

Datasheet

SFP Bidirectional Transceivers

SFP-GD-BX34xx and SFP-GD-BX43xx



Features

- SFF-8472 compliance (SFP)
- 1250 Mbps data rates
 - IEEE 802.3ah
 - Gigabit Ethernet
- Single-mode optics
- Single fiber, bi-directional
- Separate Tx and Rx wavelengths
- Class 1 laser (Tx): 1310 nm or 1490 nm
- 22 km reach
- Digital Diagnostics (SFF-8724)
- Commercial and industrial temperature availability

General Operations

Parameter	Symbol	Min.	Max.	Unit
Supply Voltage	V_{CC}	3.135	3.465	V
Total Current	I_{CC}	-	300	mA
Power Supply Noise Rejection ^a	PSR	100	-	mV _{p-p}
Operating Temperature of SFP Case ^b	T_{op}	-5	70	°C
Operating Temperature of SFP Case ^b (TH)	T_{op}	-40	85	°C
Storage Temperature	T_{st}	-40	85	°C
Data Rate	DR	-	1250	Mbps

a) 20 Hz to 155 MHz

b) Maximum Relative Humidity is 85%, non-condensing

Transmitter Specifications (Optical)

Parameter	Symbol	Min	Max	Unit
Optical Power	P_{op}	-9	-3	dBm
Optical Crosstalk	X_T	-	-40	dB
Average Launch Power Of Off Tx	P_{off}	-	-45	dBm
Extinction Ratio	ER	6	-	dB
Eye Mask	IEEE 802.3ah			
Optical Rise Time (20% to 80% values)	t_r	-	260	ps
Optical Fall Time (20% to 80% values)	t_f	-	260	ps
Mean TX Wavelength SFP-GD-BX34xx: 1310	λ	1260	1360	nm
Mean TX Wavelength SFP-GD-BX43xx: 1490	λ	1480	1500	nm
Spectral Width (RMS) SFP-GD-BX34xx	σ	-	3.5	nm
Spectral Width (RMS) SFP-GD-BX43xx	σ	-	0.88	nm
Relative Intensity Noise	RIN	-	-120	dB/Hz
Transmitter Reflectance	-	-	-12	dB
Optical Return Loss Tolerance	ORLT	-	12	dB

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Transmitter Specifications (Electrical)

Parameter	Symbol	Min	Max	Unit
Input Differential Impedance	R_{in}	80	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	V_d	2	V_{cc}	V
TxDisable_Enable	V_{en}	V_{ee}	$V_{ee}+0.8$	V

Receiver Specifications (Optical)

Parameter	Symbol	Min	Max	Unit
Receive Power ^a	$R_{sens,low/high}$	-22 (sensitivity)	-3 (saturation)	dBm
Damage Threshold For Receiver	$P_{in,damage}$	0	-	dBm
Mean Rx Wavelength SFP-GD-BX34xx: 1550 ^d	λ	1480	1580	nm
Mean Rx Wavelength SFP-GD-BX43xx: 1310 ^d	λ	1260	1360	nm
LOS Assert	-	-45	-	dBm
LOS De-assert	-	-	-20	dBm
LOS Hysteresis:	-	0.5	-	dB
Receiver Reflectance	-	-	-12	dB

a) Measured at 10⁻¹² BER, PRBS 2⁷-1, 6 dB ER

b) Receiver performance can be maintained over a broader wavelength range

Receiver Specifications (Electrical)

Parameter	Symbol	Min	Max	Unit
PECL Single Ended Data Output Swing	$V_{out,p-p}$	185	800	mV
Data Output Rise Time	t_r	-	500	ns
Data Output Fall Time	t_f	-	500	ns

Timing and Electrical

Parameter	Symbol	Min	Max	Unit
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_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

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Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Bit Value	Formula
Temperature (SFP-GD-BX34/43 and SFP-GD-BX34/43SC)	-5 to 70	± 3	°C	Internal	1/256 C	$T_c(C) = T_{ad}(16 \text{ bit signed twos complement})/256$
Temperature (SFP-GD-BX34/43TH)	-40 to 85	± 3	°C	Internal	1/256 C	$T_c(C) = T_{ad}(16 \text{ bit signed twos complement})/256$
Voltage	0 to V_{CC}	0.1	V	Internal	100µV	$V(\text{Volts}) = V_{ad}(16 \text{ bit unsigned integer}) * 0.1$
Bias Current	0 to 120	5	mA	External	-	$I(\text{mA}) = I_{slope} * I_{ad}(16 \text{ bit unsigned integer}) + I_{offset}$
TX Power	-9 to -3	±3 dB	dBm	External	-	$TX_PWR(\mu W) = TX_PWR_{slope} * TX_PWR_{ad}(16 \text{ bit unsigned integer}) + TX_PWR_{offset}$
RX Power	-20 to -3	±3 dB	dBm	External	-	$RX_PWR(\mu W) = A_0 + A_1 * x + A_2 * x^2 + A_3 * x^3 + A_4 * x^4$

