WAFFER PROBE CARD SOLUTIONS
Innovative Solutions to Test Chips in the Semiconductor Industry

Our long term experience in the electronic industry, the inspiration in new ideas and products and a strong developing and process team allow us to create the future and to support the semiconductor industry. It is our passion to satisfy your demand as our customers with a comprehensive variety of solutions.

**ViProbe®**
Vertical probe card with buckling beams for contacting on aluminum-, copper-, gold-, palladium- and other pads.

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**CiProbe®**
Probe card with cobra like beams for testing of analog and mixed signal, flip chip and grid array solder bump applications.

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**FeinProbe®**
Probe card with spring contact probes for WLCSP, SiP, analog and mixed signal flip chip applications.

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**Cantilever Probe Cards**
Probe card with Epoxy ring and needles for a wide range of applications.

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Micromechanical Processes
Manufacturing probe cards for wafer testing is based on handling finest structures and micromechanical processes. Thousands of contact elements in the size of a human hair need to be placed on a tiny space in the size of a post stamp exactly positioned in smallest distances - that’s our world. And our manufacturing equipment is optimized for these requirements of the semiconductor industry.

We Make the Impossible Possible
Innovative technologies meet the extremely high demands of precision and quality for manufacturing our products. Clean rooms and manufacturing facilities, test equipment and specially developed machines combined with consequent and continual process optimization lead to low error rates, short lead times and a high process stability.

Core Competence Micro Hole Drilling
Finest drillings and highest precision of their position allow an exact placement of the contact needles in a probe card head. The basic material for heads is ceramics, the minimum diameter of drill holes depends on the drilling technology. Mechanical drilling allows diameters down to 40 µm whereas laser drilling even results in diameters down to 30 µm.

Outstanding Test Equipment
State of the art probe card analyzers guarantee a final inspection of each probe card for highest quality standards. Special flying probe testers allow a maximum of flexibility and reliability. And they enable pre-delivery inspections of probe cards without mother board. Similar equipment has been implemented as inspection gates for high product quality along manufacturing.

Flexibility by In-House SMD Assembly
Automatic SMD assembly and semiautomatic connector wiring lead to a high degree of flexibility and quality of the electrical performance of a probe card. A jet printer applies solder paste on PCBs up to a size of 500 mm x 600 mm without soldering mask and a placement machine handles even smallest components.
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Vertical Probe Card ViProbe®

FEINMETALL ViProbe® is a buckling beam technology for contacting pads. The contact can be done with and without scrub – depending on the application. It fits for contacting on aluminum-, copper-, gold-, palladium- and other pads.

**Advantages**

- Excellent temperature behaviour
- Easy maintenance & service
- Easy exchange of beams
- Precise alignment over the entire lifetime
- Robustness

**Application Examples**

**ViProbe® - SOC**

Wired connector
Head size 45 mm x 45 mm
Beam count: 1,440
Beam size: 2.5 mil
24 DUT
Tester: Teradyne J750

**ViProbe® - Multi DUT MCU**

MLC Space transformer connector
Head size 40 mm x 40 mm
Pin count: 5,000
Beam size: 1.6 mil
32 DUT
Tester: Advantest V93000

**ViProbe® - High Multi DUT Digital**

Direct attach connector
Head size: 80 mm x 80 mm
Pin count: 5,100
Beam size: 2 mil
1700 DUT
Tester: Advantest J996

**Specifications at a glance**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact elements</td>
<td>3 mil - 2.5 mil - 2 mil - 1.6 mil</td>
</tr>
<tr>
<td>Pitch</td>
<td>down to 56 µm</td>
</tr>
<tr>
<td>Beam count</td>
<td>more than 10,000</td>
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<tr>
<td>Active area</td>
<td>up to 100 mm x 100 mm</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-55 °C to 180 °C</td>
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</tbody>
</table>

Subject to change without notice. Further information at [www.feinmetall.com](http://www.feinmetall.com)
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Probe Card CiProbe®

FEINMETALL CiProbe® is based on pre-formed wire contact elements. It is ideal for testing CPU or GPU processors, FPGA, analog and mixed signal, flip chip and grid array solder bump applications.

