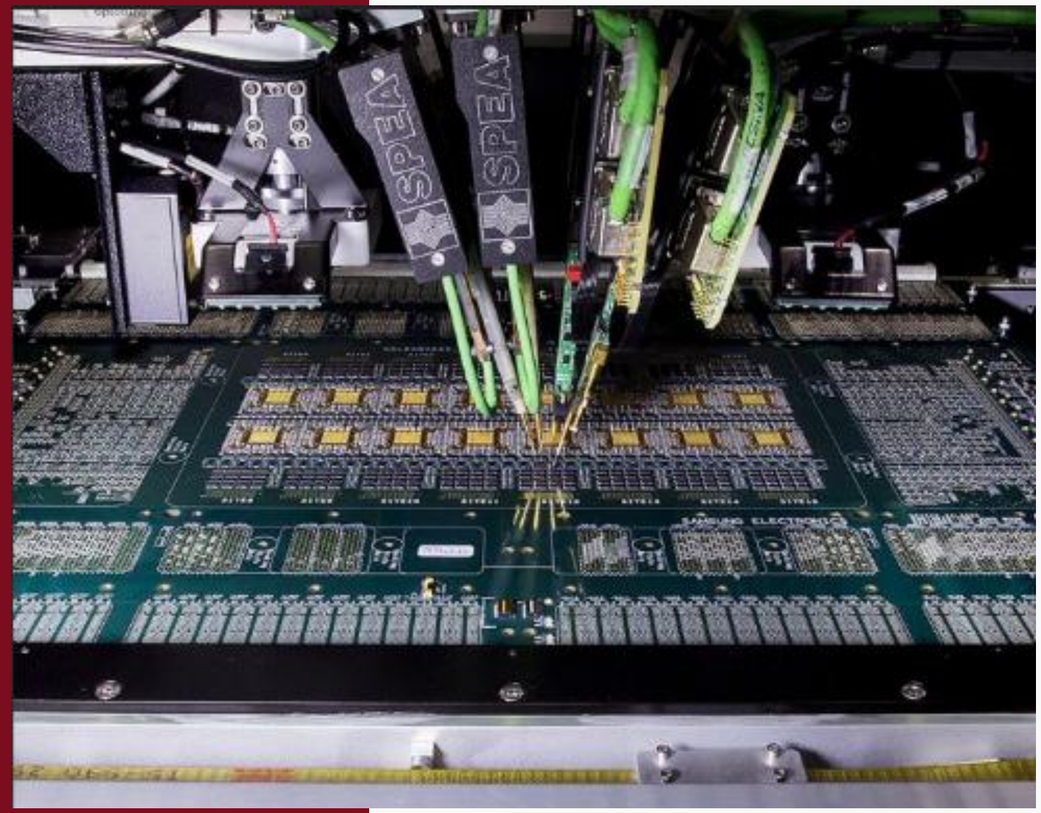
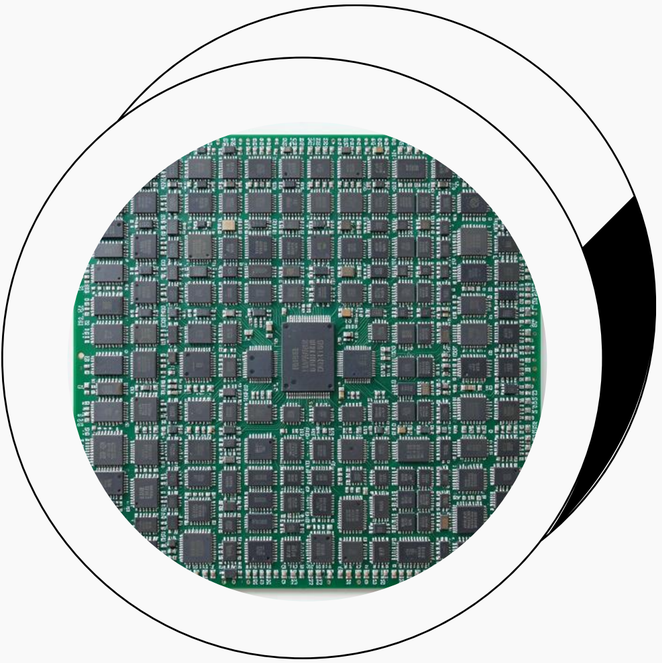
ICTC Value Add Services Overview

