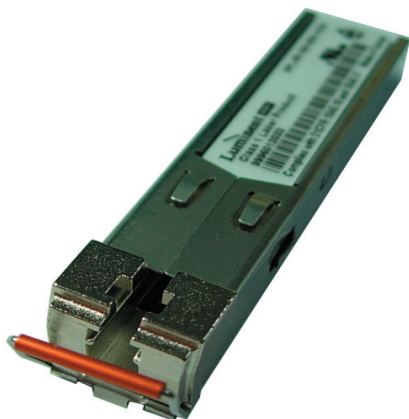


## SPL-54-GB-BZ



## Features

- Compliant with IEEE 802.3ah
- Simplex LC Connector
- Digital Diagnostic SFF-8472 Compliant
- SFP MSA SFF-8074i Compliant
- 24dB Minimum Power Budget
- 80km Minimum Reach
- Commercial Temperature Operation
- Single 3.3V Supply
- 1570nm DFB Laser
- Telcordia GR-468 Compliant
- Color Coded Bail Latch: Orange
- RoHS compliant

## General Operation

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	$V_{cc}$	3.135	3.3	3.465	V
Total Current	$I_{CC}$	-	-	300	mA
Power Supply Noise Rejection		100	-	-	mVp-p
Operating Temperature (Case)	$T_{opr}$	-5	-	70	°C
Storage Temperature	$T_{stg}$	-40	-	85	°C
Data Rate	DR	-	1250	-	Mbps

## Transmitter Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Optical Power	$P_{op}$	-2	-	+3	dBm
Optical Crosstalk	XT	-	-45	-40	dB
Average Launch Power Tx_Off	$P_{off}$	-	-	-45	dBm
Extinction Ratio	ER	9	-	-	dB
Eye Mask		IEEE 802.3ah Compliant			
Optical Rise Time (20% to 80% Values)	$t_r$	-	-	260	ps
Optical Fall Time (20% to 80% Values)	$t_f$	-	-	260	ps
Mean Wavelength	$\lambda$	1555	1570	1610	nm
Spectral Width (RMS, -20dB)	$\Delta\lambda$	-	-	1	nm
Side Mode Suppression Ratio	SMSR	30	-	-	dB
Relative Intensity Noise	RIN	-	-	-120	dB/Hz
Transmitter Reflectance	-	-	-	-12	dB
Optical Return Loss Tolerance	ORLT	-	-	12	dB

## SPL-54-GB-BZ

## Transmitter Specifications (Electrical)

Parameter	Symbol	Min	Typical	Max	Unit
Input Differential Impedence	$R_{in}$	80	100	120	$\Omega$
PECL Single Ended Data Input Swing	$V_{in, p-p}$	250	-	1200	mV
TxFault_Fault	$V_{fault}$	2	-	$V_{cc}$	V
TxFault_Normal	$V_{normal}$	$V_{ee}$	-	$V_{ee} + 0.5$	V
TxDisable_Disable	$V_d$	2	-	$V_{cc}$	V
TxDisable_Enable	$V_{en}$	$V_{ee}$	-	$V_{ee} + 0.8$	V

## Receiver Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Receiver Power Low <sup>a</sup>	$R_{sens,low}$	-	-28	-26	dBm
Receiver Power High <sup>a</sup>	$R_{sens,high}$	-3	-	-	dBm
Damage Threshold for Receiver	$P_{in, damage}$	6	-	-	dBm
Wavelength	$\lambda$	1470	-	1510	nm
LOS Assert	-	-45	-	-	dBm
LOS De-Assert	-	-	-	-24	dBm
LOS Hysteresis	-	0.5	-	-	dB
Receiver Reflectance	-	-	-	-12	dB

a) Measured at  $10^{-12}$  BER, PRBS 27-1, 9dB ER

## Receiver Specifications (Electrical)

Parameter	Symbol	Min	Typical	Max	Unit
PECL Single Ended Data Output Swing	$V_{out, p-p}$	185	-	800	mV
Data Output Rise Time	$t_r$	-	-	175	ps
Data Output Fall Time	$t_f$	-	-	175	ps

