DE104 offers excellent thermal resistance, due to its special resin system and a low coefficient of thermal expansion in the Z-axis.

The glass transition temperature (Tg) is 135°C (DSC). Time to delamination of the laminate at a temperature of 260°C is 12 minutes and the decomposition temperature (Td) is 315°C. The product is listed as FR-4 and can be processed using standard parameters. DE104 multilayer (ML) corresponds to NEMA-grade FR-4 and meets the requirements of IPC-4101.

PRODUCT FEATURES

Industry Recognition
- UL File Number: E41625
- RoHS Compliant

Performance Attributes
- CAF resistant
- Lead-free assembly compatible

Processing Advantages
- FR-4 process compatible
- UV blocking and AOI fluorescence

PRODUCT AVAILABILITY

Standard Material Offering: Laminate
- 2 to 93 mil (0.05 to 2.4 mm)
- Available in full size sheet or panel form

Copper Foil Type
- HTE Grade 3
- RTF (Reverse Treat Foil)

Copper Weight
- ½ to 2 oz (18 to 70 µm) available
- Heavier copper available
- Thinner copper foil available

Standard Material Offering: Prepreg
- Roll or panel form
- Tooling of prepreg panels

Glass Fabric Availability
- E-glass
- Square weave glass
- Mechanically spread glass

PRODUCT ATTRIBUTES

TYPICAL MARKET APPLICATIONS

ORDERING INFORMATION:

Contact your local sales representative or contact info@isola-group.com for further information.

Isola Group
6565 West Frye Road
Chandler, AZ 85226
Phone: 480-893-6527
Fax: 480-893-1409

Isola Asia Pacific
(Hong Kong) Ltd.
12/F, Kin Sang Commercial Centre,
49 King Yip Street, Kwun Tong,
Kowloon,
Hong Kong
Phone: 852-2418-1318
Fax: 852-2418-1533

Isola GmbH
Isola Strasse 2 D-52348 Düren,
Germany
Phone: 49-2421-8080
Fax: 49-2421-868164

https://www.isola-group.com/pcb-laminates-prepreg/de104/
https://www.isola-group.com/pcb-laminates/prepreg/de104/
## Typical Values Table

<table>
<thead>
<tr>
<th>Property</th>
<th>Typical Value</th>
<th>Units</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glass Transition Temperature (Tg) by DSC</td>
<td>135</td>
<td>°C</td>
<td>2.4.25C</td>
</tr>
<tr>
<td>Decomposition Temperature (Td) by TGA @ 5% weight loss</td>
<td>315</td>
<td>°C</td>
<td>2.4.24.6</td>
</tr>
<tr>
<td>Time to Delaminate by TMA (Copper removed)</td>
<td>12</td>
<td>°C</td>
<td>2.4.24.1</td>
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<tr>
<td>Z-Axis CTE</td>
<td>70</td>
<td>ppm/*C</td>
<td>2.4.24C</td>
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<tr>
<td>X/Y-Axis CTE</td>
<td>16/13</td>
<td>ppm/*C</td>
<td>2.4.24C</td>
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<tr>
<td>Thermal Conductivity</td>
<td>0.36</td>
<td>W/m·K</td>
<td>ASTM E1952</td>
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<tr>
<td>Thermal Stress 10 sec @ 288°C (350.4°F)</td>
<td>4.46</td>
<td>ppm/*C</td>
<td>2.5.5.3</td>
</tr>
<tr>
<td>Dk, Permittivity</td>
<td>0.20</td>
<td>MΩ-cm</td>
<td>2.5.17.1</td>
</tr>
<tr>
<td>Df, Loss Tangent</td>
<td>0.020</td>
<td>MΩ</td>
<td>2.5.17.1</td>
</tr>
<tr>
<td>Volume Resistivity</td>
<td>1.3 x 10⁵</td>
<td>MΩ</td>
<td>2.5.6B</td>
</tr>
<tr>
<td>Surface Resistivity</td>
<td>1.0 x 10⁶</td>
<td>MΩ</td>
<td>2.5.6.2A</td>
</tr>
<tr>
<td>Dielectric Breakdown</td>
<td>&gt;50</td>
<td>kV</td>
<td>2.5.6B</td>
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<tr>
<td>Arc Resistance</td>
<td>105</td>
<td>Seconds</td>
<td>2.5.1B</td>
</tr>
<tr>
<td>Electric Strength (Laminate &amp; laminated prepreg)</td>
<td>54 (1350)</td>
<td>kV/mm (V/mil)</td>
<td>2.5.6.2A</td>
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<tr>
<td>Comparative Tracking Index (CTI)</td>
<td>2</td>
<td>Class (Volts)</td>
<td>UL 746A</td>
</tr>
<tr>
<td>Peel Strength</td>
<td>1.23 (7.0)</td>
<td>N/mm (lb/inch)</td>
<td>2.4.8C</td>
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<tr>
<td>Flexural Strength</td>
<td>84.0</td>
<td>ksi</td>
<td>2.4.4B</td>
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<tr>
<td>Tensile Strength</td>
<td>57.0</td>
<td>ksi</td>
<td>ASTM D3039</td>
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<td>Moisture Absorption</td>
<td>0.3</td>
<td>%</td>
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<td>Flammability (Laminate &amp; laminated prepreg)</td>
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<tr>
<td>Relative Thermal Index (RTI)</td>
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<td>°C</td>
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