

GA-LD-15

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 mobile phone board and mobile communication.

Key Features

- **Tg: 153°C(DSC)**
This material with high performance, multi-function resin, material Tg values can reach above 150 °C (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°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

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

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	≥ 10 ⁶
Surface Resistivity		MΩ	2.5.17.1	1X10 ⁸	≥ 10 ⁴
Permittivity (RC50%)	At 1GHz	-	2.5.5.13	4.30	/
	At 5GHz		2.5.5.13	4.10	/
	At 10GHz		2.5.5.13	4.00	/
	At 15GHz		2.5.5.13	3.90	/
Loss Tangent (RC50%)	At 1GHz	-	2.5.5.13	0.0100	/
	At 5GHz		2.5.5.13	0.0115	/
	At 10GHz		2.5.5.13	0.0120	/
	At 15GHz		2.5.5.13	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)		°C	2.4.24.6	370	≥ 325
Glass Transition Temperature	DMA	°C	2.4.24.2	165	/
	DSC	°C	2.4.25	153	≥ 150
Thermal Conductivity		W/mK	ASTM D5470	0.40	/
Most Operation Temperature(MOT)		°C	UL Cert	130	/
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	2.4	≤ 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.