

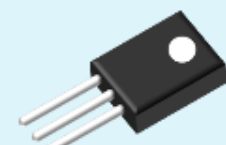


东丽的聚酰亚胺涂覆液SEMICOFINE®·PHOTONEECE®系列，是半导体，电子部品光刻制程中不可缺少的涂覆材料。秉持着优异的耐热，机械，电气特性，在保护膜，绝缘膜，中空构造形成膜等实际应用中，有着丰富的量产实绩。

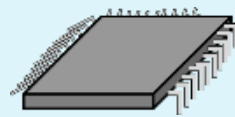
Toray manufactures polyimide coatings, Photoneece®/Semicofine®, that are widely used in semiconductor fabs and electronic component makers around the globe. With excellent mechanical properties of heat resistance, dielectric constants, robust encapsulation features and MEMS structure capability make Toray materials absolute.

应用实例 Applications

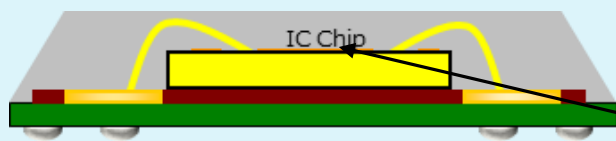
缓冲保护膜 Buffer coating



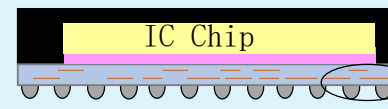
功率器件
Power device



存储器
Memory

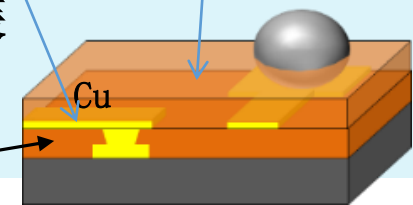
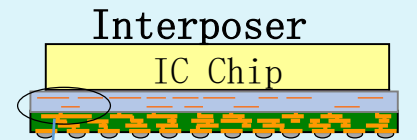


再布线层 Re-distribution layer



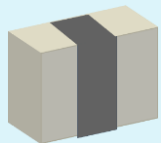
扇外型晶圆级封装
FO-WLP

载板 Interposer



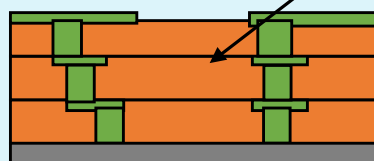
聚酰亚胺胶 Polyimide

层间绝缘膜 Interlayer dielectric

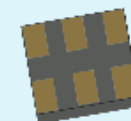


电感器 Inductor

线圈图形
Coil pattern (Cu etc.)



腔体构造 Cavity structure



声表滤波器等
Saw filter





聚酰亚胺涂覆材料一览 Product Lineups

非感光 Non-Photosensitive

感光 Photosensitive

Semicofine

- Polyimide structure design
- Photosensitize

Photoneece

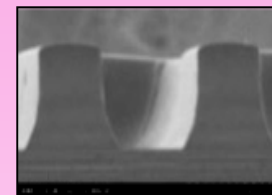
SP-series

- 优异的化学性能
- 良好的耐热性能
- Good mechanical properties
- High heat resistance

PN-series

负型/Negative tone

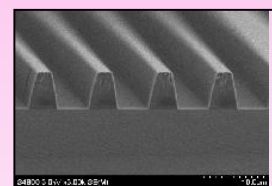
- 低温固化 Low-temp. cure
- 碱性溶液显影 Alkali-dev.
- 厚膜 Thick layer (30 μm)



PW-series

正型/Positive tone
高温固化/High temp. cure

- 高分辨率 High resolution
- 优异的CD均一性
Good CD uniformity



SP-LD series

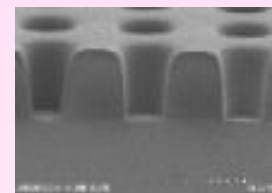
R&D

- Low Df <0.001@20Ghz
- Low Dk <2.9@20Ghz

LT-S series

正型/Positive tone
低温固化/Low-temp cure

- 高分辨率 High resolution
- 高延展率 High elongation
- 与铜兼容性 Cu compatibility





SP, PW系列在半导体保护膜的应用领域中, 已经成为业界公认的标准材料。此外, 在WLP (Wafer Level Packaging) 用途中, 保留了聚酰亚胺非常高的可靠性的同时, 还开发出了业界首款低温固化” LT-series “系列的材料。

SP&PW Series are two of the standardized semiconductor buffer-coating materials used at the fabs . Furthermore, with an intrinsic mechanical properties of prototype polyimide, low temperature curable polyimide, LT-Series, is the world’ s first positive tone polyimide in the Wafer Level Packaging market.

