QSFP-PSM4-100G

OPTICAL TRANSCEIVER MODULE

Scenario Application Test Report (Cisco)

CONTENTS

1. Test Purpose

By building test scenarios and simulating the customer's usage environment, we test whether the module's performance meets the customer's requirements.

2. Test Results Summary

Table 2: Test Results

Items	Test Data	Remarks
Multi-Version	Pass	/
Connectivity	Pass	/
Module Basic Information	Pass	/
Digital Diagnostic Monitoring	Pass	/

3. Test Environment

3.1 Test Equipment Used

Table 3-1: Test Equipment Used

Vendor	Device	Soft Version
Cisco Switch	C93180YC-EX	7.69
NVIDIA NICs	MCX755106AS-HEAT	28.43.1014
DELL Server	PowerEdge R860	/

3.2 Test Sample

Table 3-2: Test Sample

Product ID	P/N	Serial Number
#65221	QSFP-PSM4-100G	A1930008041 A1930008322

4. Test Data

Table 4: Scenario Application Testing

Test Topology	
Test Premise	1. Confirm the brand, quantity and placement of the switches to be tested. 2. Prepare control cables, test software and optical fiber patch cords. Power on the switches in advance. 3. Locate the Console port on the switch, which is usually marked as "CON" on the switch, although some switches may display it as "IOIOI" or a computer monitor icon, etc. Use a control cable to connect the switch to the computer.  4. Before connecting the software, it is necessary to confirm the connection port of the control cable. Go to the computer device manager, click on the ports (COM and LPT) to view the ports. After confirming the ports, proceed with the next step.
Test Method	Click to open the SecureCRT Portable software and enter the quick connection interface. ① Protocol selection: Serial ② Port selection: The same as the port you viewed in the previous step ③ Baud rate selection: The same as the baud rate of the port on the target switch ④ Flow control: Do not check this option The remaining configurations can keep the default values.
Test Steps	① Insert the module into the corresponding rate port of the switch, and connect the TX-RX ends with an optical fiber jumper or an MTP self-loop device. Observe whether the module is connected. If not connected, please check the jumper connection or the switch port configuration (login to the switch is required). ② Enter the test interface, input the account and password, log in to the switch and enter privileged mode. ③ According to the switch command configuration table, input the corresponding test command and view the relevant information: port status (connectivity), connection rate, alarm status, module basic information, DDM information, etc. Determine whether it meets the requirements.

Test Information	1. Read the switch model name and software version, and read the status of all ports on the switch

```
switch#  show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (C) 2002-2023, Cisco and/or its affiliates.
All rights reserved.
The copyrights to certain works contained in this software are
owned by other third parties and used and distributed under their own
licenses, such as open source.  This software is provided "as is," and unless
otherwise stated, there is no warranty, express or implied, including but not
limited to warranties of merchantability and fitness for a particular purpose.
Certain components of this software are licensed under
the GNU General Public License (GPL) version 2.0 or
GNU General Public License (GPL) version 3.0  or the GNU
Lesser General Public License (LGPL) Version 2.1 or
Lesser General Public License (LGPL) Version 2.0.
A copy of each such license is available at
http://www.opensource.org/licenses/gpl-2.0.php and
http://opensource.org/licenses/gpl-3.0.html and
http://www.opensource.org/licenses/lgpl-2.1.php and
http://www.gnu.org/licenses/old-licenses/library.txt.

Software
  BIOS: version 07.69
  NXOS: version 10.2(5) [Maintenance Release]
  BIOS compile time:  04/07/2021
  NXOS image file is: bootflash:///nxos64-cs.10.2.5.M.bin
  NXOS compile time:  3/10/2023 12:00:00 [03/03/2023 12:00:11]

Hardware
  cisco Nexus9000 C93180YC-EX chassis
  Intel(R) Xeon(R) CPU  @ 1.80GHz with 24617876 kB of memory.
  Processor Board ID FDO221418Y5
  Device name: Cisco_C93180YC-EX
  bootflash:    7906304 kB

Kernel uptime is 9 day(s), 22 hour(s), 17 minute(s), 55 second(s)

Last reset at 372357 usecs after Mon Jul 21 08:44:40 2025
  Reason: Module PowerCycled
  System version:
  Service: HW check by card-client

plugin
  Core Plugin, Ethernet Plugin

Active Package(s):

switch#  show interfaces eth 1/51-52 status

--------------------------------------------------------------------------------
Port         Name           Status    Vlan     Duplex  Speed   Type
--------------------------------------------------------------------------------
Eth1/51      --             connected 36       full    100G    QSFP-100G-PSM4
Eth1/52      --             connected 36       full    100G    QSFP-100G-PSM4
```

