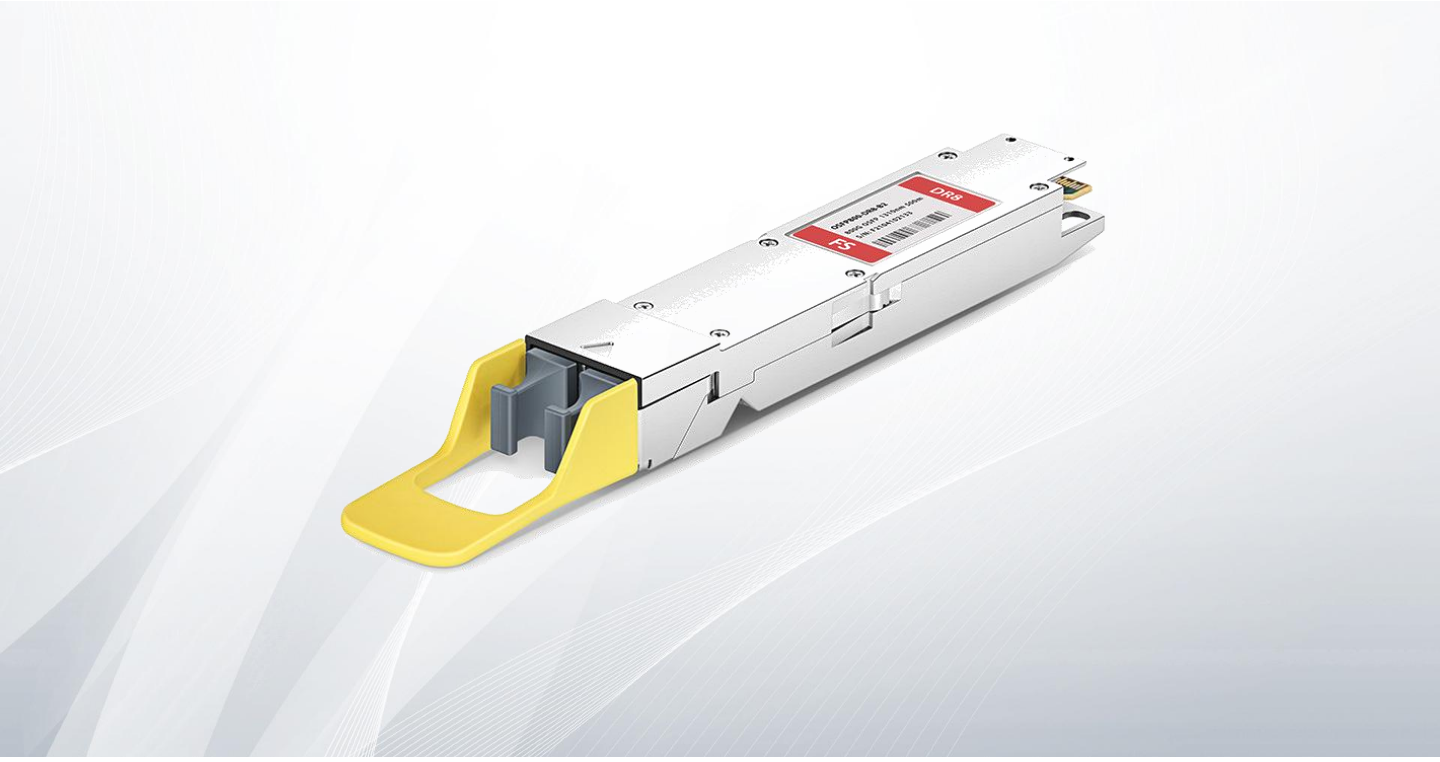
800GBASE-PLR8 OSFP 1310nm 10km Dual MTP/MPO-12 Transceiver

OSFP800-PLR8-B2



Application

- 800G Ethernet
- Data Center
- Breakout 2x 400G PLR4
- Breakout 8x 100G LR

Features

- Maximum Power Consumption 16.5W
- 8x106.25 Gb/s PAM4 Modulation
- Single 3.3V Power Supply
- Operating Case Temperature Range: 0 to +70°C
- Two Wire Serial Interface with Digital Diagnostic Monitoring
- Class 1 Laser Safety

