



ThinFlex



ThinFlex Corporation

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# ThinFlex-W22, W-1002ED-N4 Adhesiveless Double Sided Copper Clad Laminate (Halogen Free)

IPC Designation IPC-4204/11

ThinFlex-W22, W-1002ED-N4 is an adhesiveless double-sided (D/S) copper clad laminate, using ThinFlex TPI film and laminated with ED copper foil on both sides. ThinFlex-W22, W-1002ED-N4 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
- \* Excellent chemical resistance
- \* Excellent thermal, mechanical, and electrical properties

## 2. Specifications:

W- 10 02 E D-N4

Product	Thickness of PI	Thickness of Cu	Cu Type	Structure	Cu Supplier
W-type FCCL	10 : 1.0 mil	02 : 1/4 Oz.	E : ED	D: D/S	Nanya
Supply Size	W: 250/500 ± 1mm; L: 400~700 ± 2mm (sheet type) W: 250/500 ± 1mm; L: 100 +2/-0m (roll type)				

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



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**3. Construction:**

Copper foil
Polyimide film
Copper foil

**4. Properties:**

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Test item	Unit	W-1002ED-N4	Test Method	
<b>Peel Strength</b>				
As Received	Kgf/cm	≥ 0.6	IPC-TM650 2.4.9 B	
Solder Float	Kgf/cm	≥ 0.6	IPC-TM650 2.4.13 B	
After Temp. Cycling	Kgf/cm	≥ 0.6	IPC-TM650 2.4.9	
Chemical Resistance	Kgf/cm	≥ 0.6	IPC-TM650 2.3.2	
Tensile Strength (Base Film)	Kg/mm <sup>2</sup>	≥ 24	IPC-TM-650 2.4.19	
Elongation (Base Film)	%	≥ 25	IPC-TM-650 2.4.19	
Tensile Modulus (Base Film)	Kg/mm <sup>2</sup>	≥ 600	ASTM D882	
Initial Tear Strength (Base Film)	g	≥ 360	IPC-TM-650 2.4.16	
Propagation Tear Strength (Base Film)	g	≥ 8	IPC-TM-650 2.4.17.1	
<b>Flexural Endurance, MIT</b>				
M.D.	Cycles	≥ 800	JIS-C 6471, 0.8mmR, 0.5kg	
T.D.	Cycles	≥ 800	JIS-C 6471, 0.8mmR, 0.5kg	
<b>Electrical Properties</b>				
Surface Resistance	Ω	≥ 1.0×10 <sup>11</sup>	IPC-TM650 2.5.17	
Volume Resistance	Ω-cm	≥ 1.0×10 <sup>12</sup>	IPC-TM650 2.5.17	
Insulation Resistance	Ω	≥ 1.0×10 <sup>9</sup>	IPC-TM650 2.6.3.2	
Dielectric Strength	kV/mil	5.5	ASTM-D149	
Dielectric Constant	-	3.3	IPC-TM650 2.5.5.3	
Dissipation factor	-	0.01	IPC-TM650 2.5.5.3	
<b>Physical and Thermal Properties</b>				
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	24	ThinFlex	
T <sub>g</sub>	°C	350	ThinFlex	
Solder Float	30sec 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	49±10%	ThinFlex	
UL Flame Class	-	94V-0	UL	

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



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## 5. Storage:

ThinFlex-W22, W-1002ED-N4 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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