

JTAG TECHNOLOGIES SYMPHONY 6TL

Boundary-scan upgrade for 6TL functional testers



Key Features

- Cost-effective integration of JTAG boundary-scan testing/programming and 6TL YAV capabilities
- Supports YAV9JTAG boundary-scan controller card and YAV9JTAH 'DIOS' module
- Single production phase for boundary-scan and functional testing
- Greatly enhances test coverage on digital and mixed signal designs
- Adds comprehensive JTAG-based in-system programming capabilities and processor controller test options
- Easy to retrofit to existing fixtures and programs

The impact of High-density PCB design on testing As Electronics designers continue to drive greater densities onto their printed circuit boards, testing for manufacturing faults becomes an increasingly difficult challenge for the test engineers. The traditional (in-circuit style) testers can't always guarantee adequate test coverage, due to the increased use of components with no physical access to the electrical pins- bal grid arrays packages and inner board layers present inaccessible nodes, and the high density often makes the spacing between test points insufficient. Extreme clock rates also determine that the signal stubs should be omitted.

JTAG Technologies' boundary-scan enhances functional testers from 6TL by enabling greater testability and programmability of complex PCBs, performing structural boundary-scan tests, processor controlled tests and functional tests (FT) within a single process step.

Test strategy considerations

Choosing between the many possible combinations of inspection and test methods (for example, optical, X-ray and boundary-scan) depends on several factors including the characteristics of the product to be tested, production throughput requirements and the anticipated fault spectrum. Since boundary-scan and FT are complementary test methods, this combination

6TL Hardware - Principal features

YAV9JTAG card:

- JTAG Technologies compatible boundary-scan controller based on FT2232H connected via USB (important -no TRST pin support)
- Alternative external TAP connector (suitable for connection to a JT3705/USB, a JT2137 POD or a JT2147/xxx POD)
- 112 Digital I/O channels 1.8V/2.5V/3.3V (5V tolerant)

YAV9JTAH card:

- 104 Digital I/O Channels 1.8V/2.5V/3.3V (5V tolerant)
- 5 RS-232 levels inputs and 3 RS-232 level outputs
- A UART controlling 2 RS-232 outputs and 2 RS-232 inputs (accessible via JFT/Python script)
- 8 analog inputs (accessible via JFT/Python script)

often provides an optimal strategy with lowest overall cost and maximum coverage for anticipated fault types.

Test and in-system programming applications are generated on JTAG Technologies' development tools (JTAG ProVision or Classic) and can be easily imported into the 6TL environment.

Merging JTAG and functional test

JTAG has traditionally been considered a structural type test performed from the inside (of an IC)

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out- enabled by the presence of test logic embedded within JTAG/boundary-scan/ IEEE 1149.x compatible devices. When applied to suitable, mostly digital, designs JTAG can on its own, offer a complete test solution. More often however merging JTAG with an additional test or inspection method such as functional test gives a more complete solution.

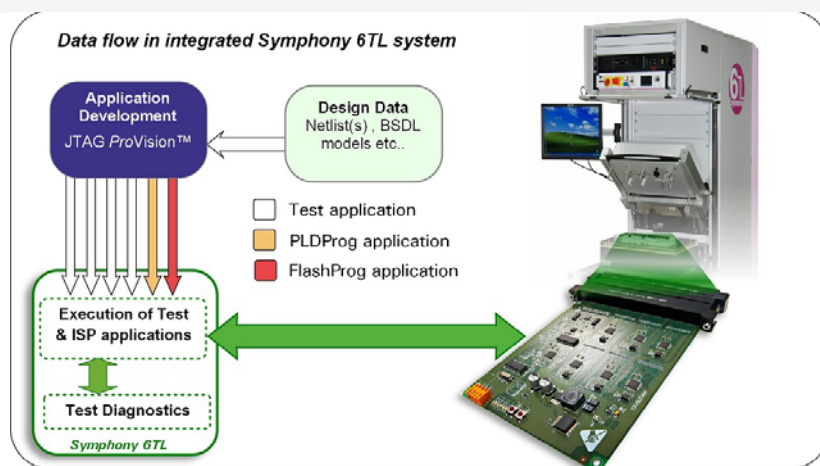
Standard JTAG tests allow users to perform pin-to-pin interconnect tests (for shorts/open) on compatible nets, plus logic tests (on so-called non-scan clusters) and memory connection tests. Processor controlled tests use the JTAG access to the on-chip debug modes of micros. This additional technique can harness the embedded resources (e.g. ADC memory controller of

such parts).

Adding functional test provides features for frequency measurements, analog stimulus and response measurement plus possibilities for mechanical interaction using pneumatics and stepper motors etc. JTAG boundary-scan as a pre-cursor to full functional test allows a design to be fully 'configured' through its in-system programming capabilities. This in turn means that more meaningful functional testing can be performed.

Similarly basic functional testing of power supplies (power off shorts, power on voltage rails and current consumption) are valuable checks prior to boundary-scan.

Data flow integrated Symphony 6TL system



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