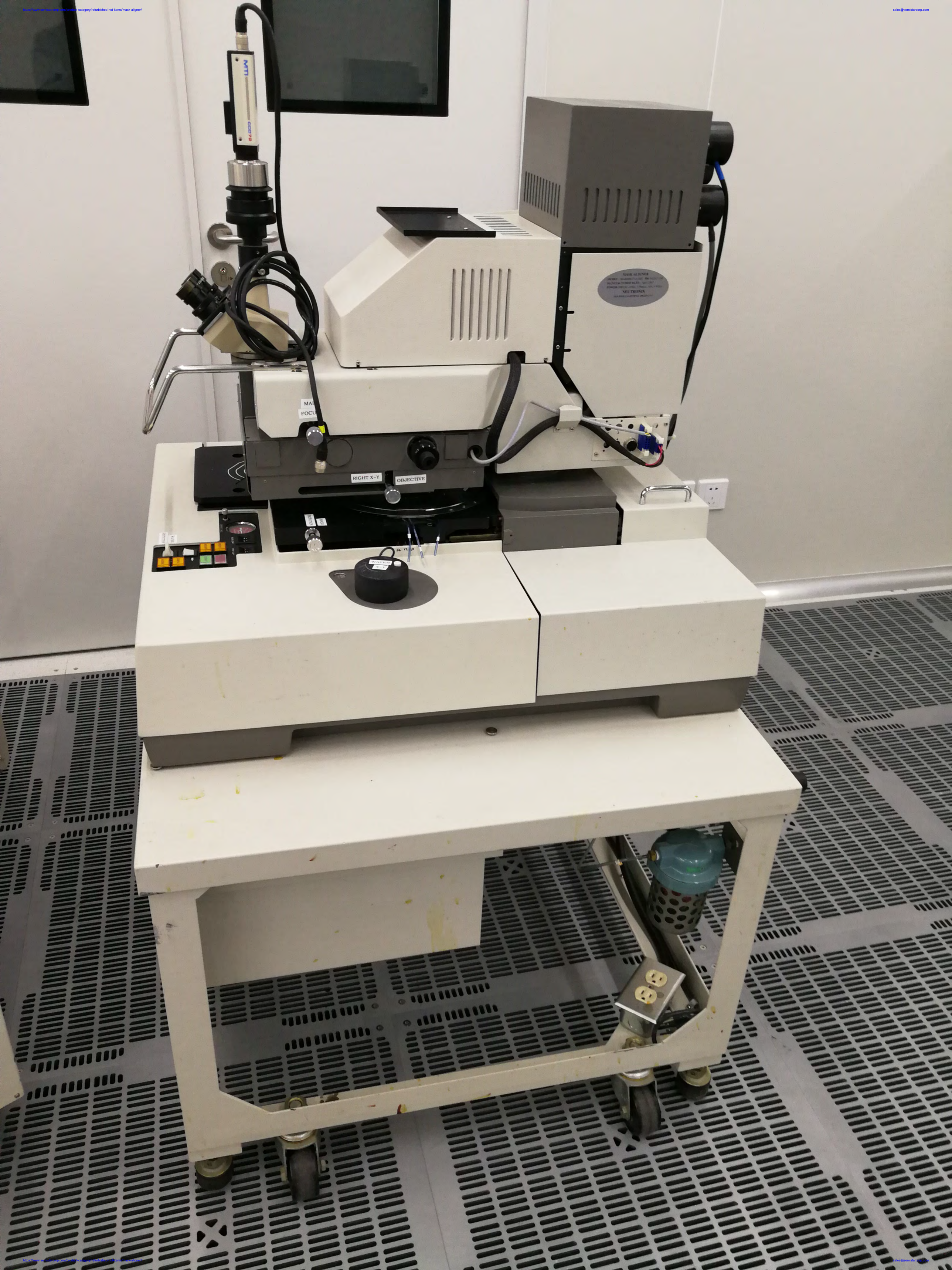

INTENSITY
OFF
LEFT
RIGHT
WAFE
AUTO
ALIGN GAP
RESET
RELOAD
ALIGN
EXPO.
LE01
NOVALUX
Last lamp change:
Lamp change due:
DO NOT operate this tool after the due date shown above. If, after this date, use eQuip to log this tool down for PM. Indicate in eQuip that the lamp is due to be replaced.


