



Product Specification

Issue Date: April, 2006

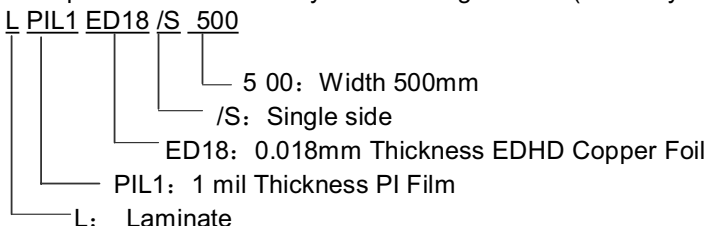
LPIX Halogen Free Laminates of Polyimide Copper

1. Description & Designation:

LPIX product consists of PI film clad copper by coating adhesive. It includes various types according to different copper and PI film utilized to meet the specific needs of customers.

| Materials | | Thickness | Supplier |
|--------------------|-------------------------|---|----------------|
| Base film | Polyimide film | 1.0, 2.0 and 3.0 mils (0.025, 0.050, 0.075mm) etc. | China, etc. |
| Copper | EDHD Copper | 1/2, 1.0 and 2.0 Oz/SF (0.012, 0.018, 0.035, 0.070mm) etc. | Mitsui, Fukuda |
| Adhesive | Modified epoxy adhesive | 0.5 1.2 mils (0.0125 0.030mm) etc. | USA, Japan |
| Laminate structure | | Single side (S) , Double sides (D) | |

- The ED copper is the type of EDHD and is classified by the treatment surface color: ED as coffee, EDPM as pink;
- Some special types appointed by customers can also be produced besides the common types of PI and copper listed in the above form.
- LPIX product is identified by the following method (X is may different letter for the different PI supplier):



2. Features & Applications:

LPIX products are widely used in the data communication, avionics, aerospace, defense, personal computer and automotive fields. It possesses following features:

- Meet the RoHS requirement & halogen free, and pass SGS certificate.
- High bond strength, excellent electrical properties and good dimensional stability.
- Excellent solderability, good chemical resistant to process chemicals and solvents.
- Very competitive price under keeping good performance.
- The appearance and dimension stability are not good as the series of LPI because the limited PI quality.

3. Package

- Standard roll: 50+0.25 square meters or 500+2.0square feet per roll, maximum 2 splices and minimum 20m distance during two splices.
- Standard width: 500mm width except the customer's special instruction within the maximum width 500mm.
- Inner diameter core: 6 inches (152mm), packed in carton and outside wrapped with PE film.

4. Storage:

- Storage time: 12 months since production date; please use after inspection again passed for the materials over the storage time.
- Recommended storage condition: temperature 68 86? (about room Temp. and cool no needed), maximum relative humidity 75%.
- Excessive exposure to heat and moisture may cause copper oxidation.

**LPIX Halogen Free Laminates of Polyimide Copper
Data Sheet of Performance**

| Property To Be Tested | Test Method | Typical Product Value LPIL1ED35/S | Typical Product Value LPIL1ED18/S |
|--|---|--|--|
| Peel strength, minimum, lb./in. width As received After sold float | IPCT M6 50 2.4.9 Method B Method D | 9.0 9.0 | 9.0 9.0 |
| Tensile strength, minimum lb./in. ² | IPCT M6 50 2.4.19 | 12,800 | 12,800 |
| Elongation, minimum percent | IPCT M6 50 2.4.19 | 80 | 80 |
| Flexural endurance, minimum cycles | IPCT M6 50 2.4.3 | In 2000 Out 1500 | In 2000 Out 1500 |
| Creasing endurance, minimum cycles | JIS C5016 1994 8.7 | MD: ≥ 80 TD: ≥ 80 | MD: ≥ 120 TD: ≥ 120 |
| Adhesive Appearance | By eye | Transparent | Transparent |
| Adhesive Thickness | Q000463 | 0.017mm | 0.015 or 0.013mm |
| Dimensional stability, maximum, percentage, | IPCT M6 50 2.2.4 Method B Method C | +/- 0.25 +/- 0.25 | +/- 0.25 +/- 0.25 |
| Solder float | IPCT M6 50 2.4.13 Method A Method B | 550? 30seconds Pass 570? 30seconds Pass | 550? 30seconds Pass 570? 30seconds Pass |
| Flammability | IPCT M6 50 2.3.8.1 | N/A | N/A |
| Chemical resistance, percentage | IPCT M6 50 2.3.2 | 80 | 80 |
| Dielectric constant, maximum (at 1 MHz) | IPCT M6 50 2.5.5.3 | 3.50 | 3.50 |
| Dissipation factor, maximum (at 1 MHz) | IPCT M6 50 2.5.5.3 | 0.015 | 0.015 |
| Volume resistivity, minimum, megohm cm | IPCT M6 50 2.5.17 | 10 ⁷ | 10 ⁷ |
| Surface resistance, minimum, megohms | IPCT M6 50 2.5.17 | 10 ⁵ | 10 ⁵ |
| Dielectric strength, minimum, volts/mil | ASTM D 149 | 3500 | 3500 |
| Insulation resistance, minimum, megohms, at ambient | IPCT M6 50 2.6.3.2 | 10 ⁵ | 10 ⁵ |
| Moisture and insulation resistance, minimum, megohms | IPCT M6 50 2.6.3.2 | 10 ⁴ | 10 ⁴ |
| Moisture absorption, maximum, percent | IPCT M6 50 2.6.2 | 4.0 | 4.0 |

Mark: (1) Above data sheet are base on the typical products values. The final data for specific products supplied, please check the testing report attached with the shipment. These data are only for user's reference. The user should determine the suitability of JJFlex LPIX materials for each application.

(2) N/A: Not applicable.