

Standard Loss, Thermally Robust Epoxy Laminate and Prepreg
Tg 180°C Td 340°C Dk 4.01 Df 0.0200

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 Copper Foil Type

- HTE Grade 3
- 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

ORDERING INFORMATION: Isola

Contact your local sales representative or contact info@isola-group.com for further information.

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





TYPICAL MARKET APPLICATIONS



MEDICAL, INDUSTRIAL & INSTRUMENTATION







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Typical Values Table

Property				Units	Test Method
Giasa Transation I emperature (1g) by UAL 1881 *C 24.28C4 Grass Transation I emperature (1g) by UAL 186 *C 24.24A4 Lecomposition Emperature (1g) by UAL A 1260 60 Minutes 24.24A1 Time to Delannate by TAM A 1260 60 Minutes 24.24A1 Copper femorable (1g) by UAL A Per Tg 40 per M*** 24.24A0 ZAVIS (CTE A Per Tg 40 per M*** 24.24A0 ZAVIS (CTE B, Florid 13.14 per M*** 24.24A0 Timeral Conductivity To 10 to 260°C (Total Expansion) 2.7 % 24.24A0 Timeral Stress 10 sec © 288°C A Linceford 9.6 Pess Place Valual 24.131 GSD APP B, B 10Hz 404 Press 25.5 Perception Striptine B, B 10Hz 40.0 40 Press Per Valual 24.131 B, B 10Hz 40.0 40 Press Per Valual 25.55 B, B 10Hz 0.0 2.0 2.0 2.		Property	Typical Value		
Sease Learnestance Lemphastance (1.0) by USAA Sease with lose 140 15	Test data generated from rigid laminate		50	%	2.3.16.2
Deconsolation Temperature (Tot) by TCA @ 50k weight loss	Glass Transition Temperature (Tg) by DSC		180	°C	2.4.25C
Time to Delaminate by TMA (Copper removed) 8 1728 A Per 1g	Glass Transition Temperature (Tg) by DMA		185	°C	2.4.24.4
A Per 1 Per 1 Per 2 Per 2 Per 3 P	Decomposition Temperature (Td) by TGA @ 5% weight loss		340	°C	2.4.24.6
April Apr	Time to Delaminate by TMA	A. T260	60	N. Granden	0.4.04.1
ZAVIS CTE IL Pool 1 project (Total Expansion) 220 ks 24.24C XYY-Axis CTE Pre 1g 13/14 pom/°C 24.24C Thermal Conductivity A Underhad Pass Poss Visual 24.13C Thermal Stras 10 see @ 288°C (500.4P) A Underhad (500.4P) Pass Pass Visual 24.13C Thermal Stras 10 see @ 288°C (500.4P) A 100 Milk2 (200.4P) 400.4P Pass Visual 25.5.3 B (200.4P) A 20 100 Milk2 (200.4P) 400.4P Personant Stripline Bereakin Stripline Discription (200.4P) A 20 100 Milk2 (200.4P) 388 Personant Stripline Bereakin Stripline Discription (200.4P) A 20 100 Milk2 (200.4P) 30 10 Milk2 (200.4P) Personant Stripline Bereakin Striplin	(Copper removed)	B. T288	>15	Minutes	2.4.24.1
C. SD1 28PC (Total Expansion) 27		A. Pre-Tg	40	ppm/°C	
XV-Axis CTE Pre-Tg 13/14 pcm/°C 2.424C Thermal Conductivity A Uneched (50.04°F) A Uneched (50.04°F) Pass Pass Visual 2.413.1 Thermal Stress 10 see @ 286°C (50.04°F) A C PIO MH2 413 2.5.53 2.5.53 A Q 9 10 MH2 404 401 Perceits Striptine Bereaks Striptine 2.5.13 Bereaks Striptine Bereaks Striptine Bereaks Striptine Bereaks Striptine Bereaks Striptine 2.5.13 Bereaks Striptine Bereaks Striptine Bereaks Striptine Bereaks Striptine Bereaks Striptine 2.5.13 Bereaks Striptine Bereaks Striptine Bereaks Striptine 2.5.13 Accessed Striptine Bereaks Striptine Bereaks Striptine Bereaks Striptine Bereaks Striptine Accessed Striptine	Z-Axis CTE			1	2.4.24C
Thermal Sives 10 see @ 288°C Sicola / Pass Sives 10 see @ 288°C A Unetched Sicola / Pass	V0.4 : 075			1	0.4040
Thermal Stress 10 sec @ 288°C School Mell's School Mell		Pre-1g		1	
Second Second Pass Visual Calca Cal	·		0.4	W/m·K	ASIM E1952
A	1		Pass	Pass Visual	2.4.13.1
Dk, Permittivity B, Ω 10 ls/c 4 044 Permittivity Bereskin Stripline Dk, Permittivity C, Ω 2 BHz 401 Permittivity Bereskin Stripline Dk, Loss Tangent A, ⊕ 100 MHz 0.0158 2.55.3 Bereskin Stripline Df, Loss Tangent B, ⊕ 16 Hz 0.0192 Permittivity Bereskin Stripline Df, Loss Tangent C, Ø 2 CHz 0.0035 Permittivity Bereskin Stripline Df, Loss Tangent A, O 96/35/90 Pull Bereskin Stripline Volume Resistivity A, O 96/35/90 Pull Mill-com 2.5 17.1 Surface Resistivity A, C 96/35/90 Pull Mill-com 2.5 17.1 Delectric Breakdown A C 96/35/90 Pull A C 96/35/90 Pull 2.5 17.1 Acc Resistance 115 A C 96/35/90 Pull Mill 2.5 17.1 Delectric Breakdown A C 96/35/90 Pull Mill 2.5 18 Acc Resistance 115 A (1950) KV 2.5 62 Delectric Breakdown A (196)	(550.4°F)		4.10		0.550
