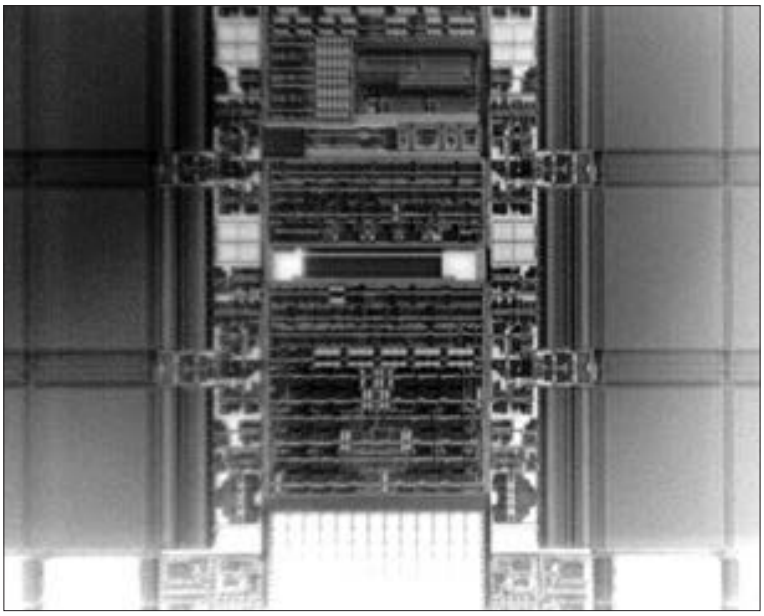
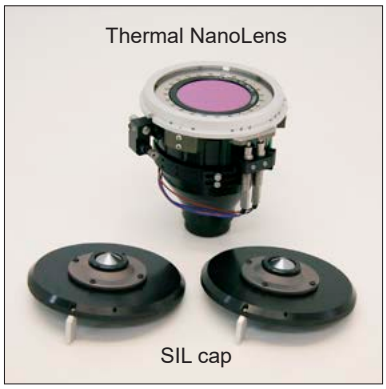
Failure Analysis Systems Option

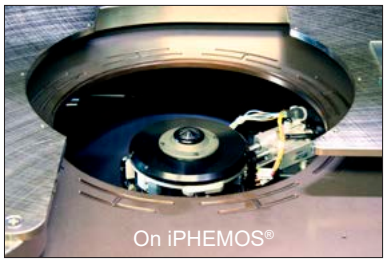
Thermal NanoLens

The Thermal NanoLens brings the advantages of SIL imaging to both downward and upward looking thermal emission microscopes.



▲Image taken with Thermal NanoLens (See last page for details)





Features

- Numerical aperture (N.A.): 2.6
  - · Maximum resolution: approx. 1 µm
- Available for both downward looking system and inverted system
- Swappable SIL Cap architecture
  - · Swapping between two types of SIL caps that cover Si thickness from thinned chip to full wafer thickness.
  - · SIL cap is keyed for straightforward mounting.
  - · Lens is automatically aligned on a device surface to get the best contact between a lens and Si surface to collect light signal most efficiently.

