



**QDD-ZRPH-400G**

**OPTICAL TRANSCEIVER  
MODULE**

**Scenario Application Test Report (Cisco)**

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# 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	C9316D-GX	05.51

## 3.2 Test Sample

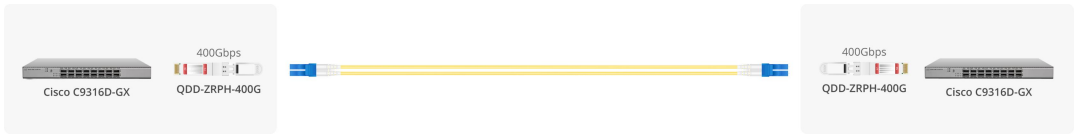

Table 3-2: Test Sample

Product ID	P/N	Serial Number
#193128	QDD-ZRPH-400G	F2407004502

## 4. Test Data

### 4.1 Test Scenario

Table 4-1: Test Scenario

<p><b>Test Topology</b></p>	
<p><b>Test Premise</b></p>	<ol style="list-style-type: none"> <li>1. Confirm the brand, quantity and placement of the switches to be tested.</li> <li>2. Prepare control cables, test software and optical fiber patch cords. Power on the switches in advance.</li> <li>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.</li> </ol>  <ol style="list-style-type: none"> <li>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.</li> </ol>
<p><b>Test Method</b></p>	<p>Click to open the SecureCRT Portable software and enter the quick connection interface.</p> <ol style="list-style-type: none"> <li>① Protocol selection: Serial</li> <li>② Port selection: The same as the port you viewed in the previous step</li> <li>③ Baud rate selection: The same as the baud rate of the port on the target switch</li> <li>④ Flow control: Do not check this option</li> </ol> <p>The remaining configurations can keep the default values.</p>

<b>Test Steps</b>	<p>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).</p> <p>② Enter the test interface, input the account and password, log in to the switch and enter privileged mode.</p> <p>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.</p>
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## 4.2 Test Result

Table 4-2: Test Result

<b>Test Information</b>	<p>1. Read the switch model name and software version, and read the status of all ports on the switch</p> <pre>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.</pre>
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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 14 day(s), 21 hour(s), 35 minute(s), 45 second(s)

Last reset at 457574 usecs after Sun Jun 25 00:50:38 2000  
 Reason: Reset Requested due to Fatal Module Error  
 System version: 10.5(1)  
 Service: mtm hap reset => [Failures < MAX] : powercycle

plugin

Core Plugin, Ethernet Plugin

Active Package(s):

N9K-9316D# show interface status

Port	Name	Status	Vlan	Duplex	Speed	Type
mgmt0	--	connected	routed	full	100	--
Port	Name	Status	Vlan	Duplex	Speed	Type
Eth1/1	--	xcvrAbsen	1	auto	auto	--
Eth1/2	--	xcvrAbsen	1	auto	auto	--
Eth1/3	--	xcvrAbsen	1	auto	400G	--
Eth1/4	--	xcvrAbsen	1	auto	400G	--
Eth1/5	--	connected	1	full	400G	QSFP-DD-400G-ZRP-S
Eth1/6	--	xcvrAbsen	1	auto	400G	--
Eth1/7	--	connected	1	full	400G	QSFP-DD-400G-ZRP-S
Eth1/8/1	--	xcvrAbsen	1	auto	auto	--
Eth1/8/2	--	xcvrAbsen	1	auto	auto	--
Eth1/8/3	--	xcvrAbsen	1	auto	auto	--
Eth1/8/4	--	xcvrAbsen	1	auto	auto	--
Eth1/9	--	xcvrAbsen	1	auto	auto	--
Eth1/10	--	xcvrAbsen	1	auto	auto	--
Eth1/11	--	xcvrAbsen	1	auto	auto	--
Eth1/12/1	--	xcvrAbsen	1	auto	auto	--
Eth1/12/2	--	xcvrAbsen	1	auto	auto	--
Eth1/12/3	--	xcvrAbsen	1	auto	auto	--
Eth1/12/4	--	xcvrAbsen	1	auto	auto	--
Eth1/13	--	xcvrAbsen	1	auto	auto	--
Eth1/14	--	xcvrAbsen	1	auto	auto	--
Eth1/15	--	xcvrAbsen	1	auto	auto	--
Eth1/16	--	xcvrAbsen	1	auto	auto	--

