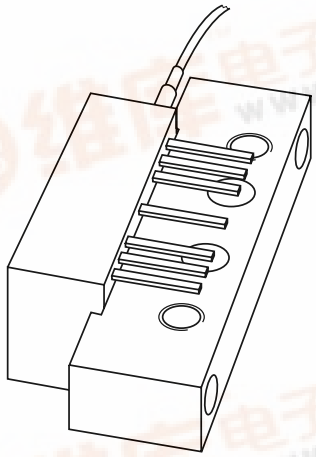
# DATA SHEET



# BGE887BO/FC
## Optical receiver module

Product specification
File under Discrete Semiconductors, SC16

1998 Jul 17

# Optical receiver module BGE887BO/FC

## FEATURES

- Excellent linearity
- Extremely low noise
- Excellent flatness
- Standard CATV outline
- Rugged construction
- Gold metallization ensures excellent reliability
- FC/APC connector (JDS version).

## APPLICATIONS

- CATV systems operating in the 40 to 860 MHz frequency range.

## DESCRIPTION

Hybrid high dynamic range optical receiver module in a SOT115N 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 Ω. The optical fibre is terminated by an FC/APC connector (JDS version) and partly reinforced by a 3 mm diameter Kevlar buffer.

## PINNING - SOT115N

| PIN | DESCRIPTION |
|---|---|
| 1 | monitor current |
| 2 | common |
| 3 | common |
| 5 | $+V_B$ |
| 7 | common |
| 8 | common |
| 9 | output |

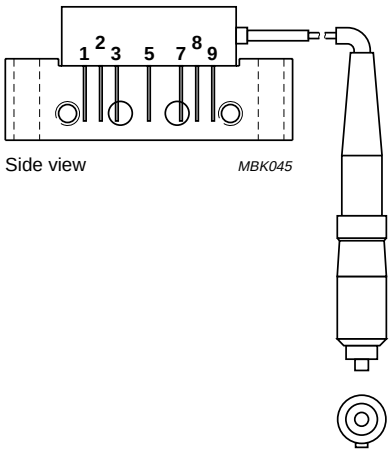



Fig.1 Simplified outline.

## QUICK REFERENCE DATA

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| f | frequency range | | 40 | 860 | MHz |
| $S_{22}$ | output return losses | f = 40 to 860 MHz | 11 | – | dB |
| | optical input return losses | | 40 | – | dB |
| $d_2$ | second order distortion | f = 324.25 MHz | – | –70 | dBc |
| F | equivalent noise input | f = 40 MHz | – | 7 | pA/√Hz |
| $I_{tot}$ | total current consumption (DC) | $V_B$ = 24 V | 175 | 205 | 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. |

## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 134).

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| f | frequency range | | 40 | 860 | MHz |
| $T_{stg}$ | storage temperature | | –40 | +85 | °C |
| $T_{mb}$ | operating mounting base temperature | | –20 | +85 | °C |
| $P_{in}$ | optical input power | continuous | – | 5 | mW |
| ESD | ESD sensitivity | human body model; R = 1.5 kΩ; C = 100 pF | 500 | – | V |

## CHARACTERISTICS

Bandwidth 40 to 860 MHz; $V_B$ = 24 V; $T_{mb}$ = 30 °C; $Z_L$ = 75 Ω.

| SYMBOL | PARAMETER | CONDITIONS | MIN. | MAX. | UNIT |
|---|---|---|---|---|---|
| S | responsivity | λ = 1300 nm | 750 | – | V/W |
| FL | flatness of frequency response | | – | ±0.5 | dB |
| $S_{22}$ | output return losses | $f_1$ = 40 to 860 MHz | 11 | – | dB |
| | optical input return losses | | 45 | – | dB |
| $OBR_C$ | connector optical return losses | | 70 | – | dB |
| $IL_C$ | connector optical insertion losses | | – | 0.5 | dB |
| $d_2$ | second order distortion | note 1 | – | –70 | dB |
| $d_3$ | third order distortion | note 2 | – | –80 | dB |
| F | equivalent noise input | $f_1$ = 40 MHz | – | 7 | pA/√Hz |
| $s_\lambda$ | 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 | buffered fibre; SM type; 9/125 μm; Kevlar buffer: 3 mm | 577 | 627 | mm |
| $I_{tot}$ | total current consumption (DC) | note 3 | 175 | 205 | mA |

