



HMD2系列980nm双通道单模激光模块

Key Features

采用DoGain自研芯片

低应力10pin蝶形封装

最高输出功率1.5W kink-free

工作温度范围-5°C至75°C

高效率TEC温度控制 ($T_s=40^{\circ}\text{C}$)

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 Dual Chip Pump Laser Module DG-HMD2 Series



*产品图片仅供参考, 最终实物以发货为准

HMD2系列980nm单模泵浦激光器采用自主研发芯片, 经过严格的性能、可靠性筛选, 保障了泵浦激光器的卓越性能和可靠性水平。

10-Pin低应力、高气密蝶形封装形式, 保证光纤稳定输出功率 $\geq 1.5\text{W}$ 。

HMD2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	μ A
4	PD反向电压 PD reverse voltage	V_{PD}			25	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 k Ω , human body model		1000	V
7	PD 静电释放 PD electrostatic discharge (ESD)	$V_{ESD\ PD}$	C = 100 pF, R = 1.5 k Ω human body model		500	V
8	管壳工作温度 Operating case temperature Top	T_{op}		-5	75	$^{\circ}$ C
9	FBG工作温度 Operating FBG Temperature	T_{FBG}		-5	75	$^{\circ}$ 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_{Mtg}		5	95	%
12	存储温度 Storage Temperature	T_{slg}	2000 hr	-40	85	$^{\circ}$ C
13	轴向拉力 Axial pull force		3 x 10 s		5	N
14	侧拉力 Side pull force		3 x 10 s		2.5	N
15	光纤弯曲半径 Fiber Bend Radius			25		mm

Notes:

* BOL for $T_{Submount} = 40^{\circ}$ C、 $T_{case} = -5^{\circ}$ C to 75° C

* EOL forward current $I(EOL) = 1.1 \times I(BOL)$

* 规格参数，如无特别说明，都指适用于全温工作范围 ($T_{case} = -5 \sim 75^{\circ}$ C, $T_{FBG} = -5 \sim 75^{\circ}$ C)

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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
HMD2-7440B-xxxxx	973nm	975nm
HMD2-7640B-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
工作波长 Operating Wavelength	> 980 nm
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 ±1 μm
涂覆层外径 Coating outside diameter	245 ±10 μm
芯包层同心度 Core-cladding concentricity	≤0.5 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 nm
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	P_f @per channel	10	680	mW
3	扭结输出功率 Kinkfree Output Power	P_{max}	$I_f = I_{max}$		750	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}		1320	mA
5	正向电压 Forward Voltage	V_f	$I_f = I_{op}$		2.1	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		%
10			Pump band = $\lambda_c \pm 1.5nm$, P_{min} < P_f < 30 mW	80		%
11	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
12	光功率稳定性 Optical Power Stability	ΔP_{f_t}	DC to 50kHz, Time=60sec, 30mW to P_{op}		4	%
13	光电二极管响应 Monitor Diode Response	R_m	At P_{op} , $V_{PD} = -5V$	0.7	1.8	$\mu A/mW$
14	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	nA
15	热敏电阻阻值 Thermistor Resistance	R_{th}	$T_{set} = 40^\circ C$	9.5	10.5	k Ω
16	热敏电阻系数 Thermistor Constant	β		3600	4200	K
17	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	%
18	半导体制冷器电流 TEC Current	I_{TEC}		-1	5.0	A
19	半导体制冷器电压TEC Voltage(BOL/EOL)	V_{TEC}			6.3	V
20	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

