

SPS-43-GB-BX



Features

- Compliant with IEEE 802.3ah, 1000BaseBX
- Simplex SC Connector
- Digital Diagnostic SFF-8472 Compliant
- 11dB Minimum Power Budget
- 10km Minimum Reach
- Commercial Temperature Operation
- Single 3.3V Supply
- 1490nm DFB Laser
- Telcordia GR-468 Compliant
- Color Coded Bail Latch: Purple
- RoHS-5/6 compliant product (lead exemption) (-xxA)
- RoHS compliant product (-xxC)

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 Noise Rejection		100	-	-	mVp-p
Operating Case Temperature (-Cxx)	$T_{opr}$	-5	-	70	°C
Operating Case Temperature (-Txx)	$T_{opr}$	-40	-	85	°C
Storage Temperature	$T_{stg}$	-40	-	85	°C
Data Rate	DR	-	1250	-	Mbps

Transmitter Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Optical Power	$P_{op}$	-9	-6	-3	dBm
Optical Crosstalk	XT	-	-45	-40	dB
Average Launch Power (Tx:Off)	$P_{off}$	-	-	-45	dBm
Extinction Ratio	ER	6	-	-	dB
Eye Mask		IEEE 802.3ah Compliant			
Optical Rise time (20% to 80% values)	$t_r$	-	-	260	ps
Optical Fall time (20% to 80% values)	$t_f$	-	-	260	ps
Mean Wavelength	$\lambda$	1480	1490	1500	nm
Maximum RMS Width	$\sigma$	-	-	0.88	nm
Relative Intensity Noise	RIN	-	-	-120	dB/Hz
Transmitter Reflectance	-	-	-	-12	dB
Optical Return Loss Tolerance	ORLT	-	-	12	dB

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## 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>a</sup>	$R_{sens,low}$	-	-22	-20	dBm
Receiver Power High <sup>a</sup>	$R_{sens,high}$	-3	-	-	dBm
Damage Threshold for Receiver	$P_{in, damage}$	0	-	-	dBm
Wavelength	$\lambda$	1260	-	1360	nm
LOS Assert	-	-45	-	-	dBm
LOS De-Assert	-	-	-	-20	dBm
LOS Hysteresis	-	0.5	-	-	dB
Receiver Reflectance	-	-	-	-12	dB

a) Measured at  $10^{-12}$  BER, PRBS 27-1, 6dB ER

## 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	$t_r$	-	-	500	ps
Data Output Fall Time	$t_f$	-	-	500	ps

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## 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)	Rx_LOS <sub>H</sub>	2	-	-	V
RX_LOS Voltage (low)	RX_LOS <sub>L</sub>	-	-	0.8	V
LOS Output Voltage-Fault	V <sub>LOS</sub> fault	2	-	V <sub>cc</sub>	V
LOS Output Voltage-Normal	V <sub>LOS</sub> normal	V <sub>ee</sub>	-	V <sub>ee</sub> + 0.5	V
MOD_DEF (0:2)-High	V <sub>h</sub>	2	-	V <sub>cc</sub>	V
MOD_DEF (0:2)-Low	V <sub>l</sub>	V <sub>ee</sub>	-	V <sub>ee</sub> + 0.5	V

## Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Bit Value	Formula
Temperature (-CDx)	-5 to 70	±3	°C	Internal	1/256 C	T <sub>c</sub> (C) = Tad(16 bit signed twos complement)/256
Temperature (-TDx)	-40 to 85	±3	°C	Internal	1/256 C	T <sub>c</sub> (C) = Tad(16 bit signed twos complement)/256
Voltage	0 to V <sub>cc</sub>	0.1	V	Internal	100μV	V(Volts) = Vad(16 bit unsigned integer)*0.1
Bias Current	0 to 120	5	mA	External	-	I(mA) = Islope * Iad(16 bit unsigned integer)+Ioffset
Tx Power	-9 to -3	±3dB	mW	External	-	Tx_PWR(μW) = Tx_PWRslope*T <sub>x_PWR</sub> ad(16 bit unsigned integer)+Tx_PWRoffset
Rx Power	-20 to -3	±3dB	mW	External	-	Rx_PWR(μW) = A0+A1*x+A2*x <sup>2</sup> +A3*x <sup>3</sup> +A4*x <sup>4</sup>

