GL28-BD3327LR10x

SFP+ 28.78Gb/s BIDI 10km Transceiver

PRODUCT FEATURES

- Supports up to 25.78Gbps bit rates
- Hot-pluggable SFP28 footprint
- Up to 10km for SMF
- DBF laser and PIN photodiode,
- Build-in dual CDR, for lower EMI
- Real Time Digital Diagnostic Monitoring
- Compliant with SFF-8402 with LC connector
- Single 3.3V power supply
- Power dissipation < 1.8W（-40°C to +85°C）
- Power dissipation < 1.5W（0°C to +70°C）
- RoHS compliant

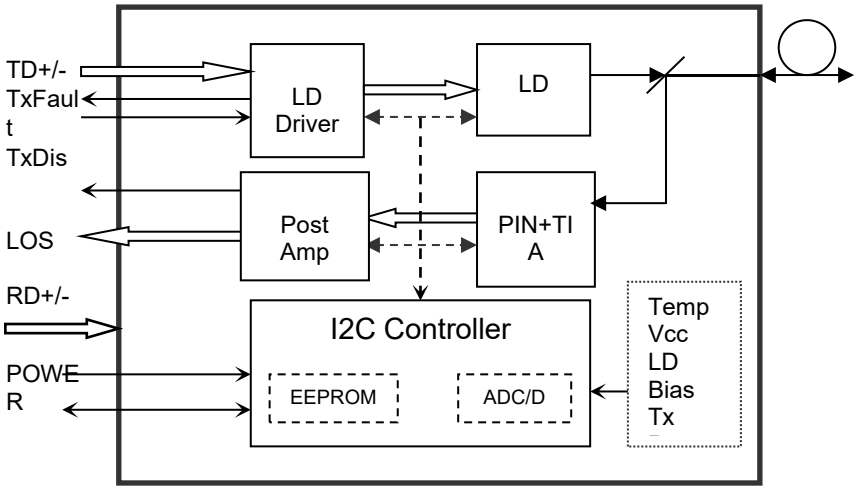
APPLICATIONS

- 25GBASE-LR Ethernet
- eCPRI and CPRI

PRODUCT DESCRIPTION

GL28-BD3327LR10x is SFP28 module for duplex optical data communications support 25.78Gb/s and 28.05Gb/s data links. It is with the SFP+ 20-pin connector to allow hot plug capability. Digital diagnostic functions are available via an I2C. It has built-in dual clock and data recovery (CDR).This module is designed for single-mode fiber and operates at a nominal wavelength of 1330nm.The transmitter section uses a high performance 1330nm DFB laser and is a class 1 laser compliant according to International Safety Standard IEC-60825. The receiver section uses an integrated InGaAs detector pre-amplifier (IDP) mounted in an optical header and a limiting post-amplifier IC.

Transceiver functional diagram



Ordering information

Product part Number	Data Rate (Gbps)	Media	Wavelength (nm)	Transmission Distance(km)	Temperature Range T_{case} / °C	
GL28-BD3327LR10C	10.3	SMF	1330/1270	10	0~70	Commercial
GL28-BD3327LR10T	10.3	SMF	1330/1270	10	-40~85	Industrial

Absolute Maximum Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Storage Temperature	T_s	-40	-	85	ºC	
Relative Humidity	R_H	5	-	95	%	
Power Supply Voltage	V_{CC}	-0.3	-	4	V	
Signal Input Voltage	V_{SI}	Vcc-0.3	-	Vcc+0.3	V	
Rx Damage Threshold	PR_{dmg}	3			dBm	

Recommended Operating Conditions

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Case Operating Temperature	Tcase	0	-	70	ºC	
		-40		85	ºC	
Power Supply Voltage	V_{CC}	3.14	3.3	3.47	V	
Power Supply Current	I_{CC}	-		363	mA	
Data Rate	BR		25.78		Gbps	
Transmission Distance	TD			10	km	
Coupled fiber	Single mode fiber					9/125um SMF

Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Average Launched Power	P_O	-5.0		+3.0	dBm	
Average Launched Power(Laser Off)	P_{off}	-	-	-30	dBm	
Center Wavelength Range	λ_C	1320	1330	1340	nm	
Spectrum Bandwidth(-20dB)	$\Delta\lambda$	-	-	1	nm	
Side-Mode Suppression Ratio	SMSR	30	-	-	dB	
Transmitter and Dispersion Penalty	TDP			2.7	dB	
Extinction Ratio	ER	3.5		-	dB	Note (1)
Output Eye Mask	Compliant with IEEE 802.3cc					Note (2)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Receiver						
Input Optical Wavelength	λ_{IN}	1260	1270	1280	nm	
Receiver Sensitivity (Average power)	P_{sen}	-	-	-13.3	dBm	Note (3)
Input Saturation Power (Overload)	P_{SAT}	2.0	-	-	dBm	Note (3)
Los Of Signal Assert	P_A	-30	-	-	dBm	
Los Of Signal De-assert	P_D	-	-	-16	dBm	

LOS -Hysteresis	P_{Hys}	0.5		5	dB	

Note:

Note (1): Measured with a PRBS 2^{31}-1 test pattern, @25.78Gb/s.

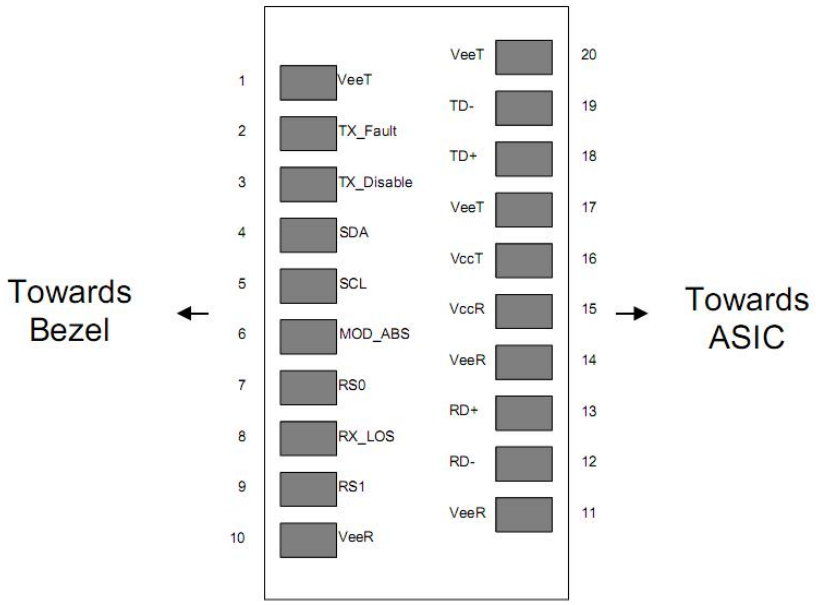
Note (2): Transmitter eye mask definition, Compliant with IEEE 802.3cc.

Note (3): Measured with Light source 1310nm, ER=3.5dB; BER =<$5x10^{-5}$ @PRBS=2^{31}-1 NRZ.

Electrical Interface Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Note
Transmitter						
Transmitter Fault Output-High	V_{FaultH}	2	-	Vcc+0.3	V	
Transmitter Fault Output-Low	V_{FaultL}	0	-	0.8	V	
Transmitter Disable Voltage- High	V_{DisH}	2	-	Vcc+0.3	V	
Transmitter Disable Voltage- low	V_{DisL}	0	-	0.8	V	
Receiver						
LOS Output Voltage-High	V_{LOSH}	2	-	Vcc+0.3	V	
LOS Output Voltage-Low	V_{LOSL}	0	-	0.8	V	

