

## 紙質酚醛樹脂銅箔積層板

COPPER CLAD PAPER PHENOLIC LAMINATE  
ETL-XPC-601 (HB grade)

## ■特長

- 高密度裝配用非難燃性類型之Paper-Phenol通用材料。
- 優越之低溫打孔性  
具低溫打孔性，可提昇尺寸精密度，適用於IC零件裝配加工、細小間距1.78mm之連接器。
- 尺寸變化、彎曲度小  
經印刷電路加工程序後，尺寸安定、彎曲度小，適合自動化高密度裝配生產。
- 符合UL746E DSR(▲標誌)

## ■用途

- 收音機、收錄音機、時鐘、數字處理機、電腦鍵盤等

## ■FEATURES

- Among the paper phenol material, this is the lowest cost universal use material for high density assembly processes and non-flame retardant.
- Excellent low temperature punchability  
Low temperature punching can be done. Because of low dimensional variation, this material is suitable for mounting of chip components, flat pack IC's, etc., and also for 1.78mm pitch for narrow interval mounting.
- Dimensional change and warpage are small  
Trouble has been prevented in the various automatic processes due to the minimized dimensional and warp behavior of this material during printed circuit board fabricating, component mounting, soldering etc.
- Meet UL746E Direct Support Requirement(▲MARK).

## ■APPLICATIONS

- Radios, Radio-cassette recorder/players, Clocks, Word processor, Personal computer keyboards, etc.

## ■性能表 PERFORMANCE LIST

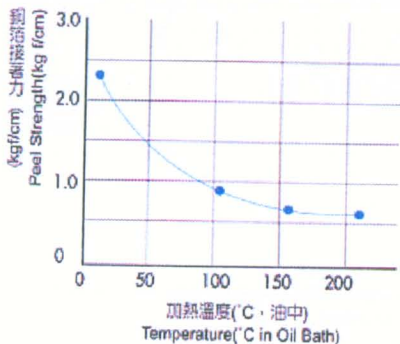
試驗項目 Test Item	單位 Unit	處理條件 Condition	標準值 Standard Value	品質規格值 Guarantee Value	
體積阻抗 Volume Resistivity	Ω-cm	C-96/20/65	$1 \times 10^{12} - 5 \times 10^{13}$	Above $1 \times 10^{12}$	
		C-96/20/65+C-96/40/90	$1 \times 10^{12} - 1 \times 10^{13}$	Above $1 \times 10^{11}$	
表面阻抗 Surface Resistance	Ω	接著劑面 Adhesive Surface	C-96/20/65	$5 \times 10^{11} - 1 \times 10^{12}$	Above $1 \times 10^{10}$
			C96/20/65+C-96/40/90	$1 \times 10^{10} - 1 \times 10^{11}$	Above $1 \times 10^9$
絕緣阻抗 Insulation Resistance	Ω	積層板面 Laminate Surface	C96/20/65	$5 \times 10^9 - 1 \times 10^{11}$	Above $1 \times 10^9$
			C96/20/65+C-96/40/90	$5 \times 10^9 - 1 \times 10^9$	Above $1 \times 10^8$
介電常數(1MHz) Dielectric Constant	—	C-96/20/65	$5 \times 10^{11} - 1 \times 10^{12}$	Above $1 \times 10^{10}$	
介電損耗因數(1MHz) Dissipation Factor	—	C-96/20/65+D-2/100	$5 \times 10^7 - 5 \times 10^8$	Above $1 \times 10^7$	
焊錫耐熱性(260°C) Solder Heat Resistance	Sec	A	4.3-5.0	Less than 5.5	
剝離強度 Peel Strength	Kgf/cm	C-96/20/65+D-48/50	5.3-5.8	Less than 6.0	
		C96/20/65	0.035-0.046	Less than 0.05	
抗折強度(橫向) Flexural Strength (crosswise direction)	Kgf/mm <sup>2</sup>	C-96/20/65+D-48/50	0.050-0.060	Less than 0.08	
吸水率 Water Absorption	%	A	20-35	Above 10	
耐熱性 Heat Resistance	—	A	1.9-2.3	Above 1.5	
難燃性(UL94法) Flame Resistance (UL94 method)	Sec	S	1.9-2.3	Above 1.5	
耐鹼性 Alkali Resistance	—	A	12-18	Above 10	
打孔加工性 Punching Temperature	—	A	E-24/50+D-24/23	0.8-1.4	Less than 1.8
	—	A	205-210°C 30 min no blistering	190°C 30 min no blistering	
	—	UL Sub 94	—	—	
	—	Immersion in 3% NaOH 40°C(3 mins)	無異常 No abnormality	無異常 No abnormality	
	—	A	Suitable temperature 50-70°C	—	

■以上數據其試片厚度1.6mm(Note: test specimen thickness is 1.6mm)



