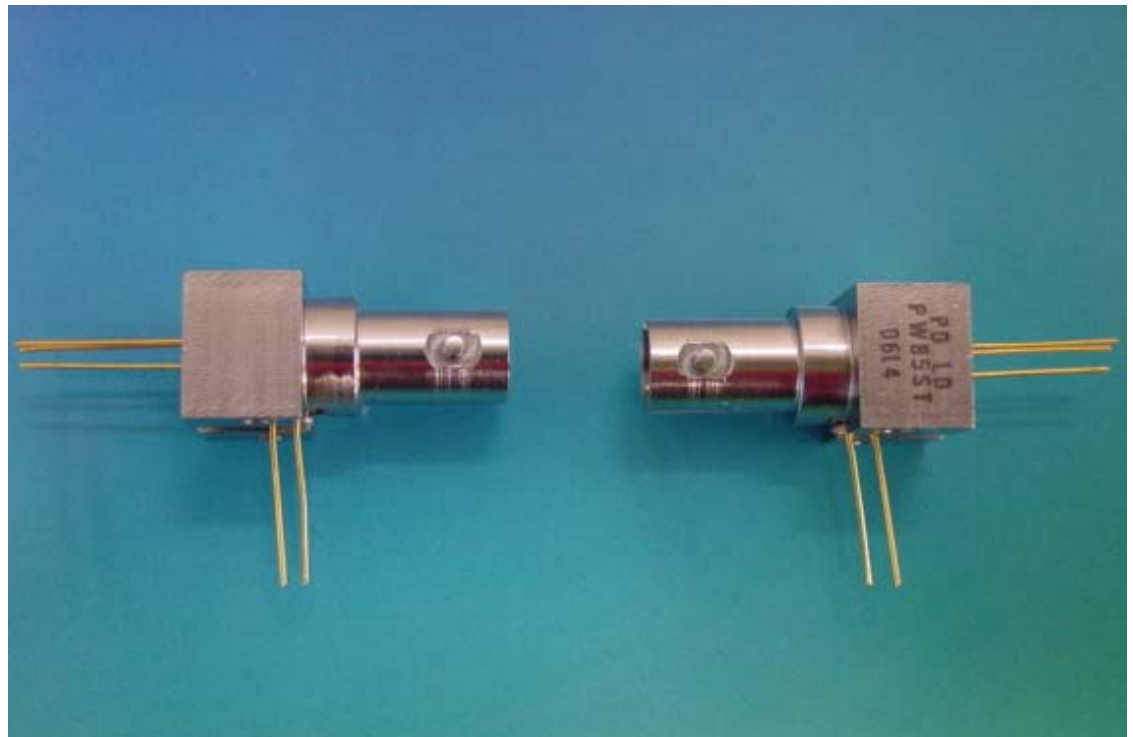


### Applications

- Video Transmission
- Short distance over MMF
- Full Duplex Communications
- WDM Bi-Directional transmission over a single fiber

### Features

- Output Power of  $-16\text{dBm}$  typical
- $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$  Operating Temperature Range
- 1300 nm LED Source
- Low Internal Cross Talk
- Low Noise Silicon PIN Photodiode Receiver
- Compact, rugged construction
- Low Power Consumption
- ST Board or Panel Mount Receptacle
- Replaces Discreet Components
- Class 1 Eye Safe Device
- UL Listed



PD-LD Inc. is now offering LED based WDM style BiDirectional transmitter and receiver modules operating in the 850 and 1310nm optical windows. These devices, part number PW13ST, are designed to simultaneously transmit and receive over a single optical fiber at frequencies from DC to 200MHz. Dual wavelength bi-directional modules replace the need for a multimode fiber coupled LEDs, a fiber coupled PIN photodiode, a discreet fiber optic WDM and a second stage optical isolator. The BiDirectional Modules combine all of these optical functions and relieve the user of having to fusion splice several discreet units together and then squeeze them onto their PCB.

