



VT-481

Datasheet

Mid-Tg Material

VT-481TC/Laminate VT-481PP/Prepreg (Same family as VT-47)

General Information

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

Application

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

Availability

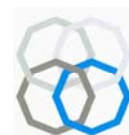
VT-481TC Laminates are available in thickness from .002" to .200" and with the copper foil from 1/4oz to 12oz; Ventec can supply either reverse treated (RT) or double side treated copper foil. For cores $\leq .005$ ", it is recommended to use the reverse treated copper due to the low profile. The peel strength for RT foil is $\approx 1-2$ lbs/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	Temperature	Below 23°C(73°F)	Below 5°C(41°F)	Room
Condition	Relative Humidity	Below 55%RH	/	/
Shelf Time*		3 Months	6 Months	12 Months(airproof)

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



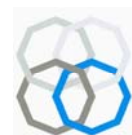
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Properties Sheet: IPC-4101B Specification Sheet(s)/21,24,97, 98, 99, 101,121

(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	136-140
Glass Transition Temp.(Tg),DMA		2.4.24.4	°C	-	165	145~155
Decomposition Temp. (Td) TGA		ASTM D3850	°C	325	345	290~310
Z-axis C.T.E.	Before Tg	TMA	ppm/°C	60	40	50
	After Tg			300	190	250
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	≥10 ⁶	5×10 ⁸	5×10 ⁸
	E-24/125			≥10 ³	5×10 ⁶	5×10 ⁶
Surface Resistance	After Moisture	2.5.17.1	MΩ	≥10 ⁴	5×10 ⁷	5×10 ⁷
	E-24/125			≥10 ³	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
Dispassion 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	Volt	-	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.