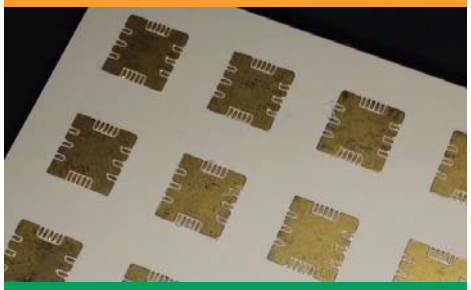
ROGERS CORPORATION

ULTRALAM® 3850HT

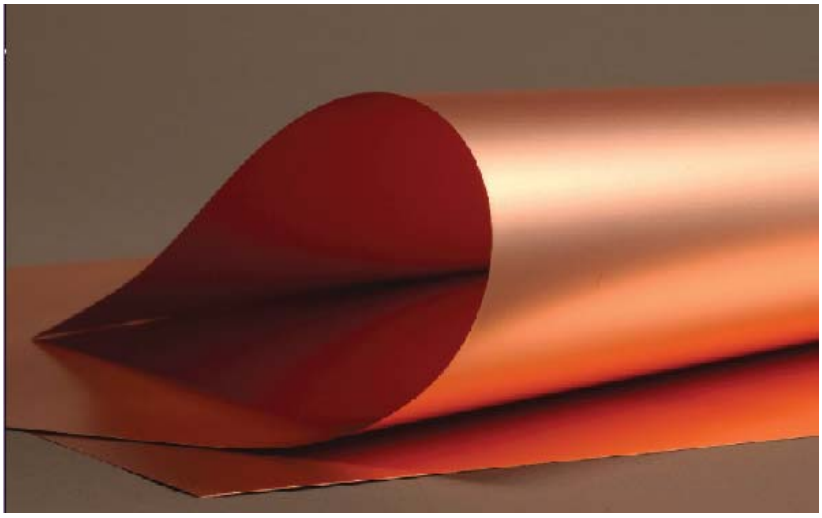
Liquid Crystalline Polymer Circuit Material Double-Clad Laminates

Data Sheet



The dielectric material used in ULTRALAM® 3850HT laminates has a melt temperature of 330C which can simplify the process of building multilayer boards and lead to increased yields. ULTRALAM 3850HT laminate circuit materials from Rogers Corporation, utilize highly temperature resistant liquid crystalline polymer (LCP) as the dielectric film. These products were developed specifically for single layer and multilayer substrate constructions. These adhesiveless laminates are well suited for high speed and high frequency applications used in mobile internet devices (phones/tablets), automotive radar, and moisture sensitive MMIC and chip packaging applications.

ULTRALAM 3850HT circuit materials are characterized by thin cores with low and stable dielectric constant and dielectric and copper loss, which are key requirements for high frequency, high-speed products. ULTRALAM 3850HT is offered as a double copper clad laminate offered in panels. It can be used, for multilayer constructions with ULTRALAM 3908 bonding film.



Features and Benefits:

Higher melt temperature
- Greater multilayer processing window
- Reduced softening and improved multilayer registration
- Reduced outgassing helps to resist blister formation
- Survives multiple solder reflow exposures

Excellent high frequency properties
- Stable electrical properties for tightly controlled impedance matching
- Excellent thickness uniformity for maximum signal integrity
- Allows use of thinner dielectric layer with minimal signal distortion

Good dimensional stability, low modulus
- Bends easily for flex and conformal applications
- Offers design flexibility and maximizes circuit density requirements

Extremely low moisture absorption
- Reduces bake times
- Maintains stable electrical, mechanical and dimensional properties in humid environments

Flame resistant
- Halogen-free - Meets WEEE
- UL94VTM/0 - meets requirement for consumer products

Some Typical Applications:

- High speed rigid flex boards
- MMIC/chip packaging
- Mobile phone/tablet antennas
- Hybrid substrates
- Automotive radar
- Mobile phone/tablet high speed cables

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Data Sheet

Property		Typical Value	Units	Test Method
Mechanical Properties				
Dimensional Stability	MD	-0.006	%	IPC 2.2.4 Condition B
	CMD	0.012		
	MD	-0.027		IPC 2.2.4 Condition C
	CMD	0.029		
Peel Strength		1.29 (7.38)	N/mm (lbs/in)	IPC 2.4.8 (1/2 oz. ED foil)
Initiation Tear Strength		1.9 (4.2)	Kg (lbs)	IPC 2.4.17 2 mil film
Tensile Strength		282 (41) MD 206 (30) CMD	MPa (Kpsi)	IPC 2.4.16
Tensile Modulus		3406 (494) MD 4047 (587) CMD	MPa (Kpsi)	IPC 2.4.19
Density		1.4	gm/cm^3	
Thermal Properties				
Coefficient of Thermal Expansion, CTE (30°C to 150°C)	X	18	ppm/ °C	IPC 2.4.41.3 4mil film
	Y	18		
	Z	200		
Solder Float, Method B (288°C)		PASS		IPC 2.4.13
Melting Temperature		330	C	DSC
Relative Thermal Index - RTI	mechanical	190	C	3850HT Addition to UL file pending
	electrical	240		
Thermal Conductivity		0.2	W/m/°K	ASTM C518
Thermal Coefficient of ε_r, -50°C to 150°C		(+) 24	ppm/°C	IPC 2.5.5.5, 8 GHz
Electrical Properties				
Dielectric Constant, 10 GHz, 23°C (Design)		3.14		Differential Phase Length, 4 mil, ½ oz RT VLP ED copper
Dissipation Factor, 10 GHz, 23°C		0.0020		
Surface Resistivity		1 x 10^{10}	MOhm	IPC 2.5.17
Volume Resistivity		1 x 10^{12}	MOhm cm	IPC 2.5.17
Dielectric Breakdown Strength		1378 (3500)	KV/cm (V/mil)	ASTM-D-149
Environmental Properties				
Chemical Resistance		98.7	%	IPC 2.3.4.2
Water Absorption (23°C, 24 hours)		0.04	%	IPC 2.6.2
Coefficient of Hygroscopic Expansion, CHE (60°C)		4	ppm/%RH	60°C
Flammability		VTM-0		UL-94

Typical values are a representation of an average value for the population of the property. For specification values contact Rogers Corporation.

Standard Thickness	Standard Panel Size	Standard Copper Cladding
0.001" (25µm) 0.002" (50µm) 0.004" (100µm) 0.007" (175µm)	18" X 12" (457mm x 305mm) panel 18" X 24" (457 mm x 610 mm) panel Custom sizes available upon request	¼ oz. (9µm), ½ oz. (18µm) **Copper Type:** Very low profile ED copper per IPC 4562 3.4.5 (<Rz 5.1 µm). ½ oz. (18µm), 1 oz. (35µm) & 2 oz. (70µm) rolled copper available upon request