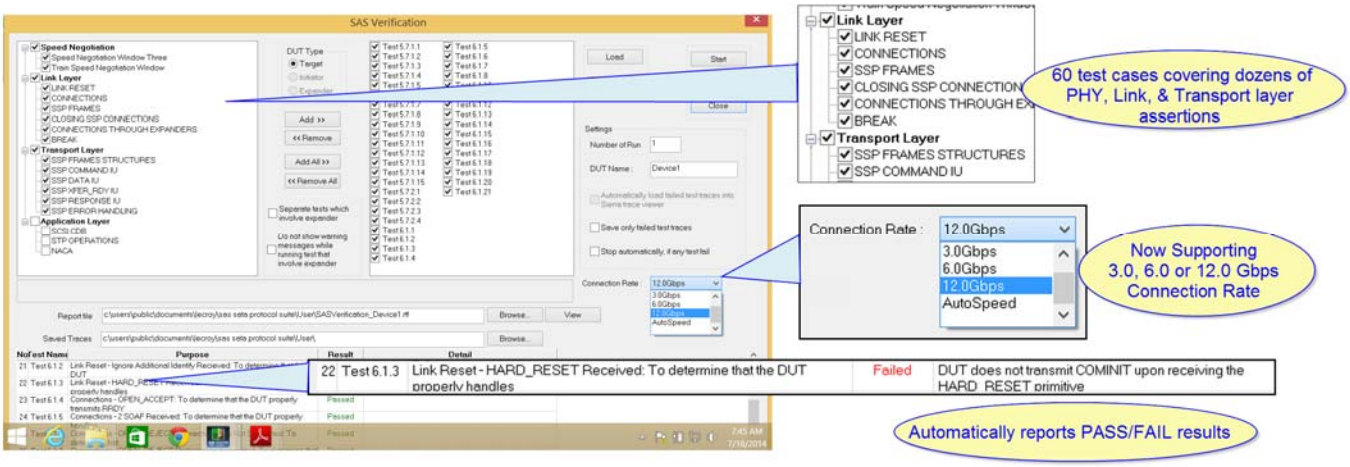
PRODUCT BULLETIN

SAS Verification Suite

Turnkey SAS Verification Test Suite

The SAS Sierra Verification Suite for the Sierra platform helps storage integrators test and qualify SAS HDD and SSD devices for conformance to the SAS specifications. The suite includes over 60 separate test cases covering dozens of PHY, Link and Transport layer assertions. For storage integrators, the SAS Verification option has become an indispensable tool for screening HDD and SSD devices to verify they properly implement speed negotiation and link layer recovery behaviors.

Fully automated, SAS Verification loads individual test scripts that generate specific traffic conditions to test individual SAS protocol rules. The responses from the DUT are automatically captured and analyzed for correct behavior. A pass/fail report is generated in text or HTML. Upon starting the test suite, SAS Verification automatically queries the DUT to determine the SAS Address - which is re-used throughout the test run. The entire process is automated through a single easy-to-use application which allows users to run individual tests or the entire suite in a single pass. Traces are saved and violations reported for any fail cases.



The SAS Verification option for 6G/12G runs on the M124/M122 platform and has been updated to support 12G connection rate. There is a 6G only version available for the M6 family of SAS analyzers. The package also requires the Power Expansion card is installed in the Sierra platform which automatically cycles power between tests. Use the models below to order the SAS Verification option.

Ordering Information for Sierra M6-2 / M6-4	**Ordering information for Sierra M122 / M124**
	
Part #: **SAS-VS-06-S02-A** Sierra SAS 6G Verification Suite M6-4 / M6-2 **ACC-EXP-005-X** Sierra External Power Expansion Card v2 (DevSlp) or **ACC-EXP-004-X** Sierra External Power Expansion Card v1	Part #: **SAS-VS-12-S02-A** Sierra SAS 6G/12G Verification Suite M124/M122 **ACC-EXP-005-X** Sierra External Power Expansion Card v2 (DevSlp)

Test Coverage Phase 1 (SAS Suite v5.60)

