



## Features

- 9.95~11.3Gbps bi-directional fiber link
- Compliant with IEEE802.3ae 10GBase-LR/LW Ethernet
- Compliant with 1200-SM-LL-L 10G Fibre Channel
- Compliant with SONET OC-192 SR standard
- Compliant with SDH STM-64 I64 standard
- Compliant with XFP MSA INF-8077i
- Compliant with SFF8472 diagnostic monitoring interface for Optical Transceivers (DOM)
- 1310nm DFB transmitter
- Built-in Tx CDR and Rx CDR
- SMF 10km point-to-point transmission
- Duplex LC receptacle connector
- 2-wire I2C interface for management and diagnostic monitor
- RoHS Compliant

## Application

- 10GBase-LR/LW
- 10x Fibre Channel
- SONET OC-192 & SDH STM-64

## Ordering Information

PART NO.	TX	RX	DISTANCE	DOM	TEMPERATURE
GL10G-XFP-LR	1310 nm	1310nm	SMF 10km	Support	0~70°C
GL10G-XFP-LR-I	1310 nm	1310nm	SMF 10km	Support	-40~85°C

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# 10GBase-LR/LW XFP Optical Transceiver Single-Mode 1310nm, 10km, DOM



## Absolute Maximum Ratings

PARAMETER	SYMBOL	MIN	MAX	UNITS	NOTE
Storage Temperature	$T_s$	-40	+85	°C	
Supply Voltage	$V_{cc}$	-0.5	4.0	V	
Storage Relative Humidity	$RH$	5	95	%	

## Recommended Operating Conditions

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Case Operating Temperature	$T_c$	0	---	70	°C	GL10G-XFP-LR
		-40	---	85	°C	GL10G-XFP-LR-I
Supply Voltage	$V_{cc}$	3.13	3.3	3.47	V	
Supply Current	$I_{TX} + I_{RX}$	---		390	mA	
Power Consumption	$P$			1.3	W	

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## Transmitter Electro-optical Interface

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Data Rate	DR	9.95	10.3125	11.3	Gbps	
Optical Output Power	P <sub>O</sub>	-6		+0.5	dBm	1
Optical Modulation Amplitude	P <sub>OMA</sub>	-5.2		+0.5	dBm	
Optical Extinction Ratio	ER	3.5			dB	
Center Wavelength	λ <sub>C</sub>	1260	1310	1355	nm	
Spectral Width (-20dB)	Δλ			1	nm	
Side Mode Suppression Ratio	SMSR	30			dB	
Relative Intensity Noise	RIN			-128	dB/Hz	
Output Eye		Compliant with IEEE802.3ae				
Output Power @Tx_Dis Asserted	P <sub>OFF</sub>			-30	dBm	
Differential Input Voltage Swing	V <sub>DIFF</sub>	180		950	mV	
Differential Input Impedance	Z <sub>d</sub>	90	100	110	Ω	
Tx_Fault – High (Tx Fault)	V <sub>Fault_H</sub>	2.0		V <sub>cc</sub>	V	
Tx_Fault – Low (Tx Normal)	V <sub>Fault_L</sub>	V <sub>ee</sub>		0.8	V	
Tx_Disable – High (Tx Off)	V <sub>Disable_H</sub>	2.0		V <sub>cc</sub>	V	
Tx_Disable – Low (Tx On)	V <sub>Disable_L</sub>	V <sub>ee</sub>		0.5	V	
Tx_Disable Assert Time	TX <sub>Dis_Off</sub>			10	μs	
Tx_Enable Assert Time	TX <sub>Dis_On</sub>			2	ms	

Note 1: Coupling into a 9/125μm single-mode fiber.

