



Miniature Gripper for High-Force-Pull Tests

($F < 50\text{N}/5\text{kg}$)

Pull-Tests on:

- BGA Solder Balls
- Tape-Connections
- SMD-Devices

The miniature gripper BPT/2 was developed especially for pull tests on BGA solder balls, but can be used advantageous in many other applications as pulling strip connectors or SMD devices (Fig. 1 - 2).

The tool is able to apply high pull and grip forces up to 100N. During design, emphasis was put on easy handling and miniaturisation.

Since the gripper tips can easily and quickly be replaced, the test tool can be adapted to different ball diameters and grids.



Fig. 1 Ball pull tester BPT/SMD for SMD pull test

Function

The gripping mechanism is driven by shape memory actuators. These actuators only need an electric current as power supply which can be realised easily. In addition, a very smooth movement of the gripper tips possible with this actuator type.

The force needed at a time is generated automatically. The applied pull force of the tester is amplified mechanically and transmitted to the gripper tips. Adjustable stoppers protect the gripped objects from deformation.

Application

The mounting shaft can easily be replaced, making it easy to use the gripper on different testers (Fig. 3).

In order to keep the electro-thermo-magnetic equilibrium of the shape memory actuators stable despite changes in resistance during operation, the gripper should be driven by a constant current. A current source well suited for this task is optional available.

High flexible connecting wires reduces measurement errors to a minimum.

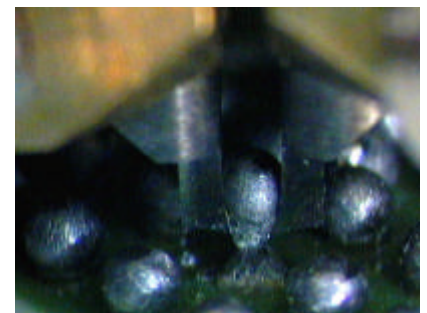
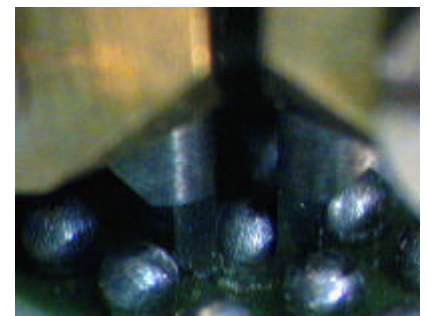


Fig. 2 Pull test on BGA with ball diameter $700\ \mu\text{m}$

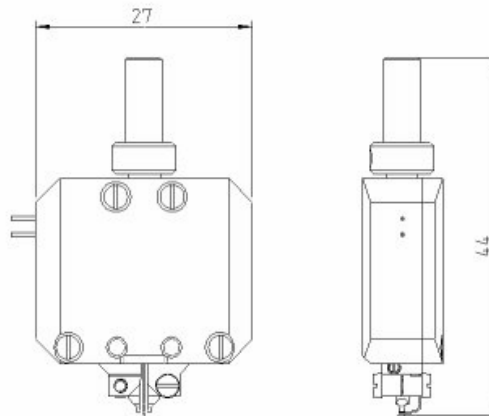
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Technical Data BPT/2

Mass:	16,5 g
Dimensions:	44 mm x 27 mm x 10 mm
Gripper tips:	replaceable, sizes and shapes according to costumers demands
Gripping force:	self-adjusting
Gripping time:	Opening ca. 0,5 s Closing ca. 1 s
Ball diameter:	0,3 ... 2 mm
Maximum pull force:	> 50 N
Mounting shaft:	replaceable
Electrical supply:	constant current source, I < 380 mA

Fig. 3 Dimensions of ball pull tester BPT/2



Scale approximately 1 : 1

Fig. 4 BPT/2 for ball-pull-test

