

ATE

4500 Series Flying Probe Test System

AEROFLEX
A passion for performance.



4550 In-line



4520 Stand-alone

Flying Probe System offering flexible, fast test solutions to the electronic manufacturing industry

- High speed, high accuracy fixtureless test
- Short program development times
- Improved test accessibility
- NetzTest intelligent shorts test
- Up to 1012 additional fixed pins
- Enhanced optical inspection
- Comprehensive toolkit of test techniques
- Optimization in X, Y and Z planes
- Suite of UUT change tools
- Integral SMEMA conveyor system (4550 only)

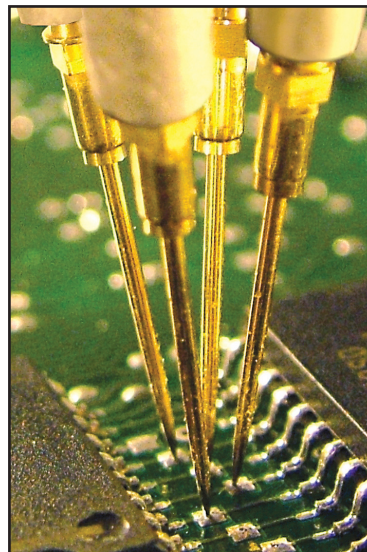
Introduction

The Aeroflex 4500 Series offers a flexible fixtureless test capability for cost effective test solutions. The benefits provided by these systems include:

- Removal of fixturing costs for test applications
- No fixture redundancy costs due to changing board layouts
- Short turnaround times for test applications
- High test coverage due to extremely accurate probing capabilities

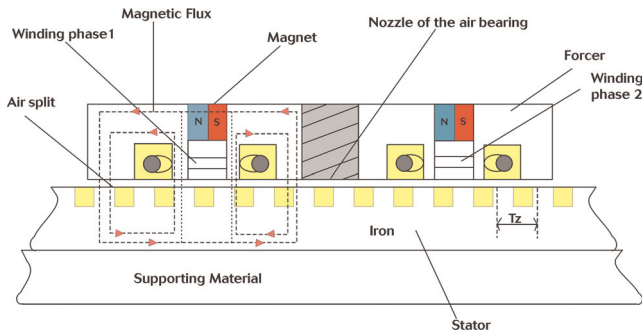
These benefits are possible thanks to the following techniques supported by the 4500 Series.

The 4500 Series provides a powerful and flexible solution for today's test needs. With its fixtureless environment, combines incredible speed with extremely high accuracy probing. Add the ability to perform advanced test techniques and the 4500 Series becomes the number one choice for both prototype and production test needs. Using the latest in flying probe hardware technology and innovative software techniques, the 4500 Series ensures short turnaround times for all applications guaranteeing cost effective test solutions.



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Latest Motion Technology



At the heart of the 4500 Series is a channeled iron stator plate that carries the 4 independently controlled head assemblies. A friction free movement of the heads over the stator is achieved by delivering compressed air through jets on the underside of the heads (forcer), which is sufficient to overcome the magnetic effect of the forcer. The major advantages of this type of air bearing are :

- Friction free motion not subject to wear and tear
- Extremely low maintenance costs
- Extremely high accuracy (probing resolution $0.625 \mu\text{m}$)
- No stick or slip effect giving lifelong probing accuracy

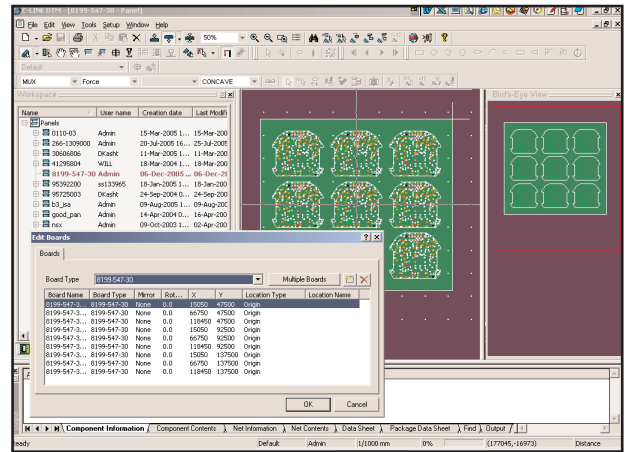
Short Program Development Times

As time to market pressures increase it is now more important for all stages of the PCB production process to be optimized. The time taken to go from CAD through to having a working test application is vitally important.

