1310nm FP Laser Diode SM Module (APC 12)

Features
- Center wavelength 1310nm
- Low threshold current
- High speed tr/tf < 0.7ns
- Built-in InGaAs monitor detector
- Four-lead package
- Wide operating temperature -40°C to 85°C
- Hermetically sealed TO-18 package in pigtailed or receptacle housing with FC, ST or SC connector

Applications
- Fiber In The Loop
- ATM, SONET/SDH
- Motorway and railway networks
- Intra and interoffice links
- Subscriber loops
- Trunk supervision
- Test instruments

Specifications

Optical And Electrical Characteristics (T=25 +/-3°C unless specified otherwise)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Test Conditions</th>
<th>Min</th>
<th>Typical</th>
<th>Max</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>Center Wavelength</td>
<td>( \lambda )</td>
<td>25°C - 40 to 85°C</td>
<td>1290</td>
<td>1310</td>
<td>1330</td>
<td>nm</td>
</tr>
<tr>
<td>Spectral Width</td>
<td>( \Delta \lambda )</td>
<td>( P_0 ) (RMS, -20dB)</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td>nm</td>
</tr>
<tr>
<td>Threshold Current</td>
<td>( I_{th} )</td>
<td>25°C - 40 to 85°C</td>
<td>3</td>
<td>5</td>
<td>15</td>
<td>mA</td>
</tr>
<tr>
<td>Operating Voltage</td>
<td>( V_{op} )</td>
<td>( P_0 )</td>
<td>-</td>
<td>1.1</td>
<td>1.5</td>
<td>V</td>
</tr>
<tr>
<td>Rise/Fall Time</td>
<td>( t_r / t_f )</td>
<td>10-90%</td>
<td>-</td>
<td>0.3</td>
<td>0.7</td>
<td>ns</td>
</tr>
<tr>
<td>Optical Output Power</td>
<td>( P_0 )</td>
<td>( I_{th} + 20mA )</td>
<td>-</td>
<td>0.1</td>
<td>0.25</td>
<td>mW</td>
</tr>
<tr>
<td>Differential Efficiency</td>
<td>( P_0 )</td>
<td>-1</td>
<td>0.01</td>
<td>-</td>
<td>-</td>
<td>mW/mA</td>
</tr>
<tr>
<td>Monitor Current (PD)</td>
<td>( I_m )</td>
<td>( P_0, V_{RD} = 1V )</td>
<td>-</td>
<td>0.1</td>
<td>0.7</td>
<td>mA</td>
</tr>
<tr>
<td>Dark Current (PD)</td>
<td>( I_d )</td>
<td>( V_{RD} = 10V )</td>
<td>-</td>
<td>-</td>
<td>0.1</td>
<td>( \mu A )</td>
</tr>
<tr>
<td>Tracking Error</td>
<td>( E_t )</td>
<td>-40 to 85°C</td>
<td>-</td>
<td>±1.0</td>
<td>-</td>
<td>dB</td>
</tr>
</tbody>
</table>

Absolute Maximum Ratings (T=25°C)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Symbol</th>
<th>Min.</th>
<th>Max.</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forward Current (LD)</td>
<td>( I_{op} )</td>
<td>-</td>
<td>85</td>
<td>mA</td>
</tr>
<tr>
<td>Reverse Voltage (LD)</td>
<td>( V_{RL} )</td>
<td>-</td>
<td>2</td>
<td>V</td>
</tr>
<tr>
<td>Forward Current (PD)</td>
<td>( I_{FD} )</td>
<td>-</td>
<td>2</td>
<td>mA</td>
</tr>
<tr>
<td>Reverse Voltage (PD)</td>
<td>( V_{RD} )</td>
<td>-</td>
<td>20</td>
<td>V</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>( T_O )</td>
<td>-</td>
<td>85</td>
<td>°C</td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>( T_{stg} )</td>
<td>-40</td>
<td>125</td>
<td>°C</td>
</tr>
<tr>
<td>Lead Soldering Temperature (10 sec)</td>
<td>( T_L )</td>
<td>-</td>
<td>260</td>
<td>°C</td>
</tr>
</tbody>
</table>
1310nm FP Laser Diode SM Module (APC 12)

Ordering Information

- Connector type
- Receptacle: SC, FC or ST
- Pigtail: SC, ST, LC, MU or SMA
- Flange type
- B for board mount
- P for panel mount
- U for UP mount
- X for None
- S for Sugar Cube

SNS-LD 13 [Diagram]

- Fiber length
  - R0 for receptacle
  - PG for pigtail 100cm
- Receptacle: X
- Pigtail: P for PC
- A for APC
- Grade
  - 1, 2, 3, 4 for coupled power level
  - (Please see the specs above)

Pin Connections

- BOTTOM VIEW
  - UNIT: MM

- C TYPE
  - PIN CONNECTIONS
  - 1 CASE
    - LD
    - 2
    - 4
    - PD
    - 3

- D TYPE
  - PIN CONNECTIONS
  - 1 CASE
    - LD
    - 2
    - 4
    - PD
    - 3

Dimension

- Pigtail Type

- BM
  - 13.5
  - 9.4
  - 2
  - 2-Φ2.2

- PM
  - 18
  - 12
  - 8
  - 2-Φ2.2

- UPM
  - 2
  - 0.5
  - 8.6
  - 7.5

- SC

- FC

- ST

- MU

- LC

- SMA

- Φ0.9 cable
- Φ3.0 cable
1310nm FP Laser Diode SM Module (APC 12)

Receptacle Type

FC-PM

FC-BM

ST-BM

ST-PM

SC
1310nm FP Laser Diode SM Module (APC 12)

Sugar Cube

Dimension (ST Receptacle)  Unit mm

<table>
<thead>
<tr>
<th>PIN No.</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NC</td>
</tr>
<tr>
<td>2</td>
<td>ANODE</td>
</tr>
<tr>
<td>3</td>
<td>CATHODE</td>
</tr>
<tr>
<td>4</td>
<td>NC</td>
</tr>
<tr>
<td>5</td>
<td>NC</td>
</tr>
<tr>
<td>6</td>
<td>ANODE or NC</td>
</tr>
<tr>
<td>7</td>
<td>ANODE or NC</td>
</tr>
<tr>
<td>8</td>
<td>NC</td>
</tr>
</tbody>
</table>

Pin Connections (Type A)

<table>
<thead>
<tr>
<th>PIN No.</th>
<th>FUNCTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NC</td>
</tr>
<tr>
<td>2</td>
<td>NC</td>
</tr>
<tr>
<td>3</td>
<td>LD Cathode (LD-)</td>
</tr>
<tr>
<td>4</td>
<td>NC</td>
</tr>
<tr>
<td>5</td>
<td>NC</td>
</tr>
<tr>
<td>6</td>
<td>LD Anode (LD+), PD-</td>
</tr>
<tr>
<td>7</td>
<td>Monitor PD Anode (PD+)</td>
</tr>
<tr>
<td>8</td>
<td>NC</td>
</tr>
</tbody>
</table>

Pin Connections (Type B)
1310nm FP Laser Diode SM Module (APC 12)

Typical Characteristics (25°C)

LONGITUDINAL MODE

CENTER WAVELENGTH vs. CASE TEMPERATURE

FORWARD CURRENT vs. FORWARD VOLTAGE

OPTICAL OUTPUT POWER vs. LD MONITOR CURRENT

THRESHOLD CURRENT vs. CASE TEMPERATURE

OPTICAL OUTPUT POWER vs. FORWARD CURRENT
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Fiber-coupled Power vs. Drive Current