

POLOS® BEAM

Maskless lithography enables nanopatterning at will, without the need for slow and expensive photomasks. This convenience is especially useful for research and rapid prototyping use. The POLOS® Beam compliments the existing benefits by bringing it to the desktop without any compromise in performance.



The Beam Engine focuses a UV laser beam into a diffraction-limited spot and scans the spot to expose any arbitrary pattern on a photoresist. To expose large wafers, precision steppers move the wafer and allows multiple exposures to be stitched. The Beam Engine is capable of producing features smaller than (CD) 0.8 μm across a 5" wafer.

COMPACT

Full-featured maskless lithography, smaller than a desktop computer.

POWERFUL

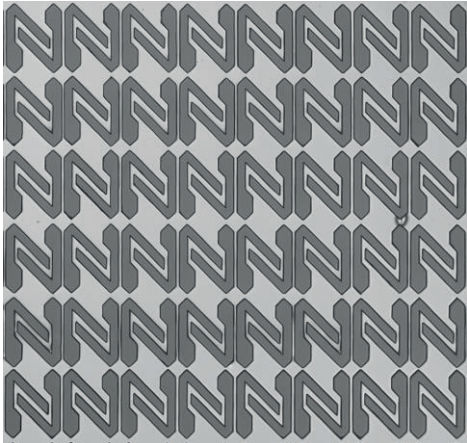
Sub-micron resolution while exposes a writefield in less than two seconds.

ULTRAFAST AUTOFOCUS

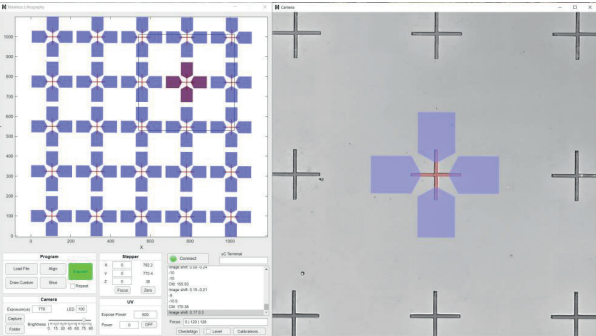
Piezo actuators reach focus in less than a second when combined with our closed looped focus optics.

NO-FUSS MULTILAYER

Semi-automatic alignment allows multilayer alignment to be completed within minutes.



Array of resist micropatterns on silicon substrate. Each cell is 50 x 63 μm, with 3 μm spacing between adjacent patterns. Resist used AZ 5214 E.



The included software makes quick work of any patterning job; just load, align and expose. Navigation is similar to CNC systems

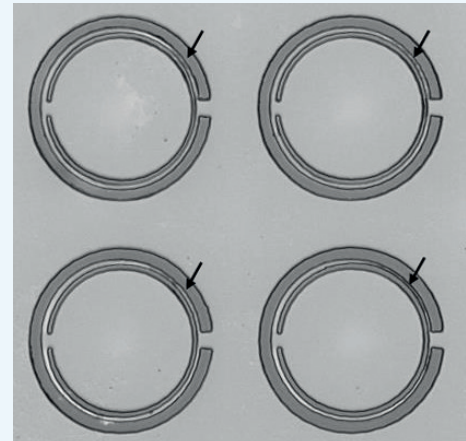
During multilayer exposures, the GDS pattern is overlaid for visualization. The control GUI (left window) has a minimap of the loaded GDS that allows navigation to any area on the wafer with 1 click.

SPECIFICATIONS

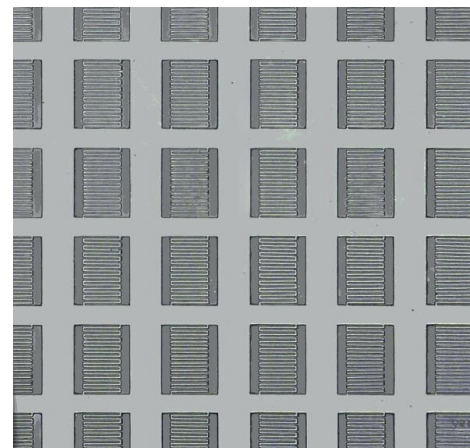
| Patterning | | |
|--------------------|--|-------------------|
| Minimum Linewidth | 2 μm guaranteed 0.8 μm achievable | |
| Minimum Pitch | 1.6 μm achievable | |
| Exposure Time | < 2 s for 1 writefield | |
| Maximum writefield | 400 μm x 400 μm | |
| Laser Wavelength | 405 nm | |
| Galvo | Step size | 8 nm |
| | Repeatability | < 100 nm (static) |
| | Speed | up to 200 mm/s |

| Stepping | | |
|---------------------|-----------------------------------|-------------------------------|
| Motorized stepper | Encoder Resolution | 0.1 μm |
| | Stage Repeatability (1 σ) | Better than 0.3 μm |
| | Movement area | 120 mm x 120 mm |
| Largest sample size | 130 mm x 130 mm (> 5") | |
| Wafer alignment | Multilayer processes supported | |

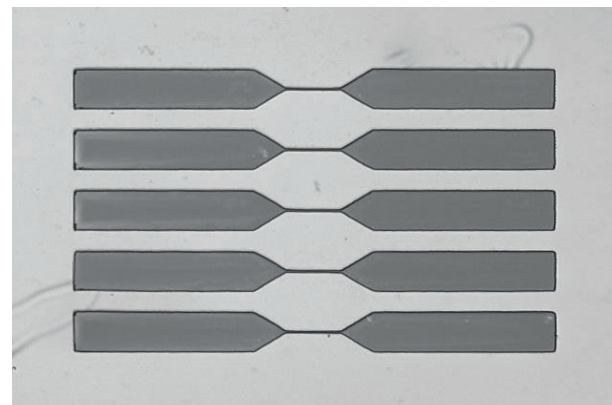
| General | | |
|-----------------------|---|---|
| Accepted file formats | .bmp, .png, .tiff, .gds Custom shapes can directly be drawn in software. | |
| Software | Patterning | Beam Xplorer |
| | Design | KLayout (most powerful), MS Paint/Powerpoint (rapid prototyping) |
| Weight | Lighter than 20 kg | |
| System size | 330 x 310 x 340 mm | |



Split-ring resonator arrays. The separation distance on the right is 1.5 μm (arrows), separation distance on the left is 2 μm . The outer ring is 80 μm across.



Interdigitated Capacitors (IDCs) with 2 μm fingers. Resist used: AZ5214E.



0.8 μm tapered middle section with 20 x 90 μm contact pads on the side. Resist used: AZ5214E.