LambdaFLEX™ Zero Chirp Tunable XFP Module

TL8800ZPCND

The Oclaro LambdaFLEX™ Tunable XFP module is a high performance tunable pluggable transceiver for use in the C-band window covering 1528nm to 1566nm. The module supports data rates from 9.95Gb/s to 11.35Gb/s and is provided in an XFP, MSA compliant package.

The optical transmitter utilizes the Oclaro LambdaFLEX™ Tunable ILMZ chip to provide a high performance, low cost 10Gb/s transceiver. Channel tuning is supported on the ITU-T 50GHz grid across full C-band with ±2.5GHz stability. Wavelength and frequency tuning modes are supported in accordance with SFF-8477.

The receive path comprises a PIN receiver with linear amplifier and CDR. For optimum system performance in noise loaded applications, support is provided for external control of the receiver decision threshold.

An external 2-wire serial interface is provided to support extensive control, monitor and diagnostic functions in accordance with INF 8077i.

Features:

- XFP MSA INF 8077i Rev 4.5 compliant
- Wavelength and frequency tuning
- Data rate: 9.95 - 11.35Gb/s
- Full C-band, 96 channel, 50GHz spacing
- Zero chirp transmitter
- PIN receiver with adjustable RxDTV
- Optional internal RxDTV control
- No reference clock required
- XFI electrical interface
- On board Enhanced Diagnostics
- Field-upgradeable firmware
- Maximum 3.5 W power dissipation
- Transmit disable and loss-of-signal functions
- XFI and lineside loopback support
- Telcordia GR-468 qualified
- RoHS 6/6 compliant

Applications:

- Supports dispersion compensated links
- 10Gb/s Gigabit Ethernet
- 10G Fibre Channel

Optical Characteristics

The following parametric limits detailed are for a case temperature range of -5°C to 70°C.

Operating Characteristics – Transmitter

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Data rate		9.95		11.35	Gb/s	NRZ
Frequency range		191.35		196.10	THz	50GHz grid, 96 channels
Frequency accuracy		-2.5		+2.5	GHz	EOL
Optical transmit power	Po		+0.5		dBm	SOL, 25°C
Optical transmit power	Po	-2		+3.0	dBm	EOL
Shuttered output power			-45	-40	dBm	
Optical power stability	ΔPout	-1.0		+1.0	dB	All channels, SOL
Side mode suppression	SMSR	35			dB	±2.5nm, modulated
Spectral width	Δλ		0.3	0.5	nm	-20dB, modulated
Extinction ratio	ER	12.0			dB	Filtered, 10.709Gb/s
Eye diagram compliance	GR-253, ITU-T G.691					
Mask margin		10			%	
OSNR		50	55		dB	0.1nm RBW
SBS threshold		18			dBm	50km SMF
Tuning speed				50	ms	
Laser enable (turn on) time				50	ms	To 90% power
Laser disable (turn off) time				10	µs	To <10% power
Module initialisation time				20	s	Time for Tx transmission of data from Power cycle or P_DOWN/RST

Operating Characteristics - Receiver

Parameter	Symbol	Min	Typ	Max	Unit	Conditions
Data rate		9.95		11.35	Gb/s	NRZ
Input operating wavelength	λ	1525		1575	nm	
Receiver sensitivity			-18	-17	dBm	10.709Gb/s, 1E-12, OSNR>35dB optimised RxDTV
Maximum input power (overload)	PIN-MAX	+1			dBm	
LOS assert		-27			dBm	
LOS de-assert				-20	dBm	
LOS Hysteresis	PA - PD	0.5		3	dB	
LOS assert time	T_A			100	µs	
LOS de-assert time	TD			100	µs	

System Performance

Parameter	Dispersion	OSNR	BER	Conditions
OSNR/dispersion tolerance	-800ps/nm	17dB	1E-04	10.709Gb/s, -2 to -15dBm, 0.25nm filter, optimised RxDTV
	0ps/nm	15dB	1E-04	
	800ps/nm	17dB	1E-04	
	±800ps/nm	>25dB	1E-12	

Parameter	Symbol	Min	Typ	Max	Unit	Notes
1.8V supply	Vcc2	1.71	1.8	1.89	V	VPS not supported
3.3V supply	Vcc3	3.15	3.3	3.45	V	
5.0V supply	Vcc5	4.75	5.0	5.25	V	
Supply current, 1.8V			330	400	mA	
Supply current, 3.3V			600	800	mA	
Supply current, 5.0V			250	400	mA	
Inrush current limit				100	mA/µs	
Total power consumption				3.5	W	Power Level 3

