

Please read this data sheet before purchasing, and keep it on file for future reference. It contains important information on the product specifications.

**Optocom**

**Optoelectronics Group**

**OPT1275-5.Ø**

**OC-12 Optical Receiver**

**Data Sheet**

**2004/5**



210 Andover Street, Wilmington, MA 01887

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## General

### Description

The OPT1275-5.Ø is a 20-pin DIP fiber optic receiver module which converts lightwaves in the 1310/1550 nm band to electrical data signals at a data rate of 20 to 650 Mbps. The receiver has a hermetically sealed InGaAs avalanche photodiode aligned to a singlemode fiber.

### Applications

The device is designed for data communication systems and telecommunication transmission systems over singlemode or multimode fiber.

### Standards Met

The specifications met are: the SONET/SDH STS-12/STM-4 interface, the Long Reach OC-12 Optical Parameters (LR-1, LR-2 & LR-3) of Bellcore GR-253-CORE, the Long-haul Recommendation (L-4.1, L-4.2 & L-4.3) of ITU-T G.957, and the monitor & alarm requirements of Bellcore GR-253-CORE & ITU-T G.783 and G.958.

## Ratings

### Absolute Maximum Ratings

| Parameter                                    | Symbol    | Min     | Max    | Unit   |
|--|-----------|---------|--------|--------|
| Supply Voltage                               | $V_{CC}$  | 0       | 6.0    | V      |
| Photodiode Supply Voltage                    | $V_{PD}$  | 0       | $V_B$  | V      |
| Operating Case Temperature Range             | $T_C$     | -40     | 85     | °C     |
| Operating Relative Humidity (non-condensing) | $H_{OP}$  | ---     | 85     | %      |
| Lead Soldering Temperature/Time              | T/t       | ---     | 250/10 | °C/s   |
| Minimum Fiber Bend Radius                    | $R_F$     | 32/1.25 | ---    | mm/in. |
| Storage Case Temperature Range               | $T_{SIG}$ | -40     | 85     | °C     |

## Features

### Operation

The OPT1275-5.Ø optical receiver operates using a single +5 V and an APD bias power supply. The device maintains electrical and optical stability over the specified temperature and voltage ratings.

### User Options and Assurance

Operator can measure the photocurrent generated in response to the incoming optical signal. The photocurrent can be calculated based on the voltage drop across an external resistor connected between the monitoring pin 10 and APD supply voltage. If photocurrent measurement is not required, pin 10 should be connected to an APD power supply directly.

Every device is optically and electrically tested to ensure highest performance and reliability.

# Operating Characteristics

## Optical

| Parameter   | Symbol    | Min  | Typ  | Max  | Unit |
|---|-----------|------|------|------|------|
| Input Wavelength  | $\lambda$ | 1260 | ---  | 1580 | nm   |
| Measured Average Sensitivity <sup>1</sup>                 | $P_{RL}$  | -39  | -41  | ---  | dBm  |
| Maximum Input Power                                       | $P_{RH}$  | -5.0 | ---  | ---  | dBm  |
| Signal Detect Threshold:                                  |           |      |      |      |      |
| Decreasing Light Input                                    | $SDT_D$   | ---  | ---  | -42  | dBm  |
| Increasing Light Input                                    | $SDT_I$   | ---  | ---  | -42  | dBm  |
| Photodiode Responsivity <sup>2</sup> ( $\lambda=1310$ nm) | $PD_R$    | 0.7  | 0.8  | ---  | A/W  |
| Photodiode Responsivity <sup>2</sup> ( $\lambda=1550$ nm) | $PD_R$    | 0.8  | 0.9  | ---  | A/W  |
| APD Photodiode Breakdown Voltage                          | $V_B$     | 40   | 65   | 100  | V    |
| Temperature Coefficient of $V_B$                          | $\gamma$  | ---  | 0.17 | ---  | %/°C |

<sup>1</sup> At a BER of  $1 \times 10^{-10}$  and an extinction ratio of 10 dB or more.

<sup>2</sup> Photocurrent  $I =$  Responsivity  $\times$  Mean Power.

## Electrical

| Parameter                    | Symbol    | Min   | Typ | Max   | Unit |
|------------------------------|-----------|-------|-----|-------|------|
| dc Power Supply Voltage      | $V_{CC}$  | 4.75  | 5.0 | 5.25  | V    |
| dc Power Supply Current      | $I_{CC}$  | 50    | 80  | 150   | mA   |
| Output Voltage: <sup>1</sup> |           |       |     |       |      |
| Low                          | $V_{OL}$  | -1.84 | --- | -1.62 | V    |
| High                         | $V_{OH}$  | -1.10 | --- | -0.90 | V    |
| Output Rise/Fall Time        | $t_R/t_F$ | ---   | 350 | 400   | ps   |
| Output Flag Voltage:         |           |       |     |       |      |
| Low                          | $V_{FL}$  | -1.84 | --- | -1.62 | V    |
| High                         | $V_{FH}$  | -1.10 | --- | -0.90 | V    |
| Output Data Current:         |           |       |     |       |      |
| Low                          | $I_{OL}$  | ---   | 5   | 50    | mA   |
| High                         | $I_{OH}$  | ---   | 20  | 50    | mA   |
| Output Flag Current:         |           |       |     |       |      |
| Low                          | $I_{FL}$  | 0     | 10  | 15    | mA   |
| High                         | $I_{FH}$  | 0     | 10  | 15    | mA   |

