BELLCOMMS®

OCTOBER 2023

SFP MODULE
CATALOG

- 155 Mbps SFP Module Transceiver Series
- 1.25 Gbps SFP Module Transceiver Sereis
- 10 Gbps SFP+ Module Transceiver Series

บริษัทฯก้าวเข้าสู่ปีที่ 23
โทร 02-508-0977 (อัตโนมัติ 20 คู่สาย)
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Content

SFP MODULE TRANSCEIVER SERIES

สอบถามรุ่นอื่นๆที่ไม่มีในแคตตาลอกจากฝ่ายขาย

SFP Transceiver module product comparing for choose

155 Mbps Series, SFP Transceiver Module

DESCRIPTIONS / MODEL	SFP-100FX85-MM	SFP-100FX20-SM	SFP-100FX20-SM-BCDI1310	SFP-100FX20-SM-BCDI1550
Data Rate	155 Mbps	155 Mbps	155 Mbps	155 Mbps
Wavelength	850 nm	1310 nm	1310/1550 nm	1550/1310 nm
Module Type	MM	SM	SM,Bidi	SM,Bidi
Fiber Distance	2 Km(MM)	20 Km(OS2), 2Km(MM)	20 Km(OS2), 2Km(MM)	20 Km(OS2), 2Km(MM)
Connector Type	LC	LC	LC	LC
Connector number	Duplex	Duplex	Simplex	Simplex
Brand compatible	สามารถใช้ได้กับตราสินค้าดังนี้ Cisco, BELLCOMMS, 3COM, Allied Telesyn, LINK และตราสินค้าอื่นๆ และไม่สามารถใช้ได้กับตราสินค้านี้ HP Procurve(บริษัทสามารถสั่งพิเศษมาให้ได้ตามความต้องการลูกค้าได้)			

1.25 Gbps Series, SFP Transceiver Module

HP compatible series
CTM-LCHP60-MM(J4858C), 1.25G,850nm,MM,0.5km
CTS-LCHP10-SM(J4859C), 1.25G,1310nm,SM,10km
BCHP-8512-02D-H3(JD118B), 1.25G,850nm,MM,0.5km
BCHP-1312-10D-H3(JD119B), 1.25G,1310nm,SM,10km

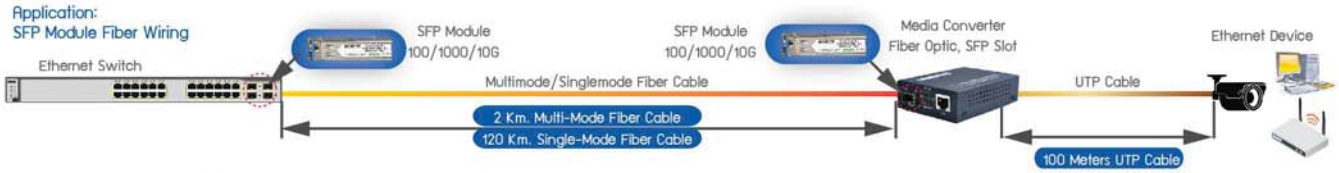
DESCRIPTIONS / MODEL	CTM-LC0500-MM	CTS-LC0020-SM	CTS-LC0040-SM	CTS-LC0080-SM	BC-GLC-T
Data Rate	1.25 Gbps	1.25 GMbps	1.25 GMbps	1.25 GMbps	10/100/1000Base-T
Wavelength	850 nm	1310 nm	1310 nm	1550 nm	-
Module Type	MM	SM	SM	SM	Copper
Fiber Distance	0.5 Km(MM)	20 Km(OS2), 2Km(MM)	40 Km(OS2), 2Km(MM)	80 Km(OS2), 2Km(MM)	100 M.(UTP Cable)
Connector Type	LC	LC	LC	LC	RJ45
Connector number	Duplex	Duplex	Duplex	Duplex	Simplex
Brand compatible	สามารถใช้ได้กับตราสินค้าดังนี้ Cisco, BELLCOMMS, 3COM, Allied Telesyn, LINK และตราสินค้าอื่นๆ และไม่สามารถใช้ได้กับตราสินค้านี้ HP Procurve(บริษัทสามารถสั่งพิเศษมาให้ได้ตามความต้องการลูกค้าได้)				

DESCRIPTIONS / MODEL	BC-BL3512-20	BC-BL5312-20	BC-BL3512-40	BC-BL5312-40	BC-BL3512-80	BC-BL5312-80
Data Rate	1.25 Gbps	1.25 Gbps	1.25 Gbps	1.25 Gbps	1.25 Gbps	1.25 Gbps
Wavelength	1310/1550 nm	1550/1310 nm	1310/1550 nm	1550/1310 nm	1490/1550 nm	1550/1490 nm
Module Type	SM, Bidi	SM, Bidi	SM, Bidi	SM, Bidi	SM, Bidi	SM, Bidi
Fiber Distance	20 Km(OS2), 2Km(MM)	20 Km(OS2), 2Km(MM)	40 Km(OS2), 2Km(MM)	40 Km(OS2), 2Km(MM)	80 Km(OS2), 2Km(MM)	80 Km(OS2), 2Km(MM)
Connector Type	LC	LC	LC	LC	LC	LC
Connector number	Simplex	Simplex	Simplex	Simplex	Simplex	Simplex
Brand compatible	สามารถใช้ได้กับตราสินค้าดังนี้ Cisco, BELLCOMMS, 3COM, Allied Telesyn, LINK และตราสินค้าอื่นๆ และไม่สามารถใช้ได้กับตราสินค้านี้ HP Procurve(บริษัทสามารถสั่งพิเศษมาให้ได้ตามความต้องการลูกค้าได้)					

10 Gbps Series, SFP+ Transceiver Module

HP compatible series
BCHP-8596-02D-H3(JD092B), 10G,850nm,MM,0.3km
BCHP-1396-10D-H3(JD094B), 10G,1310nm,SM,10km

DESCRIPTIONS / MODEL	SFP-10G-30	SFP-10G-10	SFP-10G-201	SFP-10G-202	SFP-10G-05
Data Rate	10 Gbps	10 Gbps	10 Gbps	10 Gbps	10/5/2.5/1 G Base-T
Wavelength	850 nm	1310nm	1270/1310nm	1310/1270nm	-
Module Type	MM	SM	SM, Bidi	SM, Bidi	Copper
Fiber Distance	300 Meters(MM)	10 Km(OS2)	20 Km(OS2)	20 Km(OS2)	100 M.(UTP Cable)
Connector Type	LC	LC	LC	LC	RJ45
Connector number	Duplex	Duplex	Simplex	Simplex	Simplex
Brand compatible	สามารถใช้ได้กับตราสินค้าดังนี้ Cisco, BELLCOMMS, 3COM, Allied Telesyn, LINK และตราสินค้าอื่นๆ และไม่สามารถใช้ได้กับตราสินค้านี้ HP Procurve(บริษัทสามารถสั่งพิเศษมาให้ได้ตามความต้องการลูกค้าได้)				



หมายเหตุ : ลูกค้าสามารถสั่งซื้อสินค้าได้ทุกๆรุ่นที่ไม่มีในแคตลอกนี้ กรุณาติดต่อฝ่ายขาย

SFP-100FX85-MM

155M SFP 850nm LC 2km DDMI

General

SFP-100FX85-MM The SFP transceivers are high performance, cost effective modules supporting data-rate of 155Mbps and 2km transmission distance with MMF.The transceiver consists of three sections: a VCSEL laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	3.60	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate			155		Gb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc			220	mA	
Operating Case Temperature	Tc	0 -10 -45		70 80 85	°C	

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70°C -40°c to + 85°C	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	-11°C to -1°C	dBm	±3dB	Internal/ External
RX Power	-25°C to 0°C	dBm	±3dB	Internal/ External

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			370		1800	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			370		1800	mVpp	3
Tx Disable input	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		

Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength		830	850	860	nm	
Ave. output power (Enabled)	Po	-11		1	dBm	1
Extinction Ratio	ER	10			dB	2
Rise/Fall Time (20%-80%)	Tr-Tf			2.5	ns	
Spectral Width (RMS)				4	nm	
Output Optical Eye	Compliant with ITU-T G.957					
Receiver						
Operating Wavelength		770	850	860	nm	
Sensitivity	Psen			-23	dBm	3
Min. overload	Pimax	-3			dBm	
LOS Assert	Pa	-45			dBm	
LOS De-assert	Pd			-24	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note 1) Measured at 155 Mb/s with PRBS 223 – 1 NRZ test pattern.
Note 2) Unfiltered, measured with a PRBS 223-1 test pattern @155Mbps
Note 3) Measured at 155 Mb/s with PRBS 223 – 1 NRZ test pattern for BER < 1x10-10

Product Features

- Up to 155Mbps data rate operation
- 850nm VCSEL laser and PIN photo detector for 2km transmission with MMF
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- RoHS compliant
- Temperature range : Commercial: 0°C to 70°C Extended: -10°C to +80°C Industrial: -40°C to +85°C

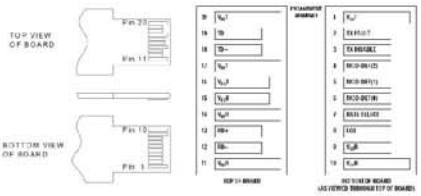
Application

- SDH STM-1,S-1.1,L-1.1,L-1.2
- SONET OC-3 IR1,LR1,LR2
- Other optical links

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
SFP-100FX85-MM	-11 ~ +1dBm	-23db	155M	850nm	2km

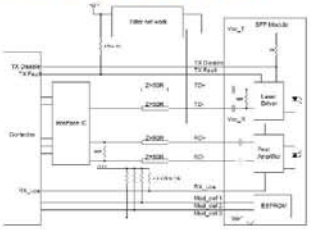
Pin Definitions And Functions



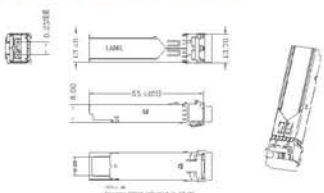
PIN	Name	Function	Notes
1	VeeT	Tx ground	Note 1
2	Tx Fault	Tx fault indication, Open Collector Output, active "H"	Note 2
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	Note 3
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 6
20	VeeT	Tx ground	

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.
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 – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.
   Mod-Def 0 has been grounded by the module to indicate that the module is present
   Mod-Def 1 is the clock line of two wire serial interface for serial ID
   Mod-Def 2 is the data line of two wire serial interface for serial ID
4. When high, this output indicates loss of signal (LOS). Low indicates normal operation.
5. RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

Typical Interface Circuit



Package Dimensions



SFP-100FX20-SM

155M SFP 1310nm LC 20km DDMI

General

SFP-100FX20-SM The SFP transceivers are high performance, cost effective modules supporting data-rate of 155Mbps and 20km transmission distance with SMF.The transceiver consists of three sections: a VCSEL laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	3.60	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate			155		Mb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc			220	mA	
Operating Case Temperature	Tc	0 -45		70 85	°C	

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70°C -40°C to + 85°C	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	-11°C to -1°C	dBm	±3dB	Internal/ External
RX Power	-25°C to 0°C	dBm	±3dB	Internal/ External

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			300		1800	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			370		1800	mVpp	3
Tx Disable input	H	VOH	2.0		Vcc+0.3		2
	L	VOL	0		0.8	V	

Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	
Transmitter						
Operating Wavelength		1270	1310	1360	nm	
Ave. output power (Enabled)	Po	-15		-8	dBm	1
Extinction Ratio	ER	10			dB	2
Rise/Fall Time (20%-80%)	Tr-Tf			0.26	ns	
Spectral Width (RMS)				3	nm	
Output Optical Eye	Compliant with ITU-T G.957					
Receiver						
Operating Wavelength		1270		1610	nm	
Sensitivity	Psen			-32	dBm	3
Min. overload	Pimax	-3			dBm	
LOS Assert	Pa	-45			dBm	
LOS De-assert	Pd			-33	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note 1) Measured at 155 Mb/s with PRBS 223 – 1 NRZ test pattern.
Note 2) Unfiltered, measured with a PRBS 223-1 test pattern @155Mbps
Note 3) Measured at 155 Mb/s with PRBS 223 – 1 NRZ test pattern for BER < 1x10-10

Product Features

- Up to 155Mbps data rate operation
- 1310nm FP laser and PIN photo detector for 20km transmission with SMF
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- Low power consumption, < 0.8W
- Temperature range:
  Commercial: 0°C to 70°C
  Industrial: -40°C to +85°C

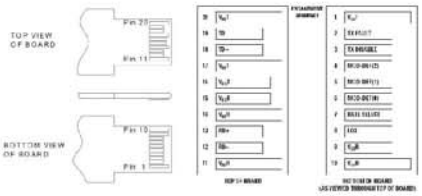
Application

- SDH STM-1,S-1.1,L-1.1,L-1.2
- SONET OC-3 IR1,LR1,LR2
- Other optical links

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
SFP-100FX20-SM	-15 ~ -8 db	-32db	155M	1310nm	20km

Pin Definitions And Functions



PIN	Name	Function	Notes
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3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	Note 3
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 6
20	VeeT	Tx ground	

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.
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 – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled
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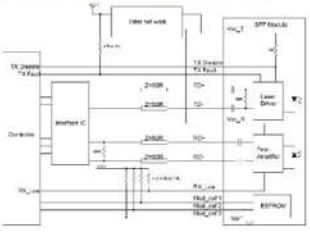
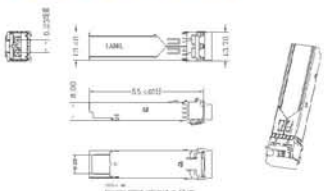
   Mod-Def 0 has been grounded by the module to indicate that the module is present
   Mod-Def 1 is the clock line of two wire serial interface for serial ID
   Mod-Def 2 is the data line of two wire serial interface for serial ID
4. When high, this output indicates loss of signal (LOS). Low indicates normal operation.
5. RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

Typical Interface Circuit



Package Dimensions



SFP-100FX20-SM-BCDI 1310

155M SFP BIDI TX1310/RX1550 LC 20km DDMI

General

SFP-100FX20-SM-BCDI 1310 Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). They simultaneously comply with Gigabit Ethernet as specified in IEEE STD 802.3 and 1x Fibre Channel as defined in FC-PI-2 Rev. 10.0 .They are RoHS compliant and lead-free

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate			155		Gb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc			220	mA	
Operating Case Temperature	Tc	0		70	°C	

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70°C -40°C to + 85°C	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	-16°C to -7°C	dBm	±3dB	Internal/ External

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			120		820	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			340	650	800	mVpp	3
Tx Disable input	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		

Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength	λC	1270	1310	1350	nm	
Ave. output power (Enabled)	Po	-15		-8	dBm	1
Extinction Ratio	ER	10			dB	1
RMS spectral width	Δλ			4	nm	
Rise/Fall time (20%~80%)	Tr/Tf			0.26	ps	2
Output Eye Mask	Compliant with IEEE802.3 z (class 1 laser safety)					
Receiver						
Operating Wavelength		1530	1550	1570	nm	
Sensitivity	Psen			-30	dBm	1
Min. overload	Pimax	-3			dBm	
LOS Assert	Pa	-45			dBm	
LOS De-assert	Pd			-31	dBm	2
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note 1) Measure at 2^23-1 NRZ PRBS pattern 2 Transmitter eye mask definition
Note 2) Measured with Light source 1310nm, ER=9dB; BER =<10^-12 @PRBS=2^23-1 NRZ.
Note 3) When LOS de-asserted, the RX data+/- output is signal output.

Product Features

- Up to 155Mbps data-rate
- TX1310nm FP laser
- RX1550 PIN photo detector for 20km transmission
- BIDI LC/UPC type pluggable optical interface
- Compliant with SFP MSA and SFF-8472 with simplex LC receptacle
- RoHS compliant and lead-free
- Single +3.3V power supply
- Support Digital Diagnostic Monitoring interface
- Case operating temperature Commercial: 0°C to +70°C Extended: -10°C to +80°C Industrial: -40°C to +85°C

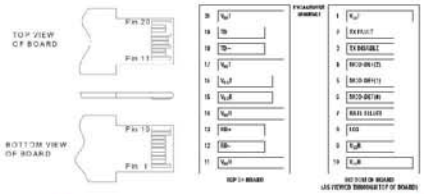
Application

- SDH STM-1,S-1.1,L-1.1,L-1.2
- SONET OC-3 IR1,LR1,LR2
- Other optical links

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
SFP-100FX20-SM-BCDI 1310	-15 ~ -8 db	-30db	155M	TX1310/RX1550nm	20km

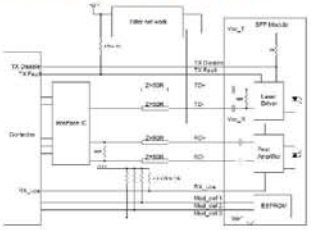
Pin Definitions And Functions



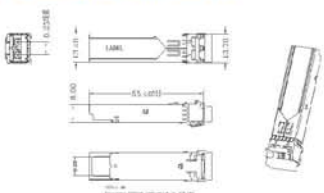
PIN	Name	Function	Notes
1	VeeT	Tx ground	Note 1
2	Tx Fault	Tx fault indication, Open Collector Output, active "H"	Note 2
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	Note 3
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 6
20	VeeT	Tx ground	

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.
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 – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.
   Mod-Def 0 has been grounded by the module to indicate that the module is present
   Mod-Def 1 is the clock line of two wire serial interface for serial ID
   Mod-Def 2 is the data line of two wire serial interface for serial ID
4. When high, this output indicates loss of signal (LOS). Low indicates normal operation.
5. RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

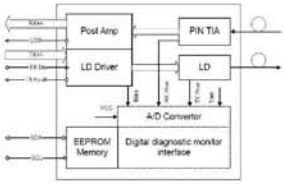
Typical Interface Circuit



Package Dimensions



Functional Diagram



SFP-100FX20-SM-BCDI 1550

155M SFP BIDI TX1550/RX1310 LC 20km DDMI

General

SFP-100FX20-SM-BCDI 1550 Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). They simultaneously comply with Gigabit Ethernet as specified in IEEE STD 802.3 and 1x Fibre Channel as defined in FC-PI-2 Rev. 10.0 .They are RoHS compliant and lead-free

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate			155		Gb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc			220	mA	
Operating Case Temperature	Tc	0		70	°C	

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70°C -40°C to + 85°C	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	-16°C to -7°C	dBm	±3dB	Internal/ External
RX Power	-33°C to -0°C	dBm	±3dB	Internal/ External

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			120		820	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			340	650	800	mVpp	3
Tx Disable input	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		

Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength	λC	1530	1550	1570	nm	
Ave. output power (Enabled)	Po	-15		-8	dBm	1
Extinction Ratio	ER	10			dB	1
RMS spectral width	Δλ			4	nm	
Rise/Fall time (20%~80%)	Tr/Tf			0.26	ps	2
Output Eye Mask	Compliant with IEEE802.3 z (class 1 laser safety)					
Receiver						
Operating Wavelength		1270	1310	1330	nm	
Sensitivity	Psen			-30	dBm	1
Min. overload	Pimax	-3			dBm	
LOS Assert	Pa	-45			dBm	
LOS De-assert	Pd			-31	dBm	2
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note 1) Measure at 2^23-1 NRZ PRBS pattern 2 Transmitter eye mask definition
Note 2) Measured with Light source 1310nm, ER=9dB; BER =<10^-12 @PRBS=2^23-1 NRZ.
Note 3) When LOS de-asserted, the RX data+/- output is signal output.

Product Features

- Up to 155Mbps data-rate
- TX1550nm FP laser
- RX1310 PIN photo detector for 20km transmission
- BIDI LC/UPC type pluggable optical interface
- Compliant with SFP MSA and SFF-8472 with simplex LC receptacle
- RoHS compliant and lead-free
- Single +3.3V power supply
- Support Digital Diagnostic Monitoring interface
- Case operating temperature Commercial: 0°C to +70°C Extended: -10°C to +80°C Industrial: -40°C to +85°C

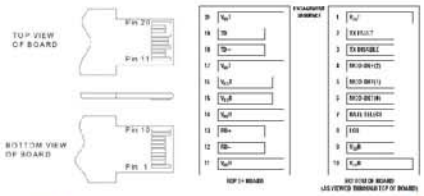
Application

- SDH STM-1,S-1.1,L-1.1,L-1.2
- SONET OC-3 IR1,LR1,LR2
- Other optical links

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
SFP-100FX20-SM-BCDI 1550	-15 ~ -8 db	-30db	155M	TX1310/RX1550nm	20km

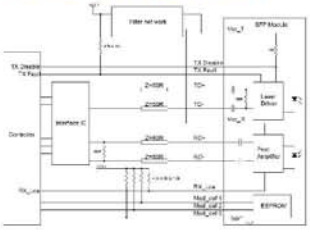
Pin Definitions And Functions



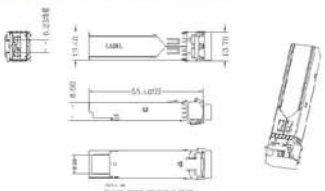
PIN	Name	Function	Notes
1	VeeT	Tx ground	Note 1
2	Tx Fault	Tx fault indication, Open Collector Output, active "H"	Note 2
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	Note 3
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 6
20	VeeT	Tx ground	

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.
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 – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.
   Mod-Def 0 has been grounded by the module to indicate that the module is present
   Mod-Def 1 is the clock line of two wire serial interface for serial ID
   Mod-Def 2 is the data line of two wire serial interface for serial ID
4. When high, this output indicates loss of signal (LOS). Low indicates normal operation.
5. RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

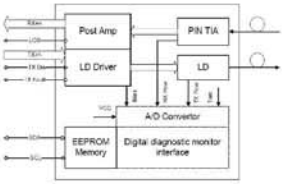
Typical Interface Circuit



Package Dimensions



Functional Diagram



BC-GLC-T

RoHS Compliant 10/100/1000M Copper SFP Transceiver

General

BC-GLC-T Copper Small Form Pluggable(SFP) transceivers is high performance, cost effective module compliant with the Gigabit Ethernet and 1000- BASE-T standards as specified in IEEE 802. 3-2002 and IEEE 802.3ab, which supporting 1000Mbps data- rate up to 100 meters reach over unshielded twisted-pair CAT 5 cable. The module supports1000 Mbps (or 10/100/1000Mbps) full duplex data-links with 5-level Pulse Amplitude Modulation (PAM) signals. All four pairs in the cable are used with symbol rate at 250Mbps on each pair. The module provides standard serial ID information compliant with SFP MSA, which can be accessed with address of A0h via the 2wire serial CMOS EEPROM protocol. The physical IC can also be accessed via 2wire serial bus at address ACh.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature	Ts	-40	85	°C	
Relative Humidity	RH	5	85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the transceiver

General Operating Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	DR	10		1000	Gb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc5		320	375	mA	
Operating Case Temperature	Tc	0		70	°C	

Low-Speed Signals Electrical Interface (TOP(C) = 0 to 70 C, VCC = 3.13 to 3.47 V)

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
SFP Output _Low	VOL	0		0.5	V	1
SFP Output _High	VOH	Vcc - 0.5		Vcc+0.3	V	1
SFP Input_Low	VIL	0		0.8	V	1
SFP Input_High	VIH	2.0		Vcc+0.3	V	1

Notes:
1. 4.7k to 10k pull-up to host _ Vcc, measured at host side of connector
2. MOD_DEF (1) (SCL) and MOD_DEF(2) (SDA), are open drain CMOS signals. Both MOD_DEF (1) and MOD_DEF(2) must be pulled up to host_ Vcc.