Pin Description

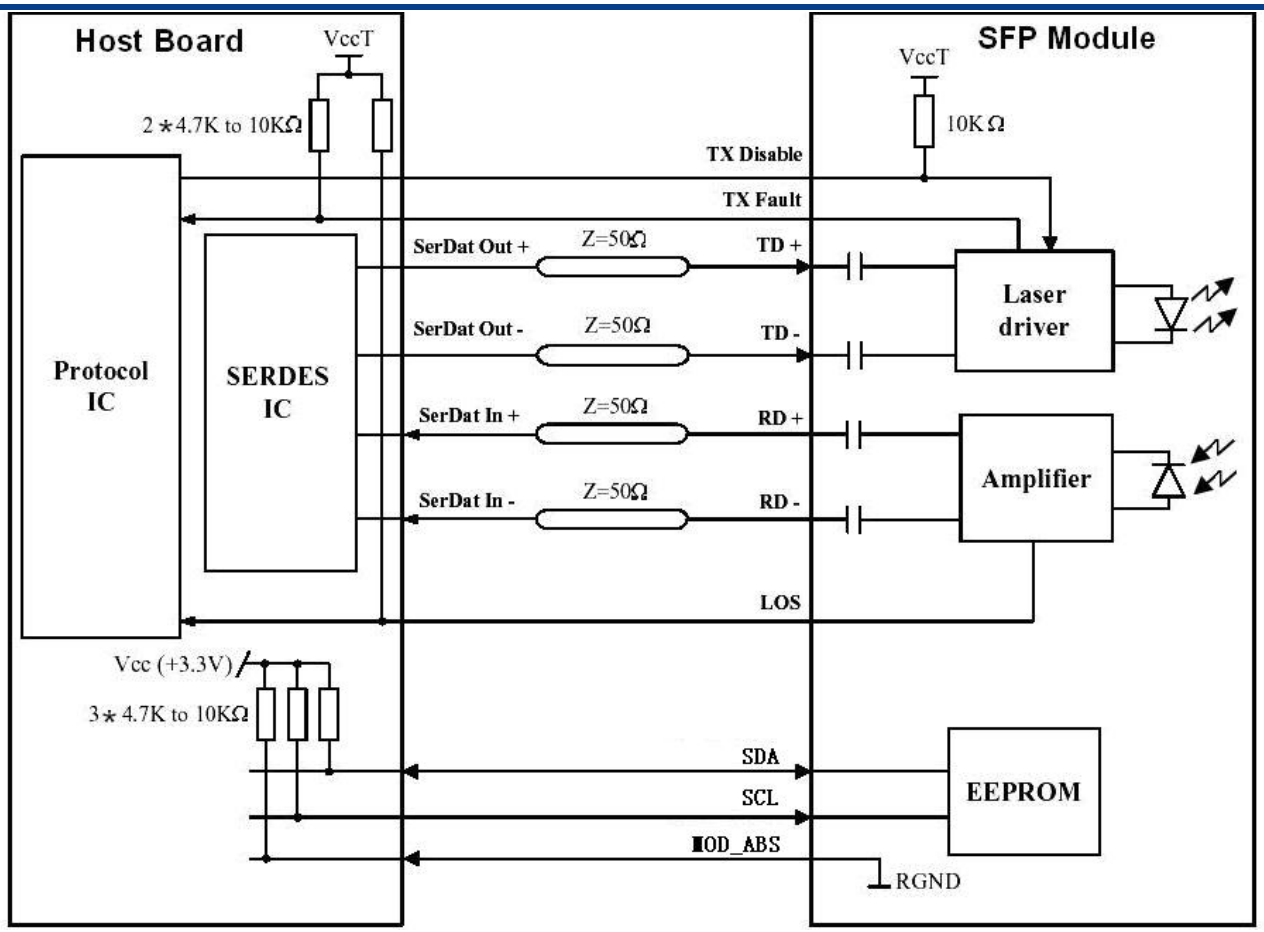


Pin	Signal Name	Description	Plug Seq.	Notes
1	V_{EET}	Transmitter Ground	1	
2	TX FAULT	Transmitter Fault Indication	3	Note 1
3	TX DISABLE	Transmitter Disable	3	Note 2
4	SDA	SDA Serial Data Signal	3	
5	SCL	SCL Serial Clock Signal	3	
6	MOD_ABS	Module Absent. Grounded within the module	3	
7	RS0	Not Connected	3	
8	LOS	Loss of Signal	3	Note 3
9	RS1	Not Connected	3	
10	V_{EER}	Receiver ground	1	
11	V_{EER}	Receiver ground	1	
12	RD-	Inv. Received Data Out	3	Note 4
13	RD+	Received Data Out	3	Note 4
14	V_{EER}	Receiver ground	1	
15	V_{CCR}	Receiver Power Supply	2	
16	V_{CCT}	Transmitter Power Supply	2	
17	V_{EET}	Transmitter Ground	1	
18	TD+	Transmit Data In	3	Note 5
19	TD-	Inv. Transmit Data In	3	Note 5
20	V_{EET}	Transmitter Ground	1	

