



EM-390 / EM-39B

High Tg / Low Dk / Halogen Free

- Applications include: smart phone, tablet, laptop and wearable devices.
- Low Dk for impedance control.
- Low CTE and high modulus.
- Good peel strength and suitable for mSAP process.
- RoHS Compliant
- UL File: E150504
- Applicable IPC Slash Sheets: IPC-4101 /127, /128, /130; IPC-4103 /240, /540

Basic Laminate Property

Property	Item		Typical Value	Unit	Test Condition	IPC-TM-650
Thermal	Tg		N/A	°C	DSC	2.4.25
			165	°C	TMA	2.4.24
			190	°C	DMA	2.4.24.4
	CTE, X/Y-axis		12/13	ppm/°C	< Tg, TMA	2.4.24.5
	CTE, Z-axis		35~40	ppm/°C	< Tg, TMA	2.4.24
			160~180	ppm/°C	> Tg, TMA	
	Z-axis Expansion		2.2	%	50~260°C	2.4.24
	Td		385	°C	TGA (5% W.L)	2.4.24.6
	T288		>60	min.	Clad	2.4.24.1
			>60	min.	Etched	
Thermal Conductivity		0.49	W/m.K	-	ASTM D5470	
Electrical	Dk (R/C: 50/70%)	1GHz	4.0/3.5	-	C-24/23/50	Cavity Resonator
		10GHz	3.8/3.3	-		
	Df (R/C: 50/70%)	1 GHz	0.007/0.008	-	C-24/23/50	Cavity Resonator
		10GHz	0.011/0.012	-		
	Volume Resistivity		>10 ¹⁰	MΩ-cm	C-96/35/90	2.5.17.1
Surface Resistivity		>10 ⁹	MΩ	C-96/35/90	2.5.17.1	
Physical	Water Absorption		0.08	%	E-1/105+D-24/23	2.6.2.1
	Peel Strength (HTE)	0.5 oz	6.0	lb/in	As Received	2.4.8
			6.0	lb/in	After Thermal Stress	
	Flexural Strength	Warp	510~570	MPa	As Received	2.4.4
		Fill	450~500	MPa	As Received	
Flame Resistance		V-0	-	A & E-24/125	UL-94	

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