Standards

- Compliant with IEEE 802.3cu-2021
  -8x100GBASE-LR1 Optical Interface
- Compliant with IEEE P802.3ck D3.0
  -8x100GAUI-1 C2M Electrical Interface
- Compliant with OSFP MSA HW Rev 4.1
  -Type 2 Housing with Dual MPO-12 Connector
- Compliant with CMIS Rev 5.0

Description

FS's 800GBASE-PLR8 OSFP transceiver supports up to 10km link lengths over single-mode fiber (SMF) via dual MTP/MPO-12 connectors. This transceiver is compliant with IEE802.3ck, IEEE 802.3cu and OSFP MSA standards. The built-in digital diagnostics monitoring (DDM) allows access to real-time operating parameters. It is suitable for Breakout 2x 400G PLR4 or 8x 100G LR, 800G Ethernet and Data Center Applications.

Products Specifications

I. Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	T_S	-40	85	ºC
Supply Voltage	V_{CC}	-0.5	3.6	V
Relative Humidity (Non-condensing)	RH	5	95	%
DataInput Voltage Differential	$\lvert V_{DIP}-V_{DIN}\rvert$		1	V
Control Input Voltage	V_I	-0.3	V_{CC}+0.5	V
Control Output Current	I_O	-20	20	mA

II. Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Operating Case Temperature	T_{OPR}	0		70	ºC
Power Supply Voltage	V_{CC}	3.135	3.3	3.465	V
Instantaneous Peak Current at Hot Plug	I_{CC_IP}			TBD	mA
Sustained Peak Current at Hot Plug	I_{CC_SP}			TBD	mA
Maximum Power Dissipation	P_D			16.5	W
Maximum Power Dissipation, Low Power Mode	P_{DLP}			2	W
Signalling Speed per Lane	DRL		53.125		GBd
Control Input Voltage High	V_{IH}	V_{CC}*0.7		V_{CC}+0.3	V
Control Input Voltage Low	V_{IL}	-0.3		V_{CC}*0.3	V
Two Wire Serial Interface Clock Rate				400	kHz
Power Supply Noise 1 kHz -1 MHz (p-p)				66	mVpp
Operating Distance		2		10000	m

III. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Transmitter						
Wavelength	λ_C	1304.5	1311	1317.5	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power, each Lane	AOP_L	-1.9		4.8	dBm	1
Outer Optical Modulation Amplitude (OMAouter), each Lane for TDECQ<1.4dB for1.4dB<= TDECQ<=3.4dB	OMA_{outer}	1.1 −0.3+TDECQ		5	dBm	
Transmitter and Dispersion Eye Closure for PAM4 (TDECQ), each Lane	TDECQ			3.4	dB	
Transmitter Eye Closure for PAM4 (TECQ), each Lane	TECQ			3.4	dB	
|TDECQ-TECQ|				2.5	dB	
Over/Under-shoot				22	%	
Transmitter Power Excursion				2.8	dBm	
Average Launch Power of OFF Transmitter, each Lane	T_{OFF}			-15	dBm	
Extinction Ratio	ER	3.5			dB	
Transmitter Transition Time	Tr			17	ps	
$RIN_{15.6}OMA$	RIN			-136	dB/Hz	
Optical Return Loss Tolerance	ORL			15.6	dB	
Transmitter Reflectance	TR			-26	dB	2

Parameter	Symbol	Min.	Typical	Max.	Unit	Notes
Receiver						
Wavelength	λ_{C0}	1304.5	1311	1317.5	nm	
Damage Threshold, each Lane	AOP_D	5.8			dBm	
Average Receive Power, each Lane	AOP_R	-8.2		4.8	dBm	
Receive Power (OMAouter), each Lane	OMA_R			5	dBm	
Receiver Reflectance	RR			-26	dB	
Receiver Sensitivity (OMAouter) for TECQ<1.4 dB for 1.4dB<=TECQ<=3.4dB	S_{OMA}			–6.1 –7.5+TECQ	dBm	3
Stressed Receiver Sensitivity (OMAouter), each Lane	SRS			-4.1	dBm	4
Conditions of Stressed Receiver Sensitivity Test						
Stressed Eye Closure for PAM4 (SECQ), Lane Under Test	SECQ		3.4		dB	

NOTE 1: Average launch power, each lane (min) is informative and not the principal indicator of signal strength.