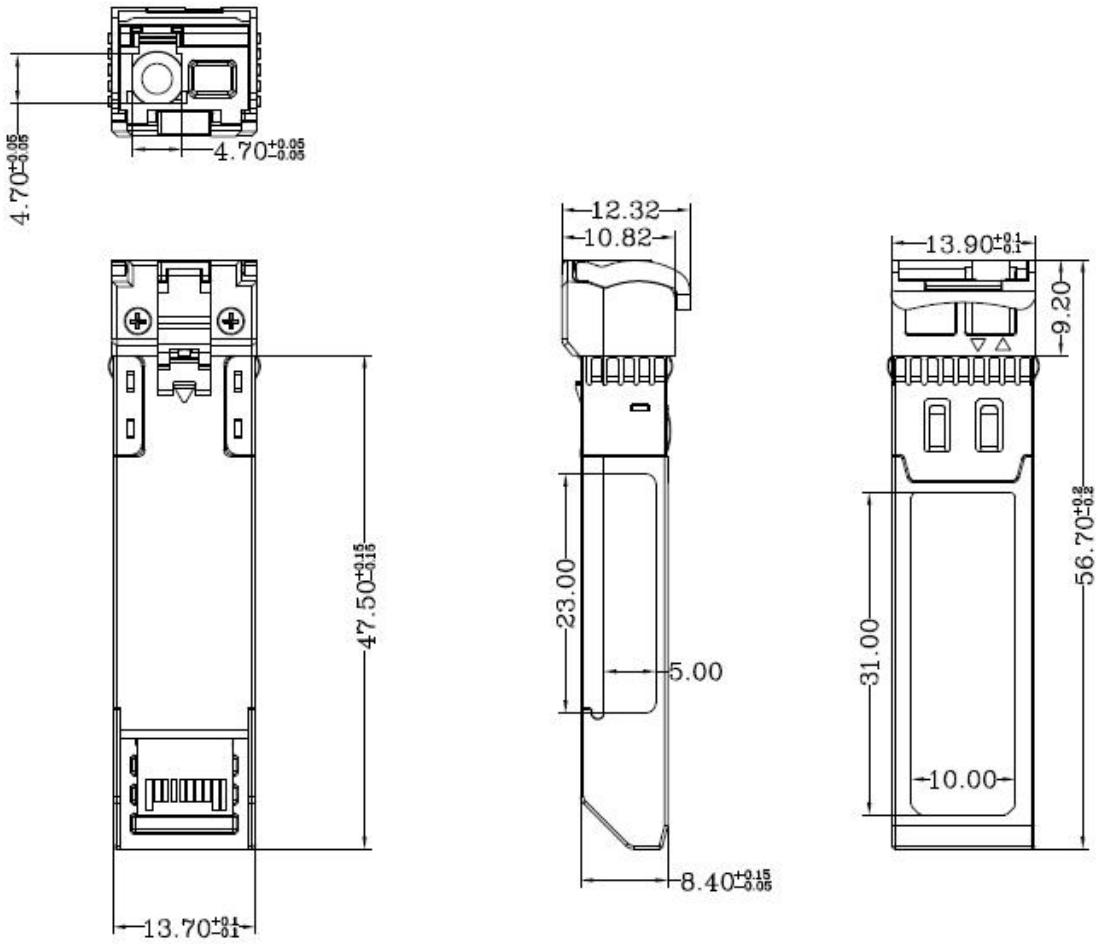
Notes:
Plug Seq.: Pin engagement sequence during hot plugging.

1) TX Fault is an open collector output, which should be pulled up with a 4.7k~10kΩ resistor on the host board to a voltage between 2.0V and Vcc+0.3V. Logic 0 indicates normal operation; Logic 1 indicates a laser fault of some kind. In the low state, the output will be pulled to less than 0.8V.
2) Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
3) LOS is open collector output. Should be pulled up with 4.7k~10kΩ on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.
4) RD-/+: These are the differential receiver outputs. They are internally AC-coupled 100 differential lines which should be terminated with 100Ω (differential) at the user SERDES.
5) TD-/+: These are the differential transmitter inputs. They are internally AC-coupled, differential lines with 100Ω differential termination inside the module.

Recommended Interface Circuit



Mechanical Dimensions



Regulatory Compliance

Feature	Reference	Performance
Electrostatic discharge（ESD）	IEC/EN 61000-4-2	Compatible with standards
Electromagnetic Interference (EMI)	FCC Part 15 Class B EN 55022 Class B (CISPR 22A)	Compatible with standards
Laser Eye Safety	IEC/EN 60825-1, 2	Class 1 laser product
ROHS	2002/95/EC	Compatible with standards
EMC	EN61000-3	Compatible with standards