Test Information	2. Read the module's basic information from the switch side switch# show interfaces eth 1/51-52 Ethernet1/51 is up admin state is up, Dedicated Interface Hardware: 1000/10000/25000/40000/50000/100000 Ethernet, address: 70df.2f96.e590 (bia 70df.2f96.e590) MTU 1500 bytes, BW 100000000 Kbit , DLY 10 usec reliability 255/255, txload 1/255, rxload 1/255 Encapsulation ARPA, medium is broadcast Port mode is access full-duplex, 100 Gb/s, media type is 100G Beacon is turned off Auto-Negotiation is turned on FEC mode is Auto Input flow-control is off, output flow-control is off Auto-mdix is turned off Rate mode is dedicated Switchport monitor is off EtherType is 0x8100 EEE (efficient-ethernet) : n/a admin fec state is auto, oper fec state is Rs-fec Last link flapped 00:00:20 Last clearing of "show interface" counters never 2 interface resets Load-Interval #1: 30 seconds 30 seconds input rate 96 bits/sec, 0 packets/sec 30 seconds output rate 280 bits/sec, 0 packets/sec input rate 96 bps, 0 pps; output rate 280 bps, 0 pps Load-Interval #2: 5 minute (300 seconds) 300 seconds input rate 64 bits/sec, 0 packets/sec 300 seconds output rate 32 bits/sec, 0 packets/sec input rate 64 bps, 0 pps; output rate 32 bps, 0 pps RX 0 unicast packets 11 multicast packets 0 broadcast packets 11 input packets 2558 bytes 0 jumbo packets 0 storm suppression bytes 0 runts 0 giants 0 CRC 0 no buffer 0 input error 0 short frame 0 overrun 0 underrun 0 ignored 0 watchdog 0 bad etype drop 0 bad proto drop 0 if down drop 0 input with dribble 0 input discard 0 Rx pause 0 Stomped CRC TX 0 unicast packets 137 multicast packets 0 broadcast packets 137 output packets 10622 bytes 0 jumbo packets 0 output error 0 collision 0 deferred 0 late collision 0 lost carrier 0 no carrier 0 babble 0 output discard 0 Tx pause 3. Read the DDM information of the module root@fs1-PowerEdge-R860:~# mlxlink -d mlx5_7 -cable -ddm Operational Info ---------- State : Active Physical state : LinkUp Speed : 100G Width : 4x FEC : Standard RS-FEC - RS(528,514) Loopback Mode : No Loopback Auto Negotiation : ON

