The Test Connection, Inc.

GETTING TO THE POINT

WWW.TTCI.COM

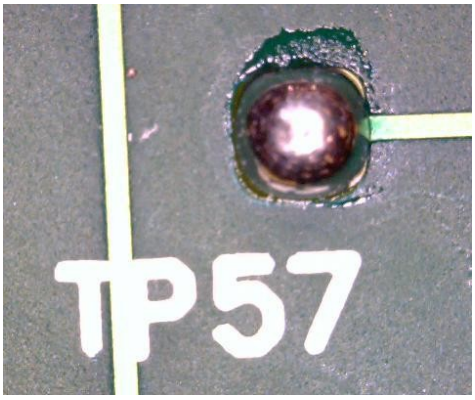
Soft Landing (Softlanding) of Flying Probe Test Points on UUTs

Dennis Lissa

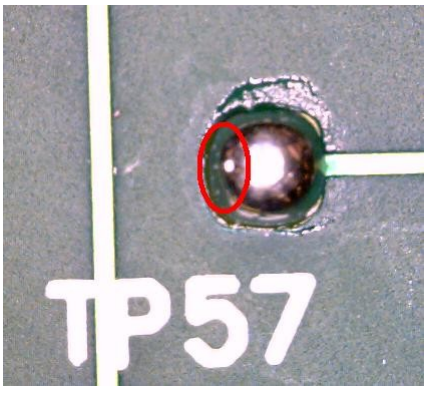
Alternate platings on printed circuit boards, including immersion gold over nickel, immersion silver for lead-free solder, immersion white tin and Entek with OSP finish are becoming more popular because they offer alternatives to hot air finish. These platings are sensitive when it comes to probing for test, since they are more easily scratched by test nails or probes.
When a test probe makes contact with a gold plated pad at a high speed, it can slide off the pad and damage nearby component legs and leads, as well as possibly scratch the pad. Digitaltest has developed a solution to these problems called “Softlanding” (Soft Landing or Probe Deceleration).

The principal is relatively simple, with the test probe traveling toward the component or pad at a normal speed until it is approximately 1-2 mm (39-79 mils) above its target when it switches to a decelerated transition speed (D.T.S.) which is maintained for the remainder of the spring probe compression (S.P.C.). This not only protects delicate components from damage, but also minimizes the footprint where the probe contacts the board. Adding Softlanding to an existing probe contact can reduce the footprint size by one third. A smaller footprint equates to more precise probing, allowing for denser test areas.

In the sample images below, the first set of test targets (TP57) is probed using standard probing. The image to the left is before probing and the image to the right is after probing. As noted below, a witness mark is visible.



Test Point 57 Before



Test Point 57 After (with witness mark)

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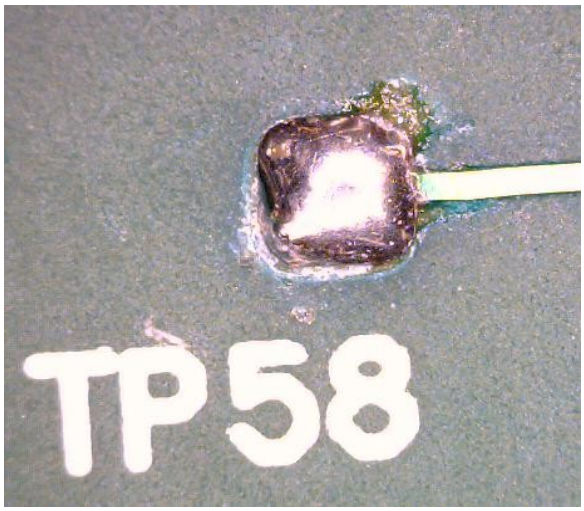
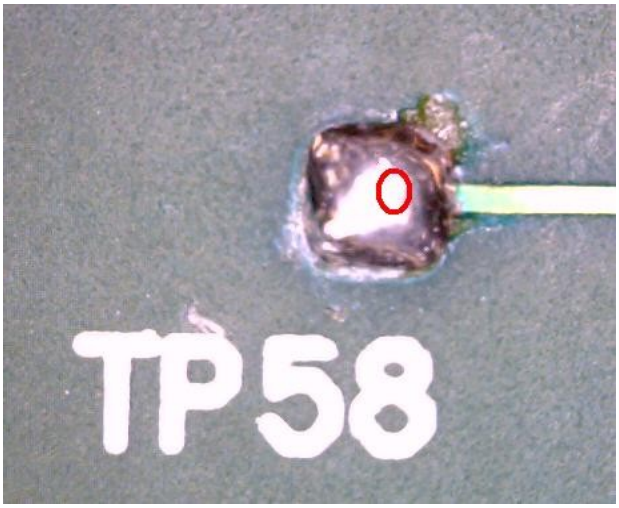
In this second set of images, the test target (TP58) was probed using the Softlanding. The first image, to the left, below is a before photo of TP58. In the image to the right, TP58 was probed with no witness mark on TP58.



