



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

## CEM-3-10

### ■ 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 the same as those of FR-4.
- Excellent in anti-tracking property (CTI=600V)
- UL file number E98983(s)
- 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	1.4x10 <sup>7</sup>	10 <sup>6</sup> ↑	2.5.17	
Surface resistivity	MΩ	C-96/35/90	9.5x10 <sup>5</sup>	10 <sup>4</sup> ↑	2.5.17	
Permittivity 1MHZ	—	C-24/23/50	4.7	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	94V0	94V0	UL94	
Peel strength 1 oz	lb/in	288°Cx10" solder floating	9-11	6 ↑	2.4.8	
Thermal stress	SEC	260°C dipping	200 ↑	40 ↑	2.4.13.1	
Flexural strength	LW	N/mm <sup>2</sup>	A	300-400	276 ↑	2.4.4
	CW	N/mm <sup>2</sup>	A	200-300	186 ↑	2.4.4
Dimensional stability X-Y axis	%	E-2.0/150	< 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 temp	°C	DSC	135 ± 5	N/A	2.4.25	
Decomposition temp	°C	TGA (5% WT% Loss)	315-335	N/A	2.4.24.6	
Punchability	Kg/cm <sup>2</sup>	Shear strength ASTM D-732	1050	N/A	ASTM D-732	
Comparative Tracking Index	V	C-96/20/65	600	PLC0	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.

### ■ CERTIFICATION UL

- UL File No. : E98983
- ANSI TYPE:CEM-3