The initial release of SAS Verification for 12G will focus on Speed Negotiation (PHY) and Link Layer

	Clause 5 - Speed Negotiation
Test 5.7.1.1	Support for SNW-3: To verify the DUT's support for SNW-3
Test 5.7.1.2	SNTT: Total Time: To verify that the DUT properly formats it's SNTT.
Test 5.7.1.3	SNNT: Remainder Time: To verify that the DUT properly formats it's SNTT.
Test 5.7.1.4	Rate Change Delay Time: To verify that the DUT properly formats it's SNTT.
Test 5.7.1.5	PHY Capabilities Bits - Start Bit: To verify that bit 0 of the PHY capabilities bits is set to one.
Test 5.7.1.6	PHY Capabilities Bits - TX SSC Type: To verify that bit 1 of the PHY capabilities bits correctly reflects the SSC employed by the DUT.
Test 5.7.1.7	PHY Capabilities Bits - Reserved Bits: To verify that bits 2 and 3 of the PHY capabilities bits are set to zero.
Test 5.7.1.8	PHY Capabilities Bits - G1 WITHOUTs SSC: To verify the contents of the DUT's PHY Capabilities G1 WITHOUT SSC bit.
Test 5.7.1.9	PHY Capabilities Bits - G1 WITH SSC: To verify the contents of the DUT's PHY Capabilities G1 WITH SSC bit.
Test 5.7.1.10	PHY Capabilities Bits - G2 WITHOUT SSC: To verify the contents of the DUT's PHY Capabilities G2 WITHOUT SSC bit.
Test 5.7.1.11	PHY Capabilities Bits - G2 WITH SSC: To verify the contents of the DUT's PHY Capabilities G2 WITH SSC bit.
Test 5.7.1.12	PHY Capabilities Bits - G3 WITHOUT SSC: To verify the contents of the DUT's PHY Capabilities G3 WITHOUT SSC bit.
Test 5.7.1.13	PHY Capabilities Bits - G3 WITH SSC: To verify the contents of the DUT's PHY Capabilities G3 WITH SSC bit.
Test 5.7.1.14	PHY Capabilities Bits - Reserved Bits: To verify that the PHY Capabilities Bits 14 through 30 are set to zero.
Test 5.7.1.15	PHY Capabilities - Parity Bit: To verify that the PHY Capabilities Bit 31,the Parity Bit, is correctly set.
Test 5.7.2.1	TRAIN Pattern: To verify that the DUT sends the proper TRAIN pattern.
Test 5.7.2.2	TRAIN_DONE Pattern: To verify that the DUT sends the proper TRAIN_DONE pattern.
Test 5.7.2.3	Negotiate to 6G, SSC: To verify that the DUT negotiates to 6G signaling with no SSC.
Test 5.7.2.4	Negotiate to 6G, No SSC: To verify that the DUT negotiates to 6G signaling withno SSC.
	Clause 6 - Link Layer
Test 6.1.1	Link Reset - Repeat PHY Sequence if no Identify Received
Test 6.1.2	Link Reset - Ignore Additional Identify Recieved: Determine that DUTwill ignore second IDENTIFY frame
Test 6.1.3	Link Reset - HARD_RESET Received: To determine that the DUT properly handles a HARD_RESET.
Test 6.1.4	Connections - OPEN_ACCEPT: To determine that the DUT properly transmits RRDY after receiving OPEN_ACCEPT.

