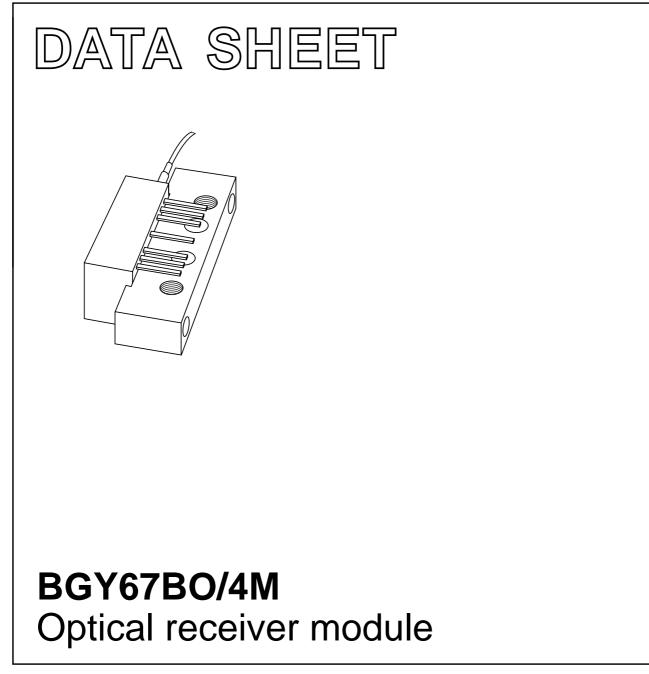
# DISCRETE SEMICONDUCTORS



Product specification Supersedes data of 1998 Apr 17 2001 Sep 27



BGY67BO/4M

## **Optical receiver module**

### FEATURES

- Excellent linearity
- Extremely low noise
- Excellent flatness
- Standard CATV outline
- Rugged construction
- Gold metallization ensures excellent reliability.

### APPLICATIONS

• Reverse receiver amplifier in two-way CATV systems in the 5 to 400 MHz frequency range.

### DESCRIPTION

Hybrid high dynamic range optical amplifier module in a SOT115U package operating at a voltage supply of 24 V (DC). The module contains a monomode optical input suitable for wavelengths from 1290 to 1600 nm, a terminal to monitor the pin diode current and an electrical output with an impedance of 75  $\Omega$ .

### **PINNING - SOT115U**

| PIN     | DESCRIPTION     |  |
|---------|-----------------|--|
| 1       | monitor current |  |
| 2,3,7,8 | common          |  |
| 5       | +V <sub>B</sub> |  |
| 9       | output          |  |

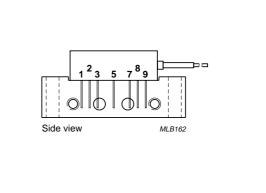


Fig.1 Simplified outline.

### QUICK REFERENCE DATA

| SYMBOL           | PARAMETER                      | CONDITIONS            | MIN. | MAX. | UNIT   |
|------------------|--------------------------------|-----------------------|------|------|--------|
| f                | frequency range                |                       | 5    | 400  | MHz    |
| S <sub>22</sub>  | output return losses           | f = 5 to 400 MHz      | 14   | -    | dB     |
|                  | optical input return losses    |                       | 40   | -    | dB     |
| d <sub>2</sub>   | second order distortion        |                       | _    | -70  | dBc    |
| F                | equivalent noise input         | f = 5 to 400 MHz      | -    | 7    | pA/√Hz |
| I <sub>tot</sub> | total current consumption (DC) | V <sub>B</sub> = 24 V | 150  | 180  | mA     |

### HANDLING

Fibreglass optical coupling: maximum tensile strength = 5 N; minimum bending radius = 35 mm.

### CAUTION

This product is supplied in anti-static packing to prevent damage caused by electrostatic discharge during transport and handling. For further information, refer to Philips specs.: SNW-EQ-608, SNW-FQ-302A, and SNW-FQ-302B.

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### LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL           | PARAMETER                           | CONDITIONS   | MIN. | MAX. | UNIT |
|------------------|-------------------------------------|--|------|------|------|
| f                | frequency range                     |  | 5    | 400  | MHz  |
| T <sub>stg</sub> | storage temperature                 |  | -40  | +85  | °C   |
| T <sub>mb</sub>  | operating mounting base temperature |  | -20  | +85  | °C   |
| P <sub>in</sub>  | optical input power                 | continuous   | _    | 5    | mW   |
| ESD              | ESD sensitivity                     | human body model;<br>R = 1.5 k $\Omega$ ; C = 100 pF | 500  | _    | V    |