## Timing and Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Tx Disable Negate Time	$t_{on}$	-	-	1	ms
Tx Disable Assert Time	$t_{off}$	-	-	10	$\mu$ s
Time to Initialize, Including Reset of Tx Fault	$t_{init}$	-	-	300	ms
Tx Fault Assert Time	$t_{fault}$	-	-	100	$\mu$ s
Tx Disable to Reset	$t_{reset}$	10	-	-	$\mu$ s
LOS Assert Time	$t_{loss_{on}}$	-	-	100	$\mu$ s
LOS De-Assert Time	$t_{loss_{off}}$	-	-	100	$\mu$ s
Serial ID Clock Rate	$f_{serial\_clock}$	-	-	100	KHz
RX_LOS Voltage (High)	$RX\_LOS_H$	2	-	$V_{cc}$	V
RX_LOS Voltage (Low)	$RX\_LOS_L$	-	-	0.8	V
LOS Output Voltage-Fault	$V_{LOS\ fault}$	2	-	$V_{cc}$	V
LOS Output Voltage-Normal	$V_{LOS\ normal}$	$V_{ee}$	-	$V_{ee} + 0.5$	V
MOD_DEF (0:2)-High	$V_h$	2	-	$V_{cc}$	V
MOD_DEF (0:2)-Low	$V_l$	$V_{ee}$	-	$V_{ee} + 0.5$	V

SPL-54-GB-BZ

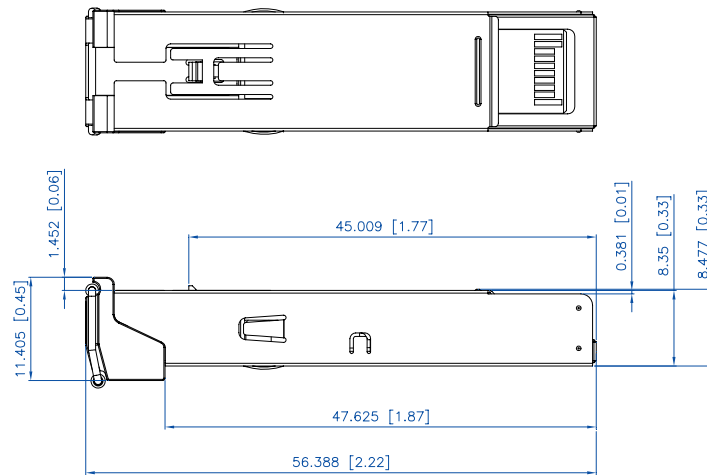
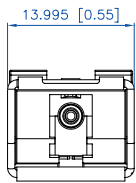
Diagnostics						
Parameter	Range	Accuracy	Unit	Calibration	Bit Value	Formula
Temperature (CDA)	-5 to 70	±3	°C	External	1/256 C	$T_c(C) = T_{slope} * T_{ad}(16 \text{ bit signed twos complement value}) + T_{offset}$
Voltage	0 to Vcc	0.1	V	External	100µV	$V(\text{Volts}) = V_{slope} * V_{ad}(16 \text{ bit unsigned integer}) + V_{offset}$
Bias Current	0 to 120	5	mA	External	-	$I(\text{mA}) = I_{slope} * I_{ad}(16 \text{ bit unsigned integer}) + I_{offset}$
Tx Power	-2 to +3	±3	dBm	External	-	$Tx\_PWR(\mu W) = Tx\_PWR_{slope} * Tx\_PWR_{ad}(16 \text{ bit unsigned integer}) + Tx\_PWR_{offset}$
Rx Power	-26 to -3	±3	dBm	External	-	$Rx\_PWR(\mu W) = A0 + A1 * x + A2 * x^2 + A3 * x^3 + A4 * x^4$

EEPROM Serial ID				
Name of Field	Description of Field	Address	Hex	ASCII
Vendor Name	SFPVendor name (ASCII)	20	4C	L
		21	55	U
		22	4D	M
		23	49	I
		24	4E	N
		25	45	E
		26	4E	N
		27	54	T
		28	4F	O
		29	49	I
		30	43	C
Vendor OUI	IEEE vendor OUI code for Luminent Inc.	37	00	
		38	06	
		39	B5	
Vendor P/N	Part number in ASCII, e.g. SPL-54-GB-BZ-CDA	40	53	S
		41	50	P
		42	4C	L
		43	35	5
		44	34	4
		45	47	G
		46	42	B
		47	42	B
		48	5A	Z
		49	43	C
		50	44	D
51	41	A		

