

Datasheet

10 Gbps 40 km XFP Transceivers

XFP-10GD-IR2



Highlights

- XFP transceiver
- Data Rates: 9.952 - 11.09 Gbps
- Protocols:
 - 10 Gigabit Ethernet
 - 10 Gigabit Fibre Channel
 - SONET OC-192/STM-64
 - SONET OC-192/STM-64 over FEC
- Single-mode fiber
- 1550 nm
- 12 to 40 km range
- Duplex LC connector
- Digital Diagnostics (SFF-8472)
- XFI Loopback
- Hot-swap

Overview

MRV Communications' XFP transceivers provide the high speeds and compact dimensions that today's demanding networks require while delivering the deployment flexibility and inventory control that network administrators demand. Designed to Multi-Source Agreement (MSA) standards for broadest compatibility, they perfectly match MRV's wide range of optical transport solutions.

Visit the MRV website at www.mrv.com or contact your nearest authorized MRV Communications dealer for more information.

Specifications Overview

Data Rate	9.952 - 11.09 Gbps
Tx Wavelength	1550 nm
Tx Power (Minimum)	-1 dBm
Tx Dispersion Penalty	2 dB
Tx Disable	Yes
Rx Wavelength Range	1530 - 1565 nm
Rx Sensitivity	-16 dBm
Rx Saturation	-1 dBm
Operating Temperature Range	0 to 70 °C
Power Consumption	2.65 Watts

Datasheet

Optical Specifications					
Parameter	Symbol	Minimum	Maximum	Unit	Notes
Operating Data Rate	DR	9.953	11.1	Gbps	-
Center Wavelength	c	1530	1565	nm	-
Transmitter					
Average Output Power	P _{OUT}	-1	2	dBm	1
Spectral Width	Δλ	-	1	nm	-
Side Mode Suppression Ratio	SMSR	30	-	dB	-
Extinction Ratio	ER	8.2	-	dB	2
Dispersion Penalty	DP	-	2	dB	2
Optical Eye Mask	Compliant with ITU-T G.691 and GR-253-CORE				-
Receiver					
Sensitivity	P _{IN}	-	-16	dBm	3
Saturation	P _{IN}	-1	-	dBm	3
LOS Assert	LOS _A	-25	-	dBm	-
LOS De-Assert	LOS _D	-	-15	dBm	-
LOS Hysteresis	-	1	4	dB	-
Reflectance	-	-	-27	dB	-

- Notes:**
1. The optical power is launched into SMF.
 2. Measured with a PRBS 2³¹-1 test pattern @9.953 Gbps.
 3. Measured with a PRBS 2³¹-1 test pattern @9.953 Gbps, BER ≤ 10⁻¹²

Monitoring Specifications				
Data Address	Parameter	Range	Accuracy	Notes
96-97	Temperature	-10 to 80 °C	± 3 °C	-
100-101	Bias Current	0 to 100 mA	± 10 %	-
102-103	TX Power	-2 to 3 dBm	± 2 dB	-
104-105	RX Power	-18 to 0 dBm	± 2 dB	-
106-107	V _{CC5} Voltage	+4.5 V to +5.5 V	± 3 %	-
108-109	V _{CC3} Voltage	+3.0 V to +3.7 V	± 3 %	-

Absolute Maximum Rating					
Parameter	Symbol	Min.	Max.	Unit	Notes
Supply Voltage (3.3V)	V _{CC3}	-0.5	4.0	V	-
Supply Voltage (5.0V)	V _{CC5}	-0.5	6.0	V	-
Operating Relative Humidity	RH	-	85	%	-
Storage Temperature	T _s	-40	85	°C	-

Recommended Operation Conditions					
Parameter	Symbol	Min	Max	Unit	Notes
Operating Temperature (Case)	T _C	0	70	°C	-
Power Supply Voltage (3.3V)	V _{CC3}	3.13	3.47	V	-
Power Supply Voltage (5V)	V _{CC5}	4.75	5.25	V	-
Power Supply Current (3.3V)	I _{CC3}	-	750	mA	-
Power Supply Current (5V)	I _{CC5}	-	200	mA	-
Power Dissipation	P _D	-	3.5	W	-
Data Rate	DR	9.953	11.1	Gbps	-

