

# Canon FPA-3030i5a I-Line Stepper Overview

At the end of 2025, TSRI (Taiwan Semiconductor Research Institute) acquired the FPA-3030i5a I-Line Stepper from Canon Semiconductor to replace the legacy FPA-3000i5+ I-Line Stepper, providing more diverse exposure services for wafers. The FPA-3030i5a I-Line Stepper offers expanded exposure capabilities compared to the FPA-3000i5+. In addition to standard 6-inch silicon wafers, its exposure size capabilities can be extended to 4-inch or 8-inch wafers. Furthermore, it supports lithography for high-warp compound semiconductor wafers as well as semi-transparent silicon carbide (SiC) wafers.



FPA-3030i5a

Although the standalone resolution limit of the FPA-3030i5a I-Line Stepper is 0.35  $\mu\text{m}$ , it can be paired with TSRI's high-resolution Canon FPA-6300ES6a KrF Scanner via mix-and-match strategies to achieve features below 110 nm.

|                 | FPA-3030i5a(CF-L32)     | FPA-6300ES6a(CF-L22)  |
|-----------------|-------------------------|-----------------------|
| Wavelength      | i-line(365nm)           | KrF (248nm)           |
| Resolution      | $\leq 0.35 \mu\text{m}$ | $\leq 110 \text{ nm}$ |
| Reduction Ratio | 1:5                     | 1:4                   |
| Field Size      | 20×20mm                 | 26 mm x 33 mm         |
| Reticle Size    | 5 inch                  | 6 inch                |
| Wafer Size      | pieces/4 in/6 in/8 in   | 8 inch                |

## Key Features of the FPA-3030i5a I-Line Stepper

**Substrate Flexibility:** The newly acquired FPA-3030i5a I-Line Stepper supports 4-inch, 6-inch, and 8-inch wafers. Additionally, the system accommodates a wide variety of compound semiconductor substrate sizes and materials, with specialized support for high-warp or semi-transparent wafers.

Advanced Alignment System: The system integrates an Off-Axis Alignment Scope that supports dark-field alignment metrology, significantly enhancing process robustness.

High Throughput & Efficiency: By incorporating the new off-axis alignment scope—which reduces alignment mark measurement times—alongside hardware upgrades such as a high-speed wafer handling system and upgraded software, the FPA-3030i5a achieves a throughput of 123 wafers per hour (wph). This represents an approximate 17% increase in manufacturing productivity compared to the previous generation.

|                      |                                     |
|----------------------|-------------------------------------|
| Resolution           | $\leq 0.35\ \mu\text{m}$            |
| Reduction Ratio      | 1:5                                 |
| Field Size           | 20mm x 20mm                         |
| Exposure Wavelength  | i-line (365 nm)                     |
| Reticle Size         | 5 inch                              |
| Wafer Size           | 4inch / 6inch / 8inch (piece wafer) |
| Overlay Accuracy     | $\leq 40\ \text{nm}$                |
| Main Body Dimensions | (W) 1,900× (D) 2,600× (H) 2,450mm   |

|               |                                                                                                     |
|---------------|-----------------------------------------------------------------------------------------------------|
|               | (Included exhaust duct: 2650mm)                                                                     |
| Major Options | Wafer Handling Kit for Special Substrates<br><br>PC Remote Console<br><br>Through Silicon Alignment |

Process Customization: To adapt to diverse and specialized manufacturing integration flows, options for Backside Alignment or Through-Silicon Alignment (TSA) have also been retained.

Next-Generation Device Applications: The FPA-3030i5a lithography system is specifically optimized for processing substrates of 8 inches or smaller. Beyond silicon, it fully supports compound semiconductor materials such as Silicon Carbide (SiC) and Gallium Nitride (GaN). This enables the fabrication of various semiconductor devices experiencing rapidly surging market demand, including high-power devices for automotive electrification and high-bandwidth RF components for 5G communications.