Power Supply Noise Tolerance

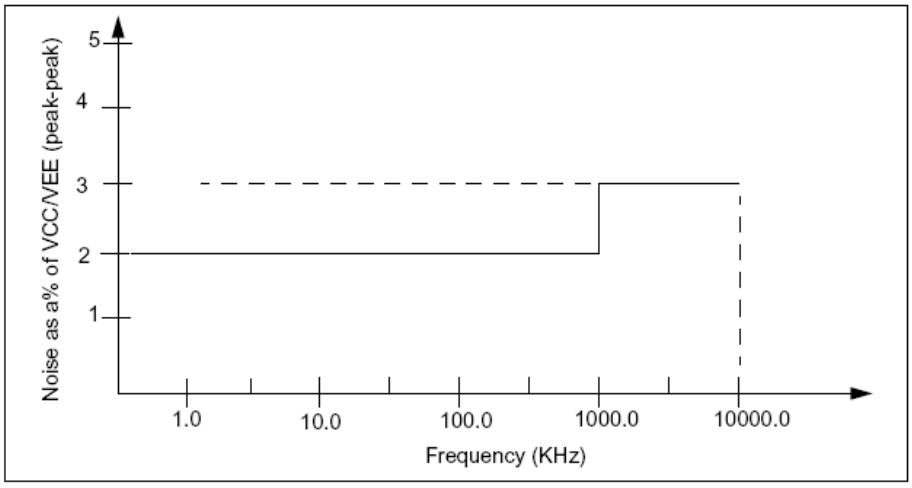


Figure 2 Power Noise Requirement

Absolute Maximum Ratings

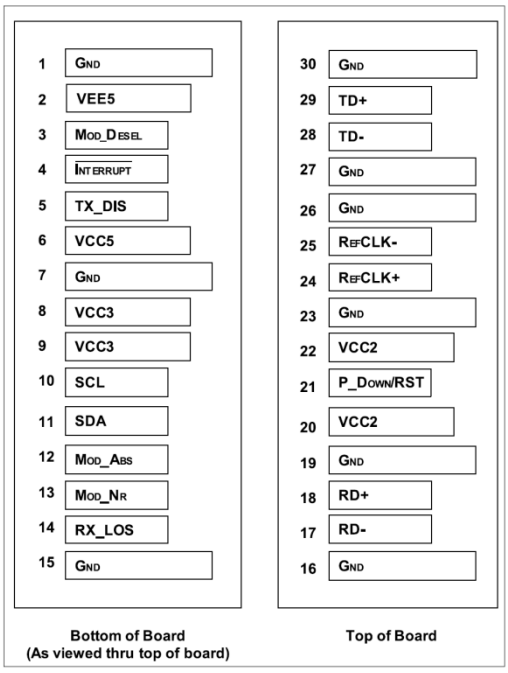
Parameter	Symbol	Min	Typ	Max	Unit	Note
Storage Temp	Tstg	-40		85	˚C	
Case Temperature		-5		70	˚C	
ESD		500			V	High speed i/o pins
		2000				All other pins
Optical input power				12	dBm	

Pinout Definition

Pin	Logic	Symbol	Name/Description	Note
1		GND	Module Ground	1
2		VEE5	Optional -5.2V Power Supply	
3	LVTTL-I	Mod_DeSel	Module De-select; When held low allows module to respond to 2-wire serial interface	
4	LVTTL-O	$\overline{\text{Interrupt}}$	$\overline{\text{Interrupt}}$; Indicates presence of an important condition which can be read over the 2-wire serial interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
6		VCC5	+5V Power Supply	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTL-I/O	SCL	2-Wire Serial Interface Clock	2
11	LVTTL-I/O	SDA	2-Wire Serial Interface Data Line	2
12	LVTTL-O	Mod_Abs	Indicates Module is not present. Grounded in the Module	2
13	LVTTL-O	Mod_NR	Module Not Ready; Indicating Module Operational Fault	2
14	LVTTL-O	RX_LOS	Receiver Loss Of Signal Indicator	2
15		GND	Module Ground	1
16		GND	Module Ground	1
17	CML-O	RD-	Receiver Inverted Data Output	
18	CML-O	RD+	Receiver Non-Inverted Data Output	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply	3
21	LVTTL-I	P_Down/RST	Power down; When high, requires the module to limit power consumption to 1.5W or below. 2-Wire serial interface must be functional in the low power mode. Reset; The falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22		VCC2	+1.8V Power Supply	3
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Not required	
25	PECL-I	RefCLK-	Not required	
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TD-	Transmitter Inverted Data Input	
29	CML-I	TD+	Transmitter Non-Inverted Data Input	
30		GND	Module Ground	1

1. Module ground pins GND are isolated from the module case and chassis ground within the module.
2. Shall be pulled up with 4.7k-10kOhms to a voltage between 3.15V and 3.45V on the host board.
3. VPS function is not supported

