VT-901

UL Approval: E214381 Version: Rev. A3

DATASHEET & PROCESS GUIDELINE - POLYIMIDE MATERIAL HIGH TG & HIGH RELIABILITY

VT-901TC /Laminate VT-901PP/Prepreg

General Information

- High Tg (Tg 250°C) and Extreme Operating Temperatures
- High Thermal Resistance (Td 390°C) and Multiple Assembly Processing
- Improved Fracture Resistance Under Extreme Conditions
- Low Z-axis CTE for Through Hole Reliability

Application

- Chip Manufacturers
- Engine/Flight Controls
- Down Hole
- Power Supply /Backplane
- Military and Burn-in Board

Availability

VT-901TC Laminates are available in thickness from .004" to .125" and with the copper foil from 1/2oz to 3oz; Ventec can supply double sided treated copper foil and single sided treated copper foil, but double sided treated copper foil and reverse copper foil are not recommended for use on VT-901 laminates as the peel strength is reduced when compared to conventional material's.

VT-901PP pre-pregs are available in many E-Glass styles, the most common being 7628, 7629, 1506, 1500, 2113, 2313, 3313, 2116.

Storage Condition & Shelf Life

		Prepreg		Laminate
Storage Condition	Temperature	Below 23°C (73°F)	Below 5°C (41°F)	Room
	Relative Humidity	Below 55% RH	/	/
Shelf Life*		3 Months	6 Months	12 Months (airproof)

*Prepreg exceeding shelf life should be retested.

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PROPERTIES SHEET

IPC-4101C Slash Sheet(s)/40/41/42

Properties	Test Method	Units	Specification	Typical Value
Thermal Properties				
Glass Transition Temp. (Tg)				
DSC	IPC-TM-650 2.4.25	°C	–	–
TMA	IPC-TM-650 2.4.24	°C	–	250
Decomposition Temp. (Td) By TGA (@5% weight loss)	ASTM D3850	°C	–	390
Time to Delamination---T260	IPC-TM-650 2.4.24.1	Minute	–	>60
Time to Delamination---T288	IPC-TM-650 2.4.24.1	Minute	–	>60
Z-axis CTE				
Before Tg	IPC-TM-650 2.4.24	ppm/°C	–	50
After Tg	IPC-TM-650 2.4.24	ppm/°C	–	150
Total Expansion (50~260°C)	IPC-TM-650 2.4.24	%	–	1.5
Thermal Stress @ 288°C	IPC-TM-650 2.4.13.1	Second	Pass 10s	>1200
Electrical Properties				
Dielectric Constant @ 1GHz	IPC-TM-650 5.5.5.9	–	5.4 maximum	4.15
Dissipation Factor @ 1GHz	IPC-TM-650 5.5.5.9	–	0.035 minimum	0.016
Volume Resistivity				
After Moisture Resistance	IPC-TM-650 2.5.17.1	MΩ-cm	–	$5*10^8$
E-24/125	IPC-TM-650 2.5.17.1	MΩ-cm	–	$5*10^6$
Surface Resistivity				
After Moisture Resistance	IPC-TM-650 2.5.17.1	MΩ	–	$5*10^7$
E24/125	IPC-TM-650 2.5.17.1	MΩ	–	$5*10^6$
Electrical Strength	IPC-TM-650 2.5.6.2	Volt/mil (KV/mm)	762 (30) minimum	1200~1400 (54)
Dielectric Breakdown	IPC-TM-650 2.5.6	KV	40 minimum	60
Comparative Tracking Index (CTI)	ASTM D3638	Rating (Volt)	–	Grade 4 (100~175)
Arc Resistance	IPC-TM-650 2.5.1	Second	120 minimum	135
Mechanical Properties				
Peel Strength (1oz)				
As received	IPC-TM-650 2.4.8	lb/in (N/mm)	–	6~9 (1.05~1.58)
After thermal stress	IPC-TM-650 2.4.8	lb/in (N/mm)	6 (1.05) minimum	6~9 (1.05~1.58)
Flexural Strength				
Warp	IPC-TM-650 2.4.4	Kpsi (MPa)	60 (415) minimum	72 (500)
Fill	IPC-TM-650 2.4.4	Kpsi (MPa)	47 (325) minimum	55 (380)
Physical Properties				
Moisture Absorption	IPC-TM-650 2.6.2.1	%	1.0 maximum	0.3
Flammability	UL-94	Rating	HB minimum	V0

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

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PROCESS GUIDELINE

Press Condition

1. Heating rate (Rate of Rise) of material:
   Programmable Press: 1.5-3.0°C/min (3~5°F/min). Manual Press :3~6°C /min (5~10°F/min)
2. Curing Temperature & Time: >150min at more than 220°C (428°F) [Material Temperature]
3. Full Pressure: ≥450psi
4. Vacuuming should be continued until over 200°C (392°F) [Material Temperature]
5. Cold Press condition: Keep Plate @ Room Temperature by water; Pressure:100psi; Keep Time: 60minutes

Typical Drilling Parameters (φ0.3-1.0 mm) [Recommended]

1. Spindle Speed:	120-180	KRPM
2. Feed Rate:	100-200	inch / min
3. Retract Rate:	550-1000	inch / min
4. Chip Load:	0.6~1.8	mil / Rev.
5. Entry board:	t0.15mm Al	
6. Stacked number (t1.6mm):	1-3 stacks	

The use of undercut drill bits has yielded better quality on smaller holes. Check with your drill supplier for more information.

Desmearing Process

Desmear rate of **VT-901** is less than that of the conventional FR-4;

Adjustments to the desmear process is necessary for the polyimide materials;

Check with your chemical supplier for recommendations.

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