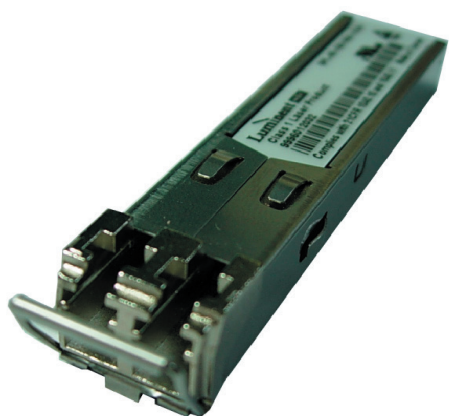


SPC-12-LR



Features

- Compliant with OC12/STM-4 Standards
- Single 3.3 V supply
- 26 dB minimum link budget
- CWDM DFB Laser, 80 km reach
- Commercial Temperature Available (-CDA)
- Industrial Temperature Available (-TDA)
- SFP MSA SFF-8074i compliant
- Digital Diagnostic SFF-8472 Compliant
- Telcordia GR-468 compliant
- RoHS compliant

General operating

Parameter	Symbol	Min.	Typical	Max.	Unit
Supply Voltage	V_{CC}	3.135	3.3	3.465	V
Total Current, -40 to -5°C ^a	I_{CC}	-	-	500	mA
Total Current, -5 to 85°C	I_{CC}	-	-	300	mA
Power Supply Noise Rejection ^b	PSR	100	-	-	mV _{p-p}
Operating Temperature (-CDA)	T_{Op}	-5	-	70	°C
Operating Temperature (-TDA)	T_{Op}	-40	-	85	°C
Storage Temperature	T_{St}	-40	-	85	°C
Data Rate OC 12/STM-4	DR	-	622	-	Mbps

a) Denotes deviation from MSA

b) 20Hz to 155MHz

Transmitter Specifications

Parameter	Symbol	Min	Typical	Max	Unit
Optical Power	P_{OP}	-2	0	+3	dBm
Average Launch Power Of Off Tx	P_{Off}	-	-	-45	dBm
Extinction Ratio	ER	10	-	-	dB
Eye Mask		-	-	-	SONET/SDH compliant
Optical Jitter Generation	J_{gen}	-	-	0.002	UI
Optical Rise Time ^c	t_r	-	-	500	ps
Optical Fall Time ^c	t_f	-	-	500	ps
Mean Wavelength	λ	1xx1-6.5	1xx1	1xx1+6.5	nm
Spectral Width (-20dB width)	$\Delta\lambda$	-	-	1	nm
Side Mode Suppression Ratio	SMSR	-	-	30	dB
Dispersion Penalty (at 80 Km)		-	0.5	1	dB
Relative Intensity Noise	RIN	-	-	-120	dB/Hz

c) 20%-80% values

SPC-12-LR

Transmitter Specifications (Electical)

Parameter	Symbol	Min	Typical	Max	Unit
Input Differential Impedence	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

Parameter	Symbol	Min	Typical	Max	Unit
Receive Power Low ^d	$R_{sens,low}$	-	-30	-28	dBm
Receive Power High	$R_{sens,high}$	-8	-	-	dBm
Damage Threshold For Receiver	$P_{in,damage}$	0	-	-	dBm
Wavelength	λ	1200	-	1625	nm
LOS Assert		-45	-	-	dBm
LOS De-assert		-	-	-28	dBm
LOS Hysteresis		0.5	-	-	dB

d) 10^{-12} BER at nominal wavelength

Electrical Output

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	-	-	500	ps
Data Output Fall Time	t_f	-	-	500	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)		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 (-CDA)	-5 to 70	±3	°C	External	$T_c(C) = T_{slope} * T_{ad}(16 \text{ bit signed twos complement value}) + T_{offset}$
Temperature (-TDA)	-40 to 85	±3	°C	External	$T_c(C) = T_{slope} * T_{ad}(16 \text{ bit signed twos complement value}) + T_{offset}$
Voltage	0 to V_{CC}	±0.1	V	External	$V(\text{Volts}) = V_{slope} * V_{ad} (16 \text{ bit unsigned integer}) + V_{offset}$
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 dB	dBm	External	$TX_PWR(\mu W) = TX_PWR_{slope} * TX_PWR_{ad}(16 \text{ bit unsigned integer}) + TX_PWR_{offset}$
RX Power	-28 to -8	±3 dB	dBm	External	$RX_PWR(\mu W) = A_0 + A_1 * x + A_2 * x^2 + A_3 * x^3 + A_4 * x^4$