NOTE 2: Transmitter reflectance is defined looking into the transmitter.

NOTE 3: Receiver sensitivity (OMAouter), each lane (max) is informative and is defined for a transmitter with a value of SECQ up to 3.4 dB.

NOTE 4: Measured with conformance test signal at TP3 for the BER = 2.4×10^{-4}.

IV. Electrical Characteristics

1. Electrical Specification High Speed Signal (Compliant with IEEE802.3ck C2M)

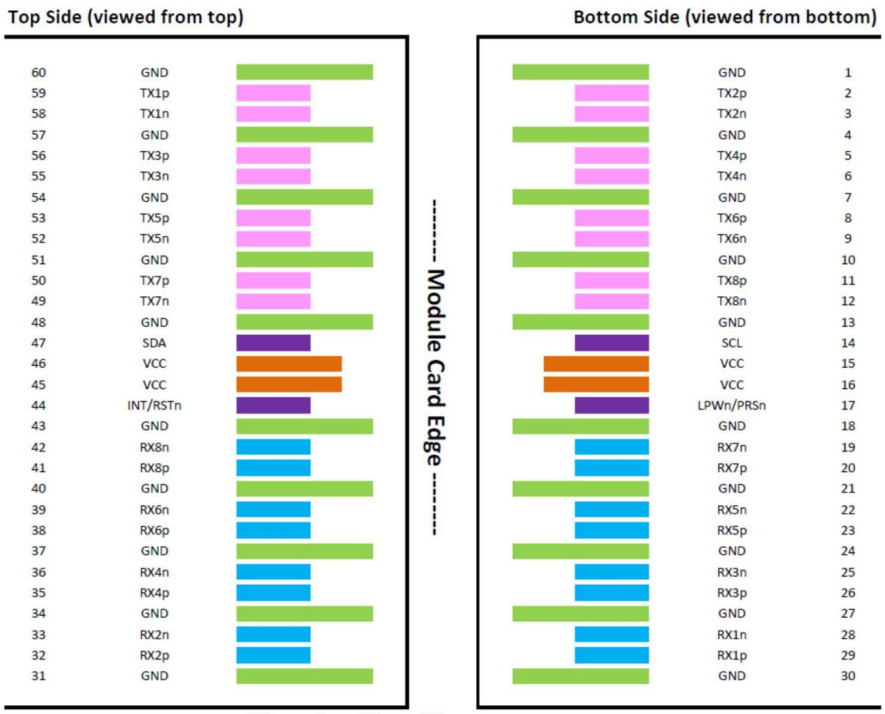
Parameter	Symbol	Min.	Typical	Max.	Unit
Receiver (Module Output, TP4)					
AC Common-mode Output Voltage (RMS)				25	mV
Differential Peak-to-peak Output Voltage **Short Mode**				600	mV
Differential Peak-to-peak Output Voltage **Long Mode**				845	mV
Eye Height	EH	15			mV
Vertical Eye Closure	VEC			12	dB
Common-mode to Differential-mode Return Loss	RLD_C		802.3ck 120G-1		dB
Effective Return Loss	ERL	8.5			dB
Differential Termination Mismatch				10	%
Transition Time		8.5			ps
DC Common-mode Voltage Tolerance		-0.35		2.85	V
Transmitter (Module Input, TP1)					
Differential Pk-pk Input Voltage Tolerance (TP1a)		750			mV
AC Common-mode RMS Voltage Tolerance (TP1a)		25			mV
Differential-mode to Common-mode Return Loss	RL_{cd}		802.3ck 120G-2		dB
Effective Return Loss	ERL	8.5			dB

