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Product Specification Sheet

TOP-XFP-CWDM-ER-XX

RoHS Compliant 40km CWDM XFP Optical Transceiver



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PRODUCT FEATURES

- Supports 9.95Gbps to 11.1Gbps bit rates
- link length up to 40km
- Cooled EML and PIN receiver
- Wavelength selectable to ITU-T standards covering CWDM grid
- XFP MSA Rev 4.5 Compliant
- Very low EMI and excellent ESD protection
- High transmission margin
- +3.3V single power supply
- Temperature range 0°C to 70°C

APPLICATIONS

- SONET OC-192&SDH STM 64
- 10GBASE ER/EW
- CWDM Networks
- 10G Fiber Channel

PRODUCT DESCRIPTIONS

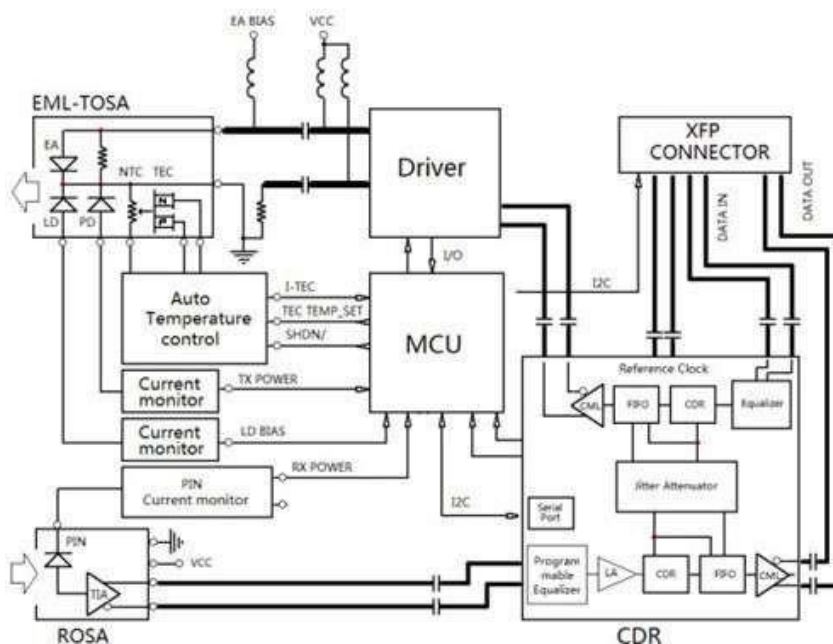
Topstar TOP-XFP-CWDM-ER-XX is Transceiver exhibits excellent wavelength stability, supporting operation at 100 GHz channel, cost effective module. It is designed for 10G CWDM SDH, 10GBASE-ER/EW and 10G Fiber- Channel applications.

The transceiver consists of two sections: The transmitter section incorporates a cooled EML laser. And the receiver section consists of a PIN photodiode integrated with a TIA. All modules satisfy class I laser safety requirements.

The CWDM XFP transceiver provides an enhanced monitoring interface, which allows real-time access to device operating parameters such as transceiver temperature, laser bias current, transmitted optical power, received optical power and transceiver supply voltage.



FUNCTIONAL DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note: Stress in excess of the maximum absolute ratings can cause permanent damage to the module

GERERAL OPERATING CHARACTERISTICS

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	Ethernet		10.3125		Gb/s	
	Fiber Channel		10.518			
Supply Voltage	Vcc	3.13	3.3	3.47	V	
	Vcc				V	
Supply Current	Icc _s				mA	
	Icc ₃			500	mA	
Operating Case Temp.	Tc	0		70	°C	



ELECTRICAL INPUT/OUTPUT CHARACTERISTICS

● **Transmitter**

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Diff. input voltage swing		120		820	mVpp	1
Tx Disable input	H	VIH	2.0	Vcc+0.3	V	
	L	VIL	0	0.8		
Tx Fault output	H	VOH	2.0	Vcc+0.3	V	2
	L	VOL	0	0.8		
Input Diff. Impedance	Zin		100		Ω	

