



# HDT3系列980nm单模无制冷激光模块

## Key Features

采用DoGain自研芯片

紧凑型3pin无制冷封装

最高输出功率330mW kink-free

工作温度范围0°C至75°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/FC/PC接头

可靠性符合Telcordia GR-468-CORE 标准

## Applications

CFP2/CFP4/QSFP-DD/OSFP高速收发模块集成

EDFAs

小型化低噪声EDFAs

单通道/DWDM EDFA

CATV

## 980nm Uncooled Laser Module DG-HDT3 Series



\*产品图片仅供参考，最终实物以发货为准

HDT3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，保障了激光模块的卓越性能和可靠性水平。

3-Pin低应力、高气密小型化无制冷封装形式，保证光纤稳定输出功率 > 300mW。

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<br>Item | 模块参数<br>Module parameter                    | 符号<br>Symbol      | 条件<br>Condition                                      | 限度Limits    |             | 单位<br>Unit   |
|------------|---------------------------------------------|-------------------|------------------------------------------------------|-------------|-------------|--------------|
|            |                                             |                   |                                                      | 最小值<br>Min. | 最大值<br>Max. |              |
| 1          | LD正向电流<br>LD Forward Current                | $I_f$             |                                                      |             | 1.2         | A            |
| 2          | LD反向电压<br>LD Reverse Voltage                | $V_r$             |                                                      |             | 2           | V            |
| 3          | LD反向电流<br>LD Reverse Current                | $I_r$             |                                                      |             | 10          | $\mu$ A      |
| 4          | LD 静电释放<br>LD electrostatic discharge (ESD) | $V_{ESD\ LD}$     | C = 100 pF, R = 1.5 k $\Omega$ ,<br>human body model |             | 1000        | V            |
| 5          | 管壳工作温度<br>Operating case temperature        | $T_{op}$          |                                                      | 0           | 75          | $^{\circ}$ C |
| 6          | FBG工作温度<br>Operating FBG Temperature        | $T_{FBG}$         |                                                      | 0           | 75          | $^{\circ}$ C |
| 7          | 相对工作湿度<br>Operating Relative humidity       | RH <sub>OP</sub>  | 非冷凝<br>Noncondensing                                 | 5           | 85          | %            |
| 8          | 相对存储湿度<br>Storage Relative Humidity         | RHD <sub>lg</sub> |                                                      | 5           | 95          | %            |
| 9          | 存储温度<br>Storage Temperature                 | $T_{stg}$         |                                                      | -40         | 85          | $^{\circ}$ C |
| 10         | 引线焊接温度<br>Lead soldering Temperature        |                   | 10 sec                                               |             | 350         | $^{\circ}$ C |
| 11         | 轴向拉力<br>Axial pull force                    |                   | 1minute                                              |             | 5           | N            |
| 12         | 侧拉力<br>Side pull force                      |                   | 3 x 10 s                                             |             | 2.5         | N            |
| 13         | 光纤弯曲半径<br>Fiber Bend Radius                 |                   |                                                      | 7           |             | mm           |

Notes:

- \* BOL for  $T_{case} = 0^{\circ}\text{C}$  to  $75^{\circ}\text{C}$
- \* 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 ( $T_{case}=0\sim75^{\circ}\text{C}$ ,  $T_{FBG}=0\sim75^{\circ}\text{C}$ )

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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<br>Minimum Center Wavelength | 中心波长最大值<br>Maximum Center Wavelength |
|---------------------|--------------------------------------|--------------------------------------|
| DG-HDT3-74UCA-xxxxx | 973nm                                | 975nm                                |
| DG-HDT3-76UCA-xxxxx | 975nm                                | 977nm                                |

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

| 参数 Parameters                                  | 规格 Specification |
|------------------------------------------------|------------------|
| 工作波长<br>Operating Wavelength                   | > 980nm          |
| 截止波长<br>Cutoff Wavelength                      | 930±40 nm        |
| 980 nm 处的最大衰减<br>Maximum Attenuation at 980 nm | 2.5 dB/km        |
| 包层外径<br>Cladding outside diameter              | 125 ±0.5 μm      |
| 涂覆层外径<br>Coating outside diameter              | 245 ±10 μm       |
| 芯包层同心度<br>Core-cladding concentricity          | ≤0.3 μm          |
| 980 nm 处的模场直径<br>Mode field diameter at 980 nm | 4.0 ±0.3 μm      |
| 光纤芯径<br>Core Diameter                          | 3.4 μm           |

1.4 RC HI 1060 FLEX光纤标称特性和公差（RC Hi 1060 FLEX Fiber Nominal Characteristics and Tolerances）

| 参数 Parameters                                  | 规格 Specification |
|------------------------------------------------|------------------|
| 工作波长<br>Operating Wavelength                   | > 980nm          |
| 截止波长<br>Cutoff Wavelength                      | 930±40 nm        |
| 980 nm 处的最大衰减<br>Maximum Attenuation at 980 nm | 2.5 dB/km        |
| 包层外径<br>Cladding outside diameter              | 80 ±1 μm         |
| 涂覆层外径<br>Coating outside diameter              | 165 ±10 μm       |
| 芯包层同心度<br>Core-cladding concentricity          | ≤0.5 μm          |
| 980 nm 处的模场直径<br>Mode field diameter at 980 nm | 4.0 ±0.3 μm      |
| 光纤芯径<br>Core Diameter                          | 3.4 μm           |

