

SPS-45-GB-EBZ-CDC



Features

- Compliant with IEEE 802.3ah
- Simplex SC Connector
- Digital Diagnostic SFF-8472 Compliant
- SFP MSA SFF-80741i Compliant
- 31dB Min, 35 Typical Link Budget
- 120km Minimum Reach
- Commercial Temperature Available
- Single 3.3V Supply
- 1490nm DFB Laser
- APD receiver
- Telcordia GR-468 Compliant
- Color Coded Bail Latch: Purple
- RoHS compliant

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 Temperature	T_{opr}	-5	-	70	°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}	-2	0	3	dBm
Optical Crosstalk	XT	-	-45	-40	dB
Average Launch Power Tx_Off	P_{off}	-	-	-45	dBm
Extinction Ratio	ER	9	-	-	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	λ	1480	1490	1500	nm
Spectral Width (RMS, -20dB)	$\Delta\lambda$	-	-	1	nm
Side Mode Suppression Ratio	SMSR	30	-	-	dB
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 Impedance	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 (Optical)

Parameter	Symbol	Min	Typical	Max	Unit
Receiver Power Low ^a	$R_{sens,low}$	-	-35	-33	dBm
Receiver Power High ^a	$R_{sens,high}$	-9	-	-	dBm
Damage Threshold for Receiver	$P_{in, damage}$	6	-	-	dBm
Wavelength	λ	1550	1570	1590	nm
LOS Assert	-	-45	-	-	dBm
LOS De-Assert	-	-	-	-33	dBm
LOS Hysteresis	-	0.5	-	-	dB
Receiver Reflectance	-	-	-	-12	dB

a) Measured at 10^{-12} BER, PRBS 27-1, 9dB 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	-	-	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	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)	RX_LOS_H	2	-	V_{CC}	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

Diagnostics

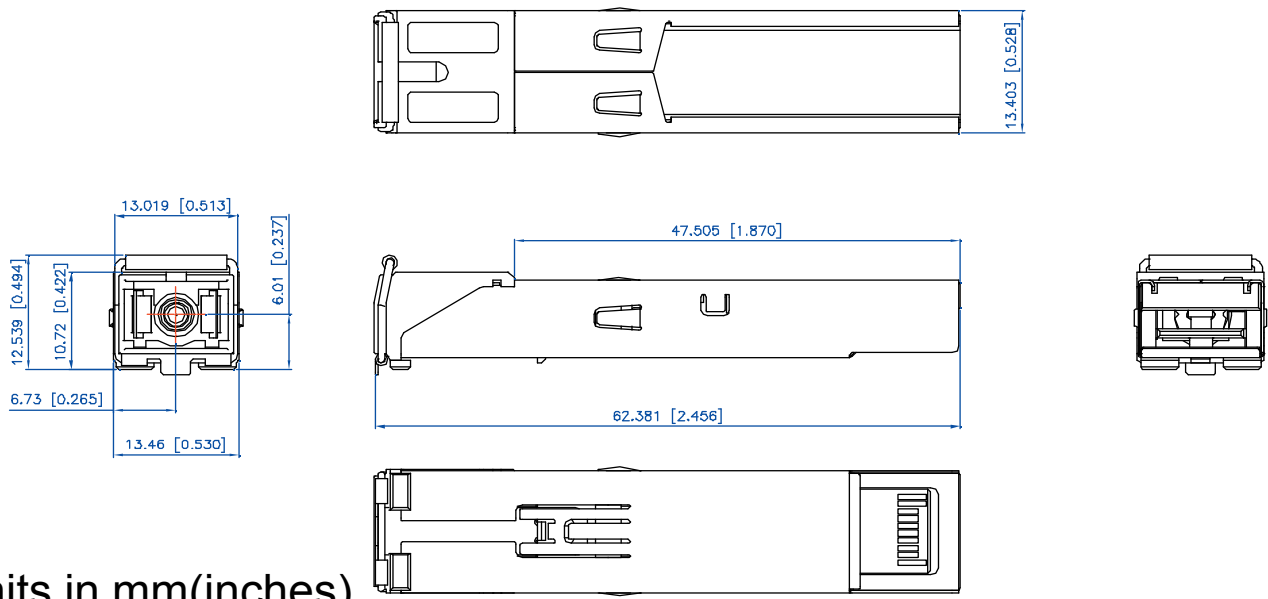
Parameter	Range	Accuracy	Unit	Calibration	Bit Value	Formula
Temperature	-5 to 70	±3	°C	External	1/256 C	$T_c(C) = T_{slope} * T_{ad}(16 \text{ bit signed twos complement value}) + T_{offset}$
Voltage	0 to Vcc	0.1	V	External	100μV	$V(\text{Volts}) = V_{slope} * V_{ad}(16 \text{ bit unsigned integer}) + V_{offset}$
Bias Current	0 to 120	5	mA	External	-	$I(\text{mA}) = I_{slope} * I_{ad}(16 \text{ bit unsigned integer}) + I_{offset}$
Tx Power	-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	-33 to -9	±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 _{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 _{CCR}	RX Power
16	V _{CCT}	TX Power
17	V _{eeT}	TX GND
18	TXD+	TX Data Positive
19	TXD-	TX Data Negative
20	V _{eeT}	TX GND

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 P/N	Part number in ASCII, e.g. SPS-45-GB-EBZ-CDC	40	53	S
		41	50	P
		42	53	S
		43	34	4
		44	35	5
		45	47	G
		46	42	B
		47	45	E
		48	42	B
		49	5A	Z
		50	43	C
		51	44	D
		52	43	C

SC Connector Mechanicals



Units in mm(inches)

Ordering Information

Available Options:
SPS-45-GB-EBZ-CDC

Part Numbering Definition:

SPS - 45 - GB - EBZ - Temperature Diagnostic Revision

- SPS = SC connector
- Wavelength
45 = Tx 1490nm/Rx 1570nm
- Data Rate
GB = GigaBit Ethernet
- Reach
EBZ = 120 km
- Operating Temperature
C = Commercial temperature (-5 to 70°C)
- D = Digital Diagnostic (SFF-8472)
- Revision
C = 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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