

IPC-4103 /17 UL - File Number E41625

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

### PRODUCT FEATURES

#### Industry Recognition

- UL File Number: E41625
- RoHS Compliant
- PFAS Free

#### 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

- HVLP (VLP2)  $\leq 2.5$  micron Rz JIS
- Embedded resistor foil

#### Copper Weight

- ½, 1 and 2 oz (18, 35 and 70  $\mu\text{m}$ ) available
- Thinner copper foil available

#### Standard Material Offering: Prepreg

- Tooling of prepreg panels
- Moisture barrier packaging

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



HIGH DENSITY INTERCONNECT



HIGH THERMAL RELIABILITY



RADIO FREQUENCY & MICROWAVE

### TYPICAL MARKET APPLICATIONS



AUTOMOTIVE & TRANSPORTATION



RADIO FREQUENCY & MICROWAVE



AEROSPACE & DEFENSE

**ORDERING INFORMATION:**

Contact your local sales representative or contact [info@isola-group.com](mailto: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: 49-2421-808164

# Typical Values Table

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 B. T288	>60	Minutes	2.4.24.1
Z-Axis CTE	A. Pre-Tg B. Post-Tg	50 - 70 250 - 350	ppm/°C	2.4.24C
X/Y-Axis CTE	Pre-Tg	12	ppm/°C	2.4.24C
Thermal Conductivity		0.45	W/m·K	ASTM E1952
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched B. Etched	Pass	Pass Visual	2.4.13.1
Dk, Permittivity	A. @ 2 GHz B. @ 10 GHz	3.00	—	2.5.5.5
Df, Loss Tangent	A. @ 2 GHz B. @ 10 GHz	0.0017	—	Bereskin Stripline
Volume Resistivity	C-96/35/90	$1.33 \times 10^7$	MΩ-cm	2.5.17.1
Surface Resistivity	C-96/35/90	$1.33 \times 10^5$	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 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 B. Cross direction	338 (49.0) 269 (39.0)	MPa (kpsi)	2.4.4B
Tensile Strength	A. Length direction B. Cross direction	214 (31.0) 165 (24.0)	MPa (kpsi)	ASTM D3039
Poisson's Ratio	A. Length direction B. Cross direction	0.183 0.182	—	ASTM D3039
Moisture Absorption		0.1	%	2.6.2.1A
Flammability (Laminate & laminated prepreg)		V-0	Rating	UL 94
Relative Thermal Index (RTI)		130	°C	UL 796

## NOTES

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 - 8/18

C: Change MOT to RTI 5/19

D: Changed VLP2 to HVLP to align with common industry terms 4/21

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