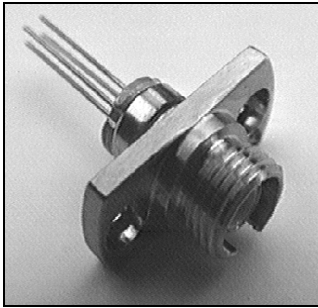
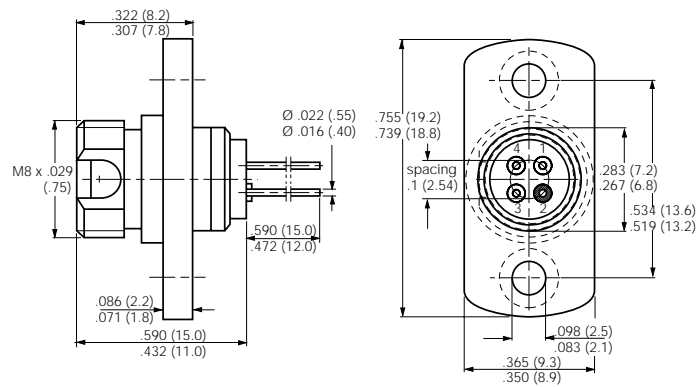


LOW POWER **STL81007x**

1550 nm FP Laser in FC Receptacle Package

Dimensions in inches (mm)



FEATURES

- Designed for applications in fiber optic networks
- Laser Diode with Multi-Quantum Well structure
- Suitable for bit rates up to 1 Gbit/s
- Ternary Photodiode at rear mirror for monitoring and control of radiant power
- Hermetically sealed subcomponents, similar to TO 46
- SM receptacle with 2-hole flange and optional connector

Absolute Maximum Ratings

Module

- Operating temperature range at case, T_C -40°C to 85°C
- Storage temperature range, T_{stg} -40°C to 85°C
- Soldering temperature $t_{max}=10$ s,
 2 mm distance from bottom edge of case, T_S260°C

Laser Diode

- Direct forward current, $I_{F\ max}$ 120 mA
- Radiant power CW, $P_{F, rad}$ 1 mW
- Reverse Voltage, V_R 2 V

Monitor Diode

- Reverse Voltage, V_R10 V
- Forward Current, I_F 2 mA

DESCRIPTION

www.DataSheet4U.com

Differences between a Fabry-Perot and a DFB Laserdiode

A conventional laser consists of an amplifying medium and two end mirrors. The cavity is longer than one wavelength, and a standing wave is created. The number n of half wavelengths λ

is $n = 2 \times \frac{L}{\lambda}$. If $L \gg \lambda$ then we speak of a Fabry-Perot Laser

because the laserdiode emits multi-longitudinal modes. Typically the laserdiode is 250 μm long. For $\lambda = 1310 \text{ nm}/1550 \text{ nm}$ n is about 350. Therefore for many neighboring wavelengths the "standing wavelength" condition specified above is fulfilled. For a DFB-Laser a special grating acts as a distributed filter allowing only one of the cavity's longitudinal modes to propagate. This can be described with a reduced oscillator length \tilde{L} which is in the range of λ . For such a reduced oscillator length the standing wavelength condition will be fulfilled for $n \approx 2$ what means for only one wavelength.

Figure 1. Fabry-Perot Laserdiode

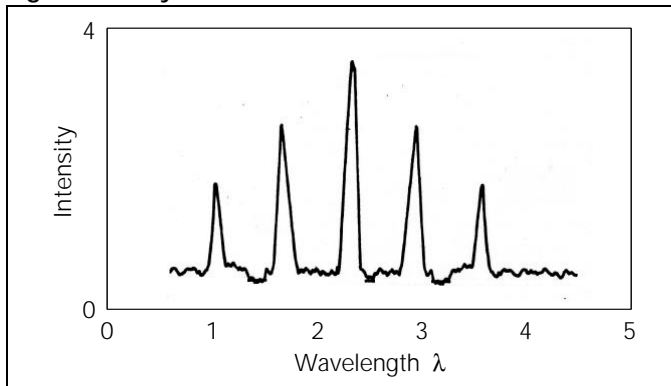
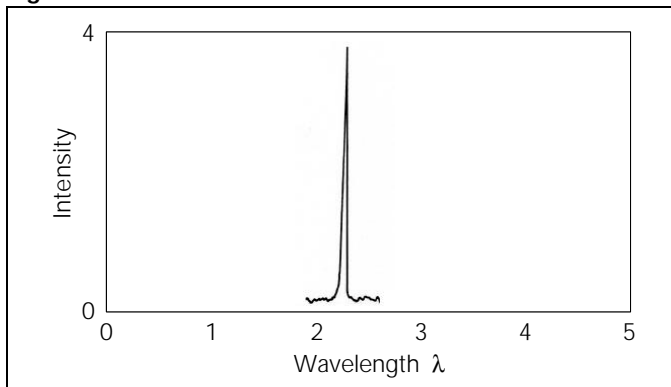


Figure 2. DFB Laserdiode



TECHNICAL DATA

The electro-optical characteristics described in the following tables are only valid for use within the specified maximum ratings or under the recommended operating conditions.

