

# isola

## Astra<sup>®</sup> MT77

### Very Low Loss Laminate and Prepreg Materials

Astra<sup>®</sup> MT77 materials are a breakthrough, very low-loss dielectric constant (Dk) product for millimeter wave frequencies and beyond.

Astra MT77 laminate materials exhibit exceptional electrical properties which are very stable over a broad frequency and temperature range. Astra MT77 is suitable for many of today's commercial RF/microwave printed circuit designs. It features a dielectric constant (Dk) that is stable between -40°C and +140°C at up to W-band frequencies. In addition, Astra MT77 offers an ultra-low dissipation factor (Df) of 0.0017, making it a cost-effective alternative to PTFE and other commercial microwave laminate materials.

Key applications include long antennas and radar applications for automobiles, such as adaptive cruise control, pre-crash, blind spot detection, lane departure warning and stop and go systems.

### Product Attributes

RF/Microwave , High Thermal Reliability

### Typical Market Applications

Aerospace & Defense , RF / Microwave , Automotive & Transportation

#### ORDERING INFORMATION:

Contact your local sales representative or visit [www.isola-group.com](http://www.isola-group.com) for further information.

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RF/Microwave

## Data Sheet

Tg 200°C  
Td 360°C  
Dk 3.00  
Df 0.0017

IPC-4103 - / 17

UL - File Number E41625

Last Updated October 31, 2018  
Revision No: B

### Product Features

- Industry Recognition
  - UL File Number: E41625
  - RoHS Compliant
- Performance Attributes
  - Lead-free assembly compatible
- Processing Advantages
  - FR-4 process compatible
  - Short lamination cycle
  - Reduced drill wear
  - No plasma desmear required
  - Good flow and fill
  - Dimensional stability
  - Multiple lamination cycles
  - Any layer technology compatible
  - HDI technology compatible
  - VIPPO design compatible

### Product Availability

- Standard Material Offering: Laminate
  - 2.5, 5, 7.5, 10, 12.5, 15, 20, 30, 60 mil (0.0635, 0.127, 0.1905, 0.254, 0.3175, 0.381, 0.510, 0.760, 1.50 mm)
- Copper Foil Type
  - VLP-2 (2 micron), 1 oz and below
- Copper Weight
  - 1/3, 1/2, 1 oz (12, 18 and 35 µm) available
  - Heavier copper available
  - Thinner copper foil available
- Standard Material Offering: Prepreg
  - Roll or panel form
  - Tooling of prepreg panels

| Property   | Typical Value                             | Units                  |                          | Test Method           |
|--|---|------------------------|--------------------------|-----------------------|
|  |   | Metric (English)       | IPC-TM-650 (or as noted) |                       |
| Glass Transition Temperature (Tg) by DSC               | 200                                       | °C                     | 2.4.25C                  |                       |
| Decomposition Temperature (Td) by TGA @ 5% weight loss | 360                                       | °C                     | 2.4.24.6                 |                       |
| Time to Delaminate by TMA (Copper removed)             | A. T260<br>B. T288                        | >60                    | Minutes                  | 2.4.24.1              |
| Z-Axis CTE   | A. Pre-Tg<br>B. Post-Tg                   | 50 - 70<br>250 - 350   | ppm/°C                   | 2.4.24C               |
| X/Y-Axis CTE   | Pre-Tg                                    | 12                     | ppm/°C                   | 2.4.24C               |
| Thermal Conductivity                                   |   | 0.45                   | W/mK                     | ASTM E1952            |
| Thermal Stress 10 sec @ 288°C (550.4°F)                | A. Unetched<br>B. Etched                  | Pass                   | Pass Visual              | 2.4.13.1              |
| Dk, Permittivity                                       | A. @ 2 GHz<br>B. @ 10 GHz                 | 3.00                   | —                        | 2.5.5.5               |
| Df, Loss Tangent                                       | A. @ 2 GHz<br>B. @ 10 GHz                 | 0.0017                 | —                        | Bereskin Stripline    |
| Volume Resistivity                                     | C-96/35/90                                | 1.33 x 10 <sup>7</sup> | MΩ-cm                    | 2.5.17.1              |
| Surface Resistivity                                    | C-96/35/90                                | 1.33 x 10 <sup>5</sup> | MΩ                       | 2.5.17.1              |
| Dielectric Breakdown                                   |   | 45.4                   | kV                       | 2.5.6B                |
| Arc Resistance   |   | 139                    | Seconds                  | 2.5.1B                |
| Electric Strength (Laminate & laminated prepreg)       |   | 45 (1133)              | kV/mm (V/mil)            | 2.5.6.2A              |
| Comparative Tracking Index (CTI)                       |   | 3 (175-249)            | Class (Volts)            | UL 746A<br>ASTM D3638 |
| Peel Strength  | 1 oz. EDC foil                            | 1.0 (5.7)              | N/mm (lb/inch)           | 2.4.8.3               |
| Flexural Strength                                      | A. Length direction<br>B. Cross direction | 49.0<br>39.0           | ksi                      | 2.4.4B                |
| Tensile Strength                                       | A. Length direction<br>B. Cross direction | 31.0<br>24.0           | ksi                      | ASTM D3039            |
| Poisson's Ratio  | A. Length direction<br>B. Cross direction | 0.183<br>0.182         | —                        | ASTM D3039            |
| Moisture Absorption                                    |   | 0.1                    | %                        | 2.6.2.1A              |
| Flammability (Laminate & laminated prepreg)            |   | V-0                    | Rating                   | UL 94                 |
| Max Operating Temperature                              |   | 130                    | °C                       | UL 796                |

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.

<https://www.isola-group.com/products/all-printed-circuit-materials/astra-mt77/>

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## NOTE

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Revision B: Corrected units for Flexural and Tensile Strength