



HS02系列980nm单模激光模块

Key Features

采用DoGain自研芯片

低应力14pin蝶形封装

最高输出功率1100mW kink-free

工作温度范围-5°C至75°C

高效率TEC温度控制 ($T_s=25^{\circ}\text{C}$)

高稳定光纤布拉格光栅锁波 (FBG)

独有的耦合封装技术, 高效率, 高稳定性

可选单模光纤/保偏光纤/FC/PC接头

可靠性符合Telcordia GR-468-CORE 标准

Applications

多级DWDM系统 (EDFAs)

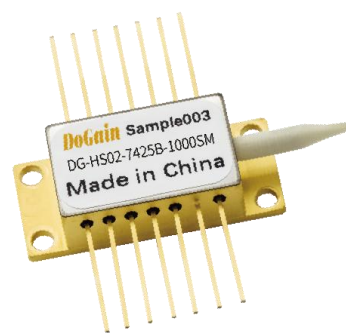
低噪声EDFAs

超快激光器泵浦源

ASE光源泵浦源

CATV

980nm Cooled Laser Module DG-HS02 Series



*产品图片仅供参考, 最终实物以发货为准

HS02系列980nm单模激光模块采用自主研发芯片, 经过严格的性能、可靠性筛选, 保障了模块的卓越性能和可靠性水平。

14-Pin低应力、高气密蝶形封装形式, 保证光纤稳定输出功率 > 1000mW。

HS系列产品包含热电冷却器(TEC), 精密的NTC热敏电阻和背面监测光电二极管。

可靠性和气密性完全符合Telcordia GR-468-CORE通信标准要求。

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1. 光电特性 ELECTRO-OPTICAL CHARACTERISTICS

1.1最大额定值 Absolute Maximum Ratings

序号 Item	模块参数 Module parameter	符号 Symbol	条件 Condition	限度Limits		单位 Unit
				最小值 Min.	最大值 Max.	
1	LD正向电流 LD Forward Current	I _f			2	A
2	LD反向电压 LD Reverse Voltage	V _r			2	V
3	LD反向电流 LD Reverse Current	I _r			10	μA
4	PD反向电压 PD Reverse Voltage	V _{PD}			20	V
5	PD正向电流 PD Forward Current	I _{PF}			10	mA
6	LD 静电释放 LD Electrostatic Discharge (ESD)	V _{ESD LD}	C = 100 pF, R = 1.5 kΩ, human body model		1000	V
7	PD 静电释放 PD Electrostatic Discharge (ESD)	V _{ESD PD}	C = 100 pF, R = 1.5 kΩ human body model		700	V
8	管壳工作温度 Operating Case Temperature Top	T _{op}		-5	75	°C
9	FBG工作温度 Operating FBG Temperature	T _{FBG}		-5	75	°C
10	相对工作湿度 Operating Relative Humidity	RH _{OP}	非冷凝 Noncondensing	5	95	%
11	相对存储湿度 Storage Relative Humidity	RH _{stg}		5	95	%
12	存储温度 Storage Temperature	T _{stg}	2000 hr	-40	85	°C
13	引线焊接时间 Lead Soldering Time		300°C		10	s
14	轴向拉力 Axial Pull Force		3 x 10 s		5	N
15	侧拉力 Side Pull Force		3 x 10 s		2.5	N
16	光纤弯曲半径 Fiber Bend Radius			15		mm

Notes:

* BOL for T_{Submount}= 25°C、T_{case}= -5°C to 75°C

* EOL forward current I(EOL)= 1.1x I(BOL)

* 规格参数，如无特别说明，都指适用于全温工作范围

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1.2 可用的峰值波长选择 (Available Peak Wavelength Selection)

产品代码 Product Code	中心波长最小值 Minimum Center Wavelength	中心波长最大值 Maximum Center Wavelength
DG-HS02-7425B-xxxxx	973nm	975nm
DG-HS02-7625B-xxxxx	975nm	977nm

