

# MIOC-1550-22-PG



## DEVICE

### Multi-functional Integrated Optical Chip, Packaged, 1550 nm, 22 mm Chip Length, w/ PM Fiber Pigtails

## OVERVIEW

The Optilab MIOC-1550-22-PG is the key component of Fiber Optic Gyroscope (FOG) for rotational rate sensing and inertial navigation systems. This Integrated Optic Chip (IOC) device is composed of a polarizer, a Y-junction coupler and dual electro optic phase modulators. Based on Lithium Niobate ( $\text{LiNbO}_3$ ), MIOC-1550-22-PG is fabricated with Annealed Proton Exchange (APE) optical waveguides. The MIOC-1550-22-PG features Polarization Extinction Ratio (PER) exceeding 60 dB that can minimize bias drift which results from polarization crosstalk induced non-reciprocity. The MIOC-1550-22-PG assures high reliability and performance over wide temperature range and is fiber pigtailed (input/output) with a variety of PM fiber configurations. Contact Optilab for more information.

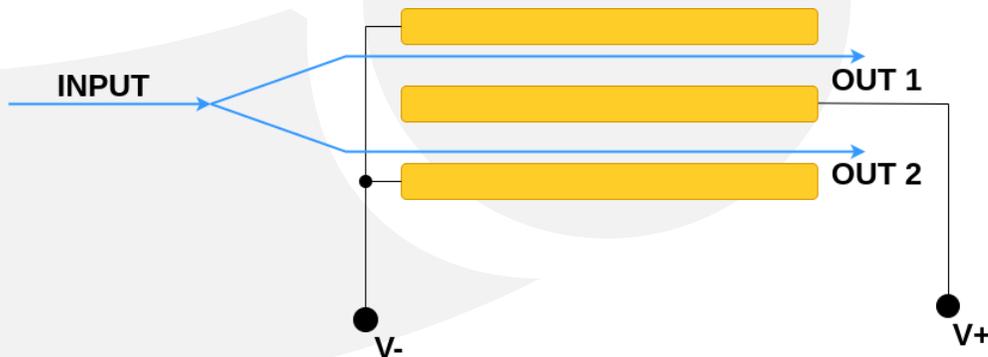
## FEATURES

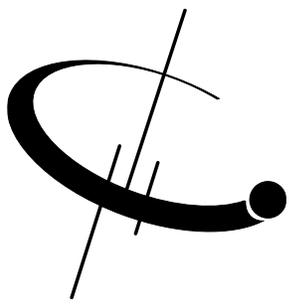
- 1550  $\pm$  20 nm operation
- Low insertion loss
- Polarization extinction ratio > 60 dB
- Low  $V_\pi$  voltage
- Low Polarization crosstalk
- PM fiber pigtails

## USE IN

- Fiber Optic Gyroscope (FOG)
- Fiber Optic Current Sensor (FOCS)
- Hydrophone and other optic sensitive fields
- Research and development

## FUNCTIONAL DIAGRAM





# MIOC-1550-22-PG

ABSOLUTE MAXIMUM RATING ( $T_c = 25\text{ }^\circ\text{C}$  unless otherwise specified)

| Parameter                  | Symbol    | Conditions                       | Min | Max | Unit             |
|----------------------------|-----------|----------------------------------|-----|-----|------------------|
| Optical Input Power        | $OP_{in}$ | CW                               |     | 100 | mW               |
| Drive Voltage              | $V_{in}$  | CW or Pulse                      | -25 | +25 | V                |
| Operation Case Temperature | $T_c$     |                                  | -45 | 75  | $^\circ\text{C}$ |
| Storage Temperature        | $T_{st}$  |                                  | -45 | 85  | $^\circ\text{C}$ |
| Soldering Time             | $T_{sld}$ | $\leq 260\text{ }^\circ\text{C}$ |     | 10  | sec              |

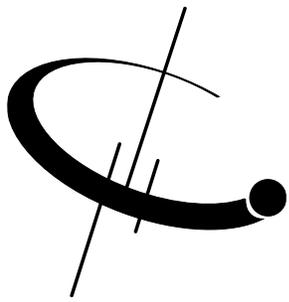
GENERAL SPECIFICATIONS at Room Temperature ( $T_c = 25\text{ }^\circ\text{C}$ )

| Parameter                          | Symbol    | Unit | P Grade     | A Grade    | B Grade    |
|------------------------------------|-----------|------|-------------|------------|------------|
| Operating Wavelength               | $\lambda$ | nm   | 1520 ~ 1570 |            |            |
| Insertion Loss                     | IL        | dB   | $\leq 3.1$  | $\leq 3.6$ | $\leq 4.1$ |
| Splitting Ratio                    | SR        | %    | $50 \pm 2$  | $50 \pm 3$ | $50 \pm 5$ |
| Half Wave Voltage                  | $V_{pi}$  | V    | $\leq 4.0$  | $\leq 4.1$ | $\leq 4.3$ |
| Pigtail Polarization Crosstalk     | XT        | dB   | $\leq -30$  | $\leq -27$ | $\leq -25$ |
| Chip Polarization Extinction Ratio | PER       | dB   | $\geq 60$   |            |            |
| Residual Intensity Modulation      | RIM       | %    | $\leq 0.1$  | $\leq 0.1$ | $\leq 0.2$ |
| Optical Back Reflection Loss       | OBRL      | dB   | $\geq 50$   | $\geq 47$  | $\geq 45$  |
| Fiber Length                       | L         | m    | $\geq 0.9$  |            |            |

Performance Over Full Temperature Range ( $-45\text{ }^\circ\text{C} \sim +75\text{ }^\circ\text{C}$ )

| Parameter                      | Unit | P Grade    | A Grade    | B Grade    |
|--------------------------------|------|------------|------------|------------|
| Insertion Loss Variation       | dB   | $\leq 0.3$ | $\leq 0.5$ | $\leq 0.7$ |
| Splitting Ratio                | %    | $50 \pm 3$ | $50 \pm 5$ | $50 \pm 5$ |
| Pigtail Polarization Crosstalk | dB   | $\leq -27$ | $\leq -25$ | $\leq -20$ |





# MIOC-1550-22-PG

## Ordering Option:

MIOC-1550-LL-FF-G-XX-YY-ZZ

### LL: Chip Length

- 18: 18 mm
- 22: 22 mm

### FF: Form Factor

- BC: Bare chip
- SB: Bare chip on submount
- SP: Fiber pigtailed w/ submount
- PG: Packaged

### G: Grade

- P: Premium grade
- A: A grade
- B: B grade

### XX: Input Fiber

**YY: Output Fiber #1**  
**ZZ: Output Fiber #2**

For each fiber:

First digit: Fiber Type

Second digit: Alignment direction

### Fiber Type Option:

- 0: No fiber pigtail
- 1: Corning RCPM15, 80/165  $\mu\text{m}$
- 2: Corning PM15-U25D, 125/250  $\mu\text{m}$

### Fiber Alignment Direction Option:

- 0: Not applicable
- 1: Slow axis aligned to TE mode
- 2: Fast axis aligned to TE mode
- 3: 45° alignment

## MECHANICAL DRAWING

Unit: mm

