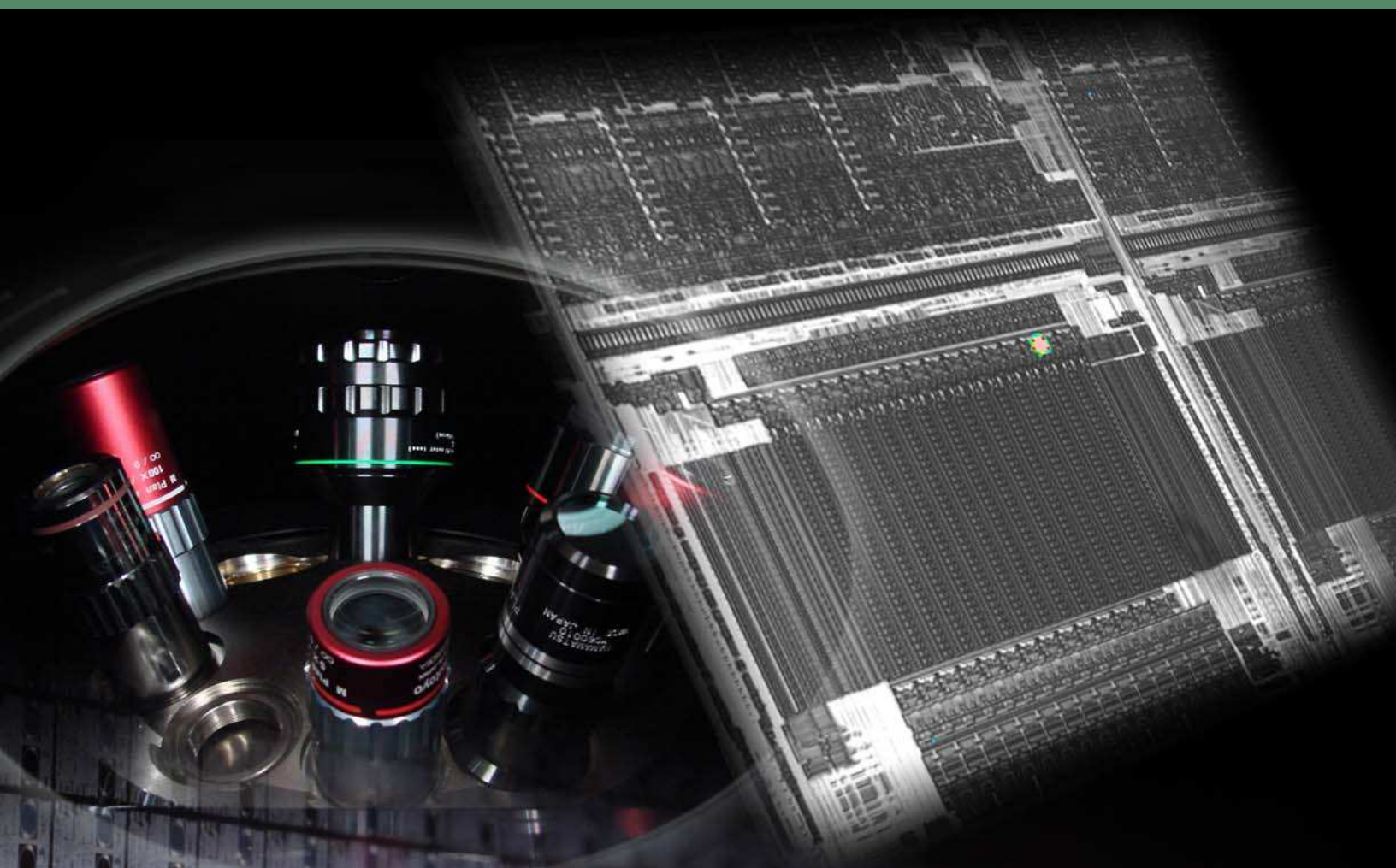


Inverted Emission Microscope

i PHEMOS[®] Series



Tester direct docking type
i PHEMOS-SD



Tester direct docking type
i PHEMOS-TD



Backside probe type
i PHEMOS-TP

HAMAMATSU
PHOTON IS OUR BUSINESS



The inverted emission microscope "iPHEMOS" is a semiconductor failure analysis system developed specifically for backside analysis of semiconductor devices. Emission analysis, thermal analysis, IR-OBIRCH analysis, and time-resolved emission analysis are possible simply by selecting a detector. Dynamic analysis is available by tester direct docking. Combined with a backside observation prober, the system carries out measurements from a single die to whole dies on a wafer as needed.

Backside
observation

Direct
docking
with
tester

Equipped
with a maximum
of 3 detectors

Uses
10-lens
turret

■ Features

- Multi-camera platform with high-precision stage
- Flexible system design
- Multiple detectors suitable for observing low voltage operating IC
- Variety of lens selection from 1× to 100×
(Optional 10-lens turret available.)
- Backside observation prober available for measurements from an entire 300 mm wafer to a single die
- Simplified tester head docking for dynamic analysis
- User friendly operation system
- Easily upgradable for future application
- High-resolution pattern image by confocal microscope

■ Options

- **NanoLens for high-resolution and high-sensitivity observation**
Using a NanoLens allows to increase the numerical aperture (N. A.) and significantly improves both resolution and light collection efficiency. This shortens detection time yet delivers high-resolution.
