QDD-ZR-400G

OPTICAL TRANSCEIVER MODULE

Scenario Application Test Report (Juniper)

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
Juniper Switch	PTX10001-36MR	5.0.0-64

3.2 Test Sample

Table 3-2: Test Sample

Product ID	P/N	Serial Number
#193135	QDD-ZR-400G	2457WOJWH

4. Test Data

4.1 Test Scenario

Table 4-1: Test Scenario

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.

4.2 Test Result

Table 4-2: Test Result

Test Information	1. Read the switch model name and software version, and read the status of all ports on the switch root@re0> show version Hostname: re0 Model: ptx10001-36mr Junos: 23.4R2-S2.3-EVO Yocto: 3.0.2 Linux Kernel: 5.2.60-yocto-standard-gbbed0c6 JUNOS-EVO OS 64-bit [junos-evo-install-ptx-fixed-x86-64-23.4R2-S2.3-EVO] External Software: JET app aos 5.0.0-64 root@re0> root@re0> show chassis hardware Hardware inventory: Item Version Part number Serial number Description Chassis GH645 JNP10001-36MR [PTX10001-36MR] PSM 0 REV 09 740-073765 1GE2C411433 AC AFO 3000W PSU PSM 1 REV 09 740-073765 1GE2C411518 AC AFO 3000W PSU Routing Engine 0 REV 16 750-100243 BCEB9400 RE-JNP10001-36MR CB 0 REV 33 750-099260 BCEB8902 Control Board FPC 0 BUILTIN BUILTIN FPC-JNP10001-36MR PIC 0 BUILTIN BUILTIN 8X400GE-MR + 4X100GE-MR Xcvr 9 REV 10 740-114884 A2302220026 QSFP56-DD-400G-ZR Xcvr 10 REV 10 740-114884 A2302220027 QSFP56-DD-400G-ZR PIC 1 BUILTIN BUILTIN 8X400GE-MR + 4X100GE-MR PIC 2 BUILTIN BUILTIN 8X400GE-MR + 4X100GE-MR SIB 0 BUILTIN BUILTIN SIB-JNP10001-36MR Fan Tray 0 JNP10001 Fan Tray, Front to Back Airflow - AFO Fan Tray 1 JNP10001 Fan Tray, Front to Back Airflow - AFO Fan Tray 2 JNP10001 Fan Tray, Front to Back Airflow - AFO Fan Tray 3 JNP10001 Fan Tray, Front to Back Airflow - AFO Fan Tray 4 JNP10001 Fan Tray, Front to Back Airflow - AFO Fan Tray 5 JNP10001 Fan Tray, Front to Back Airflow - AFO

```
root@re0> show interfaces et-0/0/9 detail
Physical interface: et-0/0/9, Enabled, Physical link is Up
  Interface index: 1270, SNMP ifIndex: 650, Generation: 631360193912
  Link-level type: Ethernet, MTU: 1514, LAN-PHY mode, Speed: 400Gbps, BPDU Error: None, Loop Detect PDU Error: None, Ethernet-Switching Error: None
  Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Disabled, Media type: Fiber
  Wavelength    : 1531.12 nm, Frequency: 195.800 THz
  Optic-loopback : Disabled , Optic-loopbacktype : nil
  Media Code    : 400ZR, DWDM, amplified
  Host Code     : 400GAUI-8 C2M (Annex 120E)
  Device flags  : Present Running
  Interface flags: SNMP-Traps
  CoS queues    : 8 supported, 8 maximum usable queues
  Hold-times    : Up 0 ms, Down 0 ms
  Damping       : half-life: 0 sec, max-suppress: 0 sec, reuse: 0, suppress: 0, state: unsuppressed
  Current address: 80:43:3f:77:47:26, Hardware address: 80:43:3f:77:47:26
  Last flapped  : 2025-02-19 08:57:45 UTC (00:00:09 ago)
  Statistics last cleared: Never
  Traffic statistics:
   Input  bytes  :                927                 0 bps
   Output bytes  :                921                 0 bps
   Input  packets:                  3                 0 pps
   Output packets:                  3                 0 pps
  Egress queues: 8 supported, 4 in use
  Queue counters:       Queued packets  Transmitted packets     Dropped packets
    0                          0               0               0
    1                          0               0               0
    2                          0               0               0
    3                          3               3               0
  Queue number:         Mapped forwarding classes
    0                   best-effort
    1                   expedited-forwarding
    2                   assured-forwarding
    3                   network-control
  Active alarms  : None
  Active defects : None
  PCS statistics                      Seconds
    Bit errors                          0
    Errored blocks                      0
  Ethernet FEC Mode  :                FEC119
    FEC Codeword size                   544
    FEC Codeword rate                 0.945
  Ethernet FEC statistics             Errors
    FEC Corrected Errors                7832
    FEC Uncorrected Errors                30
    FEC Corrected Errors Rate              3
    FEC Uncorrected Errors Rate            0
  Optic FEC Mode  :                   CFEC
  Optic FEC statistics:
    Corrected Errors                    7269860595
    Uncorrected Words                         39
    Corrected Error rate                602580481
    Uncorrected Error rate                    0
    Corrected Error Ratio (       112 seconds average)  1.40e-03
  PRBS Mode : Disabled
  Interface transmit statistics: Disabled
  Link Degrade :
