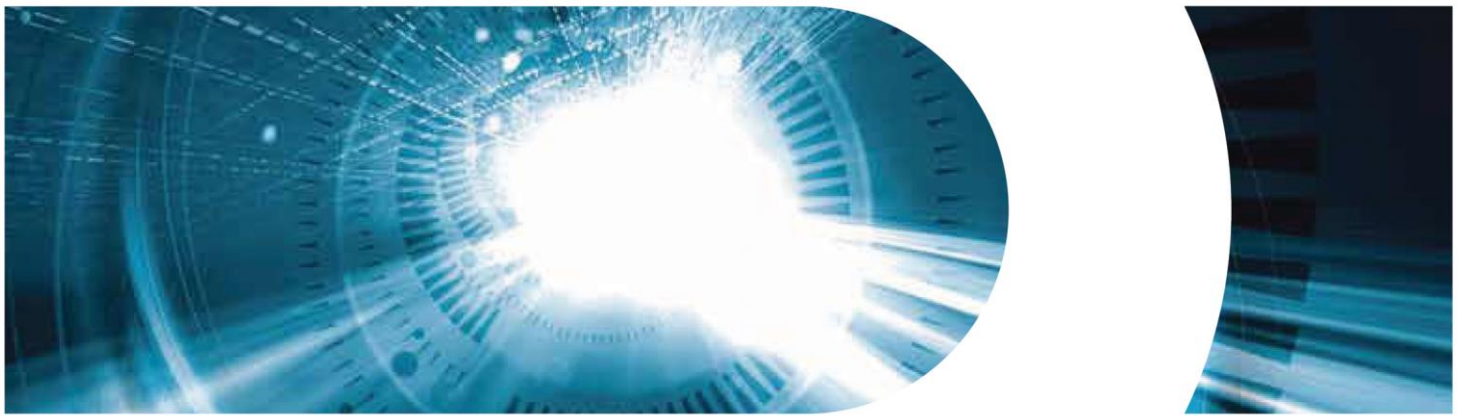


Active Components
Pump Laser Modules

Key Features

- Up to 430 mW operating power
- Operating temperature up to 75 °C
- Fiber Bragg Grating (FBG) on SMF
- Total Power Consumption: 6.0 W max @ 430 mW Pop
- Telcordia GR-468-CORE qualified
- RoHS compliant

Applications

- High output power low noise Erbium-Doped Fiber Amplifier
- Multi pumping architectures
- Sensors

1999HPM

475 mW Kink-Free, FBG Stabilized, 980 nm Cooled Pump Laser Module

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

Low Profile, 14-pin butterfly modules are available with an operating power up to 430 mW.

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

The wavelength is “locked” utilizing a fiber bragg grating (FBG) located in a Single Mode HI1060 Fiber (SMF) pigtail.

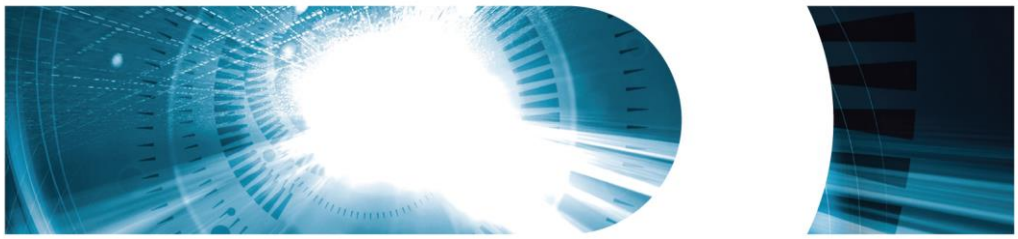
The module meets the Telcordia™ GR-468-Core requirements for hermetic 980 nm pump modules.