High-Speed Electrical Interface (TOP(C) = 0 to 70 C, VCC = 3.13 to 3.47 V)

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Line Frequecy	FL		125		MHz	2
Tx Output Impedance	Zout,tx		100		Ω	3
Rx Input Impedance	Zin.rx		100		Ω	3
Single ended data input swing	Vin	250		1200	mV	
Single ended data output swing	Vout	350		800	mV	
Rise/Fall Time	Tr/Tf		175		ps	4
Tx Input Impedance	Zin,tx		50		Ω	
Rx Output Impedance	Zout,rx		50		Ω	

Notes:
1. All high-speed signals are AC-coupled internally.
2. 5-level encoding, per IEEE 802.3
3. Differential, for all Frequencies between 1MHz and 125MHz Differential.
4. 20%-80%

Product Features

- Up to 1.25Gb/s bi-directional data links
- Compact RJ-45 connector
- Hot pluggable SFP footprint
- 1Gigabit Ethernet over Cat 5 cable
- Applicable for 100m distance transmission
- Low power consumption, < 1.2W
- Access to physical layer IC via 2-wire serial bus
- 10/100/1000BASE-T operation in host systems with SERDES interface
- Operating case temperature:
- Commercial:0 to 70 °C

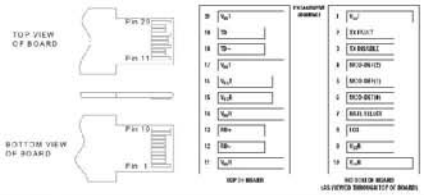
Application

- Gigabit Ethernet 1000BASE-T
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
BC-GLC-T	N/A	N/A	10/100/1000M	Copper SFP	100m

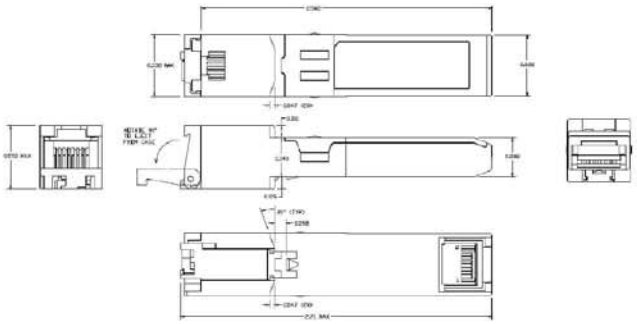
Pin Definitions And Functions



PIN	Name	Function	Notes
1	VeeT	Tx ground	Note 1
2	Tx Fault	Transmitter Fault. Not supported	
3	Tx Disable	Transmitter Disable. PHY disabled on high or open	Note 2
4	MOD-DEF2	Module Definition 2. Data line for serial ID	Note 3
5	MOD-DEF1	Module Definition 1. Clock line for serial ID	Note 3
6	MOD-DEF0	Module Definition 0. Grounded within the module	Note 3
7	Rate select	No connection	
8	LOS	Loss of Signal indication.	Note 4
9	VeeR	Rx ground	Note 1
10	VeeR	Rx ground	Note 1
11	VeeR	Rx ground	Note 1
12	RD-	Receiver Inverted DATA out. AC coupled	
13	RD+	Receiver Non-inverted DATA out. AC coupled	
14	VeeR	Rx ground	Note 1
15	VccR	Rx power supply	
16	VccT	Tx power supply	Note 1
17	VeeT	Tx ground	
18	TD+	Transmitter Non-Inverted DATA in. AC coupled	
19	TD-	Transmitter Inverted DATA in. AC coupled	
20	VeeT	Tx ground	Note 1

Notes:
1. Circuit ground is connected to chassis ground
2. PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V
3. Should be pulled up with 4.7k – 10k Ohms on host board to a voltage between 2.0 V and 3.6 V.MOD_DEF(0) pulls line low to indicate module is plugged in.
4. LVTTL compatible with a maximum voltage of 2.5V. Not supported on GE-GB-P.

Package Dimensions



CTM-LC0500-MM

1.25G SFP 850nm LC 550m DDMI

(Mini Gbic SFP Module)

General

CTM-LC0500-MM Transceivers are high performance, cost effective modules supporting data-rate of 1.25Gbps and 550m transmission distance with MMF. The transceiver consists of three sections: a VCSEL laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	Gigabit Ethernet			1.25		Gb/s	
	Fiber Channel			1.0625			
Supply Voltage		Vcc	3.1	3.3	3.5	V	
Supply Current		Icc			220	mA	
Operating Case Temperature		Tc	0 -10 -45		70 80 85	°C	

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70°C -40°C to + 85°C	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 15	mA	±10%	Internal/ External
TX Power	-13°C to -1°C	dBm	±3dB	Internal/ External
RX Power	-21°C to -0°C	dBm	±3dB	Internal/ External

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			300		1600	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			400		1000	mVpp	3
Tx Disable input	H	VOH	2.0		Vcc+0.3		2
	L	VOL	0		0.8	V	

Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Ave. Output Power (Enable)	Po	-11		1-1	dBm	1
Extinction Ratio	ER	9			dB	1
Rise/Fall Time (20%-80%)	Tr/Tf			0.26	ns	
Wavelength Range		840	850	860	nm	2
Spectral Width (RMS)				0.65	nm	
Output Optical Eye	Compliant with IEEE802.3 z (class 1 laser safety)					
Receiver						
Operating Wavelength		750		860	nm	
Sensitivity	Pimin			-18	dBm	3
Min. Overload	Pimax	-0			dBm	3
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-19	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note : 1) Measured at 1250 Mb/s with PRBS 27 – 1 NRZ test pattern.
Note : 2) Unfiltered, measured with a PRBS 27-1 test pattern @1.25Gbps
Note : 3) Measured at 1250 Mb/s with PRBS 27 – 1 NRZ test pattern for BER < 1x10-12

Product Features

- 850nm VCSEL laser and PIN photodetector
- Up to 1.25Gbps data rate operation
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitor Interface
- 550m transmission with 50/125μm MMF
- 300m transmission with 62.5/125μm MMF
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- RoHS compliant
- Case operating temperature :
- Commercial: 0°C to +70°C / Extended: -10°C to +80°C / Industrial: -40°C to +85°C

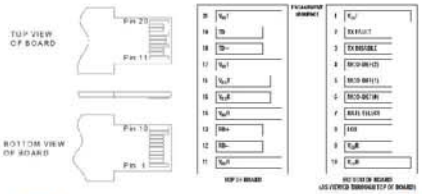
Application

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
CTM-LC0500-MM	-11 ~ -1 db	-18db	1.25/1.0625 Gbps	850nm	550m

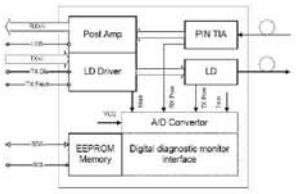
Pin Definitions And Functions



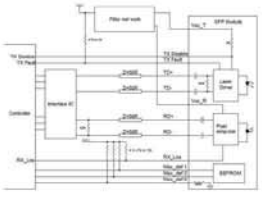
PIN	Name	Function	Notes
1	VeeT	Tx ground	
2	Tx Fault	Tx fault indication, Open Collector Output, active "H"	Note 1
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	Note 2
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	Note 3
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	Note 6
17	VeeT	Tx ground	Note 6
18	TD+	Transmit data in	
19	TD-	Inverse transmit data in	
20	VeeT	Tx ground	

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.
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 – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.
   Mod-Def 0 has been grounded by the module to indicate that the module is present
   Mod-Def 1 is the clock line of two wire serial interface for serial ID
   Mod-Def 2 is the data line of two wire serial interface for serial ID
4. When high, this output indicates loss of signal (LOS). Low indicates normal operation.
5. RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

Functional Diagram



Typical Interface Circuit



Package Dimensions

CTS-LC0020-SM

1.25G SFP 1310nm LC 20km DDMI

General

CTS-LC0020-SM SFP transceivers are high performance, cost effective modules supporting dual data-rate of 1.25Gbps/1.0625Gbps and 20km transmission The transceiver consists of three sections: a FP laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. Transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA

Product Features

- FP laser transmitter and PIN photo-detector
- Dual Data-rate of 1.25Gbps/1.0625Gbps Operation
- Up to 20KM transmission distance on 9/125μm SMF
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- Compatible with RoHS
- Operating case temperature :Commercial: 0°C to +70°C Extended: -10°C to +80°C Industrial: -40°C to +85°C

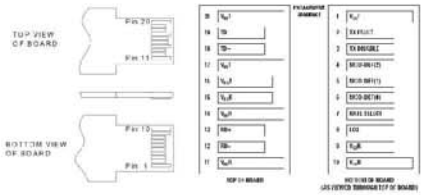
Application

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
CTS-LC0020-SM	-9 ~ -3 db	-22db	1.25/1.0625Gbps	1310nm	20km

Pin Definitions And Functions



PIN	Name	Function	Notes
1	VeeT	Tx ground	
2	Tx Fault	Tx fault indication, Open Collector Output, active "H"	Note 1
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	Note 2
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	Note 3
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 6
20	VeeT	Tx ground	

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.
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 – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.
   Mod-Def 0 has been grounded by the module to indicate that the module is present
   Mod-Def 1 is the clock line of two wire serial interface for serial ID
   Mod-Def 2 is the data line of two wire serial interface for serial ID
4. When high, this output indicates loss of signal (LOS). Low indicates normal operation.
5. RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	3.6	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	Gigabit Ethernet			1.25		Gb/s	
	Fiber Channel			1.0625			
Supply Voltage		Vcc	3.1	3.3	3.5	V	
Supply Current		Icc			220	mA	
Operating Case Temperature		Tc	0 -10 -45		70 80 85	°C	

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70°C -40°C to + 85°C	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	-12°C to -1°C	dBm	±3dB	Internal/ External
RX Power	-25°C to -0°C	dBm	±3dB	Internal/ External

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			300		1800	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			400		1000	mVpp	3
Tx Disable input	H	VOH	2.0		Vcc+0.3		2
	L	VOL	0		0.8	V	

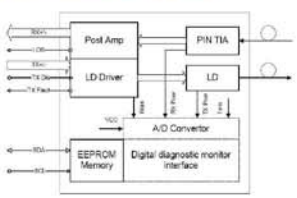
Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

