

SPC-GB-YX-xx



Features

- Data rate 1.062 to 1.25 Gb/s
- 60 km reach
- 22 dB min , 26 dB typical link budget
- Commercial and Industrial temperature available
- CWDM wavelength, DFB laser
- SFP MSA SFF-8074i compatible
- Digital Diagnostic SFF-8472 compatible
- 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
Total Current each supply pin	$I_{CCR, ICC T}$	-	-	300	mA
Power Supply Rejection ^b	PSR	100	-	-	mV _{p-p}
Operating temperature(-Cxx)	T_{OP}	-5	-	70	°C
Operating Temperature(-Txx)	T_{OP}	-40	-	85	°C
Storage Temperature	T_{ST}	-40	-	85	°C
Data Rate GbE	DR	-	1250	-	Mbps
Data Rate FC	DR	-	1062.5	-	Mbps

a) Denotes deviation from MSA

b) 20Hz to 155MHz

Transmitter Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Optical Power	P_{OP}	-2	0	3	dBm
Average Launch Power Of Off Tx	P_{OFF}	-	-	-30	dBm
Extinction Ratio (Dynamic)	ER	9	-	-	dB
Eye Mask		-	-	-	802.3z compliant
Optical Jitter Random	JR	-	-	147	ps
Optical Jitter Deterministic	JD	-	-	80	ps
Total Jitter	TJ	-	-	200	ps
Optical Rise Time ^c	t_r	-	-	260	ps
Optical Fall Time ^c	t_f	-	-	260	ps
Mean Wavelength	λ	1xx1-6.5nm	1xx1	1xx1+6.5nm	nm
Spectral Width (20dB)	$\Delta\lambda$	-	-	1	nm
Side Mode Suppression Ratio	SMSR	30	-	-	dB
Optical Path Penalty at 50 Km ^d	dp	-	0.5	1	dB
Relative Intensity Noise	RIN	-	-	-120	dB/Hz
Reflection Tolerance ^e	rp	-	-	-24	dB

c) 20%-80% values

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

e) 1 dB degradation of receiver sensitivity

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Transmitter Specifications (Electrical)

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 ^f	$R_{sens,low}$	-	-26	-24	dBm
Receive Power High ^f	$R_{sens,high}$	-3	0	-	dBm
Damage Threshold For Receiver	$P_{in,damage}$	6	-	-	dBm
Wavelength	λ	1200	-	1625	nm
Reflection tolerance	RX_r	-	-	-12	dB
LOS Assert		-34	-	-	dBm
LOS De-assert		-	-	-25	dBm
LOS Hysteresis		0.5	-	-	dB

^fat 10^{-12} BER,²⁷ -1 PRBS,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	-	-	320	ps
Data Output Fall Time	t_f	-	-	320	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
Initial Turn-on Time after power-up	$t_{power-up}$	-	TBD	60	sec
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}	2	-	100	KHz
RX_LOS Voltage (High)		2	-	V_{cc}	V
RX_LOS Voltage (Low)		-	-	0.8	V
Receiver Jitter Deterministic	JD, receive	-	-	170	ps
Receiver Jitter Random	JR, receive	-	-	96	ps
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
LOS Output Voltage-Fault	$V_{LOS\ fault}$	2	-	V_{cc}	V
LOS Output Voltage-Normal	$V_{LOSnormal}$	V_{ee}	-	$V_{ee}+0.55$	V

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 λ Wavelength Ordering

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See table below for "XX" values

 λ_c Wavelength Guide

Code	λ_c	Unit	Code	λ_c	Unit	Code	λ_c	Unit	Code	λ_c	Unit
31	1311	nm	39	1391	nm	47	1471	nm	55	1551	nm
33	1331	nm	41	1411	nm	49	1491	nm	57	1571	nm
35	1351	nm	43	1431	nm	51	1511	nm	59	1591	nm
37	1371	nm	45	1451	nm	53	1531	nm	61	1611	nm

Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Formula
Temperature(-CDx)	-5 to 70	± 3	$^{\circ}$ C	Internal	$T_c(C) = T_{ad}(16 \text{ bit signed twos complement})/256$
Temperature(-TDx)	-40 to 85	± 3	$^{\circ}$ 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	-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	-24 to -3	± 3	dBm	External	$RX_PWR(\mu W) = A_0 + A_1 * x + A_2 * x^2 + A_3 * x^3 + A_4 * x^4$

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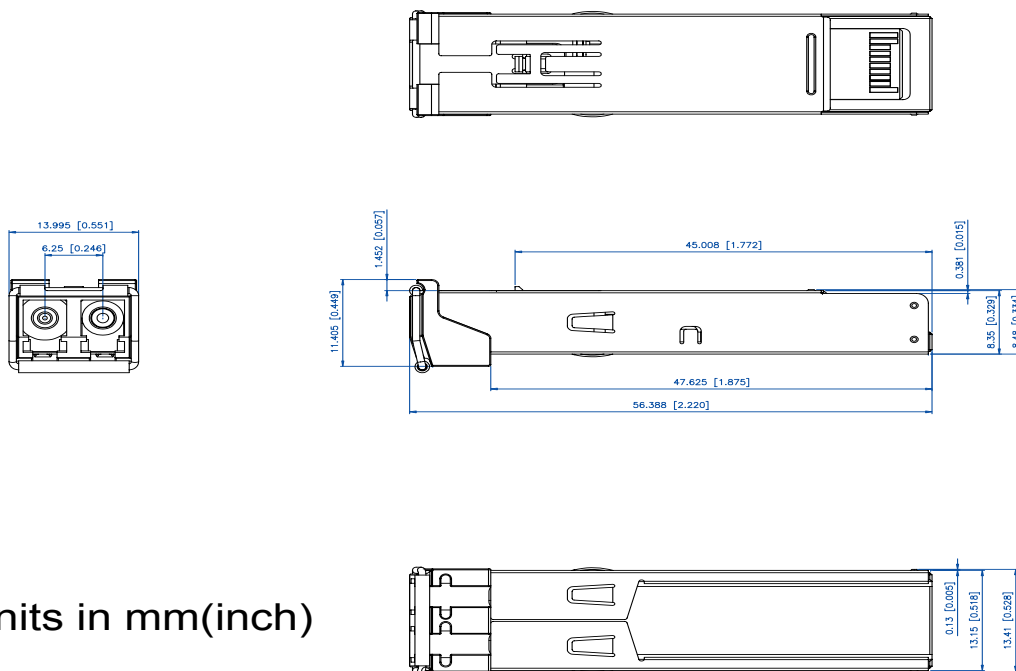
EEPROM Serial ID				
Name of Field	Description of Field	Address	Hex	ASCII
Vendor Name	SFP Vendor Name(ASCII)	20	4C	L
		21	55	U
		22	4D	M
		23	49	I
		24	4E	N
		25	45	E
		26	4E	N
		27	54	T
		28	4F	O
		29	49	I
		30	43	C
Vendor OUI	IEEE Vendor OUI Code For LuminentOIC Inc.	37	00	
		38	06	
		39	B5	
Vendor PN	Part Number in ASCII, e.g. SPC-GB-YX-xxCDA	40	53	S
		41	50	P
		42	43	C
		43	47	G
		44	42	B
		45	59	Y
		46	58	X
		47	x	x
		48	x	x
		49	43	C
		50	44	D
51	41	A		

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Pin	Function	Notes
1	V _{eeT}	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 _{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 GND
15	V _{ccT,R} *	Supply Voltage
16	V _{ccT,R} *	Supply Voltage
17	V _{eeT}	TX GND
18	TXD+	TX Data Positive
19	TXD-	TX Data Negative
20	V _{eeT}	TX GND

