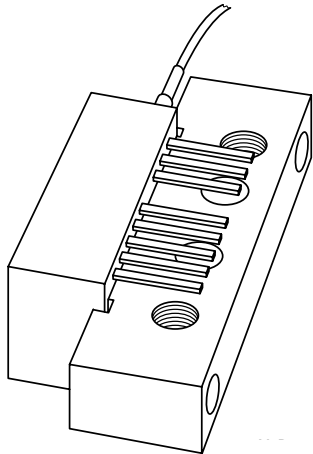


# DATA SHEET



## **BGE847BO; BGE847BO/FC0; BGE847BO/SC0** Optical receiver modules

Product specification  
Supersedes data of 2000 Feb 02

2000 Apr 04

# Optical receiver modules

## BGE847BO; BGE847BO/FC0; BGE847BO/SC0

### FEATURES

- Excellent linearity
- Low noise
- Excellent flatness
- Standard CATV outline
- Rugged construction
- Gold metallization ensures excellent reliability
- High optical input power range.

### APPLICATIONS

CATV optical node systems operating in the 40 to 870 MHz frequency range.

### DESCRIPTION

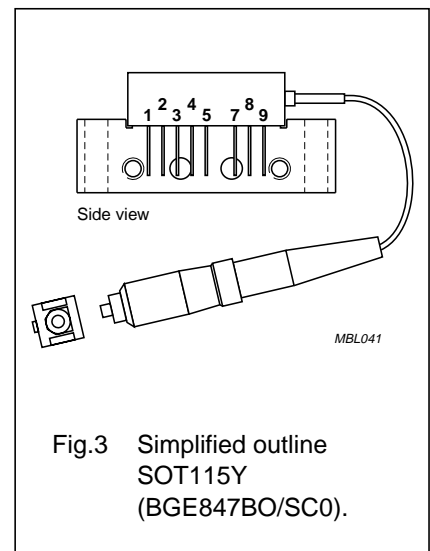
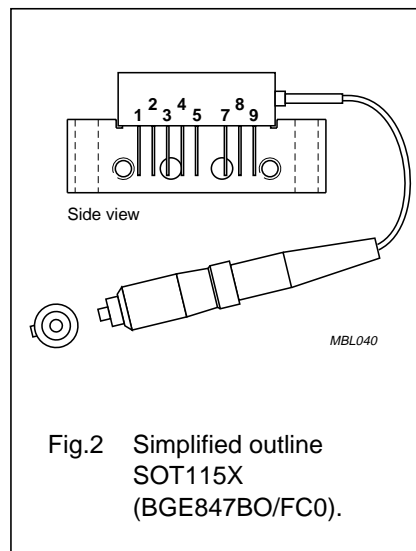
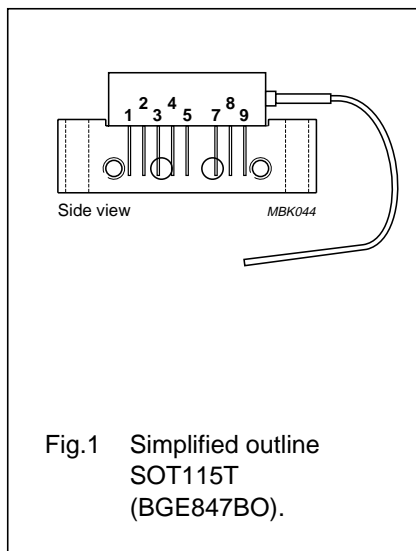
High dynamic range optical receiver amplifier modules in a standard SOT115 package where the non-jacketed fibre has either no connector or has an FC/APC or SC/APC connector.

The amplifier supply voltage pin and the photo diode bias voltage pin both connect to 24 V (DC).

The modules have a monomode optical input suitable for 1290 to 1600 nm wavelengths, a terminal to monitor the photo diode current and an electrical output having a characteristic impedance of 75 Ω.