- **IR-OBIRCH analysis function**
The highly popular IR-OBIRCH (Infrared Optical Beam Induced Resistance CHange) analysis function can be added as an option to detect line defects such as leakage or IDDQ defects.
- **Use of digital lock-in kit enhances the IR-OBIRCH analysis detection functions**
Digital lock-in by the software ensures a clear and sharp image compared to analog lock-in even by short image acquisition times.
- **Dynamic analysis function by laser radiation**
Irradiates a device with a laser beam and observes the status change (Pass/Fail) in device operation to analyze functional defects.
- **Sequence software**
This function enables automatic measurement of Emission/IR-OBIRCH observation by following the procedure set by a user. Emission/IR-OBIRCH images can be sequentially measured and saved when connected to a semi-automatic prober. Measurements under the condition with an LSI tester or an external power source are possible as well.

Lineup

Inverted Emission Microscope

iPHEMOS - TP**High-precision backside prober for 300 mm wafers with multiple platforms**

Equipped with a backside emission prober (BEP) made for 300 mm wafers by Cascade Microtech. Rapid and accurate multiple pins probing or micro-probing on a wafer enables highly efficient analysis from the backside of a wafer. Its multiple platforms and a full line of options including several laser application options and wafer automatic measurement software offer a wide range of backside analysis. A maximum of 3 detectors can be installed in one unit.



