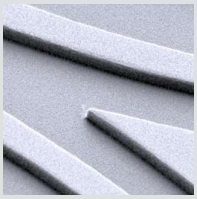
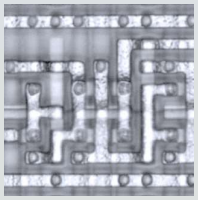
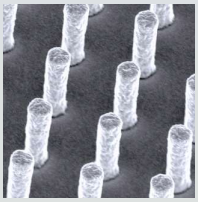
HEIDELBERG INSTRUMENTS

VPG 300 DI

THE MASKLESS DIRECT IMAGER FOR HIGH-ACCURACY AND HIGH-RESOLUTION MICROSTRUCTURES







heidelberg-instruments.com

VPG 300 DI

THE MASKLESS DIRECT IMAGER FOR HIGH-ACCURACY AND HIGH-RESOLUTION MICROSTRUCTURES

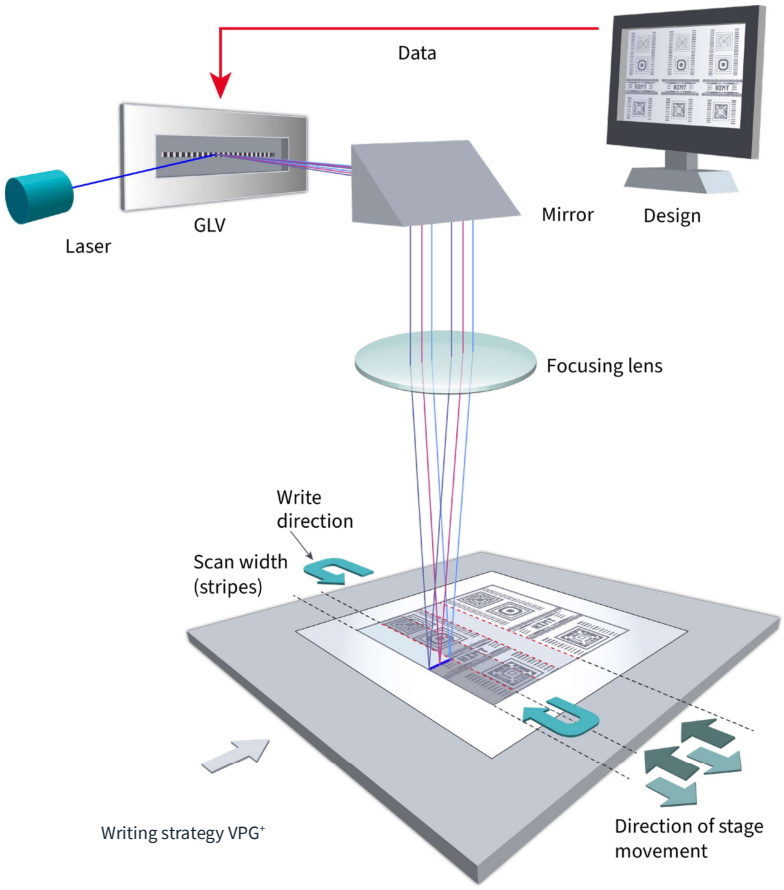
The VPG 300 DI is a Volume Pattern Generator specifically designed for direct writing high-resolution microstructures in i-line resists. It is based on the same field-proven ultra-high-speed exposure optical engine as the VPG+, with additional advanced system components like a Zerodur® stage and differential interferometer. Additionally, the VPG 300 DI offers various metrology, alignment, and wafer handling options.

