Aluminum Base Laminate

UL Approval: E214381
Version : Rev. 7

Datasheets

General Information

Ventec offers 2 types of Aluminum base laminate and prepreg, which have below features,

- VT-4A1 / VT-4A1PP: Thermal conductivity -- 1.6W/mK, Ceramic Filled
  VT-4A2 / VT-4A2PP: Thermal conductivity -- 2.2W/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

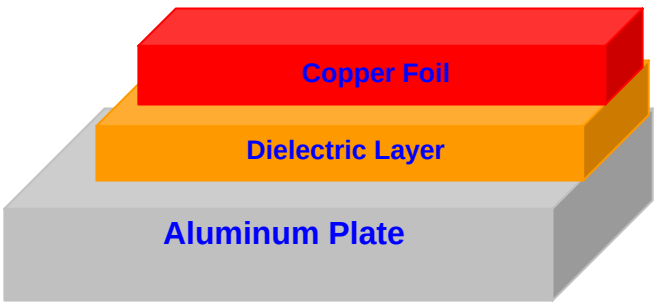
		Prepreg		Laminate
Storage Condition	Temperature	Below 23℃(73℉)	Below 5℃(41℉)	Room
	Relative Humidity	Below 55%RH	/	/
Shelf Time*		3 Months	6 Months	12 Months(airproof)

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

Designation

VT-4X .003" 5052 -1.0 / 1

- 1 → Copper Thickness
- -1.0 → Aluminum Thickness
- 5052 → Aluminum style
- .003" → Dielectric Thickness
- VT-4X → X=A1: 1.6W/mK; X=A2: 2.2W/mK



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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".

- ***Prepreg***

Material	Pressed Thickness (um)	Glass	Application
VT-4A1 PP	75	106	Circuit Clearance Filling & Hole Filling
		1080	Single Layer
	100	106	Circuit Clearance Filling & Hole Filling
		1080	Single Layer
	125	1080	-
	150	1080	-
VT-4A2 PP	75	106	Circuit Clearance Filling & Hole Filling
		1080	Single Layer
	100	106	Circuit Clearance Filling & Hole Filling
		1080	Single Layer
	125	1080	-
	150	1080	-

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➢ ***Properties Sheets***

Laminate Properties		Test Condition (IPC TM650)	Unit	VT-4A1				VT-4A2			
				75um*	100um*	125um*	150um*	75um*	100um*	125um*	150um*
Thermal Conductivity		ISO22007-2	W/m*K	1.6				2.2			
Thermal Impedance		ISO22007-2	℃*in^2/W	0.074	0.099	0.123	0.148	0.054	0.072	0.089	0.107
Tg	DSC	2.4.25	℃	170				130			
Thermal Stress	288℃,Solder Dip	2.4.13.1	minute	≥2				≥2			
Hi Pot Withstand	VDC	2.5.7	VDC	4500	5000	6000	6000	4000	4500	5500	6000
	VAC	2.5.6.2	VAC	4000	4500	5000	5000	3500	4000	4500	5000
Dielectric Strength	VAC	2.5.6.2	V/mil	1500				1500			
Dk (1MHz)	C-24 / 23 / 50	2.5.5.3	-	5.0				5.1			
Df (1MHz)	C-24 / 23 / 50	2.5.5.3	-	0.015				0.014			
Volume Resistance	After Moisture	2.5.17.1	MΩ-cm	4.5×10^8				5.1×10^8			
	E-24/125			2.3×10^7				3.1×10^7			
Surface Resistance	After Moisture	2.5.17.1	MΩ	2.2×10^7				2.3×10^7			
	E-24/125			5.1×10^6				5.2×10^6			
Peel strength (1oz Cu)	As Received	2.4.8	Lb / in	8				7.5			
	After Heated			7				7.0			
Flammability	As Received	UL 94	-	V0				V0			
CTI	As Received	ASTM D3638	Volts	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	Melting Point Range(℃)	CTE(ppm/℃)		Cp(J/g-℃)	Thermal Conductivity (W/m-K)	Resistivity (Ω-cm)
		20~100℃	20~300℃			
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	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
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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