



PRODUCTS

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IT-168G2BS/IT-168G2TC

High Speed Halogen Free, Multifunctional Epoxy Laminate & Prepreg

IT-168G2 is an advanced halogen free low Dk and low Df resin system with multifunctional epoxy laminate. Middle Tg (150 °C by DSC). Excellent thermal reliability, especially for 260 °C assembly and HDI process that need multiple laminations, even to 5 press cycles.

Key Features =====

Advanced Halogen Free Resin Technology

Industrial standard material with middle Tg (150 °C by DSC) and excellent electrical properties of dielectric constant (Dk) and loss tangent (Df) properties.

Ultra Low Dk and Low Df

Low Dk=3.3 & low Df=0.008, and keep equivalent electrical properties from 1MHz to 10GHz. It contribute to designer for easier signal simulation.

Excellent Signal Integrity

Low Dk and low Df provide high electrical performance device that need faster signal propagation and low signal loss for high frequency applications even more than 20GHz.

Lead-Free Assembly Compatible

RoHS compliant and suitable for high thermal reliability needs, and Lead free assemblies with a maximum reflow temperature of 260 °C.

CAF Resistance

Excellent CAF resistance even after multiple lead-free assembly. Provide long-term reliability for both RF and digital applications.

Available in Variety of Constructions

Available in a various of constructions, copper weights and glass styles, including RTF, VLP, HVLPCopper foil.

Applications

High Speed Servers

HDI Smart Phones

High Speed Halogen Free PCB

Multilayer PCB

Line Card

High Speed Storage Networks

Routing and Switching Systems

Antenna

RF and Wireless Communication

Industrial Approval

UL Certifying

IPC-4101C Spec / 128

RoHS Compliant

ITEQ Laminate/ Prepreg : IT-168G2TC/IT-168G2BS

IPC-4101C Spec / 128

LAMINATE (IT-168G2TC)

| Property | Thickness < 0.50 mm [0.0197 in] | | Thickness ≥ 0.50 mm [0.0197 in] | | Units | Test Method |
|---|------------------------------------|-----------------|------------------------------------|-----------------|---------------------|-----------------------------|
| | Typical Value | Spec | Typical Value | Spec | Metric (English) | IPC-TM-650 (or as noted) |
| Peel Strength, minimum | | | | | | |
| A. Low profile copper foil and very low profile copper foil - all copper weights > 17μm [0.669 mil] | 0.87 (5.0) | 0.70 (4.00) | 0.87 (5.0) | 0.70 (4.00) | N/mm (lb/inch) | 2.4.8 |
| B. Standard profile copper foil | | | | | | 2.4.8.2 |
| 1. After Thermal Stress | 1.40 (8.0) | 0.80 (4.57) | 1.40 (8.0) | 1.05 (6.00) | | 2.4.8.3 |
| 2. At 125°C [257 F] | 1.23 (7.0) | 0.70 (4.00) | 1.23 (7.0) | 0.70 (4.00) | | |
| 3. After Process Solutions | 1.23 (7.0) | 0.55 (3.14) | 1.23 (7.0) | 0.80 (4.57) | | |
| Volume Resistivity, minimum | | | | | | |
| A. C-96/35/90 | 10 ¹⁰ | 10 ⁶ | -- | -- | MΩ-cm | 2.5.17.1 |
| B. After moisture resistance | -- | -- | 10 ¹⁰ | 10 ⁴ | | |
| C. At elevated temperature E-24/125 | 10 ¹⁰ | 10 ³ | 10 ¹⁰ | 10 ³ | | |
| Surface Resistivity, minimum | | | | | | |
| A. C-96/35/90 | 10 ¹⁰ | 10 ⁴ | -- | -- | MΩ | 2.5.17.1 |
| B. After moisture resistance | -- | -- | 10 ¹⁰ | 10 ⁴ | | |
| C. At elevated temperature E-24/125 | 10 ¹⁰ | 10 ³ | 10 ¹⁰ | 10 ³ | | |
| Moisture Absorption, maximum | -- | -- | 0.12 | 0.8 | % | 2.6.2.1 |
| Dielectric Breakdown, minimum | -- | -- | 60 | 40 | kV | 2.5.6 |
| Permittivity (Dk, 70% resin content) | | 5.4 | | 5.4 | -- | |

