

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.

Performance and Processing Advantages

- **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)

Purchasing Information

- **Industry Approvals**

- IPC-4101A /24

- UL Recognized – FR-4, File Number E41625

- (Part of Isola's FR-4 Family)*

- **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), $\frac{1}{8}$ 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:** 106, 1080, 2113, 2116, 1652, and 7628

IS410 Typical Laminate Properties, 0.008" [0.20mm]

PROPERTY	UNITS	IPC-4101A Spec /24	IS410 Value	CONDITIONING
Thickness	inches	0.0197	0.008	—
	mm	[<0.50]	[0.20]	—
Glass Construction	—	—	2-2116	—
Retained Resin	%	—	44-2	—
Thermal				
Tg (DSC)	°C	150-200	180	E-2/105
Td (TGA)	°C	—	350	E-2/105
CTE x-axis	ppm/°C	—	11	Ambient to Tg
y-axis	ppm/°C	—	13	Ambient to Tg
z-axis	ppm/°C	—	140	Ambient to 288°C
Thermal Stress, 10 s @, 288°C	seconds	pass visual	>500	E-2/105
T-260 Resistance (TMA)	minutes	—	>60	Condition A
T-288 Resistance (TMA)	minutes	—	>10	Condition A
Electrical				
Permittivity (DK) @				
1 MHz (2 Fluid Cell)	—	5.4 max.	4.6	C-24/23/50
2GHz (Bereskin Stripline)	—	—	3.9	C-24/23/50
Loss Tangent (DF) @				
1 MHz (2 Fluid Cell)	—	0.035 max.	0.023	C-24/23/50
2 GHz (Bereskin Stripline)	—	—	0.023	C-24/23/50
Volume Resistivity	megohms-cm	1x10 ⁶ min.	5x10 ⁶	C-96/35/90
	megohms-cm	1x10 ³ min.	3.6x10 ⁷	E-24/125
Surface Resistivity	megohms	1x10 ⁴ min.	8x10 ⁶	C-96/35/90
	megohms	1x10 ³ min.	4.5x10 ⁷	E-24/125
Electric Strength	volt/mil	736 min.	1100	D-48/50
	[volts/mm]	[2.9x10 ⁴]	[5.5x10 ⁴]	
Arc Resistance	seconds	60 min.	129	D-48/50
Comparative Tracking				
Index	PLC-UL	—	4	UL 746A
Physical				
Peel Strength, RTF ½ oz.	lb/in	4.00 min.	5.0	After Thermal Stress
	[Kg/M]	[70] min.	[90]	After Thermal Stress
Peel Strength, Std. 1 oz.	lb/in	4.47 min.	8.0	After Thermal Stress
	[Kg/M]	[80] min.	[143]	After Thermal Stress
	lb/in	4.0 min.	7.0	E-1/125
	[Kg/M]	[70] min.	[125]	E-1/125
Flexural Strength				
LW	psi	—	78,000	Condition A
CW	psi	—	68,000	Condition A
Tensile Strength				
LW	psi	—	52,000	Tested @25°C
CW	psi	—	28,000	Tested @25°C
Young's Modulus				
LW	Million psi	—	3.6	Tested @25°C
CW	Million psi	—	3.0	Tested @25°C
Taylor's Modulus				
LW	Million psi	—	3.3	Tested @25°C
CW	Million psi	—	3.0	Tested @25°C
Poisson's Ratio				
LW	—	—	0.13	Tested @25°C
CW	—	—	0.11	Tested @25°C
Flammability	—	V-1 min.	V-0	UL94
Moisture Absorption	%	0.80 max.	0.45*	D-24/23
Moisture Absorption.	%	—	0.15**	D-24/23

* Material Thickness Tested 0.028"

** Material Thickness Tested 0.059"

ORDERING INFORMATION

USA
Isola Laminate Systems
3100 West Ray Road
Chandler, Arizona 85226
Phone: 1-800-845-2904
Fax: 1-800-344-1825
E-mail: usa@isolaAG.com
www.isola-usa.com

Asia
Isola Pacific (Hong Kong) Ltd.
Unit 2508-18, Tower 1 Metroplaza
223 Hing Fong Road,
Kwai Chung, N.T.
Hong Kong
Phone: + 8 52 / 24 18-13 18
Fax: + 8 52/ 24 18-15 33
E-mail: asia@isolaAG.com
www.isolaAG.com

Europe
Isola AG
52348 Duren
Germany
Phone: + 49(0) 24 21 / 80 80
Fax: + 49 (0) 24 21 / 80 81 64
E-mail: europe@isolaAG.com
www.isolaAG.com

Pre-Conditioning Nomenclature

Letter	Meaning
A	No conditioning
C	Preconditioning in moist air
D	Preconditioning by immersion in H ₂ O
des	Preconditioning by drying over a desiccant
E	Preconditioning at temperature
R	Recovering 1~2 hours @ 15 - 35°C & 73 - 77% RH
T	Testing at a given temperature

Examples

C-96/40/92: 96 hours conditioning @ 40°C & 92% RH

D-24/23: 24 hours immersion in H₂O @ 23°C

E-1/100: temperature conditioning in 1 hour @ 100°C

E-1008/100: temperature conditioning 1008 hours @ 100°C

E-1/105 + des: temperature conditioning 1 hour @ 105°C drying over desiccant

D-24/23: immersion in H₂O @ 23°C for 24 hours

"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"