

## OXB10G-xx60DxR

10Gb/s XFP Bi-Directional Transceiver, SMF, Tx:1270nm/Rx:1330nm or Tx:1330nm/Rx:1270nm, 60km

### Features

- Supports 9.95 to 11.3Gb/s bit rates
- Simplex LC Connector
- Hot-pluggable XFP footprint
- Uncooled 1270nm DFB transmitter, 1330nm APD photo-detector
- Uncooled 1330nm DFB transmitter, 1270nm APD photo-detector
- Applicable for 60km SMF connection
- Low power consumption, < 1.5W
- XFP MSA package
- Compatible with RoHS
- Excellent EMI performance
- Built-in digital diagnostic functions
- Operating Temperature: Standard 0~70°C, Extended -10~80°C, Industrial -40~85°C



### Applications

- 10GBASE-ER/10GBASE-EW 10G Ethernet
- 1200-SM-LL-L 10G Fibre Channel
- SONET OC-192&SDH STM-64 at 9.953Gbps
- 10GE over G.709 at 11.09Gbps
- OC192 over FEC at 10.709Gbps
- Other optical links, up to 11.1Gbps

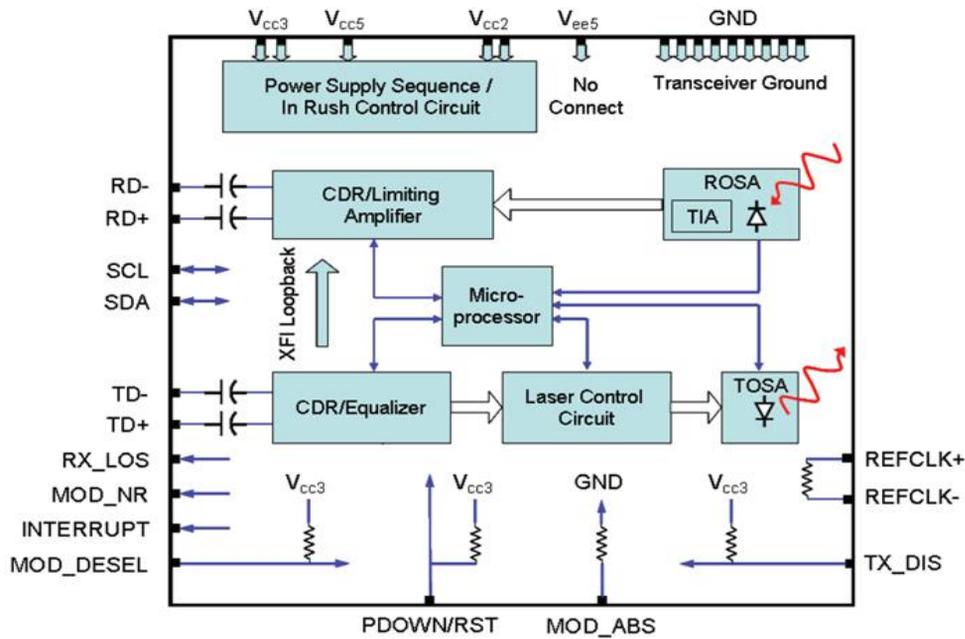
### Description

Optcore's OXB10G-xx60DxR is hot pluggable XFP Bi-Directional transceiver module, which is designed for 10Gb/s duplex optical data communications application. The BiDi XFP transceiver module comprises a transmitter with a 1270 or 1330nm DFB laser transmitter, an integrated 1330 or 1270nm detector preamplifier(IDP) mounted in an optical header and a limiting post-amplifier IC. It provides 60km link distance over single-strand single mode fiber.

This XFP BiDi transceiver module also provides digital diagnostic monitoring interface(DDM or DOM), which providing real-time monitoring of the transceiver temperature, laser bias current, optical power, received optical power and transceiver supply voltage. The transceiver module is comply with XFP MSA Rev 4.5 specifications, 10 Gigabit Ethernet specifications (10GBASE-ER/EW per IEEE 802.3ae ), and 10G Fibre Channel (1200-SM-LL-L). The transceiver is also a Class 1 laser product complies with FDA/CDRH and IEC-60825 standards.

There are three versions of the series 10G XFP BiDi 60km transceiver for different applications. The Standard grade (0~70°C) is for commonly commercial application, the Extended grade (-10~80°C) is for Extended temperature application, and the Industrial grade (-40~85°C) is made with robust and reliable components to meet the needs of Industrial Ethernet application under harsh environmental conditions.

### Functional Diagram



**Absolute Maximum Ratings**

Parameter	Symbol	Min	Max	Unit
Supply Voltage	V <sub>cc</sub>	-0.5	4.0	V
Storage Temperature	T <sub>s</sub>	-40	+85	°C
Operating Humidity	-	5	85	%

Any stress beyond the maximum ratings can result in permanent damage. The device specifications are guaranteed only under the recommended operating conditions.

