

UFS 2.0 Memory Model

Overview

Memory is a major part of every electronic product. Every system on chip (SoC) contains embedded memories and must also interface with external memory components. The operation of these interfaces impacts both SoC functionality and performance, making memory interface verification a crucial step in the SoC development process.

Cadence® Memory Models are the gold standard for memory interface verification. Used by more than 500 customers, Cadence Memory Models provide support for 6,500 memories spanning 60 memory interface types and 85 memory manufacturers.



Vendor Certification

Memory models for commercial memory components are based on the manufacturer's datasheets and are then provided to the manufacturer for certification. This closed-loop quality control process means that you can trust your simulation results. Models for new external memory standards that do not yet have commercial component providers and models for internal memory standards are based upon the specifications provided by the controlling standards body, such as JEDEC, ONFI, and SD Association. Cadence works closely with our early-adopter customers to ensure the quality of these models.

Accurate Timing Analysis

When memory models represent actual memory chips and modules, the memory models include full timing parameters that support accurate gate-level simulations. Timing specs are conveniently displayed in the PureView tool and can be overridden for what-if analysis.

Second Source Evaluation

Memory models are inserted into a testbench as generic models that are then associated with a personality file to represent a specific component. This makes it easy to do second-source evaluation of memory components.

Specification Support

Our UFS Memory Model VIP supports specification version 1.1 and 2.0.

Key Features

- UTP layer - UPIUs: NOP IN, NOP OUT, Query Request/Response, Task Management Request/Response, Command, Response, Data Out, Data In
- UCS layer - SCSI commands: READ (6, 10, 16), WRITE (6, 10, 16), Inquiry, Report LUNs, Read Capacity (10, 16), Test Unit Ready, Verify, Start Stop Unit, Mode Sense, Request Sense, Security Protocol In, Security Protocol Out, Send Diagnostic, Read Buffer, Write Buffer, Pre-Fetch (10, 16), Synchronize Cache (10, 16)
- Boot functionality supported
- LUNS and W-LUNS supported
- Interleaving of commands supported
- Queue depth of over 32 commands
- C-port connection to device UniPro
- Direct C-port connection to Host UniPro
- Supported use cases: UFS stand alone (Transaction mode or using CPort signaling interface) and Full stack UFS (with UniPro+MPHY over DPDN serial interface or with UniPro only over RMMI interface)



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