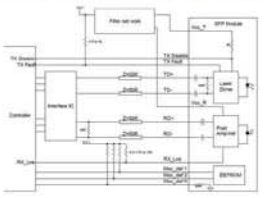
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Ave. Output Power (Enable)	Po	-9		-3	dBm	1
Extinction Ratio	ER	9			dB	1
Rise/Fall Time (20%-80%)	Tr/Tf			0.26	ns	2
Wavelength Range		1270	1310	1360	nm	
Spectral Width (RMS)				4	nm	
Output Optical Eye	Compliant with IEEE802.3 z (class 1 laser safety)					
Receiver						
Operating Wavelength		1270		1610	nm	
Sensitivity	Pimin			-22	dBm	3
Min. Overload	Pimax	-3			dBm	3
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-19	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note : 1) Measured at 1250 Mb/s with PRBS 27 – 1 NRZ test pattern.
Note : 2) Unfiltered, measured with a PRBS 27-1 test pattern @1.25Gbps
Note : 3) Measured at 1250 Mb/s with PRBS 27 – 1 NRZ test pattern for BER < 1x10-12

Functional Diagram



Typical Interface Circuit



Package Dimensions

CTS-LC0040-SM

1.25G SFP 1310nm LC 40km DDMI

Product Features

- FP laser transmitter and PIN photo-detector
- Dual Data-rate of 1.25Gbps/1.0625Gbps Operation
- Up to 40KM transmission distance on 9/125μm SMF
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- Compatible with RoHS
- Operating case temperature :Commercial: 0°C to +70°C Extended: -10°C to +80°C Industrial: -40°C to +85°C

Application

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other optical transmission systems

General

CTS-LC0040-SM SFP transceivers are high performance, cost effective modules supporting dual data-rate of 1.25Gbps/1.0625Gbps and 40km transmission distance with SMF. The transceiver consists of three sections: a DFB laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. Transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	3.6	V	
Storage Temperature		-40	85	°C	
Relative Humidity		5	85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	
Data Rate	Gigabit Ethernet			1.25		Gb/s	
	Fiber Channel			1.0625			
Supply Voltage		Vcc	3.1	3.3	3.5	V	
Supply Current		Icc			220	mA	
Operating Case Temperature		Tc	0		70	°C	
			-10		80		
			-45		85		

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70°C -40°C to + 85°C	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	-12°C to -1°C	dBm	±3dB	Internal/ External
RX Power	-25°C to -0°C	dBm	±3dB	Internal/ External

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			300		1800	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			400		1000	mVpp	3
Tx Disable input	H	VOH	2.0		Vcc+0.3		2
	L	VOL	0		0.8	V	

Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

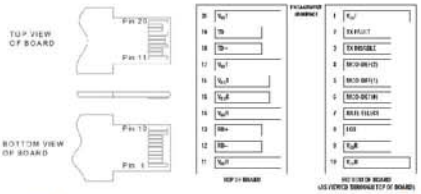
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Ave. Output Power (Enable)	Po	-6		-3	dBm	1
Extinction Ratio	ER	9			dB	1
Rise/Fall Time (20%-80%)	Tr/Tf			0.26	ns	2
Wavelength Range		1270	1310	1360	nm	
Spectral Width (RMS)				4	nm	
Output Optical Eye	Compliant with IEEE802.3 z (class 1 laser safety)					
Ave. Output Power (Enable)	PO	-9		-3	dBm	1
Receiver						
Operating Wavelength	Pimin	1270		1610	nm	
Sensitivity	Pimax			-22	dBm	3
Min. Overload	Pa	-3			dBm	3
LOS Assert	Pd	-35			dBm	
LOS De-assert	Pd-Pa			-23	dBm	
LOS Hysteresis		0.5		6	dB	

Note : 1) Measured at 1250 Mb/s with PRBS 27 – 1 NRZ test pattern.
Note : 2) Unfiltered, measured with a PRBS 27-1 test pattern @1.25Gbps
Note : 3) Measured at 1250 Mb/s with PRBS 27 – 1 NRZ test pattern for BER < 1x10-12

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
CTS-LC0040-SM	-9 ~ -3 db	-22db	1.25/1.0625 Gbps	1310nm	40km

Pin Definitions And Functions



PIN	Name	Function	Notes
1	VeeT	Tx ground	
2	Tx Fault	Tx fault indication, Open Collector Output, active "H"	Note 1
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	Note 2
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	Note 3
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 6
20	VeeT	Tx ground	

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.
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 – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.
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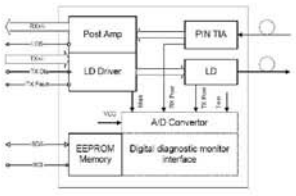
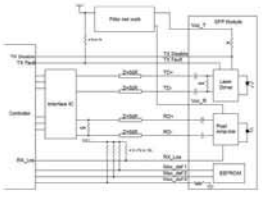
5. RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

Functional Diagram



Typical Interface Circuit



Package Dimensions

BC-BL3512-20

1.25G Bidi TX1310/RX1550nm 20KM DDMI LC

General

BC-BL3512-20 Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). They simultaneously comply with Gigabit Ethernet as specified in IEEE STD 802.3 and 1x Fibre Channel as defined in FC-PI-2 Rev. 10.0 .They are RoHS compliant and lead-free

Product Features

- Dual data-rate of 1.25Gbps/1.063Gbps operation
- TX1310nm FP laser
- RX1550 PIN photo detector for 20km transmission
- BIDI LC/UPC type pluggable optical interface
- Compliant with SFP MSA and SFF-8472 with simplex LC receptacle
- RoHS compliant and lead-free
- Single +3.3V power supply
- Support Digital Diagnostic Monitoring interface
- Case operating temperature Commercial: 0°C to +70°C Extended: -10°C to +80°C Industrial: -40°C to +85°C

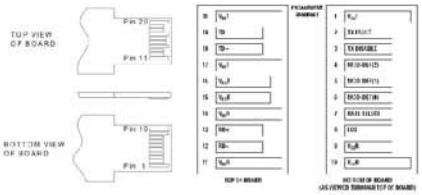
Application

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other Optical Links

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
BC-BL3512-20	-9 ~ -3 db	-25db	1.25G	TX1310/RX1550nm	20km

Pin Definitions And Functions



PIN	Name	Function	Notes
1	VeeT	Tx ground	
2	Tx Fault	Tx fault indication, Open Collector Output, active "H"	Note 1
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	Note 2
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	Note 3
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 6
20	VeeT	Tx ground	

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.
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 – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled
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   Mod-Def 0 has been grounded by the module to indicate that the module is present
   Mod-Def 1 is the clock line of two wire serial interface for serial ID
   Mod-Def 2 is the data line of two wire serial interface for serial ID
4. When high, this output indicates loss of signal (LOS). Low indicates normal operation.
5. RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	3.6	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter	Symbol	Min.	Max.	Unit	Note
Data Rate				Gb/s	
Supply Voltage	Vcc	3.13	3.47	V	
Supply Current	Icc5		220	mA	
Operating Case Temperature	Tc	0	70	°C	

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70°C -40°C to + 85°C	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	-11°C to -1°C	dBm	±3dB	Internal/ External
RX Power	-25°C to -0°C	dBm	±3dB	Internal/ External

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			120		820	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			340	650	800		3
Tx Disable input	H	VOH	2.0		Vcc+0.3	mVpp	2
	L	VOL	0		0.8	V	

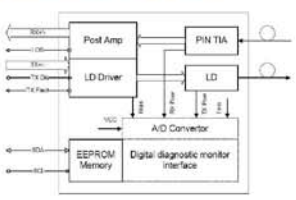
Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

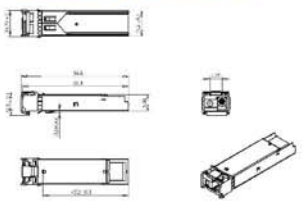
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength	λC	1270	1310	1350	nm	
Ave. output power (Enabled)	Po	-9		-8	dBm	1
Extinction Ratio	ER	9			dB	1
RMS spectral width	Δλ			4	nm	
Rise/Fall time (20%~80%)	Tr/Tf			0.26	ps	2
Output Eye Mask	Compliant with IEEE802.3 z (class 1 laser safety)					
Receiver						
Operating Wavelength		1530	1550	1570	nm	
Sensitivity	Psen			-24	dBm	
Min. overload	Pimax	-3			dBm	3
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-23	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	4

Note 1 Measure at 2^23-1 NRZ PRBS pattern
Note 2 Transmitter eye mask definition
Note 3 Measured with Light source 1550nm(1310nm), ER=9dB; BER =<10^-12 @PRBS=2^23-1 NRZ.
Note 4 When LOS de-asserted, the RX data+/- output is signal output.

Functional Diagram



Package Dimensions



BC-BL5312-20

1.25G Bidi TX1550/RX1310nm 20KM DDMI LC

General

BC-BL5312-20 Small Form Factor Pluggable (SFP) transceivers are compatible with the Small Form Factor Pluggable Multi-Sourcing Agreement (MSA). They simultaneously comply with Gigabit Ethernet as specified in IEEE STD 802.3 and 1x Fibre Channel as defined in FC-PI-2 Rev. 10.0 .They are RoHS compliant and lead-free

Product Features

- Dual data-rate of 1.25Gbps/1.063Gbps operation
- TX1550nm FP laser
- RX1310nm PIN photo detector for 20km transmission
- BIDI LC/UPC type pluggable optical interface
- Compliant with SFP MSA and SFF-8472 with simplex LC receptacle
- RoHS compliant and lead-free
- Single +3.3V power supply
- Support Digital Diagnostic Monitoring interface
- Case operating temperature Commercial: 0°C to +70°C Extended: -10°C to +80°C Industrial: -40°C to +85°C

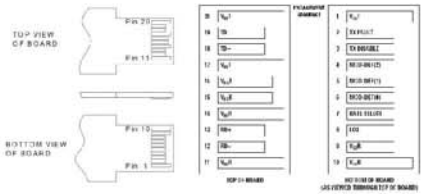
Application

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other Optical Links

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
BC-BL5312-20	-9 ~ -3 db	-25db	1.25G	TX1550/RX1310nm	20km

Pin Definitions And Functions



PIN	Name	Function	Notes
1	VeeT	Tx ground	
2	Tx Fault	Tx fault indication, Open Collector Output, active "H"	Note 1
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	Note 2
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	Note 3
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 6
20	VeeT	Tx ground	

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.
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 – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.
   Mod-Def 0 has been grounded by the module to indicate that the module is present
   Mod-Def 1 is the clock line of two wire serial interface for serial ID
   Mod-Def 2 is the data line of two wire serial interface for serial ID
4. When high, this output indicates loss of signal (LOS). Low indicates normal operation.
5. RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	3.6	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Data Rate			1250		Gb/s	
Supply Voltage	Vcc	3.13	3.3	3.47	V	
Supply Current	Icc5			220	mA	
Operating Case Temperature	Tc	0		70	°C	

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70°C -40°C to + 85°C	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	-11°C to -1°C	dBm	±3dB	Internal/ External
RX Power	-25°C to -0°C	dBm	±3dB	Internal/ External

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	
Transmitter							
Diff. input voltage swing			120		820	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			340	650	800		3
Tx Disable input	H	VOH	2.0		Vcc+0.3	mVpp	2
	L	VOL	0		0.8	V	

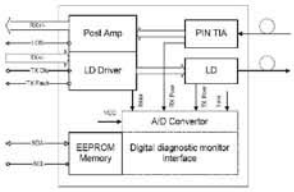
Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

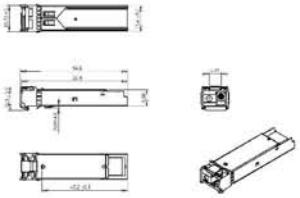
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength	λC	1530	1550	1570	nm	
Ave. output power (Enabled)	Po	-9		-3	dBm	1
Extinction Ratio	ER	9			dB	1
RMS spectral width	Δλ			4	nm	
Rise/Fall time (20%~80%)	Tr/Tf			0.26	ps	2
Output Eye Mask	Compliant with IEEE802.3 z (class 1 laser safety)					
Receiver						
Operating Wavelength		1270	1310	1350	nm	
Sensitivity	Psen			-24	dBm	
Min. overload	Pimax	-3			dBm	3
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-23	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	4

Note 1 Measure at 2^23-1 NRZ PRBS pattern
Note 2 Transmitter eye mask definition
Note 3 Measured with Light source 1550nm(1310nm), ER=9dB; BER =<10^-12 @PRBS=2^23-1 NRZ.
Note 4 When LOS de-asserted, the RX data+/- output is signal output.

