Aluminum Base Laminate

UL Approval: E214381 Version: Rev. 10

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

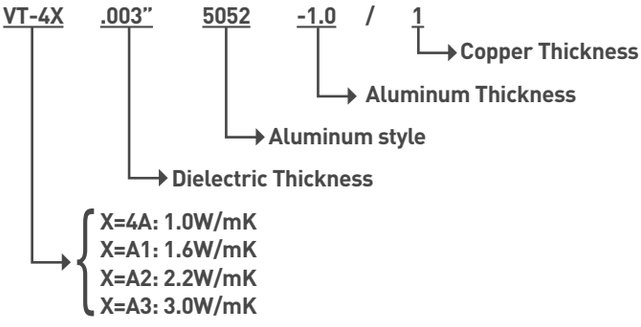
- **Power Conversion**
- **PDP, LED, Regulator for TV**
- **Monitor Drives**
- **Rectifier, Power supply**

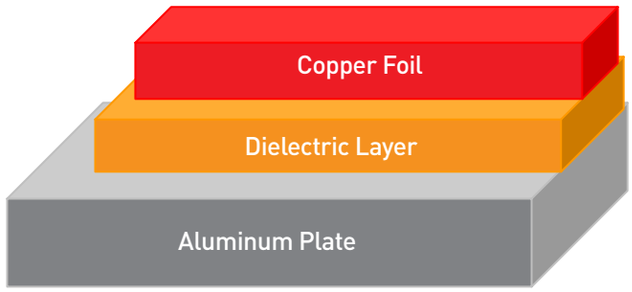
Storage Condition & Shelf Life

		Prepreg		Laminate
Storage Condition	Temperature	Below 23ºC (73ºF)	Below 5ºC (41ºF)	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





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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.• Before filming, cleaning of panel surface is necessary.

*** 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-4A1 PP	75	1080	Single Layer
	100	106	Circuit Clearance Filling & Hole Filling
		1080	Single Layer
	125	1080	-

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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*
Thermal Conductivity		ISO22007-2	W/m*K	1.0				1.6				2.2				3.0	
Thermal Impedance		ISO22007-2	°C*in2/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
Tg	DSC	2.4.25	°C	130				170				130				130	
Td	TGA	ASTM D3850	°C	380				380				380				380	
Thermal Stress	288°C, Solder Dip	2.4.13.1	minute	≥5				≥5				≥5				≥2	
Hi Pot Withstand	VDC	2.5.7	Volts	4500	5000	6000	6000	4500	5000	6000	6000	4000	4500	5500	6000	3500	4000
Dielectric Strength	VAC	2.5.6.2	V/mil	1500				1500				1500				1000	
Dk (1MHz)	C-24 / 23 / 50	2.5.5.3	_	5.0				5.0				5.1				4.9	
Df (1MHz)	C-24 / 23 / 50	2.5.5.3	_	0.016				0.015				0.014				0.012	
Volume Resistance	After Moisture	2.5.17.1	MΩ-cm	6×108				4.5×108				5.1×108				5.0×108	
	E-24/125			4×107				2.3×107				3.1×107				3.0×107	
Surface Resistance	After Moisture	2.5.17.1	MΩ	3×107				2.2×107				2.3×107				2.0×107	
	E-24/125			6×106				5.1×106				5.2×106				5.0×106	
Peel strength (1oz Cu)	As Received	2.4.8	Lb / in	8.0				8.5				7.5				6.0	
Flammability	As Received	UL 94	–	V0				V0				V0				V0	
CTI	As Received	ASTM D3638	Volts	600				600				600				600	

- All test data provided are typical values and not intended to be specification values.
- " * " ---- Dielectric thickness.

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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 Code	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	$3.00X10^{-6}$
3003	643~654	23.2	25.1	0.893	163	$4.16X10^{-6}$
5052	607.2~649	23.8	25.7	0.880	138	$4.99X10^{-6}$
6061	582~651.7	23.6	25.2	0.896	167	$3.99X10^{-6}$

Mechanical Performance

Alloy Code	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	95.5
5052H34	68	262	214	10	70.3	0.330	124	25.9	145
6061T6	95	310	276	12	68.9	0.330	96.5	26.0	207

* Number of cycles: 5.0E+8.

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