



**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.

## NPG-170R

### ■ FEATURES

- Halogen, antimony, and red phosphorous free
- Flammability meets UL 94 V-0
- Excellent long term reliability
- UV blocking type
- Superior CAF-Resistance (Anti-migration)
- Reactive type flame retardants
- High Tg 170°C (DSC) and low C.T.E will provide excellent dimensional stability and through-hole reliability
- ANSI type : FR-4

### ■ PERFORMANCE LIST

Characteristics	Unit	Conditioning	Typical Values	SPEC	Test Method	
Volume resistivity	MΩ-cm	C-96/35/90	5 x10 <sup>8</sup> ~ 5x10 <sup>9</sup>	10 <sup>6</sup> ↑	2.5.17	
Surface resistivity	MΩ	C-96/35/90	5 x10 <sup>6</sup> ~ 5x10 <sup>7</sup>	10 <sup>4</sup> ↑	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	4.1-4.3	-	2.5.5.9	
Loss Tangent 1MHZ	-	D-24/23/50	0.014-0.016	0.035 ↓	2.5.5.9	
Loss Tangent 1GHZ	-	D-24/23/50	0.012-0.014	-	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-24/23/50+E-24/125	94V0	94V0	UL94	
Peel strength 1 oz	lb/in	288°Cx10" solder floating	7-9	6 ↑	2.4.8	
Thermal stress	SEC	288°C solder dipping	200 ↑	10 ↑	2.4.13.1	
Pressure cooker (2 atm 120°C)	1/2 hr	SEC	288°C dipping	150 ↑	N/A	-
	1 hr	SEC	288°C dipping	150 ↑	N/A	-
	2 hr	SEC	288°C dipping	150	N/A	-
Flexural strength	LW	N/mm <sup>2</sup>	A	430-500	415 ↑	2.4.4
	CW	N/mm <sup>2</sup>	A	350-420	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 X-Y axis	ppm/°C	TMA	9-13	N/A	2.4.24	
Z-axis before Tg	ppm/°C	TMA	30-50			
Z-axis after Tg	ppm/°C	TMA	200-230			
Glass transition temp	°C	DSC	170 ± 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