Flying Probe Testing



Fast, fixture-less PCB test for prototypes, small runs and complex assemblies

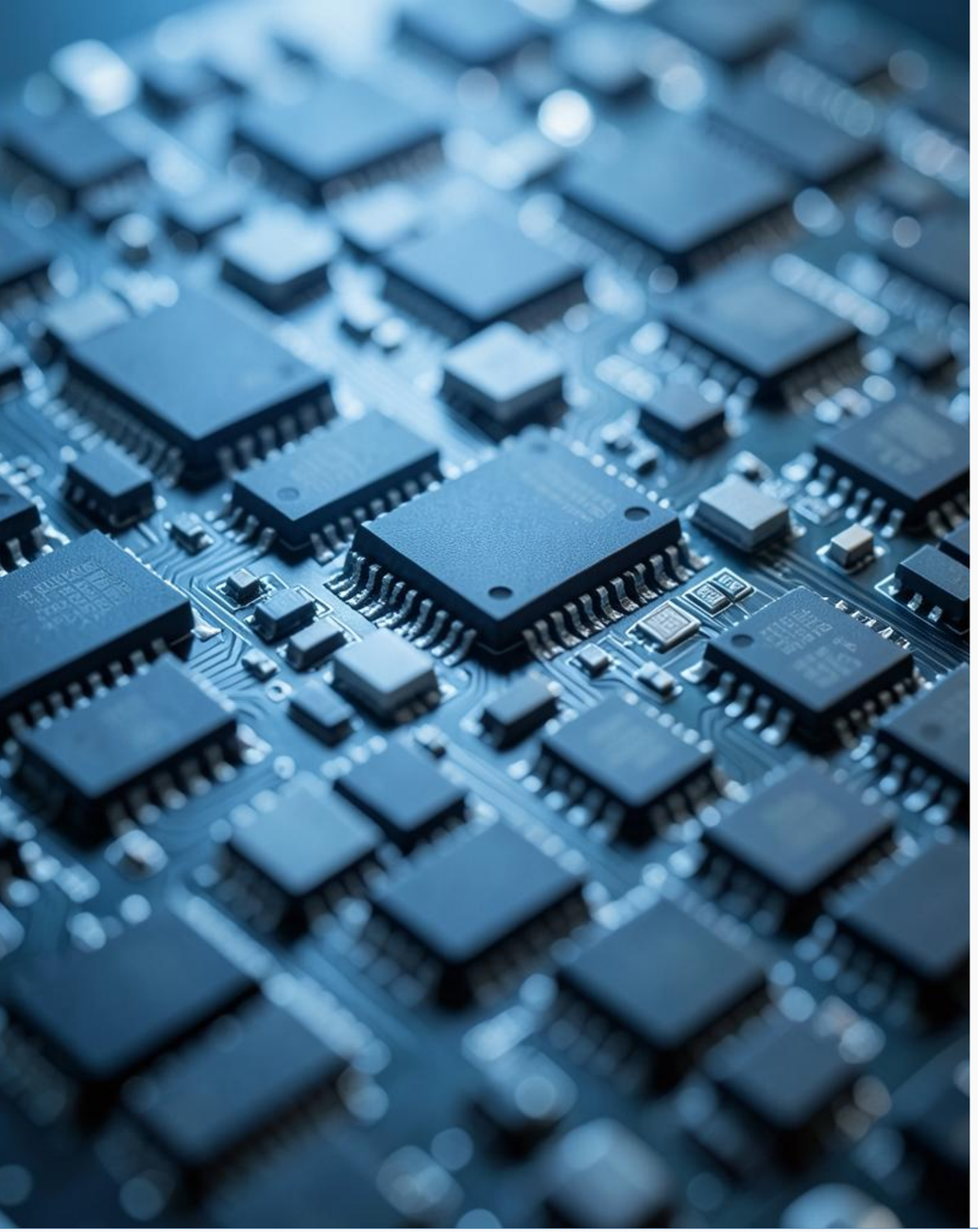


What is Flying Probe Testing?