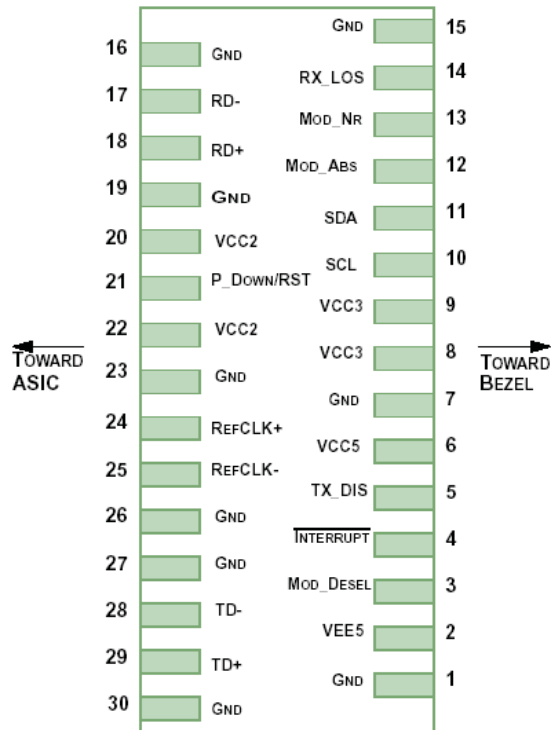
Datasheet

Electrical Specifications

Parameter	Symbol	Minimum	Maximum	Unit	Notes
High-Speed Signal (CML) Interface Specification					
Input Data Rate	-	9.953	11.1	Gbps	-
Differential Data Input Amplitude ¹	-	120	1000	mVpp	1
Input Differential Impedance	-	80	120	Ω	-
Output Data Rate	-	9.953	11.1	Gbps	-
Differential Data Output Amplitude ¹	-	500	800	mVpp	1
Output Differential Impedance	-	80	120	Ω	-
Low-Speed Signal (LVTTTL) Interface Specification					
Input High Voltage	-	2.0	Vdd1=3.3	V	-
Input Low Voltage	-	GND	0.8	V	-
Output High Voltage	-	2.4	Vdd1=3.3	V	-
Output Low Voltage	-	GND	0.4	V	-
2-Wire Serial Interface(LVTTTL) Specification					
Clock Frequency	f _{SCL}	-	400	kHz	-
Reference Clock Interface Specification					
No Reference Clock Needed					

Notes: 1. Internally AC coupled.