**Notes**

1. Two laser test; each laser with 40% modulation index:
   $f_p$ = 135 MHz; $P_p$ = 0.5 mW;
   $f_q$ = 189.25 MHz; $P_q$ = 0.5 mW;
   measured at $f_p + f_q$ = 324.25 MHz.
2. Three laser test; each laser with 40% modulation index:
   $f_p$ = 326.25 MHz; $P_p$ = 0.33 mW;
   $f_q$ = 333.25 MHz; $P_q$ = 0.33 mW;
   $f_r$ = 335.25 MHz; $P_r$ = 0.33 mW;
   measured at $f_p + f_q - f_r$ = 324.25 MHz.
3. The module normally operates at $V_B$ = 24 V, but is able to withstand supply transients up to 30 V.

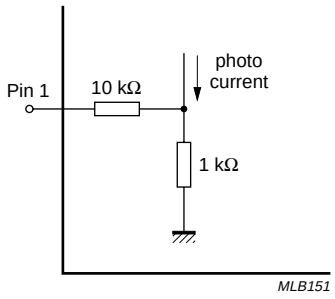



Fig.2 Monitor current pin.

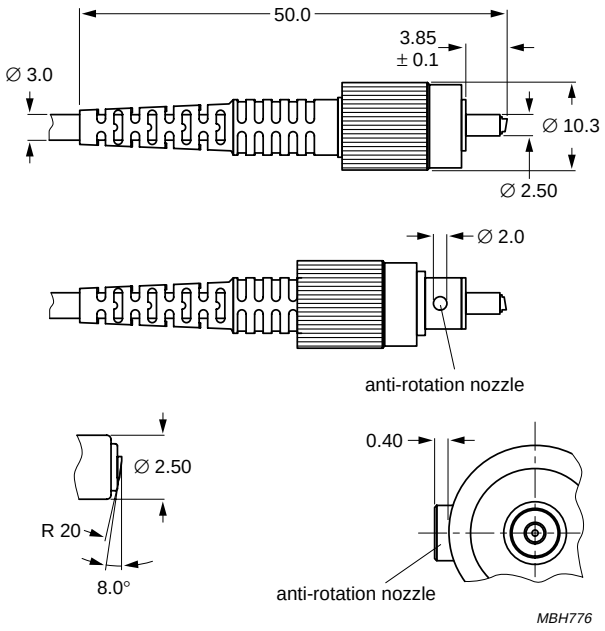
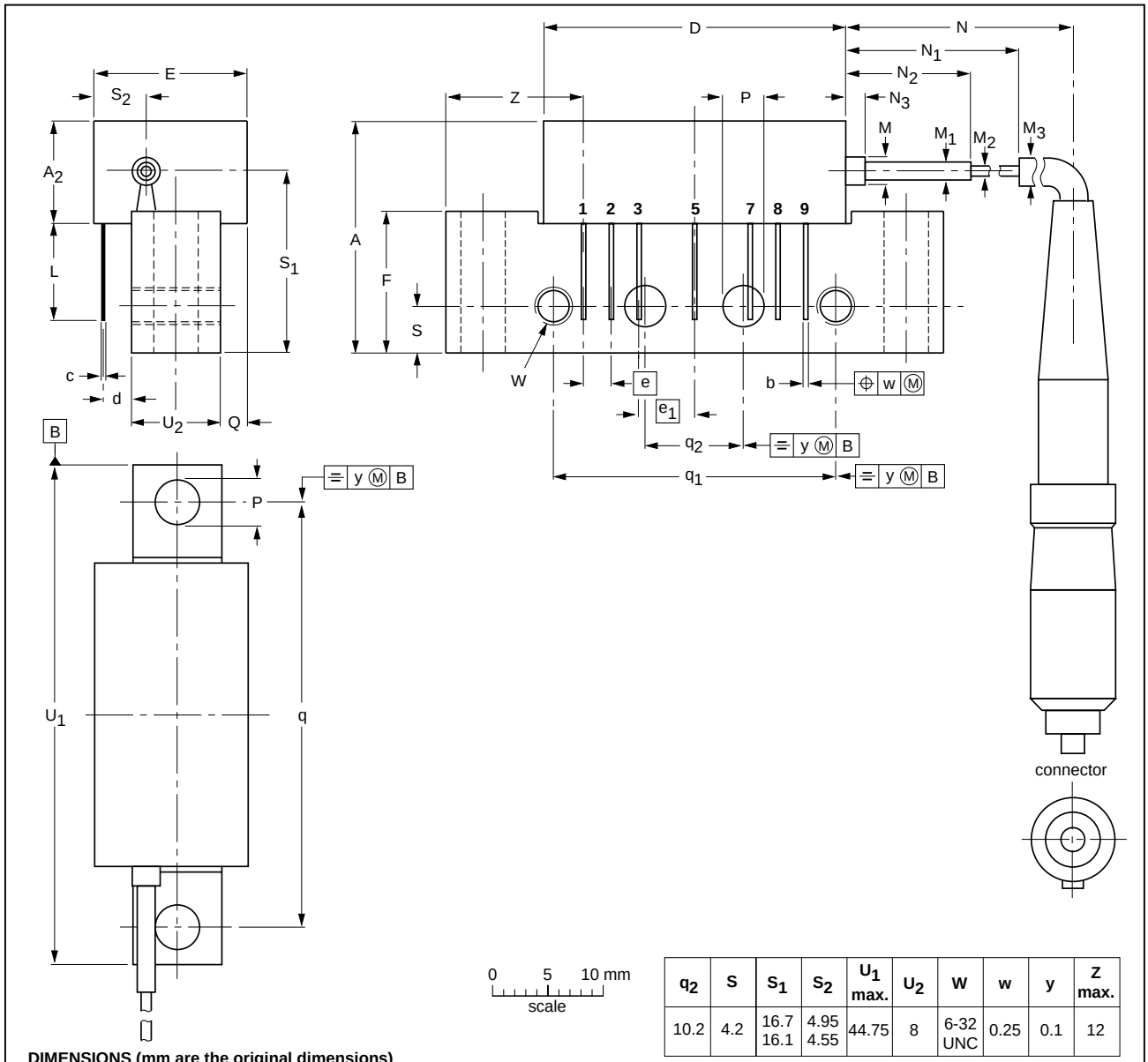