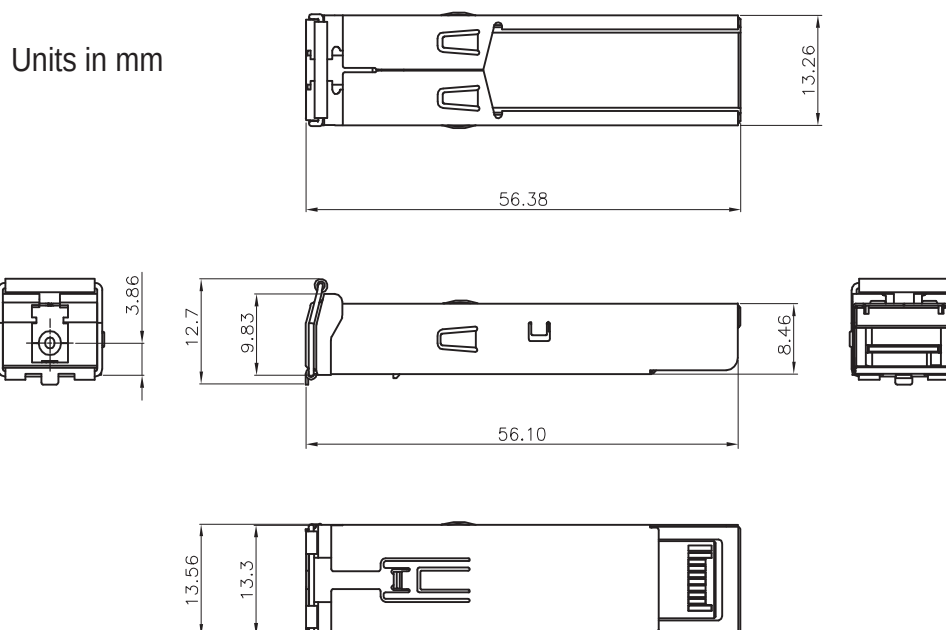
Pin	Function	Notes
1	$V_{ee}T$	TX GND
2	TX_FAULT	Open Collector
3	TX_DISABLE	Internally Pulled High
4	MOD_DEF2	Serial Data Input
5	MOD_DEF1	Serial Clock Input
6	MOD_DEF0	Internally Grounded
7	NC	Not Connected
8	LOS	Open Collector
9	$V_{ee}R$	RX Ground
10	$V_{ee}R$	RX Ground
11	$V_{ee}R$	RX Ground
12	RXD-	RX Data Negative
13	RXD+	RX Data Positive
14	$V_{ee}R$	RX GND
15	$V_{cc}R$	RX Power
16	$V_{cc}T$	TX Power
17	$V_{ee}T$	TX GND
18	TXD+	TX Data Positive
19	TXD-	TX Data Negative
20	$V_{ee}T$	TX GND

Ordering Information

Model	Description	Data Rate (Mbps)	Wavelength (nm)	Connector Type	Bail Latch Color	Distance Range (km)
SFP-GD-BX34	SFP Bidirectional Transceiver	1250	1310/1490	LC	Blue	0 -22
SFP-GD-BX43	SFP Bidirectional Transceiver	1250	1490/1310	LC	Purple	0 -22
SFP-GD-BX34TH	SFP Bidirectional Transceiver (Temperature Hardened)	1250	1310/1490	LC	Blue	0 -22
SFP-GD-BX43TH	SFP Bidirectional Transceiver (Temperature Hardened)	1250	1490/1310	LC	Purple	0 -22
SFP-GD-BX34SC	SFP Bidirectional Transceiver	1250	1310/1490	SC	Blue	0 -22
SFP-GD-BX43SC	SFP Bidirectional Transceiver	1250	1490/1310	SC	Purple	0 -22

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Outline Drawing



Regulatory Compliances

RoHS directive; China RoHS; California RoHS Law, USA and Canada UL listing; 21CFR 1040.10 and 1040.11; SFP MSA SFF-8074i; SFF-8472; Telecordia GR-468; GR-253/STM G.957 compliance

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.

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