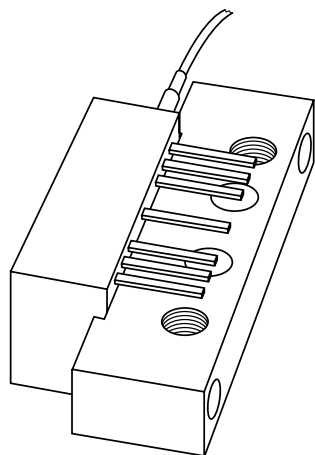


# DATA SHEET



## **BGE67BO; BGE67BO/SC0** Optical receiver modules

Product specification  
Supersedes data of 2000 Jul 31

2000 Oct 31

Optical receiver modules

BGE67BO; BGE67BO/SC0

FEATURES

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

APPLICATIONS

- Reverse receiver amplifiers in two-way CATV systems in the 5 to 300 MHz frequency range.

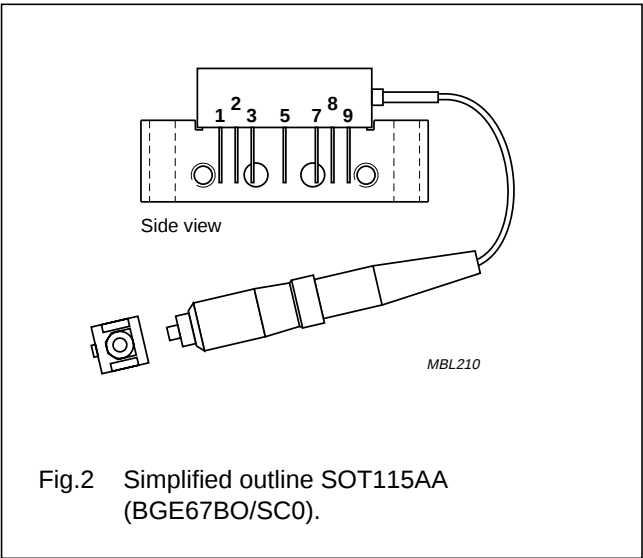
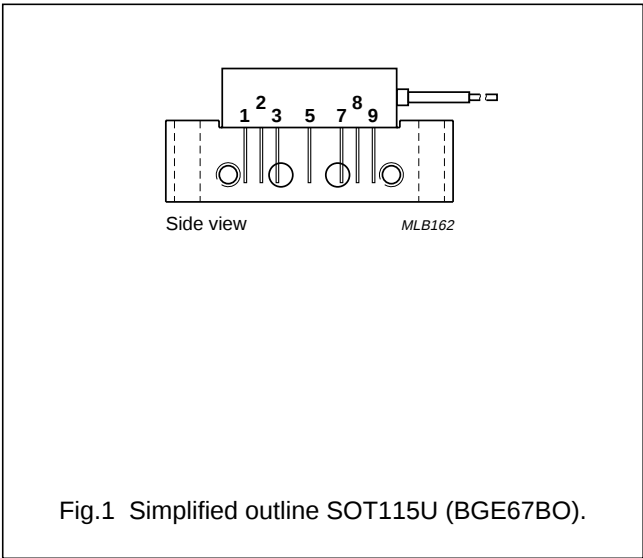
DESCRIPTION

High dynamic range optical receiver amplifier modules in a standard SOT115 package where the non-jacketed fibre has either no connector (BGE67BO) or has an SC/APC connector (BGE67BO/SC0). The operating supply voltage is 24 V (DC).

The modules contain 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 a characteristic impedance of 75  $\Omega$ .

PINNING

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



QUICK REFERENCE DATA

| SYMBOL           | PARAMETER                      | CONDITIONS            | MIN. | MAX. | UNIT                   |
|------------------|--------------------------------|-----------------------|------|------|------------------------|
| f                | frequency range                |                       | 5    | 300  | MHz                    |
| S <sub>22</sub>  | output return losses           | f = 5 to 300 MHz      | 15   | –    | dB                     |
|                  | optical input return losses    |                       | 45   | –    | dB                     |
| d <sub>2</sub>   | second order distortion        |                       | –    | –70  | dBc                    |
| F                | equivalent noise input         | f = 10 to 300 MHz     | –    | 7    | pA/ $\sqrt{\text{Hz}}$ |
| I <sub>tot</sub> | total current consumption (DC) | V <sub>B</sub> = 24 V | 160  | 190  | mA                     |

