



GA-LD-15

Halogen-free Tg150 Dicy-free Curing Low Dk/Df Laminate and Prepreg

GA-LD-15 is an advanced Halogen-free Tg 150°C (DSC), Low Dk/Df multifunctional epoxy laminate. Antimony-free, no toxic evolution during waste burning. Excellent heat resistance, CAF resistance and Low CTE, suitable for through-hole reliability, Lead Free process, and is more high multilayer PCB process and HDI process. And what's more, superior electrical performance, suitable for high frequency high-speed telecommunications.

Key Features

I Tg: 155°C(DSC)

This material with high performance, multi-function resin, material Tg values can reach above 150 °C(DSC).

I Dk: 3.40 & Df: 0.0100(RC70)

Within the scope of the 1 MHz - 20 GHZ, material has superior electrical properties, is conducive to the high frequency high-speed transmission, and high density wiring design. And the lower signal loss can ensure signal integrity.

I Z-CTE(50-260):2.8%

Its remarkable low expansion coefficient, is more suitable for making high multilayer PCB, ensure the reliability of high temperature welding and assembly process.

I Td: 370°C

Excellent resistance to aging temperature, keep the material performance in high thermal shock or high temperature environment impact.

Laminate:GA-LD-15

Prepreg: GA-LDB-15

Applications

- Ø Multilayer PCB
- Ø For HDI
- Ø Servers
- Ø Storage Networks
- Ø Routing/Switching
- Ø RF/Wireless Communication
- Ø Line cards

Industrial Approvals

- Ø IPC-4101E/127/128
- Ø UL File Number : e186152
- Ø UL Type Designation : FR-4.1
- Ø Flammability Rating : 94V-0
Maximum Operating
Temperature : 130°C

Normal Size & Thickness

Thickness Inch (mm)	Size Inch mm	Thickness Tolerance
0.0012 (0.03)	49×37 1244×0940	IPC-4101 Class C/M
To	49×41 1244×1042	
0.125 (3.2)	49×43 1244×1093	

Characteristic GA-LD-15		Unit	Test Method	Typical Values	SPEC.
			IPC-TM-650 (or as noted)		
Volume Resistivity		MΩ-cm	2.5.17.1	2X10 ⁹	≥ 10 ⁶
Surface Resistivity		MΩ	2.5.17.1	1X10 ⁸	≥ 10 ⁴
Permittivity (RC 70%)	At 1GHz	-	2.5.5.9/2.5.5.13	3.40/3.55	/
	At 5GHz		2.5.5.13	3.51	/
	At 10GHz		2.5.5.13	3.48	/
	At 15GHz		2.5.5.13	3.48	/
Loss Tangent (RC 70%)	At 1GHz	-	2.5.5.9/2.5.5.13	0.0100/0.0120	/
	At 5GHz		2.5.5.13	0.0140	/
	At 10GHz		2.5.5.13	0.0150	/
	At 15GHz		2.5.5.13	0.0155	/
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)		°C	2.4.24.6	370	≥ 325
Glass Transition Temperature	DMA	°C	2.4.24.2	165	/
	DSC	°C	2.4.25	155	≥ 150
	TMA	°C	2.4.24	150	/
Thermal Conductivity		W/mK	ASTM D5470	0.40	/
T288		Min	2.4.24.1	≥ 60	≥ 5
X/Y-Axis CTE	Before Tg	PPM/°C	2.4.24	15/13	/
Z-Axis CTE	Before Tg	PPM/°C	2.4.24	40	≤ 60
	After Tg	PPM/°C		225	≤ 300
Z-Axis CTE (50~260°C)		%	2.4.24	2.8	≤ 3.5
Peel Strength (RTF 1OZ)		Lb/in(N/mm)	2.4.8	5.5(0.96)	≥ 4(0.7)
Flexural Strength	LW	N/mm ²	2.4.4	500	≥ 415
	CW	N/mm ²		400	≥ 345
Moisture Absorption		%	2.6.2.1	0.08	≤ 0.8
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.