Test Point 58 Before

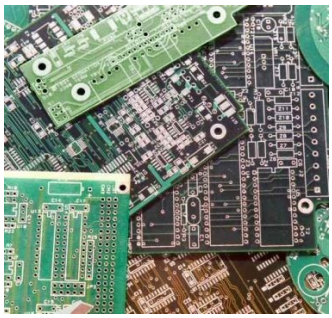


Softlanding Probing Test Probe 58 (no witness mark)

"TTCI has enhanced our testing services for our customers who are sensitive to 'witness marks' on their boards with the Digitaltest Softlanding probing solution on the Condor system." Bert Horner - Engineering Support.

With the growing popularity of the alternate platings on printed circuit boards, production test can aggressive meet the test challenges with probing small and sensitive targets. This technique minimizes the impact of the probes to the boards to be tested.

DFT Course Coming to TTCI



On April 19-21, TTCI will be offering a training course on all aspects of Design for Testability (DFT) that features guest speaker, Mr. Louis Ungar, President of A.T.E. Solutions, Inc.

Bill Horner, President and founder of The Test Connection, Inc., will be speaking on how ATE board test and functional test are coming together. Also, he will briefly discuss how flying probe, ICT and boundary scan work and complement each other

Attendees will learn what DFT is, why you might need it, why someone would object to it, and what it can and cannot accomplish. You will learn how today's technology has become elusive to certain failure modes and how important it is to expose them through more testable designs. What will a attendee come away with from this training? In this three day course, you will learn to understand the benefits and challenges of these methodologies which will give an attendee an understanding about production test challenges.

In the first stage of this training, we will look at:

- some simple techniques to enhance observability and controllability.
- test methods of In-Circuit (ICT) and Flying Probe testing.
- how you can access hundreds of internal points with as few as four additional edge connector pins.
- specific guidelines for both digital and analog circuit testability.

DFT Course Con't

- a deep understanding of the IEEE 1149.1 (JTAG) standard's operation, use and even its limitations.
- some new techniques in testability, including IDDQ testing and I/O Mapping.

In the second part of the course, you will learn what built-in [self] test (BIST) is and how it can be specified. You will learn:

- structures such as linear feedback shift registers (LFSRs), signature analyzers, and pseudo-random signal generators.
- to evaluate a number of BIST architectures.
- BIT Software techniques and consider the effect false alarms have on BIT.
- to specify BIT for your products and look at the possibilities of BIT taking over some of the ATE functions.

Giving you the knowledge and tools to address DFT challenges now and for tomorrow.

Who should attend? This is a design course, intended for designers and for those who motivate them for testability, such as test engineers. Managers concerned with testability issues will also find this course useful. Anyone interested in boundary-scan (JTAG/IEEE-1149.1) will agree with many of our graduates who called this the best course available on the subject. Since Built-In Test is becoming an issue of concern for top management as well as to marketing, this course - though a bit on the technical side - does examine applications for BIST in a product.

We look forward to seeing you there. For more information on this course or a list of topics that will be covered, please contact Bert Horner (whorner@ttci.com) or visit our website (www.ttci.com).

New Programming Abilities For The Agilent 3070

Agilent Technologies
Channel Partner
SMH Technologies™

Have you heard the news? Two of our partners, Agilent Technologies and SMH Technologies, have teamed up to offer a better solution to In-System Programming (ISP) of Flash-based microcontrollers and serial memories during ICT. In late 2009, Agilent introduced the Utility Card to add functionality to the Agilent 3070 test system. Just last month, SMH Technologies has announced their new FlashRunner designed for the 3070's Utility Card called FR3070.

The new Utility Card is an optional pin card that will fit in a card slot in any of the modules on the 3070. It has three cavities in the card to allow users to plug in their own custom electronics for added functional test or functionality during In-Circuit Test. The user can now design and add functional testing and make it part of the test system, which will save on test fixturing costs. One Utility Card can be installed on each module of the 3070, which will take a Driver/Sensor location. Each custom electronics unit should come with the necessary software drivers that can be installed on the 3070 controller.

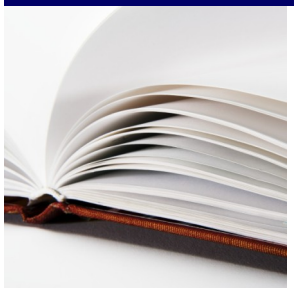
- Balanced 1:4 Multiplexed 75 Gamma ports and general purpose relays
- Flexible 1:6 multiplexed power supply channels
- 3 Plug-in external electronics slots

The SMH FlashRunner products offer a range of high-performance, standalone In-System Programmers specific for Flash-based microcontrollers and serial memories. The FlashRunner consist of three series of programmers that are targeted for the production environments and can work either in full standalone mode or controlled by a host system.