### PINNING

PIN	DESCRIPTION
1	monitor current
2	common
3	common
4	+V <sub>B</sub> of the photo diode
5	+V <sub>B</sub> of the amplifier
7	common
8	common
9	output



### QUICK REFERENCE DATA

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
f	frequency range		40	870	MHz
S <sub>22</sub>	output return losses	f = 40 to 870 MHz	11	–	dB
	optical input return losses		45	–	dB
d <sub>2</sub>	second order distortion	f = 854.5 MHz	–	–57	dBc
F	equivalent noise input	f = 40 to 450 MHz	–	7	pA/√Hz
I <sub>tot</sub>	total current consumption (DC)	V <sub>B</sub> = 24 V	175	205	mA

### HANDLING

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

## Optical receiver modules

BGE847BO; BGE847BO/FC0;  
BGE847BO/SC0**LIMITING VALUES**

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

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
f	frequency range		40	870	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

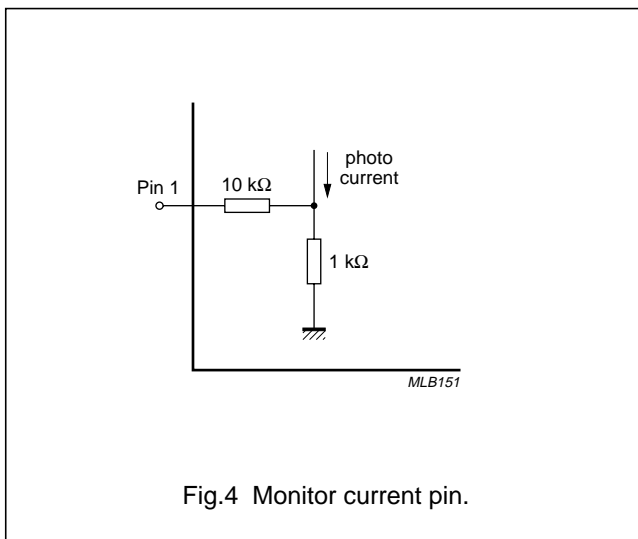
**CHARACTERISTICS**Bandwidth 40 to 870 MHz; V<sub>B</sub> = 24 V; T<sub>mb</sub> = 30 °C; Z<sub>S</sub> = Z<sub>L</sub> = 75 Ω.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
S	responsivity BGE847BO BGE847BO/FC0, BGE847BO/SC0	λ = 1300 nm	800	-	V/W
			750	-	V/W
FL	flatness straight line (peak to valley)	f = 40 to 870 MHz	-	1	dB
S <sub>22</sub>	output return losses	f = 40 to 870 MHz	11	-	dB
	optical input return losses		45	-	dB
d <sub>2</sub>	second order distortion	f <sub>m</sub> = 446.5 MHz; notes 1 and 3	-	-68	dB
		f <sub>m</sub> = 746.5 MHz; notes 1 and 4		-63	dB
		f <sub>m</sub> = 854.5 MHz; notes 1 and 5		-57	dB
d <sub>3</sub>	third order distortion	f <sub>m</sub> = 853.25 MHz; notes 2 and 6	-	-75	dB
F	equivalent noise input	f = 40 to 450 MHz	-	7	pA/√Hz
		f = 450 to 750 MHz	-	9	pA/√Hz
		f = 750 to 870 MHz	-	10.5	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 BGE847BO BGE847BO/FC0, BGE847BO/SC0	fibre; SM type; 9/125 μm	1	-	m
			746	861	mm
I <sub>tot</sub>	total current consumption (DC)		175	205	mA
I <sub>pin 4</sub>	photo diode bias current (DC)		-	25	mA