Flying probe testing is a fixtureless electrical test method that uses movable probes to contact pads, vias, and component leads on your PCB instead of a dedicated bed-of-nails fixture. Under software control, the system exercises the board and measures continuity, component values, and selected power-on conditions at many points across the assembly. This provides high-value test coverage on prototypes and low- to medium-volume builds without the cost and lead time of traditional in-circuit test (ICT) fixtures.

- Can detect opens, shorts, incorrect placements/values, and out-of-tolerance measurements—where accessible and measurable per the agreed test plan.
- Supports selected power-on/limited functional checks when required and feasible.
- Works even when you have limited or no dedicated test points.
- Program updates are software changes, not new fixtures—ideal for frequent design revisions.

Fixtureless electrical test driven by software, not hardware



Why Outsource Flying Probe at ICTC?

ICTC's flying probe service is designed for customers who need robust test coverage without investing in custom fixtures. It is especially well-suited to prototypes, NPI builds, and low- to medium-volume production where designs change frequently or demand is variable.

- Low NRE and fast time-to-test – No bed-of-nails fixtures means no tooling lead time and no fixture capital cost.
- CAD/BOM-driven test programs – We generate test programs directly from your CAD data and Bill of Materials (BOM).
- Strong fit for complex boards – Supports dense layouts, fine-pitch BGAs/QFNs, HDI, and limited test-point access.

Flexible test coverage backed by manufacturing and test expertise

Key Benefits

Our Flying Probe services are enabled using the SPEA platform

Rapid introduction of new products

Get meaningful test coverage on first articles and NPI builds without waiting for ICT fixtures.

Cost-effective for low and medium volumes

Makes sense where fixture amortization is difficult or product life cycles are short.

Supports both production and troubleshooting

Use the same platform for ongoing production test and bone-pile / field-return analysis.

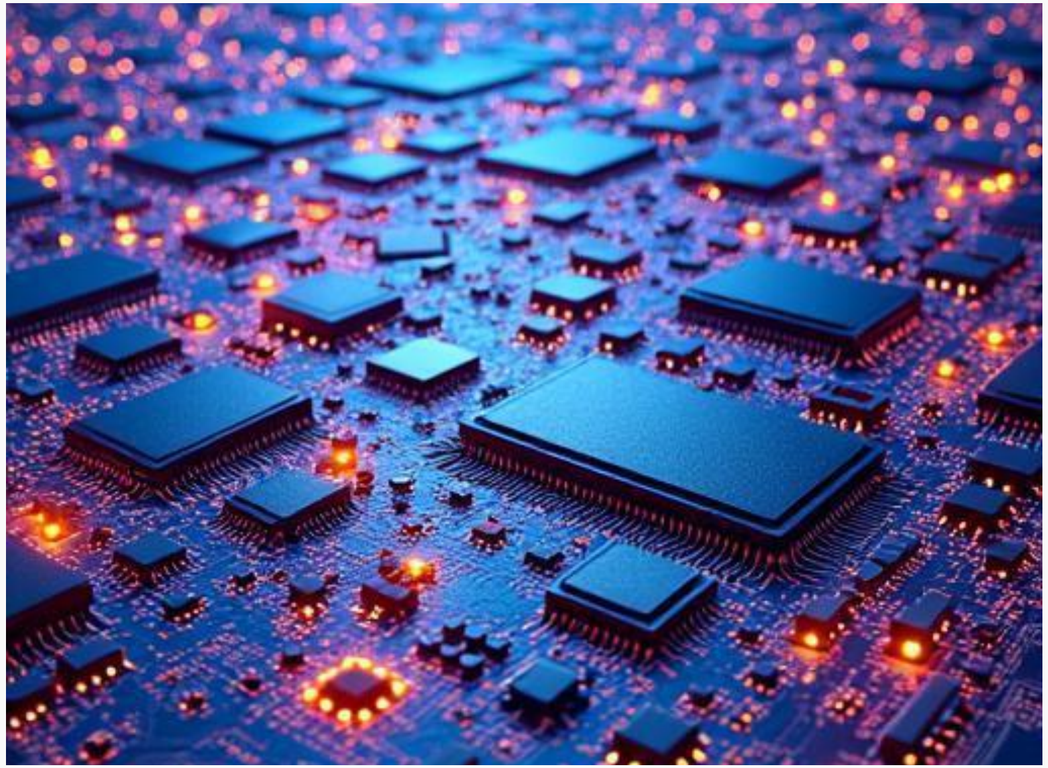
Improves confidence in process changes

Evaluate the impact of design, material or process changes by comparing measured results over time.