Test 6.1.5	Connections - 2 SOAF Received: To determine that the DUT properly handles received 2 SOAF primitives.
Test 6.1.6	Connections - OPEN_REJECT Connection Rate Not Supported: To determine thatthe DUT handles errors in OpenAddress frames properly.
Test 6.1.7	Connections - OPEN_REJECT Protocol Not Supported: To determine that the DUT handles errors in OpenAddress frames properly.
Test 6.1.8	Connections - OPEN_REJECT Wrong Destination: To determine that the DUT handle serrors in OpenAddress frames properly.
Test 6.1.10	SSP_Frames - Interlocked Frame: To determine that the DUT handles interlocked frames properly.
Test 6.1.11	SSP_Frames - No ACK for Interlocked Frame: To determine that the DUT responds properly when no ACK or NAK is received after transmitting an interlocked frame.
Test 6.1.12	SSP_Frames - Multiple ACKs: To determine that the DUT properly transmits ACK within 1 msec of receiving a frame
Test 6.1.13	SSP Frames - RRDY: To determine that the DUT properly grants credit to transit frames using RRDY.
Test 6.1.14	Closing SSP Connections - DONE (NORMAL): To determine that the DUT properly responds when DONE is received.
Test 6.1.15	Closing SSP Connections - DONE (ACK/NAK TIMEOUT): To determine that the DUT properly responds when ACK or NAK has not been received for a transmitted frame.
Test 6.1.16	Closing SSP Connections - DONE (CREDIT TIMEOUT): To determine that the DUT properly responds when RRDY has not been received for an impending transaction.
Test 6.1.17	Closing SSP Connections - CLOSE (NORMAL): To determine that the DUT properly responds when CLOSE (NORMAL) is received.
Test 6.1.18	Closing SSP Connections - BREAK Sourced by Testing Station: To determine that the DUT properly responds when BREAK is received.
Test 6.1.19	Closing SSP Connections - BREAK Sourced by DUT: To determine that the DUT properly sources BREAK when required.
Test 6.1.20	Connections through Expanders - OPEN SSP Target: To determine that the DUT can properly open a connection through an expander
Test 6.1.21	BREAK - OpenTimeout Timer SSP Target: To determine that the DUT transmits BREAK after the Open Timeout Timer expires.

Test Coverage Phase 2 (SAS Suite v5.70)

The Phase 2 release of SAS Verification for 12G will focus on transport and application layer test cases.

	Clause 8 Transport Layer
Test 8.1.1	SSP FRAMES STRUCTURE - HASHED ADDRESS
Test 8.1.2	SSP FRAMES STRUCTURE - INFORMATION UNIT
Test 8.1.3	SSP FRAMES STRUCTURE - NUMBER OF FILL BYTES
Test 8.1.4	SSP RESPONSE IU - SENSE DATA PRESENT
Test 8.1.5	SSP COMMAND IU - TARGET PORT TRANSFER TAG
Test 8.1.6	SSP DATA IU - NUMBER OF FILL BYES NON-ZERO
Test 8.1.7	SSP DATA IU - NUMBER OF FILL BYES ZERO
Test 8.1.8	SSP DATA IU - DATA OFFSET
Test 8.1.9	SSP XFER_RDY IU - REQUESTED OFFSET
Test 8.1.10	SSP XFER_RDY IU - REQUESTED OFFSET LARGE TRANSFER
Test 8.1.11	SSP XFER_RDY IU - MAXIMUM BURST SIZE
Test 8.1.12	SSP XFER_RDY IU - WRITE DATA LENGTH
Test 8.1.13	SSP RESPONSE IU - NO DATA PRESENT
Test 8.1.14	SSP RESPONSE IU - SENSE DATA PRESENT
Test 8.1.15	SSP RESPONSE IU - SENSE/RESPONSE DATA NOT PRESENT
Test 8.1.16	SSP RESPONSE IU -RESPONSE DATA PRESENT
Test 8.1.17	SSP ERROR HANDLING
Test 8.1.18	SSP ERROR HANDLING - INVALID LUN
Test 8.1.19	SSP ERROR HANDLING - NO ACK/NAK RECEIVED
Test 8.1.20	SSP ERROR HANDLING - UNKNOWN TAG
	Clause 10 Application Layer
Test 10.1.1	SCSI CDB - Test UNIT READY
Test 10.1.2	SCSI CDB - INQUIRY
Test 10.1.3	SCSI CDB - START STOP
Test 10.1.4	SCSI CDB - MODE SENSE

Test 10.1.5	SCSI CDB - MODE SELECT
Test 10.1.6	SCSI CDB - READ CAPACITY
Test 10.1.7	SCSI CDB - WRITE
Test 10.1.8	SCSI CDB - READ
Test 10.1.9	SCSI CDB - LOG SENSE

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