Parameter	Symbol	Min.	Typical	Max.	Unit
Differential Termination Mismatch				10	%
Single-ended Voltage Tolerance Range		-0.4		3.3	V
DC Common-mode Voltage Tolerance		-0.35		2.85	V

2. Electrical Specification Low Speed Control and Sense Signals(Compliant with QSFP-DD HW Rev6.01 Table 14)

Parameter	Symbol	Min.	Max.	Unit
Module Output SCL and SDA	V_{OL}	0	0.4	V
Module Input SCL and SDA	V_{IL}	-0.3	V_{CC}*0.3	V
	V_{IH}	V_{CC}*0.7	V_{CC}+0.5	V
InitMode, ResetL and ModSelL	V_{IL}	-0.3	0.8	V
	V_{IH}	2	V_{CC}+0.3	V
IntL	V_{OL}	0	0.4	V
	V_{OH}	V_{CC}-0.5	V_{CC}+0.3	V

V. Pin Description



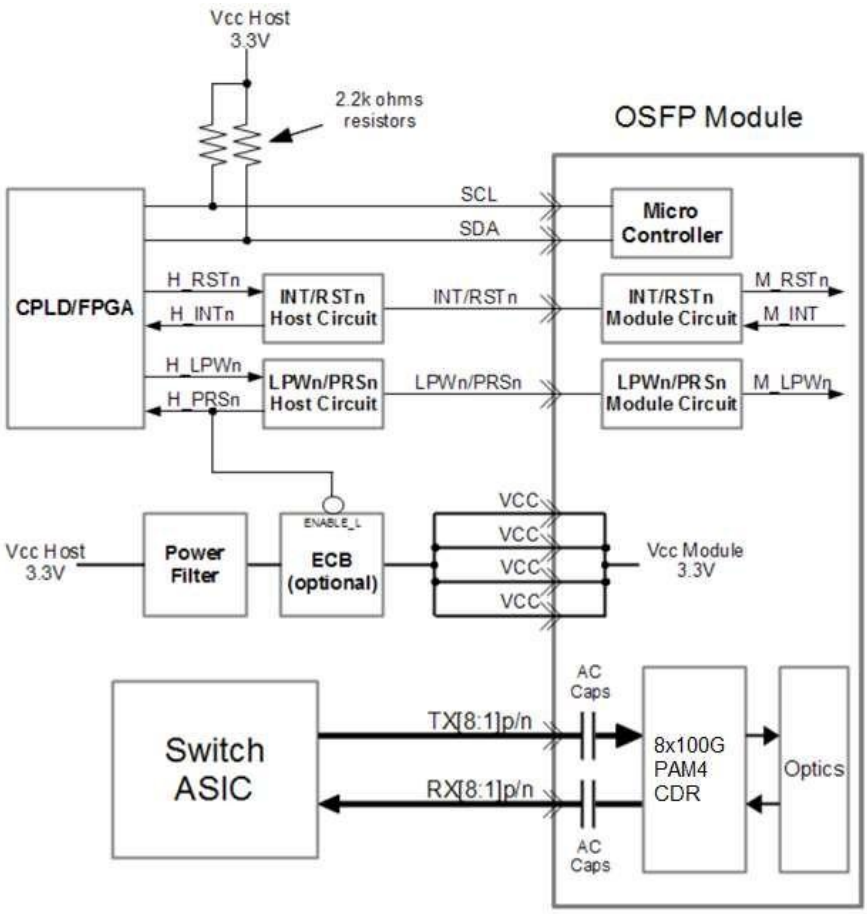
Pin	Symbol	Description	Logic
1	GND	Ground	
2	TX2p	Transmitter Data Non-Inverted	CML-I
3	TX2n	Transmitter Data Inverted	CML-I
4	GND	Ground	
5	TX4p	Transmitter Data Non-Inverted	CML-I
6	TX4n	Transmitter Data Inverted	CML-I
7	GND	Ground	
8	TX6p	Transmitter Data Non-Inverted	CML-I
9	TX6n	Transmitter Data Inverted	CML-I

