

LUXBEAM® LITHOGRAPHY SYSTEM – LLS SERIES

EIGHT PHOTOHEADS – ONE PLATFORM | 1 µm TO 30 µm LINE/SPACE | LURIA CONTROL SOFTWARE

Maskless lithography. From 30 µm down to 1 µm.

Direct imaging photoheads for PCB, advanced packaging, and semiconductor applications – engineered in-house from optics to firmware, and integrated by your machine.

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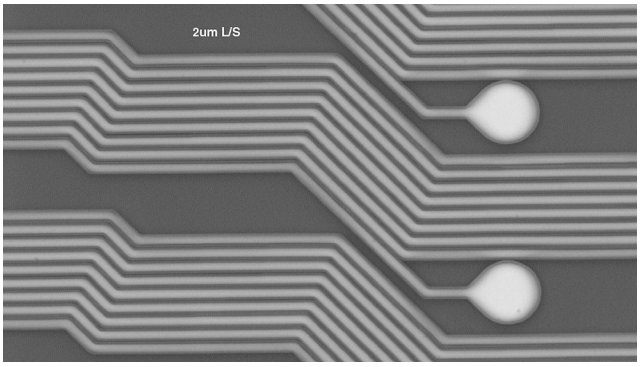
LUXBEAM® LITHOGRAPHY SYSTEM – LLS SERIES

Maximum flexibility for stable, high-yield manufacturing on the nanometer scale

THE LUXBEAM® LITHOGRAPHY SYSTEM

A field-proven subsystem series for direct imaging lithography machine integration. The LLS combines precision optics, high throughput, and intelligent control software – delivering uncompromised accuracy and flexibility across PCB, advanced packaging and semiconductor applications. LURIA is the same control software platform across the entire photohead range.



RDL INTERCONNECT ROUTING: Traces routed to contact pads at 2 µm line/space.

HIGH-YIELD MANUFACTURING

Built on decades of lithography expertise, Visitech's passion for precision and innovation helps machine builders reach new levels of yield, uptime, and consistency, keeping our partners at the leading edge of advanced manufacturing.

FLEXIBLE. EFFICIENT. RELIABLE.

Enabling chiplet and SiP designs for FOPLP and FOWLP, the LLS performs real-time warping and positioning for maximum accuracy, yield, and uptime in 24/7 production.

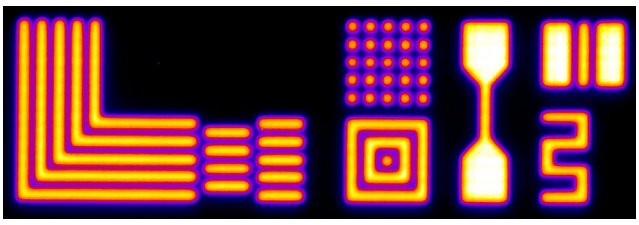
DID YOU KNOW?

For Visitech, new product development is vital. The LLS product line is culminated on over 30 years of DLP experience.



THE NEW LLS1000: SUB-MICRON TERRITORY

The finest photohead in the LLS range writes 1 µm line/space with a 405/375 nm laser on wafers, up to 600×600, and glass. Alignment camera is standard, and CD uniformity is above 90 %. Applications are RDLs, CPOs, interposers, bridge dies on organic substrates, glass core, or wafers – on the same LURIA platform as the rest of the range.



PRINT RESOLUTION: 1 µm line/space print sample.

