

ELIONIX

Ultra High Precision Electron Beam Lithography System

ELS-7800



ELIONIX Inc.

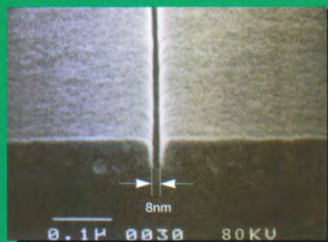
Ultra High Precision Electron Beam Lithography System

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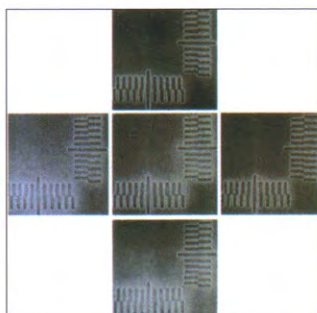
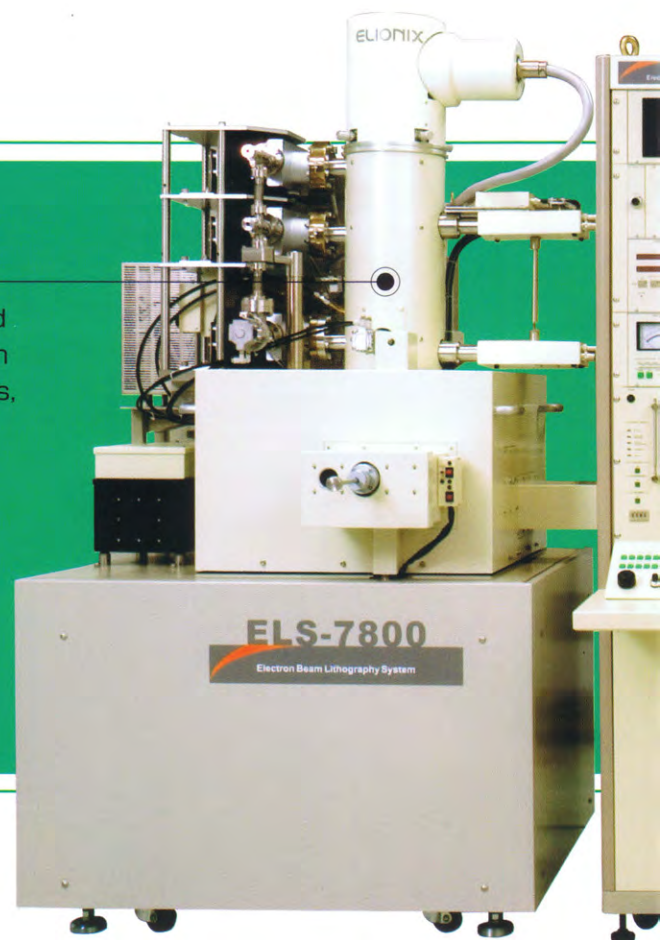
Our 80kV acceleration voltage achieves the capability of writing an 8nm line!

Ultra-fine Line Lithography

With a ZrO/W Thermal type field-emission electron gun and 80kV acceleration voltage, the ELS-7800 provides a stable electron beam of 2nm in diameter. Even on commercially available resists, fine patterns below 10nm can be fabricated.



8nm Ultra-fine Line Lithography



High-Precision Stage equipped with Laser Interferometer

The ELS-7800 high precision embodies our long expertise in lithography manufacturing. With the laser interferometer, an excellent accuracy has been achieved both in stitching lithography and overlay lithography.

Applications

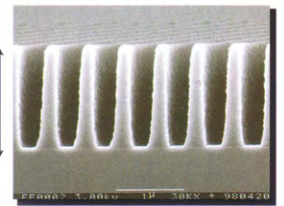
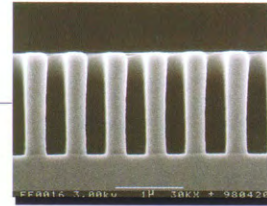
Blazed Grating

Optical planar lens
(film thickness: 0.32 μ m, pitch: 1.0 μ m)



High-Aspect Ratio Lithography

Applications to resist-mask etching
and lift-off are possible.

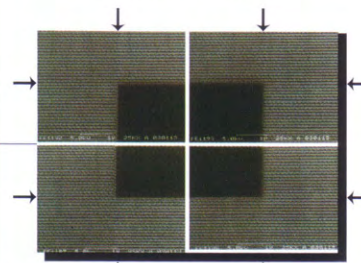


0.3 μ m line-&-space lithography
using positive resist

0.3 μ m line-&-space lithography
using negative resist

High-Precision Stitching Pattern

10nm line, 100nm pitch. The arrow marks
indicate the stitching boundaries.