Pin	Symbol	Description	Logic
10	GND	Ground	
11	TX8p	Transmitter Data Non-Inverted	CML-I
12	TX8n	Transmitter Data Inverted	CML-I
13	GND	Ground	
14	SCL	2-wire Serial Interface Clock	LVCMOS-I/O
15	V_{CC}	+3.3V Power	
16	V_{CC}	+3.3V Power	
17	LPWn/PRSn	Low-Power Mode/Module Present	Multi-Level
18	GND	Ground	
19	RX7n	Receiver Data Inverted	CML-O
20	RX7p	Transmitter Data Non-Inverted	CML-O
21	GND	Ground	
22	RX5n	Receiver Data Inverted	CML-O
23	RX5p	Receiver Data Non-Inverted	CML-O
24	GND	Ground	
25	RX3n	Receiver Data Inverted	CML-O
26	RX3p	Receiver Data Non-Inverted	CML-O
27	GND	Ground	

Pin	Symbol	Description	Logic
28	RX1n	Receiver Data Inverted	CML-O
29	RX1p	Receiver Data Non-Inverted	CML-O
30	GND	Ground	
31	GND	Ground	
32	RX2p	Receiver Data Non-Inverted	CML-O
33	RX2n	Receiver Data Inverted	CML-O
34	GND	Ground	
35	RX4p	Receiver Data Non-Inverted	CML-O
36	RX4n	Receiver Data Inverted	CML-O
37	GND	Ground	
38	RX6p	Receiver Data Non-Inverted	CML-O
39	RX6n	Receiver Data Inverted	CML-O
40	GND	Ground	
41	RX8p	Receiver Data Non-Inverted	CML-O
42	RX8n	Receiver Data Inverted	CML-O
43	GND	Ground	
44	INT/RSTn	Module Interrupt/Module Reset	Multi-Level
45	V_{CC}	3.3V Power	

Pin	Symbol	Description	Logic
46	V_{CC}	3.3VPower	
47	SDA	2-wire Serial Interface Data	LVCMOS-I/O
48	GND	Ground	
49	TX7n	Transmitter Data Inverted	CML-I
50	TX7p	Transmitter Data Non-Inverted	CML-I
51	GND	Ground	
52	TX5n	Transmitter Data Inverted	CML-I
53	TX5p	Transmitter Data Non-Inverted	CML-I
54	GND	Ground	
55	TX3n	Transmitter Data Inverted	CML-I
56	TX3p	Transmitter Data Non-Inverted	CML-I
57	GND	Ground	
58	TX1n	Transmitter Data Inverted	CML-I
59	TX1p	Transmitter Data Non-Inverted	CML-I
60	GND	Ground	

