



## Active Components Pump Laser Modules

Datasheet

### Key Features

Up to 800mW operating power

Low Power Consumption

Extended operating temperature range  
(-5 °C to +75 °C)

Fiber Bragg Grating (FBG) on SMF

High wavelength and power stability  
Telcordia GR-468-CORE qualified  
RoHS compliant

### Applications

High output power low noise EDFAs

Dense wavelength division multiplexing  
EDFAs

CATV

## 1999CHB

### 980 nm Cooled Pump Laser Module 880mW Kink-free

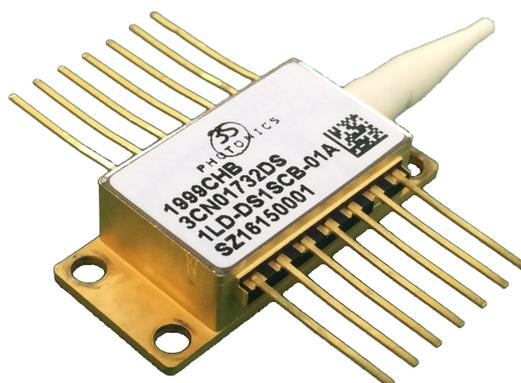
The 1999CHB is a new generation of 980 nm terrestrial pump modules powered by an in-house chip technology fully qualified, ensuring an outstanding level of performance and reliability.

Low Profile, 14-pin butterfly modules are available with an operating power up to 800 mW.

They incorporate a thermoelectric cooler (TEC), a precision NTC thermistor and a back-facet monitoring photodiode.

The 1999CHB family has been designed to ensure high wavelength and power stability performance at low power with a 16.5dB dynamic range.

The module meets the Telcordia™ GR-468-Core requirements for hermetic 980 nm pump modules.



## For more Info

Please contact us at:  
Europe & Asia: +33 169 805 750  
North America: +1 514 748 4848, Ext 4374  
[customerservice@3sptechnologies.com](mailto:customerservice@3sptechnologies.com)  
[www.3sptechnologies.com](http://www.3sptechnologies.com)



## ELECTRO-OPTICAL CHARACTERISTICS

The following parameters are specified BOL for a  $T_{\text{submount}} = 25\text{ }^{\circ}\text{C}$ ,  $T_{\text{case}} = -5\text{ }^{\circ}\text{C}$  to  $75\text{ }^{\circ}\text{C}$ ,  $V_{\text{BFM}} = -5\text{ V}$  and  $-50\text{ dB}$  max back-reflection unless otherwise stated.

Parameters	Conditions	Symbol	Min	Typ	Max	Unit
<b>PUMP LASER</b>						
Threshold current <sup>(1)</sup>		$I_{\text{th}}$	-	-	80	mA
Nominal operating power		$P_{\text{nom}}$	550	-	800	mW
Kink free power <sup>(2)</sup>		$P_{\text{kink}}$	$1.1 \times P_{\text{nom}}$	-	-	mW
Forward current <sup>(3)</sup>	$P_{\text{nom}} = 550\text{ mW}$	$I_{\text{nom}}$	-	-	900	mA
	$P_{\text{nom}} = 600\text{ mW}$		-	-	1000	
	$P_{\text{nom}} = 650\text{ mW}$		-	-	1060	
	$P_{\text{nom}} = 680\text{ mW}$		-	-	1100	
	$P_{\text{nom}} = 700\text{ mW}$		-	-	1100	
	$P_{\text{nom}} = 750\text{ mW}$		-	-	1200	
	$P_{\text{nom}} = 800\text{ mW}$		-	-	1250	
Forward voltage	@ 800 mW	$V_{\text{nom}}$	-	-	2.1	V
Peak wavelength tolerance	@ $T_{\text{case}} = T_{\text{FBG}} = 25\text{ }^{\circ}\text{C}$ Power Range	$\Delta\lambda_p$	-	-	$\pm 1$	nm
Wavelength tuning vs temperature ( $T_{\text{FBG}} = -5$ to $75\text{ }^{\circ}\text{C}$ )	Power Range	$\Delta\lambda_p / \Delta T$	-	-	0.02	nm / $^{\circ}\text{C}$
Spectral width @ -3 dB	Power Range	$\Delta\lambda_{\text{FWHM}}$	-	-	1.0	nm
Power range			15		$P_{\text{nom}}$	mW
Power in band <sup>(4)</sup>	$P_{\text{nom}}$	$P_{\text{band}}$	90	-	-	%
Optical power stability	Peak to peak, 1 Hz-50 kHz, 60 sec, $15\text{ mW} \leq P < 20\text{ mW}$ $20\text{ mW} \leq P \leq P_{\text{nom}}$	$\Delta P$	-	-	0.2 0.1	dB
Power consumption, EOL	$1.1 P_{\text{nom}} = 800\text{ mW}$		-	-	8	W
<b>MONITOR DIODE</b>						
Responsivity	$V_r = 5\text{ V}$ , $P_{\text{nom}}$	$I_{\text{BFM}} / P$	0.5	-	10	$\mu\text{A} / \text{mW}$
Dark current	$V_r = 5\text{ V}$	$I_{\text{BFM\_dark}}$	-	-	100	nA
<b>THERMO-ELECTRICAL COOLER</b>						
TEC voltage (EOL)	$T_{\text{case}} = 75\text{ }^{\circ}\text{C}$ , $1.1 P_{\text{nom}} = 800\text{ mW}$	$V_{\text{TEC, EOL}}$	-	-	3.1	V
TEC current (EOL)		$I_{\text{TEC, EOL}}$	-	-	1.5	A
TEC Power consumption		$P_{\text{TEC, EOL}}$	-	-	4.65	W
<b>THERMISTOR</b>						
Resistance	$25\text{ }^{\circ}\text{C}$	$R_{\text{th}}$	9.5	-	10.5	$\text{k}\Omega$
Constant		$\beta$	3600	-	4200	K