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D. G G-Hz S G-Hz	Dk. Permittivity			_	·
Peel Strength E	2.,	_			· ·
Df, Loss Tangent B ⊗ 1 GHz (C ≥ C Hz) (C ≥ C + C + C + C + C + C + C + C + C +		_	3.88		Bereskin Stripline
Df, Loss Tangent C. @ 2 GHz De 5	Df, Loss Tangent	A. @ 100 MHz	0.0158	-	2.5.5.3
D		B. @ 1 GHz	0.0192		Bereskin Stripline
Note of the sensitivity E ⊕ 10 GHz 0.0236 Gene Median Bereskin Stripline Volume Resistivity A C-96/35/90 - A C-96/35/90 - 2.517.1 Surface Resistivity A C-96/35/90 - - A C-96/35/90 - Buffer moisture resistance conductive resi		C. @ 2 GHz	0.0200		Bereskin Stripline
Volume Resistivity		D. @ 5 GHz	0.0235		Bereskin Stripline
Volume Resistivity B. After moisture resistance C. At elevated temperature 3.0 x 10 ⁸ 70 x 16 ⁸ ME-cm 2.5.17.1 Surface Resistivity A C-96/35/90 B. After moisture resistance C. At elevated temperature 3.0 x 10 ⁶ MB MB 2.5.17.1 Dielectric Breakdown The comparative Testistance C. At elevated temperature 115 Seconds 2.5 1B Arc Resistance 115 Seconds 2.5 1B Electric Strength (Laminate & laminate & laminate prepreg) 54 (1350) kV/mm (V/mil) 2.5 62A Comparative Tracking Index (CTT) 3175-249 Class (Volts) U.746A ASTM Dassas Peel Strength A Loop frofile copper foil and very low profile copper foil and very		E. @ 10 GHz	0.0236		Bereskin Stripline
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Surface Resistivity	Volume Resistivity	B. After moisture resistance		MII-cm	
Surface Resistivity B. After moisture resistance (C. At elevated temperature) 3.0 x 10 ⁶ (2.0 x 10 ⁸) M8 2.517.1 Dielectric Breakdown >50 kV 2.56B Arc Resistance 115 Seconds 2.51B Electric Strength (Laminate & laminate & laminate prepreps) 54 (1350) kV/mm (V/ml) 2.56.2A Comparative Tracking Index (CTI) A Low profile copper foil and very low profile copper foil and low profile copper foil and very low profile copper foil and low profile copper foil and very low profile copper		C. At elevated temperature	7.0 x 10 ⁸		
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Dielectric Breakdown >50 kV 2.5.6B Arc Resistance 115 Seconds 2.5.1B Electric Strength (Laminate & laminate 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 and very low profile copper foil all copper foil and very low profile copper foil all copper foil and very low profile copper foil all copper foil and very low profile copper foil all copper foil and very low profile copper foil and very					
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Comparative Tracking Index (CTI)					
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Peel Strength B. Standard profile copper 1. After thermal stress 2. At 125°C (257°F) 3. After process solutions 1.06 (5.9) 1.06 (5.9) 2.4.8.3 N/mm (lb/inch) 2.4.8.2A 2.4.8.3 2.4.8.3 Flexural Strength A. Length direction B. Cross direction 97.1 54.1 ksi 2.4.4B Tensile Strength A. Length direction B. Cross direction 53.3 57.7 ksi 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 prepeg) V-0 Rating UL 94			0.060 (5.5)		2.4.8C
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Young's Modulus B. Cross direction 3337 Ksl ASTM D790-1562 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	rensile strength	B. Cross direction	35.7	ASTM D30	WO LINI DODOA
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Poisson's Ratio B. Cross direction 0.155 Moisture Absorption 0.155 Cash D3039 ASTM D3039 ASTM D3039 ASTM D3039 D150 ASTM D3039 V-0 Rating UL 94	Touring 5 Miodulus	B. Cross direction	3337	KOI	7.01.01.07.30 1002
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Flammability (Laminate & laminated prepreg) V-0 Rating UL 94		B. Cross direction			
	·			%	2.6.2.1A
Relative Thermal Index (RTI) 130 °C UL 796	Flammability (Laminate & laminated p	prepreg)	V-0	-	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

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