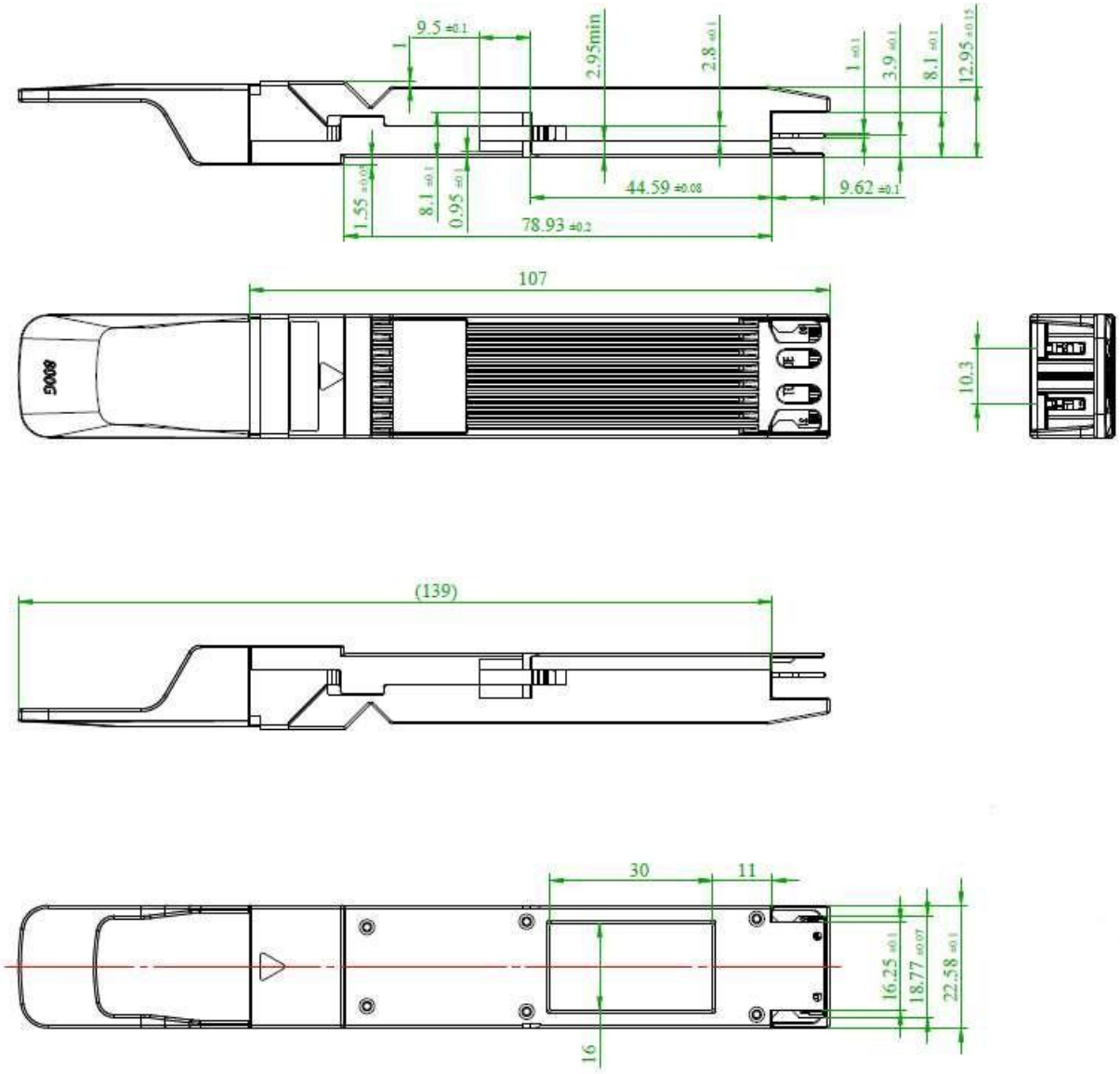
VI. Recommended OSFP Host Board Schematic



VII. Digital Diagnostic Functions

Parameter	Range	Accuracy	Unit	Calibration
Temperature	0 to 70	±3	ºC	Internal
Voltage	0 to V_{CC}	0.1	V	Internal
Tx Bias Current (each Lane)	0 to 100	10%	mA	Internal
Tx Output Power (each Lane)	-1.9 to +4.8	±3	dB	Internal
Rx Receive Power (each Lane)	-8.2 to +4.8	±3	dB	Internal

VIII. Diagram Mechanial Drawing

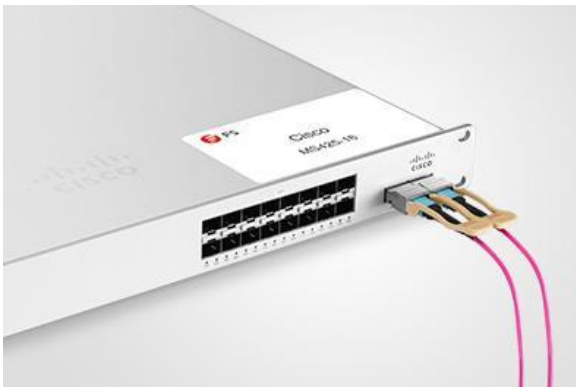


Test Center

I. Compatibility Testing

Each fiber optical transceiver has been tested in host device on site in FS Assured Program to ensure full compatibility with over 200 vendors.