(1)  $I_{\text{th}}$  is the intersection point with the x-axis of a linear fit of the P(I) curve between 15 mW and 50 mW

(2) A kink is detected when the local slope  $dP/dI$  is below  $S_{\text{min}}$  or above  $S_{\text{max}}$ .  $S_{\text{min}}$  is defined as  $0.5 \times S_{\text{avg}}$  and  $S_{\text{max}}$  is defined as  $1.5 \times S_{\text{avg}}$

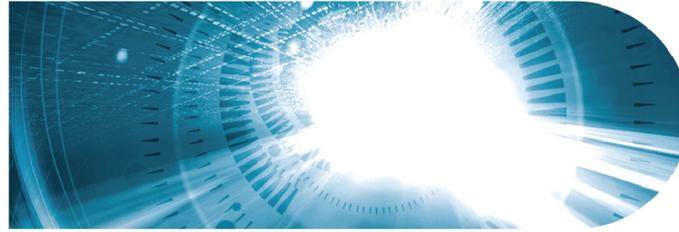
(3) EOL forward current  $I(\text{EOL}) = 1.1 \times I(\text{BOL})$

(4)  $P_{\text{band}}$  is defined as the power within the band  $\lambda_p \pm 1.5\text{ nm}$  vs the total output power

# 1999CHB

880mW Kink-free,  
FBG Stabilized,  
980 nm Cooled  
Pump Laser Module

**3SP**Technologies  
Source of Smart Solutions



3

## ABSOLUTE MAXIMUM RATINGS

Exposing this device to stresses and conditions above those listed in this section could cause permanent damage and affect reliability. The device is not meant to operate outside the operational limits described in previous section at any length of time.

Parameter Conditions	Symbol	Min	Max	Unit
Storage temperature (2000 h)	$T_{stg}$	-40	85	°C
Operating temperature ( $T_{submount} = 25\text{ °C}$ )*	$T_{op}$	-20	75	°C
Lead soldering temperature (10 s maximum)		-	280	°C
Storage Relative Humidity (Non Condensing)		5	95	%
Operating Relative humidity		5	85	%
LD forward drive current (10 s maximum)	$I_{f\_max}$	-	1300	mA
LD reverse voltage	$V_{r\_max}$	-	2.0	V
PD reverse voltage	$V_{PD\_max}$	-	15	V
PD forward current	$I_{PD\_max}$	-	10	mA
TEC voltage	$V_{TEC\_C\_max}$	-4.2	4.2	V
TEC current	$I_{TEC\_C\_max}$	-2.0	2.0	A
ESD** LD damage	$V_{ESD-LD}$	-	1000	V
ESD** MPD damage	$V_{ESD-MPD}$	-	500	V
Mounting torque		-	150	mN.m
Fiber bend radius		16	-	mm
Axial pull force (1x1 min)		-	5	N

\* No cold start. TEC will be turned on first.

