




USHIO Exposure System “UX Series”

USHIO INC., celebrating its 50-year anniversary, has been serving the global semiconductor industry as a leading supplier of UV lamps for photolithography processes, VUV lamps for surface improvement, and halogen lamps for thermal processes. Today, USHIO have developed, manufactured, and marketed a wide range of lithography tools “UX Series” for advanced packaging (fine-printed circuit boards) and wafer-level packaging (WLP), as well as MEMS, LEDs, and power devices.

The UX Series provides line up the three major types of exposure systems: full-field projection, proximity, and contact, while i supporting a wide range of substrates including silicon wafers, P boards, and roll-to-roll films. The UX Series is a best collection of USHIO’s original elemental technologies: light sources, optics including lens and mirrors, mask/substrate transfer, and alignment mechanisms. Today, more than 1,300 units of USHIO lithography tools are operating worldwide.

USHIO’s Major “UX Series” Products and Packaging Applications

Full-field Projection Aligner	Large-field Si Stepper	Large-field Panel Stepper
 <p>Full-Field Projection Aligner UX4 Series</p> <ul style="list-style-type: none"> WL-CSP MEMS LED Chips Power Devices Crystal Oscillators 	 <p>Next-Generation 2.5D/3D Si Interposer Stepper UX7-3Di</p> <ul style="list-style-type: none"> 3D Packaging WL-CSP TSV Wafer Bumping 	 <p>Next-Generation 2.5D/2.1D Organic/Glass Interposer Stepper Square 70</p> <ul style="list-style-type: none"> 2.5D/2.1D Packaging

“UX4 Series” Large-Area, Full-Field Projection Lithography Systems

Optimum for Various Advanced Applications, including MEMS Devices, High-Brightness LEDs, and Power Devices.

USHIO provides the “UX4 Series” of full-field projection exposure lithography tools to manufacture MEMS devices, high-brightness LEDs and power devices. Use of the mask-damage-free projection exposure method as well as the capability of full-field exposure of a wafer of up to 200 mm in diameter allows great enhancement of the productivity of and significant reduction for manufacturing the above products.

“UX4 Series” Large-Area Full-Field Projection Lithography Systems

Model	Application	Wafer Size
UX4-MEMS	MEMS devices	
UX4-LEDs	High-brightness LEDs	Max. 200 mm
UX4-ECO	Power devices	



UX4 Large-Area, Full-Field Projection Lithography System

UX-4 Series Features

- Automated transfer of wafers up to 200 mm in diameter
- Completely non-contact so as to cause no mask damage; thus, no mask cleaning, inspection, or replacement is required
- Proprietary alignment technology that enables easy detection of low-visibility alignment marks
- Large depth of focus of 500 μm or less and special wafer chucking method allows high-precision exposure of warped or stepped substrates or thick photoresist
- Allows simultaneous projection of both sides of a wafer to enhance productivity
- Modular design of each function on a common platform allows easy future upgrades

UX-4 Series Specifications by Models

Resolution:	2 μm L/S~
Wavelength:	365 nm
Overlay Accuracy:	$\pm 1\mu\text{m}$ (Top Side), $\pm 1.5\mu\text{m}$ (Back Side)
Throughput:	120 wph
Wafer Size:	$\varnothing 100\text{ mm}/150\text{ mm}/200\text{ mm}$
Substrates:	Si, Sapphire, GaN, GaAs, SiC, and glass
Substrate Transfer Method	Automated wafer transfer on the UX4 Series platform

Note: The specifications may slightly vary depending on applications.



Mounting Full-Field Projection Lens Originally Developed by USHIO

USHIO Welcomes Demonstration Requests and Inquiries about Its UX Series Products

Kazuya Aoiki or Fumi Nakazawa
 Section 2, Sales Department, Exposure Business Unit, Business Division I
 USHIO INC.
 Tel: 81-3-6361-5592, e-mail: exposure@ushio.co.jp