



GF21 Series CCL Specification Sheet

(Material Designation in UL File E134893:ILM-R1)

Test Item	Treat condition	Specification	Typical Data	
1. Peel Strength lb/in, minimum (1/2OZ) Accepted After thermal stress At 125°C [257°F]	A A 125°C	≥6.0 ≥6.0 ≥4.0	6.0-8.0 6.0-8.0 5.0	
2. Volume Resistivity, minimum, MΩ-cm At elevated temperature E-24/125	E-24/125	≥10 ³	1×10 ⁶	
3. Surface Resistivity, minimum, MΩ At elevated temperature E-24/125	E-24/125	≥10 ³	1×10 ⁶	
4. Moisture Absorption, maximum (%)	E-1/105+des	≤0.80	0.18-0.35	
5. Dielectric Breakdown, minimum KV (Thickness ≥0.50 mm)	D-48/50 D-0.5/23	≥35	38	
6. Flexural Strength, minimum (N/mm ²) (Thickness ≥0.50 mm) Length direction Cross direction	A A	≥415 ≥345	490 405	
7. Arc Resistance, minimum, Second	D-48/50 D-0.5/23	≥60	75	
8. Flammability	A	UL94V0	UL94V0	
9. Solderability	A	Solderable	Solderable	
10. Permittivity at 1MHZ	A	≤ 5.4	4.7-4.9	
11. Loss Tangent at 1MHZ	A	≤0.045	0.025-0.035	
12. Twist And Bow, Max (%) Double Side (≥0.78mm; Size 300mm×300mm) Single Side (≥0.78mm; Size 300mm×300mm) Double Side (0.5~0.78 mm; Size 300mm×300mm) Single Side (0.5~0.78 mm; Size 300mm×300mm)	A A A A	≤1.0 ≤1.5 ≤1.5 ≤2.0	0.20-0.50 0.30-0.70 0.30-0.50 0.35-0.70	
13. Thermal Stress, 288°C, 10 s. Unetched	A	NO DEFECT	55-80sec.	
14. CTI	IEC60112Method	CLASS 3	CLASS 3	
15. Glass Transition TG(DSC, °C)	A	≥110	≥125	
16. Z-axis CTE	Before Tg (μ m/m°C)	TMA	—	50
	After Tg (μ m/m°C)	TMA	—	250
	50~260°C (%)	TMA	—	4
17. Process Applicability: Suitable for drilling and milling process, not punch process.				
18. Application Product: Computer fitting, electric appliances, normal electric product etc. excepting of instrument.				
19. Suitable wire: Aperture >0.3mm, hole side space >0.4mm, wire space >0.1mm, only for single side\double side PWB applications.				
20. Application Size: Set ≤300×300mm, Length : Width ≤6.				

Remark: 1、The meaning of letter and date about treat condition :A-normal condition D- thermostatic water-bath E-bake in high temperature date1/date2: 1-time(hour) 2-temperature(°C) des-dry sample and fall on nature temperature.

2、The speciation of twist and bow is only suitable for CCL upward.