GA-LD-15

GA-LD-15 is an advanced Halogen-free Tg 150℃(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 mobile phone board and mobile communication.

Laminate:GA-LD-15
Prepreg: GA-LDB-15

Key Features

- **Tg: 153℃(DSC)**
  This material with high performance, multi-function resin, material Tg values can reach above 150 ℃ (DSC).
- **Dk: 4.30 & Df: 0.0100(RC50)**
  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.
- **Z-CTE(50-260):2.4%**
  Its remarkable low expansion coefficient, is more suitable for making high multilayer PCB, ensure the reliability of high temperature welding and assembly process.
- **Td: 370℃**
  Excellent resistance to aging temperature, keep the material performance in high thermal shock or high temperature environment impact.

Applications

- *Multilayer PCB*
- *High order HDI*
- *Servers*
- *Storage*
- *Router/Switch*
- *RF/Wireless Communication*
- *Line cards*
- *Mobile phone board*

Industrial Approvals

- *IPC-4101E/127/128*
- *UL File Number：e186152*
- *UL Type Designation：FR-4.1 FR-15.1*
- *Flammability Rating：94V-0*
- *Maximum Operating Temperature：130°C*

Normal Size & Thickness

Thickness Inch (mm)	Size Inch	Size mm	Thickness Tolerance
0.002 (0.05) To 0.125 (3.2)	49×37 49×41 49×43	1245×0940 1245×1042 1245×1093	IPC-4101 Class C/M

Characteristic GA-LD-15		Unit	Test Method IPC-TM-650 (or as noted)	Typical Values	SPEC.
Volume Resistivity		MΩ-cm	2.5.17.1	$2X10^9$	$\geqq 10^6$
Surface Resistivity		MΩ	2.5.17.1	$1X10^8$	$\geqq 10^4$
Permittivity (RC50%)	At 1GHz	-	2.5.5.15	4.30	/
	At 5GHz		2.5.5.15	4.10	/
	At 10GHz		2.5.5.15	4.00	/
	At 15GHz		2.5.5.15	3.90	/
Loss Tangent (RC50%)	At 1GHz	-	2.5.5.15	0.0100	/
	At 5GHz		2.5.5.15	0.0115	/
	At 10GHz		2.5.5.15	0.0120	/
	At 15GHz		2.5.5.15	0.0125	/
Arc Resistance		Sec	2.5.1	120	≧60
Dielectric Breakdown		KV	2.5.6	40	≧40
Electric Strength(thickness<0.5mm)		KV/mm	2.5.6.2	40	≧30
CTI		PLC(V)	ASTM D3638	2(250-399)	/
Thermal Stress Test		-	2.4.13.1	Pass	Pass
Td (5% Weight loss)		℃	2.4.24.6	370	≧325
Glass Transition Temperature	DMA	℃	2.4.24.2	165	/
	DSC	℃	2.4.25	153	≧150
Thermal Conductivity		W/mK	ASTM D5470	0.40	/
Most Operation Temperature(MOT)		℃	UL Cert	130	/
T288		Min	2.4.24.1	≧60	≧5
X/Y-Axis CTE	Before Tg	PPM/℃	2.4.24	15/13	/
Z-Axis CTE	Before Tg	PPM/℃	2.4.24	40	≦60
	After Tg	PPM/℃		225	≦300
Z-Axis CTE (50~260℃)		%	2.4.24	2.4	≦3.5
Peel Strength (RTF 1OZ)		Lb/in(N/mm)	2.4.8	4.5(0.8)	≧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.