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EEPROM Serial ID				
Name of Field	Discription 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 Luminent Inc.	37	00	
		38	06	
		39	B5	
Vendor P/N	Part number in ASCII, e.g. SPS-43-GB-BX-CDA	40	53	S
		41	50	P
		42	53	S
		43	34	4
		44	33	3
		45	47	G
		46	42	B
		47	42	B
		48	58	X
		49	43	C
		50	44	D
51	41	A		

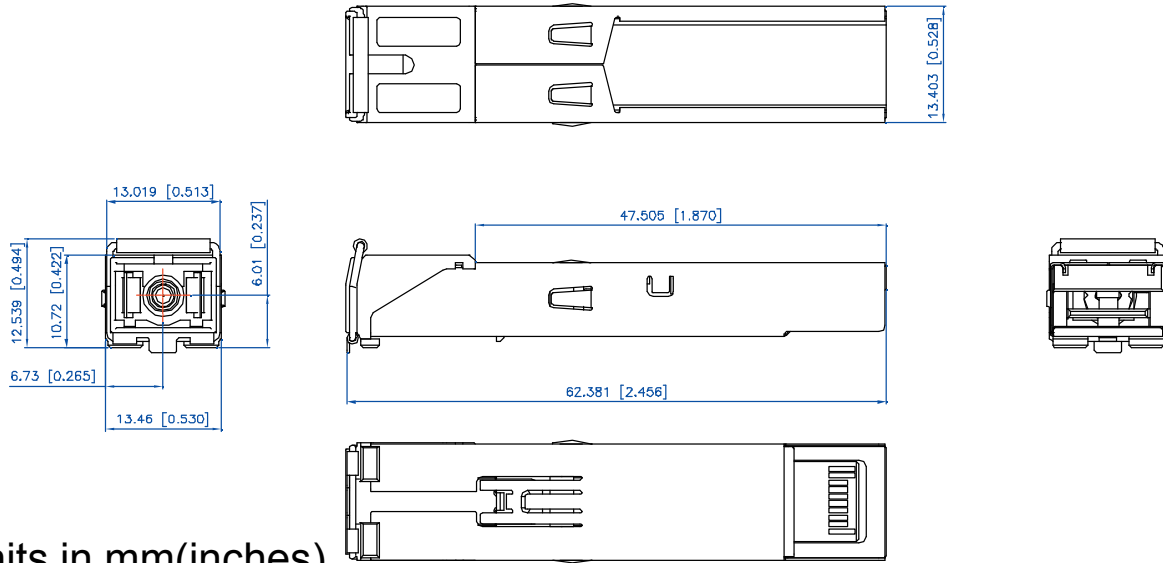
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## Pinout Definitions

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_DEF0	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

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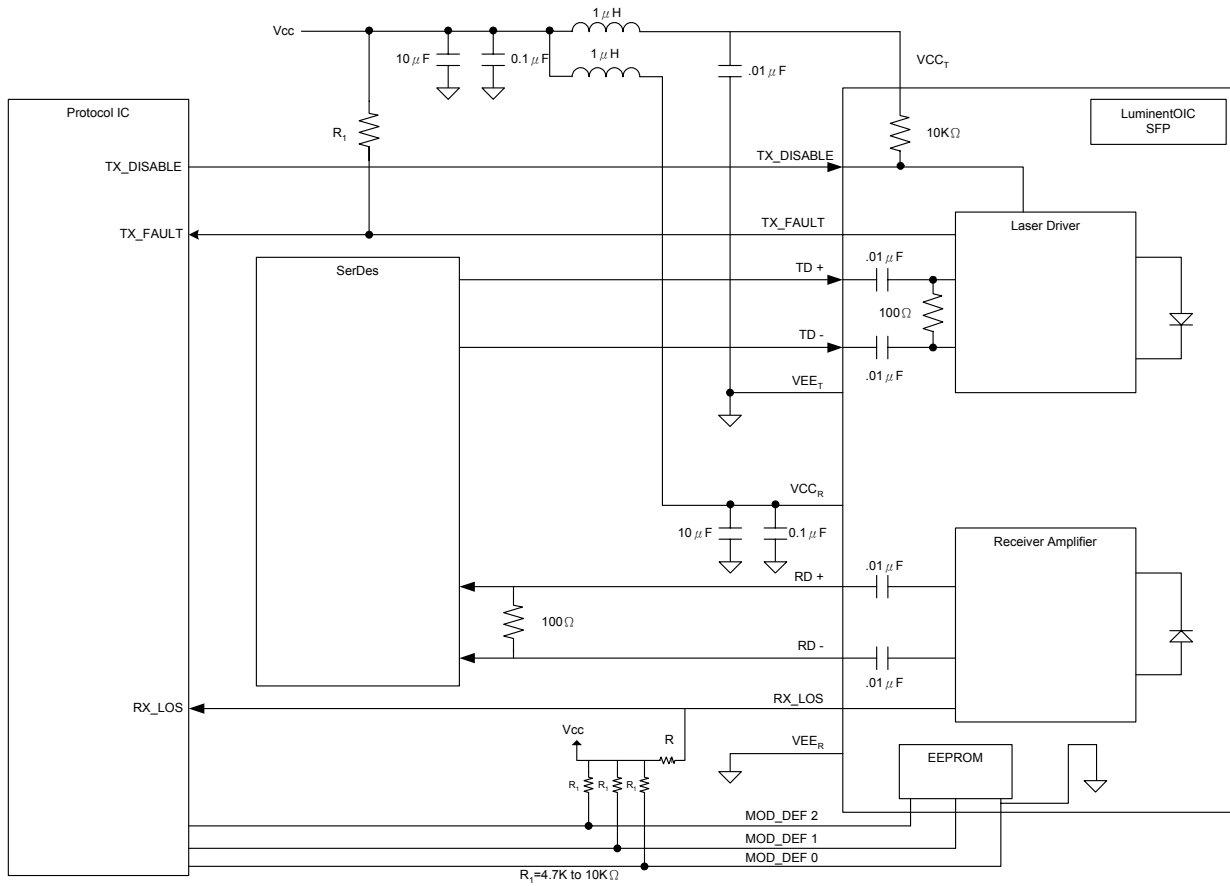
Mechanicals