*denotes deviations from MSA standard

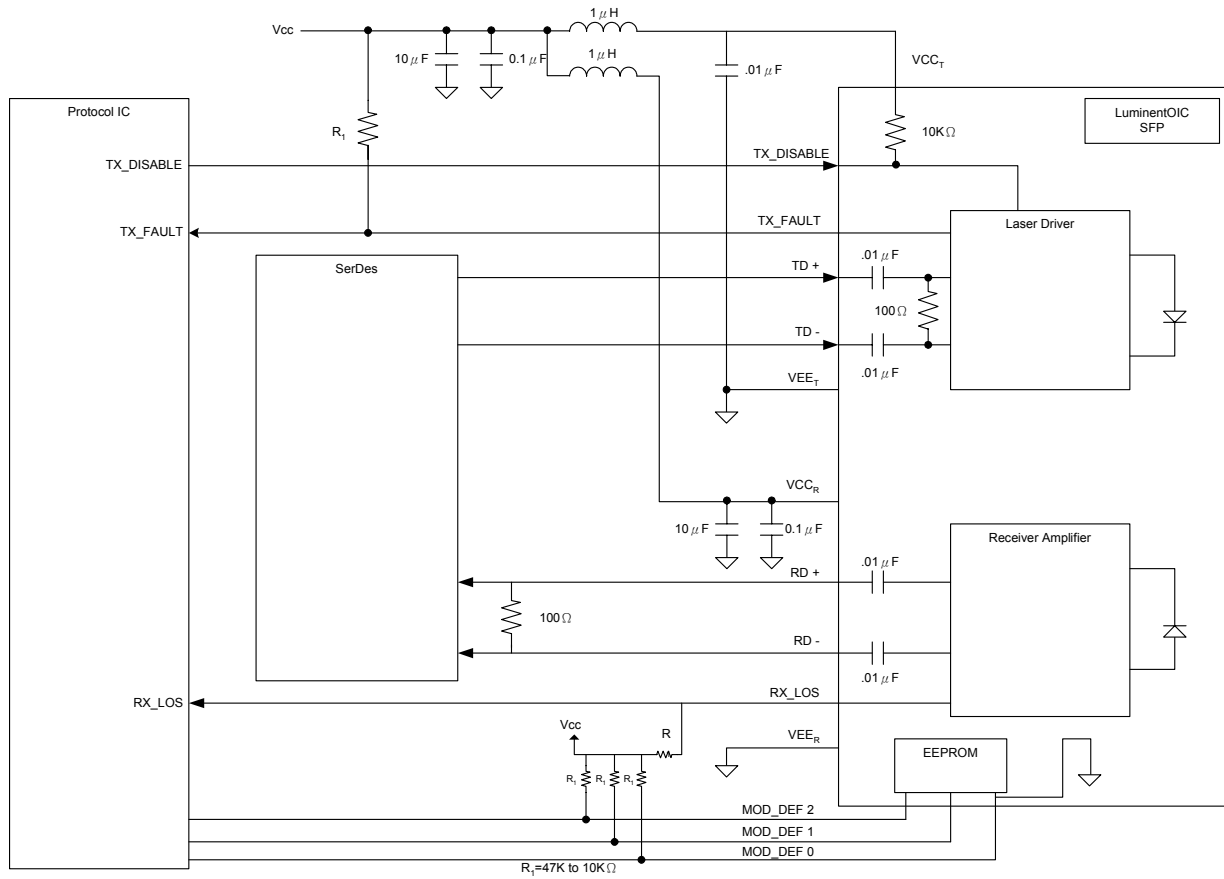
Outline Drawing



Units in mm(inch)

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Suggested Transceiver Interface



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Ordering Information

Available Options:

- SPC-GB-YX-xxCDA
- SPC-GB-YX-xxCNA
- SPC-GB-YX-xxTDA
- SPC-GB-YX-xxTNA

Part numbering Definition:

SPC - GB - YX - xx Temperature Diagnostic Revision

- SPC = Small Form Pluggable CWDM
GB = 1.25 Gbps
YX = IEEE 802.3z Interface 60km
- xx = CWDM Wavelength
- Operating Temperature
C = Commercial (-5 to 70)
T = Industrial (-40 to 85)
- D = Digital Diagnostic
N = No Digital Diagnostic
- Design Revision

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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