

SEMICONDUCTOR TESTING PRODUCTS

Wafer Probe Card
solutions



FEINMETALL
Contact Technologies



WAFER PROBE CARD SOLUTIONS



Wafer Probe Card Excellence

As numerous as the applications for semiconductor components and modules are the requirements to set up a suitable test strategy. Key is always to ensure the desired function during and after wafer processing before the bare die is further packaged and assembled.

A maximized yield and a low-wear contacting solution resulting in a low total cost of ownership are therefore central. FEINMETALL convinces with years of experience in comprehensive advice and project-specific contacting solutions as well as further service support worldwide.

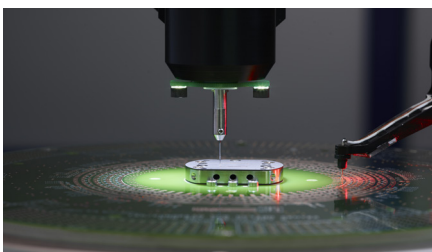
Our Products Address and Overcome the Biggest Challenges in Wafer Test

- Fine-pitch applications down to 40 μm
- High current applications up to 5 A
- Radio frequency applications up to 80 GHz
- Excellent pad (aluminum, copper and other alloys), solder bump and copper pillar probing
- Reliable probe card from -55°C to $+180^{\circ}\text{C}$
- Multiple million TDs
- Customized solutions for light and gyro sensors, nitrogen flush and non-magnetic
- Turnkey services and support in all fields of wafer testing and surrounding systems
- Service experts support you worldwide and minimize downtime



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 zero-defect quality, short lead times and a high process stability.



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.

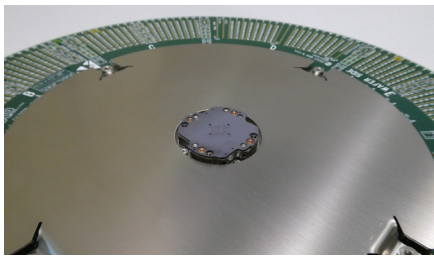
PRODUCT PORTFOLIO



ViProbe® - The Established Solution

Customizable to an enormous range of applications and probing materials it is the vertical solution in the market for many years and especially appreciated for its unique simple reparability.

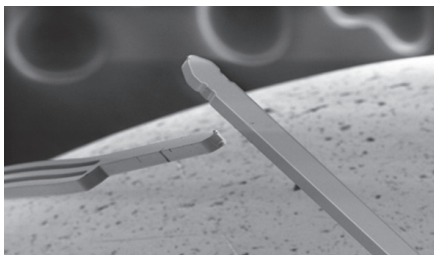
Page 4



ViProbe® II - The Next Generation

With multiple lifetime extension options and various security features for the DUT, the ViProbe®II brings all the advantages of the ViProbe® to the next level.

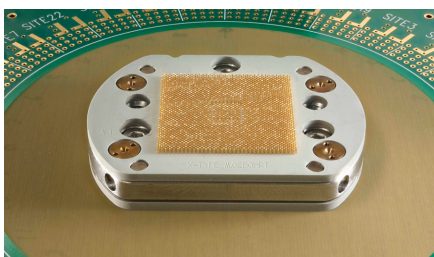
Page 4



LiProbe® - The Lamella Solution

Lamella probes offer various advantages in terms of RF and force requirements. The short length of the probe as well as the flexible amount of lamellae makes it the perfect solution for sophisticated applications.

Page 5



FeinProbe® - The Spring Probe Solution

Probing WLCSP, SiP or flipchip wafers requires probes withstanding high current while simultaneously assuring high signal integrity. The FEIN-METALL FeinProbe® addresses those applications with excellence.