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

```

N9K-9316D#
N9K-9316D# show interface ethernet 1/5
Ethernet1/5 is up
admin state is up, Dedicated Interface
Hardware: 10000/25000/40000/50000/100000/200000/400000 Ethernet, address: 4c71.0d56.04d0 (bia 4c71.0d56.04d0)
MTU 1500 bytes, BW 400000000 Kbit , DLY 10 usec
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, medium is broadcast
Port mode is access
full-duplex, 400 Gb/s, media type is 400G
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 Kp-fec
Last link flapped 00:00:58
Last clearing of "show interface" counters never
12 interface resets
Load-Interval #1: 30 seconds
  30 seconds input rate 0 bits/sec, 0 packets/sec
  30 seconds output rate 232 bits/sec, 0 packets/sec
  input rate 0 bps, 0 pps; output rate 232 bps, 0 pps
Load-Interval #2: 5 minute (300 seconds)
  300 seconds input rate 16 bits/sec, 0 packets/sec
  300 seconds output rate 64 bits/sec, 0 packets/sec
  input rate 16 bps, 0 pps; output rate 64 bps, 0 pps
RX
  0 unicast packets 193 multicast packets 0 broadcast packets
  193 input packets 26653 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 307 multicast packets 0 broadcast packets
  307 output packets 33949 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

N9K-9316D#
N9K-9316D#
N9K-9316D# show interface ethernet 1/7
Ethernet1/7 is up
admin state is up, Dedicated Interface
Hardware: 10000/25000/40000/50000/100000/200000/400000 Ethernet, address: 4c71.0d56.04e0 (bia 4c71.0d56.04e0)
MTU 1500 bytes, BW 400000000 Kbit , DLY 10 usec
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, medium is broadcast
Port mode is access
full-duplex, 400 Gb/s, media type is 400G
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 Kp-fec
Last link flapped 00:01:01
Last clearing of "show interface" counters never
8 interface resets
Load-Interval #1: 30 seconds

```

```

30 seconds input rate 232 bits/sec, 0 packets/sec
30 seconds output rate 0 bits/sec, 0 packets/sec
input rate 232 bps, 0 pps; output rate 0 bps, 0 pps
Load-Interval #2: 5 minute (300 seconds)
300 seconds input rate 64 bits/sec, 0 packets/sec
300 seconds output rate 16 bits/sec, 0 packets/sec
input rate 64 bps, 0 pps; output rate 16 bps, 0 pps
RX
0 unicast packets 1010 multicast packets 0 broadcast packets
1010 input packets 76444 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 89 multicast packets 0 broadcast packets
89 output packets 17727 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

N9K-9316D#
N9K-9316D#
N9K-9316D# show interface ethernet 1/7
Ethernet1/7 is up
admin state is up, Dedicated Interface
Hardware: 10000/25000/40000/50000/100000/200000/400000 Ethernet, address: 4c71.0d56.04e0 (bia 4c71.0d56.04e0)
MTU 1500 bytes, BW 400000000 Kbit, DLY 10 usec
reliability 255/255, txload 1/255, rxload 1/255
Encapsulation ARPA, medium is broadcast
Port mode is access
full-duplex, 400 Gb/s, media type is 400G
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 Kp-fec
Last link flapped 00:01:01
Last clearing of "show interface" counters never
8 interface resets
Load-Interval #1: 30 seconds
30 seconds input rate 232 bits/sec, 0 packets/sec
30 seconds output rate 0 bits/sec, 0 packets/sec
input rate 232 bps, 0 pps; output rate 0 bps, 0 pps
Load-Interval #2: 5 minute (300 seconds)
300 seconds input rate 64 bits/sec, 0 packets/sec
300 seconds output rate 16 bits/sec, 0 packets/sec
input rate 64 bps, 0 pps; output rate 16 bps, 0 pps
RX
0 unicast packets 1010 multicast packets 0 broadcast packets
1010 input packets 76444 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 89 multicast packets 0 broadcast packets
89 output packets 17727 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 1/5 transceiver details

