



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

NPG-200W

■ FEATURES

- Halogen, antimony, and red phosphorous free
- Excellent long term reliability
- UV blocking type
- Superior anti-yellowing
- 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	6.5×10^{10}	$10^6 \uparrow$	2.5.17
Surface resistivity	MΩ	C-96/35/90	6.5×10^9	$10^4 \uparrow$	2.5.17
Permittivity 1 MHz	-	C-24/23/50	4.9-5.1	5.4 ↓	2.5.5.9
Loss Tangent 1 MHz	-	C-24/23/50	0.016-0.018	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	0.19-0.23	0.8 ↓	2.6.2.1
Flammability	-	C-24/23/50+E-24/125	HB	HB	UL94
Peel strength 1 oz (≥0.5mm)	lb/in	288°C x 10" solder floating	5-6	5 ↑	2.4.8
Thermal stress	SEC	288°C solder dipping	600 ↑	10 ↑	2.4.13.1
Glass transition temp	°C	DSC	>170	N/A	2.4.25
Dimensional stability X-Y axis	%	E 4/105	0.01-0.03	0.05 ↓	2.4.39
Thermal conductivity	W/m.K	-	0.65	-	ASTM-D5470
Coefficient of thermal expansion					
X-Y axis	ppm/°C	TMA	12-14	N/A	2.4.24
Z-axis before Tg	ppm/°C	TMA	33-43		
Z-axis after Tg	ppm/°C	TMA	165-195		

NOTE:

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

Test method per IPC-TM-650

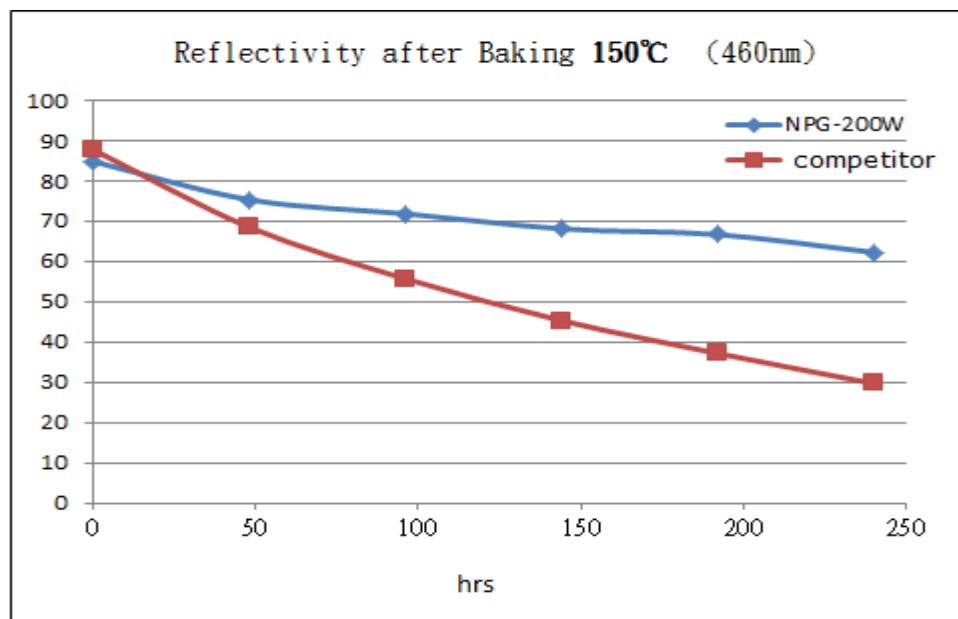
Data shown are nominal values for reference only.



■ CONSTRUCTION

THICKNESS		CONSTRUCTION		THICKNESS		CONSTRUCTION	
mm	mil	Glass style	plies	mm	mil	Glass style	plies
0.04	1.6	1037	1	0.2	8	2116	2
0.05	2	1078	1	0.25 2P	10	2155	3
0.06 1P	2.5	1078	1	0.3	12	2116	3
0.06 2P	2.5	1037	2	0.4 4P	16	2116	4
0.10	4	1078	2	0.45 3P	18	1506	3
0.15 2P	6	2112	2	0.6 6P	24	2116	6
0.15 3P	6	1078	3	0.8 8P	31.5	2116	8

■ REFLECTIVITY PROPERTIES



■ 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-4101E 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