Advantages
• Best for contacting on lead free solder bumps
• Best for high current applications (up to 3 A)
• Easy and fast maintenance
• Low cost of ownership
• Mature and robust technology

Application Examples

CiProbe® - E Type
The CiProbe® E-type is designed for solder bump wafer test applications with minimum bump pitch 250 µm. An advanced contact element alloy allows to increase the current carrying capability up to 3 A per probe. The CiProbe® is capable of probing grid array, single and multi-DUT layout applications.

CiProbe® - P Type
The CiProbe® P-type is designed for solder bump wafer test applications with minimum bump pitch 180 µm. A unique and advanced contact element alloy allows to increase the current carrying capability up to 1.7 A per probe. The CiProbe® is capable of probing grid array, single and multi-DUT layout applications.

Specifications at a glance

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact elements</td>
<td>4 mil - 5 mil</td>
</tr>
<tr>
<td>Pitch</td>
<td>down to 180 µm area array</td>
</tr>
<tr>
<td>Beam count</td>
<td>up to 8 000</td>
</tr>
<tr>
<td>Active area</td>
<td>up to 60 mm x 60 mm</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40 °C to 150 °C</td>
</tr>
</tbody>
</table>
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Probe Card FeinProbe®

FEIMETALL FeinProbe® is based on spring contact probes as contact elements. This technology is ideal for fine pitches of WLP applications and can be used for WLCSP, WLAN, RF, SiP, analog and mixed signal flip chip applications.

Advantages

- Stable and consistent contact resistance with low bump damage
- High bandwidth of contact elements
- Best for high current applications (up to 2.1 A)
- Suitable for test of single or multi packages together with manual actuators
- Low cost of ownership

Application Examples

FeinProbe® - X01

The FeinProbe® X01-type is designed for solder bump wafer test applications with a minimum solder bump pitch of down to 350 µm. A special probe design allows using this solution for applications with a bandwidth up to 9.3 GHz and temperatures up to 150 °C. The FeinProbe® is capable of probing grid array, single and multi-DUT layout applications.

FeinProbe® - X02

The FeinProbe® X02-type is designed for solder bump wafer test applications with minimum solder bump pitch 500 µm. A special probe design allows matching the ViProbe® probe card depth. The spring contact probe design allows using this solution for test temperatures up to 150 °C. The FeinProbe® is capable of probing grid array, single and multi-DUT layout applications.

Specifications at a glance

<table>
<thead>
<tr>
<th>Specification</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact elements</td>
<td>contact probes X01 and X02</td>
</tr>
<tr>
<td>Pitch</td>
<td>down to 350 µm</td>
</tr>
<tr>
<td>Beam count</td>
<td>up to 5 000</td>
</tr>
<tr>
<td>Active area</td>
<td>up to 60 mm x 60 mm</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40 °C to 150 °C</td>
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</table>

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Cantilever Probe Cards

FEINMETALL Cantilever probe cards are based on the approved epoxy ring design. The technology is suitable for pads as well as for bumps. Different needle materials, diameters and tip diameters give the customer the chance to cover a wide range of applications.

Advantages

- Fast lead time
- High flexibility and customization possible
- High current applications
- Dual temperature possible – wide temperature range
- Mature and robust technology

Application Examples

Single DUT SOC

Needle diameter: 6 mil
Needle pitch: 150 µm
Tester: MT256

Single DUT - Controlled Beam Length and Balanced Contact Force

Needle diameter: 4 mil
Needle pitch: 100 µm
Tester: SP128

Specifications at a glance

<table>
<thead>
<tr>
<th>Contact elements</th>
<th>4 mil to 12 mil (customized)</th>
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</thead>
<tbody>
<tr>
<td>Pitch</td>
<td>down to 65 µm</td>
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<tr>
<td>Beam count</td>
<td>up to 1 000</td>
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<tr>
<td>Needle material</td>
<td>RheniumTungsten (ReW) - Harden Beryllium Copper – Trivar®</td>
</tr>
<tr>
<td>Temperature range</td>
<td>-40 °C up to 180 °C</td>
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