



Epoxy Laminate and Prepreg High Thermal Reliability CAF Resistance /Lead-free

IS410 is a high-performance FR-4 epoxy laminate & prepreg system designed to support the printed circuit board industry's requirements for higher levels of reliability and the trend to lead-free solder. Isola's IS410 has a Tg of 180°C and is specially formulated for superior performance through multiple thermal excursions, passing 6X solder tests at 288°C. IS410 is optimized for enhanced drilling performance allowing high aspect ratio holes of ≤10 mils. Its unique resin chemistry provides CAF resistance with the benefit of long-term reliability of boards built with small feature designs.

High Thermal Performance

Tg of 180°C (DSC)
 Superior performance through multiple thermal excursions – Passes 6X @ 288°C

CAF Resistant

Supports small feature size pcb designs Improves long-term circuit board reliability in the field

Enhanced Drilling Performance for High Aspect PTH

Greater than 10 to 1 aspect ratio
 Optimized for drilling small holes (≤10 mils)

Standard Availability

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. Heavyweight copper foils available on request (i.e. 4 oz., 5 oz. copper)

Foil Options: Double treat, reverse treat

Prepregs: Available in roll or panel form

Glass Styles: available on most standard glass styles

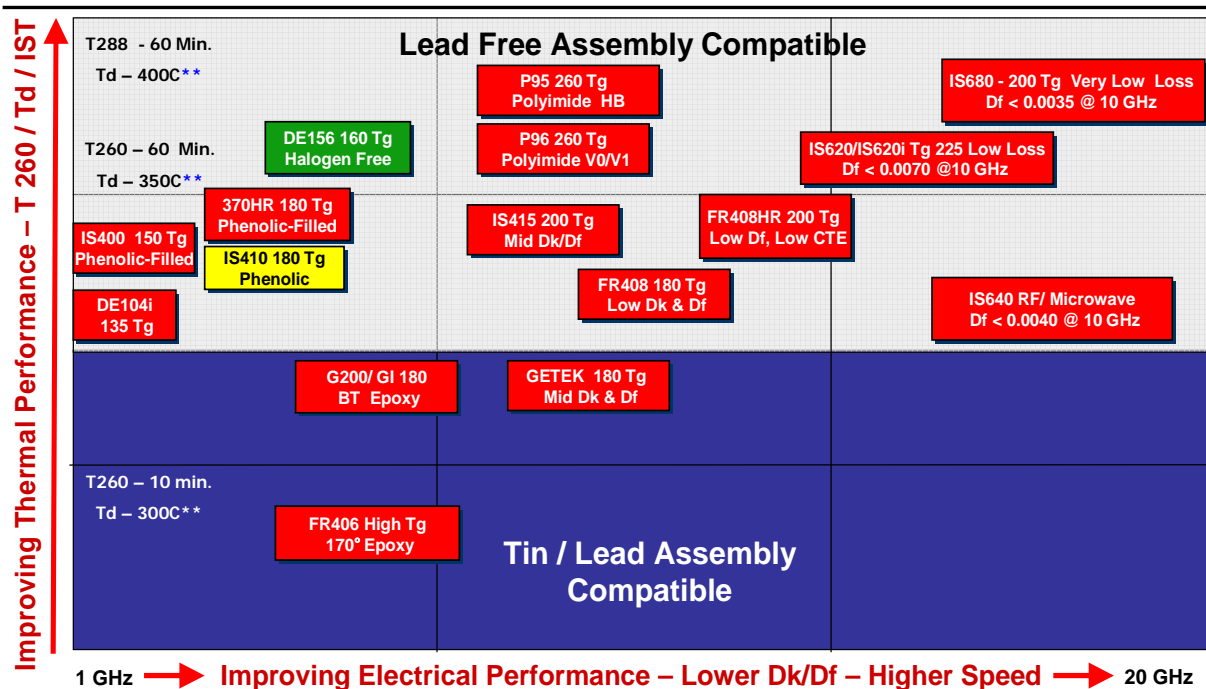
Industry Approvals

IPC-4101C /21 /24 /26 /28 /121 /124

UL Recognized – FR-4, File Number E41625



Isola - Product Position
Thermal Performance vs Signal Integrity



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

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

IS410					
Property	Typical Values				
	Typical Value	Specification	Units	Test Method	
			Metric (English)	IPC-TM-650 (or as noted)	
Glass Transition Temperature (Tg) by DSC, spec minimum	180	170-200	°C	2.4.25	
Decomposition Temperature (Td) @ 5% wt loss	350	—	°C	ASTM D3850	
CTE, Z-axis	A. Pre-Tg	65	AABUS	ppm/°C	2.4.24
	B. Post-Tg	250	—		
CTE, X-, Y-axes	A. Pre-Tg	11	AABUS	ppm/°C	2.4.24
	B. Post-Tg	13	—		
% Z-Axis Expansion (50-260C)	3.5	—	%	2.4.24	
