

Simulation VIP for USB Type-C

Includes support for USB Power Delivery 2.0

Overview

Cadence® Simulation VIP is the world’s most widely used VIP for digital simulation. Hundreds of customers have used Cadence VIP to verify thousands of designs, from IP blocks to full systems on chip (SoCs).

The Simulation VIP is ready-made for your environment, providing consistent results whether you are using Cadence Incisive®, Synopsys VCS®, or Mentor Questa® simulators. You have the freedom to build your testbench using any of these verification languages: SystemVerilog, e, Verilog, VHDL, or C/C++. Cadence Simulation VIP supports the Universal Verification Methodology (UVM) as well as legacy methodologies.

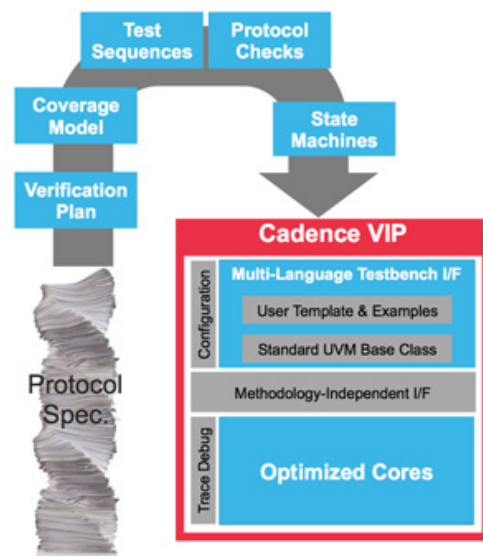
The unique flexible architecture of Cadence VIP makes this possible. It includes a multi-language testbench interface with full access to the source code to make it easy to integrate VIP with your testbench. Optimized cores for simulation and simulation-acceleration allow you to choose the verification approach that best meets your objectives.

Specification Support

The base specifications for the USB Type-C and Power Delivery protocols are available here: <http://www.usb.org/developers/docs>

Supported Design-Under-Test Configurations

- | | | |
|--|---|-------------------------------------|
| <input checked="" type="checkbox"/> Master | <input checked="" type="checkbox"/> Slave | <input type="checkbox"/> Hub/Switch |
| <input checked="" type="checkbox"/> Full Stack | <input checked="" type="checkbox"/> Controller-only | <input type="checkbox"/> PHY-only |



Deliverables

People sometimes think of VIP as just a bus functional model (BFM) that responds to interface traffic. But SoC verification requires much more than just a BFM. Cadence Simulation VIP components deliver:

- State machine models incorporate the subtle features of state machine behavior, such as support for multi-tiered, power-saving modes
- Pre-programmed assertions that are built into the VIP to continuously watch simulation traffic to check for protocol violations.
- Test suites are provided for most Cadence VIP components.
- Pre-programmed coverage models used to capture interesting combinations of simulation results. By analyzing the results collected by the coverage model, engineers can tell if the simulations have exercised the various modes of operation of an interface.
- Verification plans for most protocols link the “raw” coverage model results back to the protocol specification.

Key Features

- | | |
|--|---|
| • Receptacle interface | • Plug interface with support for SOP'/SOP"/none (1/2/0 cablePlugs) |
| • Type-C with Host (DFP)/Device (UFP) configuration | • Type-C with DFP as Source configuration |
| • Type-C with UFP as Sink configuration | • Type-C Attach/Detach detection (without DRP) |
| • Receptacle detection of Plug orientation | • Biphase Mark Coding (BMC) |
| • 4b/5b symbol encode/decode | • Ordered-Sets (tx/rx pkt only): - SOP, SOP', SOP", HardReset, CableReset, SOP'_Debug, SOP"_Debug |
| • Control message (tx/rx pkt only): GoodCRC, GotoMin, Accept, Reject, Ping, PS_RDY, Get_Source_Cap, Get_Sink_Cap, DR_Swap, PR_Swap, VCONN_Swap, Wait, Soft_Reset | • Data message (tx/rx pkt only): Source_Capabilities, Request, Sink_Capabilities |
| • Data vendor-defined message (tx/rx pkt only): Discover Identity, Discovery SVDs, Discover Modes, Enter Mode, Exit Mode, Attention | • Protocol layer message transmission state behavior |
| • Protocol layer message reception state behavior | • Policy Engine Source Port State Machine |
| • Policy Engine Sink Port State Machine | • HardReset Operation |
| • SoftReset Operation | |

Related Products

- USB 2.0 Simulation VIP
- USB 3.0 Simulation VIP
- USB 3.1 Simulation VIP



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