VT-901

UL Approval: E214381 Version: Rev. 9

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

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

General Information

- High Tg (Tg 250°C) and Extreme Operating Temperature
- High Thermal Resistance(Td 390°C) and Several Assembly Processing
- Improved Fracture Toughness
- 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 suggested using on VT-901 laminates because the peel strength would not be as good as conventional material's.

VT-901PP pre-pregs are available in many E-Glass styles, such as 7628, 7629, 1506, 1500, 2113, 2313, 3313, 2116.

Storage Condition & Retest Time

		Prepreg		Laminate
Storage Condition	Temperature	Below 23°C (73°F)	Below 5°C (41°F)	Room
	Relative Humidity	Below 55% RH	/	/
Shelf Time*		3 Months	4 Months	12 Months (airproof)

*The pre-preg exceeding shelf time should be retested.

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PROPERTIES SHEETS

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	200 minimum	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 (Rise of Rate) of material [Material Temperature]: 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:	120-220	inch / min
3. Retract Rate:	596-1000	inch / min
4. Chip Load:	0.6~2.0	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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