



Wire bonder TPT HB16

Instrument description

Wire bonding is a micro-welding technique for electrical interconnection of the sample substrate structures and semiconductor chip thin metallic layers. Contact between the sample surface and pure gold, alloyed aluminum or copper wire is provided by three main methods: ultrasonic, thermocompression and thermosonic bonding. The welding process is realized by wire attached to the substrate by bonding tool at the end of ultrasonic transducer, which is getting closer to certain distance to the sample surface. To achieve enhanced welding capability, sample is heated up to a certain temperature, for most processes being in the range from 20 °C to 250 °C. Attachment techniques defined by bonder tools are performed by wedge-wedge, ball-wedge, ribbon and bump bonding class.



Instrument: TPT HB16

Thermosonic wire bonder for *wedge* and *ball* bonding

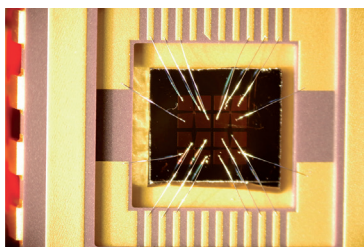
Features:

- Ultrasonic, thermocompression and thermosonic capability
- sample size up to 100 x 150 mm²
- ultrasonic transducer (62 kHz, up to 2 W power)
- sample (chip) holder heated up to 250 °C, bonding tool heatable
- gold or AlSi wires with diameters from 17 μm up to 75 μm and up to 25 μm x 250 μm ribbon compatible
- adjustable wire loop between first and second bond with motorized holder movement
- controlling software allows possibility to store up to 100 recipes

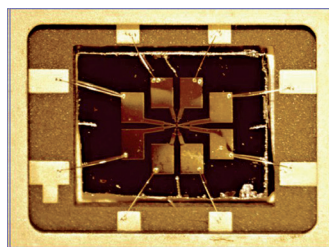
Application

Interconnection inside DIL packages for chip structure electrical measuring

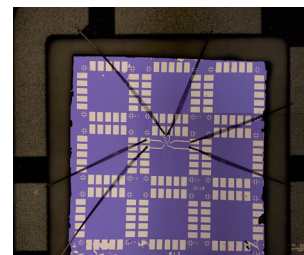
Optical image



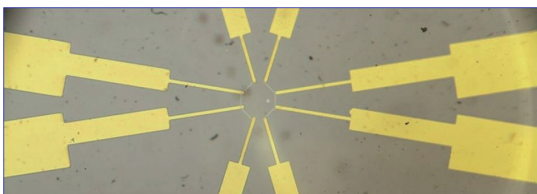
1-D nanostructures measurement configuration



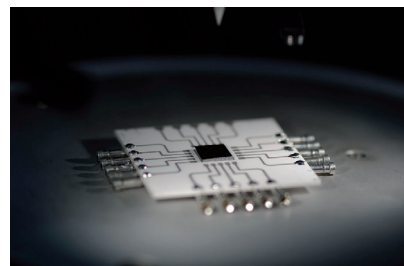
Wedge and ball bonding method, 25 μm gold wire diameter, gold pads on the chip with ceramic package with thick film technology



Optical image



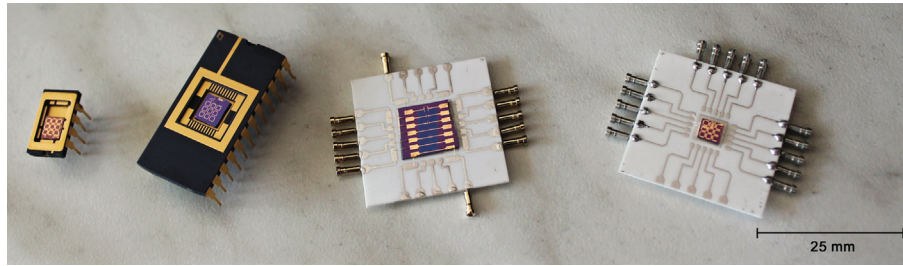
Detail of chip structure - 4 point resistivity measurement configuration