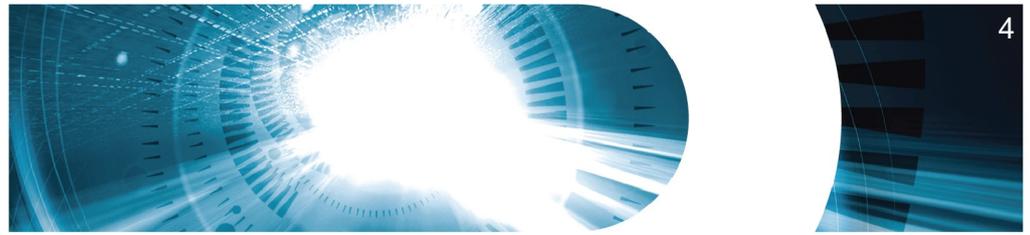
\*\* Human Body model, C = 100 pF, R = 1.5 k $\Omega$

## FIBER PIGTAIL CHARACTERISTICS

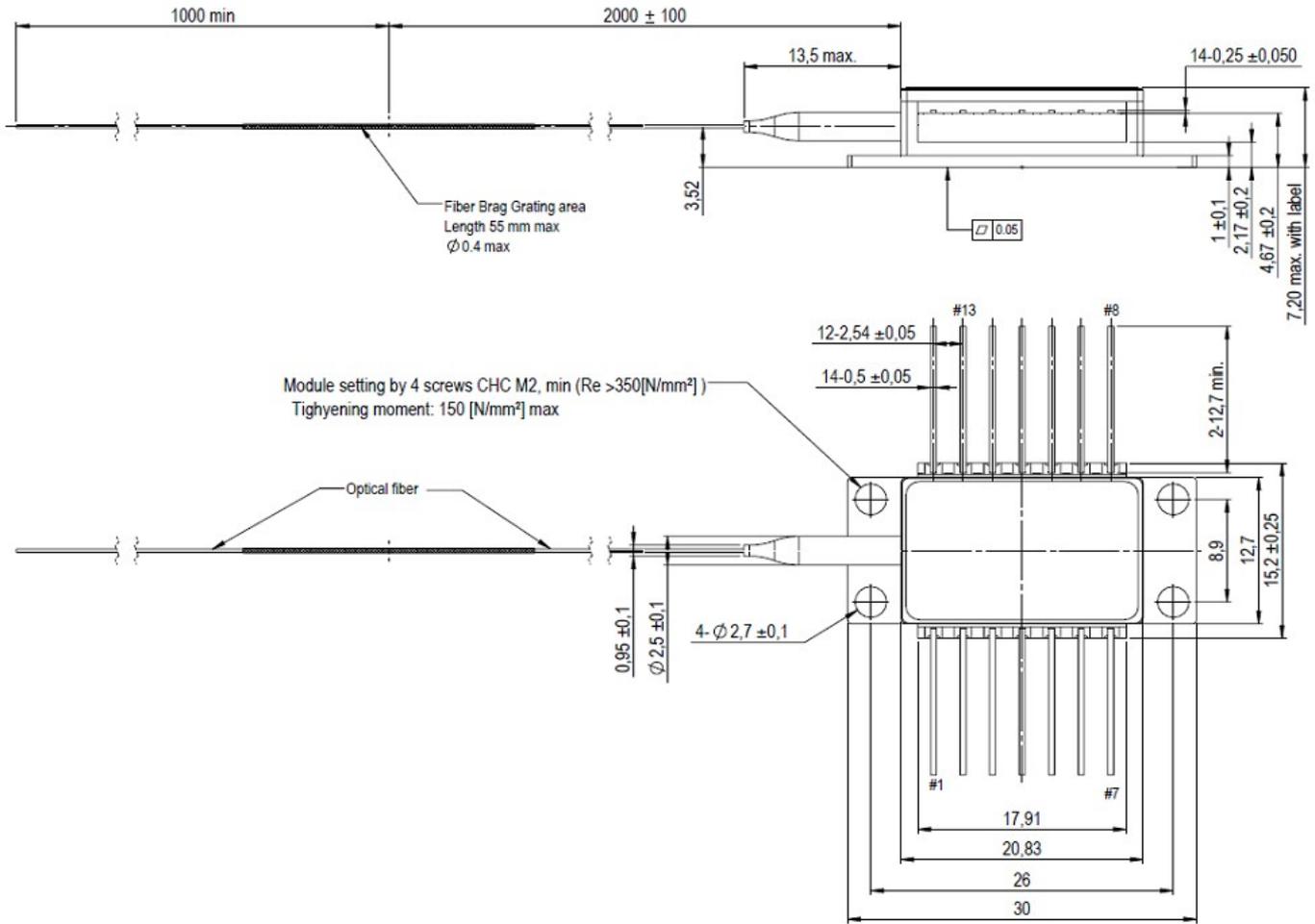
Parameter	Note	Min	Typ	Max	Unit
Fiber type		HI1060™ or equivalent			
Coating diameter	(except along grating)	230	250	270	$\mu\text{m}$
FBG recoat diameter		-	-	400	$\mu\text{m}$
FBG position	Module to center of FBG	-	2	-	m
Fiber proof test level		200	-	-	kpsi
Grating proof test level		150	-	-	kpsi
Pigtail termination	Bare fiber				

