

PHEMOS-1000

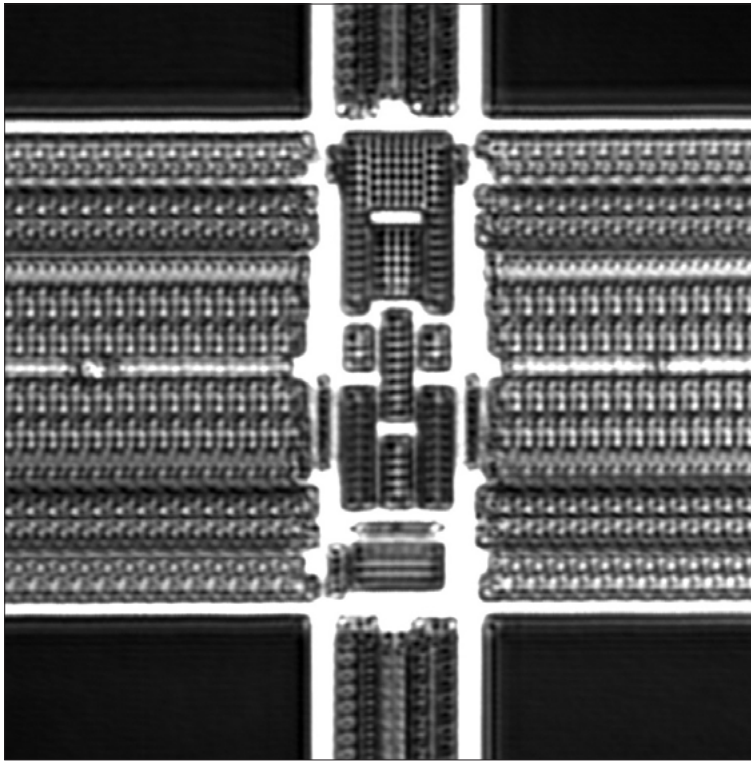
THEMOS-1000

iPHEMOS-MP

TriPHEMOS

# NanoLens-SHR

**A single Super High Resolution SIL assembly that works for photoemission and laser techniques, at various sample thicknesses**



▲ Image by the NanoLens-SHR (Details on the back page)



## Features

- Numerical aperture (N.A.): 3.1
  - Maximum resolution: approx. 120 nm
  - Sensitivity: 10 times (compared with a standard NIR100× lens)
- Available both for photoemission and laser applications (IR-OBIRCH analysis, EO probing, etc.)
- Swappable SIL cap architecture
  - Cover Si thicknesses from 50  $\mu\text{m}$  to 795  $\mu\text{m}$
  - Easy mounting on lens body
  - Lens is automatically aligned on a device surface to get the best contact between the lens and Si surface to collect light signal most efficiently.

## Applications

- Backside observation of advanced devices
  - Photoemission analysis
  - Time-resolved photoemission analysis
  - IR-OBIRCH analysis
  - DALS (Dynamic Analysis by Laser Stimulation) analysis
  - EO probing analysis

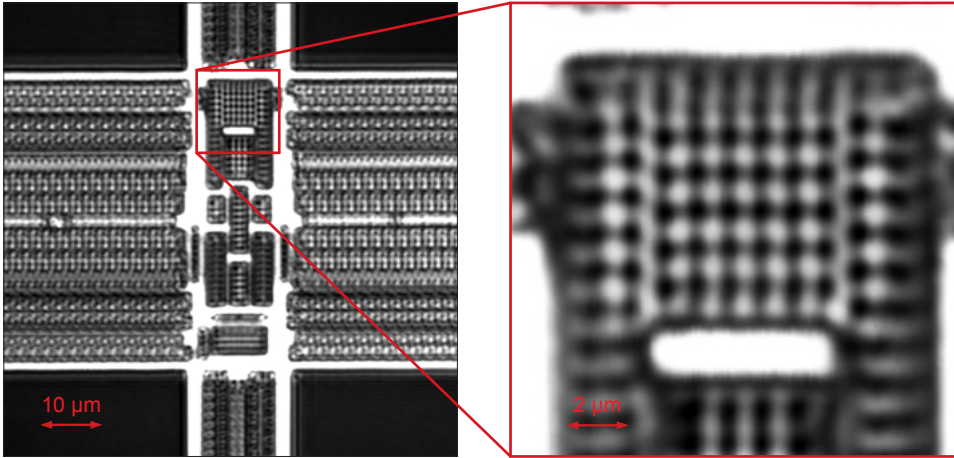
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## Case study

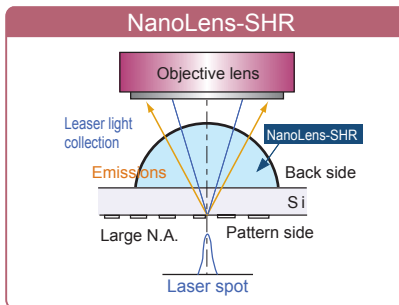
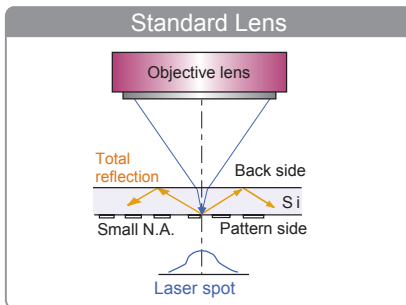
- Purpose** Evaluation of NanoLens-SHR resolution by using an actual sample
- Method** Taking a pattern image of a commercially available 38 nm DRAM with backside polish  
Light source is 1.3  $\mu\text{m}$  laser.

## Results



- Conclusion** Acquired image has no distortion. FOV 52  $\mu\text{m} \times 52 \mu\text{m}$   
The 10  $\mu\text{m}$  square digital zoomed image shows detailed structure clearly.

## Principles



Due to the high reflection index of Si, light passing through the Si layer is not collected efficiently by an objective lens. By putting a Si lens directly on the Si surface, all light that has been reflected at the boundary between Si and the lens can be collected and focused to a high N.A. objective lens. Higher light collection efficiency improves image resolution drastically.

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