I-Tera® MT40 laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range.

I-Tera MT40 is suitable for many of today’s high speed digital and RF/microwave printed circuit designs. I-Tera MT40 features a dielectric constant (Dk) that is stable between -55°C and +125°C up to W-band frequencies. In addition, I-Tera MT40 offers a lower dissipation factor (Df) of 0.0031 making it a cost effective alternative to PTFE and other commercial microwave and high-speed digital laminate materials.

I-Tera MT40 laminate materials are currently being offered in both laminate and prepreg form in typical thicknesses and standard panel sizes. This provides a complete materials solution package for high-speed digital multilayer, hybrid, RF/microwave, multilayer and double-sided printed circuit designs. I-Tera MT40 does not require any special through hole treatments commonly needed when processing PTFE-based laminate materials.

**Product Attributes**
High Speed Digital, High Thermal Reliability, High Density Interconnect

**Typical Market Applications**

ORDERING INFORMATION:
Contact your local sales representative or visit www.isola-group.com for further information.

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Phone: 852-2418-1318
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Isola GmbH
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D-52348 Düren, Germany
Phone: 49-2421-8080
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info-dur@isola-group.com

Data Sheet
Tg 200°C
Td 360°C
Dk 3.45
Df 0.0031

IPC-4103 - / 17
IPC-4101 - / 102
UL - File Number E41625

Last Updated June 4, 2020
Revision No: C

**Product Features**
- Industry Recognition
  - UL File Number: E41625
  - RoHS Compliant
- Performance Attributes
  - CAF resistant
  - Lead-free assembly compatible
- Processing Advantages
  - FR-4 process compatible
  - Dimensional stability
  - Multiple reflow capable
  - Multiple lamination cycles

**Product Availability**
- Standard Material Offering: Laminate
  - 2 to 18 mil (0.05 to 0.46 mm)
  - 10, 20, 30, 60 mil (0.25, 0.51, 0.76, 1.5 mm)
  - Available in full size sheet or panel form
- Copper Foil Type
  - HTE Grade 3
  - VLP-2 (2 micron), 1 oz and below
  - 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

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<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>200</td>
<td>°C</td>
<td>IPC-TM-650 (or as noted)</td>
</tr>
<tr>
<td>Glass Transition Temperature (Tg) by TMA</td>
<td>205</td>
<td>°C</td>
<td>2.4.24C</td>
</tr>
<tr>
<td>Decomposition Temperature (Td) by TGA @ 5% weight loss</td>
<td>360</td>
<td>°C</td>
<td>2.4.24.6</td>
</tr>
<tr>
<td>Time to Delaminate by TMA (Copper removed)</td>
<td>A. T260</td>
<td>&gt;60 Minutes</td>
<td>2.4.24.1</td>
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<tr>
<td></td>
<td>B. T288</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z-Axis CTE</td>
<td>A. Pre-Tg</td>
<td>55 ppm/°C</td>
<td>2.4.24C</td>
</tr>
<tr>
<td></td>
<td>B. Post-Tg</td>
<td>290 ppm/°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. 50 to 260°C</td>
<td>2.8 ppm/°C</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(Total Expansion)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X/Y-Axis CTE</td>
<td>Pre-Tg</td>
<td>12 ppm/°C</td>
<td>2.4.24C</td>
</tr>
<tr>
<td>Thermal Conductivity</td>
<td>0.41 W/mK</td>
<td></td>
<td>ASTM E1952</td>
</tr>
<tr>
<td>Thermal Stress 10 sec @ 288°C (550.4°F)</td>
<td>A. Unetched</td>
<td>Pass</td>
<td>2.4.13.1</td>
</tr>
<tr>
<td></td>
<td>B. Etched</td>
<td>Pass Visual</td>
<td></td>
</tr>
<tr>
<td>Dk, Permittivity</td>
<td>A. @ 2 GHz</td>
<td>3.45</td>
<td>2.5.5.5</td>
</tr>
<tr>
<td></td>
<td>B. @ 5 GHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. @ 10 GHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Df, Loss Tangent</td>
<td>A. @ 2 GHz</td>
<td>0.0031</td>
<td>Bereskin Stripline</td>
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<tr>
<td></td>
<td>B. @ 5 GHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>C. @ 10 GHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Volume Resistivity</td>
<td>C-96/35/90</td>
<td>1.33 x 10^7</td>
<td>2.5.17.1</td>
</tr>
<tr>
<td>Surface Resistivity</td>
<td>C-96/35/90</td>
<td>1.33 x 10^5</td>
<td>2.5.17.1</td>
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<tr>
<td>Dielectric Breakdown</td>
<td>45.4 kV</td>
<td></td>
<td>2.5.6B</td>
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<tr>
<td>Arc Resistance</td>
<td>139 Seconds</td>
<td></td>
<td>2.5.1B</td>
</tr>
<tr>
<td>Electric Strength (Laminate &amp; laminated prepreg)</td>
<td>45 (1133) kV/mm (V/mil)</td>
<td>2.5.6.2A</td>
<td></td>
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<tr>
<td>Comparative Tracking Index (CTI)</td>
<td>3 Class (Volts)</td>
<td></td>
<td>UL 746A ASTM D3638</td>
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<tr>
<td>Peel Strength</td>
<td>1 oz. EDC foil</td>
<td>1.0 (5.7) N/mm (lb/inch)</td>
<td>2.4.8C</td>
</tr>
<tr>
<td>Flexural Strength</td>
<td>A. Length direction</td>
<td>71.0 ksi</td>
<td>2.4.4B</td>
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<tr>
<td></td>
<td>B. Cross direction</td>
<td>58.0</td>
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<tr>
<td>Tensile Strength</td>
<td>A. Length direction</td>
<td>39.0 ksi</td>
<td>ASTM D3039</td>
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<tr>
<td></td>
<td>B. Cross direction</td>
<td>35.0</td>
<td></td>
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<tr>
<td>Young's Modulus</td>
<td>A. Length direction</td>
<td>3060 ksi</td>
<td>ASTM D790-15e2</td>
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<td></td>
<td>B. Cross direction</td>
<td>2784</td>
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<tr>
<td>Poisson's Ratio</td>
<td>A. Length direction</td>
<td>0.234</td>
<td>—</td>
</tr>
<tr>
<td></td>
<td>B. Cross direction</td>
<td>0.222</td>
<td>ASTM D3039</td>
</tr>
<tr>
<td>Moisture Absorption</td>
<td>0.1 %</td>
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<td>2.6.2.1A</td>
</tr>
<tr>
<td>Flammability (Laminate &amp; laminated prepreg)</td>
<td>V-0 Rating</td>
<td>UL 94</td>
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</tr>
<tr>
<td>Relative Thermal Index (RTI)</td>
<td>130 °C</td>
<td></td>
<td>UL 796</td>
</tr>
</tbody>
</table>

The data, while believed to be accurate and based on analytical methods considered to be reliable, is for information purposes only. Any sales of these products will be governed by the terms and conditions of the agreement under which they are sold.
NOTE
Visit our site  http://www.isola-group.com  for more details.
Revisions:
A: Initial release - 4/17
B: Corrected units for Flexural and Tensile Strength, Corrected Typo for Thermal Conductivity value - 8/18
C: Change MOT to RTI 5/19