ThinFlex

**ThinFlex Corporation**
No. 38-1, Ke-Yi Rd., Chunan, Miaoli 350, Taiwan, R.O.C.
(Kuan Yuan Technology Park)
Tel: +886-37-581686 Fax: +886-37-580571
http://www.thinflex.com.tw
e-mail: service@thinflex.com.tw

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

ThinFlex-A is an adhesiveless double sided (D/S) metal clad polyimide film, furnished in the form of roll laminate with RA or ED copper on both sides. ThinFlex-A 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 etch ability
* 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 - 10 10 R D

| Product | Thickness of PI | Thickness of Cu | Cu Type | Structure |
|---|---|---|---|---|
| A : D/S FCCL | 10 : 1.0 mil<br>20 : 2.0 mil | 02 : 1/4 oz<br>03 : 1/3 oz<br>05 : 1/2 oz<br>10 : 1.0 oz | R : RA<br>E : ED | Double-sided |
| Supply Size | W: 250/500 ± 2mm; L: 400~700 ± 2mm (sheet type)<br>W: 250/500 ± 2mm; L: 50 +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:

| Test item | | | Units | A-1003RD<br>A-1005RD | A-1002ED<br>A-1003ED<br>A-1010ED | A-1005ED<br>A-1010RD | Test Method |
|---|---|---|---|---|---|---|---|
| Mechanical Properties | Peel Strength | As Received | Kgf/cm | ≧ 0.80 | ≧ 1.00 | ≧ 1.20 | IPC-TM650 2.4.9 |
| | | Solder Float | | ≧ 0.80 | ≧ 1.00 | ≧ 1.20 | |
| | | After Temp. Cycling | | ≧ 0.80 | ≧ 1.00 | ≧ 1.20 | |
| | | Chemical Resistance | | ≧ 0.80 | ≧ 1.00 | ≧ 1.20 | IPC-TM650 2.3.2 |
| | Flexural Endurance | M.D. | Times | ≧300 | ≧300 | ≧300 | JIS-C 6471 0.8mmR, 0.5kg |
| | | T.D. | | ≧300 | ≧300 | ≧300 | |
| Electrical Properties | Surface Resistance | | Ω | ≧$1.0\times10^{11}$ | ≧$1.0\times10^{11}$ | ≧$1.0\times10^{11}$ | IPC-TM650 2.5.17 |
| | Volume Resistance | | Ω-cm | ≧$1.0\times10^{12}$ | ≧$1.0\times10^{12}$ | ≧$1.0\times10^{12}$ | |
| | Insulation Resistance | | Ω | ≧$1.0\times10^{9}$ | ≧$1.0\times10^{9}$ | ≧$1.0\times10^{9}$ | IPC-TM650 2.6.3.2 |
| Physical and Thermal Properties | Dimensional Stability | M.D. | % | -0.1~0.1 | -0.1~0.1 | -0.1~0.1 | IPC-TM650 2.2.4C |
| | | T.D. | | | | | |
| | Solder Float 10sec at 288℃(550°F) | | -- | Pass | Pass | Pass | IPC-TM650 2.4.13 |
| | Thickness Tolerance | | % | ±10% | ±10% | ±10% | ThinFlex |
| | Ion Migration (1000hr/85%/85℃/50VDC) | | -- | Pass | Pass | Pass | -- |
| | UL Flame Class | | -- | 94V-0 | 94V-0 | 94V-0 | UL |

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

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| Test item | | | Units | A-2002ED<br>A-2003RD<br>A-2005RD | A-2010RD<br>A-2010ED | Test Method |
|---|---|---|---|---|---|---|
| Mechanical Properties | Peel Strength | As Received | Kgf/cm | ≧ 0.80 | ≧ 1.00 | IPC-TM650 2.4.9 |
| | | Solder Float | | ≧ 0.80 | ≧ 1.00 | |
| | | After Temp. Cycling | | ≧ 0.80 | ≧ 1.00 | |
| | | Chemical Resistance | | ≧ 0.80 | ≧ 1.00 | IPC-TM650 2.3.2 |
| | Flexural Endurance | M.D. | Times | N/A | N/A | JIS-C 6471 0.8mmR, 0.5kg |
| | | T.D. | | N/A | N/A | |
| Electrical Properties | Surface Resistance | | Ω | ≧$1.0\times10^{11}$ | ≧$1.0\times10^{11}$ | IPC-TM650 2.5.17 |
| | Volume Resistance | | Ω-cm | ≧$1.0\times10^{12}$ | ≧$1.0\times10^{12}$ | |
| | Insulation Resistance | | Ω | ≧$1.0\times10^{9}$ | ≧$1.0\times10^{9}$ | IPC-TM650 2.6.3.2 |
| Physical and Thermal Properties | Dimensional Stability | M.D. | % | -0.1~0.1 | -0.1~0.1 | IPC-TM650 2.2.4C |
| | | T.D. | | | | |
| | Solder Float 10sec at 288℃(550°F) | | -- | Pass | Pass | IPC-TM650 2.4.13 |
| | Thickness Tolerance | | % | ±10% | ±10% | ThinFlex |
| | Ion Migration (1000hr/85%/85℃/50VDC) | | -- | Pass | Pass | -- |
| | UL Flame Class | | -- | 94V-0 | 94V-0 | UL |

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| Test item | | | Units | A-2003ED<br>A-2005ED | A-2020RD<br>A-2020ED | Test Method |
|---|---|---|---|---|---|---|
| Mechanical Properties | Peel Strength | As Received | Kgf/cm | ≧ 1.20 | ≧ 2.00 | IPC-TM650 2.4.9 |
| | | Solder Float | | ≧ 1.20 | ≧ 2.00 | |
| | | After Temp. Cycling | | ≧ 1.20 | ≧ 2.00 | |
| | | Chemical Resistance | | ≧ 1.20 | ≧ 2.00 | IPC-TM650 2.3.2 |
| | Flexural Endurance | M.D. | Times | N/A | N/A | JIS-C 6471 0.8mmR, 0.5kg |
| | | T.D. | | N/A | N/A | |
| Electrical Properties | Surface Resistance | | Ω | $\geqq 1.0\times10^{11}$ | $\geqq 1.0\times10^{11}$ | IPC-TM650 2.5.17 |
| | Volume Resistance | | Ω-cm | $\geqq 1.0\times10^{12}$ | $\geqq 1.0\times10^{12}$ | |
| | Insulation Resistance | | Ω | $\geqq 1.0\times10^{9}$ | $\geqq 1.0\times10^{9}$ | IPC-TM650 2.6.3.2 |
| Physical and Thermal Properties | Dimensional Stability | M.D. | % | -0.1~0.1 | -0.1~0.1 | IPC-TM650 2.2.4C |
| | | T.D. | | | | |
| | Solder Float 10sec at 288℃(550°F) | | -- | Pass | Pass | IPC-TM650 2.4.13 |
| | Thickness Tolerance | | % | ±10% | ±10% | ThinFlex |
| | Ion Migration (1000hr/85%/85℃/50VDC) | | -- | Pass | Pass | -- |
| | UL Flame Class | | -- | 94V-0 | 94V-0 | UL |

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## 5. Storage:

ThinFlex-A 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.



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