**Recommended Operating Conditions**

Parameter	Symbol	Min.	Typ.	Max.	Unit	Notes
Power Supply Voltage	V <sub>cc</sub>	3.13	3.3	3.47	V	
Power Supply Current	I <sub>cc</sub>			450	mA	
Case Operating Temperature	T <sub>c</sub>	0		70	°C	Standard
		-40		85	°C	Industrial
Data Rate	DR	9.95	10.3125	11.3	Gbps	
Maximum supported distance	L <sub>max</sub>			60	km	

**Optical and Electrical Characteristics**

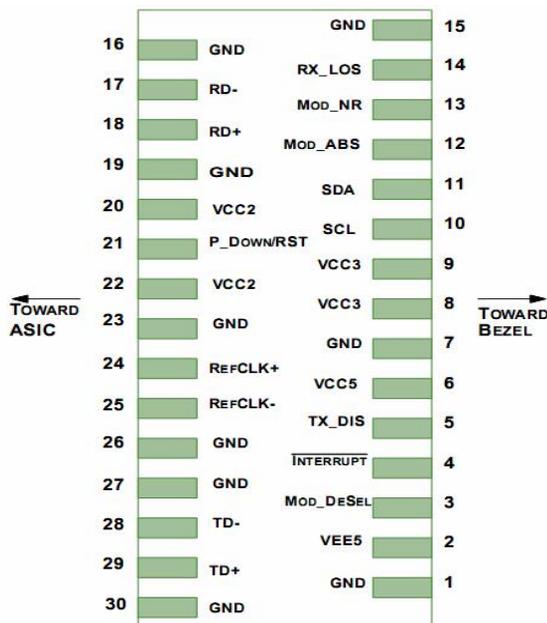
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
<b>Transmitter</b>						
Operating Wavelength	$\lambda$	1260	1270	1280	nm	OXB10G-2360DxR
		1320	1330	1340		OXB10G-3260DxR
Ave. output power (Enabled)	P <sub>AVE</sub>	0		5.0	dBm	1
Side-Mode Suppression Ratio	SMSR	30			dB	
Extinction Ratio	ER	3.5	4.5		dB	
RMS spectral width	$\Delta\lambda$			0.45	nm	
Rise/Fall time (20%~80%)	T <sub>r</sub> /T <sub>f</sub>			45	ps	

Dispersion penalty	T <sub>DP</sub>			3.2	dB	
Relative Intensity Noise	R <sub>IN</sub>			-130	dB/Hz	
Output Optical Eye	Compliant with IEEE 802.3ae					
<b>Receiver</b>						
Operating Wavelength	λ	1320	1330	1340	nm	OXB10G-2360DxR
		1260	1270	1280		OXB10G-3260DxR
Receiver Sensitivity	P <sub>SEN</sub>			-20.0	dBm	2
Overload	P <sub>AVE</sub>	-7.0			dBm	
Receiver Reflectance	R <sub>Rx</sub>			-12	dB	
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-21	dBm	
LOS Hysteresis	Pd-Pa	0.5			dB	

**Notes:**

1. Average power figures are informative only, per IEEE 802.3ae.
2. Measured with worst ER; BER<10<sup>-12</sup>; 2<sup>31</sup> – 1 PRBS.

**Pin Definitions**



**Pin Descriptions**

Pin	Logic	Symbol	Name/Description	Ref
1		GND	Module Ground	1
2		VEE5	Optional -5.2 Power Supply – <b>Not required</b>	
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 – <b>Not required</b>	
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	1
20		VCC2	+1.8V Power Supply – <b>Not required</b>	
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 the 2-wire serial interface, equivalent to a power cycle.	
22		VCC2	+1.8V Power Supply – <b>Not required</b>	
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Reference Clock non-inverted input, AC coupled on the host board – <b>Not required</b>	3
25	PECL-I	RefCLK-	Reference Clock inverted input, AC coupled on the host board – <b>Not required</b>	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:**

