

IntegraOptics Pluggables Operability and Compatibility Testing

Testing was completed in Integra's Lab

Devices Under Test

Integra Part Number	OEM Compatible Part Number	Platform Tested	Product Description
QSFP-100G-LR4-S-IO	QSFP-100G-LR4-S	Nexus 9K	QSFP28, 1310nm, LR4 SMF 10km, 100G DDM, Cisco QSFP-100G-LR4-S Compatible

Responsible Engineers

Name	Email	Organization
Ryan Soler	rsoler@integraoptics.com	Integra

Results Overview

Integra Part Number	OEM	Recognition	Error/Alarm	Link	Compatibility Certified
QSFP-100G-LR4-S-IO	QSFP-100G-LR4-S	PASS	PASS	PASS	PASS

Standard Compatibility Test Plan

The IntegraOptics' standard test plan consists of installing transceivers into the required lab elements with their interfaces configured appropriately. Each device then undergoes the following procedure to determine OEM compatibility as well as to verify correct operating performance. All IntegraOptics' transceivers must receive a "pass" rating on each of the below criteria for 100% compatible certification and subsequent GA release.

1. Initial plug in observations

- a. *Verify laser turn on – Laser turn on is typically used as a quick indicator of a transceivers compatibility.*
 - i. *Upon insertion, the transmitter light levels shall be recorded*
- b. *Observe system for error free operation – Errors consist of anomalies that severely impact a transceivers operation. Issues that may flag errors include:*
 - i. *I2C Communication Failures*
 - ii. *Electrical and/or Pin Timing Issues*
 - iii. *Code Issues resulting in host rejection and/or disabled interfaces*
 - iv. *Critical deviations from optical or electrical operating specifications*
- c. *Verify Host Recognition – Host recognition consists of determining if a part is recognized correctly. Successful recognition indicates a transceiver is communicating correctly with the host device. Parameters directly observed include:*
 - i. *Revision, Serial Number, and OEM Part ID*
 - ii. *Vendor Name and Vendor Part Number*

2. CLI Performance Observation

- a. *Observe Alarms and Warnings – General alarms consist of warnings indicating a transceiver is operating out of spec or indicates operation may not be error free, this test is typically performed using an appropriately attenuated fiber loop or active connection to another device. Issues that may flag alarms include:*
 - i. *Operation at an undesirable bit error rate or errored seconds*
 - ii. *DDM related alarms, operation above or below alarm thresholds for:*
 - *Transmit Power and Laser Bias*
 - *Receive Power*
 - *Temperature*
 - *Voltage*

Compatibility Test #1: QSFP-100G-LR4-S-IO

Results:

1. Initial Plugin Observations
 - a. Verify Laser Turn On
 - i. Result: **Pass**
 - b. Observe System Error Free Operation
 - i. Errors: None
 - ii. Link: **Pass**
 - iii. Result: **Pass**
 - c. Verify Host Recognition
 - i. Revision, Serial Number, and OEM Part ID. Result: **Pass**
 - ii. Vendor Name and Vendor Part Number. Result: **Pass**
2. CLI Performance Observations
 - a. Observe Alarms and Warnings
 - i. Alarms: None
 - ii. Result: **Pass**
 - b. Observe Alarm Thresholds
 - i. Result: **Pass**

```

Eth1/46      --      xcvrAbsen 1      auto      auto      --
Eth1/47      --      xcvrAbsen 22     auto      auto      --
Eth1/48      --      xcvrAbsen 1      auto      auto      --
Eth1/49      --      xcvrAbsen 1      auto      40G      --
Eth1/50      --      connected 1      full      100G     QSFP-100G-LR4-S
Eth1/51      --      xcvrAbsen 1      auto      40G      --
Eth1/52      --      connected 1      full      100G     QSFP-100G-SR4-S
Eth1/53      --      xcvrAbsen 1      auto      40G      --
Eth1/54      --      xcvrAbsen 1      auto      auto      --
Po20         --      noOperMem 1      auto      25G      --
Vlan1        --      down      routed      auto      auto      --

```

```

NAME: Ethernet1/50,  DESCR: CISCO-INTEGRA
PID: QSFP-100G-LR4-S      ,  VID: QSFP100GLR4S-IO,  SN: EOQK4R270728

NAME: Ethernet1/52,  DESCR: CISCO-INTEGRA
PID: QSFP-100G-SR4-S      ,  VID: QSFP100GSR4S-IO,  SN: EOQKCL410001

```

```

Ethernet1/50
  transceiver is present
  type is QSFP-100G-LR4-S
  name is CISCO-INTEGRA
  part number is QSFP100GLR4S-IO
  revision is 01
  serial number is EOQK4R270728
  nominal bitrate is 25500 MBit/sec per channel
  Link length supported for 9/125um fiber is 10 km
  cisco id is 17
  cisco extended id number is 30
  cisco part number is 10-3146-01
  cisco product id is QSFP-100G-LR4-S

```

Lane Number:1 Network Lane

SFP Detail Diagnostics Information (internal calibration)

	Current Measurement	Alarms		Warnings	
		High	Low	High	Low
Temperature	36.42 C	75.00 C	-5.00 C	70.00 C	0.00 C
Voltage	3.18 V	3.63 V	3.04 V	3.46 V	3.13 V
Current	85.19 mA	110.00 mA	10.00 mA	105.00 mA	15.00 mA
Tx Power	0.45 dBm	5.49 dBm	-5.30 dBm	4.49 dBm	-4.30 dBm
Rx Power	-0.73 dBm	5.49 dBm	-11.61 dBm	4.49 dBm	-10.60 dBm
Transmit Fault Count = 0					

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

	Current Measurement	Alarms		Warnings	
		High	Low	High	Low
Temperature	36.42 C	75.00 C	-5.00 C	70.00 C	0.00 C
Voltage	3.18 V	3.63 V	3.04 V	3.46 V	3.13 V
Current	85.19 mA	110.00 mA	10.00 mA	105.00 mA	15.00 mA
Tx Power	1.78 dBm	5.49 dBm	-5.30 dBm	4.49 dBm	-4.30 dBm
Rx Power	0.75 dBm	5.49 dBm	-11.61 dBm	4.49 dBm	-10.60 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		Warnings	
		High	Low	High	Low
Temperature	36.42 C	75.00 C	-5.00 C	70.00 C	0.00 C
Voltage	3.18 V	3.63 V	3.04 V	3.46 V	3.13 V
Current	85.40 mA	110.00 mA	10.00 mA	105.00 mA	15.00 mA
Tx Power	1.98 dBm	5.49 dBm	-5.30 dBm	4.49 dBm	-4.30 dBm
Rx Power	0.78 dBm	5.49 dBm	-11.61 dBm	4.49 dBm	-10.60 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		Warnings	
		High	Low	High	Low
Temperature	36.42 C	75.00 C	-5.00 C	70.00 C	0.00 C
Voltage	3.18 V	3.63 V	3.04 V	3.46 V	3.13 V
Current	85.00 mA	110.00 mA	10.00 mA	105.00 mA	15.00 mA
Tx Power	1.42 dBm	5.49 dBm	-5.30 dBm	4.49 dBm	-4.30 dBm
Rx Power	0.49 dBm	5.49 dBm	-11.61 dBm	4.49 dBm	-10.60 dBm
Transmit Fault Count = 0					

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