



Lead-free High Tg Material EM-320/ EM-32B

- Tg > 170 °C, Td > 330 °C
- Excellent thermal stability
- Excellent CAF resistance
- Excellent thermal stability for lead-free process

Basic Laminate Property

Laminate Requirement	Test method	Test condition	Unit	Core thickness		
				≥0.031" (0.78mm)		
	IPC-TM-650			*IPC Spec.	Typical Values	
Glass transition temp.	2.4.25	DSC	°C	min. 170	175	
CTE, X-, Y-axis	2.4.24	Pre-Tg, TMA	ppm/°C	—	12/ 15	
CTE, Z-axis	2.4.24	Alpha 1, TMA	ppm/°C	max. 60	55	
		Alpha 2, TMA	ppm/°C	max. 300	290	
Z-axis Expansion	2.4.24	50~260°C, TMA	%	max. 3.5	3.0	
Decomposition temp.	2.3.40	TGA	°C	min. 340	350	
Thermal stress 10sec 288°C	2.4.13.1	A. Clad	—	Pass Visual	Pass Visual	
		B. Etched	—	Pass Visual	Pass Visual	
Water absorption	2.6.2.1	E-1/105+D-24/23	%	max.0.5	0.14	
Peel strength	0.5 oz	2.4.8	as received	lb/in	—	6.5
			after thermal stress	lb/in	—	6.5
	1.0 oz	2.4.8	as received	lb/in	min. 6	8.5
			after thermal stress	lb/in	min. 6	8.5
Permittivity at 1 MHz (RC 50%)	2.5.5.9	C-24/23/50	—	max. 5.4	4.7	
Loss tangent at 1 MHz (RC 50%)	2.5.5.9	C-24/23/50	—	max. 0.035	0.022	
Volume resistivity	2.5.17.1	C-96/35/90	MΩ-cm	min. 1*10 ⁶	>10 ¹⁰	
Surface resistivity	2.5.17.1	C-96/35/90	MΩ	min. 1*10 ⁴	>10 ⁹	
Flexural strength	Warp	2.4.4	as received	MPa	min. 415	550~600
	Fill		as received	MPa	min. 345	410~460
Flame resistance (UL 94)	UL-94	A&E-24/125	—	min. V-0	V-0	