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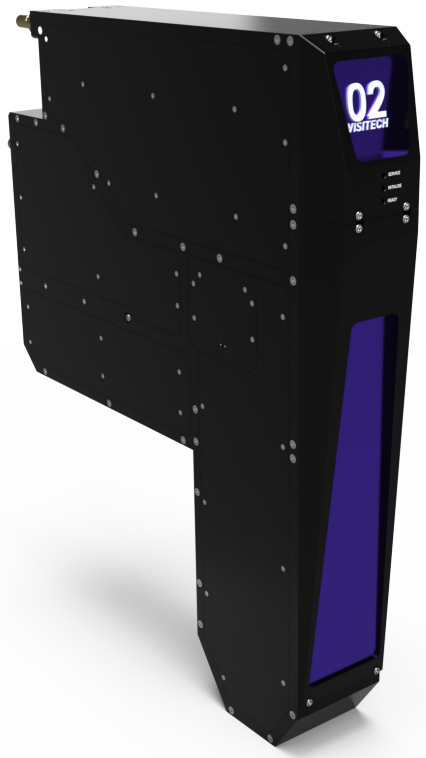
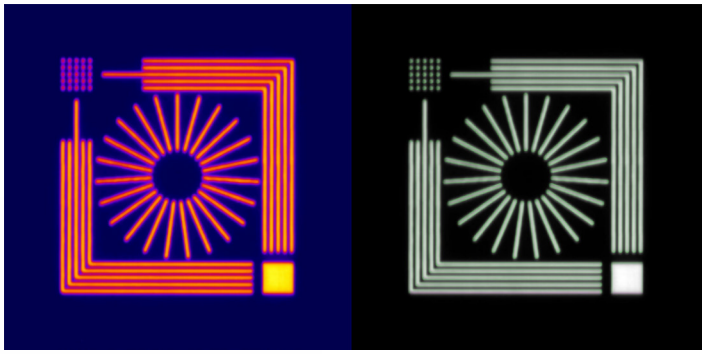


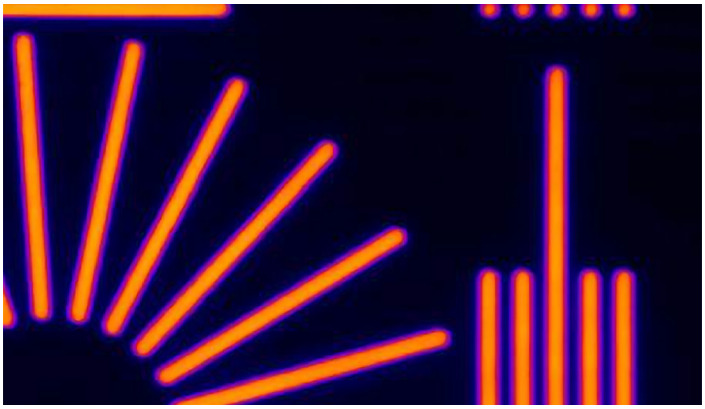
Advanced Packaging & Semiconductor

Critical parameters such as stitching, edge roughness, and Critical Dimension (CD) uniformity over wafer and extensive panels, are handled on the nanometer scale. When using System in Package (SiP), System on Chip (SoC), or other advanced packaging methods, the subsystem supports applications such as FOPLP and FOWLP.



COMPARING: 2 µm line/space print sample (left) compared with CAD file (right).

Real-time warping and positioning of the artwork enable state-of-the-art throughput. Wafer-level applications include mask writing, MEMS, sensors, and microfluidics. The 375 nm laser option gives i-line resist compatibility, and LURIA works with standard fab software.



FINE-LINE & IC SUBSTRATE: At 5 to 6 µm line/space, the LLS covers IC substrate, interposers and RDL, mSAP fine-line and glass build-up. Laser or 4-peak LED, on panels up to 600 × 600 mm.

PCB Lithography

High power, speed, and throughput with industry-proven reliability are what machine builders can expect from the LLS subsystem, which provides state-of-the-art specifications for inner/outer layer-resist work and solder mask. In addition, swapping between multiple and configurable wavelength sources is easy.

LURIA control software: Real-time adaptation, higher yield

LURIA is Visitech's imaging and control platform, powering every LLS photohead. It reads the substrate before every exposure and adapts the artwork in real time to compensate for panel distortion and die movement, enabling higher yield, tighter interconnect density and wider process windows. It maintains consistent quality even where rigid, mask-based exposure falls short.

