總公司：亞洲電材股份有限公司

////APLUS 昆山雅森電子材料科技有限公司

KUNSHAN APLUS TEC. CORPORATION

產品承認書

PRODUCT SPECIFICATION

品　　　名: **无卤无锑覆盖膜（黄色）**

DESCRIPTION: **Halogen-free & Antimony-free Coverlay Flim（Yellow）**

型　　　号：

MODEL No: **AHICX……**

客戶確認欄：

Approved:

昆山雅森電子材料科技有限公司:

KUNSHAN APLUS TEC. CORPORATION:

覆核 *Approved by*	審核 *Checked by*	製作 *Prepared by*
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修訂履歷

Curriculum vitae

修訂日期 Date	修訂者 Revised by	版次 Version number	修訂內容摘要 Content
2020.04.14	宋 埝 Nian.Song	1	新制訂 The new formulation
2020.07.01	宋 埝 Nian.Song	2	修订标签颜色 Revision label color

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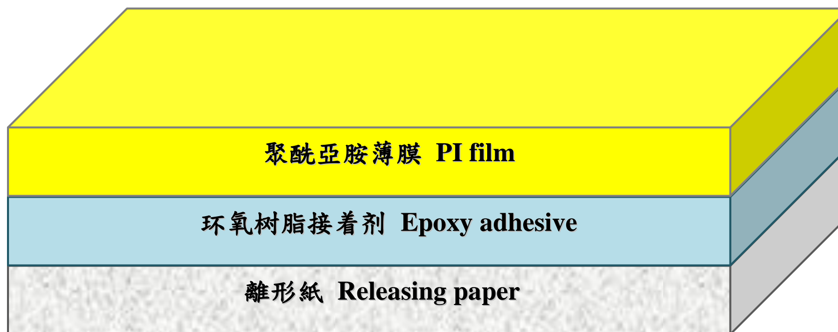
1 適用範圍 Application range

本产品承认书适用于向昆山雅森電子材料有限公司采购使用在软式印刷电路板基材用途之材料,有关品质保证规范事项如下。

The recognition of the product used in Flexible Print Circuit（FPC）is offered by Kunshan Aplus Tec.Corporation, the relative items of quality specification as followed

2 產品結構&編碼原則 Product structure & Codes

2.1 產品結構 Product structure



2.2 編碼原則 Product codes

A	H	I	C	X	*	**	*	*	*	*	*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

(1)	雅森 Aplus
(2)	接著劑類型 Adhesive type:無鹵素 halogen free
(3)	塗佈基材類型 Coated substrate types: PI film
(4)	產品類型 Product type: coverlay
(5)	貼合基材類型 Bonded substrate types:離型紙 releasing paper
(6)	塗佈基材厚度 Coated substrate thickness: 8=7.5um 0=1/2 mil=12.5um 1=1mil=25um
(7)	接著劑厚度 Thickness of adhesive(um):8=8um 15=15um 20=20um 25=25um 30=30um 35=35um 以此类推 By parity of reasoning
(8)	貼合基材厚度 Laminating machine metal thickness:離型紙 releasing paper
(9)	寬幅代碼 Wide codes:1=250mm 2=500mm
(10)	塗佈基材廠家代碼 Coated substrate code
(11)	貼合基材廠家代碼 Gluing substrate code
(12)	當為無鹵無銻覆蓋膜時，編碼固定為 N When it is a halogen-free and antimony-free product, the encoding is fixed as N.

3 保存環境及保存期限 Storage conditions

≤10℃，≤70% RH，在未開封狀態下，自製造日起保存三個月。

Store at temperature of below 10°C and below 70% relative humidity.

Guaranteed shelf-life: 3 months in the original producing.