Transmitter Electro-Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units
Optical output power (maximum)	$P_{F, \text{max}}$	0.4			mW
Emission wavelength center of range $P_F = 0.5 P_{F, \text{max}}$	λ_{trans}	1510		1590	nm
Spectral width (RMS)	σ_λ			5	
Temperature coefficient of wavelength	TC			0.5	nm/K
Threshold current (whole temperature range)	I_{th}	2		45	mA
Forward voltage $P_F = 0.5 P_{F, \text{max}}$	V_F			1.5	V
Radiant power at I_{th}	P_{th}			10	μW
Slope efficiency (-40...85°C)	η	8		60	mW/A
Variation of 1st derivative of P/I (0.05 to 0.4 mW)	S_{var}	-30		30	%
Differential series resistance	R_S			8	Ω
Rise time (10%-90%)	t_r		100	200	ps
Fall time (10%-90%)	t_f		270	500	

Monitor Diode Electro-Optical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units
Dark current, $V_R = 5 \text{ V}$, $P_F = 0$, $T = T_{\text{max}}$	I_R			500	nA
Photocurrent, $V_R = 5 \text{ V}$, $P_F = 0.5 P_{F, \text{max}}$	I_P	100		1000	μA
Capacitance, $V_R = 5 \text{ V}$, $f = 1 \text{ MHz}$	C_5			10	pF
Tracking error ⁽¹⁾ , $V_R = 5 \text{ V}$	TE	-1		1	dB

Note

- The tracking error TE is the maximum deviation of P_F at constant current I_{mon} over a specified temperature range and relative to the reference point: $I_{\text{mon,ref}} = I_{\text{mon}} (T = 25^\circ\text{C}, P_F = 0.5 P_{F, \text{max}})$. Thus, TE is given by:

$$\text{TE [dB]} = 10 \times \log \frac{P_F [T_c]}{P_F [25^\circ\text{C}]}$$

End of Life Time Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Units
Threshold current at $T=T_{max}$	I_{th}			60	mA
Current above threshold, over full temperature range, at $I_{mon,ref}=I_{mon}$ ($T=25^{\circ}C$, $P_F=0.5 P_{F,max}$, BOL)	ΔI_F	7		70	
Tracking Error	TE	-1.5		1.5	dB
Monitor Dark Current, $V_R=2V$, $T=T_{max}$	I_R			1	μA

FIBER DATA

The mechanical fiber characteristics are described in the following table.

Fiber Characteristics

Parameter	Min.	Typ.	Max.	Units
Mode Field Diameter	8	9	10	μm
Cladding Diameter	123	125	127	
Mode Field/Cladding Concentricity Error			1	
Cladding Non-circularity			2	%
Mode Field Non-circularity			6	
Cut off Wavelength	1270			nm
Jacket Diameter	0.8		1	mm
Bending Radius	30			
Tensile Strength Fiber Case	5			N
Length	0.8		1.2	m

Pin Description and Flange

Pinning (bottom view)	Pin Description
Transmitter	
Available Pinnings with Flange	
Type	Transmitter
STL81007x	1

Regulatory Compliance

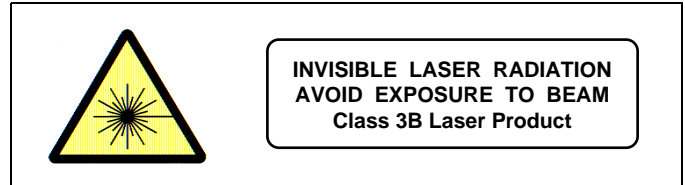
Feature	Standard	Comments
Electrostatic Discharge (ESD) to the Electrical Pins	MIL-STD 883D Method 3015.7	Class 1 (<500 V)

EYE SAFETY

Ensure to avoid exposure of human eyes to high power laser diode emitted laser beams. Especially do not look directly into the laser diode or the collimated laser beam when the diode is activated.

CLASS 3B LASER PRODUCT according to IEC 60825-1

Required Labels



Class IIb LASER PRODUCT according to FDA Regulations complies with 21 CFR 1040.10 and 1040.11

Required Label



Laser Data

Wavelength	1550 nm
Maximum total output power	less than 50 mW
Beam divergence ($1/e^2$)	10°

FLANGE OPTION

Model	Type
STH51007G	SM FC Receptacle Package

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