MTI
RIGHT X-Y
OBJECTIVE
WAFER


POWER
ON
ILLUMINATOR
ON
LEFT
RIGHT
WAFER FEED
AUTO
ERROR
ALIGNMENT
CONTACT
HARD
SOFT
PROXIMITY
MANU
LIGHT INTEGRA.
EXPOSURE
ENERGY
NEUTRONIX
SAN JOSE, CA.
EXPO./CONTACT COUNTER
VACUUM
CLEAN AIR
PRESSURE
N₂ GAS
PN2
MFC
A 5771

CCD72
15X W.F. EYEPIECE
MAIN FOCUS
MASK ROTATION
WAFER X-Y
CONTACT VAC
ALIGN. GAP
4 3
PRINT GAP
I 0
RESET
RELOAD


POWER
ON
ILLUMINATOR
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HARD
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AFER FEED
ERROR
MASK LOAD
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LIGHT INTEGRA.
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EXPOSURE
ENERGY
NEUTRONIX
SAN JOSE, CA.
EXPO./CONTACT COUNTER
EXPO.
CONTACT
B.U. PLATE
ON
OFF
MICROSCOPE LOCK LEVER
VACUUM
CLEAN AIR
PRESSURE
N2 GAS

MASK ALIGNER
MODEL: Neutronix PLA-545 SN: 042017-168
MANUFACTURED DATE: April 2007
POWER:208VAC, 60Hz, 3 Phases, 10A, 4 Wires
NEUTRONIX
SAN JOSE,CALIFORNIA 408-229-2777

Canon's Various models of Proximity Mask Aligner

Only Canon Offers such a Wide Range of Mask Aligners
Stepper, Proximity/Contact, Mirror Projection

Needless to say, in the age of mass production of VLSIs, not only printing performance but also the improvement of throughput and cost reduction are necessary attributes of a Mask Aligner. Canon, which has virtually written the history of the world's mask aligners with its unique design and high reliability, finally in 1983, creates a series of mask aligners unrivaled by any other manufacturer; filling each and every need of today's, and tomorrow's, market.

The Stepper, the Proximity and the Mirror Projection types: three different mask aligners to serve every need.

The stepper series is represented by the newly developed mask aligner model FPA-1500FA. This model resolves linewidth to 1 micron and is designed to obtain high throughput for mass production of VLSIs.

In the proximity series, the PLA-501FA established the basic technology in 1974 and has been manufactured in the greatest numbers, and continues to gain widespread use throughout the world. We take pride in its stable performance record. For even higher printing performance, there is the PLA-521FA, with it use of Deep-UV light and 0.5 micron resolution.

The MPA-500FA is offered as a mirror projection mask aligner. This model exposes entire 5-inch wafers by scanning and is designed especially for full-scale mass production of VLSIs.

As mentioned above, the merit of Canon's Mask Aligner series is that from among the wide range of mask aligners, the one specifically tailored to the production process or purpose of semiconductors can be chosen.

In addition, mix and match use of the Stepper, Proximity and Mirror Projection type aligners will help upgrade the production efficiency of the semiconductor industry.

PLA-501F/FA

Proximity Mask Aligner

- 1.5μm Line Resolution——Proximity Mask Aligner with Longest in Production

FEATURES

1. Handles wafers of up to 5 inches in diameter.
2. Proximity and contact printing capability
   Three types of printing; hard contact, soft contact and proximity can be selected by simply changing proximity gap or contact pressure.
3. A special illumination system which minimizes diffraction phenomenon and assures high resolution printing.
4. Alignment scope with high working efficiency
5. A highly reliable auto feed system

SPECIFICATIONS

Photomask size: □2-1/2"—□6"
Wafer size: ϕ2"—ϕ5"
Resolution: Contact mode
Negative resist 2μm
Positive resist 1.5μm
Illuminator: Uniformity ±3% (with 250W mercury lamp)
Exposure time is set by light integrator
Printing method: Proximity and contact modes
Printing wavelength: g-line (436nm)
h-line (405nm)
i-line (365nm)
Auto alignment accuracy: ±0.5μm (2 sigma)
Auto alignment time: 10 sec.
Cycling time: Approx. 30 sec. (with 10 sec. alignment time and 1 sec. exposure time)
Dimensions: Main unit 940 (W) × 800 (D) × 724 (H) mm
(37.0" × 31.5" × 28.5")
Main unit on special table 1100 (W) × 820 (D) × 1344 (H) mm
(43.3" × 32.3" × 52.9")
Weight: PLA-501FA 225 kg (496 lbs.) (on special table)
PLA-501F 210 kg (462 lbs.) (on special table)

