

# Aluminum Base Laminate

## Datasheets

### General Information

Ventec offers 4 types of Aluminum base laminate and prepreg, which have below features,

- VT-44A / VT-44A PP: Thermal conductivity -- 1.0W/mK, Ceramic Filled
- VT-4A1 / VT-4A1 PP: Thermal conductivity -- 1.6W/mK, Ceramic Filled
- VT-4A2 / VT-4A2 PP: Thermal conductivity -- 2.2W/mK, Ceramic Filled
- VT-4A3 : Thermal conductivity -- 3.0W/mK, Ceramic Filled
- Excellent Electrical and Mechanical Characteristics
- Flame Retardant(UL94 V0)

### Application

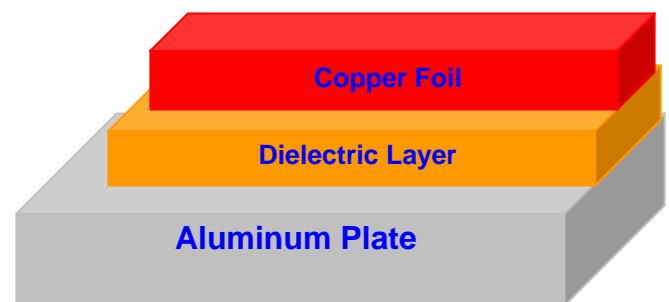
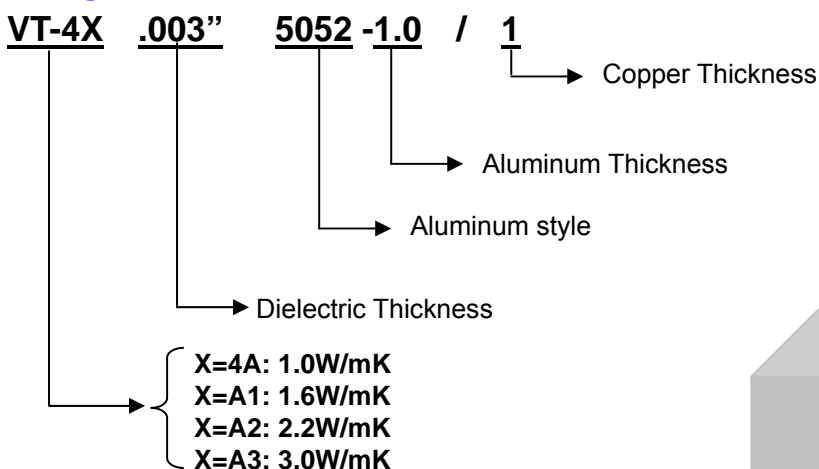
- Power Conversion
- PDP, LED, Regulator for TV
- Monitor Drives
- Rectifier, Power supply

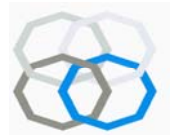
### Storage Condition & Shelf Life

		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	6 Months	12 Months(airproof)

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

### Designation





# Aluminum Base Laminate

## Availability

### ➤ Laminate

Standard Size*	Material	Material Thickness**						
18"*24"	Copper	Hoz	1oz	2oz	3oz	4oz	6oz	10oz
20"*24"	Dielectric	.003"(75um), .004"(100um), .005"(125um), .006"(150um)						
21"*24"	Aluminum***	0.5mm	0.8mm	1.0mm	1.5mm	2.0mm	3.0mm	

\* Other smaller size could be available.

\*\* Other material thickness is available.

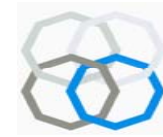
\*\*\* Couples of Aluminum (Aluminum Alloy) is available, see section "Aluminum and Aluminum Alloy Information".

### ➤ Aluminum Protective Film Selection Guide

Ventec Offers PET film as a standard aluminum protective film which can withstand up to 170°C operation temperature. Ventec also provide PI film as a special protective film which can withstand up to 270°C operation temperature.