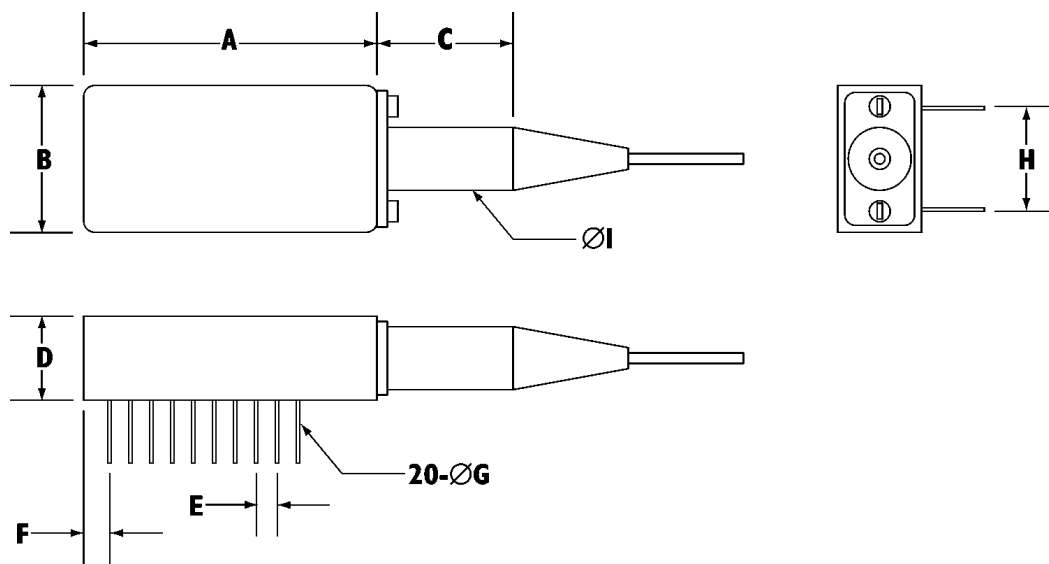
## Operating Characteristics - continued

<sup>1</sup> Output measured from  $V_{CC}$  with  $50\Omega$  load to  $[V_{CC} - 2.0]$  V

## Physical

The device package conforms to the 20-pin DIP outline shown below.

### Outline Diagram



## Physical - continued

### Dimensions

| Dimension | Typ    |             |
|-----------|--------|-------------|
|           | Inches | Metric (mm) |
| A         | 1.300  | 33.0        |
| B         | 0.635  | 16.13       |
| C         | 1.22   | 30.99       |
| D         | 0.365  | 9.27        |
| E         | 0.100  | 2.54        |
| F         | 0.110  | 2.79        |
| ØG        | 0.018  | 0.46        |
| H         | 0.400  | 10.16       |
| ØI        | 0.236  | 6.00        |

An assigned serial number in both barcode and human readable formats appear on the device.

All markings and labels are permanent and meet the requirements of MIL-STD-883C-2015.7.

### Connections

The pigtail consists of a singlemode (SM) fiber with an 8  $\mu\text{m}$  core. The outer jacket has a nominal 900  $\mu\text{m}$  outer diameter and is terminated with an ST<sup>®\*</sup>, FC, or SC Connector. The minimal pigtail length is 1 meter (39.4 inches) long.

\*ST<sup>®</sup> is a registered trademark of AT&T

## Physical - continued

### Pin Designations

|            |     |     |     |     |     |     |         |     |         |                 |
|------------|-----|-----|-----|-----|-----|-----|---------|-----|---------|-----------------|
| <b>Pin</b> | 1   | 2   | 3   | 4   | 5   | 6   | 7       | 8   | 9       | 10              |
|            | GND | GND | GND | GND | NC  | GND | DATA(+) | GND | DATA(-) | PD Bias         |
| <b>Pin</b> | 20  | 19  | 18  | 17  | 16  | 15  | 14      | 13  | 12      | 11              |
|            | NC  | NC  | NC  | NC  | GND | GND | FLAG(-) | GND | FLAG(+) | V <sub>cc</sub> |

## Safety

Please embrace all customary precautions & discretion while handling this device.

**Optical**

- Avoid direct eye exposure to laser beam projection area or a broken fiber under operation.

**Electrical**

- Warning against excessive overvoltages or current surges as these may cause failure or electrical shock.

- Solder leads to electronics entirely so as to eschew short circuits.

- Solder or plug in device while power is turned off.

**Other**

- Avoid storage above maximum temperature rating & other extreme conditions.

- Avoid device disassembly as damages may be incurred.

- Avoid excessive force to fiber pigtail and bending beyond a 30 mm radius.

- Take normal handling precautions as for all electrostatic sensitive devices.

## Appendix

### Terms

BER: Bit Error Rate

SD: indicates the presence of an incoming signal level that has a workable BER

GND: Ground

NC: not connected

## Additional Information

### Contact

For additional information, product specifications, or information about Optocom:

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