

SO-SFP-1000BASE-BX60D-34/43

SFP BIDI, 1.25 Gbps GigE, 1310/1490nm, SM, DDM, 26/22dB, 60km, LC

OVERVIEW

The SO-SFP-1000Base-BX60D series is small form factor pluggable module for Gigabit Ethernet 1000BASE-BX and Fiber Channel single fiber applications by using 1310nm / 1490nm transmitter and 1490nm / 1310nm receiver. It is with the SFP 20-pin connector to allow hot plug capability. The transmitter section uses a distributed feedback laser and is a class 1 laser compliant according to International Safety Standard IEC 60825. The receiver section uses an integrated A type / B type detector preamplifier (IDP) mounted in an optical header and a limiting post-amplifier IC. The SO-SFP-1000Base-BX60D series are designed to be compliant with SFF-8472 Multi-source Agreement (MSA).

PRODUCT FEATURES

- Up to 1.25Gbps data links
- A type: 1310nm FP Tx/1490nm Rx
- B type: 1490nm DFB Tx/1310nm Rx
- 60km with 9/125 μ m SMF
- Single 3.3V power supply and TTL logic interface
- Hot-Pluggable SFP footprint simplex LC connector interface
- Class 1 FDA and IEC60825-1 laser safety compliant
- Operating case temperature
 - Standard: 0°C ~ +70°C
 - Industrial: -40°C ~ +85°C
- Compliant with SFP MSA specification
- Compliant with Digital Diagnostic Monitor (DDM) interface SFF-8472

APPLICATIONS

- Fibre Channel links
- Gigabit Ethernet
- Fast Ethernet
- WDM Gigabit Ethernet links
- Optical networking

ORDERING INFORMATION

Part Number	Description
SO-SFP-1000Base-BX60D-34	SFP BIDI, 1.25 Gbps GigE, TX/RX=1310/1490nm, SM, DDM, 26dB, 60km, LC
SO-SFP-1000Base-BX60D-43	SFP BIDI, 1.25 Gbps GigE, TX/RX=1490/1310nm, SM, DDM, 22dB, 60km, LC
SO-SFP-1000Base-BX60D-34-I	SFP BIDI, 1.25 Gbps GigE, TX/RX=1310/1490nm, SM, DDM, 26dB, 60km, LC, ind. temp
SO-SFP-1000Base-BX60D-43-I	SFP BIDI, 1.25 Gbps GigE, TX/RX=1490/1310nm, SM, DDM, 22dB, 60km, LC, ind. temp

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ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Min	Max	Unit
Storage Temperature	TS	-40	+85	°C
Supply Voltage	VCC	-0.5	3.6	V
Operating Relative Humidity			95	%

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Min	Typ	Max	Unit
Case Operating Temperature	SO-SFP-1000Base-BX60D-34/43	0		+70	°C
	TA	SO-SFP-1000Base-BX60D-34/43			
	-I	-40		+85	
Power Supply Voltage	Vcc	3.15	3.3	3.45	V
Power Supply Current	Icc			300	mA
Data rate	GBE		1.25		Gbps
	FC		1.063		
	FE		100		

PERFORMANCE SPECIFICATIONS – ELECTRICAL TRANSMITTER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
LVPECL Inputs(Differential)	V_{IN}	400		2000	mVpp	AC coupled inputs
Input Impedance (Differential)	Z_{IN}	85	100	115	ohms	Rin > 100 kohms @ DC
TX Disable	Disable	2		Vcc	V	
	Enable	0		0.8		
TX FAULT	Fault	2		Vcc+0.3	V	
	Normal	0		0.5		

PERFORMANCE SPECIFICATIONS – ELECTRICAL RECEIVER

Parameter	Symbol	Min	Typ	Max	Unit	Notes
LVPECL Outputs (Differential)	V_{out}	400		2000	mVpp	AC coupled outputs
Output Impedance (Differential)	Z_{out}	85	100	115	ohms	
Rx_LOS Output Voltage – High		2		Vcc+0.3	V	
Rx_LOS Output Voltage – Low		0		0.8	V	
MOD_DEF (2:0)	VoH	2.5			V	With Serial ID
	VoL	0		0.5	V	

OPTICAL AND ELECTRICAL CHARACTERISTICS

SO-SFP-1000Base-BX-MMD-34

Parameter	Symbol	Min	Typ	Max	Unit
9µm Core Diameter MMF	L		60		km
Data Rate		100	1250		Mbps

