

规格承认书

Product acknowledgment

产品名称：无卤素阻燃型覆盖膜

Products name: Halogen-free flame-resistant type coverlay

产品规格：SF305C 0515NT250A T

Product Code:

供应商名称：广东生益科技股份有限公司

地址：广东省东莞市松山湖高新技术产业开发区工业西路5号，邮编523808。

Supplier Name: Guangdong Shengyi Technology Co.,LTD.

Address : NO.5, Western Industry Road, North Industry District, Dongguan SSL SCI.&Tech.Industry Park,
Dongguan City, Guangdong, P.R.China 523808

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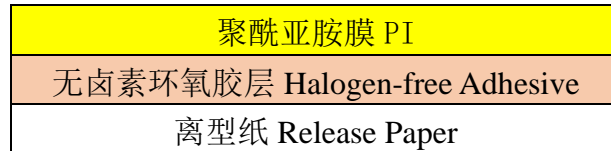
一、产品说明 Product description

本产品主要以 IPC-4203/2 标准进行品质管控，系用作挠性印制电路覆盖层的涂胶粘剂绝缘薄膜。产品所有之检测方法主要参照 IPC-TM-650 标准相应章节。本产品规格书没有纳入的性能规范和测试方法等项目，以行业公认的 IPC 标准为依据。

Quality controlled of this product is mainly according to IPC-4203/2 standards, the insulating film with adhesive which used for flexible printed circuit cover layer. All the test methods of product are reference to IPC-TM-650 corresponding chapter. The projects such as property specifications and test methods which not included in this specification, based on the industry recognized IPC standards.

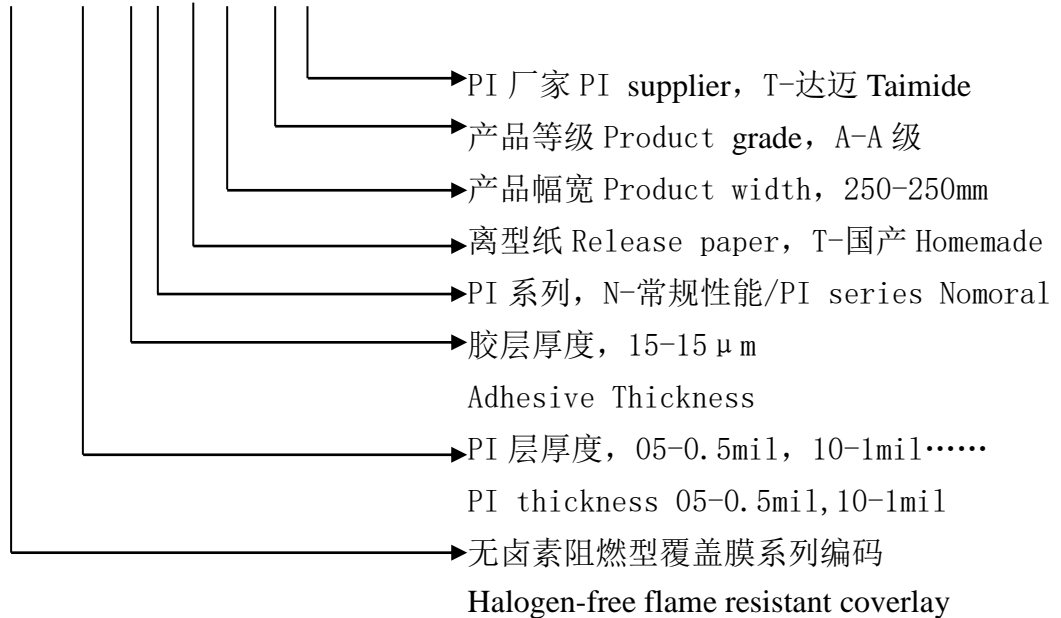
二、产品介绍 Product introduce

1、产品结构 Product structure



2、编码说明 Code description

例如：SF305C 05 15 N T 250 A T



三、产品品质 Product quality

1、表观品质 Appearance quality

覆盖膜外观平整，不应有孔洞、撕裂和缺胶；PI膜内不允许有金属性夹杂物，非金属性夹杂物在任何方向的尺寸应不大于0.50mm。胶粘剂层应没有影响使用的条纹、胶粒、色斑和脏污。

Coverlay appearance should be smooth, no holes, tears and lack of adhesive; PI film does not allow metallic inclusions, the size of non-metallic inclusions in any direction shall less than 0.50mm. Adhesive layer should be no stripes, particles, stains and dirt which affecting use.

