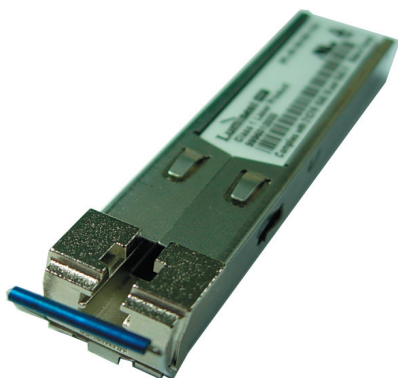


## SPL-35-FE-BD



## Features

- Compliant with OC3/STM-1, IEEE 802.3ah, 100BASE-BX10
- Simplex LC Connector
- Digital Diagnostic SFF-8472 Compliant
- SFP MSA SFF-8074i Compliant
- 23.2 dB Minimum Power Budget
- Commercial temperature available (-Cxx)
- Industrial temperature available (-Txx)
- 40 km Typical reach
- Single 3.3V Supply
- 1310nm FP Laser
- Telcordia GR-468 Compliant
- Color Coded Bail Latch: Blue
- RoHS Compliant

## General Operating Condition

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) (-Cxx)	$T_{opr}$	-5	-	70	°C
Operating Temperature(case) (-Txx)	$T_{opr}$	-40	-	85	°C
Storage Temperature	$T_{stg}$	-40	-	85	°C
Data Rate	DR	10	-	155	Mbps

## Transmitter Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Optical power	$P_{op}$	-5	-2.5	0	dBm
Optical crosstalk	XT	-	-45	-40	dB
Average Launch power of off Tx	$P_{off}$	-	-	-45	dBm
Extinction Ratio	ER	6.6	-	-	dB
Eye Mask		IEEE 802.3 and SONET/SDH Compliant			
Optical Rise time (20% to 80% values)	$t_r$	-	-	2	ns
Optical Fall time (20% to 80% values)	$t_f$	-	-	2	ns
Mean Wavelength	$\lambda$	1260	1310	1360	nm
Maximum RMS width ( $\sigma$ )	$\sigma$	-	-	3	nm
Relative Intensity Noise	RIN	-	-	-120	dB/Hz
Optical Return Loss Tolerance	ORLT	-	-	12	dB

## SPL-35-FE-BD

## 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>b</sup>	$R_{sens,low}$	-	-30	-28.2	dBm
Receiver Power High	$R_{sens,high}$	-8	-	-	dBm
Damage Threshold for Receiver	$P_{in, damage}$	4	-	-	dBm
Wavelength	$\lambda$	1480	-	1600	nm
LOS Assert	-	-45	-	-	dBm
LOS De-assert	-	-	-	-28.2	dBm
LOS hysteresis	-	0.5	-	-	dB

b) at  $10^{-12}$  BER, PRBS 27-1

## 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	$t_r$	-	-	2	ns
Data output fall time	$t_f$	-	-	2	ns

## Timing and Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Tx Disable Negate time	$t_{on}$	-	-	25	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	$t_{loss_{on}}$	-	-	300	$\mu$ 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
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-35-FE-BD

## Digital Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Bit Value	Formula
Temperature (-CDx)	-5 to 70	±3	°C	Internal	1/256 C	$Tc(C) = T_{ad}(16 \text{ bit signed twos complement})/256$
Temperature (-TDx)	-40 to 85	±3	°C	Internal	1/256 C	$Tc(C) = T_{ad}(16 \text{ bit signed twos complement})/256$
Voltage	0 to Vcc	0.1	V	Internal	100µV	$V(\text{Volts}) = V_{ad}(16 \text{ bit unsigned integer}) * 0.1$
Bias Current	0 to 120	5	mA	External	-	$I(\text{mA}) = I_{slope} * I_{ad}(16 \text{ bit unsigned integer}) + I_{offset}$
Tx Power	-5 to 0	±3	dBm	External	-	$Tx\_PWR(\mu W) = Tx\_PWR_{slope} * Tx\_PWR_{ad}(16 \text{ bit unsigned integer}) + Tx\_PWR_{offset}$
Rx Power	-28.2 to -8	±3	dBm	External	-	$Rx\_PWR(\mu W) = A0 + A1 * x + A2 * x^2 + A3 * x^3 + A4 * x^4$

