OCPchecker

SystemC Verification IP Assures Protocol Compliance

JEDA’s OCP protocol checker is a simulation based, temporal assertion library that assures that any OCP based system level designs adhere to the OCP-IP 2.0/2.1/2.2 compliance check guidelines.

FEATURES

[•] For SystemC OCP based designs
[•] Supports OCP versions 2.2, 2.1 and 2.0
[•] Over 150 OCP compliance protocol checks including 2D burst and pipeline thready busy checks
[•] Consistency check for configuration parameters
[•] Adaptive to any ESL environment consisting of OCP channels
[•] Easily extensible by users to add new checks
[•] Assertion tracing and GUI debugging
[•] Assertion coverage statistics

Challenges of OCP-IP verification

OCP is a high performance, general purpose configurable interconnect standard used in leading edge SOC based designs for Systems that have wide applications. This intrinsic flexibility of the OCP and the complexity of Systems using it bring challenges to SOC Engineers both in design and verification.

Two typical environments where OCPchecker are needed:

[•] In a System Level simulation environment where protocol compliance checking is required for any OCP interface/s

[•] OCP model development and verification

OCPchecker eliminates:

[•] The time spent to manually pin point the root cause of a protocol violation by device

[•] The time and effort spent by Engineers for writing and maintaining their own compliance checks while keeping up with ICP updates and revisions

[•] The need for post-processing debugging techniques to analyze protocol failures as this method is resource intensive and slow
Benefits

- Supports the news OCP version
- Highly effective and efficient solution to ensure protocol correctness
- The Plug-and-play feature requires minimal user effort to integrate the checker to an existing environment
- OCP configuration problems are quickly flagged by the configuration parameter checking functionality reducing debug time
- OCPChecker self configures to any OCP channel eliminating the need of for the user to configure it manual
- The visual debugging capability provided by NSCa helps to quickly analyze OCP protocol violations speeding up the debug process
- The extensibility of OCPChecker allows user to quickly build on top of core protocol validation checks pertinent to their OCP configuration
- The checker’s runtime control mechanism provides the flexibility to dynamically disable property checks during simulation

NSCa based temporal assertion

The foundation of the OCPChecker protocol checking is JEDA’s NativeSystemC assertion(NSCa) technology that enables writing native temporal checks in any SystemC/C++ modeling environment. Borrowing the notion of Assertion Checking from Standardized languages such as SystemVerilog Assertions(SVA), JEDA has demonstrated a full OCP compliance checking capability-using NSCa.

JEDA, as being one of the contributors to the OCP Verification Working group, has played participates and contributed to the multi-company effort to define and refine these compliance checks.

Supported Platforms and Simulators

Platforms

- Linux RHE 3.0

SystemC Simulators

- OSCI SystemC 2.1
- Cadence
- Coware
- Mentor
- Synopsys

Testbench Languages

Typically a fork-join construct enables the spawning of

- SystemC
- SystemVerilog (*)
- VHDL (*)

(*) Requires a mixed simulator environment

Assertion Summary View

Assertion Debugging Environment View