

SFP-155-LR1



Features

- Single 3.3 V supply
- 29 dB min, 33.5 typical link budget
- -5 to 70 °C temperature operation
- 1310nm FP Laser
- SFP MSA SFF-8074i compliant
- GR 253/STM G.957 compliant
- Digital Diagnostic SFF-8472 compliant
- Bellcore GR-468 compliant

General Operating

Parameter	Symbol	Min	Typical	Max	Unit
Supply Voltage	V_{cc}	3.135	3.3	3.465	V
Total Current	I_{cc}	-	-	300	mA
Power Supply Noise Rejection ^a		100	-	-	mVp-p
Operating Temperature (case)	T_{op}	-5	-	70	°C
Storage Temperature	T_{st}	-40	-	85	°C
Data Rate OC3	DR	-	155	-	Mb/s

a) 20Hz to 155MHz

Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit
Optical Power	P_{op}	-5	-2.5	0	dBm
Average Launch power of off Tx	P_{off}	-	-	-30	dBm
Extinction Ratio	ER	10	-	-	dB
Eye Mask		-	-	-	SONET/SDH compliant
Optical Jitter generation	J_{gen}	-	-	0.002	UI
Optical Rise time ^b	t_r	-	-	160	ps
Optical Fall time ^b	t_f	-	-	160	ps
Mean Wavelength	λ	1263	1310	1360	nm
Spectral Width (rms)	$\Delta\lambda$	-	-	3	nm
Dispersion Penalty (at 40Km)		-	0.5	1	dB
Relative Intensity Noise	RIN	-	-	-120	dB/Hz
Reflectance Tolerance	rp	-24	-	-	dB

b) 20%-80% values

Transmitter Electrical

Parameter	Symbol	Min	Typical	Max	Unit
Input Differential Impedence	R_{in}	80	100	120	Ohm
PECL Single Ended data input swing	$V_{in, pp}$	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

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Receiver Specifications

Parameter	Symbol	Min	Typical	Max	Unit
Receive Power Low ^a	$R_{sens,low}$	-34	-36	-	dBm
Receive Power High	$R_{sens,high}$	-	-	-10	dBm
Damage Threshold for Receiver	$P_{in,damage}$	-	-	4	dBm
Wavelength ^b	λ	1263	1310	1360	nm
LOS Assert		-44	-	-	dBm
LOS De-assert		-	-	-34	dBm
LOS hysteresis		1	-	-	dB

a) at 10^{-10} BER, PRBS $2^{23}-1$

b) Operational over 1200 to 1625 nm range

Electrical Output

Parameter	Symbol	Min	Typical	Max	Unit
PECL Single ended data output swing	$V_{out,pp}$	400	-	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	μs
Time to initialize, including reset of TX fault	t_{init}	-	-	300	ms
Tx fault Assert time	t_{fault}	-	-	100	μs
Tx Disable to reset	t_{reset}	10	-	-	μs
LOS Assert time	t_{loss_on}	-	-	100	μs
LOS De-assert time	t_{loss_off}	-	-	100	μs
Serial ID Clock Rate	f_{serial_clock}	-	-	100	KHz
RX_LOS Voltage (high)		2	-	-	V
RX_LOS Voltage (low)		-	-	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

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Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Formula
Temperature (-T)	-5 to 70	± 3	°C	Internal	$T_c(C) = T_{ad}(16 \text{ bit signed twos complement})/256$
Temperature	-5 to 70	± 3	°C	Internal	$T_c(C) = T_{ad}(16 \text{ bit signed twos complement})/256$
Voltage	0 to V_{cc}	0.1	V	Internal	$V(\text{Volts}) = V_{ad}(16 \text{ bit unsigned integer}) * 0.1$
Bias Current	0 to 120	5	mA	External	$I(\text{mA}) = I_{slope} * I_{ad}(16 \text{ bit unsigned integer}) + I_{offset}$
TX Power	0 to 3.5	± 3 dB	mW	External	$TX_PWR(\mu W) = TX_PWR_{slope} * TX_PWR_{ad}(16 \text{ bit unsigned integer}) + TX_PWR_{offset}$
RX Power	-34 to -10 dBm	± 3 dB	mW	External	$RX_PWR(\mu W) = A0 + A1 * x + A2 * x^2 + A3 * x^3 + A4 * x^4$