Pin Out Detail



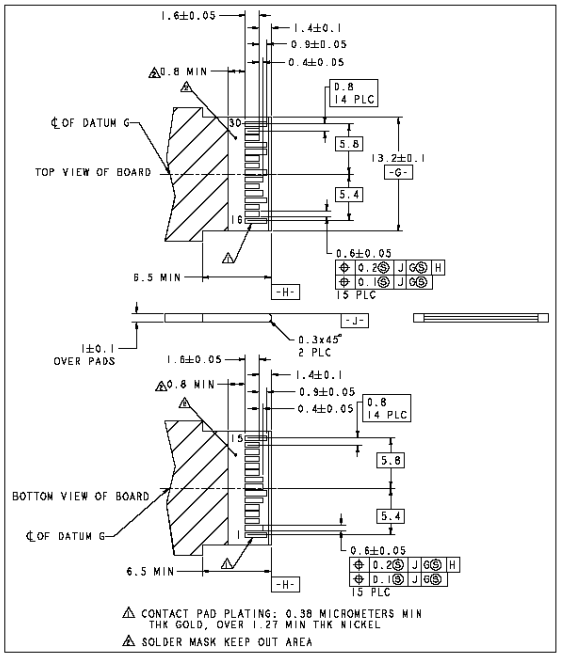
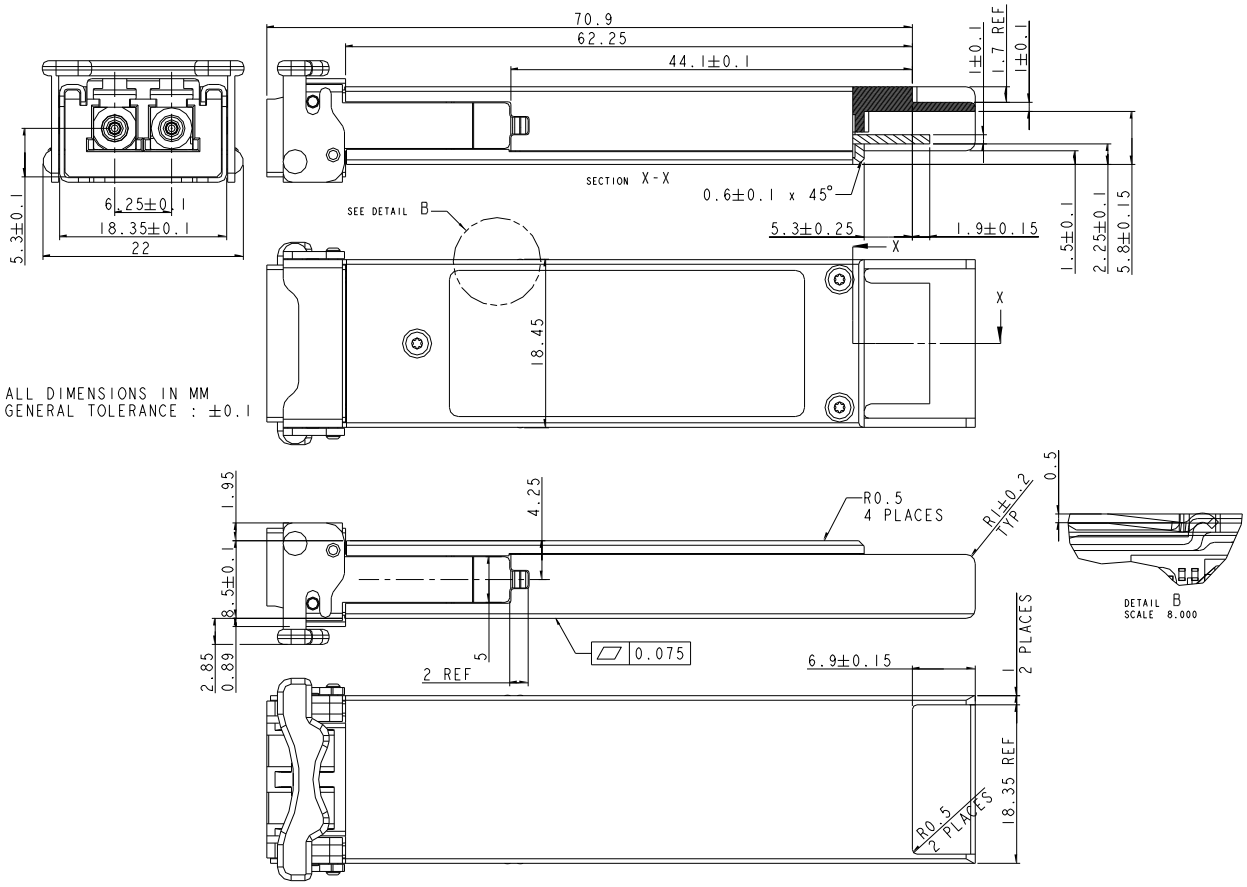


Figure 33 Recommended Pattern Layout for XFP Printed Circuit

Package Detail



RoHS Compliance

Oclaro is fully committed to environment protection and sustainable development and has set in place a comprehensive program for removing polluting and hazardous substances from all of its products. The relevant evidence of RoHS compliance is held as part of our controlled documentation for each of our compliant products. RoHS compliance parts are available to order, please refer to the ordering information section for further details.

Ordering Information:

TL8800ZPCND

Evaluation Board Available on request.

Contact Information

www.oclaro.com

Important Notice

Performance figures, data and any illustrative material provided in this data sheet are typical and must be specifically confirmed in writing by Oclaro before they become applicable to any particular order or contract. In accordance with the Oclaro policy of continuous improvement specifications may change without notice. Further details are available from any Oclaro sales representative.

CLASS 1 LASER PRODUCT

REFERENCE IEC 60825-1 Ed2.0 (2007)

CAUTION
STATIC SENSITIVE DEVICE
OBSERVE PRECAUTIONS

Caution - use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

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