Practical coverage for real-world prototypes and production

Our Flying Probe Services

ICTC’s test center offers a complete Flying Probe services package:



Service Groups

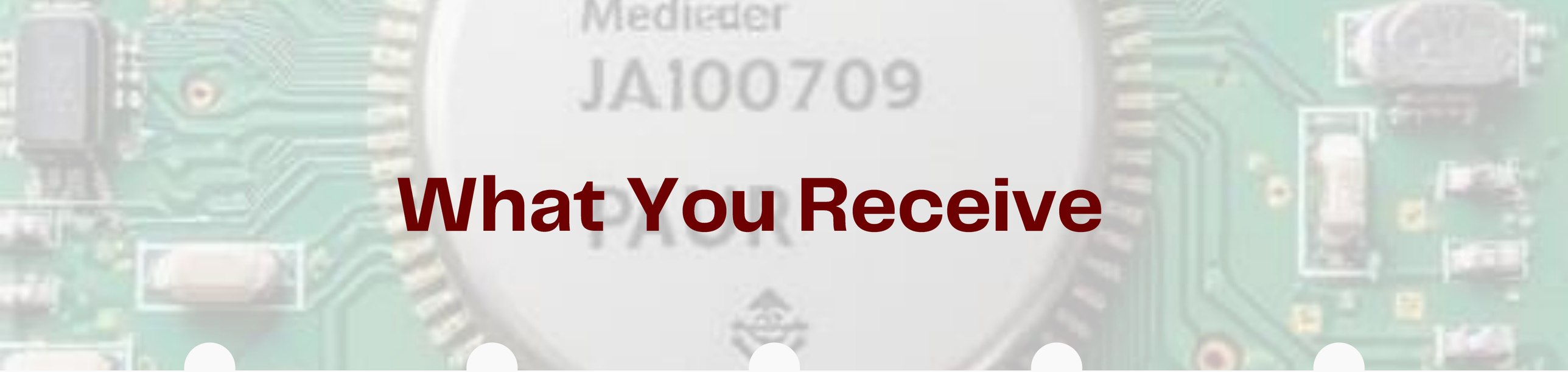
- **Quick test program development**
  - CAD + BOM–driven program generation
  - Accessibility and test coverage reporting
  - Limit setting and optimization for stable, repeatable results

- **Prototype and production board test**
  - First articles, NPI and engineering builds
  - Ongoing low– and medium–volume production lots

- **Bone pile / troubleshooting testing**
  - Evaluation of failed or suspect units
  - Support for failure analysis and corrective actions

- **Design for Test (DFT) analysis**
  - Review of access, test–point strategy and expected coverage
  - Recommendations to improve testability on future revisions

Outsourced flying probe capability, on demand



What You Receive

Defined test scope and coverage

Agreement on product, lot/build, and the intended coverage level (screening vs diagnostic / FA support).

Test results and failure details

Summary of pass/fail by unit, plus detailed failure data where applicable (measurements, suspected failure modes, and images when available).

DFT and improvement recommendations

Feedback on test-point strategy and design-for-test improvements for future revisions.

CAD/BOM-based test program

A flying probe test program generated from your CAD and BOM, tuned for your board and reusable for future builds.

Accessibility / coverage report

Documentation of where probes can and cannot reach, so you understand any test limitations and residual risk.

Pass/fail is reported against the agreed test plan and acceptance criteria provided or approved by the customer.