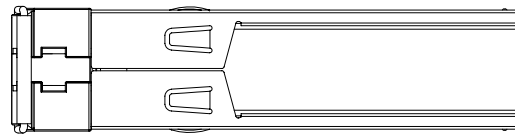
## Pinout Definitions

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

LC Connector Mechanicals

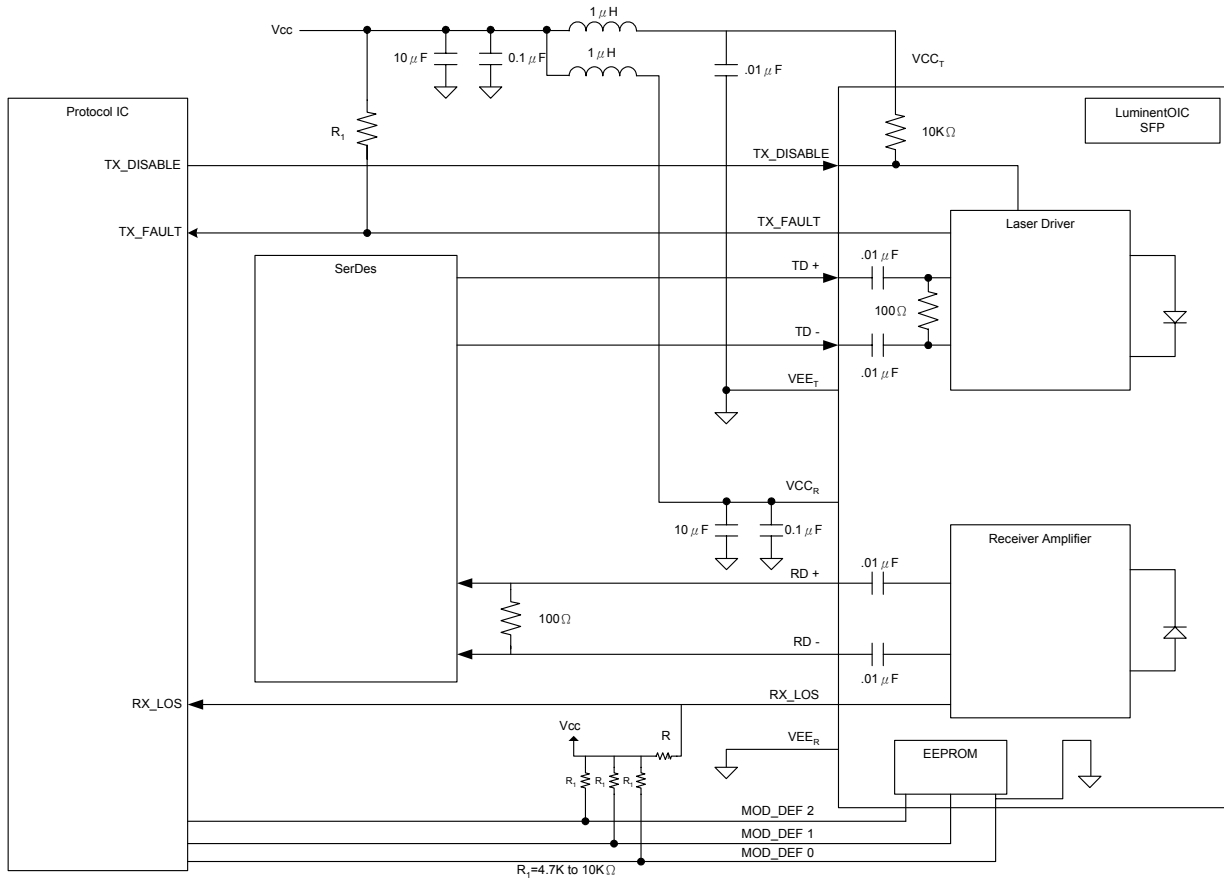


**Units in mm (inches)**



## SPL-54-GB-BZ

### Suggested Transceiver Interface



SPL-54-GB-BZ

Ordering Information

Available Options:

- SPL-54-GB-BZ-CNA
- SPL-54-GB-BZ-CDA

Part Numbering Definition:

S P L - 5 4 - G B - B Z - Temperature Diagnostic Revision

- SPL = LC connector
- Wavelength  
54 = Tx 1570nm/Rx 1490nm
- Data Rate  
GB = GigaBit Ethernet
- Reach  
BZ = 80km
- Operating Temperature  
C = Commercial temperature (-5 to 70°C)
- D = Digital Diagnostic  
N = No Digital Diagnostic
- Revision  
A = RoHS compliant

Warnings:

**Handling Precautions:** This device is susceptible to damage as a result of electrostatic discharge (ESD). A static free environment is highly recommended. Follow guidelines according to proper ESD procedures.  
**Laser Safety:** Radiation emitted by laser devices can be dangerous to human eyes. Avoid eye exposure to direct or indirect radiation.

Legal Notes:

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