Test Information

```
Supported Info
--------------
Enabled Link Speed (Ext.)        : 0x00003ff2 (200G_2X,200G_4X,100G_1X,100G_2X,100G_4X,50G_1X,50G_2X,40G,25G,10G,1G)
Supported Cable Speed (Ext.)     : 0x000002f2 (100G_4X,50G_2X,40G,25G,10G,1G)

Troubleshooting Info
--------------------
Status Opcode                    : 0
Group Opcode                     : N/A
Recommendation                   : No issue was observed

Tool Information
----------------
Firmware Version                 : 28.43.1014
amBER Version                    : 3.6
MFT Version                      : mft 4.30.1-113


Cable DDM Information
---------------------
Temperature                      : 32C
Voltage                          : 3.2840V
Channels                         : Channel 1    ,Channel 2    ,Channel 3    ,Channel 4
RX Power                         : -10.000dBm   ,-6.000dBm    ,-10.000dBm   ,-8.000dBm
TX Power                         : -4.000dBm    ,-2.000dBm    ,-2.000dBm    ,-4.000dBm
TX Bias                          : 39.808mA     ,38.272mA     ,40.576mA     ,37.760mA

DDM Flags
---------
   Temperature Alarm high        : 0
   Temperature Warning high      : 0
   Temperature Warning low       : 0
   Temperature Alarm low         : 0

   Voltage Alarm high            : 0
   Voltage Warning high          : 0
   Voltage Warning low           : 0
   Voltage Alarm low             : 0


Channel 1 Flags
---------------
   RX Power Alarm high           : 0
   RX Power Warning high         : 0
   RX Power Warning low          : 0
   RX Power Alarm low            : 0

   TX Power Alarm high           : 0
   TX Power Warning high         : 0
   TX Power Warning low          : 0
   TX Power Alarm low            : 0

   TX Bias Alarm high            : 0
   TX Bias Warning high          : 0
   TX Bias Warning low           : 0
   TX Bias Alarm low             : 0


Channel 2 Flags
---------------
   RX Power Alarm high           : 0
   RX Power Warning high         : 0
   RX Power Warning low          : 0
   RX Power Alarm low            : 0

   TX Power Alarm high           : 0
   TX Power Warning high         : 0
   TX Power Warning low          : 0
   TX Power Alarm low            : 0

   TX Bias Alarm high            : 0
   TX Bias Warning high          : 0
   TX Bias Warning low           : 0
   TX Bias Alarm low             : 0


Channel 3 Flags
---------------
   RX Power Alarm high           : 0
   RX Power Warning high         : 0
   RX Power Warning low          : 0
   RX Power Alarm low            : 0

   TX Power Alarm high           : 0
   TX Power Warning high         : 0
   TX Power Warning low          : 0
   TX Power Alarm low            : 0

   TX Bias Alarm high            : 0
   TX Bias Warning high          : 0
   TX Bias Warning low           : 0
   TX Bias Alarm low             : 0


Channel 4 Flags
---------------
   RX Power Alarm high           : 0
   RX Power Warning high         : 0
   RX Power Warning low          : 0
   RX Power Alarm low            : 0

   TX Power Alarm high           : 0
   TX Power Warning high         : 0
   TX Power Warning low          : 0
   TX Power Alarm low            : 0

   TX Bias Alarm high            : 0
   TX Bias Warning high          : 0
   TX Bias Warning low           : 0
   TX Bias Alarm low             : 0


DDM Thresholds
--------------
Thresholds                       : Temperature  ,Voltage     ,RX Power     ,TX Power     ,TX Bias
High alarm threshold             : 80C          ,3.700V      ,4.500dBm     ,3.500dBm     ,75.000mA
High warning threshold           : 75C          ,3.595V      ,2.500dBm     ,2.500dBm     ,70.000mA
Low warning threshold            : -5C          ,3.002V      ,-13.507dBm   ,-9.401dBm    ,15.000mA
Low alarm threshold              : -10C         ,2.904V      ,-15.513dBm   ,-10.400dBm   ,10.000mA
```

Test Information

4. Read the NIC model and the status of all ports

```
root@fs1-PowerEdge-R860:~# mlxfwmanager -u
Querying Mellanox devices firmware ...

Device #2:
----------

  Device Type:      ConnectX7
  Part Number:      MCX755106AS-HEA_Ax
  Description:      NVIDIA ConnectX-7 HHHL Adapter Card; 200GbE (default mode) / NDR200 IB; Dual-port QSFP112; PCIe 5.0 x16 with x16 PCIe extension option; Cry
  PSID:             MT_0000000834
  PCI Device Name:  /dev/mst/mt4129_pciconf3
  Base MAC:         a088c2d55882
  Versions:         Current        Available
     FW             28.43.1014     N/A
     PXE            3.7.0500       N/A
     UEFI           14.36.0016     N/A

  Status:           No matching image found



root@fs1-PowerEdge-R860:~#
root@fs1-PowerEdge-R860:~# mlxlink -d mlx5_7

Operational Info
----------------
State                           : Active
Physical state                  : LinkUp
Speed                           : 100G
Width                           : 4x
FEC                             : Standard RS-FEC - RS(528,514)
Loopback Mode                   : No Loopback
Auto Negotiation                : ON

Supported Info
--------------
Enabled Link Speed (Ext.)       : 0x00003ff2 (200G_2X,200G_4X,100G_1X,100G_2X,100G_4X,50G_1X,50G_2X,40G,25G,10G,1G)
Supported Cable Speed (Ext.)    : 0x000002f2 (100G_4X,50G_2X,40G,25G,10G,1G)

Troubleshooting Info
--------------------
Status Opcode                   : 0
Group Opcode                    : N/A
Recommendation                  : No issue was observed

Tool Information
----------------
Firmware Version                : 28.43.1014
amBER Version                   : 3.6
MFT Version                     : mft 4.30.1-113
```

