

SPS-43-GB-EBX-CxC



Features

- Compliant with IEEE 802.3ah, 1000Base-BX10
- Simplex SC Connector
- Digital Diagnostic SFF-8472 Compliant
- SFP MSA SFF-8074i Compliant
- 13dB Minimum Power Budget
- 20 km Minimum Reach
- Commercial temperature available
- Single 3.3V Supply
- 1490nm DFB Laser
- Telcordia GR-468 Compliant
- Color coded bail latch tube: Purple
- RoHS compliant

General Operation

Parameter	Symbol	Min.	Typ.	Max.	Unit
Supply Voltage	V <sub>CC</sub>	3.135	3.3	3.465	V
Total Current	I <sub>CC</sub>	-	-	300	mA
Power Supply Noise Rejection		100	-	-	mVp-p
Operating Temperature (-CxC)	T <sub>opr</sub>	-5	-	70	°C
Storage Temperature	T <sub>stg</sub>	-40	-	85	°C
Data Rate	DR	-	1250	-	Mbps

Transmitter Specifications (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Optical Power	P <sub>op</sub>	-7	-4	0	dBm
Optical Crosstalk	XT	-	-45	-40	dB
Average Launch Power (Tx:Off)	P <sub>off</sub>	-	-	-45	dBm
Extinction Ratio	ER	6	-	-	dB
Eye Mask	-	IEEE 802.3ah			
Optical Rise Time (20% to 80% values)	t <sub>r</sub>	-	-	260	ps
Optical Fall Time (20% to 80% values)	t <sub>f</sub>	-	-	260	ps
Mean Wavelength	λ	1480	1490	1500	nm
Spectral Width (RMS)	σ	-	-	0.88	nm
Relative Intensity Noise	RIN	-	-	-120	dB/Hz
Transmitter Reflectance	-	-	-	-12	dB
Reflection Tolerance	rp	-	-	12	dB

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## Transmitter Specifications (Electrical)

Parameter	Symbol	Min	Typical	Max	Unit
Input Differential Impedance	$R_{in}$	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 2<sup>7</sup>-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	$t_r$	-	-	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	$\mu$ s
Time to initialize, including reset of Tx fault	$t_{init}$	-	-	300	ms
Tx fault Assert time	$t_{fault}$	-	-	100	$\mu$ s
Tx Disable to reset	$t_{reset}$	10	-	-	$\mu$ s
LOS Assert time	$t_{loss\_on}$	-	-	100	$\mu$ s
LOS De-assert time	$t_{loss\_off}$	-	-	100	$\mu$ s
Serial ID Clock Rate	$f_{serial\_clock}$	-	-	100	KHz
RX_LOS Voltage (high)	$RX\_LOS_H$	2	-	-	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	$V_l$	$V_{ee}$	-	$V_{ee} + 0.5$	V

## SPS-43-GB-EBX-CxC

## Diagnostics

Parameter	Range	Accuracy	Unit	Calibration	Bit Value	Formula
Temperature(-CDC)	-5 to 70	±3	°C	External	1/256 C	$T_c(C) = T_{slope} * T_{ad}(16 \text{ bit signed twos complement value}) + T_{offset}$
Voltage	0 to V <sub>CC</sub>	0.1	V	External	100μV	$V(\text{Volts}) = V_{slope} * V_{ad} (16 \text{ bit unsigned integer}) + V_{offset}$
Bias Current	0 to 120	5	mA	External	-	$I(\text{mA}) = I_{slope} * I_{ad}(16 \text{ bit unsigned integer}) + I_{offset}$
Tx Power	-7 to 0	±3	dBm	External	-	$Tx\_PWR(\mu W) = Tx\_PWR_{slope} * Tx\_PWR_{ad}(16 \text{ bit unsigned integer}) + Tx\_PWR_{offset}$
Rx Power	-20 to -3	±3	dBm	External	-	$Rx\_PWR(\mu W) = A_0 + A_1 * x + A_2 * x^2 + A_3 * x^3 + A_4 * x^4$