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OPTICAL AND ELECTRICAL CHARACTERISTICS TRANSMITTER

SO-SFP-1000Base-BX-MMD-34

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	1290	1310	1330	nm
Spectral Width (-20dB)	$\Delta\lambda$			1	nm
Side Mode Suppression Ratio	SMSR	30			dB
Average Output Power	P_{out}	0		+5	dBm
Extinction Ratio	ER	8.2			dB
Rise/Fall Time(20%~80%)	tr/tf			0.26	ns
Total Jitter	TJ			260	ps
Output Optical Eye		Compatible with IEEE 802.3z			
TX Disable Assert Time	t_{off}			10	us
Pout@TX Disable Asserted	P_{out}			-45	dBm

OPTICAL AND ELECTRICAL CHARACTERISTICS RECEIVER

SO-SFP-1000Base-BX-MMD-34

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ	1480	1490	1500	nm
Receiver Sensitivity	P_{min}			-26	dBm
Receiver Overload	P_{max}	-3			dBm
LOS De-Assert	LOSD			-27	dBm
LOS Assert	LOSA	-45			dBm
LOS Hysteresis		0.5			dB

OPTICAL AND ELECTRICAL CHARACTERISTICS

SO-SFP-1000Base-BX-MMD-43

Parameter	Symbol	Min	Typ	Max	Unit
9 μ m Core Diameter MMF	L		60		km
Data Rate		100	1250		Mbps

OPTICAL AND ELECTRICAL CHARACTERISTICS TRANSMITTER

SO-SFP-1000Base-BX-MMD-43

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ_c	1480	1490	1500	nm
Spectral Width (-20dB)	$\Delta\lambda$			1	nm
Average Output Power	P_{out}	-2		3	dBm
Extinction Ratio	ER	8.2			dB
Side Mode Suppression Ratio	SMSR	30			dB
Rise/Fall Time(20%~80%)	tr/tf			0.26	ns
Output Optical Eye		Compatible with IEEE 802.3ah-2004			
TX Disable Assert Time	t_{off}			10	us
Pout@TX Disable Asserted	P_{out}			-45	dBm

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OPTICAL AND ELECTRICAL CHARACTERISTICS RECEIVER

SO-SFP-1000Base-BX-MMD-43

Parameter	Symbol	Min	Typ	Max	Unit
Centre Wavelength	λ	1290		1330	nm
Receiver Sensitivity)@1250Mbps	P_{min}			-24	dBm
Receiver Overload	P_{max}	-3			dBm
Return Loss		12			dB
Optical Path Penalty				1	dB
LOS De-Assert	$LOSD$			-25	dBm
LOS Assert	$LOSA$	-45			dBm
LOS Hysteresis		0.5			dB

PIN ASSIGNMENT ACCORDING TO MSA

PIN	Signal Name	Description	PIN	Signal Name	Description
1	$V_{EE}T$	Transmitter Signal Ground	11	$V_{EE}R$	Receiver Signal Ground
2	TX_Fault	Transmitter Fault Indication. Logic "1" Output = Laser Fault. Logic "0" Output = Normal Operation	12	RD-	Inverse Receiver Data Out
3	TX_Disable	Logic "1" Input (or no connection) = Laser off, Logic "0" = Laser on.	13	RD+	Receiver Data Out
4	SDA	Modulation Definition 2 – Two wires serial ID Interface	14	$V_{EE}R$	Receiver Signal Ground
5	SDL	Modulation Definition 1 – Two wires serial ID Interface	15	$V_{CC}R$	Receiver Power – 3.3V±5%
6	MOD-ABS	Modulation Definition 0 – Ground in Module	16	$V_{CC}T$	Transmitter Power – 3.3V±5%
7	RS0	RX Rate Select (LVTTTL). This pin has an internal 30k pull down to ground. A signal on this pin will not affect module performance.	17	$V_{EE}T$	Transmitter Signal Ground
8	RX_LOS	Loss of Signal Out (OC).	18	TD+	Transmitter Data In
9	RS1	TX Rate Select (LVTTTL). This pin has an internal 30k pull down to ground. A signal on this pin will not affect module performance.	19	TD-	Inverse Transmitter Data In
10	$V_{EE}R$	Receiver Signal Ground	20	$V_{EE}T$	Transmitter Signal Ground

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MECHANICAL DIMENSIONS

