

Datasheet

1.25 Gigabit Dual-Rate Single-Mode 50 km SFP Transceivers

SFP-GD-XD



Highlights

- SFP transceiver
- Data Rates: 1.0625 – 1.25 Gbps
- Protocols:
 - 1 Gigabit Ethernet
 - 1 Gbps Fibre Channel
- Single-mode fiber
- Dual fiber, bi-directional
- 1550 nm
- 12 to 50 km
- Duplex LC connector
- Digital Diagnostics (SFF-8472)
- Hot-swap
- Industrial temperature modules available

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

Data Rate	1.0625 – 1.25 Gbps
Tx Wavelength	1550 nm
Tx Power (Minimum)	-5 dBm
Tx Dispersion Penalty	2 dB
Tx Disable	Yes
Rx Wavelength	1200 - 1625 nm
Rx Sensitivity	-24 dBm
Rx Saturation	-3 dBm
Rx Damage Threshold	6 dBm
Operating Temperature Range	-5 to 70 °C
Operating Temperature Range (TH Models)	-40 to 85 °C
Power Consumption	1 Watt

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Optical Transmitter Specifications

Parameter	Symbol	Minimum	Maximum	Unit	Note
Optical Power	P_{op}	-5	0	dBm	-
Average Launch Power Tx_Off	P_{off}	-	-45	dBm	-
Extinction Ratio (Dynamic)	ER	9	-	dB	-
Eye Mask	-	802.3ah Compliant			-
Total Jitter	TJ	-	200	ps	-
Optical Rise/Fall Time	t_r/t_f	-	260	ps	1
Mean Wavelength	λ	1500	1580	nm	-
Spectral Width (20 dB)	λ_c	-	1	nm	-
Side Mode Suppression Ratio	SMSR	30	-	dB	-
Optical Path Penalty at 50 Km	dp	-	2	dB	2
Relative Intensity Noise	RIN	-	-120	dB/Hz	-
Reflection Tolerance	rp	-24	-	dB	3

- Notes:**
1. 20%~80% values
 2. Measured at BER of 10^{-12} BER, PRBS 2^7-1 , at eye center
 3. 1 dB degradation of receiver sensitivity

Optical Receiver Specifications

Parameter	Symbol	Minimum	Maximum	Unit	Note
Receiver Power Low	$R_{sens, low}$	-	-24	dBm	1
Receiver Power High	$R_{sens, high}$	-3	-	dBm	1
Damage Threshold For Receiver	$P_{in, damage}$	-	6	dBm	-
Wavelength	λ	1200	1625	nm	-
Maximum Reflectance of Receiver	RX_r	-	-12	dB	-
LOS Assert	-	-38	-	dBm	-
LOS De-Assert	-	-	-24	dBm	-
LOS Hysteresis	-	0.5	-	dB	-

- Notes:**
1. 10^{-12} BER at nominal wavelength

Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Formula
Temperature	-5 to 70	± 3	°C	External	$T_c(C) = T_{slope} * T_{ad}(16 \text{ bit signed twos complement value}) + T_{offset}$
Temperature (TH Models)	-40 to 85	± 3	°C	External	$T_c(C) = T_{slope} * T_{ad}(16 \text{ bit signed twos complement value}) + T_{offset}$
Voltage	0 to V_{cc}	0.1	V	External	$V(\text{Volts}) = V_{slope} * V_{ad}(16 \text{ bit unsigned integer}) + V_{offset}$
Bias Current	0 to 120	± 5	mA	External	$I(\text{mA}) = I_{slope} * I_{ad}(16 \text{ bit unsigned integer}) + I_{offset}$
TX Power	-5 to 0	± 3	dBm	External	$Tx_PWR(\mu W) = Tx_PWR_{slope} * Tx_PWR_{ad}(16 \text{ bit unsigned integer}) + Tx_PWR_{offset}$
RX Power	-24 to -3	± 3	dBm	External	$RX_PWR(\mu W) = A_0 + A_1 * x + A_2 * x^2 + A_3 * x^3 + A_4 * x^4$

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General Operating Conditions

Parameter	Symbol	Minimum	Maximum	Unit	Note
Supply Voltage	V_{CC}	3.135	3.465	V	-
Supply Current	I_{CC}	-	300	mA	-
Power Supply Noise Rejection	PSR	100	-	mVp-p	1
Operating Case Temperature	T_{op}	-5	70	°C	2
Operating Case Temperature (TH Models)	T_{op}	-40	85	°C	2
Storage Temperature	T_{st}	-40	85	°C	-
Data Rate GbE	DR	-	1.25	Gbps	-
Data Rate FC	DR	-	1.0625	Gbps	-

- Notes:**
1. 20 Hz to 155 MHz
 2. Please refer to the ordering information

Electrical Transmitter Specifications

Parameter	Symbol	Minimum	Maximum	Unit	Note
Input Differential Impedance	R_{in}	80	120	Ω	-
PECL Single Ended Data Input Swing	$V_{in, p-p}$	250	1200	mV	-
Tx_Fault_Fault	V_{fault}	2	V_{CC}	V	-
Tx_Fault_Normal	V_{normal}	V_{ee}	$V_{ee} + 0.5$	V	-
Tx_Disable_Disable	V_d	2	V_{CC}	V	-
Tx_Disable_Enable	V_{en}	V_{ee}	$V_{ee} + 0.8$	V	-

