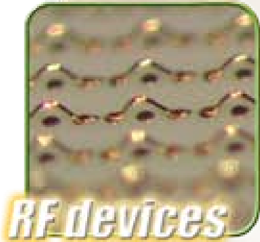
BONDJET 715/815 fully automatic, ultrasonic thin wire bonder

HESSE & KNIPPS SEMICONDUCTOR EQUIPMENT



Hesse & Knipps Semiconductor Equipment was founded in 1995. Since then, the company has focused its wire bonder product development on user requirements for accuracy, reliability, high speed, ease of use, service characteristics and automated production processes.

The BONDJET BJ715/815 Series ultrasonic wedge-wedge bonders, developed and produced for over a decade, today are used worldwide by leading electronics companies to produce *hybrid, COG, COB* and *COF* applications, *smart cards*, *MCSI*, *MCMs* and *sensors*, in addition to *HF* and *fiberoptic* applications.

Accuracy & Reliability

The BJ715/815 Series bonders maintain the highest possible positioning accuracy with advanced control technology and 3µm axis repeatability. Factors that influence reliability, including bond force, bond time and ultrasonic energy are precisely controlled. In addition a wire sensor detects the presence of wire in the buffer and prevents bonding when no wire is present. An optical recognition system further guarantees precise positioning and reliability.

Ease of Use

The BJ715/815 Series bonders are equipped with sophisticated software that distinguishes three types of users, providing individual users access only to permitted machine functions. A graphical user guide supports the user during operation with practical illustrations and reference systems.

Speed

A lightweight and compact bondhead featuring a standard 100 kHz short form transducer with a 1" wedge, enables the BJ715/815 Series bonders to place 3 to 4 wires per second. The bond cycle time depends on application factors such as loop length, wire supply angle, accuracy requirement, material, and wire thickness.

Flexibility

The BJ715/815 Series bonders handle aluminum and gold wire from 12.5µm to 85µm with the Piezo bondhead, with wire supplied at 45°, 60° or 89° angles. Bond force, bond time and loop form are all programmable. The deformation profile of the wire is displayed graphically during the entire bonding process and can be stored for later analysis.

Large Work Area

The extended version BJ815 offers a large work area of 300 mm x 180 mm (12.0" x 7.0"). Completely free loading and unloading access provides flexibility to install conveyor systems for automated production lines. In particular, these features make the BJ715/815 Series bonders well-suited for SMD production lines, display lines and smart card lines where, increasingly, bare chips are placed on large boards.

Hesse & Knipps is committed to being your reliable partner for future technological challenges in wedge bonding, offering consistent cost cutting and constant quality improvement.

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BONDJET BJ715/815 SPECIFICATIONS

Machine dimensions

BJ715	1820mm x 1015mm x 1400mm
BJ815	1820mm x 1065mm x 1400mm
Weight	approx. 1100 kg

Work area

BJ715	250mm x 180mm (9.8” x 7.0”)
BJ815	300mm x 180mm (12.0” x 7.0”)
X, Y	resolution 0.3µm
Z	28mm (1.1”), resolution 0.15µm
Rotation	400°, resolution 0.005°
Height	SMEMA std, variance optional
Feeding area	920mm x 450mm *including bonding area*

Solid piezo bondheads

- Wire feed angle: 45° standard; 60° or 89° deep access optional
- Wear-free PIEZO technique
- Programmable tail length, tear off and wire clamp gap opening
- True pivot-free vertical wedge tool alignment
- Wear-free, low maintenance components
- Immediate recognition of touchdown signal
- Precise control of the bondforce to ±1cN *both static & dynamic*
- Bond heads interchangeable in < 15 min
- Mechanical rigidity for reduced vibration, yielding higher bond speed and quality

Process advantages

Looping geometries *bond to bond distance*	70µm - 20 mm
Constant wire length function	
Fine pitch capability	< 40µm
Bonding cycle time *2mm loop length, 45° wire feed angle, 1 wire excluding travel time between wires*	180 ms
Bond time	fully programmable
Loop shape	fully programmable

Digital Hesse & Knipps ultrasonic generator and transducer technology

Electrical connection

2.2 kW, 230V ~ 50Hz

Optical system

Illumination	top and ringlights each 100 programmable brightness levels
Camera	mini-CCD camera, CCIR-Norm

Pattern recognition

Pattern recognition	256 grey level system
Recognition time *256 x 256 area of seach, 64 x 64 pattern*	18ms - 25ms
Max rotation angle	±5° rel. to master image
Precision	1µm
Programmable focus	

Bond quality control

- Continuous real time monitoring of wire deformation and transducer current within programmable upper and lower control limits
- Process-oriented sequencer for bonding with up to three intervals

Wire

Al, Au (aluminum, gold)	12.5µm - 85µm
Cu, Pt (copper, platinum) *contact factory for custom Cu or Pt wire applications*	

Ribbon

Al, Au	6 x 35µm - 25 x 250µm

Positioning repeatability

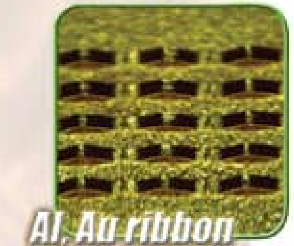
Axis repeatability	3µm at 3 sigma

In-line capabilities

- Intelligent automation concepts
- Integrated PLC controller
- Standard SMEMA input & output ports
- Profibus support

Software

- Graphical display of programmed wires
- Optional LAN support
- Parameter library



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