Fig.3 FC/APC connector.

## PACKAGE OUTLINE

**Rectangular single-ended flat 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** **SOT115N**




| q2 | S | S1 | S2 | U1 max. | U2 | W | w | y | Z max. |
|---|---|---|---|---|---|---|---|---|---|
| 10.2 | 4.2 | 16.7<br>16.1 | 4.95<br>4.55 | 44.75 | 8 | 6-32<br>UNC | 0.25 | 0.1 | 12 |

**DIMENSIONS (mm are the original dimensions)**

| UNIT | A max. | A2 max. | b | c | D max. | d max. | E max. | e | e1 | F | L min. | M | M1 | M2 | M3 | N | N1 | N2 | N3 | ∅ P | Q max. | q | q1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mm | 20.8 | 9.1 | 0.51<br>0.38 | 0.25 | 27.2 | 2.54 | 13.75 | 2.54 | 5.08 | 12.7 | 8.8 | 2.5 | 1.6 | 0.9 | 3 | 627<br>577 | 127<br>77 | 10.7<br>8.7 | 5<br>1 | 4.15<br>3.85 | 2.4 | 38.1 | 25.4 |

| OUTLINE VERSION | REFERENCES | | | | EUROPEAN PROJECTION | ISSUE DATE |
|---|---|---|---|---|---|---|
| | IEC | JEDEC | EIAJ | | | |
| SOT115N | | | | | | 98-03-06 |

## DEFINITIONS

| **Data Sheet Status** | |
|---|---|
| Objective specification | This data sheet contains target or goal specifications for product development. |
| Preliminary specification | This data sheet contains preliminary data; supplementary data may be published later. |
| Product specification | This data sheet contains final product specifications. |
| **Limiting values** | |
| Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 134). 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. | |
| **Application information** | |
| Where application information is given, it is advisory and does not form part of the specification. | |

## LIFE SUPPORT APPLICATIONS

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Printed in The Netherlands 125106/00/01/pp8 Date of release: 1998 Jul 17 Document order number: 9397 750 04162


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