

# NVMe™ Management Interface (NVMe™-MI) Conformance Tests

## Key Features

### Fully Integrated and Automated

Simplifies and speeds testing of new product designs for implementing NVMe-MI specification

### Supports PCIe SSDs

Supports all PCI Express® data rates up to and including 16.0 GT/s (PCIe® 4.0)

### Supports x1, x2, x4 and x8 Link Width

Test all lane widths to validate all possible configurations

### Hundreds of Test Cases

Extensive validation of full NVMe-MI feature set

### Customizable Test Scripts

Allows for custom test development and modifications

### Preserves Trace Data on Failure

Guides engineers directly to problem areas and enables fast debug



Add/Remove PCIe diagnostics to run		
Show Tests Groups: <b>NVMe</b>   NVMe-MI/MCTP SMBus Tests		52/52 Test(s) Selected
		<b>Apply</b> <b>Close</b>
Test	Description	
<b>NVMe-MI/MCTP SMBus Tests</b> <span style="float: right;"><a href="#">Select All</a> <a href="#">Deselect All</a></span>		
<input checked="" type="checkbox"/>	Test 1-1 MCTP Endpoint ID	The intent of this test is to ensure that a DUT returns the MCTP Endpoint ID that it was assigned.
<input checked="" type="checkbox"/>	Test 1-1-1 MCTP Endpoint ID - Reserved Bits	The intent of this test is to ensure that all the reserved bits of the response are set to zero in...
<input checked="" type="checkbox"/>	Test 1-2 MCTP Packet Sequence Number	The intent of this test is to check the sequence numbers of the Response Message when performing NVMe-MI Read.
<input checked="" type="checkbox"/>	Test 1-3 MCTP Tag Owner and Message Tag Bits	The intent of this test is to check the behavior of the response Message Message Tag and TagOwner Fields.
<input checked="" type="checkbox"/>	Test 1-4-1 MCTP Bad Packet 1	The intent of this test is to ensure that the Get Endpoint ID command with bad EOM or SOM is silently dropped by the DUT.
<input checked="" type="checkbox"/>	Test 1-4-2 MCTP Bad Packet 2	The intent of this test is to ensure that the Get Endpoint ID command with incorrect Destination EPID is silently dropped by the DUT.
<input checked="" type="checkbox"/>	Test 1-4-3 MCTP Bad Packet 3	The intent of this test is to ensure that the Get Endpoint ID command with bad tag owner is silently dropped by the DUT.
<input checked="" type="checkbox"/>	Test 1-4-4 MCTP Bad Packet 4	The intent of this test is to ensure that the Get Endpoint ID command with incorrect Destination EPID is silently dropped by the DUT.
<input checked="" type="checkbox"/>	Test 1-4-5 MCTP Bad Packet 5	The intent of this test is to ensure that the Get Endpoint ID command with Header Version is silently dropped by the DUT.
<input checked="" type="checkbox"/>	Test 11-1 NVMe-MI VPD Default Values	The intent of this test is the ensure that the Factory default values and the reserved fields are set properly.
<input checked="" type="checkbox"/>	Test 2-1 MCTP Control Instance ID	The intent of this test is to ensure that all the the Instance ID of the response corresponds to the Instance ID of the request message for Get EndPoint ID Command.
<input checked="" type="checkbox"/>	Test 3-1 MCTP Command Set EndpointID	The intent of this test is to ensure that proper Completion messages are returned for MCTP Command Set EndpointID.

## Assure Product Quality and Minimize Time-to-Market



The NVMe-MI Conformance tests are designed to determine if a product conforms to specifications defined in the NVM Express Management Interface (NVMe-MI) specification. Successful completion of these tests provides a reasonable level of confidence that the Device Under Test (DUT) will function properly in an NVMe-MI environment.

Teledyne LeCroy offers a fully integrated and automated validation testing system for NVM Express SSD devices. The NVMe-MI Conformance Tests are run using the Teledyne LeCroy LinkExpert software. The NVMe-MI Conformance Tests require one of the following hardware configurations to run the tests:

- Teledyne LeCroy Summit™ T34 Protocol Analyzer
- Summit Z3-16 Exerciser with SMBus support
- Summit Z3-16 Test Platform with SMBus support
- or
- Summit Z416
- PXP-400 Test Platform or PCIe 4.0 Test Platform

Tests are available to run on x1, x2, x4, x8 and x16 links, and at data rates of 2.5 GT/s, 5.0 GT/s, 8.0 GT/s and 16.0GT/s. The NVMe-MI Conformance tests can be run on links that use either SMBus or PCIe Vendor Defined Messages.



The NVMe Conformance Tests are separately sold from the PCIe Protocol Suite.

### The PCI Express Automation Test Tool allows you to:

- Run the NVMe-MI Conformance Tests
- Prepare your SSD to pass the NVMe-MI Conformance test from the UNH-IOLS
- Display a log window that show you the test events leading up to the pass or fail of an individual Conformance Test
- Identify error, including type, shows you where the errors occurs in the trace, and includes hyperlinks back to that trace
- Automatically run tests and save log files
- Error logs and their corresponding failure in the protocol trace are saved together for product development records

The Automated Test Application and NVMe Conformance tests together support twelve groups of tests, including: MCTP Base Tests, MCTP Control Message Test, MCTP Commands, NVMe Error handling, NVMe Manage Interface, NVMe-MI Message Processing, Control Primitives Tests, Management Interface Command, NVMe Admin Command Set, Management Enhancement, Vital Product Data, and Management Endpoint Reset. A list is given below of the available tests.

