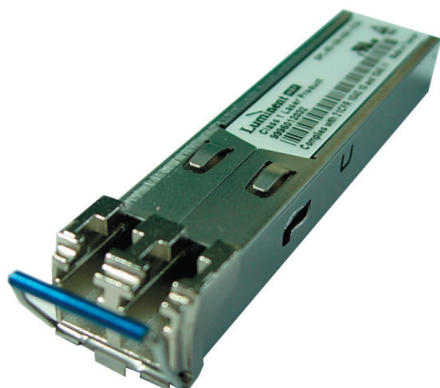


SP-GB-ELX-CxA-LO



Features

- Data Rate 1.062 to 1.25 Gb/s
- Single 3.3V Supply
- 17dB Minimum Link Budget
- Commercial Temperature Available
- 1310nm FP Laser
- Fibre Channel 100-SM-LC-L Compliant
- Gigabit Ethernet IEEE 802.3ah Compliant
- SFP MSA SFF-8074i Compliant
- Telcordia GR-468 Compliant
- Digital Diagnostic SFF-8472 Compliant
- Color Coded Bail Latch: Blue
- 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 Rejection ^a	PSR	100	-	-	mVp-p
Operating Temperature	T_{opr}	-5	-	70	°C
Storage Temperature	T_{stg}	-40	-	85	°C
Data Rate GbE	DR	-	1250	-	Mbps
Data Rate FC	DR	-	1062.5	-	Mbps

a) 20Hz to 155MHz

Transmitter Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Optical Power	P_{op}	-7	-5	0	dBm
Average Launch Power (Tx:Off)	P_{off}	-	-	-45	dBm
Extinction Ratio	ER	9	-	-	dB
Eye Mask		IEEE 802.3ah compliant			
Total Jitter	TJ	-	-	200	ps
Optical Rise Time ^b	t_r	-	-	260	ps
Optical Fall Time ^b	t_f	-	-	260	ps
Mean Wavelength	λ	1270	1310	1355	nm
Spectral Width (RMS)	$\Delta\lambda$	-	-	4	nm
Optical Path Penalty	dp		1	2	dB
Relative Intensity Noise	RIN	-	-	-120	dB/Hz

b) 20%-80% values

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Transmitter Specifications (Electrical)

Parameter	Symbol	Min	Typical	Max	Unit
Input Differential Impedance	R_{in}	80	100	120	Ω
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 ^c	$R_{sens,low}$	-	-26	-24	dBm
Receiver Power High ^c	$R_{sens,high}$	-3	0	-	dBm
Damage Threshold for Receiver	$P_{in, damage}$	6	-	-	dBm
Wavelength ^d	λ	1270	-	1355	nm
Maximum Reflectance of Receiver	RX_r	-	-	-12	dB
LOS Assert	-	-38	-	-	dBm
LOS De-Assert	-	-	-	-24	dBm
LOS Hysteresis	-	0.5	-	-	dB

c) Measured at BER of 10^{-12} , PRBS of 2^7-1 , at eye center

d) Operational over 1200-1625nm range

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	-	-	260	ps
Data Output Fall Time	t_f	-	-	260	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	μ s
Time to Initialize, Including Reset of Tx Fault	t_{init}	-	-	300	ms
Tx Fault Assert Time	t_{fault}	-	-	100	μ s
Tx Disable to Reset	t_{reset}	10	-	-	μ s
LOS Assert Time	t_{loss_on}	-	-	100	μ s
LOS De-assert Time	t_{loss_off}	-	-	100	μ 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}	-	$V_{ee} + 0.55$	V

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Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Formula
Temperature (-CDA)	-5 to 70	±3	°C	External	$Tc(C) = Tslope * Tad(16 \text{ bit signed twos complement value}) + Toffset$
Voltage	0 to Vcc	0.1	V	External	$V(\text{Volts}) = Vslope * Vad(16 \text{ bit unsigned integer}) + Voffset$
Bias Current	0 to 120	5	mA	External	$I(\text{mA}) = Islope * Iad(16 \text{ bit unsigned integer}) + Ioffset$
Tx Power	-7 to 0	±3dB	dBm	External	$Tx_PWR(\mu W) = Tx_PWRslope * Tx_PWRad(16 \text{ bit unsigned integer}) + Tx_PWRoffset$
Rx Power	-24 to -3	±3dB	dBm	External	$Rx_PWR(\mu W) = A0 + A1 * x + A2 * x^2 + A3 * x^3 + A4 * x^4$

EEPROM Serial ID (A0h)

