

# SO-XFP-8G-ER-Dxxxx

XFP, 8.5 Gbps, DWDM, SM, DDM, 14dB, 40km

## OVERVIEW

The SO-XFP-8G-ER-Dxxxx series single mode transceiver is small form factor pluggable module for duplex optical data communications up to 10G. It is with the SFP+ 20-pin connector to allow hot plug capability. This module is designed for single mode fiber and operates at a nominal wavelength of 1550 nm. The transmitter section uses a 1550nm EML, which is class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated InGaAs detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

## PRODUCT FEATURES

- Supports 8.5Gb/s bit rates
- Hot-Pluggable XFP footprint
- 14dB power budget
- Temperature-stabilized DWDM rated EML transmitter
- 100GHz ITU grid, C band
- Duplex LC connector
- Built-in digital diagnostic functions
- Support CDR function
- Support Line side loopback
- Support XFI loopback
- Auxiliary 1 monitoring laser temperature
- Auxiliary 2 monitoring 3.3V supply
- Operating case temperature
  - Standard: 0°C + 70°C
  - Industrial: -40°C to 85°C

## APPLICATIONS

- 800-SM-LC-L Fiber Channel
- Other optical links

## ORDERING INFORMATION

Part Number	Description
SO-XFP-8G-ER-Dxxxx*	XFP, 8.5 Gbps, DWDM,SM, DDM, 14dB, 40km
SO-XFP-8G-ER-Dxxxx-I*	XFP, 8.5 Gbps, DWDM,SM, DDM, 14dB, 40km ind. temp

\*xxxx = Refers to notation for frequency data. Please see extended order information on last page for additional information.

Subject to change without notice.

For more information, visit [smaroptics.com](http://smaroptics.com).

smaroptics

## ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Unit
Maximum Supply Voltage 1	Vcc3	-0.5	4.0	V
Maximum Supply Voltage 2	Vcc5	-0.5	6.0	V
Storage Temperature	TS	-40	85	°C
Case Operating Temperature	TOP, SO-XFP-8G-ER-Dxxxx	0	70	°C
	TOP, SO-XFP-8G-ER-Dxxxx-I	-40	85	

## RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min.	Typ	Max.	Unit
Supply Voltage 1	Vcc3	3.13	3.3	3.45	V
Supply Voltage 2	Vcc5	4.75	5	5.25	V
Case Operating Temperature	SO-XFP-8G-ER-Dxxxx	0		70	°C
	SO-XFP-8G-ER-Dxxxx-I	-40		85	°C

## ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Main Supply Voltage	Vcc5	4.75		5.25	V	
Supply Voltage #2	Vcc3	3.13		3.45	V	
Supply Current – Vcc5 supply	Icc5			350	mA	
Supply Current – Vcc3 supply	Icc3			520	mA	

## ELECTRICAL CHARACTERISTICS TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Input Impedance (Differential)	Rin		100		Ω	Internal AC coupling
Differential Data Input Swing	Vin, pp	120		820	mV	
Transmit Disable Voltage	VD	2.0		Vcc	V	
Transmit Enable Voltage	VEN	GND		GND+0.8	V	
Transmit Disable Assert Time				10	μs	

## ELECTRICAL CHARACTERISTICS RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
Differential Data Output Swing	$V_{out,pp}$	340	650	850	mV	
Data Output Rise Time	$T_r$			38	ps	
Data Output Fall Time	$T_f$			38	ps	20% – 80%
LOS Fault	$V_{LOS\ Fault}$	$V_{cc} - 0.5$		$V_{ccHOST}$	V	20% – 80%
LOS Normal	$V_{LOS\ Normal}$	GND		GND+0.5	V	
Power Supply Noise Rejection	$PSNR$	Compliant to Section 2.7.1 of XFP MSA				

