



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

## CEM-3-01PY

### FEATURES

- Halogen, antimony, and red phosphorous free
- Flammability meets UL 94V-0
- UV blocking type
- Wearing of drill bit is much less than that of FR-4, especially suitable for punch process
- UL file number E98983
- Through-hole reliability and warpage have been improved in order to replace some portions of the FR-4 market.
- IPC-4101E Specification is applicable.

### PERFORMANCE LIST

Characteristics		Unit	Condition	Typical Values	SPEC	Test Method
Volume resistivity		MΩ-cm	C-96/35/90	$5.0 \times 10^8$	$10^6 \uparrow$	2.5.17
Surface resistivity		MΩ	C-96/35/90	$5.0 \times 10^7$	$10^4 \uparrow$	2.5.17
Permittivity 1MHz		-	C-24/23/50	4.5	5.4 ↓	2.5.5.2
Loss tangent 1MHz		-	C-24/23/50	0.020	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	V-0	V-0	UL94
Peel strength 1oz ( $\geq 0.5\text{mm}$ )		lb/in	288°C x 10" solder floating	8-11	5.71 ↑	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-2/150	<0.065	0.11 Max	2.4.39
Coefficient of thermal expansion						
Z-axis before Tg		ppm/°C	TMA	30-50	N/A	2.4.24
Z-axis after Tg		ppm/°C	TMA	220-320		
Glass transition temperature		°C	DSC	105 ± 5	N/A	2.4.25
Punchability		Kg/cm <sup>2</sup>	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