Chip expander – ceramic substrate with expanded contacts designed for electrical measurement on the top side of chip

Realized packages for measuring on the sample structures

Optical image



Technical specification

General info:

Automatic bond height adjustment

Stage:

Motorized Y and Z axis
Heated work stages \varnothing 60 mm / 100 x 150 mm²
DIL and TO5/TO8 adapter

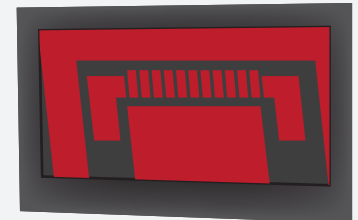
Standard:

Wire diameter 17, 25, 50, 75 μ m pure gold, ribbon
Wedge bonding tool for \varnothing 25 μ m gold wire
Ball bonding capillary for \varnothing 25 μ m gold wire
Loop profile with up to 10 steps

Optical/video system:

trinocular up to 80 x magnification
online view, aiming and documentation
Dynamic search box, possibility of manual Z control

video system

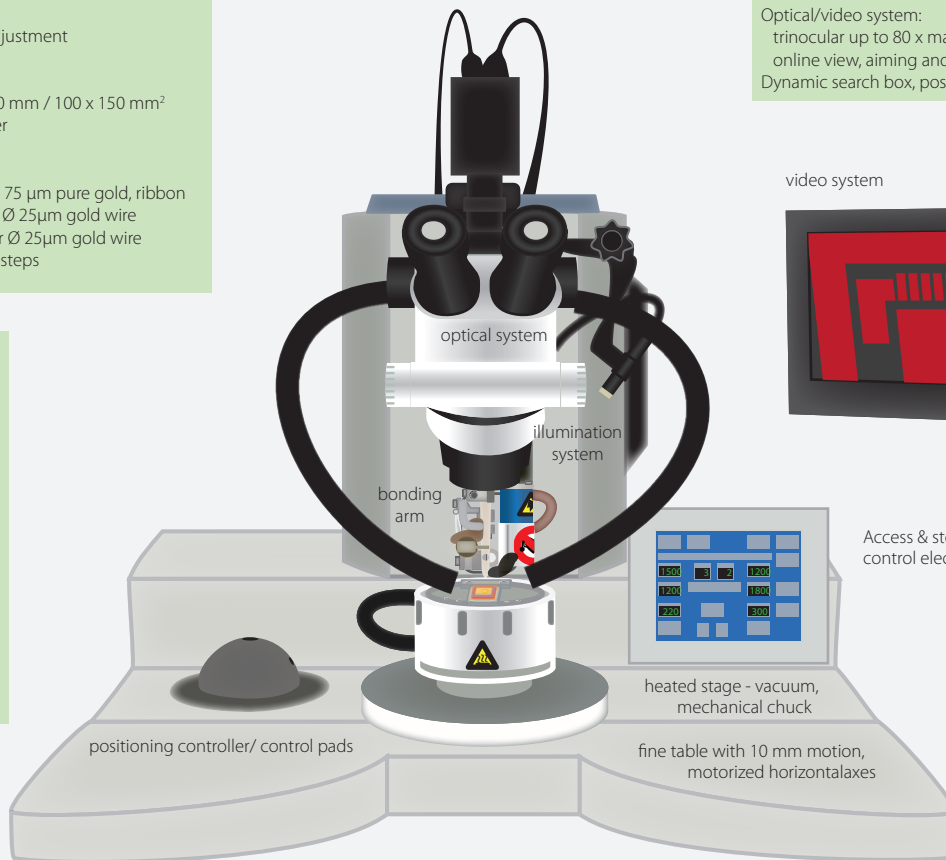


Access & storage
control electronic

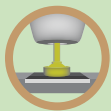
heated stage - vacuum,
mechanical chuck

fine table with 10 mm motion,
motorized horizontal axes

positioning controller/ control pads



wedge



ball



ribbon

Contact

Core Facility: Nanofabrication and Nanocharacterization

Section: Packaging & Testing

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