## Optical receiver modules

BGE847BO; BGE847BO/FC0;  
BGE847BO/SC0**Notes**

1. Two laser test; each laser with a modulation index of 40%;  $P_{\text{opt}} = 1 \text{ mW}$  (total).
2. Three laser test; each laser with a modulation index of 60%;  $P_{\text{opt}} = 1 \text{ mW}$  (total).
3.  $f_m = 446.5 \text{ MHz}$ ;  $f_p = 97.25 \text{ MHz}$ ;  $f_q = 349.25 \text{ MHz}$ .
4.  $f_m = 746.5 \text{ MHz}$ ;  $f_p = 133.25 \text{ MHz}$ ;  $f_q = 613.25 \text{ MHz}$ .
5.  $f_m = 854.5 \text{ MHz}$ ;  $f_p = 133.25 \text{ MHz}$ ;  $f_q = 721.25 \text{ MHz}$ .
6.  $f_m = 853.25 \text{ MHz}$ ;  $f_p = 133.25 \text{ MHz}$ ;  $f_q = 265.25 \text{ MHz}$ ;  $f_r = 721.25 \text{ MHz}$ .



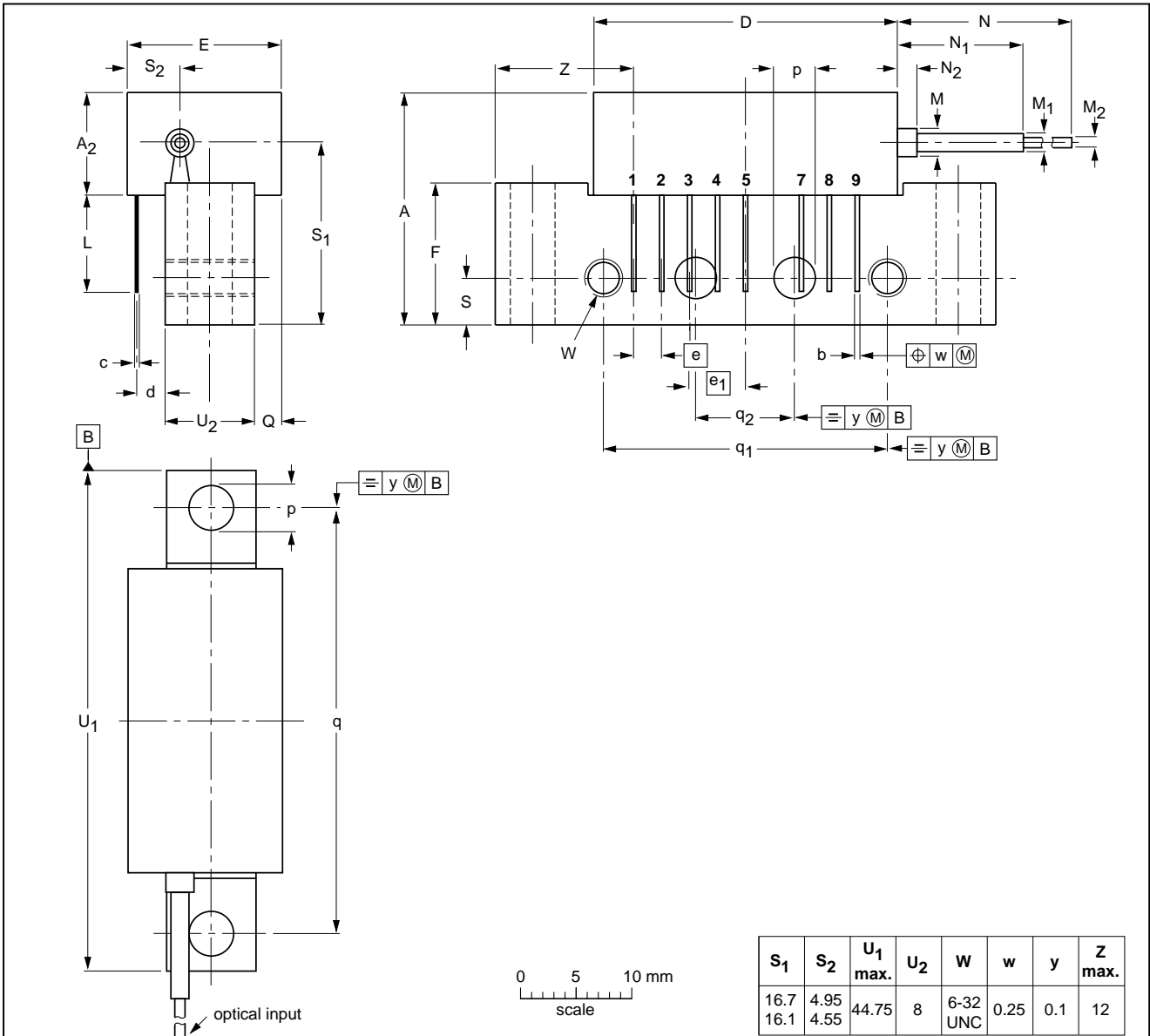
Optical receiver modules

BGE847BO; BGE847BO/FC0;  
BGE847BO/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; 8 gold-plated in-line leads

SOT115T



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>	N min.	N <sub>1</sub>	N <sub>2</sub>	p	Q max.	q	q <sub>1</sub>	q <sub>2</sub>	S
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	1000	10.7 8.7	5 1	4.15 3.85	2.4	38.1	25.4	10.2	4.2

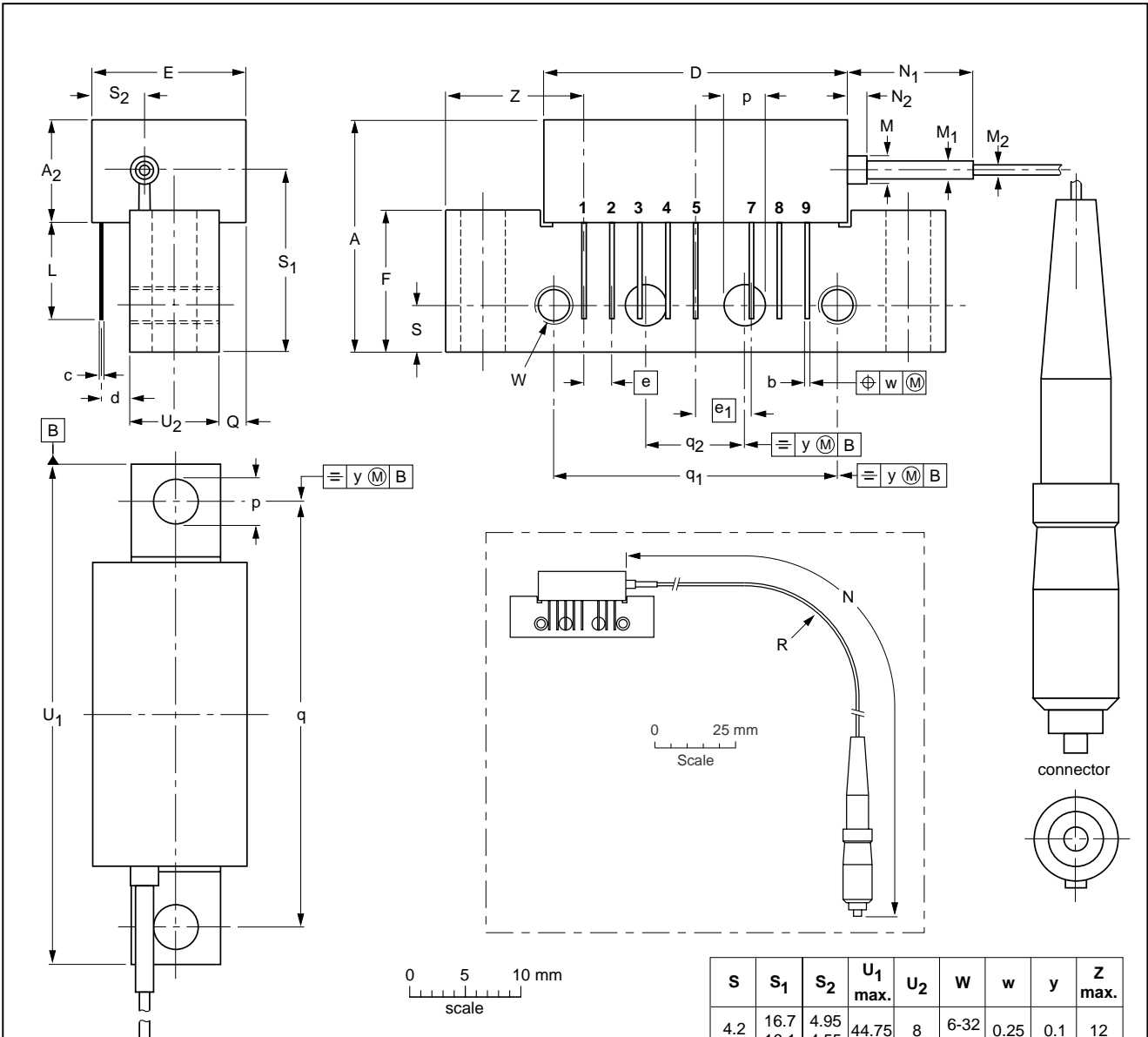
OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT115T					99-04-13

