



QSFP-ELR4-100GM

**OPTICAL TRANSCEIVER
MODULE**

Scenario Application Test Report (Cisco)

CONTENTS

1. Test Purpose 2

2. Test Results Summary2

3. Test Environment2

 3.1 Test Equipment Used2

 3.2 Test Sample 2

4. Test Data3

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	N9K-9316D	10.5(1)
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
#84020	QSFP-ELR4-100GM	A2440000662

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

```
N9K-9316D#
N9K-9316D# show version
Cisco Nexus Operating System (NX-OS) Software
TAC support: http://www.cisco.com/tac
Copyright (C) 2002-2024, 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 05.51
  NXOS: version 10.5(1) [Feature Release]
  Host NXOS: version 10.5(1)
  BIOS compile time: 11/29/2023
  NXOS image file is: bootflash://nxos64-cs.10.5.1.F.bin
  NXOS compile time: 7/31/2024 12:00:00 [07/26/2024 02:00:41]
  NXOS boot mode: LXC
```

```
Hardware
  cisco Nexus9000 C9316D-GX Chassis
  Intel(R) Xeon(R) CPU D-1526 @ 1.80GHz with 32803124 kB of memory.
  Processor Board ID FDO23430E7Z
  Device name: N9K-9316D
  bootflash: 115805708 kB
```

Kernel uptime is 15 day(s), 1 hour(s), 34 minute(s), 26 second(s)

```
Last reset at 540531 usecs after Thu Nov 16 18:01:33 2000
Reason: Module PowerCycled
System version:
Service: HW check by card-client
```

```
plugin
  Core Plugin, Ethernet Plugin
```

Active Package(s):

N9K-9316D# show interface status

Port	Name	Status	Vlan	Duplex	Speed	Type
mgmt0	--	connected	routed	full	1000	--

Port	Name	Status	Vlan	Duplex	Speed	Type
Eth1/1/1	--	xcvrAbsen	1	auto	auto	--
Eth1/1/2	--	xcvrAbsen	1	auto	auto	--
Eth1/2/1	--	xcvrAbsen	1	auto	auto	--
Eth1/2/2	--	xcvrAbsen	1	auto	auto	--
Eth1/2/3	--	xcvrAbsen	1	auto	auto	--
Eth1/2/4	--	xcvrAbsen	1	auto	auto	--
Eth1/3/1	--	xcvrAbsen	1	auto	auto	--
Eth1/3/2	--	xcvrAbsen	1	auto	auto	--
Eth1/4/1	--	xcvrAbsen	1	auto	auto	--
Eth1/4/2	--	xcvrAbsen	1	auto	auto	--
Eth1/4/3	--	xcvrAbsen	1	auto	auto	--
Eth1/4/4	--	xcvrAbsen	1	auto	auto	--
Eth1/5	--	xcvrAbsen	1	auto	100G	--
Eth1/6/1	--	xcvrAbsen	1	auto	auto	--
Eth1/6/2	--	xcvrAbsen	1	auto	auto	--
Eth1/7/1	--	xcvrAbsen	1	auto	auto	--
Eth1/7/2	--	xcvrAbsen	1	auto	auto	--
Eth1/8/1	--	xcvrAbsen	1	auto	auto	--
Eth1/8/2	--	xcvrAbsen	1	auto	auto	--
Eth1/9/1	--	xcvrAbsen	1	auto	auto	--
Eth1/9/2	--	xcvrAbsen	1	auto	auto	--
Eth1/10	--	xcvrAbsen	1	auto	200G	--
Eth1/11	--	connected	1	full	100G	QSFP-100G-LR4
Eth1/12	--	xcvrAbsen	1	auto	auto	--
Eth1/13	--	connected	1	full	100G	QSFP-100G-LR4

