

## Product Specification

### 1.25Gbps BiDi LC 10KM SFP Transceiver

#### CLSFPGEBD151310D

#### CLSFPGEBD151310DI

V20170815

### Product Features

- Up to 1.25Gbps data links
- 10Km with 9/125μm SMF \*1
- 1550nm DFB /1310nm PIN laser \*1
- Simplex LC Connector
- Hot-pluggable SFP footprint
- Single 3. 3V power supply
- Operating temperature: Refer to \*1
- RoHS



### Applications

√ 1.25Gbps 1000Base-LX

\*1

PART NUMBER	WAVE LENGTH TX/RX	DISTANCE	LASER	TEMPERATURE
<b>CLSFPGEBD151310D</b>	1550/1310nm	10Km	DFB/PIN	COM 0~70°C
<b>CLSFPGEBD151310DI</b>	1550/1310nm	10Km	DFB/PIN	IND -40~85°C

## 1. Product Description

The CLSFPGEBD151310D/I series SFPs are small form factor pluggable (SFP) transceivers compatible with multi-sourcing agreement (MSA). It is suitable for single-mode fiber (SMF) communications in 1.25Gbps Ethernet and 1G/2G Fiber Channel.

## 2. Regulatory Compliance

C-light transceivers are Class 1 Laser Products comply with FDA regulations. Meet Class 1 eye safety requirements of EN 60825 and the electrical safety requirements of EN 60950.

## 3. Absolute Maximum Ratings

Parameter		Symbol	Min.	Max.	Unit
Supply Voltage		V <sub>CC</sub>	-0.5	3.6	V
Storage Temperature		T <sub>s</sub>	-40	85	°C
<b>CLSFPGEBD151310D</b>	Operating Case Temperature	T <sub>c</sub>	0	70	°C
<b>CLSFPGEBD151310DI</b>	Operating Case Temperature	T <sub>c</sub>	-40	85	°C

## 4. Recommended Operating Conditions

Parameter		Symbol	Min.	Typical	Max.	Unit
<b>CLSFPGEBD151310D</b>	Operating Case Temperature	T <sub>c</sub>	0		70	°C
<b>CLSFPGEBD151310DI</b>	Operating Case Temperature	T <sub>c</sub>	-40		85	°C
Power Supply Voltage		V <sub>CC</sub>	3.15	3.3	3.45	V
Power Supply Current		I <sub>CC</sub>			300	mA
Data Rate				1.25		GBps
Max Link Length on 9/125μm SMF		L <sub>max</sub>		10		km

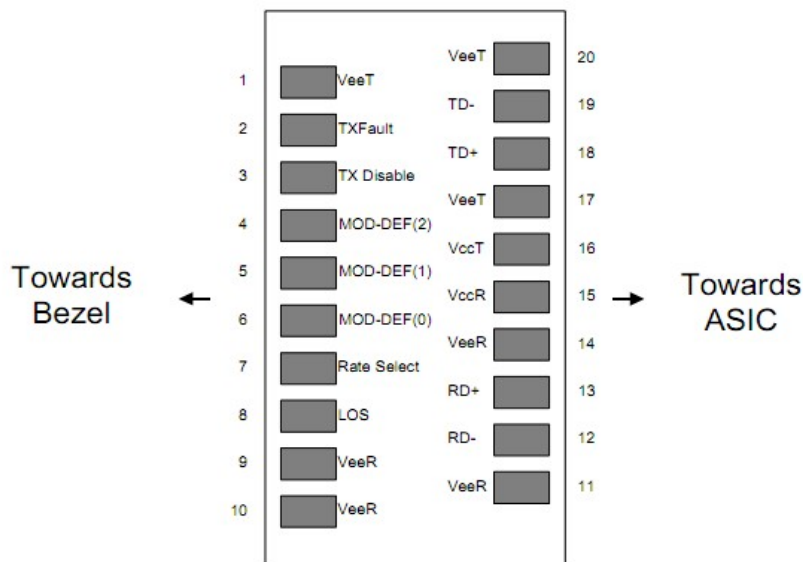
## 5. Optical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
<b>Transmitter</b>					
Centre Wavelength	$\lambda_c$	1540	1550	1560	nm
Spectral Width (-20dB)	$\sigma$			1	nm
Average Output Power	P <sub>out</sub>	-9		-3	dBm
Extinction Ratio	ER	9			dB
Optical Rise/Fall Time	tr/tf			2	ns
<b>Receiver</b>					
Centre Wavelength	$\lambda_c$	1300	1310	1320	nm
Receiver Sensitivity	P <sub>IN</sub>			-23	dBm
Receiver Overload	P <sub>MAX</sub>	1			dBm
LOS De-Assert	LOS <sub>D</sub>			-30	dBm
LOS Assert	LOS <sub>A</sub>	-35			dBm
LOS Hysteresis		0.5		4.5	dB