Optical receiver modules

BGE847BO; BGE847BO/FC0;  
BGE847BO/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; 8 gold-plated in-line leads

SOT115X



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>	N	N <sub>1</sub>	N <sub>2</sub>	p	Q max.	q	q <sub>1</sub>	q <sub>2</sub>	R min.	Z max.
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	861 746	10.7 8.7	5 1	4.15 3.85	2.4	38.1	25.4	10.2	35	12

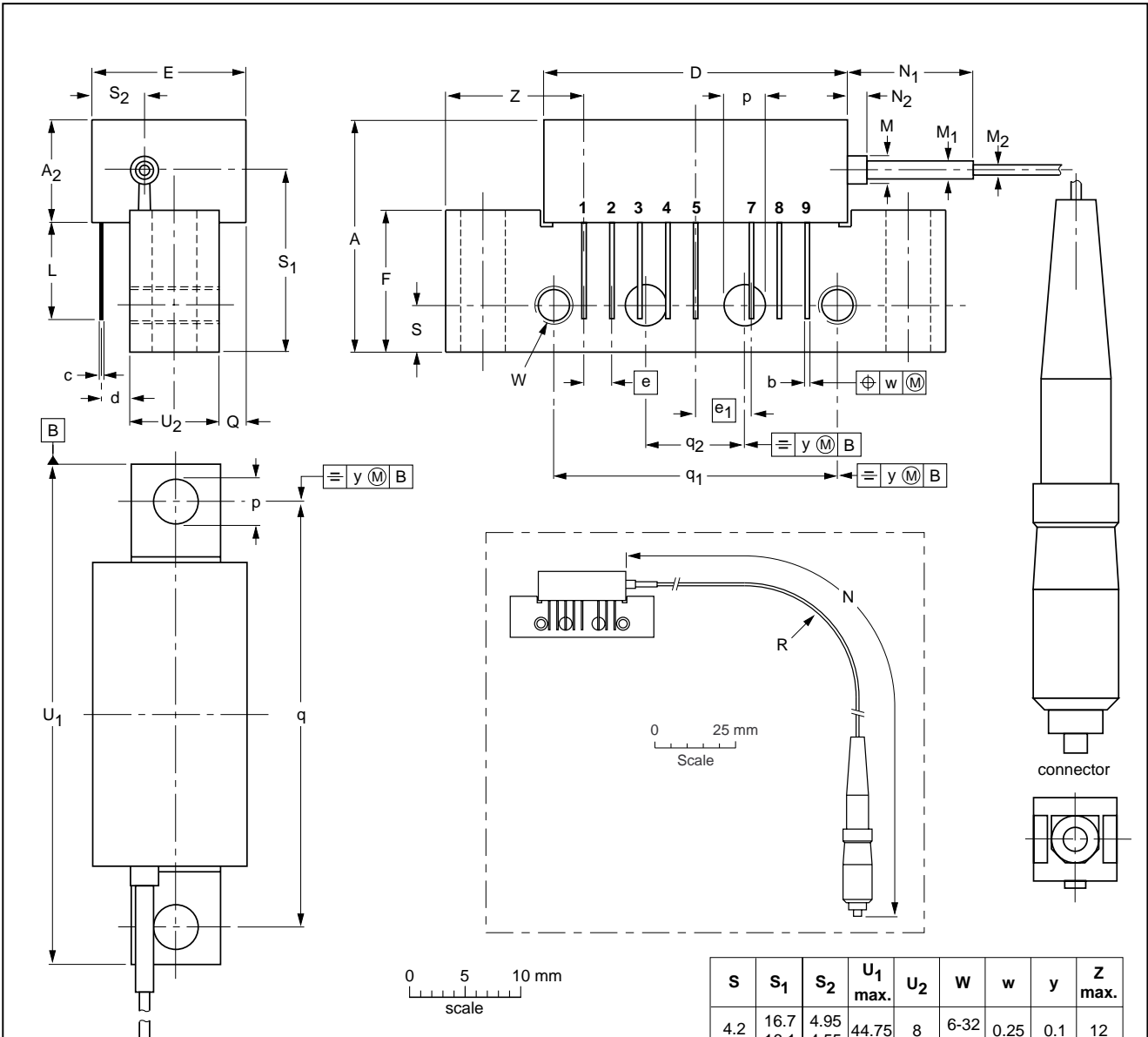
OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT115X					99-06-03- 00-01-06