For more Info

Please contact us at:
Europe & Asia: +33 169 805 833
North America: +1 514 748 4848
+1 888 922 1044
sales@3spgroup.com

1999HPM

475 mW Kink-Free, FBG Stabilized, 980 nm Cooled Pump Laser Module



ELECTRO-OPTICAL **CHARACTERISTICS**

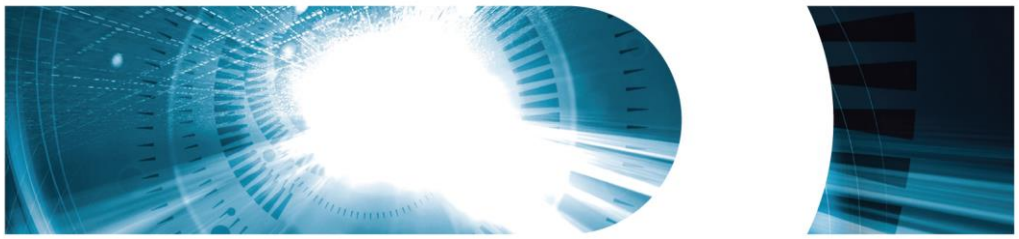
The following parameters are specified BOL for a T_{case} = -5 °C to 75 °C, V_{BFM}= -5 V and -50 dB max back-reflection unless otherwise stated.

Parameters	Conditions	Symbol	Min	Typ	Max	Unit
PUMP LASER						
Threshold current (1)		I_{th}	-	45	60	mA
Nominal operating power		P_{nom}	350	-	430	mW
Kink free power (2)		P_{kink}	1.1 x P_{nom}	-	-	mW
Forward current (3)	P_{nom}= 350 mW P_{nom}= 400 mW P_{nom}= 430 mW	I_{nom}	- - -	525 600 645	590 670 700	mA
Forward voltage	@ 430 mW	V_{nom}	-	1.8	2.1	V
Peak wavelength tolerance	@ T_{case}= T_{FBG}= 25 °C 0.1x P_{nom} to P_{nom}	$\Delta\lambda_p$	-	-	±0.5	nm
Wavelength tuning vs temperature ($T_{grating}$= -5 to 75 °C)	0.1x P_{nom} to P_{nom}	$\Delta\lambda_p$ / ΔT	-	0.01	0.02	nm / °C
Spectral width @ -3 dB	0.1x P_{nom} to P_{nom}	$\Delta\lambda_{FWHM}$	-	-	1.0	nm
Power in band (4)	P_{nom}	P_{band}	90	-	-	%
Optical power stability	Peak to peak, 10 Hz-50 kHz, 60 sec, P_{nom}	ΔP	-	<1	2	%
Power consumption, EOL	P_{nom} = 430 mW		-	-	6.0	W
MONITOR DIODE						
Responsivity		I_{BFM} / P	0.5	-	10	µA / mW
Dark current	V_r = 5 V	I_{BFM_dark}	-	50	100	nA
THERMO-ELECTRICAL COOLER						
Cooling capacity		ΔT_{TEC}	50	-	-	°C
TEC voltage (EOL)	T_{case}= 75 °C, 1.1 x I_{nom}	$V_{TEC, EOL}$	-	-	2.5	V
TEC current (EOL)		$I_{TEC, EOL}$	-	-	2.0	A
TEC Power consumption		P_{TEC}	-	-	5.0	W
THERMISTOR						
Resistance	25 °C	R_{th}	9.5	10	10.5	kΩ
Constant		B	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

1999HPM

**475 mW Kink-Free,
FBG Stabilized,
980 nm Cooled
Pump Laser Module**



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 (2000h)	T_{stg}	-40	85	°C
Operating temperature ($T_{submount}$ = 25 °C)	T_{op}	-5	75	°C
Lead soldering temperature (10s maximum)		-	280	°C
LD forward drive current	I_{f_max}	-	800	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	$V_{TEC\_C\_max}$	-	3.3	V
TEC current	$I_{TEC\_C\_max}$	-	2.4	A
ESD* damage	V_{ESD}	-	1000	V
Mounting torque		-	150	mN.m
Fiber bend radius		25	-	mm
Axial pull force (1x1min)		-	5	N

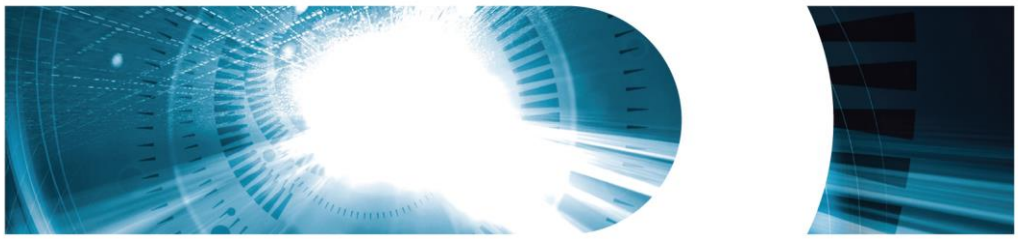
* Human Body model, C = 100 pF, R = 1.5 kΩ