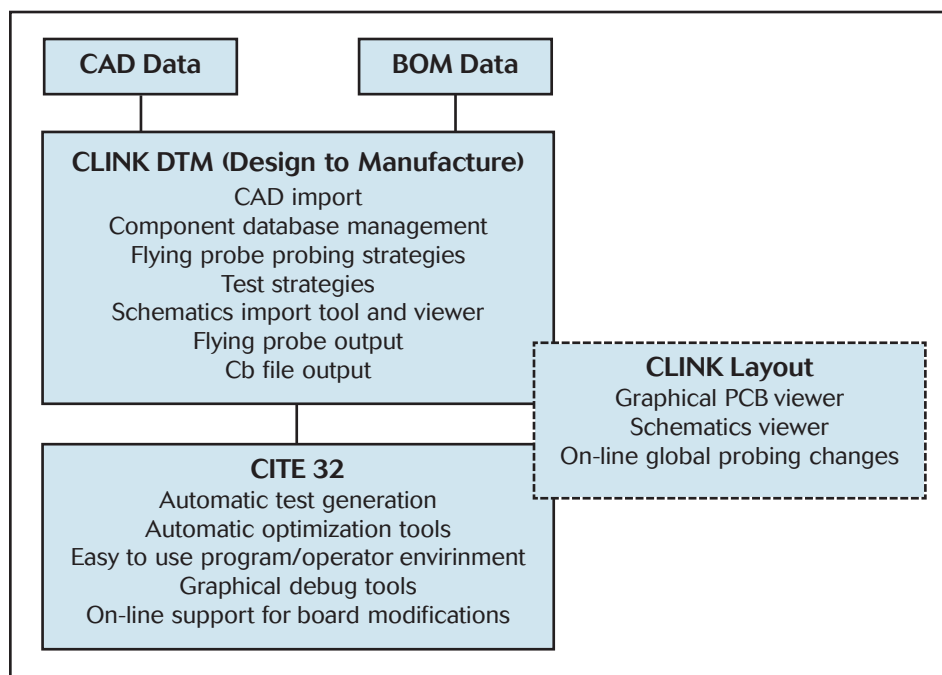
The first step in achieving this is by the use of C-LINK DTM (Design To Manufacturing), which is a state of the art solution for transferring design data to manufacture and for exploiting this data to accelerate test development times and achieve higher quality.

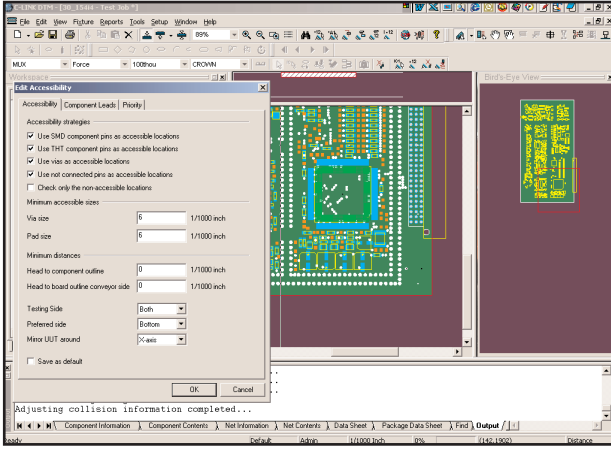
C-Link DTM has over 40 pre-processors for all leading CAE and PCB layout CAD systems, together with an integral BOM converter wizard that allows component details to be extracted automatically regardless of format. Once imported the board detail can be directly manipulated without board re-design to accommodate any changes, such as package size, net name, part number or ECO's (Engineering change orders).

In addition, C-LINK DTM also supports the generation of panelized test applications of single or multiple type boards in any combination of rotation and mirroring (flipped boards within the same panel). For identical boards a single program is generated reducing the program generation times even further.



CLINK DTM allows full control of the test probe access to ensure the maximum test coverage is achieved. With conventional bed-of-nails fixturing it is costly and potentially unreliable to probe small targets such as vias, SMD legs, etc., but with the 4500 Series these are all legitimate targets, and by means of the C-Link DTM graphical interfaces, defined comprehensive rules and integral reports generation, these tasks can be carried out quickly and easily.



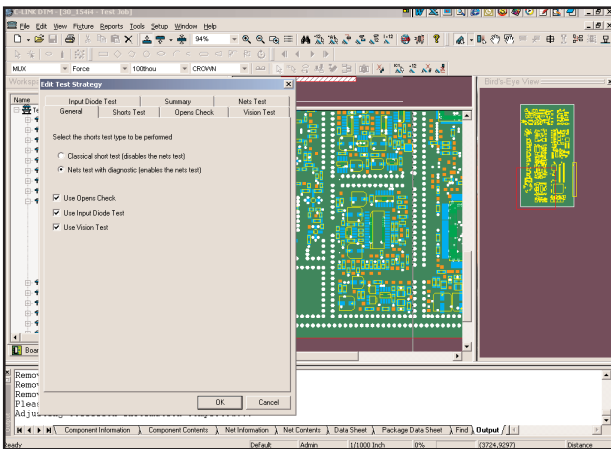


Customized test strategy rules can also be applied within the CLINK environment. This process allows the user to stipulate the test rules and techniques that will be used to achieve the required coverage for any given PCB. Examples of these include :

- The type of short circuit detection technique (Radius or NetzTest for example)
- The use of 'OpensCheck' vectorless test technique
- The use of 'Input Diode' open circuit detection technique
- The Vision Test image and shape recognition

As well as providing output for the Aeroflex flying probe systems, CLINK also offers the capability of outputting in cb format for use with other Aeroflex ATE products.

