

## tec-speed 6.0 - VT-462S

UL Approval: E214381    Version: 5 /91 /102

### Laminate/Prepreg

## General Information

- > Very Low Dk & Very Low Loss
- > Excellent Thermal Reliability
- > Lead Free Process Compatible
- > High Tg
- > Ease of Manufacturing

## Application

- > High speed Networking equipment
- > IC Tester
- > High Frequency Measuring Instruments and Devices

## Availability

- > Core Thickness: 0.002" (0.05mm) to 0.20" (0.5mm), available in sheet or panel form
- > Copper Foil: 1/3oz to 3oz
- > Prepregs are available in roll or panel form
- > E-Glass styles: 2116, 2113, 1078, 106, etc
- > Ability of Processing Copper Type: HTE, RTF, VLP & HVLP

| 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 /91 /102

| Properties                       |                            | Test Method         | Units            | Specification      | Typical Value     |
|----------------------------------|----------------------------|---------------------|------------------|--------------------|-------------------|
| <b>Thermal Properties</b>        |                            |                     |                  |                    |                   |
| Tg                               | DSC                        | IPC-TM-650 2.4.25   | °C               | –                  | –                 |
|                                  | TMA                        | IPC-TM-650 2.4.24   | °C               | 170 minimum        | 170               |
| 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         | 48                |
|                                  | After Tg                   | IPC-TM-650 2.4.24   | ppm/°C           | 300 maximum        | 260               |
|                                  | Total Expansion (50~260°C) | IPC-TM-650 2.4.24   | %                | 3.5 maximum        | 2.8               |
| X-Y CTE                          |                            | IPC-TM-650 2.4.24   | ppm/°C           | –                  | 11~13             |
| MOT                              |                            | UL 94               | °C               | –                  | 130               |
| <b>Electrical Properties</b>     |                            |                     |                  |                    |                   |
| DK (RC 50%)                      | @ 1GHz                     | IPC-TM-650 2.5.5.9  | –                | –                  | 3.6               |
|                                  | @ 10GHz                    | IPC-TM-650 2.5.5.13 | –                | –                  | 3.5               |
| DF (RC 50%)                      | @ 1GHz                     | IPC-TM-650 2.5.5.9  | –                | –                  | 0.003             |
|                                  | @ 10GHz                    | IPC-TM-650 2.5.5.13 | –                | –                  | 0.005             |
| Volume Resistivity               | After Moisture Resistance  | IPC-TM-650 2.5.17.1 | MΩ-cm            | 1.0E+4 minimum     | 5.0E+8            |
|                                  | E-24/125                   | IPC-TM-650 2.5.17.1 | MΩ-cm            | 1.0E+3 minimum     | 5.0E+6            |
| Surface Resistivity              | After Moisture Resistance  | IPC-TM-650 2.5.17.1 | MΩ               | 1.0E+4 minimum     | 5.0E+7            |
|                                  | E-24/125                   | IPC-TM-650 2.5.17.1 | MΩ               | 1.0E+3 minimum     | 5.0E+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 4 (175~250) |
| Arc Resistance                   |                            | ASTM D495           | Second           | 60 minimum         | 124               |
| <b>Mechanical Properties</b>     |                            |                     |                  |                    |                   |
| Peel Strength (1oz)              | As received                | IPC-TM-650 2.4.8    | lb/in (N/mm)     | –                  | 6.0 (1.05)        |
|                                  | After thermal stress       | IPC-TM-650 2.4.8    | lb/in (N/mm)     | 4.0 (0.70) minimum | 6.0 (1.05)        |
| Flexural Strength                | Warp                       | IPC-TM-650 2.4.4    | Kpsi (MPa)       | 60 (415) minimum   | 80 (560)          |
|                                  | Fill                       | IPC-TM-650 2.4.4    | Kpsi (MPa)       | 50 (345) minimum   | 65 (450)          |
| <b>Physical Properties</b>       |                            |                     |                  |                    |                   |
| Moisture Absorption              |                            | IPC-TM-650 2.6.2.1  | %                | 0.80 maximum       | 0.10              |
| Flammability                     |                            | UL-94               | Rating           | V1 minimum         | V0                |

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

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