1.0625/1.25 Gbps Single-Mode 20 km SFP Transceiver

SFP-GD-LX

HIghlights

- SFP transceiver
- Line Rates: 1.0625 and 1.25 Gbps
- Protocols:
  - 1 Gigabit Ethernet (1.25 Gbps)
  - 1 Gbps Fibre Channel (1.0625 Gbps)
- Single-mode fiber
- 1310 nm
- 0 to 20 km
- Duplex LC connector
- Digital Diagnostics (SFF-8472)
- Hot-swap

Overview

Small Form-Factor Pluggable (SFP) interfaces from MRV Communications provide flexible high speed links in a small industry standard package. They deliver the deployment options and inventory control that network administrators demand for growing networks.

SFPs are designed to Multi-Source Agreement (MSA) standards to ensure network equipment compatibility. They are a perfect addition to MRV 's extensive lines of networking equipment.

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

Specifications Overview	
Line Rate	1.0625 and 1.25 Gbps
Tx Wavelength	1310 nm
Tx Power (Minimum)	-9.5 dBm
Tx Disable	Yes
Rx Wavelength	1260 - 1580 nm
Rx Sensitivity	-20 dBm
Rx Saturation	-3 dBm
Operating Temperature Range	-5 to 70 ºC
Power Consumption	1 Watt

Optical Specifications

Parameter	Symbol	Minimum	Maximum	Unit	Note
Transmitter					
Centre Wavelength	λ_C	1270	1355	nm	-
Average Output Power	P_{OUT}	-9.5	-3	dBm	1
P_{OUT} @ TX Disable Asserted	P_{OUT}	-	-45	dBm	1
Spectral Width (RMS)	σ	-	4	nm	-
Extinction Ratio	EX	9	-	dB	-
Optical Rise/Fall Time (20% ~ 80%)	t_r, t_f	-	0.26	ns	2
Total Jitter @ 1250 Mbps	T_J	-	0.431	UI	3
Total Jitter @ 1062 Mbps	T_J	-	0.43	UI	3
Deterministic Jitter @ 1250 Mbps	D_J	-	0.2	UI	3
Deterministic Jitter @ 1062 Mbps	D_J	-	0.21	UI	3
Output Optical Eye	-	IEEE 802.3ah and ANSI Fibre Channel Compliant			4
Receiver					
Centre Wavelength	λ_C	1260	1580	nm	-
Receiver Sensitivity	-	-	-20	dBm	5
Receiver Overload	-	-3	-	dBm	5
Return Loss	-	12	-	dB	-
LOS De-Assert	LOS_D	-	-21	dBm	-
LOS Assert	LOS_A	-35	-	dBm	-
LOS Hysteresis	-	1	4	dB	-
Total Jitter @ 1250 Mbps	T_J	-	0.749	UI	3
Total Jitter @ 1062 Mbps	T_J	-	0.61	UI	3
Deterministic Jitter @ 1250 Mbps	D_J	-	0.462	UI	3
Deterministic Jitter @ 1062 Mbps	D_J	-	0.36	UI	3

Notes:

1. The optical power is launched into SMF.
2. Unfiltered, measured with a PRBS 2^7-1 test pattern @ 1.25Gbps
3. Meet the specified maximum output jitter requirements if the specified maximum input jitter is present.
4. Measured with a PRBS 2^7-1 test pattern @ 1 .25 Gbps/1 .0625 Gbps.
5. Measured with a PRBS 2^7-1 test pattern @ 1.25 Gbps, worst-case extinction ratio, BER ~1×10^{-12}.

Digital Diagnostics Monitoring Specifications

Parameter	Minimum	Maximum	Unit	Accuracy	Calibration	Note
Temperature	-10	80	°C	±3 °C	Internal	-
Voltage	3.0	3.6	V	±3 %	Internal	-
Bias Current	0	100	mA	±10 %	Internal	-
TX Power	-11	-2	dBm	3 dB	Internal	-
RX Power	-21	-2	dBm	3 dB	Internal	-

Recommended Operating Conditions

Parameter	Symbol	Minimum	Maximum	Unit	Note
Operating Case Temperature	T_C	-5	70	ºC	-
Power Supply Voltage	V_{CC}	3.13	3.47	V	-
Power Supply Current	I_{CC}	-	300	mA	-
Power Dissipation	P_D	-	1	W	-
Data Rate	DR	1062	1250	Mbps	-

Absolute Maximum Ratings

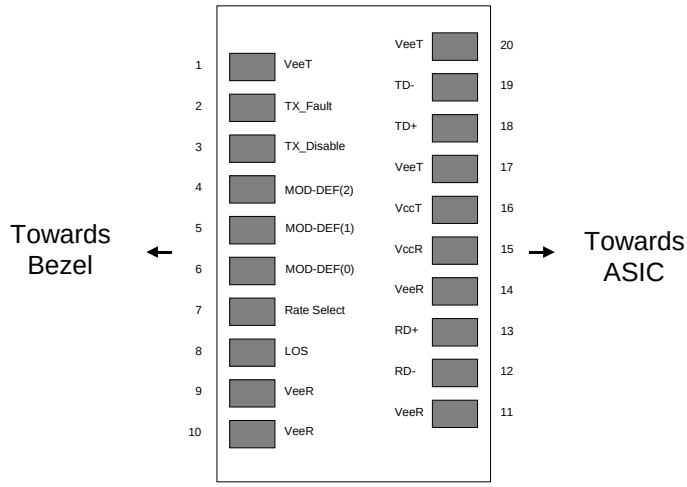
Parameter	Symbol	Minimum	Maximum	Unit	Note
Storage Temperature	T_S	-40	85	ºC	-
Supply Voltage	V_{CC}	-0.5	3.6	V	-
Operating Relative Humidity	RH	5	95	%	-