HANDLING

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

## Optical receiver modules

## BGE67BO; BGE67BO/SC0

## LIMITING VALUES

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

| SYMBOL           | PARAMETER                           | CONDITIONS                                  | MIN. | MAX. | UNIT |
|------------------|-------------------------------------|---------------------------------------------|------|------|------|
| f                | frequency range                     |                                             | 5    | 300  | 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; R = 1.5 kΩ;<br>C = 100 pF | 500  | –    | V    |

## CHARACTERISTICS

**Table 1** Bandwidth 5 to 300 MHz; V<sub>B</sub> = 24 V; T<sub>mb</sub> = 30 °C; Z<sub>L</sub> = 75 Ω

| SYMBOL             | PARAMETER                                         | CONDITIONS               | MIN.       | MAX.     | UNIT       |
|--------------------|---------------------------------------------------|--------------------------|------------|----------|------------|
| S                  | responsivity<br>BGE67BO<br>BGE67BO/SC0            | λ = 1300 nm              | 800<br>750 | –<br>–   | V/W<br>V/W |
| V <sub>pin 1</sub> | pin 1 monitor voltage                             | λ = 1300 nm              | 0.75       | 1        | V/mW       |
| FL                 | flatness of frequency response                    |                          | –          | ±0.3     | dB         |
| S <sub>22</sub>    | output return losses                              | f = 5 to 300 MHz         | 15         | –        | dB         |
|                    | optical input return losses                       |                          | 45         | –        | dB         |
| OBR <sub>C</sub>   | connector optical return losses                   | BGE67BO/SC0              | 60         | –        | dB         |
| IL <sub>C</sub>    | connector optical insertion losses                | BGE67BO/SC0              | –          | 0.5      | dB         |
| d <sub>2</sub>     | second order distortion                           | note 1                   | –          | −70      | dB         |
| d <sub>3</sub>     | third order distortion                            | note 2                   | –          | −80      | dB         |
| F                  | equivalent noise input                            | f = 10 to 300 MHz        | –          | 7        | pA/√Hz     |
| S <sub>λ</sub>     | spectral sensitivity                              | λ = 1310 ± 20 nm         | 0.85       | –        | A/W        |
|                    |                                                   | λ = 1550 ± 20 nm         | 0.9        | –        | A/W        |
| λ                  | optical wavelength                                |                          | 1290       | 1600     | nm         |
| L                  | length of optical fibre<br>BGE67BO<br>BGE67BO/SC0 | fibre; SM type; 9/125 μm | 1<br>746   | –<br>861 | m<br>mm    |
| I <sub>tot</sub>   | total current consumption (DC)                    | note 3                   | 160        | 190      | mA         |

## Notes

- Two laser test; each laser with 40% modulation index;  
f<sub>p</sub> = 20.25 MHz; P<sub>p</sub> = 0.5 mW; f<sub>q</sub> = 34 MHz; P<sub>q</sub> = 0.5 mW; measured at f<sub>p</sub> + f<sub>q</sub> = 54.25 MHz.
- Three laser test; each laser with 40% modulation index; f<sub>p</sub> = 125.25 MHz; P<sub>p</sub> = 0.33 mW; f<sub>q</sub> = 109.25 MHz;  
P<sub>q</sub> = 0.33 mW; f<sub>r</sub> = 134.25 MHz; P<sub>r</sub> = 0.33 mW; measured at f<sub>p</sub> + f<sub>q</sub> − f<sub>r</sub> = 100.25 MHz.
- The module normally operates at V<sub>B</sub> = 24 V, but is able to withstand supply transients up to 30 V.

## Optical receiver modules

## BGE67BO; BGE67BO/SC0

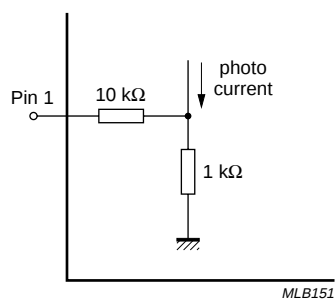


Fig.3 Monitor current pin.