## Pinout Definitions

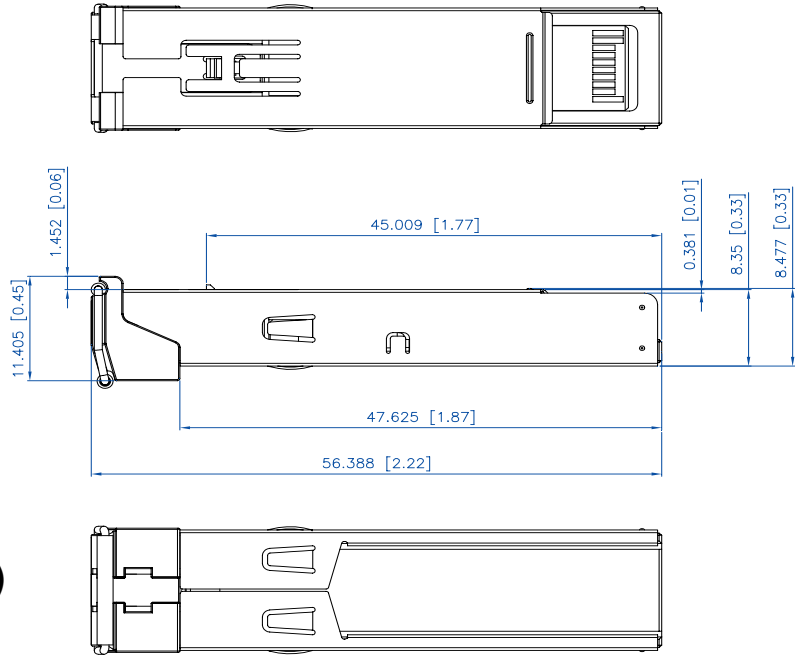
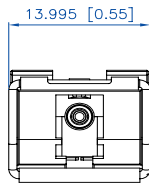
Pin	Function	Notes
1	V <sub>ee</sub> T	TX GND
2	TX_FAULT	Open Collector
3	TX_DISABLE	Internally Pulled High
4	MOD_DEF2	Serial Data Input
5	MOD_DEF1	Serial Clock Input
6	MOD_DEFO	Internally Grounded
7	NC	Not Connected
8	LOS	Open Collector
9	V <sub>ee</sub> R	RX Ground
10	V <sub>ee</sub> R	RX Ground
11	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

SPL-35-FE-BD

EEPROM Serial ID				
Name of Field	Description of Field	Address	Hex	ASCII
Vendor Name	SFP Vendor name (ASCII)	20	4C	L
		21	55	U
		22	40	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 LuminentOIC	37	00	
		38	06	
		39	B5	
Vendor P/N	Part number in ASCII, e.g. SPL-35-FE-BD-CDA	40	53	S
		41	50	P
		42	4C	L
		43	33	3
		44	35	5
		45	46	F
		46	45	E
		47	42	B
		48	44	D
		49	43	C
		50	44	D
51	41	A		