Pinout Definitions

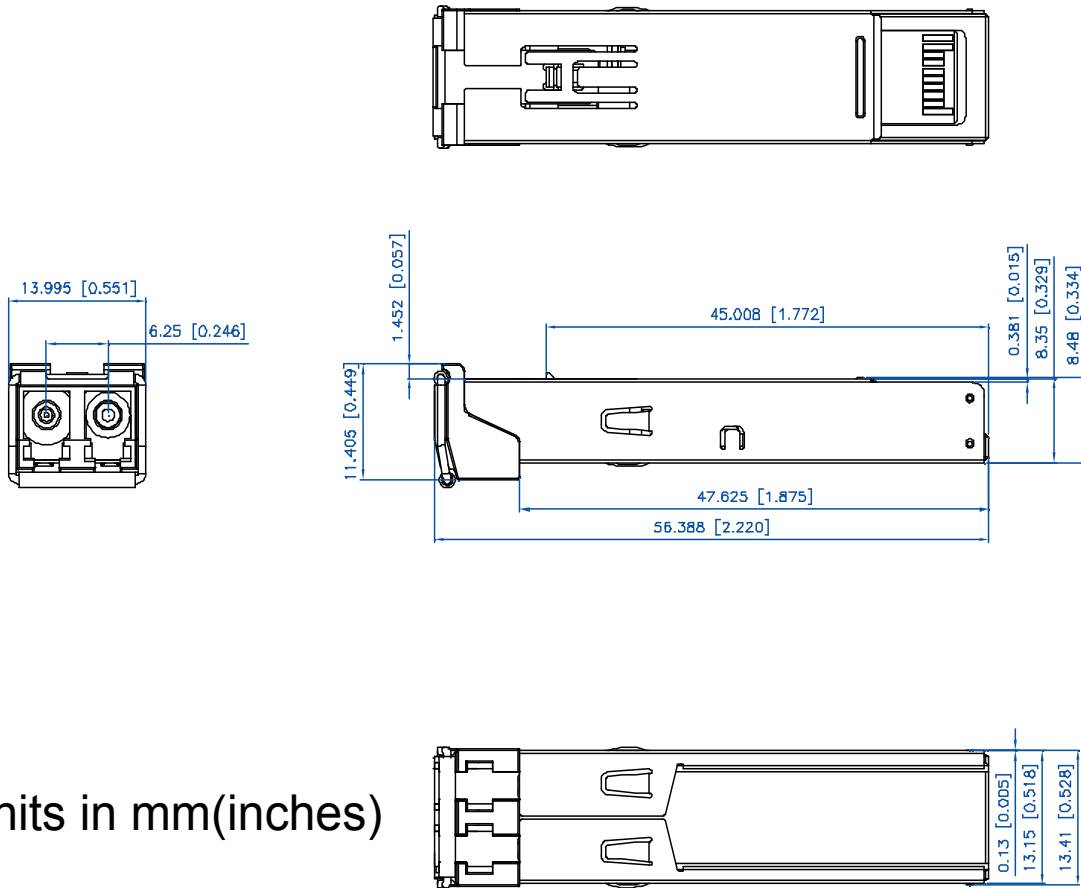
Pin	Function	Notes
1	V_{eeT}	TX Ground
2	TX_FAULT	Open Collector
3	TX_DISABLE	Internally Pulled High
4	MOD_DEF2	Serial Data Input
5	MOD_DEF1	Serial Clock Input
6	MOD_DEF0	Internally Grounded
7	NC	Not Connected
8	LOS	Open Collector
9	V_{eeR}	RX Ground
10	V_{eeR}	RX Ground
11	V_{eeR}	RX Ground
12	RXD-	RX Data Negative
13	RXD+	RX Data Positive
14	V_{eeR}	RX Ground
15	V_{ccR}	RX Power
16	V_{ccT}	TX Power
17	V_{eeT}	TX Ground
18	TXD+	TX Data Positive
19	TXD-	TX Data Negative
20	V_{eeT}	TX Ground

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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 PN	Part number in ASCII, e.g. SPC12LRxxCDA	40	53	S
		41	50	P
		42	43	C
		43	31	1
		44	32	2
		45	4C	L
		46	52	R
		47	xx	x
		48	xx	x
		49	43	C
		50	44	D
		51	41	A