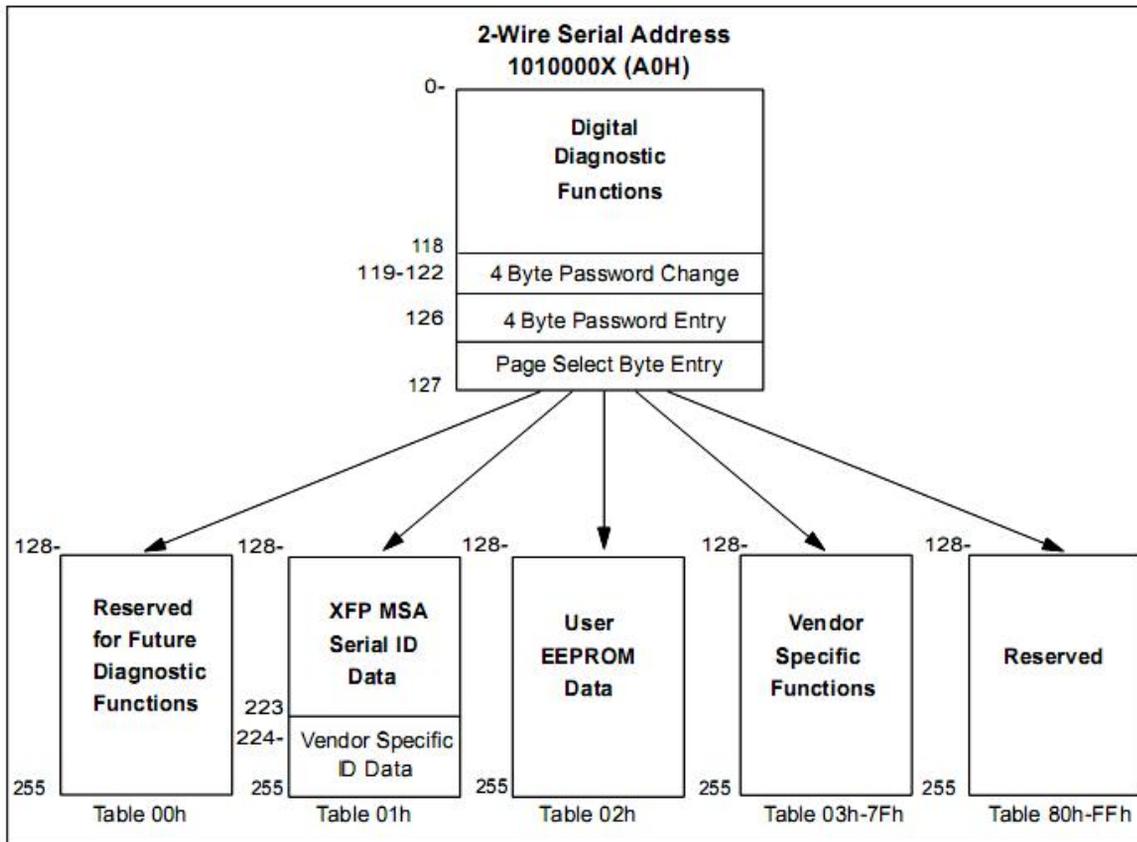
1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector, should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15V and 3.6V.
3. A Reference Clock input is not required.

**Management Interface**

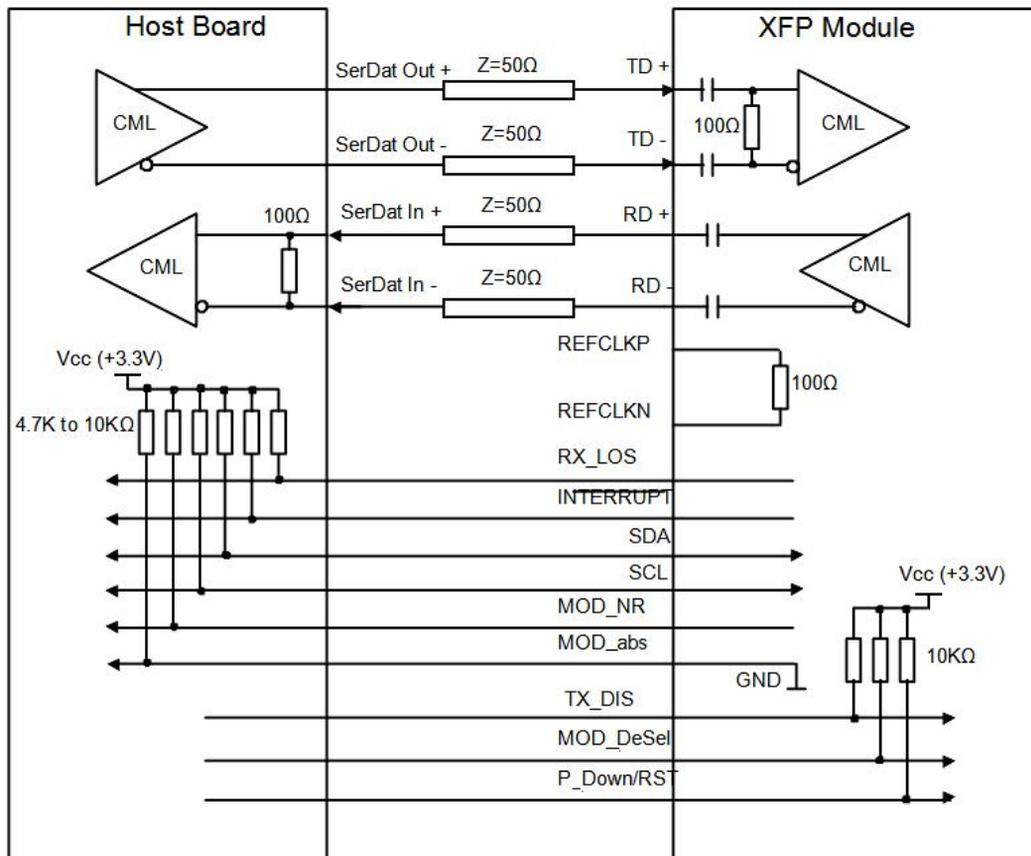
The XFP BiDi transceivers provide serial ID memory contents and diagnostic information about the present operating conditions by the 2-wire serial interface (SCL, SDA).