FIBER PIGTAIL **CHARACTERISTICS**

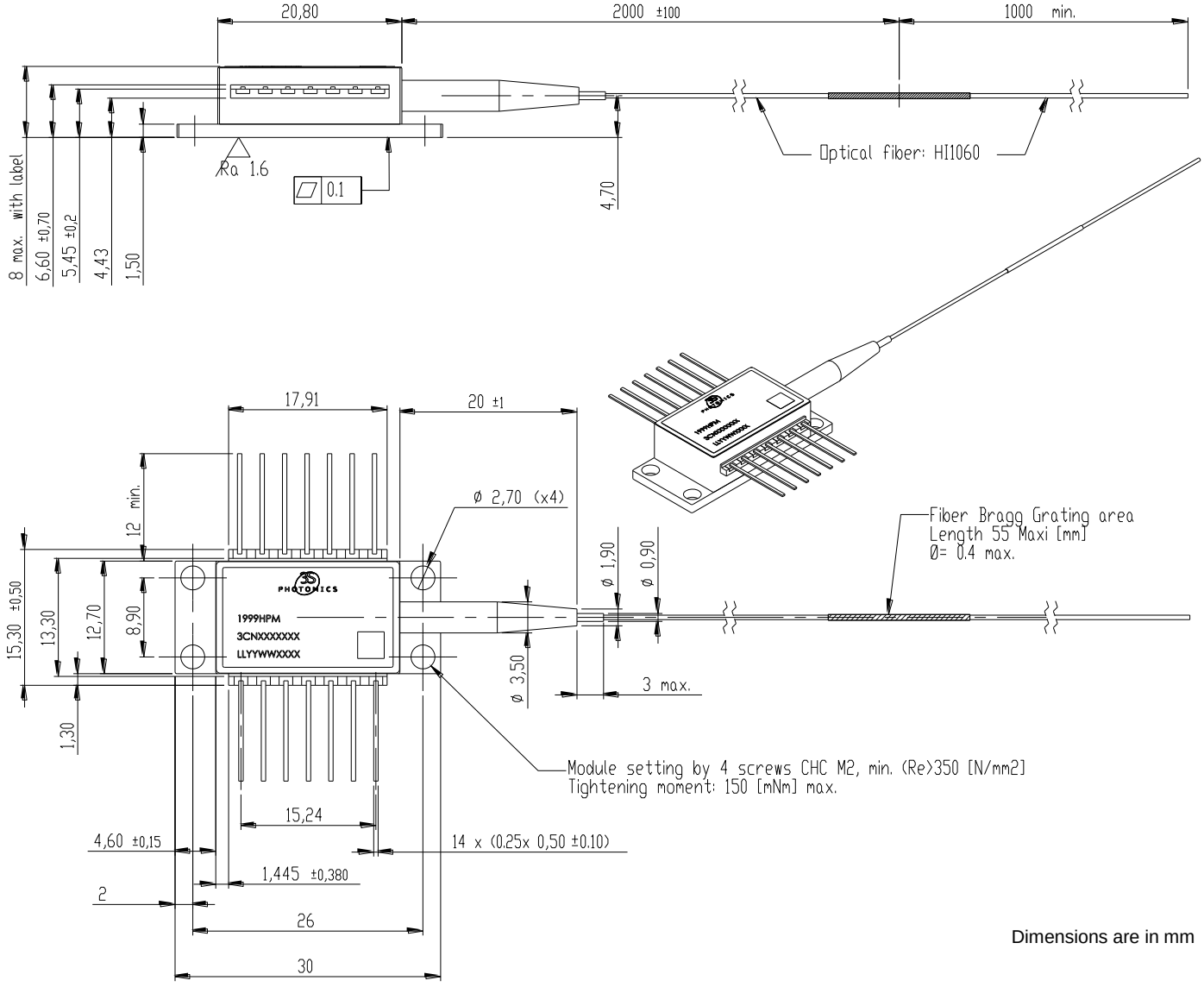
Parameter	Note	Min	Typ	Max	Unit
Fiber type		HI1060™ or equivalent			
Coating diameter	(except along grating)	230	250	270	µm
FBG recoat diameter		-	-	400	µm
FBG position	Module to center of FBG	-	2	-	m
Loose tube buffer diameter		885	-	915	µm
Fiber proof test level		200	-	-	kpsi
Grating proof test level		150	-	-	kpsi
Pigtail termination	Bare fiber				
Polarization State	Aligned parallel to the slow axis				