Name of Field	Description of Field	Address	Hex	ASCII
Identifier		0	03	
Ext. Identifier		1	04	
Connector	Code for connector type	2	07	
Transceiver		3	00	
		4	00	
		5	00	
		6	02	
		7	00	
		8	00	
		9	00	
		10	00	
Encoding		11	01	
BR.Nominal	Units of 100 Mbits/sec.	12	0D	
Reserved	Reserved	13	00	
Length (9µm,km)	9/125 µm fiber, units of km	14	1E	
Length (9µm)	9/125 µm fiber, units of 100 m	15	FF	
Length (50µm)	50/125 µm fiber, units of 10 m	16	00	
Length (62.5µm)	62.5/125 µm fiber, units of 10 m	17	00	
Length (Copper)	Units of meters	18	00	
Reserved		19	00	

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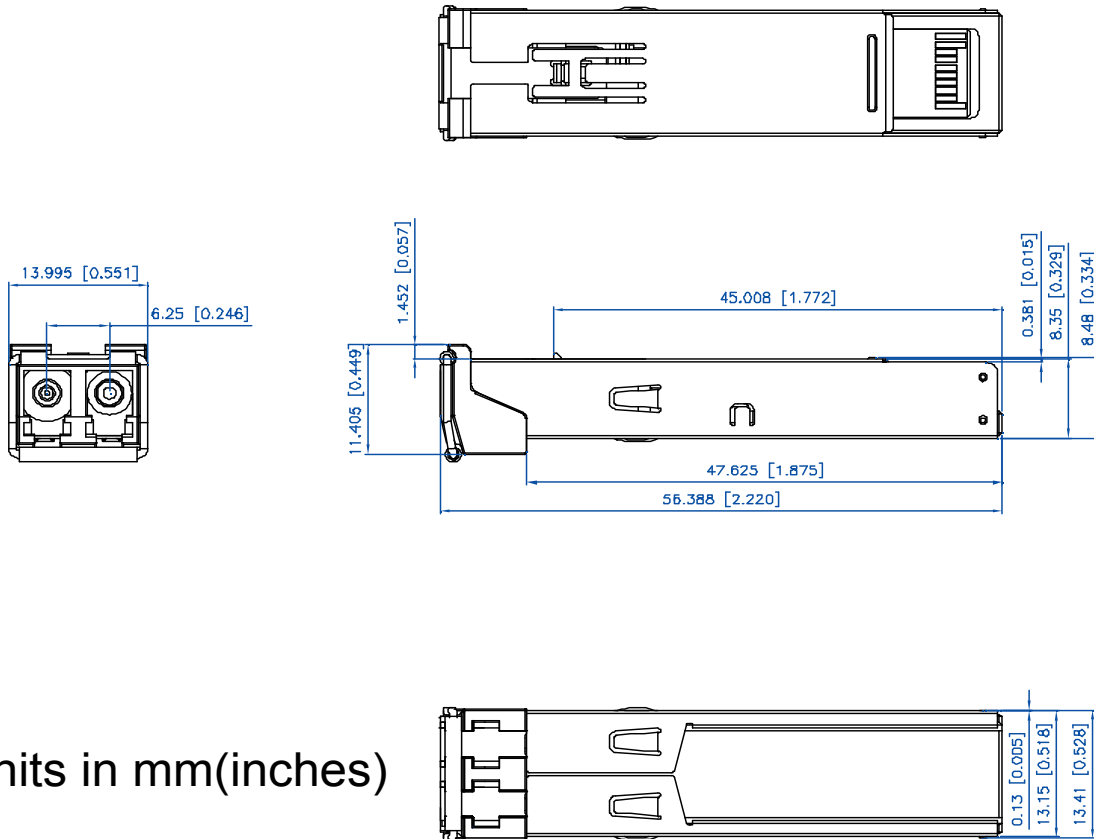
EEPROM Serial ID				
Name of Field	Description of Field	Address	Hex	ASCII
Vendor Name	SFP Vendor name (ASCII)	20	4C	L
		21	55	U
		22	4D	M
		23	49	I
		24	4E	N
		25	45	E
		26	4E	N
		27	54	T
		28	4F	O
		29	49	I
		30	43	C
Vendor OUI	IEEE vendor OUI code for LuminentOIC Inc.	37	00	
		38	06	
		39	B5	
Vendor P/N	Part number in ASCII, e.g. SP-GB-ELX-CxA-LO	40	53	S
		41	50	P
		42	47	G
		43	42	B
		44	45	E
		45	4C	L
		46	58	X
		47	43	C
		48	44 or 4E	D or N
		49	41	A
		50	4C	L
51	4F	O		

SP-GB-ELX-CxA-LO

Pinout Definitions

Pin	Function	Notes
1	V _{ee} 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 _{ee} R	RX Ground
10	V _{ee} R	RX Ground
11	V _{ee} R	RX Ground
12	RXD-	RX Data Negative
13	RXD+	RX Data Positive
14	V _{ee} R	RX GND
15	V _{CC} R	RX Power
16	V _{CC} T	TX Power
17	V _{ee} T	TX GND
18	TXD+	TX Data Positive
19	TXD-	TX Data Negative
20	V _{ee} T	TX GND