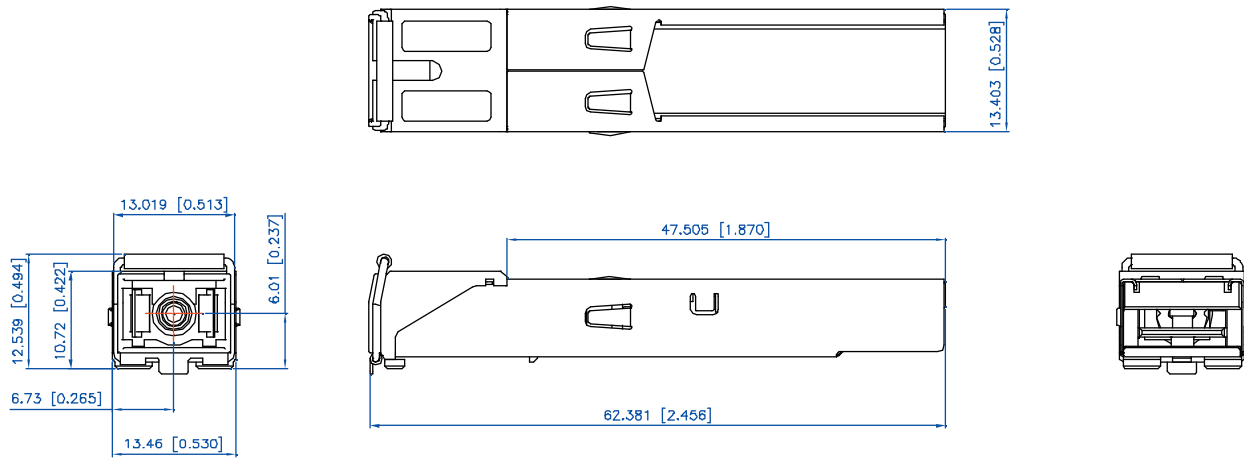
## Pinout Definitions

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

## SPS-43-GB-EBX-CxC

EEPROM Serial ID				
Name of Field	Description of Field	Address	Hex	ASCII
Vendor Name	SFPVendor 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 PN	Part number in ASCII, e.g. SPS43GBEBXCDC	40	53	S
		41	50	P
		42	53	S
		43	34	4
		44	33	3
		45	47	G
		46	42	B
		47	45	E
		48	42	B
		49	58	X
		50	43	C
		51	44	D
		52	43	C

