T-10G-XFP-SM-10KM

10Gbps XFP Single Mode Transceiver 10km

Features

Support 9.95Gbps to 11.3Gbps bit rates
Hot-pluggable XFP footprint
Maximum Link Length of 10km with SMF
1310nm Uncooled DFB Laser
XFP MSA Package with Duplex LC Connector
No reference clock required
+1.8V, +3.3V Supply Voltage
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

10GBASE-LR at 10.3125Gbpsl
Other Optical Links, up to 11.1Gbps
10GBASE-LR Ethernet with FEC

Ordering Information

Product Description

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

T-10G-XFP-SM-10KM 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 10km on 9μm SMF .
The transceiver module comprises a transmitter with 1310nm 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			240	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		1.7	1.5	W

Electrical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
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	W	
Transmitter						
Input Differential Impedance	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	
Transmit Disable Assert Time	LOSA			10	us	

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

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.

Optical Characteristic

Parameter	Symbol	Min.	Typical	Max.	Unit	Note
Transmitter						
Optical Output Power	P	-6.5		+0.5	dBm	
Optical Wavelength	λ	1260		1355	nm	
Optical Extinction Ratio	ER	6			dB	1
Side Mode Suppression Ratio	SMSR	30			dB	
Average Launch Power of OFF	POFF	-30			dBm	
Tx Jitter	TXJ	Compliant with each standard requirements				
Receiver						
Relative Sensitivity	RSENS		-16	-14.5	dBm	2
Receiver Sensitivity in OMA	RSENS			-12.5	dBm	2
Maximum Input Power	PMAX	+0.5			dBm	
Optical Center Wavelength	λC	1260		1600	nm	
LOS De-Assert	LOS_D			-15	dBm	
LOS Assert	LOS_A	-25			dBm	
LOS Hysteresis		1		4	dB	

Notes:

1, PRBS 2^{31}-1 test pattern @10.3125Gbps.

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

Pin Description

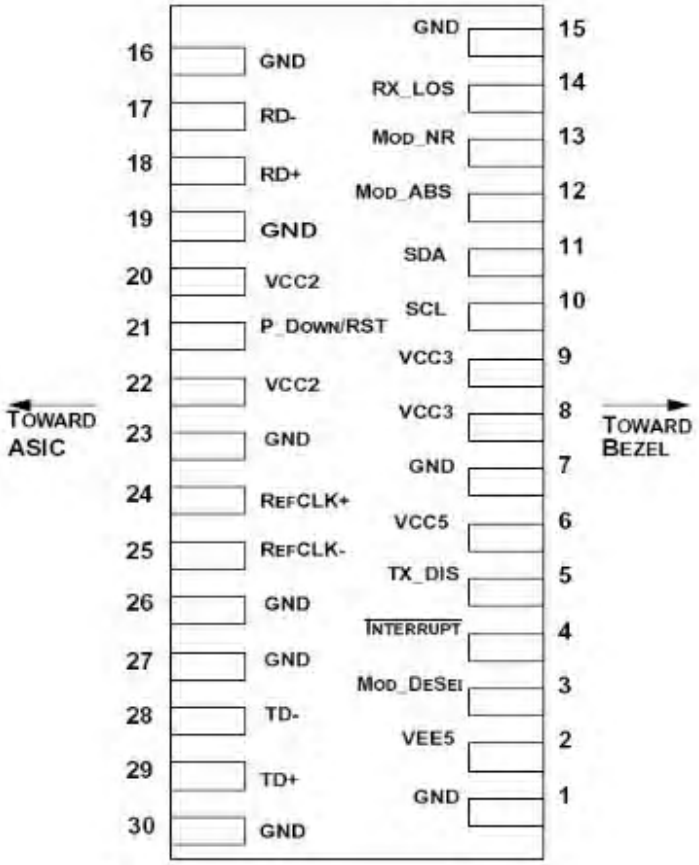
Pin Description

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/RST	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 the2-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