4 品質規格 Quality standard

4.1 物理特性 Physical properties

檢驗項目 Test items	實驗條件 Condition of treatment	單位 Units	品質標準 Index of quality		測試方法 Test method
厚 度 Thickness	A	µm	**AHICX808**	15.5±10%	雅森規範 Aplus spec (长度计 Length Gage)
			AHICX810	17.5±10%	
			AHICX815	22.5±10%	
			AHICX008	20.5±10%	雅森規範 Aplus spec (千分尺 Micrometer)
			AHICX013	25.5±10%	
			AHICX015	27.5±10%	
			AHICX020	32.5±10%	
			AHICX025	37.5±10%	
			AHICX035	47.5±10%	
			AHICX125	50.0±10%	
			AHICX135	60.0±10%	
			AHICX145	70.0±10%	
			AHICX150	75.0±10%	
			AHICX250	100.0±10%	
幅 寬 Width	A	mm	250 ±1.0		雅森規範 Aplus spec
			500 ±1.0		
捲曲 Curling	A	cm	≦±3		IPC-TM-650 2.4.22
離形力 Releasing force	A	g/5cm	不離型～40		雅森規範 Aplus Spec
剝離強度 Peel strength	A	kgf/cm	AD≧10um	≧0.7	IPC-TM-650 2.4.9
			3um≦AD＜10um	≧0.5	
焊錫耐熱性 Solder resistance	10 seconds at 300℃	-	無分層起泡 No di-lamination No air-bubble		IPC-TM-650 2.4.13
溢膠量 Resin flow	A	mm	AD≦10um	0.03~0.10	IPC-TM-650 2.3.17.1
			10um＜AD＜45um	0.04~0.20	
			AD≧45um	0.08~0.30	
尺寸安定性 Dimensional stability	MD	%	≦±0.15		IPC-TM-650 2.2.4
	TD				

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A:表示常規測試 Testing under a regular conditions

4.2 電氣特性 Electrical properties

檢驗項目 Test Items	實驗條件 Condition of Treatment	單位 Units	品質標準 Index of quality	測試方法 Test method
表面阻抗 Surface Resistance	C-96hrs/35°C/90%R.H.	Ω	≧10^{12}	IPC-TM-650 2.5.17
體積阻抗 Volume Resistance	C-96hrs/35°C/90%R.H.	Ω.cm	≧10^{14}	

4.3 化學特性 Chemical properties

檢驗項目 Test Items		實驗條件 Condition of Treatment	單位 Units	品質標準 Index of quality	測試方法 Test method
耐藥品性 Chemical Resistance	HCL2mol/L 浸泡 10mins	----	%	剝離強度下降率 Peel strength reduce≦20	IPC-TM-650 2.3.2
	NaOH2mol/L 浸泡 10mins	----		剝離強度下降率 Peel strength reduce≦20	
	IPA 浸泡 10mins	----		剝離強度下降率 Peel strength reduce≦20	

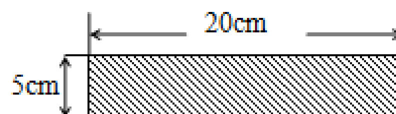
4.4 外觀 Appearance

檢查無使用上影響品質的凹凸、折皺、刮傷、氣泡、破膜等不良現象;以上不允許出現的異常若以點狀中度隨機出現，在異常點處可作異常標識後，以 0.5m/處折讓給客戶，250mm 幅寬成品收卷為 200 米/卷，成品接頭和異常標示≤7 個(接頭≤3 個)。

If appear the above rejective abnormal phenomena in irregularly, we will offer the discount of 0.5meach abnormal phenomena, and attached Quality Remark Sheet: within 7 abnormal phenomena in 200m (Joint:≤3).

5 量測方法 Test methods

5.1 離形力 Releasing force



5.1.1測試樣本 Test sample

5.1.2測試方法 Test process

5.1.2.1 量測設備:萬能拉力機 Test instrument :universal tensile machine

5.1.2.2 量測環境 Test conditions: 25±5°C 65±20%RH

5.1.2.3 測試速率 Test speed:30mm/min

5.1.2.4 拉伸距離 Test length:70mm

5.1.2.5 拉伸方向 Test direction:90 度方向向上拉起 peeling at 90°angle

5.2 剝離強度 Peel strength

5.2.1測試樣本 Preparation of specimens

5.2.1.1 將覆蓋膜平放在纯铜光面上，放入護貝機(溫度 50°C,速度 5 轉/分鐘)。

Placing the coverlay without releasing paper on a smooth surface of copper, then laminate with encapsulation machine (temperature :50°C, speed: 5rpm).

5.2.1.2 快壓：溫度 180±5°C、壓力 100kg/cm2、預熱時間 10sec、壓著時間 60sec。

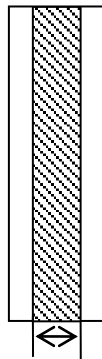
Press bonding conditions: temperature: 180±5°C; pressure:100kg/cm2; pre-press time:10sec.; press time: 60sec.