Page 6

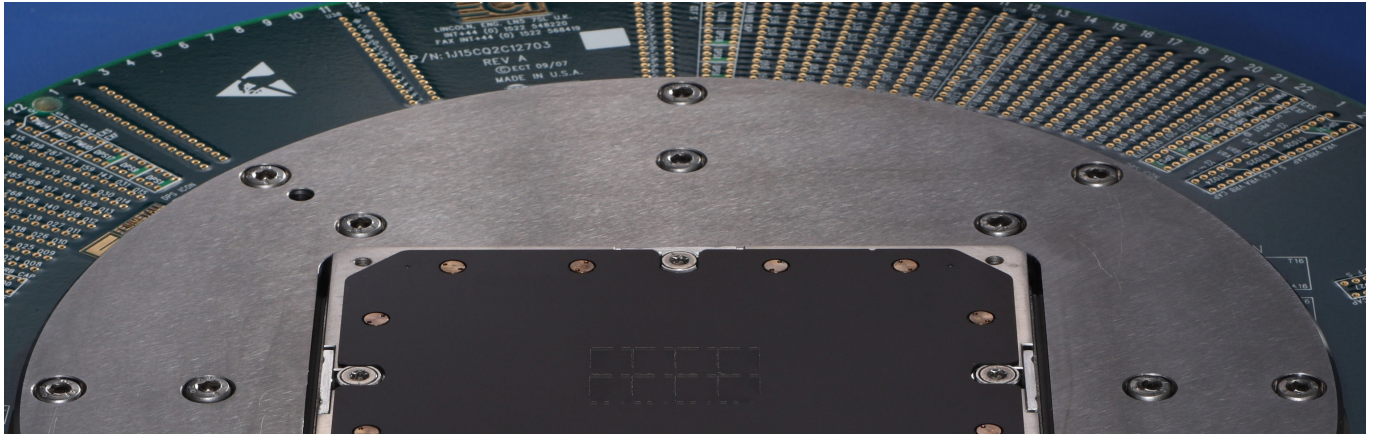


FeinProbe®II- NextGen of WLCSP testing

New Feinmetall ceramic head design as vertical test solution. The precise ceramic design enables high quality, high design flexibility as well as reliable and fast automated assembly or maintenance of the integrated contact elements.

Page 7

WAFER PROBE CARD SOLUTIONS



Vertical Probe Card ViProbe® and ViProbe®II - From the Established Solution to the Next Generation

For years, the FEINMETALL ViProbe® has dominated the vertical probe card industry. Several advantages such as the stable contact performance as well as the simple exchange of the contact elements and outstanding temperature behavior make this probing solution the favorite to the automotive industry.

With the introduction of the next generation of vertical wafer probing, the ViProbe®II, all these advantages are extended by multiple lifetime extension options and further security additions to ensure security of the DUT.

Advantages

- Accurate wafer probing on fine pitch pads over the whole temperature range
- Simple exchange of single contact elements, complete replacement of the probes and even probe heads by the customer leads to lowest cost-of-ownership
- Adjustable to most applications: from high pin count, to copper probing up to fine pitch
- Multiple lifetime extension
- Extended security features of the probe head

ViProbe®



ViProbe®II



Specifications at a glance

Min. pitch of the DUT
Diameter of the contact element
Max. active area
Capable temperature range
Current carrying capability at RT
Contact force at rec. OD

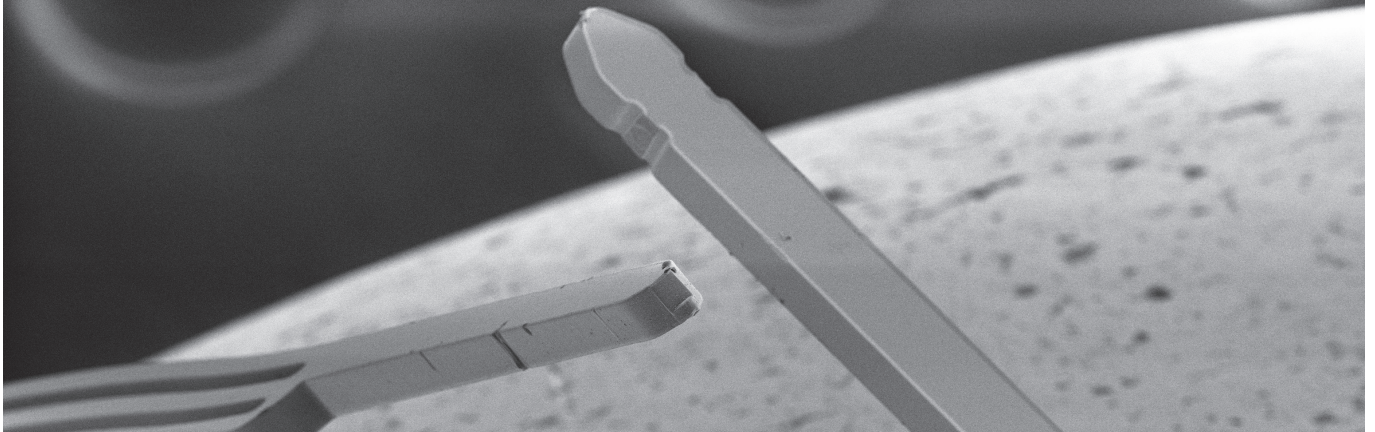
ViProbe®

Down to 56 μm
Down to 1.6 mil
Up to 80 mm x 80 mm
From -55°C to 180°C
Up to 800 mA
From 2.6 cN to 10.8 cN