## 6. Electrical Characteristics

Parameter	Symbol	Min.	Typical	Max.	Unit
<b>Transmitter</b>					
Input Differential Impedance	Z <sub>in</sub>	90	100	110	$\Omega$
Data Input Swing Differential	V <sub>in</sub>	500		2400	mV
Tx-Dis Disable	V <sub>d</sub>	2.0		V <sub>cc</sub>	V
Tx-Dis Enable	V <sub>en</sub>	0		0.8	V
TX-Fault (Fault)		2.0		V <sub>cc</sub> +0.3	V
TX-Fault (Normal)		0		0.8	V
<b>Receiver</b>					
Data Output Swing Differential	V <sub>out</sub>	370		2000	mV
Rx-Los Fault	V <sub>lf</sub>	2.0		V <sub>cc</sub> +0.3	V
Rx-Los Normal	V <sub>ln</sub>	0		0+0.8	V

## 7. Pin Descriptions



**Diagram of Host Board Connector Block Pin Numbers and Names**

Pin	Symbol	Description	Ref.
1	VEET	Transmitter Ground (Common with Receiver Ground)	6.1
2	TFAULT	Transmitter Fault. Not supported.	
3	TDIS	Transmitter Disable. Laser output disabled on high or open.	6.2
4	MOD_DEF(2)	Module Definition 2. Data line for Serial ID.	6.3
5	MOD_DEF(1)	Module Definition 1. Clock line for Serial ID.	6.3
6	MOD_DEF(0)	Module Definition 0. Grounded within the module.	6.3
7	Rate Select	No connection required	
8	LOS	Loss of Signal indication. Logic 0 indicates normal operation.	6.4
9	VEER	Receiver Ground (Common with Transmitter Ground)	6.1
10	VEER	Receiver Ground (Common with Transmitter Ground)	6.1
11	VEER	Receiver Ground (Common with Transmitter Ground)	6.1
12	RD-	Receiver Inverted DATA out. AC Coupled.	
13	RD+	Receiver Non-inverted DATA out. AC Coupled.	
14	VEER	Receiver Ground (Common with Transmitter Ground)	6.1
15	VCCR	Receiver Power Supply	
16	VCCT	Transmitter Power Supply	
17	VEET	Transmitter Ground (Common with Receiver Ground)	6.1
18	TD+	Transmitter Non-Inverted DATA in. AC Coupled.	

19	TD-	Transmitter Inverted DATA in. AC Coupled.	
20	VEET	Transmitter Ground (Common with Receiver Ground)	6.1

Notes:

- 6.1 Circuit ground is internally isolated from chassis ground.
- 6.2 Laser output disabled on TDIS >2.0V or open, enabled on TDIS <0.8V.
- 6.3 Should be pulled up with 4.7k - 10kohms on host board to a voltage between 2.0V and 3.6V. MOD\_DEF(0) pulls line low to indicate module is plugged in.
- 6.4 LOS is open collector output. Should be pulled up with 4.7k -10kohms on host board to a voltage between 2.0V and 3.6V. Logic 0 indicates normal operation; logic 1 indicates loss of signal.

## 8. EEPROM & DDM THRESHOLD

### 8.1 EEPROM

**2 wire address 1010000X (A0hex)**

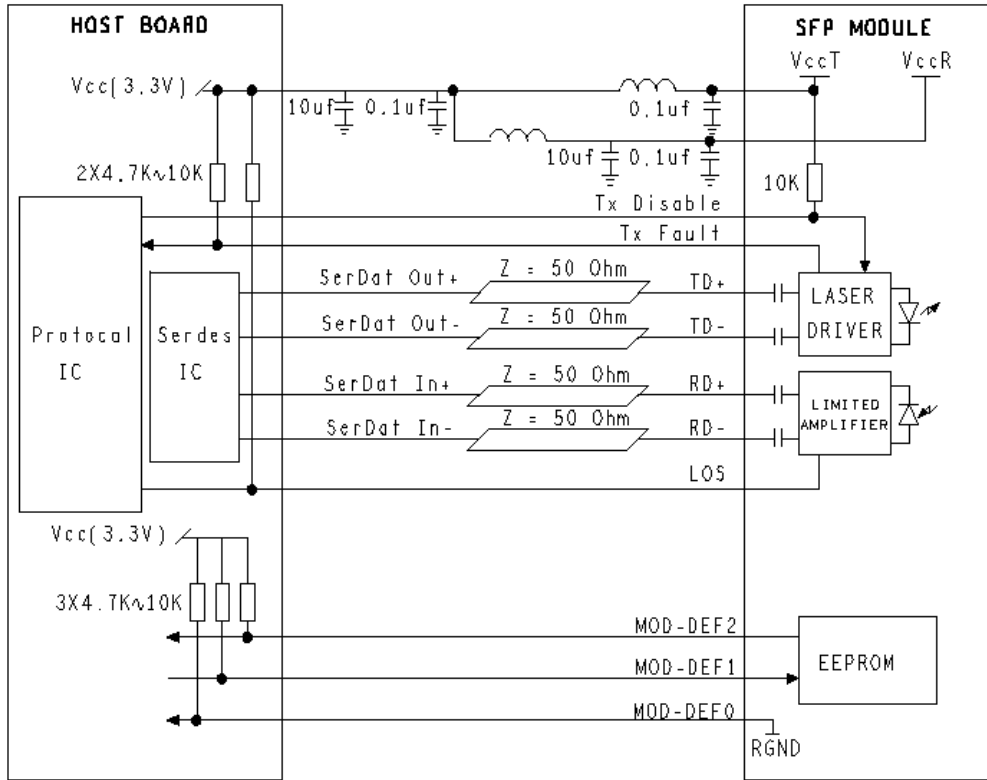
0~95	Serial ID Defined by SFP MSA (96 bytes)
96~127	Vendor Specific (32 bytes)
128~255	Reserved (128 bytes)