Electrical Transmitter Specifications

Parameter	Symbol	Minimum	Maximum	Unit	Note
PECL Single Ended Data Output Swing	$V_{out, p-p}$	185	800	mV	-
Data Output Rise/Fall Time	t_r/t_f	-	260	ps	-

Timing and Electrical Specifications

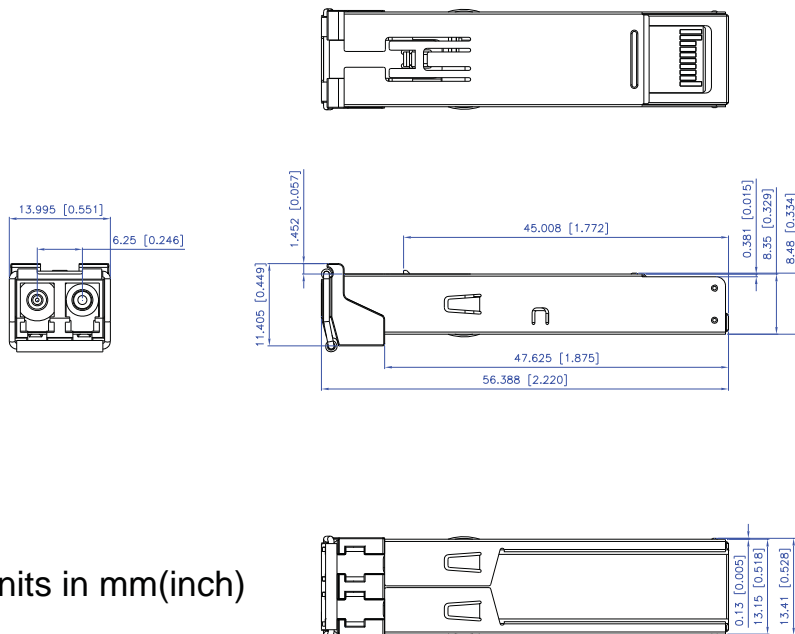
Parameter	Symbol	Minimum	Maximum	Unit	Note
Tx Disable Negate Time	t_{on}	-	1	ms	-
Tx Disable Assert Time	t_{off}	-	10	μ s	-
Time to Initialize, Including Reset of Tx Fault	t_{init}	-	300	ms	-
Tx Fault Assert Time	t_{fault}	-	100	μ s	-
Tx Disable to Reset	t_{reset}	10	-	μ s	-
LOS Assert Time	$t_{loss_{on}}$	-	100	μ s	-
LOS De-Assert Time	$t_{loss_{off}}$	-	100	μ s	-
Serial ID Clock Rate	f_{serial_clock}	-	100	kHz	-
RX_LOS Voltage (High)	Rx_LOSS_H	2	-	V	-
RX_LOS Voltage (Low)	Rx_LOSS_L	-	0.8	V	-
LOS Output Voltage-Fault	$V_{LOS\ fault}$	2	V_{CC}	V	-
LOS Output Voltage-Normal	$V_{LOS\ normal}$	V_{ee}	$V_{ee} + 0.5$	V	-
MOD_DEF (0:2)-High	V_H	2	V_{CC}	V	-
MOD_DEF (0:2)-Low	V_L	V_{ee}	$V_{ee} + 0.5$	V	-

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Pin Descriptions

Pin	Name		Note
1	VeeT	Transmitter Ground	-
2	TX_FAULT	Open Collector	-
3	TX_DISABLE	Internally Pulled High	-
4	MOD-DEF2	Serial Data Input	-
5	MOD-DEF1	Serial Clock Input	-
6	MOD-DEF0	Internally Grounded	-
7	NC	Not Connected	-
8	LOS	Open Collector	-
9	VeeR	Receiver Ground	-
10	VeeR	Receiver Ground	-
11	VeeR	Receiver Ground	-
12	RD-	Received Data Negative	-
13	RD+	Received Data Positive	-
14	VeeR	Receiver Ground	-
15	VccR	Receiver Power	-
16	VccT	Transmitter Power	-
17	VeeT	Transmitter Ground	-
18	TD+	Transmitter Data Positive	-
19	TD-	Transmitter Data Negative	-
20	VeeT	Transmitter Ground	-

Mechanical Dimensions





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Ordering Information

Model	Description	Data Rate (Gbps)	Wavelength (nm)	Connector	Digital Diagnostics	Bail Latch Color	Maximum Distance Range (km)
SFP-GD-XD	1 Gigabit Ethernet and Fibre Channel Dual-Rate SFP Transceiver	1.0625 – 1.25	1550	Duplex LC	Yes	Green	12 - 50
SFP-GD-XDTH	1 Gigabit Ethernet and Fibre Channel Dual-Rate SFP Transceiver <i>Temperature Hardened</i>	1.0625 – 1.25	1550	Duplex LC	Yes	Green	12 - 50

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; Telcordia GR-468, 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.
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