Inverted Emission Microscope

iPHEMOS - TD**Tester direct docking type with multiple platforms**

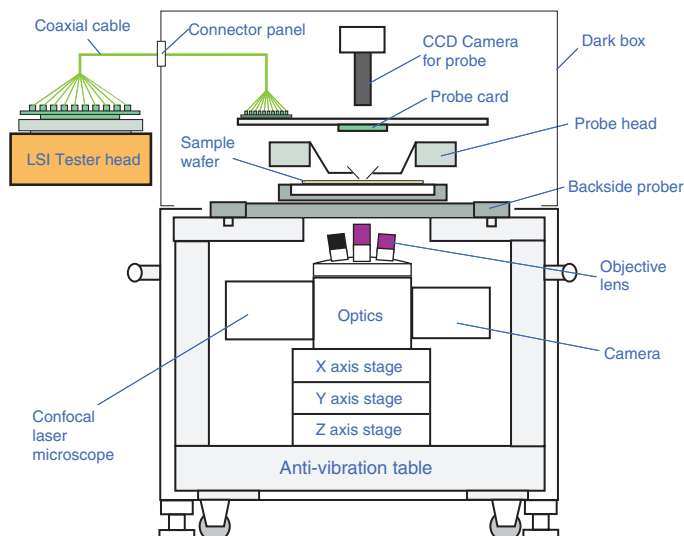
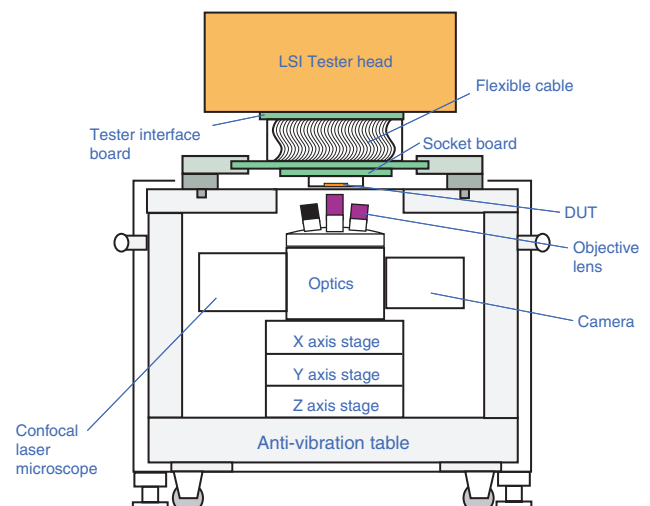
A maximum of 3 cameras and 2 lasers can be selected and installed. Direct docking with an advanced function tester or cable docking using a manipulator or probe card is selectable. A simple stage for 300 mm wafers is available. A flexible system structure including a laser application option allows you to perform a variety of backside analysis while using many types of detectors.



Inverted Emission Microscope

iPHEMOS - SD**Compact and mobile tester direct docking type**

The compact design with 80 cm height enables easy docking with different types of testers. A high-sensitivity InGaAs camera and a variety of laser options enlarge the range of dynamic analysis.

**cable connection****direct tester docking**

Selection

Type Name	iPHEMOS-TP	iPHEMOS-TD	iPHEMOS-SD
Port for Detector			
For camera	3	3	1
For laser	1 (2: option)	1 (2: option)	1 (2: option)
Camera Selection			
C-CCD Camera: C4880-59	Selectable up to 3		-
SI-CCD Camera: C11231-02			-
InGaAs Camera (LN2 cooling): C8250-25 *1			-
InGaAs Camera (Peltier cooling): C8250-27 *1			✓
InGaAs Camera (LN2 cooling): C8250-35 *1			-
Thermal Camera (InSb): C9985-04			-
2D Time-Resolved Camera *2			-
Laser Selection			
1.3 mm Laser (100 mW)	Selectable up to 2 (Cannot use 2 lasers of the same wavelength)		✓
1.3 mm High power laser (400 mW): C8430-02			Optional
1.1 mm Pulse laser (200 mW CW, 800 mW pulse): C9215-06			Optional
Objective Lens			
5-lens turret	✓	✓	✓
10-lens turret	Optional	Optional	-
Lens Selection (up to 5 lenses selectable)	Applicable technique	N.A.	WD (mm)
1x	OBIRCH / Photoemission	0.09	15
2.5x	OBIRCH / Photoemission	0.1	28
M-PLAN-NIR-5x : A11315-01	OBIRCH / Photoemission	0.14	37.5
M-PLAN-NIR-20x : A11315-03	OBIRCH / Photoemission	0.4	20
M-PLAN-NIR-50x : A11315-04	OBIRCH / Photoemission	0.42	17
NIR50x : A8756-01 *3	OBIRCH / Photoemission	0.42	17.3
High NA50x : A8018	OBIRCH	0.76	12
M-PLAN-NIR-100x : A11315-05	OBIRCH / Photoemission	0.5	12
NIR100x : A8756-02 *3	OBIRCH / Photoemission	0.5	12.3
M-PLAN-NIR-100xHR : A11315-06	OBIRCH / Photoemission	0.7	10
G-PLAN-APO-NIR100x : A11315-08 *3	OBIRCH / Photoemission	0.7	6
MWIR 0.8x	Thermal Emission	0.13	22
MWIR 4x	Thermal Emission	0.52	25
MWIR 15x	Thermal Emission	0.71	15
MWIR 30x	Thermal Emission	0.71	13
NanoLens C9710	OBIRCH / Photoemission	2.5	-
Prober	PA300BEP (Cascade Microtech)	Sample stage C10434-01	Optional Compact stage
Direct Docking	-	Optional	✓