2、物理性能 Physical property

Test Items 检测项目	Treatment Condition 实验条件	Units 单位	Index of quality 品质标准	Typical Value 实测值	Test method 测试方法
Thickness 厚度	A	μm	27.5±10%	27	生益企标 Shengyi method
Length 长度	A	%	+2/-0%	+2/-0%	生益企标 Shengyi method
Width 宽度	A	mm	+2/-0	+2/-0	生益企标 Shengyi method
Resin flow 溢胶量	-	mm	≤0.2	0.12	IPC-TM-650 2.3.17.1
Peel strength 剥离强度	A	N/mm	≥0.7	1.21	IPC-TM-650 2.4.9
Solder resistance 耐热性	288℃, 10s	-	无分层起泡 No delaminate	无分层起泡 No delaminate	IPC-TM-650 2.4.13
Dimensional stability 尺寸稳定性	A	%	±0.1	MD:-0.05 TD:+0.04	生益企标 Shengyi method
Chemical resistance 耐化学性	After chemical exposure 暴露在化学品中后	%	≥80	85	IPC-TM-650 2.3.2

3、电气性能 Electrical property

Test Items 检测项目	Treatment Condition 实验处理条件	Units 单位	Index of quality 品质标准	Typical Value 实测值	Test method 测试方法
Dielectric constant (1MHz) 介电常数	RH50%, 23℃, 24h	-	≤4.0	3.86	IPC-TM-650 2.5.5.3
Dissipation factor (1MHz) 介质损耗角正切	RH50%, 23℃, 24h	-	≤0.04	0.0335	IPC-TM-650 2.5.5.3

Volume resistivity 体积电阻率	RH90%, 35°C, 96h	MΩ · cm	$\geq 10^6$	3.5×10^7	IPC-TM-650 2.5.17
Surface resistance 表面电阻	RH90%, 35°C, 96h	MΩ	$\geq 10^4$	6.3×10^6	IPC-TM-650 2.5.17

四、保存条件 Storage condition

覆盖膜应密封包装在温度 $<10^{\circ}\text{C}$ 、干燥、无紫外光照射的环境下，在此条件下自生产日期开始可存放3个月；若密封包装存放在普通空调环境下（温度 $\leq 25^{\circ}\text{C}$ 、相对湿度 $\leq 55\%$ ），建议在20天内用完，开封后线上流转不超过7天。

Coverlay should be stored in sealed packaging at temperature $<10^{\circ}\text{C}$, dry environment without UV irradiation, in this condition it can be stored for three months since the date of manufacture; if the coverlay is sealed package stored in an ordinary air-conditioned environment (temperature $\leq 25^{\circ}\text{C}$, relative humidity $\leq 55\%$), it is recommended to use up in 20 days, after opening the online flow not more than seven days.

五、使用说明 Using instructions

1、请以原包装形式放在平台上或适宜的架上，防止存放方式不当而引起的覆盖膜形变。

Please put the coverlay of original packaging on the platform or a suitable frame, to prevent deformation caused by improper storage.

2、请勿采用将箱子正面向下倒出产品的做法，以免造成材料的受损；请保持箱子的正面向上，采用从箱子里面小心拿出材料的做法。

Do not pour out product from the face down box, so as to avoid damage to the material; Please keep the box face up, take the product out from the box carefully.

