

VT-481

UL Approval: E214381

Version : Rev. 1

Datasheet

Mid-Tg Material

VT-481TC/Laminate VT-481PP/Prepreg

General Information

- Phenolic Cured System
- Middle Tg (150°C) FR-4
- Excellent Thermal Reliability
- Low CTE
- UV Blocking;
- Laser Fluorescing;

Application

For Single Side\Double Side\ Multilayer PWB & Lead Free Assembly Applications;

Availability

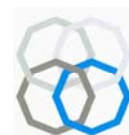
VT-481TC Laminates are available in thickness from .002" to .200" and with the copper foil from 1/4oz to 12oz; Ventec can supply either reverse treated (RT) or double side treated copper foil. On cores \leq .005", it is recommended to use the reverse treated copper due to the low profile. The peel strength for RT foil is \approx 1-2lbs/in (0.35Kg/m) less than Standard foil.

VT-481PP pre-pregs are available in many E-Glass styles, such as 7628, 7629, 1506, 1500, 2113, 2313, 3313, 2116, 1080, 1086, 1078, 106 & 1067.

Storage Condition & Shelf Life

		Prepreg		Laminate
Storage Condition	Temperature	Below 22°C(73°F)	Below 5°C(41°F)	Below 22°C(73°F)
	Relative Humidity	Below 55%RH	/	Below 55%RH
Retest Time*		3 Month	6 Month	12Month(airproof)

* The pre-preg exceeding retest time should be retested. If the Gel Time and Resin Flow is not out of the low limit of the specification(see C.O.C.), the pre-preg still can be use, but please modify the press condition with a higher rise of rate(Heat Ratio) and higher pressure.



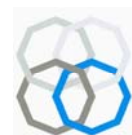
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Properties Sheet: IPC-4101B Specification Sheet(s)/21,24,97, 98, 99, 101,121

(Test Sample: .036”1/1)

TEST ITEM		Test Condition (IPC-TM-650 or As Noted)	UNIT	Specification (IPC-4101 B)	Typical Value	
					VT-481	Normal FR-4
Flexural Strength	Warp	2.4.4	Mpa	>415	560	600
	Fill			>345	450	500
Peel Strength (1 oz)	As Receive	2.4.8	1b/in	6.0 min	7.81	8.59
	After Thermal				7.72	8.03
Glass Transition Temp.(Tg),DSC		2.4.25	°C	-	150-155	136-140
Decomposition Temp. (Td) TGA		ASTM D3850	°C	325	345	290~310
Z-axis C.T.E.	Before Tg	TMA	in/in/ °C	60×10^{-6}	40×10^{-6}	50×10^{-6}
	After Tg			300×10^{-6}	190×10^{-6}	250×10^{-6}
Moisture Absorption	D-24/23	2.6.21	%	0.35 max	0.13	0.15
	After PCT	1atm.,121°C, 1hour	%	-	0.20	0.28
Volume Resistance	After Moisture	2.5.17.1	MΩ-cm	≥ 106	5×10^8	5×10^8
	E-24/125			≥ 103	5×10^6	5×10^6
Surface Resistance	After Moisture	2.5.17.1	MΩ	≥ 104	5×10^7	5×10^7
	E-24/125			≥ 103	5×10^6	5×10^6
Electric Strength		2.5.6.2	KV/mm	≥ 30	54	54
Dielectric Constant (Dk)	250 MHz	2.5.3,2.5.9,2.5.5	-	5.4 max	4.60	4.42
	750 MHz				4.57	4.39
	1.0 GHz				4.55	4.38
	2.0 GHz				4.45	4.36
Dispersion Factor (Df)	250 MHz	2.5.3,2.5.9,2.5.5	-	0.035 max	0.015	0.022
	750 MHz				0.016	0.022
	1.0 GHz				0.016	0.021
	2.0 GHz				0.017	0.020
Thermal Stress	288°C,Sold Dip	2.4.13.1	Sec.	60 Sec.	>300	90-120
Pressure Cook Test		15psi/30min/ 288°C/10Sec.	Cycle	2 cycles min	8-10	6-8
Time to Delamination---T260		2.4.24.1	Min	>30	75	18
Time to Delamination---T288		2.4.24.1	Min	>5	25	3
Flame Resistance		UL94	-	V1	V0	V0
Comparative Tracking Index (CTI)		UL-7461 ASTM D3638	Voltage	-	175~250 (Grade 3)	175~250 (Grade 3)

※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°C/min(3~5°F/min). Manual Press:3~6°C/min(5~10°F/min)

2. Curing Temperature & Time: >50min at more than 180°C (356°F)[Material Temperature].

3. Full Pressure: ≥250-300psi

4. Vacuuming should be continued until over 140°C (284°F) [Material Temperature]

Typical Drilling Parameters (φ0.3-1.0 mm)

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.

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-481 is less that of the conventional FR-4;

Minor adjustments to the desmear process may be necessary for the higher Tg materials.

Check with your chemical supplier for recommendations.