

# Maximum Throughput and Probing Accuracy

# 4080

## 8X MULTI-FUNCTIONAL FLYING PROBE TESTER

IDEAL FOR HIGH-VOLUME PRODUCTION TESTING ... & MORE



**4080** sets new benchmarks for flying probe board testing, delivering **unparalleled throughput and test capabilities**.

**Up to 180 touches/sec** are delivered by very-high speed Linear Motors on each XYZ axis. The **highest positioning accuracy** is guaranteed by sub-micron resolution Linear Optical Encoders on each XYZ axis, making **4080** suitable to touch **30µm pads** at high speed and with no mark left.<sup>1</sup>

The **natural granite chassis**, combined with state-of-art linear motion technologies, offers low vibration and thermal stability, ensuring **unprecedented probing precision at ultra-fast test speed**.

**Full test coverage** is provided by a complete range of test capabilities integrated in **4080** systems, and by the **highest available measurement accuracy** offered by Flying Tester Technology: a complete forcing/measurement board integrated on each axis.

Board loading is flexible: while the system is equipped with automatic conveyor, boards can be manually loaded as well.

**4080** footprint is **very compact: as little as 2.27m<sup>2</sup>**, including conveyor board transportation.

800,000+ Boards Tested per Year<sup>1</sup>

Full Test Coverage

Multi-disciplinary Test Capabilities

Double-sided Multi-Functional Flying Heads

Ultra-accurate Probing of 30µm Test Pads<sup>1</sup>

Safe Probing with No Mark Left<sup>1</sup>

Industry 4.0 & Smart Automation Compliant

# Speed and Accuracy Without Compromise.

With **4080**, you don't need to sacrifice speed for accuracy. Nor accuracy for speed. Product benchmarks recognized SPEA's flying probe tester as the **best on the market** in both aspects.<sup>1</sup>

**Full linear motion** with **linear optical encoders** on XYZ axes provide ultra-high acceleration and speed, along with positional repeatability and accuracy over unlimited travel.

The system chassis is completely made of **selected natural granite**. Compared to conventional iron or steel, natural granite offers best damping characteristics and thermal stability, so to minimize vibration and deformation effects that would affect accuracy and reliability through time. This results in accurate and reliable probing of **micro-pads as little as 30µm at high speed**, like no other flying probe system can do.

Despite the speed, **4080** flying probes touch the board softly, ensuring its integrity. The **programmable probing force** makes the probes able to contact components at near-zero energy: even the most delicate electronics (ultra-fine pitch pads, sticky boards, flex circuits) can be tested with no risk of damage.

All these technology features enable **4080** to test also silicon wafers and glass wafers, accurately and gently.

## Full Linear Motion on XYZ Axes

- Maximum Speed of Movement
- Position Repeatability over Unlimited Travel
- No Mechanical Wear
- Fewer Mechanical Parts than Other Motion Technologies

## Linear Optical Encoders on XYZ Axes

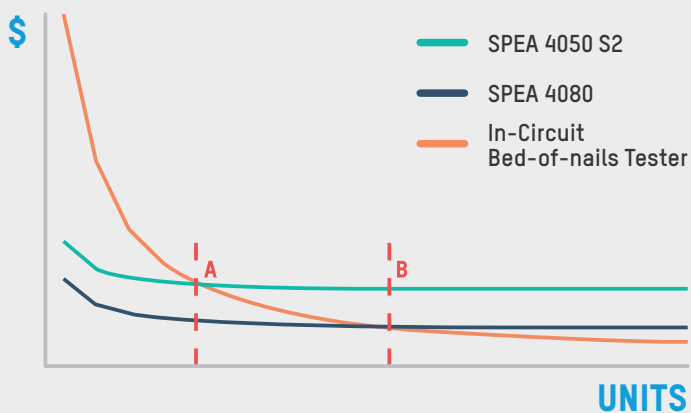
- Real-time Position Feedback
- Closed-loop Accuracy
- Axis Position Direct Measurement, with No Error Due to Additional Mechanical Elements
- Position Measurement Stability over Long Operating Time

## Selected Granite Chassis

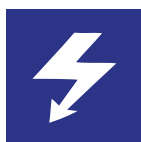
- Extremely High Dynamic Stability Due to the Machine Structure
- Excellent Vibration Damping
- High Stiffness
- Very Low Thermal Expansion

# Suitable to Replace Bed-of-Nails ICT Testers

With a throughput that is 3+ times higher than the fastest single-sided flying probe system on the market, **4080** moves the ROI time of high-volume productions to a level that is very close to the one of a traditional bed-of-nails ICT tester (from point A to point B in the chart below).<sup>1</sup>