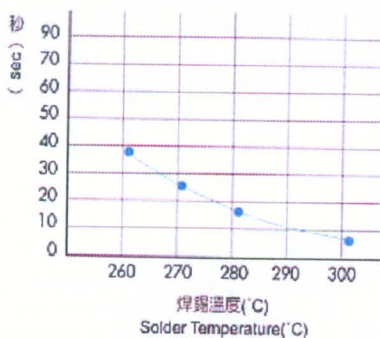
■ 銅箔接著力之溫度特性

Characteristics of Peel Strength vs. Temperature



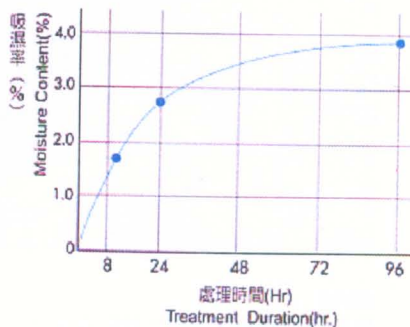
■ 焊錫中耐熱性之溫度特性

Characteristics of Solder Heat Resistance



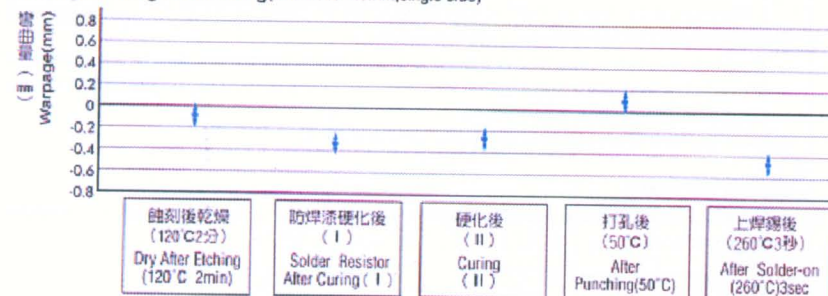
■ 吸濕率 (耐濕性) (60°Cx95%R.H.)

Variations of Moisture Absorption (60°Cx95%R.H.)



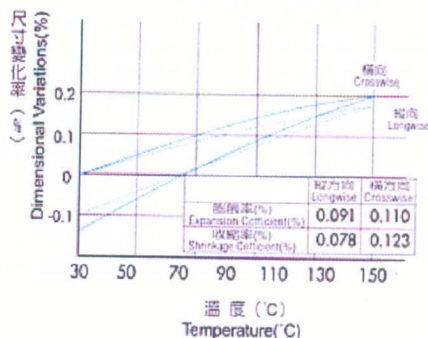
■ 印刷電路板加工時之彎曲 (板厚1.6mm, 單面銅箔)

Warpage During Processing (thickness 1.6mm, single side)



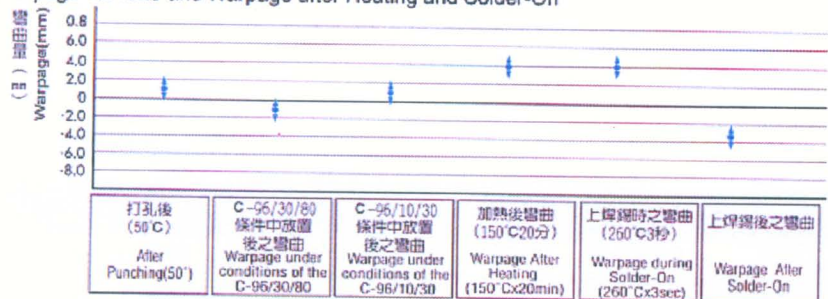
■ 加熱膨脹收縮率

Heat Expansion and Cooling Shrinkage



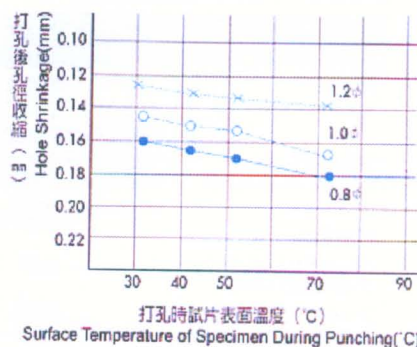
■ 彎曲隨時間之變化、加熱後及上焊錫後之彎曲

Warpage vs. Time and Warpage after Heating and Solder-On



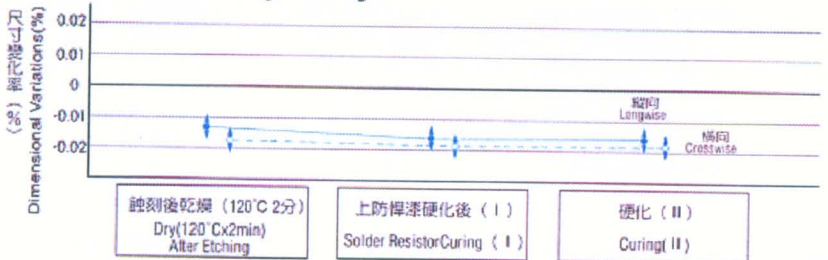
■ 打孔後孔徑收縮

Hole Shrinkage after Punching



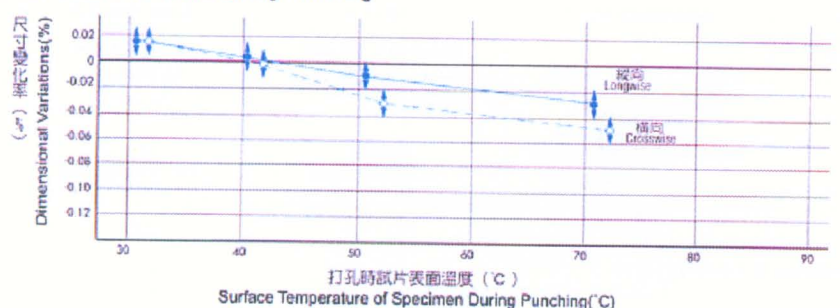
■ 在印刷工程中之尺寸變化

Dimensional Variations During Punching



■ 在打孔工程中之尺寸變化

Dimensional Variations During Punching



■ 打孔溫度與彎曲量

Warpage vs. Punching Temperature

