銀貫孔用紙質酚醛樹脂積層板

COPPER CLAD PAPER PHENOLIC LAMINATE

ETL-XPC-204 (S type)

(For FR-1, Silver through Hole Laminate)

ETL-XPC-204(S Type)銀通孔用紙基材酚醛樹脂銅箔積層板是針對印刷電路板高密度配線化的需求，通孔間隔從2.0mm到1.5mm狹窄間隔而研發，具耐銀移性，高耐濕性，高絕緣性等特性。

ETL-XPC-204(S Type), silver migration resistance, high humidity endurance and good insulation characteristics, is a newly developed paper based phenolic resin copper clad laminate for silver through hole. It responds to the requirement of high-density wiring printed circuit board made by through-hole pitch narrow from 2.0mm to 1.5mm.

■特 性

●優越之低溫打孔性(70~90℃)
適用IC(1.78mm間距)，連接器(2.0mm間距)等高密度打孔加工。

●尺寸變化，彎曲度小
經印刷電路加工，零件裝配加工等程序後，尺寸仍得安定，彎曲度小，適合自動化生產與高密度裝配。

●優越之電氣火災安全性
耐漏電破壞性，難燃性優越，又由於吸濕所造成之絕緣劣化很少，適用於電源電路、高壓電路。

●優越之耐熱性
符合UL所規定之130℃連續使用溫度，又由於電子零件發熱所致之變色也很少，因此適用於高密度裝配。

●優越之耐銀移性
銀貫孔間，銀線路間不易起銀移性。

●符合RoHS法規要求，適用於無鉛焊錫製程。

■*FEATURES*

●Low temperature (60~90℃) punching can be done.
Because of low dimensional variation, this material is suitable for high density punching process, flat pack IC's etc...and also for 1.78mm pitch IC and 2.0mm pitch connectors for narrow interval mounting.

●Warpage behavior has been suppressed to a low level.
Trouble has been prevented in the various automated processes due to the minimized warpage behavior of this material during printed circuit board fabrication, component mounting, soldering etc.

●Electrical fire safety is excellent.
Due to minimized insuiation dagradation from moisture absorption, long periods of use in high temperature and high humidity are possible. In addition, because of a good tracking characteristics, electrostatic discharge fires due to accumulated dust and dew are prevented.

●Excellent heat resistance
This material has received recognition for 130℃ in addition, color change due to heat has been minimized, and this material is ideal for mounting of heat generating components.

●Excellent resistance to silver migration
Silver migration is virtually nonexistant between silver through holes and between silver circuits.

●Conform to the claim of RoHS. More suitable for lead-free solder process.

