Track Resistant

DE104 KF

Data Sheet

Tg 135, Td 315
Dk 4.00, Df 0.022
/21

DURAVER-E-Cu Quality DE104 KF Laminate and Prepreg

Tracking can easily occur in a damp, dusty or corrosive environments such as in dishwashers and washing machines. **DE104 KF**, with high tracking resistance (CTI 400), is ideal for such circuit board applications. The Underwriters' Laboratories Standard for Safety (UL-94) has rated this product V-0 for flammability.

Tracking resistant prepreg is available for multilayer Printed Wiring Board (PWB) applications.

The product is listed as FR-4 and can be processed using standard parameters. DE104 KF multilayer (ML) corresponds to NEMA-grade FR-4 and meets the requirements of IPC-4104C /21.

Features

- High Thermal Performance
  - Tg: 135°C (DSC)
  - Td: 315°C (TGA @ 5% wt loss)
- RoHS Compliant
- UV Blocking and AOI Fluorescence
  - High throughput and accuracy during PCB fabrication and assembly
- Standard Availability
  - Thickness: 0.002″ (0.05 mm) to 0.093″ (2.4 mm)
  - Available in sheet or panel form
- Prepreg Standard Availability
  - Roll or panel form
  - Tooling of prepreg panels available
- Copper Foil Type Availability
  - Standard HTE Grade 3
- Copper Weights
  - ½, 1 and 2 oz (18, 35 and 70 µm) available
  - Heavier copper available upon request
  - Thinner copper foil available upon request
- Glass Fabric Availability
  - Standard E-glass
  - Square weave glass fabric available
  - Spread glass fabric available
- Industry Approvals
  - IPC-4101C /21
  - UL – File Number E41625
  - Qualified to UL's MCIL Program

ORDERING INFORMATION:

Contact your local sales representative or visit **www.isola-group.com** for further information.

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DE104 KF Specifications

Property		Typical Values			
				Units	Test Method
		Typical Value	Specification	Metric (English)	IPC-TM-650 (or as noted)
Glass Transition Temperature (Tg) by DSC		135	110-150	ºC	2.4.25
Decomposition Temperature (Td) by TGA @ 5% weight loss		315	–	ºC	ASTM D3850
T260		12	–	Minutes	2.4.25
T288		–	–	Minutes	2.4.25
CTE, Z-axis	A. Pre-Tg B. Post-Tg	45 230	– –	ppm/ºC	2.4.24
CTE, X-, Y-axes	A. Pre-Tg B. Post-Tg	16/13 14/7	– –	ppm/ºC	2.4.24
Z-axis Expansion (50-260ºC)		–	–	%	2.4.24
Thermal Conductivity		–	–	W/mK	ASTM D5930
Thermal Stress @ 288ºC (550.4ºF)	A. Unetched B. Etched	≥10 ≥10	≥10 ≥10	Seconds	2.4.13.1
Dk, Permittivity @ 1 MHz (Laminate & prepreg as laminated) Split Post Method, Tested at 50% resin		4.6-4.9	5.40	–	2.5.5.3
Df, Loss Tangent @ 1 MHz (Laminate & prepreg as laminated) Split Post Method, Tested at 50% resin		0.020	0.035	–	2.5.5.3
Volume Resistivity	A. 96/35/90 B. After moisture resistance C. At elevated temperature	– $1.0x10^8$ $1.0x10^6$	– $1.0x10^6$ $1.0x10^3$	MΩ-cm	2.5.17.1
Surface Resistivity	A. 96/35/90 B. After moisture resistance C. At elevated temperature	– $1.0x10^6$ $1.0x10^4$	– $1.0x10^4$ $1.0x10^3$	MΩ	2.5.17.1
Dielectric Breakdown		45	40	kV	2.5.6
Arc Resistance		–	60	Seconds	2.5.1
Electric Strength (Laminate & prepreg as laminated)		39	–	kV/mm (V/mil)	2.5.6.2
Comparative Tracking Index (CTI)		400	–	Class (Volts)	–
Peel Strength	A. Low profile copper foil and very low profile – all copper weights >17 microns B. Standard profile copper 1. After thermal stress 2. At 125ºC (257ºF) 3. After process solutions	– 1.80 1.60 1.8	0.70 (4.0) 1.05 (6.0) 0.70 (4.0) 0.80 (4.5)	N/mm (lb/inch)	2.4.8 2.4.8.2 2.4.8.3 –
Flexural Strength	A. Lengthwise direction B. Crosswise direction	580 460	415 345	$lb/inch^2$	2.4.4
Tensile Strength	A. Lengthwise direction B. Crosswise direction	–	–	$lb/inch^2$	–
Moisture Absorption		0.13	0.8	%	2.6.2.1
Flammability (Laminate & prepreg as laminated)		V-0	V-1	Rating	UL 94
Max Operating Temperature		–	UL Cert	ºC	–

The data, while believed to be accurate and based on analytical methods considered to be reliable, is for information purposes only. Any sales of these products will be governed by the terms and conditions of the agreement under which they are sold.

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