



# TU-668

Core: TU-668

Prepreg: TU-668P

TU-668/ TU-668P laminate/ prepreg are made of high quality woven E-glass coated with the epoxy resin system, which provides the laminates UV-block characteristic, and compatibility with automated optical inspection (AOI) process. These products are suitable for boards that need to survive severe thermal cycles, or to experience excessive assembly work. TU-668 laminates exhibit excellent CTE, superior chemical resistance, and thermal stability for lead free soldering assembly with general CAF resistance.

## Applications

- Automotive
- Consumer Electronics

## Performance and Processing Advantages

- Lead Free process compatible
- Excellent coefficient of thermal expansion
- Anti-CAF property
- Use friendly FR-4 processing conditions such as oxide, press, drilling and desmear
- Superior chemical and thermal resistance
- Fluorescence for AOI
- Optical characteristics provide UV-block property
- High interlayer bonding strength with optimum resin flow
- Low moisture absorption

## Industry Approvals

- IPC-4101 Type Designation : /21, /98, /99, /101
- UL Designation – ANSI Grade: FR-4.0
- UL File Number: E189572
- Flammability Rating: 94V-0
- Maximum Operating Temperature: 130°C

## Standard Availability

- Thickness: 0.002" [0.05mm] to 0.062" [1.58mm], available in sheet or panel form
- Copper Foil Cladding: 1/3 to 6 oz (HTE) for built-up; 1/3 to 3 oz (HTE) for double sides and H to 2 oz (MLS)
- Prepregs: Available in roll or panel form
- Glass Styles: 106, 1080, 2113, 2116, 1506 and 7628 etc.





| Typical Properties for TU-668 Laminate   |                          |                     |                         |
|--|--------------------------|---------------------|-------------------------|
|  | Typical Values           | Test Condition      | SPEC                    |
| <b>Thermal</b>                           |                          |                     |                         |
| Tg (DMA)                                 | 160 °C                   | E-2/105+des         | N/A                     |
| Tg (DSC)                                 | 150 °C                   |                     |                         |
| Tg (TMA)                                 | 140 °C                   |                     |                         |
| Td (TGA)                                 | 340 °C                   |                     |                         |
| CTE x-axis                               | 11~15 ppm/°C             | Ambient to Tg       | N/A                     |
| CTE y-axis                               | 11~15 ppm/°C             | Ambient to Tg       | N/A                     |
| CTE z-axis                               | 3.2 %                    | 50 to 260°C         | < 3.5%                  |
| Thermal Stress,<br>Solder Float, 288°C   | > 60 sec                 | A                   | > 10 sec                |
| T-260                                    | > 60 min                 | E-2/105+des         | > 30 min                |
| T-288                                    | > 10 min                 |                     | > 5 min                 |
| Flammability                             | 94V-0                    | E-24/125+des        | 94V-0                   |
| <b>Electrical</b>                        |                          |                     |                         |
| Permittivity (RC50%)<br>1MHz (LCR meter) | 4.7                      | C-24/23/50          | < 5.4                   |
| 1GHz (SPC method/HP4291B)                | 4.4/4.3                  |                     | N/A                     |
| Loss Tangent (RC50%)<br>1MHz (LCR meter) | 0.016                    | C-24/23/50          | < 0.035                 |
| 1GHz (SPC method/HP4291B)                | 0.018/0.014              |                     | N//A                    |
| Volume Resistivity                       | > 10 <sup>10</sup> MΩ·cm | C-96/35/90          | > 10 <sup>9</sup> MΩ·cm |
| Surface Resistivity                      | > 10 <sup>8</sup> MΩ     | C-96/35/90          | > 10 <sup>4</sup> MΩ    |
| Electric Strength                        | > 40 KV/mm               |                     | > 30 KV/mm              |
| Dielectric Breakdown Voltage             | > 50 KV                  |                     | > 40 KV                 |
| <b>Mechanical</b>                        |                          |                     |                         |
| Flexural Strength<br>Lengthwise          | > 75,000 psi             | A                   | > 60,000 psi            |
| Crosswise                                | > 65,000 psi             | A                   | > 50,000 psi            |
| Peel Strength,<br>1.0 oz. Cu foil        | 8~11 lb/in               | A                   | > 4 lb/in               |
| Bow and Twist<br>0.020"~0.031"           | < 0.8%                   | A                   | Max 1.5                 |
| 0.032"~0.065"                            | < 0.8%                   |                     | Max 1.0                 |
| >0.066"                                  | < 0.8%                   |                     | Max 1.0                 |
| Dimensional Stability                    | < 0.03%                  | E-4/105+E-2/150     | < 0.03 %                |
| Water Absorption                         | 0.13 %                   | E-1/105+des+D-24/23 | < 0.8 %                 |

## NOTE:

- Property values are for information purposes only and not intended for specification.
- Any sales of these products will be governed by the terms and conditions of the agreement under which they are sold.