Functional Diagram



Package Dimensions



BC-BL3512-40

1.25G Bidi TX1310/RX1550nm 40KM DDMI LC

General

BC-BL3512-40 SFP-BIDI transceivers are high performance, cost effective modules supporting dual data-rate of 1.25Gbps/1.0625Gbps and 40km transmission distance with SMF. The transceiver consists of three sections: a DFB laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

Product Features

- Dual data-rate of 1.25Gbps/1.063Gbps operation
- TX1310nm FP laser
- RX1550 PIN photo detector for 40km transmission
- BIDI LC/UPC type pluggable optical interface
- Compliant with SFP MSA and SFF-8472 with simplex LC receptacle
- RoHS compliant and lead-free
- Single +3.3V power supply
- Support Digital Diagnostic Monitoring interface
- Case operating temperature Commercial: 0°C to +70°C Extended: -10°C to +80°C Industrial: -40°C to +85°C

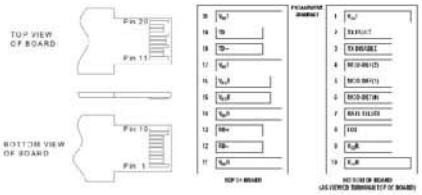
Application

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other Optical Links

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
BC-BL3512-40	-5 ~ 0 db	-22db	1.25G	TX1310/RX1550nm	40km

Pin Definitions And Functions



PIN	Name	Function	Notes
1	VeeT	Tx ground	
2	Tx Fault	Tx fault indication, Open Collector Output, active "H"	Note 1
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	Note 2
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	Note 3
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 6
20	VeeT	Tx ground	

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.
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 – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.
   Mod-Def 0 has been grounded by the module to indicate that the module is present
   Mod-Def 1 is the clock line of two wire serial interface for serial ID
   Mod-Def 2 is the data line of two wire serial interface for serial ID
4. When high, this output indicates loss of signal (LOS). Low indicates normal operation.
5. RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	3.6	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter	Symbol	Min.	Max.	Unit	Note
Data Rate				Gb/s	
Supply Voltage	Vcc	3.13	3.47	V	
Supply Current	Icc5		220	mA	
Operating Case Temperature	Tc	0	70	°C	

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70°C -40°C to + 85°C	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	-11°C to -1°C	dBm	±3dB	Internal/ External
RX Power	-25°C to -0°C	dBm	±3dB	Internal/ External

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			120		820	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			340	650	800		3
Tx Disable input	H	VOH	2.0		Vcc+0.3	mVpp	2
	L	VOL	0		0.8	V	

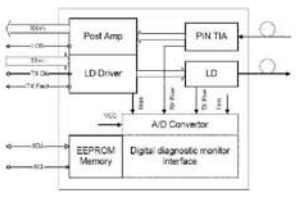
Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

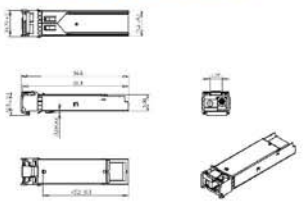
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength	λC	1270	1310	1350	nm	
Ave. output power (Enabled)	Po	-9		-8	dBm	1
Extinction Ratio	ER	9			dB	1
RMS spectral width	Δλ			4	nm	
Rise/Fall time (20%~80%)	Tr/Tf			0.26	ps	2
Output Eye Mask	Compliant with IEEE802.3 z (class 1 laser safety)					
Receiver						
Operating Wavelength		1530	1550	1570	nm	
Sensitivity	Psen			-24	dBm	
Min. overload	Pimax	-3			dBm	3
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-23	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	4

Note 1 Measure at 2^23-1 NRZ PRBS pattern
Note 2 Transmitter eye mask definition
Note 3 Measured with Light source 1550nm(1310nm), ER=9dB; BER =<10^-12 @PRBS=2^23-1 NRZ.
Note 4 When LOS de-asserted, the RX data+/- output is signal output.

Functional Diagram



Package Dimensions



BC-BL5312-40

1.25G Bidi TX1550/RX1310nm 40KM DDMI LC

General

BC-BL5312-40 SFP-BIDI transceivers are high performance, cost effective modules supporting dual data-rate of 1.25Gbps/1.0625Gbps and 40km transmission distance with SMF. The transceiver consists of three sections: a DFB laser transmitter, a PIN photodiode integrated with a trans-impedance preamplifier (TIA) and MCU control unit. All modules satisfy class I laser safety requirements. The transceivers are compatible with SFP Multi-Source Agreement (MSA) and SFF-8472. For further information, please refer to SFP MSA.

Product Features

- Dual data-rate of 1.25Gbps/1.063Gbps operation
- TX1550nm FP laser
- RX1310nm PIN photo detector for 40km transmission
- BIDI LC/UPC type pluggable optical interface
- Compliant with SFP MSA and SFF-8472 with simplex LC receptacle
- RoHS compliant and lead-free
- Single +3.3V power supply
- Support Digital Diagnostic Monitoring interface
- Case operating temperature Commercial: 0°C to +70°C Extended: -10°C to +80°C Industrial: -40°C to +85°C

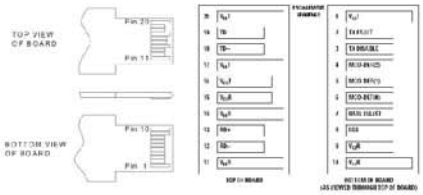
Application

- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched backplane applications
- Router/Server interface
- Other Optical Links

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
BC-BL5312-40	-5 ~ 0 db	-22db	1.25G	TX1550/RX1310nm	40km

Pin Definitions And Functions



PIN	Name	Function	Notes
1	VeeT	Tx ground	
2	Tx Fault	Tx fault indication, Open Collector Output, active "H"	Note 1
3	Tx Disable	LVTTL Input, internal pull-up, Tx disabled on "H"	Note 2
4	MOD-DEF2	2 wire serial interface data input/output (SDA)	Note 3
5	MOD-DEF1	2 wire serial interface clock input (SCL)	Note 3
6	MOD-DEF0	Model present indication	Note 3
7	Rate select	No connection	
8	LOS	Rx loss of signal, Open Collector Output, active "H"	Note 4
9	VeeR	Rx ground	
10	VeeR	Rx ground	
11	VeeR	Rx ground	
12	RD-	Inverse received data out	Note 5
13	RD+	Received data out	Note 5
14	VeeR	Rx ground	
15	VccR	Rx power supply	
16	VccT	Tx power supply	
17	VeeT	Tx ground	
18	TD+	Transmit data in	Note 6
19	TD-	Inverse transmit data in	Note 6
20	VeeT	Tx ground	

1. When high, this output indicates a laser fault of some kind. Low indicates normal operation. And should be pulled up with a 4.7 – 10KΩ resistor on the host board.
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 – 10KΩ resistor. Its states are: Low (0 – 0.8V): Transmitter on (>0.8, < 2.0V): Undefined High (2.0V~Vcc+0.3V): Transmitter Disabled Open: Transmitter Disabled
3. Mod-Def 0,1,2. These are the module definition pins. They should be pulled up with a 4.7K – 10KΩ resistor on the host board. The pull-up voltage shall be between 2.0V~Vcc+0.3V.
   Mod-Def 0 has been grounded by the module to indicate that the module is present
   Mod-Def 1 is the clock line of two wire serial interface for serial ID
   Mod-Def 2 is the data line of two wire serial interface for serial ID
4. When high, this output indicates loss of signal (LOS). Low indicates normal operation.
5. RD+/-: These are the differential receiver outputs. They are AC coupled 100Ω differential lines which should be terminated with 100Ω (differential) at the user SERDES. The AC coupling is done inside the module and is thus not required on the host board.
6. TD+/-: These are the differential transmitter inputs. They are AC-coupled, differential lines with 100Ω differential termination inside the module. The AC coupling is done inside the module and is thus not required on the host board.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter	Symbol	Min.	Max.	Unit	Note
Data Rate				Gb/s	
Supply Voltage	Vcc	3.13	3.47	V	
Supply Current	Icc5		220	mA	
Operating Case Temperature	Tc	0	70	°C	

Diagnostics Specification

Parameter	Range	Unit	Accuracy	Calibration
Temperature	0 to +70°C -40°C to + 85°C	°C	±3°C	Internal/ External
Voltage	3.0 to 3.6	V	±3%	Internal/ External
Bias Current	2 to 80	mA	±10%	Internal/ External
TX Power	-11°C to -1°C	dBm	±3dB	Internal/ External
RX Power	-25°C to -0°C	dBm	±3dB	Internal/ External

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			120		820	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			340	650	800		3
Tx Disable input	H	VOH	2.0		Vcc+0.3	mVpp	2
	L	VOL	0		0.8	V	

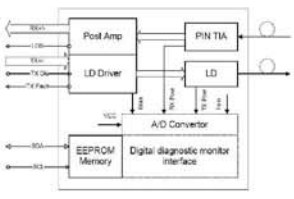
Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

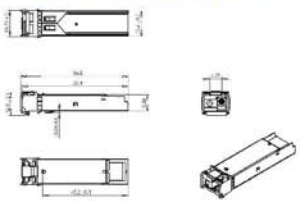
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength	λC	1500	1550	1570	nm	
Ave. output power (Enabled)	Po	-5		-3	dBm	1
Extinction Ratio	ER	9			dB	1
RMS spectral width	Δλ			4	nm	
Rise/Fall time (20%~80%)	Tr/Tf			0.26	ps	2
Output Eye Mask	Compliant with IEEE802.3 z (class 1 laser safety)					
Receiver						
Operating Wavelength		1270	1310	1360	nm	
Sensitivity	Psen			-22	dBm	
Min. overload	Pimax	-3			dBm	3
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-23	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	4

Note 1 Measure at 2^23-1 NRZ PRBS pattern
Note 2 Transmitter eye mask definition
Note 3 Measured with Light source 1550nm(1310nm), ER=9dB; BER =<10^-12 @PRBS=2^23-1 NRZ.
Note 4 When LOS de-asserted, the RX data+/- output is signal output.

Functional Diagram



Package Dimensions



General

SFP-10G-30 Optical transceivers are designed for 10Gb/s serial optical interfaces for data communications with multimode fiber (MMF). The transceiver can support 1.25Gb/s to 11.1Gb/s. The transceiver designs are optimized for high performance and cost effective to supply customers the best solutions for data-com and storage applications.

