



IS420 Lead-free Laminate and Prepreg

IS420 is a high performance 170°C glass transition temperature (Tg) FR-4 system for multilayer Printed Wiring Board (PWB) applications where maximum thermal performance and reliability are required. IS420 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 IS420 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.

www.isola-group.com/products/IS420

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

IS420 Data Sheet

Tg 170, Td 350
Dk 4.04, Df 0.021
/98 /99 /101

Features

- High Thermal Performance
 - ▶ Tg: 170°C (DSC)
 - ▶ Td: 350°C (TGA @ 5% wt loss)
 - ▶ Low CTE for reliability
- T260: 60 minutes
- T288: >15 minutes
- RoHS Compliant
- UV Blocking and AOI Fluorescence
 - ▶ High throughput and accuracy during PCB fabrication and assembly
- Superior Processing
 - ▶ Closest to conventional FR-4 processing of all high speed materials
- Standard Availability
 - ▶ Thickness: 0.002" (.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, 35 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 /98 /99 /101
 - ▶ UL – File Number E45456
 - ▶ Qualified to UL's MCIL Program

IS420 Specifications

Property		Typical Values			
		Typical Value	Specification	Units	Test Method
				Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		170	170-200	°C	2.4.25
Decomposition Temperature (Td) by TGA @ 5% weight loss		350	–	°C	ASTM D3850
T260		60	–	Minutes	ASTM D3850
T288		>15	–	Minutes	ASTM D3850
CTE, Z-axis	A. Pre-Tg	45	AABUS	ppm/°C	2.4.24
	B. Post-Tg	230	–		
CTE, X-, Y-axes	A. Pre-Tg	13/14	AABUS	ppm/°C	2.4.24
	B. Post-Tg	14/17	–		
Z-axis Expansion (50-260°C)		2.8	–	%	2.4.24
Thermal Conductivity		0.4	–	W/mK	ASTM D5930
Thermal Stress 10 sec @ 288°C (550.4°F)	A. Unetched	Pass	Pass Visual	Rating	2.4.13.1
	B. Etched				
Dk, Permittivity (Laminate & prepreg as laminated) Tested at 50% resin	A. @ 100 MHz (HP4285A)	4.24	5.4	–	2.5.5.3
	B. @ 1 GHz (HP4291A)	4.17	–		2.5.5.9
	C. @ 2 GHz (Bereskin Stripline)	4.04	–		2.5.5.5
	D. @ 5 GHz (Bereskin Stripline)	3.92	–		2.5.5.5
	E. @ 10 GHz (Bereskin Stripline)	3.92	–		2.5.5.5
Df, Loss Tangent (Laminate & prepreg as laminated) Tested at 50% resin	A. @ 100 MHz (HP4285A)	0.0150	0.035	–	2.5.5.3
	B. @ 1 GHz (HP4291A)	0.0161	–		2.5.5.9
	C. @ 2 GHz (Bereskin Stripline)	0.0210	–		2.5.5.5
	D. @ 5 GHz (Bereskin Stripline)	0.0250	–		2.5.5.5
	E. @ 8 GHz (Bereskin Stripline)	0.0250	–		2.5.5.5
Volume Resistivity	A. 96/35/90	–	1.0x10 ⁶	MΩ-cm	2.5.17.1
	B. After moisture resistance	3.0x10 ⁸	–		
	C. At elevated temperature	7.0x10 ⁸	1.0x10 ³		
Surface Resistivity	A. 96/35/90	–	1.0x10 ⁴	MΩ	2.5.17.1
	B. After moisture resistance	3.0x10 ⁶	–		
	C. At elevated temperature	2.0x10 ⁸	1.0x10 ³		
Dielectric Breakdown		>50	–	kV	2.5.6
Arc Resistance		115	60	Seconds	2.5.1
Electric Strength (Laminate & prepreg as laminated)		54 (1350)	30 (750)	kV/mm (V/mil)	2.5.6.2
Comparative Tracking Index (CTI)		3 (175-249)	–	Class (Volts)	UL-746A ASTM D3638
Peel Strength	A. Low profile copper foil and very low profile – all copper weights >17 microns	1.14 (6.5)	0.70 (4.0)	N/mm (lb/inch)	2.4.8
	B. Standard profile copper	–	–		2.4.8.2
	1. After thermal stress	1.25 (7.0)	0.80 (4.5)		2.4.8.3
	2. At 125°C (257°F)	1.25 (7.0)	0.70 (4.0)		–
	3. After process solutions	1.14 (6.5)	0.55 (3.0)	–	–
Flexural Strength	A. Lengthwise direction	TBD	–	lb/inch ²	2.4.4
	B. Crosswise direction	TBD	–		
Tensile Strength	A. Lengthwise direction	TBD	–	lb/inch ²	–
	B. Crosswise direction	TBD	–		
Moisture Absorption		0.15	–	%	2.6.2.1
Flammability (Laminate & prepreg as laminated)		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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