



High Performance Epoxy Laminate and Prepreg Lead-Free ROHS Compliant

Isola's FR406HR is the answer for Lead Free processing while maintaining the electrical properties and processing of FR406. This product is engineered to meet the demands of ROHS, while maintaining standard FR-4 processing. FR406HR offers improved dimensional control, superior chemical and thermal performance and product consistency.

• Industry Approvals

IPC-4101B: /21, /24, /26, /28, /98, /99, /101

UL Recognized – FR-4, File Number E41625

(Part of Isola's FR406 UL Family)

High Tg – 190 °C (DSC)

Td – 325 °C (TGA)

Lower CTE from ambient to 288 DegC

Ultraviolet (UV) Blocking & AOI Compatible

UV blocking and enhanced fluorescence

Compatible with all AOI equipment, including Laser-enhanced reflectance systems.

Standard FR-4 Processing

No post bake after pressing.

Standard Drilling parameters and hole wall preparation

Thickness: 0.002" [.05 mm] to 0.125" [3.2 mm]

Available in sheet or panel form

Copper Foil Cladding: Grade 3 (HTE) , 1/8 to 3 oz.

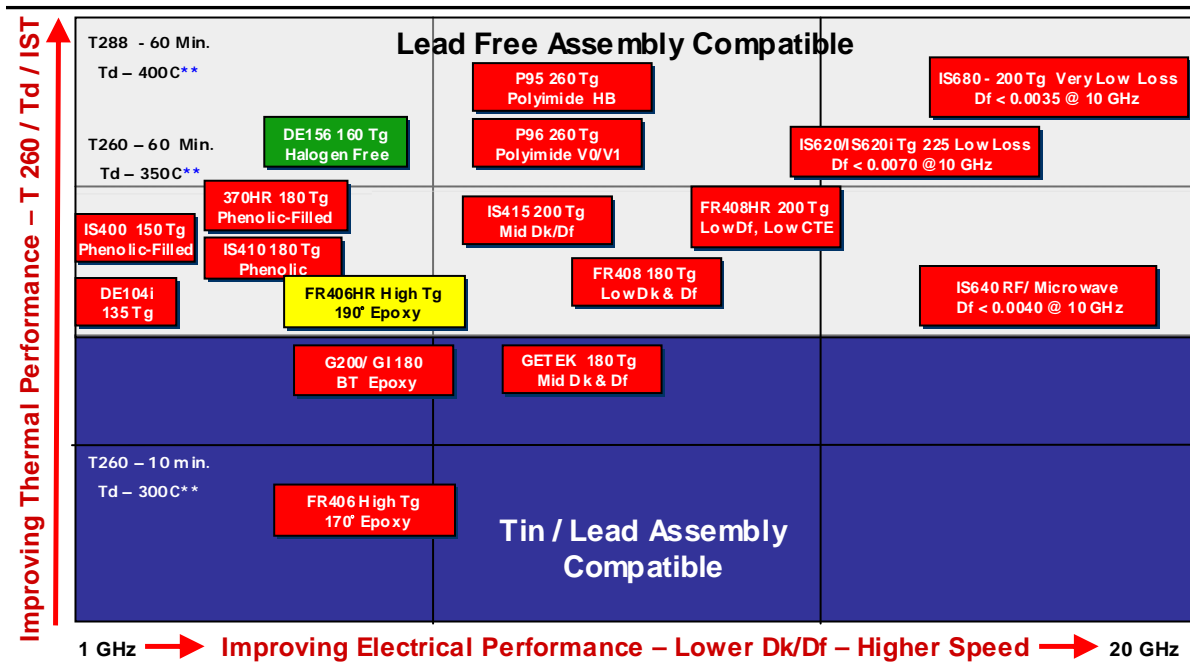
Foil Options: Double treat, reverse treat

Prepregs: Available in roll or panel form

Glass Styles: standard offerings



Isola - Product Position Thermal Performance vs Signal Integrity



Speed is a function of design such as line length etc.

** LaminateData - IST performance is a function of Hole diameter, board thickness, plating parameters and laminate attributes.