#### MCTP Base Tests

Test 1.1 – MCTP Endpoint ID	PASSED
Test 1.1.1 – MCTP Endpoint ID – Reserved Bits	PASSED
Test 1.2 – MCTP Packet Sequence Number	PASSED
Test 1.3 –MCTP Tag Owner and Message Tag Bits	PASSED
Test 1.4.1 – MCTP Bad Packet 1	PASSED
Test 1.4.2 – MCTP Bad Packet 2	PASSED
Test 1.4.3 – MCTP Bad Packet 3	PASSED
Test 1.4.4 – MCTP Bad Packet 4	PASSED
Test 1.4.5 – MCTP Bad Packet 5	PASSED

#### MCTP Control Message Test

Test 2.1 – MCTP Control Instance ID	PASSED
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#### MCTP Commands

Test 3.1 – MCTP Command Set Endpoint ID	PASSED
Test 3.2 – MCTP Command Get MCTP Version	PASSED
Test 3.3 – MCTP Command Get Message Type	PASSED
Test 3.4 – MCTP Command Prepare for Endpoint Discovery	PASSED
Test 3.5 – MCTP Command Endpoint Discovery	PASSED
Test 3.6 – MCTP Command Get Endpoint ID	PASSED

#### NVMe Error Handling

Test 4.1 - NVMe-MI Invalid Opcode	PASSED
Test 4.2 - NVMe-MI Reserved Identifier	PASSED
Test 4.3 - NVMe-MI Health Status Change	PASSED
Test 4.4 - NVMe-MI Reserved Identifier 2	PASSED
Test 4.5 - NVMe-MI MAXRENT Error	PASSED
Test 4.6 - NVMe-MI Reserved Data Structure Type	PASSED
Test 4.7 - NVMe-MI Invalid VPD Read Size	PASSED
Test 4.8 - NVMe-MI Invalid VPD Write Status	PASSED
Test 4.9 - NVMe-MI Invalid Parameter Status	PASSED
Test 4.10 - NVMe-MI Invalid Command Size	PASSED

#### NVMe Management Interface

Test 5.1 – NVMe-MI Message Type	PASSED
Test 5.2 – NVMe-MI Message IC	PASSED
Test 5.3 – NVMe-MI CRC Check	PASSED
Test 5.4 – NVMe-MI Command	PASSED
Test 5.6 – NVMe-MI MCTP packet padding	PASSED
Test 5.7 – NVMe-MI Message Integrity Check	PASSED

#### NVMe-MI Message Processing

Test 6.1 – NVMe-MI Reserved Fields	PASSED
Test 6.2 – NVMe-MI Error Response Code	PASSED

#### Control Primitives Tests

Test 7.1 – NVMe-MI Response Tag	PASSED
Test 7.2 – NVMe-MI Response Message	PASSED
Test 7.3 – NVMe-MI GetState Primitive Response	PASSED
Test 7.4 – NVMe-MI Response Message Replay	PASSED
Test 7.5 – NVMe-MI Response Relay Offset	PASSED

#### Management Interface Command

Test 8.1 – NVMe-MI Response Header	PASSED
Test 8.2 – NVMe-MI Configuration Set	PASSED
Test 8.3 – NVMe-MI Config Get Response	PASSED
Test 8.4 – NVMe-MI Health Status Poll	PASSED
Test 8.5.1 – NVMe-MI Controller Health Status Poll	PASSED
Test 8.5.2 – NVMe-MI Controller Health Status Poll	PASSED
Test 8.6 – NVMe-MI Read Data Structure	PASSED
Test 8.7.1 – NVMe-MI NVMSSI Data Length	PASSED
Test 8.7.2 – NVMe-MI PortInfo Data Length	PASSED
Test 8.7.3 – NVMe-MI CtrlrList Data Length	PASSED
Test 8.7.4 – NVMe-MI CtrlrInfo Data Length	PASSED
Test 8.7.5 – NVMe-MI OptCmds Data length	PASSED

#### Vital Product Data

Test 11.1 – NVMe-MI VPD Default Values	PASSED
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## Ordering Information

### Product Description

Summit T34 Protocol Analyzer  
 Summit T34 MCTP SMBus/NVMe-MI Decode Option  
 Summit T34 MCTP PCIe/NVMe-MI Inband Decode Option  
 Summit Z3-16 Exerciser with SMBus support  
 Summit Z3-16 MCTP SMBus/NVMe-MI Option  
 Summit Z3-16 MCTP PCIe/NVMe-MI Inband Option  
 Test Platform for Summit Z3-16 with SMBus support  
 x4-to-x8 Straight iPass Blue Cable,1 meter  
 NVMe-MI Conformance Tests

Summit Z416 Exerciser  
 Summit Z416 MCTP SMBus/NVMe-MI Generation Option  
 Summit Z416 MCTP PCIe/NVMe-MI Inband Generation Option  
 Summit Z416 MCTP SMBus/NVMe-MI Decode Option  
 Summit Z416 MCTP PCIe/NVMe-MI Inband Decode Option  
 NVMe-MI Conformance Tests (requires Summit Z416/ Test Platform)  
 Base Analyzer Software License for Summit Z416  
 Base Exerciser Software License for Summit Z416  
 PCIe Gen 4 Test Platform  
 PXP-400 G4 DVT Platform

### Product Code

PE080AAA-X  
 PE182SUA-A  
 PE184SUA-A  
 PE072AGA-X  
 PE181SUA-A  
 PE183SUA-A  
 PE052UEA-X  
 PE015UCA-X  
 PE189SUA-A

PE204SUA-A  
 PE205SUA-A  
 PE238SUA-A  
 PE239SUA-A  
 PE299SUA-A  
 PE150SUA-A  
 PE130SUA-A  
 PE053UEA-X  
 PXP-400A



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