Thermal Conductivity	0.5	—	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 HP4285A	3.96	5.4	—	2.5.5.3
	B. @ 1 GHz HP4291A	3.90	—		2.5.5.9
	C. @ 2 GHz Bereskin Stripline	3.97	—		2.5.5.5
	D. @ 5 GHz Bereskin Stripline	3.87	—		2.5.5.5
	E. @ 10 GHz Bereskin Stripline	3.87	—		2.5.5.5
Loss Tangent, spec maximum (Laminate & prepreg as laminated)	A. @ 100 MHz HP4285A	0.0149	0.035	—	2.5.5.3
	B. @ 1 GHz HP4291A	0.0189	—		2.5.5.9
	C. @ 2 GHz Bereskin Stripline	0.0200	—		2.5.5.5
	D. @ 5 GHz Bereskin Stripline	0.0230	—		2.5.5.5
	E. @ 10 GHz Bereskin Stripline	0.0230	—		2.5.5.5
Volume Resistivity, spec minimum	A. 96/35/90	—	1.0 x 10 ⁸	MΩ -cm	2.5.17.1
	B. After moisture resistance	5.0x10 ⁸	—		
	C. At elevated temperature	3.6x10 ⁸	1.0 x 10 ³		
Surface Resistivity, spec minimum	A. 96/35/90	—	1.0 x 10 ⁴	MΩ	2.5.17.1
	B. After moisture resistance	8x10 ⁶	—		
	C. At elevated temperature	4.5x10 ⁸	1.0 x 10 ³		
Dielectric Breakdown, spec minimum	>50	—	kV	2.5.6	
Arc Resistance, spec minimum	129	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	6.5(1.14)	4.0(0.70)	lb/inch(N/mm)	2.4.8
	B. Standard profile copper	—	—	—	2.4.8.2
	1. After thermal stress	7(1.225)	4.5(0.8)	—	2.4.8.3
	2. At 125°C (257°F)	6.5(1.14)	4.0(0.70)	lb/inch(N/mm)	—
	3. After process solutions	5.1(0.9)	3.0(0.55)	—	—
Flexular Strength, minimum	A. Lengthwise direction	79,000	—	lb/inch ²	—
	B. Crosswise direction	68,000	—		
Moisture Absorption, spec maximum	0.20	—	%	2.6.2.1	
Flammability (Laminate & prepreg as laminated), spec min	V0	—	Rating	UL-94	
HWI	2	—	—	—	
Max Operating Temperature	130 (150)	UL Cert (tested)	Deg C	—	
DSR	yes	—	—	—	
TensileStrength, minimum	A. Lengthwise direction	52,000	—	lb/inch ²	—
	B. Crosswise direction	38,000	—		
Poisson's Ratio	A. Lengthwise direction	0.13	—	—	—
	B. Crosswise direction	0.11	—		
Youngs Modulus	A. Lengthwise direction	3.6	—	—	—
	B. Crosswise direction	3.0	—		
Taylors Modulus	A. Lengthwise direction	3.3	—	—	—
	B. Crosswise direction	3.0	—		

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
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 For further information visit www.isola-group.com

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