T-XFP-CWDM-10KM

10Gbps XFP CWDM Transceiver 10KM

Features

4-Wavelengths Uncooled CWDM DFB transmitter from 1270nm to 1330nm, with step 20nm.
Supports 9.95Gbps to 11.3Gbps bit rates
XFP MSA Rev4.5 Compliant
Maximum Link Length of 10km with SMF
No reference clock required
+1.8V, +3.3V Supply Voltage
Low Power Dissipation 2W Maximum
XFI and Lineside Loopback Mode Supported
0 to 70℃ Operating Case Temperature
Diagnostic Performance Monitoring of Module Temperature, Supply Voltages, Laser Bias Current, Transmit Optical Power and Receive Optical Power
RoHS compliant

Applications

SDH STM I-64.1 at 9.953Gbps
10GBASE-LR/LW 10G Ethernet
10G Fiber Channel
10GBASE-LR/LW 10G Ethernet with FEC

Description

The T-XFP-CWDM-10KM series compliant with the 10G Small Form-Factor Pluggable (XFP) Multi-Source Agreement (MSA),supporting data-rate of 10.3125Gbps(10GBASE-LR) or 9.953Gbps 10GBASE-LW), and transmission distance up to 10km on SMF.

The transceiver module comprises a transmitter with uncooled CWDM DFB laser and a receiver with a PIN photodiode.Transmitter and receiver are separate within a wide temperature range of 0℃ to +70℃ and offers optimum heat dissipation and excellent electromagnetic shielding thus enabling high port densities for 10 GbE systems.

Regulatory Compliance

Feature	Agency	Standard	Certificate / Comments
Laser Safety	FDA	CDRH 21 CFR 1040 and Laser Notice No.50	1120292-000
Product Safety	UL	UL and CUL EN60950-2:2007	E347511
Environmental Protection	SGS	RoHS Directive 2002/95/EC	GZ1001008918/CHEM
EMC	WALTEK	EN55022:2006+A1:20077 EN55024:1998+A1+A2:2003	WT10093759-D-E-E

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit
Storage Temperature	Tst	-40	+85	°C
Operating Case Temperature	Tc	0	+70	°C
Supply Voltage 1	Vcc3.3	-0.5	4.0	V
Supply Voltage 2	Vcc1.8	-0.5	2	V
Operating Relative Humidity	RH		85	%

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage 1	Vcc3	3.13	3.3	3.47	V
Supply Current 1	Icc3			40	mA
Supply Voltage 2	Vcc2	1.71	1.8	1.89	V
Supply Current 2	Icc2			400	mA
Operating Case Temperature	Tca	-5		70	°C
Module Power Dissipation	Pm			2	W

Optical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Ref.
Transmitter						
Optical Output Power	Po	-8.2		+0.5	dBm	
Optical Wavelength	λ	1260		1355	nm	
Optical Extinction Ratio	ER	3.5			dB	1
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power Of OFF Transmitter	POFF	-30			dBm	
Tx Jitter	TX_J	Compliant with each standard requirements				
Receiver						
Average Receive Power	Rip	-14.4			dBm	2
Receiver Sensitivity in OMA	RSENS1			-12.6	dBm	2
Stressed Receiver Sensitivity (OMA)@10.5Gb/s	RSENS2			-10.3	dBm	
Maximum Input Power	PMAX	+0.5			dBm	
Optical Center Wavelength	λC	1260		1600	nm	
LOS De-Assert	LOS_D		nm	-18	dBm	
LOS Assert	LOS_A	-32	dB		dBm	
LOS Hysteresis		0.5	dBm		dB	

Notes:

1. PRBS 2^{31}-1 test pattern @10.3125Gbps.
2. PRBS 2^{31}-1 test pattern @10.3125Gbps, BER≤10^{-12}.

Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max	Unit	Notes
Operating Case Temperature Range	Tc	0		+70	°C	
Power Supply Voltage@3.3V	Vcc3	3.13	3.3	3.47	V	
Module Total Power	P			2.5	m	
Transmitter						
Input Differential Impendence	Rin		100		Ω	1
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	At 0.7mA
Transmit Disable Assert Time				10	us	

Receiver						
Differential Data Output Swing	Vout.pp	500		850	mV	
Data Output Rise Time	t_r			38	ps	2
Rx Output Rise and Fall Time	t_f			38	ps	2
LOS Fault	$V_{LOS\ Fault}$	Vcc-0.5		Vcc_{HOST}	V	3
LOS Normal	$V_{LOS\ norm}$	GND		GND+0.5	V	3
Power Supply Rejection	PSR	See Note 4 below				4

Notes:

1. After internal AC coupling.
2. 20 – 80 %
3. Loss of Signal is open collector to be pulled up with a 4.7k – 10kohm resistor to 3.15 – 3.6V. Logic 0 indicates normal operation; logic 1 indicates no signal detected.
4. Per Section 2.7.1. in the XFP MSA Specification.

