

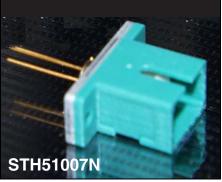
STH51007x

High Power 1300 nm FP Laser in FC or SC Receptacle Package

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







Pin Configuration and Flange

Pin Configuration and Flange

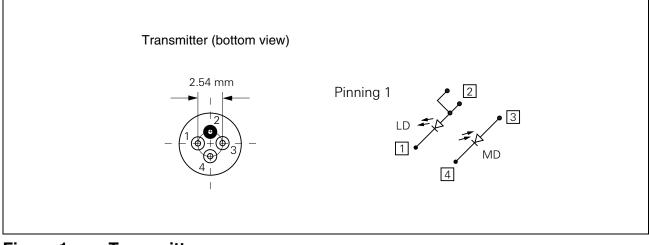


Figure 1 Transmitter

Available Pinnings with Flange

Туре	Transmitter
STH51007x	1



Description

Description

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 >> λ then we speak of a Fabry-Perot Laser because the

laserdiode emits multi-longitudinal modes. Typically the laserdiode is 250 μ m 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.

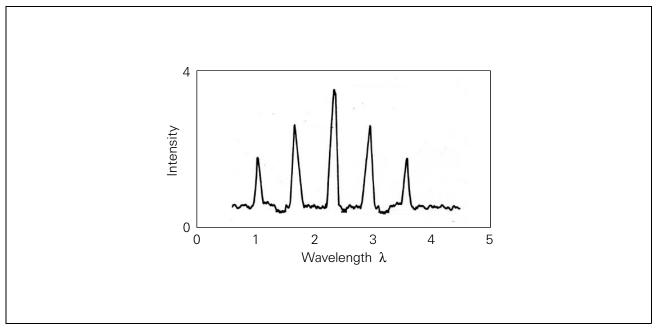
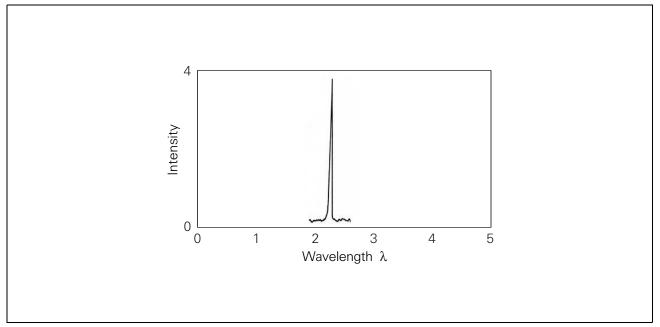


Figure 2 Fabry-Perot Laserdiode



STH51007x

Description





Regulatory Compliance

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



Technical Data

Technical Data

Absolute Maximum Ratings

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Module				
Operating temperature range at case	T _C	-40	85	°C
Storage temperature range	T _{stg}	-40	85	
Soldering temperature ($t_{max} = 10$ s, (2 mm distance from bottom edge of case)	T _S		260	
Laser Diode				·
Direct forward current	I _{F max}		120	mA
Radiant power CW	$P_{\rm F, rad}$		4	mW
Reverse Voltage	V_{R}		2	V
Monitor Diode				·
Reverse Voltage	V_{R}		10	V
Forward Current	I _F		2	mA

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	Limit Values			Unit
		min.	typ.	max.	
Optical output power (maximum)	P _{F, max}	> 2.4			mW
Emission wavelength center of range, $P_{\rm F}$ = 0.5 $P_{\rm F, max.}$	λ_{trans}	1280		1330	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, $P_{\rm F} = 0.5 P_{\rm F, max.}$	V_{F}			1.5	V
Radiant power at $I_{\rm th}$	P_{th}			80	μW



Technical Data

Transmitter Electro-Optical Characteristics (cont'd)

Parameter	Symbol	Limit Values			Unit
		min.	typ.	max.	
Slope efficiency (-4085°C)	η	40		160	mW/A
Variation of 1st derivative of P/I (0.2 to 2 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%)	<i>t</i> _f		270	500	

Monitor Diode Electro-Optical Characteristics

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Dark current, $V_{\rm R}$ = 5 V, $P_{\rm F}$ = 0, $T = T_{\rm max}$	I _R		500	nA
Photocurrent, $V_{\rm R}$ = 5 V, $P_{\rm F}$ = 0.5 $P_{\rm F, max}$	I _P	100	1000	μA
Capacitance, $V_{\rm R}$ = 5 V, f = 1 MHz	<i>C</i> ₅		10	pF
Tracking error ¹⁾ , $V_{\rm R}$ = 5 V	TE	-1	1	dB

¹⁾ The tracking error TE is the maximum deviation of $P_{\rm F}$ at constant current $I_{\rm mon}$ over a specified temperature range and relative to the reference point: $I_{\rm mon, ref} = I_{\rm mon}$ ($T = 25^{\circ}$ C, $P_{\rm F} = 0.5 P_{\rm F, max}$). Thus, TE is given by:

 $\mathsf{TE}[\mathsf{dB}] = 10 \times \log \frac{P_{\mathsf{F}}[T_{\mathsf{C}}]}{P_{\mathsf{F}}[25^{\circ}\mathsf{C}]}$

End of Life Time Characteristics

Parameter	Symbol	Limit Values		Unit
		min.	max.	
Threshold current at $T = T_{max}$	I_{th}		60	mA
Current above threshold, over full temperature range, at $I_{\text{mon, ref}} = I_{\text{mon}}$ $(T = 25^{\circ}\text{C}, P_{\text{F}} = 0.5 P_{\text{F, max.}}, \text{BOL})$	ΔI_{F}	7	70	
Tracking Error	TE	-1.5	1.5	dB
Monitor Dark Current, $V_{\rm R}$ = 2 V, $T = T_{\rm max}$	I _R		1	μA



Fiber Data

Fiber Data

The mechanical fiber characteristics are described in the following table.

Fiber Characteristics

Parameter	Limit Values			Unit
	min.	typ.	max.	
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			Ν
Length	0.8		1.2	m



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

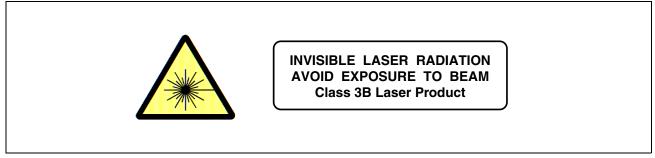


Figure 4 Required Labels

Class IIIb Laser Product According to FDA Regulations Complies with 21 CFR 1040.10 and 1040.11



Figure 5 Required Label

Laser Data

Wavelength	1300 nm
Maximum total output power	less than 50 mW
Beam divergence (1/e ²)	10°



Package Outlines

Package Outlines

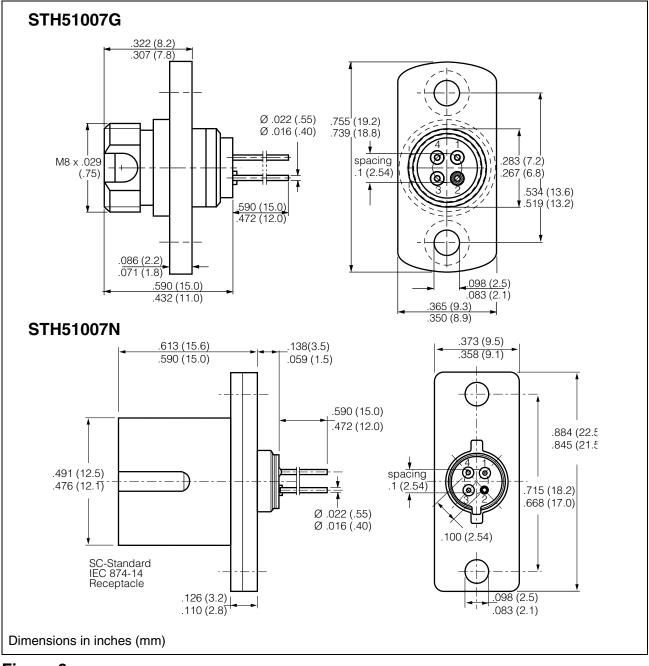


Figure 6

Flange Options

Model	Туре
STH51007G	SM FC Receptacle Package
STH51007N	SM SC Receptacle Package

STH510	07x		
Revisio	n History:	2001-06-01	DS0
Previous	s Version:		
Page	Subjects	(major changes since last revision)	
	Documen	t's layout has been changed: 2002-Aug.	

For questions on technology, delivery and prices please contact the Infineon Technologies Offices in Germany or the Infineon Technologies Companies and Representatives worldwide: see our webpage at http://www.infineon.com.

Edition 2001-06-01

Published by Infineon Technologies AG, St.-Martin-Strasse 53, D-81541 München, Germany © Infineon Technologies AG 2002. All Rights Reserved.

Attention please!

The information herein is given to describe certain components and shall not be considered as warranted characteristics.

Terms of delivery and rights to technical change reserved.

We hereby disclaim any and all warranties, including but not limited to warranties of non-infringement, regarding circuits, descriptions and charts stated herein.

Infineon Technologies is an approved CECC manufacturer.

Information

For further information on technology, delivery terms and conditions and prices please contact your nearest Infineon Technologies Office in Germany or our Infineon Technologies Representatives worldwide.

Warnings

Due to technical requirements components may contain dangerous substances. For information on the types in question please contact your nearest Infineon Technologies Office.

Infineon Technologies Components may only be used in life-support devices or systems with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system, or to affect the safety or effectiveness of that device or system. Life-support devices or systems are intended to be implanted in the human body, or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.