



250HR High Performance Laminate and Prepreg

250HR is a high-performance 150°C glass transition temperature (Tg) FR-4 system for multilayer Printed Wiring Board (PWB) applications where maximum thermal performance and reliability are required.

250HR laminate and prepreg products are manufactured with a unique high performance multifunctional epoxy resin, reinforced with electrical grade (E-glass) glass fabric. This system provides improved thermal performance and low expansion rates in comparison to traditional FR-4 while retaining FR-4 processability. In addition to this superior thermal performance, the mechanical, chemical and moisture resistance properties all equal or exceed the performance of traditional FR-4 materials.

The 250HR system is also laser fluorescing and UV blocking for maximum compatibility with Automated Optical Inspection (AOI) systems, optical positioning systems and photoimagable solder mask imaging.

www.isola-group.com/products/250HR

ORDERING INFORMATION:

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

Isola Group
3100 West Ray Road
Suite 301
Chandler, AZ 85226
Phone: 480-893-6527
Fax: 480-893-1409
info@isola-group.com

Isola Asia Pacific (Hong Kong) Ltd.
Unit 3512 - 3522, 35/F
No. 1 Hung To Road, Kwun Tong,
Kowloon, Hong Kong
Phone: 852-2418-1318
Fax: 852-2418-1533
info.hkg@isola-group.com

Isola GmbH
Isola Strasse 2 D-52348
Düren, Germany
Phone: 49-2421-8080
Fax: 49-2421-808164
info-dur@isola-group.com

High Performance

250HR Data Sheet

Tg 150, Td 325
Dk 4.00, Df 0.020
/21 /24 /97 /101

Features

- High Thermal Performance
 - ▶ Tg: 150°C (DSC)
 - ▶ Td: 325°C (TGA @ 5% wt loss)
 - ▶ Superior performance through multiple thermal excursions
 - ▶ Resistance to measling
 - ▶ Extended capabilities
- T260: 30 minutes
- T288: >5 minutes
- RoHS Compliant
- UV Blocking and AOI Compatible
 - ▶ Increased throughput and accuracy
 - ▶ Compatible with all AOI equipment
- Standard FR-4 Processing
- Standard Availability
 - ▶ Thickness: 0.002" (0.05 mm) to 0.093" (2.4 mm)
 - ▶ Available in sheet or panel form
- Prepreg Standard Availability
 - ▶ Roll or panel form
 - ▶ Tooling of prepreg panels available
- Copper Foil Type Availability
 - ▶ Standard HTE Grade 3
 - ▶ RTF (Reverse Treat Foil)
- Copper Weights
 - ▶ ½, 1 and 2 oz (18, 38 and 70 µm) available
 - ▶ Heavier copper available upon request
 - ▶ Thinner copper foil available upon request
- Glass Fabric Availability
 - ▶ Standard E-glass
 - ▶ Square weave glass fabric available
- Industry Approvals
 - ▶ IPC-4101C /21 /24 /97 /101
 - ▶ UL – File Number E41625
 - ▶ Qualified to UL's MCIL Program

250HR Specifications

Property	Typical Values			
			Units	Test Method
	Typical Value	Specification	Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		150-200	°C	2.4.25
Decomposition Temperature (Td) by TGA @ 5% weight loss		–	°C	ASTM D3850
T260		–	Minutes	2.4.25
T288		–	Minutes	2.4.25
CTE, Z-axis	A. Pre-Tg B. Post-Tg	AABUS –	ppm/°C	2.4.24
CTE, X-, Y-axes	A. Pre-Tg B. Post-Tg	AABUS –	ppm/°C	2.4.24
Z-axis Expansion (50-260°C)		–	%	2.4.24
Thermal Conductivity		–	W/mK	ASTM D5930
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched B. Etched	Pass Pass Visual	Rating	2.4.13.1
Dk, Permittivity (Laminate & prepreg as laminated) Split Post Method, Tested at 50% resin	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	4.00 3.90 –	5.4 – –	2.5.5.3 2.5.5.9 2.5.5.5
Df, Loss Tangent (Laminate & prepreg as laminated) Split Post Method, Tested at 50% resin	A. @ 2 GHz B. @ 5 GHz C. @ 10 GHz	0.020 0.022 –	0.035 – –	2.5.5.3 2.5.5.9 2.5.5.5
Volume Resistivity	A. 96/35/90 B. After moisture resistance C. At elevated temperature	– 2.4x10 ⁸ 2.3x10 ⁸	– 1.0x10 ⁴ 1.0x10 ³	MΩ-cm 2.5.17.1
Surface Resistivity	A. 96/35/90 B. After moisture resistance C. At elevated temperature	– 2.6x10 ⁸ 2.8x10 ⁸	– 1.0x10 ⁴ 1.0x10 ³	MΩ 2.5.17.1
Dielectric Breakdown		>50	40	kV 2.5.6
Arc Resistance		105	60	Seconds 2.5.1
Electric Strength (Laminate & prepreg as laminated)		48 (1200)	29 (736)	kV/mm (V/mil) 2.5.6.2
Comparative Tracking Index (CTI)		3 (175-249)	–	Class (Volts) –
Peel Strength	A. Low profile copper foil and very low profile – all copper weights >17 microns B. Standard profile copper 1. After thermal stress 2. At 125°C (257°F) 3. After process solutions	1.05 (6.0) – 1.58 (9.0) 1.23 (7.0) 1.58 (9.0)	0.70 (4.0) – 1.05 (6.0) 0.70 (4.0) 0.80 (4.5)	N/mm (lb/inch) 2.4.8 2.4.8.2 2.4.8.3 – –
Flexural Strength	A. Lengthwise direction B. Crosswise direction	86,000 84,100	–	lb/inch ² –
Tensile Strength	A. Lengthwise direction B. Crosswise direction	56,810 43,745	–	lb/inch ² –
Moisture Absorption		0.3	0.8	% 2.6.2.1
Flammability (Laminate & prepreg as laminated)		V-0	V-0	Rating UL 94
Max Operating Temperature		130	UL Cert	°C –

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.

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