### ➤ Prepreg

Material	Pressed Thickness (um)	Glass	Application
VT-44A PP	75	1080	Single Layer
	100	106	Circuit Clearance Filling & Hole Filling
		1080	Single Layer
	125	1080	-
VT-4A1 PP	75	1080	Single Layer
	100	106	Circuit Clearance Filling & Hole Filling
		1080	Single Layer
	125	1080	-
VT-4A2 PP	75	1080	Single Layer
	100	106	Circuit Clearance Filling & Hole Filling
		1080	Single Layer
	125	1080	-



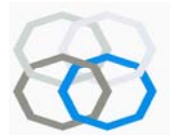
# Aluminum Base Laminate

➤ **Properties Sheets**

Laminate Properties		Test Condition (IPC TM650)	Unit	VT-44A				VT-4A1				VT-4A2				VT-4A3	
				75um*	100um*	125um*	150um*	75um*	100um*	125um*	150um*	75um*	100um*	125um*	150um*	75um*	100um*
<b>Thermal Conductivity</b>		ISO22007-2	W/m*K	1.0				1.6				2.2				3.0	
<b>Thermal Impedance</b>		ISO22007-2	°C*in <sup>2</sup> /W	0.118	0.158	0.197	0.237	0.074	0.099	0.123	0.148	0.054	0.072	0.089	0.107	0.040	0.053
<b>Tg</b>	DSC	2.4.25	°C	130				130				130				130	
<b>Td</b>	TGA	ASTM D3850	°C	380				380				380				380	
<b>Thermal Stress</b>		288°C, Solder Dip	minute	≥5				≥5				≥5				≥2	
<b>Hi Pot Withstand</b>		VDC	Volts	4500	5000	6000	6000	4500	5000	6000	6000	4000	4500	5500	6000	3500	4000
<b>Dielectric Strength</b>		VAC	V/mil	1500				1500				1500				1000	
<b>Dk (1MHz)</b>		C-24 / 23 / 50	-	5.0				5.0				5.1				4.9	
<b>Df (1MHz)</b>		C-24 / 23 / 50	-	0.016				0.015				0.014				0.012	
<b>Volume Resistance</b>		After Moisture	MΩ-cm	6×10 <sup>8</sup>				4.5×10 <sup>8</sup>				5.1×10 <sup>8</sup>				5.0×10 <sup>8</sup>	
		E-24/125		4×10 <sup>7</sup>				2.3×10 <sup>7</sup>				3.1×10 <sup>7</sup>				3.0×10 <sup>7</sup>	
<b>Surface Resistance</b>		After Moisture	MΩ	3×10 <sup>7</sup>				2.2×10 <sup>7</sup>				2.3×10 <sup>7</sup>				2.0×10 <sup>7</sup>	
		E-24/125		6×10 <sup>6</sup>				5.1×10 <sup>6</sup>				5.2×10 <sup>6</sup>				5.0×10 <sup>6</sup>	
<b>Peel strength (1oz Cu)</b>		As Received	Lb / in	8.0				8.5				7.5				6.0	
<b>Flammability</b>		As Received	-	V0				V0				V0				V0	
<b>CTI</b>		As Received	Volts	600				600				600				600	

※ All test data provided are typical values and not intended to be specification values.

※ “ \* ” ---- Dielectric thickness.



# Aluminum Base Laminate

## Aluminum and Aluminum Alloy Information

### ➤ Major Chemical Composition

Alloy Code	Major Chemical Composition	Alloy Code	Major Chemical Composition
1100	Al, Si, Fe, Cu, Zn, Mn	5052	Al, Mg, Fe, Si, Cr, Cu, Zn
3003	Al, Mn, Si, Fe, Cu, Zn	6061	Al, Mg, Si, Fe, Cr, Cu, Zn, Ti, Mn

### ➤ Calorific & Electrical Performance

Alloy	Melting Point Range(°C)	CTE(ppm/°C)		Cp(J/g-°C)	Thermal Conductivity (W/m-K)	Resistivity (Ω-cm)
		20~100°C	20~300°C			
1100	643~657.2	23.6	25.5	0.904	220	3.00X10 <sup>-6</sup>
3003	643~654	23.2	25.1	0.893	163	4.16X10 <sup>-6</sup>
5052	607.2~649	23.8	25.7	0.880	138	4.99X10 <sup>-6</sup>
6061	582~651.7	23.6	25.2	0.896	167	3.99X10 <sup>-6</sup>

### ➤ Mechanical Performance

Alloy	Hardness (HB)	Ultimate Tensile Strength (MPa)	Tensile Yield Strength (MPa)	Elongation at Break 1.6mm (%)	Modulus of Elasticity (GPa)	Poisson Ratio	Fatigue Strength (MPa)*	Shear Modulus (GPa)	Shear Strength (MPa)
1100H24	32	124	117	9	68.9	0.330	48.3	26.0	75.8
3003H24	40	152	145	8	68.9	0.330	62.1	25.0	96.5
5052H32	60	228	193	12	70.3	0.330	117	25.9	138
6061T6	95	310	276	12	68.9	0.330	96.5	26.0	207

\*Number of cycles: 5.0E+8