Optical receiver modules

BGE847BO; BGE847BO/FC0;  
BGE847BO/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; 8 gold-plated in-line leads

SOT115Y



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>	N	N <sub>1</sub>	N <sub>2</sub>	p	Q max.	q	q <sub>1</sub>	q <sub>2</sub>	R min.	Z max.
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	861 746	10.7 8.7	5 1	4.15 3.85	2.4	38.1	25.4	10.2	35	12

OUTLINE VERSION	REFERENCES			EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ		
SOT115Y					99-06-03 00-01-06

## Optical receiver modules

BGE847BO; BGE847BO/FC0;  
BGE847BO/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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Optical receiver modules

BGE847BO; BGE847BO/FC0;  
BGE847BO/SC0

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**NOTES**

Optical receiver modules

BGE847BO; BGE847BO/FC0;  
BGE847BO/SC0

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**NOTES**

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Optical receiver modules

BGE847BO; BGE847BO/FC0;  
BGE847BO/SC0

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# Philips Semiconductors – a worldwide company

**Argentina:** see South America

**Australia:** 3 Figtree Drive, HOMEBUSH, NSW 2140,  
Tel. +61 2 9704 8141, Fax. +61 2 9704 8139

**Austria:** Computerstr. 6, A-1101 WIEN, P.O. Box 213,  
Tel. +43 1 60 101 1248, Fax. +43 1 60 101 1210

**Belarus:** Hotel Minsk Business Center, Bld. 3, r. 1211, Volodarski Str. 6,  
220050 MINSK, Tel. +375 172 20 0733, Fax. +375 172 20 0773

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**Bulgaria:** Philips Bulgaria Ltd., Energoproject, 15th floor,  
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**Canada:** PHILIPS SEMICONDUCTORS/COMPONENTS,  
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**China/Hong Kong:** 501 Hong Kong Industrial Technology Centre,  
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**Czech Republic:** see Austria

