

tec-speed 5.0 - VT-464G

Laminate/Prepreg

UL Approval: E214381    Version: 02/12/2024 /130

General Information

- > Halogen Free & High Tg
- > Very Low Dk & Very Low Loss
- > Excellent Thermal Reliability

Application

Server, Storage, Switches, Routers, High Performance Computing, High Speed Network Equipment

Availability

- > Core Thickness: 0.002" (0.05mm) to 0.030" (0.762mm), available in sheet or panel form
- > Copper Foil: 1/3oz to 2oz
- > Prepregs are available in roll or panel form
- > E-Glass styles: 3313, 2116, 1078, 1067, 106 etc

| Properties        |                   | Prepreg           |                  | Laminate             |
|-------------------|-------------------|-------------------|------------------|----------------------|
| Storage Condition | Temperature       | Below 23°C (73°F) | Below 5°C (41°F) | Room                 |
|                   | Relative humidity | Below 55% RH      | /                | /                    |
| Shelf Life        |                   | 3 months          | 6 months         | 24 months (airproof) |

The prepreg exceeding shelf life should be retested.

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## Properties Sheet IPC-4101E /130

| Properties                       |                            | Test Method         | Units            | Specification    | Typical Value     |
|----------------------------------|----------------------------|---------------------|------------------|------------------|-------------------|
| <b>Thermal Properties</b>        |                            |                     |                  |                  |                   |
| Tg                               | TMA                        | IPC-TM-650 2.4.24   | °C               | 170 minimum      | 175               |
|                                  | DMA                        | IPC-TM-650 2.4.24.4 |                  |                  | 200               |
| Td                               |                            | ASTM D3850          | °C               | 340 minimum      | 400               |
| T260                             |                            | IPC-TM-650 2.4.24.1 | Minute           | 30 minimum       | >60               |
| T288                             |                            | IPC-TM-650 2.4.24.1 | Minute           | 15 minimum       | >30               |
| Thermal Stress @ 288°C           |                            | IPC-TM-650 2.4.13.1 | Second           | Pass 10s         | >600              |
| Z-axis CTE                       | Before Tg                  | IPC-TM-650 2.4.24   | ppm/°C           | 60 maximum       | 35                |
|                                  | After Tg                   | IPC-TM-650 2.4.24   | ppm/°C           | 300 maximum      | 200               |
|                                  | Total Expansion (50~260°C) | IPC-TM-650 2.4.24   | %                | 3.5 maximum      | 2.1               |
| <b>Electrical Properties</b>     |                            |                     |                  |                  |                   |
| Dk                               | @ 1GHz                     | IPC-TM-650 2.5.5.9  | –                | 5.2 maximum      | 3.81              |
|                                  | @ 10GHz                    | Cavity Resonator    | –                | –                | 3.62              |
| Df                               | @ 1GHz                     | IPC-TM-650 2.5.5.9  | –                | 0.035 maximum    | 0.0031            |
|                                  | @ 10GHz                    | Cavity Resonator    | –                | –                | 0.0050            |
| Volume Resistivity               | After Moisture Resistance  | IPC-TM-650 2.5.17.1 | MΩ-cm            | 1.0E+4 minimum   | 6.0E+8            |
|                                  | E-24/125                   | IPC-TM-650 2.5.17.1 | MΩ-cm            | 1.0E+3 minimum   | 6.0E+6            |
| Surface Resistivity              | After Moisture Resistance  | IPC-TM-650 2.5.17.1 | MΩ               | 1.0E+4 minimum   | 6.0E+7            |
|                                  | E-24/125                   | IPC-TM-650 2.5.17.1 | MΩ               | 1.0E+3 minimum   | 6.0E+6            |
| Electrical Strength              |                            | IPC-TM-650 2.5.6.2  | Volt/mil (KV/mm) | 762 (30) minimum | 1372 (54)         |
| Dielectric Breakdown             |                            | IPC-TM-650 2.5.6    | KV               | 40 minimum       | 60                |
| Comparative Tracking Index (CTI) |                            | ASTM D3638          | Rating (Volt)    | –                | Grade 3 (175~250) |
| Arc Resistance                   |                            | IPC-TM-650 2.5.1    | Second           | 60 minimum       | 124               |
| <b>Mechanical Properties</b>     |                            |                     |                  |                  |                   |
| Peel Strength (1oz RTF2)         | As received                | IPC-TM-650 2.4.8    | lb/in (N/mm)     | –                | 5.0 (0.88)        |
|                                  | After thermal stress       | IPC-TM-650 2.4.8    | lb/in (N/mm)     | 6 (1.05) minimum | 5.0 (0.88)        |
| Flexural Modulus                 | Warp                       | IPC-TM-650 2.4.24.4 | Kpsi (MPa)       | 60 (415) minimum | 80 (560)          |
|                                  | Fill                       | IPC-TM-650 2.4.24.4 | Kpsi (MPa)       | 50 (345) minimum | 65 (450)          |
| <b>Physical Properties</b>       |                            |                     |                  |                  |                   |
| Moisture Absorption              |                            | IPC-TM-650 2.6.2.1  | %                | 0.80 maximum     | 0.08              |
| Flammability                     |                            | UL-94               | Rating           | V-0 minimum      | V-0               |

All test data provided are typical values and not intended to be specification values.

Disclaimer: The information and data contained in this technical literature is based on data and knowledge correct at the time of publishing/printing and 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.