Clear scope, coverage, and results you can act

How Our Flying Probe Service Works

Send Your Data Package

- PCB design data (ODB++, IPC-2581, or native CAD preferred; Gerber + BOM also accepted)
- Latest BOM with reference designators and values
- Assembly drawings and any existing test requirements
- Any known problem areas or special constraints

DFT & Accessibility Review

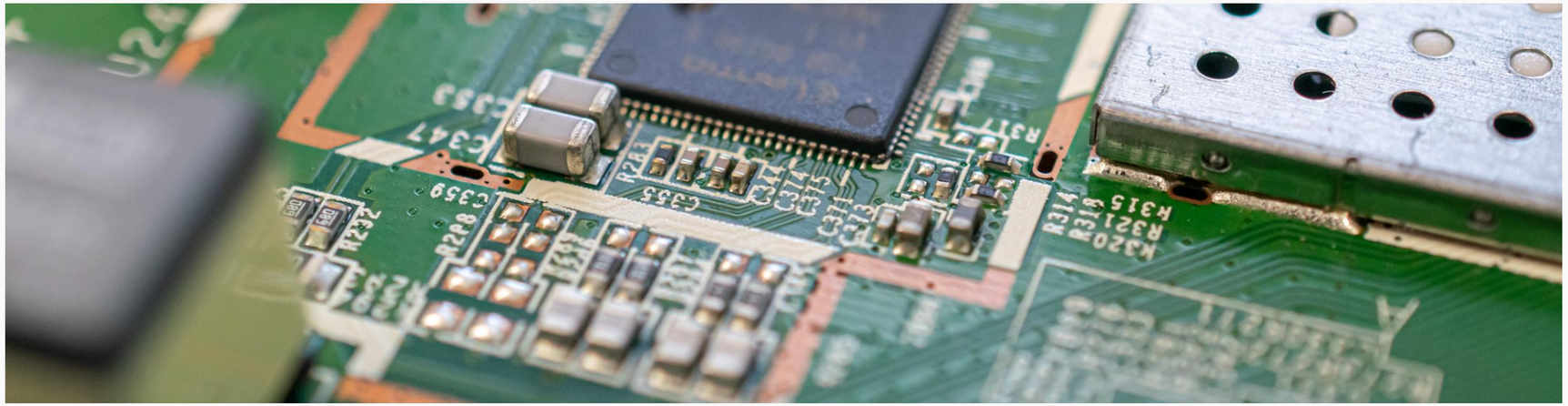
- We analyze probe access, coverage and risk components
- Provide feedback on achievable coverage and any limitations
- Identify opportunities to improve testability on future revisions

Test Program Creation & Debug

- Generate the flying probe program from your CAD / BOM
- Run pilot units, tune limits, and optimize test time versus coverage