## OPTICAL CHARACTERISTICS TRANSMITTER

Parameter	Symbol	Min.	Typ	Max.	Unit
Output Opt. Pwr: 9/125 SMF	$P_{out}$	-1		+4	dBm
Center Wavelength Spacing			100		GHz
			0.8		nm
Optical Wavelength-EOL	$\lambda_c$	X-100	X	X+100	Pm
Transmitter Center Wavelength –BOL	$\lambda_c$	X-25	X	X+25	Pm
Optical Extinction Ratio	$ER$	8.2			dB
Transmitter and Dispersion Penalty	$TDP$			2	dB
Side Mode Suppression Ratio	$SMSR$	30			dB
TX Jitter Generation (peak-to-peak)	$TX_j$			0.1	UI
TX Jitter Generation (RMS)	$TX_jRMS$			0.01	UI

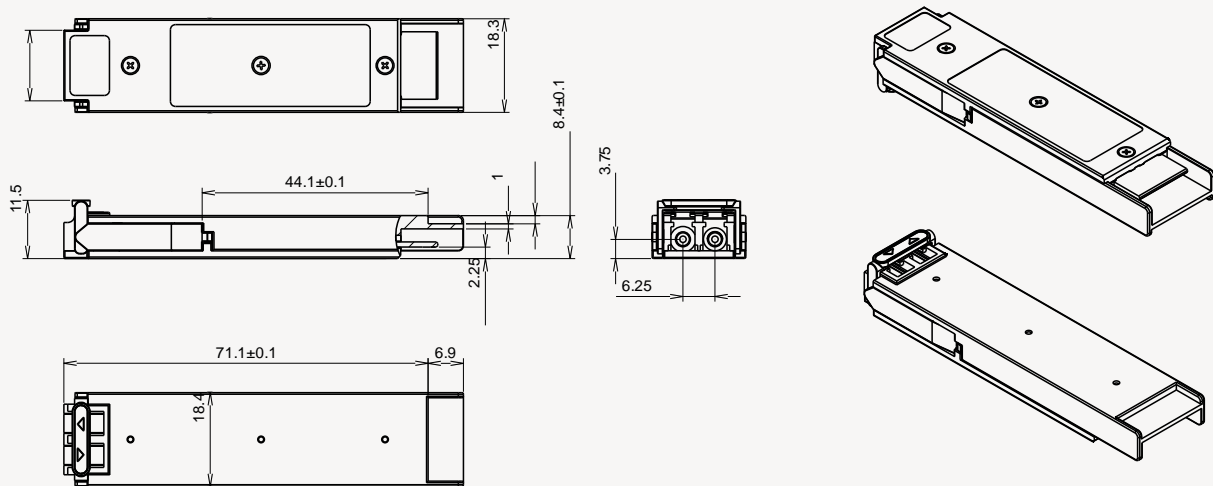
## OPTICAL CHARACTERISTICS RECEIVER

Parameter	Symbol	Min.	Typ	Max.	Unit
Receiver Sensitivity @ 10.5Gb/s	$P_{min}$			-15	dBm
Maximum Input Power	$P_{max}$	0.5			dBm
Optical Centre Wavelength	$\lambda_c$	1270		1600	nm
Path Penalty				2	dB
Receiver Reflectance	$R_{rx}$			-27	dB
LOS De-Assert	$LOSD$			-16	dBm
LOS Assert	$LOSA$	-28			dBm
LOS Hysteresis		1			dB

## PIN FUNCTION DEFINITIONS

PIN	Signal Name	Description	PIN	Signal Name	Description
1	V <sub>EE</sub> T	Transmitter Ground	11	V <sub>EE</sub> R	Receiver Ground
2	TX_Fault	Transmitter Fault Indication	12	RD-	Inv. Received Data Out
3	TX_Disable	Transmitter Disable	13	RD+	Received Data Out
4	SDA	Module Definition 2	14	V <sub>EE</sub> R	Receiver Ground
5	SCL	Module Definition 1	15	V <sub>CC</sub> R	Receiver Power
6	MOD_ABS	Module Definition 0	16	V <sub>CC</sub> T	Transmitter Power
7	RS0	RX Rate Select (LVTTL).	17	V <sub>EE</sub> T	Transmitter Ground
8	LOS	Loss of Signal	18	TD+	Transmit Data In
9	RS1	TX Rate Select (LVTTL).	19	TD-	Inv. Transmit Data In
10	V <sub>EE</sub> R	Receiver Ground	20	V <sub>EE</sub> T	Transmitter Ground

