



High Tg / Ultra Low Loss / Halogen Free

EM-890 / EM-89B

- Very low Df and excellent electrical performance
- Excellent CAF resistance
- Multiple lamination and high thermal reliability applications
- For high speed Ethernet, network , 5G , Antenna applications
- Applicable IPC-4101 Slash Sheets: /134

Basic Laminate Property

| SProperty | Item | | IPC-TM-650 | Test Condition | Unit | Typical Value |
|---------------------|-------------------------|----------|------------------|----------------|------------------|-------------------|
| Thermal | Tg | | 2.4.25 | DSC | °C | N/A |
| | | | 2.4.24 | TMA | °C | 170 |
| | | | 2.4.24.4 | DMA | °C | 205 |
| | CTE, X/Y-axis | | 2.4.24.5 | < Tg, TMA | ppm/°C | 12/13 |
| | CTE, Z-axis | | 2.4.24 | < Tg, TMA | ppm/°C | 45~50 |
| | | | | > Tg, TMA | ppm/°C | 185~205 |
| | Z-axis Expansion | | 2.4.24 | 50~260°C | % | 2.2 |
| | Td | | 2.4.24.6 | TGA (5% W.L) | °C | 430 |
| T288 | | 2.4.24.1 | Clad | Min | >60 | |
| | | | Etched | Min | >60 | |
| Electrical | Dk (R/C: 55/70%) | 1 GHz | 2.5.5.9 | C-24/23/50 | - | 3.5/3.1 |
| | | 10 GHz | Cavity Resonator | | | 3.4/3.0 |
| | | | SPC method | | | 3.4/3.0 |
| | Df (R/C: 55/70%) | 1 GHz | 2.5.5.9 | C-24/23/50 | - | 0.0033/0.0027 |
| | | 10 GHz | Cavity Resonator | | | 0.0043/0.0036 |
| | | | SPC method | | | 0.0032/0.0026 |
| | Volume Resistivity | | 2.5.17.1 | C-96/35/90 | MΩ-cm | >10 ¹⁰ |
| Surface Resistivity | | 2.5.17.1 | C-96/35/90 | MΩ | >10 ⁹ | |
| Water Absorption | | 2.6.2.1 | E-1/105+D-24/23 | % | 0.07 | |
| Physical | Peel Strength (HVLP) | H oz | 2.4.8 | As Received | lb/in | 4.5 |
| | Flexural Strength | Warp | 2.4.4 | As Received | MPa | 430-470 |
| | | Fill | | | | 410-450 |
| | Flame Resistance | | UL-94 | A & E-24/125 | - | V-0 |

Above typical values are tested under specified constructions and not intended for specification.