Product Features

- Hot pluggable
- Optical interface compliant to IEEE 802.3ae
- Up to 300m on 50/125um MMF(2000MHZ.KM)
- 850nm VCSEL transmitter, PIN photo-detector
- SFP MSA package with duplex LC connector
- Low power consumption
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- Cost effective SFP+ solution, enables higher port densities and greater bandwidth
- Operating case temperature: 0 to 70 °C

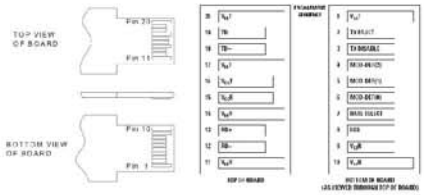
Application

- 10GBASE-SR/SW 10G Ethernet
- 10G Fiber Channel
- Other optical links

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
SFP-10G-30	-6 ~ -1 db	-11db	1.25G~11.1G	850nm	300M

Pin Definitions And Functions



PIN	Name	Function
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0 [5]	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	Rate Select 1
10	VEER [1]	Receiver Ground
11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

Notes:
1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15Vand 3.6V.
3. Reference Clock input is not required.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	Ethernet			10.3125		Gb/s	
	Fiber Channel			10.518			
Supply Voltage		Vcc	3.13	3.3	3.47	V	
		Vcc				V	
Supply Current		Icc5				mA	
		Icc5			300	mA	
Operating Case Temperature		Tc	0		70	°C	

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			120		820	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			340	650	800		3
Tx Disable input	H	VOH	2.0		Vcc+0.3	mVpp	2
	L	VOL	0		0.8	V	

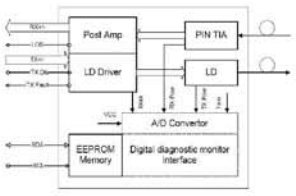
Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

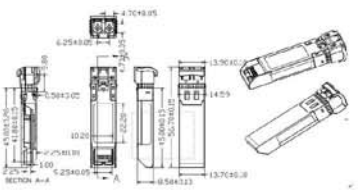
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength			850		nm	
Ave. output power (Enabled)	Po	-6		-1	dBm	1
Extinction Ratio	ER	3.5			dB	1
RMS spectral width	Δλ			0.45	nm	
Rise/Fall time (20%~80%)	Tr/Tf			45	ps	2
Optical modulation amplitude	OMA			-2.8	dBm	
Dispersion penalty				3.9	dB	
Output Optical Eye	IEEE 802.3-2005 Compliant					
Receiver						
Operating Wavelength		840		860	nm	3
Sensitivity	Psen			-11	dBm	
Min. overload	Pimax	-1			dBm	
LOS Assert	Pa	-24			dBm	
LOS De-assert	Pd			-12	dBm	
LOS Hysteresis	Pd-Pa	0.5		4	dB	

Note 1) Measured at 10.3125b/s with PRBS 231 – 1 NRZ test pattern.
Note 2) 20%~80%
Note 3) Under the ER worst case, measured at 10.3125 Gb/s with PRBS 231 - 1 NRZ test pattern for BER < 1x10-12

Functional Diagram



Package Dimensions



General

SFP-10G-10 This 1310nm DFB 10Gbps SFP+ transceiver is designed to transmit and receive optical data over single mode optical fiber for link length 10km. The transceiver designs are optimized for high perform-ance and cost effective to supply customers the best solutions for telecommunication.

Product Features

- Optical interface compliant to IEEE 802.3ae 10GBASE-LR
- Electrical interface compliant to SFF-8431
- Digital Diagnostic Monitor Interface
- Hot pluggable
- 1310nm DFB transmitter, PIN photo-detector
- Applicable for 10km SMF connection
- High transmission margin
- Low power consumption
- Cost effective SFP+ solution, enables higher port densities and greater bandwidth
- Operating case temperature: 0 to 70 °C

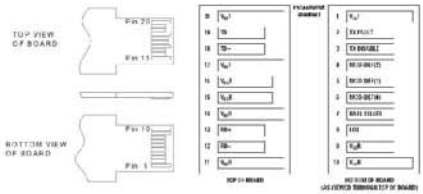
Application

- 10GBASE-SR/SW 10G Ethernet
- 10G Fiber Channel

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
SFP-10G-10	-6 ~ -1 db	-14.4db	10G	1310nm	10km

Pin Definitions And Functions



PIN	Name	Function
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0 [5]	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	Rate Select 1
10	VEER [1]	Receiver Ground
11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

Notes:
1. Module circuit ground is isolated from module chassis ground within the module.
2. should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15Vand 3.6V.
3. Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pullup to VccT inside the module.
4. Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc_Host with a resistor in the range 4.7 kΩ to10 kΩ.Mod_ABS is asserted "High" when the SFP+ module is physically absent from a host slot.
5. RS0 and RS1 are module inputs and are pulled low to VeeT with > 30 kΩ resistors in the module.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	Ethernet			10.3125		Gb/s	
	Fiber Channel			10.518			
Supply Voltage		Vcc	3.13	3.3	3.47	V	
		Vcc				V	
Supply Current		Icc5				mA	
		Icc5			300	mA	
Operating Case Temperature		Tc	0		70	°C	

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	
Transmitter							
Diff. input voltage swing			120		820	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			340	650	800		3
Tx Disable input	H	VOH	2.0		Vcc+0.3	mVpp	2
	L	VOL	0		0.8	V	

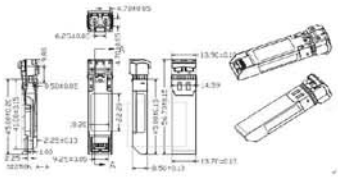
Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

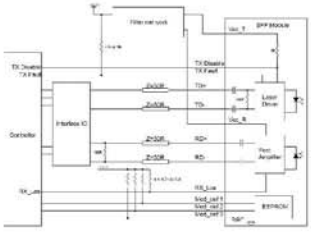
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength		1290		1330	nm	
Ave. output power (Enabled)	Po	-6		0	dBm	1
Extinction Ratio	ER	4			dB	1
RMS spectral width	Δλ			1	nm	
Rise/Fall time (20%~80%)	Tr/Tf			50	ps	2
SMSR	OMA			>30	dB	
Tx jitter(4m-80MHz)				0.1	uipp	
Tx jitter(20k-80MHz)				0.3	uipp	
Optical modulation amplitude	OMA	-6.2			dBm	
Dispersion penalty				1	dB	
Output Optical Eye	IEEE 802.3-2005 Compliant					
Receiver						
Operating Wavelength		1270		1610	nm	
Sensitivity	Psen			-22	dBm	3
Min. overload	Pimax	-3			dBm	
LOS Assert	Pa	-35			dBm	
LOS De-assert	Pd			-23	dBm	
LOS Hysteresis	Pd-Pa	0.5		6	dB	

Note 1) Measured at 10.3125b/s with PRBS 231 – 1 NRZ test pattern.
Note 2) 20%~80%
Note 3) Under the ER worst case, measured at 10.3125 Gb/s with PRBS 231 - 1 NRZ test pattern for BER < 1x10-12

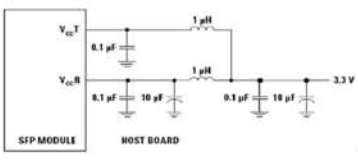
Recommended power supply filter



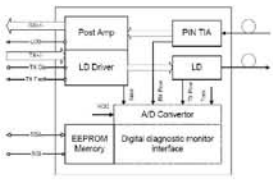
Typical Interface Circuit



Recommended power supply filter



Functional Diagram



Note: Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30 mA greater than the steady state value

Product Features

- Support 10Gbase-T / 5Gbase-T / 2.5Gbase-T / 1000base-T
- Hot-pluggable SFP footprint
- Compact RJ-45 connector assembly
- RoHS compliant and lead-free
- Single +3.3V power supply
- 10 Gigabit Ethernet over Cat 6a cable
- Ambient Operating temperature: 0°C to +65°C

Ordering Information

Part Number	Cable	Reach	Host Port
SFP-10G-05	CAT6A	30m	XFI

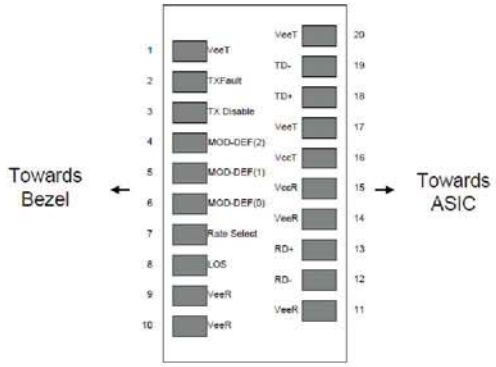
General

SFP-10G-05 SFP+-10GBASE-T Copper Small Form Pluggable (SFP) transceivers are based on the SFP Multi Source Agreement (MSA) . They are compatible with the 10Gbase-T / 5Gbase-T / 2.5Gbase-T / 1000base-T standards as specified in IEEE Std 802.3. SFP+-10GBASE-T uses the SFP's RX_LOS pin for link indication. If pull up SFP's TX_DISABLE pin, PHY IC be reset.

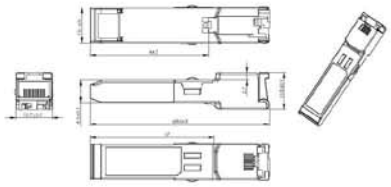
PIN	Name	Function	Notes
1	VEET	Transmitter Ground (Common with Receiver Ground)	
2	TFAULT	Transmitter Fault. Not supported.	Note 1
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	Note 2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	Note 3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	Note 3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	Note 3
7	Rate Select	No connection required	
8	LOS	High indicates no linked. low indicates linked.	Note 4
9	VEER	Receiver Ground (Common with Transmitter Ground)	
10	VEER	Receiver Ground (Common with Transmitter Ground)	
11	VEER	Receiver Ground (Common with Transmitter Ground)	
12	RD-	Receiver Inverted DATA out. AC Coupled	Note 5
13	RD+	Receiver Non-inverted DATA out. AC Coupled	Note 5
14	VEER	Receiver Ground (Common with Transmitter Ground)	
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	Note 6
19	TD-	Transmitter Inverted DATA in. AC Coupled.	Note 6
20	VEET	Transmitter Ground (Common with Receiver Ground)	

Notes:
1. Circuit ground is connected to chassis ground
2. PHY disabled on TDIS > 2.0V or open, enabled on TDIS < 0.8V
3. Should be pulled up with 4.7k - 10k Ohms on host board to a voltage between 2.0 V and 3.6 V. MOD_DEF(0) pulls line low to indicate module is plugged in.
4. LVTTL compatible with a maximum voltage of 2.5V.

SFP to Host Connector Pin Out



Package Dimensions



+3.3V Volt Electrical Power Interface

The SFP+-10GBASE-T has an input voltage range of 3.3 V +/- 5%. The 4V maximum voltage is not allowed for continuous operation.