1.3 Hi 1060光纤标称特性和公差 (Hi 1060 Fiber Nominal Characteristics and Tolerances)

参数 Parameters	规格 Specification
截止波长 Cutoff wavelength	920±50 nm
980 nm 处的最大衰减 Maximum attenuation at 980 nm	2.1 dB/km
包层外径 Cladding outside diameter	125 ±0.5 μm
涂覆层外径 Coating outside diameter	245 ±10 μm
芯包层同心度 Core-cladding concentricity	≤0.3 μm
模场直径 Mode field diameter	5.9 ±0.3 μm

1.4 保偏 980光纤标称特性和公差 (PM 980 Fiber Nominal Characteristics and Tolerances)

参数 Parameters	规格 Specification
工作波长 Operating Wavelength	970-1550nm
截止波长 Cutoff Wavelength	920±50 nm
980 nm 处的最大衰减 Maximum Attenuation at 980 nm	2.5 dB/km
包层外径 Cladding outside diameter	125 ±1 μm
涂覆层外径 Coating outside diameter	245 ±15 μm
芯包层同心度 Core-cladding concentricity	≤0.5 μm
模场直径 Mode field diameter	6.6 ±0.5 μm

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1.5性能规格 Performance Specification

序号 Item	模块参数 Module parameter	符号 Symbol	条件 Condition	限度Limits		单位 Unit
				最小值 Min.	最大值 Max.	
1	阈值电流 Threshold Current	I_{th}			85	mA
2	光纤输出功率范围 ^{*1} Fiber Output Power Range ^{*1}	P_f		30	1000	mW
3	扭结输出功率 Kinkfree Output Power	P_{max}	$I_f = I_{max}$		1100	mW
4	正向工作电流 Operating Forward Current	I_{op}	连续电流以保持输出功率 Continuous current to maintain output power P_{op}		1980	mA
5	正向电压 Forward Voltage	V_f	$I_f = I_{op}$		2.0	V
6	光谱宽度 Spectral Width	$\Delta\lambda_{RMS}$	50 mW < P_f < P_{op}		0.5	nm
7	中心发射波长 ^{*2} Center Emission Wavelength ^{*2}	λ_m	覆盖 P_f 范围 Over P_f range	974.0	975.0	nm
				975.0	977.0	nm
8	中心波长稳定性 Center Wavelength Stability	λ_{stab}	覆盖 P_{op} 范围 Over P_{op} range		0.5	nm p-p
9	带内功率比 Power in pump band	P_{pump}	Pump band = $\lambda_c \pm 1.5nm$, 30 mW < P_f < P_{op}	90		%
			Pump band = $\lambda_c \pm 1.5nm$, P_{min} < P_f < 30 mW	80		%
10	波长调谐与温度的关系 Wavelength Tuning vs. Temperature	$\Delta\lambda/T$	$I_f = I_{op}$		0.01	nm/°C
11	光功率稳定性 Optical Power Stability	ΔP_{f_t}	DC to 50kHz, Time=60sec, 20mW to P_{op}		4	%
12	光电二极管响应 Monitor Diode Response	R_m	At P_{op} , $V_R = 5V$ $\lambda = 1310nm$	0.5		A/W
			At P_{op} , $V_R = 5V$ $\lambda = 1550nm$	0.65		
13	光电二极管暗电流 Monitor Diode Dark Current	I_{dark}	在整个温度范围内保持5V 反向偏置 5V reverse bias, over the whole temperature range		500	pA
14	热敏电阻阻值 Thermistor Resistance	R_{th}	$T_{set} = 25^\circ C$	9.5	10.5	kΩ
15	热敏电阻系数 Thermistor Constant	β		3800	4200	K
16	热敏电阻 Thermistor	ΔR_{th}	热敏电阻值相对于BOL值的变化 Change in thermistor value relative to BOL value	-5	5	%
17	半导体制冷器电流 TEC Current	I_{TEC}		-1	4.4	A
18	半导体制冷器电压TEC Voltage(BOL/EOL)	V_{TEC}			4.3	V
19	偏振消光比 Polarization extinction ratio	PR		13		dB

Notes:

^{*1}根据客户需求可定制光纤输出功率30~1000mW

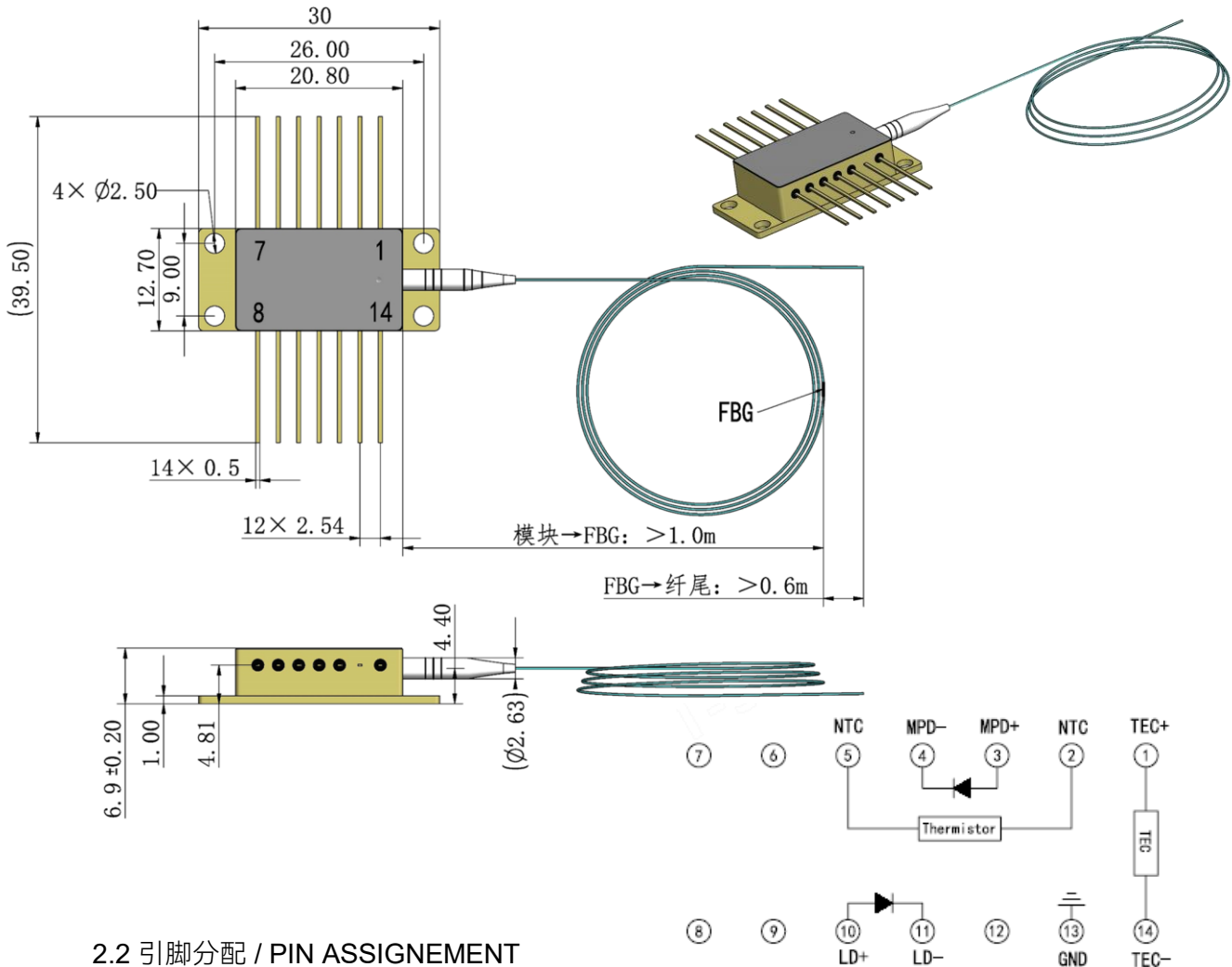
^{*2}根据客户需求可定制中心波长974或976nm

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2. Dimensions & Pin Assignment

2.1 尺寸图 / Dimensions Diagram



2.2 引脚分配 / PIN ASSIGNEMENT

Pin	Description	Pin	Description
1	TEC正极/Cooler (+)	8	空/N/C
2	热敏电阻/Thermistor	9	空/N/C
3	PD正极/Monitor PD anode (-)	10	激光器正极/Laser anode
4	PD负极/Monitor PD cathode (+)	11	激光器负极/Laser cathode
5	热敏电阻/Thermistor	12	空N/C
6	空/N/C	13	地/ground
7	空/N/C	14	TEC负极/Cooler (-)