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## Receiver Electro-optical Interface

PARAMETER	SYMBOL	MIN	TYP.	MAX	UNITS	NOTE
Data Rate	DR	9.95	10.3125	11.3	Gbps	
Optical Input Power-maximum	P <sub>IN</sub>			+0.5	dBm	
Receiver Sensitivity	P <sub>IN</sub>			-14.5	dBm	1
Receiver Sensitivity (OMA)	P <sub>IN</sub>			-12.6	dBm	1
Stressed Receiver Sensitivity (OMA)	P <sub>IN</sub>			-10.3	dBm	1
Operating Center Wavelength	λ <sub>c</sub>	1260		1620	nm	
Receiver Reflectance	RR			-12	dB	
Loss of Signal (LOS) - Asserted	P <sub>A</sub>	-26			dBm	
Loss of Signal (LOS) - De-asserted	P <sub>D</sub>			-15.5	dBm	
Differential Output Voltage Swing	V <sub>DIFF</sub>	400		800	mV	
Differential Input Impedance	Z <sub>d</sub>	90	100	110	Ω	
LOS Signal Output Voltage - Low	LOS <sub>VL</sub>	V <sub>ee</sub>		0.8	V	
LOS Signal Output Voltage - High	LOS <sub>VH</sub>	2.4		V <sub>cc</sub>	V	
LOS Assert Time (Low to High)	LOS <sub>AT</sub>			100	μs	
LOS De-Assert Time (Low to High)	LOS <sub>DT</sub>			100	μs	

Note 1: With BER better than or equal to  $1 \times 10^{-12}$ , measured in the center of the eye opening with 10.3125Gbps, PRBS 2<sup>31</sup> -1

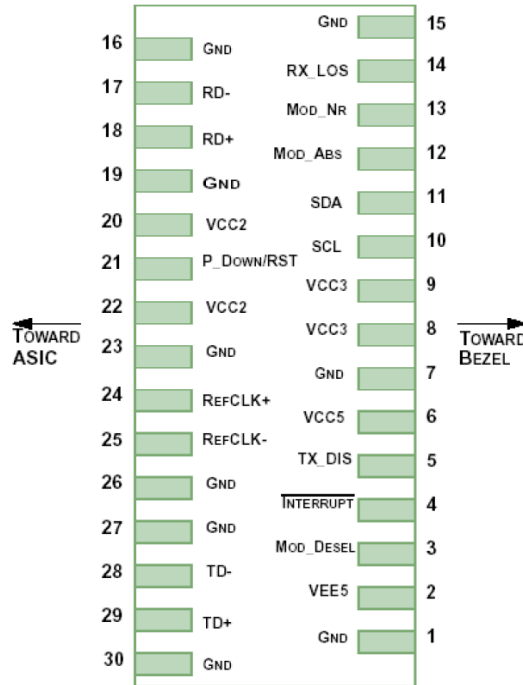
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## Pin Assignment



PIN NO.	PIN NAME	FUNCTION	NOTE
1	GND	Ground	
2	VEE5	-5V Power Supply (Not required)	
3	MOD_DESEL	Module De-Select	LVTTL-I
4	INTERRUPT	Interrupt (bar)	LVTTL-O
5	TX_DIS	Transmitter Disable (Laser source turned Off)	LVTTL-I
6	VCC5	+5V Power Supply (Not required)	
7	GND	Ground	
8	VCC3	+3.3V Power Supply	
9	VCC3	+3.3V Power Supply	
10	SCL	Serial 2-wire interface Clock	LVTTL-I
11	SDA	Serial 2-wire interface Data	LVTTL-I/O
12	MOD_ABS	Module Absent (Indicates module is not present)	LVTTL-O