5.2.1.3 熟化： 溫度 160°C 60min。

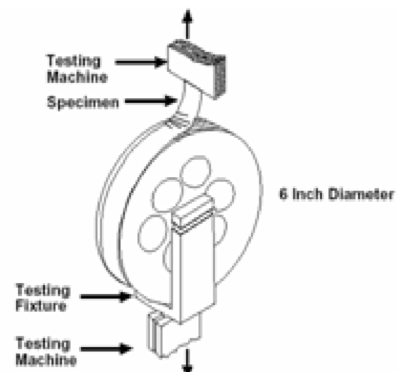
Postcure conditions: 160°C 60min

5.2.1.4 熟化後試片以刀片裁銅箔置中 0.3175cm 寬，基材 1.5cm 寬的試片。

Test specimen has a test pattern, such as figure 1



0.3175cm 寬銅箔
圖 1 Figure 1 (copper foil width)



剥离强度示意图
圖 Figure 2 (Peel strength test pattern)

5.2.2測試方法 Test process

5.2.2.1 量測設備：萬能拉力機 Test instrument: universal tensile machine

5.2.2.2 量測環境: 25±5°C 65±20%RH Test conditions: 25±5°C 65±20%RH

5.2.2.3 測試速率:50.8mm/min Test speed:50.8mm/min

5.2.2.4 拉伸距離:70mm Test length:70mm

5.2.2.5 拉伸方向 90 度方向向上拉起(撕起銅箔)

Test direction: peeling at 90 °angle (tear the copper foil side), such as figure

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5.3 溢膠量 Resin flow

5.3.1 測試樣本 Preparation of specimens

5.3.1.1 將保護膠片以沖孔機打出圓孔，圓孔直徑分別為 6.4、4.8、3.2 及 1.6mm。
With the release film intact, punch seven graduating holes (hole diameter: 6.4、4.8、3.2 and 1.6mm) across the coverlay (see figure 3).

5.3.1.2 將覆蓋膜平放在纯铜光面上，再用壓合機壓合。
Placing the coverlay without releasing paper on the smooth surface of copper, then laminated with encapsulation machine.

5.3.1.3 壓合條件為溫度 180±5°C、表壓力為：100kg/cm2，預壓時間為 10 sec，壓合時間 60sec。
Press bonding conditions: temperature: 180±5°C; pressure: 100kg/cm2;
Pre-press time:10sec. Press time: 60sec.

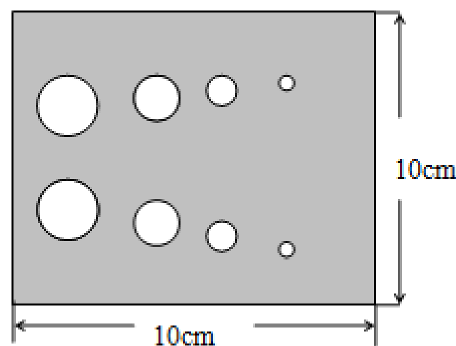


圖 Figure3 (Test pattem for resin flow measurement)

5.3.2 測試方法 Test process

5.3.2.1 量測設備:金相顯微鏡 Test instrument: Photo Microscope

5.3.2.2 量測環境: 25±5°C 65±20%RH Test conditions: 25±5°C 65±20%RH

5.3.2.3 溢膠量: 分別量測並記錄每個孔徑之最大溢膠刻度與最小溢膠刻度之平均值，取各組平均值的平均值即為測試值。
Account resin flow: measuring and record the hole’s (each hole) resin flow of adhesive, averaging the minimum and maximum resin flow for each hole, finally resin reflow be accounted by 4 hole’s averaging resin flow (different diameter).

5.4 尺寸安定性 Dimensional stability

5.4.1測試樣本 Preparation of specimen

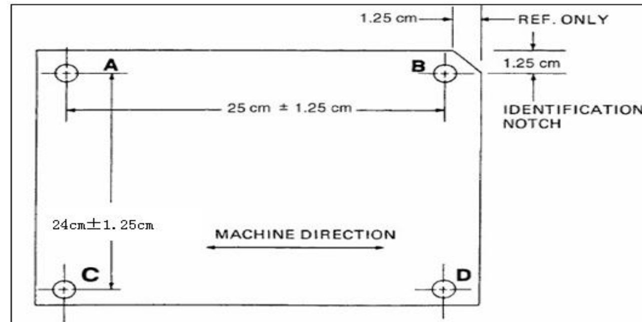


图 4 Figure4 :Test pattern of dimensional

5.4.2測試方法 Test process

5.4.2.1 量測設備:二次元測試儀 Test instrument: Two dimension X-Y table

5.4.2.2 量測環境: 25±5°C 65±20%RH Test conditions: 25±5°C 65±20%RH

5.4.2.3 量測步驟 Test steps:

※保護膜裁取如圖大小尺寸後，以沖孔機在四週打出直徑 4mm 四個孔，分別標以 A.B.C.D.符號。

Punch holes (hole diameter is 4mm) at positions A through D in specimen at locations show in figure 4.