Test Information

2. Read the module's basic information from the switch side

```
N9K-9316D# show interface ethernet 1/11
Ethernet1/11 is up
admin state is up, Dedicated Interface
Hardware: 10000/25000/40000/50000/100000/200000/400000 Ethernet, address: 4c71.0d56.0500 (bia 4c71.0d56.0500)
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 off 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 off
Last link flapped 00:00:32
Last clearing of "show interface" counters never
3 interface resets
Load-Interval #1: 30 seconds
  30 seconds input rate 0 bits/sec, 0 packets/sec
  30 seconds output rate 216 bits/sec, 0 packets/sec
  input rate 0 bps, 0 pps; output rate 216 bps, 0 pps
Load-Interval #2: 5 minute (300 seconds)
  300 seconds input rate 0 bits/sec, 0 packets/sec
  300 seconds output rate 40 bits/sec, 0 packets/sec
  input rate 0 bps, 0 pps; output rate 40 bps, 0 pps
RX
  0 unicast packets 78 multicast packets 0 broadcast packets
  78 input packets 7434 bytes
  0 jumbo packets 0 storm suppression bytes
  0 runs 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 96 multicast packets 0 broadcast packets
  96 output packets 8586 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

```
N9K-9316D# show interface ethernet 1/11 transceiver details
Ethernet1/11
transceiver is present
type is QSFP-100G-LR4
name is FS
part number is QSFP-ELR4-100GM
revision is 04
serial number is A2404120142
nominal bitrate is 25500 Mbit/sec per channel
Link length supported for 9/125um fiber is 20 km
Link length supported for 50/125um OM3 fiber is 400 m
cisco id is 17
cisco extended id number is 220
```

Lane Number:1 Network Lane

SFP Detail Diagnostics Information (internal calibration)

	Current Measurement	Alarms		Warnings	
		High	Low	High	Low
Temperature	34.11 C	75.00 C	-5.00 C	70.00 C	0.00 C
Voltage	3.30 V	3.63 V	2.97 V	3.46 V	3.13 V
Current	59.26 mA	110.00 mA	20.00 mA	100.00 mA	30.00 mA
Tx Power	0.68 dBm	5.49 dBm	-6.30 dBm	4.49 dBm	-5.30 dBm
Rx Power	-9.20 dBm	5.49 dBm	-12.59 dBm	4.50 dBm	-11.59 dBm
Transmit Fault Count	= 0				

Note: ++ high-alarm; + high-warning; -- low-alarm; - low-warning

Lane Number:2 Network Lane

SFP Detail Diagnostics Information (internal calibration)

	Current Measurement	Alarms		Warnings	
		High	Low	High	Low
Temperature	34.11 C	75.00 C	-5.00 C	70.00 C	0.00 C
Voltage	3.30 V	3.63 V	2.97 V	3.46 V	3.13 V
Current	75.68 mA	110.00 mA	20.00 mA	100.00 mA	30.00 mA
Tx Power	0.54 dBm	5.49 dBm	-6.30 dBm	4.49 dBm	-5.30 dBm
Rx Power	-9.12 dBm	5.49 dBm	-12.59 dBm	4.50 dBm	-11.59 dBm
Transmit Fault Count	= 0				

Note: ++ high-alarm; + high-warning; -- low-alarm; - low-warning

Lane Number:3 Network Lane
SFP Detail Diagnostics Information (internal calibration)

	Current Measurement	Alarms High	Low	Warnings High	Low
Temperature	33.53 C	75.00 C	-5.00 C	70.00 C	0.00 C
Voltage	3.29 V	3.63 V	2.97 V	3.46 V	3.13 V
Current	57.07 mA	110.00 mA	20.00 mA	100.00 mA	30.00 mA
Tx Power	1.79 dBm	5.49 dBm	-6.30 dBm	4.49 dBm	-5.30 dBm
Rx Power	-9.30 dBm	5.49 dBm	-12.59 dBm	4.50 dBm	-11.59 dBm
Transmit Fault Count	= 0				

Note: ++ high-alarm; + high-warning; -- low-alarm; - low-warning

Lane Number:4 Network Lane
SFP Detail Diagnostics Information (internal calibration)

	Current Measurement	Alarms High	Low	Warnings High	Low
Temperature	33.53 C	75.00 C	-5.00 C	70.00 C	0.00 C
Voltage	3.29 V	3.63 V	2.97 V	3.46 V	3.13 V
Current	56.70 mA	110.00 mA	20.00 mA	100.00 mA	30.00 mA
Tx Power	1.20 dBm	5.49 dBm	-6.30 dBm	4.49 dBm	-5.30 dBm
Rx Power	-10.31 dBm	5.49 dBm	-12.59 dBm	4.50 dBm	-11.59 dBm
Transmit Fault Count	= 0				

Note: ++ high-alarm; + high-warning; -- low-alarm; - low-warning

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

Operational Info