ViProbe®II

Down to 40 μm
Down to 1.1 mil
Up to 105 mm x 105 mm
From -55°C to 180°C
Up to 800 mA
From 2.2 cN to 10.8 cN

WAFER PROBE CARD SOLUTIONS



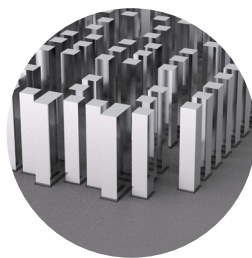
Probe Card LiProbe® - *The Lamella Solution*

The FEINMETALL LiProbe® is the solution for advanced probing requirements. It has been designed to ensure a specific contact force as well as maintaining it over the whole lifetime. The lamella technology allows the probe to be much shorter than a conventional buckling beam and therefore is used in applications which require advanced frequency requirements.

Due to the flexibility of the probe design it is possible to equip a probe head with probes in different geometries depending on their specific function.

Advantages

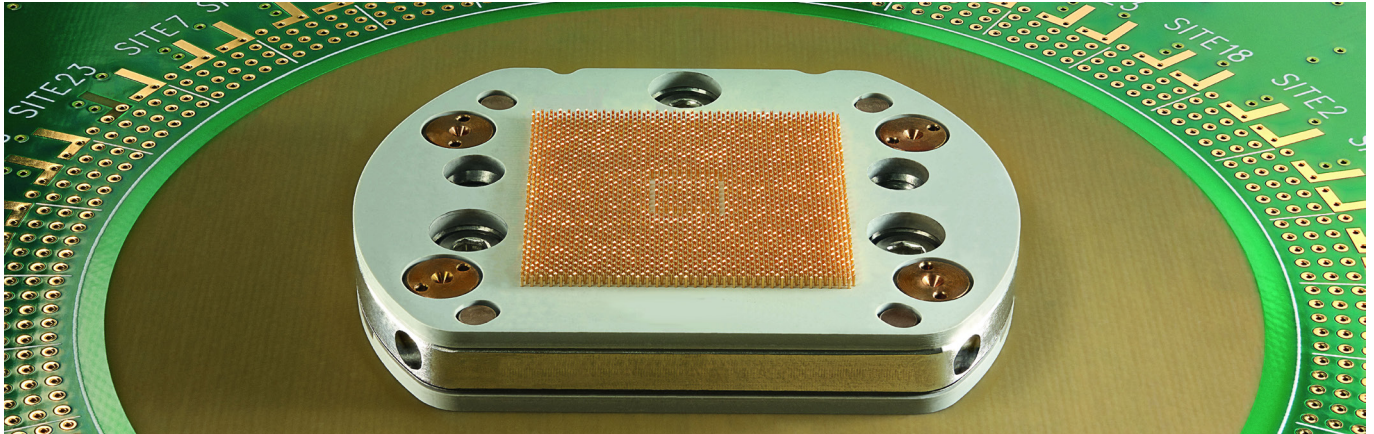
- Shortness of the probe excellent for frequency-dependent applications
- Product families with different geometries in the same probe head
- High design flexibility in terms of defining exact contact force
- Stable contact force over the lifetime as well as a low contact resistance
- FEINMETALL patented lamella design



Specifications at a glance

Min. pitch of the DUT	Down to 60 μm
Max. active area	Up to 105 mm x 105 mm
Capable temperature range	From -55°C to 180°C
Current carrying capability at RT	Up to 1300 mA
Contact force at rec. OD	From 2.8 cN to 5.4 cN
Bandwidth analog @ -1dB limit	Up to 30 GHz

WAFER PROBE CARD SOLUTIONS



FeinProbe®- The Spring Probe Solution

The FEINMETALL FeinProbe® uses contact probes as contact elements for contacting bumped wafers for WLCSP, SiP and Flip Chip Applications.

By using FEINMETALL contact probes, the probe solution has several advantages because of the independent spring loaded pins and the crown tip of the contact element. This ensures a stable contact without a stressful impact on the bumps. Even more, signal transmission can be guaranteed when applying specific design rules.