    Link Monitoring                 :  Disable

  Logical interface et-0/0/9.16386 (Index 1055) (SNMP ifIndex 596) (Generation 631360193913)
    Flags: Up SNMP-Traps Encapsulation: ENET2 DF
  Traffic statistics:
   Input  bytes  :                873
   Output bytes  :               1212
   Input  packets:                  3
   Output packets:                  4
   Local statistics:
    Input  bytes  :                915
    Output bytes  :               1212
    Input  packets:                  3
    Output packets:                  4
   Transit statistics:
    Input  bytes  :                  0              2320 bps
    Output bytes  :                  0                 0 bps
    Input  packets:                  0                 1 pps
    Output packets:                  0                 0 pps
    Protocol multiservice, MTU: Unlimited, Generation: 631360193915, Route table: 0
      Flags: None
```

```
root@re0> show interfaces et-0/0/10 detail
Physical interface: et-0/0/10, Enabled, Physical link is Up
  Interface index: 1269, SNMP ifIndex: 651, Generation: 631360193908
  Link-level type: Ethernet, MTU: 1514, LAN-PHY mode, Speed: 400Gbps, BPDU Error: None, Loop Detect PDU Error: None, Ethernet-Switching Error: None
  Source filtering: Disabled, Flow control: Enabled, Auto-negotiation: Disabled, Media type: Fiber
  Wavelength    : 1531.12 nm, Frequency: 195.800 THz
  Optic-loopback : Disabled , Optic-loopbacktype : nil
  Media Code    : 400ZR, DWDM, amplified
  Host Code     : 400GAUI-8 C2M (Annex 120E)
  Device flags  : Present Running
  Interface flags: SNMP-Traps
  CoS queues    : 8 supported, 8 maximum usable queues
  Hold-times    : Up 0 ms, Down 0 ms
  Damping       : half-life: 0 sec, max-suppress: 0 sec, reuse: 0, suppress: 0, state: unsuppressed
  Current address: 80:43:3f:77:47:30, Hardware address: 80:43:3f:77:47:30
  Last flapped  : 2025-02-19 08:57:46 UTC (00:00:14 ago)
  Statistics last cleared: Never
  Traffic statistics:
   Input  bytes  :                 921                 0 bps
   Output bytes  :                 927                 0 bps
   Input  packets:                   3                 0 pps
   Output packets:                   3                 0 pps
  Egress queues: 8 supported, 4 in use
  Queue counters:       Queued packets  Transmitted packets     Dropped packets
    0                            0               0               0
    1                            0               0               0
    2                            0               0               0
    3                            3               3               0
  Queue number:         Mapped forwarding classes
    0                   best-effort
    1                   expedited-forwarding
    2                   assured-forwarding
    3                   network-control
  Active alarms  : None
  Active defects : None
  PCS statistics                      Seconds
    Bit errors                          0
    Errored blocks                      0
  Ethernet FEC Mode  :                FEC119
    FEC Codeword size                   544
    FEC Codeword rate                 0.945
  Ethernet FEC statistics             Errors
    FEC Corrected Errors                2272
    FEC Uncorrected Errors               141
    FEC Corrected Errors Rate              0
    FEC Uncorrected Errors Rate            0
  Optic FEC Mode  :                   CFEC
  Optic FEC statistics:
    Corrected Errors                    48811948289
    Uncorrected Words                          15
    Corrected Error rate                1169569892
    Uncorrected Error rate                      0
    Corrected Error Ratio (       112 seconds average)  2.86e-03
  PRBS Mode : Disabled
  Interface transmit statistics: Disabled
  Link Degrade :
    Link Monitoring                 :  Disable

  Logical interface et-0/0/10.16386 (Index 1054) (SNMP ifIndex 597) (Generation 631360193909)
    Flags: Up SNMP-Traps Encapsulation: ENET2 DF
  Traffic statistics:
   Input  bytes  :                 867
   Output bytes  :                1220
   Input  packets:                   3
   Output packets:                   4
   Local statistics:
    Input  bytes  :                 909
    Output bytes  :                1220
    Input  packets:                   3
    Output packets:                   4
   Transit statistics:
    Input  bytes  :                   0                 0 bps
    Output bytes  :                   0                 0 bps
    Input  packets:                   0                 0 pps
    Output packets:                   0                 0 pps
    Protocol multiservice, MTU: Unlimited, Generation: 631360193911, Route table: 0
      Flags: None
```

