



About Single Fiber Transceivers

Single fiber transceivers look like the typical transceivers but have only one connector. Instead of transmitting on one fiber and receiving on another fiber strand using the same wavelength, single fiber parts, called bi-directional or “Bi-Di,” transmit and receive on the same fiber strand using different wavelengths. This technology allows customers to experience a lower fiber cost for their installed services.

Purpose of This Test Plan

The purpose of this test plan is to illustrate to customers how to test single fiber transceivers and confirm their operation. These units are tested at Champion ONE prior to their shipment, but some customers may prefer a re-test on site.

The Following Units are Covered by This Document;

1000X31B40S, 1000X55B40S
1000SFP31B20L, 1000SFP49B20L
1000SFP31B40L, 1000SFP55B40L
1000SFP49B80L, 1000SFP59B80L

Items Needed to Perform Tests

Optical Power Meter for measuring light levels at the 1310nm, 1550nm, 1490nm, and 1590nm wavelengths

Fiber patch cords with SC and LC connectors for the transceivers and the appropriate connector for the power meter and Variable Optical Attenuator.

Fiber cleaning kit

Variable Optical Attenuator (VOA) and two available ports for testing the receive side



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TEST PLAN FOR SINGLE FIBER TRANSCEIVERS

Champion ONE

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STEP 1

Locate the part numbers of the transceivers you are testing in the tables below. These tables contain the wavelength, transmit, and receive values you'll need to confirm.

Single Fiber GBIC Compatibility Matrix

40 KM Rated GBIC	UPSTREAM	DOWNSTREAM
Single Fiber P/N	1000X31B40S	1000X55B40S
Kit P/N (incl. 1 of each wavelength)	1000X3155B40S-KIT	
Laser Type	Class 1 laser at 1310nm Tx	Class 1 laser at 1550nm Tx
Min, Max Output Power	-3, 2 dBm	-3, 2 dBm
Max Receive Sensitivity	-23 dBm	-23 dBm
Link Budget	20 dB (.5 dB/km 1310nm Tx source)	
Equiv. Duplex P/N	1000SX (550m Multimode), 1000LX (10km Single Mode), ELX (40km Single Mode)	
Connector/H x W x D	Single SC connector, side tabs/ 10 x 30 x 28 mm	

Single Fiber SFP Compatibility Matrix

20KM Rated SFP	UPSTREAM	DOWNSTREAM
Single Fiber P/N	1000SFP31B20L	1000SFP49B20L
Kit P/N (incl. 1 of each wavelength)	1000SFP3149B20L-KIT	
Laser Type	Class 1 DFB laser at 1310nm Tx	Class 1 DFB laser at 1490nm Tx
Min, Max Output Power	-7, -1 dBm	-7 -1 dBm
Min, Max Receive Sensitivity	0, -22 dBm	0, -22 dBm
Link Budget	15 dB (Expected 0.5 dB/km 1310nm Tx source, 3 dB insertion loss)	
Equiv. Duplex P/N	1000SFP055 (550m Multimode), 1000SFP10 (10km Single Mode)	
Connector/H x W x D	Single LC connector, pull hasp / 8.5 x 13.6 x 56.4 mm	

40KM Rated SFP	UPSTREAM	DOWNSTREAM
Single Fiber P/N	1000SFP31B40L	1000SFP55B40L
Kit P/N (incl. 1 of each wavelength)	1000SFP3155B40L-KIT	
Laser Type	Class 1 DFB laser at 1310nm Tx	Class 1 DFB laser at 1550nm Tx
Min, Max Output Power	-5, 0 dBm	-5, 0 dBm
Min, Max Receive Sensitivity	0, -22 dBm	0, -22 dBm
Link Budget	17 dB (Expected 0.5 dB/km 1310nm Tx source, 3 dB insertion loss)	
Equiv. Duplex P/N	1000SFP055 (550m Multimode), 1000SFP10 (or 40) (10km Single Mode)	
Connector/H x W x D	Single LC connector, pull hasp / 8.5 x 13.6 x 56.4 mm	

80KM Rated SFP	UPSTREAM	DOWNSTREAM
Single Fiber P/N	1000SFP49B80L	1000SFP59B80L
Kit P/N (incl. 1 of each wavelength)	1000SFP4959B80L-KIT	
Laser Type	Class 1 laser at 1490nm Tx	Class 1 laser at 1590nmTx
Min, Max Output Power	-2, 3 dBm	-2, 3 dBm
Min, Max Receive Sensitivity	-7, -27 dBm	-7, -27 dBm
Link Budget	25 dB (Expected 0.20 - 25 dB/km 1550nm Tx source, 3 dB insertion loss)	
Equiv. Duplex P/N	1000SFP055 (550m Multimode), 1000SFP10 (10km Single Mode), 1000SFP40 or 80 (40 or 80km Single Mode)	
Connector/H x W x D	Single LC connector, pull hasp / 8.5 x 13.6 x 56.4 mm	



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STEP 2

Provision the port the transceiver is going to plug into. After completion, place the transceiver into this port.

STEP 3

Select the appropriate fiber patch cord and then clean it. (GBICs require SC connectors and SFPs require LC connectors). Connect the fiber patch cord to the optical power meter. Set the optical power meter to the wavelength of the transceiver under test (this information can be retrieved from the above tables).

STEP 4

Place the other end of the fiber patch cord into the transceiver under test, measure the light level, and record below. If the light level is NOT within range of the above listed specification, try cleaning the fiber patch cord again.

Part Number _____

Transmit Level _____

STEP 5

Locate the part number of the remaining transceiver in the tables above, set the optical power meter to the assigned wavelength, and measure its light level. If the light level is NOT within the specified range, try cleaning the fiber patch cord again. Record the reading below.

Part Number _____

Transmit Level _____

STEP 6

When an acceptable level is measured on both transceivers in the kit, the transmitter testing is completed. Contact Champion ONE if you experience difficulties with the transmit levels. The receiver testing remains to be completed.



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STEP 7

Proceed to test the receivers. Plug both transceivers into pre-provisioned ports. Check the receiver specs in the tables above in order to determine the amount of initial attenuation that may be required. Set the VOA for the initial amount of attenuation. Using fiber patch cords, connect the VOA in series with the two transceivers. Both ports should display link lights or the “Up/Up” status. Slowly increase the attenuation on the VOA until the ports display errors, lose Link status, or move to “Down” status. The amount of attenuation added when compared to the transmitter light level is a measure of the receiver’s sensitivity. Record the sensitivity of the receivers below.

Part Number _____

Receiver Sensitivity _____

Part Number _____

Receiver Sensitivity _____

Contact Champion ONE if you encounter problems with the receivers’ sensitivity.