Low Temperature Co-Fired Ceramic Systems
A6M-E High Frequency LTCC Tape System

Application

Ferro’s A6M-E LTCC Tape system combines stable dielectric constant and unique low loss over a wide frequency range making it ideal for Hi-reliability packaging applications.

A6M-E tape is an enhanced version of A6M with improved handling, lamination and green cutting properties while maintaining the same properties and performance of A6M.

A6M-E is available in standard tape thicknesses of 2, 5, and 10 mil and in roll and blank forms.

A complete set of highly engineered Gold based conductors make A6 the material system of choice for high frequency modules and components up to 110GHz.

A6M-E and their associated metallizations are formulated and processed to be RoHS compliant.

Typical Fired Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>A6M-E</th>
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</thead>
<tbody>
<tr>
<td>Thermal Coefficient of Expansion</td>
<td>7 ppm/°C</td>
</tr>
<tr>
<td>Tape Shrinkage % X,Y</td>
<td>15.6 ± 0.3</td>
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<tr>
<td>Tape Shrinkage % Z</td>
<td>26 ± 3</td>
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<tr>
<td>Fired Density</td>
<td>&gt;2.45 gm/cc</td>
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<tr>
<td>Flexural Strength</td>
<td>170 MPa</td>
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<tr>
<td>Thermal Conductivity</td>
<td>2 W/mK</td>
</tr>
<tr>
<td>Dielectric Constant @10GHz</td>
<td>5.7±0.2</td>
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<tr>
<td>Loss Tangent @10GHz</td>
<td>&lt;0.1</td>
</tr>
<tr>
<td>Insulation resistance</td>
<td>&gt;10^10</td>
</tr>
<tr>
<td>Breakdown Voltage</td>
<td>&gt;750V/mil</td>
</tr>
</tbody>
</table>

Electrical Test Methods:

• Split-Post Resonator (1-10 GHz)
• Split-Cylinder Resonator (5-30 GHz)
• Fabry-Perot Resonator (30-100 GHz)

Complies with EU RoHS Directive 2011/65/EU

RoHS
Low Temperature Co-fired Ceramic Systems
Au Conductor System for A6M, A6M-E, and L8 Tape System

Typical Process Parameters

Metallization:

- **Au-based System**
  - FX30-025H Au Inner Conductor
  - CN30-078 Au Via Fill
  - CN30-080M Au Surface Wire-bondable
  - CN36-020 AuPtPd Surface Solderable
  - FX87 Series Resistors

- **Mixed-Metal Based System**
  - CN33-398 Ag Inner Conductor
  - CN33-407 Ag Via Fill
  - CN39-005 Transition Via Fill
  - CN30-080M Au Surface Wire-bondable
  - CN36-020 AuPtPd Surface Solderable
  - FX87 Series Resistors

- **Post Fireable System**
  - FX30-025JH Brazeable Base Layer
  - C4007 Brazeable Top Layer
  - CN31-014/17 Solderable AuPt Conductor
  - 3066 Wirebondable Au Conductor

Lamination: Iso-static 3000 psi (21Mpa) @ 70°C for 10 minutes

Setters: Fused quartz for typical applications; Zirconia felt for hi-metallization parts

Binder Burn-out: Room temperature to 450°C @ ≤ 2°C/min, with 2 hour hold at peak in box (preferred) or belt furnace with 100 SCFH air-flow.

Firing: 450 to 850°C @ 6-8°C/min, with 10-15 minute hold at peak in box (preferred) or belt furnace with controlled with 100 SCFH air-flow.

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