Electrical Specifications

Parameter	Symbol	Minimum	Maximum	Unit	Note
Transmitter					
Data Input Swing Differential	V_{IN}	500	2400	mV	1
Input Differential Impedance	Z_{IN}	90	110	Ω	-
Tx_ DIS Disable	V_D	2.0	V_{CC}	V	-
Tx_ DIS Enable	V_{EN}	GND	GND - 0.8	V	-
Tx_ Fault (Fault)	-	2.0	V_{CC} - 0.3	V	-
Tx_ Fault (Normal)	-	0	0.8	V	-
Receiver					
Data Output Swing Differential	Vout	370	2000	mV	1
LOS Fault	$V_{LOS\ fault}$	2.0	V_{CC} - 0.3	V	-
LOS Normal	$V_{LOS\ norm}$	GND	GND - 0.8	V	-

Notes: 1. AC coupled.

Diagram of Host Board Connector Block Pin Numbers and Names



Pin Descriptions

Pin	Name	Name/Description	Plug Seq.	Note
1	VeeT	Transmitter Ground	1	-
2	Tx Fault	Transmitter Fault Indication	3	1
3	Tx Disable	Transmitter Disable	3	2
4	MOD-DEF2	Module Definition 2	3	3
5	MOD-DEF1	Module Definition 1	3	3
6	MOD-DEF0	Module Definition 0	3	3
7	Rate Select	Not Connected	3	-
8	LOS	Loss of Signal	3	4
9	VeeR	Receiver Ground	1	-
10	VeeR	Receiver Ground	1	-
11	VeeR	Receiver Ground	1	-
12	RD-	Inverted Received Data Out	3	5
13	RD+	Received Data Out	3	5
14	VeeR	Receiver Ground	1	-
15	VccR	Receiver Power	2	-
16	VccT	Transmitter Power	2	-
17	VeeT	Transmitter Ground	1	-
18	TD+	Transmitter Data In	3	6
19	TD-	Inverted Transmitter Data In	3	6
20	VeeT	Transmitter Ground	1	-

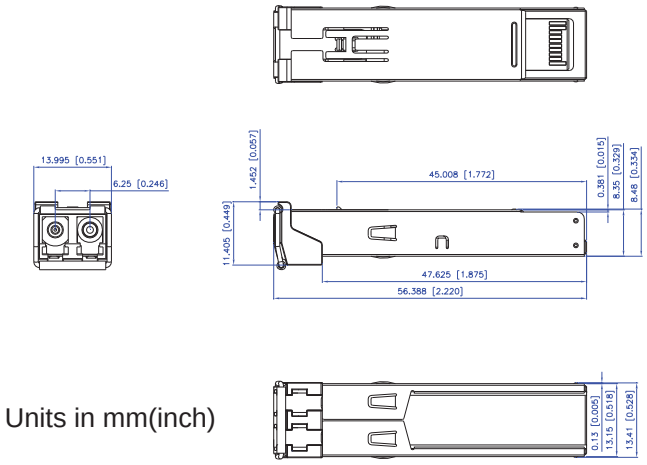
Notes:

1. TX Fault is an open collector output, which should be pulled up with a 4.7 k ~10 kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8 V.
2. TX Disable is an input that is used to shut down the transmitter optical output. It is pulled up within the module with a 4.7 k ~10 kΩ resistor. Its states are:
   Low (0~0.8V): Transmitter on
   (>0.8V, <2.0V): Undefined
   High (2.0~3.465V): Transmitter Disabled
   Open: Transmitter Disabled
3. MOD-DEF 0,1,2 are the module definition pins. They should be pulled up with a 4.7 k ~ 10 kΩ resistor on the host board. The pull-up voltage shall be VccT or VccR.
   MOD-DEF 0 is grounded by the module to indicate that the module is present
   MOD-DEF 1 is the clock line of two wires serial interface for serial ID
   MOD-DEF 2 is the data line of two wires serial interface for serial ID
4. LOS is an open collector output, which should be pulled up with a 4.7 k ~ 10 kΩ resistor on the host board to a voltage between 2.0 V and Vcc+0.3 V. Logic 0 indicates normal operation; logic 1 indicates loss of signal. In the low state, the output will be pulled to less than 0.8 V.
5. These are the differential receiver output. They are internally AC-coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES.
6. These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module.

Optical Communications Systems™

Datasheet

Mechanical Dimensions



Units in mm(inch)

Ordering Information

Model	Description	Data Rate (Gbps)	Waveength (nm)	Connector	Digital Diagnostics	Bail Latch Color	Maximum Distance Range (km)
SFP-GD-LX	1.0625/1.25 Gbps Singe-Mode SFP Transceiver	1.0625/1.25	1310	Duplex LC	Yes	Blue	0 -20

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 SFF-8074i; 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 descharge (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.
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