

# VT-46

## Datasheets

## Low Dk Material

VT-46TC/Laminate VT-46PP/Prepreg

### General Information

- **Low Dk & Low Transmission Loss**
- **High Tg (>180 °C) & Phenolic Cured System**
- Excellent Thermal Reliability
- UV Blocking;
- Laser Fluorescing;
- Low CTE

### Application

For Single Side\Double Side\ Multilayer PWB - High Speed Products & Lead Free Assembly Applications;

### Availability

VT-46TC 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  $\approx 1-2$ lbs/in (0.35Kg/m) less than Standard foil.

VT-46PP 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 22°C(73°F)	Below 5°C(41°F)	Below 22°C(73°F)
Condition	Relative Humidity	Below 55%RH	/	Below 55%RH
Shelf Life		3 Month	6 Month	12Month(airproof)

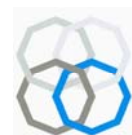


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## Properties Sheet: IPC-4101B Specification Sheet(s)/121,124,129

TEST ITEM		Test Condition (IPC-TM-650 or As Noted)	UNIT	Specification (IPC-4101 B)	Typical Value	
					VT-46	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	8.0 min	7.28	8.59
	After Thermal				6.92	8.03
Glass Transition Temp.(Tg),TMA		2.4.24C	°C	-	185~195	136~140
Decomposition Temp. (TD) TGA		ASTM D3850	°C	-	350	290~310
Z-axis C.T.E.	Before Tg	TMA	in/in/ °C	60x10 <sup>-6</sup>	43x10 <sup>-6</sup>	50x10 <sup>-6</sup>
	After Tg			300x10 <sup>-6</sup>	220x10 <sup>-6</sup>	250x10 <sup>-6</sup>
Moisture Absorption	D-24/23	2.6.21	%	0.35 max	0.12	0.28
	After PCT	1atm.,121°C, 1hour	%	-	0.20	0.28
Volume Resistance	After Moisture	2.5.17.1	MΩ-cm	≥106	5×10 <sup>8</sup>	5×10 <sup>8</sup>
	E-24/125			≥103	5×10 <sup>6</sup>	5×10 <sup>6</sup>
Surface Resistance	After Moisture	2.5.17.1	MΩ	≥104	5×10 <sup>7</sup>	5×10 <sup>7</sup>
	E-24/125			≥103	5×10 <sup>6</sup>	5×10 <sup>6</sup>
Electric Strength		2.5.6.2	KV/mm	≥30	54	54
Dielectric Constant	250 MHz	2.5.3,2.5.9,2.5.5	-	5.4 max	3.96	4.39
Dispersion Factor	250 MHz	2.5.3,2.5.9,2.5.5	-	0.035 max	0.013	0.019
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	14~18	6-8
Time to Delamination---T260		2.4.24.1	Min	>30	>60	18
Time to Delamination---T288		2.4.24.1	Min	>5	>30	-
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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## Properties Sheet: Dielectric Characteristics

Test Item	Test Condition	Sample Construction	Dielectric Constant	Dispersion Factor
250MHz	C24/23/50	2116 RC53% × 1	3.82	0.011
750MHz			3.78	0.010
1.0 GHz			3.66	0.009
2.0 GHz			3.56	0.008
5.0 GHz			3.50	0.007
10.0 GHz			3.40	0.005
250MHz	C24/23/50	1080 RC63% × 1	3.72	0.010
750MHz			3.68	0.009
1.0 GHz			3.62	0.009
2.0 GHz			3.57	0.008
250MHz	C24/23/50	7628 RC43% × 1	3.92	0.012
750MHz			3.87	0.011
1.0 GHz			3.85	0.010
2.0 GHz			3.76	0.009
5.0 GHz			3.70	0.008
10.0 GHz			3.60	0.006



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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: >60min at more than 185°C (365°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.

### Desmearing Process

- Desmear rate of **VT-46** 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.