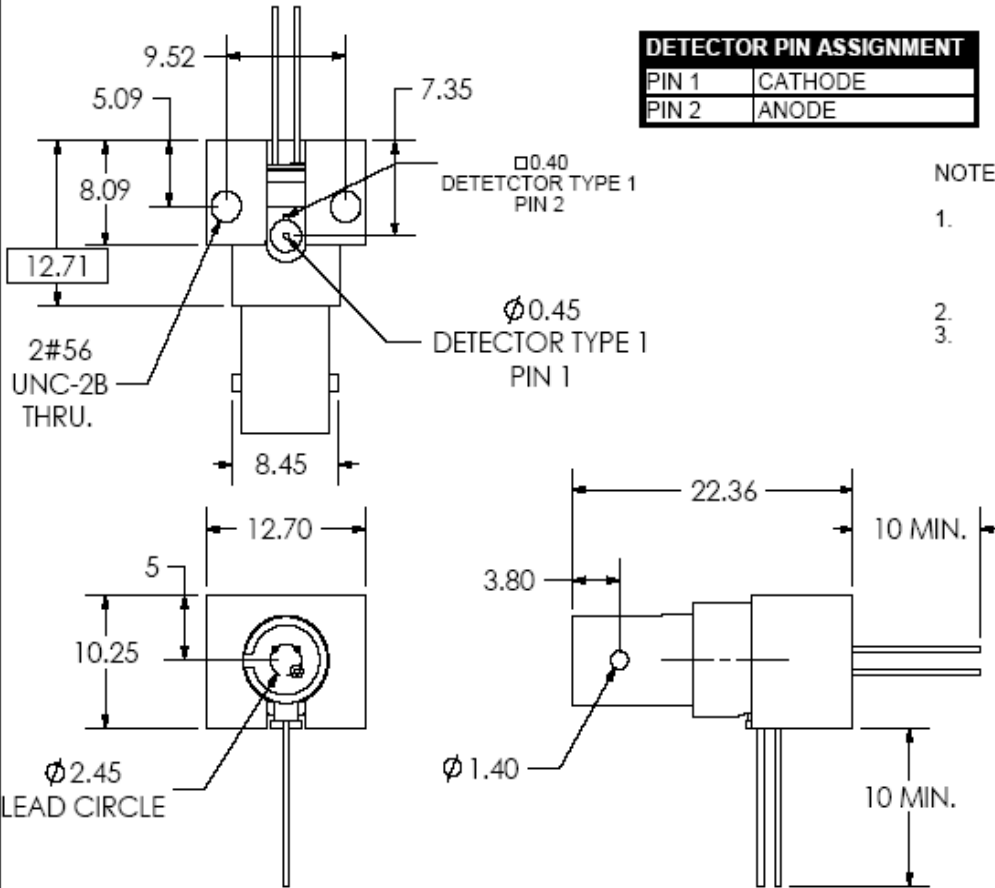
These small, compact modules require minimal board real estate and when used in pairs deliver two way operation over a single 62.5/125um optical fiber.

The PD-LD product incorporates high reliability surface emitting 1300nm light emitting diodes (LEDs) transmitters that have typical operating currents between 50 and 100mA. The receiver sections offer discreet Silicon PIN photodiodes of planar semiconductor design that have dielectric passivation for very low noise performance at 850nm. See the data sheet for the PW85ST series for the matching bidirectional module. PD-LD's BiDirectional WDM modules are built to meet the demanding requirements of industrial operating temperature ranges of  $-40$  to  $85^{\circ}\text{C}$ .

The PD-LD BiDirectional modules are 100% tested for conformance to specification and are of robust construction. The optical semiconductor die are mounted within hermetically sealed TO can subassemblies making them impervious to contaminants and moisture. This construction ensures that the modules will operate over full industrial temperature range.

**Absolute  
Maximum Ratings  
Parameters**

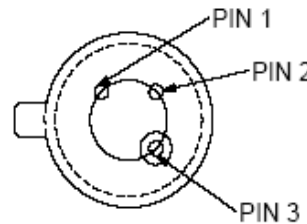
| Module                | Symbol      | Rating    | Units |
|-----------------------|-------------|-----------|-------|
| Operating Temp        | $T_{OP}$    | -40 to 85 | °C    |
| Storage Temp          | $T_{STG}$   | -40 to 85 | °C    |
| Soldering Temp        | $T_{SLD}$   | 240       | °C    |
| <b>LED</b>            |             |           |       |
| Forward Current       | $I_{F(LD)}$ | 150       | mA    |
| Reverse Voltage       | $V_{R(LD)}$ | 2         | V     |
| <b>PIN Photodiode</b> |             |           |       |
| Forward Current       | $I_{F(PD)}$ | 10        | mA    |
| Reverse Current       | $I_{R(PD)}$ | 5         | mA    |
| Reverse Voltage       | $V_{R(PD)}$ | 20        | V     |



