

Verification Continuum™

VC VIP USB

Performance Metrics

Supported Through Verdi

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Preface

About This Manual

This manual contains installation, setup, and usage material for SystemVerilog UVM users of the Discovery USB VIP, and is for design or verification engineers who want to verify USB operation using a UVM testbench written in SystemVerilog. Readers are assumed to be familiar with USB, Object Oriented Programming (OOP), SystemVerilog, and Universal Verification Methodology (UVM) techniques.

Web Resources

- ❖ Documentation through SolvNetPlus: <https://solvnetplus.synopsys.com> (Synopsys password required)
- ❖ Synopsys Common Licensing (SCL): <http://www.synopsys.com/keys>

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1. Go to <https://solvnetplus.synopsys.com/> and open a case.
 - ◆ Enter the information according to your environment and your issue.
 - ◆ For simulation issues, provide a UVM_FULL verbosity log file of the VIP instance and a VPD or FSDB dump file of the VIP interface.
2. Send an e-mail message to support_center@synopsys.com
 - ◆ Include the Product name, Sub Product name, and Product version for which you want to register the problem.
3. Telephone your local support center.
 - ◆ North America:
Call 1-800-245-8005 from 7 AM to 5:30 PM Pacific time, Monday through Friday.
 - ◆ All other countries:
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as our IPs implement industry-standard specifications that are currently under review to remove exclusionary language.

Performance Metrics

The following is the list of USB Performance Metrics and its description:

Table 3-1 USB Metrics Description

Metrics	Description
usb_avg_trans_bus_transfer_rate	This metric computes the average transfer rate for completed transaction.
usb_lup_ldn_time	This metric computes the begin time of every LUP/LDN.
usb_packet_ss_tp_distribution	This metric computes the Transaction Packets.
usb_transaction_ss_distribution	This metric computes all the SS/SSP Transactions.
usb_avg_trans_link_response_latency	This metric computes the average of time between the SS Transaction being sent and corresponding Link Command response received.
usb_max_trans_bus_transfer_rate	This metric computes the maximum transfer rate per completed transaction.
usb_previous_pkts_lcnds_first_lup_ldn	This metric computes the time taken to send LUP/LDN after the last Packet/LinkCommand.
usb_trans_bus_transfer_rate	This metric computes the rate at which each transfer of a transaction happens.
usb_cinst_total_transferred_bytes	This metric computes the total bytes transferred.
usb_max_trans_link_response_latency	This metric computes the maximum of all the time between the each SS Transaction being sent and corresponding Link Command response received.
usb_rx_detect_active_to_polling_lfps_latency	This metric computes the time taken for the SS LTSSM to move from Rx.Detect.Active to Polling.
usb_transfer_20_distribution	This metric computes all the 2.0 Transfers.
usb_lfps_first_tx_last_rx_latency	This metric computes the time between the first LFPS sent and the first LFPS received after one being sent.
usb_min_trans_bus_transfer_rate	This metric computes the minimum of all the transfers in a transaction.
usb_symbol_set_rx_tx_count	This metric computes the number of Symbols Sets transmitted and received.

Table 3-1 USB Metrics Description

Metrics	Description
usb_transfer_bulk_in_latency	This metric computes the time taken to complete a Bulk in Transfer.
usb_lfps_recieve_transmit_count	This metric computes the number of LFPSs sent and received.
usb_min_trans_link_response_latency	This metric computes the minimum of all time taken between a Transfer and the Link Command received.
usb_transaction_20_distribution	This metric computes the number of all the transaction of USB 2.0.
usb_transfer_isoc_in_latency	This metric computes the time of each ISOC transfer of USB SS.
usb_lfps_rx_tx_latency	This metric computes the time between the first LFPS being sent and the first LFPS being received.
usb_packet_20_distribution	This metrci computes the number of Packets for USB 2.0.
usb_transaction_in_latency	This metric computes the time taken for each IN Transaction for USB SS.
usb_transfer_ss_distribution	This metric computes all the USB SS transfers.
usb_lgo_to_lau_latency	This metric computes the time taken between the LGO Link command sent and the time taken for LAU/LXU Link Command received.
usb_packet_ss_distribution	This metric computes the count of all differen types of USB SS Packets.
usb_transaction_out_latency	This metric computes the time taken for each OUT Trasactions of USB SS.
usb_trans_link_response_latency	This metric computes the time taken between the Transaction sent and Link Command response received in USB SS.