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

```
root@re0> show chassis pic fpc-slot 0 pic-slot 0
FPC slot 0, PIC slot 0 information:
  Type                  8X400GE-MR + 4X100GE-MR
  State                 Online
  PIC version           255.09
  Uptime                  1 day, 7 hours, 10 minutes, 17 seconds

PIC port information:
                  Fiber              Xcvr vendor       Wave-               Xcvr        JNPR     MSA
  Port Cable type     type  Xcvr vendor      part number      length               Firmware      Rev     Version
  9   400G-ZR         SM    FS              740-114884       1528.77 nm - 1567.13 nm   2.11         REV 10   CMIS 5.0
  10   400G-ZR         SM    FS              740-114884       1528.77 nm - 1567.13 nm   2.11         REV 10   CMIS 5.0

Port speed information:

  Port  PFE      Capable Port Speeds
  0     0      1x10G 4x10G 1x40G 4x25G 1x100G 2x50G 8x25G 8x50G 2x100G 1x200G 3x100G 4x100G 2x200G 1x400G
  1     0      1x10G 4x10G 1x40G 4x25G 1x100G 2x50G 8x25G 8x50G 2x100G 1x200G 3x100G 4x100G 2x200G 1x400G
  2     0      1x10G 4x10G 1x40G 4x25G 1x100G 2x50G 8x25G 8x50G 2x100G 1x200G 3x100G 4x100G 2x200G 1x400G
  3     0      1x10G 4x10G 1x40G 4x25G 1x100G 2x50G 8x25G 8x50G 2x100G 1x200G 3x100G 4x100G 2x200G 1x400G
  4     0      1x10G 4x10G 1x40G 4x25G 1x100G
  5     0      1x10G 1x100G
  6     0      1x10G 4x10G 1x40G 4x25G 1x100G
  7     0      1x10G 1x100G
  8     0      1x10G 4x10G 1x40G 4x25G 1x100G 2x50G 8x25G 8x50G 2x100G 1x200G 3x100G 4x100G 2x200G 1x400G
  9     0      1x10G 4x10G 1x40G 4x25G 1x100G 2x50G 8x25G 8x50G 2x100G 1x200G 3x100G 4x100G 2x200G 1x400G
  10    0      1x10G 4x10G 1x40G 4x25G 1x100G 2x50G 8x25G 8x50G 2x100G 1x200G 3x100G 4x100G 2x200G 1x400G
  11    0      1x10G 4x10G 1x40G 4x25G 1x100G 2x50G 8x25G 8x50G 2x100G 1x200G 3x100G 4x100G 2x200G 1x400G
```