- Fastest programming algorithms (as fast as target device's memory technology limit), approved by silicon manufacturers
- Easy ATE integration
- Standalone operations (projects and code images stored on a memory card)
- Supports most ISP protocols (BDM, JTAG, SPI, I2C, MON, ICC, SCI, etc.)

For more product or sales information for the Utility Card, please contact Agilent Technologies (www.agilent.com) and for information on the FlashRunner products, please contact The Test Connection or visit our website (www.ttci.com).

Folsom's Fast Fact



Reliability and Stability not an Option

In-circuit test engineers must make a choice: Do I attempt to test the component at tolerance and risk false failures or do I expand the test limits enough to ensure a stable, repeatable measurement? Some test engineers justify **attempting** to test at tolerance with the false logic that a measurement that passes a good part 99 times out of 100 is a good measurement. However, on a board with 500 good parts, each run of the board test will average 5 false failures. TTCI, based on decades of experience, recommends a stable repeatable test over an unreasonably accurate test. The way to achieve stability is to guardband every measurement on the board.

The above best-case example only applies to isolated components. In a real in-circuit situation, parts are not isolated and the surrounding circuitry can interfere with the device-under-test (DUT). Adding guards helps, but may not eliminate the affects of nearby devices on the DUT.

Testing LEDs For Color & Intensity In 7 Steps?

LEDs are becoming one of the most important new technologies. Within a few years normal incandescent bulbs will be replaced by LEDs as they are much more efficient than standard bulbs. Automotive manufacturers have long since replaced the standard bulbs in dashboard and switched backlighting with LEDs and now are replacing tail lights and indicator lights with LEDs.

One of the biggest problems in LED testing is to accurately measure color and intensity. Electrical testing will tell you that the LED is placed on a printed circuit board and is orientated in the correct direction. It won't tell you anything about the color or brightness of the Led.

There are many different ways of testing LED color, such as manual inspection and automated Camera based systems but they are either error prone or very expensive with long development cycles. The LED Analyser is an inexpensive product, based on a digital CMOS image sensor and plastic fiber optic cables that allow you easily to guide light between source and the measuring device (the LED Analyser). This is very easy to do; just follow the steps:

1. Install the required PC drivers.
2. Connect the power supply to the LED Analyser.
3. Connect the communication cable between the LED Analyser and the computer. USB, serial and parallel ports available in the LED Analyser.
4. Connect the fibers to the light sources.
5. Start the provided software (Functional Test, Frequency Demo, LED Demo, Demo Board...).
6. Press the "Read" or the "Execute" button.
7. View the results that appear in the program window.

For more product or sales information for the Feasa LED Analyser, please contact The Test Connection or visit our website (www.ttci.com).

Joining and Participating in Worth While Industry Groups

With 2010 promising to be a turnaround year, please consider joining and becomming active in your local chapters of the SMTA and IPC.

The SMTA membership is an international network of professionals who build skills, share practical experience and develop solutions in electronic assembly technologies, including microsystems, emerging technologies, and related business operations. Last year the SMTA celebrated their 25th year and looks forward to the future...adding new members and providing the most current information to its members.

The IPC has been guiding the electronic interconnection industry through its dramatic changes for over 53 years and represents all facets of the industry, including design, printed circuit board manufacturing and electronics assembly. As a member-driven organization and leading source for industry standards, training, market research and public policy advocacy for the global electronics industry.

There is always a struggle to get new participants involved the local chapter meetings. Both organizations need fresh input from new members. The meetings always include topics of interest to our industry.

TTCI is a corporate member of IPC Chesapeake Chapter and SMTA Capital Chapter.
If you are interested in joining either origination and would like details, please contact: SMTA (WWW.SMTA.ORG) or IPC (WWW.IPC.ORG).

The Test Connection, Inc. (TTCI) has been supporting the electronics test arena for over 30 years by offering printed circuit board test solutions. Our services range from offering: In-Circuit Test (ICT) development and board testing services for **Agilent 3070** and **Teradyne (Formerly GenRad) TestStation/228X** test systems, Flying Probe development and board testing services on our **Digitaltest MTS500 flying probe** test system, Boundary-Scan Test Solutions with the **JTAG Technologies** system and TTCI is the U.S. Distributor of the LED Testing tool: **Feasa LED Analyser**. Also, TTCI's newest offering is the InteFun 2700. The **InteFun 2700** is our Functional Test solution that "integrates" PXI/PXIe instrument functional test with In-Circuit Test.

Suggestions on what type of news you would like to hear about are welcome. Please contact newsletter@ttci.com with your suggestions or other informational requests on topics you would like to see discussed in Getting To the Point.