GA-150-LL

Middle Tg150 Phenolic Curing Laminate and Prepreg

GA-150-LL is an advanced medium Tg (150℃/DSC) multifunctional epoxy laminate . Excellent heat resistance, CAF resistance and Low CTE performance, suitable for through-hole reliability, Lead Free process, high multilayer PCB process , and HDI process.

Laminate:GA-150-LL
Prepreg: GA-150B-LL

Key Features

- ***Tg: 153℃(DSC)***
  This material with high performance, multi-function resin, Tg values can reach above 150 ℃(DSC).
- ***Z-CTE(50-260):3.2%***
  Its remarkable low expansion coefficient, is more suitable for making high multilayer PCB, ensure the reliability of high temperature welding and assembly process.
- ***Td: 350℃***
  Excellent resistance to aging temperature, keep the material performance in high thermal shock or high temperature environment impact.
- ***T288: 30min***
  Suitable for Lead-free process. Subjected to thermal shock for many times, still can maintain good material performance. Excellent dimensional stability and low expansion coefficient, apply to HDI process.

Applications

- *Multilayer PCB*
- *HDI*
- *Servers*
- *LCD Panels*
- *Telecommunications*
- *Memory Module*

Industrial Approvals

- *IPC-4101D/98/99/101*
- *UL File Number：e186152*
- *UL Type Designation：FR-4.0*
- *Flammability Rating：94V-0*
- *Maximum Operating Temperature： 130℃*

Normal Size & Thickness

Thickness Inch (mm)	Size Inch mm	Thickness Tolerance
0.002 (0.05) To 0.125 (3.2)	49×37 1244×0940 49×41 1244×1042 49×43 1244×1093	IPC-4101 Class C/M

Characteristic GA-150-LL		Unit	Test Method IPC-TM-650 （or as noted）	Typical Values	SPEC.
Volume Resistivity		MΩ-cm	2.5.17.1	$7X10^9$	≧10^6
Surface Resistivity		MΩ	2.5.17.1	$2X10^5$	≧10^4
Permittivity (RC 50%)	At 1MHz	-	2.5.5.9	4.92	≦5.40
	At 1GHz		2.5.5.9/2.5.5.13	4.30/4.53	/
Loss Tangent (RC 50%)	At 1MHz	-	2.5.5.9	0.0128	≦0.035
	At 1GHz		2.5.5.9/2.5.5.13	0.0160/0.0180	/
Arc Resistance		Sec	2.5.1	120	≧60
Dielectric Breakdown		KV	2.5.6	40	≧40
Dielectric Strength(thickness<0.5mm)		KV/mm	2.5.6.2	40	≧30
CTI		PLC(V)	ASTM D3638	3(175-249)	/
Thermal Stress Test		-	2.4.13.1	Pass	Pass
Td (5% Weight loss)		℃	2.4.24.6	350	≧325
Glass Transition Temperature	DMA	℃	2.4.24.2	165	/
	DSC	℃	2.4.25	153	≧150
	TMA	℃	2.4.24	145	/
Thermal Conductivity		W/mK	ASTM D5470	0.40	/
Most Operation Temperature(MOT)		℃	UL Cert	130	/
T288		Min	2.4.24.1	30	≧5
X/Y-Axis CTE	Before Tg	PPM/℃	2.4.24	14/15	/
Z-Axis CTE	Before Tg	PPM/℃	2.4.24	45	≦60
	After Tg	PPM/℃		250	≦300
Z-Axis CTE (50~260℃)		%	2.4.24	3.2	≦3.5
Peel Strength (HTE 1OZ)		Lb/in(N/mm)	2.4.8	9(1.58)	≧6(1.05)
Flexural Strength	LW	N/mm^2	2.4.4	500	≧415
	CW	N/mm^2		440	≧345
E-modulus	LW/CW	Gpa	---	22/22	/
Flexural Modulus	LW/CW	Gpa	---	24/22	/
Moisture Absorption		%	2.6.2.1	0.095	≦0.5
Flammability		-	UL94	V-0	V-0

Note: 1.Test sample is 62mil 1/1(without special remark).

2. The data above is only for reference, and the actual data will have deviation, according to varieties of test equipment and method.