### 8.2 DDM THRESHOLD

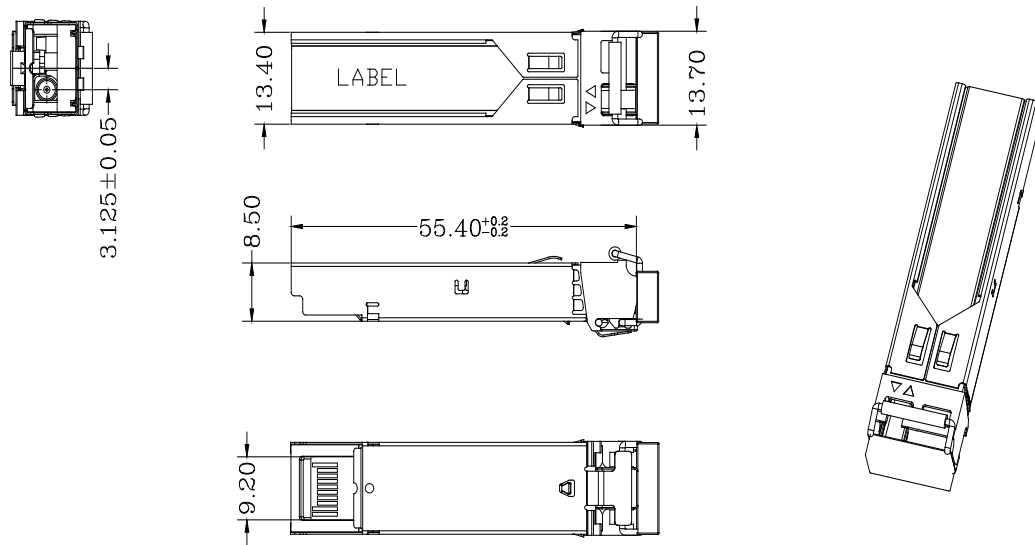
**CLSFPGEBD151310D-L/I**

		<b>Low Alarm</b>	<b>Low Warn</b>	<b>High Warn</b>	<b>High Alarm</b>
Temp	CLSFPGEBD151310DI	-45°C	-40°C	85°C	90°C
Temp	CLSFPGEBD151310D	-5°C	0°C	70°C	75°C
Voltage		3V	3.1V	3.6V	3.7V
Tx Bias	CLSFPGEBD151310D	3mA	4mA	70mA	75mA
Tx Bias	CLSFPGEBD151310DI	3mA	4mA	125mA	130mA
Tx Power		-13.5dBm	-9.5dBm	-1dBm	1dBm
Rx Power		-23dBm	-19dBm	-3dBm	1dBm

## 9. Recommend Circuit



## 10. Mechanical Specifications



Units in mm  
Tolerance without indication is ±0.1mm

## 11. LABEL

C-LIGHT offers label OEM design and print.  
Label barcode supports code128 and 2D barcode  
SIZE: 30mm \* 9mm



## Ordering Information

Part No.	Data Rate	DDM	TX/RX	Fiber Type	Dist.	Temp.	Optical Interface
CLSFPGEBD151310D	1.25Gbps	yes	1550nm/ 1310nm	SMF	10km	0~70℃	BiDi LC
CLSFPGEBD151310DI	1.25Gbps	yes	1550nm/ 1310nm	SMF	10km	-40~85℃	BiDi LC

## VERSION UPDATE:

VERSION NO.	DATE	UPDATED INFORMATION
V20161010	20161010	1. EEPROM& DDM Threshold updated 2. "LABEL" added 3. Ordering information updated 4. Product picture updated
V20170815	20170815	1. More items added into list

## NOTICE:

C-LIGHT reserves the right to make changes to this product in this specification without notice, in order to improve product performance.

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