SFP Multi Rate Bidirectional Transceivers

SFP-MR-45IR2 and SFP-MR-54IR2



Features

- 100 Mbps-2.7 Gbps data rates
- OC-48/STM-16 standard compliances
- IEEE 802.3ah, 1000Base-BX10 compatibility
- Simplex LC connector
- 16 dB minimum power budget
- 40 km reach
- Single 3.3 V supply
- 1490 nm or 1570 DFB laser
- Digital Diagnostic SFF-8472 compliance
- Telcordia GR-468 compliance
- GR 253/STM G.957 compliance
- RoHS and China RoHS compliance
- SFP MSA SFF-8074i compliance
- 21CFR 1040.10 and 1040.11 compliance
- TÜV compliance
- Commercial temperature rating
- Class 1 Laser
- Color coded bail latch: Purple or Orange

General Operating

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	V_{cc}	3.135	3.3	3.465	V
Total Current	I_{cc}	-	-	300	mA
Power Supply Noise Rejection	PSR	100	-	-	mV_{p-p}
Operating Temperature	T_{op}	-5	-	70	ºC
Storage Temperature	T_{st}	-40	-	85	ºC
Data Rate	DR	100	-	2700	Mbps

Transmitter Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Optical Power	P_{op}	-2	0.5	3	dBm
Optical Crosstalk	XT	-	-	-45	dB
Average Launch Power (Tx: Off)	P_{off}	-	-	-45	dBm
Extinction Ratio	ER	8.2	-	-	dB
Eye Mask	IEEE 802.3 and SONET/SDH compliant				
Optical Rise Time (20% - 80% values)	t_r	-	-	160	ps
Optical Fall Time (20% - 80% values)	t_f	-	-	160	ps
Mean Wavelength: **SFP-MR-45IR2**	λ	1480	1490	1500	nm
SFP-MR-54IR2	λ	1560	1570	1580	nm
Spectral Width (20 dB)	$\Delta\lambda$	-	-	1	nm
Relative Intensity Noise	RIN	-	-	-120	dB/Hz
Transmitter Reflectance	-	-	-	-12	dB
Dispersion Penalty (at 40 km)[1]	dp	-	0.5	1	dB
Side Mode Suppression Ration	SMSR	30	-	-	dB
Reflectance Tolerance	rp	-24	-	-	dB

1) Measured at 2.7 Gbps, BER of 10^{-12}, PRBS of 2^{23}-1, at eye center

Transmitter Specifications (Electical)					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Input Differential Impedence	R_{in}	80	100	120	Ω
PECL Single Ended Data Input Swing	$V_{in,p-p}$	250	-	1200	mV
TxFault_Fault	V_{fault}	2	-	V_{cc}	V
TxFault_Normal	V_{normal}	V_{ee}	-	V_{ee}+0.5	V
TxDisable_Disable	Vd	2	-	V_{cc}	V
TxDisable_Enable	V_{en}	V_{ee}	-	V_{ee}+0.8	V

Receiver Specifications (Optical)					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Receive Power Low[2]	$R_{sens,low}$	-	-20	-18	dBm
Receive Power High[2]	$R_{sens,high}$	0	-	-	dBm
Damage Threshold for Receiver	$P_{in,damage}$	-	-	0	dBm
Wavelength: **SFP-MR-45IR2**	λ	1560	-	1580	nm
SFP-MR-54IR2	λ	1480	-	1500	nm
LOS Assert	-	-28	-	-	dBm
LOS De-assert	-	-	-	-18	dBm
LOS Hysteresis	-	0.5	-	-	dB
Receiver Reflectance	-	-	-	-12	dB

2) Measured at 10^{-10} BER, 2.7 Gbps, 2^{23}-1 PRBS, and 10^{-12} BER, 1250 Mbps, 2^{7}-1 PRBS