Cisco Catalyst C9500-24Y4C



Cisco MS425-16

Brocade VDX 6940-144S

Dell EMC Networking Z9100-ON

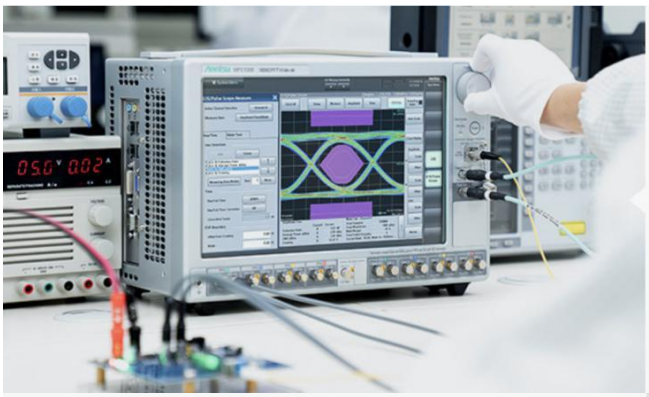
Force⑩tm S60-44T

HUAWEI S6720-30L-HI-24S

Above is part of our test bed network equipment. For more information, please click the Test Bed PDF. It will be updated in real time as we expand our portfolio.

II. Performance Testing

Each fiber optical transceiver has been fully tested in FS Assured Program equipped with world's most advanced analytical equipment to ensure that our transceivers work perfectly on your device.



1. TX/RX Signal Quality Testing

Equipped with the all-in-one tester integrated 4ch BERT & sampling oscilloscope, and variable optical attenuator to ensure the input and output signal quality.

- Eye Pattern Measurements: Jitter, Mask Margin, etc
- Average Output Power
- OMA
- Extinction Ratio
- Receiver Sensitivity
- BER Curve

2. Reliability and Stability Testing

Subject the transceivers to dramatic changes in temperature on the thermal shock chamber to ensure reliability and stability of the transceivers.

- Commercial: 0 °C to 70 °C
- Extended: -5 °C to 85 °C
- Industrial: -40 °C to 85 °C

3. Transfer Rate and Protocol Testing

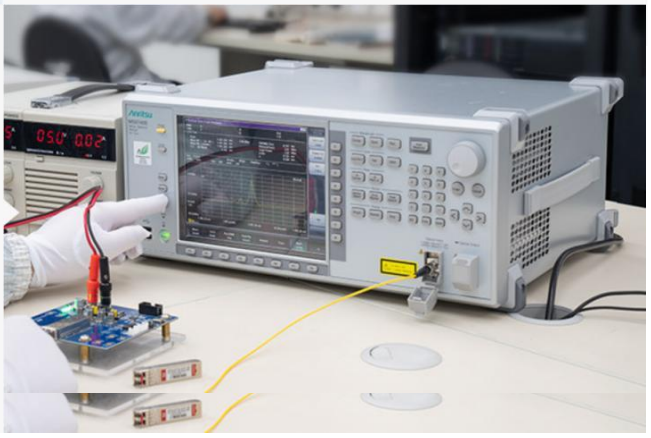
Test the actual transfer data rate and the transmission ability under different protocols with Network Master Pro.