3、请戴无尘手套小心地操作覆盖膜。碰撞、滑动等会损伤材料；裸手操作会污染覆盖膜，这些缺陷都可能会对覆盖膜的使用造成不良的影响。

Please wear clean gloves and be carefully while operate the coverlay. Collision, sliding and so on will damage the material; bare-handed operation will pollute the coverlay, these defects may be adverse effects on the use of coverlay.

4、PI遇碱性药水容易出现咬噬，因此请尽可能避免或减少PI接触碱性药水的时间。PI膜及胶层较容易吸潮，请谨防吸潮。

Because of PI is easy etched by the alkaline potion, so please avoid or reduce the time contact with alkaline potion as possible. PI film and adhesive layer is easy to absorb moisture, please prevent of moisture absorption.

5、由于挠性材料在生产加工过程中会产生一定的涨缩，因此在批量生产之前需结合板子结构及实际情况整理出覆盖膜合适的补偿参数，以免造成后续对位不良现象。

Because the FPCB process will bring some expansion and contraction, so need to make a suitable compensation parameters of coverlay before mass production according to FPCB structure and the actual process situation, in order to avoid misalignments.

6、如果从较低温的存放空间搬到温度较高的生产空间，需以原包装形式在使用空间放置一

段时间（一般 4 小时以上，根据两空间温差大小的不同而不同），待温度平衡后再打开包装，以避免产品表面出现冷凝水而受潮，影响覆盖膜的使用质量。

If the product move to a higher temperature production place from low temperature storage place, you need to place for some time by the original packaging (usually more than four hours, depending on the temperature difference between two spaces) until the temperature equilibrium before opening package, to avoid absorb moisture while water condensation on the surface of product, effecting the using quality of coverlay.

7、覆盖膜在常温或者空调环境下打开包装后请尽快使用，以免由于储存条件不当造成吸潮、溢胶量变化等带来的不良缺陷。对于已开材料，在线流转时间不宜超过 7 天。投料剩余的尾数，若暂时不用，请及时密封包装送回冷库存放。

Please use the coverlay as soon as possible after opening the package at room temperature or air-conditioned environment, in order to avoid defects such as absorb moisture, resin flow change which caused by wrong storage conditions. If the material has been opened, the online circulation time should not more than seven days. If no need for the remaining mantissa, please return to cold storage with sealed package.

8、PI 膜和离型纸容易吸潮而导致覆盖膜尺寸发生变化，且随时间延长尺寸不断拉伸，因此在加工过程中注意防潮，以免覆盖膜尺寸变化后影响贴合。胶层厚度与线路铜箔厚度（底铜+镀铜）的搭配建议胶厚/铜厚比大于 0.7。具体的搭配还请根据线宽线距、线路外形、覆盖膜溢胶量、层压参数等进行综合考虑。

PI film and release paper is easily absorb moisture resulting in the size changes of the coverlay, and the size get expand with time past, so pay attention to prevent moisture absorption in the process, avoid the affect to bonded by coverlay size change. Thickness Ratio of Adhesive and copper (include base copper + plating copper) with a recommendation ratio more than 0.7. Please also consider the copper line width and distance, line shape, the resin flow of coverlay, lamination parameters.

9、压合工艺推荐 Lamination conditions

覆盖膜的压合目前主要分为层压和快压两种，下面就两种压合方式分别推荐压合参数。

The coverlay lamination is currently divided into tranditional press and fast press, the following parameters were recommended about this two ways.

9.1 快压 Fast Press

压合步骤 Laminating Step	温度 (°C) Temperature	压力 (Kg/cm ²) Pressure	时间 (S) Time
预压 pre-press	175~185	0	0~10
成型压 molding		100~130	90~150

快压后需进行烘烤固化，温度宜在 155~165°C，烘烤时间宜控制在 60~90min。烘烤过程中应

注意使板均匀受热，建议使用千层架进行烘烤，若堆叠在一起烘烤时建议叠层不宜超过 20PNLS。

The coverlay need post curing after fast pressing, the temperature should be 155-165°C, curing time should be controlled at 60 ~ 90min. Curing process should pay attention to make the board evenly heated, recommended to use shelf baking. The number of boards should less than 20 PNLs if need stack baking.