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13	MOD_Nr	Module Not Ready	LVTTL-O
14	RX_LOS	Receiver Loss of Signal Indicator	LVTTL-O
15	GND	Ground	
16	GND	Ground	
17	RD-	Receiver Inverted Data Out (AC coupled)	CML-O
18	RD+	Receiver Non-Inverted Data Out (AC coupled)	CML-O
19	GND	Ground	
20	VCC2	+1.8V Power Supply (Not required)	
21	P_DOWN/RST	Power Down/RESET	
22	VCC2	+1.8V Power Supply (Not required)	
23	GND	Ground	
24	REF_CLK+	Reference Clock Non-Inverted Input (Not required)	PECL-I
25	REF_CLK-	Reference Clock Inverted Input (Not required)	PECL-I
26	GND	Ground	
27	GND	Ground	
28	TD-	Transmitter Inverted Data In (AC coupled)	CML-I
29	TD+	Transmitter Non-Inverted Data In (AC coupled)	CML-I
30	GND	Ground	

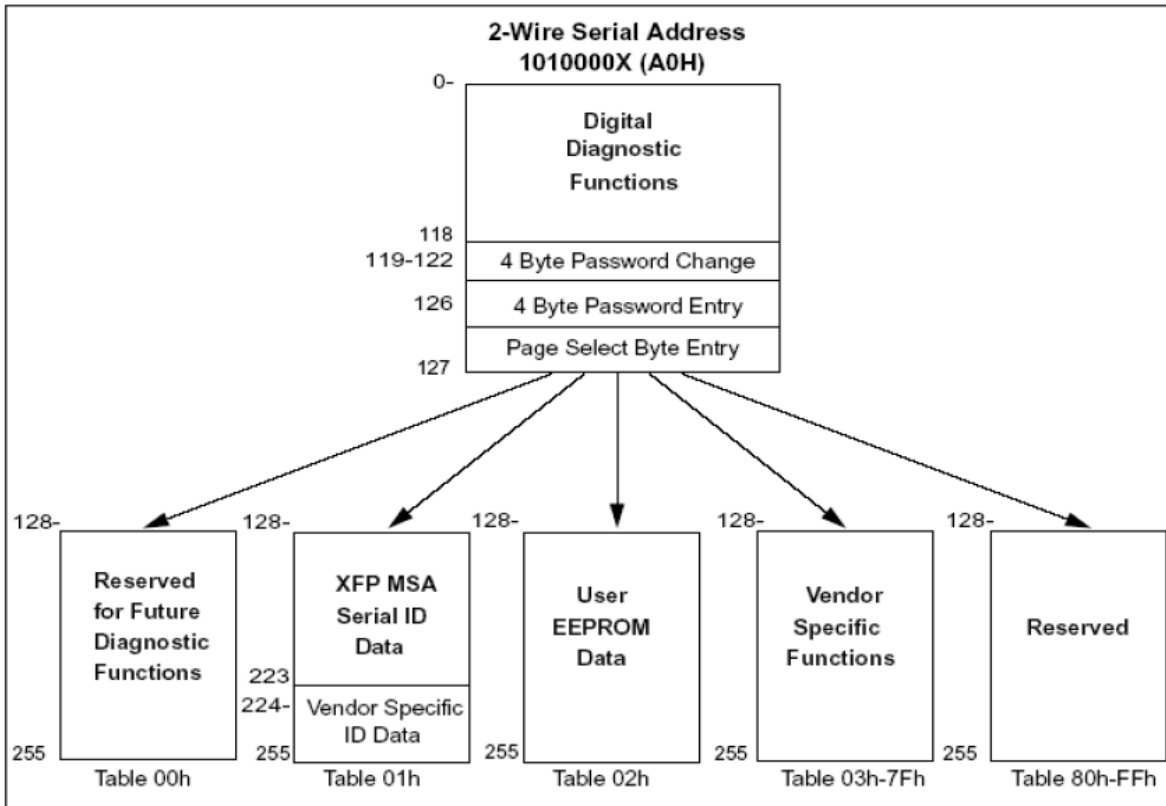
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## Digital Diagnostic Memory Map



