UL Approval: E214381
Version : Rev. 5

VT-901

Datasheets & Process Guideline

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

High Tg & High Reliability Material

General Information

- ***High Tg (Tg 250℃) and Extreme Operating Temperature***
- High Thermal Resistance(Td 390℃) 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 side treated copper foil and single side treated copper foil, but double side 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 & Shelf Life

		Prepreg	Laminate
Storage Condition	Temperature	Below 20℃(68℉)	Room
	Relative Humidity	Below 50% RH	/
Shelf Life		3 Months	5 Months(airproof)

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

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Properties Sheet: *IPC-4101B Specification Sheet(s)/41、42*

(Test Sample: .061"1/1)

Test Item		Test Condition (IPC-TM-650 or As Noted)	Unit	Specification (IPC-4101 B)	Typical Value	
					VT-901	Normal FR-4
Flexural Strength	Warp	2.4.4	MPa	>415	500	600
	Fill			>345	380	500
Peel Strength (1 oz)	As Received	2.4.8	Lb/in	6.0 min	6~9	10~12
	After Thermal stress				6~9	9~12
Glass Transition Temp.(Tg),DSC		2.4.25	℃	-	250	136~140
Decomposition Temp. (Td), By TGA (@5% weight loss)		ASTM D3850	℃	-	390	290~310
X.Y-axis C.T.E.		TMA	ppm/℃	-	13~14	12~15
Z-axis C.T.E.	Before Tg	TMA	ppm/℃	-	50	50
	After Tg			-	250	250
Z-axis Total Expansion	50→260℃	TMA	%	-	1.5%	3.5~4.0%
	50→288℃	TMA	%	-	2.0%	4.0~5.0%
Moisture Absorption	D-24/23	2.6.21	%	0.35 max	0.10~0.16	0.25
	After PCT	1atm.,121℃,1hour	%	-	0.20	0.28
Volume Resistance	After Moisture	2.5.17.1	MΩ-cm	$\geq 10^6$	5×10^8	5×10^8
	E-24/125			$\geq 10^3$	5×10^6	5×10^6
Surface Resistance	After Moisture	2.5.17.1	MΩ	$\geq 10^4$	5×10^7	5×10^7
	E-24/125			$\geq 10^3$	5×10^6	5×10^6
Electric Strength		2.5.6.2	KV/mm	≥30	54	54
Dielectric Breakdown		2.5.6	KV	≥40	>50	>50
Arc Resistance		2.5.1	Second	≥120	135	65
Dielectric Constant (Dk)	1.0 MHz	2.5.5.3,	-	5.4 max.	4.2~4.5	4.42
	1.0 GHz	2.5.5.9,			4.0~4.3	4.39
	2.0 GHz	2.5.5.5			3.9~4.2	4.38
Dispassion Factor(Df)	1.0 MHz	2.5.5.3,	-	0.035 max.	0.016~0.018	0.022
	1.0 GHz	2.5.5.9,			0.016~0.018	0.022
	2.0 GHz	2.5.5.5			0.018~0.020	0.021
Thermal Stress	288℃,Solder Dip	2.4.13.1	Second	60	>1200	90~120
Pressure Cook Test		Pre-treat15psi/30m 288℃,10Sec/cycle	Cycle	2 Cycles Min.	>18	6~8
Time to Delamination---T288		2.4.24.1	Minute	-	>60	3
Time to Delamination---T300		2.4.24.1	Minute	-	>30	-
Flammability		UL94	-	V1	V0	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: Programmable Press: 1.5-3.0℃/min(3~5℉/min) Manual Press:3~6℃/min(5~10℉/min)
2. Curing Temperature & Time: >200min at more than 220℃ (428℉) [Material Temperature]
3. Full Pressure: ≥450psi
4. Vacuuming should be continued until over 200℃ (392℉) [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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