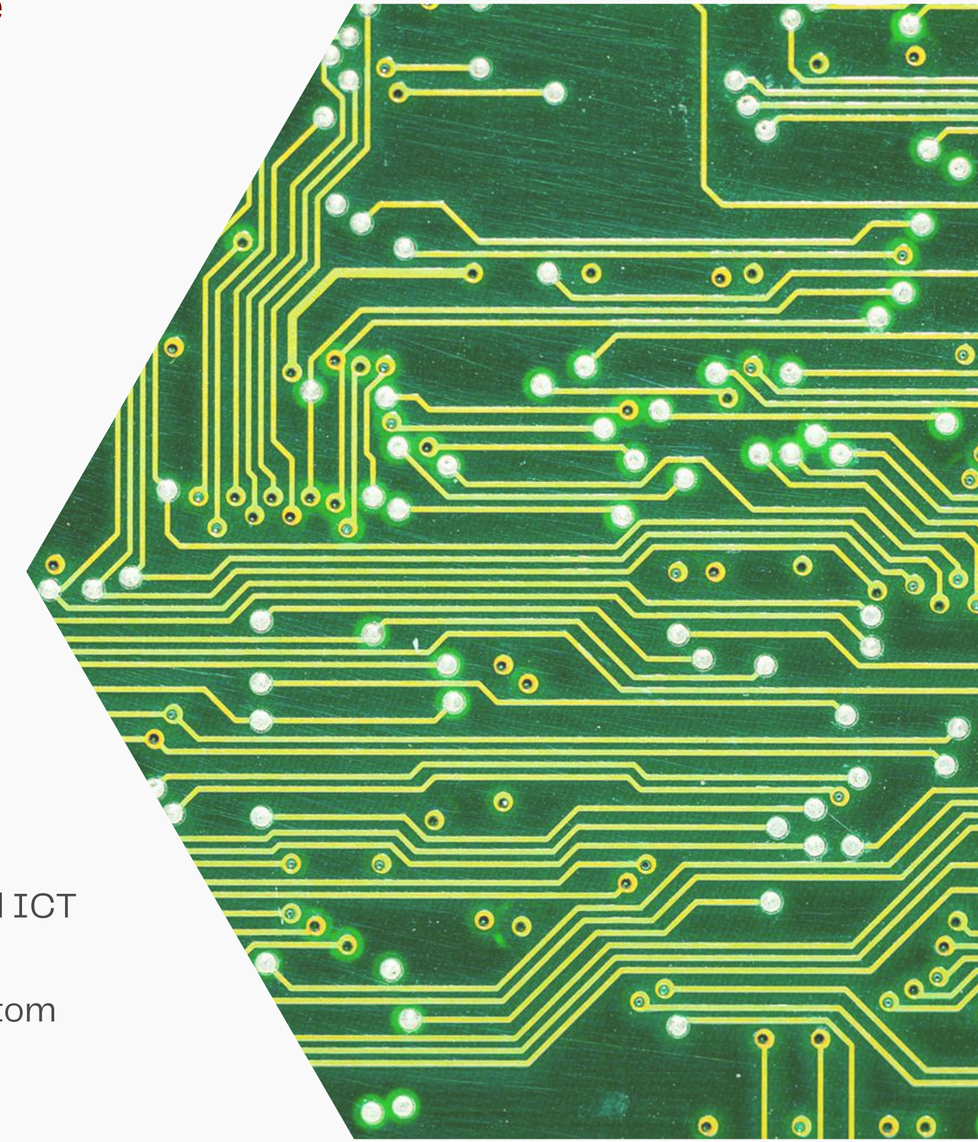
Testing & Reporting

- Test your agreed build quantity
- Provide a clear summary of results plus detailed failure reports where required
- Optional periodic statistics and trend data for process improvement



From CAD data to test results in four steps

As production volumes grow and designs stabilize, a dedicated ICT fixture may become economical. Until then, flying probe is often the most cost-effective way to maintain robust test coverage.



Typical Applications

- Prototypes, NPI and engineering builds that need rapid test coverage
- Low- or medium-volume products, or those with short life cycles
- Complex PCBs with limited test points and fine-pitch BGAs/QFNs/HDI that don't suit traditional ICT
- High-mix environments with frequent assembly changes and many active part numbers
- Bone-pile and field-return boards that require structured troubleshooting without building custom hardware