## Digital Diagnostic Monitoring Characteristics

PARAMETER	SYMBOL	ACCURACY	UNIT	NOTE
Transceiver Temperature	$T_{INT}$	$\pm 3$	$^{\circ}C$	
Transceiver Supply Voltage	$V_{INT}$	$\pm 3$	%	
TX Bias Current	$I_{BIAS}$	$\pm 10$	%	
TX Output Power	$P_{TX}$	$\pm 3$	dB	
RX Received Optical Power	$P_{RX}$	$\pm 3$	dB	

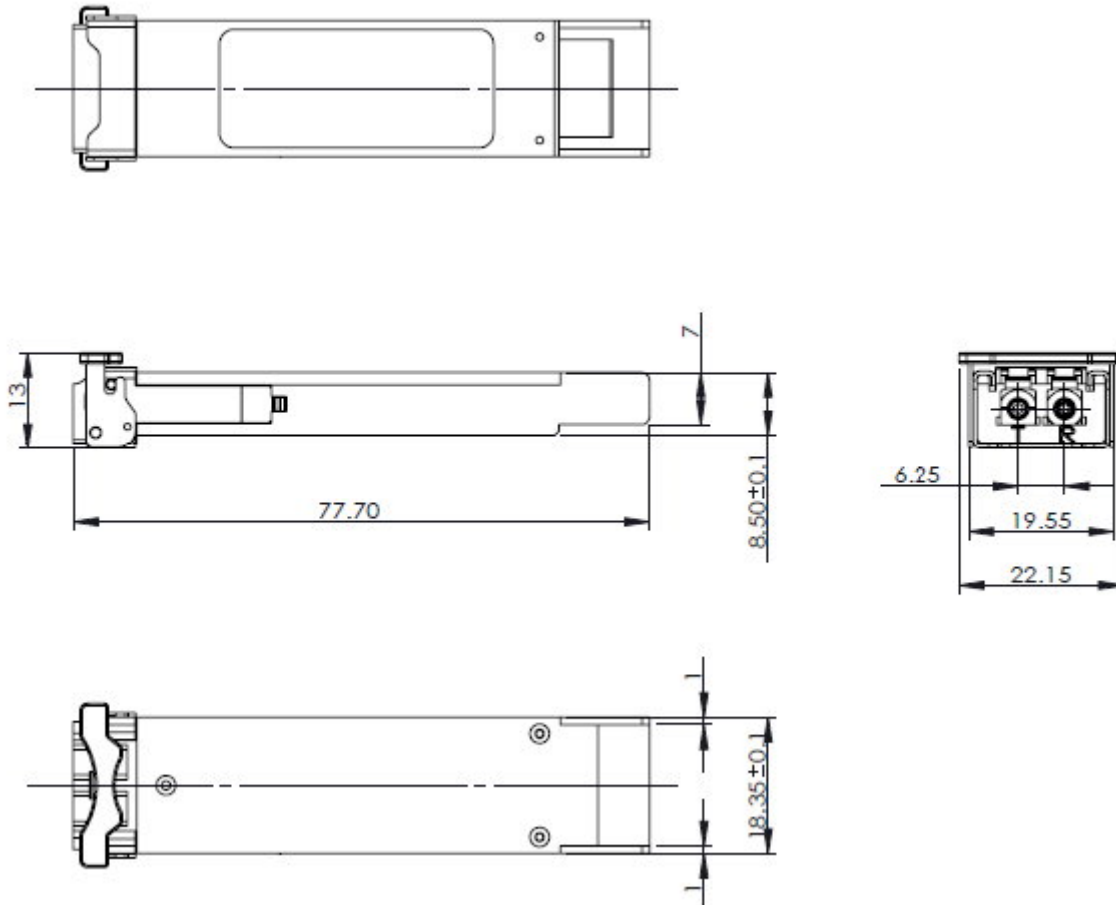
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**Mechanical Dimensions** (All dimensions are  $\pm 0.20\text{mm}$  Unless Otherwise Specified, Unit: mm):



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