```
Ethernet1/5
  transceiver is present
  type is QSFP-DD-400G-ZRP-S
  name is FS
  part number is QDD-ZRP-400G
  revision is A
  serial number is CS250308002
  nominal bitrate is 425000 MBit/sec per channel
  cisco id is 24
  cisco extended id number is 22
  firmware version is 2.10
  Link length SMF is 63 km
  Nominal transmitter wavelength is 1547.70 nm
  Wavelength tolerance is 0.015 nm
  host lane count is 8
  media lane count is 1
  max module temperature is 70 deg C
  min module temperature is 0 deg C
  min operational voltage is 3.14 V
  vendor OUI is 0x649d99
  date code is 250226
  clei code is INUIANZEEA
  power class is 8 (>14 W maximum)
  max power is 23.75 W
  near-end lanes used none
  far-end lane code for 8 lanes Undefined
  media interface is unknown value 0x10
  Advertising code is Optical Interfaces: SMF
  Host electrical interface code is 400GAUI-8 C2M (Annex 120E)
```

FEC State: FEC cFEC

Optics Status

Optics Type: QSFP-DD-400G-ZRP-S

DWDM carrier Info: Frequency: 193.70 THz

Alarm Status

-----  
DAC Rate: 1x1

THRESHOLD VALUES

-----  
Configured Tx Power: -9 dBm

Modulation Type: 16QAM

Muxponder Type: 1x400

Configured CD-MIN: 0 ps/nm    CD-MAX: 0 ps/nm

Lane Number:1 Network Lane

	Current Measurement	Alarms High	Low	Warnings High	Low
Temperature	57.64 C	80.00 C	-5.00 C	75.00 C	0.00 C
Voltage	3.27 V	3.63 V	2.97 V	3.46 V	3.13 V
Current	N/A	N/A	N/A	N/A	N/A
Tx Power	-0.95 dBm	2.99 dBm	-8.01 dBm	1.99 dBm	-7.01 dBm
Rx Power	-1.39 dBm	7.99 dBm	-23.01 dBm	7.99 dBm	-22.21 dBm
Transmit Fault Count	= 0				

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

\*\*\* This QSFP support partial diagnostic data! \*\*\*

```

N9K-9316D#
N9K-9316D# show interface ethernet 1/7 transceiver details
Ethernet1/7
  transceiver is present
  type is QSFP-DD-400G-ZRP-S
  name is FS
  part number is QDD-ZRP-400G
  revision is A
  serial number is CS250308001
  nominal bitrate is 425000 MBit/sec per channel
  cisco id is 24
  cisco extended id number is 22
  firmware version is 2.10
  Link length SMF is 63 km
  Nominal transmitter wavelength is 1547.70 nm
  Wavelength tolerance is 0.015 nm
  host lane count is 8
  media lane count is 1
  max module temperature is 70 deg C
  min module temperature is 0 deg C
  min operational voltage is 3.14 V
  vendor OUI is 0x649d99
  date code is 250226
  clei code is INUIANZEAA
  power class is 8 (> 14 W maximum)
  max power is 23.75 W
  near-end lanes used none
  far-end lane code for 8 lanes Undefined
  media interface is unknown value 0x10
  Advertising code is Optical Interfaces: SMF
  Host electrical interface code is 400GAUI-8 C2M (Annex 120E)

FEC State: FEC cFEC
Optics Status
  Optics Type: QSFP-DD-400G-ZRP-S
  DWDM carrier Info: Frequency: 193.70 THz

Alarm Status
-----
  DAC Rate: 1x1

THRESHOLD VALUES
-----
  Configured Tx Power: -9 dBm
  Modulation Type: 16QAM
  Muxponder Type: 1x400
  Configured CD-MIN: 0 ps/nm   CD-MAX: 0 ps/nm

Lane Number:1 Network Lane
-----
          Current      Alarms      Warnings
          Measurement  High      Low      High      Low
-----
Temperature 57.18 C    80.00 C  -5.00 C  75.00 C   0.00 C
Voltage      3.27 V     3.63 V   2.97 V   3.46 V    3.13 V
Current      N/A        N/A      N/A      N/A       N/A
Tx Power     -0.96 dBm  2.99 dBm -8.01 dBm 1.99 dBm  -7.01 dBm
Rx Power     -1.36 dBm  7.99 dBm -23.01 dBm 7.99 dBm  -22.21 dBm
Transmit Fault Count = 0
-----
Note: ++ high-alarm; + high-warning; -- low-alarm; - low-warning

*** This QSFP support partial diagnostic data! ***
    
```

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