Advanced Wafer Probe Cards

High-performance probe cards for memory, RF, foundry and logic devices
FormFactor, Inc. - Company Profile

FormFactor, Inc. (NASDAQ: FORM) is a leading provider of essential test and measurement technologies along the full IC life cycle – from characterization, modeling, reliability, and design de-bug, to qualification and production test.

Vision & Mission

Our heritage is innovation.

Key Facts

FormFactor at a glance.

- Founded in 1993, IPO 2003
- #1 Advanced Probe Card Supplier
- #1 Engineering Probe Systems Supplier
- Named as a BEST Supplier in customer satisfaction surveys, year-after-year
- Ship >50 million MEMS probes annually
- Over 10,000 probe systems installed
- 2020 revenue of ~694 million (USD)

Customer Collaboration

Global and local.

- Enable customer success through technology, partnerships, “First Time Right” product quality, global customer support
- 2000 employees
- 22 service and repair centers
- 13 sales offices
- 11 design centers
- 9 production locations

Apollo™ Vertical Probe Cards for Bump/Cu Pillar Probing

High Current Capacity for Artificial Intelligence, Applications Processors and Server Chips

- Pitch scalability to 40 µm.
- Variety of metallurgies and geometries.
- Best-in-class contact stability and lifetime.
- Membrane, MLO, MLC space transformation options.

Customer Applications

- High pin-count and multi-site: >64K probes
- Ideal for AI, AP and server chip testing:
  - >1.8A CCC/probe
- V93K and Ultraflex+ DirectDock for KGD performance
- Low-force probing for Cu pillar and bumps

MF60R Probe Options for Pad Probing

- Supports fine pitch, multi-site pad probing down to 60 µm
- Low-force spring ideal for automotive, and other high temperature applications
- Designed for both peripheral and core pad layouts applications

Katana™ Vertical MEMS Probe Cards for AI/Cu Pads Probing

Low Impact Probe (LIP) Optimized for Automotive Applications

- No-float architecture for stable Cres, planarity and alignment (-40 to 165°C) at 60 µm pitch and above.
- High current-carrying capability, 0.8A CCC & 0.6A MAC.
- Low-impact probe to minimize pad damage: <2g at production overdrive; >10 TDs with no punch-through or dielectric cracking.
- Wear-resistive PA2 tip material for long life.

Wear-resistive PA2 tip material for long life. Constant probe pressure to minimize pad damage.

8K pins pointed tip probe card for pre-bump application.
FormFactor Full Wafer Contactor Probe Card Solutions
Matrix Probe Card Family for DRAM: Targeting 1-2 Touchdowns with 256-3200 Sites

/ Lowest full wafer contact planarity for optimum scrub performance and contact resistance.
/ HFTAP (High Frequency Test at Speed) for KGD (Known Good Die) applications and Advanced memory characterization up to 3.2 GHz.
/ Advanced tester resource extension (ATRE) capability: Maximize parallelism with high performance and reliability on existing ATE to minimize CAPEX investment.
/ Industry-leading electrical performance.

Customer Applications
/ DRAM Sort and BI – over 150K springs (Smart Matrix)
/ Best suited for High Bandwidth Memory (HBM) stack wafer sort
/ NAND and NOR Flash (TouchMatrix) SoC embedded Memory (TrueScale Matrix)
/ Wide temperature probing, from -40°C to 175°C
/ 3D MEMS Spring technology with superior CCC performance

Genus Probe Card for NAND Flash Probing
/ NAND and NOR Flash (Genus) Sort and wafer level BI – over 35K springs
/ Monolithic space transformer technology for better signal performance and multi-chuck applications.
/ Wide temperature probing, -33°C to 125°C.
/ 2D MEMS Spring technology with superior scrub performance.

Pyramid Probe® for High-Performance RF Applications
Leading Supplier for 5G Mobile Devices with Performance up to 81 GHz

/ High-bandwidth RF microstrip transmission lines to probe tips guarantee performance and ensure low signal loss.
/ Consistent low contact resistance and low-inductance probe tips ensure accurate and repeatable RF measurements.
/ Patented ground and power planes, provide resonance-free stable power supplies directly to the DUTs.
/ Permanent probe tip placement improves test cell uptime reducing the cost of ownership compared to other probing technologies.

Pyrmad Probe tips
Probe mark on 70 µm solder ball

Pyran™ Family for RF Device Production Test
High Performance Vertical MEMS Probe Card

/ Superior measurement accuracy with excellent signal integrity, minimum contact resistance and repeatable results.
/ Measurements up to 40 GHz with excellent signal integrity and low-inductance performance.
/ Long lifetime for lower cost of test.
/ High test efficiency with straightforward cleaning and maintenance. Minimum contact force and easily replaceable probes.
/ Versatile Pyran offers potential of generic PCBs to support families of similar devices.

Genus Flash Probe Card
SmartMatrix™ enables parallel testing of >3000 DRAM DUTs on 300 mm wafers
FormFactor's unique "DUTLet" architecture enables superior scrub margin performance, zero soak, wide temperature range, and high speed testing
Patented ground and power planes, provide resonance-free stable power supplies directly to the DUTs.
Consistent low contact resistance and low-inductance probe tips ensure accurate and repeatable RF measurements.
High-bandwidth RF microstrip transmission lines to probe tips guarantee performance and ensure low signal loss.
Patented ground and power planes, provide resonance-free stable power supplies directly to the DUTs.
Permanent probe tip placement improves test cell uptime reducing the cost of ownership compared to other probing technologies.

The world’s most comprehensive portfolio of wafer probe cards with an extensive library of advanced probe contact technologies.

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<td>FormFactor’s industry leading MEMS factories enable wafer test capability across SoC, Foundry, DRAM and Flash markets.</td>
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