Transparent Printed Circuit Board

Translucent base material HT820 · multilayer up to 6 layers · material performance specification

Leiton manufactures a transparent printed circuit board based on a translucent laminate instead of the usual opaque FR4. The material transmits light and leaves the conductor pattern visible. It is built as a genuine multilayer, currently with up to six layers feasible. This enables see-through circuits for lighting, display and signage carriers, and decorative or design assemblies.

≥ 55 %	1 – 6	≥ 105 °C	low-halogen
Light transmittance	layers, multilayer	T_g (DSC)	Cl+Br < 1500 ppm

Material performance specification

Property	Unit	Condition	Specification		Test method
			< 0.5 mm	≥ 0.5 mm	
Density	g/cm³	As received	1.5 ± 0.15		—
Light transmittance	%	As received	≥ 55		GB/T 2410-80 (2008)
Haze	%	As received	≤ 92		GB/T 2410-80 (2008)
Glass transition temp. T_g (DSC)	°C	As received	≥ 105		IPC-TM-650 2.4.25
ΔT_g	°C	—	≤ 5		IPC-TM-650 2.4.25
Decomposition temp. T_d	°C	—	≥ 305		IPC-TM-650 2.4.24.6
Solder heat resistance	—	As received	288 °C / 10 s / 3 cycles; no measling, blistering, delamination, wrinkling or cracking		—
Peel strength (1 oz HTE copper foil)	N/mm	As received	≥ 0.8		IPC-TM-650 2.4.13.1
Flexural strength — lengthwise	N/mm²	As received	—	≥ 380	IPC-TM-650 2.4.4
Flexural strength — crosswise	N/mm²	As received	—	≥ 330	IPC-TM-650 2.4.4
Z-axis CTE — α1 (below T_g)	ppm/°C	—	—	≤ 80	IPC-TM-650 2.4.24
Z-axis CTE — α2 (above T_g)	ppm/°C	—	—	≤ 400	IPC-TM-650 2.4.24
Z-axis expansion 50–260 °C	%	—	—	≤ 6.0	IPC-TM-650 2.4.24
Flammability	—	—	UL94 HB		UL94
Volume resistivity	MΩ·cm	C-96/35/90	≥ 10^6		IPC-TM-650 2.5.17.1
Surface resistivity	MΩ	C-96/35/90	≥ 10^4		IPC-TM-650 2.5.17.1
Dielectric constant (D_k)	—	—	3.93		—
Dissipation factor (D_f)	—	—	0.0157		—
Water absorption	%	As received	≤ 0.80	≤ 0.50	IPC-TM-650 2.6.2.1
Halogen content — Chlorine (Cl)	ppm	As received	< 900		ANSI/ASTM D4755
Halogen content — Bromine (Br)	ppm	As received	< 900		ANSI/ASTM D4755
Halogen content — Cl + Br	ppm	As received	< 1500		ANSI/ASTM D4755

Construction & processing

Standard imaging, drilling and surface-finish processes; finishes such as ENIG on request.

Translucent, not optically clear. Light transmittance ≥ 55 % with diffuse scattering gives even, area-wide light distribution rather than a clear see-through view.

Typical applications

- LED and lighting assemblies, backlit panels
- Transparent signage and display carriers
- Decorative and architectural lighting
- Retail and trade-show pieces
- Design objects with a visible conductor pattern

Please note

Flammability: rated UL94 HB, i.e. not flame-retardant to V-0 / V-1. Verify suitability against the application's fire-safety requirement.
Optical character: translucent with diffuse scattering, not optically clear. Suited to even light distribution, not to a clear see-through view.

Test conditions & methods. C-96/35/90 = 96 h at 35 °C / 90 % RH prior to test. Thickness columns < 0.5 / ≥ 0.5 mm; where one column is filled, the value applies to both. Dk/Df are nominal values. Test methods per IPC-TM-650, GB/T 2410-80 (2008) and ANSI/ASTM D4755.