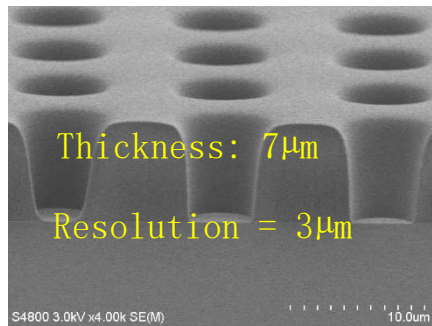
膜特性 Cured film Property		SP- series	PN- series	PW- series	LT-S series
		非感光 Non- Photosensitive	感光负胶 Negative- tone type	感光正型 Positive- tone type	感光正型 Positive- tone type
		-	碱性溶液显影 Alkali-dev	碱性溶液显影 Alkali-dev	碱性溶液显影 Alkali-dev
Cure condition (1hour)		320-350°C	200-350°C	320-350°C	170-250°C
Tensile strength	MPa	≥ 180	≥ 110	≥ 150	≥ 130
Elongation	%	≥ 20	≥ 25	≥ 20	≥ 60
CTE	ppm/°C	15-40	60-65	35-40	55-60
Young’ s modulus	GPa	2.9-4.4	3.3-3.9	3.8-4.0	2.0-2.5
5% weight loss Temp.	°C	≥ 540	≥ 380	≥ 450	≥ 340
Tg (TMA)	°C	280-320	220-330	300-350	240-270
Breakdown voltage	kV/mm	≥ 300	≥ 400	≥ 400	≥ 400



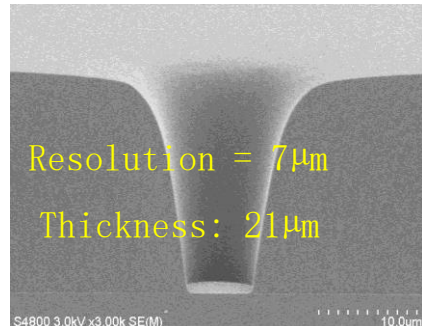
Features of PN, PW, LT-Series

高分辨率 和适用于各种曝光条件及光谱
Fine resolution and wide selection of exposure tool.

i-线步进式曝光 i-line stepper

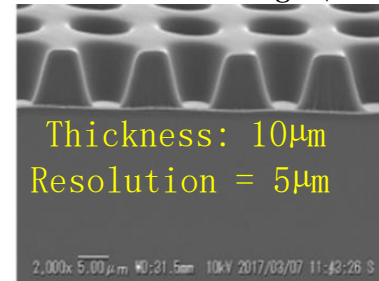


宽域对准曝光 Broad band aligner



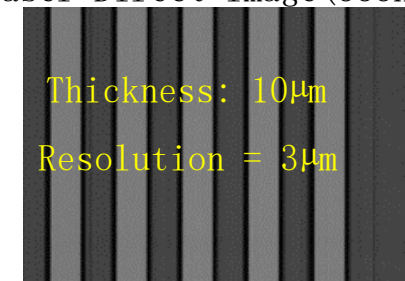
激光直接成像

Laser Direct Image (405nm)



激光直接成像

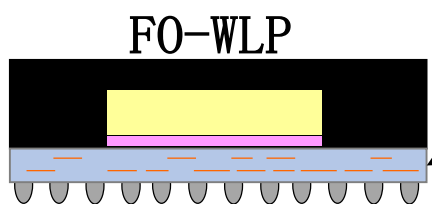
Laser Direct Image (355nm)



Features of LT-Series

不仅实现了正型特有的超精细加工，还满足了碱性溶液显影及低温固化需求。同时也可适用于面板工艺制程。

LT-Series is low curable positive photosensitive type. It has some excellent properties like high resolution, reworkable by acetone etc., and applicable to panel process.



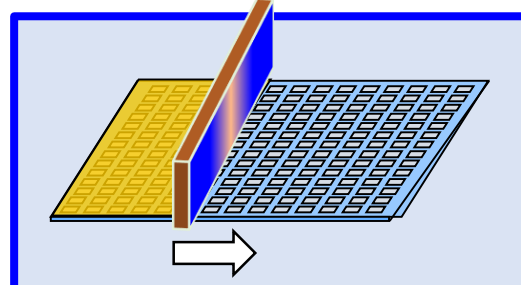
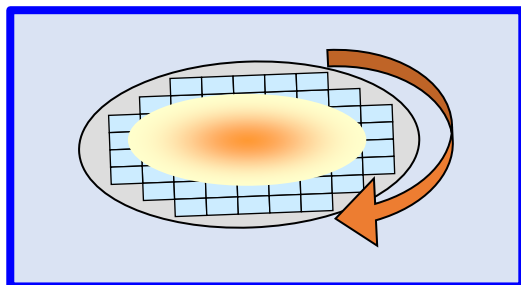
LT-series

Wafer Process

Panel Process

Spin coating

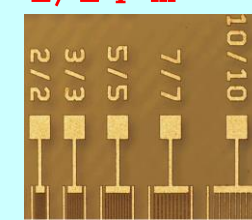
Slit coating



东丽加工案例

Panel Size: 500x 600mm

L/S=2/2 µm



Wafer Size:
8 inch

3层 再布线 RDLs 3 Layer

