



NAN YA PLASTICS CORPORATION

ELECTRONIC MATERIALS DIVISION.

COPPER CLAD LAMINATE DEPARTMENT

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

NO. 201. TUNG HWA N. ROAD,
TAIPEI, TAIWAN.

NP-180R

■ FEATURES

- High Tg 175°C (DSC)
- Excellent dimensional stability through-hole reliability
- Excellent electrical, chemical and heat resistance properties
- IPC-4101B specification is applicable
- U.L. designation:ANSI grade FR-5
- U.L. file number E98983
- Outstanding heat resistance
- High luminance of multi-functional epoxy contrast with copper for A.O.I.

■ PERFORMANCE LIST

Characteristics	Unit	Conditioning	Typical Values	SPEC	Test Method	
Volume resistivity	MΩ-cm	C-96/35/90	5 x10 ⁹ ~ 5x10 ¹⁰	10 ⁶ ↑	2.5.17	
Surface resistivity	MΩ	C-96/35/90	5 x10 ⁸ ~ 5x10 ⁹	10 ⁴ ↑	2.5.17	
Permittivity 1MHZ	-	C-24/23/50	4.6-4.8	5.4 ↓	2.5.5.9	
Permittivity 1GHZ	-	C-24/23/50	4.3-4.5	-	2.5.5.9	
Loss Tangent 1MHZ	-	C-24/23/50	0.015-0.020	0.035 ↓	2.5.5.9	
Loss Tangent 1GHZ	-	C-24/23/50	0.014-0.018	-	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	0.05-0.10	0.35 ↓	2.6.2.1	
Flammability	-	C-48/23/50	94V0	94V0	UL94	
Peel strength 1 oz	lb/in	288°Cx10" solder floating	8-10	6 ↑	2.4.8	
Thermal stress	SEC	288°C solder dipping	600 ↑	10 ↑	2.4.13.1	
Pressure cooker (2 atm 120°C)	1/2 hr	SEC	288°C dipping	600 ↑	N/A	-
	1 hr	SEC	288°C dipping	600 ↑	N/A	-
	2 hr	SEC	288°C dipping	600	N/A	-
Flexural strength	LW	N/mm ²	A	480-550	415 ↑	2.4.4
	CW	N/mm ²	A	415-480	345 ↑	2.4.4
Dimensional stability X-Y axis	%	E-0.5/170	0.005-0.030	0.050 ↓	2.4.39	
Coefficient of thermal expansion						
Z-axis before Tg	ppm/°C	TMA	50-70	N/A	2.4.24	
Z-axis after Tg	ppm/°C	TMA	200-300			
Glass transition temp	°C	DSC	175 ± 5	N/A	2.4.25	

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