

AUTOMATED PROJECTION SCANNING PLATFORM

SUSS DSC300 Gen3

Projection scanner for WLP, 2.5D & 3D packaging





PROJECTION SCANNER

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Projection lithography scanner for WLP, 2.5D & 3D packaging, bumping and fan-out applications

SUSS introduces its next generation projection scanner – the DSC300 Gen3. This proprietary scanning lithography platform touts triple digit throughput with fine ($2\ \mu\text{m}$) resolution capabilities at the lowest cost of owner- ship (CoO) among 1X projection lithography systems.

Re-engineered with a large diamond shaped scan beam and highly minimized overhead time – the DSC300 Gen3 Scanner delivers 300 mm wafer throughput of > 90 wph at $400\ \text{mJ}/\text{cm}^2$ and > 80 wph at $1000\ \text{mJ}/\text{cm}^2$.

Its enhanced 1X Wynne-Dyson optics and four recipe selectable numerical apertures enable the achievement of fine $2\ \mu\text{m}$ features in thin resist, as well as $> 100\ \mu\text{m}$ DoF in thick resist. The DSC300's full-field imaging technology supports industry roadmaps for large die patterning and mixed die packaging in heterogeneous integration without stitching or pattern size limits.

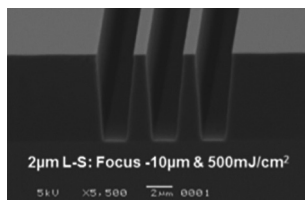
The state-of-the-art vision and alignment system includes both on-axis and off-axis cameras for maximum flexibility and an overlay accuracy of $\leq 1.0\ \mu\text{m}$ (mean $+ 3\sigma$). The DSC300 Gen3 is also equipped with proprietary Optical Magnification Correction and Beam Steering Technology which is invaluable in compensating for large amounts of

HIGHLIGHTS

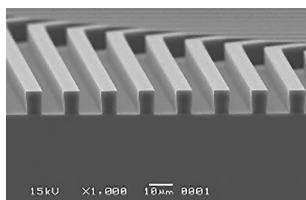
- + > 90 wph for 300 mm wafers at $400\ \text{mJ}/\text{cm}^2$ dose
- + Lowest cost of ownership among 1X projection lithography tools
- + $2/2\ \mu\text{m}$ L/S resolution and $\leq 1.0\ \mu\text{m}$ overlay (mean $+ 3\sigma$)
- + Full-field large-die patterning with no stitching
- + Active optical magnification compensation and beam steering to correct die shift errors in FOWLP



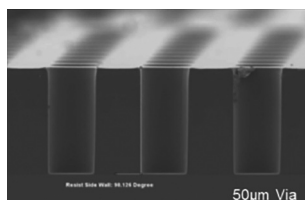
die shift in FOWLP applications, as well as common wafer run-in and run-out. Symmetric magnification to ± 200 ppm ($\pm 30\ \mu\text{m}$ on a 300 mm wafer) is available without throughput or resolution impact.



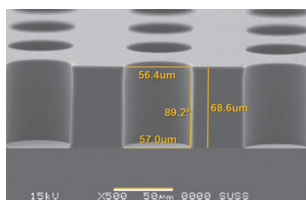
2 μm L/S in 7 μm TOK-PW1000T



10 μm L/S in 12 μm AZ15nxT



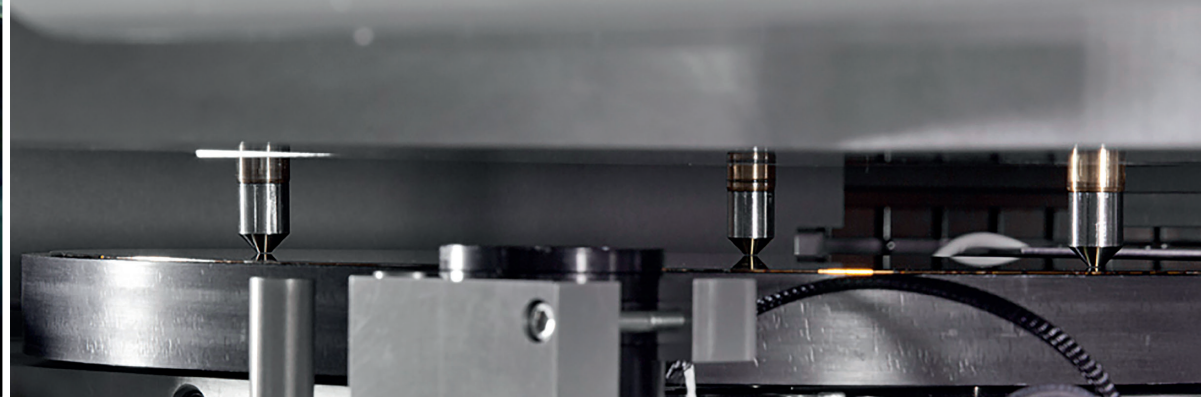
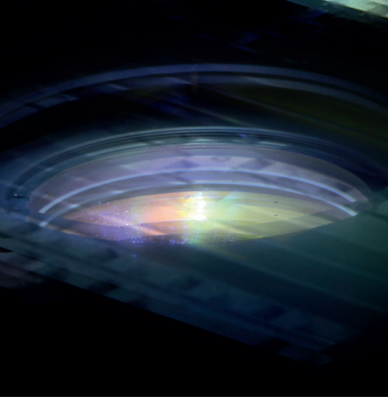
50 μm vias in 115 μm ASAHI-CX-A240



