



**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.

## UV BLOCK FR-4-86

### ■ FEATURES

- High luminance of epoxy contrast with copper for laser type A.O.I.
- UV solder mask may be applied simultaneously to increase yields.
- High performance epoxy blended to achieve higher heat resistance than that of FR-4-86
- Thickness 0.8mm capability.

### ■ PERFORMANCE LIST

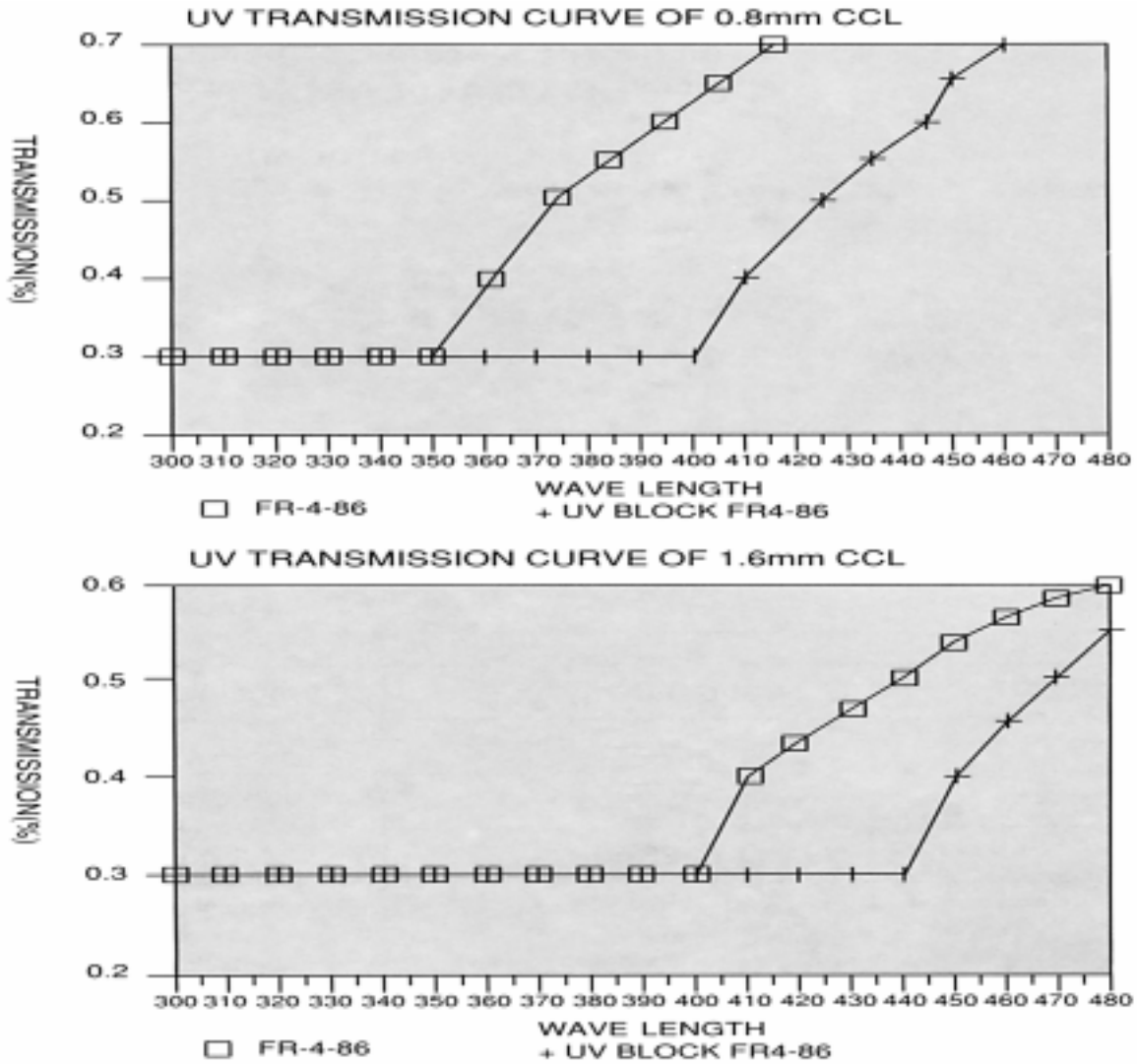
Characteristics	Unit	Conditioning	Typical Values	SPEC	Test Method	
Volume resistivity	MΩ-cm	C-96/35/90	5 x10 <sup>8</sup> ~ 5x10 <sup>9</sup>	10 <sup>6</sup> ↑	2.5.17	
Surface resistivity	MΩ	C-96/35/90	5 x10 <sup>6</sup> ~ 5x10 <sup>7</sup>	10 <sup>4</sup> ↑	2.5.17	
Permittivity 1MHZ	-	C-24/23/50	4.5-4.7	5.4 ↓	2.5.5.9	
Permittivity 1GHZ	-	C-24/23/50	4.0-4.2	-	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	0.012-0.014	-	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	10-14	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	480-550	415 ↑	2.4.4
	CW	N/mm <sup>2</sup>	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	250-350			
Glass transition temp	°C	DSC	140 ± 5	N/A	2.4.25	

**NOTE:**

The average value in the table refers to samples of .062" 1/1.  
 Test method per IPC-TM-650

Data shown are nominal values for reference only.

■ Low UV Transmission



■ High luminance of epoxy contrast with copper

FR-4-86 1.6 mm

Orbotech's