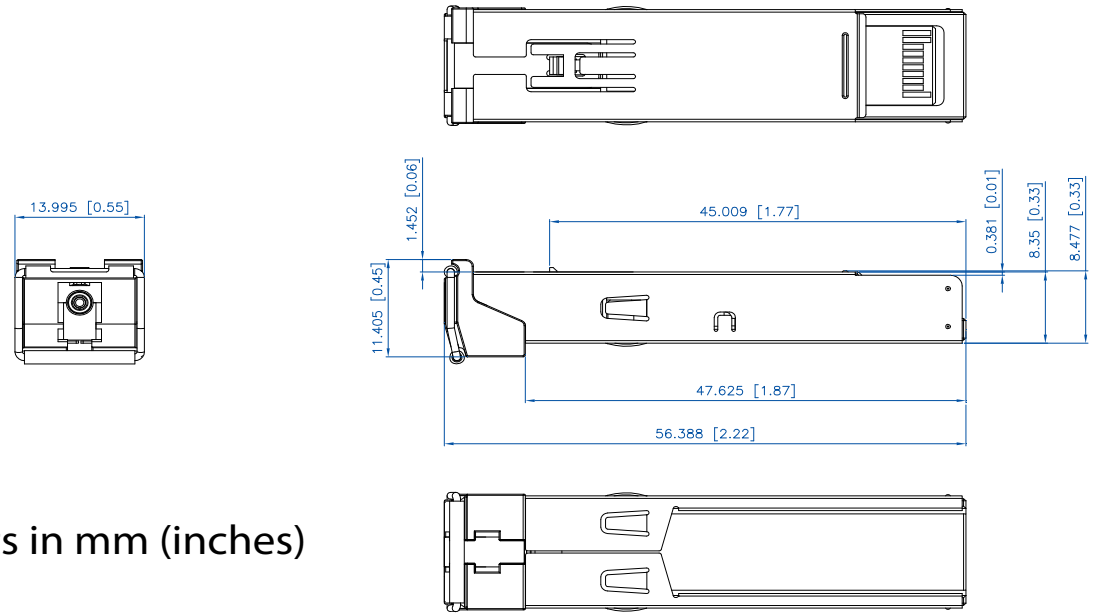
Receiver Specifications (Electrical)					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
PECL Single Ended Data Output Swing	$V_{out,\,p-p}$	185	-	800	mV
Data Output Rise Time	t_r	-	-	175	ps
Data Output Fall Time	t_f	-	-	175	ps

Timing and Electrical					
Parameter	**Symbol**	**Min**	**Typical**	**Max**	**Unit**
Tx Disable Negate Time	t_on	-	-	1	ms
Tx Disable Assert Time	t_off	-	-	10	µs
Time to Initialize, Including Reset of Tx Fault	t_init	-	-	300	ms
Tx Fault Assert Time	t_fault	-	-	100	µs
Tx Disable to Reset	t_reset	10	-	-	µs
LOS Assert Time	t_loss_on	-	-	100	µs
LOS De-assert Time	t_loss_off	-	-	100	µs
Serial ID Clock Rate	f_serial_clock	-	-	100	KHz
RX_LOS Voltage (High)	RX_LOS_H	2	-	-	V
RX_LOS Voltage (Low)	RX_LOS_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

Digital Diagnostics						
Parameter	**Range**	**Accuracy**	**Unit**	**Calibration**	**Bit Value**	**Formula**
Temperature	-5 to 70	± 3	° C	Internal	1/256 C	Tc(C)=Tad(16 bit signed twos complement)/256
Voltage	0 to V_{cc}	0.1	V	Internal	100 µV	V(Volts)=Vad(16 bit unsigned integer)*0.1
Bias Current	0 to 120	5	mA	External	0.002 mA	I(mA)=Islope*Iad(16 bit unsigned integer)+Ioffset
TX Power	-2 to 3	±2 dB	dBm	External	0.1µW	TX_PWR(µW)=TX_PWRslope*TX_PWRad(16 bit unsigned
RX Power	-18 to 0	±2 dB	dBm	External	0.1µW	RX_PWR(µW)=A0+A1*x+A2*x^2+A3*x^3+A4*x^4

Pin	Function	Notes
1	$V_{ee}T$	TX 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	$V_{ee}R$	RX Ground
10	$V_{ee}R$	RX Ground
11	$V_{ee}R$	RX Ground
12	RXD-	RX Data Negative
13	RXD+	RX Data Positive
14	$V_{ee}R$	RX Ground
15	V_{ccR}	RX Power
16	V_{ccT}	TX Power
17	$V_{ee}T$	TX Ground
18	TXD+	TX Data Positive
19	TXD-	TX Data Negative
20	$V_{ee}T$	TX Ground

Outline Drawing



Units in mm (inches)

Ordering Information

Model	Description	Data Rate	Wavelength (nm)	Bail Latch Color	Distance Range (km)
SFP-MR-45IR2	SFP Multi Rate Bidirectional Transceiver	100 - 2700 Mbps	1490/1570	Purple	0 -40
SFP-MR-54IR2	SFP Multi Rate Bidirectional Transceiver	100 - 2700 Mbps	1570/1490	Orange	0 -40

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 **sales@mrv.com** or call us for assistance.

MRV (West Coast USA)
20415 Nordhoff St.
Chatsworth, CA 91311
800-338-5316
818-773-0900

MRV (East Coast USA)
295 Foster St.
Littleton, MA 01460
800-338-5316
978-952-4700

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.

Copyright ©2007 MRV Communications, Inc. All Rights Reserved.