3. Read the DDM information of the module

```
root@re0> show interfaces diagnostics optics
Physical interface: et-0/0/9
    Module temperature                          :  50 degrees C / 122 degrees F
    Module voltage                              :  3.252 V
    Module max power                            :  16.5 W
    Wavelength channel number                   :  4
    Wavelength setpoint                         :  1531.12 nm
    Tx dither                                   :  Disabled
    Frequency error                             :  0.00 GHz
    Wavelength error                            :  0 nm
    TEC fault alarm                             :  False
    Wavelength unlocked alarm                   :  False
    Tx tune alarm                               :  False
    Module temperature high alarm               :  Off
    Module temperature low alarm                :  Off
    Module temperature high warning             :  Off
    Module temperature low warning              :  Off
    Module voltage high alarm                   :  Off
    Module voltage low alarm                    :  Off
    Module voltage high warning                 :  Off
    Module voltage low warning                  :  Off
    Module temperature high alarm threshold     :  75 degrees C / 167 degrees F
    Module temperature low alarm threshold      :  -5 degrees C / 23 degrees F
    Module temperature high warning threshold   :  70 degrees C / 158 degrees F
    Module temperature low warning threshold    :  0 degrees C / 32 degrees F
```

Module voltage high alarm threshold : 3.599 V
Module voltage low alarm threshold : 3 V
Module voltage high warning threshold : 3.464 V
Module voltage low warning threshold : 3.134 V
Laser bias current high alarm threshold : 120 mA
Laser bias current low alarm threshold : 80 mA
Laser bias current high warning threshold : 110 mA
Laser bias current low warning threshold : 90 mA
Laser output power high alarm threshold : 0.398 mW / -4.00 dBm
Laser output power low alarm threshold : 0.025 mW / -16.00 dBm
Laser output power high warning threshold : 0.316 mW / -5.00 dBm
Laser output power low warning threshold : 0.031 mW / -15.00 dBm
Laser rx power high alarm threshold : 2.511 mW / 4.00 dBm
Laser rx power low alarm threshold : 0.004 mW / -23.01 dBm
Laser rx power high warning threshold : 1.995 mW / 3.00 dBm
Laser rx power low warning threshold : 0.006 mW / -22.00 dBm
Laser temperature high alarm threshold : 59 degrees C / 138 degrees F
Laser temperature low alarm threshold : 39 degrees C / 102 degrees F
Laser temperature high warning threshold : 54 degrees C / 129 degrees F
Laser temperature low warning threshold : 44 degrees C / 111 degrees F
Lane 0
Laser bias current : 100 mA
Laser output power : 0.125 mW / -9.00 dBm
Laser temperature : 49 degrees C / 120 degrees F
Laser receiver power : 0.112 mW / -9.48 dBm
Rx power (signal) : 0.09 mW / -10.61 dBm
Lane chromatic dispersion : 0.0 ps/nm
Lane differential group delay : 1.6 ps
Lane carrier frequency offset : -47.0 MHz
Lane polarization dependent loss : 0.1 dB
Lane snr : 16.4 dB
Lane Optical signal-to-noise ratio : 31.7 dB
Lane sopmd : 31.8
Laser bias current high alarm : Off
Laser bias current low alarm : Off
Laser bias current high warning : Off
Laser bias current low warning : Off
Laser temperature high alarm : Off
Laser temperature low alarm : Off
Laser temperature high warning : Off
Laser temperature low warning : Off
Laser receiver power high alarm : Off
Laser receiver power low alarm : Off
Laser receiver power high warning : Off
Laser receiver power low warning : Off
Laser output power high alarm : Off
Laser output power low alarm : Off
Laser output power high warning : Off
Laser output power low warning : Off
Tx loss of signal functionality alarm : Off
Rx loss of signal alarm : Off
Tx laser disabled alarm : Off