EEPROM Serial ID

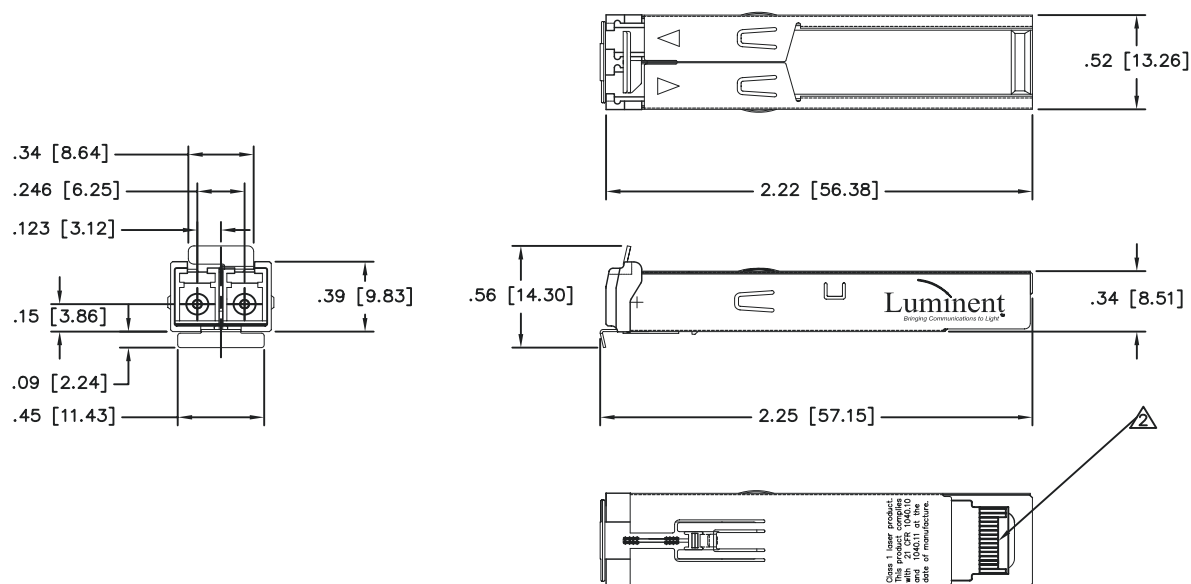
Name of Field	Description of Field	Address	Hex	ASCII
Vendor Name	SFP Vendor name(ASCII)	20	4C	L
		21	55	U
		22	4D	M
		23	49	I
		24	4E	N
		25	45	E
		26	4E	N
		27	54	T
Vendor OUI	IEEE vendor OUI code for Luminent Inc.	37	00	
		38	06	
		39	B5	
Vendor PN	Part number in ASCII, e.g. SFP-155-LR1	40	53	S
		41	46	F
		42	50	P
		43	31	1
		44	35	5
		45	35	5
		46	4C	L
		47	52	R
		48	31	1

Pinout Definitions

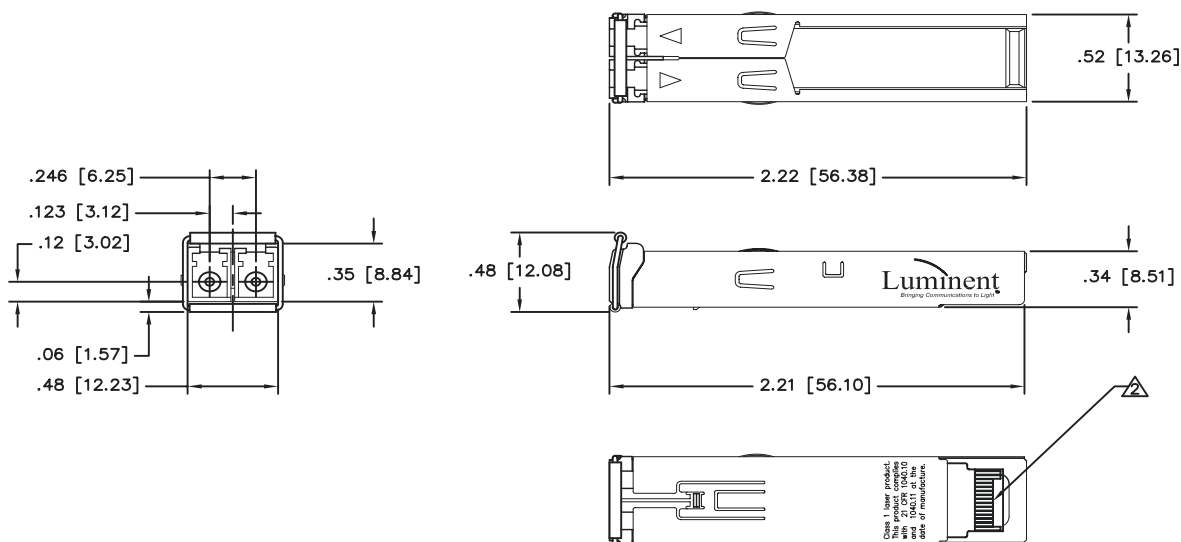
Pin	Function	Notes
1	$V_{ee}T$	TX GND
2	TX_FAULT	Open Collector
3	TX_DISABLE	Internally Pulled High
4	MOD_DEF2	Serial Data Input
5	MOD_DEF1	Serial Clock Input
6	MOD_DEF0	Internally Grounded
7	NC	Not Connected
8	LOS	Open Collector
9	$V_{ee}R$	RX Ground
10	$V_{ee}R$	RX Ground
11	$V_{ee}R$	RX Ground
12	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

