T-10G-XFP-SM-40KM
10Gbps XFP Single Mode Transceiver 40km

Features

XFP MSA Rev 4.5 Compliant

Data Rate from 9.95Gbps to 11.3Gbps

No reference clock required

Cooled 1550nm EML and Pin Receiver

Link Length up to 40km

+1.8V, +3.3V Supply Voltage

Low Power Dissipation 3.5W Maximum

XFI and lineside loopback Mode Supported

-5~70 ℃ Operating Case Temperature

Diagnostic Performance Monitoring of Module Temperature, Supply Voltage, Laser Bias Current,

Transmit Optical Power and Receive Optical Power.

RoHS6 compliant

Applications

SONET OC-192&SDH STM64 (with/without FEC)

10G Fiber Channel

10GBASE-ER/EW (with / without FEC)

Ordering Information

Part No.	Data Rate	Fiber	Distance	Interface	Temperature	DDMI
T-10G-XFP-SM-40KM	9.95~10.3 Gbps	SMF	1550nm 40KM	LC	Standard	YES

Product Description

T-10G-XFP-SM-40KM is 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 40km on 9μm SMF .

The transceiver module comprises a transmitter with 1550nm Uncooled 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	WT10093766-D-E-E
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
Case Operating Temperature	Top	-5	+70	°C
Supply Voltage 1	Vcc3.3	-0.5	4.0	V
Supply Voltage 2	Vcc5	-0.5	6.0	V
Supply Voltage 3	Vcc2	-0.5	2	V

Recommended Operating Conditions

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage 1	Vcc3	3.13	3.3	3,47	V
Supply Current 1	Icc3			750	mA
Supply Voltage 2	Vcc5	4.75	5	5.25	V
Supply Current 2	Icc5			400	mA
Supply Voltage3	Vcc2	1.71	1.8	1.89	V
Supply Current3	Icc2			750	mA
Operating Case Temperature	Tca	-5		70	°C
Module Power Dissipation	Pm			3.5	W

Electrical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Input Differential Impedance	Rim		100		Ω	1
Differential Data Input Swing	Vin.pp	120		850	mV	
Transmit Disable Voltage	VD	2.0		Vcc3+0.3	V	
Transmit Enable Voltage	VEN	0		+0.8	V	
Transmit Disable Assert Time	Vn			10	us	
Receiver						
Output Differential Impendance	Rom		100		Ω	
Differential Output Swing	Tvout p-p	350		850	mV	2
Rise/Fall Time (1)	Tr/Tf	24			ps	3
LOS of Signal-Asserted	VOH	2		VccHost	V	3
LOS Normal	VOL	GND		GND+0.5	V	4

Optical Characteristic

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter						
Center Wavelength	λc	1530		1565	nm	
Optical Transmit Power	Po	-1		+2	dBm	
Optical Modulation Amplitude	OMA	-2.1			dB	1
Optical Transmit Power(disable)	PTX_DIS			-30	dBm	
Extinction Ratio	ER	8.2			dB	
Jitter Generation (P-P)	JG P-P			0.1	UI	
Jitter Generation (RMS)	JG RMS			0.01	UI	
Spectral Width(-20 dB)	$\Delta\lambda20$			0.3	nnm	
Side Mode Suppression Ratio	SMSR	30			dB	
Dispersion Penalty(800ps/nm) (2)	DP			2	dB	
Relative Intensity Noise	RIN			-130	dB/Hz	
Eye Mask	Compliant with ITU-T G.691 STM-64 eye mask					
Receiver						
Input Operating Wavelength	λ	1270		1600	nm	
Receiver Sensitivity 9.95~10.7Gbps (1)	P_{avg}			-16	dBm	2
Receiver Sensitivity 10.1~11.3Gbps (1)	P_{avg}			-15	dBm	
Received Sensitivity in 10.3Gbps (OMA)	Rsen1			-14.1	dBm	
Stressed Received Sensitivity in 10.3Gbps(OMA)	Rsen2			-11.3	dBm	
Maximum Input Power	RX-overload	-1				
Reflectance	Rrx			-27	dBm	
LOS Asserted	Lsa	-28			dBm	
LOS De-Asserted	Lda			-22	dBm	
LOS Hysteresis	Lh	0.5			dB	

Notes:

1, PRBS 2³¹-1 test pattern @10.3125Gbps.