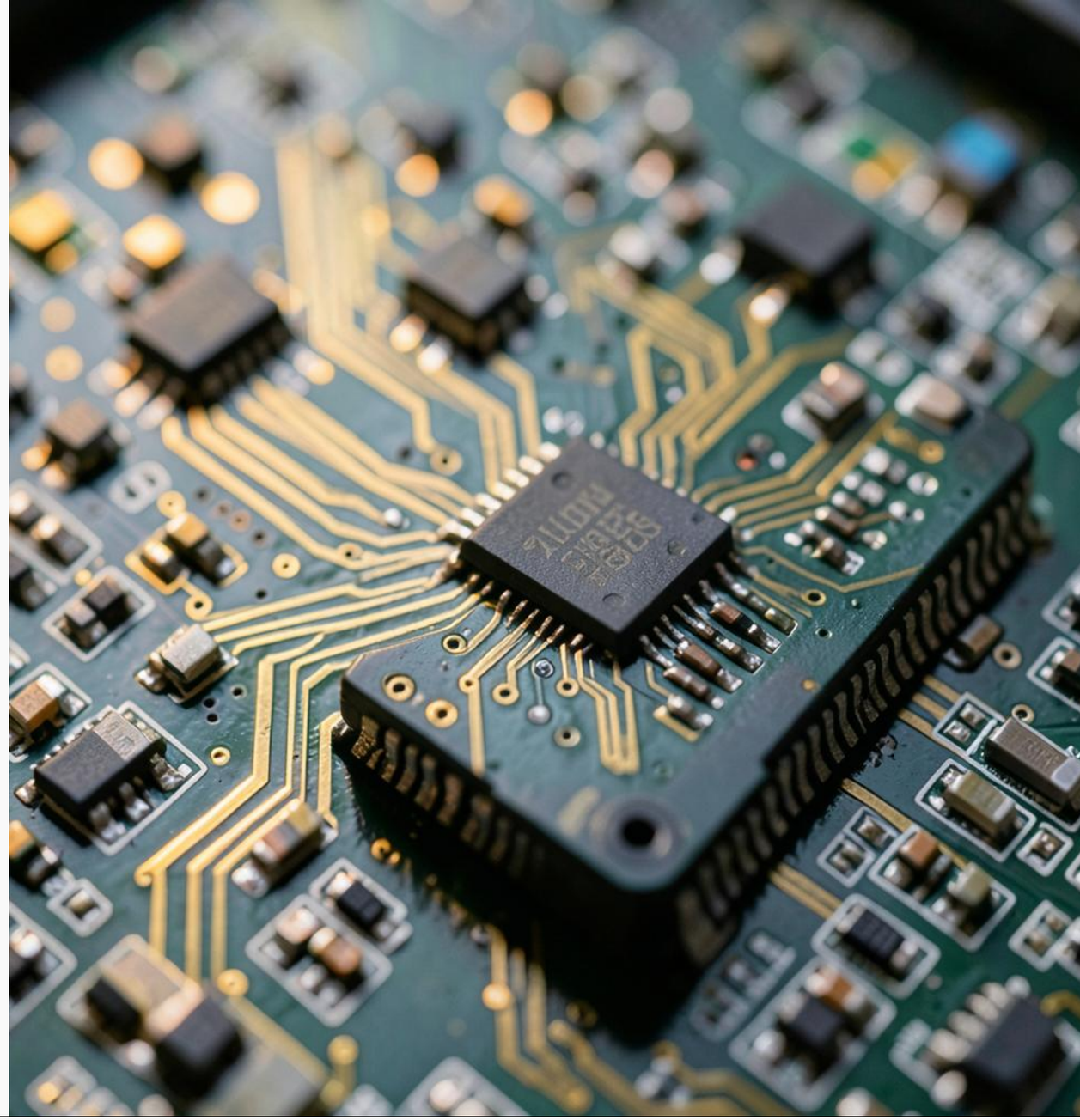
Where flying probe is the right choice

ICTC can combine selected test methods (as applicable) in a single setup:

Electrical & Optical Capabilities

- In-circuit testing for opens, shorts, and component/value verification where measurable per the agreed test plan
- Nodal impedance / analog signature analysis
- Open-pin detection for unsoldered or marginal joints
- Power-on checks for voltage rails and current draw
- Selected functional checks and boundary scan integration
- On-board programming for programmable devices
- High-resolution camera inspection for presence, polarity and code reading
- LED color and intensity testing for indicator and lighting boards

Test methods are selected per your product's requirements, accessibility, and agreed test plan.



Structural, power-on, and visual checks in one test cell

When you outsource Flying Probe to ICTC, your product is tested in a:

Facility, Quality, and Compliance

- Modern, clean facility designed around electronics manufacturing
- ESD controls appropriate for electronics handling and storage
- ITAR-registered U.S. facility suitable for controlled defense-related work
- Organization with deep experience in complex, high-reliability assemblies
- AS9100
- ISO 13485

We understand that for many customers, Flying Probe is only one piece of a broader quality and reliability strategy. Our goal is to plug in where you need us—whether that's prototype test only, overflow production test, or ongoing support for specific programs.

Flying probe testing in a controlled quality environment

Ready to Discuss Your Flying Probe Requirements?

For ITAR-controlled or other sensitive design data, please contact us for secure upload instructions

Please use the contact details to tell us about your project and how you'd like to proceed. We'll respond with recommended next steps.

- Email: MHunter@ictcusa.com
- Phone: (352) 238-3784