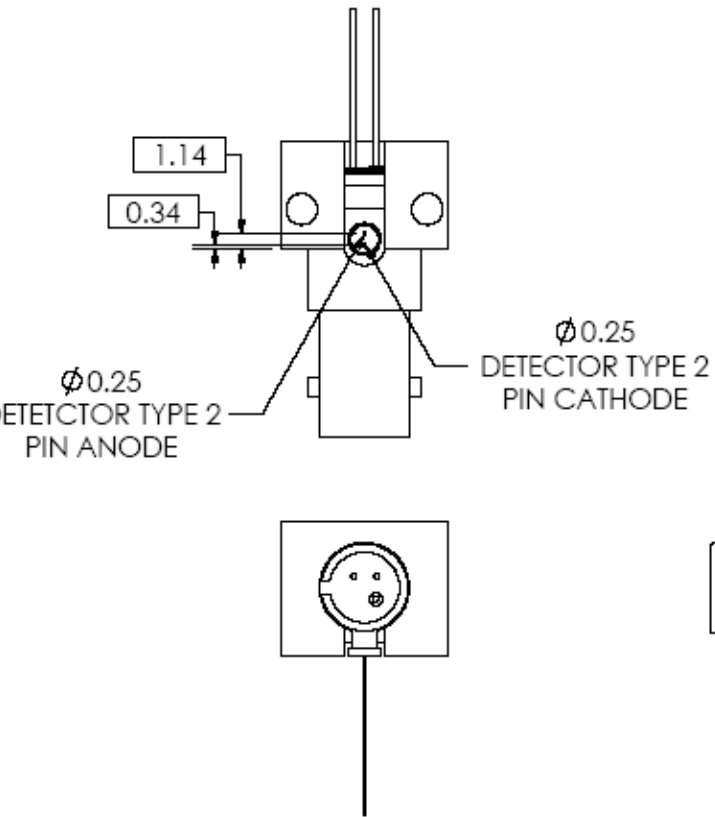
|       |         |
|-------|---------|
| PIN 1 | CATHODE |
| PIN 2 | ANODE   |

**NOTE :**

1. THIS DEVICE IS SUSCEPTABLE TO DAMAGE FROM ELECTROSTATIC DISCHARGE (ESD). FOLLOW GUIDELINES ACCORDING TO PROPER ESD PROCEDURES.
2. CROSSTALK TO BE <75nA
3. ANY OF TWO DIFFERENT DETECTOR TYPES (DIFFERENT PIN LOCATIONS) MAY BE USED WITH THIS PRODUCT. SEE SHEET 1 & 2.

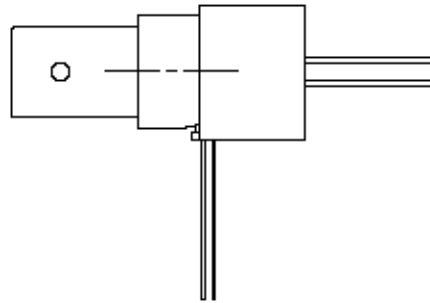


|       |             |
|-------|-------------|
| PIN 1 | ANODE       |
| PIN 2 | CATHODE     |
| PIN 3 | CASE GROUND |



NOTES:

1. ALL MECHANICAL DIMENSIONS ARE SAME AS SHOWN IN SHEET 1
2. FINAL PRODUCT MAY CONTAIN EITHER DETECTOR TYPE.



| BiDirectional Module Characteristics and Parameters |                 |      |      |      |               |  |
|---|-----------------|------|------|------|---------------|--|
|   | Symbol          | MIN. | TYP. | MAX  | Units         | Test Condition   |
| <b>1300nm LED</b>                                   |                 |      |      |      |               |  |
| Power   | $P_O$           | 20   | 35   |      | uW            | $I_F=100\text{ mA}$<br>(Note 1)                            |
| Operating Current                                   | $I_{OP}$        |      | 50   | 100  | mA            | $I_F = I_{OP}$   |
| Operating Voltage                                   | $V_{OP}$        | -    | 1.2  | 1.7  | V             | $I_F = I_{OP}$   |
| Peak Wavelength                                     | $\Lambda$       | 1280 | 1310 | 1350 | nm            | 25°C   |
| Spectral Width                                      | Delta $\Lambda$ | -    | -    | 170  | nm            | FWHM   |
| Rise/Fall Time                                      | $t_r, t_f$      | -    | -    | 3.0  | nsec          | 10~90%   |
| <b>Si PIN Photodiode</b>                            |                 |      |      |      |               |  |
| Active Area   |                 |      | 300  |      | $\mu\text{m}$ | Diameter   |
| Spectral Sensitivity                                | S               | 0.4  | 0.5  |      | A/W           | $V_{R(PD)}$<br>=5V@1310nm                                  |
| Reverse Voltage                                     | V               |      | 5    | 15   | V             |  |
| Dark Current  | $I_{D(PD)}$     | -    | 0.1  | 1.0  | nA            | $V_{R(PD)}=5\text{V}@25^\circ\text{C}$                     |
| Capacitance   | $C_{(PD)}$      |      | 2    | 4    | pF            | $V_{R(PD)}=5\text{V},$<br>$f=1\text{MHz}$                  |
| Rise/Fall Time                                      | $t_r, t_f$      | -    | -    | 2.0  | nsec          | $V_{R(PD)}=5\text{V},$<br>10~90%                           |
| <b>Cross Talk Current</b>                           | $I_{Cr}$        |      | 75   |      | nA            | $V_{R(PD)}=5\text{V}$<br>$I_{LED}=60\text{mA}$<br>(Note 2) |

Note 1: 62.5/125um graded index fiber (NA=0.275)

Note 2: Internal Cross Talk with ceramic ferrule inserted but no optical power from fiber. Total current = Dark Current + Cross Talk Current.