2, PRBS 2³¹-1 test pattern @10.3125Gbps, BER≤10⁻¹².

Pin Description

Pin No	Logic	Symbol	Name / Description	Ref
1		GND	Module Ground	1
2		VEE5	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	

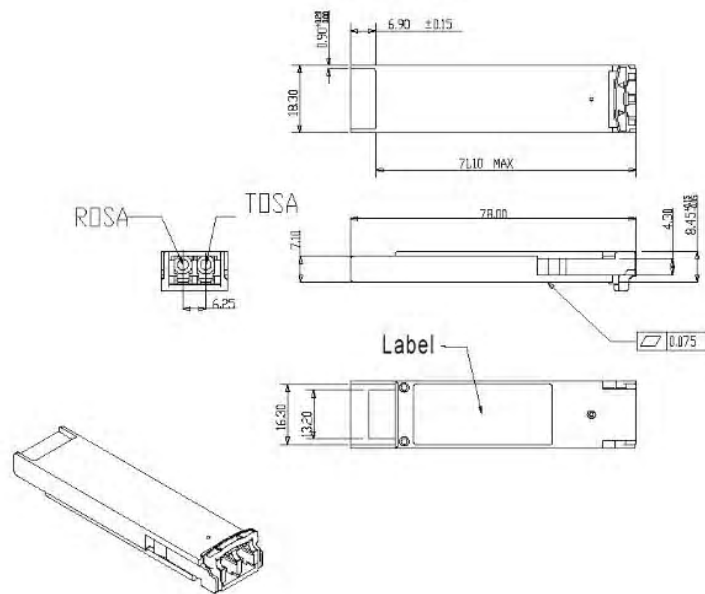|				
			commands	
4	LVTTL-0O	Interrupt	Interrupt (bar); Indicates presence of an important condition which can be read over the serial 2-wire interface	2
5	LVTTL-I	TX_DIS	Transmitter Disable; Transmitter laser source turned off	
6		VCC5	+5 Power Supply-Not required	
7		GND	Module Ground	1
8		VCC3	+3.3V 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. Ground 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	1
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	Port Address Bit 1 (Low = 0)	
23		GND	Port Address Bit 0 (Low = 0)	1
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – **Not required**	3
25	PECL-I	RefCLK-	Reference Clock inverted input, AC coupled on the host board – **Not required**	3
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

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 3.15V and 3.6V.