■性能表 PERFORMANCE LIST

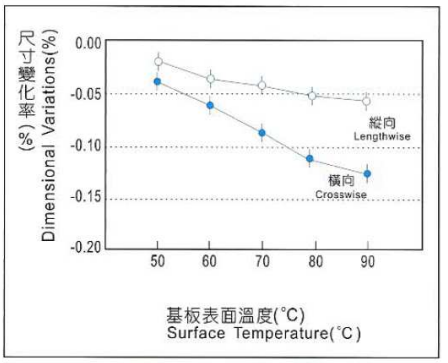
試驗項目 Test Item		單位 Unit	處理條件 Condition	實測標準值 Standard Value	品管規格值 Guarantee Value
體積阻抗 Volume Resistivity		Ω-cm	C-96/20/65	5×10^{13}~5×10^{14}	Above 5×10^{12}
			C-96/20/65+C-96/40/90	1×10^{13}~1×10^{14}	Above 5×10^{11}
表面阻抗 Surface Resistance		Ω	C-96/20/65	1×10^{12}~5×10^{13}	Above 1×10^{11}
			C-96/20/65+C-96/40/90	5×10^{11}~5×10^{12}	Above 1×10^{10}
絕緣阻抗 Insulation Resistance		Ω	C-96/20/65	5×10^{12}~5×10^{13}	Above 1×10^{12}
			C-96/20/65+D-2/100	1×10^{10}~5×10^{11}	Above 1×10^{10}
			C-96/20/65+D-8/100	5×10^{8}~5×10^{9}	Above 1×10^{8}
			PCT 8hr 2atm 121℃	1×10^{8}~1×10^{9}	Above 1×10^{8}
介電常數 (1MHZ) Dielectric Constant		—	C-96/20/65	3.7~4.3	Less than 5.3
			C-96/20/65+D-48/50	4.4~4.8	Less than 5.6
介電損耗因數 (1MHZ) Dissipation Factor		—	C-96/20/65	0.025~0.032	Less than 0.045
			C-96/20/65+D-48/50	0.033~0.039	Less than 0.055
焊錫耐熱度(260℃) Solder heat Resistance		sec	A	40~60	Above 10
剝離強度 Peel Strength	銅箔(35μm) Copper Foil	Kgf/cm	A	1.90~2.40	Above 1.5
			S	1.90~2.40	Above 1.5
耐熱性 Heat Resistance		—	A	205-210℃ 30 min no blistering	190℃ 30 min no blistering
抗折強度(橫向) Flexural Strength	縱向 Lengthwise	Kgf/mm²	A	17~19	Above 10
	橫向 Crosswise			16~18	Above 10
吸水率 Water Absorption		%	E-24/50+D-24/23	0.50~0.75	Less than 0.8
			E-1/80+PCT 8hr (121℃)	3.40~3.90	Less than 4.0
耐燃性 (UL94法) Flame Resistance (UL 94 method)		sec	A&E-168/70	Less than $\overline{X}$=3.5 Max=8	Less than $\overline{X}$=3.5 Less than Max=10
尺寸變化率 Shinkage after heating	縱向 Lengthwise	%	E-1/80+E-2/150	0.095~0.115	—
	橫向 Crosswise			0.135~0.155	—
耐鹼性 Alkali Resistance		—	Immersion in 3 % NaOH 40℃ (3 mins)	無異常 No abnormality	無異常 No abnormality
熱膨脹係數 (TMA法)熱處理後E-15/150	X	x 10^{-5}/℃	30~150℃	1.2~1.4	—
	Y			2.0~2.2	—
	Z			28~30	—
打孔加工性 Punching Temperature		—	A	Suitable temperature 70~90℃	—
耐漏電性(CTI值)		v	A	≧600	≧600

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

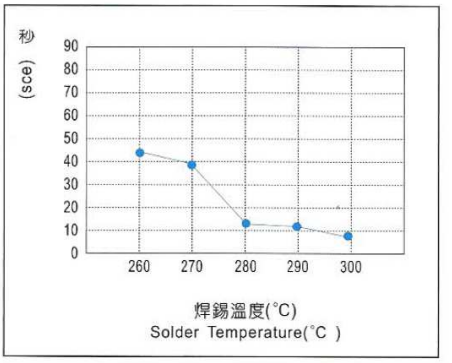
ETERNAL CHEMICAL

RIGID COPPER CLAD INDUSTRIAL LAMINATES

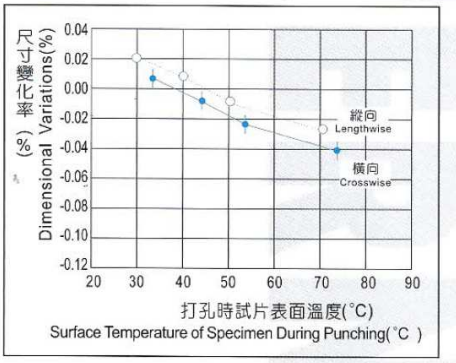
■ 沖孔後尺寸變化率
Dimensional Variation after Punching



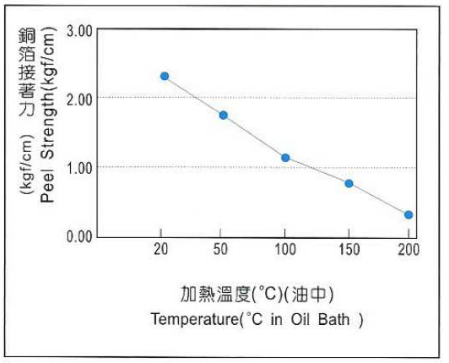
■ 焊錫中耐熱性之溫度特性
Characteristics of Solder Heat Resistance