In-Circuit Test Power-Off



In-Circuit Test Power-On



100% Short Circuit Test



Open Pin Scan



Nodal Impedance Test



Power Supply Test



Waveform Capture



5G RF Test

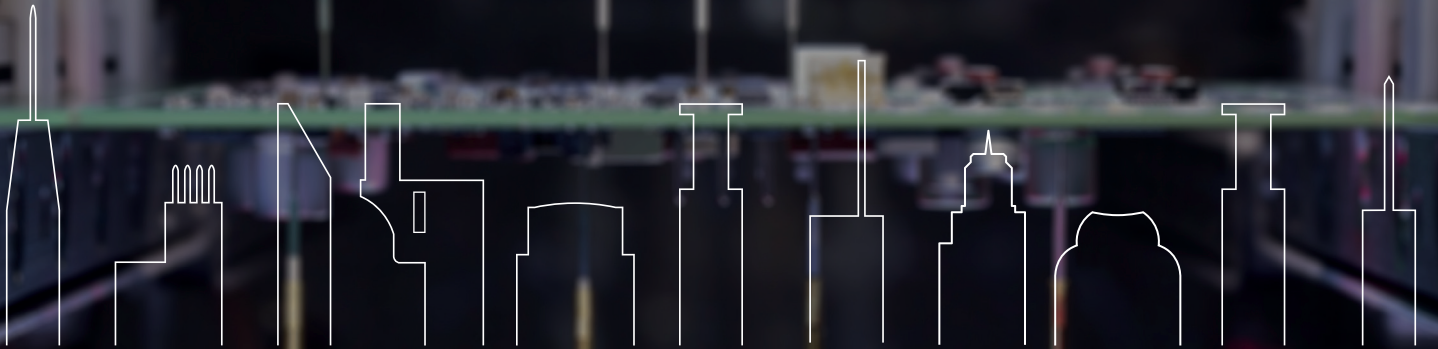
# Leonardo 4: A World of Apps.

4080 users take the advantage of working with an **extremely easy-to-use, app-based software environment**, similar to what smartphones made us used to. Every app is dedicated to a defined function, while its updating process is independent and does not affect overall software integrity. Leonardo 4 operating system incorporates all the functionalities and effectiveness of previous Leonardo versions, bringing them a step ahead. In the world of apps you want to use.

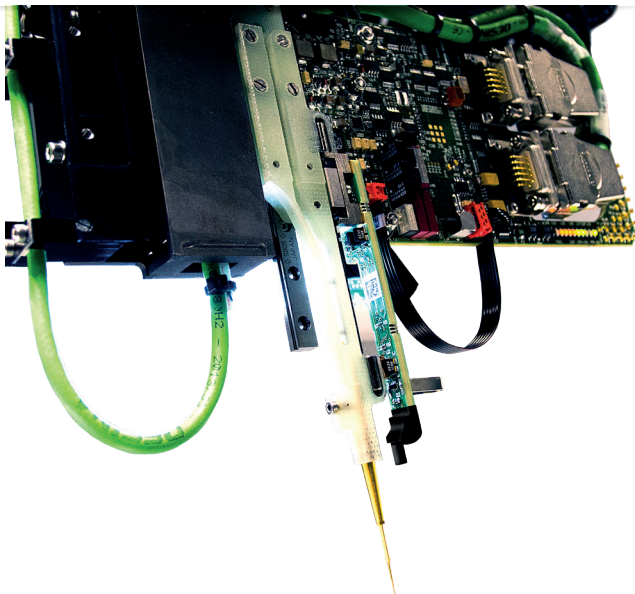


# Up to 28 Top & Bottom Flying Tools

The 8 flying heads (4 top + 4 bottom) of 4080 tester allow you to install up to 28 simultaneous flying test tools, within a range of more than 50: in addition to the electrical probes, a variety of test tools are available to expand 4080 test capabilities.



Spring Probe    Multi-Pin Probe    Planarity Support    Light Meter    RGB Vision Unit    Open Pin Probe    3D Laser Meter    RF Probe    Thermal Camera    Pushing Finger    Marker

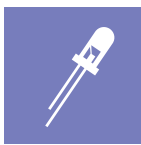


# The Best Measurement Accuracy

The shorter the distance between probe and instruments, the faster and more accurate is the measurement. According to this simple rule, SPEA designed the Flying Tester Technology.