SPC-12-LR

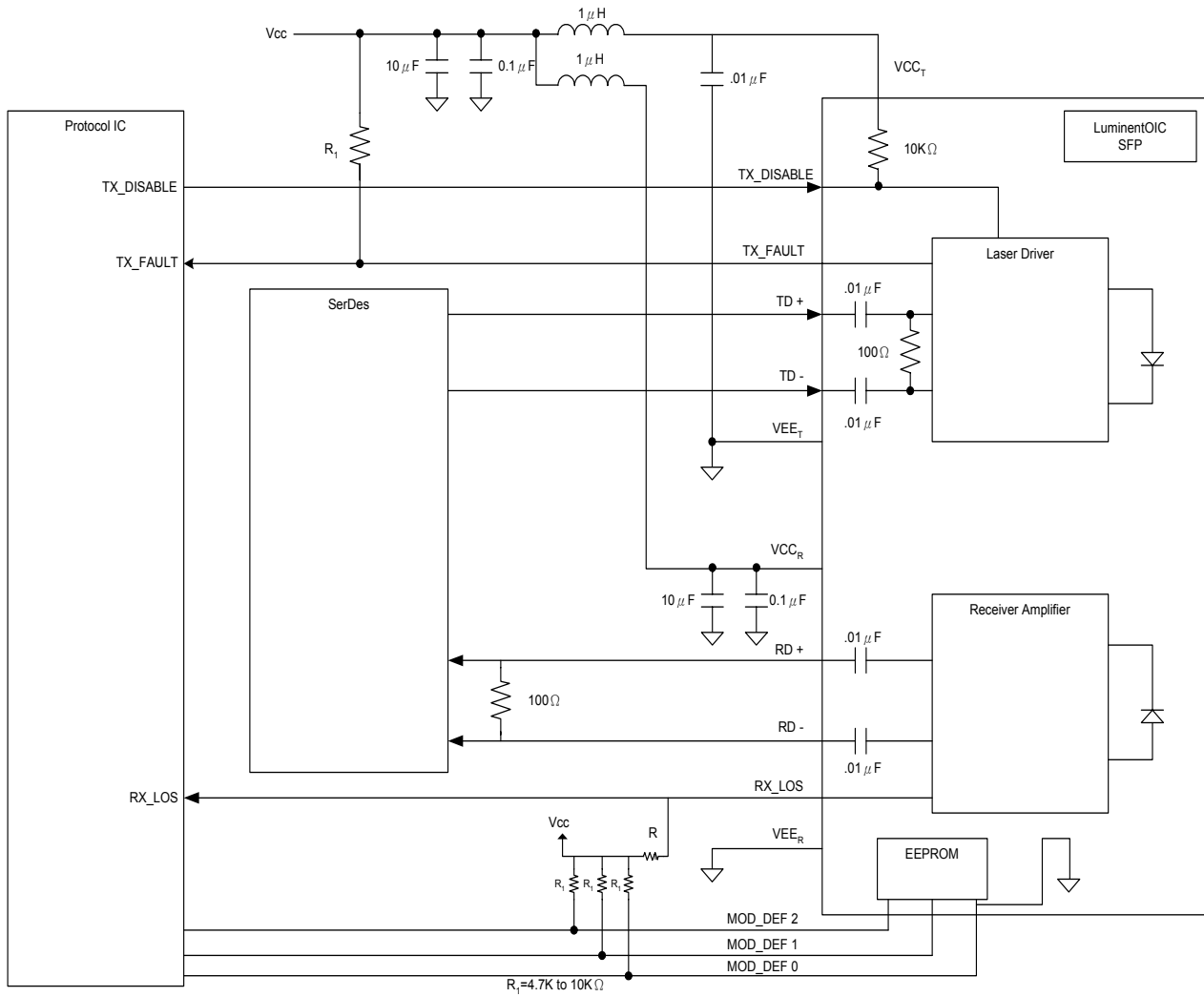
Outline drawing



Units in mm(inches)

SPC-12-LR

Suggested Transceiver Interface



SPC-12-LR

Ordering Information

Available Options:
 SPC-12-LR-xxCDA
 SPC-12-LR-xxTDA

Part numbering Definition:

SPC - 12 - LR - xx Temperature Diagnostic Revision

- **SPC = Small Form Pluggable CWDM**
 12 = OC12, 622 Mbps
 LR = Long Reach 80 km
- **xx = 1xx1 nm center wavelength**
 47, 49, 51, 53, 55, 57, 59, 61
- **Operating Temperature**
 C = Commercial Temperature (-5 to 70°C)
 T = Industrial Temperature (-40 to 85°C)
- **D = Digital Diagnostic (SFF-8472)**
- **Design 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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