3SPTechnologies
Source of Smart Solutions

Active Components
Pump Laser Modules

Datasheet

Key Features

- Up to 540mW Pop
- Small form factor, hermetically sealed 10 pin mini-butterfly package
- Pin-out compatibility with 14 pin BTF package
- Extended operating temperature range (-5 °C to +75 °C)
- Ultra Low Power Consumption (T_{chip}@40°C)
- Fiber Bragg Grating (FBG) on SMF
- High wavelength and power stability
- RoHS compliant

1999SHX

980nm Low Power Consumption 10 pin mini-butterfly Pump Module Up to 600mW kink-free

The 1999SHX 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, 10-pin butterfly modules are available with an operating power up to 540 mW. They incorporate a thermoelectric cooler (TEC), a precision NTC thermistor and a back-facet monitoring photodiode.
The 1999SHB family has been designed to ensure high wavelength and power stability performance at low power with a large dynamic range.

The 1999SHB pump module meets the Telcordia™ GR-468-Core requirements for hermetic 980 nm pump modules.

Applications

- High output power low noise Erbium-Doped Fiber Amplifiers
- Dense wavelength division multiplexing
- CATV

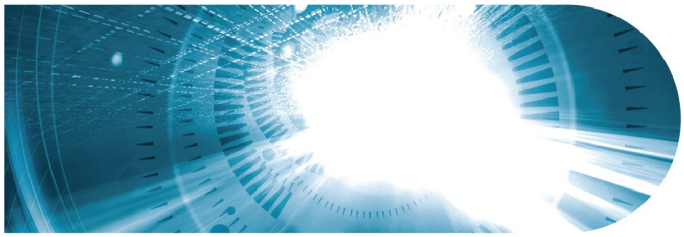
For more Info

Please contact us at:
Europe & Asia: +33 16980 5863
North America: +1 514 748 4848 ext 4374
+1 408 470 0945
sales@3spgroup.com

1999SHX

600mW Kink-free, FBG Stabilized, 980 nm 40°C Cooled 10 pin butterfly Pump Laser Module

3SP Technologies
Source of Smart Solutions

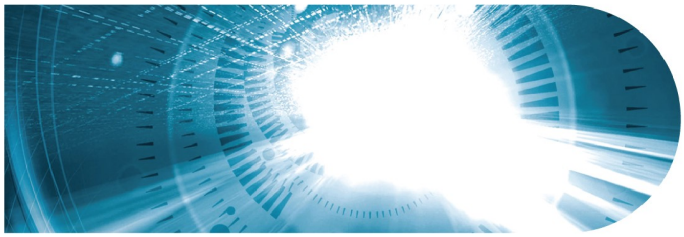


ELECTRO-OPTICAL **CHARACTERISTICS**

The following parameters are specified BOL for a $T_{submount}$ = 40 °C, T_{case} = -5 °C to 75 °C, V_{BFM}= -5 V and -50 dB max back-reflection unless otherwise stated.

Parameters	Conditions	Symbol	Min	Typ	Max	Unit
PUMP LASER						
Threshold current (1)		I_{th}	-		80	mA
Nominal operating power		P_{nom}	360	-	540	mW
Kink free power (2)		P_{kink}	1.1 x P_{nom}	-	-	mW
Forward current (3)	P_{nom}= 360 mW P_{nom}= 400 mW P_{nom}= 440 mW P_{nom}= 460 mW P_{nom}= 480 mW P_{nom}= 500 mW P_{nom}= 540 mW	I_{nom}		- - - - - - -	740 780 830 880 910 940 1010	mA
Forward voltage	@ 540 mW	V_{nom}	-	-	1.9	V
Peak wavelength tolerance	@ T_{case}= T_{FBG}= 25 °C Power range	$\Delta\lambda_p$	-	-	±1	nm
Center Wavelength		λ_{974}	973	974	975	nm
		λ_{976}	975	976	977	
Wavelength tuning vs temperature ($T_{grating}$= -5 to 75 °C)	Power range	$\Delta\lambda_p$ / ΔT	-	0.01	0.02	nm / °C
Spectral width @ -3 dB	Power range	$\Delta\lambda_{FWHM}$	-	0.6	1.0	nm
Power in band (4)	P_{nom}	P_{band}	90	-	-	%
Power Range			15		P_{nom}	mW
Optical power stability	Peak to peak, 1 Hz-50 kHz, 60 sec 15mW≤P<20mW 20mW≤P≤P_{nom}	ΔP	-		 0.2 0.1	dB
Power consumption,	P_{nom} = 540 mW		-	-	4.8	W
MONITOR DIODE						
Responsivity		I_{BFM} / P	0.5	-	10	µA / mW
Dark current	V_r = 5 V	I_{BFM_dark}	-	-	100	nA
THERMO-ELECTRICAL COOLER						
TEC voltage (EOL)	T_{case}= 75 °C, 1.1 x P_{nom} = 540mW	$V_{TEC, EOL}$	-	-	1.75	V
TEC current (EOL)		$I_{TEC, EOL}$	-	-	1.5	A
TEC Power consumption		$P_{TEC, EOL}$	-	-	2.6	W
THERMISTOR						
Resistance	40 °C	R_{th}	9.5	10	10.5	kΩ
Constant		β	3600	-	4200	K