- Ethernet
- Fibre Channel
- SDH/SONET
- CPRI

4. Optical Spectrum Evaluation

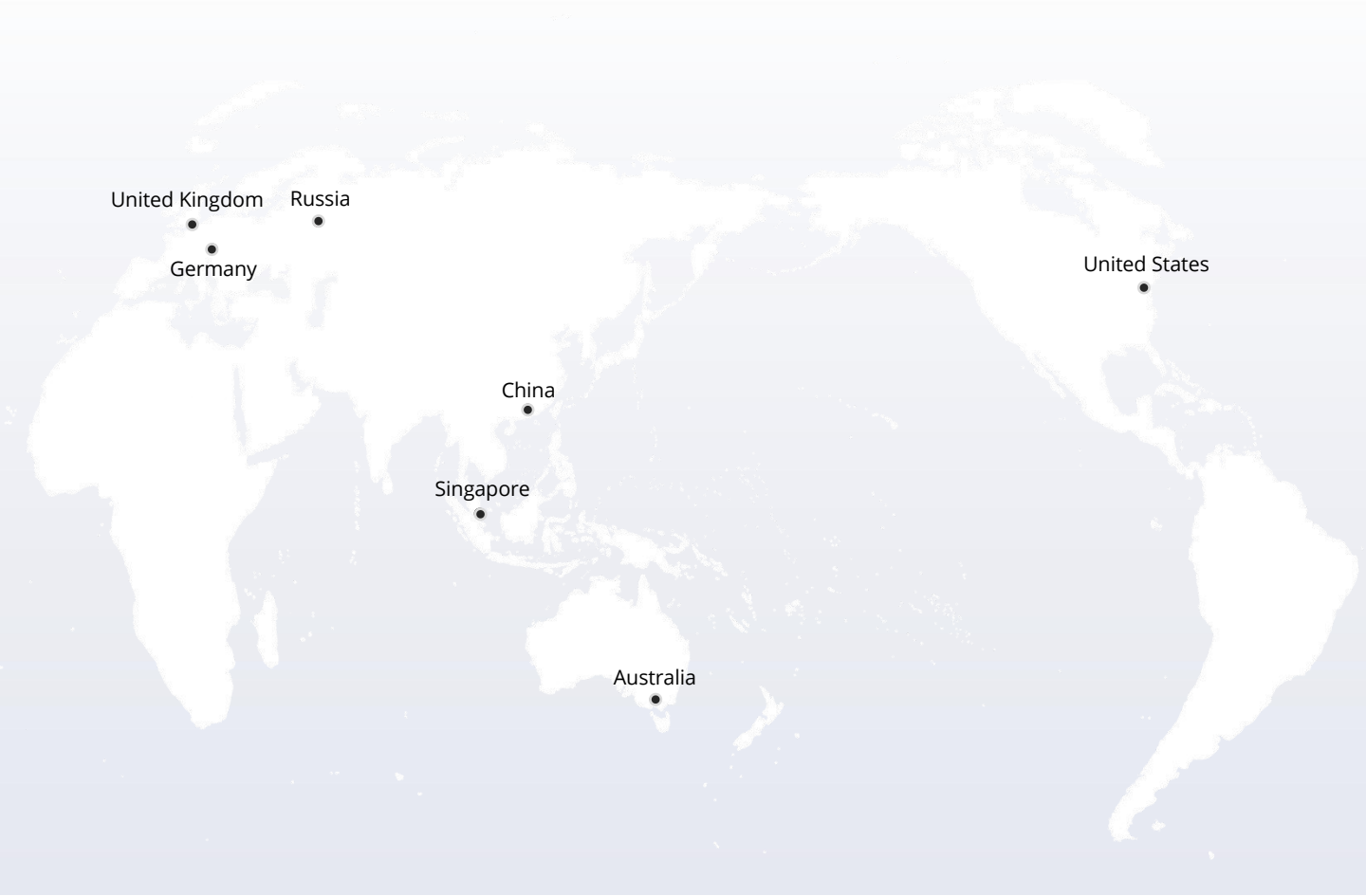
Evaluate various important parameters with the Optical Spectrum Analyzer to meet the industry standards.

- Center Wavelength, Level
- OSNR
- SMSR
- Spectrum Width



Order Information

Part Number	Description
OSFP800-PLR8-B2	800GBASE-PLR8 OSFP PAM4 1310nm 10km DOM Dual MTP/MPO-12 SMF Optical Transceiver Module
OSFP800-DR8-B2	800GBASE-DR8 OSFP PAM4 1310nm 500m DOM MTP/MPO SMF Optical Transceiver
OSFP800-2FR4-A2	800GBASE-2FR4 OSFP PAM4 1310nm 2km DOM LC SMF Optical Transceiver
QDD800-2FR4-C1	800GBASE-2FR4 QSFP-DD PAM4 1310nm 2km DOM Dual CS SMF Optical Transceiver



https://www.fs.com

The information in this document is subject to change without notice. FS has made all efforts to ensure the accuracy of the information, but all information in this document does not constitute any kind of warranty.

Copyright © 2009-2022 FS.COM All Rights Reserved.