50 μm vias in 63 μm TOK CR-4000

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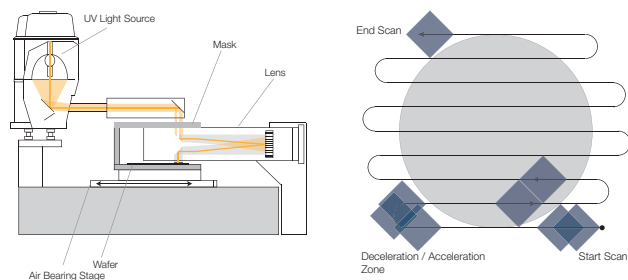
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Technical data

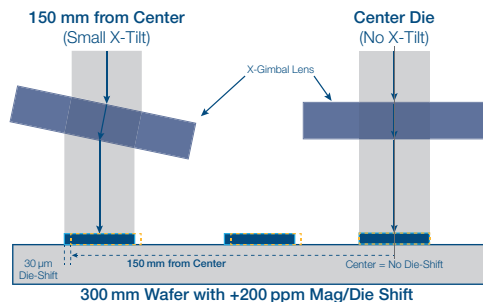
CORE TECHNOLOGY: Scanning Projection Lithography

Mask and wafer are co-mounted on a scanning stage. The system scans in a serpentine pattern with controlled velocity in the x-axis and precision stepping in the y-axis. Excellent exposure uniformity is achieved over the entire exposure area by scanning with a high intensity homogenized beam, overlapping adjacent scans, and precisely controlling the scan velocity.



Continuous serpentine scanning technique with diamond shaped beam

NEW TECHNOLOGY: Optical Die Shift Compensation



X-Gimbal lens angle adjusted in sync with stage position to compensate for mag/die shift

Data, design and specification depend on individual process conditions and can vary according to equipment configurations. Not all specifications may be valid simultaneously. Illustrations, photos and specifications in this brochure are not legally binding. SUSS MicroTec reserves the right to change machine specifications without prior notice.



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EXPOSURE SYSTEM

Exposure Mode	Full-field projection scanning (Dyson optics)
Resolution	2 µm L/S 2 µm resist
Numerical Aperture	Four selectable: 0.15, 0.14, 0.10, 0.07 NA
Imaging	Non-contact, single-side exposure
Wavelength Selection	350-450 nm selectable
Exposure Uniformity	< ± 3 %
Environmental Control	ECU (± 0.2 °C)

ALIGNMENT SYSTEM

Top-side Alignment	Optical: On-axis and off-axis IR: Off-axis (optional)
Back-side Alignment	IR TSA (optional)
Overlay Accuracy (Tool to Self)	Optical: ≤ 1.0 µm (mean + 3 σ) IR: ≤ 2.5 µm (mean + 3 σ)
Run-in / Run-out Control	Mask cooling (standard) Optional Optical Mag Correction and Beam Steering: Symmetric correction: ± 200 ppm
Fan-Out Die Shift Compensation	Optional Optical Mag Correction and Beam Steering: Symmetric correction: ± 200 ppm

WAFER AND MASK HANDLING

Wafers	300 mm (optional 200 mm and 330 mm)
Allowable Warpage	< 2 mm (standard); up to 5 mm (customized)
Carrier Mounted Substrates	Yes
Thin Substrates w/o Carrier	Thickness down to 200 µm
Wafer Loading	Fully automated
Mask Loading	Fully automated
Mask	Full field (entire substrate layout)
Mask Sizes	14" (300 mm wafers); Optional 9" (200 mm wafers)
Pellicle Mask Handling	Optional

DIMENSIONS

Width x Depth x Height	3220 mm x 4197 mm x 2466 mm (incl. peripherals)
Weight	Main tool: 4587 kg; EFEM: 562 kg; ECU: 290 kg

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