Application

- Backside observation of advanced devices
  - · Thermal photoemission analysis

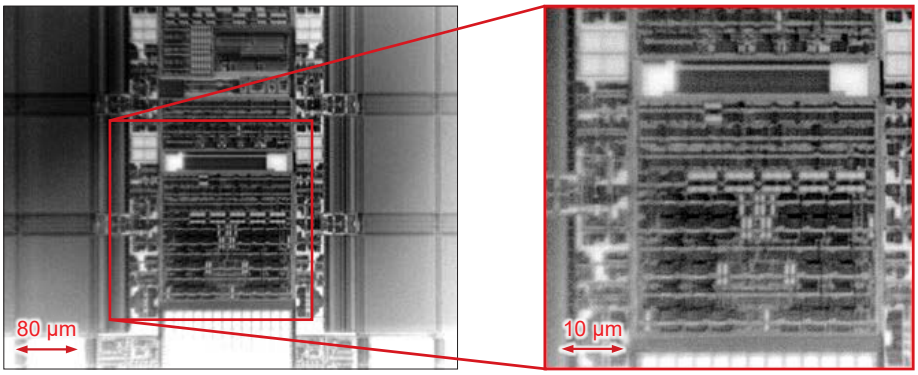
HAMAMATSU

PHOTON IS OUR BUSINESS

Failure Analysis Systems Option

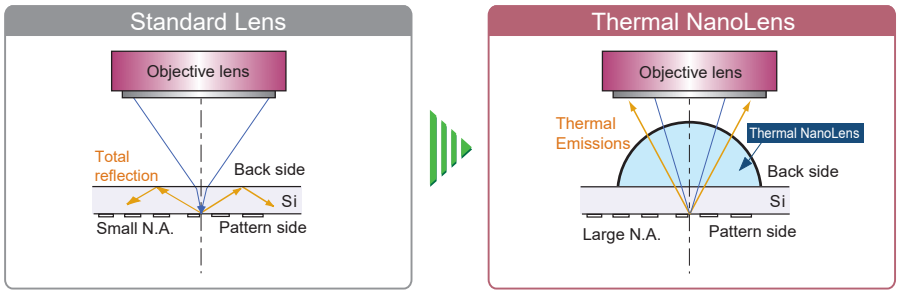
Case study

- **Purpose** Evaluation of a Thermal NanoLens resolution by using an actual device
- **Method** Sample: A commercially available 38 nm DRAM with decapsulation.
  Take a pattern image using an InSb camera
- **Result**



- **Conclusion** Acquired image has no distortion. FOV 340 µm × 270 µm
  The 100 µm × 90 µm size 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.

HAMAMATSU PHOTONICS K.K. **www.hamamatsu.com**

Systems Division
812 Joko-cho, Higashi-ku, Hamamatsu City, 431-3196, Japan, Telephone: (81)53-431-0124, Fax: (81)53-433-8031, E-mail: export@sys.hpk.co.jp

U.S.A.: Hamamatsu Corporation: 360 Foothill Road, Bridgewater, NJ 08807, U.S.A., Telephone: (1)908-231-0960, Fax: (1)908-231-1218 E-mail: usa@hamamatsu.com
Germany: Hamamatsu Photonics Deutschland GmbH.: Arzbergerstr. 10, D-82211 Herrsching am Ammersee, Germany, Telephone: (49)8152-375-0, Fax: (49)8152-265-8 E-mail: info@hamamatsu.de
France: Hamamatsu Photonics France S.A.R.L.: 19, Rue du Saule Trapu, Parc du Moulin de Massy, 91882 Massy Cedex, France, Telephone: (33)1 69 53 71 00, Fax: (33)1 69 53 71 10 E-mail: infos@hamamatsu.fr
United Kingdom: Hamamatsu Photonics UK Limited: 2 Howard Court,10 Tewin Road, Welwyn Garden City, Hertfordshire AL7 1BW, UK, Telephone: (44)1707-294888, Fax: (44)1707-325777 E-mail: info@hamamatsu.co.uk
North Europe: Hamamatsu Photonics Norden AB: Torshamnsgatan 35 16440 Kista, Sweden, Telephone: (46)8-509 031 00, Fax: (46)8-509 031 01 E-mail: info@hamamatsu.se
Italy: Hamamatsu Photonics Italia S.r.l.: Strada della Moia, 1 int. 6, 20044 Arese (Milano), Italy, Telephone: (39)02-93 58 17 33, Fax: (39)02-93 58 17 41 E-mail: info@hamamatsu.it
China: Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Beilu, Chaoyang District, 100020 Beijing, P.R. China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn
Taiwan: Hamamatsu Photonics Taiwan Co., Ltd.: 8F-3, No.158, Section 2, Gongdao 5th Road, East District, Hsinchu, 300, Taiwan R.O.C. Telephone: (886)3-659-0080, Fax: (886)3-659-0081 E-mail: info@hamamatsu.com.tw

Cat.No.SSMS0054E02
JUL/2021 HPK
Created in Japan