Challenge	LURIA response	Result
Panel shift, rotation, expansion, and warpage	Real-time pattern adaptation	Higher yield
Die movement during processing	Real-time die-shift compensation	Accurate feature placement
Distortion across the panel	Dynamic scaling, rotation, and warping	Wider process windows
Interconnect displacement	Interconnect re-routing	Tighter interconnect density
Dose variation across the field	Per-pixel power control	Uniform dose, consistent quality
Native pixel resolution	Sub-pixel positioning	Finer-than-pixel edge placement

PLATFORM CAPABILITIES

- Open- and closed-loop autofocus
- Common software platform across the entire LLS range
- Seamless process transfer between systems
- Full API access and parameter control

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Properties/Photohead	LLS1000	LLS02	LLS03	LLS05	LLS06	LLS15	LLS30	BEAM30
Line / Space	1 µm	2 µm	3 µm	5 µm	6 µm	15 µm	30 µm	30 µm (high power)
Category	Advanced packaging	Advanced packaging	Advanced packaging	Advanced packaging	AP / fine-line PCB	PCB	PCB	High power
Typical applications	Finest RDL for CPO and photonic interposers, glass-core fine RDL, mask writing	CPO RDL, glass-core / interposer RDL, FOWLP, MEMS, microfluidics	RDL and interposers, IC substrate, CPO, FOPLP fine RDL	AP RDL / interposers, IC substrate, glass build-up, mSAP fine-line	Selective AP, IC substrate / glass build-up, mSAP, SLP, HBM RDL	HDI, mSAP, inner layer, fine-line (selective), RF / antenna-in-package, flex	Solder mask, standard PCB, inner / outer layer	Thick-copper PCB, SiC / GaN power modules, high-current substrates, solder mask
Substrate / panel	Wafers, up to 600×600, 24×18", glass	Wafers, 310×310, 510×515, 24×18"	Wafers, 310×310, 510×515, 24×18"	Wafers, 310×310, 510×515, 24×18", 600×600	Wafers, 310×310, 510×515, 24×18", 600×600	510×515, 24×18", 600×600, large PCB	24×18", largest production panels	24×18", largest panels, high power
Throughput* (Ø300 mm wafer)	40–90 wph	31 wph	79 wph	113 wph	381 wph (LLS06 LASER)	-	-	-
Throughput* (510 × 515 mm panel)	24–58 pph	19 pph	49 pph	70 pph	247 pph (LLS06 LASER)	297 pph (LLS15 LASER)	569 pph (LLS30 LASER)	-
Throughput* (24 × 18" panel)	27–64 pph	21 pph	54 pph	77 pph	271 pph (LLS06 LASER)	328 pph (LLS15 LASER)	626 pph (LLS30 LASER)	413 pph
Light source	405 / 375 nm laser				405 / 375 nm laser, or 4-peak LED	405 nm laser, or 4-peak LED		1-7 channel 4-peak LED
Alignment camera	Standard				Option		-	-
CD uniformity	>90%							

*Throughput figures are indicative, not a specification. They count exposure time for one side; loading, alignment and handling are not included. wph = wafers per hour, pph = panels per hour.

Common for all photoheads	
Power uniformity	>99%
Autofocus	Real-time, open- or closed-loop (run on the subsystem or fed to the customer's motion controller)
Depth of focus	Application dependent, aspect ratio typically 3:1 to 5:1
Cooling	Liquid only
Maximum panel size	No theoretical limit
Input formats	GDSII, OASIS, ODB++, Gerber
Data adaptation	Real-time positioning, scaling, rotation, warping, re-routing
Serialization	User-defined, unit-level
Software	LURIA
Wavelength notes	4-peak LED = 365 / 380 / 395 / 405 nm, switchable. 375 nm laser = shorter wavelength for finest features and i-line resist compatibility.

Specifications subject to change without notice. Please contact us for more detailed product specifications.



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