle: 60 min total firing time with 10 min at 850°C.

*4 Space between conductor lines: 250 µm (10mil). Bias Voltage: 5 V.

*5 Space between conductor lines: 250 µm (10mil). Bias Voltage: 60 V.

Information in this datasheet shows anticipated typical physical properties for Micromax™ 4093 based on specific controlled experiments in our labs and are not intended to represent the product specifications, details of which are available upon request.

Storage and shelf life

Containers should be stored, tightly sealed, in a clean, stable environment at room temperature between 5°C - 30°C. Shelf life of material in unopened containers is 6 months from date of shipment. Some settling of solids may occur and compositions should be thoroughly mixed prior to use.

Storage conditions on the product data sheets are intended to represent long-term material storage recommendations and not a shipping or temperature-at-receipt requirement.

Transportation: Under normal shipping conditions, without temperature control, Micromax™ products are not expected to exhibit a change in quality or fitness for use. Should extraordinary events result in extended transportation periods, Micromax™ recommends customers confirm products remain suitable for the intended application.

Safety and handling

For safety and handling information pertaining to this product, read Safety Data Sheet (SDS).

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.

WASTE TREATMENT

Prior to using any recommendations or suggestions for waste treatment, the user is required to know the appropriate local/state/federal regulations for on-site or off-site treatment which may require permits. If there is any conflict regarding our recommendations, local/state/federal regulations take precedence.

CONTACT INFORMATION

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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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