※以二次元座標儀分別量測 A-B,C-D,A-C,B-D 孔中心之距離並記錄之(I)。

Measure separation of holes between corresponding positions (center of holes).For example, The distance between hole centers A-B and C-D, also A-C and B-D. Record as initial measurement (I).

※將試片的離形紙撕離並在常溫下靜置 20 分鐘。

Remove the releasing paper, allow specimen to stabilize under usually atmosphere for 20 minutes.

※以二次元座標儀分別量測 A-B,C-D,A-C,B-D 孔中心之距離並記錄之(F),以 d)計算公式計算 MD、TD 之尺寸安定性數據。

Measured AB, CD, AC, the BD-hole center distance and record (F).Calculate the dimensional changes ,as follow formula d)

d)計算公式 Note:

$$MD(\%) = \frac{\frac{AB_F - AB_I}{AB_I} + \frac{CD_F - CD_I}{CD_I}}{2} \times 100\% \qquad TD(\%) = \frac{\frac{AC_F - AC_I}{AC_I} + \frac{BD_F - BD_I}{BD_I}}{2} \times 100\%$$

【下標 F 代表離型後之量測值，下標 I 代表離型前之量測值。】

MD=% dimension change in machine direction;

TD=% dimension change in transverse direction

I= Initial reading; F= Final reading.

5.5 表面電阻與體積電阻 Surface resistance and volume resistance

5.5.1 測試樣本 Preparation of specimens

5.5.1.1 將 10cm × 10cm 壓合好銅箔之覆蓋膜以蝕刻方法，將銅箔完全蝕刻掉。

Prepare a 10cm × 10cm coverlay that laminated with copper foil, then fully etched out the copper foil by etching solution. The test pattern of specimen, such as figure 5.

5.5.1.2 蝕刻好之試片以清水完全沖洗乾淨，擦拭再以 100°C烘箱烘烤 10min。

Using water to clean the coverlay specimen then wipe off water and baking 10mins at 100°Cfor fully drying.

5.5.1.3 將試片先置於 35°C±2°C及 90%-0,+5% R.H.之恒溫恒濕機中 96hr 後再量測。

Before testing, put the specimen under 35±2 °C, 90±5%R.H. condition for 96hrs

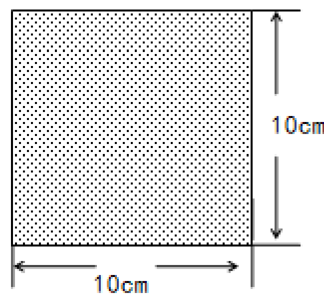


图 5Figure 5: Test pattern of volume and surface resistivity

5.5.2 測試方法 Test process

5.5.2.1 量測設備:高阻計 Test instrument : High resistance meter

5.5.2.2 量測環境: 25±5°C 65±20%RH Test conditions: 25±5°C 65±20%RH

5.5.2.3 選擇高阻計之充電電壓為 500 伏特及充電時間 60 秒，測試時間 30 秒。

Turn on the megohm meter and allow to warming up for 15 minutes. After warm up, calibrate meter and adjust charge voltage to 500 volts DC. Switch the adjustment button to select surface or volume resistivity testing mode.

5.5.2.4 記錄所測數據。

Read the resistivity value on the meter after the voltage (500 volts) charge for 60 seconds.

5.6 焊錫耐熱性 Solder resistance

5.6.1 測試樣本 Preparation of specimens

5.6.1.1 將覆蓋膜平放在蝕刻好的 CCL 回行線路上，

Placing the coverlay without releasing paper on the Etched CCL return circuit

5.6.1.2 將復貼好之樣片用快壓機壓合，壓合條件：溫度：180±5°C、表壓力為：100kg/cm^2

預熱時間：10sec、壓著時間：60sec。

Press bonding conditions: Temperature: 180±5°C; Pressure: 100kg/ cm^2;

Pre-press time: 10sec. Press time: 60sec.