```
Physical interface: et-0/0/10
    Module temperature                  : 47 degrees C / 116 degrees F
    Module voltage                      : 3.253 V
    Module max power                    : 16.5 W
    Wavelength channel number           : 4
    Wavelength setpoint                 : 1531.12 nm
    Tx dither                           : Disabled
    Frequency error                     : 0.00 GHz
    Wavelength error                    : 0 nm
    TEC fault alarm                     : False
    Wavelength unlocked alarm           : False
    Tx tune alarm                       : False
    Module temperature high alarm       : Off
    Module temperature low alarm        : Off
    Module temperature high warning     : Off
    Module temperature low warning      : Off
    Module voltage high alarm           : Off
    Module voltage low alarm            : Off
    Module voltage high warning         : Off
    Module voltage low warning          : Off
    Module temperature high alarm threshold  : 75 degrees C / 167 degrees F
    Module temperature low alarm threshold   : -5 degrees C / 23 degrees F
    Module temperature high warning threshold: 70 degrees C / 158 degrees F
    Module temperature low warning threshold : 0 degrees C / 32 degrees F
    Module voltage high alarm threshold      : 3.599 V
    Module voltage low alarm threshold       : 3 V
    Module voltage high warning threshold    : 3.464 V
    Module voltage low warning threshold     : 3.134 V
    Laser bias current high alarm threshold  : 120 mA
    Laser bias current low alarm threshold   : 80 mA
    Laser bias current high warning threshold: 110 mA
    Laser bias current low warning threshold : 90 mA
    Laser output power high alarm threshold  : 0.398 mW / -4.00 dBm
    Laser output power low alarm threshold   : 0.025 mW / -16.00 dBm
    Laser output power high warning threshold: 0.316 mW / -5.00 dBm
    Laser output power low warning threshold : 0.031 mW / -15.00 dBm
    Laser rx power high alarm threshold      : 2.511 mW / 4.00 dBm
    Laser rx power low alarm threshold       : 0.004 mW / -23.01 dBm
    Laser rx power high warning threshold    : 1.995 mW / 3.00 dBm
    Laser rx power low warning threshold     : 0.006 mW / -22.00 dBm
    Laser temperature high alarm threshold   : 59 degrees C / 138 degrees F
    Laser temperature low alarm threshold    : 39 degrees C / 102 degrees F
    Laser temperature high warning threshold : 54 degrees C / 129 degrees F
    Laser temperature low warning threshold  : 44 degrees C / 111 degrees F
```

	Lane 0 Laser bias current : 100 mA Laser output power : 0.127 mW / -8.95 dBm Laser temperature : 49 degrees C / 120 degrees F Laser receiver power : 0.122 mW / -9.11 dBm Rx power (signal) : 0.12 mW / -9.04 dBm Lane chromatic dispersion : 0.0 ps/nm Lane differential group delay : 1.5 ps Lane carrier frequency offset : 73.0 MHz Lane polarization dependent loss : 0.4 dB Lane snr : 15.8 dB Lane Optical signal-to-noise ratio : 30.7 dB Lane sopmd : 44.2 Laser bias current high alarm : Off Laser bias current low alarm : Off Laser bias current high warning : Off Laser bias current low warning : Off Laser temperature high alarm : Off Laser temperature low alarm : Off Laser temperature high warning : Off Laser temperature low warning : Off Laser receiver power high alarm : Off Laser receiver power low alarm : Off Laser receiver power high warning : Off Laser receiver power low warning : Off Laser output power high alarm : Off Laser output power low alarm : Off Laser output power high warning : Off Laser output power low warning : Off Tx loss of signal functionality alarm : Off Rx loss of signal alarm : Off Tx laser disabled alarm : Off
Test Conclusion	After completing the above test content, all the test information should be copied and pasted into a TXT document.
Remarks	/