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HB-series

Low Loss Thermoset Bondply

HB-series prepregs are designed to have reduced electrical loss and improved ease of fabrication for multi-layer packages with high performance and high reliability. This thermosetting prepreg is based on a ceramic filled hydrocarbon resin system constructed with a woven matrix of fiberglass fabric.

HB-series is engineered to provide a cost effective bondply with low dielectric loss for RF and high speed multilayer boards with well controlled electrical and mechanical properties. Lower dielectric loss along with sufficient thermal conductivity can reduce heat dissipation in high power RF applications.

Benefits

- Stable multilayer performance
- Low loss ceramic filled thermoset resin system
- Tightly controlled DK tolerance
- Bonds well to most laminates
- Single layer can cover wider circuitry pattern thickness
- Utilizes standard FR-4 process
- Excellent dimensional and thermal stability
- Excellent price/performance ratio

Applications

- RF/multilayer components
- Military
- Multilayer power modules
- High speed digital
- Aerospace components

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HB-series TYPICAL VALUES					
Property	Test Method	Units	HB-360	HB-350F	HB-300F
Dielectric Constant @ 1.9 GHz (after pressing)	IPC-TM 650 2.5.5.5.1 Mod	-	3.67±0.05	3.52±0.05	3.02±0.05
Dissipation Factor @ 1.9 GHz (after pressing)	IPC-TM 650 2.5.5.5.1 Mod	-	0.0027	0.0029	0.0029
Dielectric Constant @ 10 GHz (after pressing)	IPC-TM 650 2.5.5.5.1 Mod	-	3.65±0.05	3.50±0.05	3.00±0.05
Dissipation Factor @ 10 GHz (after pressing)	IPC-TM 650 2.5.5.5.1 Mod	-	0.0032	0.0032	0.0032
Thickness (after pressing) ↓	IPC-TM 650 2.2.18	mils	5	4	4
Volume Resistivity	IPC-TM 650 2.5.17.1	Mohm·cm	6.0×10^{8}	5.8×10^{9}	1.3×10^{9}
Surface Resistivity	IPC-TM 650 2.5.17.1	Mohm	1.0×10^{7}	2.7×10^{9}	5.6×10^{9}
Tensile Strength (MD)	IPC-TM-650 2.4.19	psi	9400	12000	14000
Tensile Strength (TD)	IPC-TM-650 2.4.19	psi	7000	9500	10000
Density	IPC-TM-650 2.3.5	g/㎤	1.80	1.80	1.80
Specific Heat	IPC-TM-650 2.4.50	J/g℃	0.9	0.8	0.8
Thermal Conductivity (Unclad)	IPC-TM-650 2.4.50	W/m/K	0.6	0.5	0.4
Water absorption	IPC-TM 650 2.6.2.1	%	0.08	0.08	0.14
Tg	IPC-TM 650 2.4.24 (TMA)	℃	>250	>250	>250
Td (5% Wt. Loss)	IPC-TM 650 2.4.24.6 (TGA)	℃	370	362	365
Peel Strength (1oz. RTF copper)	IPC-TM 650 2.4.8 (Solder)	lbs. / inch	7	5	5
x-y CTE (50 ~ 150℃)	IPC-TM 650 2.4.41	ppm/℃	15-20	4-5	15-20
Flammability	Internal	-	Non-FR	V-0	V-0
Color	-	-	Ivory	Ivory	Ivory
Lead-Free Process Compatible	-	-	Yes	Yes	Yes

Remark : All reported values are typical and should not be used for specification purposes. In all instances, the user shall determine suitability in any given application.

↓ The actual thickness of each ply that will be added to a multilayer construction can be different based on the weight and distribution of the remaining copper circuitry on the inner-layer surfaces.

An example of a 5mil prepreg for bondply(HB-360) is part# :
HB-360-0050-12” x 18”(HB-360-0050-304mm x 457mm)

Storage

1. After receipt, all bondplies should be immediately moved into a controlled environment.
2. Store the HB-series material flat in a cool dry area away from catalytic conditions such as high radiation, UV light, and direct sunlight, avoiding material contamination. HB-360 shall be certified to meet all the requirements specified when stored as per condition 2 for not less than 90 days after receipt of the shipment by user. For extended storage, products can be stored as per condition 1. Continuous refrigeration is always a good practice for storing prepregs.
   - Condition 1 ; <4℃
   - Condition 2 ; 21 ±2 ℃, Relative Humidity 30~50%

Handling

We recommend using care for the following:

(1) Do not mechanically scrub the surface.
(2) Do not pick up a panel horizontally by one end or edge.
(3) Do not stack panels directly on top of each other.
(4) Care should always be taken to avoid contamination.
(5) Cavities and tooling holes can be punched, drilled or cut.
- Thin entry and a backer board may be needed to support the bondply.

Recommended Bonding cycle

- ✓ Vacuum lamination recommended
- ✓ Heat rise +3.5~6.5 ℃/min to 215℃
- ✓ Maintain pressure up to 600 psi through whole cycle
- ✓ Hold at 215℃ for 60 minutes
- ✓ Cool package under full pressure with -3℃/min rate