5. Read the module basic information on NIC

```
root@fs1-PowerEdge-R860:~# mlxlink -d mlx5_7 -c -m -e

Operational Info
----------------
State                           : Active
Physical state                  : LinkUp
Speed                           : 100G
Width                           : 4x
FEC                             : Standard RS-FEC - RS(528,514)
Loopback Mode                   : No Loopback
Auto Negotiation                : ON

Supported Info
--------------
Enabled Link Speed (Ext.)       : 0x00003ff2 (200G_2X,200G_4X,100G_1X,100G_2X,100G_4X,50G_1X,50G_2X,40G,25G,10G,1G)
Supported Cable Speed (Ext.)    : 0x000002f2 (100G_4X,50G_2X,40G,25G,10G,1G)

Troubleshooting Info
--------------------
Status Opcode                   : 0
Group Opcode                    : N/A
Recommendation                  : No issue was observed

Tool Information
----------------
Firmware Version                : 28.43.1014
amBER Version                   : 3.6
MFT Version                     : mft 4.30.1-113
```

Physical Counters and BER Info

Time Since Last Clear [Min] : 0.6
Effective Physical Errors : 0
Effective Physical BER : 15E-255
Raw Physical Errors Per Lane : 67016614,0,0,0
Link Down Counter : 7
Link Error Recovery Counter : 0
Raw Physical BER : 5E-10

Module Info

Temperature [C] : N/A
Voltage [mV] : N/A
Bias Current [mA] : N/A
Rx Power Current [dBm] : N/A
Tx Power Current [dBm] : N/A
Identifier : QSFP28
Compliance : 100G PSM4 Parallel SMF
Cable Technology : 1310 nm DFB laser
Cable Type : Optical Module (separated)
OUI : Mellanox
Vendor Name : FS
Vendor Part Number : QSFP28-PIR4-100G
Vendor Serial Number : A1930008041
Rev : A2
Wavelength [nm] : 1302
Transfer Distance [m] : 0
Attenuation (5g,7g,12g)[dB] : N/A
FW Version : N/A
Digital Diagnostic Monitoring : No
Power Class : 3.5 W max
CDR RX : ON,ON,ON,ON
CDR TX : ON,ON,ON,ON
LOS Alarm : N/A
SNR Media Lanes [dB] : N/A
SNR Host Lanes [dB] : N/A
IB Cable Width : 1x,2x,4x
Memory Map Revision : 7
Linear Direct Drive : 0
Cable Breakout : Channels implemented [1,2,3,4]/Far end is unspecified
SMF Length : N/A
MAX Power : 0
Cable Rx AMP : 0
Cable Rx Emphasis : 0
Cable Rx Post Emphasis : 0
Cable Tx Equalization : 0
Wavelength Tolerance : 1.0nm
Module State : N/A
DataPath state [per lane] : N/A
Rx Output Valid [per lane] : N/A
Nominal bit rate : 26.000Gb/s
Rx Power Type : Average power
Manufacturing Date : 31_12_20
Active Set Host Compliance Code : N/A
Active Set Media Compliance Code : N/A
Error Code Response : N/A
Module FW Fault : N/A
DataPath FW Fault : N/A
Tx Fault [per lane] : N/A
Tx LOS [per lane] : N/A
Tx CDR LOL [per lane] : N/A
Rx LOS [per lane] : N/A
Rx CDR LOL [per lane] : N/A
Tx Adaptive EQ Fault [per lane] : N/A

EYE Opening Info

FOM Mode : SLRG_FOM_MODE_EYEO
Lane : 0, 1, 2, 3
Initial FOM : 167, 185, 178, 175
Last FOM : 160, 176, 178, 173