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1.5 性能规格 Performance Specification

| 序号<br>Item | 模块参数<br>Module parameter                                         | 符号<br>Symbol          | 条件<br>Condition                                                                     | 限度Limits    |             | 单位<br>Unit |
|------------|------------------------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------|-------------|-------------|------------|
|            |                                                                  |                       |                                                                                     | 最小值<br>Min. | 最大值<br>Max. |            |
| 1          | 阈值电流<br>Threshold Current                                        | $I_{th}$              |                                                                                     | —           | 100         | mA         |
| 2          | 光纤输出功率范围 <sup>*1</sup><br>Fiber Output Power Range <sup>*1</sup> | $P_f$                 |                                                                                     | 30          | 300         | mW         |
| 3          | 扭结输出功率<br>Kinkfree Output Power                                  | $P_{max}$             | $I_f = I_{max}$                                                                     |             | 330         | mW         |
| 4          | 正向工作电流<br>Operating Forward Current                              | $I_{op}$              | 连续电流以保持输出功率<br>Continuous current to maintain output power $P_{op}$                 | —           | 800         | mA         |
| 5          | 正向工作电压<br>Operating Forward Voltage                              | $V_f$                 | $I_f = I_{op}$                                                                      |             | 2           | V          |
| 6          | 光谱宽度<br>Spectral Width                                           | $\Delta\lambda_{RMS}$ | $50\text{ mW} < P_f < P_{op}$                                                       |             | 1.0         | nm         |
| 7          | 中心发射波长 <sup>*2</sup><br>Center Emission Wavelength <sup>*2</sup> | $\lambda_m$           | 覆盖 $P_f$ 范围<br>Over $P_f$ range                                                     | 973         | 975         | nm         |
| 8          |                                                                  |                       |                                                                                     | 975         | 977         |            |
| 9          | 中心波长稳定性<br>Center Wavelength Stability                           | $\lambda_{stab}$      | 覆盖 $P_{op}$ 范围<br>Over $P_{op}$ range                                               |             | 1.0         | nm p-p     |
| 10         | 带内功率比<br>Power in pump band Ratio                                | $P_{pump}$            | Pump band = $\lambda_c \pm 1.5\text{nm}$ , $P_f > 100\text{ mW}$                    | 90          | —           | %          |
| 11         |                                                                  |                       | Pump band = $\lambda_c \pm 1.5\text{nm}$ , $50\text{mW} \leq P_f \leq 100\text{mW}$ | 80          | —           | %          |
| 12         | 波长调谐与温度的关系<br>Wavelength Tuning vs.<br>Temperature               | $\Delta\lambda/T$     | $I_f = I_{op}$                                                                      |             | 0.01        | nm/°C      |

Notes:

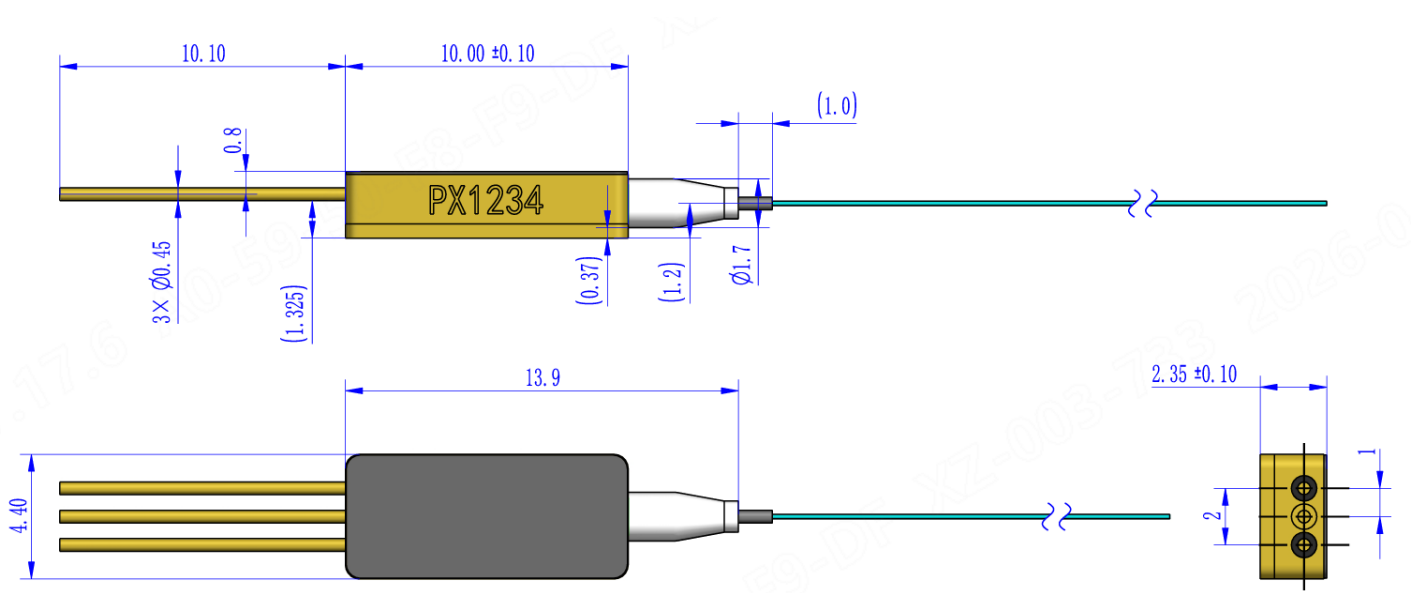
- \*1 根据客户需求可定制光纤输出功率30mW~300mW
- \*2 根据客户需求可定制中心波长
- \*  $EOL\text{ forward current } I(EOL) = 1.1 \times I\text{ (BOL)}$
- \* 如无特别说明, 规格参数都指适用于全温工作范围 ( $T_{case}=0\sim75\text{ }^{\circ}\text{C}$ ,  $T_{FBG}=0\sim75\text{ }^{\circ}\text{C}$ )