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3. 产品订购信息

- Fiber Output Power: 30~1000mW
- SM-Hi1060/PM Fiber or FC-UPC/APC连接头
- DG P/Number: DG- HS02-7x25B-xxxxx*

DG-HSxx	7x25B	xxx (Code)	xx
HS02: 14-pin butterfly package	Wavelength Specification: 74 for 974nm 76 for 976nm 25 for T _S =25°C B for T _{case} =-5~75°C	Fiber Output Power: 300:300mW 400:400mW 500:500mW 600:600mW 700:700mW 800:800mW 900:900mW 1000:1000mW	PM: <i>Nufern PMF 980 or equivalent</i> SM: <i>Corning HI1060 Single Mode Fibre or Equivalent</i>

- * Example: DG-HS02-7425B-1000SM-FC/APC
- ✓ 14pin蝶形封装, FBG锁波974nm, T_{Submount}=25°C, 1000mW@Fiber Output Power 单芯出光
 - ✓ Corning HI1060 Single Mode Fibre or Equivalent
 - ✓ (PM)Nufern PMF 980 or equivalent
 - ✓ (-FC/APC) customized connector or equivalent

4. 产品工作参数

Product Code	Maximum Operating Power Pop (mW)	Maximum Operating Current lop (mA)	Minimum Kink-Free Power Pmax (mW)	Maximum Kink-Free Current lmax (mA)	TEC Power@BOL P _{TEC} (W)	Total Module Power@BOL P _{max} (W)
7x25B-300SM	300	550	330	600	3.60	4.51
7x25B-400SM	400	700	440	750	3.80	4.98
7x25B-500SM	500	850	550	950	3.91	5.37
7x25B-600SM	600	1050	660	1150	4.24	5.97
7x25B-700SM	700	1250	770	1350	4.56	6.61
7x25B-800SM	800	1400	880	1550	5.00	7.35
7x25B-900SM	900	1600	990	1750	5.54	8.22
7x25B-1000SM	1000	1800	1100	2000	6.3	9.28

* 7x25B标识为1.2项中每个产品代码的波长。

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■ 980nm单模激光模块- HS02系列

Corning Hi1060 (or PM980 Fiber)	$\lambda_p = 974.0 \text{ nm}$, $T_{\text{submount}} = 25^\circ\text{C}$	$\lambda_p = 976.0 \text{ nm}$, $T_{\text{submount}} = 25^\circ\text{C}$
Nominal Power	Customer Part Number	Customer Part Number
300mW	DG-HS02-7425B-300SM	DG-HS02-7625B-300PM
400mW	DG-HS02-7425B-400SM	DG-HS02-7625B-400PM
500mW	DG-HS02-7425B-500SM	DG-HS02-7625B-500PM
600mW	DG-HS02-7425B-600SM	DG-HS02-7625B-600PM
700mW	DG-HS02-7425B-700SM	DG-HS02-7625B-700PM
800mW	DG-HS02-7425B-800SM	DG-HS02-7625B-800PM
900mW	DG-HS02-7425B-900SM	DG-HS02-7625B-900PM
1000mW	DG-HS02-7425B-1000SM	DG-HS02-7625B-1000PM

5. 使用说明

- 输出激光是不可见光，使用时须遵守 IEC四级激光标准安全规范，避免激光直接或间接照射眼睛。
- The laser beam is invisible, please follow the standard safety procedures for IEC Class 4 lasers, avoid eyes exposure to radiation.
- 静电击穿导致半导体激光器失效，激光器安装人员须经过培训，操作时须佩戴防静电手腕带，工作台需接地；在供电连接头与激光器连接前，正负极应处于短接状态。
- ESD cause diode laser failure, The operator should be trained, wearing ESD grounding straps and the work surface should be grounded. The positive and negative poles shall be connected before the power supply is connected with the laser.
- 电流过冲可能损坏激光器，驱动电源须稳定无过冲。
- The current overshoot may damage the laser, and the driving power must be stable without overshoot.
- 超规格使用会导致激光器寿命下降，请严格按照产品规格书进行使用。
- Reduced lifetime if used above nominal operating condition, Please strictly follow the product specifications for use.

For more Info

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