✓ : standard composition — : not available

*1 : Select either one *2 : Please consult with Hamamatsu when you select 2D Time-Resolved Camera. *3 : With glass thickness correction

Dimensions / Weight

	iPHEMOS-TP	iPHEMOS-TD	iPHEMOS-SD
iPHEMOS main unit	1990 mm (W) × 1510 mm (D) × 2090 mm (H), Approx. 1800 kg ^{*1}	1740 mm (W) × 1270 mm (D) × 1500 mm (H), Approx. 1500 kg	805 mm (W) × 915 mm (D) × 1180 (775 ²) mm (H), Approx. 500 kg
iPHEMOS control rack	880 mm (W) × 700 mm (D) × 1542 mm (H), Approx. 255 kg	880 mm (W) × 700 mm (D) × 1542 mm (H), Approx. 255 kg	880 mm (W) × 1000 mm (D) × 1775 mm (H), Approx. 200 kg
Operation desk	1000 mm (W) × 800 mm (D) × 700 mm (H), Approx. 45 kg	1000 mm (W) × 800 mm (D) × 700 mm (H), Approx. 45 kg	-

*Weight will differ according to option configuration.

*1 : Weight of iPHEMOS-TP unit includes a prober or equivalent item. *2 : Height is up to the sample edge on the iPHEMOS-SD.

LASER SAFETY

Hamamatsu Photonics classifies laser diodes, and provides appropriate safety measures and labels according to the classification as required for manufacturers according to IEC 60825-1. When using this product, follow all safety measures according to the IEC.

CLASS I LASER PRODUCT

Description Label (Sample)



Caution Label

★ PHEMOS are registered trademark of Hamamatsu Photonics K.K. (France, Germany, Japan, U.K., U.S.A.)

★ Product and software package names noted in this documentation are trademarks or registered trademarks of their respective manufacturers.

★ Information furnished by HAMAMATSU is believed to be reliable. However, no responsibility is assumed for possible inaccuracies or omissions.

Specifications and external appearance are subject to change without notice.

© 2013 Hamamatsu Photonics K.K.

HAMAMATSU PHOTONICS K.K. www.hamamatsu.com**HAMAMATSU PHOTONICS K.K., Systems Division****812 Joko-cho, Higashi-ku, Hamamatsu City, 431-3196, Japan, Telephone: (81)53-431-0124, Fax: (81)53-435-1574, E-mail: export@sys.hpk.co.jp****U.S.A.:** Hamamatsu Corporation: 360 Foothill Road, P. O. Box 6910, Bridgewater, N.J. 08807-0910, 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)8152-2658 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, United Kingdom, Telephone: 44-(0)1707-294888, Fax: 44-(0)1707-325777 E-mail: info@hamamatsu.co.uk**North Europe:** Hamamatsu Photonics Norden AB: Thorshamnsgatan 35 SE-164 40 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/E, 20020 Arese, (Milano), Italy, Telephone: (39)02-935 81 733, Fax: (39)02-935 81 741 E-mail: info@hamamatsu.it**China:** Hamamatsu Photonics (China) Co., Ltd.: 1201 Tower B, Jiaming Center, 27 Dongsanhuan Road North, Chaoyang District, Beijing 100020, China, Telephone: (86)10-6586-6006, Fax: (86)10-6586-2866 E-mail: hpc@hamamatsu.com.cn

Cat. No. SSMS0019E14

JAN/2013 HPK

Created in Japan