



## NAN YA PLASTICS CORPORATION

ELECTRONIC MATERIALS DIVISION.

### COPPER CLAD LAMINATE DEPARTMENT

**Glass cloth base epoxy resin  
flame retardant copper clad laminate**

NO. 201. TUNG HWA N. ROAD,  
TAIPEI, TAIWAN.

## UV BLOCK FR-4-86

### ■ FEATURES

- High luminance of epoxy contrast with copper for laser type A.O.I.
- UV solder mask may be applied simultaneously to increase yields.
- High performance epoxy blended to achieve higher heat resistance than that of FR-4-86
- Thickness 0.8mm capability.

### ■ PERFORMANCE LIST

| Characteristics                  | Unit   | Conditioning              | Typical Values                     | SPEC            | Test Method |       |
|----------------------------------|--------|---------------------------|------------------------------------|-----------------|-------------|-------|
| Volume resistivity               | MΩ-cm  | C-96/35/90                | $5 \times 10^8 \sim 5 \times 10^9$ | $10^6 \uparrow$ | 2.5.17      |       |
| Surface resistivity              | MΩ     | C-96/35/90                | $5 \times 10^6 \sim 5 \times 10^7$ | $10^4 \uparrow$ | 2.5.17      |       |
| Permittivity 1MHZ                | -      | C-24/23/50                | 4.5-4.7                            | 5.4 ↓           | 2.5.5.9     |       |
| Permittivity 1GHZ                | -      | C-24/23/50                | 4.0-4.2                            | -               | 2.5.5.9     |       |
| Loss Tangent 1MHZ                | -      | C-24/23/50                | 0.015-0.020                        | 0.035 ↓         | 2.5.5.9     |       |
| Loss Tangent 1GHZ                | -      | C-24/23/50                | 0.012-0.014                        | -               | 2.5.5.9     |       |
| Arc resistance                   | SEC    | D-48/50+D-0.5/23          | 120 ↑                              | 60 ↑            | 2.5.1       |       |
| Dielectric breakdown             | KV     | D-48/50                   | 60 ↑                               | 40 ↑            | 2.5.6       |       |
| Moisture absorption              | %      | D-24/23                   | 0.05-0.10                          | 0.35 ↓          | 2.6.2.1     |       |
| Flammability                     | -      | C-48/23/50                | 94V0                               | 94V0            | UL94        |       |
| Peel strength 1 oz               | lb/in  | 288°Cx10" solder floating | 10-14                              | 6 ↑             | 2.4.8       |       |
| Thermal stress                   | SEC    | 288°C solder dipping      | 200 ↑                              | 10 ↑            | 2.4.13.1    |       |
| Pressure cooker<br>(2 atm 120°C) | 1/2 hr | SEC                       | 288°C dipping                      | 150↑            | N/A         | -     |
|                                  | 1 hr   | SEC                       | 288°C dipping                      | 150↑            | N/A         | -     |
|                                  | 2 hr   | SEC                       | 288°C dipping                      | 150             | N/A         | -     |
| Flexural strength                | LW     | N/mm <sup>2</sup>         | A                                  | 480-550         | 415 ↑       | 2.4.4 |
|                                  | CW     | N/mm <sup>2</sup>         | A                                  | 415-480         | 345 ↑       | 2.4.4 |
| Dimensional stability X-Y axis   | %      | E-0.5/170                 | 0.005-0.030                        | 0.050 ↓         | 2.4.39      |       |
| Coefficient of thermal expansion |        |                           |                                    |                 |             |       |
| Z-axis before Tg                 | ppm/°C | TMA                       | 50-70                              | N/A             | 2.4.24      |       |
| Z-axis after Tg                  | ppm/°C | TMA                       | 250-350                            |                 |             |       |
| Glass transition temp            | °C     | DSC                       | 140 ± 5                            | N/A             | 2.4.25      |       |

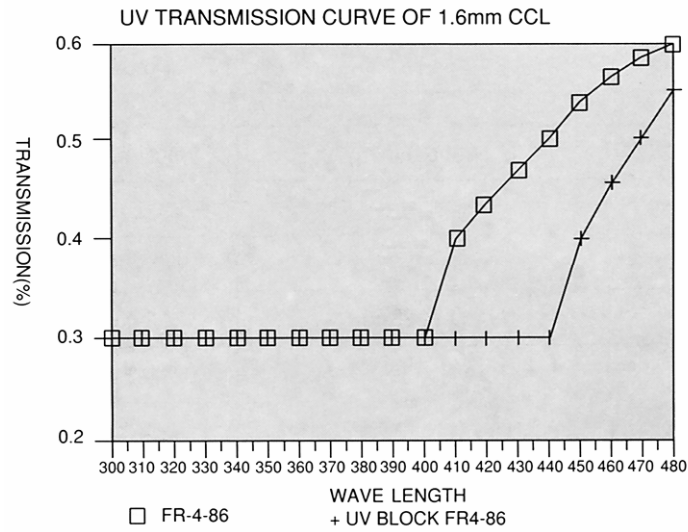
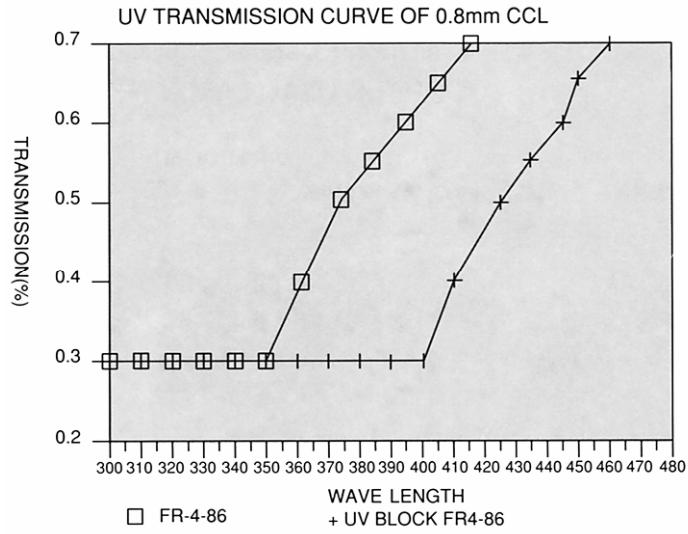
#### NOTE:

The average value in the table refers to samples of .062" 1/1.

Test method per IPC-TM-650

Data shown are nominal values for reference only.

## ■ Low UV Transmission



## ■ High luminance of epoxy contrast with copper

FR-4-86 1.6 mm

Orbotech's