快压常见叠片方式：The common laminations of fast pressing:

_____	烧附铁板 Iron plate
_____	硅橡胶钢板 Silastic plate
_____	锡铝箔 Tin foil
_____	离型膜 Release film
_____	FPCB 搭配覆盖膜 FPCB and coverlay
_____	离型膜 Release film
_____	硅橡胶 Si rubber
_____	铁氟龙玻纤布 Teflon glass-fibre fabric
_____	硅橡胶钢板 Silastic plate
_____	烧附铁板 Iron plate

9.2 层压 Traditional Press

压合步骤 Press step	温度 (°C) Temperature	压力 (Kg/cm2) Pressure	时间 (min) time
第一阶段 Step 1	常温 RT~175	10	35
第二阶段 Step 2	175	40	60~90
第三阶段 Step 3	175~常温 RT	40	35

注：以上参数仅供参考，请根据设备特点适当调整参数。

Note: The parameters are just for reference, please adjust the parameters according to the equipment characteristics.

传压常见叠片方式 The laminations layup of traditional pressing:

_____	钢板 Plate
_____	高温离型膜 Release film
_____	覆形材料 Cover type film
_____	分离片 Separate film
_____	FPCB 搭配覆盖膜 FPCB and coverlay
_____	分离片 Separate film
_____	硅橡胶 Si rubber
_____	钢板 Plate

六、测试方法 Test method

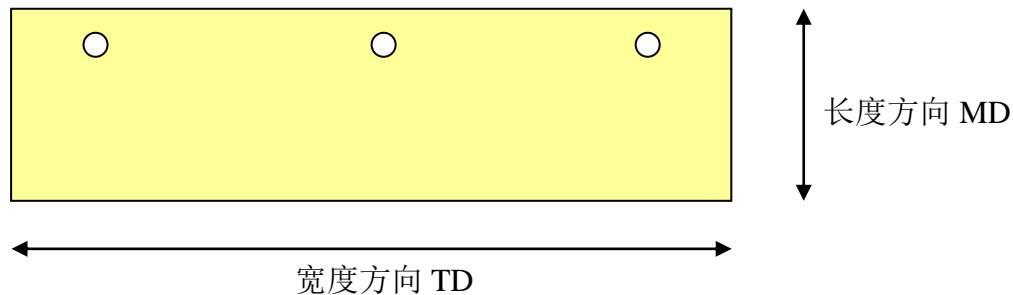
此规格书所列测试项目仅为行业内 IQC 对覆盖膜进行测试之常规项目，如溢胶量、剥离强度、耐热性、尺寸稳定性等。对覆盖膜的其它测试项目，如电气特性测试方法、阻燃性测试方法等不再单独列出。

The test items of this specification are normal IQC test items for coverlay, such as the resin flow, peel strength, heat resistance, dimensional stability. Other tests items such as the electrical property, flame-resistant test methods are no longer listed separately.

1、厚度 Thickness

用千分尺测量覆盖膜绝缘基膜（胶层和 PI 层）宽度方向左、中、右 3 个位置的厚度值（如下图所示），取 3 个值的平均值为产品的厚度值。

Use a micrometer to measure the thickness of three positions (width direction of the left, middle and right), which is the insulating base film (PI and adhesive layer) of coverlay, as shown below. Take the average of three data for the thickness of product.



2、溢胶量 Resin flow

2.1 样品图形 Coupon pattern



2.2 样品制作 Coupon prepare

①将覆盖膜在冲床上按上图所示尺寸冲孔。

Punching the size as shown above on the coverlay.

②撕下离形纸后，将覆盖膜平放在电解铜箔光面上，放入过塑机（120℃）过塑。

Remove the release paper, put the coverlay on the shiny side of electrolytic copper foil, put them into the photo laminater (120 °C) and laminate them.