Advantages

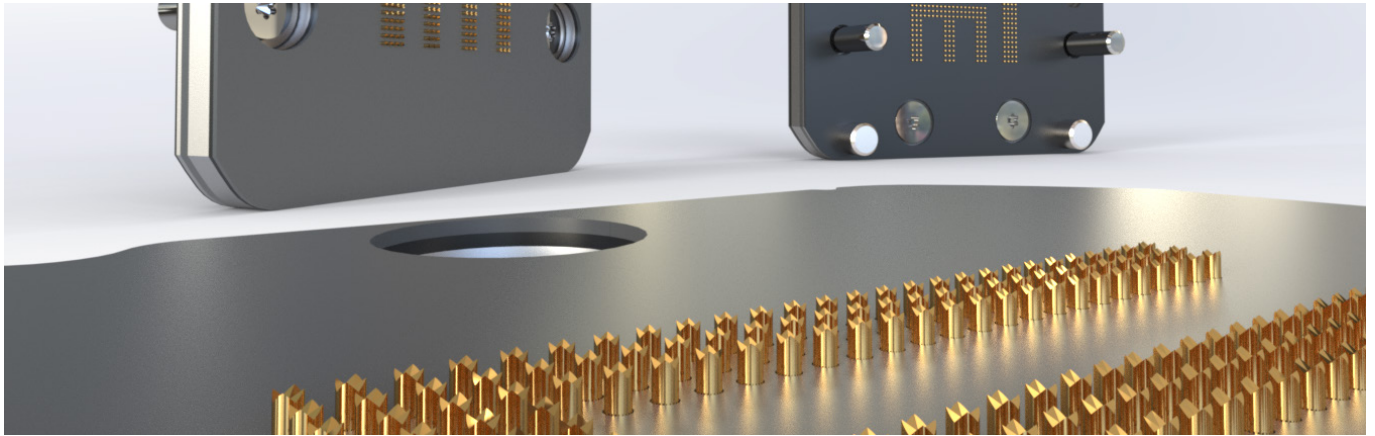
- Stable contact performance in terms of low contact resistance and force
- Self-aligning plunger and crown tip reduces stress to the bump
- Spring probes are able to withstand higher currents
- Signal transmission of up to 80 GHz (when following specific layout rules)
- Combined know-how from FM spring probe department, special adaptations and wafer probe cards



Specifications at a glance

Min. pitch of the DUT	Down to 150 µm
Diameter of the plunger	Down to 120 µm
Max. active area	Up to 50 mm x 61 mm
Capable temperature range	From -40°C to 150°C
Current carrying capability at RT	Up to 2800 mA
Contact force at rec. OD	From 10 cN to 18 cN
Bandwidth analog @ -1dB limit	30 GHz (80 GHz on request)

WAFER PROBE CARD SOLUTIONS

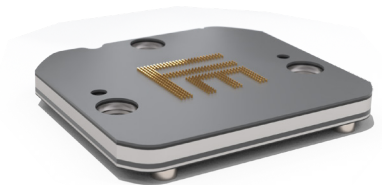


FeinProbe®II- WLCSP Head Design

New Feinmetall ceramic head design as vertical test solution. The precise ceramic design enables high quality, highest design flexibility as well as reliable and fast automated assembly or maintenance of the integrated contact elements. FeinProbe II offers the benefits of both fast delivery times and favorable pricing.

Advantages

- Fast delivery time due to automatic spring probe assembly
- High quality due to accurate ceramic design
- High design flexibility enables compatibility with any connector
- Easy maintenance
- 5G proven wafer testing technology



Specifications at a glance

Spring probe length	3.2 - 8.6 mm
Recommended overdrive (OD)	150 - 200 μm
Maximum OD	200 - 600 μm
Contact force @ rec. OD	4.5 - 15.1 cN
Minimum pitch full array	150 - 500 μm
Electrical planarity	< 75 μm
Spring probe resistance	< 0.2
Self inductance	1.7 - 2.37 nH
Current carrying capability at RT	200 - 2100 mA
Capable temperature range	From -55°C to 150°C



FEINMETALL

Contact Technologies

Customer Oriented Probe Card Service - All Over the Globe

For your tailored support we offer various levels of service agreements, combining some important advantages:

- On-the-spot support - we are where our probe cards are
- Guaranteed turnaround times
- Custom-tailored solution from small repairs to complete repair shop management
- High competence and deep understanding of customer needs

Please contact us directly by email: service@feinmetall.de

CONTACT

SEMICONDUCTOR TESTING PRODUCTS
semiconductor@feinmetall.com

FEINMETALL GMBH | HERRENBERG, GERMANY
(+49) 7032 2001-0 | info@feinmetall.com

FEINMETALL USA LLC | SAN JOSE, USA
(+1) 408 432 7500 | info.us@feinmetall.com

FEINMETALL SINGAPORE PTE LTD | SINGAPORE
(+65) 6817 8764 | info-sg@feinmetall.com

FEINMETALL-OCT | HSINCHU COUNTY, TAIWAN
(+886) 3 560 15 66 | info@tw.feinmetall.com

FEINMETALL SHANGHAI | SHANGHAI, CHINA
(+86) 21 2898 6848 | info@cn.feinmetall.com

PASSION
FOR FINEST
TECHNOLOGY.

> FEINMETALL.COM

1131702 - SEMICONDUCTOR TESTING / Version 1.1