



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

CEM-3-09

■ FEATURES

- Excellent in thermal conductivity and anti-tracking property
- The CTE of X and Y-axis before Tg under 20 ppm
- Electrical property as well as chemical resistance are the same as those FR-4
- Through-hole reliability and warpage have been improved in order to replace some portions of the FR-4 market.
- IPC-4101C Specification is applicable.

■ PERFORMANCE LIST

Characteristics		Unit	Conditioning	Typical Values	SPEC	Test Method
Volume resistivity		MΩ-cm	C-96/35/90	5.0×10^8	$10^6 \uparrow$	2.5.17
Surface resistivity		MΩ	C-96/35/90	5.0×10^7	$10^4 \uparrow$	2.5.17
Permittivity 1MHZ		-	C-24/23/50	5.1	5.4 ↓	2.5.5.2
Loss tangent 1MHZ		-	C-24/23/50	0.020	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	94V0	94V0	UL94
Peel strength H oz		lb/in	288°C x 10" solder floating	8-10	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 0.5/170	<0.065	0.11 Max	2.4.39
Coefficient of thermal expansion Z-axis before Tg Z-axis after Tg X-axis before Tg Y-axis before Tg		ppm/°C ppm/°C ppm/°C ppm/°C	TMA TMA TMA TMA	30-50 160-260 16-18 17-19	N/A	2.4.24
Glass transition temp		°C	DSC	135 ± 5	N/A	2.4.25
Thermal Conductivity		W/mK	A	1.0	N/A	ASTM D-5470
			A	2.0	N/A	ASTM E-1461
Punchability		Kg/cm ²	Shear strength ASTM D-732	1150	N/A	ASTM D-732
Comparative Tracking Index		V	Etched	600 ↑	N/A	ASTM-D3638
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:CEM-3