③将预贴合好的试样按温度为 180±2℃，预压时间 10s、预压压力 10kg/cm²，成型时间 60s、成型压力 100kg/cm² 的条件进行快压。

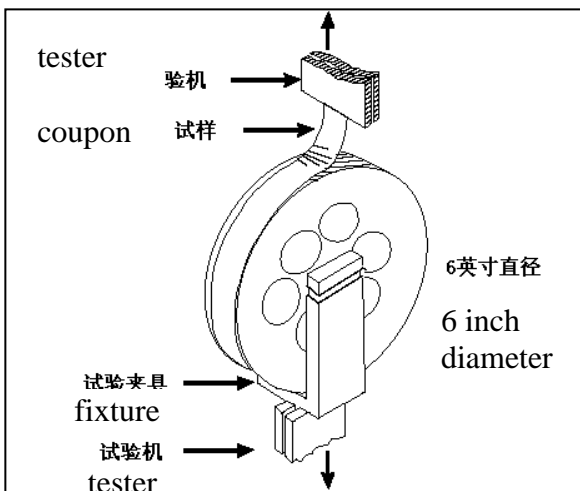
Put the layup sample into fast press with the condition of $180\pm 2^{\circ}\text{C}$ temperature, pre-press time 10s, pre-press pressure $10\text{kg}/\text{cm}^2$, molding time 60s, molding pressure $100\text{ kg}/\text{cm}^2$

2.3 测试方法 Test method

用二次元测量试样快压后沿冲孔圆周流胶的长度，测试应至少选择两种孔径，每个孔测试至少 4 个数据，取平均值作为溢胶量，单位为 mm。

Use the quadratic elements measuring the length of resin flow around the circle after fast pressing. The test should be selected at least two sizes of aperture, each aperture at least four test data. Take the average data as resin flow which units of mm.

3、剥离强度 Peel strength



3.1 样品制作 Coupon prepare

①将覆盖膜压合在 18 微米铜箔光面，烘烤固化；

Laminating the coverlay on the shiny side of $18\ \mu\text{m}$ ED copper foil, then post curing. Condition is recommended above as 11.1

②采用蚀刻方法制作尺寸为 $3.0\pm 1\text{mm}\times 100\text{mm}$ 的试样。

etching a sample with size of $3.0\pm 1\text{mm}\times 100\text{mm}$.

③试样数量为 2 块试样，纵向和横向各一块。如果测试过程中试样断裂，应重新制样进行测试。

Make the sample of MD and TD each piece. If the simple broken down in the test, should re-prepare the samples to test.

3.2 测试方法 Test method

①将试样用双面胶带、胶粘剂和/或机械夹具固定在试验夹具上。

Take the sample stickup to the test fixture with double sided adhesive tape and / or with mechanical clamps

②剥离长度为 50mm 范围内，最初剥起固定入夹具的 10mm 不计入。以 50mm/min 的速度（滑块速度）剥离试样。剥离负载应在试验机量程的 15-85% 范围内。至少剥离 50mm，最初的 6mm 可忽略。

In the peel length of 50mm range, the first 10mm begin to peel which fix in the fixture is not included. Peel the sample with speed of 50 mm/min (crosshead speed). Peel load should be in 15-85% of test machine range. Peel length should at least 50mm, the initially 6mm can be ignored.

③观察并记录剥离过程中的最小拉力。测量试样条的实际宽度，准确至 0.02mm。

Observe and record the minimum tensile strength of the stripping process. Measure the actual wire width of sample, accurate to 0.02mm.