(1) I_{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_{min} or above S_{max}. S_{min} is defined as 0.5xS_{avg} and S_{max} is defined as 1.5xS_{avg}
(3) EOL forward current I(EOL)= 1.1x I(BOL)
(4) P_{band} is defined as the power within the band λp ±1.5 nm vs the total output power



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 ($T_{submount}$ = 40 °C)*	T_{op}	-20	75	°C
Storage relative humidity (Non condensing)		5	95	%
Operating relative humidity		5	85	%
Lead soldering temperature (10 s maximum)		-	280	°C
LD forward drive current (10 s maximum)	I_{f_max}	-	1150	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	$V_{TEC\_C\_max}$	-	3.6	V
TEC current	$I_{TEC\_C\_max}$	-	4	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 kΩ

FIBER PIGTAIL **CHARACTERISTICS**

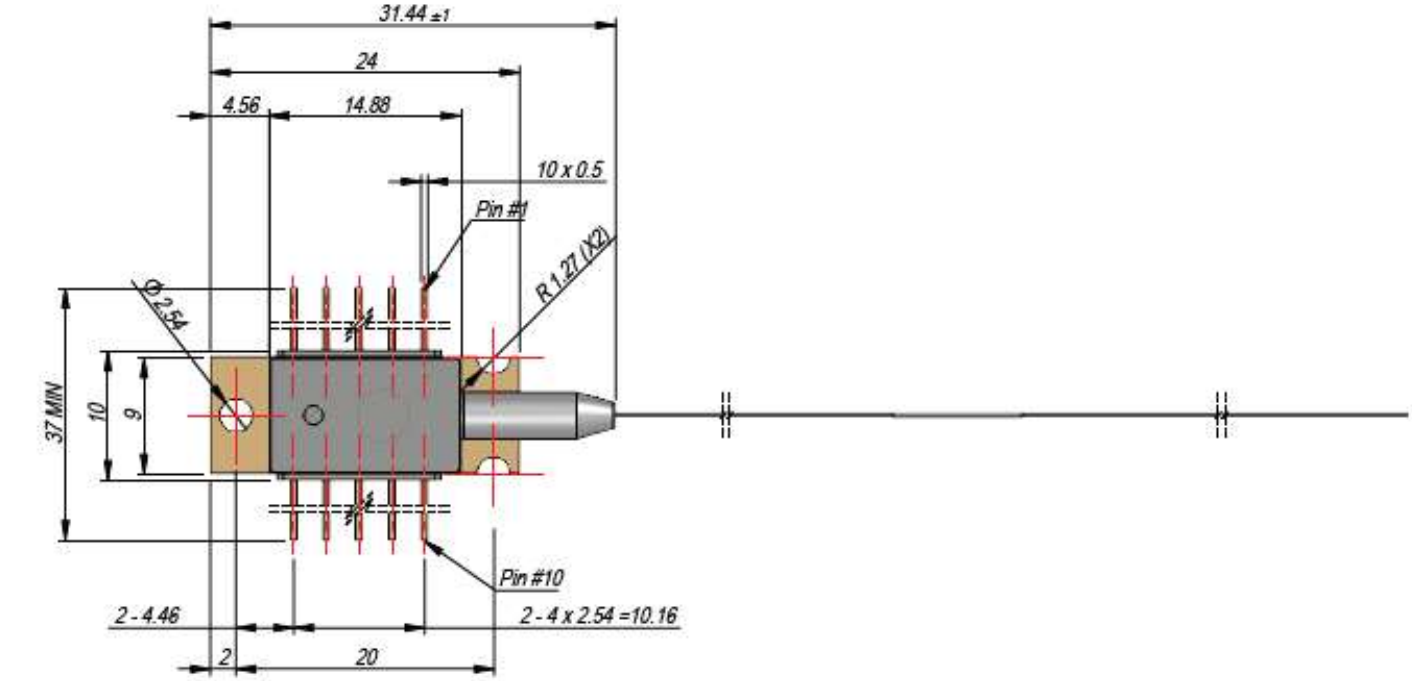
Parameter	Note	Min	Typ	Max	Unit
Fiber type		HI1060™ or equivalent			
Coating diameter	(except along grating)	230	250	270	µm
FBG recoat diameter		-	-	400	µm
FBG position	Module to center of FBG	1.9	2	2.1	m
	Center of FBG to end of pigtail	0.7			m
Fiber proof test level		200	-	-	kpsi
Grating proof test level		150	-	-	kpsi
Pigtail termination	Bare fiber				