SPL-35-FE-BD

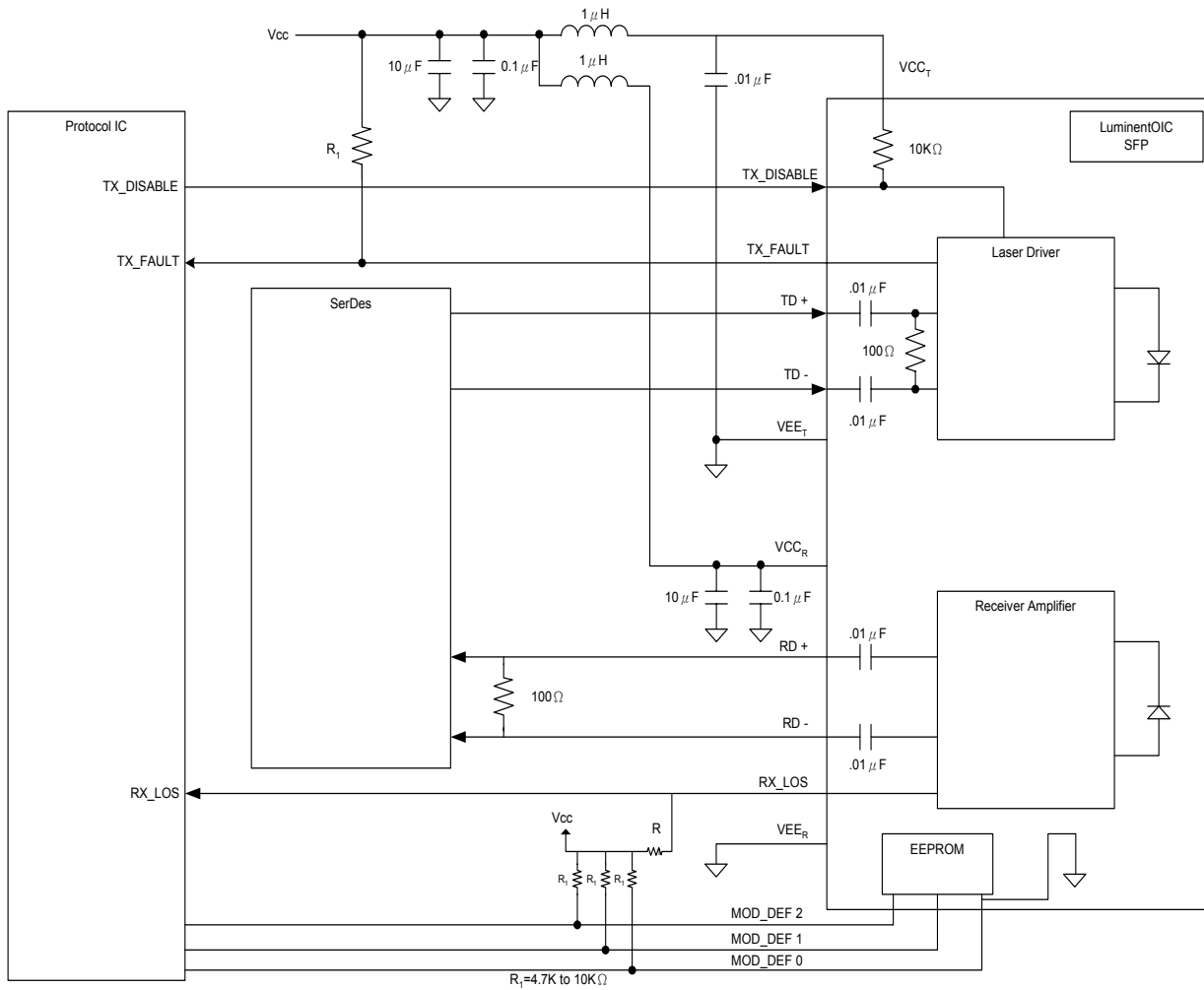
LC Connector Mechanical



**Units in mm (inches)**

SPL-35-FE-BD

Suggested Transceiver Interface



SPL-35-FE-BD

Ordering Information

Available Options:  
 SPL-35-FE-BD-CDA  
 SPL-35-FE-BD-CNA  
 SPL-35-FE-BD-TDA  
 SPL-35-FE-BD-TNA

Part numbering Definition:

S P L - 3 5 - F E - B D - Temperature Diagnostic Revision

• SPL = LC connector

• Wavelength  
 35 = Tx 1310nm/Rx 1550nm

• Data Rate  
 FE = Fast Ethernet (100Mbps)

• Standard  
 BD = 40km reach

• Operating Temperature  
 C = Commercial temperature (-5 to 70°C)  
 T = Industrial temperature (-40 to 85°C)

• D = Digital Diagnostic (SFF-8472)  
 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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