

Photo-Definable Materials

KQ610A

Etchable Silver Conductor

Description:

KQ610A is a silver conductor paste developed for producing ultra-high density interconnections using a combination of screen printing and etching. This material will produce extremely dense fired films with very smooth fired finishes. These properties enable the production of conductor geometries of 50 microns (2 mils), or better.

● Key Benefits

- High conductivity
- Precise edge acuity
- Smooth surface
- Excellent bondability
- Excellent adhesion

● Typical Properties:

Lines/Spaces Resolution:

50 micron lines and spaces

Fired Thickness:

7 to 10 microns

Resistivity:

< 2.5 milliohms/square
at 10 microns thickness

Adhesion:

62/36/2 @ 225°C,
RMA Flux
Initial: > 10 lbs
Aged: > 5 lbs (48 hours at 150°C)

Aluminum Wire Bondability:

10 mil wire, 99.99% Al, Elongation
Initial: > 480 grams
1 Hour at 300°C: > 475 grams
***Note:** All failures were wire breaks

Thinner:

RV-372 (Terpineol)

● Recommended Processing Guidelines

(For more detailed information, see document entitled, "Processing Guidelines for KQ610A", AN# KQ006A.)

Printing:

325 or 400 mesh screen, 0.5 mil emulsion, 0.9 mil wire,
45° bias
Print Speed: 6-7 inches per second

Drying:

Dry at 150°C for 10 minutes.

Firing:

850°C peak temperature
10 minutes at peak
Total cycle time of 45 - 60 minutes.
Good burnout and cleanliness are vital.

Thicknesses:

Fired : 7-10 microns (two individually printed
and fired layers)

● Photoresist Application:

Hoechst Celanese AZ P4400 positive photoresist or equivalent.
Static dispense used while part is stationary.
Use a spread speed of 600 rpm for 10 seconds for a uniform layer of photoresist.
Spin photoresist at 2800 rpm for 20 seconds.
Soft bake the photoresist for 3 minutes, 20 seconds at 110°C on hot plate or in box oven.

Exposure:

Use positive photo mask in mask aligner.
Level substrate, align the part and expose using soft contact mode. Use UV light source with a usable wavelength of 350 to 450 nm.
Use sufficient exposure time to deliver 400mJ/cm² of energy.

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Development:

Hoechst Celanese AZ 400K developer recommended.
Option 1: Immerse part in a bubble developing tank for 2.5 minutes at 20 - 25°C.
Option 2: Agitate part slowly in beaker of swirling developer at 20-25°C for 2 minutes.
Rinse with DI water.

Etching:

Use standard thin film silver etchant solution (iodine/potassium iodide solution).
Best results achieved with spray etcher at 35-50°C.
Suspend part in the spray for approximately 4-6 minutes.
Etching time varies by silver thickness and strength of etching solution.
Rinse with DI water.
Remove the remaining resist by spraying part with acetone or recommended stripper for the photoresist used.
Clean part surface thoroughly to remove residue. For optimum cleanliness, re-fire the parts through an 850°C profile, 10 minutes at peak temperature.

Storage:

Slow roll at 10 - 30°C.
DO NOT REFRIGERATE.
Spatulate well before using.

Warranty:

Material guaranteed to meet specifications for 6 months from date of shipment

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The descriptions and engineering data shown here have been compiled by Heraeus using commonly-accepted procedures, in conjunction with modern testing equipment, and have been compiled as according to the latest factual knowledge in our possession. The information was up-to date on the date this document was printed (latest versions can always be supplied upon request). Although the data is considered accurate, we cannot guarantee accuracy, the results obtained from its use, or any patent infringement resulting from its use (unless this is contractually and explicitly agreed in writing, in advance). The data is supplied on the condition that the user shall conduct tests to determine materials suitability for a particular application.

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