| | | | | | | |
|--|--------|-------------|-----------------|-------------|--|--------------------------|
| (Laminate & Laminated Prepreg) | | | | | | |
| A. 1MHz | 3.3 | | 3.3 | | | 2.5.5.9 |
| B. 1GHz | 3.3 | | 3.3 | | | |
| C. 2GHz | 3.3 | | 3.3 | | | 2.5.5.13 |
| D. 5GHz | 3.3 | | 3.3 | | | |
| E. 10GHz | 3.2 | | 3.2 | | | |
| Loss Tangent (Df, 70% resin content) (Laminate & Laminated Prepreg) | | | | | | |
| A. 1MHz | 0.0065 | | 0.0065 | | | 2.5.5.9 |
| B. 1GHz | 0.007 | 0.035 | 0.007 | 0.035 | -- | |
| C. 2GHz | 0.007 | | 0.007 | | | 2.5.5.13 |
| D. 5GHz | 0.007 | | 0.007 | | | |
| E. 10GHz | 0.008 | | 0.008 | | | |
| Flexural Strength, minimum | | | | | | |
| A. Length direction | -- | -- | 450-480 | 415 | N/mm ² (lb/in ²) | 2.4.4 |
| | -- | -- | (65,250-69,600) | (60,190) | | |
| B. Cross direction | -- | -- | 390-420 | 345 | | |
| | -- | -- | (56,550-60,900) | (50,140) | | |
| Arc Resistance, minimum | 90 | 60 | 90 | 60 | S | 2.5.1 |
| Thermal Stress 10 s at 288°C [550.4F], minimum | | | | | | |
| A. Unetched | Pass | Pass Visual | Pass | Pass Visual | Rating | 2.4.13.1 |
| B. Etched | Pass | Pass Visual | Pass | Pass Visual | | |
| Electric Strength, minimum (Laminate & Laminated Prepreg) | 45 | 30 | -- | -- | kV/mm | 2.5.6.2 |
| Flammability, (Laminate & Laminated Prepreg) | V-0 | V-0 | V-0 | V-0 | Rating | UL94 |
| Glass Transition Temperature(DSC) | 161 | 150 minimum | 166 | 150 minimum | °C | 2.4.25 |
| Decomposition Temperature | -- | -- | 378 | 360 minimum | °C | 2.4.24.6 (5% wt loss) |
| X/Y Axis CTE (40°C to 125°C) | -- | -- | 12-14 | -- | ppm/°C | 2.4.24 |
| Z-Axis CTE | | | | | | |
| A. Alpha 1 | -- | -- | 40 | -- | ppm/°C | 2.4.24 |
| B. Alpha 2 | -- | -- | 235 | -- | ppm/°C | |
| C. 50 to 260 Degrees C | -- | -- | 3.0 | -- | % | |
| Thermal Resistance | | | | | | |
| A. T260 | -- | -- | >60 | -- | Minutes | 2.4.24.1 |
| B. T288 | -- | -- | >60 | -- | Minutes | |
| CAF Resistance | -- | -- | Pass | AABUS | Pass/Fail | 2.6.25 |
| Halogen Content, maximum | | | | | | |
| -Chlorine | <900 | 900 | <900 | 900 | ppm | 2.3.41 |
| -Bromine | <900 | 900 | <900 | 900 | | |

| | | | | | | |
|-------------------|-------|------|-------|------|--|--|
| -Chlorine+Bromine | <1500 | 1500 | <1500 | 1500 | | |
|-------------------|-------|------|-------|------|--|--|

The above data and fabrication guide provide designers and PCB shop for their reference. We believe that these information are accurate, however, the data may vary depend on the test methods and specification used. The actual sales of the product should be according to specification in the agreement between ITEQ and its customer. ITEQ reserves the right to revise its data at any time without notice and maintain the best information available to users.