5.6.1.3 外觀狀況: 利用顯微鏡量觀察保護膠片有無氣泡產生;

Observation : observe the bubble situation of adhesive with microscope

5.6.1.4 壓合後將樣片放入 160°C ×60min 熟化。

Post-cure will be done after laminated. Post-cure conditions: 160 °C×60min.

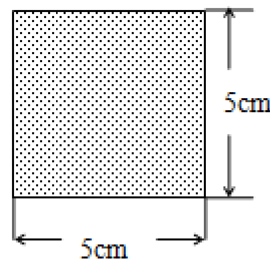


图 6 Figure 6：Test pattem for soldering resistance

5.6.2 測試方法 (Test process)

5.6.1.1.1 量測設備:高溫錫爐 Test instrument: High temperature soldering bath.

5.6.1.1.2 量測環境: 25±5°C 65±20%RH Test conditions: 25±5°C 65±20%RH

5.6.1.1.3 量測步驟 Test steps:

將熟化之樣品裁成 5cm ×5cm，直接浸入恒溫之高溫錫鉛液，錫爐溫度設定依相應品質標准簡表，每個試片浸入恆溫錫鉛液中 10 秒並觀察其變化。

Immersing the specimens which has a testing pattern(test pattern is5cm×5cm such as(figure 6) in the solder bath and floating for 10 seconds ,then visual viewing for blistering、crack、de-lamination or wrinkle and record phenomenon.

5.7 耐藥品性 Chemical resistance

5.7.1 測試樣本 Preparation of specimens

5.7.1.1 復帖：將覆蓋膜平放在纯铜光面上，放入護貝機(溫度 50°C,速度 5 轉/分鐘)。

Placing the coverlay without releasing paper on a smooth surface of copper, then laminate with encapsulation machine (temperature :50°C, speed: 5rpm).

5.7.2 快壓：溫度 180±5°C、壓力 100kg/cm^2、預熱時間 10sec、壓著時間 60sec。

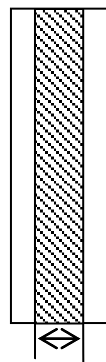
Press bonding conditions: temperature: 180±5°C; pressure:100kg/cm^2;

pre-press time:10sec.; press time: 60sec.

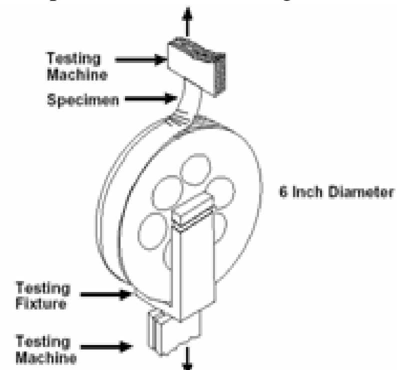
5.7.3 熟化 Postcure conditions： 溫度 160°C 60min。

5.7.4 熟化後試片以刀片裁銅箔置中 0.3175cm 寬，基材 1.5cm 寬的試片，將試片浸泡於 HCl、NaOH 及 IPA 中 10mins 後，拿出以清水將化學藥液沖洗並擦拭乾淨。

Test specimen has a test pattern, such as figure 1.The specimen has a 0.3175cm (width) copper strip and total specimen width is 1.5cm. Finally, the specimen will be immersed in HCl、NaOH and IPA for 10 mins then wash out chemicals with water and wipe off water for testing.



0.3175cm 寬銅箔
圖 1 Figure 1 (copper foil width)



剥离强度示意图
圖 Figure 2 (Peel strength test pattern)

5.7.5 測試方法 Test process

5.7.5.1 量測設備 Test instrument:萬能拉力機 universal tensile machine

5.7.5.2 量測環境 Test conditions: 25±5°C 65±20%RH

5.7.5.3 測試速率 Test speed:50.8mm/min

5.7.5.4 拉伸距離 Test length:70mm

5.7.5.5 拉伸方向 Test direction:90 度方向向上拉起(撕起銅箔) peeling at 90°angle, such as figure2