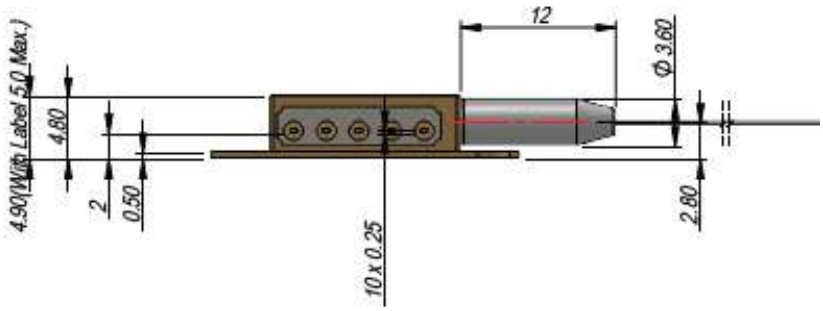
1999SHX

600mW Kink-free,
FBG Stabilized,
980 nm 40°C Cooled
10 pin butterfly Pump
Laser Module

3SPTechnologies
Source of Smart Solutions

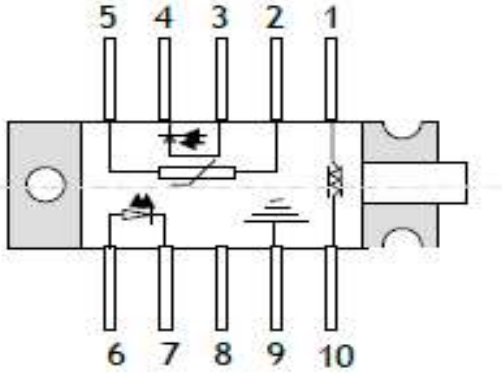
MECHANICAL **DETAILS**





Dimensions are in mm

PIN **ASSIGNEMENT**



Pin	Description	Pin	Description
1	TEC (+)	6	Laser anode (+)
2	Thermistor	7	Laser cathode (-)
3	Monitor anode (-)	8	NC
4	Monitor cathode (+)	9	Package ground
5	Thermistor	10	TEC (-)

1999SHX

**600mW Kink-free,
FBG Stabilized,
980 nm 40°C Cooled
10 pin butterfly Pump
Laser Module**

3SPTechnologies
Source of Smart Solutions

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.

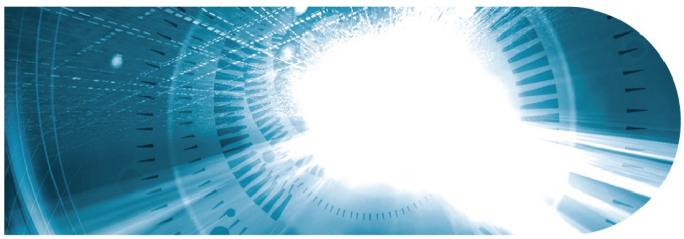
HANDLING

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.

ORDERING **INFORMATION**

1999SHX PUMP PRODUCT FAMILY

SMF Pigtail	λ_p= 974.0 nm, T= 40 °C	λ_p= 97460 nm, T= 40 °C
Nominal Power	**Part Number**	**Part Number**
360mW	3CN01760CN	3CN01761CN
400mW	3CN01760DA	3CN01761DA
440 mW	3CN01760DJ	3CN01761DJ
460 mW	3CN01760DN	3CN01761DN
480 mW	3CN01760DS	3CN01761DS
500 mW	3CN01760EA	3CN01761EA
540 mW	3CN01760EJ	3CN01761EJ



CONTACT **INFORMATION**

Europe & Asia: +33 169 805 833
North America: +1 514 748 4848 ext 4374
+1 408 470 0945

sales@3spgroup.com
www.3sptechnologies.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.

3S PHOTONICS