ISOLA FR406HR					
IPC-4101B SPECIFICATION SHEET(S) /21, /24, /26, /28, /98, /99 and /101					
LAMINATE					
Property		Typical Values/IPC-4101/26 Specification			
		Typical Value	Specification	Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC, spec minimum		190	170-200	°C	2.4.25
Decomposition Temperature (Td)		325	—	°C	ASTM D3850
CTE, Z-axis	A. Pre-Tg	60	AABUS	ppm/°C	2.4.24
	B. Post-Tg	250	—		
CTE, X-, Y-axes	A. Pre-Tg	13	AABUS	ppm/°C	2.4.24
	B. Post-Tg	14	—		
% Z-Axis Expansion (50-260C)		3	—	%	2.4.24
Thermal Conductivity		0.3-0.4	—	W/mK	ASTM D5930
Thermal Stress 10 Sec @ 288°C (550.4°F), spec min	A. Unetched	Pass	Pass Visual	Rating	2.4.13.1
	B. Etched	Pass	Pass Visual		
Permittivity, spec maximum (Laminate & prepreg as laminated)	A. @ 100 MHz (HP 4285A)	4.00	5.4	—	2.5.5.3
	B. @ 1 GHz (HP 4291A)	3.95	—		2.5.5.9
	C. @ 2 GHz (Bereskin Stripline)	3.79	—		2.5.5.5
	D. @ 5 GHz (Bereskin Stripline)	3.76	—		
	E. @ 10 GHz (Bereskin Stripline)	3.76	—		
Loss Tangent, spec maximum (Laminate & prepreg as laminated)	A. @ 100 MHz (HP 4285A)	0.0130	0.035	—	2.5.5.3
	B. @ 1 GHz (HP 4291A)	0.0161	—		2.5.5.9
	C. @ 2 GHz (Bereskin Stripline)	0.0176	—		2.5.5.5
	D. @ 5 GHz (Bereskin Stripline)	0.0176	—		
	E. @ 10 GHz (Bereskin Stripline)	0.0171	—		
Volume Resistivity, spec minimum	A. 96/35/90	9X10 ⁷	10 ⁶	MΩ-cm	2.5.17.1
	B. After moisture resistance	0	—		
	C. At elevated temperature	3x10 ⁷	10 ³		
Surface Resistivity, spec minimum	A. 96/35/90	3x10 ⁸	10 ⁴	MΩ	2.5.17.1
	B. After moisture resistance	—	—		
	C. At elevated temperature	8x10 ⁸	10 ³		
Dielectric Breakdown, spec minimum			—	kV	2.5.6
Arc Resistance, spec minimum		90	60	Seconds	2.5.1
Electric Strength, spec minimum (Laminate & prepreg as laminated)		44	30	kV/mm	2.5.6.2
		1100	(750)	(V/mil)	
Comparative Tracking Index (CTI)		3 (175-249)		Class (volts)	UL-746A ASTM D3638
Peel Strength, spec minimum	A. Low profile copper foil and very low profile – all copper weights >17 microns	122 (1.19) (7)	70 (0.70) (4.0)	N/mm (kg/M) (lb/inch)	2.4.8
	B. Standard profile copper	160 (1.60) (9)			2.4.8.2
	1. After thermal stress	122 (1.19) (7)	80 (0.80) (4.5)		2.4.8.3
	2. At 125°C (257°F)	122 (1.19) (7)	70 (0.70) (4.0)		
Flexural Strength, minimum	A. Lengthwise direction	0	—	Mpa	2.4.4
	B. Crosswise direction	0	—	(lb/inch ²)	
Moisture Absorption, spec maximum		0.2	—	%	2.6.2.1
Flammability (Laminate & prepreg as laminated), spec min		V-0	V-0	Rating	UL-94
PREPREG					
Property		Typical Value		IPC-4101 Specification	
Volatile Content Spec maximum		<.75		1.5	
Shelf life, spec minimum (Condition 1 / Condition 2)		180/90		180/90	

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.

ORDERING INFORMATION:

Contact your local sales representative or the Customer Service Department in Chandler, AZ
 Isola Group 3100 W Ray Road, Chandler, AZ 85226
 Phone: 480-893-6527
 For further information visit www.isola-group.com