



ThinFlex

ThinFlex Corporation

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# ThinFlex-A, A-4010RD Adhesiveless Double Sided Copper Clad Laminate (Halogen Free)

ThinFlex-A, A-4010RD is an adhesiveless double-sided (D/S) copper clad laminate, using UBE TPI film and laminated with RA copper foil on both sides. ThinFlex-A, A-4010RD adhesiveless D/S composites are designed for a wide variety of flexible circuit applications which require advanced material performance, temperature resistance, fine pitch, and high reliability.

## 1. Product Characteristics:

- \* Excellent dimensional stability
- \* Excellent flexibility
- \* Finer line etching capability
- \* Low moisture absorption
- \* Excellent flammability (Flame class UL 94V-0; UL File No. E219724)
- \* Excellent chemical resistance
- \* Excellent thermal, mechanical, and electrical properties

## 2. Specifications:

A - 40 10 R D

<b>Product</b> A : D/S FCCL	<b>Thickness of PI</b> 40 : 4.0 mil	<b>Thickness of Cu</b> 10 : 1.0oz	<b>Cu Type</b> R : RA	<b>Structure</b> Double-sided
<b>Supply Size</b>	W: 250/500 ± 1mm; L: 400~700 ± 2mm (sheet type)			

\*Other thicknesses and dimensions are available on customers' demand.



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### 3. Construction:

Copper foil

Polyimide film

### 4. Properties:

Copper foil

Test item	Unit	A-4010RD	Test Method	
Peel Strength				
As Received	Kgf/cm	≥ 1.0	IPC-TM650 2.4.9	
Solder Float	Kgf/cm	≥ 1.0	IPC-TM650 2.4.9	
After Temp. Cycling	Kgf/cm	≥ 1.0	IPC-TM650 2.4.9	
Chemical Resistance	Kgf/cm	≥ 1.0	IPC-TM650 2.3.2	
Tensile Strength (Base Film)	Kg/mm <sup>2</sup>	≥ 30	IPC-TM-650 2.4.19	
Elongation (Base Film)	%	≥ 80	IPC-TM-650 2.4.19	
Tensile Modulus (Base Film)	Kg/mm <sup>2</sup>	≥ 550	ASTM D882	
Initial Tear Strength (Base Film)	g	≥ 3600	IPC-TM-650 2.4.16	
Propagation Tear Strength (Base Film)	g	≥ 55	IPC-TM-650 2.4.17.1	
Flexural Endurance, MIT				
M.D.	Cycles	NA	JIS-C 6471, 0.8mmR, 0.5kg	
T.D.	Cycles	NA	JIS-C 6471, 0.8mmR, 0.5kg	
Electrical Properties				
Surface Resistance	Ω	~10 <sup>11</sup>	IPC-TM650 2.5.17	
Volume Resistance	Ω-cm	~10 <sup>12</sup>	IPC-TM650 2.5.17	
Insulation Resistance	Ω	~10 <sup>9</sup>	IPC-TM650 2.6.3.2	
Dielectric Strength	kV/mil	6.9	IPC-TM650 2.5.5.3	
Dielectric Constant	-	3.3	ASTM-D149	
Dissipation factor	-	0.002	IPC-TM650 2.5.5.3	
Physical and Thermal Properties				
Dimensional Stability	M.D.	%	-0.1~0.1	IPC-TM650 2.2.4C
	T.D.	%	-0.1~0.1	IPC-TM650 2.2.4C
CTE	ppm/°C	19.3	ThinFlex	
T <sub>g</sub>	°C	350	ThinFlex	
Solder Float	10sec at 288°C (550°F)	-	Pass	IPC-TM650 2.4.13
Moisture Absorption Test	%	1.1	IPC-TM650 2.6.2	
Chemical Resistance-single	-	Pass	IPC-TM650 2.3.2	
Thickness tolerance	um	170±10%	ThinFlex	
UL Flame Class	-	94V-0	UL	

\* Above data are typical values, and are not guaranteed values.

Technical Data Sheet: 201401



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### 5. Storage:

ThinFlex-A, A-4010RD will meet its shelf-life for at least 12 months after arrival at the user's factory when stored in the original packaging at temperatures of below 25°C and below 70% humidity. The products do not need refrigeration and should not be frozen.

Note: The information and data contained in this technical literature is believed to be accurate and is offered in good faith for the benefit of the user. The user should make his own tests to verify the suitability of this product for any application before its use. All data are typical values only and subject to change without notice.

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