NAN YA PLASTICS CORPORATION
ELECTRONIC MATERIALS DIVISION.
COPPER CLAD LAMINATE DEPARTMENT
NO. 201. TUNG HWA N. ROAD, TAIPEI, TAIWAN.

Issued:
New: 2016/06/01

Glass cloth base epoxy resin
flame retardant copper clad laminate

NP-140F

■ 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

■ PERFORMANCE LIST

Characteristics		Unit	Conditioning	Typical Values	SPEC	Test Method
Volume resistivity		MΩ-cm	C-96/35/90	5 x10^8 ~ 5x10^9	10^6 ↑	2.5.17
Surface resistivity		MΩ	C-96/35/90	5 x10^6 ~ 5x10^7	10^4 ↑	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-48/23/50	94V0	94V0	UL94
Peel strength 1 oz		lb/in	288℃x10" solder floating	9-13	6 ↑	2.4.8
Thermal stress		SEC	288℃ solder dipping	200 ↑	10 ↑	2.4.13.1
Pressure cooker (2 atm 120℃)	1/2 hr	SEC	288℃ dipping	150↑	N/A	-
	1 hr	SEC	288℃ dipping	150↑	N/A	-
	2 hr	SEC	288℃ dipping	150	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 Z-axis after Tg		 ppm/℃ ppm/℃	 TMA TMA	 50-60 220-320	N/A	2.4.24
Glass transition temp		℃	DSC	135 ± 5	N/A	2.4.25
Decomposition Temperature (Td 5% W/L)		℃	TGA	310	N/A	2.4.24.6

Data shown are nominal values for reference only.

Noted: NP-140F product is NOT suitable for automobile relative application.

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

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補充: NP-140F 與 NP-140TL 基本物性對比:

規格			1/1 1.6mm	
			NP-140F	NP-140TL
peeling	NO.1		12.60	13.48
	NO.2		12.97	13.07
PCT 2hr	吸水率 (%)		0.35	0.38
	288℃耐熱性(min)		4↑	4↑
Tg-DSC	不含銅	Tg1	138.36	139.34
		Tg2	138.03	139.18
		△Tg	-0.33	-0.16
TMA(不含銅)	260℃(min)	含銅	11	10
		不含銅	16	18
	288℃(min)	不含銅	2	2
CTE(不含銅)	α1		40.75	47.53
	α2		238.9	270.0
	%		3.50	4.09
CTE(不含銅)	Tg		128.50	129.03
彎曲強度	經向		633.56	625.88
	緯向		509.75	483.90