



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

# NPG-200WT

**■ 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
- White material with high reflectance of visible light, much suitable for chip LED substrate.
- ANSI type : No ANSI

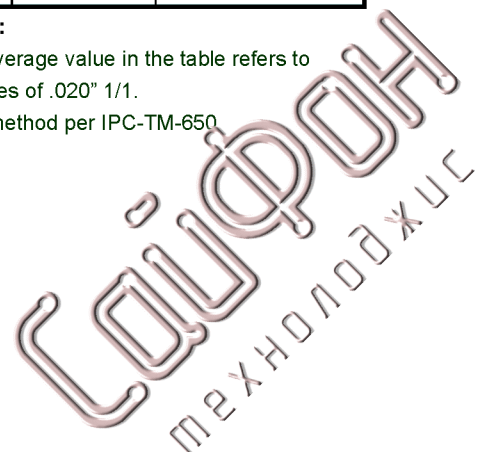
**■ PERFORMANCE LIST**

Characteristics	Unit	Conditioning	Typical Values	SPEC	Test Method	
Volume resistivity	MΩ-cm	C-96/35/90	6.0 x10 <sup>10</sup>	10 <sup>6</sup> ↑	2.5.17	
Surface resistivity	MΩ	C-96/35/90	6.0 x10 <sup>9</sup>	10 <sup>4</sup> ↑	2.5.17	
Permittivity 1 MHZ	-	C-24/23/50	5.1-5.3	5.4 ↓	2.5.5.9	
Loss Tangent 1 MHZ	-	C-24/23/50	0.018-0.020	0.035 ↓	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	%	C-24/23	0.23-0.28	0.7 ↓	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	6-9	6 ↑	2.4.8	
Thermal stress	SEC	288°C solder dipping	600 ↑	10 ↑	2.4.13.1	
Glass transition temp	°C	DMA	200±10	N/A	2.4.25	
Dimensional stability X-Y axis	%	E 4/105	0.01-0.03	0.05 ↓	2.4.39	
Coefficient of thermal expansion	ppm/°C	TMA	11-13	N/A	2.4.24	
						X-Y axis
						Z-axis before Tg
Z-axis after Tg	ppm/°C	TMA	165-195			
Decomposition Temperature (Td 5% W/L)	°C	TGA	395	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 .020" 1/1.  
 Test method per IPC-TM-650





**■ CONSTRUCTION:**

THICKNESS		CONSTRUCTION		THICKNESS		CONSTRUCTION	
mm	mil	Glass style	plies	mm	mil	Glass style	plies
0.04	1.6	1027	1	0.2	8	2116	2
0.05	2	1078	1	0.25	10	2313	3
0.06 1P	2.5	1078	1	0.3	12	2116	3
0.06 2P	2.5	1037	2	0.4 2P	16	7567	2
0.10	4	1078	2	0.4 4P	16	2116	4
0.15 2P	6	2112	2	0.6	24	7567	3
0.15 3P	6	1078	3	0.8	31.5	7567	4

**■ PRODUCT SIZE & THICKNESS**

THICKNESS	COPPER CLADDING	SIZE		THICKNESS TOLERANCE
INCH(mm)	OZ (µm)	INCH	mm	
0.0012(0.03)	3/8 (12)	48.8 x 36.6	1240 x 0930	IPC-4101C SPEC CLASS C/M
to	to	48.8 x 40.5	1240 x 1030	
0.047(1.2)	3.0 (105)	48.8 x 42.5	1240 x 1080	

**■ Keeping the core and prepreg in the same grain direction is crucial to ensure the flatness of multilayer boards.**

**Grain direction is shown on the Certificate of Conformance**

**■ CERTIFICATION UL**

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

