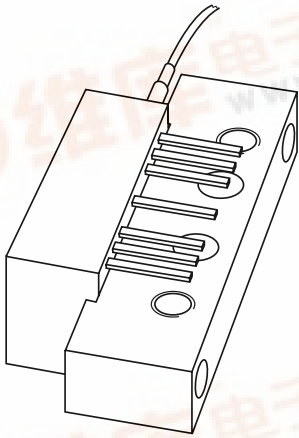


**DISCRETE SEMICONDUCTORS**

# DATA SHEET



## **BGE67BO/SC** Optical receiver module

Preliminary specification

1998 Aug 31

File under Discrete Semiconductors, SC16

# Optical receiver module

# BGE67BO/SC

## 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 300 MHz frequency range.

## DESCRIPTION

Hybrid high dynamic range optical amplifier module in a SOT115P 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 SC/APC connector and partly reinforced by a 3 mm diameter Kevlar buffer.

## PINNING - SOT115P

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

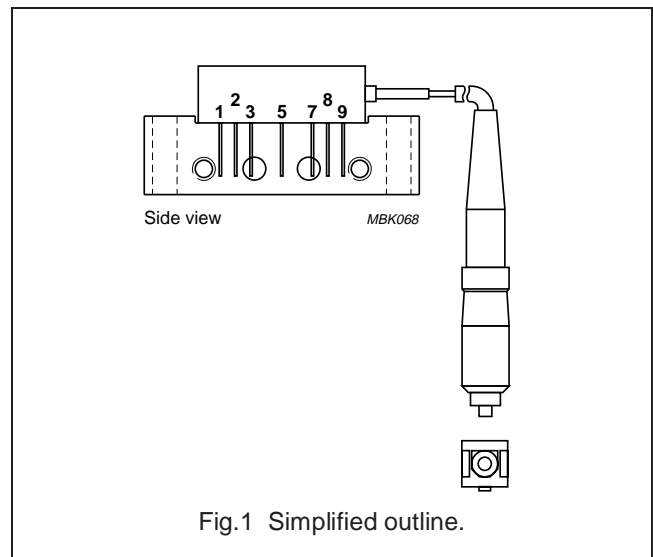


Fig.1 Simplified outline.

## QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
f	frequency range		5	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/√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.

To prevent damage to the optical fibre, a clamp should be fixed at a distance of not less than 26 mm from the cap of the module.

## CAUTION

The device is supplied in an antistatic package and must be protected against static discharge during transport or handling.

## Optical receiver module

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## LIMITING VALUES

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

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; C = 100 pF	500	-	V

## CHARACTERISTICS

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	λ = 1300 nm	750	-	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		60	-	dB
IL <sub>C</sub>	connector optical insertion losses		-	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	buffered fibre; SM type; 9/125 μm; kevlar buffer: 3 mm	817	917	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> = 110.25 MHz; P<sub>q</sub> = 0.33 mW;  
f<sub>r</sub> = 135.25 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.

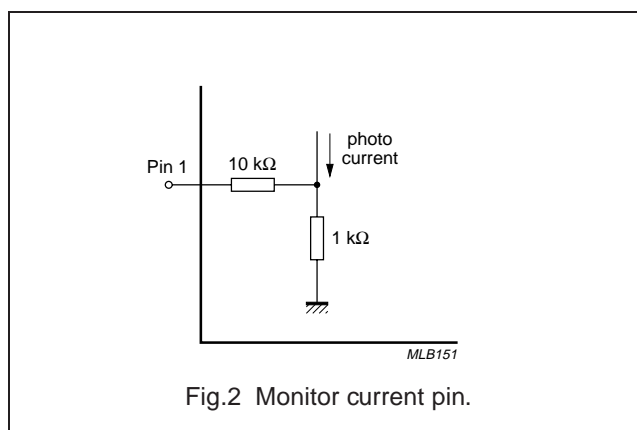


Fig.2 Monitor current pin.