Units in mm(inches)

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Suggested Transceiver Interface



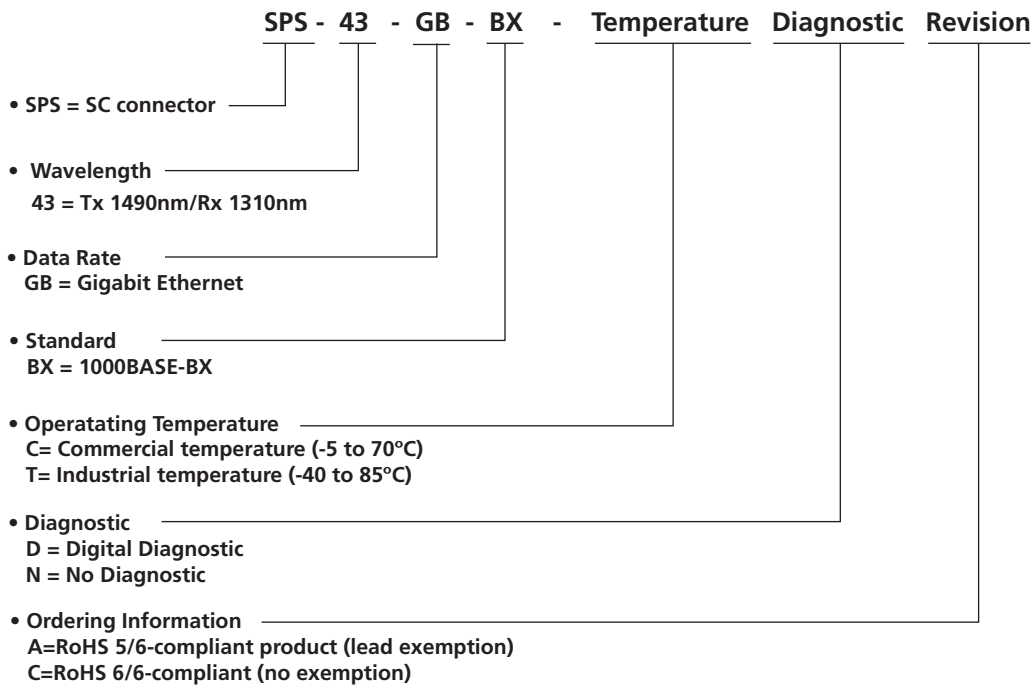
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Ordering Information

Available Options:

SPS-43-GB-BX-CNA	SPS-43-GB-BX-CNC
SPS-43-GB-BX-CDA	SPS-43-GB-BX-CDC
SPS-43-GB-BX-TNA	SPS-43-GB-BX-TNC
SPS-43-GB-BX-TDA	SPS-43-GB-BX-TDC

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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