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

Our long term experience in the electronic industry and our strong developing and process teams are inspired 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.  Page 4

MµProbe®/ LiProbe®
Contacting solutions for pads and copper pillars using solid and lamella MEMS beams.  Page 5

FeinProbe®
Probe card with spring contact probes for WLCSP, SiP, analog and mixed signal flip chip applications.  Page 6

CiProbe®
Probe card with cobra like beams for testing of analog and mixed signal, flip chip and grid array solder bump applications.  Page 7

Cantilever Probe Cards
Probe card with epoxy ring and needles for a wide range of applications.  Page 7
WAFER PROBE CARD COMPETENCE

Micro-mechanical Processes
Manufacturing probe cards for wafer testing is based on handling finest structures and micro-mechanical processes. Our world is to place thousands of contact elements in the size of a human hair exactly on a tiny space in the size of a post stamp. 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 elements 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. A wide variety of testers allow a maximum of test flexibility and reliability. Flying probe testers enable inspections of SMD components on PCBs. Special test equipment has been implemented as inspection gates for high product quality and early failure detection 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.
**Vertical Probe Card ViProbe®**

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

**Advantages**
- Excellent temperature behavior
- 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
- Pin count: 1 500
- Beam size: 2.5 mil
- Number of DUTs: 24
- 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
- Number of DUTs: 32
- 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
- Number of DUTs: 1 700
- Tester: Advantest J996

**Specifications at a glance**

<table>
<thead>
<tr>
<th>Specifications</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>Pin count</td>
<td>more than 10 000</td>
</tr>
<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>
</tr>
</tbody>
</table>

*Subject to change without notice. Further information at [www.feinmetall.com](http://www.feinmetall.com)*
MEMS Probe Cards MµProbe® and LiProbe®

FEINMETALL MEMS probe cards are using latest production processes to obtain the solid and lamella MEMS beams used for contacting even smallest pitches in high-current applications. Compatibility with our well-established probe card setup is thereby guaranteed and ensures a reliable functionality. It is the optimal addition to our product range, especially developed to contact small pitch copper pillars and aluminum pads.

Advantages

• Long lifetime due to shimming
• High density
• Short beams possible with low force
• High current in respect to density and pitch
• Patented lamella design beam

Application Examples

LiProbe® - SOC
Hybrid space transformer connector
Head size: 30 mm x 30 mm
Pin count: 1500
Number of DUTs: 9
Tester: Teradyne UltraFlex

MµProbe® - GPU
MLC space transformer connector
Head size: 40 mm x 40 mm
Pin count: 5000
Number of DUTs: 4
Tester: Teradyne J750

Specifications at a glance

<table>
<thead>
<tr>
<th>Contact elements</th>
<th>M, N for copper pillars and R, L for pads</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch</td>
<td>80 µm array for copper pillars and 50 µm for pads</td>
</tr>
<tr>
<td>Pin count</td>
<td>more than 12 000</td>
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<tr>
<td>Active area</td>
<td>up to 100 mm x 100 mm</td>
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<tr>
<td>Temperature range</td>
<td>-55 °C to 200 °C</td>
</tr>
</tbody>
</table>

Subject to change without notice. Further information at www.feinmetall.com
Probe Card FeinProbe®

FEINMETALL 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 (up to 10 GHz and higher)
• Best for high current applications (up to 2.1 A)
• Suitable for test of single or multi packages together with manual actuators
• Low risk of damaging bumps

Application Examples

FeinProbe® X01 - WLCSP
Direct Attach connector
Head size: 20 mm x 20 mm
Pin count: 5 000
Tester: Teradyne UltraFlex

FeinProbe® X02 - Sensor
Direct Attach connector
Head size: 32 mm x 32 mm
Pin count: 500
Tester: Teradyne J750

Specifications at a glance

<table>
<thead>
<tr>
<th>Contact elements</th>
<th>X01, X02, X03, X04</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pitch</td>
<td>down to 250 µm</td>
</tr>
<tr>
<td>Pin 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>
</tr>
</tbody>
</table>
**Wafer Probe Card Solutions**

**Probe Card CiProbe®**

FEINMETALL CiProbe® is based on preformed 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)
- Mature and robust technology

**Application Example**

![CiProbe® - CSBGA](image)

Substrate connector
Pin count: 600
Beam size: 4 mil
Tester: Catalyst

**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 cover a wide range of applications.

**Advantages**
- Fast lead time
- High current applications
- Dual temperature possible - wide temperature range

**Application Example**

![Single DUT - SOC](image)

Needle diameter: 4 mil
Needle pitch: 100 µm
Tester: MT 256

**Specifications at a glance**

<table>
<thead>
<tr>
<th></th>
<th>CiProbe®</th>
<th>Cantilever Probe Cards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact elements:</td>
<td>5 mil - 4 mil - 3 mil</td>
<td></td>
</tr>
<tr>
<td>Pitch:</td>
<td>down to 150 µm area array</td>
<td>4 mil - 12 mil (customized)</td>
</tr>
<tr>
<td>Pin count:</td>
<td>up to 8 000</td>
<td>down to 65 µm</td>
</tr>
<tr>
<td>Active Area</td>
<td>up to 60 mm x 60 mm</td>
<td>up to 1 000</td>
</tr>
<tr>
<td>Temperature range:</td>
<td>-40°C to 150°C</td>
<td>-40°C to 180°C</td>
</tr>
</tbody>
</table>
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