## MECHANICAL SPECIFICATIONS



## EXTENDED ORDERING INFORMATION, STANDARD

Part Number	ITU channel no.	Frequency [THz]	Center Wavelength (nm)
SO-XFP-8G-ER-D9180	18.0	191.80	1563.05
SO-XFP-8G-ER-D9190	19.0	192.90	1562.23
SO-XFP-8G-ER-D9200	20.0	192.00	1561.42
SO-XFP-8G-ER-D9210	21.0	192.10	1560.61
SO-XFP-8G-ER-D9220	22.0	192.20	1559.79
SO-XFP-8G-ER-D9230	23.0	192.30	1558.98
SO-XFP-8G-ER-D9240	24.0	192.40	1558.17
SO-XFP-8G-ER-D9250	25.0	192.50	1557.36
SO-XFP-8G-ER-D9260	26.0	192.60	1556.55
SO-XFP-8G-ER-D9270	27.0	192.70	1555.75
SO-XFP-8G-ER-D9280	28.0	192.80	1554.94
SO-XFP-8G-ER-D9290	29.0	192.90	1554.13
SO-XFP-8G-ER-D9300	30.0	193.00	1553.33
SO-XFP-8G-ER-D9310	31.0	193.10	1552.52
SO-XFP-8G-ER-D9320	32.0	193.20	1551.72
SO-XFP-8G-ER-D9330	33.0	193.30	1550.92
SO-XFP-8G-ER-D9340	34.0	193.40	1550.12
SO-XFP-8G-ER-D9350	35.0	193.50	1549.32
SO-XFP-8G-ER-D9360	36.0	193.60	1548.51
SO-XFP-8G-ER-D9370	37.0	193.70	1547.72
SO-XFP-8G-ER-D9380	38.0	193.80	1546.92
SO-XFP-8G-ER-D9390	39.0	193.90	1546.12
SO-XFP-8G-ER-D9400	40.0	194.00	1545.32
SO-XFP-8G-ER-D9410	41.0	194.10	1544.53
SO-XFP-8G-ER-D9420	42.0	194.20	1543.73
SO-XFP-8G-ER-D9430	43.0	194.30	1542.94
SO-XFP-8G-ER-D9440	44.0	194.40	1542.14
SO-XFP-8G-ER-D9450	45.0	194.50	1541.35
SO-XFP-8G-ER-D9460	46.0	194.60	1540.56
SO-XFP-8G-ER-D9470	47.0	194.70	1539.77
SO-XFP-8G-ER-D9480	48.0	194.80	1538.98
SO-XFP-8G-ER-D9490	49.0	194.90	1538.18
SO-XFP-8G-ER-D9500	50.0	195.00	1537.40
SO-XFP-8G-ER-D9510	51.0	195.10	1536.61
SO-XFP-8G-ER-D9520	52.0	195.20	1535.82
SO-XFP-8G-ER-D9530	53.0	195.30	1535.04
SO-XFP-8G-ER-D9540	54.0	195.40	1534.25
SO-XFP-8G-ER-D9550	55.0	195.50	1533.47
SO-XFP-8G-ER-D9560	56.0	195.60	1532.68
SO-XFP-8G-ER-D9570	57.0	195.70	1531.90
SO-XFP-8G-ER-D9580	58.0	195.80	1531.12
SO-XFP-8G-ER-D9590	59.0	195.90	1530.33
SO-XFP-8G-ER-D9600	60.0	196.00	1529.55
SO-XFP-8G-ER-D9610	61.0	196.10	1528.77

Subject to change without notice.