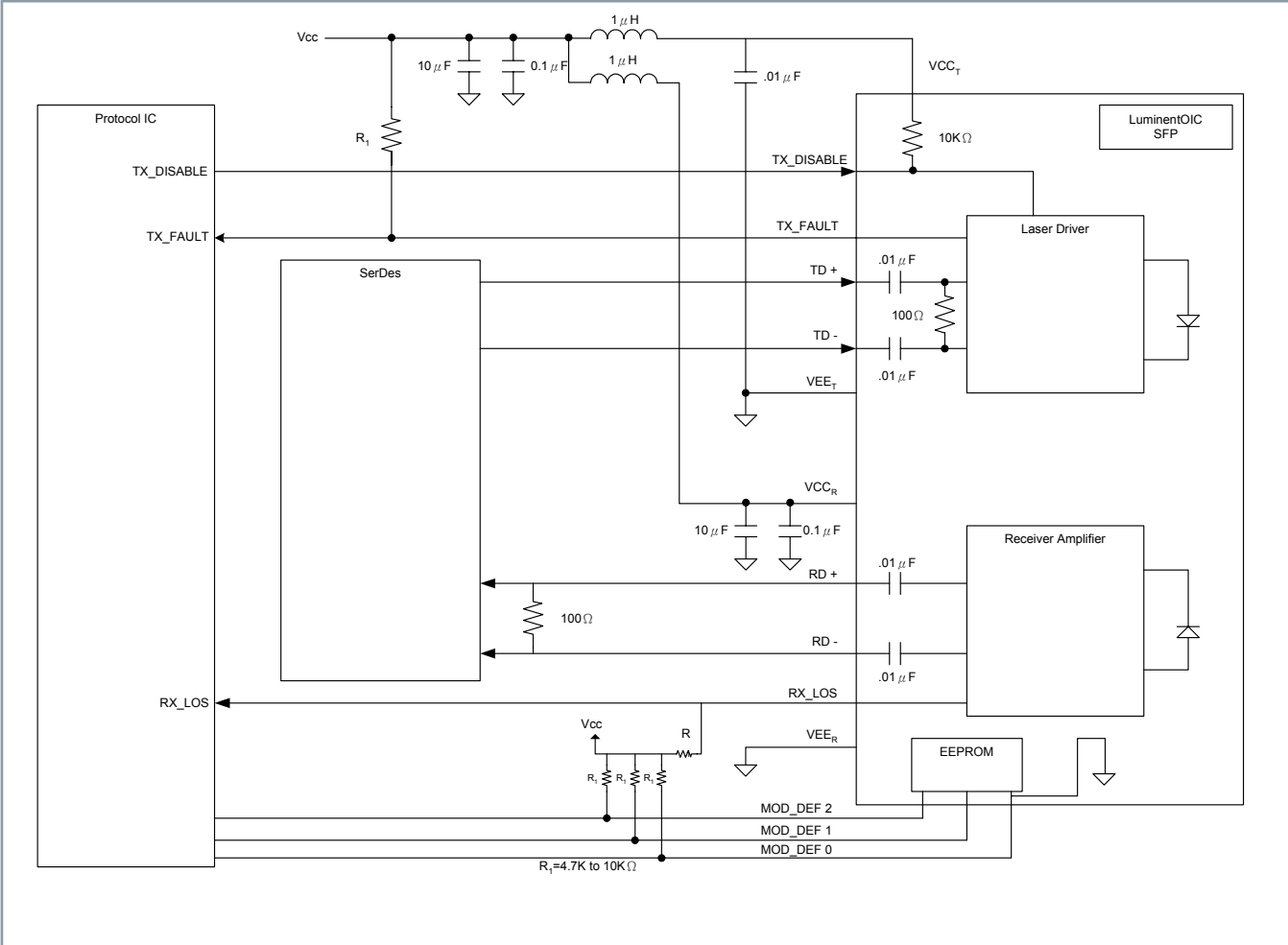
Outline Drawing



Units in mm(inches)

SP-GB-ELX-CxA-LO

Suggested Transceiver interface



SP-GB-ELX-CxA-LO

Ordering Information

Available Options:
 SP-GB-ELX-CNA-LO
 SP-GB-ELX-CDA-LO

Part numbering Definition:

SP - GB - ELX - Temperature Diagnostic Revision - LO

- SP = Small Form Pluggable
 GB = 1.25Gbps
 ELX = IEEE 802.3ah Interface
- Operating Temperature
 C = Commercial temperature (-5 to 70°C)
- D = Digital Diagnostic (SFF-8472)
 N = No Digital Diagnostic
- Design Revision
 A = RoHS compliant
- LO = LooP Customization

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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