PLA-521F/FA

Proximity Mask Aligner

- 0.5μm Line Resolution — Deep-UV Printing

FEATURES

1. Printing of wafers up to 5″
2. Proximity and contact printing capability
   Three printing methods; proximity, soft contact and hard contact methods can be selected.
3. High quality printing
   Use of Deep-UV light (wavelength of 200nm to 270nm) and PMMA results in a linewidth resolution of 0.5μm with contact printing.
4. Alignment scope with high working efficiency
5. Uniform exposure owing to light integrator

SPECIFICATIONS

Photomask size: □2-1/2″—□6″
Wafer size: ϕ2″—ϕ5″
Resolution: Contact mode 0.5μm
Proximity mode with 20μm gap 2μm
Illuminator: Uniformity ±5% (500W Xe-Hg lamp)
Exposure time is set by light integrator
Printing method: Proximity and contact modes
Auto alignment accuracy: ±0.5μm (2 sigma)
Dimensions: Main unit 940 (W) × 800 (D) × 724 (H) mm
(37.0″ × 31.5″ × 28.5″)
Main unit on special table 1100 (W) × 820 (D) × 1344 (H) mm
(43.3″ × 32.3″ × 52.9″)
Weight: PLA-521FA 225 kg (496 lbs.) (on special table)
PLA-521F 210 kg (462 lbs.) (on special table)

FPA-1500FA

Fine Pattern Projection Mask Aligner

- 1 μm Line Resolution Newly Developed High Volume ——— 1/5 Stepper

FEATURES

1. TTL ON AXIS Auto alignment method
   Both the reticle and the wafer patterns are aligned through the lens accurately and automatically with each step. This auto alignment method permits the combined use of other aligners, especially the MPA-500FA. Auto alignment patterns are simple and small enough to be placed within the scribe lines, and even the patterns on rough aluminum surfaces can be auto aligned with a high degree of accuracy.
2. High throughput
   The development of the large field, high resolution projection lens has resulted in fine pattern printing with high throughput.
3. Temperature control is allowed at 23°C±1°C
   Installation condition is allowed at 23°C±1°C owing to the adoption of the TTL ON AXIS auto alignment method. No special environmental chamber is required.
4. Wafer prealignment by TV monitor has been employed to obtain high prealignment accuracy.

SPECIFICATIONS

Wafer size: Max. ϕ6"
Reticle size: □5", 0.09"t
Reduction ratio: 1/5x
Numerical aperture: 0.35
Field size: □14mm
Resolution: 1μm
Auto alignment accuracy: 0.2μm (2 sigma)
Throughput: 50 w.p.h. (ϕ4" wafer)
Temperature: 23°C ± 1°C
Dimensions: Main unit 1340 (W) × 1170 (D) × 1900 (H) mm
(52.8" × 46.1" × 74.8")
Control box 650 (W) × 1350 (D) × 1600 (H) mm
(25.6" × 53.1" × 63.0")
Weight: Main unit 1400 kg (3087 lbs.)
Control box 200 kg (441 lbs.)

MPA-500FA

Mirror Projection Mask Aligner

- 1.5μm Line Resolution——5″ Mass Production Type Mask Aligner for VLSIs

FEATURES

1. Higher resolution and greater depth of focus
   The original reflective optical system achieves better resolution, 1.5μm, and a greater depth of focus, ±6μm. The adoption of a deep-UV light source offers a resolvable linewidth of 1μm.
2. Full exposure of 5-inch wafers by scanning slit
   Full exposure over an entire 5-inch wafer by a single scan increases productivity of mass produced VLSI chips, greatly reducing production costs.
3. High luminance illuminator reduces exposure time
4. Pneumatic distortion control (PDC)
   Distortion problems are resolved by the implementation of the PDC, and alignment accuracy significantly improved.
5. Automatic alignment by laser beam scanning