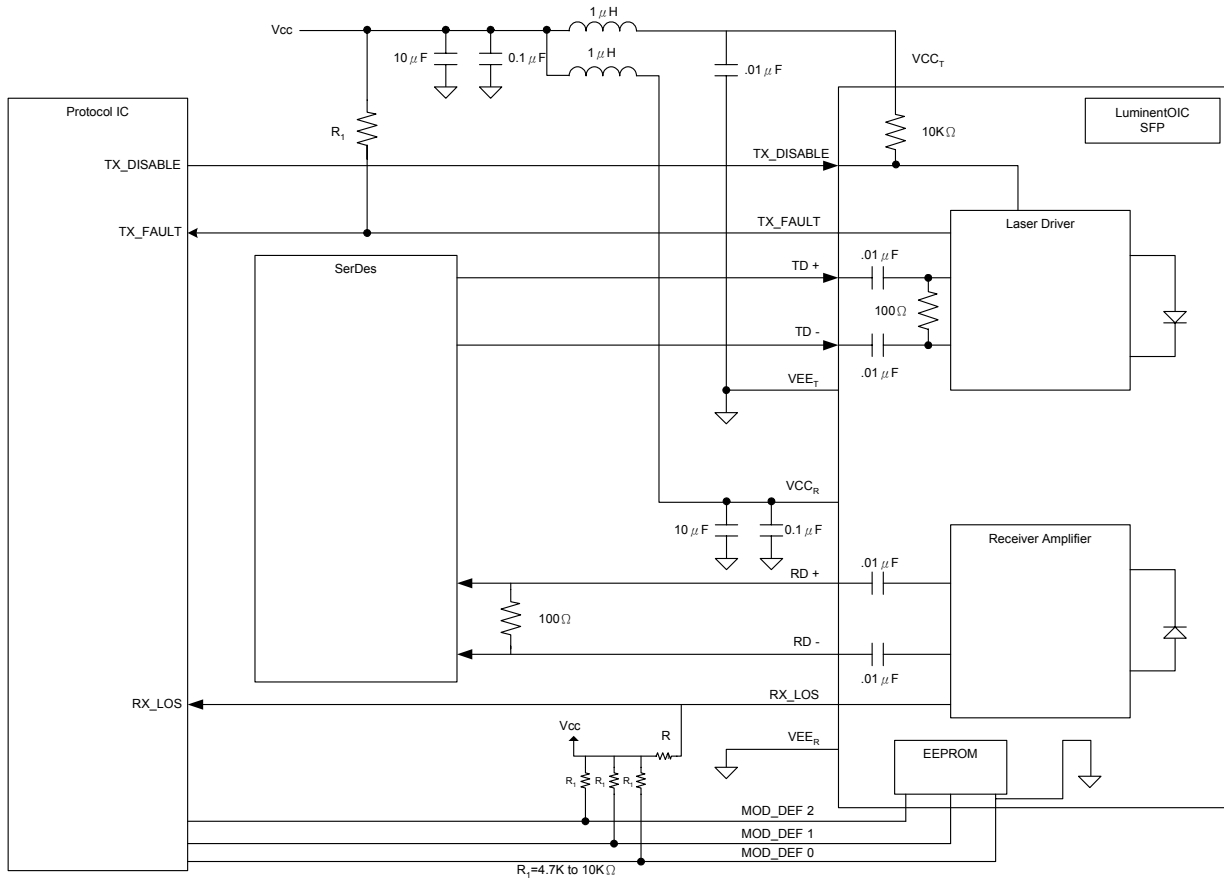
Mechanicals



Units in mm(inches)

SPS-43-GB-EBX-CxC

Suggested Transceiver Interface

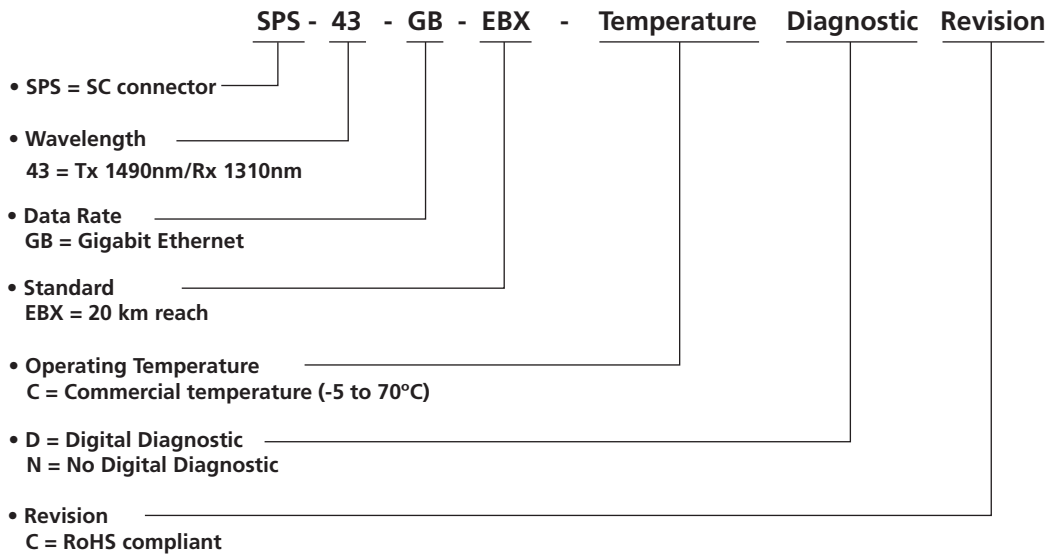


SPS-43-GB-EBX-CxC

Ordering Information

Available Options:  
 SPS-43-GB-EBX-CNC  
 SPS-43-GB-EBX-CDC

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.

Legal Notes:

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