# 1999CHB

880mW Kink-free,  
FBG Stabilized,  
980 nm Cooled  
Pump Laser Module



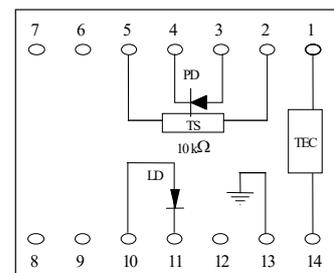
## MECHANICAL DETAILS



Dimensions are in mm

## PIN ASSIGNMENT

N°	Description	N°	Description
1	TEC (+)	8	No connect
2	Thermistor	9	No connect
3	Monitor PD Anode	10	Laser Anode (+)
4	Monitor PD Cathode	11	Laser Cathode (-)
5	Thermistor	12	No connect
6	No connect	13	Ground
7	No connect	14	TEC (-)

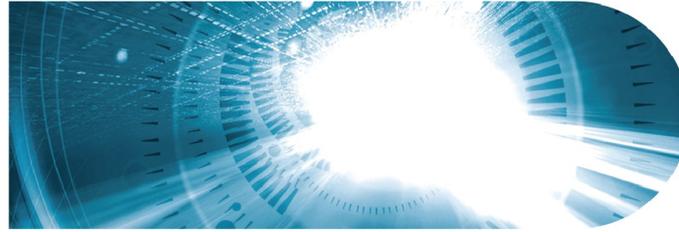


Totally floating pin-out

# 1999CHB

880mW Kink-free,  
FBG Stabilized,  
980 nm Cooled  
Pump Laser Module

**3SP**Technologies  
Source of Smart Solutions



5

## LASER SAFETY INFORMATION

This laser module emits invisible light. Take appropriate precautions to prevent undue exposure to naked eye when module is in operation. This product is classified Class 4 Laser Product according to IEC-60825-1.

## HANDLING

This product is sensitive to electrostatic discharge and should not be handled except at a static free workstation. Take precautions to prevent ESD; use wrist straps, grounded work surfaces and recognized anti-static techniques when handling the pump laser module. Caution! Handle the module by its package only; never hold it by its pigtail.

Care should be taken to avoid supply transient currents and voltages. Drive voltage above the maximum specified in absolute maximum rating section may cause permanent damage to the device.



## APPLICATION NOTE

In order to prevent any mishandling, misuse, neglect or accident, it is highly recommended to read and follow the instructions detailed in the application note reference "3SPT\_980nm Cooled 14\_10 pin butterfly module & Raman pump\_Application Note\_RCLIMAAPN00000007" that can be downloaded from 3SP Technologies website: <http://www.3sptechnologies.com>

## ORDERING INFORMATION

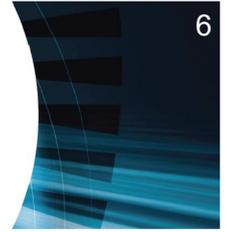
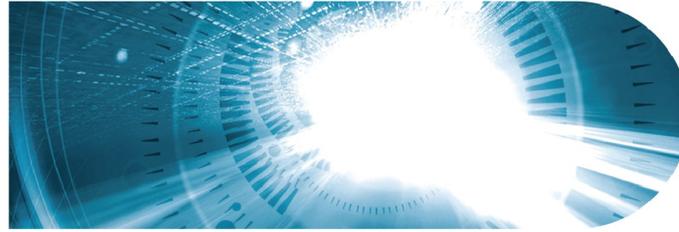
### 1999CHB PUMP PRODUCT FAMILY

SMF Pigtail	$\lambda_p = 974.0 \text{ nm}$ , T= 25 °C	$\lambda_p = 976.0 \text{ nm}$ T= 25 °C
Nominal Power	Part Number	Part Number
550mW	3CN04019EL	3CN04020EL
600mW	3CN04019FA	3CN04020FA
650mW	3CN04019FL	3CN04020FL
680mW	3CN04019FS	3CN04020FS
700mW	3CN04019GA	3CN04020GA
750mW	3CN04019GL	3CN04020GL
800mW	3CN04019HA	3CN04020HA

# 1999CHB

880mW Kink-free,  
FBG Stabilized,  
980 nm Cooled  
Pump Laser Module

**3SP**Technologies  
Source of Smart Solutions



## CONTACT INFORMATION

Please contact us at:

Europe & Asia: +33 169 805 750

North America: +1 514 748 4848, Ext 4374

[customerservice@3spttechnologies.com](mailto:customerservice@3spttechnologies.com)

[www.3spttechnologies.com](http://www.3spttechnologies.com)

## IMPORTANT NOTICE

Information in this document is typical and must be specifically confirmed in writing by your supplier before it becomes applicable to any order or contract.

Information is subject to change without notice.

©2024 3SP Technologies S.A.S.