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Outline Drawing (I Latch)



Outline Drawing (Bail Latch)



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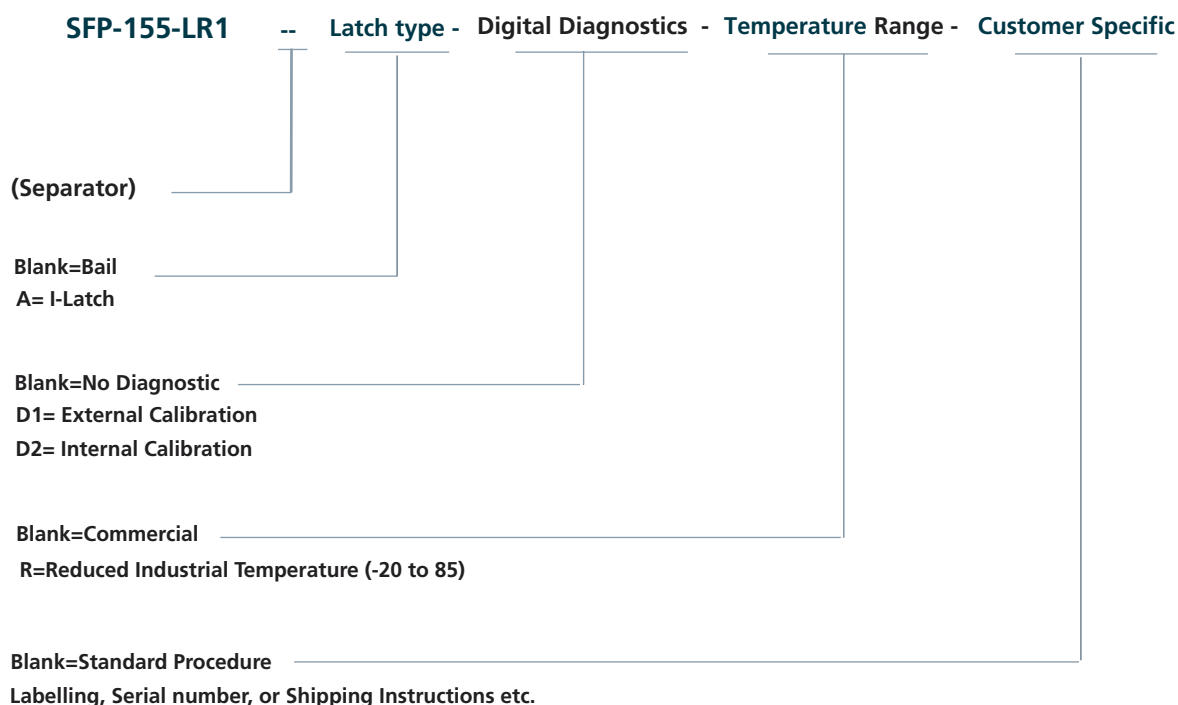
Ordering Information

Available Options:

SFP-155-LR1

SFP-155-LR1--D1

Part numbering Definition:



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.

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