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**Low Moisture Absorption**  
 <20 ppm/°C CTE

**High Moisture Resistance**  
**Electrically Conductive**  
**Epoxy Film Adhesive**

**IDEAL FOR:**

- High Volume, Automated Assemblies
- Large Area Substrate Attach
- Wafer Level Die-Attach
- For Large Area Board Level Attach

**DESCRIPTION:**

ESP8650--FG is a semi-flexible fiber-glass mesh reinforced electrically and thermally conductive film adhesive with low CTE from -55 to 150°C. It is a silver filled high-bond strength epoxy film adhesive. It can be used in die-cut preform for ease of pick-and-placement. This new generation film can also be laminated onto a wafer at <130°C and then mounted on dicing tape.

It is designed for bonding component and substrate to substrate and carrier with matched thermal coefficients of expansion. ESP8660-HK-FG has good thermal stability. The dry, tack-free handling of the film makes it suitable for an automated assembly.

**AVAILABILITY:**

ESP8650-FG is available in sheet sizes or rolls. Standard thickness of ESP8650-FG are 75 microns and above. Special thicknesses are available upon request.

**APPLICATION PROCEDURES:**

- ( 1 ) Keep product in aluminum poly-laminate protective bag when not in use.
- ( 2 ) Before using, remove protective release liner from film. Place wafer onto adhesive film.
- ( 3 ) Laminate (low heat of >130°C) wafer onto adhesive film until good wetting is achieved.
- ( 4 ) Cure according to one of the recommended schedules.

**CAUTION:** This product may cause skin irritation. Avoid skin contact. If contact does occur, wash immediately with soap and water. Please refer SDS for more details.

The information contained herein is believed to be reliable. All recommendations or suggestions are made without guarantee inasmuch as conditions and methods of commercial use are beyond our control. Properties given are typical values and not intended for use in preparing specifications. The user is advised to evaluate the product in the manner the product is to be used in manufacturing and in the final product. Under no circumstance shall AI Technology be liable for accidental, consequential or other damages arising from the use or handling of this product.

While AI Technology owns all proprietary rights of material formulations of its products, specific usage in the manufacturing of certain products may involve patent rights of other companies.

**Die Attach Film**  
**ESP8650-FG**

**TYPICAL PROPERTIES\***

<b>Electrical Resistivity</b> ( 150 °C/ 60 minutes )	<b>&lt;4x10<sup>-4</sup> ohm-cm</b>
<b>Dielectric Strength (Volts/mil)</b>	<b>N/A</b>
<b>Glass Transition Temp.(°C)</b>	<b>50 ±10%</b>
<b>Current Carrying Capabilities</b>	<b>N/A</b>
<b>Lap-Shear Strength</b>	<b>N/A</b>
<b>Device Push-off Strength</b>	<b>&gt;2500 psi</b> <b>&gt;17.1 N/mm<sup>2</sup></b>
<b>Hardness (Type)</b>	<b>65 (D) ±10%</b>
<b>Cured Density (gm/cc)</b>	<b>4.0 ±10%</b>
<b>Thermal Conductivity</b>	<b>&gt;56 Btu-in/hr-ft<sup>2</sup>-°F</b> <b>&gt;8.0 W/m-°C</b>
<b>Linear Thermal Expansion</b>	<b>20 ±10%</b>
<b>Coeff. (ppm/°C)</b>	
<b>Maximum Continuous Operation Temp. (°C)</b>	<b>&lt;150</b>

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**CURE SCHEDULES:**

<u>Temperature</u>	<u>Time</u>	<u>Pressure</u>
130°C	1hr	10-15 psi
150°C	30min	8-15 psi

The die or component can also be tacked on the substrate at >130°C or higher with 10 psi. When a fillet around the edge of the die or component is observed, the pressure can be released for the rest of the bonding cycle.

Besides major transition of Tg at around 175°C, additional molecular relaxation occurs at 50-120°C.

Proven to passed most stringent military and commercial applications

**SHELF LIFE:**

<u>Storage temperature</u>	<u>Shelf Life</u>
25°C	1 yr in sealed package