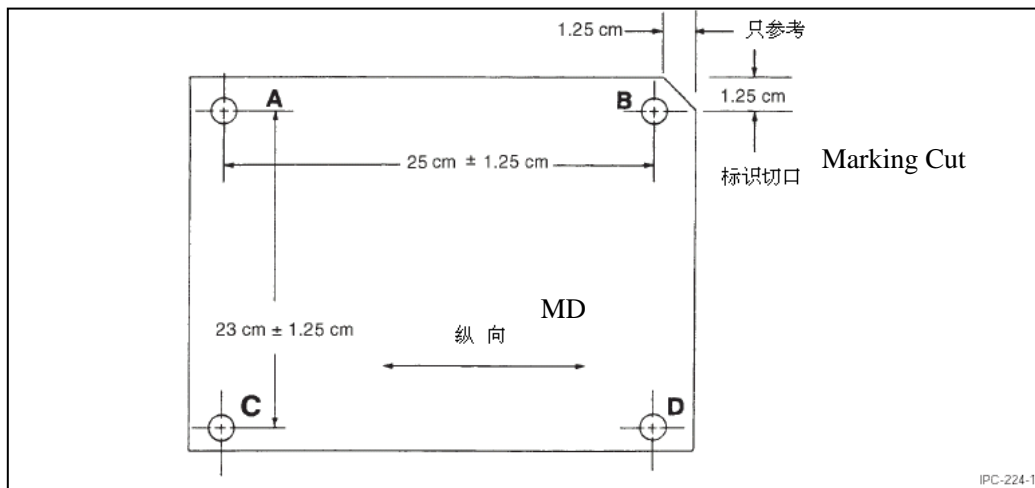
3.3 计算方法 Calculating method

剥离强度 (N/mm) = 最小拉力 (N) / 试样导线宽度 (mm)。

Peel strength (N / mm) = minimum tensile strength (N) / sample wire width (mm).

4、尺寸稳定性 Dimensional stability

4.1 样品图形 Coupon pattern



4.2 测试方法 Test method

①按以上样品图形制备样品，测量各孔间或各线间的中心距，记作初始测量值 (I)
Samples were prepared according to the above sample graph, measure the center distance between the lines or the wells, referred as the initial data (I).

②缓慢剥离离型纸，避免绝缘基膜受外力而变形。然后将绝缘基膜自然平整的放置在测试台上。

Peel the release paper slowly, avoid the deformation of insulating basis film caused by external force. Then put the basis film on the test platform natural and steady .

④重新测量各孔间或各线间的中心距，记作最终测量值 (F)。

Measure the center distance of each hole or each line again, referred as the final measured data (F).

4.3 计算方法 Calculating method

$$M.D.(%) = \frac{\frac{(A-B)_F - (A-B)_I}{(A-B)_I} + \frac{(C-D)_F - (C-D)_I}{(C-D)_I}}{2} \times 100$$

$$T.D.(%) = \frac{\frac{(A-C)_F - (A-C)_I}{(A-C)_I} + \frac{(B-D)_F - (B-D)_I}{(B-D)_I}}{2} \times 100$$

5、浸锡耐热性 Solder resistance

5.1 样品制作 Coupon prepare

①将覆盖膜压合在 18 微米铜箔光面，烘烤固化。

Laminating the coverlay on the shining side of 18 μ m ED copper foil, then post curing the sample as given above .

②将测试材料裁切成 5cm 大小的正方形，每个测试材料制备 3 个样品；

Cut the sample into the size of 5cm square, 3 coupons were prepared.

5.2 测试方法 Test method

样品进行 135℃ 烘烤 1h 除湿处理后浸入温度为 288℃ 的高温锡炉，浸入 10s 后取出观察。

The coupon were baked at 135℃ for 1h to dehumidify, then dipped into the solder of 288℃ for 10s, removed and observation;

5.3 测试评判 Pass judgment

样品无分层起泡等不良。

No delaminate and blister

七、技术反馈 Technical feedback

贵司在使用我司产品过程中，若有任何疑问和建议，请随时直接或通过贵司采购联系我们的技术或业务人员，我们将在第一时间给贵司提供技术服务。

If you have any doubts and suggestions while using our products, please contact our technical engineer and seller directly or through the purchaser at any time. We will provide technical services to your company in the first time.

对产品特殊案例中无法满足使用要求或有疑问的情况，双方依据行业相关标准和具体情况秉持真诚合作的原则进行协商处理。

If the products could not meet the requirements or have any questions in special cases, we will deal the problem with principle of sincere cooperation, and base on the correlative industry standards and actual situation.