

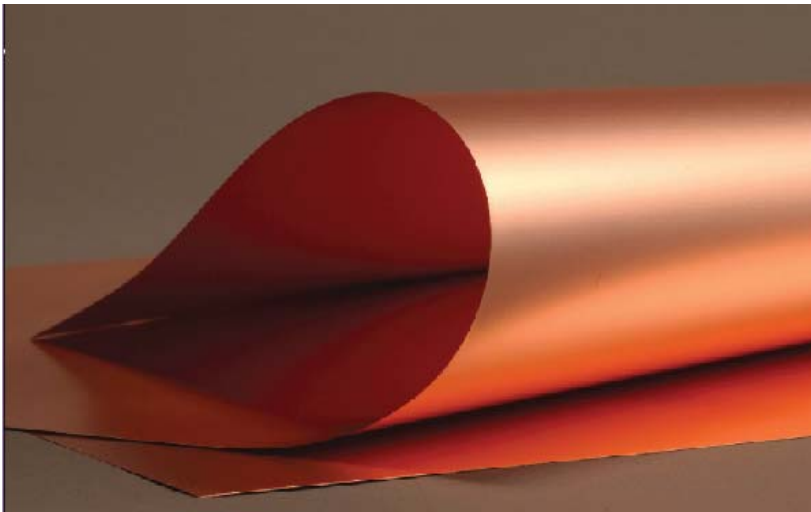


# ULTRALAM® 3850HT

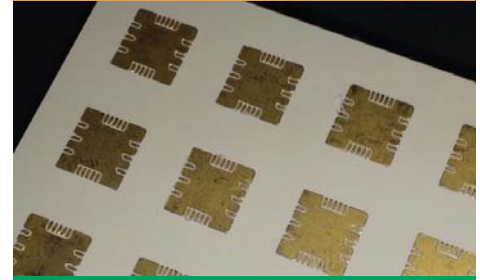
## Liquid Crystalline Polymer Circuit Material Double-Clad Laminates

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.



### Data Sheet



#### 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

Property	Typical Value	Units	Test Method
<b>Mechanical Properties</b>			
Dimensional Stability	MD	-0.006	IPC 2.2.4 Condition B
	CMD	0.012	
	MD	-0.027	
	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 <sup>3</sup>	
<b>Thermal Properties</b>			
Coefficient of Thermal Expansion, CTE (30°C to 150°C)	X	18	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	3850HT Addition to UL file pending
	electrical	240	
Thermal Conductivity	0.2	W/m/°K	ASTM C518
Thermal Coefficient of $\epsilon_r$ , -50°C to 150°C	(+) 24	ppm/°C	IPC 2.5.5.5, 8 GHz
<b>Electrical Properties</b>			
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 <sup>10</sup>	MOhm	IPC 2.5.17
Volume Resistivity	1 x 10 <sup>12</sup>	MOhm cm	IPC 2.5.17
Dielectric Breakdown Strength	1378 (3500)	KV/cm (V/mil)	ASTM-D-149
<b>Environmental Properties</b>			
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) <b>Copper Type:</b> 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

The information contained in this datasheet is intended to assist you in designing with Rogers' liquid crystalline polymer circuit materials. It is not intended to and does not create any warranties, express or implied, including any warranty of merchantability or fitness for a particular purpose or that the results shown on this datasheet will be achieved by a user for a particular purpose. The user is responsible for determining the suitability of Rogers' liquid crystalline polymer circuit materials for each application.

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