● **Receiver**

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Diff. output voltage swing		340	650	800	mVpp	3
Rx LOS Output	H	VOH	2.0	Vcc+0.3	V	2
	L	VOL	0	0.8		

Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
 Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
 Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

OPTICAL CHARACTERISTICS

● **Transmitter**

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Operating Wavelength			xx		nm	4
Ave. output power (Enabled)	Po	-1		2	dBm	1
Extinction Ratio	ER	8.2			dB	1
RMS spectral width	Δλ			0.45	nm	
Rise/Fall time (20%~80%)	Tr/Tf			45	ps	2
Optical modulation amplitude	OMA			-2.8	dBm	
Dispersion penalty				3.9	dB	
Output Optical Eye	IEEE 802.3-2005 Compliant					

● **Receiver**

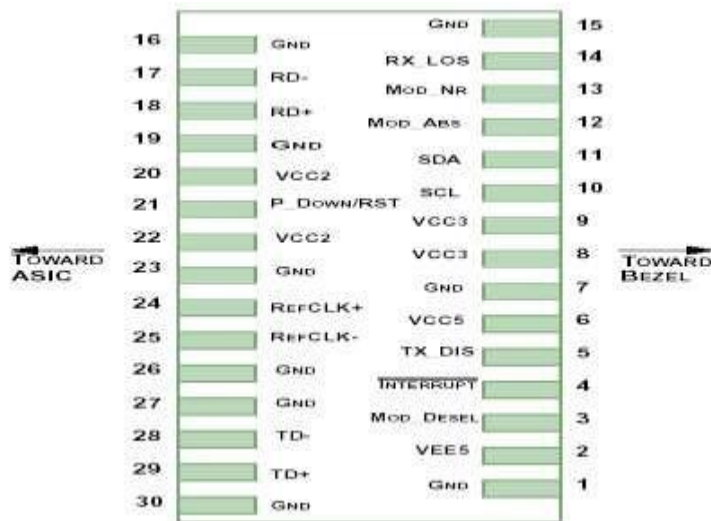
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Operating Wavelength		1260		1610	nm	
Sensitivity	Psen			-16	dBm	3
Min. overload	Pimax	0.5			dBm	
LOS Assert	Pa	-30			dBm	
LOS De-assert	Pd			-18	dBm	



LOS Hysteresis	Pd-Pa	0.5		4	dB	
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Note 1) Measured at 10.3125b/s with PRBS 231 – 1 NRZ test pattern. Note 2) 20%~80%
 Note 3) Under the ER worst case, measured at 10.3125 Gb/s with PRBS 231 - 1 NRZ test pattern for BER < 1x10⁻¹²
 Note 4) If there is CWDM Product ,the wavelength XX -- 1470nm-1610nm

PIN DEFINITIONS AND FUNCTIONS



PIN #	Name	Function	Name/Description	Notes
1		GND	Module Ground	1
2		VEE5	Optional -5.2V Power Supply (Not required)	
3	LVTTL-I	MOD_DESEL	Module De-select; When held low allows the module to respond to 2-wire serial interface	
4	LVTTL-O	INTb	Interrupt; Indicates presence of an important condition which can be read via the 2-wire serial interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Turns off transmitter laser output	
6		VCC5	+5V Power Supply (Not required)	
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	RDN	Receiver Inverted Data Output	
18	CML-O	RDP	Receiver Non-Inverted Data Output	
19		GND	Module Ground	1
20		VCC2	+1.8V Power Supply (Not required).	



