

Liquid Crystal Polymer-Copper Clad Laminate (LCP-CCL) ESPANEX® L Series

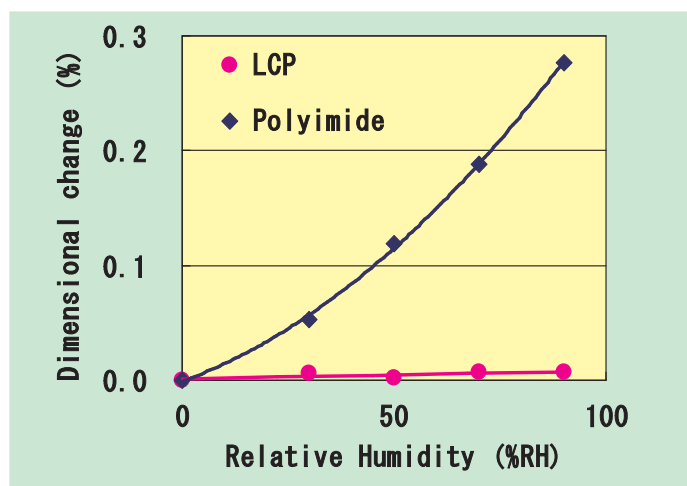
L-series is new flexible CCL using LCP film Vecstar® for the dielectric film.

- Adhesiveless laminate.
- Bends easily for flex applications.
- Extremely low moisture absorption.
- Low Profile ED Copper foil. (Rz=2.0 μm)
- Good dimensional stability.
- No storage issues in manufacturing environments.
- Excellent high frequency properties.

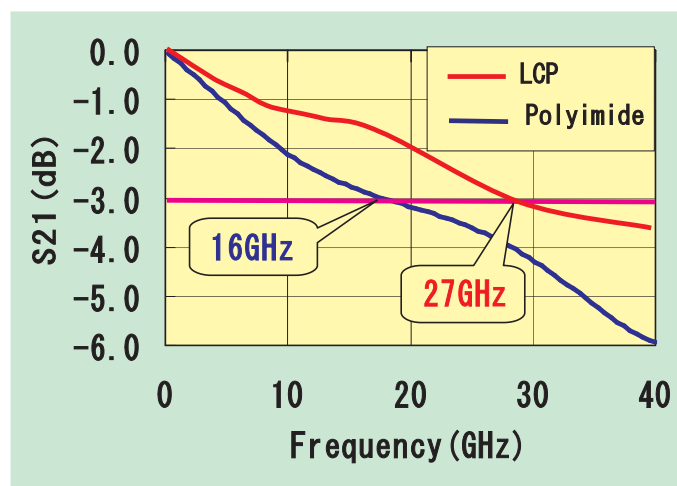
■ Products

ESPANEX L	Single sided	Double sided
LCP thickness (μm)	25, 50	25, 50, 100
Copper thickness (μm)	18	18

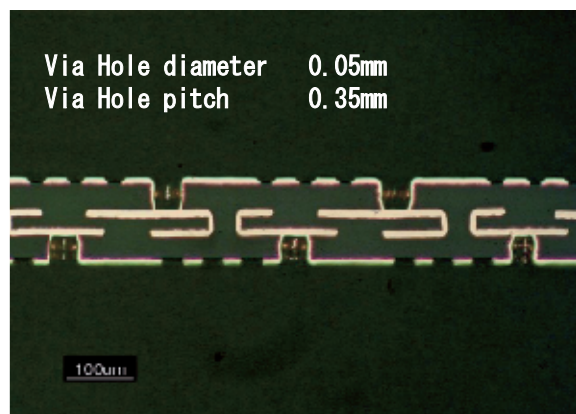
Dimensional Stability for Relative Humidity



Low Transmission



All LCP Multilayer PWB



Offered from Nippon Mektron, Ltd.

Properties

Properties	Units	ESPANEX L		Test Conditions
		Double sided	Single sided	
Moisture Absorption	%	<0.04	<0.04	25°C, 50%RH, 24hr
Coefficient of Thermal Expansion	ppm/%	17	17	TMA (100~190°C)
Solder Limit Temperature	°C	>270	>270	JIS C-6471
Dielectric Constant (Dk)	1GHz	2.86	2.86	Resonance method
Dissipation Factor (Df)	1GHz	0.0025	0.0025	Resonance method
Peel Strength	kN/m	1.2	1.0	JIS C-6471
Dimensional Stability <after etching> (3σ)	%	X±0.03	X±0.05	IPC-TM-650. 2. 2.4
Dimensional Stability <after heating> (3σ)	%	X±0.05	X±0.05	150°C, 30min IPC-TM-650. 2. 2.4
Flammability		VTM-0	VTM-0	UL94