*2 根据客户需求可定制中心波长 974 或976nm

* BOL for $T_{Submount} = 40^\circ C$, $T_{case} = -5^\circ C \sim 75^\circ C$

* EOL forward current $I(EOL) = 1.1 \times I(BOL)$

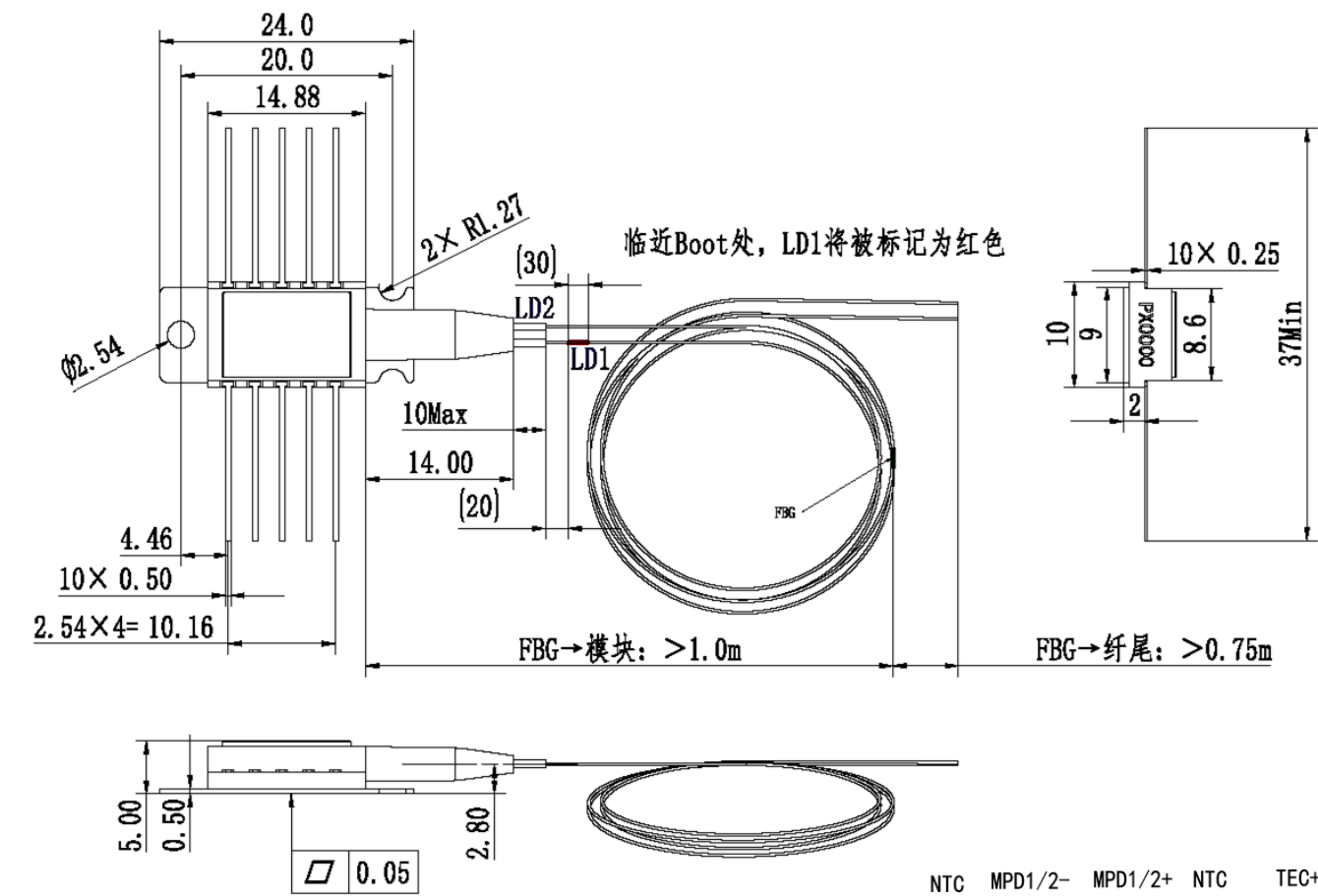
* 如无特别说明, 规格参数都指适用于全温工作范围 ($T_{case} = -5 \sim 75^\circ C$, $T_{FBG} = -5 \sim 75^\circ C$)

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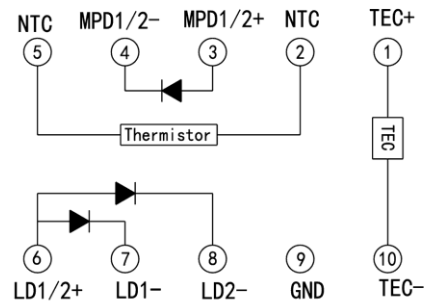


2. Dimensions & Pin Assignment

2.1 尺寸图 / Dimensions Diagram



2.2 引脚分配 / PIN ASSIGNMENT



Pin	Description	Pin	Description
1	TEC正极/Cooler(+)	6	激光器1、2正极/Laser anode1、 2 (+)
2	热敏电阻/Thermistor	7	激光器1负极/Laser cathode 1 (-)
3	PD正极/Monitor PD anode (-)	8	激光器2负极/Laser cathode 2(-)
4	PD负极/Monitor PD cathode (+)	9	封装地/Package ground
5	热敏电阻/Thermistor	10	TEC负极/Cooler(-)

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3. 产品订购信息

- Fiber Output Power: 10~680mW
- SM-Hi1060/PM Fiber or FC-UPC/APC连接头
- DG P/Number: DG- HMD2-7xxxB-xxxxx

DG-HSxx	7x xxB	xxx (Code)	PM
HMD2: 10-pin Dual Chip butterfly package	Wavelength Specification: 74 xxB for 974nm 76 xxB for 976nm 7x 40B for T _S =40°C	Fiber Output Power: 555mW x 2 680mW x 2	-PM: <i>Nufern PM980-XP or equivalent</i> -SM: <i>Single-mode fiber</i>

- * Example: DG-HMD2-7440B-680SM-FC/APC
- ✓ 10pin蝶形封装, FBG锁波974nm, T_{Submount}=40°C, T_{case}= -5°C to 75°C, 680mW@Fiber Output Power 出光
 - ✓ Corning HI1060 Single Mode Fibre or Equivalent
 - ✓ (-PM) Nufern PM980-XP or equivalent
 - ✓ (-FC/APC) customized connector or equivalent

4. 产品工作参数

Product Code	Operating Power (mW) (Per 1x LD)	Operating Current (mA) (Per 1x LD)	Kink-Free Power (mW) (Per 1x LD)	Kink-Free Current (mA) (Per 1x LD)	TEC Power@BOL P _{TEC} (W)	Total Module Powe@BOL Consumption (W) (2xLD)
7x40B-550SM	550	1050	605	1100	4.5	7.5
7x40B-680SM	680	1200	750	1320	5	8.5

* 7x40B 标识为1.2项中每个产品代码的波长。

* 度亘激光技术还可以开发定制产品, 以满足广泛的技术要求。

* 请联系你的销售经理了解详情。

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■ 980nm单模半导体泵浦激光器- HMD2系列

Corning Hi1060 (or PM980 Fiber)	$\lambda_p = 974.0 \text{ nm}$, $T_{\text{submount}} = 40^\circ\text{C}$	$\lambda_p = 976.0 \text{ nm}$, $T_{\text{submount}} = 40^\circ\text{C}$
Nominal Power	Customer Part Number	Customer Part Number
550mW	DG-HMD2-7440B-550SM	DG-HMD2-7640B-550PM
680mW	DG-HMD2-7440B-680SM	DG-HMD2-7640B-680PM

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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