

IPC-4101 /98 /99 /101 /126    UL - File Number E41625

185HR laminate and prepreg materials are a proprietary, high-performance resin system with a Tg of 180°C for multilayer Printed Wiring Board (PWB) applications where maximum thermal performance and reliability are required.

#### PRODUCT FEATURES

##### Industry Recognition

- UL File Number: E41625
- Qualified to UL's MCIL Program
- 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)

##### Copper Foil Type

- HTE Grade 3
- RTF (Reverse Treat Foil)

##### Copper Weight

- ½, 1 and 2 oz (18, 35 and 70 µm) available
- Heavier copper foil 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

185HR laminate and prepreg materials are manufactured using Isola's patented technology, reinforced with electrical grade (E-glass) glass fabric. This system delivers a 340°C decomposition temperature, a lower Z-axis expansion and offers lower loss compared to competitive products in this space. The 185HR system is also laser fluorescing and UV blocking for maximum compatibility with Automated Optical Inspection (AOI) systems, optical positioning systems and photoimageable solder mask imaging.

#### PRODUCT ATTRIBUTES



HIGH DENSITY INTERCONNECT



HIGH THERMAL RELIABILITY

#### TYPICAL MARKET APPLICATIONS



AUTOMOTIVE & TRANSPORTATION



NETWORKING & COMMUNICATIONS



AEROSPACE & DEFENSE



CONSUMER ELECTRONICS



MEDICAL, INDUSTRIAL & INSTRUMENTATION

**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)	
Test data generated from rigid laminate	50	%	2.3.16.2	
Glass Transition Temperature (Tg) by DSC	180	°C	2.4.25C	
Glass Transition Temperature (Tg) by DMA	185	°C	2.4.24.4	
Decomposition Temperature (Td) by TGA @ 5% weight loss	340	°C	2.4.24.6	
Time to Delaminate by TMA (Copper removed)	A. T260 B. T288	60 >15	Minutes 2.4.24.1	
Z-Axis CTE	A. Pre-Tg B. Post-Tg C. 50 to 260°C, (Total Expansion)	40 220 2.7	ppm/°C ppm/°C %	
X/Y-Axis CTE	Pre-Tg	13/14	ppm/°C 2.4.24C	
Thermal Conductivity		0.4	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. @ 100 MHz B. @ 1 GHz C. @ 2 GHz D. @ 5 GHz E. @ 10 GHz	4.13 4.04 4.01 3.88 3.88	— 2.5.5.3 Bereskin Stripline Bereskin Stripline Bereskin Stripline Bereskin Stripline	
Df, Loss Tangent	A. @ 100 MHz B. @ 1 GHz C. @ 2 GHz D. @ 5 GHz E. @ 10 GHz	0.0158 0.0192 0.0200 0.0235 0.0236	— 2.5.5.3 Bereskin Stripline Bereskin Stripline Bereskin Stripline Bereskin Stripline	
Volume Resistivity	A. C-96/35/90 B. After moisture resistance C. At elevated temperature	— $3.0 \times 10^8$ $7.0 \times 10^8$	MΩ-cm 2.5.17.1	
Surface Resistivity	A. C-96/35/90 B. After moisture resistance C. At elevated temperature	— $3.0 \times 10^6$ $2.0 \times 10^8$	MΩ 2.5.17.1	
Dielectric Breakdown		>50	kV 2.5.6B	
Arc Resistance		115	Seconds 2.5.1B	
Electric Strength (Laminate & laminated prepreg)		54 (1350)	kV/mm (V/mil) 2.5.6.2A	
Comparative Tracking Index (CTI)		3 (175-249)	Class (Volts) UL 746A ASTM D3638	
Peel Strength	A. Low profile copper foil and very low profile copper foil all copper foil >17 μm [0.669 mil] B. Standard profile copper 1. After thermal stress 2. At 125°C (257°F) 3. After process solutions	>0.79 (>4.5) >0.79 (>4.5) >0.79 (>4.5) >0.79 (>4.5)	N/mm (lb/inch) 2.4.8C 2.4.8.2A 2.4.8.3 2.4.8.3	
Flexural Strength	A. Length direction B. Cross direction	669 (97.1) 373 (54.1)	MPa (kpsi) 2.4.4B	
Tensile Strength	A. Length direction B. Cross direction	367 (53.3) 246 (35.7)	MPa (kpsi) ASTM D3039	
Young's Modulus	A. Length direction B. Cross direction	3770 3337	ksi ASTM D790-15e2	
Poisson's Ratio	A. Length direction B. Cross direction	0.172 0.155	— ASTM D3039	
Moisture Absorption		0.15	% 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 Peel Strength to >0.79(>4.5) 4/22

Isola, the Isola logo, Astra, Chronon, GETEK, I-Fill, IsoDesign, IsoStack, I-Speed, I-Tera, Polyclad, Stratus, TerraGreen, and The Base for Innovation are registered trademarks or trademarks of ISOLA USA Corp. in the United States and in other countries. Copyright © 2021 Isola Group. All rights reserved.