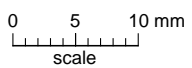
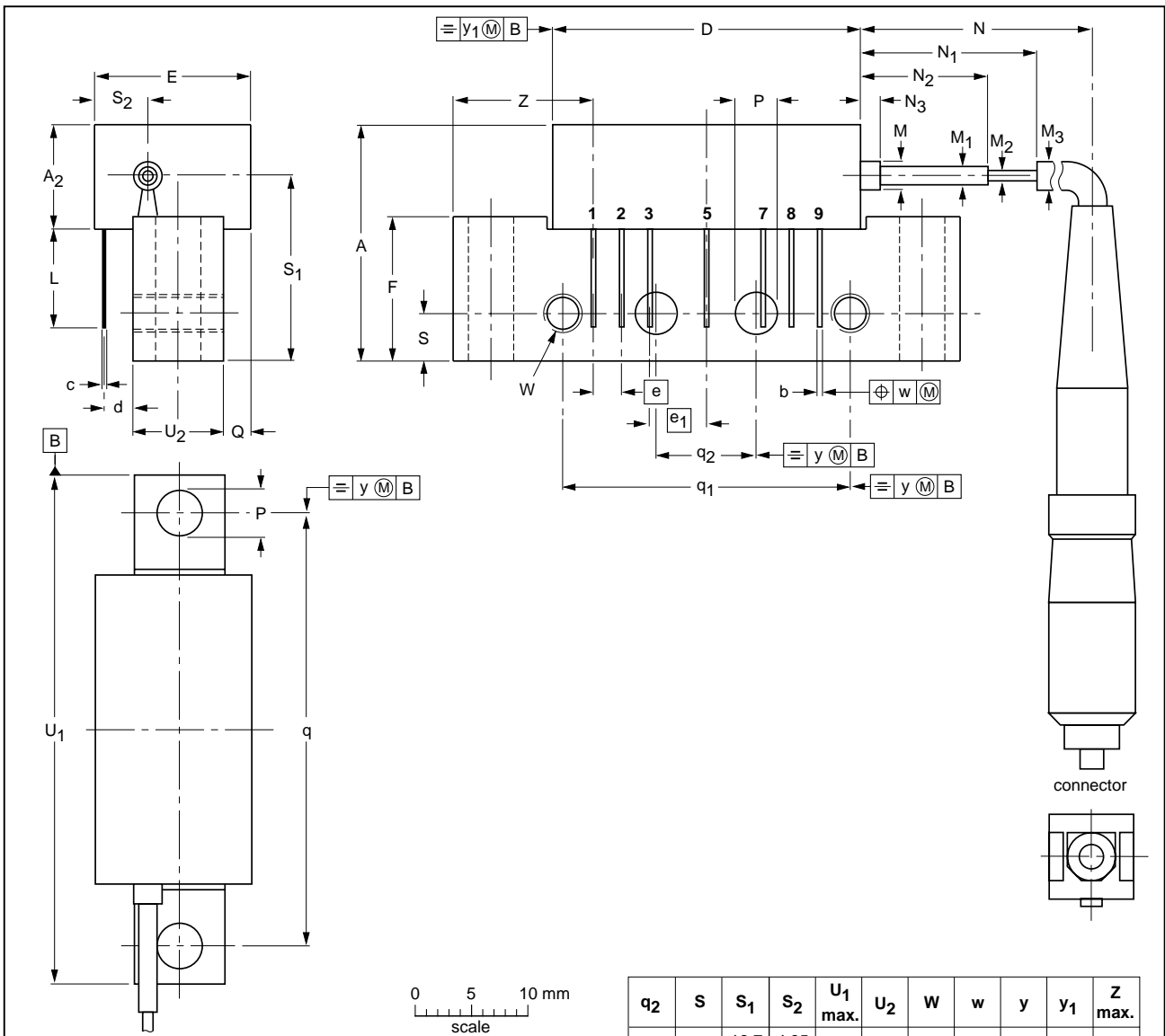
Optical receiver module

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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

SOT115P



q <sub>2</sub>	S	S <sub>1</sub>	S <sub>2</sub>	U <sub>1</sub> max.	U <sub>2</sub>	W	w	y	y <sub>1</sub>	Z max.
10.2	4.2	16.7 16.1	4.95 4.55	44.75	8	6-32 UNC	0.25	0.1	0.2	12

DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A <sub>2</sub> max.	b	c	D max.	d max.	E max.	e	e <sub>1</sub>	F	L min.	M	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	N	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	∅ P	Q max.	q	q <sub>1</sub>
mm	20.8	9.1	0.51 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	917 817	15.3 8.7	10.7 8.7	5 1	4.15 3.85	2.4	38.1	25.4

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT115P						98-03-06

## Optical receiver module

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**DEFINITIONS**

<b>Data Sheet Status</b>	
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.
<b>Limiting values</b>	
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.	
<b>Application information</b>	
Where application information is given, it is advisory and does not form part of the specification.	

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