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.	
21	LVTTL-I	P_DOWN/RST	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 (Not required)	
23		GND	Module Ground	1
24	PECL-I	REFCLKP	Not used, internally terminated to 50ohm (100ohm diff).	3
25	PECL-I	REFCLKN	Not used, internally terminated to 50ohm (100ohm diff).	3
26		GND	Module Ground	1
27		GND	Module Ground	1
28	CML-I	TDN	Transmitter Inverted Data Input	
29	CML-I	TDP	Transmitter Non-Inverted Data Input	
30		GND	Module Ground	1

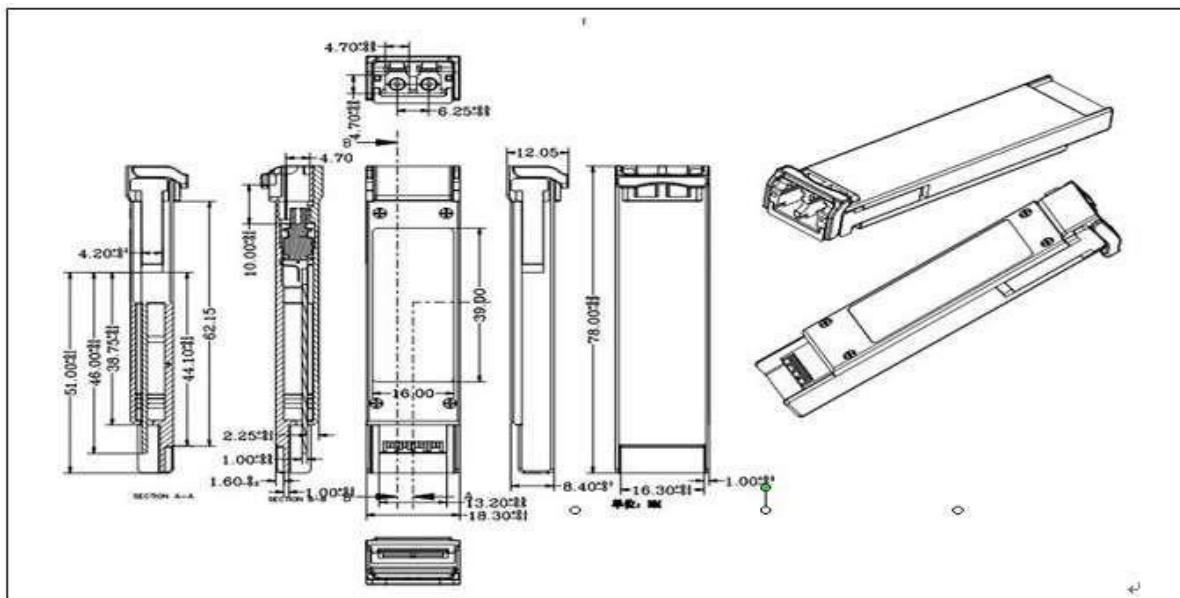
Notes:

Module circuit ground is isolated from module chassis ground within the module.

Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.

Reference Clock input is not required.

TYPICAL INTERFACE CIRCUIT





ORDERING INFORMATION

Part Number	Description
TOP-XFP-CWDM-ER-47	XFP PLUS,10.3125Gbps, 1470nm, 40km,
TOP-XFP-CWDM-ER-49	XFP PLUS,10.3125Gbps, 1490nm, 40km,
TOP-XFP-CWDM-ER-51	XFP PLUS,10.3125Gbps, 1510nm, 40km,
TOP-XFP-CWDM-ER-53	XFP PLUS,10.3125Gbps, 1530nm, 40km,
TOP-XFP-CWDM-ER-55	XFP PLUS,10.3125Gbps, 1550nm, 40km,
TOP-XFP-CWDM-ER-57	XFP PLUS,10.3125Gbps, 1570nm, 40km,
TOP-XFP-CWDM-ER-59	XFP PLUS,10.3125Gbps, 1590nm, 40km,
TOP-XFP-CWDM-ER-61	XFP PLUS,10.3125Gbps, 1610nm, 40km,



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