**Denmark:** Sydhavnsgade 23, 1780 COPENHAGEN V,  
Tel. +45 33 29 3333, Fax. +45 33 29 3905

**Finland:** Sinikalliontie 3, FIN-02630 ESPOO,  
Tel. +358 9 615 800, Fax. +358 9 6158 0920

**France:** 51 Rue Carnot, BP317, 92156 SURESNES Cedex,  
Tel. +33 1 4099 6161, Fax. +33 1 4099 6427

**Germany:** Hammerbrookstraße 69, D-20097 HAMBURG,  
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**Hungary:** see Austria

**India:** Philips INDIA Ltd, Band Box Building, 2nd floor,  
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Tel. +91 22 493 8541, Fax. +91 22 493 0966

**Indonesia:** PT Philips Development Corporation, Semiconductors Division,  
Gedung Philips, Jl. Buncit Raya Kav.99-100, JAKARTA 12510,  
Tel. +62 21 794 0040 ext. 2501, Fax. +62 21 794 0080

**Ireland:** Newstead, Clonskeagh, DUBLIN 14,  
Tel. +353 1 7640 000, Fax. +353 1 7640 200

**Israel:** RAPAC Electronics, 7 Kehilat Saloniki St, PO Box 18053,  
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**Japan:** Philips Bldg 13-37, Kohnan 2-chome, Minato-ku,  
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**Mexico:** 5900 Gateway East, Suite 200, EL PASO, TEXAS 79905,  
Tel. +9-5 800 234 7381, Fax +9-5 800 943 0087

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**New Zealand:** 2 Wagener Place, C.P.O. Box 1041, AUCKLAND,  
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**Norway:** Box 1, Manglerud 0612, OSLO,  
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**Pakistan:** see Singapore

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**Poland:** Al.Jerozolimskie 195 B, 02-222 WARSAW,  
Tel. +48 22 5710 000, Fax. +48 22 5710 001

**Portugal:** see Spain

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Tel. +27 11 471 5401, Fax. +27 11 471 5398

**South America:** Al. Vicente Pinzon, 173, 6th floor,  
04547-130 SÃO PAULO, SP, Brazil,  
Tel. +55 11 821 2333, Fax. +55 11 821 2382

**Spain:** Balmes 22, 08007 BARCELONA,  
Tel. +34 93 301 6312, Fax. +34 93 301 4107

**Sweden:** Kottbygatan 7, Akalla, S-16485 STOCKHOLM,  
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**Switzerland:** Allmendstrasse 140, CH-8027 ZÜRICH,  
Tel. +41 1 488 2741 Fax. +41 1 488 3263

**Taiwan:** Philips Semiconductors, 6F, No. 96, Chien Kuo N. Rd., Sec. 1,  
TAIPEI, Taiwan Tel. +886 2 2134 2886, Fax. +886 2 2134 2874

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Tel. +66 2 745 4090, Fax. +66 2 398 0793

**Turkey:** Yukari Dudullu, Org. San. Blg., 2.Cad. Nr. 28 81260 Umraniye,  
ISTANBUL, Tel. +90 216 522 1500, Fax. +90 216 522 1813

**Ukraine:** PHILIPS UKRAINE, 4 Patrice Lumumba str., Building B, Floor 7,  
252042 KIEV, Tel. +380 44 264 2776, Fax. +380 44 268 0461

**United Kingdom:** Philips Semiconductors Ltd., 276 Bath Road, Hayes,  
MIDDLESEX UB3 5BX, Tel. +44 208 730 5000, Fax. +44 208 754 8421

**United States:** 811 East Arques Avenue, SUNNYVALE, CA 94088-3409,  
Tel. +1 800 234 7381, Fax. +1 800 943 0087

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**Yugoslavia:** PHILIPS, Trg N. Pasica 5/v, 11000 BEOGRAD,  
Tel. +381 11 3341 299, Fax.+381 11 3342 553

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