6. Read the module DDM on NIC

```
root@fs1-PowerEdge-R860:~# mlxlink -d mlx5_7 -cable -ddm

Operational Info
----------------
State                           : Active
Physical state                  : LinkUp
Speed                           : 100G
Width                           : 4x
FEC                             : Standard RS-FEC - RS(528,514)
Loopback Mode                   : No Loopback
Auto Negotiation                : ON

Supported Info
--------------
Enabled Link Speed (Ext.)       : 0x00003ff2 (200G_2X,200G_4X,100G_1X,100G_2X,100G_4X,50G_1X,50G_2X,40G,25G,10G,1G)
Supported Cable Speed (Ext.)    : 0x000002f2 (100G_4X,50G_2X,40G,25G,10G,1G)

Troubleshooting Info
--------------------
Status Opcode                   : 0
Group Opcode                    : N/A
Recommendation                  : No issue was observed

Tool Information
----------------
Firmware Version                : 28.43.1014
amBER Version                   : 3.6
MFT Version                     : mft 4.30.1-113


Cable DDM Information
---------------------
Temperature                     : 32C
Voltage                         : 3.2840V
Channels                        : Channel 1     ,Channel 2      ,Channel 3      ,Channel 4
RX Power                        : -10.000dBm    ,-6.000dBm      ,-10.000dBm     ,-8.000dBm
TX Power                        : -4.000dBm     ,-2.000dBm      ,-2.000dBm      ,-4.000dBm
TX Bias                         : 39.808mA      ,38.272mA       ,40.576mA       ,37.760mA

DDM Flags
---------
    Temperature Alarm high      : 0
    Temperature Warning high    : 0
    Temperature Warning low     : 0
    Temperature Alarm low       : 0

    Voltage Alarm high          : 0
    Voltage Warning high        : 0
    Voltage Warning low         : 0
    Voltage Alarm low           : 0


Channel 1 Flags
---------------
    RX Power Alarm high         : 0
    RX Power Warning high       : 0
    RX Power Warning low        : 0
    RX Power Alarm low          : 0

    TX Power Alarm high         : 0
    TX Power Warning high       : 0
    TX Power Warning low        : 0
    TX Power Alarm low          : 0

    TX Bias Alarm high          : 0
    TX Bias Warning high        : 0
    TX Bias Warning low         : 0
    TX Bias Alarm low           : 0


Channel 2 Flags
---------------
    RX Power Alarm high         : 0
    RX Power Warning high       : 0
    RX Power Warning low        : 0
    RX Power Alarm low          : 0

    TX Power Alarm high         : 0
    TX Power Warning high       : 0
    TX Power Warning low        : 0
    TX Power Alarm low          : 0

    TX Bias Alarm high          : 0
    TX Bias Warning high        : 0
    TX Bias Warning low         : 0
    TX Bias Alarm low           : 0


Channel 3 Flags
---------------
    RX Power Alarm high         : 0
    RX Power Warning high       : 0
    RX Power Warning low        : 0
    RX Power Alarm low          : 0

    TX Power Alarm high         : 0
    TX Power Warning high       : 0
    TX Power Warning low        : 0
    TX Power Alarm low          : 0

    TX Bias Alarm high          : 0
    TX Bias Warning high        : 0
    TX Bias Warning low         : 0
    TX Bias Alarm low           : 0


Channel 4 Flags
---------------
    RX Power Alarm high         : 0
    RX Power Warning high       : 0
    RX Power Warning low        : 0
    RX Power Alarm low          : 0

    TX Power Alarm high         : 0
    TX Power Warning high       : 0
    TX Power Warning low        : 0
    TX Power Alarm low          : 0

    TX Bias Alarm high          : 0
    TX Bias Warning high        : 0
    TX Bias Warning low         : 0
    TX Bias Alarm low           : 0


DDM Thresholds
--------------
Thresholds                      : Temperature   ,Voltage        ,RX Power       ,TX Power       ,TX Bias
High alarm threshold            : 80C           ,3.700V         ,4.500dBm       ,3.500dBm       ,75.000mA
High warning threshold          : 75C           ,3.595V         ,2.500dBm       ,2.500dBm       ,70.000mA
Low warning threshold           : -5C           ,3.002V         ,-13.507dBm     ,-9.401dBm      ,15.000mA
Low alarm threshold             : -10C          ,2.904V         ,-15.513dBm     ,-10.400dBm     ,10.000mA
```

Test Conclusion	After completing the above test content, all the test information should be copied and pasted into a TXT document.
Remarks	/