

KADETT K1

High Accuracy Placement & Bonding

The new KADETT Device Bonder is a very flexible and open platform for accurate placement and bonding of various types of Devices on a wide variety of Substrates.

Although it is particularly well suited for Research and Development laboratories, the Vision System makes it usable for pre-production environment.

The KADETT is designed to evolve with the user requirements. The optics, coupled with a high resolution XY stage which is mapped during calibration sequence, enable sub-micron alignment.



Features & Benefits

- Sub-micron Alignment and Repeatability of the XY stage positioning guarantee Accurate Placement.
- Simple and Robust Design, associated to a user friendly and intuitive operator interface results in quick set-up of new application.
- Tailoring of the configuration enables new application requirements, which is ideal for universities and research laboratories.
- The vision system, available even on the basic version, enables low volume pre production.

Bonding Processes

- Die Bonding (Face Up)
- Flip Chip Bonding (Face Down)
- Pick and Place
- In-situ Reflow
- Thermocompression, Thermosonic
- Thermal or UV Cured Adhesive

Applications

- Chip-to-Chip, Chip-to-Substrate bonding
- Multi Chip Modules
- MOEMS, MEMS, MCM...
- Advanced Packaging
- MEMS

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Technical Specifications

Process station

Component Size

Chip (Upper Component)	Up to 20 x 20 mm Thickness 3 mm
Substrate (Lower Component)	100 x 200 mm (Heated chuck limited to 50 x 50 mm) Thickness 6 mm

Bonding Arm

Leveling	Self Leveling by Compliant Material
Placement Accuracy	$\pm 3 \mu\text{m} @ 3 \text{ sigma}^*$
Z Travel	20 mm, Resolution 0.1 μm
Theta Travel	± 100 degrees, Resolution 1/1000°
Force	0.03 to 60 N* (higher on request)

Alignment Stage

Travel	295 x 198 mm Resolution 0.1 μm
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Bonding Heads

Heating option	sq. 22 mm
Ultrasonic	56 - 58.5 kHz 40 W max
UV	130 mW/cm ² @365 nm at 90 mm from fiber output

Substrate Chucks

Heating option	sq. 22, 50 mm Adapted to the application
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Optics

XY Inspection Stage	50 x 50 mm on chip 100 x 200 mm on substrate
Digital Camera Resolution	0.45 x 0.34 μm per pixel Bright Field (by LED)
2 Independent Cameras for chip and substrate	20 x 0.4 N.A Lens
Field of View	200 x 280 μm
Pattern Recognition System	Cognex™

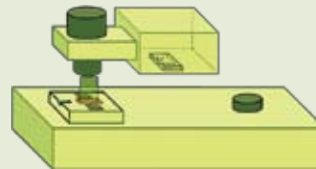
Options

UV glue curing system, Ultrasonic bonding head, Face-up Station, Carter available upon request.

General Characteristics

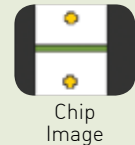
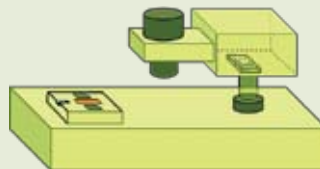
Machine Footprint	1100 mm x 1000 mm
Machine Height	1810 mm
Machine Total weight	170 kg
Electrical Power Supply	200 V/240 V - 2 kVA 50/60 Hz - 1 phase

Flip Chip Alignment & Bonding Principle



Step #1: Substrate Referencing

- The Substrate is viewed by the camera attached to the Bonding Arm
- Focus is performed by Z-adjustment of the arm
- Alignment mark positions are measured and stored



Step #2: Chip Alignment

- The chip is viewed by the camera embedded in the XY stage
- Focus is performed by Z-adjustment of the arm
- The Chip is aligned in rotation and the XY offset is calculated based on the calibration information



Cameras for Chip and Substrate Alignment

Chip Storage in Trays

*Process or Configuration Dependent

Data, design and specifications depend on individual process conditions and can vary according to equipment configurations. Not all specifications may be valid simultaneously. Illustrations, photos and specifications in this datasheet are not legally binding. Specifications are subject to change without prior notice.

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