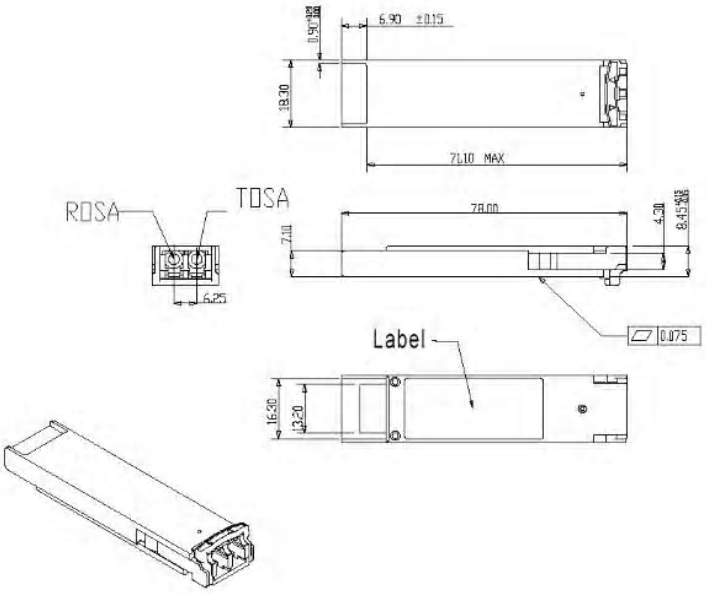
Notes:

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 3.15Vand 3.6V.
3. Reference Clock input is not required

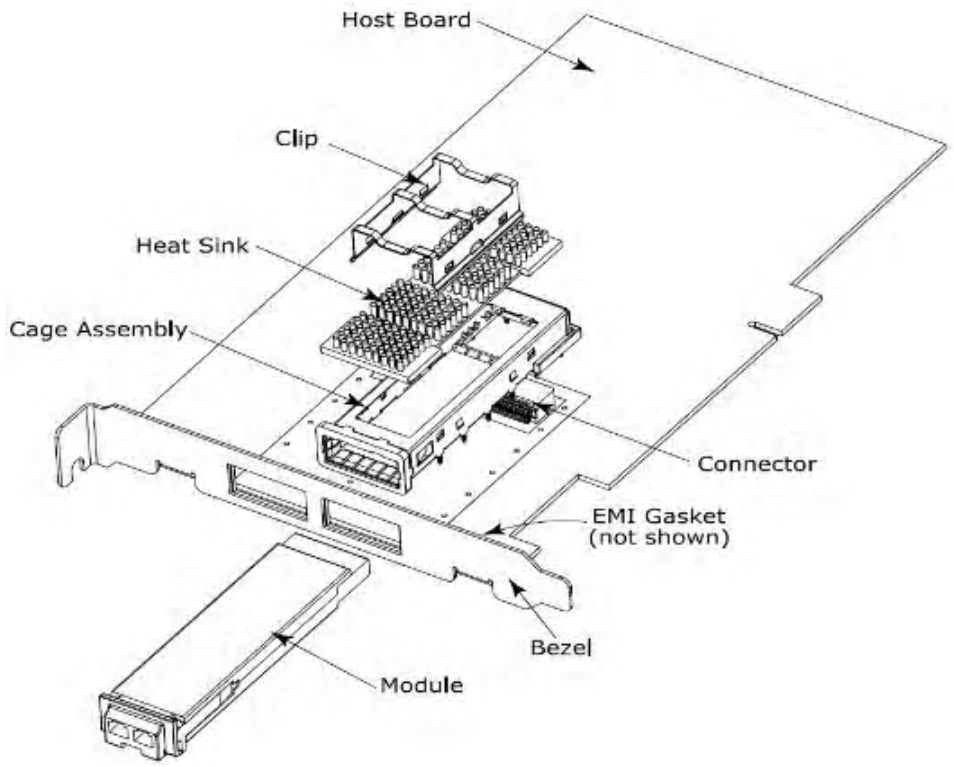
Electrical Pin-out Details



Mechanical Specification



XFP Mechanical Components



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