The output from C-Link DTM seamlessly interfaces with the system test software (CITE) to automatically generate the test program by means of circuit analysis algorithms to ensure that the most accurate and efficient component test is generated.



Optimized Test Throughput

To ensure the maximum throughput for any flying probe test, the Aeroflex 4550 Series uses optimisation algorithms to ensure the fastest possible test times. Optimization ensures that the test program:

- Has the minimum number of head and probe movements
- Has the shortest route for each head movement
- Has a maximized component test to head movement ratio so there are more tests per move
- Has the best possible Z plane profile

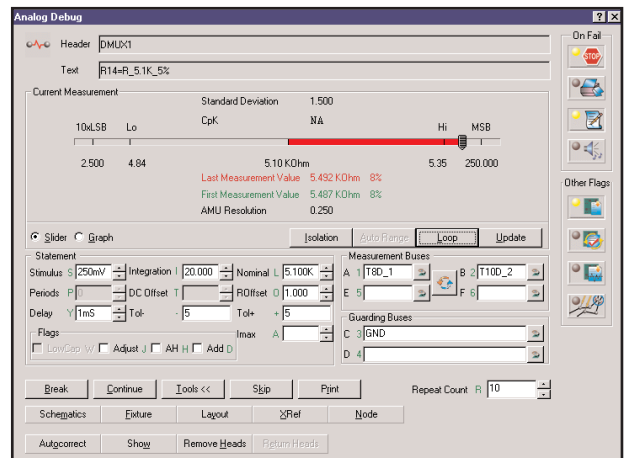
The latter is performed using the z-optimization capability. This automatic process works out the highest component level along the path of motion and raises the probes to just above this level. As a result, the probes are raised only to the level they need to be rather than to a generic PCB area 'fly' height.

Graphical Programmer/Operator Environment

The Aeroflex 4500 Series provides a graphical debug and operator environment that can be set up with different password secure security levels. A range of debug tools allows the user to easily modify test parameters.

- Add guards to isolate components manually or with the assistance of the 'Isolation' utility
- Interactive schematics tools also remove the need for paper copies of circuits and allow additional means of adding guards by selecting the appropriate point on the circuit.
- View the DUT through the integral camera in order to ensure the component is fitted and soldered
- Change the probing position and/or the probing angle on any net
- Change the target probe point on any access points

The programming language used on the Aeroflex 4500 Series is Visual Basic which provides a simple to use operator interface with the flexibility required to allow programmers to provide solutions for more advanced test techniques.



Fixed Pin Access

Test times can be further reduced with the use of fixed pins. Large savings can be made with the use of very few fixed pins. Providing fixed pin access to VCC and GND, for example, greatly reduce the number of movements required by the flying heads. Any board can be accessed by the following means:

- Magnetic fixed pins
- Through connector on a board
- Through a simple fixture

The camera supplied with the system is used to provide an accurate visual means of placing the magnetic fixed pins.

The Aeroflex 4500 Series has the capability of providing up to 1012 fixed pin channels. This provides the system with the flexibility of providing a purely fixtureless test through to emulating a bed of nails system. One system can then be used for products that start at low volumes and ramp up during the length of the product life cycle.

Test Techniques

To ensure the highest possible test coverage, the Aeroflex 4500 Series provides a comprehensive suite of test techniques. In addition to the standard MDA component test techniques, power can be applied to a board using integral PSU's to allow full in-circuit testing.

The quality of the unit can be further assured by using a range of additional test techniques.

- Openscheck vectorless test
- Optical Inspection
- Netztest enhanced shorts test algorithm
- Digital In-circuit
- Boundary scan
- Device programming
- Functional test modules

Providing a 'one-stop' test solution, the 4500 Series garners savings in capital spend, factory space and training requirements.

Maintenance support

With one of the smallest footprints in the market, 16A single phase mains connection and filtered air supply, the Aeroflex 4500 Series is easily serviced and requires very low maintenance.

Aeroflex offers the same level of service for both flying probe systems as for all Aeroflex ATE products with full maintenance contracts to customer specific contracts that fit all differing customer requirements.

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