Parameter	Symbol	Min.	Typ	Max.	Unit	Notes/Conditions
Supply Current	Is		700	900	mA	3.0W max power over full range of voltage and temperature. See caution note below
Input Voltage	Vcc	3.13	3.3	3.47	V	Referenced to GND
Maximum Voltage	Vmax		TBD	4	V	Hot plug above steady state current.
Surge Current	Isurgez				mA	See caution note below

Caution: Power consumption and surge current are higher than the specified values in the SFP MSA

High-Speed Electrical Interface

All high-speed signals are AC-coupled internally

Parameter	Symbol	Min.	Max.	Unit	Notes/Conditions
Supply Current	VOL	0	0.5	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
Input Voltage	VOH	host_Vcc -0.5	host_Vcc + 0.3	V	4.7k to 10k pull-up to host_Vcc, measured at host side of connector
Maximum Voltage	VIL	0	0.8	V	4.7k to 10k pull-up to Vcc, measured at SFP side of connector
Surge Current	VIH	2	Vcc + 0.3	V	4.7k to 10k pull-up to Vcc, measured at SFP side of connector

Caution: Power consumption and surge current are higher than the specified values in the SFP MSA

Optical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Notes/Conditions
	High-Speed Electrical Interface, Transmission Line-SFP					
Line Frequency	fl		125		MHz	5-level encoding, per IEEE 802.3
Tx Output Impedance	Zout, TX		100		Ohm	Differential, for all frequencies between MHz and 125MHz
Rx Input Impedance	Zin, RX		100		Ohm	Differential, for all frequencies between1MHz and 125MHzNotes/Conditions
	High-Speed Electrical Interface, Host-SFP					
Single ended data input swing	Vinsing	250		1200	mV	Single ended
Single ended data output swing	Voutsing	350		800	mV	Single ended
Rise/Fall Time	Tr,Tf		175		psec	20%-80%
Tx Input Impedance	Zin		50		Ohm	Single ended
Rx Output Impedance	Zout		50		Ohm	Single ended

Environmental Specifications

Automatic crossover detection is enabled. External crossover cable is not required

Parameter	Symbol	Min.	Typ	Max.	Unit	Notes/Conditions
Operating Temperature	Top	0		65	°C	Case temperature
Storage Temperature	Tsto	-40		85	°C	Ambient temperature

Serial Communication Protocol

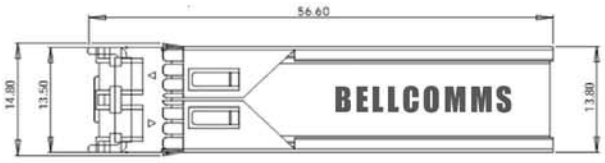
SFPs support the 2-wire serial communication protocol outlined in the SFP MSA. These SFPs use an MCU, can be accessed with address of A0h

Parameter	Symbol	Min.	Typ	Max.	Unit	Notes/Conditions
I 2C Clock Rate		0		200,000	Hz	

CTM-LCHP50-MM

HP Compatible J4858C

1.25G SFP 850nm, Multimode, 550m (Compatible with HP part number is J4858C)



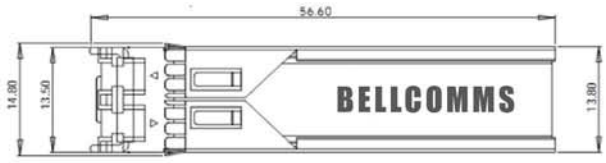
Product Features
- 850nm VCSEL laser and PIN photodetector
- Up to 1.25Gbps data rate operation
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitor Interface
- 500m transmission with 50/125μm MMF
- 300m transmission with 62.5/125μm MMF
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- Compatible with HP part number is J4858C
- RoHS compliant
- Case operating temperature :
- Commercial: 0°C to +70°C / Extended: -10°C to +80°C / Industrial: -40°C to +85°C

Application
- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched back plane applications
- Router/Server interface
- Other optical transmission systems

BCHP-8512-02D-H3

HP Compatible JD118B

1.25G SFP 850nm, Multimode, 550m (Compatible with HP part number is JD118B)



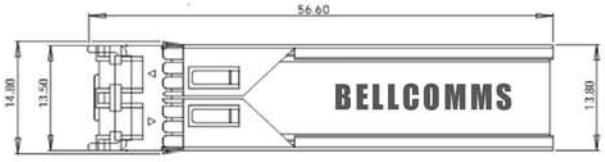
Product Features
- 850nm VCSEL laser and PIN photodetector
- Up to 1.25Gbps data rate operation
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitor Interface
- 500m transmission with 50/125μm MMF
- 300m transmission with 62.5/125μm MMF
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- Compatible with HP part number is JD118B
- RoHS compliant
- Case operating temperature :
- Commercial: 0°C to +70°C / Extended: -10°C to +80°C / Industrial: -40°C to +85°C

Application
- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched back plane applications
- Router/Server interface
- Other optical transmission systems

CTS-LCHP10-SM

HP Compatible J4859C

1.25G SFP 1310nm, Singlemod, 10km (Compatible with HP part number is J4859C)



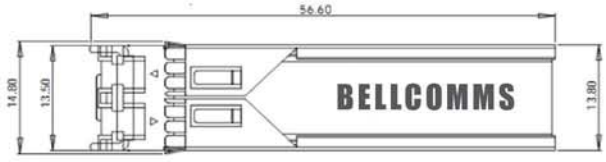
Product Features
- FP laser transmitter and PIN photo-detector
- Dual Data-rate of 1.25Gbps/1.0625Gbps Operation
- Up to 10KM transmission distance on 9/125μm SMF
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- Compatible with HP part number is J4859C
- Compatible with RoHS
- Operating case temperature: Commercial: 0°C to +70°C
- Extended: -10°C to +80°C
- Industrial: -40°C to +85°C

Application
- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched back plane applications
- Router/Server interface
- Other optical transmission systems

BCHP-1312-10D-H3

HP Compatible JD119B

1.25G SFP 1310nm, Singlemode, 10km (Compatible with HP part number is JD119B)



Product Features
- FP laser transmitter and PIN photo-detector
- Dual Data-rate of 1.25Gbps/1.0625Gbps Operation
- Up to 10KM transmission distance on 9/125μm SMF
- Compliant with SFP MSA and SFF-8472 with duplex LC receptacle
- Digital Diagnostic Monitor Interface
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- Compatible with HP part number is JD119B
- Compatible with RoHS
- Operating case temperature: Commercial: 0°C to +70° /Extended: -10°C to +80°C Industrial: -40°C to +85°C

Application
- Gigabit Ethernet
- Fiber Channel
- Switch to Switch interface
- Switched back plane applications
- Router/Server interface
- Other optical transmission systems

BCHP-8596-02D-H3

HP Compatible JD092B

10G SFP+ 850nm, Multimode, 300m. (Compatible with HP Part number is JD092B)

General

Optical transceivers are designed for 10Gb/s serial optical interfaces for data communications with multimode fiber (MMF). The transceiver can support 1.25Gb/s to 11.1Gb/s. The transceiver designs are optimized for high performance and cost effective to supply customers the best solutions for data-com and storage applications.

Product Features

- Optical interface compliant to IEEE 802.3ae
- Up to 300m on 50/125um MMF (2000MHZ.KM)
- 850nm VCSEL transmitter, PIN photo-detector
- SFP MSA package with duplex LC connector
- Low power consumption
- Very low EMI and excellent ESD protection
- +3.3V single power supply
- Cost effective SFP+ solution, enables higher port densities and greater bandwidth
- Compatible with HP part number is JD092B
- Operating case temperature: 0 to 70 °C

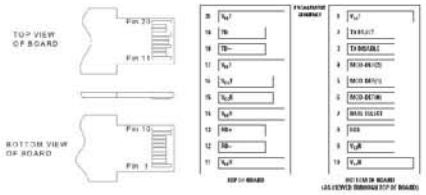
Application

- 10GBASE-SR/SW 10G Ethernet
- 10G Fiber Channel
- Other optical links

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
BCHP-8596-02D-H3	-6 ~ -1 db	-11db	1.25G~11.1G	850nm	300M

Pin Definitions And Functions



PIN	Name	Function
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0 [5]	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	Rate Select 1
10	VEER [1]	Receiver Ground
11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

Notes:
1. Module circuit ground is isolated from module chassis ground within the module.
2. Open collector; should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15Vand 3.6V.
3. Reference Clock input is not required.

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	Ethernet			10.3125		Gb/s	
	Fiber Channel			10.518			
Supply Voltage		Vcc	3.13	3.3	3.47	V	
		Vcc				V	
Supply Current		Icc5				mA	
		Icc5			300	mA	
Operating Case Temperature		Tc	0		70	°C	

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			120		820	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			340	650	800		3
Tx Disable input	H	VOH	2.0		Vcc+0.3	mVpp	2
	L	VOL	0		0.8	V	

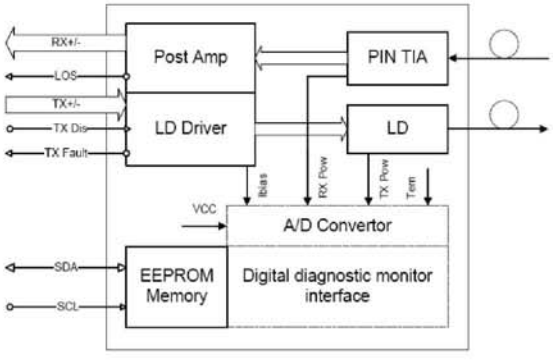
Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength			850		nm	
Ave. output power (Enabled)	Po	-6		-1	dBm	1
Extinction Ratio	ER	3.5			dB	1
RMS spectral width	Δλ			0.45	nm	
Rise/Fall time (20%~80%)	Tr/Tf			45	ps	2
Optical modulation amplitude	OMA			-2.8	dBm	
Dispersion penalty				3.9	dB	
Output Optical Eye	IEEE 802.3-2005 Compliant					
Receiver						
Operating Wavelength		840		860	nm	3
Sensitivity	Psen			-11	dBm	
Min. overload	Pimax	-1			dBm	
LOS Assert	Pa	-24			dBm	
LOS De-assert	Pd			-12	dBm	
LOS Hysteresis	Pd-Pa	0.5		4	dB	

Note 1) Measured at 10.3125b/s with PRBS 231 – 1 NRZ test pattern.
Note 2) 20%~80%
Note 3) Under the ER worst case, measured at 10.3125 Gb/s with PRBS 231 - 1 NRZ test pattern for BER < 1x10-12

Functional Diagram



BCHP-1396-10D-H3

HP Compatible JD094B

10G SFP+ 1310nm, Singlemode, 10Km (Compatible with HP Part number is JD094B)

General

This 1310nm DFB 10Gbps SFP+ transceiver is designed to transmit and receive optical data over single mode optical fiber for link length 10km. The transceiver designs are optimized for high perform-ance and cost effective to supply customers the best solutions for telecommunication.

