CAN-VIP

CAN/CAN-FD Verification IP

CAN-VIP is a comprehensive VIP package for CN 2.0 and CAN FD controllers. SoC and IP designers use this CAN VIP package to ensure complete verification of their designs and full protocol and timing compliance.

CAN-VIP implements a ready-to-use set of models, protocol checkers, and compliance testsuites in 100% native SystemVerilog and UVM. It supports the latest relevant specifications, including CAN 2.0 Part A/B and FD modes and Time-Triggered CAN.

The complete bus functional CAN node model in the VIP package supports integration steps, transmitter and receiver modes (including multiple bit rates), inter-frame delay, and bit phase delay adjustment. It supports the random configuration of node type and bit timing rate, and includes APIs to preload and access sparse memory regions.

The BFM's frame class models all supported CAN frame formats and types. Its open and unencrypted timing class models all applicable timing parameters, including randomize and modifiable. The BFM also performs error detection (callback, bit stuffing) and injection.

The testsuites included with CAN-Xactor include both Avery-developed directed and constrained random tests and the ISO 16845 conformance tests.

Controlling and executing the CAN bus model is straightforward, as shown in this example.

```
begin
     acan_frame_class cmd = new;
     ok = cmd.randomize() with {
        frame_type inside {ACAN_FRAME_REMOTE, ACAN_FRAME_FDEXT};
        header.id == 4};
     assert (ok) else test_log.fatal("randomization failed");
     node_2.post_command(cmd);
     cmd.wait_done(1ms, `acan_fline);

     if (cmd.frame_error != 0) begin
        $display("Completion is not OK: %s", cmd.sprint_error());
     end

end
```

FEATURES

Standards Compliance

- CAN 2.0 (A, B & ISO 11898)
- CAN FD
  - Non-ISO CAN FD
  - ISO CAN FD (compliant to ISO 11898-1)
- TTCAN (ISO 11989-4 level 1)
- Verified with CAST CAN IP

CAN Node Bus Functional Model

- Transmitter and Receiver modes
- Performs integration steps
- Random configuration
- Node type, bit timing rate, time base, jitter
- Frame class models all frame formats and types
- Timing class models all timing parameters
  - Randomize
  - Modifiable
- Multiple bit rates, bit phase delay adjustment
- Inter-frame delay
- APIs to preload and access sparse memory regions
- Error detection (callback, bit stuffing) and injection
- Error injection/callbacks
- Protocol analyzer log
- Protocol checking and coverage report
- Functional coverage model
- Compliance testsuite
- Avery based tests
- Functional Coverage (fram types/subfields, error types)

Deliverables

The CAN-VIP includes everything required for successful verification:

- CAN Node BFM
- Compliance Testsuite
- User Guide

Support

The CAN-VIP as delivered is warranted against defects for ninety days from purchase. Thirty days of phone and email technical support are included, starting with the first interaction. Additional maintenance and support options are available.