

tec-speed 2.1 - VT-461

UL Approval: E214381 Version: B3 /97 /98 /99 /101 /126

Laminate/Prepreg

General Information

- > Mid Dk & Mid Loss
- > FR4.0
- > Excellent Thermal Reliability
- > Lead Free Process Compatible
- > High Tg
- > Ease of Manufacturing

Application

Server, Router, Satellite Communication, Storage, Backpanel, Navigation, etc

Availability

- > Core Thickness: 0.002" (0.05mm) to 0.200" (5mm), available in sheet or panel form
- > Copper Foil: 1/4oz to 12oz
- > Prepregs are available in roll or panel form
- > E-Glass styles: 7628, 1506, 1500, 2113, 2313, 3313, 2116, 1080, 1086, 1078, 106 & 1067, 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 /97 /98 /99 /101 /126

Properties		Test Method	Units	Specification	Typical Value
Thermal Properties					
T _g	DSC	IPC-TM-650 2.4.25	°C	170 minimum	175
	TMA	IPC-TM-650 2.4.24	°C	–	–
T _d		ASTM D3850	°C	340 minimum	370
T ₂₆₀		IPC-TM-650 2.4.24.1	Minute	30 minimum	>60
T ₂₈₈		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 T _g	IPC-TM-650 2.4.24	ppm/°C	60 maximum	40
	After T _g	IPC-TM-650 2.4.24	ppm/°C	300 maximum	240
	Total Expansion (50~260°C)	IPC-TM-650 2.4.24	%	3.0 maximum	2.8
X-Y CTE		IPC-TM-650 2.4.24	ppm/°C	–	11~13
MOT		UL 94	°C	–	130
Electrical Properties					
DK (RC 50%)	@ 1GHz	IPC-TM-650 2.5.5.9	–	5.2 maximum	3.9
	@ 10GHz	IPC-TM-650 2.5.5.13	–	–	3.8
DF (RC 50%)	@ 1GHz	IPC-TM-650 2.5.5.9	–	0.035 maximum	0.0080
	@ 10GHz	IPC-TM-650 2.5.5.13	–	–	0.0095
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 3 (175~250)
Arc Resistance		ASTM D495	Second	60 minimum	195
Mechanical Properties					
Peel Strength (1oz)	As received	IPC-TM-650 2.4.8	lb/in (N/mm)	–	8.0 [1.40]
	After thermal stress	IPC-TM-650 2.4.8	lb/in (N/mm)	6 [1.05] minimum	8.0 [1.40]
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]
Physical Properties					
Moisture Absorption		IPC-TM-650 2.6.2.1	%	0.80 maximum	0.12
Flammability		UL-94	Rating	V-0	V-0

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

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