



High Tg / Low Dk / Halogen Free

EM-390 / EM-39B

- Low Dk for impedance control
- Superior thermal resistance for lead-free process
- Low CTE and high modules
- Good peel strength and suitable for mSAP process
- Applicable IPC Slash Sheets: IPC-4101/127,/128,/130

Basic Laminate Property

Property	Item		IPC-TM-650	Test Condition	Unit	Typical Value
Thermal	Tg		2.4.25	DSC	°C	N/A
			2.4.24	TMA		165
			2.4.24.4	DMA		190
	CTE, X/Y-axis		2.4.24.5	< Tg, TMA	ppm/°C	12/13
	CTE, Z-axis		2.4.24	< Tg, TMA	ppm/°C	35~40
				> Tg, TMA	ppm/°C	160~180
	Z-axis Expansion		2.4.24	50~260°C	%	2.2
	Td		2.4.24.6	TGA (5% W.L)	°C	385
T288		2.4.24.1	Clad	Min	>60	
			Etched	Min	>60	
Electrical	Dk (R/C:50/ 70%)	1GHz	Cavity Resonator	C-24/23/50	-	4.0/3.5
		10GHz				3.8/3.3
	Df (R/C: 50/70%)	1 GHz		C-24/23/50	-	0.007/0.008
		10GHz				0.011/0.012
	Volume Resistivity		2.5.17.1	C-96/35/90	MΩ-cm	>10 ¹⁰
Surface Resistivity		2.5.17.1	C-96/35/90	MΩ	>10 ⁹	
Physical	Water Absorption		2.6.2.1	E-1/105+D-24/23	%	0.08
	Peel Strength (HTE)	0.5 oz	2.4.8	As Received	lb/in	6.0
				After Thermal Stress	lb/in	6.0
	Flexural Strength	Warp	2.4.4	As Received	MPa	510~570
		Fill		As Received	MPa	450~500
Flame Resistance		UL-94	A & E-24/125	-	V-0	

Above typical values are tested under specified constructions and not intended for specification.