The XFP BiDi Module provides diagnostic information about the present operating conditions. The transceiver generates this diagnostic data by digitization of internal analog signals. Alarm/warning threshold data is written during device manufacture. Received power monitoring, transmitted power monitoring, bias current monitoring, supply voltage monitoring and temperature monitoring all are implemented.

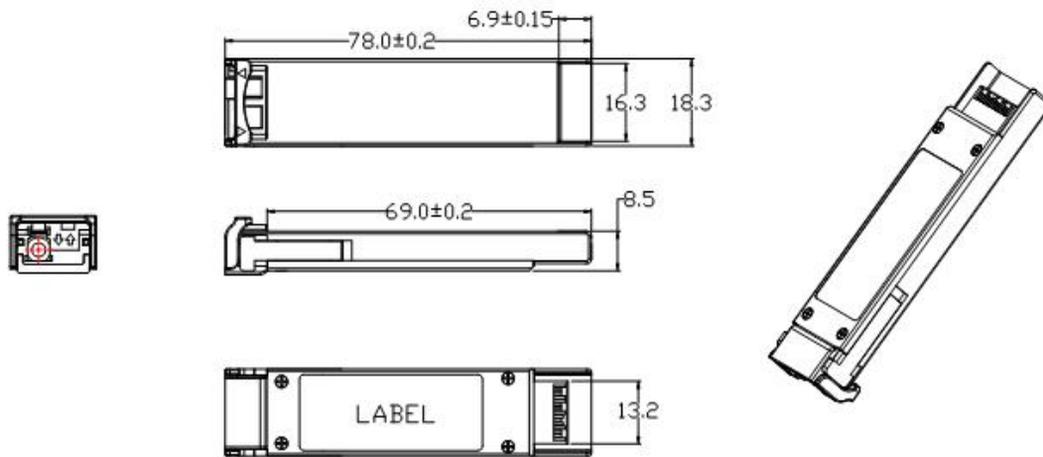
The digital diagnostic memory map specific data field defines as following.



**Recommended High-speed Interface Circuit**



**Mechanical Specifications**



Dimensions are in Millimeter

Tolerance without indication is ±0.1mm

Wavelength	Latch Color
TX 1270nm	Red
TX 1330nm	White

**Ordering information**

Part number	Description
OXB10G-2360DCR	10G XFP BiDi Transceiver, Tx:1270nm/Rx:1330nm, 60km, LC, DDM, 0°C~+70°C
OXB10G-3260DCR	10G XFP BiDi Transceiver, Tx:1330nm/Rx:1270nm, 60km, LC, DDM, 0°C~+70°C
OXB10G-2360DER	10G XFP BiDi Transceiver, Tx:1270nm/Rx:1330nm, 60km, LC, DDM, -10°C~+80°C
OXB10G-3260DER	10G XFP BiDi Transceiver, Tx:1330nm/Rx:1270nm, 60km, LC, DDM, -10°C~+80°C
OXB10G-2360DTR	10G XFP BiDi Transceiver, Tx:1270nm/Rx:1330nm, 60km, LC, DDM, -40°C~+85°C
OXB10G-3260DTR	10G XFP BiDi Transceiver, Tx:1330nm/Rx:1270nm, 60km, LC, DDM, -40°C~+85°C

**Warnings**

**Process plug**

The transceiver optics is supplied with a dust cover. This plug protects the transceiver optics during standard manufacturing processes by preventing contamination from air borne particles. It is recommended that the dust cover remain in the transceiver whenever an optical fiber connector is not inserted.

**Handling Precautions**

The transceiver optics is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.

**Laser Safety**

The transceiver optics is a Class 1 laser product per international standard IEC 60825-1. Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

For more product information, visit us on the web at [www.optcore.net](http://www.optcore.net)



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