

Aluminum Base Laminate

Datasheets & Process Guideline

General Information

Ventec offers 3 types of Aluminum base laminate and prepreg, which have below features,

- VT-44A / VT-441 PP: Thermal conductivity-- 0.4W/mK, Halogen-Free Type
- VT-4A1 / VT-4A1PP: Thermal conductivity -- above 1.0W/mK, Ceramic Filled
- VT-4A2 / VT-4A2PP: Thermal conductivity -- above 2.0W/mK, Ceramic Filled
- Excellent Electrical and Mechanical Characteristics
- Flame Retardant(UL94 V0)

Application

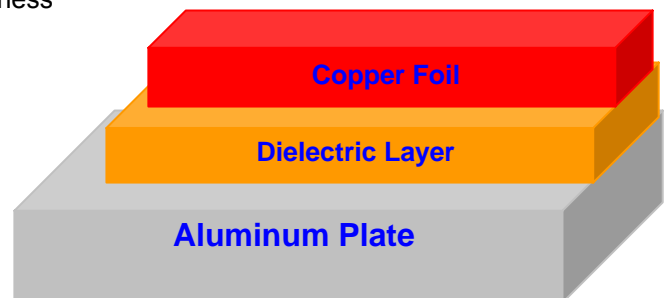
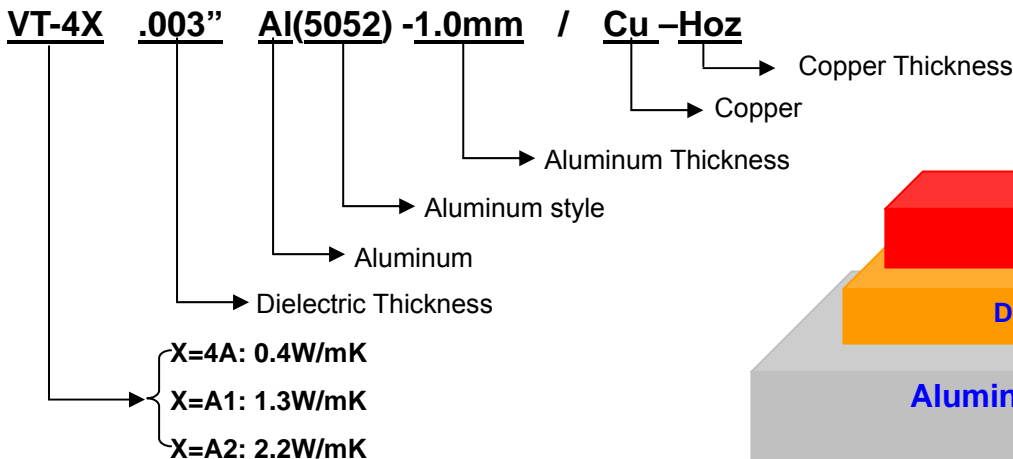
- Power Conversion
- PDP, LED, Regulator for TV
- Monitor Drives
- Rectifier, Power supply

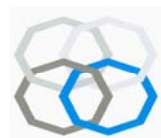
Storage Condition & Shelf Life

		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





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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	1.0mm	1.5mm	2.0mm	3.0mm		

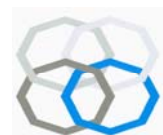
* Other smaller size could be available.

** Other material thickness is available.

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

➤ Prepreg

Material	Pressed Thickness (um)
VT-4A1 PP	75
	100
	125
	150
VT-4A2 PP	75
	100
	125
	150



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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

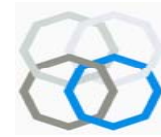
➤ Calorific & Electrical Performance

Alloy	Melting Point Range(°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	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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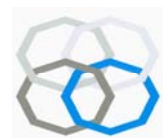
Datasheets

➤ Properties Sheets

Laminate Properties		Test Condition (IPC TM650)	Unit	VT-44A				VT-4A1				VT-4A2			
				75um*	100um*	125um*	150um*	75um*	100um*	125um*	150um*	75um*	100um*	125um*	150um*
Thermal Conductivity		ASTM D5470	W/m*K	0.3~0.5				1.1~1.5				2.0~2.5			
Thermal Impedance		ASTM D5470	°C-in ² / W	0.291	0.388	0.485	0.582	0.090	0.120	0.150	0.179	0.053	0.071	0.088	0.106
Tg	DSC	2.4.25	°C	150(TMA)				170				130			
Thermal Stress		288°C, Solder Dip	min.	≥3				≥3				≥2			
Hi Pot Withstand		VDC	V	1500	2000	2500	3500	1500	2000	2500	3500	1000	1500	2000	3000
Dielectric Strength		VAC	V/mil	1000				1000				800			
Dk (1MHz)		C-24 / 23 / 50	-	4.8				5.0				5.1			
Df (1MHz)		C-24 / 23 / 50	-	0.012				0.015				0.008			
Volume Resistance		After Moisture	MΩ-cm	7×10 ⁸				5×10 ⁷				5×10 ⁸			
		E-24/125		5×10 ⁷				3×10 ⁵				3×10 ⁷			
Surface Resistance		After Moisture	MΩ	6×10 ⁷				2×10 ⁵				2×10 ⁷			
		E-24/125		4×10 ⁶				5×10 ⁴				5×10 ⁶			
Peel strength (1oz Cu)		As Received	Lb / in	8				8				5.5			
		After Heated		2.4.8				7				5.0			
Flammability		As Received	-	V0				V0				V0			

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

※ “ * ” ---- Dielectric thickness



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Process Guide and Notice

➤ **Press Condition**

1. Heating rate(Rise of Rate) of material [Material Temperature]:

Programmable Press: 2.0-4.0°C/min (3.6~7.2°F/min). Manual Press :4~8°C /min (7.2~14.4°F/min)

2. Curing Temperature & Time: >60min at more than 180°C (356°F)[Material Temperature] [VT-4A2 maximum material temperature should be less than 210°C]

3. Full Pressure: ≥400psi

4. Vacuuming should be continued until over 140°C (284°F) [Material Temperature]

5. Cold Press condition: Keep Plate @ Room Temperature by water; Pressure:100psi; Dwell Time:60minutes

➤ **Mechanical Process Notice**

The mechanical process should refer to the aluminum alloy mechanical performance.