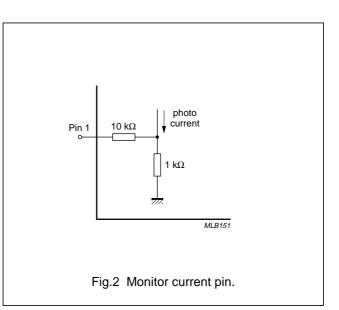
### CHARACTERISTICS

| Table 1 | Bandwidth 5 to 400 N | ИНz; V <sub>B</sub> = 24 V; Т <sub>mb</sub> : | = 30 °C; Z <sub>L</sub> = 75 Ω |
|---------|----------------------|---|--------------------------------|
|---------|----------------------|---|--------------------------------|

| SYMBOL           | PARAMETER                      | CONDITIONS                         | MIN. | MAX. | UNIT   |
|------------------|--------------------------------|------------------------------------|------|------|--------|
| S                | responsivity                   | λ = 1300 nm                        | 800  | -    | V/W    |
| FL               | flatness of frequency response |                                    | -    | ±0.3 | dB     |
| S <sub>22</sub>  | output return losses           | f = 5 to 400 MHz                   | 14   | -    | dB     |
|                  | optical input return losses    |                                    | 40   | -    | dB     |
| d <sub>2</sub>   | second order distortion        | note 1                             | -    | -70  | dB     |
|                  |                                | note 2                             | -    | -70  | dB     |
| d <sub>3</sub>   | third order distortion         | note 3                             | -    | -80  | dB     |
| F                | equivalent noise input         | f = 5 to 400 MHz                   | -    | 7    | pA/√Hz |
| s <sub>λ</sub>   | spectral sensitivity           | $\lambda = 1310 \pm 20 \text{ nm}$ | 0.85 | -    | A/W    |
|                  |                                | $\lambda$ = 1550 ±20 nm            | 0.9  | -    | A/W    |
| λ                | optical wavelength             |                                    | 1290 | 1600 | nm     |
| L                | length of optical fibre        | fibre; SM type; 9/125 μm           | 1    | -    | m      |
| I <sub>tot</sub> | total current consumption (DC) | note 4                             | 150  | 180  | mA     |

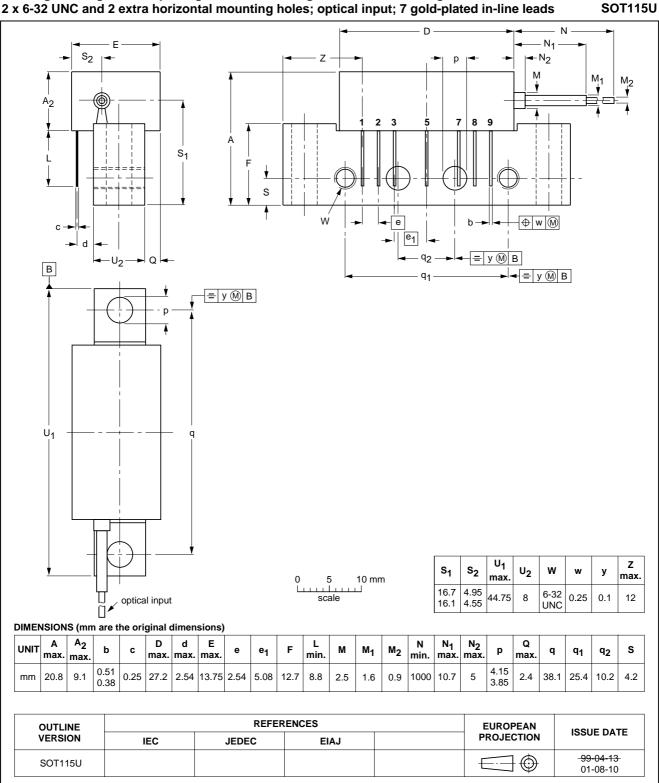
#### Notes

- 1. Two laser test; each laser with 40% modulation index;  $f_p = 30.25 \text{ MHz}; P_p = 0.5 \text{ mW};$   $f_q = 70 \text{ MHz}; P_q = 0.5 \text{ mW};$ measured at  $f_p + f_q = 100.25 \text{ MHz}.$
- 2. Two laser test; each laser with 40% modulation index;  $f_p = 200.25 \text{ MHz}$ ;  $P_p = 0.5 \text{ mW}$ ;  $f_q = 100 \text{ MHz}$ ;  $P_q = 0.5 \text{ mW}$ ; measured at  $f_p + f_q = 300.25 \text{ MHz}$ .
- 3. Three laser test; each laser with 40% modulation index;  $f_p = 325.25 \text{ MHz}; P_p = 0.33 \text{ mW};$   $f_q = 210.25 \text{ MHz}; P_q = 0.33 \text{ mW};$   $f_r = 135.25 \text{ MHz}; P_r = 0.33 \text{ mW};$ 
  - measured at  $f_p + f_q f_r = 400.25$  MHz.
- 4. The module normally operates at  $V_B = 24$  V, but is able to withstand supply transients up to 30 V.



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### PACKAGE OUTLINE



Rectangular single-ended package; aluminium flange; 2 vertical mounting holes; 2 x 6-32 UNC and 2 extra horizontal mounting holes; optical input; 7 gold-plated in-line leads

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### DATA SHEET STATUS

| DATA SHEET STATUS <sup>(1)</sup> | PRODUCT<br>STATUS <sup>(2)</sup> | DEFINITIONS  |
|----------------------------------|----------------------------------|--|
| Objective data                   | Development                      | This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.  |
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### Notes

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Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

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