The arrow marks indicate the stitching boundaries.



ELS-7800

A Wide Variety of Lithography Software

The ELS-7800 comes standard with an Elionix developed CAD system. Various Lithography functions for drawing elementary shapes are provided. A CAD converter, that accepts conventional CAD formats (GDSII, DXF) and changes them to the Elionix format, is optional.



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Specifications

Main unit

Lithography performance

- [Drawing method]
Vector scanning
Raster scanning (optional)
- [Stage Movement]
Step & repeat
- [Electron beam shape]
Spot beam (Gaussian)
- [Lithography field size]
2400 μ m x 2400 μ m (maximum)
75 μ m x 75 μ m (minimum)
- [Minimum line width]
8nm or less
(80kV, 75 μ m square field)
- [Beam positioning]
240,000 x 240,000 positions (maximum)
- [Beam positioning resolution]
0.31nm

Electron optics system

- [Emitter]
ZrO/W thermal field emitter
- [Acceleration voltage]
80kV, 50kV, 25kV changeover
- [Minimum beam diameter]
 ϕ 2nm (80kV)
- [Beam current intensity]
5x10⁻¹³ - 1x10⁻⁹A

Lithography unit

- [Exposure area]
150mm x 130mm
- [Stage movement range]
X direction: 155mm
Y direction: 155mm
Z direction: \pm 2.5mm
- [Laser interferometer resolution]
0.6nm
- [Field stitching accuracy]
30nm
- [Overlay accuracy]
30nm
- [Maximum specimen size]
6" wafer, or, 6" square mask
(8" optional)

Option

- Small piece specimen holder
- 4 channel secondary electron detector system
- Circle pattern generator
- Raster scanning function
- Spot lithography function
- Variable field size function
- Software for functional patterns
- Data conversion function (GDS II, DXF format)
- 8" specimen chamber
- Printer
- Super fine coating system

Installation requirements

Room size

4.8mW x 4mD x 2.5mH or more

Power

- [Main unit control system]
Single phase AC100V 3kVA 50/60Hz with a switch (NFB)
 - [Evacuation control system]
Single phase AC100V 2kVA 50/60Hz with a switch (NFB)
 - [Computer control system]
Single phase AC100V 2kVA 50/60Hz with a switch (NFB)
- A distribution board is needed in the room.

Room temperature

\pm 0.3°C or less, within 20 - 25°C
(\pm 0.1°C or less for ultra fine lithography)

Humidity

60% or less

Floating magnetic field

0.3 μ Tesla (3 mGauss) or less
(0.1 μ Tesla or less during ultra fine lithography)

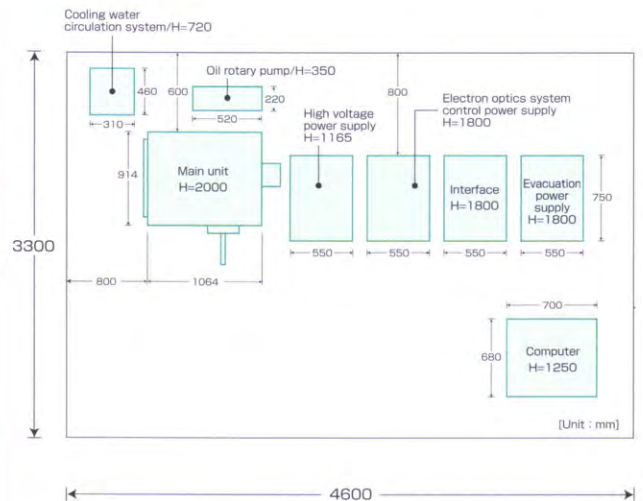
Floor vibration

Acceleration 0.5gal, displacement 2 μ m p-p or less
(Acceleration 0.2gal, displacement 2 μ m p-p or less during ultra fine lithography)

Ground terminal

100 Ω or less, exclusive
For 3 wire conductors, 2 wires are used for power and the remaining one for grounding.
The ground terminal must be within 30cm of the power source. N2 gas and compressed air are also required. When installing in a clean room, the exhaust pipe for the oil rotary pump is also necessary.

Layout example



Specifications are subject to change without notice

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