Force & measurement instruments are placed directly on each flying head, delivering unsurpassed measurement speed and performance.

- Highest measurement performance & accuracy (0.1pF)
- Signal integrity
- No measurement degradation or interference
- Immediate signal acquisition (within hundreds of microseconds)



LED Light Test



Optical Test



Thermal Test



3D Laser Test



Functional Test



Flashing



Boundary Scan



Built-In Self-Test

# Models



4080



4080X



4080L



4080 + ALM 100 Series  
Operatorless Test Cell

## Main Specs

### EQUIPMENT CHARACTERISTICS

Multi-Functional Flying Heads	8 (4 top + 4 bottom)
Connector Tester Interface	576 channels
Min. SMD Package Size <sup>1</sup>	008004 (0.203x0.102mm)
Min. Pad Size <sup>1</sup>	30 µm
Probing Accuracy / Repeatability <sup>1</sup>	• 4080/4080X: ±10 µm / ±5 µm • 4080L: ±20 µm / ±5 µm
Min. Pitch <sup>1</sup>	160 µm
XYZ Motion Technology	Linear Motors
Footprint (LxW)	• 4080: 1700 x 1335mm (2.3m <sup>2</sup> ) 5.6x4.4ft (24ft <sup>2</sup> ) • 4080X: 1700 x 1408mm (2.4m <sup>2</sup> ) 5.6x4.6ft (26ft <sup>2</sup> ) • 4080L: 2335 x 1760mm (4.1m <sup>2</sup> ) 5.8x7.7ft (44ft <sup>2</sup> )

### BOARD LOADING

Automatic Loading via Tester Conveyor	<ul style="list-style-type: none"> <li>• From Production/SMD line, Conveyor, Rack Loader</li> <li>• Left-to-Right and Right-to-Left</li> <li>• Pass-Through and Pass-Back</li> </ul>
Manual Loading	<ul style="list-style-type: none"> <li>• Side loading via Tester Conveyor</li> </ul>

### TEST AREA

Max. Board Size (L x W) <sup>2</sup>	<ul style="list-style-type: none"> <li>• 4080/4080X: 1000x463mm (39x18")</li> <li>• 4080L: 1200x668mm (47"x26")</li> </ul>
Max. Test Area (L x W)	<ul style="list-style-type: none"> <li>• 4080/4080X: 1000x455mm (39x18")</li> <li>• 4080L: 1200x662mm (47"x26")</li> </ul>
Max. Component Height (Top & Bottom)	<ul style="list-style-type: none"> <li>• 4080: 85mm</li> <li>• 4080X/4080L: 150mm</li> </ul>
Max. Board Thickness	10mm

### TESTING TOOLS

• Spring Probe	• Multi-Pin Probe
• Open Pin Probe	• RF Probe
• RGB Vision Unit	• Light Meter
• 3D Laser Meter	• Thermal Camera
• Pushing Finger	• Flying Support Probe
• Marker	

## Testing Capability

### ELECTRICAL TEST

• In-Circuit Test Power off	• In-Circuit Test Power on
• All-Nets Short Circuit Test	• Nodal Impedance Test
• Open Pin Scan	• Power Supply Test
• 5G RF Test	• Waveform Capture Test
• Discharge Capacitor Test	• Functional Test
• On-Board Device Flashing	• Boundary Scan
• Built-In Self-Test	

### OTHER TESTS

<b>Light Test</b>	• Light Intensity, HSL, RGB, XY CIE 1931, Color Temperature, CRI, Dominant Waveform, LED Binning, etc.
<b>3D Laser Test</b>	• Component Test: presence, alignment, height, tombstone • Board warpage
<b>Optical Test</b>	• Surface Test: uniformity, scratches, cracks, voids, particles, splash, stains presence • Component Test: presence, placement, shape, color • 2D Measurement: bounding box, area, perimeter, compactness, etc. Character Test: OCR, OCV • Pattern Test: pattern and image verification • 1D/2D Barcode Test
<b>Thermal Test</b>	• Shorts localization, thermal characterization, optical thermal match, hot-spot identification, etc.

## Easy to Use Software

### LEONARDO 4 - APP-BASED OPERATING SYSTEM

- Automatic Test Program Generation
- Automatic Board Data Import
- Test Program Autodebug & Autotuning
- Automatic Product Variant Management
- Easy Test Program Migration
- Automatic Board Repair Test with no need for CAD data
- Automatic Reverse Engineering & Board Data Generation

- Information about testing and probing capabilities is summary in nature and was calculated under specific test conditions.
- For larger boards, please contact SPEA.

