

VT-4A2H

UL Approval: E214381 Version: 24/08/2023

Laminate/Prepreg

General Information

Ventec offers a series of Ceramic Filled thermally conductive Laminates and Prepregs for multilayer PCB applications requiring thermal dissipation. Laminates and prepregs provide ease of manufacture during ply-up. The prepreg provides higher thermal conductivity and flowability, which suits high power and heavy copper designs.

- > Thermal conductivity - 2.2 W/mK, 8 times that of FR4
- > Tg 130°C & Td 380°C
- > Excellent thermal and insulation performance
- > MOT 105°C
- > Lead-free assembly compatible
- > ROHS & WEEE compliant

Application

- > Power Conversion
- > PDP, LED, Regulator for TV, Monitor Drives
- > Rectifier, Power supply
- > Automotive Electronics
- > Hybrid Multilayer Constructions
- > Other designs with thermal management requirements

Storage Condition

		Prepreg		Laminate
Storage Condition	Temperature	< 23°C [73°F]	< 5°C [41°F]	Room
	Relative humidity	< 55%	/	/

The Prepreg exceeding shelf life should be retested.

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Laminate Properties

Properties		Test Method	Units	Specification	Typical Value
Thermal Properties					
Tg	DSC	IPC-TM-650 2.4.25	°C	90 minimum	130
	DMA	IPC-TM-650 2.4.24.4		130 minimum	150
Td		ASTM D3850	°C	340 minimum	380
T260		IPC-TM-650 2.4.24.1	Minute	30 minimum	>60
T288		IPC-TM-650 2.4.24.1	Minute	15 minimum	>30
Thermal Stress @ 288°C		IPC-TM-650 2.4.13.1	Second	10 minimum	>600
Z-axis CTE	Before Tg	IPC-TM-650 2.4.24	ppm/°C	60 maximum	28
	After Tg	IPC-TM-650 2.4.24	ppm/°C	300 maximum	145
	Total Expansion (50-260°C)	IPC-TM-650 2.4.24	%	3.0 maximum	2.3
MOT		UL 746B	°C	-	105
Electrical Properties					
Dk (RC 90%)	@ 1GHz	IPC-TM-650 2.5.5.9	-	7 maximum	5.1
Df (RC 90%)	@ 1GHz	IPC-TM-650 2.5.5.9	-	0.035 maximum	0.014
Volume Resistivity	After Moisture Resistance	IPC-TM-650 2.5.17.1	MΩ-cm	1.0E+4 minimum	5.0E+8
	E-24/125	IPC-TM-650 2.5.17.1	MΩ-cm	1.0E+3 minimum	3.1E+7
Surface Resistivity	After Moisture Resistance	IPC-TM-650 2.5.17.1	MΩ	1.0E+4 minimum	2.3E+7
	E-24/125	IPC-TM-650 2.5.17.1	MΩ	1.0E+3 minimum	5.2E+6
Electrical Strength		IPC-TM-650 2.5.6.2	Volt/mil (KV/mm)	762 (30) minimum	>1000 (40)
Dielectric Breakdown		IPC-TM-650 2.5.6	KV	40 minimum	60
Comparative Tracking Index (CTI)		UL 746A	Rating (Volt)	-	Grade 2 (Internal Test Grade 0)
Mechanical Properties					
Peel Strength (1oz)	As received	IPC-TM-650 2.4.8	lb/in (N/mm)	6 (1.05)	12 (2.1)
	After thermal stress	IPC-TM-650 2.4.8	lb/in (N/mm)	6 (1.05) minimum	12 (2.1)
Physical Properties					
Moisture Absorption		IPC-TM-650 2.6.2.1	%	0.5 maximum	0.12
Flammability		UL-94	Rating	-	V-0
Thermal Conductivity	Z-axis	ISO22007-2	W/mK	-	2.2
	XY-axis			-	3.4

Note: All test data provided are typical values and not intended to be specification values.

Disclaimer: The information and data contained in this technical literature is based on data and knowledge correct at the time of publishing/printing and is believed to be accurate and is offered in good faith for the benefit of the user. The user should make his own tests to verify the suitability of this product for any application before its use. All data are typical values only and subject to change without notice.

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Availability

Laminate

Item	Availability
Copper Foil	Hoz, 1oz, 2oz, 3oz
Dielectric	.003" (80um), .004" (100um), .006" (150um), .008" (200um)
Standard Size	37"*49", 41"*49", 43"*49", and panels could be cut from above sizes.

Prepreg

Glass Fabric	Press Thickness (um)
106*	80
106	125
106	150

Remark: 106* has limited ability of resin filling. Please contact Ventec Technical Support before use.

Inner Layer

Item	Recommendation
Surface Preparation	Chemical treatment preferred
D.E.S.	Standard process
Oxide	Compatible with most oxide chemicals

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Press Condition

Item	Recommendation
1. Heating rate (Rise of Rate) on Product	3-6°C min (5~10°F/min)
2. Full Pressure on Product	≥400psi in 5~10 minutes after pressing starts
3. Curing Temperature & Time	>50min at more than 170°C (338°F) on Product
4. Vacuuming should be continued until over 140°C (284°F) [Material Temperature]	
5. Cold Press condition: Keep Plate cooled by water; Pressure: 100psi; Dwell: 60 minutes	
3. Curing Temperature & Time	

Machining & Wet Processes

Item	Recommendation
Drilling	Excessive wear of carbide drill bits. Diamond coated drill
Desmearing	Alkaline permanganate or plasma
Metallization	Compatible with direct deposit or electroless copper processes
Surface Finish	Compatible with OSP, HASL, ENIG, etc. Bake prior to HASL.
Punching & Routing	Aggressive wear of machining tools