



**Glass cloth base epoxy resin  
 flame retardant copper clad laminate**

# NP-140TLPY

**■ FEATURES**

- Excellent dimensional stability, through-hole reliability
- High CTI value
- Excellent electrical, chemical and heat resistance properties
- U. L file number E98983
- IPC-4101C specification is applicable

**■ PERFORMANCE LIST**

Characteristics	Unit	Conditioning	Typical Values	SPEC	Test Method
Volume resistivity	MΩ-cm	C-96/35/90	5 x 10 <sup>9</sup>	10 <sup>6</sup> ↑	2.5.17
Surface resistivity	MΩ	C-96/35/90	5 x 10 <sup>7</sup>	10 <sup>4</sup> ↑	2.5.17
Permittivity 1MHZ	-	C-24/23/50	4.2~4.4	5.4 ↓	2.5.5.9
Permittivity 1GHZ	-	C-24/23/50	3.8-4.0	-	2.5.5.9
Loss Tangent 1MHZ	-	C-24/23/50	0.012~0.020	0.035 ↓	2.5.5.9
Loss Tangent 1GHZ	-	C-24/23/50	0.012-0.020	-	2.5.5.9
Arc resistance	SEC	D-48/50+D-0.5/23	120 ↑	60 ↑	2.5.1
Dielectric breakdown	KV	D-48/50	60 ↑	40 ↑	2.5.6
Moisture absorption	%	D-24/23	0.02~0.30	0.35 ↓	2.6.2.1
Flammability	-	C-48/23/50	94V0	94V0	UL94
Peel strength 1 oz	lb/in	288°C x 10" solder floating	8-12	4.5 ↑	2.4.8
Thermal stress	SEC	288°C solder dipping	90 ↑	10 ↑	2.4.13.1
Dimensional stability X-Y axis	%	E-0.5/170	0.005~0.030	0.05 ↓	2.4.39
Coefficient of thermal expansion				N/A	2.4.24
Z-axis before Tg	ppm/°C	TMA	50-70		
Z-axis after Tg	ppm/°C	TMA	200-300		
Glass transition temp	°C	DSC	140 ± 5	N/A	2.4.25
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

**NOTE:**

The average value in the table refers to samples of .020" 1/1.

Test method per IPC-TM-650

Data shown are nominal values for reference only

**■ CERTIFICATION UL**

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