Host Board Connector Pinout



Datasheet

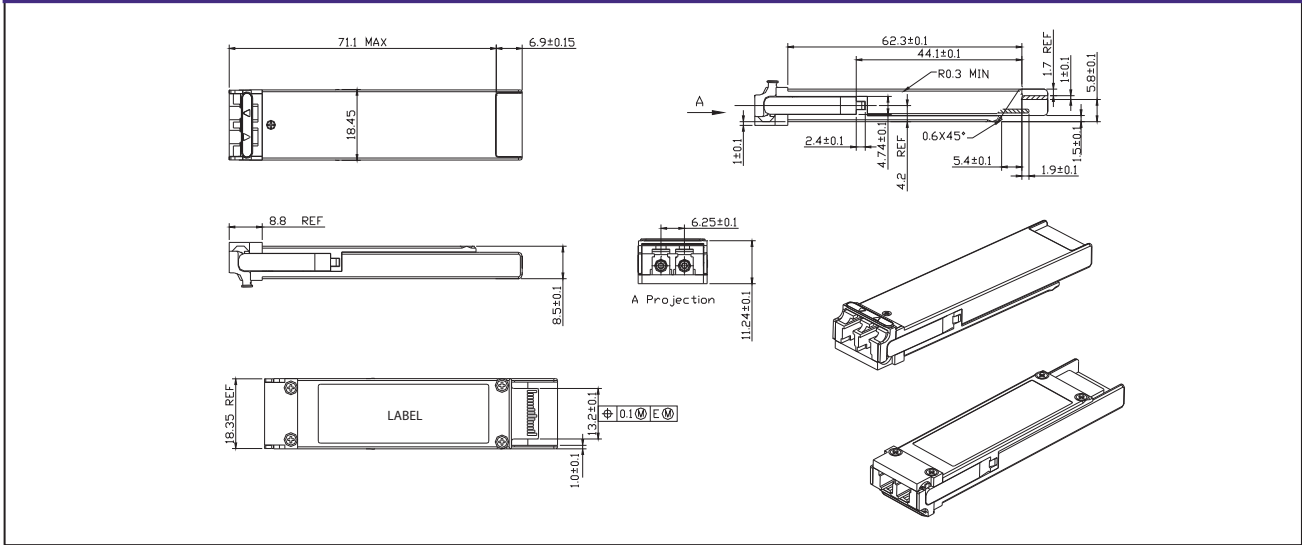
Host Board Connector Legend

Pin	Logic	Symbol	Name/Description	Note
1		GND	Module Ground	1
2		V _{EE5}	Optional -5.2V power supply (Not Implemented)	
3	LVTTTL-I	Mod_DeSel	Module De-Select; when held low allows module to respond to 2-wire serial interface	
4	LVTTTL-O	Interrupt	Interrupt; indicates presence of an important condition which can be read over the 2-wire serial interface	2
5	LVTTTL-I	TX_DIS	Transmitter Disable; turns off transmitter laser output	
6		V _{CC5}	+5 V Power Supply	
7		GND	Module Ground	1
8		V _{CC3}	+3.3 V Power Supply	
9		V _{CC3}	+3.3 V Power Supply	
10	LVTTTL-I/O	SCL	2-Wire Serial Interface Clock	2
11	LVTTTL-I/O	SDA	2-Wire Serial Interface Data Line	2
12	LVTTTL-O	Mod_Abs	Indicates module is not present. Grounded in the module	2
13	LVTTTL-O	Mod_NR	Module Not Ready; indicating module operational fault	2
14	LVTTTL-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		V _{CC2}	+1.8 V Power Supply (Not Implemented)	3
21	LVTTTL-I	P_Down/RST	Power Down; When high, requires the module to limit power consumption to 1.5 W or below. 2-wire serial interface must be functional in the low power mode. Reset; the falling edge initiates a complete reset of the module including the 2-wire serial interface, equivalent to a power cycle.	
22		V _{CC2}	+1.8 V Power Supply (Not Implemented)	3
23		GND	Module Ground	1
24	PECL-I	RefCLK+	Not used, internally terminated to 50 ohm (100 ohm diff).	4
25	PECL-I	RefCLK-	Not used, internally terminated to 50 ohm (100 ohm diff).	4
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 ground pins GND are isolated from the module case and chassis ground within the module.
 2. Shall be pulled up with 4.7 K-10 Kohms to a voltage between 3.15 V and 3.45 V on the host board.
 3. The pins are open within module.
 4. Reference Clock is not required.

Datasheet

Mechanical Drawing



Ordering Information

Model	Description	Data Rate	Wavelength (nm)	Dispersion Penalty (dB)	Bail Latch Color	Distance (km)
XFP-10GD-IR2	OC192/STM-64, OC192/STM-64 over FEC, 10GE or 10G FC, single-mode XFP transceiver with Digital Diagnostics.	9.953 - 11.1 Gbps	1550	2.0	Magenta	12 -40

Regulatory and Industry Compliances

Class 1 Laser Product, complies with EN 60825-1 and 21 CFR 1040.10 except for deviations pursuant to Laser Notice No. 50. dated June 24, 2007
 MSA INF-8077i; Digital Diagnostic SFF-8472
 Certified by one or more of the following agencies: TÜV, UL, CSA;
 RoHS Directive; China RoHS; California RoHS Law, REACH Directive SVHC; WEEE Directive
 The Quality Management System is certified to ISO 9001 by QMI-SAI Global
 The Environmental Management System is in compliance with ISO 14001

Warnings

Handling Precautions: This device 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: Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

MRV has more than 50 offices throughout the world. Addresses, phone numbers and fax numbers are listed at www.mrv.com. Please e-mail us at info@mrv.com or call us for assistance.

MRV Los Angeles
 20415 Nordhoff Street
 Chatsworth, CA 91311
 800-338-5316
 818-773-0900

MRV Boston
 300 Apollo Drive
 Chelmsford, MA 01824
 800-338-5316
 978-674-6800

MRV International
 Business Park Moerfelden
 Waldeckerstrasse 13
 64546 Moerfelden-Walldorf
 Germany
 Tel. (49) 6105/2070
 Fax (49) 6105/207-100

All statements, technical information and recommendations related to the products herein are based upon information believed to be reliable or accurate. However, the accuracy or completeness thereof is not guaranteed, and no responsibility is assumed for any inaccuracies. Please contact MRV Communications for more information. MRV Communications and the MRV Communications logo are trademarks of MRV Communications, Inc. Other trademarks are the property of their respective holders.