SPECIFICATIONS

Photomask size: □4″—□6″
Wafer size: ϕ3″ – ϕ5″
Projection optical system: Magnification 1:1
Effective F-No. Fe3.5
Resolution 1.5μm
Depth of focus ±6μm when resolution is 1.5μm
Light uniformity: ±3% (with 2 kW super-high-pressure mercury lamp)
Distortion: ±0.25μm/4″ wafer
Auto alignment accuracy: ±0.4μm (2 sigma)
Auto alignment time: 7 sec. (averaged)
Cycling time: 21 sec. + alignment time + exposure time
Dimensions: Main unit 1430 (W) × 1230 (D) × 1765 (H) mm (56.3″ × 48.4″ × 69.5″)
Mercury lamp power supply box 380 (W) × 850 (D) × 500 (H) mm (15.0″ × 33.5″ × 19.7″)
Weight: Main unit 1200 kg (2646 lbs.) (including control box)
Mercury lamp power supply box 120 kg (264.6 lbs.)

FPA-141/143/F

Fine Pattern Projection Mask Aligner

- **Submicron Resolution** — **With 1/4 Reduction Lens**

FEATURES

1. High-resolution lens
   Thanks to Canon's U lens (90mm 1:1.4 M=1/4), a high resolution of 0.8μm linewidth is obtainable.
2. Improved image quality by g- and h-line exposure
   Both g-line and h-line are used for exposure to minimize standing wave effect and improve image quality.
3. Speedy exposure
   The effective image format is 14mm in diameter and exposure time is around 2.5 seconds.
4. Less alignment time
5. Advantageous non-contact projection
   Higher yield can be obtained because defects in photoresist patterns on the wafers are minimized thanks to the mask being separated from the wafer.

SPECIFICATIONS

Photomask size: □2"—□2-1/2"
Wafer size: ϕ2"—ϕ3"
Resolution: 0.8μm
Projection optics: Magnification 1/4
Effective image format ϕ14mm
Light uniformity: ±3.5%
Printing wavelength: g-line (436nm) and h-line (405nm)
Image surface illumination: 64000μW/cm²
Prealignment accuracy: Less than ±0.15mm
Step-and-repeat mechanism: Ball screw drive system with stepping motor
FPA-141F 1, 4 and 9 steps changeable
FPA-143 9, 16 and 25 steps changeable
Step accuracy: Repeatability ±2μm
Absolute accuracy ±8μm
Dimensions: Main unit 940 (W) × 790 (D) × 974 (H) mm
(37.0" × 31.1" × 38.3")
Control box 382 (W) × 900 (D) × 575 (H) mm
(15.0" × 35.4" × 22.6")
Weight: Main unit 170 kg (374.9 lbs.)
Control box 65 kg (143.3 lbs.)

FPA-112FA

Fine Pattern Projection Mask Aligner

- 1.4μm Line Resolution with Auto Align ——— 1/1 Projection Stepper

FEATURES

1. Auto alignment system with laser beam scanning
2. Printing of wafers up to 4 inches in diameter
3. Better alignment accuracy
   With the adoption of a step exposure system in which the wafer is aligned at every step, the influence of expansion and/or shrinking due to in-plane distortion of the wafer is reduced.
4. Less repeating defects
   The FPA-112FA with a field size of 22mm × 22mm requires only 14 steps to cover a 4-inch wafer. Repeating reticle defects are far fewer than with 10:1 systems in which a field of 10mm × 10mm requires about 80 steps to cover a 4-inch wafer.
5. Test pattern insertion does not result in a loss of throughput, thanks to reticle shift mechanism.

SPECIFICATIONS

Photomask size: □3"
Wafer size: ϕ3"—ϕ4"
Printing wavelength: g-line (436nm) and h-line (405nm)
Projection lens: Magnification 1x
Resolution 1.4μm with 14mm × 14mm field
1.6μ with 22mm × 22mm field
Light uniformity: ±3.5%
Alignment accuracy: ±0.3μm (2 sigma)
Auto alignment time: Approx. 3 sec./alignment
Step mechanism: 1, 4, 7, 9, 12, 14, 16, 18 or 23 steps changeable
Step accuracy: Repeatability ±2μm
Absolute accuracy ±8μm
Dimensions: 1150 (W) × 960 (D) × 1685 (H) mm
(45.3" × 37.8" × 66.3")
Weight: 330 kg (728 lbs.)