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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             |
|-----|-------------------------|
| 1   | 激光器负极/Laser Cathode (-) |
| 2   | 封装地/Package ground      |
| 3   | 激光器正极/Laser Anode (+)   |

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3. 产品订购信息

- Fiber Output Power: 30~300mW
- SM-Hi1060 FLEX Fiber or FC-UPC/APC连接头
- DG P/Number: DG- HDT3-7xUCA-xxxxx\*

| DG-HDxx                                 | 7x UCA                                                                                                          | xxx (Code)                                                 | xx                                                                                                              |
|-----------------------------------------|-----------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| HDT3:<br>3-pin Ultra-compact<br>package | Wavelength Specification:<br>74 for 974nm<br>76 for 976nm<br>UC for Uncooled<br>A for T <sub>case</sub> =0~75°C | Fiber Output Power:<br>100:100mW<br>200:200mW<br>300:300mW | SF:<br>Corning HI1060<br>FLEX Single-mode<br>fiber<br><br>FR:<br>Corning RC HI1060<br>FLEX Single-mode<br>fiber |

\* Example: DG-HDT3-74UCA-300FR-FC/APC

✓ 3pin超小型无制冷封装, FBG锁波974nm, T<sub>case</sub>= 0℃ to 75℃, 300mW@Fiber Output Power 出光

✓ Corning Hi1060 FLEX Single-mode fiber or Equivalent

✓ (-FC/APC) Customized connector or equivalent

4. 产品工作参数

| 产品型号<br>Product Code | 最大输出功率<br>(mW)<br>Maximum<br>Operating<br>Power(mW) | 最小无扭结输出<br>功率 (mW)<br>Minimum Kink-<br>Free<br>Power(mW) | 典型工作电流<br>@75°C<br>Typical<br>Operating<br>Current @75°C | 最大工作电流<br>@75°C<br>Maximum<br>Operating<br>Current@75°C | 最大总功耗(W)<br>Total power<br>consumption |
|----------------------|-----------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------|----------------------------------------|
| DG-HDT3-7xUCA-100xx  | 100                                                 | 110                                                      | 265                                                      | 300                                                     | 0.6                                    |
| DG-HDT3-7xUCA-150xx  | 150                                                 | 165                                                      | 360                                                      | 400                                                     | 0.8                                    |
| DG-HDT3-7xUCA-200xx  | 200                                                 | 220                                                      | 455                                                      | 520                                                     | 1                                      |
| DG-HDT3-7xUCA-250xx  | 250                                                 | 275                                                      | 550                                                      | 630                                                     | 1.2                                    |
| DG-HDT3-7xUCA-300xx  | 300                                                 | 330                                                      | 660                                                      | 800                                                     | 1.45                                   |

\* 7xUCA 标识为1.2项中每个产品代码的波长。

\* 度亘核芯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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\*商业秘密\*



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■ 980nm单模激光模块- HDT3系列

|                                                   |                                                                                                                 |                                                                                                                     |
|---------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
| Corning Hi1060 FLEX Fiber<br>(or RC Hi 1060 FLEX) | $\lambda_p = 974.0\text{ nm}$ , $T_{case} = 0^{\circ}\text{C} \sim 75^{\circ}\text{C}$<br>(Corning Hi1060 FLEX) | $\lambda_p = 974.0\text{ nm}$ , $T_{case} = 0^{\circ}\text{C} \sim 75^{\circ}\text{C}$<br>(Corning RC Hi 1060 FLEX) |
| Nominal Power                                     | Customer Part Number                                                                                            | Customer Part Number                                                                                                |
| 100mW                                             | DG-HDT3-74UCA-100SF                                                                                             | DG-HDT3-74UCA-100FR                                                                                                 |
| 200mW                                             | DG-HDT3-74UCA-200SF                                                                                             | DG-HDT3-74UCA-200FR                                                                                                 |
| 300mW                                             | DG-HDT3-74UCA-300SF                                                                                             | DG-HDT3-74UCA-300FR                                                                                                 |

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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