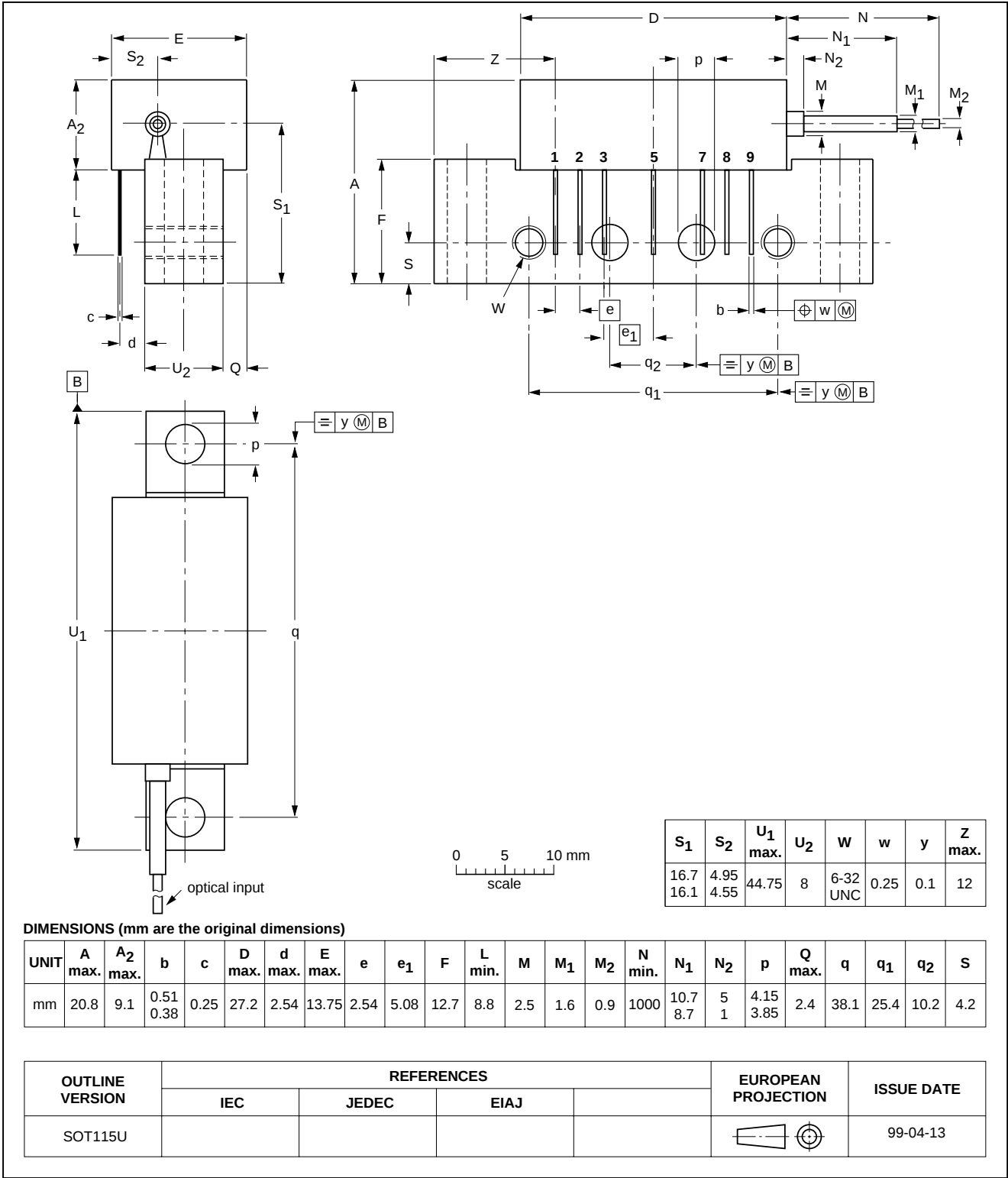
Optical receiver modules

BGE67BO; BGE67BO/SC0

PACKAGE OUTLINES

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

SOT115U

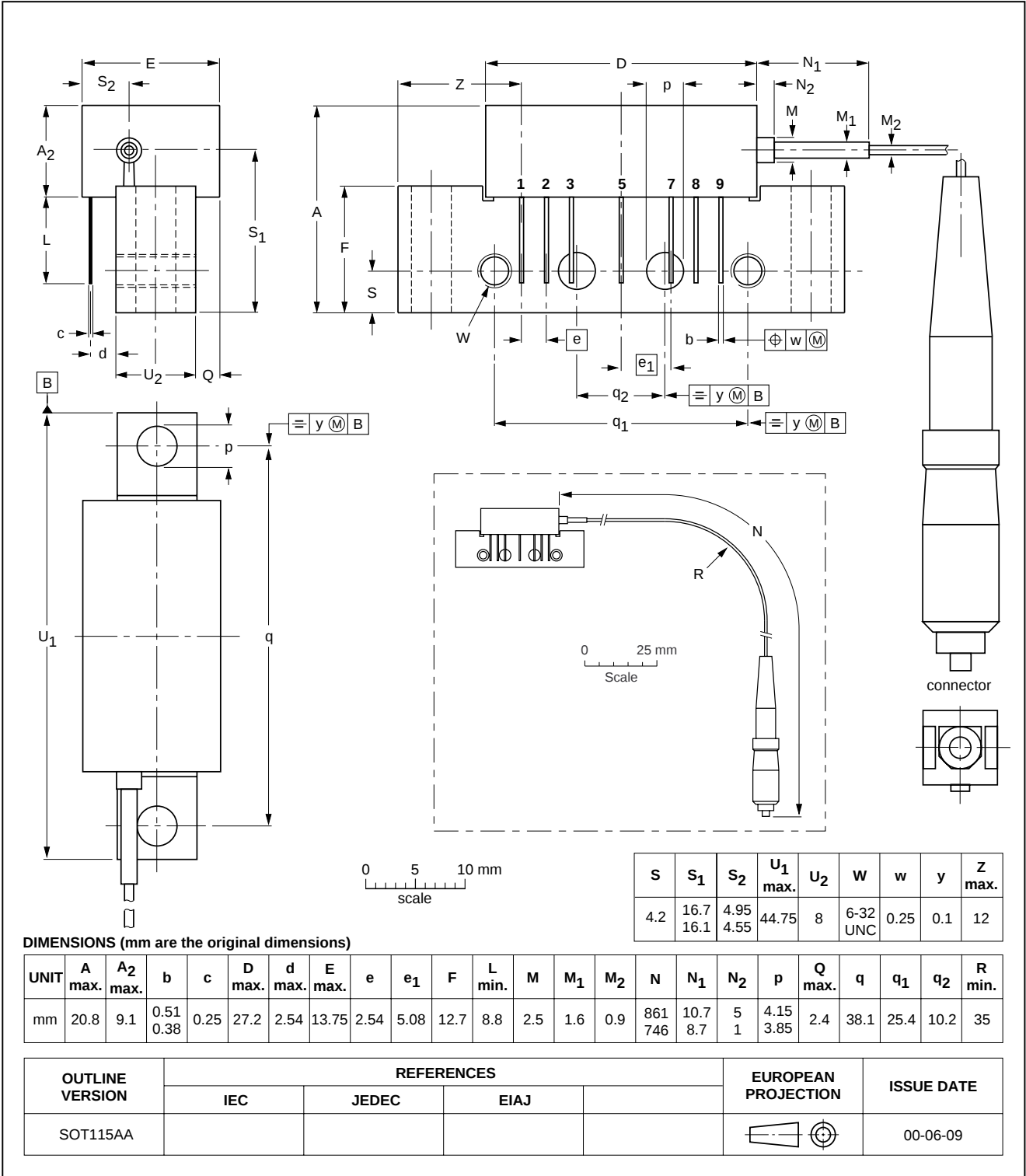


Optical receiver modules

BGE67BO; BGE67BO/SC0

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

SOT115AA



## Optical receiver modules

## BGE67BO; BGE67BO/SC0

## DATA SHEET STATUS

| DATA SHEET STATUS         | PRODUCT STATUS | DEFINITIONS <sup>(1)</sup>                                                                                                                                                                                                                                 |
|---------------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Objective specification   | Development    | This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.                                                                                                          |
| Preliminary specification | Qualification  | This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product. |
| Product specification     | Production     | This data sheet contains final specifications. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.                                                       |

## Note

1. Please consult the most recently issued data sheet before initiating or completing a design.

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**Short-form specification** — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

**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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## 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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