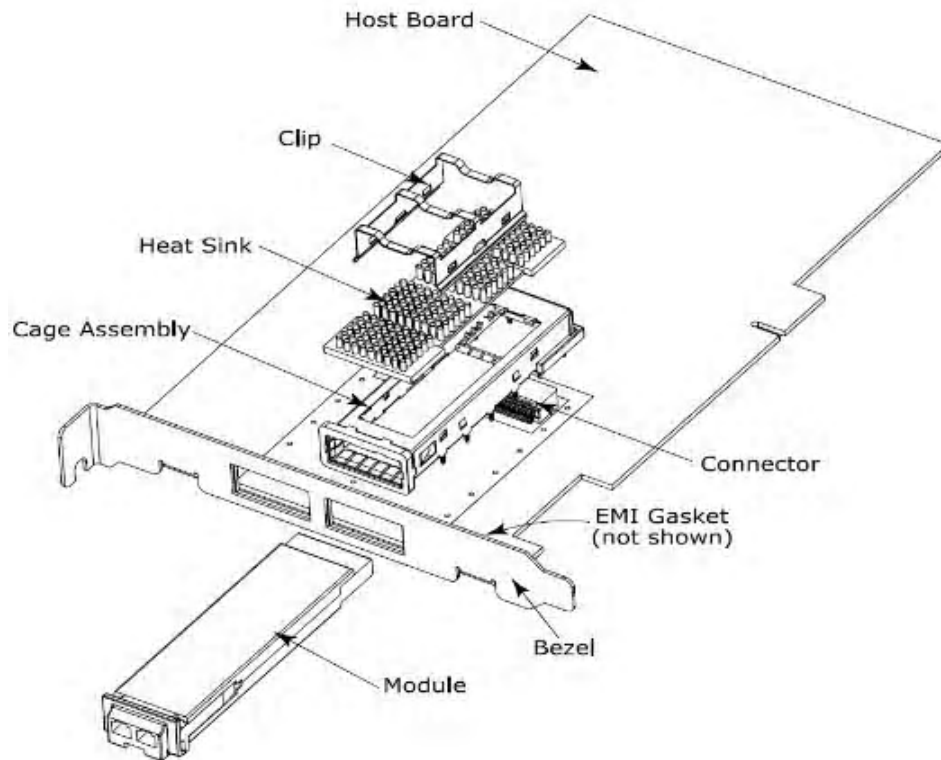3. Reference Clock input is not required

Electrical Pin-out Details

Pin	Signal		Signal	Pin
		GND	15
16	GND	RX_LOS	14
17	RD-	MOD_NR	13
18	RD+	MOD_ABS	12
19	GND	SDA	11
20	VCC2	SCL	10
21	P_DOWN/RST	VCC3	9
22	VCC2	VCC3	8
23	GND	GND	7
24	REFCLK+	VCC5	6
25	REFCLK-	TX_DIS	5
26	GND	INTERRUPT	4
27	GND	MOD_DESEI	3
28	TD-	VEE5	2
29	TD+	GND	1
30	GND		

TOWARD ASIC ←

TOWARD BEZEL →
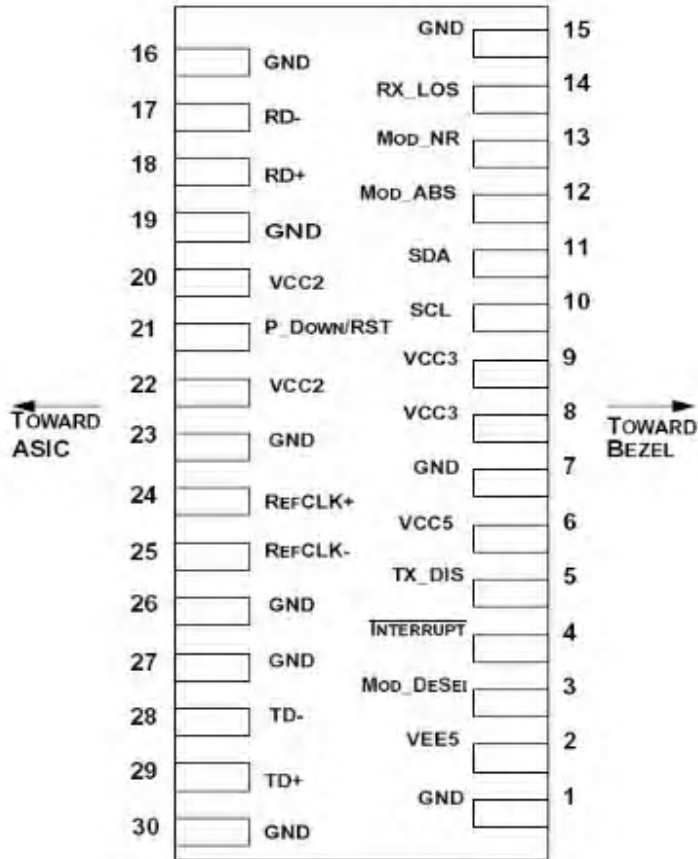
Mechanical Specification

ROSA   TOSA

Label

XFP Mechanical Components

Host Board

Clip

Heat Sink

Cage Assembly

Connector

EMI Gasket
(not shown)

Bezel

Module

Notice:

T-TECH reserves the right to make changes to or discontinue any optical link product or service identified in this publication, without notice, in order to improve design and/or performance. Applications that are described herein for any of the optical link products are for illustrative purposes only. T-TECH makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Contact:

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