Product Features

- Optical interface compliant to IEEE 802.3ae 10GBASE-LR
- Electrical interface compliant to SFF-8431
- Digital Diagnostic Monitor Interface
- Hot pluggable
- 1310nm DFB transmitter, PIN photo-detector
- Applicable for 10km SMF connection
- High transmission margin
- Low power consumption
- Cost effective SFP+ solution, enables higher port densities and greater bandwidth
- Compatible with HP part number is JD094B
- Operating case temperature: 0 to 70 °C

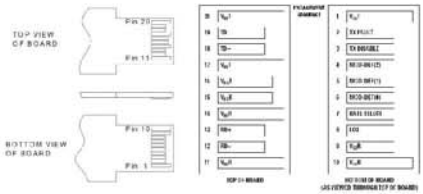
Application

- 10G Ethernet
- 10G Fiber Channel

Ordering Information

Part Number	Output Power	Rec. Sens	Data Rate	Wavelength	Distance
BCHP-1396-10D-H3	-6 ~ -1 db	-14.4db	10G	1310nm	10KM

Pin Definitions And Functions



PIN	Name	Function
1	VEET [1]	Transmitter Ground
2	Tx_FAULT [2]	Transmitter Fault
3	Tx_DIS [3]	Transmitter Disable. Laser output disabled on high or open
4	SDA [2]	2-wire Serial Interface Data Line
5	SCL [2]	2-wire Serial Interface Clock Line
6	MOD_ABS [4]	Module Absent. Grounded within the module
7	RS0 [5]	Rate Select 0
8	RX_LOS [2]	Loss of Signal indication. Logic 0 indicates normal operation
9	RS1 [5]	Rate Select 1
10	VEER [1]	Receiver Ground
11	VEER [1]	Receiver Ground
12	RD-	Receiver Inverted DATA out. AC Coupled
13	RD+	Receiver DATA out. AC Coupled
14	VEER [1]	Receiver Ground
15	VCCR	Receiver Power Supply
16	VCCT	Transmitter Power Supply
17	VEET [1]	Transmitter Ground
18	TD+	Transmitter DATA in. AC Coupled
19	TD-	Transmitter Inverted DATA in. AC Coupled
20	VEET [1]	Transmitter Ground

Notes:
1. Module circuit ground is isolated from module chassis ground within the module.
2. should be pulled up with 4.7k – 10k ohms on host board to a voltage between 3.15Vand 3.6V.
3. Tx_Disable is an input contact with a 4.7 kΩ to 10 kΩ pullup to VccT inside the module.
4. Mod_ABS is connected to VeeT or VeeR in the SFP+ module. The host may pull this contact up to Vcc_Host with a resistor in the range 4.7 kΩ to10 kΩ. Mod_ABS is asserted "High" when the SFP+ module is physically absent from a host slot.
5. RS0 and RS1 are

Absolute Maximum Ratings

Parameter	Symbol	Min.	Max.	Unit	Note
Supply Voltage	Vcc	-0.5	4.0	V	
Storage Temperature		-40	85	°C	
Relative Humidity			85	%	

Note : Stress in excess of the maximum absolute ratings can cause permanent damage to the module

General Operating Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Data Rate	Ethernet			10.3125		Gb/s	
	Fiber Channel			10.518			
Supply Voltage		Vcc	3.13	3.3	3.47	V	
		Vcc				V	
Supply Current		Icc5				mA	
		Icc5			300	mA	
Operating Case Temperature		Tc	0		70	°C	

Electrical Input/Output Characteristics

Parameter		Symbol	Min.	Typ	Max.	Unit	Note
Transmitter							
Diff. input voltage swing			120		820	mVpp	1
Tx Disable input	H	VIH	2.0		Vcc+0.3	V	
	L	VIL	0		0.8		
Tx Fault output	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		
Input Diff. Impedance		Zin		100		Ω	
Receiver							
Diff. output voltage swing			340	650	800	mVpp	3
Tx Disable input	H	VOH	2.0		Vcc+0.3	V	2
	L	VOL	0		0.8		

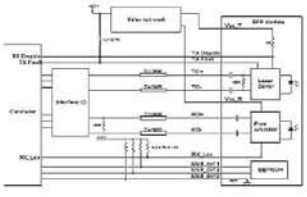
Note 1) TD+/- are internally AC coupled with 100Ω differential termination inside the module.
Note 2) Tx Fault and Rx LOS are open collector outputs, which should be pulled up with 4.7k to 10kΩ resistors on the host board. Pull up voltage between 2.0V and Vcc+0.3V.
Note 3) RD+/- outputs are internally AC coupled, and should be terminated with 100Ω (differential) at the user SERDES.

Optical Characteristics

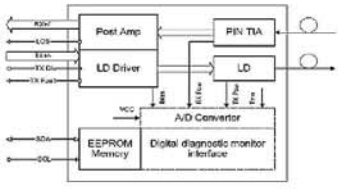
Parameter	Symbol	Min.	Typ	Max.	Unit	Note
Transmitter						
Operating Wavelength		1290		1330	nm	
Ave. output power (Enabled)	Po	-6		0	dBm	1
Extinction Ratio	ER	3.5			dB	1
RMS spectral width	Δλ			1	nm	
Rise/Fall time (20%~80%)	Tr/Tf			50	ps	2
SMSR				>30	dB	
Tx jitter(4m-80MHz)				0.1	uipp	
Tx jitter(20k-80MHz)				0.3	uipp	
Optical modulation amplitude	OMA	-6.2			dBm	
Dispersion penalty				1	dB	
Output Optical Eye			Compliant with IEEE 0802.3ae			
Receiver						
Operating Wavelength		1260		1610	nm	
Sensitivity	Psen			-14.4	dBm	3
Min. overload	Pimax	0.5			dBm	
LOS Assert	Pa	-30			dBm	
LOS De-assert	Pd			-16	dBm	
LOS Hysteresis	Pd-Pa	0.5		4	dB	

Note 1) Measured at 10.3125b/s with PRBS 231 – 1 NRZ test pattern.
Note 2) 20%~80%
Note 3) Under the ER worst case, measured at 10.3125 Gb/s with PRBS 231 - 1 NRZ test pattern for BER < 1x10-12

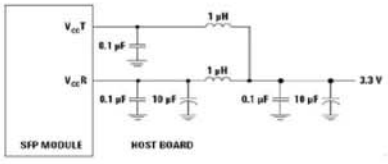
Typical Interface Circuit



Package Dimensions



Recommended power supply filter



Note:
Inductors with DC resistance of less than 1Ω should be used in order to maintain the required voltage at the SFP input pin with 3.3V supply voltage. When the recommended supply filtering network is used, hot plugging of the SFP transceiver module will result in an inrush current of no more than 30 mA greater than the steady state value

10.3Gb/s SFP+ AOC

Passive cables may require host pre-emphasis and equalization to reach at the longer lengths

Product Features
- Truly broadband operates from 1 to 10.5 Gb/s
- Support hot-pluggable
- Available in lengths from 1m to 50m
- 360 degree cable braid crimp and enhanced EMI skirt
- Excellent ESD protection
- Single 3.3V power supply
- RoHS Compliant and Lead-Free
- Compliant with SFF-8472 Rev 11.1
- Compliant with SFP+ MSA: SFF-8431 Rev4.1

Application
- 1/10GbE
- 1/2/4/8x FC
- Infiniband 1X SDR DDR QDR
- Proprietary Interconnects

Order part number
BC-AOC10G xx
xx - length of cable 1-50meters of requirment

40Gb/s QSFP+AOC

Passive cables may require host pre-emphasis and equalization to reach at the longer lengths

Product Features
- Available in lengths of 1 to 100m
- 4 independent full-duplex channels up To 11.3Gbps data rate per wavelength
- Hot-pluggable QSFP +footprint
- RoHS compliant and Lead Free
- Power dissipation <1.5W (0~70°C)
- Commercial operating temperature optional
- Compliant with IEEE802.3ba, SFF-8436

Application
- 40G Ethernet
- Infiniband 4X SDR DDR QDR
- 40G Telecom connections

Order part number
BC-AOC40G xxx
xxx - length of cable 1-100meters of requirment

25Gb/s SFP28 AOC

Passive cables may require host pre-emphasis and equalization to reach at the longer lengths

Product Features
- Supports 25Gbps data rate
- Support hot-pluggable
- Maximum link length of 70m on OM3 MMF and 100m on OM4 MMF
- Excellent ESD protection
- Single 3.3V power supply
- Power dissipation < 1.0W (Per side)
- RoHS Compliant andLead-Free

Application
- 25GBASE-SR Ethernet
- Data Center

Order part number
BC-AOC25G xx
xx - length of cable 1-50meters of requirment

100Gb/s QSFP AOC

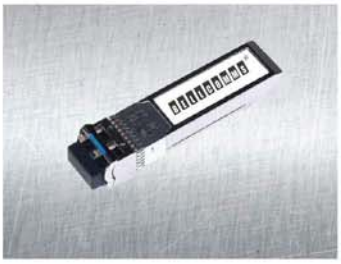
Passive cables may require host pre-emphasis and equalization to reach at the longer lengths

Product Features
- Available in lengths of 1 to 50m on OM3 multimode fiber (MMF)
- 4 independent full-duplex channels up To 25Gbps data rate per wavelength
- Reliable VCSEL array technology using multimode fiber
- Hot-pluggable QSFP28 footprint
- Power dissipation: <3.5W per cable end
- Commercial operating case temperature range: 0°C to 70°C
- RoHS compliant and Lead Free
- UL certification optional cables

Application
- IEEE 802.3bm 100GBASE SR4 and 40GBASE SR4128G Fiber Channel
- InfiniBand FDR/EDR

Order part number
BC-AOC100G xxx
xxx - length of cable 1-100meters of requirment

Optical transceiver solutions cover a wide range of applications including data communication, SDH FTTX, Data center and cloud computing.



25G Products

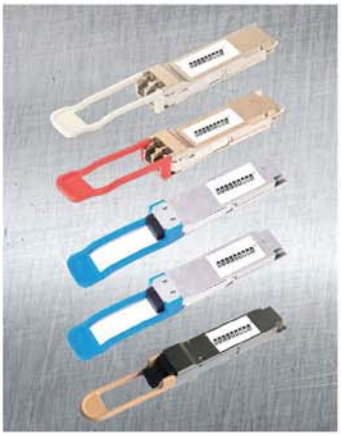
25GBASE-SR SFP28 850nm 100m Transceiver
BC-25G01
25GBASE-LR SFP28 1310nm 10km Transceiver
BC-25G10
25GBASE-BIDI SFP28 1270/1330nm 10km Transceiver
BC-25GBIDITX Tx-1270 / Rx-1330
BC-25GBIDIRX Tx-1330 / Rx-1270
25GBASE-LR SFP28 1310nm 20km Transceiver
BC-25G20
25GBASE-ER SFP28 1310nm 40km Transceiver
BC-25G40

40G Products

40GBASE-SR4 QSFP+ 850nm 100m Transceiver
BC-40G01
40GBASE-LR4 QSFP+ 1310nm 10km Transceiver
BC-40G10

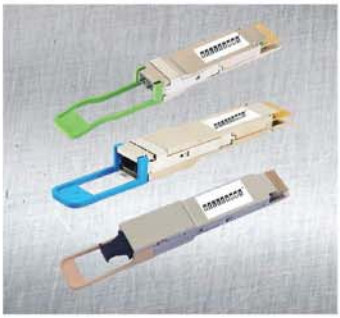
50G Products

50G PAM4 QSFP28 Transceiver for Ethernet 1310nm 40KM Transceiver
BC-50G40



100G Products

100GBASE-SR4 QSFP28 850nm 100m Transceiver
BC-100G01
100GBASE-LR4 QSFP28 1310nm 10km Transceiver
BC-100G10
112G BASE-LR4 OTU4 QSFP28 1310nm 10km Transceiver
BC-112G10
100G BASE-ER4 QSFP28 1310nm 40km Transceiver
BC-100G40
100G BASE-ZR4 QSFP28 1310nm 80km Transceiver
BC-100G80



400G Products

400G QSFP-DD SR8 Transceiver for Ethernet 850nm 100m Transceiver
BC-400G01
400G QSFP-DD DR4 1310nm 500m Transceiver
BC-400G05
400G QSFP-DD FR4 CWDM 2km Transceiver
BC-400G02

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FOR ALL YOUR NETWORKING NEEDS

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