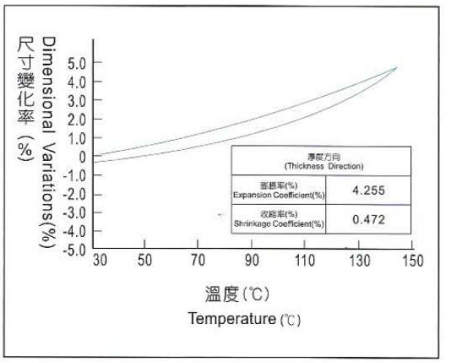
■ 沖孔後孔徑收縮
Hole Shrinkage after Punching



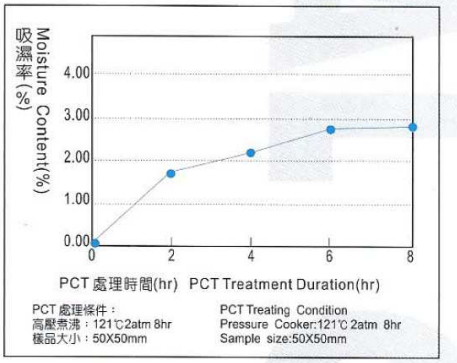
■ 銅箔接著力之溫度特性
Characteristics of Peel Strength vs. Temperature



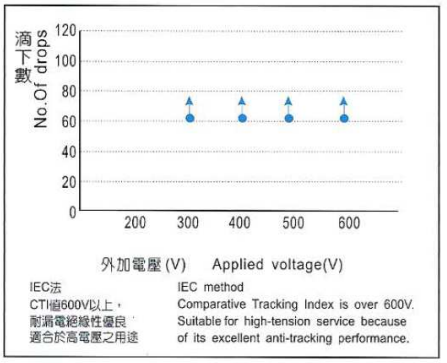
■ 加熱膨脹收縮率(TMA法)
Heat Expansion and Cooling Shrinkage



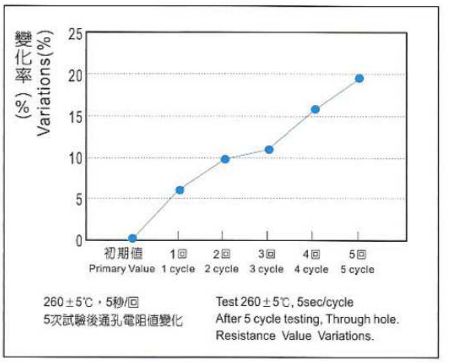
■ 吸濕性(耐濕性)
Moisture Absorption



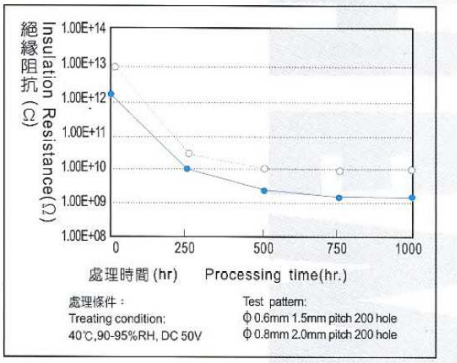
■ 耐漏電試驗(IEC 112法，0.1%NH_4Cl)
Anti-tracking Performance (IEC112 method)

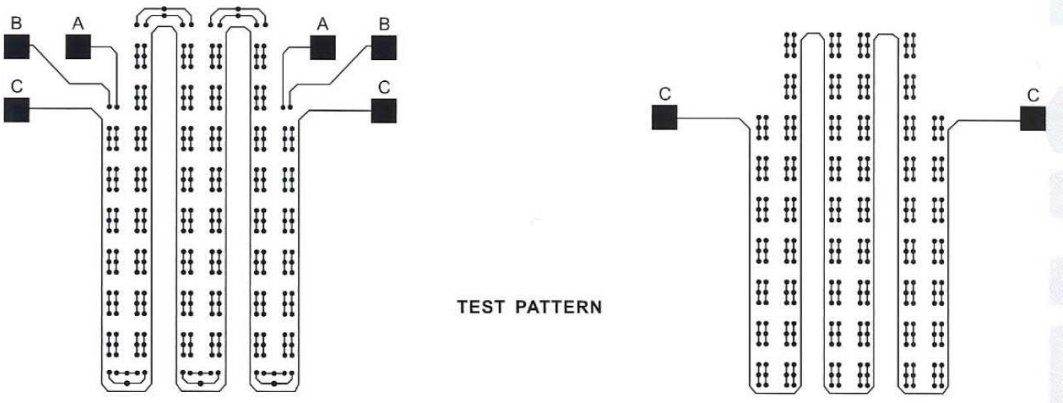


■ 焊錫耐熱處理後，通孔電阻值變化
Resistance Value Variation After Solder Heat Treatment



■ 耐銀移位性
Silver Migration Resistance





TEST PATTERN