

Featured image: <https://www.sfcircuits.com/userfiles/image/flying-probe-test-for-pcb-sm.jpg>

Flying Probe Testing: A Practical Solution for PCB Designs That Traditional Fixtures Cannot Test

Flying probe testing (FPT) has long been a reliable method for validating PCB designs, particularly for prototypes and low volume production. Unlike traditional in circuit testing (ICT), which relies on custom built fixtures, flying probe systems use movable probes to test electrical connections directly, eliminating the need for dedicated hardware.

What Is Flying Probe Testing?

Flying probe testing uses multiple programmable probes to contact pads, vias, and component leads across a PCB. These probes perform continuity and isolation checks, verify component values, confirm polarity, and test power rails, all without requiring a custom fixture. Instead of redesigning hardware for every iteration, engineers can simply update the test program.

Why Engineers Choose Flying Probe Testing

FPT is especially valuable for designs where fixtures are impractical or uneconomical. It enables testing on dense layouts, high complexity boards, and frequent design revisions without adding unnecessary cost or delay. While slower than ICT, its flexibility makes it ideal for early stage validation and small production runs.

Flying Probe vs In Circuit Testing

Compared to ICT, flying probe testing offers faster setup, lower upfront costs, and greater adaptability to design changes. ICT remains the preferred option for high volume production due to its speed, but FPT provides deeper flexibility and detailed diagnostics when fixtures are not feasible.

Designing for Testability

As PCB designs become more compact and complex, test accessibility becomes a critical challenge. Engineers should plan for testability early by incorporating accessible test points, maintaining adequate spacing, and ensuring probe clearance. Designing with testing in mind helps avoid costly redesigns and ensures reliable validation.

When Flying Probe Isn't Enough

Although powerful, flying probe testing has limitations. It cannot easily access buried nets, verify high frequency signal integrity, or replicate real world operating conditions. For advanced

designs such as RF layouts, rigid flex assemblies, or multi board stacks, a hybrid testing approach combining flying probe testing, AOI, X ray inspection, and functional testing is often required.

A Smarter Approach to PCB Testing

Modern PCB validation relies on combining multiple testing methods to ensure performance and reliability. Flying probe testing plays a key role in this strategy by providing flexible, detailed diagnostics where traditional fixtures fall short.

San Francisco Circuits – Your Trusted PCB Testing Partner

San Francisco Circuits delivers comprehensive PCB testing solutions, including flying probe testing, to support complex designs at every stage of development. Their expertise ensures accurate validation, reduced risk, and high-quality results for even the most challenging applications.

Read more about [flying probe testing](#) on San Francisco Circuits' website.