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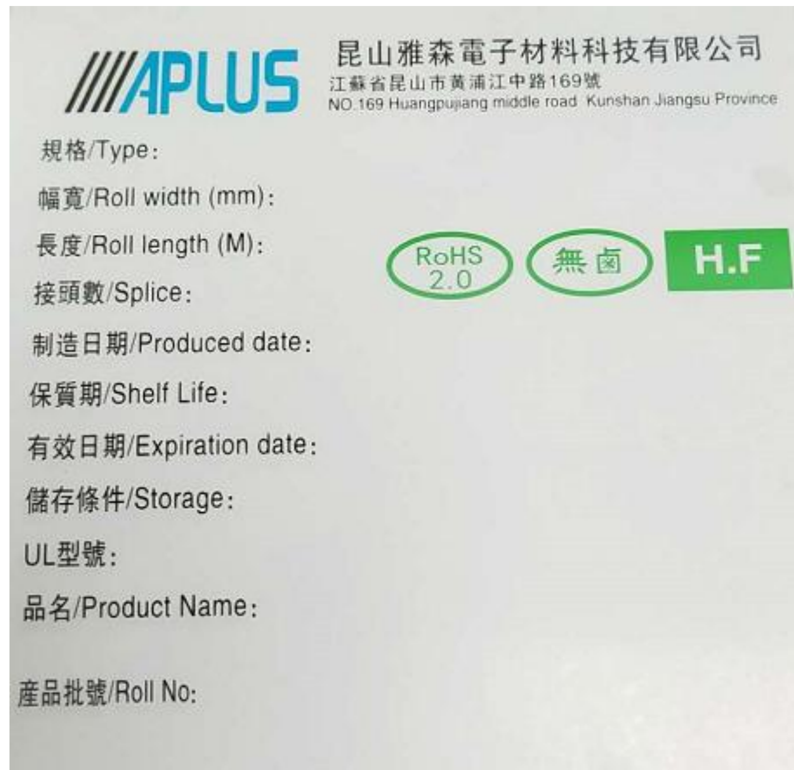
6 產品之包裝型態 Packaging

項目 Item	規格 Specification
寬幅 Width	標準幅寬 250mm,可依客戶要求裁取不同的寬度。 Standard width is 250mm,can slitting in different width as customer's require.
卷狀供應 Roll	250mm 幅寬 200m/卷 250mm Width 200m/roll
接頭和異常 Joints & abnormal	≦7 個(接頭≦3 個) Within 7 abnormal phenomena (Joint ≦3)
包裝型態 Packaging	1.將產品放入 PE 袋內，放入乾燥劑後真空處理。 Put the product with drying agent in PE bag, then vacuum sealed. 2.接縫處用膠帶密封,再在紙心管兩端各套一珍珠棉和紙護板,然後將整卷產品放置於紙箱內。 Seal the seam with adhesive tape, then use releasing roll and paper to over 2 side, at last put the roll in carton 3.將外箱嘜頭標簽貼在成品紙箱側面中間處。 Stick the shipping mark on the middle of carton's side. 4.然後再封箱膠帶將紙箱封好。 At last close the carton with adhesive tape.
標籤 Product sticker	每一卷外箱上貼上標籤 Stick product sticker on each carton
出貨品質檢驗報告 Quality test report	每訂購出貨批隨貨附上 Together with goods of each order

地址：中國昆山市黃浦江中路 169 號 電話：0512-57701568 傳真號碼：0512-57701558
address：Huangpujiang Middle road No.169,Kunshan Economic & Technical Development Zone Jiangsu Province, China
telephone：0512-57701568 fax：0512-57701558

7 標籤的表示內容 Content of product sticker



8 建議快壓參數 Lamination conditions

8.1 快壓參數 Quickly lamination

基板類型 Type	預壓時間 Time of Preload（S）	成型時間 Time of Load（S）	成型壓力(表壓) Lamination pressure(Gauge)（kg/cm^2）	壓合溫度 Temperature of Lamination（℃）	熟化時間 Curing condition
單面板 Single Side	10～20	60～120	100	185±10	160℃*60min
雙面板 Double Side	10～30	120～180	100	185±10	160℃*60min

8.2 傳統壓合參數 Typical lamination

條件 Condition	壓合溫度 Temperature of Load（℃）	壓力(單位面積受力) Pressure（kg/cm^2）	壓合時間 Time of Load（min）
升溫段 Heating Period	****	15±5	20～40
恒溫段（成型）Curing Period	165±5℃	25±5	50～90
降溫段 Cooling Period	****	25±5	30～40

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備註：这些时间和温度是建议作为确定适用于粘接覆盖膜與覆铜板的起始條件。请注意，所使用的设备和电路设计可能會有所不同。

PS: This times and temperature are suggested as a starting point of determining condition suitable for bonding coverlay materials to copper Clad laminate. please note that conditions may vary with the equipment used and circuit design.

9 批號編碼 Lot codes