Pin Definition

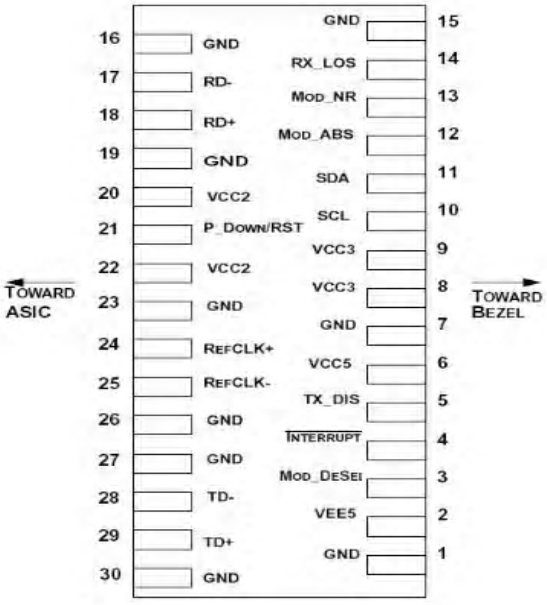
Parameter	Logic	Unit	Values	
1		GND	Module Ground	1
2		VEE 5	Optional-5.2 Power Supply-Not Required	
3	LVTTL-I	Mod-Desel	Module De-select; When held low allows the module to , respond to 2-wire serial interface commands	
4	LVTTL-O	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	LVTTL-I	TX-DIS	Transmitter Disable; Transmitter laser source turned off	
6		VCC5	+5 Power Supply – **Not required**	
7		GND	Module Ground	1
8		VCC3	+3.3V Power Supply	
9		VCC3	+3.3V Power Supply	
10	LVTTL-I	SCL	Serial 2-wire interface clock	2
11	LVTTL-I/O	SDA	Serial 2-wire interface data line	2
12	LVTTL-O	Mod_Abs-	Module Absent; Indicates module is not present. Grounded in the module.	2

13	LVTTL-O	Mod_NR	Module Not Ready;	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	
20		VCC2	+1.8V Power Supply	
21	LVTTL-I	P Down/R ST	Power Down; When high, places the module in the low power stand-by mode and on the falling edge of P_Down initiates a module reset 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	
23		GND	Module Ground	
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – **Not required**	
25	PECL-I	RefCLK-	Reference Clock inverted input, AC coupled on the host board – **Not required**	
26		GND	Module Ground	
27		GND	Module Ground	
28	CML-I	TD-	Transmitter inverted data input	
29	CML-I	TD+	Transmitter non-inverted data input	
30		GND	Module Ground	

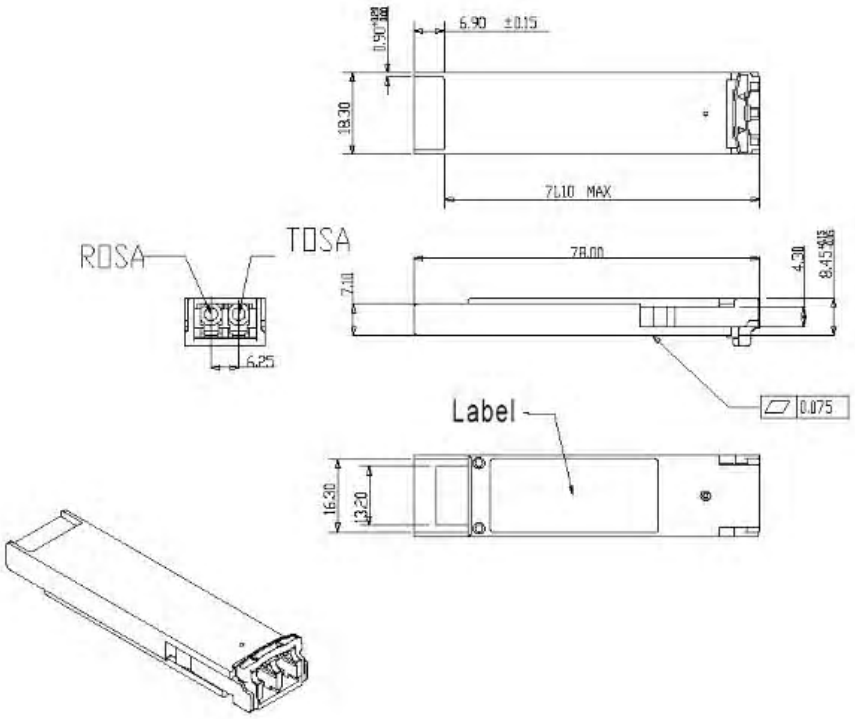
Notes:

1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15Vand 3.6V.
3. Reference Clock input is not required.

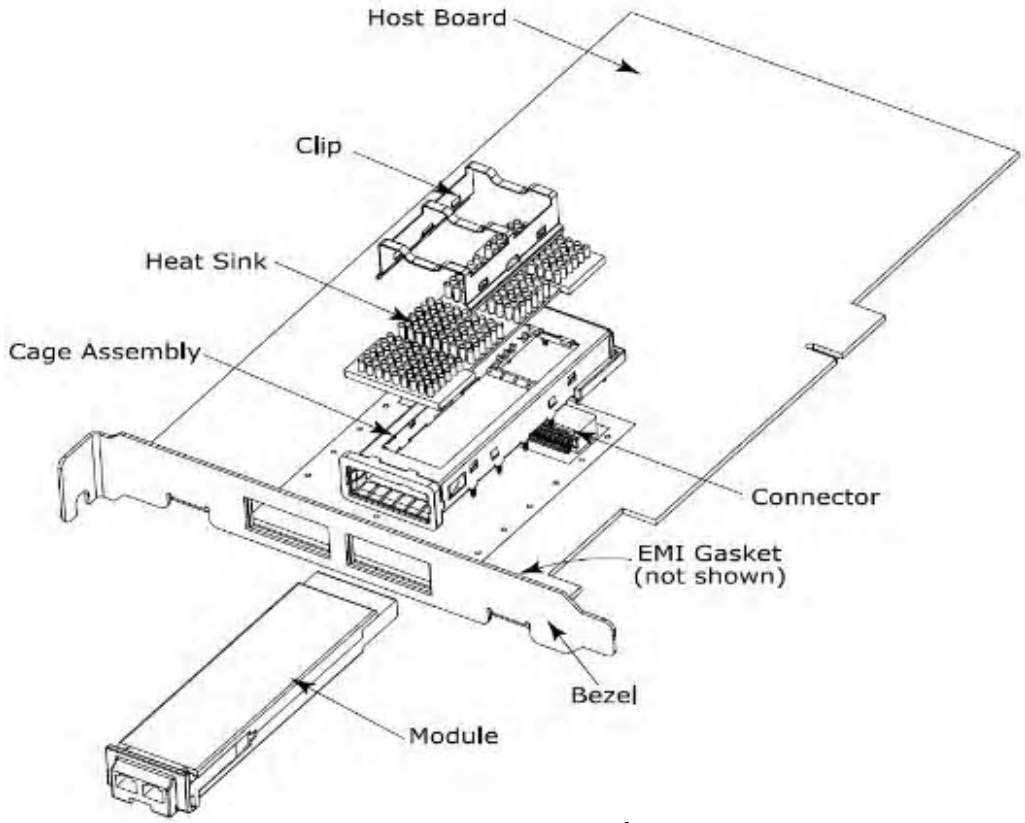
Electrical Pin-out Details



Mechanical Specifications



XFP Mechanical Components



The mechanical components defined：

1. The module, clip and connector dimensions are constant for all applications. While the bezel, cage assembly, EMI gasket and heat sink can be designed and/or adjusted for the individual application.
2. The relatively small form factor of the XFP module combined with an adaptable heatsink option allows host system design optimization of module location, heatsink shape/dimension/fins design, and airflow control. The module can be inserted and removed from the cage with the heat sink and clip attached.

Ordering information

Part Number	**Product Description**
T-XFP-CWDM-10KM	**9.95~10.3Gbps CWDM XFP 40km -5℃~+70℃ (1270~1330nm)**

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Contact

E-mail:sales@t-techvip.com
http://www.t-techvip.com