



**Glass cloth and glass mat base epoxy resin
Flame retardant copper clad laminate**

CEM-3-98

■ FEATURES

- Wearing of drill bit is much less than that of FR-4, especially suitable for punch process
- Electrical properties as well as chemical resistance are same as those of FR-4.
- Through-hole reliability and warpage have been improved in order to replace some portions of the FR-4 market.
- IPC-4101E Specification is applicable.
- Excellent in anti-tracking property (CTI=600V)

■ PERFORMANCE LIST

Characteristics	Unit	Condition	Typical Values	SPEC	Test Method	
Volume resistivity	MΩ-cm	C-96/35/90	1.5×10^7	$10^6 \uparrow$	2.5.17	
Surface resistivity	MΩ	C-96/35/90	9.7×10^5	$10^4 \uparrow$	2.5.17	
Permittivity 1MHz	-	C-24/23/50	4.5	5.4 ↓	2.5.5.2	
Loss tangent 1MHz	-	C-24/23/50	0.021	0.035 ↓	2.5.5.2	
Dielectric breakdown	KV	D-48/50	60 ↑	40 ↑	2.5.6	
Moisture absorption	%	D-24/23	0.09	0.50 ↓	2.6.2.1	
Flammability	-	C-48/23/50	V-0	V-0	UL94	
Peel strength 1oz ($\geq 0.5\text{mm}$)	lb/in	288°C x 10" solder floating	8-12	6 ↑	2.4.8	
Thermal stress	SEC	260°C dipping	200 ↑	40 ↑	2.4.13.1	
Flexural strength	LW	N/mm ²	A	300-400	276 ↑	2.4.4
	CW	N/mm ²	A	200-300	186 ↑	2.4.4
Dimensional stability X-Y axis	%	E-2/150	<0.065	0.11 Max.	2.4.39	
Coefficient of thermal expansion						
Z-axis before Tg	ppm/°C	TMA	55	N/A	2.4.24	
Z-axis after Tg	ppm/°C	TMA	285			
Glass transition temperature	°C	DSC	130 ± 5	N/A	2.4.25	
Punchability	Kg/cm ²	Shear strength ASTM D-732	1150	N/A	ASTM D-732	
Comparative Tracking Index	V	C-96/20/65	600	PLC 0	ASTM D-3638	
Decomposition temperature (Td 5% W/L)	°C	TGA	310	N/A	2.4.24.6	

Data shown are nominal values for reference only.

NOTE:

The average value in the table refers to samples of .062" 1/1.
Test method per IPC-TM-650

■ CERTIFICATION UL

- UL File No.: E98983
- ANSI TYPE: No ANSI