For more information, visit [smaroptics.com](http://smaroptics.com).

## EXTENDED ORDERING INFORMATION, INDUSTRIAL

Part Number	ITU channel no.	Frequency (THz)	Center Wavelength (nm)
SO-XFP-8G-ER-D9180-I	18.0	191.80	1563.05
SO-XFP-8G-ER-D9190-I	19.0	192.90	1562.23
SO-XFP-8G-ER-D9200-I	20.0	192.00	1561.42
SO-XFP-8G-ER-D9210-I	21.0	192.10	1560.61
SO-XFP-8G-ER-D9220-I	22.0	192.20	1559.79
SO-XFP-8G-ER-D9230-I	23.0	192.30	1558.98
SO-XFP-8G-ER-D9240-I	24.0	192.40	1558.17
SO-XFP-8G-ER-D9250-I	25.0	192.50	1557.36
SO-XFP-8G-ER-D9260-I	26.0	192.60	1556.55
SO-XFP-8G-ER-D9270-I	27.0	192.70	1555.75
SO-XFP-8G-ER-D9280-I	28.0	192.80	1554.94
SO-XFP-8G-ER-D9290-I	29.0	192.90	1554.13
SO-XFP-8G-ER-D9300-I	30.0	193.00	1553.33
SO-XFP-8G-ER-D9310-I	31.0	193.10	1552.52
SO-XFP-8G-ER-D9320-I	32.0	193.20	1551.72
SO-XFP-8G-ER-D9330-I	33.0	193.30	1550.92
SO-XFP-8G-ER-D9340-I	34.0	193.40	1550.12
SO-XFP-8G-ER-D9350-I	35.0	193.50	1549.32
SO-XFP-8G-ER-D9360-I	36.0	193.60	1548.51
SO-XFP-8G-ER-D9370-I	37.0	193.70	1547.72
SO-XFP-8G-ER-D9380-I	38.0	193.80	1546.92
SO-XFP-8G-ER-D9390-I	39.0	193.90	1546.12
SO-XFP-8G-ER-D9400-I	40.0	194.00	1545.32
SO-XFP-8G-ER-D9410-I	41.0	194.10	1544.53
SO-XFP-8G-ER-D9420-I	42.0	194.20	1543.73
SO-XFP-8G-ER-D9430-I	43.0	194.30	1542.94
SO-XFP-8G-ER-D9440-I	44.0	194.40	1542.14
SO-XFP-8G-ER-D9450-I	45.0	194.50	1541.35
SO-XFP-8G-ER-D9460-I	46.0	194.60	1540.56
SO-XFP-8G-ER-D9470-I	47.0	194.70	1539.77
SO-XFP-8G-ER-D9480-I	48.0	194.80	1538.98
SO-XFP-8G-ER-D9490-I	49.0	194.90	1538.18
SO-XFP-8G-ER-D9500-I	50.0	195.00	1537.40
SO-XFP-8G-ER-D9510-I	51.0	195.10	1536.61
SO-XFP-8G-ER-D9520-I	52.0	195.20	1535.82
SO-XFP-8G-ER-D9530-I	53.0	195.30	1535.04
SO-XFP-8G-ER-D9540-I	54.0	195.40	1534.25
SO-XFP-8G-ER-D9550-I	55.0	195.50	1533.47
SO-XFP-8G-ER-D9560-I	56.0	195.60	1532.68
SO-XFP-8G-ER-D9570-I	57.0	195.70	1531.90
SO-XFP-8G-ER-D9580-I	58.0	195.80	1531.12
SO-XFP-8G-ER-D9590-I	59.0	195.90	1530.33
SO-XFP-8G-ER-D9600-I	60.0	196.00	1529.55
SO-XFP-8G-ER-D9610-I	61.0	196.10	1528.77

Subject to change without notice.

For more information, visit [smaroptics.com](http://smaroptics.com).