1999HPM

**475 mW Kink-Free,
FBG Stabilized,
980 nm Cooled
Pump Laser Module**



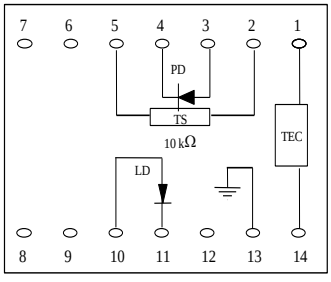
MECHANICAL **DETAILS**



Dimensions are in mm

PIN **ASSIGNEMENT**

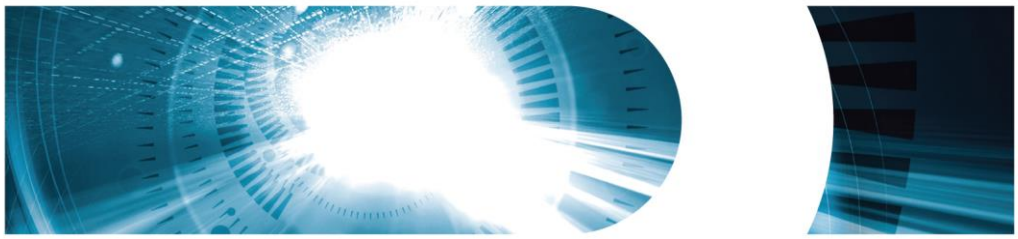
N°	Description	N°	Description
1	TEC (+)	8	No connect
2	Thermistor	9	No connect
3	Monitor PD Anode	10	Laser Anode (+)
4	Monitor PD Cathode	11	Laser Cathode (-)
5	Thermistor	12	No connect
6	No connect	13	Ground
7	No connect	14	TEC (-)



Totally floating pin-out

1999HPM

**475 mW Kink-Free,
FBG Stabilized,
980 nm Cooled
Pump Laser Module**



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**

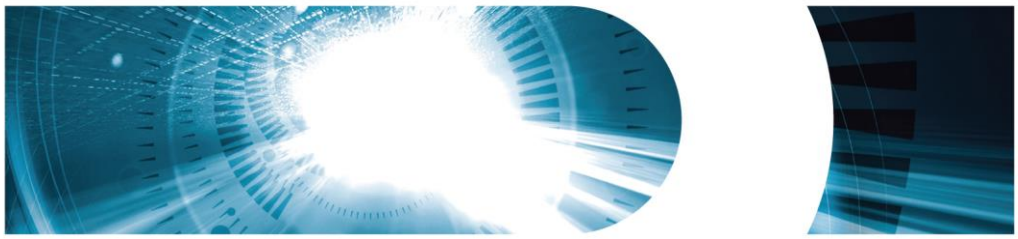
1999HPM PUMP PRODUCT FAMILY

SMF pigtail	λ_p= 974.5 nm, T= 25 °C	λ_p= 976.0 nm, T= 25 °C
Nominal Power	**Part Number**	**Part Number**
350 mW	3CN01174CL	3CN01371CL
400 mW	3CN01174DA	3CN01371DA
430 mW	3CN01367DG	3CN01371DG

3SPGroup can also develop custom products to meet a wide range of technical requirements. Please contact your Sales Manager for details.

1999HPM

**475 mW Kink-Free,
FBG Stabilized,
980 nm Cooled
Pump Laser Module**



CONTACT **INFORMATION**

Europe & Asia: +33 169 805 833
North America: +1 514 748 4848
+1 888 922 1044

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

NOTES