HIGH-PRECISION DIRECT WRITER

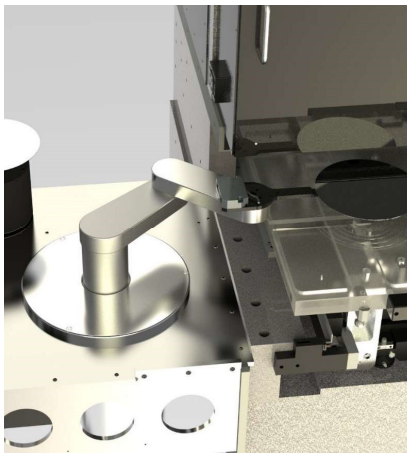
The VPG 300 DI is a direct write lithography tool with outstanding imaging quality, resolution, and pattern position precision. The system is derived from the Heidelberg Instruments series of VPG+ laser writers, which are typically used for photo-mask production with the corresponding high-performance specifications and are designed to fulfil the demanding requirements of industrial environments.

The VPG+ systems can look back on a long and successful career in mask shops all over the world. The VPG 300 DI vastly benefits from the in-depth experience that Heidelberg Instruments gained in the development and production of these high-speed production tools.

The system offers a choice of two high-resolution write modes, both capable of patterning sub-micron features with minimum features sizes down to 500 nm. Address grids below 10 nm guarantee high structure fidelity, while the data biasing during conversion corrects for target CD deviations.



The system's second-layer alignment performance, the layer to layer repeatability, and the pattern position accuracy allow for the fabrication of precise multi-layer structures as well as mix-and-match applications with other tools.



Fully automatic substrate handling

THE VPG 300 DI IN A NUTSHELL

- Ultra-high-speed exposure engine
- Real-time autofocus system
- High-power DPSS laser with 355 nm wavelength
- Two write modes
- Camera system for metrology and alignment
- Closed-loop climate chamber
- Automatic loading system
- Optical edge detection
- Multiple data input formats
- User programmable interface
- Special chucks
- Labelling options
- Resolution down to 500 nm
- VIS/IR backside alignment

Application images on front page, left to right: Waveguide; CMOS personalization (courtesy of IMS Chips); Fine pitch Cu pillars chiplet connection (Courtesy of Fraunhofer IZM)

VPG 300 DI

SYSTEM SPECIFICATIONS

Write mode	I	II
Writing performance		
Minimum feature size [µm]	0.5	0.8
Minimum lines and spaces [µm]	0.8	1.2
Address grid [nm]	4	8
Edge roughness [3σ, nm]	30	40
CD uniformity [3σ, nm]	50	60
2nd layer alignment (global) [nm]	100	130
Write speed [mm²/min]	340*	1020*
	*Fast mode: 680 and 2056 mm²/min with similar performance, but without specification	
Exposure time for 100 x 100 mm² area [min]	39	17
System features		
Light source	High-power DPSS laser with 355 nm	
Maximum substrate sizes	300 x 300 mm²	
Substrate thickness	0 to 12 mm (other thicknesses on request)	
Maximum exposure area	300 x 300 mm²	
Autofocus	Realtime autofocus system (optical and pneumatic)	
Autofocus compensation range	>160 µm	
Flowbox	(Closed-loop) temperature controlled environmental chamber	
Alignment and metrology	Camera system and software package for metrology and alignment.	
Other features and options	Full automatic handling and prealigning of 100, 150, 200, and 300 mm wafers. Optical edge detection, topside alignment and optional IR and backside alignment. Zerodur® stage and high-resolution differential interferometer.	
System dimensions		
	System	Electronic rack
Width [mm]	2605	800
Depth [mm]	1652	650
Height [mm]	2102	1800
Weight [kg]	3550	180
Installation requirements		
Electrical	400 VAC ± 5 %, 50/60 Hz, 16A, 3 phases	
Compressed air	6 - 10 bar	

Please note: Specifications depend on individual process conditions and may vary according to equipment configuration. Write speed depends on exposure area. Design and specifications are subject to change without prior notice.

Visit product website for more information

To contact your local representative, please consult our website *heidelberg-instruments.com*

HEIDELBERG INSTRUMENTS
The power of direct writing

Heidelberg Instruments Mikrotechnik GmbH
Mittelgewannweg 27, D-69123 Heidelberg
Tel.: +49 6221 728899-0

HIMT V1.7.1 | 08 / 25