```
State : Active
Physical state : LinkUp
Speed : 100G
Width : 4x
FEC : No FEC
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.) : 0x00000200 (100G_4X)
```

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 : No FEC
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.) : 0x00000200 (100G_4X)

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] : 2.8
Effective Physical Errors : 0
Effective Physical BER : 15E-255
Raw Physical Errors Per Lane : 0,0,0,0
Link Down Counter : 10
Link Error Recovery Counter : 0
Raw Physical BER : 15E-255

Module Info

Temperature [C] : 35 [-5..75]
Voltage [mV] : 3303.9 [2970..3630]
Bias Current [mA] : 56.770,56.506,56.942,56.708 [20..110]
Rx Power Current [dBm] : -9.830,-10.706,-9.172,-10.223 [-12.596..5.5]
Tx Power Current [dBm] : 1.364,1.392,1.790,1.196 [-6.308..5.5]
Identifier : QSFP28
Compliance : 100GBASE-LR4 or 25GBASE-LR
Cable Technology : 1310 nm DFB laser
Cable Type : Optical Module (separated)
OUI : Mellanox
Vendor Name : FS
Vendor Part Number : QSFP-ELR4-100GM
Vendor Serial Number : A2440000662
Rev : A1
Wavelength [nm] : 1302
Transfer Distance [m] : 0
Attenuation (5g,7g,12g)[dB] : N/A
FW Version : 81.83.18000
Digital Diagnostic Monitoring : Yes
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 : 8
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,N/A,N/A,N/A
Rx Output Valid [per lane] : 0,0,0,0
Nominal bit rate : 26.000Gb/s
Rx Power Type : Average power
Manufacturing Date : 15_10_24
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] : 0,0,0,0
Tx LOS [per lane] : 0,0,0,0
Tx CDR LOL [per lane] : 0,0,0,0
Rx LOS [per lane] : 0,0,0,0
Rx CDR LOL [per lane] : 0,0,0,0
Tx Adaptive EQ Fault [per lane] : 0,0,0,0

EYE Opening Info

FOM Mode : SLRG_FOM_MODE_EYEO
Lane : 0, 1, 2, 3
Initial FOM : 190, 183, 182, 196
Last FOM : 189, 180, 181, 195

6. Read the module DDM on NIC

```
root@fs1-PowerEdge-R860-# mxdlink -d mx5_7 -cable -ddm

Operational Info
-----
State : Active
Physical state : LinkUp
Speed : 100G
Width : 4x
FEC : No FEC
Loopback Mode : No Loopback
Auto Negotiation : ON

Supported Info
-----
Enabled Link Speed (Ext.) : 0x00003f2 (200G_2X,200G_4X,100G_1X,100G_2X,100G_4X,50G_1X,50G_2X,40G,25G,10G,1G)
Supported Cable Speed (Ext.) : 0x00000200 (100G_4X)

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 : 35C
Voltage : 3.3030V
Channels : Channel 1 ,Channel 2 ,Channel 3 ,Channel 4
RX Power : -10.000dBm , -10.000dBm , -10.000dBm , -10.000dBm
TX Power : 2.000dBm , 2.000dBm , 2.000dBm , 2.000dBm
TX Bias : 56.736mA , 56.528mA , 56.910mA , 56.734mA

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 : 75C , 3.630V , 5.500dBm , 5.500dBm , 110.000mA
High warning threshold : 70C , 3.460V , 4.500dBm , 4.500dBm , 100.000mA
Low warning threshold : 0C , 3.130V , -11.599dBm , -5.300dBm , 30.000mA
Low alarm threshold : -5C , 2.970V , -12.596dBm , -6.300dBm , 20.000mA

root@fs1-PowerEdge-R860-#
```

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